Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Office of the Secretary Of Defense	Date: February 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607210D8Z / *Industrial Base Analysis and Sustainment Support*

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	61.296	16.464	48.765	10.051	0.000	10.051	10.129	10.176	10.360	10.482	Continuing	Continuing
819: *Industrial Base Analysis and Sustainment*	61.296	16.464	48.765	10.051	0.000	10.051	10.129	10.176	10.360	10.482	Continuing	Continuing

A. Mission Description and Budget Item Justification

Industrial Base Analysis and Sustainment (IBAS) was established in accordance with 10 USC Sec 2508 Industrial Base Fund direction to strengthen the force posture of the U.S. Defense Manufacturing and Industrial Base to respond at will in support of the Warfighter today and tomorrow. The IBAS Program provides the Department with a unique capability to achieve the strategic goals within the 2018 National Defense Strategy for a strong, resilient, responsive and healthy US Industrial Base (IB) that improves the Departments force readiness posture. This program is uniquely positioned to improve the US Industrial Base's competitiveness and ability to respond to the Departments needs by applying focused investments to: 1) monitor and assess the current state of the IB, 2) address critical issues in the IB relating to Urgent Operational Needs, 3) address supply chain vulnerabilities and, 4) support efforts to expand the Industrial Base.

Manufacturing dominance underpins technical dominance. A healthy manufacturing and defense industrial base and resilient supply chains are essential to the economic strength and national security of the United States. The ability of the United States to maintain readiness, and to surge and sustain in response to an emergency, directly relates to the capacity, capabilities, and resiliency of our manufacturing and defense industrial base and supply chains.

IBAS is fundamental to achieving a modern IB that integrates traditional and emerging sectors to be able to respond at will to National Security Requirements.

IBAS investments focus on addressing Industrial Base issues that support defense needs by identifying and closing gaps in defense manufacturing capabilities and creating and sustaining reliable sources. Key areas of IBAS investment will include:
1) advancing and sustaining both traditional and emerging defense manufacturing sectors,
2) preserving critical and unique manufacturing and design skills,
3) supporting and expanding reliable sources, and
4) identifying and mitigating supply chain vulnerabilities

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Office of the Secretary Of Defense	Date: February 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607210D8Z / *Industrial Base Analysis and Sustainment Support*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	10.882	10.376	10.428	0.000	10.428
Current President's Budget	16.464	48.765	10.051	0.000	10.051
Total Adjustments	5.582	38.389	-0.377	0.000	-0.377
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	6.000	38.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.397	-			
• FFRDC	-0.021	-0.111	-	-	-
• Realignment for Administration priorities for Biological and Chemical Threats Preparedness	-	-	-0.377	-	-0.377

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 819: *Industrial Base Analysis and Sustainment*		
Congressional Add: *Program Increase*	6.000	38.500
Congressional Add Subtotals for Project: 819	6.000	38.500
Congressional Add Totals for all Projects	6.000	38.500

Change Summary Explanation

Congressional Adds for FY 2018 and FY 2019 are addressed in the R2a section on Congressional Adds

FY 2020 change is Realignment for Administration priorities for Biological and Chemical Threats Preparedness

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense											Date: February 2019	
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607210D8Z / *Industrial Base Analysis and Sustainment Support*				Project (Number/Name) 819 / *Industrial Base Analysis and Sustainment*			
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**
819: *Industrial Base Analysis and Sustainment*	61.296	16.464	48.765	10.051	0.000	10.051	10.129	10.176	10.360	10.482	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2019 to FY 2020 reflects the FY 2019 four one-time appropriation enactment increases of $38,500 as addressed in the R2a Congressional Add section

A. Mission Description and Budget Item Justification

IBAS mission is to strengthen the force posture and readiness of the U.S. Defense Manufacturing and Industrial Base to respond at will to national security needs.

The IBAS program has a multi-pronged approach to identify projects: 1) assessments of the national technology and industrial base by the OSD Acquisition & Sustainment (A&S), Office of Industrial Policy (INDPOL) as directed by 10 U.S. Code 2505, and 2) working directly in partnership with defense programs, and 3) working directly with industry. INDPOL collaborates with the services and agencies in performing assessments under the Title 10 USC Section 2505 program to identify elements of the industrial base critical to a healthy and resilient defense industrial base:

1) Gaps in national-security-related domestic manufacturing capabilities
2) Threatened, single, or sole source capabilities especially within the lower tiers
3) Foreign Dependency from high risk sources or countries
4) Education and manufacturing workforce skills

The continued corrosion on the industrial base is a direct and severe threat to National Security, especially with the reemergence of long-term, strategic competition of authoritarian peer nations.

