



ATD-2 Integrated Arrival/ Departure/Surface (IADS) System Software Version 4.x Releases and Notes

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1 Purpose

Below are change reports for the 4.x series of releases to Charlotte-Douglas International Airport (CLT) and/or Dallas-Fort Worth International Airport (DFW). These list all the changes since the previous release. The Release Notes for Distribution are meant to be more readable by stakeholders.

Release	Release Date	CLT Deployment Date	DFW Deployment Date	Notes
V4.0.0	05 Sep 2018	11 Sep 2018	n/a	CLT only; Phase 2 Go-Live
V4.1.0	12 Oct 2018	17 Oct 2018	22 Oct 2018	Aircraft Management
V4.2.0	07 Nov 2018	13 Nov 2018	26 Nov 2018	Scheduler improvements for CLT
V4.2.1	04 Dec 2018	10 Dec 2018	n/a	Scheduler bug fixes
V4.2.2	02 Feb 2019	12 Feb 2019	n/a	Adaptation and FlightHub update for CLT
V4.2.3	05 Mar 2019	11 Mar 2019	n/a	CLT only; Taxiway closures, sensitive data, scheduler freeze logic
V4.3.0	18 Apr 2019	Not deployed	Not deployed	CLT feature requests and bug fixes Updates for AEFS v5.6 final Site Testing/ Deployment starting 4/29/19
V4.3.1	26 Apr 2019	01 May 2019	15 May 2019	
V4.4.0	22 May 2019	Not deployed	Not deployed	
V4.4.1	23 May 2019	05 Jun 2019		
V4.5.0	19 Jun 2019	25 Jun 2019	n/a	Bug fixes, construction updates
V4.6.0	23 Jul 2019	30 Jul 2019	n/a	RTC advisory to leverage surface metering, bug fixes
V4.7.0	26 Aug 2019	09 Sep 2019	n/a	Trajectories, Scheduler improvements, bug fixes, construction updates

2 Release 4.0.0

2.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.0.0. Version 4.0.0 was deployed on 11 Sep 2018 to CLT.

2.2 AEFS

- Added storage for a list of pre-departure flight plans in the Fuser and STBO, using the ERAM flight plan data available from TFMS.
- Stopped sending time message to AEFS if the time difference is not changed when comparing time values in minutes resolution (disregarding seconds and milliseconds).
- Added a heartbeat to the AEFSProcessor to monitor the AEFS connection with ATD-2.

2.3 APREQ Scheduling

- (CLT) Added evaluation of flight updates to determine if a flight is eligible for pre-scheduling. A flight eligible for pre-scheduling should meet the following criteria:
 - Be a departure
 - Be arriving into ATL
 - Not be considered a GA flight
 - Have a flight state greater than or equal to SCHEDULED and less than OFF
 - Be constrained by an APREQ TMI
 - Have an IDAC state of either SEMI or AUTO
 - Not have a scheduled release time
 - Not be in the middle of release negotiation
 - Have either an EOBT or UOBT within 25 minutes of the current time

If a flight meets the above criteria, then a release time request will be sent. The request should be processed the same as any other release request and no further action should be required.

2.4 Dashboard

- (DFW) Trimmed the Dashboard down to just the Quicklook panel and the feedback form.

2.5 RTC

- Added the yellow border along with the TMAT countdown timer (if appropriate) when an untracked/hollow target is dragged into the hardstand.
- Separated the single Emergency right mouse menu option into a Medical Emergency and a generic (non-Medical) Emergency. Flights flagged as a medical emergency will have a data tag of red text on a white background plus a '+' icon before and after the first line of the data tag. Flights flagged as a generic emergency will have a similar timeline tag except the icon is a '!' displayed in black instead of red.
- Added the ability to set a note when flagging a priority flight in the Ramp Manager's Tools -> Priority Flights window. This note will show up in the scratch pad of the flight's data tag and in its Flight Menu.
- Modified display to show taxiway links in red on the map if they have been marked as closed from the STBO Client.
- Improved Search feedback:
 - Added dialog telling the user why flights that match the search criteria are not being displayed.
 - Jumps to follow a found arrival only if it was found by callsign or tail number (i.e. not airline).
 - Search field now requires at least 3 characters (or GA) before displaying in red if nothing found.

- Forces display of created flight without track as a hollow flight.
- (DFW) Updated the default RTC user profiles to match expected usage at DFW.
- Added a gear icon on the toolbar to provide notification when there is a new proposed SMP. The icon is orange when there is a proposed SMP or black otherwise.
- Added entries in the notification panel for updates to SMPs:
 - Event Type = SMP
 - Description = <resource> <status>, e.g. “18R PROPOSED”
 - Details = <smp statistics>, e.g. “Flight Count: 15 Avg Gate Hold: 6 Max Gate Hold: 10”

As the state changes, the current row is updated rather than adding new rows; for example, there will be one row “18R PROPOSED” that is updated to “18R AFFIRMED” instead of one row for “18R PROPOSED” and a second row for “18R AFFIRMED”.

- Added L-Time (LOBT, airline-provided OUT time) to the Flight Menu.
- Added a white border around the icons of flights with the “Super” weight class.
- (CLT) Removed the red boxes around gates A9 and A11 per RMTC request.

2.6 Scheduler

- Updated the wake vortex separations between any two exempt arrivals to default to zero. All other combination of any other type of arrivals should follow generic arrival-arrival wake vortex table separations.
- Updated the EFTT and CTD buffer decision trees to utilize a flight’s arrival and departure airport. One usage of this is so that CFR flights with an EOBT should have a different EFTT value than those without while leaving the current AAL EFTT value alone.
- Added determination of whether a particular controlled time change should warrant a rescheduled refreeze, such as an APREQ flight that had an EDCT time change.
 - If a flight is an APREQ flight with or without a time, the only controlled time change that would warrant a rescheduled refreeze would be an APREQ time change. For any flight, if an APREQ time changes, a rescheduled refreeze should happen.
 - If a flight is a pure EDCT flight, a change to the EDCT time will cause a scheduled refreeze.
 - If a frozen flight without controlled times receives a new controlled time, a rescheduled refreeze should happen.

