Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*				R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	379.046	423.466	828.171	0.000	828.171	445.207	758.161	635.655	570.340	Continuing	Continuing
67A019: *GPS IIIA*	379.046	423.466	446.304	0.000	446.304	328.153	321.364	194.825	200.073	Continuing	Continuing
67A020: *OCX*	0.000	0.000	381.867	0.000	381.867	117.054	436.797	440.830	370.267	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Navstar Global Positioning System (GPS) is a space based navigation system that fills validated Joint Service requirements for worldwide, accurate, common grid three dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures and rapid deployment for all services. The system is composed of three segments: user equipment (funded under PE 0305164F), space, and a control network. The satellites broadcast high accuracy data using precisely synchronized signals which are received and processed by user equipment installed in military platforms. This equipment computes the platform position and velocity and provides steering vectors to target locations or navigation equipment installed in military platforms. The control segment provides daily updates to the navigation messages broadcast from the satellites to maintain system precision in three dimensions to 16 meters spherical error probable worldwide.

Additionally, GPS supports the United States Nuclear Detonation (NUDET) Detection System (NDS) mission, and provides strategic and tactical support to the following Department of Defense (DoD) missions: Joint Operations by providing capabilities for Positioning, Navigation, and Timing (PNT), Command, Control, Communications, and Intelligence, Special Operations; Military Operations in Urban Terrain, Defense-Wide Mission Support, Air Mobility, and Space Launch Orbital Support.

GPS IIIA is the next generation space vehicle supporting the Navstar GPS constellation. GPS IIIA space vehicles will deliver significant enhancements, including a new L1C (civil) Galileo-compatible signal, enhanced M-code Earth Coverage power, and a growth path to full warfighter capabilities. GPS III is in the preliminary design phase of development (Phase B). Funds in this PE will support research, development, test and evaluation of two GPS IIIA space vehicles and associated simulators through a structured systems engineering approach that matures and delivers space vehicles for launch. The program includes capability maturation and risk reduction efforts to address and mitigate program cost, schedule and technical challenges. Additionally the program also includes engineering studies and analyses, trade studies, system development, test and evaluation efforts, integrated logistics support products, on orbit support, and mission operations in support of civil applications necessary to support efforts to protect U.S. military and allies' use of GPS.

OCX is the next generation GPS control segment which includes, but is not limited to, advanced concept development, systems engineering and analysis, modernized control segment development, training simulators, Integrated Logistics Support (ILS) products, and developmental test resources. The OCX acquisition was established to 1) fly the GPS III satellites, 2) incorporate situational awareness to support Navwar and signal monitoring, and 3) enable mission capability upgrades

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305265F: *GPS III Space Segment*

to support warfighter Effects-Based Approach to Operations (EBAO). Funds will support engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, science and technology, technology development, systems engineering, system development, test and evaluation efforts, GPS enterprise integration and mission operations in support of upgrades and product improvements for military and civil applications necessary to support efforts to protect U.S. military and allies' use of GPS. Additionally, funds will ensure a disciplined Capability Insertion Program (CIP) plan to meet Joint Requirements Oversight Council (JROC) approved required capabilities.

This program is Budget Activity 7 - Operational System Development

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	392.276	815.095	0.000	0.000	0.000
Current President's Budget	379.046	423.466	828.171	0.000	828.171
Total Adjustments	-13.230	-391.629	828.171	0.000	828.171
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-13.230	0.000			
• Other Adjustments	0.000	-391.629	828.171	0.000	828.171

