# Department of Defense
# Fiscal Year (FY) 2019 Budget Estimates

February 2018

## Army

*Justification Book of*

## *Research, Development, Test & Evaluation, Army*

## RDT&E − Volume III, Budget Activity 7

# Table of Contents

# RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

## APPROPRIATION LANGUAGE

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, $10,484,483,000.00 to remain available for obligation until September 30, 2020.

The following Justification Books were prepared at a cost of $226,413: Aircraft (ACFT), Missile (MSLS), Weapons & Tracked Combat Vehicles (WTCV), Ammunition (AMMO), Other Procurement Army (OPA) 1 - Tactical & Support Vehicles, Other Procurement Army (OPA) 2 – Communications & Electronics, Other Procurement Army (OPA) 3 & 4 - Other Support Equipment & Spares, Research, Development, Test and Evaluation (RDTE) for: Budget Activity 1, Budget Activity 2, Budget Activity 3, Budget Activity 4, Budget Activity 5A, Budget Activity 5B, Budget Activity 6, and Budget Activity 7.

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Appropriation | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO |
|---|---|---|---|---|---|
| Research, Development, Test & Eval, Army | 8,852,507 | 8,273,447 | 8,273,447 | 342,356 | 342,356 |
| Total Research, Development, Test & Evaluation | 8,852,507 | 8,273,447 | 8,273,447 | 342,356 | 342,356 |

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Appropriation | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency |
|---|---|---|---|---|---|---|
| Research, Development, Test & Eval, Army | 20,700 | -20,700 | | 8,636,503 | -20,700 | 8,615,803 |
| Total Research, Development, Test & Evaluation | 20,700 | -20,700 | | 8,636,503 | -20,700 | 8,615,803 |

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Appropriation | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|
| Research, Development, Test & Eval, Army | 10,159,379 | 325,104 | 10,484,483 |
| Total Research, Development, Test & Evaluation | 10,159,379 | 325,104 | 10,484,483 |

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Summary Recap of Budget Activities | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO |
|---|---|---|---|---|---|
| Basic Research | 473,216 | 430,022 | 430,022 | | |
| Applied Research | 1,196,132 | 889,182 | 889,182 | | |
| Advanced Technology Development | 1,351,035 | 1,070,977 | 1,070,977 | | |
| Advanced Component Development & Prototypes | 619,976 | 890,889 | 890,889 | 18,000 | 18,000 |
| System Development & Demonstration | 2,502,560 | 3,012,840 | 3,012,840 | 57,840 | 57,840 |
| RDT&E Management Support | 1,413,481 | 1,253,845 | 1,253,845 | | |
| Operational Systems Development | 1,296,107 | 1,877,685 | 1,877,685 | 43,528 | 43,528 |
| Undistributed | | -1,151,993 | -1,151,993 | 222,988 | 222,988 |
| Total Research, Development, Test & Evaluation | 8,852,507 | 8,273,447 | 8,273,447 | 342,356 | 342,356 |
| **Summary Recap of FYDP Programs** | | | | | |
| General Purpose Forces | 611,072 | 710,401 | 710,401 | 15,000 | 15,000 |
| Intelligence and Communications | 342,648 | 370,519 | 370,519 | 29,728 | 29,728 |
| Research and Development | 7,826,372 | 8,215,942 | 8,215,942 | 74,640 | 74,640 |
| Central Supply and Maintenance | 59,891 | 60,877 | 60,877 | | |
| Administration and Associated Activities | 7,899 | -1,151,993 | -1,151,993 | 222,988 | 222,988 |
| Space | | 60,547 | 60,547 | | |
| Classified Programs | 4,625 | 7,154 | 7,154 | | |
| Total Research, Development, Test & Evaluation | 8,852,507 | 8,273,447 | 8,273,447 | 342,356 | 342,356 |

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Summary Recap of Budget Activities | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency |
|---|---|---|---|---|---|---|
| Basic Research | | | | 430,022 | | 430,022 |
| Applied Research | | | | 889,182 | | 889,182 |
| Advanced Technology Development | 12,000 | -12,000 | | 1,082,977 | -12,000 | 1,070,977 |
| Advanced Component Development & Prototypes | 8,700 | -8,700 | | 917,589 | -8,700 | 908,889 |
| System Development & Demonstration | | | | 3,070,680 | | 3,070,680 |
| RDT&E Management Support | | | | 1,253,845 | | 1,253,845 |
| Operational Systems Development | | | | 1,921,213 | | 1,921,213 |
| Undistributed | | | | -929,005 | | -929,005 |
| Total Research, Development, Test & Evaluation | 20,700 | -20,700 | | 8,636,503 | -20,700 | 8,615,803 |
| **Summary Recap of FYDP Programs** | | | | | | |
| General Purpose Forces | | | | 725,401 | | 725,401 |
| Intelligence and Communications | | | | 400,247 | | 400,247 |
| Research and Development | 20,700 | -20,700 | | 8,311,282 | -20,700 | 8,290,582 |
| Central Supply and Maintenance | | | | 60,877 | | 60,877 |
| Administration and Associated Activities | | | | -929,005 | | -929,005 |
| Space | | | | 60,547 | | 60,547 |
| Classified Programs | | | | 7,154 | | 7,154 |
| Total Research, Development, Test & Evaluation | 20,700 | -20,700 | | 8,636,503 | -20,700 | 8,615,803 |

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Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Summary Recap of Budget Activities | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|
| Basic Research | 445,895 | | 445,895 |
| Applied Research | 919,609 | | 919,609 |
| Advanced Technology Development | 1,026,698 | | 1,026,698 |
| Advanced Component Development & Prototypes | 1,329,393 | 28,500 | 1,357,893 |
| System Development & Demonstration | 3,192,689 | 236,863 | 3,429,552 |
| RDT&E Management Support | 1,322,481 | | 1,322,481 |
| Operational Systems Development | 1,922,614 | 59,741 | 1,982,355 |
| Undistributed | | | |
| Total Research, Development, Test & Evaluation | 10,159,379 | 325,104 | 10,484,483 |

| Summary Recap of FYDP Programs | | | |
|---|---|---|---|
| General Purpose Forces | 783,464 | 10,000 | 793,464 |
| Intelligence and Communications | 313,112 | 40,613 | 353,725 |
| Research and Development | 8,775,582 | 274,491 | 9,050,073 |
| Central Supply and Maintenance | 53,958 | | 53,958 |
| Administration and Associated Activities | | | |
| Space | 227,308 | | 227,308 |
| Classified Programs | 5,955 | | 5,955 |
| Total Research, Development, Test & Evaluation | 10,159,379 | 325,104 | 10,484,483 |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Summary Recap of Budget Activities | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO |
|---|---|---|---|---|---|
| Basic Research | 473,216 | 430,022 | 430,022 | | |
| Applied Research | 1,196,132 | 889,182 | 889,182 | | |
| Advanced Technology Development | 1,351,035 | 1,070,977 | 1,070,977 | | |
| Advanced Component Development & Prototypes | 619,976 | 890,889 | 890,889 | 18,000 | 18,000 |
| System Development & Demonstration | 2,502,560 | 3,012,840 | 3,012,840 | 57,840 | 57,840 |
| RDT&E Management Support | 1,413,481 | 1,253,845 | 1,253,845 | | |
| Operational Systems Development | 1,296,107 | 1,877,685 | 1,877,685 | 43,528 | 43,528 |
| Undistributed | | -1,151,993 | -1,151,993 | 222,988 | 222,988 |
| Total Research, Development, Test & Evaluation | 8,852,507 | 8,273,447 | 8,273,447 | 342,356 | 342,356 |
| **Summary Recap of FYDP Programs** | | | | | |
| General Purpose Forces | 611,072 | 710,401 | 710,401 | 15,000 | 15,000 |
| Intelligence and Communications | 342,648 | 370,519 | 370,519 | 29,728 | 29,728 |
| Research and Development | 7,826,372 | 8,215,942 | 8,215,942 | 74,640 | 74,640 |
| Central Supply and Maintenance | 59,891 | 60,877 | 60,877 | | |
| Administration and Associated Activities | 7,899 | -1,151,993 | -1,151,993 | 222,988 | 222,988 |
| Space | | 60,547 | 60,547 | | |
| Classified Programs | 4,625 | 7,154 | 7,154 | | |
| Total Research, Development, Test & Evaluation | 8,852,507 | 8,273,447 | 8,273,447 | 342,356 | 342,356 |

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Department of the Army
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(Dollars in Thousands)

18 Jan 2018

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|---|---|---|---|---|---|---|
| Basic Research | | | | 430,022 | | 430,022 |
| Applied Research | | | | 889,182 | | 889,182 |
| Advanced Technology Development | 12,000 | -12,000 | | 1,082,977 | -12,000 | 1,070,977 |
| Advanced Component Development & Prototypes | 8,700 | -8,700 | | 917,589 | -8,700 | 908,889 |
| System Development & Demonstration | | | | 3,070,680 | | 3,070,680 |
| RDT&E Management Support | | | | 1,253,845 | | 1,253,845 |
| Operational Systems Development | | | | 1,921,213 | | 1,921,213 |
| Undistributed | | | | -929,005 | | -929,005 |
| Total Research, Development, Test & Evaluation | 20,700 | -20,700 | | 8,636,503 | -20,700 | 8,615,803 |
| **Summary Recap of FYDP Programs** | | | | | | |
| General Purpose Forces | | | | 725,401 | | 725,401 |
| Intelligence and Communications | | | | 400,247 | | 400,247 |
| Research and Development | 20,700 | -20,700 | | 8,311,282 | -20,700 | 8,290,582 |
| Central Supply and Maintenance | | | | 60,877 | | 60,877 |
| Administration and Associated Activities | | | | -929,005 | | -929,005 |
| Space | | | | 60,547 | | 60,547 |
| Classified Programs | | | | 7,154 | | 7,154 |
| Total Research, Development, Test & Evaluation | 20,700 | -20,700 | | 8,636,503 | -20,700 | 8,615,803 |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

| Summary Recap of Budget Activities | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
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| Basic Research | 445,895 | | 445,895 |
| Applied Research | 919,609 | | 919,609 |
| Advanced Technology Development | 1,026,698 | | 1,026,698 |
| Advanced Component Development & Prototypes | 1,329,393 | 28,500 | 1,357,893 |
| System Development & Demonstration | 3,192,689 | 236,863 | 3,429,552 |
| RDT&E Management Support | 1,322,481 | | 1,322,481 |
| Operational Systems Development | 1,922,614 | 59,741 | 1,982,355 |
| Undistributed | | | |
| Total Research, Development, Test & Evaluation | 10,159,379 | 325,104 | 10,484,483 |

| Summary Recap of FYDP Programs | | | |
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| Research and Development | 8,775,582 | 274,491 | 9,050,073 |
| Central Supply and Maintenance | 53,958 | | 53,958 |
| Administration and Associated Activities | | | |
| Space | 227,308 | | 227,308 |
| Classified Programs | 5,955 | | 5,955 |
| Total Research, Development, Test & Evaluation | 10,159,379 | 325,104 | 10,484,483 |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0601101A | In-House Laboratory Independent Research | 01 | 11,936 | 12,010 | 12,010 | | | U |
| 2 | 0601102A | Defense Research Sciences | 01 | 286,086 | 263,590 | 263,590 | | | U |
| 3 | 0601103A | University Research Initiatives | 01 | 66,506 | 67,027 | 67,027 | | | U |
| 4 | 0601104A | University and Industry Research Centers | 01 | 108,688 | 87,395 | 87,395 | | | U |
| | Basic Research | | | 473,216 | 430,022 | 430,022 | | | |
| 5 | 0602105A | Materials Technology | 02 | 81,950 | 29,640 | 29,640 | | | U |
| 6 | 0602120A | Sensors and Electronic Survivability | 02 | 50,574 | 35,730 | 35,730 | | | U |
| 7 | 0602122A | TRACTOR HIP | 02 | 6,995 | 8,627 | 8,627 | | | U |
| 8 | 0602126A | TRACTOR JACK | 02 | | | | | | U |
| 9 | 0602211A | Aviation Technology | 02 | 67,593 | 66,086 | 66,086 | | | U |
| 10 | 0602270A | Electronic Warfare Technology | 02 | 34,528 | 27,144 | 27,144 | | | U |
| 11 | 0602303A | Missile Technology | 02 | 66,173 | 43,742 | 43,742 | | | U |
| 12 | 0602307A | Advanced Weapons Technology | 02 | 52,766 | 22,785 | 22,785 | | | U |
| 13 | 0602308A | Advanced Concepts and Simulation | 02 | 29,767 | 28,650 | 28,650 | | | U |
| 14 | 0602601A | Combat Vehicle and Automotive Technology | 02 | 89,852 | 67,232 | 67,232 | | | U |
| 15 | 0602618A | Ballistics Technology | 02 | 103,484 | 85,309 | 85,309 | | | U |
| 16 | 0602622A | Chemical, Smoke and Equipment Defeating Technology | 02 | 3,772 | 4,004 | 4,004 | | | U |
| 17 | 0602623A | Joint Service Small Arms Program | 02 | 5,331 | 5,615 | 5,615 | | | U |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0601101A | In-House Laboratory Independent Research | 01 | | | | 12,010 | | 12,010 | U |
| 2 | 0601102A | Defense Research Sciences | 01 | | | | 263,590 | | 263,590 | U |
| 3 | 0601103A | University Research Initiatives | 01 | | | | 67,027 | | 67,027 | U |
| 4 | 0601104A | University and Industry Research Centers | 01 | | | | 87,395 | | 87,395 | U |
| | | Basic Research | | | | | 430,022 | | 430,022 | |
| 5 | 0602105A | Materials Technology | 02 | | | | 29,640 | | 29,640 | U |
| 6 | 0602120A | Sensors and Electronic Survivability | 02 | | | | 35,730 | | 35,730 | U |
| 7 | 0602122A | TRACTOR HIP | 02 | | | | 8,627 | | 8,627 | U |
| 8 | 0602126A | TRACTOR JACK | 02 | | | | | | | U |
| 9 | 0602211A | Aviation Technology | 02 | | | | 66,086 | | 66,086 | U |
| 10 | 0602270A | Electronic Warfare Technology | 02 | | | | 27,144 | | 27,144 | U |
| 11 | 0602303A | Missile Technology | 02 | | | | 43,742 | | 43,742 | U |
| 12 | 0602307A | Advanced Weapons Technology | 02 | | | | 22,785 | | 22,785 | U |
| 13 | 0602308A | Advanced Concepts and Simulation | 02 | | | | 28,650 | | 28,650 | U |
| 14 | 0602601A | Combat Vehicle and Automotive Technology | 02 | | | | 67,232 | | 67,232 | U |
| 15 | 0602618A | Ballistics Technology | 02 | | | | 85,309 | | 85,309 | U |
| 16 | 0602622A | Chemical, Smoke and Equipment Defeating Technology | 02 | | | | 4,004 | | 4,004 | U |
| 17 | 0602623A | Joint Service Small Arms Program | 02 | | | | 5,615 | | 5,615 | U |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 1 | 0601101A | In-House Laboratory Independent Research | 01 | 11,585 | | 11,585 | U |
| 2 | 0601102A | Defense Research Sciences | 01 | 276,912 | | 276,912 | U |
| 3 | 0601103A | University Research Initiatives | 01 | 65,283 | | 65,283 | U |
| 4 | 0601104A | University and Industry Research Centers | 01 | 92,115 | | 92,115 | U |
| | | Basic Research | | 445,895 | | 445,895 | |
| 5 | 0602105A | Materials Technology | 02 | 28,600 | | 28,600 | U |
| 6 | 0602120A | Sensors and Electronic Survivability | 02 | 32,366 | | 32,366 | U |
| 7 | 0602122A | TRACTOR HIP | 02 | 8,674 | | 8,674 | U |
| 8 | 0602126A | TRACTOR JACK | 02 | 400 | | 400 | U |
| 9 | 0602211A | Aviation Technology | 02 | 64,847 | | 64,847 | U |
| 10 | 0602270A | Electronic Warfare Technology | 02 | 25,571 | | 25,571 | U |
| 11 | 0602303A | Missile Technology | 02 | 50,183 | | 50,183 | U |
| 12 | 0602307A | Advanced Weapons Technology | 02 | 29,502 | | 29,502 | U |
| 13 | 0602308A | Advanced Concepts and Simulation | 02 | 28,500 | | 28,500 | U |
| 14 | 0602601A | Combat Vehicle and Automotive Technology | 02 | 70,450 | | 70,450 | U |
| 15 | 0602618A | Ballistics Technology | 02 | 75,541 | | 75,541 | U |
| 16 | 0602622A | Chemical, Smoke and Equipment Defeating Technology | 02 | 5,032 | | 5,032 | U |
| 17 | 0602623A | Joint Service Small Arms Program | 02 | 12,394 | | 12,394 | U |

Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 18 | 0602624A | Weapons and Munitions Technology | 02 | 118,068 | 41,455 | 41,455 | | | U |
| 19 | 0602705A | Electronics and Electronic Devices | 02 | 72,979 | 58,352 | 58,352 | | | U |
| 20 | 0602709A | Night Vision Technology | 02 | 34,762 | 34,723 | 34,723 | | | U |
| 21 | 0602712A | Countermine Systems | 02 | 29,495 | 26,190 | 26,190 | | | U |
| 22 | 0602716A | Human Factors Engineering Technology | 02 | 23,359 | 24,127 | 24,127 | | | U |
| 23 | 0602720A | Environmental Quality Technology | 02 | 21,553 | 21,678 | 21,678 | | | U |
| 24 | 0602782A | Command, Control, Communications Technology | 02 | 36,396 | 33,123 | 33,123 | | | U |
| 25 | 0602783A | Computer and Software Technology | 02 | 13,452 | 14,041 | 14,041 | | | U |
| 26 | 0602784A | Military Engineering Technology | 02 | 92,140 | 67,720 | 67,720 | | | U |
| 27 | 0602785A | Manpower/Personnel/Training Technology | 02 | 23,475 | 20,216 | 20,216 | | | U |
| 28 | 0602786A | Warfighter Technology | 02 | 59,327 | 39,559 | 39,559 | | | U |
| 29 | 0602787A | Medical Technology | 02 | 78,341 | 83,434 | 83,434 | | | U |
| | | Applied Research | | 1,196,132 | 889,182 | 889,182 | | | |
| 30 | 0603001A | Warfighter Advanced Technology | 03 | 50,004 | 44,863 | 44,863 | | | U |
| 31 | 0603002A | Medical Advanced Technology | 03 | 106,040 | 67,780 | 67,780 | | | U |
| 32 | 0603003A | Aviation Advanced Technology | 03 | 111,654 | 160,746 | 160,746 | | | U |
| 33 | 0603004A | Weapons and Munitions Advanced Technology | 03 | 198,245 | 84,079 | 84,079 | | | U |
| 34 | 0603005A | Combat Vehicle and Automotive Advanced Technology | 03 | 163,501 | 125,537 | 125,537 | | | U |

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Department of the Army
FY 2019 President's Budget
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Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 | 0602624A | Weapons and Munitions Technology | 02 | | | | 41,455 | | 41,455 | U |
| 19 | 0602705A | Electronics and Electronic Devices | 02 | | | | 58,352 | | 58,352 | U |
| 20 | 0602709A | Night Vision Technology | 02 | | | | 34,723 | | 34,723 | U |
| 21 | 0602712A | Countermine Systems | 02 | | | | 26,190 | | 26,190 | U |
| 22 | 0602716A | Human Factors Engineering Technology | 02 | | | | 24,127 | | 24,127 | U |
| 23 | 0602720A | Environmental Quality Technology | 02 | | | | 21,678 | | 21,678 | U |
| 24 | 0602782A | Command, Control, Communications Technology | 02 | | | | 33,123 | | 33,123 | U |
| 25 | 0602783A | Computer and Software Technology | 02 | | | | 14,041 | | 14,041 | U |
| 26 | 0602784A | Military Engineering Technology | 02 | | | | 67,720 | | 67,720 | U |
| 27 | 0602785A | Manpower/Personnel/Training Technology | 02 | | | | 20,216 | | 20,216 | U |
| 28 | 0602786A | Warfighter Technology | 02 | | | | 39,559 | | 39,559 | U |
| 29 | 0602787A | Medical Technology | 02 | | | | 83,434 | | 83,434 | U |
| | | Applied Research | | | | | 889,182 | | 889,182 | |
| 30 | 0603001A | Warfighter Advanced Technology | 03 | | | | 44,863 | | 44,863 | U |
| 31 | 0603002A | Medical Advanced Technology | 03 | | | | 67,780 | | 67,780 | U |
| 32 | 0603003A | Aviation Advanced Technology | 03 | | | | 160,746 | | 160,746 | U |
| 33 | 0603004A | Weapons and Munitions Advanced Technology | 03 | | | | 84,079 | | 84,079 | U |
| 34 | 0603005A | Combat Vehicle and Automotive Advanced Technology | 03 | | | | 125,537 | | 125,537 | U |

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Total Obligational Authority
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18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 18 | 0602624A | Weapons and Munitions Technology | 02 | 40,444 | | 40,444 | U |
| 19 | 0602705A | Electronics and Electronic Devices | 02 | 58,283 | | 58,283 | U |
| 20 | 0602709A | Night Vision Technology | 02 | 29,582 | | 29,582 | U |
| 21 | 0602712A | Countermine Systems | 02 | 21,244 | | 21,244 | U |
| 22 | 0602716A | Human Factors Engineering Technology | 02 | 24,131 | | 24,131 | U |
| 23 | 0602720A | Environmental Quality Technology | 02 | 13,242 | | 13,242 | U |
| 24 | 0602782A | Command, Control, Communications Technology | 02 | 55,003 | | 55,003 | U |
| 25 | 0602783A | Computer and Software Technology | 02 | 14,958 | | 14,958 | U |
| 26 | 0602784A | Military Engineering Technology | 02 | 78,159 | | 78,159 | U |
| 27 | 0602785A | Manpower/Personnel/Training Technology | 02 | 21,862 | | 21,862 | U |
| 28 | 0602786A | Warfighter Technology | 02 | 40,566 | | 40,566 | U |
| 29 | 0602787A | Medical Technology | 02 | 90,075 | | 90,075 | U |
| | | Applied Research | | 919,609 | | 919,609 | |
| 30 | 0603001A | Warfighter Advanced Technology | 03 | 39,338 | | 39,338 | U |
| 31 | 0603002A | Medical Advanced Technology | 03 | 62,496 | | 62,496 | U |
| 32 | 0603003A | Aviation Advanced Technology | 03 | 124,958 | | 124,958 | U |
| 33 | 0603004A | Weapons and Munitions Advanced Technology | 03 | 102,686 | | 102,686 | U |
| 34 | 0603005A | Combat Vehicle and Automotive Advanced Technology | 03 | 119,739 | | 119,739 | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 35 | 0603006A | Space Application Advanced Technology | 03 | 3,787 | 12,231 | 12,231 | | | U |
| 36 | 0603007A | Manpower, Personnel and Training Advanced Technology | 03 | 12,110 | 6,466 | 6,466 | | | U |
| 37 | 0603009A | TRACTOR HIKE | 03 | 21,374 | 28,552 | 28,552 | | | U |
| 38 | 0603015A | Next Generation Training & Simulation Systems | 03 | 18,238 | 16,434 | 16,434 | | | U |
| 39 | 0603020A | TRACTOR ROSE | 03 | 11,910 | | | | | U |
| 40 | 0603125A | Combating Terrorism - Technology Development | 03 | 33,553 | 26,903 | 26,903 | | | U |
| 41 | 0603130A | TRACTOR NAIL | 03 | 2,340 | 4,880 | 4,880 | | | U |
| 42 | 0603131A | TRACTOR EGGS | 03 | 2,470 | 4,326 | 4,326 | | | U |
| 43 | 0603270A | Electronic Warfare Technology | 03 | 40,819 | 31,296 | 31,296 | | | U |
| 44 | 0603313A | Missile and Rocket Advanced Technology | 03 | 113,683 | 62,850 | 62,850 | | | U |
| 45 | 0603322A | TRACTOR CAGE | 03 | 11,107 | 12,323 | 12,323 | | | U |
| 46 | 0603461A | High Performance Computing Modernization Program | 03 | 215,462 | 182,331 | 182,331 | | | U |
| 47 | 0603606A | Landmine Warfare and Barrier Advanced Technology | 03 | 16,798 | 17,948 | 17,948 | | | U |
| 48 | 0603607A | Joint Service Small Arms Program | 03 | 5,615 | 5,796 | 5,796 | | | U |
| 49 | 0603710A | Night Vision Advanced Technology | 03 | 42,798 | 47,135 | 47,135 | | | U |
| 50 | 0603728A | Environmental Quality Technology Demonstrations | 03 | 21,415 | 10,421 | 10,421 | | | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 0603006A | Space Application Advanced Technology | 03 | | | | 12,231 | | 12,231 | U |
| 36 | 0603007A | Manpower, Personnel and Training Advanced Technology | 03 | | | | 6,466 | | 6,466 | U |
| 37 | 0603009A | TRACTOR HIKE | 03 | 12,000 | -12,000 | | 40,552 | -12,000 | 28,552 | U |
| 38 | 0603015A | Next Generation Training & Simulation Systems | 03 | | | | 16,434 | | 16,434 | U |
| 39 | 0603020A | TRACTOR ROSE | 03 | | | | | | | U |
| 40 | 0603125A | Combating Terrorism - Technology Development | 03 | | | | 26,903 | | 26,903 | U |
| 41 | 0603130A | TRACTOR NAIL | 03 | | | | 4,880 | | 4,880 | U |
| 42 | 0603131A | TRACTOR EGGS | 03 | | | | 4,326 | | 4,326 | U |
| 43 | 0603270A | Electronic Warfare Technology | 03 | | | | 31,296 | | 31,296 | U |
| 44 | 0603313A | Missile and Rocket Advanced Technology | 03 | | | | 62,850 | | 62,850 | U |
| 45 | 0603322A | TRACTOR CAGE | 03 | | | | 12,323 | | 12,323 | U |
| 46 | 0603461A | High Performance Computing Modernization Program | 03 | | | | 182,331 | | 182,331 | U |
| 47 | 0603606A | Landmine Warfare and Barrier Advanced Technology | 03 | | | | 17,948 | | 17,948 | U |
| 48 | 0603607A | Joint Service Small Arms Program | 03 | | | | 5,796 | | 5,796 | U |
| 49 | 0603710A | Night Vision Advanced Technology | 03 | | | | 47,135 | | 47,135 | U |
| 50 | 0603728A | Environmental Quality Technology Demonstrations | 03 | | | | 10,421 | | 10,421 | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 35 | 0603006A | Space Application Advanced Technology | 03 | 13,000 | | 13,000 | U |
| 36 | 0603007A | Manpower, Personnel and Training Advanced Technology | 03 | 8,044 | | 8,044 | U |
| 37 | 0603009A | TRACTOR HIKE | 03 | 22,631 | | 22,631 | U |
| 38 | 0603015A | Next Generation Training & Simulation Systems | 03 | 25,682 | | 25,682 | U |
| 39 | 0603020A | TRACTOR ROSE | 03 | | | | U |
| 40 | 0603125A | Combating Terrorism - Technology Development | 03 | 3,762 | | 3,762 | U |
| 41 | 0603130A | TRACTOR NAIL | 03 | 4,896 | | 4,896 | U |
| 42 | 0603131A | TRACTOR EGGS | 03 | 6,041 | | 6,041 | U |
| 43 | 0603270A | Electronic Warfare Technology | 03 | 31,491 | | 31,491 | U |
| 44 | 0603313A | Missile and Rocket Advanced Technology | 03 | 61,132 | | 61,132 | U |
| 45 | 0603322A | TRACTOR CAGE | 03 | 16,845 | | 16,845 | U |
| 46 | 0603461A | High Performance Computing Modernization Program | 03 | 183,322 | | 183,322 | U |
| 47 | 0603606A | Landmine Warfare and Barrier Advanced Technology | 03 | 11,104 | | 11,104 | U |
| 48 | 0603607A | Joint Service Small Arms Program | 03 | 5,885 | | 5,885 | U |
| 49 | 0603710A | Night Vision Advanced Technology | 03 | 61,376 | | 61,376 | U |
| 50 | 0603728A | Environmental Quality Technology Demonstrations | 03 | 9,136 | | 9,136 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 51 | 0603734A | Military Engineering Advanced Technology | 03 | 59,101 | 32,448 | 32,448 | | | U |
| 52 | 0603772A | Advanced Tactical Computer Science and Sensor Technology | 03 | 52,572 | 52,206 | 52,206 | | | U |
| 53 | 0603794A | C3 Advanced Technology | 03 | 36,439 | 33,426 | 33,426 | | | U |
| | | Advanced Technology Development | | 1,351,035 | 1,070,977 | 1,070,977 | | | |
| 54 | 0603305A | Army Missle Defense Systems Integration | 04 | 39,395 | 9,634 | 9,634 | | | U |
| 55 | 0603308A | Army Space Systems Integration | 04 | 32,278 | | | | | U |
| 56 | 0603327A | Air and Missile Defense Systems Engineering | 04 | 6,100 | 33,949 | 33,949 | 15,000 | 15,000 | U |
| 57 | 0603619A | Landmine Warfare and Barrier - Adv Dev | 04 | 65,062 | 72,909 | 72,909 | | | U |
| 58 | 0603627A | Smoke, Obscurant and Target Defeating Sys-Adv Dev | 04 | 43,177 | 7,135 | 7,135 | | | U |
| 59 | 0603639A | Tank and Medium Caliber Ammunition | 04 | 47,745 | 41,452 | 41,452 | | | U |
| 60 | 0603645A | Armored System Modernization - Adv Dev | 04 | | 32,739 | 32,739 | | | U |
| 61 | 0603747A | Soldier Support and Survivability | 04 | 13,607 | 10,157 | 10,157 | 3,000 | 3,000 | U |
| 62 | 0603766A | Tactical Electronic Surveillance System - Adv Dev | 04 | 15,730 | 27,733 | 27,733 | | | U |
| 63 | 0603774A | Night Vision Systems Advanced Development | 04 | 9,930 | 12,347 | 12,347 | | | U |
| 64 | 0603779A | Environmental Quality Technology - Dem/Val | 04 | 7,480 | 10,456 | 10,456 | | | U |

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| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 51 | 0603734A | Military Engineering Advanced Technology | 03 | | | | 32,448 | | 32,448 | U |
| 52 | 0603772A | Advanced Tactical Computer Science and Sensor Technology | 03 | | | | 52,206 | | 52,206 | U |
| 53 | 0603794A | C3 Advanced Technology | 03 | | | | 33,426 | | 33,426 | U |
| | | Advanced Technology Development | | 12,000 | -12,000 | | 1,082,977 | -12,000 | 1,070,977 | |
| 54 | 0603305A | Army Missle Defense Systems Integration | 04 | | | | 9,634 | | 9,634 | U |
| 55 | 0603308A | Army Space Systems Integration | 04 | | | | | | | U |
| 56 | 0603327A | Air and Missile Defense Systems Engineering | 04 | 8,700 | -8,700 | | 57,649 | -8,700 | 48,949 | U |
| 57 | 0603619A | Landmine Warfare and Barrier - Adv Dev | 04 | | | | 72,909 | | 72,909 | U |
| 58 | 0603627A | Smoke, Obscurant and Target Defeating Sys-Adv Dev | 04 | | | | 7,135 | | 7,135 | U |
| 59 | 0603639A | Tank and Medium Caliber Ammunition | 04 | | | | 41,452 | | 41,452 | U |
| 60 | 0603645A | Armored System Modernization - Adv Dev | 04 | | | | 32,739 | | 32,739 | U |
| 61 | 0603747A | Soldier Support and Survivability | 04 | | | | 13,157 | | 13,157 | U |
| 62 | 0603766A | Tactical Electronic Surveillance System - Adv Dev | 04 | | | | 27,733 | | 27,733 | U |
| 63 | 0603774A | Night Vision Systems Advanced Development | 04 | | | | 12,347 | | 12,347 | U |
| 64 | 0603779A | Environmental Quality Technology - Dem/Val | 04 | | | | 10,456 | | 10,456 | U |

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| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 51 | 0603734A | Military Engineering Advanced Technology | 03 | 25,864 | | 25,864 | U |
| 52 | 0603772A | Advanced Tactical Computer Science and Sensor Technology | 03 | 34,883 | | 34,883 | U |
| 53 | 0603794A | C3 Advanced Technology | 03 | 52,387 | | 52,387 | U |
| | | Advanced Technology Development | | 1,026,698 | | 1,026,698 | |
| 54 | 0603305A | Army Missle Defense Systems Integration | 04 | 10,777 | | 10,777 | U |
| 55 | 0603308A | Army Space Systems Integration | 04 | | | | U |
| 56 | 0603327A | Air and Missile Defense Systems Engineering | 04 | 42,802 | 1,000 | 43,802 | U |
| 57 | 0603619A | Landmine Warfare and Barrier - Adv Dev | 04 | 45,254 | | 45,254 | U |
| 58 | 0603627A | Smoke, Obscurant and Target Defeating Sys-Adv Dev | 04 | 22,700 | 1,500 | 24,200 | U |
| 59 | 0603639A | Tank and Medium Caliber Ammunition | 04 | 41,974 | | 41,974 | U |
| 60 | 0603645A | Armored System Modernization - Adv Dev | 04 | 119,395 | | 119,395 | U |
| 61 | 0603747A | Soldier Support and Survivability | 04 | 8,746 | 3,000 | 11,746 | U |
| 62 | 0603766A | Tactical Electronic Surveillance System - Adv Dev | 04 | 35,667 | | 35,667 | U |
| 63 | 0603774A | Night Vision Systems Advanced Development | 04 | 7,350 | | 7,350 | U |
| 64 | 0603779A | Environmental Quality Technology - Dem/Val | 04 | 14,749 | | 14,749 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 65 | 0603790A | NATO Research and Development | 04 | 2,211 | 2,588 | 2,588 | | | U |
| 66 | 0603801A | Aviation - Adv Dev | 04 | 7,702 | 14,055 | 14,055 | | | U |
| 67 | 0603804A | Logistics and Engineer Equipment - Adv Dev | 04 | 17,445 | 35,333 | 35,333 | | | U |
| 68 | 0603807A | Medical Systems - Adv Dev | 04 | 47,336 | 33,491 | 33,491 | | | U |
| 69 | 0603827A | Soldier Systems - Advanced Development | 04 | 54,497 | 20,239 | 20,239 | | | U |
| 70 | 0604017A | Robotics Development | 04 | | 39,608 | 39,608 | | | U |
| 71 | 0604020A | Cross Functional Team (CFT) Advanced Development & Prototyping | 04 | | | | | | U |
| 72 | 0604100A | Analysis Of Alternatives | 04 | 6,354 | 9,921 | 9,921 | | | U |
| 73 | 0604113A | Future Tactical Unmanned Aircraft System (FTUAS) | 04 | | | | | | U |
| 74 | 0604114A | Lower Tier Air Missile Defense (LTAMD) Sensor | 04 | 33,780 | 76,728 | 76,728 | | | U |
| 75 | 0604115A | Technology Maturation Initiatives | 04 | 57,737 | 115,221 | 115,221 | | | U |
| 76 | 0604117A | Maneuver - Short Range Air Defense (M-SHORAD) | 04 | | 20,000 | 20,000 | | | U |
| 77 | 0604118A | TRACTOR BEAM | 04 | | 10,400 | 10,400 | | | U |
| 78 | 0604120A | Assured Positioning, Navigation and Timing (PNT) | 04 | 83,074 | 164,967 | 164,967 | | | U |
| 79 | 0604121A | Synthetic Training Environment Refinement & Prototyping | 04 | | 1,600 | 1,600 | | | U |

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| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 65 | 0603790A | NATO Research and Development | 04 | | | | 2,588 | | 2,588 | U |
| 66 | 0603801A | Aviation - Adv Dev | 04 | | | | 14,055 | | 14,055 | U |
| 67 | 0603804A | Logistics and Engineer Equipment - Adv Dev | 04 | | | | 35,333 | | 35,333 | U |
| 68 | 0603807A | Medical Systems - Adv Dev | 04 | | | | 33,491 | | 33,491 | U |
| 69 | 0603827A | Soldier Systems - Advanced Development | 04 | | | | 20,239 | | 20,239 | U |
| 70 | 0604017A | Robotics Development | 04 | | | | 39,608 | | 39,608 | U |
| 71 | 0604020A | Cross Functional Team (CFT) Advanced Development & Prototyping | 04 | | | | | | | U |
| 72 | 0604100A | Analysis Of Alternatives | 04 | | | | 9,921 | | 9,921 | U |
| 73 | 0604113A | Future Tactical Unmanned Aircraft System (FTUAS) | 04 | | | | | | | U |
| 74 | 0604114A | Lower Tier Air Missile Defense (LTAMD) Sensor | 04 | | | | 76,728 | | 76,728 | U |
| 75 | 0604115A | Technology Maturation Initiatives | 04 | | | | 115,221 | | 115,221 | U |
| 76 | 0604117A | Maneuver - Short Range Air Defense (M-SHORAD) | 04 | | | | 20,000 | | 20,000 | U |
| 77 | 0604118A | TRACTOR BEAM | 04 | | | | 10,400 | | 10,400 | U |
| 78 | 0604120A | Assured Positioning, Navigation and Timing (PNT) | 04 | | | | 164,967 | | 164,967 | U |
| 79 | 0604121A | Synthetic Training Environment Refinement & Prototyping | 04 | | | | 1,600 | | 1,600 | U |

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| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 65 | 0603790A | NATO Research and Development | 04 | 3,687 | | 3,687 | U |
| 66 | 0603801A | Aviation - Adv Dev | 04 | 10,793 | | 10,793 | U |
| 67 | 0603804A | Logistics and Engineer Equipment - Adv Dev | 04 | 14,248 | | 14,248 | U |
| 68 | 0603807A | Medical Systems - Adv Dev | 04 | 34,284 | | 34,284 | U |
| 69 | 0603827A | Soldier Systems - Advanced Development | 04 | 18,044 | | 18,044 | U |
| 70 | 0604017A | Robotics Development | 04 | 95,660 | | 95,660 | U |
| 71 | 0604020A | Cross Functional Team (CFT) Advanced Development & Prototyping | 04 | 38,000 | | 38,000 | U |
| 72 | 0604100A | Analysis Of Alternatives | 04 | 9,765 | | 9,765 | U |
| 73 | 0604113A | Future Tactical Unmanned Aircraft System (FTUAS) | 04 | 12,393 | | 12,393 | U |
| 74 | 0604114A | Lower Tier Air Missile Defense (LTAMD) Sensor | 04 | 120,374 | | 120,374 | U |
| 75 | 0604115A | Technology Maturation Initiatives | 04 | 95,347 | | 95,347 | U |
| 76 | 0604117A | Maneuver - Short Range Air Defense (M-SHORAD) | 04 | 95,085 | 23,000 | 118,085 | U |
| 77 | 0604118A | TRACTOR BEAM | 04 | 52,894 | | 52,894 | U |
| 78 | 0604120A | Assured Positioning, Navigation and Timing (PNT) | 04 | | | | U |
| 79 | 0604121A | Synthetic Training Environment Refinement & Prototyping | 04 | 77,939 | | 77,939 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 80 | 0604319A | Indirect Fire Protection Capability Increment 2-Intercept (IFPC2) | 04 | | 11,303 | 11,303 | | | U |
| 81 | 0305251A | Cyberspace Operations Forces and Force Support | 04 | 29,336 | 56,492 | 56,492 | | | U |
| 82 | 1206120A | Assured Positioning, Navigation and Timing (PNT) | 04 | | | | | | U |
| 83 | 1206308A | Army Space Systems Integration | 04 | | 20,432 | 20,432 | | | U |
| | | Advanced Component Development & Prototypes | | 619,976 | 890,889 | 890,889 | 18,000 | 18,000 | |
| 84 | 0604201A | Aircraft Avionics | 05 | 54,915 | 30,153 | 30,153 | | | U |
| 85 | 0604270A | Electronic Warfare Development | 05 | 33,419 | 71,671 | 71,671 | | | U |
| 86 | 0604290A | Mid-tier Networking Vehicular Radio (MNVR) | 05 | 9,363 | 10,589 | 10,589 | | | U |
| 87 | 0604321A | All Source Analysis System | 05 | 11,958 | 4,774 | 4,774 | | | U |
| 88 | 0604328A | TRACTOR CAGE | 05 | 12,525 | 17,252 | 17,252 | | | U |
| 89 | 0604601A | Infantry Support Weapons | 05 | 63,842 | 87,643 | 87,643 | | | U |
| 90 | 0604604A | Medium Tactical Vehicles | 05 | | 6,039 | 6,039 | | | U |
| 91 | 0604611A | JAVELIN | 05 | 19,241 | 21,095 | 21,095 | | | U |
| 92 | 0604622A | Family of Heavy Tactical Vehicles | 05 | 10,989 | 10,507 | 10,507 | | | U |
| 93 | 0604633A | Air Traffic Control | 05 | 3,326 | 3,536 | 3,536 | | | U |
| 94 | 0604641A | Tactical Unmanned Ground Vehicle (TUGV) | 05 | 32,315 | | | | | U |
| 95 | 0604642A | Light Tactical Wheeled Vehicles | 05 | 476 | 7,000 | 7,000 | | | U |

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| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 0604319A | Indirect Fire Protection Capability Increment 2-Intercept (IFPC2) | 04 | | | | 11,303 | | 11,303 | U |
| 81 | 0305251A | Cyberspace Operations Forces and Force Support | 04 | | | | 56,492 | | 56,492 | U |
| 82 | 1206120A | Assured Positioning, Navigation and Timing (PNT) | 04 | | | | | | | U |
| 83 | 1206308A | Army Space Systems Integration | 04 | | | | 20,432 | | 20,432 | U |
| | | Advanced Component Development & Prototypes | | 8,700 | -8,700 | | 917,589 | -8,700 | 908,889 | |
| 84 | 0604201A | Aircraft Avionics | 05 | | | | 30,153 | | 30,153 | U |
| 85 | 0604270A | Electronic Warfare Development | 05 | | | | 71,671 | | 71,671 | U |
| 86 | 0604290A | Mid-tier Networking Vehicular Radio (MNVR) | 05 | | | | 10,589 | | 10,589 | U |
| 87 | 0604321A | All Source Analysis System | 05 | | | | 4,774 | | 4,774 | U |
| 88 | 0604328A | TRACTOR CAGE | 05 | | | | 17,252 | | 17,252 | U |
| 89 | 0604601A | Infantry Support Weapons | 05 | | | | 87,643 | | 87,643 | U |
| 90 | 0604604A | Medium Tactical Vehicles | 05 | | | | 6,039 | | 6,039 | U |
| 91 | 0604611A | JAVELIN | 05 | | | | 21,095 | | 21,095 | U |
| 92 | 0604622A | Family of Heavy Tactical Vehicles | 05 | | | | 10,507 | | 10,507 | U |
| 93 | 0604633A | Air Traffic Control | 05 | | | | 3,536 | | 3,536 | U |
| 94 | 0604641A | Tactical Unmanned Ground Vehicle (TUGV) | 05 | | | | | | | U |
| 95 | 0604642A | Light Tactical Wheeled Vehicles | 05 | | | | 7,000 | | 7,000 | U |

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| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 80 | 0604319A | Indirect Fire Protection Capability Increment 2-Intercept (IFPC2) | 04 | 51,030 | | 51,030 | U |
| 81 | 0305251A | Cyberspace Operations Forces and Force Support | 04 | 65,817 | | 65,817 | U |
| 82 | 1206120A | Assured Positioning, Navigation and Timing (PNT) | 04 | 146,300 | | 146,300 | U |
| 83 | 1206308A | Army Space Systems Integration | 04 | 38,319 | | 38,319 | U |
| | | Advanced Component Development & Prototypes | | 1,329,393 | 28,500 | 1,357,893 | |
| 84 | 0604201A | Aircraft Avionics | 05 | 32,293 | | 32,293 | U |
| 85 | 0604270A | Electronic Warfare Development | 05 | 78,699 | | 78,699 | U |
| 86 | 0604290A | Mid-tier Networking Vehicular Radio (MNVR) | 05 | | | | U |
| 87 | 0604321A | All Source Analysis System | 05 | | | | U |
| 88 | 0604328A | TRACTOR CAGE | 05 | 17,050 | 12,000 | 29,050 | U |
| 89 | 0604601A | Infantry Support Weapons | 05 | 83,155 | | 83,155 | U |
| 90 | 0604604A | Medium Tactical Vehicles | 05 | 3,704 | | 3,704 | U |
| 91 | 0604611A | JAVELIN | 05 | 10,623 | | 10,623 | U |
| 92 | 0604622A | Family of Heavy Tactical Vehicles | 05 | 11,950 | | 11,950 | U |
| 93 | 0604633A | Air Traffic Control | 05 | 12,347 | | 12,347 | U |
| 94 | 0604641A | Tactical Unmanned Ground Vehicle (TUGV) | 05 | | | | U |
| 95 | 0604642A | Light Tactical Wheeled Vehicles | 05 | 8,212 | | 8,212 | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 96 | 0604645A | Armored Systems Modernization (ASM) - Eng Dev | 05 | 9,306 | 36,242 | 36,242 | | | U |
| 97 | 0604710A | Night Vision Systems - Eng Dev | 05 | 76,491 | 108,504 | 108,504 | | | U |
| 98 | 0604713A | Combat Feeding, Clothing, and Equipment | 05 | 1,975 | 3,702 | 3,702 | | | U |
| 99 | 0604715A | Non-System Training Devices - Eng Dev | 05 | 33,888 | 43,575 | 43,575 | | | U |
| 100 | 0604741A | Air Defense Command, Control and Intelligence - Eng Dev | 05 | 200,205 | 28,726 | 28,726 | | | U |
| 101 | 0604742A | Constructive Simulation Systems Development | 05 | 17,363 | 18,562 | 18,562 | | | U |
| 102 | 0604746A | Automatic Test Equipment Development | 05 | 8,503 | 8,344 | 8,344 | | | U |
| 103 | 0604760A | Distributive Interactive Simulations (DIS) - Eng Dev | 05 | 10,150 | 11,270 | 11,270 | | | U |
| 104 | 0604768A | Brilliant Anti-Armor Submunition (BAT) | 05 | | 10,000 | 10,000 | | | U |
| 105 | 0604780A | Combined Arms Tactical Trainer (CATT) Core | 05 | 14,538 | 18,566 | 18,566 | | | U |
| 106 | 0604798A | Brigade Analysis, Integration and Evaluation | 05 | 101,927 | 145,360 | 145,360 | | | U |
| 107 | 0604802A | Weapons and Munitions - Eng Dev | 05 | 75,845 | 145,232 | 145,232 | | | U |
| 108 | 0604804A | Logistics and Engineer Equipment - Eng Dev | 05 | 76,374 | 90,965 | 90,965 | | | U |
| 109 | 0604805A | Command, Control, Communications Systems - Eng Dev | 05 | 4,166 | 9,910 | 9,910 | | | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 96 | 0604645A | Armored Systems Modernization (ASM) - Eng Dev | 05 | | | | 36,242 | | 36,242 | U |
| 97 | 0604710A | Night Vision Systems - Eng Dev | 05 | | | | 108,504 | | 108,504 | U |
| 98 | 0604713A | Combat Feeding, Clothing, and Equipment | 05 | | | | 3,702 | | 3,702 | U |
| 99 | 0604715A | Non-System Training Devices - Eng Dev | 05 | | | | 43,575 | | 43,575 | U |
| 100 | 0604741A | Air Defense Command, Control and Intelligence - Eng Dev | 05 | | | | 28,726 | | 28,726 | U |
| 101 | 0604742A | Constructive Simulation Systems Development | 05 | | | | 18,562 | | 18,562 | U |
| 102 | 0604746A | Automatic Test Equipment Development | 05 | | | | 8,344 | | 8,344 | U |
| 103 | 0604760A | Distributive Interactive Simulations (DIS) - Eng Dev | 05 | | | | 11,270 | | 11,270 | U |
| 104 | 0604768A | Brilliant Anti-Armor Submunition (BAT) | 05 | | | | 10,000 | | 10,000 | U |
| 105 | 0604780A | Combined Arms Tactical Trainer (CATT) Core | 05 | | | | 18,566 | | 18,566 | U |
| 106 | 0604798A | Brigade Analysis, Integration and Evaluation | 05 | | | | 145,360 | | 145,360 | U |
| 107 | 0604802A | Weapons and Munitions - Eng Dev | 05 | | | | 145,232 | | 145,232 | U |
| 108 | 0604804A | Logistics and Engineer Equipment - Eng Dev | 05 | | | | 90,965 | | 90,965 | U |
| 109 | 0604805A | Command, Control, Communications Systems - Eng Dev | 05 | | | | 9,910 | | 9,910 | U |

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| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 96 | 0604645A | Armored Systems Modernization (ASM) - Eng Dev | 05 | 393,613 | | 393,613 | U |
| 97 | 0604710A | Night Vision Systems - Eng Dev | 05 | 139,614 | | 139,614 | U |
| 98 | 0604713A | Combat Feeding, Clothing, and Equipment | 05 | 4,507 | | 4,507 | U |
| 99 | 0604715A | Non-System Training Devices - Eng Dev | 05 | 49,436 | | 49,436 | U |
| 100 | 0604741A | Air Defense Command, Control and Intelligence - Eng Dev | 05 | 95,172 | 119,300 | 214,472 | U |
| 101 | 0604742A | Constructive Simulation Systems Development | 05 | 22,628 | | 22,628 | U |
| 102 | 0604746A | Automatic Test Equipment Development | 05 | 13,297 | | 13,297 | U |
| 103 | 0604760A | Distributive Interactive Simulations (DIS) - Eng Dev | 05 | 9,145 | | 9,145 | U |
| 104 | 0604768A | Brilliant Anti-Armor Submunition (BAT) | 05 | 9,894 | | 9,894 | U |
| 105 | 0604780A | Combined Arms Tactical Trainer (CATT) Core | 05 | 21,964 | | 21,964 | U |
| 106 | 0604798A | Brigade Analysis, Integration and Evaluation | 05 | 49,288 | | 49,288 | U |
| 107 | 0604802A | Weapons and Munitions - Eng Dev | 05 | 183,100 | | 183,100 | U |
| 108 | 0604804A | Logistics and Engineer Equipment - Eng Dev | 05 | 79,706 | | 79,706 | U |
| 109 | 0604805A | Command, Control, Communications Systems - Eng Dev | 05 | 15,970 | | 15,970 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 110 | 0604807A | Medical Materiel/Medical Biological Defense Equipment - Eng Dev | 05 | 36,237 | 39,238 | 39,238 | | | U |
| 111 | 0604808A | Landmine Warfare/Barrier - Eng Dev | 05 | 32,069 | 34,684 | 34,684 | | | U |
| 112 | 0604818A | Army Tactical Command & Control Hardware & Software | 05 | 169,375 | 164,409 | 164,409 | | | U |
| 113 | 0604820A | Radar Development | 05 | 15,368 | 32,968 | 32,968 | | | U |
| 114 | 0604822A | General Fund Enterprise Business System (GFEBS) | 05 | 11,044 | 49,554 | 49,554 | | | U |
| 115 | 0604823A | Firefinder | 05 | 6,177 | 45,605 | 45,605 | | | U |
| 116 | 0604827A | Soldier Systems - Warrior Dem/Val | 05 | 11,929 | 16,127 | 16,127 | | | U |
| 117 | 0604852A | Suite of Survivability Enhancement Systems - EMD | 05 | | 98,600 | 98,600 | | | U |
| 118 | 0604854A | Artillery Systems - EMD | 05 | 1,689 | 1,972 | 1,972 | | | U |
| 119 | 0605013A | Information Technology Development | 05 | 70,104 | 81,776 | 81,776 | | | U |
| 120 | 0605018A | Integrated Personnel and Pay System-Army (IPPS-A) | 05 | 149,597 | 172,361 | 172,361 | | | U |
| 121 | 0605028A | Armored Multi-Purpose Vehicle (AMPV) | 05 | 177,133 | 199,778 | 199,778 | | | U |
| 122 | 0605029A | Integrated Ground Security Surveillance Response Capability (IGSSR-C) | 05 | 4,789 | 4,418 | 4,418 | | | U |
| 123 | 0605030A | Joint Tactical Network Center (JTNC) | 05 | 14,463 | 15,877 | 15,877 | | | U |
| 124 | 0605031A | Joint Tactical Network (JTN) | 05 | 16,430 | 44,150 | 44,150 | | | U |
| 125 | 0605032A | TRACTOR TIRE | 05 | 27,254 | 34,670 | 34,670 | 5,000 | 5,000 | U |

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| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 110 | 0604807A | Medical Materiel/Medical Biological Defense Equipment - Eng Dev | 05 | | | | 39,238 | | 39,238 | U |
| 111 | 0604808A | Landmine Warfare/Barrier - Eng Dev | 05 | | | | 34,684 | | 34,684 | U |
| 112 | 0604818A | Army Tactical Command & Control Hardware & Software | 05 | | | | 164,409 | | 164,409 | U |
| 113 | 0604820A | Radar Development | 05 | | | | 32,968 | | 32,968 | U |
| 114 | 0604822A | General Fund Enterprise Business System (GFEBS) | 05 | | | | 49,554 | | 49,554 | U |
| 115 | 0604823A | Firefinder | 05 | | | | 45,605 | | 45,605 | U |
| 116 | 0604827A | Soldier Systems - Warrior Dem/Val | 05 | | | | 16,127 | | 16,127 | U |
| 117 | 0604852A | Suite of Survivability Enhancement Systems - EMD | 05 | | | | 98,600 | | 98,600 | U |
| 118 | 0604854A | Artillery Systems - EMD | 05 | | | | 1,972 | | 1,972 | U |
| 119 | 0605013A | Information Technology Development | 05 | | | | 81,776 | | 81,776 | U |
| 120 | 0605018A | Integrated Personnel and Pay System-Army (IPPS-A) | 05 | | | | 172,361 | | 172,361 | U |
| 121 | 0605028A | Armored Multi-Purpose Vehicle (AMPV) | 05 | | | | 199,778 | | 199,778 | U |
| 122 | 0605029A | Integrated Ground Security Surveillance Response Capability (IGSSR-C) | 05 | | | | 4,418 | | 4,418 | U |
| 123 | 0605030A | Joint Tactical Network Center (JTNC) | 05 | | | | 15,877 | | 15,877 | U |
| 124 | 0605031A | Joint Tactical Network (JTN) | 05 | | | | 44,150 | | 44,150 | U |
| 125 | 0605032A | TRACTOR TIRE | 05 | | | | 39,670 | | 39,670 | U |

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| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 110 | 0604807A | Medical Materiel/Medical Biological Defense Equipment - Eng Dev | 05 | 44,542 | | 44,542 | U |
| 111 | 0604808A | Landmine Warfare/Barrier - Eng Dev | 05 | 50,817 | | 50,817 | U |
| 112 | 0604818A | Army Tactical Command & Control Hardware & Software | 05 | 178,693 | | 178,693 | U |
| 113 | 0604820A | Radar Development | 05 | 39,338 | | 39,338 | U |
| 114 | 0604822A | General Fund Enterprise Business System (GFEBS) | 05 | 37,851 | | 37,851 | U |
| 115 | 0604823A | Firefinder | 05 | 45,473 | | 45,473 | U |
| 116 | 0604827A | Soldier Systems - Warrior Dem/Val | 05 | 10,395 | | 10,395 | U |
| 117 | 0604852A | Suite of Survivability Enhancement Systems - EMD | 05 | 69,204 | | 69,204 | U |
| 118 | 0604854A | Artillery Systems - EMD | 05 | 1,781 | | 1,781 | U |
| 119 | 0605013A | Information Technology Development | 05 | 113,758 | | 113,758 | U |
| 120 | 0605018A | Integrated Personnel and Pay System-Army (IPPS-A) | 05 | 166,603 | | 166,603 | U |
| 121 | 0605028A | Armored Multi-Purpose Vehicle (AMPV) | 05 | 118,239 | | 118,239 | U |
| 122 | 0605029A | Integrated Ground Security Surveillance Response Capability (IGSSR-C) | 05 | 3,211 | | 3,211 | U |
| 123 | 0605030A | Joint Tactical Network Center (JTNC) | 05 | 15,889 | | 15,889 | U |
| 124 | 0605031A | Joint Tactical Network (JTN) | 05 | 41,972 | | 41,972 | U |
| 125 | 0605032A | TRACTOR TIRE | 05 | 41,166 | 66,760 | 107,926 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 126 | 0605033A | Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) | 05 | 4,838 | 5,207 | 5,207 | | | U |
| 127 | 0605034A | Tactical Security System (TSS) | 05 | 2,792 | 4,727 | 4,727 | | | U |
| 128 | 0605035A | Common Infrared Countermeasures (CIRCM) | 05 | 90,685 | 105,778 | 105,778 | 21,540 | 21,540 | U |
| 129 | 0605036A | Combating Weapons of Mass Destruction (CWMD) | 05 | 2,008 | 6,927 | 6,927 | | | U |
| 130 | 0605037A | Evidence Collection and Detainee Processing | 05 | | 214 | 214 | | | U |
| 131 | 0605038A | Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite | 05 | | 16,125 | 16,125 | | | U |
| 132 | 0605041A | Defensive CYBER Tool Development | 05 | 32,535 | 55,165 | 55,165 | | | U |
| 133 | 0605042A | Tactical Network Radio Systems (Low-Tier) | 05 | 14,198 | 20,076 | 20,076 | | | U |
| 134 | 0605047A | Contract Writing System | 05 | 19,868 | 20,322 | 20,322 | | | U |
| 135 | 0605049A | Missile Warning System Modernization (MWSM) | 05 | | 55,810 | 55,810 | | | U |
| 136 | 0605051A | Aircraft Survivability Development | 05 | 121,530 | 30,879 | 30,879 | 30,100 | 30,100 | U |
| 137 | 0605052A | Indirect Fire Protection Capability Inc 2 - Block 1 | 05 | 80,781 | 175,069 | 175,069 | | | U |
| 138 | 0605053A | Ground Robotics | 05 | | 70,760 | 70,760 | | | U |
| 139 | 0605054A | Emerging Technology Initiatives | 05 | | | | | | U |

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| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 126 | 0605033A | Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) | 05 | | | | 5,207 | | 5,207 | U |
| 127 | 0605034A | Tactical Security System (TSS) | 05 | | | | 4,727 | | 4,727 | U |
| 128 | 0605035A | Common Infrared Countermeasures (CIRCM) | 05 | | | | 127,318 | | 127,318 | U |
| 129 | 0605036A | Combating Weapons of Mass Destruction (CWMD) | 05 | | | | 6,927 | | 6,927 | U |
| 130 | 0605037A | Evidence Collection and Detainee Processing | 05 | | | | 214 | | 214 | U |
| 131 | 0605038A | Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite | 05 | | | | 16,125 | | 16,125 | U |
| 132 | 0605041A | Defensive CYBER Tool Development | 05 | | | | 55,165 | | 55,165 | U |
| 133 | 0605042A | Tactical Network Radio Systems (Low-Tier) | 05 | | | | 20,076 | | 20,076 | U |
| 134 | 0605047A | Contract Writing System | 05 | | | | 20,322 | | 20,322 | U |
| 135 | 0605049A | Missile Warning System Modernization (MWSM) | 05 | | | | 55,810 | | 55,810 | U |
| 136 | 0605051A | Aircraft Survivability Development | 05 | | | | 60,979 | | 60,979 | U |
| 137 | 0605052A | Indirect Fire Protection Capability Inc 2 - Block 1 | 05 | | | | 175,069 | | 175,069 | U |
| 138 | 0605053A | Ground Robotics | 05 | | | | 70,760 | | 70,760 | U |
| 139 | 0605054A | Emerging Technology Initiatives | 05 | | | | | | | U |

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| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 126 | 0605033A | Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) | 05 | 5,175 | | 5,175 | U |
| 127 | 0605034A | Tactical Security System (TSS) | 05 | 4,496 | | 4,496 | U |
| 128 | 0605035A | Common Infrared Countermeasures (CIRCM) | 05 | 51,178 | 2,670 | 53,848 | U |
| 129 | 0605036A | Combating Weapons of Mass Destruction (CWMD) | 05 | 11,311 | | 11,311 | U |
| 130 | 0605037A | Evidence Collection and Detainee Processing | 05 | | | | U |
| 131 | 0605038A | Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite | 05 | 17,154 | | 17,154 | U |
| 132 | 0605041A | Defensive CYBER Tool Development | 05 | 36,626 | | 36,626 | U |
| 133 | 0605042A | Tactical Network Radio Systems (Low-Tier) | 05 | 3,829 | | 3,829 | U |
| 134 | 0605047A | Contract Writing System | 05 | 41,928 | | 41,928 | U |
| 135 | 0605049A | Missile Warning System Modernization (MWSM) | 05 | 28,276 | | 28,276 | U |
| 136 | 0605051A | Aircraft Survivability Development | 05 | 21,965 | 34,933 | 56,898 | U |
| 137 | 0605052A | Indirect Fire Protection Capability Inc 2 - Block 1 | 05 | 157,710 | | 157,710 | U |
| 138 | 0605053A | Ground Robotics | 05 | 86,167 | | 86,167 | U |
| 139 | 0605054A | Emerging Technology Initiatives | 05 | 42,866 | | 42,866 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 140 | 0605380A | AMF Joint Tactical Radio System (JTRS) | 05 | 4,088 | 8,965 | 8,965 | | | U |
| 141 | 0605450A | Joint Air-to-Ground Missile (JAGM) | 05 | 47,446 | 34,626 | 34,626 | | | U |
| 142 | 0605457A | Army Integrated Air and Missile Defense (AIAMD) | 05 | 273,240 | 336,420 | 336,420 | | | U |
| 143 | 0605766A | National Capabilities Integration (MIP) | 05 | 4,955 | 6,882 | 6,882 | | | U |
| 144 | 0605812A | Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph | 05 | 11,086 | 23,467 | 23,467 | | | U |
| 145 | 0605830A | Aviation Ground Support Equipment | 05 | 2,060 | 6,930 | 6,930 | | | U |
| 146 | 0210609A | Paladin Integrated Management (PIM) | 05 | 39,902 | 6,112 | 6,112 | | | U |
| 147 | 0303032A | TROJAN - RH12 | 05 | 4,273 | 4,431 | 4,431 | 1,200 | 1,200 | U |
| 148 | 0303267A | Auctioned Spectrum Relocation Fund | 05 | 34,967 | | | | | U |
| 149 | 0303367A | Spectrum Access Research and Development | 05 | 66,125 | | | | | U |
| 150 | 0304270A | Electronic Warfare Development | 05 | 18,425 | 14,616 | 14,616 | | | U |
| 151 | 1205117A | Tractor Bears | 05 | | 17,928 | 17,928 | | | U |
| | | System Development & Demonstration | | 2,502,560 | 3,012,840 | 3,012,840 | 57,840 | 57,840 | |
| 152 | 0604256A | Threat Simulator Development | 06 | 28,883 | 22,862 | 22,862 | | | U |
| 153 | 0604258A | Target Systems Development | 06 | 18,518 | 13,902 | 13,902 | | | U |
| 154 | 0604759A | Major T&E Investment | 06 | 93,668 | 102,901 | 102,901 | | | U |
| 155 | 0605103A | Rand Arroyo Center | 06 | 19,863 | 20,140 | 20,140 | | | U |

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| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 140 | 0605380A | AMF Joint Tactical Radio System (JTRS) | 05 | | | | 8,965 | | 8,965 | U |
| 141 | 0605450A | Joint Air-to-Ground Missile (JAGM) | 05 | | | | 34,626 | | 34,626 | U |
| 142 | 0605457A | Army Integrated Air and Missile Defense (AIAMD) | 05 | | | | 336,420 | | 336,420 | U |
| 143 | 0605766A | National Capabilities Integration (MIP) | 05 | | | | 6,882 | | 6,882 | U |
| 144 | 0605812A | Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph | 05 | | | | 23,467 | | 23,467 | U |
| 145 | 0605830A | Aviation Ground Support Equipment | 05 | | | | 6,930 | | 6,930 | U |
| 146 | 0210609A | Paladin Integrated Management (PIM) | 05 | | | | 6,112 | | 6,112 | U |
| 147 | 0303032A | TROJAN - RH12 | 05 | | | | 5,631 | | 5,631 | U |
| 148 | 0303267A | Auctioned Spectrum Relocation Fund | 05 | | | | | | | U |
| 149 | 0303367A | Spectrum Access Research and Development | 05 | | | | | | | U |
| 150 | 0304270A | Electronic Warfare Development | 05 | | | | 14,616 | | 14,616 | U |
| 151 | 1205117A | Tractor Bears | 05 | | | | 17,928 | | 17,928 | U |
| | | System Development & Demonstration | | | | | 3,070,680 | | 3,070,680 | |
| 152 | 0604256A | Threat Simulator Development | 06 | | | | 22,862 | | 22,862 | U |
| 153 | 0604258A | Target Systems Development | 06 | | | | 13,902 | | 13,902 | U |
| 154 | 0604759A | Major T&E Investment | 06 | | | | 102,901 | | 102,901 | U |
| 155 | 0605103A | Rand Arroyo Center | 06 | | | | 20,140 | | 20,140 | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 140 | 0605380A | AMF Joint Tactical Radio System (JTRS) | 05 | 15,984 | | 15,984 | U |
| 141 | 0605450A | Joint Air-to-Ground Missile (JAGM) | 05 | 11,773 | | 11,773 | U |
| 142 | 0605457A | Army Integrated Air and Missile Defense (AIAMD) | 05 | 277,607 | | 277,607 | U |
| 143 | 0605766A | National Capabilities Integration (MIP) | 05 | 12,340 | | 12,340 | U |
| 144 | 0605812A | Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph | 05 | 2,686 | | 2,686 | U |
| 145 | 0605830A | Aviation Ground Support Equipment | 05 | 2,706 | | 2,706 | U |
| 146 | 0210609A | Paladin Integrated Management (PIM) | 05 | | | | U |
| 147 | 0303032A | TROJAN - RH12 | 05 | 4,521 | 1,200 | 5,721 | U |
| 148 | 0303267A | Auctioned Spectrum Relocation Fund | 05 | | | | U |
| 149 | 0303367A | Spectrum Access Research and Development | 05 | | | | U |
| 150 | 0304270A | Electronic Warfare Development | 05 | 8,922 | | 8,922 | U |
| 151 | 1205117A | Tractor Bears | 05 | 23,170 | | 23,170 | U |
| | | System Development & Demonstration | | 3,192,689 | 236,863 | 3,429,552 | |
| 152 | 0604256A | Threat Simulator Development | 06 | 12,835 | | 12,835 | U |
| 153 | 0604258A | Target Systems Development | 06 | 12,135 | | 12,135 | U |
| 154 | 0604759A | Major T&E Investment | 06 | 82,996 | | 82,996 | U |
| 155 | 0605103A | Rand Arroyo Center | 06 | 19,821 | | 19,821 | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 156 | 0605301A | Army Kwajalein Atoll | 06 | 219,271 | 246,663 | 246,663 | | | U |
| 157 | 0605326A | Concepts Experimentation Program | 06 | 24,668 | 29,820 | 29,820 | | | U |
| 158 | 0605502A | Small Business Innovative Research | 06 | 230,691 | | | | | U |
| 159 | 0605601A | Army Test Ranges and Facilities | 06 | 305,238 | 307,588 | 307,588 | | | U |
| 160 | 0605602A | Army Technical Test Instrumentation and Targets | 06 | 70,523 | 49,242 | 49,242 | | | U |
| 161 | 0605604A | Survivability/Lethality Analysis | 06 | 38,245 | 41,843 | 41,843 | | | U |
| 162 | 0605606A | Aircraft Certification | 06 | 4,486 | 4,804 | 4,804 | | | U |
| 163 | 0605702A | Meteorological Support to RDT&E Activities | 06 | 6,793 | 7,238 | 7,238 | | | U |
| 164 | 0605706A | Materiel Systems Analysis | 06 | 21,510 | 21,890 | 21,890 | | | U |
| 165 | 0605709A | Exploitation of Foreign Items | 06 | 12,415 | 12,684 | 12,684 | | | U |
| 166 | 0605712A | Support of Operational Testing | 06 | 49,580 | 51,040 | 51,040 | | | U |
| 167 | 0605716A | Army Evaluation Center | 06 | 55,460 | 56,246 | 56,246 | | | U |
| 168 | 0605718A | Army Modeling & Sim X-Cmd Collaboration & Integ | 06 | 7,653 | 1,829 | 1,829 | | | U |
| 169 | 0605801A | Programwide Activities | 06 | 50,971 | 55,060 | 55,060 | | | U |
| 170 | 0605803A | Technical Information Activities | 06 | 29,905 | 33,934 | 33,934 | | | U |
| 171 | 0605805A | Munitions Standardization, Effectiveness and Safety | 06 | 63,983 | 43,444 | 43,444 | | | U |
| 172 | 0605857A | Environmental Quality Technology Mgmt Support | 06 | 2,048 | 5,087 | 5,087 | | | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 156 | 0605301A | Army Kwajalein Atoll | 06 | | | | 246,663 | | 246,663 | U |
| 157 | 0605326A | Concepts Experimentation Program | 06 | | | | 29,820 | | 29,820 | U |
| 158 | 0605502A | Small Business Innovative Research | 06 | | | | | | | U |
| 159 | 0605601A | Army Test Ranges and Facilities | 06 | | | | 307,588 | | 307,588 | U |
| 160 | 0605602A | Army Technical Test Instrumentation and Targets | 06 | | | | 49,242 | | 49,242 | U |
| 161 | 0605604A | Survivability/Lethality Analysis | 06 | | | | 41,843 | | 41,843 | U |
| 162 | 0605606A | Aircraft Certification | 06 | | | | 4,804 | | 4,804 | U |
| 163 | 0605702A | Meteorological Support to RDT&E Activities | 06 | | | | 7,238 | | 7,238 | U |
| 164 | 0605706A | Materiel Systems Analysis | 06 | | | | 21,890 | | 21,890 | U |
| 165 | 0605709A | Exploitation of Foreign Items | 06 | | | | 12,684 | | 12,684 | U |
| 166 | 0605712A | Support of Operational Testing | 06 | | | | 51,040 | | 51,040 | U |
| 167 | 0605716A | Army Evaluation Center | 06 | | | | 56,246 | | 56,246 | U |
| 168 | 0605718A | Army Modeling & Sim X-Cmd Collaboration & Integ | 06 | | | | 1,829 | | 1,829 | U |
| 169 | 0605801A | Programwide Activities | 06 | | | | 55,060 | | 55,060 | U |
| 170 | 0605803A | Technical Information Activities | 06 | | | | 33,934 | | 33,934 | U |
| 171 | 0605805A | Munitions Standardization, Effectiveness and Safety | 06 | | | | 43,444 | | 43,444 | U |
| 172 | 0605857A | Environmental Quality Technology Mgmt Support | 06 | | | | 5,087 | | 5,087 | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 156 | 0605301A | Army Kwajalein Atoll | 06 | 246,574 | | 246,574 | U |
| 157 | 0605326A | Concepts Experimentation Program | 06 | 30,430 | | 30,430 | U |
| 158 | 0605502A | Small Business Innovative Research | 06 | | | | U |
| 159 | 0605601A | Army Test Ranges and Facilities | 06 | 305,759 | | 305,759 | U |
| 160 | 0605602A | Army Technical Test Instrumentation and Targets | 06 | 62,379 | | 62,379 | U |
| 161 | 0605604A | Survivability/Lethality Analysis | 06 | 40,496 | | 40,496 | U |
| 162 | 0605606A | Aircraft Certification | 06 | 3,941 | | 3,941 | U |
| 163 | 0605702A | Meteorological Support to RDT&E Activities | 06 | 9,767 | | 9,767 | U |
| 164 | 0605706A | Materiel Systems Analysis | 06 | 21,226 | | 21,226 | U |
| 165 | 0605709A | Exploitation of Foreign Items | 06 | 13,026 | | 13,026 | U |
| 166 | 0605712A | Support of Operational Testing | 06 | 52,718 | | 52,718 | U |
| 167 | 0605716A | Army Evaluation Center | 06 | 57,049 | | 57,049 | U |
| 168 | 0605718A | Army Modeling & Sim X-Cmd Collaboration & Integ | 06 | 2,801 | | 2,801 | U |
| 169 | 0605801A | Programwide Activities | 06 | 60,942 | | 60,942 | U |
| 170 | 0605803A | Technical Information Activities | 06 | 29,050 | | 29,050 | U |
| 171 | 0605805A | Munitions Standardization, Effectiveness and Safety | 06 | 42,332 | | 42,332 | U |
| 172 | 0605857A | Environmental Quality Technology Mgmt Support | 06 | 3,216 | | 3,216 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 173 | 0605898A | Army Direct Report Headquarters - R&D - MHA | 06 | 49,287 | 54,679 | 54,679 | | | U |
| 174 | 0606001A | Military Ground-Based CREW Technology | 06 | | 7,916 | 7,916 | | | U |
| 175 | 0606002A | Ronald Reagan Ballistic Missile Defense Test Site | 06 | | 61,254 | 61,254 | | | U |
| 176 | 0606003A | CounterIntel and Human Intel Modernization | 06 | | | | | | U |
| 177 | 0606942A | Assessments and Evaluations Cyber Vulnerabilities | 06 | | | | | | U |
| 178 | 0303260A | Defense Military Deception Initiative | 06 | 1,923 | 1,779 | 1,779 | | | U |
| 179 | 0909980A | Judgment Fund Reimbursement | 06 | 7,893 | | | | | U |
| 180 | 0909999A | Financing for Cancelled Account Adjustments | 06 | 6 | | | | | U |
| | RDT&E | Management Support | | 1,413,481 | 1,253,845 | 1,253,845 | | | |
| 181 | 0603778A | MLRS Product Improvement Program | 07 | 34,391 | 8,929 | 8,929 | | | U |
| 182 | 0603813A | TRACTOR PULL | 07 | 3,960 | 4,014 | 4,014 | | | U |
| 183 | 0605024A | Anti-Tamper Technology Support | 07 | 3,498 | 4,094 | 4,094 | | | U |
| 184 | 0607131A | Weapons and Munitions Product Improvement Programs | 07 | 19,969 | 15,738 | 15,738 | | | U |
| 185 | 0607133A | TRACTOR SMOKE | 07 | 4,479 | 4,513 | 4,513 | | | U |
| 186 | 0607134A | Long Range Precision Fires (LRPF) | 07 | 36,322 | 102,014 | 102,014 | | | U |
| 187 | 0607135A | Apache Product Improvement Program | 07 | 60,995 | 59,977 | 59,977 | | | U |

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| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 173 | 0605898A | Army Direct Report Headquarters - R&D - MHA | 06 | | | | 54,679 | | 54,679 | U |
| 174 | 0606001A | Military Ground-Based CREW Technology | 06 | | | | 7,916 | | 7,916 | U |
| 175 | 0606002A | Ronald Reagan Ballistic Missile Defense Test Site | 06 | | | | 61,254 | | 61,254 | U |
| 176 | 0606003A | CounterIntel and Human Intel Modernization | 06 | | | | | | | U |
| 177 | 0606942A | Assessments and Evaluations Cyber Vulnerabilities | 06 | | | | | | | U |
| 178 | 0303260A | Defense Military Deception Initiative | 06 | | | | 1,779 | | 1,779 | U |
| 179 | 0909980A | Judgment Fund Reimbursement | 06 | | | | | | | U |
| 180 | 0909999A | Financing for Cancelled Account Adjustments | 06 | | | | | | | U |
| | | RDT&E Management Support | | | | | 1,253,845 | | 1,253,845 | |
| 181 | 0603778A | MLRS Product Improvement Program | 07 | | | | 8,929 | | 8,929 | U |
| 182 | 0603813A | TRACTOR PULL | 07 | | | | 4,014 | | 4,014 | U |
| 183 | 0605024A | Anti-Tamper Technology Support | 07 | | | | 4,094 | | 4,094 | U |
| 184 | 0607131A | Weapons and Munitions Product Improvement Programs | 07 | | | | 15,738 | | 15,738 | U |
| 185 | 0607133A | TRACTOR SMOKE | 07 | | | | 4,513 | | 4,513 | U |
| 186 | 0607134A | Long Range Precision Fires (LRPF) | 07 | | | | 102,014 | | 102,014 | U |
| 187 | 0607135A | Apache Product Improvement Program | 07 | | | | 59,977 | | 59,977 | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 173 | 0605898A | Army Direct Report Headquarters - R&D - MHA | 06 | 54,145 | | 54,145 | U |
| 174 | 0606001A | Military Ground-Based CREW Technology | 06 | 4,896 | | 4,896 | U |
| 175 | 0606002A | Ronald Reagan Ballistic Missile Defense Test Site | 06 | 63,011 | | 63,011 | U |
| 176 | 0606003A | CounterIntel and Human Intel Modernization | 06 | 2,636 | | 2,636 | U |
| 177 | 0606942A | Assessments and Evaluations Cyber Vulnerabilities | 06 | 88,300 | | 88,300 | U |
| 178 | 0303260A | Defense Military Deception Initiative | 06 | | | | U |
| 179 | 0909980A | Judgment Fund Reimbursement | 06 | | | | U |
| 180 | 0909999A | Financing for Cancelled Account Adjustments | 06 | | | | U |
| | RDT&E | Management Support | | 1,322,481 | | 1,322,481 | |
| 181 | 0603778A | MLRS Product Improvement Program | 07 | 8,886 | | 8,886 | U |
| 182 | 0603813A | TRACTOR PULL | 07 | 4,067 | | 4,067 | U |
| 183 | 0605024A | Anti-Tamper Technology Support | 07 | 4,254 | | 4,254 | U |
| 184 | 0607131A | Weapons and Munitions Product Improvement Programs | 07 | 16,022 | 2,548 | 18,570 | U |
| 185 | 0607133A | TRACTOR SMOKE | 07 | 4,577 | 7,780 | 12,357 | U |
| 186 | 0607134A | Long Range Precision Fires (LRPF) | 07 | 186,475 | | 186,475 | U |
| 187 | 0607135A | Apache Product Improvement Program | 07 | 31,049 | | 31,049 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 188 | 0607136A | Blackhawk Product Improvement Program | 07 | 44,966 | 34,416 | 34,416 | | | U |
| 189 | 0607137A | Chinook Product Improvement Program | 07 | 88,314 | 194,567 | 194,567 | | | U |
| 190 | 0607138A | Fixed Wing Product Improvement Program | 07 | 765 | 9,981 | 9,981 | | | U |
| 191 | 0607139A | Improved Turbine Engine Program | 07 | 111,638 | 204,304 | 204,304 | | | U |
| 192 | 0607140A | Emerging Technologies from NIE | 07 | 2,278 | 1,023 | 1,023 | | | U |
| 193 | 0607141A | Logistics Automation | 07 | 1,542 | 1,504 | 1,504 | | | U |
| 194 | 0607142A | Aviation Rocket System Product Improvement and Development | 07 | | 10,064 | 10,064 | | | U |
| 195 | 0607143A | Unmanned Aircraft System Universal Products | 07 | | 38,463 | 38,463 | | | U |
| 196 | 0607665A | Family of Biometrics | 07 | 11,632 | 6,159 | 6,159 | | | U |
| 197 | 0607865A | Patriot Product Improvement | 07 | 48,073 | 90,217 | 90,217 | | | U |
| 198 | 0202429A | Aerostat Joint Project - COCOM Exercise | 07 | 6,178 | 6,749 | 6,749 | | | U |
| 199 | 0203728A | Joint Automated Deep Operation Coordination System (JADOCS) | 07 | 29,412 | 33,520 | 33,520 | | | U |
| 200 | 0203735A | Combat Vehicle Improvement Programs | 07 | 340,353 | 343,175 | 343,175 | | | U |
| 201 | 0203740A | Maneuver Control System | 07 | 3,943 | 6,639 | 6,639 | | | U |
| 202 | 0203743A | 155mm Self-Propelled Howitzer Improvements | 07 | | 40,784 | 40,784 | | | U |
| 203 | 0203744A | Aircraft Modifications/Product Improvement Programs | 07 | 32,397 | 39,358 | 39,358 | | | U |

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Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 188 | 0607136A | Blackhawk Product Improvement Program | 07 | | | | 34,416 | | 34,416 | U |
| 189 | 0607137A | Chinook Product Improvement Program | 07 | | | | 194,567 | | 194,567 | U |
| 190 | 0607138A | Fixed Wing Product Improvement Program | 07 | | | | 9,981 | | 9,981 | U |
| 191 | 0607139A | Improved Turbine Engine Program | 07 | | | | 204,304 | | 204,304 | U |
| 192 | 0607140A | Emerging Technologies from NIE | 07 | | | | 1,023 | | 1,023 | U |
| 193 | 0607141A | Logistics Automation | 07 | | | | 1,504 | | 1,504 | U |
| 194 | 0607142A | Aviation Rocket System Product Improvement and Development | 07 | | | | 10,064 | | 10,064 | U |
| 195 | 0607143A | Unmanned Aircraft System Universal Products | 07 | | | | 38,463 | | 38,463 | U |
| 196 | 0607665A | Family of Biometrics | 07 | | | | 6,159 | | 6,159 | U |
| 197 | 0607865A | Patriot Product Improvement | 07 | | | | 90,217 | | 90,217 | U |
| 198 | 0202429A | Aerostat Joint Project - COCOM Exercise | 07 | | | | 6,749 | | 6,749 | U |
| 199 | 0203728A | Joint Automated Deep Operation Coordination System (JADOCS) | 07 | | | | 33,520 | | 33,520 | U |
| 200 | 0203735A | Combat Vehicle Improvement Programs | 07 | | | | 343,175 | | 343,175 | U |
| 201 | 0203740A | Maneuver Control System | 07 | | | | 6,639 | | 6,639 | U |
| 202 | 0203743A | 155mm Self-Propelled Howitzer Improvements | 07 | | | | 40,784 | | 40,784 | U |
| 203 | 0203744A | Aircraft Modifications/Product Improvement Programs | 07 | | | | 39,358 | | 39,358 | U |

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| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 188 | 0607136A | Blackhawk Product Improvement Program | 07 | 35,240 | | 35,240 | U |
| 189 | 0607137A | Chinook Product Improvement Program | 07 | 157,822 | | 157,822 | U |
| 190 | 0607138A | Fixed Wing Product Improvement Program | 07 | 4,189 | | 4,189 | U |
| 191 | 0607139A | Improved Turbine Engine Program | 07 | 192,637 | | 192,637 | U |
| 192 | 0607140A | Emerging Technologies from NIE | 07 | | | | U |
| 193 | 0607141A | Logistics Automation | 07 | | | | U |
| 194 | 0607142A | Aviation Rocket System Product Improvement and Development | 07 | 60,860 | | 60,860 | U |
| 195 | 0607143A | Unmanned Aircraft System Universal Products | 07 | 52,019 | | 52,019 | U |
| 196 | 0607665A | Family of Biometrics | 07 | 2,400 | | 2,400 | U |
| 197 | 0607865A | Patriot Product Improvement | 07 | 65,369 | | 65,369 | U |
| 198 | 0202429A | Aerostat Joint Project - COCOM Exercise | 07 | 1 | | 1 | U |
| 199 | 0203728A | Joint Automated Deep Operation Coordination System (JADOCS) | 07 | 30,954 | | 30,954 | U |
| 200 | 0203735A | Combat Vehicle Improvement Programs | 07 | 411,927 | | 411,927 | U |
| 201 | 0203740A | Maneuver Control System | 07 | | | | U |
| 202 | 0203743A | 155mm Self-Propelled Howitzer Improvements | 07 | 40,676 | | 40,676 | U |
| 203 | 0203744A | Aircraft Modifications/Product Improvement Programs | 07 | 17,706 | | 17,706 | U |

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| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 204 | 0203752A | Aircraft Engine Component Improvement Program | 07 | 249 | 145 | 145 | | | U |
| 205 | 0203758A | Digitization | 07 | 6,234 | 4,803 | 4,803 | | | U |
| 206 | 0203801A | Missile/Air Defense Product Improvement Program | 07 | 24,925 | 2,723 | 2,723 | 15,000 | 15,000 | U |
| 207 | 0203802A | Other Missile Product Improvement Programs | 07 | 8,283 | 5,000 | 5,000 | | | U |
| 208 | 0203808A | TRACTOR CARD | 07 | 20,333 | 37,883 | 37,883 | | | U |
| 209 | 0205402A | Integrated Base Defense - Operational System Dev | 07 | 3,450 | | | | | U |
| 210 | 0205410A | Materials Handling Equipment | 07 | 119 | 1,582 | 1,582 | | | U |
| 211 | 0205412A | Environmental Quality Technology - Operational System Dev | 07 | | 195 | 195 | | | U |
| 212 | 0205456A | Lower Tier Air and Missile Defense (AMD) System | 07 | 61,449 | 78,926 | 78,926 | | | U |
| 213 | 0205778A | Guided Multiple-Launch Rocket System (GMLRS) | 07 | 21,196 | 102,807 | 102,807 | | | U |
| 214 | 0208053A | Joint Tactical Ground System | 07 | 12,649 | | | | | U |
| 216 | 0303028A | Security and Intelligence Activities | 07 | 15,719 | 13,807 | 13,807 | | | U |
| 217 | 0303140A | Information Systems Security Program | 07 | 36,892 | 132,438 | 132,438 | | | U |
| 218 | 0303141A | Global Combat Support System | 07 | 26,176 | 64,370 | 64,370 | | | U |
| 219 | 0303142A | SATCOM Ground Environment (SPACE) | 07 | 18,761 | | | | | U |
| 220 | 0303150A | WWMCCS/Global Command and Control System | 07 | 4,536 | 10,475 | 10,475 | | | U |

Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 204 | 0203752A | Aircraft Engine Component Improvement Program | 07 | | | | 145 | | 145 | U |
| 205 | 0203758A | Digitization | 07 | | | | 4,803 | | 4,803 | U |
| 206 | 0203801A | Missile/Air Defense Product Improvement Program | 07 | | | | 17,723 | | 17,723 | U |
| 207 | 0203802A | Other Missile Product Improvement Programs | 07 | | | | 5,000 | | 5,000 | U |
| 208 | 0203808A | TRACTOR CARD | 07 | | | | 37,883 | | 37,883 | U |
| 209 | 0205402A | Integrated Base Defense - Operational System Dev | 07 | | | | | | | U |
| 210 | 0205410A | Materials Handling Equipment | 07 | | | | 1,582 | | 1,582 | U |
| 211 | 0205412A | Environmental Quality Technology - Operational System Dev | 07 | | | | 195 | | 195 | U |
| 212 | 0205456A | Lower Tier Air and Missile Defense (AMD) System | 07 | | | | 78,926 | | 78,926 | U |
| 213 | 0205778A | Guided Multiple-Launch Rocket System (GMLRS) | 07 | | | | 102,807 | | 102,807 | U |
| 214 | 0208053A | Joint Tactical Ground System | 07 | | | | | | | U |
| 216 | 0303028A | Security and Intelligence Activities | 07 | | | | 13,807 | | 13,807 | U |
| 217 | 0303140A | Information Systems Security Program | 07 | | | | 132,438 | | 132,438 | U |
| 218 | 0303141A | Global Combat Support System | 07 | | | | 64,370 | | 64,370 | U |
| 219 | 0303142A | SATCOM Ground Environment (SPACE) | 07 | | | | | | | U |
| 220 | 0303150A | WWMCCS/Global Command and Control System | 07 | | | | 10,475 | | 10,475 | U |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 204 | 0203752A | Aircraft Engine Component Improvement Program | 07 | 146 | | 146 | U |
| 205 | 0203758A | Digitization | 07 | 6,316 | | 6,316 | U |
| 206 | 0203801A | Missile/Air Defense Product Improvement Program | 07 | 1,643 | 2,000 | 3,643 | U |
| 207 | 0203802A | Other Missile Product Improvement Programs | 07 | 4,947 | | 4,947 | U |
| 208 | 0203808A | TRACTOR CARD | 07 | 34,050 | | 34,050 | U |
| 209 | 0205402A | Integrated Base Defense - Operational System Dev | 07 | | 8,000 | 8,000 | U |
| 210 | 0205410A | Materials Handling Equipment | 07 | 1,464 | | 1,464 | U |
| 211 | 0205412A | Environmental Quality Technology - Operational System Dev | 07 | 249 | | 249 | U |
| 212 | 0205456A | Lower Tier Air and Missile Defense (AMD) System | 07 | 79,283 | | 79,283 | U |
| 213 | 0205778A | Guided Multiple-Launch Rocket System (GMLRS) | 07 | 154,102 | | 154,102 | U |
| 214 | 0208053A | Joint Tactical Ground System | 07 | | | | U |
| 216 | 0303028A | Security and Intelligence Activities | 07 | 12,280 | 23,199 | 35,479 | U |
| 217 | 0303140A | Information Systems Security Program | 07 | 68,533 | | 68,533 | U |
| 218 | 0303141A | Global Combat Support System | 07 | 68,619 | | 68,619 | U |
| 219 | 0303142A | SATCOM Ground Environment (SPACE) | 07 | | | | U |
| 220 | 0303150A | WWMCCS/Global Command and Control System | 07 | 2,034 | | 2,034 | U |

Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO | FY 2018 Total PB Requests+ with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 223 | 0305172A | Combined Advanced Applications | 07 | | 1,100 | 1,100 | | | U |
| 224 | 0305179A | Integrated Broadcast Service (IBS) | 07 | | | | | | U |
| 225 | 0305204A | Tactical Unmanned Aerial Vehicles | 07 | 8,218 | 9,433 | 9,433 | 7,492 | 7,492 | U |
| 226 | 0305206A | Airborne Reconnaissance Systems | 07 | 11,799 | 5,080 | 5,080 | 15,000 | 15,000 | U |
| 227 | 0305208A | Distributed Common Ground/Surface Systems | 07 | 32,284 | 24,700 | 24,700 | | | U |
| 228 | 0305219A | MQ-1C Gray Eagle UAS | 07 | 13,470 | 9,574 | 9,574 | | | U |
| 229 | 0305232A | RQ-11 UAV | 07 | 1,613 | 2,191 | 2,191 | | | U |
| 230 | 0305233A | RQ-7 UAV | 07 | 4,597 | 12,773 | 12,773 | | | U |
| 231 | 0307665A | Biometrics Enabled Intelligence | 07 | 8,854 | 2,537 | 2,537 | 6,036 | 6,036 | U |
| 232 | 0310349A | Win-T Increment 2 - Initial Networking | 07 | 4,680 | 4,723 | 4,723 | | | U |
| 233 | 0708045A | End Item Industrial Preparedness Activities | 07 | 59,891 | 60,877 | 60,877 | | | U |
| 234 | 1203142A | SATCOM Ground Environment (SPACE) | 07 | | 11,959 | 11,959 | | | U |
| 235 | 1208053A | Joint Tactical Ground System | 07 | | 10,228 | 10,228 | | | U |
| 9999 | 9999999999 | Classified Programs | | 4,625 | 7,154 | 7,154 | | | U |
| | | Operational Systems Development | | 1,296,107 | 1,877,685 | 1,877,685 | 43,528 | 43,528 | |
| 236 | 0901560A | Continuing Resolution Programs | 20 | | -1,151,993 | -1,151,993 | 222,988 | 222,988 | U |
| | | Undistributed | | | -1,151,993 | -1,151,993 | 222,988 | 222,988 | |
| Total Research, Development, Test & Eval, Army | | | | 8,852,507 | 8,273,447 | 8,273,447 | 342,356 | 342,356 | |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | Sec |
|---|---|---|---|---|---|---|---|---|---|---|
| 223 | 0305172A | Combined Advanced Applications | 07 | | | | 1,100 | | 1,100 | U |
| 224 | 0305179A | Integrated Broadcast Service (IBS) | 07 | | | | | | | U |
| 225 | 0305204A | Tactical Unmanned Aerial Vehicles | 07 | | | | 16,925 | | 16,925 | U |
| 226 | 0305206A | Airborne Reconnaissance Systems | 07 | | | | 20,080 | | 20,080 | U |
| 227 | 0305208A | Distributed Common Ground/Surface Systems | 07 | | | | 24,700 | | 24,700 | U |
| 228 | 0305219A | MQ-1C Gray Eagle UAS | 07 | | | | 9,574 | | 9,574 | U |
| 229 | 0305232A | RQ-11 UAV | 07 | | | | 2,191 | | 2,191 | U |
| 230 | 0305233A | RQ-7 UAV | 07 | | | | 12,773 | | 12,773 | U |
| 231 | 0307665A | Biometrics Enabled Intelligence | 07 | | | | 8,573 | | 8,573 | U |
| 232 | 0310349A | Win-T Increment 2 - Initial Networking | 07 | | | | 4,723 | | 4,723 | U |
| 233 | 0708045A | End Item Industrial Preparedness Activities | 07 | | | | 60,877 | | 60,877 | U |
| 234 | 1203142A | SATCOM Ground Environment (SPACE) | 07 | | | | 11,959 | | 11,959 | U |
| 235 | 1208053A | Joint Tactical Ground System | 07 | | | | 10,228 | | 10,228 | U |
| 9999 | 9999999999 | Classified Programs | | | | | 7,154 | | 7,154 | U |
| | | Operational Systems Development | | | | | 1,921,213 | | 1,921,213 | |
| 236 | 0901560A | Continuing Resolution Programs | 20 | | | | -929,005 | | -929,005 | U |
| | | Undistributed | | | | | -929,005 | | -929,005 | |
| Total Research, Development, Test & Eval, Army | | | | 20,700 | -20,700 | | 8,636,503 | -20,700 | 8,615,803 | |

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Department of the Army
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 2040A Research, Development, Test & Eval, Army

| Line No | Program Element Number | Item | Act | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Sec |
|---|---|---|---|---|---|---|---|
| 223 | 0305172A | Combined Advanced Applications | 07 | 1,500 | | 1,500 | U |
| 224 | 0305179A | Integrated Broadcast Service (IBS) | 07 | 450 | | 450 | U |
| 225 | 0305204A | Tactical Unmanned Aerial Vehicles | 07 | 6,000 | | 6,000 | U |
| 226 | 0305206A | Airborne Reconnaissance Systems | 07 | 12,416 | 14,000 | 26,416 | U |
| 227 | 0305208A | Distributed Common Ground/Surface Systems | 07 | 38,667 | | 38,667 | U |
| 228 | 0305219A | MQ-1C Gray Eagle UAS | 07 | | | | U |
| 229 | 0305232A | RQ-11 UAV | 07 | 6,180 | | 6,180 | U |
| 230 | 0305233A | RQ-7 UAV | 07 | 12,863 | | 12,863 | U |
| 231 | 0307665A | Biometrics Enabled Intelligence | 07 | 4,310 | 2,214 | 6,524 | U |
| 232 | 0310349A | Win-T Increment 2 - Initial Networking | 07 | | | | U |
| 233 | 0708045A | End Item Industrial Preparedness Activities | 07 | 53,958 | | 53,958 | U |
| 234 | 1203142A | SATCOM Ground Environment (SPACE) | 07 | 12,119 | | 12,119 | U |
| 235 | 1208053A | Joint Tactical Ground System | 07 | 7,400 | | 7,400 | U |
| 9999 | 9999999999 | Classified Programs | | 5,955 | | 5,955 | U |
| | | Operational Systems Development | | 1,922,614 | 59,741 | 1,982,355 | |
| 236 | 0901560A | Continuing Resolution Programs | 20 | | | | U |
| | | Undistributed | | | | | |
| Total Research, Development, Test & Eval, Army | | | | 10,159,379 | 325,104 | 10,484,483 | |

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## Program Element Table of Contents (by Budget Activity then Line Item Number)

***Appropriation 2040: Research, Development, Test & Evaluation, Army***

***Appropriation 2040: Research, Development, Test & Evaluation, Army***

***Appropriation 2040: Research, Development, Test & Evaluation, Army***

## Program Element Table of Contents (Alphabetically by Program Element Title)

# FY 2019 RDT&E, ARMY PROGRAM ELEMENT DESCRIPTIVE SUMMARIES

## Introduction and Explanation of Contents

1. **General.** The purpose of this document is to provide summary information concerning the Research, Development, Test and Evaluation, Army program. The descriptive summaries are comprised of R-2 (Army RDT&E Budget Item Justification – program element level), R-2A (Army RDT&E Budget Item Justification – project level), R-3 (Army RDT&E Cost Analysis), R-4 (Schedule Profile Detail) and R-5 (Termination Liability Funding for MDAPs) Exhibits, which provide narrative information on all RDT&E program elements and projects through FY 2019.

2. **Relationship of the FY 2019 Budget Submitted to Congress to the FY 2018 Budget Submitted to Congress.** This paragraph provides a list of program elements/projects that are major new starts, restructures, developmental transitions, and terminated programs. Explanations for these changes can be found in the narrative sections of the Program Element R-2A Exhibits.

### A. New Start Programs:

| Budget Activity | OSDPE / Project | Project Title |
|---|---|---|
| 02 | 0602126A / XW8 | TRACTOR JACK |
| 02 | 0602787A / XV5 | Medical Capabilities to Support Dispersed Ops |
| 04 | 0604020A / CF1 | CFT Advanced Development & Prototyping |
| 04 | 0604113A / EX8 | Future Tactical Unmanned Aircraft System (FTUAS) |
| 06 | 0605898A / FJ2 | Army SHARP RDTE |
| 06 | 0606942A / FL2 | Cyber Vulnerabilities Assessments and Evaluations |
| 07 | 0305179A / EF4 | Integrated Broadcast System |
| 07 | 0305206A / EH7 | Guardrail Common Sensor (GRCS) Payloads (MIP) |
| 07 | 0305206A / EH2 | EMARSS ADV DEV (MIP) |

**B. Program Element/Project Restructures:**

| Budget Activity | Old OSDPE / Project: Title | New OSDPE / Project: Title |
|---|---|---|
| 02 | 0602105A / H84: Materials | 0602105A / XW4: Manufacturing Science |
| 02 | 0602270A / 906: Tactical Electronic Warfare Applied Research | 0602270A / CYB: Applied Offensive Cyber |
| 02 | 0602782A / 779: Command, Control And Platform Electronics Tech | 0602782A / CY2: Applied Defensive Cyber |
| 02 | 0602782A / H92: Communications Technology | 0602782A / CY2: Applied Defensive Cyber |
| 02 | 0602786A / 283: Airdrop Adv Tech | 0602786A / XW5: Small Unit Expeditionary Maneuver Technology |
| 02 | 0602786A / H99: Joint Service Combat Feeding Technology | 0602786A / XW5: Small Unit Expeditionary Maneuver Technology |
| 02 | 0602786A / VT4: Expeditionary Mobile Base Camp Technology | 0602786A / XW5: Small Unit Expeditionary Maneuver Technology |
| 03 | 0603001A / C07: Joint Service Combat Feeding Tech Demo | 0603001A / XW6: Small Unit Expeditionary Maneuver |
| 03 | 0603001A / VT5: Expeditionary Mobile Base Camp Demonstration | 0603001A / XW6: Small Unit Expeditionary Maneuver |
| 03 | 0603001A / 242: Airdrop Equipment | 0603001A / XW6: Small Unit Expeditionary Maneuver |
| 03 | 0603270A / K15: Advanced Comm Ecm Demo | 0603270A / CY3: Offensive Cyber Demonstration |
| 03 | 0603270A / K16: Non-Commo Ecm Tech Dem | 0603270A / CY3: Offensive Cyber Demonstration |
| 04 | 0603639A / EL7: Reduced Range Ammunition | 0604802A / EP3: Reduced Range Ammunition - Small Caliber |
| 04 | 0603639A / EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER | 0607131A / ER6: Direct Fire Technology |
| 04 | 0603639A / EU1: Enhanced Lethality Cannon Munitions | 0604802A / EU7: Enhanced Lethality Cannon Munitions |
| 04 | 0603639A / EU1: Enhanced Lethality Cannon Munitions | 0604802A / EU6: 155mm HE Rocket Assist Project Extended Range |
| 04 | 0604120A / ED5: Assured Positioning, Navigation and Timing (PNT) | 1206120A / FJ8: Assured Positioning, Navigation and Timing (PNT) |
| 04 | 0604120A / EH8: DISMOUNTED | 1206120A / FJ9: Dismounted A-PNT |
| 04 | 0604120A / EH9: PSEUDOLITES | 1206120A / FK1: Pseudolites |
| 04 | 0604120A / EJ2: MOUNTED | 1206120A / FK2: Mounted A-PNT |
| 04 | 0604120A / EJ3: ANTI-JAM ANTENNA | 1206120A / FK3: Anti-Jam Antenna |
| 05 | 0210609A / ED8: Paladin Integrated Management (PIM) | 0203743A / FF9: PIM Improvement Program |
| 05 | 0604798A / FG7: Emerging Technology Initiatives | 0604798A / FI3: Rapid Capability Development and Maturation |
| 05 | 0604827A / S65: Platoon Power Generator | 0604827A / EY3: Soldier Power Generator |
| 05 | 0605053A / FB4: Common Robotic Systems | 0605053A / FG8: Common Robotic Controller |
| 07 | 0303028A / FG2: Counterintelligence & Human Intel Modernization | 0606003A / FI9: Counterl Intel and Human Intel Modernization |
| 07 | 0205402A / EF2: Integrated Base Defense | 0605029A / EQ2: IntegGrdSecSurvRespC(IGSSR-C) |
| 07 | 0205402A / EF2: Integrated Base Defense | 0605033A / EQ3: Grnd-Based Opnl Surv Sys -Exped (GBOSS-E) |
| 07 | 0303142A / 253: Dscs-Dcs (Phase II) | 1203142A / FE1: Dscs-Dcs (Phase II) |
| 07 | 0303142A / 456: MILSATCOM System Engineering | 1203142A / FE2: MILSATCOM System Engineering |
| 07 | 0303142A / EK8: Enroute Mission Command | 1203142A / FE4: Enroute Mission Command |

**C. Program Terminations:**

| Budget Activity | OSDPE / Project | OSDPE Title / Project Title |
|---|---|---|
| 01 | 0601103A / V72 | University Research Initiatives / Minerva; project ends |
| 01 | 0601104A / H50 | University and Industry Research Centers / Network Sciences Cta; project ends |
| 01 | 0601104A / H53 | University and Industry Research Centers / Army High Performance Computing Research Center; project ends |
| 01 | 0601104A / H54 | University and Industry Research Centers / Micro-Autonomous Systems Technology (MAST) CTA; project ends |
| 02 | 0602105A / H7G | Materials Technology / Nanomaterials Applied Research; project ends |
| 02 | 0602120A / SA2 | Sensors and Electronic Survivability / Biotechnology Applied Research; project ends |
| 02 | 0602705A / H17 | Electronics and Electronic Devices / Flexible Display Center; project ends |
| 02 | 0602720A / 895 | Environmental Quality Technology / Pollution Prevention; project ends |
| 03 | 0603001A / 543 | Warfighter Advanced Technology / Ammunition Logistics; project ends |
| 03 | 0603015A / S28 | Next Generation Training & Simulation Systems / Immersive Learning Environments; project ends |
| 03 | 0603020A / DB1 | TRACTOR ROSE / DDB1; project ends |
| 03 | 0603606A / 683 | Landmine Warfare and Barrier Advanced Technology / Area Denial Sensors; project ends |
| 03 | 0603728A / 025 | Environmental Quality Technology Demonstrations / Pollution Prevention Technology; project ends |
| 04 | 0604115A / EX3 | Technology Maturation Initiatives / Ground Vehicle Prototyping; project ends |
| 05 | 0604290A / DW1 | Mid-tier Networking Vehicular Radio (MNVR) / Mid-Tier Wideband Networking Vehicular Radio Mnvr; project ends |
| 05 | 0604321A / B41 | All Source Analysis System / CI/HUMINT Software Products (MIP); project ends |
| 05 | 0604321A / B51 | All Source Analysis System / Machine - Foreign Language Translation System; project ends |
| 05 | 0604818A / 334 | Army Tactical Command & Control Hardware & Software / Common Software; project ends |
| 06 | 0303260A / FA9 | Defense Military Deception Initiative / Security Initiatives; project ends |
| 06 | 0604759A / FA4 | Major T&E Investment / Warrior Injury Assessment Manikin (WIAMan); transitions to procurement |
| 07 | 0202429A / EP8 | Aerostat Joint Project - COCOM Exercise / COCOM Exercise; project ends |
| 07 | 0203740A / 484 | Maneuver Control System / Maneuver Control System; project ends |
| 07 | 0303142A / EA3 | SATCOM Ground Environment (SPACE) / Transportable Tactical Cmd Comms (T2C2); transitions to procurement |
| 07 | 0303150A / EA5 | WWMCCS/Global Command and Control System / Strategic and Joint Mission Command; transitions to procurement |
| 07 | 0305219A / MQ1 | MQ-1 Gray Eagle UAV / MQ-1 Gray Eagle - Army UAV (MIP); project ends |
| 07 | 0607140A / ES7 | Emerging Technologies from NIE / Emerging Technologies from NIE; project ends |
| 07 | 0607141A / DY1 | Logistics Automation / Logistics Information Warehouse (LIW); project ends |

**3. Classification:** This document contains no classified data Appropriately cleared individuals can obtain further information on Classified/Special Access Programs by contacting the Department of the Army (ASA(ALT)) Special Programs Office.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0603778A / *MLRS Product Improvement Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 34.391 | 8.929 | 8.886 | - | 8.886 | 8.877 | 10.167 | 12.479 | 53.296 | 0.000 | 137.025 |
| 093: *Multi-Launch Rocket System (MLRS)* | - | 25.100 | 5.000 | 4.947 | - | 4.947 | 4.943 | 5.041 | 5.040 | 31.506 | 0.000 | 81.577 |
| 789: *Guided MLRS (GMLRS) Rocket P3I** | - | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 17.748 | 0.000 | 17.748 |
| DX8: *HIMARS Product Improvement Program* | - | 9.291 | 3.929 | 3.939 | - | 3.939 | 3.934 | 5.126 | 7.439 | 4.042 | 0.000 | 37.700 |

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019

**A. Mission Description and Budget Item Justification**

Project 093. The Multiple Launch Rocket System (MLRS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the MLRS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems.

FY2019 Base funding in the amount of $4.947 million for project 093 supports the continued software development of an organic tactical software build in support of the Fire Control System (FCS) hardware supporting both the current MLRS Fleet (upon upgrade with a modern hardware FCS) and the Army's MLRS Fleet Expansion effort. This software development leverages the program's completed software transition from the prime contractor to the government in FY2016. This FCS solution will be ready to field in FY2021. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and will be the first release of organic software common to both the MLRS and HIMARS launcher in FY2021.

Project 789. The Multiple Launch Rocket System (MLRS) Low Cost Reduced Range Practice Rocket (LCRRPR) is the only live training rocket for High Mobility Artillery Rocket System (HIMARS) and M270/M270A1 MLRS Launcher units/crews. LCRRPR meets a critical validated requirement for Active and National Guard HIMARS and M270A1 launcher units to achieve and maintain combat readiness. HIMARS and M270A1 Battalions are organic and attached to modular Fires Brigades supporting Brigade Combat Teams (BCTs), Joint Expeditionary Force, and Joint Special Operations Force combatant commanders. The training rocket has an inert payload section and blunt nose for inducing reduced range for use at multiple facilities in the United States and foreign countries. LCRRPRs are manufactured by Lockheed Martin in Camden, Arkansas and Letterkenny Munitions Center (LEMC) in Chambersburg, Pennsylvania. LEMC provides an organic dual source. The LCRRPR is currently produced by reusing the M26 pod and rocket motor, however, the US Government will soon experience inventory depletion of M26 rocket motors and Launch Pod Containers that feed the LCRRPR production line.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0603778A *I MLRS Product Improvement Program* |

Project DX8. The M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the HIMARS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems.

FY2019 Base funding in the amount of $3.939 million for project DX8 supports HIMARS-unique software build, version 8.2. The Product Manager will field this software to the M142 fleet in FY2019. In addition to addressing software maintenance, software version 8.2 enables portability to the M270A2 (MLRS) tracked launcher upon receipt of a hardware Fire Control System upgrade.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 34.763 | 8.929 | 8.981 | - | 8.981 |
| Current President's Budget | 34.391 | 8.929 | 8.886 | - | 8.886 |
| Total Adjustments | -0.372 | 0.000 | -0.095 | - | -0.095 |
| • Congressional General Reductions | -0.005 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.367 | - | | | |
| • Other Adjustments 2 | - | - | -0.095 | - | -0.095 |

**Change Summary Explanation**

FY17: $0.367 million SBIR transfer

FY17: $0.005 million FFRDC transfer

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0603778A / *MLRS Product Improvement Program* | Project (Number/Name)<br>093 / *Multi-Launch Rocket System (MLRS)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 093: *Multi-Launch Rocket System (MLRS)* | - | 25.100 | 5.000 | 4.947 | - | 4.947 | 4.943 | 5.041 | 5.040 | 31.506 | 0.000 | 81.577 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Project 093. The Multiple Launch Rocket System (MLRS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the MLRS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems.

FY2019 Base funding in the amount of $4.947 million for project 093 continues software development of an organic tactical software build in support of the Common Fire Control System (CFCS) hardware supporting both the current MLRS Fleet (upon upgrade with a modern hardware FCS) and the Army's MLRS Fleet Expansion effort. This software development leverages the program's completed software transition from the prime contractor to the government in FY2016. The CFCS solution will be ready to field in FY2021. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and will be the first release of organic software common to both the MLRS and HIMARS launcher.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** MLRS Product Improvement Program | 25.100 | 5.000 | 4.947 | - | 4.947 |
| ***Description:*** The MLRS Product Improvement Program provides the preservation of platform viability and readiness to accept technology insertion as capability enhancements and obsolescence mitigations are developed. Support efforts include: obsolescence mitigation and enhancements for the M993A1 carrier, Fire Control System, Launcher Loader Module and Enhanced Command and Control (EC2); develop and update the Fire Control System software to keep pace with changes to the munitions; and perform Command, Control, Communications, Computers and Intelligence (C4I)/interoperability and Information Assurance compliance certification and network interoperability testing. Perform technical assessments and concept studies for: obsolescence mitigation; crew protection; automotive, hardware and software enhancements; improving operational timelines; and risk reduction. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0603778A / *MLRS Product Improvement Program* | **Project (Number/Name)**<br>093 / *Multi-Launch Rocket System (MLRS)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***FY 2018 Plans:***<br>Began tactical launcher software development to support the Fire Control System obsolescence mitigation hardware upgrade required to operate a MLRS launcher.<br>***FY 2019 Base Plans:***<br>Continue tactical launcher software development to support the Fire Control System obsolescence mitigation hardware upgrade required to operate a MLRS launcher.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Decrease is due to economic adjustment from FY18 to FY19. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 25.100 | 5.000 | 4.947 | - | 4.947 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • C67500: *MLRS Mods* | 25.052 | 138.235 | 383.216 | 122.000 | 505.216 | 290.039 | 412.452 | 216.428 | 208.888 | Continuing | Continuing |
| • CA0265: *MLRS MODIFICATION INITIAL SPARES* | 0.476 | - | 0.000 | - | 0.000 | - | - | - | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The MLRS Product Improvement Program performs development efforts required to address emerging requirements. The Army completed transition from the prime contractor (legacy v7.x) to an organic (government developed, maintained, and owned) approach (v8.x forward)) by utilizing the Aviation & Missile Research & Development Engineering Center's (AMRDEC) Software Engineering Directorate (SED) as the software developer and maintainer. These efforts are funded via Military Interdepartmental Purchase Request (MIPR). Emerging requirements include updates to address emerging threats of the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility. Communication suite changes, munitions updates, and introduction of new munitions require software and/or hardware updates to ensure full compatibility and maintain operational viability. The enduring organic v8.2 software effort is projected for Materiel Release and fielding to the M270A2 (MLRS) launcher when upgraded with the Fire Control System solution.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0603778A / *MLRS Product Improvement Program* | Project (Number/Name)<br>093 / *Multi-Launch Rocket System (MLRS)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | Various | PFRMS Project Office : Redstone Arsenal, AL | 8.955 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 8.955 | - | | - | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

PFRMS - Precision Fires Rocket and Missile Systems

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Government Agencies OGA | MIPR | FT SILL OK, CECOM-NJ AMRDEC-RSA AL, : various | 17.108 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| MLRS IAC | C/CPFF | Lockheed Martin : Grand Prairie, TX | 30.498 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| MLRS FCS Development | SS/CR | Lockheed Martin : Grand Prairie, TX | 70.200 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Organic Software Development | MIPR | AMRDEC's Software Engineering Directorate : Redstone Arsenal, AL | - | - | | 5.000 | | 4.947 | Mar 2019 | - | | 4.947 | Continuing | Continuing | Continuing |
| Risk Reduction Effort: Common Fire Control System | SS/TBD | TBD : TBD | - | 21.900 | Feb 2018 | - | | - | | - | | - | 0.000 | 21.900 | - |
| Risk Reduction Effort: Hulls | MIPR | Red River Army Depot : Red River Army Depot, TX | - | 3.200 | Jan 2018 | - | | - | | - | | - | 0.000 | 3.200 | - |
| | | **Subtotal** | 117.806 | 25.100 | | 5.000 | | 4.947 | | - | | 4.947 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0603778A / *MLRS Product Improvement Program* | Project (Number/Name)<br>093 / *Multi-Launch Rocket System (MLRS)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

AMRDEC - Aviation and Missile Research Development and Engineering Center

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support Contract | Various | Multiple : Multiple | 4.834 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 4.834 | - | | - | | - | | - | | - | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support, Joint Interoperability Test Certificate | MIPR | CTSF, Ft. Hood : Texas | 10.712 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 10.712 | - | | - | | - | | - | | - | Continuing | Continuing | N/A |

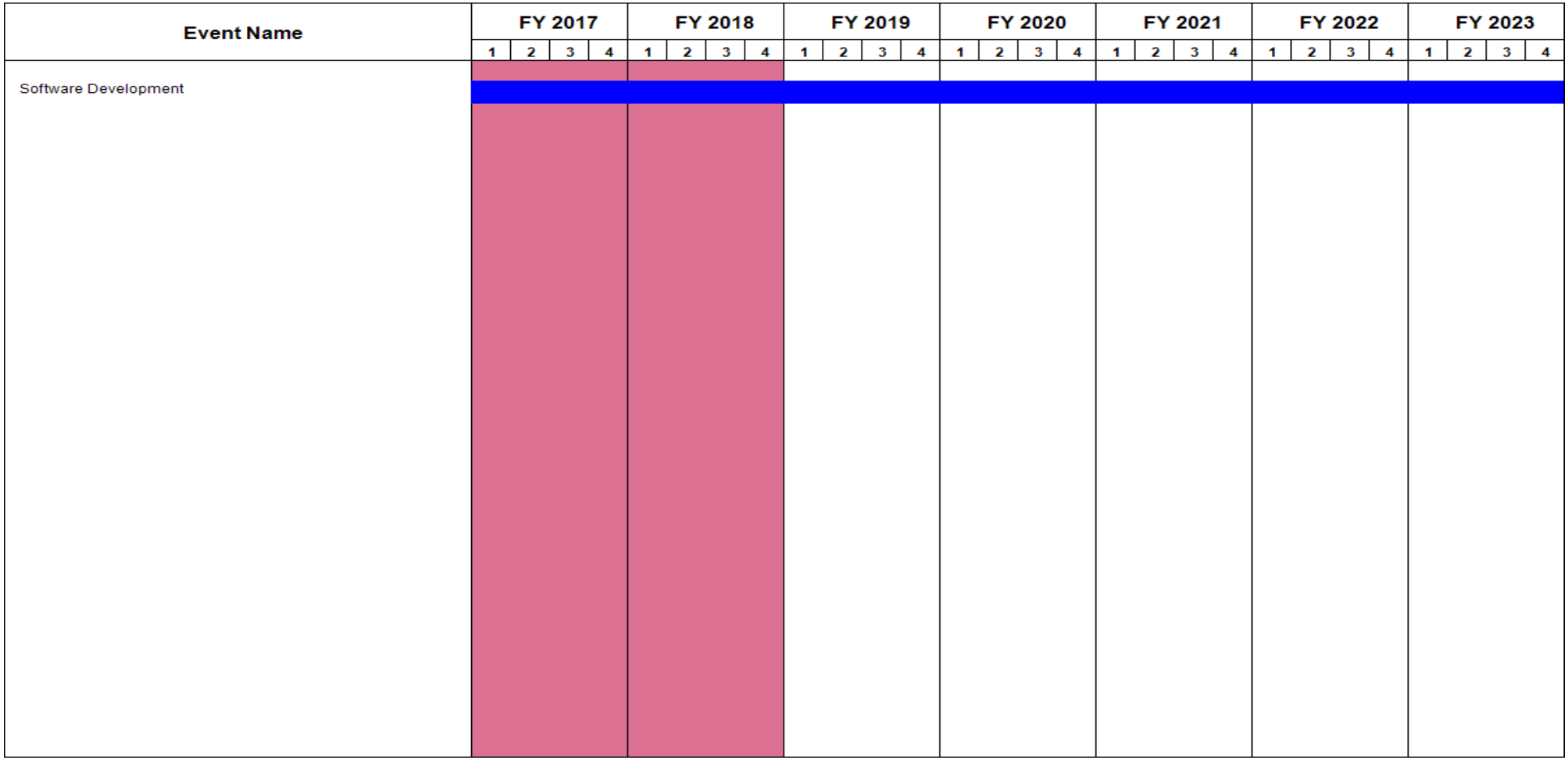
**Remarks**

CTSF - Central Technical Support Facility

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 142.307 | 25.100 | | 5.000 | | 4.947 | | - | | 4.947 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0603778A / *MLRS Product Improvement Program* | **Project (Number/Name)**<br>093 / *Multi-Launch Rocket System (MLRS)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0603778A / *MLRS Product Improvement Program* | **Project (Number/Name)**<br>093 / *Multi-Launch Rocket System (MLRS)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Software Development | 2 | 2013 | 4 | 2023 |

**Note**

Software Development by Aviation and Missile Research, Development, and Engineering Center (AMRDEC) Software Engineering Directorate (SED).

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0603778A / *MLRS Product Improvement Program* | Project (Number/Name)<br>DX8 / *HIMARS Product Improvement Program* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DX8: *HIMARS Product Improvement Program* | - | 9.291 | 3.929 | 3.939 | - | 3.939 | 3.934 | 5.126 | 7.439 | 4.042 | 0.000 | 37.700 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Project DX8. The M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full spectrum, combat proven, all weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System (GMLRS) and the Army Tactical Missile System (ATACMS). These munitions are capable of engaging targets with precision at ranges up to 300 kilometers. This project funds software development for the HIMARS launcher. The government assumed responsibility for software development and maintenance from the prime contractor in FY2016. Organic software is defined as government developed, maintained, and owned software. The long-term end state is a convergence of tactical software across the HIMARS and MLRS launcher platforms into a single product supporting both systems.

FY2019 Base funding in the amount of $3.939 for project DX8 supports development of HIMARS-unique software build, version 8.2. In addition to addressing software maintenance, software version 8.2 enables portability to the M270A2 (MLRS) tracked launcher upon receipt of a hardware Fire Control System upgrade.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** MLRS Production Improvement Program (PIP)-HIMARS PIP | 9.291 | 3.929 | 3.939 | - | 3.939 |
| ***Description:*** Provide enduring tactical software development and maintenance required to address security concerns, implement fixes to newly discovered issues, and address emerging threats. | | | | | |
| ***FY 2018 Plans:***<br>Completed version 8.1 tactical software build for HIMARS launcher and achieve readiness for operational fielding. Began version 8.2 tactical software build to add support to launcher Insensitive Munitions Propulsion System (IMPS) Guided Multiple Launch Rocket System (GMLRS) munitions starting production. This software upgrade will be required to launch the newest production munitions. | | | | | |
| ***FY 2019 Base Plans:***<br>Complete developing version 8.2 tactical software build to add support to launcher IMPS GMLRS munitions starting production. This software upgrade will be required to launch the newest production munitions. | | | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0603778A / *MLRS Product Improvement Program* | **Project (Number/Name)**<br>DX8 / *HIMARS Product Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| No change | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 9.291 | 3.929 | 3.939 | - | 3.939 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • C67501: *HIMARS Modifications (C67501)* | 1.847 | 9.566 | 10.196 | - | 10.196 | 12.483 | 6.089 | 7.300 | 9.711 | 204.749 | 261.941 |
| • C02901: *High Mobility Artillery Rocket System (HIMARS)* | - | 41.000 | 0.000 | 171.138 | 171.138 | - | - | 89.077 | 41.274 | 0.000 | 342.489 |

**Remarks**

**D. Acquisition Strategy**

The HIMARS Product Improvement Program performs development efforts required to address emerging requirements. The Army completed transition from the prime contractor (legacy v7.x) to an organic approach organic (government developed, maintained, and owned) approach (v8.x forward)) by utilizing the Aviation & Missile Research & Development Engineering Center's (AMRDEC) Software Engineering Directorate (SED) as both the software developer and maintainer. These efforts are funded via Military Interdepartmental Purchase Request (MIPR). Emerging requirements include updates to address emerging threats of the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility. Communication suite changes, munitions updates, and introduction of new munitions require software and/or hardware updates to ensure full compatibility and maintain operational viability. The enduring organic version 8 software effort is projected for Materiel Release and fielding to HIMARS fleet in FY2019. When fielded, Version 8.2 will enable portability to the M270A2 (MLRS) launcher when upgraded with the Common Fire Control System solution.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0603778A / *MLRS Product Improvement Program* | Project (Number/Name)<br>DX8 / *HIMARS Product Improvement Program* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | Various | PFRMS Project Office : Redstone Arsenal, AL | 0.422 | 0.395 | Oct 2016 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.422 | 0.395 | | - | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

PFRMS - Precision Fires Rocket and Missile Systems

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Government Agencies (OGA) | MIPR | AMCOM, GSA, RSA : Various | 3.318 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Organic Software Development & Maintenance | MIPR | AMRDEC's Software Engineering Directorate : Redstone Arsenal, AL | 0.463 | 6.400 | Feb 2017 | 3.929 | | 3.939 | Mar 2019 | - | | 3.939 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 3.781 | 6.400 | | 3.929 | | 3.939 | | - | | 3.939 | Continuing | Continuing | N/A |

**Remarks**

AMRDEC - Aviation & Missile Research, Development, and Engineering Center

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support | MIPR | Ft Hood, TX, ATEC, APG, MD, WSMR, RTC, RSA : Various | 0.963 | 2.496 | Aug 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.963 | 2.496 | | - | | - | | - | | - | Continuing | Continuing | N/A |

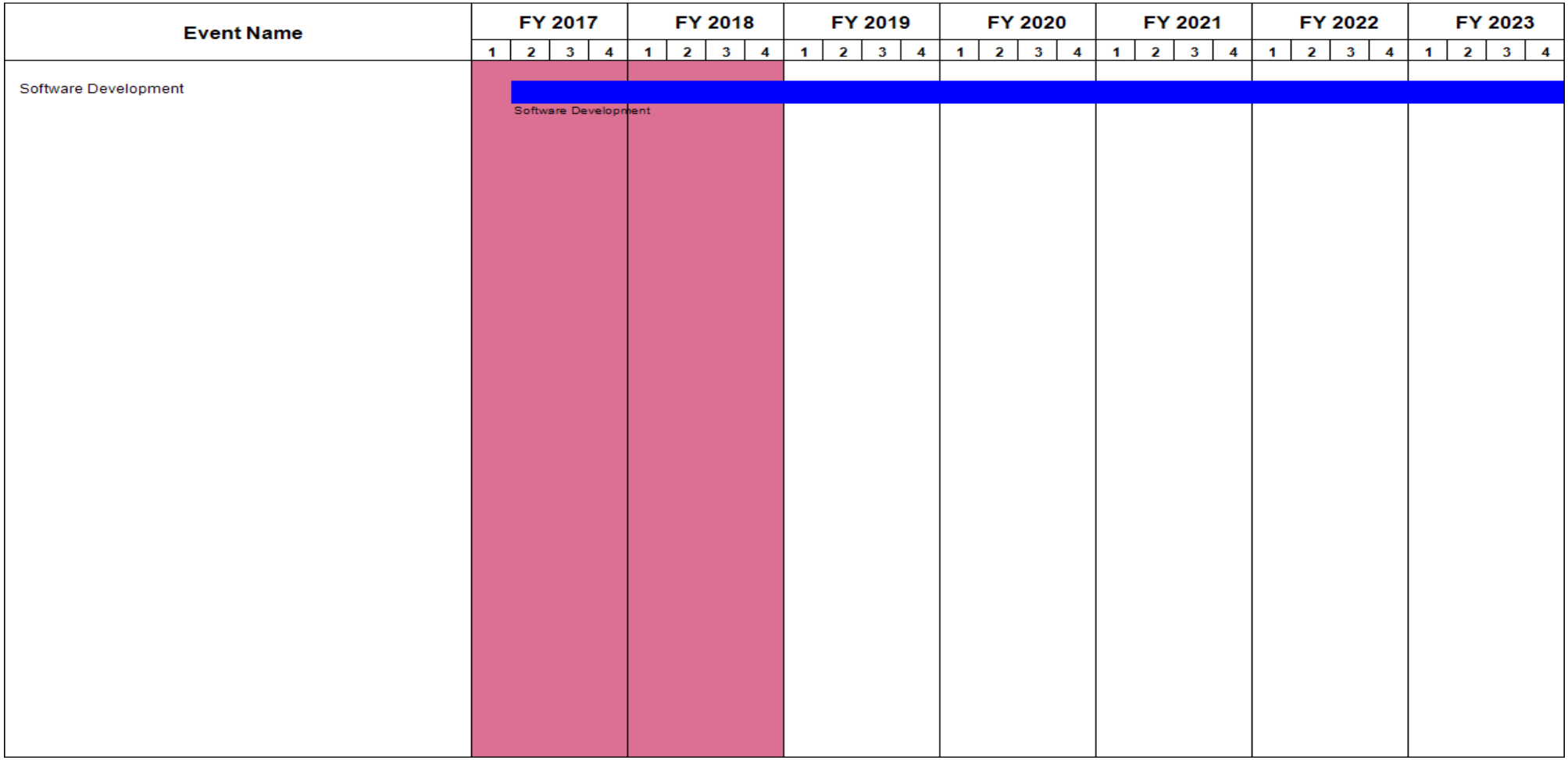
| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0603778A / *MLRS Product Improvement Program* | Project (Number/Name)<br>DX8 / *HIMARS Product Improvement Program* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Remarks**<br>ATEC - US Army Test and Evaluation Command; APG MD - Aberdeen Proving Ground, Maryland; WSMR - White Sands Missile Range; RTC RSA - Redstone Test Center, Redstone Arsenal, Alabama | | | | | | | | | | | | | | | |
| **Project Cost Totals** | | | 5.166 | 9.291 | | 3.929 | | 3.939 | | - | | 3.939 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0603778A / *MLRS Product Improvement Program* | **Project (Number/Name)**<br>DX8 / *HIMARS Product Improvement Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0603778A / *MLRS Product Improvement Program* | **Project (Number/Name)**<br>DX8 / *HIMARS Product Improvement Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Software Development | 2 | 2017 | 4 | 2023 |

**Note**

Software Development by Aviation and Missile Research, Development, and Engineering Center (AMRDEC) Software Engineering Directorate (SED).

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0603813A / *TRACTOR PULL* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 3.960 | 4.014 | 4.067 | - | 4.067 | 4.333 | 4.414 | 4.544 | 4.635 | 0.000 | 29.967 |
| ET1: *Tractor Peel* | - | 3.960 | 4.014 | 4.067 | - | 4.067 | 4.333 | 4.414 | 4.544 | 4.635 | 0.000 | 29.967 |

**A. Mission Description and Budget Item Justification**

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 3.960 | 4.014 | 4.067 | - | 4.067 |
| Current President's Budget | 3.960 | 4.014 | 4.067 | - | 4.067 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

**Change Summary Explanation**

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0605024A *I Anti-Tamper Technology Support* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 3.498 | 4.094 | 4.254 | - | 4.254 | 7.017 | 6.384 | 6.571 | 6.698 | Continuing | Continuing |
| FB1: *Anti-Tamper Technology Support* | - | 3.498 | 4.094 | 4.254 | - | 4.254 | 7.017 | 6.384 | 6.571 | 6.698 | Continuing | Continuing |

**Note**

Prior to FY17, the Anti-Tamper Technology Support program was funded under APE 0605801A M46.

**A. Mission Description and Budget Item Justification**

Anti-Tamper (AT) Technology Support. The Protective Technologies (PT) organization is the Army's Technical Center for the DoD AT program, which is focused on preventing exploitation reverse engineering (RE) of U.S. systems lost or captured on the battlefield or sold via Foreign Military Sales (FMS) or Direct Commercial Sales (DCS). In support of this mission, PT's classified efforts are focused on AT Validation and Verification (V&V) activities with Army programs, AT/RE Lab facilities and equipment and AT/RE Lab assessments.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 3.638 | 4.094 | 4.362 | - | 4.362 |
| Current President's Budget | 3.498 | 4.094 | 4.254 | - | 4.254 |
| Total Adjustments | -0.140 | 0.000 | -0.108 | - | -0.108 |
| • Congressional General Reductions | -0.002 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.136 | - | | | |
| • Adjustments to Budget Years | -0.002 | - | -0.108 | - | -0.108 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0605024A / *Anti-Tamper Technology Support* | Project (Number/Name)<br>FB1 / *Anti-Tamper Technology Support* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FB1: *Anti-Tamper Technology Support* | - | 3.498 | 4.094 | 4.254 | - | 4.254 | 7.017 | 6.384 | 6.571 | 6.698 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Anti-Tamper (AT) Technology Support. The Protective Technologies (PT) organization is the Army's Technical Center for the DoD AT program, which is focused on preventing exploitation reverse engineering (RE) of U.S. systems lost or captured on the battlefield or sold via Foreign Military Sales (FMS) or Direct Commercial Sales (DCS). In support of this mission, PT's classified efforts are focused on AT Validation and Verification (V&V) activities with Army programs, AT/RE Lab facilities and equipment and AT/RE Lab assessments.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Anti-Tamper (AT) Technology Support | 3.498 | 4.094 | 4.254 |
| ***Description:*** AT is a DoD program that encompasses the systems engineering activities intended to prevent and/or delay exploitation of critical technologies in U.S. weapon systems. These activities involve the entire life-cycle of systems acquisition, including research, development, implementation, and testing of AT measures.<br><br>***FY 2018 Plans:***<br>Maintain the core team of subject matter experts (SMEs) available for this mission to support the development of and evaluate the AT designs for Army programs, and in support of that primary mission, conduct technical assessments of micro-electronic parts used in the electronic designs of a number of critical Army weapons systems.<br><br>***FY 2019 Plans:***<br>Will build and maintain the PT core team of subject matter experts (SMEs) available for this mission to support the development of and evaluate the AT designs for Army programs. In support of that primary mission, will continue to build state-of-the-art RE capabilities to facilitate technical assessments of micro-electronic parts used in the electronic designs of critical Army weapons systems.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 adjustment supports current senior leader strategy/priorities. | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.498 | 4.094 | 4.254 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0605024A / *Anti-Tamper Technology Support* | **Project (Number/Name)**<br>FB1 / *Anti-Tamper Technology Support* |

**C. Other Program Funding Summary ($ in Millions)**

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0605024A / *Anti-Tamper Technology Support* | Project (Number/Name)<br>FB1 / *Anti-Tamper Technology Support* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT V&V Activities | Various | Redstone Arsenal & Prime Contract locations : Redstone Arsenal | - | 1.267 | Jun 2017 | 2.092 | Jul 2018 | 2.040 | Sep 2019 | - | | 2.040 | 0.000 | 5.399 | - |
| | | **Subtotal** | - | 1.267 | | 2.092 | | 2.040 | | - | | 2.040 | 0.000 | 5.399 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT/RE Lab Facilities & Equipment | Various | Redstone Arsenal, AL : Redstone Arsenal, AL | - | 1.598 | Sep 2017 | 1.230 | Jul 2018 | 1.352 | Sep 2019 | - | | 1.352 | 0.000 | 4.180 | - |
| | | **Subtotal** | - | 1.598 | | 1.230 | | 1.352 | | - | | 1.352 | 0.000 | 4.180 | N/A |

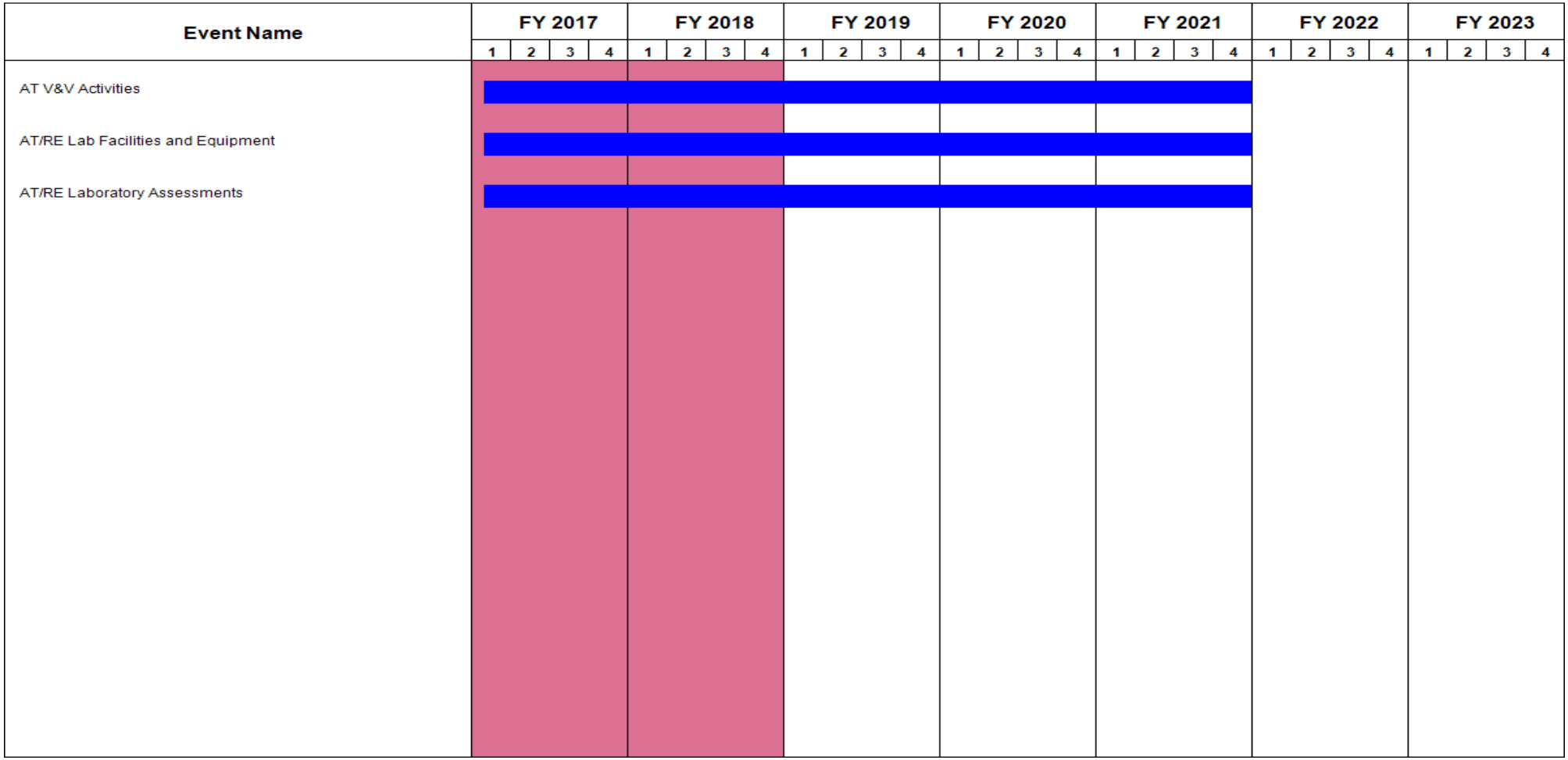
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT/RE Laboratory Assessments | Various | Redstone Arsenal, AL : Redstone Arsenal, AL | - | 0.633 | Jun 2017 | 0.772 | Jul 2018 | 0.862 | Sep 2019 | - | | 0.862 | 0.000 | 2.267 | - |
| | | **Subtotal** | - | 0.633 | | 0.772 | | 0.862 | | - | | 0.862 | 0.000 | 2.267 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | 3.498 | | 4.094 | | 4.254 | | - | | 4.254 | 0.000 | 11.846 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0605024A / *Anti-Tamper Technology Support* | **Project (Number/Name)**<br>FB1 / *Anti-Tamper Technology Support* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0605024A / *Anti-Tamper Technology Support* | **Project (Number/Name)**<br>FB1 / *Anti-Tamper Technology Support* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| AT V&V Activities | 1 | 2017 | 4 | 2021 |
| AT/RE Lab Facilities and Equipment | 1 | 2017 | 4 | 2021 |
| AT/RE Laboratory Assessments | 1 | 2017 | 4 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 19.969 | 15.738 | 16.022 | 2.548 | 18.570 | 12.740 | 9.023 | 4.952 | 2.198 | Continuing | Continuing |
| ER2: *Close Combat Technology* | - | 6.036 | 3.774 | 3.147 | - | 3.147 | 2.056 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| ER5: *Indirect Fire and Fuze Technology* | - | 2.525 | 2.268 | 2.820 | - | 2.820 | 5.387 | 5.387 | 4.200 | 2.025 | 0.000 | 24.612 |
| ER6: *Direct Fire Technology* | - | 11.408 | 9.696 | 10.055 | 2.548 | 12.603 | 5.297 | 3.636 | 0.752 | 0.173 | Continuing | Continuing |

**Note**

In FY 2019, Program Element (PE) 0603639A, Project EL8, Lightweight Cartridge Case for Small Caliber, will transition to PE 0607131, Project ER6, Direct Fire Technology. This project is not a new start.

**A. Mission Description and Budget Item Justification**

Project ER2: The Close Combat Technology program includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, countermeasure flares, non-lethal ammunition/systems, networked munitions and mines, that have been fielded or have received approval for full rate production. This program will identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

FY 2019 funds resource improvements to the following programs: MK3A2 Offensive Hand Grenade, AN-M82A1 Obscuration Grenade, M82 Simulant Smoke Practice Grenade Improved Propellant Retainer, and M84 Stun Grenade Design.

Project ER5: The Indirect Fire and Fuze Technology project includes product improvement development efforts to upgrade indirect fire weapon systems and munitions that have already been fielded and/or are in production. Indirect Fire Weapons and Munitions Product Improvement Projects include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products.

This supports the identification, study, analysis, and development of fuzing technologies and Safe & Arm (S&A) devices in production and in the field. This project will implement technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The project addresses two major areas: (1) analysis and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce costs by providing competition, and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect and identify latent defects. The second major area is block upgrades, which will

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0607131A *I Weapons and Munitions Product Improvement Programs* |

identify and perform studies on improvements to fuzes, increase commonality of fuze components and requirements. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues, and add capabilities.

FY 2019 will support modeling and simulation on medium caliber S&A modifications, will evaluate medium caliber prototype modifications against performance requirements, will conduct studies on mortar fuze design architecture with the latest Fuze safety guidelines to preclude component obsolescence, will conduct studies on hand grenade fuze to reduce the number of critical defects that will improve producibility and increase safety, will conduct engineering tests to prove-out electronic transceiver replacement prototypes for indirect fire and direct fire proximity fuzes, will conduct studies on artillery fuze electronic safe and arm designs for low cost safe and arm performance enhancements, and will evaluate optimized impact switch prototypes.

Project ER6: The Direct Fire Technology funding will be used to support direct fire ammunition from small caliber ammunition, 40mm grenade, medium caliber cannon ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. FY 2019 funds are used for a more lethal and safer design for 40mm grenades that will be built and tested. Warhead improvement and primer improvement for the 30mm Apache ammunition are also under development. A number of studies on potential improvements for training ammunition and environmentally friendly primers will be conducted. Potential improvements to 105mm and 120mm ammunition will be examined.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 19.617 | 15.738 | 13.599 | - | 13.599 |
| Current President's Budget | 19.969 | 15.738 | 16.022 | 2.548 | 18.570 |
| Total Adjustments | 0.352 | 0.000 | 2.423 | 2.548 | 4.971 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | 0.352 | - | 2.423 | - | 2.423 |
| • Other Adjustments 1 | - | - | 0.000 | 2.548 | 2.548 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER2 / *Close Combat Technology* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER2: *Close Combat Technology* | - | 6.036 | 3.774 | 3.147 | - | 3.147 | 2.056 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This program includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, countermeasure flares, non-lethal ammunition/systems, networked munitions and mines, that have been fielded or have received approval for full rate production. This program will identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

FY 2019 funds will resource improvements to the following programs: MK3A2 Offensive Hand Grenade, AN-M8A1 Obscuration Grenade, M82 Simulant Smoke Practice Grenade Improved Propellant Retainer, and M84 Stun Grenade Design.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Claymore Force-on-Force Training Aids, Devices, Simulators, and Simulations (TADSS) Trainer<br>***Description:*** Develop an improved Claymore Force-on-Force Training Aids, Devices, Simulators, and Simulations (TADSS) Trainer. The Claymore does not have a TADSS trainer with sight, sound & Multiple Integrated Laser Engagement System (MILES) capability. Development of an improved Claymore trainer will allow Claymore to be trained at Combat Training Centers (CTCs) and will provide more realistic and effective training for the user when they are training Claymore as an end item and when training Claymore as initiated by Spider. | 0.914 | - | - | - | - |
| ***Title:*** MK3A2 Replacement, Offensive Hand Grenade Effort<br>***Description:*** The Current MK3A2 Offensive Hand Grenade can expose the warfighter to toxic levels of asbestos and is restricted for use in Continental United States and Outside Continental United State (CONUS/OCONUS). The warfighter cannot safely employ this grenade. Alternate munitions do not satisfy user requirements for incapacitating the enemy. This effort incorporates modern materials and insensitive explosives to provide a safer, producible offensive grenade.<br>***FY 2018 Plans:*** | 2.481 | 0.867 | 0.182 | - | 0.182 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Both Production Qualification and Arena testing will be conducted as well as documentation for Type Classification (TC) (planned for 3QFY19).<br>***FY 2019 Base Plans:***<br>Complete TC/FMR documentation.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Decreased ARDEC support is required in FY19. | | | | | |
| ***Title:*** Countermeasure Flare Decoy Formulations<br>***Description:*** Improve the producibility of countermeasure (CM) decoy formulations in order to increase the production safety and functional reliability to protect aircraft against multiple threat systems.<br>***FY 2018 Plans:***<br>Improve the producibility of countermeasure (CM) decoy formulations and solutions in order to increase the production safety and functional reliability and performance improvement of solutions to protect aircraft against multiple threat systems. Develop prototype solutions and conduct testing. Effort will result in a production representative prototype countermeasure solutions.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Effort ends in FY18; no FY19 funds required. | 0.548 | 1.635 | - | - | - |
| ***Title:*** AN-M8A1 Obscuration Grenade<br>***Description:*** This effort supports the Type Classification/Production Prove Out of an improved obscurant grenade that provides the warfighter with screening performance of the legacy AN-M8 smoke grenade without exposing Soldiers to the toxic effects of that legacy grenade's Hexachloroethane smoke. Use of the AN-M8 Obscuration Grenade has been discontinued inside and outside the Continental United States (CONUS/ OCONUS) due to restrictions on the use of Hexachloroethane on the battlefield. The M83 training smoke grenade is currently used in lieu of the AN-M8 in both training and tactical operations. However, since the M83 does not give screening performance comparable to the legacy AN-M8 grenade, the current warfighter strategy is to use two M83 Obscuration Grenades in lieu of a single AN-M8.<br>***FY 2018 Plans:***<br>Requirement Validation and completion of the HX grenade fill Toxicity Study. Assessment of suitability of the legacy M201A1 Fuze for use with the proposed HX fill, and detailed review of the AN-M8 Technical Data | 0.192 | 1.272 | 1.266 | - | 1.266 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Package (TDP) for adequacy to support future production. Also, development of a plan to facilitize Pine Bluff Arsenal (PBA) for future production of the M8A1.<br>***FY 2019 Base Plans:***<br>Perform Energetic Material Qualification Testing (EMQ) testing. Review/Finalize Technical Data Package. Coordinate with Pine Bluff Arsenal (PBA) to ensure PBA programs required production facility upgrades, in synchronization with PM CCS program objectives, to establish an AN-M8A1 production capability that currently does not exist.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Reduced ARDEC support required. | | | | | |
| ***Title:*** M84 Stun Grenade Design<br>***Description:*** The M84 Stun Grenade was previously procured using a performance specification acquisition approach. Based on upcoming buys due to increased quantities, the current detailed TDP needs to be evaluated to ensure a consistent design.<br>***FY 2019 Base Plans:***<br>Work to complete TDP validation and testing is required, as well as complete TC/FMR activities.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>New improvement effort funded in FY19; not previously funded. | - | - | 1.080 | - | 1.080 |
| ***Title:*** M82 Simulant Smoke Practice Grenade<br>***Description:*** The M82 encountered performance issues during the last production as a result of the less than optimal design for the base. Developing a new base design that minimizes any leak paths and facilitates the metal clip contact surface with the launcher will greatly improve the producibility and reliability of the grenade. This effort consists of the development and prove out of the base design.<br>***FY 2019 Base Plans:***<br>Develop base design, procure mold and parts for testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>New improvement effort funded in FY19; not previously funded. | - | - | 0.619 | - | 0.619 |
| ***Title:*** FASCAM | 1.901 | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** This effort supports the development of a new Deep Terrain Shaping Obstacle (DTSO). The current DTSO in the U.S. inventory has a life expectancy of 36 years (losing capability in 2025). The methods used to make this determination are unknown. Testing effort is to determine the actual life expectancy and effectiveness of the current DTSO system in order to decide when a replacement capability needs to be fielded. In parallel, evaluation the technical data package and determining the cost of producing additional units of the current DTSO. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 6.036 | 3.774 | 3.147 | - | 3.147 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The strategy for the MK3A2 Offensive Hand Grenade is to develop, test and qualify a new design that eliminates the toxic hazards and provides the required performance for the user in FY19. Follow-on procurement efforts will be competitive pending market research.

