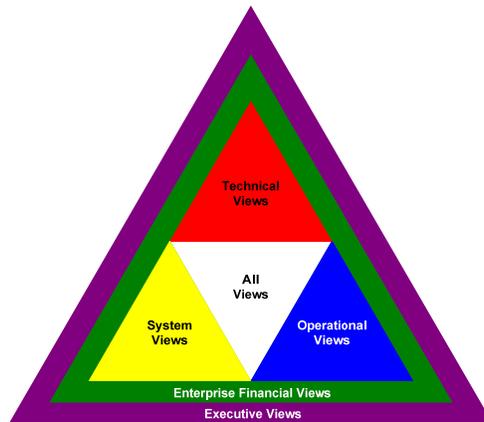




National Airspace System Enterprise Architecture (NAS EA)

Air Traffic Organization



**NextGen Far-Term (2025)
To-Be Enterprise-Level Architecture
Systems Interface Description (SV-1)
Version 1.0
January 29, 2010**

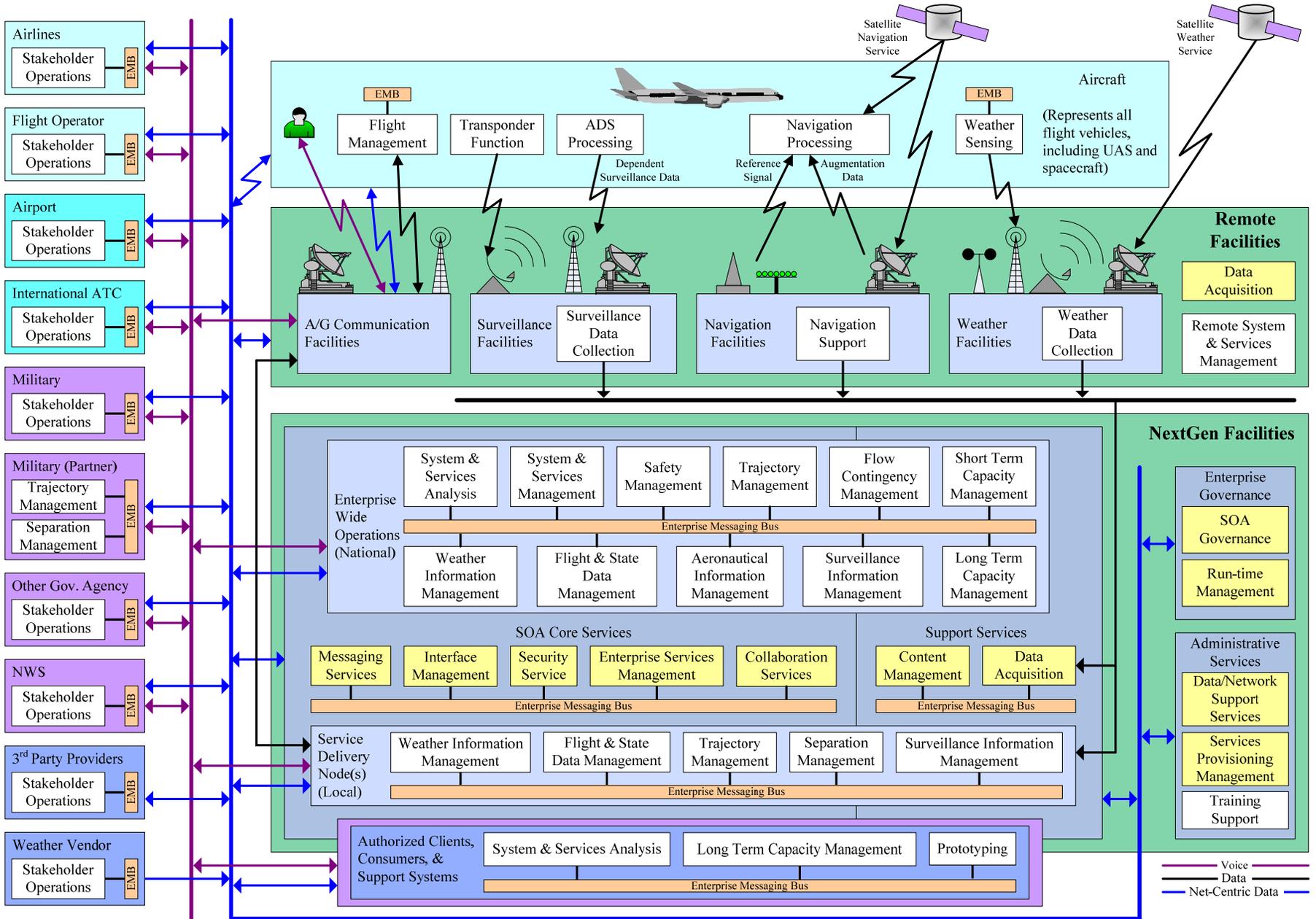


Figure 1: NextGen 2025 System Interface Description SV-1p

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NextGen 2025 System Interface Description SV-1p¹

Overview

The NextGen 2025 System Interface Description (SV-1p) is divided into four areas. Along the top of the diagram are airborne elements, including aircraft (intended to represent all types of consumer flight vehicles) and satellite support systems. (See Figure 2 below.) The aircraft functions shown in the blue box represent the maximum configuration of functions that interact with NextGen. This is not meant to imply that all aircraft will have the maximum set of functions.

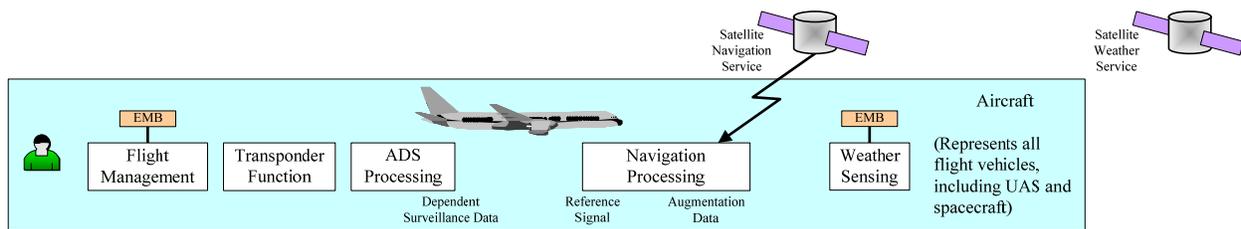


Figure 2: Airborne Elements

The aircraft box is shaded sky blue to indicate that these are consumer elements, which could be private, commercial, or governmental elements. In the case where one of these elements is an unmanned aircraft system (UAS) that collects weather data, and that element is operated by the National Weather Service (NWS), the aircraft is treated as a consumer of NextGen services, and the weather data collected is provided to NextGen through an interface with a remote NextGen facility. Two types of satellites are shown. One represents the satellite that provides navigation; the other represents the satellite that provides weather graphics. Communications satellites are not explicitly shown.

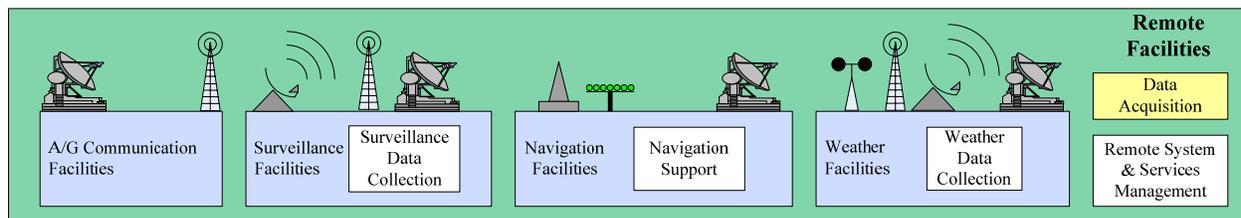


Figure 3: Remote Facilities

Across the middle, just below the airborne elements, are the remote facilities. (See Figure 3 above.) The green shading of the outer box is intended to indicate that these elements are part of the National Airspace System (NAS). Joint-use facilities, i.e., those owned by other governmental entities including the military, are considered part of the NAS. The A/G Communications Facilities represents both satellite and radio communications. The Surveillance

¹ The “p” stands for preliminary. The SV-1 can either be done using system nodes (SV-1n) or systems (SV-1s). Since neither system nodes nor systems are fully defined for the 2025 timeframe, this artifact uses system functions or services as the nodes.

Facilities box represents all three types of facilities – ground-based radar systems (primary and secondary), ADS-B transceivers, and ADS-C satellite transceivers (for oceanic operations). The Navigation Facilities box represents all three categories of facilities – ground-based electronic reference systems (VOR, landing systems, etc.), visual guidance systems (landing lights), and satellite navigation support systems (WAAS, LAAS). The Weather Facilities box represents four types of facilities – surface observation systems, airborne weather sensor collection systems, weather radar systems, and weather satellite receivers. All four types of remote facility include a System & Services Management function that monitors the status of the remote functions and responds to maintenance commands from the national System & Services Management function.

Data collected at the remote facilities is provided to NextGen Mission Functions via Data Acquisition Services (yellow box on the left of Figure 3) that are part of the Support Services of NextGen, which then provide the data to the net-centric grid. For those remote facilities that have access to a local net-centric grid node, these Data Acquisition Services are located at the remote facility. Otherwise, these Data Acquisition Services are located at the nearest net-centric node, and the connectivity between the remote facilities is through data access networks which connect systems to the nearest net-centric node. (These are described in the SV-2.) The remote System & Services Management function receives maintenance commands from the national function either through the net-centric grid (if the remote facility is located at a node) or via the data access networks. Both alternatives are shown on the SV-1p as can be seen in Figure 4 below. Note that the blue arrow that touches the green Remote Facilities box implies that any or all functions within that box can be connected to the grid.

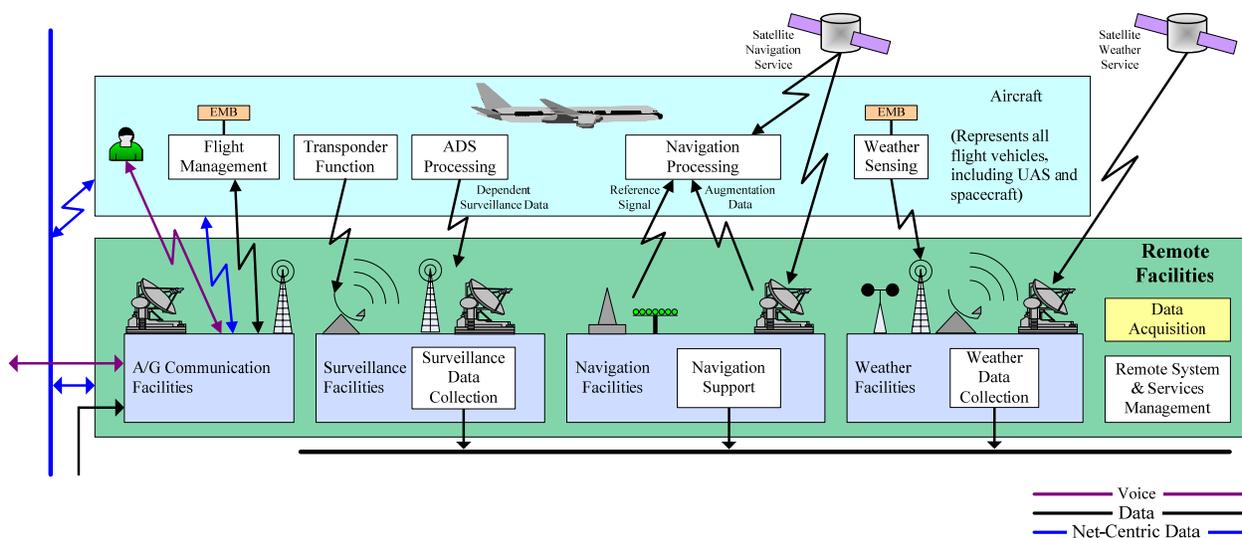


Figure 4: Interactions among Airborne Elements and Remote Facilities

Figure 4 above shows the interactions among the airborne elements and the Remote Facilities. As shown in the color key at the bottom right-hand corner of the diagram, purple lines represent voice communications, blue lines represent net-centric data communications² (within the Service

² The blue line that connects to the outer light blue box indicates that any element within that box could be connected through that interface. A similar convention is used throughout the diagram.

Oriented Architecture (SOA) environment), and black lines represent non-net-centric data communications. Currently it is assumed that only the Aircraft Flight Management and Weather Sensing functions will be connected via the net-centric grid, though some data is exchanged directly with the Flight Management function because of critical timing issues. Data transmitted down from the other aircraft functions to the remote facilities are also direct (not net-centric) until they pass through the Data Acquisition services that are part of Support Services. Navigation information provided to the aircraft is also direct (not on the grid). Transponder interrogations are not explicitly shown.

Along the left side of the diagram are ground-based stakeholders and consumers in boxes shaded sky blue similar to the aircraft box described above. The Airlines box represents major carriers and commuter operators, i.e. those operators that provide services to the flying public. The Flight Operator box represents general aviation and private (business) consumers.

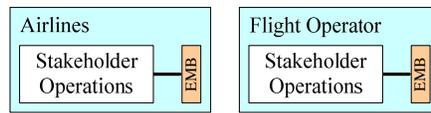


Figure 5: Ground-based NextGen Consumers

The Airport box represents airport operators who share information on the net-centric grid provided by NextGen in order to provide benefits from gate to gate. International ATC represents foreign providers of aviation services that collaborate with NextGen. Both of these entities are shaded with a bright blue to indicate non-federal partners.

