Airport Departure Flow Management System
(ADFMS)

Concept of Operations

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1.0 INTRODUCTION

This Concept of Operations (CONOPs) communicates overall system characteristics of Airport Departure Flow Management System (ADFMS) at Philadelphia International Airport (PHL).

PHL Airport Authority currently manages aircraft departures using the First-Come, First-Served (FCFS) queuing paradigm. In this paradigm, airlines schedule departures three or more months out. The implementation of ADFMS at PHL will enable a pre-ordered, efficient queue that retains the ability for airlines to schedule departures three months out, but also allows for efficiency and flexibility within the departure queue to accommodate airline and individual aircraft needs. The Philadelphia Airport Authority will procure, operate and maintain ADFMS at PHL in order to efficiently conduct airport operations to the benefit of all stakeholders.

1.1 Purpose

The purpose of this document is to identify and describe the overall concept of operations for the Airport Departure Flow Management System at PHL. This CONOPs will serve as the basis for the ADFMS System Requirements document.

1.2 Scope

The Airport Departure Flow Management System (ADFMS) will coordinate and manage airport departures at the Philadelphia International Airport (PHL) from push-back to take-off.

ADFMS provides a user-friendly, Web-based aircraft departure flow management system for users to search, view, enter, and manage airline and airport departure information to best utilize PHL airport resources and meet efficiency needs while conserving airline resources.

ADFMS will be easily accessible and usable at PHL as well as the Airline Operating Centers (AOCs) and the Federal Aviation Administration's (FAA's) National Airspace System (NAS) air traffic control centers. ADFMS will allow for single sign-on within the PHL airport domain.

The ADFMS interoperates with the following systems: FAA's Air Flow Traffic Management (AFTM) System, PHL's Airport Surface Detection Equipment, Model X (ASDE-X), the Airline Operating Center Network (AOCnet), and the Official Airline Guide (OAG).

1.3 Stakeholders

1.3.1 Users

The Airport Departure Flow Management System will be used by the following participants within the PHL airport operations domain:

1.3.1.1 Airlines

- Station Managers

There is one Station Manager for each airline at the airport. Each Station Managers is responsible for management and oversight of its airline operations at PHL. The Station Manager also coordinates with PHL Ramp Control with respect to all local airline matters and departure schedules. They will be responsible for handling all the flights of the airline and maintaining the schedules on behalf of the airline. They will be responsible for dealing and handling the trade and exchange of departure slots just within the two-hour time-frame window before the actual departure of the flight. They will have an interface and access to the ADFMS system via which they would be able to view the schedule, manage airline specific information and data, and trade / exchange departure slots. They will be able to communicate directly with the PHL Airport Authority and Ramp Control via ADFMS system for all necessary accommodations and procedures. They will deal with all immediate operations right before the departure.

- Airline Operating Centers (AOCs)

The airline operating center (AOC) is the main headquarters of a particular airline and will be responsible for the operation of requesting departure slots and their allocation via ADFMS system. The AOC is responsible for handling all the flights of the airline, making the departure schedule and dealing with trade and exchange slots outside the two-hour time frame window of the departure. They will be able to address, accommodate and resolve all concerns and issues relating to delays by employing ADFMS system. The will be able to communicate with and respond to the PHL Airport Authority in a timely manner.

- Pilots

The pilots are the secondary stakeholder and are not directly involved in the operation of ADFMS system. They do not receive any direct advantages and benefits of the system. They mainly adhere to the functionality of ADFMS system and act accordingly. They receive the benefits of avoiding hassles and inconveniences from departure delays and waiting periods.

1.3.1.2 PHL Airport Authority

- PHL Ramp Control

The ADFMS system is hosted in the PHL Airport Operations Center within the Ramp Control tower. PHL Ramp Control owns, manages, and operates ADFMS, thereby providing the overall supervision for the system. The final and ultimate authority of ADFMS rests with PHL Ramp Control. The PHL Ramp Control staff deals with ramp areas and corresponding clearances, aprons, and taxiways, assisting the aircraft to steer and reach the runway. They are responsible for maintaining the system and ensuring that it is operating normally. They are also responsible for providing adequate user training to the new staff. They will be able to track and monitor the history of all operations and penalize the airlines who fail to abide by the system.

- Information Technology (IT) Staff

The Information Technology (IT) staff will be responsible to manage, operate and maintain the airport system's network infrastructure on which the ADFMS functions.

The IT personnel will be responsible to ensure the security of data and systems involved. They would make sure that the data is available and the system is up and operational all the times. They would also make sure the concepts such as authorization, authentication, and data integrity and security are implemented so that the system and data are never comprised. If a problem arises, they would ensure prompt repair, so the system is in operational mode instantaneously. The IT staff would also provide redundancy by maintaining the backup of the data for the worst case circumstances. They would also replace the equipment and devices when appropriate and required. Moreover, they would keep up to date on latest state-of-the-art technology and upgrade the systems and the Intranet. The IT staff is responsible to hire technicians who will perform the manual as well as technical work such as building, modifying, managing the physical internetworking infrastructure. The IT personnel would also be responsible to train and educate the airport system's users such as airlines, PHL Airport Authority, and FAA on using the system efficiently. They would also provide help desk support when an airport system's administrative staff member runs into a problem.

