Traffic Flow Management System ADL and Broadcast File Format Specification for the Traffic Flow Management-Modernization (TFM-M) Program

Final, Release 9, Version 13.3

Contract Number: DTFAWA-04-C-00045
CDRL: E05

October 31, 2013

Prepared for:
U.S. Federal Aviation Administration

Prepared by:
CSC
North American Public Sector – Civil Group
15245 Shady Grove Road
Rockville, MD 20850

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ADL and Broadcast File Format Specification
APPROVAL SIGNATURE PAGE

APPROVAL SIGNATURES

PARTICIPANT	NAME	DATE

File Format Specification

Date: October 31, 2013

Feature Described: ADL and Broadcast File Format Specification

Document Version: 13.2

Remarks: Effective TFMS 9 / FSM 10.0

Revision History		
Version	**Date**	**Description of Change**
13.0	7/1/2012	Initial Incorporation of TFMS 9 / FSM 10.0 Changes • Updated ADL Version Number from 12 to 13. • Added Support for Collaborative Trajectory Options Programs o Added CTL_PROGRAM field o Added CTL_PRGM field o Added PROG_NAME field o Added CTOP Control Type • General Corrections
13.1	11/19/2012	• Addressed Peer Review comments.
13.2	7/2/2013	• Updated CTL_TYPE for DAS, RCTL, SUB, and UDP to include CTOP
13.3	10/31/2013	• Addressed time format with LAST_MODIFIED field in section 2.2.2 Control Time

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Introduction

The ADL is the main data product that drives FSM and the TFMS Ground Delay Program Enhancements operations. TFMS-Core generates an ADL for each element that is being monitored by FSM. The ADL is composed of data extracted from the TFMS-Core databases, which are maintained with a combination of OAG data, CDM Participant provided flight data messages, NAS messages generated from the ATC systems (FAA and others), and issued ground delays (EDCTs). The ADL also includes AFP and GDP specific data entered by Authorized FAA Users via FSM. The ADL is described in Part 1 consisting of the following sections:

- 1.1 – ADL General Description: Provides an overview of the ADL
- 1.2 – ADL Data Blocks: Describes the data blocks provided in the ADL
- 1.3 – ADL Flight-Specific Data: Describes the data fields provided in the ADL flight data records

To monitor and model an AFP, FSM must have an ADL based on a Flow Evaluation Area (FEA) or Flow Constrained Area (FCA). Unlike airports, FEA and FCA names are not known to FSM ahead of time. Therefore, TFMS-Core generates the FSM Broadcast message, which notifies all FSMs which FEAs and/or FCAs are currently available for monitoring. Also, to meet a requirement for FSM to automatically monitor AFPs or GDPs in place, the FSM Broadcast message includes a list of all the initiatives for the current day. The FSM Broadcast message is described in Part 2, which consists of the following sections:

- 2.1 – FSM Broadcast Description: Provides an overview of the FSM Broadcast
- 2.2 – FSM Broadcast Data Elements: Describes the XML data provided in the FSM Broadcast

ADLs are also provided for FCAs that are included in a CTOP for monitoring purposes only. The FSM cannot model or issue an AFP from an FCA that is included in a CTOP, nor directly modify the data provided for the FCA.

Changes

In conjunction with the release of version R9 of the Traffic Flow Management System (TFMS) and version 10.0 of Flight Schedule Monitor (FSM), the format of the Aggregate Demand List (ADL) file is changing. These changes are primarily driven by the introduction of the Collaborative Trajectory Options Program (CTOP) capabilities. This document describes the new format that is effective upon the operational deployment of TFMS R9 in the fall of 2013. At that time, this document supersedes all prior versions.

The body of the document has been fully updated to reflect the new format. The following is a summary list of the specific ADL items that have changed:

- Updated the version number from 12 to 13. (Section 1.1.5)
- Added Support for Collaborative Trajectory Options Programs
- Miscellaneous corrections and clarifications made. (Throughout Document)

Terminology

The following common terminology is utilized throughout this document;

- “NAS User”

An airline, cargo carrier, general aviation (GA) pilot, military, or anyone else who operates aircraft in the National Airspace System (NAS). A NAS User is not required to be a CDM Participant in order to submit substitutions.

- "CDM Participant"

  A subset of NAS Users who participates in the CDM process by submitting schedule data and substitutions to TFMS-Core.

- "FAA User"

  A traffic manager or other member of the FAA that uses TFMS/FSM. This also includes other ATC service providers, such as Nav Canada, who make use of TFMS/FSM.

- "Authorized FAA User"

  FAA Users who are authorized to perform specific restricted functions such as issuing a TMI. This also includes other ATC service providers, such as Nav Canada, who make use of TFMS/FSM.

- "Any User"

  Any user of TFMS/FSM regardless of their affiliation (ATC service provider or NAS User).

- "Initial Program"

  The initial issuance of an AFP or GDP to manage flights arriving at an airport or FCA. Slot allocation is based principally on arrival at the controlling element.

- "Revised Program"

  The revision of an AFP or GDP that is already in place. This revision can be simply to change the rate, scope, or a modification in start / end times which extend or reduce the time frame of the program. Revisions replace existing slots with new slots during the time frame of the revision.

- "Compression"

  The compression of an initial or revised AFP or GDP. A compression reallocates slots which are open due to flight cancellations or delays. Compressions do not create new slots, but simply reallocate existing slots.

- "Blanket"

  The blanket adjustment of a GDP that is already in place. A blanket reduces or increases delay times, based on a user specified value, without consideration of the airport rate.

- "Ground Stop"

  The issuance of a traffic stop. Ground Stops differ from an Initial or Revised GDP in that slot allocation is based on a specified earliest departure time (i.e., the Ground Stop Time).

- "Purge"

  The cancellation of a TMI. The purge process removes from TFMS all TMIs currently in place for a specific element.

- "Traffic Management Initiative" or "TMI"

  These terms refer to the domain of all FSM events (Initial, Revision, Compression, Blanket, Ground Stop and Purge) whether they are for an airport (GDP) or FCA (AFP).

- "Ground Delay Program" or "GDP"

These terms refer only to the domain of Airport Ground Delay Program events (Initial, Revision, Compression, Blanket, Ground Stop and Purge).

- "Airspace Flow Program" or "AFP"

  These terms refer only to the domain of Airspace Flow Program events (Initial, Revision, Compression and Purge).

- "Collaborative Trajectory Options Program" or "CTOP"

  These terms refer only to the domain of Collaborative Trajectory Options Program events (Initial, Revision, and Purge).

- "Trajectory Option Set" or "TOS"

  A set of trajectories for a given flight that is acceptable to the flight operator. A trajectory option includes data that defines the relative preferences and usability of the trajectories.

- Specific Program Type.

  Any reference to a specific type of AFP or GDP event shall be spelled out by hyphenating the General and Specific TMI Type;

Text Specific to GDP Events	**Text Specific to AFP Events**	**Text Specific to CTOP Events**	**Text Applicable to a Combination of Events Example**
GDP-Initial	AFP-Initial	CTOP-Initial*	AFP/CTOP/GDP-Initial
GDP-Revision	AFP-Revision	CTOP-Revision*	AFP/CTOP/GDP-Revision
GDP-Compression	AFP-Compression	n/a	AFP/GDP-Compression
GDP-Blanket	n/a	n/a	
GDP-Ground Stop	n/a	n/a	
GDP-Purge	AFP-Purge	CTOP-Cancel*	AFP/GDP-Purge

*NOTE: CTOP operations are not controlled through FSM, and therefore to not function exactly as the others. When TFMS users add, modify, or cancel CTOPs, the resulting ADLs mimic existing functionality in order to ensure FSM users are aware of any active or proposed CTOPs.

Part 1 – Aggregate Demand List (ADL) File Specification

1.1 - General Description

1.1.1 Contents

An ADL file contains all data pertinent to viewing demand at or issuing a TMI for arrivals at specified NAS Elements (e.g., FEA, FCA, or Airport). A particular ADL contains data for only one element (FEA, FCA, or Airport). The data provided can include the following items. (NOTE: The data block name for each item is shown in square brackets.)

- The description of the content of the ADL [ADL_DEFINITION] (all ADLs)
- The airport arrival rate [AAR] (all ADLs)

  NOTE: For historical reasons, this term is used for airports, FEAs, and FCAs. It should be thought of as an element acceptance rate.
- The airport departure rate [ADR] (airport ADLs only)
- The historical pop-up demand prediction for the element. [HISTORICAL_POP-UPS] (all ADLs)
- The arrival fixes [AFIX] (airport ADLs only)
- The departure fixes [DFIX] (airport ADLs only)
- The definition of the FEA or FCA on which the ADL is based [ELEMENT_DEFINITION] (FEA/FCA ADLs only)
- The current weather at the airport [METAR] (airport ADLs only)
- The forecast weather at the airport [TAF] (airport ADLs only)
- The current list of unassigned slots [UNASSIGNED_SLOTS] (all ADLs)
- The parameters defining a proposed or actual ground delay program [GDP_PARAMS]
- The parameters defining a proposed or actual CTOP program [CTOP_PARAMS]
- The parameters defining a compression [COMP_PARAMS]
- The parameters defining a blanket [BKT_PARAMS]
- The parameters defining a ground stop [GS_PARAMS]
- The status of substitutions [SUB_FLAG]
- A list of all the FADTs that have been issued for this element [FADT_TIMES]
- A list of all airport arrivals from one hour in the past to 24-plus hours in the future [ARRIVALS]. (NOTE: Flights are added into the ADL 24 hours prior to departure time. When viewing an arrival list, you are guaranteed to see all arrivals for the next 24 hours, but will see many arrivals beyond this time as well.)
- A list of all airport departures from one hour in the past to 24 hours in the future [DEPARTURES] (airport ADL only).

- A list of all flights traversing an FEA or FCA during the defined FEA/FCA time range [ARRIVALS]. (NOTE: Unlike airports, the time range for an FEA or FCA is fixed and is defined as part of the FEA/FCA.)
- For each arrival and departure, a record containing virtually every field in the TFMS list request, except for route-of-flight related fields.
- Any flights that would normally be within the ADL time range, but are then delayed up to 12 hours beyond the ADL will continue to be listed, in effect giving the ADL a 36 hour time range for some flights.

The application protocol for registering for ADL data and receiving ADLs is described in reference 1.

1.1.2 File Naming

TFMS uses a file naming convention that facilitates identifying files for users who are trying to find particular files in a directory full of data files. The file naming for the ADL files follows this convention for two reasons:

- It has proven to be useful to FAA users
- It allows the ADL files to be co-mingled with TFMS data files in a logical manner

A file name consists of six parts separated by periods (.):

- Element identifier for which the data was generated;
  - For airports ADLs – three or four alpha-numeric character airport identifier padded to five characters with trailing blanks filled with underscores (_)
  - For FEA ADLs – up to six characters limited to alpha-numeric, "-", and "_". Characters may be used in any position except that "-", and "_" may not be used in the last position. NOTES - FEA names are not guaranteed to be unique and can duplicate airport names, in such a case they should not be considered to be the same element. FEA names can also be reused within the same day, in such a case they should not be considered to be the same element.
  - For FCA ADLs – six alpha-numeric characters beginning with "fca".
- Report type; four characters— for ADL files, type is "lcdm"
- Date and time the file was requested— 8 digits; ddhhmmss
- Sequence number, used to distinguish two identical files requested in the same second— 2 digits; 01, 02, etc.
- Data type ,
  - For airports ADLs – "arr" for airport arrivals only, "dep" for airport departures only, "all" for both (airport arrivals and departures)
  - For FEA ADLs – "fea" for Flow Evaluation Area
  - For FCA ADLs -– "fca" for Flow Control Area
- Filtering type— "unfilt" for no filtering, "gamf" for GA and military filtering, "airline name" (e.g., , aal) for airline-specific filtering

All letters in a file name are lower case even though various elements of the file name can be upper case when used in other contexts.

For example, an ADL file generated for the ATCSCC for Boston arrivals on February 6 at 15:35:33 Z would be named:

bos__.lcdm.06153533.01.arr.unfilt

An ADL file generated for Delta for Atlanta arrivals and departures on July 17 at 09:17:05 would be named:

atl__.lcdm.17091705.01.all.dal

An ADL file generated for an FEA named "EWR_A" on July 17 at 09:17:05 would be named:

ewr_a.lcdm.17091705.01.fea.unfilt

An ADL file generated for an FCA named "FCA027" on July 17 at 09:17:05 would be named:

fca027.lcdm.17091705.01.fca.unfilt

Encryption and Compression for the ADL

The ADL files require both compression (to reduce size) and encryption (to provide security) before transmission to user sites. Encryption is required by the CDM Memorandum of Understanding (MOU) to protect sensitive flight service provider data during transmission. The required public key to decrypt the ADLs will be provided to all external FAA clients via out-of-band communications (i.e.,, the decryption key is not published in any formal interface documentation but rather provided via removable media or email during FSM site deployment). Encryption is not required for ADL files transmitted via the FAA network but compression is required due to the ADL file size.

Currently TFMS utilizes the following programs and protocols for these functions:

- Blowfish - Blowfish is a keyed, symmetric block cipher, designed in 1993 and included in a large number of cipher suites and encryption products. Blowfish provides a good encryption rate in software and no effective cryptanalysis of it has been found to date.
- GZIP – gzip is a software application used for file compression. The name gzip is short for GNU zip. The program is a free software replacement for the compress program used in early Unix systems, intended for use by the GNU Project.

The suffix ".gz" indicates a file is compressed (using "gzip"). The suffix ".enc" indicates a file is encrypted (using blowfish). The following combinations are supported:

- Compressed and Encrypted Extension .gz.enc (note the compressed file is encrypted)
- Compressed Only Extension .gz

1.1.3 Organization

An ADL file consists of two main parts: the header and the data update. The header consists of five fixed-format lines required by FSM, interspersed by some comment lines containing useful information about the report. The data update section consists of multiple blocks of data delimited by keywords. Each data block starts with a keyword "START_xxx" where "xxx" is the mnemonic indicating the data type. Each data block ends with a corresponding "END_xxx" keyword. The entire data update section is delimited by its own keywords: "START_UPDATE" and "END_UPDATE".