FY 2020 and beyond investment strategies will also be informed by, 1) the findings of Executive Order (EO) 13806, "Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States," and 2) the Committee on Foreign Investment in the U.S. (CFIUS). The EO assessment identified nearly 300 risks across 16 sectors; concludes the current state and trajectory of the U.S. industrial base and our capacity to support readiness is in question; and requires significant changes including increased investment for the industrial base.

Findings from the nine traditional defense sectors and seven cross-cutting sectors will be used to inform both product specific investments as well as developing enterprise-wide initiatives to mitigate and capture domestic capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense		Date: February 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607210D8Z / *Industrial Base Analysis and Sustainment Support*	**Project (Number/Name)** 819 / *Industrial Base Analysis and Sustainment*

IBAS investments seek to ameliorate industrial base and manufacturing issues to strengthen the defense industrial base. All projects are evaluated for industrial base risks using fragility and criticality risk criteria, similar to the more familiar probability and consequence risk criteria. Fragility examines characteristics that make a specific capability likely to be disrupted. Criticality examines characteristics that make a specific capability difficult to replace if disrupted.

IBAS currently focuses efforts and investments in four categories: Radars, Sensors, and Electronics Sectors; Materials Sector; Munitions and Missiles Sector; and Cross-cutting Supply Chain Vulnerabilities Mitigation.

Cornerstone Other Transaction Agreement (OTA): Enhanced efficiency of IBAS program execution will be supported by a new non-Federal Acquisition Regulation (FAR) OTA procurement vehicle called Cornerstone, established February 2018 in partnership between ODASD (Industrial Policy) and the Army Edgewood Chemical Biological Center (ECBC). Cornerstone was specifically designed for industrial base investments to meet the Departments needs to improve readiness and sustainment through proactive engagement and investment within and across supply chains. Cornerstone provides the ability to access (18) different industry sectors under one agreement where all parties have agreed to one common management agreement and one intellectual property agreement, and it allows the Government to open or direct solicit tasks as legally appropriate against OTA statues. Cornerstone's period of performance is "in perpetuity" with no overall ceiling, with task award ceilings. IBAS authorities coupled with Cornerstone enable the department to efficiently execute IBAS investments – positioning the industrial base to modernize at pace with our military.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Supply Chain Vulnerabilities Mitigation	2.718	1.715	3.954	0.000	3.954
Description: Efforts include supplier specific, sector specific, and enterprise-wide efforts. Supplier specific efforts support one or more programs and are critical path suppliers, sole or single source suppliers. Sector-Specific investments are aimed at addressing vulnerabilities across multiple-participants that share a common issue; and enterprise-wide are cross-cutting challenges requiring mitigation. Findings from the Executive Order 13806 assessment for both traditional defense sectors and cross-cutting sectors will inform this effort including supply chain issues for ships and subs, casting and forgings, workforce skills for the trades including welding and machining, and machine tools. ***FY 2019 Plans:*** FOCUS: Entrants into the technical skills lag both commercial and defense requirements. Lack of awareness and prestige of the career opportunities stifled potential candidates from entering. Surging defense production budgets concurrent with rising U.S. manufacturing are placing significant pressures on states and companies to increase entrants and accelerate development. Specialty defense skills such as those related to ship construction and precision optics are highly constrained. The focus in FY 2019 is to coalesce past and ongoing workforce development efforts for engineering and trade skills into a structured framework to elevate the prestige of and need for the technical skills; accelerate entrants into the technical skills, and comprehensively accelerate					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense		Date: February 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607210D8Z / *Industrial Base Analysis and Sustainment Support*	**Project (Number/Name)** 819 / *Industrial Base Analysis and Sustainment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
training for the technical skills. . This FY 2019 initiative shall coalesce prior projects, Manufacturing Skills Challenge and ELEV8 Supply Chain Resiliency, and expand into precision optics and additional shipyard trade skills, into an industrial base enterprise level. Specific Efforts: Manufacturing Skills Challenge (MSC). This effort was initiated in prior years, and continues into FY 2020. MSC project description is addressed below for FY 2020 Plans. ***FY 2020 Base Plans:*** The engineering and workforce development trade skills initiative will begin executing pilot projects for precision optics, large volume machine parts, and expand the manufacturing skills challenge. Manufacturing Skills Challenge (MSC): Similar to STEM efforts such as First Robotics, the MSC project seeks to close gaps in industrial capabilities, increase industrial base readiness, elevate the prestige of manufacturing, and identify future supply chain members by establishing a manufacturing skills challenge. This effort across multiple fiscal years starting in FY 2017 is a collaboration between OSD and the National Aeronautics and Space Administration (NASA) to define and address strategic manufacturing value chain vulnerabilities and technologies, and strengthen workforce skills. This effort includes competitions with "Support for a prize". The pilot effort will focus on welding workforce in the Southeast corridor including Mississippi, Louisiana, Alabama, and South Carolina where large ship, aerospace, and automotive growth have created workforce skills and supply chain challenges. Executive Order (EO) 13806 Findings in Supply Chain Vulnerabilities: Efforts will include mitigation of foreign dependency; critical path suppliers for production, surge, and sustainment; and workforce skills. ***FY 2020 OCO Plans:*** NA ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Net increase of $2.239 represents focused attention on DoD Supply Chain Vulnerabilities outlined above, requiring reprioritization and realignment of available resources from other sectors within this Program Element.					
Title: Radars, Sensors, and Electronics Sectors ***Description:*** The enabling components and systems capabilities availability is limited with few domestic suppliers, presenting risks to system production and sustainment and directly impacting system procurement	2.354	2.329	3.650	0.000	3.650

