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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / <i>FRIGATE Development</i>
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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	222.249	119.821	59.007	82.309	-	82.309	69.400	70.655	72.022	73.438	Continuing	Continuing
3086: <i>Frigate</i>	222.249	119.821	59.007	82.309	-	82.309	69.400	70.655	72.022	73.438	Continuing	Continuing

**Program MDAP/MAIS Code:**  
**Project MDAP/MAIS Code(s):** P606

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

In FY 2014, the Navy established the requirements for a lethal and survivable small surface combatant ship (later redesignated as Frigate (FF)), above that of Littoral Combat Ship (LCS) to meet future missions. Based upon the Navy's 2016 Force Structure Assessment resulting in validation of the need for 52 small surface combatants and the need to address increasingly complex threats in the global maritime environment, the Navy reassessed the capabilities required to ensure the Frigate paces future threats. With Guided Missile Frigate (FFG(X)), the Navy desires to maximize the small surface combatant capabilities in the Anti-Surface Warfare (SUW), Anti-Submarine Warfare (ASW), Electromagnetic Maneuver Warfare (EMW), and Air Warfare (AW) mission areas, while keeping the ship affordable and as a part of a "high-low" mix of surface ships. The updated assessment was completed to support establishment of top-level FFG(X) requirements in Summer 2017 and resulted in a Navy-approved Capability Development Document (CDD). The CDD entered the Joint Requirement Oversight Council (JROC) Staffing in August 2018 and was approved in February 2019. The Frigate program completed Gate 5 in June 2019.

The FFG(X) program completed a Component Cost Position (CCP) in support of MS B and the FY 2020 Detail Design and Construction (DD&C) contract award. FY 2019 focused on refining the system SPEC and continued to mature the FFG(X) Government Furnished Equipment (GFE) baseline; continued Frigate-unique AEGIS Weapons System (AWS, formally FWS) design development, coding, and test; acquisition documentation development; C4I systems development; and continued system engineering efforts to ensure mature Government Furnished Information (GFI) deliveries. Conceptual Design contracts completed in 3rd QTR FY2019. FY 2020 marked the shift to SCN after the award of the DD&C for efforts in systems engineering, cost estimating, and ship design management. Remaining FY 2020 funds focused on the continuation of DD&C source selection, AWS design development, coding, and test; acquisition documentation approval for MS B; Combat System and C4I Element Integration; and test and evaluation efforts. FY 2021 funds will continue focus on AWS design development, coding, and test; Combat System and C4I Element Integration; and test and evaluation activities including Live Fire Test and Evaluation (LFT&E) and cyber table top (#2).

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	132.775	59.007	85.341	-	85.341
Current President's Budget	119.821	59.007	82.309	-	82.309
Total Adjustments	-12.954	0.000	-3.032	-	-3.032
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-9.400	0.000			
• SBIR/STTR Transfer	-3.554	0.000			
• Program Adjustments	0.000	0.000	-3.600	-	-3.600
• Rate/Misc Adjustments	0.000	0.000	0.568	-	0.568

**Change Summary Explanation**

FY 2019 decrease of \$12.954M: -\$3.554M due to SBIR transfer and -\$9.400M OMNIBUS reprogramming to fund higher Departmental priorities.  
 FY 2021 decrease of \$3.032M: -\$3.6M due to updated program execution adjustment ahead of component cost position and +\$0.568M for NWCF rate adjustments.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603599N / FRIGATE Development				<b>Project (Number/Name)</b> 3086 / Frigate			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3086: <i>Frigate</i>	222.249	119.821	59.007	82.309	-	82.309	69.400	70.655	72.022	73.438	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Project MDAP/MAIS Code:** P606

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

Frigate (FFG(X)) efforts are composed of the design and development for a more lethal and survivable multi-mission warship focused on Anti-Surface Warfare (SUW) and Anti-Submarine Warfare capabilities (ASW), local air defense and enhanced survivability features. FFG(X) design modifications for added capability over LCS include an Over-the-Horizon (OTH) surface-to-surface missile system, upgraded air defense weapons and sensors, advanced electronic warfare system and improved decoys, local air defense, and enhanced survivability features. This effort will encompass design, development, and technical issue resolution to support design maturity for DD&C FY 2020 contract award. Certification and testing efforts are also required to support the FFG(X) delivery, operations, and introduction to the fleet.