1.3.1.3 Federal Aviation Administration

- PHL Air Traffic Control Tower (ATCT)

The air traffic control tower (ATCT) is not a key player and does not have any direct involvement in the operation of the ADFMS system. The ATCT controls the immediate airport environment and maintains situational awareness via the visual observation from the control tower and using automated monitoring systems. The tower controller is responsible for the separation and efficient movement of the aircraft which constitute the

ground control and movement planner duties. The ATCT takes over the control when the aircraft reaches the departure runway and gives clearance to take off. The ATCT maintains the control until the aircraft reaches a certain height after the take off and is within certain distance from the airport, usually within 2 to 5 nautical miles. The ATCT is also responsible for carrying out runway crossings. The ATCT also desires improved reactivity of unforeseen circumstances and reducing its negative impact. The ATCT requires that ADFMS distribute the information and new plan based on the current situation to the different operators and stakeholders at the airport.

- PHL Terminal Radar Approach Control (TRACON)

The Terminal Radar Approach Control (TRACON) is also not a key player and contributor and does not have any sort of involvement in the operation and management of ADFMS. The TRACON takes over the control of the departure aircraft from the control tower at an altitude of about 1,000 feet to 2,000 feet. The TRACON places the departing aircraft on a track and in a geographical location that is pre-determined by the en-route center controller. Although the TRACON is not directly connected to the ADFMS since the system specifically deals with ground operations and movement, TRACON does receive the benefits in terms of ease and convenience of operations as a result of the consistency, safety and orderly flow of operations achieved by the ADFMS.

1.3.1.4 Passengers

Passengers are end beneficiaries of ADFMS. Their main concerns are punctuality and customer satisfaction. ADFMS achieves these objectives by ensuring on-time departures. The passengers also get the advantage in economical and financial terms, since the airlines and PHL airport authority save resources and money by employing ADFMS.

2.0 AIRPORT DEPARTURE FLOW MANAGEMENT SYSTEM CONCEPT

ADFMS provides continuous situational awareness of the status of the airport departure queue via a database of scheduled and historical departures and their business data, to include airline and flight number, aircraft type, destination, scheduled departure time (scheduled "push-back" time per airline schedule (OAG)), departure slot, gate, expected and actual push-back times, take-off time, taxiway-path, departure runway, physical queue size, and actual take-off time (wheels off).

ADFMS provides three main capabilities: schedule of airline departure requests into assigned departure slots; segmentation of the physical departure queue into a departure queue with physical and virtual components; and brokering of the virtual queue to allow aircraft to trade departure slots and to fall-back to later departure slots to support airline needs and desires.

ADFMS enables PHL Ramp Control to efficiently sequence aircraft departures, via assigned aircraft departure slots and expected and actual push-back times, into a correctly-ordered physical departure queue at the departure runway threshold, accounting for multiple taxi-paths from 120 different departure gates across seven different terminals to one or more departure runway queues dependent upon the runway configuration and the aircraft's assigned departure slot.

ADFMS also enables airlines to trade-up departure slots as necessary to meet airline needs for an earlier departure slot, or to trade-down to a later departure slot to accommodate aircraft delays due to gate operations, extended turnarounds, late arrivals and connections, or unscheduled maintenance. When an airline cannot find a willing trading partner to execute a trade to a later departure slot, ADFMS will enable airlines to fall-back to a later slot with the corresponding bump-up of aircraft in subsequent departure slots, to accommodate the airline's needs. ADFMS will enable trading of departure slots via a point system currency that allows airlines to spend points to "buy" an earlier desired departure slot and earn points to "sell" an earlier departure slot. Within the "fall-back" scenario, airlines will not be charged points unless the number of "fall-backs" over a specific time period exceeds an allowable limit to discourage airlines from holding on to departure slots too long prior to requesting a trade.

The ADFMS system is hosted within the Philadelphia Airport Operations Center within the Ramp Control Tower. ADFMS operates locally on the PHL local area network (LAN), but is exposed to the World Wide Web to accommodate remote users to include Airline Operating Centers (AOCs) across AOCnet. ADFMS also interoperates with other systems through IP-based routing on the Internet.