Change Summary Explanation

The FY2010 President's Budget submittal did not reflect FY2011 through FY2015 funding. Therefore, explanation of changes between the two budget positions cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A019: *GPS IIIA*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
67A019: *GPS IIIA*	379.046	423.466	446.304	0.000	446.304	328.153	321.364	194.825	200.073	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This Budget Program Activity Code (BPAC) funds Research & Development (R&D) of the GPS IIIA next generation space vehicle (SV) supporting the Navstar GPS constellation. GPS IIIA SVs will deliver significant enhancements, including a new L1C (civil) Galileo-compatible signal, enhanced M-code Earth Coverage power, and a growth path to full warfighter capabilities. GPS IIIA is in the preliminary design phase of development (Phase B). Funds in this PE will support research, development, test and evaluation of two GPS IIIA space vehicles and associated simulators through a structured systems engineering approach that matures and delivers space vehicles for launch. The program includes capability maturation and risk reduction efforts to address and mitigate program cost, schedule and technical challenges. Additionally the program also includes engineering studies and analyses, trade studies, system development, test and evaluation efforts, integrated logistics support products, on orbit support, and mission operations in support of civil applications necessary to support efforts to protect U.S. military and allies' use of GPS.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Development, test and evaluation of two GPS IIIA space vehicles and associated simulators, capability maturation, risk reduction efforts, engineering studies and analyses, trade stud...	379.046	423.466	446.304	0.000	446.304
FY 2009 Accomplishments: In FY 2009: GPS IIIA space vehicle development, System Engineering & Integration (SE&I), technical and program support, capability maturation and risk reduction.					
FY 2010 Plans: In FY 2010: GPS IIIA space vehicle development, SE&I, technical and program support, capability maturation and risk reduction.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A019: *GPS IIIA*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: GPS IIIA space vehicle development, SE&I, technical and program support, capability maturation and risk reduction. *FY 2011 OCO Plans:* In FY 2011 OCO: Not Applicable.					
Accomplishments/Planned Programs Subtotals	379.046	423.466	446.304	0.000	446.304

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE Not Provided (4577): *Related Activities:*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
• PE 0603423F: *OCX (RDT&E)*	289.702	289.620	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
• PE 0305265F: *OCX (RDT&E)*	0.000	0.000	381.867	0.000	381.867	117.054	436.797	440.830	370.267	0.000	0.000
• PE 0305265F (1): *GPS III Space Segment (MPAF)*	0.000	0.000	122.490	0.000	122.490	680.879	496.942	790.366	700.931	0.000	0.000
• PE 0305265F (2): *OCX (OPAF)*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.454	12.681	0.000	0.000

D. Acquisition Strategy

The Air Force is pursuing a "Block" approach to the GPS III next generation space segment to rapidly respond to warfighter capability requirements. The Block acquisition approach utilizes a disciplined systems engineering approach which focuses on mitigating cost and schedule risk through a lower risk incremental delivery of mature technologies. This approach focuses on mission success and on time delivery. The first block of GPS III satellites, GPS IIIA, will have GPS IIF capabilities plus up to a 10 dB increase in military (M-code) signal power, a new L1C civil signal compatible with the European Galileo and a satellite bus capable of supporting Block B and C capability upgrades.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A019: *GPS IIIA*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A019: *GPS IIIA*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Block IIIA Development	C/Various	Lockheed Martin Newtown, PA	332.150	373.140	Nov 2009	376.898	Nov 2010	0.000		376.898	Continuing	Continuing	0.000
SE&I	C/CPAF	SAIC Huntington Beach, CA	4.963	6.678	Nov 2009	5.100	Nov 2010	0.000		5.100	Continuing	Continuing	0.000
Modernization/SE & Technical Support	Various/ Various	Various Various	17.657	16.110	Nov 2009	12.779	Nov 2010	0.000		12.779	Continuing	Continuing	0.000
		Subtotal	354.770	395.928		394.777		0.000		394.777			0.000

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Wing Support	Various/ Various	Various Various	24.276	27.538	Nov 2009	51.527	Nov 2010	0.000		51.527	Continuing	Continuing	0.000
		Subtotal	24.276	27.538		51.527		0.000		51.527			0.000

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A019: *GPS IIIA*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	379.046	423.466		446.304		0.000		446.304			0.000

Remarks

Total Prior Years Cost may include only FY 2009 data.