The use of the "START" and "END" keywords is designed to make it easier to keep backwards compatibility when new data is added to the file. When a software program encounters a "START" keyword, it should check to see if the keyword is one that the program recognizes. If not, the program should discard lines until it reaches the corresponding "END" keyword.

1.1.4 General Formatting

The ADL files are formatted to enhance the readability of the files. The general characteristics of the formatting follow.

- An ADL contains ASCII records terminated by NEWLINE characters.
- Comment lines are used to provide helpful information or to separate blocks of text. A comment line contains a "#" character in column 1.
- FSM Header lines contain a ":" character in column 1.
- "START_xxx" and "END_xxx" keywords appear on separate lines starting in column 1.
- Lines within a data block are indented by one column; that is, a space character appears in column 1.
- There can be no blank lines within a data block.
- Within the flight records:
  - fields are fixed-width (column-aligned)
  - a blank field is indicated by "-" in the first column of the field
  - the value of a true/false field is shown as "Y" (true) or "-" (false)

1.1.5 Header

The header of an ADL file consists of five lines required by FSM interspersed with comment lines. A colon (:) in column 1 indicates a required header line. Comment lines are indicated by a pound sign (#) in column 1. The required lines must be in the order listed below; the comment lines can appear anywhere. In some cases, blank comment lines are used just to improve the readability of the file.

The five required lines are defined as follows. (NOTE: The line numbers ignore any interspersed comment lines.)

- Required line 1 –":Product Code:" followed by the FSM product code.
- Required line 2 – ":Magic Number:" followed by the FSM magic number
- Required line 3 – ":Version Num:" followed by the ADL version number in hexadecimal
- Required line 4 – ":Date:" followed by the date (mm/dd/yyyy) the ADL was generated
- Required line 5 – ":First Update:" followed by the day/time (ddhhmmss) at which the ADL was generated

A sample header follows:

```
:Product Code:  0xfaa
:Magic Number:  0xfaa1
:Version Num :  0xD
#
#
:Date:  11/16/2012
:First Update:  16010315
#
```

1.2 - ADL Data Blocks

The bulk of an ADL file is the data update. It starts with a single line containing the day-hour-minute-second at which the update was generated, as follows:

```
START_UPDATE ddhhmmss
```

The data update is terminated by a single line that also includes the update time, as follows:

```
END_UPDATE ddhhmmss
```

The data update itself is composed of many data blocks, described in following sub-sections. Individual data blocks may or may not appear in a particular ADL depending on the element type and user actions. A table titled *Data Block Applicability* summarizing this information appears following the data block descriptions.

There is no specified order for the various data blocks except that the ARRIVALS and DEPATURES blocks are the last two blocks.

1.2.1 ADL_DEFINITION

The ADL Definition data block is required for all ADLs. This block provides various information regarding the generation of the ADL file. The ADL Definition data block must contain four parameters, as follows:

```
START_ADL_DEFINITION
 ELEM_NAME ccc[c] (for airports) / cccccc (for FEAs) / FCAccc (for
FCAs)
 ELEM_TYPE LLL
 ADL_START_TIME ddhhmmss
 ADL_END_TIME ddhhmmss
END_ADL_DEFINITION
```

Following is a description of each of the keywords in the ADL_DEFINITION data block:

1. ELEM_NAME – The name of the airport, FEA, or FCA described in this ADL. Maximum length is 6-characters.

   For airport ADLs – three or four alpha-numeric character airport identifier

   For FEA ADLs – up to six characters limited to upper case alpha-numeric, "-", and "_". Characters may be used in any position except that "-", and "_" may not be used in the last position. NOTES - FEA names are not guaranteed to be unique and can duplicate airport names, in such a case they should not be considered to be the same element. FEA names can be reused within the same day, in such a case they should not be considered to be the same element.

   For FCA ADLs – six alpha-numeric characters beginning with "FCA".

2. ELEM_TYPE – The type of element described in this ADL. Type can be APT, FEA, or FCA.
3. ADL_START_TIME – The start time of the request that generated the ADL.
4. ADL_END_TIME – The end time of the request that generated the ADL.

The time range should be interpreted as follows:

- For an airport arrival list, the list includes all flights whose arrival time (ETA) is greater than or equal to the ADL_START_TIME and less than or equal to the ADL_END_TIME.

- For an airport departure list, the list includes all flights whose departure time (ETD) is greater than or equal to the ADL_START_TIME and less than or equal to the ADL_END_TIME.
- For an FCA-based arrival list, the list includes all flights whose entry time (ENTRY) is greater than or equal to the ADL_START_TIME and less than or equal to the ADL_END_TIME.

1.2.1.1 Airport ADL Time Interval

The ADL time range is computed as follows:

- Get the current time.
- Truncate to the start of the current hour.
- Subtract 1:00 from the current hour; this is the start time.
- Add 35:59 to the current hour; this is the end time.

For example, if a report is generated at 12:35, it contains the flights arriving/departing from 11:00 the same day to 23:59 the next day.

These values are provided in the ADL_DEFINITION Block.

1.2.1.2 FEA/FCA Time Interval

When an FEA or FCA is created in TFMS, the user defines a time range for that FEA/FCA. The ADL for an FEA/FCA contains flights for that user-defined time range, plus an additional time range to help ensure that flights are not delayed out of the ADL. The ADL time range is defined as the FEA/FCA start to the FEA/FCA end time plus X hours, where X is a parameter than can be defined at the TFMS-Core (X is initially set at six hours). The ADL time range for an FEA/FCA is applied as follows:

- The ADL start time is set to the later of the following two options:
  - The FEA/FCA start time
  - The current time truncated to the current hour minus one hour.
- For an FEA/FCA that defines a volume of airspace, the ADL includes any flight that is in the FEA/FCA at any time from the ADL start time to the FEA/FCA end time plus X hours.
- For an FEA/FCA that defines an airspace fix or a line segment, the ADL includes any flight that crosses the FEA/FCA from the ADL start time to the FEA/FCA end time plus X hours.
- For an FEA/FCA that defines an airport, the ADL includes any flight arriving at or departing from the FEA/FCA, from the ADL start time to the FEA/FCA end time plus X hours.

These values are provided in the ADL_DEFINITION Block.

1.2.2 AFIX

The AFIX block is required for an airport ADL, but does not appear in an FEA/FCA ADL. It contains a list of the arrival fixes defined in TFMS-Core for the ADL airport. Up to 20 fixes may be indicated. A sample AFIX block follows:

```
START_AFIX
 ROBRT
 BARIN
 TRIXY
 FINKS
 MUMSY
```

```
END_AFIX
```

A sample AFIX block without any defined fixes follows:

```
START_AFIX
END_AFIX
```

1.2.3 DFIX

The DFIX block is required for an airport ADL, but does not appear in an FEA/FCA ADL. It contains a list of the departure fixes defined in TFMS-Core for the ADL airport. Up to 20 fixes may be indicated. A sample DFIX block follows:

```
START_DFIX
 ROBRT
 BARIN
 TRIXY
 FINKS
 MUMSY
END_DFIX
```

A sample DFIX block without any defined fixes follows:

```
START_DFIX
END_DFIX
```

1.2.4 AAR

The AAR block is required for all ADLs. It contains at least one line showing the default value for the airport or FEA/FCA arrival rate. For an FEA/FCA the default value is always "0". It may contain an additional line showing values that an Authorized FAA User has entered, either through an AAR update or as part of a TMI.

A full description of the AAR block format is provided in reference 3.

A sample AAR block follows:

```
START_AAR
 DEFAULT 60
 AAR_TIME 161500 IDX 9 AAR-15 10 9 9 9 10 9 9 9 10 9 9 9 10 9 9 9 10 9
9
END_AAR
```

The AAR_TIME value is the date/time of the first 15 minute period to which the first AAR should be applied. The remaining AARs are for the subsequent 15 minute periods. The "IDX 9" should be ignored.

1.2.5 ADR

The ADR block is required for an airport ADL, but does not appear in an FEA/FCA ADL. It contains at least one line showing the default value, as an hourly ADR. It may contain an additional line showing values that an Authorized FAA User has entered, either through an ADR update or as part of a GDP.

A full description of the ADR block format is provided in reference 3.

A sample ADR block follows:

```
START_ADR
```

```
 DEFAULT 60
 ADR_TIME 131900 IDX 13 ADR-15 10 9 9 9 10 9 9 9 10 9 9 9 10 9 9 9 10
9 9
END_ADR
```

The ADR_TIME value is the date/time of the first 15 minute period to which the first ADR should be applied. The remaining ADRs are for the subsequent 15 minute periods. The "IDX 13" should be ignored.

1.2.6 HISTORICAL POP-UPS

The HISTORICAL_POP-UPS block is required for all ADLs. It contains three lines, each indicating the projected number of pop-up flights which historically arrive in each hour for each of three confidence levels (HIGH, MEDIUM, and LOW).

For each confidence level the first value indicates the percentile used to calculate that confidence level, this value is enclosed in parentheses and is a whole number between 1 and 99. The remainder of each line contains the projected pop-up values for each hour. Pop-up values may be between 0 and 999, decimal values are allowed only for values less than 10. The range of hours for which pop-up values are provided corresponds to the hours of the ADL_START_TIME and ADL_END_TIME in the ADL_DEFINITION block. If TFMS-Core is not able to provide values for specific hours these hours indicate 0. This results in pop-up values being provided for the full range of hours covered by that ADL.

Note that the first projected pop-up estimate in an airport ADL is always zero because it represents an hour in the past (i.e.,, ADL START TIME) and all flights for an hour in the past are known to the system. The 2nd - 37th estimated pop-up values in an airport ADL represent the 1st - 36th lead-time hours taken from the "bucket" of estimates generated for the current UTC hour. The estimates are selected for the current UTC hour because the estimates are relative to the time the ADL file is created.

A sample HISTORICAL_POP-UP block follows:

```
START_HISTORICAL_POP-UPS
 HIGH (80) 0 10 9 9 9 10 9 9 9 10 9 9 9 10 9 9 9 10 ( ...and 19 more..)
 MEDIUM (50) 0 10 9 9 9 10 9 9 9 10 9 9 9 10 9 9 9 10 ( ...and 19 more..)
 LOW (30) 0 2 2 9.5 9 10 9 0.5 9 10 9 9 9 10 9 9 9 10 ( ...and 19 more..)
END HISTORICAL_POP-UPS
```

In some cases, such as an ADL for an FEA or FCA, TFMS-Core is not able to provide pop-up values. In these cases the HISTORICAL_POP-UPS block are still present except the percentile levels indicate "-", and all pop-up predictions indicate 0.

A sample HISTORICAL_POP-UP block follows:

```
START_HISTORICAL_POP-UPS
 HIGH (-) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 MEDIUM (-) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 LOW (-) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
END HISTORICAL_POP-UPS
```

1.2.7 ELEMENT_DEFINITION

The ELEMENT_DEFINITION block is required for ADLs defining an FEA or FCA, but does not appear in an airport ADL. The ELEMENT_DEFINITION block contains information defining the FEA/FCA. An FEA/FCA definition is in XML format using the same formatting as in the TFMDI data feed (see

reference document 2) and as used internally by TFMS, with the slight difference that the following unnecessary containers and their sub-elements are omitted:

- <INDEX_INFO>
- <FCA_DISPLAY_PREFERENCES> – This entire container is omitted.

A full description of the FEA/FCA format is provided in reference 2. A sample ELEMENT_DEFINITION block follows:

```
START_ELEMENT_DEFINITION
  <FCA>
    <FCA_ID>fca.etmst1.lxpc94.20050523143218</FCA_ID>
    <NAME>FCA004</NAME>
    <DOMAIN>PUBLIC</DOMAIN>
    <LASTUPDATE>20050523143331</LASTUPDATE>
    <UP_WKSTN>lxpc94</UP_WKSTN>
    <UP_SITE>etmst1</UP_SITE>
    <CR_WKSTN>lxpc94</CR_WKSTN>
    <CR_SITE>etmst1</CR_SITE>
    <SHARE_SITES>CCSD</SHARE_SITES>
    <REASON>NONE</REASON>
    <TYPE>FCA</TYPE>
    <COLOR_ID>34</COLOR_ID>
    <START>20050523143000</START>
    <END>20050523193000</END>
    <EXTENDED>TRUE</EXTENDED>
    <LOOK_AHEAD>12</LOOK_AHEAD>
    <FSM_ELIGIBLE>TRUE</FSM_ELIGIBLE>
    <POLYGON>
      <CEILING>600</CEILING>
      <FLOOR>0</FLOOR>
      <DIRECTION>0</DIRECTION>
        <SPEED>0</SPEED>
      <DRAWING>false</DRAWING>
      <POINTS>4285,8015 4008,8003 </POINTS>
    </POLYGON>
    <PRIMARY_FILTER>
      <COLOR_ID>25</COLOR_ID>
      <CONDITIONS>
        <ALL>
          <DEPARTS_ANY>ORD</DEPARTS_ANY>
          <ARRIVES_ANY>EWR</ARRIVES_ANY>
        </ALL>
      </CONDITIONS>
    </PRIMARY_FILTER>
  </FCA>
END_ELEMENT_DEFINITION
```

1.2.8 METAR

The METAR block is optional for an airport ADL, but does not appear in an FEA/FCA ADL. The METAR block always contains the current METAR. A sample METAR block follows:

```
START_METAR
 KEWR 071851Z 22012G20KT 10SM OVC250 19/00 A3020 RMK AO2
     SLP225 T01890000=
END_METAR
```

1.2.9 TAF

The TAF block is optional for an airport ADL, but does not appear in an FEA/FCA ADL. The TAF block always contains the current TAF. A sample TAF block follows:

```
START_TAF
 KEWR 071901Z 071918 24012KT P6SM OVC250
      BECMG 0002 VRB03KT SCT060 BKN250
     FM0800 VRB03KT P6SM SKC
      TEMPO 0912 6SM BR
     FM1400 17005KT P6SM SCT250=
END_TAF
```

