FAA Surface CDM Concept

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Collaborative Decision Making and Airport Operations

Presented to:
Workshop on Airport Collaborative Decision Making

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FAA
Air Traffic Organization

Surface-CDM Concept

- Builds upon, and leverages CDM philosophy.
- Provides the basis for more efficient surface flows at U.S. airports while increasing safety.
- Decreases uncertainty in demand and increases predictability.
- Data exchange dependent.
- Leverages NextGen technologies / principals.
- Drives collaborative culture.

Surface-CDM Foundation

Required components:

- Access to airport aircraft surface surveillance data.
- Electronic Flight Data Automation.
- Accurate and timely operational data.
- Ability to share operational data among the FAA, airport operators, flight operators, pilots, and other stakeholders.

A-CDM Stakeholders

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ANSPs are able to provide information on:

- Estimated arrival times
- Estimated departure times based on planning data provided by handling agent
- Runway in use and runway capacity

The airport operators should provide information on:

- Stand and gate allocation
- Environmental information
- Special events such as air shows, major sport events
- Reduction in airport capacity
- Runway availability
- Aircraft movement data

A-CDM Stakeholders

The apron control is a partner that is responsible for acting on information related to arrival and departure information, such as:

- landing times
- In-block times
- Off-block times
- Start-up approval times

Also take-off time while sharing the information with the ANSP, the airlines and the airport operator.

Ground handling operators are able to provide information on:

Changes in turn-round times

- Target off-block time (TOBT) updates
- Planning data
- Information concerning de-icing

A-CDM Stakeholders

Having up-to-date information available on the overall flight and related processes will allow airlines to deliver a better service to the end customer. Information to be provided by airlines

- Priority of flights
- Flight plans
- Aircraft registration
- Aircraft type

Initial Surface-CDM Data Elements

Actual In-Block Time (AIBT)	Flight Cancellation
Actual Landing Time (ALDT)	Flight Intent
Actual Off-Block Time (AOBT)	Gate Assignment (Arrival and Departure)
Actual Take-Off Time (ATOT)	Initial Off-Block Time (IOBT)
Aircraft Tail / Registration Number	Target Movement Area entry Time (TMAT)
Earliest Off-Block Time (EOBT)	

