TFDM Tech Talk: Data Submission for Non-FAA Stakeholders

Presented to: TFDM Industry Stakeholders

By: FAA TFDM Collaborative Site Implementation Team

Date: July 28, 2021

Federal Aviation Administration

Introductions

Keith Henry	FAA	TFDM CSIT Lead
Melissa Brown	MITRE	TFDM Systems Engineering
Isaac Robeson	Mosaic ATM	TFDM Systems Engineering

Federal Aviation Administration

Agenda

- TFDM & Surface Metering Program Overview
- TFDM External Data Flow & Governance
- Surface CDM Enabling Data & Submission
- CDM Flight Times
- CDM Flight Information
- Stand Availability & Conflicts
- CDM Additional Intent Information
- Terminal Flight Data Not Currently Used in TFDM
- Other Flight Operator Data
- TFDM TFCS Data & Submission
- Additional Resources & Next Steps

Terminal Flight Data Manager (TFDM) Overview

Federal Aviation Administration

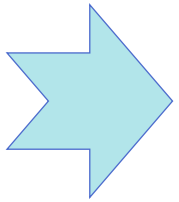
TFDM Program Overview

TFDM is the surface management solution for NextGen and iTBO.

https://www.faa.gov/air_traffic/technology/tfdm/

- TFDM will provide an integrated tower flight data automation system, which will improve situational awareness.
- TFDM will improve efficiencies on the airport surface and terminal airspace by providing:

- Electronic Flight Strips in the Tower
- Collaborative Decision Making for the Surface
- Traffic Flow Management Integration
- Systems Consolidation



Key Benefits:

- Fuel Savings
- Carbon Emission Savings
- Improved Situational Awareness
- Pre-scheduling flights

Federal Aviation Administration

TFDM Program Roll-Out Overview

Build 1

Key Site - PHX

- Full hardware development to support the deployment of Build 1 & 2
- Improved Electronic Flight Data Exchange and Electronic Flight Strips
- Runway Assignment Predictions
- Maintenance tools for life cycle support
- B1 TTP Service Offered

- **Initial Operating Capability:** ~~June 2020~~
- **In-Service Decision:** ~~September 2020~~

Dates being replanned due to COVID-19 Impacts
B1 IOC will not occur before Spring 2022

Build 2

Key Site - CLT

In addition to the Build 1 capabilities

- Surface Scheduling
- Surface Metering
- Runway Load Balancing
- Metric Reporting & Analysis (MRA)
- B2 TTP and TFCS Services Offered

- **Initial Operating Capability:** ~~May 2021~~
- **In-Service Decision:** ~~September 2021~~

Dates being replanned due to COVID-19 Impacts
B2 IOC will not occur before Spring 2023

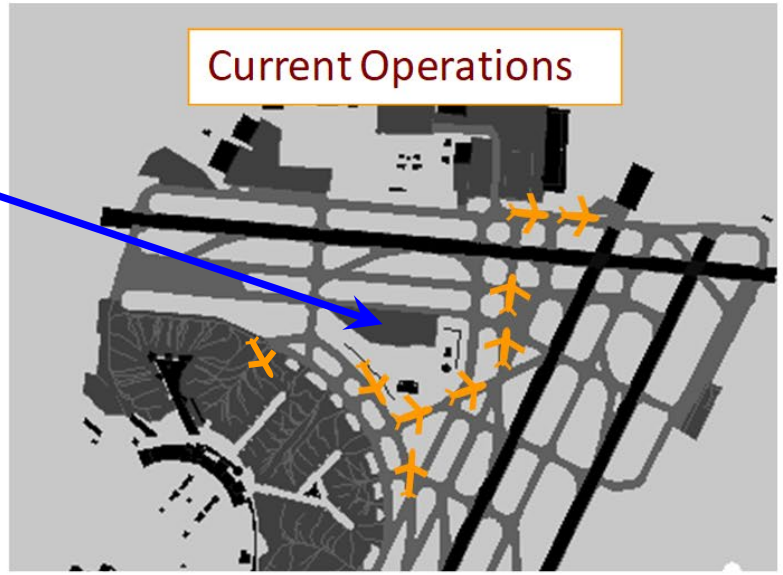
Federal Aviation Administration

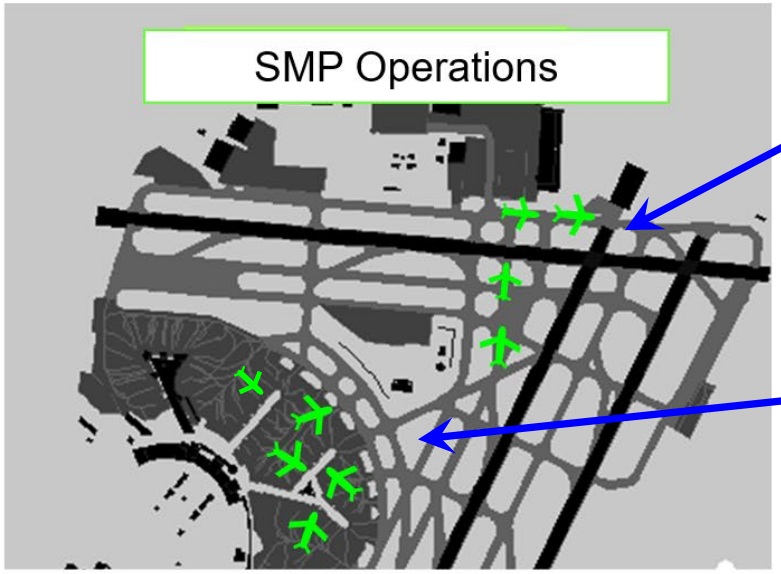
Surface Metering Program (SMP) Overview

The TFDM SMP Concept

- Departure operations in the NAS are largely managed on a first come, first served basis
- The result is often long departure queues, surface congestion and excess fuel burn
- The goal of SMP operations is to manage the departure queue length by assigning equitable off block times without reducing departure throughput

Long departure queue develops as flights begin taxi as soon as they are ready





SMP operations result in shorter queues…

…through the control of pushback times

Federal Aviation Administration

TFDM External Data Flow & Governance

TFDM's Interface to Industry

- To interact with TFDM, stakeholders will utilize two SWIM interfaces:
  - **TFDM Terminal Publication (TTP)** – Pub/sub service that provides all of TFDM's data across six business functions:
    - Flight Data
    - Airport Information
    - Flight Delay
    - Traffic Management Restrictions
    - Operational Metrics
    - Surface Management Programs
  - **TFDM FOS Collaboration Service (TFCS)** – Request/reply service that allows stakeholders to request substitution during surface metering and indicate ramp closures/gridlock events

Federal Aviation Administration

TTP Overview

TTP provides data used by, generate by, and consumed by TFDM for surface scheduling and metering across six core areas

Business Function	Description
TFDM Flight Data Service	The service returns all relevant **flight-specific data** along with subsequent updates to that data.
TFDM Flight Delay Data Service	The service returns all **flight-specific delay** information along with subsequent updates to that data.
TFDM Airport Information Service	This includes **current and future runway configurations**, departure and arrival **rates**, **runway and taxiway closures**, **de-icing** information and **surface delays**. The service returns all relevant information along with subsequent updates to that data for the specified airport.
TFDM Traffic Management Restrictions Service	This includes **departure fix restrictions** (e.g., Miles-in-Trail [MIT], Minutes-in-Trail [MINIT], fix closures), **arrival and departure fixes metering** information, and **CFR information**. The service returns all relevant information along with subsequent updates to that data.
TFDM SMP Service	This includes all **SMP parameters and notifications** related to SMPs. The service returns all relevant information along with subsequent updates to that data.
TFDM Operational Metrics Data	This includes TFDM preset **Key Performance Indicators (KPI) generated reports**. The service returns all relevant information for standard, pre-defined KPIs along with subsequent updates to that data.

