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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2020 Office of the Secretary Of Defense **Date:** February 2019

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605170D8Z / <i>Support to Networks and Information Integration</i>
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COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	58.876	12.141	11.424	9.441	-	9.441	9.341	8.742	9.010	9.010	Continuing	Continuing
170: <i>Support to NII</i>	58.876	12.141	11.424	9.441	-	9.441	9.341	8.742	9.010	9.010	Continuing	Continuing

**Note**

The FY2019 funding request was reduced by 2.012 million to account for the availability of prior year execution balances.

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

Funding supports Global Positioning System (GPS) User Equipment Synchronization with GPS space and operational control segments to conduct DoD CIO oversight of Global Positioning System (GPS) management and planning activities required for meeting JCIDs requirements. Funding supports policy and guidance for incorporation of alternative means of PNT delivery to augment GPS. Funding also supports the DoD's PNT Oversight Council and inputs into interagency activities under the National Space-Based Positioning, Navigation, and Timing Executive Committee.

Defense Architecture Support includes development, analysis, testing and evaluation of DoD IT Enterprise Reference and solution architecture products in support of the DoD's Joint Information Environment and the closely related Mission Partner Environment.

The Department maintains a catalog of architecture data holdings and provides users the ability to store, search, retrieve, and use DoD architecture data through capabilities provided by the architecture portal. The portal is a central, federated hub for discovery, accessibility, understandability, and reusability of architectures. With the ability to import different architecture tool data and display disparate architecture data in a uniform, consistent method for ease of use and understanding. The portal provides a federated environment for sharing of architectures, mission threads, and other related capability integrated information between various authoritative repositories to increase effectiveness and efficiency of decision-making in a dynamic environment by our customers. Implementations are accessible on both the NIPRNET (unclassified) and SIPRNET (Collateral Classified). Key features of the Defense Architecture Support program focus on: (1) Research and Development of JIE and MPE architectures, (2) Making JIE and MPE architecture data visible, accessible, trusted, understandable, and interoperable (2) enabling reuse of validated architecture data to build "composite" integrated architectures; (3) enabling architecture analysis; and, (4) integrating architecture data into the DoD mainstream decision-making processes. The Department of the Air Force, Army, and Navy CIO's collaborate in the development of federation web services via the Enterprise Architecture and Engineering Panel under the oversight of the DoD CIOs Enterprise Architecture and Service Board to ensure DoD-wide access to and usability of all components of the composite DoD enterprise architecture model, enterprise services, data and technical standards.

The Integrated Planning and Management Project encompasses the National Leadership Command Capability (NLCC) Management Office's (NMO) responsibilities for establishing overall DoD policy and oversight with respect to the capability development, interoperability, standards, and architecture for National and Nuclear Command Capabilities for our National Leadership. The NMO serves as the single point of contact within the Department for policy, long-range plans, programs and budget, integrated mission advocacy, and management of decision-maker capabilities. NMO's objective is to ensure capabilities are in place to provide complete and timely situational awareness and decision tools for senior decision-makers. Additionally, the NMO assists the DoD CIO as the Executive Agent and primary OSD advocate for the White House Military Office with oversight of a wide range of DoD command, control, and communications (C3) assets and oversees the efforts of the Services and Agencies in the design, integration, and deployment of critical and sensitive C3 capabilities. Three overall areas of focus include: 1) National Senior Leader C3 Systems,

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National Security/Emergency Preparedness (NS/EP), DoD support to Civil Authorities; Continuity of Government (COG); 2) Nuclear C2, Integrated Missile Defense, Tactical Warning, Global Strike; and 3) Cyber Mission Indications and Warnings.

The Mission Assurance Risk Management System (MARMS) is a Department of Defense (DoD) risk management system that directly supports the Secretary of Defense’s Mission Assurance (MA) responsibilities as defined in the DoD Directive (DoDD) 3020.40, Mission Assurance, with the objectives of creating resilience and supporting critical processes to enable the protection of assets and ensuring defense critical missions. MARMS will function as an integration framework spanning multiple security domains that will support risk-informed decision-making, resource investment, and improved synchronization at different levels within DoD. MARMS supports multiple Joint Capability Areas (JCA): Command and Control, Logistics, and Protection. MARMS is an acquisition category (ACAT) III software program and has a “high” impact value for each of the three security objectives (confidentiality, integrity, and availability) in accordance with DoD Instruction (DoDI) 8510.01 and the Committee on National Security Systems Instruction (CNSSI) 1253. This program is funded under Budget Activity 6, RDT&E Management Support because it includes studies and analysis in support of RDT&E efforts.

