A Stakeholder Approach to Develop an Initial Federal Aviation Administration (FAA) Weather Strategy

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BLUF: Initial FAA Weather Strategy Overview

FAA Weather Strategy Overview				
Why: Case for Change				
The connected environment offers opportunities and threats, including increased data sharing and cyber security.	New entrants require observations and forecasts not yet supported by current weather infrastructure and enterprise.	The FAA must address vulnerabilities related to climate change and enhance the resilience of facilities and operations.	The NAS is changing over the next 15 years and will require updates to regulations and operations.	Operations need to drive weather research based on a holistic view of the role of aviation weather in the future NAS.
Given: Current State		**How: Weather Strategy Goals**		**What: Future State**
FAA has gaps in its ability to observe and forecast weather, especially in non-legacy operational areas (e.g., rural, urban, & upper E). The weather research community frequently initiates changes without always considering operational needs. Operational inefficiencies caused by variable and excessively manual weather data processes (e.g., PIREPs). Weather regulations can lag behind rapid operational and technological changes.		Goal 1: Support an evolving NAS with improved, mission-focused weather observation and forecasting information Goal 2: Ensure relevant weather information is appropriately incorporated into operational decision-making processes Goal 3: Transform aviation weather services for the future NAS by using advanced information technology Goal 4: Develop and enable weather standards, procurement processes, and partnerships to keep pace with an evolving NAS		Stakeholders use necessary observation and forecast weather services for safe and efficient operations while considering climate change. Weather information is integrated into decision support capabilities. FAA uses information technology advances to enhance weather prediction and automate manual processes. FAA has weather regulations reflecting operations and technologies in the future NAS with a supporting agile procurement process allowing for more effective weather solutions.

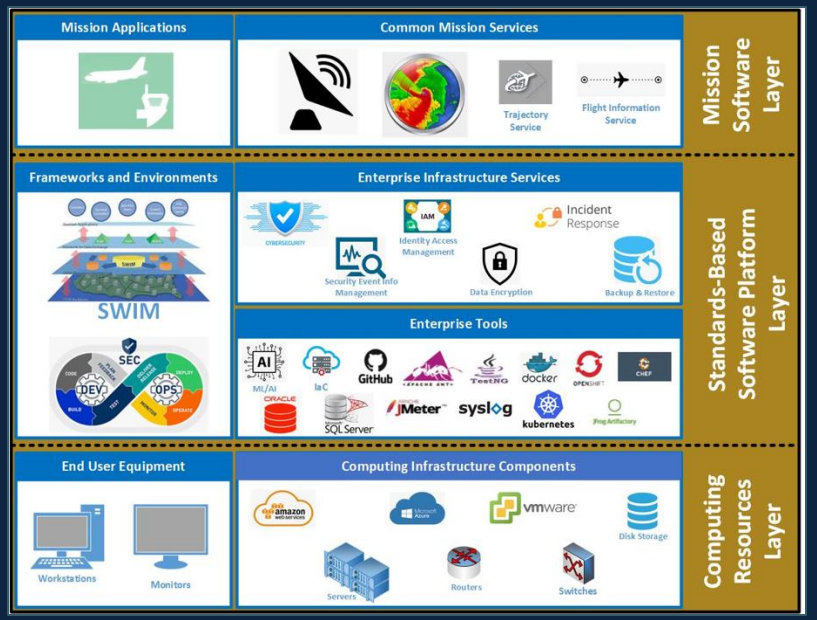
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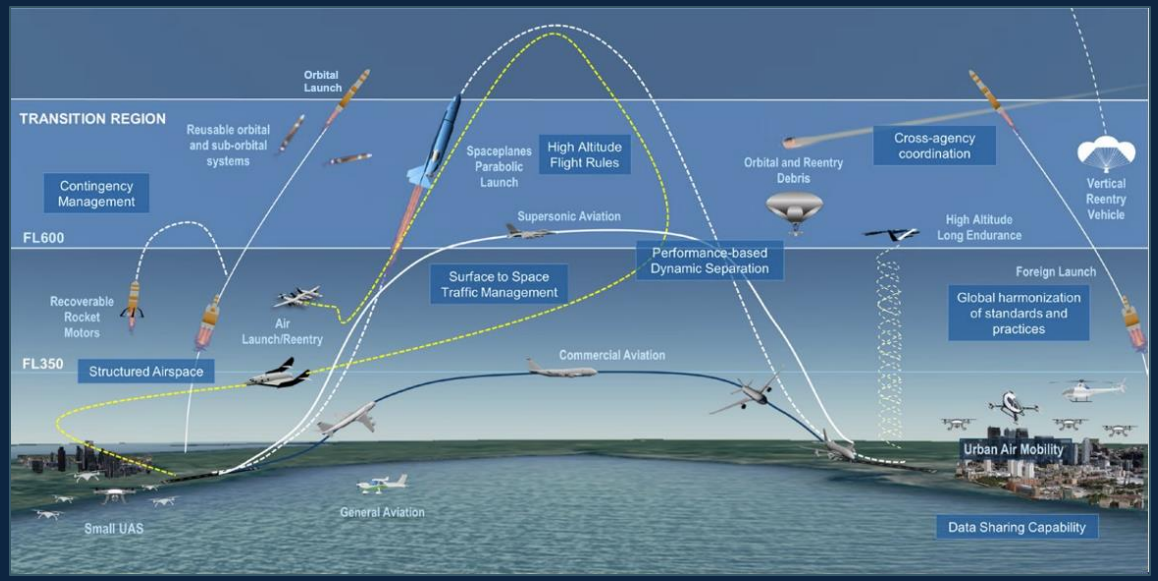
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Part 1: Literature Review