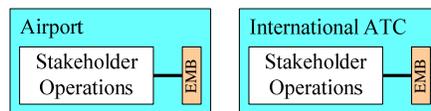


Figure 6: NextGen Non-Federal Partners

The Military box represents the military as a consumer of NextGen services, and the Military (Partner) box represents military ATC functions that are integrated with NextGen. Other Government Agencies include any agency that interacts with the National Airspace System (NAS), such as, law enforcement and the Department of Homeland Security (DHS). NWS provides and receives raw weather data. It also interacts with the NextGen Weather Information Management function to develop aviation-related products. These entities are shaded purple to indicate federal partners.

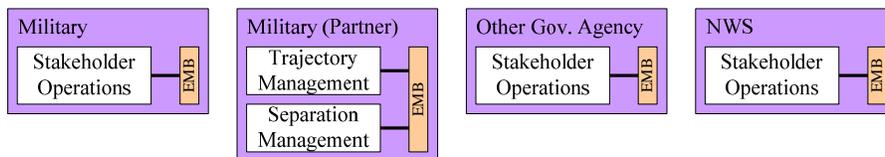


Figure 7: NextGen Federal Partners

Third Party Providers provide a commercial outlet for NextGen information. The Contractor box represents those flight planning services that are contracted out. The Vendors box represents entities that provide weather information to NextGen. These entities are shaded darker blue to indicate commercial partners.

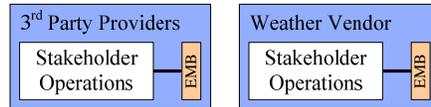


Figure 8: NextGen Commercial Partners

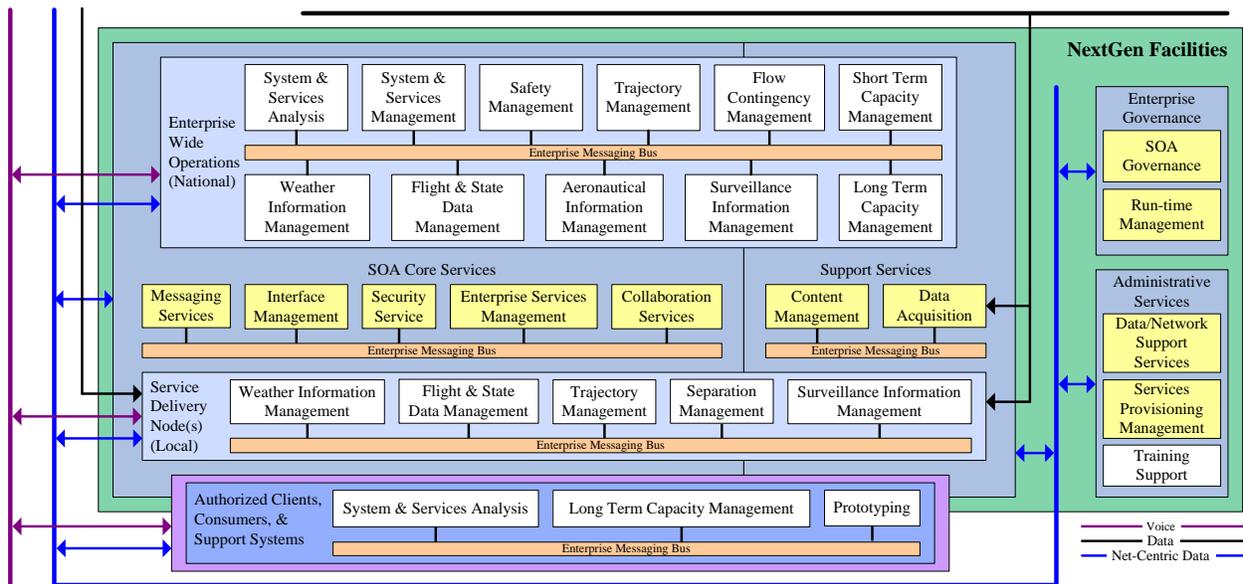


Figure 9: NextGen Facilities

The fourth area is below the remote facilities, and consists of the functions located at NextGen facilities, which are major operations centers. They are surrounded by a green box to indicate that they are part of the NAS. These functions are segmented into seven groups. Enterprise Wide Operations consists of those functions that are national in scope. Service Delivery Node(s) consists of those functions that are local in scope.

SOA Core Services provides the infrastructure support for net-centric operations. These services are transparent to the operations of the other functions. Support Services consists of net-centric services that support the Enterprise Wide and Service Delivery applications by providing data acquisition and content management (management of data distribution, subscription services, and request/reply).

Enterprise Governance manages the development and operation of the SOA environment. Administrative Services manages the databases, networks, and services of the SOA environment. Detailed descriptions of these services are given in the SV-4.

Authorized Clients, Consumers, & Support Systems include those third party agents that support the development and operation of NextGen. It represents both contractor elements and other government agencies, such as NASA, and is therefore colored dark blue (to match the Third Party Providers and Contractors along the left side) with a purple border (to match the other federal elements along the left side). Unlike the partners shown in Figures 6 through 8, these partners would be connected to NextGen at points within the firewall.

It should be noted that arrows which touch the perimeter of a box that contains multiple functions implies that all functions in that box are connected to the associated network.

Some functions appear in more than one grouping. These include the following:

Function	Enterprise Wide	Service Delivery	Authorized Clients
Weather Information Management	Integrates the local weather data into a national product. Provides support to enterprise-wide functions, including climatology analysis.	Develops the local portion of the weather products. Provides time-sensitive data to critical local functions.	
Surveillance Information Management	Integrates the local surveillance data into a national product. Provides support to enterprise-wide functions, including Trajectory Management.	Develops the local portion of the surveillance products. Provides time-sensitive data to critical local functions.	
Trajectory Management	Manages the aggregate of 4-D trajectories in support of plans developed by Short Term Capacity Management and Flow Contingency Management.	Manages 4-D trajectories at the local level in support of plans developed by Short Term Capacity Management and Flow Contingency Management, including adjusting trajectories to sequence traffic.	
Flight & State Data Management	National flight plan filing and flight data distribution, including interaction with International ATC. Is the national repository for flight plans, 4-D trajectories, and flight status data.	Performs the same Local flight plan filing functions as the national version, but at the local level.	

Function	Enterprise Wide	Service Delivery	Authorized Clients
System & Services Analysis	Records all system and operational data for analysis and investigation purposes. Provides the capability to access and analyze recorded data.		Can be assigned to record selected system and operational data for analysis and investigation purposes. Provides the capability to access and analyze recorded data.
Long Term Capacity Management	Provides for the development of procedures, concepts, and airspace configuration to improve system capacity.		Provides analytical support for the Enterprise Wide Operations Long Term Capacity Management.

While some functions are shown at both the enterprise wide and service delivery levels, no explicit assumption has been made regarding the location of functions at separate facilities. The distinction is intended to indicate scope of operation. However, it was assumed that some functions, such as Weather Information Management and Surveillance Information Management, will be implemented on a distributed basis to address latency issues, and the national versions are intended to integrate the various distributed parts. The exact implementation strategy is to be determined.

Supplemental Diagrams

The following sections will describe the individual NextGen functions and their interfaces using supplemental diagrams and tables listing the inputs and outputs of each function. The diagram for each function shows a proposed decomposition into functions and services, along with those functions that provide data to, and receive data from the function. The decomposition was primarily derived from the Concept of Operations for the Next Generation Air Transportation System, Version 2.0, dated June 13, 2007, and is consistent with the latest decomposition done by a team of Chief Systems Engineers.

The decomposition included in this document is an unofficial decomposition which, along with the information exchanges, is intended to provide context for the system interface description. The OV-3³ documents the same information exchanges, and will be expanded in the future to include the characteristics of those exchanges. The sub-functions and services that form the decomposition are shown as green ovals. Grey ovals indicate that the function or service is assumed not to be active in that diagram except in support of business continuity.

The mechanism for the data output of each function is either Data Acquisition or Content Management, which are net-centric Support Services that are integrated into each system function. Which service is used depends on the data type and the circumstances. Data Acquisition is used for raw data collection such as surveillance, weather, and system status data. Content Management is used for operational outputs, such as flight plans, trajectories, integrated weather, integrated surveillance, aeronautical information, etc.

Because the Support Services are integrated with the system functions, separate supplemental diagrams are not provided. The details of their operation in conjunction with specific system functions are left to service-level and program-level architectures.

The focus of the diagrams is on data communications, but they have been annotated with symbols to indicate where voice communications would also apply. This has two purposes: 1) it provides details of the voice interactions that are shown on the main SV-1 diagram, and 2) it shows which voice interactions are recorded by the System & Services Analysis function. Voice communications between the operational entities related to the major functions are indicated by purple diamonds attached to the data communication arrows. A purple circle with an “R” indicates a connection for voice recording and playback.

Each function has a border to indicate the category of stakeholder it belongs to. This correlates with the colors used in the SV-1p, with green representing NextGen elements.

³ Because the SV-1 is based on functions rather than systems, and the functions are operationally oriented, a decision was made to use the OV-3 instead of the SV-6, and to capture information flows among high-level functions instead of among operational activities. This is an adaptive tailoring of the standard DoDAF model.

Aeronautical Information Management (AIM)

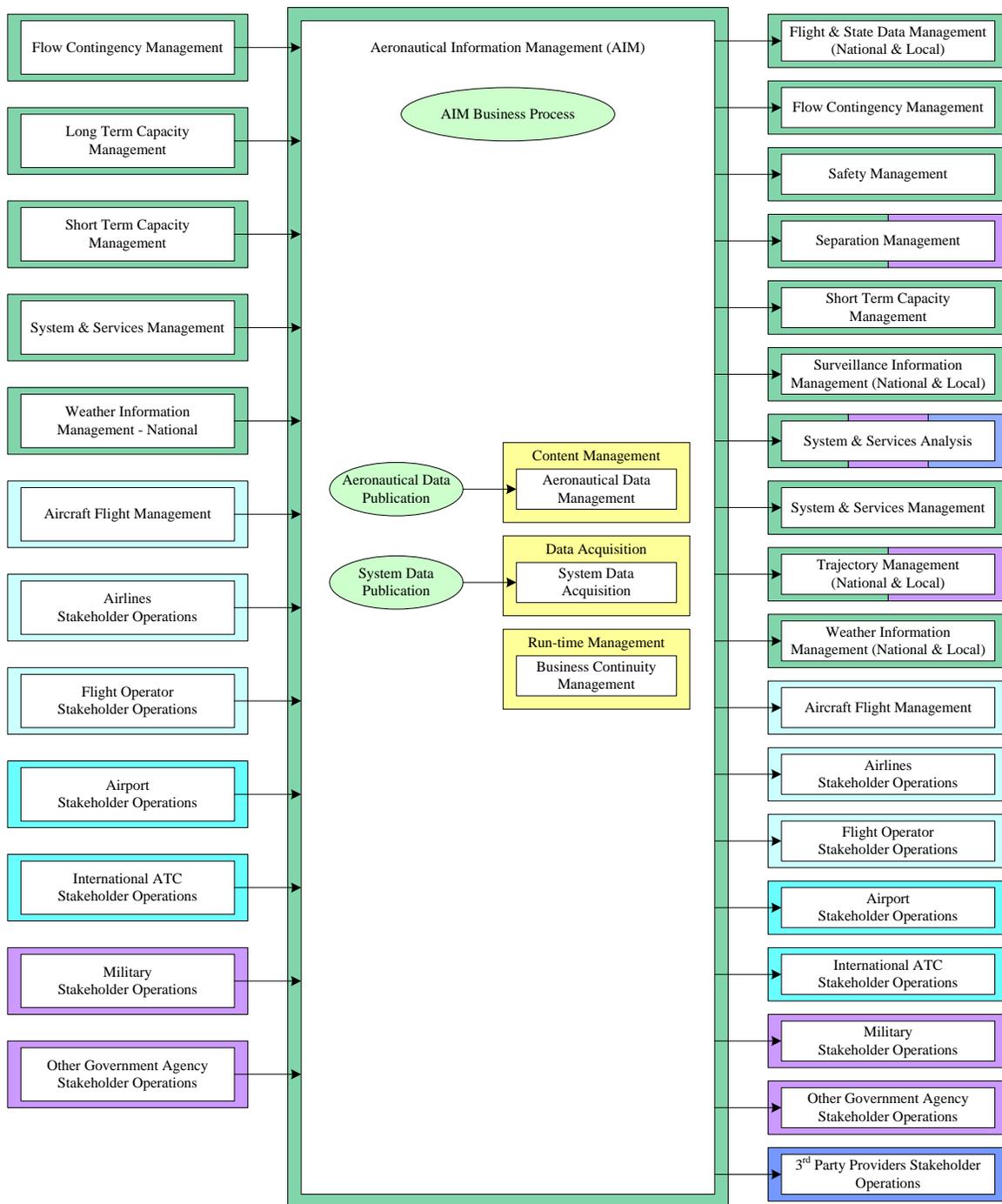


Figure 10: Aeronautical Information Management (AIM)

Aeronautical Information Management is decomposed into the following main functions: Aeronautical Data Publication and System Data Publication. There is also an AIM Business Process to orchestrate the operations of the function. The function is supported by the following

Support Services: Aeronautical Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
29	Aircraft Flight Management	NOTAM Inputs
39	Airlines Stakeholder Operations	NOTAM Inputs
48	Airport Stakeholder Operations	Airport Status
83	Flight Operator Stakeholder Operations	NOTAM Inputs
93	Flow Contingency Management	Flow Management Decisions
107	International ATC Stakeholder Operations	Aeronautical Information
118	Long Term Capacity Management	Aeronautical Information
127	Military Stakeholder Operations	Airspace Restrictions
128	Military Stakeholder Operations	NOTAM Inputs
157	Other Government Agency Stakeholder Operations	NOTAM Inputs
180	Short Term Capacity Management	Flow Management Decisions
225	System & Services Management	Service Status
267	Weather Information Management - National	Weather Information

NOTAM inputs are general reports from consumers that are appropriate for dissemination as a NOTAM.

