

# Web Service Description Document (WSDD) Example

## Abstract

This Web Service Description Document (WSDD) is an instructional example of describing a web service the way it is prescribed in FAA-STD-065. The WSDD describes a fictitious “Flight Plan Service” used to file and modify a flight plan.

The FAA Pilot/Controller Glossary (P/CG) defines a flight plan as “specified information relating to the intended flight of an aircraft that is filed orally or in writing with an FSS or an ATC facility.” The example WSDD simulates a scenario wherein a flight plan can also be filed on-line by utilizing a web service.

This document does not attempt to model or suggest a new web service. Therefore, while an effort was made to present a realistic picture of a web service that could be developed for flight planning, a number of logical and technical components that a “real” web service usually requires were purposely omitted to make it easier for a reader to perceive or understand the major notions presented in FAA-STD-065. For the same reason, all technological standards or protocols employed in this example should not be taken as endorsing, recommending, or favoring any technology used in implementing web services.

To make this example complete, the WSDD also includes Appendixes containing a hypothetical flight plan conceptual data model, an associated XML schema, and an example of a submitted (filed) flight plan as rendered in XML. These Appendixes are intended to present the sort of data that might be used by such a web service. The data model, schema and filed flight plan example do not represent any actual artifacts developed or being developed by FAA and should not be used for any purpose except as an instructional aide.

Instances of shaded and bordered paragraphs inserted at several points in this document represent explanatory notes that would not appear in an actual WSDD.



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

**FAA-1-234  
Revision A  
August 10, 2010**

## Web Service Description Document Flight Plan Service (FPS)

## Web Service Description Document Flight Plan Service (FPS)

### Approval Signatures

Name	Organization	Signature	Date Signed
John Smith	FAA En Route Services Modernization Group, ATO-X		

## Web Service Description Document Flight Plan Service (FPS)

This document dated August 10, 2010 supersedes the original document approved May 26, 2010.

### Revision Record

Revision Letter	Description	Revision Date	Entered By
A	Editorial changes to bring document into compliance with FAA-STD-065.	July 30, 2010	Jane Doe

## Table of Contents

1	Scope .....	1
1.1	Background .....	1
2	Applicable Documents .....	1
2.1	Government Documents .....	1
2.2	Non-Government Standards and Other Publications .....	2
3	Definitions .....	2
3.1	Terms and Definitions .....	2
3.2	Acronyms .....	5
4	Web Service Properties and Capabilities .....	6
4.1	Service Profile .....	6
4.1.1	Service Provider .....	7
4.1.1.1	Point of Contact .....	7
4.1.2	Service Consumers .....	7
4.1.2.1	Traffic Modernization Program (TMP) .....	7
4.1.2.2	Alpha Airline .....	7
4.1.3	Service Functionality .....	8
4.1.4	Security .....	8
4.1.4.1	Roles .....	9
4.1.4.2	Access Control Mechanisms .....	10
4.1.4.3	Security Policies .....	10
4.1.5	Qualities of Service .....	10
4.1.6	WSDL Document .....	11
4.2	Service Interfaces .....	12
4.2.1	Types .....	12
4.2.2	Messages .....	17
4.2.2.1	Input/Output Messages .....	17
4.2.2.2	Error Messages .....	17
4.2.3	Operations .....	18
4.2.3.1	Operation FileFlightPlan .....	18
4.2.3.2	Operation CancelFlightPlan .....	19
4.2.3.3	Operation UpdateDestinationAerodrome .....	20
4.2.4	List of Interfaces .....	21
4.3	Service Implementation .....	21
4.3.1	End Points .....	21
4.3.1.1	End Point "HTTPExternalFlightPlanEndPoint" .....	21
4.3.1.1.1	Associated Interface .....	21
4.3.1.1.2	Communication Protocol .....	21
4.3.1.1.3	Messaging Protocol .....	21
4.3.1.1.4	Network Address .....	21
4.3.1.1.5	End Point-Specific Qualities of Service .....	22
	Appendixes .....	23
	Appendix A. FlightPlanService.wsdl .....	23
	Appendix B. FlightPlan.xsd .....	25

Appendix C. FlightPlan.xsd - diagram .....29  
Appendix D. FlightPlan.xml.....31

## List of Figures

Figure 1. FPS Roles.....9  
Figure 2. Flight Plan Data Model..... 12  
Figure 3. Operation FileFlightPlan Sequence Diagram ..... 18  
Figure 4. Operation CancelFlightPlan Sequence Diagram ..... 19  
Figure 5. Operation UpdateDestinationAerodrome Sequence Diagram .....20

## List of Tables

Table 1. Selected Flight Plan Data Elements..... 13  
Table 2. Selected Flight Plan Service Elements ..... 16

## 1 Scope

This Web Service Description Document (WSDD) provides a description of a Flight Plan Service (FPS). This [service](#) gives a [service consumer](#) the capability to file and modify a proposed flight plan operating under Instrument Flight Rules (IFR).

This document was prepared in accordance with FAA-STD-065 [1] .

### 1.1 Background

In today's NAS environment, a flight plan specifies information that describes a desired route of flight between a well-defined departure and destination point within which separation services are required. Additional information provided in the flight plan shows that the proposed flight meets the legal requirements of Instrument Flight Rules (IFR).

The intended outcome of filing an IFR flight plan is to receive air traffic control (ATC) separation services between the departure and destination airports through a subsequent flight plan clearance.

As a part of transitioning toward the Next Generation Air Transportation System (NextGen), the En Route Services Modernization Group (ESMG) has implemented this flight plan filing capability as a web-enabled [service](#). See the original requirements document [3] for more information.

## 2 Applicable Documents

NOTE: Documents [4], [6] and [8] are not specifically cited in this WSDD but rather are included for possible reader interest. Document [3] is fictitious.

### 2.1 Government Documents

- [1] FAA-STD-065, Preparation of Web Service Description Documents, 02/26/10 [http://www.faa.gov/air\\_traffic/nas/system\\_standards/](http://www.faa.gov/air_traffic/nas/system_standards/)
- [2] FAA-STD-066: Web Service Taxonomies, 02/26/10 [http://www.faa.gov/air\\_traffic/nas/system\\_standards/](http://www.faa.gov/air_traffic/nas/system_standards/)
- [3] Flight Plan Service Final Requirements Document (ESMG-123), January 2010 (Available on request from En Route Services Modernization Group)
- [4] ICAO flight plan form (OMB No. 2120-0026), 09/30/06 <http://forms.faa.gov/forms/faa7233-4.pdf>
- [5] NAS System Engineering Manual: Version 3.1:06/06/06 ([http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/operations/sysengsaf/seman/](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/operations/sysengsaf/seman/))

## 2.2 Non-Government Standards and Other Publications

- [6] ICAO Flight Plan Filing Overview (updated July 22, 2009)  
[http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/enroute/flight\\_plan\\_filing/](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/flight_plan_filing/)
- [7] RFC 2828: Internet Security Glossary, Network Working Group: May 2000  
<http://www.ietf.org/rfc/rfc2828.txt>
- [8] W3C XML Schema <http://www.w3.org/XML/Schema>
- [9] Web Services Description Language (WSDL) Version 2.0 Part 1: Core Language, W3C Recommendation 26 June 2007  
<http://www.w3.org/TR/wsdl20>
- [10] RFC 2660: The Secure Hypertext Transfer Protocol, Network Working Group: August 1999 <http://tools.ietf.org/html/rfc2660>
- [11] RFC 5246: The Transport Layer Security (TLS) Protocol Version 1.2, Network Working Group, August 2008, <http://tools.ietf.org/html/rfc5246>
- [12] Web Services Security: UsernameToken Profile 1.0, OASIS Standard 200401, March 2004, <http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0.pdf>
- [13] ANSI/INCITS 359-2004 Information Technology - Role Based Access Control International Committee for Information Technology Standards: 03-Feb-2004,  
<http://www.cs.purdue.edu/homes/ninghui/readings/AccessControl/ANSI+INCITS+359-2004.pdf>
- [14] ISO/IEC 11179-1 Second edition 2004-09-15; <http://metadata-standards.org/11179/>.

## 3 Definitions

### 3.1 Terms and Definitions

NOTE: All definitions are taken from FAA-STD-065 [1] unless otherwise specified.