In support of the National Defense Strategy (NDS), GPS continues to provide a force multiplier for the Joint Force and key US allies. Its modernization, and alternative, complement means of PNT provision will maintain this advantage. Superior PNT provides enhanced Joint Force lethality through precision targeting, exacting ISR, efficient logistics, blue force tracking, and a myriad of other force enhancements. These are enjoyed by the Joint Force and key US allies. As such, they ensure efficient and effective force employment.

NLCC provides guidance, oversight and policy direction support for Senior Leadership communications, Continuity communications and NC3 which enable the National Security Strategy's "build a more lethal force" line of effort. By coordinating and integrating with the National Security Agency in the development of a security policy that provides guidance to the NLCC community on cyber secure connection interfaces and security patterns on a continuous basis to addresses hardware, firmware and software vulnerabilities. Working with DISA, the Services, and other federal government agencies to ensure the safety of our Nation's critical undersea cable infrastructure. Provide guidance and oversight to all NLCC cryptographic modernization programs, ensure NSA and the appropriate Service delivers their cryptographic capability on time and work with the combatant commanders' staff to ensure they have operationalized any potential risks with potential cryptographic program delays. Coordinate the DoD's critical time dissemination resiliency plans and initiatives with senior representatives from the precision, navigation and timing (PNT) community. Work with the Joint Staff, Army, Air Force, Navy, and Marine Corps to ensure their PNT plans include primary and alternate capabilities. Continue analysis of White House, DoD Services, DoD Agencies and Combatant Command initiatives to ensure the effectiveness of our airborne command, control and communications, commercial and military satellite communications, and their supporting ground infrastructure. Analysis will ensure our Senior Leadership C3 is operationally effective during all phases of a conflict.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
Previous President's Budget	12.583	11.450	15.041	-	15.041
Current President's Budget	12.141	11.424	9.441	-	9.441
Total Adjustments	-0.442	-0.026	-5.600	-	-5.600
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.442	-			
• FFRDC Reduction	-	-0.026	-	-	-
• MARMS Functional Transfer to DTRA	-	-	-5.600	-	-5.600

**Change Summary Explanation**

FY 2018: SIBR/STTR Reduction -0.442 million.

FY 2019: FFRDC Reduction -0.026 million.

FY2020: Functional Transfer of MARMS to DTRA -5.600 million.

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COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
170: <i>Support to NII</i>	58.876	12.141	11.424	9.441	-	9.441	9.341	8.742	9.010	9.010	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