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What Was Different About This Approach?



NAS = National Airspace System

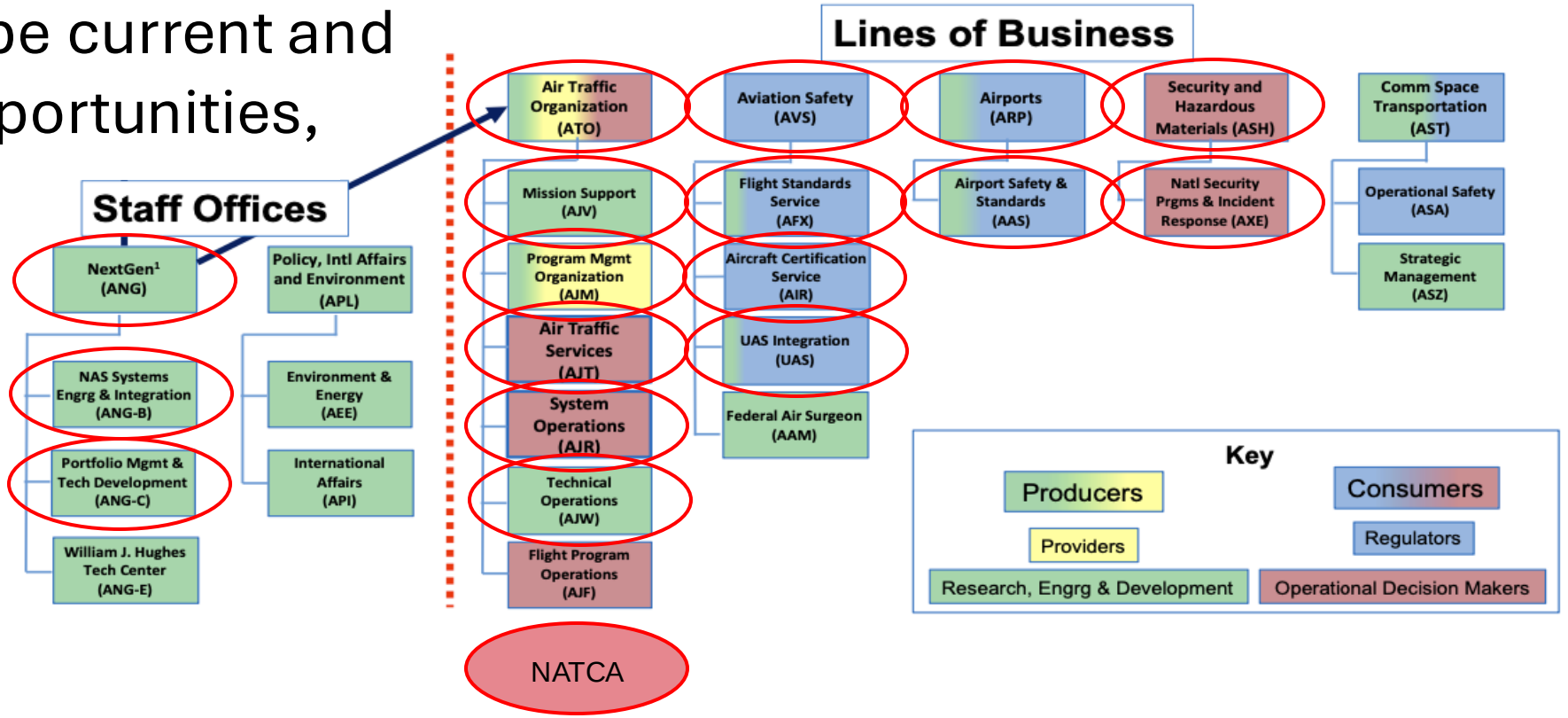
NAS Decision Makers* include Dispatchers, FAA Air Traffic Controllers and Traffic Managers, Pilots