<b><i>Access Control</i></b>	Protection of system resources against unauthorized access; a process by which use of system resources is regulated according to a <a href="#">security</a> policy and is permitted by only authorized entities.
<b><i>Agent</i></b>	See <a href="#">software agent</a> .
<b><i>Authentication</i></b>	The process of verifying an identity claimed by or for a system entity. [7]

<b><i>Authorization</i></b>	(1) A right or a permission that is granted to a system entity to access a system resource. (2) A procedure for granting such rights. [7]
<b><i>Binding</i></b>	An association between an <a href="#">interface</a> , a concrete protocol and a data format. A binding specifies the protocol and/or data format to be used in transmitting <a href="#">messages</a> defined by the associated interface. [9]
<b><i>Business Function</i></b>	A characteristic action or activity that needs to be performed to achieve a desired objective, or in the context of this standard, to achieve a <a href="#">real world effect</a> .
<b><i>Data Element</i></b>	A unit of data that is considered, in context, to be indivisible.
<b><i>Effect</i></b>	A state or condition that results from interaction with a <a href="#">service</a> . Multiple states may result depending on the extent to which the interaction completes successfully or generates a <a href="#">fault</a> .
<b><i>End Point</i></b>	An association between a fully-specified concrete protocol and/or a data format and a network address, often specified by a <a href="#">URI</a> , that is used to communicate with an instance of a <a href="#">web service</a> .
<b><i>FAA Data Registry (FDR)</i></b>	The official source of the FAA's data standards. The FDR ( <a href="http://fdr.gov/fdr/Home.jsp">http://fdr.gov/fdr/Home.jsp</a> ) is a web-enabled system that provides ready access to the agency's standards and is compliant with the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Standard 11179, Metadata Registries.
<b><i>Fault</i></b>	A condition that causes a functional unit to fail to perform its required <a href="#">business function</a> .
<b><i>Input</i></b>	Data entered into, or the process of entering data into, an information processing system or any of its parts for storage or processing.
<b><i>Interface</i></b>	A logical grouping of <a href="#">operations</a> . An Interface represents an abstract <a href="#">web service</a> type, independent of transmission protocol and data format.
<b><i>Message</i></b>	A basic unit of communication from one web <a href="#">software agent</a> to another sent in a single logical transmission.
<b><i>Operation</i></b>	A set of <a href="#">messages</a> related to a single <a href="#">web service</a> action.
<b><i>Organization</i></b>	A unique framework of authority within which a person or persons act, or are designated to act, towards some purpose.

<b><i>Output</i></b>	Data transferred out of, or the process by which an information processing system or any of its parts transfers data out of, that system or part.
<b><i>Precondition</i></b>	A state or condition that is required to be true before an action can be successfully invoked.
<b><i>Protocol</i></b>	A formal set of conventions governing the format and control of interaction among communicating functional units.
<b><i>Provider Agent</i></b>	A <a href="#">software agent</a> that is capable and empowered to perform the actions associated with a service on behalf of its owner – the <a href="#">service provider</a> .
<b><i>Quality of Service</i></b>	A characteristic or parameter that measures the value of the provided <a href="#">service</a> .
<b><i>Real World Effect</i></b>	An ultimate purpose associated with the interaction with a particular <a href="#">service</a> . It may be the response to a request for information or the change in the state of some entities shared between the participants in the interaction.
<b><i>Registry</i></b>	An enabling infrastructure that uses a formal registration process to store, catalog, and manage metadata relevant to the <a href="#">service</a> . A registry supports the search, identification, and understanding of resources, as well as query capabilities.
<b><i>Requester Agent</i></b>	A <a href="#">software agent</a> that wishes to interact with a <a href="#">provider agent</a> in order to request that a task be performed on behalf of its owner - the <a href="#">service consumer</a> .
<b><i>Role</i></b>	A predefined set of rules establishing the allowed interactions between a <a href="#">service consumer</a> and the <a href="#">service</a> .
<b><i>Role-Based Access Control (RBAC)</i></b>	A form of identity-based access control where the system entities that are identified and controlled are functional positions in an organization or process.
<b><i>Security</i></b>	The protection of information and data so that unauthorized persons or systems cannot read or modify them and authorized persons or systems are not denied access to them.
<b><i>Security Mechanism</i></b>	A process (or a device incorporating such a process) that can be used in a system to implement a <a href="#">security service</a> that is provided by or within the system.
<b><i>Service</i></b>	An implementation-independent reusable operational function that may be discovered as self-describing <a href="#">interfaces</a> , and invoked using open standard protocols across networks.

<b><i>Service Consumer</i></b>	An <a href="#">organization</a> that seeks to satisfy a particular need through the use of capabilities offered by means of a <a href="#">service</a> .
<b><i>Service Criticality</i></b>	A single value that represents the criticality of a <a href="#">service</a> by expressing the significance given to a functional failure of that service. (See also FAA-STD-066 [2] section 5.3.8.)
<b><i>Service Description</i></b>	The information needed in order to use, or consider using, a <a href="#">service</a> .
<b><i>Service Level Agreement (SLA)</i></b>	A set of pre-defined and established expectations for levels of performance, usually realistic and measurable, between a <a href="#">service consumer</a> (s) and a <a href="#">service provider</a> .
<b><i>Service Provider</i></b>	An <a href="#">organization</a> that offers the use of capabilities by means of a <a href="#">service</a> .
<b><i>Software Agent</i></b>	A running program that drives <a href="#">web services</a> , both to implement them and to access them.
<b><i>Uniform Resource Identifier (URI)</i></b>	A compact string of characters for identifying an abstract or physical resource.
<b><i>Uniform Resource Locator (URL)</i></b>	A type of <a href="#">URI</a> that identifies a resource via a representation of its primary access mechanism (e.g., its network "location"), rather than by some other attributes it may have.
<b><i>Web Service</i></b>	A self-describing, self-contained, modular unit of software application logic that provides defined <a href="#">business functionality</a> . Web services are consumable software <a href="#">services</a> that typically include some combination of business logic and data.

## 3.2 Acronyms

<b><i>ATC</i></b>	Air Traffic Control
<b><i>ESMG</i></b>	FAA En Route Services Modernization Group
<b><i>FDR</i></b>	FAA Data Registry
<b><i>FPS</i></b>	Flight Plan Service
<b><i>HTTPS</i></b>	Hypertext Transfer Protocol Secure
<b><i>ICAO</i></b>	International Civil Aviation Organization
<b><i>IFR</i></b>	Instrument Flight Rules
<b><i>NAS</i></b>	National Airspace System

<b><i>RBAC</i></b>	Role-Based Access Control
<b><i>RFC</i></b>	Request For Comments
<b><i>SLA</i></b>	Service Level Agreement
<b><i>SOAP</i></b>	Simple Object Access Protocol
<b><i>TLS</i></b>	Transport Layer Security
<b><i>TMP</i></b>	Traffic Modernization Program
<b><i>URI</i></b>	Uniform Resource Identifier
<b><i>URL</i></b>	Uniform Resource Locator
<b><i>W3C</i></b>	World Wide Web Consortium
<b><i>WSDD</i></b>	Web Service Description Document
<b><i>WSDL</i></b>	Web Services Description Language
<b><i>XML</i></b>	eXtensible Mark-up Language

## 4 Web Service Properties and Capabilities

### 4.1 Service Profile

<b>Name</b>	Flight Plan Service (FPS)
<b>Namespace</b>	urn:us:gov:dot:faa:example:atm:enroute:fps
<b>Description</b>	Service for filing, deleting, and modifying a proposed IFR flight plan for subsequent automatic submission to FAA flight data processing.
<b>Version or Revision Level</b>	1.0
<b>Service Category</b>	Air Traffic Control Information Service [urn:us:gov:dot:faa:taxonomies:service-category#1.3.1.3] Flight Information Service [urn:us:gov:dot:faa:taxonomies:service-category#1.3.1.3.2]
<b>Lifecycle Stage</b>	Development [urn:us:gov:dot:faa:taxonomies:lifecycle-stage#development]
<b>Criticality Level</b>	Essential [urn:us:gov:dot:faa:taxonomies:service-criticality#essential]

