

APPENDIX G

MCO East Airfield - Wildlife Data Review (Jan 9, 2015)

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Date: January 9, 2015

Subject: East Airfield Environmental Assessment – Wildlife Analysis

Project No: 13001.TP

Environmental Resource Solutions, Inc. (ERS) was tasked with evaluating the potential wildlife hazard issues at Orlando International Airport (MCO) related to the natural areas east of the airfield within close proximity of the air operations area (AOA). This technical review includes an analysis of previously collected data, summaries of data on the east vs. west AOA at MCO, and a discussion of observations as it pertains to the habitats located within the east airfield property. For the purposes of this technical memo, the following distinctions are important and should be noted:

East Airfield = Undeveloped airport property located east of Runway 17L/35R; currently undergoing an environmental assessment

East AOA = All of the existing airport within the perimeter fence and east of the four airside/terminal buildings; this includes Runways 17R/35L and 17L/35R

West AOA = All of the existing airport within the perimeter fence and west of the four airside/terminal buildings; this includes Runways 18R/36L and 18L/36R

1.0 Introduction

ERS' Qualified Airport Wildlife Biologist has been conducting supplemental wildlife surveys (aka avifauna surveys) at MCO since September 2011 in partnership with biologists from Environmental Management & Design, Inc. (EMD) and MCO's lead biologist, Johnny Metcalf. These surveys are currently ongoing. Data is collected and presented in an annual summary report. The avifauna surveys have been designed to provide data to MCO Airside Operations Wildlife Control Division in their on-going assessment of wildlife hazards on the airfield and aid in the refinement of the MCO Wildlife Hazard Management Plan (WHMP). Refinement of the WHMP is a continual objective of Airside Operations. The focus of the surveys is to document those intrusions by birds (or other species) into operations areas which have the potential to compromise aircraft, particularly during take-off and landing. This monitoring is not mandated by the Federal Aviation Administration (FAA), but rather serves to assist the Wildlife Control Division in making continually informed and dynamic management decisions.

2.0 Methodology

MCO has four runways, two terminals (A & B), and four clusters of access gates (Airside 1-4). Two runways are west of the terminals (18R/36L and 18L/36R) and are considered the "west AOA". The other two runways are

located east of the terminal (17R/35L and 17L/35R) and are referred to as the “east AOA”. Runway (RW) and surface water (SW) stations were established for the avifauna surveys. Surface waters are scattered throughout the airport and generally consist of stormwater treatment ponds, canals, conveyance ditches, and lakes.

2.1 Point Count Stations

The selection of runway point count stations (RW) was coordinated with MCO Wildlife Control. Two factors were weighed in their selection: (1) access and (2) line of sight. The primary objective of monitoring at the RW stations was to count birds with the potential to conflict with aircraft during take-off and landing phases of flight. Because Runways 18L/36R and 18R/36L are close in proximity, only two stations were needed to monitor the north and south approaches (RW-01 and RW-02). Runways 17L/35R and 17R/35L are separated by Heintzelman Boulevard, a conveyance canal, and undeveloped lands necessitating separate north and south approach stations for both runways. Runway 17R/35L was monitored at RW-03 and RW-06, while runway 17L/35R was monitored at RW-04 and RW-05. In all, six RW point count stations were selected. See Figure 2.1 for exact locations of survey points.



Figure 2.1 Survey points, Runway locations, and significant water bodies at MCO.

Generally, surface waters provide food and limited cover while adjacent vegetation may provide cover, roosting, and nesting areas for birds and other wildlife. The selection of surface waters for point count stations (SW) was also coordinated with MCO Wildlife Control. The primary objectives of monitoring at the SW stations were to (1) establish the regional population of birds, (2) count birds with the potential to conflict with operational aircraft, and (3) determine how attractive various stormwater features are to potentially hazardous wildlife to focus management efforts. In total, ten surface water (SW) point count stations were selected. See Figure 2.1 (above) for exact location of survey points.

Runway observations were generally confined to prime aircraft activity hours: dawn to 11:00 hours local and 14:00 hours to 18:00 hours (dusk). One complete rotation of runway monitoring (RW-01 through RW-06) was performed in the morning and another in the evening. One rotation of surface water observations was performed in the intervening hours of a single day as convenient, ambient conditions permitted. The order of station monitoring within each rotation was non-rigorously (due to time constraints) randomized. One cycle (RW-SW-RW) of avifauna surveys is conducted bi-weekly.