2.7 STBO Client

- Enhanced to allow the user to save and load configurations for a single timeline or flights table.
 - Added ability to save-for-quick-create on timelines by opening the Timeline Settings then clicking the Save for Quick Create button. Once saved, the user can load the timeline from the toolbar's Create -> Create Timeline -> <type> -> <profile>
 - Added ability to save-for-quick-create on flights tables by clicking the 'save' icon on the toolbar (4th icon). Once saved, the user can load the flights table from the toolbar's Create -> Create Table -> Flights Table -> <profile>
- Updated the load/save settings dialog to display names in mixed-case alphabetical order (instead of all upper then all lower) and to remove the file extensions.
- Separated the single Emergency right mouse menu option into a Medical Emergency and a generic (non-Medical) Emergency. Flights flagged as a medical emergency will have a timeline tag of red text on a black background plus a ‘+’ icon in red on a white background. Flights flagged as a generic emergency will have a similar timeline tag except the icon is a ‘!’. These flights will be displayed with a red background on the Flights Table.
- Set a timeout on the search feature so that the search results are cleared after 3 minutes. (Note: the 3 minutes is configurable via a property file.)
- Activated the ability for users to mark taxiway links as closed.
 - The feature is accessed by click on the “Open/Close Links” button on the map toolbar.

- Closed links are displayed in red on the map.
- Link closures are reflected across all connected Clients and RTCs.
- Links may be re-opened by accessing the same the “Open/Close Links” button.
- When links are closed, trajectories are re-calculated to exclude the closed links.
- Updated the list of fixes and their associated colors in the Departure Fix color scheme.
- Added a dialog that lets the user know when the airport configuration (runway utilization) has been changed by automation. The dialog has two options, one will keep the configuration and the other will open the TM Actions -> Runway Utilization panel to allow the user to change it.
- Added ability to persist default TMIs (closures, restrictions, etc.) so that users do not have to manually enter them daily. CLT systems will now show an APREQ for ATL 1030-0200 daily. There are currently no default TMIs being loaded for DFW.
- Added Departure Gate as a resource type option on the TM Action Panel when creating a new MIT, APREQ, or Fix Closure. When a TMI is entered for a departure gate, the system will use the parameters entered to create identical TMIs for each of the departure fixes included in the departure gate. Also, when users are entering TMI constraints for any TMI that does not have a departure fix/gate as the main resource, there will be an option to create departure gate constraints. Any flight using a fix included in the selected gate(s) will be included/excluded from the TMI.
- Added a gear icon on the toolbar to alert the TMC when there is a new proposed SMP so that it cues the TMC to go review it on the SMD and either accept or reject it. The icon is orange when there is a proposed SMP or black otherwise.
- Added entries in the notification panel for updates to SMPs:
 - Event Type = SMP
 - Description = <resource> <status>, e.g. “18R PROPOSED”
 - Details = <smp statistics>, e.g. “Flight Count: 15 Avg Gate Hold: 6 Max Gate Hold: 10”

As the state changes, the current row is updated rather than adding new rows; for example, there will be one row “18R PROPOSED” that is updated to “18R AFFIRMED” instead of one row for “18R PROPOSED” and a second row for “18R AFFIRMED”.
- Added a black-on-white ‘S’ as a heavy indicator on the timeline and map data tags of flights with the “Super” weight class.
- Updated the Departure Fix Status Table window labels to show units. (i.e., 'Avg Dly (min)', 'Max Dly (min)').
- (CLT) Updated the Departure Gate color scheme:
 - The colors for EAST and WEST were adjusted.
 - The color for arrivals was changed from white to gray.
 - These fixes are no longer associated with a departure gate: LILLS, RUNIE, PEKNN, GIPPR, GANTS, CEGAL, JOJJO, PITYY.

2.8 Surface Metering Display

- Set STRATEGIC as the Surface Metering Program type (instead of TACTICAL). The user can now affirm or reject proposed SMPs.
- Allowed an ‘admin’ user to set the static time horizon.
- Updated the handling of the up/down arrow keys for numeric inputs to start from the current value instead of zero.

2.9 TTP

- Added the ground stop reason from the ImpactingCondition of the TFM ground stop data be included in the TTP TrafficManagementRestriction AirportDepartureStop data.
- Updated the TMI Identifiers in TrafficManagementRestriction messages to always be a positive integer value and the ICAO airport code. Also, TMIs with no end time will no longer include the end time value.

- Updated TTP Flight Update messages to include all flight matching fields (eram_gufi, computer_id, initial_gate_time_of_departure) that are available instead of just those that were updated. Assigned arrival/departure runways will no longer be included in the TTP flight data messages since the 'assigned' definition in TFDM does not line up with the ATD-2 definition. Instead, the predicted runway values will use the last runway source from MatmFlight and will use that to determine the correct predicted runway value to send.
- Made Off Block Time Accuracy Metrics more precise by factoring in time periods even when no EOBT update was received.
- Made Arrival Throughput Counts based on arrival runway time instead of arrival stand time.

3 Release 4.1.0

3.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.1.0. Version 4.1.0 will be deployed on 17 Oct 2018 to CLT and on 22 Oct 2018 to DFW.