#### 4.1.1 Service Provider

<b>Name</b>	FAA En Route Services Modernization Group (ESMG)
<b>Description</b>	A program within the FAA Air Traffic Organization responsible for developing web services.
<b>Web Page</b>	<a href="http://www.faa.gov/air_traffic/flight_info/">http://www.faa.gov/air_traffic/flight_info/</a>

##### 4.1.1.1 Point of Contact

<b>Name</b>	John D. Doe
<b>Title</b>	ATO-X ESGM Manager
<b>Telephone</b>	(609) 444-5555
<b>E-mail Address</b>	Joe.doe@faa.gov
<b>Postal Address</b>	Bldg. 300 FAA William J. Hughes Technical Center Atlantic City International Airport Atlantic City, NJ

#### 4.1.2 Service Consumers

##### 4.1.2.1 Traffic Modernization Program (TMP)

<b>Name</b>	FAA Traffic Modernization Program (TMP) - The FAA-maintained program responsible for regulating traffic during arrival, departure, or approach stages of flights with the goal to avoid exceeding airport or air traffic control capacity.
<b>Web Page</b>	<a href="http://www.faa.gov/air_traffic/TMP/">http://www.faa.gov/air_traffic/TMP/</a> *
<b>SLA document</b>	Service Level Agreement for the Flight Plan Service (FPS) as provided by FAA En Route Services Modernization Group (ESMG) to FAA Traffic Modernization Program (TMP).  The document is located at <a href="http://www.faa.gov/air_traffic/flight_info/SLA/FPS/SLA_TMP.pdf">http://www.faa.gov/air_traffic/flight_info/SLA/FPS/SLA_TMP.pdf</a> .*

##### 4.1.2.2 Alpha Airline

<b>Name</b>	Alpha Airline - A United States commercial air carrier headquartered in Atlanta, Georgia. Alpha Airline provides air transport services for passengers and freight.
<b>Web Page</b>	<a href="http://www.example.alpha.com">http://www.example.alpha.com</a> *

<b>SLA document</b>	Service Level Agreement for the Flight Plan Service (FPS) as provided by FAA En Route Services Modernization Group (ESMG) to Alpha Airline  The document is located at <a href="http://www.faa.gov/air_traffic/flight_info/SLA/FPS/SLA_Alpha_Airline.pdf">http://www.faa.gov/air_traffic/flight_info/SLA/FPS/SLA_Alpha_Airline.pdf</a> *
---------------------	--

\* The URLs in section 4.1.2 are provided as examples only and do not resolve to any resource.

### 4.1.3 Service Functionality

Business Function	Real World Effect
File proposed flight plan	A proposed flight plan is queued by the <a href="#">web service</a> for distribution to the FAA flight data processing application within some parameter time of the estimated departure time.
Change destination aerodrome of a filed proposed flight plan.	Given that a proposed flight plan was previously filed and is still queued by the <a href="#">web service</a> , this function updates the proposed destination aerodrome.
Delete proposed flight plan	Given that a proposed flight plan was previously filed and is still queued by the <a href="#">web service</a> , this function provides the flight plan filer the ability to retract the proposed flight plan before it is submitted to FAA ATS. This reduces the flight plan processing load and systemic workload of the FAA air traffic planning system.

### 4.1.4 Security

The FPS deploys [authentication](#) as well as [authorization](#) as primary [security mechanisms](#).

The UserID/Password credentials token over SOAP is used to authenticate a request for filing, canceling or modifying a flight plan. The token formats and semantics are defined in [section 4.1.4.2](#).

For implementing authorization the FPS deploys [role-based access control \(RBAC\)](#). [Section 4.1.4.1](#) contains the definition of roles related to protected resources and permissions related to a specific role. Specific information about approval to perform an operation offered by FPS is found in [section 4.1.4.3](#).

Since the authentication token is presented in plain text, HTTPS needs to be utilized to protect the credentials with the TLS protocol to provide encryption and secure identification of the server. The following protocols are being applied:

- Hypertext Transfer Protocol Secure (HTTPS)  
<http://tools.ietf.org/html/rfc2660> [10]
- The Transport Layer Security (TLS) Protocol Version 1.2  
<http://tools.ietf.org/html/rfc5246> [11]

#### 4.1.4.1 Roles

Name	Description
Reader	A user who only has permission to read or examine ('view only') a filed flight plan.
Originator	A user, generally a pilot or operator, who submits a flight plan and has permission to file and sub-sequentially modify or cancel filed flight plan. Since the Reader role is derived from the Originator role, an Originator role inherently includes the "view" privileges.

The following diagram depicts the roles defined for FPS.

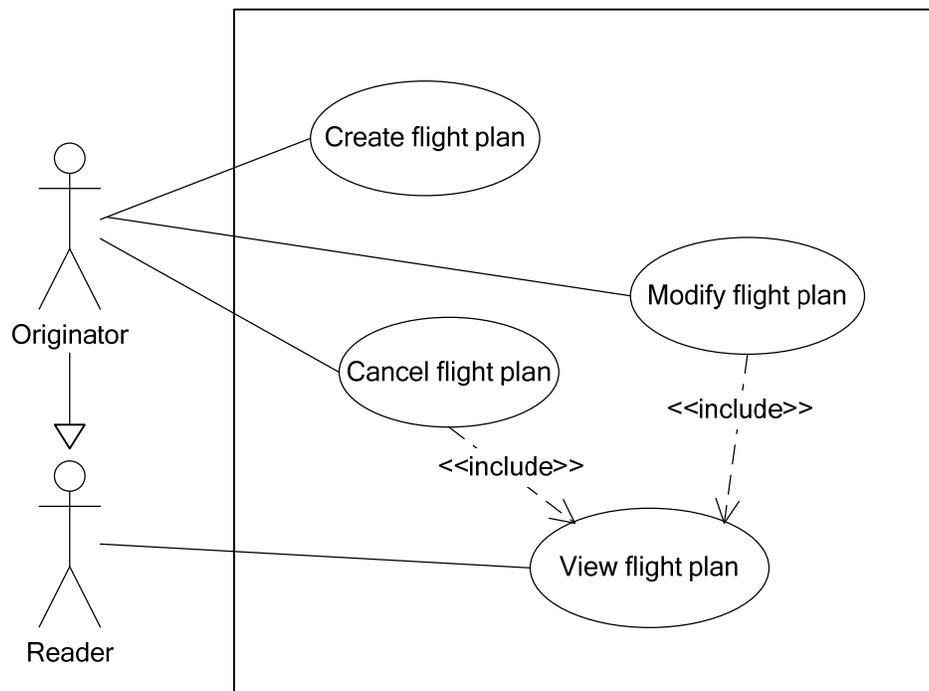


Figure 1. FPS Roles

#### 4.1.4.2 Access Control Mechanisms

Mechanism	Regulating Document
Authentication	Web Services Security: UsernameToken Profile 1.0, OASIS Standard 200401, March 2004. [12] <a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0.pdf">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0.pdf</a>
Authorization	ANSI/INCITS 359-2004 Information Technology - Role Based Access Control International Committee for Information Technology Standards: 03-Feb-2004. [13] <a href="http://www.cs.purdue.edu/homes/ninghui/readings/AccessControl/ANSI+INCITS+359-2004.pdf">http://www.cs.purdue.edu/homes/ninghui/readings/AccessControl/ANSI+INCITS+359-2004.pdf</a>

#### 4.1.4.3 Security Policies

The policy document associated with FPS can be found at: <https://www.faa.gov/atm/policies/fps-policy.xml>. \* Note: proper authentication may be required to access the document. For information about obtaining access to the policy document, contact the individual indicated in [section 4.1.1.1](#).

\* The URL does not resolve to any resource and is provided as an example only.

#### 4.1.5 Qualities of Service

QoS Parameter	Value	Unit of Measure	Definition	Calculation Method
Availability	99.900	Percentage, accurate to 3 decimal places	The fraction of the total available hours that the service is operational. (Adapted from FAA SEM 4.8.2. [5] )	$100 * ((24 - \text{Total Outage Time}) / 24)$ . Measurements are taken daily and apply to the preceding 24-hour period.
Capacity	200	Number, integer	Limit of concurrent requests for guaranteed performance.	Continuous count.

