

# JUNEAU RUNWAY INCURSION MITIGATION (RIM) PROGRAM

JANUARY 25, 2017





# Agenda

- Program Description
- Runway Incursions
- Design and Geometry Deficiencies
- Runway 8/26 Operations
- Potential Mitigation
- Next Steps





# PROGRAM DESCRIPTION





# Background

- ➔ Master Plan considered the runway incursions data and found solutions for TWY E and TWY D
- ➔ Recommended further study for TWY C
- ➔ FAA funded a Runway Incursion Mitigation (RIM) Study





# Overview (FAA RIM Program)

- ➔ FAA funded RIM Program to decrease incursions nation-wide
- ➔ Airfield geometry identified as primary contributing factor for runway incursions (RI)
- ➔ FAA targeted spots located based on data from 2008-2015
  - » Three or more RI's in one spot in one year
  - » More than eight RI's in one spot cumulative



# Goals and Objectives

- ➔ The goal of the JNU RIM Program is to determine mitigation solutions for Taxiway C that will reduce the risk of runway incursions at the Airport.
- ➔ The objectives are:
  - » Examine runway incursions data related to Taxiway C, D, E
  - » Consider airfield design and geometry
  - » Develop potential solutions
  - » Priorities mitigation techniques



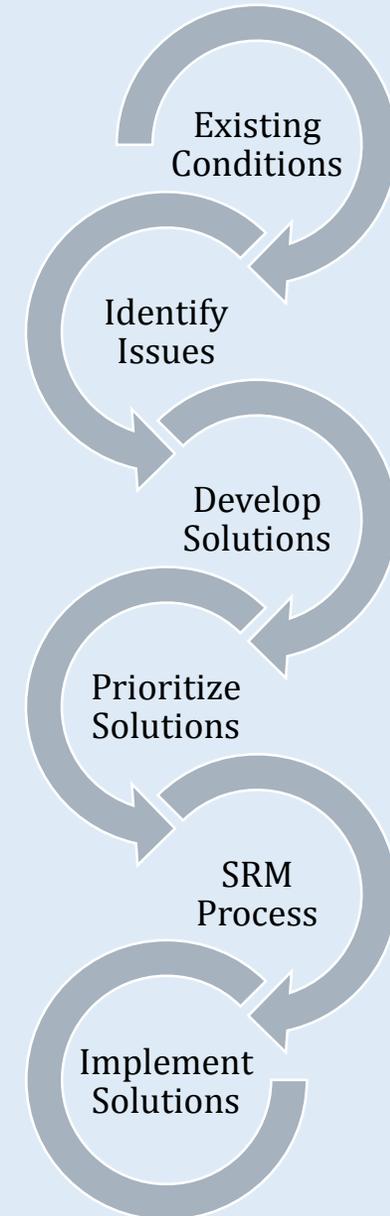
# Schedule





# Process

- Interviews and Site Assessments
- Determine Issues
- Engage Stakeholders
- Develop Solutions
- Prioritize Solutions
- Conduct a Safety Risk Management Panel







# Runway Incursions



# Runway Incursion Definitions

→ “Any occurrence at an aerodrome involving the incorrect presence of an aircraft vehicle or person on the protected area of a surface designated for the landing and take off of aircraft.”

» (ICAO Doc 4444 - PANS-ATM)



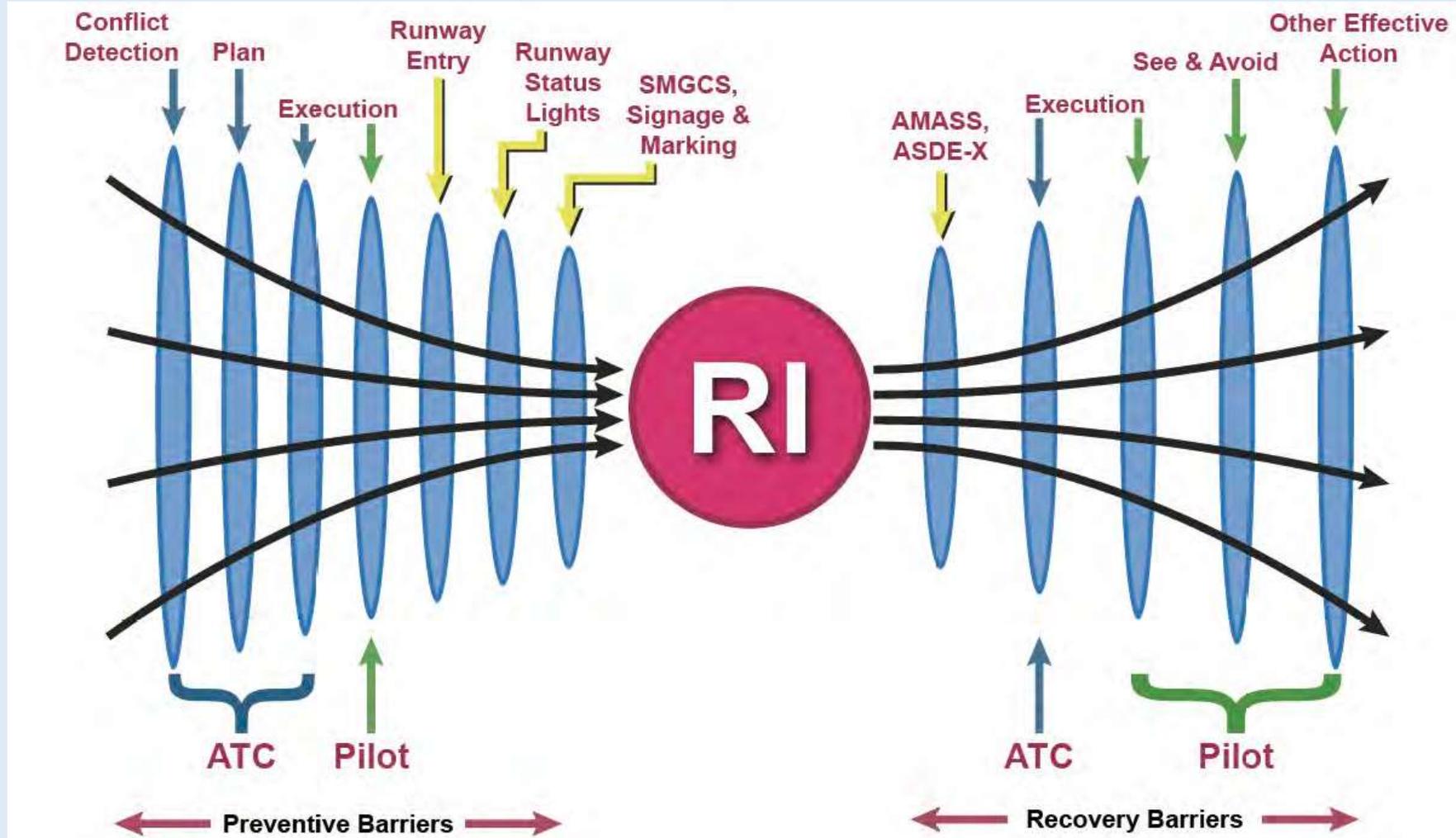


# Runway Incursion Definitions

→ Three types of Runway Incursion (RI)

<b>Operational Incident</b>	a surface event attributed to ATC action or inaction.
<b>Pilot Deviation</b>	action of a pilot that violates any Federal Aviation Regulation
<b>Vehicle / Pedestrian Deviation (V/PD)</b>	any entry or movement on the movement area or safety area by a vehicle or pedestrian that has not been authorized by ATC.