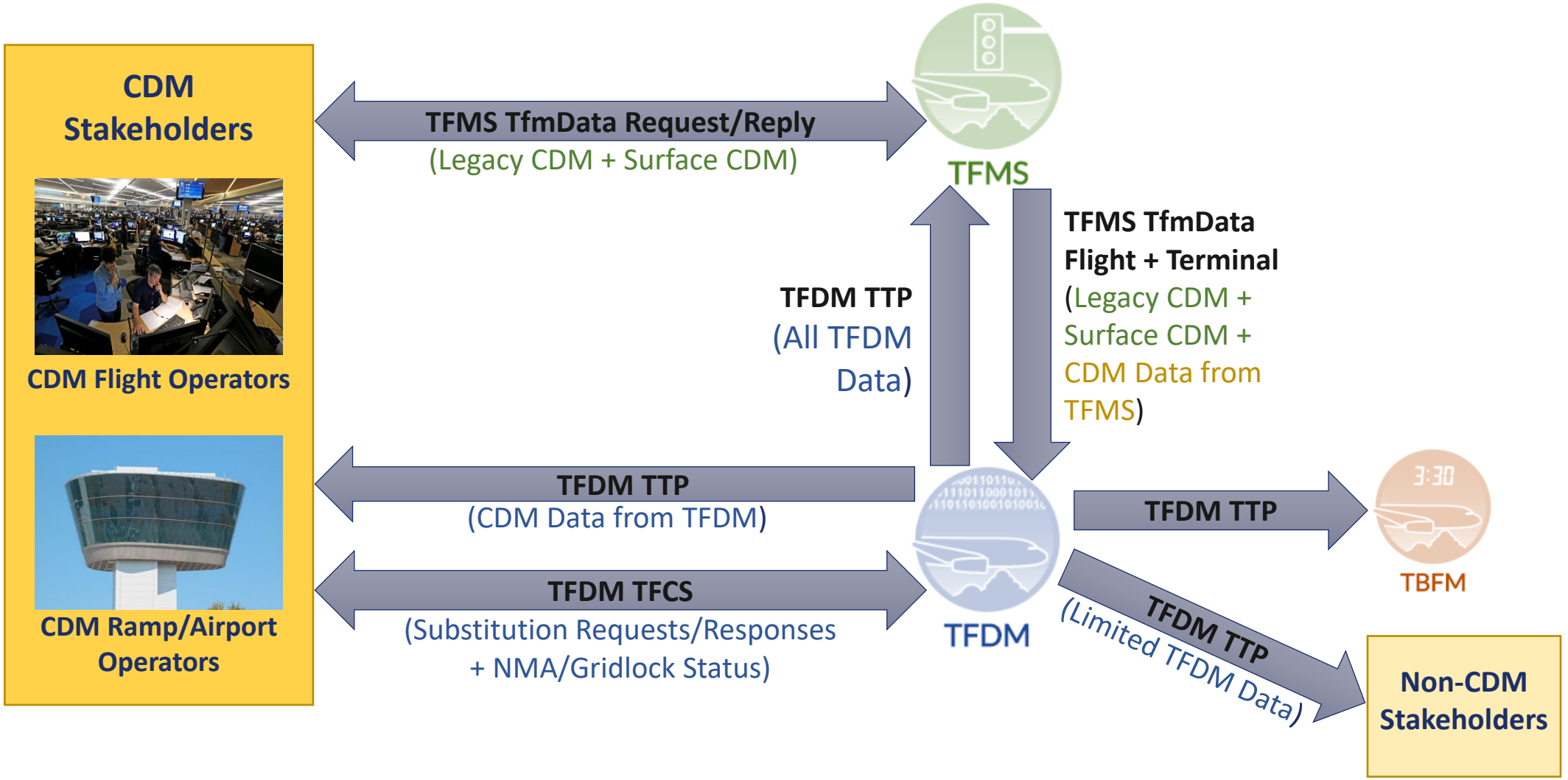
Federal Aviation Administration

TFMS and CDM Data Overview

- Traffic Flow Management System (TFMS) currently uses a set of legacy CDM data to
  - Predict arrival and airspace demand
  - Manage demand/capacity imbalances with GDPs, AFPs, or Ground Stops
- The new terminal CDM data elements were added to the set of legacy CDM data elements
- TFMS forwards the CDM data on from CDM flight operators and airports to TFDM