3.2 Adaptation

- **(DFW)** Updated the D10 TRACON video maps to include two new maps DFW_RNAV_NORTH and DAL_DEP_NORTH and to update the three maps of DEPARTURE_NORTH, FEEDER_NORTH, and SATELLITE_NORTH. Also, shifted the reference point for the DAL_DEP_SOUTH map for a slightly difference appearance.
- **(CLT)** Updated the TRACON maps for SRNAVAR (south RNAV arrival) and NRNAVAR (north RNAV arrival).
- **(CLT)** Updated the background map to include the addition of a temporary guidance line in the apron surface due to construction.
- **(CLT)** Reduced the AMA and ramp taxi speeds, based on median values for the AMA taxi speeds of arrivals at CLT using actual operations data. From this update, it is expected to achieve more accurate taxi-in time prediction at CLT and reduce false gate conflicts.

3.3 AEFS

- Corrected a problem where a runway assignment from AEFS was clearing the OpNec flag of a user-set runway from STBO.

3.4 Dashboard

- **(DFW)** Modified the Dashboard for DFW as follows:
 - Modified Departure Arrival monitor to show arrivals and departures on separate graphs by side (E/W).
 - Added Departures by Departure Gates monitor to show departures on separate graphs by departure gate direction (N/S/E/W).
 - Added Departures by Runway Headings monitor to show departures on separate graphs by direction per runway side (E/W tower).
 - Added Arrivals by Cornerposts monitor to show arrivals on separate graphs by cornerpost used.
 - Modified Quick Look to remove unnecessary tables.
 - Added Taxi out by Runway monitor to show average taxi out times by runway side (E/W tower).
 - Added Taxi in by Runway monitor to show average taxi in times by runway side (E/W tower) per terminal.
 - Added Taxi in by Terminals monitor to show average taxi in times per terminal control group (AAL/DFW).
- **(CLT and DFW)** Added GDPs.

- (CLT and DFW) Changed to display the strategic (instead of tactical) SMP setup.
- (CLT) Added ramp closures.

3.5 RTC

- Displayed GDPs in the notification panel. (Note: Flights are not evaluated as constrained by a GDP.)
- Improved gate conflict detection due to a neighboring heavy.
- Saved the map display as the default view when a user profile is saved, without having to save it in "View 1" first.
- Corrected problems with manually removing a cancelled flight.
- Changed TMAT display such that when a TMAT is displayed for flights without an underlying TMI, the TMAT will no longer be highlighted and no longer have an indicator block at far zoom levels.
- Corrected the problem of the metering icon not turning blue and the watermark not showing up when metering is turned on.
- Expanded the Search feature for "GA" to include corporate jets and air taxis, by including a flight if its gate is in the general aviation ramp area or if the flight belongs to specific carriers based on historical data.
- Added aircraft management:
 - Displayed aircraft not associated with a flight as a gray diamond.
 - Added the ability to create an aircraft icon by selecting the "Add Aircraft Target" option from the map's right mouse menu. An aircraft can be created at a gate, at a hardstand, or at the current mouse location.
 - Added the ability to double-click on an aircraft icon or use the right mouse menu for an aircraft icon to open an Aircraft Menu, allowing the user to:
 - Set or clear a gate assignment
 - Set or clear a hardstand assignment
 - Set a scratch pad entry
 - Update the aircraft type
 - Reposition the icon
 - Remove the icon
 - Added the ability to select or bloom aircraft icons; they can also be dragged to any location.
 - Added aircraft icons drawn with the Heavy, B757, Super, or Hardstand borders, if appropriate.
 - Changed aircraft tags to display, when zoomed out, the appropriate indicator for tags with a scratch pad entry or that are repositioned. Aircraft tags contain the tail, aircraft type, gate, and scratch pad, depending on the zoom level.
 - Added the ability in the Search feature to search for aircraft by tail number.
 - Included aircraft in gate conflict detection, including a heavy aircraft blocking a flight at a neighboring gate.

3.6 Scheduler

- Changed international and heavy flights to no longer be automatically exempt from metering.
- Changed logic so an SMP will no longer be proposed based on flights in the UNCERTAIN group. These flights were already not included in the trigger for an SMP to go active; now they no longer used in the proposed SMP logic due to the planning group changes made in 4.0.0.
- Made algorithmic changes to SMP matching to fix a bug in strategic SMPs which occurred when two imbalance periods were merged into one.

- Modified the freeze logic to freeze the previous schedule, rather than a flight schedule that has pushed back without a hold after the current iteration schedule.

3.7 STBO Client

- Displayed GDPs in the notification panel. (Note: Flights are not evaluated as constrained by a GDP.)
- Corrected the problem of the metering icon not turning blue and the watermark not showing up when metering is turned on.
- Changed map display to no longer allow arrival fixes and procedures to be displayed at the same time on the map; ditto for departures.
- Changed timeline legend checkboxes to no longer allow the removal of emergency flights from the timeline display via the checkboxes.
- Updated the Timeline Settings dialog to remove the "One Line DB" and the "Extended Datablock" options.
- Expanded the Search feature for "GA" to include corporate jets and air taxis by including a flight if its gate is in the general aviation ramp area or if the flight belongs to specific carriers based on historical data.
- Cleared the Search field in the Flights Table and Toolbar if the user clears the search results by clicking on the background of the timeline or map displays.
- Allowed the user to remove a group of APREQ, MIT, Departure Fix, and Ground Stop TMI restrictions at one time by using shift-click to multi-select.
- Changed Range Ring distance labels to now show on the range rings for the 4 cardinal directions, instead of just north.
- Updated the Flight Plan Demand dialog:
 - Moved the cursor focus to the start time field when the "Show" option is selected.
 - Disabled but no longer cleared the start and end times when the "Show" option is de-selected.
 - Cleared the start and end times fields when the user-entered end time has expired.
- Changed the dialog that pops up when the model detects a configuration change so it should no longer pop up in Observer mode.