The strategy for the AN-M8A1 is to develop a safer smoke for use by the soldiers that meet the existing requirements. Once the smoke fill is developed and qualified, the plan is to examine the potential use of adding this capability to Pine Bluff Arsenal.

The strategy for the M84 Stun Grenade is to complete the development of the technical date package and test/qualify the design prior to being used in future competitive pending the results of a market survey.

The M82 program is updating the design of specific parts to make it more producible and will be proving out the design for use in future production efforts.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER2 / *Close Combat Technology* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | PM CCS : Picatinny Arsenal, NJ | - | - | | 0.090 | | - | | - | | - | Continuing | Continuing | - |
| AN-M8A1 Enhanced Obscuration Grenade | MIPR | PM CCS : Picatinny Arsenal, NJ | - | - | | 0.150 | | - | | - | | - | Continuing | Continuing | - |
| M82 Simulant Smoke Practice Grenade Improved Propellant Retainer | MIPR | PM CCS : Picatinny Arsenal, NJ | - | - | | - | | 0.044 | Jan 2019 | - | | 0.044 | Continuing | Continuing | - |
| M84 Stun Grenade | MIPR | PM-CCS : Picatinny Arsenal, NJ | - | - | | - | | 0.048 | Jan 2019 | - | | 0.048 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 0.240 | | 0.092 | | - | | 0.092 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Claymore Force-on-Force TADSS Trainer - Design, Develop and Deliver a Production Prototype | MIPR | ARDEC : Picatinny Arsenal, NJ | 0.353 | 0.914 | May 2017 | - | | - | | - | | - | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | C/FFP | Battelle Memorial Institute : Columbus, OH | 0.359 | 0.189 | Apr 2017 | - | | - | | - | | - | Continuing | Continuing | - |
| M82 Simulant Smoke Practice Grenade Improved Propellant Retainer | MIPR | ARDEC : Picatinny Arsenal. NJ | - | - | | - | | 0.381 | Jan 2019 | - | | 0.381 | Continuing | Continuing | - |
| | | **Subtotal** | 0.712 | 1.103 | | - | | 0.381 | | - | | 0.381 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER2 / *Close Combat Technology* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | ARDEC : Picatinny Arsenal | - | 1.227 | May 2017 | 0.660 | | 0.182 | Dec 2018 | - | | 0.182 | Continuing | Continuing | - |
| Countermeasure Flare Decoy Formulations | MIPR | ARDEC : Picatinny Aresenal, NJ | - | 0.269 | Aug 2017 | 0.415 | | - | | - | | - | Continuing | Continuing | - |
| Countermeasure Flare Decoy Formulations | MIPR | CERDEC Flight Testing Support : Lakehurst, NJ | - | - | | 0.170 | | - | | - | | - | Continuing | Continuing | - |
| AN-M8A1 Enhanced Obscuration Grenade | MIPR | ARDEC : Picatinny Arsenal, NJ | - | 0.125 | Aug 2017 | 0.413 | | 0.429 | Jan 2019 | - | | 0.429 | Continuing | Continuing | - |
| AN-M8A1 Enhanced Obscuration Grenade | MIPR | ECBC : Edgewood, MD | - | - | | 0.387 | | 0.370 | Jan 2019 | - | | 0.370 | Continuing | Continuing | - |
| AN-M8A1 Enhanced Obscuration Grenade | MIPR | Pine Bluff : Pine Bluff Arsenal | - | 0.067 | Jan 2017 | 0.322 | | 0.244 | Jan 2019 | - | | 0.244 | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | Defense Information Technical Center : Fort Belvoir, VA | - | 0.007 | Mar 2017 | - | | - | | - | | - | Continuing | Continuing | - |
| M82 Simulant Smoke Practice Grenade Improved Propellant Retainer | MIPR | ECBC : Edgewood, MD | - | - | | - | | 0.095 | Jan 2019 | - | | 0.095 | Continuing | Continuing | - |
| M82 Simulant Smoke Practice Grenade Improved Propellant Retainer | MIPR | Pine Bluff Arsenal : PBA, AR | - | - | | - | | 0.099 | Mar 2019 | - | | 0.099 | Continuing | Continuing | - |
| M84 Stun Grenade | MIPR | ARDEC : Picatinny Arsenal, NJ | - | - | | - | | 0.832 | Jan 2019 | - | | 0.832 | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | DTIC : Ft. Belvoir,VA | - | 0.001 | Oct 2017 | - | | - | | - | | - | Continuing | Continuing | - |
| FASCAM Study - Mine Design and Producibility Review | C/CPFF | Savit : Rockaway, NJ | - | 0.401 | Aug 2017 | - | | - | | - | | - | Continuing | Continuing | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FASCAM Study - Gator Landmine System Reliability Review | MIPR | ARDEC : Picatinny Arsenal, NJ | - | 0.440 | | - | | - | | - | | - | Continuing | Continuing | - |
| FASCAM Study - GATOR Drop Test | MIPR | ARDEC : Picatinny Arsenal, NJ | - | 0.160 | | - | | - | | - | | - | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | Nova Tech : NJ | - | 0.104 | Aug 2017 | - | | - | | - | | - | Continuing | Continuing | - |
| FASCAM Study - YPG Gator Component Testing | MIPR | Yuma Proving Ground (YPG) : Yuma, AZ | - | 0.383 | | - | | - | | - | | - | Continuing | Continuing | - |
| FASCAM Study - ARDEC Gator Component Testing | MIPR | ARDEC : Picatinny Arsenal, NJ | - | 0.290 | | - | | - | | - | | - | Continuing | Continuing | - |
| FASCAM Study - ARDEC Gator Component Testing | MIPR | ARDEC : Picatinny Arsenal, NJ | - | 0.227 | | - | | - | | - | | - | Continuing | Continuing | - |
| | | **Subtotal** | - | 3.701 | | 2.367 | | 2.251 | | - | | 2.251 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | Army Test and Evaluation Command : Aberdeen Proving Grounds, MD | - | 0.626 | Aug 2017 | - | | - | | - | | - | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | Fort Hood, Tx : TBD | - | - | | 0.117 | | - | | - | | - | Continuing | Continuing | - |
| Countermeasure Flare Decoy Formulations | MIPR | Naval Air Warefare Center Aircraft Division : Patuxent River, MD | - | 0.150 | Sep 2017 | 0.300 | | - | | - | | - | Continuing | Continuing | - |
| Countermeasure Flare Decoy Formulations | MIPR | Naval Air Warfare Center Weapons | - | 0.129 | Sep 2017 | 0.750 | | - | | - | | - | Continuing | Continuing | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER2 / *Close Combat Technology* | |

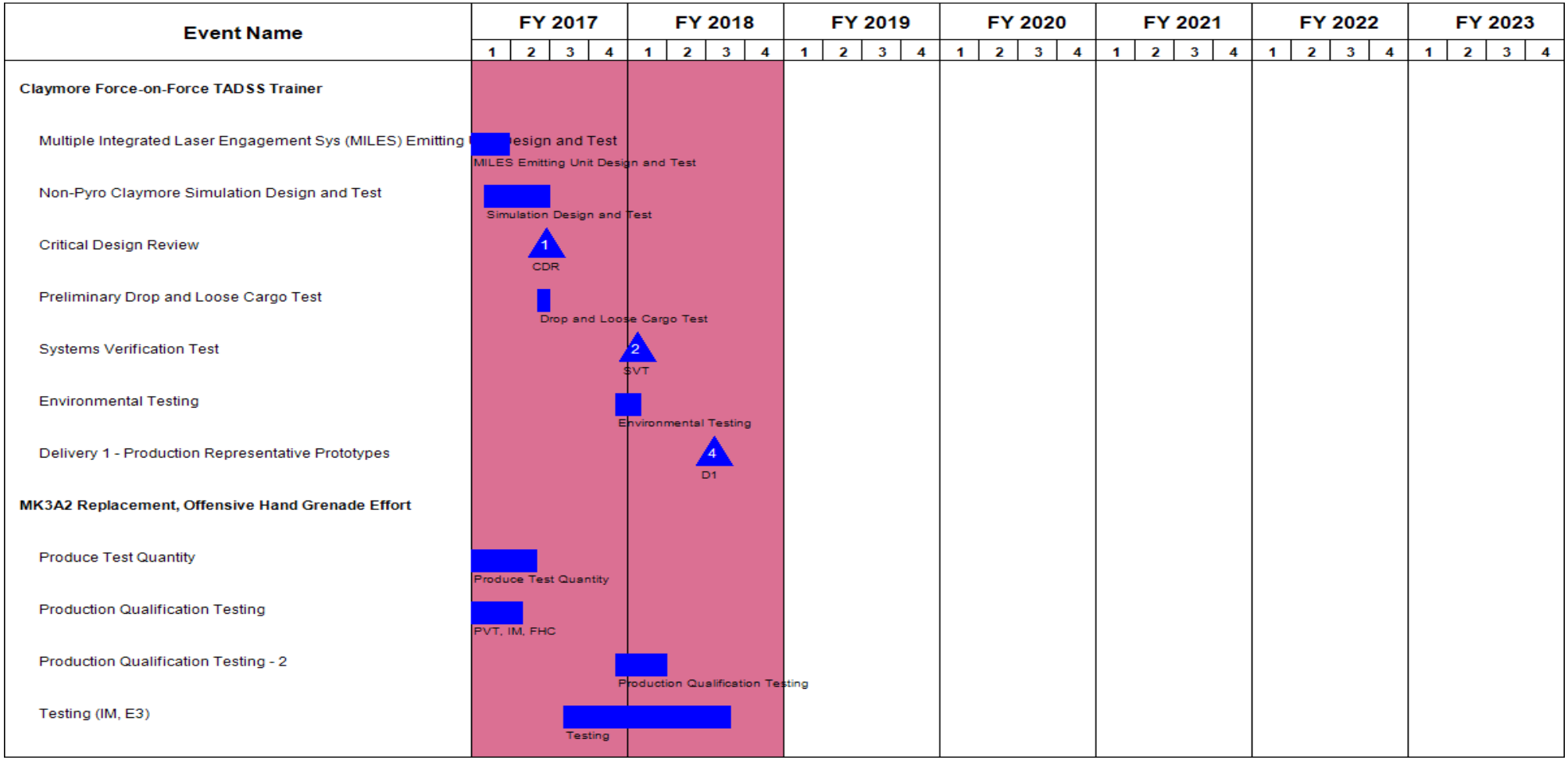
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Division - Flight Testing : China Lake, CA | | | | | | | | | | | | | |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | ATEC : Aberdeen Proving Grounds, NJ | - | 0.147 | Jan 2018 | - | | - | | - | | - | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | Dugway Proving Grounds : UT | - | 0.024 | Aug 2017 | - | | - | | - | | - | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | Various : Various | - | 0.116 | Jan 2018 | - | | - | | - | | - | Continuing | Continuing | - |
| MK3A2 Replacement, Offensive Hand Grenade | MIPR | Public Health Command : MD | - | 0.040 | Jan 2018 | - | | - | | - | | - | Continuing | Continuing | - |
| AN-M8A1 Enhanced Obscuration Grenade | MIPR | ARDEC : Picatinny Arsenal. NJ | - | - | | - | | 0.112 | Nov 2018 | - | | 0.112 | Continuing | Continuing | - |
| AN-M8A1 Enhanced Obscuration Grenade | MIPR | Pine Bluff Arsenal (PBA) : Pine Bluff Arsenal, AR | - | - | | - | | 0.111 | Nov 2018 | - | | 0.111 | Continuing | Continuing | - |
| M84 Stun Grenade | MIPR | TBD : TBD | - | - | | - | | 0.200 | Mar 2019 | - | | 0.200 | Continuing | Continuing | - |
| | | **Subtotal** | - | 1.232 | | 1.167 | | 0.423 | | - | | 0.423 | Continuing | Continuing | N/A |

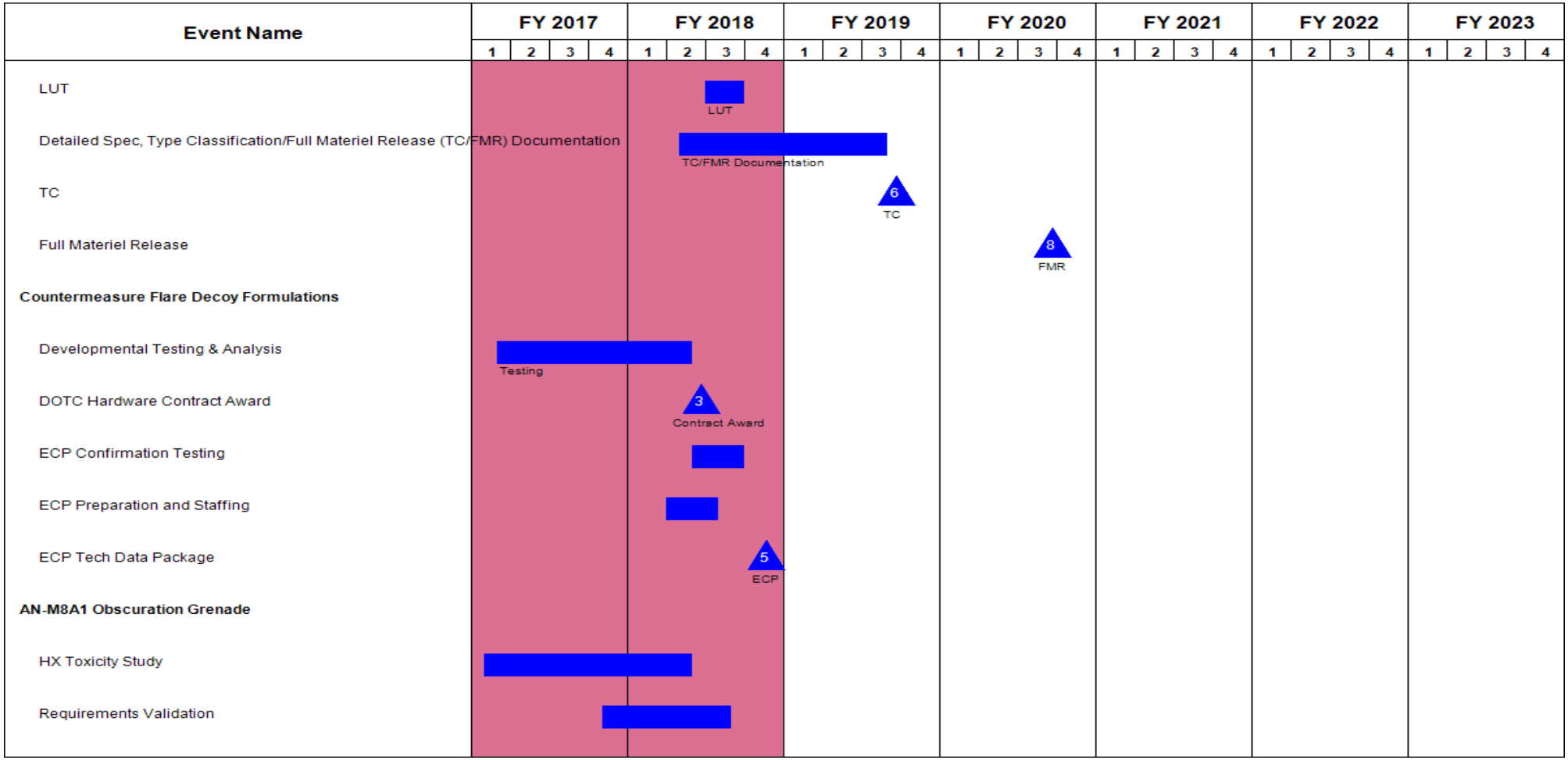
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.712 | 6.036 | | 3.774 | | 3.147 | | - | | 3.147 | Continuing | Continuing | N/A |

**Remarks**

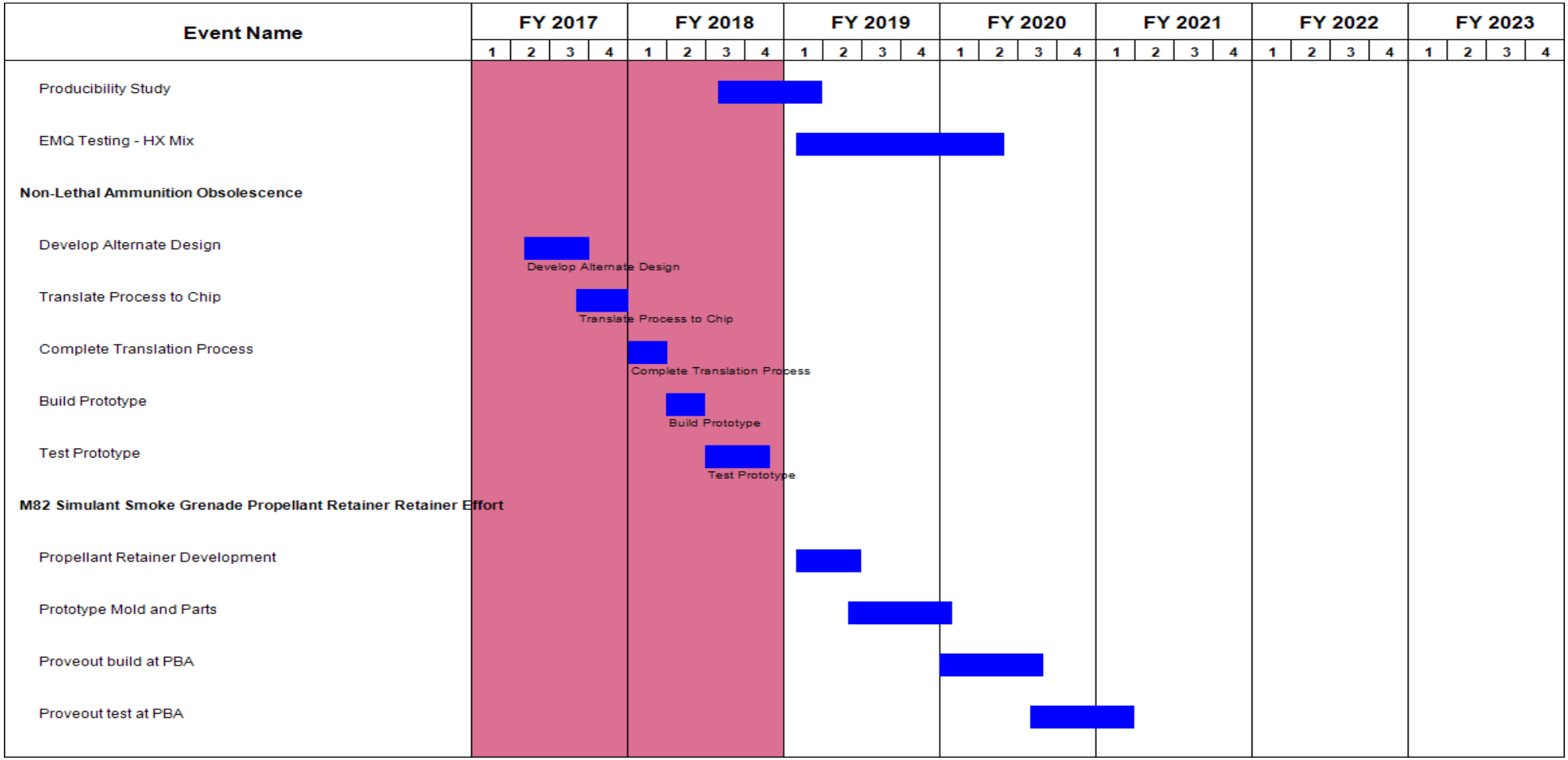
| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |



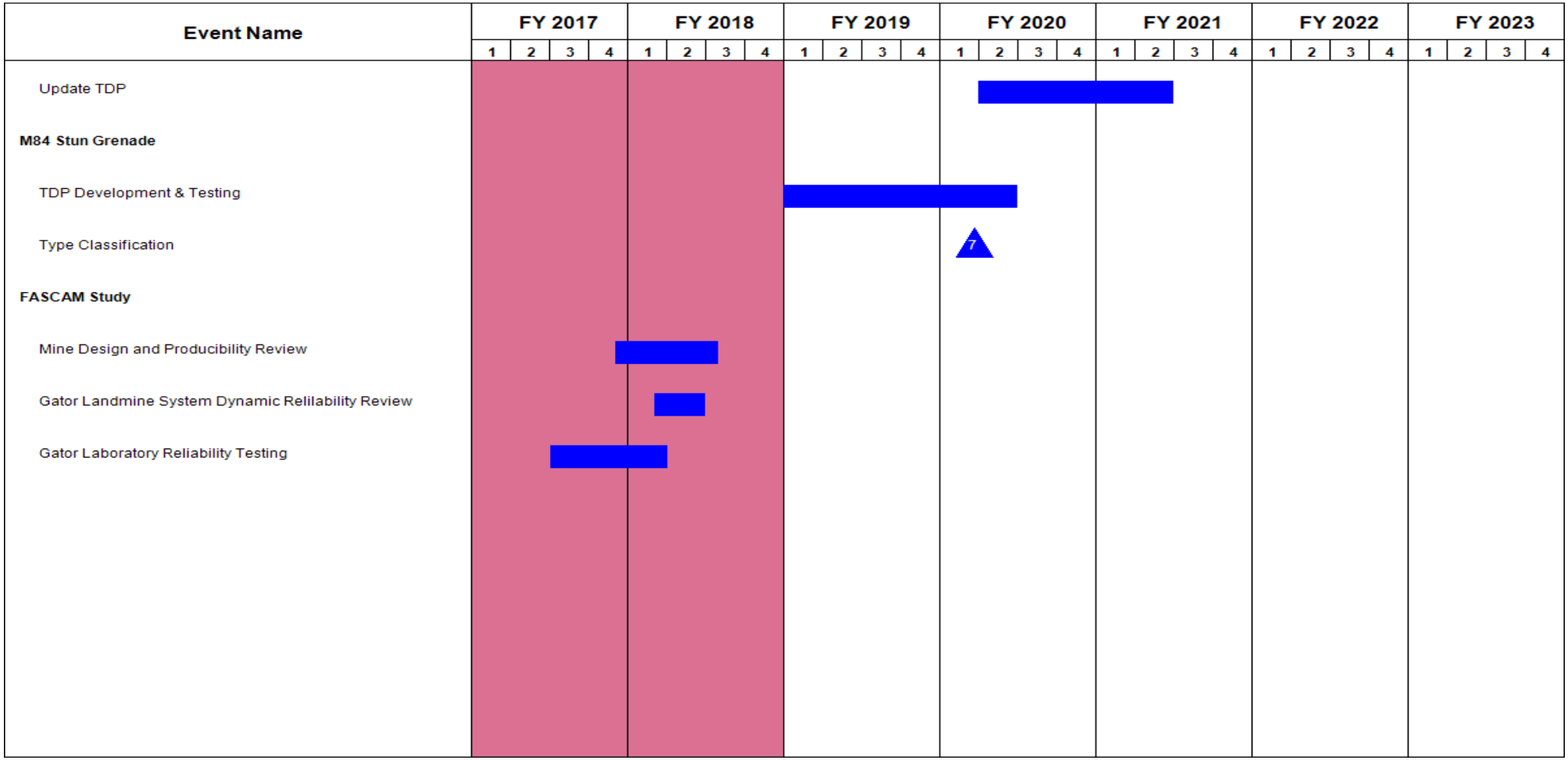
| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |



| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |



| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Claymore Force-on-Force TADSS Trainer | 1 | 2017 | 4 | 2020 |
| Fireset Board Design and Test | 1 | 2016 | 3 | 2016 |
| Multiple Integrated Laser Engagement Sys (MILES) Emitting Unit Design and Test | 1 | 2016 | 1 | 2017 |
| Non-Pyro Claymore Simulation Design and Test | 1 | 2016 | 2 | 2017 |
| Early User Assessment | 1 | 2016 | 1 | 2016 |
| Critical Design Review | 2 | 2017 | 2 | 2017 |
| Fort Leonard Wood and Benning Demonstration | 4 | 2016 | 4 | 2016 |
| Preliminary Drop and Loose Cargo Test | 2 | 2017 | 2 | 2017 |
| Systems Verification Test | 1 | 2018 | 1 | 2018 |
| Environmental Testing | 4 | 2017 | 1 | 2018 |
| Delivery 1 - Production Representative Prototypes | 3 | 2018 | 3 | 2018 |
| MK3A2 Replacement, Offensive Hand Grenade Effort | 1 | 2017 | 4 | 2020 |
| Produce Test Quantity | 2 | 2016 | 2 | 2017 |
| Production Qualification Testing | 3 | 2016 | 1 | 2017 |
| Production Qualification Testing - 2 | 4 | 2017 | 1 | 2018 |
| Testing (IM, E3) | 3 | 2017 | 3 | 2018 |
| LUT | 3 | 2018 | 3 | 2018 |
| Detailed Spec, Type Classification/Full Materiel Release (TC/FMR) Documentation | 2 | 2018 | 3 | 2019 |
| TC | 3 | 2019 | 3 | 2019 |
| Full Materiel Release | 3 | 2020 | 3 | 2020 |
| Countermeasure Flare Decoy Formulations | 1 | 2017 | 4 | 2020 |
| Developmental Testing & Analysis | 1 | 2017 | 2 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| DOTC Hardware Contract Award | 2 | 2018 | 2 | 2018 |
| ECP Confirmation Testing | 2 | 2018 | 3 | 2018 |
| ECP Preparation and Staffing | 2 | 2018 | 3 | 2018 |
| ECP Tech Data Package | 4 | 2018 | 4 | 2018 |
| AN-M8A1 Obscuration Grenade | 1 | 2017 | 4 | 2020 |
| HX Toxicity Study | 1 | 2017 | 2 | 2018 |
| Requirements Validation | 4 | 2017 | 3 | 2018 |
| Producibility Study | 3 | 2018 | 1 | 2019 |
| EMQ Testing - HX Mix | 1 | 2019 | 2 | 2020 |
| Non-Lethal Ammunition Obsolescence | 1 | 2017 | 4 | 2020 |
| Develop Alternate Design | 2 | 2017 | 3 | 2017 |
| Translate Process to Chip | 3 | 2017 | 4 | 2017 |
| Complete Translation Process | 1 | 2018 | 1 | 2018 |
| Build Prototype | 2 | 2018 | 2 | 2018 |
| Test Prototype | 3 | 2018 | 4 | 2018 |
| M82 Simulant Smoke Grenade Propellant Retainer Retainer Effort | 1 | 2017 | 4 | 2020 |
| Propellant Retainer Development | 1 | 2019 | 2 | 2019 |
| Prototype Mold and Parts | 2 | 2019 | 1 | 2020 |
| Proveout build at PBA | 1 | 2020 | 3 | 2020 |
| Proveout test at PBA | 3 | 2020 | 1 | 2021 |
| Update TDP | 2 | 2020 | 2 | 2021 |
| M84 Stun Grenade | 1 | 2017 | 4 | 2020 |
| TDP Development & Testing | 1 | 2019 | 2 | 2020 |
| Type Classification | 1 | 2020 | 1 | 2020 |
| FASCAM Study | 3 | 2017 | 3 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER2 / *Close Combat Technology* |

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Mine Design and Producibility Review | 4 | 2017 | 3 | 2018 |
| Gator Landmine System Dynamic Relilability Review | 1 | 2018 | 2 | 2018 |
| Gator Laboratory Reliability Testing | 3 | 2017 | 1 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER5 / *Indirect Fire and Fuze Technology* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER5: *Indirect Fire and Fuze Technology* | - | 2.525 | 2.268 | 2.820 | - | 2.820 | 5.387 | 5.387 | 4.200 | 2.025 | 0.000 | 24.612 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Indirect Fire and Fuze Technology project includes product improvement development efforts to upgrade indirect fire weapon systems and munitions that have already been fielded and/or are in production. Indirect Fire Weapons and Munitions Product Improvement Projects include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products.

This supports the identification, study, analysis, and development of fuzing technologies and Safe & Arm (S&A) devices in production and in the field. This project will implement technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The project addresses two major areas: (1) analysis and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce costs by providing competition, and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect and identify latent defects. The second major area is block upgrades, which will identify and perform studies on improvements to fuzes, increase commonality of fuze components and requirements. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues, and add capabilities.

FY 2019 will support modeling and simulation on medium caliber S&A modifications, will evaluate medium caliber prototype modifications against performance requirements, will conduct studies on mortar fuze design architecture with the latest Fuze safety guidelines to preclude component obsolescence, will conduct studies on hand grenade fuze to reduce the number of critical defects that will improve producibility and increase safety, will conduct engineering tests to prove-out electronic transceiver replacement prototypes for indirect fire and direct fire proximity fuzes, will conduct studies on artillery fuze electronic safe and arm designs for low cost safe and arm performance enhancements, and will evaluate optimized impact switch prototypes.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Fuze Technology Improvements (FTI) | 0.625 | 1.818 | 2.820 | - | 2.820 |
| ***Description:*** Activities include maturation, validation, and risk reduction of fuze technology and fuze component alternatives to increase sources of supply, improve performance, increase safety, and lower cost. Activities also include integration of fuze initiation improvements to increase reliability and lower fuze costs, evaluation of fuze | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER5 / *Indirect Fire and Fuze Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| electronic upgrades to improve safety and increase performance reliability, assessment of inductive fuze setting improvements to lower costs, and evaluation of medium caliber fuze safe and arm improvements for increased safety.<br><br>***FY 2018 Plans:***<br>Block Upgrades: Conduct engineering tests to prove-out the mortar fuze electronics upgrades. Conduct studies on medium caliber fuze safe and arm features to improve safety and increase throughput. Conduct tests to prove-out mortar fuze impact switch upgrades.<br><br>Analysis/Risk Mitigation: Conduct evaluations on transceiver component replacement prototype devices for indirect fire and direct fire fuzes. Conduct studies on Microelectromechanical systems (MEMS) based impact switches for medium and large caliber applications for reduced cost and improved producibility.<br>***FY 2019 Base Plans:***<br>Block Upgrades: Will conduct modeling and simulation on medium caliber S&A design modifications, will evaluate medium caliber prototype modifications against performance requirements, will conduct studies on hand grenade fuze to reduce the number of critical defects that will improve producibility and increase safety, will conduct studies on artillery fuze electronic safe and arm designs for low cost S&A performance enhancements.<br><br>Analysis / Risk Mitigation: Will conduct engineering tests to prove-out electronic transceiver replacement prototypes for indirect fire and direct fire proximity fuzes, will evaluate optimized impact switch prototypes, will conduct studies on mortar fuze design architecture with the latest fuze safety guidelines to preclude component obsolescence.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>There is an increase in funding from FY 2018 to FY 2019 due to three additional Fuze Technology Integration (FTI) projects that have been added to the program portfolio in FY 2019. | | | | | |
| ***Title:*** 81mm M821A3E1 HE IM Mortar Program<br><br>***Description:*** Activities include the maturation of the lethality through modeling and simulation as well as testing to ensure the 81mm will meet all user requirements. Activities also include ballistic testing to ensure safe and effective firing of the 81mm Mortar. This will also include modeling to ensure the contour of the round will ensures stable interior and exterior ballistics. Activities will also focus on maturation of the manufacturability | 1.900 | 0.450 | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER5 / *Indirect Fire and Fuze Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| of the round to ensure unit cost is as low as possible, this will be executed through loading studies and other Design of Experiments (DOE).<br><br>***FY 2018 Plans:***<br>Program completes safety/environmental test and analysis. Activities will include full arena testing and analysis of test data.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>In FY 2018, the M821A3E1 Program is transitioning to PAA dollars. Zero RDT&E dollars are required in FY 2019 for this effort. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.525 | 2.268 | 2.820 | - | 2.820 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Fuze Technology Improvement (FTI) will improve current production munitions by exploiting existing fuzing technologies and inserting them into current fielded and/or production fuzes, providing safer, more producible, and more lethal fuzing solutions. FTI develops second source suppliers and resolves component obsolescence issues to mitigate risk and prevent production interruptions in order to continue to provide safer, more reliable munitions for the Warfighter with significant risk reduction to production fuzes also benefiting the U.S. Taxpayer. The effort is a continuation of studies, analysis, evaluations, and development of fuzing technologies and safe and arm devices in production and in the field. This program will implement these technologies into fuzing systems to preclude component obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The Fuze Technology Integration Program utilizes both the DoD Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) initiatives to produce prototypes of the fuze technologies and devices, and FAR-based contracts to implement proven efforts into production fuzes.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER5 / *Indirect Fire and Fuze Technology* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40mm Fuze Improvements | SS/FFP | AMTEC Corporation : Janesville, WI | - | - | | 0.100 | Mar 2018 | 0.200 | Sep 2019 | - | | 0.200 | 0.000 | 0.300 | 0.100 |
| Fuze Technology Development | MIPR | DoD Ordnance Technology Consortium (DOTC) : Various | 0.200 | 0.152 | Feb 2017 | 1.060 | Dec 2017 | 1.481 | Oct 2018 | - | | 1.481 | 0.000 | 2.893 | - |
| 81mm M821A3E1 HE IM Mortar Prototyping | MIPR | DoD Ordnance Technology Consortium (DOTC) : Various | - | 1.040 | Jan 2017 | - | | - | | - | | - | 0.000 | 1.040 | - |
| | | **Subtotal** | 0.200 | 1.192 | | 1.160 | | 1.681 | | - | | 1.681 | 0.000 | 4.233 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuze Technology Integration Engineering Support | MIPR | Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ | 1.136 | 0.473 | Dec 2016 | 0.658 | Nov 2017 | 0.819 | Nov 2018 | - | | 0.819 | 0.000 | 3.086 | - |
| M821A3E1 Engineering Support | MIPR | Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ | - | 0.491 | Dec 2016 | - | | - | | - | | - | 0.000 | 0.491 | - |
| | | **Subtotal** | 1.136 | 0.964 | | 0.658 | | 0.819 | | - | | 0.819 | 0.000 | 3.577 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER5 / *Indirect Fire and Fuze Technology* | |

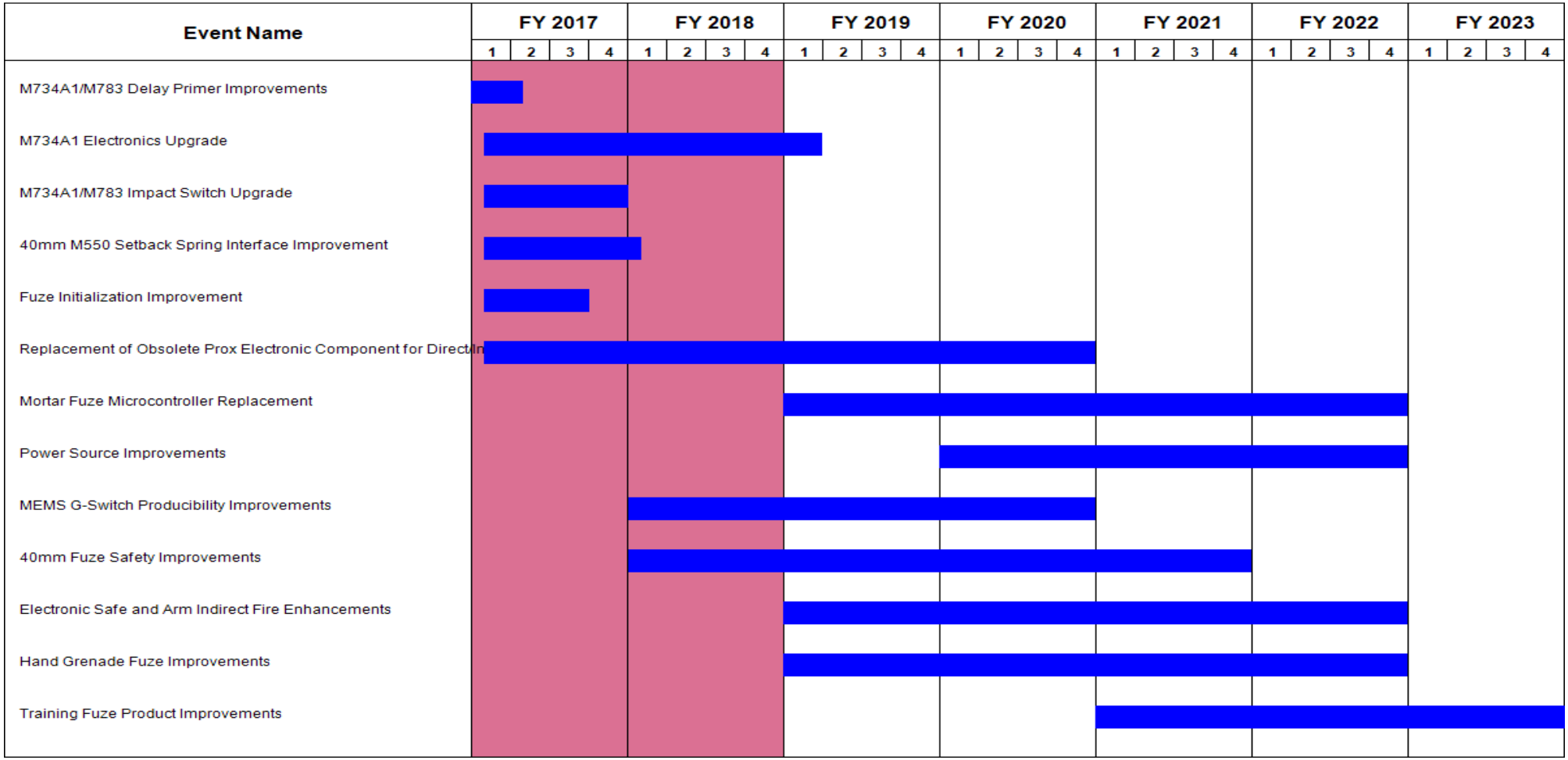
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FTI Ballistic Testing | MIPR | Army Test and Evaluation Command (ATEC) : Yuma Proving Ground, AZ | 0.100 | - | | - | | 0.320 | Mar 2019 | - | | 0.320 | 0.000 | 0.420 | - |
| M821A3E1 Full Arena Testing and Analysis | MIPR | Army Research Lab : Aberdeen Proving Ground, MD | - | - | | 0.450 | Mar 2018 | - | | - | | - | 0.000 | 0.450 | - |
| M821A3E1 HE IM Mortar Testing | MIPR | Army Test and Evaluation Command (ATEC) : Yuma Proving Ground, AZ | - | 0.369 | Jun 2017 | - | | - | | - | | - | 0.000 | 0.369 | - |
| | | **Subtotal** | 0.100 | 0.369 | | 0.450 | | 0.320 | | - | | 0.320 | 0.000 | 1.239 | N/A |

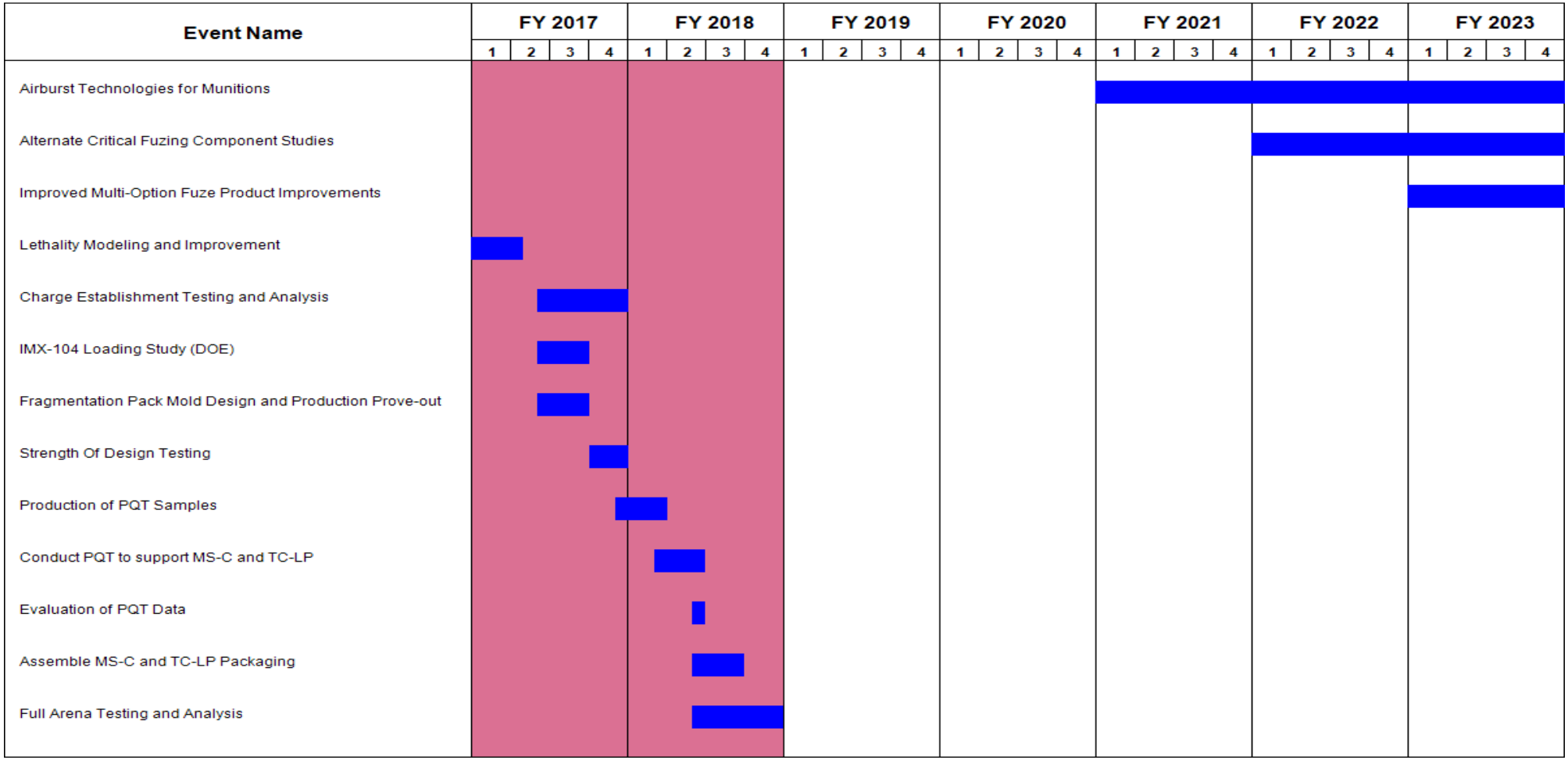
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 1.436 | 2.525 | | 2.268 | | 2.820 | | - | | 2.820 | 0.000 | 9.049 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER5 / *Indirect Fire and Fuze Technology* |



| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER5 / *Indirect Fire and Fuze Technology* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER5 / *Indirect Fire and Fuze Technology* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| M734A1/M783 Delay Primer Improvements | 1 | 2016 | 1 | 2017 |
| M734A1 Electronics Upgrade | 1 | 2016 | 1 | 2019 |
| M734A1/M783 Impact Switch Upgrade | 1 | 2016 | 4 | 2017 |
| 40mm M550 Setback Spring Interface Improvement | 1 | 2016 | 1 | 2018 |
| Fuze Initialization Improvement | 1 | 2016 | 3 | 2017 |
| Replacement of Obsolete Prox Electronic Component for Direct/Indirect Fire Fuzes | 1 | 2017 | 4 | 2020 |
| Mortar Fuze Microcontroller Replacement | 1 | 2019 | 4 | 2022 |
| Power Source Improvements | 1 | 2020 | 4 | 2022 |
| MEMS G-Switch Producibility Improvements | 1 | 2018 | 4 | 2020 |
| 40mm Fuze Safety Improvements | 1 | 2018 | 4 | 2021 |
| Electronic Safe and Arm Indirect Fire Enhancements | 1 | 2019 | 4 | 2022 |
| Hand Grenade Fuze Improvements | 1 | 2019 | 4 | 2022 |
| Training Fuze Product Improvements | 1 | 2021 | 4 | 2024 |
| Airburst Technologies for Munitions | 1 | 2021 | 4 | 2024 |
| Alternate Critical Fuzing Component Studies | 1 | 2022 | 4 | 2024 |
| Improved Multi-Option Fuze Product Improvements | 1 | 2023 | 4 | 2025 |
| Lethality Modeling and Improvement | 3 | 2016 | 1 | 2017 |
| Charge Establishment Testing and Analysis | 2 | 2017 | 4 | 2017 |
| IMX-104 Loading Study (DOE) | 2 | 2017 | 3 | 2017 |
| Fragmentation Pack Mold Design and Production Prove-out | 2 | 2017 | 3 | 2017 |
| Strength Of Design Testing | 4 | 2017 | 4 | 2017 |
| Production of PQT Samples | 4 | 2017 | 1 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER5 / *Indirect Fire and Fuze Technology* |

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Conduct PQT to support MS-C and TC-LP | 1 | 2018 | 2 | 2018 |
| Evaluation of PQT Data | 2 | 2018 | 2 | 2018 |
| Assemble MS-C and TC-LP Packaging | 2 | 2018 | 3 | 2018 |
| Full Arena Testing and Analysis | 2 | 2018 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER6 / *Direct Fire Technology* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER6: *Direct Fire Technology* | - | 11.408 | 9.696 | 10.055 | 2.548 | 12.603 | 5.297 | 3.636 | 0.752 | 0.173 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

In FY 2019, Program Element (PE) 0603639A, Project EL8, Lightweight Cartridge Case for Small Caliber, will transition to PE 0607131, Project ER6, Direct Fire Technology. This project is not a new start.

**A. Mission Description and Budget Item Justification**

The Direct Fire Technology funding will be used to support direct fire ammunition from small caliber ammunition, 40mm grenade, medium caliber cannon ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. FY 2019 funds are used for a more lethal and safer design for 40mm grenades that will be built and tested. Warhead improvement and primer improvement for the 30mm Apache ammunition are also under development. A number of studies on potential improvements for training ammunition and environmentally friendly primers will be conducted. Potential improvements to 105mm and 120mm ammunition will be examined.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Lightweight Ammunition | - | 0.855 | 3.000 | - | 3.000 |
| ***Description:*** Develop, demonstrate, and qualify a Lightweight Small Caliber Ammunition (LSCA) 7.62mm, 5.56mm, and .50 caliber capability that will provide an ammunition weight savings of ten to fifty percent to the M2, M240, M4A1, and M249 gunner, assistant gunner, and ammo bearer.<br>***FY 2018 Plans:***<br>Phase II Contractors are developing a preliminary lightweight cartridge design. The Government is completing the Systems Requirement Review and Preliminary Design Review then beginning Pre-Validation Testing.<br>***FY 2019 Base Plans:***<br>Phase II contractor will continue to develop preliminary lightweight cartridge design. The government will conduct Pre-Validation Testing (PVT) and a Limited User Evaluation (LUE) prior to down-selecting to a single contractor for Phase III award.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding needed to continue research and development of lightweight ammunition in FY 2019. | | | | | |
| ***Title:*** Lead Free Primer | 1.868 | 1.500 | 0.755 | - | 0.755 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** Automate and Integrate environmental friendly lead free primary explosives within the small caliber family of ammunition. Addresses health concerns of lead intake during firing by removing lead styphnate from small caliber primers. Automated pilot line combined with new mix reduces human exposure, improves quality, improves safety and reduces environmental waste in manufacturing process.<br><br>***FY 2018 Plans:***<br>FY 2018 funding completes the build for the 5.56mm primer qualification and initiates the 7.62mm and .50 caliber pilot lines. FY 2018 finalizes the Technical Data Packages for the three calibers and completes the EMQB process. Finally, the program refines and optimizes the automation of the manufacturing process.<br><br>***FY 2019 Base Plans:***<br>FY 2019 funding will provide the ability to conduct primer qualification testing on 5.56mm primers, complete the build for the 7.62mm primer qualification, and begin the build for Caliber .50 primer qualification. The program will continue to work through the transition of the automated primer manufacturing process to Lake City Army Ammunition Plant (LCAAP), as well as refinement and optimization of the automated process.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding needed to continue research and development of Green Primer ammunition in FY 2019. | | | | | |
| ***Title:*** Support Sniper Ammunition Integration Into Army Standard Sniper Weapons<br><br>***Description:*** Modify existing sniper ammunition to support integration into new Army standard sniper weapons. Maintain compatibility with legacy sniper weapons while improving operational availability.<br><br>***FY 2018 Plans:***<br>FY 2018 work continues to test and evaluate sniper ammunition improvements.<br><br>***FY 2019 Base Plans:***<br>FY 2019 work will continue to test and evaluate sniper ammunition improvements.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 funding needed for continued sniper ammunition development. | 0.243 | 1.360 | 0.500 | - | 0.500 |
| ***Title:*** Support Improvements in Direct Fire Propulsion Systems<br><br>***Description:*** Improve Direct Fire Propulsion Systems to increase user survivability.<br><br>***FY 2018 Plans:*** | 0.117 | 0.500 | 0.500 | - | 0.500 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| FY 2018 work continues to explore additional sources of supply in the National Technology and Industrial Base (NTIB) to reduce the dependence on foreign suppliers and pursue improvements to address temperature sensitivities of energetics and primer ballistics. Work also includes technology improvements to reduce muzzle flash and increase precision by reducing dispersion of the M80A1, M118LR, and other sniper compatible ammunition.<br>***FY 2019 Base Plans:***<br>FY 2019 work will continue to explore additional sources of supply in the NTIB and pursue improvements to address temperature sensitivities of energetics and primer ballistics. Efforts will also be made to continue to explore technology improvements to reduce muzzle flash and increase precision by reducing dispersion of the M80A1, M118LR, and other sniper compatible ammunition. | | | | | |
| ***Title:*** Improved M789 Lethality, Warhead Fragmentation Improvement<br>***Description:*** Improve 30mm M789 warhead lethality by performing trade studies and implementing advanced warhead and fuze technologies to promote more efficient fragmentation.<br>***FY 2018 Plans:***<br>FY 2018 work supports the completion and implementation of trade studies following testing, Technical Data Packages (TDP) updating, and preparing for manufacturability and qualification build.<br>***FY 2019 Base Plans:***<br>FY 2019 work will continue to support the completion and implementation of trade studies following testing, TDP updating, and preparing for manufacturability and qualification build. Funding will also support the initial build to be used to for qualification testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 funding needed for continued M789 lethality development. | 0.020 | 1.000 | 2.900 | - | 2.900 |
| ***Title:*** M433 Warhead Improvement<br>***Description:*** 40mm: Improve lethality (fragmentation) of the M433 grenade.<br>***FY 2018 Plans:*** | 3.360 | 1.570 | 0.500 | - | 0.500 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| FY 2018 work finishes Pre Production Qualification Tests (PPQT), perform Materiel Release (MR)/Engineering Change Proposal (ECP) actions, and support contracting actions to transition new Technical Data Package (TDP) into Full Rate Production (FRP).<br>***FY 2019 Base Plans:***<br>FY 2019 work will complete ECP and TDP actions. FY 2019 work will also complete qualification testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 funding needed to finalize the development of the M433E1 round. | | | | | |
| ***Title:*** 20mm C-RAM Ammo Improvement<br>***Description:*** As per Joint Urgent Operational Needs Statement (JUONS) CC-0562 for enhanced lethality, M940 20mm ammunition requires research and development efforts to increase the lethality effects of the Land-based Phalanx Weapon System (LPWS) against larger rocket threats. This effort will increase the current capability of the M940 by incorporating design features to provide improvement to probability of Kill.<br>***FY 2018 Plans:***<br>FY 2018 funding continues to support the design and testing of multiple improved M940 concepts aimed at quickly providing enhanced lethality effects against large rocket threats. Concurrently, an optimized concept is being designed and tested to provide a more permanent solution with enhanced lethality and significant improvement to probability of kill.<br>***FY 2019 Base Plans:***<br>FY 2019 funding will continue to support the design and development of an optimized M940 concept to achieve enhanced lethality and an improved probability of kill.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 funding needed for additional M940 research and development. | 5.800 | 0.580 | 0.250 | - | 0.250 |
| ***Title:*** 30x173mm and 30x113mm Airburst Munitions<br>***Description:*** Increase anti-personnel lethality and lethality within Military Operations in an Urban Terrain (MOUT) structures compared to current Army medium caliber solutions.<br>***FY 2018 Plans:***<br>FY 2018 funding supports the study of the 30x173mm airburst capable cartridge and programming/ communication unit which interfaces with Stryker Infantry Carrier Vehicle (ICV) and/or Army Future Fighting | - | 0.653 | 0.250 | - | 0.250 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Vehicles. Funding supports the 30x113 airburst capable cartridge and unit programming. Efforts will try to establish commonality for these key systems.<br>***FY 2019 Base Plans:***<br>FY 2019 funding will continue to support the study of the 30x173mm airburst capable cartridge and programming/communication unit which interfaces with Stryker Infantry Carrier Vehicle (ICV) and/or Army Future Fighting Vehicles. Funding will support the 30x113mm cartridge development for the Apache aircraft and other Army weapon platforms.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 funding needed for additional research, development, and testing of the munitions. | | | | | |
| ***Title:*** Tank Ammunition Improvements<br>***Description:*** Develop and test potential improvements to 105mm and 120mm gun system ammunition.<br>***FY 2018 Plans:***<br>FY 2018 work includes various efforts for 105mm and 120mm tank ammunition, including chemical tracer improvements, combustible cartridge case design and fabrication improvements, and non-developmental cartridge testing for the M68 cannon.<br>***FY 2019 Base Plans:***<br>FY 2019 work will continue to support various efforts for 105mm and 120mm tank ammunition, including tracer improvements, combustible cartridge case design and fabrication improvements, and non-developmental cartridge testing for the M68 cannon. Additionally, preliminary design work will be conducted to improve the M1002 training cartridge to an acceptable training cartridge for the new 120mm Advanced Multipurpose (AMP) cartridge.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Additional funding in FY 2019 needed to continue development of combustible cartridge case on other large caliber enhancements. | - | 1.450 | 0.250 | - | 0.250 |
| ***Title:*** 40mm M576 Improvement Study<br>***Description:*** 40mm M576 product improvement will provide the warfighter with the ability to quickly defeat closed-in personnel targets<br>***FY 2018 Plans:*** | - | 0.178 | 0.200 | - | 0.200 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| FY 2018 funding supports efforts to baseline the current M576 capabilities and explore improved candidate designs.<br>***FY 2019 Base Plans:***<br>FY 2019 funding will be used to continue to explore improved candidate designs.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Additional funding in FY 2019 will support M576 baseline and exploration of enhanced designs. | | | | | |
| ***Title:*** Medium Caliber Single Crystal Tungsten Evaluation<br>***Description:*** Testing will be conducted to determine the effectiveness of single crystal tungsten penetrators against armored targets.<br>***FY 2018 Plans:***<br>FY 2018 work includes testing to determine the effectiveness of single crystal tungsten penetrators against armored targets.<br>***FY 2019 Base Plans:***<br>FY 2019 work will continue to include testing to determine the effectiveness of single crystal tungsten penetrators against armored targets. | - | 0.050 | 0.050 | - | 0.050 |
| ***Title:*** M550 Fuze Improvement<br>***Description:*** Replace 40mm M550 single stage fuze with a dual spinlock fuze to improve safety and performance reliability.<br>***FY 2019 Base Plans:***<br>FY 2019 funding will be used to acquire and study M550 fuzes and materials in order to support the new fuze build and FY 2020 testing events.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 funding needed for research and development activities for the M550 Fuze. | - | - | 0.400 | - | 0.400 |
| ***Title:*** Caliber .50 Improvement<br>***Description:*** Explore options for improvement to current legacy .50 caliber ammunition in response to the .50 caliber Munitions Capabilities Development Document (CDD). | - | - | 0.500 | - | 0.500 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***FY 2019 Base Plans:***<br>FY2019 funding will support the exploration of improvements to various .50 caliber munitions to include the M903 and M962 rounds.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase of funds will support improvements to .50 caliber munitions. | | | | | |
| ***Title:*** Operation Inherent Resolve for ISIL - JUONS CC-0562 M940 Ammunition<br>***Description:*** FY 2019 Overseas Contingency Operations request includes $2.548 Million for a Joint Urgent Operational Needs Statement for M940 ammunition.<br>***FY 2019 Base Plans:***<br>OCO only<br>***FY 2019 OCO Plans:***<br>OCO funds will provide M940 ammunition improvements.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>JUONS CC-0562 | - | - | 0.000 | 2.548 | 2.548 |
| **Accomplishments/Planned Programs Subtotals** | 11.408 | 9.696 | 10.055 | 2.548 | 12.603 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • EL8: *LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER* | 1.807 | 2.500 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 4.307 |

**Remarks**

The funding lines started work on the 7.62mm lightweight ammunition which transitions to PE 0607131A ER6, Direct Fire Technology.

**D. Acquisition Strategy**

All contracts will be full and open competition firm fixed price.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Manager Maneuver Ammunition Systems (PM MAS) - Labor & Travel | Various | Picatinny Arsenal : NJ | 0.009 | 0.100 | | 0.300 | | 0.400 | | - | | 0.400 | Continuing | Continuing | Continuing |
| Contract 1 - M433 Warhead Improvement | C/FFP | Polymer Technologies Incorporated : Newark, DE | 0.171 | - | | - | | - | | - | | - | 0.000 | 0.171 | - |
| Contract 2 - M433 Warhead Improvement | C/IDIQ | Amtec Corporation : Huntsville, AL | 0.134 | - | | - | | - | | - | | - | 0.000 | 0.134 | - |
| Contract 3 - M433 Warhead Improvement | C/FFP | Amtec Corporation : Huntsville, AL | - | 2.275 | | 1.500 | | - | | - | | - | 0.000 | 3.775 | - |
| Contract 1 - M789 Enhanced Lethality | C/FFP | TBD : TBD | - | - | | - | | 0.500 | | - | | 0.500 | 0.000 | 0.500 | - |
| Contract 1 - Lightweight Ammunition | C/FFP | TBD : TBD | - | - | | 0.500 | | 1.742 | | - | | 1.742 | 0.000 | 2.242 | - |
| Contract 1 - Green Primer | C/FFP | Innovative Materials & Processes (IMP), LLC : Rapid City, SD | 0.415 | 0.556 | | - | | 0.500 | | - | | 0.500 | 0.000 | 1.471 | - |
| Contract 2 - Green Primer | C/FFP | Alion Science and Technology Corporation : McLean, VA | 0.038 | - | | - | | - | | - | | - | 0.000 | 0.038 | - |
| Contract 3 - Green Primer | C/FFP | Orbital - ATK : Independence, MO | - | 0.750 | | - | | 0.500 | | - | | 0.500 | 0.000 | 1.250 | - |
| Contract 4 - Green Primer | C/FFP | Frankilin Engineering Group : Nashville, TN | - | 0.170 | | - | | - | | - | | - | 0.000 | 0.170 | - |
| Contract 1 - M940 Enhancement | C/FFP | General Dynamics Ordnance and Tactical Systems : Marion, VA | - | 0.231 | | - | | - | | - | | - | 0.000 | 0.231 | - |
| Contract 2 - M940 Enhancement | C/FFP | MATSYS : Sterling, VA | - | 0.168 | | - | | - | | - | | - | 0.000 | 0.168 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER6 / *Direct Fire Technology* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contract 3 - M940 Enhancement | C/FFP | TBD : TBD | - | - | | 0.500 | | - | | - | | - | 0.000 | 0.500 | - |
| Contract 1 - M80A1 | C/FFP | TBD : TBD | - | - | | - | | 0.575 | | - | | 0.575 | 0.000 | 0.575 | - |
| Contract 1 - JUONS CC-0562 M940 Ammunition | C/FFP | TBD : TBD | - | - | | - | | 0.000 | | 2.548 | | 2.548 | 0.000 | 2.548 | - |
| | | **Subtotal** | 0.767 | 4.250 | | 2.800 | | 4.217 | | 2.548 | | 6.765 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Armament Research Development and Engineering Center (ARDEC) | MIPR | ARDEC : Picatinny Arsenal, NJ | 1.361 | 3.702 | | 6.296 | | 5.438 | | - | | 5.438 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 1.361 | 3.702 | | 6.296 | | 5.438 | | - | | 5.438 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

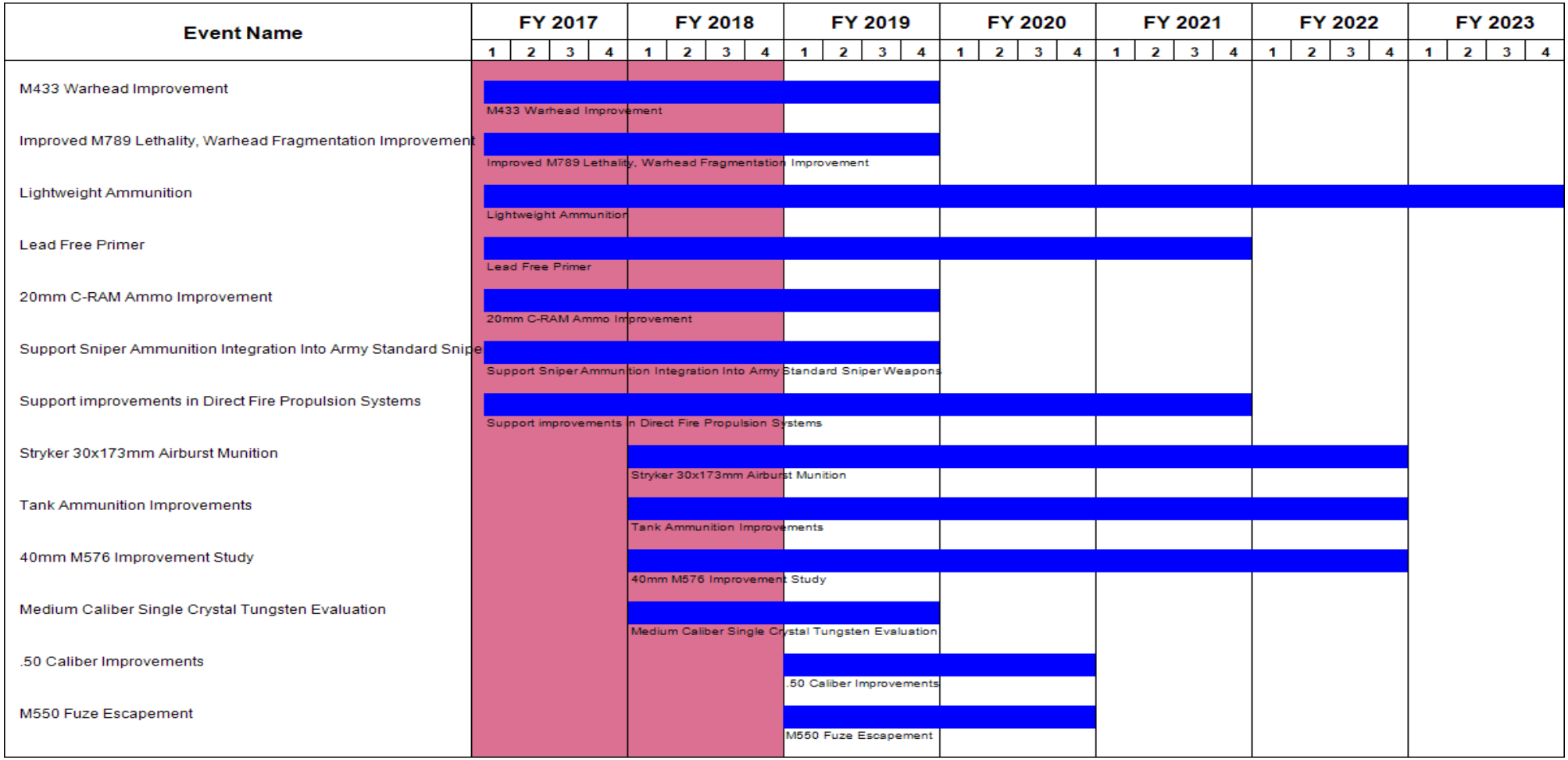
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Army Research Lab (ARL) | MIPR | Aberdeen : MD | 0.015 | 0.200 | | 0.300 | | 0.400 | | - | | 0.400 | Continuing | Continuing | Continuing |
| Aberdeen Test Center (ATC) | MIPR | Aberdeen Test Center : Aberdeen, MD | 0.036 | - | | 0.300 | | - | | - | | - | Continuing | Continuing | Continuing |
| Redstone Arsenal | MIPR | Redstone Arsenal : Redstone Arsenal AL | - | 3.256 | | - | | - | | - | | - | 0.000 | 3.256 | - |
| | | **Subtotal** | 0.051 | 3.456 | | 0.600 | | 0.400 | | - | | 0.400 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | Project (Number/Name)<br>ER6 / *Direct Fire Technology* | |

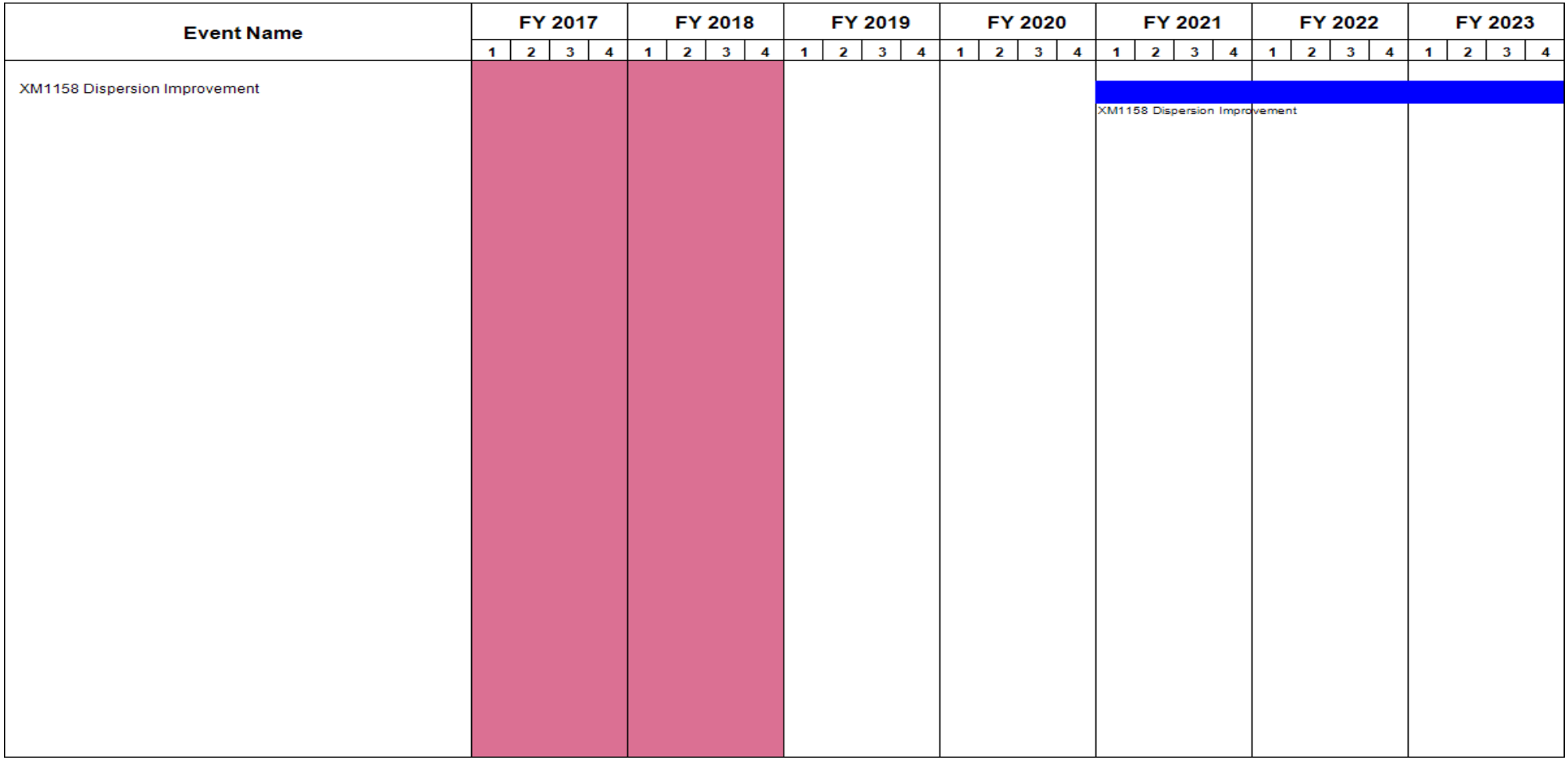
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 2.179 | 11.408 | | 9.696 | | 10.055 | | 2.548 | | 12.603 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |



| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607131A / *Weapons and Munitions Product Improvement Programs* | **Project (Number/Name)**<br>ER6 / *Direct Fire Technology* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Improved Door Breach | 1 | 2016 | 4 | 2016 |
| Target Practice Spotter Technology Insertion | 1 | 2015 | 4 | 2016 |
| New Ammo Design Qualification & NATO Mission Support | 1 | 2016 | 4 | 2016 |
| M433 Warhead Improvement | 1 | 2015 | 4 | 2019 |
| Improved M789 Lethality, Warhead Fragmentation Improvement | 1 | 2015 | 4 | 2019 |
| Lightweight Ammunition | 1 | 2015 | 4 | 2023 |
| Lead Free Primer | 1 | 2015 | 4 | 2021 |
| 20mm C-RAM Ammo Improvement | 1 | 2017 | 4 | 2019 |
| Support Sniper Ammunition Integration Into Army Standard Sniper Weapons | 1 | 2017 | 4 | 2019 |
| Support improvements in Direct Fire Propulsion Systems | 1 | 2017 | 4 | 2021 |
| Stryker 30x173mm Airburst Munition | 1 | 2018 | 4 | 2022 |
| Tank Ammunition Improvements | 1 | 2018 | 4 | 2022 |
| 40mm M576 Improvement Study | 1 | 2018 | 4 | 2022 |
| Medium Caliber Single Crystal Tungsten Evaluation | 1 | 2018 | 4 | 2019 |
| .50 Caliber Improvements | 1 | 2019 | 4 | 2020 |
| M550 Fuze Escapement | 1 | 2019 | 4 | 2020 |
| XM1158 Dispersion Improvement | 1 | 2021 | 4 | 2023 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607133A / *TRACTOR SMOKE* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 4.479 | 4.513 | 4.577 | 7.780 | 12.357 | 6.876 | 7.966 | 10.723 | 9.426 | 0.000 | 56.340 |
| ET2: *Tractor Stove* | - | 4.479 | 4.513 | 4.577 | 7.780 | 12.357 | 6.876 | 7.966 | 10.723 | 9.426 | 0.000 | 56.340 |

**A. Mission Description and Budget Item Justification**

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 4.479 | 4.513 | 4.577 | - | 4.577 |
| Current President's Budget | 4.479 | 4.513 | 4.577 | 7.780 | 12.357 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | 7.780 | 7.780 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 0.000 | 7.780 | 7.780 |

**Change Summary Explanation**

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607134A *I Long Range Precision Fires (LRPF)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 36.322 | 102.014 | 186.475 | - | 186.475 | 89.182 | 122.852 | 105.019 | 93.939 | Continuing | Continuing |
| ES1: *Long Range Precision Fires (LRPF)* | - | 36.322 | 102.014 | 186.475 | - | 186.475 | 89.182 | 122.852 | 105.019 | 93.939 | Continuing | Continuing |
| **Program MDAP/MAIS Code:** 494 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

Long Range Precision Fires (LRPF) is being developed as a cluster and insensitive munition compliant system that replaces and improves upon Army Tactical Missile System (ATACMS) capabilities. LRPF is a major improvement over the current ATACMS with increased range, lethality, loadout, and an open systems architecture. The mission of the LRPF System is to attack/neutralize/suppress/destroy targets using missile delivered indirect precision fires. LRPF will provide Joint Force Commanders with a 24/7, all-weather capability to attack critical and time sensitive area and point targets including threat air defense, missile launchers, command and control centers, assembly/staging areas and high payoff targets at all depths of the multi-domain battlefield. The LRPF will counter the enemy's ability to conduct combat maneuver and air defense operations. LRPF requirements include: max range of greater than 400km, specified lethality against the designated target set, a Launch Pod Missile Container (LPMC) that holds a minimum of two missiles, and compatibility with the existing launcher platforms (M270A1 Multiple Launch Rocket System (MLRS) and M142 High Mobility Artillery Rocket System (HIMARS)). LRPF is being designed with an open system architecture that provides the capability for future growth to counter new and emerging threats. Milestone A; Technology Maturation and Risk Reduction (TMRR) was approved on 31 March 2017.

FY 2019 base dollars in the amount of $186.475 million support the continuation of LRPF development through the execution of two TMRR competitive prototyping and flight demonstration agreements. FY 2019 funding increase supports integration of test assets for risk reduction activities and allows both contractors to complete their tactical designs through the Critical Design Review (CDR), allows both contractors to conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments and ensures risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Carrying 2 contractors through CDR prior to down select, will reduce risk and ensure a more mature design. FY 2019 efforts include conducting a Preliminary Design Review (PDR) and completion of the final prototype tactical design with an assessment of future growth capabilities. Each contractor will complete final integration of four (4) prototype missiles. The first two prototype flight demonstrations are planned for FY19. Results will provide performance data to inform the contractor's proposed design.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 0607134A *I Long Range Precision Fires (LRPF)* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 67.006 | 102.014 | 111.505 | - | 111.505 |
| Current President's Budget | 36.322 | 102.014 | 186.475 | - | 186.475 |
| Total Adjustments | -30.684 | 0.000 | 74.970 | - | 74.970 |
| • Congressional General Reductions | -0.018 | - | | | |
| • Congressional Directed Reductions | -1.500 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.435 | - | | | |
| • Adjustments to Budget Years | - | - | 74.970 | - | 74.970 |
| • Amended FY2017 | -27.731 | - | - | - | - |

**Change Summary Explanation**

FY 2017 funding reflects an adjustment of $30.684M which includes $27.731M that was requested in the Request for Additional FY17 Appropriations, but Congress did not appropriate the funds, a $1.5M funding decrement and $1.453M allocated against Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR).

FY 2019 funding reflects an increase of $74.970M to support the integration of test assets and continuation of design maturation activities for both vendors through the Critical Design Review (CDR). The increase in funding will allow both contractors to conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments and ensures risk mitigation activities support transition to Engineering and Manufacturing Development (EMD).

Note: Program Office core employee labor costs moved from RDTE to OMA as part of an OSD auditability directive.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607134A / *Long Range Precision Fires (LRPF)* | Project (Number/Name)<br>ES1 / *Long Range Precision Fires (LRPF)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES1: *Long Range Precision Fires (LRPF)* | - | 36.322 | 102.014 | 186.475 | - | 186.475 | 89.182 | 122.852 | 105.019 | 93.939 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Long Range Precision Fires (LRPF) is being developed as a cluster and insensitive munition compliant system that replaces and improves upon Army Tactical Missile System (ATACMS) capabilities while enabling an architecture which facilitates future growth. LRPF is a major improvement over the current ATACMS with increased range, lethality, loadout, and an open systems architecture. The mission of the LRPF System is to attack/neutralize/suppress/ destroy targets using missile delivered indirect precision fires. LRPF will provide Joint Force Commanders with a 24/7, all-weather capability to attack critical and time sensitive area and point targets including threat air defense, missile launchers, command and control centers, assembly/staging areas and high payoff targets at all depths of the multi-domain battlefield. LRPF will counter the enemy's ability to conduct combat maneuver and air defense operations. LRPF requirements include: max range of greater than 400km, specified lethality against the designated target set, a Launch Pod Missile Container (LPMC) that holds a minimum of two missiles, and compatibility with the existing launcher platforms (M270A1 Multiple Launch Rocket System (MLRS) and M142 High Mobility Artillery Rocket System (HIMARS)). LRPF is being designed with an open system architecture that provides the capability for future growth to counter new and emerging threats. Milestone A; Technology Maturation and Risk Reduction (TMRR) was approved on 31 March 2017.

FY 2019 base dollars in the amount of $186.475 million support the continuation of LRPF development through the execution of two TMRR competitive prototyping and flight demonstration agreements. FY 2019 funding increase supports integration of test assets for risk reduction activities and allows both contractors to complete their tactical designs through the Critical Design Review (CDR), allows both contractors to conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments and ensures risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Carrying 2 contractors through CDR prior to down select, will reduce risk and ensure a more mature design. FY 2019 efforts include conducting a Preliminary Design Review (PDR) and completion of the final prototype tactical design with an assessment of future growth capabilities. Each contractor will complete final integration of four (4) prototype missiles. The first two prototype flight demonstrations are planned for FY19. Results will provide performance data to inform the contractor's proposed design.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** TMRR | 36.322 | 102.014 | 186.475 |
| ***Description:*** Develop and prototype an insensitive munition compliant missile that provides increased range, improved lethality for both point and area targets, meets cluster munition policy requirements, and provides increased firepower with a multiple missile per launch pod solution. Long Range Precision Fires (LRPF) provides field artillery units with a deep-strike capability while supporting Brigade, Division, Corps, Army, Theater, Joint and Coalition forces in full, limited or expeditionary operations. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607134A / *Long Range Precision Fires (LRPF)* | **Project (Number/Name)**<br>ES1 / *Long Range Precision Fires (LRPF)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***FY 2018 Plans:***<br>Continued execution of two TMRR prototyping and flight demonstration agreements. Completed Launch Pod Missile Container (LPMC), static motor, warhead arena and insensitive munition component level testing and flight termination system development. Conducted Hardware in the Loop (HWIL), Software in the Loop (SWIL) and 6 degrees of freedom analysis of test data. Developed system level designs that incorporate technologies required to defeat an emerging threat. Initiated fabrication of prototype missiles required to support prototype flight demonstration. Conducted missile and launcher software development. Conducted assessment and implementation of software cyber security requirements.<br>***FY 2019 Plans:***<br>Continue execution of two TMRR prototyping and flight demonstration agreements. Complete system level designs that incorporate technologies required to defeat an emerging threat. Complete integration of a Flight Termination System (FTS) to support White Sands Missile Range testing. Complete a Preliminary Design Review (PDR) with each competing contractor. Continue risk reduction activities and allow both contractors to complete their tactical designs through the Critical Design Review (CDR). Both contractors will conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments, and ensure risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Continue to conduct Hardware in the Loop (HWIL), Software in the Loop (SWIL) and 6 Degrees of Freedom (6DoF) analysis of test data. Complete missile and launcher software development. Complete assessment and implementation of software cybersecurity requirements.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>$84.461M funding increase from FY18-19 is required to support completion of missile integration efforts, initiation of the TMRR flight test program, and procuring EDT test articles for competing contractors. | | | |
| **Accomplishments/Planned Programs Subtotals** | 36.322 | 102.014 | 186.475 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The LRPF Acquisition Strategy supports development of a cluster and insensitive munition compliant system that replaces and improves upon ATACMS capabilities while enabling an architecture which facilitates future growth. LRPF provides responsive engagement of high value point and area targets by Army and Joint Force Commanders under all weather conditions, at operational ranges defended by enemy air-defense systems. An AoA supporting the MS A decision was completed by U.S. Army Training and Doctrine Command (TRADOC) Analysis Center-White Sands Missile Range (TRAC-WSMR), with an OSD letter of sufficiency issued in September 2015. In 4QFY16, the Army awarded 9 month risk reduction, trade study and initial design development agreements to two contractors. The effort resulted

in development of initial baseline designs presented during final technical reviews that resulted in a seamless transition into the TMRR phase. Subsequent to MS A approval on 31 March 2017, the Army awarded TMRR agreements to two contractors.

TMRR is ongoing and includes risk reduction activities and further maturation of contractor design concepts. Both contractors will participate in a PDR and build four (4) missile prototypes culminating in flight tests to provide demonstration of their system capabilities. Both contractors will continue risk reduction activities allowing the contractors to mature their tactical designs through the Critical Design Review (CDR), conduct component and system level Engineering Development Test (EDT) qualification activities, conduct critical missile survivability assessments, and ensure risk mitigation activities support transition to Engineering and Manufacturing Development (EMD). Component level testing during TMRR, results of prototype flight tests, and results of EDT flight tests will inform the Source Selection. The EMD phase will complete product development, qualification, production readiness assessment, and a Limited User Test (LUT).

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607134A / *Long Range Precision Fires (LRPF)* | Project (Number/Name)<br>ES1 / *Long Range Precision Fires (LRPF)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | MIPR | Various : RSA | - | 3.869 | Nov 2016 | 7.659 | Nov 2017 | 7.889 | Nov 2018 | - | | 7.889 | 47.706 | 67.123 | - |
| | | **Subtotal** | - | 3.869 | | 7.659 | | 7.889 | | - | | 7.889 | 47.706 | 67.123 | N/A |

**Remarks**

RSA - Redstone Arsenal, Alabama

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LRPF Risk Reduction - 2 Vendors (Raytheon and Lockheed Martin) | C/CPIF | DOTC : Picatinny, NJ | - | 29.652 | May 2017 | 86.130 | Nov 2017 | 169.768 | Nov 2018 | - | | 169.768 | 434.469 | 720.019 | - |
| Development Engineering Support | MIPR | AMCOM/AMRDEC : RSA | - | 1.022 | Nov 2016 | 2.665 | Nov 2017 | 2.978 | Nov 2018 | - | | 2.978 | 38.972 | 45.637 | - |
| | | **Subtotal** | - | 30.674 | | 88.795 | | 172.746 | | - | | 172.746 | 473.441 | 765.656 | N/A |

**Remarks**

AMCOM - Aviation and Missile Command; AMRDEC - U.S. Army Research, Development and Engineering Command; DOTC - DoD Ordnance Technology Consortium; OTA - Other Transaction Agreements; RSA - Redstone Arsenal, Alabama

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System Engineering, Testing, and Analysis | SS/T&M | ACC : RSA | - | 1.496 | Nov 2016 | 2.461 | Nov 2017 | 2.508 | Nov 2018 | - | | 2.508 | 16.133 | 22.598 | - |
| | | **Subtotal** | - | 1.496 | | 2.461 | | 2.508 | | - | | 2.508 | 16.133 | 22.598 | N/A |

**Remarks**

ACC - Army Contracting Command; RSA - Redstone Arsenal, AL

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607134A / *Long Range Precision Fires (LRPF)* | Project (Number/Name)<br>ES1 / *Long Range Precision Fires (LRPF)* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support | MIPR | WSMR; RTC : WSMR,NM; RSA, AL | - | 0.283 | Nov 2016 | 3.099 | Nov 2017 | 3.332 | Nov 2018 | - | | 3.332 | 60.106 | 66.820 | - |
| | | **Subtotal** | - | 0.283 | | 3.099 | | 3.332 | | - | | 3.332 | 60.106 | 66.820 | N/A |

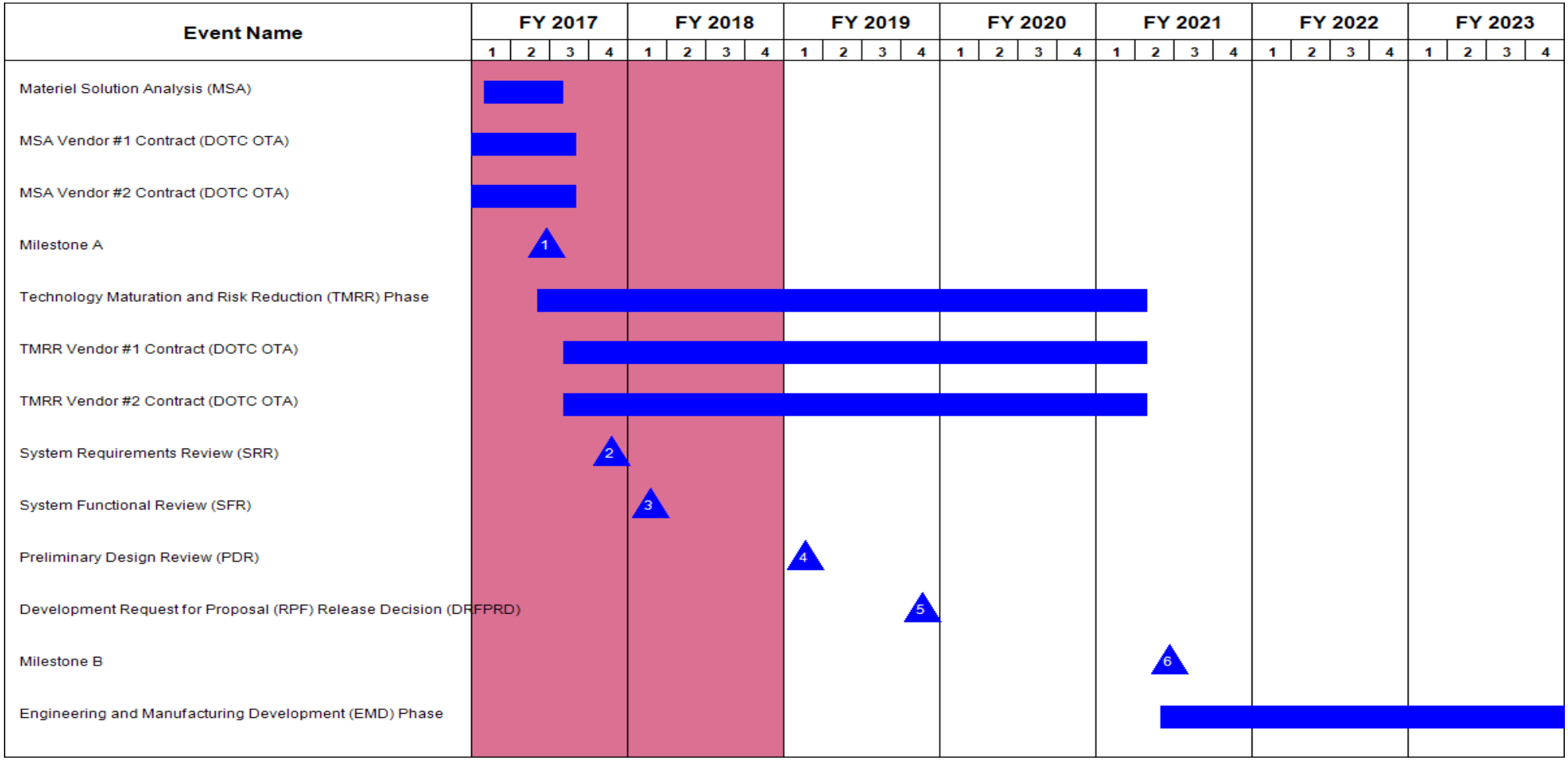
**Remarks**

WSMR,NM - White Sands Missile Range, New Mexico; RTC - Redstone Test Center; RSA - Redstone Arsenal, Alabama

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | 36.322 | | 102.014 | | 186.475 | | - | | 186.475 | 597.386 | 922.197 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607134A / *Long Range Precision Fires (LRPF)* | **Project (Number/Name)**<br>ES1 / *Long Range Precision Fires (LRPF)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607134A / *Long Range Precision Fires (LRPF)* | **Project (Number/Name)**<br>ES1 / *Long Range Precision Fires (LRPF)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| AoA | 2 | 2015 | 3 | 2015 |
| Materiel Solution Analysis (MSA) | 1 | 2014 | 3 | 2017 |
| MSA Vendor #1 Contract (DOTC OTA) | 3 | 2016 | 3 | 2017 |
| MSA Vendor #2 Contract (DOTC OTA) | 3 | 2016 | 3 | 2017 |
| Milestone A | 2 | 2017 | 2 | 2017 |
| Technology Maturation and Risk Reduction (TMRR) Phase | 2 | 2017 | 2 | 2021 |
| TMRR Vendor #1 Contract (DOTC OTA) | 3 | 2017 | 2 | 2021 |
| TMRR Vendor #2 Contract (DOTC OTA) | 3 | 2017 | 2 | 2021 |
| System Requirements Review (SRR) | 4 | 2017 | 4 | 2017 |
| System Functional Review (SFR) | 1 | 2018 | 1 | 2018 |
| Preliminary Design Review (PDR) | 1 | 2019 | 1 | 2019 |
| Development Request for Proposal (RPF) Release Decision (DRFPRD) | 4 | 2019 | 4 | 2019 |
| Milestone B | 2 | 2021 | 2 | 2021 |
| Engineering and Manufacturing Development (EMD) Phase | 2 | 2021 | 2 | 2025 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607135A / *Apache Product Improvement Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 60.995 | 59.977 | 31.049 | - | 31.049 | 0.169 | 0.173 | 0.000 | 0.000 | 0.000 | 152.363 |
| ES2: *Apache Product Improvement Program* | - | 60.995 | 59.977 | 31.049 | - | 31.049 | 0.169 | 0.173 | 0.000 | 0.000 | 0.000 | 152.363 |

**A. Mission Description and Budget Item Justification**

The Fiscal Year (FY) 2019 budget request for Apache AH-64E, previously known as Apache Block III, will fund the non-recurring engineering (NRE), development, and testing work associated with the planned remanufacture and new build of 690 Apache aircraft in the AH-64E configuration (deliveries began in Oct 2011). The AH-64E program consists of two Major Defense Acquisition Programs (MDAP), AH-64E Remanufacture and AH-64E New Build. This project also addresses obsolescence and reliability challenges and provides increased combat capability to the aircraft. Upgrades include: Unmanned Aircraft System (UAS) Level III-IV Control, Improved Situational Awareness, Upgraded Communications Suite, Improved Drive and Propulsion Systems, Improved Targeting Capability, Increased Computer Processing Capability and Speed, Improved Navigation Systems, Improved Diagnostics and Maintainability, and Joint Air to Ground Missile (JAGM) integration. Upgrades are integrated as incremental block modifications. The program addresses operational shortfalls identified during real-world combat missions and meets Longbow Apache Capability Production Document (CPD) requirements for modernization.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 66.441 | 59.977 | 0.180 | - | 0.180 |
| Current President's Budget | 60.995 | 59.977 | 31.049 | - | 31.049 |
| Total Adjustments | -5.446 | 0.000 | 30.869 | - | 30.869 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | -2.000 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | -1.512 | - | 30.869 | - | 30.869 |
| • Other Adjustments 1 | -1.934 | - | - | - | - |

**Change Summary Explanation**

Funding for FY19 moved from PE 677145, Project FD5 line. 1) Allows alignment with Joint Air to Ground Missile (JAGM) without requiring a future software insertion. 2) Improves efficiency and effectiveness of operational testing by conducting a combined OT event for JAGM and AH-64Ev6. 3) Reduces burden on FORSCOM and Soldiers by consolidating two test events into one event. 4) Allows further development and refinement of AH-64Ev6 software with user input prior to fielding.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607135A / *Apache Product Improvement Program* | Project (Number/Name)<br>ES2 / *Apache Product Improvement Program* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES2: *Apache Product Improvement Program* | - | 60.995 | 59.977 | 31.049 | - | 31.049 | 0.169 | 0.173 | 0.000 | 0.000 | 0.000 | 152.363 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Fiscal Year (FY) 2019 budget request for Apache AH-64E, previously known as Apache Block III, will fund the non-recurring engineering (NRE), development, and testing work associated with the planned remanufacture and new build of 690 Apache aircraft in the AH-64E configuration (deliveries began in Oct 2011). The AH-64E program consists of two Major Defense Acquisition Programs (MDAP), AH-64E Remanufacture and AH-64E New Build. This project also addresses obsolescence and reliability challenges and provides increased combat capability to the aircraft. Upgrades include: Unmanned Aircraft System (UAS) Level III-IV Control, Improved Situational Awareness, Upgraded Communications Suite, Improved Drive and Propulsion Systems, Improved Targeting Capability, Increased Computer Processing Capability and Speed, Improved Navigation Systems, Improved Diagnostics and Maintainability, and Joint Air to Ground Missile (JAGM) integration. Upgrades are integrated as incremental block modifications. The program addresses operational shortfalls identified during real-world combat missions and meets Longbow Apache Capability Production Document (CPD) requirements for modernization.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Product Development | 51.105 | 55.316 | 22.325 |
| ***Description:*** Funding is provided for the following efforts by Boeing.<br><br>***FY 2018 Plans:***<br>Development, Integration & Testing work associated with the planned remanufacture and new build of Apache aircraft in the AH-64E Capability Version 6 configuration (cognitive decision aiding, soldier radio waveform, modernized dayside assembly, modernized radio frequency interferometer, maritime targeting, and radar upgrades) and to enhance operational capabilities, and JAGM integration.<br><br>***FY 2019 Plans:***<br>Development, Integration & Testing work associated with the planned remanufacture and new build of Apache aircraft in the AH-64E Capability Version 6 configuration (cognitive decision aiding, soldier radio waveform, modernized dayside assembly, modernized radio frequency interferometer, maritime targeting, and radar upgrades) and to enhance operational capabilities, and JAGM integration.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 Funding is expected to complete efforts by Boeing. | | | |
| ***Title:*** Support Costs | 1.129 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607135A / *Apache Product Improvement Program* | **Project (Number/Name)**<br>ES2 / *Apache Product Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Funding is provided for GFE supporting Apache AH-64E tests and government R&D Facilities. | | | |
| ***Title:*** Test and Evaluation<br>***Description:*** Funding is provided for Development Testing and Evaluation and Operational Test and Evaluation.<br>***FY 2018 Plans:***<br>Funding is provided for Development Testing and Evaluation and Operational Test and Evaluation.<br>***FY 2019 Plans:***<br>Funds required for completion of FOT&E II<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 funding is expected to complete FOT&E II. | 6.500 | 2.100 | 7.289 |
| ***Title:*** Management Services<br>***Description:*** Funding is provided for the following effort: Payroll, Travel, Support Contractors, Matrix Support.<br>***FY 2018 Plans:***<br>Funding is provided for the following effort: Payroll, Travel, Support Contractors, Matrix Support.<br>***FY 2019 Plans:***<br>Funding is provided for the following effort: Payroll, Travel, Support Contractors, Matrix Support.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 Funding is provided for Payroll, Travel, Support Contractors, and Matrix Support. | 2.261 | 2.561 | 1.435 |
| **Accomplishments/Planned Programs Subtotals** | 60.995 | 59.977 | 31.049 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • AA6605: *AH-64 Mods* | 187.883 | 238.141 | 104.996 | - | 104.996 | 95.027 | 85.546 | 112.579 | 89.240 | 580.576 | 1,493.988 |
| • A05111: *AH-64 Apache Block IIIA Reman* | 852.112 | 765.016 | 753.248 | - | 753.248 | 808.514 | 789.701 | 707.777 | 509.487 | Continuing | Continuing |
| • A05133: *AH-64 Apache Block IIIB New Build* | 261.900 | 374.100 | 284.687 | - | 284.687 | 100.640 | 184.258 | - | - | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607135A / *Apache Product Improvement Program* | **Project (Number/Name)**<br>ES2 / *Apache Product Improvement Program* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

**D. Acquisition Strategy**

The NRE will encompass subsystem integration and will utilize existing test aircraft, incorporate the technical insertions, and initiate appropriate qualification and operational flight-testing.

In FY14, a contract for Apache AH-64E Lot 3, initiating Full Rate Production, was awarded with options for Lot 4 and will continue to a total of 690 remanufactured and new build aircraft.

Training device concurrency will be maintained with each technical insertion. The Engineering/Manufacturing Design (EMD) effort is managed as Cost Reimbursable. Production efforts will be awarded as Fixed Price Incentive (FPI) and include the Advance Procurement requirements.

In FY13, FY14, and FY15 MRL NRE encompassed US Government (USG) design of the Hydra Launcher Electronics Assembly (LEA), modification of the M261 launcher, launcher fabrication, and launcher testing.

In FY15-FY19, Apache AH-64E Version 6 System Development and Demonstration (SDD) Contract.

Multi-year production awarded March 15, 2017.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607135A / *Apache Product Improvement Program* | Project (Number/Name)<br>ES2 / *Apache Product Improvement Program* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Services (In-House, Travel, etc.) | MIPR | PMO AAH Matrix Support AMCOM Express : Redstone Arsenal, AL | 6.030 | 2.261 | | 2.561 | | 1.435 | | - | | 1.435 | 0.000 | 12.287 | - |
| | | **Subtotal** | 6.030 | 2.261 | | 2.561 | | 1.435 | | - | | 1.435 | 0.000 | 12.287 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The Boeing Company | SS/CPIF | Boeing Contracts : Mesa, AZ | 114.407 | 51.105 | | 55.316 | | 22.325 | | - | | 22.325 | 0.000 | 243.153 | - |
| Longbow Limited Liability (LBL) Contracts | SS/CPIF | Longbow Limited Liability (LBL) Contracts : Orlando, FL | 9.000 | - | | - | | - | | - | | - | 0.000 | 9.000 | - |
| Ground Fire Acquisition Development (GFAD) | SS/CPIF | PM AVIATION SYSTEMS Various Activities : Various | 12.000 | - | | - | | - | | - | | - | 0.000 | 12.000 | - |
| | | **Subtotal** | 135.407 | 51.105 | | 55.316 | | 22.325 | | - | | 22.325 | 0.000 | 264.153 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Support Activities | MIPR | Various : Various | 2.726 | 1.129 | | - | | - | | - | | - | 0.000 | 3.855 | - |
| | | **Subtotal** | 2.726 | 1.129 | | - | | - | | - | | - | 0.000 | 3.855 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607135A / *Apache Product Improvement Program* | **Project (Number/Name)**<br>ES2 / *Apache Product Improvement Program* |

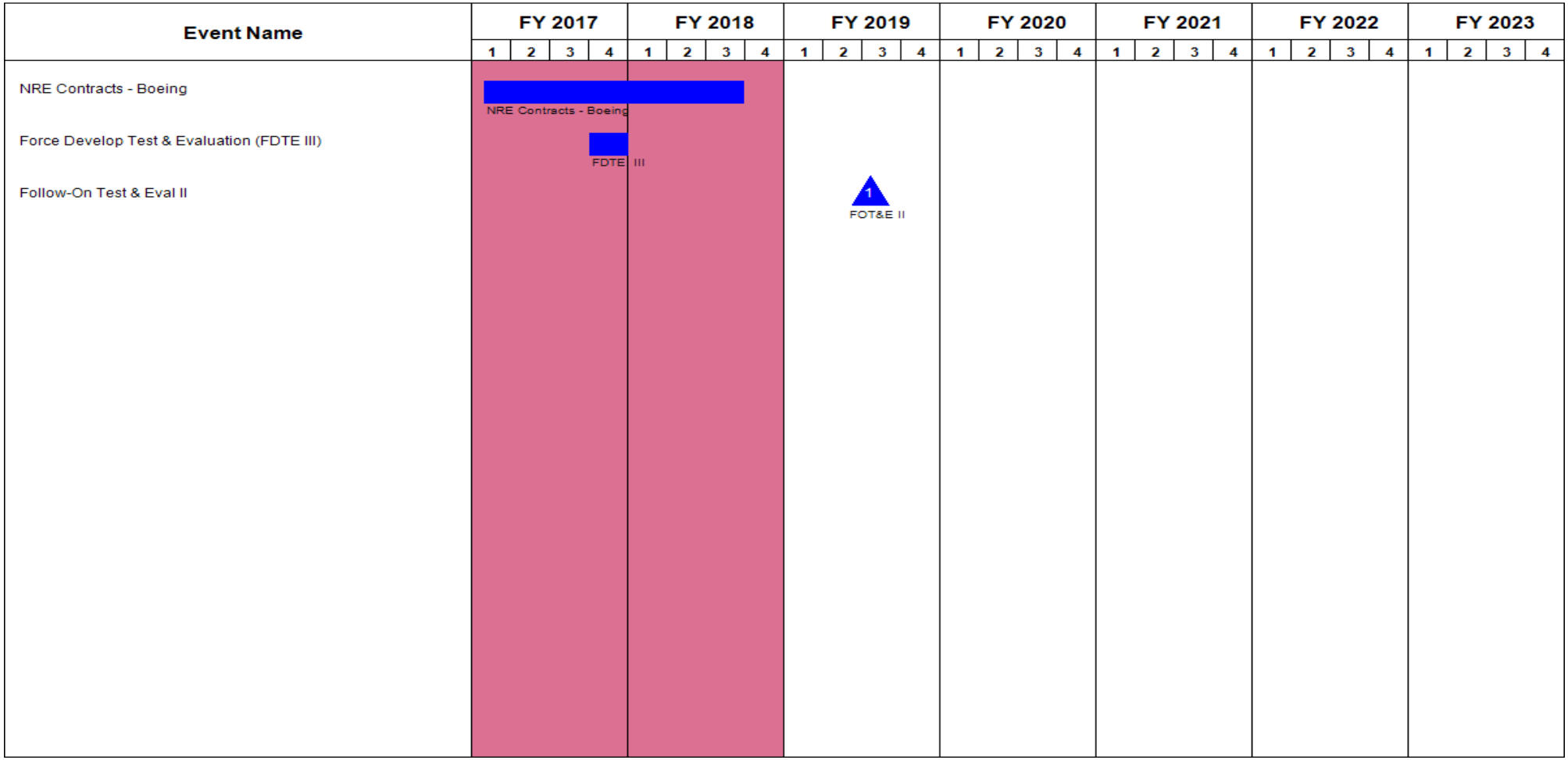
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operational Assessments, Test Integration Working Group (TWIG), TEMP, etc. | MIPR | Various : Various | 4.900 | 6.500 | | 2.100 | | 7.289 | | - | | 7.289 | 0.000 | 20.789 | - |
| | | **Subtotal** | 4.900 | 6.500 | | 2.100 | | 7.289 | | - | | 7.289 | 0.000 | 20.789 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 149.063 | 60.995 | | 59.977 | | 31.049 | | - | | 31.049 | 0.000 | 301.084 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607135A / *Apache Product Improvement Program* | **Project (Number/Name)**<br>ES2 / *Apache Product Improvement Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607135A / *Apache Product Improvement Program* | **Project (Number/Name)**<br>ES2 / *Apache Product Improvement Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| NRE Contracts - Boeing | 1 | 2011 | 3 | 2018 |
| NRE Contracts - Longbow Limited Liability | 1 | 2011 | 4 | 2016 |
| MRL Design | 3 | 2013 | 4 | 2014 |
| Force Develop Test & Evaluation (FDTE III) | 4 | 2017 | 4 | 2017 |
| Follow-On Test & Eval II | 3 | 2019 | 3 | 2019 |
| MRL Integration and Test | 2 | 2015 | 4 | 2015 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607136A / *Blackhawk Product Improvement Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 44.966 | 34.416 | 35.240 | - | 35.240 | 13.039 | 11.247 | 5.232 | 3.571 | Continuing | Continuing |
| ES3: *Blackhawk Product Improvement Program* | - | 44.966 | 34.416 | 35.240 | - | 35.240 | 13.039 | 11.247 | 5.232 | 3.571 | Continuing | Continuing |

**Note**

UH-60V:
Funds in this program were realigned in Fiscal Year (FY) 2015 from Program Element 0203744A Aircraft Modifications/Product Improvement Programs, Projected 504, for more efficient program management.

MEDEVAC:
Incremental RDT&E funding to support integration of a MEDEVAC capability on UH-60V is planned for FY19-22. In accordance with AR 40-60, Medical Materiel Acquisition Policy, the Army's Aeromedical Evacuation capability is funded by two portfolio managers, PEOAVN and MRMC. PEOAVN is responsible for the integration of MEDEVAC Mission Equipment Package (MEP) on the UH-60V. MRMC is responsible for recurring costs to procure kits and resource the installation of MEP kits on UH-60V MEDEVAC helicopters.

**A. Mission Description and Budget Item Justification**

UH-60V:
The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging. Continuing funding will provide hardware and software development, training material development, as well as developmental and operational testing.

MEDEVAC:
Beginning in FY19, RDT&E funding will support the non-recurring engineering and integration of MEDEVAC MEP into the UH-60V Black Hawk. The Surgeon General (TSG) has a requirement for a MEDEVAC capability provided by Black Hawk helicopters that were not initially produced for MEDEVAC, but are designated to support the MEDEVAC mission. In accordance with AR 40-60 Medical Materiel Acquisition Policy, the PEOAVN is responsible for the costs associated with medical MEP integration on Black Hawk helicopters that were not initially produced for MEDEVAC, but require medical MEP modifications/upgrades to support the MEDEVAC mission. MEDEVAC MEP integration on the UH-60V will address obsolescence and reduce the logistics footprint by increasing equipment commonality across the MEDEVAC fleet and will reduce the number of Black Hawk MEDEVAC configurations. Additionally, UH-60V MEDEVAC capabilities will increase when comparing MEDEVAC MEP integration on legacy Black Hawk helicopters. Capability improvements will include simultaneous Rescue Hoist and extended range capability, enabled

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0607136A *I Blackhawk Product Improvement Program* |

MEDEVAC Mission Sensor (MMS) use in Arctic conditions, UH-60V Multi-Function Display (MFD) integrated MMS video, and Multi-Function Controller Unit (MFCU) integration of MMS functions.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 46.765 | 34.416 | 17.085 | - | 17.085 |
| Current President's Budget | 44.966 | 34.416 | 35.240 | - | 35.240 |
| Total Adjustments | -1.799 | 0.000 | 18.155 | - | 18.155 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.799 | - | | | |
| • Adjustments to Budget Years | - | - | 18.155 | - | 18.155 |

**Change Summary Explanation**

FY2019 Funding added for MEDEVAC MEP RDT&E.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0607136A / *Blackhawk Product Improvement Program* | | | | Project (Number/Name)<br>ES3 / *Blackhawk Product Improvement Program* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| ES3: *Blackhawk Product Improvement Program* | - | 44.966 | 34.416 | 35.240 | - | 35.240 | 13.039 | 11.247 | 5.232 | 3.571 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

UH-60V:
Funds in this program were realigned in Fiscal Year (FY) 2015 from Program Element 0203744A Aircraft Modifications/Product Improvement Programs, Projected 504, for more efficient program management.

MEDEVAC:
Incremental RDT&E funding to support integration of a MEDEVAC capability on UH-60V is planned for FY19-22. In accordance with AR 40-60, Medical Materiel Acquisition Policy, the Army's Aeromedical Evacuation capability is funded by two portfolio managers, PEOAVN and MRMC. PEOAVN is responsible for the integration of MEDEVAC Mission Equipment Package (MEP) on the UH-60V. MRMC is responsible for recurring costs to procure kits and resource the installation of MEP kits on UH-60V MEDEVAC helicopters.

**A. Mission Description and Budget Item Justification**

UH-60V:
The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging. Continuing funding will provide hardware and software development, training material development, as well as developmental and operational testing.

MEDEVAC:
Beginning in FY19, RDT&E funding will support the non-recurring engineering and integration of MEDEVAC MEP into the UH-60V Black Hawk. The Surgeon General (TSG) has a requirement for a MEDEVAC capability provided by Black Hawk helicopters that were not initially produced for MEDEVAC, but are designated to support the MEDEVAC mission. In accordance with AR 40-60 Medical Materiel Acquisition Policy, the PEOAVN is responsible for the costs associated with medical MEP integration on Black Hawk helicopters that were not initially produced for MEDEVAC, but require medical MEP modifications/upgrades to support the MEDEVAC mission. MEDEVAC MEP integration on the UH-60V will address obsolescence and reduce the logistics footprint by increasing equipment commonality across the MEDEVAC fleet and will reduce the number of Black Hawk MEDEVAC configurations. Additionally, UH-60V MEDEVAC capabilities will increase when comparing MEDEVAC MEP integration on legacy Black Hawk helicopters. Capability improvements will include simultaneous Rescue Hoist and extended range capability, enabled

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607136A / *Blackhawk Product Improvement Program* | **Project (Number/Name)**<br>ES3 / *Blackhawk Product Improvement Program* |

MEDEVAC Mission Sensor (MMS) use in Arctic conditions, UH-60V Multi-Function Display (MFD) integrated MMS video, and Multi-Function Controller Unit (MFCU) integration of MMS functions.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development<br><br>***Description:*** The UH-60V program provides an integrated digital map, integrated performance planning, common functionality and commonality of training with UH-60M. Product Development includes all activities related to Hardware and Software development, Prototype Manufacturing (3 units), Training Equipment, Data, and Production Engineering and Planning for the UH60V program. Examples of specific activities include drawing development, work instruction development, prototype builds, Preliminary Design Review (PDR)/Critical Design Review (CDR), Software Engineering Directorate (SED) Simulation Integration Laboratory (SIL) design, Software Development (aircraft and off aircraft), trainers, and training material development.<br><br>***FY 2018 Plans:***<br>Delivery of software Build 2 and associated technical data package (TDP) that will be used to support Limited User Test (LUT). Complete installation of UH-60V kit on EDM 3 and begin Government verification of Technical Manuals (TMs).<br><br>***FY 2019 Base Plans:***<br>Continued 60V EMD efforts including hardware development, Flight Test Software Build 2, and PIF labor in support of 60V development.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Software development nearing completion. | 32.536 | 24.007 | 8.486 | - | 8.486 |
| ***Title:*** Support<br><br>***Description:*** Support Costs include Systems Engineering/Program Management (SEPM) type activities performed at the Prototype Integration Facility (PIF). This includes Army Engineering Directorate (AED) support for propulsion, structures, aeromechanics, mission equipment, as well as PIF program management.<br><br>***FY 2018 Plans:***<br>Continue SEPM activities in support of UH-60V.<br><br>***FY 2019 Base Plans:*** | 3.104 | 2.681 | 3.348 | - | 3.348 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607136A / *Blackhawk Product Improvement Program* | **Project (Number/Name)**<br>ES3 / *Blackhawk Product Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Continue AED support for propulsion, structures, aeromechanics, mission equipment, SED SIL Support, Air Worthiness Release (AWR), as well as PIF program management.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increased effort to support Material Fielding and Training Support Development. | | | | | |
| ***Title:*** Test & Evaluation<br>***Description:*** The Utility Helicopters Project Office (UHPO) is responsible for day-to-day test management activities to include execution of all developmental tests and support of operational tests for the UH-60V Program. The focal point for test management is the UH-60V Test Lead Engineer who is the chair for the UH-60V Test and Evaluation (T&E) Working-level Integrated Product Team. The UH-60 T&E team ensures integration and coordination of test and data requirements among all agencies involved in the test and acquisition of the UH-60V effort. T&E activities include, AFTD Baseline Flight Testing, Initial Operational Test and Evaluation (IOTE), Cybersecurity and Interoperability tests.<br>***FY 2018 Plans:***<br>Complete flight testing on software Build 2 and review flight test report. Continue test planning and execution efforts for continuous improvement of system level testing to include software builds (3 & 4) for IOT&E. Conduct LUT.<br>***FY 2019 Base Plans:***<br>ATEC Initial Operational Testing and Evaluation (IOT&E).<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Initial Operational Testing and Evaluation (IOT&E). | 3.597 | 3.800 | 4.475 | - | 4.475 |
| ***Title:*** Management Services<br>***Description:*** Management Services includes all activities related to Government/Contractor SEPM to include the cost of Government and Contractor personnel supporting the UH-60V program.<br>***FY 2018 Plans:***<br>Continue core and contractor (SEPM) activities in support of UH-60V.<br>***FY 2019 Base Plans:*** | 5.729 | 3.928 | 1.794 | - | 1.794 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607136A / *Blackhawk Product Improvement Program* | **Project (Number/Name)**<br>ES3 / *Blackhawk Product Improvement Program* | |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Continue core and contractor (SEPM) activities in support of UH-60V.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Management activities transitioning to production. | | | | | |
| ***Title:*** MEDEVAC MEP Integration Product Development<br>***Description:*** MEDEVAC MEP Integration Product Development.<br>***FY 2019 Base Plans:***<br>Develop Contract with PIF Contractor to perform Hardware (HW) design and Software (SW) Design activities for H-60V MEDEVAC MEP Integration effort.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>MEDEVAC MEP effort begins in FY19. | - | - | 13.947 | - | 13.947 |
| ***Title:*** MEDEVAC MEP Integration Support<br>***Description:*** Support the HW and SW Design Activities with Airworthiness and Technical data division support.<br>***FY 2019 Base Plans:***<br>Support the HW and SW Design Activities with Airworthiness and Technical data division support.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>MEDEVAC MEP effort begins in FY19. | - | - | 0.592 | - | 0.592 |
| ***Title:*** MEDEVAC MEP Management Services<br>***Description:*** Management Services includes all activities related to Government/Contractor SEPM to include the cost of Government and Contractor personnel supporting the H-60V MEDEVAC MEP Integration Program.<br>***FY 2019 Base Plans:***<br>Provide Management Services with Government / Contractor System Engineering Program Management (SEPM) to include the cost of the Government and contractor personnel supporting the H-60V MEDEVAC MEP Integration Program.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>MEDEVAC MEP effort begins in FY19. | - | - | 2.598 | - | 2.598 |
| **Accomplishments/Planned Programs Subtotals** | 44.966 | 34.416 | 35.240 | - | 35.240 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607136A / *Blackhawk Product Improvement Program* | **Project (Number/Name)**<br>ES3 / *Blackhawk Product Improvement Program* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A05009: *UH-60 BLACK HAWK A AND L MODELS* | 46.173 | 76.516 | 146.138 | - | 146.138 | 173.690 | 166.969 | 171.634 | 174.656 | 0.000 | 955.776 |
| • MN1000: *Combat Support Medical* | 75.524 | 69.033 | 57.752 | 17.527 | 75.279 | 30.496 | 35.727 | 37.072 | 33.513 | 0.000 | 356.644 |

**Remarks**

A05009 UH-60 Blackhawk A and L Models provides procurement funding for conversions to UH-60V starting in FY2018.

MN1000, MEDEVAC Mission Equipment Package provides procurement funding for MEDEVAC MEP capability on UH-60 helicopters. Starting in FY22, MN1000 will resource procurement of MEDEVAC MEP kits and installations at a rate of 15 aircraft per year through FY34 when the AAO of 200 UH-60V MEDEVAC is reached.

* Figures shown above reflect the full MN1000 - OPA3/MN1000/Combat Support Medical funding line. UH-60V MEDEVAC MEP MN1000 requirements are $5.630 in FY22 and $6.040 in FY23.

**D. Acquisition Strategy**

The UH-60V program plans to leverage the Prototype Integration Facility (PIF), a Government Owned Government Operated (GOGO) facility, to design, integrate and build three production representative aircraft. The GOGO facility uses a cost plus contract vehicle and conducted full and open competition for the selection of the avionics solution provider.

The MEDEVAC MEP program plans to utilize the U. S. Army Aviation and Missile Research Development and Engineering Center (AMRDEC) Prototype Integration Facility (PIF) to design and integrate MEDEVAC capability into the UH-60V. By leveraging the same Government Owned/Government Operated (GOGO) facility utilized by the UH-60V program, efficient design, software development, integration, and testing will occur by eliminating redundant tasks and employing experienced government resources already in possession of pertinent UH-60V technical data required to support the MEDEVAC MEP non-recurring engineering (NRE) effort. Prototype, validation, and verification of technical publications, as well as airworthiness testing will be accomplished following completion of the UH-60V IOT&E, at which time up to two UH-60V EDM aircraft will be allocated to the MEDEVAC MEP program. Following completion of MEDEVAC MEP NRE, technical products will feed production and fielding contracts, which will be resourced by MEDCOM. Procurement funding is programmed on MN1000 Combat Support Medical, G13010 MEDEVAC MEP.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607136A / *Blackhawk Product Improvement Program* | Project (Number/Name)<br>ES3 / *Blackhawk Product Improvement Program* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH-60V - Organic | MIPR | Various : Redstone Arsenal, AL | 7.121 | 3.231 | Oct 2016 | 1.657 | Oct 2017 | 1.117 | Oct 2018 | - | | 1.117 | Continuing | Continuing | - |
| UH-60V - Contractor | C/LH | Various : Redstone Arsenal, AL | 4.985 | 2.498 | Oct 2016 | 2.271 | Oct 2017 | 0.677 | Oct 2018 | - | | 0.677 | Continuing | Continuing | - |
| MEDEVAC MEP Integration - Organic | MIPR | Various : Redstone Arsenal | - | - | | - | | 1.015 | Oct 2018 | - | | 1.015 | Continuing | Continuing | - |
| MEDEVAC MEP Integration - Contractor | C/LH | Various : Redstone Arsenal, AL | - | - | | - | | 1.583 | Oct 2018 | - | | 1.583 | Continuing | Continuing | - |
| | | **Subtotal** | 12.106 | 5.729 | | 3.928 | | 4.392 | | - | | 4.392 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH-60V Development Engineering | C/CPFF | AMRDEC PIF : Redstone Arsenal, AL | 92.055 | 32.536 | Oct 2016 | 24.007 | Oct 2017 | 8.486 | Oct 2018 | - | | 8.486 | Continuing | Continuing | - |
| MEDEVAC MEP Product Development and Integration | C/CPFF | AMRDEC PIF : Redstone Arsenal AL | - | - | | - | | 13.947 | Oct 2018 | - | | 13.947 | Continuing | Continuing | - |
| | | **Subtotal** | 92.055 | 32.536 | | 24.007 | | 22.433 | | - | | 22.433 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH-60V | MIPR | Various : Redstone Arsenal, AL | 6.236 | 3.104 | Oct 2016 | 2.681 | Oct 2017 | 3.348 | Oct 2018 | - | | 3.348 | Continuing | Continuing | - |
| MEDEVAC MEP Integration Support | MIPR | Various : Redstone Arsenal AL | - | - | | - | | 0.592 | Oct 2018 | - | | 0.592 | Continuing | Continuing | - |
| | | **Subtotal** | 6.236 | 3.104 | | 2.681 | | 3.940 | | - | | 3.940 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607136A / *Blackhawk Product Improvement Program* | Project (Number/Name)<br>ES3 / *Blackhawk Product Improvement Program* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH-60V | MIPR | Redstone Test Center : Redstone Arsenal, AL | 2.020 | 3.597 | Oct 2016 | 3.800 | Oct 2017 | 4.475 | Oct 2018 | - | | 4.475 | Continuing | Continuing | - |
| | | **Subtotal** | 2.020 | 3.597 | | 3.800 | | 4.475 | | - | | 4.475 | Continuing | Continuing | N/A |

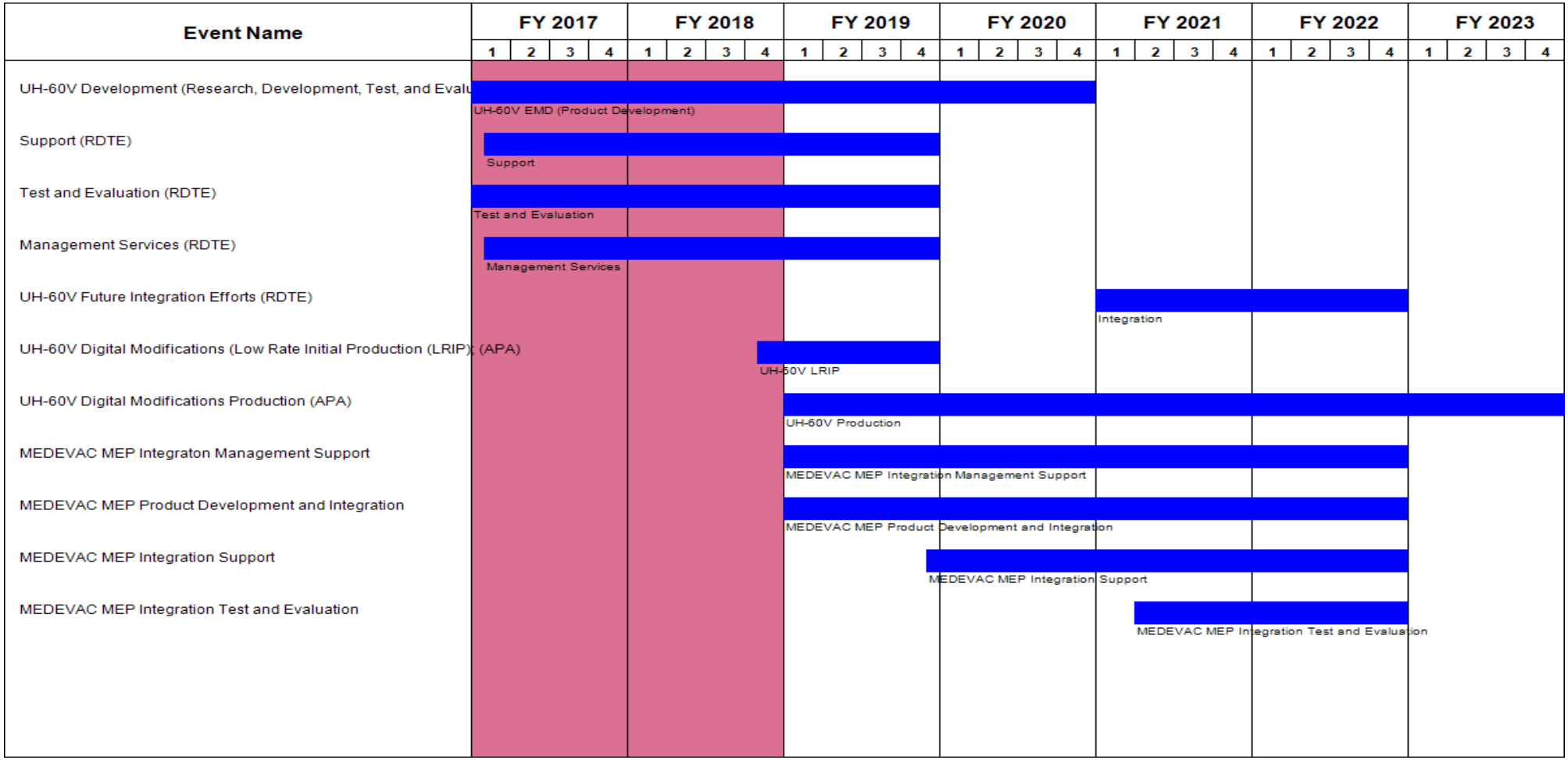
**Remarks**

Government Support

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 112.417 | 44.966 | | 34.416 | | 35.240 | | - | | 35.240 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607136A / *Blackhawk Product Improvement Program* | **Project (Number/Name)**<br>ES3 / *Blackhawk Product Improvement Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607136A / *Blackhawk Product Improvement Program* | **Project (Number/Name)**<br>ES3 / *Blackhawk Product Improvement Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| UH-60V Development (Research, Development, Test, and Evaluation (RDTE) | 4 | 2014 | 4 | 2020 |
| Support (RDTE) | 1 | 2014 | 4 | 2019 |
| Test and Evaluation (RDTE) | 4 | 2015 | 4 | 2019 |
| Management Services (RDTE) | 1 | 2014 | 4 | 2019 |
| UH-60V Future Integration Efforts (RDTE) | 1 | 2021 | 4 | 2022 |
| UH-60V Digital Modifications (Low Rate Initial Production (LRIP); (APA) | 4 | 2018 | 4 | 2019 |
| UH-60V Digital Modifications Production (APA) | 1 | 2019 | 1 | 2024 |
| MEDEVAC MEP Integraton Management Support | 1 | 2019 | 4 | 2022 |
| MEDEVAC MEP Product Development and Integration | 1 | 2019 | 4 | 2022 |
| MEDEVAC MEP Integration Support | 4 | 2019 | 4 | 2022 |
| MEDEVAC MEP Integration Test and Evaluation | 2 | 2021 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607137A / *Chinook Product Improvement Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 88.314 | 194.567 | 157.822 | - | 157.822 | 174.371 | 49.178 | 32.641 | 34.817 | 0.000 | 731.710 |
| ES4: *Chinook Product Improvement Program* | - | 88.314 | 194.567 | 157.822 | - | 157.822 | 174.371 | 49.178 | 32.641 | 34.817 | 0.000 | 731.710 |

**A. Mission Description and Budget Item Justification**

The CH-47 Chinook is the Army's only heavy lift helicopter and is an essential element of the Army Aviation portfolio strategy. This program budget activity funds improvements to the CH-47F System that include the transition from individual Engineering Change Proposals (ECPs) to a CH-47F Block II program of record. Engineering/Manufacturing Design (EMD) contract awarded July 2017. EMD phase will produce three production representative test articles to support a Milestone C decision in 4th quarter FY 2021. Additionally, funding supports: continued development and testing of the Advanced Chinook Rotor Blades (ACRB) to increase lift in high/hot conditions, and improvements to flight control and drive train components to increase aircraft performance and reduce Operation and Support (O&S) costs.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 91.848 | 194.567 | 131.124 | - | 131.124 |
| Current President's Budget | 88.314 | 194.567 | 157.822 | - | 157.822 |
| Total Adjustments | -3.534 | 0.000 | 26.698 | - | 26.698 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -3.489 | - | | | |
| • GP SEC 8025 FFRDC | -0.045 | - | - | - | - |
| • CH-47F RECAP ACP | - | - | 26.698 | - | 26.698 |

**Change Summary Explanation**

FY 2017 funds have been adjusted -.450 million for GP SEC 8025 FFRDC -3.489 SBR/STTR
FY 2019 program increase for 26.698 million for Block II EMD and Test and Evaluation efforts

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607137A / *Chinook Product Improvement Program* | Project (Number/Name)<br>ES4 / *Chinook Product Improvement Program* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES4: *Chinook Product Improvement Program* | - | 88.314 | 194.567 | 157.822 | - | 157.822 | 174.371 | 49.178 | 32.641 | 34.817 | 0.000 | 731.710 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The CH-47 Chinook is the Army's only heavy lift helicopter and is an essential element of the Army Aviation portfolio strategy. This program budget activity funds improvements to the CH-47F System that include the transition from individual Engineering Change Proposals (ECPs) to a CH-47F Block II program of record. Engineering/Manufacturing Design (EMD) contract awarded July 2017. EMD phase will produce three production representative test articles to support a Milestone C decision in 4th quarter FY 2021. Additionally, funding supports: continued development and testing of the Advanced Chinook Rotor Blades (ACRB) to increase lift in high/hot conditions, and improvements to flight control and drive train components to increase aircraft performance and reduce Operation and Support (O&S) costs.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Modernization Integration | 15.404 | 4.400 | - | - | - |
| ***Description:*** Continued system integration non-recurring engineering prior to EMD. Developed the Air Vehicle Airworthiness Qualification Specification (AQS) and EMD Disposition Document completion of manufacturing tool designs for specific cockpit and cabin positions. Updated weight and balance information. Generated and provided structural, stress, and fatigue substantiation. Created manufacturing tool orders for all zones and prepared them for release. Generated preliminary manufacturing planning for the Block II Air Vehicle. Continued Ground Test Vehicle (GTV) design work. Released engineering to support test article development.<br><br>***FY 2018 Plans:***<br>This effort will continue to develop and finalize a test article design that converts a CH-47D aircraft to a GTV; continue Block II Common Avionics Architecture System (CAAS) coordination and vehicle interface planning; and update weight and balance data with the latest design inputs. Additionally, the effort will finalize Reliability and Maintainability (R&M) and safety analyses; structural, stress, and fatigue substantiation; vehicle level drawings and assemblies (including alignment definitions). Complete all manufacturing tooling designs.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding decrease due to CH-47F ECPs transitioning to the Block II Program. | | | | | |
| ***Title:*** Electronic Control Unit (ECU) Software Upgrade | 2.697 | 3.840 | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607137A / *Chinook Product Improvement Program* | **Project (Number/Name)**<br>ES4 / *Chinook Product Improvement Program* | |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** Software upgrade improves engine communication with the aircraft monitoring system to increase aircrew situational awareness and reduce workload. In addition software enhancements accommodate increased capability of the Improved Drive Train (IDT). Software upgrades will occur at designated intervals to allow efficient and expedient fielding of any improvements/enhancements.<br><br>***FY 2018 Plans:***<br>Complete qualification testing and integration of Version 3+ ECU software with Block II aircraft. Conduct Electromagnetic Environmental Effects (E3) and engine testing on the Hydro Mechanical Assembly improvements.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding decrease due to R&D ECU Software upgrade program complete. | | | | | |
| ***Title:*** Improved Drive Train (IDT)<br><br>***Description:*** This effort addresses O&S cost reduction while simultaneously re-qualifying the combining, forward, and aft transmissions to a higher power level to maximize engine power available at sea-level conditions.<br><br>***FY 2018 Plans:***<br>Continue test preparation. Continue test execution for the forward transmission, static/dynamics strain surveys test, sync shaft fatigue tests. Initiate qualification endurance, overstress, gear tooth bending fatigue test for aft/forward transmission. Initiate reduced lubrication and oil out test planning for aft/combiner/forward transmissions.<br><br>***FY 2019 Base Plans:***<br>Complete test preparation. Complete qualification test for the aft transmission, overstress test, gear tooth bending fatigue test, reduced lubrication and oil out testing. Document results of aft transmission qualification testing. Complete qualification test for the forward transmission, gear tooth bending fatigue test, reduced lubrication and oil out testing. Document results of forward transmission qualification testing. Complete qualification test for the combiner transmission, reduced lubrication and oil out testing. Document results of combiner transmission qualification testing.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | 6.842 | 19.500 | 7.700 | - | 7.700 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607137A / *Chinook Product Improvement Program* | **Project (Number/Name)**<br>ES4 / *Chinook Product Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Funding decrease due to completion of testing on the IDT. | | | | | |
| ***Title:*** Transportable Flight Proficiency Simulator (TFPS)<br>***Description:*** The TFPS is a certified trainer using high fidelity, motion cueing, transportable, flight simulator capable of training to include training for mission tasks and emergency procedures and provides flying hour dollars savings. The Block II TFPS is required to safely support initial trainer and operator aircrew training for the Limited User Test (LUT) and beyond. The TFPS will decrease risk to unit aircrew and trainers by allowing them to train with the new design modifications, handling quality changes and pilot visibility differences versus learning in aircraft. Training in the TFPS significantly reduces LUT timelines and improves aircrew proficiency as confirmed in the CH-47F (Block I) Phase 2 User Test Report. Additionally, the initial TFPS serves as a prototype for the remainder of the required TFPS upgrades.<br>***FY 2018 Plans:***<br>Redesign of the existing CH-47F TFPS to incorporate Block II changes and order bulk of materials.<br>***FY 2019 Base Plans:***<br>Continue integration of hardware and software components.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding decrease due to completion of initial TFPS to support Block II. | - | 28.838 | 3.723 | - | 3.723 |
| ***Title:*** CH-47F Block II Engineering and Manufacturing Development (EMD)<br>***Description:*** Description: The EMD contract award July 2017 which will develop affordable and executable manufacturing processes, complete system fabrication, remanufacture three production representative CH-47F Block II Chinook test articles, and reduce program risk.<br>***FY 2018 Plans:***<br>Conduct System Level Delta Preliminary Design Review (PDR) and System Level Critical Design Review (CDR). Conduct and support aircraft development and assembly to include ACRB, airframe components, Improved Drive Train (IDT) and rotor components, light weight fuel system and electrical components. Deliver documentation that demonstrates requirements verification and production configuration baseline. Initiate building of the GTV.<br>***FY 2019 Base Plans:*** | 34.964 | 107.726 | 110.052 | - | 110.052 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607137A / *Chinook Product Improvement Program* | **Project (Number/Name)**<br>ES4 / *Chinook Product Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Complete building of the GTV and conduct the GTV testing. Complete building test aircraft. Conduct Test Readiness Review (TRR) for EMD flight testing. Release of EMD flight test software.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding increase due to Block II approval to the ACP. | | | | | |
| ***Title:*** In-house and Program Management Administration<br>***Description:*** This funding provides support costs for various government agencies.<br>***FY 2018 Plans:***<br>Continue funding support costs for various government agencies in addition to funding for Project Management Office Full Time Equivalent (FTE) employees supporting the Block II development Program.<br>***FY 2019 Base Plans:***<br>Continue funding support costs for various government agencies in addition to funding for Project Management Office FTE employees and other matrix organizations supporting the Block II development Program.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding changes meet R&D requirements as program ramps to LRIP. | 4.547 | 13.874 | 13.767 | - | 13.767 |
| ***Title:*** Advanced Chinook Rotor Blade (ACRB)<br>***Description:*** This effort provides an ACRB which is a redesign of the current rotor blade to provide improved capability. It improves high/hot performance, reduces Operations and Support (O&S) costs and is a form, fit, function replacement for the legacy blade.<br>***FY 2018 Plans:***<br>Complete build of ACRB blades to support component level qualification testing. Commence testing of material coupons (samples) for component structural testing and development of material allowables in support of ACRB full qualification requirements. Begin preparation of blades for live fire static and quasi static testing. Begin building blades to support the ACRB dynamic Live Fire Test and Evaluation (LFTE).<br>***FY 2019 Base Plans:***<br>Complete material coupon testing. Finalize fatigue, stress and material allowable reports to support EMD Airworthiness Release (AWR).<br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | 12.828 | 14.368 | 13.779 | - | 13.779 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607137A / *Chinook Product Improvement Program* | **Project (Number/Name)**<br>ES4 / *Chinook Product Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Funding decrease due to CH-47F ACRB completing final testing. | | | | | |
| ***Title:*** Testing and Evaluation<br>***Description:*** This effort supports component level and system level testing to qualify design improvement in the airframe, fuel system, avionics, drive train, rotor subsystem, and ACRB. Through endurance, live-fire, E3, and limited user, testing and evaluation activities will validate Block II improvements.<br>***FY 2018 Plans:***<br>Emplacement of a GTV fixture and endurance testing of the IDT and Improved Rotor Subsystem<br>***FY 2019 Base Plans:***<br>Begin system level LFTE excluding ACRB LFTE. Initiate system level developmental testing (ie E3 and ground test). Initiate planning of Limited User Test (LUT).<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding increase due to LFTE and LUT. | 11.032 | 2.021 | 8.801 | - | 8.801 |
| **Accomplishments/Planned Programs Subtotals** | 88.314 | 194.567 | 157.822 | - | 157.822 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • AA0252: *CH-47 CARGO HELICOPTER MODS* | 102.943 | 20.166 | 7.807 | - | 7.807 | 11.785 | 23.957 | 15.092 | 15.697 | Continuing | Continuing |
| • A05105: *CH-47 SLEP (Including Adv Proc)* | 553.257 | 70.740 | 99.278 | 25.000 | 124.278 | 128.644 | 332.421 | 300.324 | 417.570 | Continuing | Continuing |
| • A05008: *CH-47 CARGO HELICOPTER NEW BUILD* | - | 131.836 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 131.836 |

**Remarks**

The Block II program will restore performance lost due to the added weight of safety and survivability equipment incorporated since initial fielding of the CH-47F Block I in 2007. The CH-47F Block II will also increase the operational envelope allowing more to be carried at high hot conditions.

**D. Acquisition Strategy**

Given the need to maintain the Chinook fleet's sustained relevance until replaced, the PM is proposing a block strategy to facilitate incremental upgrades. The Block II program will restore performance lost due to the added weight of safety and survivability equipment incorporated since initial fielding in 2007. Additional objectives of

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607137A / *Chinook Product Improvement Program* | **Project (Number/Name)**<br>ES4 / *Chinook Product Improvement Program* |

the Block II program include: Efficiently incorporating multiple engineering changes; Accomplishing required mid-life airframe recapitalization; Converging the special operations and conventional Army designs; Establishing a foundation for future block upgrades; and Maintaining the industrial base until Future Vertical Lift (FVL)-Heavy is realized.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607137A / *Chinook Product Improvement Program* | Project (Number/Name)<br>ES4 / *Chinook Product Improvement Program* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Support | C/T&M | Various : Redstone Arsenal AL | - | - | | 2.663 | Oct 2018 | - | | - | | - | 0.000 | 2.663 | - |
| | | **Subtotal** | - | - | | 2.663 | | - | | - | | - | 0.000 | 2.663 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Modernization Integration | SS/CPFF | Boeing Ridley : Park PA | 15.477 | 15.404 | Nov 2016 | 4.400 | | - | | - | | - | Continuing | Continuing | Continuing |
| Engineering and Manufacturing Development (Pre-Decisional) | SS/CPIF | Boeing Ridley : Park, PA | - | 34.964 | Jul 2017 | 107.726 | Dec 2017 | 110.052 | Dec 2018 | - | | 110.052 | Continuing | Continuing | Continuing |
| Advanced Chinook Rotor Blade (ACRB) | SS/CPFF | Boeing Ridley : Park PA | 18.695 | 12.828 | Mar 2017 | 14.368 | Nov 2017 | 13.779 | Nov 2018 | - | | 13.779 | Continuing | Continuing | Continuing |
| Improved Drive Train | SS/CPFF | Boeing Ridley : Park, PA | 11.662 | 6.842 | Oct 2016 | 19.500 | Nov 2017 | 7.700 | Nov 2018 | - | | 7.700 | Continuing | Continuing | Continuing |
| Electronic Control Unit (ECU) Software Upgrade | SS/CPFF | Honeywell : Phoenix, AZ | 5.910 | 2.697 | Apr 2017 | 3.840 | Apr 2018 | - | | - | | - | Continuing | Continuing | Continuing |
| Ratio Detector Power Supply (RDPS) | SS/CPFF | Boeing Ridley : Park, PA | 5.570 | - | | - | | - | | - | | - | 0.000 | 5.570 | - |
| Transportable Flight Proficienct Simulator (TFPS) | MIPR | NAVAIR : Patuxent River NAS, MD | - | - | | 28.838 | | 3.723 | | - | | 3.723 | Continuing | Continuing | - |
| | | **Subtotal** | 57.314 | 72.735 | | 178.672 | | 135.254 | | - | | 135.254 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607137A / *Chinook Product Improvement Program* | Project (Number/Name)<br>ES4 / *Chinook Product Improvement Program* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PMO/OGA | Various | Various Government : Redstone Arsenal AL | 3.391 | 4.547 | Oct 2016 | 11.211 | Oct 2017 | 13.767 | Oct 2018 | - | | 13.767 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 3.391 | 4.547 | | 11.211 | | 13.767 | | - | | 13.767 | Continuing | Continuing | N/A |

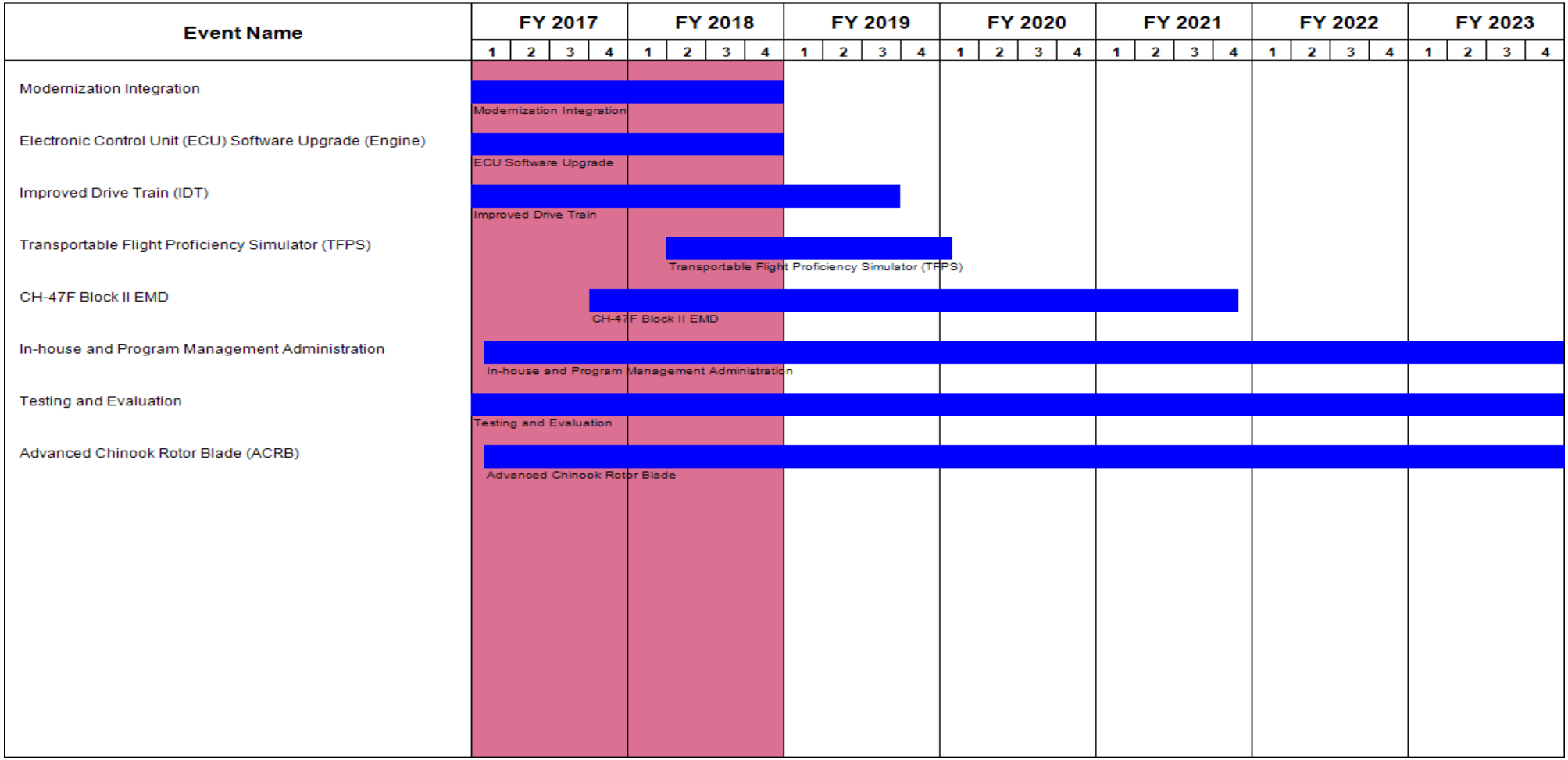
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Testing of configuration update ECPs to include the Advanced Chinook Rotor Blades | SS/CPFF | Boeing Ridley : Park PA | 5.841 | 11.032 | Jul 2017 | 2.021 | Dec 2017 | 8.801 | Dec 2018 | - | | 8.801 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 5.841 | 11.032 | | 2.021 | | 8.801 | | - | | 8.801 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 66.546 | 88.314 | | 194.567 | | 157.822 | | - | | 157.822 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607137A / *Chinook Product Improvement Program* | **Project (Number/Name)**<br>ES4 / *Chinook Product Improvement Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607137A / *Chinook Product Improvement Program* | **Project (Number/Name)**<br>ES4 / *Chinook Product Improvement Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Modernization Integration | 3 | 2015 | 4 | 2018 |
| Electronic Control Unit (ECU) Software Upgrade (Engine) | 4 | 2010 | 4 | 2018 |
| Improved Drive Train (IDT) | 3 | 2014 | 3 | 2019 |
| Transportable Flight Proficiency Simulator (TFPS) | 2 | 2018 | 1 | 2020 |
| CH-47F Block II EMD | 4 | 2017 | 4 | 2021 |
| In-house and Program Management Administration | 1 | 2016 | 4 | 2023 |
| Testing and Evaluation | 3 | 2015 | 4 | 2023 |
| Advanced Chinook Rotor Blade (ACRB) | 1 | 2010 | 1 | 2024 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607138A / *Fixed Wing Product Improvement Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.765 | 9.981 | 4.189 | - | 4.189 | 4.545 | 1.920 | 1.979 | 1.908 | Continuing | Continuing |
| ES5: *Fixed Wing Product Improvement Program* | - | 0.765 | 9.981 | 4.189 | - | 4.189 | 4.545 | 1.920 | 1.979 | 1.908 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The budget line provides for Fixed Wing (FW) fielded fleet Non-Recurring Engineering (NRE), development of supplemental type certificates (STC) and associated developmental testing, and integration of all Army fixed wing aircraft to provide Communications, Navigation and Surveillance (CNS), Aircraft Survivability Equipment (ASE), and Department of Defense (DoD) mandated safety equipment to meet current and evolving international and Army standards. As requirements for new avionics equipment evolve, aircraft delays and airspace exclusions are likely for aircraft not properly equipped. Upgrade of communication and aircraft modifications assures worldwide deployability for those required to deploy. This budget line provides funding for studies, evaluations and Analysis of Alternatives to support emerging Army fixed wing requirements for product improvements to support the FW fleet. This budget line also provides funding for Test and Evaluation of Fixed Wing Aircraft.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.796 | 9.981 | 2.234 | - | 2.234 |
| Current President's Budget | 0.765 | 9.981 | 4.189 | - | 4.189 |
| Total Adjustments | -0.031 | 0.000 | 1.955 | - | 1.955 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.031 | - | | | |
| • Adjustments to Budget Years | - | - | 1.955 | - | 1.955 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607138A / *Fixed Wing Product Improvement Program* | Project (Number/Name)<br>ES5 / *Fixed Wing Product Improvement Program* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES5: *Fixed Wing Product Improvement Program* | - | 0.765 | 9.981 | 4.189 | - | 4.189 | 4.545 | 1.920 | 1.979 | 1.908 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Funding for this Program Element (PE) was previously on PE 0203744A Project D18 - Aircraft Modifications/Product Improvement Programs

**A. Mission Description and Budget Item Justification**

The budget line provides for Fixed Wing (FW) fielded fleet Non-Recurring Engineering (NRE), development of supplemental type certificates (STC) and associated developmental testing, and integration of all Army fixed wing aircraft to provide Communications, Navigation and Surveillance (CNS), Aircraft Survivability Equipment (ASE), and Department of Defense (DoD) mandated safety equipment to meet current and evolving international and Army standards. As requirements for new avionics equipment evolve, aircraft delays and airspace exclusions are likely for aircraft not properly equipped. Upgrade of communication and aircraft modifications assures worldwide deployability for those required to deploy. This budget line provides funding for studies, evaluations and Analysis of Alternatives to support emerging Army fixed wing requirements for product improvements to support the FW fleet. This budget line also provides funding for continued Test and Evaluation of Fixed Wing Aircraft.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Program Management (PM) | - | 0.594 | 0.377 |
| ***Description:*** PM Fixed Wing (FW) | | | |
| ***FY 2018 Plans:***<br>PM Fixed Wing (FW) | | | |
| ***FY 2019 Plans:***<br>PM Fixed Wing (FW) | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 was decreased due to reduction in Test and Evaluation efforts. | | | |
| ***Title:*** Test And Evaluation | 0.765 | 9.387 | 1.906 |
| ***Description:*** Support for Test and Evaluation efforts on Fixed Wing Aircraft. | | | |
| ***FY 2018 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607138A / *Fixed Wing Product Improvement Program* | **Project (Number/Name)**<br>ES5 / *Fixed Wing Product Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| FY18 funding supports FUA Developmental Test (DT) Production Qualification, planning/execution for Live Fire Test and Evaluation (LFT&E) for FUA and LFT&E hardware materials consisting of Structural Wing, Engine, Propeller, Fuselage, Wing Iron Bird, Hydraulic System, Dry Bay Fire Suppression System, and ESOS System. PQT includes electromagnetic environmental effects (E3), handling qualities, Safety of Flight (SOF), human factors, cyber security, AIMS certification, ASE, interoperability and COM/NAV to support final airworthiness release (AWR) for Phase 4 Initial Operational T&E (IOT&E).<br>***FY 2019 Plans:***<br>This budget line provides funding for continued Test and Evaluation of Fixed Wing Aircraft.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 was decreased due to reduction in Test and Evaluation efforts. | | | |
| ***Title:*** Support Cost<br>***Description:*** Non-recurring Engineering Support for Fixed Wing (FW) Aircraft.<br>***FY 2019 Plans:***<br>This budget line provides funding for Support Cost of FW Aircraft.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 was increase as this provides funding for Support Cost of FW Aircraft. | - | - | 1.906 |
| **Accomplishments/Planned Programs Subtotals** | 0.765 | 9.981 | 4.189 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A11300: *Utility F/W Aircraft* | 41.342 | 75.115 | 0.744 | - | 0.744 | 34.269 | 42.431 | 41.731 | 31.257 | 0.000 | 266.889 |
| • AA0270: *Utility/ Cargo Airplane Mods* | 17.526 | 57.737 | 17.719 | - | 17.719 | 14.676 | 13.882 | 16.042 | 10.781 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The US Army Fixed Wing acquisition and modernization strategy leverages commercial derivative aircraft through the use of supplemental type certificates (STC) and associated testing and includes cockpit modernization for civil and tactical upgrades of military unique equipment and integration of Mission Equipment Packages (MEP). Cockpit modernization upgrades include items such as dual Flight Management Systems, Terrain Area Warning Systems, transponder, Mode S/5 transponders, Satellite Communications, Traffic Alert and Collision Avoidance II, Flight Data Recorders, Cockpit Voice Recorders, communication radios, military Global Positioning System

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607138A / *Fixed Wing Product Improvement Program* | **Project (Number/Name)**<br>ES5 / *Fixed Wing Product Improvement Program* |

(GPS), Wide Area Augmentation System/ Localizer Performance with Vertical Guidance, Automatic Dependence Surveillance Broadcast (ADS-B) Out, M-code GPS, Blue Force Tracker, and Smart books.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607138A / *Fixed Wing Product Improvement Program* | Project (Number/Name)<br>ES5 / *Fixed Wing Product Improvement Program* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | Various | PM Fixed Wing : Redstone Arsenal, AL | 0.118 | - | | 0.594 | | 0.377 | | - | | 0.377 | Continuing | Continuing | - |
| | | **Subtotal** | 0.118 | - | | 0.594 | | 0.377 | | - | | 0.377 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fixed Wing Non-recurring Engineering | Various | Various : Various | 1.806 | - | | - | | 1.906 | | - | | 1.906 | Continuing | Continuing | - |
| | | **Subtotal** | 1.806 | - | | - | | 1.906 | | - | | 1.906 | Continuing | Continuing | N/A |

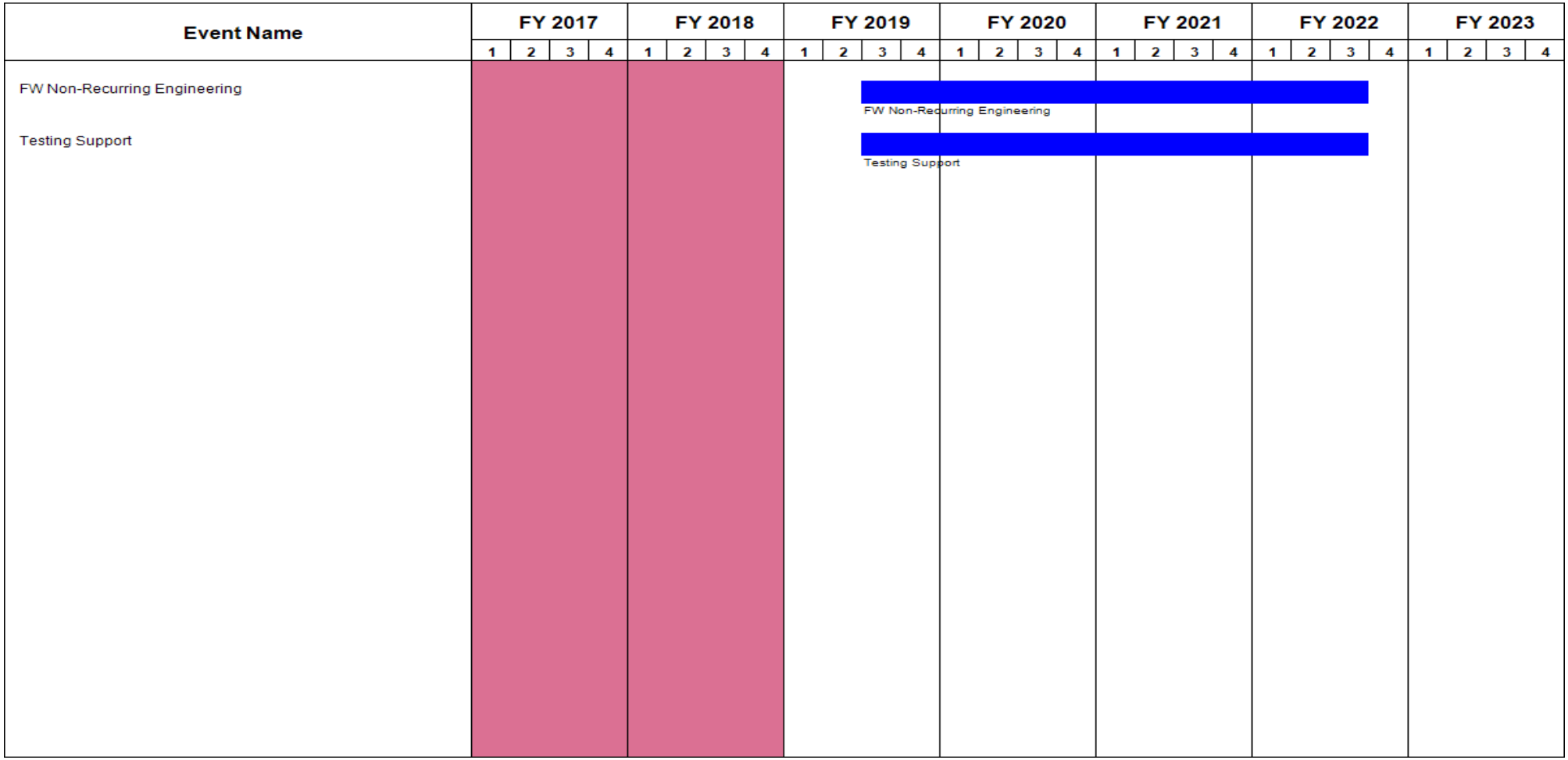
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Testing Support | Various | Various : Various | - | 0.765 | | 9.387 | | 1.906 | | - | | 1.906 | Continuing | Continuing | - |
| | | **Subtotal** | - | 0.765 | | 9.387 | | 1.906 | | - | | 1.906 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 1.924 | 0.765 | | 9.981 | | 4.189 | | - | | 4.189 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607138A / *Fixed Wing Product Improvement Program* | **Project (Number/Name)**<br>ES5 / *Fixed Wing Product Improvement Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607138A / *Fixed Wing Product Improvement Program* | **Project (Number/Name)**<br>ES5 / *Fixed Wing Product Improvement Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| FW Non-Recurring Engineering | 3 | 2019 | 3 | 2022 |
| Testing Support | 3 | 2019 | 3 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607139A *I Improved Turbine Engine Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 111.638 | 204.304 | 192.637 | - | 192.637 | 246.810 | 240.846 | 315.360 | 250.728 | Continuing | Continuing |
| ES6: *Improved Turbine Engine Program* | - | 111.638 | 204.304 | 192.637 | - | 192.637 | 246.810 | 240.846 | 315.360 | 250.728 | Continuing | Continuing |

**Note**

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to PE 0607139A, Project ES6.