Federal Aviation Administration

TFDM External System Data Flow

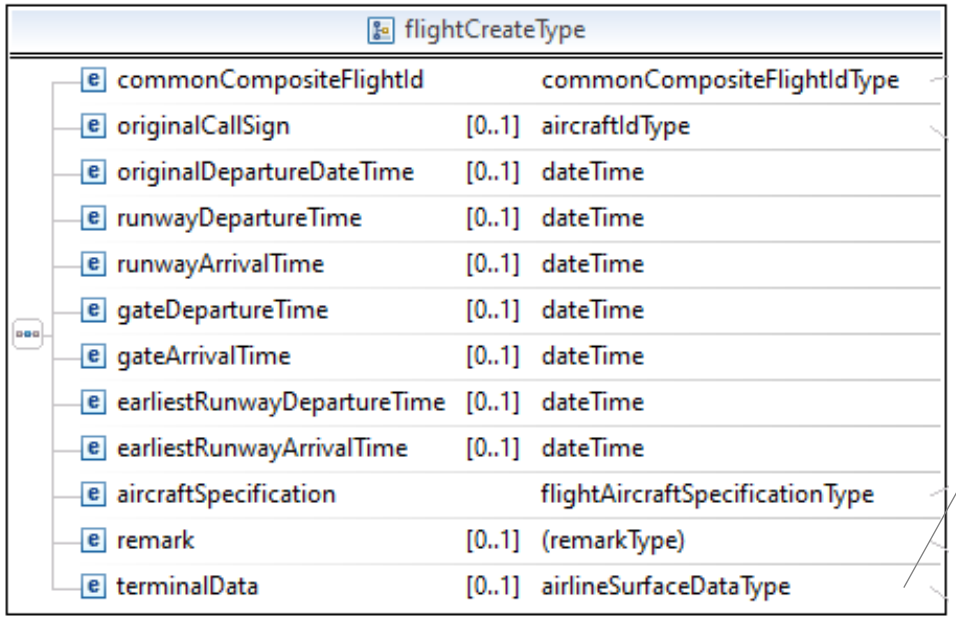


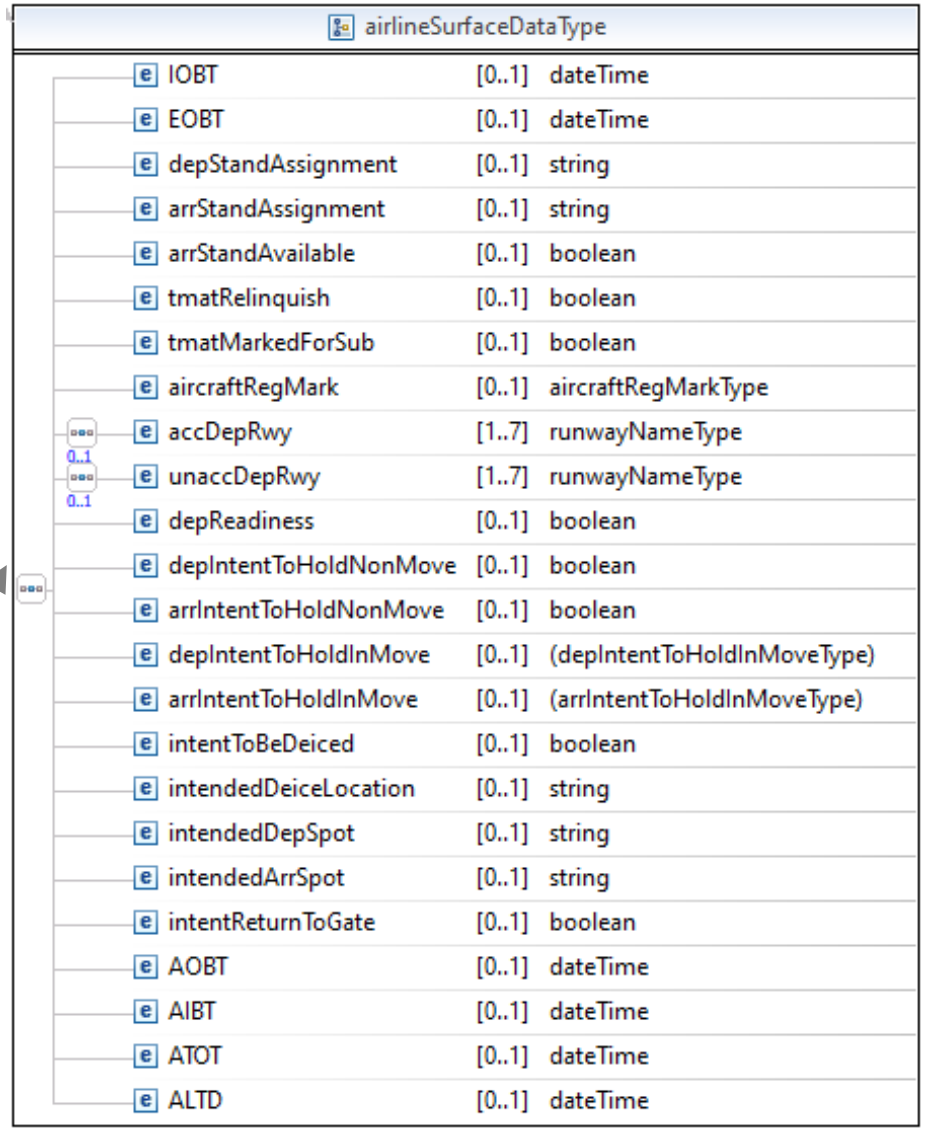
Federal Aviation Administration

CDM Data from External Stakeholders to TFMS

CDM data should be sent through the SWIM TfmData Request/Reply service in the Flight Create and Flight Modify messages.

NOTE: Legacy CDM messages should not be sent to TFMS at the same time as the new SWIM request/reply.





Most data referenced in these slides is contained in airlineSurfaceDataType

This type is contained in both FlightCreate and FlightModify messages

This data is republished by TFMS in the TfmData Terminal service.

See TfmData JMSDD Appendix for mapping between this schema and the TfmData Terminal schema

Federal Aviation Administration

Surface CDM Enabling Data & Submission

Federal Aviation
Administration

TFDM's Reliance on External Data to Facilitate S-CDM

- **Why is data submission from external users so important?**
  - TFDM relies on intent and non-intent data to schedule individual flights
  - Individual flight information impacts runway assignment, surface transit predictions, overall surface scheduling, TMI scheduling, surface metering program predictions and execution, and metrics

- **CDM data submission is vital to all TFDM operations** and not limited to Surface Metering Program usage
  - This data serves as a foundation to TFDM's scheduling capabilities and provides enhanced situational awareness to the FAA and ATC

- Important factors to consider when providing data:
  - **Timeliness of submission**: Certain data, especially intent data, is utilized by TFDM well in advance of a flight's departure and/or arrival
  - **Timeliness of update**: Data may significantly impact a flight's predictions and/or surface predictions
  - **Accuracy**: Data submitted should be accurate to the best of the abilities of the provided
  - **Business Intent**: Data submitted should reflect the intent of the operation of the flight

CDM Data Types & TFDM Use

- TFDM utilizes a variety of data elements to inform TFDM's surface scheduling and metering capabilities
  - **Flight-specific times** provides operators' flight-specific intent and actual events to TFDM for schedule predictions, post-event calculations, and improvements to historical data used in schedule generation
  - **Flight intent data** provides information during situations that could impact a flight's operation and TFDM's associated predictions (e.g. de-icing)
  - **Other non-intent flight data** provides information regarding a specific flight's status (e.g. diversion recovery) and/or an associated resource status (e.g. arrival stand availability) to TFDM for scheduling and ATC users' situational awareness

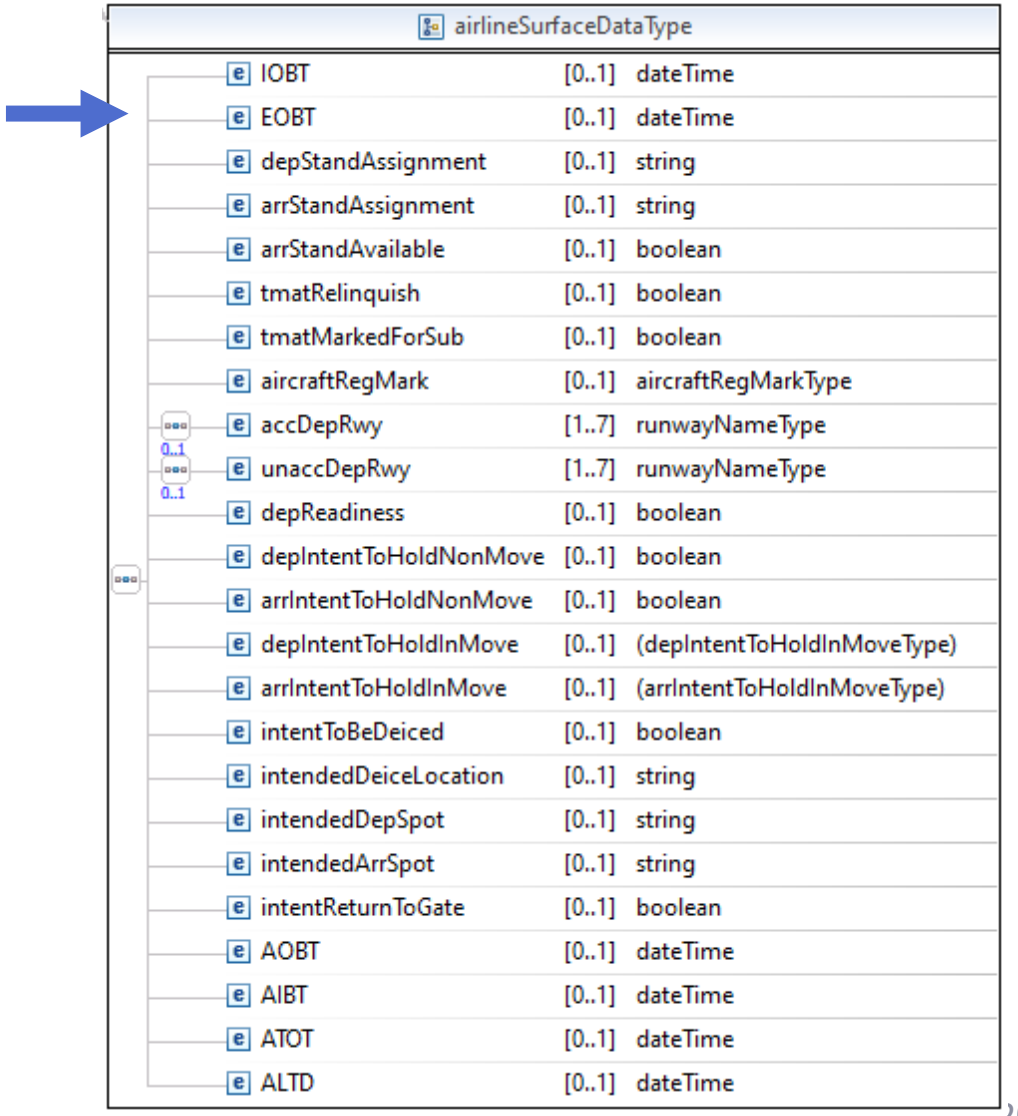
CDM Flight Times

Earliest Off Block Time (EOBT)

- **Description**: Submitted by the flight operator for departure flights, the EOBT represents the earliest time an aircraft is intending to push back from the gate/stand.
- **TFDM Use**: TFDM utilizes the EOBT to predict key flight events for departing aircraft, impacting:
  - TFDM-generated estimate time of departure
  - TBFM CFR release request
  - Surface Metering predictions and assignments
  - Flight-specific metrics
- **Submission Expectations**: EOBTs should be submitted by the flight operator as early as possible and kept updated to reflect business intent of the flight.
  - In cases where a flight is provided a Target Off Block Time (TOBT), the operator may choose to update the EOBT to reflect the TOBT if it meets flight operation intent (e.g. delayed boarding)
- **When an EOBT is not provided by the operator**, TFDM will derive the EOBT using a hierarchy of other available times submitted by the operator:
  - Airline Gate Time of Departure (LGTD)
  - Proposed Departure Time (P-Time)
  - Initial Off Block Time (IOBT)