# RIM Prevention Strategies





# Incidents at Juneau

**50 Runway Incursions between  
2004 – August 2016**

— 18 related to construction activities

=

**32 Runway Incursions Left to  
Analyze**

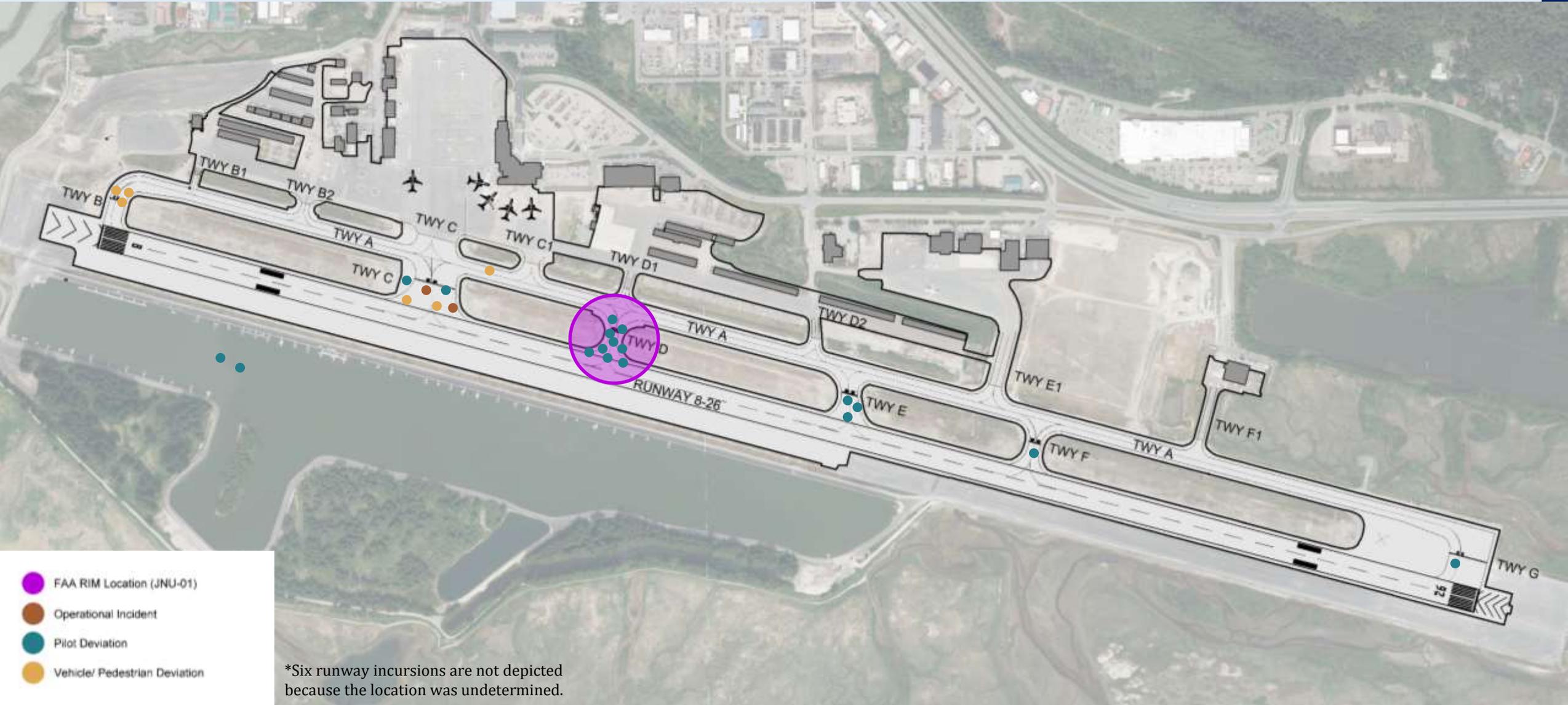
4 Operational Incident

19 Pilot Deviations

9 Vehicle/Pedestrian Deviation



# Juneau Runway Incursions

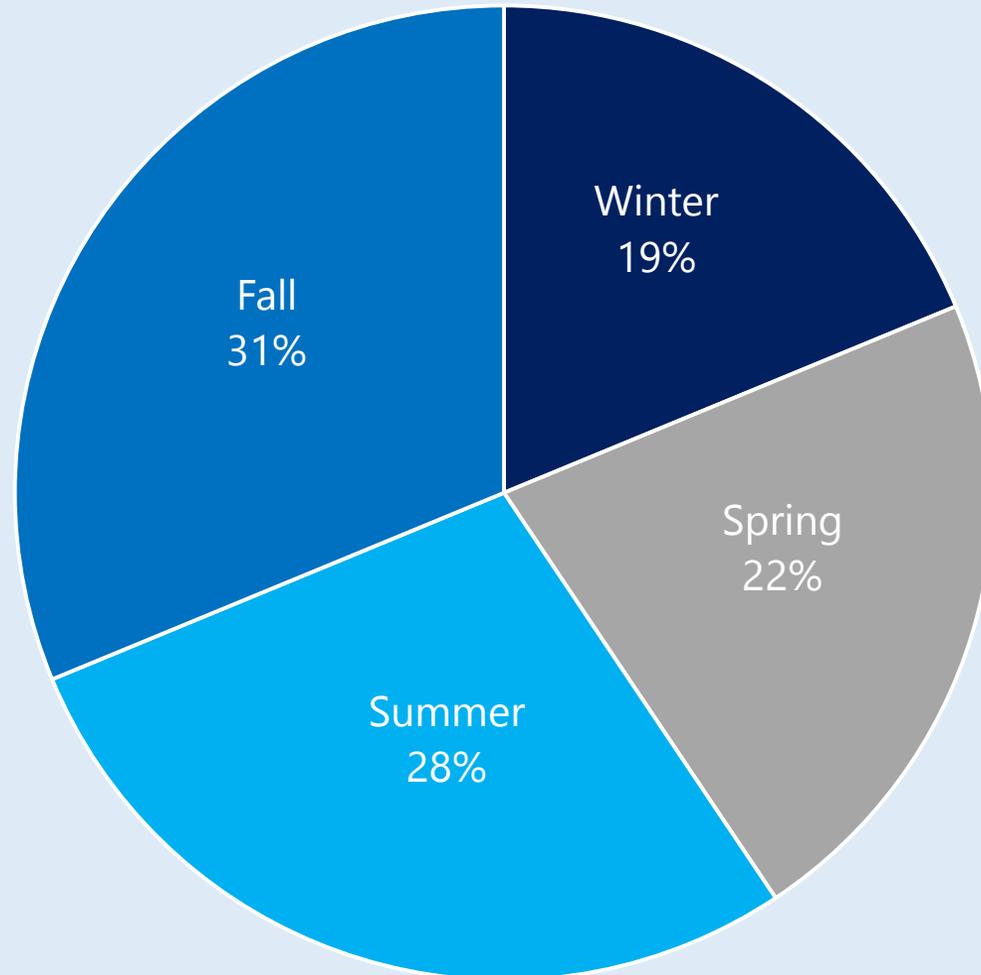


\*Six runway incursions are not depicted because the location was undetermined.