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
and maintenance costs. These limitations of technology can be overcome by identifying common industrial base challenges, development of sustainable modular and scalable architectures, supported by a strengthened and broadened domestic supplier base. Sector investments will improve production process efficiencies, explore modular and scalable technology, and upgrade outdated radar and sensor technology. ***FY 2019 Plans:*** Radar Affordability: Continuing an effort started in 2014 to collaborate and field cross reaching radar technologies, with an emphasis on driving down program costs and increasing operational tempo through common technology optimization and industry coordination. FY 2019 focuses on the development and execution of a supplier resiliency strategy that specifically focuses on key components of DoD radars in an open and modular architecture and then starts the execution of the proof-of-concept effort with the U.S. Navy's SPS-49 Technology Refresh Program. Directed Energy (DE)Supply Chain Assurance: Continuing an effort initiated in FY 2018, supply chain assessment coordination of critical technology investments that promote improvements in DE production technologies and applications involved in lasers and common electro optic technologies. Small Diameter Bomb Multispectral Zinc Sulfide (ZnS): Establish and qualify domestic source for multispectral Zinc Sulfide (ZnS) dome capability for critical munitions. Effort initiated in FY 2018 and scheduled for completion with FY 2019 resources. ***FY 2020 Base Plans:*** Radar Affordability, continuing an effort started in 2014 to collaborate and field cross reaching radar technologies, with an emphasis on driving down program costs through common technology optimization and industry coordination. FY 2020 focuses on creating detailed system engineering models within the open and modular architectures to enable the DoD to leverage small to medium size companies in defense and in adjacent industrial markets to improve overall DoD radar supplier resiliency. Fused Panoramic Night Vision Goggle (F-Pano) Declining research and development for critical subcomponents risks the ability to field next generation technologies. This project will exercise the design and production skills for next generation capabilities to maintain industrial base design capabilities and catalyze innovation. The					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
design skills will develop a fused panoramic night vision goggle; power integration; and modular design and packaging. ***FY 2020 OCO Plans:*** NA ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $1.321 includes a $1.000 decrease for completion of the Directed Energy and Small Diameter Bomb efforts in FY 2019; an increase of $1.200 for the new start F-Pano Night Vision Goggle effort, and reallocation increase of $.892 to focus on tentative completion of Radar Affordability efforts in FY 2020. This total increase represents reprioritization and realignment of available resources within this Program Element.					
Title: Materials Sector ***Description:*** This multi-year Materials Sector is focused on maturing technologies necessary for the construction of DoD ground, air, and space assets, to mitigate risks associated with the reliance on non-US materials and components. This sector is envisioned to address the technical risk associated with the dependence on materials from foreign non allied countries. The materials sector is currently focused on three general focus areas within the portfolio: 1) Boron Carbide, 2) Carbon Fiber and Carbon Nanotubes, and 3) Congressional Add efforts (described below in the Congressional Adds section). ***FY 2019 Plans:*** Boron Carbide (B4C) Initiative. B4C is a critical material across a wide range of DoD systems such as armor and rocket nozzles. Current sources are foreign and at risk. This IBAS initiative is a multi-year effort to: first develop a U.S. source, second to qualify the U.S. B4C material into a program of record (body armor), third to develop a second U.S. source to provide competition and surge capability, and forth to begin systematically qualifying both U.S. sources across multiple systems. Carbon Fiber and Carbon Nanotube Initiative: is a multi-project multi-year enterprise wide effort to ensure critical material to critical systems (space platforms and missiles). The IBAS program is assessing its FY 2018 investments into its Carbon Fiber Domestic Sourcing efforts for follow-on funding requirements. Carbon Fiber Poly-Acrylic-Nitrile (PAN) Alternative to Rayon Carbon Fiber: effort initiated in FY 2019 and continuing into FY 2020. Project description addressed below under FY 2020 Base Plans.	2.344	2.721	2.052	0.000	2.052