The outputs are as follows:

#	Receiving Function	Information Name
3	3rd Party Providers Stakeholder Operations	Aeronautical Information
4	Aircraft Flight Management	Aeronautical Information
5	Airlines Stakeholder Operations	Aeronautical Information
6	Airport Stakeholder Operations	Aeronautical Information
7	Flight & State Data Management - Local	Aeronautical Information
8	Flight & State Data Management - National	Aeronautical Information
9	Flight Operator Stakeholder Operations	Aeronautical Information
10	Flow Contingency Management	Aeronautical Information
11	International ATC Stakeholder Operations	Aeronautical Information
12	Military Separation Management	Aeronautical Information
13	Military Stakeholder Operations	Aeronautical Information
14	Military Trajectory Management - Local	Aeronautical Information
15	Other Government Agency Stakeholder Operations	Aeronautical Information
16	Safety Management	Aeronautical Information
17	Separation Management	Aeronautical Information
18	Short Term Capacity Management	Aeronautical Information
19	Surveillance Information Management - Local	Aeronautical Information
20	Surveillance Information Management - National	Aeronautical Information
21	System & Services Analysis	Aeronautical Information
22	System & Services Analysis	System Status
23	System & Services Management	System Status
24	Trajectory Management - Local	Aeronautical Information
25	Trajectory Management - National	Aeronautical Information
26	Weather Information Management - Local	Aeronautical Information
27	Weather Information Management - National	Aeronautical Information

Flight & State Data Management - Local (F&SDM-L)

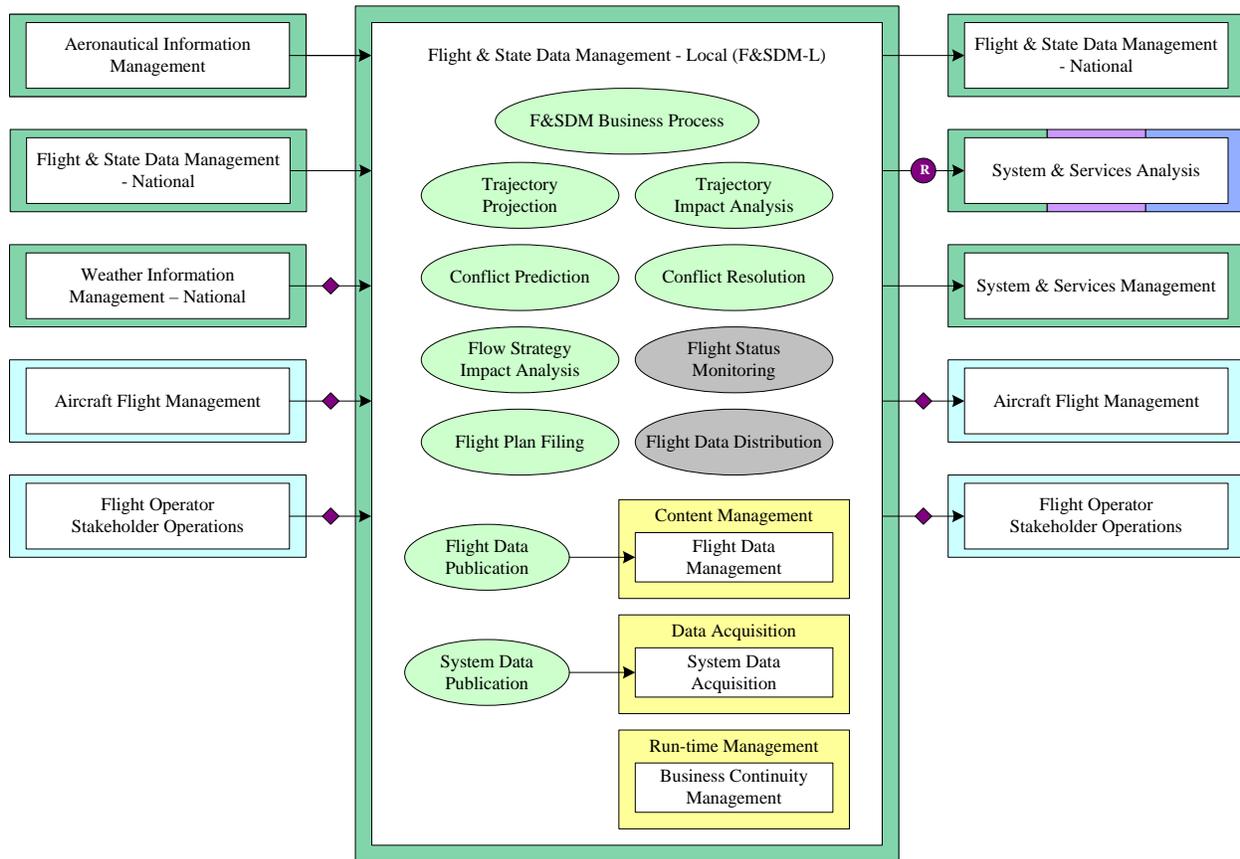


Figure 11: Flight & State Data Management - Local (F&SDM-L)

Flight & State Data Management - Local is decomposed into the following main functions: Trajectory Projection, Trajectory Impact Analysis, Conflict Prediction, Conflict Resolution, Flow Strategy Impact Analysis, Flight Plan Filing, Flight Status Monitoring, Flight Data Distribution, Flight Data Publication, and System Data Publication. The Flight Status Monitoring and Flight Data Distribution functions are primarily used at the national level, but are included to support business continuity. There is also a F&SDM Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Flight Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
7	Aeronautical Information Management	Aeronautical Information
30	Aircraft Flight Management	Flight Information
67	Flight & State Data Management - National	Flight Information
85	Flight Operator Stakeholder Operations	Flight Information
271	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
58	Aircraft Flight Management	Flight Information
59	Flight & State Data Management - National	Flight Information
60	Flight Operator Stakeholder Operations	Flight Information
61	System & Services Analysis	Flight Information
62	System & Services Analysis	System Status
63	System & Services Management	System Status

Flight & State Data Management - National (F&SDM-N)

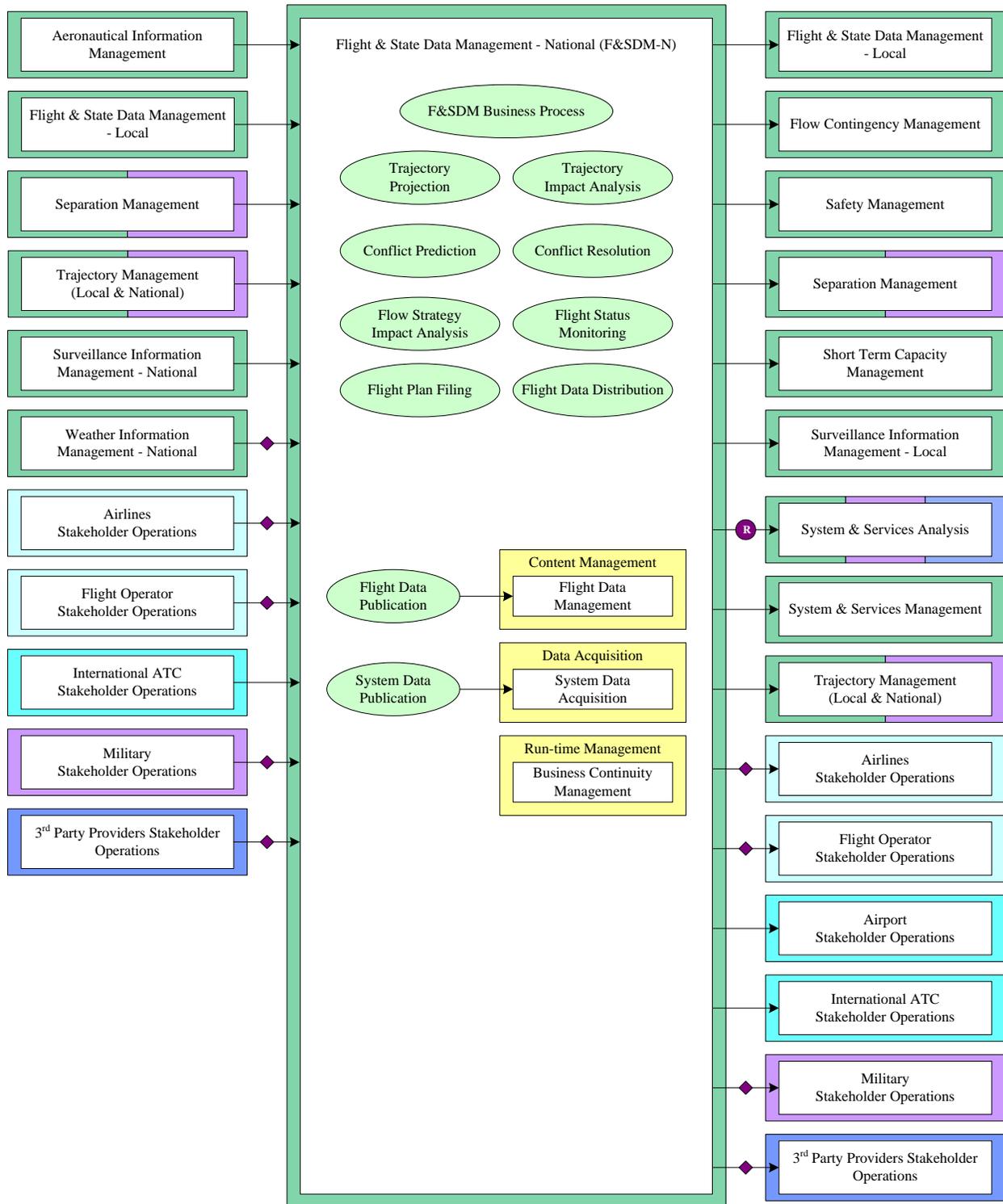


Figure 12: Flight & State Data Management - National (F&SDM-N)

Flight & State Data Management - National is decomposed into the following main functions: Trajectory Projection, Trajectory Impact Analysis, Conflict Prediction, Conflict Resolution, Flow Strategy Impact Analysis, Flight Plan Filing, Flight Status Monitoring, Flight Data Distribution, Flight Data Publication, and System Data Publication. There is also a F&SDM Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Flight Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
1	3rd Party Providers Stakeholder Operations	Flight Information
8	Aeronautical Information Management	Aeronautical Information
40	Airlines Stakeholder Operations	Flight Information
59	Flight & State Data Management - Local	Flight Information
86	Flight Operator Stakeholder Operations	Flight Information
108	International ATC Stakeholder Operations	Flight Information
121	Military Separation Management	Control Information
129	Military Stakeholder Operations	Flight Information
140	Military Trajectory Management - Local	Control Information
175	Separation Management	Control Information
206	Surveillance Information Management - National	Processed Surveillance Information
234	Trajectory Management - Local	Control Information
246	Trajectory Management - National	Control Information
272	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
64	3rd Party Providers Stakeholder Operations	Flight Information
65	Airlines Stakeholder Operations	Flight Information
66	Airport Stakeholder Operations	Flight Information
67	Flight & State Data Management - Local	Flight Information
68	Flight Operator Stakeholder Operations	Flight Information
69	Flow Contingency Management	Flight Information
70	International ATC Stakeholder Operations	Flight Information
71	Military Separation Management	Flight Information
72	Military Stakeholder Operations	Flight Information
73	Military Trajectory Management - Local	Flight Information
74	Safety Management	Flight Information
75	Separation Management	Flight Information
76	Short Term Capacity Management	Flight Information
77	Surveillance Information Management - Local	Flight Information
78	System & Services Analysis	Flight Information
79	System & Services Analysis	System Status
80	System & Services Management	System Status
81	Trajectory Management - Local	Flight Information
82	Trajectory Management - National	Flight Information

Flow Contingency Management (FCM)



Figure 13: Flow Contingency Management (FCM)

Flow Contingency Management is decomposed into the following main functions: Demand Projection, Capacity Assessment, Constraint Assessment, Stakeholder Collaboration, Airspace

Reconfiguration, Trend Analysis, Flow Corridors, Slot Management, Flow Optimization, Flow Data Publication and System Data Publication. There is also a FCM Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Flow Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
10	Aeronautical Information Management	Aeronautical Information
41	Airlines Stakeholder Operations	Collaboration Support Information
49	Airport Stakeholder Operations	Collaboration Support Information
69	Flight & State Data Management - National	Flight Information
87	Flight Operator Stakeholder Operations	Collaboration Support Information
109	International ATC Stakeholder Operations	Collaboration Support Information
130	Military Stakeholder Operations	Airspace Restrictions
158	Other Government Agency Stakeholder Operations	Airspace Restrictions
166	Safety Management	Safety Issues
184	Short Term Capacity Management	Collaboration Support Information
208	Surveillance Information Management - National	Processed Surveillance Information
226	System & Services Management	Collaboration Support Information
248	Trajectory Management - National	Collaboration Support Information
274	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
93	Aeronautical Information Management	Flow Management Decisions
94	Airlines Stakeholder Operations	Collaboration Support Information
95	Airport Stakeholder Operations	Collaboration Support Information
96	Flight Operator Stakeholder Operations	Collaboration Support Information
97	International ATC Stakeholder Operations	Collaboration Support Information
98	Military Stakeholder Operations	Flow Management Decisions
99	Other Government Agency Stakeholder Operations	Flow Management Decisions
100	Safety Management	Flow Information
101	Short Term Capacity Management	Collaboration Support Information
102	System & Services Analysis	Flow Management Decisions
103	System & Services Analysis	System Status
104	System & Services Management	Collaboration Support Information
105	System & Services Management	System Status
106	Trajectory Management - National	Collaboration Support Information

Long Term Capacity Management (LTCM)