# Runway Incursions by Season

- 6 RIs in Winter
- 7 RIs in Spring
- 9 RIs in Summer
- 10 RIs in Fall

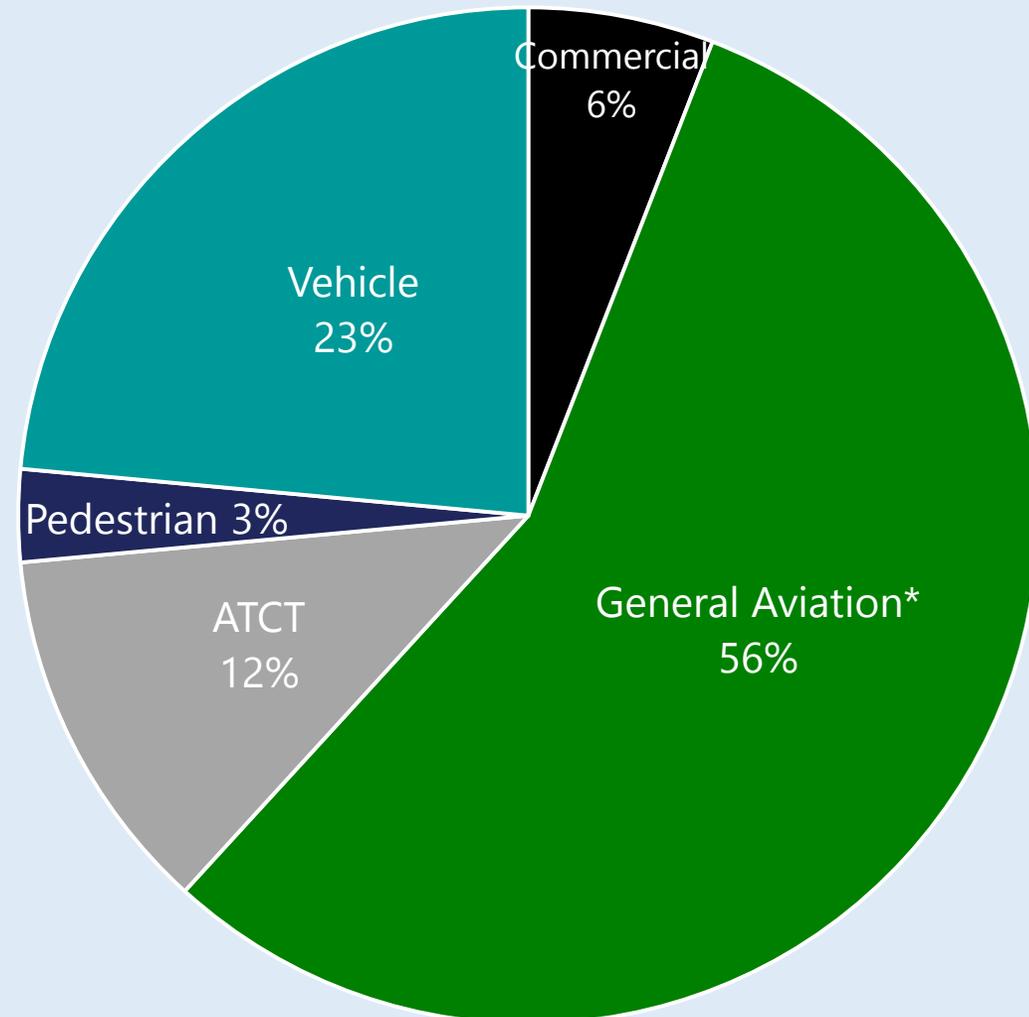




# Runway Incursions by User

- 1 RI by Pedestrian
- 2 RIs by Commercial Service Aircraft
- 4 RIs by ATCT
- 8 RIs by Vehicle
- 17 RIs by General Aviation

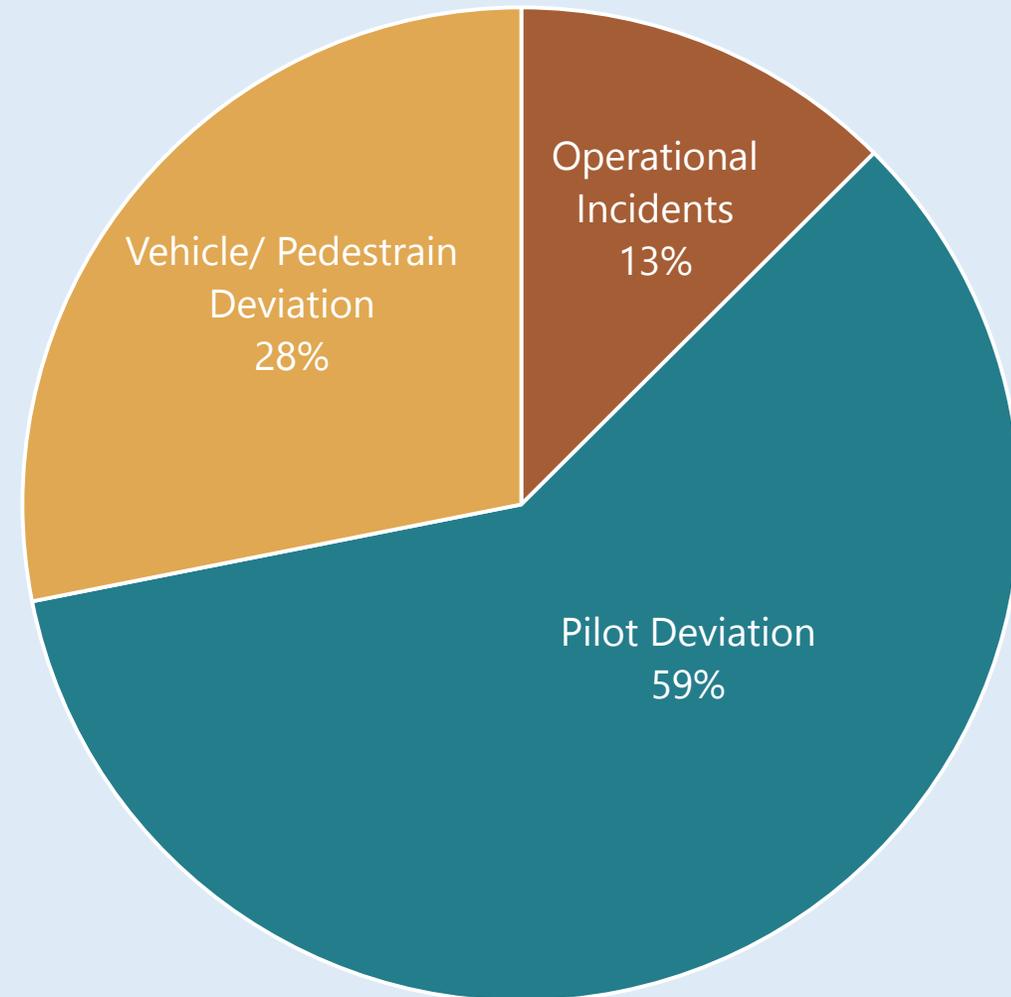
\*aircraft under 12,500lbs.