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A019: *GPS IIIA*

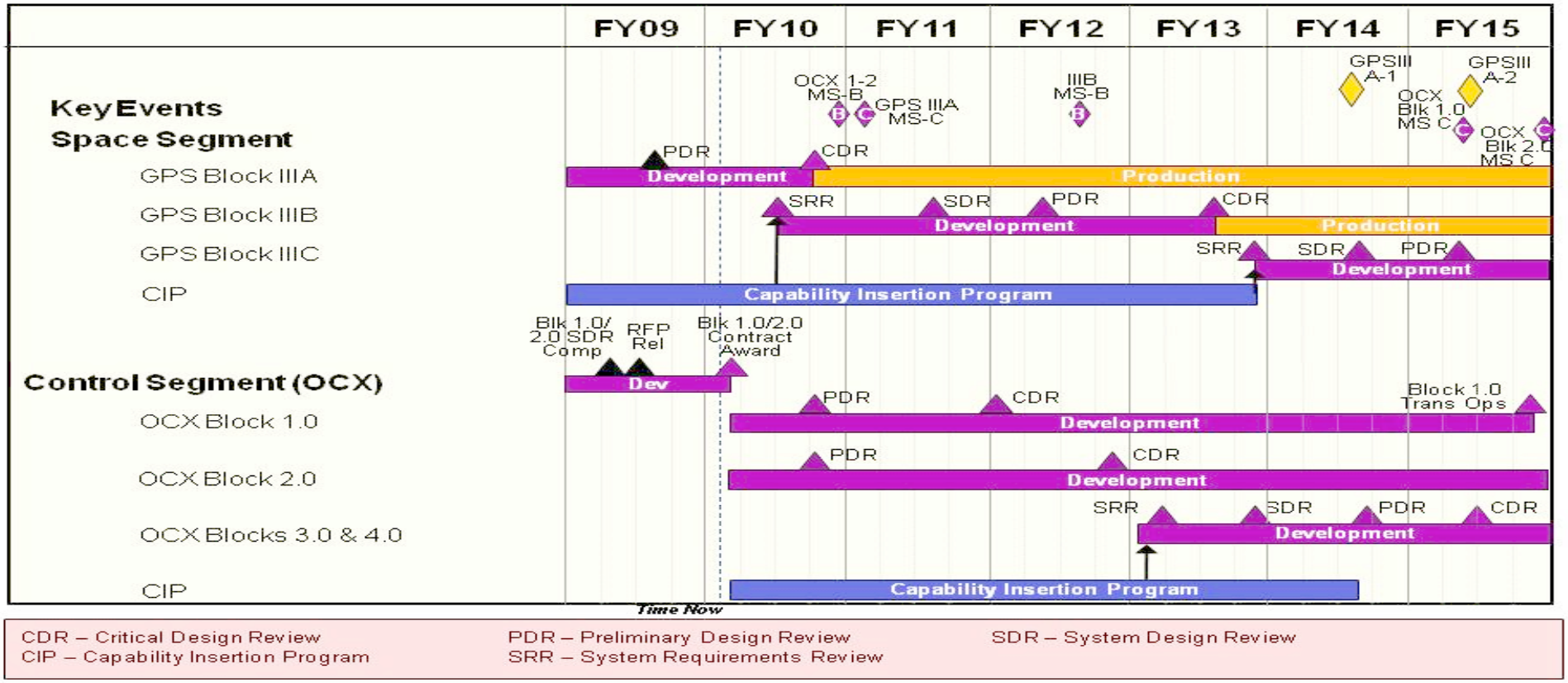

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305265F: *GPS III Space Segment*	**PROJECT** 67A019: *GPS IIIA*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
GPS IIIA Preliminary Design Review (PDR)	3	2009	3	2009
GPS IIIA Milestone C	1	2011	1	2011
GPS IIIA Critical Design Review (CDR)	4	2010	4	2010
GPS IIIB System Design Review (SDR)	3	2011	3	2011

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A020: *OCX*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
67A020: *OCX*	0.000	0.000	381.867	0.000	381.867	117.054	436.797	440.830	370.267	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This Budget Program Activity Code (BPAC) funds Research and Development (R&D) for the next generation GPS control segment (OCX). This includes, but is not limited to, advance concept development, systems engineering and analysis, modernized control segment development, GPS enterprise integration, training simulators, Integrated Logistics Support (ILS) products, and developmental test resources. The OCX acquisition was established to 1) fly the GPS III satellites, 2) incorporate situational awareness to support Navwar and signal monitoring, and 3) enable mission capability upgrades to support warfighter Effects-Based Approach to Operations (EBAO).