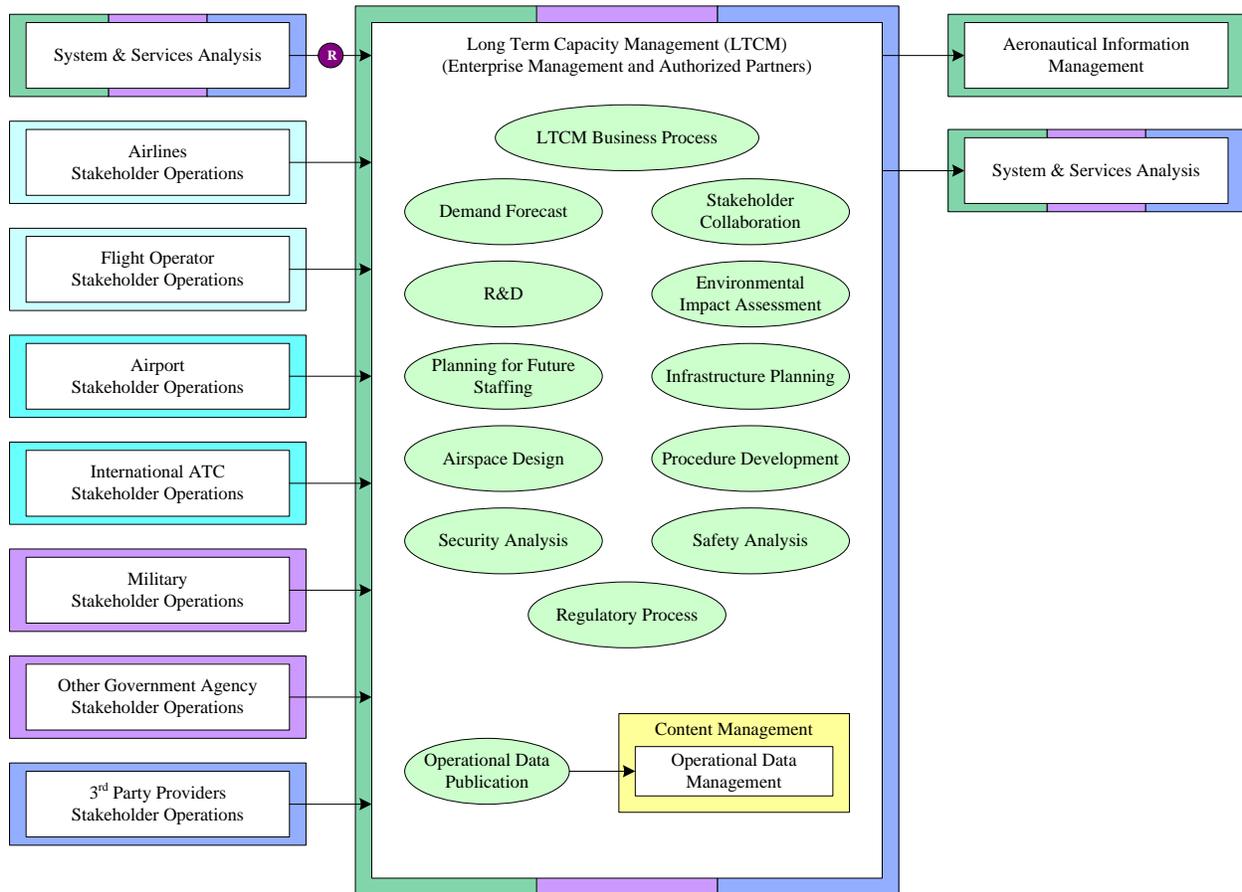


Figure 14: Long Term Capacity Management (LTCM)

Long Term Capacity Management is decomposed into the following main functions: Demand Forecast, Stakeholder Collaboration, R&D, Environmental Impact Assessment, Planning for Future Staffing, infrastructure Planning, Airspace Design, Procedure Development, Security Analysis, Safety Analysis, Regulatory Process, and Operational Data Publication. There is also a LTCM Business Process to orchestrate the operations of the function. The function is supported by the following Support Service: Operational Data Management.

The inputs are as follows:

#	Sending Function	Information Name
2	3rd Party Providers Stakeholder Operations	Consumer Needs
42	Airlines Stakeholder Operations	Consumer Needs
50	Airport Stakeholder Operations	Aeronautical Information
51	Airport Stakeholder Operations	Consumer Needs
88	Flight Operator Stakeholder Operations	Consumer Needs
110	International ATC Stakeholder Operations	Consumer Needs
131	Military Stakeholder Operations	Aeronautical Information
132	Military Stakeholder Operations	Consumer Needs
159	Other Government Agency Stakeholder Operations	Consumer Needs
219	System & Services Analysis	Analysis Data

The outputs are as follows:

#	Receiving Function	Information Name
118	Aeronautical Information Management	Aeronautical Information
119	System & Services Analysis	Proposed System Changes

Navigation Support (NS)

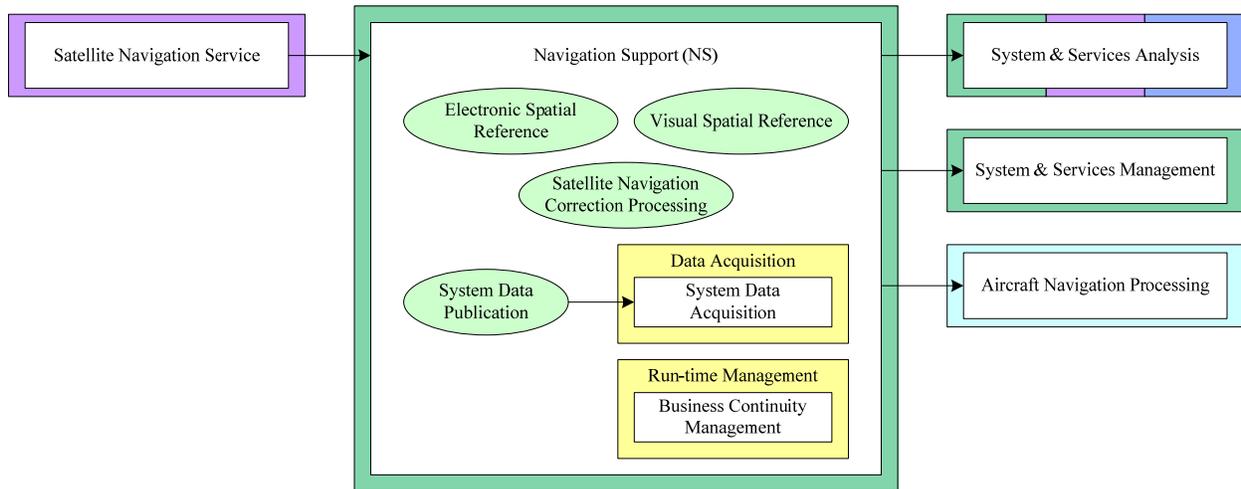


Figure 15: Navigation Support (NS)

Navigation Support is decomposed into the following main functions: Electronic Spatial Reference, Visual Spatial Reference, Satellite Navigation Correction Processing and System Data Publication. There is no Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: System Data Acquisition and Business Continuity Management.

Both the Electronic Spatial Reference and the Satellite Navigation Correction Processing interact directly with the aircraft. The Visual Spatial Reference interacts directly with the pilot, so no data exchanges show up in the tables below.

The inputs are as follows:

#	Sending Function	Information Name
172	Satellite Navigation Service	Navigation Information

The outputs are as follows:

#	Receiving Function	Information Name
149	Aircraft Navigation Processing	Correction Information
150	Aircraft Navigation Processing	Navigation Information
151	System & Services Analysis	Correction Information
152	System & Services Management	Correction Information

Remote System & Services Management (RS&SM)

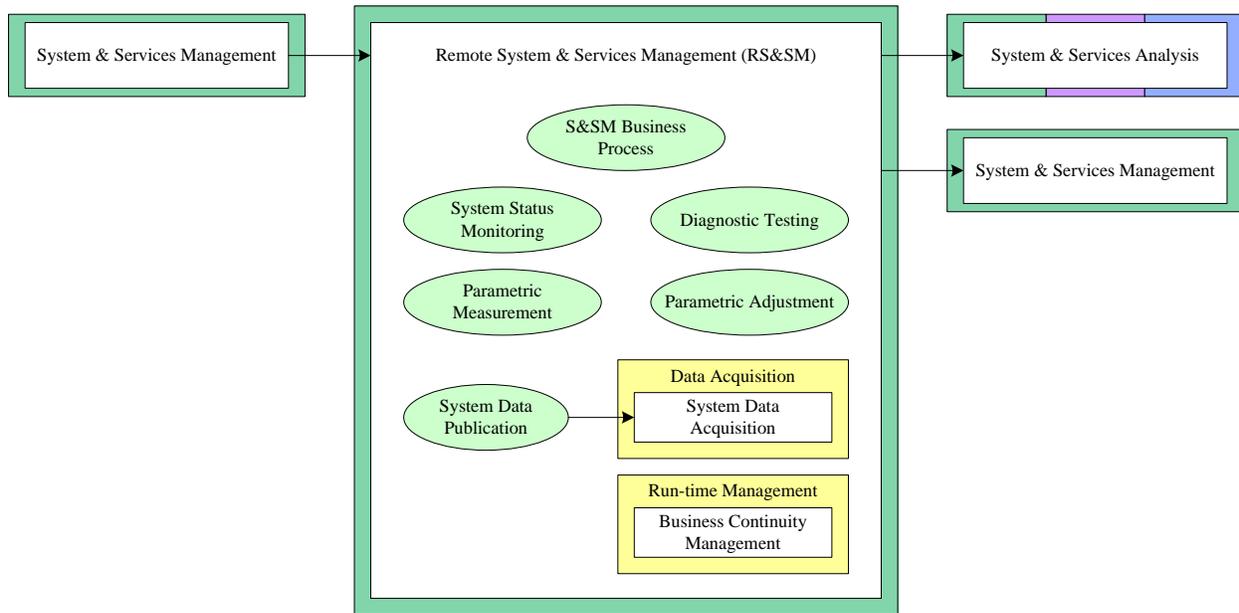


Figure 16: Remote System & Services Management (RS&SM)

Remote System & Services Management (RS&SM) is decomposed into the following main functions: System Status Monitoring, Diagnostic Testing, Parametric Measurement, Parametric Adjustment, and System Data Publication. There is also a S&SM Business Process to orchestrate the operations of the function. RS&SM would be located at the remote facility along with system function it is monitoring. This includes Air/Ground Communications Facilities, Surveillance Facilities, Navigation Facilities, and Weather Facilities. The publication and acquisition services would be located at either the remote facility or a NextGen facility depending on the type and location of the remote facility and its access to the net-centric grid.

The inputs are as follows:

#	Sending Function	Information Name
227	System & Services Management	Maintenance Commands

In addition, some inputs are derived from the monitoring sensors.

The outputs are as follows:

#	Receiving Function	Information Name
164	System & Services Analysis	System Status
165	System & Services Management	System Status

Safety Management

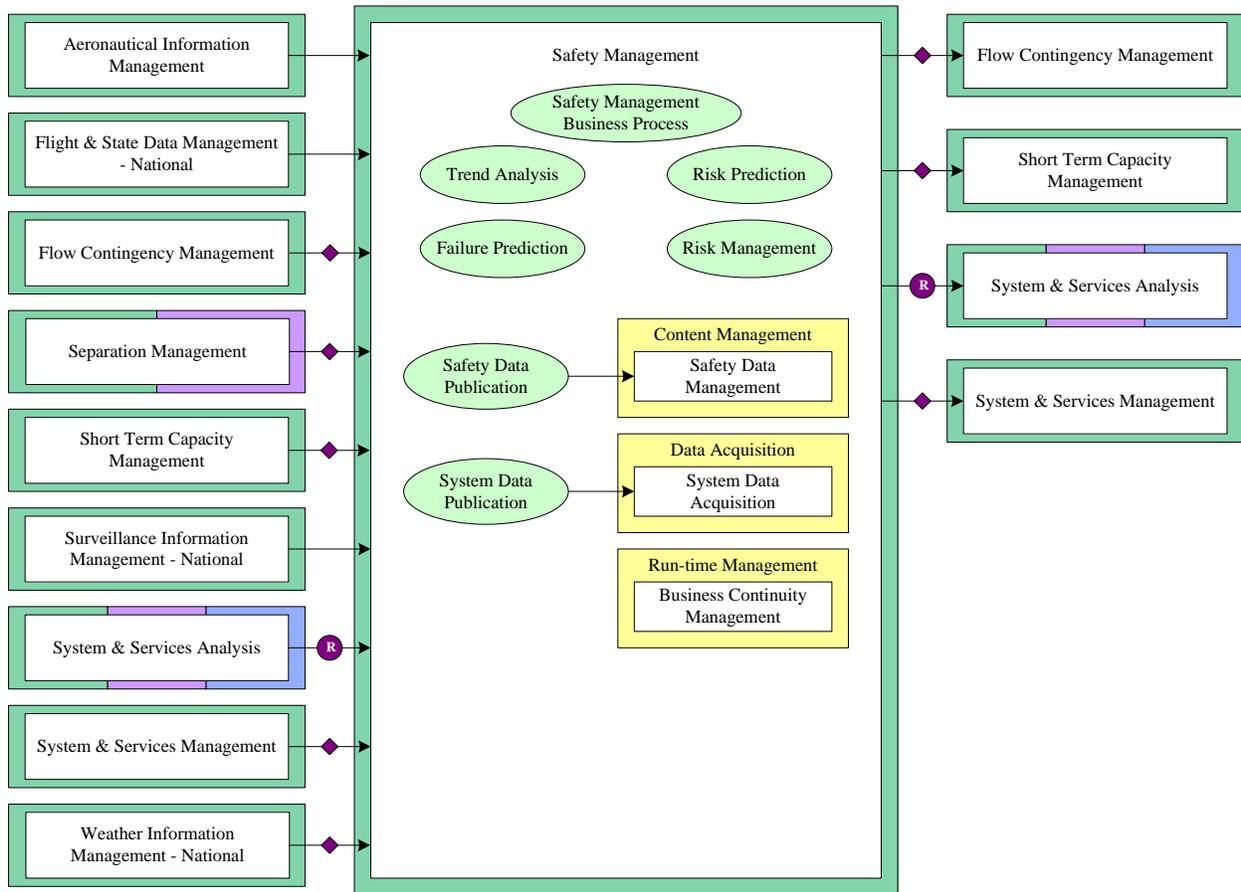


Figure 17: Safety Management

Safety Management is decomposed into the following main functions: Trend Analysis, Failure Prediction, Risk Prediction, Risk Management, Safety Data Publication, and System Data Publication. There is also a Safety Management Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Safety Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
16	Aeronautical Information Management	Aeronautical Information
74	Flight & State Data Management - National	Flight Information
100	Flow Contingency Management	Flow Information
122	Military Separation Management	Control Information
176	Separation Management	Control Information
188	Short Term Capacity Management	Flow Information
213	Surveillance Information Management - National	Processed Surveillance Information
223	System & Services Analysis	Analysis Data
228	System & Services Management	Service Status
280	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
166	Flow Contingency Management	Safety Issues
167	Short Term Capacity Management	Safety Issues
168	System & Services Analysis	Safety Data
169	System & Services Analysis	System Status
170	System & Services Management	Safety Issues
171	System & Services Management	System Status