Earliest Off Block Time (EOBT)

- **Submission Location & Schema**:
  - tfmRequestReply->request->flightBlockReqData->
    - flightCreate->terminalData->**EOBT**
    - flightModify->terminalData->**EOBT**



Federal Aviation Administration

EOBT vs LGTD vs P-Time

- If flight operators do not provide an EOBT, TFDM will use a hierarchy of other data elements to derive an EOBT for internal use
  - Derived EOBT hierarchy: LGTD, P-Time, IGTD/IOBT

	EOBT	LGTD	P-Time
Definition	Earliest Off Block Time	AirLine Gate Time of Departure	Proposed Departure Time
Meaning	Predicted Stand Pushback - New SWIM data element for TFMData Service	Predicted Stand Pushback - Legacy data element provided to TFMS	Proposed stand pushback time associated with a flight plan
Use	• Used to generate a surface schedule in TFDM • Used to generate an ETD in TFMS • Used by TFDM to request release time from TBFM	• LGTD often used by airlines to display changes in departure time to customer facing applications (airport FIDS, airline mobile apps) • Used to generate an ETD in TFMS (if EOBT not provided)	• Printed on flight strip in Air Traffic Control Tower • Often the same as the OAG departure time • Used to generate an ETD in TFMS (if EOBT not provided)

LGTD and P-Time Submission

- LGTD can be submitted through SWIM TfmData Request/Reply messages
  - tfmRequestReply->request->flightBlockReqData->
    - flightCreate->**gateDepartureTime**
    - flightModify->**predictedGateDepartureTime**

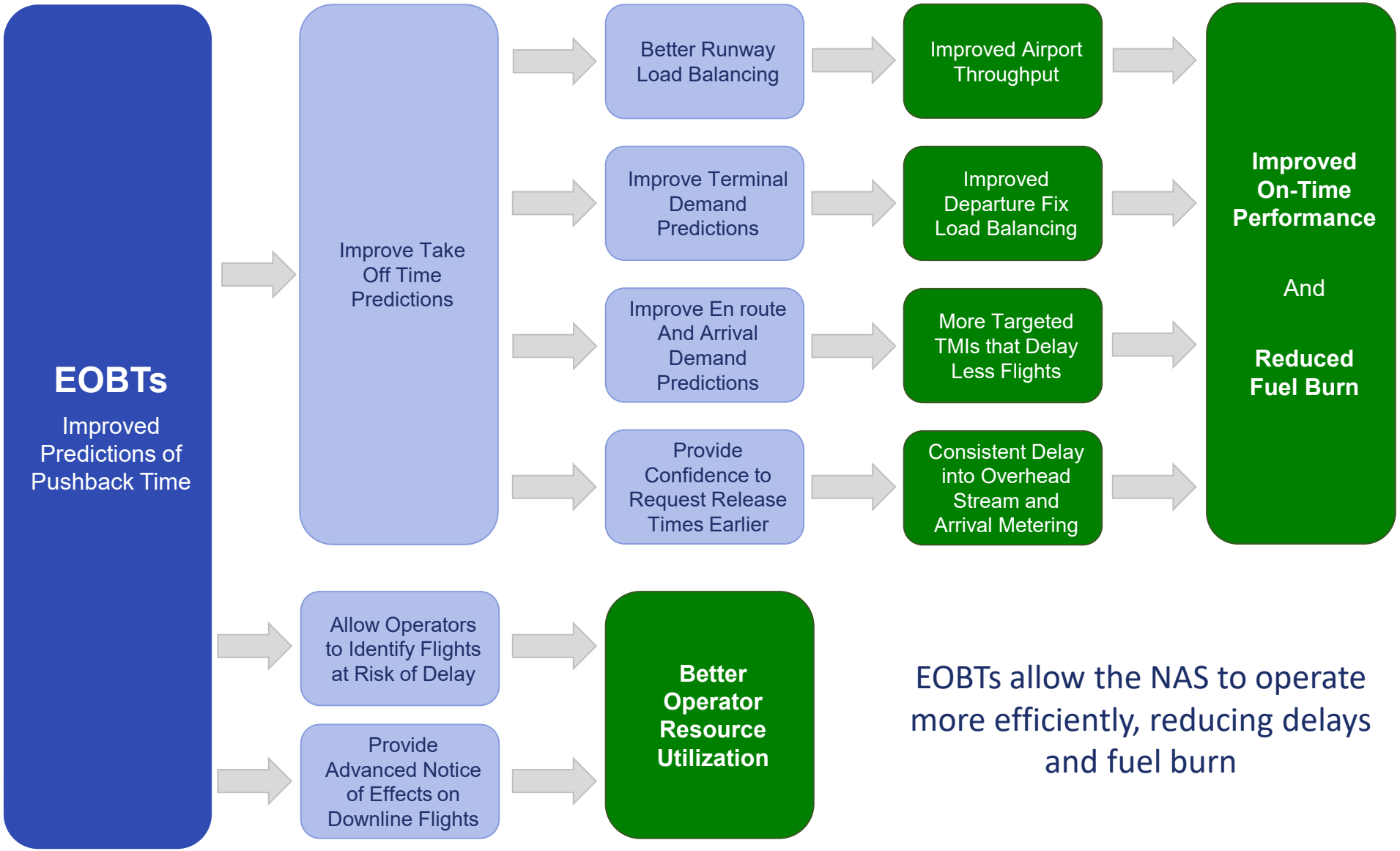
- P-Time is the departure time in the flight plan that is filed by the flight operator
  - Status quo in today's operations
  - Submitted via flight operator-desired method

Federal Aviation Administration

Benefits of EOBT Submission

- **Accurate EOBT submission and timely updates result in improved efficiency of the airport surface as well as the overall NAS**
  - Improved schedule predictability for demand/capacity planning
  - Move from reactive NAS to predictive NAS
  - Improved accuracy and compliance with TBFM metering
  - Improved situational awareness of aircraft intent, non-movement area status, and airport throughput/efficiency impacts
- **Flight Operators can also expect to see improvements in operations**
  - Accuracy in surface metering program metering time assignment
  - Increased surface scheduling and metering benefits due to improved schedule predictions
  - Delay savings due to improved TBFM metering release time scheduling
  - Greater situational awareness of flight status and overall airport operations
  - Improved ATC awareness of impending departure demand, resulting in improved decision and efficiency in routine and off-nominal surface operations (e.g. configuration change timing)

EOBT Benefits Beyond Surface Metering



EOBTs allow the NAS to operate more efficiently, reducing delays and fuel burn

Actual Off Block Time (AOBT)

