

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense **Date:** February 2020

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z I <i>Industrial Base Analysis and Sustainment Support</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	77.760	48.383	104.051	9.151	-	9.151	9.896	10.627	10.146	10.845	Continuing	Continuing
819: <i>Industrial Base Analysis and Sustainment</i>	77.760	48.383	104.051	9.151	-	9.151	9.896	10.627	10.146	10.845	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Format is changed from previous submissions to produce an R-2 long versus R-2 Plus R-2a.

A. Mission Description and Budget Item Justification

The IBAS mission is to strengthen the posture and readiness of the U.S. Defense Manufacturing and Industrial Base to respond at will to national security needs. Industrial Base Analysis and Sustainment (IBAS) Support was established in accordance with 10 USC Sec 2508 Industrial Base Fund direction to strengthen the 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 aims of the 2018 National Defense Strategy calling for a strong, resilient, responsive and healthy U.S. Industrial Base (IB) that underpins current and future U.S. force readiness. This program is uniquely positioned to improve the U.S. Industrial Base’s competitiveness and ability to respond to the Department’s 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. 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. 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 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) Continue advancement and sustainment of both traditional and emerging defense manufacturing sectors; 2) Continue preservation of critical and unique manufacturing and design skills; 3) Continue the support and expansion of reliable sources; and 4) Continue Identification and mitigation of supply chain vulnerabilities

The IBAS program has a multi-pronged approach to identify projects: 1) assessments of the national technology and industrial base by the OUSD Acquisition & Sustainment (A&S), Office of Industrial Policy (INDPOL) as directed by 10 U.S. Code 2505, 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 in order to address: 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; and 4) Education and manufacturing workforce skills needs

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense **Date:** February 2020

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>
---	---

FY 2020 and beyond investment strategies will also be informed by findings from 1) Executive Order (EO) 13806 report, "Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States" and 2) follow-on industrial base and technology assessments. 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.

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 in February 2018 in partnership between the Office of Deputy Assistant Secretary of Defense ODASD (Industrial Policy) and the Army Futures Command, Combat Capabilities Development Command (CCDC) Chemical Biological Center (CBC). 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 19 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. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	10.376	10.051	10.129	-	10.129
Current President's Budget	48.383	104.051	9.151	-	9.151
Total Adjustments	38.007	94.000	-0.978	-	-0.978
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	38.500	94.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.374	-			
• FFRDC	-0.111	-	-	-	-
• Other Program Adjustments	-0.008	-	-0.289	-	-0.289
• Defense Wide Review	-	-	-0.689	-	-0.689

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 819: *Industrial Base Analysis and Sustainment*

Congressional Add: *General Increase*

Congressional Add: *Expand Manufacturing Capability for Cold Rolled Aluminum*

Congressional Add: *Large Scale Classified Electron Beam Welding (EBW)*

	FY 2019	FY 2020
	3.500	10.000
	10.000	-
	15.000	-

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense **Date:** February 2020

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z I <i>Industrial Base Analysis and Sustainment Support</i>
---	---

Congressional Add Details (\$ in Millions, and Includes General Reductions)

	FY 2019	FY 2020
Congressional Add: <i>Risk Reduction for Tungsten Defense Products</i>	10.000	-
Congressional Add: <i>Submarine Workforce Development</i>	-	8.000
Congressional Add: <i>Manufacturing Engineering</i>	-	12.500
Congressional Add: <i>Advanced Armor Piercing Penetrator</i>	-	12.000
Congressional Add: <i>Lead-free Electronics</i>	-	5.000
Congressional Add: <i>Precision Optics Manufacturing</i>	-	7.500
Congressional Add: <i>Machine and advanced manufacturing</i>	-	20.000
Congressional Add: <i>Automated textile manufacturing</i>	-	9.000
Congressional Add: <i>Interdisciplinary center for advanced manufacturing systems</i>	-	5.000
Congressional Add: <i>Rare Earth Elements from Coal Ash</i>	-	5.000
Congressional Add Subtotals for Project: 819	38.500	94.000
Congressional Add Totals for all Projects	38.500	94.000

Change Summary Explanation

The FY 2021 funding request was reduced by \$0.689 million as a result of the Defense Wide Review, which focused on the Secretary's guidance to streamline operations, increase efficiency, and promote greater affordability within the OSD and Defense Agencies and Field Activities in order to ensure the Department's optimum alignment to the National Defense Strategy and DoD strategic guidance, with particular focus on building a more lethal, resilient, agile, and ready force while strengthening alliances, prioritizing cyber and space capabilities, and focusing on innovation to maintain the technological advantage."

An additional \$0.289 million dollars of FY 2021 funding was re-aligned to support planned program changes within the Office of the Under Secretary of Defense Acquisition and Sustainment OUSD(A&S).