The FFG(X) design and development phases include platform design, development and risk reduction; combat system element integration; total ship system engineering and integration; combat systems and warfare systems certification; and planning and conduct of system testing. These efforts include procurement of combat and warfare system equipment and/or simulators to support production representative testing in support of design, development, and certification efforts and ordnance in support of testing.

This funding will also include efforts and activities required for formal Developmental and Operational testing of the FFG(X). Test and Evaluation (T&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the FFG(X) design to achieve the mission capabilities and performance requirements as defined in the FFG(X) Capability Development Document (CDD). Funding will also be for the execution of DT, C4I integration & test, cyber test and certification, warfare system integration & test and certification, aviation (manned and unmanned) integration & test and certification. T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP).

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Test & Evaluation	5.500	8.828	12.504	0.000	12.504
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Conduct FFG(X) test planning in support of Developmental Testing (DT) and Operational Testing (OT). Plan for and begin testing in support of Live Fire Test and Evaluation (LFT&E) modeling and small-scale empirical testing to support initiation of efforts to model FFG(X) survivability. Plan for and begin aligning resources to conduct future Early Integration Tests and Cybersecurity Tests as risk reductions for ship construction industrial stage testing. Refine testing schedules and testing resource requirements timelines to support later integration and certification testing. Complete high-level plans such as Test and Evaluation Master Plan (TEMP) and LFT&E Management Plan, and begin review and refinement of more detailed test plans					

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / <i>FRIGATE Development</i>	<b>Project (Number/Name)</b> 3086 / <i>Frigate</i>
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**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>and procedures. Plan for and execute DT, C4I integration &amp; test, cyber test and certification, warfare system integration &amp; test and certification, aviation (manned and unmanned) integration &amp; test and certification.</p> <p><b>FY 2020 Plans:</b> Complete collaborative development of FFG(X) TEMP and obtain approvals from stakeholder organizations. Complete approvals process and obtain required waiver for the LFT&amp;E alternative to full-up system level live-fire survivability testing. Develop DT and OT scenarios and detailed test planning. Continue execution of LFT&amp;E; SIM/STIM modeling; Verification, Validation and Accreditation (VV&amp;A) and test efforts. Continue work to refine for FFG(X) the various survivability models that will be used in place of live-fire survivability testing. Plan and conduct small scale live-fire tests on ship-representative materials to create empirical test data that will support accrediting some of the survivability models. Begin test planning for Early Integration Testing and Cybersecurity Table Top 2 (CTT-2). Continue alignment and pursuing options for early cybersecurity risk-reduction testing. Review warfare system planning and test requirements. Participate in source selection activities for DD&amp;C contract award.</p> <p><b>FY 2021 Base Plans:</b> Complete planning and conduct CTT-2. Execute additional live-fire tests in support of generating empirical LFT&amp;E survivability data to continue the verification, validation, and accreditation of multiple LFT&amp;E survivability models. Continue test planning and resources coordination for the multi-site land based Early Integration Testing. Begin developing schedules and identifying resource requirements timing to support testing and certifications that will be required for the first FFG(X) ship. Review Test Procedures submitted for Government Furnished Equipment (GFE) to confirm suitability for shipyard stage testing. Continue to identify data from previously conducted testing and assess relevance for use as FFG(X) DT and OT data to reduce future at-sea testing requirements. Continue combat system planning and test requirements review.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase in FY2021 will support Cyber Table Top 2 testing and additional Cyber/Weapons Testing in support of DD&amp;C phase.</p>					
<p><b>Title:</b> Ship Systems / C4I / Warfare Systems Engineering</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> The Frigate (FFG(X)) is a multi-mission ship that focuses on Anti-Surface Warfare (SUW), Anti-Submarine Warfare (ASW) capabilities and local air defense. Specific capabilities include Over-the-Horizon</p>	114.321	50.179	69.805	0.000	69.805
	-	-	-	-	-

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**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

(OTH), upgraded Air Defense weapons and sensors, advanced electronic warfare system and improved decoys, towed array, torpedo defense, and enhanced survivability features.