2.2 Data Collection

Data collected at point count stations included: observer, station number, date and time of observations, weather (temperature, wind speed and direction, cloud cover, and precipitation), species observed (number of individuals, location, activity, estimated altitude, and direction of movement), observational notes, as well as the number of aircraft observations (landing/take-off) observed. Data at the RW stations were collected during a discrete 30-minute period in all weather conditions. Data at the SW stations were collect for no less than 5 minutes, with duration dependent upon travel time (SW-09 and SW-10 were monitored while driving the route) and number of observations recorded. Time data collected at the SW sites was generally recorded as initial observation for all subsequent observations, while birds leaving and entering or traveling between stations were only counted once.

2.3 Data Treatment

Field data are entered into a Microsoft Excel workbook. Weather and aircraft data are placed into a separate worksheet with paired worksheets for each cycle. Quality control against the original data is performed by an independent party.

3.0 Data Analysis & Summary

3.1 Avifauna Data

For the purposes of this memo, data collected from October 2012 through September 2014 will be analyzed. When comparing total number of individuals counted during bi-monthly surveys between the west AOA (RW-01 & RW-02) and the east AOA (RW-03 through RW-06), it is clear that the east AOA experiences more wildlife activity (Figure 3.1). This is in spite of MCO's wildlife management techniques being focused throughout the east AOA complex.

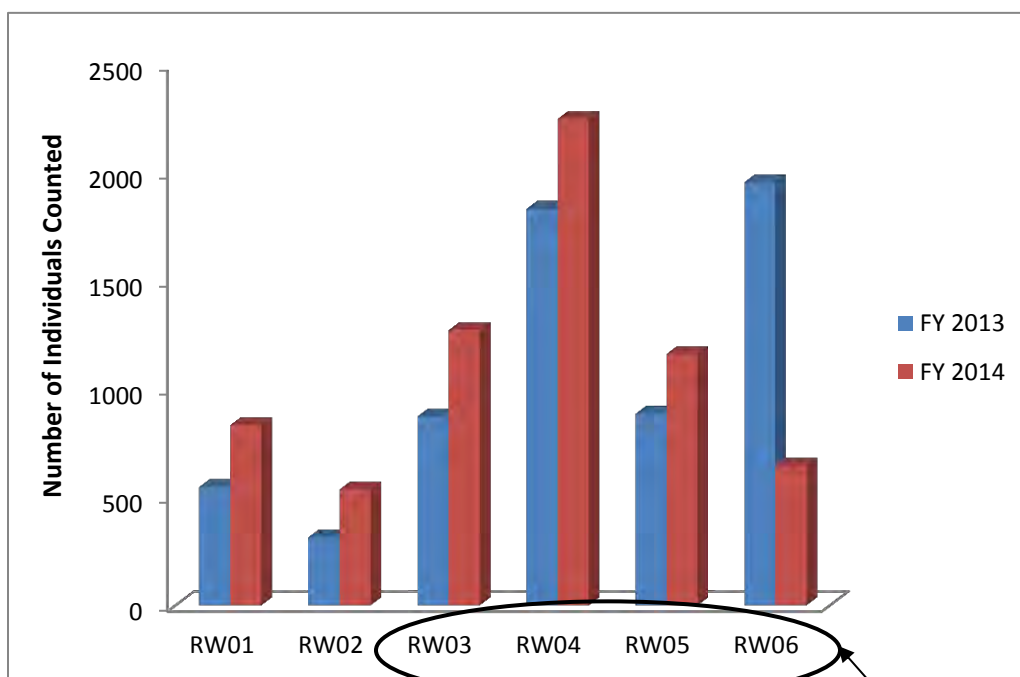


Figure 3.1, left. Total individuals counted for FY 2013 and FY 2014 at each runway observation station at MCO

East AOA

When birds are observed in flight, their direction of movement is recorded as local flight (L), soaring flight (SO), or a cardinal direction (N, S, E, or W) if they're flying passed the observation station. When comparing only movements recorded as east-west to movements recorded as north-south, the east AOA complex experiences more east-west movements than the west AOA. The east AOA also experiences predominantly greater east-west movements than north-south movements (Figure 3.2).