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Industrial Base Analysis and Sustainment Support (core program, excludes Congressional Adds)	9.883	10.051	9.151	0.000	9.151
<p>Description: IBAS currently focuses efforts and investments in the four categories listed below: 1) Supply Chain Vulnerabilities Mitigation: Findings from the Executive Order (EO) 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.</p>					

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense	Date: February 2020
---	----------------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z <i>I Industrial Base Analysis and Sustainment Support</i>
---	---

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>2) Radars, Sensors, and Electronics Sectors: Investments will improve production process efficiencies, explore modular and scalable technology, and upgrade outdated radar and sensor technology.</p> <p>3) Materials Sector: Efforts will address the technical risk associated with the dependence on materials from foreign non allied countries for DoD ground, air, and space assets.</p> <p>4) Munitions and Missiles Sector: Efforts will improve existing production processes, exploring advanced materials for higher performance, and upgrading outdated technology for missile components.</p> <p>FY 2020 Plans:</p> <p>1) Supply Chain Vulnerabilities Mitigation: 1a) Manufacturing Skills Challenge (MSC): This effort across multiple fiscal years starting in FY 2017 is a collaboration among OSD, industry and academia (Universities and Community Colleges). Similar to broad-based Science, Technology, Engineering and Math (STEM) efforts, MSC is comprised of an expanding set of competitions that will help prototype longer-term development of manufacturing training and education models that: 1) promote the prestige of manufacturing and inspire individuals, 2) can be regionally and nationally integrated, 3) close critical gaps in industrial capabilities, and 4) ultimately increase industrial base and defense readiness. The efforts funded with FY 2017, FY 2018 and FY 2020 resources focused on the welding, metrology, machining workforce in regional corridors with defense supply chains including Mississippi, Louisiana, Alabama, South Carolina, Illinois, New York, Texas, Virginia, and Tennessee where large ship, aerospace, and automotive growth have created serious workforce skills and supply chain challenges. This effort includes competitions with "support for a prize." FY 2020 focused on completing state- and invitational-level competitions, hosting four regional competitions, and concluding with a national championship.</p> <p>2) Radars, Sensors and Electronics Sector: 2a) Radar Affordability: This is a continuing multi-year effort started in 2016. FY 2020 focuses on harmonizing cross-service system requirements and 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.</p> <p>2b) Unmanned Systems Affordability : Continues effort initiated in FY 2018. Establish efforts that will develop and assure open and modular product architectures for Radio Frequency (RF), Electro-Optic (EO), and Infrared (IR) sensors, and for power and electric propulsion systems in UAS systems/platforms.</p>					

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense	Date: February 2020
---	----------------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z <i>I Industrial Base Analysis and Sustainment Support</i>
---	---

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
---	---------	---------	--------------	-------------	---------------

2c) Directed Energy (DE) Supply Chain Assurance: Continued efforts initiated in FY 2018. Convene cross-service working group to identify supply chain requirements for meeting service program milestone requirements, assessing and prioritizing risks for mitigation strategies.

3) Materials Sector
 3a) Boron Carbide: Continue efforts initiated in FY 2019 to: 1) develop a United States (U.S.) source; 2) qualify the U.S. B4C material into a program of record (body armor); 3) develop a second U.S. source to provide competition and surge capability; and 4) to begin systematically qualifying both U.S. sources across multiple systems.

3b) Heavy Rare Earth Elements (HREE) Supply Chain Resiliency. Continue efforts initiated in FY 2019 as an emergent requirement, not addressed in PB 2020. Executive Orders (E.O.) 13806 and 13817 identified critical materials such as rare earths and components reliant upon rare earths as potential strategic vulnerabilities to the DoD and U.S. Commercial industrial bases. Currently, China has a near global monopoly on rare earths. This initiative is a critical element within the DoD's broader rare earths supply chain risk mitigation plan. It aligns with the Defense Logistics Agency (DLA) Strategic Materials and OSD assessment on HREE. The overall strategy is a systems engineering approach to systematically identify and mitigate risks within the rare earth supply chain and further develop domestic HREE manufacturing processes, ensuring critical component availability and continuity across the material lifecycle. FY2020 assessed Phase 0 studies for viability of domestic capability.

4) Munitions Sector
 4a) Fuze Initiatives: Continues program management and oversight of Electronic Safe and Arm Device (ESAD) multi-year efforts initiated in FY 2015 and still in FY 2019 contract execution to mitigate a supply chain loss caused by a reduction in non-DoD demand.

