Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305221F / *Network-Centric Collaborative Targeting*							
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	-	14.837	14.288	10.757	0.000	10.757	15.077	17.788	17.269	12.346	Continuing	Continuing
675197: *NCCT Core Technology*	-	12.290	14.288	10.757	0.000	10.757	15.077	17.788	17.269	12.346	Continuing	Continuing
675275: *SUTER*	-	2.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

In FY 2019, PE 0305221F, Network-Centric Collaborative Targeting, Project 675275, SUTER efforts were transferred to PE 0305208F, Distributed Common Ground/ Surface Systems, Project 674826, Common Imagery Ground/Surface Systems, in order to facilitate the development and integration of SUTER as a mission application on Open Architecture (OA) DCGS.

A. Mission Description and Budget Item Justification

Network Centric Collaborative Targeting (NCCT) is the Air Force program of record responsible for developing core technologies supporting the horizontal and/or vertical integration of Intelligence, Surveillance and Reconnaissance (ISR) sensor systems. The result of such integration is a multi-intelligence (multi-INT) sensor network. Operationally, NCCT core technologies provide a tactical collaborative multi-INT geolocation capability employed against high-value targets. NCCT software supports Machine-to-Machine (M2M) cross-cueing and Internet Protocol (IP) connectivity to coordinate collection activities across the NCCT network. NCCT correlation and fusion software ingests collection data to produce a single, composite track (geolocation and identification) in near real-time for high-value targets. SUTER supports development of sub nodal analysis tools. Operationally, such tools can be used to identify the nodes within an adversary's Command, Control, Communications, Computers, and Intelligence (C4I) network to engage or protect to achieve desired effects.

NCCT Core Technology includes, but is not limited to, network management software, a network messaging standard, correlation and fusion software, software supporting tactical-to-national Signals Intelligence (SIGINT) Concept of Operations (CONOPS), NCCT multi-level security hardware and software items and operator interfaces. Development funds support software modifications required for technology modernization specific to network and fusion architecture design, data fusion algorithms and cyber security, while keeping pace with evolving adversary tactics, techniques, and procedures (TTPs). FY 2020 funding will be dedicated to transitioning software development from Core Technology to a cloud architecture (v6.0) and fielding follow-on Core Technology Software versions as necessary.

SUTER develops concepts, TTPs and technologies for synchronizing the capabilities of ISR and non-kinetic capabilities in a coordinated fashion with traditional kinetic weapons to prosecute targets connected together or dependent upon some form of communications network. SUTER's planning, execution and assessment capability is implemented in a virtual architecture available to all Air Operations Centers (AOCs), taking advantage of the military value added from the synergies of Joint composite ISR, non-kinetic, and/or kinetic strike packages operating against networked target sets. This virtualized Service Oriented Architecture (SOA) utilizes software applications which employ M2M interfaces and IP communications to impact these target sets by attacking or influencing/shaping links, nodes or end points in the network to include: Radio Frequency and terrestrial links, switches, routers, hubs, servers, IP addresses, cell phones, antennas, radars, microwave relays, Satellite Communications (SATCOM) receivers, transceivers, etc. The three main pieces of the SUTER CONOPS include: first, the use of SUTER's sub-nodal analysis software to determine which nodes of the adversary's C4I network to engage or protect to achieve desired effects; second, the SUTER's distributed operations architecture to tie together relevant planning cells (e.g. AOCs, Joint Information Operations Warfare Center, etc.) so they can collaborate in developing and modeling the execution plan(s)

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*

needed to disrupt or monitor the required network aim-points; and third, via SUTER's combined network Graphical User Interface, all involved players monitor the plan's execution, provide Near-Real Time (NRT) updates to the status of on-going activities, provide continuous assessment/updates of the execution of the plan, and, within authorities (Rules of Engagement), re-direct activities based on changing battlefield conditions.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver NCCT and SUTER capability.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	18.842	14.288	14.752	0.000	14.752
Current President's Budget	14.837	14.288	10.757	0.000	10.757
Total Adjustments	-4.005	0.000	-3.995	0.000	-3.995
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-4.005	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-3.995	0.000	-3.995

Change Summary Explanation

FY 2018 -$4.005M reprogramming

FY 2020 -$3.995M reprogramming

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305221F / *Network-Centric Collaborative Targeting*	Project (Number/Name) 675197 / *NCCT Core Technology*	

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
675197: *NCCT Core Technology*	-	12.290	14.288	10.757	0.000	10.757	15.077	17.788	17.269	12.346	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Network Centric Collaborative Targeting (NCCT) is the Air Force program of record responsible for developing core technologies supporting the horizontal and/or vertical integration of Intelligence, Surveillance and Reconnaissance (ISR) sensor systems. The result of such integration is a multi-intelligence (multi-INT) sensor network. Operationally, NCCT core technologies provide a tactical collaborative multi-INT geolocation capability employed against high-value targets. NCCT software supports Machine-to-Machine (M2M) cross-cueing and Internet Protocol (IP) connectivity to coordinate collection activities across the NCCT network. NCCT correlation and fusion software ingests collection data to produce a single, composite track (geolocation and identification) in near real-time for high-value targets.