**A. Mission Description and Budget Item Justification**

ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on the Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970's and meets the operational requirement of 6,000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth, without increasing the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, as well as integration into the airframe.

FY 2017 funding continues engine design effort and the platform/engine integration trade studies. FY 2018 funds the remaining TMRR engine design effort, the Engineering and Manufacturing Development (EMD) Source Selection Evaluation Board (SSEB) for entry into Milestone B (MS B), and concludes the platform/engine integration trade studies. In FY 2019, the EMD contract will be awarded to one vendor, and platform/engine integration design engineering will begin. FY 2020 funding continues both the EMD effort and platform/engine integration A-kit development, resulting in a Critical Design Review (CDR) in FY 2020. FY 2021 continues the EMD effort, provides for First Engine To Test (FETT), and begins physical airframe integration. FY 2022 funding will provide Preliminary Flight Rating (PFR) testing, leading to an Air Worthiness Rating (AWR). FY 2023 funding will provide for aircraft flight/qualification testing for both Apache and Black Hawk.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0607139A *I Improved Turbine Engine Program* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 126.105 | 204.304 | 196.074 | - | 196.074 |
| Current President's Budget | 111.638 | 204.304 | 192.637 | - | 192.637 |
| Total Adjustments | -14.467 | 0.000 | -3.437 | - | -3.437 |
| • Congressional General Reductions | -10.056 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -4.411 | - | | | |
| • Other Adjustments 1 | - | - | -3.437 | - | -3.437 |

**Change Summary Explanation**

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to PE 0607139A, Project ES6.

FY 2017 funding was reduced due to a delay in TMRR contract award.

The FY 2019 funding request was reduced by $3.437M to account for the availability of prior year execution balances.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607139A / *Improved Turbine Engine Program* | Project (Number/Name)<br>ES6 / *Improved Turbine Engine Program* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES6: *Improved Turbine Engine Program* | - | 111.638 | 204.304 | 192.637 | - | 192.637 | 246.810 | 240.846 | 315.360 | 250.728 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to PE 0607139A, Project ES6.

**A. Mission Description and Budget Item Justification**

ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on the Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970's and meets the operational requirement of 6000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth, without increasing the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, as well as integration into the airframe.

FY 2017 funding continues engine design effort and the platform/engine integration trade studies. FY 2018 funds the remaining TMRR engine design effort, the Engineering and Manufacturing Development (EMD) Source Selection Evaluation Board (SSEB) for entry into Milestone B (MS B), and concludes the platform/engine integration trade studies. In FY 2019, the EMD contract will be awarded to one vendor, and platform/engine integration design engineering will begin. FY 2020 funding continues both the EMD effort and platform/engine integration A-kit development, resulting in a Critical Design Review (CDR) in FY 2020. FY 2021 continues the EMD effort, provides for First Engine To Test (FETT), and begins physical airframe integration. FY 2022 funding will provide Preliminary Flight Rating (PFR) testing, leading to an Air Worthiness Rating (AWR). FY 2023 funding will provide for aircraft flight/qualification testing for both Apache and Black Hawk.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** ITEP | 111.638 | 204.304 | 192.637 |
| ***Description:*** ITEP - a multi-platform turbine engine development required across existing Army aircraft to fill the capability gaps for Army Aviation Operations | | | |
| ***FY 2018 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607139A / *Improved Turbine Engine Program* | **Project (Number/Name)**<br>ES6 / *Improved Turbine Engine Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Continue Systems Engineering/Program Management activities, provide for final increment of funding of dual vendor competitive TMRR contract awarded in FY16, culminating in a Preliminary Design Review (PDR), continues aircraft platform/engine integration trade studies. Executes EMD SSEB.<br>***FY 2019 Plans:***<br>Down-select to a single vendor, and award an EMD contract to develop, test, and qualify the engine design. Platform/engine integration design engineering will begin.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Down-select to a single vendor results in an engine OEM EMD contract award in FY 2019. | | | |
| **Accomplishments/Planned Programs Subtotals** | 111.638 | 204.304 | 192.637 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

For Fiscal Year (FY) 2014 and prior, all funding for the Improved Turbine Engine Program (ITEP) was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to to PE 0607139A, Project ES6. This is not a New Start.

**D. Acquisition Strategy**

ITEP TMRR contracts were based on Full and Open Competition. Awarded Fixed Price Incentive (Firm Target) contracts in FY 2016 to two vendors for TMRR. Following a successful Milestone B decision, there will be a cost-plus-incentive-fee contract awarded to one vendor for EMD contractual effort.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607139A / *Improved Turbine Engine Program* | Project (Number/Name)<br>ES6 / *Improved Turbine Engine Program* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITEP SEPM - Organic | Allot | Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITE/FVL), Various : Redstone Arsenal, AL | 12.162 | 0.256 | Oct 2016 | 13.267 | Oct 2017 | 10.299 | Oct 2018 | - | | 10.299 | Continuing | Continuing | Continuing |
| ITEP SEPM - Contractor | C/IDIQ | PMO Huntsville, AL Various : PMO Huntsville, AL Various | 4.782 | 0.319 | Oct 2016 | 4.567 | Oct 2017 | 4.664 | Oct 2018 | - | | 4.664 | Continuing | Continuing | Continuing |
| ITEP SEPM - OGA | MIPR | PMO Huntsville, AL Various : PMO Huntsville, AL Various | 9.654 | 1.967 | Oct 2016 | 3.394 | Oct 2017 | 3.465 | Oct 2018 | - | | 3.465 | Continuing | Continuing | Continuing |
| ITEP EMD SSEB | MIPR | PMO Huntsville, AL Various : PMO Huntsville, AL Various | - | - | | 7.744 | Oct 2017 | - | | - | | - | 0.000 | 7.744 | - |
| | | **Subtotal** | 26.598 | 2.542 | | 28.972 | | 18.428 | | - | | 18.428 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITEP Technology Maturation/Risk Reduction (TMRR) Contracts | C/FPIF | General Electric Company (GE), and Advanced Turbine Engine Company (ATEC) : Lynn, MA (GE), and Huntsville, AL (ATEC) | 38.710 | 103.626 | Oct 2016 | 115.907 | Oct 2017 | - | | - | | - | 0.000 | 258.243 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607139A / *Improved Turbine Engine Program* | Project (Number/Name)<br>ES6 / *Improved Turbine Engine Program* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engine OEM EMD Contract | C/FPIF | TBD : TBD | - | - | | - | | 129.903 | Jan 2019 | - | | 129.903 | Continuing | Continuing | - |
| Boeing - ITEP Vehicle Platform Integration Trade Studies Contract | SS/IDIQ | Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL | 9.998 | - | | 11.652 | Oct 2017 | - | | - | | - | 0.000 | 21.650 | - |
| Sikorsky Aircraft - ITEP Vehicle Platform Integration Trade Studies Contract | SS/FPIF | Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL | 18.900 | - | | 4.832 | Oct 2017 | - | | - | | - | 0.000 | 23.732 | - |
| Apache Integration and Qualification Phase I | SS/CPFF | The Boeing Company : Phoenix AZ | - | - | | 29.806 | Oct 2017 | - | | - | | - | 0.000 | 29.806 | - |
| Platform Integration and Qualification Contracts, Phase I | SS/CPIF | Sikorsky Corporation, The Boeing Company : Stratford, CT; Phoenix, AZ | - | - | | - | | 30.012 | Oct 2018 | - | | 30.012 | Continuing | Continuing | - |
| | | **Subtotal** | 67.608 | 103.626 | | 162.197 | | 159.915 | | - | | 159.915 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITEP Engineering Support - Organic | Allot | Program Management Office | 0.164 | 0.149 | Oct 2016 | 0.170 | Oct 2017 | 0.174 | Oct 2018 | - | | 0.174 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607139A / *Improved Turbine Engine Program* | Project (Number/Name)<br>ES6 / *Improved Turbine Engine Program* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL | | | | | | | | | | | | | |
| ITEP Engineering Support - Contractor | C/IDIQ | Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL | 0.781 | 0.654 | Oct 2016 | 3.488 | Oct 2017 | 3.561 | Oct 2018 | - | | 3.561 | Continuing | Continuing | Continuing |
| ITEP Engineering Support - OGA | MIPR | Program Management Office (PMO) Improved Turbine Engine/ Future Vertical Lift (ITEP/FVL), Various : Redstone Arsenal, AL | 3.314 | 4.667 | Oct 2016 | 9.477 | Oct 2017 | 7.046 | Oct 2018 | - | | 7.046 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 4.259 | 5.470 | | 13.135 | | 10.781 | | - | | 10.781 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

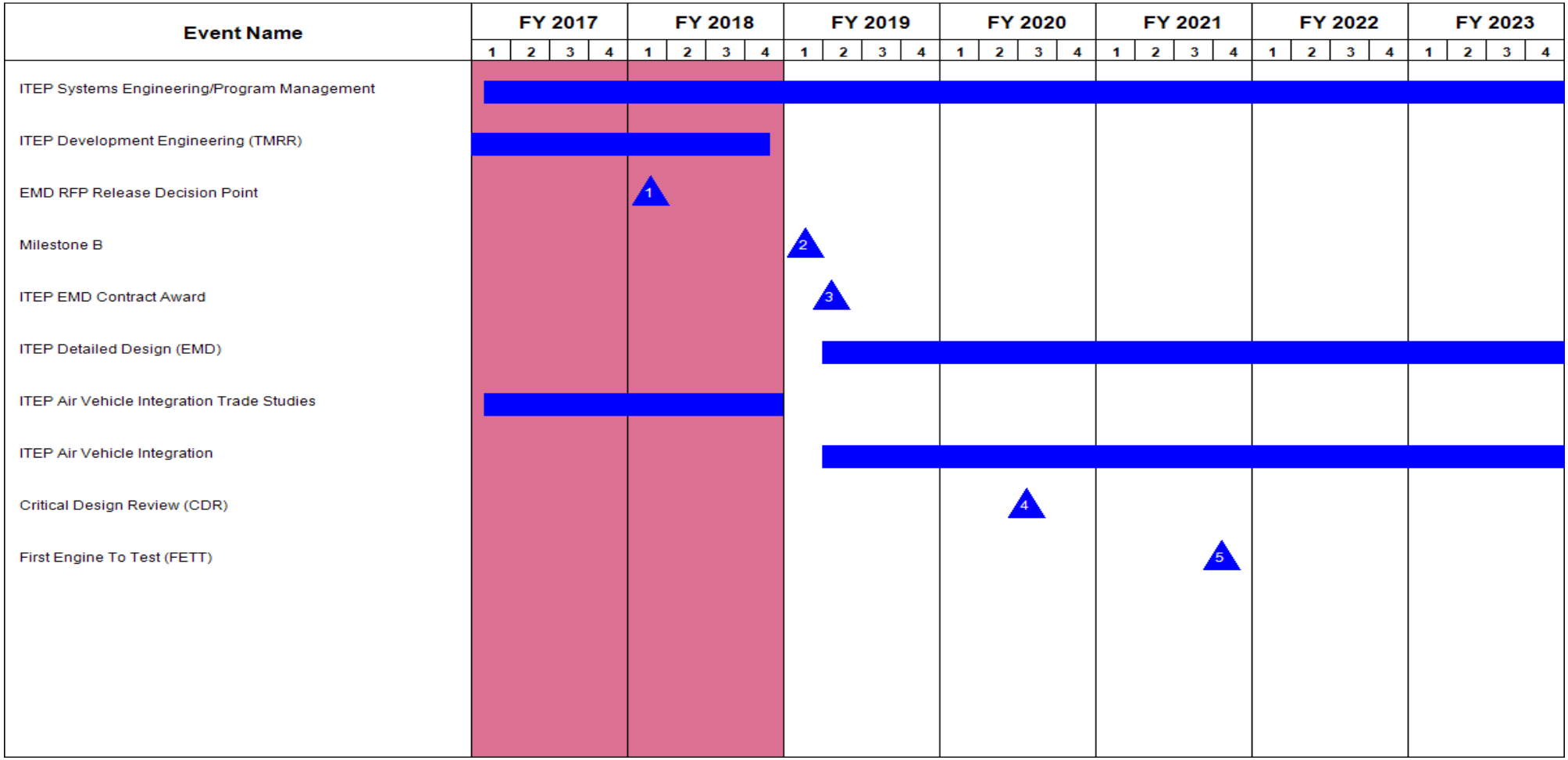
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engine OEM EMD Contract | C/CPIF | TBD : TBD | - | - | | - | | 2.697 | Jan 2019 | - | | 2.697 | 0.000 | 2.697 | Continuing |
| Government Test Planning | SS/TBD | TBD : TBD | - | - | | - | | 0.816 | Oct 2018 | - | | 0.816 | 0.000 | 0.816 | - |
| | | **Subtotal** | - | - | | - | | 3.513 | | - | | 3.513 | 0.000 | 3.513 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607139A / *Improved Turbine Engine Program* | Project (Number/Name)<br>ES6 / *Improved Turbine Engine Program* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 98.465 | 111.638 | | 204.304 | | 192.637 | | - | | 192.637 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607139A / *Improved Turbine Engine Program* | **Project (Number/Name)**<br>ES6 / *Improved Turbine Engine Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607139A / *Improved Turbine Engine Program* | **Project (Number/Name)**<br>ES6 / *Improved Turbine Engine Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| ITEP Systems Engineering/Program Management | 1 | 2015 | 1 | 2026 |
| ITEP Development Engineering (TMRR) | 4 | 2016 | 4 | 2018 |
| EMD RFP Release Decision Point | 1 | 2018 | 1 | 2018 |
| Milestone B | 1 | 2019 | 1 | 2019 |
| ITEP EMD Contract Award | 2 | 2019 | 2 | 2019 |
| ITEP Detailed Design (EMD) | 2 | 2019 | 3 | 2024 |
| ITEP Air Vehicle Integration Trade Studies | 1 | 2015 | 4 | 2018 |
| ITEP Air Vehicle Integration | 2 | 2019 | 2 | 2024 |
| Critical Design Review (CDR) | 3 | 2020 | 3 | 2020 |
| First Engine To Test (FETT) | 4 | 2021 | 4 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607140A / *Emerging Technologies from NIE* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 2.278 | 1.023 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.301 |
| ES7: *Emerging Technologies from NIE* | - | 2.278 | 1.023 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.301 |

**A. Mission Description and Budget Item Justification**

Emerging Technologies from Network Integration Evaluation (NIE) supports the Army's Equipment Modernization Strategy, Army Force Generation (ARFORGEN) cycle and consolidates capabilities to gain efficiencies. These funds provide for an iterative and incremental approach to software development and hardware/software integration as a result of NIEs and Joint Warfighter Assessments (JWA). These funds promote industry's efforts to support the Army's Modernization Plan for Force 2025 and beyond. These funds will facilitate the identification, assessment and acquisition of capability solutions for the Army.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 2.369 | 1.023 | 0.000 | - | 0.000 |
| Current President's Budget | 2.278 | 1.023 | 0.000 | - | 0.000 |
| Total Adjustments | -0.091 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | -0.001 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.090 | - | | | |

**Change Summary Explanation**

FY 2017 funds in the amount of $0.001 million was transferred to support FFRDC.
FY 2017 funds in the amount of $0.09 million was transferred to support SBIR/STTR.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607140A / *Emerging Technologies from NIE* | Project (Number/Name)<br>ES7 / *Emerging Technologies from NIE* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES7: *Emerging Technologies from NIE* | - | 2.278 | 1.023 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.301 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Emerging Technologies from Network Integration Evaluation (NIE) supports the Army's Equipment Modernization Strategy, Army Force Generation (ARFORGEN) cycle and consolidates capabilities to gain efficiencies. These funds provide for an iterative and incremental approach to software development and hardware/software integration as a result of NIEs and Army Warfighting Assessments (AWA). These funds promote industry's efforts to support the Army's Modernization Plan for Force 2025 and beyond. These funds will facilitate the identification, assessment and acquisition of capability solutions for the Army.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Emerging Technologies from NIEs | 2.278 | 1.023 | - |
| ***Description:*** To mature, test, integrate and evaluate traditional and nontraditional small business and industry's technologies.<br><br>***FY 2018 Plans:***<br>Electronic Warfare Phase 1 Requirements (in support of USAREUR ONS ? 16-21509) will complete Ground EW capability with enhanced and networked for Versatile Radio Observation & Direction Finding (VROD) / Modular Adaptive Transmitter (VMAX) and Sabre Fury previously assessed at AWA 17.1.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Based on requirements. | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.278 | 1.023 | - |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

This is the only project within this Program Element.

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607140A / *Emerging Technologies from NIE* | **Project (Number/Name)**<br>ES7 / *Emerging Technologies from NIE* |

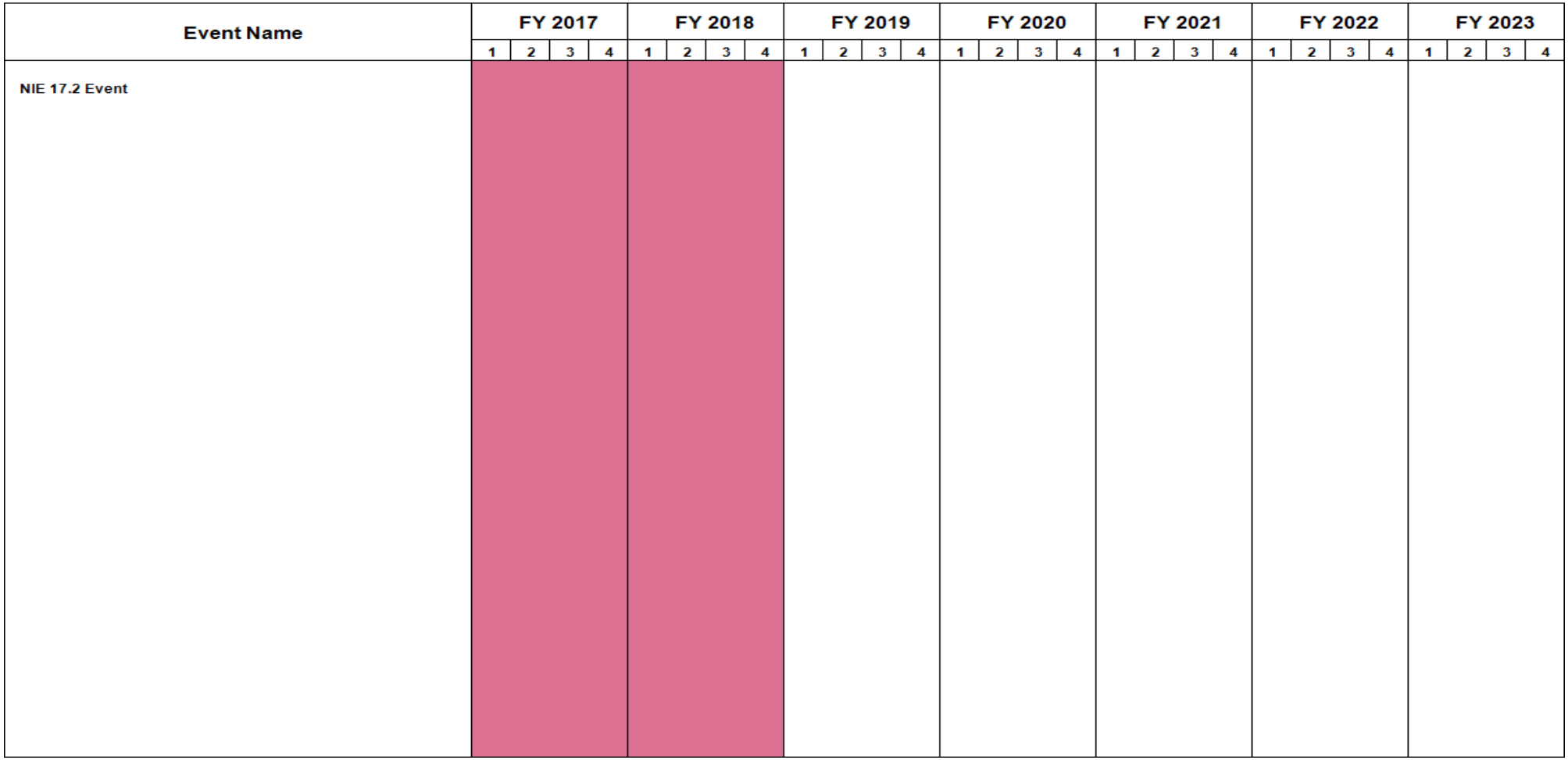
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Emerging Technologies from NIEs | TBD | Various Locations : - | 7.299 | 2.278 | Dec 2016 | 1.023 | | - | | - | | - | 0.000 | 10.600 | - |
| | | **Subtotal** | 7.299 | 2.278 | | 1.023 | | - | | - | | - | 0.000 | 10.600 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 7.299 | 2.278 | | 1.023 | | - | | - | | - | 0.000 | 10.600 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607140A / *Emerging Technologies from NIE* | **Project (Number/Name)**<br>ES7 / *Emerging Technologies from NIE* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607140A / *Emerging Technologies from NIE* | **Project (Number/Name)**<br>ES7 / *Emerging Technologies from NIE* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| NIE 17.2 Event | 4 | 2017 | 4 | 2017 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607141A / *Logistics Automation* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 1.542 | 1.504 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.046 |
| DY1: *Logistics Information Warehouse (LIW)* | - | 1.374 | 1.504 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.878 |
| DY2: *Lead Material Integrator (LMI) (DST)* | - | 0.168 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.168 |

**A. Mission Description and Budget Item Justification**

The Logistics Information Warehouse (LIW) has been designated by the Secretary of the Army as the primary system for the accessing, acquiring, and delivery of materiel data. This includes data from all sources designated as Authoritative, as well as, system derived data and appropriate reference data. This data will be used in support of materiel sourcing and distribution and other Materiel Enterprise missions. It enables Command visibility of business intelligence and resulting metrics for critical logistics components enabling enterprise-level analytics to be performed in support of the equipping mission within the Army's Tiered Readiness processes. LOGSA and its LIW suite of products and services provide the Army community with vital logistics data necessary for the planning, conducting and sustainment of war fighting capability worldwide. The LMI-DST directly supports Tiered Readiness by linking available equipment to the Generated Force model. Specifically, LMI-DST synchronizes an Army authoritative Demand Signal for manning, equipping, services & infrastructure and authoritative resourcing (money) information, resulting in an accurate prediction of a ready and properly equipped force. The Army Financial Liability Investigation of Property Loss Tracker (AFT) tool is a web-based, automated FLIPL processing and tracking system which provides an electronic FLIPL documentation packet that includes intelligent, digital versions of required forms and allows for attachment of supporting documentation.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 4.563 | 1.504 | 0.000 | - | 0.000 |
| Current President's Budget | 1.542 | 1.504 | 0.000 | - | 0.000 |
| Total Adjustments | -3.021 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | -0.001 | - | | | |
| • Congressional Directed Reductions | -2.827 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -0.127 | - | | | |
| • SBIR/STTR Transfer | -0.066 | - | | | |

**Change Summary Explanation**

No FY 2019 funding is requested because this program is entering sustainment.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607141A / *Logistics Automation* | Project (Number/Name)<br>DY1 / *Logistics Information Warehouse (LIW)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DY1: *Logistics Information Warehouse (LIW)* | - | 1.374 | 1.504 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.878 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Logistics Information Warehouse (LIW) is designated as the Army's authoritative materiel data repository. As chartered by the Secretary of The Army, LIW will provide enterprise-accepted and trusted information for analysis, aggregation, and reuse in support of the Lead Materiel Integrator (LMI) mission. As an Army enterprise level repository and retrieval system to facilitate accurate choices and rapid decision making. Specifically, LIW will provide all required data structured in a way that allows for querying and reporting; e.g., equipment authorizations, equipment on-hand, new procurement schedules, RESET production schedules and in transit visibility from origin and distribution to final destination, in support of the information needs of the Army Materiel Command (AMC) and other command logistics managers. This includes data from all sources designated as authoritative, as well as system derived data and appropriate reference data. This data will be used in support of materiel sourcing and distribution and other Materiel Enterprise missions. LIW enables visibility of business intelligence and resulting metrics for critical logistics components enabling enterprise-level analytics to be performed in support of the equipping mission within the Army's Tiered Readiness processes. LIW supports the tenants of Mission Command by logistically empowering the Commander to successfully integrate and synchronize logistics information with warfighter functions in time and space to maximize potential for mission success.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** LIW | 1.374 | 1.504 | - |
| ***Description:*** Execution of tasks to create Army Logistics Repository.<br><br>***FY 2018 Plans:***<br>Funds Logistics Information Warehouse<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>No FY 2019 funding is requested because this program is entering sustainment. | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.374 | 1.504 | - |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Utilize contract services available through LiTES contract vehicle in CHESS.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607141A / *Logistics Automation* | **Project (Number/Name)**<br>DY1 / *Logistics Information Warehouse (LIW)* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607141A / *Logistics Automation* | **Project (Number/Name)**<br>DY1 / *Logistics Information Warehouse (LIW)* |

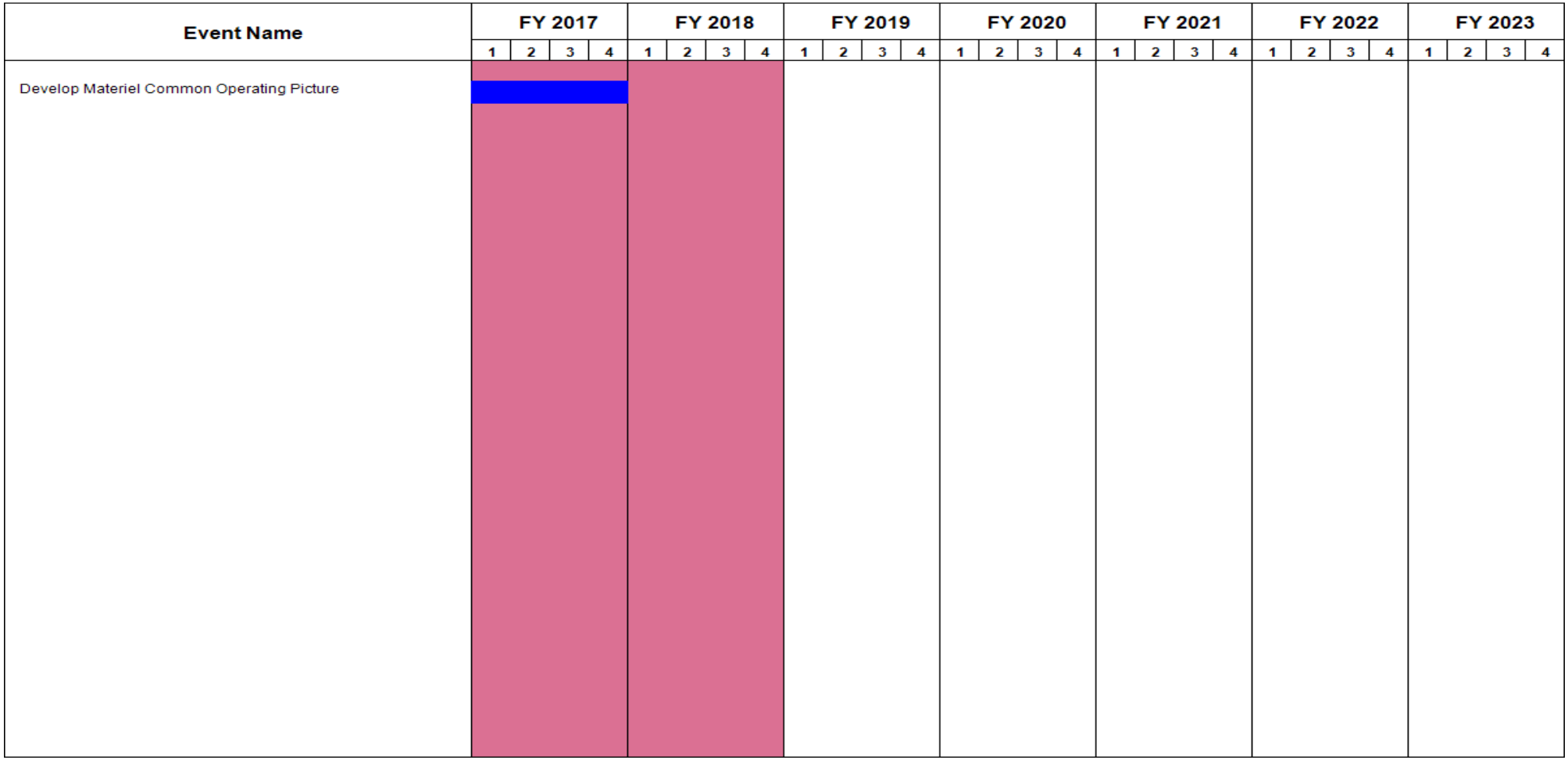
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Priority Group 3 Sprint, continue Best of Breed. Develop Materiel Operating Picture (M-COP) | TBD | IBM Contract - currently under recompete status. : Huntsville, AL | 2.514 | 1.374 | | 1.504 | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 2.514 | 1.374 | | 1.504 | | - | | - | | - | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 2.514 | 1.374 | | 1.504 | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607141A / *Logistics Automation* | **Project (Number/Name)**<br>DY1 / *Logistics Information Warehouse (LIW)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607141A / *Logistics Automation* | **Project (Number/Name)**<br>DY1 / *Logistics Information Warehouse (LIW)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Develop Materiel Common Operating Picture | 4 | 2015 | 4 | 2017 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0607141A / *Logistics Automation* | | | | Project (Number/Name)<br>DY2 / *Lead Material Integrator (LMI) (DST)* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| DY2: *Lead Material Integrator (LMI) (DST)* | - | 0.168 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.168 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Lead Materiel Integrator Decision Support Tool (LMI DST) is a software solution, resident within the Logistics Information Warehouse, that supports the Army Materiel Command in its mission as the Army Lead Materiel Integrator as well as materiel managers at Army Commands, Army Service Component Commands, Direct Reporting Units, Corps and Divisions with making informed equipping decisions. The LMI DST directly supports Army Forces Generation (ARFORGEN) by linking available equipment to the Generated Force model.

Specifically, development will enable the tool to consume and display additional data sources, such as maintenance data from both legacy and Enterprise data sources- a critical capability during the fielding of Global Combat Support System (GCSS)-Army; provide additional modules, including Second Destination Transportation Planning, supporting United States Army Reserve Command and National Guard Bureau requirements to deprecate legacy systems and a Readiness Cost Banding module to implement analysis algorithms to deliver decisions to optimize readiness within Army cost constraints. New development will also enable equippers to redistribute items, based on their level of modernization, limiting transportation costs of moving outdated equipment.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** LMI/DST<br>***Description:*** The Lead Materiel Integrator Decision Support Tool (LMI DST) is a software solution, resident within the Logistics Information Warehouse. | 0.168 | - | - |
| **Accomplishments/Planned Programs Subtotals** | 0.168 | - | - |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The LMI DST is a development effort to meet the Secretary of the Army's intent in designating the Army Materiel Command as the Lead Materiel Integrator and the Logistics Information Warehouse (LIW) as the authoritative repository of Army logistics domain data. The LMI DST integrates logistics domain data from the LIW with materiel demand requirements from the Readiness Enterprise to enable automated decision support for equippers throughout the Army. In August 2011, a sole source contract was awarded to ProModel Corporation to leverage their COTS modeling and simulation capability, the ProModel Application Framework to develop the Lead Materiel Integrator Decision Support Tool, which is a GOTS product. The project utilizes an agile development methodology. Versions 1-4 were released on a six-month

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607141A / *Logistics Automation* | **Project (Number/Name)**<br>DY2 / *Lead Material Integrator (LMI) (DST)* |

cadence between December 2011 and April 2013. LMI DST development and sustainment have been transitioned to LOGSA's Information and Technology Services Contract. Requirements for additional development were collected from Army Commands and vetted through a General Officer Steering Committee, chaired by Army Materiel Command. RDTE funding supports future major version releases.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607141A / *Logistics Automation* | Project (Number/Name)<br>DY2 / *Lead Material Integrator (LMI) (DST)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development of LMI DST | C/T&M | IBM IT CONTRACT : Huntsville, AL | 5.909 | - | | - | | - | | - | | - | 0.000 | 5.909 | - |
| | | **Subtotal** | 5.909 | - | | - | | - | | - | | - | 0.000 | 5.909 | N/A |

**Remarks**

Current LOGSA RDTE missions are complete.

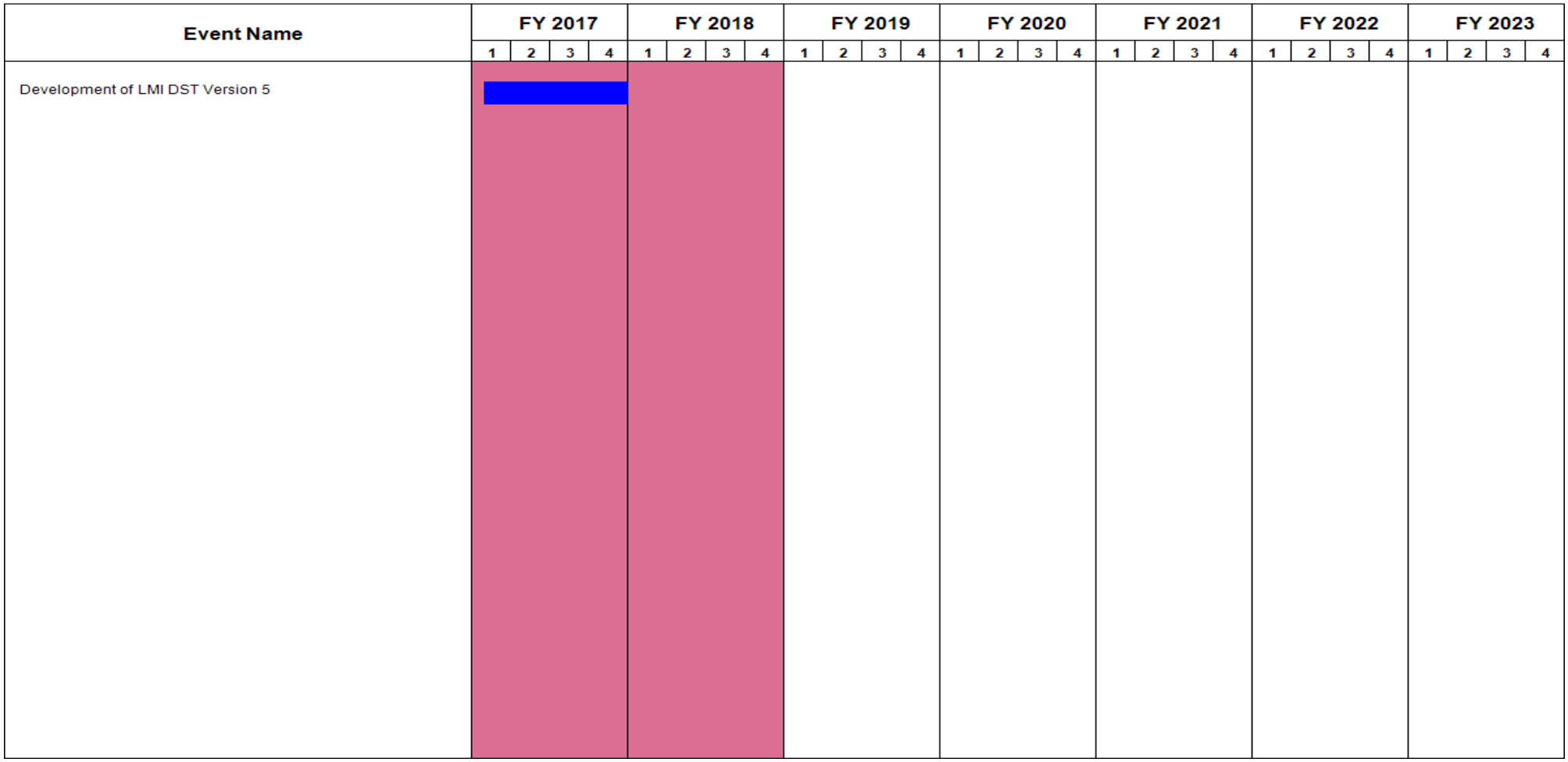
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development of LMI DST Version 5 | C/T&M | IBM IT CONTRACT SERVICES : Huntsville, AL | 5.909 | 0.168 | | - | | - | | - | | - | 0.000 | 6.077 | - |
| | | **Subtotal** | 5.909 | 0.168 | | - | | - | | - | | - | 0.000 | 6.077 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 11.818 | 0.168 | | 0.000 | | - | | - | | - | 0.000 | 11.986 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607141A / *Logistics Automation* | **Project (Number/Name)**<br>DY2 / *Lead Material Integrator (LMI) (DST)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607141A / *Logistics Automation* | **Project (Number/Name)**<br>DY2 / *Lead Material Integrator (LMI) (DST)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Development of LMI DST Version 5 | 1 | 2017 | 4 | 2017 |

**Note**

LOGSA currently does not have an approved problem statement for RDTE. Due to mandatory DISA migration, RDTE missions are completed.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | - | 0.000 | 10.064 | 60.860 | - | 60.860 | 24.221 | 17.171 | 13.608 | 11.066 | Continuing | Continuing |
| EW9: *Aviation Rocket System Product Improvement and Dev* | - | 0.000 | 10.064 | 60.860 | - | 60.860 | 24.221 | 17.171 | 13.608 | 11.066 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Aviation Rockets Product Improvement and Development line funds the development, integration and test of munitions and their interface to launcher and platforms to meet user requirements. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 Inch rocket and launcher system to include improvements to performance, safety, reliability, transportability, producibility, affordability and Insensitive Munitions (IM) compliance. The current Hydra-70 2.75 inch rocket system is more than 50 years old and is in need of performance improvements to comply with 1) USC - Title 10, Chapter 141, Section 2389, 2) DoD Directive 5000.1, CJCS Instruction 3170.01C, USD (AT&L) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to IM Requirements", and 3) validated Lightweight Precision Munition (LPM) Operational Needs Statement ONS 16-21556 and 4) existing/emerging HQDA G-3/5/7 and TRADOC aviation weapon requirements for guided and unguided rocket systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced war fighter workload, and reduced environmental impact for both manned and unmanned applications.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 8.000 | 10.064 | 26.103 | - | 26.103 |
| Current President's Budget | 0.000 | 10.064 | 60.860 | - | 60.860 |
| Total Adjustments | -8.000 | 0.000 | 34.757 | - | 34.757 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 34.757 | - | 34.757 |
| • RAA not Appropriated | -8.000 | - | - | - | - |

**Change Summary Explanation**

Additional funding is required to support technical assessments, concept studies, perform risk reduction, technology maturation, demonstration, engineering design, engineering / manufacturing development, test, integration and document preparation for Army Aviation manned and unmanned platforms.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | Project (Number/Name)<br>EW9 / *Aviation Rocket System Product Improvement and Dev* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EW9: *Aviation Rocket System Product Improvement and Dev* | - | 0.000 | 10.064 | 60.860 | - | 60.860 | 24.221 | 17.171 | 13.608 | 11.066 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Aviation Rockets Product Improvement and Development line funds the development, integration and test of munitions and their interface to launcher and platforms to meet user requirements. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 Inch rocket and launcher system to include improvements to performance, safety, reliability, transportability, producibility, affordability and Insensitive Munitions (IM) compliance. The current Hydra-70 2.75 inch rocket system is more than 50 years old and is in need of performance improvements to comply with 1) USC - Title 10, Chapter 141, Section 2389, 2) DoD Directive 5000.1, CJCS Instruction 3170.01C, USD (AT&L) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to IM Requirements", 3) validated Lightweight Precision Munition (LPM) Operational Needs Statement ONS 16-21556, and 4) existing/emerging HQDA G-3/5/7 and TRADOC aviation weapon requirements for guided and unguided rocket systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced war fighter workload, and reduced environmental impact for both manned and unmanned applications.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Advanced Precision Kill Weapon System (APKWS) | - | 3.536 | 2.064 | - | 2.064 |
| ***Description:*** These funds will be used to optimize APKWS integration on the Apache and for activities required to obtain an Army Full Materiel Release (FMR) for APKWS II. This effort includes design and build of all-up-round (AUR) containers and test assets, conduct environmental qualification testing, perform ground firings, update aviation platform software, support Apache weapon survey firings, provide technical support to platform integration and testing, and development and revision of training/maintenance materiel. | | | | | |
| ***FY 2018 Plans:***<br>Begin FMR efforts and analysis needed to optimize fire control integration on the AH-64 for guided variants. | | | | | |
| ***FY 2019 Base Plans:***<br>Complete FMR efforts and analysis needed to optimize fire control integration on the AH-64 for guided variants. Continue APKWS IM AUR container. | | | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Decrease due to effort completion of FMR and containers activities. | | | | | |
| ***Title:*** Modernized Rocket Launcher Increment 1<br>***Description:*** This effort will provide the interface with aircraft and emerging munitions utilizing non-proprietary, open systems architecture allowing easy compatibility when integrating with aircrafts. This inherent flexibility of an open architecture serves as a building block for future weapons systems.<br>***FY 2018 Plans:***<br>Design and development of the HYLEA software and hardware efforts.<br>***FY 2019 Base Plans:***<br>Perform technical performance assessments, concept studies, and prepare documentation in effort to merge Modernized Rocket Launcher (MRL) and Smart Digital Interface (SDI) efforts into a single, universal capability.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase due to merging of Modernized Rocket Launcher (MRL) and Smart Digital Interface (SDI) into single, integrated capability. | - | 2.930 | 9.176 | - | 9.176 |
| ***Title:*** Insensitive Munitions (IM) Compliance<br>***Description:*** Incorporation of IM-compliant explosives and design features into the Hydra-70 Rocket System to make system less sensitive.<br>***FY 2018 Plans:***<br>1. Continue efforts to qualify the XM283 Warhead / XM1165 Fuze for fielding in place of the M151, achieving warhead compliance with Fast Cook Off, Slow Cook Off, and Bullet Impact IM requirements.<br>2. Continue efforts to begin transition of demonstrated venting technology to production MK66 motor and associated containers to achieve compliance with Fast Cook Off and Slow Cook Off IM requirements.<br>***FY 2019 Base Plans:***<br>1. Continue qualification of the XM283 Warhead / XM1165 Fuze for fielding in place of the M151 warhead, achieving warhead compliance with Fast Cook Off, Slow Cook Off, and Bullet Impact IM requirements to comply with 1) USC - Title 10, Chapter 141, Section 2389, and 2) DoD Directive 5000.1, CJCS Instruction 3170.01C, USD (AT&L) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to IM Requirements.<br>2. Complete transition of demonstrated venting technology to production MK66 motor and associated containers to achieve compliance with Fast Cook Off and Slow Cook Off IM requirements to comply with 1) USC - Title | - | 2.000 | 6.042 | - | 6.042 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| 10, Chapter 141, Section 2389, and 2) DoD Directive 5000.1, CJCS Instruction 3170.01C, USD (AT&L) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to IM Requirements."<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase due to delay start of efforts in FY2018 due to new start. | | | | | |
| ***Title:*** Smart Digital Interface<br>***Description:*** The Smart Digital Interface program is an effort to support the future smart, two-way digital communications capability to be included in the fully capable Integrated Munitions Launcher (IML). This effort will evaluate launcher-to-munition physical interfaces for the fully capable smart munition and launcher system to reduce both programmatic and technical risk, as well as to inform requirements for a government owned, non-proprietary physical interface definition.<br>***FY 2018 Plans:***<br>Complete the program phase 1 physical interface candidate evaluation, interface asset availability determination, and interface concept selection. Begin the phase 2 test asset development/procurement and testing.<br>***FY 2019 Base Plans:***<br>Continue phase 2 test asset development/procurement and testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase due to merging of MRL and SDI into single, integrated capability | - | 1.598 | 4.941 | - | 4.941 |
| ***Title:*** Army aviation weapons<br>***Description:*** These funds will be used for Army Aviation modular weapon systems and their interface to launchers and platforms. This effort will include technical assessments, concept studies, perform risk reduction efforts, technology maturation, demonstration, engineering design, engineering / manufacturing development, test, integration and document preparation for Army Aviation manned and unmanned platforms.<br>***FY 2019 Base Plans:***<br>1. Perform technical assessments, concept studies, perform risk reduction efforts and prepare appropriate documentation for emerging Army Aviation Weapons, Sub-systems and Munitions (AAWSM) Initial Capability Document requirements. | - | - | 38.637 | - | 38.637 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| 2. Begin Lightweight Precision Munition (LPM) technology maturity and risk reduction efforts with industry to include fabrication of munition/launch system prototypes, evaluate mature existing systems to meet validated ONS 16-21556, integration and test efforts on the MQ-1C Gray Eagle.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>This is a new start. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 10.064 | 60.860 | - | 60.860 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • E37300: *Rockets Hydra, All Types* | 144.794 | 236.975 | 211.211 | 39.974 | 251.185 | 74.536 | 73.527 | 78.906 | 129.758 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The Acquisition Strategy is to utilize in-house expertise, Other Government Agencies and defense industry capabilities. The strategy allows for the Government to have the ability to support urgent operational needs and to support unanticipated incidents, which require immediate and expert attention. Each product will have an individual strategy developed in a timely manner. This strategy will allow for the Government to maintain the capability of the Hydra-70 all-up-round rocket, its variants, Small Guided Munitions and posture for emerging requirements.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | Project (Number/Name)<br>EW9 / *Aviation Rocket System Product Improvement and Dev* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System Engineering/ Project Management | SS/ Various | Various : Performers | - | - | | 0.507 | Mar 2018 | 3.874 | Oct 2018 | - | | 3.874 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 0.507 | | 3.874 | | - | | 3.874 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Advanced Precision Kill Weapon System (APKWS) | MIPR | AMRDEC : Redstone Arsenal, AL | - | - | | 2.944 | Mar 2018 | 1.156 | Nov 2018 | - | | 1.156 | Continuing | Continuing | - |
| Modernized Rocket Launcher Increment 1 | MIPR | AMRDEC : Redstone Arsenal, AL | - | - | | 2.197 | Mar 2018 | 9.176 | Nov 2018 | - | | 9.176 | Continuing | Continuing | - |
| Insensitive Munitions (IM) Compliance | SS/CPFF | GDOTS : Wilmington, VT | - | - | | 1.710 | Mar 2018 | 4.306 | Dec 2018 | - | | 4.306 | Continuing | Continuing | - |
| Smart Digital Interface | MIPR | AMRDEC : Redstone Arsenal, AL | - | - | | 0.500 | Mar 2018 | 4.941 | Dec 2018 | - | | 4.941 | Continuing | Continuing | - |
| Army aviation weapons | MIPR | Various : Various Performers | - | - | | - | | 21.207 | Jan 2019 | - | | 21.207 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 7.351 | | 40.786 | | - | | 40.786 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Research Studies | MIPR | AMRDEC : Redstone Arsenal, AL | - | - | | 0.415 | Mar 2018 | 14.467 | Dec 2018 | - | | 14.467 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 0.415 | | 14.467 | | - | | 14.467 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | Project (Number/Name)<br>EW9 / *Aviation Rocket System Product Improvement and Dev* | |

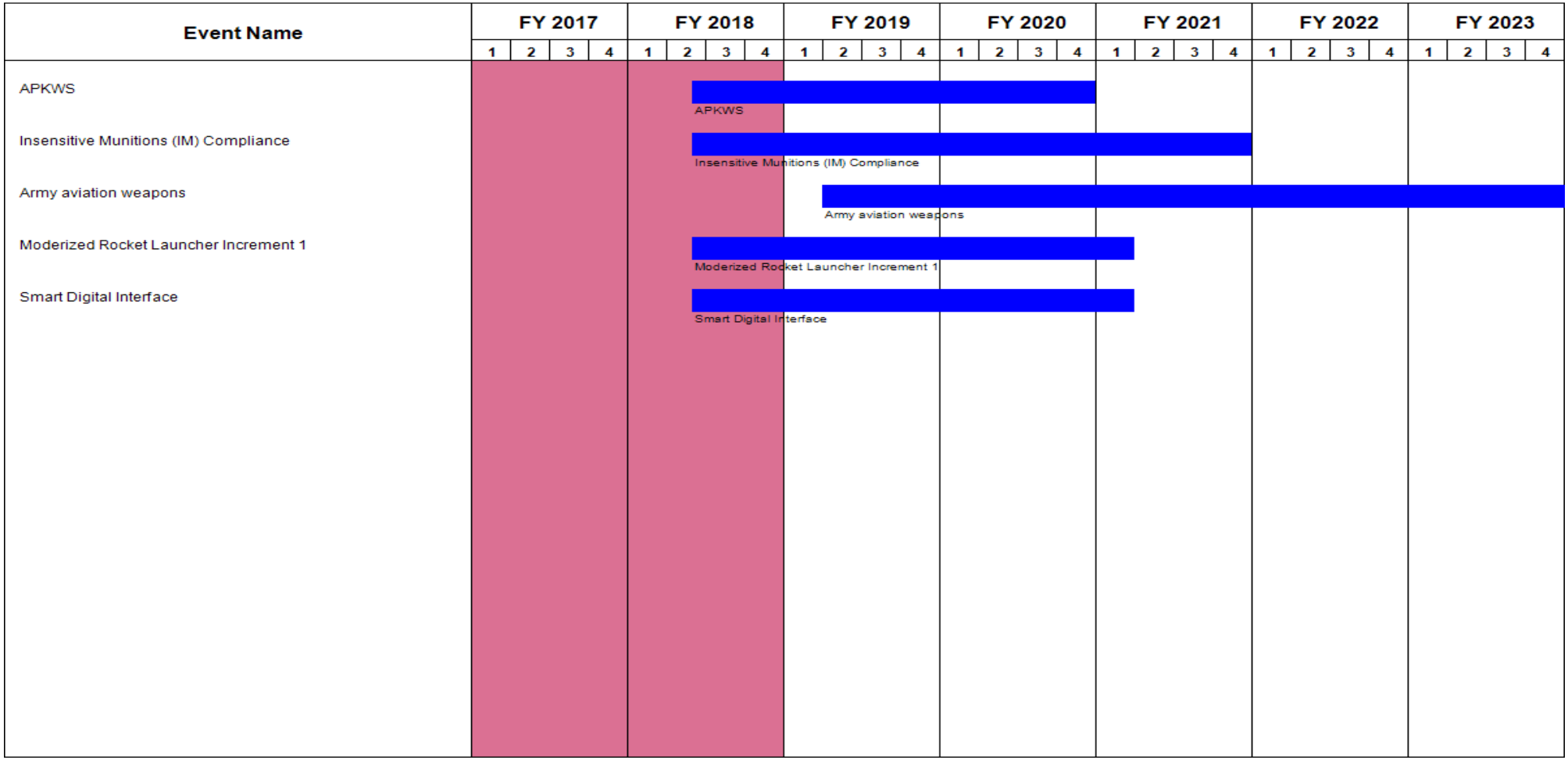
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Confidence Testing | C/Various | TBD : TBD | - | - | | 1.791 | Mar 2018 | 1.733 | Dec 2018 | - | | 1.733 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 1.791 | | 1.733 | | - | | 1.733 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 10.064 | | 60.860 | | - | | 60.860 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607142A / *Aviation Rocket System Product Improvement & Dev* | **Project (Number/Name)**<br>EW9 / *Aviation Rocket System Product Improvement and Dev* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| APKWS | 2 | 2018 | 4 | 2020 |
| Insensitive Munitions (IM) Compliance | 2 | 2018 | 4 | 2021 |
| Army aviation weapons | 2 | 2019 | 4 | 2028 |
| Moderized Rocket Launcher Increment 1 | 2 | 2018 | 1 | 2021 |
| Smart Digital Interface | 2 | 2018 | 1 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | | Date: February 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607143A *I Unmanned Aircraft System Universal Products* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.000 | 38.463 | 52.019 | - | 52.019 | 6.716 | 5.585 | 3.512 | 1.241 | 0.000 | 107.536 |
| EX1: *Unmanned Aircraft Systems Universal Products* | - | 0.000 | 38.463 | 52.019 | - | 52.019 | 6.716 | 5.585 | 3.512 | 1.241 | 0.000 | 107.536 |

**A. Mission Description and Budget Item Justification**

The Universal Products consist of the Universal Ground Control Station (UGCS), the Universal Ground Data Terminal (UGDT) and the Universal Mission Simulator (UMS), to support the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record. The Universal Products will be capable of flight and payload control of multiple types of Unmanned Aircraft Systems (UAS). Protected in a climate-controlled, standard S-280 or S-788 U.S. Army shelter and mounted on either a standard Army FMTV or HMMWV, the UGCS receives and disseminates battlefield video and situational awareness data through state-of-the-art operator consoles. Consoles can be used to provide aircraft command and control, payload control and weapons launch.

The UGDT provides a Line of Sight (LOS) capability for transmit and receipt of UAS command and control, and UAS payload product. The UGDT is the common datalink system for U. S. Army UAS.

The Universal Mission Simulator (UMS) consists of the hardware and software required to fully train UAS operators to full Readiness Level (RL) 1. The UMS will be capable of training and simulating flight and payload control of multiple types of unmanned aircraft systems and features Directorate of Simulation (DOS) accredited Shadow software and Gray Eagle software.

Justification: FY2019 Universal Product Base funding of $52.019 Million will be used for continuing the development of modifications needed to address UGCS obsolescence, maintain interoperability, increase commonality for the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record, including System Engineering, Logistics, and Program Management.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 0607143A / *Unmanned Aircraft System Universal Products* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 0.000 | 38.463 | 25.794 | - | 25.794 |
| Current President's Budget | 0.000 | 38.463 | 52.019 | - | 52.019 |
| Total Adjustments | 0.000 | 0.000 | 26.225 | - | 26.225 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 26.225 | - | 26.225 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607143A / *Unmanned Aircraft System Universal Products* | Project (Number/Name)<br>EX1 / *Unmanned Aircraft Systems Universal Products* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EX1: *Unmanned Aircraft Systems Universal Products* | - | 0.000 | 38.463 | 52.019 | - | 52.019 | 6.716 | 5.585 | 3.512 | 1.241 | 0.000 | 107.536 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Universal Products consist of the Universal Ground Control Station (UGCS), the Universal Ground Data Terminal (UGDT) and the Universal Mission Simulator (UMS), to support the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record. The Universal Products will be capable of flight and payload control of multiple types of Unmanned Aircraft Systems (UAS). Protected in a climate-controlled, standard S-280 or S-788 U.S. Army shelter and mounted on either a standard Army FMTV or HMMWV, the UGCS receives and disseminates battlefield video and situational awareness data through state-of-the-art operator consoles. Consoles can be used to provide aircraft command and control, payload control and weapons launch.

The UGDT provides a Line of Sight (LOS) capability for transmit and receipt of UAS command and control, and UAS payload product. The UGDT is the common datalink system for U. S. Army UAS.

The Universal Mission Simulator (UMS) consists of the hardware and software required to fully train UAS operators to full Readiness Level (RL) 1. The UMS will be capable of training and simulating flight and payload control of multiple types of unmanned aircraft systems and features Directorate of Simulation (DOS) accredited Shadow software and Gray Eagle software.

Justification:
FY2019 Universal Product Base funding of $52.019 Million will be used for continuing the development of modifications needed to address UGCS obsolescence, maintain interoperability, increase commonality for the Gray Eagle (MQ-1C) and Shadow (RQ-7) Programs of Record, including System Engineering, Logistics, and Program Management.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Universal Products (UGCS and UGDT) Improvements | - | 33.009 | 47.244 |
| ***Description:*** Universal Product Improvements are with respect to the Universal Ground Control Station (UGCS) and the Universal Ground Data Terminal (UGDT), which are used to operate the Gray Eagle (MQ-1C) and Shadow (RQ-7) Unmanned Aircraft Systems (UAS). | | | |
| ***FY 2018 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607143A / *Unmanned Aircraft System Universal Products* | **Project (Number/Name)**<br>EX1 / *Unmanned Aircraft Systems Universal Products* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Funding supports the Development of Universal Products Improvements to include: Hardware, Software and documentation to ensure a supportable UGCS and UGDT that is interoperable and increases commonality. The UGCS and UGDT will be used across Army UAS.<br>***FY 2019 Plans:***<br>Funding continues to support Development of Universal Products Improvements to include: Hardware, Software and documentation to ensure a supportable UGCS and UGDT that is interoperable and increases commonality. The UGCS and UGDT will be used across Army UAS.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding increased from $25.794 Million to $52.019 Million in FY2019 in order to support the Developmental of Universal Products. | | | |
| ***Title:*** Training Device Improvements<br>***Description:*** Training Device Improvements are with respect to the Universal Mission Simulator (UMS), which is used for training and simulating flight and payload control of multiple types of Unmanned Aircraft Systems (UAS).<br>***FY 2018 Plans:***<br>Funding supports development and integration of hardware, software and documentation to support updated training capabilities utilizing the UMS and UGCS.<br>***FY 2019 Plans:***<br>Funding supports increased training capability of Unmanned Aircraft Systems to support Manned Unmanned Training (MUMT), Live/Virtual and Constructive Integrated Architecture (LVC-IA), and other PEO Aviation training devices.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding decreased due to economic adjustments. | - | 5.454 | 4.775 |
| **Accomplishments/Planned Programs Subtotals** | - | 38.463 | 52.019 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The Universal Products began full rate production as a part of the MQ-1C and RQ-7 programs of record (both ACAT 1C) after Milestone III/C decisions were reached for both programs. Continued development of the Universal Products will be accomplished through a series of modifications and retrofits. Individual development/ integration efforts will be based on competitive awards. Expected to award in May 2018 timeframe and will result in a Cost Plus Fixed Fee contracts.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607143A / *Unmanned Aircraft System Universal Products* | **Project (Number/Name)**<br>EX1 / *Unmanned Aircraft Systems Universal Products* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607143A / *Unmanned Aircraft System Universal Products* | Project (Number/Name)<br>EX1 / *Unmanned Aircraft Systems Universal Products* | |

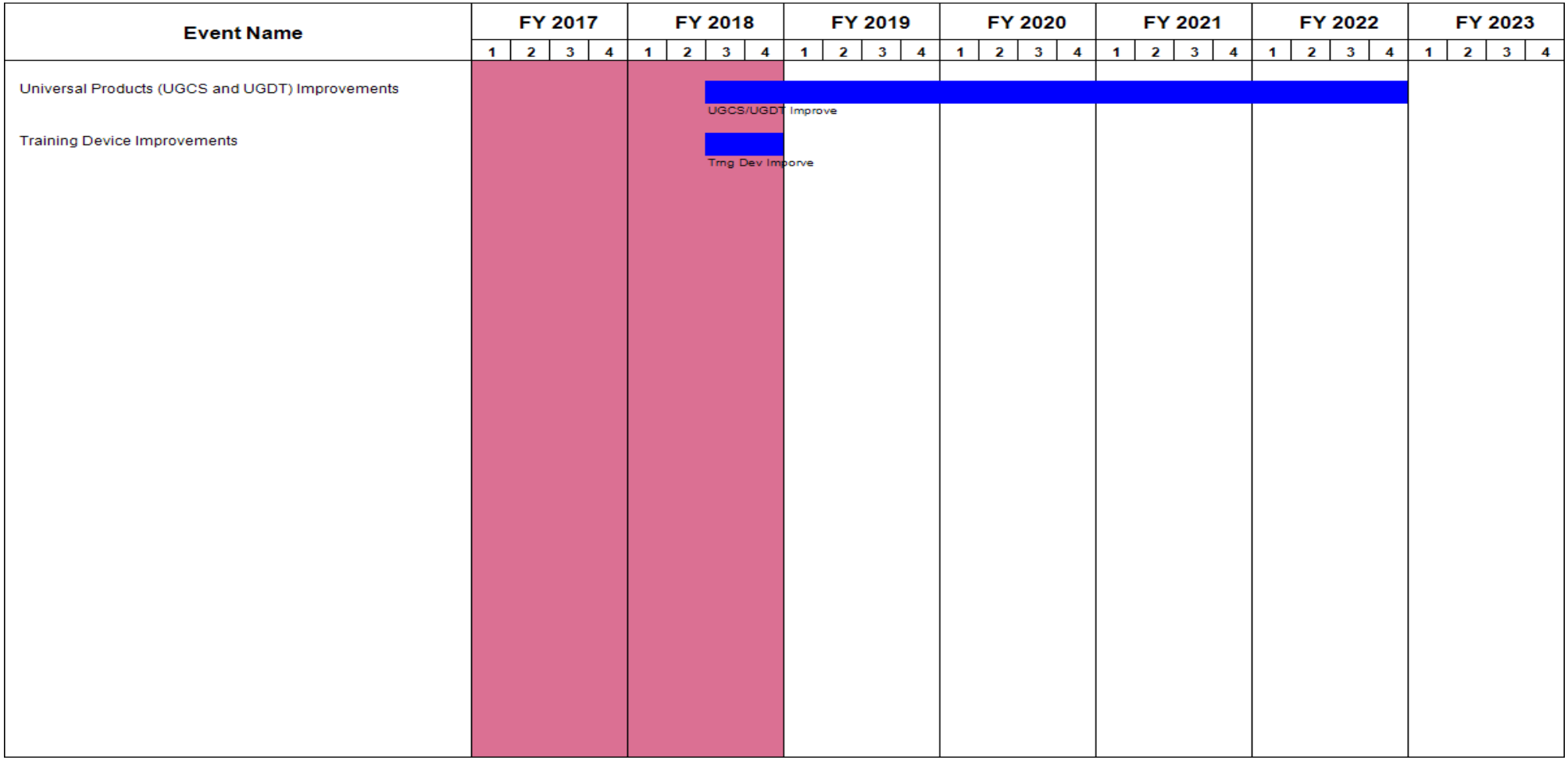
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Universal Products (UGCS and UGDT) Improvements | C/CPFF | TBD : TBD | - | - | | 33.009 | | 47.244 | | - | | 47.244 | 0.000 | 80.253 | - |
| Training Device Improvements | C/CPFF | TBD : TBD | - | - | | 5.454 | | 4.775 | | - | | 4.775 | 0.000 | 10.229 | - |
| | | **Subtotal** | - | - | | 38.463 | | 52.019 | | - | | 52.019 | 0.000 | 90.482 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 38.463 | | 52.019 | | - | | 52.019 | 0.000 | 90.482 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607143A / *Unmanned Aircraft System Universal Products* | **Project (Number/Name)**<br>EX1 / *Unmanned Aircraft Systems Universal Products* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607143A / *Unmanned Aircraft System Universal Products* | **Project (Number/Name)**<br>EX1 / *Unmanned Aircraft Systems Universal Products* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Universal Products (UGCS and UGDT) Improvements | 3 | 2018 | 4 | 2022 |
| Training Device Improvements | 3 | 2018 | 4 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607665A / *Family of Biometrics* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 11.632 | 6.159 | 2.400 | - | 2.400 | 1.421 | 1.325 | 1.193 | 1.209 | 0.000 | 25.339 |
| DT2: *Non-MIP Biometrics* | - | 10.431 | 5.500 | 0.989 | - | 0.989 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 16.920 |
| DU2: *Management Agency* | - | 1.201 | 0.659 | 1.411 | - | 1.411 | 1.421 | 1.325 | 1.193 | 1.209 | 0.000 | 8.419 |

**A. Mission Description and Budget Item Justification**

The Biometrics Enabling Capability (BEC) product office has full life-cycle management responsibility of the DoD authoritative biometrics enterprise repository system, known as DoD Automated Biometrics Identification System (DoD ABIS). BEC Increment 0 is comprised of the current version (v1.2) of DoD ABIS and the Service Life Extension Program (SLEP) which is DoD ABIS v1.3. DoD ABIS supports identity superiority capabilities for Warfighters to identify known or suspected terrorists and third country nationals in the course of military operations. DoD ABIS provides matching, sharing, and storing of biometrics data. The capability can receive multi-modal biometrics submissions to include iris, face, palm, and finger prints from biometrics collection devices, which will support the Warfighter in making retain, capture, or release decisions. DoD ABIS has a direct impact on the availability of critical intelligence information that is of vital interest to DoD and other government agencies, including Department of Justice (DoJ), Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), and Department of State (DoS).

The Defense Forensics and Biometrics Agency (DFBA) is the Executive Agent for DoD Biometrics and the proponent to establish and maintain Research, Development, Test & Evaluation (RDTE) and information management support throughout the Armed Services and DoD. DFBA leads and facilitates in the development of improvements, and implementation of efficiencies to developed and deployed biometric technologies for Combatant Commands (CCMDs), Services, DoD, and Agencies; facilitates transition of capabilities that contribute to the enhancement of the biometric community; increases Joint Service interoperability; and empowers the warfighter by improving operational effectiveness on the battlefield. The DFBA strategy pursues technology opportunities through scientific discovery and makes investments responsive to specific requirements identified by combat developers.

Justification:

FY 2019 RDT&E funding in the amount of $989 Thousand (DT2: Non-MIP Biometrics) supports developmental testing and limited user testing for the SLEP (DoD ABIS v 1.3)
FY 2019 funding in the amount of $1.411 million for Project DU2 will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. DFBA conducts biometric activities (e.g. standards conformance and interoperability assessments), support to DoD acquisition organizations, and provision of subject matter expertise to DoD and non-DoD government stakeholders.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0607665A *I Family of Biometrics* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 12.098 | 6.159 | 1.426 | - | 1.426 |
| Current President's Budget | 11.632 | 6.159 | 2.400 | - | 2.400 |
| Total Adjustments | -0.466 | 0.000 | 0.974 | - | 0.974 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | -0.460 | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | -0.006 | - | 0.974 | - | 0.974 |

**Change Summary Explanation**

Net increase of FY19 BASE RDT&E by $0.974 million from that reflected in the FY18 PB submission is to support developmental testing and limited user testing of DoD ABIS V1.3.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607665A / *Family of Biometrics* | Project (Number/Name)<br>DT2 / *Non-MIP Biometrics* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT2: *Non-MIP Biometrics* | - | 10.431 | 5.500 | 0.989 | - | 0.989 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 16.920 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Biometrics Enabling Capability (BEC) product office has full life-cycle management responsibility of the DoD authoritative biometrics enterprise repository system, known as DoD Automated Biometrics Identification System (DoD ABIS). BEC Increment 0 is comprised of the current version (v1.2) of DoD ABIS and the Service Life Extension Program (SLEP) which is DoD ABIS v1.3. DoD ABIS supports identity superiority capabilities for Warfighters to identify known or suspected terrorists and third country nationals in the course of military operations. DoD ABIS provides matching, sharing, and storing of biometrics data. The capability can receive multi-modal biometrics submissions to include iris, face, palm, and finger prints from biometrics collection devices, which will support the Warfighter in making retain, capture, or release decisions. DoD ABIS has a direct impact on the availability of critical intelligence information that is of vital interest to DoD and other government agencies, including Department of Justice (DoJ), Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), and Department of State (DoS).

Justification:

FY 2019 RDT&E funding in the amount of $989 Thousand (DT2: Non-MIP Biometrics) supports developmental testing and limited user testing for the SLEP (DoD ABIS v 1.3)

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** DoD ABIS (BEC 0) | 10.431 | 5.500 | 0.989 |
| ***Description:*** Funding in FY18 and prior supports development and testing activities for the DoD ABIS (BEC Increment 0).<br><br>***FY 2018 Plans:***<br>Supports development and testing activities for the DoD Automated Biometric Identification System (ABIS) (BEC Increment 0). BEC Increment 0 is comprised of the current version (v1.2) of DoD ABIS and the Service Life Extension Program (SLEP) which is DoD ABIS v1.3. Funding supports the continuation of the SLEP of the DoD (ABIS), including a required update to the Search core, transaction manager, and the authoritative repository, as well as improved / enhanced interoperability with FBI, Department of Homeland Security, and other government entities.<br><br>***FY 2019 Plans:***<br>FY 2019 RDT&E funding in the amount of $989 Thousand (DT2: Non-MIP Biometrics) supports developmental testing and limited user testing for the SLEP (DoD ABIS v 1.3)<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607665A / *Family of Biometrics* | **Project (Number/Name)**<br>DT2 / *Non-MIP Biometrics* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Decrease from FY18 to FY19 is due to the migration from development to testing for the Service Life Extension for DoD ABIS | | | |
| **Accomplishments/Planned Programs Subtotals** | 10.431 | 5.500 | 0.989 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BA1300: *FAMILY OF BIOMETRICS* | 2.978 | - | 8.319 | - | 8.319 | 0.281 | 1.447 | 1.240 | 1.252 | 0.000 | 15.517 |

**Remarks**

**D. Acquisition Strategy**

The Army conducted a fair opportunity competition in FY17 to competitively select the contractor to continue to sustain the system and perform the Service Life Extension Project (SLEP) (DoD ABIS v1.3) Development and Deployment. The resulting contract for DoD ABIS Sustainment Services and SLEP was awarded on June 30, 2017. This upgrade is extremely critical in order to replace end of life hardware and software components, including Commercial Off the Shelf products whose versions currently included in DoD ABIS v1.2 are no longer supported. The SLEP (v1.3) will extend the service life of the current capability through FY22 and transition to sustainment and will improve interoperability with other government entities such as the FBI, DHS, and Department of Justice. The Army is currently staffing an Information System-Capability Development Document (IS-CDD) for BEC Increment 1 that will continue to improve upon the DoD ABIS.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607665A / *Family of Biometrics* | Project (Number/Name)<br>DT2 / *Non-MIP Biometrics* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development | C/CPFF | Various : various | 87.351 | - | | - | | - | | - | | - | 0.000 | 87.351 | - |
| Service Life Extension | Option/ Various | Various : Various | 5.772 | 10.431 | Jun 2017 | 5.500 | | 0.839 | Jun 2019 | - | | 0.839 | 0.000 | 22.542 | - |
| | | **Subtotal** | 93.123 | 10.431 | | 5.500 | | 0.839 | | - | | 0.839 | 0.000 | 109.893 | N/A |

**Remarks**

FY 2018, $150K will cover the cost of Test & Evaluation (T&E) and $839K will cover the developmental testing (DT).

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM Civilian Personnel | TBD | Alexandria : Virginia | 3.358 | - | | - | | - | | - | | - | 0.000 | 3.358 | - |
| Other Support Costs (Facility Related Expenses) | TBD | Alexandria : Virginia | 0.794 | - | | - | | - | | - | | - | 0.000 | 0.794 | - |
| | | **Subtotal** | 4.152 | - | | - | | - | | - | | - | 0.000 | 4.152 | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Evaluation (System Testing) | MIPR | Army Test and Evaluation (ATEC); Joint Interoperability Test Command : Various Locations | 3.282 | - | | - | | 0.150 | Jun 2019 | - | | 0.150 | 0.000 | 3.432 | - |
| | | **Subtotal** | 3.282 | - | | - | | 0.150 | | - | | 0.150 | 0.000 | 3.432 | N/A |

**Remarks**

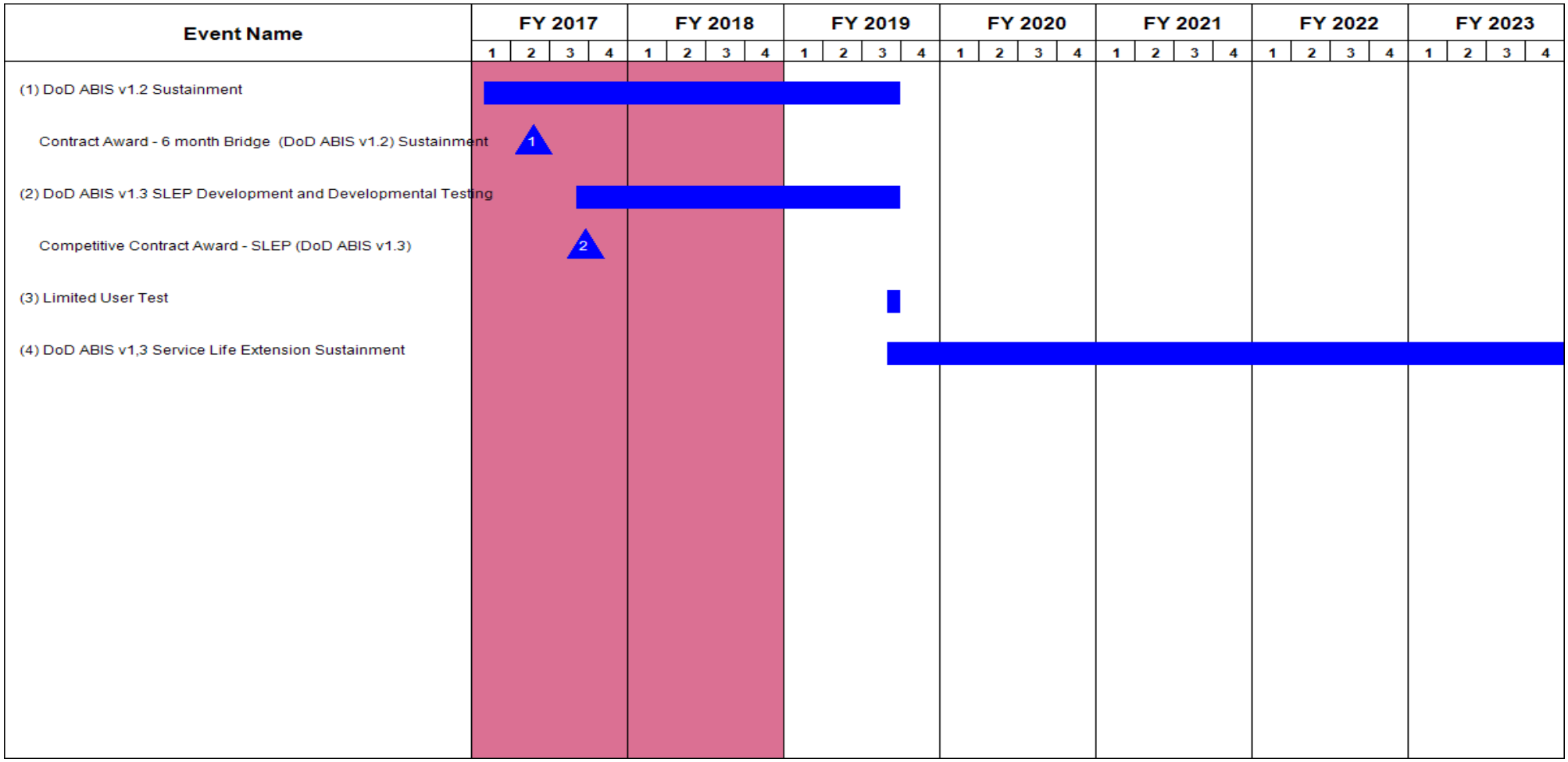
Funding in the amount of $150K is used to fund Testing and Evaluation in FY 2018.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607665A / *Family of Biometrics* | Project (Number/Name)<br>DT2 / *Non-MIP Biometrics* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 100.557 | 10.431 | | 5.500 | | 0.989 | | - | | 0.989 | 0.000 | 117.477 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607665A / *Family of Biometrics* | **Project (Number/Name)**<br>DT2 / *Non-MIP Biometrics* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607665A / *Family of Biometrics* | **Project (Number/Name)**<br>DT2 / *Non-MIP Biometrics* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| (1) DoD ABIS v1.2 Sustainment | 1 | 2015 | 3 | 2019 |
| Contract Award - 6 month Bridge (DoD ABIS v1.2) Sustainment | 2 | 2017 | 2 | 2017 |
| (2) DoD ABIS v1.3 SLEP Development and Developmental Testing | 3 | 2017 | 3 | 2019 |
| Competitive Contract Award - SLEP (DoD ABIS v1.3) | 3 | 2017 | 3 | 2017 |
| (3) Limited User Test | 3 | 2019 | 3 | 2019 |
| (4) DoD ABIS v1,3 Service Life Extension Sustainment | 3 | 2019 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607665A / *Family of Biometrics* | Project (Number/Name)<br>DU2 / *Management Agency* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DU2: *Management Agency* | - | 1.201 | 0.659 | 1.411 | - | 1.411 | 1.421 | 1.325 | 1.193 | 1.209 | 0.000 | 8.419 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Defense Forensics and Biometrics Agency (DFBA) is the Executive Agent for DoD Biometrics and the proponent to establish and maintain Research, Development, Test & Evaluation (RDTE) and information management support throughout the Armed Services and DoD. DFBA leads and facilitates in the development of improvements, and implementation of efficiencies to developed and deployed biometric technologies for Combatant Commands (CCMDs), Services, DoD, and Agencies; facilitates transition of capabilities that contribute to the enhancement of the biometric community; increases Joint Service interoperability; and empowers the warfighter by improving operational effectiveness on the battlefield. The DFBA strategy pursues technology opportunities through scientific discovery and makes investments responsive to specific requirements identified by combat developers.

Justification:

FY 2019 funding in the amount of $1.411 million for Project DU2 will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. DFBA conducts biometric activities (e.g. standards conformance and interoperability assessments), support to DoD acquisition organizations, and provision of subject matter expertise to DoD and non-DoD government stakeholders.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Development and Implementation of Biometric Technologies | 1.201 | 0.659 | 1.411 |
| ***Description:*** Internal and External Research of Biometric Technologies | | | |
| ***FY 2018 Plans:***<br>FY 2018 funding in the amount of $.659 million will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. Funding will be used to support enhancements for automated matching and detection capabilities for fingerprints, face, iris, voice, DNA modalities supporting DoD acquisition organizations and stakeholders, and in coordination with non-DoD stakeholders. | | | |
| ***FY 2019 Plans:***<br>FY 2019 funding in the amount of $1.411 million will provide DFBA the ability to actively manage internal and external research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. Funding will be used to support enhancements for automated matching and detection capabilities for fingerprints, face, iris, voice, DNA modalities supporting DoD acquisition organizations and stakeholders, and in coordination with non-DoD stakeholders. | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607665A / *Family of Biometrics* | **Project (Number/Name)**<br>DU2 / *Management Agency* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| The increase of $0.752 million between FY 2018 and FY 2019 will allow DFBA the ability to actively manage additional planned biometric research efforts. | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.201 | 0.659 | 1.411 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

DFBA uses a variety of existing contract vehicles to support the continued development of technology advancements for the fingerprint, face, iris, palm, and voice modalities. In addition to advancing the state of the art, these efforts enable DFBA to produce updated standards and architectures for the DoD Biometrics Enterprise in support of interoperability objectives.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607665A / *Family of Biometrics* | Project (Number/Name)<br>DU2 / *Management Agency* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DFBA RDTE efforts | MIPR | Various Activities : Various locations | 9.221 | 1.201 | | 0.659 | | 1.411 | | - | | 1.411 | 0.000 | 12.492 | - |
| | | **Subtotal** | 9.221 | 1.201 | | 0.659 | | 1.411 | | - | | 1.411 | 0.000 | 12.492 | N/A |

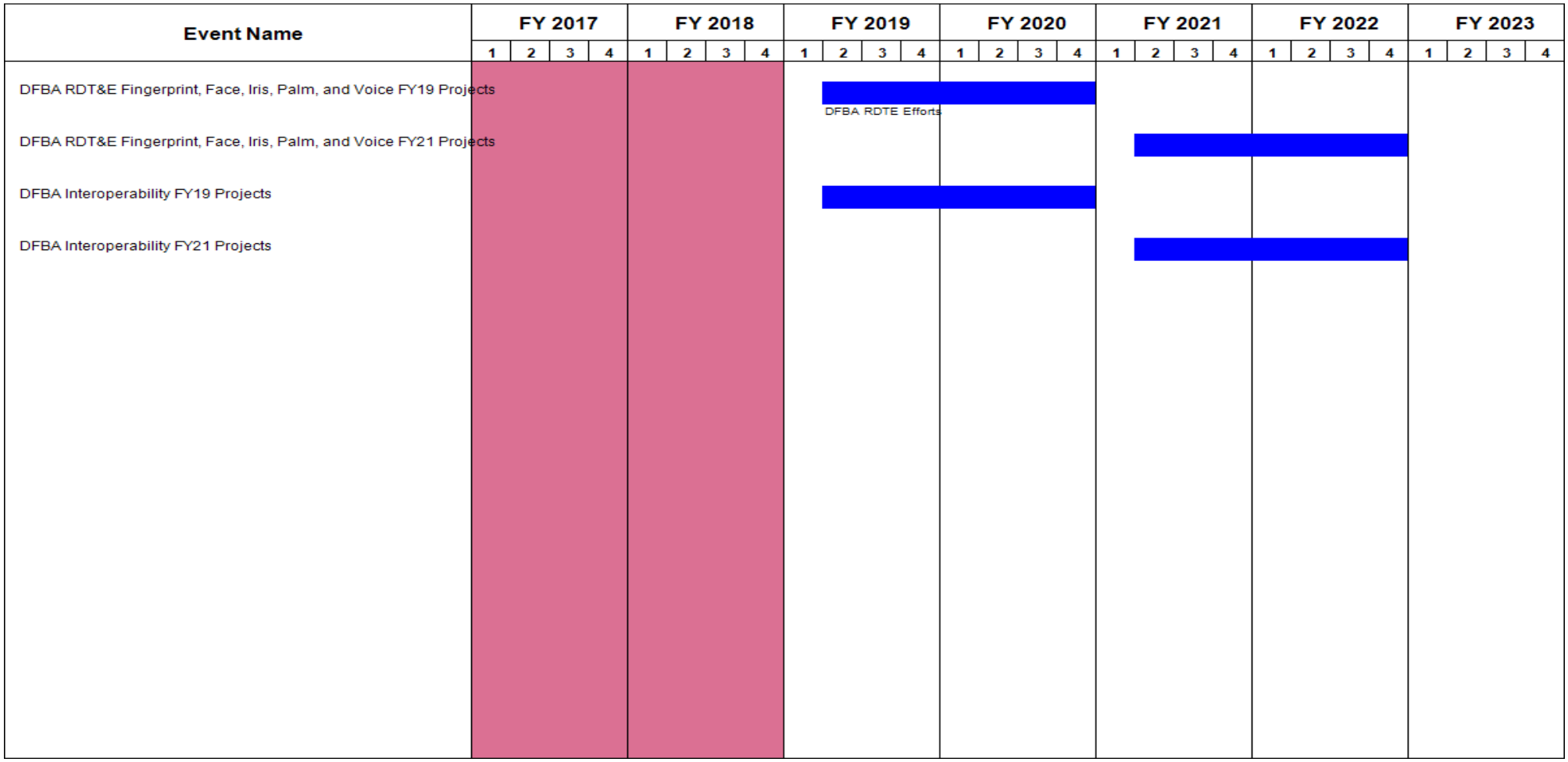
**Remarks**

Continuation of development of state of the art sensor capabilities enables the advancement of collection, match, share, and store capabilities. As sensors mature and take advantage of new spectra for biometric identification, the results from these capabilities enable DFBA to proactively advance the standards and architectures needed to use the advanced capabilities.

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 9.221 | 1.201 | | 0.659 | | 1.411 | | - | | 1.411 | 0.000 | 12.492 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607665A / *Family of Biometrics* | **Project (Number/Name)**<br>DU2 / *Management Agency* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607665A / *Family of Biometrics* | **Project (Number/Name)**<br>DU2 / *Management Agency* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| DFBA RDT&E Fingerprint, Face, Iris, Palm, and Voice FY19 Projects | 2 | 2019 | 4 | 2020 |
| DFBA RDT&E Fingerprint, Face, Iris, Palm, and Voice FY21 Projects | 2 | 2021 | 4 | 2022 |
| DFBA Interoperability FY19 Projects | 2 | 2019 | 4 | 2020 |
| DFBA Interoperability FY21 Projects | 2 | 2021 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607865A / *Patriot Product Improvement* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 48.073 | 90.217 | 65.369 | - | 65.369 | 42.803 | 61.495 | 78.745 | 94.510 | Continuing | Continuing |
| DV8: *Patriot Product Improvement* | - | 48.073 | 90.217 | 65.369 | - | 65.369 | 42.803 | 61.495 | 78.745 | 94.510 | Continuing | Continuing |

**Note**

Beginning FY17, funding specific to LTAMD-C realigned to PE 0604114A, Lower Tier Missile Defense (LTAMD) Capability.

**A. Mission Description and Budget Item Justification**

PATRIOT is an advanced Surface-to-Air guided missile system with a high probability of kill, capable of operation in the presence of Electronic Countermeasures (ECM) and able to conduct multiple simultaneous engagements against high performance air breathing targets and ballistic missiles likely to be encountered by U.S. Forces. The PATRIOT Product Improvement Program provides for the upgrade of the PATRIOT System through individual materiel changes and upgrades to the PATRIOT system to address operational lessons learned, enhancements to joint force interoperability, and other system performance improvements to provide overmatch capability with the emerging threat.

The hardware and software funding provides for the identification, analysis, design and test improvements to the PATRIOT system against the evolving threat. This effort supports work with national agencies to evaluate, assess, and develop means to mitigate threat trends and specific threat developments potentially impacting system performance. Specific improvements may be developed and fielded under this task if warranted. The effort maintains the Mission Tailoring Database, responding to immediate tactical concerns. Database updates are fielded between major software upgrades as necessary.

Funding provides authority to identify, analyze, design and test materiel solutions to counter cybersecurity and electronic warfare shortcomings to all elements of the Lower Tier Battle Space.

FY2019 base dollars in the amount of $65.369 million support the continuance of Software Improvement for Threat Evolution, Advanced Electronic Counter Measures (AECM), Assured Positioning, Navigation and Timing (PNT), Combat ID enhancements, Tasks 2, 6, and 7 activities, listed under project DV8.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0607865A / *Patriot Product Improvement* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 49.482 | 90.217 | 69.976 | - | 69.976 |
| Current President's Budget | 48.073 | 90.217 | 65.369 | - | 65.369 |
| Total Adjustments | -1.409 | 0.000 | -4.607 | - | -4.607 |
| • Congressional General Reductions | -0.016 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.393 | - | | | |
| • Adjustments to Budget Years | - | - | -4.607 | - | -4.607 |

**Change Summary Explanation**

FY2019: Program Office core employee labor costs moved from RDTE to OMA as part of an OSD auditability directive.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0607865A / *Patriot Product Improvement* | | | | Project (Number/Name)<br>DV8 / *Patriot Product Improvement* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| DV8: *Patriot Product Improvement* | - | 48.073 | 90.217 | 65.369 | - | 65.369 | 42.803 | 61.495 | 78.745 | 94.510 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Beginning FY17, funding specific to LTAMD-C realigned to PE 0604114A, Lower Tier Missile Defense (LTAMD) Capability.

**A. Mission Description and Budget Item Justification**

Software and hardware improvements for threat evolution: Performs necessary analysis and development efforts to maintain PATRIOT system effectiveness against evolving threat technologies and specific threat capabilities. This effort identifies evolving threats and threat characteristics that might present a challenge to PATRIOT's current capabilities and develops initial concepts to maintain system effectiveness relative to these threats.

Upper-Tier Debris Mitigation (UTDM): Implements algorithms to mitigate system impacts of debris from Upper Tier intercepts associated with operating in the Ballistic Missile Defense System (BMDS) environment. Debris from Upper Tier intercepts can cause significant radar loading effects and the potential for erroneous engagements and missile wastage on debris.

Radar Digital Processor (RDP) Waveform Suite: Develops a comprehensive set of waveforms in the RDP to improve PATRIOT radar capabilities against current and evolving threats, including support to Task 6 and 7 efforts (see below), and implements advanced data collection enabled by the RDP to support further system improvements. The new waveforms enabled by the RDP allow capability improvements in Discrimination, Combat ID, Electronic Protection, Search, Tracking, and other areas of need.

THAAD/PATRIOT Interoperability: Implements improvements to THAAD/PATRIOT Interoperability and addresses Joint Defense Network deficiencies that impact Tactical Ballistic Missile battle management and force/engagement operations. Efforts will be concentrated on joint, collaborative force operations (defense design and planning) and enhanced Tactical Digital Information Link - Joint interoperability.

Advanced Electronic Counter Measures (AECM): This task investigates the implications of advanced technology Digital Radio Frequency Memory available on airborne platforms that enables new ECM techniques which could adversely affect Air and Missile Defense System effectiveness.

Task 2: Implements improved ground system and interceptor capabilities (PATRIOT Advanced Capability-2/Guidance Enhanced Missiles, PATRIOT Advanced Capability-3, and Missile Segment Enhancement) to counter emerging Tactical Ballistic Missile threats.

Task 6: Software improvements enhance discrimination of higher altitude Tactical Ballistic Missile Re-entry Vehicles (RVs) from associated objects to support the full engagement capabilities of the interceptor. Longer-range detection, track, and improved high-altitude discrimination are required to achieve the required lethality

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607865A / *Patriot Product Improvement* | **Project (Number/Name)**<br>DV8 / *Patriot Product Improvement* |

performance against the RV and to mitigate missile wastage against separation debris. This task leverages the signal processing capabilities of the Radar Digital Processor, and supports the high altitude engagements required by the PATRIOT Advanced Capability-3 (PAC-3) and PAC-3 Missile Segment Enhancement (MSE) missiles.

Task 7: Performs analysis on existing and evolving Tactical Ballistic Missile countermeasures to determine the effects on PATRIOT system effectiveness. Develops hardware and software concepts to address countermeasure effects to ensure the PATRIOT system maintains its effectiveness. Develops detailed system requirements to implement concepts; design/code/test software implementation leveraging Radar Digital Processor, Modernized Adjunct Processor, Enhanced Weapons Control Computer - Emulator and Flight Solution Computer-Redesign processing capabilities. Implements simulation based concepts to define tradespace and establish system requirements.

Assured Positioning, Navigation, and Timing (PNT): Efforts will develop and test the military's improved Global Position M-Code with Patriot Major End Items (MEI) integrating the improved anti-jamming and secure access of military GPS signals. This effort meets the requirement for Assured PNT through M-Code as mandated by FY2011 National Defense Act, public law 111-383 & 913.

Combat ID Enhancements: Develop and implement improvements to the Radar Digital Processor-Capability Combat ID capabilities and additional Non-Cooperative Target Recognition techniques to further mitigate misclassification and fratricide risk, and to provide the Warfighter with improved situational awareness.

Anti-Radiation Missile (ARM) Asset Defense: Provides improved capability for PATRIOT to protect other Army and Joint Services Sensors from ARM attacks. Builds on an initial capability provided in Post-Deployment Build-7 by determining remaining gaps, identifying and evaluating alternatives, and implementing further improvements.

Tactical Telemetry Ground Station: Develops a ground-based telemetry receive station to be deployed with the tactical units and collect PAC-3 telemetry data for tactical engagements. This data will be used to assess missile and system effectiveness in tactical environments against real-world threats, and will support the development of operational improvements (Firing Doctrine and other system settings) and system software improvements to mitigate stressing threat behaviors.

U.S. Government and contractor support for PIP efforts.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** PATRIOT Product Improvement | 48.073 | 90.217 | 65.369 |
| ***Description:*** Continuous Improvement to Counter the Evolving Threat. | | | |
| ***FY 2018 Plans:***<br>-Continued Software Improvement for Threat Evolution, Upper-Tier Debris Mitigation (UTDM), THAAD/PATRIOT Interoperability and Advanced Electronic Countermeasures (AECM).<br>-Began Tactical Telemetry Ground Station development.<br>-Continued Combat ID enhancements, PNT and ARM Asset Defense development. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607865A / *Patriot Product Improvement* | **Project (Number/Name)**<br>DV8 / *Patriot Product Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| -Continued Tasks 2, 6, and 7 activities.<br>-Began Radar Digital Processor (RDP) Waveform Suite activities.<br>-U.S. Government and contractor support to counter emerging threat.<br>***FY 2019 Plans:***<br>-Continues Software Improvement for Threat Evolution and Advanced Electronic Countermeasures (AECM).<br>-Continues Combat ID enhancements and Assured Positioning, Navigation, and Timing (PNT).<br>-Continues Tasks 2, 6, and 7 activities.<br>-U.S. Government and contractor support to counter emerging threat.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY2018 PIP funding of $90.2M was reduced to $65.4M in FY2019. Scheduled improvements are constrained by budget allocation for each respective fiscal year. Current funding profile will enable the development of a capability to address evolving threats; however, any further reductions in funding will increase risk in delivering a mature, fully tested Combat ID capability in PDB-8.1. | | | |
| **Accomplishments/Planned Programs Subtotals** | 48.073 | 90.217 | 65.369 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • C50700: *Patriot Mods (C50700)* | 197.107 | 496.073 | 313.228 | - | 313.228 | 292.218 | 209.387 | 146.657 | 160.679 | Continuing | Continuing |

**Remarks**

The improvements/enhancements developed through the PATRIOT Product Improvement Program (PIP) are interrelated with the hardware kits that are procured and installed under the Missile Procurement, Army (MIPA) appropriation's PATRIOT Mods program and maximizes PAC-3 MSE capabilities.

**D. Acquisition Strategy**

The design objective of the PATRIOT system was to provide a baseline system capable of modification to cope with continuing threat evolution. This program minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The PATRIOT Product Improvement Program upgrades the PATRIOT system to address operational lessons learned, enhancements to joint force interoperability and communications, and other system performance improvements to provide overmatch capability against the emerging threat. Upgrades are implemented through individual hardware and software materiel changes and fielded incrementally. This program encompasses several changes which will require the use of a variety of acquisition methods to develop, test, procure and field. Future hardware and software capabilities will be incorporated into future Post Deployment Build (PDB) releases.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0607865A / *Patriot Product Improvement* | Project (Number/Name)<br>DV8 / *Patriot Product Improvement* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | MIPR | RSA, AL : RSA, AL | 3.621 | 2.379 | Oct 2016 | 5.177 | Oct 2017 | 2.538 | Oct 2018 | - | | 2.538 | Continuing | Continuing | Continuing |
| U.S. Contracts | Various | Multiple : Multiple | 3.761 | 1.600 | Feb 2017 | 1.600 | Feb 2018 | 1.600 | Feb 2019 | - | | 1.600 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 7.382 | 3.979 | | 6.777 | | 4.138 | | - | | 4.138 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Improvement for Threat Evolution | Various | Multiple : Multiple | 31.370 | 7.729 | Jan 2017 | 9.246 | Jan 2018 | 9.018 | Jan 2019 | - | | 9.018 | Continuing | Continuing | - |
| Upper Tier Debris Mitigation (UTDM) | Various | Multiple : Multiple | 1.000 | - | | 4.000 | Jan 2018 | - | | - | | - | Continuing | Continuing | - |
| Radar Digital Processor (RDP) Development | Various | Raytheon : Andover, Massachusetts | 49.835 | - | | - | | - | | - | | - | 0.000 | 49.835 | 49.835 |
| RDP Waveform Suite | Various | Raytheon : Andover, Massachusetts | - | - | | 2.500 | Jan 2018 | - | | - | | - | Continuing | Continuing | - |
| THAAD PATRIOT Interoperability | Various | Raytheon : Andover, Massachusetts | 3.200 | - | | 4.000 | Jan 2018 | - | | - | | - | Continuing | Continuing | - |
| Advanced Electronic Counter Measures (AECM) | Various | Multiple : Multiple | 41.700 | 8.304 | Jan 2017 | 15.158 | Jan 2018 | 18.576 | Jan 2019 | - | | 18.576 | Continuing | Continuing | - |
| Task 2 Non-Ballistic Tactical Ballistic Missile (TBM) | Various | Multiple : Multiple | 24.700 | 5.400 | Feb 2017 | 8.000 | Feb 2018 | 4.400 | Feb 2019 | - | | 4.400 | Continuing | Continuing | - |
| Task 6 Discrimination Improvements | Various | Multiple : Multiple | 22.000 | 6.000 | Feb 2017 | 9.500 | Feb 2018 | 3.700 | Feb 2019 | - | | 3.700 | Continuing | Continuing | - |
| Task 7 TBM Countermeasures / Effectors | Various | Multiple : Multiple | 13.000 | 4.000 | May 2017 | 10.700 | May 2018 | 10.000 | May 2019 | - | | 10.000 | Continuing | Continuing | - |
| Assured PNT | Various | Multiple : Multiple | - | 7.440 | Jan 2017 | 3.600 | Jan 2018 | 3.300 | Jan 2019 | - | | 3.300 | Continuing | Continuing | - |
| Combat ID Enhancements | Various | Multiple : Multiple | 10.816 | 4.621 | May 2017 | 9.000 | May 2018 | 11.537 | May 2019 | - | | 11.537 | Continuing | Continuing | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607865A / *Patriot Product Improvement* | **Project (Number/Name)**<br>DV8 / *Patriot Product Improvement* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flat Panel Array Concept Development | Various | Multiple : Multiple | 3.300 | - | | - | | - | | - | | - | 0.000 | 3.300 | 3.300 |
| Anti-Radiation Missile (ARM) Asset Defense | Various | Raytheon : Andover, Massachusetts | 2.000 | - | | 3.000 | Jan 2018 | - | | - | | - | Continuing | Continuing | - |
| Tactical Telemetry Ground Station | Various | Multiple : Multiple | - | - | | 4.036 | Jan 2018 | - | | - | | - | Continuing | Continuing | - |
| | | **Subtotal** | 202.921 | 43.494 | | 82.740 | | 60.531 | | - | | 60.531 | Continuing | Continuing | N/A |

**Remarks**

The contract method type Sole Source/Various is Fixed Price Level of Effort which includes Cost Plus Fixed Fee for material, ODC, and travel.

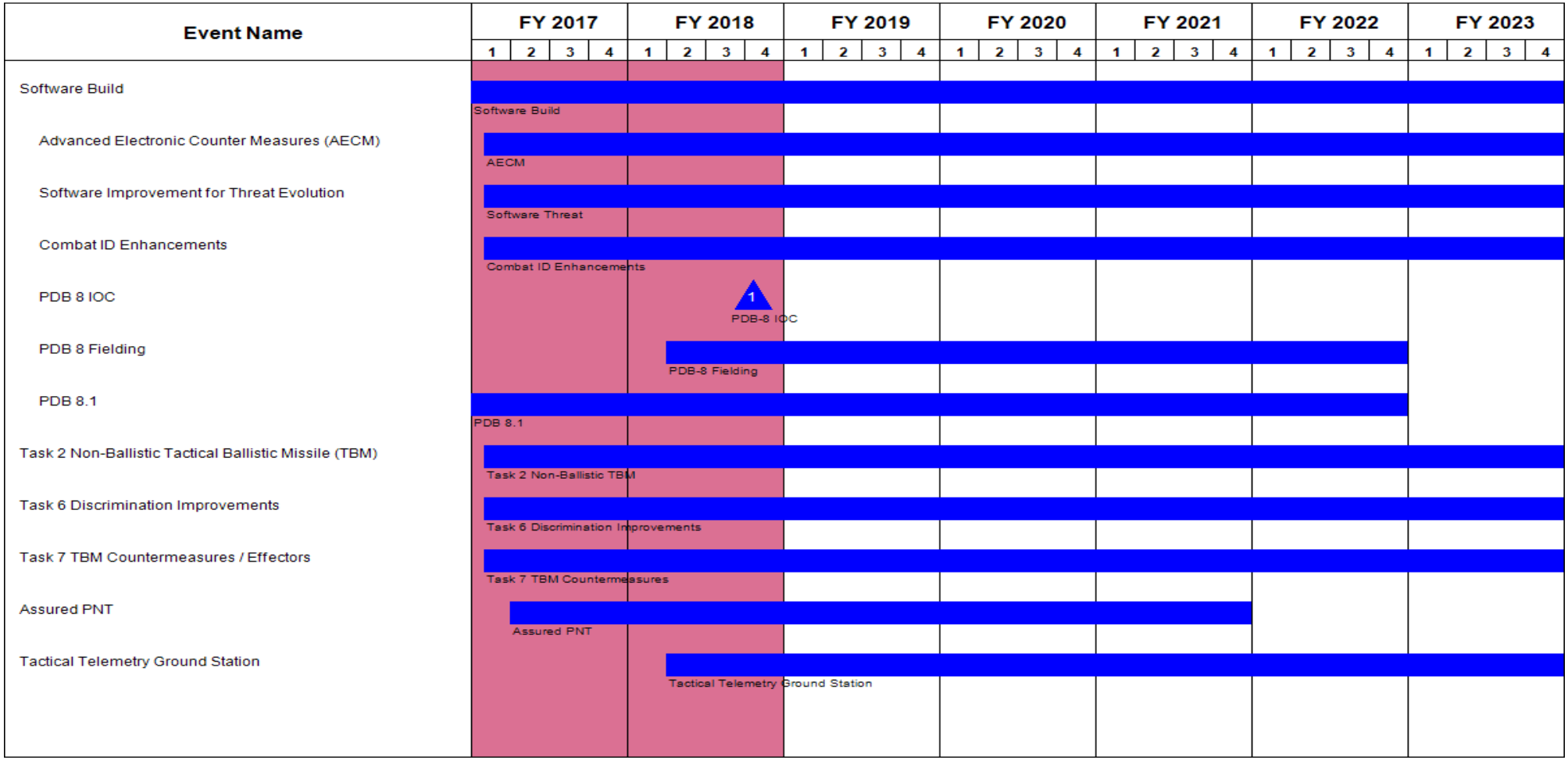
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDEC and Other Govt Agencies | MIPR | RDEC and OGA'S : RSA, AL | 3.912 | 0.600 | Jan 2017 | 0.700 | Jan 2018 | 0.700 | Jan 2019 | - | | 0.700 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 3.912 | 0.600 | | 0.700 | | 0.700 | | - | | 0.700 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 214.215 | 48.073 | | 90.217 | | 65.369 | | - | | 65.369 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607865A / *Patriot Product Improvement* | **Project (Number/Name)**<br>DV8 / *Patriot Product Improvement* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607865A / *Patriot Product Improvement* | **Project (Number/Name)**<br>DV8 / *Patriot Product Improvement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Software Build | 4 | 2005 | 4 | 2023 |
| Advanced Electronic Counter Measures (AECM) | 1 | 2014 | 4 | 2023 |
| Software Improvement for Threat Evolution | 1 | 2014 | 4 | 2023 |
| Combat ID Enhancements | 1 | 2014 | 4 | 2023 |
| PDB 8 IOC | 4 | 2018 | 4 | 2018 |
| PDB 8 Fielding | 2 | 2018 | 4 | 2022 |
| PDB 8.1 | 2 | 2016 | 4 | 2022 |
| Radar Digital Processor Development | 1 | 2012 | 3 | 2016 |
| Task 2 Non-Ballistic Tactical Ballistic Missile (TBM) | 1 | 2015 | 4 | 2023 |
| Task 6 Discrimination Improvements | 1 | 2014 | 4 | 2023 |
| Task 7 TBM Countermeasures / Effectors | 1 | 2015 | 4 | 2023 |
| Assured PNT | 1 | 2017 | 4 | 2021 |
| Lower Tier Air & Missile Defense-Capability (LTAMD-C) Concept Study | 1 | 2014 | 4 | 2016 |
| Tactical Telemetry Ground Station | 2 | 2018 | 4 | 2023 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0202429A / *Aerostat Joint Project - COCOM Exercise* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 6.178 | 6.749 | 0.001 | - | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.928 |
| EP8: *COCOM Exercise* | - | 6.178 | 6.749 | 0.001 | - | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.928 |

**A. Mission Description and Budget Item Justification**

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) is a supporting program for Army and Joint Integrated Air and Missile Defense, providing elevated, persistent, over the horizon surveillance and fire control quality data on Army and Joint networks, enabling protection of the U.S. and coalition forces as well as critical geo political assets from Cruise Missiles, Aircraft, Unmanned Aerial Vehicles, Tactical Ballistic Missiles, Large Caliber Rockets, and Surface Moving Targets. A JLENS Orbit consists of two systems: a fire control radar system and a wide-area surveillance radar system. Each radar system consists of a separate 74-meter tethered aerostat, mobile mooring station, radar and communications payload, processing station, and associated ground support equipment. The systems are designed to work together, but can operate independently. The JLENS Orbit is transportable by road, rail, sea and air.

JLENS uses advanced sensor and networking technologies to provide persistent, 360-degree, wide-area surveillance and precision tracking of Land Attack Cruise Missiles and other types of Air Breathing Threats. This information is distributed via joint service networks and provides fire control quality data to Surface to Air missile systems, such as Army Patriot and Navy Aegis, increasing the weapons' capabilities by allowing systems to engage targets normally below, outside, or beyond surface based weapons' field of view. JLENS also provides fire control quality data to fighter aircraft, allowing the aircraft to engage hostile threats from extended ranges, and contributes to the development of a single integrated air picture.

JLENS prepared and participated in Operation Noble Eagle (ONE) with NORAD-USNORTHCOM National Capital Region (NCR) Integrated Air Defense System (IADS) Operational Exercise (OPEX) from FY14-FY16 as directed by the Joint Requirements Oversight Council Memorandum (JROCM) 021-13 signed by the Vice Chairman of the Joint Chiefs of Staff on 31 January 2013. The OPEX included an operational assessment to "inform a future decision for enduring operational employment", in accordance with Joint Requirements Oversight Council Memorandum (JROCM) 021-13. The Combatant Command (CCMD) objective for the OPEX was to provide the full range of JLENS Orbit level capability to include: Persistent Wide Area Surveillance (WAS) through Battle Command System Fixed (BCS-F) Integration Combat Identification (CID) / Electronic Identification (EID) Precision Cue to Fighters/Ground-Based Air Defense (GBAD) via Tactical Data Link (TDL) Integrated Fire Control to Fighters (IFC)/GBAD via TDL.

JLENS ended OPEX participation in October 2015 with the direction to store the system in place.

JLENS received an Acquisition Decision Memorandum (ADM), dated 18 July 2017, directing the program to prepare and submit a program termination plan. Disposition of 185 ISO containers consisting of classified and unclassified material along with 12 trailers will take two years (FY 2018-2019). In FY 2018, the focus is on the disposition of classified and starting the disposition of unclassified material. The remaining unclassified material will be disposed of in FY 2019.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0202429A *I Aerostat Joint Project - COCOM Exercise* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 45.482 | 6.749 | 0.001 | - | 0.001 |
| Current President's Budget | 6.178 | 6.749 | 0.001 | - | 0.001 |
| Total Adjustments | -39.304 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | -0.003 | - | | | |
| • Congressional Directed Reductions | -39.082 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.219 | - | | | |

**Change Summary Explanation**

FY 2017 adjustments are the result of Congressional mark as part of the FY 2017 Appropriation Act, SBIR/STTR and FFRDC transfer.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0202429A / *Aerostat Joint Project - COCOM Exercise* | Project (Number/Name)<br>EP8 / *COCOM Exercise* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EP8: *COCOM Exercise* | - | 6.178 | 6.749 | 0.001 | - | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.928 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) is a supporting program for Army and Joint Integrated Air and Missile Defense, providing elevated, persistent, over the horizon surveillance and fire control quality data on Army and Joint networks, enabling protection of the U.S. and coalition forces as well as critical geo political assets from Cruise Missiles, Aircraft, Unmanned Aerial Vehicles, Tactical Ballistic Missiles, Large Caliber Rockets, and Surface Moving Targets. A JLENS Orbit consists of two systems: a fire control radar system and a wide-area surveillance radar system. Each radar system consists of a separate 74-meter tethered aerostat, mobile mooring station, radar and communications payload, processing station, and associated ground support equipment. The systems are designed to work together, but can operate independently. The JLENS Orbit is transportable by road, rail, sea and air.

JLENS uses advanced sensor and networking technologies to provide persistent, 360-degree, wide-area surveillance and precision tracking of Land Attack Cruise Missiles and other types of Air Breathing Threats. This information is distributed via joint service networks and provides fire control quality data to Surface to Air missile systems, such as Army Patriot and Navy Aegis, increasing the weapons' capabilities by allowing systems to engage targets normally below, outside, or beyond surface based weapons' field of view. JLENS also provides fire control quality data to fighter aircraft, allowing the aircraft to engage hostile threats from extended ranges, and contributes to the development of a single integrated air picture.

JLENS prepared for and participated in Operation Noble Eagle (ONE) with NORAD-USNORTHCOM National Capital Region (NCR) Integrated Air Defense System (IADS) Operational Exercise (OPEX) from FY14-FY16, as directed by the Joint Requirements Oversight Council Memorandum (JROCM) 021-13 signed by the Vice Chairman of the Joint Chiefs of Staff on 31 January 2013. JLENS participation in the OPEX was to allow for a combatant commander's operational assessment of JLENS capabilities to "inform a future decision for enduring operational employment".

Operational Control of JLENS for the OPEX was transferred to the NORAD/NORTHCOM Joint Air Defense Operations Center (JADOC) on 15 October 2015. Due to a tether break accident on 28 October 2015 and resulting loss of the Fire Control System aerostat and significant damage to the Radar and Mobile Mooring Station, the Commander NORAD/NORTHCOM suspended JLENS participation in the OPEX pending results of accident investigations and Failure Review Board recommendations. JLENS participation in the OPEX was terminated per an Under Secretary for Defense Policy decision memorandum dated 15 June 2016. In accordance with Army Acquisition Executive (AAE) direction, JLENS equipment supporting the OPEX was packed and stored at the APG sites effective 21 June 2016, pending higher headquarters decision on the future of the JLENS program.

JLENS ended OPEX participation in October 2015 with the direction to store the system in place.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0202429A / *Aerostat Joint Project - COCOM Exercise* | **Project (Number/Name)**<br>EP8 / *COCOM Exercise* |

JLENS received an Acquisition Decision Memorandum (ADM), dated 18 July 2017, directing the program to prepare and submit a program termination plan. Disposition of 185 ISO containers consisting of classified and unclassified material along with 12 trailers will take two years (FY 2018-2019). In FY 2018, the focus is on the disposition of classified and starting the disposition of unclassified material. The remaining unclassified material will be disposed of in FY 2019.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** JLENS Exercise | 6.178 | 6.749 | 0.001 |
| ***Description:*** Plan and execute JLENS participation in the NORAD-USNORTHCOM National Capital Region Integrated Air Defense System (IADS) OPEX.<br><br>***FY 2018 Plans:***<br>Perform program shutdown activities to include disposition of assets and program office support.<br><br>***FY 2019 Plans:***<br>Perform program shutdown activities.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 remaining activity is disposal of unclassified material. | | | |
| **Accomplishments/Planned Programs Subtotals** | 6.178 | 6.749 | 0.001 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

JLENS prepared for and participated in Operation Noble Eagle (ONE) with NORAD-USNORTHCOM National Capital Region (NCR) Integrated Air Defense System (IADS) Operational Exercise (OPEX) from FY 2014-FY 2016, as directed by the Joint Requirements Oversight Council Memorandum (JROCM) 021-13 signed by the Vice Chairman of the Joint Chiefs of Staff on 31 January 2013. JLENS participation in the OPEX was to allow for a combatant commander's operational assessment of JLENS capabilities to "inform a future decision for enduring operational employment".

Operational Control of JLENS for the OPEX was transferred to the NORAD/NORTHCOM Joint Air Defense Operations Center (JADOC) on 15 October 2015. Due to a tether break accident on 28 October 2015 resulting in the loss of the Fire Control System aerostat, significant damage to the Radar and Mobile Mooring Station, the Commander NORAD/NORTHCOM suspended JLENS participation in the OPEX pending results from accident investigations and Failure Review Board recommendations. JLENS participation in the OPEX was terminated per an Under Secretary for Defense Policy decision memorandum dated 15 June 2016. In accordance with Army Acquisition Executive (AAE) direction, JLENS equipment supporting the OPEX was packed and stored at the APG sites effective 21 June 2016, pending higher headquarters decision on the future of the JLENS program. Courses of action under consideration are staging JLENS equipment in indefinite storage to meet potential future contingency requirements; and termination of the JLENS program with disposition/demilitarization of JLENS equipment.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0202429A / *Aerostat Joint Project - COCOM Exercise* | **Project (Number/Name)**<br>EP8 / *COCOM Exercise* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0202429A / *Aerostat Joint Project - COCOM Exercise* | Project (Number/Name)<br>EP8 / *COCOM Exercise* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLENS Exercise - PM Support, OGA, Travel, Transportation, Licenses, Agreements and program shutdown | MIPR | Multiple Various : AL/ MD/UT/SC | 10.624 | 6.178 | Jan 2017 | 6.749 | | 0.001 | | - | | 0.001 | 4.396 | 27.948 | - |
| JLENS Exercise Aberdeen Proving Ground, MD (APG) Support | MIPR | Multiple Various : MD | 9.814 | - | | - | | - | | - | | - | 2.350 | 12.164 | - |
| | | **Subtotal** | 20.438 | 6.178 | | 6.749 | | 0.001 | | - | | 0.001 | 6.746 | 40.112 | N/A |

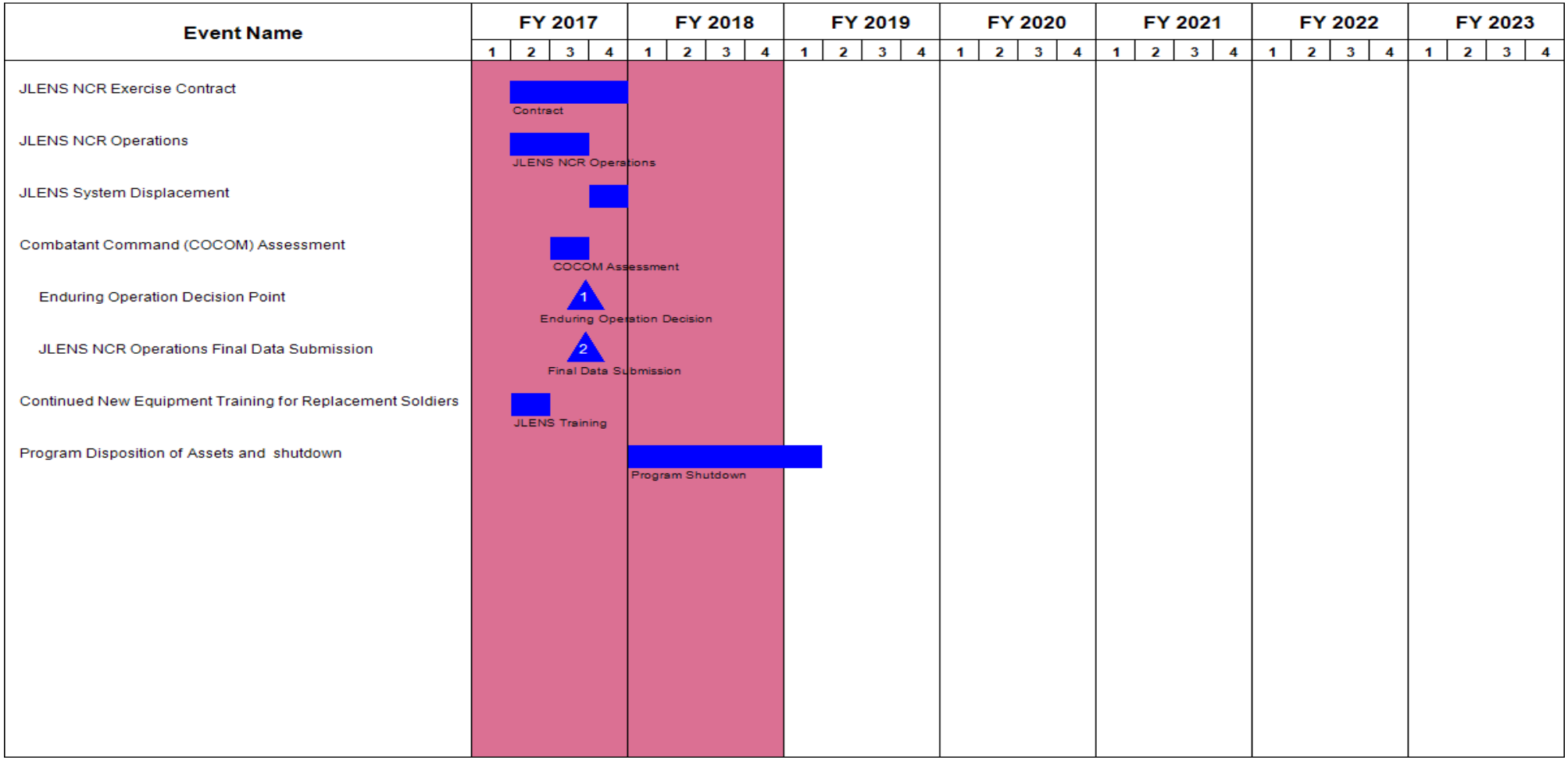
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JLENS - COCOM Exercise, Failure Review Board and Displacement Contract | SS/FFP | Multiple Various : AL/ MD/NC/MA/CA | 45.257 | - | | - | | - | | - | | - | 0.000 | 45.257 | - |
| JLENS - Technical Services Contract | SS/ FFPLOE | Multiple Various : MD/MA/CA | 2.000 | - | | - | | - | | - | | - | 0.000 | 2.000 | - |
| UTTR Orbit 2 Staging | IA | Various : UT | 1.257 | - | | - | | - | | - | | - | 0.000 | 1.257 | - |
| | | **Subtotal** | 48.514 | - | | - | | - | | - | | - | 0.000 | 48.514 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 68.952 | 6.178 | | 6.749 | | 0.001 | | - | | 0.001 | 6.746 | 88.626 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0202429A / *Aerostat Joint Project - COCOM Exercise* | **Project (Number/Name)**<br>EP8 / *COCOM Exercise* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0202429A / *Aerostat Joint Project - COCOM Exercise* | **Project (Number/Name)**<br>EP8 / *COCOM Exercise* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Aberdeen Proving Grounds (APG) Site Planning and Preparation | 1 | 2014 | 4 | 2015 |
| JLENS NCR Exercise Contract | 1 | 2015 | 4 | 2017 |
| JLENS NCR Operations | 1 | 2015 | 3 | 2017 |
| JLENS System Displacement | 4 | 2017 | 4 | 2017 |
| Combatant Command (COCOM) Assessment | 3 | 2017 | 3 | 2017 |
| Enduring Operation Decision Point | 3 | 2017 | 3 | 2017 |
| JLENS NCR Operations Final Data Submission | 3 | 2017 | 3 | 2017 |
| New Equipment Training for Replacement Soldiers | 2 | 2015 | 1 | 2016 |
| Continued New Equipment Training for Replacement Soldiers | 2 | 2017 | 2 | 2017 |
| Program Disposition of Assets and shutdown | 1 | 2018 | 1 | 2019 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203728A *I Joint Automated Deep Operation Coordination System (JADOCS)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 29.412 | 33.520 | 30.954 | - | 30.954 | 32.807 | 18.299 | 5.261 | 7.839 | 0.000 | 158.092 |
| EF6: *JADOCS* | - | 2.717 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.717 |
| EF7: *Pocket-Sized Forward Entry Device (PFED) Inc 2* | - | 2.891 | 4.537 | 3.884 | - | 3.884 | 3.118 | 1.508 | 0.000 | 2.648 | 0.000 | 18.586 |
| EF8: *AFATDS Increment 1* | - | 23.804 | 28.983 | 27.070 | - | 27.070 | 29.689 | 16.791 | 5.261 | 5.191 | 0.000 | 136.789 |

**A. Mission Description and Budget Item Justification**

This program element provides development for fire support command and control systems used by all Services from platoon to echelons above Corps. There are two developmental efforts that are being executed concurrently FY 2018 and beyond: Pocket-sized Forward Entry Device (Increment II) (project code EF7) and Advanced Field Artillery Tactical Data System (AFATDS) (Increment I) (project code EF8). The development on the Joint Automated Deep Operations Coordination System (JADOCS) (project code EF6) was completed in FY 2017.

Joint Automated Deep Operations Coordination System (JADOCS) is a Joint and Coalition targeting, coordination mission management software application. It links Command and Control (C2), Intelligence, and Air operations information with execution systems using real time collaborative targeting managers, customized for each service or specific functional area. JADOCS is used to significantly enhance the Joint Force and Component Command's capability to simultaneously develop, coordinate and execute Dynamic and Time Sensitive targets and fire missions, as well as battle space coordination worldwide. JADOCS provides coordination and de-confliction of targeting information at all levels of command structure for the military. JADOCS is used by Air, Ground, Maritime, and Special Operations forces. It provides horizontal (across Services) as well as vertical (within Services) coordination of missions to ensure a common picture of targeting operational status across the entire joint force. As a software application, JADOCS can be configured and customized for each user and location.

Pocket-sized Forward Entry Device (PFED) Increment II is a software application that operates on the Nett Warrior End User Device (EUD). It will provide the dismounted Forward Observer (FO) and Fire Support Teams (FISTs) the capability and functionality to accurately and rapidly locate ground targets and digitally process a Call For Fire. PFED Increment II answers the Mobile Handheld Computing Environment requirement that all handheld applications reside on the Nett Warrior EUD.

AFATDS 7.0 modernizes the existing AFATDS program currently in the field. AFATDS 7.0 enhances the existing AFATDS baseline by: (1) Providing a modernized web service based backend that will simplify long-term maintenance of the software, (2) Bringing AFATDS into full compliance with the Army's Common Operating Environment (COE) Command Post Computing Environment (CPCE) initiative and (3) Enhancing overall usability of the system through the implementation of a role-based capability architecture with embedded training that allows the AFATDS operator to receive on-the-spot training for any aspect of AFATDS via interactive instruction.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0203728A *I Joint Automated Deep Operation Coordination System (JADOCS)* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 30.455 | 33.520 | 29.558 | - | 29.558 |
| Current President's Budget | 29.412 | 33.520 | 30.954 | - | 30.954 |
| Total Adjustments | -1.043 | 0.000 | 1.396 | - | 1.396 |
| • Congressional General Reductions | -0.013 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | -1.030 | - | 1.396 | - | 1.396 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | | | | | | | | Date: February 2018 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | | | | Project (Number/Name)<br>EF6 / *JADOCS* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| EF6: *JADOCS* | - | 2.717 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.717 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Joint Automated Deep Operations Coordination System (JADOCS) is a Joint and Coalition targeting, coordination mission management software application. It links Command and Control (C2), Intelligence, and Air operations information with execution systems using real time collaborative targeting managers, customized for each service or specific functional area. JADOCS is used to significantly enhance the Joint Force and Component Command's capability to simultaneously develop, coordinate and execute Dynamic and Time Sensitive targets and fire missions, as well as battle space coordination worldwide. JADOCS provides coordination and de-confliction of targeting information at all levels of command structure for the military.

JADOCS is used by Air, Ground, Maritime, and Special Operations forces. It provides horizontal (across Services) as well as vertical (within Services) coordination of missions to ensure a common picture of targeting operational status across the entire joint force. As a software application, JADOCS can be configured and customized for each user and location.

JADOCS fires and targeting capabilities will migrate to AFATDS v 7.1. JADOCS v2.0 will be sustained throughout the force until AFATDS 7.1 is fielded and satisfies the requirement for JADOCS fires and targeting functionality. JADOCS v 2.0 software is being developed by CECOM Life Cycle Management Command, Software Engineering Center (SEC).

There is no FY 2019 RDTE funding request.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** JADOCS Software Development Efforts<br>***Description:*** Software development of JADOCS v2.0 software. | 1.222 | - | - |
| ***Title:*** Program Management Support Costs for JADOCS<br>***Description:*** Program support for JADOCS v2.0 software development efforts. | 0.596 | - | - |
| ***Title:*** Army and Joint Testing Activities<br>***Description:*** Conduct and support Army and Joint Testing Activities. | 0.791 | - | - |
| ***Title:*** FFRDC | 0.001 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF6 / *JADOCS* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** FFRDC | | | |
| ***Title:*** SBIR/STTR | 0.107 | - | - |
| **Accomplishments/Planned Programs Subtotals** | 2.717 | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • B28504: *JOINT AUTOMATED DEEP OPNS COORDINATION SYSTEM* | 1.969 | 1.722 | 1.679 | - | 1.679 | 0.494 | - | - | - | 0.000 | 5.864 |

**Remarks**

**D. Acquisition Strategy**

JADOCS v2.0 is the last version of JADOCS software. JADOCS v2.0 will interoperate with AFATDS. JADOCS v 2.0 will be maintained and sustained until the Joint Users requirements are met by AFATDS and other systems. JADOCS 2.0 is developed under agreement with the LCMC SEC.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | Project (Number/Name)<br>EF6 / *JADOCS* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Development | IA | CECOM LCMC SEC FD : Ft. Sill, OK | 21.525 | 1.221 | | - | | - | | - | | - | 0.000 | 22.746 | - |
| | | **Subtotal** | 21.525 | 1.221 | | - | | - | | - | | - | 0.000 | 22.746 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | Various | PM Mission Command (MC) : APG, MD | 1.400 | 0.596 | | - | | - | | - | | - | 0.000 | 1.996 | - |
| | | **Subtotal** | 1.400 | 0.596 | | - | | - | | - | | - | 0.000 | 1.996 | N/A |

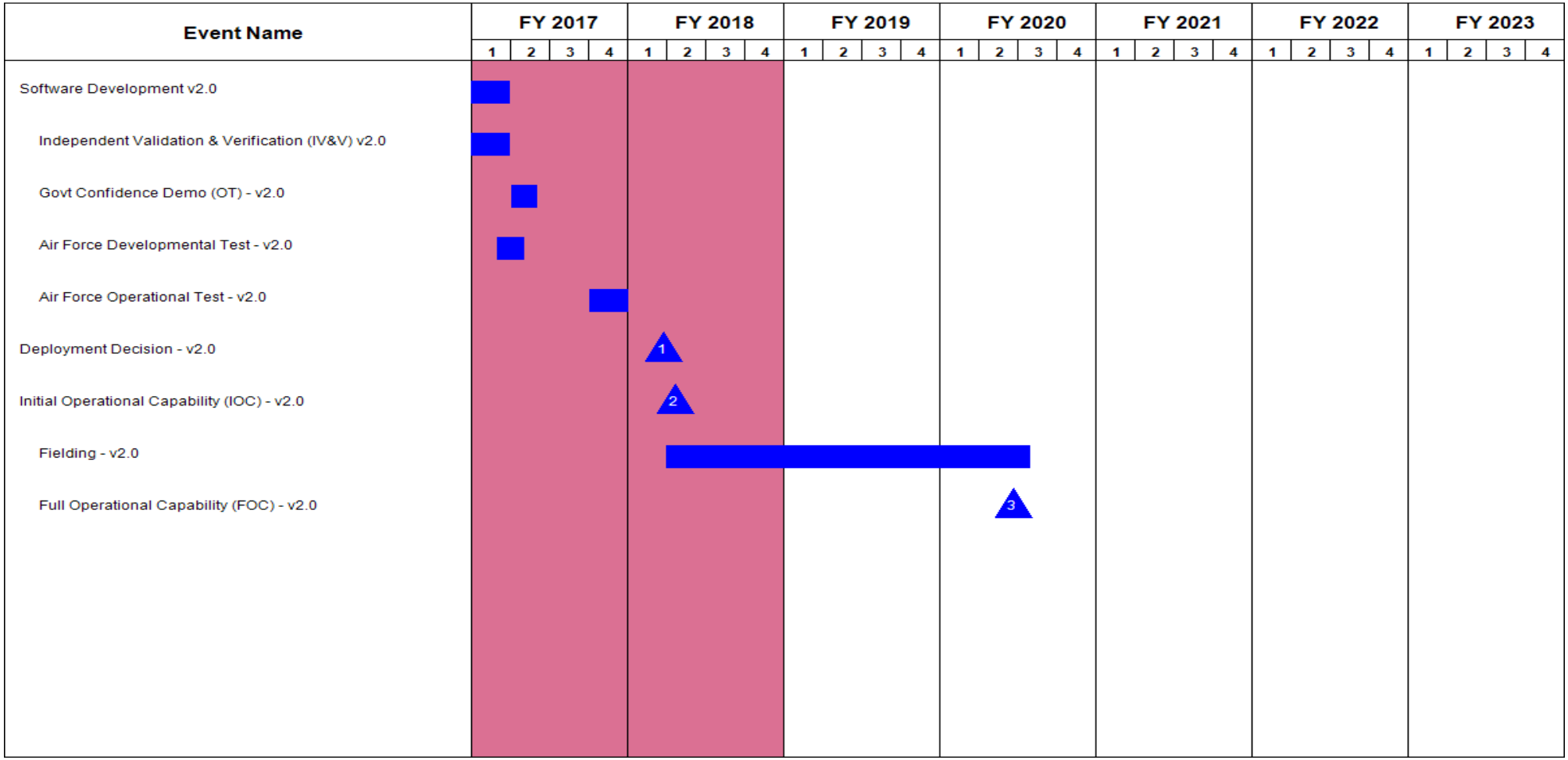
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Army and Joint Test Support | Various | Joint Service Testing : Various | 0.700 | 0.900 | | - | | - | | - | | - | 0.000 | 1.600 | - |
| | | **Subtotal** | 0.700 | 0.900 | | - | | - | | - | | - | 0.000 | 1.600 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 23.625 | 2.717 | | 0.000 | | - | | - | | - | 0.000 | 26.342 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF6 / *JADOCS* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF6 / *JADOCS* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Software Development v2.0 | 3 | 2014 | 1 | 2017 |
| Independent Validation & Verification (IV&V) v2.0 | 3 | 2015 | 1 | 2017 |
| Govt Confidence Demo (OT) - v2.0 | 2 | 2017 | 2 | 2017 |
| Air Force Developmental Test - v2.0 | 1 | 2017 | 2 | 2017 |
| Air Force Operational Test - v2.0 | 4 | 2017 | 4 | 2017 |
| Deployment Decision - v2.0 | 1 | 2018 | 1 | 2018 |
| Initial Operational Capability (IOC) - v2.0 | 2 | 2018 | 2 | 2018 |
| Fielding - v2.0 | 2 | 2018 | 3 | 2020 |
| Full Operational Capability (FOC) - v2.0 | 2 | 2020 | 2 | 2020 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | Project (Number/Name)<br>EF7 / *Pocket-Sized Forward Entry Device (PFED) Inc 2* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF7: *Pocket-Sized Forward Entry Device (PFED) Inc 2* | - | 2.891 | 4.537 | 3.884 | - | 3.884 | 3.118 | 1.508 | 0.000 | 2.648 | 0.000 | 18.586 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Pocket-sized Forward Entry Device (PFED) Increment II is a software application that operates on the Nett Warrior End User Device (EUD). It will provide the dismounted Forward Observer (FO) and Fire Support Teams (FISTs) the capability and functionality to accurately and rapidly locate ground targets and digitally process a Call For Fire. PFED Increment II answers the Mobile Handheld Computing Environment requirement that all handheld applications reside on the Nett Warrior EUD.

FY 2019 funding of $3.884 million supports the evolutionary software development and testing of PFED Increment II and transition to the mounted computing environment.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Program Management Support Costs for PFED Increment II<br>***Description:*** Program support for PFED INC II software development efforts.<br>***FY 2018 Plans:***<br>Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspects of the PFED Inc II program including requirements development, software development efforts, logistics, and business management support.<br>***FY 2019 Plans:***<br>Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspects of the PFED Inc II program including requirements development, software development efforts, logistics, and business management support.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>RDTE management requirements decreasing as development moves to fielding | 0.267 | 0.662 | 0.390 |
| ***Title:*** PFED INC II Software Development<br>***Description:*** PFED INC II Software Development<br>***FY 2018 Plans:***<br>Development and testing of Block 2 capabilities. Complete hardware/software integration with Nett Warrior EUD and MFOCS. Complete software Information Assurance certification.<br>***FY 2019 Plans:*** | 2.453 | 3.525 | 3.244 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF7 / *Pocket-Sized Forward Entry Device (PFED) Inc 2* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Development and testing of Block 2 capabilities. Complete hardware/software integration with Nett Warrior EUD and MFOCS. Complete software Information Assurance certification.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>RDTE development requirements decreasing as development moves to fielding | | | |
| ***Title:*** Testing<br>***Description:*** Conduct and Support Army Testing Activities<br>***FY 2018 Plans:***<br>Prepare and execute Engineering Release Evaluation/Testing.<br>***FY 2019 Plans:***<br>Prepare and execute Engineering Release Evaluation/Testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>RDTE test requirements decreasing as development moves to fielding | 0.171 | 0.350 | 0.250 |
| **Accomplishments/Planned Programs Subtotals** | 2.891 | 4.537 | 3.884 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BZ9851: *BZ9851 POCKET FORWARD ENTRY DEVICE (PFED) - OPA* | 4.340 | 4.213 | 10.644 | - | 10.644 | 3.726 | 3.802 | 5.850 | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

On 18 May 2015, the Milestone Decision Authority (PEO C3T) signed the Acquisition Decision Memorandum (ADM) approving the PFED Increment II Milestone B. The Acquisition Decision Memorandum (ADM) officially approved entry into the Development phase as an Acquisition Category (ACAT) III program. The system received a limited deployment decision in Dec 2016 to enter into operational test and subsequently expects to receive full material release in Jan 2018

PFED Increment II leverages an Army Science and Technology investment by transitioning a software application that has been developed and used in proponent experimentation events (e.g. Army Expeditionary Warrior Experiment (AEWE) and Bold Quest). Upon a successful Milestone B decision in FY2015, this software application transitioned to PM Mission Command to conduct all Army developmental and operational test and evaluation requirements. PFED Increment II will be

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF7 / *Pocket-Sized Forward Entry Device (PFED) Inc 2* |

integrated onto the Nett Warrior End User Devices (EUDs) and will be fielded by PM Soldier Warrior (PM SWAR). Training on the PFED Increment II software will be conducted by PM Mission Command as units are fielded the capability.

PM Mission Command will continue to manage future capability blocks of software development. PM Mission Command will continue to coordinate with PM Soldier Warrior to field and train future versions of the software, as described above.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | Project (Number/Name)<br>EF7 / *Pocket-Sized Forward Entry Device (PFED) Inc 2* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support for PFED Inc2 (CORE) | Sub Allot | PM Mission Command (MC) : APG, MD | - | - | | 0.100 | | 0.100 | | - | | 0.100 | 0.000 | 0.200 | - |
| Program Management Support for PFED Inc2 (Matrix) | IA | Various Mix Orgs (Govt) : APG, MD | - | 0.075 | | 0.226 | | 0.196 | | - | | 0.196 | 0.000 | 0.497 | - |
| Program Management Support for PFED Inc2 (SETA) | C/FFP | CRSA : APG, MD | - | - | | 0.450 | | 0.390 | | - | | 0.390 | 0.000 | 0.840 | - |
| | | **Subtotal** | - | 0.075 | | 0.776 | | 0.686 | | - | | 0.686 | 0.000 | 1.537 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PFED Increment II Software Development efforts | IA | AMRDEC : Redstone, AL | 5.163 | 2.419 | Oct 2017 | 3.048 | | 2.384 | | - | | 2.384 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 5.163 | 2.419 | | 3.048 | | 2.384 | | - | | 2.384 | Continuing | Continuing | N/A |

**Remarks**

SW development contract awarded 6 October 2017

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | Various | PM Mission Command (MC) : APG, MD | 1.003 | 0.151 | | 0.363 | | 0.314 | | - | | 0.314 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 1.003 | 0.151 | | 0.363 | | 0.314 | | - | | 0.314 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | Project (Number/Name)<br>EF7 / *Pocket-Sized Forward Entry Device (PFED) Inc 2* | |

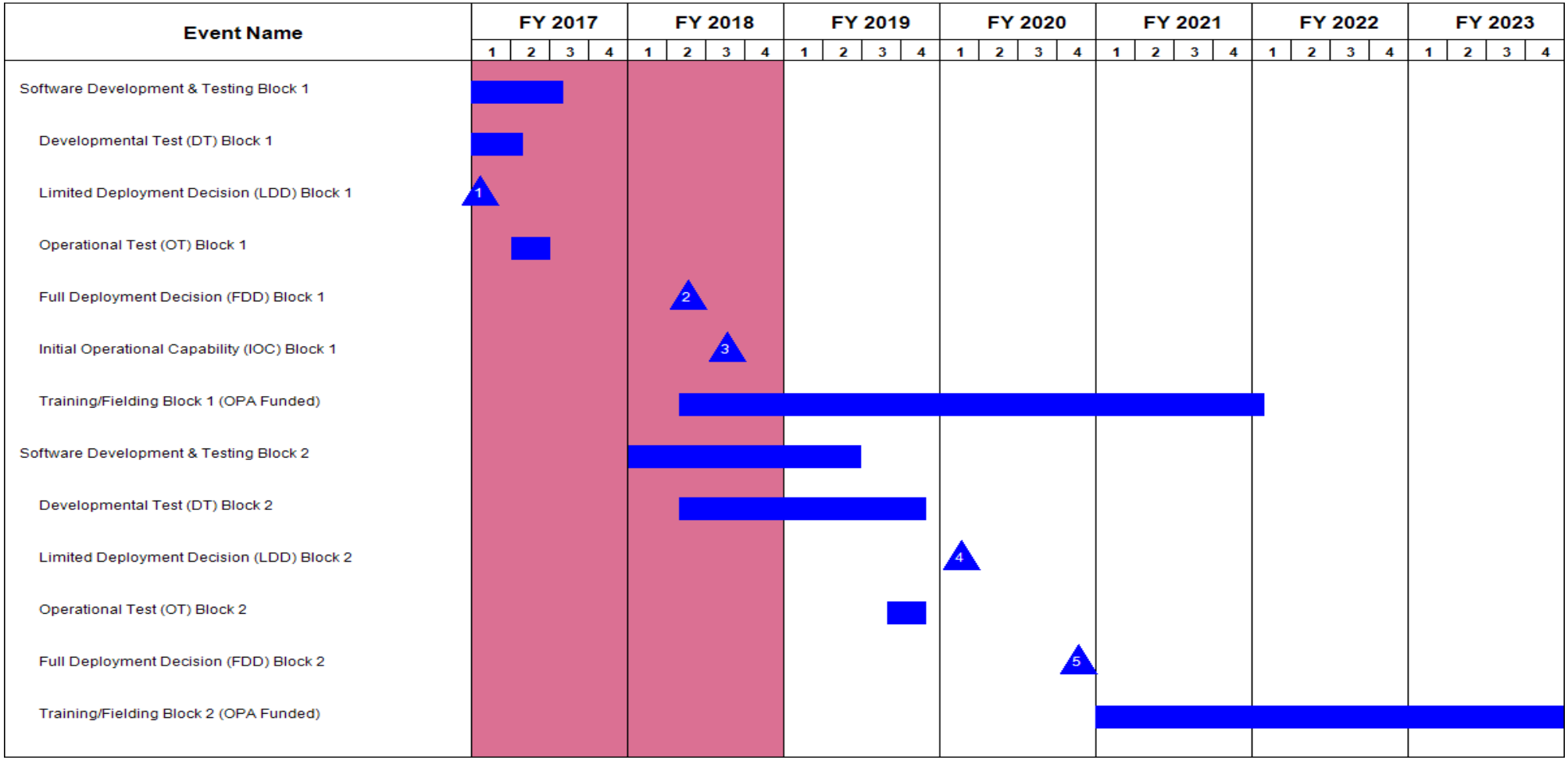
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support (Engineering Release) | Various | Testing : Various | 0.560 | 0.246 | | 0.350 | | 0.500 | | - | | 0.500 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.560 | 0.246 | | 0.350 | | 0.500 | | - | | 0.500 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 6.726 | 2.891 | | 4.537 | | 3.884 | | - | | 3.884 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF7 / *Pocket-Sized Forward Entry Device (PFED) Inc 2* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF7 / *Pocket-Sized Forward Entry Device (PFED) Inc 2* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Software Development & Testing Block 1 | 3 | 2015 | 3 | 2017 |
| Developmental Test (DT) Block 1 | 1 | 2017 | 1 | 2017 |
| Limited Deployment Decision (LDD) Block 1 | 1 | 2017 | 1 | 2017 |
| Operational Test (OT) Block 1 | 2 | 2017 | 2 | 2017 |
| Full Deployment Decision (FDD) Block 1 | 2 | 2018 | 2 | 2018 |
| Initial Operational Capability (IOC) Block 1 | 3 | 2018 | 3 | 2018 |
| Training/Fielding Block 1 (OPA Funded) | 2 | 2018 | 1 | 2022 |
| Software Development & Testing Block 2 | 1 | 2018 | 2 | 2019 |
| Developmental Test (DT) Block 2 | 2 | 2018 | 4 | 2019 |
| Limited Deployment Decision (LDD) Block 2 | 1 | 2020 | 1 | 2020 |
| Operational Test (OT) Block 2 | 3 | 2019 | 4 | 2019 |
| Full Deployment Decision (FDD) Block 2 | 4 | 2020 | 4 | 2020 |
| Training/Fielding Block 2 (OPA Funded) | 1 | 2021 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | Project (Number/Name)<br>EF8 / *AFATDS Increment 1* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF8: *AFATDS Increment 1* | - | 23.804 | 28.983 | 27.070 | - | 27.070 | 29.689 | 16.791 | 5.261 | 5.191 | 0.000 | 136.789 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Advanced Field Artillery Tactical Data System (AFATDS) 7.0 modernizes the existing AFATDS software currently in the field. AFATDS 7.0 enhances the existing AFATDS baseline by: (1) Providing a modernized web service based backend that will simplify long-term maintenance of the software, (2) Bringing AFATDS into full compliance with the Army's Common Operating Environment (COE) Command Post Computing Environment (CPCE) initiative and (3) Enhancing overall usability of the system through the implementation of a role-based capability architecture with embedded training that allows the AFATDS operator to receive on-the-spot training for any aspect of AFATDS via interactive instruction.