3.8 TTP

- Changed TTP messages to only send ICAO airport codes instead of a mix of IATA and ICAO, to match TFDM.
- Changed flight data add and update events to only be published via TTP if the flight has been updated by a source other than FlightHub. This will keep TTP from publishing flight data several days in advance.
- Changed EstimatedTimeOfArrival to now publish the arrivalRunwayTargetTime instead of arrivalRunwayEstimatedTime.
- Changed EstimatedTimeOfDeparture to now publish the departureRunwayTargetTime instead of departureRunwayEstimatedTime.
- Changed Actual/PredictedArrivalSpot, Actual/PredictedDepartureSpot, ArrivalRunwayPredicted/Actual and DepartureRunwayPredicted/Actual to include a timestamp and source value in addition to the actual assignment value.

4 Release 4.2.0

4.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.2.0. Version 4.2.0 was deployed on 13 Nov 2018 to CLT and 26 Nov 2018 to DFW.

4.2 Adaptation

- **(DFW)** Updated the D10 TRACON video maps to include two new maps DFW_RNAV_NORTH and DAL_DEP_NORTH and to update the three maps of DEPARTURE_NORTH, FEEDER_NORTH, and SATELLITE_NORTH. Also, shifted the reference point for the DAL_DEP_SOUTH map, giving it a slightly difference appearance.
- **(CLT)** Updated the TRACON maps for SRNAVAR (south RNAV arrival) and NRNAVAR (north RNAV arrival).
- **(CLT)** Updated the background map to include the addition of a temporary guidance line indicating construction on the apron surface.
- **(CLT)** Reduced the AMA and ramp taxi speeds, based on median values for the AMA taxi speeds of arrivals at CLT using actual operations data. From this update, it is expected to achieve more accurate taxi-in time predictions at CLT and reduce false gate conflicts.

4.3 AEFS

- Corrected a problem where a runway assignment from AEFS was clearing the OpNec flag of a user-set runway from STBO.

4.4 Dashboard

- **(DFW)** Modified the Dashboard for DFW:
 - Modified Departure Arrival monitor to show arrivals and departures on separate graphs by runway side (E/W).
 - Added Departures by Departure Gates monitor to show departures on separate graphs by departure gate direction (N/S/E/W).
 - Added Departures by Runway Headings monitor to show departures on separate graphs by direction per runway side (E/W tower).
 - Added Arrivals by Cornerposts monitor to show arrivals on separate graphs by cornerpost used.
 - Modified Quick Look to remove unnecessary tables.
 - Added Taxi out by Runway monitor to show average taxi out times by runway side (E/W tower).
 - Added Taxi in by Runway monitor to show average taxi in times by runway side (E/W tower) per terminal.
 - Added Taxi in by Terminals monitor to show average taxi in times per terminal control group (AAL/DFW).
- **(CLT and DFW)** Added GDPs.
- **(CLT)** Added ramp closures.

4.5 RTC

- Displayed GDPs in the notification panel. (Note: Flights are not evaluated as constrained by a GDP.)
- Improved gate conflict detection logic due to a neighboring heavy.
- Saved the map display as the default view, without having to save it in "View 1" first, for a saved user profile.

- Corrected problems with manually removing a cancelled flight.
- Removed both TMAP highlighting and the indicator block at far zoom levels when a TMAP is displayed for flights without an underlying TMI.
- Corrected the problem of the metering icon not turning blue and the watermark not showing up when metering is turned on.
- Expanded the Search feature for "GA" to include corporate jets and air taxis, by including a flight if its gate is in the general aviation ramp area or if the flight belongs to specific carriers, based on historical data.
- Added aircraft management features:
 - Added display of aircraft not associated with a flight as a gray diamond.
 - Added ability to create an aircraft icon by selecting the "Add Aircraft Target" option from the map's right mouse menu. An aircraft can be created at a gate, at a hardstand, or at the current mouse location.
 - Added ability to open an Aircraft Menu by double-clicking on an aircraft icon or using the right mouse menu for an aircraft icon, which will allow the user to:
 - Set or clear a gate assignment.
 - Set or clear a hardstand assignment.
 - Set a scratch pad entry.
 - Update the aircraft type.
 - Reposition the icon.
 - Remove the icon.
 - Added ability for aircraft icons to be selected or bloomed; they can also be dragged to any location.
 - Added borders to display of aircraft icons for the Heavy, B757, Super, or Hardstand designation, if appropriate.
 - Added aircraft tags that contain the tail, aircraft type, gate, and scratch pad, depending on the zoom level. When zoomed out, aircraft tags with a scratch pad entry or that are repositioned will display the appropriate indicator instead.
 - Added ability to use the Search feature to find aircraft by tail number.
 - Included aircraft in gate conflict detection, including a heavy aircraft blocking a flight at a neighboring gate

4.6 Scheduler

- Changed international and heavy flights to remove automatic exemption from metering.
- Removed the possibility of an SMP being proposed based on flights in the UNCERTAIN group. These flights were already not included in the trigger for an SMP to go active; now they are no longer used in the proposed SMP logic, due to the planning group changes made in 4.0.0.
- Made algorithmic changes to SMP matching to fix a bug in strategic SMPs, which occurred when two imbalance periods were merged into one.
- Modified the scheduler functionality to freeze the previous schedule for a flight, rather than a flight schedule that has pushed back without a hold after the current iteration schedule.