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The Mission Assurance Risk Management System (MARMS) is a Department of Defense (DoD) risk management system that directly supports the Secretary of Defense’s Mission Assurance (MA) responsibilities as defined in the DoD Directive (DoDD) 3020.40, Mission Assurance, with the objectives of creating resilience and supporting critical processes to enable the protection of assets and ensuring defense critical missions. MARMS will function as an integration framework spanning multiple security domains that will support risk-informed decision-making, resource investment, and improved synchronization at different levels within DoD. MARMS supports multiple Joint Capability Areas (JCA): Command and Control, Logistics, and Protection. MARMS is an acquisition category (ACAT) III software program and has a “high” impact value for each of the three security objectives (confidentiality, integrity, and availability) in accordance with DoD Instruction (DoDI) 8510.01 and the Committee on National Security Systems Instruction (CNSSI) 1253. This program is funded under Budget Activity 6, RDT&E Management Support because it includes studies and analysis in support of RDT&E efforts.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2018	FY 2019	FY 2020
<p><b>Title:</b> Support to NII</p> <p><b>FY 2019 Plans:</b>                      Global Positioning System (GPS) User Equipment Synchronization with GPS space and control segments to conduct DoD CIO oversight of Global Positioning System (GPS) management and planning activities required for meeting JCIDs requirements and supporting the National Space-Based Positioning, Navigation and Timing Executive Committee. Funding will support:</p> <ul style="list-style-type: none"> <li>- Manage the GPS Security Policy (DoDM-O4650.11).</li> <li>- Manage the Information Assurance/COMSEC elements of DoDM-O4650.11.</li> <li>- Develop the NAVWAR manual (DoDM-4650.ed).</li> <li>- Continue implementation of the GPS Protection Profile matrix from Navigation Warfare Concept of Operations in conjunction with Warfighting Operations Plans (OPLANS) and Contingency Plans (CONPLANS) in coordination with US STRATCOM.</li> <li>- Manage PNT Navigation Warfare Instruction and Annexes to all the Operations Plans (OPLANS) and Contingency Plans (CONPLANS) in coordination with US STRATCOM.</li> <li>- Manage NextGen interfaces with the GPS Wing, Joint Program Development Office (JPDO), and Air Force. Continue implementation of Red Key Sundown Policy.</li> <li>- Provide staff support, perform research and conduct studies as directed by DEPSECDEF in his role as co-chair of the National Executive Committee for Space-Based PNT and for DoD CIO in his role as co-chair of the Executive Steering Group.</li> <li>- Perform annual update of National Five-year Plan for Space-Based Positioning, Navigation and Timing (PNT).</li> <li>- Apply Navigation Warfare Concept of Operations via the Joint Navigation Warfare Center (JNWC) and US STRATCOM to develop Doctrine, Tactics, Techniques and Procedures, Training, Equipment Validation and Material Solutions to Navigation Warfare challenges to the Military Services and Combatant Commanders in the scenarios defined in the CONPLANS and OPLANS.</li> <li>- Manage and implement the DoD PNT investment strategy using the NetCentric Operations CPM portfolio to insure PNT material solutions are developed in a synchronized fashion in JCIDs, DAS, and PPBE.</li> <li>- Implement additional Instructions (DoDIs) for public affairs and receiver certification, and DoDM for security policy.</li> </ul>	12.141	11.424	9.441

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**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2018	FY 2019	FY 2020
<ul style="list-style-type: none"> <li>- Manage inventory of DoD GPS receivers.</li> <li>- Analyze and promote alternative PNT delivery means for inclusion in the force structure for force protection.</li> <li>- Biennially task Intelligence Community (IC) to assess threat vectors to GPS and other means of PNT delivery; biennial operational assessments to reveal gaps in PNT delivery against OPLANS and CONPLANS of COCOMS; maintenance of PNT equipment inventories, refreshed biennially.</li> <li>- Develop Directives, Instructions, and Manuals for implementation of the PNT Strategy within the Department.</li> <li>- Continue special task directed by DCIO to address acceleration of development and fielding of advanced GPS receivers in the Joint Force.</li> <li>- Maintain and update inventory of existing GPS receiver equipage; expand to include antennae and antennae electronics; expand to include delivery of PNT via other-than-GPS equipment.</li> <li>- Address prioritized platforms in fielding plans and guidance to Services.</li> <li>- Develop MGUE "Roadmap" illustrating necessary fielding milestones for Joint Force MGUE equipage.</li> <li>- Administer PNT Council within DoD via supporting DoDDs and DoDIs, agendas and minutes for Council meetings, Council task disposition and annual report to Congress.</li> </ul> <p>Continue IT Enterprise and solution architecture development, analysis, and registration processes.</p> <p>Continue NC3 Modeling and Simulation and Analysis – Continue to provide direction and support to the DISA/JSEIO in developing campaign level modeling and simulation tools for NC3. The research and development of the tools will continue to increase the capabilities of modeling and simulation for strategic communications (MASSC) (conferencing capabilities), NC3-N executable architecture management system (NC3-N ExAMS) (analysis of nodes, metrics and assets associated with a Navy communications system), joint operations visualization environment (JOVE) and NC3 integrated scenario modeler (NISM) (provide extendable, transparent multi-level simulations of scenarios).</p> <p>- \$0.800 million – Continue to perform financial database analysis and use the R-DOCs and P-DOCs to create a new structure for the NLCC Investment Strategy. Continue to build automatic extraction tools for the R=DOCs and P-DOCs. Continue developing program lists using programmatic data in Excel. Continue to develop an XML Parser to move data to into a single database to work on Schedule Views (GANTT) and move to a roadmap format, starting off as a manual process, and leading to an automated process.</p> <p>System Engineering and Agile Development per MARMS Requirements Definition Package(RDP)-1. In FY19 MARMS will continue development of CD1 Information Sharing, CD2 Assessments, and CD3 Enhanced Stakeholder Systems to an Initial Operational Capability (IOC). This will provide the department with a single repository of DCI and AT data to perform analysis and manage risk perf DODD 3020.40. The development focus in FY19 will be on the development and implementation of the Mission Assurance Workspace and Viewer on SIPRNet and JWICS. The MA Workspace and Viewer will provide the</p>			