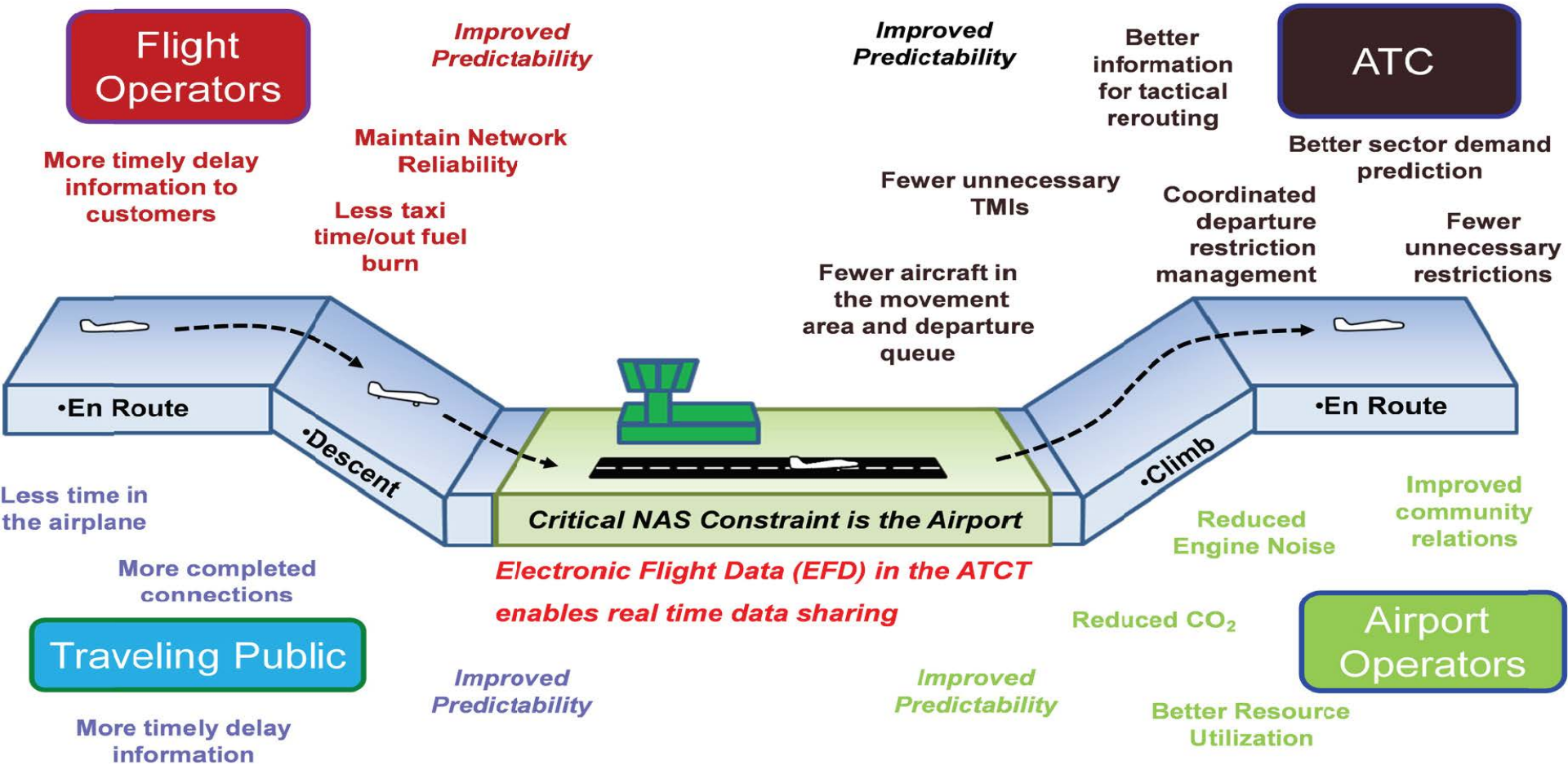
Determining need for A-CDM

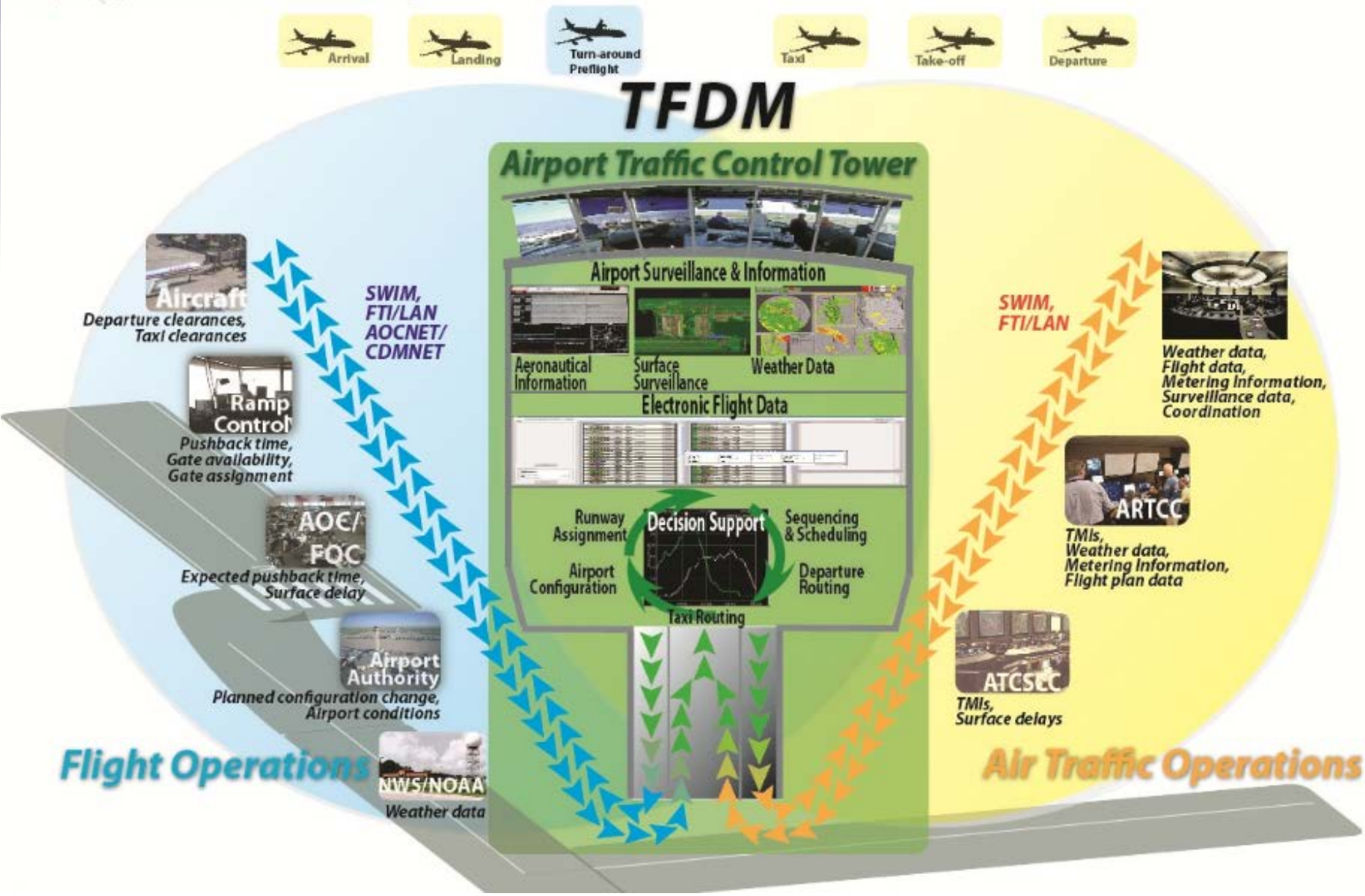
Potential Problem	Conditions for Potential Application
Departure metering	• How frequently does the airport expect to have more than 7 aircraft queued for departure at a single runway?
De-icing coordination	• Does aircraft de-ice capacity sometimes restrict the departure rate?
Diversion coordination	• Is the airport a frequent diversion receiver? • Is there a potential for those diversions to exceed some element of airport capacity? • Is the airport notified in a timely manner of flight diversions?
Customs staffing	• Are customs clearing times highly variable due to timing of international arrivals?
Irregular Operations (IROPS) coordination	• Are all the mechanisms in place to respond to, and to prevent, tarmac rule violations?
Real-time departure scheduling	• How often are flights metered over shared departure fixes or into nearby TBFM arrival streams with delays?
Terminal service	• Do late departures frequently arrive after normal operating hours? • Could vendors capture additional revenue from adjusting hours in those cases?
Safety	• Is taxi conformance monitoring an issue for the airport operator?
Passenger movement information	• Could airlines/airport make use of the TSA boarding pass scans?
Service vehicle monitoring	• Is there a significant amount of surface vehicle traffic? • Do these vehicles interfere with flight operations?
Passenger facilities	• Are passenger facilities (food, curbside, restrooms, etc.) frequently overloaded?