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Part 2: Listening to FAA Decision Makers

- Thirty-three one-hour listening sessions with ~30 LOBs and SOs from across the agency
- Their task: describe current and future mission opportunities, challenges, and problem areas
- Our task: filter, identify and aggregate key weather needs and shortfalls



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Part 2: Filtering the Feedback

Stakeholder-Centric Approach:
"Tell Us About Your Current and Future Missions"

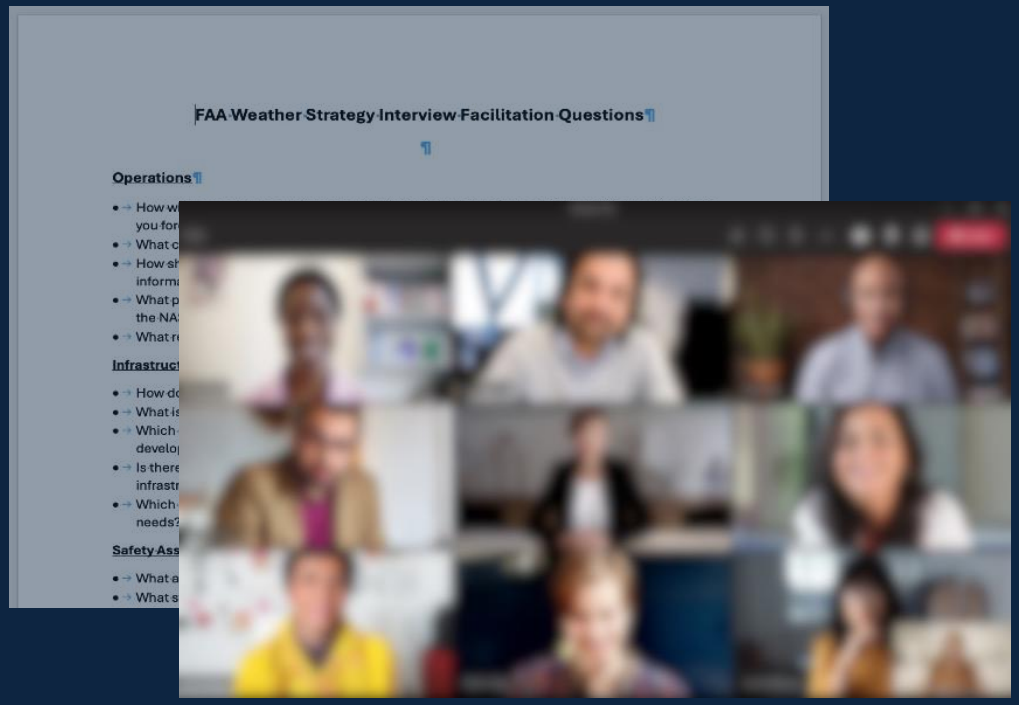
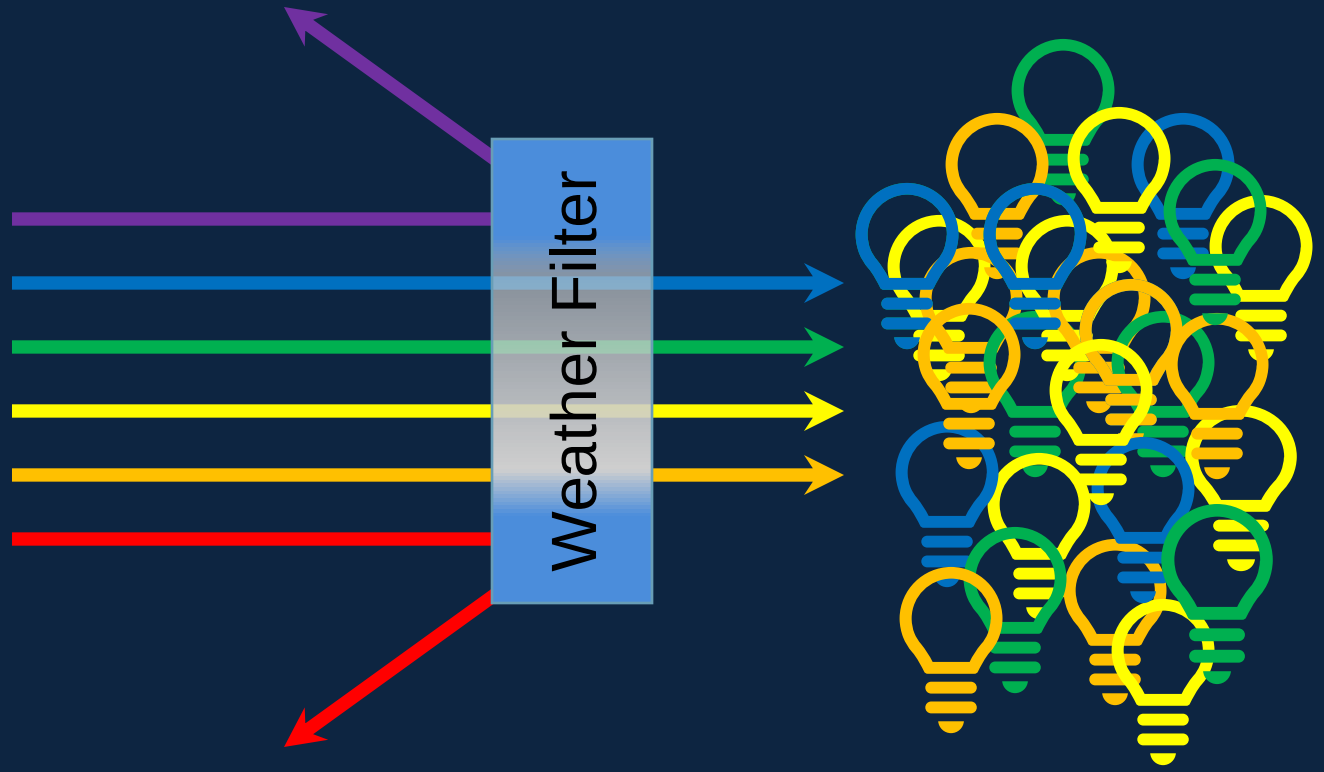