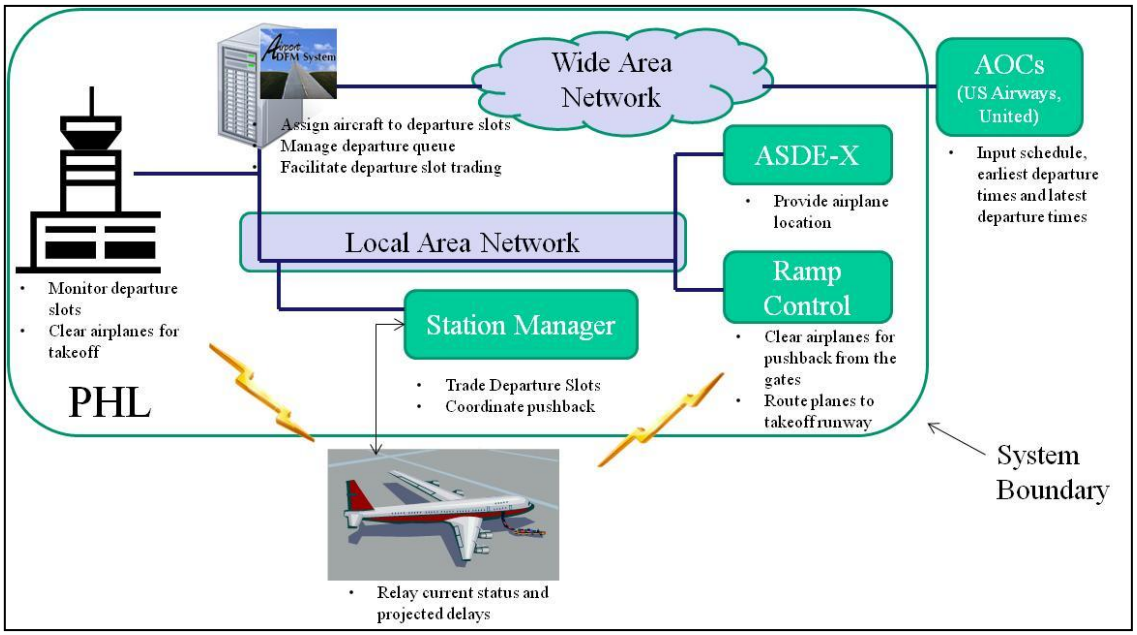

Figure 1: ADFMS Operational Concept

3.0 PHILADELPHIA INTERNATIONAL AIRPORT

Philadelphia International Airport (PHL) is the 11th largest airport in the United States. It is situated along the Delaware River in south Philadelphia and accommodates 34 airlines. In 2008, it handled a total of 31.8 million passengers and had 499,653 total flight movements. It contains two main parallel runways (9L/27R and 9R/27L) as well as an intersecting runway (17/35) and a runway (8/26) for general aviation flights. The PHL airport is the primary international hub of US Airways. It serves destinations in the U.S., Canada, Caribbean, Latin America, Europe, and the Middle East. (PHL - Philadelphia International Airport, www.phl.org)

This CONOPs describes system capabilities for the Airport Departure Flow Management System (ADFMS) for Philadelphia International Airport (PHL).

Figure 2: PHL International Airport

("Philadelphia International Airport - Google Maps." *Google Maps*. Google, n.d. Web. 13 Feb. 2010)

3.1 ADFMS / PHL Surface Areas

ADFMS assigns each gate to a default taxi path for each departure runway, which is based upon the PHL runway configuration and an aircraft's assigned departure runway. PHL's two parallel runways (27R/9L and 27L/9R) and its intersecting runway (35/17) are the primary runways in support of major airline operations. These runways can be configured into different runway configurations dependent upon prevailing winds, visibility, and other weather and operational conditions.

There are 120 departure gates at PHL, spread across seven terminals. With gates located on each side (generally, east side and west side of each terminal, with the exception of terminals E and F, which are oriented differently), there are nine separate ramp areas where aircraft taxi within close proximity to each other. Team AirportDFM defines the PHL ramp areas as follows:

Ramp Areas	Location	Ramp Control Spots
Red	West of A-West Terminal	2 and 3
Orange	Between A-West and A-East Terminals	4 and 5
Yellow	Between A-East and B Terminals	6 and 7
Green	Between B and C Terminals	8
Blue	Between C and D Terminals	9
Indigo	Between D and E Terminals	10
Violet	Between E Terminal and F1 Concourse	11
Purple	Between F2 and F3 Concourses	13
Black	Between F3 and F1 Concourses	14

Figure 3: PHL Ramp Areas and Ramp Control Spots

ADFMS assigns each departure gate to a Ramp Area and Ramp Control Spot. From each Ramp Control Spot, ADFMS assigns the default taxi path to the specific departure runway. ADFMS stores the maximum taxi path traverse time based upon a rolling average of taxi times for the same taxi path over the previous four-week period. These taxi path times accommodate times for taxi-way clearance and Hold Short Of (HSO) runway clearance. Based upon the stored values for departure gate, departure runway, and taxi path traverse time, along with the aircraft's assigned departure slot, ADFMS calculates the required pushback time for the aircraft. Then within the expected pushback window – the time between the aircraft's scheduled pushback (per the Official Airline Guide) and the required pushback time – ADFMS calculates the aircraft's expected pushback time. The expected pushback time is the time that the airline must meet in order to arrive at the departure runway threshold in the correct physical sequence with respect to other departing aircraft.