1.2.10 UNASSIGNED_SLOTS

The UNASSIGNED_SLOTS block is required for all ADLs. If a TMI utilizes a Delay Assignment Mode of GAAP or UDP the block contains a list of unassigned slots that have not yet been allocated to flights. Each line may contain up to 50 slots. If all available slots have been assigned or if Delay Assignment Mode of DAS is utilized the block contains the value NONE. A sample UNASSIGNED_SLOTS block for a GDP follows:

```
START_UNASSIGNED_SLOTS
 EWR.191233A EWR.191234A EWR.191235A EWR.191236A EWR.191237A EWR.191238A EWR.191239A
 EWR.191241A EWR.191242A EWR.191243A EWR.191442A EWR.191245A EWR.191246A EWR.191247A
 EWR.191249A EWR.191250A EWR.191251A EWR.191252A EWR.191253A EWR.191254A EWR.191255A
END_UNASSIGNED_SLOTS
```

A sample UNASSIGNED_SLOTS block for an AFP follows:

```
START_UNASSIGNED_SLOTS
 FCA027.191233A FCA027.191234A FCA027.191235A FCA027.191236A FCA027.191237A
 FCA027.191241A FCA027.191242A FCA027.191243A FCA027.191442A FCA027.191245A
 FCA027.191249A FCA027.191250A FCA027.191251A FCA027.191252A FCA027.191253A
END_UNASSIGNED_SLOTS
```

A sample empty UNASSIGNED_SLOTS block follows:

```
START_UNASSIGNED_SLOTS
 NONE
END_UNASSIGNED_SLOTS
```

1.2.11 GDP_PARAMS

The GDP_PARAMS block contains all the parameters specified when an Authorized FAA User either proposes or issues an AFP/GDP-Initial or AFP/GDP-Revision. Each parameter is preceded by an explanatory keyword. The first line after START_GDP_PARAMS contains either PROPOSED or ACTUAL, indicating whether the AFP/GDP-Initial or AFP/GDP-Revision has actually been issued. Times are shown as day/time (DDHHMM) as well as in an internal FSM format. A proposed GDP_PARAMS block appears whenever a proposed CDM advisory for an AFP/GDP-Initial or AFP/GDP-Revision has been sent and does not replace any GDP_PARAMS blocks containing actual parameters. An actual GDP_PARAMS block appears if EDCTs have actually been issued. Only the parameters from the last actual AFP/GDP-Initial or AFP/GDP-Revision issued are shown and, when shown, they cause any previously proposed AFP/GDP parameters to be dropped.

Once an actual GDP_PARAMS block appears in the ADL, it remains in the ADL until one of the following conditions occurs:

- The AFP or GDP is purged (cancelled).

- A new AFP/GDP-Initial or AFP/GDP-Revision is issued.

Once proposed GDP_PARAMS block appears in the ADL, it remains in the ADL until one of the following conditions occurs:

- The AFP or GDP is purged (cancelled).
- A new actual AFP/GDP-Initial or AFP/GDP-Revision is issued.
- A new proposed AFP/GDP-Initial or AFP/GDP-Revision is issued.

This means the last GDP_PARAMS block remains in the ADL even if a compression, blanket, or ground stop is issued or if the AFP's or GDP's end time has passed.

When a GDP or AFP is cancelled, all of the lines in the block are removed and are replaced by the text PGM_TERMINATED followed by the time of the cancellation in MMDDHHMMSS format. This message is retained until a new TMI, either actual or proposed, is issued or until 0800z.

A full description of the GDP_PARAMS block format is provided in reference 3.

A sample GDP_PARAMS block follows:

```
START_GDP_PARAMS
ACTUAL
ELEM_NAME JFK
ELEM_TYPE APT
CTL_PROGRAM JFK
DATA_TIME 20060501182400
ADL_TIME 20060501182423
REPORT_TIME 01182851Z
REPORT_TIME_FULL 20060501182851
EVENT_START_TIME 200605011824
EVENT_END_TIME 200605020259
CUMULATIVE_START_TIME 200605011824
CUMULATIVE_END_TIME 200605020259
POP-UP_FACTOR 0
AIRCRAFT_TYPE ALL
ARRIVAL_FIX ALL
CARRIER_NAME ALL
NOW_PLUS 45
EXEMPT_TYPE By_Tiers
NONEXEMPT_CENTER_ORIG :INTERNAL: ZNY
OPERATION_TYPE RBS++
DELAY_CEILING 999
DELAY_MODE DAS
START_AAR
:200605011800 - 33: 9 8 8 8
:200605011900 - 33: 9 8 8 8
:200605012000 - 33: 9 8 8 8
:200605012100 - 33: 9 8 8 8
:200605012200 - 33: 9 8 8 8
:200605012300 - 33: 9 8 8 8
:200605020000 - 33: 9 8 8 8
:200605020100 - 33: 9 8 8 8
:200605020200 - 33: 9 8 8 8
:200605020300 - 54: 14 13 14 13
:200605020400 - 54: 14 13 14 13
:200605020500 - 54: 14 13 14 13
:200605020600 - 54: 14 13 14 13
```

```
:200605020700 - 54: 14 13 14 13
:200605020800 - 54: 14 13 14 13
:200605020900 - 54: 14 13 14 13
:200605021000 - 54: 14 13 14 13
:200605021100 - 54: 14 13 14 13
:200605021200 - 54: 14 13 14 13
:200605021300 - 54: 14 13 14 13
:200605021400 - 54: 14 13 14 13
:200605021500 - 54: 14 13 14 13
:200605021600 - 54: 14 13 14 13
:200605021700 - 54: 14 13 14 13
END_AAR
DEP_EXEMPT_TYPE By_Time
GS_BY_STATUS Y
LAST_GDP_END_TIME NA
TOTAL_FLIGHTS 268
AFFECTED_FLIGHTS 0
STACK_VALUE 3
TOTAL_DELAY_BEFORE 0
TOTAL_DELAY_AFTER 0
TOTAL_DELAY_DIFFERENCE 0
MAX_DELAY_BEFORE 0
MAX_DELAY_AFTER 0
MAX_DELAY_DIFFERENCE 0
MIN_DELAY_BEFORE 0
MIN_DELAY_AFTER 0
MIN_DELAY_DIFFERENCE 0
AVG_DELAY_BEFORE 0.0
AVG_DELAY_AFTER 0.0
AVG_DELAY_DIFFERENCE 0.0
END_GDP_PARAMS
```

1.2.12 CTOP_PARAMS

The CTOP_PARAMS block contains most of the parameters specified when an Authorized FAA User issues a CTOP using TFMS. It is similar to the GDP_PARAMS block.

Once an actual CTOP_PARAMS block appears in the ADL, it remains in the ADL until one of the following conditions occurs:

- A CTOP-Cancel is issued from TFMS.
- A new CTOP-Initial or CTOP-Revision is issued.

Once proposed CTOP_PARAMS block appears in the ADL, it remains in the ADL until one of the following conditions occurs:

- A CTOP-Cancel is issued from TFMS.
- A new actual CTOP-Initial or CTOP-Revision is issued.
- A new proposed CTOP-Initial or CTOP-Revision is issued.

When a CTOP is purged (cancelled), all of the lines in the block are removed and are replaced by the text PGM_TERMINATED followed by the time of the cancellation in mmddhhmmss format. This message is retained until a new CTOP, either actual or proposed, is started or until 0800z.

A full description of the CTOP_PARAMS block format is provided in reference 3.

A sample CTOP_PARAMS block follows:

```
START_CTOP_PARAMS
ACTUAL
ELEM_NAME FCA001
ELEM_TYPE FCA
CTL_PROGRAM CTP001
DATA_TIME 20120330184200
ADL_TIME 20120330184223
REPORT_TIME 301845562
REPORT_TIME_FULL 20120330184556
EVENT_START_TIME 201203301915
EVENT_END_TIME 201203310415
CUMULATIVE_START_TIME 201203301915
CUMULATIVE_END_TIME 201203310415
NOW_PLUS 45
EXEMPT_TYPE By_Tiers
NONEXEMPT_CENTER_ORIG :ALL: ZAB ZSE ZFW ZKC ZME ZTL ZOA ZLC ZLA ZAU
ZMP ZDV ZID ZMA ZHU ZJX ZBW ZOB ZDC ZNY
DELAY_MODE DAS
START_PROGRAM_RATE
:201203301700 - 0: 0 0 0 0
:201203301800 - 0: 0 0 0 0
:201203301900 - 0: 0 0 0 0
:201203302000 - 15: 4 4 4 3
:201203302100 - 15: 4 4 4 3
:201203302200 - 15: 4 4 4 3
:201203302300 - 15: 4 4 4 3
:201203310000 - 15: 4 4 4 3
:201203310100 - 15: 4 4 4 3
:201203310200 - 15: 4 4 4 3
:201203310300 - 15: 4 4 4 3
:201203310400 - 15: 4 4 4 3
:201203310500 - 15: 4 4 4 3
:201203310600 - 15: 4 4 4 3
:201203310700 - 0: 0 0 0 0
:201203310800 - 0: 0 0 0 0
:201203310900 - 0: 0 0 0 0
:201203311000 - 0: 0 0 0 0
:201203311100 - 0: 0 0 0 0
:201203311200 - 0: 0 0 0 0
:201203311300 - 0: 0 0 0 0
:201203311400 - 0: 0 0 0 0
:201203311500 - 0: 0 0 0 0
:201203311600 - 0: 0 0 0 0
:201203311700 - 0: 0 0 0 0
:201203311800 - 0: 0 0 0 0
:201203311900 - 0: 0 0 0 0
:201203312000 - 0: 0 0 0 0
:201203312100 - 0: 0 0 0 0
:201203312200 - 0: 0 0 0 0
:201203312300 - 0: 0 0 0 0
:201204010000 - 0: 0 0 0 0
:201204010100 - 0: 0 0 0 0
:201204010200 - 0: 0 0 0 0
:201204010300 - 0: 0 0 0 0
:201204010400 - 0: 0 0 0 0
:201204010500 - 0: 0 0 0 0
```

```
END_PROGRAM_RATE
DEP_EXEMPT_TYPE By_Time
CHARGE_TO Center ZAB
CHARGE_TO_NONFAA N
IC_CODE 3001
IC_TEXT Equipment, Equipment
IC_CATEGORY Equipment
IC_CAUSE Equipment
IC_EQUIPMENT :FAA:N:SCHEDULED:N
END_CTOP_PARAMS
```

1.2.13 COMP_PARAMS

The COMP_PARAMS block contains all the parameters specified when an Authorized FAA User performs a compression of a previously issued AFP or GDP. It is similar to the GDP_PARAMS block.

Once a COMP_PARAMS block appears in the ADL, it remains in the ADL until one of the following conditions occurs:

- The TMI is purged (cancelled).
- A new TMI is issued.

A full description of the COMP_PARAMS block format is provided in reference 3.

A sample COMP_PARAMS block follows:

```
START_COMP_PARAMS
ACTUAL
ELEM_NAME JFK
ELEM_TYPE APT
CTL_PROGRAM JFK
DATA_TIME 20060501182900
ADL_TIME 20060501182929
REPORT_TIME 011830022
REPORT_TIME_FULL 20060501183002
EVENT_START_TIME 200605011829
EVENT_END_TIME 200605020259
CUMULATIVE_START_TIME 200605011824
CUMULATIVE_END_TIME 200605020259
COMPRESS_LAST_CTA N
TOTAL_FLIGHTS 127
AFFECTED_FLIGHTS 11
TOTAL_DELAY_BEFORE 2848
TOTAL_DELAY_AFTER 2818
TOTAL_DELAY_DIFFERENCE -30
MAX_DELAY_BEFORE 59
MAX_DELAY_AFTER 59
MAX_DELAY_DIFFERENCE 0
MIN_DELAY_BEFORE 1
MIN_DELAY_AFTER 1
MIN_DELAY_DIFFERENCE 0
AVG_DELAY_BEFORE 22.4
AVG_DELAY_AFTER 22.2
AVG_DELAY_DIFFERENCE -0.2
END_COMP_PARAMS
```

1.2.14 BKT_PARAMS

The BKT_PARAMS block contains all the parameters specified when an Authorized FAA User performs a blanket delay of a previously issued ground delay program. It is similar to the GDP_PARAMS and COMP_PARAMS blocks.

Once a BKT_PARAMS block appears in the ADL, it remains in the ADL until one of the following conditions occurs:

- The TMI is purged (cancelled).
- A new TMI is issued.

A full description of the BKT_PARAMS block format is provided in reference 3.

A sample BKT_PARAMS block follows:

```
START_BKT_PARAMS
ACTUAL
ELEM_NAME IAD
ELEM_TYPE APT
CTL_PROGRAM IAD
DATA_TIME 20060501182500
ADL_TIME 20060501182536
REPORT_TIME 01182620Z
REPORT_TIME_FULL 20060501182620
EVENT_START_TIME 200605011835
EVENT_END_TIME 200605020302
CUMULATIVE_START_TIME 200605011819
CUMULATIVE_END_TIME 200605020259
AIRCRAFT_TYPE ALL
ARRIVAL_FIX ALL
CARRIER_NAME ALL
NOW_PLUS 30
EXEMPT_TYPE By_Tiers
NONEXEMPT_CENTER_ORIG :INTERNAL: ZDC
ADJUST_MINUTE 20
TOTAL_FLIGHTS 300
AFFECTED_FLIGHTS 15
TOTAL_DELAY_BEFORE 1246
TOTAL_DELAY_AFTER 1546
TOTAL_DELAY_DIFFERENCE 300
MAX_DELAY_BEFORE 165
MAX_DELAY_AFTER 185
MAX_DELAY_DIFFERENCE 20
MIN_DELAY_BEFORE 1
MIN_DELAY_AFTER 21
MIN_DELAY_DIFFERENCE 20
AVG_DELAY_BEFORE 83.1
AVG_DELAY_AFTER 103.1
AVG_DELAY_DIFFERENCE 20.0
END_BKT_PARAMS
```

1.2.15 GS_PARAMS

The GS_PARAMS block contains all the parameters specified when an Authorized FAA User issues a ground stop using FSM. It is similar to the GDP_PARAMS block.

Once a GS_PARAMS block appears in the ADL, it remains in the ADL until one of the following conditions occurs:

- The TMI is purged (cancelled).
- A new TMI is issued.