FY 2019 funding in the amount of $27.070 million will be used to continue development efforts on AFATDS version 7.0.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Program Management Costs for AFATDS software development<br>***Description:*** Provide program support for AFATDS software development efforts.<br>***FY 2018 Plans:***<br>Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspect of the AFATDS program including requirements analysis, software development efforts, logistics, and business management support.<br>***FY 2019 Plans:***<br>Provide Program Management Office (PMO) support (Core, Matrix, and SETA) for all aspect of the AFATDS program including requirements analysis, software development efforts, logistics, and business management support.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Economic adjustment. | 2.350 | 2.560 | 2.416 |
| ***Title:*** AFATDS software development efforts<br>***Description:*** Development of AFATDS software - including V6.8.1.1 and V7.0<br>***FY 2018 Plans:***<br>FY 2018 Development will focus on the AFATDS v7.0 effort to include building fire support, fire control and fire direction role based capabilities, integrating available CP CE v3 common components, and updating the user interface for the application.<br>***FY 2019 Plans:*** | 19.931 | 26.423 | 24.654 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF8 / *AFATDS Increment 1* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| FY 2019 Development will continue to focus on the AFATDS v7.0 effort to include building fire support, fire control and fire direction role based capabilities, integrating available CP CE v3 common components, and updating the user interface for the application.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Software development continuing at a steady rate. | | | |
| ***Title:*** Defensive Cyber Tools<br>***Description:*** Integration of Tactical Public Key Infrastructure (T-PKI) defensive cyber tools into AFATDS v7.0 | 1.100 | - | - |
| ***Title:*** Operational and Developmental Testing<br>***Description:*** Conduct and support test activities for AFATDS development. | 0.423 | - | - |
| **Accomplishments/Planned Programs Subtotals** | 23.804 | 28.983 | 27.070 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • B28620: *MOD OF IN-SVC EQUIP, AFATDS* | 2.598 | 2.765 | 6.830 | - | 6.830 | 6.063 | 6.006 | 0.878 | 4.575 | 0.000 | 29.715 |

**Remarks**

**D. Acquisition Strategy**

On 13 May 2015, the Army Acquisition Executive (AAE) determined that a modernization of the existing AFATDS software code is required to comply with Army Common Operating Environment (COE) standards to be executed as AFATDS 7.0. In V7.0, the PM will re-design AFATDS to provide the operator role/duty-based interaction, a dynamic embedded training capability, integration of COE compliant architectures and allowance for more efficient insertion of future capabilities.

Development of future AFATDS capabilities will be considered based on requirements approved through the Fires Center of Excellence (FCoE) Tactical Software Requirements Governance Board.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF8 / *AFATDS Increment 1* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support for AFATDS (Core) | Sub Allot | PM Mission Command (MC) : APG, MD | 2.491 | 0.707 | | 0.810 | | 0.837 | | - | | 0.837 | 0.000 | 4.845 | - |
| Program Management Support for AFATDS (Matrix) | IA | Various Matrix Orgs (Govt) : Aberdeen PG, MD | 0.890 | 0.900 | | 1.010 | | 0.968 | | - | | 0.968 | 0.000 | 3.768 | - |
| Program Management Support for AFATDS (SETA Contr) | C/FFP | CRSA : Aberdeen PG, MD | 0.500 | 0.743 | Feb 2017 | 0.540 | | 0.627 | | - | | 0.627 | 0.000 | 2.410 | - |
| Program Management Support for AFATDS (FFRDC) | FFRDC | MITRE : APG, MD | - | - | | 0.200 | | 0.183 | | - | | 0.183 | 0.000 | 0.383 | - |
| | | **Subtotal** | 3.881 | 2.350 | | 2.560 | | 2.615 | | - | | 2.615 | 0.000 | 11.406 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Development of AFATDS Version 6.8.1.1 | C/CPFF | Raytheon Systems Corp. : Ft. Wayne, IN | 21.636 | - | | - | | - | | - | | - | 0.000 | 21.636 | 33.188 |
| Software Development of AFATDS Version 7.0 | C/CPFF | TBD : TBD | 3.000 | 18.931 | Jun 2017 | 26.423 | | 24.455 | | - | | 24.455 | 0.000 | 72.809 | - |
| | | **Subtotal** | 24.636 | 18.931 | | 26.423 | | 24.455 | | - | | 24.455 | 0.000 | 94.445 | N/A |

**Remarks**

AFATDS 7.0 contract awarded 8 June 2017

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | Project (Number/Name)<br>EF8 / *AFATDS Increment 1* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Information Assurance and Engineering Support for AFATDS requirements | C/CPFF | CSC : Various Locations | 1.060 | - | | - | | - | | - | | - | 0.000 | 1.060 | - |
| Defensive Cyber Tools (T-PKI) | TBD | TBD : TBD | - | 1.100 | | - | | - | | - | | - | 0.000 | 1.100 | - |
| Risk Reduction Analysis, Solution Refinement, Requirements Development, RFP Development. | IA | US Army Operational Test Command : Ft Hood, Tx | 1.506 | - | | - | | - | | - | | - | 0.000 | 1.506 | - |
| | | **Subtotal** | 2.566 | 1.100 | | - | | - | | - | | - | 0.000 | 3.666 | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Confidence Demo for AFATDS V6.8.x requirements. | IA | Army Test & Evaluation Command (ATEC)/Fires Test Directorate (FTD) : Various Locations | 0.626 | - | | - | | - | | - | | - | 0.000 | 0.626 | - |
| Independent Verification and Validation of AFATDS V7.0 requirements | C/CPFF | Engility : Various Locations | 0.515 | 1.023 | | - | | - | | - | | - | 0.000 | 1.538 | - |
| Developmental Testing for AFATDS v7.0 | IA | Multiple Govt Test Agencies (ATEC, ATC, EPG) : Multiple | 0.350 | 0.400 | | - | | - | | - | | - | 0.000 | 0.750 | - |
| | | **Subtotal** | 1.491 | 1.423 | | - | | - | | - | | - | 0.000 | 2.914 | N/A |

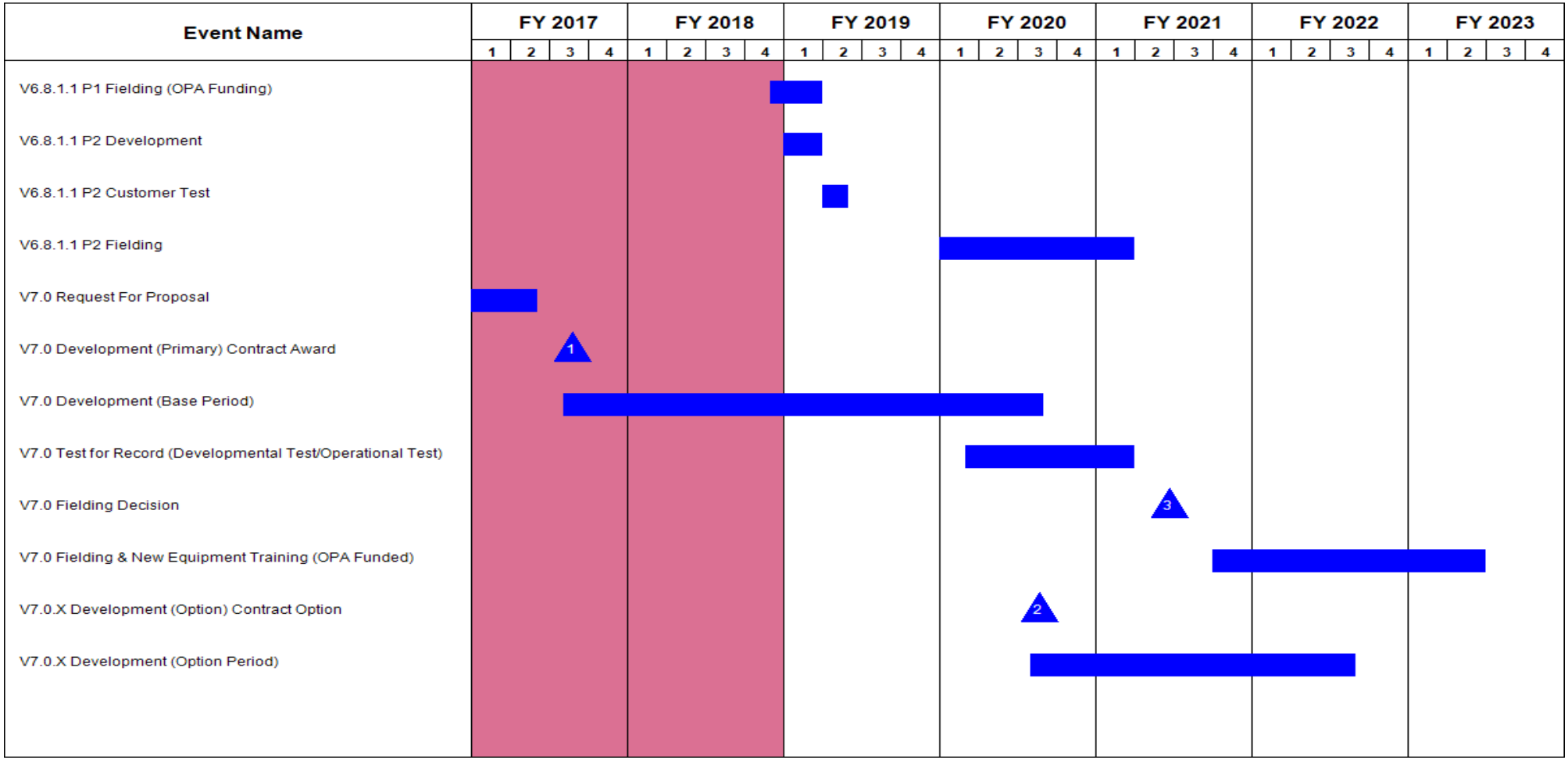
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 32.574 | 23.804 | | 28.983 | | 27.070 | | - | | 27.070 | 0.000 | 112.431 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | Project (Number/Name)<br>EF8 / *AFATDS Increment 1* | |

| | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF8 / *AFATDS Increment 1* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)* | **Project (Number/Name)**<br>EF8 / *AFATDS Increment 1* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| V6.8.1.1 P1 Fielding (OPA Funding) | 4 | 2018 | 1 | 2019 |
| V6.8.1.1 P2 Development | 1 | 2019 | 1 | 2019 |
| V6.8.1.1 P2 Customer Test | 2 | 2019 | 2 | 2019 |
| V6.8.1.1 P2 Fielding | 1 | 2020 | 1 | 2021 |
| V7.0 Request For Proposal | 4 | 2016 | 2 | 2017 |
| V7.0 Development (Primary) Contract Award | 3 | 2017 | 3 | 2017 |
| V7.0 Development (Base Period) | 3 | 2017 | 3 | 2020 |
| V7.0 Test for Record (Developmental Test/Operational Test) | 1 | 2020 | 1 | 2021 |
| V7.0 Fielding Decision | 2 | 2021 | 2 | 2021 |
| V7.0 Fielding & New Equipment Training (OPA Funded) | 4 | 2021 | 2 | 2023 |
| V7.0.X Development (Option) Contract Option | 3 | 2020 | 3 | 2020 |
| V7.0.X Development (Option Period) | 3 | 2020 | 3 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 340.353 | 343.175 | 411.927 | - | 411.927 | 335.086 | 296.425 | 246.195 | 172.710 | Continuing | Continuing |
| 280: *Recov Veh Improv Prog* | - | 0.000 | 5.000 | 13.321 | - | 13.321 | 15.159 | 94.591 | 85.054 | 57.436 | 0.000 | 270.561 |
| 330: *Abrams Tank Improve Prog* | - | 117.707 | 108.570 | 164.840 | - | 164.840 | 105.901 | 66.332 | 58.338 | 53.425 | 0.000 | 675.113 |
| 371: *Bradley Improve Prog* | - | 107.330 | 130.863 | 166.985 | - | 166.985 | 152.705 | 87.933 | 80.389 | 48.851 | Continuing | Continuing |
| 431: *M113 IMPROVEMENTS* | - | 0.000 | 15.000 | 7.915 | - | 7.915 | 4.943 | 0.000 | 0.000 | 0.000 | 0.000 | 27.858 |
| EE2: *Stryker Improvement* | - | 114.988 | 80.642 | 58.866 | - | 58.866 | 56.378 | 47.569 | 22.414 | 12.998 | 0.000 | 393.855 |
| FD8: *Light Armored Vehicle Improvement* | - | 0.328 | 3.100 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.428 |

**Note**

PE Number 0203735A/Project EE2 funds development efforts for the Stryker Double V-Hull A1 (DVH A1) Engineering Change Proposal (ECP) (formerly named Stryker ECP 1), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS) (formerly named Stryker ONS Lethality), Stryker Survivability Enhancements, and Stryker Lethality ECPs (formerly referred to as Stryker ECP 2). PE Number 0203735A/Project FD8 funds the development of LAV25 enhancements.

**A. Mission Description and Budget Item Justification**

This Program Element (PE) corrects vehicle deficiencies identified during Army operations; continues technical system upgrades to include the integration of applicable technologies on ground systems; addresses needed evolutionary enhancements to tracked combat vehicles; and develops technology improvements which have application to or insertion opportunities across multiple Ground Combat Systems vehicles. This PE provides combat effectiveness and Operating and Support (O&S) cost reduction enhancements for the Abrams tanks, Bradley Fighting Vehicles and Stryker Family of Vehicles (FOVs) through a series of product improvements.

The strategy for Abrams and Bradley will focus on incrementally delivering capability to the warfighter to meet both near-term limitations as well as mitigating gaps and maintaining combat overmatch in the future. This effort was approved by the Army Acquisition Executive in 3Q FY 2011.

The Recovery Vehicle Improvement program is a group of ECPs that will allow the current recovery vehicle to regain Single Vehicle Recovery (SVR) for the heaviest tracked combat vehicle. The current M88A2 is not capable of Single Vehicle Recovery of the M1A2 SEPv2 in all situations and the M1A2 SEPv3 fielding in FY 2020 will further exacerbate the recovery problem.

The Abrams M1A2 SEP V2 and M2/M3A3 Bradley Fighting Vehicles are at or exceed Space, Weight, and Power-Cooling (SWaP-C) limitations. In order to host and restore lost platform capability, the Abrams Tank and Bradley Fighting Vehicle programs will execute a series of Engineering Change Proposals (ECPs) to support the current embedded systems and to facilitate integration of technologies currently in development under other existing Programs of Record. The ECPs are not intended to

exceed the operational capability outlined in current system requirements documents, but rather to ensure that the existing system performance is not further degraded and that Army mission equipment packages can be integrated on the Abrams and Bradley Platforms.

M113 improvements will develop an affordable solution for upgrading the M113s to enhance protection, survivability, mobility and power generation to support the current and future network systems. This will provide the necessary enhancements to the M113 capability for Echelons Above Brigade (EAB) units with priority to the forward deployed units and equipment sets. The Armored Multi Purpose Vehicle (AMPV) program will replace all M113 family of vehicles in Armored Brigade Combat Teams (ABCT).

Stryker Improvement will address the development of Lethality, Survivability, Mobility, and Communication, Command and Control (C3) improvements within the Stryker Family of Vehicles (FoV). Principal development efforts include upgrades associated with the Stryker Double V-Hull (DVH) A1 Engineering Change Proposal (ECP), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS), Stryker Survivability Enhancement, and Stryker Lethality ECPs. DVH A1 ECP power generation, suspension, and network upgrades will both restore Stryker DVH Space, Weight, and Power-Cooling (SWaP-C) lost as a result of incorporating vehicle changes to counter threats encountered during deployment operations while allowing the future network to be hosted without further degradation in vehicle protection and mobility. The Stryker 30mm ICVD ONS effort will address an Urgent Operational Need to increase the firepower of Stryker Infantry Carrier Vehicles (ICV) within the US Army European Command (USAREUR). The 30mm ICVD ONS effort will integrate a 30mm-equipped weapon station that will provide USAREUR with precision direct firepower to overwhelm the enemy in encounter actions and suppressive fire to preserve mounted and dismounted freedom of movement. The Stryker Survivability Enhancement will address evolving threats by assessing survivability improvements, to include passive protection systems, active protection systems, and an under-armor fire capability for Stryker-equipped reconnaissance troops. Stryker Lethality ECP efforts focus on the integration of a suite of complementary Mission Equipment Package (MEP) lethality upgrades (medium caliber weapon ECP, Common Remotely Operated Weapon Station-Javelin (CROWS-J) ONS, CROWS-J ECP, Anti-Tank Guided Missile (ATGM) ECP, common masted sensor ECP, and other capabilities) that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs) and address Remote Weapon Station (RWS) and Improved Target Acquisitions System (ITAS) obsolescence issues that will impact fleet sustainment beginning in FY2020.

Light Armored Vehicle improvement program will design, test and modify two Light Armored Vehicles (LAV-25A2s) for Low Velocity Air Drop (LVAD) to inform operational concepts for Infantry Brigade Combat Teams (IBCT) in support of Global Response Force early entry operations. This will directly support the expeditionary maneuver excursion that will be conducted by the XVIII Airborne Corps in FY17-18.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 327.357 | 343.175 | 422.303 | - | 422.303 |
| Current President's Budget | 340.353 | 343.175 | 411.927 | - | 411.927 |
| Total Adjustments | 12.996 | 0.000 | -10.376 | - | -10.376 |
| • Congressional General Reductions | -0.147 | - | | | |
| • Congressional Directed Reductions | -12.826 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 38.000 | - | | | |
| • SBIR/STTR Transfer | -11.531 | - | | | |
| • Adjustments to Budget Years | - | - | -10.376 | - | -10.376 |
| • Amended 2017 | -0.500 | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>280 / *Recov Veh Improv Prog* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 280: *Recov Veh Improv Prog* | - | 0.000 | 5.000 | 13.321 | - | 13.321 | 15.159 | 94.591 | 85.054 | 57.436 | 0.000 | 270.561 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The M88A2 Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES), designated as an ACAT IC program on 15 Jun 2016, has been providing towing, winching, and hoisting operations to support battlefield recovery operations and evacuation of heavy tanks and other tracked combat vehicles since its production and deployment in 1998. The HERCULES recovers tanks mired to different depths, removes M1 Abrams turrets and power packs, and uprights overturned heavy combat vehicles. Currently, the M88A2 is unable to safely perform Single Vehicle Recovery (SVR) of the Abrams tank in all conditions, due to added weight/survivability improvements made to the tank. In order to ensure SVR is met, Project Director- Main Battle Tank Systems (PD-MBTS) will develop and integrate technologies for the M88A2 HERCULES through an Operations and Support (O&S) initiative to meet its operational requirements of SVR throughout its life cycle. This initiative is not intended to exceed current operational capability, but will instead regain SVR capability of the heaviest tracked combat vehicle.

Technical assessments and analyses will be used to evaluate design solutions to meet SVR, and inform key program decision points. The goal of the assessments will be to provide confidence to Army Leadership that a M88A2 HERCULES solution is affordable, achievable, and feasible using existing technology with manageable risk. Limited analyses, conducted to date, suggests that upgrades to the M88A2 track, suspension, hydraulics, engine, transmission and other related components are required.

FY 2019 Base dollars will be used to continue the development of SVR ECP, initiate fabrication of vehicle prototypes, and continue the development of the transmission upgrade ECP (the longest developmental item).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Program Management (PMO) Support | - | 2.000 | 2.000 | - | 2.000 |
| ***Description:*** Program Management Office Support includes Systems Engineering, Government and Contractor salaries, travel and other support costs required to effectively manage the program.<br><br>***FY 2018 Plans:***<br>The United States Government (USG) will conduct system and sub-system tests/analysis to inform decisions for key vehicle sub-systems such as engine, suspension, track, transmission and other related components to inform the Scope of Work for the Development contract for the M88A2 HERCULES program. The analysis and testing will occur at various government sites (Army Test and Evaluation Command (ATEC), Aberdeen Proving | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>280 / *Recov Veh Improv Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Ground (APG), Yuma Proving Grounds (YPG) and TARDEC). Contractors will conduct subsystem trades, technical evaluations, requirements development, and test support.<br>***FY 2019 Base Plans:***<br>Continue the United States Government (USG) acquisition activities to support a contractor full vehicle prototype delivery in FY 2021, continue the transmission ECP contract with a target completion in FY 2020. These activities will include conducting contractor surveillance, receipt of CDRLS, contract changes as required and conducting of key program milestones such as SRR. | | | | | |
| ***Title:*** Test and Evaluation<br>***Description:*** Concept and Evaluation activities include contractor and government testing, as well as test documentation development. Contractor prove-out testing will be conducted using U.S. Army test facilities. Evaluation activities also include the testing of other platform inbound technologies, along with the development of test documentation to include Test and Evaluation Master Plans, test procedures and reports.<br>***FY 2018 Plans:***<br>USG will begin conducting system/sub-system tests on engine, suspension, track, etc. The concept, demonstration and evaluation events will occur at various government sites (Army Test and Evaluation Command (ATEC), Aberdeen Proving Ground (APG), Yuma Proving Grounds (YPG) and TARDEC. Contractor will begin conducting sub-system trades, technical evaluations, requirements development, test support, deliverables, and powertrain upgrades. Begin developing the Test and Evaluation Master Plan (TEMP) to inform Request for Proposal (RFP) and award in FY 2020.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Refinements to schedule highlight no need for test and evaluation in FY 2019. | - | 3.000 | - | - | - |
| ***Title:*** Product Development<br>***Description:*** Design, and Development of Engineering Change Proposals (ECPs).<br>***FY 2019 Base Plans:***<br>Funding supports contractor development of transmission and modernization ECPs.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding increase from FY 2018 to FY 2019 allows for the program to start Product Development efforts. | - | - | 11.321 | - | 11.321 |
| **Accomplishments/Planned Programs Subtotals** | - | 5.000 | 13.321 | - | 13.321 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>280 / *Recov Veh Improv Prog* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • GA0570: *Improved Recovery Vehicle (M88A2 HERCULES)* | 91.963 | 72.402 | 110.500 | 42.354 | 152.854 | - | - | 10.500 | - | 215.454 | 543.173 |
| • G80571: *M88 FOV MODS* | 8.685 | 4.826 | 4.517 | - | 4.517 | - | - | - | - | 0.000 | 18.028 |

**Remarks**

**D. Acquisition Strategy**

The M88A2 HERCULES O&S initiative is designed to regain Single Vehicle Recovery (SVR) capability. An Acquisition Strategy is being developed for this effort.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>280 / *Recov Veh Improv Prog* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Office (PMO) Support | MIPR | PMO Support Offices : Various | - | - | | 2.000 | Dec 2017 | 2.000 | Dec 2018 | - | | 2.000 | 0.000 | 4.000 | - |
| | | **Subtotal** | - | - | | 2.000 | | 2.000 | | - | | 2.000 | 0.000 | 4.000 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development | Various | Various : TBD | - | - | | - | | 11.321 | Dec 2018 | - | | 11.321 | 0.000 | 11.321 | - |
| | | **Subtotal** | - | - | | - | | 11.321 | | - | | 11.321 | 0.000 | 11.321 | N/A |

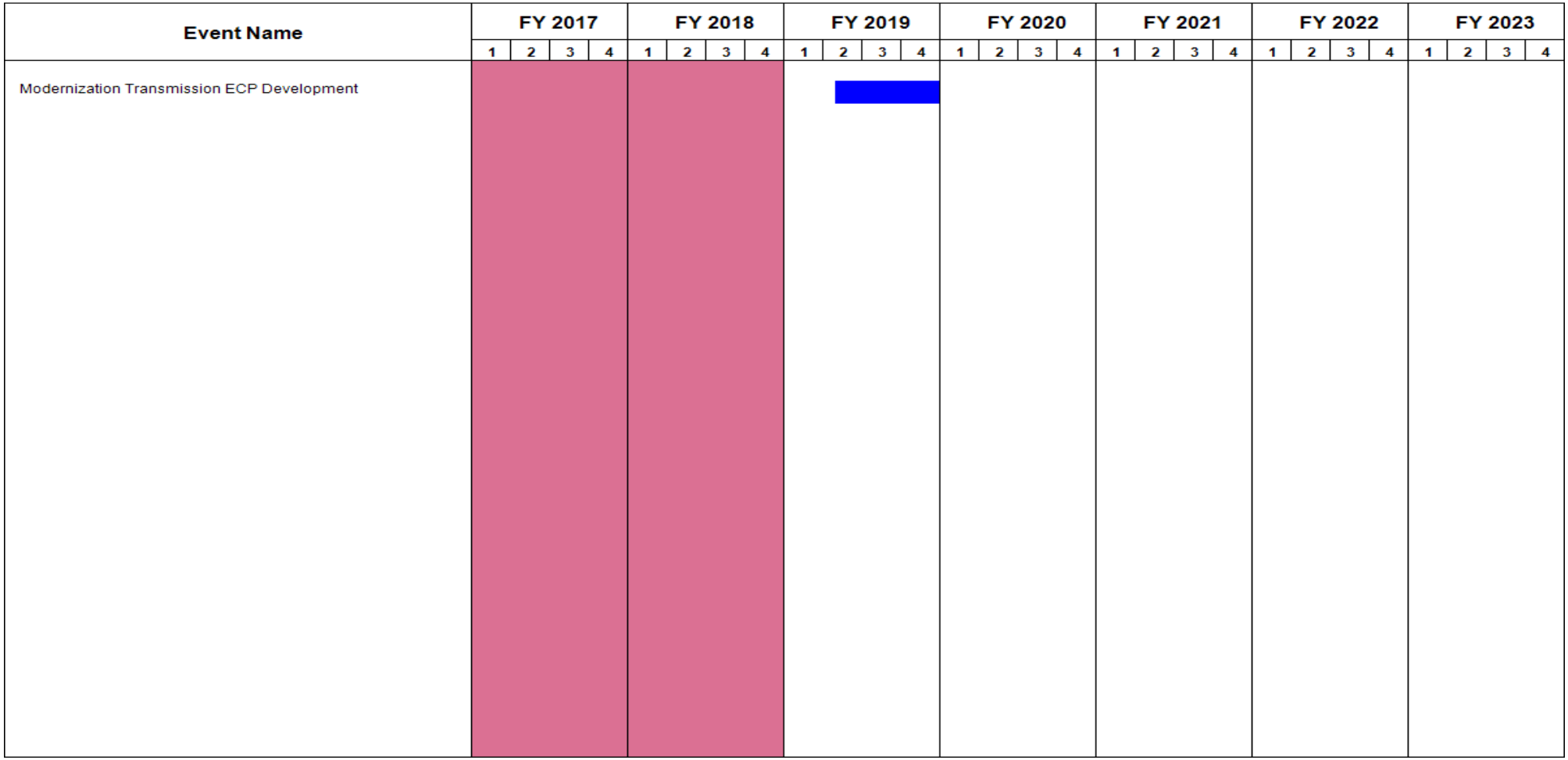
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Evaluation | Various | Various : Various | - | - | | 3.000 | Jul 2018 | - | | - | | - | 0.000 | 3.000 | - |
| | | **Subtotal** | - | - | | 3.000 | | - | | - | | - | 0.000 | 3.000 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 5.000 | | 13.321 | | - | | 13.321 | 0.000 | 18.321 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>280 / *Recov Veh Improv Prog* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>280 / *Recov Veh Improv Prog* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Modernization Transmission ECP Development | 2 | 2019 | 4 | 2019 |

**Note**

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| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>330 / *Abrams Tank Improve Prog* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 330: *Abrams Tank Improve Prog* | - | 117.707 | 108.570 | 164.840 | - | 164.840 | 105.901 | 66.332 | 58.338 | 53.425 | 0.000 | 675.113 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Army has approved Engineering Change Proposals (ECPs) for the Abrams Main Battle Tank to restore lost capability, host inbound technologies, and to meet objective performance requirements called out in approved platform requirements documents. The strategy for Abrams will focus on incrementally delivering capability to the warfighter to meet both near-term limitations as well as mitigating gaps and maintaining combat overmatch in the future. This approach was approved by the Army Acquisition Executive in 3Q FY2011.

The Abrams vehicle is at or exceeds Space, Weight, and Power-Cooling (SWaP-C) limitations. In order to restore lost platform capability, the Abrams Tank will execute a series of ECPs to support the current embedded systems and to facilitate integration of technologies currently in development. The ECPs are not intended to exceed the operational capability outlined in current system requirements documents, but rather to ensure that the existing system performance is not further degraded and that Army mission equipment packages can be integrated on the Abrams. The ECPs will incorporate lost power generation and distribution technologies, force protection and survivability improvements to counter evolving threats to include, but not limited to Active Protection Systems, technologies to mitigate obsolescence issues, in-bound technologies under development, and technologies to decrease the overall weight of the tank and technologies in support of any validated Army requirement.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Abrams Power Engineering Change Proposal (ECP) 1A | 10.000 | 7.998 | 12.283 | - | 12.283 |
| ***Description:*** The improvements implemented through the Abrams Power ECP 1A program will restore lost power generation and distribution, mitigate impending obsolescence, and incorporate inbound technologies currently under development. | | | | | |
| ***FY 2018 Plans:***<br>The USG will complete Production Prove-Out Test (PPT). The USG will begin Production Qualification Testing (PQT), Live Fire Test and Evaluation (LFT&E), and preparations for Follow-on Operational Test and Evaluation (FOT&E). The team will continue to complete root cause and corrective actions (hardware and software) for failures found during testing. Logistics will complete technical manual development and begin conducting the logistics demonstration. | | | | | |
| ***FY 2019 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>330 / *Abrams Tank Improve Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| The USG will complete Live Fire Test and Evaluation (LFT&E). The USG will continue Production Qualification Testing (PQT) and begin Follow-on Operational Test and Evaluation (FOT&E). Logistics will finalize technical manual development and complete the logistics demonstration.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>The ECP 1A increase in FY19 funding is needed to cover logistics product development in support of log demo. The additional funds will also cover the start of Production Qualification Test support. | | | | | |
| ***Title:*** Training Device Updates<br>***Description:*** Development and design of training device upgrades to reflect upgrades to the vehicle.<br>***FY 2018 Plans:***<br>Development, design, test, and evaluation activities of training device upgrade kits.<br>***FY 2019 Base Plans:***<br>Continue development, design, test, and evaluation activities of training device upgrade kits.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase in FY19 is due to additional training device upgrades (maintenance trainers) coming on line in FY19 that were not part of the FY18 work. | - | 3.300 | 7.231 | - | 7.231 |
| ***Title:*** Abrams Lethality Engineering Change Proposal (ECP) 1B<br>***Description:*** The Abrams Lethality ECP 1B program consists of lethality improvements. The primary focus is the integration of 3GEN Forward Looking Infrared (FLIR) and the integration of Ammunition Data Link (ADL) for the Advanced Multi-purpose (AMP) round. Additional improvements to the target acquisition sensors consist of inclusion of color cameras, laser capabilities, and image processing improvements. Other potential improvements consist of an improved environmental control system, laser warning receiver, vehicle smoke generation, and weight reduction efforts. Trade studies, analysis and technology maturation will be performed to evaluate prospective improvements, along with obsolescence mitigation, and incorporation of inbound technologies currently under development.<br>***FY 2018 Plans:***<br>ECP 1B will continue preliminary design efforts. The primary tasks will be focused on systems engineering, design trade studies, engineering modeling and analysis, initial hardware mockups, and software development. | 25.452 | 60.561 | 110.463 | - | 110.463 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>330 / *Abrams Tank Improve Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Early hardware will be used to start Design Verification Testing (DVT). PM Abrams will continue to integrate the Advanced Multi-Purpose (AMP) round into the Abrams family of vehicles (FOV).<br>***FY 2019 Base Plans:***<br>ECP 1B will complete a Preliminary Design Review (PDR) in 1Q FY19 and begin critical design efforts. The primary tasks will be focused on systems engineering, design trade studies, engineering modeling and analysis, initial hardware mockups, and software development. Early hardware will be used to continue Design Verification Testing (DVT). Test and logistics planning will be completed throughout FY19. PM Abrams will continue to integrate the Advanced Multi-Purpose (AMP) round into the Abrams family of vehicles (FOV).<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>The ECP 1B program is ramping up from FY18 to FY19 to complete the Preliminary Design Review (PDR) and the majority of the Critical Design Phase. Significant long lead material and subcontractor labor will increase throughout FY19. | | | | | |
| ***Title:*** Program Management Office (PMO) Support<br>***Description:*** Program Management Office Support includes Systems Engineering and Government and Contractor salaries, travel and other support costs required to effectively manage the program.<br>***FY 2018 Plans:***<br>Continue Government Systems Engineering and Program Management office support in FY2018. This will include labor, training, travel, supplies, and equipment to effectively manage the program.<br>***FY 2019 Base Plans:***<br>Continue Government Systems Engineering and Program Management office support in FY2019. This will include labor, training, travel, supplies, and equipment to effectively manage the program.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program Management has decreased slightly in FY19 due to completion of some SEP V3 program tasks. | 7.337 | 12.620 | 11.873 | - | 11.873 |
| ***Title:*** Test & Evaluation - Engineering Change Proposal (ECP) 1A<br>***Description:*** Test and Evaluation activities includes contractor and government testing, as well as test documentation development. Contractor shakedown/proveout testing will be conducted using U.S. Army test facilities. Government development testing of prototype vehicles will evaluate vehicle performance, to include Reliability, Availability, and Maintainability testing. Early User evaluation will also be performed. Test and | 7.234 | 24.091 | 22.990 | - | 22.990 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>330 / *Abrams Tank Improve Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| evaluation activities also include the testing of other platform inbound technologies, along with the development of test documentation to include Test and Evaluation Master Plans, test procedures, and reports.<br><br>***FY 2018 Plans:***<br>In FY18 the USG will complete ECP 1a Production Prove-Out Test (PPT) including all automotive RAM testing, and EMI/EMC testing. The USG will also conduct ECP 1a Live Fire Test and Evaluation (LFT&E) and transportability testing. The USG will begin ECP 1a Production Qualification Testing (PQT) and preparations for Follow-on Operational Test and Evaluation (FOT&E). These test and evaluation events will occur at various sites (Aberdeen Proving Ground, Yuma Proving Ground, and White Sands Missile Range).<br><br>***FY 2019 Base Plans:***<br>The USG will complete Live Fire Test and Evaluation (LFT&E). The USG will continue Production Qualification Testing (PQT) and begin Follow-on Operational Test and Evaluation (FOT&E).<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>ECP 1A live fire testing wraps up half way through FY19 and requires slightly less funding than required in FY18. | | | | | |
| ***Title:*** Survivability Enhancements<br><br>***Description:*** PM Abrams will integrate and test survivability, lethality, mobility, reliability, and architecture improvements on the Abrams Family of Vehicles. Force protection and survivability improvements to counter evolving threats include, but are not limited to, Active Protective Systems. Lethality improvements include, but are not limited to, cannon and ammunition upgrades. | 67.684 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 117.707 | 108.570 | 164.840 | - | 164.840 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • GA0750: *Abrams Upgrade Program* | 276.829 | 717.800 | 1,075.999 | 455.000 | 1,530.999 | 1,118.156 | 801.009 | 832.481 | 1,044.492 | Continuing | Continuing |
| • GA0700: *M1 Abrams Tank (MOD)* | 492.044 | 387.526 | 927.600 | 34.000 | 961.600 | 284.209 | 289.323 | 269.175 | 286.432 | Continuing | Continuing |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>330 / *Abrams Tank Improve Prog* |

**D. Acquisition Strategy**

Abrams Power ECP 1A: Research & Development Contract - Sole Source, Cost Plus Incentive Fee (CPIF); ECP 1B - Research & Development Contract - Sole Source, Cost Plus Incentive Fee (CPIF)

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>330 / *Abrams Tank Improve Prog* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abrams ECP 1A | SS/CPIF | General Dynamics Land Systems : Sterling Heights, MI | 327.519 | 3.613 | Feb 2017 | 7.998 | Feb 2018 | 5.642 | Feb 2019 | - | | 5.642 | Continuing | Continuing | Continuing |
| ECP 1A Training Device Upgrades | MIPR | PEO, STRI : Orlando, FL | - | - | | 3.300 | Dec 2017 | 7.231 | Dec 2018 | - | | 7.231 | Continuing | Continuing | Continuing |
| Abrams ECP 1B | SS/CPIF | General Dynamics Land Systems : Sterling Heights, MI | 15.969 | 18.324 | Aug 2017 | 58.561 | Nov 2017 | 110.463 | Nov 2018 | - | | 110.463 | Continuing | Continuing | Continuing |
| Advanced Multi-Purpose (AMP) Round | SS/CPIF | General Dynamics Land Systems : Sterling Heights, MI | - | 7.128 | Sep 2017 | 2.000 | Mar 2018 | - | | - | | - | 0.000 | 9.128 | - |
| Survivability Enhancements | Various | US Army TARDEC; Rafael Advanced Defense Systems; General Dynamics Land Systems (GDLS) : Sterling Heights, MI | 10.645 | 41.243 | Dec 2016 | - | | - | | - | | - | 0.000 | 51.888 | - |
| | | **Subtotal** | 354.133 | 70.308 | | 71.859 | | 123.336 | | - | | 123.336 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Office (PMO)Support | MIPR | PMO Support Offices : Various | 65.090 | 7.337 | Jan 2017 | 12.620 | Jan 2018 | 11.873 | Jan 2019 | - | | 11.873 | Continuing | Continuing | Continuing |
| Program Management Office (PMO) Support - Survivability Enhancements | MIPR | PMO Support Offices : Various | 0.127 | 2.080 | Dec 2016 | - | | - | | - | | - | 0.000 | 2.207 | - |
| | | **Subtotal** | 65.217 | 9.417 | | 12.620 | | 11.873 | | - | | 11.873 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>330 / *Abrams Tank Improve Prog* | |

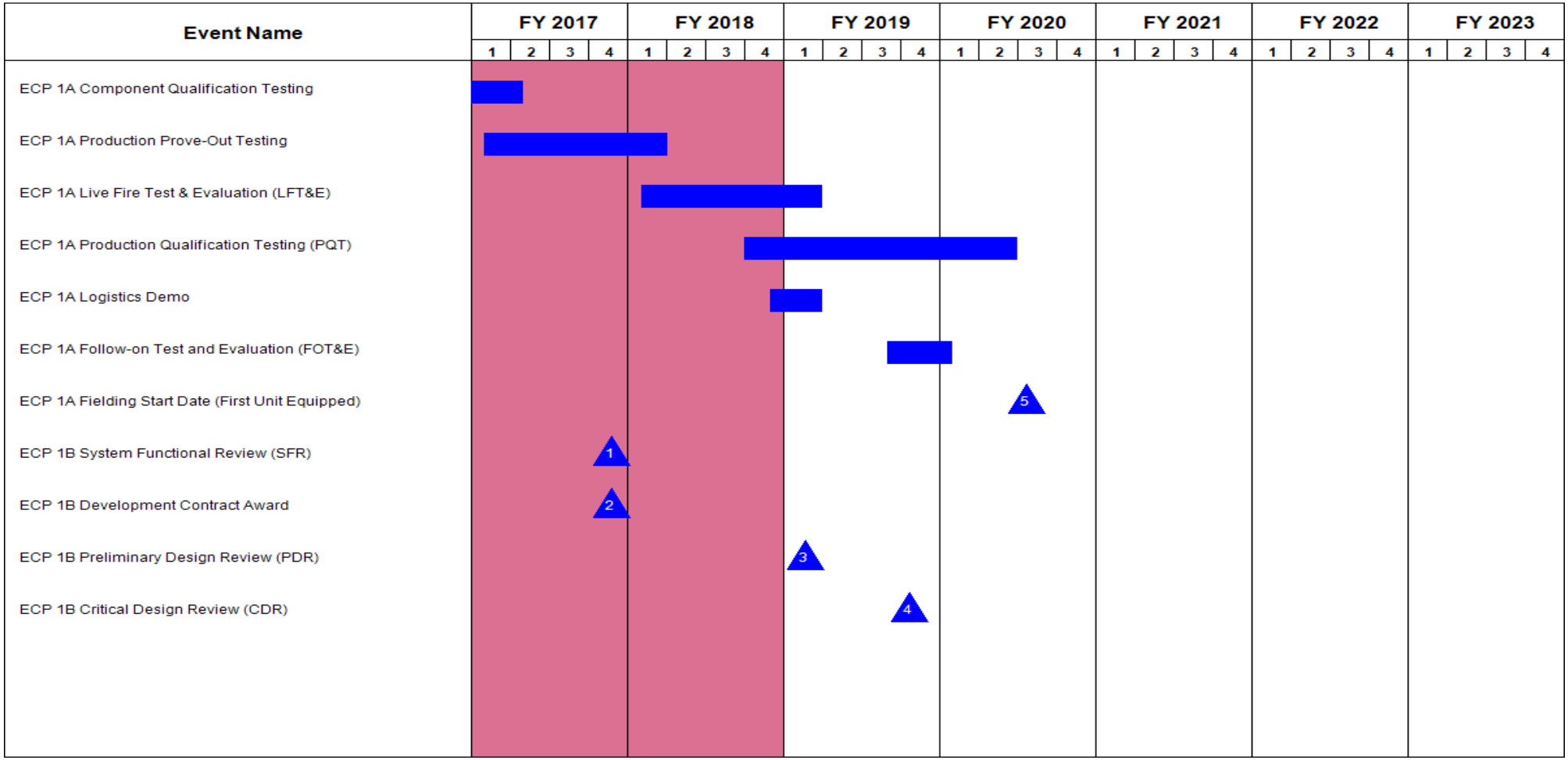
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Testing | MIPR | Aberdeen Proving Ground; Yuma Proving Ground; White Sands Missile Range, : Various | 28.368 | 7.234 | Jan 2017 | 12.089 | Jan 2018 | 22.990 | Jan 2018 | - | | 22.990 | Continuing | Continuing | Continuing |
| Contractor Testing | Various | Various : Various | 28.574 | 6.387 | Feb 2017 | 12.002 | Feb 2018 | 6.641 | Feb 2019 | - | | 6.641 | Continuing | Continuing | Continuing |
| Government Testing - Survivability Enhancements | Various | Various : Various | 0.130 | 24.361 | Apr 2017 | - | | - | | - | | - | 0.000 | 24.491 | - |
| | | **Subtotal** | 57.072 | 37.982 | | 24.091 | | 29.631 | | - | | 29.631 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 476.422 | 117.707 | | 108.570 | | 164.840 | | - | | 164.840 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>330 / *Abrams Tank Improve Prog* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>330 / *Abrams Tank Improve Prog* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| ECP 1A Component Qualification Testing | 4 | 2014 | 1 | 2017 |
| ECP 1A Contractor Prototype Proveout | 3 | 2015 | 1 | 2016 |
| ECP 1A Production Prove-Out Testing | 1 | 2016 | 1 | 2018 |
| ECP 1A Live Fire Test & Evaluation (LFT&E) | 1 | 2018 | 1 | 2019 |
| ECP 1A Production Qualification Testing (PQT) | 4 | 2018 | 2 | 2020 |
| ECP 1A Logistics Demo | 4 | 2018 | 1 | 2019 |
| ECP 1A Follow-on Test and Evaluation (FOT&E) | 3 | 2019 | 1 | 2020 |
| ECP 1A Fielding Start Date (First Unit Equipped) | 3 | 2020 | 3 | 2020 |
| ECP 1B System Functional Review (SFR) | 4 | 2017 | 4 | 2017 |
| ECP 1B Development Contract Award | 4 | 2017 | 4 | 2017 |
| ECP 1B Preliminary Design Review (PDR) | 1 | 2019 | 1 | 2019 |
| ECP 1B Critical Design Review (CDR) | 4 | 2019 | 4 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>371 / *Bradley Improve Prog* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 371: *Bradley Improve Prog* | - | 107.330 | 130.863 | 166.985 | - | 166.985 | 152.705 | 87.933 | 80.389 | 48.851 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Bradley Family of Vehicles is at or exceeds Space, Weight, and Power-Cooling (SWAP-C) limitations. To restore lost platform capability and to host other Army existing programs of record, the Bradley Fighting Vehicle program shall execute a series of Engineering Change Proposals (ECPs). ECP 1 improves vehicle's track and suspension while the Bradley A4 ECP improves the power train and electrical system to enable the A3 fleet to host inbound technologies from Army program of records, including continued SINCGARS integration and Handheld Manpack Small (HMS) Radios and Joint Battle Command - Platform (JBC-P). The Bradley A4 development effort led to a production decision in FY 2017. The Bradley M2A4/M7A4 Vehicle is the combination of the M2A3/M7A3 Base Vehicle with ECP 1 and ECP 2 components installed and integrated. Additionally, a follow on Engineering Change Proposal to the Bradley A4 ECP, Bradley A5 ECP (Lethality) integrates Third Generation Forward Looking Infrared (3GEN FLIR) to replace the current FLIR for increased lethality through improved target acquisition capability along with other technology upgrades and insertions (i.e. laser pointing, color camera, laser range finder, etc). Product Manager Bradley will characterize a Non Developmental Item (NDI) to develop force protection and survivability improvements to counter evolving threats to include, but not limited to Active Protection System. A separate integration effort began in FY 2018 for an underbelly armor kit for improved survivability against blast threats.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Bradley A4 Engineering Change Proposal (ECP) Program | 43.711 | 21.875 | - | - | - |
| ***Description:*** The Bradley Fighting Vehicle System (BFVS) improvements implemented through the Engineering Change Proposal (ECP) Program will focus on restoring lost platform capability to support Army inbound technologies and to facilitate integration of technologies currently in development under other existing programs of record.<br><br>***FY 2018 Plans:***<br>The Bradley A4 ECP program will continue system level development and support software and reliability upgrades to include integrated electronic technical manuals (IETM) development and vehicle diagnostics. Conduct a logistics demonstration at the contractor's facility.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Bradley A4 has decreased to zero in FY 2019 since A4 EMD will be complete. | | | | | |
| ***Title:*** Bradley A5 Engineering Change Proposal (ECP) Program | 18.575 | 85.155 | 128.039 | - | 128.039 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** Continues Third Generation Forward Looking Infrared (3GEN FLIR) and other necessary technology integration efforts.<br><br>***FY 2018 Plans:***<br>The Bradley A5 ECP (Lethality) program will continue the developmental engineering effort for integration of the 3GEN FLIR into the Bradley Commander's Independent Viewer (CIV) and Improved Bradley Acquisition System (IBAS), providing the commander an independent weapon station, and integrating additional lethality improvements within the sight systems (laser pointer, Laser Range Finder, and Color Day Camera). The A5 ECP will complete the System Functional Review (SFR) and begin working towards the Preliminary Design Review (PDR). The A5 ECP will coordinate commonality and synchronization with PD Main Battle Tank Systems Abrams SEPv4 ECP (Lethality), PM Ground Sensors, PM Close Combat Weapon Systems.<br><br>***FY 2019 Base Plans:***<br>The Bradley A5 ECP (Lethality) program will continue the developmental engineering effort for integration of the 3GEN FLIR into the Bradley Commander's Independent Viewer (CIV) and Improved Bradley Acquisition System (IBAS), providing the commander an independent weapon station, and integrating additional lethality improvements within the sight systems (laser pointer, laser range finder, and color day camera). The A5 ECP will complete the Preliminary Design Review (PDR), support test planning development, and begin working towards the Critical Design Review (CDR). The A5 ECP will coordinate commonality and synchronization with PD Main Battle Tank Systems Abrams SEPv4 ECP (Lethality), PD Ground Sensors, PM Close Combat Weapon Systems.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Bradley A5 has increased in FY 2019 to fund developmental engineering effort for integration of the 3GEN FLIR and integrating additional lethality improvements within the sight systems (laser pointer, laser range finder, and color day camera). The A5 ECP will complete the Preliminary Design Review (PDR), support test planning development, and begin working towards the Critical Design Review (CDR). | | | | | |
| ***Title:*** Survivability Enhancements<br><br>***Description:*** Initiate a Non Development Initiative (NDI) Active Protection System (APS) installation and characterization initiative to evaluate Bradley performance with an APS solution installed which includes developing force protection and survivability improvements to counter evolving threats to include, but not limited to Active Protection System in FY 2017. The Bradley Family of Vehicles (BFV) will integrate underbelly armor for improved survivability against underbelly blast events. Conduct integration activities for Army directed | 17.343 | - | 5.445 | - | 5.445 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| improvements such as, but not limited to, rear view sensor system, and installing a man portable short range air defense (SHORAD).<br><br>***FY 2019 Base Plans:***<br>Engineering, logistics, test, and program management to continue development; complete contractor testing; conduct USG testing; and complete the logistics support Maintenance Allocation Chart (MAC), provisioning plan, test support package, MWO development, and Logistics Demonstration (LOGDEMO) of the Underbelly Interim Solution (UBIS). Development of software upgrades such as, but not limited to, rearview sensor system and installation of a man portable short range air defense (SHORAD).<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Survivability enhancements has increased FY 2019 to fund UBIS and software upgrades. FY 2018 NDI APS funding was included in PE 0604852A/XU9. | | | | | |
| ***Title:*** Program Management Office (PMO) Support<br><br>***Description:*** Program Management Office Support includes systems engineering, government and contractor salaries, travel, training and other support costs required to effectively manage the program.<br><br>***FY 2018 Plans:***<br>Continue government program management and system engineering support costs. These funds cover the costs of government and direct support contractor salaries, travel, training, supplies, equipment and facilities to manage the issues resulting from Bradley A4 ECP testing and developing logistics products, engineering phases of Bradley A5 ECP (Lethality), and execute UBIS development activities.<br><br>***FY 2019 Base Plans:***<br>Continue government program management and system engineering support costs. These funds cover the costs of government and direct support contractor salaries, travel, training, supplies, equipment and facilities to manage the issues resulting from Bradley A4 ECP testing and developing logistics products, engineering phases of Bradley A5 ECP (Lethality), and execute UBIS and other development activities.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program Management has decreased slightly in FY 2019 due to the fluctuations in support costs. | 8.916 | 9.448 | 9.084 | - | 9.084 |
| ***Title:*** Test & Evaluation | 18.785 | 14.385 | 17.125 | - | 17.125 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** Test & Evaluation efforts support developmental and operational test events. These events include system sub-system test events, planning and development of test documentation.<br><br>***FY 2018 Plans:***<br>In accordance with the OSD approved Bradley ECP Test and Evaluation Master Plan (TEMP), Bradley A4 ECP testing and evaluation completes all Reliability, Availability and Maintainability Test as well as conducts Live Fire testing to complete initial developmental testing on the program. Additional developmental testing will be completed to support the test-fix-test cycle and testing at Cold Regions Test Center in Alaska will be completed. The Logistics Demonstration will also be preformed to demonstrate supportability of the platform and associated logistics materials. Detailed planning will be conducted to support operational testing that will occur in FY 2019.<br><br>***FY 2019 Base Plans:***<br>Conduct Bradley A4 production verification testing and Bradley A4 ECP operational testing. Continue MWO test activities.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Test & Evaluation has increased in FY 2019 to continue A4 production verification testing. | | | | | |
| ***Title:*** Current Fleet Enhancements<br><br>***Description:*** Current fleet enhancement efforts support development and testing of capabilities that will increase the reliability of the Bradley Family of Vehicles.<br><br>***FY 2019 Base Plans:***<br>Conduct integration activities for Army directed improvements such as, but not limited to, rear view sensor system, vehicle generated smoke, and upgrade and maintain software for the current fleet of vehicles.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Current fleet enhancements is a new effort in FY 2019 to conduct integration activities for Army directed improvements. | - | - | 7.292 | - | 7.292 |
| **Accomplishments/Planned Programs Subtotals** | 107.330 | 130.863 | 166.985 | - | 166.985 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • GZ2400: *Bradley Program (MOD)* | 265.333 | 474.851 | 625.424 | 50.000 | 675.424 | 637.190 | 663.460 | 650.662 | 840.733 | 0.000 | 4,207.653 |
| • G80718: *Bradley Program* | 72.800 | 200.000 | 0.000 | 205.000 | 205.000 | - | - | - | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Product Manager Bradley will execute a series of Engineering Change Proposals (ECP) reestablishing Space, Weight, Power and Cooling (SWAP-C) to facilitate integration of technologies being developed under existing Programs of Record (POR). ECP 1 production contract was awarded in FY 2014, and began fielding in FY 2015. Bradley A4 ECP is scheduled to begin fielding in FY 2020 to address powerpack and electrical power upgrades, which will enable the vehicle to host Army directed inbound technologies with no further performance degradation to the vehicle. Bradley A4 development has been executed on a sole source cost plus incentive fee contract to the current platform Original Equipment Manufacturer. Initiate studies and analysis in order to integrate Third Generation Forward Looking Infrared (3GEN FLIR) sights began in FY 2016. The 3GEN FLIR (A5 Lethality) system will be developed by Project Manager, Ground Sensors (PM GS) and be provided to Product Manager Bradley as a Horizontal Technology Insertion effort. Product Manager Bradley will characterize a Non Developmental Item (NDI) Active Protection System in order to develop force protection and survivability improvements to counter evolving threats.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bradley A4 Engineering Change Proposal (ECP) Program | SS/CPIF | PMO : Warren | 79.009 | - | | - | | - | | - | | - | 0.000 | 79.009 | - |
| Non Recurring Engineering-Bradley A4 ECP | SS/FFP | L3COM : Muskegon, MI | 15.695 | 0.528 | May 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Non Recurring Engineering- Bradley A4 ECP | SS/CPIF | BAE : Sterling Heights, MI | 209.834 | 43.183 | Nov 2016 | 21.875 | Nov 2017 | - | | - | | - | Continuing | Continuing | Continuing |
| Bradley A5 ECP (Lethality) | SS/CPIF | BAE : Sterling Heights, MI | 21.242 | 18.575 | Nov 2016 | 80.574 | Nov 2017 | 128.039 | Jan 2019 | - | | 128.039 | Continuing | Continuing | Continuing |
| Survability Enhancements - Underbelly Armor | SS/CPIF | TBD : TBD | 0.182 | - | | 4.581 | Jan 2018 | 5.445 | Feb 2019 | - | | 5.445 | Continuing | Continuing | Continuing |
| Survivability Enhancements - Active Protection System (APS) | SS/CPIF | TBD : TBD | 11.000 | 17.343 | Jan 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Current Fleet Enhancements | C/TBD | TBD : TBD | - | - | | - | | 7.292 | Nov 2019 | - | | 7.292 | 0.000 | 7.292 | - |
| | | **Subtotal** | 336.962 | 79.629 | | 107.030 | | 140.776 | | - | | 140.776 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PMO/PEO Support/OGA | MIPR | PMO/PEO : Bradley ECP Program | 24.238 | 3.076 | Dec 2016 | 3.260 | Dec 2017 | 2.283 | Dec 2018 | - | | 2.283 | Continuing | Continuing | Continuing |
| Government Engineering Support | MIPR | Various : Bradley ECP Program | 38.593 | 5.840 | Dec 2016 | 6.188 | Dec 2017 | 6.801 | Dec 2018 | - | | 6.801 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 62.831 | 8.916 | | 9.448 | | 9.084 | | - | | 9.084 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>371 / *Bradley Improve Prog* | |

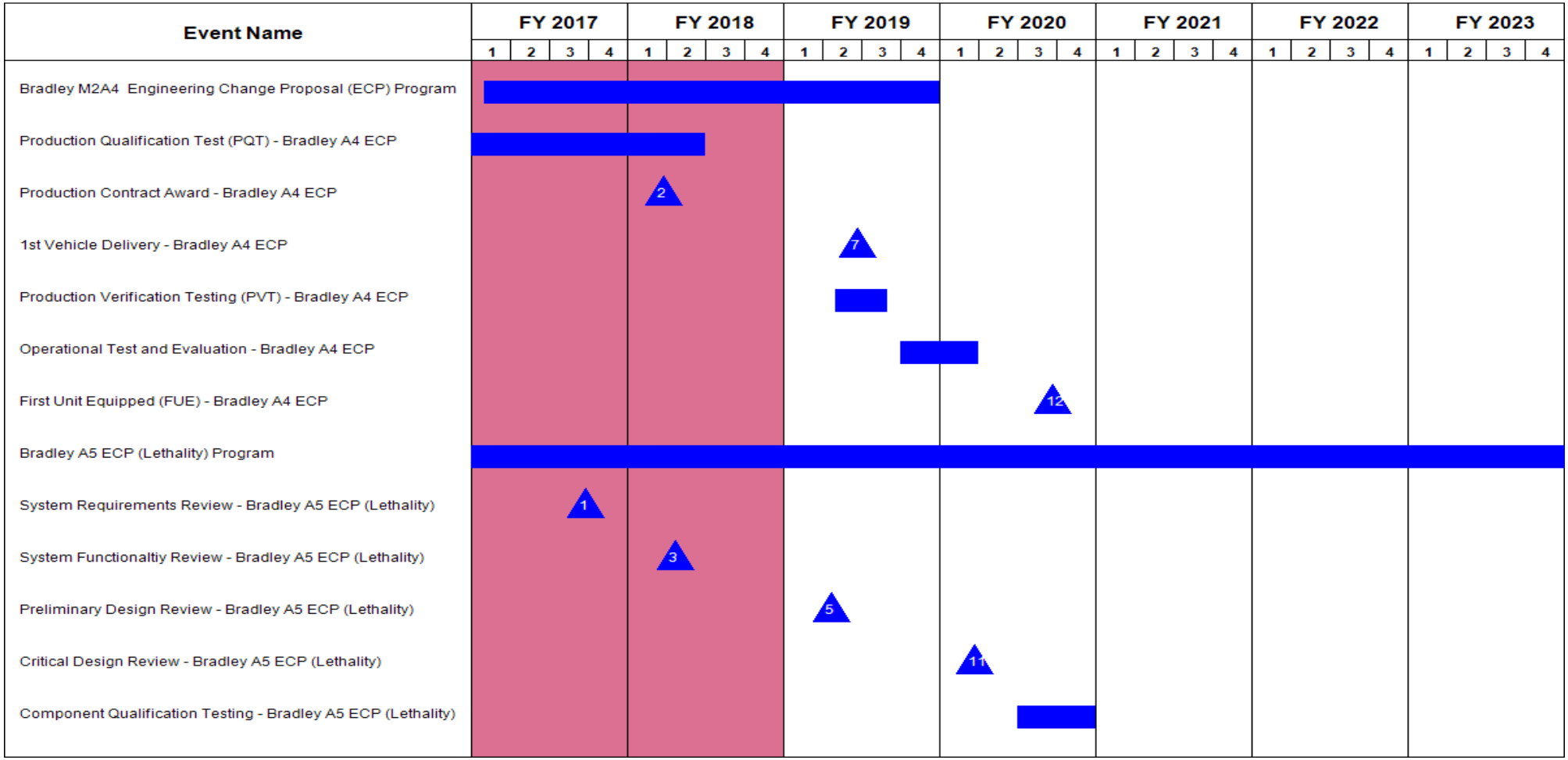
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Testing | MIPR | Various : Test Sites | 14.269 | 18.785 | Jan 2017 | 14.385 | Dec 2017 | 17.125 | Jan 2019 | - | | 17.125 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 14.269 | 18.785 | | 14.385 | | 17.125 | | - | | 17.125 | Continuing | Continuing | N/A |

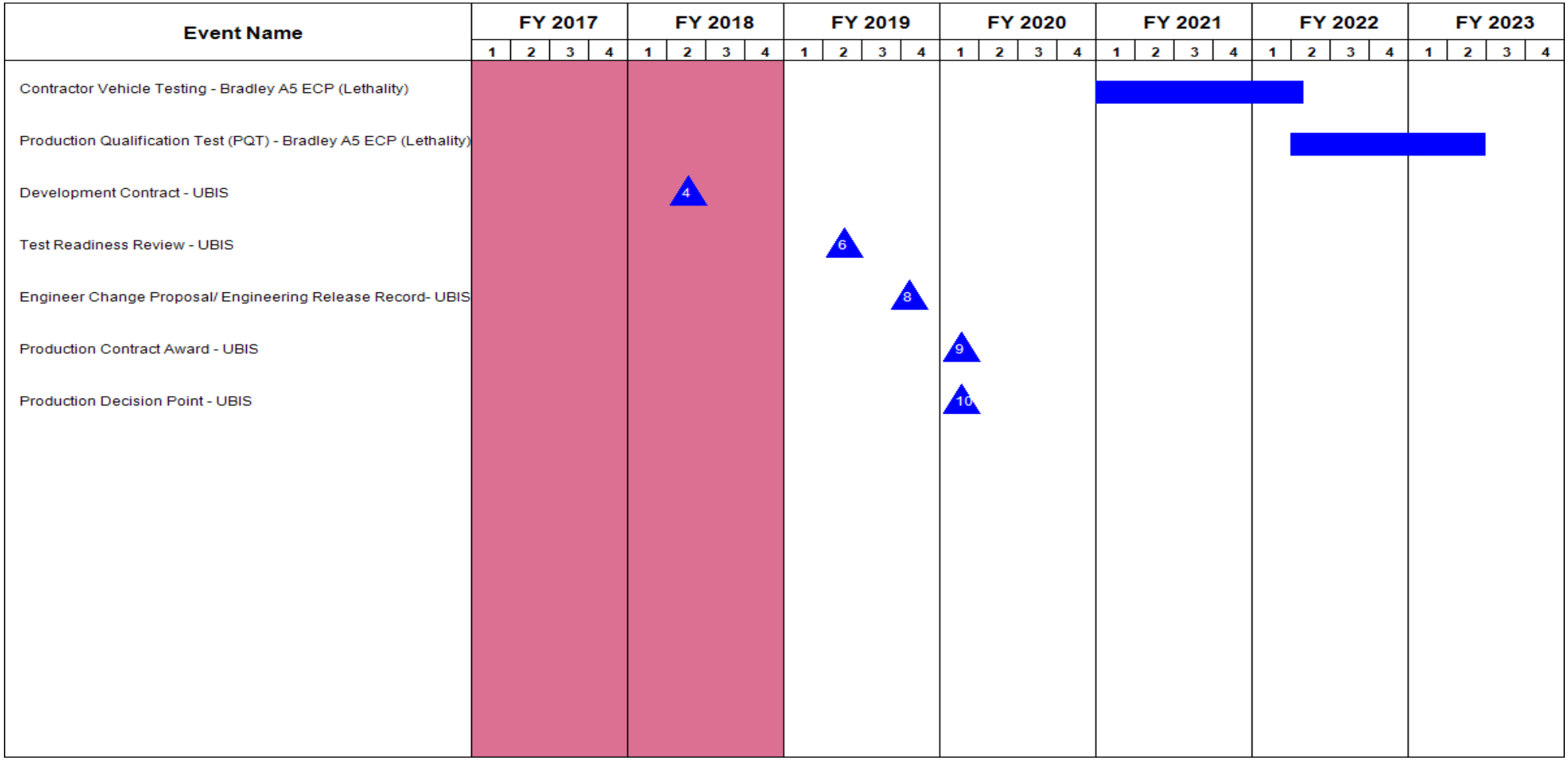
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 414.062 | 107.330 | | 130.863 | | 166.985 | | - | | 166.985 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |



| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>371 / *Bradley Improve Prog* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Bradley M2A4 Engineering Change Proposal (ECP) Program | 1 | 2012 | 4 | 2019 |
| Component Qualification Testing - Bradley A4 ECP | 3 | 2014 | 3 | 2015 |
| Contractor Vehicle Testing - Bradley A4 ECP | 3 | 2015 | 3 | 2016 |
| Production Qualification Test (PQT) - Bradley A4 ECP | 2 | 2016 | 2 | 2018 |
| Production Contract Award - Bradley A4 ECP | 1 | 2018 | 1 | 2018 |
| 1st Vehicle Delivery - Bradley A4 ECP | 2 | 2019 | 2 | 2019 |
| Production Verification Testing (PVT) - Bradley A4 ECP | 2 | 2019 | 3 | 2019 |
| Operational Test and Evaluation - Bradley A4 ECP | 4 | 2019 | 1 | 2020 |
| First Unit Equipped (FUE) - Bradley A4 ECP | 3 | 2020 | 3 | 2020 |
| Bradley A5 ECP (Lethality) Program | 3 | 2016 | 3 | 2025 |
| System Requirements Review - Bradley A5 ECP (Lethality) | 3 | 2017 | 3 | 2017 |
| System Functionaltiy Review - Bradley A5 ECP (Lethality) | 2 | 2018 | 2 | 2018 |
| Preliminary Design Review - Bradley A5 ECP (Lethality) | 2 | 2019 | 2 | 2019 |
| Critical Design Review - Bradley A5 ECP (Lethality) | 1 | 2020 | 1 | 2020 |
| Component Qualification Testing - Bradley A5 ECP (Lethality) | 3 | 2020 | 4 | 2020 |
| Contractor Vehicle Testing - Bradley A5 ECP (Lethality) | 1 | 2021 | 2 | 2022 |
| Production Qualification Test (PQT) - Bradley A5 ECP (Lethality) | 2 | 2022 | 2 | 2023 |
| Development Contract - UBIS | 2 | 2018 | 2 | 2018 |
| Test Readiness Review - UBIS | 2 | 2019 | 2 | 2019 |
| Engineer Change Proposal/ Engineering Release Record- UBIS | 4 | 2019 | 4 | 2019 |
| Production Contract Award - UBIS | 1 | 2020 | 1 | 2020 |
| Production Decision Point - UBIS | 1 | 2020 | 1 | 2020 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>431 / *M113 IMPROVEMENTS* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 431: *M113 IMPROVEMENTS* | - | 0.000 | 15.000 | 7.915 | - | 7.915 | 4.943 | 0.000 | 0.000 | 0.000 | 0.000 | 27.858 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

M113 improvements will develop an affordable solution for upgrading the M113s to enhance protection, survivability, mobility and power generation to support the current and future network systems. This will provide the necessary enhancements to the M113 capability for Echelons Above Brigade (EAB) units with priority to the forward deployed units and equipment sets. The Armored Multi Purpose Vehicle (AMPV) program will replace all M113 family of vehicles in Armored Brigade Combat Teams (ABCT).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development<br>***Description:*** Design, fabrication and testing of Engineering Change Proposals (ECPs).<br>***FY 2018 Plans:***<br>Government RFP development and competitive source selection planning to include the preparation of government furnished material and technical data that will support a competitively awarded contract. After award the contractor will complete Engineering Change Proposals (ECP) vehicle modifications designs, fabricate ECP vehicle modifications kits for test, provide support to testing and finalize ECPs in support of production.<br>***FY 2019 Base Plans:***<br>Complete test and collect performance data to down select to one vendor for production.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Fixed price contract awarded in FY18 moving the focus on test execution in FY19. | - | 14.100 | 6.015 | - | 6.015 |
| ***Title:*** Government Program Management<br>***Description:*** Program Management Office Support includes Systems Engineering, support to logistics development, Government salaries, travel, training and other support costs required to effectively manage the program.<br>***FY 2018 Plans:***<br>Provide integrated program management to oversee technical development and fabrication efforts of the contractor. Provide program management to plan and oversee test efforts if test vehicles are delivered ahead of | - | 0.900 | 1.900 | - | 1.900 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>431 / *M113 IMPROVEMENTS* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| schedule.<br>***FY 2019 Base Plans:***<br>Program Management Office Support includes Systems Engineering, contract execution, support to Government test sites, Government salaries, travel, training and other support costs required to effectively manage the program. Government RFP development for follow-on production contract and competitive source selection planning and execution for planned award in FY20.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Fixed Price contract awarded in FY 2018 with test execution in FY 2019 requiring an increase in government support. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 15.000 | 7.915 | - | 7.915 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • GB1930: *CARRIER, MOD GB1930 WTCV* | - | - | 0.000 | - | 0.000 | 49.563 | 49.562 | 49.560 | - | 0.000 | 148.685 |

**Remarks**

**D. Acquisition Strategy**

The Acquisition strategy will be finalized upon receipt of finalized Department of the Army Directed Requirement with a planned competitive contract award by 2Q FY18. The Army plans to conduct a formal source selection to competitively down select to no more than three vendors. Vendor(s) will complete vehicle design and fabricate vehicle modifications for testing. Test results will be used to down select to one vendor for the follow-on production contract in FY20. Overall program schedule could be accelerated if vendor designs are mature.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>431 / *M113 IMPROVEMENTS* |

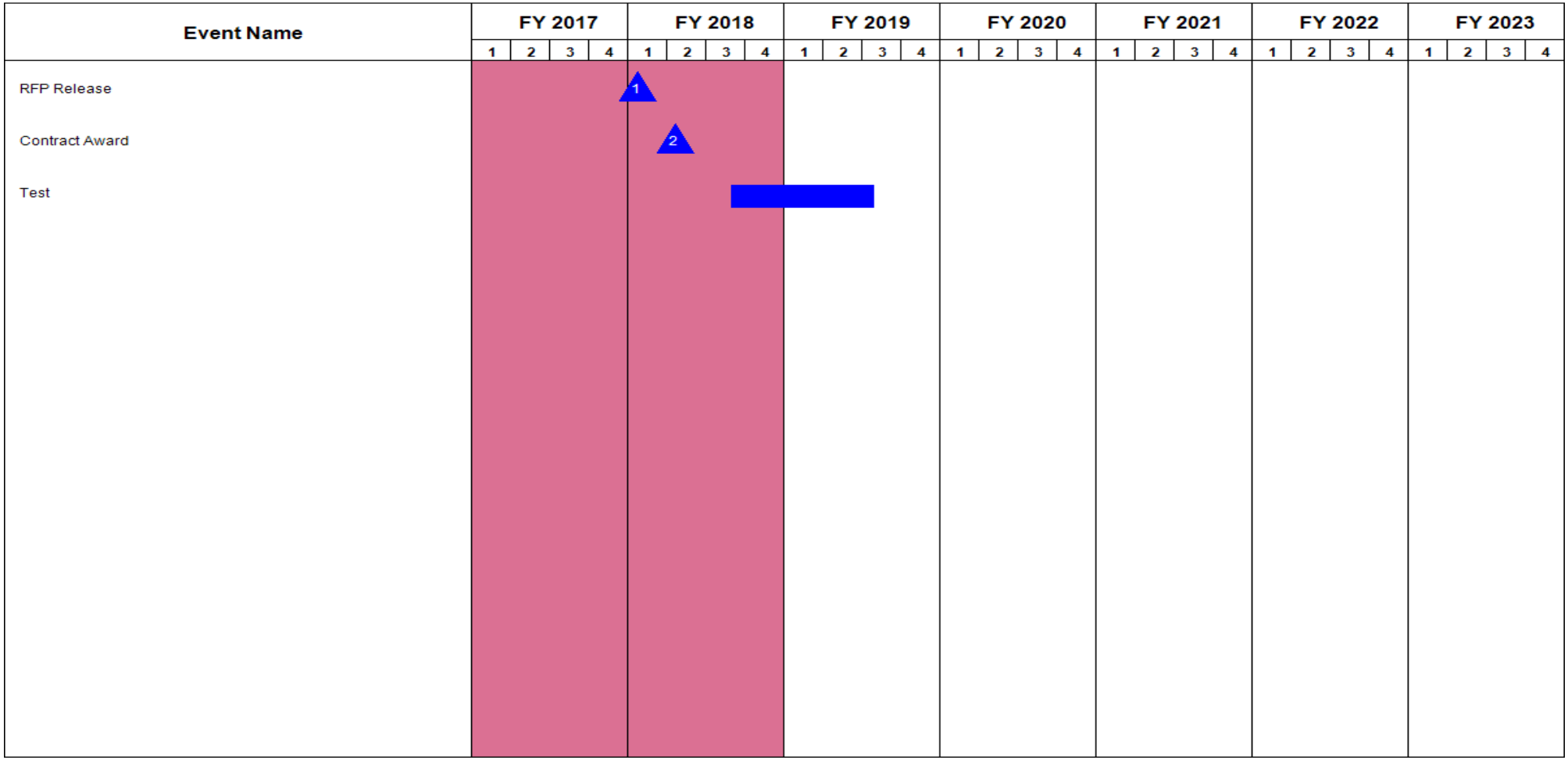
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development | C/FFP | TBD : TBD | - | - | | 14.100 | May 2018 | 6.015 | May 2019 | - | | 6.015 | 0.000 | 20.115 | - |
| Program Management Support | MIPR | TBD : TBD | - | - | | 0.900 | Jan 2018 | 1.900 | Jan 2019 | - | | 1.900 | 0.000 | 2.800 | - |
| | | **Subtotal** | - | - | | 15.000 | | 7.915 | | - | | 7.915 | 0.000 | 22.915 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 15.000 | | 7.915 | | - | | 7.915 | 0.000 | 22.915 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>431 / *M113 IMPROVEMENTS* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>431 / *M113 IMPROVEMENTS* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| RFP Release | 1 | 2018 | 1 | 2018 |
| Contract Award | 2 | 2018 | 2 | 2018 |
| Test | 3 | 2018 | 3 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>EE2 / *Stryker Improvement* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EE2: *Stryker Improvement* | - | 114.988 | 80.642 | 58.866 | - | 58.866 | 56.378 | 47.569 | 22.414 | 12.998 | 0.000 | 393.855 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

PE Number 0203735A/Project EE2 funds development efforts for the Stryker Double V-Hull A1 (DVH A1) Engineering Change Proposal (ECP) (formerly named Stryker ECP 1), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS) (formerly named Stryker ONS Lethality), Stryker Survivability Enhancements, and Stryker Lethality ECPs (formerly referred to as Stryker ECP 2).

**A. Mission Description and Budget Item Justification**

Stryker Improvement will address the development of Lethality, Survivability, Mobility, and Communication, Command and Control (C3) improvements within the Stryker Family of Vehicles (FoV). Principal development efforts include upgrades associated with the Stryker Double V-Hull (DVH) A1 Engineering Change Proposal (ECP), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS), Stryker Survivability Enhancement, and Stryker Lethality ECPs. DVH A1 ECP power generation, suspension, and network upgrades will both restore Stryker DVH Space, Weight, and Power-Cooling (SWaP-C) lost as a result of incorporating vehicle changes to counter threats encountered during deployment operations while allowing the future network to be hosted without further degradation in vehicle protection and mobility. The Stryker 30mm ICVD ONS effort will address an Urgent Operational Need to increase the firepower of Stryker Infantry Carrier Vehicles (ICV) within the US Army European Command (USAREUR). The 30mm ICVD ONS effort will integrate a 30mm-equipped weapon station that will provide USAREUR with precision direct firepower to overwhelm the enemy in encounter actions and suppressive fire to preserve mounted and dismounted freedom of movement. The Stryker Survivability Enhancement will address evolving threats by assessing survivability improvements, to include passive protection systems, active protection systems, and an under-armor fire capability for Stryker-equipped reconnaissance troops. Stryker Lethality ECP efforts focus on the integration of a suite of complementary Mission Equipment Package (MEP) lethality upgrades (medium caliber weapon ECP, Common Remotely Operated Weapon Station-Javelin (CROWS-J) ONS, CROWS-J ECP, Anti-Tank Guided Missile (ATGM) ECP, common masted sensor ECP, and other capabilities) that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs) and address Remote Weapon Station (RWS) and Improved Target Acquisitions System (ITAS) obsolescence issues that will impact fleet sustainment beginning in FY2020.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Stryker DVH A1 ECP Development (Engineering/Prototypes) | 14.278 | - | 7.883 | - | 7.883 |
| ***Description:*** Funding is provided for the following effort<br><br>***FY 2019 Base Plans:***<br>Continuing DVH A1 ECP engineering efforts, to include finalization of In-Vehicle Network (IVN) design, development, validation/verification and logistic demonstration of revisions to Stryker Operator and Maintenance | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Manuals, provisioning of DVH A1 ECP-unique parts, and incorporation of DVH A1 ECP design changes resulting from deficiencies identified during prototype build and development testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>No funding requirements for Development in FY2018. | | | | | |
| ***Title:*** Stryker DVH A1 ECP Testing<br>***Description:*** Funding is provided for the following effort<br>***FY 2018 Plans:***<br>Continuing test execution activities for the Stryker ECP 1 upgrade technologies, including tests for Communications, Command, and Control (C3) and electronics, and information assurance testing. These events will be conducted at various test sites throughout the US including Yuma Proving Ground (YPG), Electronic Proving Ground (EPG), and White Sands Missile Range (WSMR). Conduct Follow-on Operational Test & Evaluation (FOT&E).<br>***FY 2019 Base Plans:***<br>Completion of DVH A1 ECP test execution and development of final assessment/report.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 decrease of funding due to a single final test event occurring in FY 2019, the DVH A1 ECP Capabilities Set test. | 7.023 | 18.760 | 1.186 | - | 1.186 |
| ***Title:*** Stryker DVH A1 Training Device Updates<br>***Description:*** Funding is provided for the following effort<br>***FY 2019 Base Plans:***<br>Development of updates to Stryker training devices resulting from DVH A1 ECP engine, alternator, suspension, and network design changes.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 funding initiates development of updates to Stryker training devices resulting from DVH A1 engine, alternator, suspension, and network design changes. | - | - | 1.242 | - | 1.242 |
| ***Title:*** Stryker DVH A1 Contractor Support to Test<br>***Description:*** Funding is provided for the following effort | 12.220 | 0.080 | 2.222 | - | 2.222 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***FY 2018 Plans:***<br>Continuing contractor technical support (system troubleshooting, maintenance and repair of prototypes during execution of tests) to ECP 1 developmental test and operational test.<br>***FY 2019 Base Plans:***<br>Continuing contractor technical support (system troubleshooting, maintenance and repair of prototypes during execution of tests) to ECP 1.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 increase due to ramp up of ECP1 developmental an operational testing. | | | | | |
| ***Title:*** Stryker 30mm ICVD ONS Testing | 17.000 | - | - | - | - |
| ***Title:*** Stryker 30mm ICVD ONS Training Device Updates | 0.393 | - | - | - | - |
| ***Title:*** Stryker 30mm ICVD ONS Contractor Support to Test | 10.114 | - | - | - | - |
| ***Title:*** Survivability Enhancements<br>***Description:*** Funding is provided for the following effort<br>***FY 2018 Plans:***<br>Continuing assessment of force protection and survivability improvements, to include passive and protection systems.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 NDI APS funding transferred to PE0604852A/XU9. | 14.364 | 2.133 | - | - | - |
| ***Title:*** Stryker Lethality ECPs Development (Engineering/Protoypes)<br>***Description:*** Funding is provided for the following effort<br>***FY 2018 Plans:***<br>Continuing developmental engineering of the Engineering Change Proposal (ECP) 2 lethality upgrades to include under armor Javelin, medium caliber weapon, and improved target acquisition optics.<br>***FY 2019 Base Plans:*** | 21.144 | 50.639 | 23.727 | - | 23.727 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Stryker Lethality ECPs developmental engineering to include completion of CROWS-J ECP integration, continuation of ATGM ECP integration, and continuation of medium caliber weapon system design.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding decrease in FY 2019 due to completion of CROWS-J ONS and work accomplished on CROWS-J ECP in FY 2018. FY 2019 completes design of the CROWS-J ECP and ATGM ECP, and continues development of the medium caliber weapon system. | | | | | |
| ***Title:*** Stryker Lethality ECPs Testing<br>***Description:*** Funding is provided for the following effort<br>***FY 2018 Plans:***<br>Initiation of developmental test, to include safety, performance and environmental test planning and execution activities for the Stryker ECP 2 under armor Javelin effort.<br>***FY 2019 Base Plans:***<br>Continuation of developmental test, to include safety, performance and environmental test planning and execution activities for the CROWS-J ECP.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY18 funding supports initial test planning activities for the CROWS-J ECP effort. FY19 funding supports the execution of CROWS-J ECP developmental testing. | 3.851 | 0.380 | 5.016 | - | 5.016 |
| ***Title:*** Stryker Lethality ECPs Contractor Support to Test<br>***Description:*** Funding is provided for the following effort<br>***FY 2019 Base Plans:***<br>Contractor technical support to government safety, performance and environmental test execution activities for the CROWS-J ECP effort.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Contractor technical support (system troubleshooting, maintenance and repair of prototypes during execution of tests) for the CROWS-J ECP effort initiates in FY 2019. | 1.015 | - | 1.572 | - | 1.572 |
| ***Title:*** Government Systems Engineering and Project Management<br>***Description:*** Funding is provided for the following effort | 13.586 | 8.650 | 16.018 | - | 16.018 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***FY 2018 Plans:***<br>Continuing Government Systems Engineering and Program Management support (labor, travel, training, supplies, and equipment) to support ECP 1, ONS Lethality, Survivability Enhancements, and ECP 2 development efforts. Includes execution of an ECP 2 medium caliber weapon Source Selection and Evaluation Board (SSEB).<br>***FY 2019 Base Plans:***<br>Continuing Government Systems Engineering and Program Management support (labor, travel, training, supplies, and equipment) for Stryker DVH A1 ECP, 30mm ICVD ONS, Survivability Enhancement, and Lethality ECP (CROWS-J ECP, ATGM ECP, medium caliber weapon system) development efforts. Includes completion of a medium caliber weapon system Source Selection and Evaluation Board (SSEB).<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 includes additional armament-specific systems engineering and program management support necessary to execute Stryker 30mm ECP development engineering. Additionally, FY 2019 includes increased program management support necessary to develop plans required to initiate medium caliber weapon system developmental test in FY 2020. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 114.988 | 80.642 | 58.866 | - | 58.866 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • GM0100: *Stryker (Mod)* | 82.681 | 97.552 | 287.490 | - | 287.490 | 465.780 | 570.391 | 544.979 | 500.041 | Continuing | Continuing |
| • G85200: *Stryker Upgrade* | 418.561 | - | 21.900 | - | 21.900 | - | - | - | - | Continuing | Continuing |

**Remarks**

AAE approval for a 3rd Double V-Hull (DVH) SBCT Brigade of 337 Exchange Vehicles was given on July 26, 2013 (funded in G85100). A successful production decision for the DVH A1 Engineering Change Proposal (ECP) was executed on July 22, 2016, which provided approval to begin 4th Brigade DVH A1 ECP production (funded in Stryker Upgrade - G85200). Approval to procure an additional 123 DVH A1 ECP vehicles was received through a successful decision point on April 26, 2017. Stryker MOD (GM0100) supports Stryker Fleet modifications to include Infantry Carrier Vehicle Dragoon (ICVD) production and fielding in FY16-18, DVH A1 ECP retrofits in FY19-23, and Lethality ECP retrofits in FY19-23.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

**D. Acquisition Strategy**

The Stryker Engineering Change Proposal (ECP) 1 effort will buy back the vehicle space, weight, and power margin lost due to the addition of numerous kits in response to eleven years of war (20-combat rotations & 37+ million total miles), in order to allow integration of the future network (as directed by VCSA in August 2011) without further degrading the performance of the platform. In May 2012, Stryker ECP 1 program (Phase I) was approved, permitting preliminary design and integration efforts on both the Flat Bottom (FB) and Double-V Hull (DVH) variants. In March 2013, Phase II was approved continuing design and integration of ECP 1 mechanical power, electrical power generation, chassis upgrades, and the in-vehicle network upgrades. Based on additional testing conducted in the summer of 2013, the decision was made to focus ECP 1 efforts on the DVH platform and defer efforts on flat-bottom Strykers. The effort has subsequently been renamed the Stryker DVH A1 ECP. The DVH A1 ECP Phase II contract, awarded November 25, 2013, continues development engineering, prototype build test and evaluation. The initial DVH A1 ECP production contract was awarded in October 2016 (Sole-Source Firm Fixed Price arrangement). A second buy of DVH A1 ECP vehicles was awarded in October 2017 (Fixed Price Incentive Fee arrangement).

On July 2, 2015, ASARC authorization was granted to execute the Stryker 30mm ICVD Operational Needs Statement (ONS) effort. 30mm ICVD Engineering, Manufacturing, and Development (EMD) contracts for Non-Recurring Engineering (NRE) and Logistics Products Development/Test Support were awarded in January 2016 and May 2016, respectively (Cost Plus Incentive-Fee basis). The 30mm ICVD ONS Production/Retrofit contract was awarded in May 2016 through an Undefinitized Contract Action (UCA). Definitization of the Fixed Price Incentive Fee (FPIF) Production contract occurred in March 2017.

The Stryker Lethality ECP efforts will focus on the integration of a suite of complementary Mission Equipment Package (MEP) lethality upgrades (medium caliber weapon system, Common Remotely Operated Weapon Station-Javelin (CROWS-J), common masted sensor, Anti-Tank Guided Missile (ATGM) target acquisition optics, and other capabilities) that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs). Army Acquisition Executive (AAE) approval to initiate the Stryker CROWS-J ECP and ATGM ECP efforts was received in a September 30, 2016 Acquisition Decision Memorandum (ADM).

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stryker 30mm ICVD ONS Project Management | MIPR | PEO GCS/TACOM : Sterling Heights, MI | 4.919 | 5.914 | Jan 2017 | - | | - | | - | | - | 0.000 | 10.833 | - |
| Survivability Enhancement Government Engineering and Project Management | MIPR | PEO GCS/TACOM : Various | 0.161 | 0.682 | Jan 2017 | - | | - | | - | | - | 0.000 | 0.843 | - |
| Project Management Office (PMO) | MIPR | PEO GCS/TACOM : Various | 9.236 | 6.990 | Jan 2017 | 8.650 | Oct 2017 | 16.018 | Nov 2018 | - | | 16.018 | 25.597 | 66.491 | - |
| | | **Subtotal** | 14.316 | 13.586 | | 8.650 | | 16.018 | | - | | 16.018 | 25.597 | 78.167 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stryker DVH A1 ECP Development | SS/CPIF | GDLS, MI : Various | 157.869 | 14.278 | Dec 2016 | - | | 7.883 | Dec 2018 | - | | 7.883 | 0.000 | 180.030 | - |
| Stryker DVH A1 ECP Training Device Updates | MIPR | PEO STRI, FL : Various | - | - | | - | | 1.242 | Dec 2018 | - | | 1.242 | 0.000 | 1.242 | - |
| Stryker 30mm ICVD ONS Development | SS/CPIF | GDLS, MI : Various | 79.220 | - | | - | | - | | - | | - | 0.000 | 79.220 | - |
| Stryker 30mm ICVD ONS Training Device Updates | MIPR | PEO STRI, FL : Various | - | 0.393 | Jan 2018 | - | | - | | - | | - | 0.000 | 0.393 | - |
| Stryker Lethality ECPs Development | C/Various | PM CSW; PM CCWS : Various | 5.373 | 21.144 | Mar 2017 | 50.639 | Apr 2018 | 23.727 | Jan 2019 | - | | 23.727 | 101.381 | 202.264 | - |
| Stryker Survivability Enhancement | Various | US Army TARDEC, Various : Sterling Heights, MI | 12.860 | 8.370 | Jan 2017 | 2.133 | Oct 2017 | - | | - | | - | 0.000 | 23.363 | - |
| | | **Subtotal** | 255.322 | 44.185 | | 52.772 | | 32.852 | | - | | 32.852 | 101.381 | 486.512 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

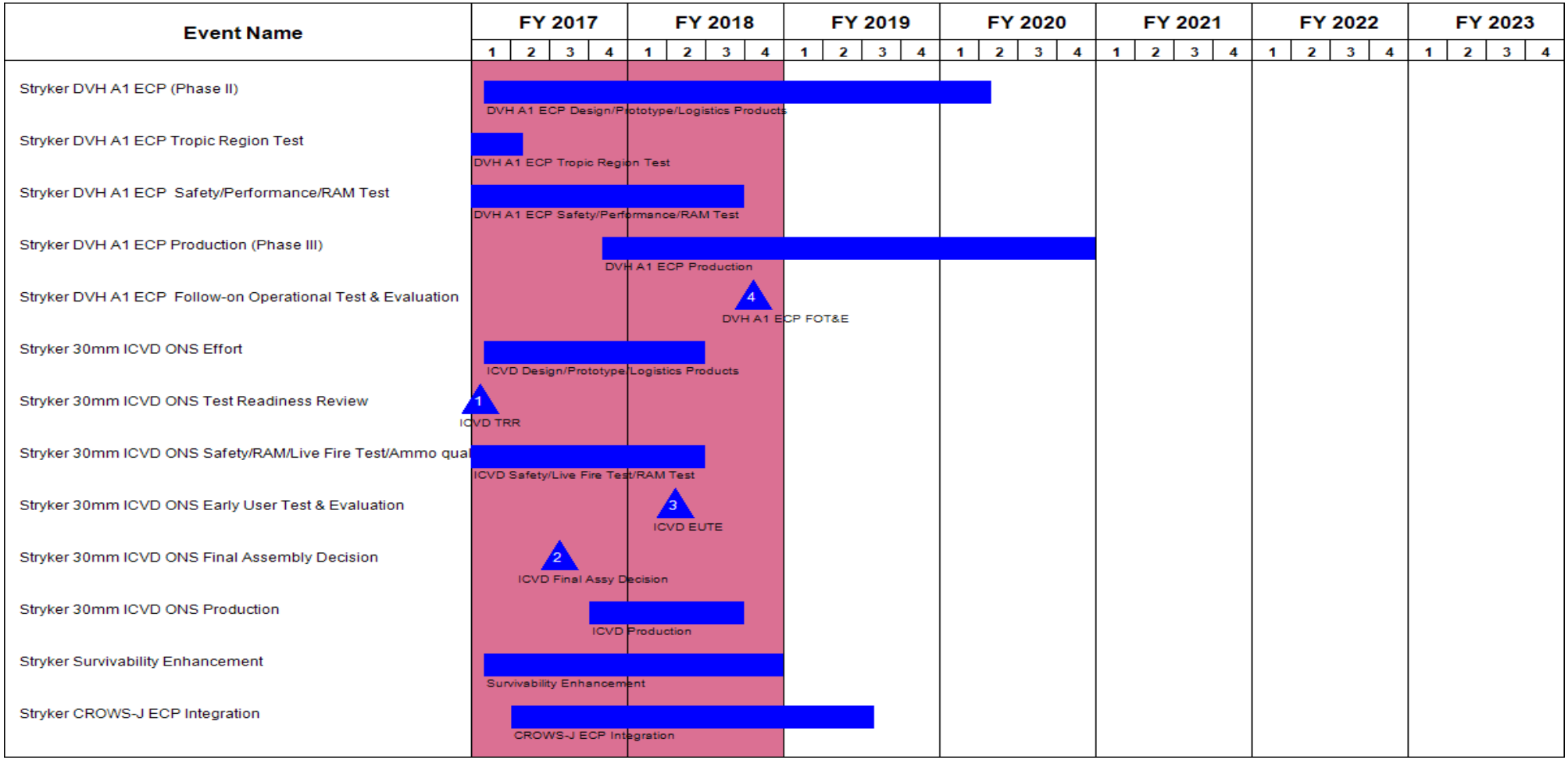
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stryker DVH A1 ECP Testing | MIPR | Army Test Centers : Various | 24.160 | 7.023 | Dec 2016 | 18.760 | Dec 2017 | 1.186 | Dec 2018 | - | | 1.186 | 0.000 | 51.129 | - |
| Stryker DVH A1 ECP Contractor Support to Test | SS/CPFF | GDLS, MI : Various | 23.234 | 12.220 | Dec 2016 | 0.080 | Feb 2018 | 2.222 | Dec 2018 | - | | 2.222 | 0.000 | 37.756 | - |
| Stryker 30mm ICVD ONS Test | MIPR | Army Test Centers : Various | 6.546 | 17.000 | Oct 2016 | - | | - | | - | | - | 0.000 | 23.546 | - |
| Stryker 30mm ICVD ONS Contractor Support to Test | SS/CPFF | GDLS, MI : Various | 16.456 | 10.114 | Dec 2016 | - | | - | | - | | - | 0.000 | 26.570 | - |
| Stryker Lethality ECPs Testing | MIPR | Army Test Centers : Various | - | 3.851 | Mar 2017 | 0.380 | Aug 2018 | 5.016 | Dec 2018 | - | | 5.016 | 7.561 | 16.808 | - |
| Stryker Lethality ECPS Contractor Support to Test | MIPR | Various : Various | - | 1.015 | Dec 2016 | - | | 1.572 | Dec 2018 | - | | 1.572 | 6.460 | 9.047 | - |
| Stryker Survivability Enhancement | MIPR | Army Test Centers : Various | 0.635 | 5.994 | Oct 2016 | - | | - | | - | | - | 0.000 | 6.629 | - |
| | | **Subtotal** | 71.031 | 57.217 | | 19.220 | | 9.996 | | - | | 9.996 | 14.021 | 171.485 | N/A |

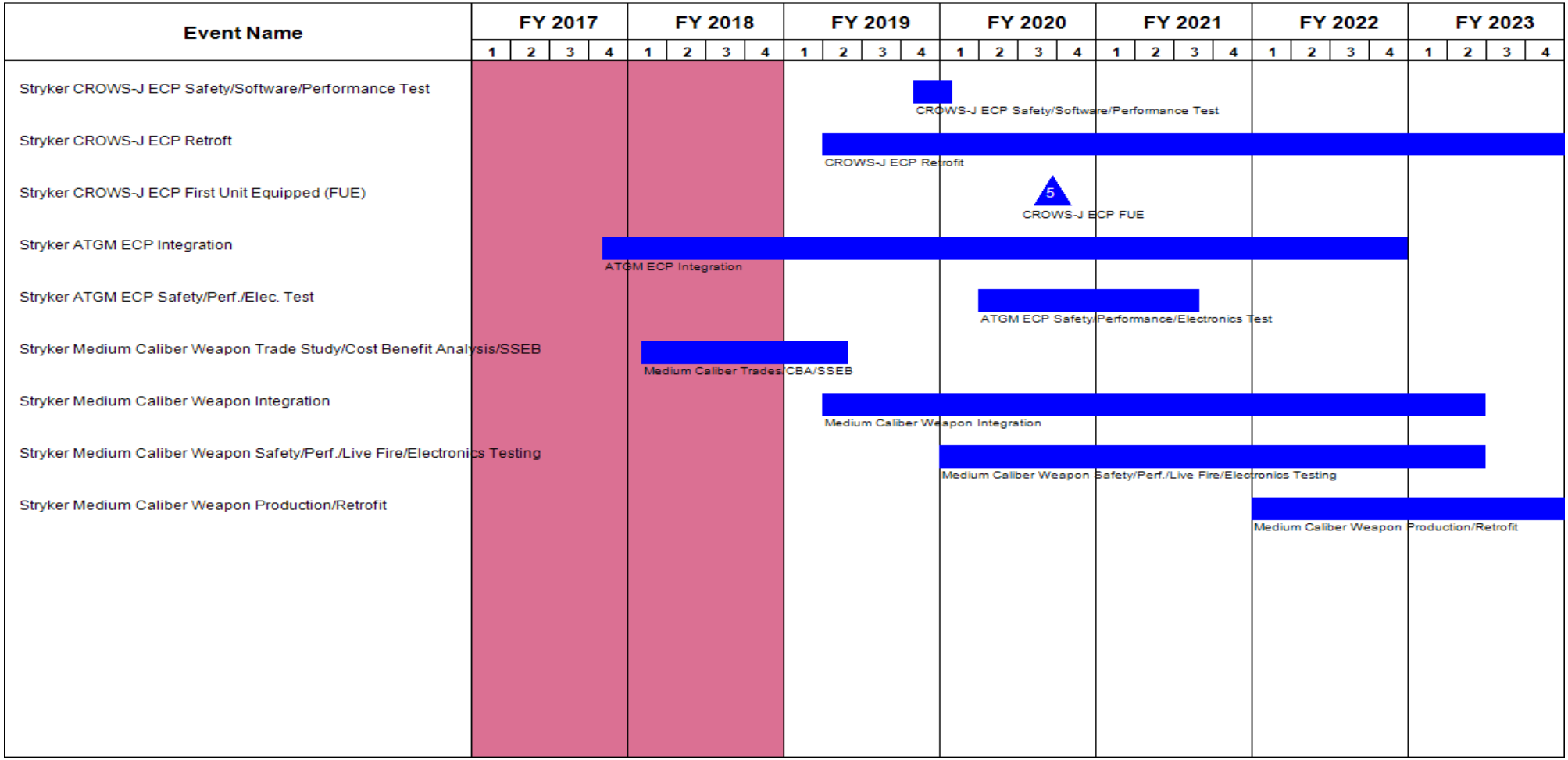
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 340.669 | 114.988 | | 80.642 | | 58.866 | | - | | 58.866 | 140.999 | 736.164 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |



| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Stryker DVH A1 ECP (Phase II) | 1 | 2014 | 2 | 2020 |
| Stryker DVH A1 ECP Tropic Region Test | 3 | 2016 | 1 | 2017 |
| Stryker DVH A1 ECP Cold Region Test | 1 | 2016 | 3 | 2016 |
| Stryker DVH A1 ECP Safety/Performance/RAM Test | 4 | 2015 | 3 | 2018 |
| Stryker DVH A1 ECP Production (Phase III) | 4 | 2017 | 4 | 2020 |
| Stryker DVH A1 ECP Follow-on Operational Test & Evaluation | 4 | 2018 | 4 | 2018 |
| Stryker 30mm ICVD ONS Effort | 1 | 2016 | 2 | 2018 |
| Stryker 30mm ICVD ONS Test Readiness Review | 1 | 2017 | 1 | 2017 |
| Stryker 30mm ICVD ONS Safety/RAM/Live Fire Test/Ammo qualification | 2 | 2016 | 2 | 2018 |
| Stryker 30mm ICVD ONS Early User Test & Evaluation | 2 | 2018 | 2 | 2018 |
| Stryker 30mm ICVD ONS Final Assembly Decision | 3 | 2017 | 3 | 2017 |
| Stryker 30mm ICVD ONS Production | 4 | 2017 | 3 | 2018 |
| Stryker Survivability Enhancement | 1 | 2017 | 4 | 2018 |
| Stryker CROWS-J ECP Integration | 2 | 2017 | 3 | 2019 |
| Stryker CROWS-J ECP Safety/Software/Performance Test | 4 | 2019 | 1 | 2020 |
| Stryker CROWS-J ECP Retroft | 2 | 2019 | 4 | 2026 |
| Stryker CROWS-J ECP First Unit Equipped (FUE) | 3 | 2020 | 3 | 2020 |
| Stryker ATGM ECP Integration | 4 | 2017 | 4 | 2022 |
| Stryker ATGM ECP Safety/Perf./Elec. Test | 2 | 2020 | 3 | 2021 |
| Stryker Medium Caliber Weapon Trade Study/Cost Benefit Analysis/SSEB | 1 | 2018 | 2 | 2019 |
| Stryker Medium Caliber Weapon Integration | 2 | 2019 | 2 | 2023 |
| Stryker Medium Caliber Weapon Safety/Perf./Live Fire/Electronics Testing | 1 | 2020 | 2 | 2023 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>EE2 / *Stryker Improvement* |

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Stryker Medium Caliber Weapon Production/Retrofit | 1 | 2022 | 4 | 2026 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>FD8 / *Light Armored Vehicle Improvement* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FD8: *Light Armored Vehicle Improvement* | - | 0.328 | 3.100 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.428 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Light Armored Vehicle improvement program will design, test and modify two Light Armored Vehicles (LAV-25A2s) for Low Velocity Air Drop (LVAD) to inform operational concepts for Infantry Brigade Combat Teams (IBCT) in support of Global Response Force early entry operations. This will directly support the expeditionary maneuver excursion that will be conducted by the XVIII Airborne Corps in FY17-18.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Government Engineering and Project Management | 0.328 | 3.100 | - | - | - |
| ***Description:*** Funding is provided for the following effort<br><br>***FY 2018 Plans:***<br>The Army plans to use 6 LAV-25A2s in a training excursion to inform operational concepts for Airborne Infantry Brigade Combat Teams in support of Global Response Force early entry operation and to determine airdrop feasibility. XVIII Airborne Corps will have an opportunity to assess operational employment of LAV-25A2s, develop tactics, techniques and procedures and assess the air drop feasibility through air certification testing. The Army plans to determine whether or not to field additional LAV-25A2s to XVIII Airborne Corps based on results of the excursion and air drop testing.<br><br>In FY2018 the Army will complete air certification testing to determine LAV-25A2 airdrop feasibility. If the excursion is successful and the Army decides to field additional vehicles it is anticipated that additional modifications and testing will be required to address upgrades to survivability, mobility, integrate Army communications equipment and add obsolescence upgrades for commonality with USMC fielded systems.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding ends in FY18 | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.328 | 3.100 | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>FD8 / *Light Armored Vehicle Improvement* |

**C. Other Program Funding Summary ($ in Millions)**

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203735A / *Combat Vehicle Improvement Programs* | Project (Number/Name)<br>FD8 / *Light Armored Vehicle Improvement* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Office | Allot | PM office : Warren, MI | - | 0.328 | Nov 2016 | 0.325 | Nov 2017 | - | | - | | - | 0.000 | 0.653 | - |
| | | **Subtotal** | - | 0.328 | | 0.325 | | - | | - | | - | 0.000 | 0.653 | N/A |

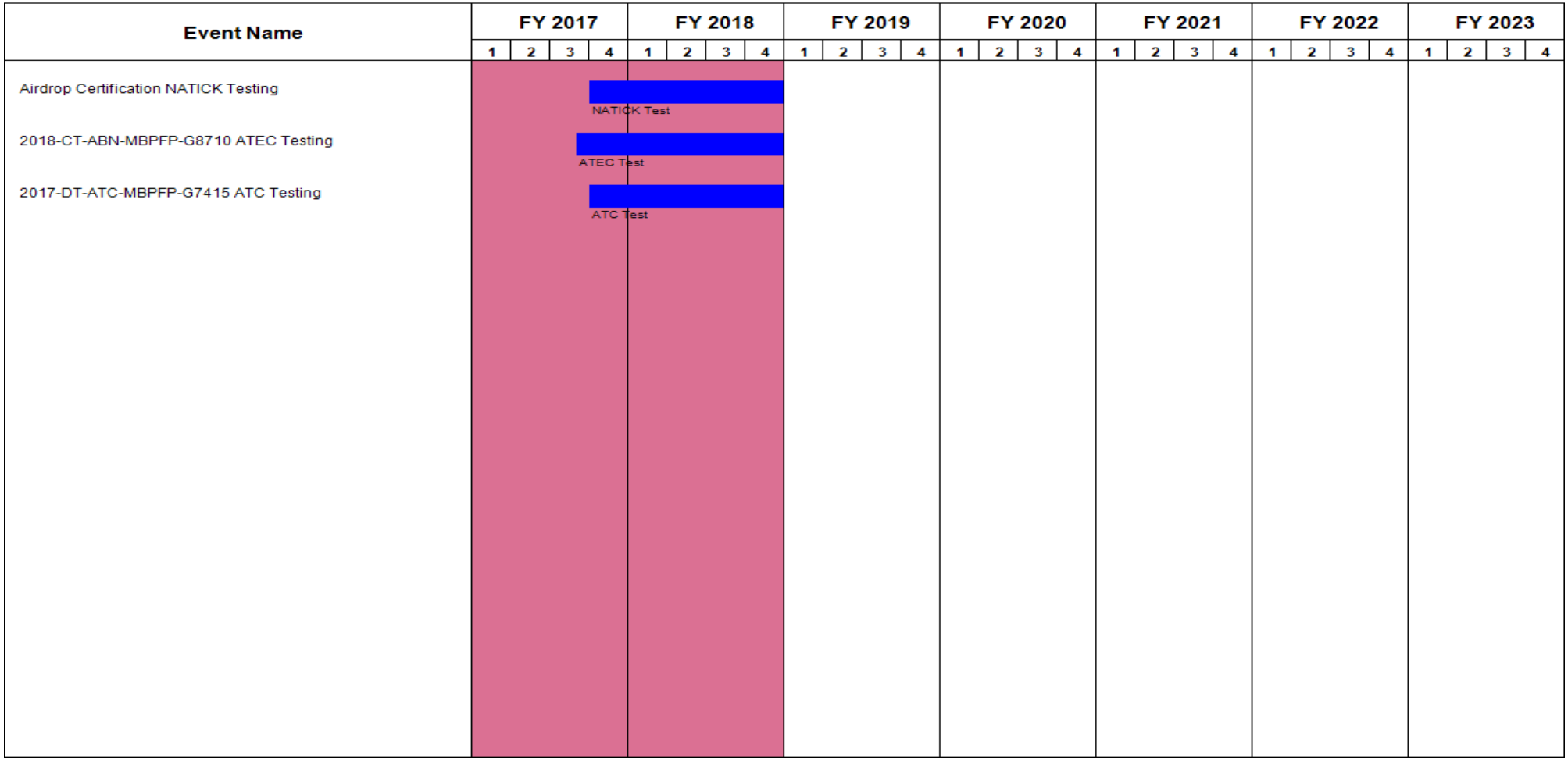
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Support cost | RO | TBD : TBD | - | - | | 2.775 | Mar 2018 | - | | - | | - | 0.000 | 2.775 | - |
| | | **Subtotal** | - | - | | 2.775 | | - | | - | | - | 0.000 | 2.775 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | 0.328 | | 3.100 | | - | | - | | - | 0.000 | 3.428 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>FD8 / *Light Armored Vehicle Improvement* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203735A / *Combat Vehicle Improvement Programs* | **Project (Number/Name)**<br>FD8 / *Light Armored Vehicle Improvement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Airdrop Certification NATICK Testing | 4 | 2017 | 4 | 2018 |
| 2018-CT-ABN-MBPFP-G8710 ATEC Testing | 3 | 2017 | 4 | 2018 |
| 2017-DT-ATC-MBPFP-G7415 ATC Testing | 4 | 2017 | 4 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203740A *I Maneuver Control System* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 3.943 | 6.639 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 10.582 |
| 484: *Maneuver Control System* | - | 3.943 | 6.639 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 10.582 |

**A. Mission Description and Budget Item Justification**

Tactical Mission Command (TMC) is a suite of products and services that provide commanders and their staff executive decision making capability in a collaborative environment. The suite of products currently in development consist of Command Web (CW), Tactical Services Infrastructure (TSI), and an Army Voice Communication System (WAVE). TMC satisfies requirements and capabilities identified in the Maneuver Control System (MCS) 6.4 Capability Production Document. The overarching capability includes a user-defined Common Operating Picture (COP) with integrated Command and Control (C2) and Situational Awareness (SA), map-centric collaboration, Army Mission Command Systems (and others) enabling system interoperability, data management, and enterprise services. TMC contributes to Mission Command (MC) Convergence for commanders and staff to effectively conduct collaborative mission planning and execution across a range of operations and spectrum of conflict. Legacy products supported by this Budget Item include Command Post of the Future (CPOF) and Battle Command Common Services (BCCS).

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 4.031 | 6.639 | 4.047 | - | 4.047 |
| Current President's Budget | 3.943 | 6.639 | 0.000 | - | 0.000 |
| Total Adjustments | -0.088 | 0.000 | -4.047 | - | -4.047 |
| • Congressional General Reductions | -0.001 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.087 | - | | | |
| • Adjustments to Budget Years | - | - | -4.047 | - | -4.047 |

**Change Summary Explanation**

TMC (MCS) will be transitioning into sustainment in FY 2019.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203740A / *Maneuver Control System* | Project (Number/Name)<br>484 / *Maneuver Control System* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 484: *Maneuver Control System* | - | 3.943 | 6.639 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 10.582 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Tactical Mission Command (TMC) is a portfolio of products and services that enable commanders and their staff with collaborative environment, planning tools, and Common Operation Picture (COP) management and other maneuver functional tools. The overarching capability includes above platform level user-defined COP with integrated Command and Control (C2) and Situational Awareness (SA), map-centric collaboration, Army Mission Command System and other enabling system interoperability, data management and enterprise services. Products include:

Command Web is a set of modular software widgets served up over the web providing engineering functionality, improved supportability and ease-of-use in robust network environments.

Tactical Server Infrastructure (TSI) provides the network available services critical to ensuring system and software can transmit the network effectively. Additionally, TSI serves as the hosting platform for many other enabling software systems, as well as multiple Warfighter Functional Area Applications (WFAs) such as Intel, Air Missile Defense Workstations and Fires gateway, providing efficiencies in the Command Post via decreased size, weight and power.

WAVE is the voice of the internet protocol common voice solution for the CPOF portfolio of programs. It provides real-time voice interoperability between radios, intercom and other previously fielded technologies in support of the Commander's update briefing and other Mission Command tasks.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** BCCS / TSI software development / integration | 2.456 | - | - |
| ***Title:*** Command Web Development<br>***Description:*** Command Web provides modular software widgets served up over the web providing engineering functionality. Improved supportability and ease-of-use in robust network environments (compliant w/COE guidance) | 0.549 | - | - |
| ***Title:*** Program Management Office<br>***Description:*** Codification of program operational requirements into discrete technical packages for development, testing, deployment, and support over the systems lifecycle.<br>***FY 2018 Plans:***<br>Codification of program operational requirements into discrete technical packages for development, testing, deployment, and support over the systems lifecycle<br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | 0.320 | 0.639 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203740A / *Maneuver Control System* | **Project (Number/Name)**<br>484 / *Maneuver Control System* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| TMC (MCS) will be transitioning into sustainment in FY19. | | | |
| ***Title:*** Test and Evaluation<br>***Description:*** Encompasses formal test (operational assessment/test, joint certification, interoperability, and information assurance) and informal testing such as acceptance testing and risk reduction testing.<br>***FY 2018 Plans:***<br>Formal test (Joint certification, interoperability, and information assurance) and informal testing such as acceptance testing and risk reduction testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>TMC (MCS) will be transitioning into sustainment in FY19. | 0.018 | 0.512 | - |
| ***Title:*** WAVE MIP / Development / Intergration<br>***Description:*** Developing and integrating voice over IP solutions into the CPOF portfolio of programs. It provides real-time voice interoperability between radios,<br>***FY 2018 Plans:***<br>Finalize integration of WAVE (VOIP) with TMC portfolio of products.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Requirements for MIP/WAVE are incorporated under CPCE development in FY19 and out. | 0.600 | 5.488 | - |
| **Accomplishments/Planned Programs Subtotals** | 3.943 | 6.639 | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BA9320: *Maneuver Control System (MCS)* | 151.464 | 132.572 | 38.015 | - | 38.015 | 0.260 | - | - | - | 0.000 | 322.311 |
| • BS9710: *MCS SPARES* | - | 4.869 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 4.869 |

**Remarks**

**D. Acquisition Strategy**

In accordance with the Training and Doctrine Command (TRADOC) requirements document approved in 2008, Maneuver Control System Capabilities Production Document, software capability will be developed in 3-year increments in support of Common Operating Environment (COE) Guidance designed to deploy specified Mission Command Essential Capabilities to operating force commanders and their integrated battle staffs. This strategy accounts for subsequent Army directives and

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203740A / *Maneuver Control System* | **Project (Number/Name)**<br>484 / *Maneuver Control System* |

continued migration to the Army COE; designed to optimize opportunities for improved interoperability. The products developed under this funding line are an integral part of the Army Mission Command System of Systems.

TMC (MCS) will be transitioning into sustainment in FY 2019.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203740A / *Maneuver Control System* | Project (Number/Name)<br>484 / *Maneuver Control System* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Office Mgmt | Various | PM Mission Command : Aberdeen Proving Grounds, MD | 19.990 | 0.320 | Jan 2017 | 0.639 | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 19.990 | 0.320 | | 0.639 | | - | | - | | - | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tactical Applications (TacApps) | IA | Software Development: WSEC : Picatinny Arsenal, NJ | 19.107 | - | | - | | - | | - | | - | 0.000 | 19.107 | - |
| Command Web Development | Various | CECOM SEC : APG, MD | 1.450 | 0.549 | Apr 2017 | - | | - | | - | | - | 0.000 | 1.999 | - |
| Log Widget Development | TBD | Development: Government Agency : TBD | 3.665 | - | | - | | - | | - | | - | Continuing | Continuing | - |
| Misc Contracts | Various | Various : Various | 24.931 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| ABCS SoS Contract (Joint Convergence Development) | Various | Lockheed Martin : Tinton Falls, NJ | 6.404 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Technical Support | Various | PM Mission Command/SEC : Various | 27.251 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| CPOF Development | Various | General Dynamics : Scottsdale, AZ | 137.255 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| ABCS SoS Contract (Joint Convergence Development) Follow-on | Various | General Dynamics : Scottsdale, AZ | 1.025 | - | | - | | - | | - | | - | Continuing | Continuing | - |
| Mission Command Convergence Development & Integration | Various | Various : Various | 42.698 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203740A / *Maneuver Control System* | Project (Number/Name)<br>484 / *Maneuver Control System* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mission Command Convergence - CP CE Software Development & Integration (Common Software) | Various | software development Future Skies : APG, MD | 11.055 | - | | - | | - | | - | | - | 0.000 | 11.055 | - |
| Mission Command Convergence Development & Integration (TAIS) | Various | software development SED : Redstone Arsenal, AL | 2.103 | - | | - | | - | | - | | - | 0.000 | 2.103 | - |
| Software Development & Technical Support for BCCS | Various | CECOM Software Engineering Center : APG, MD | 68.906 | 2.456 | Feb 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| PAL Integration | IA | SRI : AZ | 11.000 | - | | - | | - | | - | | - | Continuing | Continuing | - |
| WAVE / MIP Development &intergration | Various | TBD : APG | - | 0.600 | Apr 2017 | 5.488 | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 356.850 | 3.605 | | 5.488 | | - | | - | | - | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Misc Engineering Support | Various | PM Mission Command/SEC : Aberdeen Proving Ground, MD | 10.340 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Misc Contracts | Various | PM Mission Command : Aberdeen Proving Ground | 5.743 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 16.083 | - | | - | | - | | - | | - | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203740A / *Maneuver Control System* | Project (Number/Name)<br>484 / *Maneuver Control System* | |

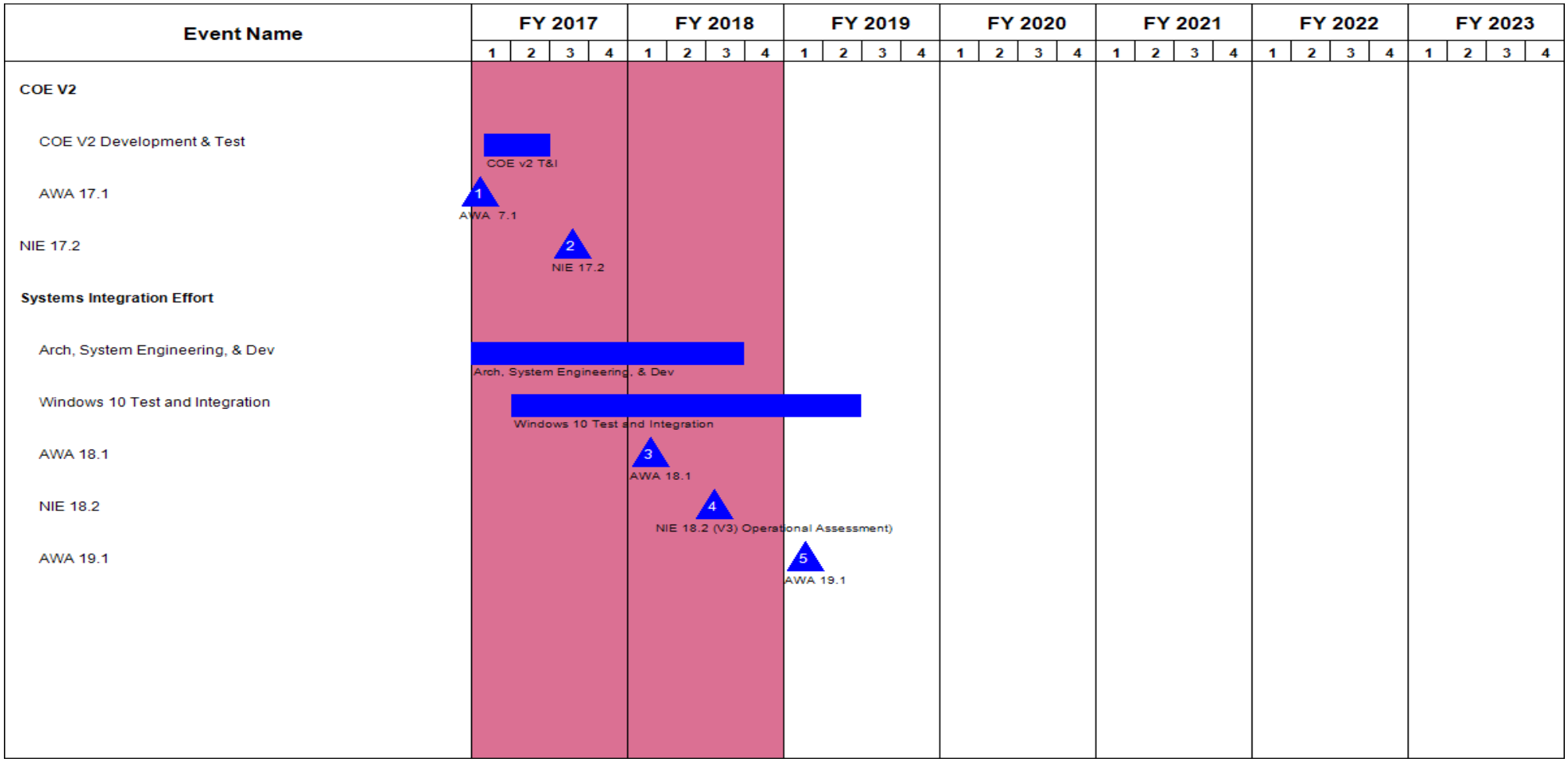
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental tests / CTSF integration testing | Various | Various : APG, MD | 9.627 | 0.018 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| AIC/NIE Testing | TBD | VARIOUS : APG, MD | 10.060 | - | | 0.512 | | - | | - | | - | 0.000 | 10.572 | - |
| Operational Assessment/ testing | Various | Various : APG, MD | 36.804 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 56.491 | 0.018 | | 0.512 | | - | | - | | - | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 449.414 | 3.943 | | 6.639 | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203740A / *Maneuver Control System* | **Project (Number/Name)**<br>484 / *Maneuver Control System* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203740A / *Maneuver Control System* | **Project (Number/Name)**<br>484 / *Maneuver Control System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| COE V2 | 2 | 2012 | 2 | 2017 |
| COE v2 Arch, System Engineering, & Dev | 2 | 2012 | 2 | 2016 |
| COE V2 Development & Test | 1 | 2015 | 2 | 2017 |
| AWA 17.1 | 1 | 2017 | 1 | 2017 |
| NIE 17.2 | 3 | 2017 | 3 | 2017 |
| Systems Integration Effort | 4 | 2014 | 2 | 2019 |
| Arch, System Engineering, & Dev | 4 | 2014 | 3 | 2018 |
| Windows 10 Test and Integration | 2 | 2017 | 2 | 2019 |
| AWA 18.1 | 1 | 2018 | 1 | 2018 |
| NIE 18.2 | 3 | 2018 | 3 | 2018 |
| AWA 19.1 | 1 | 2019 | 1 | 2019 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203743A / *155MM Self-Propelled Howitzer Improvements* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.000 | 40.784 | 40.676 | - | 40.676 | 33.953 | 22.147 | 0.000 | 0.000 | 0.000 | 137.560 |
| FF9: *PIM Improvement Program* | - | 0.000 | 40.784 | 40.676 | - | 40.676 | 33.953 | 22.147 | 0.000 | 0.000 | 0.000 | 137.560 |

**A. Mission Description and Budget Item Justification**

The current Paladin Integrated Management (PIM) is an ACAT1C Acquisition program. The PIM improvement program is intended to address the current Howitzer capability gap based on a capability needs assessment performed by the user community to restore indirect fires support overmatch to the US Army. This effort will evaluate developing technologies to determine which configuration will add optimal value to the Army. This effort may include but is not limited to the integration of a new cannon, gun mount, gun drive systems, fire control systems and autoloader into the M109A7 Howitzer. Analysis will be required to evaluate the impact of the new cannon technology on current platform chassis, cab, suspension, mobility, and electronic architecture. This evaluation will be the foundation for this Engineering Change Proposal (ECP) and further inform the level of effort needed to integrate this capability into the current SPHS.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 40.784 | 42.137 | - | 42.137 |
| Current President's Budget | 0.000 | 40.784 | 40.676 | - | 40.676 |
| Total Adjustments | 0.000 | 0.000 | -1.461 | - | -1.461 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | -1.024 | - | -1.024 |
| • Other Adjustments 1 | - | - | -0.437 | - | -0.437 |

**Change Summary Explanation**

Adjustments

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203743A / *155MM Self-Propelled Howitzer Improvements* | Project (Number/Name)<br>FF9 / *PIM Improvement Program* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FF9: *PIM Improvement Program* | - | 0.000 | 40.784 | 40.676 | - | 40.676 | 33.953 | 22.147 | 0.000 | 0.000 | 0.000 | 137.560 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The current Paladin Integrated Management (PIM) is an ACAT1C Acquisition program. The PIM improvement program is intended to address the current Howitzer capability gap based on a capability needs assessment performed by the user community to restore indirect fires support overmatch to the US Army. This effort will evaluate developing technologies to determine which configuration will add optimal value to the Army. This effort may include but is not limited to the integration of a new cannon, gun mount, gun drive systems, fire control systems and autoloader into the M109A7 Howitzer. Analysis will be required to evaluate the impact of the new cannon technology on current platform chassis, cab, suspension, mobility, and electronic architecture. This evaluation will be the foundation for this Engineering Change Proposal (ECP) and further inform the level of effort needed to integrate this capability into the current SPHS. .

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** PIM Improvement Program | - | 40.784 | - |
| ***Description:*** Funding is provided to support Cost Benefit Analysis (CBA) and associated following on activities, and range requirements<br><br>***FY 2018 Plans:***<br>Will conduct a Cost Benefit Analysis (CBA) comparing several different packages of upgrades for the M109A7. Each upgrade package will be evaluated for cost, technology readiness and added performance. At the conclusion of the CBA the Army will be better informed to choose a path which can be sole source with the current vendor, open competition, or continue with government development through Engineering Manufacturing Development (EMD). This work effort is to pursue Objective Indirect Fire Range Requirement in the current M109 FOV Capability Production Document (CPD). The effort will address increased range requirements from a holisitic development process. Program will focus on gun mount, breech, tube, and fire control. It will be designed around M109A7 objective requirements for range. It is intended to address capability gaps as identified by the Army Chief of Staff.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding in FY19 has decreased to zero and transitioned to the Extended Range ECP Development (ERCA) | | | |
| ***Title:*** Extended Range ECP Development (ERCA) | - | - | 35.585 |
| ***Description:*** Funds support Range ECP development.costs<br><br>***FY 2019 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203743A / *155MM Self-Propelled Howitzer Improvements* | **Project (Number/Name)**<br>FF9 / *PIM Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Will focus on executing the plan to begin Integration of improved armament configuration developed by ARDEC Science & Technology (S&T) effort onto the M109A7. Purchase of long lead hardware and prototype build. Develop testing strategy, systems engineering documentation and logistics input.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY 2019 transition to ERCA as result of Army CBA conclusion | | | |
| ***Title:*** Program Management<br>***Description:*** Funding is provided for all Program Management efforts on the Extended Range ECP program.<br>***FY 2019 Plans:***<br>Begin the development for all required documents, office staff and engineering Integrated Product Team (IPT) development.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding has increase in FY 2019 to fund program management support costs for ERCA | - | - | 4.231 |
| ***Title:*** Training<br>***Description:*** Funding is provided for all training efforts on the Extended Range ECP program.<br>***FY 2019 Plans:***<br>Establish procedures for logistical development, production engineering and test.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding in FY 2019 has increased to fund training for ERCA | - | - | 0.860 |
| **Accomplishments/Planned Programs Subtotals** | - | 40.784 | 40.676 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

N/A

**D. Acquisition Strategy**

PdM Self Propelled Howitzer will use available information from the completed Cost Benefits Analysis (CBA) and Market Survey to solidify the acquisition plan and execute contracting activities to award an EMD contract to accomplish development, integration, test and sustainment actions as the program moves forward.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203743A / *155MM Self-Propelled Howitzer Improvements* | **Project (Number/Name)**<br>FF9 / *PIM Improvement Program* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203743A / *155MM Self-Propelled Howitzer Improvements* | Project (Number/Name)<br>FF9 / *PIM Improvement Program* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIM Improvement Program | C/TBD | To Be Determined : To Be Determined | - | - | | 38.784 | Jun 2018 | - | | - | | - | 0.000 | 38.784 | - |
| Extended Range ECP Development - Government | MIPR | ARDEC : Picatinny | - | - | | - | | 21.682 | Dec 2018 | - | | 21.682 | 0.000 | 21.682 | - |
| Extended Range ECP Development - Contractor | SS/CPFF | BAE Systems : York, PA | - | - | | - | | 13.903 | Dec 2018 | - | | 13.903 | 0.000 | 13.903 | - |
| Training | MIPR | Various - OGAs : Various | - | - | | - | | 0.860 | Dec 2018 | - | | 0.860 | 0.000 | 0.860 | - |
| | | **Subtotal** | - | - | | 38.784 | | 36.445 | | - | | 36.445 | 0.000 | 75.229 | N/A |

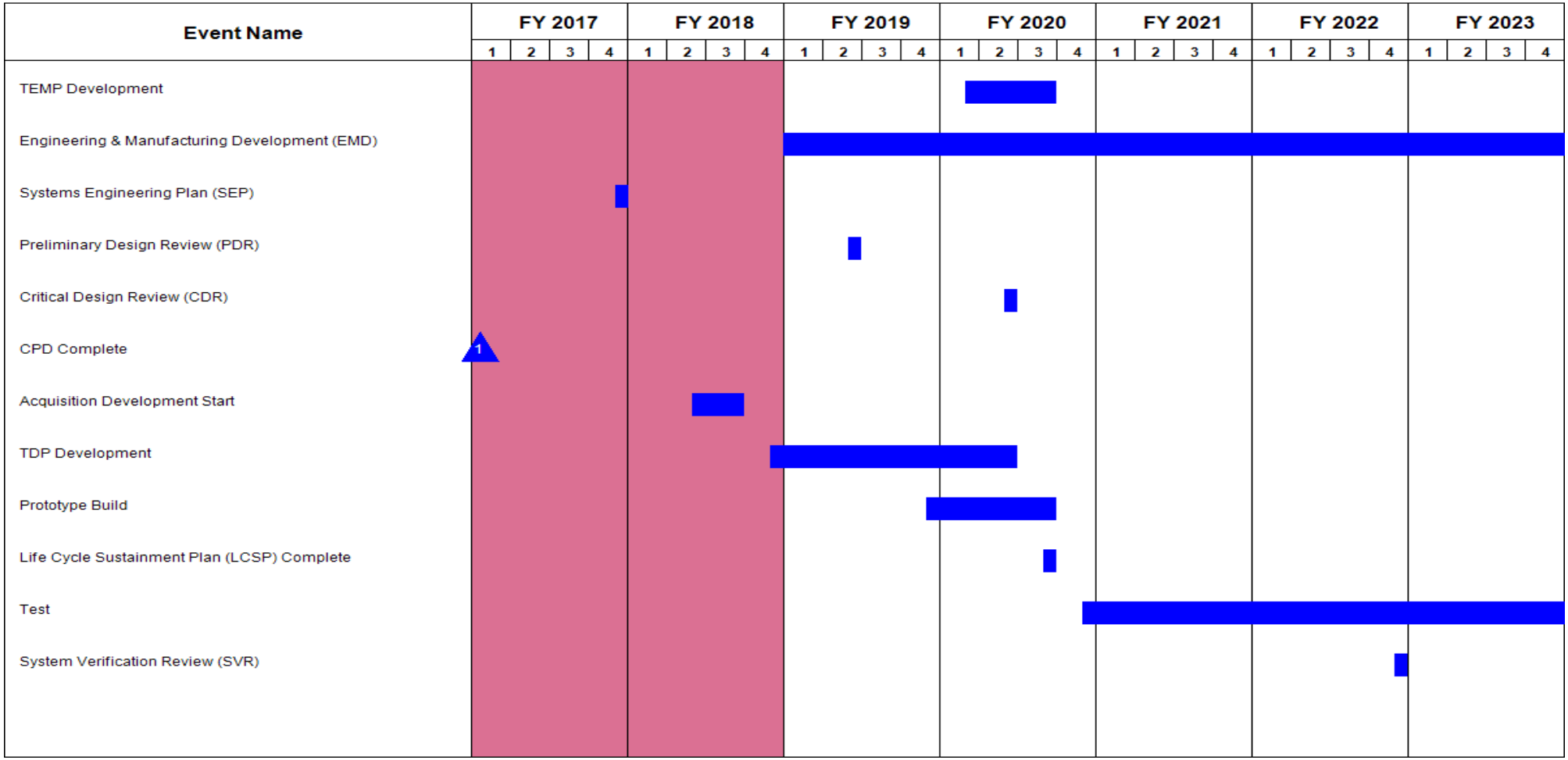
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PMO/PEO Support | MIPR | PM/PEO PIM : Various | - | - | | 2.000 | Dec 2017 | 4.231 | Dec 2018 | - | | 4.231 | 0.000 | 6.231 | - |
| | | **Subtotal** | - | - | | 2.000 | | 4.231 | | - | | 4.231 | 0.000 | 6.231 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 40.784 | | 40.676 | | - | | 40.676 | 0.000 | 81.460 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203743A / *155MM Self-Propelled Howitzer Improvements* | **Project (Number/Name)**<br>FF9 / *PIM Improvement Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203743A / *155MM Self-Propelled Howitzer Improvements* | **Project (Number/Name)**<br>FF9 / *PIM Improvement Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| TEMP Development | 1 | 2020 | 3 | 2020 |
| Engineering & Manufacturing Development (EMD) | 1 | 2019 | 1 | 2024 |
| Systems Engineering Plan (SEP) | 4 | 2017 | 4 | 2017 |
| Preliminary Design Review (PDR) | 2 | 2019 | 2 | 2019 |
| Critical Design Review (CDR) | 2 | 2020 | 2 | 2020 |
| CPD Complete | 1 | 2017 | 1 | 2017 |
| Acquisition Development Start | 2 | 2018 | 3 | 2018 |
| TDP Development | 4 | 2018 | 2 | 2020 |
| Prototype Build | 4 | 2019 | 3 | 2020 |
| Life Cycle Sustainment Plan (LCSP) Complete | 3 | 2020 | 3 | 2020 |
| Test | 4 | 2020 | 1 | 2025 |
| System Verification Review (SVR) | 4 | 2022 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0203744A / *Aircraft Modifications/Product Improvement Programs* |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | - | 32.397 | 39.358 | 17.706 | - | 17.706 | 6.686 | 4.271 | 0.220 | 0.163 | 0.000 | 100.801 |
| EB6: *MQ-1C Gray Eagle MODS* | - | 32.397 | 39.358 | 17.706 | - | 17.706 | 6.686 | 4.271 | 0.220 | 0.163 | 0.000 | 100.801 |

**A. Mission Description and Budget Item Justification**

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and Hellfire missiles; providing a near all-weather mission capability. MQ-1C Gray Eagle is a dedicated, assured, multi-mission Unmanned Aircraft System (UAS) fielded to all Army Divisions, Intelligence and Security Command and Army Special Operations Command in support of the commander's warfighting priorities.

The MQ-1C Gray Eagle Modification/Product Improvement Program (PIP) funding is required for Global Positioning System (GPS) Denied, an electronic warfare capability, and Ground Based Sense And Avoid (GBSAA) Block II.

The Fiscal Year (FY) 2019 Aircraft Modification/Product Improvement funding of $17.706 million will support the development required to integrate Alternate Munition, and GPS Denied for the MQ-1C Gray Eagle product. GBSAA RDTE will provide development, integration and testing for Block II. Block II decreases operational and sustainment costs, operator workload, hardware/software costs, increases system safety, and provides full materiel release for Soldier operation.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 35.793 | 39.358 | 18.488 | - | 18.488 |
| Current President's Budget | 32.397 | 39.358 | 17.706 | - | 17.706 |
| Total Adjustments | -3.396 | 0.000 | -0.782 | - | -0.782 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | -2.100 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.280 | - | | | |
| • Adjustments to Budget Years | - | - | -0.782 | - | -0.782 |
| • FFRDC Transfer | -0.016 | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | Project (Number/Name)<br>EB6 / *MQ-1C Gray Eagle MODS* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EB6: *MQ-1C Gray Eagle MODS* | - | 32.397 | 39.358 | 17.706 | - | 17.706 | 6.686 | 4.271 | 0.220 | 0.163 | 0.000 | 100.801 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission capability. MQ-1C Gray Eagle is a dedicated, assured, multi-mission Unmanned Aircraft System (UAS) fielded to all Army Divisions, Intelligence and Security Command and Army Special Operations Command in support of the commander's warfighting priorities.

The MQ-1C Gray Eagle Modification/Product Improvement Program (PIP) funding is required for the implementation Global Positioning System (GPS) Denied which is an electronic warfare capability and Ground Based Sense And Avoid (GBSAA) Block II.

The Fiscal Year (FY) 2019 Aircraft Modification/Product Improvement funding of $17.706 million will support the development required to integrate Alternate Munition and GPS Denied. GBSAA RDTE will provide development, integration and testing for Block II. Moving the GBSAA display into the UGCS provides the aircraft operator real-time information for evasive maneuvers. Block II decreases operational and sustainment costs, operator workload, hardware/software costs, increases system safety, and provides full materiel release for Soldier operation.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Global Positioning System (GPS) Denied | 2.741 | 4.313 | 6.447 | - | 6.447 |
| ***Description:*** GPS Denied<br><br>***FY 2018 Plans:***<br>Funding supports continued development of an electronic warfare capability that provides the system the ability to continue operations during periods of GPS outage as well as the ability to identify GPS jammer position location. The funding will enable the MQ-1C Gray Eagle to implement all levels of electro-optical countermeasures that will be compatible with other tactical UAS?s.<br><br>***FY 2019 Base Plans:***<br>Funding continues development of an electronic warfare capability that provides the system the ability to continue operations during periods of GPS outage as well as the ability to identify GPS jammer position location. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | **Project (Number/Name)**<br>EB6 / *MQ-1C Gray Eagle MODS* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| The funding will enable the MQ-1C Gray Eagle to implement all levels of electro-optical countermeasures that will be compatible with other tactical UAS?s.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Development is transition from concept refinement and requirement definition to design and prototype development. | | | | | |
| ***Title:*** Universal Ground Control Station (UGCS) Improvement<br>***Description:*** UGCS Improvement<br>***FY 2018 Plans:***<br>Funding will be used to continue the implementation, training, and documentation updates to correct FOT&E findings and maintain the Net Ready KPP for the MQ-1C Gray Eagle UGCS.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Budget Estimate Submission captured under PE: 0607143A | 7.825 | 9.235 | - | - | - |
| ***Title:*** Alternate Munition Integration<br>***Description:*** Alternate Munition Integration<br>***FY 2018 Plans:***<br>Development of software changes, training, and documentation, ground/flight tests, environmental testing, Electromagnetic Environmental Effects (E3) testing, production prove-out tests, and live-fire tests. This capability will provide reduced collateral damage during weapons engagement, increase munitions inventory without affecting flight endurance, reducing enemy engagement costs and potentially reduce advanced audible and visual signatures.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>JAGM integration is anticipated to be completed in FY18. | 8.577 | 9.180 | - | - | - |
| ***Title:*** Ground Base Sense and Avoid (GBSAA) Block II<br>***Description:*** GBSAA Block II<br>***FY 2018 Plans:*** | 12.851 | 8.330 | 6.699 | - | 6.699 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | **Project (Number/Name)**<br>EB6 / *MQ-1C Gray Eagle MODS* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Funding supports the development and Integration for Block II to provide GBSAA display moved to Ground Control Station (GCS). Maneuver Recommendation to Aircraft Operator (AO).<br>***FY 2019 Base Plans:***<br>Funding supports the development and Integration for Block II to provide GBSAA display moved to Ground Control Station (GCS). Maneuver Recommendation to Aircraft Operator (AO).<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program is entering system test phase. | | | | | |
| ***Title:*** Ground Base Sense and Avoid (GBSAA) Test Block II<br>***Description:*** Ground Base Sense and Avoid (GBSAA) Test Block II | 0.403 | - | - | - | - |
| ***Title:*** Survivability<br>***FY 2018 Plans:***<br>Funding for Electronic Attack (EA) survivability requirements for the MQ-1C Gray Eagle will be used to assess vulnerabilities of the current datalink. The Joint System Integration Lab (JSIL) will be funded to research and provide a Datalink Vulnerabilities Improvement Assessment. The prime contractor will be funded to provide survivability solutions for both software and hardware features.<br>***FY 2019 Base Plans:***<br>Funding for Electronic Attack (EA) survivability requirements for the MQ-1C Gray Eagle will be used to develop prototype solutions against known threat vulnerabilities. The Joint System Integration Lab (JSIL) will be funded to research and provide a Datalink Vulnerabilities Improvement Assessment. The prime contractor will be funded to provide survivability solutions for both software and hardware features.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program anticipated to be completed in FY19. | - | 8.300 | 4.560 | - | 4.560 |
| **Accomplishments/Planned Programs Subtotals** | 32.397 | 39.358 | 17.706 | - | 17.706 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A00005: *MQ-1 Unmanned Aircraft Vehicle (UAV)* | 249.838 | 30.206 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 280.044 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | **Project (Number/Name)**<br>EB6 / *MQ-1C Gray Eagle MODS* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • AA6601: *MQ-1C Gray Eagle Mods2* | - | 74.291 | 98.640 | 32.000 | 130.640 | 34.030 | 15.970 | - | 2.263 | Continuing | Continuing |
| • 0305219A: *MQ-1C Gray Eagle - Army UAV (MIP)* | 13.470 | 9.574 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 23.044 |

**Remarks**

**D. Acquisition Strategy**

An Extended Range Multi-Purpose (ERMP) Operational Requirement Document (ORD) was approved by the Joint Requirement Oversight Council (JROC) 6 Apr 2005. Milestone B occurred on 20 Apr 2005, and the System Development and Demonstration contract was awarded 8 Aug 2005, as a result of a competitive solicitation which included a vendor system capabilities demonstration. A Capabilities Production Document (CPD) was approved 14 Mar 2009. MQ-1C Gray Eagle completed FOTE 12 Jun 2015.