4.7 STBO Client

- Displayed GDPs in the notification panel. (Note: Flights are not evaluated as constrained by a GDP.)
- Corrected the problem of the metering icon not turning blue and the watermark not showing up when metering is turned on.
- Removed arrival fixes and procedures from being displayed at the same time on the map; it is no longer allowed. Ditto for departure fixes and procedures.

- Deleted ability to remove emergency flights from the timeline display via the timeline legend checkboxes.
- Updated the Timeline Settings dialog to remove the "One Line DB" and the "Extended Datablock" options.
- Expanded the Search feature for "GA" to include corporate jets and air taxis by including a flight if its gate is in the general aviation ramp area or if the flight belongs to specific carriers, based on historical data.
- Changed the Search field in the Flights Table and Toolbar, such that it will be cleared if the user clicks on the background of the timeline or map displays.
- Changed functionality such that a user is now allowed to remove a group of APREQ, MIT, Departure Fix, and Ground Stop TMI restrictions at one time by using shift-click to multi-select.
- Added Range Ring distance labels at the 4 cardinal directions on the rings, instead of just North.
- Updated the Flight Plan Demand dialog:
 - Moved the cursor focus to the start time field when the "Show" option is selected.
 - Disabled the start and end times (no longer cleared) when the "Show" option is de-selected.
 - Cleared the start and end times fields when the user-entered end time has expired.
- Removed the dialog that pops up when the model detects a configuration change, when in Observer mode.

4.8 TTP

- Changed TTP messages to only send ICAO airport codes, instead of a mix of IATA and ICAO, to match TFDm.
- Changed logic such that flight data add and update events will only be published via TTP if the flight has been updated by a source other than FlightHub. This will keep TTP from publishing flight data several days in advance.
- Changed EstimatedTimeOfArrival to now publish the arrivalRunwayTargetTime instead of arrivalRunwayEstimatedTime.
- Changed EstimatedTimeOfDeparture to now publish the departureRunwayTargetTime instead of departureRunwayEstimatedTime.
- Changed Actual/PredictedArrivalSpot, Actual/PredictedDepartureSpot, ArrivalRunwayPredicted/Actual and DepartureRunwayPredicted/Actual to include a timestamp and source value in addition to the actual assignment value.

5 Release 4.2.1

5.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.2.1. Version 4.2.1 was deployed on 10 Dec 2018 to CLT only.

5.2 Scheduler

- Changed treatment of EDCT+APREQ flight without APREQ time yet. Now flight is properly treated as controlled flight for TOBT generation.
- Changed APREQ flights without release times that should not have been frozen when put on hold. New TOBT that properly factors in the new release time will be frozen.
- Changed priority flights with controlled time to not be prioritized; they will be treated like any other controlled flight.

- Recalculated TMAT correctly. Previously, flights that got APREQ after pushback showed stale TMATs.
- Changed non-surface metering flights that should not have been frozen.
- Removed extraneous buffer on uncertain flights. (Buffer had been applied twice).

5.3 Model

- Corrected aircraft time hovers (for flights that have pushed back, but are not moving).
- Improved gate conflict logic to use the latest of either UOBT or TOBT.

6 Release 4.2.2

6.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.2.2. Version 4.2.2 was deployed on 12 Feb 2019 to CLT only.

6.2 Adaptation

- Added carriers VTE, VOI, VIV, and SWQ to the default gate decision tree.
 - VTE is now replacing SRY for flights; they were awarded the EAS route contract back in October and first flights began on 12/5/2018. The 12/4/2018 flight was for training and familiarization. These flights are assigned to Gate A29 moving forward, and they may flex between A28 or A29 depending upon any delays or schedule changes that occur.
VTE was also removed from the list of General Aviation carriers.
 - Volaris (Y4) (VOI) began service from CLT to GDL on 12/13/2018 from default gate D4.
 - Viva Aerobus (VB) (VIV) is beginning service from CLT to CUN on 02/16/2019, using gate A28 when departing and D4 when arriving.
 - Swift Air (WQ) (SWQ) is beginning service from CLT to PUJ on 05/27/2019 for seasonal service, using gate A28 when departing and D4 when arriving.

6.3 Back End

- Updated the FlightHub connection configuration to refer to the latest schema. This is in preparation for when the new data is turned on. The schema changes are backwards compatible, so this update will not affect processing in the current release.

7 Release 4.2.3

7.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.2.3. Version 4.2.3 was deployed on 11 Mar 2019 to CLT only.

7.2 Scheduling

- Added an option to turn ON/OFF the ability to treat an APREQ flight without CTOT like exempt flights. This option is turned OFF by default. If turned ON, an APREQ flight without a CTOT will have its schedule priority type set to EXEMPT.
- Corrected the freeze logic for a frozen flight whose best OUT time was updated to be later than the frozen time. If the new best OUT time is still within the static freeze horizon, the

frozen time will be updated to the new best OUT time. If the best OUT time is outside of the freeze horizon, the flight will be unfrozen.

- Corrected the slot network to retain flights that have already used a resource (e.g., runway) but still need to be used as a constraint (such as for separations) for following flights that will be scheduled to use the resource.
- Reset a buffer that had been hovering taxi at 60-70 seconds in the past. The hover buffer was reset to 0, so a flight will hover at the current time instead of a time the past.

7.3 Sensitive Data

- Added filtering of sensitive flights to the user interface displays, based on a sensitive data flag set by TFMS.
 - RTC: All sensitive flights are hidden.
 - STBO Client: FAA users (e.g., Tower) can view sensitive flights, but non-FAA users (e.g., Ramp) cannot.
- Added a configurable whitelist / blacklists to the Fuser that can either filter sensitive data in or out. Initially there are no whitelist entries, and the only blacklist entries are the US Executive Branch callsigns (e.g., AF1/AF2).