When a GS is cancelled, all of the lines in the block are removed and are replaced by the text PGM_TERMINATED followed by the time of the cancellation in mmddhhmmss format. This message is retained until a new GS, either actual or proposed, is started or until 0800z.

A full description of the GS_PARAMS block format is provided in reference 3.

A sample GS_PARAMS block follows:

```
START_GS_PARAMS
ACTUAL
ELEM_NAME DTW
ELEM_TYPE APT
CTL_PROGRAM DTW
DATA_TIME 20060501181800
ADL_TIME 20060501181857
REPORT_TIME 01182225Z
REPORT_TIME_FULL 20060501182225
EVENT_START_TIME 200605011808
EVENT_END_TIME 200605011907
CUMULATIVE_START_TIME 200605011808
CUMULATIVE_END_TIME 200605011907
AIRCRAFT_TYPE ALL
ARRIVAL_FIX ALL
CARRIER_NAME ALL
NOW_PLUS 0
EXEMPT_TYPE By_Tiers
NONEXEMPT_CENTER_ORIG :INTERNAL: ZOB
START_AAR
:200605011800 - 72: 18 18 18 18
:200605011900 - 72: 18 18 18 18
:200605012000 - 72: 18 18 18 18
:200605012100 - 72: 18 18 18 18
:200605012200 - 72: 18 18 18 18
:200605012300 - 72: 18 18 18 18
:200605020000 - 72: 18 18 18 18
:200605020100 - 72: 18 18 18 18
:200605020200 - 72: 18 18 18 18
:200605020300 - 72: 18 18 18 18
:200605020400 - 72: 18 18 18 18
:200605020500 - 72: 18 18 18 18
:200605020600 - 72: 18 18 18 18
:200605020700 - 72: 18 18 18 18
:200605020800 - 72: 18 18 18 18
:200605020900 - 72: 18 18 18 18
:200605021000 - 72: 18 18 18 18
:200605021100 - 72: 18 18 18 18
:200605021200 - 72: 18 18 18 18
:200605021300 - 72: 18 18 18 18
:200605021400 - 72: 18 18 18 18
:200605021500 - 72: 18 18 18 18
:200605021600 - 72: 18 18 18 18
```

```
:200605021700 - 72: 18 18 18 18
END_AAR
DEP_EXEMPT_TYPE By_Status
TOTAL_FLIGHTS 45
AFFECTED_FLIGHTS 1
TOTAL_DELAY_BEFORE 0
TOTAL_DELAY_AFTER 13
TOTAL_DELAY_DIFFERENCE 13
MAX_DELAY_BEFORE 0
MAX_DELAY_AFTER 13
MAX_DELAY_DIFFERENCE 13
MIN_DELAY_BEFORE 0
MIN_DELAY_AFTER 13
MIN_DELAY_DIFFERENCE 13
AVG_DELAY_BEFORE 0.0
AVG_DELAY_AFTER 13.0
AVG_DELAY_DIFFERENCE 13.0
END_GS_PARAMS
```

1.2.16 SUB_FLAG

The SUB_FLAG block shows the status of the slot substitution process. The SUB_FLAG block may contain the following keywords:

- SUBS – Indicates whether substitutions in general are enabled (ON) or disabled (OFF) for this element. When SUBS are indicated as OFF, that indicates that simplified substitution requests (SSR), slot credit substitutions (SCS), and adaptive compression (ADPT) are all OFF, regardless of the setting of those individual flags. When SUBS are indicated as ON, SCS and ADPT may be either ON or OFF, as indicated by those individual flags.
- SCS – Indicates whether slot credit substitutions for all users are enabled (ON) or disabled (OFF) for this element. A separate SCS flag is provided since SCS can be disabled independently of SUBS. However, if SUBS are OFF, SCS is also OFF regardless of the setting of this flag.
- ADPT – Indicates whether adaptive compression processing is enabled (ON) or disabled (OFF) for this element. A separate ADPT flag is provided since adaptive compression can be disabled independently of SUBS. However, if SUBS are OFF, adaptive compression is also OFF regardless of the setting of this flag.
- BRIDGING – Indicates whether bridging is disabled (OFF) for a particular user (user name, GA, or MILITARY). If bridging is off for a NAS User, any flight whose MAJOR Field or carrier code (from the ACID) matches the airline name is not used for an SCS bridging nor is it moved by adaptive compression. If bridging is enabled for a NAS User, no line appears; that is, the only allowed value for this keyword is OFF.

A sample SUB_FLAG block follows:

```
START_SUB_FLAG
 SUBS ON
 SCS OFF
 ADPT OFF
 BRIDGING OFF AAL
 BRIDGING OFF BLR
 BRIDGING OFF GA
 BRIDGING OFF MILITARY
END_SUB_FLAG
```

1.2.17 FADT_TIMES

The FADT_TIMES block contains a list of FADT files that have been processed during the current traffic management event at the element defined by the ADL. A FADT file is the file that FSM generates whenever a set of EDCTs and DAS delays are sent out. Any TMI, except an AFP/GDP-Purge, causes a FADT to be generated. The FADT_TIMES block lists each FADT that has been processed and for each indicates the time at which it was processed (ddhhmmss) and the type of TMI. The FADT_TIME block only appears if a TMI is in place for that Airport or FCA. A sample FADT_TIMES block follows:

```
START_FADT_TIMES
 04173029 GDP
 04184317 COMP
 04200011 GDP
END_FADT_TIMES
```

For AFPs the following event types can be listed in the FADT_TIMES block;

- AFP
- COMP

For CTOPs the following event type can be listed in the FADT_TIMES block;

- CTOP

For GDPs the following event types can be listed in the FADT_TIMES block;

- GDP
- COMP
- BLKT
- GS

1.2.18 ARRIVALS

The ARRIVALS block is required for an FEA/FCA ADL and optional for an airport ADL. The ARRIVALS block contains the arriving flights for the ADL Element. The START_ARRIVALS line contains an additional field indicating the number of flight records that appear in the block. START_ARRIVALS is then followed by a line for each flight in the ARRIVALS block. The contents of each line and the definition of the data fields are provided in section 1.3 of this document.

Two comment lines precede the ARRIVALS block. One indicates that the following list is for arrivals. The other shows the column headers for each of the data fields in the flight records.

TFMS-Core defines a flight to be a flight leg; that is, a unique combination of call sign (ETMSID), origin (ORIG), destination (DEST), and time of operation (IGTD). For example, flight ABC1223 from BOS to ORD to SFO on 8/23/99 is two flights, one operating from BOS to ORD, another operating from ORD to SFO. Given this definition, the ARRIVALS block contains the following flights for the ADL time range.

For an airport, the ADL includes:

- All flights that TFMS-Core currently predicts to arrive at the given airport in the ADL time interval.
- All cancelled flights that, when they originally entered the CDM database via an FS, FC, FM, or FZ message, were predicted to arrive at the given airport in the ADL time interval.

- All flights that are diverted but that, when they originally entered the CDM database via an FS, FC, FM, or FZ message, were predicted to arrive at the given airport in the ADL time range. (NOTE: The original diverted flight does not appear in the ADL if a diversion recovery is created with the same call sign.)

For an FEA and FCA, the ADL includes:

- All flights currently meeting the FEA/FCA criteria. This includes all flights traversing the spatial area and meeting any filtering specified for that FEA/FCA.
- All flights that would meet the FEA/FCA criteria if the end time was extended. This time range can be determined from the ADL_DEFINITION block.

  NOTE – Since the FEA is not baselined, a flight that cancels or reroutes out of an FEA is no longer listed in the ADL.

For an FCA, the ADL includes:

- All flights that were at some point predicted to traverse the FCA in the ADL time interval but which no longer traverse the FCA due to a time or route change. That is, only flights that were delayed or rerouted after the FCA was created can possibly appear in the FCA ADL. These flights have the DO flag set.
- All cancelled flights that were at some point predicted to traverse the FCA in the ADL time interval. That is, only cancelled flights that were cancelled after the FCA was created can possibly appear in the FCA ADL. These flights have the appropriate cancel flag set in addition to having the DO flag set.

A sample ARRIVALS block follows (NOTE: the records have been truncated to the width of the page, and only two records are shown):

```
#                    ARRIVALS
#ACID     ETMSID     DEST  ACENTR  ORIG  DCENTR  ETD      ETA      DFIX    EDFT …
#
START_ARRIVALS 592
 UCA4467  UCA4467    BOS   ZBW     ISP   ZNY     A152320  A160001  -       -    …
 AAL0155  AAL155     BOS   ZBW     EGLL  ZEU     E151617  A160003  -       -    …
 …
END_ARRIVALS
```

1.2.19 DEPARTURES

The DEPARTURES block contains the departing flights for an airport. The START_ DEPARTURES line contains an additional field indicating the number of flight records that appear in the block. START_DEPARTURES is then followed by a line for each flight in the DEPARTURES block. The contents of each line and the definition of the data fields are provided in section 1.3 of this document.

Two comment lines precede the DEPARTURES block. One indicates that the following list is for departures. The other shows the column headers for each of the data fields in the flight records.

TFMS-Core defines a flight to be a flight leg; that is, a unique combination of call sign (ETMSID), origin (ORIG), destination (DEST), and time of operation (IGTD). For example, flight ABC1223 from BOS to ORD to SFO on 8/23/99 is two flights, one operating from BOS to ORD, another operating from ORD to SFO. Given this definition, the DEPARTURES block contains the following flights for the ADL time range:

- All flights that TFMS-Core currently predicts to depart from the given airport in the ADL time interval.
- All cancelled flights that, when they originally entered the CDM database via an FS, FC, FM, or FZ message, were predicted to depart from the given airport in the ADL time interval.
- All flights that are diverted but that, when they originally entered the CDM database via an FS, FC, FM, or FZ message, were predicted to depart from the given airport in the ADL time range. (NOTE: The original diverted flight does not appear in the ADL if a diversion recovery is created with the same call sign.)

A sample DEPARTURES block follows (NOTE: the records have been truncated to the width of the page, and only two records are shown):

```
#                    DEPARTURES
#ACID      ETMSID    DEST  ACENTR  ORIG  DCENTR  ETD      ETA      DFIX    EDFT    …
#
START_DEPARTURES 608
 GAA1234   GAA1234   ISP   ZNY     BOS   ZBW     A160004  E160057  LUCOS   160013  …
 SWA0785   SWA785    STL   ZKC     BOS   ZBW     A160007  E160402  MHT     160018  …
END_DEPARTURES
```

1.2.20 Data Block Applicability

The table below defines which types of data blocks are required, dependent on the element type of the ADL. The different applicability for FEAs and FCAs is due to the actual program only being issued for FCAs and not FEAs. Due to this, the blocks applicable to an implemented program are never seen in an ADL for an FEA.

	Element Type		
Data Block Type	**Airport**	**FEA**	**FCA**
ADL_DEFINITION	Required	Required	Required
AFIX	Required	Not Supported	Not Supported
DFIX	Required	Not Supported	Not Supported
AAR	Required	Required	Required
ADR	Required	Not Supported	Not Supported
HISTORICAL_POP-UPS	Required	Required	Required
ELEMENT_DEFINITION	Not Supported	Required	Required
METAR	Optional	Not Supported	Not Supported
TAF	Optional	Not Supported	Not Supported
UNASSIGNED_SLOTS	Required	Required	Required
GDP_PARAMS	Optional	Not Supported	Optional
CTOP_PARAMS	Not Supported	Not Supported	Optional
COMP_PARAMS	Optional	Not Supported	Optional

	Element Type		
Data Block Type	**Airport**	**FEA**	**FCA**
BKT_PARAMS	Optional	Not Supported	Not Supported
GS_PARAMS	Optional	Not Supported	Not Supported
SUB_FLAG	Optional	Not Supported	Optional
FADT _TIMES	Optional	Not Supported	Optional
ARRIVALS	Optional	Required	Required
DEPARTURES	Optional	Not Supported	Not Supported

1.3 – Flight-Specific Data

This section describes the data items that CDM provides for a flight. Each data item description includes:

- The name under which the data item appears in the ADL file (these are the names that appear in the column header comment line)
- An expanded descriptor for the data item
- The corresponding CDM message field reference number, when it exists, in square brackets
- The format of the field
- When necessary, a definition of the field and how it is filled

Some general notes about the field descriptions and formats:

- Fields with null values appear in the ADL file as the character '-'.
    - Field syntax is given in abbreviated shorthand using the following conventions. Example: Ldd[cc] means an upper case letter followed by two required digits and zero, one, or two characters.
    - L – represents one upper-case letter
    - d – represents one digit
    - c – represents one alphanumeric character (either letter or digit); by convention, CDM uses only upper case letters in the data fields
    - [] – means the characters within are optional; any characters not shown in brackets are required
- All time-of-day fields are 6 digits: two digits each of day-hour-minute (ddhhmm).
- Field values are left aligned with their column headers.
- Fields are separated by two or more blanks.
- No field is blank; if no value is defined for that field, a '-' appears.
- Current TFMS report field names have been used wherever appropriate. Some new names have been suggested where the existing field names are misleading or confusing.
- The name choices are constrained so that all of the current TFMS field names can still be used (this is critical for backwards compatibility). This leads to what may seem like some strange

choices for names. For example: Airline Gate Time of Departure would be logically abbreviated as AGTD. Unfortunately, this is a pre-existing name for the Actual Gate Time of Departure (although it is not a gate time!). CDM Gate Time of Departure might also be a desirable choice, but CGTD is Controlled Gate Time of Departure (again, even though it is not a gate time). So LGTD is used (it is at least somewhat mnemonic: airLine).

- Flag name lengths have been minimized in an attempt to keep the ADL files from getting any bigger than necessary. This again follows TFMS convention.

1.3.1 Parsing Hints

The ADL file formatting has been designed to be parsed by name rather than by position. Although every effort has been made not to rearrange the file, in some cases it has been desirable to do so in order to add fields but still keep the file readable. The approach that some have used to parse data out of the TFMS reports is to:

- Define the field names that you are looking for as constants
- Search for those names in the column header line counting what position each is in
- Read the flight data records, assigning the values in the previously determined positions into the appropriate internal variables

For example, if you are interested in PGTD, you search the column header line to find that it is the 20th field. You parse each flight record, grab the 20th token, convert it to internal format, and store it in the appropriate internal variable (this works because we ensure that a token exists in every column). Additionally, you can flag an error if a key field that you need is not in the ADL file. This generally keeps the parsing software forward compatible through file format changes.