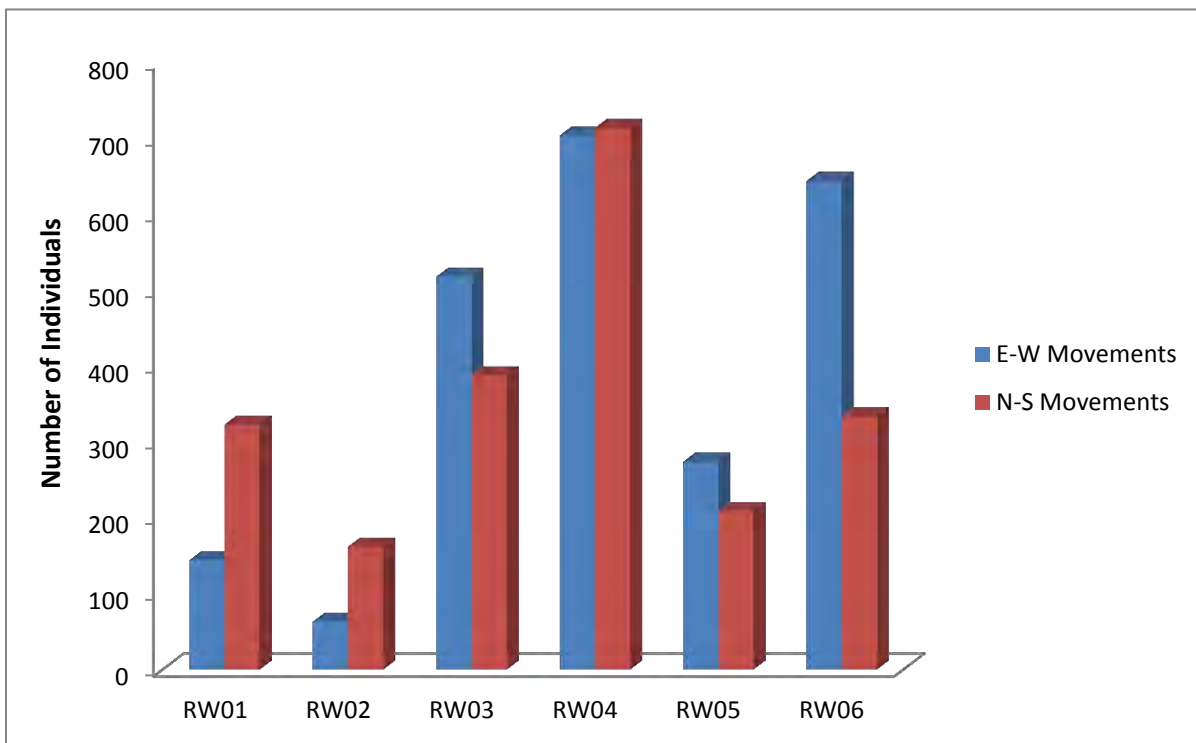


Figure 3.2. Number of movements at each runway station per direction of movement

The most common species observed flying in east or west directions are listed in tables 3.1 and 3.2 below. Each table contains the species (common and scientific name), to what habitats they are most commonly attracted, and their relative hazard score. Relative hazard scores were developed by a U.S. Department of Agriculture (USDA) research team. A total of 77 species are ranked from most hazardous to least hazardous based on an analysis of three factors: (1) number of strikes in the national database with damage, (2) number of strikes in the national database with substantial damage, and (3) number of strikes in the national database that caused a negative effect on flight. The most hazardous species is considered the mule deer (*Odocoileus hemionus*) with a relative hazard score of 100. The least hazardous species on the list is the opossum (*Didelphis virginiana*) with a relative hazard score of 0. At MCO, the most common species noted moving east were tree swallows. Tree swallows have a low relative hazard score of 1. The most common species noted moving west were gulls. Since the gulls were not identified to species, they cannot be assigned a relative hazard score. However, gulls are considered relatively hazardous with scores ranging from 18 to 39 depending on species. The majority of the species observed flying east-west across the airfield are attracted to some aspect of water or wetlands (e.g. aquatic vegetation, open water for foraging, wetland forests for roosting, etc.)