FY 2021 Base Plans:
 1) Supply Chain Vulnerabilities Mitigation:
 1a) Manufacturing Skills Challenge (MSC): Continues efforts initiated in FY 2017 and continuing through FY 2020, as described above under FY 2020 plans. FY 2021 plans will include expanding state-level competitions to additional mid-west, southeast, and northeast states; increase complexity to include additive/hybrid manufacturing processes.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense **Date:** February 2020

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z I <i>Industrial Base Analysis and Sustainment Support</i>
---	---

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
1b) Industrial Skills Development and Acceleration: these efforts in FY 2021 and continuing for multiple future fiscal years build on the Manufacturing Skills Challenge efforts outlined previously above, and are now characterized in the IBAS program as a “national imperative” to build a sufficient core of industrial skills across the defense and national industrial base. Multiyear efforts to partner with industry and universities to prototype and expand training development pipelines that accelerate entrance into and out of the pipeline for critical Defense critical industrial workforce skills including welding, specialty welding, metrology, and machinists. 2) Radars, Sensors and Electronics Sector: 2a) Radar Affordability: This is a continuing multi-year effort started in 2016. FY 2021 continues efforts addressed above under FY 2020 plans. 2b) Directed Energy Supply Chain Assurance: Efforts initiated in FY 2018. FY 2021 continues efforts addressed above under FY 2020 plans. FY 2021 activities include developing mitigation and investment strategies, harmonizing service requirements for DE fielding and identifying subcomponents for development common standards and processes to enable a more robust supply chain. <i>FY 2021 OCO Plans:</i> NA <i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Net decrease of \$0.900 million reflects Defense Wide Review adjustments and planned program changes within the Office of the Under Secretary of Defense Acquisition and Sustainment OUSD(A&S).					
Accomplishments/Planned Programs Subtotals	9.883	10.051	9.151	0.000	9.151

	FY 2019	FY 2020
<i>Congressional Add:</i> General Increase <i>FY 2019 Accomplishments:</i> General Increase was applied to Silicon Interposer microelectronics requirement. Contracted efforts will establish a prototype process to establish Advanced System Integration and Packaging (ASIP) of copper-based silicon interposer technology, making the technology available to the U.S. industrial	3.500	10.000

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense		Date: February 2020	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0607210D8Z <i>I Industrial Base Analysis and Sustainment Support</i>	
		FY 2019	FY 2020
base, using U.S. based facilities. The minimum implementation requirements for the prototype will include a silicon bridge interposer and a digital high density interconnect interposer.			
FY 2020 Plans: Will be applied to requirements including microelectronics, tools development, additional workforce, casting and forgings, munitions and missiles, critical materials, and other Executive Order (EO) 13806 emergent requirements identified through on-going studies.			
Congressional Add: Expand Manufacturing Capability for Cold Rolled Aluminum		10.000	-
FY 2019 Accomplishments: 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.			
Congressional Add: Large Scale Classified Electron Beam Welding (EBW)		15.000	-
FY 2019 Accomplishments: 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 development, small scale prototype demonstrations, acquisition, installation and commissioning of large scale capable equipment, and full-scale prototype demonstration. EBW enables significant cost, schedule, and quality benefits over traditional, domestically available arc welding technologies.			
Congressional Add: Risk Reduction for Tungsten Defense Products		10.000	-
FY 2019 Accomplishments: 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. 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 and efficiency, and increase overall capacity.			
Congressional Add: Submarine Workforce Development		-	8.000
FY 2020 Plans: Public private partnership with States mitigating shortfalls within the submarine supply chain.			
Congressional Add: Manufacturing Engineering		-	12.500
FY 2020 Plans: Workforce development pipelines for engineering and critical technicians.			
Congressional Add: Advanced Armor Piercing Penetrator		-	12.000

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Office of the Secretary Of Defense	Date: February 2020
---	----------------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z <i>I Industrial Base Analysis and Sustainment Support</i>
---	---

	FY 2019	FY 2020
FY 2020 Plans: Improve tungsten penetrator production efficiencies and capacities for munitions.		
Congressional Add: Lead-free Electronics	-	5.000
FY 2020 Plans: Establish standards to mitigate risk associated with lead-free electronics.		
Congressional Add: Precision Optics Manufacturing	-	7.500
FY 2020 Plans: Advancing precision optics manufacturing capability and workforce development pipelines.		
Congressional Add: Machine and advanced manufacturing	-	20.000
FY 2020 Plans: Advance machine tools capabilities for DoD specific applications; lower the barrier to entry for small and medium manufacturers to adopt new machine tool capabilities; workforce development.		
Congressional Add: Automated textile manufacturing	-	9.000
FY 2020 Plans: Integrate automated manufacturing capability with high end advanced fibers.		
Congressional Add: Interdisciplinary center for advanced manufacturing systems	-	5.000
FY 2020 Plans: Lower the barriers for entry to small and medium manufacturers to adopt digital and Internet of Things (IOT) 4.0 capabilities.		
Congressional Add: Rare Earth Elements from Coal Ash	-	5.000
FY 2020 Plans: Prototyping rare earth elements extraction from coal ash.		
Congressional Adds Subtotals	38.500	94.000