The RDTE funded elements for GPS Denied, UGCS Improvements and Alternate Munition Integration addressed in this submission are planned for award on the Gray Eagle Engineering Services contract as a Sub-Engineering Services Memorandum (SESM) task order, and as Military Interdepartmental Purchase Requisitions (MIPRs) to various other Government Agencies. The purpose of the SESMs is to mature the respective designs to a level that Engineering Change Requests (ECR) are submitted to the Government via the Configuration Control Board (CCB). Following successful completion of the SESM and CCB approval, a contract modification to retrofit and/or cut-in the respective engineering change will be awarded on the appropriate Performance Based Logistics (PBL) or Production contract. The RDTE funded element for GBSAA Block II addressed in this submission are planned for award on various contracts and MIPR actions to other government agencies.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | Project (Number/Name)<br>EB6 / *MQ-1C Gray Eagle MODS* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Global Positioning System (GPS) Denied | SS/CPFF | General Atomics/ ASI : San Diego, CA | - | 2.741 | Jan 2017 | 4.313 | Jan 2018 | 6.447 | Jan 2019 | - | | 6.447 | Continuing | Continuing | - |
| Universal Ground Control Station (UGCS) Improvements | SS/CPFF | General Atomics/ ASI : San Diego, CA | - | 7.825 | Jan 2017 | 9.235 | Jan 2018 | - | | - | | - | Continuing | Continuing | - |
| Alternate Munition Integration | MIPR | Various : Various | - | 8.577 | Jan 2017 | 9.180 | Jan 2018 | - | | - | | - | Continuing | Continuing | - |
| Ground Base Sense and Avoid Block II | SS/CPFF | Various : Various | - | 10.688 | Oct 2016 | 8.330 | Oct 2017 | 6.699 | Oct 2018 | - | | 6.699 | Continuing | Continuing | - |
| Survivability | SS/CPIF | GA-ASI : Poway, CA | - | - | | 6.880 | Jan 2018 | 3.110 | Jan 2019 | - | | 3.110 | Continuing | Continuing | - |
| | | **Subtotal** | - | 29.831 | | 37.938 | | 16.256 | | - | | 16.256 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering Support - MQ-1 | MIPR | Various : Various | - | - | | 1.420 | Jan 2018 | 1.450 | Jan 2019 | - | | 1.450 | 0.000 | 2.870 | - |
| Engineering Support - GBSAA | MIPR | Various : Various | - | 2.163 | Mar 2017 | - | | - | | - | | - | 0.000 | 2.163 | - |
| | | **Subtotal** | - | 2.163 | | 1.420 | | 1.450 | | - | | 1.450 | 0.000 | 5.033 | N/A |

**Test and Evaluation ($ in Millions)**

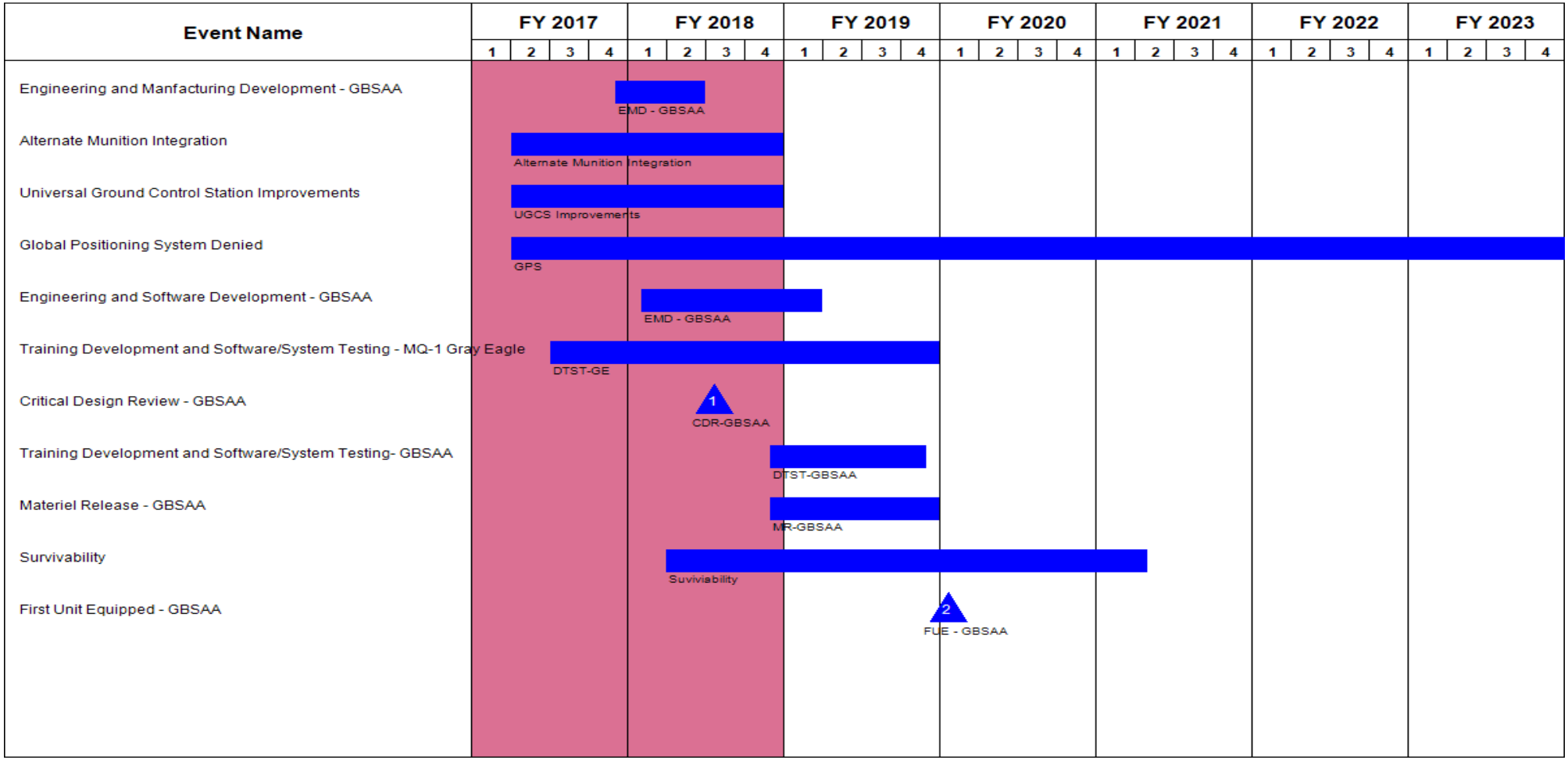
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Testing and Software Testing Block II - GBSAA | MIPR | Various : Various | - | 0.403 | Mar 2017 | - | | - | | - | | - | 0.000 | 0.403 | - |
| | | **Subtotal** | - | 0.403 | | - | | - | | - | | - | 0.000 | 0.403 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | Project (Number/Name)<br>EB6 / *MQ-1C Gray Eagle MODS* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | 32.397 | | 39.358 | | 17.706 | | - | | 17.706 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | **Project (Number/Name)**<br>EB6 / *MQ-1C Gray Eagle MODS* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203744A / *Aircraft Modifications/ Product Improvement Programs* | **Project (Number/Name)**<br>EB6 / *MQ-1C Gray Eagle MODS* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Engineering and Manfacturing Development - GBSAA | 4 | 2017 | 2 | 2018 |
| Alternate Munition Integration | 2 | 2017 | 4 | 2018 |
| Universal Ground Control Station Improvements | 2 | 2017 | 4 | 2018 |
| Global Positioning System Denied | 2 | 2017 | 1 | 2024 |
| Engineering and Software Development - GBSAA | 1 | 2018 | 1 | 2019 |
| Training Development and Software/System Testing - MQ-1 Gray Eagle | 3 | 2017 | 4 | 2019 |
| Critical Design Review - GBSAA | 3 | 2018 | 3 | 2018 |
| Training Development and Software/System Testing- GBSAA | 4 | 2018 | 4 | 2019 |
| Materiel Release - GBSAA | 4 | 2018 | 4 | 2019 |
| Survivability | 2 | 2018 | 2 | 2021 |
| First Unit Equipped - GBSAA | 1 | 2020 | 1 | 2020 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203752A *I Aircraft Engine Component Improvement Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.249 | 0.145 | 0.146 | - | 0.146 | 0.144 | 0.000 | 0.000 | 0.000 | 0.000 | 0.684 |
| 106: *A/C Compon Improv Prog* | - | 0.249 | 0.145 | 0.146 | - | 0.146 | 0.144 | 0.000 | 0.000 | 0.000 | 0.000 | 0.684 |

**A. Mission Description and Budget Item Justification**

Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.259 | 0.145 | 0.148 | - | 0.148 |
| Current President's Budget | 0.249 | 0.145 | 0.146 | - | 0.146 |
| Total Adjustments | -0.010 | 0.000 | -0.002 | - | -0.002 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.010 | - | | | |
| • Adjustments to Budget Years | - | - | -0.002 | - | -0.002 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203752A / *Aircraft Engine Component Improvement Program* | Project (Number/Name)<br>106 / *A/C Compon Improv Prog* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 106: *A/C Compon Improv Prog* | - | 0.249 | 0.145 | 0.146 | - | 0.146 | 0.144 | 0.000 | 0.000 | 0.000 | 0.000 | 0.684 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element (PE).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** T700 Engine<br>***Description:*** no funds after FY 17. T700 funding is used to address flight safety and readiness problems that arise in the field. This includes programs to improving durability and reliability while reducing cost of ownership. | 0.037 | - | - |
| ***Title:*** UAV Engine<br>***Description:*** UAV Gray Eagle Engine Investigation at U.S. Army Research Laboratory (ARL) Vehicle Technology Directorate (VTD) at Aberdeen Proving Ground, MD. Provide research to support airworthiness, reliability and performance improvements of UAV engines. Investigate and research the technology challenges (i.e. engine performance, engine durability, engine life, and engine modifications) for reliable engine operation using JP-8 fuel and readily available MIL-spec lubricants.<br>***FY 2018 Plans:***<br>Continue to research improvements to address service related deficiencies to improve safety and reduce operating and support (O&S) Costs.<br>***FY 2019 Plans:***<br>Will continue to research improvements to address service related deficiencies to improve safety and reduce O&S Costs.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 increase reflects inflation adjustment. | 0.125 | 0.085 | 0.086 |
| ***Title:*** In-House Support<br>***Description:*** In-house support for the CIP engineers. Contracting support for CIP contracts.<br>***FY 2018 Plans:*** | 0.087 | 0.060 | 0.060 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203752A / *Aircraft Engine Component Improvement Program* | **Project (Number/Name)**<br>106 / *A/C Compon Improv Prog* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Continue to provide in-house engineering support for engine CIP programs.<br>***FY 2019 Plans:***<br>Will continue to provide in-house engineering support for engine CIP programs. | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.249 | 0.145 | 0.146 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Improved designs will be implemented via Engineering Change Proposal (ECP) and follow-on procurement or modification to a production contract to introduce the improved hardware.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203752A / *Aircraft Engine Component Improvement Program* | Project (Number/Name)<br>106 / *A/C Compon Improv Prog* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In-house Engineering | Allot | US Army AMRDEC : Redstone Arsenal, AL | 2.803 | 0.087 | Oct 2016 | 0.060 | Sep 2018 | 0.060 | Oct 2018 | - | | 0.060 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 2.803 | 0.087 | | 0.060 | | 0.060 | | - | | 0.060 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T700 Engine | SS/IDIQ | GE-Air : Lynn, MA | 61.692 | 0.037 | Jan 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| T55 Engine | SS/IDIQ | Honeywell : Phoenix, AZ | 30.161 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| T62 Auxiliary Power Unit (APU) | C/IDIQ | Redstone Technical Center Redstone Arsenal, AL : ATEC | 0.050 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| APU's | SS/IDIQ | Air Force : Kelly AFB, TX | 13.647 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| UAV Engine | Various | ARL-Vehicle Technology Directorate : TBD | 0.808 | 0.125 | Aug 2017 | 0.085 | Sep 2018 | 0.086 | Sep 2019 | - | | 0.086 | Continuing | Continuing | Continuing |
| APU's | SS/IDIQ | Air Force : Hill AFB, UT | 2.319 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 108.677 | 0.162 | | 0.085 | | 0.086 | | - | | 0.086 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T-62T-2B Vibration Test | Various | Redstone Technical Text Center : Redstone Arsenal, AL | 0.050 | - | | - | | - | | - | | - | Continuing | Continuing | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203752A / *Aircraft Engine Component Improvement Program* | Project (Number/Name)<br>106 / *A/C Compon Improv Prog* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Subtotal** | 0.050 | - | | - | | - | | - | | - | Continuing | Continuing | N/A |

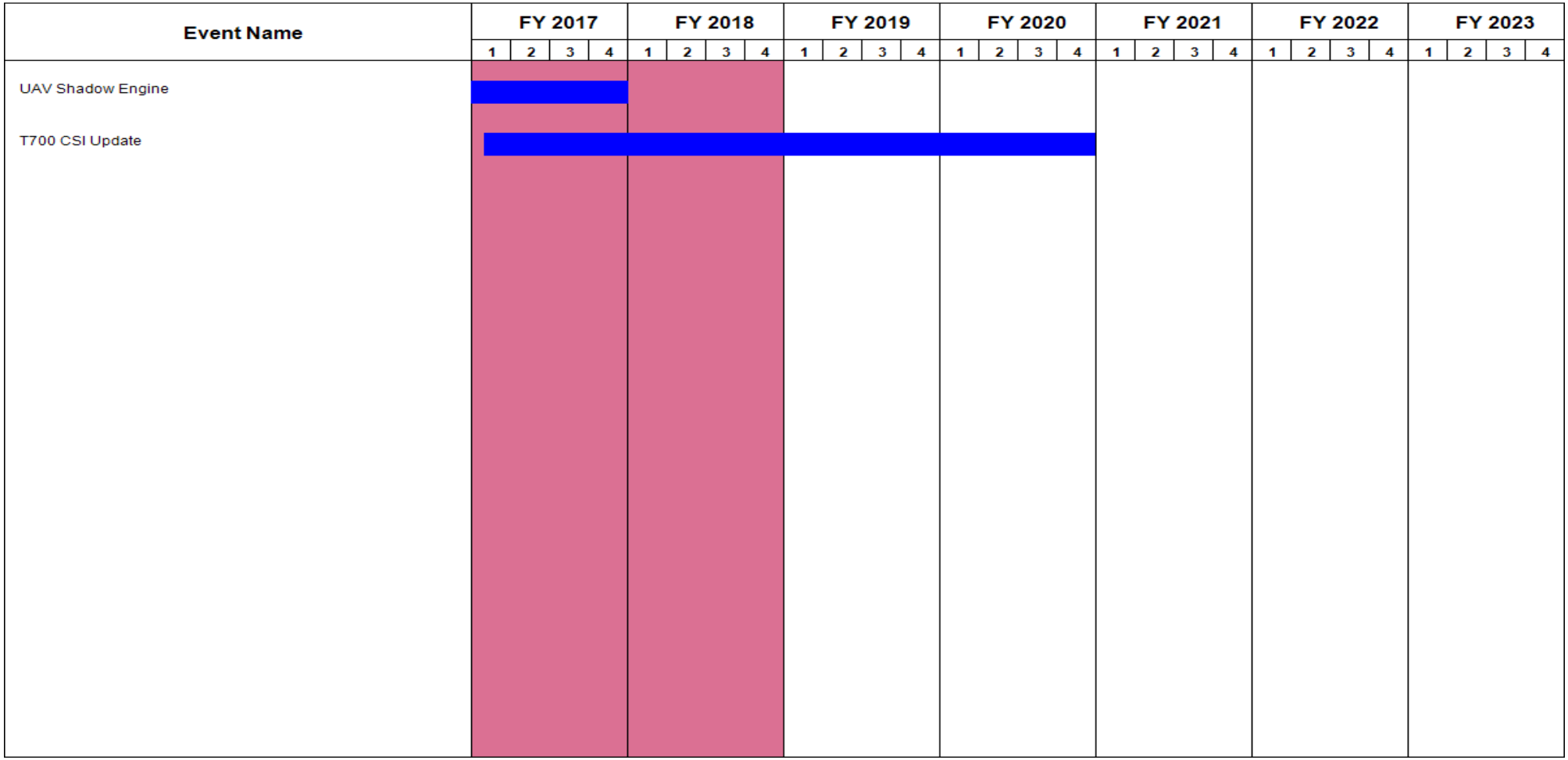
**Remarks**

Not Applicable

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 111.530 | 0.249 | | 0.145 | | 0.146 | | - | | 0.146 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203752A / *Aircraft Engine Component Improvement Program* | **Project (Number/Name)**<br>106 / *A/C Compon Improv Prog* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203752A / *Aircraft Engine Component Improvement Program* | **Project (Number/Name)**<br>106 / *A/C Compon Improv Prog* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| UAV Shadow Engine | 2 | 2014 | 4 | 2017 |
| T700 CSI Update | 1 | 2017 | 4 | 2020 |

**Note**

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203758A / *Digitization* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 6.234 | 4.803 | 6.316 | - | 6.316 | 6.020 | 5.650 | 5.571 | 5.681 | 0.000 | 40.275 |
| 374: *HOR Battlefld Digitizn* | - | 6.234 | 4.803 | 6.316 | - | 6.316 | 6.020 | 5.650 | 5.571 | 5.681 | 0.000 | 40.275 |

**A. Mission Description and Budget Item Justification**

Horizontal Battlefield Digitization is a strategy that allows warfighters, from the individual soldier and platform to echelons above corps, to share critical situation awareness (SA) and command and control (C2) information. It conducts analysis and evaluation of new information technologies, concepts, and applications of integrated management activities. Digital information technologies to acquire, exchange, and employ data throughout the operational environment, are used to provide an operational picture for leaders. This timely sharing of information significantly improves the ability to quickly make decisions, synchronize forces and fires, and increase the operational tempo. The major efforts included in the program element are: 1) Integration and synchronization of the Army's interoperability efforts; between joint and multi-national forces, combat material, and training efforts. 2) Systems engineering and integration of hardware and software from a System of Systems (SOS) perspective. 3) Develop Army Equipping Enterprise System (AE2S) integration of the Force Development Investment Information System (FDIIS), Army Flow Model (AFM), and Force Development Knowledge Center (FDKC) programs into a single integrated system.

Digitization efforts are in support of the Army Equipping Strategy, National Defense Authorization Act 804, and OSD reports to Congress.

| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
|---|---|---|---|---|---|
| Previous President's Budget | 6.483 | 4.803 | 6.384 | - | 6.384 |
| Current President's Budget | 6.234 | 4.803 | 6.316 | - | 6.316 |
| Total Adjustments | -0.249 | 0.000 | -0.068 | - | -0.068 |
| • Congressional General Reductions | -0.003 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.246 | - | | | |
| • Adjustments to Budget Years | - | - | -0.068 | - | -0.068 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203758A / *Digitization* | Project (Number/Name)<br>374 / *HOR Battlefld Digitizn* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 374: *HOR Battlefld Digitizn* | - | 6.234 | 4.803 | 6.316 | - | 6.316 | 6.020 | 5.650 | 5.571 | 5.681 | 0.000 | 40.275 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project funds the Army Equipping Enterprise System (AE2S) continued development and integration of the Force Development Investment Information System (FDIIS), Army Flow Model (AFM), and the Force Development Knowledge Center (FDKC) into an improved, single system. Continued development of the suite of the AE2S applications is necessary to create and improve workflow efficiencies amongst various organizations and data base systems, Active and Reserve Component equipment transparency reporting requirements, and Active and Reserve equipment fielding plans to the Solider according to the Army Force Generation (ARFORGEN). Additionally, this program element funds various Federally Funded Research and Development Center (FFRDC) projects that provide system engineering expertise to provide unbiased advice, formulate course of actions, analyze programs and make technical support and process recommendations to create efficiencies and improve systems. Specifically, these FFRDC projects support Army Mission Command and network architecture (operational and systems) development, technical and policy document review in support of planning and acquisition, network and joint integration and interoperability evaluations and assessments, program and database analysis, independent technical analysis, special studies, and acquisition process improvement. In accordance with the National Defense Authorization Act (NDAA) 804 and support of the Office of the Secretary of Defense's (OSD) report to Congress, the Army is poised to implement an incremental approach to software development and hardware/software capability integration. This process will improve effectiveness in the identification, assessment and acquisition of capability solutions for the Army.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Interoperability and Integration | 1.054 | 0.824 | 1.095 |
| ***Description:*** Funds are to be used for the following efforts<br><br>***FY 2018 Plans:***<br>FFRDC contractor shall conduct independent analyses of Army, joint, and multinational interfaces, adherence to standards, implementation profiles and interoperability baselines<br><br>***FY 2019 Plans:***<br>FFRDC contractor shall conduct independent analyses of Army, joint, and multinational interfaces, adherence to standards, implementation profiles and interoperability baselines<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Return to previous level of effort. | | | |
| ***Title:*** Operational Capability Analysis and Evaluation | 1.114 | 0.871 | 1.158 |
| ***Description:*** Funds are to be used for the following efforts<br><br>***FY 2018 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203758A / *Digitization* | **Project (Number/Name)**<br>374 / *HOR Battlefld Digitizn* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| FFRDC contractor shall conduct iterative capability analyses and assessments consistent with CJCSI 3170 (JCIDS) and 6212 (Net Readiness) to ensure Army and joint program technical and operational requirements are consistent. Efforts support army and joint initiatives.<br>***FY 2019 Plans:***<br>FFRDC contractor shall conduct iterative capability analyses and assessments consistent with CJCSI 3170 (JCIDS) and 6212 (Net Readiness) to ensure Army and joint program technical and operational requirements are consistent. Efforts support army and joint initiatives.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Return to previous level of effort. | | | |
| ***Title:*** Systems Architecture Development<br>***Description:*** Funds are to be used for the following efforts<br>***FY 2018 Plans:***<br>FFRDC contractor shall conduct broad concept studies with emphasis on interoperability and joint/coalition operations.<br>***FY 2019 Plans:***<br>FFRDC contractor shall conduct broad concept studies with emphasis on interoperability and joint/coalition operations.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Return to previous level of effort. | 0.910 | 0.711 | 0.945 |
| ***Title:*** AE2S Software<br>***Description:*** Procures AE2S software integration and enhancements for the single program language, single platform system that incorporates FDIIS, CEaVa, COP and AFM.<br>***FY 2018 Plans:***<br>Integrate existing code-base for FDIIS, AFM and FDKC to reduce overall cost and maintenance footprint and incorporate the development of new applications to satisfy Long-Range Investment Requirements Analysis (LIRA), Sustainment Program Evaluation Group (SS PEG), and Equipping PEG (EE PEG) Manpower.<br>***FY 2019 Plans:***<br>Integrate existing code-base for FDIIS, AFM and FDKC to reduce overall cost and maintenance footprint and incorporate the development of new applications to satisfy Long-Range Investment Requirements Analysis (LIRA), Sustainment Program Evaluation Group (SS PEG), and Equipping PEG (EE PEG) Manpower.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | 1.958 | 1.267 | 1.684 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203758A / *Digitization* | **Project (Number/Name)**<br>374 / *HOR Battlefld Digitizn* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Return to previous level of effort. | | | |
| ***Title:*** Technical Reviews and Technical Performance Analysis<br>***Description:*** Funds are to be used for the following efforts<br><br>***FY 2018 Plans:***<br>FFRDC contractor shall provide technology maturity assessments and prepare technical recommendations in support of Army Transformation and specific technologies of interest to G8. Test and evaluate network systems and infrastructure modeling and simulations.<br>***FY 2019 Plans:***<br>FFRDC contractor shall provide technology maturity assessments and prepare technical recommendations in support of Army Transformation and specific technologies of interest to G8. Test and evaluate network systems and infrastructure modeling and simulations.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Return to previous level of effort. | 0.909 | 0.710 | 0.944 |
| ***Title:*** Academic Research<br>***Description:*** Apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces.<br><br>***FY 2018 Plans:***<br>Will apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces.<br>***FY 2019 Plans:***<br>Will apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Economic increase. | 0.289 | 0.420 | 0.490 |
| **Accomplishments/Planned Programs Subtotals** | 6.234 | 4.803 | 6.316 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203758A / *Digitization* | **Project (Number/Name)**<br>374 / *HOR Battlefld Digitizn* |

**D. Acquisition Strategy**

The AE2S development will be done through either a competitive Cost Plus or Fixed Price Incentive contracts that will deliver capabilities in increments, recognizing up front the need for future improvements. The objective of the strategy is to develop and optimize system capabilities while reducing risk and streamlining business and engineering processes.

FFRDC requirements will be accomplished by competitive contract.

Other efforts will be accomplished by various contract methods and types.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203758A / *Digitization* | Project (Number/Name)<br>374 / *HOR Battlefld Digitizn* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Digitization Technical Integration | Various | Various : Various | 5.556 | - | | - | | - | | - | | - | 0.000 | 5.556 | - |
| Joint & Coalition Interoperability | Various | Various : Various | 5.091 | - | | - | | - | | - | | - | 0.000 | 5.091 | - |
| | | **Subtotal** | 10.647 | - | | - | | - | | - | | - | 0.000 | 10.647 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Army Equipping Enterprise SYstem (AE2S) Software | C/CPFF | TBD : TBD | 4.981 | 1.958 | | 1.451 | | 1.684 | | - | | 1.684 | Continuing | Continuing | Continuing |
| Cross-Platform Development | Various | TBD : TBD | 3.605 | - | | - | | - | | - | | - | 0.000 | 3.605 | - |
| | | **Subtotal** | 8.586 | 1.958 | | 1.451 | | 1.684 | | - | | 1.684 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Interoperability and Integration | Various | Various : Various | 5.161 | 1.054 | Dec 2016 | 0.781 | | 1.095 | | - | | 1.095 | 0.000 | 8.091 | - |
| Operational Capability Analysis and Evaluation | Various | VAR : VAR | 4.333 | 1.114 | Aug 2017 | 0.825 | | 1.158 | | - | | 1.158 | 0.000 | 7.430 | - |
| Academic Research | Various | Various : Various | 2.942 | 0.289 | Aug 2017 | 0.399 | | 0.490 | | - | | 0.490 | 0.000 | 4.120 | - |
| Operational CapabilityAnalysis and Evaluation | Various | Various : Various | 5.608 | - | | - | | - | | - | | - | 0.000 | 5.608 | - |
| Systems Architecture Development | Various | VAR : VAR | 4.257 | 0.910 | Dec 2016 | 0.674 | | 0.945 | | - | | 0.945 | 0.000 | 6.786 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203758A / *Digitization* | Project (Number/Name)<br>374 / *HOR Battlefld Digitizn* | |

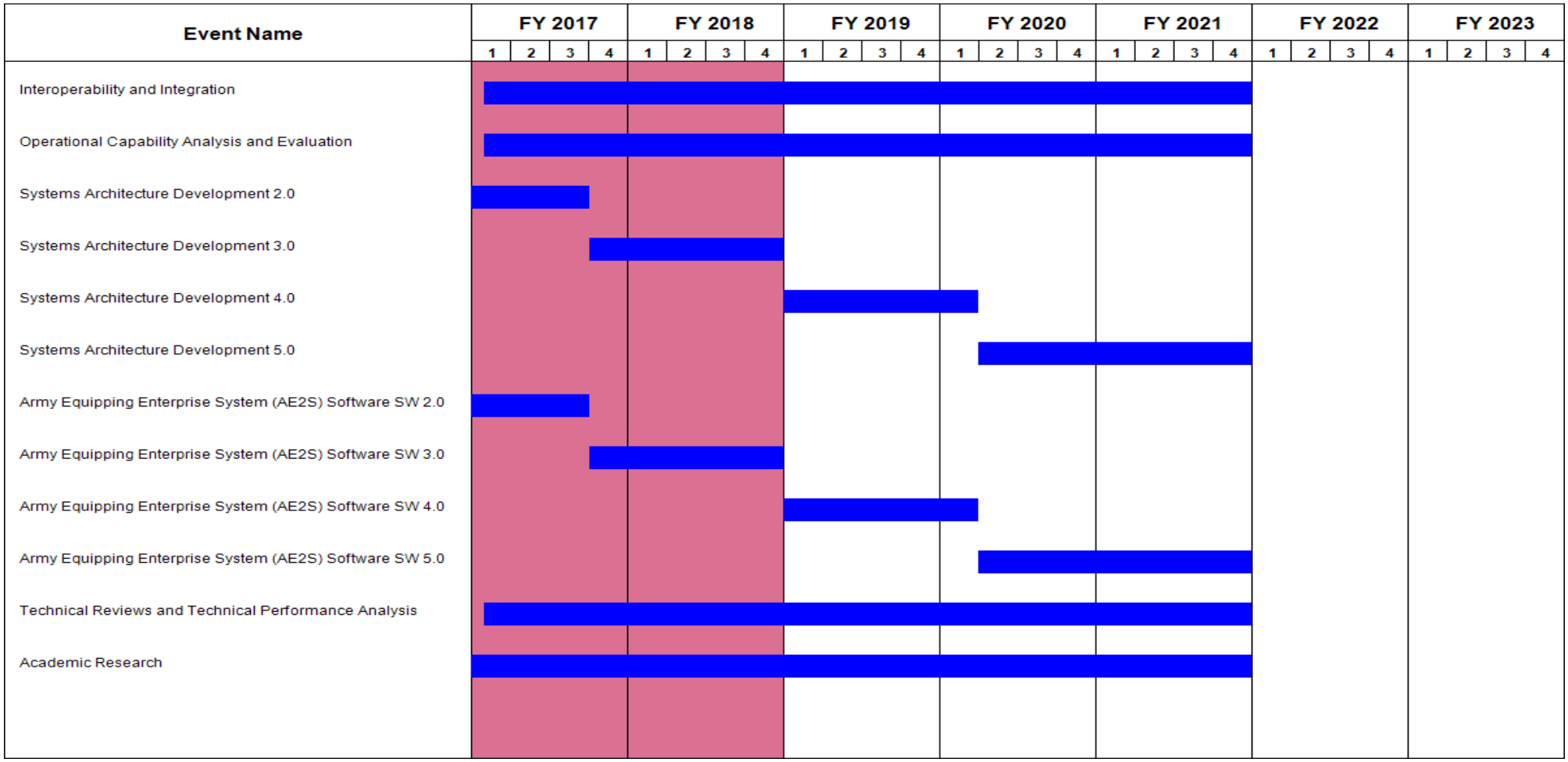
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technical Reviews and Technical Performance Analysis | Various | VAR : VAR | 3.774 | 0.909 | Dec 2016 | 0.673 | | 0.944 | | - | | 0.944 | 0.000 | 6.300 | - |
| | | **Subtotal** | 26.075 | 4.276 | | 3.352 | | 4.632 | | - | | 4.632 | 0.000 | 38.335 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 45.308 | 6.234 | | 4.803 | | 6.316 | | - | | 6.316 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203758A / *Digitization* | **Project (Number/Name)**<br>374 / *HOR Battlefld Digitizn* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203758A / *Digitization* | **Project (Number/Name)**<br>374 / *HOR Battlefld Digitizn* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Interoperability and Integration | 1 | 2016 | 4 | 2021 |
| Operational Capability Analysis and Evaluation | 1 | 2016 | 4 | 2021 |
| Systems Architecture Development 1.0 | 2 | 2015 | 2 | 2016 |
| Systems Architecture Development 2.0 | 3 | 2016 | 3 | 2017 |
| Systems Architecture Development 3.0 | 4 | 2017 | 4 | 2018 |
| Systems Architecture Development 4.0 | 1 | 2019 | 1 | 2020 |
| Systems Architecture Development 5.0 | 2 | 2020 | 4 | 2021 |
| Army Equipping Enterprise System (AE2S) Software SW 1.0 | 2 | 2015 | 2 | 2016 |
| Army Equipping Enterprise System (AE2S) Software SW 2.0 | 3 | 2016 | 3 | 2017 |
| Army Equipping Enterprise System (AE2S) Software SW 3.0 | 4 | 2017 | 4 | 2018 |
| Army Equipping Enterprise System (AE2S) Software SW 4.0 | 1 | 2019 | 1 | 2020 |
| Army Equipping Enterprise System (AE2S) Software SW 5.0 | 2 | 2020 | 4 | 2021 |
| Technical Reviews and Technical Performance Analysis | 1 | 2015 | 4 | 2021 |
| Academic Research | 3 | 2015 | 4 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 24.925 | 17.723 | 1.643 | 2.000 | 3.643 | 1.287 | 1.289 | 0.128 | 0.000 | 0.000 | 48.995 |
| 038: *Avenger PIP* | - | 4.925 | 2.723 | 1.643 | 2.000 | 3.643 | 1.287 | 1.289 | 0.128 | 0.000 | 0.000 | 13.995 |
| DT5: *Stinger Product Improvement* | - | 20.000 | 15.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 35.000 |

**A. Mission Description and Budget Item Justification**

The Avenger Air Defense System is a lightweight, ground-to-air missile and gun weapon system mounted on a High Mobility Multi-purpose Wheeled Vehicle. The Avenger's mission is to protect fixed critical assets and Corps/Echelons above Corps Maneuver forces from Unmanned Aircraft Systems (UAS), Cruise Missiles (CM), and Fixed Wing and Rotary Wing aircraft. Avenger provides day/night adverse weather operations, shoot on the move capability, rapid target engagement, and remote firing capability.

The Avenger Modification - Service Life Extension Program (MOD - SLEP) consists of Project 038: Avenger Production Improvement Program (PIP) and Program Element CE8710: Avenger MODS. Avenger MOD-SLEP ensures that Avenger is viable and sustainable through the end of program life. Avenger MOD-SLEP maintains operational capability of Avenger until replaced by the Indirect Fire Protection Capability Increment 2- Intercept (IFPC Inc 2-I) in the Fiscal Year (FY) 31 timeframe.

The Stinger Block I missile is an advanced, fire-and-forget, short-range, man-portable, air defense weapon system. Stinger's mission is to provide the force with low-altitude air defense against fixed and rotary wing aircraft, unmanned aircraft systems (UAS) and cruise missiles (CM). Stinger is deployable from the shoulder or from a variety of platforms that includes vehicles, helicopters and UAS. The missile is delivered as a certified round and requires no field testing or maintenance.

Funding provided for the Stinger Product Improvement completes design, development, test and integration of the Proximity Fuze (PROX) and addresses obsolescence. This will make PROX available for incorporation into the existing Stinger Block I missile. The PROX will improve effectiveness by eliminating the need for a hit-to-kill against UAS threats. UAS defense is a requirement of the Operational Requirements Document (ORD) for the Stinger Guided Missile System and validated by the Deputy Chief of Staff, G-3/5/7, Current and Future Warfighting Capabilities Division (DAMO-CIC) in a memo dated 28 May 2013.

Also funded under DT5 (Stinger Product Improvement), the Maneuver - Short Range Air Defense (M-SHORAD) demonstration in 4QFY17 assessed available industry solutions for mitigating the M-SHORAD gap in the near term. The intent is to inform requirements and identify what capability could be fielded by FY21 in order to help mitigate this critical air defense gap. This project moved to its own PE, 0604117A (Short Range air Defense(M-SHORAD)), Project FI4 (Maneuver - Short Range Air Defense (M-SHORAD)), starting in FY18.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0203801A *I Missile/Air Defense Product Improvement Program* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 53.722 | 11.173 | 1.661 | - | 1.661 |
| Current President's Budget | 24.925 | 17.723 | 1.643 | 2.000 | 3.643 |
| Total Adjustments | -28.797 | 6.550 | -0.018 | 2.000 | 1.982 |
| • Congressional General Reductions | -0.002 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.195 | - | | | |
| • Adjustments to Budget Years | - | 6.550 | 0.000 | 2.000 | 2.000 |
| • Amended FY2017 not appropriated | -28.600 | - | - | - | - |
| • Other Adjustments 2 | - | - | -0.018 | - | -0.018 |

**Change Summary Explanation**

The $28.6M was part of the FY17 Request for Additional Appropriations but was not appropriated. The FY18 $6.55M is an administrative correction to balance the R-2 with the R-1. The $2.0M is an OCO increase to support Avenger MOD-SLEP.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | Project (Number/Name)<br>038 / *Avenger PIP* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 038: *Avenger PIP* | - | 4.925 | 2.723 | 1.643 | 2.000 | 3.643 | 1.287 | 1.289 | 0.128 | 0.000 | 0.000 | 13.995 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Avenger PIP consists of the ongoing Avenger Modification - Service Life Extension Program (MOD-SLEP). Avenger MOD-SLEP provides development and testing of six key Line Replaceable Units (LRUs) to ensure Avenger maintains operational capability through FY31, when the IFPC Inc 2-I system is fielded. The six LRUs are: Targeting Console (TC), .50 Caliber Machine Gun (M3P), Avenger Fire Control Computer - Revised (AFCC-R), Mode 5 Identification Friend or Foe (IFF), Vehicle Internal Communications (VIC-5) and the Environmental Control Unit/Prime Power Unit (ECU/PPU) governor and starter.

FY2019 Base dollars in the amount of $1.643 million supports activities to ensure the Avenger is viable and sustainable through FY31, the end of its program life. The funding will contribute to the testing, test support and materiel release package for the AFCC-R, IFF, VIC-5 and ECU/PPU.

FY2019 OCO dollars in the amount of $2.000 million supports redesign of Training Aids, Devices, Simulators and Simulations (TADSS) for the European Deterrence Initiative (EDI).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Avenger MOD-SLEP | 4.925 | 2.723 | 1.643 | 2.000 | 3.643 |
| ***Description:*** The Avenger MOD-SLEP consists of development activities for platform integration, software upgrades, and capability enhancements. Develops and executes test requirements and conducts limited contractor and government testing. Performs technical assessments, concept studies, cost reduction, risk reduction and development documentation. | | | | | |
| ***FY 2018 Plans:***<br>Executed test requirements and conducted limited contractor and government testing. Performed technical assessments, concept studies, cost reduction, and risk reduction. The Army Interoperability Certification (AIC) testing ensured that Avenger could properly interface, with other systems, and execute its mission. | | | | | |
| ***FY 2019 Base Plans:***<br>Complete test requirements and initiate materiel release package. | | | | | |
| ***FY 2019 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | **Project (Number/Name)**<br>038 / *Avenger PIP* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Funding will be used for redesign of Training Aids, Devices, Simulators and Simulations (TADSS) for EDI.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY18 completed development of MOD SLEP Phase II Components. FY19 is for redesign of TADDS for EDI. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.925 | 2.723 | 1.643 | 2.000 | 3.643 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • CE8710: *AVENGER MODS* | 35.979 | 62.931 | 48.670 | - | 48.670 | 86.807 | 165.928 | 454.994 | 291.600 | 0.000 | 1,146.909 |

**Remarks**

The Avenger MODS procures MOD-SLEP LRUs for the Avenger system to ensure that Avenger is viable and sustainable through FY31. This program is an integral part of the Army Air and Missile Defense Modernization strategy.

**D. Acquisition Strategy**

The Avenger Modification - Service Life Extension Program (MOD-SLEP) addresses obsolescence of key Line Replaceable Units (LRUs) and ensures that Avenger is viable and sustainable through FY31, filling a capability gap to counter Unmanned Aircraft Systems (UAS), Cruise Missiles (CM), and Fixed Wing and Rotary Wing aircraft. The Avenger capability will be permanently filled by the IFPC Inc 2-I. The MOD-SLEP provides new M3P machine guns and TCs. The MOD-SLEP will upgrade the AFCC, IFF, the VIC system and the ECU/PPU governor and starter.

MOD-SLEP Phase II will be installed as a single installation package. MOD-SLEP Phase II components are the Avenger Fire Control Computer- Revised (AFCC-R), the Mode 5 Identification Friend or Foe (IFF) and the Vehicle Internal Communications (VIC-5).

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | Project (Number/Name)<br>038 / *Avenger PIP* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avenger Modification Management Services | PO | Various : Redstone Arsenal, AL | 0.752 | 0.254 | Jun 2017 | 0.228 | | 0.164 | Jan 2019 | - | | 0.164 | Continuing | Continuing | - |
| | | **Subtotal** | 0.752 | 0.254 | | 0.228 | | 0.164 | | - | | 0.164 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avenger Modification Product Development | PO | Raytheon, The Boeing Company and others : Aberdeen Proving Grounds, MD and Huntsville, AL | 5.140 | 2.558 | Jun 2017 | 1.424 | | 0.000 | | 2.000 | Jun 2019 | 2.000 | Continuing | Continuing | - |
| | | **Subtotal** | 5.140 | 2.558 | | 1.424 | | 0.000 | | 2.000 | | 2.000 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

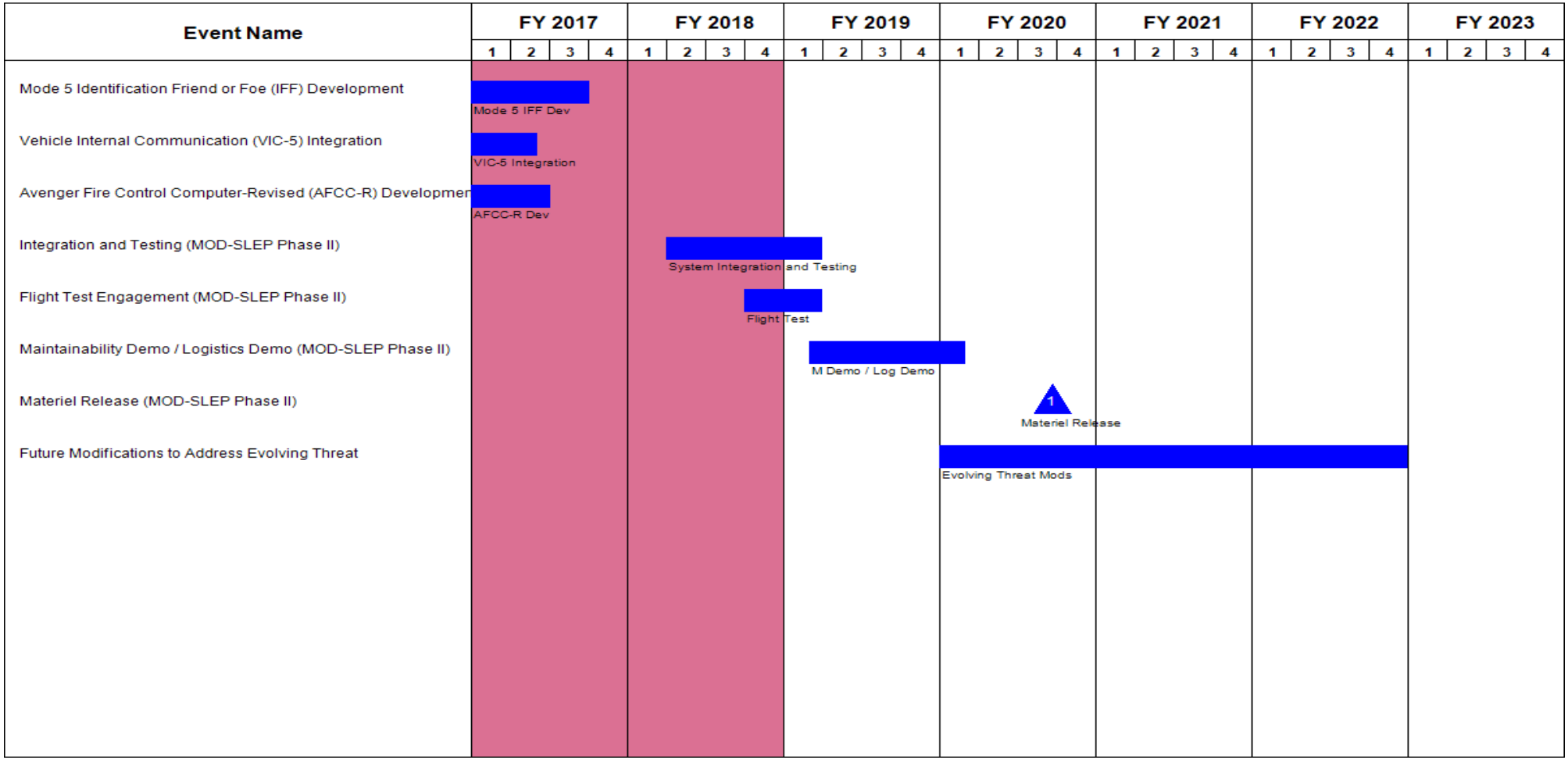
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avenger Modification Test Support | Various | The Boeing Company, Aviation and Missile Research Development and Engineering Center (AMRDEC) and others : Huntsville, AL and Redstone Arsenal, AL | 2.054 | 2.113 | Jun 2017 | 1.071 | | 1.479 | Jun 2019 | - | | 1.479 | Continuing | Continuing | - |
| | | **Subtotal** | 2.054 | 2.113 | | 1.071 | | 1.479 | | - | | 1.479 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | Project (Number/Name)<br>038 / *Avenger PIP* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 7.946 | 4.925 | | 2.723 | | 1.643 | | 2.000 | | 3.643 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | **Project (Number/Name)**<br>038 / *Avenger PIP* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | **Project (Number/Name)**<br>038 / *Avenger PIP* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Mode 5 Identification Friend or Foe (IFF) Development | 3 | 2015 | 3 | 2017 |
| Vehicle Internal Communication (VIC-5) Integration | 4 | 2015 | 2 | 2017 |
| Avenger Fire Control Computer-Revised (AFCC-R) Development | 3 | 2015 | 2 | 2017 |
| Integration and Testing (MOD-SLEP Phase II) | 2 | 2018 | 1 | 2019 |
| Flight Test Engagement (MOD-SLEP Phase II) | 4 | 2018 | 1 | 2019 |
| Maintainability Demo / Logistics Demo (MOD-SLEP Phase II) | 1 | 2019 | 1 | 2020 |
| Materiel Release (MOD-SLEP Phase II) | 3 | 2020 | 3 | 2020 |
| Future Modifications to Address Evolving Threat | 1 | 2020 | 4 | 2022 |

**Note**

Modification - Service Life Extension Program (MOD-SLEP) Phase II components are the AFCC-R, IFF and VIC-5.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | Project (Number/Name)<br>DT5 / *Stinger Product Improvement* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT5: *Stinger Product Improvement* | - | 20.000 | 15.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 35.000 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Stinger Block I missile is an advanced, fire-and-forget, short-range, man-portable, air defense weapon system. Stinger's mission is to provide the force with low-altitude air defense against fixed and rotary wing aircraft, Unmanned Aircraft Systems (UAS) and cruise missiles (CM). Stinger is deployable from the shoulder or from a variety of platforms to include vehicles, helicopters and UAS. The missile is delivered as a certified round and requires no field testing or maintenance.

Funding provided for the Stinger Product Improvement completes design, development, test and integration of the Proximity Fuze (PROX) and addresses obsolescence. This will make PROX available for incorporation into the existing Stinger Block I missile. The PROX will improve effectiveness by eliminating the need for a hit-to-kill against UAS threats. UAS defense is a requirement of the Operational Requirements Document (ORD) for the Stinger Guided Missile System and validated by the Deputy Chief of Staff, G-3/5/7, Current and Future Warfighting Capabilities Division (DAMO-CIC) in a memo dated 28 May 2013.

The Stinger Product Improvement also funded the Short Range Air Defense (SHORAD) demonstration in 4QFY17. This assessed available industry solutions for mitigating the Maneuver SHORAD gap in the near term. The intent is to inform requirements and identify what capability could be fielded by FY21 in order to help mitigate this critical air defense gap. Starting in FY18, the Maneuver SHORAD effort has been moved to its own PE, 0604117A, for all future requirements.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Proximity Fuze (PROX) Development and Integration<br>***Description:*** These funds will be used to complete test and integration of the PROX which will be incorporated into existing Stinger Block I missiles during Stinger SLEP.<br>***FY 2018 Plans:***<br>There are no base dollars. Continued the design, development, test and integration of a PROX fuze into existing Singer Block 1 missiles.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Decrease from FY18 to FY19 is due to anticipated completion of the effort. | - | 8.450 | - | - | - |
| ***Title:*** Obsolescence and Improvements<br>***Description:*** This effort funds the obsolescence and improvements to the Stinger Block I missile. | - | 6.550 | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | **Project (Number/Name)**<br>DT5 / *Stinger Product Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***FY 2018 Plans:***<br>This effort funds the obsolescence and improvements of Stinger Block I missile and redesign of Training Aids, Devices, Simulators and Simulations (TADSS) for EDI.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>This effort does not require FY19 funding. | | | | | |
| ***Title:*** M-SHORAD Demonstration<br>***Description:*** This effort funded the M-SHORAD Demonstration that was completed in 4QFY17. The M-SHORAD funding line was moved to its own line (PE 0604117A) beginning in FY18. | 20.000 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 20.000 | 15.000 | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • C21300: *STINGER BLK I UPGRADES* | 6.578 | 91.090 | 94.756 | - | 94.756 | 81.615 | 1.457 | 3.072 | - | 0.000 | 278.568 |

**Remarks**

Stinger Block 1 Upgrades program provides for Service Life Extension Program (SLEP) of Stinger Block 1 missiles and the PROX fuze.

**D. Acquisition Strategy**

In Fiscal Year (FY) 12 the Stinger Based Systems (SBS) Product Office utilized Picatinny Arsenal to award a Proximity Fuze (PROX) development contract for the design, development, test and integration of the PROX capability. This capability will be incorporated into the existing Stinger Block I missile SLEP.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | Project (Number/Name)<br>DT5 / *Stinger Product Improvement* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Mgt/Admin | PO | Trident, Intuitive Research and others : Redstone Arsenal, AL | 0.981 | - | | - | | - | | - | | - | 0.000 | 0.981 | - |
| | | **Subtotal** | 0.981 | - | | - | | - | | - | | - | 0.000 | 0.981 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROX Development and Testing | Various | Aviation and Missiles Research Development and Engineering Center, Redstone Test Center and others : Redstone Arsenal, AL | 22.977 | - | | 15.000 | | - | | - | | - | 0.000 | 37.977 | - |
| M-SHORAD Development | Various | Letterkenny Army Depot, Anniston Army Depot and others : Chambersburg, PA, and Anniston, AL | - | 4.938 | Feb 2018 | - | | - | | - | | - | 0.000 | 4.938 | - |
| | | **Subtotal** | 22.977 | 4.938 | | 15.000 | | - | | - | | - | 0.000 | 42.915 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M-SHORAD Support | Various | Trident, Intuitive Research, Aviation and | - | 2.305 | Jun 2017 | - | | - | | - | | - | 0.000 | 2.305 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | Project (Number/Name)<br>DT5 / *Stinger Product Improvement* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Missiles Research Development and Engineering Center and others : Huntsville, AL | | | | | | | | | | | | | |
| | | **Subtotal** | - | 2.305 | | - | | - | | - | | - | 0.000 | 2.305 | N/A |

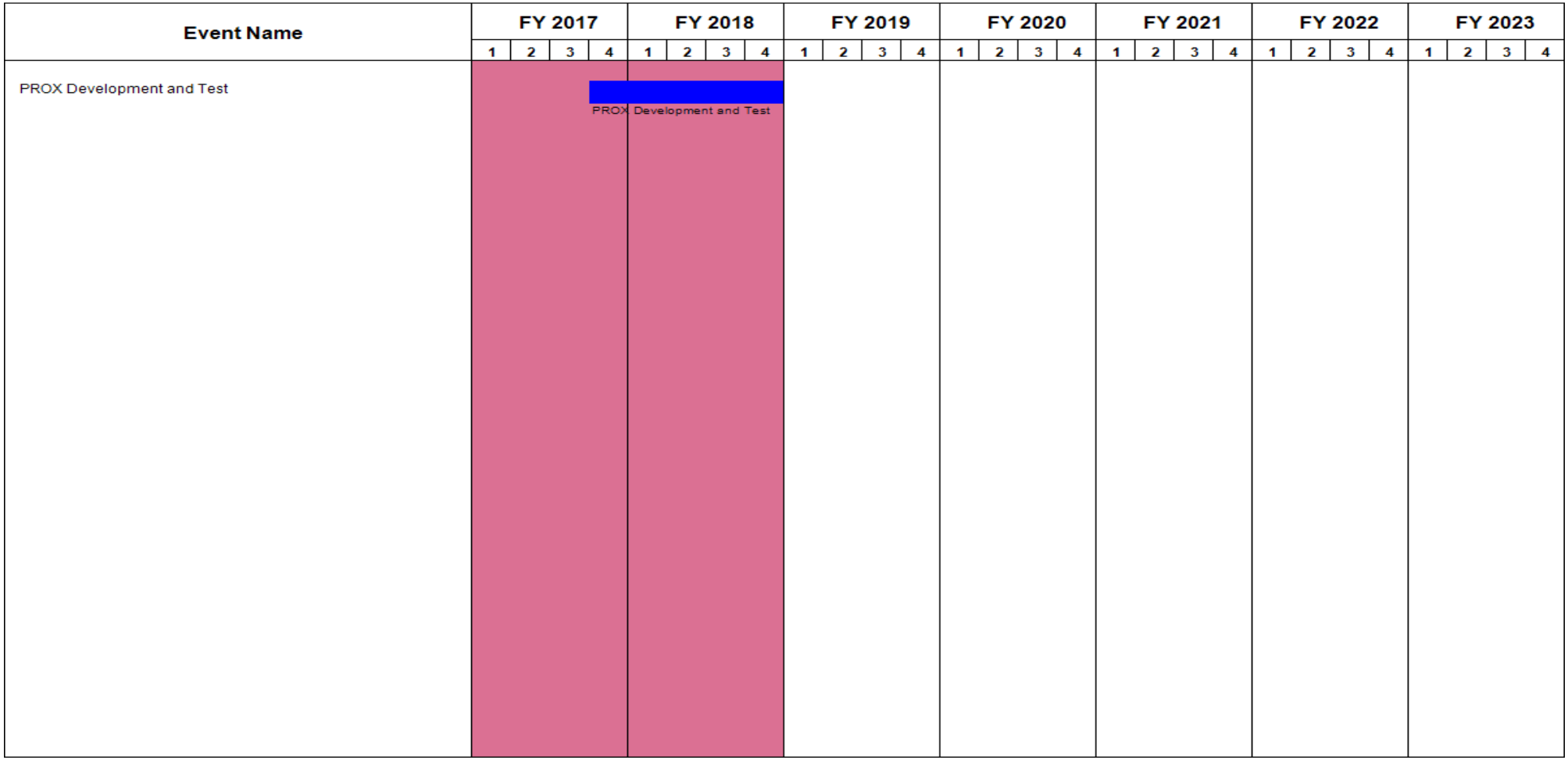
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROX Test and Evaluation | MIPR | Redstone Test Center and others : Redstone Arsenal, AL and Eglin Air Force Base, FL | 5.414 | - | | - | | - | | - | | - | 0.000 | 5.414 | - |
| M-SHORAD Government Test & Evaluation | Various | White Sands Missile Range (WSMR), Target Manangment Office (PEO STRI) and others : WSMR, NM and Redstone Arsenal, AL | - | 5.032 | Jun 2017 | - | | - | | - | | - | 0.000 | 5.032 | - |
| M-SHORAD Test Support | MIPR | Target Management Office : Fort Belvoir, VA | - | 7.725 | Jun 2017 | - | | - | | - | | - | 0.000 | 7.725 | - |
| | | **Subtotal** | 5.414 | 12.757 | | - | | - | | - | | - | 0.000 | 18.171 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 29.372 | 20.000 | | 15.000 | | - | | - | | - | 0.000 | 64.372 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | **Project (Number/Name)**<br>DT5 / *Stinger Product Improvement* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203801A / *Missile/Air Defense Product Improvement Program* | **Project (Number/Name)**<br>DT5 / *Stinger Product Improvement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Technology Demonstrations | 2 | 2012 | 2 | 2012 |
| Proximity (PROX) Fuze Critical Design Review (CDR) | 4 | 2013 | 4 | 2013 |
| Component Level Qualifications (CLQ) | 1 | 2014 | 2 | 2014 |
| Proximity Flight Readiness Reviews (PFRR) | 2 | 2014 | 3 | 2014 |
| PROX Development and Test | 4 | 2017 | 4 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203802A / *Other Missile Product Improvement Programs* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 8.283 | 5.000 | 4.947 | - | 4.947 | 4.943 | 4.942 | 4.941 | 4.940 | 0.000 | 37.996 |
| 788: *ATACMS PIP* | - | 0.000 | 5.000 | 4.947 | - | 4.947 | 4.943 | 4.942 | 4.941 | 4.940 | 0.000 | 29.713 |
| DZ9: *ATACMS Mods* | - | 7.203 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 7.203 |
| VT9: *Lethal Miniature Aerial Missle System (LMAMS)* | - | 1.080 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.080 |
| **Program MDAP/MAIS Code:** PRE | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

Army Tactical Missile System (ATACMS) is the United States (U.S.) Army's primary all-weather, surface-to-surface long-range artillery precision guided missile used by Combatant Commanders to shape the battlefield with long-range fires against hard & soft targets in open, complex, and urban environments.

788: ATACMS Product Improvement Program (PIP) focuses on safety, cost reduction, reliability, deficiency corrections, standardization, and new or improved operational capabilities. FY19 Base funds in the amount of $4.947 million supports completion of operational testing, corrections of identified deficiencies, and fielding support activities for a Height-of-Burst capability via proximity sensor, GPS M-Code Study & Prototyping, Insensitive Munitions Study and other evolving capabilities. Additional supporting efforts include launcher software and training updates to enable firing for new ATACMS configuration.

DZ9: Block (BLK) I/IA ATACMS currently have warheads that are non-compliant with the 2008 Department of Defense (DoD) policy on cluster munitions (CM). Starting with a BLK I/IA missile, this modification effort will integrate, test, and qualify an ATACMS configuration to include a policy compliant warhead, obsolescence refresh, and re-grained rocket motors. Performance of a characterization effort will include qualification and flight testing to assess ATACMS performance with inclusion of a proximity sensor. Additional efforts include launcher updates to enable firing of the new ATACMS configuration. There is no funding in FY19.

VT9: Lethal Miniature Aerial Missile System (LMAMS) develops, integrates, and tests the Switchblade Multi-Pack Launcher (MPL). Multi-Pack Launcher provides the capability to launch up to 6 Switchblade missiles remotely in a Force Protection Environment. The mission for the MPL is to be placed in a Forward Operating Base (FOB) in a constant ready-to-use state to enable Soldiers to remain in the safety of a building while launching Switchblade missiles. There is no funding in FY19. .

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0203802A / *Other Missile Product Improvement Programs* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 8.571 | 5.000 | 15.000 | - | 15.000 |
| Current President's Budget | 8.283 | 5.000 | 4.947 | - | 4.947 |
| Total Adjustments | -0.288 | 0.000 | -10.053 | - | -10.053 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.284 | - | | | |
| • Adjustments to Budget Years | - | - | -10.053 | - | -10.053 |
| • Sec. 8025: FFRDC Reduction | -0.004 | - | - | - | - |

**Change Summary Explanation**

FY 2017 funding change is due to SBIR/STTR and the Federally Funded Research and Development Center (FFRDC) reduction for ATACMS Mods (Project #: DZ9).

FY 2019 funding change is due to realignment of funds from ATACMS PIP (PE 0203802A, Project #: 788) to ATACMS BLK II (PE 0604768A, Project #: 688) and Multi-Mode Seeker Development and Test (PE 0604768A, Project #: P01) and revised economic assumptions.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203802A / *Other Missile Product Improvement Programs* | Project (Number/Name)<br>788 / *ATACMS PIP* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 788: *ATACMS PIP* | - | 0.000 | 5.000 | 4.947 | - | 4.947 | 4.943 | 4.942 | 4.941 | 4.940 | 0.000 | 29.713 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

ATACMS Product Improvement Program (PIP) focuses on safety, cost reduction, reliability, deficiency corrections, standardization, and new or improved operational capabilities. FY19 Base funds in the amount of $4.947 million supports completion of operational testing, corrections of identified deficiencies, and fielding support activities for a Height-of-Burst capability via proximity sensor, GPS M-Code Study & Prototyping, Insensitive Munitions Study and other evolving capabilities.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Improvement Program (PIP) Activities | - | 5.000 | 4.947 | - | 4.947 |
| ***Description:*** PIP focuses on safety, cost reduction, reliability, deficiency corrections, standardization, and new or improved operational capabilities for ATACMS.<br><br>***FY 2018 Plans:***<br>Developed Test & Evaluation Master Plan (TEMP) for Height-of-Burst capability, conducted Operational Test (OT) assuming existing ATACMS test quantities were sufficient, and initiated activities for production cut-in and fielding.<br><br>***FY 2019 Base Plans:***<br>Complete Height-of-Burst capability testing and activities for production cut-in and fielding, GPS M-code study and prototyping, Insensitive Munitions study, Cost Reduction study, and flight test support/equipment.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY18-19 funding decrease due to revised economic assumptions. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 5.000 | 4.947 | - | 4.947 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>788 / *ATACMS PIP* |

**D. Acquisition Strategy**

After successful OT and DOT&E approval is received for the height-of-burst capability, a proximity sensor will be inserted into the ongoing ATACMS SLEP production. Future improvements, such as M-code and other capabilities, will be inserted into future production once those technologies are matured, tested, and approved for fielding.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>788 / *ATACMS PIP* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | MIPR | AMRDEC : RSA | - | - | | 0.300 | | 0.250 | Nov 2019 | - | | 0.250 | Continuing | Continuing | Continuing |
| | | **Subtotal** | - | - | | 0.300 | | 0.250 | | - | | 0.250 | Continuing | Continuing | N/A |

**Remarks**

AMRDEC - U.S Army Research, Development and Engineering Command; RSA - Redstone Arsenal, Alabama

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Studies | Various | Various : Various | - | - | | - | | 1.483 | Nov 2018 | - | | 1.483 | 0.000 | 1.483 | - |
| Prototyping | C/CPFF | LMMFC : Dallas, TX | - | - | | - | | 1.881 | Mar 2019 | - | | 1.881 | 0.000 | 1.881 | - |
| | | **Subtotal** | - | - | | - | | 3.364 | | - | | 3.364 | 0.000 | 3.364 | N/A |

**Remarks**

LMMFC - Lockheed Martin Missiles and Fire Control

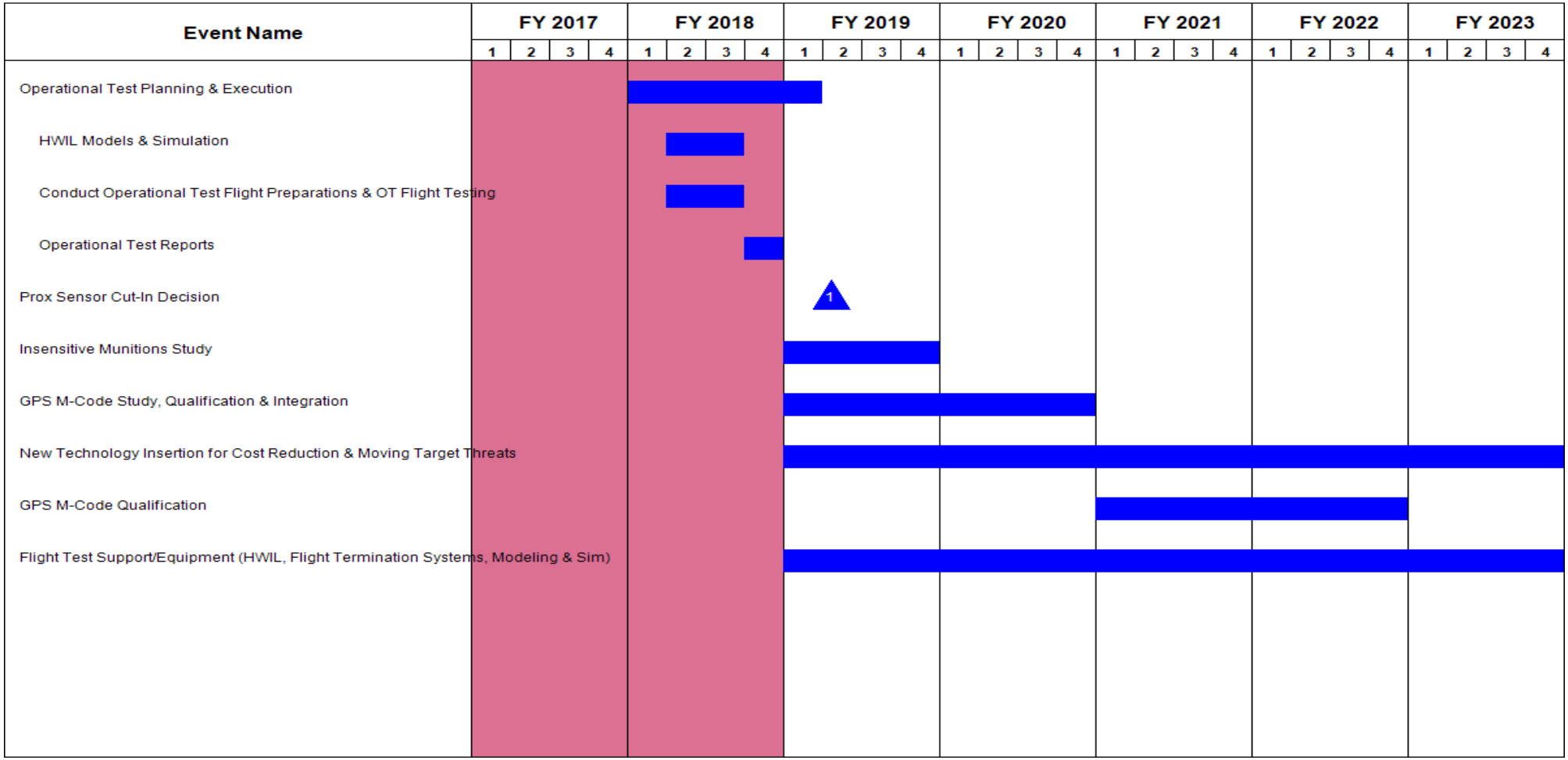
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support | Various | Various : Various | - | - | | 4.700 | | 1.333 | Nov 2019 | - | | 1.333 | Continuing | Continuing | Continuing |
| | | **Subtotal** | - | - | | 4.700 | | 1.333 | | - | | 1.333 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 5.000 | | 4.947 | | - | | 4.947 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>788 / *ATACMS PIP* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>788 / *ATACMS PIP* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Operational Test Planning & Execution | 1 | 2018 | 1 | 2019 |
| HWIL Models & Simulation | 2 | 2018 | 3 | 2018 |
| Conduct Operational Test Flight Preparations & OT Flight Testing | 2 | 2018 | 3 | 2018 |
| Operational Test Reports | 4 | 2018 | 4 | 2018 |
| Prox Sensor Cut-In Decision | 2 | 2019 | 2 | 2019 |
| Insensitive Munitions Study | 1 | 2019 | 4 | 2019 |
| GPS M-Code Study, Qualification & Integration | 1 | 2019 | 4 | 2020 |
| New Technology Insertion for Cost Reduction & Moving Target Threats | 1 | 2019 | 4 | 2023 |
| GPS M-Code Qualification | 1 | 2021 | 4 | 2022 |
| Flight Test Support/Equipment (HWIL, Flight Termination Systems, Modeling & Sim) | 1 | 2019 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203802A / *Other Missile Product Improvement Programs* | Project (Number/Name)<br>DZ9 / *ATACMS Mods* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DZ9: *ATACMS Mods* | - | 7.203 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 7.203 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Army Tactical Missile System (ATACMS) is the United States (U.S.) Army's primary 24/7, all-weather, and surface-to-surface artillery precision missile used by current and future Combatant Commanders to shape the battlefield with long-range fires against hard and soft stationary targets in open, complex, and urban environments. Block (BLK) I/IA ATACMS currently have warheads that are non-compliant with the 2008 Department of Defense (DoD) policy on cluster munitions (CM). Starting with a BLK I/IA missile, this modification effort will integrate, test, and qualify an ATACMS configuration to include a policy compliant warhead, obsolescence refresh, and re-grained rocket motors. Performance of a characterization effort will include qualification and flight testing to assess ATACMS performance with inclusion of a proximity sensor. Additional efforts include launcher updates to enable firing of the new ATACMS configuration.

There is no FY19 funding.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Conduct Development Engineering, Design Component Testing, and Performance Analysis.<br>***Description:*** Develop and qualify obsolescence updates, build-up of flight test missiles, perform component and system flight testing, and characterize proximity sensor performance. | 7.203 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 7.203 | - | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • CA6700: *ATACMS MODS* | 165.943 | 186.040 | 221.656 | 225.580 | 447.236 | 259.011 | 332.791 | 374.310 | 374.270 | 0.000 | 2,139.601 |

**Remarks**

**D. Acquisition Strategy**

The ATACMS MOD program will qualify a new configuration needed to support follow-on production in order to maintain critical inventory levels. Lockheed Martin Missile and Fire Control (LMMFC) will integrate and test ATACMS MOD under a Cost Plus Fixed Fee (CPFF) contract.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>DZ9 / *ATACMS Mods* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | MIPR | PFRMS Project Office : RSA | 12.527 | 1.243 | | - | | - | | - | | - | 0.000 | 13.770 | - |
| | | **Subtotal** | 12.527 | 1.243 | | - | | - | | - | | - | 0.000 | 13.770 | N/A |

**Remarks**

PFRMS-Precision Fires Rocket and Missile Systems; RSA-Redstone Arsenal; MIPR-Military Interdepartmental Purchase Request

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ATACMS Mods Contracts | SS/CPFF | LMMFCS : (Dallas, TX) | 108.667 | 3.866 | | - | | - | | - | | - | 0.000 | 112.533 | - |
| Other Government Agencies | MIPR | AMCOM/AMRDEC : RSA | 7.436 | 0.093 | | - | | - | | - | | - | 0.000 | 7.529 | - |
| | | **Subtotal** | 116.103 | 3.959 | | - | | - | | - | | - | 0.000 | 120.062 | N/A |

**Remarks**

ATACMS-Army Tactical Missile System; Mods-Modifications; CPFF-Cost Plus Fixed Fee; LMMFCS-Lockheed Martin Missile and Fire Control; TX-Texas; MIPR-Military Interdepartmental Purchase Request; AMCOM-Army Materiel Command; AMRDEC-U.S. Army Research, Development and Engineering Command; RSA-Redstone Arsenal, Alabama

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support Contract | C/CPFF | Various : Various | 2.984 | 0.549 | | - | | - | | - | | - | 0.000 | 3.533 | - |
| | | **Subtotal** | 2.984 | 0.549 | | - | | - | | - | | - | 0.000 | 3.533 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203802A / *Other Missile Product Improvement Programs* | Project (Number/Name)<br>DZ9 / *ATACMS Mods* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support | MIPR | WSMR, NM : RTC, AL | 12.885 | 1.452 | | - | | - | | - | | - | 0.000 | 14.337 | - |
| | | **Subtotal** | 12.885 | 1.452 | | - | | - | | - | | - | 0.000 | 14.337 | N/A |

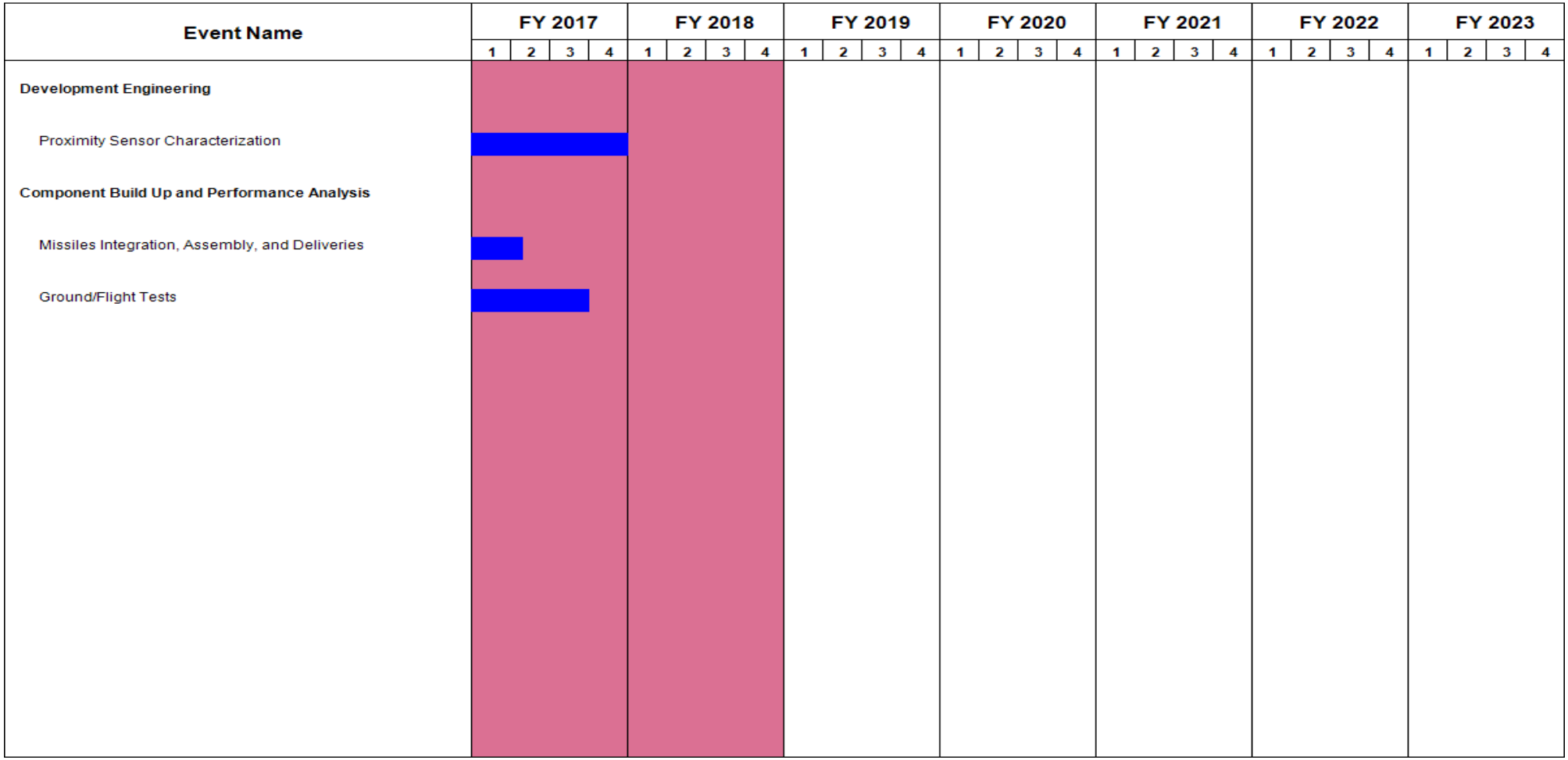
**Remarks**

WSMR, NM-White Sands Missile Range, New Mexico; RTC, AL-Redstone Test Center, Alabama; MIPR-Military Interdepartmental Purchase Request

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 144.499 | 7.203 | | 0.000 | | - | | - | | - | 0.000 | 151.702 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>DZ9 / *ATACMS Mods* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>DZ9 / *ATACMS Mods* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Development Engineering | 3 | 2014 | 4 | 2017 |
| Conduct Arena Warhead Tests | 4 | 2014 | 2 | 2015 |
| Procure Flight Termination Systems | 3 | 2014 | 2 | 2016 |
| Proximity Sensor Characterization | 4 | 2014 | 4 | 2017 |
| Obsolescence | 3 | 2014 | 4 | 2016 |
| Component Build Up and Performance Analysis | 1 | 2015 | 3 | 2017 |
| Sub Component Hardware Build Up | 1 | 2015 | 3 | 2016 |
| Missiles Integration, Assembly, and Deliveries | 3 | 2016 | 1 | 2017 |
| Ground/Flight Tests | 3 | 2016 | 3 | 2017 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203802A / *Other Missile Product Improvement Programs* | Project (Number/Name)<br>VT9 / *Lethal Miniature Aerial Missle System (LMAMS)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VT9: *Lethal Miniature Aerial Missle System (LMAMS)* | - | 1.080 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.080 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

VT9: Lethal Miniature Aerial Missile System (LMAMS) develops, integrates, and tests the Switchblade Multi-Pack Launcher (MPL). Multi-Pack Launcher provides the capability to launch up to 6 Switchblade missiles remotely in a Force Protection Environment. The mission for the MPL is to be placed in a Forward Operating Base (FOB) in a constant ready-to-use state to enable Soldiers to remain in the safety of a building while launching Switchblade missiles.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Develop, Integrate and Test the LMAMS Multi-Pack Launcher<br>***Description:*** Development, Integration, and Testing of the Multi-Pack Launcher (MPL). Multi-Pack Launcher provides the capability to launch up to 6 Switchblades remotely in a Force Protection Environment. | 1.080 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 1.080 | - | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • C88001: *LETHAL MINIATURE AERIAL MISSILE SYSTEM (LMAMS)* | 55.377 | 8.669 | 0.000 | 112.973 | 112.973 | - | - | - | - | 0.000 | 177.019 |

**Remarks**

**D. Acquisition Strategy**

All contractor funds are planned to be awarded via sole source contract to Aerovironment. Remaining funding is planned for CCWS Program Management costs, test facility costs, range costs, and test support personnel.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203802A / *Other Missile Product Improvement Programs* | Project (Number/Name)<br>VT9 / *Lethal Miniature Aerial Missle System (LMAMS)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Management | Allot | Close Combat Weapon Systems Project Office : Redstone Arsenal, AL | - | 0.046 | May 2017 | - | | - | | - | | - | 0.000 | 0.046 | - |
| | | **Subtotal** | - | 0.046 | | - | | - | | - | | - | 0.000 | 0.046 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development | SS/CPFF | Aerovironment : Simi Valley, CA | - | 0.449 | Jun 2017 | - | | - | | - | | - | 0.000 | 0.449 | - |
| | | **Subtotal** | - | 0.449 | | - | | - | | - | | - | 0.000 | 0.449 | N/A |

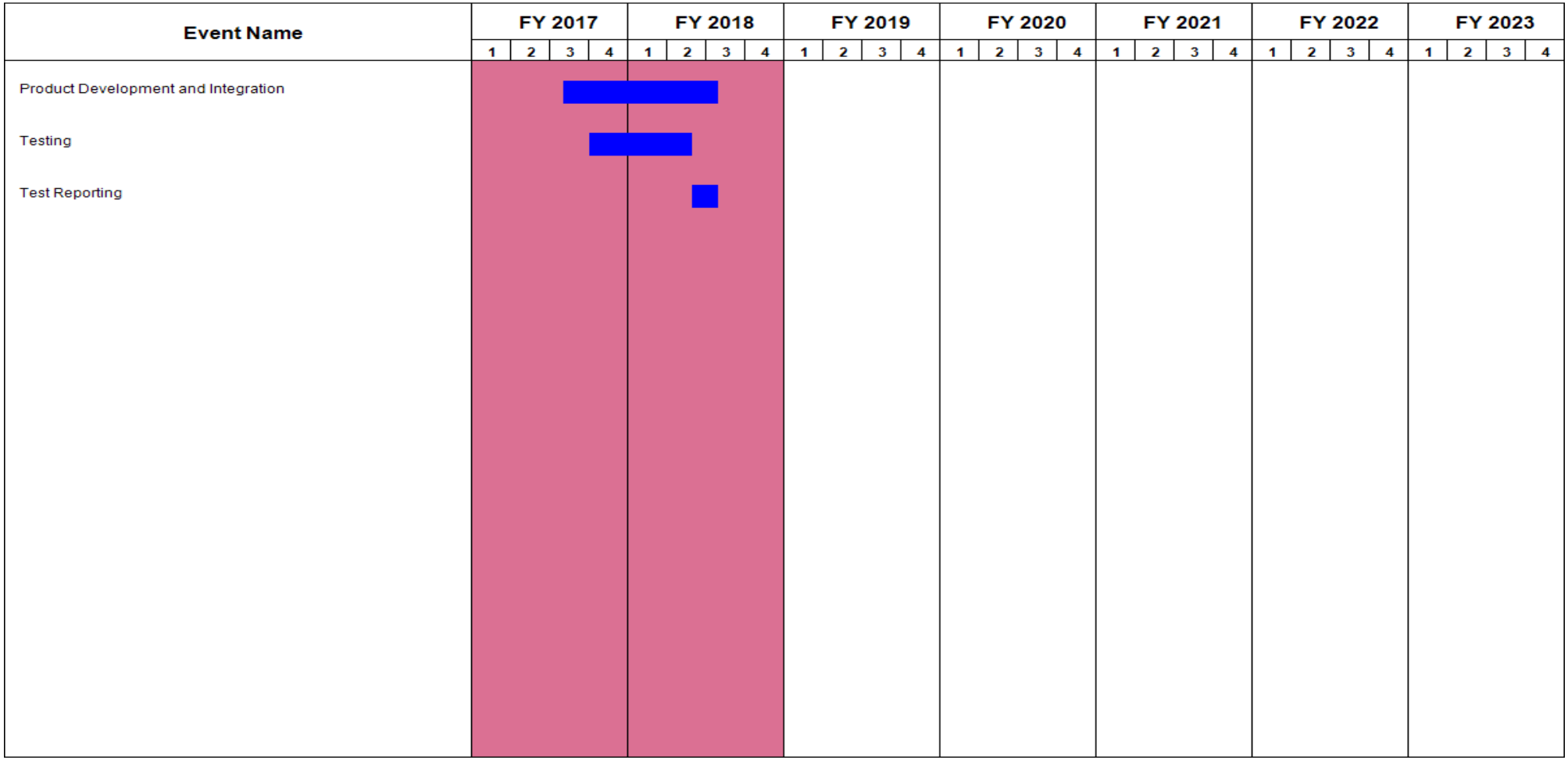
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test & Evaluation | MIPR | ATEC : Fort Huachuca, AZ | - | 0.585 | May 2017 | - | | - | | - | | - | 0.000 | 0.585 | - |
| | | **Subtotal** | - | 0.585 | | - | | - | | - | | - | 0.000 | 0.585 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | 1.080 | | 0.000 | | - | | - | | - | 0.000 | 1.080 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>VT9 / *Lethal Miniature Aerial Missle System (LMAMS)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203802A / *Other Missile Product Improvement Programs* | **Project (Number/Name)**<br>VT9 / *Lethal Miniature Aerial Missle System (LMAMS)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Product Development and Integration | 3 | 2017 | 3 | 2018 |
| Testing | 4 | 2017 | 2 | 2018 |
| Test Reporting | 2 | 2018 | 3 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203808A / *TRACTOR CARD* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 20.333 | 37.883 | 34.050 | - | 34.050 | 21.871 | 19.005 | 19.234 | 19.619 | 0.000 | 171.995 |
| DS1: *TRACTOR BARN* | - | 0.000 | 12.000 | 13.000 | - | 13.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 25.000 |
| DS2: *Tractor Puma* | - | 4.335 | 10.532 | 5.432 | - | 5.432 | 3.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.299 |
| E11: *DELL* | - | 15.998 | 15.351 | 15.618 | - | 15.618 | 18.871 | 19.005 | 19.234 | 19.619 | 0.000 | 123.696 |

**A. Mission Description and Budget Item Justification**

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 20.333 | 37.883 | 34.050 | - | 34.050 |
| Current President's Budget | 20.333 | 37.883 | 34.050 | - | 34.050 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

**Change Summary Explanation**

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203808A / *TRACTOR CARD* | Project (Number/Name)<br>DS1 / *TRACTOR BARN* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS1: *TRACTOR BARN* | - | 0.000 | 12.000 | 13.000 | - | 13.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 25.000 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203808A / *TRACTOR CARD* | Project (Number/Name)<br>DS2 / *Tractor Puma* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS2: *Tractor Puma* | - | 4.335 | 10.532 | 5.432 | - | 5.432 | 3.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.299 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0203808A / *TRACTOR CARD* | Project (Number/Name)<br>E11 / *DELL* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E11: *DELL* | - | 15.998 | 15.351 | 15.618 | - | 15.618 | 18.871 | 19.005 | 19.234 | 19.619 | 0.000 | 123.696 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 3.450 | 0.000 | 0.000 | 8.000 | 8.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 11.450 |
| EF2: *Integrated Base Defense* | - | 3.450 | 0.000 | 0.000 | 8.000 | 8.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 11.450 |

**Note**

PE 0205402A has now been realigned into two separate PEs for Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) and Integrated Ground Security, Surveillance and Response Capability (IGSSR-C). Beginning in FY 2017 Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) funding is under PE0605033A Project EQ3. Beginning in FY 2017 Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) funding is under PE0605029A Project EQ2.

**A. Mission Description and Budget Item Justification**

GBOSS-E: Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System-Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities and will provide network integration and better mobility utilizing modular configurations. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-E will operate in a stand-alone mode or as part of an integrated network utilizing government owned software, be easily operated and maintained, and be rugged enough to support employment in expeditionary operations worldwide.

IGSSR-C: The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) is an Automated Information System (AIS) program. IGSSR-C has a requirement to provide a layered approach to integrate sensors, sensor systems and unmanned systems with automated fusion capabilities. The system will provide a Force Protection (FP) Common Operational Picture (COP) capability for CONUS fixed, OCONUS semi-fixed or expeditionary elements in all Operating Environments (OE). This capability will enable rapid decision analysis, speed the response process as well as increase information dissemination horizontally and vertically along the chain of command and with outside supporting organizations. IGSSR-C is a software centric fusion engine that connects legacy and emerging FP systems, legacy Chemical, Biological, Radiological, and Nuclear (CBRN), unmanned systems, biometric identification and forensic data systems. The desired end state is to achieve interoperability and COP with current and emerging FP systems used by Joint Forces, Department of Defense (DoD) agencies and multi-national forces.

Integrated Base Defense (IBD): The purpose of IBD Kitting is to harvest and refurbish physical security and Force Protection (FP) Non-Standard Equipment (NS-E) and package them into integrated and interoperable IBD Capabilities. IBD provides integration of software and analytical capability to support the integration of systems in the field. IBD employs an enterprise approach to enable IBD capabilities across the operational spectrum by leveraging interoperability efforts in support of the Integrated Unit, Base and Installation Protection (IUBIP) framework. In support of JUONS 0540 to address the Vehicle Borne Improvised Explosive Device (VBIED) threat. Additional capabilities are being developed and integrated to the current Force Protection structure.

Justification: FY 2019 OCO PB Request in the amount of $8.000 million supports JUONS 0540 to address the Vehicle Borne Improvised Explosive Device (VBIED) threat. Additional capabilities are being developed and integrated to the current Force Protection structure..

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* |

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 3.450 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 3.450 | 0.000 | 0.000 | 8.000 | 8.000 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | 8.000 | 8.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 0.000 | 8.000 | 8.000 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | Project (Number/Name)<br>EF2 / *Integrated Base Defense* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF2: *Integrated Base Defense* | - | 3.450 | 0.000 | 0.000 | 8.000 | 8.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 11.450 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

PE 0205402A has now been realigned into two separate PEs for Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) and Integrated Ground Security, Surveillance and Response Capability (IGSSR-C). Beginning in FY 2017 Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) funding is under PE0605033A Project EQ3. Beginning in FY 2017 Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) funding is under PE0605029A Project EQ2.

**A. Mission Description and Budget Item Justification**

GBOSS-E: Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System-Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities and will provide network integration and better mobility utilizing modular configurations. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-E will operate in a stand-alone mode or as part of an integrated network utilizing government owned software, be easily operated and maintained, and be rugged enough to support employment in expeditionary operations worldwide.

IGSSR-C: The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) is an Automated Information System (AIS) program. IGSSR-C has a requirement to provide a layered approach to integrate sensors, sensor systems and unmanned systems with automated fusion capabilities. The system will provide a Force Protection (FP) Common Operational Picture (COP) capability for CONUS fixed, OCONUS semi-fixed or expeditionary elements in all Operating Environments (OE). This capability will enable rapid decision analysis, speed the response process as well as increase information dissemination horizontally and vertically along the chain of command and with outside supporting organizations. IGSSR-C is a software centric fusion engine that connects legacy and emerging FP systems, legacy Chemical, Biological, Radiological, and Nuclear (CBRN), unmanned systems, biometric identification and forensic data systems. The desired end state is to achieve interoperability and COP with current and emerging FP systems used by Joint Forces, Department of Defense (DoD) agencies and multi-national forces.

Integrated Base Defense (IBD): The purpose of IBD is to harvest and refurbish physical security and FP Non-Standard Equipment and package them into integrated and interoperable IBD Capabilities. IBD provides integration of software and analytical capability to support the integration of systems in the field. IBD employs an enterprise approach to enable IBD capabilities across the operational spectrum by leveraging interoperability efforts in support of the Integrated Unit, Base and Installation Protection framework. Additionally, IBD is being updated in response to JUONS 0540 to address the Vehicle Borne Improvised Explosive Device (VBIED) threat. These capabilities are being developed and integrated into the current Force Protection infrastructure.

Justification: FY 2019 OCO PB Request in the amount of $8.000 million supports JUONS 0540 to perform system and sensor improvements to counter the Vehicle Borne Improvised Explosive Device (VBIED) threat.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | **Project (Number/Name)**<br>EF2 / *Integrated Base Defense* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** IBD Test and Evaluation<br>***Description:*** Test and Evaluation of Integrated Base Defense Software Development Efforts in support if Integrated Base Defense Kitting. | 1.600 | - | - | - | - |
| ***Title:*** IBD Engineering and Management Services<br>***Description:*** Engineering and Managment Services in support of Integrated Base Defense Software Development Efforts for Integrated Base Defense Kitting. | 0.100 | - | - | - | - |
| ***Title:*** IBD Design and Build | 0.750 | - | - | - | - |
| ***Title:*** IBD Architecture and Software Development<br>***Description:*** Integrated Base Defense Architecture and Software Development | 1.000 | - | - | - | - |
| ***Title:*** IBD JUONS 0540<br>***Description:*** This funding supports JUONS 0540. This funding is OCO.<br>***FY 2019 Base Plans:***<br>There is no Base FY 2019 PB Request.<br>***FY 2019 OCO Plans:***<br>This is OCO funding and supports JUONS 0540 to include Hyperspectal sensor system development and testing;<br>Automatic Vehicle Inspection System integration; Vehicle-Scanning System technology; System of systems test and integration.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase from FY18 to FY19 supports the capabilities associated with JUONS 0540 to include: Hyperspectal sensor system development and testing, Automatic Vehicle Inspection System integration, Wide Area Motion Imagery sensor integration, and vehicle scanning system technology migration as well as System of systems test and integration. | - | - | 0.000 | 8.000 | 8.000 |
| **Accomplishments/Planned Programs Subtotals** | 3.450 | - | 0.000 | 8.000 | 8.000 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | **Project (Number/Name)**<br>EF2 / *Integrated Base Defense* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • M90115: *INTEG BASE DEF NONSTAND EQUIP (IBD NS-E) KITTING* | - | 3.726 | 0.000 | 39.200 | 39.200 | - | - | - | - | 0.000 | 42.926 |

**Remarks**

**D. Acquisition Strategy**

Ground-Based Operational Surveillance System (Expeditionary) (G-BOSS(E)) will replace the interim Persistent Surveillance System - Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities along with network integration and better mobility utilizing modular configurations. The G-BOSS(E) Capability Design Document (CDD) was approved May 2014. In FY 2014, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funds to conduct pre-milestone B activities. G-BOSS(E) received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015. Pending successful Milestone B decision in FY 2017, the existing United States Marine Corps (USMC) tower's design (Ground Based Operational Surveillance System) (GBOSS) will be leveraged and modified to meet the Army's G-BOSS(E) program requirements. The acquisition strategy for G-BOSS(E) was signed by the Milestone Decision Authority (MDA) on 11 December 2016, which approved plans to leverage the Naval Surface Warfare Center (NSWC) at Crane, Indiana and the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to provide system design, development, and integration support, as well as a Technical Data Package (TDP) to support future procurements. The Heavy Tower Trailer, EO/IR, and RF Sensor which are the main cost drivers for the system will be competitively awarded through the product office and provided to a prime integrator with the TDP to construct future GBOSS-E systems. Milestone C is planned for FY 2020 to align G-BOSS(E), IGSSR-C, and Tactical Security System (TSS) in order to gain programmatic efficiencies.

The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) provides a layered approach to integrate sensors, sensor systems and unmanned systems. The IGSSR-C Capability Design Document (CDD) was approved September 2013. IGSSR-C is made up of a suite of software that achieves integration, fusion and interoperability in support of the Army Acquisition Executive's Common Operating Environment (COE) Command Post Compute Environment (CPCE) and Sensor CE efforts. In FY 2014, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funds to conduct pre-milestone B activities. IGSSR-C received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015. The acquisition strategy for IGSSR-C was signed by the MDA on 5 December 2016, which approved plans to leverage the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to develop, integrate and test the Initial Capability (IC). Milestone C is planned for FY 2020 to align Ground-Based Operational Surveillance System (Expeditionary) (G-BOSS(E)), Tactical Security System (TSS) and Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) in order to gain programmatic efficiencies.

The IBD acquisition strategy is to leverage existing IBD-related government organizations and to competitively award multiple contracts in support of IBD objectives for the development of holistic IBD architectures and products to support interoperability of fielded and emerging IBD-related systems.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | **Project (Number/Name)**<br>EF2 / *Integrated Base Defense* |

FY19 funding supports IBD JUONS 0540. Product Manager Force Protection Systems is overseeing the integration of both Commercial Off The Shelf and Government developed technologies that will address the identified capability gap to the existing Force Protection structure.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | Project (Number/Name)<br>EF2 / *Integrated Base Defense* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G-BOSS(E) Project Management | MIPR | PM EOIR : Fort Belvoir, VA | 0.288 | - | | - | | - | | - | | - | 0.000 | 0.288 | - |
| IGSSR-C Project Management | MIPR | PM EOIR : Fort Belvoir, VA | 0.175 | - | | - | | - | | - | | - | 0.000 | 0.175 | - |
| IBD Engineering and Management Services | Allot | Joint Project Manager Guardian Joint Product Manager Force Protection Services : Fort Belvoir, VA | 0.530 | 0.100 | May 2017 | - | | - | | - | | - | 0.000 | 0.630 | - |
| JUONS 0540 PMO | TBD | PdM FPS : Fort Belvoir, VA | - | - | | - | | 0.000 | | 0.460 | | 0.460 | 0.000 | 0.460 | - |
| | | **Subtotal** | 0.993 | 0.100 | | - | | 0.000 | | 0.460 | | 0.460 | 0.000 | 1.553 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G-BOSS(E) Design | MIPR | NSWC Crane : Crane, IN | 1.985 | - | | - | | - | | - | | - | 0.000 | 1.985 | - |
| G-BOSS(E) Prototypes | MIPR | RDECOM CERDEC : Fort Belvoir, VA | 2.733 | - | | - | | - | | - | | - | 0.000 | 2.733 | - |
| IGSSR-C Design | C/CPFF | TBD : TBD | 2.653 | - | | - | | - | | - | | - | 0.000 | 2.653 | - |
| IBD Acrhitecture and Software Development | C/CR | AMRDEC : Huntsville, AL | 3.985 | 1.000 | May 2017 | - | | - | | - | | - | 0.000 | 4.985 | - |
| IBD Design and Build | C/CR | AMRDEC : Huntsville, AL | - | 0.750 | May 2017 | - | | - | | - | | - | 0.000 | 0.750 | - |
| JUONS 0540 integration | C/CR | AMRDEC : Huntsville, AL | - | - | | - | | 0.000 | | 4.040 | | 4.040 | 0.000 | 4.040 | - |
| | | **Subtotal** | 11.356 | 1.750 | | - | | 0.000 | | 4.040 | | 4.040 | 0.000 | 17.146 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | **Project (Number/Name)**<br>EF2 / *Integrated Base Defense* |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G-BOSS(E) Design Support | MIPR | RDECOM CERDEC : Fort Belvoir, VA | 0.502 | - | | - | | - | | - | | - | 0.000 | 0.502 | - |
| IGSSR-C Design Support | MIPR | RDECOM CERDEC : Fort Belvoir, VA | 0.547 | - | | - | | - | | - | | - | 0.000 | 0.547 | - |
| JUONS 0540 Support | MIPR | NVESD/ARL : Fort Belvoir, VA | - | - | | - | | 0.000 | | 0.500 | | 0.500 | 0.000 | 0.500 | - |
| | | **Subtotal** | 1.049 | - | | - | | 0.000 | | 0.500 | | 0.500 | 0.000 | 1.549 | N/A |

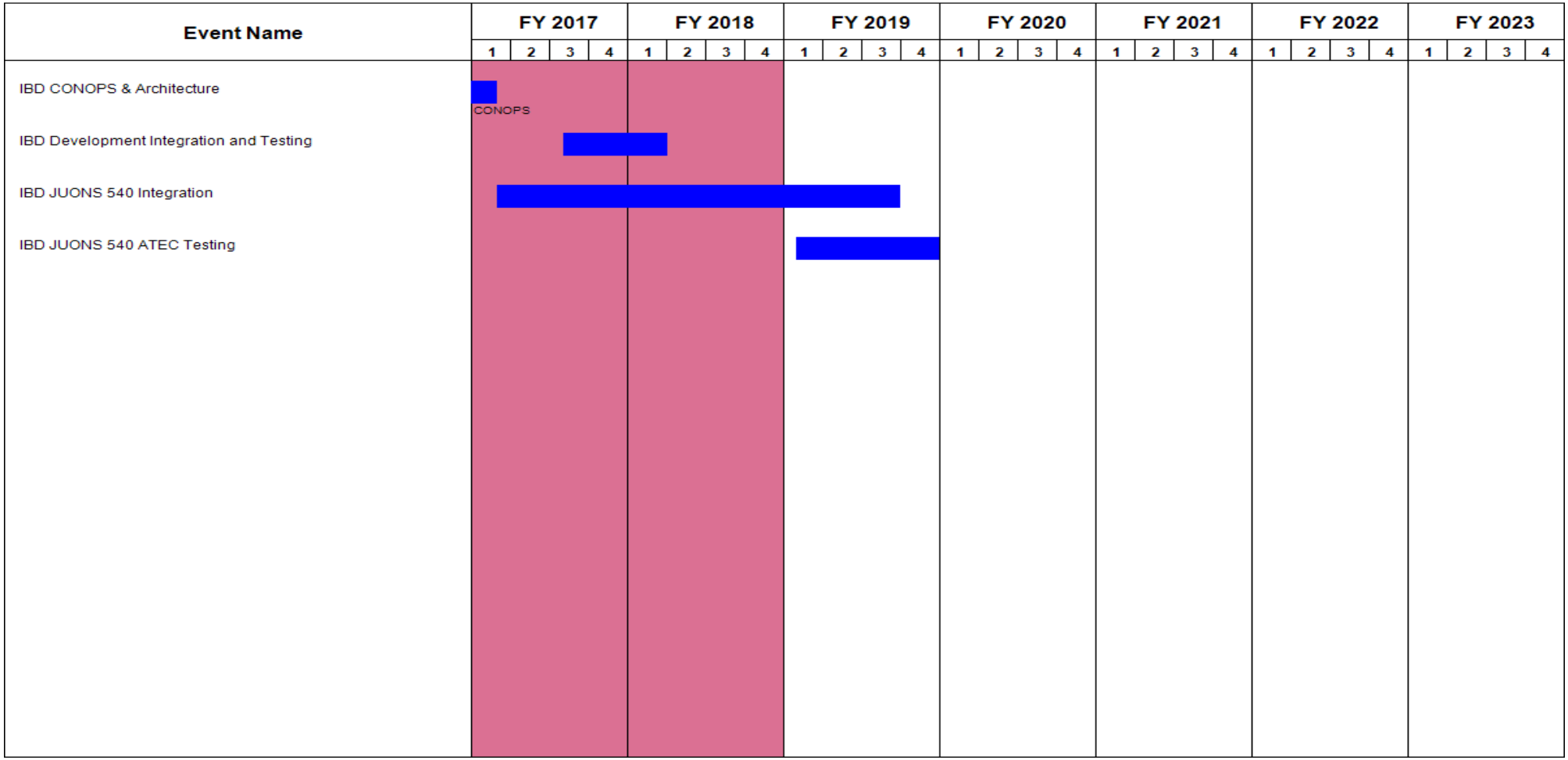
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IBD Test and Evaluation | MIPR | ATEC : Aberdeen Proving Ground, MD | 1.122 | 1.600 | May 2017 | - | | - | | - | | - | 0.000 | 2.722 | - |
| JUONS 0540 Test and Evaluation | MIPR | ATEC : Aberdeen Proving Ground, MD | - | - | | - | | 0.000 | | 3.000 | | 3.000 | 0.000 | 3.000 | - |
| | | **Subtotal** | 1.122 | 1.600 | | - | | 0.000 | | 3.000 | | 3.000 | 0.000 | 5.722 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 14.520 | 3.450 | | 0.000 | | 0.000 | | 8.000 | | 8.000 | 0.000 | 25.970 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | **Project (Number/Name)**<br>EF2 / *Integrated Base Defense* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205402A / *Integrated Base Defense - Operational System Dev* | **Project (Number/Name)**<br>EF2 / *Integrated Base Defense* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| IBD CONOPS & Architecture | 2 | 2016 | 1 | 2017 |
| IBD Development Integration and Testing | 3 | 2017 | 1 | 2018 |
| IBD JUONS 540 Integration | 1 | 2017 | 3 | 2019 |
| IBD JUONS 540 ATEC Testing | 1 | 2019 | 4 | 2019 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205410A / *Materials Handling Equipment* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.119 | 1.582 | 1.464 | - | 1.464 | 0.743 | 0.762 | 0.691 | 0.799 | Continuing | Continuing |
| EE9: *Material Handling Equipment - Advance Development* | - | 0.119 | 1.582 | 1.464 | - | 1.464 | 0.743 | 0.762 | 0.691 | 0.799 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This program element supports component development and Material Handling Equipment (MHE) prototyping, and stays abreast of emerging and available technologies to be integrated into military MHE to address identified capability gaps and warfighter objectives. This project enables the development of selected technologies and transition to system integration and development or production of MHE products. MHE includes Rough Terrain Forklifts, Rough Terrain Container Handlers (RTCH) and Cranes, as well as ancillary MHE equipment, to support distribution of critical supplies in the theater of operations.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.124 | 1.582 | 1.480 | - | 1.480 |
| Current President's Budget | 0.119 | 1.582 | 1.464 | - | 1.464 |
| Total Adjustments | -0.005 | 0.000 | -0.016 | - | -0.016 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.005 | - | | | |
| • Adjustments to Budget Years | - | - | -0.016 | - | -0.016 |

**Change Summary Explanation**

Funding realigned from 603804A Project G14

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205410A / *Materials Handling Equipment* | Project (Number/Name)<br>EE9 / *Material Handling Equipment - Advance Development* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EE9: *Material Handling Equipment - Advance Development* | - | 0.119 | 1.582 | 1.464 | - | 1.464 | 0.743 | 0.762 | 0.691 | 0.799 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project supports component development and Material Handling Equipment (MHE) prototyping and stays abreast of emerging and available technologies to be integrated into military MHE to address identified capability gaps and warfighter objectives. This project enables the development of selected technologies and transition to system integration and development or production of MHE products. MHE includes Rough Terrain Forklifts, Rough Terrain Container Handlers (RTCH) and Cranes, as well as ancillary MHE equipment, to support distribution of critical supplies in the theater of operations.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Material Handling Equipment (MHE) Enhancement | - | 0.647 | 0.677 |
| ***Description:*** Integrate and demonstrate Commercial-off-the-Shelf (COTS) technologies to enhance Material Handling Equipment (MHE) operations. System technologies will include obstacle detection, electronic control systems, electric-hydraulic controls, driveline control technology, and work tool automation. | | | |
| ***FY 2018 Plans:***<br>Integrate Commercial-off-the-Shelf (COTS) obstacle detectors, similar to collision sensors, to increase situational awareness of MHE operator. Integrate COTS controllers, similar to gaming devices to enable MHE operator to control machine from outside the cab. Research the integration and replacement of levers with joysticks for improved operator efficiency. Research steering and driving control devices which will allow semi or full autonomous control. Research and integrate COTS technology such as self-aligning forks and boom extension for telescoping boom forklift. | | | |
| ***FY 2019 Plans:***<br>Integrate Commercial-off-the-Shelf (COTS) obstacle detectors, similar to collision sensors, to increase situational awareness of MHE operator. Integrate COTS controllers, similar to gaming devices to enable MHE operator to control machine from outside the cab. Research the integration and replacement of levers with joysticks for improved operator efficiency. Research steering and driving control devices which will allow semi or full autonomous control. Research and integrate COTS technology such as self-aligning forks and boom extension for telescoping boom forklift. | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205410A / *Materials Handling Equipment* | **Project (Number/Name)**<br>EE9 / *Material Handling Equipment - Advance Development* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Man-Year Rates are increased for FY19 Reimbursable Labor Costs. | | | |
| ***Title:*** Operational Energy Technologies<br>***Description:*** Evaluate emerging technologies that can improve machine productivity and efficiency. Baseline fuel efficiency, engine management, efficient lubricants and hydraulic technologies.<br>***FY 2018 Plans:***<br>Instrument up to three vehicle types (Light Capacity Rough Terrain Forklift, Rough Terrain Container Handler, and All Terrain Lifting Army System), and monitor fuel consumption during operations. Build duty cycle profiles for the classes of equipment and identify areas of inefficiency and language to include in future procurements.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Operational Energy Technologies efforts will be completed in FY2018. | - | 0.050 | - |
| ***Title:*** System Engineering/Program Management<br>***Description:*** Fund for Material Handling Equipment System Engineering and Program Management.<br>***FY 2018 Plans:***<br>Provide funding for Material Handling Equipment System Engineering and Program Management.<br>***FY 2019 Plans:***<br>Fund for Material Handling Equipment System Engineering and Program Management.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Man-Year Rates for reimbursable labor support increased from FY2018 to FY2019. | 0.119 | 0.211 | 0.217 |
| ***Title:*** Driver Assist<br>***Description:*** Research and demonstrate technologies which would enhance operation such as the inclusion of cameras, collision sensors, and lifting aids.<br>***FY 2018 Plans:***<br>Integrate COTS cameras, similar to backup cameras, to increase situational awareness of MHE operator. Integrate COTS collision warning sensors to increase situational awareness of MHE operator. Integrate discrete lifting aids to assist rough terrain forklifts with non-pallet lift missions.<br>***FY 2019 Plans:*** | - | 0.674 | 0.570 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205410A / *Materials Handling Equipment* | **Project (Number/Name)**<br>EE9 / *Material Handling Equipment - Advance Development* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Integrate COTS cameras, similar to backup cameras, to increase situational awareness of MHE operator. Integrate COTS collision warning sensors to increase situational awareness of MHE operator. Integrate discrete lifting aids to assist rough terrain forklifts with non-pallet lift missions.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Man-Year required for FY2019 is reduced. | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.119 | 1.582 | 1.464 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • G41001: *5K LIGHT CAPABILITY ROUGH TERRAIN (LCRT) FORKLIFT G41002* | 3.153 | 9.000 | 12.901 | - | 12.901 | 16.869 | 15.887 | 21.772 | 22.973 | Continuing | Continuing |
| • MA4501: *Modification Of In-Svc Equipment (OPA-3) MHE* | 46.363 | 26.018 | 25.201 | - | 25.201 | 28.122 | 26.466 | 22.310 | 30.770 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Procure prototype component items for engineering tests and demonstrations with subject matter experts. Conduct trades between cost and improved maintainability and environmental risk reduction. Process engineering change proposals, update technical manuals and training materials, and prepare supporting acquisition documents and data to procure new training aids.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205410A / *Materials Handling Equipment* | Project (Number/Name)<br>EE9 / *Material Handling Equipment - Advance Development* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upgrade RTCH control systems and on-board diagnostics | Various | Various : Various | 0.293 | - | | - | | - | | - | | - | 0.000 | 0.293 | - |
| Robotic Assist on Material Handling Equipment | MIPR | TARDEC : Warren, MI | 0.461 | - | | 0.647 | | 0.677 | Mar 2019 | - | | 0.677 | Continuing | Continuing | - |
| Operational Energy Technologies | MIPR | Various : Various | 0.143 | - | | 0.050 | | - | | - | | - | 0.000 | 0.193 | - |
| Driver Assist | Various | Various : Various | - | - | | 0.674 | | 0.570 | Mar 2019 | - | | 0.570 | Continuing | Continuing | - |
| | | **Subtotal** | 0.897 | - | | 1.371 | | 1.247 | | - | | 1.247 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System Engineering/ Program Management | MIPR | TARDEC : Warren, MI | 0.121 | 0.119 | Dec 2017 | 0.211 | | 0.217 | Oct 2018 | - | | 0.217 | Continuing | Continuing | - |
| | | **Subtotal** | 0.121 | 0.119 | | 0.211 | | 0.217 | | - | | 0.217 | Continuing | Continuing | N/A |

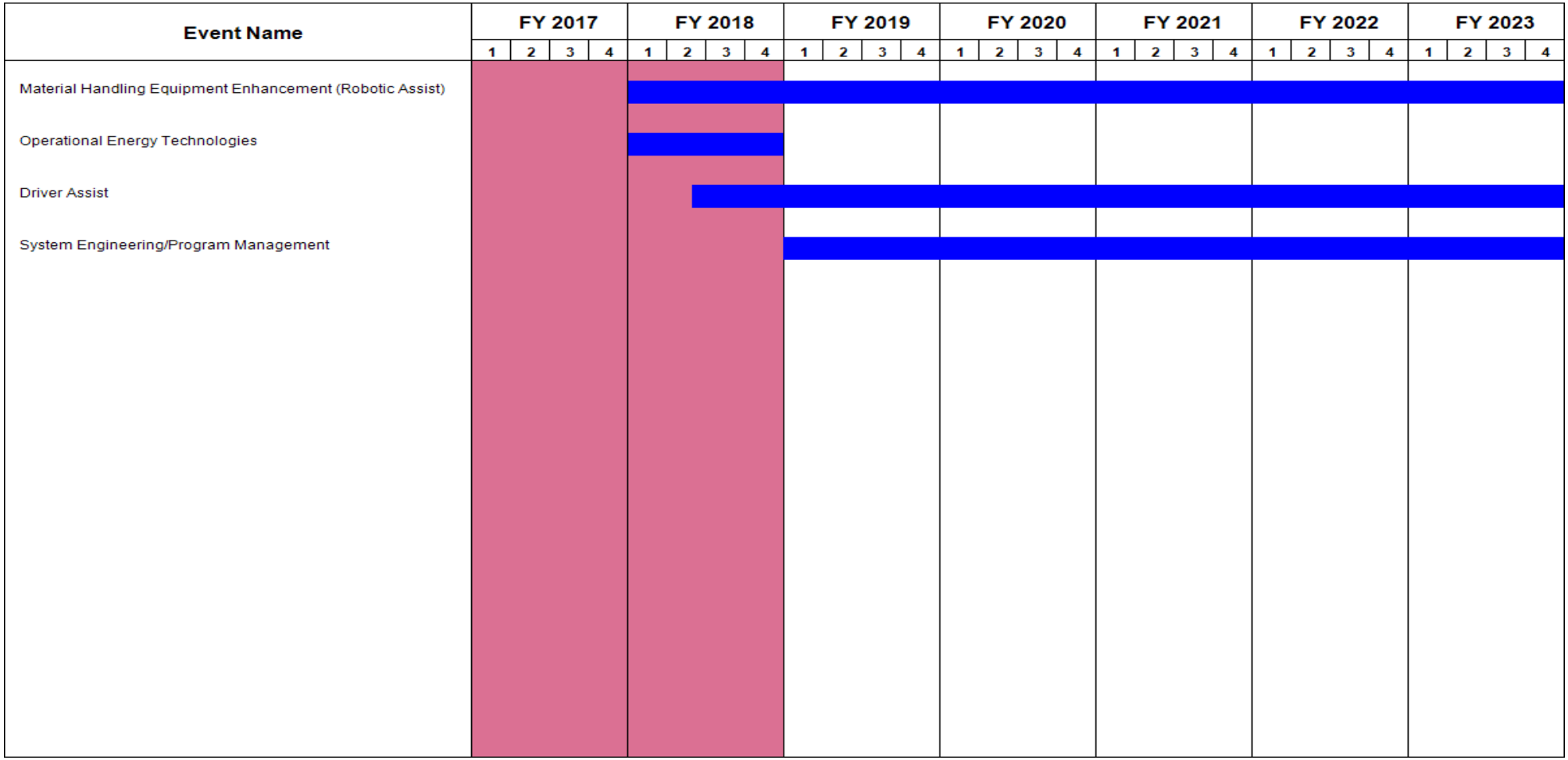
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lightweight Armor for ATLAS II | Various | Various : Various | 0.170 | - | | - | | - | | - | | - | 0.000 | 0.170 | - |
| | | **Subtotal** | 0.170 | - | | - | | - | | - | | - | 0.000 | 0.170 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 1.188 | 0.119 | | 1.582 | | 1.464 | | - | | 1.464 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205410A / *Materials Handling Equipment* | **Project (Number/Name)**<br>EE9 / *Material Handling Equipment - Advance Development* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205410A / *Materials Handling Equipment* | **Project (Number/Name)**<br>EE9 / *Material Handling Equipment - Advance Development* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Material Handling Equipment Enhancement (Robotic Assist) | 1 | 2018 | 4 | 2023 |
| Operational Energy Technologies | 1 | 2018 | 4 | 2018 |
| Driver Assist | 2 | 2018 | 4 | 2023 |
| System Engineering/Program Management | 1 | 2019 | 4 | 2023 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205412A / *Environmental Quality Technology - Operational System Dev* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.000 | 0.195 | 0.249 | - | 0.249 | 0.732 | 0.259 | 0.265 | 0.776 | 0.000 | 2.476 |
| EE6: *Environmental Information Tech Modernization* | - | 0.000 | 0.195 | 0.249 | - | 0.249 | 0.732 | 0.259 | 0.265 | 0.776 | 0.000 | 2.476 |

**A. Mission Description and Budget Item Justification**

Conducts system enhancements as required to meet data management, cybersecurity risk, and performance requirements for the Defense Environmental Network Information Exchange (DENIX) defense business system, as well as its database and reporting application, the Knowledge Based Corporate Reporting System (KBCRS).

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 0.195 | 0.202 | - | 0.202 |
| Current President's Budget | 0.000 | 0.195 | 0.249 | - | 0.249 |
| Total Adjustments | 0.000 | 0.000 | 0.047 | - | 0.047 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 0.047 | - | 0.047 |

**Change Summary Explanation**

Increase in RDTE funding for subsequent years will be allocated to comply with Cybersecurity Service Provider and Risk Management Framework requirements for the system.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205412A / *Environmental Quality Technology - Operational System Dev* | Project (Number/Name)<br>EE6 / *Environmental Information Tech Modernization* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EE6: *Environmental Information Tech Modernization* | - | 0.000 | 0.195 | 0.249 | - | 0.249 | 0.732 | 0.259 | 0.265 | 0.776 | 0.000 | 2.476 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Environmental Information Technology Management (EITM) program includes support for the Defense Environmental Network Information Exchange (DENIX) defense business system, as well as its database and reporting application, the Knowledge Based Corporate Reporting System (KBCRS). This request for research, development, test and evaluation (RTDE) is to enhance the DBS to a net-centric all services transactional system of record and reporting tool set. This also includes upgrades to incorporate ongoing cybersecurity, cloud computing, and other information technology requirements.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Environmental Information Technology Modernization | - | 0.195 | 0.249 |
| ***Description:*** Prototype, develop and implement platform enhanacements as required to meet data management requirements for the Knowledge Based Corporate Reporting System and the Defense Environmental Network Information Exchange.<br><br>***FY 2018 Plans:***<br>The current architecture of the DENIX platform will be expanded from one Level 4 container (Controlled Unclassified Information) to add a separate Level 2 container (Non-Controlled Unclassified Information) within the cloud infrastructure-as-a-service (IaaS) model.<br><br>***FY 2019 Plans:***<br>The containerization effort from FY 2018 will continue into FY 2019 and will provide DENIX architecture and bandwidth required to support large scale web conferencing and implement necessary user experience updates to the platform.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase in funding for subsequent years is driven by and consistent with the Deputy Secretary of Defense's Memorandum "Accelerating Enterprise Cloud Adoption" and the goals and objectives of the Army ESOH Strategy 2025. In order to provide optimized performance that improves cyber security and enhances user functionality for mission support DENIX requires a modernization effort over a five year period aligned with the FYDP. | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 0.195 | 0.249 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205412A / *Environmental Quality Technology - Operational System Dev* | **Project (Number/Name)**<br>EE6 / *Environmental Information Tech Modernization* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 432612000: *Information Management - Automation* | - | - | 3.309 | - | 3.309 | 0.337 | 3.443 | 3.511 | 3.582 | 0.000 | 14.182 |

**Remarks**

This is the associated OMA line that provides daily support for the Defense Environmental Network Information Exchange and associated applications. EITM is managed as a Defense Business System #3180.

**D. Acquisition Strategy**

The Environmental Information Technology Management (EITM) Program is an Office of the Secretary of the Secretary of Defense sponsored program that was assigned to the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health as the Department of Defense (DoD) overarching authority by the Under Secretary of Defense for Acquisition, Technology, and Logistics in 2001. The DoD Directive 4715.1E defined EITM mission is to ensure efficient use of enterprise environment, safety, and occupational health (ESOH) corporate information management processes by providing and sustaining requirement-driven ESOH corporate data management, Congressional-reporting, and public outreach tools to the DoD, and other DoD stakeholders. Funding provided for this program will allow EITM to continue to develop and modernize the system to meet requirements set forth by the DoD's Risk Management Framework (DoDI 8510.01) as well as the Defense Information Systems Agency's Cloud Computing Security Requirements Guide. Prior to funding being committed, DoD ESOH stakeholders, authoritative information technology organizations, and the program's functional sponsor were consulted to determine necessary system interface upgrades to be incorporated. Expanding DENIX's architecture to create a Level 2 container separate from the current Level 4 container will not only provide a more secure, cybersecurity risk-adverse environment, but it will also optimize performance, capabilities, and mandatory reporting for ESOH stakeholders. This phased solution begins in FY 2018 by prototyping of system architecture optimization that improves user experience, enabling web conferencing in FY 2019 and applying machine learning concepts to improve data quality in FY 2020-2022.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205412A / *Environmental Quality Technology - Operational System Dev* | Project (Number/Name)<br>EE6 / *Environmental Information Tech Modernization* | |

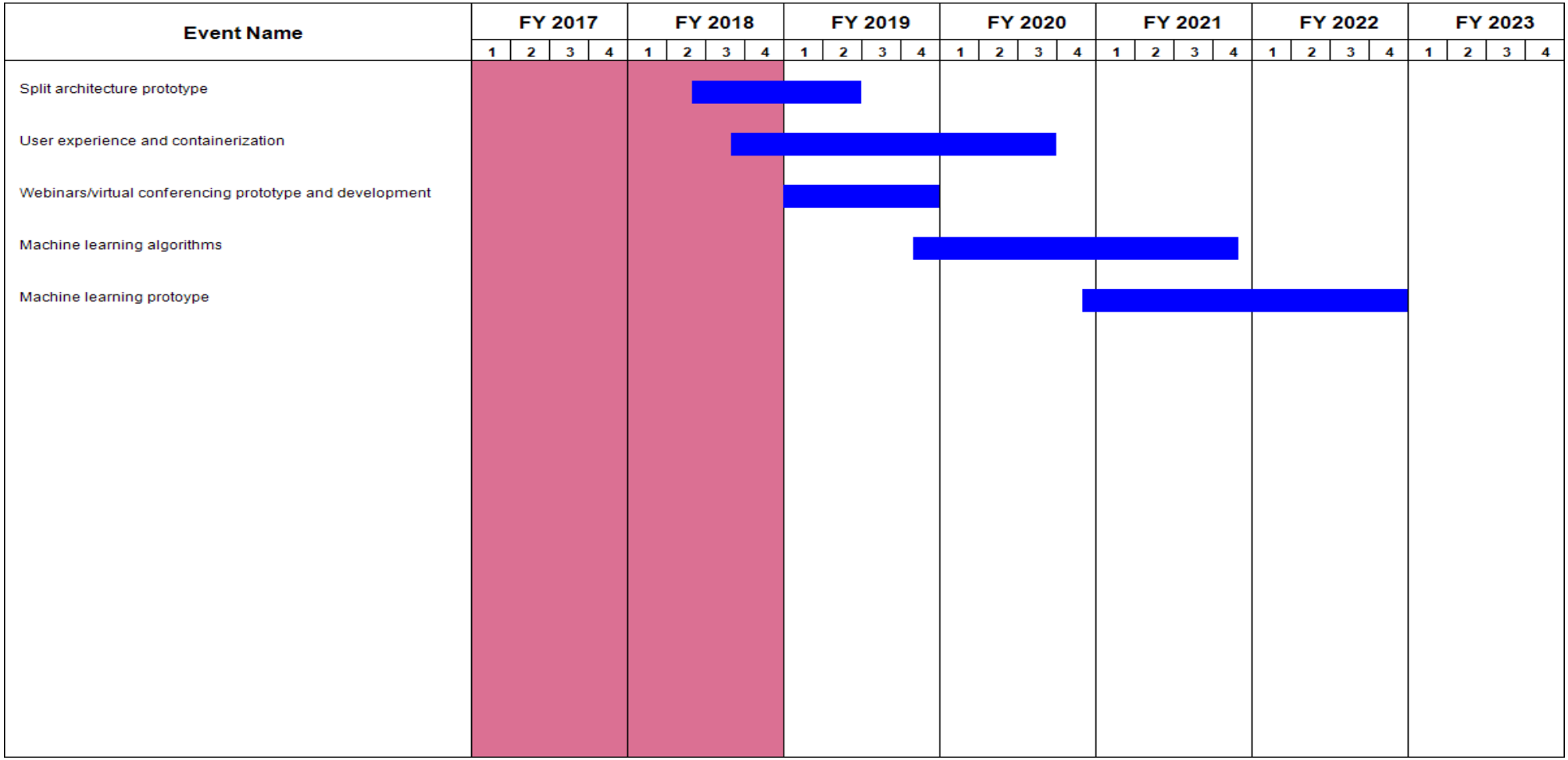
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System enhancements for required network interfaces to support EITM mission. | C/FFP | Delta Resources : Arlington, VA | 0.270 | - | | 0.195 | | 0.249 | | - | | 0.249 | 0.000 | 0.714 | - |
| | | **Subtotal** | 0.270 | - | | 0.195 | | 0.249 | | - | | 0.249 | 0.000 | 0.714 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.270 | - | | 0.195 | | 0.249 | | - | | 0.249 | 0.000 | 0.714 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205412A / *Environmental Quality Technology - Operational System Dev* | **Project (Number/Name)**<br>EE6 / *Environmental Information Tech Modernization* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205412A / *Environmental Quality Technology - Operational System Dev* | **Project (Number/Name)**<br>EE6 / *Environmental Information Tech Modernization* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Split architecture prototype | 2 | 2018 | 2 | 2019 |
| User experience and containerization | 3 | 2018 | 3 | 2020 |
| Webinars/virtual conferencing prototype and development | 1 | 2019 | 4 | 2019 |
| Machine learning algorithms | 4 | 2019 | 4 | 2021 |
| Machine learning protoype | 4 | 2020 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205456A *I Lower Tier Air and Missile Defense (AMD) System* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 61.449 | 78.926 | 79.283 | - | 79.283 | 107.785 | 111.124 | 121.376 | 117.336 | Continuing | Continuing |
| EF9: *System Integration and Test* | - | 61.449 | 78.926 | 79.283 | - | 79.283 | 107.785 | 111.124 | 121.376 | 117.336 | Continuing | Continuing |
| **Program MDAP/MAIS Code:** 505 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

The PATRIOT system includes a family of hardware, software, interceptors (PAC-2, Guidance Enhanced Missiles, PAC-3 and PAC-3 Missile Segment Enhancement) and Ground Support Equipment. As software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation (M&S) allow for performance assessment against all threats that would not be possible in flight tests due to cost, target and range constraints. Flight testing is periodically required for validation of the Modeling and Simulation as well as satisfying Army Test and Evaluation Command/Director, Operational Test and Evaluation (ATEC/DOTE) requirements of segment improvements.

PATRIOT is an integral part of the overall Air and Missile Defense (AMD) Architecture and enables the incremental fielding of the system capability for Army Air and Missile Defense Battalions.

Funding supports identification, analysis, design, and test materiel solutions to counter cyber security and electronic warfare shortcomings to all elements of the Lower Tier Battle Space.

FY2019 base dollars in the amount of $79.283 million supports the continuance of program development with the integration of missile and ground system software and hardware in support of complete Post Deployment Build-8.1 (PDB-8.1). Continues the testing program to support the Test and Evaluation Master Plan (TEMP) and system testing/analysis long lead activities for PDB-8.1 Development Test and Evaluation (DTE) and Limited User Test (LUT).

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0205456A *I Lower Tier Air and Missile Defense (AMD) System* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 73.417 | 78.926 | 80.314 | - | 80.314 |
| Current President's Budget | 61.449 | 78.926 | 79.283 | - | 79.283 |
| Total Adjustments | -11.968 | 0.000 | -1.031 | - | -1.031 |
| • Congressional General Reductions | -0.031 | - | | | |
| • Congressional Directed Reductions | -5.528 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -2.409 | - | | | |
| • Adjustments to Budget Years | - | - | -1.031 | - | -1.031 |
| • Amended FY2017 not appropriated | -4.000 | - | - | - | - |

**Change Summary Explanation**

FY2017: -$5.528 million due to the availability of prior year execution balances.

FY2017: Amended PB17 Base request of $4.0 million was not appropriated.

FY2019: Base Adjustments to Budget Years: Program Office core employee labor costs moved from RDTE to OMA as part of an OSD auditability directive.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | | | | Project (Number/Name)<br>EF9 / *System Integration and Test* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| EF9: *System Integration and Test* | - | 61.449 | 78.926 | 79.283 | - | 79.283 | 107.785 | 111.124 | 121.376 | 117.336 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The PATRIOT system includes a family of hardware, software, interceptors (PAC-2, Guidance Enhanced Missiles, PAC-3 and PAC-3 Missile Segment Enhancement) and Ground Support Equipment. As software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation allow for performance assessment against all threats that would not be possible in flight tests due to cost, target, and range constraints. Flight testing is periodically required for validation of Modeling and Simulation as well as satisfying ATEC/DOTE requirements of segment improvements.

PATRIOT is an integral part of the overall Air and Missile Defense (AMD) Architecture and enables the incremental fielding of the system capability for Army Air and Missile Defense Battalions.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Program Development, Integration, and Support | 27.171 | 32.144 | 38.684 | - | 38.684 |
| ***Description:*** Funding is provided for the following effort:<br><br>***FY 2018 Plans:***<br>-Continued program development.<br>-Continued integration of missile and ground system hardware and software to complete Post Deployment Build (PDB) -8.1 activities.<br><br>***FY 2019 Base Plans:***<br>-Continues program development.<br>-Continues integration of missile and ground system hardware and software to complete PDB-8.1 activities.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY18 budget reflects completing PDB-8 testing and initial PDB 8.1 test planning, support, analysis and integration efforts to include significant investments of long-lead target hardware. FY19 budget reflects ramping into PDB 8.1 test support, analysis and integration efforts with lower levels of target hardware investments. The resultant budget is an increase of FY19 budget of $363K over FY18. | | | | | |
| ***Title:*** Testing, Targets, Modeling and Simulation | 34.278 | 46.782 | 40.599 | - | 40.599 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | **Project (Number/Name)**<br>EF9 / *System Integration and Test* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** Funding is provided for the following effort:<br><br>***FY 2018 Plans:***<br>-Continued the testing program to include utilization of targets/threat simulators, flight simulator and modeling efforts.<br>-Continued test activities to support the Test & Evaluation Master Plan (TEMP).<br>-Completed (Post Deployment Build) PDB 8.0 Testing<br>-Completed PDB 8.0.5 Testing<br>-Continued system testing/analysis for PDB-8.1 Development Test and Evaluation (DTE) and Limited User Test (LUT).<br>-Began planning, integration and testing of missile and ground system hardware and software to complete PDB 8.1 activities.<br>-Began planning, design, and acquisition of long lead Targets for PDB 8.1 Testing<br>-Continued PATRIOT program Modeling & Simulation (M&S) laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements.<br><br>***FY 2019 Base Plans:***<br>-Continues the testing program to include utilization of targets/threat simulators, flight simulator and modeling efforts.<br>-Continues test activities to support the TEMP.<br>-Continues system testing/analysis for PDB-8.1 DTE and LUT.<br>-Continues planning, integration and testing of missile and ground system hardware and software to complete PDB 8.1 activities.<br>-Continues PATRIOT program M&S laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements.<br>-Planning, design, and acquisition of long lead Targets for PDB 8.1 Testing.<br>-Begins Ballistic Missile Defense System (BMDS) Integration Testing.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY18 budget reflects completing PDB-8 testing and initial PDB 8.1 test planning, support, analysis and integration efforts to include significant investments of long-lead target hardware. FY19 budget reflects ramping | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | **Project (Number/Name)**<br>EF9 / *System Integration and Test* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| into PDB 8.1 test support, analysis and integration efforts with lower levels of target hardware investments. The resultant budget is an increase of FY19 budget of $363K over FY18. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 61.449 | 78.926 | 79.283 | - | 79.283 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • C53101: *MSE Missile* | 809.201 | 1,106.040 | 871.276 | 260.000 | 1,131.276 | 512.775 | 734.152 | 727.032 | 813.280 | 793.430 | 6,627.186 |
| • C50016: *Lower Tier Air and Missile Defense (AMD)* | 126.470 | 140.826 | 111.395 | - | 111.395 | 130.051 | 105.044 | 107.288 | 106.178 | 0.000 | 827.252 |
| • 0604319A: *Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)* | - | 11.303 | 51.030 | - | 51.030 | 146.731 | 132.361 | 156.732 | 21.528 | 0.000 | 519.685 |
| • C62002: *IFPC INC 2-I BLOCK 1 SYSTEM* | - | - | 0.000 | - | 0.000 | 175.576 | 303.422 | 273.802 | 388.377 | 0.000 | 1,141.177 |
| • C62001: *IFPC Inc 2-I Block 1 Missile* | - | 57.742 | 145.636 | - | 145.636 | 143.466 | 99.516 | 14.472 | - | 0.000 | 460.832 |
| • E10: *Sentinel* | 15.368 | 32.968 | 39.338 | - | 39.338 | 91.534 | 96.427 | 80.394 | 43.874 | 0.000 | 399.903 |
| • S40: *Army Integrated Air and Missile Defense* | 273.240 | 336.420 | 277.607 | - | 277.607 | 200.275 | 130.860 | 63.741 | 33.196 | 0.000 | 1,315.339 |
| • BZ5075: *IAMD Battle Command System* | - | - | 0.000 | - | 0.000 | 72.307 | 323.680 | 428.572 | 497.974 | Continuing | Continuing |
| • 0604741A: *Air Defense Command, Control and Intelligence - Eng Dev* | 200.205 | 28.726 | 95.172 | 119.300 | 214.472 | 15.577 | 9.310 | 2.915 | 29.489 | 0.000 | 500.694 |
| • AD5070: *AIR & MSL Defense Planning & Control Sys* | 126.539 | 35.735 | 33.837 | - | 33.837 | 24.983 | 49.385 | 68.021 | 63.273 | 0.000 | 401.773 |
| • EX2: *Lower Tier Air Missile Defense (LTAMD) Capability* | 33.780 | 76.728 | 120.374 | - | 120.374 | 125.772 | 376.738 | 332.322 | 241.461 | 0.000 | 1,307.175 |
| • EY7: *IFPC Increment 2 - Block 1* | 80.781 | 175.069 | 157.710 | - | 157.710 | 77.599 | 32.517 | - | - | 0.000 | 523.676 |

**Remarks**

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | **Project (Number/Name)**<br>EF9 / *System Integration and Test* |

**D. Acquisition Strategy**

The ongoing design and developmental activities enable modeling and simulation infrastructure maintenance and upgrades coupled with end to end testing of the Lower Tier architecture against the evolving threat as an element of an integrated Air and Missile Defense system. This strategy minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. Lower Tier system development efforts enable further improvement of system capabilities against emerging and reactive threats. Developing, fabricating and testing hit to kill surface to air missile and associated ground support equipment provides essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. These state-of-the-art capabilities and enhancements require ongoing demonstration through a series of flight tests and modeling and simulation activities.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | Project (Number/Name)<br>EF9 / *System Integration and Test* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | MIPR | Various : Huntsville, Alabama | 2.308 | 0.964 | Dec 2016 | 1.156 | Dec 2017 | 1.186 | Dec 2018 | - | | 1.186 | Continuing | Continuing | - |
| PAC-3 Product Office | RO | Project Office : Huntsville, AL | 1.265 | 1.051 | Oct 2016 | 1.188 | Oct 2017 | 1.663 | Oct 2018 | - | | 1.663 | Continuing | Continuing | - |
| | | **Subtotal** | 3.573 | 2.015 | | 2.344 | | 2.849 | | - | | 2.849 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Integration MSE LMMFC | Various | Lockheed Martin Missiles and Fire Control (LMMFC) : Dallas, Texas | 12.300 | 14.427 | Feb 2017 | 15.456 | Feb 2018 | 18.207 | Feb 2019 | - | | 18.207 | Continuing | Continuing | - |
| MSE/PAC-3 Raytheon | Various | Raytheon : Waltham, Massachusetts | 8.250 | 4.569 | Feb 2017 | 5.598 | Feb 2018 | 6.930 | Feb 2019 | - | | 6.930 | Continuing | Continuing | - |
| SETA Contracts | Various | Multiple : Multiple | 4.933 | 0.889 | Feb 2017 | 1.069 | Feb 2018 | 1.096 | Feb 2019 | - | | 1.096 | Continuing | Continuing | - |
| U.S. Other Government Agencies (OGAs) | MIPR | Various : Huntsville, Alabama | 9.530 | 7.680 | Dec 2016 | 7.677 | Dec 2017 | 9.602 | Dec 2018 | - | | 9.602 | Continuing | Continuing | - |
| | | **Subtotal** | 35.013 | 27.565 | | 29.800 | | 35.835 | | - | | 35.835 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Targets/Threats Simulators | MIPR | Various : Huntsville, Alabama | 47.533 | 20.591 | Feb 2017 | 33.637 | Feb 2018 | 14.833 | Feb 2019 | - | | 14.833 | Continuing | Continuing | - |
| Modeling and Simulation | MIPR | Various : Huntsville, Alabama | 6.724 | 3.065 | Jan 2017 | 3.685 | Jan 2018 | 3.779 | Jan 2019 | - | | 3.779 | Continuing | Continuing | - |
| Contractor T&E | Various | Multiple : Multiple | 13.377 | 1.625 | Feb 2017 | 1.953 | Feb 2018 | 2.003 | Feb 2019 | - | | 2.003 | Continuing | Continuing | - |
| Other T&E funding | MIPR | Various : WSMR, NM | 6.135 | 2.822 | May 2017 | 3.190 | May 2018 | 3.246 | May 2019 | - | | 3.246 | Continuing | Continuing | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | Project (Number/Name)<br>EF9 / *System Integration and Test* | |

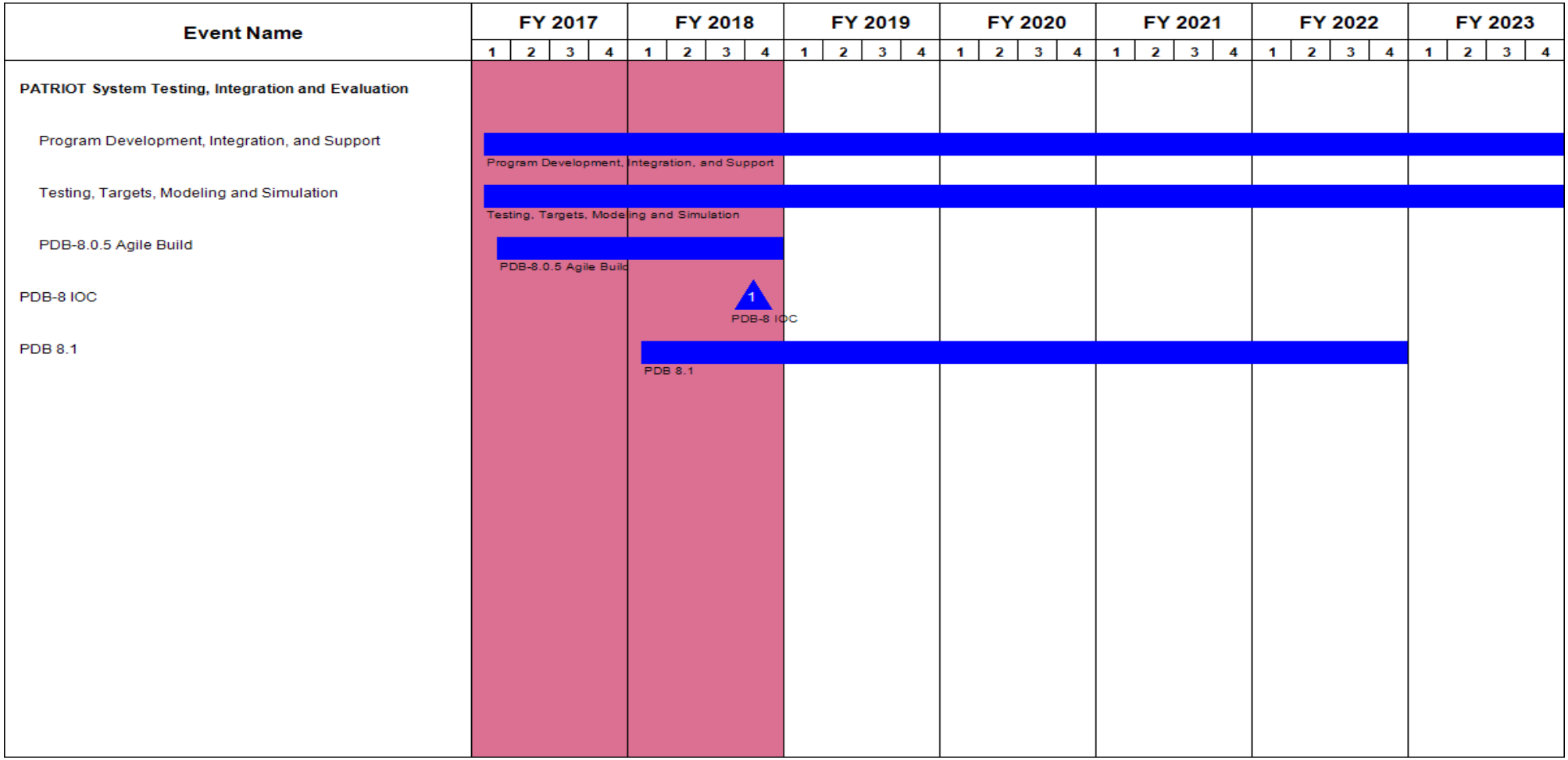
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobile Flight Mission Simulator (MFMS) | SS/FPIF | Raytheon : Massachusetts | 9.900 | 1.226 | Jan 2017 | 0.948 | Jan 2018 | 1.080 | Jan 2019 | - | | 1.080 | Continuing | Continuing | - |
| PDB-8 | MIPR | Various : WSMR, NM | 3.231 | 2.540 | Feb 2017 | 3.369 | Feb 2018 | 15.658 | Feb 2019 | - | | 15.658 | Continuing | Continuing | - |
| PDB-8 DT/OT | MIPR | Various : WSMR, NM | 14.887 | - | | - | | - | | - | | - | 0.000 | 14.887 | - |
| | | **Subtotal** | 101.787 | 31.869 | | 46.782 | | 40.599 | | - | | 40.599 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 140.373 | 61.449 | | 78.926 | | 79.283 | | - | | 79.283 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | **Project (Number/Name)**<br>EF9 / *System Integration and Test* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205456A / *Lower Tier Air and Missile Defense (AMD) System* | **Project (Number/Name)**<br>EF9 / *System Integration and Test* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| PATRIOT System Testing, Integration and Evaluation | 1 | 2015 | 4 | 2023 |
| Program Development, Integration, and Support | 1 | 2015 | 4 | 2023 |
| Testing, Targets, Modeling and Simulation | 1 | 2015 | 4 | 2023 |
| PDB-8.0.5 Agile Build | 1 | 2017 | 4 | 2018 |
| PDB-8 IOC | 4 | 2018 | 4 | 2018 |
| PDB 8.1 | 1 | 2018 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | | Date: February 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 21.196 | 102.807 | 154.102 | - | 154.102 | 132.594 | 54.328 | 64.789 | 1.993 | 0.000 | 531.809 |
| EG2: *GMLRS Alternative Warheads** | - | 0.000 | 0.000 | 0.000 | - | 0.000 | 11.566 | 14.529 | 24.409 | 0.000 | 0.000 | 50.504 |
| EG3: *Guided MLRS* | - | 21.196 | 102.807 | 154.102 | - | 154.102 | 121.028 | 39.799 | 40.380 | 1.993 | 0.000 | 481.305 |
| **Program MDAP/MAIS Code:** 260 | | | | | | | | | | | | |

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019

**A. Mission Description and Budget Item Justification**

Projects EG2/EG3. GMLRS rockets are surface-to-surface artillery rockets fired from the Multiple Launch Rocket System (MLRS) and High Mobility Artillery Rocket System (HIMARS) launchers. GMLRS rockets provide 24/7, all-weather precision fires to engage both area and point targets at short, medium, and long ranges with a cluster compliant warhead.

The GMLRS Program consists of three variants: GMLRS Dual Purpose Improved Conventional Munition (DPICM) cluster munition to engage area or imprecisely located targets; GMLRS Unitary utilizes a 200 pound high explosive warhead to engage point targets with limited collateral damage; and GMLRS Alternative Warhead (AW) which has been developed as a non-cluster munition to replace GMLRS DPICM. GMLRS DPICM Production was terminated in response to the June 2008 Department of Defense (DoD) Cluster Munitions Policy. GMLRS Unitary is currently in full rate production. GMLRS AW entered full rate production in FY 2015. The GMLRS AW rocket is 90% common with the Unitary variant.

The GMLRS program will continue to leverage ongoing Science & Technology (S&T) efforts to extend range, increase survivability, and develop warhead technologies to meet DOD Cluster Munition Policy requirements. The Extended Range GMLRS variant will be a modification of the current production GMLRS and will be remain approximately 85% common with the current GMLRS. It will carry both the Unitary and AW warheads. It will extend the current GMLRS capability to 150 km and allow for potential future growth capability in the payload section.

The FY2019 dollars in the amount of $154.102 million will continue qualification of key rocket obsolescence upgrades (including the M-Code compliant NAVSTRIKEM upgrade); qualify a new rocket pod in support of future GMLRS production; and continue the design, qualification, and testing of an extended range variant of the GMLRS.

The United States (U.S.) Army has identified funding in FY2021-FY2023 for the technology transition, development and integration of an anti-radiation homing (ARH) future payload into the GMLRS.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 38.044 | 102.807 | 164.015 | - | 164.015 |
| Current President's Budget | 21.196 | 102.807 | 154.102 | - | 154.102 |
| Total Adjustments | -16.848 | 0.000 | -9.913 | - | -9.913 |
| • Congressional General Reductions | -0.011 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.837 | - | | | |
| • Adjustments to Budget Years | - | - | -9.913 | - | -9.913 |
| • Amended FY2017 not appropriated | -16.000 | - | - | - | - |

**Change Summary Explanation**

FY 2017 funding reflects an adjustment of $16.848 million. $16.000 million was requested in the Request for Additional FY17 Appropriations, but was not appropriated. The remaining $0.837 and $0.011 million was for Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) and FFRDC adjustments.

FY 2019 funding reflects a decrease of $9.913 million.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | Project (Number/Name)<br>EG3 / *Guided MLRS* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EG3: *Guided MLRS* | - | 21.196 | 102.807 | 154.102 | - | 154.102 | 121.028 | 39.799 | 40.380 | 1.993 | 0.000 | 481.305 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The United States (U.S.) Army continues to explore ways to enhance Guided Multiple Launch Rocket System (GMLRS) rockets and common components and to mitigate obsolescence issues under the Guided MLRS project code. The Army is requesting funding for the following GMLRS Research, Development, Test and Evaluation (RDT&E) activities: (1) evaluation of enhanced operational capabilities to provide more flexibility across the target set to include increased range, flight performance, and end-game optimization; (2) investigation of potential life cycle cost savings through obsolescence initiatives; (3) development of enhancements to the Multiple Launch Rocket System (MLRS) common test equipment; (4) evaluation and development of technologies to enhance overall product performance and survivability; and (5) Insensitive Munitions (IM) compliance.

The FY2019 dollars in the amount of $154.102 million will continue qualification of key rocket obsolescence upgrades (including the M-Code compliant NAVSTRIKE-M upgrade); qualify a new rocket pod in support of future GMLRS production; and continue the design, qualification, and testing of an extended range variant of the GMLRS.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Assess and improve GMLRS rockets. | 3.192 | 4.104 | 14.850 | - | 14.850 |
| ***Description:*** Funding is provided for the following effort<br><br>***FY 2018 Plans:***<br>Investigate and assess methods to increase range performance and rocket effectiveness. Evaluate rocket pod improvements, assess rocket reliability, and reduce collateral damage.<br><br>***FY 2019 Base Plans:***<br>Continue to assess methods to increase range performance and rocket effectiveness. Qualify the design of a new rocket pod to support future GMLRS production, assess rocket reliability, and reduce collateral damage.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding increase from FY18-19 is required to support increased testing effort to assess and improve GMLRS rockets. | | | | | |
| ***Title:*** Conduct qualification and testing for Insensitive Munitions (IM) Propulsion System (IMPS). | 11.105 | 8.757 | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | **Project (Number/Name)**<br>EG3 / *Guided MLRS* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** Funding is provided for the following effort<br><br>***FY 2018 Plans:***<br>Complete system ground/flight testing and Insensitive Munition Propulsion System (IMPS) qualification.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding decrease from FY18-19 is due to completion of IMPS qualification and testing effort. | | | | | |
| ***Title:*** Investigate obsolescence cost/cost reduction opportunities/second source suppliers/survivability.<br><br>***Description:*** Funding is provided for the following effort (The NAVSTRIKE GPS Receiver provides tightly coupled GPS/INS integration. Rockwell Collins has stopped producing the NAVSTRIKE 3.3).<br><br>***FY 2018 Plans:***<br>Design and qualification of M-Code compliant NAVSTRIKE-M upgrade. System level integration and qualification of side-mounted proximity sensor.<br><br>***FY 2019 Base Plans:***<br>Design and qualification of M-Code compliant NAVSTRIKE-M upgrade.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding increase from FY18-19 is required to support increased effort to investigate obsolescence and cost/cost reduction opportunities/second source suppliers/survivability. | 4.379 | 9.950 | 20.715 | - | 20.715 |
| ***Title:*** Conduct System Test and Evaluation activities.<br><br>***Description:*** Funding is provided for the following effort<br><br>***FY 2018 Plans:***<br>Ground/Flight testing of side-mounted proximity sensor.<br><br>***FY 2019 Base Plans:***<br>Ground and qualification tests of a new GMLRS rocket pod in support of current configuration and extended range variant GMLRS production. Begin component and system-level ground testing and complete initial system qualification flight tests for the extended range GMLRS variant.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | 2.520 | 2.590 | 19.709 | - | 19.709 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | **Project (Number/Name)**<br>EG3 / *Guided MLRS* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Funding increase from FY18-19 is required to support increased effort to conduct System Test and Evaluation activities. | | | | | |
| ***Title:*** Qualification and integration of the GMLRS extended range effort.<br>***Description:*** Funding is provided for the following effort<br>***FY 2018 Plans:***<br>Define system performance requirements, select component suppliers, conduct facilitization planning, conduct preliminary design review, and conduct a flight demonstration.<br>***FY 2019 Base Plans:***<br>Will conduct component and system-level design reviews and the system-level software design review. Will complete Cooperative Vulnerability Identification. Will conduct facilitation planning, and conduct a proof of concept flight demonstration.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding increase from FY18-19 is required to support increased effort to qualify and integrate the GMLRS extended range effort. | - | 77.406 | 98.828 | - | 98.828 |
| **Accomplishments/Planned Programs Subtotals** | 21.196 | 102.807 | 154.102 | - | 154.102 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • C64400: *Guided MLRS Rocket (GMLRS)* | 408.842 | 786.704 | 359.613 | 624.500 | 984.113 | 598.977 | 655.304 | 718.791 | 875.675 | Continuing | Continuing |
| • EG2: *GMLRS Alternative Warheads* | - | - | 0.000 | - | 0.000 | 11.566 | 14.529 | 24.409 | - | 0.000 | 50.504 |
| • C57701: *GMLRS MOD* | 0.395 | 0.531 | 0.266 | - | 0.266 | 15.394 | 52.714 | 100.958 | 69.154 | Continuing | Continuing |

**Remarks**

GMLRS Procurement funding includes C65404 and C65406.