Table 3.1 Species recorded moving east (top 85% of movements)

Common Name	Scientific Name	Percentage of total movements (east only)	Relative Hazard Score*	Common Attractant
Tree swallow	<i>Tachycineta bicolor</i>	24%	1	Wax myrtle shrubs (bayberries)
Unidentified duck	<i>Anas spp.</i>	17%	Unknown	Open water, aquatic vegetation
White ibis	<i>Eudocimus albus</i>	9%	Not listed	Wetlands
Cattle egret	<i>Bubulcus ibis</i>	8%	23	Wetlands (roosting) and open grass fields (feeding)
Red-winged blackbird	<i>Agelaius phoeniceus</i>	8%	9	Wetland vegetation (especially cattails)
American crow	<i>Corvus brachyrhynchos</i>	4%	12	Dense trees, carrion, garbage
Killdeer	<i>Charadrius vociferus</i>	4%	7	Bare ground
Fish crow	<i>Corvus ossifragus</i>	3%	Not listed	Open water, carrion, dense trees, garbage
Mourning dove	<i>Zenaida macroura</i>	3%	10	Bare ground
Boat-tailed grackle	<i>Quiscalus major</i>	2%	9	Dense trees, aquatic vegetation, garbage
Turkey vulture	<i>Carthartes aura</i>	2%	44	Carrion, thermals
Wood stork	<i>Mycteria americana</i>	2%	Not listed	Open water, wetlands, aquatic vegetation

*Source: Devault, Travis L., Jerrold L. Belant, Bradley F. Blackwell, and Thomas W. Seamans. "Interspecific Variation in Wildlife Hazards to Aircraft: Implications for Airport Wildlife Management." *Wildlife Society Bulletin* 35.4 (2011): 394-402.

Table 3.2 Species recorded moving west (top 88% of movements)

Common Name	Scientific Name	Percentage of total movements (west only)	Relative Hazard Score*	Common Attractant
Unidentified gull	<i>Larus spp.</i>	17%	Unknown	Bare ground, temporary standing water, carrion, garbage
Cattle egret	<i>Bubulcus ibis</i>	15%	23	Wetlands (roosting) and open grass fields (feeding)
White ibis	<i>Eudocimus albus</i>	15%	Not listed	Wetlands
Tree swallow	<i>Tachycineta bicolor</i>	11%	1	Wax myrtle shrubs (bayberries)
American crow	<i>Corvus brachyrhynchos</i>	4%	12	Dense trees, carrion, garbage
Fish crow	<i>Corvus ossifragus</i>	4%	Not listed	Open water, carrion, dense trees, garbage

Common Name	Scientific Name	Percentage of total movements (west only)	Relative Hazard Score*	Common Attractant
Common grackle	<i>Quiscalus quiscula</i>	3%	9	Dense trees, aquatic vegetation, garbage
Boat-tailed grackle	<i>Quiscalus major</i>	3%	9	Dense trees, aquatic vegetation, garbage
Glossy ibis	<i>Plegadis falcinellus</i>	3%	Not listed	Wetlands
Double-crested cormorant	<i>Phalacrocorax auritus</i>	3%	43	Open water
Red-winged blackbird	<i>Agelaius phoeniceus</i>	3%	9	Wetland vegetation (especially cattails)
Mourning dove	<i>Zenaida macroura</i>	2%	10	Bare ground
Killdeer	<i>Charadrius vociferus</i>	2%	7	Bare ground
Tricolored heron	<i>Egretta tricolor</i>	2%	Not listed	Wetlands
Great egret	<i>Ardea alba</i>	2%	28	Wetlands

*Source: Devault, Travis L., Jerrold L. Belant, Bradley F. Blackwell, and Thomas W. Seamans. "Interspecific Variation in Wildlife Hazards to Aircraft: Implications for Airport Wildlife Management." *Wildlife Society Bulletin* 35.4 (2011): 394-402.

3.2 MCO Strike Data

MCO staff have reported wildlife strikes at the airport to the FAA Wildlife Strike Database since 1990. At the time of this tech memo, the database was current through 31 July 2014. For the purposes of this data analysis, only data from 2003 through 31 July 2014 will be analyzed. This is because Runway 17L/35R was complete and in use in 2003. A total of 1,299 strikes have been reported at MCO within this time period. Of those 1,299 strikes, 1,148 strike reports (88%) listed a specific runway. Runway 17L/35R (east AOA) has the most reported strikes to date (Figure 3.3).