1.3.2 Flight Data Fields

Prior to the version 10 ADL, every flight record in every ADL had the same format. Starting with version 10, the record format depends on the ADL element type. If the ADL is for an FEA or FCA, the records contain all of the same fields from the airport ADL plus additional FEA/FCA-specific fields. These FEA/FCA-only fields are indicated in the text. If a field has no indicator, it is required in every ADL. A table at the end of this section summarizes which fields appear in each type of ADL.

The fields currently provided for each flight in an ADL are, from left to right:

1. ACID: NAS Aircraft Identifier (AKA. flight identifier, call sign) [CDM Field 02] – Lc[ccccc]

   The flight identifier as it is displayed by TFMS. The ACID is populated from OAG data, CDM message, or NAS message. If TFMS-Core has received NAS data on the flight the ACID appears exactly as it appears in the NAS; that is, it includes any extra leading zeros. The ACID is used for display purposes in all products utilizing the ADL. The ACID may change during the lifecycle of a flight in TFMS; specifically, leading zeros may be introduced into the flight number portion of a commercial flight identifier.

2. ETMSID: TFMS Aircraft Identifier (AKA. flight identifier, call sign) [CDM Field 02] – Lc[ccccc]

   The ETMSID is the internal aircraft identifier used by TFMS for flight data matching. The ETMSID for a given flight record does not change during the existence of the flight in TFMS. The ETMSID matches the ACID except in the case where leading zeros appear in the flight number portion of a commercial flight identifier. In this case, TFMS-Core strips the leading zeros. The ETMSID should be used only to determine the uniqueness of a particular flight and should not be used for display purposes.

3. DEST: Destination Airport (AKA. arrival airport) [CDM Field 27] – ccc[c]
4. ACENTR: Arrival Center – LLL

   ARTCC of the destination airport
5. ORIG: Origin Airport (AKA. departure airport) [CDM Field 26] – ccc[c]
6. DCENTR: Departure Center – LLL

   ARTCC of the origin airport
7. ETD: Estimated Time of Departure from the Origin Airport – Ldddddd

   The ETD is a concatenation of two fields, the prefix and the actual ETD time. The prefix indicates the status of the flight and its source data; that is, it is a combination of what data TFMS-Core has processed for the flight and what state the flight is in (e.g., , scheduled, taxied, active). The ETD is the best, estimated runway departure time considering all data sources. The prefix also gives clues to how the ETD was modeled; however, one must be careful in interpreting the ETD modeling.

   The prefixes are explained below, both in terms of flight status and ETD computation. They are listed in increasing order of priority. TFMS-Core shows the highest priority prefix; for example, if TFMS-Core shows a "P" prefix for a flight, it may also have received "S" and "N" data.

   - "S" Prefix (**S**cheduled)
     - Status: TFMS-Core has processed only OAG schedule data for this flight. There has been no CDM or NAS message to corroborate that the flight will operate as indicated. The flight may be controlled but is not airborne.
     - ETD Computation:
       - If the flight is controlled, TFMS-Core sets the ETD to the controlled departure time (CTD).
       - If the flight is not controlled, TFMS-Core models the ETD as the scheduled departure time (SGTD) from OAG plus a historical ground time estimate.
       - TFMS-Core applies "time-out" logic, as described below.
   - "N" Prefix (Early i**N**tent or a TOS option)
     - Status: TFMS-Core is modeling the flight using an early-intent flight plan or a TOS option. TFMS-Core may have also processed OAG schedule data or a reroute. There have been no other NAS messages for the flight. The flight may be controlled but is not airborne.
     - ETD Computation:
       - If the flight is controlled, TFMS-Core sets the ETD to the CTD.
       - If the flight is not controlled, TFMS-Core models the ETD as the departure time from the early-intent flight plan plus a historical ground time estimate.
       - TFMS-Core applies "time-out" logic, as described below.
   - "R" Prefix (**R**eroute)
     - Status: TFMS-Core is modeling the flight using a reroute assigned by the ATCSCC Severe Weather Unit. TFMS-Core may have also processed OAG schedule data or an early intent message. There has been no other CDM message or NAS message for the flight. The flight may be controlled but is not airborne.

- ETD Computation:
  - If the flight is controlled, TFMS-Core sets the ETD to the CTD.
  - If the flight is not controlled, TFMS-Core models the ETD as the departure time from the OAG data or early-intent flight plan plus a historical ground time estimate.
  - TFMS-Core applies "time-out" logic, as described below.

- "P" Prefix (**P**roposed)
  - Status: TFMS-Core has received a flight plan from the NAS for the flight. There may also have been OAG schedule data, reroute, or early intent message. There have been no CDM messages. The flight may be controlled but is not airborne.
  - ETD Computation:
    - If the flight is controlled, TFMS-Core sets the ETD to the CTD.
    - If the flight is not controlled, TFMS-Core models the ETD as the departure time from the flight plan (P-time, PGTD) plus a historical ground time estimate.
    - TFMS-Core applies "time-out" logic, as described below.

- "L" Prefix (air**L**ine time)
  - Status: TFMS-Core has processed a CDM message for the flight. TFMS-Core may also have processed OAG schedule data, reroute, an early-intent flight plan, and/or a NAS flight plan for the flight. The flight may be controlled but is not airborne.
  - ETD Computation:
    - If the flight is controlled and the CTD is later than the LRTD and LGTD, TFMS-Core sets the ETD to the CTD.
    - If the CDM message contained a runway departure time estimate (LRTD) and the flight is not controlled or the CTD is earlier than the LRTD, TFMS-Core sets the ETD to the user-provided time (LRTD).
    - If the CDM message contained only a gate time departure estimate (LGTD) and the flight is not controlled or the LGTD is later than the CTD, TFMS-Core models the ETD as the gate departure time plus a historical ground time estimate.
    - TFMS-Core applies "time-out" logic, as described below.

- "T" Prefix (**T**axied)
  - Status: TFMS-Core has received a CDM message from the user with an OUT time. This indicates that the flight has pushed off the gate and is in "Taxi" status.
  - ETD Computation: TFMS-Core does not use the OUT time in the ETD modeling. Since the "T" prefix indicates that TFMS-Core has processed CDM messages for the flight, the ETD modeling is the same as for the "L" prefix. The rules are repeated here for clarity.
    - If the flight is controlled and the CTD is later than the LRTD and LGTD, TFMS-Core sets the ETD to the CTD.
    - If the CDM message contained a runway departure time estimate (LRTD) and the flight is not controlled or the CTD is earlier than the LRTD, TFMS-Core sets the ETD to the user-provided time (LRTD).

- If the CDM message contained only a gate time departure estimate (LGTD) and the flight is not controlled or the LGTD is later than the CTD, TFMS-Core models the ETD as the gate departure time plus a historical ground time estimate.
- TFMS-Core applies "time-out" logic, as described below.

- "E" Prefix (**E**stimated)
  - Status: TFMS-Core has received an active NAS message for the flight, but did not get a NAS activation message (DZ) or CDM message with an OFF time. The active message is most commonly a track update (TZ), but may also be a flight plan (FZ), amendment (AF), or boundary crossing (UZ). Flight is active or completed.
  - ETD Computation: TFMS-Core estimates the actual departure time from the active NAS message by modeling backwards from the position and time on the message.
- "A" Prefix (**A**ctual)
  - Status: TFMS-Core has received a NAS activation message or a CDM message with an OFF time. Flight is active or completed.
  - ETD Computation: TFMS-Core uses the actual departure time from a NAS DZ message or from a CDM-participant provided OFF time. If both are available, TFMS-Core uses the NAS DZ time.

"Time-out" Logic

If at any time a flight's departure time goes more than 5-minutes in the past and the flight is not active, TFMS-Core adds five minutes to the ETD. TFMS-Core does not change the prefix in this case. Thus, for any flight with a prefix of S, N, P, L, or T, the ETD may include additional "time-out" delay that TFMS-Core has added to keep the flight current. The amount of time-out delay is shown in the field LTOD (item 79). TFMS-Core eventually cancels flights when the "time-out" delay gets too large (see TO flag – item 66).

8. ENTRY (FEA/FCA-only): Estimated Element Entry Time – dddddd

   The ENTRY is the current, best, estimated entry time for an FEA or FCA considering all data sources.

9. EXIT (FEA/FCA-only): Estimated Element Exit Time – dddddd

   The EXIT is the current, best, estimated exit time for an FEA or FCA considering all data sources. If the FEA/FCA is a fix or line segment, then the EXIT time equals the ENTRY time.

10. ETA: Estimated Time of Arrival at the Destination Airport – Ldddddd

    The ETA is a concatenation of two fields, the prefix and the actual ETA time. The prefix indicates the status of the flight and its source data; that is, it is a combination of what data TFMS-Core has processed for the flight and what state the flight is in (e.g., , estimated, controlled). The ETA is the best, estimated runway arrival time considering all data sources. The prefix also gives clues to how the ETA was modeled; however, as with the ETD, the prefix must be interpreted very carefully.

    The prefixes are explained below, both in terms of flight status and ETA computation. They are listed in increasing order of priority. TFMS-Core shows the highest priority prefix; for example, if TFMS-Core shows a "C" prefix for a flight, the flight may also have "L" data.

    The rules for the arrival prefix depend on whether the flight is on the ground or has departed and are therefore presented separately below.

    ETA Prefix for Flights on the Ground (ETD Prefix is S, N, P, L, or T)

- "E" Prefix (**E**stimated)
  - Status: The flight is on the ground and not controlled.
  - ETA Computation:
    - TFMS-Core models the en route time of the flight based on current route, altitude, speed, aircraft type, and winds. TFMS-Core adds the en route time to the ETD to get the ETA. If TFMS-Core has not received flight plan data from the user or the NAS, it assigns a default route, altitude, and speed based on historical data for that city-pair and aircraft type.
- "L" Prefix (air**L**ine time)
  - Status: TFMS-Core has received a CDM message with a predicted runway arrival time. The flight is on the ground and is not controlled.
  - ETA Computation:
    - TFMS-Core sets the ETA to the airline-provided en route time (LRTA – LRTD) plus the ETD. (NOTE: If the flight is in time-out delay, the ETA is later than the LRTA.)
- "C" Prefix (**C**ontrolled)
  - Status: TFMS-Core has received a controlled departure time for the flight. The flight has not yet departed.
  - ETA Computation: TFMS-Core applies no special ETA processing for a controlled flight. That is, TFMS-Core applies the same logic as for an "E" or "L" ETA. The rules are repeated here to put them in context.
    - If no LRTA has been processed, TFMS-Core models the en route time of the flight based on current route, altitude, speed, aircraft type, and winds. TFMS-Core adds the en route time to the ETD to get the ETA. If TFMS-Core has not received flight plan data from the user or the NAS, it assigns a default route, altitude, and speed based on historical data for that city-pair and aircraft type.
    - If an LRTA has been processed, TFMS-Core sets the ETA to the airline-provided en route time (LRTA – LRTD) plus the ETD. (NOTE: If the flight is in time-out delay, the ETA is later than the LRTA.)

ETA Prefix for Flights That Have Departed (ETD Prefix is E or A)

- "E" Prefix (**E**stimated)
  - Status: The flight is in the air.
  - ETA Computation:
    - TFMS-Core uses reported positions and speeds to refine the ETA.
- "A" Prefix (**A**ctual)
  - Status: TFMS-Core has received a NAS termination message (AZ) and/or has inferred from the track data (TZs) that the flight has landed.
  - ETA Computation:
    - TFMS-Core sets the ETA to the AZ time if it appears consistent with the TZ data. Otherwise, TFMS-Core leaves the ETA to be the last predicted time.

11. DFIX: Departure Fix – LLL[LL]

    The name of the departure fix, at the origin airport, as determined by TFMS-Core modeling.

12. EDFT: Estimated Departure Fix Time – dddddd

    Time over the departure fix as estimated by TFMS-Core.

13. DP: Departure Procedure – LLL[LL]d

    The name of the Departure Procedure (DP) taken from the historical, early intent, or NAS flight plan.

14. DTRSN: DP Transition Fix – LLL[LL]

    The name of the DP transition taken fix from the historical, early intent, or NAS flight plan.

15. AFIX: Arrival Fix – LLL[LL]

    The name of the arrival fix as determined by TFMS-Core modeling.

16. EAFT: Estimated Arrival Fix Time – dddddd

    Time over the arrival fix as estimated by TFMS-Core.

17. STAR: Standard Terminal Arrival Route – LLL[LL]d

    The name of the Standard Terminal Arrival Route (STAR) taken from the historical, early intent, or NAS flight plan.

18. STRSN: STAR Transition Fix – LLL[LL]

    The name of the STAR transition fix from the historical, early intent, or NAS flight plan.

19. USR: User Category – L

    One character indicating the category of user operating the flight. The available values are:

    - C - Air Carrier
    - F - Freight/Cargo Carrier
    - G - General Aviation
    - M - Military
    - T - Air Taxi

- O - Other

20. TYPE: Aircraft Type [CDM Field 03] – Lcc[c]

    Rules of precedence for setting this field, in decreasing order of priority are:

    - Value received from NAS
    - Value received from CDM Participant
    - Value received from OAG

21. CTG: Aircraft Category – L

    One character indicating:

    - J - Jets
    - P - Props
    - T - Turbo

22. CLS: Aircraft Weight Class – L

    One character indicating:

    - H - Heavy
    - L - Large
    - S - Small

23. ARTD: Actual Runway Time of Departure – dddddd

    Name changed as previous name was misleading (it is a runway time not a gate time). ARTD is the time from a NAS DZ message. If no DZ has been received, this field is blank.

24. ARTA: Actual Runway Time of Arrival – dddddd

    Name changed as previous name was misleading (it is a runway time not a gate time). ARTA is the time from a NAS AZ message. If no AZ has been received, this field is blank.