Response Time	3	Seconds	A measure of the maximum time required to complete a service request, from the time the service provider receives the request to the time the service provider transmits the response.	Continuously measured for each request.
---------------	---	---------	--	---

#### 4.1.6 WSDL Document

<b>Name</b>	FlightPlan.wsdl
<b>Target Namespace</b>	urn:us:gov:dot:faa:example:atm:enroute:fps
<b>Standard</b>	WSDL 2.0 <a href="http://www.w3.org/TR/wsdl20/">http://www.w3.org/TR/wsdl20/</a>
<b>File Version</b>	1.0
<b>Location</b>	1. <a href="http://faa.gov/example/FlightPlan/wsdl/FlightPlan.wsdl">http://faa.gov/example/FlightPlan/wsdl/FlightPlan.wsdl</a> * 2. <a href="#">Appendix A</a>

\* The URL does not resolve to any resource and is provided as an example only.

## 4.2 Service Interfaces

### 4.2.1 Types

Figure 2 presents a conceptual model of the data elements that appear in the FlightPlan XML schema ([Appendix B](#)). The elements are described in Table 1.

NOTE: A conceptual model is a data model that represents an abstract view of the real world. [14] A conceptual model such as the one in Figure 2 shows a real world view and understanding of the more important data concepts (entities) and their externally visible properties (attributes), and the relationships among them. FAA-STD-065 recommends that a data model of all data used by the service be included to enhance understanding of the mutual relationship between the XML schema (sometimes dubbed an “exchange model”) and the “Types” section in the WSDD. A data model is usually the result of an architectural effort, and a reference to the model’s location in the architecture can be made instead of reproducing the model in the WSDD.

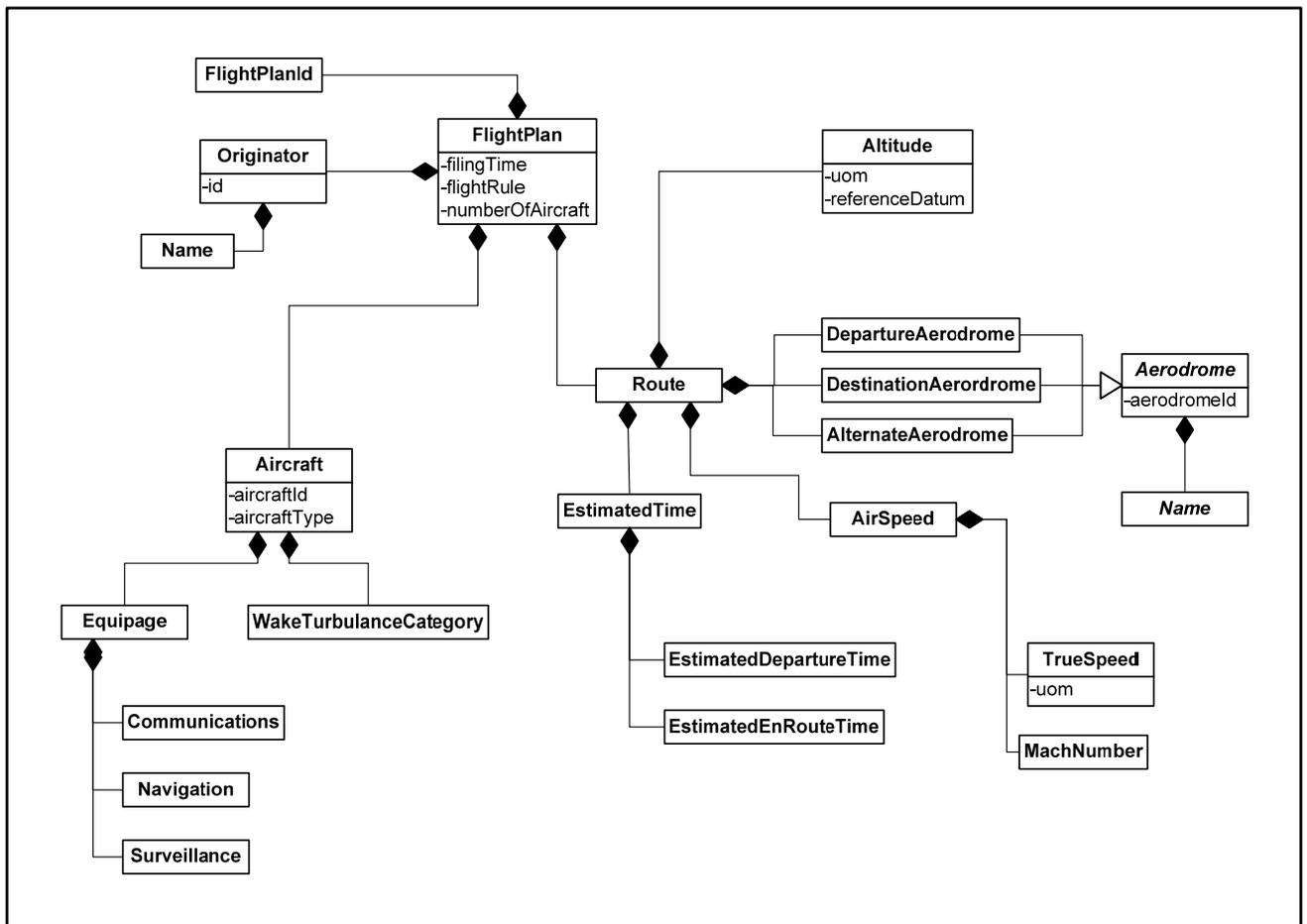


Figure 2. Flight Plan Data Model

NOTE: The following table does not contain an exhaustive list of all of the data elements that appear in the FlightPlan XML schema (Appendix B) nor in the conceptual model shown in Figure 1. Rather, it provides a subset of elements selected to exemplify how to document data types in accordance with FAA-STD-065 section 5.8.2.1. Note also that all metadata is required (Unit of Measure and Permissible Values are required if applicable) except for Data Type, Maximum Length, and Format which are optional. In addition, two of the elements have been registered in the [FAA Data Registry](http://fdreg.faa.gov) and their metadata may be seen by accessing the FDR at <http://fdreg.faa.gov/fdr/Home.jsp>, clicking on “Administered Items”, entering the FDR ID number in the “data identifier” block, and pressing “Next”. When an element has been registered in FDR, its metadata (except for Name, Obligation and Occurrence) does not need to be repeated in the WSDD although it is shown here for illustration.

All elements in Table 1 are defined in the namespace `urn:us:gov:dot:faa:example:atm:enroute:fps:entities`

Table 1. Selected Flight Plan Data Elements

FDR ID	Name	Definition	Unit of Measure	Permissible Values	Data Type	Format	Obligation	Maximum Occurrence
	FlightPlan	The outmost container (root) element for all data provided by the pilot or his/her designated representative to air traffic services units, relative to the intended flight or portion of the flight of the aircraft.	NA	N/A	Complex		Required	1
	FlightPlanId	An element that uniquely identifies the flight plan.	NA	N/A	String	[A-Za-z0-9]*	Required	1
	FlightPlan.flightRule	A code representing regulations (i.e., instrument or visual flight rules) under which the pilot is flying or intends to fly the aircraft.	NA	“I” - IFR only “V” - VFR only “Y” - IFR first “Z” - VFR first	String		Required	1
	FlightPlan.filingTime	The point in time (UTC) at which the flight plan is filed.	NA	N/A	dateTime	CCYY-MM-DDThh:mm:ss	Required	1

FDR ID	Name	Definition	Unit of Measure	Permissible Values	Data Type	Format	Obligation	Maximum Occurrence
	Altitude	An element that indicates the pressure altitude above mean sea level (MSL) at which the aircraft is flying or is intended to be flown.	NA	N/A	Complex		Required	1
	Altitude.uom	A code representing the units of measure of the aircraft's altitude.	NA	"m", "meter" - altitude in meters "foot" - altitude in feet	String		Required	1
	Altitude.referenceDatum	A code representing the atmospheric pressure reference used to adjust a pressure altimeter.	NA	"Local" - local pressure extrapolated to zero MSL. "Standard" - pressure with respect to the pressure datum 1013.2 hectopascals (hPa).	String		Required	1
	Aircraft	A container element for all data related to the aircraft.	NA	N/A	Complex		Required	1
2730	Aircraft.aircraftType	An aircraft type designator that informs an air traffic controller of the performance characteristics of the aircraft.	NA	Values are listed in ICAO 8643, Aircraft Type Designators, <a href="http://www.icao.int/anb/ais/8643/index.cfm">http://www.icao.int/anb/ais/8643/index.cfm</a> .	String		Required	1