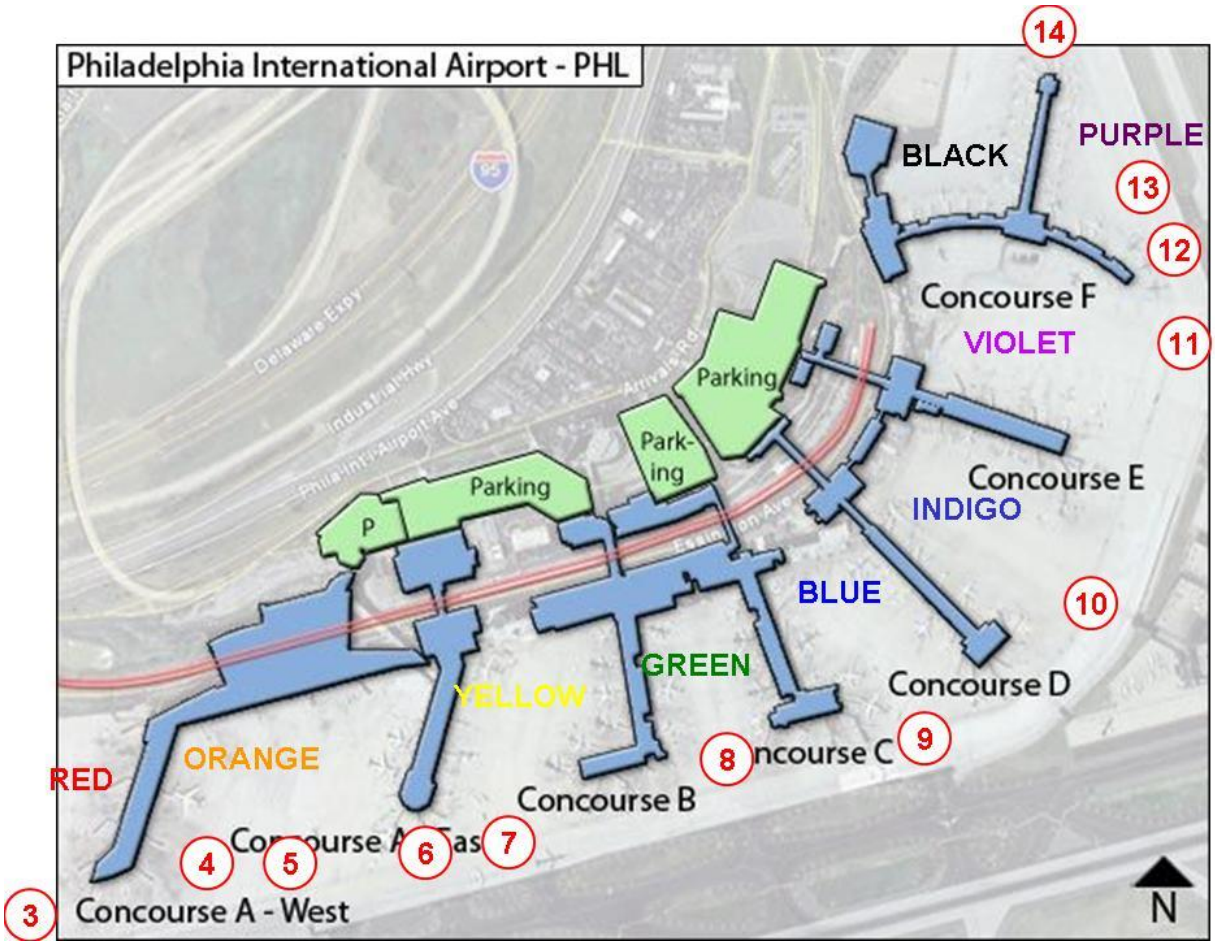

Figure 4: Ramp Areas and Ramp Control Spots

(Airport Graphic by "Philadelphia PHL Services --> Main Terminal / Concourses." iFly.com The Web's Best Guide to Airports. < http://www.ifly.com/resources/img/airports/terminal-maps/Philadelphia-PHL-terminal-map.jpg)

ADFMS calculates the expected push-back time to accommodate 12 to 20 aircraft taxiing simultaneously on PHL from various departure gates to a single departure runway that enables a sustained maximum departure rate of ten aircraft take-offs every 15 minutes. ADFMS sequences the airport simultaneously over multiple taxi paths that comprise multiple feeder queue paths into a single physical queue at the runway threshold no larger than three stationary aircraft, sequenced correctly with respect to departure slot. In order to perform this sequencing successfully, ADFMS assigns expected push-back times where an aircraft with a later departure slot may pushback prior to an aircraft with an earlier departure slots due to the respective departure gates and taxi paths of each aircraft.