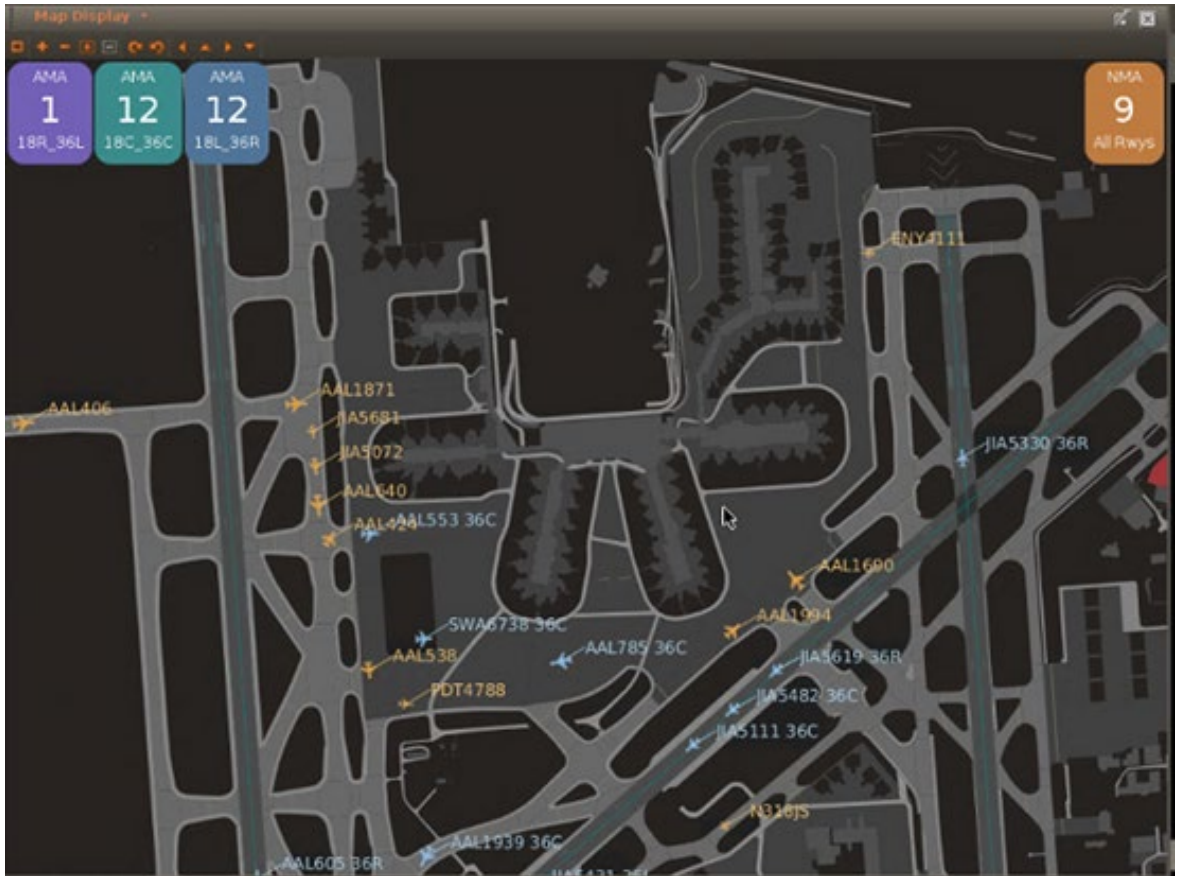
- **Description**: the time at which a flight pushes back from the gate to start taxiing to the runway or a hold location.
  - Flight Operators may choose to use legacy “OUT” or AGTD (flightModify) time as AOBT input

- **TFDM Use**: TFDM will use this data to improve post-event and historical calculations
  - Flight state/status
  - Real-time metrics that ATC will use to make runway load balancing decisions
  - Post-event flight metrics (e.g. accuracy of flight operators’ EOBT, delay, emissions)
  - Historical ramp transit time calculation, used to improve surface transit time predictions and associated flight event time predictions (e.g. ETD)

- **Submission Location & Schema**
  - New AOBT field: tfmRequestReply->request->flightBlockReqData->flightModify->terminalData->**AOBT**
  - NOTE: If submitted, it should match value submitted in legacy Actual Gate Time of Departure field in the same message
    - tfmRequestReply->request->flightBlockReqData->flightModify->**actualGateDepatureTime**
  - If more than one value is sent, the most recent submission is used by TFDM.

Example of AOBT Usage in TFDM

- Counts of active flights can be displayed on the TFDM map to TMCs
- The counts can be grouped by runway and NMA/AMA
- NMA counts are based on AOBT provision
- NMA counts provide TMCs with a tactical picture of upcoming demand at a quick glance



NOTE: System under development. Final views subject to change.
Flight information shown in this image is based on a test scenario.

Federal Aviation Administration

Initial Off Block Time (IOBT)

- **Description**: The initial off-block time provided for a flight.
  - Flight Operators may choose to use legacy IGTD time as IOBT input
- **TFDM Use**: TFDM records the IOBT as the original Off-Block time of the flight and uses this data for:
  - Flight data matching
  - SMP calculations (e.g. Ration By Schedule (RBS) metering time assignment, average metering hold)
  - Metrics calculations (e.g. flight initialization lead time metric)
- **Submission Location & Schema**
  - New IOBT field: tfmRequestReply->request->flightBlockReqData->flightCreate/flightModify->terminalData->**IOBT**
  - **NOTE: If submitted, it needs to match value submitted in legacy IGTD field**
    - tfmRequestReply->request->flightBlockReqData->flightCreate->commonCompositeFlightId-> **departureDateTime**
    - tfmRequestReply->request->flightBlockReqData->flightModify->commonCompositeFlightId-> **departureDateTime**

Federal Aviation Administration

Actual Take Off Time (ATOT)

- **Description**: The time at which a flight lifts off from the runway as reported via a CDM message.
  - If more than one value is sent, the most recent submission is saved to this field.
  - TFDM can calculate based on EFS strip movement and surface surveillance, if available
  - Flight Operators may choose to use legacy “OFF” or ARTD time (flightModify) as ATOT input.
- **TFDM Use**: Upon receipt of an ATOT for a flight, TFDM will use this data to calculate:
  - Flight-specific delay
  - Accuracy of take-off time and CFR time assigned to a flight
  - Historical taxi time calculations
  - Post-event flight metrics (e.g. aircraft count, throughput, delay, emissions)
  - Flight state/status
- **Submission Location & Schema**
  - New ATOT field: tfmRequestReply->request->flightBlockReqData->flightModify->terminalData->**ATOT**
  - NOTE: If submitted, it should match value submitted in legacy Actual Runway Time of Departure field in the same message
    - tfmRequestReply->request->flightBlockReqData->flightModify->**actualRunwayDepatureTime**

Federal Aviation Administration

Actual Landing Time (ALDT)

- **Description**: The actual time the flight has landed on the runway.
  - Flight Operators may choose to use legacy “ON” or ARTA time (flightModify) as ALDT input.
- **TFDM Use**: Upon receipt of an ALTD for a flight, TFDM will use this data to calculate:
  - Gate/alleyway conflicts
  - Historical taxi time calculations
  - Flight state/status
  - Runway schedule
  - Post-event flight metrics
- **Submission Location & Schema**
  - New ALDT field: tfmRequestReply->request->flightBlockReqData->flightModify->terminalData->**ALDT**
  - NOTE: If submitted, it should match value submitted in legacy Actual Runway Time of Arrival field in the same message
    - tfmRequestReply->request->flightBlockReqData->flightModify->**actualRunwayArrivalTime**

Federal Aviation Administration

Actual In Block Time (AIBT)

- **Description**: The Actual time the flight has blocked in at the stand/gate.
  - Flight Operators may choose to use legacy “IN” or AGTA time (flightModify) as AIBT input.
- **TFDM Use**: Upon receipt of an AIBT for a flight, TFDM will use this data to calculate:
  - Gate/alleyway conflicts
  - Historical taxi time calculations
  - Flight state/status
  - Resource status (e.g. number of aircraft in non-movement area)
  - Post-event flight metrics (e.g. delay, emissions)
- **Submission Location & Schema**
  - New AIBT field: tfmRequestReply->request->flightBlockReqData->flightModify->terminalData->**AIBT**
  - NOTE: If submitted, it should match value submitted in legacy Actual Gate Time of Arrival field in the same message
    - tfmRequestReply->request->flightBlockReqData->flightModify->**actualGateArrivalTime**

CDM Flight Information

Departure / Arrival Stand

- **Description**: Two separate data elements
  - The departure stand that the flight will pushback from
  - The arrival stand that the flight will park at upon arrival at the airport
- **Uses**:
  - Provides common situational awareness between airport/airline and ATC
    - ATC can display stands on EFS and Surface Management tools
  - Used to predict spot and taxi times
    - Taxi times are based on historical taxi times between gate, spot and runway
  - Used to determine if a flight is affected by a ramp closure
    - TFDM has a mapping of gates to ramp areas