FDR ID	Name	Definition	Unit of Measure	Permissible Values	Data Type	Format	Obligation	Maximum Occurrence
2732	WakeTurbulenceCategory	A code that classifies the aircraft for the purpose of wake turbulence separation minima, based on the maximum certified takeoff mass of the aircraft.	NA	<p>“H”, “HEAVY” - aircraft having a maximum certificated take-off mass of 136,000 kg (300,000 lb) or more.</p> <p>“M”, “MEDIUM” - aircraft having a maximum certificated take-off mass of less than 136,000 kg (300,000 lb) and more than 7,000 kg (15,500 lb).</p> <p>“L”, “LIGHT” - aircraft having a maximum certificated take-off mass of 7,000 kg (15,500 lb) or less.</p>	String		Required	1
	DestinationAerodrome	A container element for all data related to the primary aerodrome to which the flight is destined.	NA	N/A	Complex		Required	1
	DestinationAerodrome.aerodromeld	An element that uniquely identifies the destination aerodrome.	NA	Values are listed in ICAO Document 7910, Location Indicators, <a href="http://www.icao.int/eshop/index.html">http://www.icao.int/eshop/index.html</a> .	String	[A-Z][A-Z][A-Z][A-Z]	Required	1

FDR ID	Name	Definition	Unit of Measure	Permissible Values	Data Type	Format	Obligation	Maximum Occurrence
	DestinationAerodromeName	An element that contains the name or location (nearest city) of the destination aerodrome.	NA	N/A	String		Optional	1

All elements in Table 2 are defined in the namespace `urn:us:gov:dot:faa:example:atm:enroute:fp`

Table 2. Selected Flight Plan Service Elements

FDR ID	Name	Definition	Unit of Measure	Permissible Values	Data Type	Obligation	Maximum Occurrence
	InvalidDataError	A field that contains the faulty value.	NA	"Flight Rule", "Number Of Aircraft", "Filing Time", "Flight Plan Id", "Airman Id", "Originator Name", "Aircraft Type", "Aircraft Id", "Equipage Communication", "Equipage Navigation", "Equipage Surveillance", "Wake Turbulence Category", "Altitude Reference Datum", "Altitude uom", "Estimated Departure Time", "Estimated Enroute Time", "True Speed uom", "True Speed", "Mach Number", "Departure Aerodrome Id", "Destination Aerodrome Id", "Alternate Aerodrome Id"	String	Required	1

## 4.2.2 Messages

### 4.2.2.1 Input/Output Messages

Name	Description	Types
FileFlightPlanRequest	Used by a service consumer to submit (file) a flight plan.	<a href="#">FlightPlan</a>
FileFlightPlanResponse	Used to inform a service consumer that flight plan information has been accepted and returns ID that has been assigned to the flight plan.	<a href="#">FlightPlanId</a>
CancelFlightPlanRequest	Used by a service consumer to cancel a previously filed flight plan.	<a href="#">FlightPlanId</a>
CancelFlightPlanResponse	Used to inform a service consumer that the flight plan has been canceled.	<a href="#">FlightPlanId</a>
UpdateDestinationAerodromeRequest	Used by a service consumer to change a destination aerodrome.	<a href="#">DestinationAerodrome</a> , <a href="#">FlightPlanId</a>
UpdateDestinationAerodromeResponse	Used to inform a service consumer that the original destination aerodrome has been changed.	<a href="#">DestinationAerodrome</a> , <a href="#">FlightPlanId</a>

### 4.2.2.2 Error Messages

Name	Description	Types
InvalidDataFault	Used to inform a service consumer that submitted flight plan data is not valid and service is unable to process the flight plan.	<a href="#">InvalidDataError</a>

## 4.2.3 Operations

### 4.2.3.1 Operation FileFlightPlan

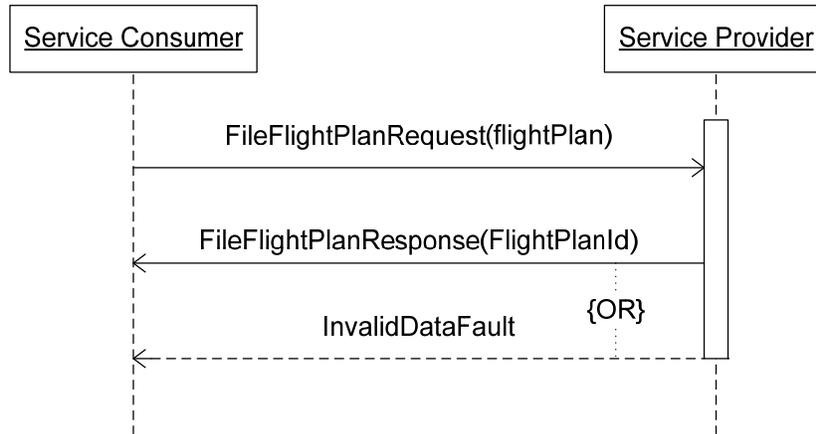


Figure 3. Operation FileFlightPlan Sequence Diagram

<b>Name</b>	FileFlightPlan
<b>Description</b>	The FileFlightPlan operation allows the creation of persistent information defining an intended flight (flight plan).
<b>Message Exchange Pattern</b>	In-Out [urn:us:gov:dot:faa:taxonomies:messageExchangePattern#in-out]
<b>Precondition</b>	Service consumer has been authenticated and authorized to perform the FileFlightPlan operation.
<b>Input</b>	Message <a href="#">FileFlightPlanRequest</a> containing required flight plan information encapsulated in FlightPlan element.
<b>Output</b>	Message <a href="#">FileFlightPlanResponse</a> containing FlightPlanId for filed flight plan.
<b>Effect</b>	Flight plan has been submitted (filed).
<b>Faults</b>	Fault <a href="#">InvalidDataFault</a> is returned when submitted flight plan data is not valid and service is unable to process the flight plan.

#### 4.2.3.2 Operation CancelFlightPlan

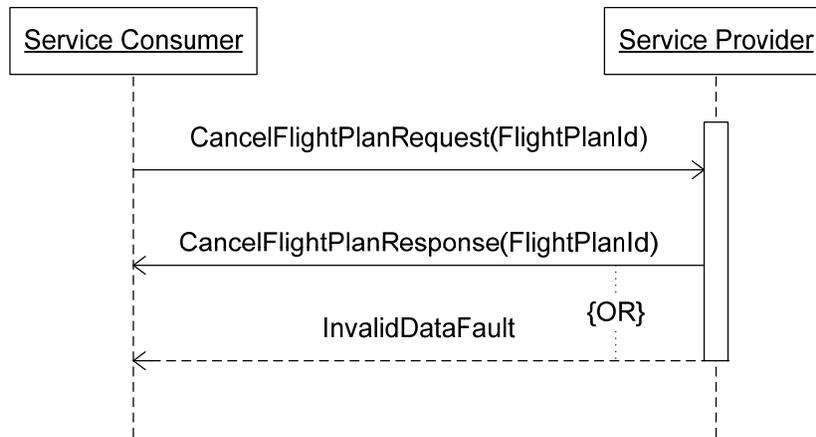


Figure 4. Operation CancelFlightPlan Sequence Diagram

<b>Name</b>	CancelFlightPlan
<b>Description</b>	The CancelFlightPlan operation allows canceling a previously filed flight plan.
<b>Message Exchange Pattern</b>	In-Out [urn:us:gov:dot:faa:taxonomies:messageExchangePattern#in-out]
<b>Precondition</b>	Service consumer has been authenticated and authorized to perform the CancelFlightPlan operation. The referenced flight plan has been filed.
<b>Input</b>	Message <a href="#">CancelFlightPlanRequest</a> containing FlightPlanId of a FlightPlan to be canceled.
<b>Output</b>	Message <a href="#">CancelFlightPlanResponse</a> containing confirmation of canceling the flight plan.
<b>Effect</b>	Flight plan has been canceled.
<b>Faults</b>	Fault <a href="#">InvalidDataFault</a> is returned when submitted flight plan ID is not valid