NCCT Core Technology includes, but is not limited to, network management software, a network messaging standard, correlation and fusion software, software supporting tactical-to-national (SIGINT) CONOPS, NCCT multi-level security hardware and software items, and operator interfaces. Development funds support software modifications required for technology modernization specific to network and fusion architecture design, data fusion algorithms, and cyber security, while keeping pace with evolving adversary tactics, techniques, and procedures (TTPs). FY 2020 funding will be dedicated to transitioning software development from Core Technology to a cloud architecture (v6.0) and fielding follow-on Core Technology Software versions as necessary.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Core Technology	12.290	14.288	10.757	0.000	10.757
Description: Accomplishments and planned efforts include development and update of Network-Centric Collaborative Targeting (NCCT) Core Technology; technical support to users, and management activities					
FY 2019 Plans: - Resolves critical & high software vulnerabilities for fielding of NCCT v5.2 and obtains Authority to Operate (ATO) to replace ATOs currently supporting the fielded system.					
FY 2020 Base Plans: - Will transition software development of Core Technology to a cloud architecture (v6.0) and fielding follow-on Core Technology Software versions as necessary.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Will expand NCCT capabilities to ingest emergent national and tactical level multi-INT sensor data such as expanded Airborne Overhead Cooperative Operations (AOCO) standards and platform sensor data that will enrich and improve current fusion and dissemination of data to the tactical edge. ***FY 2020 OCO Plans:*** None. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decreased due to reprogramming efforts that supported higher Air Force priorities.					
Accomplishments/Planned Programs Subtotals	12.290	14.288	10.757	0.000	10.757

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• OPAF 03 Line Item 832070: *Intelligence Comm Equipment*	3.312	3.095	3.148	-	3.148	3.207	3.264	3.322	3.382	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Network-Centric Collaborative Targeting (NCCT) Core Technology capabilities are developed, maintained and sustained with baseline/incremental upgrades plus any Quick Reaction Capability (QRC) developments acquired through the 645th Aeronautical System Group (645 AESG) in accordance with their Program Management Directive (PMD), Class Justification and Approval (J&A), and Life Cycle Management Plan (LCMP) across the full spectrum of system life cycle management ("cradle to grave" support concept). Due to the rapidly changing threat environment encountered during our prolonged commitment to Overseas Contingency Operations (OCO), the acquisition program manager has the authority to redirect funding as necessary to meet current stated and emerging/evolving Combatant Commander requirements.

645 AESG, Wright Patterson AFB OH, manages the Cost Plus Fixed Fee (CPFF) contracts used to develop NCCT Core Technology. 645 AESG will develop NCCT Core Technology software on common hardware for systems and platforms designated to field this ISR capability. Individual platform program management offices may contract directly with their prime contractors or through the 645 AESG for integration of NCCT capabilities on their respective systems and platforms.

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 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*

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
Core Technology Development A	SS/CPFF	L-3 ComCept : Rockwall, TX	-	4.830	Nov 2017	7.388	Jan 2019	-		-		-	Continuing	Continuing	-
Core Technology Development B	SS/CPFF	L-3 ComCept : Rockwall, TX	-	6.413	Jul 2018	6.300	Jan 2019	9.857	Jan 2020	-		9.857	Continuing	Continuing	-
		Subtotal	-	11.243		13.688		9.857		-		9.857	Continuing	Continuing	N/A

Support ($ 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
Security Certification/ Technical Engineering	SS/CPFF	L-3 ComCept : Rockwall, TX	-	0.500	Mar 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.500		-		-		-		-	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
PMA	Allot	645 AESG : Dayton, OH	-	0.547	Mar 2018	0.600	Mar 2019	0.900	Mar 2020	-		0.900	Continuing	Continuing	-
		Subtotal	-	0.547		0.600		0.900		-		0.900	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	-	12.290		14.288		10.757		-		10.757	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*