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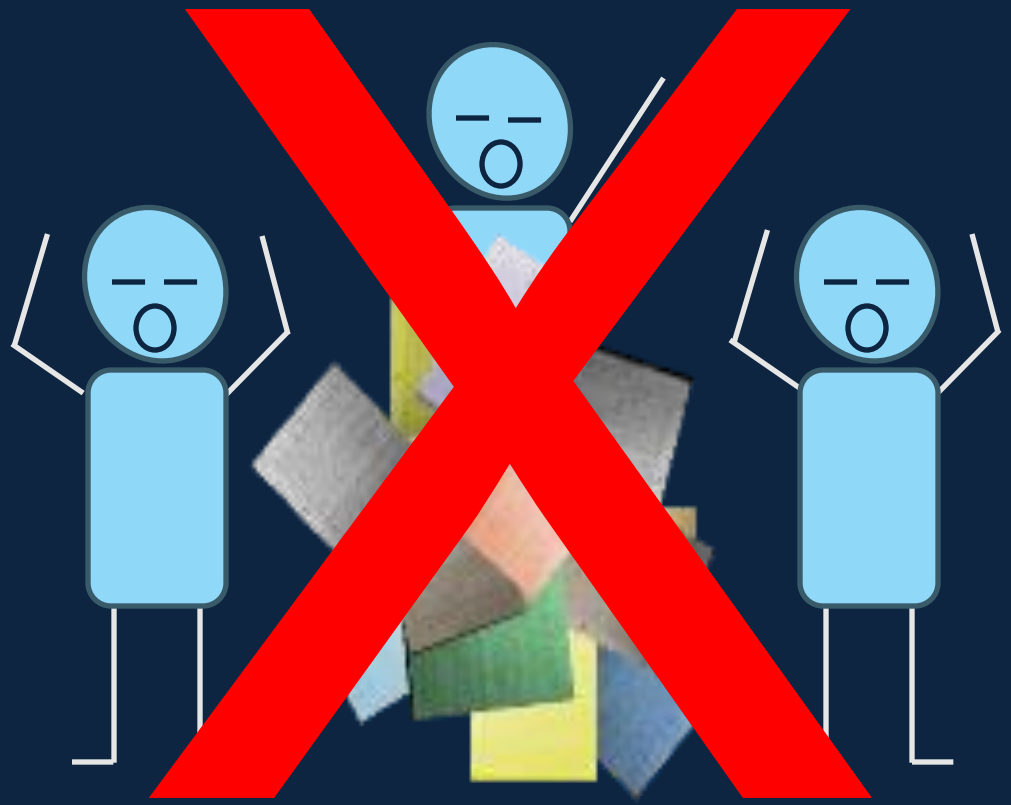


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Initial FAA Weather Strategy Development Process: Goals

- Goal: A high-level, long-term desired outcome, 3-4 for a Strategy
- Initial Goal Development Process: Manually review, aggregate and synthesize notes from 33 listening sessions, then apply expertise…
- Problem: Limited resources and time



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Part 3: Initial FAA Weather Strategy Goals

- Goal: A high-level, long-term desired outcome, 3-4 for a Strategy
- Goal Development Process: Use MS Teams transcription coupled with MITRE Chat GPT to review, aggregate and synthesize, Mural online collaboration tool and expertise to modify and sharpen the proposed goals

Goal #1	Goal #2	Goal #3	Goal #4
Support an evolving NAS with improved, mission-focused weather observation and forecast information	Ensure relevant weather information is appropriately incorporated into operational decision-making processes	Transform aviation weather services for the future NAS by using advanced information technology	Develop and enable weather standards, procurement processes, and partnerships to keep pace with an evolving NAS

- Approval Process: Coordinate with, receive approval of, FAA sponsor

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Part 4: Initial FAA Weather Strategy Objectives