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Braided Carbon Fiber: Innovative emerging capability for a single layer quasi-isotropic carbon fiber fabric for improved production of composite structures, predominantly in aircraft and space platforms. ***FY 2020 Base Plans:*** Carbon Fiber Poly-Acrylic-Nitrile (PAN) Alternative to Rayon Carbon Fiber: This effort was initiated in FY 2019. DoD is dependent on a single foreign source of unique and proprietary rayon-based carbon fibers for critical materials requirements in DoD strategic and tactical strike missile systems, ballistic missile defense interceptors, military and civilian space launch systems, and other hypersonic defense systems. Current materials are either produced at a foreign sole source outside the United States or are no longer in production due to material obsolescence. These materials represent a high risk to key DoD defense system supply chains. The purpose of this project is to fund needed evaluation, demonstration, qualification and transition of potential substitute carbon fibers produced from domestically-produced commercial sources of poly-acrylic-nitrile (PAN)-based carbon fibers and therefore mitigate the supply risk of sole foreign and obsolete sources. ***FY 2020 OCO Plans:*** NA ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease of $.669 reflects tentatively final FY 2020 investment in the two-year project phasing for the Carbon Fiber effort, pending identification and reallocation of resources for other Carbon Fiber requirements. This decrease represents reprioritization and realignment of available resources within this Program Element.					
Title: Munitions and Missiles Sector ***Description:*** With a multi-decade decline in missile program development and procurement, design and production capabilities for critical components within the missile sector industrial base are at risk. This has a significant impact on current and future missile programs, limiting the readiness and availability of superior technology to U.S. Warfighters. The missile sector sustainment will exercise the design and production skills of this critical industrial base by improving existing production processes, exploring advanced materials for higher performance, and upgrading outdated technology for missile components. ***FY 2019 Plans:*** Fuze initiative for Electronic Safe and Arm Device (ESAD), an effort continuing from prior years, to mitigate a supply chain loss caused by a reduction in non-DoD demand. Industrial Base (IB) design and production	3.048	3.500	0.395	0.000	0.395

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
workforce critical skills were needed to meet future requirements. Application of ESAD designs as common architecture to multiple missiles and munitions during this phase enables realization of the desired cost savings. ***FY 2020 Base Plans:*** FY 2019 efforts are complete, with no carry-over into FY 2020. No new efforts are currently programmed in this sector for FY 2020. Available resources have been realigned within this Program Element based on reprioritization of requirements. ***FY 2020 OCO Plans:*** NA ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease of $3.105 reflects completion of FY 2019 efforts, with no significant carry-over into FY 2020, and no new efforts programmed in this sector for FY 2020. Munitions and Missiles Sector decrease represents reprioritization and realignment of available resources within this Program Element.					
Accomplishments/Planned Programs Subtotals	10.464	10.265	10.051	0.000	10.051

	FY 2018	FY 2019
Congressional Add: Program Increase	6.000	38.500
FY 2018 Accomplishments: Navy Ship & Industrial Base Sector Propulsion Foundry Improvement: This effort addresses a critical issue by maintaining a unique and vital manufacturing capability at the only U.S. commercial producer of critical propulsors. In 2014, the producer announced it was preparing to close its facility and relocate operations OCONUS. Investing in casting equipment allows the producer to develop additional skills, which should drive revenue and increase the foundry's utilization rate. Keeping the U.S. foundry operational is vital to maintaining and protecting domestic production of Navy submarine and surface ship propulsors. Electron Beam Welding (EBW): Alternative electron beam welding (EBW) processes are required to support critical path production timelines for large volume support structures. EBW enables significant cost, schedule, and quality benefits over traditional, domestically available arc welding technologies. Currently large volume EBW is only available at a foreign source. This effort seeks to establish a U.S. capability via a phased approach, which includes: welding process		