**D. Acquisition Strategy**

Project EG3 is intended to support, investigate, and develop alternative material changes to improve the GMLRS family of munitions as they are identified by the material developer or combat developer. This project also supports IM activities to improve the overall posture of the system down to component level. Two Insensitive

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | **Project (Number/Name)**<br>EG3 / *Guided MLRS* |

Munition Propulsion Systems (Rocket Motor and Ignition Safety Device) suppliers will complete design and qualification, and the IMPS will be integrated into the GMLRS rocket. Design, development, and qualification of a side-mounted proximity sensor will provide a cost reduction initiative and improved area munition lethality. The GMLRS extended range effort is pursuing a strategy of modifying the current system in order to increase its range. It will be a 36 month development and qualification effort leveraging existing contract vehicles where practicable.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | **Project (Number/Name)**<br>EG3 / *Guided MLRS* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | MIPR | Various : RSA | 2.154 | 2.721 | Oct 2016 | 5.425 | Oct 2017 | 5.959 | Oct 2018 | - | | 5.959 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 2.154 | 2.721 | | 5.425 | | 5.959 | | - | | 5.959 | Continuing | Continuing | N/A |

**Remarks**

RSA-Redstone Arsenal, Alabama

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unitary Contracts/Multiple | SS/FPIF | LMMFCS : Dallas, TX | 17.285 | 4.850 | Jan 2017 | 8.629 | Jan 2018 | 29.606 | Jan 2019 | - | | 29.606 | Continuing | Continuing | Continuing |
| IM Qualification Contracts/ Multiple | C/FPIF | Orbital ATK, Aerojet Rocketdyne : Rocket Center, WV; Bristow, VA | 16.518 | 11.105 | Jan 2017 | 8.757 | Jan 2018 | - | | - | | - | 0.000 | 36.380 | - |
| GMLRS Extended Range | SS/TBD | TBD : TBD | - | - | | 77.406 | Jan 2018 | 98.828 | Jan 2019 | - | | 98.828 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 33.803 | 15.955 | | 94.792 | | 128.434 | | - | | 128.434 | Continuing | Continuing | N/A |

**Remarks**

SS/FPIF-Sole Source/Fixed-Price Incentive Firm; LMMFCS - Lockheed Martin Missile and Fire Control System; TX - Texas; C/FPIF - Competitive/Fixed-Price Incentive Firm; WV - West Virginia; VA - Virginia; TBD - To Be Determined

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support | MIPR | WSMR, : NM | 10.806 | 2.520 | Oct 2016 | 2.590 | Oct 2017 | 19.709 | Oct 2018 | - | | 19.709 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 10.806 | 2.520 | | 2.590 | | 19.709 | | - | | 19.709 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | Project (Number/Name)<br>EG3 / *Guided MLRS* | |

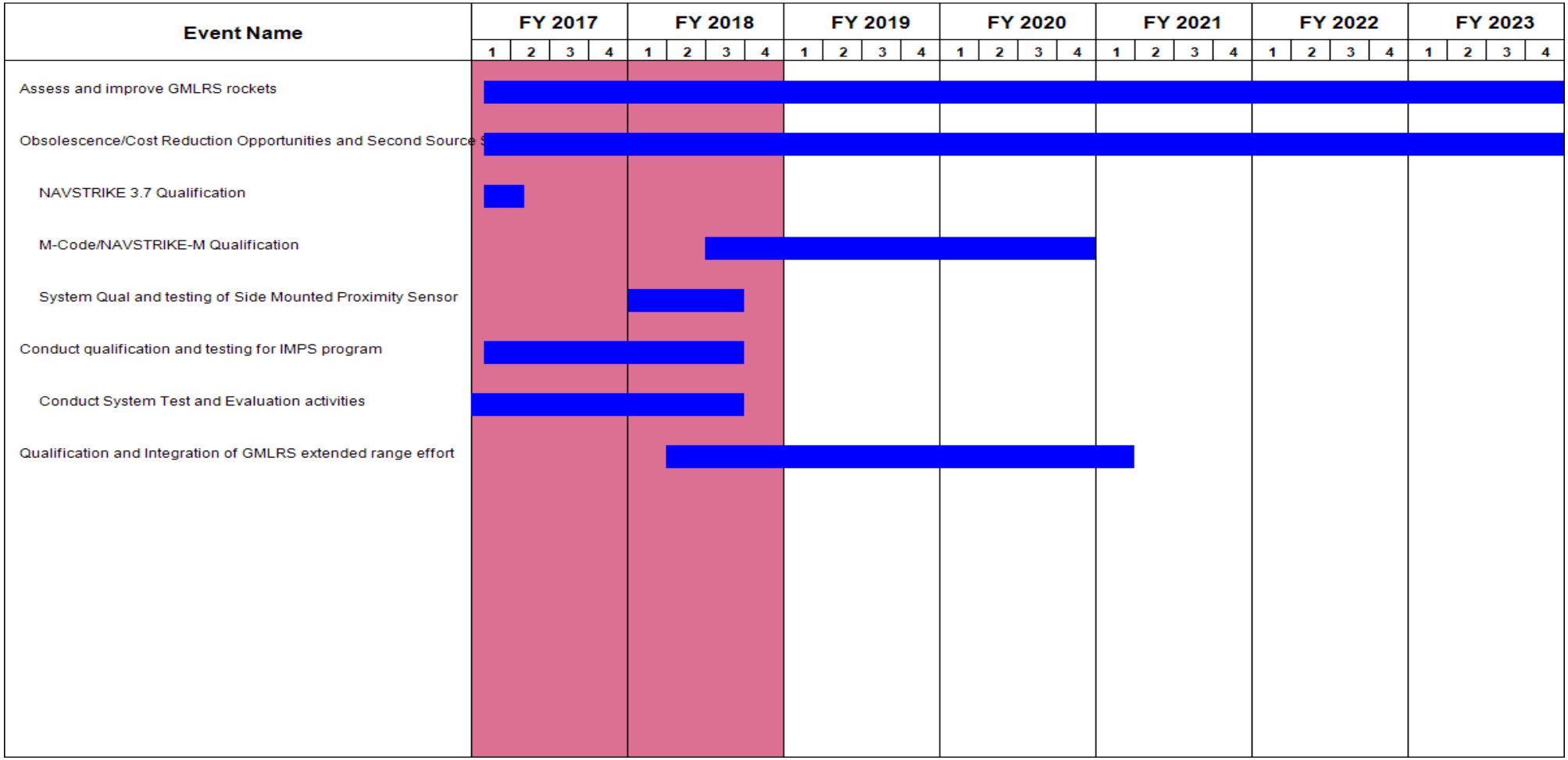
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | | | | | | | | | | | | | | | |
| WSMR, NM-White Sands Missile Range, New Mexico | | | | | | | | | | | | | | | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 46.763 | 21.196 | | 102.807 | | 154.102 | | - | | 154.102 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | **Project (Number/Name)**<br>EG3 / *Guided MLRS* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205778A / *Guided Multiple Launch Rocket System (GMLRS)* | **Project (Number/Name)**<br>EG3 / *Guided MLRS* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Assess and improve GMLRS rockets | 1 | 2015 | 4 | 2023 |
| Obsolescence/Cost Reduction Opportunities and Second Source Suppliers | 1 | 2015 | 4 | 2023 |
| NAVSTRIKE 3.7 Qualification | 1 | 2016 | 2 | 2017 |
| M-Code/NAVSTRIKE-M Qualification | 3 | 2018 | 4 | 2020 |
| System Qual and testing of Side Mounted Proximity Sensor | 1 | 2018 | 3 | 2018 |
| Conduct qualification and testing for IMPS program | 1 | 2015 | 3 | 2018 |
| Conduct System Test and Evaluation activities | 4 | 2015 | 3 | 2018 |
| Qualification and Integration of GMLRS extended range effort | 2 | 2018 | 1 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0208053A *I Joint Tactical Ground System* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 12.649 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.649 |
| 635: *Joint Tact Grd Station-P3I(MIP)* | - | 12.649 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.649 |

**Note**

FY 2018 and out funding moved from PE 0208053A to PE 1208053A as directed by OSD to better track Space Programs

**A. Mission Description and Budget Item Justification**

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity.

The JTAGS Program Element (PE) supports development and test to meet JTAGS ORD thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. JTAGS P3I Block II Phase 1 and Block II Phase 2 Spiral 1 efforts are included under PE 0208053A. JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 0208053A / *Joint Tactical Ground System* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 12.649 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 12.649 | 0.000 | 0.000 | - | 0.000 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0208053A / *Joint Tactical Ground System* | Project (Number/Name)<br>635 / *Joint Tact Grd Station-P3I(MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 635: *Joint Tact Grd Station-P3I(MIP)* | - | 12.649 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.649 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

FY 2018 and out funding moved from PE 0208053A to PE 1208053A as directed by OSD to better track Space Programs

**A. Mission Description and Budget Item Justification**

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity.

The JTAGS Program Element (PE) supports development and test to meet JTAGS ORD thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. JTAGS Block II Phase 1 and Block II Phase 2 Spiral 1 efforts are included under PE 0208053A. JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** JTAGS Test and Evaluation Support<br>***Description:*** Effort covered the Limited User Test for JTAGS Block II Phase 1 | 1.778 | - | - |
| ***Title:*** JTAGS P3I Block II Phase 2 Development<br>***Description:*** JTAGS Block II Phase 2 activities include a three spiral approach which will provide stereo SBIRS GEO starer sensor data and Net Centric capabilities, per JROC Memos 197-12 and 113-13. | 10.871 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0208053A / *Joint Tactical Ground System* | **Project (Number/Name)**<br>635 / *Joint Tact Grd Station-P3I(MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Accomplishments/Planned Programs Subtotals | 12.649 | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BZ8420: *JOINT TACTICAL GROUND STATION MODS (JTAGS)* | 4.417 | - | 5.434 | - | 5.434 | - | - | - | 6.393 | 0.000 | 16.244 |
| • 1208053A: *Joint Tactical Ground System* | - | 10.228 | 7.400 | - | 7.400 | 9.282 | 9.529 | 11.209 | 11.658 | 0.000 | 59.306 |

**Remarks**

**D. Acquisition Strategy**

Under this program element, critical improvements will be developed making maximum use of Non-Developmental Items (NDI)/Commercial Off-The-Shelf (COTS) components. After design and integration, the system will be subject to thorough developmental and validation/verification testing to verify performance, operational effectiveness and suitability. P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, improving warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2, is further divided into three spirals to facilitate delivering critical capabilities to the fielded units faster. JTAGS Block II Phase 1 and JTAGS Block II Phase 2 Spiral 1 efforts will be completed under PE 0208053A. JROC-Memos 197-12 and 113-13 direct fielding of JTAGS Block II capabilities as soon as possible.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0208053A / *Joint Tactical Ground System* | Project (Number/Name)<br>635 / *Joint Tact Grd Station-P3I(MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | Allot | MDSS Project Office : Redstone Arsenal, AL | 59.453 | 2.653 | Oct 2015 | - | | - | | - | | - | 0.000 | 62.106 | - |
| | | **Subtotal** | 59.453 | 2.653 | | - | | - | | - | | - | 0.000 | 62.106 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JTAGS Block I Engineering Services Hardware/Software | SS/CPFF | Northrop Grumman : Colorado Springs, CO | 39.882 | - | | - | | - | | - | | - | 0.000 | 39.882 | - |
| P3I Block II Phase 1 Development | SS/CPIF | Northrop Grumman : Colorado Springs, CO | 56.928 | - | | - | | - | | - | | - | 0.000 | 56.928 | 49.578 |
| P3I Block II Phase 2 Development | SS/CPIF | Northrop Grumman : Colorado Springs, CO | 18.500 | 6.907 | Dec 2016 | - | | - | | - | | - | 0.000 | 25.407 | - |
| Government Furnished Equipment | TBD | Various : Various | 1.510 | - | | - | | - | | - | | - | 0.000 | 1.510 | - |
| | | **Subtotal** | 116.820 | 6.907 | | - | | - | | - | | - | 0.000 | 123.727 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering Support | C/CPFF | Sigmatech, Inc : Huntsville Al | 32.325 | 1.311 | Feb 2017 | - | | - | | - | | - | 0.000 | 33.636 | - |
| | | **Subtotal** | 32.325 | 1.311 | | - | | - | | - | | - | 0.000 | 33.636 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0208053A / *Joint Tactical Ground System* | Project (Number/Name)<br>635 / *Joint Tact Grd Station-P3I(MIP)* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support (ATEC/JITC/ ETC) | Various | Various : Various | 11.116 | 1.778 | Oct 2016 | - | | - | | - | | - | 0.000 | 12.894 | - |
| | | **Subtotal** | 11.116 | 1.778 | | - | | - | | - | | - | 0.000 | 12.894 | N/A |

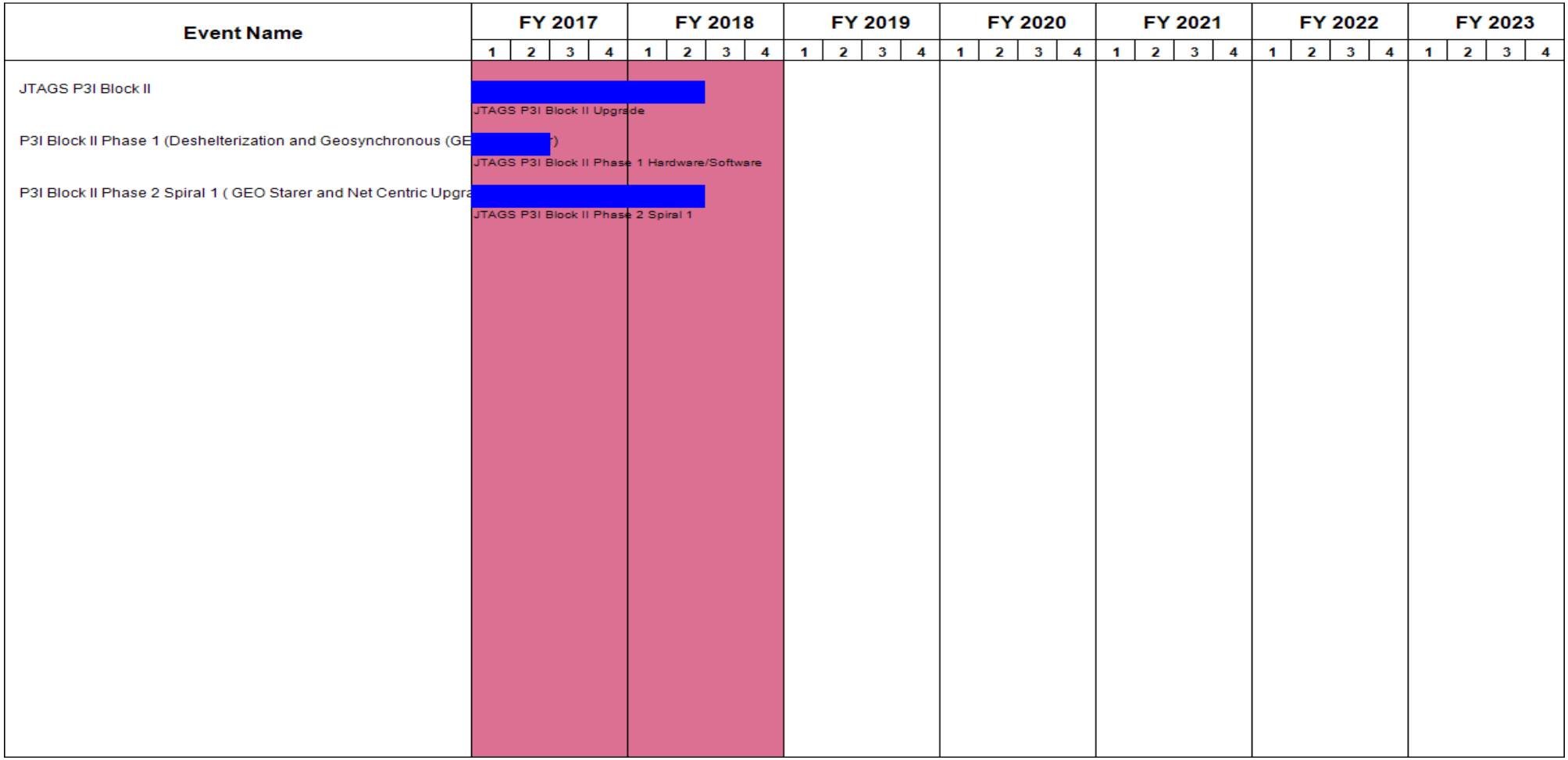
**Remarks**

N/A-Not Applicable

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 219.714 | 12.649 | | 0.000 | | - | | - | | - | 0.000 | 232.363 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0208053A / *Joint Tactical Ground System* | **Project (Number/Name)**<br>635 / *Joint Tact Grd Station-P3I(MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0208053A / *Joint Tactical Ground System* | **Project (Number/Name)**<br>635 / *Joint Tact Grd Station-P3I(MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| JTAGS P3I Block II | 3 | 2012 | 2 | 2018 |
| P3I Block II Phase 1 (Deshelterization and Geosynchronous (GEO) Scanner) | 4 | 2012 | 2 | 2017 |
| P3I Block II Phase 2 Spiral 1 ( GEO Starer and Net Centric Upgrade) | 4 | 2015 | 2 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303028A *I INTEL SPT TO FORCE XXI* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 15.719 | 13.807 | 12.280 | 23.199 | 35.479 | 14.024 | 14.764 | 14.636 | 14.889 | 0.000 | 123.318 |
| FG2: *Counterintelligence & Human Intel Modernization* | - | 0.000 | 1.825 | 2.264 | 0.799 | 3.063 | 1.779 | 2.280 | 1.779 | 1.778 | 0.000 | 12.504 |
| H13: *Information Dominance Center (IDC) - Tiara* | - | 15.719 | 11.982 | 10.016 | 22.400 | 32.416 | 12.245 | 12.484 | 12.857 | 13.111 | 0.000 | 110.814 |

**Note**

In FY 2019 $2.636 million for Counter Intel and Human Intel Modernization transfers from this line to 0606003 FI9.

**A. Mission Description and Budget Item Justification**

The U.S. Army Intelligence and Security Command's (INSCOM) RDTE program provides the Army with low-density, high-demand, extremely advanced offensive cyberspace technologies designed to degrade, deny, disrupt, or destroy adversary Command, Control, Communications, Computers and Intelligence (C4I) and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, National Security Presidential Directive (NSPD)-38, NSPD-54 and Homeland Security Presidential Directive (HSPD)-23.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 11.619 | 13.807 | 13.407 | - | 13.407 |
| Current President's Budget | 15.719 | 13.807 | 12.280 | 23.199 | 35.479 |
| Total Adjustments | 4.100 | 0.000 | -1.127 | 23.199 | 22.072 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | -1.127 | 23.199 | 22.072 |
| • RAA Appropriated | 4.100 | - | - | - | - |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303028A *I INTEL SPT TO FORCE XXI* |

**Change Summary Explanation**

FY 2017 base funding in the amount of $4.1 million was appropriated from the Request for Additional Appropriations (RAA).

FY 2019 base funding in the amount of $1.026 million was increased with the addition of Insider Threat CE Support and Identity Intelligence requirements.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | Project (Number/Name)<br>FG2 / *Counterintelligence & Human Intel Modernization* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FG2: *Counterintelligence & Human Intel Modernization* | - | 0.000 | 1.825 | 2.264 | 0.799 | 3.063 | 1.779 | 2.280 | 1.779 | 1.778 | 0.000 | 12.504 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

In FY 2019 $2.636 million for Counter Intel and Human Intel Modernization transfers from this line to 0606003 FI9.

**A. Mission Description and Budget Item Justification**

Details of this program are reported in accordance with Title 10, United States Code, Section 119,(a)(1).

This project provides the Army with a new capability to communicate near-real-time (NRT) updates from advanced sensors to elements in theater who can prosecute the adversary. This capability greatly enhances the ground commander's battlespace awareness by integrating additional Intelligence, Surveillance, and Reconnaissance (ISR) platforms with Army Mission Command Systems (MCS) during the find, fix, and finish process. The increased battlespace awareness contributes to more effective and efficient use of fire support platforms like artillery. NRT updates to the intelligence picture allows forces to rapidly tailor fire support plans to make better use of existing assets. Providing NRT updates aids weapon and ammunition selection decisions based on current enemy disposition. FY 2019 request includes $0.799 million for these activities in support of Operation Inherent Resolve for ISIL.

This capability supports operational gaps and supports documented Army requirements. This funding provides resources to complete integration efforts into Army MCS. Initial integration testing is complete and shows the ability to produce the desired end state of passing intelligence data to the end user. Development efforts include interface refinement and measurement of message latency under a variety of realistic environments, which culminates in participation in live fire events. During the ongoing development of this capability, the project will receive and respond to feedback from the warfighter to ensure that the capability meets the warfighter's needs.

HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel.

The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Project supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat the foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions. Funding will transfer to 0606003 FI9 Counter Intel and Human Intel Modernization in FY 2019.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>FG2 / *Counterintelligence & Human Intel Modernization* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Classified<br>***Description:*** Classified<br>***FY 2019 Base Plans:***<br>Not Applicable<br>***FY 2019 OCO Plans:***<br>Refines existing messaging framework and test the concept beyond the lab through integration in warfighter exercises. Publishes tactics, techniques, and procedures for utilization. Educates the intelligence and maneuver communities on the capability and enhance the capability based on warfighter input.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 OCO funding to support MIP-GEOINT Enterprise TPED Service. | - | - | 0.000 | 0.799 | 0.799 |
| ***Title:*** Insider Threat CE Support<br>***Description:*** HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel.<br>***FY 2019 Base Plans:***<br>Funding supports personnel security- related capabilities for identifying, reporting and responding to potential personnel security information of concern. These tools are key enablers of the Army Insider Threat Program. These tools provide statistical models to assess risk, centralized analysis, reporting and response capabilities, and reporting mechanisms for relevant insider threat data.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>New effort in FY19. | - | - | 1.800 | - | 1.800 |
| ***Title:*** Identity Intelligence<br>***Description:*** RDT&E funding supports the development of new software code and associated testing necessary to update an instance of the Identity Intelligence Repository (I2AR) -the unique software-based analytic production system used by intelligence analysts and the National Ground Intelligence Center (NGIC) specifically to create the Biometric Enabled Watchlist for worldwide missions. | - | - | 0.464 | - | 0.464 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>FG2 / *Counterintelligence & Human Intel Modernization* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***FY 2019 Base Plans:***<br>The developed updates will provide capable to facilitate automated information exchange with complimentary DoD and Intelligence Community programs resident on the IC ITE C2S cloud to facilitate automated linkage of information and intelligence to persons of interest. Specific efforts include the development of Extensible Markup Language (XML) that supports transactional interface between exploitation system, data repositories and, analytic tools.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>New effort in FY19. | | | | | |
| ***Title:*** Counterintelligence Activities<br>***Description:*** The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Project supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat the foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions.<br>***FY 2018 Plans:***<br>Funding supports development & testing of software code integrating existing and new algorithms to analyze multiple data source to record, identify, sort, and prioritize behaviors indicative of espionage, national security compromises, and other foreign and insider threats. The new, more capable software sets will facility counterintelligence analysis, insider threat detection, counterintelligence investigative focus, and automated exchange and display of critical counterintelligence information.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Effort concludes in FY18. | - | 1.825 | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | - | 1.825 | 2.264 | 0.799 | 3.063 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>FG2 / *Counterintelligence & Human Intel Modernization* |

**D. Acquisition Strategy**

Classified

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>FG2 / *Counterintelligence & Human Intel Modernization* |

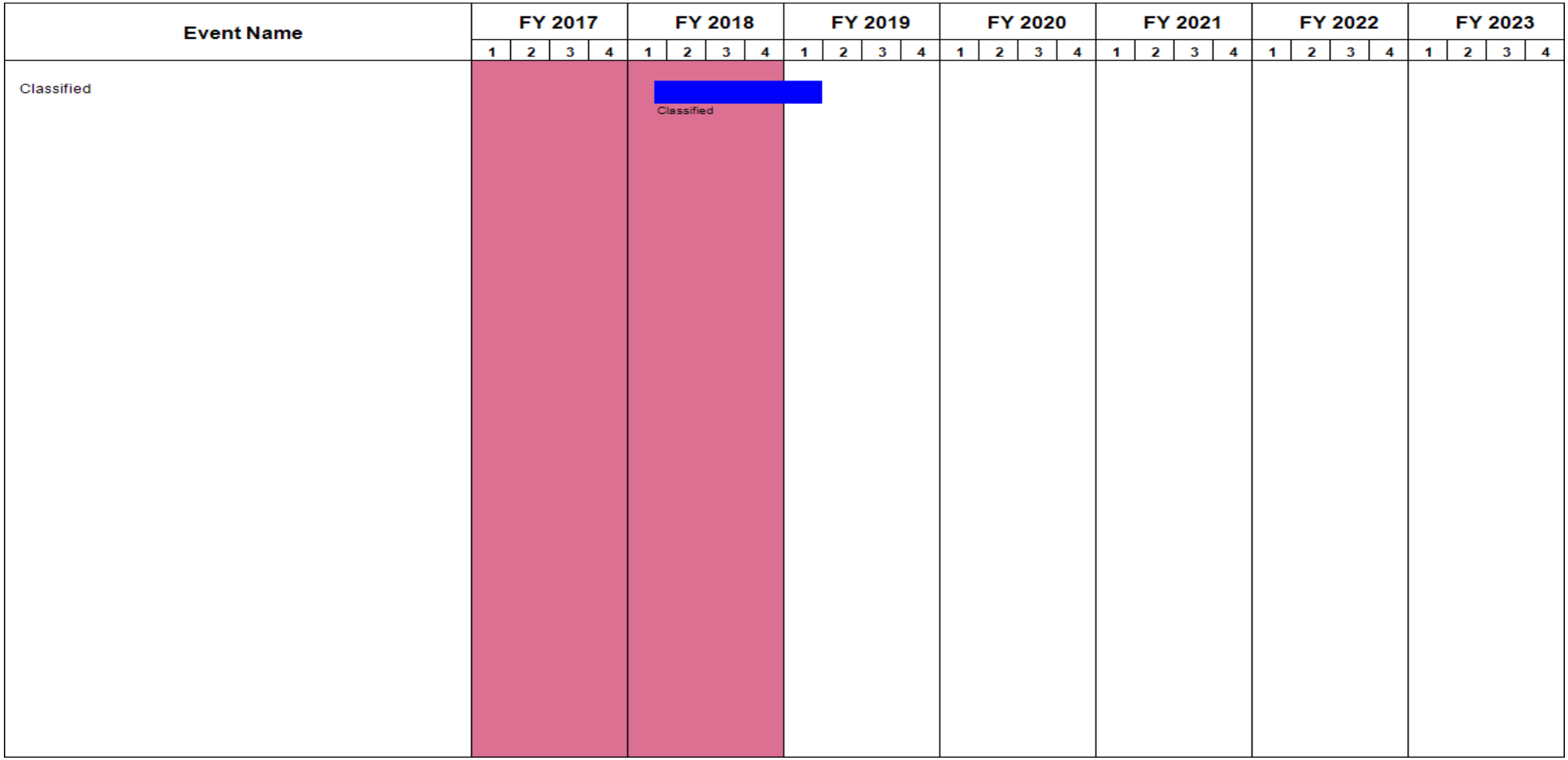
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classified | Various | To Be Determined : To Be Determined | - | - | | 1.825 | | 0.000 | | 0.799 | | 0.799 | 0.000 | 2.624 | - |
| Insider Threat CE Support | TBD | To Be Determined : To Be Determined | - | - | | - | | 0.828 | | - | | 0.828 | 0.000 | 0.828 | - |
| Identity Intelligence | TBD | To Be Determined : To Be Determined | - | - | | - | | 0.224 | | - | | 0.224 | 0.000 | 0.224 | - |
| Counterintelligence Activities | TBD | To Be Determined : To Be Determined | - | - | | - | | 1.212 | | - | | 1.212 | 0.000 | 1.212 | - |
| | | **Subtotal** | - | - | | 1.825 | | 2.264 | | 0.799 | | 3.063 | 0.000 | 4.888 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 1.825 | | 2.264 | | 0.799 | | 3.063 | 0.000 | 4.888 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>FG2 / *Counterintelligence & Human Intel Modernization* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>FG2 / *Counterintelligence & Human Intel Modernization* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Classified | 1 | 2018 | 1 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | Project (Number/Name)<br>H13 / *Information Dominance Center (IDC) - Tiara* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H13: *Information Dominance Center (IDC) - Tiara* | - | 15.719 | 11.982 | 10.016 | 22.400 | 32.416 | 12.245 | 12.484 | 12.857 | 13.111 | 0.000 | 110.814 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

In FY 2019 $2.636 million for Counter Intel and Human Intel Modernization transfers from this line to 0606003 FI9.

**A. Mission Description and Budget Item Justification**

INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced offensive cyberspace technologies designed to degrade, deny, disrupt, or destroy adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, NSPD-38, NSPD-54 and HSPD-23. FY 2019 request includes $22.4 million for these activities in support of Operation Inherent Resolve for ISIL.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Cyberspace technologies | 15.719 | 11.982 | 10.016 | 22.400 | 32.416 |
| ***Description:*** INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced offensive cyberspace technologies designed to degrade, deny, disrupt, or destroy adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. | | | | | |
| ***FY 2018 Plans:***<br>Continue to develop and support leading-edge Cyberspace technologies designed to exploit, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>H13 / *Information Dominance Center (IDC) - Tiara* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept.<br>***FY 2019 Base Plans:***<br>Continue to develop and support leading-edge Cyberspace technologies designed to exploit, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept.<br>***FY 2019 OCO Plans:***<br>Continue to develop and support leading-edge Cyberspace technologies designed to exploit, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Economic adjustment. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 15.719 | 11.982 | 10.016 | 22.400 | 32.416 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

classified

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>H13 / *Information Dominance Center (IDC) - Tiara* |

**E. Performance Metrics**

classified

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | Project (Number/Name)<br>H13 / *Information Dominance Center (IDC) - Tiara* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobile Objects/ PHAEDRUS | C/Various | Multiple : Multiple | - | 4.100 | | - | | - | | - | | - | 0.000 | 4.100 | - |
| | | **Subtotal** | - | 4.100 | | - | | - | | - | | - | 0.000 | 4.100 | N/A |

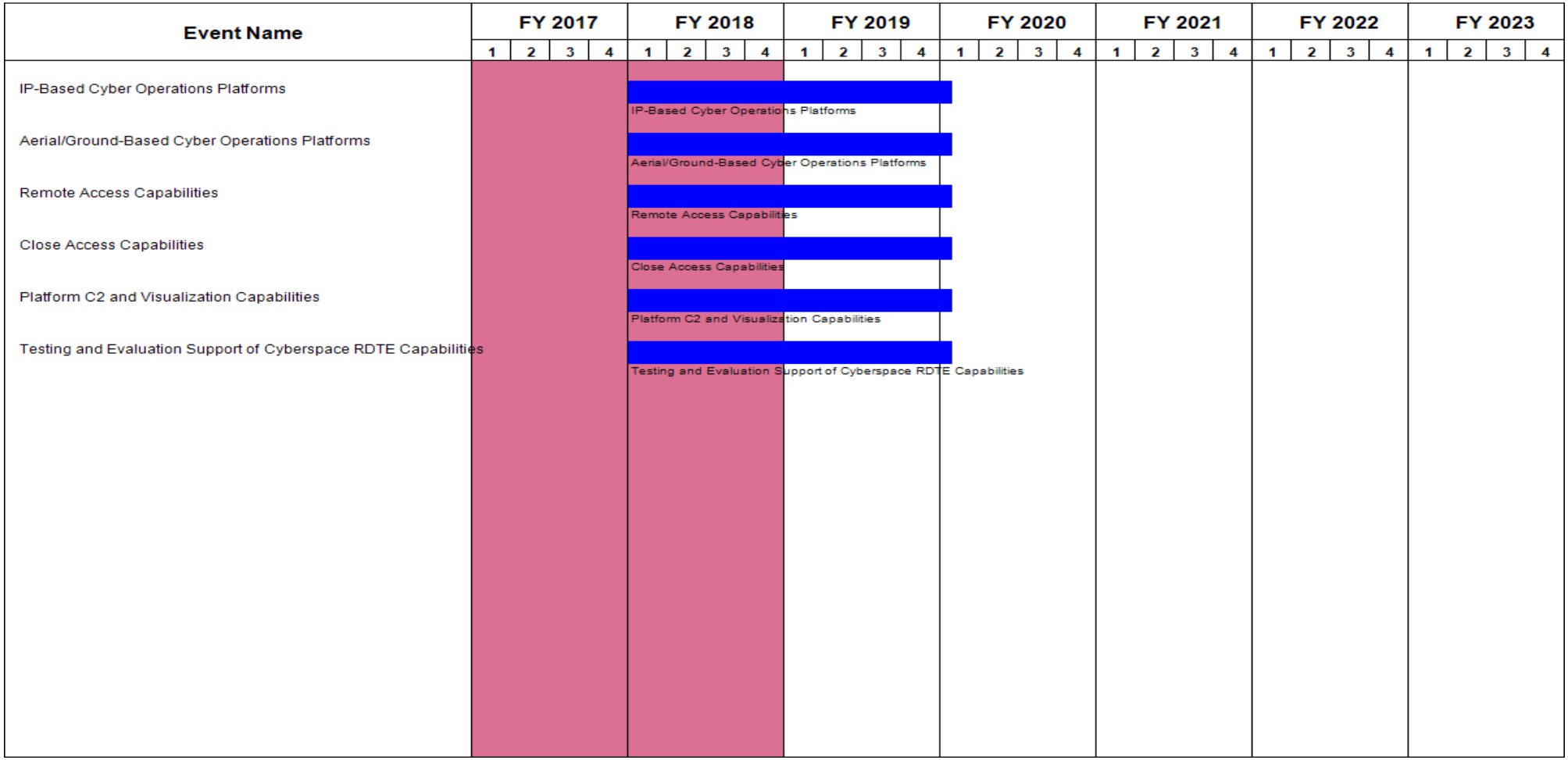
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CYBER PLATFORM/ WEAPONS DEVELOPMENT | Various | TBD : TBD | 60.159 | 11.619 | | 11.982 | | 10.016 | | 22.400 | | 32.416 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 60.159 | 11.619 | | 11.982 | | 10.016 | | 22.400 | | 32.416 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 60.159 | 15.719 | | 11.982 | | 10.016 | | 22.400 | | 32.416 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>H13 / *Information Dominance Center (IDC) - Tiara* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303028A / *INTEL SPT TO FORCE XXI* | **Project (Number/Name)**<br>H13 / *Information Dominance Center (IDC) - Tiara* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| IP-Based Cyber Operations Platforms | 1 | 2018 | 1 | 2020 |
| Aerial/Ground-Based Cyber Operations Platforms | 1 | 2018 | 1 | 2020 |
| Remote Access Capabilities | 1 | 2018 | 1 | 2020 |
| Close Access Capabilities | 1 | 2018 | 1 | 2020 |
| Platform C2 and Visualization Capabilities | 1 | 2018 | 1 | 2020 |
| Testing and Evaluation Support of Cyberspace RDTE Capabilities | 1 | 2018 | 1 | 2020 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303140A *I Communications Security (COMSEC) Equipment* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 36.892 | 132.438 | 68.533 | - | 68.533 | 54.714 | 24.486 | 23.236 | 22.267 | 0.000 | 362.566 |
| 491: *Information Assurance Development* | - | 7.145 | 10.194 | 10.172 | - | 10.172 | 10.668 | 11.317 | 10.104 | 10.245 | 0.000 | 69.845 |
| DV4: *Key Management Infrastructure (KMI)* | - | 4.518 | 4.696 | 2.702 | - | 2.702 | 3.265 | 3.543 | 3.415 | 0.000 | 0.000 | 22.139 |
| DV5: *Crypto Modernization (Crypto Mod)* | - | 20.820 | 27.047 | 25.831 | - | 25.831 | 24.824 | 8.580 | 8.646 | 10.936 | 0.000 | 126.684 |
| ET9: *Embedded Crypto Modernization (CRYPTO MOD)* | - | 4.409 | 88.949 | 28.857 | - | 28.857 | 14.974 | 0.000 | 0.000 | 0.000 | 0.000 | 137.189 |
| FF8: *Unit Activity Monitoring (UAM)* | - | 0.000 | 1.552 | 0.971 | - | 0.971 | 0.983 | 1.046 | 1.071 | 1.086 | 0.000 | 6.709 |

**A. Mission Description and Budget Item Justification**

Information Assurance Development supports the implementation of the National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army by providing COMSEC system capabilities through encryption, trusted software or standard operating procedures, and integrating these mechanisms into specific systems in support of securing the Army Tactical and Enterprise Networks. This entails architecture studies, system integration and testing, developing installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates Cyber Security (CS)/COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camp and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan.

Information Assurance Development funding implements and establishes functional and technical boundaries of cryptographic, key management and Information Assurance (IA) capabilities in coordination with the NSA, the Defense Information Systems Agency (DISA), and Joint Services, to secure National Security Systems (NSS), and National Security Information (NSI). Technical evaluations assess the security, operational effectiveness and network interoperability of advanced concept technologies to develop policies, standards, and fundamental building blocks for Army COMSEC capabilities that reduce the risk of future material solutions that could underperform and disrupt classified operations. Develop and publish the COMSEC Implementation Planning Guidance to identify, standardize, and govern the insertion of CS capabilities to bridge operational gaps and support the Department of Defense (DoD) and NSA mandated requirements to enhance network capacity while providing for secure information exchange of voice, video, and data in accordance with the Army Network Campaign Plan. This will be accomplished by interoperability evaluation, standards testing, and CS, System of System Network Vulnerability Assessments (SoS NVA) for Army Capability Sets for CS/COMSEC capabilities that provide protections for tactical and fixed infrastructure post, camp, and station networks.

The Defensive Cyberspace Operations (DCO) program provides initial capabilities that enable passive and active cyberspace defense operations to preserve friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems. Big Data Pilot provides an advanced analytics capability

capable of ingesting structured, semi-structured, and unstructured data from multiple data sources (e.g., Joint Regional Security Stacks (JRSS), intrusion detection systems, intrusion prevention systems, network device log files, trouble tickets, firewalls, proxies, web and applications server log files, etc) and proves situational awareness of cyberspace battlefield. It provides the computer network defense provider with common analytic platform which informs and reduces risk associated with future material solutions and forms a blueprint for future Big Data Analytics. Big Data (analysis-of-all DoD Information Network sensor data) provides two optimized and accredited clusters deployed in support of JRSS and Defense Research and Engineering Network (DREN) with a tools suite accessible to Cyber Mission Forces via secure remote access. The Army's DCO activities are a construct of active cyberspace defenses which provide synchronized, real-time capability to discover, detect, analyze, and mitigate threats to and vulnerability of DoD networks and systems.

The Army Key Management Infrastructure (AKMI) is the Army's implementation of the NSA KMI ACAT IAM program, automating the functions of COMSEC electronic key management, control, planning, and distribution. AKMI supports the Army's ability to communicate and distribute Cryptographic data on the Army's tactical and strategic networks by limiting adversarial access to, and reducing the vulnerability of, Army Command, Control, Communications, Computers, Intelligence (C4I) systems. The AKMI System of Systems (SoS) systems components are the Management Client (MGC), Automated Communications Engineering Software (ACES) and Next Generation Load Device Family of fill devices. The NSA Key Management Infrastructure (KMI) Program replaced NSA EKMS program. AKMI has replaced Army Key Management System. The transition from AKMS to AKMI started in FY12. The AKMS System of Systems (SoS) systems components are the Local COMSEC Management Software (LCMS), Automated Communications Engineering Software (ACES) and Simple Key Loader (SKL).

The Army COMSEC program supports using NSA developed COMSEC technologies within the Army providing encryption, trusted software, or standard operating procedures, and integrating these mechanisms into specified systems in support of securing the Army network (which is made up of tactical and enterprise networks). This entails architecture studies, system integration and testing, developing installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates emerging COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camp, and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan.

Embedded Cryptographic Modernization Initiative (ECMI) is an upgrade activity that will ensure Army radios remain secure by operating with modern cryptographic algorithms. Tactical radios using legacy embedded cryptographic systems will no longer be able to communicate securely after cease key dates documented in the Chairman of the Joint Chiefs Staff instruction (CJCSI) 6510. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army tactical radios are required to support modern cryptographic capabilities by implementing modern algorithms. If cease key dates are not met, the Army will be forced to communicate at risk.

User activity monitoring (UAM) automation/analytics will provide technical capability to enhance Army UAM analysis effectiveness and efficiency. The UAM mission is to observe and record the actions and activities of an individual, at any time, on any device accessing Army information on classified networks in order to detect insider threats and to support authorized investigations. Army UAM is a component of the Army Insider Threat (InT) Program. Army's InT Program and UAM are conducted in accordance with the National Defense Authorization Act for Fiscal Year 2012, section 922., Insider Threat Detection; Presidential Memorandum, National Insider Threat Policy and Minimum Standards for Executive Branch Insider Threat Programs, dated 21 November 2012; Executive Order 13587, Structural Reforms to Improve the Security of Classified Networks and the Responsible Sharing and Safeguarding of Classified Information, (Reference b) dated 7 October 2011, and Army Directive 2013-18 (Army Insider Threat Program), 31 July 2013. Innovative enhancements are required to improve UAM analysis productivity, data visualization, and workflow

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303140A *I Communications Security (COMSEC) Equipment* |

management. The analysis productivity objective is to develop and implement user behavior models that use UAM and other network data to identify anomalous user behavior over time, and to integrated new data sources into the UAM analytical data store and processing system. Data visualization advances will present UAM analysts behavior model processing results in an intuitive format that reduce the time required to review the results. Workflow management improvements will add new capabilities to the UAM workflow management system with the objective of enhancing analysis reporting productivity and metrics collection.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 38.280 | 132.438 | 90.008 | - | 90.008 |
| Current President's Budget | 36.892 | 132.438 | 68.533 | - | 68.533 |
| Total Adjustments | -1.388 | 0.000 | -21.475 | - | -21.475 |
| • Congressional General Reductions | -0.017 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.371 | - | | | |
| • Adjustments to Budget Years | - | - | -21.475 | - | -21.475 |

**Change Summary Explanation**

FY 2017 decrease of $1.388 million for FFRDC and SBIR/STTR adjustments.

FY 2019 decrease of $21.475 million based on requirement adjustments.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>491 / *Information Assurance Development* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 491: *Information Assurance Development* | - | 7.145 | 10.194 | 10.172 | - | 10.172 | 10.668 | 11.317 | 10.104 | 10.245 | 0.000 | 69.845 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

PE 0303140A, project 491 includes funding for the Army CIO/G6, Project Lead (PL) Network Enablers (Net E), and Project Lead (PL) Enterprise Services (ES).

**A. Mission Description and Budget Item Justification**

This program supports the implementation of National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army by providing COMSEC system capabilities through encryption, trusted software, or standard operating procedures; integrating these mechanisms into specified systems in support of securing the Army Tactical and Enterprise Network.

This entails architecture studies, system integration and testing, developing, installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates Cyber Security (CS)/COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camps and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization Strategy Plan.

Implement, establish functional and technical boundaries of cryptographic, key management and Information Assurance (IA) capabilities In Coordination With (ICW) the NSA, the Defense Information Systems Agency (DISA), and Joint Services, to secure National Security Systems (NSS), and National Security Information (NSI). Technical evaluations assess the security, operational effectiveness and network interoperability of advanced concept technologies to develop policies, standards, and fundamental building blocks for Army COMSEC capabilities that reduce the risk of future materiel solutions that could underperform and disrupt classified operations.

Develop and publish the COMSEC Implementation Planning Guidance to identify, standardize, and govern the insertion of IA capabilities that will bridge operational gaps and support the DoD and NSA mandated requirements to enhance network capacity while providing secure information exchange of voice, video, and data IAW the Army Network Campaign Plan. This will be accomplished by interoperability evaluation, standards testing, and CS System of System Network Vulnerability Assessments (SoS NVA) Army Capability Sets for CS/COMSEC capabilities that provide protections for the tactical and fixed infrastructure post, camps, and station networks.

The Defensive Cyberspace Operations (DCO) program provides initial capabilities that enable passive and active cyberspace defense operations to preserve friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems. Big Data Pilot provides an advanced analytics capability capable of ingesting structured, semi-structured, and unstructured data from multiple data sources (e.g., Joint Regional Security Stacks (JRSS), intrusion detection systems, intrusion prevention systems, network device log files, trouble tickets, firewalls, proxies, web and applications server log files, etc) and provides situational awareness of the cyberspace battlefield. It provides the computer network defense provider with a common analytic platform which informs and reduces risk associated with future material solutions and forms a blueprint for future Big Data Analytics. Big Data (analysis-of-all DoD Information Network sensor data) provides two optimized

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>491 / *Information Assurance Development* |

and accredited clusters deployed in support of JRSS and Defense Research and Engineering Network (DREN) with a tools suite accessible to Cyber Mission Forces via secure remote access. The Army's DCO activities are a construct of active cyberspace defenses which provide synchronized, real-time capability to discover, detect, analyze, and mitigate threats to and vulnerability of DoD networks and systems.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Assessing emerging COMSEC hardware and software systems and products (PL Net E)<br><br>***Description:*** Conduct research and analyses as well as basic testing for meeting specific focused goals that will enhance the functions and support of cryptographic systems improving the security and usability of the Army tactical and enterprise networks. (PL Net E)<br><br>***FY 2018 Plans:***<br>As the Army implements new network technology, Secure Voice (SV) and In-line Network Encryption (INE) devices must continue to be identified and tested for effectiveness and suitability. Key areas of investigation include cyber security, interoperability, and standards compliance. (PL Net E)<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>No funding allocated in FY19 and outyears | 1.170 | 1.466 | - | - | - |
| ***Title:*** Oversight and implementation guidance of emerging Cryptographic and CS capabilities to ensure interoperability to maintain compliance with DoD, NSA, and Army policies and regulations. (CIO/G6)<br><br>***Description:*** The program provides oversight and guidance for technical research and evaluation of Cryptographic Modernization (CM) and Key Management (KM) capabilities to ensure IA compliance and interoperability. This effort improves operational effectiveness, ensures efficient implementation, and enhances network performance by deploying standardized COMSEC capabilities that are interoperable and supportable in Army, coalition and Joint operating environments. This program enables the Army to collaborate and participate in Joint and Army Capability Technology Demonstrations to define, improve, develop and publish Cyber Security (CS) standards for new/modernized technology insertion to support the LWN 2025 and Beyond. This effort assesses and defines risk mitigation of CS network vulnerabilities in end-to-end Army network operations and Common Operating Environment. (CIO/G6)<br><br>***FY 2018 Plans:***<br>Oversee execution of the Army's COMSEC Modernization initiative by identifying and developing new security baseline for implementation of Army CM and KM initiatives. Assess, review and validate Army operational needs. Test and evaluate CM and KM technologies to determine the maturity and viability for Army use to protect and strengthen the Network posture. Identify fundamental building blocks for IA solutions, perform risk | 5.975 | 8.728 | 10.172 | - | 10.172 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>491 / *Information Assurance Development* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| reduction testing of commercial products prior to insertion into Army for use to increase operational availability with documented operational value and rapid integration. Collaborate with the NSA, DoD and Joint Staff to define new ACC standards (security and interoperability) for the tactical and operational environment. Provide continuous test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Participate in operational assessment of NSA, DoD, Joint Staff and Service led Joint Capability Technology Demonstrations to align new technologies to documented Army and Service capability gaps for protecting National Security Systems and National Information. Develop strategies and policies that leverage emerging cryptographic and key management tools and services. (CIO/G6)<br>***FY 2019 Base Plans:***<br>Oversee executions of the Army's COMSEC Modernization initiatives. Identify and develop new security baseline for Army implementation in the areas of CM and KM. Develop end-to-end, tactical-to-strategic COMSEC standardization to meet Army?s operational needs and requirements. Test and evaluate CM and KM technologies to determine the maturity and viability for Army use to protect and strengthen the Army Network posture. Document new fundamental building blocks for IA solutions, perform risk reduction testing of commercial products prior to insertion into Army for use to increase operational availability with documented operational value and rapid integration. Collaborate with the NSA, DoD and Joint Staff to continue to define the second phase of ACC standards (security and interoperability) for the tactical and operational environment. Provide timely test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Participate in operational assessment of NSA, DoD, Joint Staff and Service led Joint Capability Technology Demonstrations to align new technologies to documented Army and Service capability gaps and requirements for protecting National Security Systems and National Security Information. Develop strategies and policies to posture Army?s operations to implement innovative cryptographic and key management tools and services.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Economic adjustment. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 7.145 | 10.194 | 10.172 | - | 10.172 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • DV5: *Crypto Modernization* | 20.820 | 27.047 | 25.831 | - | 25.831 | 24.824 | 8.580 | 8.646 | 10.936 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>491 / *Information Assurance Development* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • ET9: *Embedded Crypto Modernization* | 4.409 | 88.949 | 28.857 | - | 28.857 | 14.974 | - | - | - | 0.000 | 137.189 |
| • B96002: *Cryptographic Systems* | 66.692 | 49.441 | 49.107 | 0.003 | 49.110 | 104.421 | 106.898 | 103.106 | 109.001 | Continuing | Continuing |
| • B96006: *Embedded Cryptographic Modernization* | 3.014 | - | 3.520 | - | 3.520 | 97.959 | 157.904 | 48.382 | 5.013 | Continuing | Continuing |
| • BS9716: *NON PEO-SPARES* | 2.545 | 3.135 | 3.131 | - | 3.131 | 4.857 | 4.901 | 4.939 | 4.940 | Continuing | Continuing |

**Remarks**

Line Item and Title:
DV5 - Crypto Modernization - RDTE
ET9 - Embedded Crypto Modernization - RDTE
B96002 - Cryptographic Systems - OPA2
B96006 - Embedded Cryptographic Modernization - OPA2
BS9716 - NON PEO-SPARES - OPA4

**D. Acquisition Strategy**

The objective of the Cryptographic Systems program is to provide adaptive, flexible, and programmable cryptographic solutions using best practices, lessons learned and programmatic management to meet the challenge of modernizing the Army's aging cryptographic systems. Associated documents include CDD, approved by CIO/G6, 15 Jul 10; ICD, approved by JROC, 25 Mar 11; AAO; approved by G3, 15 Dec 11 and revised and approved, 19 Jun 15.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>491 / *Information Assurance Development* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System Engineering (PL Net E) | SS/LH | CECOM RDEC : CECOM RDEC APG, MD | 79.147 | 1.170 | | 1.466 | | - | | - | | - | 0.000 | 81.783 | - |
| Big Data Pilot (PL ES-CYBER) | TBD | TBD : FT BELVOIR, VA | 9.725 | - | | - | | - | | - | | - | 0.000 | 9.725 | - |
| Information Assurance System Engineering Support (PL Net E) | C/FFP | DSCI Consulting : APG, MD | 7.106 | - | | - | | - | | - | | - | 0.000 | 7.106 | - |
| Engineering Support (PL Net E) | C/CPFF | CACI : APG, MD | 5.018 | - | | - | | - | | - | | - | 0.000 | 5.018 | - |
| Engineering Support (PL Net E) | C/CPFF | Booz Allen Hamilton : APG, MD | 3.408 | - | | - | | - | | - | | - | 0.000 | 3.408 | - |
| Engineering Support (PL Net E) | C/FP | CSC : APG, MD | 16.448 | - | | - | | - | | - | | - | 0.000 | 16.448 | - |
| | | **Subtotal** | 120.852 | 1.170 | | 1.466 | | - | | - | | - | 0.000 | 123.488 | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support (PL Net E) | C/CPFF | TBD : TBD | 1.598 | - | | - | | - | | - | | - | 0.000 | 1.598 | - |
| Engineering Support (CIO/G-6) | C/FP | CACI : APG, MD | 5.124 | 1.309 | | 2.196 | | 2.496 | | - | | 2.496 | Continuing | Continuing | - |
| System Engineering (CIO/G-6) | SS/LH | CECOM RDEC : APG, MD | 3.771 | 1.086 | | 1.496 | | 2.196 | | - | | 2.196 | Continuing | Continuing | - |
| Engineering Support (CIO/G-6) | C/CPFF | Booz Allen Hamilton : APG, MD | 6.188 | 1.261 | | 1.737 | | 1.897 | | - | | 1.897 | Continuing | Continuing | - |
| Engineering Support (CIO/G-6) | C/FFP | AASKI : Edgewood, MD | 2.111 | 1.316 | | 1.813 | | 2.372 | | - | | 2.372 | Continuing | Continuing | - |
| Service (CIO-G-6) | SS/LH | ARL/SLAD : White Sand Missile Range (WSMR) | 4.969 | 1.003 | | 1.486 | | 1.211 | | - | | 1.211 | Continuing | Continuing | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>491 / *Information Assurance Development* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Subtotal** | 23.761 | 5.975 | | 8.728 | | 10.172 | | - | | 10.172 | Continuing | Continuing | N/A |

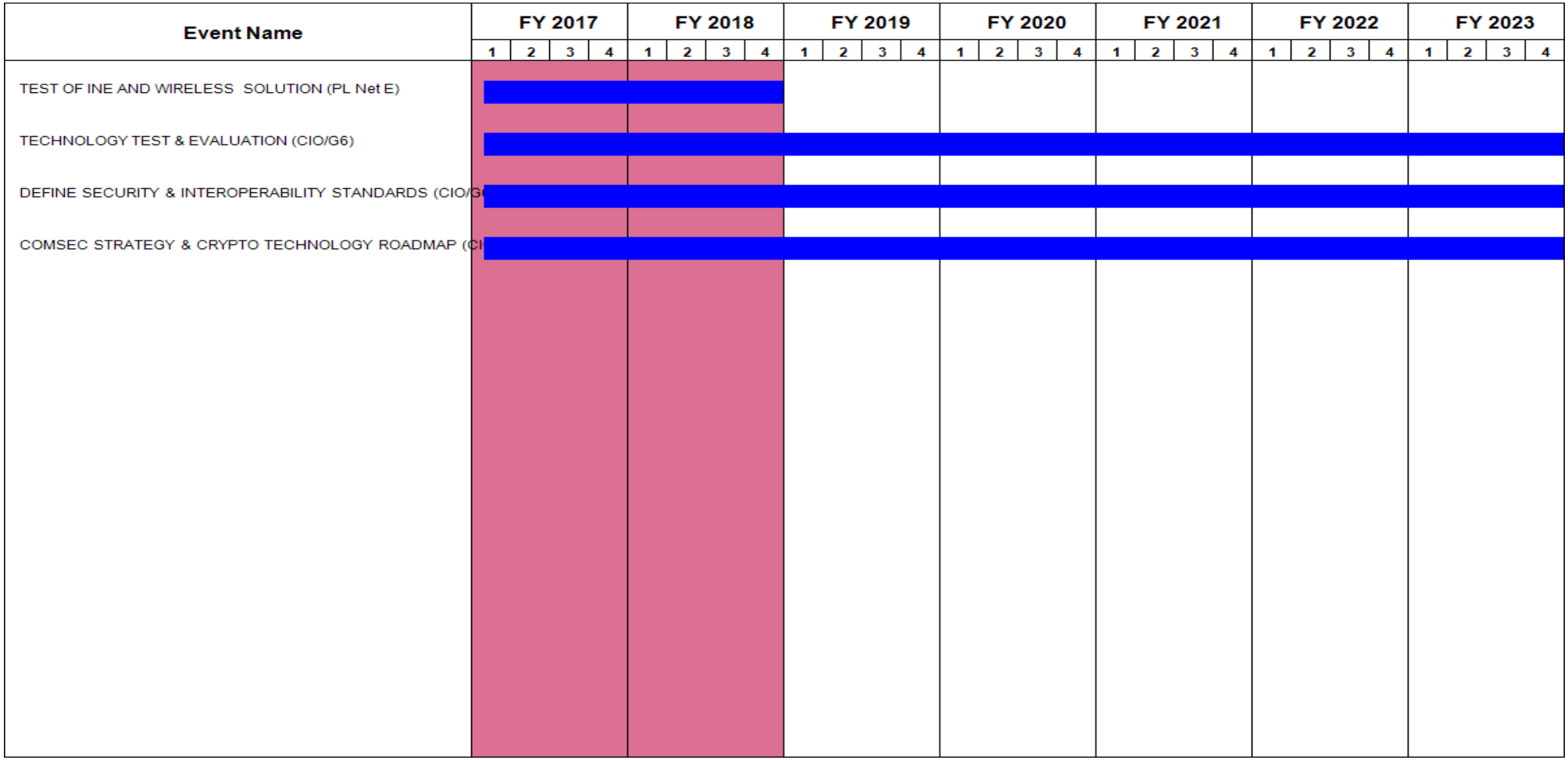
**Remarks**

Not Applicable

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 144.613 | 7.145 | | 10.194 | | 10.172 | | - | | 10.172 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>491 / *Information Assurance Development* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>491 / *Information Assurance Development* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| TEST & EVALUATION OF CRYPTOGRAPHIC SYSTEMS (PL Net E) | 1 | 2014 | 4 | 2014 |
| STUDY OF CURRENT AND EMERGING CRYPTO ALGORITHMS AND TECHNOLOGIES (PL Net E) | 1 | 2015 | 2 | 2015 |
| TEST OF INE AND WIRELESS SOLUTION (PL Net E) | 1 | 2016 | 4 | 2018 |
| BIG DATA PILOT (PD ES-CYBER) | 1 | 2016 | 4 | 2016 |
| TECHNOLOGY TEST & EVALUATION (CIO/G6) | 1 | 2017 | 4 | 2023 |
| DEFINE SECURITY & INTEROPERABILITY STANDARDS (CIO/G6) | 1 | 2017 | 4 | 2023 |
| COMSEC STRATEGY & CRYPTO TECHNOLOGY ROADMAP (CIO/G6) | 1 | 2014 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | | | | Project (Number/Name)<br>DV4 / *Key Management Infrastructure (KMI)* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| DV4: *Key Management Infrastructure (KMI)* | - | 4.518 | 4.696 | 2.702 | - | 2.702 | 3.265 | 3.543 | 3.415 | 0.000 | 0.000 | 22.139 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Key Management Infrastructure (KMI) funding line DV4 was established in FY2014. Army Key Management System (AKMS) funding line 501 realigned to KMI funding line DV4 in FY2017. AKMI supports infrastructure requirements in support of Key Management.

**A. Mission Description and Budget Item Justification**

The Army Key Management Infrastructure (AKMI) is the Army's implementation of the National Security Agency's (NSA) Key Management Infrastructure (KMI) ACAT IAM program. AKMI supports Department of Defense (DoD) Global Information Grid (GIG) Net Centric and Cryptographic Modernization Initiatives (CMI) and supports emerging requirements transitioned from the Army Key Management System (AKMS). AKMI automates the functions of Communications Security (COMSEC) electronic key management, control, planning, and distribution. AKMI supports the Army's ability to communicate and distribute data on the Army's tactical and strategic networks by limiting adversarial access to, and reducing the vulnerability of, Army Command, Control, Communications, Computers, Intelligence (C4I) systems.

The AKMI Program includes the Management Clients (MGC) nodes, Automated Communications Engineering Software (ACES) and Next Generation Load Device (NGLD) Family of devices to include the NGLD Small and Medium. AKMI provides an integrated, operational environment that brings essential key management functions in-band. Objective AKMI will leverage NSA KMI program to provide secure software provisioning, will support legacy and modern End Crypto Units (ECU)s, simplifies all aspects of key provisioning and ECU management with traceability to individuals, expands operations to DoD unclassified networks, North Atlantic Treaty Organization (NATO) and Coalition users, automates manual business processes to increase Soldier efficiency, transforms key delivery from manual to an automate enterprise service and will provide an Over the Network Keying (OTNK) capability to support CMI.

One of the major enhancement in the AKMI architecture is the ability to leverage the various capabilities and services from NSA KMI. The end state for the Army is to leverage AKMI capabilities (OTNK, Mission Plan/Mission Support System (MP/MSS), Delivery Only Client (DOC), Client Host Only (CHO)) to increase automation, reduce soldier oversight, manage, and deliver key products to the tactical edge up through strategic ECU's. The objective AKMI capabilities will be found in all of the products across the AKMI product line to include MGC, ACES and NGLD family of fill devices. NGLD family will be an enduring solution to bridge the gap until legacy ECUs are fully modernized.

The NGLD Medium is reliant on the Reprogrammable Single Chip Universal Encryptor (RESCUE), a new KMI compliant cryptographic engine that is currently being developed. The KOV-21 card currently used in Army Simple Key Loader (SKL) fill devices has hardware obsolescence issues and does not support OTNK. Redesign and developmental efforts using modern and readily available components for use in the Army's SKL devices have been initiated under the RESCUE program. The current KOV-21 card is referred to as the KOV-21 Replacement and is an extension of the RESCUE program as a technology insertion. The follow-on RESCUE technology development will start in FY2018.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV4 / *Key Management Infrastructure (KMI)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Key Management Infrastructure (KMI) Awareness (RESCUE / KOV-21 Replacement Effort)<br><br>***Description:*** KMI Awareness initiative creates a secure, highly automated interface in providing future Over the Network Keying (OTNK) capability to legacy End Crypto Units (ECU)s. This initiative will allow ECUs to receive, authenticate, and decrypt OTNK messages and increases WarFighter survivability by minimizing the need for Soldiers to travel to obtain keys. The KOV 21 card, previously in production through NSA for use in the Simple Key Loader (SKL) and the Secure DTD 2000 System (SDS), is nearing the end of life due to unavailability of parts. Redesigning and developmental efforts using modern and readily available components for use in the Army's SKL and Next Generation Load Devices (NGLDs) are currently underway. The redesign of the current KOV 21 card is referred to as the KOV 21 Replacement and is an extension of the KOV 21 card as a technology insertion. The KOV 21 Replacement will also address requirements codified in the NGLD CPD and the AKMI CPD that were technologically unachievable with the KOV 21 card.<br><br>***FY 2018 Plans:***<br>The RESCUE technology development will complete in FY2018. RESCUE development will provide the ability to upgrade legacy ECUs, enabling a KMI aware fully developed PDE-enabled ECU fleet. The KOV-21 Replacement effort lays the foundation for AKMI capabilities that can be inserted into the SKL to make it an NGLD Medium.<br><br>***FY 2019 Base Plans:***<br>The follow-on RESCUE technology will continue in FY2019.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>The follow-on RESCUE technology will continue in FY2019. | 4.518 | 4.696 | 2.702 | - | 2.702 |
| **Accomplishments/Planned Programs Subtotals** | 4.518 | 4.696 | 2.702 | - | 2.702 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • B96004: *Key Management Infrastructure* | 63.578 | 58.363 | 35.710 | - | 35.710 | 97.061 | 99.098 | 89.919 | 115.498 | Continuing | Continuing |
| • 432140: *ISSP (TSEC-AKMS)* | 7.966 | 8.319 | 8.682 | - | 8.682 | 3.950 | 4.048 | 4.124 | 4.194 | Continuing | Continuing |

**Remarks**

Line Item & Title:

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV4 / *Key Management Infrastructure (KMI)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B96004: Key Management Infrastructure (OPA2) | | | | | | | | | | | |
| 432140: ISSP (TSEC-AKMS) (OMA) | | | | | | | | | | | |

**D. Acquisition Strategy**

Army Key Management Infrastructure (AKMI) is a Non Program of Record (POR) under Project Lead Network Enablers (PL Net E). AKMI is the Army's implementation of the National Security Agency (NSA) Key Management Infrastructure (KMI) ACAT IAM Program of Record. The AKMI will allow the Army to manage, control, plan, and distribute electronic key for the ~1.5M End Cryptographic Units (ECU)s necessary to communicate and distribute data on the Army's tactical and strategic networks.

AKMI initial Army Acquisition Program Baseline (APB) was approved 2QFY12. The AKMI Program will include the Management Clients (MGC) nodes, Automated Communications Engineering Software (ACES) and Next Generation Load Device (NGLD) Family. Each component of the AKMI Program is in a different phase of the acquisition cycle.

The NSA KMI Program is replacing the NSA Electronic Key Management System (EKMS) program. As the DoD Key Management Lead, NSA is dictating the change from EKMS to KMI by a sunset date of December 2017. Components of the AKMI Program will be retained and adapted from the legacy AKMS program while others will be developed and fielded to meet AKMI requirements.

The NGLD family of devices will become the primary Army fill devices and Tier 3 component of the AKMI Program. The NGLD Capability Production Document (CPD) was signed 4QFY13. The NGLD CPD calls for a family of 2 devices (small and medium) to meet the AKMI requirements. The AKMI program has partnered with RDECOM CERDEC to develop a KMI compliant cryptographic engine, the Reprogrammable Single Chip Universal Encryptor (RESCUE). The Army will gain the NGLD Medium capability through the SKL v3.1 in combination with a new KMI compliant cryptographic engine, the RESCUE, the first iteration of the RESCUE being the KOV-21 Replacement. The redesign of the current SKL cryptographic engine, the KOV-21 card, is required due to parts obsolescence and inability to be KMI Aware. The KOV-21 Replacement is an extension of the RESCUE program as a technology insertion into the SKL v3.1 which in turn meets the NGLD Medium CPD requirements. The NGLD Medium will be available in FY19. The follow-on RESCUE technology development will start in FY2019.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>DV4 / *Key Management Infrastructure (KMI)* | |

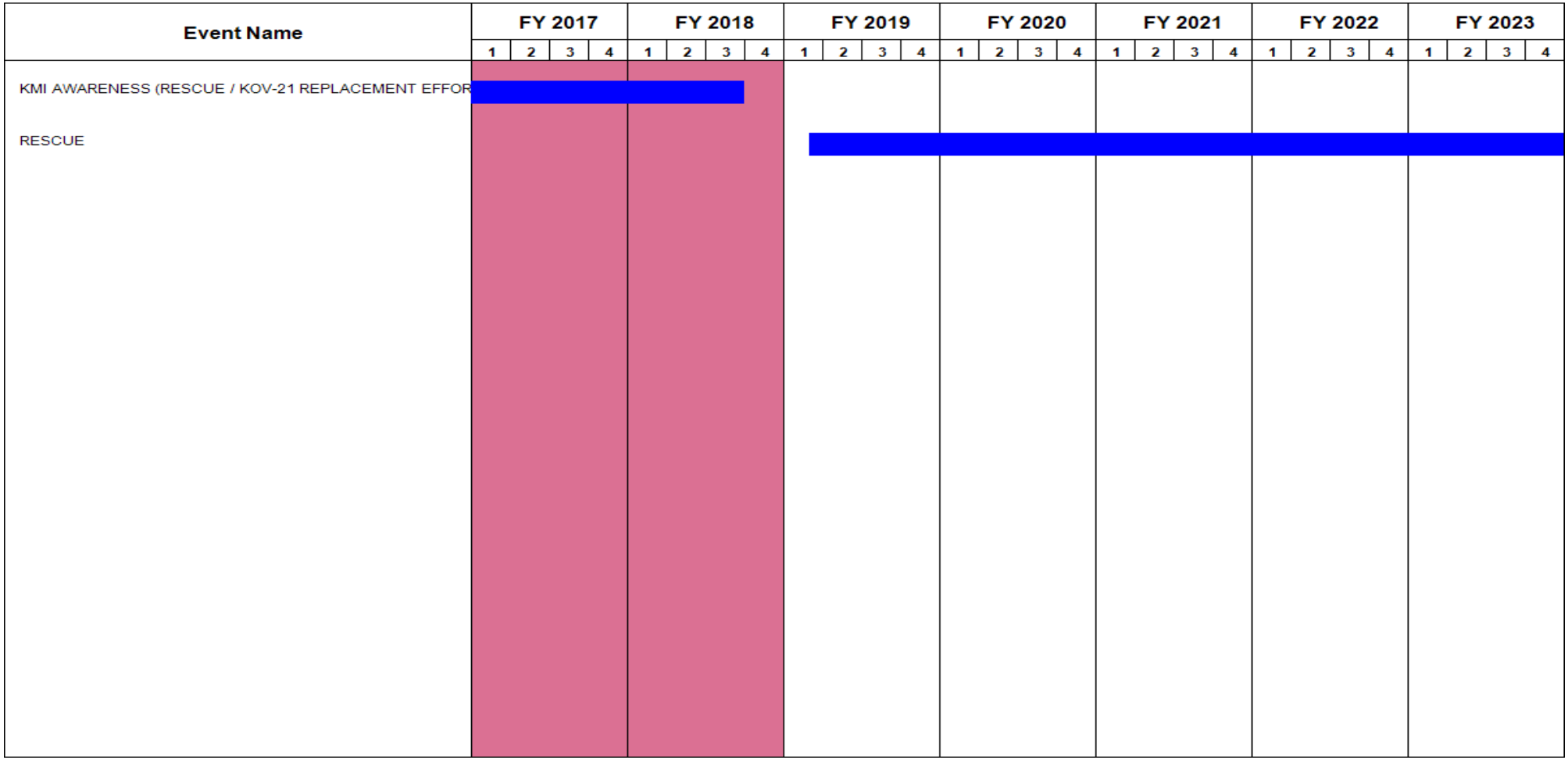
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KMI Awareness (RESCUE / KOV-21 Replacement Effort) | C/CPFF | Dynamics Research Corporation/Engility : APG, MD | 4.011 | 4.518 | Jul 2017 | 4.696 | Jul 2018 | - | | - | | - | Continuing | Continuing | Continuing |
| KMI Awareness | C/CPFF | CERDEC, S&TCD : APG, MD | 1.451 | - | | - | | - | | - | | - | 0.000 | 1.451 | - |
| RESCUE Embedment | C/TBD | CERDEC STCD : APG, MD | - | - | | - | | 2.702 | Dec 2018 | - | | 2.702 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 5.462 | 4.518 | | 4.696 | | 2.702 | | - | | 2.702 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 5.462 | 4.518 | | 4.696 | | 2.702 | | - | | 2.702 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV4 / *Key Management Infrastructure (KMI)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV4 / *Key Management Infrastructure (KMI)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| KMI AWARENESS (RESCUE / KOV-21 REPLACEMENT EFFORT) | 4 | 2015 | 3 | 2018 |
| RESCUE | 1 | 2019 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>DV5 / *Crypto Modernization (Crypto Mod)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DV5: *Crypto Modernization (Crypto Mod)* | - | 20.820 | 27.047 | 25.831 | - | 25.831 | 24.824 | 8.580 | 8.646 | 10.936 | 0.000 | 126.684 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

DV5 - The Crypto Modernization line was established in Sept 2012.

**A. Mission Description and Budget Item Justification**

This program supports using National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army providing encryption, trusted software, or standard operating procedures, and integrating these mechanisms into specified systems in support of securing the Army Tactical and Enterprise Networks.

This entails architecture studies, system integration and testing, developing installation kits, and certification and accreditation of Automation Information Systems. The program assesses, develops and integrates emerging Information Assurance (IA)/COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camp, and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan.

The Embedded Cryptographic Modernization Initiative (ECMI) is designed to investigate Courses Of Action, conduct a Material Solution Analysis, and execute upgrade activities to ensure all enduring Army communications and data equipment that employ embedded cryptographic hardware will utilize modern cryptographic algorithms and keys.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** VINSON/ANDVT (Advanced Narrowband Digital Voice Terminal) Cryptograph Modernization (VACM) program | 0.919 | 0.600 | 1.059 | - | 1.059 |
| ***Description:*** This program researches, assesses, tests, plans and works to integrate VACM products for the Army. The VACM program is a NSA mandated program established to replace legacy external cryptographic devices such as the KY-57, KY-99A, KY-58, KY-100 and CV- 3591 / KYV-5. In order to ensure the confidentiality, integrity and availability of classified communications, the cryptographic modules must be tested for interoperability and form fit to ensure a successful fielding. Each software release will require testing to insure comparability and interoperability. | | | | | |
| ***FY 2018 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV5 / *Crypto Modernization (Crypto Mod)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| The program will continue to test and evaluate engineering changes to Full Rate Production (FRP) of VACM devices to confirm continued capability and interoperability on Army networks and tactical systems as well as identifying new risk areas for compliance with COMSEC regulations and procedures. The program will begin fielding, performing site surveys and installing at both CONUS and OCONUS locations.<br>***FY 2019 Base Plans:***<br>The program will continue to test and evaluate any engineering changes to Full Rate Production (FRP) of VACM devices to confirm continued capability and interoperability on Army networks and tactical systems as well as identifying new risk areas for compliance with COMSEC regulations and procedures. The program will continue fielding, performing site surveys and installing at both CONUS and OCONUS locations.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Additional test and evaluation required for FRP VACM Devices. | | | | | |
| ***Title:*** Cryptographic Systems Test and Evaluation<br>***Description:*** This program supports the Army Cryptographic Modernization Transformational Initiative. This is accomplished by providing test and evaluation capabilities to the COMSEC community in order to assess emerging technologies before being released and approved for Army use; testing will be performed on hardware, software and network systems.<br>***FY 2018 Plans:***<br>The program continues testing and evaluation of COMSEC devices to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures. The program will test and evaluate Crypto Systems compliant devices, Suite B IPSec devices built on commercial standards, CHVP, CSfC- Guidance, and new software releases to HAIPE 4.X devices in accordance with AR 700-142 Rapid Action Revision dated October 16, 2008. The program tests interoperability and provides ways to insert data at rest (DAR) and data in transit (DIT) technology within the existing and future network infrastructure. Additionally, this program evaluates performance of technologies and provides direction to ensure the lowest impact on performance while providing the greatest protection from loss of sensitive data.<br>***FY 2019 Base Plans:***<br>The program continues testing and evaluation of COMSEC devices to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures. The program will test and evaluate Crypto Systems compliant devices, Suite B IPSec devices built on commercial standards, CHVP, CSfC Guidance, and new software releases to HAIPE 4.X devices in | 4.303 | 5.450 | 5.938 | - | 5.938 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV5 / *Crypto Modernization (Crypto Mod)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| accordance with AR 700-142 Rapid Action Revision dated October 16, 2008. The program tests interoperability and provides ways to insert data at rest (DAR) and data in transit (DIT) technology within the existing and future network infrastructure. Additionally, this program evaluates performance of technologies and provides direction to ensure the lowest impact on performance while providing the greatest protection from loss of sensitive data.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase in CTR support. | | | | | |
| ***Title:*** High Assurance Internet Protocol Encryption (HAIPE) extension manager<br>***Description:*** A management tool to configure the new extensions to the HAIPE standard and process the resulting data to provide early indications of cyber attacks.<br>***FY 2018 Plans:***<br>Continue software development efforts that will provide configuration and management of the HAIPE extensions and the user interface for collecting and analyzing the data that results from implementation of these HAIPE extensions. This will facilitate the upgrade of the Army HAIPEs to include new cyber-sensor functionality for the tactical cyber cell.<br>***FY 2019 Base Plans:***<br>Continue software development efforts that will provide configuration and management of the HAIPE extensions and the user interface for collecting and analyzing the data that results from implementation of these HAIPE extensions. This will facilitate the upgrade of the Army HAIPIES to include new cyber sensor functionality for the tactical cell.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Decrease in Matrix and SETA manpower costs. | 1.095 | 1.748 | 0.946 | - | 0.946 |
| ***Title:*** Embedded Cryptographic Modernization Initiative (ECMI)<br>***Description:*** The ECMI is an upgrade activity that will ensure enduring Army radios remain secure by operating with modern cryptographic algorithms and keys. Funding secured in DV5 line to support ECMI Non Recurring Engineering (NRE) efforts to comply with cease key dates mandated by CJCSI 6510.<br>***FY 2018 Plans:***<br>Continue execution of NRE efforts to develop, design, test/evaluate, and certify cryptographic hardware and software embedded in tactical radios to ensure these radios remain secure. System engineering activities | 14.503 | 19.249 | 17.888 | - | 17.888 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV5 / *Crypto Modernization (Crypto Mod)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| including detailed requirements decomposition, functional allocation, design of modern reprogrammable cryptographic modules, and detailed hardware design and software coding.<br><br>***FY 2019 Base Plans:***<br>Continue execution of NRE efforts to develop, design, test/evaluate, and certify cryptographic hardware and software embedded in tactical radios to ensure these radios remain secure. System engineering activities including detailed requirements decomposition, functional allocation, design of modern reprogrammable cryptographic modules, and detailed hardware design and software coding.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>ECMI R&D efforts will be entering the final stages in FY19 and beyond. Future efforts will be funded using OPA dollars. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 20.820 | 27.047 | 25.831 | - | 25.831 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 491: *Information Assurance Development* | 7.145 | 10.194 | 10.172 | - | 10.172 | 10.668 | 11.317 | 10.104 | 10.245 | Continuing | Continuing |
| • ET9: *Embedded Crypto Modernization* | 4.409 | 88.949 | 28.857 | - | 28.857 | 14.974 | - | - | - | 0.000 | 137.189 |
| • B96002: *Cryptographic Systems* | 66.692 | 49.441 | 49.107 | 0.003 | 49.110 | 104.421 | 106.898 | 103.106 | 109.001 | Continuing | Continuing |
| • B96006: *Embedded Cryptographic Modernization* | 3.014 | - | 3.520 | - | 3.520 | 97.959 | 157.904 | 48.382 | 5.013 | Continuing | Continuing |
| • BS9716: *NON PEO-SPARES* | 2.545 | 3.135 | 3.131 | - | 3.131 | 4.857 | 4.901 | 4.939 | 4.940 | Continuing | Continuing |

**Remarks**

Line Item & Title:
491 - Information Assurance Development - RDTE - funding executed by PL Net E, CIO/G6 and PL ES-CYBER
ET9 - Embedded Crypto Modernization - RDTE
B96002 - Cryptographic Systems - OPA2
B96006 - Embedded Cryptographic Modernization - OPA2

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV5 / *Crypto Modernization (Crypto Mod)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BS9716 - NON PEO-SPARES - OPA4 | | | | | | | | | | | |

**D. Acquisition Strategy**

The objective of this program is to integrate and validate hardware and software solutions to provide COMSEC superiority in order to protect against threats, increase battlefield survivability/lethality, and enable critical Mission Command activities. The objective of the Cryptographic Systems program is to provide adaptive, flexible, and programmable cryptographic systems using best practices, lessons learned and programmatic management to meet the challenge of modernizing the Army's aging cryptographic systems. The effort will support the network operations from end-to-end throughout the force and the Common Operating Environment (COE) thus mitigating networked vulnerabilities to Army information security systems. CDD, approved by CIO/G6, 15 Jul 10; ICD, approved by JROC, 25 Mar 11; AAO; approved by G3, 15 Dec 11 and revised and approved, 19 Jun 15.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV5 / *Crypto Modernization (Crypto Mod)* | |

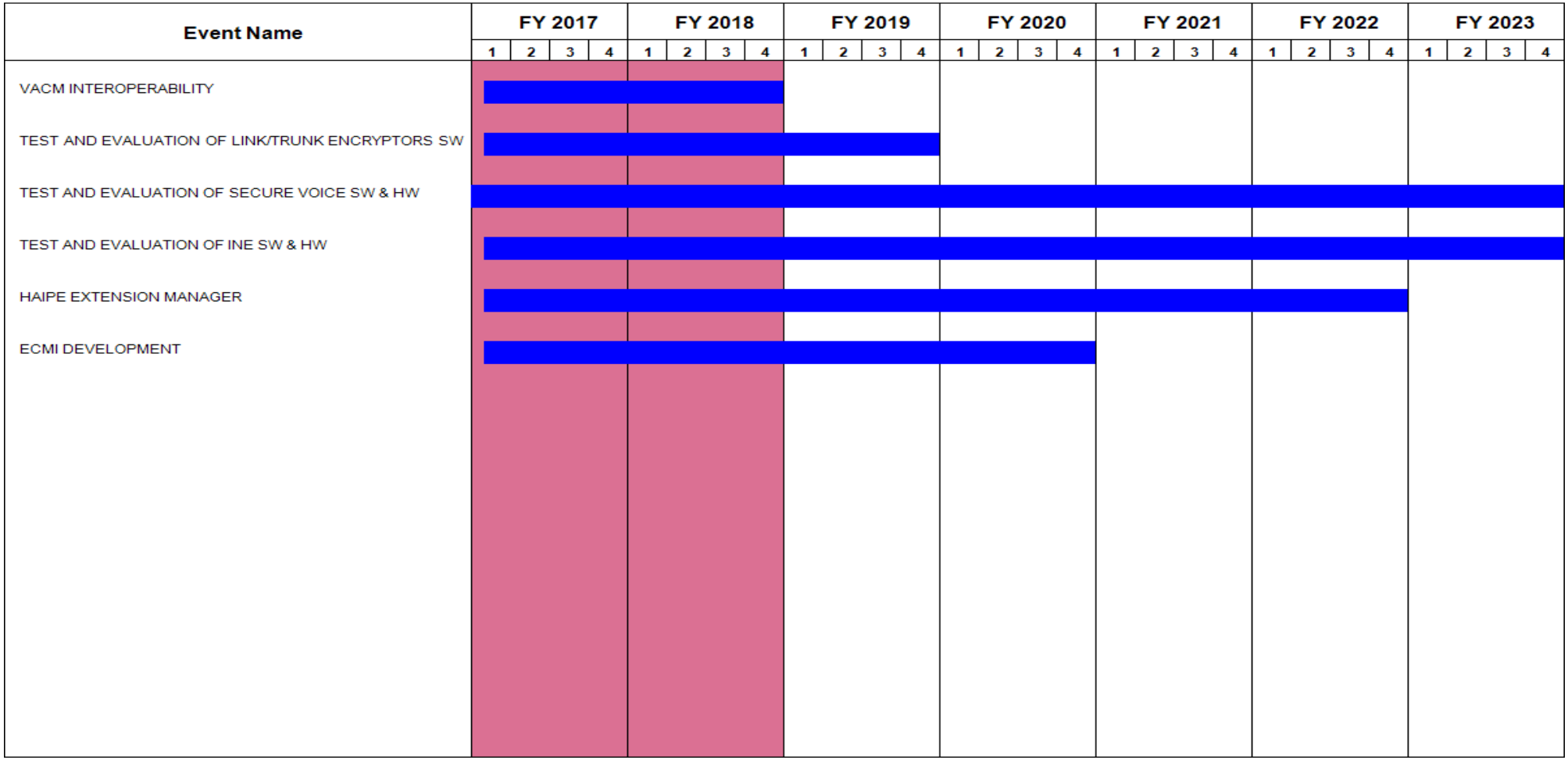
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System Engineering | SS/LH | CECOM RDEC : APG, MD | 2.237 | 1.450 | | 1.796 | | 1.809 | | - | | 1.809 | Continuing | Continuing | Continuing |
| Engineering Support | C/CPFF | CACI : Aberdeen Maryland | 3.583 | 1.297 | Apr 2017 | 1.641 | | 1.750 | Apr 2019 | - | | 1.750 | Continuing | Continuing | Continuing |
| Engineering Support | C/CPFF | Booz Allen Hamilton (BAH) : APG, MD | 0.695 | 1.641 | Sep 2016 | 1.996 | | 2.034 | Sep 2018 | - | | 2.034 | Continuing | Continuing | Continuing |
| Engineering Support | C/CPFF | AASKI : Edgewood, Maryland | 1.596 | 1.728 | Sep 2016 | 1.982 | | 1.959 | Sep 2018 | - | | 1.959 | Continuing | Continuing | Continuing |
| Information Assurance System Engineering Support | C/CPFF | Envision : Aberdeen, Maryland | 0.382 | 0.201 | Jun 2016 | 0.383 | | 0.391 | Jun 2018 | - | | 0.391 | Continuing | Continuing | Continuing |
| Embedded Crypto Modernization Support | C/LH | TBD : TBD | 5.230 | 14.503 | | 19.249 | | 17.888 | | - | | 17.888 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 13.723 | 20.820 | | 27.047 | | 25.831 | | - | | 25.831 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 13.723 | 20.820 | | 27.047 | | 25.831 | | - | | 25.831 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV5 / *Crypto Modernization (Crypto Mod)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>DV5 / *Crypto Modernization (Crypto Mod)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| VACM INTEROPERABILITY | 1 | 2016 | 4 | 2018 |
| TEST AND EVALUATION OF LINK/TRUNK ENCRYPTORS SW | 1 | 2016 | 4 | 2019 |
| TEST AND EVALUATION OF SECURE VOICE SW & HW | 4 | 2013 | 4 | 2023 |
| TEST AND EVALUATION OF INE SW & HW | 1 | 2017 | 4 | 2023 |
| HAIPE EXTENSION MANAGER | 1 | 2017 | 4 | 2022 |
| ECMI DEVELOPMENT | 1 | 2017 | 4 | 2020 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>ET9 / *Embedded Crypto Modernization (CRYPTO MOD)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ET9: *Embedded Crypto Modernization (CRYPTO MOD)* | - | 4.409 | 88.949 | 28.857 | - | 28.857 | 14.974 | 0.000 | 0.000 | 0.000 | 0.000 | 137.189 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

ET9 - The Embedded Crypto Modernization Initiative (ECMI) line was established in July 2015

**A. Mission Description and Budget Item Justification**

Embedded Cryptographic Modernization Initiative (ECMI) is an upgrade activity that will ensure Army radios remain secure by operating with modern cryptographic algorithms. Tactical radios using legacy embedded cryptographic systems will no longer be able to communicate securely after cease key dates documented in the Chairman of the Joint Chiefs Staff instruction (CJCSI) 6510. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army tactical radios are required to support modern cryptographic capabilities by implementing modern algorithms. If cease key dates are not met, the Army will be forced to communicate at risk.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Embedded Cryptographic Modernization Initiative (ECMI) Development Contracts | 4.409 | 88.949 | 28.857 | - | 28.857 |
| ***Description:*** ECMI Non Recurring Engineering (NRE) Contract Prep Work and Execution<br><br>***FY 2018 Plans:***<br>Support NRE development of ECMI efforts for vendor developmental and production contracts which supports NSA mandated Cease Key Date IAW CJCSI 6510.02E. This capability will ensure Army tactical radios operate with the latest cryptographic solutions.<br><br>***FY 2019 Base Plans:***<br>Support NRE development of ECMI efforts for vendor developmental and production contracts which supports NSA mandated Cease Key Date IAW CJCSI 6510.02E. This capability will ensure Army tactical radios operate with the latest cryptographic solutions.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding in FY19 was realigned by HQDA in order to fund other priority requirements. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.409 | 88.949 | 28.857 | - | 28.857 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>ET9 / *Embedded Crypto Modernization (CRYPTO MOD)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 491: *Information Assurance Development* | 7.145 | 10.194 | 10.172 | - | 10.172 | 10.668 | 11.317 | 10.104 | 10.245 | Continuing | Continuing |
| • DV5: *Crypto Modernization* | 20.820 | 27.047 | 25.831 | - | 25.831 | 24.824 | 8.580 | 8.646 | 10.936 | Continuing | Continuing |
| • B96002: *Cryptographic Systems* | 66.692 | 49.441 | 49.107 | 0.003 | 49.110 | 104.421 | 106.898 | 103.106 | 109.001 | Continuing | Continuing |
| • B96006: *Embedded Cryptographic Modernization* | 3.014 | - | 3.520 | - | 3.520 | 97.959 | 157.904 | 48.382 | 5.013 | Continuing | Continuing |
| • BS9716: *NON PEO-SPARES* | 2.545 | 3.135 | 3.131 | - | 3.131 | 4.857 | 4.901 | 4.939 | 4.940 | Continuing | Continuing |

**Remarks**

Line Item & Title:
491 - Information Assurance Development - RDTE - funding executed by PL Net E, CIO/G6 and PL ES-CYBER
DV5 - Crypto Modernization - RDTE
B96002 - Cryptographic Systems - OPA2
B96006 - Embedded Cryptographic Modernization - OPA2
BS9716 - NON PEO-SPARES - OPA4

**D. Acquisition Strategy**

The objective of the ECMI program is to provide adaptive, flexible, and programmable embedded cryptographic solutions using best practices, lessons learned and programmatic management to meet the challenge of modernizing the Army's aging cryptographic tactical radios. ECMI will design, develop, and execute upgrade activities to ensure non modernized Army tactical radios will be able to accept and utilize modern cryptographic algorithms.

Applicable documents affecting Tactical Radio ONS, ORD, & CPDs requiring crypto:
CDD for Cryptographic Equipment and Services Modernization, Increment 1, dated March 2010.
CJCSI 6510.02E - "Cryptographic Modernization Planning", 01 April 2014.
CNSSP-15 - "National Information Assurance Policy on the Use of Public Standards for the Secure Sharing of Information Among National Security Systems", 01 October 2012.
NSA CSS 3-9 - "Cryptographic Modernization Initiative Requirements for Type 1 Cryptographic Products", dated 28 March 2013.
Memorandum from Army Acquisition Executive with subject "Management and Procurement of Communications Security (COMSEC) Capability, dated 28 Feb 2012.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>ET9 / *Embedded Crypto Modernization (CRYPTO MOD)* | |

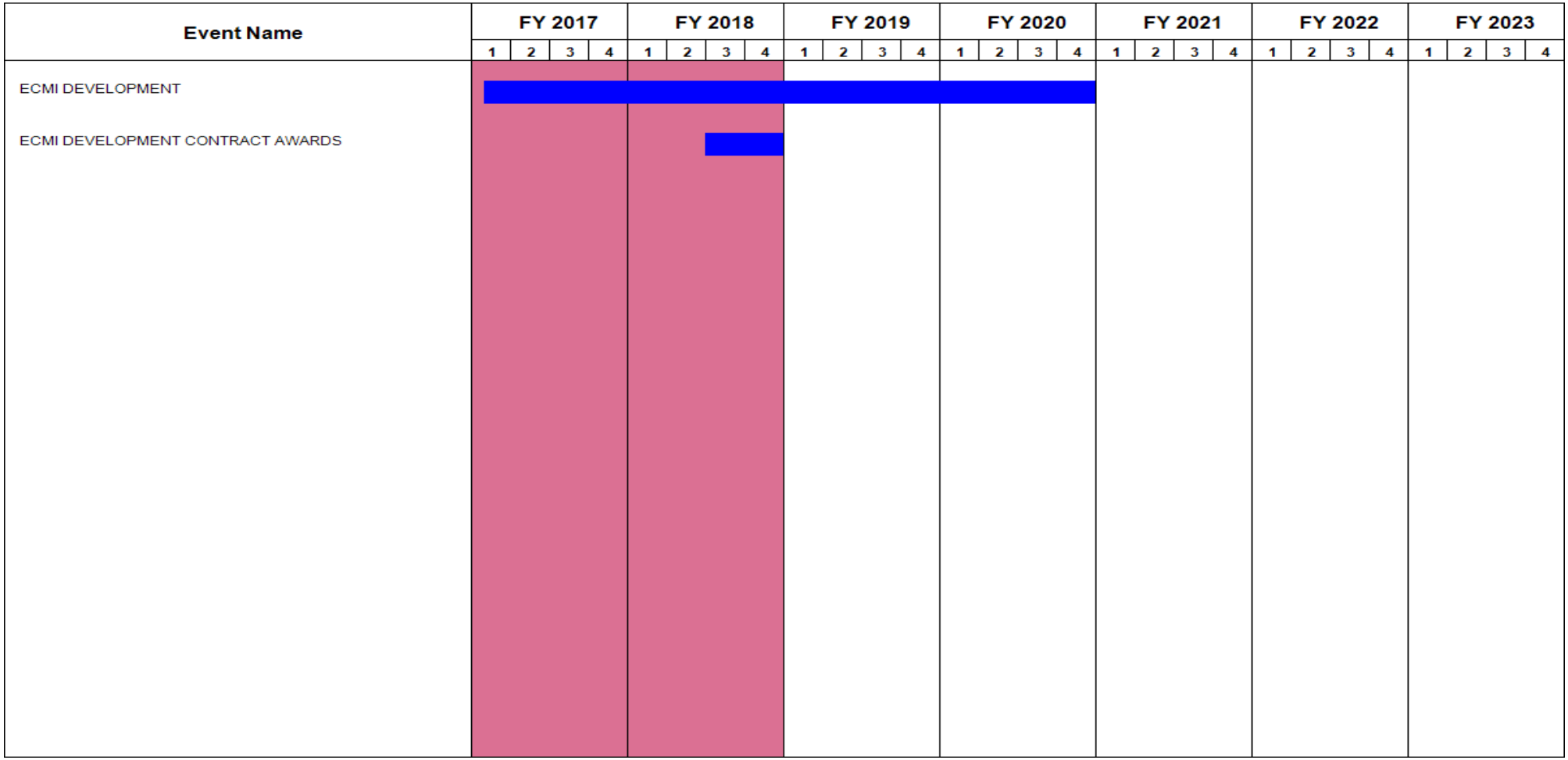
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PL NET E Program Mgmt Personnel | C/CPFF | TBD : Aberdeen, MD | - | 2.663 | | 4.968 | | 1.612 | | - | | 1.612 | Continuing | Continuing | Continuing |
| PM TR Program Mgmt Personnel | C/CPFF | BAH : Aberdeen, MD | - | 1.424 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| PM TR Program Mgmt Personnel | C/CPFF | TBD : Aberdeen, MD | - | 0.322 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| ECMI Development Contracts | C/CPFF | TBD : TBD | - | - | | 83.981 | | 27.245 | | - | | 27.245 | Continuing | Continuing | Continuing |
| | | **Subtotal** | - | 4.409 | | 88.949 | | 28.857 | | - | | 28.857 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | 4.409 | | 88.949 | | 28.857 | | - | | 28.857 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>ET9 / *Embedded Crypto Modernization (CRYPTO MOD)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>ET9 / *Embedded Crypto Modernization (CRYPTO MOD)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| ECMI DEVELOPMENT | 1 | 2017 | 4 | 2020 |
| ECMI DEVELOPMENT CONTRACT AWARDS | 3 | 2018 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>FF8 / *Unit Activity Monitoring (UAM)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FF8: *Unit Activity Monitoring (UAM)* | - | 0.000 | 1.552 | 0.971 | - | 0.971 | 0.983 | 1.046 | 1.071 | 1.086 | 0.000 | 6.709 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

User activity monitoring (UAM) automation/analytics will provide technical capability to enhance Army UAM analysis effectiveness and efficiency. The UAM mission is to observe and record the actions and activities of an individual, at any time, on any device accessing Army information on classified networks in order to detect insider threats and to support authorized investigations. Army UAM is a component of the Army Insider Threat (InT) Program. Army's InT Program and UAM are conducted in accordance with the National Defense Authorization Act for Fiscal Year 2012, section 922., Insider Threat Detection; Presidential Memorandum, National Insider Threat Policy and Minimum Standards for Executive Branch Insider Threat Programs, dated 21 November 2012; Executive Order 13587, Structural Reforms to Improve the Security of Classified Networks and the Responsible Sharing and Safeguarding of Classified Information, (Reference b) dated 7 October 2011, and Army Directive 2013-18 (Army Insider Threat Program), 31 July 2013. Innovative enhancements are required to improve UAM analysis productivity, data visualization, and workflow management. The analysis productivity objective is to develop and implement user behavior models that use UAM and other network data to identify anomalous user behavior over time, and to integrated new data sources into the UAM analytical data store and processing system. Data visualization advances will present UAM analysts behavior model processing results in an intuitive format that reduce the time required to review the results. Workflow management improvements will add new capabilities to the UAM workflow management system with the objective of enhancing analysis reporting productivity and metrics collection.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Unit Activity Monitoring | - | 1.552 | 0.971 | - | 0.971 |
| ***Description:*** FY 2019 Base funds in the total amount of $.971 million are provided for software engineering development and testing resources to enhance the Army? UAM data processing, analysis, and data visualization capabilities, and its workflow management system, plus the integration of new data sources into the data processing component. All work is focused on the development of new capabilities.<br><br>The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).<br><br>***FY 2018 Plans:***<br>Unit Activity Monitoring<br><br>***FY 2019 Base Plans:***<br>Unit Activity Monitoring<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>FF8 / *Unit Activity Monitoring (UAM)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Requirement decrease from FY18 to FY19. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 1.552 | 0.971 | - | 0.971 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

FY 2019: The planned acquisition strategy to acquire UAM Automation/Analytics software engineering services is to award through the use of competitive acquisition, a Base plus three-option year firm-fixed price contract.

FY 2019: The planned acquisition is to exercise next option year of the software engineering services contract.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | Project (Number/Name)<br>FF8 / *Unit Activity Monitoring (UAM)* | |

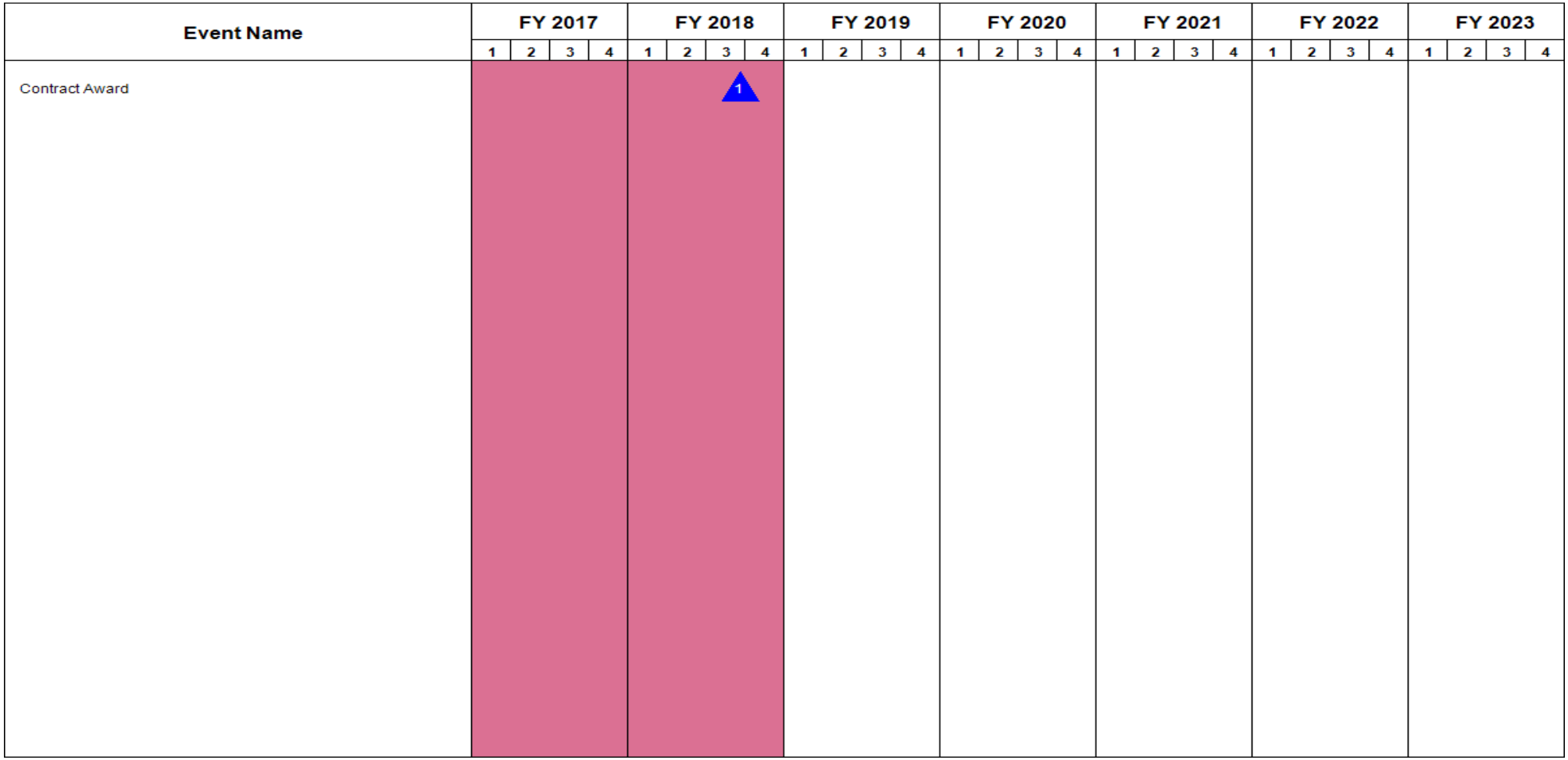
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Engineering Development | C/TBD | TBD : TBD | - | - | | 1.552 | Jun 2018 | 0.971 | Jun 2019 | - | | 0.971 | 0.000 | 2.523 | Continuing |
| | | **Subtotal** | - | - | | 1.552 | | 0.971 | | - | | 0.971 | 0.000 | 2.523 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 1.552 | | 0.971 | | - | | 0.971 | 0.000 | 2.523 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>FF8 / *Unit Activity Monitoring (UAM)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140A / *Communications Security (COMSEC) Equipment* | **Project (Number/Name)**<br>FF8 / *Unit Activity Monitoring (UAM)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Contract Award | 3 | 2018 | 3 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 26.176 | 64.370 | 68.619 | - | 68.619 | 33.630 | 29.372 | 25.288 | 28.575 | 0.000 | 276.030 |
| 083: *Global Combat Support Sys - Army* | - | 1.084 | 0.307 | 1.299 | - | 1.299 | 1.309 | 1.317 | 1.341 | 1.225 | 0.000 | 7.882 |
| 08A: *Army Enterprise System Integration Program* | - | 0.862 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.862 |
| EK2: *GCSS-A Increment 2* | - | 24.230 | 64.063 | 67.320 | - | 67.320 | 32.321 | 28.055 | 19.006 | 24.485 | 0.000 | 259.480 |
| EK3: *AESIP Increment 2** | - | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 4.941 | 2.865 | 0.000 | 7.806 |

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2019

**Note**

Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to Global Combat Support System. This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."

**A. Mission Description and Budget Item Justification**

The Global Combat Support System-Army (GCSS-Army) program has two components: a functional component titled GCSS-Army and a technology enabler component titled Army Enterprise Systems Integration Program (AESIP). GCSS-Army coupled with AESIP are information and communications technology investments that will provide key enabling support to the transformation of the Army into a network-centric, knowledge-based future force. The GCSS-Army approved Capability Description Document (CDD) and Capability Production Document (CPD) require an enterprise approach to replace current logistics and maintenance Standard Army Management Information Systems (STAMIS). GCSS-Army will provide the Army's Sustainment Support for the soldier with a seamless flow of timely, accurate, accessible and secure information management that gives combat forces a decisive edge. AESIP will provide the system's enterprise hub services, centralized master data management and cross-functional business intelligence/analytics. GCSS-Army will implement best business practices to streamline supply, accountability, maintenance, distribution, and reporting procedures in support of the future force transition path of the Army Campaign Plan.

Building on the foundation of GCSS-Army Increment 1, Increment 2 will provide the Army Enterprise Aviation maintenance, enhanced Business Intelligence / Business Warehouse (BI/BW) and Army Pre-Positioned Stock (APS) functional capabilities to deliver greater efficiencies and to improve information flow and accuracy in real time to decision makers. Upon the completion of Increment 2, the Unit Level Logistics System-Aviation (Enhanced) (ULLS-A(E)), Unmanned Aircraft System-Initiative (UAS-I), and Army War Reserve Deployment System (AWRDS) will be eligible for retirement since the necessary functionality will have been replaced by GCSS-Army increments. GCSS-Army will provide the Army sustainment support for the warfighter with a seamless flow of timely, accurate, accessible and secure management information that gives combat forces a decisive edge.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0303141A *I Global Combat Support System* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 28.667 | 64.370 | 74.484 | - | 74.484 |
| Current President's Budget | 26.176 | 64.370 | 68.619 | - | 68.619 |
| Total Adjustments | -2.491 | 0.000 | -5.865 | - | -5.865 |
| • Congressional General Reductions | -0.013 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.034 | - | | | |
| • Adjustments to Budget Years | - | - | -5.865 | - | -5.865 |
| • RAA Not Appropriated | -1.444 | - | - | - | - |

**Change Summary Explanation**

FY19 -$5.865 adjustment to 0303141: $6.847 reduction adjustment to Project EK2; +$982 increase to Project 083.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>083 / *Global Combat Support Sys - Army* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 083: *Global Combat Support Sys - Army* | - | 1.084 | 0.307 | 1.299 | - | 1.299 | 1.309 | 1.317 | 1.341 | 1.225 | 0.000 | 7.882 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

GCSS-Army is the tactical unit / installation logistics and financial system for the U.S. Army. GCSS-Army is an Enterprise Resource Planning (ERP) solution that will track supplies, spare parts and organizational equipment. It will track unit maintenance, total cost of ownership and other financial transactions related to logistics for all Army units. This modernized application will subsume outdated Standard Army Management Information Systems (STAMIS) that are not financially compliant and integrate numerous local supply and logistics databases into a single, enterprise-wide authoritative system. GCSS-Army will be financially compliant and is a key component for the Army Enterprise strategy to be financially auditable. When fully deployed, GCSS-Army will affect every supply room, motor pool, direct support repair shop, warehouse, Logistics Readiness Centers (LRCs) and property book office in the Army.

GCSS-Army will modernize automated logistics by implementing best business practices to streamline supply operations, maintenance operations, property accountability, and tactical logistics and financial management and integration procedures in support of the Future Force transition path of the Army Campaign Plan. GCSS-Army is a key component of the Federated ERP Integration solution that will optimize tactical logistics and finance domain business processes into a single federated approach. Delivering GCSS-Army will eliminate the need for extensive maintenance and modification of aging, diverse software systems that are not cyber compliant, resulting in improved and efficient change control and configuration management through implementation of an enterprise system.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Government System Test and Evaluation | 1.084 | 0.307 | - |
| ***Description:*** Plans, conducts and reports on developmental tests and assists in planning, conducting, and reporting of operational and interoperability tests, assessments, and experiments in order to provide essential information for the acquisition and fielding of warfighting systems.<br><br>***FY 2018 Plans:***<br>The program finishes Increment 1, Wave 2 fielding. Funding will be utilized to perform regression testing to ensure proper interfaces remain interoperable with system and technology upgrades and modifications.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Final testing completed, no FY19 funds. | | | |
| ***Title:*** Product Development | - | - | 1.299 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>083 / *Global Combat Support Sys - Army* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Funds have been added to the Increment 1 RDTE line for continuous improvement. After transition to sustainment, RDT&E funding would be used to execute system change requests to enhance sustainment activities, accountability, auditability, and calculations of total cost of ownership.<br><br>***FY 2019 Plans:***<br>After transition to sustainment, RDT&E funding of $1.313 Million would be used to execute system change requests (SCRs) to enhance sustainment activities, accountability, auditability, and calculations of total cost of ownership. Implementation of SCRs enhance sustainment and effectiveness by synchronizing system data and utilizing enterprise interface tools to eliminate input errors.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 RDTE funds increased for system change requests and baseline modernization. | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.084 | 0.307 | 1.299 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • W00800: *GCSS-Army Increment 1* | 131.434 | 30.637 | 7.085 | - | 7.085 | 6.944 | 0.068 | 0.024 | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

GCSS-Army has an evolutionary acquisition strategy as defined in DoD Directive 5000.01 and DoD Instruction 5000.02 and will define, develop, and deploy an initial operational capability based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities. Increment 1 will be a viable stand alone capability.

GCSS-Army Increment I was implemented in two waves:

Wave 1 contains the retail supply and associated financial functions and completed fielding in Nov 2015.

Wave 2 contains the property book and maintenance and associated financial functions. Fielding was completed in Dec 2017.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>083 / *Global Combat Support Sys - Army* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 . PM GCSS-Army- PMO Operations | Various | PM GCSS-Army : Fort Lee, VA 23805 | 103.931 | - | | - | | - | | - | | - | 0.000 | 103.931 | 62.385 |
| | | **Subtotal** | 103.931 | - | | - | | - | | - | | - | 0.000 | 103.931 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Enterprise Resource Planning (ERP) design and development | C/FPAF | Northrop Grumman Information Systems : Chester, VA 23836 | 465.845 | - | | - | | 1.299 | | - | | 1.299 | 0.000 | 467.144 | 453.329 |
| Government Developer Subject Matter Experts | IA | ASA (FM&C), CASCOM and GFEBS : Various Locations | 22.315 | - | | - | | - | | - | | - | Continuing | Continuing | 19.730 |
| | | **Subtotal** | 488.160 | - | | - | | 1.299 | | - | | 1.299 | Continuing | Continuing | N/A |

**Remarks**

FY19 $1.299 Million RDTE will be used for continuing baseline modernization.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PM Support - Independent Verification and Validation (IV&V) | C/T&M | CAP Gemini : 2250 Corporate Park Dr, Herndon, VA 20171 | 1.031 | - | | - | | - | | - | | - | 0.000 | 1.031 | 1.031 |
| 2. PM Support - Program Management Support Services A | C/T&M | Engility Corporation : 3750 Centerview Drive Chantilly, VA 20151 | 1.386 | - | | - | | - | | - | | - | 0.000 | 1.386 | 25.580 |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>083 / *Global Combat Support Sys - Army* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3. PM Support - Program Management Support Services B | C/T&M | Logistics Management Institue : Colonial Heights, VA 23834 | 42.101 | - | | - | | - | | - | | - | 0.000 | 42.101 | 34.531 |
| | | **Subtotal** | 44.518 | - | | - | | - | | - | | - | 0.000 | 44.518 | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Test and Evaluation - Test and Evaluation | IA | AEC, ATEC, OTC and JITC : Various Locations | 38.309 | 1.084 | | 0.307 | | - | | - | | - | Continuing | Continuing | - |
| | | **Subtotal** | 38.309 | 1.084 | | 0.307 | | - | | - | | - | Continuing | Continuing | N/A |

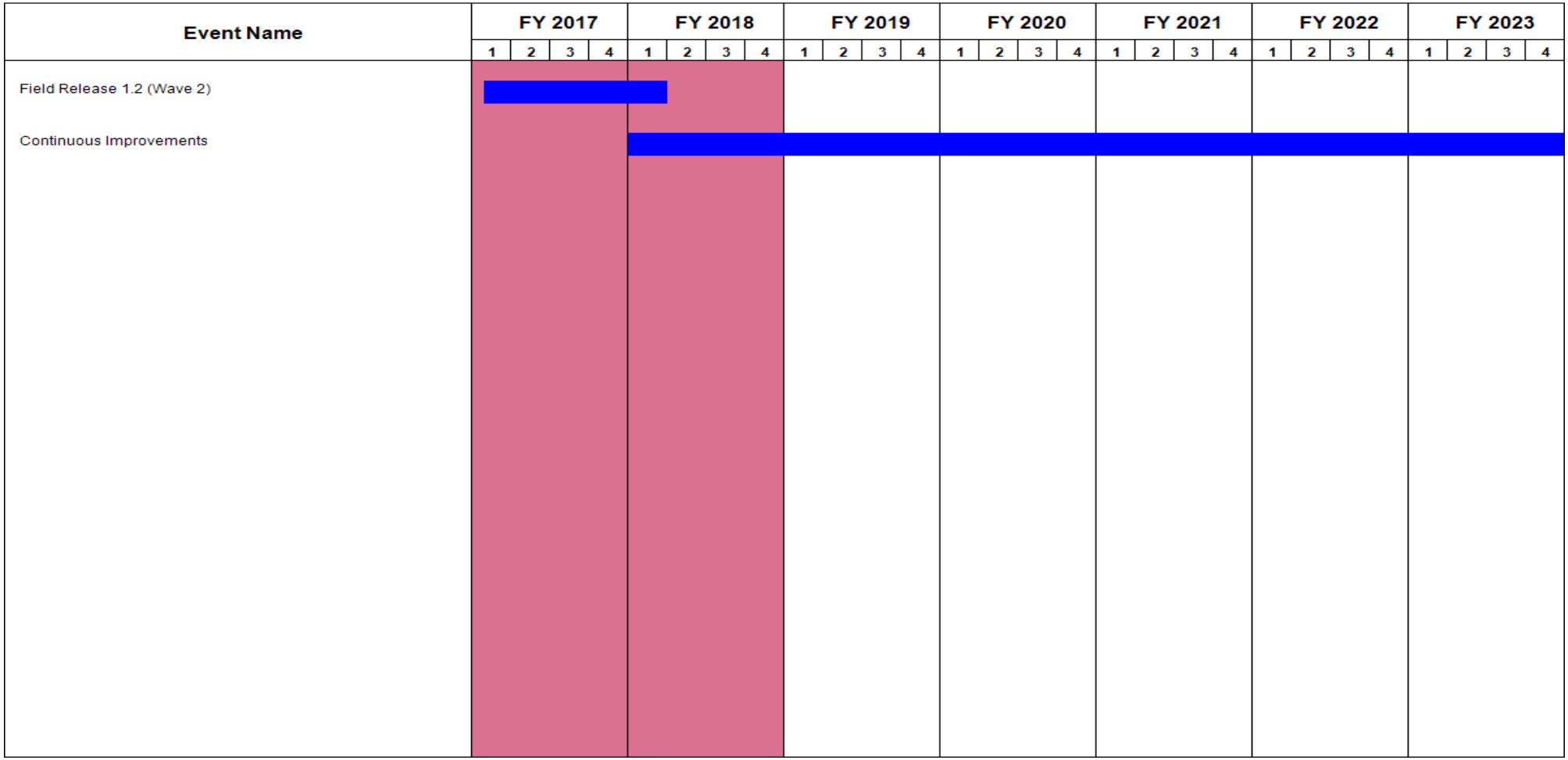
**Remarks**

The program finishes Increment 1, Wave 2 Fielding, fixing any major issues in the ERP solution that are identified during the fielding to make necessary updates to the software baseline to meet operational requirements. Perform regression testing to ensure partner interfaces remain interoperational with system and technology upgrades and modifications.

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 674.918 | 1.084 | | 0.307 | | 1.299 | | - | | 1.299 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>083 / *Global Combat Support Sys - Army* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>083 / *Global Combat Support Sys - Army* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Seg 2 Contract Award | 1 | 2008 | 1 | 2008 |
| Increment 1 - Acquisition Review | 2 | 2008 | 2 | 2008 |
| Increment 1/Segment 1 Operational Assessment | 1 | 2008 | 3 | 2010 |
| Increment 1/Release 1.1 DTOE | 3 | 2010 | 4 | 2010 |
| GCSS-Army Release 1.1 Design, Build, Test & Stabilize | 1 | 2011 | 3 | 2011 |
| Release 1.1 Intial Operational Test and Evaluation (IOT&E) | 1 | 2012 | 1 | 2012 |
| Release 1.1 Stabilization | 2 | 2011 | 1 | 2013 |
| Field Wave 1 | 1 | 2013 | 1 | 2016 |
| GCSS-Army Release 1.2 (Wave 2) Plan, Analyze, Design, Build & Test | 3 | 2011 | 4 | 2015 |
| Field Release 1.2 (Wave 2) | 1 | 2015 | 1 | 2018 |
| Continuous Improvements | 1 | 2018 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>08A / *Army Enterprise System Integration Program* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08A: *Army Enterprise System Integration Program* | - | 0.862 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.862 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Not applicable for this item.

**A. Mission Description and Budget Item Justification**

Army Enterprise Systems Integration Program (AESIP), mission is to integrate Army business processes by providing a single source for enterprise hub services, centralized master data management, and business intelligence and analytics. AESIP is the principle GCSS-Army Business Intelligence system and will aggregate data for enterprise reporting. AESIP will support the Army's federated approach and enable the integration of end-to-end logistical and financial processes. The Army has successfully addressed concerns about the lack of integration of ERPs by leveraging AESIP core capabilities and expanding those benefits across the Army enterprise. AESIP will be an Army specific commercial off-the-shelf (COTS) web portal implementation via the NetWeaver Platform from developer Systems Applications and Products (SAP) American Group to support Army process scenarios and requirements that will provide core competencies:

Enterprise Service Bus (Hub Services) - For a Service oriented, Single Point of Entry to connect, mediate, and control the exchange of data.
Enterprise Business Intelligence/Business Warehouse - Aggregates data from ERP and non-ERP systems to provide flexible Enterprise level reporting.
Enterprise Master Data Management - For a single source of authoritative data and improved workflow and business processes.

The AESIP solution establishes a framework for a fully integrated ERP centric environment that will ultimately provide Commanders Total Visibility from Factory to Battlefield thereby ensuring delivery of the right equipment to the right unit at the right time, while reducing backlogs of material on the battlefield.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Production & Full Deployment Phases Contract Activity | 0.862 | - | - |
| ***Description:*** Manage Government contracts associated with work relating to acquisition, engineering, planning and integration activities supporting Army Enterprise Systems Integration Program (AESIP). | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.862 | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • W11001: *AESIP Increment 1* | 0.405 | 2.697 | 1.238 | - | 1.238 | 5.034 | 3.333 | 2.589 | - | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>08A / *Army Enterprise System Integration Program* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

**D. Acquisition Strategy**

As the technical component of GCSS-Army, AESIP employs an evolutionary acquisition strategy as defined in DoD Directive 5000.01 and DoD Instruction 5000.02, and will define, develop, and deploy an initial operational capability based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities. The system will be developed in multiple releases then integrated and synchronized with related systems.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>08A / *Army Enterprise System Integration Program* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 . PM AESIP- PMO Operations | Various | PM AESIP : 5911 Kingstowne Village Pkwy, Alexandria, VA 22315 | 26.090 | - | | - | | - | | - | | - | 0.000 | 26.090 | 26.090 |
| | | **Subtotal** | 26.090 | - | | - | | - | | - | | - | 0.000 | 26.090 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Enterprise Resource Planning (ERP) Implementation Systems Integration | C/T&M | Computer Sciences Corporation (CSC) : 3160 Fairview Park Drive, Falls Church, VA 22042 | 118.445 | - | | - | | - | | - | | - | 0.000 | 118.445 | 118.445 |
| 2. Enterprise Resource Planning (ERP) Implementation - Technical Support Services | FFRDC | MITRE Corporation : 7615 Colshire Drive, McLean, VA 22102 | 7.179 | - | | - | | - | | - | | - | 0.000 | 7.179 | 7.179 |
| 3. Enterprise Resource Planning (ERP) - Government Lead Systems Integrator | IA | US Army ARDEC : Picatinny Arsenal, NJ 08706 | 49.500 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| 4. Enterprise Resource Planning (ERP) - Technical Support Services | C/T&M | Systems Applications and Services (SAP) : 1300 Pennsylvania Ave, Washington, DC 20004 | 16.205 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| 5. Enterprise Resource Planning (ERP) - ERP/ SAP Technical and Management Support Services | C/T&M | iLuMina Solution Inc. : 23330 Cottonwood, California, MD 20619 | 5.313 | - | | - | | - | | - | | - | 0.000 | 5.313 | 5.313 |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>08A / *Army Enterprise System Integration Program* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6. Enterprise Resource Planning (ERP) - Enterprise Application Services A | C/T&M | Attain, LLC : 8000 Towers Crescent Dr., Vienna, VA 22182 | 8.931 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| 7. Enterprise Resource Planning (ERP) - Enterprise Application Services B | C/T&M | Insap Services Inc. : 12000 Lincoln Dr. Marlton, NJ 08053 | 0.020 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| 8. Enterprise Resource Planning (ERP) - Enterprise Application Services C | C/T&M | Oakland Consulting Group Inc : 9501 Sheridan, Lanham, MD 20706 | 11.897 | 0.862 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Enterprise Resource Planning (ERP) - Enterprise Application Services D | C/T&M | VARIOUS : VARIOUS | 18.032 | - | | - | | - | | - | | - | 0.000 | 18.032 | - |
| 9. Enterprise Resource Planning (ERP) - Enterprise Integration Services | C/T&M | EDC Consulting LLC : 1104 Good Hope Rd SE, Washington, DC 20020 | 1.364 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| 10. Enterprise Resource Planning (ERP) - Infrastructure Services | C/T&M | TBD : TBD | 0.100 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 236.986 | 0.862 | | - | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

Special FY17 Appropriations request for $1.444M FY17 was not allocated.
Funds will be used to develop Business Intelligence (BI)/Business Warehouse technology application to AESIP.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>08A / *Army Enterprise System Integration Program* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PM Support - Program Management Support Services A | C/FFP | L3 Services Inc. (MPRI Division) : 1320 Braddock PL, Alexandria, VA 22314 | 6.940 | - | | - | | - | | - | | - | 0.000 | 6.940 | 6.940 |
| 2. PM Support - Program Management Support Services B | C/T&M | LMI Government Consulting : 2000 Corporate Ridge, McLean, VA 22102 | 26.208 | - | | - | | - | | - | | - | 0.000 | 26.208 | 26.208 |
| 3. PM Support - Program Management Support Services C | C/T&M | Science Applications Internation Corporation (SAIC) : 1710 SAIC Dr., McLean, VA 22102 | 7.020 | - | | - | | - | | - | | - | 0.000 | 7.020 | 7.020 |
| 4. PM Support - Indepent Verification and Validation (IV&V) | C/T&M | CAP Gemini : 2250 Corporate Park Dr, Herndon, VA 20171 | 2.104 | - | | - | | - | | - | | - | 0.000 | 2.104 | 2.104 |
| | | **Subtotal** | 42.272 | - | | - | | - | | - | | - | 0.000 | 42.272 | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Test and Evaluation - Test and Evaluation | IA | AEC, ATEC, OTC and JITC : Various Locations | 4.042 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 4.042 | - | | - | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

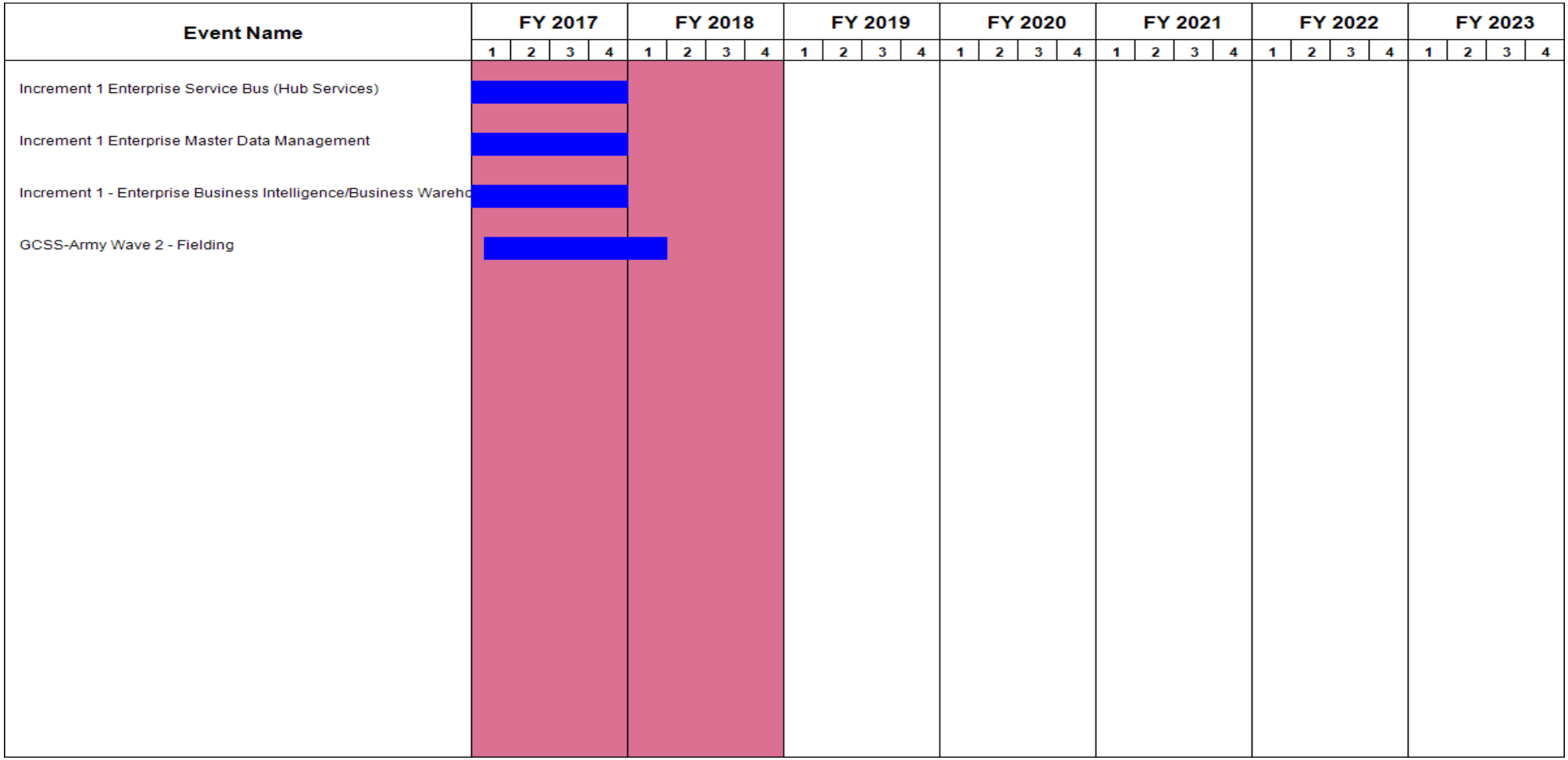
No funding in FY18.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>08A / *Army Enterprise System Integration Program* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 309.390 | 0.862 | | 0.000 | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>08A / *Army Enterprise System Integration Program* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>08A / *Army Enterprise System Integration Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Increment 1 Enterprise Service Bus (Hub Services) | 4 | 2008 | 4 | 2017 |
| Increment 1 Enterprise Master Data Management | 4 | 2008 | 4 | 2017 |
| Increment 1 - Enterprise Business Intelligence/Business Warehouse | 4 | 2008 | 4 | 2017 |
| Material Master (MM) Release 3.3 | 4 | 2012 | 4 | 2015 |
| MM Release 3.4 | 1 | 2013 | 3 | 2014 |
| MM Release 3.5 | 4 | 2012 | 2 | 2015 |
| GCSS-Army Release 1.1 (Wave 1) - Fielding | 1 | 2013 | 1 | 2016 |
| Customer Vender Solution 2.0 | 2 | 2013 | 4 | 2016 |
| GCSS-Army Release 1.2 (Wave 2) Plan, Analyze, Design, Build & Test | 3 | 2011 | 4 | 2015 |
| GCSS-Army Wave 2 - Fielding | 1 | 2015 | 1 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>EK2 / *GCSS-A Increment 2* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EK2: *GCSS-A Increment 2* | - | 24.230 | 64.063 | 67.320 | - | 67.320 | 32.321 | 28.055 | 19.006 | 24.485 | 0.000 | 259.480 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Global Combat Support System-Army (GCSS-Army) program has two components: a functional component titled GCSS-Army and a technology enabler component titled Army Enterprise Systems Integration Program (AESIP). GCSS-Army coupled with AESIP are information and communications technology investments that currently provides provide key enabling support to the transformation of the Army into a network-centric, knowledge-based future force.

Building on the foundation of GCSS-Army Increment 1, Increment 2 will provide the Army Enterprise Aviation maintenance, enhanced Business Intelligence / Business Warehouse (BI/BW) and Army Pre-Positioned Stock (APS) functional capabilities to deliver greater efficiencies and to improve information flow and accuracy in real time to decision makers. Upon the completion of Increment 2, the Unit Level Logistics System-Aviation (Enhanced) (ULLS-A(E)), Unmanned Aircraft System-Initiative (UAS-I), and Army War Reserve Deployment System (AWRDS) will be eligible for retirement since the necessary functionality will have been replaced by GCSS-Army increments. GCSS-Army will provide the Army sustainment support for the warfighter with a seamless flow of timely, accurate, accessible and secure management information that gives combat forces a decisive edge.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Technology Maturation and Risk Reduction Phase | 23.310 | 20.573 | - |
| ***Description:*** During the Technology Maturation and Risk Reduction (TMRR) phase, the program develops and demonstrates prototype designs to reduce technical risk, validate design approaches, validate cost estimates, and refine requirements. TMRR is an iterative process of maturing technologies and refining user performance parameters to ensure an affordable and executable production program.<br><br>***FY 2018 Plans:***<br>Complete analysis to assess risk, affordability, and feasibility. Continue fit/gap analysis and blueprinting of stakeholder requirements.Efforts are intended to reduce the specific risks (e.g. technology, engineering, integration and life-cycle risk) associated with the incremental development of the GCSS-Army system.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>TMMR phase ends in FY18 as program proceeds in EMD. | | | |
| ***Title:*** System Design, Develop and Build | - | 42.550 | 60.585 |
| ***Description:*** The purpose of this phase is to begin the system development for an incremental capability that is affordable and executable to satisfy the Key Performance Parameters and Key System Attributes . | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>EK2 / *GCSS-A Increment 2* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***FY 2018 Plans:***<br>Finish design phase and begin the development and build of Increment 2. Develop test plans preparatory to begin testing. Verify achievement of critical technical parameters and the ability to achieve key performance parameters, and assess progress toward achievement of critical operational issues. Validate system functionality. Identify system capabilities, limitations, and deficiencies. Assess system specification compliance, system safety, and compatibility with relational database management systems.<br>***FY 2019 Plans:***<br>Engineering and Manufacturing Development of Increment 2, to include design, development, and build. Complete all needed hardware and software detailed design; retire any open risks; build and test prototypes or first articles to verify compliance with capability requirements; and establish initial product baseline for all configuration items. Perform design reviews prior to test article fabrication and/or software build or increment coding.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Development efforts increase as program proceeds in Full Development phase | | | |
| ***Title:*** PMO Operations<br>***Description:*** Program Management operations to support engineering and manufacturing development.<br>***FY 2018 Plans:***<br>Program Management operations to support engineering and manufacturing development.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>PMO operations funding moved to OMA in FY19. | 0.920 | 0.940 | - |
| ***Title:*** Government System Test and Evaluation<br>***FY 2019 Plans:***<br>FY 2019 Plans:<br>Begin test and evaluation of Increment 2. Build and test prototypes or first articles to verify compliance with capability requirements; and establish initial product baseline for all configuration items. Perform design reviews prior to test article fabrication and/or software build or increment coding. Preparations for Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E).<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Testing efforts accelerate during Development phase in FY19. | - | - | 6.735 |
| **Accomplishments/Planned Programs Subtotals** | 24.230 | 64.063 | 67.320 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>EK2 / *GCSS-A Increment 2* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • W11011: *GCSS-Army Increment 2 Other Procurement (SSN W11011)* | - | 3.867 | 6.841 | - | 6.841 | 21.461 | 34.653 | 11.796 | 38.022 | 0.000 | 116.640 |

**Remarks**

**D. Acquisition Strategy**

GCSS-Army Increment 2 continues the evolutionary acquisition strategy of Increment 1 and will define, develop, and deploy additional and enhanced capabilities to GCSS-Army based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities.

GCSS-Army Increment 2 is being implemented in three waves:

Wave 1 provides the Army Enterprise Aviation maintenance capability.

Wave 2 provides the enhanced Business Intelligence/Business Warehouse (BI/BW) capability.

Wave 3 provides the Army Pre-Positioned Stock (APS) capability

Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to Global Combat Support System. This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>EK2 / *GCSS-A Increment 2* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PMO Operations | TBD | PMO : Huntsville AL | - | 0.920 | | 0.940 | | - | | - | | - | 2.920 | 4.780 | - |
| | | **Subtotal** | - | 0.920 | | 0.940 | | - | | - | | - | 2.920 | 4.780 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technology Maturization and Risk Reduction | C/IDIQ | Various : Various | 22.097 | 23.310 | Feb 2017 | 20.573 | Feb 2018 | - | | - | | - | 0.000 | 65.980 | - |
| System Design, Develop and Build | C/CPFF | TBD : TBD | - | - | | 42.550 | May 2018 | 57.997 | May 2019 | - | | 57.997 | 72.847 | 173.394 | 115.397 |
| | | **Subtotal** | 22.097 | 23.310 | | 63.123 | | 57.997 | | - | | 57.997 | 72.847 | 239.374 | N/A |

**Remarks**

Finish Design and begin development (FY17-FY18) and build of Increment 2. Verify achievement of critical technical parameters and the ability to achieve key performance parameters, and assess progress toward achievement of critical operational issues. Validate system functionality. Identify system capabilities, limitations, and deficiencies. Assess system specification compliance, system safety, and compatibility.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Evaluation | C/Various | TBD : TBD | - | - | | - | | 9.323 | Nov 2018 | - | | 9.323 | 39.916 | 49.239 | 39.916 |
| | | **Subtotal** | - | - | | - | | 9.323 | | - | | 9.323 | 39.916 | 49.239 | N/A |

**Remarks**

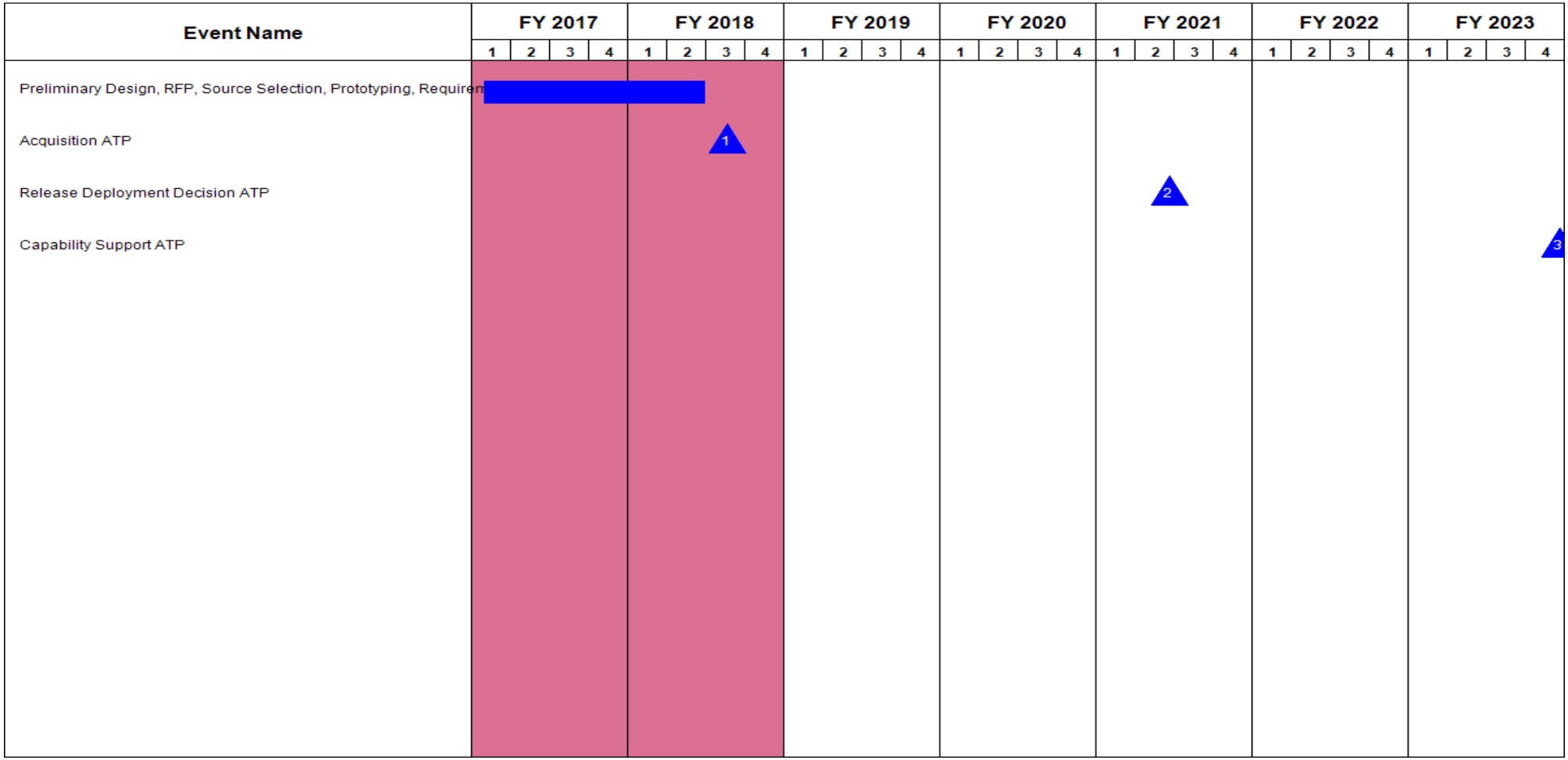
Test and evaluation efforts anticipated to begin FY19. Includes Developmental Testing, Operational Testing, ATEC and JTIC tests, and various other tests as required by regulation.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303141A / *Global Combat Support System* | Project (Number/Name)<br>EK2 / *GCSS-A Increment 2* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 22.097 | 24.230 | | 64.063 | | 67.320 | | - | | 67.320 | 115.683 | 293.393 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>EK2 / *GCSS-A Increment 2* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303141A / *Global Combat Support System* | **Project (Number/Name)**<br>EK2 / *GCSS-A Increment 2* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Preliminary Design, RFP, Source Selection, Prototyping, Requirements Analysis | 1 | 2016 | 2 | 2018 |
| Acquisition ATP | 3 | 2018 | 3 | 2018 |
| Release Deployment Decision ATP | 2 | 2021 | 2 | 2021 |
| Capability Support ATP | 4 | 2023 | 4 | 2023 |

**Note**

The schedule for GCSS-Army Increment 2 is based upon the Army Acquisition Executive (AAE) decision to utilize the Government System Integrator

Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to Global Combat Support System. This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303142A *I SATCOM Ground Environment (SPACE)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 18.761 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 18.761 |
| 253: *Dscs-Dcs (Phase II)* | - | 5.008 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.008 |
| 456: *MILSATCOM System Engineering* | - | 5.750 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.750 |
| EA3: *Transportable Tactical Cmd Comms (T2C2)* | - | 3.511 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.511 |
| EK8: *Enroute Mission Command* | - | 4.492 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4.492 |

**Note**

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

**A. Mission Description and Budget Item Justification**

Military Satellite Communication (MILSATCOM) systems are joint program/project efforts to satisfy ground mobile requirements for each Service, the Joint Chiefs of Staff (JCS), the National Command Authority, the combatant commanders, the Office of the Secretary of Defense, and other governmental, non-DoD users. The worldwide MILSATCOM systems are: the Super High Frequency (SHF) Defense Satellite Communications System (DSCS); the Wideband Global SATCOM (WGS); the MILSTAR Extremely High Frequency (EHF) Low Data Rate (LDR) and Medium Data Rate (MDR); the Advanced Extremely High Frequency (AEHF); and future MILSATCOM capabilities. All of these systems are required to support legacy, interim and emerging communication space architectures and Future Force requirements. The Army is responsible for materiel development, acquisition, product improvement, testing, fielding and integrated logistics support of ground satellite terminals and SATCOM control subsystems and all associated equipment used to provide range extension of Mission Command Networks and Systems. The Army also participates in the development of MILSATCOM programs, including architectures, payloads, waveforms, antennas and terminal developments to ensure US Army equities are appropriately addressed with our sister services. This includes technology assessment efforts associated with the integration of MILSATCOM components to US Army LandWarNet. This responsibility also includes maintaining the life cycle logistics support required to achieve end-to-end connectivity and interoperability, satisfying JCS network operations in support of the President, JCS, combatant commanders, Military Departments, Department of State, and other government Departments and Agencies. EMC supports Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forcible entry operations with the ability to conduct mission command.

This program is designated as a DoD Space Program.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0303142A *I SATCOM Ground Environment (SPACE)* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 18.815 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 18.761 | 0.000 | 0.000 | - | 0.000 |
| Total Adjustments | -0.054 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | -0.054 | - | - | - | - |

**Change Summary Explanation**

FY18 funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>253 / *Dscs-Dcs (Phase II)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 253: *Dscs-Dcs (Phase II)* | - | 5.008 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.008 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

**A. Mission Description and Budget Item Justification**

This project provides funds to develop Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future Force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** SATCOM Terminal Digital IF Implementation Analysis<br>***Description:*** SATCOM Terminal Digital IF Implementation Analysis | 3.801 | - | - | - | - |
| ***Title:*** Electromagnetic Interference Mitigation Analysis<br>***Description:*** Electromagnetic Interference Mitigation Analysis | 1.207 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 5.008 | - | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BB8500: *Defense Enterprise Wideband SATCOM Systems (DEWSS) (BB8500)* | 143.805 | 161.383 | 108.133 | - | 108.133 | 111.000 | 99.480 | 118.628 | 108.253 | Continuing | Continuing |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>253 / *Dscs-Dcs (Phase II)* |

**D. Acquisition Strategy**

As result of the new Major Force Program 12 (MFP12) Space Configuration, OSD directed this funding line transition to OSD PE 1203142/FE1 in FY 2018 and beyond.

This effort finances Project Manager, Defense Communications and Army Transmission Systems (PM DCATS) Netcentric systems engineering, modem risk mitigation, and DoD Information Assurance Certification Accreditation Process (DIACAP) support. Funding provides for SATCOM terminal upgrades, enhancement of baseband throughput capabilities, technology insertion and upgrades which enhance decision support capabilities, allowing for full utilization of Wideband Global SATCOM (WGS) capabilities. Both the Wideband SATCOM Operational Management System (WSOMS) and the Enterprise Wideband SATCOM Terminal System (EWSTS) Capability Production Documents (CPDs) contain Netcentric-Ready Key Performance Parameters (NR-KPPs) as required by CJCSI 6212.01C. Netcentric efforts are required to facilitate the migration from the current trunk-based communications systems to Internet Protocol (IP) based systems and to engineer, test and integrate IP based capabilities into EWSTS and WSOMS systems. Studies, risk mitigation, system integration and advanced demonstrations for Netcentric baseband and policy based control will accommodate technology insertion, data sharing, remote operations, architecture efforts and use of commercial technology, thus ensuring the life of the Defense Enterprise Wideband System (DEWSS) terminal family beyond 2025 and reducing lifecycle costs and enterprise requirements on the WGS and Defense Satellite Communication System (DSCS) satellites in the future.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>253 / *Dscs-Dcs (Phase II)* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SATCOM Terminal Digital IF Implementation Analysis | MIPR | CERDEC : APG, MD | 6.730 | 2.503 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Electromagnetic Interference Mitigation Analysis | MIPR | CERDEC : APG, MD | 4.946 | 1.207 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 11.676 | 3.710 | | - | | - | | - | | - | Continuing | Continuing | N/A |

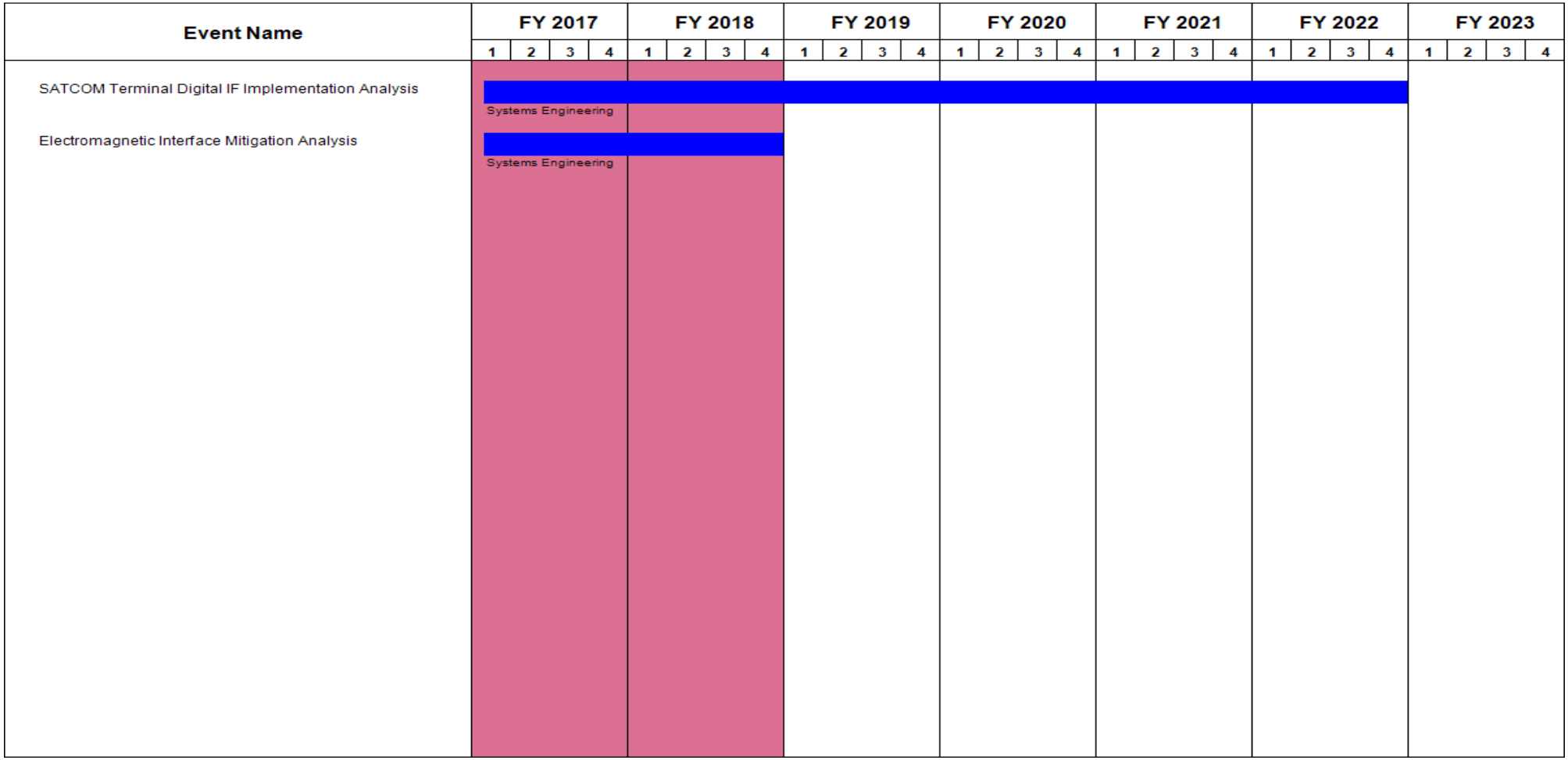
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In house Support | Allot | PdM WESS : Ft. Belvoir, VA | 1.699 | 0.600 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Contractor Support | C/CPFF | ACC-APG : APG, MD | 3.247 | 0.698 | Mar 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 4.946 | 1.298 | | - | | - | | - | | - | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 16.622 | 5.008 | | 0.000 | | - | | - | | - | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>253 / *Dscs-Dcs (Phase II)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>253 / *Dscs-Dcs (Phase II)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| SATCOM Terminal Digital IF Implementation Analysis | 1 | 2016 | 4 | 2022 |
| Electromagnetic Interface Mitigation Analysis | 1 | 2016 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>456 / *MILSATCOM System Engineering* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 456: *MILSATCOM System Engineering* | - | 5.750 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.750 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

**A. Mission Description and Budget Item Justification**

Military Satellite Communications (MILSATCOM)System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts, performed by MILSATCOM SE, lead to savings for the overall Army in the out years.

FY 2017 funds support the continued systems engineering required to support technology maturation, systems analysis, and planning associated with joint SATCOM development efforts including complying with the outcome of the Protected SATCOM communications Systems (PSCS) Analysis of Alternatives (AoA), the follow-on Wideband AoA, and other efforts that have impact on tactical Army use of military and commercial satellite constellations. These efforts have a direct impact in reducing technical and programmatic risk for the acquisition efforts for tactical Army SATCOM systems using these constellations.

FY 2018 and out funding will be realigned to 1203142A/FE2 to reflect the new Major Force Program 12 (MFP12) Space configuration.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Protected Communications System Engineering<br>***Description:*** Protected Communications System Engineering | 2.207 | - | - | - | - |
| ***Title:*** Wideband Global SATCOM (WGS) Communications System Engineering<br>***Description:*** WGS Communications System Engineering | 1.833 | - | - | - | - |
| ***Title:*** Experimentation, development, testing and certification of critical SATCOM and Satellite-On-The-Move (SOTM) communication and network technologies.<br>***Description:*** Experimentation, development, testing and certification of critical SATCOM and SOTM communication and network technologies. | 0.100 | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>456 / *MILSATCOM System Engineering* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Data Rights | 1.610 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 5.750 | - | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

FY 2018 and out funding will be realigned to 1203142A/FE2 to reflect the new Major Force Program 12 (MFP12) Space configuration.