***FY 2020 Plans:***

Ship Systems Engineering  
Continue system engineering efforts related to naval architecture, machinery engineering, Frigate Architecture Framework (FAF). Emphasis was placed on the structural and stability disciplines, and incorporation of lethality and survivability enhancements to include the flow-down impacts to the supporting machinery and electrical systems. Continue development of the documentation to support Milestone B in FY 2020. Complete MS B for 2nd QTR approval. Participated in source selection for DD&C Award, including technical and cost evaluation.

C4I / Warfare Systems Engineering

Continue system engineering efforts related to C4I and warfare systems specifications. Continue OTH systems engineering and testing efforts for integration of OTH missile. Continued AWS development efforts to ensure full ship integration aligned with total ship design efforts and integrated additional FFG(X) required capabilities. Continue integration of other CS and C4I elements into total ship design. Implement additional cyber security/ Information Assurance (IA) measures on the warfare system and C4I suite to pace the current and future threats. Continue development of the Milestone B documentation for approval in 2nd QTR. Participate in Source Selection for DD&C Award, including technical and cost evaluation. Continue product development and planning for warfare system, C4I, Hull, Mechanical & Engineering (HM&E), and training/ facility requirement efforts.

***FY 2021 Base Plans:***

C4I / Warfare Systems Engineering  
Continue system engineering efforts related to C4I and warfare systems specifications. Continue OTH systems engineering and testing efforts for integration of OTH missile. Continue AWS development efforts to ensure full ship integration aligns with total ship design efforts and integrate additional FFG(X) required capabilities. Continue integration of other CS, HM&E and C4I elements into total ship design. Implement additional cyber security/information assurance (IA) measures on the warfare system and C4I suite to pace the current and future threats. Continue product development and planning for warfare system, C4I, and HM&E.

***FY 2021 OCO Plans:***

N/A

***FY 2020 to FY 2021 Increase/Decrease Statement:***

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>(OTH), upgraded Air Defense weapons and sensors, advanced electronic warfare system and improved decoys, towed array, torpedo defense, and enhanced survivability features.</p> <p><b><i>FY 2020 Plans:</i></b> Ship Systems Engineering Continue system engineering efforts related to naval architecture, machinery engineering, Frigate Architecture Framework (FAF). Emphasis was placed on the structural and stability disciplines, and incorporation of lethality and survivability enhancements to include the flow-down impacts to the supporting machinery and electrical systems. Continue development of the documentation to support Milestone B in FY 2020. Complete MS B for 2nd QTR approval. Participated in source selection for DD&amp;C Award, including technical and cost evaluation.</p> <p>C4I / Warfare Systems Engineering Continue system engineering efforts related to C4I and warfare systems specifications. Continue OTH systems engineering and testing efforts for integration of OTH missile. Continued AWS development efforts to ensure full ship integration aligned with total ship design efforts and integrated additional FFG(X) required capabilities. Continue integration of other CS and C4I elements into total ship design. Implement additional cyber security/ Information Assurance (IA) measures on the warfare system and C4I suite to pace the current and future threats. Continue development of the Milestone B documentation for approval in 2nd QTR. Participate in Source Selection for DD&amp;C Award, including technical and cost evaluation. Continue product development and planning for warfare system, C4I, Hull, Mechanical &amp; Engineering (HM&amp;E), and training/ facility requirement efforts.</p> <p><b><i>FY 2021 Base Plans:</i></b> C4I / Warfare Systems Engineering Continue system engineering efforts related to C4I and warfare systems specifications. Continue OTH systems engineering and testing efforts for integration of OTH missile. Continue AWS development efforts to ensure full ship integration aligns with total ship design efforts and integrate additional FFG(X) required capabilities. Continue integration of other CS, HM&amp;E and C4I elements into total ship design. Implement additional cyber security/information assurance (IA) measures on the warfare system and C4I suite to pace the current and future threats. Continue product development and planning for warfare system, C4I, and HM&amp;E.</p> <p><b><i>FY 2021 OCO Plans:</i></b> N/A</p> <p><b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b></p>					

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Increase in FY 2021 will support AEGIS combat system integration with GFE systems, most notably, the Enterprise Air Surveillance Radar (EASR) and Rolling Airframe Missile (RAM).					
<b>Accomplishments/Planned Programs Subtotals</b>	119.821	59.007	82.309	0.000	82.309