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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	FY 2018	FY 2019
development, small scale prototype demonstrations, acquisition, installation and commissioning of large scale capable equipment, and full-scale prototype demonstration. EBW will enable the Navy to reduce the time required to produce large scale parts with significantly better repeatability, quality, and reliability, and at a lower cost. ***FY 2019 Plans:*** Program increase $3.500: Microelectronics Expand manufacturing capability for Cold Rolled Aluminum $10.000: optimize the manufacturing processes for aluminum armor alloys that are enabled by cold mill upgrades, which include dynamic shape rolling, non-contact shape measurement, automatic gauge, profile and flatness controls. The enhanced and upgraded cold mill will rapidly prototype aluminum armor manufacturing processes that not only optimize quality and throughput, but examine and mature processes to prototype mill products that enable more cost efficient downstream processing. Large Scale Classified Electron Beam Welding $15.000: described above under Congressional Add FY 2018 Accomplishments. Risk reduction for tungsten defense products $10.000: Defense applications for tungsten range widely: from consumables such as ammunition, bombs, and missiles to critical components in radar, communication equipment, tungsten carbide tooling inserts and ferrotungsten used in the production of super alloys in jet turbines. Several DoD programs have a supply chain vulnerability of either one domestic source or only foreign owned sources for tungsten. Dependence on a sole source results in higher costs to the DoD, inability to meet surge requirements, and creates a potential single point failure that could jeopardize the warfighter's access to an essential piece of material. This effort seeks to reduce risk and enhance the U.S. capability to produce tungsten through critical modernization investments in areas that support DoD, improve quality, efficiency and increase overall capacity.		
Congressional Adds Subtotals	6.000	38.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

NA

Exhibit R-2A, RDT&E Project Justification: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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D. Acquisition Strategy