# Runway Incursions by Category

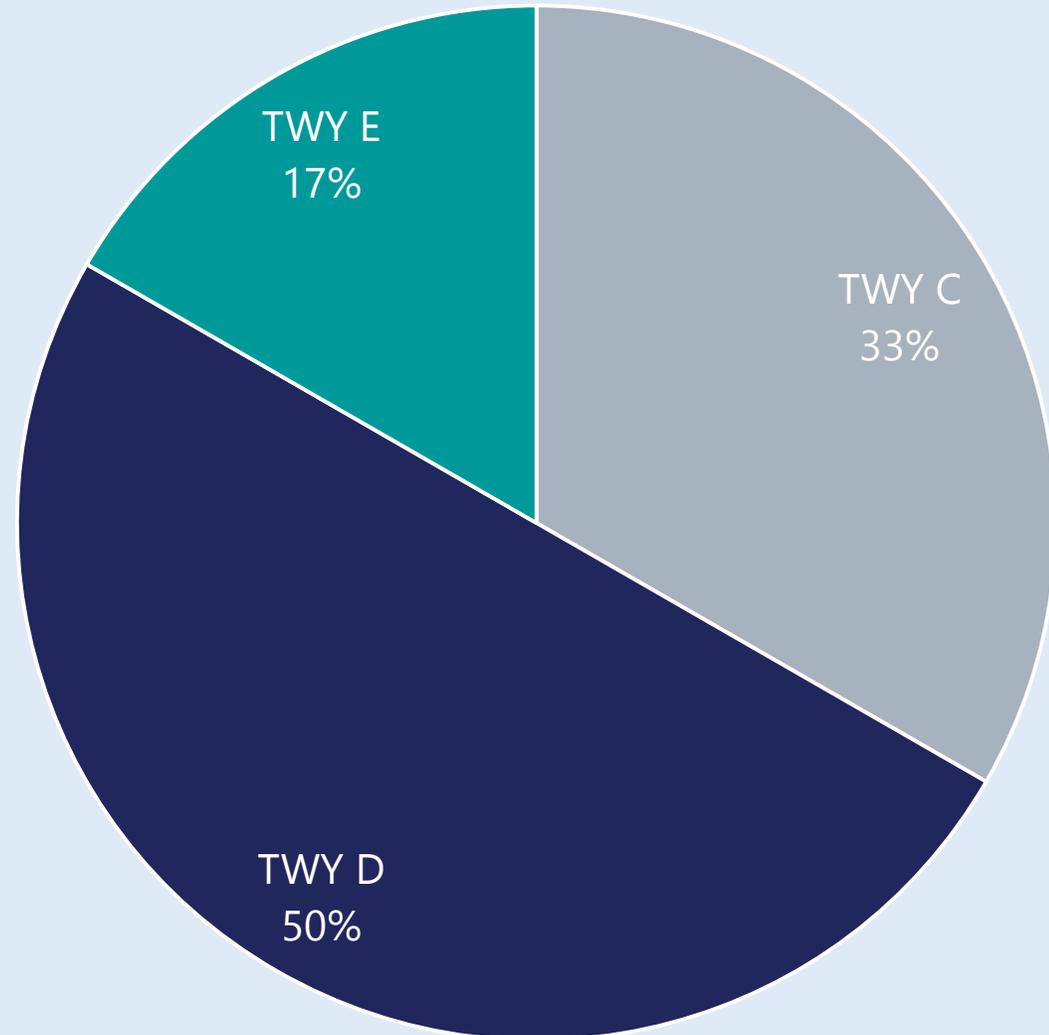
- 4 Operational Incidents
- 19 Pilots Deviations
- 9 Vehicle/ Pedestrian Deviations





# Runway Incursions by Location

- TWY C – 6 Runway Incursions
- TWY D – 9 Runway Incursions
- TWY E – 3 Runway Incursions





# Design and Geometry Deficiencies





# Taxiway Design Deficiencies

## Taxiway Delta

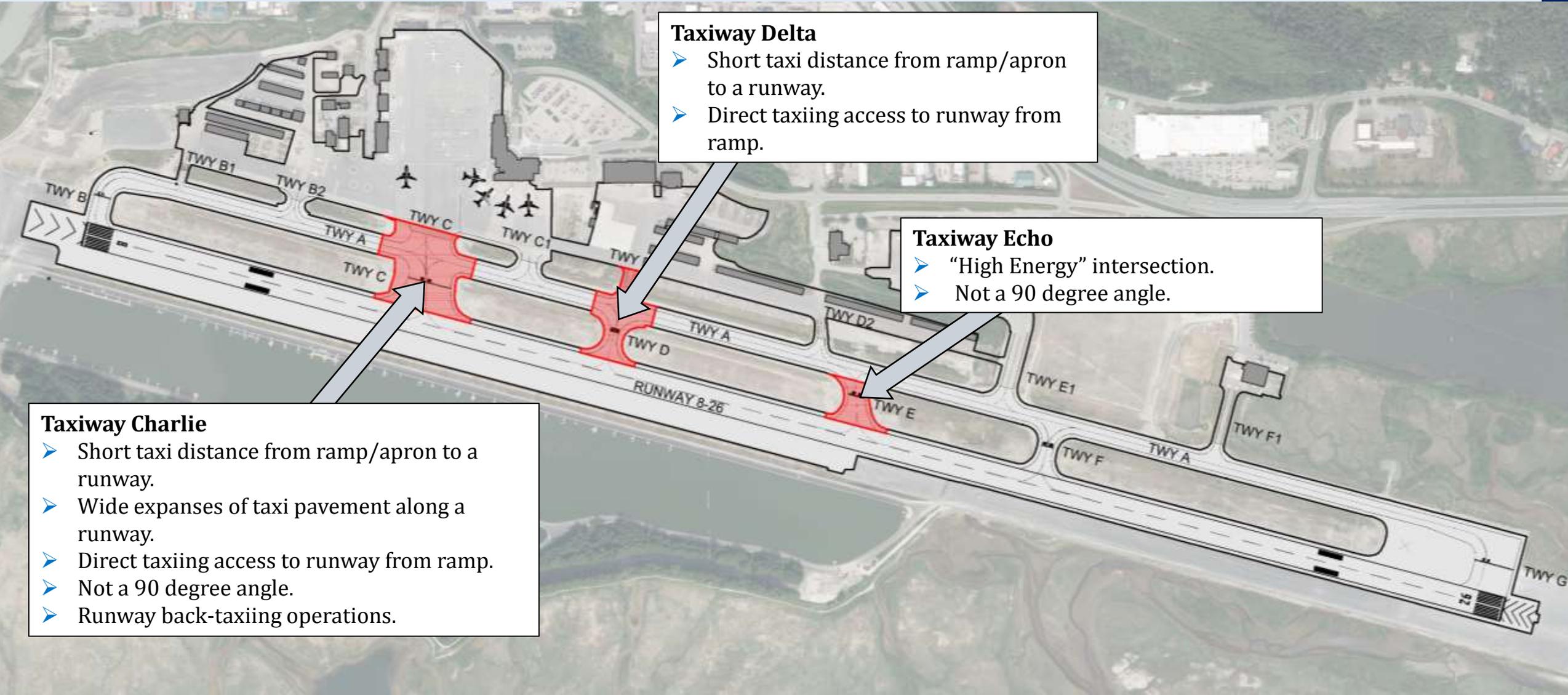
- Short taxi distance from ramp/apron to a runway.
- Direct taxiing access to runway from ramp.

## Taxiway Echo

- “High Energy” intersection.
- Not a 90 degree angle.