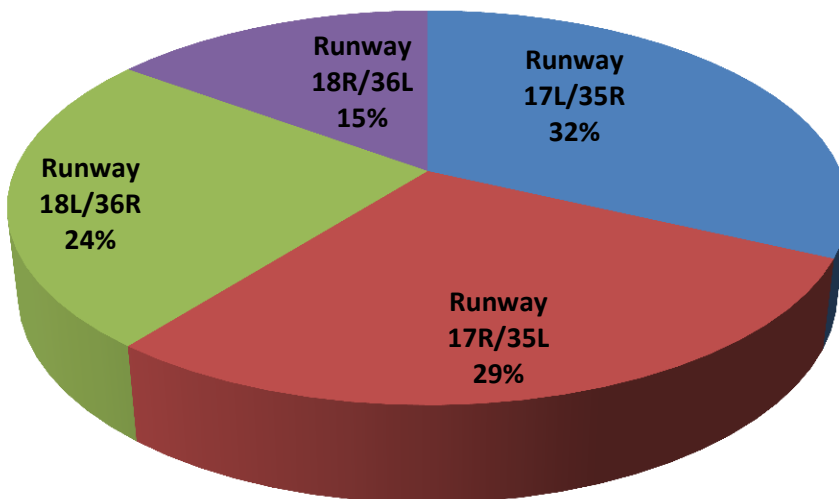


Figure 3.3. Percentage of wildlife strikes per runway at MCO

There are a total of 1,168 strikes that list runway or runway pair, but not a specific runway (e.g. Runway 18/36). Utilizing that data and dividing the runways into “east” or “west”, the east AOA experienced 61% of the total strikes that designated a runway (Figure 3.4).

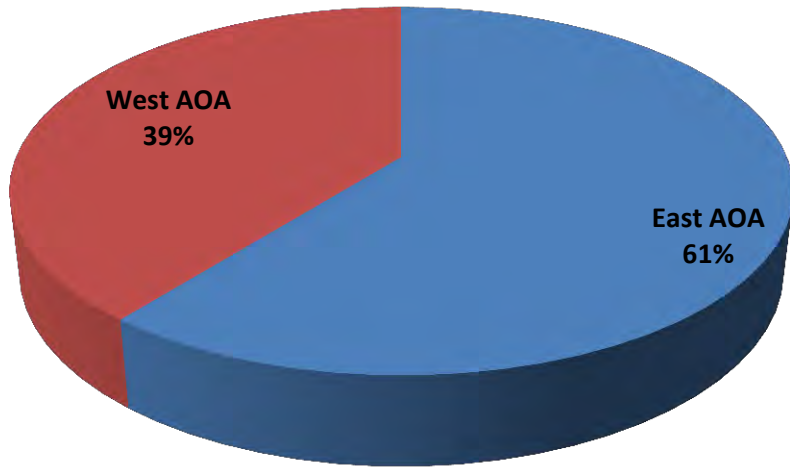


Figure 3.4. Percentage of strikes at MCO reported on the east airfield vs. the west airfield.

There are 92 total strikes with reported damage (either minor or substantial) at MCO. Out of the 92 strikes with reported damages, 74 of the reports specified on which runway the strike occurred. The runway with the most strikes with reported damage is Runway 17R/35L (Figure 3.5)

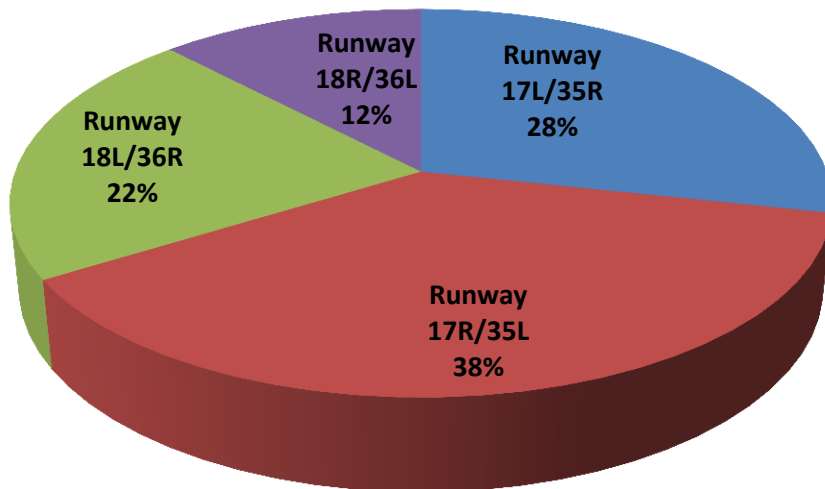


Figure 3.5. Percentage of strikes with damage per runway at MCO.