Separation Management (SM)

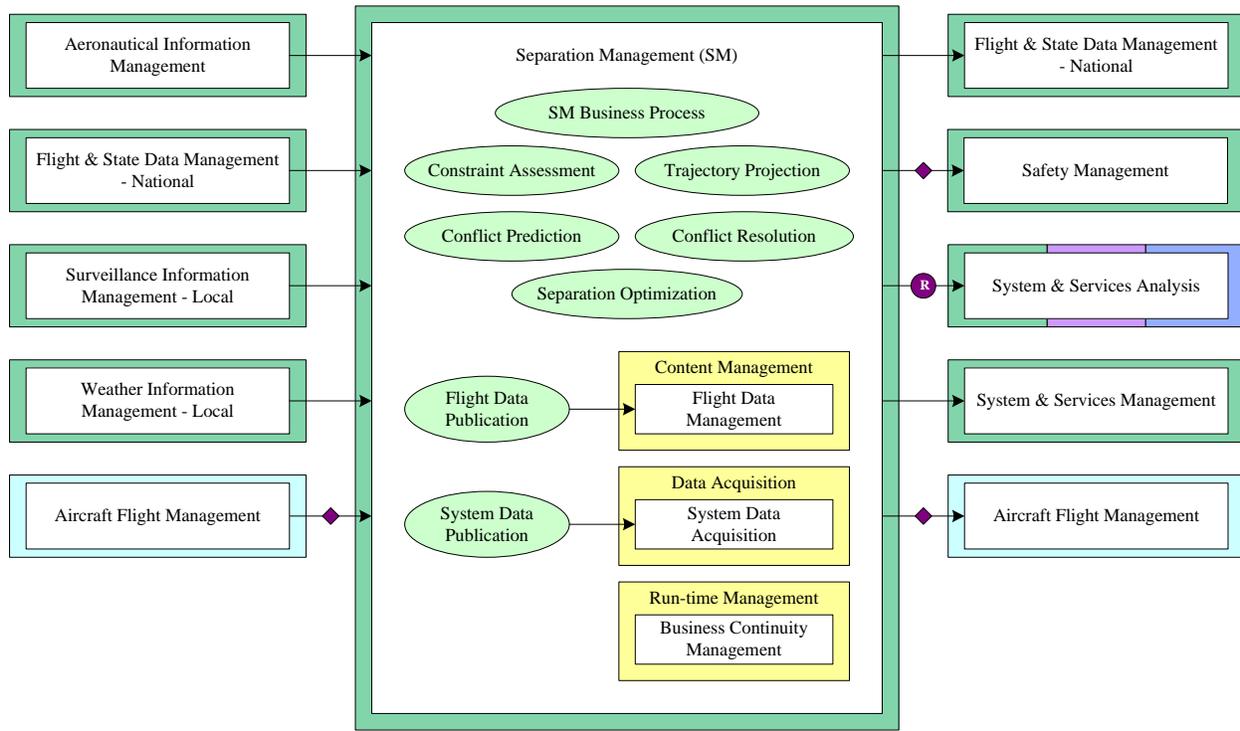


Figure 18: Separation Management (SM)

Separation Management is decomposed into the following main functions: Constraint Assessment, Trajectory Projection, Conflict Prediction, Conflict Resolution, Separation Optimization, Flight Data Publication and System Data Publication. There is also a SM Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Flight Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
17	Aeronautical Information Management	Aeronautical Information
31	Aircraft Flight Management	Collaboration Support Information
75	Flight & State Data Management - National	Flight Information
123	Military Separation Management	Collaboration Support Information
198	Surveillance Information Management - Local	Processed Surveillance Information
261	Weather Information Management - Local	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
174	Aircraft Flight Management	Control Decisions
175	Flight & State Data Management - National	Control Information
176	Safety Management	Control Information
177	System & Services Analysis	Control Information
178	System & Services Analysis	System Status
179	System & Services Management	System Status

Short Term Capacity Management (STCM)



Figure 19: Short Term Capacity Management (STCM)

Short Term Capacity Management is decomposed into the following main functions: Demand Projection, Capacity Assessment, Personnel Allocation, Airspace Reconfiguration, SUA Management, Airspace Restrictions, Capacity Optimization, Flow Data Publication and System Data Publication. There is also a STCM Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Flow Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
18	Aeronautical Information Management	Aeronautical Information
43	Airlines Stakeholder Operations	Collaboration Support Information
53	Airport Stakeholder Operations	Collaboration Support Information
76	Flight & State Data Management - National	Flight Information
90	Flight Operator Stakeholder Operations	Collaboration Support Information
101	Flow Contingency Management	Collaboration Support Information
112	International ATC Stakeholder Operations	Collaboration Support Information
134	Military Stakeholder Operations	Airspace Restrictions
161	Other Government Agency Stakeholder Operations	Airspace Restrictions
167	Safety Management	Safety Issues
229	System & Services Management	Collaboration Support Information
281	Weather Information Management - National	Climatology Information
282	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
180	Aeronautical Information Management	Flow Management Decisions
181	Airlines Stakeholder Operations	Collaboration Support Information
182	Airport Stakeholder Operations	Collaboration Support Information
183	Flight Operator Stakeholder Operations	Collaboration Support Information
184	Flow Contingency Management	Collaboration Support Information
185	International ATC Stakeholder Operations	Collaboration Support Information
186	Military Stakeholder Operations	Airspace Status
187	Other Government Agency Stakeholder Operations	Flow Management Decisions
188	Safety Management	Flow Information
189	System & Services Analysis	Flow Management Decisions
190	System & Services Analysis	System Status
191	System & Services Management	Collaboration Support Information
192	System & Services Management	System Status

Surveillance Data Collection (SDC)

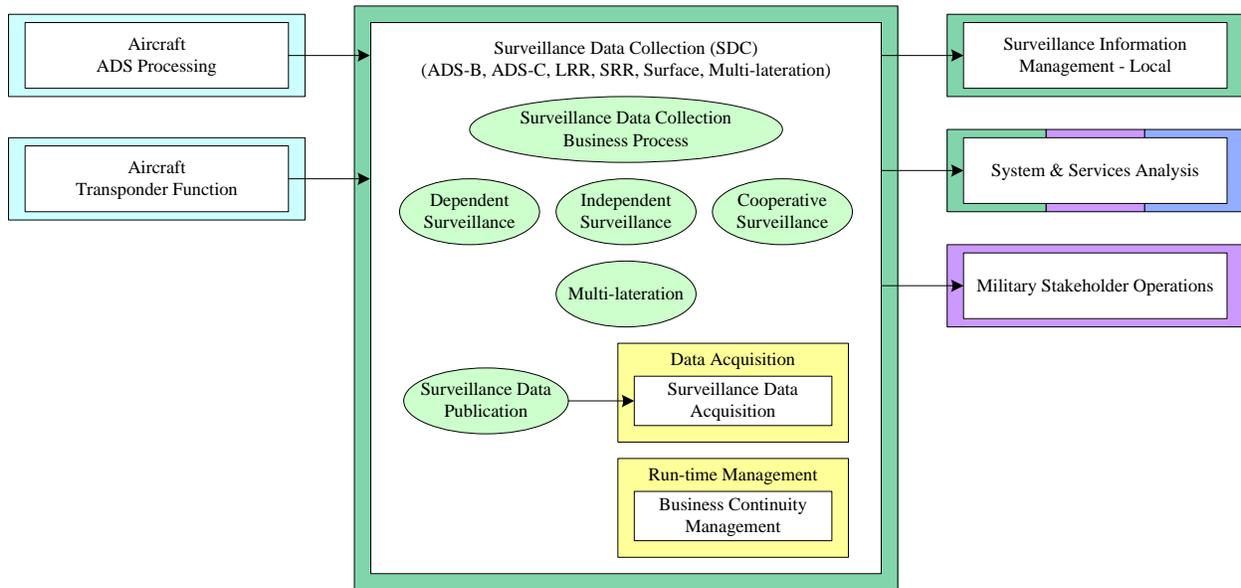


Figure 20: Surveillance Data Collection (SDC)

There are three types of surveillance data collections – dependent surveillance (ADS-B and ADS-C), independent surveillance (primary radar), and cooperative surveillance (secondary or beacon radar). Multi-lateration is a special application of one or more of the three types in areas where line-of-sight coverage is a problem. The collection processing for all three would be located at the remote facility along with business process applications. The publication and acquisition services would be located at a NextGen facility with access to the grid, which could be a remote facility.

The inputs are as follows:

#	Sending Function	Information Name
28	Aircraft ADS Processing	Raw Surveillance Information
37	Aircraft Transponder Function	Raw Surveillance Information

Both the Independent Surveillance and Cooperative Surveillance functions derive position information from returns received by the sensor.

The outputs are as follows:

#	Receiving Function	Information Name
193	Military Stakeholder Operations	Raw Surveillance Information
194	Surveillance Information Management - Local	Raw Surveillance Information
195	System & Services Analysis	Raw Surveillance Information

Surveillance Information Management - Local (SIM-L)

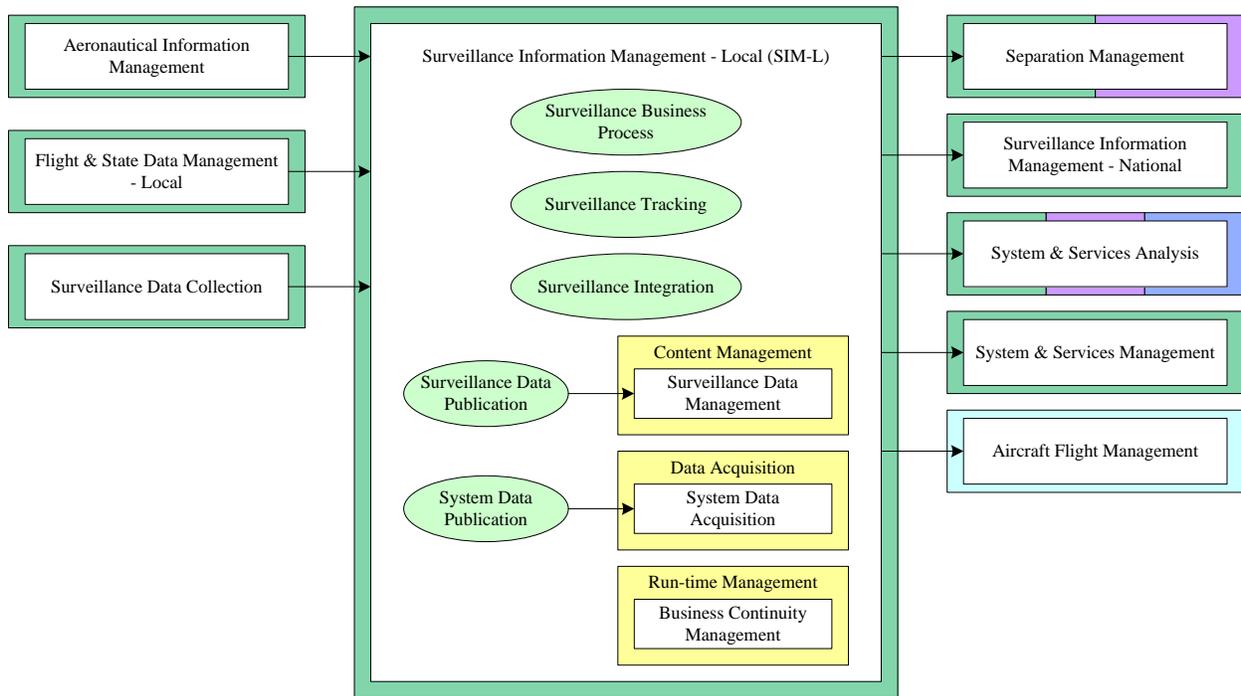


Figure 21: Surveillance Information Management - Local (SIM-L)

Surveillance Information Management - Local is decomposed into the following main functions: Surveillance Tracking, Surveillance Integration, Surveillance Data Publication, and System Data Publication. There is also a Surveillance Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Surveillance Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
19	Aeronautical Information Management	Aeronautical Information
77	Flight & State Data Management - National	Flight Information
194	Surveillance Data Collection	Raw Surveillance Information

The outputs are as follows:

#	Receiving Function	Information Name
196	Aircraft Flight Management	Processed Surveillance Information
197	Military Separation Management	Processed Surveillance Information
198	Separation Management	Processed Surveillance Information
199	Surveillance Information Management - National	Processed Surveillance Information
200	System & Services Analysis	Processed Surveillance Information
201	System & Services Analysis	System Status
202	System & Services Management	System Status

Surveillance Information Management - National (SIM-N)

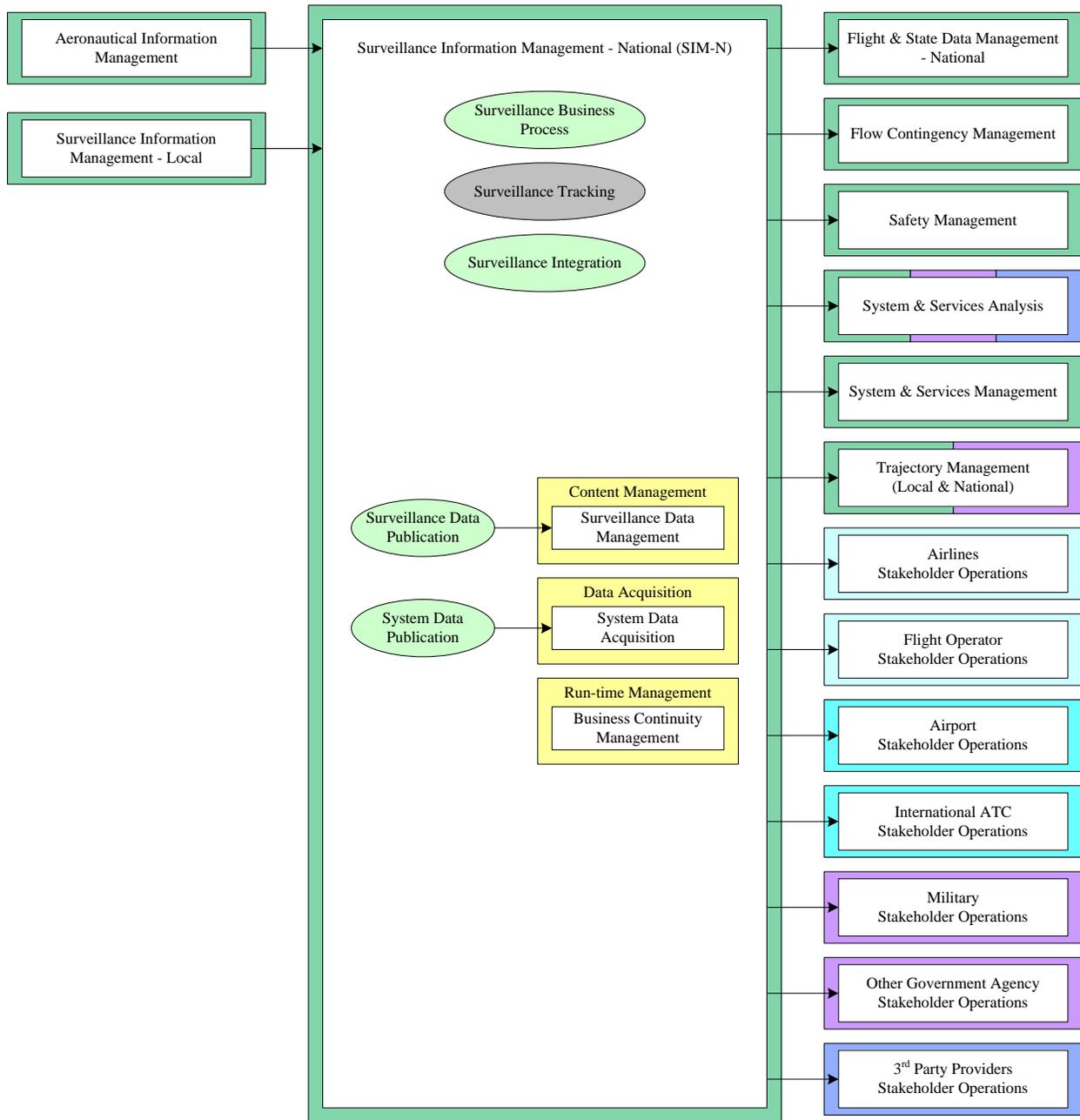


Figure 22: Surveillance Information Management - National (SIM-N)

Surveillance Information Management - National is decomposed into the following main functions: Surveillance Tracking, Surveillance Integration, Surveillance Data Publication, and System Data Publication. The Surveillance Tracking function is primarily used by the local version of the function, but is included to support business continuity. There is also a Surveillance Business Process to orchestrate the operations of the function. The function is

supported by the following Support Services: Surveillance Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
20	Aeronautical Information Management	Aeronautical Information
199	Surveillance Information Management - Local	Processed Surveillance Information

The outputs are as follows:

#	Receiving Function	Information Name
203	3rd Party Providers Stakeholder Operations	Processed Surveillance Information
204	Airlines Stakeholder Operations	Processed Surveillance Information
205	Airport Stakeholder Operations	Processed Surveillance Information
206	Flight & State Data Management - National	Processed Surveillance Information
207	Flight Operator Stakeholder Operations	Processed Surveillance Information
208	Flow Contingency Management	Processed Surveillance Information
209	International ATC Stakeholder Operations	Processed Surveillance Information
210	Military Stakeholder Operations	Processed Surveillance Information
211	Military Trajectory Management - Local	Processed Surveillance Information
212	Other Government Agency Stakeholder Operations	Processed Surveillance Information
213	Safety Management	Processed Surveillance Information
214	System & Services Analysis	Processed Surveillance Information
215	System & Services Analysis	System Status
216	System & Services Management	System Status
217	Trajectory Management - Local	Processed Surveillance Information
218	Trajectory Management - National	Processed Surveillance Information

System & Services Analysis (S&SA)

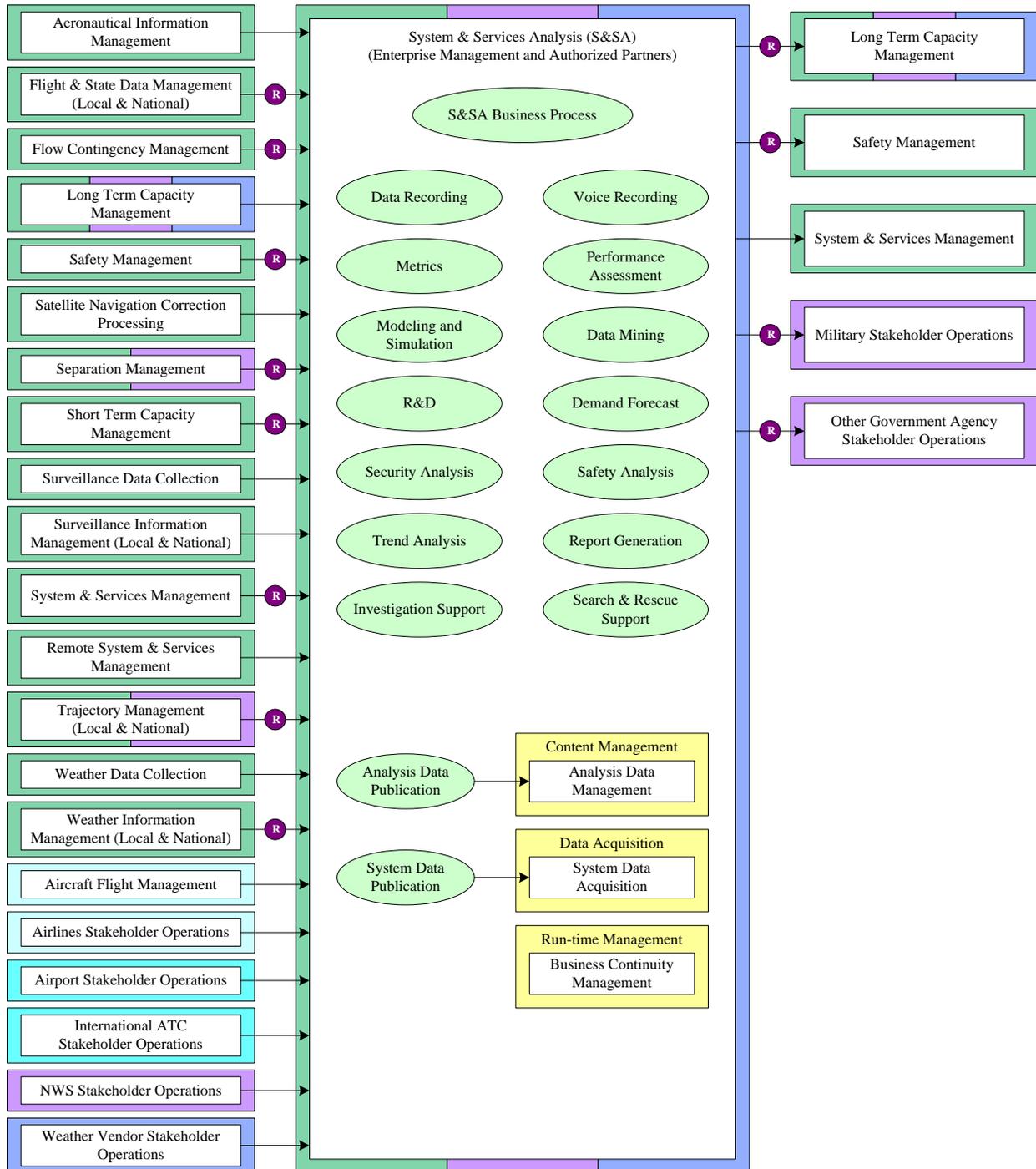


Figure 23: System & Services Analysis (S&SA)

System & Services Analysis is decomposed into the following main functions: Data Recording, Voice Recording, Metrics, Performance Assessment, Modeling and Simulation, Data Mining, R&D, Demand Forecast, Security Analysis, Safety Analysis, Trend Analysis, Report Generation, Investigation Support, Search & Rescue Support, Analysis Data Publication, and System Data Publication. There is also a S&SA Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Analysis Data Management, System Data Acquisition, and Business Continuity Management. The Investigation Support function can be used to support accident investigation or law enforcement and security investigations by coordinating access to recorded data.

The inputs, which are recorded and analyzed, are as follows:

#	Sending Function	Information Name
21	Aeronautical Information Management	Aeronautical Information
22	Aeronautical Information Management	System Status
32	Aircraft Flight Management	System Status
44	Airlines Stakeholder Operations	System Status
54	Airport Stakeholder Operations	System Status
61	Flight & State Data Management - Local	Flight Information
62	Flight & State Data Management - Local	System Status
78	Flight & State Data Management - National	Flight Information
79	Flight & State Data Management - National	System Status
102	Flow Contingency Management	Flow Management Decisions
103	Flow Contingency Management	System Status
113	International ATC Stakeholder Operations	System Status
119	Long Term Capacity Management	Proposed System Changes
124	Military Separation Management	Control Information
125	Military Separation Management	System Status
145	Military Trajectory Management - Local	Control Information
146	Military Trajectory Management - Local	System Status
151	Navigation Support	Correction Information
153	NWS Stakeholder Operations	System Status
164	Remote System & Services Management	System Status
168	Safety Management	Safety Data
169	Safety Management	System Status
177	Separation Management	Control Information
178	Separation Management	System Status
189	Short Term Capacity Management	Flow Management Decisions
190	Short Term Capacity Management	System Status
195	Surveillance Data Collection	Raw Surveillance Information
200	Surveillance Information Management - Local	Processed Surveillance Information
201	Surveillance Information Management - Local	System Status
214	Surveillance Information Management - National	Processed Surveillance Information
215	Surveillance Information Management - National	System Status
230	System & Services Management	Service Status
239	Trajectory Management - Local	Control Information
240	Trajectory Management - Local	System Status
253	Trajectory Management - National	Control Information
254	Trajectory Management - National	System Status
257	Weather Data Collection	Current Weather Parameters
262	Weather Information Management - Local	System Status

#	Sending Function	Information Name
263	Weather Information Management - Local	Weather Information
283	Weather Information Management - National	System Status
284	Weather Information Management - National	Weather Information
289	Weather Vendor Stakeholder Operations	System Status

The outputs are as follows:

#	Receiving Function	Information Name
219	Long Term Capacity Management	Analysis Data
220	Military Stakeholder Operations	Recorded Data & Voice
221	Other Government Agency Stakeholder Operations	Analysis Data
222	Other Government Agency Stakeholder Operations	Recorded Data & Voice
223	Safety Management	Analysis Data
224	System & Services Management	System Status

System & Services Management (S&SM)