Departure / Arrival Stand

- **Submission Expectations**:
  - Stands should be kept updated at planned gate changes
  - Stands should match TFDM adapted values for full functionality
    - For example, if TFDM adapts a gate name as “A1”, then gate “A01” would not match adapted value
    - Names that do not match will still be accepted and shown on displays
  - If no stand provided, TFDM will use adapted default stand (one default per airport)

- **Submission Location & Schema:**
  - Schema location
    - tfmRequestReply->request->flightBlockReqData->flightCreate/flightModify->terminalData-> **depStandAssignment**
    - tfmRequestReply->request->flightBlockReqData->flightCreate/flightModify->terminalData-> **arrStandAssignment**
  - Schema constraints
    - Limited to 5 characters

Federal Aviation Administration

Unacceptable Runways

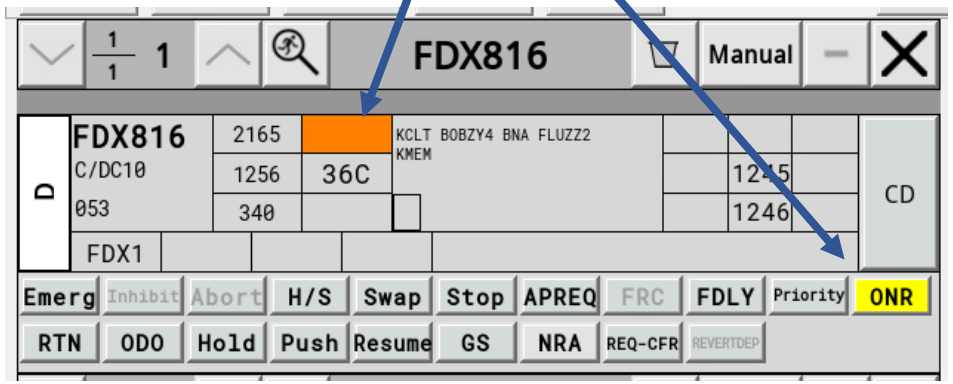
- **Description**: A list of runways that a departure flight cannot accept based on operational constraints
  - For example, weight and balance constrains which runways a flight can take off from
  - Flight operators should not use this field to request a runway for convenience
- **Uses**:
  - TFDM will take this list into consideration when predicting runways
  - EFS and Surface Management can display to ATC that this flight has been assigned its runway for reasons of operational necessity
- **Submission Expectations**:
  - Should be submitted as soon as operational constraints are known
- **Submission Location & Schema:**
  - Schema location
    - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **unaccDepRwy**
  - Schema constraints
    - Limited to 7 unacceptable runways
  - **Do not use acceptable runways list (accDepRwy)**.
    - Any values submitted in that field will not be used by TFDM

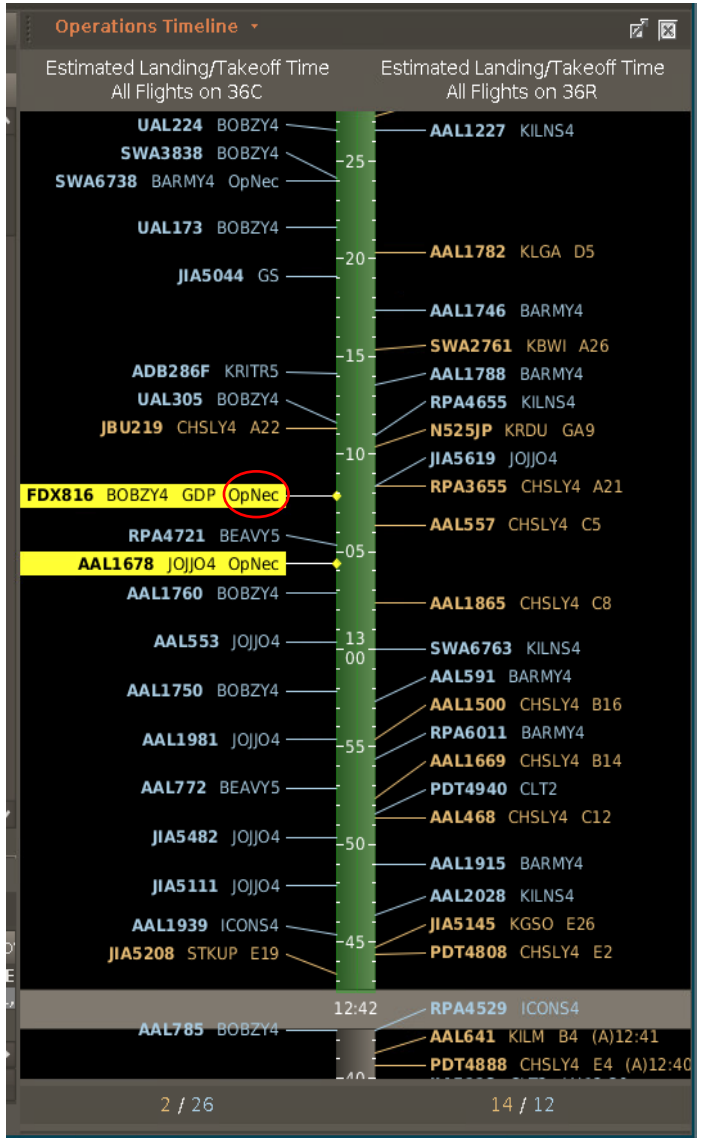
Example of Unacceptable Runways Usage in TFDM

- FDX816 needs the long center runway (18C/36C) at CLT
- FDX816 submits unacceptable runways of 18R, 18L, 36R, 36L
- TFDM updates prediction based on unacceptable runways
- TFDM displays “OpNec” on TMC’s timeline and in the flight table
- TFDM highlights electronic flight strip to alert controllers

Timeline shows “OpNec”

EFS highlighting





NOTE: System under development. Final views subject to change.
Flight information shown in this image is based on a test scenario.
EFS highlighting based on test adaptation

Federal Aviation Administration

Aircraft Registration

- **Description**: The aircraft tail number that will be used to operate the flight
- **Uses**: Common situational awareness and gate conflicts
- **Submission Expectations**:
  - Should be kept updated with the latest plan
- **Submission Location & Schema:**
  - Schema location
    - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **aircraftRegMark**
  - Do not submit to TFMS until R14 has been deployed
    - There is a schema mismatch in R13 that prevents TFMS from republishing Surface CDM data when aircraft registration is set
    - Schema mismatch will be fixed in R14

Stand Availability & Conflicts

Arrival Stand Availability

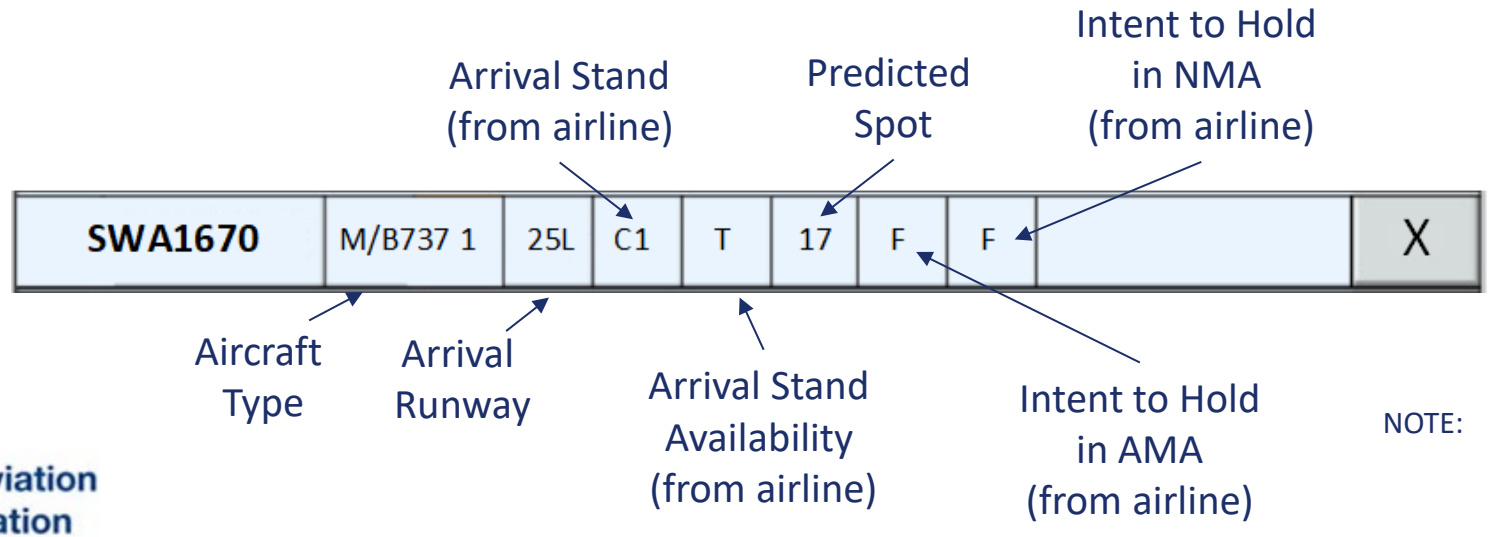
- **Description**: A true/false flag indicating if the arrival flight's stand is available for the arrival to park at
  - True – the arrival is able taxi to its stand
  - False – the arrival's stand is occupied, and the arrival will not be able to proceed directly to the stand
- **Uses**: Common situational awareness between flight operator, airport, and ATC
  - If not provided, TFDM will predict gate conflicts as best as possible given current flight data
- **Submission Expectations**:
  - Should be kept updated with the latest available information
- **Submission Location & Schema:**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **arrStandAvailable**