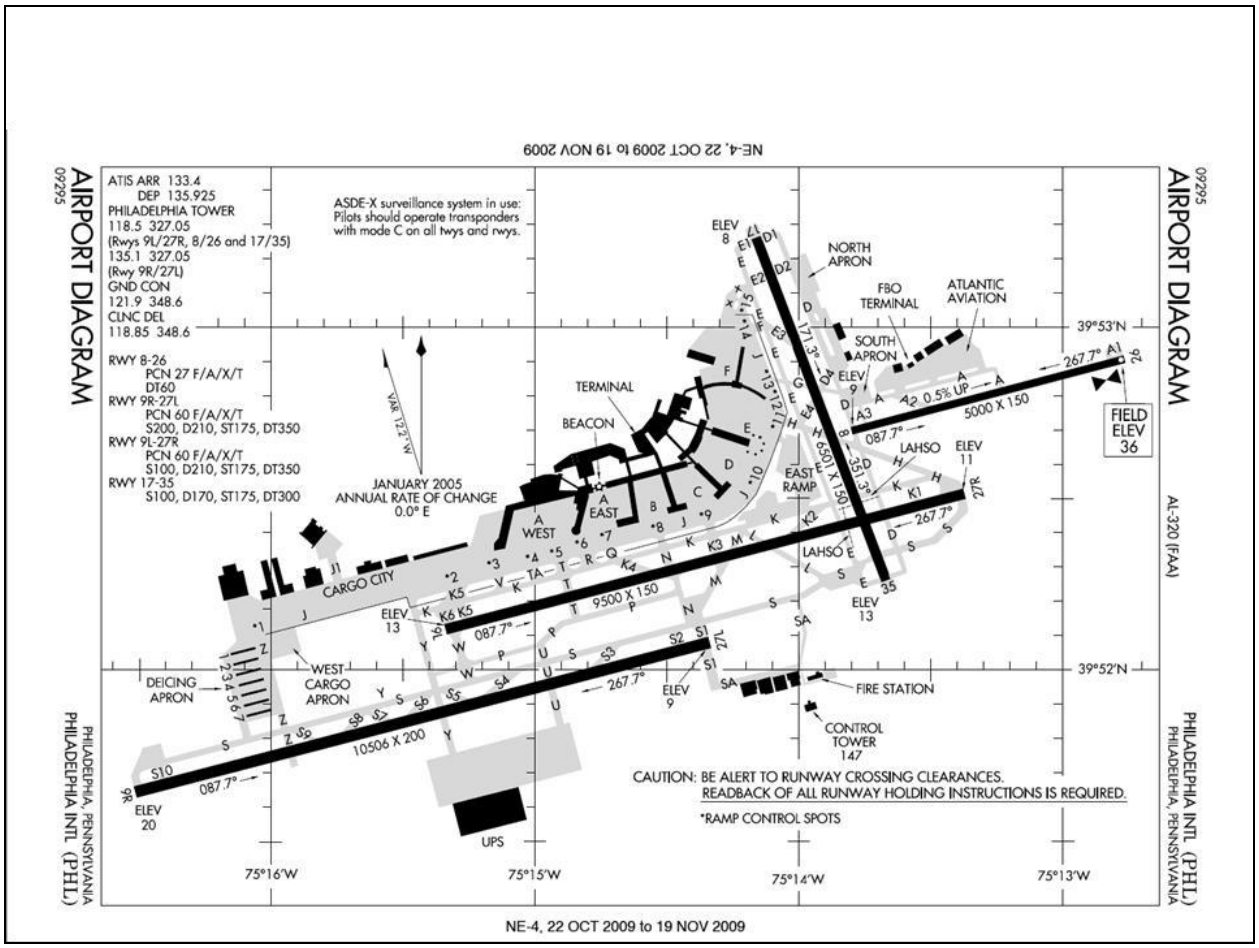

Figure 5: Airport Diagram for PHL (http://www.airnav.com/airport/KPHL)

Ramp Area	Control Spot	Taxi-path to 27L	LAHSO
Red	2 and 3	K5 - K6 - W - S- S1	27R
Orange	4 and 5	T - P - N - S1	27R
Yellow	6 and 7	Q - K - N - S1	27R
Green	8	N - S1	27R
Blue	9	K3 - M - N - S1	27R
Indigo	10	J - K3 - M - N - S1	27R
Violet	11	H - E - S - S1	27R
Purple	13	G - E - S - S1	27R
Black	14	E3 - E - S - S1	27R

Figure B-6: ADFMS Assigned Taxi paths for Departure Runway 27L

3.2 ADFMS PHL Display

ADFMS works with PHL's ASDE-X system to provide situational awareness and display of aircraft location. ADFMS will overlay ADFMS data over the ASDE-X display to append assigned departure slot, departure gate, taxiway path, and expected push-back time. ADFMS will utilize the ASDE-X data to monitor the status of the physical queue.

4.0 ADFMS CAPABILITY PACKAGES

The Airport Departure Flow Management System provides the following capability packages in order to support the PHL Airport Operations / Departure process:

- Departure Slot Lottery and Assignment
- Virtual and Physical Queue Management
- Departure Slot Brokering
- Virtual Queue Reconfiguration
- ADFMS Notification and Alerts
- ADFMS Reporting

4.1 Departure Slot Lottery and Assignment

ADFMS provides the ability for Airline Operating Centers (AOCs) to request and reserve departure slots at PHL three months in advance. The ADFMS scheduling module imposes a deadline for requests for aircraft departures for a specific Take-Off Time Window (TOTW) 100 days out before the proposed departure date. The lottery assigns each requestor to a specific departure slot within a 15-minute window. With the sustained departure rate of ten aircraft per 15 minutes, flights are input to and output from the departure process every one minute and 30 seconds. Airlines are assigned to departure slots designated by the following schema:

- Each Take-Off Time Window (TOTW) commences on the quarter of each hour. E.g. 0800, 0815, 0830, 0845, 0900, . . .
- There are 10 slots per 15 minutes, these slots are lettered A through J.

When an airline requests a Take-Off Time Window of 0815, ADFMS will assign one of 10 available departure slots in the window , such as 0815A (eight-fifteen Alpha), 0815E (eight-fifteen Echo), or 0815J (eight-fifteen Juliet).