25. CR_TIME (FEA/FCA-only): Create Time – dddddd

    Used to indicate how long TFMS-Core has known of the flight. For FEA/FCA ADLs this is the time the flight was first detected to be intersecting the FEA/FCA.

26. SGTD: Scheduled Gate Time of Departure – dddddd

    Gate departure time from OAG. Null if no OAG data available for the flight.

27. SGTA: Scheduled Gate Time of Arrival – dddddd

    Gate arrival time from OAG. Null if no OAG data available for the flight.

28. IGTD: Initial Gate Time of Departure [CDM Field A1] – dddddd

    Used to save the initial gate departure time of the flight. Used for flight data matching. IGTD is set as follows:

    - When a flight is first created, if it is created from OAG data, CDM Participant data (from CDM message), or flight plan data, the IGTD is set to the gate departure time from that source. Thereafter it is never changed.

- If a flight is created from an "active" message (e.g., , departure message, airborne flight plan, etc.), the IGTD is set to null.

29. IENTRY (FEA/FCA-only): Initial Element Entry Time – dddddd

    Used to save the original entry time into the area defined by the FEA or FCA. IENTRY is used by FSM to determine the priority order when allocating flights to slots. IENTRY is set as follows:

    - For an FEA, the IENTRY time is always set to the predicted entry time (ENTRY) minus any delay the flight has already incurred (ETD – IGTD).
    - For an FCA, the IENTRY time is set as follows. When a flight is first observed to be traversing the FCA, the IENTRY time is set to the predicted entry time (ENTRY) minus any delay the flight has already incurred (ETD – IGTD). Thereafter it is never changed.
    - If a flight is created from an "active" message (e.g., , departure message, airborne flight plan, etc.), the IENTRY is set to null.

30. IGTA: Initial Gate Time of Arrival – dddddd

    Used to save the original gate arrival time of the flight. Useful for flight data matching. IGTA is set as follows:

    - When a flight is first created, if it is created from OAG data, CDM Participant data (from CDM message), or flight plan data, the IGTA is set to the gate arrival time from that source. Thereafter it is never changed.
    - If a flight is created from an "active" message (e.g., , departure message, airborne flight plan, etc.), the IGTA is set to null.

31. PGTD: Proposed Gate Time of Departure – dddddd

    Departure time from NAS flight plan. Null if no flight plan has been received for the flight. If multiple flight plans have been processed, shows the P time from the last one.

32. PGTA: Proposed Gate Time of Arrival – dddddd

    Arrival time from NAS. Generally this is initially set from the flight plan, and then updated when DZs and UZs are processed. Null if no NAS arrival time has been received for the flight.

33. PETE: Filed ETE – dddd

    The PETE field was created because the PGTD and PGTA pair does not preserve the ETE filed by the flight operator on the flight plan. PETE is set in the following manner:

    - If a NAS flight plan has been received for this flight with an ETE field, PETE is set to the latest such value. Otherwise the value is null. PETE is in units of minutes.

34. LRTD: Airline Runway Time of Departure [CDM Field T1] – dddddd

    Predicted runway time of departure provided by the CDM Participant in a CDM message. If a CDM Participant has sent in a runway departure time in a CDM message, then this field contains the most recent such time. Otherwise, the value is null.

35. LRTA: Airline Runway Time of Arrival [CDM Field T2] – dddddd

    Predicted runway time of arrival provided by the CDM Participant in a CDM message. If a CDM Participant has sent in a runway arrival time in a CDM message, then this field contains the most recent such time. Otherwise, the value is null.

36. LGTD: Airline Gate Time of Departure [CDM Field T3] – dddddd

    Predicted gate time of departure provided by the CDM Participant in a CDM message. If a CDM Participant has sent in a gate departure time in a CDM message, then this field contains the most recent such time. Otherwise, the value is null.

37. LGTA: Airline Gate Time of Arrival [CDM Field T4] – dddddd

    Predicted gate time of arrival provided by the CDM Participant in a CDM message. If a CDM Participant has sent in a gate arrival time in a CDM message, then this field contains the most recent such time. Otherwise, the value is null.

38. ERTD: Earliest Runway Time of Departure [CDM Field T7] – dddddd

    The earliest departure time that the CDM Participant would like to have assigned to this flight in a TMI. If the CDM Participant has sent this field in a CDM FC or FM message, then the most recent such time is contained in this field. Otherwise, the value is null.

39. EENTRY (FEA/FCA-only): Earliest Element Entry Time – dddddd

    The earliest possible entry time into the FEA or FCA, as calculated by TFMS-Core. This field is used to ensure that a flight is not assigned a slot for an FEA/FCA that it cannot use. Since the CDM Participants do not send earliest entry times for an FEA/FCA, TFMS-Core computes this value.

    Compute EENTRY as follows:

    - If flight has ERTD, EENTRY = ENTRY + (ERTD-ETD)
    - Else if flight has LRTD, EENTRY = ENTRY + (LRTD-ETD)
    - Else if flight has LGTD, EENTRY = ENTRY + ((LGTD+10)-ETD)
    - Else if flight has IGTD, EENTRY = ENTRY + ((IGTD+10)-ETD)
    - Else, EENTRY = ENTRY

40. ERTA: Earliest Runway Time of Arrival [CDM Field T8] – dddddd

    The earliest arrival time that the CDM Participant would like to have assigned to this flight in a TMI. If the CDM Participant has sent this field in a CDM FC or FM message, then the most recent such time is contained in this field. Otherwise, the value is null.

41. OUT: Gate Out Time [CDM Field T13] – dddddd

    The time at which a flight pushed out from the gate as reported by the CDM Participant via a CDM message. If the CDM Participant sends more than one value, the most recently submitted time is contained in this field. Otherwise, the value is null.

42. OFF: Runway Off Time [CDM Field T11] – dddddd

    The time at which a flight lifts off from the runway as reported by the CDM Participant via a CDM message. If the CDM participant sends more than one value, the most recently submitted time is contained in this field. Otherwise, the value is null.

43. ON: Runway On Time [CDM Field T12] – dddddd

    The time at which a flight touches down on the runway as reported by the CDM Participant via a CDM message. If the CDM participant sends more than one value, the most recently submitted time is contained in this field. Otherwise, the value is null.

44. IN: Gate In Time [CDM Field T14] – dddddd

The time at which a flight pulls in at the gate as reported by the CDM Participant via a CDM message. If the CDM Participant sends more than one value, the most recently submitted time is contained in this field. Otherwise, the value is null.

45. OETD: Original Estimated Time of Departure – dddddd

    OETD is used to save the ETD last modeled by TFMS-Core before either a TMI is issued, or the flight departs, or the flight is "time-out" delayed by TFMS-Core. The OETD is used to "back out" of a TMI. The OETD is different from the BETD in that it does NOT include any time-out delay modeled by TFMS-Core whereas the BETD does include time-out delay. Renamed from OGTD because the TFMS-Core name is misleading. OETD is set in the following manner:

    - Whenever an ETD is updated from an FS, FC, FM, or FZ, as long as the flight is not controlled or active, the OETD is set to the new ETD minus any current time-out delay.

46. OENTRY (FEA/FCA-only): Original Element Entry Time – dddddd

    OENTRY is used to save the ENTRY last modeled by TFMS-Core before either an AFP is issued and the flight departs, or the flight is "time-out" delayed by TFMS-Core. The OENTRY is different from the BENTRY in that it does NOT include any time-out delay modeled by TFMS-Core whereas the BENTRY does include time-out delay. OENTRY is set by referencing the OETD in the following manner:

    - OENTRY = ENTRY + (OETD – ETD)

47. OETA: Original Estimated Time of Arrival – dddddd

    See discussion of Original Estimated Time of Departure. OETA is set in the following manner:

    - Whenever the ETA is updated from an FS, FC, FM, or FZ, as long as the flight is not controlled or active, the OETA is updated to the ETA.

48. BETD: Base Estimated Time of Departure – dddddd

    BETD is used to save the ETD at the time a TMI is issued or the flight departs. The BETD is used to compute the amount of departure delay that can be attributed to a TMI. The BETD includes any time-out delay modeled by TFMS-Core. BETD is set in the following manner:

    - Whenever an ETD is updated from an FS, FC, FM, or FZ, as long as the flight is not controlled or active, the BETD is set to the new ETD.
    - Whenever CDM re-models a departure time due to a "time-out" delay, the BETD is updated to the new ETD.

49. BENTRY (FEA/FCA-only): Based Element Entry Time – dddddd

    BENTRY is used to save the ENTRY at the time an AFP is issued or the flight departs. The BENTRY is used to compute the amount of departure delay that can be attributed to an AFP. The BENTRY includes any time-out delay modeled by TFMS-Core. BENTRY is set relative to the BETD in the following manner:

    - BENTRY = ENTRY + (BETD – ETD)

50. BETA: Base Estimated Time of Arrival – dddddd

    See discussion of Base Estimated Time of Departure. BETA is set in the following manner:

    - Whenever the ETA is updated from an FS, FC, FM, or FZ, as long as the flight is not controlled or active, the BETA is updated to the ETA.

- Whenever CDM re-models a departure time due to a "time-out" delay, the BETA is updated to the new ETA.

51. OCTD: Original Controlled Time of Departure – dddddd

    OCTD preserves the first controlled departure time (CTD, a.k.a. EDCT), for the current CTL_ELEM, for a flight. OCTD is set in the following manner:

    - If an EDCT is received for a flight and the flight is not already controlled, the OCTD is set to the EDCT time.
    - If an EDCT is received for a flight and the flight is already controlled, the OCTD is not changed.
    - If an EDCT purge is received for a flight and the flight is not active or completed, the OCTD is cleared.
    - If a flight is not currently controlled, nor was it controlled when it departed, the value of OCTD is null.

52. OCTA: Original Controlled Time of Arrival – dddddd

    OCTA preserves the first controlled arrival time (CTA), for the current CTL_ELEM, for a flight. Refer to the CTA definition for a full definition of this field. OCTA is set in the following manner:

    - If an EDCT is received for a flight and the flight is not already controlled, the OCTA is set to the CTA.
    - If an EDCT is received for a flight and the flight is already controlled, the OCTA is not changed.
    - If an EDCT purge is received for a flight and the flight is not active or completed, the OCTA is cleared.
    - If a flight is not currently controlled, nor was it controlled when it departed, the value of OCTA is null.

53. CTD: Controlled Time of Departure – dddddd

    CTD is the current controlled departure time (EDCT) for a flight. CTD is set in the following manner:

    - If an EDCT is received for a flight, the CTD is set to the EDCT time.
    - If an EDCT purge is received for a flight and the flight is not active or completed, the CTD is cleared.
    - If a flight is not currently controlled, nor was it controlled when it departed, the value of CTD is null.

54. CTA: Controlled Time of Arrival – dddddd

    CTA is the current controlled arrival time (EDCT) for a flight at the controlled element as defined in the CTL_ELEM field. That is, if the CTL_ELEM is an airport, the CTA is the assigned arrival time at the airport. If the CTL_ELEM is an FCA, the CTA is the assigned entry time at the FCA. CTA is set in the following manner:

    - If an EDCT is received for a flight, the CTA is set to the CTA from the EDCT.
    - If an EDCT purge is received for a flight and the flight is not active or completed, the CTA is cleared.

- If a flight is not currently controlled, nor was it controlled when it departed, the value of CTA is null.

55. ASLOT: Arrival Slot [CDM Field A2] – ccc[c].ddddddL for GDP Slots / FCAccc.ddddddL for AFP Slots

    When a TMI is issued, each controlled flight is assigned an arrival slot. The ASLOT is the flight's slot for the control element defined by the CTL_ELEM field. Slots for AFPs can be easily identified since the first three characters are always FCA. The ASLOT field is set as follows:

    - If an EDCT is received for a flight, the ASLOT is assigned to the value from the message.
    - If an EDCT purge is received for a flight and the flight is not active or completed, the ALSOT is cleared.
    - If a flight is not currently controlled, nor was it controlled when it departed, the value of ASLOT is null.

    The ASLOT is constructed by combining the element identifier, the slot time, and a letter suffix. The letter suffix is most typically used to create unique ASLOT identifications when multiple slots are created within the same minute and are normally assigned in alphabetic sequence starting with "A". Various other suffixes that can be encountered and their typical usage are;

    - P, Q, … - Starting suffix letter for ASLOTS created for RCTL flights or created by the EDCT UPDATE command. Letters are assigned in alphabetic sequence starting with "P" using the first available letter.
    - Z – Suffix letter for ASLOTS created for pop-up flights until they are assigned an actual slot by an AFP/GDP-revision.

56. CTL_ELEM: Control Element – ccc[c] for GDPs / FCAddd for AFPs or FCAs included in a CTOP

    If a flight is controlled (i.e.,, has a CTD and CTA), the CTL_ELEM indicates the constrained NAS element for which a TMI was issued. Currently, the CTL_ELEM can be an arrival airport or FCA. It is set in the following manner:

    - If a flight is controlled, the CTL_ELEM is the name of the airport or the name of the FCA for an AFP or an FCA included in a CTOP
    - If a flight is not controlled, the CTL_ELEM is null.

57. CTL_PRGM: Control Program –FCAddd for AFPs / CTPddd for CTOPs / LLL[L] for GDPs

    If a flight is controlled (i.e., has a CTD and CTA), the CTL_PRGM indicates the name of the TMI that was issued. It is set in the following manner:

    * If a flight is controlled by an AFP, the CTL_PRGM is the name of the FCA for which the TMI was issued.
    * If a flight is controlled by a CTOP, the CTL_PRGM is the CTOP short name.
    * If a flight is controlled by a GDP, the CTL_PRGM is the name of the airport for which the TMI was issued.
    * If a flight is not controlled, the CTL_PRGM is null.