Arrival Intent to Hold in AMA / NMA

- **Description**: Two fields that provide intent of arrivals that need to hold
  - Electronically communicates to ATC how ramp wants to handle gate conflict (hold in AMA or hold in ramp)
  - Can be provided even if arrival stand is available
    - For example, a heavy aircraft cannot be accepted into alleyway due to other aircraft pushing back from the gates
- **Uses**: Common situational awareness between flight operator, airport, and ATC
- **Submission Expectations**:
  - Should be kept updated with the latest available intentions
- **Submission Location & Schema:**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **arrIntentToHoldInMove**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **arrIntentToHoldNonMove**

Gate Conflict and Arrival Intent Display on TFDM

- TFDM's EFS display can be locally adapted to show a list of arrivals with gate conflicts and arrival intent data
  - Available starting in B2.1
  - Will not be available in the first build deployed at PHX
- Notional mockup of a gate conflict arrival list strip
  - Data elements on the strip will depend on local adaptation
  - Note that the arrival stand field can be adapted to be highlighted if TFDM predicts a stand conflict
  - Other fields can also be adapted based on values (e.g. orange if intent to hold in the AMA)



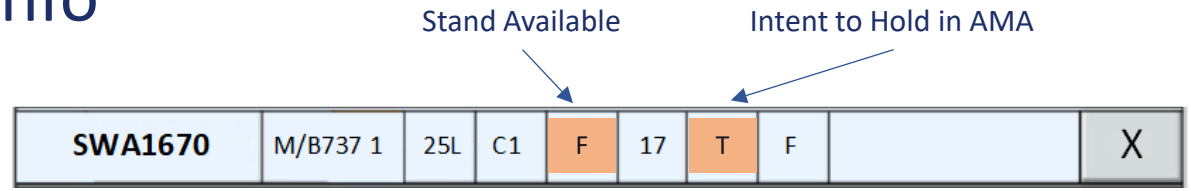
NOTE: System under development. Final views subject to change. Flight information shown in this image is based on a test scenario. EFS highlighting based on test adaptation

Federal Aviation Administration

Example Use Case 1 – Stand Conflict and Need to Hold in AMA

- Arrival has a stand conflict and needs to hold in the AMA

- The airline could send the following info
  - arrStandAvailable = FALSE
  - arrIntentToHoldInMove = HOLD
  - arrIntentToHoldNonMove = NO_HOLD



- When the stand conflict is resolved, the airline would then send
  - arrStandAvailable = TRUE
  - arrIntentToHoldInMove = NO_HOLD
  - arrIntentToHoldNonMove = NO_HOLD

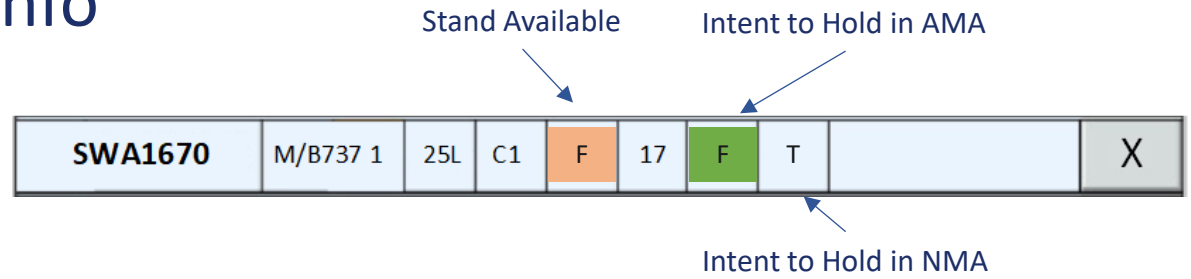
NOTE: System under development. Final views subject to change. Flight information shown in this image is based on a test scenario. EFS highlighting based on test adaptation

Federal Aviation Administration

Example Use Case 2 – Stand Conflict but can Hold in the Ramp

- The arrival has a stand conflict but the ramp wants to hold the arrival close to the gate in the ramp area

- The airline could send the following info
  - arrStandAvailable = FALSE
  - arrIntentToHoldInMove = NO_HOLD
  - arrIntentToHoldNonMove = HOLD



- When the stand conflict is resolved, the airline would then send
  - arrStandAvailable = TRUE
  - arrIntentToHoldInMove = NO_HOLD
  - arrIntentToHoldNonMove = NO_HOLD

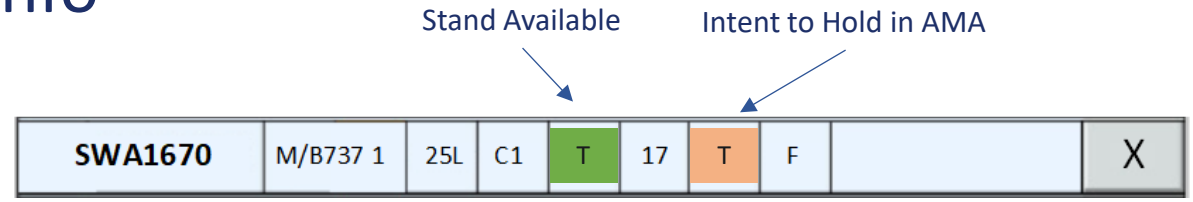
NOTE: System under development. Final views subject to change. Flight information shown in this image is based on a test scenario. EFS highlighting based on test adaptation

Federal Aviation Administration

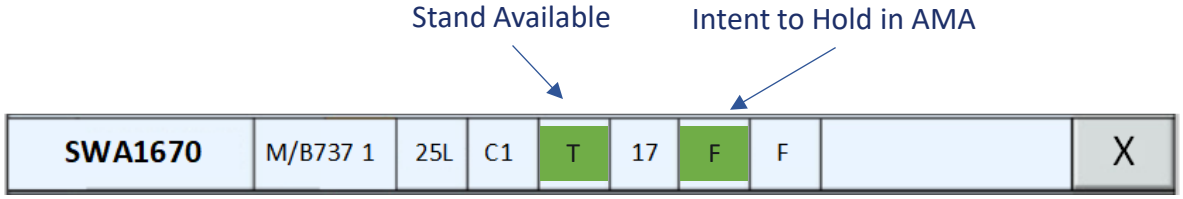
Example Use Case 3 – No Stand Conflict but Needs to Hold in the AMA

- An arrival has a stand available, but it cannot get there because of ramp congestion

- The airline could send the following info
  - arrStandAvailable = TRUE
  - arrIntentToHoldInMove = HOLD
  - arrIntentToHoldNonMove = NO_HOLD