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>
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<p>department's leadership with a consolidated MA dashboard, and analytical capabilities to perform planning and analysis of Mission Assurance activities per DoDD 3020.40 and 3020.45.</p> <p><b>FY 2020 Plans:</b></p> <p>Global Positioning System (GPS) User Equipment Synchronization with GPS space and control segments to conduct DoD CIO oversight of Global Positioning System (GPS) management and planning activities required for meeting JCIDs requirements and supporting the National Space-Based Positioning, Navigation and Timing Executive Committee. Funding will support:</p> <ul style="list-style-type: none"> <li>- Manage the GPS Security Policy (DoDM-O4650.11).</li> <li>- Manage the Information Assurance/COMSEC elements of DoDM-O4650.11.</li> <li>- Develop Precise Time and Time Interval (PTTI) Manual in DoDD 4650.05 family of PNT Issuances.</li> <li>- Continue implementation of the GPS Protection Profile matrix from Navigation Warfare Concept of Operations in conjunction with Warfighting Operations Plans (OPLANS) and Contingency Plans (CONPLANS) in coordination with US STRATCOM.</li> <li>- Manage PNT Navigation Warfare Instruction and Annexes to all the Operations Plans (OPLANS) and Contingency Plans (CONPLANS) in coordination with US STRATCOM.</li> <li>- Manage NextGen interfaces with the GPS Wing, Joint Program Development Office (JPDO), and Air Force. Continue implementation of Red Key Sundown Policy.</li> <li>- Provide staff support, perform research and conduct studies as directed by DEPSECDEF in his role as co-chair of the National Executive Committee for Space-Based PNT and for DoD CIO in his role as co-chair of the Executive Steering Group.</li> <li>- Perform annual update of National Five-year Plan for Space-Based Positioning, Navigation and Timing (PNT).</li> <li>- Apply Navigation Warfare Concept of Operations via the Joint Navigation Warfare Center (JNWC) and US STRATCOM to develop Doctrine, Tactics, Techniques and Procedures, Training, Equipment Validation and Material Solutions to Navigation Warfare challenges to the Military Services and Combatant Commanders in the scenarios defined in the CONPLANS and OPLANS.</li> <li>- Manage and implement the DoD PNT investment strategy using the NetCentric Operations CPM portfolio to insure PNT material solutions are developed in a synchronized fashion in JCIDs, DAS, and PPBE.</li> <li>- Implement additional Instructions (DoDIs) for public affairs and receiver certification, and DoDM for security policy.</li> <li>- Manage inventory of DoD GPS receivers. Complete Roadmap of GPS UE fielding for MGUE.</li> <li>- Analyze and promote alternative PNT delivery means for inclusion in the force structure for force protection. Develop Open Systems Architecture Standards for fielding of alternative PNT. Develop M&amp;S tool for alternative PNT analysis.</li> <li>- Biennially task Intelligence Community (IC) to assess threat vectors to GPS and other means of PNT delivery; biennial operational assessments to reveal gaps in PNT delivery against OPLANS and CONPLANS of COCOMS; maintenance of PNT equipment inventories, refreshed biennially.</li> <li>- Develop Directives, Instructions, and Manuals for implementation of the PNT Strategy within the Department.</li> </ul>			
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**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2018	FY 2019	FY 2020
<ul style="list-style-type: none"> <li>- Continue special task directed by DCIO to address acceleration of development and fielding of advanced GPS receivers in the Joint Force.</li> <li>- Maintain and update inventory of existing GPS receiver equipage; expand to include antennae and antennae electronics; expand to include delivery of PNT via other-than-GPS equipment.</li> <li>- Address prioritized platforms in fielding plans and guidance to Services.</li> <li>- Develop MGUE "Roadmap" illustrating necessary fielding milestones for Joint Force MGUE equipage.</li> <li>- Administer PNT Council within DoD via supporting DoDDs and DoDIs, agendas and minutes for Council meetings, Council task disposition and annual report to Congress. Chair and manage subordinate WGs for PNT Policy and NAVWAR.</li> <li>- Address NATO PNT interoperability via STANAGs, Allied Navigation Plans, and associated documentation in NATO CaP-2 under C3 Board direction. Insure complementarity of allied equipage and planning based on USAF GPS development, open systems architecture development, and foreign PNT systems and capabilities.</li> <li>- Insure cyber security of all elements of the Department PNT ecosystem. Assist civil Departments and Agencies, as required.</li> </ul> <p>Integrated Planning and Management (NLCC): Continue NC3 Modeling and Simulation and Analysis – Continue to provide oversight and guidance to the DISA/JSEIO in developing end-to-end campaign-level modeling and simulation tools for NC3. The research and development of the tools continued to increase the capabilities of MASSC (conferencing capabilities), NC3-N ExAMS (analysis of nodes, metrics and assets associated with a Navy communications system) and NISM (provide extendable, transparent multi-level simulation of scenarios). Deliverable will determine COCOM OPLAN risk in denied environments.</p> <p>Provide oversight and guidance on Maritime Information Systems (MIS) and Submarine Fiber Optic Cables (SFOC) and associated infrastructure. These activities will encompass overseeing analysis of requirements, identifying communications capability shortfalls and interoperability issues, assessing equipment performance issues and exploring future communications improvements. This includes technical expertise and systems engineering expertise in support of acquisition, planning, procurement, installation, operations and sustainment of MIS and SFOC capabilities.</p> <p>Provide technical expertise and oversight of Senior Leader C3 Systems and platforms including fixed and mobile communications capabilities of the White House, Secretary of Defense, Chairman of the Joint Chiefs of Staff, and other identified Senior Leaders. These activities will encompass consolidating Senior Leader operational mission requirements, identifying communications capability shortfalls and interoperability issues, assessing equipment performance issues and exploring future communications improvements.</p> <p><b><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></b></p>			