### 4.2.3.3 Operation UpdateDestinationAerodrome

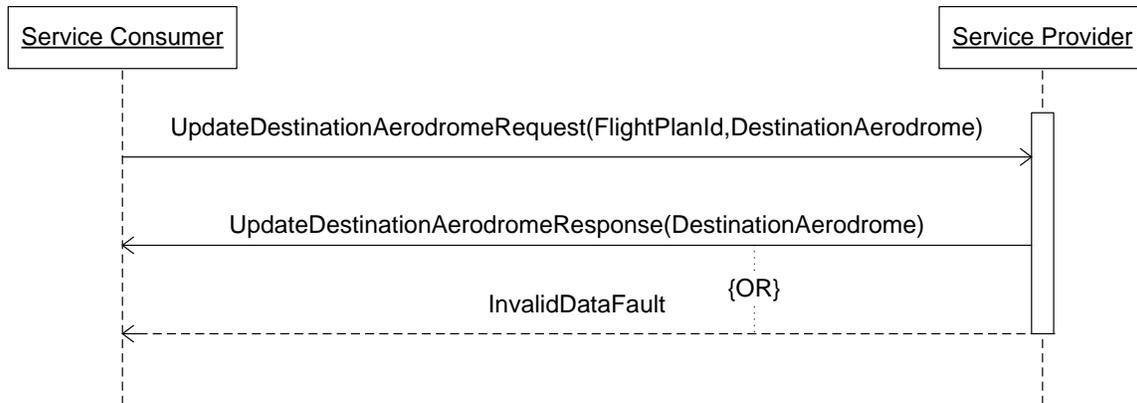


Figure 5. Operation UpdateDestinationAerodrome Sequence Diagram

<b>Name</b>	UpdateDestinationAerodrome
<b>Description</b>	The UpdateDestinationAerodrome operation allows updating the destination aerodrome information within a filed flight plan.
<b>Message Exchange Pattern</b>	In-Out [urn:us:gov:dot:faa:taxonomies:messageExchangePattern#in-out]
<b>Precondition</b>	Service consumer has been authenticated and authorized to update flight plan information. The referenced flight plan has been filed.
<b>Input</b>	Message <a href="#">UpdateDestinationAerodromeRequest</a> containing FlightPlanId and the new destination aerodrome.
<b>Output</b>	Message <a href="#">UpdateDestinationAerodromeResponse</a> containing Flight Plan Id of the updated flight plan (FlightPlanId) and Aerodrome data for the destination aerodrome as it is recognized by the service.
<b>Effect</b>	Originally indicated flight destination aerodrome has been changed.
<b>Faults</b>	Fault <a href="#">InvalidDataFault</a> is returned when submitted flight plan ID or aerodrome ID is not valid.

#### 4.2.4 List of Interfaces

Name	Description	Operations
FlightPlanInterface	FlightPlanInterface allows service consumer to file and sequentially modify or cancel flight plan information.	<a href="#">FileFlightPlan</a> <a href="#">CancelFlightPlan</a> <a href="#">UpdateDestinationAerodrome</a>

### 4.3 Service Implementation

#### 4.3.1 End Points

##### 4.3.1.1 End Point "HTTPExternalFlightPlanEndPoint"

##### 4.3.1.1.1 Associated Interface

[FlightPlanInterface](#)

##### 4.3.1.1.2 Communication Protocol

Name	Hypertext Transfer Protocol - HTTP/1.1 urn:us:gov:omb:fea:trm:service-transport#http
Description	Application-level protocol for distributed, collaborative, hypermedia information systems.
Specification Version	1.1
Specification Web Page	<a href="http://www.w3.org/Protocols/rfc2616/rfc2616.html">http://www.w3.org/Protocols/rfc2616/rfc2616.html</a>

##### 4.3.1.1.3 Messaging Protocol

Name	SOAP
Description	Lightweight protocol intended for exchanging structured information in a decentralized, distributed environment.
Specification Version	1.2
Specification Web Page	<a href="http://www.w3.org/TR/soap12-part1/">http://www.w3.org/TR/soap12-part1/</a>

##### 4.3.1.1.4 Network Address

<http://esmg.faa.gov/dev/flight-plan.do> \*

\* The URL does not resolve to any resource and is provided as an example only.

#### **4.3.1.1.5 End Point-Specific Qualities of Service**

No specific qualities of service are identified for this end point.

## Appendixes

### Appendix A. FlightPlanService.wsdl

In this exercise we assume that multiple services may use the common set of Flight Plan data elements and that all these definitions have been placed in an XML schema document. (The schema document named "FlightPlanDataTypes.xsd" is found in [Appendix B.](#))

Note also that recreating the WSDL file in an actual Web Service Description Document is not required by FAA-STD-065 unless there is no accessible location (URL) for the file.

Finally, note that the URLs shaded in gray do not resolve to any actual location.

```
<?xml version="1.0" encoding="utf-8"?>
<description
targetNamespace="urn:us:gov:dot:faa:example:atm:enroute:fps"
xmlns="http://www.w3.org/ns/wsdl"
xmlns:tns="urn:us:gov:dot:faa:example:atm:enroute:fps"
xmlns:fpd="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
xmlns:wsoap="http://www.w3.org/ns/wsdl/soap"
xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsdlix="http://www.w3.org/ns/wsdl-extensions">
<documentation>
  This WSDL document describes the FlightPlan service.
  Additional application-level information for use of this service --
  beyond what this WSDL describes-- is available at
  http://www.faa.gov/examples/WSDD Flight Plan Service.doc
</documentation>
  <!-- TYPES -->
<types>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="urn:us:gov:dot:faa:example:atm:enroute:fps"
xmlns="urn:us:gov:dot:faa:example:atm:enroute:fps"
xmlns:fpd="urn:us:gov:dot:faa:example:atm:enroute:fps:entities">
<xs:import
namespace="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
schemaLocation="./FlightPlan.xsd"/>
  <!--Messages types -->
<xs:element name="FileFlightPlanRequest" type="fpd:FlightPlanType"/>
<xs:element name="FileFlightPlanResponse" type="fpd:FlightPlanIdType"/>
<xs:element name="CancelFlightPlanRequest"
type="fpd:FlightPlanIdType"/>
<xs:element name="CancelFlightPlanResponse"
type="fpd:FlightPlanIdType"/>
<xs:element name="UpdateDestinationAerodromeRequest"
type="UpdateDestinationAerodromeRequestType"/>
```

```
<xs:element name="UpdateDestinationAerodromeResponse"
type="fpd:FlightPlanIdType"/>
  <!-- Messages types definitions -->
<xs:complexType name="UpdateDestinationAerodromeRequestType">
  <xs:sequence>
    <xs:element name="FlightPlanId" type="fpd:FlightPlanIdType"/>
    <xs:element name="DestinationAerodrome"
type="fpd:AerodromeType"/>
  </xs:sequence>
</xs:complexType>
<!-- Faults -->
  <xs:element name="InvalidDataError" type="xs:string"/>
</xs:schema>
</types>
  <!-- INTERFACE -->
<interface name="FlightPlanInterface">
  <!-- The 'fault' element here is established here at the same level as
'operation'. This allows one fault message to be reused across
different operations. -->
  <fault name="InvalidDataFault" element="tns:InvalidDataError"/>
  <operation name="FileFlightPlan"
pattern="http://www.w3.org/ns/wsd1/in-out" wsdlx:safe="true">
  <input messageLabel="In" element="tns:FileFlightPlanRequest"/>
    <output messageLabel="Out" element="tns:FileFlightPlanResponse"/>
    <outfault ref="tns:invalidDataFault" messageLabel="Out"/>
  </operation>
  <operation name="CancelFlightPlan"
pattern="http://www.w3.org/ns/wsd1/in-out" wsdlx:safe="true">
  <input messageLabel="In" element="tns:CancelFlightPlanRequest"/>
    <output messageLabel="Out"
element="tns:CancelFlightPlanResponse"/>
    <outfault ref="tns:invalidDataFault" messageLabel="Out"/>
  </operation>
  <operation name="UpdateDestinationAerodrome"
pattern="http://www.w3.org/ns/wsd1/in-out" wsdlx:safe="true">
  <input messageLabel="In"
element="tns:UpdateDestinationAerodromeRequest"/>
    <output messageLabel="Out"
element="tns:UpdateDestinationAerodromeResponse"/>
    <outfault ref="tns:invalidDataFault" messageLabel="Out"/>
  </operation>
</interface>
  <!-- BINDING -->
  <!-- We are deploying a reusable binding here -->
  <binding name="SOAPoverHTTPBinding"
type="http://www.w3.org/ns/wsd1/soap"
wssoap:protocol="http://www.w3.org/2003/05/soap/bindings/HTTP"/>
  <!-- SERVICE -->
  <service name="FlightPlanService" interface="tns:FlightPlanInterface">
    <endpoint name="HTTPExternalFlightPlanEndPoint"
binding="tns:SOAPoverHTTPBinding"
address="http://esmg.faa.gov/dev/flight-plan.do"/>
  </service>
</description>
```