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SCN/2128: <i>FFG-Frigate</i>	0.000	1,281.177	1,053.123	-	1,053.123	954.513	1,865.908	1,868.826	2,817.264	9,973.959	19,814.770

**Remarks**

**D. Acquisition Strategy**

The FFG(X) acquisition strategy was signed in 1st QTR FY 2019 to support a full and open competitive contract award in FY 2020. The DD&C RFP was released on 20 June 2019.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / FRIGATE Development	<b>Project (Number/Name)</b> 3086 / Frigate
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<b>Product Development (\$ in Millions)</b>				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			
Conceptual Design Contracts	C/FFP	Various : Various	74.000	38.247	Feb 2019	0.000		0.000		-		0.000	0.000	112.247	-
System SPEC Development	WR	Government Activities : Various	7.080	1.375	Jan 2019	0.000		0.000		-		0.000	0.000	8.455	-
System SPEC Development	C/CPAF	Various Contractors : Various	5.000	1.225	Jan 2019	0.000		0.000		-		0.000	0.000	6.225	-
Over the Horizon (OTH) Missile Integration	WR	NAWC, China Lake : China Lake, CA	1.210	0.645	Feb 2019	0.054	Feb 2020	0.854	Feb 2021	-		0.854	Continuing	Continuing	Continuing
Over the Horizon (OTH) Missile Integration	WR	Various : Various	2.649	0.656	Feb 2019	0.061	Feb 2020	2.088	Feb 2021	-		2.088	Continuing	Continuing	Continuing
FFG Architecture Framework/ Cyber	C/CPAF	Engility : San Diego, CA	2.614	1.178	Jan 2019	0.400	Jan 2020	0.000		-		0.000	Continuing	Continuing	Continuing
C4I Development	WR	NIWC : Charleston, SC	4.880	1.831	Nov 2018	1.100	Nov 2019	1.996	Nov 2020	-		1.996	Continuing	Continuing	Continuing
C4I Development	WR	NIWC : San Diego, CA	3.297	1.686	Nov 2018	1.516	Nov 2019	2.609	Nov 2020	-		2.609	Continuing	Continuing	Continuing
AEGIS Weapons System Development (AWS)	C/CPIF	Lockheed Martin : Various	29.732	9.166	Jan 2019	12.949	Jan 2020	21.098	Jan 2021	-		21.098	Continuing	Continuing	Continuing
AEGIS Weapons System Development (AWS)	Various	Various Contractors : Various	2.323	1.000	Nov 2018	1.400	Nov 2019	4.280	Nov 2020	-		4.280	Continuing	Continuing	Continuing
AEGIS Weapons System Development (AWS)	WR	Government Activities : Various	3.288	3.348	Nov 2018	3.530	Nov 2019	3.971	Nov 2020	-		3.971	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NUWC, Newport : Newport, RI	2.910	1.740	Nov 2018	0.554	Nov 2019	0.521	Nov 2020	-		0.521	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NSWC, DD : Dahlgren, VA	6.539	1.307	Nov 2018	0.900	Nov 2019	3.545	Nov 2020	-		3.545	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NSWC, CD : Carderock, MD	1.016	0.555	Nov 2018	0.554	Nov 2019	2.593	Nov 2020	-		2.593	Continuing	Continuing	Continuing
Warfare Systems Development	C/CPIF	Lockheed Martin : Various	2.512	9.104	Dec 2018	3.194	Dec 2019	5.865	Dec 2020	-		5.865	Continuing	Continuing	Continuing
Warfare Systems Development	Various	Various : Various	8.408	8.133	Nov 2018	3.200	Nov 2019	4.135	Nov 2020	-		4.135	Continuing	Continuing	Continuing