When comparing strikes with damage between the east and west AOAs, the east AOA has experienced 64% of the damaging strikes with a reported runway location (Figure 3.6).

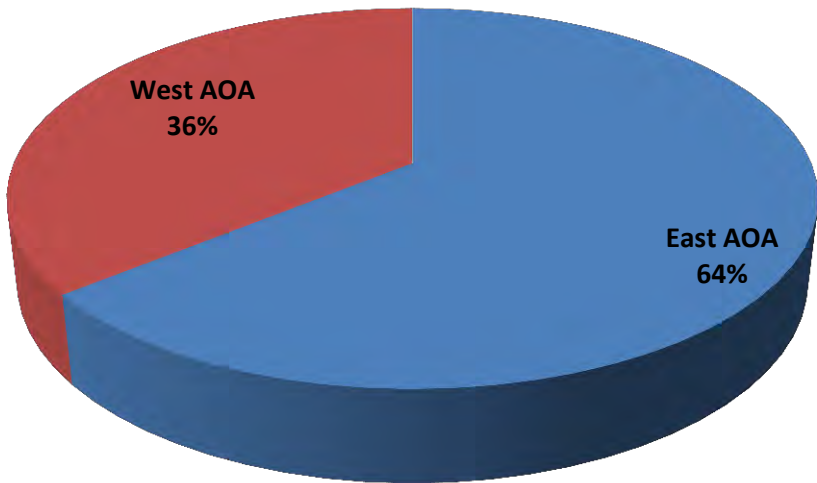


Figure 3.6. Percentage of strikes at MCO with reported damage on the east vs. west AOAs.

4.0 Discussion

It is apparent from both quantitative and qualitative observations that the east AOA at MCO is exceedingly more attractive to wildlife than the west AOA. This is likely caused by several factors. Most importantly, the west AOA is surrounded by predominantly urban lands (Figure 2.1). This area is highly industrial and includes large businesses, hangars, Fixed Based Operators (FBOs), parking lots, hotels, and major roadways. However, the east AOA remains bordered by natural lands including two large lakes, several canals, and the east airfield property. Due to the availability of these natural habitats, there are many more opportunities for wildlife to find food and cover on the east AOA. Waterfowl and wading birds are commonly observed foraging throughout the stormwater ponds and ditches on airport property during the day. These wetland-dependent species move to and from their foraging areas and their roosting areas all through the day, repeatedly crossing the east runways in the process. In addition to the species listed in Tables 3.1 and 3.2 above, bald eagles (*Haliaeetus leucocephalus*) are often observed perching, soaring, and/or foraging on the east AOA during the winter months. MCO is surrounded by several active bald eagle nests and both adults and juveniles frequently utilize the east AOA. Bald eagles have a relative hazard score of 36 and can cause substantial damage when struck by an aircraft. Again, the availability of natural habitats on the east AOA provides optimum nesting, perching, and foraging opportunities. This is also the case with sandhill cranes (*Grus canadensis*). Sandhill cranes nest and roost on the east airfield and forage in the mowed, maintained grasses on the east AOA throughout the day. The mowed and maintained runway aprons provide an easily accessible food source adjacent to their roosting location. Bald eagles and sandhill cranes are only occasionally noted on the west AOA. Finally, the east AOA, specifically runway 17L/35R, is the only area at MCO where coyotes, deer, wild turkeys, and wild hogs were observed during the avifauna surveys. This wildlife is predominantly observed outside the perimeter fence, east or south of the approach to runway 35R, in the natural areas. However, sometimes these larger, hazardous species are found inside the perimeter fence, potentially causing a great risk to aviation safety. It is apparent that the abundance of undeveloped habitat surrounding the east AOA increases the occurrence of hazardous wildlife and wildlife strikes on the east runways.