## Appendix B. FlightPlan.xsd

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
  targetNamespace="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Title: FlightPlan schema for WSDD Example.
      Description: This schema declares XML elements for defining
      a Flight Plan transmitted by FlightPlanService
      Creator: Mark Kaplun (mark.kaplun@faa.gov)
      Date: 2010-01-21
      See also: WSDD Flight Plan Service.doc
    </xs:documentation>
  </xs:annotation>
  <!--
  //////////////////////////////////////
                        Global types
  ////////////////////////////////////// -->
  <xs:element name="FlightPlan">
    <xs:complexType>
      <xs:sequence>
        <!-- "FlightPlanId" is always required.
          When flight plan is filed and the "FlightPlanId" element
has no content
          - the content is nil. -->
        <xs:element name="FlightPlanId" type="FlightPlanIdType"
nillable="true"/>
        <xs:element name="Originator" type="OriginatorType"/>
        <xs:element ref="Aircraft"/>
        <xs:element ref="Route"/>
      </xs:sequence>
      <xs:attribute name="filingTime" type="xs:dateTime"
use="required"/>
      <xs:attribute name="flightRule" type="FlightRuleType"
use="required"/>
      <xs:attribute name="numberOfAircraft" type="xs:positiveInteger"
default="1"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="Aircraft" type="AircraftType"/>
  <xs:element name="Route" type="RouteType"/>
  <!--
  //////////////////////////////////////
                        Types definitions
  ////////////////////////////////////// -
->
  <xs:simpleType name="FlightPlanIdType">
```

```

<xs:restriction base="xs:string">
  <xs:pattern value="[A-Za-z0-9]*"/>
</xs:restriction>
</xs:simpleType>
<xs:complexType name="AircraftType">
  <xs:sequence>
    <xs:element name="Equipage">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Communication" type="xs:string"/>
          <xs:element name="Navigation" type="xs:string"/>
          <xs:element name="Surveillance" type="xs:string"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="WakeTurbulenceCategory"
type="WakeTurbulenceCategoryType"/>
  </xs:sequence>
  <xs:attribute name="aircraftId" type="xs:string"/>
  <xs:attribute name="aircraftType" type="xs:string"/>
  <!-- Values are listed in ICAO 8643, Aircraft Type Designators,
        http://www.icao.int/anb/ais/8643/index.cfm.-->
</xs:complexType>
<xs:complexType name="OriginatorType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string"/>
  </xs:sequence>
  <xs:attribute name="airmanId" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="RouteType">
  <xs:sequence>
    <xs:element name="Altitude" type="AltitudeType"/>
    <xs:element name="EstimatedTime ">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="EstimatedDepartureTime" type="xs:time"/>
          <xs:element name="EstimatedEnRouteTime"
type="xs:duration"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="AirSpeed" type="AirSpeedType"/>
    <xs:element name="DepartureAerodrome" type="AerodromeType"/>
    <xs:element name="DestinationAerodrome" type="AerodromeType"/>
    <xs:element name="AlternateAerodrome" type="AerodromeType"/>
    <xs:any minOccurs="0" maxOccurs="unbounded">
      <!--This element is declared as "any" to indicate that Route
element
        can be extended with elements such as: fixes (significant
points),
        route names, route segments and etc. -->
    </xs:any>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="AerodromeType">
  <xs:annotation>

```

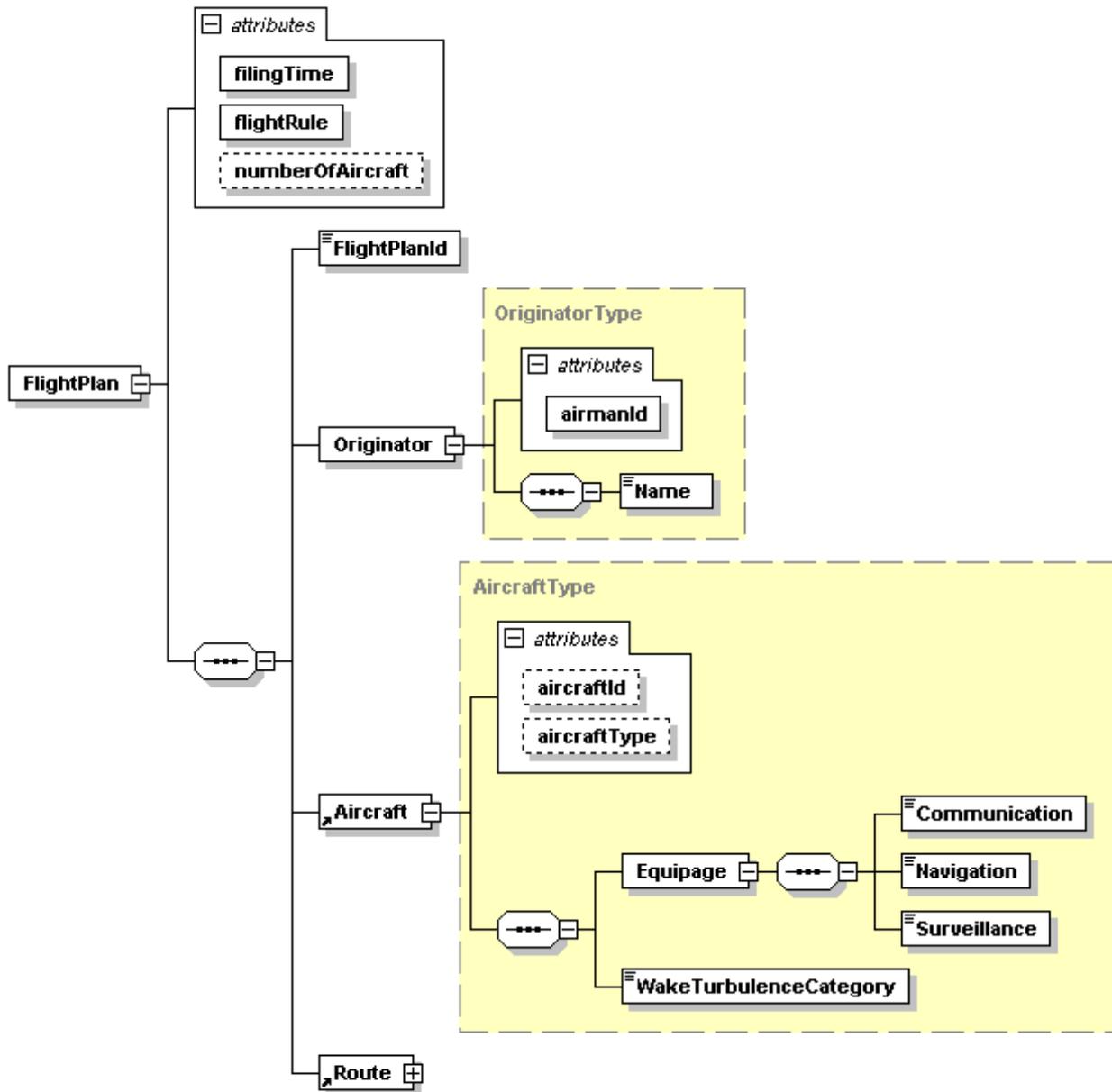
```
<xs:documentation>
  Values for aerodrome Ids are listed in ICAO Document 7910,
  Location Indicators, http://www.icao.int/eshop/index.html.
</xs:documentation>
</xs:annotation>
<xs:sequence>
  <xs:element name="Name" type="xs:string"/>
</xs:sequence>
  <xs:attribute name="aerodromeId" type="AerodromeIdType"
use="required"/>
</xs:complexType>
<xs:simpleType name="SpeedBase">
  <xs:restriction base="xs:decimal"/>
</xs:simpleType>
<xs:complexType name="TrueSpeedType">
  <xs:simpleContent>
    <xs:extension base="SpeedBase">
      <xs:attribute name="uom" type="UnitOfSpeedType"
default="knots"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="AirSpeedType">
  <xs:sequence>
    <xs:element name="TrueSpeed" type="TrueSpeedType"/>
    <xs:element name="MachNumber" type="xs:decimal"/>
  </xs:sequence>
</xs:complexType>
<xs:simpleType name="AltitudeBase">
  <xs:restriction base="xs:nonNegativeInteger"/>
</xs:simpleType>
<xs:complexType name="AltitudeType">
  <xs:simpleContent>
    <xs:extension base="AltitudeBase">
      <xs:attribute name="uom" type="UnitOfAltitudeType"
default="foot"/>
      <xs:attribute name="referenceDatum" type="ReferenceDatumType"
use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<!--
////////////////////////////////////
                          Code types
////////////////////////////////////
-->
<xs:simpleType name="AerodromeIdType">
  <xs:restriction base="xs:string">
    <xs:maxLength value="4"/>
    <xs:pattern value="[A-Z][A-Z][A-Z][A-Z]"/>
  </xs:restriction>
</xs:simpleType>
<!--
////////////////////////////////////
                          Enumerations types
////////////////////////////////////
```