Funds will support engineering studies and analyses, architecture engineering studies, trade studies, technology needs forecasting, systems engineering, systems development, test and evaluation efforts and transition to mission operations in support of upgrades and product improvements for military and civil applications necessary to support efforts to protect U.S. military and allies' use of GPS. Funds will support science and technology, technology development, systems development and GPS enterprise integration efforts.

In FY2009 and FY2010, this effort is funded in PE 0603423F, Global Positioning System III - Operational Control Segment.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Development, test and evaluation of OCX and engineering studies, technology needs forecasting, systems engineering, system development, and test and evaluation efforts. *FY 2009 Accomplishments:* In FY 2009: NA	0.000	0.000	381.867	0.000	381.867

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A020: *OCX*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: In FY 2010: NA *FY 2011 Base Plans:* In FY 2011: Continued OCX Block 1-2 development System Engineering & Integration (SE&I), technical and program support. *FY 2011 OCO Plans:* In FY 2011 OCO: Not Applicable.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	381.867	0.000	381.867

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE Not Provided (4839): *Related Activities:*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
• PE 0603423F: *OCX (RDT&E)*	289.702	289.620	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
• PE 0305265F: *GPS III (RDT&E)*	379.046	423.466	466.304	0.000	466.304	328.153	321.364	194.825	200.073	0.000	0.000
• PE 0305265F (1): *GPS III Space Segment (MPAF)*	0.000	0.000	122.490	0.000	122.490	680.879	496.942	790.366	700.931	0.000	0.000
• PE 0305265F (2): *OCX (OPAF)*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.454	12.681	0.000	0.000

D. Acquisition Strategy

The Air Force is pursuing a "Block" approach to the GPS III next generation control segment (OCX) to rapidly respond to warfighter capability requirements. The Block acquisition utilizes a disciplined system engineering approach which focuses on mitigating cost and schedule risk through a lower risk incremental delivery of mature technologies. This approach focuses on mission success and on time delivery. The first block of GPS III ground control segment (OCX) will provide backwards compatibility to GPS Block II mission operation and provide GPS IIIA mission operation capability.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305265F: *GPS III Space Segment*	**PROJECT** 67A020: *OCX*

The full content of OCX Blocks 1.0 and 2.0 includes M-code and civil signal monitoring, Net Centric Global Information Grid connectivity, command and control for GPS IIIA vehicles, and will meet current Information Assurance standards. This acquisition includes a structured capability insertion program to support risk reduction for OCX Blocks 3.0 and 4.0 (associated with controlling GPS IIIB and IIIC SVs).

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A020: *OCX*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Phase B OCX Blk I & II Development	C/CPIF	TBD TBD	0.000	0.000	Nov 2009	241.754	Nov 2010	0.000		241.754	Continuing	Continuing	0.000
SE&I	C/CPAF	SAIC El Segundo, CA	0.000	0.000	Nov 2009	5.993	Nov 2010	0.000		5.993	Continuing	Continuing	0.000
SE & Technical Support	Various/ Various	Various Various	0.000	0.000	Nov 2009	9.973	Nov 2010	0.000		9.973	Continuing	Continuing	0.000
		Subtotal	0.000	0.000		257.720		0.000		257.720			0.000

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Wing Support	Various/ Various	Various Various	0.000	0.000	Nov 2009	124.147	Nov 2010	0.000		124.147	Continuing	Continuing	0.000
		Subtotal	0.000	0.000		124.147		0.000		124.147			0.000

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A020: *OCX*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		381.867		0.000		381.867			0.000

Remarks

Total Prior Years Cost may include only FY 2009 data.