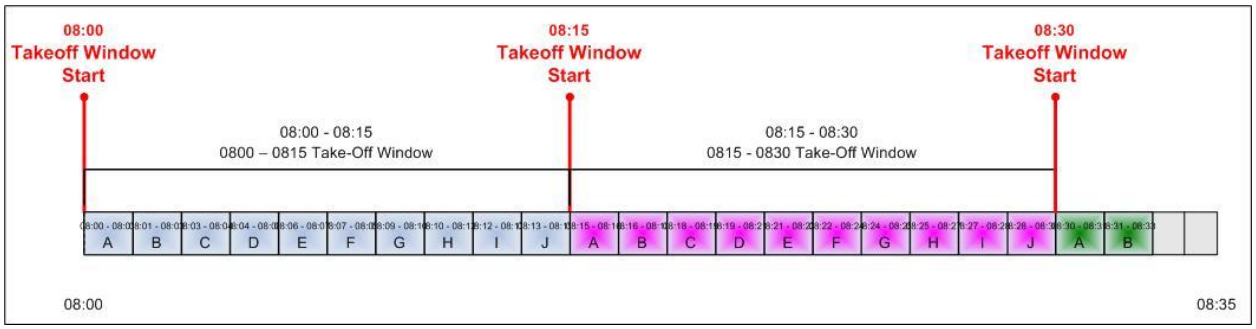

Figure 7: ADFMS Departure Slots

ADFMS assigns these slots to the airlines based upon a lottery, and levels demand across the airport capacity. ADFMS confirms departure slots to the airlines no later than 95 days prior to departure. The assignment of departure slots to the airlines allows the airlines to finalize its flight schedule and lock-in its departure time per their reservation system (the reservation departure time is the scheduled push-back time). ADFMS imposes a minimum time of 30 minutes prior to departure slot for the announced scheduled pushback time. This 30-minute window will allow for minimum physical queue (taxi path) and near-term virtual queue flexibility (managed by ADFMS and Ramp Control) to optimize the physical queue. Airlines may request trades via ADFMS within the extended virtual queue in order to acquire more optimal departure slots (see paragraph 4.3 Departure Slot Brokering and Virtual Queue Reconfiguration).

4.2 Virtual and Physical Queue Management

The ADFMS Queuing Module enables the management of the departure queue with virtual and physical components that accommodates each aircraft's departure gate, ramp area, taxi path, departure runway, and departure slot relative to all other aircraft that are concurrently taxiing on PHL ramps and taxi paths while ensuring proper separation and sequencing.

The purpose of a virtual queue is to mitigate ramp and taxiway congestion while efficiently conserving airline resources. The virtual queue component therefore exists to optimize the sequencing of the physical queue component. To allow for this optimization, aircraft must be ready for pushback at the time of their scheduled pushback (i.e., for the entire expected pushback window) in order to allow for ADFMS-enabled flexibility within the near-term virtual queue.

The near-term virtual queue is the time between an aircraft's scheduled pushback time and the expected pushback time. The near-term virtual queue also serves as the last opportunity for the resequencing of aircraft prior to commitment to a Ramp Control Spot, taxi path and departure runway queue in order to accommodate airline desires to trade departure slots or fall-back to a later departure slot. The near-term virtual queue is the critical time period; ADFMS can accommodate trades and fall-backs of aircraft within

the extended virtual queue (prior to scheduled pushback) with less impact on departure queue due to less critical required response times.

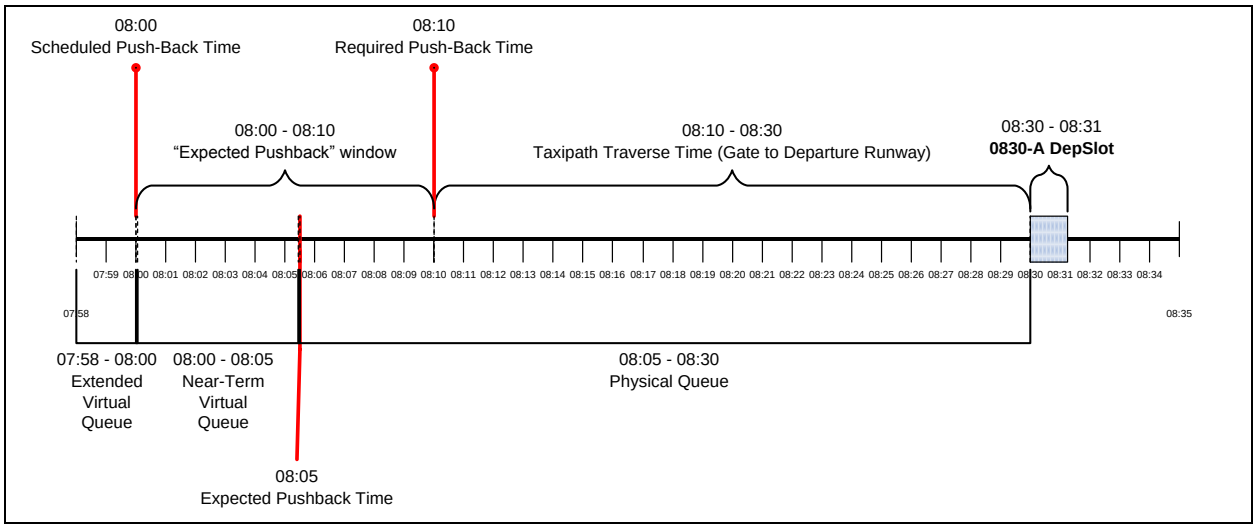

Figure 8: ADFMS Virtual and Physical Queue

4.3 Departure Slot Brokering and Virtual Queue Reconfiguration

The ADFMS scheduling module assigns departure slots to airlines via lottery no later than 95 days prior to departure. These departure slots comprise the extended virtual queue that exists until an aircraft departure enters the near-term virtual queue at its scheduled pushback time. Once within the virtual queue, airlines are free to trade departure slots within the virtual queue utilizing the ADFMS brokering module.