## Taxiway Charlie

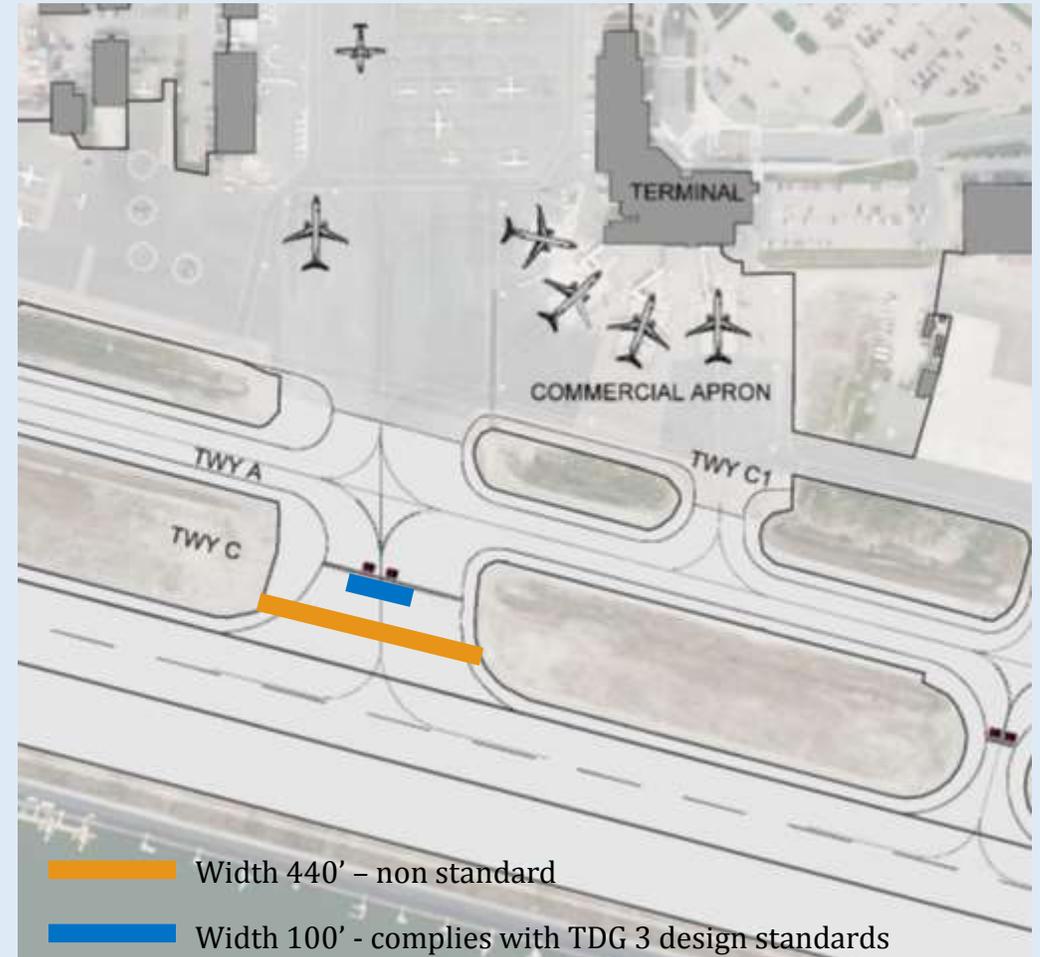
- Short taxi distance from ramp/apron to a runway.
- Wide expanses of taxi pavement along a runway.
- Direct taxiing access to runway from ramp.
- Not a 90 degree angle.
- Runway back-taxiing operations.