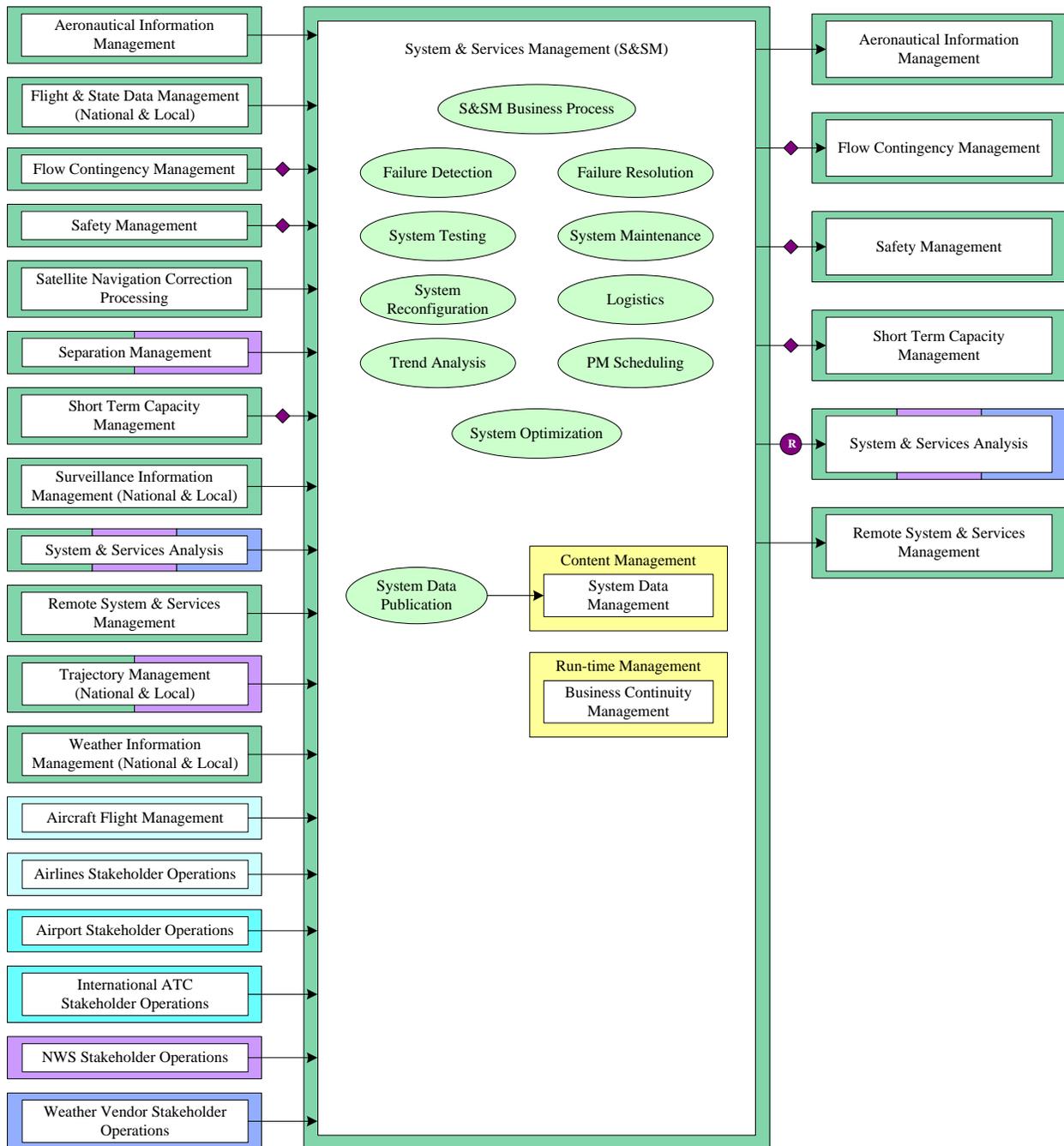


Figure 24: System & Services Management (S&SM)

System & Services Management is decomposed into the following main functions: Failure Detection, Failure Resolution, System Testing, System Maintenance, System Reconfiguration, Logistics, Trend Analysis, PM Scheduling, System Optimization, and System Data Publication.

There is also a S&SM Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: System Data Management and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
23	Aeronautical Information Management	System Status
33	Aircraft Flight Management	System Status
45	Airlines Stakeholder Operations	System Status
55	Airport Stakeholder Operations	System Status
63	Flight & State Data Management - Local	System Status
80	Flight & State Data Management - National	System Status
104	Flow Contingency Management	Collaboration Support Information
105	Flow Contingency Management	System Status
114	International ATC Stakeholder Operations	System Status
126	Military Separation Management	System Status
147	Military Trajectory Management - Local	System Status
152	Navigation Support	Correction Information
154	NWS Stakeholder Operations	System Status
165	Remote System & Services Management	System Status
170	Safety Management	Safety Issues
171	Safety Management	System Status
179	Separation Management	System Status
191	Short Term Capacity Management	Collaboration Support Information
192	Short Term Capacity Management	System Status
202	Surveillance Information Management - Local	System Status
216	Surveillance Information Management - National	System Status
224	System & Services Analysis	System Status
241	Trajectory Management - Local	System Status
255	Trajectory Management - National	System Status
264	Weather Information Management - Local	System Status
285	Weather Information Management - National	System Status
290	Weather Vendor Stakeholder Operations	System Status

The outputs are as follows:

#	Receiving Function	Information Name
225	Aeronautical Information Management	Service Status
226	Flow Contingency Management	Collaboration Support Information
227	Remote System & Services Management	Maintenance Commands
228	Safety Management	Service Status
229	Short Term Capacity Management	Collaboration Support Information
230	System & Services Analysis	Service Status

Trajectory Management - Local (TM-L)



Figure 25: Trajectory Management - Local (TM-L)

Trajectory Management - Local is decomposed into the following main functions: Constraint Assessment, Runway/Stream Assignment, Sequencing, Trajectory Projection, Conflict Prediction, Conflict Resolution, Trajectory Optimization, Flight Data Publication and System Data Publication. There is also a TM Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Flight Data Management, System Data Acquisition, and Business Continuity Management.

The principal difference between the local Trajectory Management and the national Trajectory Management is the scope of operation. Both are capable of managing trajectories from departure point to arrival point, but the local version will more likely be focused on trajectory modifications that resolve regional capacity issues.

The inputs are as follows:

#	Sending Function	Information Name
24	Aeronautical Information Management	Aeronautical Information
34	Aircraft Flight Management	Collaboration Support Information
46	Airlines Stakeholder Operations	Collaboration Support Information
56	Airport Stakeholder Operations	Collaboration Support Information
81	Flight & State Data Management - National	Flight Information
91	Flight Operator Stakeholder Operations	Collaboration Support Information
116	International ATC Stakeholder Operations	Collaboration Support Information
135	Military Stakeholder Operations	Collaboration Support Information
162	Other Government Agency Stakeholder Operations	Collaboration Support Information
217	Surveillance Information Management - National	Processed Surveillance Information
256	Trajectory Management - National	Collaboration Support Information
286	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
231	Aircraft Flight Management	Control Decisions
232	Airlines Stakeholder Operations	Collaboration Support Information
233	Airport Stakeholder Operations	Collaboration Support Information
234	Flight & State Data Management - National	Control Information
235	Flight Operator Stakeholder Operations	Collaboration Support Information
236	International ATC Stakeholder Operations	Collaboration Support Information
237	Military Stakeholder Operations	Collaboration Support Information
238	Other Government Agency Stakeholder Operations	Collaboration Support Information
239	System & Services Analysis	Control Information
240	System & Services Analysis	System Status
241	System & Services Management	System Status
242	Trajectory Management - National	Collaboration Support Information

Trajectory Management - National (TM-N)

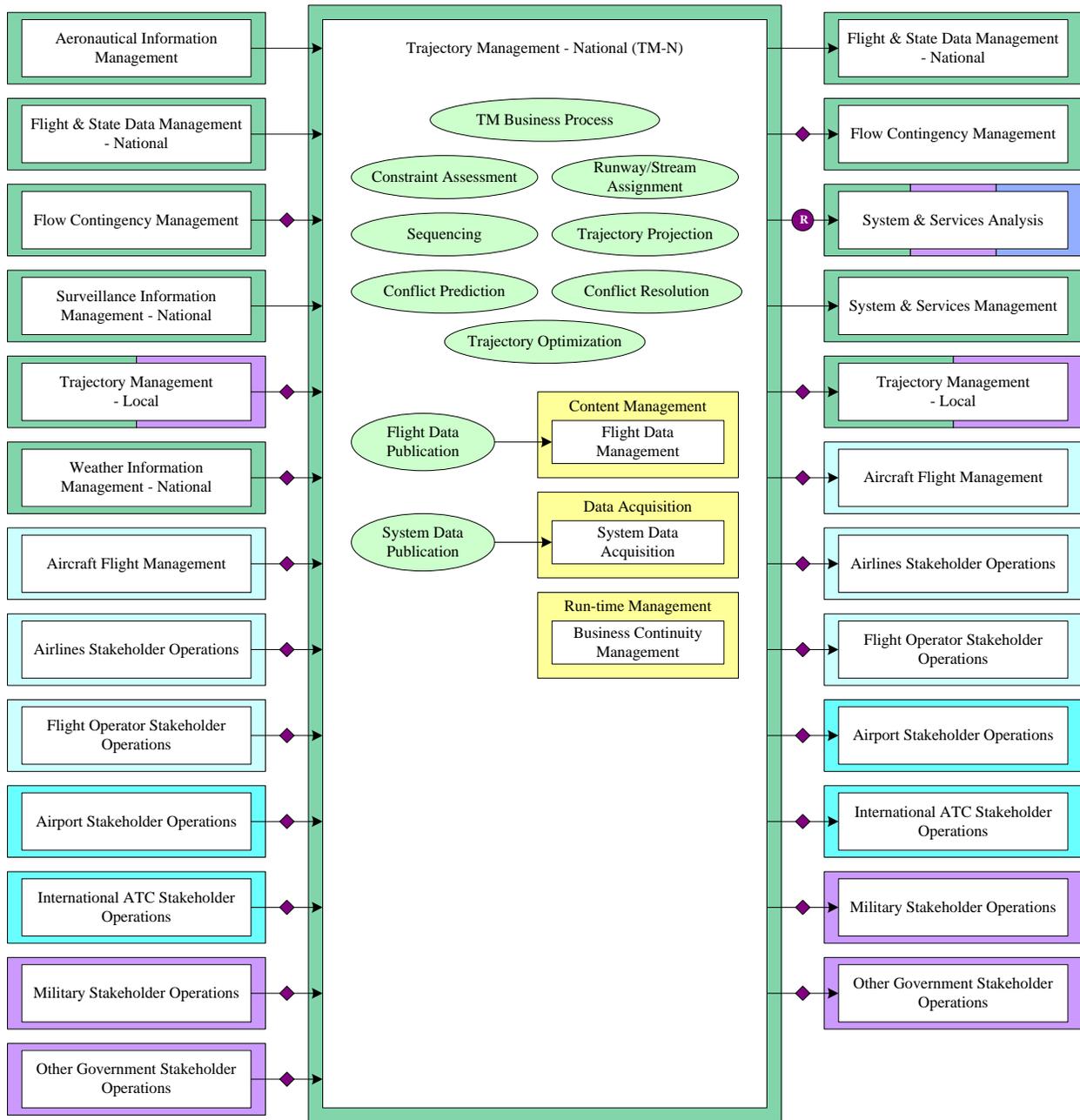


Figure 26: Trajectory Management - National (TM-N)

Trajectory Management - National is decomposed into the following main functions: Constraint Assessment, Runway/Stream Assignment, Sequencing, Trajectory Projection, Conflict Prediction, Conflict Resolution, Trajectory Optimization, Flight Data Publication and System Data Publication. There is also a TM Business Process to orchestrate the operations of the

function. The function is supported by the following Support Services: Flight Data Management, System Data Acquisition, and Business Continuity Management.

The principal difference between the national Trajectory Management and the local Trajectory Management is the scope of operation. Both are capable of managing trajectories from departure point to arrival point, but the national version will more likely be focused on trajectory modifications that resolve national capacity issues.

The inputs are as follows:

#	Sending Function	Information Name
25	Aeronautical Information Management	Aeronautical Information
35	Aircraft Flight Management	Collaboration Support Information
47	Airlines Stakeholder Operations	Collaboration Support Information
57	Airport Stakeholder Operations	Collaboration Support Information
82	Flight & State Data Management - National	Flight Information
92	Flight Operator Stakeholder Operations	Collaboration Support Information
106	Flow Contingency Management	Collaboration Support Information
117	International ATC Stakeholder Operations	Collaboration Support Information
136	Military Stakeholder Operations	Collaboration Support Information
148	Military Trajectory Management - Local	Collaboration Support Information
163	Other Government Agency Stakeholder Operations	Collaboration Support Information
218	Surveillance Information Management - National	Processed Surveillance Information
242	Trajectory Management - Local	Collaboration Support Information
287	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
243	Aircraft Flight Management	Control Decisions
244	Airlines Stakeholder Operations	Collaboration Support Information
245	Airport Stakeholder Operations	Collaboration Support Information
246	Flight & State Data Management - National	Control Information
247	Flight Operator Stakeholder Operations	Collaboration Support Information
248	Flow Contingency Management	Collaboration Support Information
249	International ATC Stakeholder Operations	Collaboration Support Information
250	Military Stakeholder Operations	Collaboration Support Information
251	Military Trajectory Management - Local	Collaboration Support Information
252	Other Government Agency Stakeholder Operations	Collaboration Support Information
253	System & Services Analysis	Control Information
254	System & Services Analysis	System Status
255	System & Services Management	System Status
256	Trajectory Management - Local	Collaboration Support Information

Weather Data Collection (WDC)

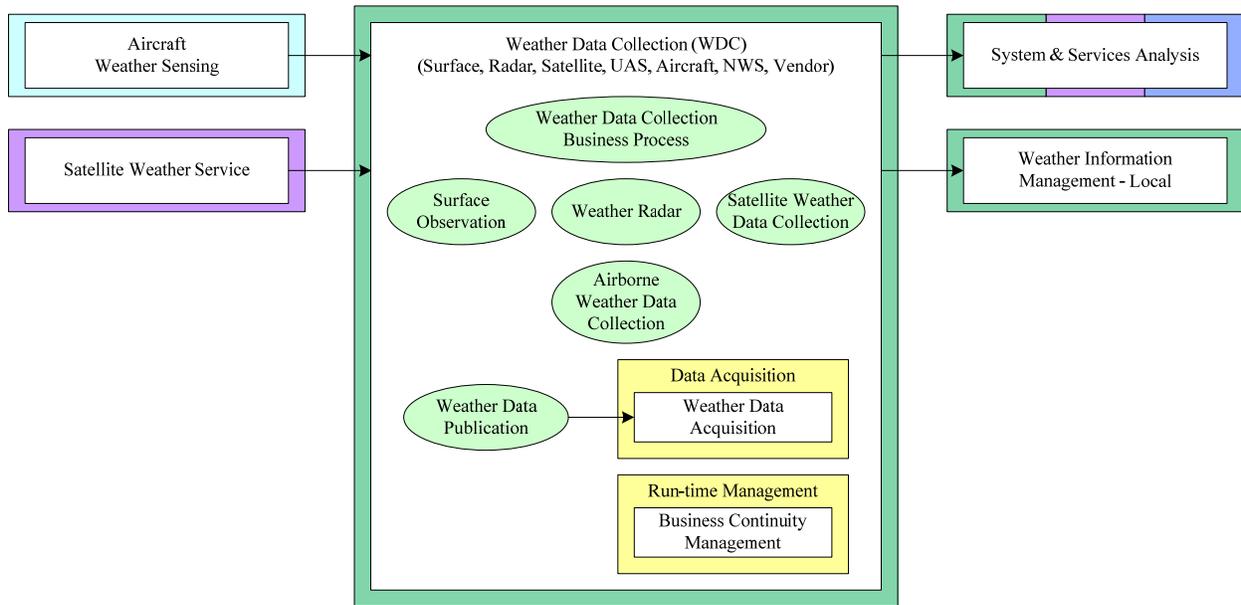


Figure 27: Weather Data Collection (WDC)

There are four types of weather data collections – surface observations, weather radar, satellite weather, and airborne observations. The collection processing, along with business process applications, for surface observations, weather radar, and airborne observations could be located at either a remote facility or a NextGen facility. The collection processing for satellite weather would be located at a NextGen facility. The publication and acquisition services would be located at a NextGen facility with access to the grid, which could be a remote facility.