NA

E. Performance Metrics

Goal - Insert industrial base considerations consistently in program review:
To make informed investment and production decisions
To avoid reconstitution costs for capabilities that DoD will need again.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Munitions and Missiles Sector	C/Various	various : various	40.705	2.341		2.251		0.250		-		0.250	Continuing	Continuing	-
Supply Chain Vulnerabilities Mitigation	C/Various	various : various	4.212	2.086		1.103		2.507		-		2.507	Continuing	Continuing	-
Radars, Sensors, & Electronics Sector	C/Various	various : various	8.675	1.808		4.998		2.176		-		2.176	Continuing	Continuing	-
Critical Materials Sector	C/Various	various : various	2.800	1.800		21.750		1.300		-		1.300	Continuing	Continuing	-
Navy Ship & Industrial Base Sector	C/Various	various : various	-	6.000		15.000		-		-		-	Continuing	Continuing	-
		Subtotal	56.392	14.035		45.102		6.233		-		6.233	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management - Army level support	Option/ BOA	Frontier Technology Inc : Rock Island, IL	1.550	1.144		0.000		0.000		-		0.000	0.000	2.694	-
Program Management - OSD level support	Option/ BOA	ByteCubed LLC : Alexandria VA	1.592	0.000		0.000		0.000		-		0.000	0.000	1.592	-
Program Management - Army	MIPR	RDECOM ECBC : Rock Island IL	1.762	0.285		0.975		0.993		-		0.993	Continuing	Continuing	-
Program Management - OSD support	C/T&M	Analytic Services Inc : Alexandria, VA	-	1.000		2.688		2.825		-		2.825	Continuing	Continuing	-
		Subtotal	4.904	2.429		3.663		3.818		-		3.818	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	61.296	16.464		48.765		10.051		-		10.051	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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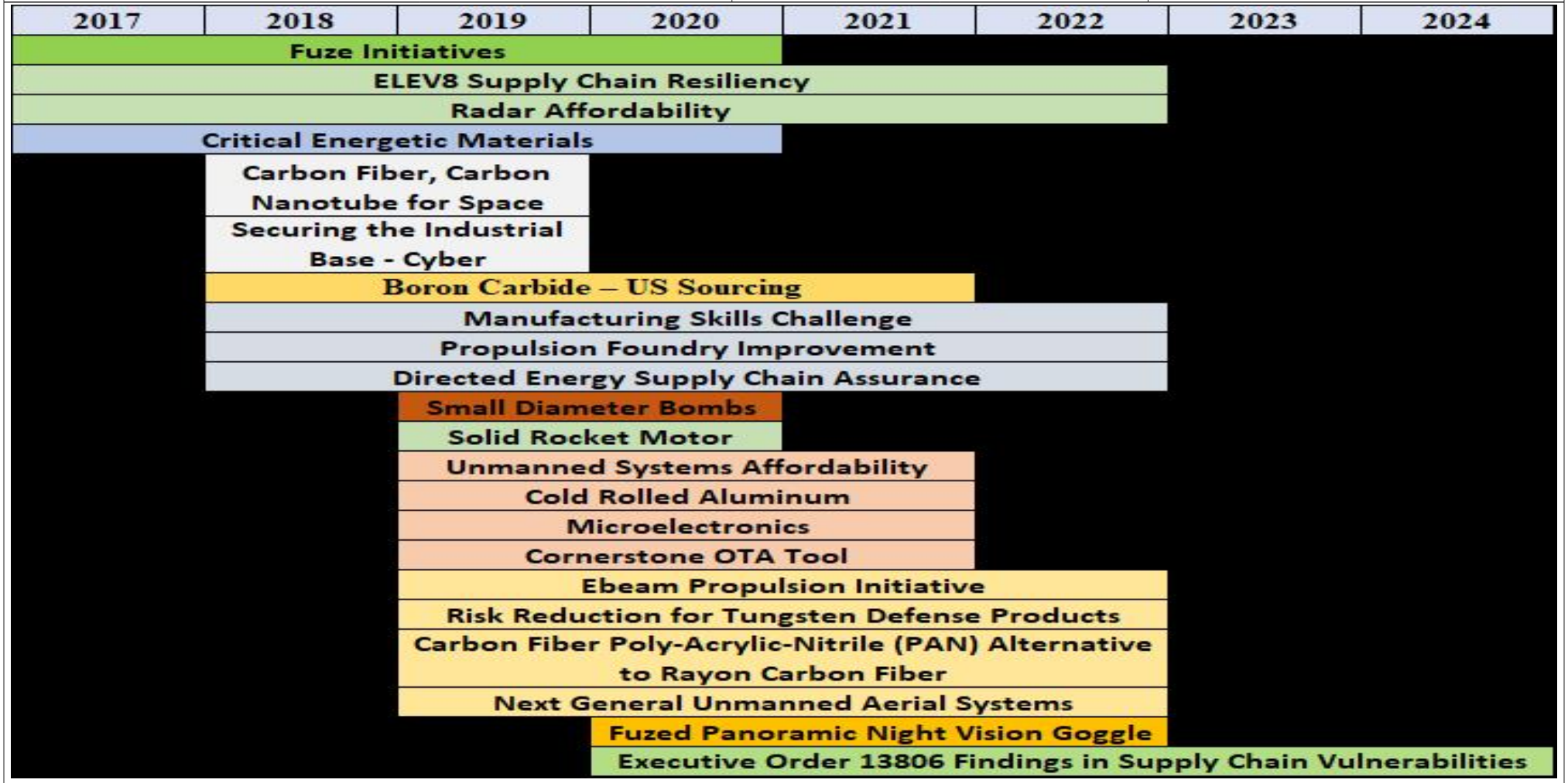

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
All Sectors				
Securing the Industrial Base - Cyber	4	2018	4	2022
Manufacturing Skills Challenge	3	2018	4	2022
ELEV8 Supply Chain Resiliency	2	2017	4	2022
Radar Affordability	2	2017	4	2022
Fuzed Panoramic Night Vision Goggle	2	2020	4	2022
Small Diameter Bombs	2	2019	4	2020
Boron Carbide - US Sourcing	2	2019	2	2021
Carbon Fiber, Carbon Nanotube for Space	4	2018	4	2019
Carbon Fiber Poly-Acrylic-Nitrile (PAN) Alternative to Rayon Carbon Fiber	2	2019	4	2022
Fuze Initiatives	2	2017	4	2020
Solid Rocket Motor	2	2019	4	2021
Critical Energetic Materials	3	2017	4	2020
Propulsion Foundry Improvement	4	2018	3	2022
Ebeam Propulsion Initiative	2	2019	2	2022
Unmanned Systems Affordability	2	2019	4	2022
Directed Energy Supply Chain Assurance	1	2019	4	2022
Braided Carbon Fiber	3	2019	2	2020
Cornerstone OTA Tool	2	2019	3	2020
Cold Rolled Aluminum	2	2019	4	2021
Risk Reduction for Tungsten Defense Products	3	2019	4	2022
Microelectronics	3	2019	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Office of the Secretary Of Defense		Date: February 2019
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Executive Order 13806 Findings in Supply Chain Vulnerabilities	4	2019	4	2024