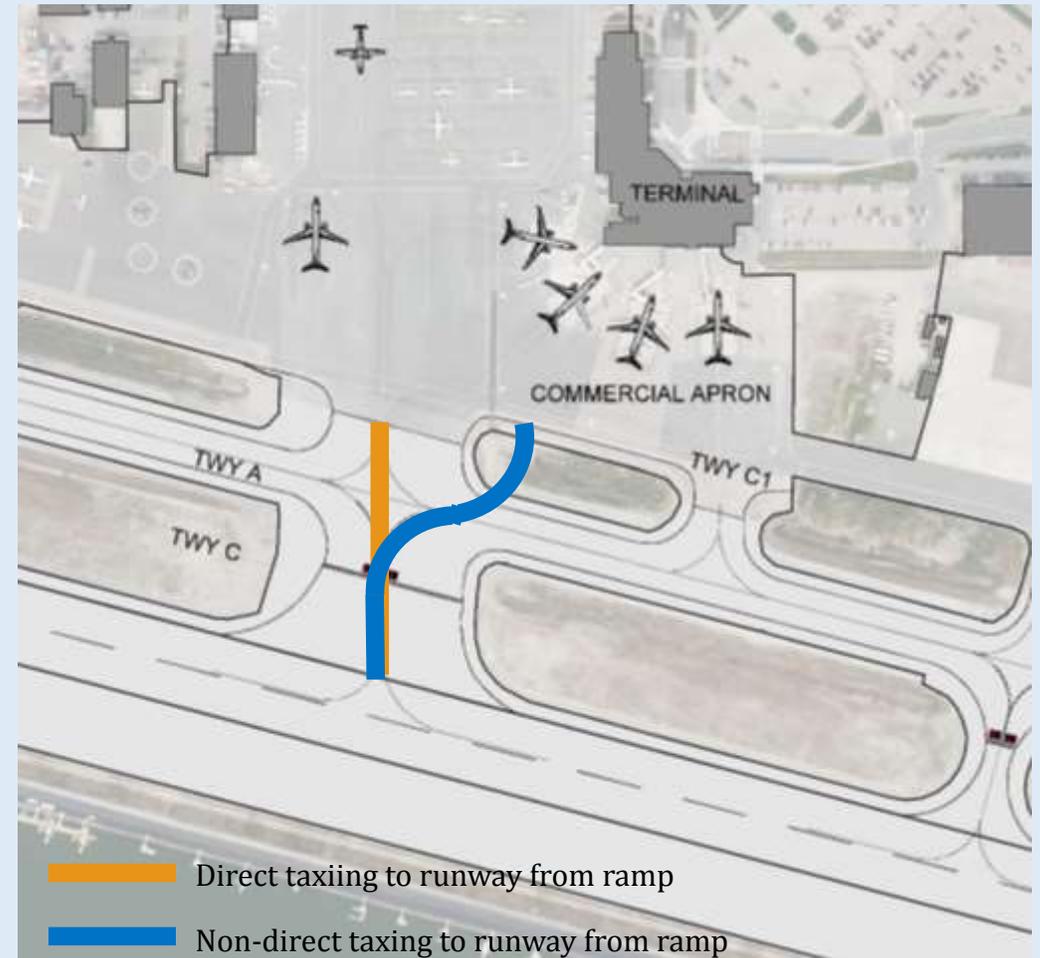
# Geocode 3

➔ Wide Expanse of Pavement



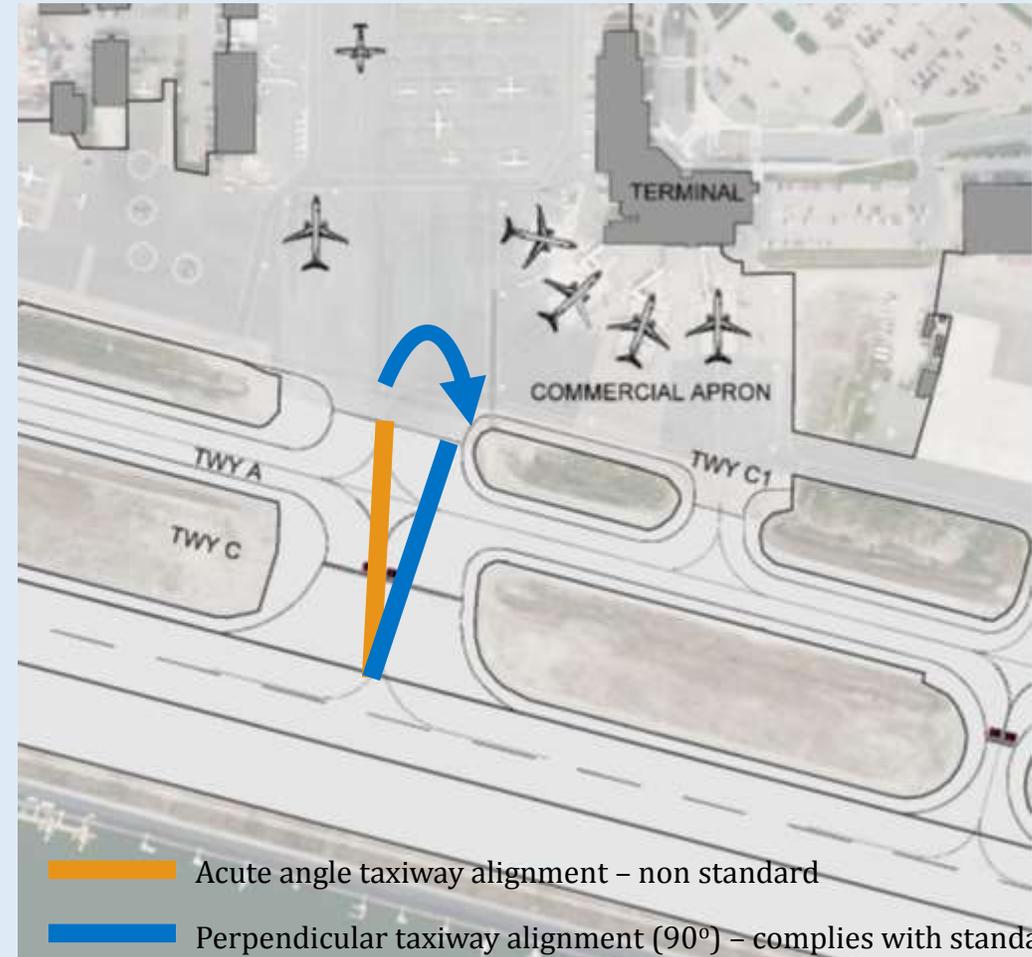
# Geocode 8

➔ Direct Taxiing Access to Runway from the Ramp



# Geocode 13

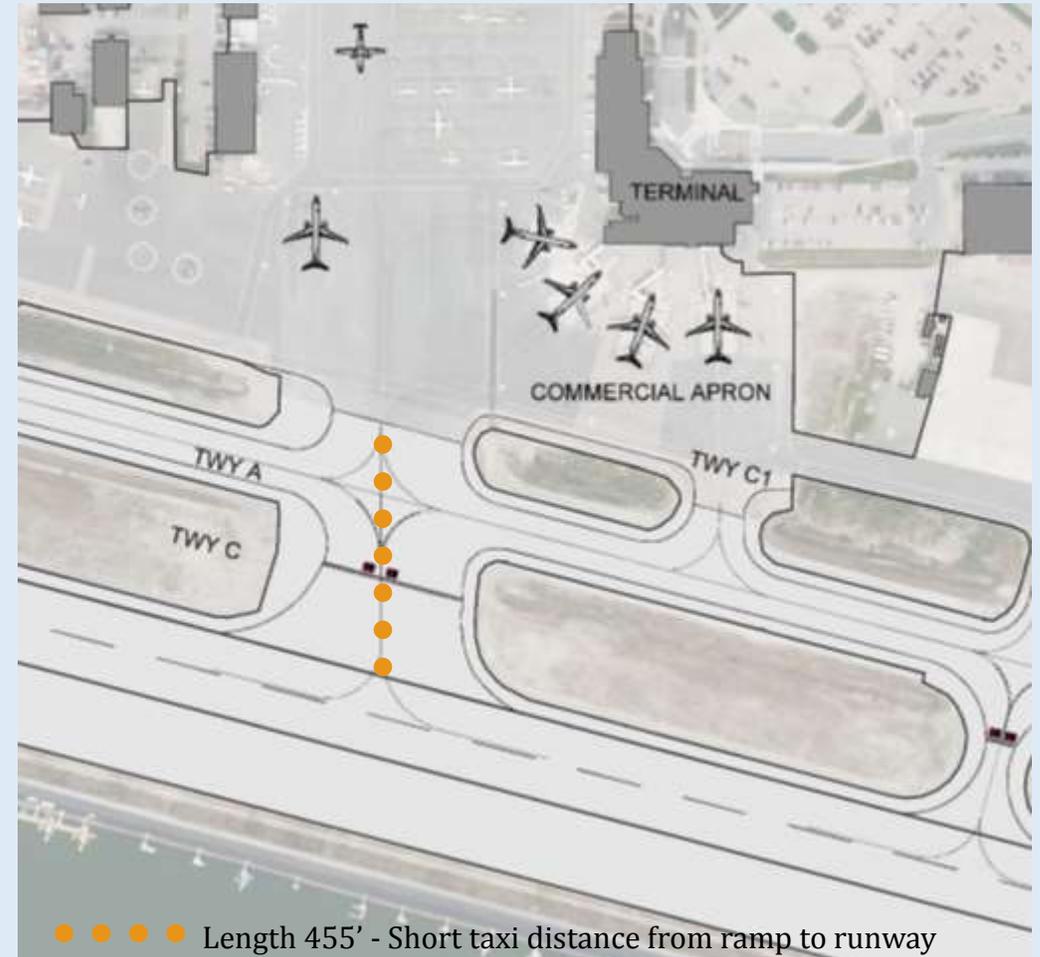
➔ Taxiway Intersects Runway at Other Than Right Angle





# Geocode 14

➔ Short Taxi Distance From Ramp to Runway





# Taxiway C - Design Challenges

- Wide Expanse of Pavement
- Direct Taxiing Access to Runway from Ramp
- Taxiway Intersects Runway at other than Right Angle
- Short Taxi Distance from Ramp to Runway





# Runway 8/26 Operations





# Fleet Mix and Critical Aircraft

Aircraft Fleet for Runway 8-26			
Aircraft	Design	Operations	Percentage of Total Operations
<b>Commercial Air Carrier</b>			
Boeing 737 Series	C-III-3	7,986	29%
Boeing 737-900/Max	D-III-3	166	0.5%
Boeing 757-200	C-IV-4	166	0.5%
<b>Commuter/ Air Taxi / Air Cargo</b>			
Cessna Caravan	A-II-1A	2,822	10%
Beech 1900	B-II-2	1,411	5%
ATR-72	B-III-2	1,411	5%
Single Engine Piston	B-I-1B	7,054	26%
<b>General Aviation</b>			
Corporate Jets - Heavy	C-III-3	163	1%
Corporate Jets - Light	B-II-3	489	2%
Multi-Engine Piston	B-II-2	651	2%
Single-Engine Piston	A-I-1A	4,886	18%
<b>Military</b>			
Piston	C-IV-4	220	1%
<b>Total Operations</b>		<b>27,425</b>	