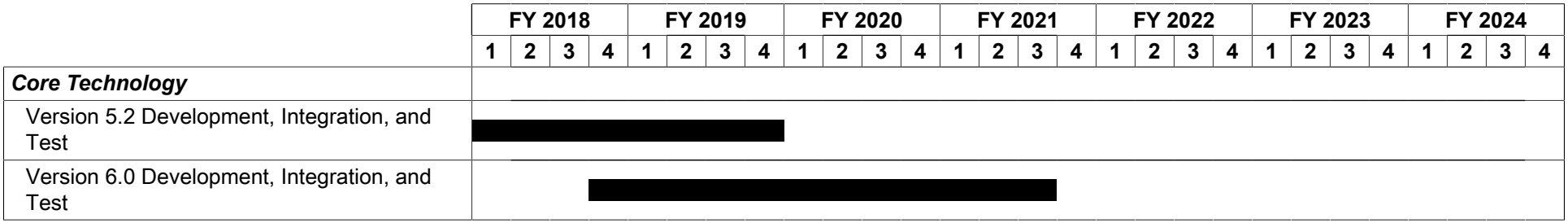

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Core Technology				
Version 5.2 Development, Integration, and Test	1	2018	4	2019
Version 6.0 Development, Integration, and Test	4	2018	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305221F / *Network-Centric Collaborative Targeting*	Project (Number/Name) 675275 / *SUTER*	

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
675275: *SUTER*	-	2.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, PE 0305221F, Network-Centric Collaborative Targeting, Project 675275, SUTER efforts were transferred to PE 0305208F, Distributed Common Ground/ Surface Systems, Project 674826, Common Imagery Ground/Surface Systems, in order to facilitate the development and integration of SUTER as a mission application on Open Architecture (OA) DCGS.

A. Mission Description and Budget Item Justification

SUTER develops concepts, TTPs and technologies for synchronizing the capabilities of ISR and non-kinetic capabilities in a coordinated fashion with traditional kinetic weapons to prosecute targets connected together or dependent upon some form of communications network. SUTER's planning, execution and assessment capability is implemented in a virtual architecture available to all Air Operations Centers (AOCs), taking advantage of the military value added from the synergies of Joint composite ISR, non-kinetic, and/or kinetic strike packages operating against networked target sets. This virtualized Service Oriented Architecture (SOA) utilizes software applications which employ M2M interfaces and IP communications to impact these target sets by attacking or influencing/shaping links, nodes or end points in the network to include: Radio Frequency and terrestrial links, switches, routers, hubs, servers, IP addresses, cell phones, antennas, radars, microwave relays, Satellite Communications (SATCOM) receivers, transceivers, etc. The three main pieces of the SUTER CONOPS include: first, the use of SUTER's sub-nodal analysis software to determine which nodes of the adversary's C4I network to engage or protect to achieve desired effects; second, the SUTER's distributed operations architecture to tie together relevant planning cells (e.g. AOCs, Joint Information Operations Warfare Center, etc.) so they can collaborate in developing and modeling the execution plan(s) needed to disrupt or monitor the required network aim-points; and third, via SUTER's combined network Graphical User Interface, all involved players monitor the plan's execution, provide Near-Real Time (NRT) updates to the status of on-going activities, provide continuous assessment/updates of the execution of the plan, and, within authorities (Rules of Engagement), re-direct activities based on changing battlefield conditions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: SUTER Software Development	2.547	0.000	0.000	-	0.000
Description: Efforts include development and release of SUTER software upgrade.					
FY 2019 Plans: None. SUTER transitioning to PE 0305208F, Distributed Common Ground/Surface Systems, Project 674826, Common Imagery Ground/Surface Systems. No money is laid in for FY 2019 and beyond.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675275 / *SUTER*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A					
Accomplishments/Planned Programs Subtotals	2.547	0.000	0.000	-	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Prior to FY 2017, SUTER capabilities were developed, maintained and sustained with baseline/incremental upgrades plus any Quick Reaction Capability (QRC) developments acquired through the 645 AESG. In FY 2017, due to software limitations and a lack of technical maturity of SUTER's capabilities, the Air Force decided not to proceed with the 645 AESG technical plan on SUTER and transitioned SUTER program execution responsibilities to the Air Force Research Laboratory (AFRL). AFRL is increasing the technical maturity of the SUTER software and capabilities to a level suitable for operational capability and for transition to PE 0305208F, Distributed Common Ground/Surface Systems, Project 674826, Common Imagery Ground/Surface Systems. This transition will be made in order to facilitate the development and integration of SUTER as a mission application on Open Architecture (OA) DCGS.

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 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675275 / *SUTER*	

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
SUTER Technology Development and Maturation	SS/CPFF	Northrop Grumman : Bellevue, NY	-	1.036	Jun 2018	-		-		-		-	Continuing	Continuing	-
SUTER Technology Development	SS/CPAF	Booze Allen : McLean, VA	-	1.036	Jul 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	2.072		-		-		-		-	Continuing	Continuing	N/A

Support ($ 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
SUTER Technical Support	SS/CPFF	BAE Systems Info Solution : McLean, VA	-	0.475	Jun 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.475		-		-		-		-	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	-	2.547		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675275 / *SUTER*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
SUTER																												
SUTER Technology Development and Maturation	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675275 / *SUTER*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SUTER				
SUTER Technology Development and Maturation	1	2018	2	2019