Surface-CDM Differences from A-CDM

- “Incoming leg” information not used in calculations
- Metered time begins at the Taxi entry point (TMAT)
- Substitutions will be allowed with S-CDM
- Departure slot will be the property of the airline
- Each airline will be allowed to swap their own flights
- Departure slots for cancelled flights will be used in substitution or made available for others

Surface Efficiency Benefits All Stakeholders




Arrival
Landing
Turn-around Preflight
Taxi
Take-off
Departure
TFDM
Airport Traffic Control Tower
Airport Surveillance & Information
Aeronautical Information
Surface Surveillance
Weather Data
Electronic Flight Data
Runway Assignment
Decision Support
Sequencing & Scheduling
Airport Configuration
Departure Routing
Taxi Routing
Aircraft
Departure clearances, Taxi clearances
SWIM, FTI/LAN AOCNET/ CDMNET
Ramp Control
Pushback time, Gate availability, Gate assignment
AOC/ FOC
Expected pushback time, Surface delay
Airport Authority
Planned configuration change, Airport conditions
NWS/NOAA
Weather data
Flight Operations
SWIM, FTI/LAN
Weather data, Flight data, Metering Information, Surveillance data, Coordination
ARTCC
TMIs, Weather data, Metering Information, Flight plan data
ATCSCC
TMIs, Surface delays
Air Traffic Operations