The inputs are as follows:

#	Sending Function	Information Name
38	Aircraft Weather Sensing	Current Weather Parameters
173	Satellite Weather Service	Current Weather Parameters

Both the Surface Observations and Weather Radar functions derive information from the sensor.

The outputs are as follows:

#	Receiving Function	Information Name
257	System & Services Analysis	Current Weather Parameters
258	Weather Information Management - Local	Current Weather Parameters

Weather Information Management - Local (WIM-L)

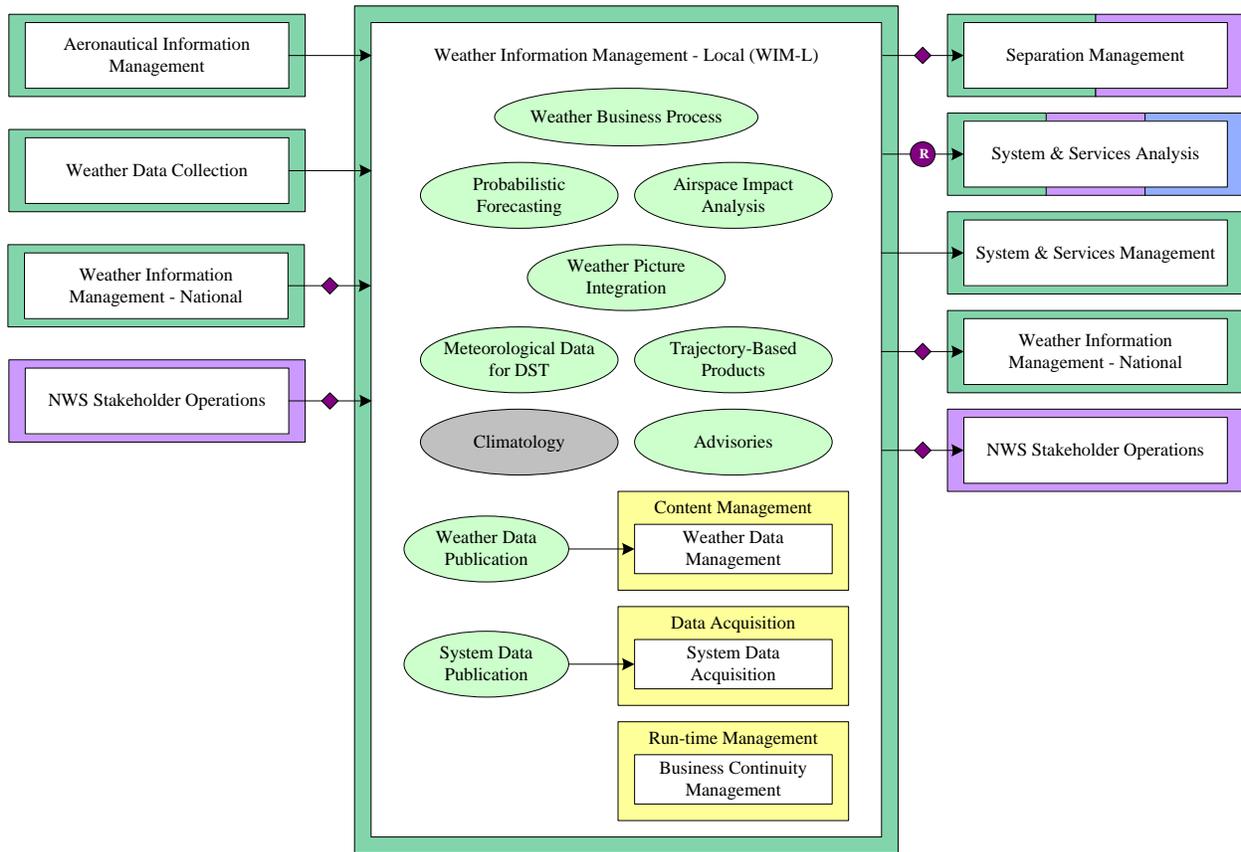


Figure 28: Weather Information Management - Local (WIM-L)

Weather Information Management - Local is decomposed into the following main functions: Weather Picture Integration, Probabilistic Forecasting, Airspace Impact Analysis, Meteorological Data for DST, Trajectory-Based Products, Climatology, Advisories, Weather Data Publication, and System Data Publication. The Climatology function is primarily used at the national level, but is included to support business continuity. There is also a Weather Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Weather Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows (see OV-3 for complete data exchanges):

#	Sending Function	Information Name
26	Aeronautical Information Management	Aeronautical Information
155	NWS Stakeholder Operations	Weather Information
258	Weather Data Collection	Current Weather Parameters
288	Weather Information Management - National	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
259	Military Separation Management	Weather Information
260	NWS Stakeholder Operations	Weather Information
261	Separation Management	Weather Information
262	System & Services Analysis	System Status
263	System & Services Analysis	Weather Information
264	System & Services Management	System Status
265	Weather Information Management - National	Weather Information

Weather Information Management - National (WIM-N)

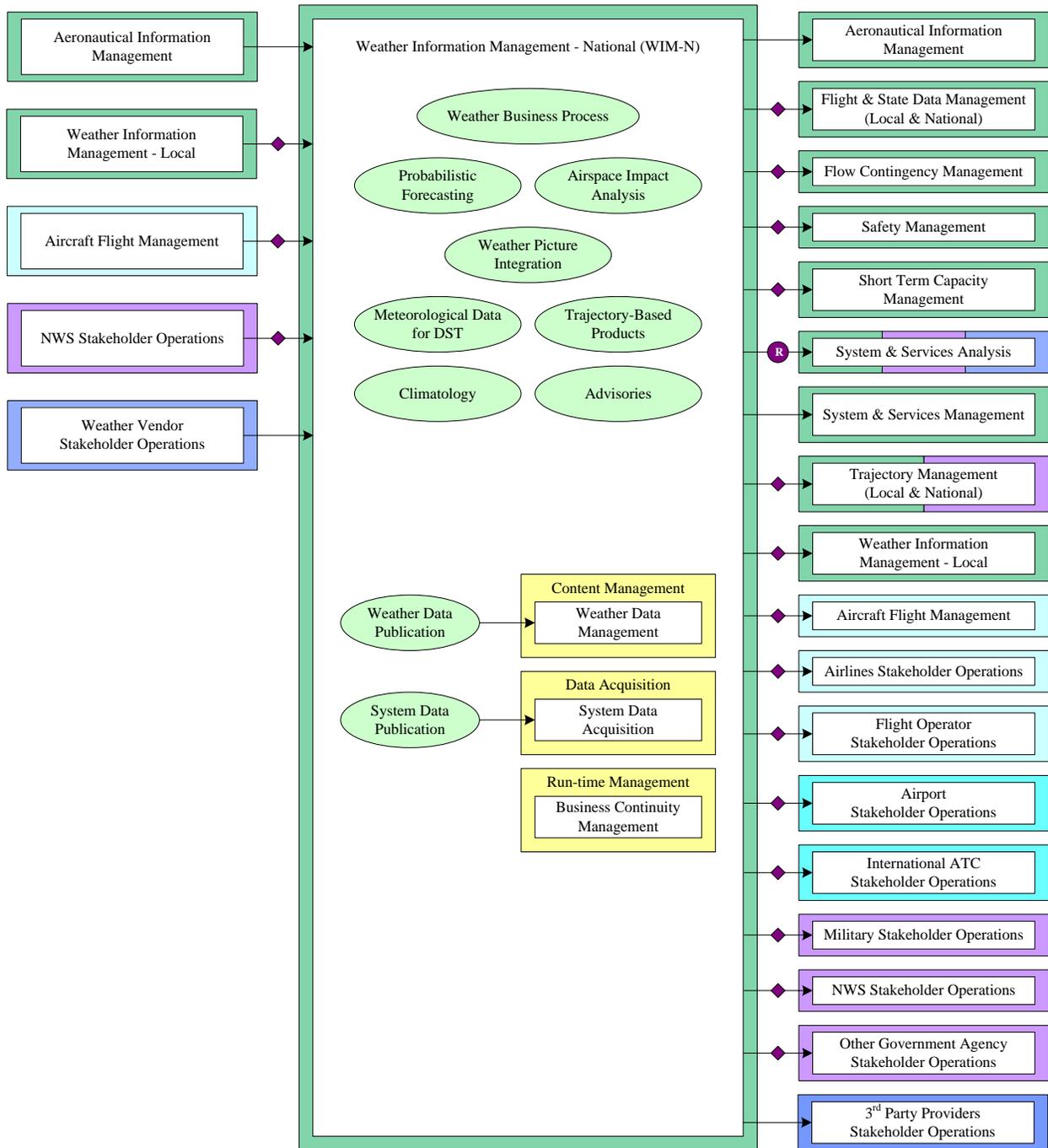


Figure 29: Weather Information Management - National (WIM-N)

Weather Information Management - National is decomposed into the following main functions: Weather Picture Integration, Probabilistic Forecasting, Airspace Impact Analysis, Meteorological Data for DST, Trajectory-Based Products, Climatology, Advisories, Weather

Data Publication, and System Data Publication. There is also a Weather Business Process to orchestrate the operations of the function. The function is supported by the following Support Services: Weather Data Management, System Data Acquisition, and Business Continuity Management.

The inputs are as follows:

#	Sending Function	Information Name
27	Aeronautical Information Management	Aeronautical Information
36	Aircraft Flight Management	PIREPS
156	NWS Stakeholder Operations	Weather Information
265	Weather Information Management - Local	Weather Information
291	Weather Vendor Stakeholder Operations	Weather Information

The outputs are as follows:

#	Receiving Function	Information Name
266	3rd Party Providers Stakeholder Operations	Weather Information
267	Aeronautical Information Management	Weather Information
268	Aircraft Flight Management	Weather Information
269	Airlines Stakeholder Operations	Weather Information
270	Airport Stakeholder Operations	Weather Information
271	Flight & State Data Management - Local	Weather Information
272	Flight & State Data Management - National	Weather Information
273	Flight Operator Stakeholder Operations	Weather Information
274	Flow Contingency Management	Weather Information
275	International ATC Stakeholder Operations	Weather Information
276	Military Stakeholder Operations	Weather Information
277	Military Trajectory Management - Local	Weather Information
278	NWS Stakeholder Operations	Weather Information
279	Other Government Agency Stakeholder Operations	Weather Information
280	Safety Management	Weather Information
281	Short Term Capacity Management	Climatology Information
282	Short Term Capacity Management	Weather Information
283	System & Services Analysis	System Status
284	System & Services Analysis	Weather Information
285	System & Services Management	System Status
286	Trajectory Management - Local	Weather Information
287	Trajectory Management - National	Weather Information
288	Weather Information Management - Local	Weather Information

Acronym List

ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance-Broadcast
ADS-C	Automatic Dependent Surveillance-Contract
AIM	Aeronautical Information Management
ATC	Air Traffic Control
DHS	Department of Homeland Security
DST	Decision Support Tool
F&SDM-L	Flight & State Data Management-Local
F&SDM-N	Flight & State Data Management- National
FCM	Flow Contingency Management
LAAS	Local-Area Augmentation System
LTCM	Long Term Capacity Management
MSM	Military Separation Management
MTM	Military Trajectory Management
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NASEA	National Airspace System Enterprise Architecture
NOTAM	Notice to Airmen
NWS	National Weather Service
PM	Periodic Maintenance
R&D	Research and Development
RS&SM	Remote System & Services Management
S&SA	System & Services Analysis
S&SM	System & Services Management
SAA	Special Activity Airspace
SDC	Surveillance Data Collection
SIM-L	Surveillance Information Management- Local
SIM-N	Surveillance Information Management- National
SM	Separation Management
SOA	Service Oriented Architecture
STCP	Short Term Capacity Management
TM-L	Trajectory Management- Local
TM-N	Trajectory Management- National
UAS	Unmanned Aircraft System
VOR	Very High Frequency Omnidirectional Range
WAAS	Wide-Area Augmentation System
WDC	Weather Data Collection
WIM-L	Weather Information Management- Local
WIM-N	Weather Information Management- National