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

NA

E. Acquisition Strategy

NA

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Office of the Secretary Of Defense **Date:** February 2020

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
--	--	--

Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
IBAS Sectors	C/Various	various : various	70.427	7.877	Dec 2019	6.075	Dec 2020	4.764	Dec 2021	-		4.764	Continuing	Continuing	-
E-Beam Propulsion Initiative - Cong Add	C/FFP	Dynetics Technical Solutions : Huntsville, AL	-	14.674	Mar 2019	-		-		-		-	0.000	14.674	-
Cold Rolled Aluminum - Cong Add	C/FFP	Costellium Rolled Products : Ravenswood WV	-	9.454	Oct 2019	-		-		-		-	0.000	9.454	-
Cold Rolled Aluminum Technical, Ballistic and Blast Testing of Prototype Armor Plate - Cong Add	MIPR	Army Research Laboratory : Aberdeen Proving Ground, MD	-	0.500	Dec 2018	-		-		-		-	0.000	0.500	-
Risk Reduction for Tungsten Defense Products - Cong Add	C/FFP	INSITECH INC : Warren NJ	-	4.257	Oct 2019	-		-		-		-	0.000	4.257	-
Risk Reduction for Tungsten Defense Products - Cong Add	C/FFP	Global Tungsten and Powders Corp : Towanda PA	-	4.234		-		-		-		-	0.000	4.234	-
Risk Reduction for Tungsten Def Products - Sintering Equipment - Cong Add	C/FFP	Thermal Technologies : Santa Rosa CA	-	0.548	Sep 2019	-		-		-		-	0.000	0.548	-
Tungsten Sintering Equipment Technical and Engineering Support - Cong Add	MIPR	Army CCDC Armaments Center : Picatinny, NJ	-	0.950		-		-		-		-	0.000	0.950	-
Silicon Interposer	C/FFP	JCAMB Inc BRIDG : Kissimmee, FL	-	3.200	Oct 2019	-		-		-		-	0.000	3.200	-
Silicon Interposer DoD Product Development Technical Oversight	MIPR	Navy - NSWC Crane : Crane IN	-	0.075	Apr 2019	-		-		-		-	0.000	0.075	-
FY 2020 Congressional Adds Total - planning of efforts beginning	C/FFP	Planning : Planning	-	-		94.000	Sep 2020	-		-		-	0.000	94.000	-
Subtotal			70.427	45.769		100.075		4.764		-		4.764	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Office of the Secretary Of Defense **Date:** February 2020

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
--	--	--

	2017	2018	2019	2020	2021	2022	2023	2024
	1	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
Fuze Initiatives	█	█	█	█				
Radar Affordability		█	█	█	█	█		
Radio Frequency Antenna Supply Chain Analysis			█	█	█	█		
Manufacturing Skills Challenge		█	█	█	█	█		
Propulsion Foundry Improvement		█	█	█	█	█	█	
Boron Carbide - US Sourcing			█	█	█	█		
Directed Energy Supply Chain Assurance			█	█	█	█		
Ebeam Propulsion Initiative			█	█	█	█	█	█
Small Diameter Bombs			█	█				
Joint Biological Point Detection Sys Type IV Kits			█	█	█	█		
Unmanned Systems Affordability			█	█	█	█	█	█
Risk Reduction for Tungsten Defense Products			█	█	█	█		
Cold Rolled Aluminum			█	█	█	█		
Industrial Skills Development and Acceleration			█	█	█	█	█	█
Interposer Silicon			█	█	█	█	█	
Heavy Rare Earth Elements Supply Chain Resiliency			█	█	█	█	█	█
FY 2020 Congressional Adds				█	█	█	█	█

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Office of the Secretary Of Defense		Date: February 2020
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
All Sectors				
Fuze Initiatives	2	2017	4	2020
Boron Carbide - US Sourcing	1	2019	2	2021
Radio Frequency Antenna Supply Chain Analysis	1	2019	4	2022
Directed Energy Supply Chain Assurance	1	2019	4	2022
Risk Reduction for Tungsten Defense Products	1	2019	4	2022
Expand Manufacturing Capability for Cold Rolled Aluminum	1	2019	4	2022
Interposer Silicon	1	2019	4	2023
E-beam Propulsion Initiative	1	2019	2	2024
Heavy Rare Earth Elements Supply Chain Resiliency	3	2019	1	2025
Radar Affordability	3	2018	4	2025
Industrial Skills Development and Acceleration	4	2019	4	2025
Manufacturing Skills Challenge	3	2018	4	2022
Unmanned Systems Affordability	3	2019	3	2024
FY 2020 Congressional Adds	1	2020	4	2025