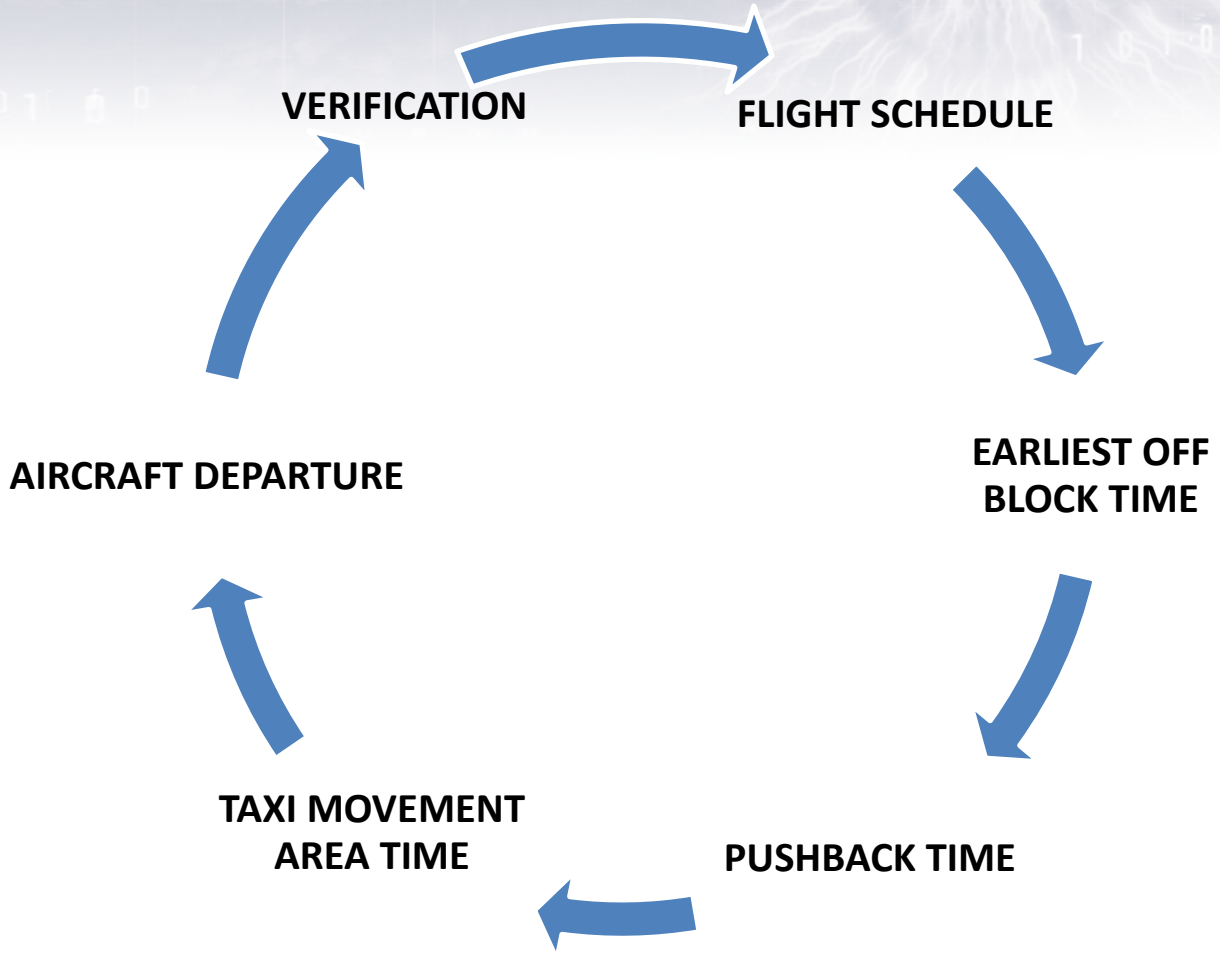
How Does the System Work

1	Designed in an airport specific fashion. It is customized to each airports desire for queue length and customized for specific runways. The system will issue times when aircraft are expected to taxi.
2	The implementation of taxi times will only occur when needed. At each selected airport this will only occur a few hours a day. The average delay on taxi times in modeling was 8 minutes.
3	The system is running constantly, looking a few hours ahead (2.5 but adjustable if necessary) to determine if a program is needed.
4	The program uses a variety of sources to determine information. The program will be integrated with other air traffic control systems so that it can take many factors into consideration.

How Does the System Work

5	Aircraft participating in delay and recovery programs for other airports are automatically exempted from the metering.
6	The two most important elements in the system are; EOBT (Earliest Off Block Time) and TMAT (Target Movement Area Time)
7	EOBT – More precise information in the scheduling of departures. Airlines will provide several automated systems that will determine/update EOBT's. It is essential for airlines to notify the system through EOBT if an aircraft will be delayed or cancelled.
8	The result of the information is TMAT. Aircraft are expected to enter the taxiway/movement area +/- 5 minutes of their assigned TMAT.

CDM - TFDM - DATA EXCHANGE



Collaborative Decision Making (CDM) is essential to the success of Surface Management. The Airlines, Airport and Air Traffic Control must all work together for the system to be effective.

TFDM Benefits To The System

- Streamlines the sequence of aircraft scheduled to depart, while accounting for aircraft scheduled to arrive, to maximize airport efficiency and reduce delays.
- Optimizes the experience for flying public, Air Traffic Control (ATC), and the airline industry.
- Modernizes Air Traffic Control Tower (ATCT) equipment and provides electronic flight strips to controllers.
- Uses surface surveillance and flow-management capabilities in its predictive modeling for improved departure management, ground movement, and flight coordination.

Questions?

Thank You!