Source: Juneau International Airport Master Plan, 2016

\*Operation numbers exclude rotorcraft and float planes



Source: World Airline News, 2016

**Existing Critical Aircraft: Boeing 737-800**  
 Aircraft Approach Category: C  
 Airplane Design Group: III  
 Taxiway Design Group: 3



Source: World Airline News, 2016

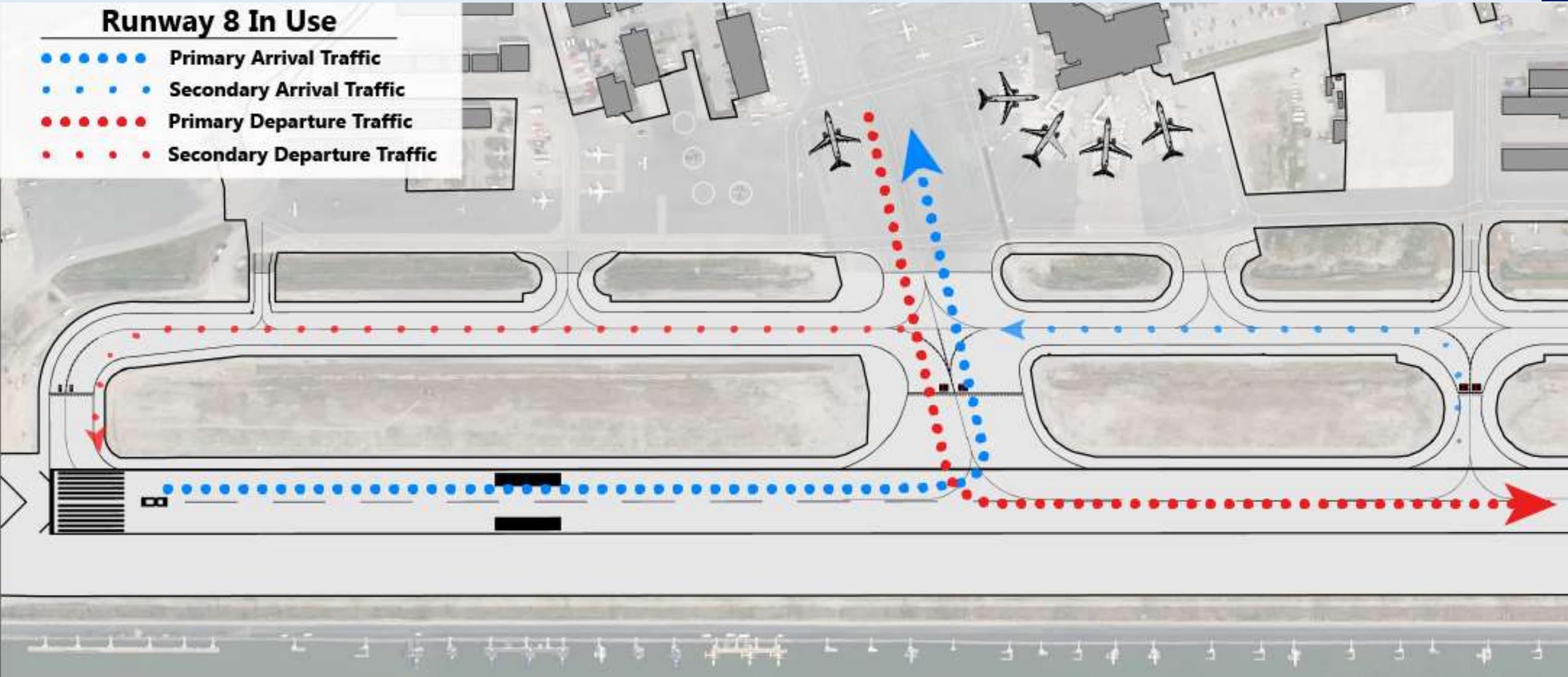
**Future Critical Aircraft: Boeing 737-900W**  
 Aircraft Approach Category: D  
 Airplane Design Group: III  
 Taxiway Design Group: 3



# Runway 8 – Existing Taxiway C Flow

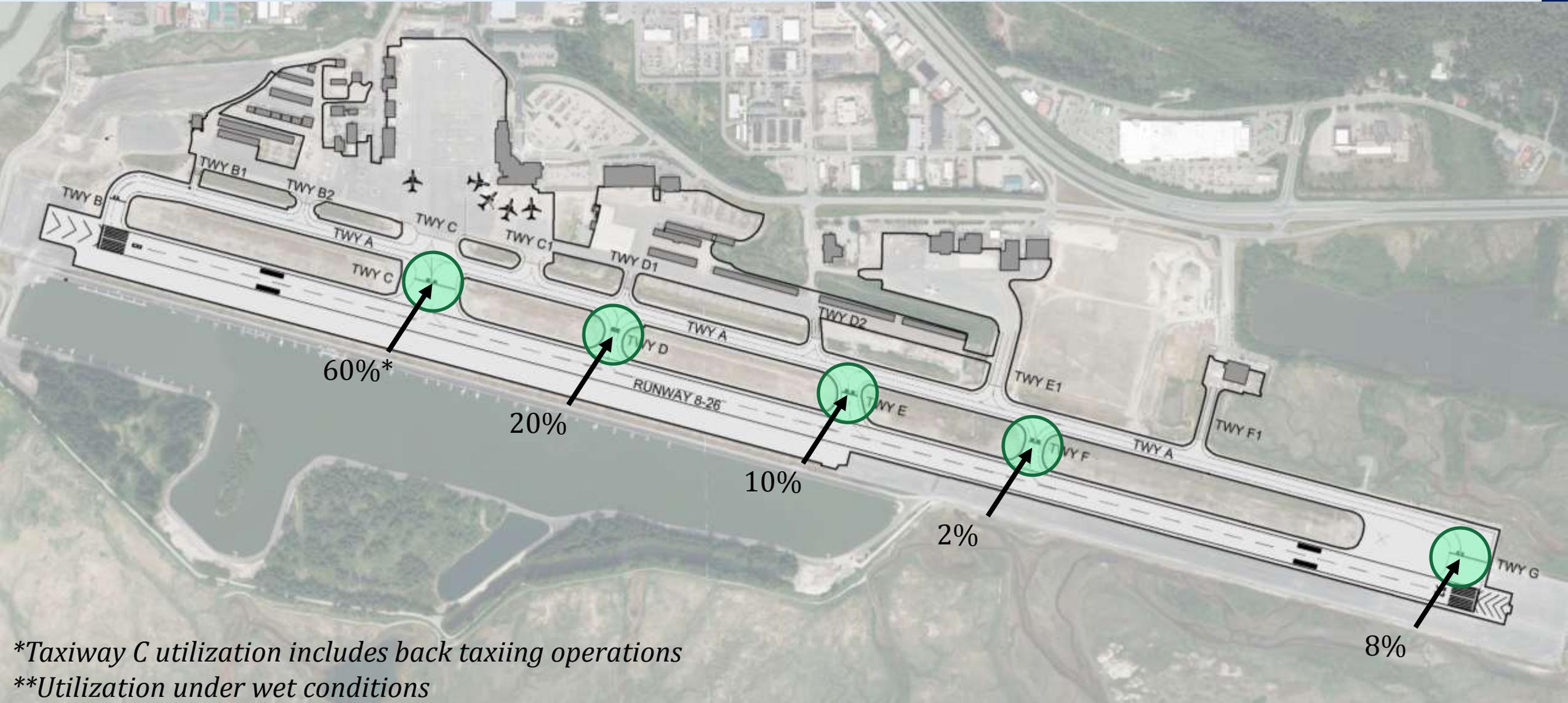
## Runway 8 In Use

- Primary Arrival Traffic
- Secondary Arrival Traffic
- Primary Departure Traffic
- Secondary Departure Traffic