**D. Acquisition Strategy**

This project funds advanced systems engineering, research, development, test and evaluation of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation of the technology will transition to WIN-T and related PoRs.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>456 / *MILSATCOM System Engineering* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Oversight | MIPR | PM WIN T : PEO C3T | 3.014 | - | | - | | - | | - | | - | 0.000 | 3.014 | - |
| Advanced Architecture/ Advanced Wideband System Architecture | MIPR | MIT Lincoln Labs : Lexington , MA | 11.474 | - | | - | | - | | - | | - | 0.000 | 11.474 | - |
| | | **Subtotal** | 14.488 | - | | - | | - | | - | | - | 0.000 | 14.488 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Communications and WGS Communications SE | TBD | Various : APG, MD | 74.531 | 1.151 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| FCC/ITU SOTM Regulatory Proposals/ Analyses/Modifications | MIPR | John Hopkins Universtiy Applied Physics Lab : Laurel, MD | 2.655 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| T2C2 Development Analysis of AoA activity, market research, MS C | TBD | PEO C3T PM WIN-T : APG, MD | 2.444 | - | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Software Data Rights | MIPR | Contractor : Md | - | 1.463 | | - | | - | | - | | - | 1.463 | 2.926 | 1.463 |
| | | **Subtotal** | 79.630 | 2.614 | | - | | - | | - | | - | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering (In House) | MIPR | PM WIN T : APG, MD | 28.508 | 1.200 | Nov 2016 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Engineering Contractors Support | C/CPFF | PM WIN-T : APG, MD | 40.043 | 1.136 | Mar 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>456 / *MILSATCOM System Engineering* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System Architecture & Analysis | Various | CERDEC PM WIN-T : APG, MD | 17.501 | 0.200 | Jan 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| T2C2 preparation for Milestone C; Request for Proposal and solcitation preparation | TBD | PEO C3T PM WIN T : APG, MD | 0.500 | - | | - | | - | | - | | - | 0.000 | 0.500 | - |
| | | **Subtotal** | 86.552 | 2.536 | | - | | - | | - | | - | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Terminal Testing and Evaluation System Engineering | FFRDC | PEO C3T WIN T : TBD | 2.504 | 0.200 | Jan 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Test Support | MIPR | MATRIX : PM WIN T | 22.587 | 0.200 | Jan 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Testing, Certification | MIPR | Support Technical Testing : PM WIN T | 7.001 | 0.200 | Jan 2017 | - | | - | | - | | - | Continuing | Continuing | Continuing |
| Test support to study the feasibility of moving small terminal activity from COMSATCOMO to MILSATCOM | C/CPFF | PEO C3T : PM WIN-T | 0.400 | - | | - | | - | | - | | - | 0.000 | 0.400 | - |
| T2C2 complete Intitial Operational Test and Evaluation | TBD | PEO C3T : PM WIN-T | 1.960 | - | | - | | - | | - | | - | 0.000 | 1.960 | - |
| | | **Subtotal** | 34.452 | 0.600 | | - | | - | | - | | - | Continuing | Continuing | N/A |

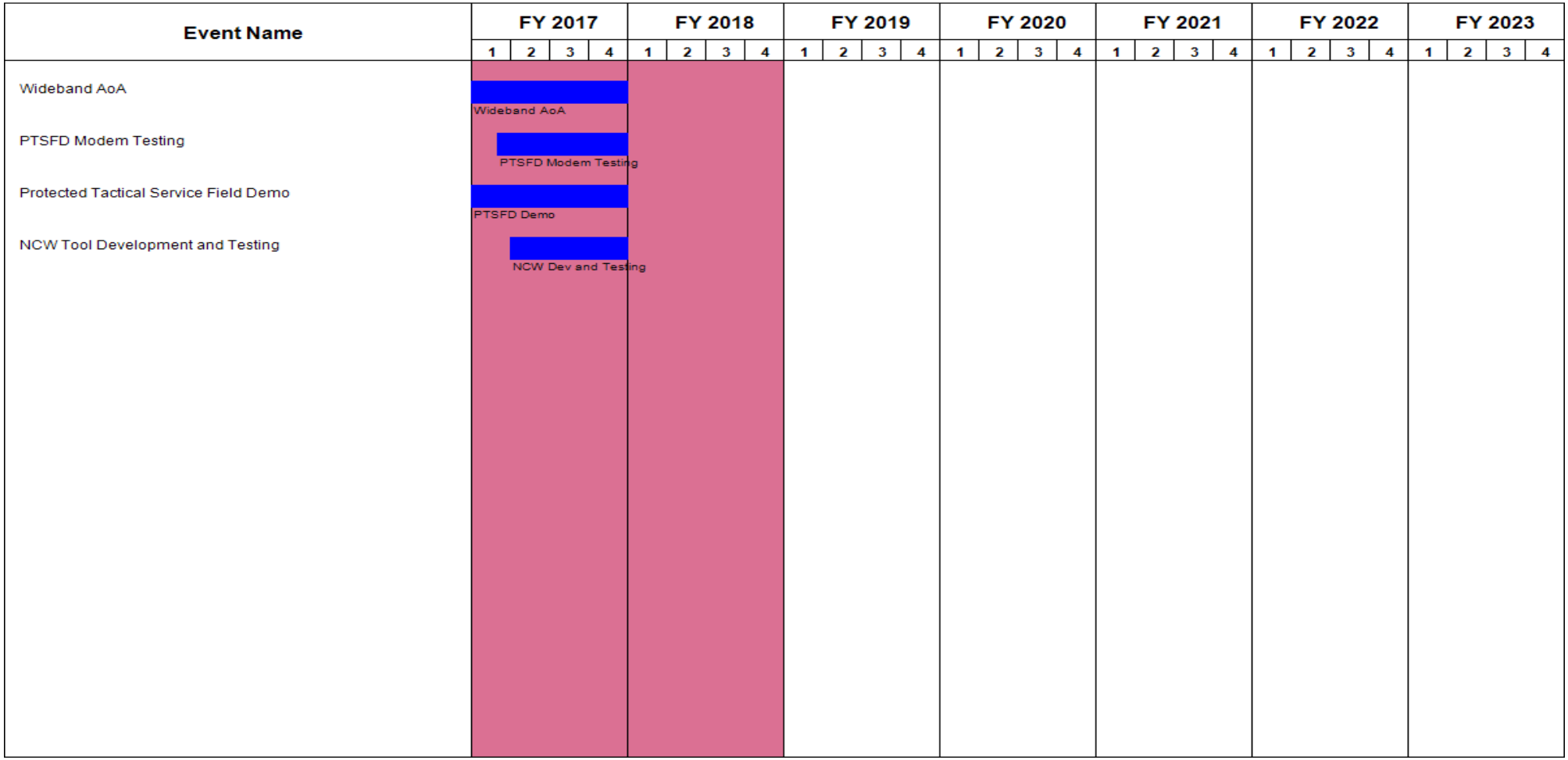
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 215.122 | 5.750 | | 0.000 | | - | | - | | - | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>456 / *MILSATCOM System Engineering* | |

| | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>456 / *MILSATCOM System Engineering* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>456 / *MILSATCOM System Engineering* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Wideband AoA | 4 | 2016 | 4 | 2017 |
| PTSFD Modem Testing | 1 | 2017 | 4 | 2017 |
| Protected Tactical Service Field Demo | 4 | 2015 | 4 | 2017 |
| NCW Tool Development and Testing | 1 | 2015 | 4 | 2017 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>EA3 / *Transportable Tactical Cmd Comms (T2C2)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA3: *Transportable Tactical Cmd Comms (T2C2)* | - | 3.511 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.511 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

**A. Mission Description and Budget Item Justification**

Transportable Tactical Command Communications (T2C2) extends the Warfighter Information Network Tactical (WIN-T) network to small company and team sized early entry units. The T2C2 system is based on combat proven capabilities and provides robust voice and data communication capabilities. The T2C2 systems will also integrate users into the higher capacity WIN-T network and extend that network to the tactical edge; T2C2 also enables warfighters in select small Command Posts (CP) (typically Company level) and select Army teams to send and receive time sensitive Situational Awareness (SA), Intelligence, and Mission Command (MC) information while At-the-Halt (ATH) in support of all Joint determined and defined operational phases. These phases span from the initial Shaping Phase, designed to dissuade or deter adversaries and assure mission friends, to Deterrence, Initiative Seizure and Domination phases culminating with post maneuver Stabilization and Enabling of Civil Authorities enabling legitimate civil governance in safe and secure environment. FY17 funds are in support of T2C2 systems (Light and Heavy) Initial Operational Test & Evaluation (IOT&E) to inform a Full Rate Production (FRP) decision scheduled for 4Q FY17 (on track).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** T2C2 Testing<br>***Description:*** Testing requirements to achieve FRP. | 3.511 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 3.511 | - | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • B85800: *Transportable Tactical Command Communications (T2C2)* | 36.580 | 62.600 | 56.737 | 7.100 | 63.837 | 77.680 | 73.146 | 74.625 | 75.551 | Continuing | Continuing |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>EA3 / *Transportable Tactical Cmd Comms (T2C2)* |

**D. Acquisition Strategy**

The Transportable Tactical Command Communications (T2C2) program Acquisition Strategy (AS) is based on integration of existing Commercial-Off-the-Shelf (COTS)/Non-Developmental Items (NDI) into new integrated systems fielded in the needed configuration for small teams or small unit Command Posts (CP) to allow these units to receive and transmit data. T2C2 will provide a high bandwidth tactical network extension for small unit CPs operating beyond line-of-sight from their higher headquarters and for teams operating outside the full tactical network architecture. The acquisition strategy leverages an existing Small Business Innovation Research (SBIR) Phase III Indefinite Delivery Indefinite Quantity (IDIQ) contract supporting the commercialization of the preceding SBIR efforts. T2C2 will utilize a two-level maintenance concept, will be Soldier-maintained, and initially supported by Interim Contractor Support. An analysis will be conducted to determine the ultimate supportability path. This strategy will allow a capability to be integrated and delivered quickly to support a limited deployment of Low Rate Initial Production (LRIP) units in FY17 required for Production Verification and the Initial Operational Test and Evaluation (IOT&E), with Full-Rate Production (FRP) planned for 4Q FY17.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>EA3 / *Transportable Tactical Cmd Comms (T2C2)* | |

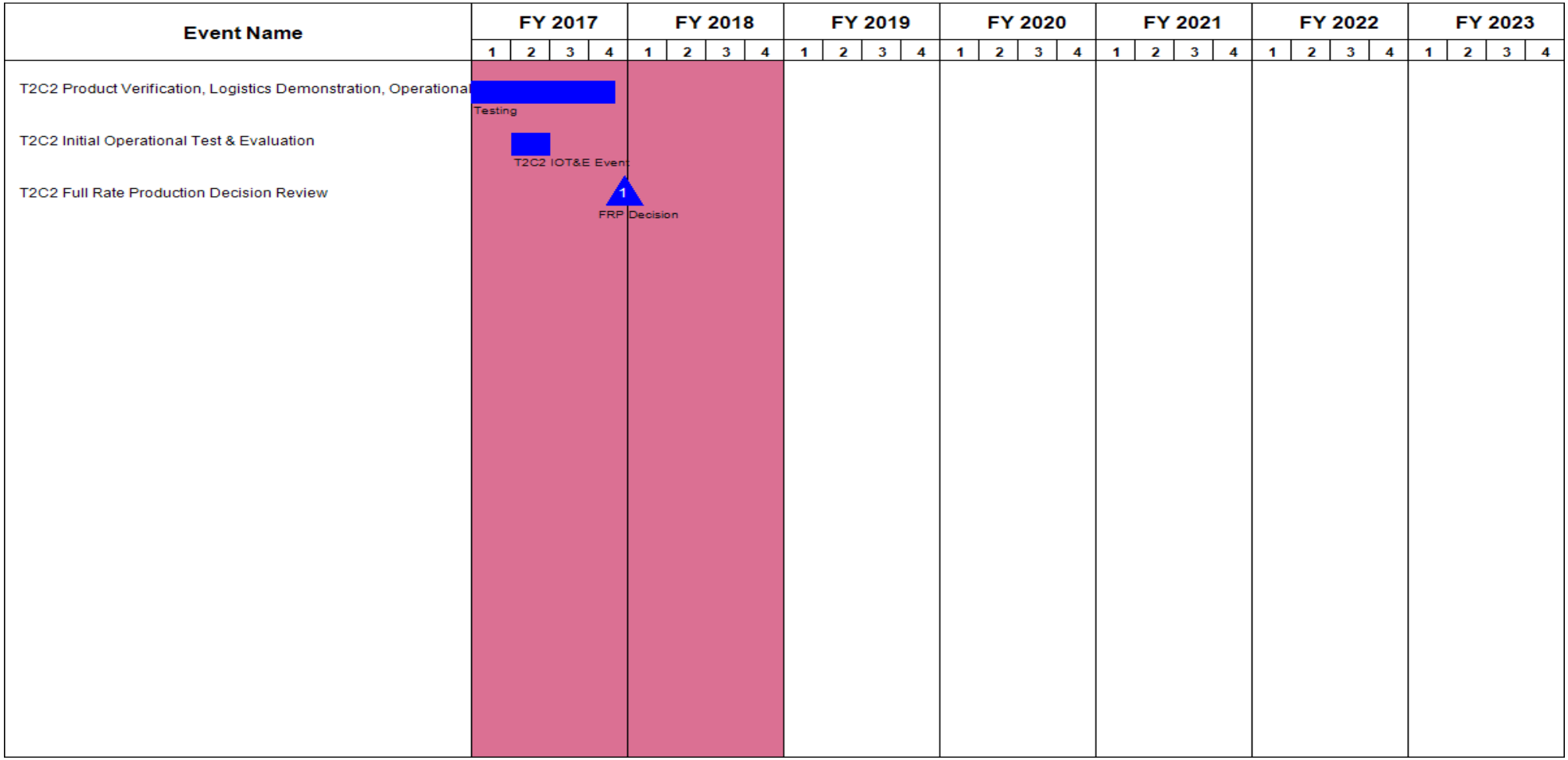
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T2C2 Testing | TBD | Various : Various | 4.894 | 3.511 | Oct 2016 | - | | - | | - | | - | 0.000 | 8.405 | - |
| T2C2 Testing Articles and Transportation | TBD | Various : Various | 0.309 | - | | - | | - | | - | | - | 0.000 | 0.309 | - |
| | | **Subtotal** | 5.203 | 3.511 | | - | | - | | - | | - | 0.000 | 8.714 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 5.203 | 3.511 | | 0.000 | | - | | - | | - | 0.000 | 8.714 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>EA3 / *Transportable Tactical Cmd Comms (T2C2)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>EA3 / *Transportable Tactical Cmd Comms (T2C2)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Milestone C Preparation | 3 | 2014 | 1 | 2016 |
| T2C2 Product Verification, Logistics Demonstration, Operational Test & Reports | 4 | 2016 | 4 | 2017 |
| T2C2 Initial Operational Test & Evaluation | 2 | 2017 | 2 | 2017 |
| T2C2 Full Rate Production Decision Review | 4 | 2017 | 4 | 2017 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>EK8 / *Enroute Mission Command* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EK8: *Enroute Mission Command* | - | 4.492 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4.492 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

FY 2018 and out funding realigned to OSD PE 1203142A to reflect new Major Force Program 12 (MFP12) Space configuration.

**A. Mission Description and Budget Item Justification**

Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.

FY17 funding will support test by the Army Test and Evaluation Command (ATEC) during Operational Assessment (OA). The OA supports the Milestone Decision Authority (MDA) Disposition Decision (FY18) to continue procurement and fielding.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** EMC Testing<br>***Description:*** EMI/EMC, Flight Test and Operational Assessment | 4.492 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 4.492 | - | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • B08400: *Enroute Mission Command* | - | 21.667 | 37.401 | - | 37.401 | 8.653 | - | - | - | 0.000 | 67.721 |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>EK8 / *Enroute Mission Command* |

**D. Acquisition Strategy**

The continued procurement of the EMC full operational capability follows DoDI 5000.02, 7 Jan 2015, Enclosure 13, Rapid Fielding of Capabilities. The Milestone Decision Authority (MDA) and project manager will tailor and streamline program strategy based on the required timelines to meet urgent need capability requirements. The Army Executive Agent signed an Acquisition Decision Memorandum (ADM) on 27 April 2015 delegating MDA to PEO C3T. The MDA signed an ADM on 11 May 2015 selecting the KuKa Antenna and Radome for the Full Operational Capability (FOC). An ADM was signed on 20 May 2015 granting approval to enter into production and deployment phase.

Due to rephasing of FY17 OPA funding into FY18/19, program has been restructured. Initial Operational Capability met in May 2015 with modification of five C-17s with satellite antennae and installation kits, and roll-on/roll-off, battalion level, Key Leader Node (KEN). Full Operational Capability (FOC) is 35 C-17s, seven KENs and 21 company level Dependent Airborne Nodes (DAN) and an airborne command post suite (CASPAN). FOC is currently projected for FY20. Planning to field an interim capability and conduct an Operational Assessment in FY17.

FY17 RDT&E funding supports test by the Army Test and Evaluation Command (ATEC) during Operational Assessment (OA). The OA supports the Milestone Decision Authority (MA) Disposition Decision (FY18) to continue procurement and fielding.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>EK8 / *Enroute Mission Command* | |

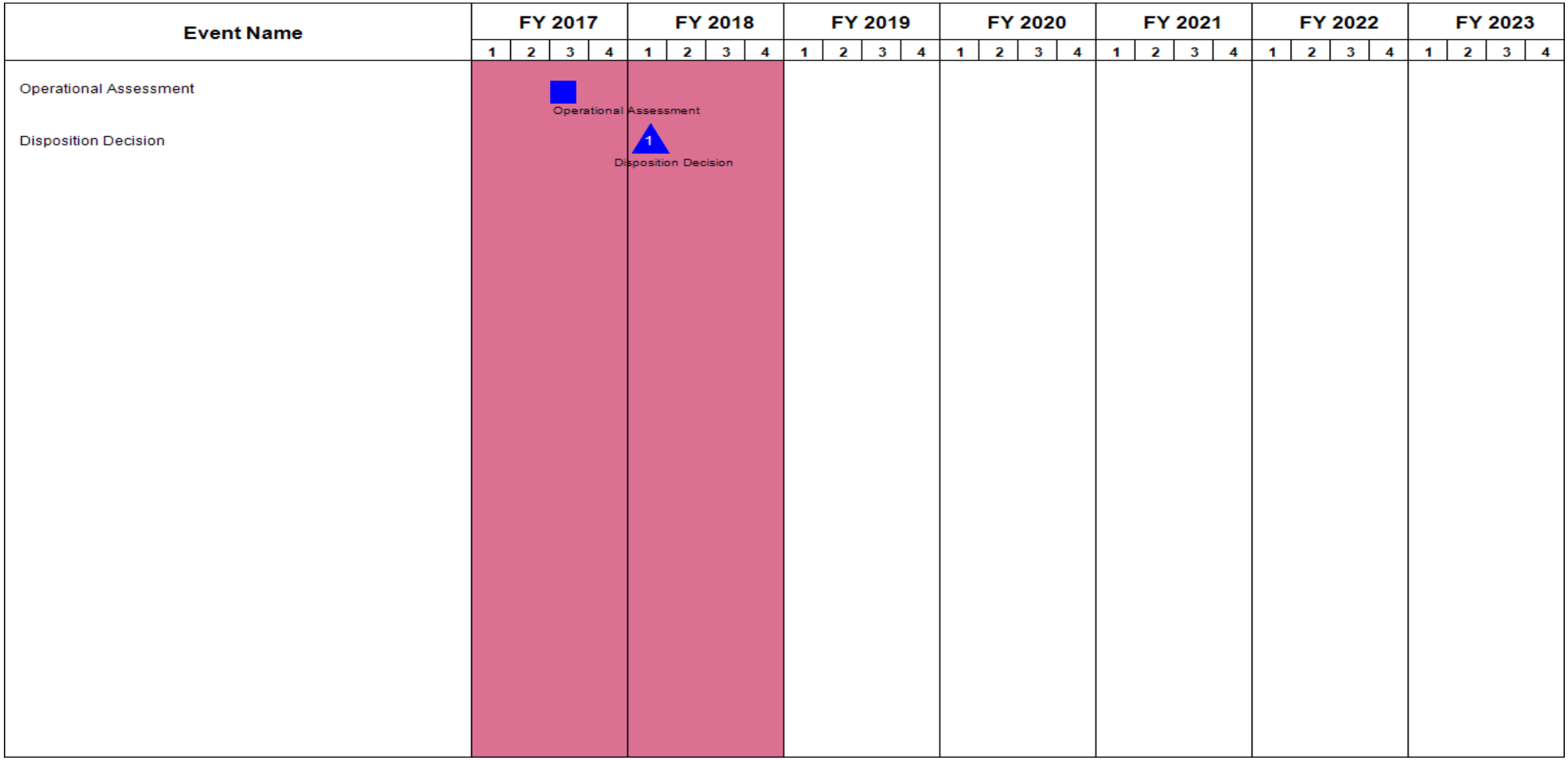
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EMC Testing | MIPR | Aberdeen Proving Ground, MD : ATEC | 1.361 | 4.492 | | - | | - | | - | | - | 0.000 | 5.853 | - |
| | | **Subtotal** | 1.361 | 4.492 | | - | | - | | - | | - | 0.000 | 5.853 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 1.361 | 4.492 | | 0.000 | | - | | - | | - | 0.000 | 5.853 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>EK8 / *Enroute Mission Command* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>EK8 / *Enroute Mission Command* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| EMI/EMC Test | 2 | 2016 | 2 | 2016 |
| Flight Test | 4 | 2016 | 4 | 2016 |
| Operational Assessment | 3 | 2017 | 3 | 2017 |
| Disposition Decision | 1 | 2018 | 1 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303150A *I Army Global Command & Control System* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 4.536 | 10.475 | 2.034 | - | 2.034 | 2.073 | 2.110 | 2.157 | 2.198 | Continuing | Continuing |
| C86: *Army Global C2 System* | - | 0.449 | 6.028 | 2.034 | - | 2.034 | 2.073 | 2.110 | 2.157 | 2.198 | Continuing | Continuing |
| EA5: *Strategic and Joint Mission Command* | - | 4.087 | 4.447 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 8.534 |

**A. Mission Description and Budget Item Justification**

Global Command and Control System-Army (GCCS-A): This project is the Army component system that directly supports the implementation of the Global Command and Control System Family of Systems. GCCS-A provides automated command and control tools for Army Strategic and Operational Theater Commanders to enhance warfighter capabilities throughout the spectrum of conflict during joint and combined operations in support of National Security. The GCCS-A developed software systems dramatically improves the Army's ability to analyze courses of action; develop and manage Army Forces; and ensure feasibility of war plans. In accordance with Army Command Post Computing Environment and Joint Command and Control objectives, GCCS-A was re-architected away from a scalable process architecture based server - thick client architecture to a virtualized server - web client architecture hosted on Battle Command Common Services (BCCS)/Tactical Server Infrastructure (TSI) and Mission Command Workstation. GCCS-A strategic tools for readiness reporting have been modernized and replaced with the Defense Readiness Reporting System - Army (DRRS-A), a suite of web based applications for Army Readiness, Force Registration and Force Projection.

Army Joint and Strategic Command and Control (AJaSC2) is a modernization development effort for the Army's joint and strategic C2 capabilities. AJaSC2 provides the materiel solution in response to the Army Mission Command for Unified Action Capability Definition Package (AMCUA CDP). AJaSC2 enables Army operational headquarters to integrate with the Joint Force Commands and Unified Action Partners (UAP). AJaSC2 provides Army leaders: Joint Common Operating Picture (COP); Adaptive planning and execution capabilities for distributed, synchronous and asynchronous collaboration services to develop, revise, and execute their warfighting plans supported by theaterwide analytics; strategic Situational Awareness (SA) to coalition operations and other mission partners and Coordination and synchronization of Joint Execution Mission Management.

GCCS-A will transition into sustainment in FY19.

Fiscal Year 2019 base funding will support the Defense Readiness Reporting System - Army (DRRS-A), the Army's capability for unit readiness reporting, unit registration and force planning and projection activities that enables Title 10 reporting to Congress. Specifically the funding will provide program oversight and technical development, testing and training support to enable the readiness and force projection capabilities.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0303150A *I Army Global Command & Control System* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 4.718 | 10.475 | 4.554 | - | 4.554 |
| Current President's Budget | 4.536 | 10.475 | 2.034 | - | 2.034 |
| Total Adjustments | -0.182 | 0.000 | -2.520 | - | -2.520 |
| • Congressional General Reductions | -0.002 | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.180 | - | | | |
| • Adjustments to Budget Years | - | - | -2.520 | - | -2.520 |

**Change Summary Explanation**

Fiscal Year 2019 base funding will support DRRS-A. The Army's capability for unit readiness reporting, unit registration and force planning and projection activities that enable Title 10 reporting to Congress. Specifically the funding will provide program oversight, technical development, testing and training support to enable the readiness and force projection capabilities.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303150A / *Army Global Command & Control System* | Project (Number/Name)<br>C86 / *Army Global C2 System* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C86: *Army Global C2 System* | - | 0.449 | 6.028 | 2.034 | - | 2.034 | 2.073 | 2.110 | 2.157 | 2.198 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Global Command and Control System-Army (GCCS-A): This project is the Army component of the Global Command and Control System (GCCS) Family of Systems (FoS). GCCS-A provides automated command and control tools, including Force readiness, planning and movement, and situational awareness, for Army Strategic and Operational Theater commanders to enhance warfighter capabilities throughout the spectrum of conflict during Joint and combined operations in support of National Security. GCCS-A dramatically improves the Army's ability to analyze courses of action, develop and manage Army forces and execute war plans. GCCS-A links the GCCS-Joint Common Operating Picture with the Army Mission Command systems. In accordance with Army Command Post Computing Environment and Joint Command and Control objectives, GCCS-A is being re-architected away from a scalable process architecture based server - thick client architecture to a virtualized server - Battle Command Common Services (BCCS)/Tactical Server Infrastructure (TSI) and Mission Command Workstation.

GCCS-A will transition into sustainment in FY19.

The Defense Readiness Reporting System- Army (DRRS-A) is the Army's Authoritative Readiness Reporting System. This information technology system provides unit readiness reporting, unit registration and force planning and projection activities to enable Title 10 reporting to Congress. All Fiscal Year 2019 base funding will support DRRS-A. Specifically this funding will provide additional system enhancements and testing to support emerging developmental requirements to satisfy the Army's and Joint readiness reporting capabilities along with ensuring interoperability of Army and Joint Systems. DRRS-A is the Army's critical enabler which directly enables the Quarterly Readiness report to Congress.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Software and System Engineering (GCCS-A)<br>***Description:*** Software and System Engineering for GCCS-A and DRRS-A Modernization | 0.162 | - | - |
| ***Title:*** Synchronize with Joint C2 objective Architecture (GCCS-A)<br>***Description:*** Software ehancement efforts required to synchronize with Joint C2 objective Architecture | 0.047 | - | - |
| ***Title:*** Test and Evaluation (GCCS-A)<br>***Description:*** Test and Evaluation for GCCS-A | 0.110 | - | - |
| ***Title:*** Program Support and Management (GCCS-A) | 0.130 | 0.150 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>C86 / *Army Global C2 System* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs<br><br>***FY 2018 Plans:***<br>Program Support and Management for GCCS-A<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>GCCS-A C86 line will be transitioning into sustainment in FY19. | | | |
| ***Title:*** Program Support and Management for Readiness Capabilities (GCCS-A)<br><br>***Description:*** Provides program management and acquisition oversight functions to enable the Army's readiness capabilities.<br><br>***FY 2018 Plans:***<br>Provide program management and acquisition oversight functions to enable the Army's readiness capabilities.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>GCCS-A C86 line will be transitioning into sustainment in FY19. | - | 0.166 | - |
| ***Title:*** Defense Readiness Reporting System (DRRS-A) - Software Enhancements (Design/Develop)<br><br>***Description:*** Support to design, develop, and deploy emerging requirements into the Army's authoritative readiness reporting system to include: Software enhancements to support evolving DoD and Army readiness policies, processes, technical standards and new interace and interoperability requirements needed to share Army authoritative readiness data with Joint and Army data sharing partners.<br><br>***FY 2018 Plans:***<br>Software enhancements for the Army's authoritative readiness reporting system.<br><br>***FY 2019 Plans:***<br>Software enhancements for the Army's authoritative readiness reporting system.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Initial year incorporated start up costs | - | 4.845 | 1.726 |
| ***Title:*** Defense Readiness Reporting Sytem (DRRS-A) - Test and Integration<br><br>***Description:*** Support for developmental and interoperability testing required for the Army's authoritative readiness reporting system. | - | 0.867 | 0.308 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>C86 / *Army Global C2 System* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***FY 2018 Plans:***<br>Support for developmental and interoperability testing required for the Army's authoritative readiness reporting system.<br>***FY 2019 Plans:***<br>Developmental and interoperability testing.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Initial year incorporated start up costs | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.449 | 6.028 | 2.034 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BA8250: *BA8250 Army Global Cmd & Control Sys (AGCCS) - OPA* | 2.530 | 2.658 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 5.188 |

**Remarks**

**D. Acquisition Strategy**

The GCCS-A Modernization Strategy consists of two separate program efforts. (1) A Bridge effort, Acquisition Category (ACAT) III level and (2) a Modernization development effort for the Army's Joint and Strategic command and Control capabilities infrastructure software products. The GCCS-A modernization development effort will be in compliance with Joint Command and Control Capability Development Document (JC2 CDD) and Army Mission Command for Unified Action Capability Definition Package (AMCUA CDP). DRRS-A will continue to satisfy readiness reporting requirements from Army Readiness Division (DAMO-ODR). The Bridge Effort's acquisition approach consists of a support agreement with CECOM LCMC SEC as the prime software developer utilizing a mix of government and contractor support.

The DRRS-A development effort in FY19 is accomplished through an existing Cost Plus Fixed Fee contract with Sotera Defense Solutions Inc. and testing is managed at the Army Software Engineering Center at Aberdeen Proving Grounds, Maryland.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303150A / *Army Global Command & Control System* | Project (Number/Name)<br>C86 / *Army Global C2 System* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Office Management (GCCS-A) | Various | Various : Various Locations | 15.808 | 0.130 | | 0.150 | | - | | - | | - | 0.000 | 16.088 | Continuing |
| | | **Subtotal** | 15.808 | 0.130 | | 0.150 | | - | | - | | - | 0.000 | 16.088 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Defense Readiness Reporting System-Army Software Development | Option/ CPFF | Software Engineering Center : APG, MD | 10.217 | - | | 4.845 | Sep 2018 | 1.726 | Mar 2019 | - | | 1.726 | 0.000 | 16.788 | 10.217 |
| GCCS-A/DRRS-A Bridge Effort Software Development (GCCS-A) | MIPR | Software Engineering Center : APG, MD | 17.636 | 0.209 | | - | | - | | - | | - | 0.000 | 17.845 | 4.893 |
| | | **Subtotal** | 27.853 | 0.209 | | 4.845 | | 1.726 | | - | | 1.726 | 0.000 | 34.633 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support Contractors (GCSS-A) | C/FP | Various : Various | 17.333 | - | | 0.166 | | - | | - | | - | 0.000 | 17.499 | 17.333 |
| | | **Subtotal** | 17.333 | - | | 0.166 | | - | | - | | - | 0.000 | 17.499 | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ATEC/JTIC/CTSF/ SEC(GCCS-A) | MIPR | Various : Various | 5.938 | 0.110 | | - | | - | | - | | - | 0.000 | 6.048 | 6.878 |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303150A / *Army Global Command & Control System* | Project (Number/Name)<br>C86 / *Army Global C2 System* | |

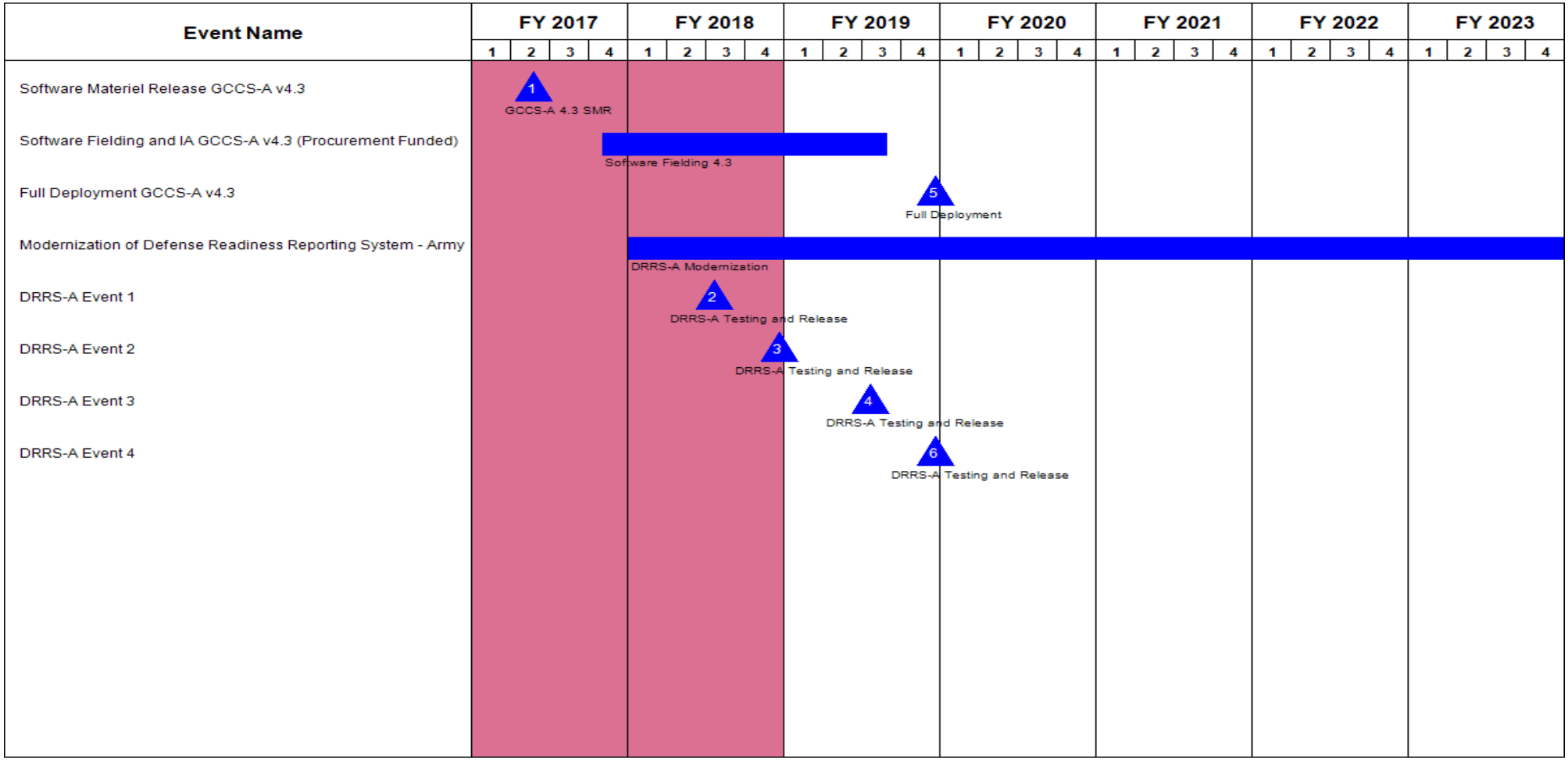
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Defense Readiness Reporting System - Army (DRRS-A) | IA | Army Software Engineering Center : Aberdeen Proving Grounds, MD | - | - | | 0.867 | Sep 2018 | 0.308 | Mar 2019 | - | | 0.308 | 0.000 | 1.175 | - |
| | | **Subtotal** | 5.938 | 0.110 | | 0.867 | | 0.308 | | - | | 0.308 | 0.000 | 7.223 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 66.932 | 0.449 | | 6.028 | | 2.034 | | - | | 2.034 | 0.000 | 75.443 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>C86 / *Army Global C2 System* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>C86 / *Army Global C2 System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Software Materiel Release GCCS-A v4.3 | 2 | 2017 | 2 | 2017 |
| Software Fielding and IA GCCS-A v4.3 (Procurement Funded) | 4 | 2017 | 3 | 2019 |
| Full Deployment GCCS-A v4.3 | 4 | 2019 | 4 | 2019 |
| Modernization of Defense Readiness Reporting System - Army | 1 | 2018 | 4 | 2023 |
| DRRS-A Event 1 | 3 | 2018 | 3 | 2018 |
| DRRS-A Event 2 | 4 | 2018 | 4 | 2018 |
| DRRS-A Event 3 | 3 | 2019 | 3 | 2019 |
| DRRS-A Event 4 | 4 | 2019 | 4 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303150A / *Army Global Command & Control System* | Project (Number/Name)<br>EA5 / *Strategic and Joint Mission Command* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA5: *Strategic and Joint Mission Command* | - | 4.087 | 4.447 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 8.534 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Army Joint and Strategic Command and Control (AJaSC2) is a modernization development effort for the Army's joint and strategic C2 capabilities. AJaSC2 provides the materiel solution in response to the Army Mission Command for Unified Action Capability Definition Package (AMCUA CDP). AJaSC2 enables Army operational headquarters to integrate with the Joint Force Commands and Unified Action Partners (UAP). AJaSC2 is a software only implementation of strategic applications and interoperability services that leverage the unified software architecture design (core infrastructure and selected common applications being implemented in the CPCE) that provides Army leaders: Joint Common Operating Picture (COP); Adaptive planning and execution capabilities for distributed, synchronous and asynchronous collaboration services to develop, revise, and execute their warfighting plans supported by theaterwide analytics; strategic Situational Awareness (SA) to coalition operations and other mission partners and coordination and synchronization of Joint Execution Mission Management. Capability Packages enabled by AJaSC2 are providing Force Employment, Joint Force Synchronization, and Total Force Analysis. The operational payoff providing the Joint Force Commander a linkage between Army Mission Command and Unified Action Partners, enabling Unified Action through integration with existing and future applications (including CPCE and MCE) and contributes to achieving Shared Understanding during Unified Land Operations (ULO) facilitating effective Mission Command.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Software Design and Systems Engineering (Pre Milestone B)<br>***Description:*** Software Development and Systems Engineering of Capability Packages (Common Operating Environment (COE) System Engineering)<br>***FY 2018 Plans:***<br>Finalize Capability Package designs and required specifications/standards. Conduct research and analysis and systems engineering in coordination with other Joint Programs with an interdependency and with the Army Command Post and Mounted Computing Environments.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Requirement to be completed in FY18. | 3.177 | 1.853 | - |
| ***Title:*** Synchronization with COE and Command Post Computing Environment (CP CE) and Joint C2 objective Architecture<br>***Description:*** Software ehancement efforts required to sync with COE/CPCE and Joint C2 objective architecture | 0.510 | - | - |
| ***Title:*** Program Support and Management | 0.400 | 1.315 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>EA5 / *Strategic and Joint Mission Command* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs<br><br>***FY 2018 Plans:***<br>Develop technical requirements for the three Capability Packages and synchronize those requirements with CPCE and the Joint community to ensure requirements supporting the Joint C2 objective Architecture are fully accounted for.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Requirement to be completed in FY18. | | | |
| ***Title:*** Joint Requirements Validation Process<br><br>***Description:*** Synchronization and Systems Engineering efforts with COE and Command Post Computing Environment (CPCE) and Joint C2 objective Architecture for CP 3, 4 and 5.<br><br>***FY 2018 Plans:***<br>Develop technical requirements for the three Capability Packages and synchronize those requirements with CPCE and the Joint community to ensure requirements supporting the Joint C2 objective Architecture are fully accounted for.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Requirement to be completed in FY18. | - | 1.279 | - |
| **Accomplishments/Planned Programs Subtotals** | 4.087 | 4.447 | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BA8250: *BA8250 Army Global Cmd & Control Sys (AGCCS) - OPA* | 2.530 | 2.658 | 2.643 | - | 2.643 | 3.688 | 2.848 | - | - | 0.000 | 14.367 |

**Remarks**

**D. Acquisition Strategy**

In accordance with the Army Mission Command for Unified Action (AMCUA) CDP approved December of 2014. The AMCUA CDP provides an overarching structure for future Army Mission Command systems. The AMCUA initiative will meet the requirements to enable planning and share situational awareness within an interdependent enterprise services network comprised of Unified Action Partners (UAP) and sister service components to achieve integrated mission operations. The AMCUA CDP defines the Land Component-unique Mission Command (MC) capabilities that the Army will develop to enable unified action through integration with existing and future

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>EA5 / *Strategic and Joint Mission Command* |

Joint and Service command and control applications. MC capability contributions will enable Joint Forces Land Component Command (JFLCC) Commanders to gain and maintain Situational Awareness (SA), make decisions, and exercise authority and direction via a flexible, distributive and seamless system.

The acquisition strategy for AJaSC2 consists of the development, testing and fielding of Capability Packages implemented over time and synchronized with Command Post Computing Environment infrastructure. AJaSC2 will utilize the "Information Technology (IT) Box" construct. As such, evolutionary development of the software will continue as defined Capability Packages to meet emerging requirements that fall within the bounds of the approved IT Box. AJaSC2 strategy will consist of agile application development which will utilize and leverage existing and emerging technologies from Programs of Record and Common Operating Environment (COE) infrastructure. The product development under this R-Form will be accomplished in part under a Project Manager, Mission Command engineering services contract approach which will consist of multiple prime contractors competitively bidding on development efforts.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0303150A / *Army Global Command & Control System* | Project (Number/Name)<br>EA5 / *Strategic and Joint Mission Command* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Office Management | Various | APG, MD : APG, MD | - | 0.400 | | 1.315 | | - | | - | | - | 0.000 | 1.715 | - |
| | | **Subtotal** | - | 0.400 | | 1.315 | | - | | - | | - | 0.000 | 1.715 | N/A |

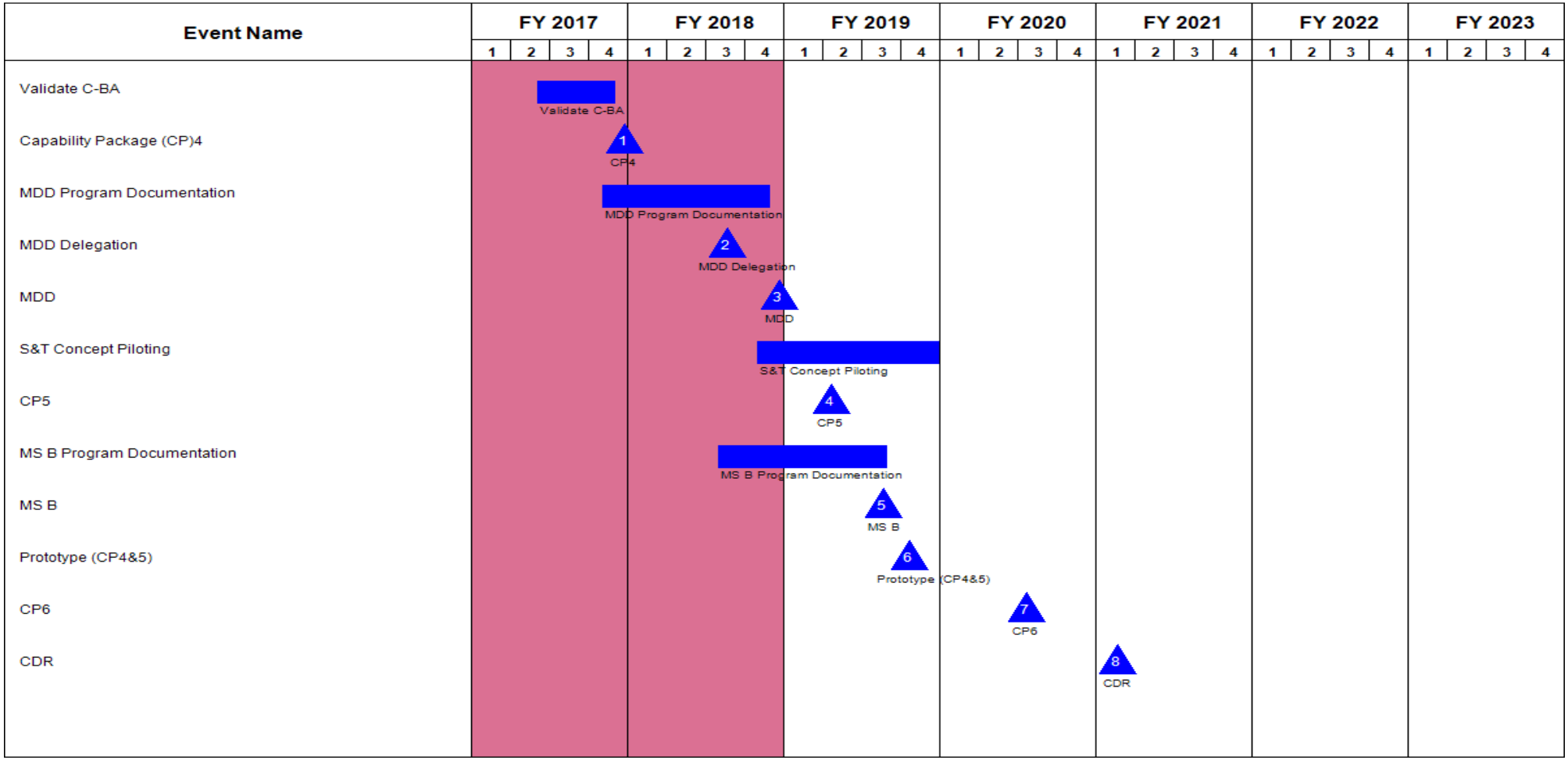
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Development and Systems Engineering | TBD | TBD : TBD | - | 3.177 | | 1.853 | | - | | - | | - | 0.000 | 5.030 | - |
| Synchronization with COE, CP CE, and Joint C2 | TBD | TBD : TBD | - | 0.510 | | 1.279 | | - | | - | | - | 0.000 | 1.789 | - |
| | | **Subtotal** | - | 3.687 | | 3.132 | | - | | - | | - | 0.000 | 6.819 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | 4.087 | | 4.447 | | - | | - | | - | 0.000 | 8.534 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>EA5 / *Strategic and Joint Mission Command* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303150A / *Army Global Command & Control System* | **Project (Number/Name)**<br>EA5 / *Strategic and Joint Mission Command* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Validate C-BA | 2 | 2017 | 4 | 2017 |
| Capability Package (CP)4 | 4 | 2017 | 4 | 2017 |
| MDD Program Documentation | 4 | 2017 | 4 | 2018 |
| MDD Delegation | 3 | 2018 | 3 | 2018 |
| MDD | 4 | 2018 | 4 | 2018 |
| S&T Concept Piloting | 4 | 2018 | 4 | 2019 |
| CP5 | 2 | 2019 | 2 | 2019 |
| MS B Program Documentation | 3 | 2018 | 3 | 2019 |
| MS B | 3 | 2019 | 3 | 2019 |
| Prototype (CP4&5) | 4 | 2019 | 4 | 2019 |
| CP6 | 3 | 2020 | 3 | 2020 |
| CDR | 1 | 2021 | 1 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305172A / *Combined Advanced Applications* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.000 | 1.100 | 1.500 | - | 1.500 | 1.500 | 1.500 | 1.500 | 1.500 | 0.000 | 8.600 |
| XT9: *COMBINED ADVANCED APPLICATIONS* | - | 0.000 | 1.100 | 1.500 | - | 1.500 | 1.500 | 1.500 | 1.500 | 1.500 | 0.000 | 8.600 |

**A. Mission Description and Budget Item Justification**

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 1.100 | 1.500 | - | 1.500 |
| Current President's Budget | 0.000 | 1.100 | 1.500 | - | 1.500 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305179A / *Integrated Broadcast Service (IBS)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.000 | 0.000 | 0.450 | - | 0.450 | 0.459 | 0.467 | 0.500 | 0.000 | 0.000 | 1.876 |
| EF4: *Integrated Broadcast System* | - | 0.000 | 0.000 | 0.450 | - | 0.450 | 0.459 | 0.467 | 0.500 | 0.000 | 0.000 | 1.876 |

**Note**

Integrated Broadcast Service is a new start effort in FY 2019. This project last received funding in FY 2016.

**A. Mission Description and Budget Item Justification**

The Joint Program Office (JPO) for Integrated Broadcast Service (IBS) Terminals supports the Joint Services and the Special Operations Command (SOCOM). The IBS transmits worldwide time-sensitive tactical and strategic intelligence and targeting data to all echelons of Joint Service operational users. The JPO is responsible for coordinating modernization and sustainment of IBS terminals compatible with the UHF SATCOM IBS broadcasts. The JPO is pursuing a next generation non-developmental item to replace the existing Joint Tactical Terminals (JTT). The transmit/receive-capable JTT systems currently consist of the JTT-Senior and JTT-IBS configurations, and they satisfy the radio communication Key Performance Parameters for the IBS Program. The JTT is the official IBS producer system, and ensures continued IBS interoperability to a variety of tactical producers/consumers across the Joint Services.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 0.000 | 0.450 | - | 0.450 |
| Current President's Budget | 0.000 | 0.000 | 0.450 | - | 0.450 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305179A / *Integrated Broadcast Service (IBS)* | Project (Number/Name)<br>EF4 / *Integrated Broadcast System* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF4: *Integrated Broadcast System* | - | 0.000 | 0.000 | 0.450 | - | 0.450 | 0.459 | 0.467 | 0.500 | 0.000 | 0.000 | 1.876 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Integrated Broadcast Service is a new start effort in FY 2019. This project last received funding in FY 2016.

**A. Mission Description and Budget Item Justification**

The Joint Program Office (JPO) for Integrated Broadcast Service (IBS) Terminals supports the Joint Services and the Special Operations Command (SOCOM). The IBS transmits worldwide time-sensitive tactical and strategic intelligence and targeting data to all echelons of Joint Service operational users. The JPO is responsible for coordinating modernization and sustainment of IBS terminals compatible with the UHF SATCOM IBS broadcasts. The JPO is pursuing a next generation non-developmental item to replace the existing Joint Tactical Terminals (JTT) and performs JTT life cycle program management and technical fixes. The IBS network uses Type-1 encryption, Common Interactive Broadcast (CIB), and Common Message Format (CMF). Funds support acquisition related technical development, requirements, testing and integration of next generation JTT systems and components.

FY 2019 funds in the amount of $0.450 million will be used for testing and certification for the next generation JTT and engineering services to support the program office.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Support Costs and Management Services | - | - | 0.450 |
| ***Description:*** Engineering Support | | | |
| ***FY 2019 Plans:***<br>Initiate system engineering support. | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>New start - Market research for next generation JTT efforts. | | | |
| **Accomplishments/Planned Programs Subtotals** | - | - | 0.450 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • V29600: *JTT/CIBS-M* | 5.337 | 12.154 | 10.268 | - | 10.268 | 7.714 | 5.338 | 5.511 | 1.837 | 0.000 | 48.159 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305179A / *Integrated Broadcast Service (IBS)* | **Project (Number/Name)**<br>EF4 / *Integrated Broadcast System* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

FY 2019 funds start support of the next generation JTT acquisition. FY 2017 and FY 2018 funds support fielding support efforts for JTT IBS.

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305179A / *Integrated Broadcast Service (IBS)* | Project (Number/Name)<br>EF4 / *Integrated Broadcast System* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| User Support | MIPR | ICOE : Fort Huachuca, AZ | 0.046 | - | | - | | - | | - | | - | 0.000 | 0.046 | - |
| Project Management Support | Allot | PM DCGS-A : APG, MD; Fort Huachuca, AZ | 0.075 | - | | - | | - | | - | | - | 0.000 | 0.075 | - |
| | | **Subtotal** | 0.121 | - | | - | | - | | - | | - | 0.000 | 0.121 | N/A |

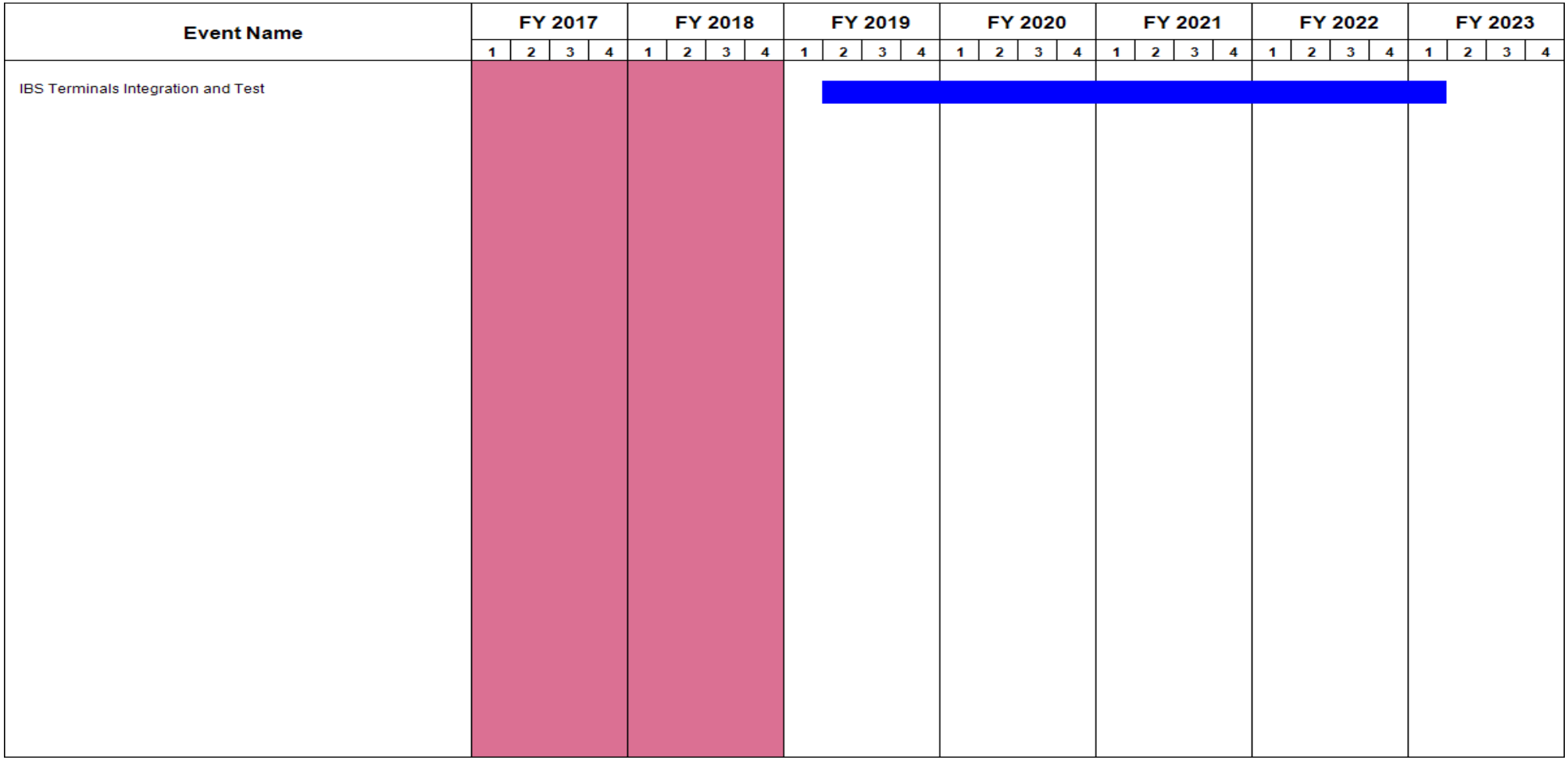
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Integration and Testing of JTT fleet Modernization | MIPR | JITC : Fort Huachuca, AZ; APG,MD | 0.629 | - | | - | | 0.450 | | - | | 0.450 | 0.000 | 1.079 | - |
| | | **Subtotal** | 0.629 | - | | - | | 0.450 | | - | | 0.450 | 0.000 | 1.079 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.750 | - | | 0.000 | | 0.450 | | - | | 0.450 | 0.000 | 1.200 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305179A / *Integrated Broadcast Service (IBS)* | **Project (Number/Name)**<br>EF4 / *Integrated Broadcast System* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305179A / *Integrated Broadcast Service (IBS)* | **Project (Number/Name)**<br>EF4 / *Integrated Broadcast System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| IBS Terminals Integration and Test | 2 | 2019 | 1 | 2023 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 8.218 | 16.925 | 6.000 | - | 6.000 | 5.099 | 5.249 | 5.231 | 8.223 | 0.000 | 54.945 |
| 11A: *Advanced Payload Develop & Spt (MIP)* | - | 1.975 | 10.733 | 1.252 | - | 1.252 | 0.145 | 0.148 | 0.000 | 7.223 | 0.000 | 21.476 |
| 11B: *Tsp Development (MIP)* | - | 2.301 | 1.480 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.781 |
| 123: *Joint Technology Center System Integration* | - | 3.942 | 4.712 | 4.748 | - | 4.748 | 4.954 | 5.101 | 5.231 | 1.000 | 0.000 | 29.688 |

**Note**

The FY2018 funding of $4,700,000 was re-aligned in accordance to Project 11B scheduled Test Event of the desired Signal of Interest in FY19 on the UAS Grey Eagle platform and MQ-1C (ER).

**A. Mission Description and Budget Item Justification**

Project 11A: The Advanced Payloads Development project line is a shared funding line between multiple Payload programs. These Payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Small Tactical Radar - Lightweight (STARLite) Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI)is a lightweight, high performance, all weather, multi-functional radar system for the Gray Eagle UAS. The STARLite system provides wide area, near real time Reconnaissance, Surveillance and Target Acquisition (RSTA) capabilities. It operates throughout the UAS flight mission profile in adverse weather and through battlefield obscurants. The Synthetic Aperture Radar (SAR) mode generates quality images for the battlefield commander for detection, classification and location of stationary commercial wheeled vehicle-size targets. The MTI mode detects moving ground targets, to include man-sized detection, and provides location information and performs cross-cue with the Electro-Optic/Infrared (EO/IR) sensors. STARLite is increasing its software capabilities based on Initial Operational Test and Evaluation (IOT&E) results which will increase automation and upgrade to a common Graphical User Interface (GUI) to align with the Common Operating Environment (COE) requirement to enable Sensor Processing and Exploitation (SPE). The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness.

Common Sensor Payload (CSP) - Electro Optical / Infrared / Laser Designator (EO/IR/LD) provides High Definition (HD) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums with day/night capability to collect and display continuous imagery and the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for the Gray Eagle UAS which supports force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities. Additional initiatives will continue to focus on the transition of technologies directly supporting emerging requirements and the Army's Current and Future Force.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305204A *I Tactical Unmanned Aerial Vehicles* |

Project 11B: The Tactical Signals Intelligence (SIGINT) Payload (TSP) is a SIGINT sensor for the Gray Eagle that detects radio frequency (RF) emitters. The TSP system will provide a SIGINT capability to the tactical commander. The TSP system will be a modular, scalable payload using an architecture that is software reconfigurable to allow for growth and flexibility as technology, and as the adversaries use of technology, changes. This flexible architecture allows for third party software applications to be integrated into the TSP system. The TSP system processing, control and data dissemination is integrated into the Distributed Common Ground System - Army (DCGS-A) via the Operational Ground Station. It supports Manned/Unmanned (MUM) teaming with Brigade Combat Team ground SIGINT Terminal Guidance (STG) teams and manned airborne assets. The TSP system improves situational awareness and shortens the targeting cycle by detecting and identifying emitters associated with high value targets (HVTs). The TSP system is capable of processing conventional signals, standard military signals, and modern signals of interest. This includes detection, recognition, identification, direction finding, and high confidence geo-location.

Project 123: The UAS Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a Joint facility that develops, integrates, and supports the enhancement of its Multiple Unified Simulation Environment (MUSE) capability for Army systems and operational concepts. The JTC/SIL conducts prototype hardware and software development, builds the UAS Institutional Mission Simulator (IMS) trainers for the Shadow, Hunter, and Gray Eagle programs, and provides modeling and simulation support. The MUSE is a real-time, operator in-the-loop simulation that may be integrated with larger simulations in support of Army and Joint training and exercises. The MUSE is also employed as a Mission Rehearsal Tool for ongoing combat operations. This project funds the management of the JTC/SIL and MUSE enhancements. This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 8.218 | 16.925 | 12.657 | - | 12.657 |
| Current President's Budget | 8.218 | 16.925 | 6.000 | - | 6.000 |
| Total Adjustments | 0.000 | 0.000 | -6.657 | - | -6.657 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | -6.657 | - | -6.657 |

**Change Summary Explanation**

The FY2019-FY23 funding profile in accordance to Project 11B Fiscal Year (FY) 2019 Army has ceased investment (FY19-FY23) for TSP POR in support of acquisition strategy of QRCs towards a Family of Systems to meet the critical SIGINT capability need with the desired Signals of Interest on the UAS Grey Eagle Platform and the MQ-1C (ER).

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>11A / *Advanced Payload Develop & Spt (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11A: *Advanced Payload Develop & Spt (MIP)* | - | 1.975 | 10.733 | 1.252 | - | 1.252 | 0.145 | 0.148 | 0.000 | 7.223 | 0.000 | 21.476 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Advanced Payloads Development project is a shared funding line between multiple Payload programs. These Payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Small Tactical Radar - Lightweight (STARLite) ACAT III - Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI) is a lightweight, high performance, all weather, multi-functional radar system for the Gray Eagle UAS. The STARLite system provides wide area, near real time RSTA capabilities. It operates throughout the UAS flight mission profile in adverse weather and through battlefield obscurants. The Synthetic Aperture Radar (SAR) mode generates quality images for the battlefield commander for detection, classification and location of stationary commercial wheeled vehicle-size targets. The MTI mode detects moving ground targets, to include man-sized detection, and provides location information and performs cross-cue with the Electro-Optic/Infrared (EO/IR) sensors. STARLite is increasing its software capabilities based on Initial Operational Test and Evaluation (IOT&E) results which will increase automation and upgrade to a common Graphical User Interface (GUI) to align with the Common Operating Environment (COE) requirement to enable Sensor Processing and Exploitation (SPE). The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness.

Common Sensor Payload (CSP) - ACAT III - Electro Optical / Infrared / Laser Designator (EO/IR/LD) provides Standard Definition (SD) or High Definition (HD) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums. These systems provide day/night capability to collect and display continuous imagery and the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for the Gray Eagle UAS which supports intelligence gathering, force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities. Additional updates to enhance CSP usability include Target Location Accuracy (TLA) and Target Awareness Improvement (TAI). These initiatives develop the CSP into a metric sensor capable of providing rapid and enhanced targeting and reducing cognitive burden by providing improved situational awareness and multiple fields of view in a simplified manner through Hardware (H/W) and Software (S/W) improvements.

Fiscal Year (FY) 2019 base dollars in the amount of $1.252 million is for STARLite Sensor CE Development and enhanced CSP to reduce cognitive burden on the Warfighter.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** STARLite SPE | 0.560 | 1.620 | 0.626 | - | 0.626 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11A / *Advanced Payload Develop & Spt (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Description:*** Software Development to improve STARLite SPE Development, Testing and Integration.<br>***FY 2018 Plans:***<br>Complete test and integration of SPE (v.501) Software improvements onto Gray Eagle<br>***FY 2019 Base Plans:***<br>STARLite Sensor CE Development<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>STARLite Sensor CE Development | | | | | |
| ***Title:*** CSP Increased Usability<br>***Description:*** S/W development to increase the usability of the CSP. Development to increase the usability of the CSP while reducing cognitive burden on the Warfighter.<br>***FY 2018 Plans:***<br>H/W and S/W enhancements to reduce cognitive burden on the Warfighter and program office management support.<br>***FY 2019 Base Plans:***<br>Develop Tactical Awareness Improvements for increased operator situational awareness and program office management support<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program focus shift from TLA to TAI. | 1.415 | 9.113 | 0.626 | - | 0.626 |
| **Accomplishments/Planned Programs Subtotals** | 1.975 | 10.733 | 1.252 | - | 1.252 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A01003: *SAR/MTI (MIP) - A01003* | 15.724 | 19.000 | 0.000 | - | 0.000 | - | - | - | - | Continuing | Continuing |
| • A01005: *CSP FMV (MIP) - A01005* | 58.129 | 26.810 | 0.000 | 11.400 | 11.400 | - | - | - | - | Continuing | Continuing |

**Remarks**

MQ-1 PAYLOAD - UAS - A00020 was a shared Aircraft Procurement, Army (APA) funding line for CSP, STARLite and Tactical Signals Intelligence (SIGINT) Payload (TSP).

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11A / *Advanced Payload Develop & Spt (MIP)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STARLite (A01003), and CSP (A01005) are broken into individual lines within MQ-1Payload (MIP) (A01001). | | | | | | | | | | | |
| SAR/MTI (MIP) - A01003: Procurement funding line for STARLite | | | | | | | | | | | |
| CSP FMV (MIP) - A01005: Procurement funding line for CSP | | | | | | | | | | | |

**D. Acquisition Strategy**

STARLite SAR/MTI is a threshold requirement for the Gray Eagle UAS. The acquisition strategy for STARLite program was based on a full and open competition for the Army. Full Rate Production (FRP) was successfully achieved in June 2013. A follow-on production contract was awarded in April 2014 to procure all remaining STARLite Payloads required for the Gray Eagle platform. Based on Initial Operational test and Evaluation (IOT&E) results, STARLite is increasing its software capabilities to increase automation and upgrade to a common Graphical User Interface (GUI) and aligns SPE with the COE requirements. The SPE software enhancements will improve performance, reduce operator workload and enhance operator effectiveness. A competitive Research, Development, Test, and Evaluation (RDTE) funded contract was awarded to Northrop Grumman in October 2013 to perform trade studies and begin the development of the software improvements. Integration onto the Gray Eagle will be done via a sole source cost-plus fixed fee contract with the UAS prime contractor, General Atomics ASI.

Common Sensor Payload (CSP) EO/IR/LD enables the Gray Eagle to meet a KPP (Key Performance Parameter) requirement. The acquisition strategy for the CSP program was based on a full and open competition for the Army. A competitive contract was awarded in Nov 2007 to Raytheon for the build, integration, test and delivery of the CSP. Full Rate Production (FRP) was completed June 2013. A three (3) year system support contract was awarded in July 2015 for sustainment and upgrade of the CSP to include retrofitting standard definition sensors with high definition sensors and to perform RDT&E activities. The Enhanced EO/IR Capability Production Document, approved 19 Dec 2016, defines additional KPP requirements for Full Motion Video (FMV) sensors. The first KPP increases detection, recognition, and identification requirements which can only be met with the High Definition (HD) variation of the CSP. Currently, units are being fielded HD CSPs, with additional HD CSPs in production and retrofit. The second KPP requirement is for the CSP to be a metric sensor with rapid and enhanced Target Location Accuracy (TLA). The acquisition strategy for CSP in FY 2019 is to mature Software and Hardware efforts for CSP that reduce cognitive burdens on the Warfighter, improve situational awareness, provide multiple fields of view, and enhance targeting capabilities.

The acquisition strategy is to complete STARLite SPE software developmental test and integration onto Gray Eagle and Non-Recurring Engineering (NRE) support to the Night Vision and Electronic Sensors Directorate (NVESD) to continue enhancing CSP's usability for the Warfighter to reduce cognitive burden by providing improved situational awareness, while providing multiple fields of view in a simplified manner through Hardware (H/W) and S/W improvements.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>11A / *Advanced Payload Develop & Spt (MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP Program Management | MIPR | PM EOIR : Fort Belvoir, VA | 0.090 | 0.100 | | 0.632 | | 0.100 | Dec 2018 | - | | 0.100 | Continuing | Continuing | Continuing |
| STARLite Program Mgmt Personnel | Various | PM SAI : Aberdeen, MD | 1.000 | 0.150 | | 0.617 | | 0.227 | | - | | 0.227 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 1.090 | 0.250 | | 1.249 | | 0.327 | | - | | 0.327 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP Development | C/CPFF | Raytheon : McKinney, TX | 84.022 | - | | - | | - | | - | | - | 0.000 | 84.022 | - |
| STARLite Sensor CE Development | SS/CPFF | General Atomics ASI : Potway, CA | 1.295 | - | | 1.003 | | 0.399 | | - | | 0.399 | Continuing | Continuing | Continuing |
| CSP HW/SW Improvements Reduce Cognitive Burden | MIPR | Night Vision Labs : Fort Belvoir, VA | 1.704 | 1.115 | | 1.202 | | 0.426 | Mar 2019 | - | | 0.426 | Continuing | Continuing | Continuing |
| CSP Target Location Accuracy (TLA) | SS/CPFF | Raytheon : McKinney, TX | - | - | | 6.187 | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | 87.021 | 1.115 | | 8.392 | | 0.825 | | - | | 0.825 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP TLA Integration (NRE) | SS/CPFF | PM MAE(General Automics) : San Diego, CA | - | - | | 0.781 | | - | | - | | - | Continuing | Continuing | Continuing |
| | | **Subtotal** | - | - | | 0.781 | | - | | - | | - | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>11A / *Advanced Payload Develop & Spt (MIP)* | |

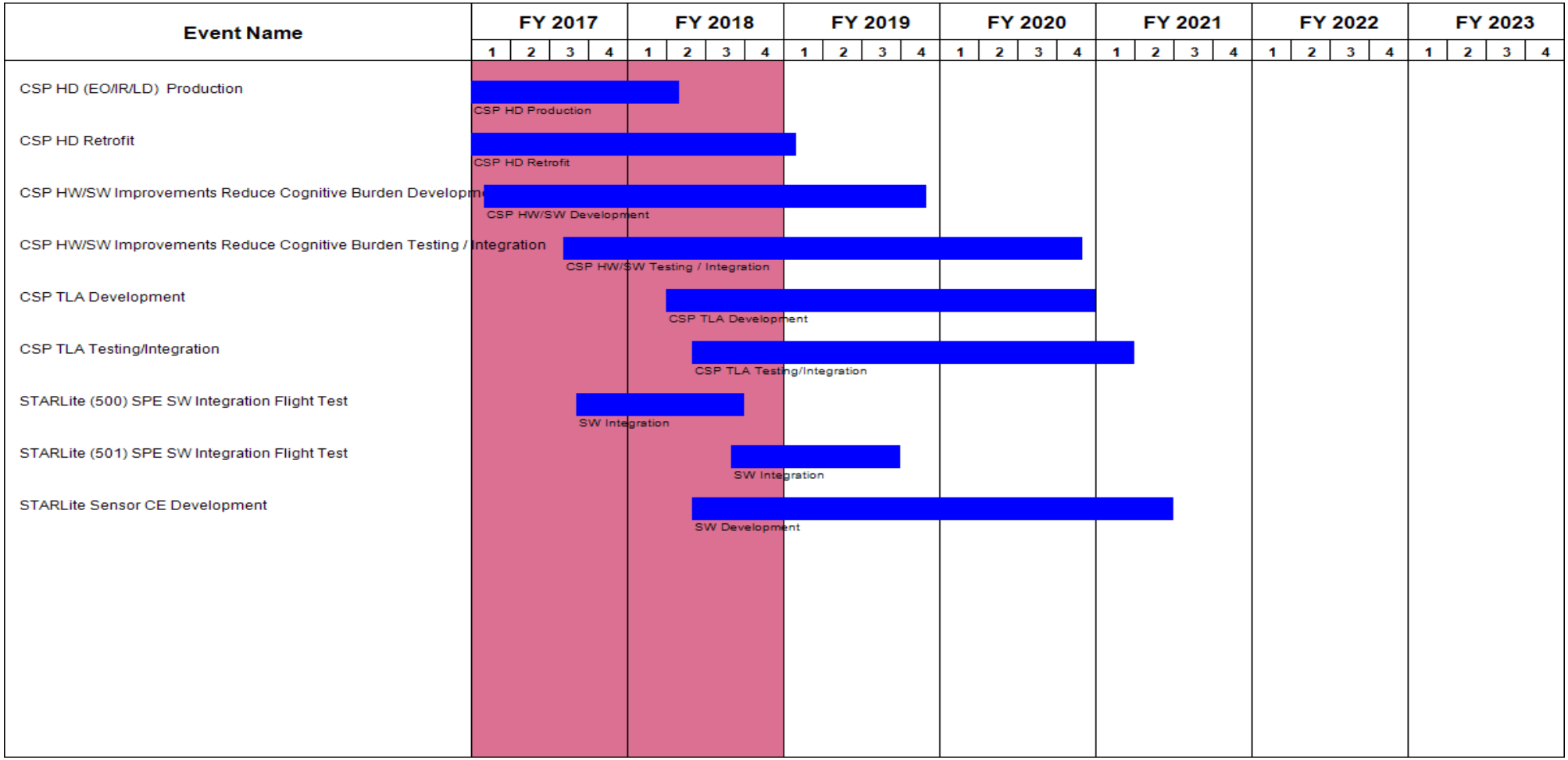
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP Testing | MIPR | Various : Various | 17.086 | - | | - | | - | | - | | - | 0.000 | 17.086 | - |
| CSP HW/SW Improvements Reduce Cognitive Burden | MIPR | Night Vision Labs : Fort Belvoir, VA | - | 0.200 | | 0.311 | | 0.100 | Mar 2019 | - | | 0.100 | Continuing | Continuing | Continuing |
| STARLite YTC Software Development Testing | MIPR | YPG : Yuma Proving Ground | 0.500 | 0.410 | | - | | - | | - | | - | Continuing | Continuing | Continuing |
| STARLite IGE Testing | MIPR | Various : Various | 13.441 | - | | - | | - | | - | | - | 0.000 | 13.441 | - |
| | | **Subtotal** | 31.027 | 0.610 | | 0.311 | | 0.100 | | - | | 0.100 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 119.138 | 1.975 | | 10.733 | | 1.252 | | - | | 1.252 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11A / *Advanced Payload Develop & Spt (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11A / *Advanced Payload Develop & Spt (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| CSP (EO/IR/LD) Award | 1 | 2008 | 1 | 2008 |
| CSP (EO/IR/LD) Production | 1 | 2008 | 2 | 2016 |
| CSP (EO/IR/LD) Testing | 2 | 2009 | 4 | 2012 |
| CSP (EO/IR/LD) Milestone C | 2 | 2010 | 2 | 2010 |
| CSP HD (EO/IR/LD) Development | 2 | 2012 | 2 | 2013 |
| CSP HD (EO/IR/LD) Testing | 1 | 2013 | 3 | 2013 |
| CSP HD (EO/IR/LD) Production | 2 | 2013 | 2 | 2018 |
| CSP HD Retrofit | 4 | 2013 | 1 | 2019 |
| CSP HW/SW Improvements Reduce Cognitive Burden Development | 1 | 2016 | 4 | 2019 |
| CSP HW/SW Improvements Reduce Cognitive Burden Testing / Integration | 3 | 2017 | 4 | 2020 |
| CSP TLA Development | 2 | 2018 | 4 | 2020 |
| CSP TLA Testing/Integration | 2 | 2018 | 1 | 2021 |
| Improvements to STARLite Sensor Processing and Exploitation | 1 | 2014 | 3 | 2016 |
| STARLite (500) SPE SW Integration Flight Test | 3 | 2017 | 3 | 2018 |
| STARLite (501) SPE SW Integration Flight Test | 3 | 2018 | 3 | 2019 |
| STARLite Sensor CE Development | 2 | 2018 | 2 | 2021 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>11B / *Tsp Development (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11B: *Tsp Development (MIP)* | - | 2.301 | 1.480 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.781 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Tactical Signals Intelligence (SIGINT) Payload (TSP) is a SIGINT sensor for the Gray Eagle that detects radio frequency (RF) emitters. The TSP system will provide a SIGINT capability to the tactical commander. The TSP system will be a modular, scalable payload using an architecture that is software reconfigured to allow for growth and flexibility as technology, and as the adversaries use of technology, changes. This flexible architecture allows for third party software applications to be integrated into the TSP system. The TSP system processing, control and data dissemination is integrated into the Distributed Common Ground System - Army (DCGS-A) via the Operational Ground Station. It supports Manned/Unmanned (MUM) teaming with Brigade Combat Team ground SIGINT Terminal Guidance (STG) teams and manned airborne assets. The TSP system improves situational awareness and shortens the targeting cycle by detecting and identifying emitters associated with high value targets (HVTs). The TSP system is capable of processing conventional signals, standard military signals, and modern signals of interest. This includes detection, recognition, identification, direction finding, and high confidence geo-location.

Fiscal Year (FY) 2019 FDI/G8 has ceased EE PEG Investment (FY19-FY23) for TSP POR in support of acquisition strategy of QRCs towards a Family of Systems to meet the critical SIGINT capability need with the desired Signals of Interest on the UAS Grey Eagle Platform and the MQ-1C (ER).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Engineering Research Development Integration and Test Support.<br><br>***Description:*** Engineering, Research, Development, Integration, and Test of the desired Signal of Interest. In addition, any activities for TSP for ongoing system improvements.<br><br>***FY 2018 Plans:***<br>Executed corrective engineering actions resulting from DT/LUT Testing Event. Initiate the required development work for TSP Beyond Block 1 for Future upgrades. Continue support of TSP Interim Contractor Logistics Support (ICLS).<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Executed corrective engineering actions resulting from DT/LUT Testing Event. Initiate the required development work for TSP Beyond Block 1 for Future upgrades. Continue support of TSP Interim Contractor Logistics Support (ICLS). | 2.301 | 1.480 | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 2.301 | 1.480 | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11B / *Tsp Development (MIP)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A01004: *A01004 - SIGINT (MIP)* | 37.682 | 1.500 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 39.182 |
| • 0605766A: *TSP Theater Net-Centric Geolocation (TNG) - PE0605766A, Project DX9: TNG funding included in Tactical Exploitation of National Capabilities (TENCAP) funding line.* | 4.955 | 6.882 | 12.340 | - | 12.340 | 11.435 | 9.177 | 13.182 | 12.554 | 0.000 | 70.525 |

**Remarks**

MQ-1 PAYLOAD - UAS - A00020: Shared Aircraft Procurement, Army (APA) procurement funding line for CSP, STARLite, TSP, and Advanced Payloads.

SIGINT (MIP) - A01004: Procurement funding line for TSP Payloads. Under Parent Line MQ-1 Payloads (MIP) - A01001.

TSP Theater Net-Centric Geolocation (TNG) - PE0605766A, Project DX9: TNG funding included in Tactical Exploitation of National Capabilities (TENCAP) funding line.

**D. Acquisition Strategy**

TSP is a threshold requirement for the MQ-1C Gray Eagle UAS. The TSP program completed the Engineering and Manufacturing Development (EMD) phase with a Milestone B decision in September 2011. The TSP Program EMD contract award was based on full-and-open competition with a period of performance that was completed in October 2015, and focused on integration and test onto the Gray Eagle platform, and integration and test of TSP software into the Operational Ground Station. The TSP EMD program is a derivative of systems that were fielded as a Quick Reaction Capability on the MQ-1C UAS and a variety of other manned platforms. The demonstrated scalability of these fielded materiel solutions allows the TSP EMD program to leverage effort that directly supports the TSP EMD program.

The TSP program entered the Low Rate Initial Production (LRIP) phase with a Milestone C decision that was approved on 2 May 2014. The TSP Program LRIP contract award was based on sole source selection with a period of performance that was completed on June 2016, and primarily focused on the obsolescence of the EMD phase assets via the required Engineering Change Proposals, and the first initial production of 30 TSP Payloads in support of the Gray Eagle Platform. The TSP Program ICLS contract award was a result of previous sole selection with a period of performance of 12-months with a 5 year option for total completion into August 2021. The primary focus supports fielding of system, continuous contractual support through operational and sustainment transition, engineering corrective actions, support of the MQ-1C (ER), and the conversion of the 30 LRIP TSP systems.

The TSP Block 1 is the current Program of Record capability. TSP Beyond Block 1 will address objectives and remaining deferred Block 1 threshold requirements as reflected in the approved Capability Production Document (CPD).

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11B / *Tsp Development (MIP)* |

Improved Gray Eagle (IGE)- Program Manager Unmanned Aircraft Systems(PM UAS)received a Congressional plus up of $49M President's Budget15(PB15) to procure Extended Range UAS which increases the CPD objective endurance requirements for the current GE configuration to an Improved Gray Eagle (IGE). TSP is scheduled for integration and testing on the IGE platform upon completion of the platform's Follow on Test Evaluation#2 scheduled 1QFY18.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>11B / *Tsp Development (MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management-Gov | RO | PM SAI : APG | 8.556 | - | | - | | - | | - | | - | 0.000 | 8.556 | - |
| Program Management Support | MIPR | Various : APG | 4.575 | - | | - | | - | | - | | - | 0.000 | 4.575 | Continuing |
| FFRDC Support | SS/CR | MITRE : APG | 2.198 | 0.350 | Dec 2016 | 0.350 | | - | | - | | - | 0.000 | 2.898 | - |
| | | **Subtotal** | 15.329 | 0.350 | | 0.350 | | - | | - | | - | 0.000 | 16.029 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP EMD | C/CPIF | BAE Systems, : Nashua, NH | 20.206 | - | | - | | - | | - | | - | 0.000 | 20.206 | - |
| TSP Engineering Changes | SS/CPFF | BAE Systems : Nashua, NH | 8.295 | - | | 0.477 | | - | | - | | - | 0.000 | 8.772 | - |
| MQ-1C (ER) and OGS Integration | SS/CPFF | Various : Various | 6.575 | - | | - | | - | | - | | - | 0.000 | 6.575 | - |
| TSP System Support (Logistics, Training, & Test) | MIPR | Various : Various | 11.843 | - | | - | | - | | - | | - | 0.000 | 11.843 | - |
| Block 2 | C/CPIF | To Be Determined : To Be Determined | - | - | | 0.478 | | - | | - | | - | 0.000 | 0.478 | - |
| | | **Subtotal** | 46.919 | - | | 0.955 | | - | | - | | - | 0.000 | 47.874 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering Support | MIPR | Various : Various | 6.158 | - | | 0.175 | | - | | - | | - | 0.000 | 6.333 | - |
| | | **Subtotal** | 6.158 | - | | 0.175 | | - | | - | | - | 0.000 | 6.333 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>11B / *Tsp Development (MIP)* | |

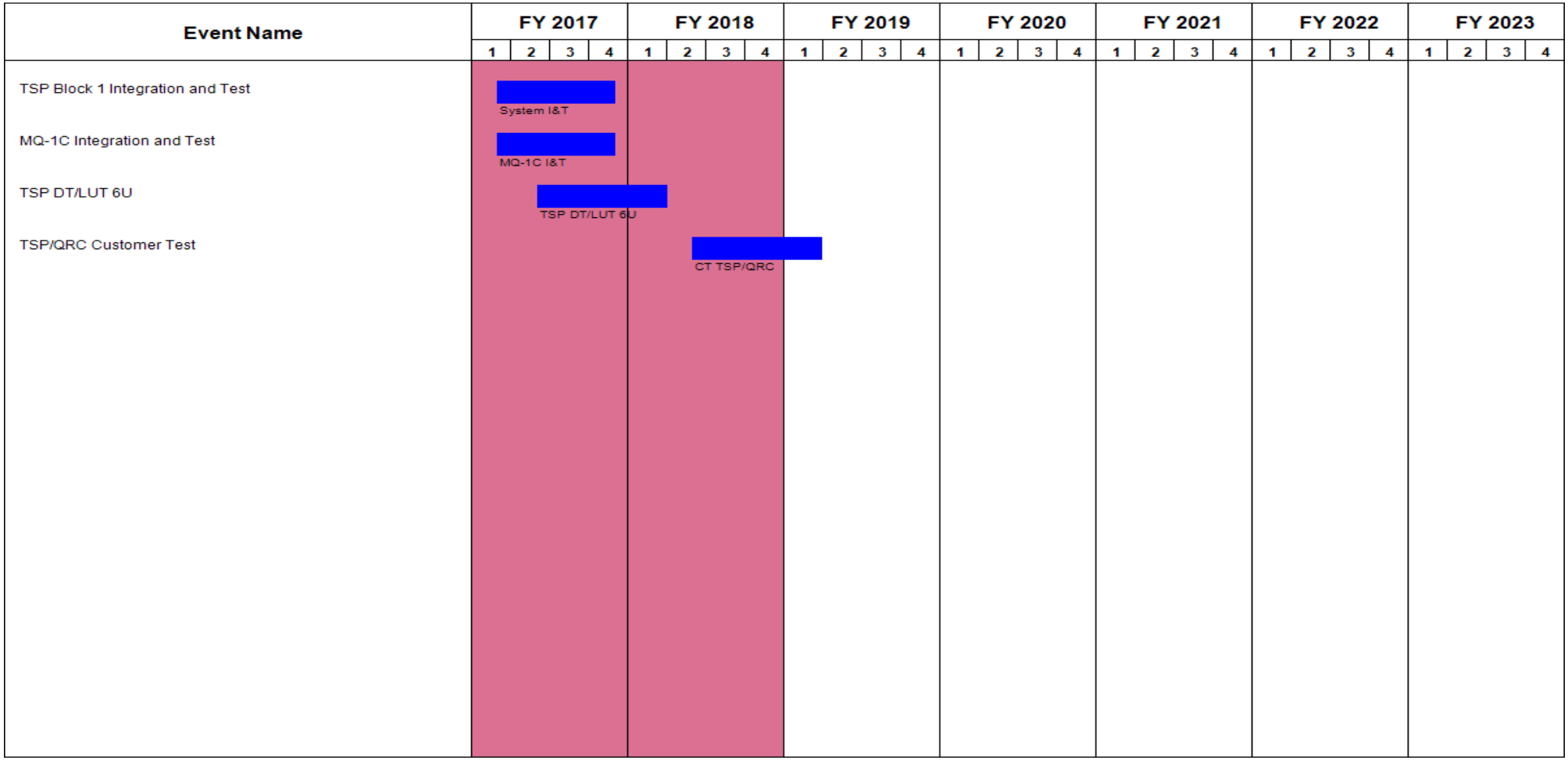
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test and Activities | MIPR | ATEC/APG : Various | 7.515 | - | | - | | - | | - | | - | 0.000 | 7.515 | - |
| Inital Operational Test & Evaluation | MIPR | ATEC/Various : Various | 2.372 | - | | - | | - | | - | | - | 0.000 | 2.372 | - |
| Test Range & Aircraft Support | MIPR | CECOM Flight Activity : Lakehurst, NJ | 4.268 | - | | - | | - | | - | | - | 0.000 | 4.268 | - |
| TSP Production Qualification Test #4 | MIPR | ATEC/Various : Various | 3.170 | 1.951 | Mar 2017 | - | | - | | - | | - | 0.000 | 5.121 | - |
| | | **Subtotal** | 17.325 | 1.951 | | - | | - | | - | | - | 0.000 | 19.276 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 85.731 | 2.301 | | 1.480 | | - | | - | | - | 0.000 | 89.512 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11B / *Tsp Development (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>11B / *Tsp Development (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| TSP Block 1 Integration and Test | 1 | 2015 | 4 | 2017 |
| MQ-1C Integration and Test | 1 | 2016 | 4 | 2017 |
| TSP/MQ-1C Air Worthiness Release | 1 | 2016 | 1 | 2016 |
| TSP DT/LUT 6U | 2 | 2017 | 1 | 2018 |
| TSP/QRC Customer Test | 2 | 2018 | 1 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>123 / *Joint Technology Center System Integration* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123: *Joint Technology Center System Integration* | - | 3.942 | 4.712 | 4.748 | - | 4.748 | 4.954 | 5.101 | 5.231 | 1.000 | 0.000 | 29.688 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Unmanned Aircraft System (UAS) Joint Technology Center/System Integration Laboratory (JTC/SIL) is a Joint facility that develops, integrates, and supports the enhancement of its Multiple Unified Simulation Environment (MUSE) capability for Army systems and operational concepts. The JTC/SIL conducts prototype hardware and software development, builds the UAS Institutional Mission Simulator (IMS) trainers for the Shadow, Hunter, and Gray Eagle programs, and provides modeling and simulation support. The MUSE is a real-time, operator in-the-loop simulation that may be integrated with larger simulations in support of Army and Joint training exercises. The MUSE is also employed as a Mission Rehearsal Tool for ongoing combat operations. This project funds the management of the JTC/SIL and MUSE enhancements.

This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

Continued integration of Night Vision Image Generator (NVIG) into the Modeling & Simulation domain as it pertains to UAS simulation. Terrain, and model development for NVIG and Virtual Reality Scene Generator (VRSG) to increase fidelity. Support of theater level Exercises, Ulchi Freedom Guardian (UFG), Yama Sakura (YS) and Key Resolve (KR). Improvement of mapping capability for mission planning. Redesign of Windows Entity Server (WES) and NetLink to improve network routing, thus lessening bandwidth consumption. Incorporation of Common Image Generator Interface to provide an Image Generator (IG) agnostic solution thereby allowing for other IGs to be supported that are currently not supported. Continued implementation of tactical protocols into the simulation domain to enhance interoperability. Development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Redesign of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without touching code; again a reduction in costs and increased solution delivery speed.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 3.611 | 4.212 | 4.248 | - | 4.248 |
| ***Description:*** Funding is provided for the following efforts.<br><br>***FY 2018 Plans:***<br>Continued integration of Night Vision Image Generator (NVIG) into the Modeling & Simulation domain as it pertains to UAS simulation. Terrain, and model development for NVIG and Virtual Reality Scene Generator (VRSG) to increase fidelity. Support of theater level Exercises, Ulchi Freedom Guardian (UFG), Yama | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>123 / *Joint Technology Center System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Sakura (YS) and Key Resolve (KR). Improvement of mapping capability for mission planning. Redesign of Windows Entity Server (WES) and NetLink to improve network routing, thus lessening bandwidth consumption. Incorporation of Common Image Generator Interface to provide an Image Generator (IG) agnostic solution thereby allowing for other IGs to be supported that are currently not supported. Continued implementation of tactical protocols into the simulation domain to enhance interoperability. Development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Redesign of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without touching code; again a reduction in costs and increased solution delivery speed.<br>***FY 2019 Base Plans:***<br>Continued movement towards standards based solutions, e.g. Common Image Generator Interface (CIGI), which will facilitate optimal interoperability and an IG agnostic framework with which to integrate with various IGs. Continued specific integration of Night Vision Image Generator (NVIG) and Virtual Reality Scene Generator (VRSG) into the Modeling & Simulation domain as it pertains to UAS simulation, terrain and model development. Continued support of annual/bi-annual theater level Exercises (Ulchi Freedom Guardian (UFG), Yama Sakura (YS) and Key Resolve (KR), Talisman Saber (TS), Pacific Sentry -2 & -3, as well as 5 other Exercises coming online, Integration Events (IEs) and Validation Events (VEs). Continued improvement of mapping capability for mission planning. Continued redesign of Windows Entity Server (WES) and NetLink to improve network routing and large PDU data feeds (i.e. ? 7 million+), thus lessening bandwidth consumption. Continued development of a Heads Up Display (HUD) designer application that will allow for the creation and modification of HUDs without having to touch the software baseline thereby reducing costs and increasing fidelity and speed of solution in theater. Continued implementation of generic 6 Degree of Freedom (DoF) application that will allow for creation of new platforms without modifying code; again a reduction in costs and increased solution delivery velocity. Continued architecture optimization, to facilitate extensibility and scalability, to maintain readiness for growth of M&S requirements coming from the Services.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>The increase of $133,000 funds the following: Additional sensor simulation and UAV platform simulation. | | | | | |
| ***Title:*** Management Services<br>***Description:*** Funding is provided for the following efforts.<br>***FY 2018 Plans:*** | 0.331 | 0.500 | 0.500 | - | 0.500 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>123 / *Joint Technology Center System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Continue coordination and oversight of MUSE product development.<br>***FY 2019 Base Plans:***<br>Continue coordination and oversight of MUSE product development. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.942 | 4.712 | 4.748 | - | 4.748 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PE 0305206F Air Force:<br>*PE 0305206F Air Force* | 3.841 | 3.429 | 3.480 | - | 3.480 | 3.548 | 3.607 | 3.680 | 3.746 | Continuing | Continuing |

**Remarks**

The JTC/SIL and the MUSE receive funding from the Air Force. This effort is a continuing effort in support of Service UAS programs.

**D. Acquisition Strategy**

Continued MUSE development will be accomplished through a combination of Government in-house functional directorate support using a variety of existing contract vehicles.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | Project (Number/Name)<br>123 / *Joint Technology Center System Integration* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | MIPR | AMC, AMCOM, AMRDEC, SED : Redstone Arsenal, AL | 2.688 | 0.331 | | 0.500 | | 0.520 | | - | | 0.520 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 2.688 | 0.331 | | 0.500 | | 0.520 | | - | | 0.520 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MUSE Development | MIPR | AMC, AMCOM, AMRDEC, SED : Redstone Arsenal, AL | 13.448 | 3.611 | | 4.212 | | 4.228 | | - | | 4.228 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 13.448 | 3.611 | | 4.212 | | 4.228 | | - | | 4.228 | Continuing | Continuing | N/A |

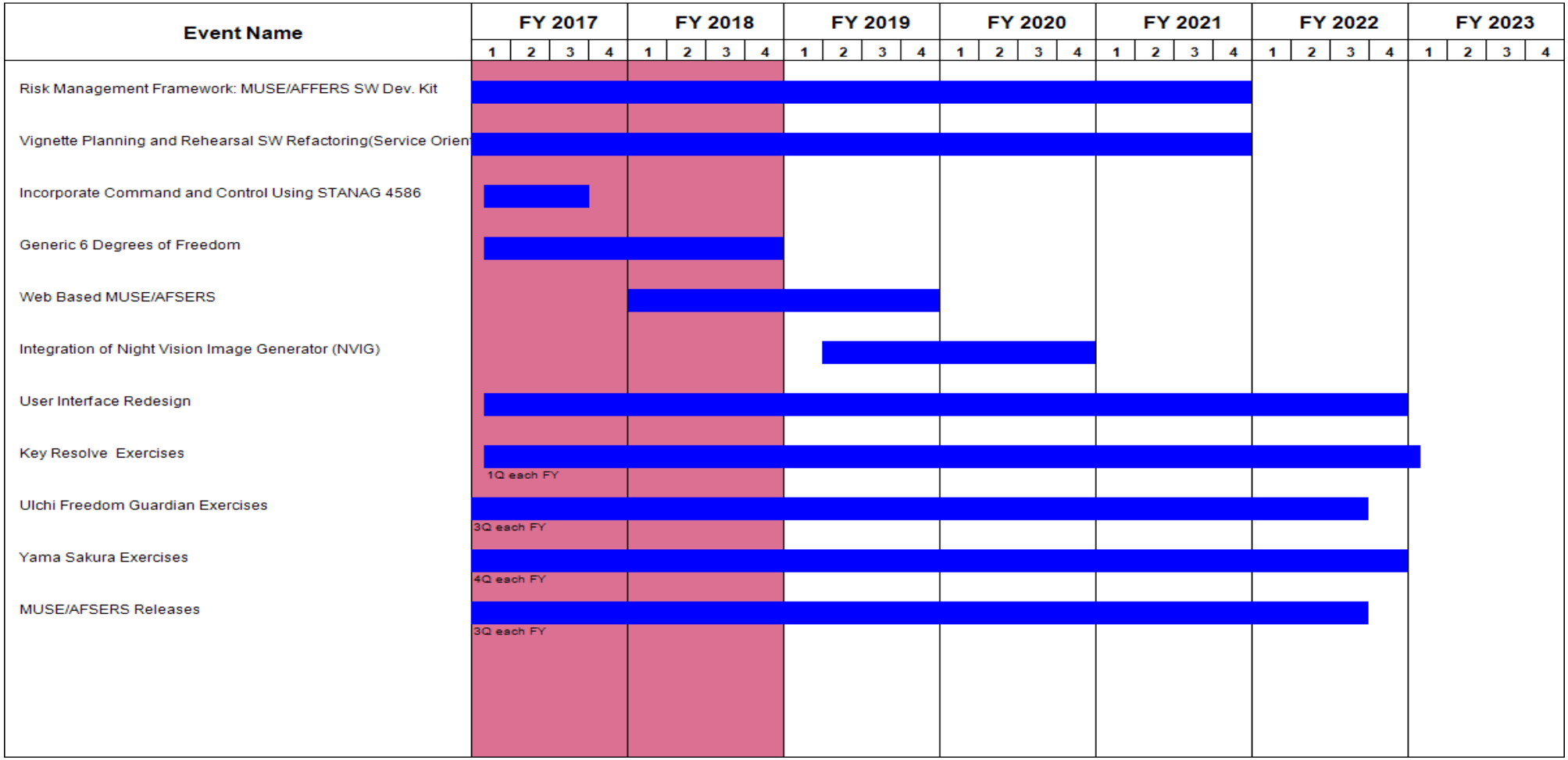
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Interoperability Support | MIPR | AMC, RDECOM, AMRDEC : Redstone Arsenal, AL | 9.460 | - | | - | | - | | - | | - | 0.000 | 9.460 | - |
| | | **Subtotal** | 9.460 | - | | - | | - | | - | | - | 0.000 | 9.460 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 25.596 | 3.942 | | 4.712 | | 4.748 | | - | | 4.748 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>123 / *Joint Technology Center System Integration* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204A / *Tactical Unmanned Aerial Vehicles* | **Project (Number/Name)**<br>123 / *Joint Technology Center System Integration* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Windows Entity Server and NetLink Redesign | 1 | 2015 | 3 | 2016 |
| Risk Management Framework: MUSE/AFFERS SW Dev. Kit | 3 | 2015 | 4 | 2021 |
| Vignette Planning and Rehearsal SW Refactoring(Service Oriented Architecture) | 2 | 2015 | 4 | 2021 |
| Incorporate Command and Control Using STANAG 4586 | 1 | 2016 | 3 | 2017 |
| Generic 6 Degrees of Freedom | 1 | 2017 | 4 | 2018 |
| Web Based MUSE/AFSERS | 1 | 2018 | 4 | 2019 |
| Integration of Night Vision Image Generator (NVIG) | 2 | 2019 | 4 | 2020 |
| User Interface Redesign | 1 | 2015 | 4 | 2022 |
| Key Resolve Exercises | 1 | 2015 | 1 | 2023 |
| Ulchi Freedom Guardian Exercises | 3 | 2015 | 3 | 2022 |
| Yama Sakura Exercises | 4 | 2015 | 4 | 2022 |
| MUSE/AFSERS Releases | 3 | 2015 | 3 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305206A *I Airborne Reconnaissance Systems* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 11.799 | 20.080 | 12.416 | 14.000 | 26.416 | 19.177 | 7.296 | 13.083 | 14.457 | 0.000 | 112.308 |
| EH2: *EMARSS ADV DEV (MIP)* | - | 0.000 | 0.000 | 3.205 | - | 3.205 | 3.218 | 0.000 | 2.011 | 2.051 | 0.000 | 10.485 |
| EH3: *EMARSS Payloads ADV DEV (MIP)* | - | 0.130 | 2.111 | 6.531 | - | 6.531 | 14.464 | 6.296 | 6.493 | 6.622 | 0.000 | 42.647 |
| EH5: *ARL Payloads ADV DEV (MIP)* | - | 11.669 | 17.969 | 1.980 | 14.000 | 15.980 | 1.495 | 1.000 | 4.579 | 5.784 | 0.000 | 58.476 |
| EH7: *Guardrail Common Sensor (GRCS) Payloads (MIP)* | - | 0.000 | 0.000 | 0.700 | - | 0.700 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.700 |

**Note**

This program is not a New Start and funding transferred from Program Element (PE) 0605626.

**A. Mission Description and Budget Item Justification**

Airborne Reconnaissance Low - Enhanced (ARL-E) is a worldwide self-deployable airborne Intelligence Surveillance Reconnaissance (ISR) system designed for timely, accurate, assured support to tactical forces over the full spectrum of operations. This system is a De Havilland DHC-8 aircraft replacing the DHC-7 in accordance with the Aerial ISR (AISR) 2020 Strategy. ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E Capabilities Production Document (CPD) requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), Electro-Optical/Infrared (EO/IR)/Full-Motion Video (FMV) , Multi-Mode Radar, Robust Communications Intelligence (COMINT), on-Board Collection, Analysis, Sensor Cross Cue and dissemination through Distributed Common Ground System-Army (DCGS-A) Enabled workstations. ARL-E will be assigned to the U.S. Army Intelligence and Security Command's Aerial ISR Brigade providing AISR support to combatant commanders. For the overall system, the Army Acquisition Objective and the Army Procurement Objective, is nine (9). The Mission Equipment Package (MEP) objective is eight (8).

The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's next generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, and include the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT).

The Guardrail Common Sensor (GRCS) is a RC-12X fixed-wing aircraft, which hosts Communications Intelligence (COMINT) and Electronic Intelligence (ELINT) sensors. It provides a persistent capability to detect, locate and classify/identify critical targets with a relevant degree of timeliness and accuracy. GRCS is assigned to two (2) U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance (AISR) support to

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305206A *I Airborne Reconnaissance Systems* |

combatant commanders. In accordance with the Army's AISR 2020 strategy, the Army's Acquisition Objective/Army's Procurement Objective (AAO/APO) is 19 RC-12X; seven (7) fielded to 3rd MI BN; seven (7) fielded to the 204th MI BN, and five (5) pilot trainers to support Force Generation. The five (5) trainers are not equipped with Primary Mission Equipment (PME).

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 11.799 | 20.080 | 11.887 | - | 11.887 |
| Current President's Budget | 11.799 | 20.080 | 12.416 | 14.000 | 26.416 |
| Total Adjustments | 0.000 | 0.000 | 0.529 | 14.000 | 14.529 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | -0.171 | - | -0.171 |
| • Other Adjustments 1 | - | - | 0.700 | 14.000 | 14.700 |

**Change Summary Explanation**

Fiscal Year (FY) 2019 OCO funds increase is a result of a funds realignment to support ARL New Signal Development.

Fiscal Year (FY) 2019 Base funds increase is a result of a funds realignment to support Guardrail Common Sensor (GRCS) Operational Needs Statement (ONS) 22410.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH2 / *EMARSS ADV DEV (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EH2: *EMARSS ADV DEV (MIP)* | - | 0.000 | 0.000 | 3.205 | - | 3.205 | 3.218 | 0.000 | 2.011 | 2.051 | 0.000 | 10.485 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Project EH2 last received funding in FY2016.

**A. Mission Description and Budget Item Justification**

The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's next generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, to include the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT).

This funding line supports non-recurring engineering (NRE), development of type certificates (TC), testing, integration of Modifications in Service of Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems and engineering analysis/structural modifications to substantially increase EMARSS (King Air B300) payload capacity and time on station. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) and the integration of the AISR mission equipment package (MEP) as well as obsolescence issues and commonality with the conversion of Quick Reaction Capability (QRC) Liberty Project Aircraft (LPA), VADER and Constant Hawk/TACOP aircraft to the EMARSS Program of Record (POR).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Non-Recurring Engineering | - | - | 3.205 | - | 3.205 |
| ***Description:*** This funding line supports non-recurring engineering (NRE), development of type certificates (TC), testing, integration of Modifications in Service of Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems and engineering analysis/studies/structural modifications to substantially increase EMARSS (King Air B300) payload capacity and time on station. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) and the integration of the AISR mission equipment package (MEP) as well as obsolescence issues and | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH2 / *EMARSS ADV DEV (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| commonality with the conversion of Quick Reaction Capability (QRC) Liberty Project Aircraft (LPA), VADER and Constant Hawk/TACOP aircraft to the EMARSS Program of Record (POR).<br><br>***FY 2019 Base Plans:***<br>This funding line supports NRE, development of TC, testing and integration of Army AISR systems. Funding provides for the integration of DoD mandated safety equipment to meet current and evolving International Standards. It also enhances aircraft CNS, ASE and the integration of the AISR MEP as well as obsolescence issues involved with the transition from QRC to POR in regards to the Navy AAR-47 changing to Army AAR-57, BFT to BFT-2 and APX-123 Transponder to APX-119 Transponder.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>RDT&E funds were not required in FY18 | | | | | |
| **Accomplishments/Planned Programs Subtotals** | - | - | 3.205 | - | 3.205 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A02112: *EMARSS SEMA Mods (MIP)* | 77.997 | 51.279 | 20.448 | - | 20.448 | 3.859 | 2.632 | 1.903 | 1.940 | 0.000 | 160.058 |
| • AZ2054: *EMARSS Payloads (MIP)* | 17.097 | 7.279 | 18.809 | - | 18.809 | 2.195 | 2.214 | 7.834 | 7.987 | 0.000 | 63.415 |
| • EH3: *EMARSS Payloads ADV DEV (MIP)* | 0.130 | 2.111 | 6.531 | - | 6.531 | 14.464 | 6.296 | 6.493 | 6.622 | 0.000 | 42.647 |

**Remarks**

The EMARSS RDTE efforts are found in the following two project lines; 0305206AEH2 EMARSS ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02112 and AZ2054. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

**D. Acquisition Strategy**

The acquisition strategy, supported by the EMARSS CPD, is to design and test 24 systems as well as provide enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: Electro-optical/Infrared (EO/IR)/Full Motion Video (FMV); Communications Intelligence (COMINT); Wide Area Aerial Surveillance (WAAS); Light Imaging Detection and Ranging (LiDAR) and improved Synthetic Aperture Radar / Moving Target Indicator (SAR/MTI) radar; line-of-site (LOS) and

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH2 / *EMARSS ADV DEV (MIP)* |

beyond line-of-site (BLOS) communications; and Processing Exploitation and Dissemination (PED) supporting two Distributed Common Ground System - Army (DCGS-A) enabled operator workstations. The EMARSS fleet of 24 systems will consist of the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT).

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH2 / *EMARSS ADV DEV (MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PMO | RO | FW PO/ PM SAI : Huntsville, AL/ Aberdeen, MD | 0.104 | - | | - | | 0.272 | Nov 2018 | - | | 0.272 | 0.000 | 0.376 | - |
| | | **Subtotal** | 0.104 | - | | - | | 0.272 | | - | | 0.272 | 0.000 | 0.376 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NRE | SS/CPFF | Northrop Grumman : Herndon, VA | - | - | | - | | 2.933 | Mar 2019 | - | | 2.933 | 0.000 | 2.933 | - |
| | | **Subtotal** | - | - | | - | | 2.933 | | - | | 2.933 | 0.000 | 2.933 | N/A |

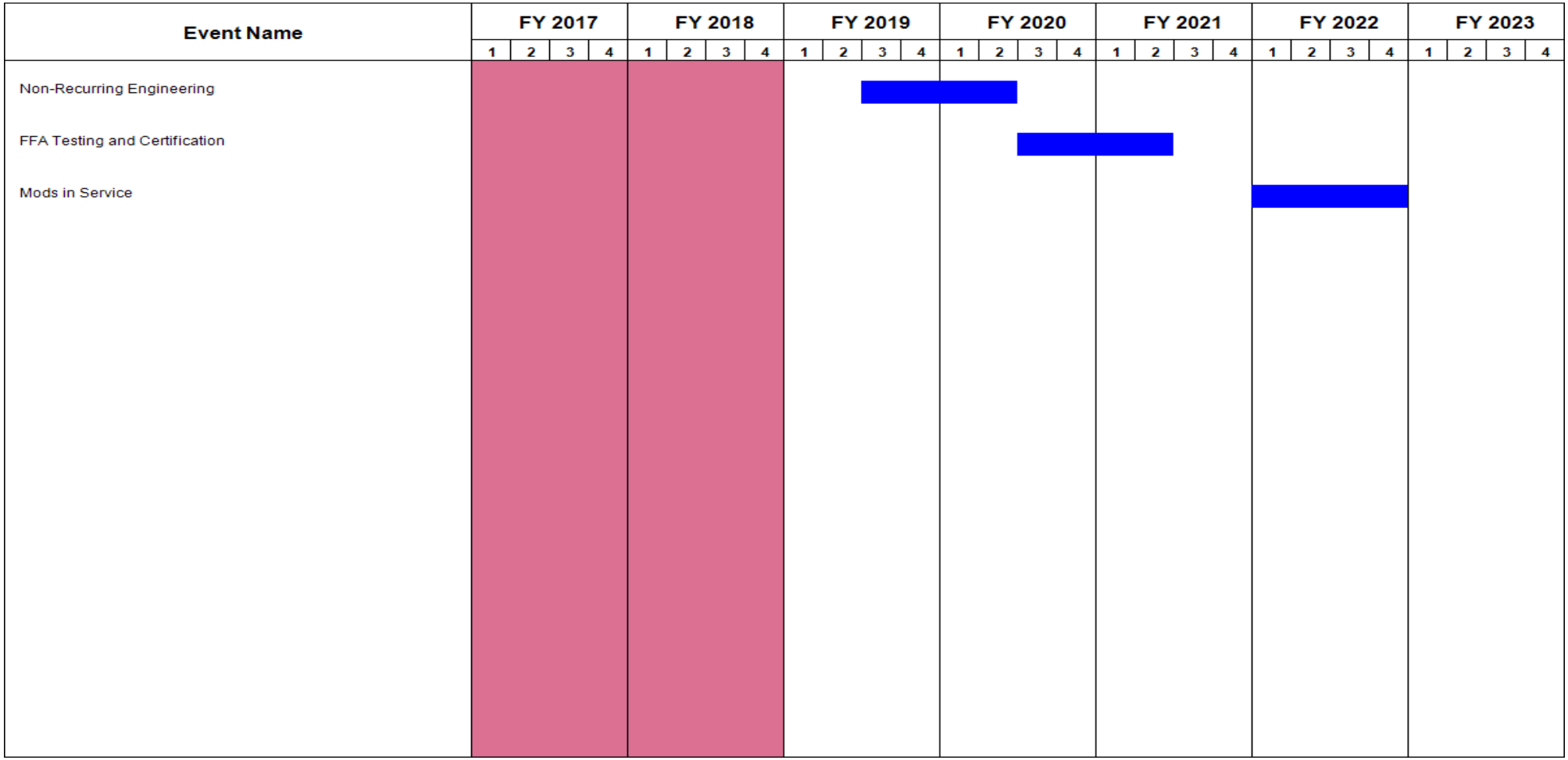
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Testing | MIPR | AFTD RTC : Eglin, AFB, FL | 1.636 | - | | - | | - | | - | | - | 0.000 | 1.636 | - |
| | | **Subtotal** | 1.636 | - | | - | | - | | - | | - | 0.000 | 1.636 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 1.740 | - | | 0.000 | | 3.205 | | - | | 3.205 | 0.000 | 4.945 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH2 / *EMARSS ADV DEV (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH2 / *EMARSS ADV DEV (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Non-Recurring Engineering | 3 | 2019 | 2 | 2020 |
| FFA Testing and Certification | 3 | 2020 | 2 | 2021 |
| Mods in Service | 1 | 2022 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH3 / *EMARSS Payloads ADV DEV (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EH3: *EMARSS Payloads ADV DEV (MIP)* | - | 0.130 | 2.111 | 6.531 | - | 6.531 | 14.464 | 6.296 | 6.493 | 6.622 | 0.000 | 42.647 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

The EMARSS RDTE efforts are found in the following two (2) project lines; 0305206AEH2 EMARSS ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02112 and AZ2054. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

**A. Mission Description and Budget Item Justification**

The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's next generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, to include the following variants: eight EMARSS-G (Geo-INT); four EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight EMARSS-M (Multi-INT); and four EMARSS-S (SIGINT).

This funding line supports enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: Electro-Optical/Infrared (EO/IR)/Full Motion Video (FMV); Communications Intelligence (COMINT); Signals Intelligence (SIGINT); Wide Area Aerial Surveillance (WAAS); Light Imaging Detection and Ranging (LiDAR) and improved Synthetic Aperture Radar / Moving Target Indicator (SAR/MTI) radar; Line-Of-Site (LOS) and Beyond Line-Of-Sight (BLOS) communications; and Processing Exploitation and Dissemination (PED) supporting two Distributed Common Ground System - Army (DCGS-A) enabled operator workstations.

Fiscal Year (FY) 2019 funding in the amount of $6.531 million provides LiDAR Sensor Development and Mission Equipment Packages (MEP) and PED Sensor Engineering Support.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** EMARSS - Sensor Enhancement | - | 1.893 | 5.577 | - | 5.577 |
| ***Description:*** Research, Development, Test, and Evaluation (RDTE) funded LiDAR, SIGINT and Airborne Wide Area Persistent Surveillance System (AWAPSS) sensor enhancement. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH3 / *EMARSS Payloads ADV DEV (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***FY 2018 Plans:***<br>RDTE funds next generation LiDAR Enhancement Engineering Change Proposals (ECPs) and contractor system support.<br>***FY 2019 Base Plans:***<br>RDTE funds next generation LiDAR Enhancement Engineering Change Proposals (ECPs) and contractor system support.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increased funding is required in order to continue development on the next generation LiDAR sensor in order to meet CPD requirements and to ensure the safety, readiness and relevancy of the warfighter. | | | | | |
| ***Title:*** EMARSS - Sensor Engineering Support<br>***Description:*** Matrix Government and Matrix Contractor engineering support for sensor enhancements.<br>***FY 2018 Plans:***<br>Funds Matrix Contractor engineering support for sensor enhancements.<br>***FY 2019 Base Plans:***<br>Funds Matrix Contractor engineering support for sensor enhancements.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increased engineering support is required to manage the engineering development effort. | 0.130 | 0.126 | 0.301 | - | 0.301 |
| ***Title:*** Program Management Support<br>***Description:*** Program Management Office (PMO) support and travel, as well as Systems Engineering and Technical Assistance (SETA) support.<br>***FY 2018 Plans:***<br>PMO government support and travel.<br>***FY 2019 Base Plans:***<br>PMO government support and travel.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | - | 0.092 | 0.653 | - | 0.653 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH3 / *EMARSS Payloads ADV DEV (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Increased program management is required to manage the engineering development effort. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.130 | 2.111 | 6.531 | - | 6.531 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A02112: *EMARSS SEMA Mods (MIP)* | 77.997 | 51.279 | 20.448 | - | 20.448 | 3.859 | 2.632 | 1.903 | 1.940 | 0.000 | 160.058 |
| • AZ2054: *EMARSS Payloads (MIP)* | 17.097 | 7.279 | 18.809 | - | 18.809 | 2.195 | 2.214 | 7.834 | 7.987 | 0.000 | 63.415 |
| • EH2: *EMARSS ADV DEV (MIP)* | - | - | 3.205 | - | 3.205 | 3.218 | - | 2.011 | 2.051 | 0.000 | 10.485 |

**Remarks**

The EMARSS RDTE efforts are found in the following two (2) project lines; 0305206AEH2 EMARSS ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02112 and AZ2054. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

**D. Acquisition Strategy**

The acquisition strategy, supported by the EMARSS CPD, is to provide enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: EO/IR FMV; COMINT; WAAS; LiDAR and improved SAR/MTI radar; LOS and BLOS communications; and PED supporting two DCGS-A enabled operator workstations. The EMARSS fleet of 24 systems consists of the following variants: eight EMARSS-G (Geo-INT); four EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight EMARSS-M (Multi-INT); and four EMARSS-S (SIGINT).

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH3 / *EMARSS Payloads ADV DEV (MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PMO | C/CR | PEO IEW&S, PM SAI : APG, MD | 0.298 | - | | 0.092 | | 0.653 | Dec 2019 | - | | 0.653 | Continuing | Continuing | - |
| | | **Subtotal** | 0.298 | - | | 0.092 | | 0.653 | | - | | 0.653 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LiDAR sensor enhancement | SS/CPFF | JHU APL : Laurel, MD | 1.500 | - | | - | | - | | - | | - | 0.000 | 1.500 | - |
| AWAPSS sensor enhancement | C/CPIF | BAE : Nashua, CT | 0.200 | - | | - | | - | | - | | - | 0.000 | 0.200 | - |
| SIGINT sensor enhancement | C/CPFF | CACI/Boeing : APG, MD | 0.114 | - | | - | | - | | - | | - | 0.000 | 0.114 | - |
| SIGINT sensor enhancement | C/CPFF | Lockheed Martin Integrated Systems : Marlton, NJ | 0.948 | - | | - | | - | | - | | - | 0.000 | 0.948 | - |
| Advanced LiDAR Development | Option/ CPIF | TBD : APG MD | - | - | | 1.893 | | 5.577 | Dec 2019 | - | | 5.577 | Continuing | Continuing | - |
| | | **Subtotal** | 2.762 | - | | 1.893 | | 5.577 | | - | | 5.577 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix Government Engineering Support | MIPR | USACERDEC, I2WD : APG, MD | 0.260 | 0.130 | Nov 2016 | - | | - | | - | | - | Continuing | Continuing | - |
| Matrix Contractor Engineering Support | C/CPFF | BAH : APG, MD | 0.087 | - | | 0.126 | | 0.301 | Dec 2019 | - | | 0.301 | Continuing | Continuing | - |
| | | **Subtotal** | 0.347 | 0.130 | | 0.126 | | 0.301 | | - | | 0.301 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH3 / *EMARSS Payloads ADV DEV (MIP)* | |

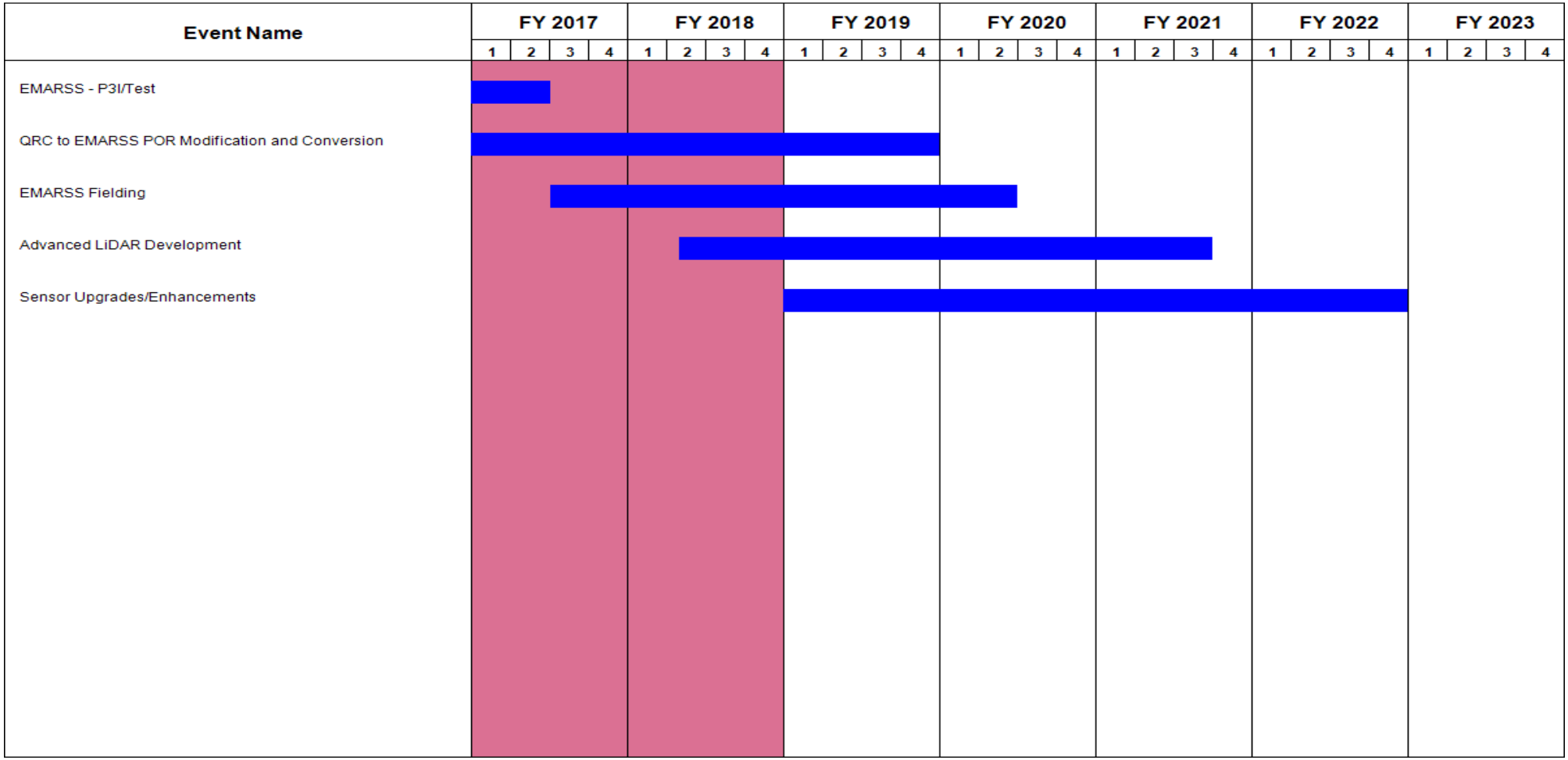
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering Government Testing | MIPR | CFA : Lakehurst, NJ | 0.125 | - | | - | | - | | - | | - | Continuing | Continuing | - |
| | | **Subtotal** | 0.125 | - | | - | | - | | - | | - | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 3.532 | 0.130 | | 2.111 | | 6.531 | | - | | 6.531 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH3 / *EMARSS Payloads ADV DEV (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH3 / *EMARSS Payloads ADV DEV (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| EMARSS - P3I/Test | 3 | 2016 | 2 | 2017 |
| QRC to EMARSS POR Modification and Conversion | 2 | 2015 | 4 | 2019 |
| EMARSS Fielding | 3 | 2017 | 2 | 2020 |
| Advanced LiDAR Development | 2 | 2018 | 3 | 2021 |
| Sensor Upgrades/Enhancements | 1 | 2019 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH5 / *ARL Payloads ADV DEV (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EH5: *ARL Payloads ADV DEV (MIP)* | - | 11.669 | 17.969 | 1.980 | 14.000 | 15.980 | 1.495 | 1.000 | 4.579 | 5.784 | 0.000 | 58.476 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Airborne Reconnaissance Low - Enhanced (ARL-E) is a worldwide self-deployable airborne Intelligence Surveillance Reconnaissance (ISR) system designed for timely, accurate, assured support to tactical forces over the full spectrum of operations. This system is a De Havilland DHC-8 aircraft replacing the DHC-7 IAW the Aerial ISR (AISR) 2020 Strategy. ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E Capabilities Production Document (CPD) requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), Electro-Optical/Infrared (EO/IR)/Full-Motion Video (FMV) , Multi-Mode Radar, Robust Communications Intelligence (COMINT), on-Board Collection, Analysis, Sensor Cross Cue and dissemination through Distributed Common Ground System-Army (DCGS-A) Enabled workstations. ARL-E will be assigned to the U.S. Army Intelligence and Security Command's Aerial ISR Brigade providing AISR support to combatant commanders. For the overall system, the Army Acquisition Objective and the Army Procurement Objective, is nine. The Mission Equipment Package (MEP) objective is eight.

Fiscal Year (FY) 2019 Base funding of $1.980 million continues the lab and flight test for Signal 3 and 4 software to see if it meets the requirements in the ARL-E CPD.
.
Fiscal Year (FY) 2019 OCO funding of $14.000 million continues the new signal enhancement development effort for Signal 3 and 4 to develop software to enhance the COMINT collection capabilities. This funding line supports continued software development to enhance COMINT collection capabilities to effectively prosecute high priority and emerging modern signal emitters.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Long Range Radar Development<br>***Description:*** Long Range Radar Development will be completed in FY18 | 6.445 | - | - | - | - |
| ***Title:*** New Signals (COMINT/Software Upgrades)<br>***Description:*** To develop software for Signals 1, 2, 3 and 4<br>***FY 2018 Plans:***<br>Fiscal Year (FY) 2018 Base funding of $2.969 million initiates the new signal enhancement development effort for Signal 4 to develop software, perform lab testing and flight testing.<br>***FY 2019 Base Plans:*** | 5.224 | 17.969 | 1.980 | 14.000 | 15.980 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH5 / *ARL Payloads ADV DEV (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Fiscal Year (FY) 2019 Base funding of $1.980 million continues the lab and flight test for Signal 3 and 4 software to see if it meets the requirements in the ARL-E CPD.<br>***FY 2019 OCO Plans:***<br>Fiscal Year (FY) 2019 OCO funding of $14.000 million continues the new signal enhancement development effort for Signal 3 and 4 to develop software to enhance the COMINT collection capabilities.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 OCO added $14.000 million | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 11.669 | 17.969 | 1.980 | 14.000 | 15.980 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • AZ2050: *AZ2050* | 74.380 | 59.938 | 7.613 | - | 7.613 | 8.215 | - | - | - | 0.000 | 150.146 |
| • DX9: *0605766A-DX9* | 1.360 | 1.898 | 0.257 | - | 0.257 | 0.257 | - | - | - | 0.000 | 3.772 |
| • A02109: *A02109* | - | - | 12.103 | - | 12.103 | 12.294 | 9.796 | - | - | 0.000 | 34.193 |
| • A02110: *A02110* | 6.793 | 11.650 | 19.636 | - | 19.636 | 22.023 | - | - | - | Continuing | Continuing |

**Remarks**

The Airborne Reconnaissance Low- Enhanced (ARL-E) RDTE efforts are found in the following two (2) project lines; 0305206AEH4 ARL ADV DEV (MIP) (Fixed Wing Project Office) and 0305206AEH5 ARL Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02110 and AZ2050. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne Intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

**D. Acquisition Strategy**

ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E CPD requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), EO/IR FMV, COMINT, on-Board Collection, Analysis, Sensor Cross Cue and dissemination through DCGS-A Enabled workstations. The development and testing of LRR is required to replace the current ARL Phoenix Eye Radar to increase performance and meet the improved requirements of the Appendix J Payload for the approved ARL-E CPD. The remainder will fund software development to enhance COMINT collection capabilities. The software will be added to existing COMINT systems to effectively prosecute high priority and emerging modern signal emitters.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH5 / *ARL Payloads ADV DEV (MIP)* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH5 / *ARL Payloads ADV DEV (MIP)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Long Range Radar Development | C/CPFF | Northrop Grumman : Linthicum Heights, MD | 6.053 | - | | - | | - | | - | | - | 0.000 | 6.053 | - |
| New Signals (COMINT/ Software Upgrades) | C/CPFF | Boeing Argon : California | 4.300 | 7.669 | Mar 2017 | 14.969 | Nov 2017 | 0.000 | | 14.000 | Mar 2019 | 14.000 | 0.000 | 40.938 | - |
| | | **Subtotal** | 10.353 | 7.669 | | 14.969 | | 0.000 | | 14.000 | | 14.000 | 0.000 | 46.991 | N/A |

**Remarks**

New Signals Contract: W15P7T-10-D-D420/ KZ01. Fiscal Year (FY) 2019 OCO funding of $14.000 million continues the new signal enhancement development effort for Signal 3 and 4 to develop software to enhance the COMINT collection capabilities. This funding line supports continued software development to enhance COMINT collection capabilities to effectively prosecute high priority and emerging modern signal emitters.

.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support to LRR and New Signals (COMINT/ Software Upgrades) | C/CPFF | Boeing Argon/NG : Mountain View, CA/ Lithicum, MD | - | 4.000 | Nov 2016 | 3.000 | Nov 2017 | 1.980 | Mar 2019 | - | | 1.980 | 0.000 | 8.980 | - |
| | | **Subtotal** | - | 4.000 | | 3.000 | | 1.980 | | - | | 1.980 | 0.000 | 8.980 | N/A |

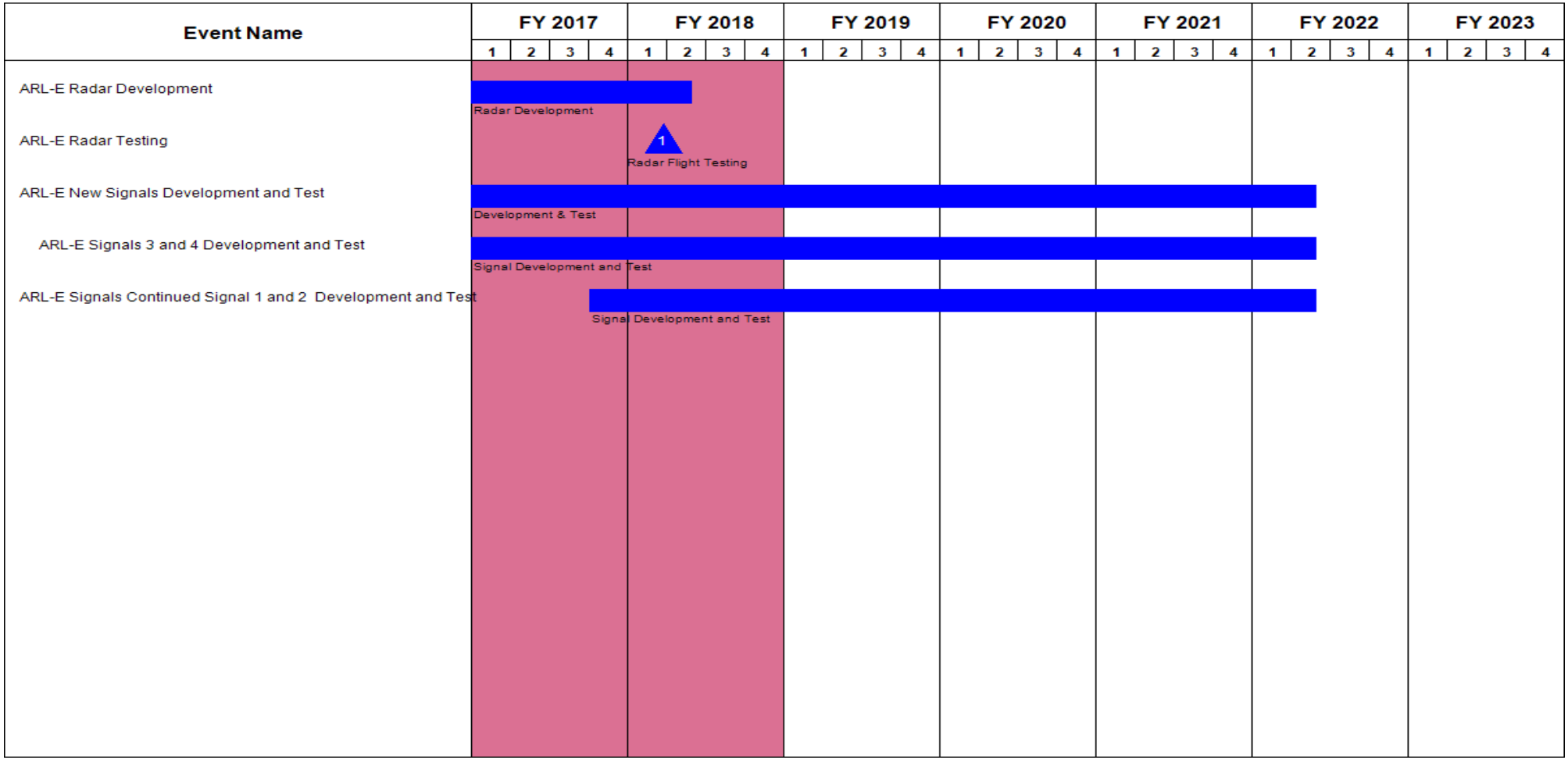
**Remarks**

New Signals Contract: W15P7T-10-D-D420/ KZ01. Fiscal Year (FY) 2019 Base funding of $1.980 million continues the lab and flight test for Signal 3 and 4 software to see if it meets the requirements in the ARL-E CPD.

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 10.353 | 11.669 | | 17.969 | | 1.980 | | 14.000 | | 15.980 | 0.000 | 55.971 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH5 / *ARL Payloads ADV DEV (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH5 / *ARL Payloads ADV DEV (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| ARL-E Radar Development | 4 | 2015 | 2 | 2018 |
| ARL-E Radar Testing | 1 | 2018 | 1 | 2018 |
| ARL-E New Signals Development and Test | 2 | 2016 | 2 | 2022 |
| ARL-E Signals 3 and 4 Development and Test | 2 | 2016 | 2 | 2022 |
| ARL-E Signals Continued Signal 1 and 2 Development and Test | 4 | 2017 | 2 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH7 / *Guardrail Common Sensor (GRCS) Payloads (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EH7: *Guardrail Common Sensor (GRCS) Payloads (MIP)* | - | 0.000 | 0.000 | 0.700 | - | 0.700 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.700 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Project EH7 is a new start.

**A. Mission Description and Budget Item Justification**

The Guardrail Common Sensor (GRCS) is a RC-12X fixed-wing aircraft, which hosts Communications Intelligence (COMINT) and Electronic Intelligence (ELINT) sensors. It provides a persistent capability to detect, locate and classify/identify critical targets with a relevant degree of timeliness and accuracy. GRCS is assigned to two (2) U.S. Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance (AISR) support to combatant commanders. In accordance with the Army's AISR 2020 strategy, the Army's Acquisition Objective/Army's Procurement Objective (AAO/APO) is 19 RC-12X; seven (7) fielded to 3rd MI BN; seven (7) fielded to the 204th MI BN, and five (5) pilot trainers to support Force Generation. The five (5) trainers are not equipped with Primary Mission Equipment (PME).

This funding line supports JICD 4.2 Compliance (ONS 22419).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** ONS 22419 Development | - | - | 0.700 | - | 0.700 |
| ***Description:*** Development and Testing for JICD 4.2 Compliance | | | | | |
| ***FY 2019 Base Plans:***<br>Development and Testing for JICD 4.2 Compliance | | | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase funding is required in order to develop and test for ONS 22410 for JICD 4.2 Compliance. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | - | - | 0.700 | - | 0.700 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • AZ2052: *Guardrail Payloads (MIP)* | 24.450 | 35.070 | 4.346 | - | 4.346 | 0.129 | 0.112 | 0.093 | 0.074 | 0.000 | 64.274 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH7 / *Guardrail Common Sensor (GRCS) Payloads (MIP)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

**D. Acquisition Strategy**

The acquisition strategy, supported by Operational Needs Statement (ONS) 22419, dated August 2017, is to provide additional enhancements to the SIGINT Sensors. Will leverage current PASS Contract #W15P7T-10-D-D420-KZ01.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305206A / *Airborne Reconnaissance Systems* | Project (Number/Name)<br>EH7 / *Guardrail Common Sensor (GRCS) Payloads (MIP)* | |

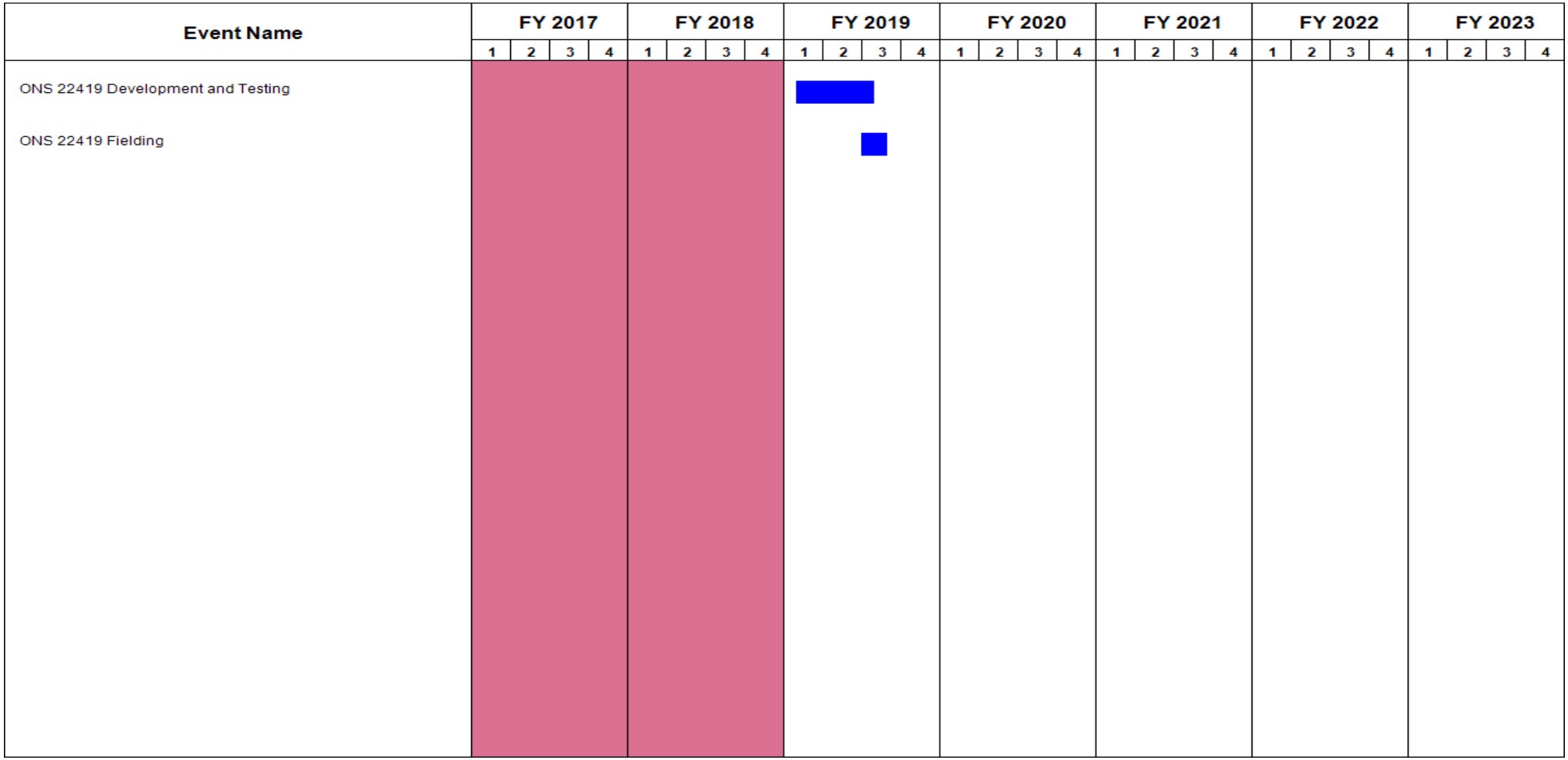
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ONS 22419 Development and Test | C/CPFF | PEO IEW&S : Aberdeen Proving Ground, MD | - | - | | - | | 0.700 | Nov 2018 | - | | 0.700 | 0.000 | 0.700 | 0.700 |
| | | **Subtotal** | - | - | | - | | 0.700 | | - | | 0.700 | 0.000 | 0.700 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 0.000 | | 0.700 | | - | | 0.700 | 0.000 | 0.700 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH7 / *Guardrail Common Sensor (GRCS) Payloads (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305206A / *Airborne Reconnaissance Systems* | **Project (Number/Name)**<br>EH7 / *Guardrail Common Sensor (GRCS) Payloads (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| ONS 22419 Development and Testing | 1 | 2019 | 3 | 2019 |
| ONS 22419 Fielding | 3 | 2019 | 3 | 2019 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 32.284 | 24.700 | 38.667 | - | 38.667 | 57.481 | 57.621 | 38.802 | 2.567 | 0.000 | 252.122 |
| D07: *DCGS-A Common Modules (MIP)* | - | 32.284 | 24.700 | 38.667 | - | 38.667 | 57.481 | 57.621 | 38.802 | 2.567 | 0.000 | 252.122 |

**Note**

The Distributed Common Ground Systems - Army (DCGS-A) was formerly designated a Major Automation Information System (MAIS) program.

**A. Mission Description and Budget Item Justification**

Distributed Common Ground System - Army (DCGS-A) is the Intelligence, Surveillance and Reconnaissance (ISR) System of Systems (SoS) for Joint, Interagency, Allied, Coalition, and National data analysis, sharing and collaboration. The core functions of DCGS-A are: the vertical and horizontal synchronization of ISR Processing, Exploitation and Dissemination (PED) efforts; operations in a networked environment at multiple security levels; the control of select Army and joint sensor systems; the fusion of all acquired data and information, and distribution of relevant red (threat), gray (non-aligned), and environmental (weather and terrain) information; and providing the Warfighters' early warning, targeting, and sensor ground station capabilities. DCGS-A provides a single integrated ISR ground processing system composed of common components that are interoperable with sensors, other information sources, all Warfighting Functions, and the Defense Information & Intelligence Enterprise (DI2E) and Intelligence Community Information Technology Enterprise (IC ITE). DCGS-A is fielded in Fixed, Mobile, and embedded configurations emphasizing the use of reach and split based operations by improving accessibility of data in order to reduce forward deployed footprint. As new software capability drops are integrated and tested, a continuing series of modifications will be integrated and fielded to units IAW the Army Resourcing Priority List (ARPL) process.

DCGS-A is designated as a Program of Record (PoR) within the Command Post Computing Environment (CP CE) of the Common Operating Environment (COE). DCGS-A provides the Single and Shareable Geospatial Foundation (SSGF) Cross Cutting Capability (CCC), and is defining the DCGS-A architecture to fit within the COE as described by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) COE Implementation Plan. This is in accordance with the G-3/5/7 priority to align all Army networks, procurements and enhancements under one COE and one vision leveraging intelligence community investments. PM DCGS-A continues to work with PM Mission Command (PM MC) to converge on CP CE Tactical Server Infrastructure (TSI) for FY 2019 fielding.

DCGS-A software is tailored by echelon and scalable to each unit's mission. DCGS-A provides commanders and staffs the ability to maintain an accurate and up to date understanding of the operational environment. The DCGS-A contribution to commanders' visualization and situational awareness, rapid planning, and the synchronization of all warfighting functions, enable Army units to operate within the enemy's decision cycle. This capability enhances tactical and operational maneuver and the conduct of full spectrum operations across the range of military operations from Humanitarian Assistance and Disaster Relief (HADR) to major combat operations and campaigns through all phases of the Joint Continuum of Military Operations.

The DCGS-A configurations range from laptops to systems integrated in tactical shelters and mounted on tactical vehicles to large commodity servers operating in a sanctuary based data center processing environments. The fundamental intent and tenet of this approach is to reduce forward deployed equipment/footprint by co-locating the advanced analytics capabilities within the DCGS-A baseline with the regional data centers, where the data is stored. This infrastructure

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305208A *I Distributed Common Ground/Surface Systems* |

consolidation simultaneously reduces processor and communications requirements in tactical units by limiting the number of large data files transported across tactical communications systems. Following a successful operational assessment and Milestone C in 2QFY12/Full Deployment Decision in 1QFY13, Follow-on Test & Evaluation in 3QFY15, the program is deploying DCGS-A Increment 1 Software Baseline throughout the Army.

FY 2019 has no funding for Project 956.

FY 2019 Base funding in the amount of $38.667 million for D07, DCGS-A, will be used for modification, testing and integration of commercially available technologies to support multi-source intelligence processing at the tactical levels, as directed in the FY 2017 National Defense Authorization Act (NOAA), Section 113 and Section 220 that will increase the Processing, Exploitation, and Dissemination capability our Army requires. DCGS-A will continue critical updates to the Army's ISR PED and multi-intelligence planning, analysis, and production capabilities through the exploitation of Cloud Computing and advanced analytics capabilities. This approach will achieve Information Technology efficiencies through alignment with the Intelligence Community Information Technology Environment (IC ITE), while providing iterative software updates required to remain current.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 32.284 | 24.700 | 46.400 | - | 46.400 |
| Current President's Budget | 32.284 | 24.700 | 38.667 | - | 38.667 |
| Total Adjustments | 0.000 | 0.000 | -7.733 | - | -7.733 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | -7.733 | - | -7.733 |

**Change Summary Explanation**

FY 2019 decrease of $7.733M to project D07 supports re-phasing of funds to support program restructure.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | Project (Number/Name)<br>D07 / *DCGS-A Common Modules (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D07: *DCGS-A Common Modules (MIP)* | - | 32.284 | 24.700 | 38.667 | - | 38.667 | 57.481 | 57.621 | 38.802 | 2.567 | 0.000 | 252.122 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Note: The Distributed Common Ground System - Army was formerly designated a Major Automation Information System (MAIS) program.

**A. Mission Description and Budget Item Justification**

Distributed Common Ground System - Army (DCGS-A) is the Intelligence, Surveillance and Reconnaissance (ISR) System of Systems (SoS) for Joint, Interagency, Allied, Coalition, and National data analysis, sharing and collaboration. The core functions of DCGS-A are: the vertical and horizontal synchronization of ISR Processing, Exploitation and Dissemination (PED) efforts; operations in a networked environment at multiple security levels; the control of select Army and joint sensor systems; the fusion of all acquired data and information, and distribution of relevant red (threat), gray (non-aligned), and environmental (weather and terrain) information; and providing the Warfighters' early warning, targeting, and sensor ground station capabilities. DCGS-A provides a single integrated ISR ground processing system composed of common components that are interoperable with sensors, other information sources, all Warfighting Functions, compliant with standards providing the Defense Information & Intelligence Enterprise (DI2E) and Intelligence Community Information Technology Enterprise (IC ITE). DCGS-A is fielded in Fixed, Mobile, and embedded configurations emphasizing the use of reach and split based operations by improving accessibility of data in order to reduce forward deployed footprint. As enhanced commercial capabilities are integrated and tested, a continuing series of software capability drop releases will be provided into Army Common/commodity hardware and fielded to units IAW the Army Resourcing Priority List (ARPL) process.

DCGS-A is designated as a Program of Record (PoR) within the Command Post Computing Environment (CP CE) of the Common Operating Environment (COE). DCGS-A provides the Single and Shareable Geospatial Foundation (SSGF) Cross Cutting Capability (CCC), and is defining the DCGS-A architecture to fit within the COE as described by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) COE Implementation Plan. This is in accordance with the G-3/5/7 priority to align all Army networks, procurements and enhancements under one COE and one vision leveraging intelligence community investments. PM DCGS-A continues to work with PM Mission Command (PM MC) to converge on CP CE Tactical Server Infrastructure (TSI).

DCGS-A provides technologically advanced Processing, Exploitation, and Dissemination (PED) capabilities through iterative software releases delivered in tailored and scalable mobile, fixed, and embedded configurations in all maneuver and maneuver support units from Company Intelligence Support Team to Army Service Component Command, and in select maneuver sustainment units battalion and above.