- Objective: A specific, measurable, timebound step needed to reach a goal, typically 3-4 per goal
- Objective Development Process Step 1: Use approved Goals, MS Teams transcription, MITRE Chat GPT, Mural online collaboration tool and expertise to drill down into each Goal and develop preliminary Objectives
- Objective Development Process Step 2: Use Mural online collaboration tool with FAA Weather Community of Interest (Wx COI) Strategic Planning Team (SPT) to review, modify preliminary Objectives
- Approval Process: Coordinate with, receive approval of, FAA sponsor

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Initial FAA Weather Strategy: Goals and Objectives

Goal #1: Support an evolving NAS with improved, mission-focused weather observation and forecast information	Goal #2: Ensure relevant weather information is appropriately incorporated into operational decision-making processes	Goal #3: Transform aviation weather services for the future NAS by using advanced information technology	Goal #4: Develop and enable weather standards, procurement processes, and partnerships to keep pace with an evolving NAS
Objective 1-1: Sources of Weather Information – Approve and incorporate weather observation information from non-traditional sources, such as private third-party suppliers, to help mitigate the lack of current weather information for NAS operations	Objective 2-1: Common Meteorological Picture – Define and promote a unified framework for a common meteorological picture that improves coordination among FAA and external stakeholders, especially during impactful weather conditions	Objective 3-1: Distributed Information Services and Infrastructure – Enable better access to and use of weather information through increased adoption of distributed information services and infrastructure to meet the needs of the future NAS	Objective 4-1: Weather Standards – Develop and implement updated weather regulations and standards to facilitate safe NAS operations
Objective 1-2: Low Level Weather Sensor Types – Research and incorporate new sensor types to observe and measure impactful weather for low altitude operations	Objective 2-2: Weather Translation – Translate weather information into constraints for incorporation into target Air Traffic Management decision support systems, enabling more consistent and effective decision-making in the face of impactful weather	Objective 3-2: Artificial Intelligence – Explore and incorporate artificial intelligence applications into weather observing and forecasting capabilities that support real time NAS operation decision making	Objective 4-2: Procurement Processes – Leverage existing and future FAA procurement processes to enable timely and effective implementation of weather-related capabilities
Objective 1-3: Low-Level Forecasts – Improve low-level forecasts of impactful weather through increased resolution and measures of uncertainty to improve decision-making, operating efficiency, and safety for NAS operators	Objective 2-3: Human-Machine Teaming – Define the role of operational decision makers using advanced decision support concepts such as AI and weather integration, and then train them to use these tools for consistent, effective solutions during impactful weather in the NAS	Objective 3-3: Alternative Communications Methods – Develop and utilize alternative communication methods to address the growing demand for bandwidth and sharing of weather data needed for the future NAS	Objective 4-3: Partnerships – Strengthen internal and external partnerships to enhance the quality and utilization of aviation weather data in decision-making
Objective 1-4: Climate Change – Identify and address vulnerabilities related to climate change, ensuring sustainable and adaptive infrastructure and processes to strengthen the resilience of FAA facilities and operations		Objective 3-4: Cyber Security – Mitigate cyber security risks of weather information to protect the integrity and functionality of the NAS	

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Next Steps

- Evolution of Initial Goals and Objectives
- Roadmap development
- Communications plan
- Plan ownership

Goal 1: Support an evolving NAS with improved, mission-focused weather observation and forecasting information			
Objective 1-1: Approve and incorporate weather observation information from non-traditional sources, such as private third-party suppliers, to help mitigate the lack of current weather information for NAS operations.			
Outcome: Integrating observations from nonfederal weather systems into FAA networks will increase the coverage of weather data, thereby addressing existing observation gaps in cities, rural areas, and high-altitude operations. Access to a larger set of weather information will provide new entrant operators with the precise and reliable data they need to operate safely in under-observed areas. Increased numbers of weather observations will also lead to improved weather forecasts with decreased forecast uncertainty for both emerging and legacy operators, increasing the likelihood of successful operations throughout the entire NAS into the future.			
Identifier	**Related Activities**	**Phase**	**OPR**
1-1.1			
1-1.2			
1-1.3			
1-1.4			
1-1.5			

OPR = Office of Primary Responsibility

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