58. CTL_TYPE: Control Type – LL[LL]

If a flight is controlled (i.e.,, has a CTD and CTA), CTL_TYPE indicates the specific source of the current CTD/CTA. The possible sources along with an indication of what program type they are applicable to:

* ABRG – control times were assigned when the flight was utilized to create a bridge for Adaptive Compression performed automatically by the TFMS-Core (AFP and GDP)
* ADPT – control time assigned when the flight was adaptively compressed by the TFMS-Core (AFP and GDP)
* AFP – control times were assigned as part of an AFP-Initial or AFP-Revision (AFP)
* BLKT – control times were assigned as part of a GDP Blanket (+/-) (GDP)
* COMP – control times were assigned as part of a AFP-Compression or GDP-Compression (AFP and GDP)
* CTOP – control times were assigned as part of a CTOP-Initial or CTOP-Revision (CTOP)
* DAS – control time which resulted from the assignment of the delay to a pop-up flight which did not receive an unassigned slot in an AFP,GDP, or CTOP. For DAS based programs this is used for the initial delay assignments to all pop-up flights. For GAAP and UDP based program, this control type is used only if no unassigned slot is available for the pop-up. This control type is not used for re-controlled flights. (AFP, GDP, and CTOP)
* ECR – control time assigned by a slot credit substitution message submitted by an Authorized FAA user (AFP and GDP)
* GAAP – control times are the result of a GAAP or UDP based AFP or GDP if a pop-up or a re-control flight is allocated to an unassigned slot. This occurs for all pop-up flights in a GAAP or UDP based program when an unassigned slot is available for the flight. However, only some classes of re-controlled flights in a GAAP or UDP are assigned to unassigned slots. (e.g., , those that occur after dropping out of an AFP). (AFP and GDP)
* GDP – control times were assigned as part of an GDP-Initial or GDP-Revision (GDP)
* GS – control times were assigned as part of a GDP-Ground Stop (GDP)
* RCTL – control time which resulted from the assignment of the average delay to a flight that was at some point controlled by a GDP, AFP, or CTOP, which was then purged or the flight dropped out and was re-controlled in another AFP or CTOP. For DAS programs this is used for the initial delay assignments to all re-controlled flights. For GAAP and UDP, this control type is used only if no unassigned slot is available for the re-controlled flight or the class of re-controlled flight is never assigned to unassigned slots. As opposed to other pop-ups, RCTL flights retain full substitution rights (AFP or CTOP)
* SBRG – control times were assigned when creating a bridge for an SCS or ECR request (AFP and GDP)
* SCS – control times assigned by a slot credit substitution message submitted by a NAS User (AFP and GDP)
* SUB – control times assigned by a conventional user substitution message (AFP,GDP, and CTOP)
* UBRG – control times were assigned when creating a bridge for pop-up flight assignment during UDP. Performed automatically by the TFMS-Core (AFP and GDP)

* UPD – control time or UX cancel status from an TFMS "EDCT UPDATE" command made by an Authorized FAA user (AFP, GDP, and CTOP)

59. CTL_EXMPT: Control Exempt Flag – c

    If a flight is controlled (i.e.,, has a CTD and CTA), CTL_EXMPT indicates whether the flight was categorized as "exempt" (for example, due to departure time status or departure center) when the AFP/GDP-Initial or AFP/GDP-Revision was computed. This exemption is in relation to the CTL_ELEM listed in that specific ADL.

60. SL_HOLD: Slot Hold Flag [CDM Field A6] – L

    If a flight is controlled and cancelled (i.e.,, has a CTD, CTA, and ASLOT), the SL_HOLD flag indicates whether the slot associated with this flight is being held, or would be held, by the NAS User for the next full compression. The FSM compression algorithm does not automatically fill slots that are held. If a flight is not controlled the slot hold has no effect, although users may set the slot hold in anticipation of a flight becoming controlled. A slot hold may only be set for flights that are cancelled. The SL_HOLD flag does NOT prevent a slot from being compressed by Adaptive Compression.

61. DVREC: Diversion Recovery Flag – c

    Indicates that the flight is a recovery of a flight that previously changed its destination. A diversion recovery inherits data from the original flight to ensure that it is given the same degree of priority that the original flight would have received in any GDP that has been or may be run.

    - G – Diversion recovery segment of a flight where the destination of the original flight was changed while that flight was still proposed.
    - A – Diversion recovery segment of a flight where the destination of the original flight was changed after the original flight was active.

    NOTE: The DVREC field simply indicates the flight is a result of a change of destination; it is not an indicator that the flight is eligible for any priority due to diversion recovery status.

62. DO (FEA/FCA-only): Drop Out Flight – L

    Indicates a flight was in the FCA but either due to cancellation, rerouting, or change in entry time it no longer traverses the FEA/FCA (i.e., it has Dropped Out of the FEA/FCA). (NOTE: In the case of an FEA the traffic has no baseline, thus no flight ever has a DO status.)

63. UX: Update Cancelled – L

    Indicates whether the flight is currently cancelled due to an EDCT UPDATE cancel. An Authorized FAA User may utilize the EDCT UPDATE command to cancel a flight that is part of a TMI.

64. FX: FX Cancelled – L

    Indicates whether the flight is currently cancelled and an FX message has been processed for this flight. An FX message is the CDM message used by a CDM Participant to indicate a flight is not operating.

65. RZ: RZ or NAS Cancelled – L

    Indicates whether the flight is currently cancelled and an RZ message has been processed for this flight. An RZ message is a NAS flight plan cancel message.

66. RS: RS Cancelled – L

Indicates whether the flight is currently cancelled and an RS message has been processed for this flight. An RS message is an internal TFMS message generated when an Authorized FAA User takes an OAG flight out of the database.

67. TO: Time Out Cancelled – L

    Indicates whether the flight is currently cancelled due to having been timed out by TFMS-Core. TFMS-Core times out a flight when no activation message has been received within a certain time of the predicted departure time.

    The time out logic for flights departing the 20 Continental United States (CONUS), seven Canadian, Honolulu (ZHN/PHZH) and Anchorage (ZAN/PAZA) Centers is as follows:

    - If NAS messages have been received for a flight, TFMS-Core times out the flight 90 minutes after its predicted departure time.
    - If only OAG data or CDM messages have been received for a flight, TFMS-Core times out the flight five minutes after departure time.

    TFMS-Core does not time out flights departing from other regions of the world.

68. DV: Diversion Cancelled – L

    Indicates whether the flight is currently cancelled and was diverted to an alternate destination. The diversion may have come from either a NAS flight plan or a CDM modify (FM) message.

69. RM: Remove Cancelled – L

    Indicates a flight that has been manually removed by an Authorized FAA User.

70. ALD: Airline Delayed – L

    Indicates that the CDM Participant has at some point sent in a departure time estimate (via an FC or FM) for a flight that was later than the estimate previously in the database.

71. GDP: GDP Delayed – L

    Indicates that the flight has at some point been controlled by a GDP-Initial or GDP-Revision.

72. AFP: AFP Delayed – L

    Indicates that the flight has at some point been controlled by an AFP-Initial or AFP-Revision.

73. CTOP: CTOP Delayed – L

    Indicates that the flight has at some point been controlled by a CTOP-Initial or CTOP-Revision.

74. DAS: DAS Delayed – L

    Indicates that a DAS (formerly FA) delay has been applied to this flight.

75. GSD: Ground Stop Delayed – L

    Indicates the flight has at some point been part of a GDP-Ground Stop program.

76. TOD: Time Out Delayed – L

    Indicates that TFMS-Core is delaying this flight due to the fact that it has not departed as projected. The TOD status precedes a time out cancel (TO). A time out delay occurs when a flight has a flight plan message, its departure time is in the past, and it has not been activated yet. In this case, TFMS-Core moves the flight back in time in 5-minute increments until cancelled by time out logic (see TO field). If TFMS-Core receives a new message for this flight moving its departure time into the future,

the TOD flag is cleared indicating that the flight is no longer in time out delay. Time out delay logic is applied only to the same flight as time out cancel logic (see TO field).

77. CTL_ALM: Alarm Flag – 0xdddd

    Indicates the alarm status flags that are set for a particular flight. The CTL_ALM value is the hexadecimal value of the cumulative total of all set flags, where each flag is a bit in the CTL_ALM word. Once set, a flag is never cleared. More than one alarm can be set at a given time.

    The alarm flags are defined as follows:

    - NO_ALARM = 0
    - CTA_COMPLIANCE (0x1)
        - For a GDP, indicates that a flight landed outside the CTA compliance window (more than 5 minutes earlier or 5 minutes later than the CTA).
        - For an AFP, indicates that the estimated entry time into the FCA was outside the CTA compliance window (more than 5 minutes earlier or 5 minutes later than the CTA).
    - CTD_COMPLIANCE (0x2) – For both a GDP and AFP, indicates that a flight took off outside the CTD compliance window (more than 5 minutes earlier or 5 minutes later than the CTD).
    - ETE_VALUE (0x4)
        - For a GDP, indicates the difference between the actual en route time (ORIG to DEST) and the controlled en route time (ORIG to DEST) is outside the compliance time range (more than 15 minutes).
        - For an AFP, indicates that the estimated flying time from the origin airport to the FCA entry point was outside the compliance time range (more than 15 minutes).
    - SPURIOUS_FLT (0x8) –For both a GDP and AFP, indicates that a flight was not scheduled (that is, was created on that day from a CDM message or flight plan), was controlled in a TMI and was cancelled by a CDM message.
    - CANCELLED_FLEW (0x10) – For both a GDP and AFP, indicates a flight that had a status of cancelled at the time that it was activated by a DZ, UZ, TZ, or AZ message.

    Example: A CTL_ALM value of 0x0013 means that the CTA_COMPLIANCE, CTD_COMPLIANCE, and CANCELLED_FLEW alarm flags are all set.

78. CDM_MBR: CDM Member Flag – L

    Flag indicating whether this flight belongs to a CDM Participant and is thus eligible for the full benefits of compression.

79. SUB: Subbable Flight Flag (New) – L

    Flag indicating whether any NAS user has substitution rights for this flight.

80. MAJOR: Major Carrier – LLL[L] or .LL

    Indicates the organization within which this flight is considered when RBS++ is computed (that is, all flights with the same MAJOR value are considered together during the intra-airline swapping portion of RBS++ and Compression). The MAJOR code can indicate an actual air carrier, a general aviation fleet operator, or a pseudo carrier used to logically group certain flights. If the MAJOR code is three letters, it is an official three-letter code that can be used for flight plan filing. If the MAJOR starts

with a period character (.), it is a dummy code used only within TFMS. Dummy codes are used for any organization, such as a GA data provider, that is a CDM Participant but does not have an official three-letter code. If the flight IDs are being filtered, the MAJOR field contains the filtered four-letter code, and the "." is not indicated.

81. GCD: Great Circle Distance – ddddd

    Indicates the great circle distance, in nautical miles, between the origin and the destination airports.

82. LTOD: Length of Time Out Delay – ddd

    If the TOD flag is set, this field indicates the length of the time that the flight has currently been time out delayed, in minutes. If a new message is received pushing the flight out of time out delay status, this time is reset to zero. Time out delay logic is not applied to international flights (See additional discussion under field TOD).

83. NRP: National Route Program flight – L

    Flight plan has been processed with the keyword "NRP" or its aliases in field 11. This indicates the flight is participating in the National Route Program.

84. LFG: Lifeguard or MEDEVAC flight – L

    Flight plan has been processed with the keyword "LIFEGUARD" or its aliases in field 11.

85. III: Flight is capable of utilizing CAT3 landing minimums – L

    Flight plan has been processed with the keyword "CATIII" or its aliases in field 11.

86. ATV: Altitude Reservation – L

    Flight plan has been processed with the keyword "ALTRV" or its aliases in field 11.

87. SWP: Swapping – L

    Flight plan has been processed with the keyword "SWAP" or its aliases in field 11.

88. DVT: Diversion Recovery flight – L

    Flight plan has been processed with the keyword "DVRSN" or its aliases in field 11.

89. ADC: Advise Customs – L

    Flight plan has been processed with the keyword "ADCUS" or its aliases in field 11.

90. FCA: Flow Constrained Area – L

    Flight plan has been processed with the keyword "FCA" or its aliases in field 11.

91. WXR: Severe weather reroute – L

    Flight plan has been processed with the keyword "WXRTE" or its aliases in field 11.

1.3.3 Flight Data Field Applicability

The below table defines which flight data fields are supported dependent on the element type of the ADL. Required fields are always listed but may be null. Fields not supported are not included in the ADL. Additionally the context reference for each field is specified.

The following information is provided;

- Field Reference - The field number referencing the detailed field description contained in this document.