- When the ramp congestion is resolved, the airline would then send
  - arrStandAvailable = TRUE
  - arrIntentToHoldInMove = NO_HOLD
  - arrIntentToHoldNonMove = NO_HOLD



NOTE: System under development. Final views subject to change. Flight information shown in this image is based on a test scenario. EFS highlighting based on test adaptation

Federal Aviation Administration

Example Use Case 4 – Manual Coordination of All Arrivals into the Ramp

- At some airports, there might be a need to coordinate between the ramp and tower on when all arrivals can enter the ramp regardless of stand conflicts

- Airline could send the following for all flights be default
  - arrIntentToHoldInMove = HOLD

- When the ramp can accept the arrival, the airline would send the following for the arrival flight
  - arrIntentToHoldInMove = NO_HOLD

Federal Aviation Administration

CDM Additional Intent Information

Federal Aviation
Administration

Departure Intent to Hold in the AMA/NMA

- **Description**: Two fields that provide intent of departures that need to hold off the gate
  - For example, a flight with an TMAT from surface metering or a flight with an EDCT that cannot hold on the gate because an arrival needs the gate
  - Use during surface metering would need to be agreed upon in Surface Working Group meetings between ramp and ATC

- **Uses**:
  - Common situational awareness between flight operator, airport, and ATC
  - Update taxi time predictions depending on where the flight intends to hold

- **Submission Location & Schema:**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **depIntentToHoldInMove**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **depIntentToHoldNonMove**

De-icing Intent / Location

- **Description**: Two fields
  - De-icing Intent – True/False flag indicating that the flight needs to de-ice
  - De-icing Location – Location where the flight intends to de-ice

- **Uses**: Common situational awareness between flight operator, airport, and ATC
  - Taxi time predictions
  - Surface metering exemptions

- **Submission Location & Schema:**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **intentToBeDeiced**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData-> **intendedDeiceLocation**
    - Limited to 5 characters in schema
    - TFDM will only use input values of “AMA” or “RAMP” to update taxi times

Return to Gate Intent

- **Description**: True/false flag indicating that a departure on the airport surface needs to return to the gate

- **Uses**:
  - Common situational awareness between flight operator, airport, and ATC

- **Submission Location & Schema:**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData->**intentReturnToGate**

Federal Aviation Administration

Intended Arrival/Departure Spot

- **Description**: Two separate fields
  - Departure spot – the spot that the ramp intends to send the departure to
  - Arrival spot – the spot that the ramp would like ATC to send the flight too
  - One or both can be provided
  - If not provided, TFDM will predict the spot based on a set of rules (e.g. lookup based on gate and runway)

- **Uses**:
  - Common situational awareness between flight operator, airport, and ATC
  - Taxi time prediction

- **Submission Location & Schema:**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData->**intendedDepSpot**
  - tfmRequestReply->request->flightBlockReqData->flightModify->terminalData->**intendedArrSpot**

Terminal Flight Data Not Currently Used in TFDM

Unused Terminal Flight Data

- The following data elements in the TfmData schema are not currently used by TFDM
  - tmatRelinquish
    - Use TFCS substitution request interface instead
  - tmatMarkedForSub
    - Use TFCS substitution request interface instead
  - accDepRwy
    - Use unaccDepRwy data element instead
  - depReadiness
    - Instead use EOBT to indicate when the flight will be ready to pushback

Other Flight Operator Data

Diversion Recovery

- **Description**: Diversion recovery flights are flights that are returning to their original destination after diverting to another airport
  - For example
    - Flight ABC123 is flying from JFK to ATL, but diverts to CLT
    - A new Flight ABC123 is created to fly the passengers from CLT to ATL. This is the diversion recovery flight
  - Diversion recovery flights currently receive priority handling by ATC and in TFMS GDPs
  - Diversion recovery flights will be exempt from surface metering if created outside of the Static Time Horizon

- **Submission**
  - Put “DVRSN” in the remarks section of the filed flight plan

Lifeguard

- **Description**: Lifeguard/Medevac flights generally receive priority handling from ATC (see JO 7110.774)
  - TFDM will exempt Lifeguard/Medevac flights from surface metering

- **Submission**
  - Put “LIFEGUARD”, “MEDEVAC”, or “HOSP” in the remarks section of the filed flight plan

TFDM TFCS Data & Submission

TFDM FOS Collaboration Service (TFCS)

- The TFDM FOS Collaboration Services handles requests submitted by the Flight Operator System group of users. Functionality categorized into Airport Data requests and Surface Metering Program (SMP) Flight Substitution Requests
- Intended Service Users:
  - Any commercial air carrier, airport operator, ramp operator, or CDM participant.
- Availability:
  - From TFDM Configuration A Sites Only (post-Build 2 deployment)
- Data Exchange (Request/Reply)

Business Function	Explanation	Data examples	Intended Users
Flight Substitution	TFDM flight substitution service (only 27 Configuration A sites)	Substitution requests / responses	FAA & Flight / Ramp / Airport Operators
Airport Data	Submission of Gridlock, ramp status (only 27 Configuration A sites)	Ramp closure(s), Gridlock status	FAA & Flight / Ramp / Airport Operators

Federal Aviation Administration

TFDM TFCS - Substitution

- **Flight Substitution Request Message**
  - Message from the flight operator to the TFDM system, via TFCS, that includes:
    - Identification of the SMP involved in the substitution request
    - Flights (two or more) being requested for substitution
    - Flags for specific flights that are being cancelled and/or having their TMAT relinquished (as applicable)
    - Flags for specific flights marked for future substitution (as applicable)
- **TFDM Use**: These messages will trigger TFDM to assess the request, calculate the substitution, and reply with a substitution response message.
- **Submission Expectations**: To substitute flights successfully, the following considerations must be made, all flights in the message must meet the substitution rules set by TFDM (*see previous TFDM Tech Talk: Substitution)

TFDM TFCS – Non-Movement Area Status

- **Closure Request Message**
  - Message from the flight (or ramp) operator to create, activate, deactivate, update, or remove a closure request for a resource in the non-movement (or ramp) area.
  - **TFDM Use**:
    - TFDM will remove flights impacted by the closure from the runway schedules.
    - TFDM will display closure information to the TFDM ATCT user and provide status information externally via TTP.
- **Gridlock Request Message**
  - Message from the flight (or ramp) operator to create, update, or remove a gridlock request for a resource in the non-movement (or ramp) area.
  - **TFDM Use**: TFDM will display gridlock information to the TFDM ATCT user and provide status information externally via TTP.
- **Submission Expectations**: Local Surface Working Groups (SWG) are expected to set policy regarding the submission of closure and gridlock information.

Additional Resources & Next Steps

Federal Aviation
Administration

TFDM Testbed

- TFDM has set up a testbed to allow airport stakeholders to test connectivity with a test instance of TFDM B2 software
  - Hosted in a Leidos (TFDM prime contractor) lab with simulated SWIM connections
  - Uses recorded data from CLT

- Open to airports, airlines, and 3rd party vendors to test connections to TFDM prior to TFDM B2 being deployed in the field

- If interested, contact Doug Swol (Christopher.D.Swol@faa.gov) or CSIT (csit@faa.gov)

Federal Aviation Administration

TFDM Data Exchange Resources

- TFDM has available interface resource documentation for guidance on exchange of data to/from TFDM and stakeholders available on the NAS Service Registry and Repository (NSRR) [nsrr.faa.gov]
  - TTP JMSDD
  - TFCS JMSDD

- TFDM has additional resources to guide stakeholders in the purpose, use, and exchange mechanisms on the CDM website [https://cdm-staging.infinaweb.com/surface-cdm-team/]
  - TFDM Data Operation User Guide (DOUG)
  - TFDM S-CDM User Guide

Questions & Upcoming CSIT Events

- Open-to-All TFDM Orientation: September 9 at 1pm
- Tech Talk #5: Topic, schedule to be determined
- DOUG, User Manual, and Previous Tech Talks and other CSIT resources available at: https://cdm-staging.infinaweb.com/surface-cdm-team/
- Follow-up questions: csit@faa.gov

Federal Aviation Administration