```

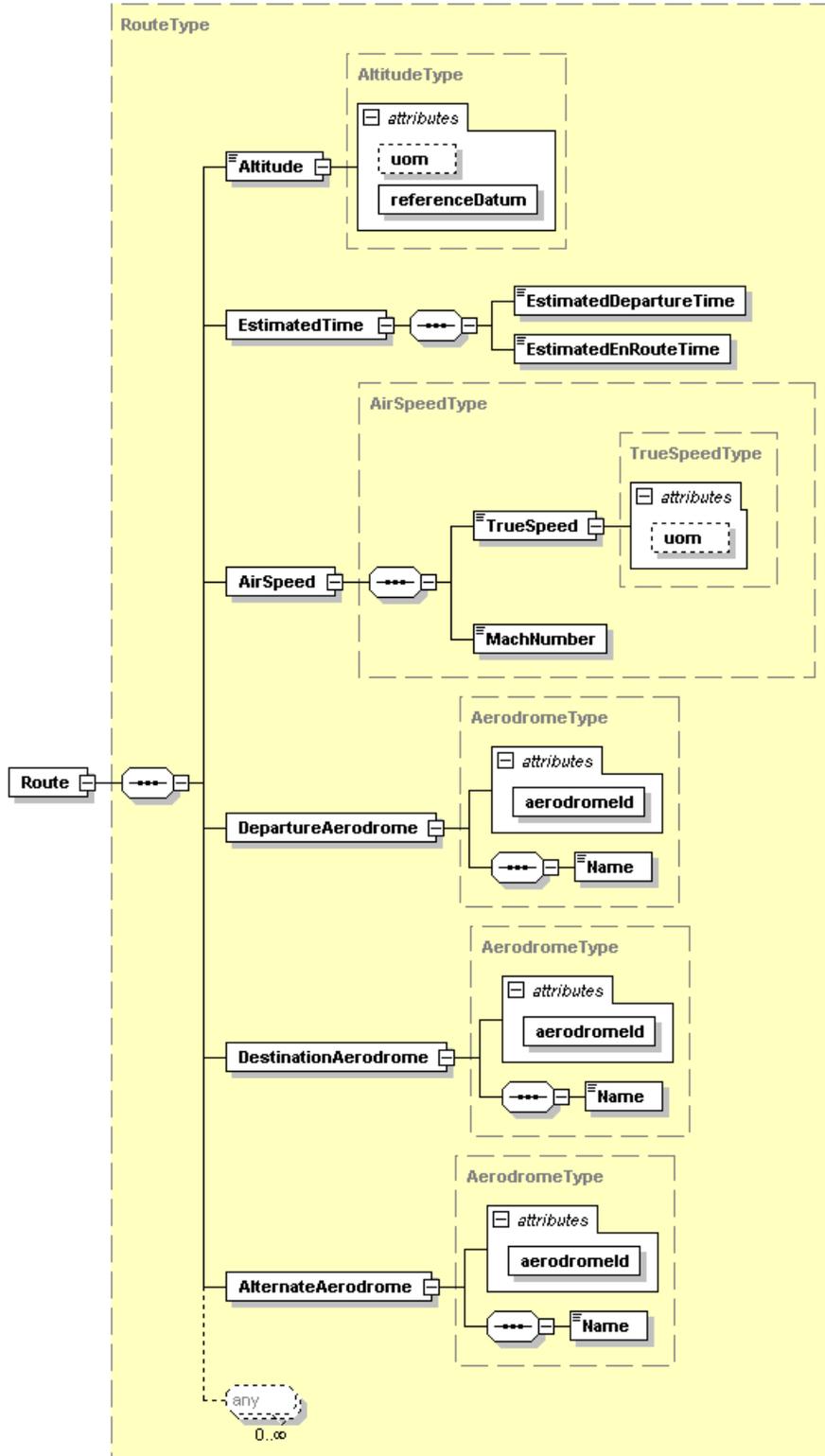
////////////////////////////////////
-->
<xs:simpleType name="FlightRuleType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="I"/>
    <xs:enumeration value="V"/>
    <xs:enumeration value="Y"/>
    <xs:enumeration value="Z"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="WakeTurbulenceCategoryType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="H"/>
    <xs:enumeration value="HEAVY"/>
    <xs:enumeration value="M"/>
    <xs:enumeration value="MEDIUM"/>
    <xs:enumeration value="L"/>
    <xs:enumeration value="LIGHT"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ReferenceDatumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="local"/>
    <xs:enumeration value="standard"/>
  </xs:restriction>
</xs:simpleType>
<!--
////////////////////////////////////
                          Units of Measurement  enumerations
////////////////////////////////////
-->
<xs:simpleType name="UnitOfSpeedType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="km/h"/>
    <xs:enumeration value="knots"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="UnitOfAltitudeType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="m"/>
    <xs:enumeration value="meter"/>
    <xs:enumeration value="foot"/>
  </xs:restriction>
</xs:simpleType>
</xs:schema>

```

### Appendix C. FlightPlan.xsd - diagram



### Fragment - Route element



## Appendix D. FlightPlan.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<FlightPlan
xmlns="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="./FlightPlan.xsd"
flightRule="I"
numberOfAircraft="1"
filingTime="2001-12-17T09:30:47Z" >
  <FlightPlanId xsi:nil="true" />
  <Originator airmanId="215336745">
    <Name>John Doe</Name>
  </Originator>
  <Aircraft aircraftType="PA-32R" aircraftId="JHB426E">
    <Equipage>
      <Communication>V</Communication>
      <Navigation>C</Navigation>
      <Surveillance>OL</Surveillance>
    </Equipage>
    <WakeTurbulenceCategory>LIGHT</WakeTurbulenceCategory>
  </Aircraft>
  <Route>
    <Altitude referenceDatum="local" uom="foot">7000</Altitude>
    <EstimatedTime>
      <EstimatedDepartureTime>14:20:00.0Z</EstimatedDepartureTime>
      <EstimatedEnRouteTime>PT3H30M</EstimatedEnRouteTime>
    </EstimatedTime>
    <AirSpeed>
      <TrueSpeed uom="knots">170</TrueSpeed>
      <MachNumber>0.12</MachNumber>
    </AirSpeed>
    <DepartureAerodrome aerodromeId="KBWI">
      <Name>Baltimore-Washington International, MD</Name>
    </DepartureAerodrome>
    <DestinationAerodrome aerodromeId="KBOS">
      <Name>Logan International Airport, Boston, MA</Name>
    </DestinationAerodrome>
    <AlternateAerodrome aerodromeId="KJFK">
      <Name>John F. Kennedy International
Airport, NY, NY</Name>
    </AlternateAerodrome>
  </Route>
</FlightPlan>
```