The ADFMS brokering module enables an airline with a departure slot to request to trade-up (i.e. "buy") an earlier departure slot to meet airline needs. The trading of slots is facilitated through the use of a point system for which each preceding departure slot is worth one point and requires the bidder to offer an amount of points equal to the number of preceding departure slots bypassed to acquire the desired earlier departure slot. Using ADFMS, an airline's AOC can accept a trade offer by swapping ("selling") its earlier departure slot and accepting the buyer's departure slot. During this transaction, the selling airline acquires the points offered by the buyer. The net points in the transaction are zero: the selling airline acquires the points of the buying airline. If transactions are made between aircraft within the same airline (e.g. the US Airways hub at PHL would potentially be the source of many transactions), the net points to the airline would be zero. The offer to sell a departure slot to an airline bidding to trade is voluntary: no movement of aircraft in the queue will be accommodating without a willing seller. Therefore, there is no inherent unfairness to the aircraft surpassed within the queue as there is a one-for-one trade of departure slots.

The ADFMS brokering module will also enable an airline to request a trade-down to a later departure slot to meet airline needs. However, the trade request is a request to

"sell" the earlier departure slots, as an earlier slot is always an asset within ADFMS relative to a slot with a later departure slot. The airline that "buys" the earlier slot in response to a trade request for a later departure slot would be debited a number of points equal to the number of departure slots later within the departure queue that it desires to drop back; the requesting ("seller") airline acquires the points of the buyer in the transaction.

A third scenario is the ability for an airline to "fall-back" to a later departure slot to meet airline needs. As unscheduled maintenance is a common cause of aircraft delays, these situations are not likely to occur within the extended virtual queue (where ADFMS can best facilitate a swap), but instead within the near-term virtual queue. When an offer for trade-down to a later departure slot goes unfulfilled, an aircraft will have to fall-back to a later slot based upon an estimated recovery period, and all other aircraft prior to this later departure slot will bump-up one departure slot in order to optimize the physical queue. Aircraft that successfully bump-up to an earlier slot will earn one point for each preceding slot it achieves. However, the fall-back aircraft will not lose any points due to the general inability to foresee unscheduled maintenance. Point penalties will be counted but not assessed. When an airline surpasses a monthly point ceiling, point deductions will begin to be assessed to discourage airlines from allowing situations that lead to unplanned fall-back situations. Each airline's monthly point ceiling threshold will differ; it will be based upon a percentage (perhaps 5%) of all scheduled monthly departures for the airline, but will also have allow a minimum number of fall-back occurrences so that low-volume airlines at PHL are not unfairly punished due to percentage calculations.

Airlines acquire points to facilitate the trading of departure slots. These points have no monetary value, and instead exist to encourage good behavior amongst the airline participants at PHL. Each airline starts out the month with a base set of points to first enable buying departure slots from willing sellers. Sellers acquire points to facilitate buying desired departure slots during the month as well. Points expire after four weeks to discourage the hoarding of points that may discourage future cooperative activity amongst all airlines at PHL.

Trade requests are made by the airlines' AOC within the virtual queue up to two hours prior to scheduled pushback time. Within the last two hours of the extended virtual queue, and within the near-term virtual queue, all trade offers are made within ADFMS by the airline Station Managers. Once an airline enters its expected pushback window, it must be ready to pushback immediately in order to accommodate the fall-back and bump-up scenario that occurs due to unscheduled maintenance activity and other unforeseen circumstances.

4.3.1 The Points System

The point system is defined by a set of rules.

1. An airline cannot execute a buying transaction when points are less than zero.
2. When a departure slot is purchased, the number of points spent is equal to the number of slot positions moved.
3. Points are transferred from the buyer to the seller.
4. Unused or unfilled slots can be acquired without spending points.
5. Airlines only purchase slots scheduled to departure earlier.
6. Airlines do not purchase slots in order to depart later; however, they could attempt to sell a slot to go later. If the sale does not happen, the slot is simply lost.

The points system comprises rolling points system based on weeks which are reset periodically. Any unused points expire periodically. The reset period removes the possibility of unlimited point totals. The points roll over to the subsequent weeks in first-in first-out (FIFO) fashion.

Consider an example based on an average of 40 points over a four week period as shown in the example below.

Each week 10 points are acquired. After conducting the buying and selling transactions throughout the week, the points for the most recent last three weeks get rolled over to the next week and 10 points are gained for the new week. The points for the fourth previous week expire. The initial point total is defined as the number of points added each period times the number of periods. As shown in the diagram below, the number of points per period is 10 and the number of periods is 4. This yields 40 initial points.