- Field Name - The ADL column header used in the ADL for this field
- Context – Describes the context in which the field should be referenced.
    - For a context of "Flight" the field is unique to a flight record and is the same no matter which ADL or element type the field is encountered.
    - For context "FEA/FCA" the field is unique to each FEA/FCA and is different in the ADL for each FEA/FCA.
    - For context "CTL_ELEM" the field is in reference to the current element that controls the flight.
- Element Type
    - Airport - Indicates applicability of this field to ADLs defining an Airport Element.
    - FEA/FCA - Indicates applicability of this field to ADLs defining an FEA or FCA Element

			Element Type	
Field Reference	**Field Name**	**Context**	**Airport**	**FEA/FCA**
1	ACID	Flight	Required	Required
2	ETMSID	Flight	Required	Required
3	DEST	Flight	Required	Required
4	ACENTR	Flight	Required	Required
5	ORIG	Flight	Required	Required
6	DCENTR	Flight	Required	Required
7	ETD	Flight	Required	Required
8	ENTRY	**FEA/FCA**	Not Supported	Required
9	EXIT	**FEA/FCA**	Not Supported	Required
10	ETA	Flight	Required	Required
11	DFIX	Flight	Required	Required
12	EDFT	Flight	Required	Required
13	DP	Flight	Required	Required
14	DTRSN	Flight	Required	Required
15	AFIX	Flight	Required	Required
16	EAFT	Flight	Required	Required
17	STAR	Flight	Required	Required
18	STRSN	Flight	Required	Required
19	USR	Flight	Required	Required

			Element Type	
Field Reference	**Field Name**	**Context**	**Airport**	**FEA/FCA**
20	TYPE	Flight	Required	Required
21	CTG	Flight	Required	Required
22	CLS	Flight	Required	Required
23	ARTD	Flight	Required	Required
24	ARTA	Flight	Required	Required
25	CR_TIME	**FEA/FCA**	Not Supported	Required
26	SGTD	Flight	Required	Required
27	SGTA	Flight	Required	Required
28	IGTD	Flight	Required	Required
29	IENTRY	**FEA/FCA**	Not Supported	Required
30	IGTA	Flight	Required	Required
31	PGTD	Flight	Required	Required
32	PGTA	Flight	Required	Required
33	PETE	Flight	Required	Required
34	LRTD	Flight	Required	Required
35	LRTA	Flight	Required	Required
36	LGTD	Flight	Required	Required
37	LGTA	Flight	Required	Required
38	ERTD	Flight	Required	Required
39	EENTRY	**FEA/FCA**	Not Supported	Required
40	ERTA	Flight	Required	Required
41	OUT	Flight	Required	Required
42	OFF	Flight	Required	Required
43	ON	Flight	Required	Required
44	IN	Flight	Required	Required
45	OETD	Flight	Required	Required
46	OENTRY	**FEA/FCA**	Not Supported	Required
47	OETA	Flight	Required	Required
48	BETD	Flight	Required	Required
48	BENTRY	**FEA/FCA**	Not Supported	Required

			Element Type	
Field Reference	**Field Name**	**Context**	**Airport**	**FEA/FCA**
50	BETA	Flight	Required	Required
51	OCTD	**CTL_ELEM**	Required	Required
52	OCTA	**CTL_ELEM**	Required	Required
53	CTD	**CTL_ELEM**	Required	Required
54	CTA	**CTL_ELEM**	Required	Required
55	ASLOT	**CTL_ELEM**	Required	Required
56	CTL_ELEM	Flight	Required	Required
57	CTL_PRGM	**CTL_ELEM**	Required	Required
58	CTL_TYPE	**CTL_ELEM**	Required	Required
59	CTL_EXMPT	**CTL_ELEM**	Required	Required
60	SL_HOLD	**CTL_ELEM**	Required	Required
61	DVREC	Flight	Required	Required
62	DO	**FEA/FCA**	Not Supported	Required
63	UX	Flight	Required	Required
64	FX	Flight	Required	Required
65	RZ	Flight	Required	Required
66	RS	Flight	Required	Required
67	TO	Flight	Required	Required
68	DV	Flight	Required	Required
69	RM	Flight	Required	Required
70	ALD	Flight	Required	Required
71	GDP	Flight	Required	Required
72	AFP	Flight	Required	Required
73	CTOP	Flight	Required	Required
74	DAS	Flight	Required	Required
75	GSD	Flight	Required	Required
76	TOD	Flight	Required	Required
77	CTL_ALM	Flight	Required	Required
78	CDM_MBR	Flight	Required	Required
79	SUB	Flight	Required	Required

			Element Type	
Field Reference	**Field Name**	**Context**	**Airport**	**FEA/FCA**
80	MAJOR	Flight	Required	Required
81	GCD	Flight	Required	Required
82	LTOD	Flight	Required	Required
83	NRP	Flight	Required	Required
84	LFG	Flight	Required	Required
85	III	Flight	Required	Required
86	ATV	Flight	Required	Required
87	SWP	Flight	Required	Required
88	DVT	Flight	Required	Required
89	ADC	Flight	Required	Required
90	FCA	Flight	Required	Required
91	WXR	Flight	Required	Required

Part 2 –FSM Broadcast File Format Specification

2.1 - General Description

2.1.1 Contents

TFMS-Core sends an FSM Broadcast message (separate from ADLs) to notify applications, primarily FSM, of two sets of dynamic data:

- The current traffic management initiatives that are proposed, in place, or have been purged on this day
- The current FEAs and FCAs that are available for monitoring with FSM

The protocol for receiving FSM Broadcast messages is fully described in reference 1. An application that wants to initiate the flow of ADLs for any element contained in the FSM Broadcast message must follow the protocol described in that document.

The FSM Broadcast message consists of three parts, a header, the list of current programs, and the list of current FEAs and FCAs. Each is described in a following section.

Some general items about this file:

- All times and dates are in Zulu.
- The TMIs displayed in this file are reset at 0800; that is, at 0800 each day, any TMIs which are purged or beyond their end time at 0800 are removed from the file. In general, this means that the file starts out empty at 0800 and accumulates data until 0759 the next day. However, if a TMI is still active at 0800, it remains in the file through the next day.
- The file is broadcast at a regular 5 minute interval, except that the following events trigger a new file irrespective of the set interval:
    - When a TMI is processed by TFMS-Core
    - When a FEA/FCA is created, modified, or removed
    - When requested by an application

2.1.2 File Naming

TFMS uses a file naming convention that facilitates users who are trying to find particular files in a directory full of data files. The file naming for the FSM Broadcast files follows this convention for two reasons:

* It has proven to be useful to FAA users
* It allows the Broadcast, ADL, and Delta files to be co-mingled with TFMS data files in a logical manner

A file name consists of four parts separated by periods (.):

* Element identifier for which the data was generated; six characters with trailing blanks filled with underscores (_), for the broadcast files — this is always “fsm”
* Report type; four characters — for FSM Broadcast files, type is “bcdm”
* Date and time the file was created — 8 digits; ddhhmmss

* Sequence number, used to distinguish two identical files created in the same second — 2 digits; 01, 02, etc.

All letters in a file name are lower case.

For example, an FSM Broadcast file generated on February 6 at 15:35:33 Z would be named:

fsm___.bcdm.06153533.01

2.1.3 Organization

An FSM Broadcast file consists of three main parts: the header, a list of current TMIs, and a list of current FSM eligible FEAs/FCAs. Each of the sections is contained within the top level container of <FSM_BROADCAST>.

```
<FSM_BROADCAST>
   <HEADER>
      ..Header Elements
   </HEADER>
   <CURRENT_PROGRAMS>
      ..Current Programs Elements
   </CURRENT_PROGRAMS>
   <CURRENT_FEAS_FCAS>
      ..Current FEAs/FCAs Elements
   </CURRENT_FEAS_FCAS>
</FSM_BROADCAST>
```

2.1.4 General Formatting

The FSM Broadcast files are formatted using the XML standard. Additional information regarding the XML format can be found at http://www.w3c.org/XML. The XML format utilized differs from the XML specification in the following ways:

- The standard XML document header is not provided

2.2 FSM Broadcast Data Elements

The bulk of an FSM Broadcast file is the data elements. Each block of data is contained within an XML container.

2.2.1 Header

The header of an FSM Broadcast file consists of four required XML elements. These elements provide general information regarding the specific FSM broadcast file. The header is required for all FSM broadcast files.

Following is an example of a current header block:

```
<HEADER>
   <FILE_NAME>fsm___.bcdm.06153533.01</FILE_NAME>
   <UPDATE_TIME>20051106050315</UPDATE_TIME>
   <HUB_SITE>etmsa</HUB_SITE>
</HEADER>
```

Following is a description of each of the elements of the header block:

1. HEADER – The container for the file header. This container is required as are the contents.

2. FILE_NAME – The file name of the message. This field is required.
3. UPDATE_TIME – The time (yyyymmddhhmmss) at which this file was last updated by TFMS-Core. This field is required.
4. HUB_SITE – The name of the TFMS-Core that generated this file. Maximum length is 8characters. This field is required.

2.2.2 Current Programs

The Current Programs block is required for all FSM Broadcast files. It defines all current proposed and actual TMIs.

Following is an example of a current programs block.

```
<CURRENT_PROGRAMS>
  <CTL_ELEM>
    <ELEM_NAME>bos</ELEM_NAME>
    <ELEM_TYPE>APT</ELEM_TYPE>
    <ISSUED>12134040</ISSUED>
    <LAST_MODIFIED>200505121545</LAST_MODIFIED>
    <CUM_START>200505121400</CUM_START>
    <CUM_END>200505121959</CUM_END>
    <PROGRAM>
      <PROG_TYPE>GDP</PROG_TYPE>
      <PROG_NAME>BOS</PROG_NAME>
      <PROG_START>200505121400</PROG_START>
      <PROG_END>200505121959</PROG_END>
      <PROG_STATUS>ACTIVE<PROG_STATUS>
    </PROGRAM>
  </CTL_ELEM>
</CURRENT_PROGRAMS>
```

Following is a description of each of the elements of the current programs block:

1. CURRENT_PROGRAMS – The container for the list of elements (airport or FCA) that have or had some type of TMI on the current day. This container is required and may appear only once. If there are no controlled elements, CURRENT_PROGRAMS appears as an empty tag.
2. CTL_ELEM – The container for an element that is currently controlled or has been controlled on this day. This container is optional; that is, there may not be any controlled elements at some times. This container may have multiple instances. If a CTOP has been issued that includes multiple FCAs, there will be a CTL_ELEM for each FCA.
3. ELEM_NAME – The name of the airport or FCA described in this container. Maximum length is 6 characters. Required if and only if CTL_ELEM is present.
4. ELEM_TYPE – The type of element described in this container. Type can be APT or FCA. Required if and only if CTL_ELEM is present.
5. ISSUED – The time (ddhhmmss) that a program was first issued for this element on this day. Time is reset if a program is purged and then re-issued. Required if and only if CTL_ELEM is present.
6. LAST_MODIFIED – The time (yyyymmddhhmm) at which the program parameters or status was last updated. If the program is active or proposed, this is the time at which the last set of valid parameters was received. If the program is purged, this is the time the purge was processed. Required if and only if CTL_ELEM is present.

7. CUM_START – The overall start time (yyyymmddhhmm) of the collective set of programs for this element. If the program is purged, this reflects the value at the time of the purge. Required if and only if CTL_ELEM is present.
8. CUM_END – The overall end time (yyyymmddhhmm) for the collective set of programs for this element. If the program is purged, this reflects the value at the time of the purge. Required if and only if CTL_ELEM is present.
9. PROGRAM – Container for an instance of a TMI that is currently in effect for this element or which was in effect at the time the program was purged. One or more PROGRAM containers are required if and only if CTL_ELEM is present.
10. PROG_TYPE – The type of TMI described in this container; can be AFP, GDP, GS, COMP, BLKT, or CTOP. Required if and only if PROGRAM is present.
11. PROG_NAME – The name of the Controlling Program. For FCA/FEA elements which are part of a proposed or active CTOP, this is the CTOP short name of that CTOP. For Airport elements and FCA/FEA elements which are not part of a proposed or active CTOP, this is the name of the airport or FCA. Required if the PROG_TYPE is CTOP.
12. PROG_START – The start time (yyyymmddhhmm) of the program described in this container. Required if and only if PROGRAM is present. Not included if PROG_STATUS is PURGED or EXPIRED.
13. PROG_END – The end time (yyyymmddhhmm) of the program described in this container. Required if and only if PROGRAM is present. Not included if PROG_STATUS is PURGED or EXPIRED.
14. PROG_STATUS – The current status of the program described in this container. Can be PROPOSED, ACTIVE, PURGED, or EXPIRED. Required if and only if PROGRAM is present.
    a. PROPOSED – Parameters have been sent but the program has not actually been issued. PROPOSED parameters are removed when ACTUAL parameters are added. However, if new PROPOSED parameters are sent after an ACTUAL, both the proposed and actual parameters are included.
    b. ACTIVE – A program is in place and currently controlling flights.
    c. PURGED – The program has been cancelled. If a PROGRAM block with a status of PURGED is present, it is the only PROGRAM block.
    d. EXPIRED – The parameters for this program have been dropped from the ADL even though the program was not purged. If a PROGRAM block with a status of EXPIRED is present, it is the only PROGRAM block.

2.2.3 Current_FEAs_FCAs

The Current FEAs/FCAs block is required for all FSM Broadcast files. It defines FEAs/FCAs currently available for FSM monitoring.

Following is an example of a current FEA/FCA block.

```
<CURRENT_FEAS_FCAS>
  <FCA>
    <FCA_ID>fca.etmst1.lxpc94.20050523143218</FCA_ID>
    <NAME>FCA004</NAME>
    <DOMAIN>PUBLIC</DOMAIN>
    <LASTUPDATE>20050523143331</LASTUPDATE>
```

```
    <UP_WKSTN>lxpc94</UP_WKSTN>
    <UP_SITE>etmst1</UP_SITE>
    <CR_WKSTN>lxpc94</CR_WKSTN>
    <CR_SITE>etmst1</CR_SITE>
    <REASON>NONE</REASON>
    <TYPE>FCA</TYPE>
    <COLOR_ID>34</COLOR_ID>
    <START>20050523143000</START>
    <END>20050523193000</END>
    <POLYGON>
      <CEILING>600</CEILING>
      <FLOOR>0</FLOOR>
      <DIRECTION>0</DIRECTION>
        <SPEED>0</SPEED>
      <DRAWING>false</DRAWING>
      <POINTS>4285,8015 4008,8003 </POINTS>
    </POLYGON>
    <PRIMARY_FILTER>
      <COLOR_ID>25</COLOR_ID>
      <CONDITIONS>
        <ALL>
          <DEPARTS_ANY>ORD</DEPARTS_ANY>
          <ARRIVES_ANY>EWR</ARRIVES_ANY>
        </ALL>
      </CONDITIONS>
    </PRIMARY_FILTER>
  </FCA>
</CURRENT_FEAS_FCAS>
```

The CURRENT_FEAS_FCAS container is required and can appear only once. If there are no FEAs or FCAs defined for monitoring, the CURRENT_FEAS_FCAS tag appears as an empty tag.

The FCA definition can include elements not shown in the above sample; data is fully described in reference 2. The only difference between reference 2 and the FCA definition included in the ADL is the omission of the following unnecessary data elements:

- <INDEX_INFO>
- <FCA_DISPLAY_PREFERENCES> – This entire container is omitted.

References

The following documents are useful in understanding the contents of this document. The first reference describes the communications protocol for registering for and receiving the data described in this document. The second reference describes the format of the FEA/FCA definition data. The third reference describes the various ADL parameters blocks generated by FSM as part of the TMI issuance process. In all cases, you should refer to the latest versions of the documents.

1. *CDM Message Protocol v2.5*
(http://flycdm.org /ad/CDM-GDP_specs.htm).
2. *TFM Data to Industry (TFMDI) Interface Control Document*
(http://www.fly.faa.gov/ASDI/asdi.html).
3. *FSM ADL Parameter Specification v5.5*
(http://flycdm.org/ad/CDM-GDP_specs.htm).