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / <i>FRIGATE Development</i>	<b>Project (Number/Name)</b> 3086 / <i>Frigate</i>
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Warfare Systems Development	WR	Government Activities : Various	4.105	2.245	Nov 2018	1.811	Nov 2019	3.665	Nov 2020	-		3.665	Continuing	Continuing	Continuing
Aviation Integration Development	WR	NAWC, AD : Patuxent River, MD	2.698	1.615	Dec 2018	1.150	Dec 2019	0.975	Dec 2020	-		0.975	Continuing	Continuing	Continuing
Aviation Integration Development	WR	NSWC, DD : Dahlgren, VA	0.557	0.686	Nov 2018	0.586	Nov 2019	0.300	Nov 2020	-		0.300	Continuing	Continuing	Continuing
Product Development Support	WR	Various : Various	0.000	1.052	Nov 2018	1.776	Nov 2019	1.875	Nov 2020	-		1.875	Continuing	Continuing	Continuing
<b>Subtotal</b>			164.818	86.794		34.735		60.370		-		60.370	Continuing	Continuing	N/A

**Remarks**  
Beginning in FY 2020, most efforts are realigned to SCN Line Item 2128 after ship contract award. Additional funds were needed for Warfare system integration efforts for systems including ASW, EASR and CEC since FY 2020 President's Budget Request. Funds were realigned from Support efforts.

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Government Engineering Support	WR	NSWC, CD : Carderock, MD	7.549	7.077	Nov 2018	2.962	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, PD : Philadelphia, PA	4.394	1.749	Nov 2018	1.625	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, DD : Dahlgren, VA	6.270	3.704	Nov 2018	0.934	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, PHD : Port Hueneme, CA	1.032	0.348	Nov 2018	0.270	Nov 2019	0.401	Nov 2020	-		0.401	Continuing	Continuing	Continuing
Government Engineering Support	WR	Government Activities : Various	2.601	1.356	Nov 2018	0.714	Nov 2019	0.550	Nov 2020	-		0.550	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Booz Allen Hamilton : McLean, VA	1.606	1.563	Feb 2019	1.101	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Gryphon : Arlington, VA	1.175	0.300	Nov 2018	0.000	Nov 2019	0.000		-		0.000	0.000	1.475	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / FRIGATE Development	<b>Project (Number/Name)</b> 3086 / Frigate
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<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Contractor Engineering Support	C/CPIF	Alion : Arlington, VA	3.476	2.666	Feb 2019	2.470	Feb 2020	2.417	Feb 2021	-		2.417	Continuing	Continuing	Continuing
Contractor Engineering Support	Various	Various : Various	3.212	2.000	Jan 2019	0.400	Jan 2020	1.000	Jan 2021	-		1.000	Continuing	Continuing	Continuing
<b>Subtotal</b>			31.315	20.763		10.476		4.368		-		4.368	Continuing	Continuing	N/A

**Remarks**  
Beginning in FY 2020, a portion of the Support costs related to HM&E/ detail design engineering support are realigned to SCN Line Item 2128.

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Model Development	WR	NSWC, CD : Carderock, MD	6.293	1.237	Dec 2018	2.846	Dec 2019	1.525	Dec 2020	-		1.525	Continuing	Continuing	Continuing
Test and Evaluation Master Plan (TEMP) Development	WR	Government Activities : Various	2.200	0.754	Dec 2018	0.210	Dec 2019	0.152	Dec 2020	-		0.152	Continuing	Continuing	Continuing
Test and Evaluation Mast Plan (TEMP) and Cyber Support	C/CPAF	Engility : San Diego	0.300	2.872	Dec 2018	1.010	Dec 2019	4.451	Dec 2020	-		4.451	Continuing	Continuing	Continuing
Land Based Integration & Test	WR	Government Activities : Various	0.172	0.100	Nov 2018	3.728	Nov 2019	1.725	Nov 2020	-		1.725	Continuing	Continuing	Continuing
Life Fire Test and Evaluation	WR	NSWC, CD : Carderock, MD	0.000	0.537	Feb 2019	1.034	Dec 2019	4.651	Dec 2020	-		4.651	Continuing	Continuing	Continuing
<b>Subtotal</b>			8.965	5.500		8.828		12.504		-		12.504	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Management Support	C/CPIF	Alion : Arlington, VA	3.580	2.752	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / <i>FRIGATE Development</i>	<b>Project (Number/Name)</b> 3086 / <i>Frigate</i>
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<b>Management Services (\$ in Millions)</b>				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			
Program Management Support	WR	Various : Various	13.571	4.012	Dec 2018	4.968	Dec 2019	5.067	Dec 2020	-		5.067	Continuing	Continuing	Continuing
<b>Subtotal</b>			17.151	6.764		4.968		5.067		-		5.067	Continuing	Continuing	N/A

**Remarks**  
 Program Management Support includes Program Office support, Cost Estimation support, Acquisition Documentation Support, and Program Office travel. Beginning in FY 2020, a portion of the PM Support costs are realigned to SCN Line Item 2128.