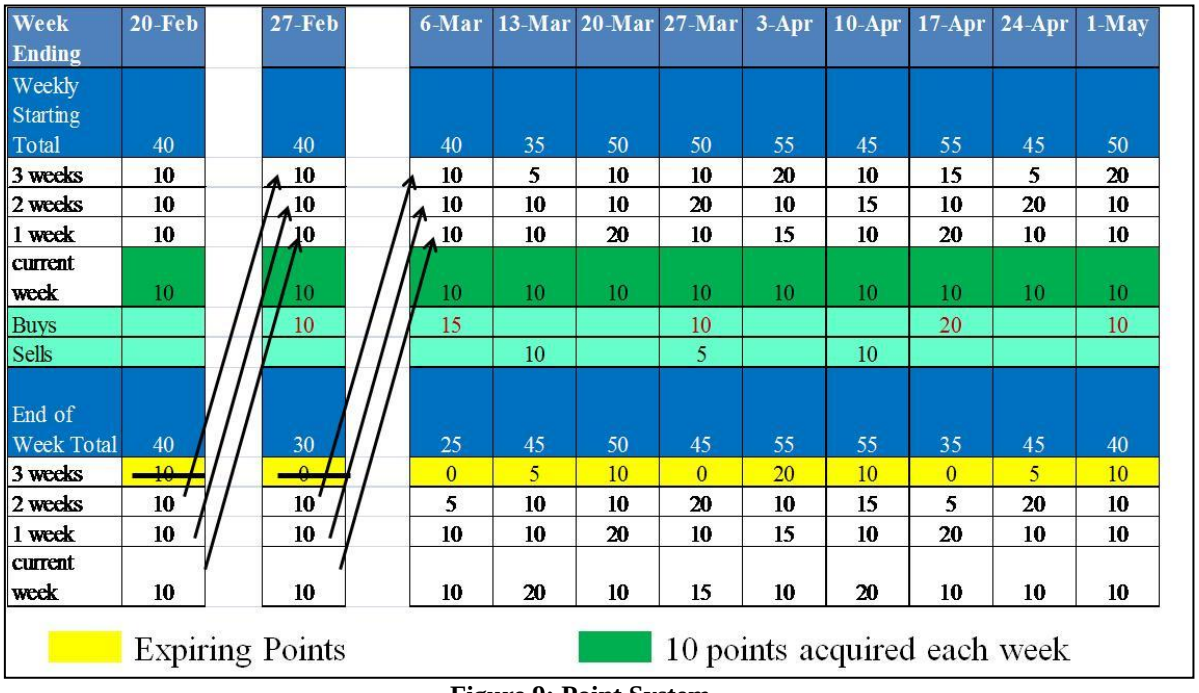

Figure 9: Point System

The rolling points system is based on three rules applied at the end of each week (or other defined period):

1. The oldest points expire.
2. Non-expiring points shift one week in age.
3. 10 points are added for the current week.

If needed the period length (currently one week), maximum point age (currently three weeks) and points added each period (currently 10 points) can vary in order to better suit the users of the system.

4.3.2 Virtual Queue Reconfiguration

The ADFMS virtual queuing module works with the brokering module to reconfigure the virtual queue to accommodate the departure slot swapping and fall-back scenarios. Each pair of exchanged departure slots requires ADFMS to recalculate each aircraft's taxi path, required pushback time, expected pushback window and expected pushback time to best reconfigure the virtual and physical queue sequencing.

4.4 Notifications and Alerts

The Airport Departure Flow Management System uses notifications and alerts to assist Ramp Control and Station Managers in the execution of their duties. ADFMS notifications and alerts are system messaging, not email. Notifications and alerts are instantly recognizable on the ADFMS display.

ADFMS will notify AOCs of departure slots assignments after the scheduling module completes the departure slot lottery and levels demand across airport capacity. On the day of departure, ADFMS will notify AOCs and Station Managers of each airline's expected pushback time per flight after determinations are made for PHL runway configuration and aircraft gate assignments. ADFMS will update the each flights' expected pushback time to account for changes in runway configuration or gate assignment and send out alerts when changes are made.

ADFMS will notify Station Managers of departure slot trade requests per flight while the aircraft is in the extended virtual queue. Station managers may accept or reject trade requests through their ADFMS interface/display. ADFMS will send notification of a trade confirmation or rejection to the participating Station Managers.

Once a flight enters the near-term virtual queue component of the departure queue, ADFMS will send alerts to Station Managers when there are updates to the flight's expected pushback time, normally the result of the need for an aircraft with an earlier departure slot to fall-back for unscheduled maintenance or other unforeseen need.

ADFMS will also send notifications for point transactions as a result of trades and assessed penalties.

4.5 ADFMS Reports

ADFMS provides a reporting capability that allows ADFMS users to generate, view, print, and save reports relating to current and historical operational status of PHL airport departure operations. The ADFMS reporting module provides pre-defined reports as well as an ad hoc reporting capability. Pre-defined reports includes a record of performance for individual and collective airline flights with respect to expected and actual pushback times, actual taxi time per flight and airline with data to include departure gate, taxi path, departure runway and take-off time. ADFMS also reports on the results of the trade brokering module to include a record of airline trade requests (made and received), acceptances, and rejections; fallback and bump up occurrences, suspended and assessed penalties, and current and historical airline point totals. ADFMS reports will include a record of trades and point exchanges both intra-airline and inter-airlines, as well as a report that documents undesired behavior to include unused departure slots (both significantly delayed as well as cancelled departures) flights. The ad hoc reporting capability will enable ADFMS users to create reports based upon desired database fields as necessary to meet the users' needs.