FY 2019 Base funding in the amount of $38.667 million for D07, DCGS-A, will be used for modification, testing and integration of commercially available technologies to support multi-source intelligence processing at the tactical levels, as directed in the FY 2017 National Defense Authorization Act (NOAA), Section 113 and Section 220 that will increase the Processing, Exploitation, and Dissemination capability our Army requires. DCGS-A will continue critical updates to the Army's ISR PED and multi-intelligence planning, analysis, and production capabilities through the exploitation of Cloud Computing and advanced analytics capabilities. This approach will achieve

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>D07 / *DCGS-A Common Modules (MIP)* |

Information Technology efficiencies through alignment with the Intelligence Community Information Technology Environment (IC ITE), while providing iterative software updates required to remain current.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Integrate and Test DCGS-A Software | 27.791 | 13.010 | 24.126 |
| ***Description:*** Continue efforts to integrate and test DCGS-A software. DCGS-A will continue to expand on the capabilities provided by DCGS-A Increment 1 by leveraging commercial items at the Army and below echelons while providing new, enhanced, and leap-ahead Intelligence, Surveillance, and Reconnaissance (ISR) and Standard and Shareable Geospatial Foundation (SSGF) enterprise capabilities to align with the Intelligence Community (IC) and Army's Common Operating Environment (COE) and transformation objectives. DCGS-A and beyond will leverage the investment made in previous DCGS-A increments and include emerging technologies related to: Tasking of sensors; controlling select Army sensor systems; Processing, fusing, and Exploiting data and information; supporting knowledge generation; providing ground station capabilities; automated support to intelligence product generation; Disseminating information and intelligence about the threat, weather, and terrain at all echelons; automating intelligence synchronization, including ISR planning, reconnaissance and surveillance integration and assessment; supporting situation understanding; supporting targeting and effects; providing the Standard and Sharable Geospatial Foundation (SSGF) to COE Computing Environments (CEs). These requirements will be defined in the DCGS-A Capability Drops (CDs) as necessary to ensure DCGS-A provides the data, information, intelligence, situation awareness, and interoperability needed to support the Warfighter.<br><br>***FY 2018 Plans:***<br>Will continue to integrate and test DCGS-A Software.<br><br>***FY 2019 Plans:***<br>Will continue to integrate and test DCGS-A Software.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Testing requirements increased from one Capability Drop to multiple Capability Drops. | | | |
| ***Title:*** Matrix Support Government for Software Integration | 1.131 | 3.899 | 3.787 |
| ***Description:*** Matrix Support Government for software integration to the target platforms.<br><br>***FY 2018 Plans:***<br>Will continue Government Matrix Support for software integration to the target platforms.<br><br>***FY 2019 Plans:***<br>Will continue Government Matrix Support for software integration to the target platforms.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>D07 / *DCGS-A Common Modules (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Increased Government matrix support to accommodate software integration requirements for additional Capability Drops. | | | |
| ***Title:*** Project Management<br>***Description:*** Project Management support to manage the cost, schedule, and performance metrics for the program.<br>***FY 2018 Plans:***<br>The program will prepare Acquisition Requirements Packages for solicitations to satisfy multiple capability drops.<br>***FY 2019 Plans:***<br>Continue acquisition document preparation and support for multiple capability drops.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Similar level of effort in FY18 and FY19. | 1.641 | 2.118 | 1.997 |
| ***Title:*** Army and Joint Interoperability Testing/Developmental Testing/Operational Testing<br>***Description:*** Testing of DCGS-A<br>***FY 2018 Plans:***<br>Testing of DCGS-A.<br>***FY 2019 Plans:***<br>Continue to support testing requirements for DCGS software.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Testing requirements increased from one Capability Drop to multiple Capability Drops. | - | 2.090 | 5.568 |
| ***Title:*** Training Support<br>***Description:*** Training support - embedded computer based training (CBT) for the DCGS-A software.<br>***FY 2018 Plans:***<br>Continue training support - embedded computer based training (CBT) for the DCGS-A software.<br>***FY 2019 Plans:***<br>Continue training support - embedded computer based training (CBT) for the DCGS-A software.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Similar level of effort in FY18 and FY19. | 1.316 | 3.203 | 2.851 |
| ***Title:*** Logistics Documentation | 0.405 | 0.380 | 0.338 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>D07 / *DCGS-A Common Modules (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Logistics activities including maintenance task analysis, level of repair analysis, user manual, training support package, and MANPRINT activities.<br><br>***FY 2018 Plans:***<br>Continue logistics activities including task maintenance task analysis, level of repair analysis, user manual, training support package, and MANPRINT activities.<br><br>***FY 2019 Plans:***<br>Continue logistics activities including task maintenance task analysis, level of repair analysis, user manual, training support package, and MANPRINT activities.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Similar level of effort in FY18 and FY19. | | | |
| **Accomplishments/Planned Programs Subtotals** | 32.284 | 24.700 | 38.667 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • B01001: *DCGS-A (MIP)* | - | - | 0.000 | - | 0.000 | 67.615 | 301.252 | 276.387 | 294.885 | Continuing | Continuing |

**Remarks**

Note: The Distributed Common Ground System - Army is designated a Major Automation Information System (MAIS) program.

**D. Acquisition Strategy**

DCGS-A is a former ACAT IAM, Major Automated Information System (MAIS) program. The DCGS-A program will consist of multiple capability drops structured to meet DCGS-A User requirements. The DCGS-A program will follow the Information Technology (IT) Box concept for an agile acquisition strategy to iteratively provide and field Intelligence, Surveillance, and Reconnaissance (ISR) capabilities, hosted on Commercial off the Shelf (COTS) equipment/hardware, providing low risk, efficient, time- phased releases of capability to satisfy the Army's operational needs.

The DCGS-A capabilities under Increment 1 will be leveraged to the maximum extent where applicable to meet the future DCGS-A requirements set. The DCGS-A will also leverage the Increment 1 configuration platforms fielded across the Army.

DCGS-A is a collection of software packages (COTS, and GOTS products) selected to provide each Army echelon (from Battalion up to Echelon Above Corps (EAC)) the capability to synthesize and exploit intelligence data. DCGS-A delivers these software packages on COTS and GOTS hardware components, tailored to meet each Army Echelon's intelligence mission requirements. DCGS-A is the Army's ISR Foundation Layer for Tasking, Processing, Exploitation, Dissemination (TPED) and

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>D07 / *DCGS-A Common Modules (MIP)* |

development of situation understanding using intelligence information about the threat, weather, and terrain at all Army Echelons. DCGS-A provides the capabilities necessary for Commanders to access information, task organic sensors, and synchronize non-organic sensor assets with their organic assets. DCGS-A will continuously acquire and synthesize data and information from Joint, Interagency, Intergovernmental, and Multi-national (JIIM) sources to maintain an updated and accurate understanding of the operational environment to inform critical and time sensitive command decisions.

The DCGS-A software baseline will be updated and iteratively deployed to address emerging and prioritized operational requirements. PM DCGS-A, in coordination with the operational user community, will align releases with the technological readiness of targeted enhancements, and to support low-risk integration and test cycle times. As capability drop requirements are approved, DCGS-A will leverage commercially available solutions and non-developmental items to meet user needs. The DCGS-A software will be hardware agnostic so that the software can be deployed in any processing hardware equipment. This allows the DCGS-A software to be scalable and deployable in different hardware system configurations, as required by the Army at different echelons. The implementation of the latest COTS hardware procurement through the Army Common Hardware System (CHS) program with the established post-deployment hardware sparing, sustainment, and maintenance provisions, will result in significant cost efficiencies.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | Project (Number/Name)<br>D07 / *DCGS-A Common Modules (MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Management | Allot | DCGS-A : APG, MD | 2.190 | 1.641 | Oct 2016 | 2.118 | Oct 2017 | 1.997 | Oct 2018 | - | | 1.997 | Continuing | Continuing | - |
| Milestone preparation; Activities; Trade Space Analysis (TSA) | MIPR | Various : Various | 3.318 | - | | - | | - | | - | | - | 0.000 | 3.318 | - |
| | | **Subtotal** | 5.508 | 1.641 | | 2.118 | | 1.997 | | - | | 1.997 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Integrate & Test software | C/FP | Various : Various | 11.921 | 27.791 | Jun 2017 | 13.010 | Dec 2017 | 24.126 | Dec 2018 | - | | 24.126 | Continuing | Continuing | Continuing |
| System reconfiguration | C/FP | Various : Various | 4.020 | - | | - | | - | | - | | - | Continuing | Continuing | - |
| | | **Subtotal** | 15.941 | 27.791 | | 13.010 | | 24.126 | | - | | 24.126 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix Support | MIPR | Various : Various | 3.805 | 1.131 | Oct 2016 | 3.899 | Oct 2017 | 3.787 | Oct 2018 | - | | 3.787 | Continuing | Continuing | - |
| Training Development | MIPR | Various : Various | - | 1.316 | Jan 2017 | 3.203 | Jan 2018 | 2.851 | Oct 2018 | - | | 2.851 | Continuing | Continuing | - |
| Logistics Documentation | MIPR | Various : Various | - | 0.405 | Jan 2017 | 0.380 | Jan 2018 | 0.338 | Jan 2019 | - | | 0.338 | Continuing | Continuing | - |
| | | **Subtotal** | 3.805 | 2.852 | | 7.482 | | 6.976 | | - | | 6.976 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

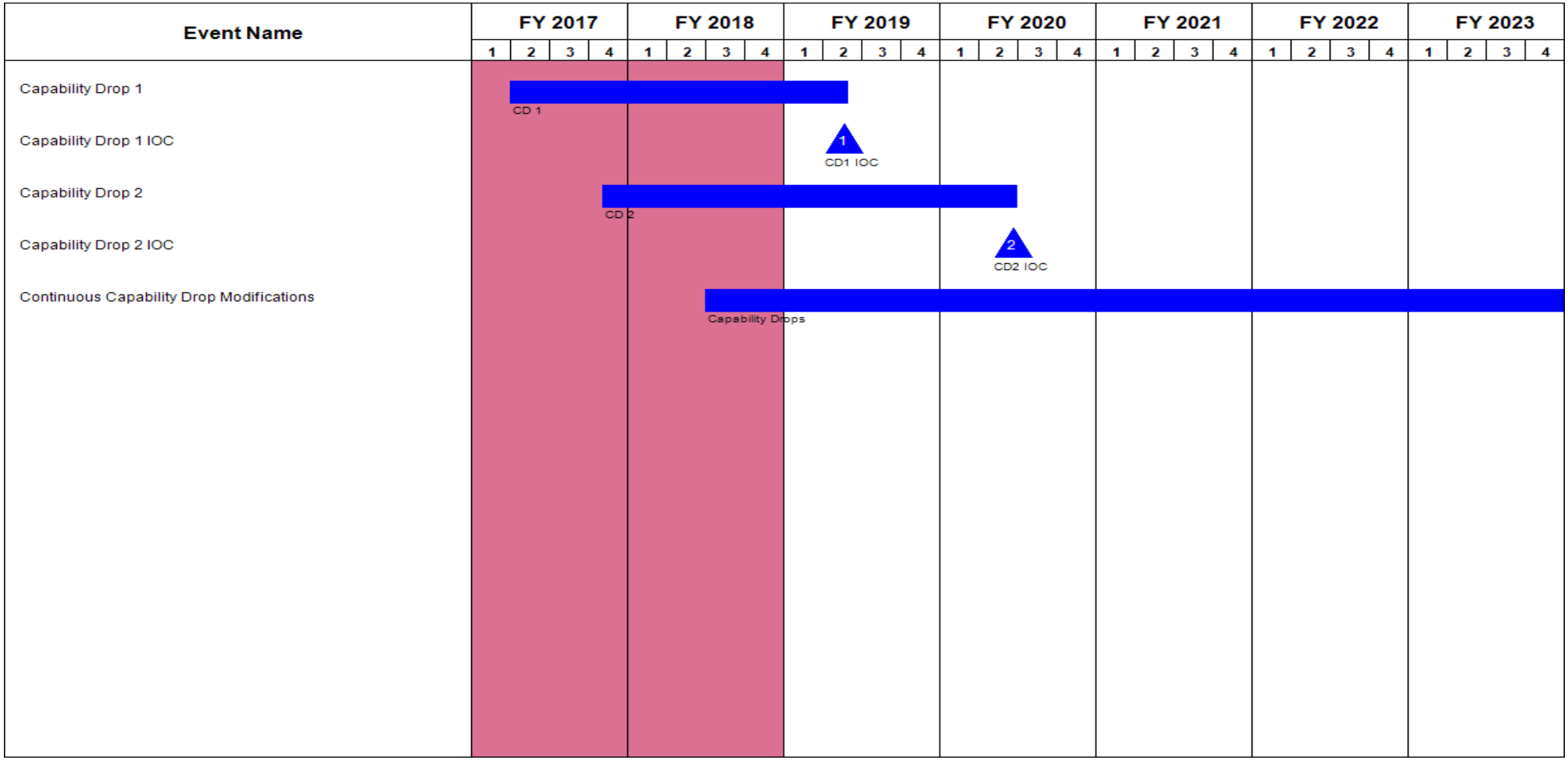
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Test & Integration Lab | MIPR | Various : Various | 1.000 | - | | 2.090 | Mar 2018 | 5.568 | Mar 2019 | - | | 5.568 | Continuing | Continuing | - |
| | | **Subtotal** | 1.000 | - | | 2.090 | | 5.568 | | - | | 5.568 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | Project (Number/Name)<br>D07 / *DCGS-A Common Modules (MIP)* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 26.254 | 32.284 | | 24.700 | | 38.667 | | - | | 38.667 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>D07 / *DCGS-A Common Modules (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208A / *Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>D07 / *DCGS-A Common Modules (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Capability Drop 1 | 1 | 2017 | 2 | 2019 |
| Capability Drop 1 IOC | 2 | 2019 | 2 | 2019 |
| Capability Drop 2 | 4 | 2017 | 2 | 2020 |
| Capability Drop 2 IOC | 2 | 2020 | 2 | 2020 |
| Continuous Capability Drop Modifications | 3 | 2018 | 4 | 2023 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305219A / *MQ-1 Gray Eagle UAV* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 13.470 | 9.574 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.044 |
| MQ1: *MQ-1 Gray Eagle - Army UAV (MIP)* | - | 13.470 | 9.574 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.044 |

**A. Mission Description and Budget Item Justification**

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission capability. MQ-1C Gray Eagle is a dedicated, assured, multi-mission Unmanned Aircraft System (UAS) fielded to all Army Divisions, Intelligence and Security Command and Army Special Operations Command in support of the commander's warfighting priorities.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 30.970 | 9.574 | 0.000 | - | 0.000 |
| Current President's Budget | 13.470 | 9.574 | 0.000 | - | 0.000 |
| Total Adjustments | -17.500 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • FY17 Amendment not appropriated | -17.500 | - | - | - | - |

**Change Summary Explanation**

The Fiscal Year (FY) 2017 increase requests MQ-1C Gray Eagle funding of $17.500 million to support development of Cyber Threat assessment activities and design and integration efforts.

The Fiscal Year (FY) 2018 MQ-1C Gray Eagle funding of $9.574 million will support Test and Evaluation efforts associated with the MQ-1C Gray Eagle Extended Range Engineering Change Proposal (ECP). The test effort will evaluate the changes to materiel (Extended Range Gray Eagle). The types of effort required include Environmental Testing, Electromagnetic Environmental Effects (E3) testing, transport/mobility testing, logistics demonstration, and Follow-On Operational Test and Evaluation (FOTE II).

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305219A / *MQ-1 Gray Eagle UAV* | Project (Number/Name)<br>MQ1 / *MQ-1 Gray Eagle - Army UAV (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MQ1: *MQ-1 Gray Eagle - Army UAV (MIP)* | - | 13.470 | 9.574 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.044 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) unmanned aircraft system (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission capability. MQ-1C Gray Eagle is a dedicated, assured, multi-mission Unmanned Aircraft System (UAS) fielded to all Army Divisions, Intelligence and Security Command and Army Special Operations Command in support of the commander's warfighting priorities.

The Fiscal Year (FY) 2018 MQ-1 Gray Eagle funding of $9.574 million will support Test and Evaluation efforts associated with the MQ-1C Gray Eagle Extended Range Engineering Change Proposal (ECP). The test effort will evaluate overall system level performance to ensure it meets developmental and operational requirements. The types of effort required include Environmental Testing, Electromagnetic Environmental Effects (E3) testing, transport/mobility testing, logistics demonstration, and Follow-On Operational Test and Evaluation (FOTE II).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** MQ-1C Gray Eagle Extended Range - Testing | 13.470 | 9.574 | - | - | - |
| ***Description:*** MQ-1C ER Testing<br><br>***FY 2018 Plans:***<br>The FY2018 efforts will complete trans/mobility for Gray Eagle along with testing and evaluation of MQ1C Gray Eagle Extended Range system hardware.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>MQ-1C Extended Range testing completed. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.470 | 9.574 | - | - | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A00005: *A00005* | 55.388 | 30.206 | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 85.594 |
| • AA6601: *AA6601* | - | 74.291 | 98.640 | 92.000 | 190.640 | 34.030 | 15.970 | - | 2.263 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305219A / *MQ-1 Gray Eagle UAV* | **Project (Number/Name)**<br>MQ1 / *MQ-1 Gray Eagle - Army UAV (MIP)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • EB6: *273744 EB6* | - | 39.362 | 17.896 | - | 17.896 | 6.764 | 4.321 | 0.223 | 0.165 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

An Extended Range Multi-Purpose (ERMP) Operational Requirement Document (ORD) was approved by the Joint Requirement Oversight Council (JROC) 6 Apr 2005. Milestone B occurred on 20 Apr 2005, and the System Development and Demonstration contract was awarded 8 Aug 2005, as a result of a competitive solicitation which included a vendor system capabilities demonstration. A Capabilities Production Document (CPD), version 8.7 was approved on 17 Jul 15. MQ-1C Gray Eagle completed FOTE 12 Jun 2015. On 14 Jul 2015, the trigger Configuration Steering Board (CSB) concurred with the Course of Action (COA) to validate the revised requirement for the Echelons Above Division (EAD) Gray Eagle and grant authorities through a new Acquisition Decision memorandum (ADM) to pursue the extended range capable Gray Eagle configuration. ER is an enhanced derivative of the MQ-1C Gray Eagle UAS and closes the capability gap by delivering extended surveillance coverage which supports Army RSTA missions in excess of 34 hours. ER's extended range provides the capacity for multi-intelligence payloads, precision strike capability, and reconnaissance in support of Special Operations Forces (SOF), Mission command from Aerial Intelligence Brigade (AIB) and U.S. Army Special Operations Command (USASOC). The Gray Eagle Research, Development, Test, and Evaluation (RDTE) acquisition strategy emphasis will be to complete Developmental test events (Environmental, E3, Transportability, & Performance Tests) to define and address system risks, followed by a FOTE II for the IGE.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305219A / *MQ-1 Gray Eagle UAV* | Project (Number/Name)<br>MQ1 / *MQ-1 Gray Eagle - Army UAV (MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | MIPR | PM UAS : Redstone Arsenal, AL | 9.066 | - | | - | | - | | - | | - | 0.000 | 9.066 | - |
| | | **Subtotal** | 9.066 | - | | - | | - | | - | | - | 0.000 | 9.066 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Engineering | C/CPIF | General Atomics / ASI : San Diego, CA | 165.070 | - | | - | | - | | - | | - | 0.000 | 165.070 | - |
| Prototype Manufacturing | Various | General Atomics / ASI : San Diego, CA | 213.776 | - | | - | | - | | - | | - | 0.000 | 213.776 | - |
| Ground Support Equipment | C/CPIF | Various : Various | 9.075 | - | | - | | - | | - | | - | 0.000 | 9.075 | - |
| Ground Base Sense & Avoid (GBSAA) | SS/CPFF | Various : Various | 16.445 | - | | - | | - | | - | | - | 0.000 | 16.445 | - |
| Software / Hardware Development | SS/CPIF | General Atomics : San Diego, CA | 95.179 | - | | - | | - | | - | | - | 0.000 | 95.179 | - |
| Common System Integration (CSI) Obsolescence | SS/CPFF | General Dynamics Mission Systems/ Various : Various | 19.985 | - | | - | | - | | - | | - | 0.000 | 19.985 | - |
| MQ-1C Gray Eagle Extended Range - Longbow Integration | SS/CPFF | GA-ASI : Poway, CA | 2.300 | - | | - | | - | | - | | - | 0.000 | 2.300 | - |
| | | **Subtotal** | 521.830 | - | | - | | - | | - | | - | 0.000 | 521.830 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering Support | MIPR | Ft. Huachuca : Ft. Huachuca | 24.501 | - | | - | | - | | - | | - | 0.000 | 24.501 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305219A / *MQ-1 Gray Eagle UAV* | Project (Number/Name)<br>MQ1 / *MQ-1 Gray Eagle - Army UAV (MIP)* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Training and Training Equipment | MIPR | Ft. Huachuca : Ft. Huachuca | 43.892 | - | | - | | - | | - | | - | 0.000 | 43.892 | - |
| Government Engineering Support | C/FFP | Various : Various | 18.859 | - | | - | | - | | - | | - | 0.000 | 18.859 | - |
| | | **Subtotal** | 87.252 | - | | - | | - | | - | | - | 0.000 | 87.252 | N/A |

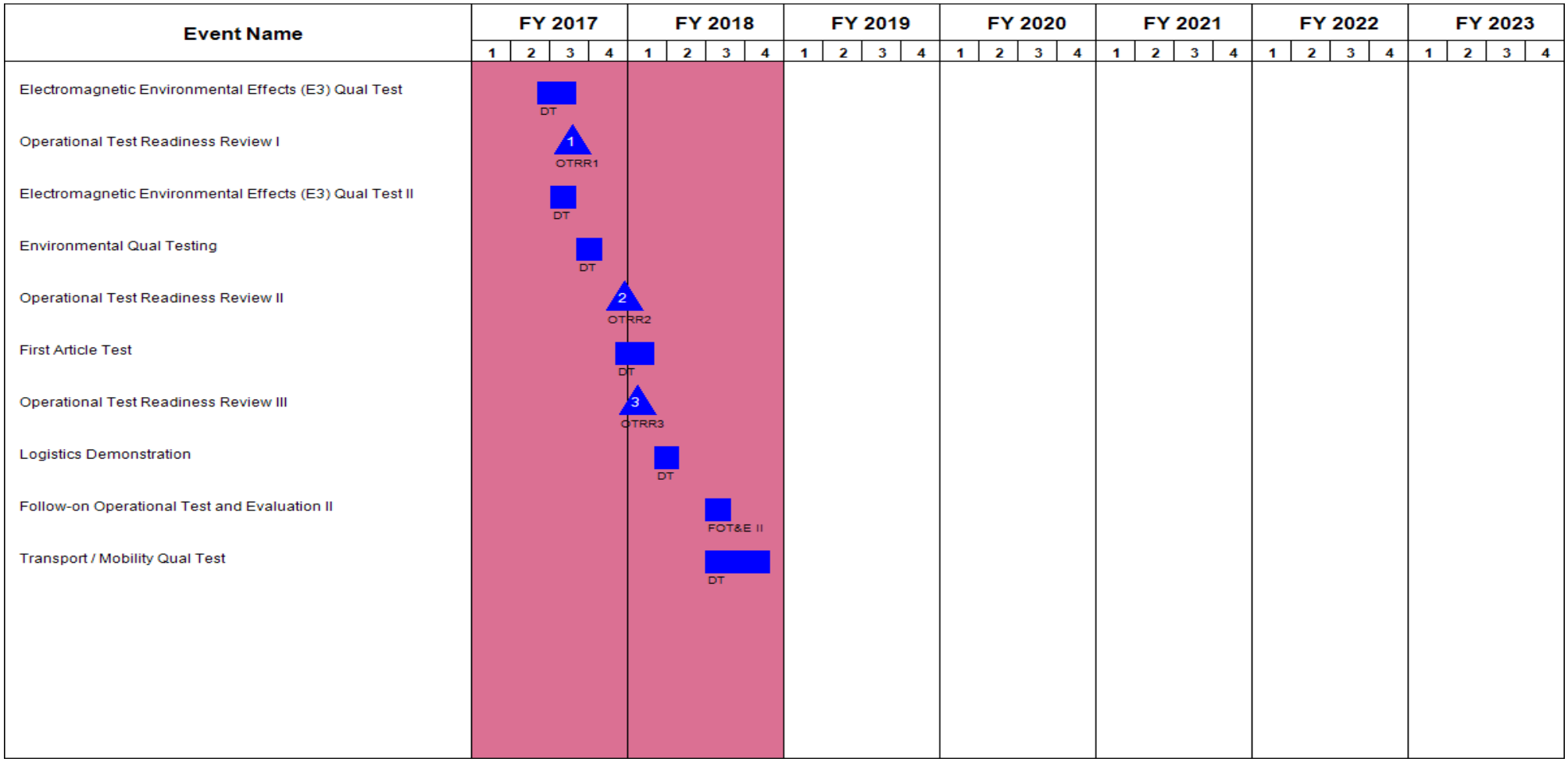
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Evaluation | MIPR | Various Government Agencies : Various Government Agencies | 81.768 | - | | - | | - | | - | | - | 0.000 | 81.768 | - |
| MQ-1C Gray Eagle Extended Range Development Testing and Software Testing | MIPR | Various Test Agencies : Various Test Agencies | - | 13.470 | Jan 2017 | 9.574 | | - | | - | | - | 0.000 | 23.044 | - |
| | | **Subtotal** | 81.768 | 13.470 | | 9.574 | | - | | - | | - | 0.000 | 104.812 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 699.916 | 13.470 | | 9.574 | | - | | - | | - | 0.000 | 722.960 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305219A / *MQ-1 Gray Eagle UAV* | **Project (Number/Name)**<br>MQ1 / *MQ-1 Gray Eagle - Army UAV (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305219A / *MQ-1 Gray Eagle UAV* | **Project (Number/Name)**<br>MQ1 / *MQ-1 Gray Eagle - Army UAV (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Engineering and Manufacturing Development | 3 | 2005 | 4 | 2013 |
| Critical Design Review | 2 | 2006 | 2 | 2006 |
| Operational Assessment | 3 | 2009 | 3 | 2010 |
| Milestone C | 2 | 2011 | 2 | 2011 |
| Initial Operational Test and Evaluation (IOT&E) | 4 | 2012 | 4 | 2012 |
| Engineering Software / Hardware Development | 1 | 2013 | 1 | 2014 |
| Electromagnetic Environmental Effects (E3) Qual Test | 2 | 2017 | 3 | 2017 |
| Operational Test Readiness Review I | 3 | 2017 | 3 | 2017 |
| Electromagnetic Environmental Effects (E3) Qual Test II | 3 | 2017 | 3 | 2017 |
| Environmental Qual Testing | 3 | 2017 | 4 | 2017 |
| Operational Test Readiness Review II | 4 | 2017 | 4 | 2017 |
| First Article Test | 4 | 2017 | 1 | 2018 |
| Operational Test Readiness Review III | 1 | 2018 | 1 | 2018 |
| Logistics Demonstration | 1 | 2018 | 2 | 2018 |
| Follow-on Operational Test and Evaluation II | 3 | 2018 | 3 | 2018 |
| Transport / Mobility Qual Test | 3 | 2018 | 4 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | | Date: February 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305232A *I RQ-11 UAV* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 1.613 | 2.191 | 6.180 | - | 6.180 | 3.222 | 1.174 | 0.000 | 0.000 | 0.000 | 14.380 |
| RA7: *RQ-11 Raven (MIP)* | - | 1.613 | 2.191 | 6.180 | - | 6.180 | 3.222 | 1.174 | 0.000 | 0.000 | 0.000 | 14.380 |

**A. Mission Description and Budget Item Justification**

The Family of Small Unmanned Aircraft System (FoSUAS) provides the battalion and below ground maneuver elements critical situational awareness and enhance force protection. The system provides the small unit commander an organic and responsive tactical Intelligence, Reconnaissance, Surveillance (IRS) capability through the ability to view real-time Full Motion Video and sensor data via the system ground control stations. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

A FoSUAS includes three hand-launched aircraft that do not require an improved launch/recovery location. In addition to the aircraft, the system contains ground control equipment, which includes an interoperable hand controller, Tactical Open Government Owned Architecture (TOGA). The equipment is fully transportable in or on rucksack type packs that are organic to the unit. FoSUAS is transitioning to a Capabilities Production Document (CPD) that will utilize existing RQ-11 and RQ-20 in a system of systems fielding concept, with a Short Range Micro (SRM) option under consideration.

Justification: Fiscal Year (FY) 2019 Research, Development, Test, and Evaluation (RDTE) Base funding of $6.180 million will be utilized for Program Management Engineering support and to meet CPD Increment II Block II related requirements. Specifically, to continue the research and development required to identify and baseline the SRM prototype solution for the FoSUAS effort. Options range from testing non developmental items produced by industry to researching what other government agencies have achieved in quad copter development and technology.

| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
|---|---|---|---|---|---|
| Previous President's Budget | 1.613 | 2.191 | 0.180 | - | 0.180 |
| Current President's Budget | 1.613 | 2.191 | 6.180 | - | 6.180 |
| Total Adjustments | 0.000 | 0.000 | 6.000 | - | 6.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 6.000 | - | 6.000 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305232A *I RQ-11 UAV* |

**Change Summary Explanation**

Increase in funding will primarily be used for Developmental Engineering for the investigation of options for Short Range Micro.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305232A / *RQ-11 UAV* | Project (Number/Name)<br>RA7 / *RQ-11 Raven (MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RA7: *RQ-11 Raven (MIP)* | - | 1.613 | 2.191 | 6.180 | - | 6.180 | 3.222 | 1.174 | 0.000 | 0.000 | 0.000 | 14.380 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Family of Small Unmanned Aircraft System (FoSUAS) provides the battalion and below ground maneuver elements critical situational awareness and enhance force protection. The system provides the small unit commander an organic and responsive tactical Intelligence, Reconnaissance, Surveillance (IRS) capability through the ability to view real-time Full Motion Video and sensor data via the system ground control stations. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

A FoSUAS includes three hand-launched aircraft that do not require an improved launch/recovery location. In addition to the aircraft, the system contains ground control equipment, which includes an interoperable hand controller, Tactical Open Government Owned Architecture (TOGA). The equipment is fully transportable in or on rucksack type packs that are organic to the unit. FoSUAS is transitioning to a Capabilities Production Document (CPD) that will utilize existing RQ-11 and RQ-20 in a system of systems fielding concept, with a Short Range Micro (SRM) option under consideration.

Justification: Fiscal Year (FY) 2019 Research, Development, Test, and Evaluation (RDTE) Base funding of $6.180 million will be utilized for Program Management Engineering support and to meet CPD Increment II Block II related requirements. Specifically, to continue the research and development required to identify and baseline the SRM prototype solution for the FoSUAS effort. Options range from testing non developmental items produced by industry to researching what other government agencies have achieved in quad copter development and technology.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Program Management Support | 0.581 | 0.230 | 0.649 |
| ***Description:*** Program Management Support during SRM engineering and testing efforts<br><br>***FY 2018 Plans:***<br>Program Management Support<br><br>***FY 2019 Plans:***<br>Program Management Support<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase continues Program Management Support for Short Range Micro solution investigation of candidates. | | | |
| ***Title:*** Developmental Engineering | 0.927 | 1.876 | 5.290 |
| ***Description:*** Developmental Engineering | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305232A / *RQ-11 UAV* | **Project (Number/Name)**<br>RA7 / *RQ-11 Raven (MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***FY 2018 Plans:***<br>Continuing the Short Range Micro (SRM) prototype materiel baseline<br>***FY 2019 Plans:***<br>Continuing the Short Range Micro (SRM) prototype materiel baseline<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase continues Development Engineering effort Short Range Micro (SRM) candidate investigation. | | | |
| ***Title:*** System Test and Evaluation<br>***Description:*** System Test and Evaluation<br>***FY 2018 Plans:***<br>Continue the prototype testing of the SRM<br>***FY 2019 Plans:***<br>Continue the development testing of the SRM<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase for continuation of Test and Evaluation of candidates for Short Range Micro investigation. | 0.105 | 0.085 | 0.241 |
| **Accomplishments/Planned Programs Subtotals** | 1.613 | 2.191 | 6.180 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A00010: *RQ-11 (RAVEN)* | - | - | 46.416 | - | 46.416 | 25.000 | 32.500 | 35.400 | 10.500 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The Tactical Unmanned Product Office (TUAS) will contract utilizing full and open competition via an Other Transaction Agreement (OTA) or a traditional contracting method to host a fly-off and down select. The Government will make contract award based upon competitive source selection criteria.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305232A / *RQ-11 UAV* | Project (Number/Name)<br>RA7 / *RQ-11 Raven (MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Personnel | RO | AMRDEC, Redstone Arsenal, AL : AMRDEC, Redstone Arsenal, AL | 1.109 | 0.581 | Nov 2016 | 0.230 | | 0.649 | | - | | 0.649 | 0.462 | 3.031 | - |
| | | **Subtotal** | 1.109 | 0.581 | | 0.230 | | 0.649 | | - | | 0.649 | 0.462 | 3.031 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Engineering | C/IDIQ | Aberdeen Proving Grounds, Natick Contracting Division, Orlando, FL : Aberdeen Proving Grounds, Natick Contracting Divis | 8.897 | 0.927 | Dec 2016 | 1.876 | Dec 2017 | 5.290 | Dec 2018 | - | | 5.290 | 3.763 | 20.753 | - |
| Developmental Engineering | C/IDIQ | AMRDEC, Redstone Arsenal, Redstone, Al : AMRDEC, Redstone Arsenal, Redstone, Al | 1.935 | - | | - | | - | | - | | - | 0.000 | 1.935 | - |
| | | **Subtotal** | 10.832 | 0.927 | | 1.876 | | 5.290 | | - | | 5.290 | 3.763 | 22.688 | N/A |

**Test and Evaluation ($ in Millions)**

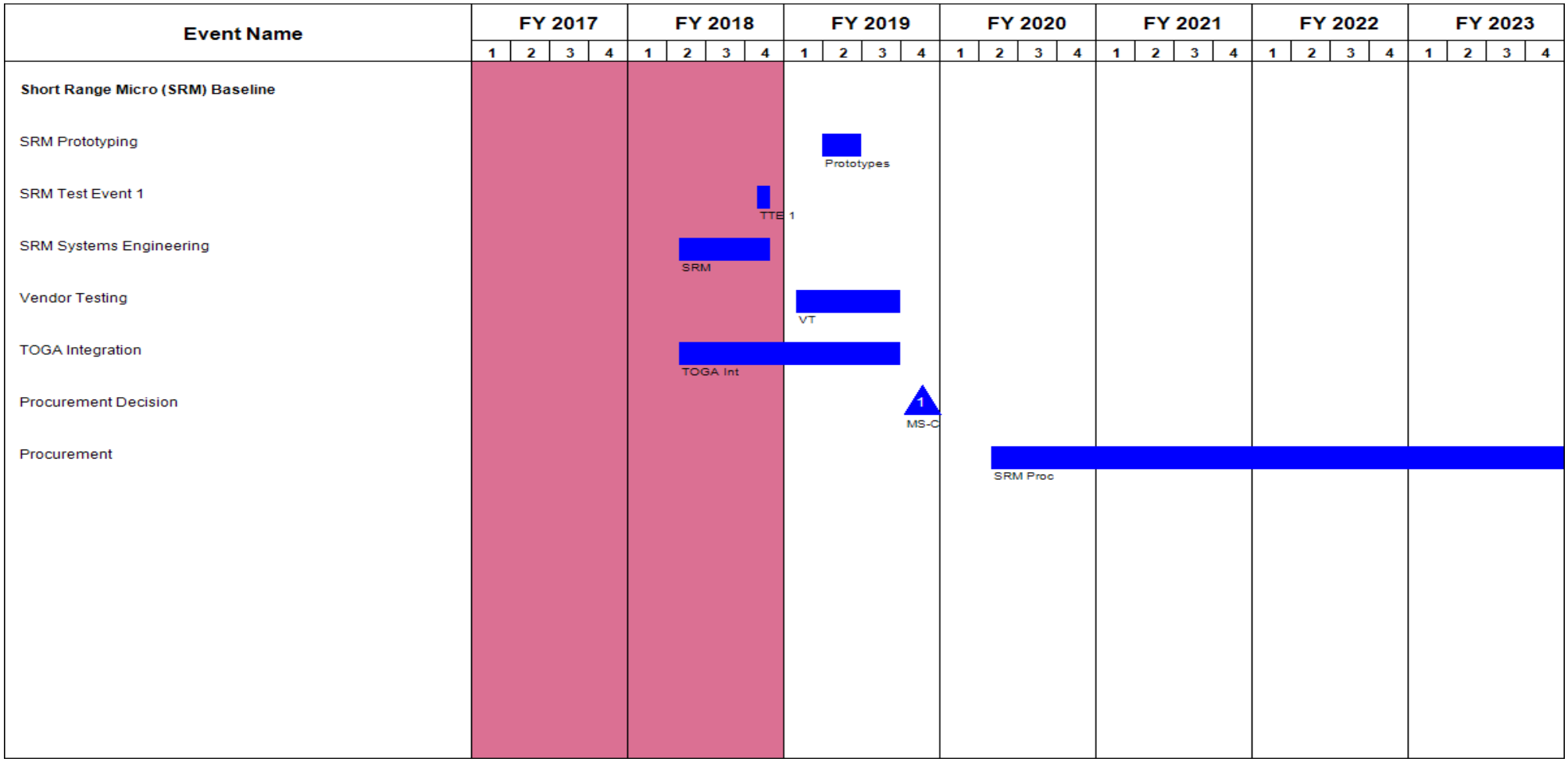
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Evaluation 1 | MIPR | Various : Various | 0.941 | 0.105 | Jul 2017 | 0.085 | Jul 2018 | 0.241 | Jul 2019 | - | | 0.241 | 0.171 | 1.543 | - |
| Test and Evaluation 2 | MIPR | Varies : Varies | 0.300 | - | | - | | - | | - | | - | 0.000 | 0.300 | - |
| | | **Subtotal** | 1.241 | 0.105 | | 0.085 | | 0.241 | | - | | 0.241 | 0.171 | 1.843 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305232A / *RQ-11 UAV* | Project (Number/Name)<br>RA7 / *RQ-11 Raven (MIP)* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 13.182 | 1.613 | | 2.191 | | 6.180 | | - | | 6.180 | 4.396 | 27.562 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305232A / *RQ-11 UAV* | **Project (Number/Name)**<br>RA7 / *RQ-11 Raven (MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305232A / *RQ-11 UAV* | **Project (Number/Name)**<br>RA7 / *RQ-11 Raven (MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Short Range Micro (SRM) Baseline | 1 | 2018 | 4 | 2018 |
| SRM Prototyping | 2 | 2019 | 2 | 2019 |
| SRM Test Event 1 | 4 | 2018 | 4 | 2018 |
| SRM Systems Engineering | 2 | 2018 | 4 | 2018 |
| Vendor Testing | 1 | 2019 | 3 | 2019 |
| TOGA Integration | 2 | 2018 | 3 | 2019 |
| Procurement Decision | 4 | 2019 | 4 | 2019 |
| Procurement | 2 | 2020 | 4 | 2023 |

**Note**

N/A

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305233A / *RQ-7 Shadow UAV* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 4.597 | 12.773 | 12.863 | - | 12.863 | 10.817 | 2.269 | 3.000 | 0.225 | 0.000 | 46.544 |
| RQ7: *RQ-7 Shadow UAV* | - | 4.597 | 12.773 | 12.863 | - | 12.863 | 10.817 | 2.269 | 3.000 | 0.225 | 0.000 | 46.544 |

**A. Mission Description and Budget Item Justification**

The Tactical Unmanned Aircraft System (TUAS) RQ-7 provides the Army Brigade Commander with dedicated Reconnaissance, Surveillance and Target Acquisition (RSTA), Intelligence, Battle Damage Assessment (BDA), and Force Protection. In line with the Army's Aviation Restructure Initiative (ARI) three Shadow Platoons are being integrated into the Combat Aviation Brigade's (CAB) Apache Reconnaissance Battalion. This will provide Aviation Brigades with Manned-Unmanned-Teaming (MUM-T) and enhanced Aerial Scout capabilities. The RQ-7B Shadow has logged over 1,090,000 flight hours, most of which were flown in support of Overseas Contingency Operations (OCO).

The full Shadow system consists of four air vehicles with payload, two Universal Ground Control stations, two Universal Ground Data Terminals, one Portable Ground Control Station with Portable Ground Data Terminal, Ground Support Equipment, two launchers, ten High Mobility Multipurpose Wheeled Vehicles (HMMWVs) with trailer(s), and a Light Medium Tactical Vehicle. Each system is equipped with one Maintenance Section Multifunctional (MSM) and is supported at the division level by a Mobile Maintenance Facility (MMF). The baseline fielded payload was the electro-optic infrared (EO/IR), but half of those have been replaced with a Laser Designator (LD) payload. All 104 systems required by the Army Procurement Objective (APO) have been procured. In 2010 the Army G8 established an RQ-7B Unmanned Aerial Vehicle (UAV) MODs program.

Justification: Fiscal Year (FY) 2019 RQ-7B UAS Base funding of $12.863 million will be utilized in the following: 1) $10.696M will be used to continue modifications for the RQ-7B UAS, 2) $2.167M provides interoperability and enhancements for the One System Remote Video Terminal (OSRVT). The $10.696M for modifications of the RQ-7B UAS will conduct an operational test on the Shadow v2 Block III upgrade, complete testing of the air vehicle modifications to allow operations in a Global Positioning System (GPS) denied environment and Air Vehicle and Ground Equipment software development for interoperability and MUM-T. The operational test for the Block III upgrade is required to assess the safety, suitability and effectiveness of the Block III upgrade prior to fielding. The GPS denied development is a phased, multi-year effort. Phase I (FY16) provided a trade study to determine the best hardware and software alternatives. Phase II (FY16) initiated the design and development through preliminary design review. Phase III (FY17) completed design and development through critical design review and conducted engineering flight testing. Phase IV (FY18 & FY19) will complete development, qualification, and developmental testing. RDTE also provides interoperability modifications that support MUM-T with the AH-64 Apache Helicopter, and Systems Engineering and Test and Evaluation to support the capability improvements.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 0305233A / *RQ-7 Shadow UAV* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 7.597 | 12.773 | 10.163 | - | 10.163 |
| Current President's Budget | 4.597 | 12.773 | 12.863 | - | 12.863 |
| Total Adjustments | -3.000 | 0.000 | 2.700 | - | 2.700 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 2.700 | - | 2.700 |
| • RAA not appropriated | -3.000 | - | - | - | - |

**Change Summary Explanation**

Addition of $2.7 Million in FY2019 will be used towards the completion of developmental testing of the ability to operate in a GPS denied environment; Interoperability software modifications that support Manned Unmanned Teaming with the AH-64 Apache Helicopter.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305233A / *RQ-7 Shadow UAV* | Project (Number/Name)<br>RQ7 / *RQ-7 Shadow UAV* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RQ7: *RQ-7 Shadow UAV* | - | 4.597 | 12.773 | 12.863 | - | 12.863 | 10.817 | 2.269 | 3.000 | 0.225 | 0.000 | 46.544 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Tactical Unmanned Aircraft System (TUAS) RQ-7 provides the Army Brigade Commander with dedicated Reconnaissance, Surveillance and Target Acquisition (RSTA), Intelligence, Battle Damage Assessment (BDA), and Force Protection. In line with the Army's Aviation Restructure Initiative (ARI) three Shadow Platoons are being integrated into the Combat Aviation Brigade's (CAB) Apache Reconnaissance Battalion. This will provide Aviation Brigades with Manned-Unmanned-Teaming (MUM-T) and enhanced Aerial Scout capabilities. The RQ-7B Shadow has logged over 1,090,000 flight hours, most of which were flown in support of Overseas Contingency Operations (OCO).

The full Shadow system consists of four air vehicles with payload, two Universal Ground Control stations, two Universal Ground Data Terminals, one Portable Ground Control Station with Portable Ground Data Terminal, Ground Support Equipment, two launchers, ten High Mobility Multipurpose Wheeled Vehicles (HMMWVs) with trailer(s), and a Light Medium Tactical Vehicle. Each system is equipped with one Maintenance Section Multifunctional (MSM) and is supported at the division level by a Mobile Maintenance Facility (MMF). The baseline fielded payload was the electro-optic infrared (EO/IR), but half of those have been replaced with a Laser Designator (LD) payload. All 104 systems required by the Army Procurement Objective (APO) have been procured. In 2010 the Army G8 established an RQ-7B Unmanned Aerial Vehicle (UAV) MODs program.

Justification: Fiscal Year (FY) 2019 RQ-7B UAS Base funding of $12.863 million will be utilized in the following: 1) $10.696M will be used to continue modifications for the RQ-7B UAS, 2) $2.167M provides interoperability and enhancements for the One System Remote Video Terminal (OSRVT). The $10.696M for modifications of the RQ-7B UAS will conduct an operational test on the Shadow v2 Block III upgrade, complete testing of the air vehicle modifications to allow operations in a Global Positioning System (GPS) denied environment and Air Vehicle and Ground Equipment software development for interoperability and MUM-T. The operational test for the Block III upgrade is required to assess the safety, suitability and effectiveness of the Block III upgrade prior to fielding. The GPS denied development is a phased, multi-year effort. Phase I (FY16) provided a trade study to determine the best hardware and software alternatives. Phase II (FY16) initiated the design and development through preliminary design review. Phase III (FY17) completed design and development through critical design review and conducted engineering flight testing. Phase IV (FY18 & FY19) will complete development, qualification, and developmental testing. RDTE also provides interoperability modifications that support MUM-T with the AH-64 Apache Helicopter, and Systems Engineering and Test and Evaluation to support the capability improvements.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Air Vehicle Improvements | 2.087 | 5.543 | 2.620 |
| ***Description:*** Air Vehicle Improvements | | | |
| ***FY 2018 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305233A / *RQ-7 Shadow UAV* | **Project (Number/Name)**<br>RQ7 / *RQ-7 Shadow UAV* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Complete development of the ability to operate in GPS denied environment.<br>***FY 2019 Plans:***<br>Complete developmental testing of the ability to operate in a GPS denied environment; Interoperability software modifications that support Manned Unmanned Teaming with the AH-64 Apache Helicopter.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>'Complete developmental testing of the ability to operate in a GPS denied environment | | | |
| ***Title:*** Ground Equipment Improvements<br>***Description:*** Ground Equipment Improvements<br>***FY 2018 Plans:***<br>Continues to fund Ground Equipment Improvements. Continues development of interoperability capabilities through use of Universal Ground Data Terminals and Universal Ground Control Stations. Network Security and System Vulnerability.<br>***FY 2019 Plans:***<br>Continues to fund Ground Equipment Improvements. Continues development of interoperability capabilities through use of Universal Ground Data Terminals and Universal Ground Control Stations. Network Security and System Vulnerability.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Continues to fund Ground Equipment Improvements. Continues development of interoperability capabilities through use of Universal Ground Data Terminals and Universal Ground Control Stations. Network Security and System Vulnerability | - | 2.933 | 5.018 |
| ***Title:*** Test and Evaluation<br>***Description:*** Test and Evaluation<br>***FY 2018 Plans:***<br>Continues to fund test and evaluation of Air Vehicle and Ground Equipment Improvements.<br>***FY 2019 Plans:***<br>Funds Operational Test for the Shadow V2 Block III upgrade and continues to fund test and evaluation of Air Vehicle and Ground Equipment.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funds Operational Test for the Shadow V2 Block III upgrade and continues to fund test and evaluation of Air Vehicle and Ground Equipment. | 0.492 | 0.900 | 2.454 |
| ***Title:*** System Engineering/Program Management | 0.699 | 1.278 | 1.304 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305233A / *RQ-7 Shadow UAV* | **Project (Number/Name)**<br>RQ7 / *RQ-7 Shadow UAV* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** System Engineering/Program Management<br><br>***FY 2018 Plans:***<br>Continues to fund System Engineering/Program management<br><br>***FY 2019 Plans:***<br>Continues to fund System Engineering/Program management<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Continues to fund System Engineering/Program management | | | |
| ***Title:*** One System Remote Video Terminal (OSRVT)<br><br>***Description:*** OSRVT<br><br>***FY 2018 Plans:***<br>Continues to fund interoperability and performance improvements for OSRVT.<br><br>***FY 2019 Plans:***<br>Continues to fund interoperability and performance improvements for OSRVT.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Continues to fund interoperability and performance improvements for OSRVT. | 1.319 | 2.119 | 1.467 |
| **Accomplishments/Planned Programs Subtotals** | 4.597 | 12.773 | 12.863 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • A00018: *A00018* | 135.408 | 83.160 | 46.786 | - | 46.786 | 21.753 | 15.000 | 24.000 | 20.137 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

A System Capability Demonstration (SCD) was conducted with four contractors. The results from the SCD in conjunction with proposal evaluations resulted in the competitive down select of a Best Value TUAS. A successful Milestone II Army Systems Acquisition Review Council (ASARC) was conducted 21 Dec 1999 and a Milestone III Decision was reached on 25 Sep 2002. The full rate production contract was awarded 27 Dec 2002 and in FY2009 the last of the authorized 104 systems was placed on contract. Continued development of the selected Tactical Unmanned Aircraft Vehicle (TUAV) system will be accomplished through a series of modifications and retrofits such as Shadow v2, Communications Relay, Laser Designator, Block III engine, and reliability upgrades. Development/integration of

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305233A / *RQ-7 Shadow UAV* | **Project (Number/Name)**<br>RQ7 / *RQ-7 Shadow UAV* |

these improved capabilities will be through individual efforts on an engineering services contract with Shadow contractors. Development of the Block III engine was accomplished through a competitive process.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305233A / *RQ-7 Shadow UAV* | Project (Number/Name)<br>RQ7 / *RQ-7 Shadow UAV* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base: Program Management | RO | PM UAS : Redstone Arsenal, AL | 3.552 | 0.110 | Nov 2016 | 0.426 | | 0.491 | | - | | 0.491 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 3.552 | 0.110 | | 0.426 | | 0.491 | | - | | 0.491 | Continuing | Continuing | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OIF Improvements / Block Upgrades / Capability Improvements | SS/CPFF | AAI Corporation : Hunt Valley, MD | 4.605 | - | | - | | 1.302 | | - | | 1.302 | 0.000 | 5.907 | - |
| System Engineering / Reliability Solutions | SS/CPFF | AAI Corporation : Hunt Valley, MD | 2.025 | - | | - | | 4.252 | | - | | 4.252 | Continuing | Continuing | - |
| Ground Equipment Improvements | C/CPFF | TBD: Competitive in FY18 : TBD: Competitive in FY18 | 19.298 | - | | 2.933 | Dec 2017 | - | | - | | - | Continuing | Continuing | Continuing |
| Block III Engine Development | C/CPFF | LSF : Redstone Arsenal, AL | 30.725 | - | | - | | - | | - | | - | 0.000 | 30.725 | - |
| Other Air Vehicle Improvements | C/CPFF | TBD: Competitive in FY18 : TBD: Competitive in FY18 | 16.643 | - | | 0.375 | | 0.168 | | - | | 0.168 | Continuing | Continuing | Continuing |
| GPS Denied Development | C/CPFF | TBD: Competitive in FY18 : TBD: Competitive in FY18 | 1.500 | 2.087 | Dec 2016 | 5.168 | Dec 2017 | 1.916 | | - | | 1.916 | Continuing | Continuing | - |
| Payload Improvements | SS/CPFF | Various : Various | 4.750 | - | | - | | - | | - | | - | 0.000 | 4.750 | - |
| One System Remote Video Terminal (OSRVT) | SS/CPFF | AAI Corporation, MD : AAI Corporation, MD | 13.087 | 1.319 | Apr 2017 | 2.119 | | 1.467 | | - | | 1.467 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 92.633 | 3.406 | | 10.595 | | 9.105 | | - | | 9.105 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0305233A / *RQ-7 Shadow UAV* | Project (Number/Name)<br>RQ7 / *RQ-7 Shadow UAV* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering Support | Various | Various : Various | 2.549 | 0.379 | Dec 2016 | 0.284 | | 0.183 | | - | | 0.183 | Continuing | Continuing | Continuing |
| Base: Government Engineering and Logistic Support | MIPR | Various : Various | 1.274 | 0.189 | Nov 2016 | 0.568 | | 0.630 | | - | | 0.630 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 3.823 | 0.568 | | 0.852 | | 0.813 | | - | | 0.813 | Continuing | Continuing | N/A |

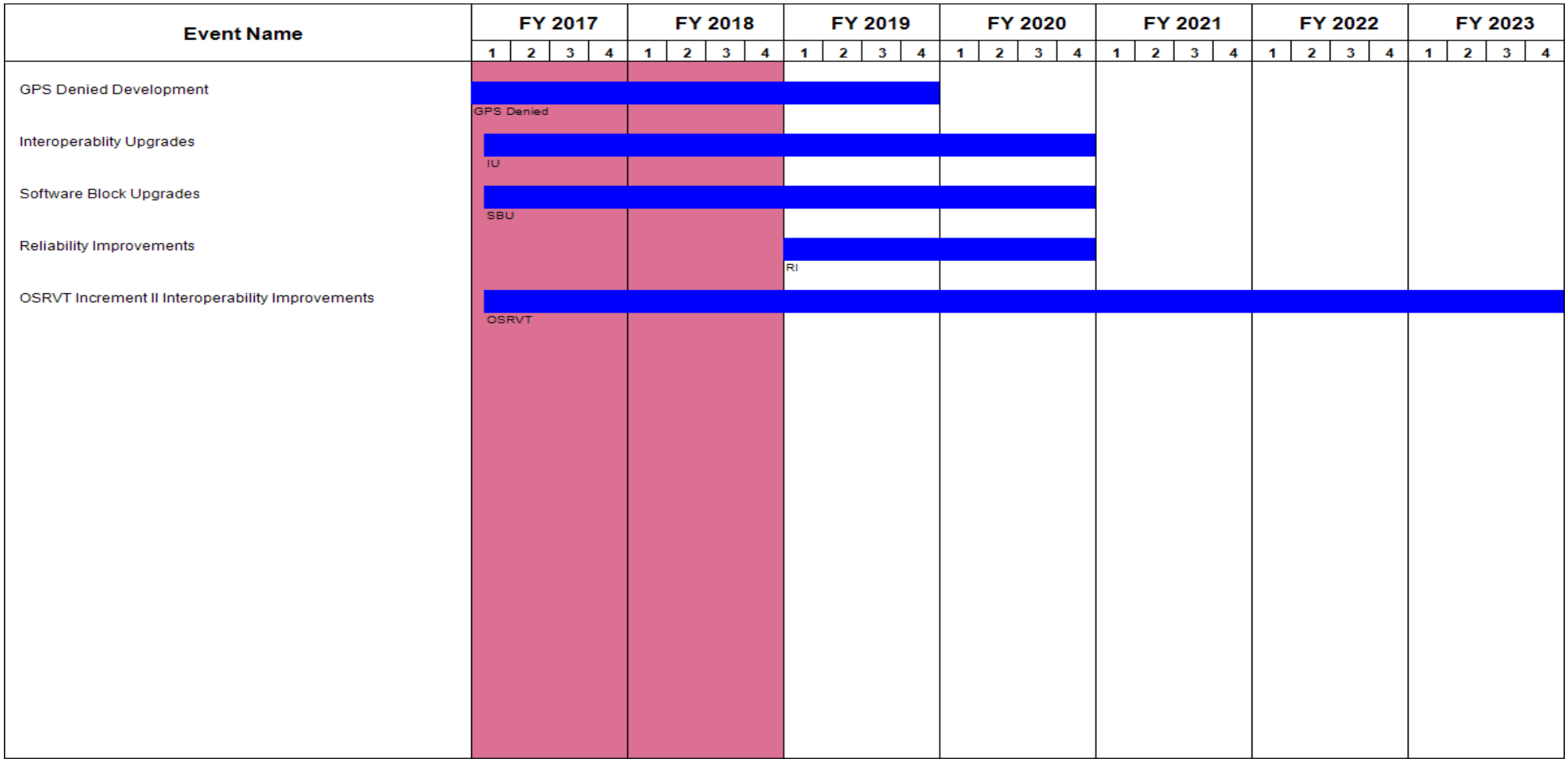
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RQ-7 Developmental Testing of Product Development | Various | Various : Various | 5.675 | 0.413 | Dec 2016 | 0.800 | | 1.000 | | - | | 1.000 | Continuing | Continuing | Continuing |
| RQ-7 Operational Testing of Product Developments | MIPR | Various : Various | 0.400 | 0.100 | Dec 2016 | 0.100 | | 1.454 | | - | | 1.454 | Continuing | Continuing | Continuing |
| OSRVT Developmental Testing | MIPR | Various : Various | 0.100 | - | | - | | - | | - | | - | 0.000 | 0.100 | - |
| OSRVT - Operational Testing | MIPR | Various : Various | 2.033 | - | | - | | - | | - | | - | 0.000 | 2.033 | - |
| | | **Subtotal** | 8.208 | 0.513 | | 0.900 | | 2.454 | | - | | 2.454 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 108.216 | 4.597 | | 12.773 | | 12.863 | | - | | 12.863 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305233A / *RQ-7 Shadow UAV* | **Project (Number/Name)**<br>RQ7 / *RQ-7 Shadow UAV* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305233A / *RQ-7 Shadow UAV* | **Project (Number/Name)**<br>RQ7 / *RQ-7 Shadow UAV* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Block III Engine Development | 1 | 2015 | 3 | 2016 |
| GPS Denied Development | 3 | 2016 | 4 | 2019 |
| Interoperablity Upgrades | 1 | 2015 | 4 | 2020 |
| Software Block Upgrades | 1 | 2015 | 4 | 2020 |
| Reliability Improvements | 1 | 2019 | 4 | 2020 |
| OSRVT Increment II Interoperability Improvements | 1 | 2013 | 4 | 2023 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0307665A *I Biometrics Enabled Intelligence* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 8.854 | 8.573 | 4.310 | 2.214 | 6.524 | 4.800 | 0.000 | 0.000 | 0.000 | 0.000 | 28.751 |
| BI7: *BIOMETRICS ENABLED INTELLIGENCE - MIP* | - | 8.854 | 8.573 | 4.310 | 2.214 | 6.524 | 4.800 | 0.000 | 0.000 | 0.000 | 0.000 | 28.751 |

**A. Mission Description and Budget Item Justification**

The Army Program of Record for biometrics tactical collection capability is presently the Biometrics Automated Toolset-Army (BAT-A). It consists of the BAT-A Kit, BAT-A Handheld and BAT-A Web Service. This capability supports the Army Force Protection Mission and Identity Dominance Mission. The BAT-A system collects, matches, stores, and shares biometric and contextual information on Known & Suspected Terrorists, potential adversaries, host nation personnel, and third country nationals. Recipients of collected information include DoD organizations, other U.S. government agencies, and Coalition Partners. The BAT-A system is also used by non-Military Intelligence personnel (Infantry and Military Police) for protection missions. The capability was originally deployed as a Quick Reaction Capability and has been deployed in a combat zone for over 17 years. Today, BAT-A supports Operation Freedom's Sentinel, Operation Inherent Resolve and Operation Guantanamo Bay. The BAT-A system will reach end of useful life in FY22.

The $4.310 million of FY 2019 Base Funding will continue the transition phase established in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC), the replacement for the BAT-A. The program will use the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.

The FY 2019 OCO of $2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence Repository (BI2R -the unique software-based analytic production system used by the National Ground Intelligence Center (NGIC) specifically to create the Biometric Enabled Watchlist for Operation Freedom's Sentinel (OFS) and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) Commercial Cloud Service (C2S) cloud.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0307665A *I Biometrics Enabled Intelligence* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 8.854 | 8.573 | 0.000 | - | 0.000 |
| Current President's Budget | 8.854 | 8.573 | 4.310 | 2.214 | 6.524 |
| Total Adjustments | 0.000 | 0.000 | 4.310 | 2.214 | 6.524 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | 4.310 | 2.214 | 6.524 |

**Change Summary Explanation**

The FY 2019 funding request was reduced by $1.490 million to account for the availability of prior year execution balances.

The $4.310 million of FY 2019 Base Funding will continue on the transition phase established in FY 2018 for Next Generation Biometric Collection Capability, (NXGBCC) the replacement for the BAT-A. The program will use the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.

The FY 2019 OCO of $2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence Repository (BI2R -the unique software-based analytic production system used by NGIC specifically to create the Biometric Enabled Watchlist for OFS and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) C2S cloud.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0307665A / *Biometrics Enabled Intelligence* | Project (Number/Name)<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BI7: *BIOMETRICS ENABLED INTELLIGENCE - MIP* | - | 8.854 | 8.573 | 4.310 | 2.214 | 6.524 | 4.800 | 0.000 | 0.000 | 0.000 | 0.000 | 28.751 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Army Program of Record for biometrics tactical collection capability is presently the Biometrics Automated Toolset-Army (BAT-A). It consists of the BAT-A Kit, BAT-A Handheld and BAT-A Web Service. This capability supports the Army Force Protection Mission and Identity Dominance Mission. The BAT-A system collects, matches, stores, and shares biometric and contextual information on Known & Suspected Terrorists, potential adversaries, host nation personnel, and third country nationals. Recipients of collected information include DoD organizations, other U.S. government agencies, and Coalition Partners. The BAT-A system is also used by non-Military Intelligence personnel (Infantry and Military Police) for protection missions. The capability was originally deployed as a Quick Reaction Capability and has been deployed in a combat zone for over 17 years. Today, BAT-A supports Operation Freedom's Sentinel, Operation Inherent Resolve and Operation Guantanamo Bay. The BAT-A system will reach end of useful life in FY22.

The $4.310 million of FY 2019 Base Funding will continue the transition phase established in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC), the replacement for the BAT-A. The program will use the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.

The FY 2019 OCO of $2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence Repository (BI2R -the unique software-based analytic production system used by the National Ground Intelligence Center (NGIC) specifically to create the Biometric Enabled Watchlist for Operation Freedom's Sentinel (OFS) and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) Commercial Cloud Service (C2S) cloud.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Army G2 Projects | 7.104 | 6.036 | 0.000 | 2.214 | 2.214 |
| ***Description:*** Army G2 supports various development of intelligence capabilities currently used to support Operation Freedom's Sentinel (OFS) and Operation Inherent Resolve (OIR) including Vigilant Pursuit Systems and the Biometrics Intelligence Information Repository (BI2R).<br><br>***FY 2018 Plans:***<br>FY 2018 RDT&E OCO Funding ($3,886) supports Five Vigilant Pursuit System Sets (10 vehicles total plus equipment) are currently deployed in support of OFS (two sets) and OIR (three sets). The Vigilant Pursuit | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0307665A / *Biometrics Enabled Intelligence* | **Project (Number/Name)**<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| System currently consists of 2 vehicles with integrated Multi-Intelligence (Multi-INT) Collection, Processing, Exploitation, and Dissemination capability packages installed on Mine-Resistant Ambush Protected All-Terrain Vehicles (MATVs). The funding supports developmental activities to create modularized, vehicle-independent and tailorable Multi-INT Collection, Processing, Exploitation, and Dissemination capability packages that can be installed and removed in a matter of minutes on any vehicle type to meet specific mission needs.<br><br>The remaining FY 2018 RDT&E OCO Funding ($2,150K) supports the development of new software code & associated testing to deliver the Biometric Intelligence Information Repository (I2AR) a replacement for the Biometrics Identity Intelligence Repository (BI2R -the unique software-based analytic production system used by NGIC specifically to create the Biometric Enabled Watchlist for OFS and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) C2S cloud.<br><br>***FY 2019 Base Plans:***<br>No RDT&E Base associated efforts are planned for FY 2019.<br><br>***FY 2019 OCO Plans:***<br>The FY 2019 OCO of $2.214 million will continue to support the development of new software code & associated testing to deliver the Identity Intelligence Analytic Resource (I2AR) a replacement for the Biometrics Identity Intelligence Repository (BI2R -the unique software-based analytic production system used by NGIC specifically to create the Biometric Enabled Watchlist for OFS and other worldwide missions) on the Intelligence Community Information Technology Environment (IC ITE) C2S cloud.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY18 RDT&E OCO Funding ($3,886K) supports developmental activities to create modularized, vehicle-independent and tailorable Multi-INT Collection, Processing, Exploitation, and Dissemination capability packages will conclude in FY18. The RDT&E funding of $2,150K for FY19 will continue the development of new software code & associated testing. | | | | | |
| ***Title:*** Next Generation Biometric Collection Capability (NXGBCC)<br><br>***Description:*** The Next Generation Biometric Collection Capability (NXGBCC) will be the successor program to the current BAT-A Program of Record.<br><br>***FY 2018 Plans:*** | - | 2.537 | 4.310 | - | 4.310 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0307665A / *Biometrics Enabled Intelligence* | **Project (Number/Name)**<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| The FY 2018 Base funding of $2.537 million will support program planning and pre-acquisition efforts for the Next Generation Biometric Collection Capability (NXGBCC).<br>***FY 2019 Base Plans:***<br>The $4.310 million of FY 2019 Base Funding will expand on the transition phase established in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC) the replacement for the BAT-A. The program will continue the Other Transaction Agreement (OTA) process to down-select prototypes from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>The increase of $1.773 million of FY 2019 Base Funding will further expand market research and industry engagement initiated in FY 2018 for Next Generation Biometric Collection Capability (NXGBCC). The program will complete the OTA to down-select a prototype from commercial vendors. Also, the program will begin NXGBCC infrastructure assessment, functionality and modality evaluation. | | | | | |
| ***Title:*** Joint Urgent Operational Needs Statement (JUONS) CC-0548<br>***Description:*** OSD S&T effort to develop a portable rapid DNA solution to meet the requirements for JUONS CC-0548. | 1.750 | - | - | - | - |
| **Accomplishments/Planned Programs Subtotals** | 8.854 | 8.573 | 4.310 | 2.214 | 6.524 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The NXGBCC Acquisition Strategy is to procure a limited development integrated solution that meets the NXGBCC collect/store/match/share requirements and interfaces with the Biometric Family of Systems. The strategy will maximize mature technologies (integrated commercial off the shelf products) and reward industry for providing a solution that is integrated and can be fielded in FY21. The program office will use an Other Transaction Agreement (OTA) to down-select a prototype from commercial vendors. Upon OTA completion, the procurement, fielding and sustainment sustainment process will begin.

The $2.214 million of FY 2019 OCO funding will continue the development of new software code & associated testing necessary to deliver the Identity Intelligence Analytic Resource (I2AR). The acquisition strategy will be to exercise a contract option which enables for continuation of a contractor to develop activities for the Army Requirements Oversight Council (AROC) approved Quick Reaction Capability (QRC).

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0307665A / *Biometrics Enabled Intelligence* | **Project (Number/Name)**<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0307665A / *Biometrics Enabled Intelligence* | Project (Number/Name)<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM Management Services | Various | Various : Various | 12.921 | - | | 2.537 | | - | | - | | - | 0.000 | 15.458 | - |
| PM Management Services | C/Various | TBD : TBD | - | - | | - | | 4.310 | | 2.214 | | 6.524 | 0.000 | 6.524 | - |
| | | **Subtotal** | 12.921 | - | | 2.537 | | 4.310 | | 2.214 | | 6.524 | 0.000 | 21.982 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Products Development | C/IDIQ | Various : TBD | 44.293 | 5.494 | Jul 2017 | 5.247 | | - | | - | | - | 0.000 | 55.034 | - |
| | | **Subtotal** | 44.293 | 5.494 | | 5.247 | | - | | - | | - | 0.000 | 55.034 | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM Civilian Personnel and Other Support Costs | Various | Various : Various | 20.102 | - | | - | | - | | - | | - | 0.000 | 20.102 | - |
| | | **Subtotal** | 20.102 | - | | - | | - | | - | | - | 0.000 | 20.102 | N/A |

**Test and Evaluation ($ in Millions)**

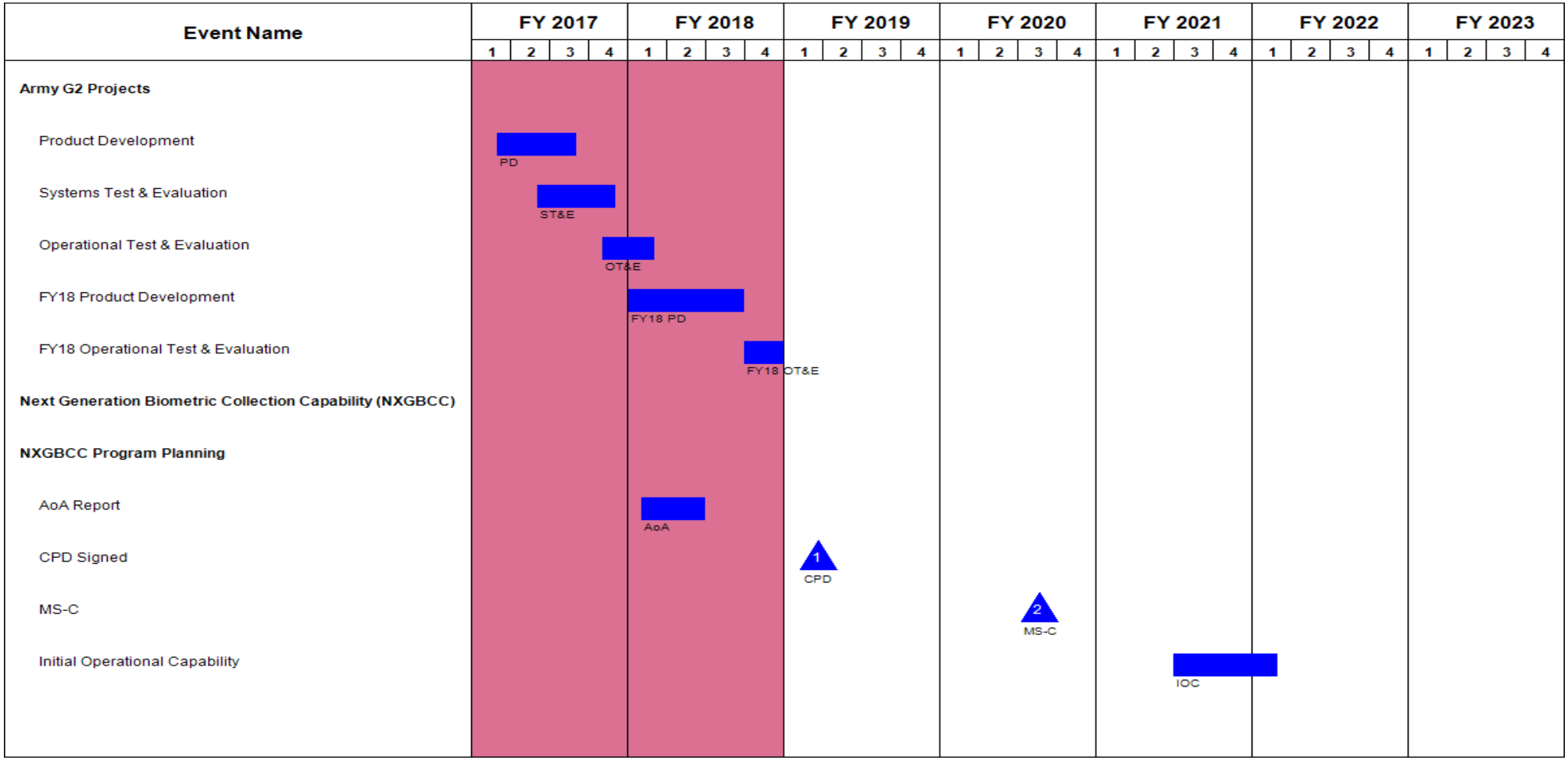
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IA, T&E, Threat Assessment, Interoperabiity Certifications | Various | Various : TBD | 0.917 | 3.360 | Aug 2017 | 0.789 | | - | | - | | - | 0.000 | 5.066 | - |
| | | **Subtotal** | 0.917 | 3.360 | | 0.789 | | - | | - | | - | 0.000 | 5.066 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0307665A / *Biometrics Enabled Intelligence* | Project (Number/Name)<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 78.233 | 8.854 | | 8.573 | | 4.310 | | 2.214 | | 6.524 | 0.000 | 102.184 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0307665A / *Biometrics Enabled Intelligence* | **Project (Number/Name)**<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0307665A / *Biometrics Enabled Intelligence* | **Project (Number/Name)**<br>BI7 / *BIOMETRICS ENABLED INTELLIGENCE - MIP* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Contract Closeout | 2 | 2015 | 2 | 2015 |
| PM JPIv2 Closeout | 2 | 2015 | 1 | 2016 |
| Army G2 Projects | 1 | 2017 | 1 | 2021 |
| Product Development | 1 | 2017 | 3 | 2017 |
| Systems Test & Evaluation | 2 | 2017 | 4 | 2017 |
| Operational Test & Evaluation | 4 | 2017 | 1 | 2018 |
| FY18 Product Development | 1 | 2018 | 3 | 2018 |
| FY18 Operational Test & Evaluation | 4 | 2018 | 4 | 2018 |
| Next Generation Biometric Collection Capability (NXGBCC) | 1 | 2018 | 1 | 2032 |
| NXGBCC Program Planning | 1 | 2018 | 4 | 2019 |
| AoA Report | 1 | 2018 | 2 | 2018 |
| CPD Signed | 1 | 2019 | 1 | 2019 |
| MS-C | 3 | 2020 | 3 | 2020 |
| Initial Operational Capability | 3 | 2021 | 1 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0310349A / *Win-T Increment 2 - Initial Networking* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 4.680 | 4.723 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 9.403 |
| EE7: *WIN-T Increment 2 - Initial Networking* | - | 4.680 | 4.723 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 9.403 |

**A. Mission Description and Budget Item Justification**

Warfighter Information Network - Tactical Increment 2 (WIN-T Inc 2) provides the Army with On-The-Move (OTM) networking capability. The WIN-T Inc 2 network retains capabilities delivered by WIN-T Inc 1 and by leveraging proven Government and commercial technologies, adds greater network throughput and automated network management to optimize planning (to include spectrum use), initialization, monitoring and troubleshooting. WIN-T Inc 2 employs Satellite Communications OTM to extend the network in maneuver Brigade Combat Teams to Company-level through FY2018. Using equipment mounted on combat platforms, WIN-T Inc 2 delivers a mobile capability that reduces reliance on fixed infrastructure and allows key leaders to move on the battlefield while retaining situational awareness and mission command capabilities. Using the Highband Networking Radio, with the Highband Networking Waveform and high performance antennas, the WIN-T Inc 2 Line-of-Sight network offers an adaptive 30-Megabit per second aggregate throughput to key leaders in their Command Post or in their vehicle. The WIN-T Inc 2 network is self-forming, which means it automatically creates transmission paths based on terrain and environmental conditions; and self-healing, meaning that transmission paths will automatically re-route traffic to complete network transactions and calls even if one or more nodes break down or lose connectivity. This capability offers greater network reliability and better end-to-end connectivity than traditional point-to-point networks. WIN-T Inc 2 introduces the network management capability needed to keep mobile and dispersed forces networked through automated planning, initialization, monitoring, and troubleshooting. Finally, WIN-T Inc 2 adopts "Colorless Core" technology that encrypts both classified and unclassified user information in the network and minimizes the number of users on the "core" of the network. The Colorless Core allows commanders to utilize the tactical network without fear of the enemy intercepting information. Colorless Core is a technical insertion in the WIN-T Inc 1b network which enables information sharing between WIN-T Inc 1b and WIN-T Inc 2.

Inc 3 developed NetOps software and NetCentric Waveform (NCW) updates will be inserted into Inc 2 equipped units.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0310349A *I Win-T Increment 2 - Initial Networking* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 4.867 | 4.723 | 5.833 | - | 5.833 |
| Current President's Budget | 4.680 | 4.723 | 0.000 | - | 0.000 |
| Total Adjustments | -0.187 | 0.000 | -5.833 | - | -5.833 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | -0.187 | - | -5.833 | - | -5.833 |

**Change Summary Explanation**

Program has no FY 2019 RDTE requirement.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0310349A / *Win-T Increment 2 - Initial Networking* | Project (Number/Name)<br>EE7 / *WIN-T Increment 2 - Initial Networking* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EE7: *WIN-T Increment 2 - Initial Networking* | - | 4.680 | 4.723 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 9.403 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Warfighter Information Network - Tactical Increment 2 (WIN-T Inc 2) provides the Army with On-The-Move (OTM) networking capability. The WIN-T Inc 2 network retains capabilities delivered by WIN-T Inc 1 and by leveraging proven Government and commercial technologies, adds greater network throughput and automated network management to optimize planning (to include spectrum use), initialization, monitoring and troubleshooting. WIN-T Inc 2 employs Satellite Communications OTM to extend the network in maneuver Brigade Combat Teams to Company-level through FY2018. Using equipment mounted on combat platforms, WIN-T Inc 2 delivers a mobile capability that reduces reliance on fixed infrastructure and allows key leaders to move on the battlefield while retaining situational awareness and mission command capabilities. Using the Highband Networking Radio, with the Highband Networking Waveform and high performance antennas, the WIN-T Inc 2 Line-of-Sight network offers an adaptive 30-Megabit per second aggregate throughput to key leaders in their Command Post or in their vehicle. The WIN-T Inc 2 network is self-forming, which means it automatically creates transmission paths based on terrain and environmental conditions; and self-healing, meaning that transmission paths will automatically re-route traffic to complete network transactions and calls even if one or more nodes break down or lose connectivity. This capability offers greater network reliability and better end-to-end connectivity than traditional point-to-point networks. WIN-T Inc 2 introduces the network management capability needed to keep mobile and dispersed forces networked through automated planning, initialization, monitoring, and troubleshooting. Finally, WIN-T Inc 2 adopts "Colorless Core" technology that encrypts both classified and unclassified user information in the network and minimizes the number of users on the "core" of the network. The Colorless Core allows commanders to utilize the tactical network without fear of the enemy intercepting information. Colorless Core is a technical insertion in the WIN-T Inc 1b network which enables information sharing between WIN-T Inc 1b and WIN-T Inc 2.

Inc 3 developed NetOps software and NetCentric Waveform (NCW) updates will be inserted into Inc 2 equipped units.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Product Development | 3.783 | 2.938 | - |
| ***Description:*** Product Development<br><br>***FY 2018 Plans:***<br>FY18 funds development efforts for Technical Insertions.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program has no FY 2019 RDTE requirement. | | | |
| ***Title:*** Test and Evaluation | 0.473 | 1.354 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0310349A / *Win-T Increment 2 - Initial Networking* | **Project (Number/Name)**<br>EE7 / *WIN-T Increment 2 - Initial Networking* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Test and Evaluation<br><br>***FY 2018 Plans:***<br>FY18 funds support Operational Testing (JWA 18) and support Next Gen PoP and SNE efforts.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program has no FY 2019 RDTE requirement. | | | |
| ***Title:*** Management Services<br><br>***Description:*** Provides system engineering and program management support<br><br>***FY 2018 Plans:***<br>Continues system engineering and program management support.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Program has no FY 2019 RDTE requirement. | 0.424 | 0.431 | - |
| **Accomplishments/Planned Programs Subtotals** | 4.680 | 4.723 | - |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WIN-T Inc 2: *WIN-T Inc 2 Procurement* | 291.933 | 420.492 | 0.000 | - | 0.000 | - | - | - | - | Continuing | Continuing |
| • WINT Inc 2 OCO: *WIN-T Inc 2 OCO* | 1.288 | - | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 1.288 |
| • Inc 2 Spares: *WIN-T Inc 2 Procurement Spares* | 19.808 | 23.935 | 0.000 | - | 0.000 | - | - | - | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The current Initial Production contract was awarded in 2010 for procurement of Low Rate Initial Production Lots. Lots 1-5a were procured prior to the Full Rate Production (FRP) decision review. Approval for full rate production was granted at the Defense Acquisition Board on 11 May 2015. Lots 5b/6 were the first full rate production lots procured. Lot 7 was procured in 2Q FY 2016. Lot 8 was procured in 1Q FY 2018. Inc 3 developed NetOps software and NetCentric Waveform was tested at Network Integration Evaluation (NIE) 16.2 event and will be inserted into Inc 2 equipped units.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0310349A / *Win-T Increment 2 - Initial Networking* | **Project (Number/Name)**<br>EE7 / *WIN-T Increment 2 - Initial Networking* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0310349A / *Win-T Increment 2 - Initial Networking* | Project (Number/Name)<br>EE7 / *WIN-T Increment 2 - Initial Networking* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Services | C/ FFPLOE | Various : Various | 0.620 | 0.424 | | 0.431 | | - | | - | | - | 0.000 | 1.475 | - |
| | | **Subtotal** | 0.620 | 0.424 | | 0.431 | | - | | - | | - | 0.000 | 1.475 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development | MIPR | CERDEC : Various | 0.396 | 3.783 | | 2.938 | | - | | - | | - | 0.000 | 7.117 | - |
| | | **Subtotal** | 0.396 | 3.783 | | 2.938 | | - | | - | | - | 0.000 | 7.117 | N/A |

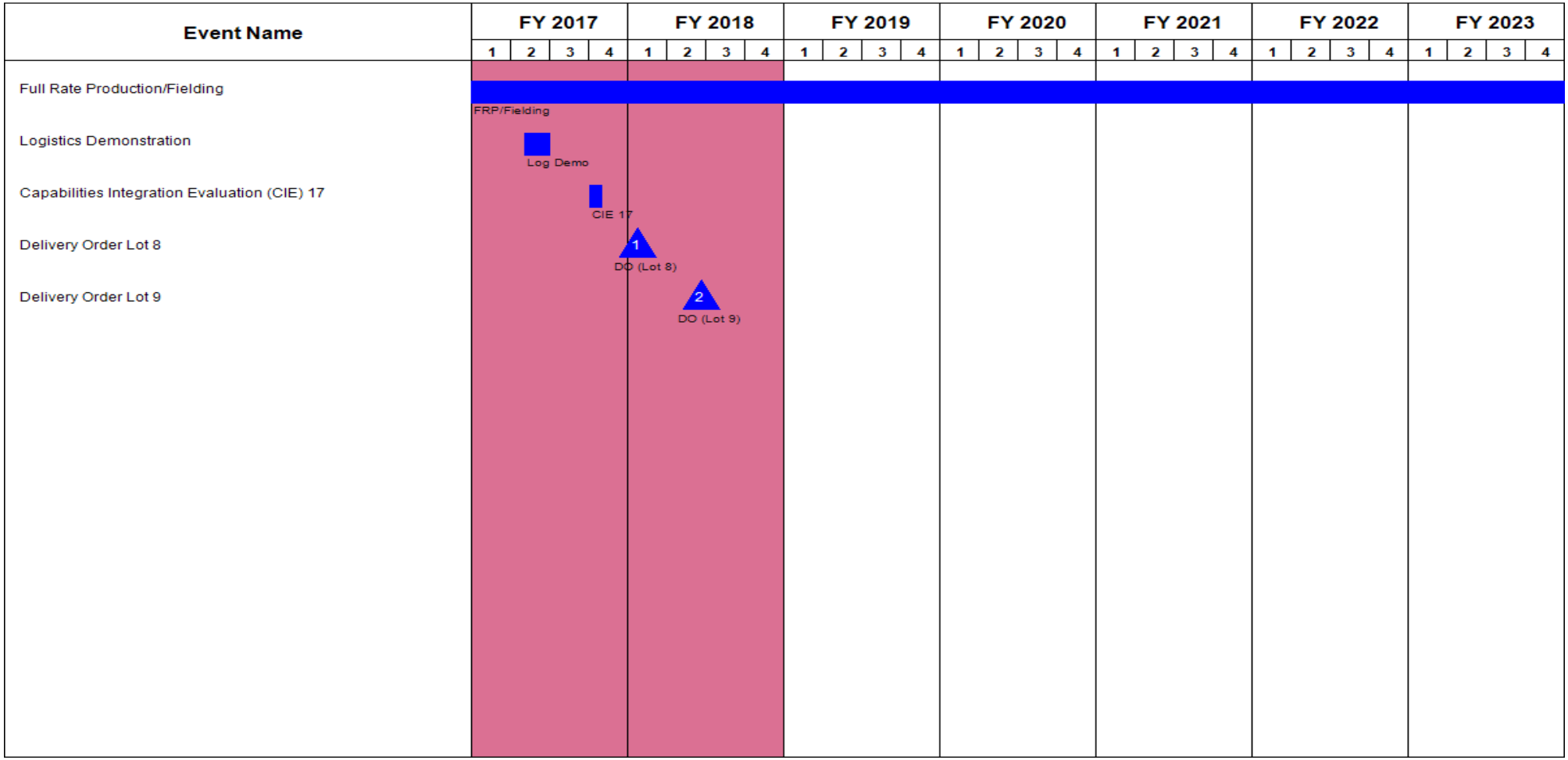
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test | Various | Various : Various | 5.756 | 0.473 | | 1.354 | | - | | - | | - | 0.000 | 7.583 | - |
| | | **Subtotal** | 5.756 | 0.473 | | 1.354 | | - | | - | | - | 0.000 | 7.583 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 6.772 | 4.680 | | 4.723 | | - | | - | | - | 0.000 | 16.175 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0310349A / *Win-T Increment 2 - Initial Networking* | **Project (Number/Name)**<br>EE7 / *WIN-T Increment 2 - Initial Networking* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0310349A / *Win-T Increment 2 - Initial Networking* | **Project (Number/Name)**<br>EE7 / *WIN-T Increment 2 - Initial Networking* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| LRIP Production | 2 | 2010 | 3 | 2015 |
| Network Integrated Evaluation 14.1 | 1 | 2014 | 1 | 2014 |
| Developmental Test 1 | 2 | 2014 | 2 | 2014 |
| Network Integrated Evaluation 14.2 | 3 | 2014 | 3 | 2014 |
| Developmental Test 2 | 3 | 2014 | 3 | 2014 |
| Network Integrated Evaluation 15.1 (FOT&E) (Stryker) | 1 | 2015 | 1 | 2015 |
| Log Verification | 1 | 2016 | 1 | 2016 |
| Full Rate Production/Fielding | 3 | 2015 | 4 | 2029 |
| NIE 16.2 NetOps/NCW | 3 | 2016 | 3 | 2016 |
| Logistics Demonstration | 2 | 2017 | 2 | 2017 |
| Capabilities Integration Evaluation (CIE) 17 | 4 | 2017 | 4 | 2017 |
| Delivery Order Lot 8 | 1 | 2018 | 1 | 2018 |
| Delivery Order Lot 9 | 2 | 2018 | 2 | 2018 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 59.891 | 60.877 | 53.958 | - | 53.958 | 59.848 | 61.071 | 62.543 | 63.749 | 0.000 | 421.937 |
| E25: *Mfg Science & Tech* | - | 59.891 | 60.877 | 53.958 | - | 53.958 | 59.848 | 61.071 | 62.543 | 63.749 | 0.000 | 421.937 |

**A. Mission Description and Budget Item Justification**

This Program Element (PE) develops, demonstrates, and transitions manufacturing processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, and sensors and electronics. Initiatives within the PE result in cost savings and reduced risk of transitioning military-unique manufacturing processes into production. Project E25 fosters the transfer of new/improved manufacturing technologies to the industrial base, including manufacturing efforts that have potential for high payoff across the spectrum of Army systems.

Work in this PE is related to, and fully coordinated with, PE 0603710A (Night Vision Advanced Technology), PE 0602303A (Missile Technology), PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0602601A (Combat Vehicle and Automotive Technology), and PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603002 (Medical Advanced Technology), and PE 0602705A (Electronics and Electronic Devices).

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology focus areas and the Army Modernization Strategy.

Work in this PE is performed by: the U.S. Army Research Development and Engineering Command (RDECOM), Aberdeen Proving Ground, MD; The U.S. Army Medical Research and Materiel Command (MRMC), Ft. Detrick, MD; and the Army Space and Missile Defense Command/Army Forces Strategic Command (SMDC/ARSTRAT), Huntsville, AL.

| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
|---|---|---|---|---|---|
| Previous President's Budget | 62.287 | 60.877 | 59.083 | - | 59.083 |
| Current President's Budget | 59.891 | 60.877 | 53.958 | - | 53.958 |
| Total Adjustments | -2.396 | 0.000 | -5.125 | - | -5.125 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -2.366 | - | | | |
| • Adjustments to Budget Years | - | - | -5.125 | - | -5.125 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | Date: February 2018 |
|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 0708045A *I INDUSTRIAL PREPARDEDNESS* | | |
| • FFRDC | -0.030 | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | Project (Number/Name)<br>E25 / *Mfg Science & Tech* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E25: *Mfg Science & Tech* | - | 59.891 | 60.877 | 53.958 | - | 53.958 | 59.848 | 61.071 | 62.543 | 63.749 | 0.000 | 421.937 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This Project develops and demonstrates manufacturing processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, and sensors and electronics. Focus is on components and subsystems such as advanced armor, lightweight structural components, sensors, propellants, and gun tubes. In addition, work is conducted to advance the state of the art in processing and fabrication techniques for coatings, multifunctional materials, and structural elements for Army specific applications.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science & Technology focus areas and the Army Modernization Strategy.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Long Range Precision Fires | - | - | 12.869 |
| ***Description:*** The effort funds manufacturing improvements to support areas such as Advanced Weapon Systems, Fire Control, and Advanced Energetics and Warheads. Work focuses on addressing challenges in areas such as enhanced missile seekers; fuses and initiators for munitions; and boring, honing, and rifling cannon and mortar barrels.<br><br>***FY 2019 Plans:***<br>Will complete development of manufacturing processes for battery free initiators for scatterable munitions; develop methods to manufacture large caliber canon-boring tools at reduced cost; develop safer and more cost effective methods for mixing and packing of propellants; develop enhanced processes to fabricate large-caliber cannon and mortar tubes with longer range and higher durability than existing systems; and complete development of manufacturing technologies for complex missile seekers.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of effort. Continues work from Lethality. | | | |
| ***Title:*** Next Generation Combat Vehicle (Formerly Ground Maneuver) | 14.088 | 18.244 | 13.875 |
| ***Description:*** This effort funds manufacturing technology advances needed for more affordable components and subsystems for tactical and combat vehicles and weapons systems. Work focuses on addressing challenges in areas such as advanced armor, lighter weight components, insensitive propellants, precision munitions, and vehicle power devices.<br><br>***FY 2018 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | **Project (Number/Name)**<br>E25 / *Mfg Science & Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Fabricate hatch and ramps for demonstration on selected vehicles, document and transition magnesium alloy ballistic specifications; demonstrate a cathode coating process and enhanced production of high energy density safe 5 volt lithium-ion batteries for use in Army ground vehicle systems; prove out and deliver a manufacturing line and associated processes for adaptive protection modules; transition improved rocket nozzle insulation processes to PM Precision Fires; construct an agile manufacturing cell and sensor suite to demonstrate efficient welding of thicker plate materials used for armored multi-purpose and other vehicles; continue development of a lithium-ion battery pilot line leveraging multiple battery form factors leading to reduced cost and increased throughput; research novel joining technology processes that will replace existing steel components leading to lighter heavy combat vehicles.<br>***FY 2019 Plans:***<br>Will develop manufacturing technology to reduce the cost and improve the performance of weight sensitive armor protection systems against future threats; demonstrate manufacturing technologies to reduce cost and improve performance when joining dissimilar materials for ground platform structural components; develop manufacturing techniques for ground vehicle powertrain components with improved efficiency and power density.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of the effort. | | | |
| ***Title:*** Future Vertical Lift (Formerly Air Systems)<br>***Description:*** This effort funds manufacturing technology advances needed for more affordable manned and unmanned aircraft components and subsystems. Work focuses on addressing challenges in areas such as engine performance and life, ballistically tolerant fuel bladders and composite transmission sumps, reliable component integration/attachment, structural durability at low weight, sensors for aircraft protection and pilotage, and reduced corrosion.<br>***FY 2018 Plans:***<br>Transition to Utility Helicopters Project Office for qualification testing direct digitally manufactured helicopter engine components of additively manufactured articles resulting in increased performance and reduced weight of the T700 platform.<br>***FY 2019 Plans:***<br>Will investigate novel manufacturing methods for fabrication of composite material air platform components with reduced weight and improved fatigue resistance.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of the effort. | 3.373 | 1.557 | 0.592 |
| ***Title:*** Networks and Command, Control, Communications and Intelligence (Formerly Command, Control, Communications and Intelligence Systems) | 17.271 | 11.678 | 8.314 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | **Project (Number/Name)**<br>E25 / *Mfg Science & Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** This effort funds manufacturing technology advances needed for more affordable components and subsystems for intelligence, surveillance, reconnaissance and targeting systems, mission command systems, electronic warfare and improved explosive device detect/defeat systems. Work focuses on addressing challenges in areas such as large format multi-color focal plane arrays, flexible displays, night vision sensors, target detectors, advanced antennas and sensors.<br><br>***FY 2018 Plans:***<br>Transition improved processes for 12um focal plane arrays used in high definition cameras to Project Manager (PM) ? Soldier Sensors and Lasers; deliver to PM Aircraft Survivability Equipment millimeter wave packaging improvements to include module development and antenna/module interface advancements of devices used in radio frequency threat warning applications in air combat platforms; continue optimization of a manufacturing process to produce ultra-thin, lightweight, wide-band conformal antennas; continue refining and validating a 3D, read-only integrated circuit manufacturing process resulting in sensors with improved sensitivity and dynamic range; improve assembly processes utilizing epoxies that resist high shocks & temperature cycling for weapon boresight systems.<br><br>***FY 2019 Plans:***<br>Will complete optimization of manufacturing process to produce ultra-thin, wide-band, conformal antennas for Army platforms; investigate process improvements for digital imagers and sensors for aviation protection and pilotage.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of the effort. Work continues in Future Vertical Lift and Soldier Lethality. | | | |
| ***Title:*** Air & Missile Defense<br><br>***Description:*** This effort funds manufacturing improvements to support areas such as High Energy Laser system components (e.g. diodes, optics), interceptor components, and armament systems for counter-unmanned aerial systems and counter-rocket, artillery, and mortar systems.<br><br>***FY 2019 Plans:***<br>Will develop processes to improve manufacturing yield for high energy laser diodes.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of effort. Continues work from Lethality. | - | - | 0.592 |
| ***Title:*** Soldier Lethality (Formerly Soldier Systems)<br><br>***Description:*** This effort funds manufacturing technology advances needed for more affordable components and subsystems in areas such as combat feeding, aerial delivery of supplies, expeditionary basing, Soldier-borne sensors, clothing, and protective equipment. Work focuses on addressing challenges in areas such as multifunctional fabrics for shelters, uniforms and portage | 3.420 | 4.554 | 12.167 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | **Project (Number/Name)**<br>E25 / *Mfg Science & Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| equipment; affordable, non-contaminating packaging for rations; lightweight materials for body armor; and medical technologies such as biotechnology and vaccine production.<br><br>***FY 2018 Plans:***<br>Transition to Soldier protection systems programs of record a full scale manufacturing pilot line developed for polyethylene films; build a continuous reactor to demonstrate high yield manufacturing processes for gallium arsenide based solar arrays for portable Soldier power sources; refine manufacturing processes in the production of low cost augmented reality eyepieces that provide the Soldier with high resolution imagery across a wide field of view for increased situational awareness.<br><br>***FY 2019 Plans:***<br>Will develop manufacturing techniques for flexible light-weight solar cells, low cost freeform prism eyepieces, and components for Infantry sighting systems; develop manufacturing process improvement techniques for optical coatings and optical components to reduce cost and improve performance; complete characterization of a scaled up process for Adenovirus vaccine production.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of the effort. Continues work from Medical and Networks and Command, Control, Communications and Intelligence. | | | |
| ***Title:*** Cross-cutting<br><br>***Description:*** This effort funds manufacturing technology advances with impact across processes or platforms of Army interest. Work focuses on addressing challenges in areas such as advanced additive manufacturing technologies for fabrication of weapons systems, platforms, and munitions; and novel manufacturing techniques for expedient and cost effective repair of worn or damaged platform components.<br><br>***FY 2018 Plans:***<br>Complete delivery to PM MAS processes and tooling requirements of 2D and 3D additively manufactured energetics and electronics for use in 40mm grenades; demonstrate a laser enhanced net shaping repair process at Anniston Army Depot for the qualification and reclamation of Army components; perform modeling and simulation for cold spray repair processes to reduce the sustainment cost of Army weapon systems.<br><br>***FY 2019 Plans:***<br>Will demonstrate advanced additive manufacturing capabilities for the build, remanufacture, and life extension of critical weapon systems components to improve performance, allow fabrication of structures not possible thorough subtractive methods, and/or improve component affordability; demonstrate an integrated augmented reality solution for advanced machining.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:*** | 11.420 | 12.643 | 5.549 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | **Project (Number/Name)**<br>E25 / *Mfg Science & Tech* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| Planned progression of effort. | | | |
| ***Title:*** Lethality<br><br>***Description:*** The effort funds manufacturing improvements to support areas such as Advanced Weapon Systems, Fire Control, Logistics, Emerging Technologies, and Advanced Energetics and Warheads. Work focuses on addressing challenges in areas such as enhanced missile seekers; fuses and initiators for munitions; and boring, honing, and rifling cannon and mortar barrels.<br><br>***FY 2018 Plans:***<br>Improve manufacturing methods, conduct materials analysis and demonstrate more efficient production processes that enable multi-mode missile seekers; build and test prototype programmable initiators of an automated, scaled-up manufacturing process addressing requirements for Family of Scatterable Munitions (FASCAM); develop smart tooling and process models of a software-based module capable of aiding production engineers across the organic industrial base and S&T community to verify and implement best value part manufacturing programs; fabricate disk components and test components to demonstrate spark plasma sintering process to reduce costs and lead times for large caliber cannon broach cutting tools; demonstrate processes on internal components that validate suitable energetic inks in the production of next generation hand grenades and small munitions; mature the manufacturing processes for the fabrication of small format liquid reserve batteries which support small to medium caliber munitions and hand emplaced munitions; mature waterjet milling to produce the rifling in large caliber cannon tubes in order to replace the expensive broaching process; investigate advanced manufacturing techniques for small caliber lightweight cartridge cases.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of the effort. Work from this effort is continues in Long Range Precision Fires and in Air & Missile Defense. | 9.319 | 11.100 | - |
| ***Title:*** Medical<br><br>***Description:*** This effort funds manufacturing technology advances needed for more affordable process methods in areas such as manufacturing of lighter weight multi-functional materials, biotechnology, vaccines, medical equipment power sources, and component ruggedization that directly address Soldier rehabilitation.<br><br>***FY 2018 Plans:***<br>Produce test batches in the development of a modernized, scaled-up production process addressing spray drying and encapsulation methods of the Adenovirus vaccine.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Planned progression of effort. Work continues in Soldier Lethality. | 1.000 | 1.101 | - |
| **Accomplishments/Planned Programs Subtotals** | 59.891 | 60.877 | 53.958 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | **Project (Number/Name)**<br>E25 / *Mfg Science & Tech* |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

Not applicable for this item.

**D. Acquisition Strategy**

Not applicable for this item.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | Project (Number/Name)<br>E25 / *Mfg Science & Tech* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TBD | C/Various | TBD : TBD | - | - | | 0.018 | | - | | - | | - | 0.000 | 0.018 | - |
| | | **Subtotal** | - | - | | 0.018 | | - | | - | | - | 0.000 | 0.018 | N/A |

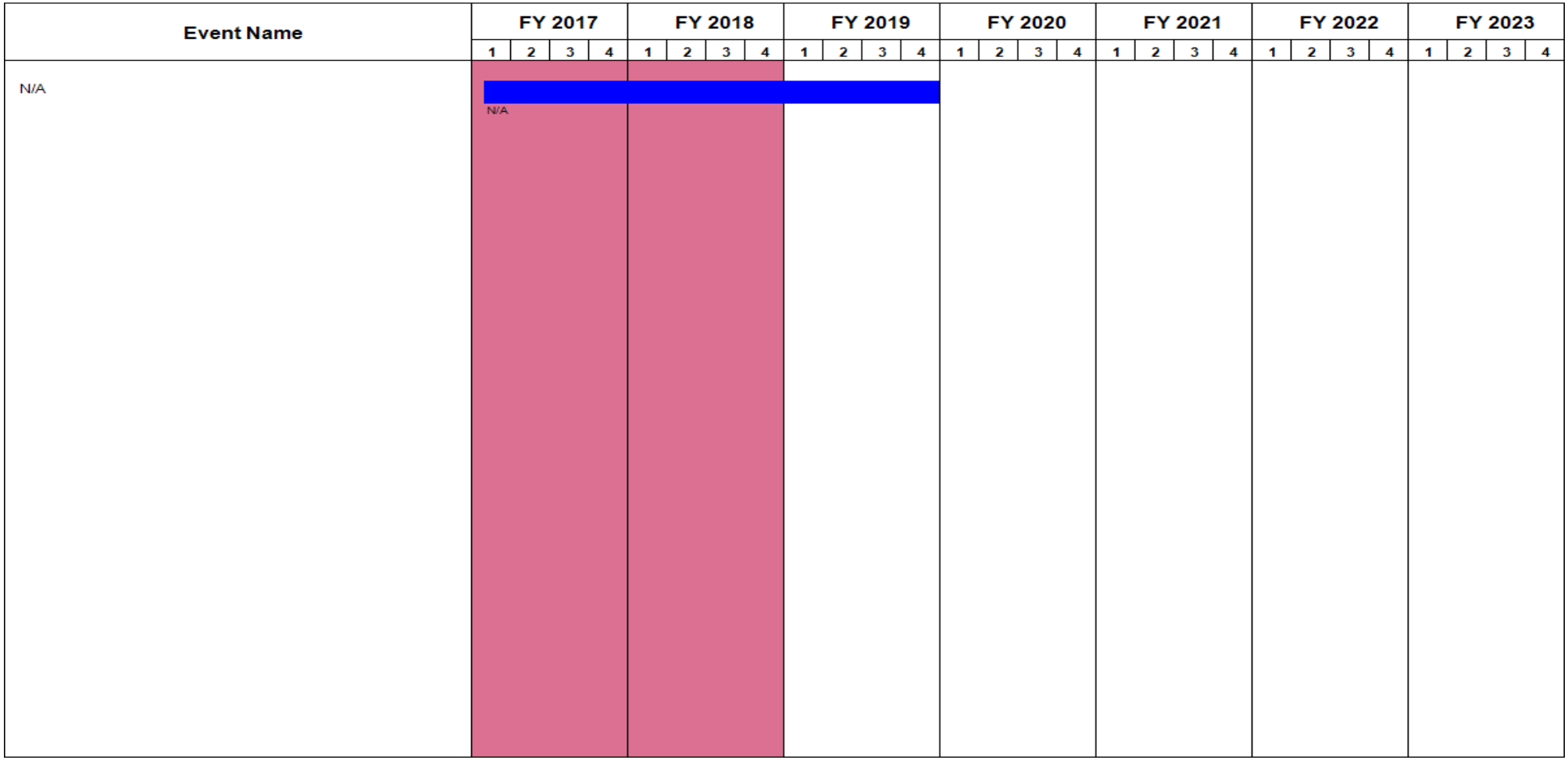
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TBD | Various | TBD : TBD | 231.921 | 59.891 | | 60.859 | | 53.958 | | - | | 53.958 | 0.000 | 406.629 | - |
| | | **Subtotal** | 231.921 | 59.891 | | 60.859 | | 53.958 | | - | | 53.958 | 0.000 | 406.629 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 231.921 | 59.891 | | 60.877 | | 53.958 | | - | | 53.958 | 0.000 | 406.647 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | **Project (Number/Name)**<br>E25 / *Mfg Science & Tech* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708045A / *INDUSTRIAL PREPARDEDNESS* | **Project (Number/Name)**<br>E25 / *Mfg Science & Tech* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| N/A | 1 | 2016 | 4 | 2019 |

**Note**

N/A

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 1203142A *I SATCOM Ground Environment (SPACE)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.000 | 11.959 | 12.119 | - | 12.119 | 8.644 | 8.769 | 8.908 | 9.506 | Continuing | Continuing |
| FE1: *Dscs-Dcs (Phase II)* | - | 0.000 | 6.756 | 4.234 | - | 4.234 | 4.265 | 4.381 | 4.505 | 4.566 | Continuing | Continuing |
| FE2: *MILSATCOM System Engineering* | - | 0.000 | 4.203 | 4.392 | - | 4.392 | 4.379 | 4.388 | 4.403 | 4.940 | Continuing | Continuing |
| FE4: *Enroute Mission Command* | - | 0.000 | 1.000 | 3.493 | - | 3.493 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4.493 |

**Note**

Program in FY 2017 and prior funded in OSD PE 0303142A. Realigned in FY 2018 to OSD PE 1203142A to reflect Major Force Program 12 (MFP12) Space.

**A. Mission Description and Budget Item Justification**

FE1: Dscs-Dcs (Phase II):
This project provides funds to develop Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future Force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations

FE2: Military Satellite Communications (MILSATCOM)System Engineering (SE):
Military Satellite Communications (MILSATCOM)System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts, performed by MILSATCOM SE, lead to savings for the overall Army in the out years.

FE4 / Enroute Mission Command:
Mission Description and Budget Item Justification:
Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | Date: February 2018 |
|---|---|
| **Appropriation/Budget Activity**<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 1203142A *I SATCOM Ground Environment (SPACE)* |

Due to rephasing of FY 2017 OPA funding into FY 2018/2019, program was restructured in Dec 2015. MDA addressed schedule issues (Oct 2016) by authorizing to field a Ku FISA FOC (4QFY17) and complete a Modification Word Order (MWO), adding Ka FISA capability, post Ku FISA FOC.

| B. Program Change Summary ($ in Millions) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 11.959 | 19.425 | - | 19.425 |
| Current President's Budget | 0.000 | 11.959 | 12.119 | - | 12.119 |
| Total Adjustments | 0.000 | 0.000 | -7.306 | - | -7.306 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | -7.306 | - | -7.306 |

**Change Summary Explanation**

Reduction in project FE1 funding reflects updated costs to develop interfaces necessary to fully integrate Digital IF technology in DoD gateway architecture, complete IA accreditation, and finalize interoperability tests and certifications.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>FE1 / *Dscs-Dcs (Phase II)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FE1: *Dscs-Dcs (Phase II)* | - | 0.000 | 6.756 | 4.234 | - | 4.234 | 4.265 | 4.381 | 4.505 | 4.566 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project provides funds to develop Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future Force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** SATCOM Terminal Digital IF Implementation Analysis | - | 3.831 | 3.014 |
| ***Description:*** SATCOM Terminal Digital Intermediate Frequency (IF) implementation analysis aimed at improving bandwidth efficiency of gateway terminals while providing an additional layer of resiliency through terminal redundancy. These analyses include various evaluations for digital terminal components to replace current, less efficient, analog components. These analyses also include assessment of terrestrial connectivity among SATCOM terminals to enable Continuity Of Operations (COOP) and Failover scenarios required for resiliency.<br><br>***FY 2018 Plans:***<br>Develop interfaces necessary to fully integrate Digital IF technology into DoD gateway architecture. Complete IA accreditation and finalize interoperability tests and certifications.<br><br>***FY 2019 Plans:***<br>Assess various vendor implementations for compliance with Digital IF standard. Perform multi-vendor interoperability analysis to ensure maximum vendor participation in future Digital IF technology and foster competition.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Reduction in funds is due to switch from standard development and IA certification to conducting multi-vendor interoperability analysis. | | | |
| ***Title:*** Electromagnetic Interference Mitigation Analysis | - | 2.925 | 1.220 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE1 / *Dscs-Dcs (Phase II)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Assess various interference mitigation/cancellation technologies for effectiveness in SATCOM gateway operations. Mature technology to software/firmware that will improve SATCOM modem/terminal performance in contested environment.<br><br>***FY 2018 Plans:***<br>Investigate and develop solutions to support satellite communications operating in a contested environment. Perform interoperability and IA accreditation tests. Integrate solutions into DoD gateway satellite communications architecture.<br><br>***FY 2019 Plans:***<br>Mature Interference Mitigation / Cancellation technology to software/firmware that can be incorporated in SATCOM modem/terminal. Integrate solutions into DoD gateway satellite communications architecture.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Reduction in funds is due to switch from developing solutions and conducting testing to maturing software/firmware and integration. | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 6.756 | 4.234 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BB8500: *Defense Enterprise Wideband Satcom Systems* | 143.805 | 161.383 | 108.133 | - | 108.133 | 111.000 | 99.480 | 118.628 | 108.253 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

This effort finances Project Manager, Defense Communications and Army Transmission Systems (PM DCATS) netcentric systems engineering, modem risk mitigation, and Risk Management Framework (RMF) support. Funding provides for SATCOM terminal upgrades, enhancement of baseband throughput capabilities, technology insertion and upgrades which enhance decision support capabilities, allowing for full utilization of Wideband Global SATCOM (WGS) capabilities. Both the Wideband SATCOM Operational Management System (WSOMS) and the Enterprise Wideband SATCOM Terminal System (EWSTS) Capability Production Documents (CPDs) contain Netcentric-Ready Key Performance Parameters (NR-KPPs) as required by CJCSI 6212.01C. Netcentric efforts are required to facilitate the migration from the current trunk-based communications systems to Internet Protocol (IP) based systems and to engineer, test and integrate IP based capabilities into EWSTS and WSOMS systems. Studies, risk mitigation, system integration and advanced demonstrations for Netcentric baseband and policy based control will accommodate technology insertion, data sharing, remote operations, architecture efforts and use of commercial technology, thus ensuring the life of the Defense Enterprise Wideband System (DEWSS) terminal family beyond 2025 and reducing lifecycle costs and enterprise requirements on the WGS and Defense Satellite Communication System (DSCS) satellites in the future.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE1 / *Dscs-Dcs (Phase II)* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE1 / *Dscs-Dcs (Phase II)* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SATCOM Terminal Digital IF Implementation Analysis | MIPR | TBD : APG, MD | - | - | | 2.709 | Jan 2018 | 2.183 | Jan 2019 | - | | 2.183 | Continuing | Continuing | Continuing |
| Electromagnetic Interference Mitigation Analysis | MIPR | TBD : APG, MD | - | - | | 2.393 | Jan 2018 | 1.035 | Jan 2019 | - | | 1.035 | Continuing | Continuing | Continuing |
| | | **Subtotal** | - | - | | 5.102 | | 3.218 | | - | | 3.218 | Continuing | Continuing | N/A |

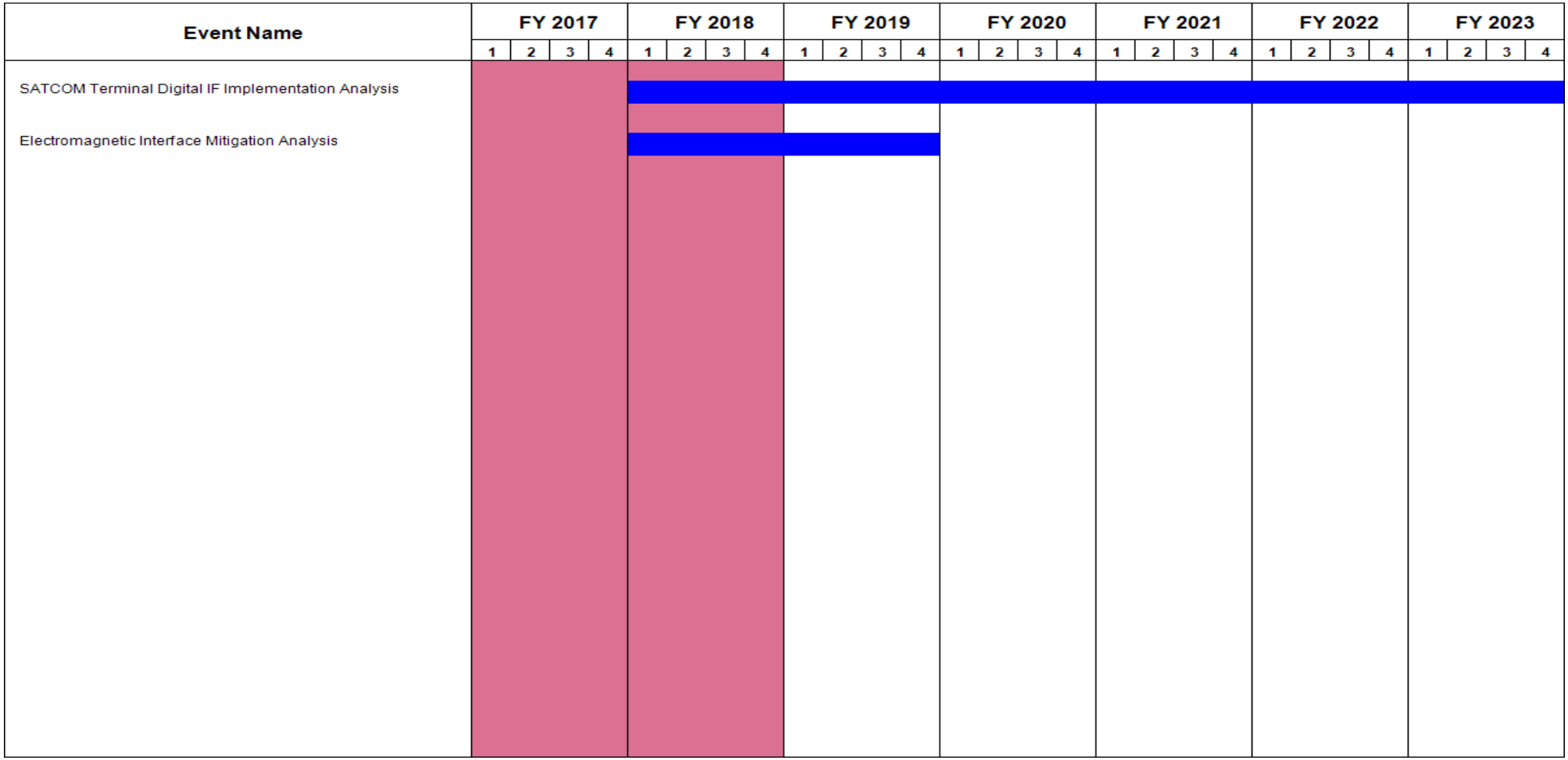
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In-house Support | Allot | PdM WESS : Ft. Belvoir, VA | - | - | | 1.121 | | 0.689 | | - | | 0.689 | Continuing | Continuing | Continuing |
| Contractor Support | C/CPFF | ACC, MD : APG, MD | - | - | | 0.533 | Jan 2018 | 0.327 | Jan 2019 | - | | 0.327 | Continuing | Continuing | Continuing |
| | | **Subtotal** | - | - | | 1.654 | | 1.016 | | - | | 1.016 | Continuing | Continuing | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 6.756 | | 4.234 | | - | | 4.234 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE1 / *Dscs-Dcs (Phase II)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE1 / *Dscs-Dcs (Phase II)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| SATCOM Terminal Digital IF Implementation Analysis | 1 | 2018 | 4 | 2023 |
| Electromagnetic Interface Mitigation Analysis | 1 | 2018 | 4 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>FE2 / *MILSATCOM System Engineering* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FE2: *MILSATCOM System Engineering* | - | 0.000 | 4.203 | 4.392 | - | 4.392 | 4.379 | 4.388 | 4.403 | 4.940 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

FE2: Military Satellite Communications (MILSATCOM)System Engineering (SE) assures that tactical Army Satellite Communications (SATCOM) and SATCOM On-The-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM SE shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM SE represents the Army's tactical interests within DoD, Commercial & International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts, performed by MILSATCOM SE, lead to savings for the overall Army in the out years.

FY 2019 funds support the continued systems engineering required to support technology maturation, systems analysis, and planning associated with joint SATCOM development efforts including complying with the outcome of the Protected SATCOM Communications Systems (PSCS) Analysis of Alternatives (AoA). In addition, FY 2019 funding covers the Protected Tactical Service Field Demo (PTSFD) Modem Testing, Narrowband Mobile User Objective System (MUOS) Analysis of Alternatives (AoA), Protected Tactical Service Field Demo (PTSFD), Network Centric Waveform Tool (NCWT) Development and Testing, Network Centric Waveform - Resilient (NCW-R) engineering support and other efforts that have impact on tactical Army use of military and commercial satellite constellations. These efforts have a direct impact in reducing technical and programmatic risk for the acquisition efforts for tactical Army SATCOM systems using these constellations.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** Protected Communications System Engineering and WGS Communications | - | 1.051 | 1.185 |
| ***FY 2018 Plans:***<br>Product development and analysis for the Protected Communications and WGS Communications System Engineering to include CCW-R, NCW Tool, and Protected Tactical Waveform Programs. | | | |
| ***FY 2019 Plans:***<br>Product development and analysis for the Protected Communications and WGS Communications System Engineering to include NCW-R, NCW Tool, and Protected Tactical Waveform Programs. | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>No significant change. | | | |
| ***Title:*** System Engineering Support | - | 2.552 | 2.644 |
| ***FY 2018 Plans:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE2 / *MILSATCOM System Engineering* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| In house Engineering Support, Contractor Support and System Architecture & Analysis<br>***FY 2019 Plans:***<br>In house Engineering Support, Contractor Support and System Architecture & Analysis<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>No significant change. | | | |
| ***Title:*** Testing and certification of critical SATCOM and Satellite-On-The-Move (SOTM) communication and network technologies<br>***FY 2018 Plans:***<br>Testing and certification of critical SATCOM and SOTM communication and network technologies.<br>***FY 2019 Plans:***<br>Testing and certification of critical SATCOM and SOTM communication and network technologies.<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>No significant change. | - | 0.600 | 0.563 |
| **Accomplishments/Planned Programs Subtotals** | - | 4.203 | 4.392 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 456: *MILSATCOM System Engineering* | 4.287 | - | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 4.287 |

**Remarks**

FY 2017 and prior funding was aligned to 0303142A/456.
FY 2016 0.908M
FY 2017 4.287M

**D. Acquisition Strategy**

This project funds advanced systems engineering, research, development, test and evaluation of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation of the technology will transition to PM Tactical Network and related programs of record.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>FE2 / *MILSATCOM System Engineering* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Communications and WGS Communications SE | TBD | Various : APG, MD | - | - | | 1.051 | | 1.185 | Jan 2019 | - | | 1.185 | Continuing | Continuing | Continuing |
| | | **Subtotal** | - | - | | 1.051 | | 1.185 | | - | | 1.185 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering (In House) | MIPR | PM WIN-T : APG, MD | - | - | | 1.200 | | 1.214 | Sep 2019 | - | | 1.214 | Continuing | Continuing | - |
| Engineering Contractors Support | C/CPFF | PM WIN-T : APG, MD | - | - | | 1.152 | | 1.200 | Mar 2019 | - | | 1.200 | Continuing | Continuing | - |
| System Architecture & Analysis | Various | CERDEC : APG, MD | - | - | | 0.200 | | 0.230 | Apr 2019 | - | | 0.230 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 2.552 | | 2.644 | | - | | 2.644 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Terminal Testing and Evaluation System Engineering | FFRDC | PEO C3T : TBD | - | - | | 0.200 | | 0.200 | Dec 2018 | - | | 0.200 | 0.000 | 0.400 | - |
| Test Support | MIPR | Matrix : APG, MD | - | - | | 0.175 | | 0.163 | Apr 2019 | - | | 0.163 | 0.000 | 0.338 | - |
| Testing, Certification | MIPR | TBD : APG, MD | - | - | | 0.225 | | 0.200 | Jul 2019 | - | | 0.200 | 0.000 | 0.425 | - |
| | | **Subtotal** | - | - | | 0.600 | | 0.563 | | - | | 0.563 | 0.000 | 1.163 | N/A |

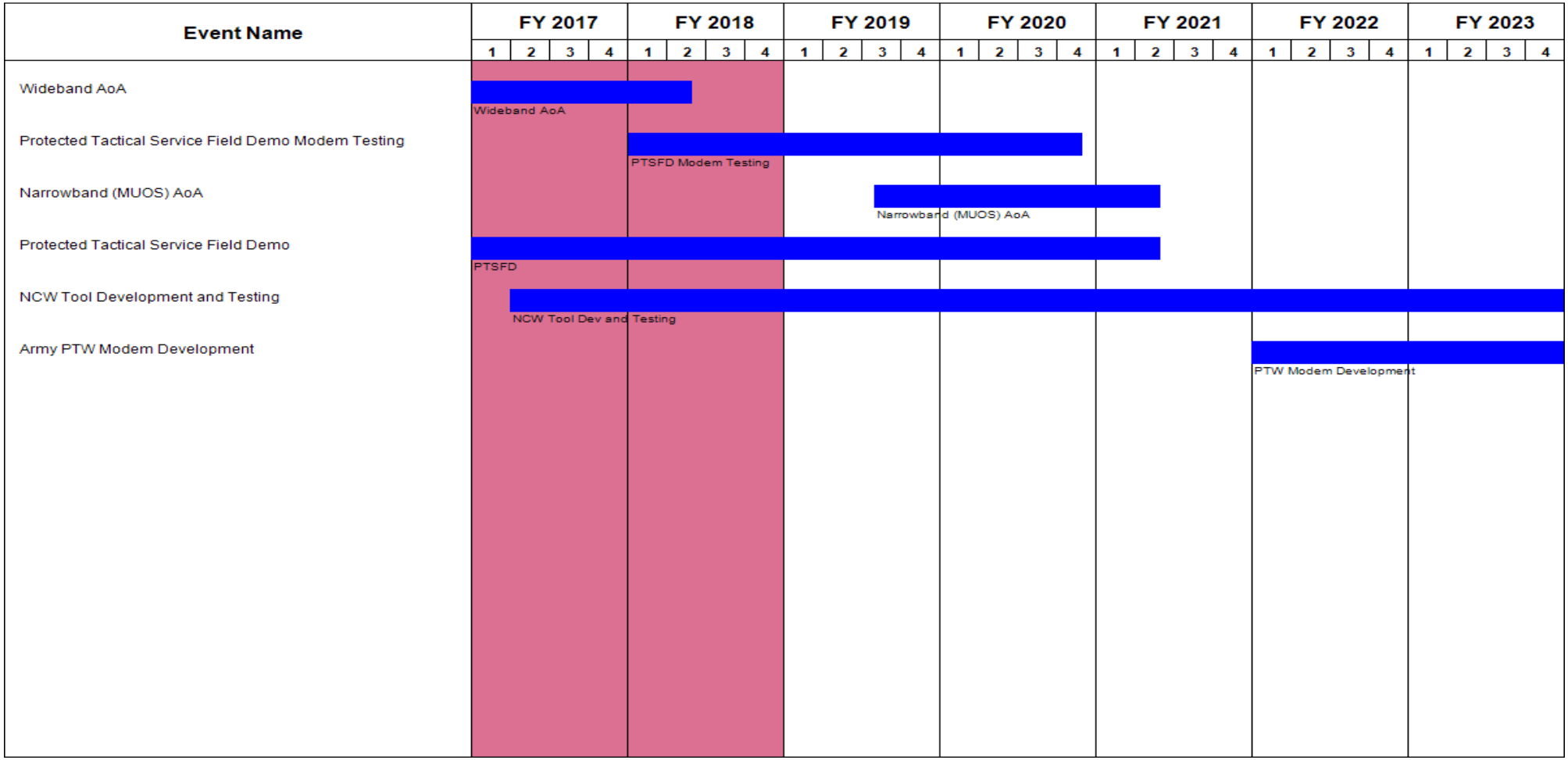
| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 4.203 | | 4.392 | | - | | 4.392 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>FE2 / *MILSATCOM System Engineering* | |

| | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE2 / *MILSATCOM System Engineering* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE2 / *MILSATCOM System Engineering* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Wideband AoA | 4 | 2016 | 2 | 2018 |
| Protected Tactical Service Field Demo Modem Testing | 1 | 2018 | 4 | 2020 |
| Narrowband (MUOS) AoA | 3 | 2019 | 2 | 2021 |
| Protected Tactical Service Field Demo | 4 | 2015 | 2 | 2021 |
| NCW Tool Development and Testing | 1 | 2015 | 4 | 2023 |
| Army PTW Modem Development | 1 | 2022 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>FE4 / *Enroute Mission Command* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FE4: *Enroute Mission Command* | - | 0.000 | 1.000 | 3.493 | - | 3.493 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4.493 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Enroute Mission Command (EMC) supports the Global Response Force (GRF) and other Army units with the requirement to conduct Airborne forced entry operations with the ability to conduct mission command, to include mission planning and rehearsal, while enroute on board US Air Force Air Mobility Command (AMC) aircraft. EMC provides a modernization to enroute communications to enable broadband reach-back data capability utilizing military or commercial networks with adequate bandwidth support required by Mission Command and Intelligence applications. EMC will provide commanders with the ability to obtain and share near real-time information regarding intelligence, situational awareness and command and control information while enroute to their objective. The ability to adjust plans and strategize utilizing the latest Intel data will give the GRF the information dominance needed to execute their mission once they arrive at their objective.

Ku FOC was achieved in September 2017 as directed by MDA due to rephasing of FY 2017 OPA funding into FY 2018/2019 and program was restructure in Dec 2015. A Modification Work Order (MWO), adding Ka Fixed Installed Satellite Antenna (FISA) capability begins in FY18.

FY 2019 funding supports the Ka FISA Post Deployment Assessment (PDA) requirement which will validate the EMC capability for warfighters to conduct mission command utilizing the Key Leader Enroute Node (KEN), Dependent Airborne Node (DAN) and Command and Staff Palletized Airborne Node (CASPAN) on the C17 aircraft.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** EMC Testing | - | 1.000 | 3.493 |
| ***Description:*** Post Deployment Assessment (PDA) | | | |
| ***FY 2018 Plans:***<br>Wideband Global System (WGS) Terminal and Modem Certification. | | | |
| ***FY 2019 Plans:***<br>Ka FISA Post Deployment Assessment (PDA) | | | |
| ***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>FY19 Funding increase is for Post Deployment Assessment (PDA) | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 1.000 | 3.493 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE4 / *Enroute Mission Command* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • B00015: *Enroute Mission Command (EMC)* | - | 21.667 | 37.401 | - | 37.401 | 8.653 | - | - | - | 0.000 | 67.721 |

**Remarks**

B08400: OPA funding line for EMC

**D. Acquisition Strategy**

The continued procurement of the EMC full operational capability follows DoDI 5000.02, 7 Jan 2015, Enclosure 13, Rapid Fielding of Capabilities. The Milestone Decision Authority (MDA) and project manager will tailor and streamline program strategy based on the required timelines to meet urgent need capability requirements. The Army Executive Agent signed an Acquisition Decision Memorandum (ADM) on 27 April 2015 delegating MDA to PEO C3T. The MDA signed an ADM on 11 May 2015 selecting the KuKa Antenna and Radome for the Full Operational Capability (FOC). An ADM was signed on 20 May 2015 granting approval to enter into production and deployment phase.

Ku FOC was achieved in September 2017 as directed by MDA due to rephasing of FY 2017 OPA funding into FY 2018/2019 and program was restructure in Dec 2015. A Modification Work Order (MWO), adding Ka Fixed Installed Satellite Antenna (FISA) capability begins in FY18.

FY 2019 funding (173142 FE4) supports the Ka FISA Post Deployment Assessment (PDA) requirement which will validate the EMC capability for warfighters to conduct mission command utilizing the Key Leader Enroute Node (KEN), Dependent Airborne Node (DAN) and Command and Staff Palletized Airborne Node (CASPAN) on the C17 aircraft.

Initial Operational Capability met in May 2015 with modification of five C-17s with satellite antennae and installation kits, and roll-on/roll-off, battalion level, Key Leader Node (KEN). FOC is 35 C-17s, eight Key Leader Enroute Node (KEN), and 24 company level Dependent Airborne Nodes (DAN), and a Command and Staff Palletized Airborne Node (CASPAN).

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | Project (Number/Name)<br>FE4 / *Enroute Mission Command* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ka FISA Post Deployment Assessment (PDA) | MIPR | Air Mobility Command (AMC) : Ft Bragg, NC | - | - | | - | | 3.493 | May 2019 | - | | 3.493 | 0.000 | 3.493 | - |
| | | **Subtotal** | - | - | | - | | 3.493 | | - | | 3.493 | 0.000 | 3.493 | N/A |

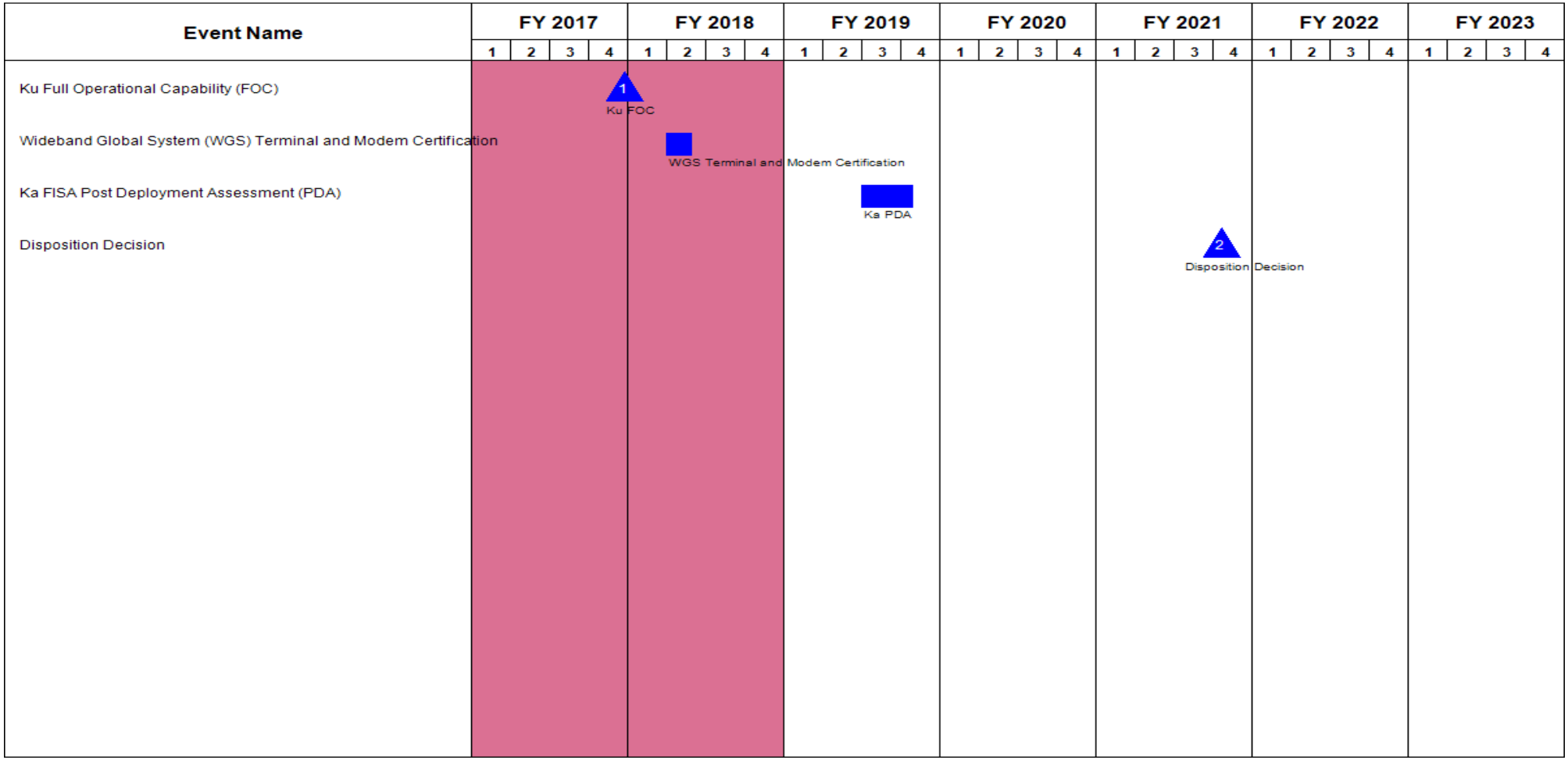
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Testing | MIPR | Army Test and Evaluation Command (ATEC) : Ft. Bragg, NC | - | - | | 1.000 | | - | | - | | - | 0.000 | 1.000 | - |
| | | **Subtotal** | - | - | | 1.000 | | - | | - | | - | 0.000 | 1.000 | N/A |

| | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 1.000 | | 3.493 | | - | | 3.493 | 0.000 | 4.493 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE4 / *Enroute Mission Command* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203142A / *SATCOM Ground Environment (SPACE)* | **Project (Number/Name)**<br>FE4 / *Enroute Mission Command* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Ku Full Operational Capability (FOC) | 4 | 2017 | 4 | 2017 |
| Wideband Global System (WGS) Terminal and Modem Certification | 2 | 2018 | 2 | 2018 |
| Ka FISA Post Deployment Assessment (PDA) | 3 | 2019 | 4 | 2019 |
| Disposition Decision | 4 | 2021 | 4 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 1208053A *I Joint Tactical Ground System* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | - | 0.000 | 10.228 | 7.400 | - | 7.400 | 9.282 | 9.529 | 11.209 | 11.658 | 0.000 | 59.306 |
| FE7: *Joint Tact Grd Station-P3I(MIP)* | - | 0.000 | 10.228 | 7.400 | - | 7.400 | 9.282 | 9.529 | 11.209 | 11.658 | 0.000 | 59.306 |

**Note**

Funding moved from PE 0208053A to PE 1208053A as directed by OSD to track Space Programs.

**A. Mission Description and Budget Item Justification**

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (PACOM, CENTCOM, EUCOM), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity. JTAGS funding was moved to a new PE as directed by OSD to track Space Programs. Program Office core employee labor costs have been moved from RDTE to OMA as part of an OSD auditability directive.

The JTAGS Program Element (PE) supports development and test to meet JTAGS Operational Requirement(s) Document (ORD) thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 1 is complete. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. P3I Block II Phase 2 Spiral 1 delivers Increased sensor capabilities to include, but not be limited to, GEO satellite Starer and additional Highly Elliptical Orbit data. Spiral 2 delivers increased sensor, communications, training, and exercise capabilities to include, but not be limited to, integration of the Missile Defense System Exerciser (FY2018-19). Spiral 3 delivers software tuning and testing in accordance with the Operational Requirements Document (ORD) (FY2019-20). JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army | | | | | Date: February 2018 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 1208053A / *Joint Tactical Ground System* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
| Previous President's Budget | 0.000 | 10.228 | 11.594 | - | 11.594 |
| Current President's Budget | 0.000 | 10.228 | 7.400 | - | 7.400 |
| Total Adjustments | 0.000 | 0.000 | -4.194 | - | -4.194 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Adjustments to Budget Years | - | - | -4.194 | - | -4.194 |

**Change Summary Explanation**

Program Office core employee labor costs $1.536 million moved from RDTE to OMA as part of an OSD auditability directive.
The FY 2019 funding request was reduced by $2.658 million to account for the availability of prior year execution balances

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1208053A / *Joint Tactical Ground System* | Project (Number/Name)<br>FE7 / *Joint Tact Grd Station-P3I(MIP)* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FE7: *Joint Tact Grd Station-P3I(MIP)* | - | 0.000 | 10.228 | 7.400 | - | 7.400 | 9.282 | 9.529 | 11.209 | 11.658 | 0.000 | 59.306 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**Note**

Funding moved from PE 0208053A to PE 1208053A as directed by OSD to track Space Programs

**A. Mission Description and Budget Item Justification**

The Joint Tactical Ground Station (JTAGS) is a post-production, ACAT III program and is designated as a DoD Space Program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS Block I system is a transportable information processing system, receiving and processing in-theater, direct down-linked data from Defense Support Program (DSP) and other Infrared (IR) satellites. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (PACOM, CENTCOM, EUCOM), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is being used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor to shooter connectivity. JTAGS funding was moved to a new PE as directed by OSD to track Space Programs. Program Office core employee labor costs have been moved from RDTE to OMA as part of an OSD auditability directive.

The JTAGS Program Element (PE) supports development and test to meet JTAGS Operational Requirement(s) Document (ORD) thresholds using improved sensors and algorithms as Pre-Planned Product Improvements (P3I). The P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and will improve warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 1 is complete. JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. P3I Block II Phase 2 Spiral 1 delivers Increased sensor capabilities to include, but not be limited to, GEO satellite Starer and additional Highly Elliptical Orbit data. Spiral 2 delivers increased sensor, communications, training, and exercise capabilities to include, but not be limited to, integration of the Missile Defense System Exerciser (FY2018-19). Spiral 3 delivers software tuning and testing in accordance with the Operational Requirements Document (ORD) (FY2019-20). JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Title:*** JTAGS Test and Evaluation Support | - | 1.616 | 1.083 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1208053A / *Joint Tactical Ground System* | **Project (Number/Name)**<br>FE7 / *Joint Tact Grd Station-P3I(MIP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2017 | FY 2018 | FY 2019 |
|---|---|---|---|
| ***Description:*** Test and evaluation support for the JTAGS P3I Block II program<br><br>***FY 2018 Plans:***<br>Begin testing support of the JTAGS P3I Block II Phase 2 Spiral 2 development program<br><br>***FY 2019 Plans:***<br>Complete testing support of the JTAGS P3I Block II Phase 2 Spiral 2 development program<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding for testing efforts decreased due to test completions in FY 2018 and reduced testing requirements in FY 2019. | | | |
| ***Title:*** JTAGS Block II Phase 2<br><br>***Description:*** JTAGS Block II Phase 2 activities are broken into three spirals to expedite getting critical capabilities fielded sooner. P3I Block II Phase 2 Spiral 1 delivers stereo SBIRS Geosynchronous scanner capability and SBIRS HEO Pseudo-Link 4 (P/L 4) data. Spiral 2 delivers Cobra Brass and "Walkers" data (FY2018-19). Spiral 3 delivers software tuning and testing to the Operational Requirements Document (ORD) (FY2019-20). JROC-Memos 197-12 and 113-13 supports the need to develop and field JTAGS Block II capabilities as soon as possible Also includes Government management/oversight of the JTAGS Block II program.<br><br>***FY 2018 Plans:***<br>Begin development efforts of the JTAGS Block II Phase 2 Spiral 2 program and Government management/oversight.<br><br>***FY 2019 Plans:***<br>Continue development efforts of the JTAGS Block II Phase 2 Spiral 2 program. Also covers some Government management/oversight.<br><br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Funding for Block II Phase 2 development efforts decreased to account for the availability of prior year execution balances. | - | 8.612 | 6.317 |
| **Accomplishments/Planned Programs Subtotals** | - | 10.228 | 7.400 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 635: *Joint Tact Grd Station-P3I(MIP)* | 12.649 | - | 0.000 | - | 0.000 | - | - | - | - | 0.000 | 12.649 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1208053A / *Joint Tactical Ground System* | **Project (Number/Name)**<br>FE7 / *Joint Tact Grd Station-P3I(MIP)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • BZ8420: *JOINT TACTICAL GROUND STATION MODS (JTAGS)* | 4.417 | - | 5.434 | - | 5.434 | - | - | - | 6.393 | 0.000 | 16.244 |

**Remarks**

**D. Acquisition Strategy**

Under this program element, critical improvements will be developed making maximum use of Non-Developmental Items (NDI)/Commercial Off-The-Shelf (COTS) components. After design and integration, the system will be subject to thorough developmental and validation/verification testing to verify performance, operational effectiveness and suitability. P3I Improvements will upgrade JTAGS to a new Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, improving warning tactical parameters and timeliness. JTAGS Block II is on contract for a two-Phase development effort. JTAGS Block II Phase 2 is further divided into three spirals to provide critical capabilities to the fielded units faster. JTAGS Block II Phase 2 Spiral 1 delivers stereo SBIRS Geosynchronous scanner capability and SBIRS Highly Elliptical Orbit (HEO) Pseudo-Link 4 (P/L 4) data. Spiral 2 delivers Cobra Brass and "Walkers" data (FY2018-19). Spiral 3 delivers software tuning and testing in accordance with the Operational Requirements Document (ORD) (FY2019-20). JTAGS Block II Phase 2 is a Cost Plus Incentive Fee (CPIF) option on the JTAGS Block II (P3I) contract (W9113M-12-C-0055). The option was definitized 4Q17. JROC-Memos 197-12 and 113-13 direct fielding of JTAGS Block II capabilities as soon as possible.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1208053A / *Joint Tactical Ground System* | Project (Number/Name)<br>FE7 / *Joint Tact Grd Station-P3I(MIP)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Program Management | Allot | Various : Redstone Arsenal AL | - | - | | 2.689 | | 1.190 | Oct 2018 | - | | 1.190 | 0.000 | 3.879 | - |
| | | **Subtotal** | - | - | | 2.689 | | 1.190 | | - | | 1.190 | 0.000 | 3.879 | N/A |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JTAGS P3I Block II Phase 2 Development | Option/ CPIF | Northrop Grumman : Colorado Springs Co | - | - | | 4.590 | Dec 2017 | 3.749 | Dec 2018 | - | | 3.749 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 4.590 | | 3.749 | | - | | 3.749 | Continuing | Continuing | N/A |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering Support | C/CPFF | TBD : Huntsville AL | - | - | | 1.333 | Dec 2017 | 1.378 | Nov 2018 | - | | 1.378 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 1.333 | | 1.378 | | - | | 1.378 | Continuing | Continuing | N/A |

**Test and Evaluation ($ in Millions)**

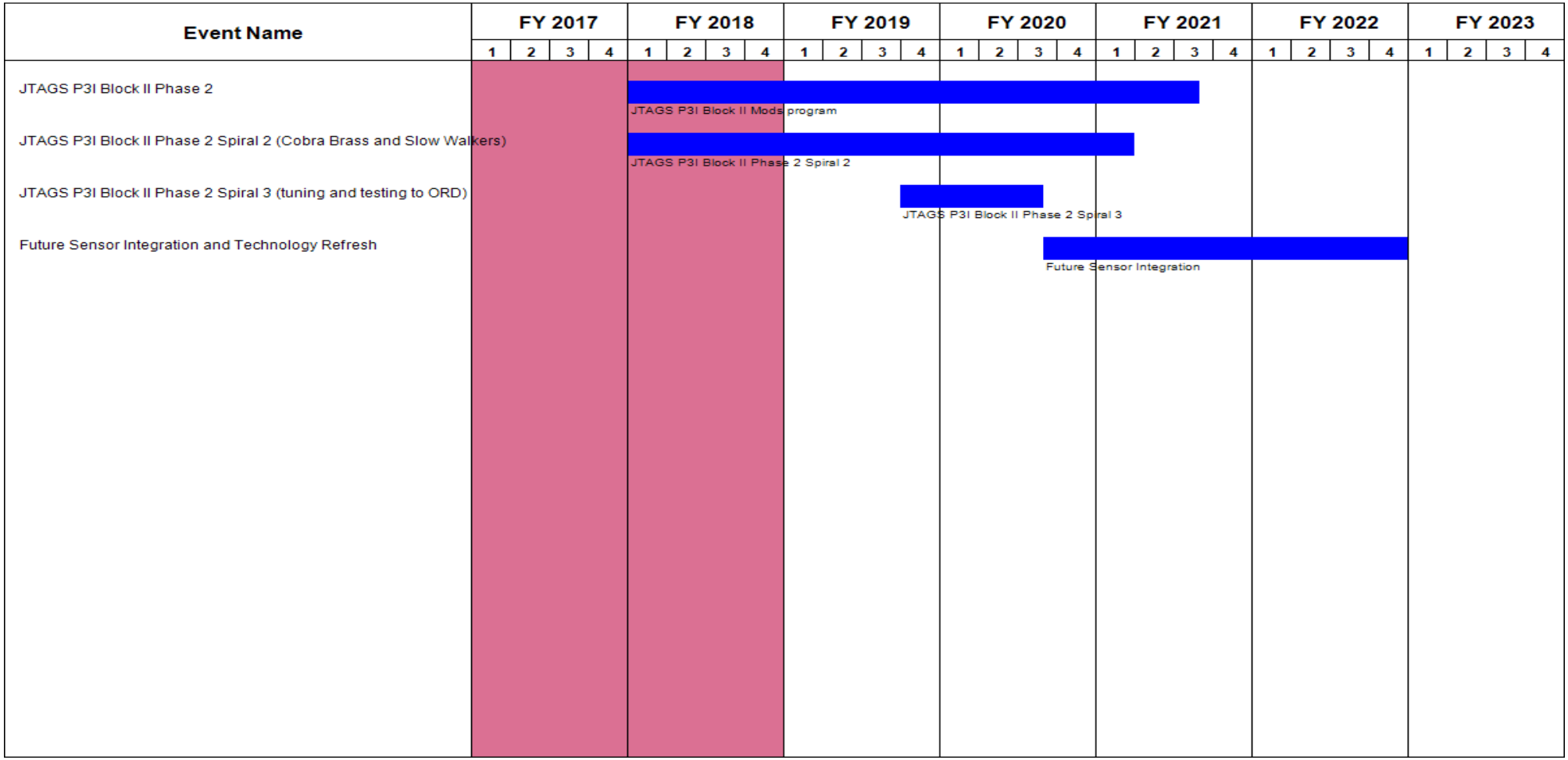
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Support (ATEC/AIC/ JITC) | Various | Various : Various | - | - | | 1.616 | Dec 2017 | 1.083 | Dec 2018 | - | | 1.083 | Continuing | Continuing | - |
| | | **Subtotal** | - | - | | 1.616 | | 1.083 | | - | | 1.083 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>2040 / 7 | R-1 Program Element (Number/Name)<br>PE 1208053A / *Joint Tactical Ground System* | Project (Number/Name)<br>FE7 / *Joint Tact Grd Station-P3I(MIP)* | |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | - | - | | 10.228 | | 7.400 | | - | | 7.400 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1208053A / *Joint Tactical Ground System* | **Project (Number/Name)**<br>FE7 / *Joint Tact Grd Station-P3I(MIP)* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>2040 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1208053A / *Joint Tactical Ground System* | **Project (Number/Name)**<br>FE7 / *Joint Tact Grd Station-P3I(MIP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| JTAGS P3I Block II Phase 2 | 1 | 2018 | 3 | 2021 |
| JTAGS P3I Block II Phase 2 Spiral 2 (Cobra Brass and Slow Walkers) | 1 | 2018 | 1 | 2021 |
| JTAGS P3I Block II Phase 2 Spiral 3 (tuning and testing to ORD) | 4 | 2019 | 3 | 2020 |
| Future Sensor Integration and Technology Refresh | 3 | 2020 | 4 | 2022 |