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2018	FY 2019	FY 2020
The FY2019 funding request was reduced to account for the availability of prior year execution balances. The funding was re-phased in FY2020 and FY2021.			
FY2020 Functional Transfer of the MARMs program to DTRA -5.600 Million.			
<b>Accomplishments/Planned Programs Subtotals</b>	12.141	11.424	9.441

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

PNT Performance Metrics

- Implement and successfully manage PNT Navigation Warfare Instructions and Manuals subordinate to DoDD 4650.05 and Annexes to applicable Operations Plans (OPLANS) and Contingency Plans (CONPLANS) in coordination with the appropriate Unified Combatant Command
- Implement the recommendations of the Analyses of Alternatives for the CIO and DCIO C4IIC Global Positioning System (GPS) portfolio of Position, Navigation, and Timing (PNT) programs and activities and additional PNT alternatives included in the US Army PNT Assurance AoA and the PNT Science and Technology Roadmap.
- Provide staff support, perform research and conduct studies as directed by the CIO and DCIO C4IIC relating to the Global Positioning System (GPS) portfolio of Position, Navigation, and Timing (PNT) programs and activities and other forms of PNT delivery.

Integrated Planning & Management Performance Metrics:

- Continue development of the required infrastructure to support Senior Leader Secure Mobile Communications. (measure of systems upgraded/enhanced)
- Continue development of the Overarching NLCC Initial Capabilities Document JROCM taskings. Includes both the development of measures to inform subordinate JCIDS documents as well as a roadmap and investment strategy for the sustainment and modernization of the NLCC.
- Continue policy development for National Leadership Command Capabilities (NLCC) directives (DoDDs) and instructions (DoDIs) (e.g., updates to DoDI for NC3 Management, develop DoDI for NC3 Governance, etc.).

DARS Performance Metrics:

- Timely development and issuance of policy, guidance, processes, and technologies to build, populate, govern, operate, and protect the Network.
- Policies developed and issued for GIG design, architecture content management, implementation, and operations.