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	222.249	119.821	59.007	82.309	-	82.309	Continuing	Continuing	N/A

**Remarks**

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy

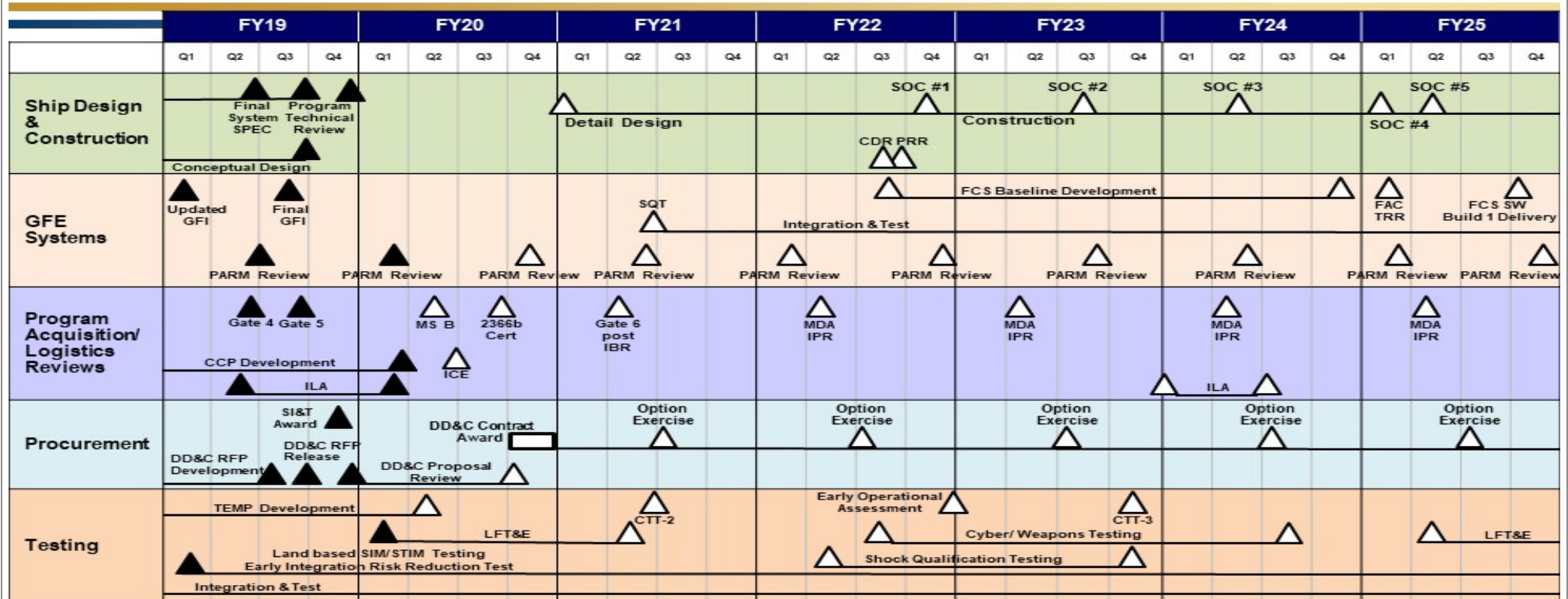
Date: February 2020

Appropriation/Budget Activity  
1319 / 4

R-1 Program Element (Number/Name)  
PE 0603599N / FRIGATE Development

Project (Number/Name)  
3086 / Frigate

# Guided Missile Frigate (FFG(X)) Program Schedule



**ACRNs:**  
 PARM: Participating Acquisition Resource Manager  
 GFI: Government Furnished Information  
 TEMP: Test and Evaluation Master Plan  
 ILA: Independent Logistics Assessment  
 DD&C: Detail Design & Construction  
 SQT: Software Qualification Testing  
 MDA: Milestone Decision Authority  
 PRR: Production Readiness Review  
 CCP: Component Cost Position  
 ICE: Independent Cost Estimate  
 IBR: Integrated Baseline Review  
 LFT&E: Live Fire Test & Evaluation  
 CDR: Critical Design Review  
 TRR: Test Readiness Review  
 FAC: Frigate Combat System  
 SIM/STIM: Simulation/Stimulation  
 SI&T: Ship Integration and Test  
 SOC: Start of Construction  
 IPR: In Process Review  
 SW: Software  
 MS: Milestone  
 RFP: Request for Proposal  
 ▲ = complete or started