7.4 Closed Taxiways

- Added CLT link closures to the default TMI file that is loaded by the TmiService at startup. The links in the file will be closed with each TMI daily reset and remain closed unless manually removed.
- Updated the predicted surface trajectory generation to account for portions of taxiways that might be closed. It does this by using a shortest path that attempts to go around the closed links without using a runway as a taxiway.
- Corrected the Model to update the spot for a flight if the flight's predicted trajectory contains a new spot due to rerouting around a closed link.

8 Release 4.3.0 / 4.3.1

8.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.3.0 and 4.3.1. Version 4.3.1 was deployed on 01 May 2019 to CLT and 15 May 2019 to DFW. Version 4.3.0 was not deployed.

8.2 Adaptation

- Updated aircraft types.
- **(CLT)** Updated taxiway closures.
- **(CLT)** Updated apron and taxiway guidance lines on the background map.
- **(CLT)** Added KMTJ to the departure fix decision tree for BOBZY.
- **(CLT)** Added gate expansion at E concourse for gates E12-E16.
- **(CLT)** Updated default gates for specific seasonal carriers. (Note: Not all default gate assignments can be made since the only difference in criteria between flights is the day-of-week, which ATD-2 decision trees currently do not support.)
- **(DFW)** Added holding pads around terminal F.
- **(DFW)** Corrected locations of gates 37, 38, and 29 in terminal B.
- **(DFW)** Added Drop Points to the background map display.
- **(DFW)** Updated apron and taxiway guidance lines on the background map.
- **(DFW)** Updated spot decision tree based on analysis of historical data.

8.3 AEFS

- Added a message to add an arrival to AEFS when the flight is 10 nm from the end of the runway.
- Added a message to remove an arrival from AEFS when the flight enters the Non-Movement Area.
- Added message throttling such that ETD time changes will now only trigger updates if the time changes are greater than a specified threshold (2 min).
- Added the sending of gate conflict data and gate conflict resolution.

8.4 APREQ Management Service

- Disabled release prescheduling for a flight subject to a ground stop. A flight is said to be part of a ground stop if the undelayed OFF time is within the ground stop start/end time.

8.5 DASH

- (CLT) Coalesced the actual, user, and position derived runways in the queries used to generate the dashboards instead of using the position derived runway only, which is relevant when AEFS is in use.

8.6 Flight Management

- Changed the logic for detecting sensitive flights to use the FAA's SFD Instructions instead of data from TFMS, which may not always be accurate.
- Added tracking of multiple CIDs for a flight, which is relevant when flights are flying near multiple ARTCC boundaries and messages are received from multiple systems.

8.7 Model

- Improved the automatic airport configuration change detection.
- (CLT) Added automatic marking of any heavy flight (e.g., A33X) or B75X as a priority flight.
- (CLT) Added automatic addition of "Flagship" in the scratch pad of any heavy or B75X AAL flight.

8.8 RTC

- Added new flight option to right mouse menu of "Pushback w/ Direction", which is in addition to the current "Pushback" option. If a direction is selected, the direction's abbreviation will appear on the engine spool-up icon during pushback.
 - **CLT:** Pushback directions are North (N), South (S), East (E), and West (W).
 - **DFW:** Added gate-specific options for pushback direction from many gates. For example, A38 has options West (W), Whiskey (WHI), and Zulu (ZUL). If a gate does not have gate-specific options, the default North (N), South (S), East (E), and West (W) are provided.
- (RMTC) Added a "Refresh" option to the Tools menu. Selecting this option will clear out the flight and aircraft lists and then resync them. (This option will be added to RTC in the 4.4 release.)
- Added a notification to the Notification Panel when a gate is closed and when a closed gate is re-opened.
- Removed the gear icon that displays proposed SMP events from RTC. (Note: It continues to be displayed on RMTC.)
- Allowed availability of Air Start option both before and after pushback. When both air start and pushback are enabled, there are two outlines around the engine image to indicate both the air start (red) and pushback (yellow) at the same time.
- Added a new column to the Arrival Count list to show the flight's arrival runway.

- Corrected a problem of metering mode updates not displaying in the toolbar icon.
- **(DFW)** Added the ability to show ramp sector frequencies to the background map.

8.9 STBO Client

- Adjusted the Flight Plan Demand per user requests:
 - Lightened the color of the Flight Plan Demand lasso and reduced the width to allow the flight leader lines to be more visible.
 - Added a "Preview" button to the Flight Plan Demand dialog to temporarily show or hide the flight plan demand box (lasso).
- **(DFW)** Removed the notification dialog when the automatic airport configuration change monitor detects a new configuration based on runway usage. (The airport configuration change still takes effect automatically, only the notification dialog was removed.)
- Added a Long On Board token "LOB" to the timeline data tags which is colored yellow for 60-89 minutes, orange for 90-119 minutes, and red for 120+ minutes.
- Corrected the display of when the gate conflict color coding is triggered in the Flights Table.
- Corrected a problem of metering mode updates not displaying in the toolbar icon.

8.10 Surface Metering Display

- **(DFW)** Set up the runways, tabs, and colors to be used when running for DFW.