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305265F: *GPS III Space Segment*	PROJECT 67A020: *OCX*

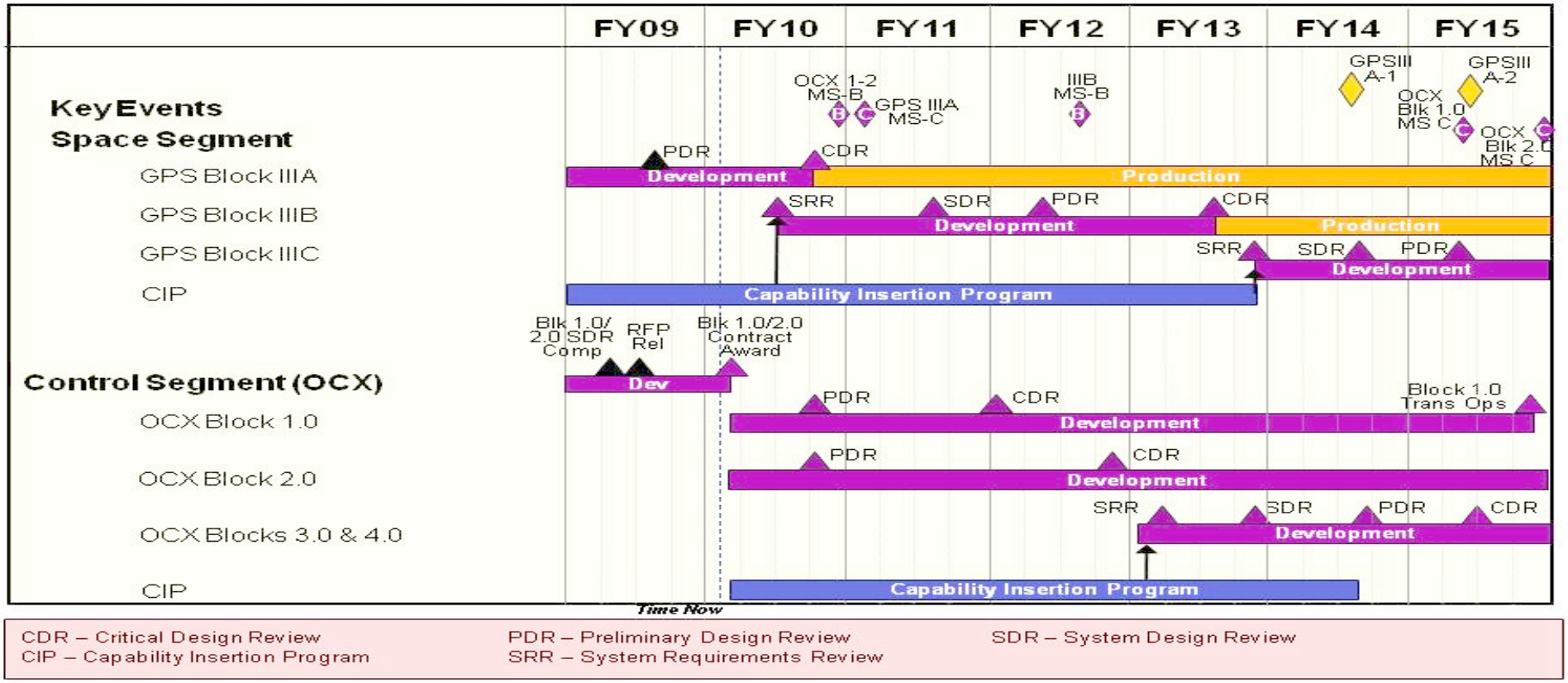

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305265F: *GPS III Space Segment*	**PROJECT** 67A020: *OCX*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Launch, Anomaly & Disposal Operations and LADO Authority to Proceed (ATP)	3	2011	3	2011