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / <i>FRIGATE Development</i>	<b>Project (Number/Name)</b> 3086 / <i>Frigate</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3086</b>				
Ship Design: System SPEC Development	1	2019	2	2019
Ship Design: Conceptual Design (Contractor Led Design)	1	2019	3	2019
Ship Design: Final System SPEC Approval	2	2019	2	2019
Ship Design: Program Technical Review	3	2019	3	2019
Ship Design: Production (Ship) Proposal Review	4	2019	3	2020
Ship Design: Detail Design Phase	4	2020	4	2022
GFE Systems: Updated GFI	1	2019	1	2019
GFE Systems: Final GFI	3	2019	3	2019
GFE Systems: Production (Ship) Proposal Review	4	2019	3	2020
GFE Systems: System Qualification Testing	2	2021	2	2021
GFE Systems: CS Integration and Testing	2	2021	4	2025
GFE Systems: CS Software Technical Readiness Review (TRR)	1	2025	1	2025
GFE Systems: FCS SW Delivery	4	2025	4	2025
Program Acquisition/Logistics Reviews: Component Cost Position (CCP) Development	1	2019	1	2020
Program Acquisition/Logistics Reviews: Final CCP	1	2020	1	2020
Program Acquisition/Logistics Reviews: Independent Cost Estimate (ICE)	2	2020	2	2020
Program Acquisition/Logistics Reviews: Gate 4 Review	2	2019	2	2019
Program Acquisition/Logistics Reviews: Gate 5 Review	3	2019	3	2019
Program Acquisition/Logistics Reviews: Independent Cost Analysis Assessment (ILA) Development	2	2019	1	2020
Program Acquisition/Logistics Reviews: Milestone B	2	2020	2	2020
Program Acquisition/Logistics Reviews: Gate 6 Review	2	2021	2	2021

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**Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603599N / <i>FRIGATE Development</i>	<b>Project (Number/Name)</b> 3086 / <i>Frigate</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Program Acquisition/Logistics Reviews: Independent Logistics Assessment (ILA) Development	4	2023	3	2024
Program Acquisition/Logistics Reviews: Milestone Decision Authority (MDA) IPR #1	2	2022	2	2022
Program Acquisition/Logistics Reviews: Milestone Decision Authority (MDA) IPR #2	2	2023	2	2023
Program Acquisition/Logistics Reviews: Milestone Decision Authority (MDA) IPR #3	2	2024	2	2024
Program Acquisition/Logistics Reviews: Milestone Decision Authority (MDA) IPR #4	2	2025	2	2025
Procurement: Detail Design & Construction (DD&C) Contract Development	1	2019	3	2019
Procurement: Production (Ship) Draft RFP Release	2	2019	2	2019
Procurement: Production (Ship) RFP Release	4	2019	4	2019
Procurement: Production (Ship) Proposal Review	4	2019	3	2020
Procurement: Ship Integration and Testing (SI&T) Award	4	2019	4	2019
Procurement: Production (Ship) Award	4	2020	4	2020
Testing: Test and Evaluation Master Plan (TEMP) Development	1	2019	1	2020
Testing: Live Fire Test & Evaluation (LFT&E) #1	1	2020	2	2021
Testing: Cyber Table Top (CTT)-2	2	2021	2	2021
Testing: Land Based SIM/STIM Testing/Early Integration Risk Reduction Test	1	2019	3	2024
Testing: Shock Qualification Testing	2	2022	4	2023
Testing: Cyber Table Top (CTT-3)	4	2023	4	2023
Testing: Integration and Test Efforts	1	2019	4	2025
Testing: Live Fire Test & Evaluation (LFT&E) #2	2	2025	4	2025