8.11 Tactical Scheduler

- **(CLT)** Updated the default static time horizon to 10 minutes.
- **(DFW)** Added the adaptation to allow the tactical scheduler to be executed for DFW.
- Corrected a bug where a rejected SMP would return and auto-affirm the next cycle.
- Changed the order of consideration within taxiing flights, as well as between taxiing flights and flights at gate. Previously, taxiing flights were scheduled with FCFS order, then the flights at the gate were scheduled in the remaining slots with frozen, exempt, CTOT, non-CTOT order. In this update, given a departure slot on the runway, taxiing, frozen, exempt, and CTOT flights are all competing for a slot based on their expected UTOT. The expected UTOT is when a flight is expected to arrive at the runway; for example, a taxiing flight's E-UTOT is UTOT while a frozen flight's E-UTOT is TOBT+ transit time. Within the just-mentioned new order of consideration, the taxiing controlled flight will also be restricted to be no earlier than its controlled time. This is to prevent a controlled flight with a known later controlled time to take up an immediate slot near the current time where it will cause flights at the gate to be advised unnecessary delay.
- Updated how the controlled taxiing flight is accounted for in the departure queue scheduling. For timeline display purposes, though, the taxiing flight is still scheduled on the timeline free from their CTOT. This allows the TMC to identify the most suitable APREQ time for re-negotiation.
- Added the ability to freeze a flight's TOBT/TMAT based on the result of either the previous computation cycle or the current cycle. The default is to freeze with the current cycle's result. This allows the flight's READY time to be used as the UOBT before it is frozen.
- Added the unfreezing of a previously frozen flight when it becomes UNCERTAIN, with the exception of manually frozen flights.
- Prevented the best OUT time from updating the READY-frozen and frozen controlled flight's TOBT/TMAT. A READY frozen flight's advisory is generated with a flight's READY time; the READY time can be earlier than the flight's EOBT (best OUT time). In this case, there is an error in the EOBT. Frozen controlled flights can have an advisory that is earlier than the best-out-time (e.g., EOBT); this is desired given an unrealistically early controlled time. We want to preserve the unrealistically early advisory. This will also prevent EOBT-holding when there is an EOBT error.
- Fixed a bug in the controlled flight advisory generation where the advisory can be too early. This was because the controlled flight being advised was trying to take a slot of another

controlled flight whose UTOT-prime was unrealistically early because its controlled time was unrealistically early.

- Fixed a bug in which the delay distribution was not using the correct schedule-priority type because the SMP processing altered the schedule-priority type of the flights used in the scheduler's first pass. This bug could cause controlled flights to have a much earlier advisory than necessary.

8.12 TMI Service

- **(DFW)** Created default metering parameters.
- **(CLT)** Updated latest taxiway closures.
- **(CLT)** Updated the ATL APREQ that is loaded daily for CLT to start at 1000.

8.13 TTP

- Changed FlightData delete messages to include the current timestamp instead of the Fuser processed time (which may be outdated for a flight being deleted).

9 Release 4.4.0 / 4.4.1

9.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.4.0 and 4.4.1. Version 4.4.1 was deployed on 3 June 2019 to CLT only. Version 4.4.0 was not deployed.

9.2 Adaptation

- **(CLT)** Enhanced the background map with the expanded concrete, new buildings, and apron lines.
- **(CLT)** Updated the north hardstand detection region.
- **(DFW)** Updated to use RECAT values for aircraft weight classes.
- **(DFW)** Updated wake turbulence separation values to include RECAT.

9.3 Model

- Added tolerance buffers for entering and exiting gate conflicts, similar to the metering thresholds to enter metering and exit metering, to help reduce/eliminate flickering for gate conflicts. The buffer is subtracted from the gate conflict occupancy window start time if the previous arrival flight is also part of a gate conflict. The default buffer used is 5 minutes, and the buffer is only defined for CLT. Essentially what will happen is that the gate conflict logic will run once to determine if there are any conflict. The second time the gate conflict runs, if there existed any arrival flights that part of a gate conflict in the previous run, then an additional buffer will be subtracted from the occupancy window for that flight. What this does is artificially inflate the time of the occupancy window, making it harder to then exit a gate conflict status. This should help reduce flights flickering in and out of conflict on RTC.

9.4 RTC

- **(DFW)** Added the display of TMAP advisories.
- Updated the display of TOBT/TMAT times so that they display with black text on a highlighted background (cyan for TOBT, green for TMAP) when the times are frozen by the scheduler.
- Added an option "Show Uncertainty with #" under the "Map Options" menu to toggle between showing the '#' or the unfrozen advisory for UNCERTAIN flights.

- Selecting the option will display a hash tag (“#”) instead of the gate advisory for UNCERTAIN flights. When the Pilot calls ready, click the hash tag to view the now-frozen advisory.
- De-selecting the option will display the gate advisory. The gate advisory will likely decrease when the advisory is eventually frozen.
- Added a “Tools” menu with a "Refresh" option. Selecting this option will clear out the flight and aircraft lists and then resync them. (This option was added to RMTC only in the 4.3 release.)
- (CLT) Removed the “Push 10 and Hold” red boxes around gate numbers.
- (DFW) Added the ability for a user to change the spot of a flight via the right mouse menu. Selecting this option highlights the spots that can be chosen. Once one is clicked on, if the spot change is successful, it will show a short message saying so. By default, this is enabled for DFW but disabled for CLT.

9.5 Scheduler

- Fixed the bug that was causing repeated notification of metering being off when the metering mode was set to "No Metering".
- Modified what constitutes an UNCERTAIN and a PLANNING flight.
 - The Scheduler categorizes any flight **without** an Earliest Off-Block Time (EOBT) as UNCERTAIN.
 - Flights whose EOBT is 8 min, or more past current time and who have not yet called ‘ready’, are also categorized as UNCERTAIN.
 - All remaining flights at the gate belong to the PLANNING group.
- Changed the scheduler from FCFS (First Come First Served) back to FSFS (First Scheduled First Served) order, which was its original implementation. While FCFS sorts flight in the order of “EOBT + taxi time”, FSFS sorts flights in “SOBT + taxi time” order. The reasons for changing back to FSFS are:
 - It will reduce gate holds on flights with delay (EOBT > SOBT).
 - It will reduce jumps in advisory when a flight is placed on hold.
 - FSFS is recognized in industry as more equitable.
 - FSFS aligns more closely with TFDM.
- Corrected a problem so that processing will properly filter out controlled flights that are in the AMA from having a delay distribution applied.
- (DFW) Added adaptation that will allow the scheduler to schedule to the ADW window of 13R and 18L.

9.6 STBO Client

- Added "Current Delay" to the timeline datatag configuration options for departure flights. Current Delay is defined to be whatever type of data the timeline is displaying, such as LATEST, minus the flight's UNDELAYED time. The current delay is displayed in a pale orange in units of minutes.

9.7 Tactical Scheduler

- (CLT) Updated the default static time horizon to 10 minutes.

9.8 TMI Service

- Updated processing so that, when a departure gate closure or MIT is entered via OIS, individual corresponding fix restrictions will be able to be manually removed without being re-added by the OIS processing. This corrects the problem where, if CLT Tower manually removed a fix closure, it would get added back in automatically after a few seconds.

10 Release 4.5.0

10.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.5.0. Version 4.5.0 was deployed on 25 June 2019 to CLT only.

10.2 RTC

- Added alert to indicate that a flight has been selected via the gate, even though the flight is not tethered if it is not within the terminal area.

10.3 Tactical Scheduler

- Added ORD to the list of airports that pre-schedule flights.

10.4 TMI Service

- Updated default link closures to remove newly reopened taxiways at CLT.

10.5 TTP

- Modified TTP such that TTP Flight Data flight identification information will now be entered into the TfdmFlightType's FlightIdentification instead of FlightIdentificationPrevious field.

11 Release 4.6.0

11.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.6.0. Version 4.6.0 was deployed on 30 July 2019 to CLT only.

11.2 Adaptation

- Updated the default departure fix decision tree for flights with the route KCLT..KAND.

11.3 Model

- Modified so that updates to the flight's aircraft type will cause the flight to be re-evaluated to determine if it should be added to or removed from the priority list. Scratchpad "Flagship" text is also added or removed, if needed. If a user manually added the flight to the priority list, the priority status and scratch pad text will not be changed.

11.4 RTC

- Added an indicator that a flight with a frozen advisory was a candidate for leveraging surface metering, which means it has a large gate hold. The change is to highlight the advisory of a frozen flight in a green color if (TOBT - UOBT) is greater than a user set threshold. The default threshold is 10 minutes. The user can change the threshold by selecting "Map Options -> Metering Candidate Settings" from the main menu bar. The value of the option can be saved in the user profiles.

11.5 Tactical Scheduler

- Updated the default static time horizon to 15 minutes after approval from stakeholders.

11.6 TTP

- Corrected the TfdmSwimEngine to include the airline in the NasMessage/flight/operator field instead of in the AdditionalFlightInformation when publishing Flight Data.

12 Release 4.7.0

12.1 Overview

This document describes the changes to the ATD-2 software baseline for version 4.7.0. Version 4.7.0 will be deployed on 9 September 2019 to CLT only.

12.2 Adaptation

- (CLT) Removed taxiway C7 from the background map and node-link network.
- (CLT) Updated the default gates for some carriers from old gates A1-A13 to the new concourse A21-A29. This will not fix UNK or make strips appear at the gate on RTC (this is working as intended since we don't have airline gate assignments), but at least a default gate will be assigned on the new concourse where the airlines are now operating.

12.3 Tactical Scheduler

- Removed the application of MIT constraints for departure flights.
- Corrected an error where the order of consideration sort time was being overwritten for GA flights.
- Modified the priority algorithm to allow priority flights to swap STAs with frozen flights in the same airline. When swaps do happen, the algorithm also updates the frozen times.
- Added the ability to freeze the SMP start time prior to the SMP going active. If the feature is turned ON, the SMP start time should not be changed once the SMP start time is in the static time horizon. *This capability is disabled by default.*
- Updated taxiing flights with an EDCT to be scheduled at the front of the EDCT window. A recent change allowed an EDCT flight to be scheduled at the front of the time window when possible, but that change was only applied to flights not yet taxiing.
- Corrected a problem in which priority flights were not sorted properly and thus received a higher delay than they should.
- Modified the sequence swap logic such that it uses gate time plus transit time as a basis for a swap. Previously, airline priority flights were implemented based on runway STA. This was not a problem until the priority logic started to incorporate frozen flights. Since the TTOT for frozen flights can change over time, this caused unnecessary sequence swaps long after flights are frozen, which sometimes cause the system to look unstable. This modified logic should not impact non-frozen flights, but should get rid of numerous unnecessary swaps for frozen flights after the system stabilized.

12.4 TMI Service

- Updated the default TMI file to reflect that taxiway F has been re-opened.

12.5 TTP

- Added Surface Metering Program messages. When the METERING_MODE_UPDATE and DMP_TYPE event types are received, they are transformed and published in SurfaceMeteringProgram messages via JMS to TTP consumers.

- Added a property to enable/disable the router to split TTP flight data to separate JMS topics per airline. This is disabled by default so that the TTP flight data will be broadcast to a single JMS topic (swim.flightdata.publish).
- Added filtering of CDM Data Elements in TTP Flight Data messages when sent to non-CDM participants. The original message with all data will be published with the CDM privacy level header. A copy of the message with the CDM elements removed will be published with the CDM-omit privacy level header. Messages originally containing no CDM elements will continue to be published with the NoSFD_NoCDM header. CDM elements published by ATD-2:
 - ActualTakeOffTime
 - ActualLandingTime
 - ActualOffBlockTime
 - ActualInBlockTime
 - EarliestOffBlockTime
 - DepartureStandDesignator
 - ArrivalStandDesignator
 - AircraftRegistrationMark