# Runway 8 – Exiting Aircraft Utilization



\*Taxiway C utilization includes back taxiing operations

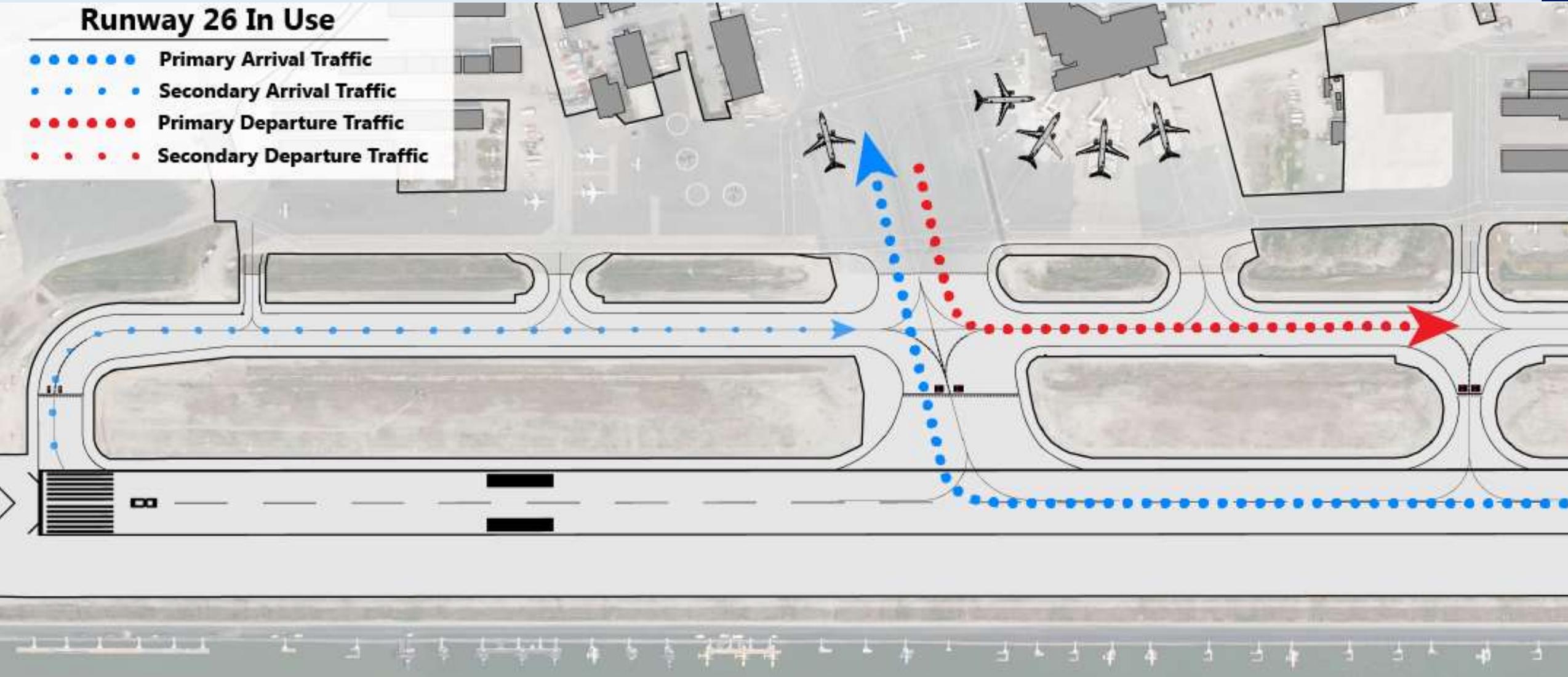
\*\*Utilization under wet conditions



# Runway 26 – Existing Taxiway C Flow

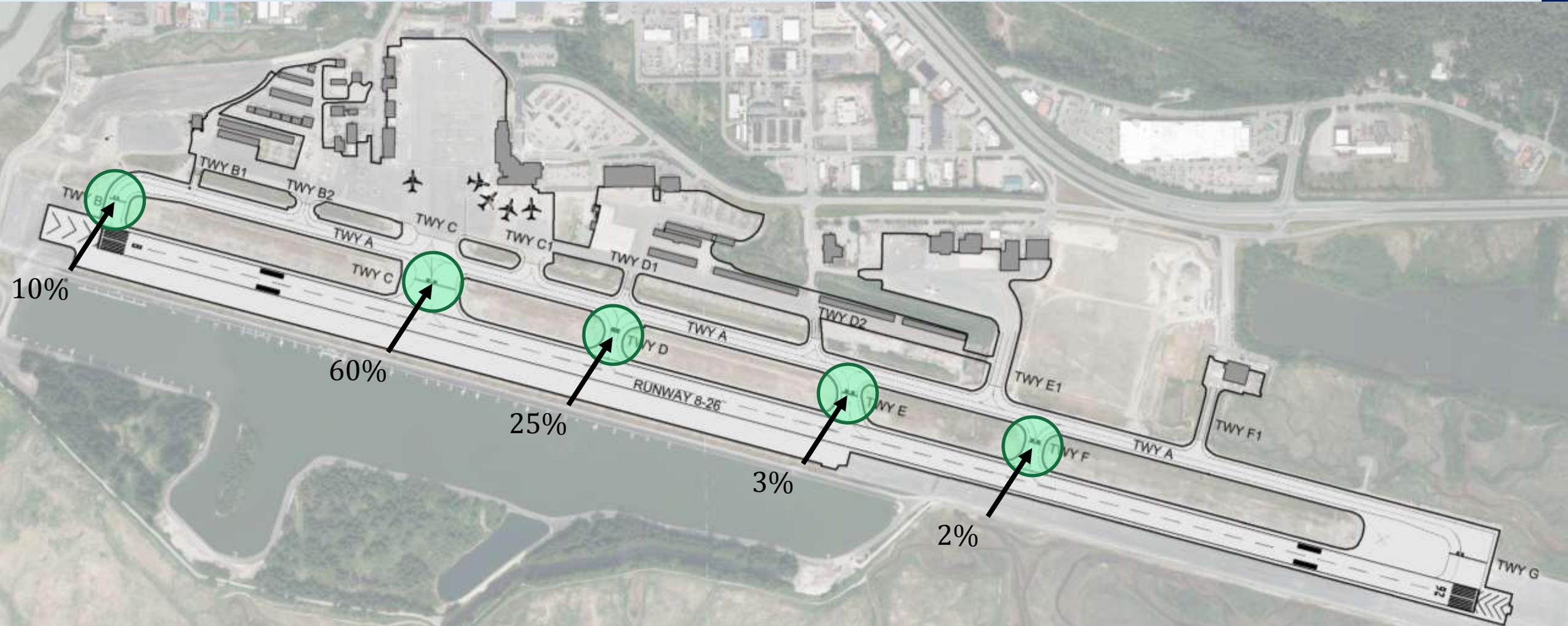
## Runway 26 In Use

- Primary Arrival Traffic
- Secondary Arrival Traffic
- Primary Departure Traffic
- Secondary Departure Traffic





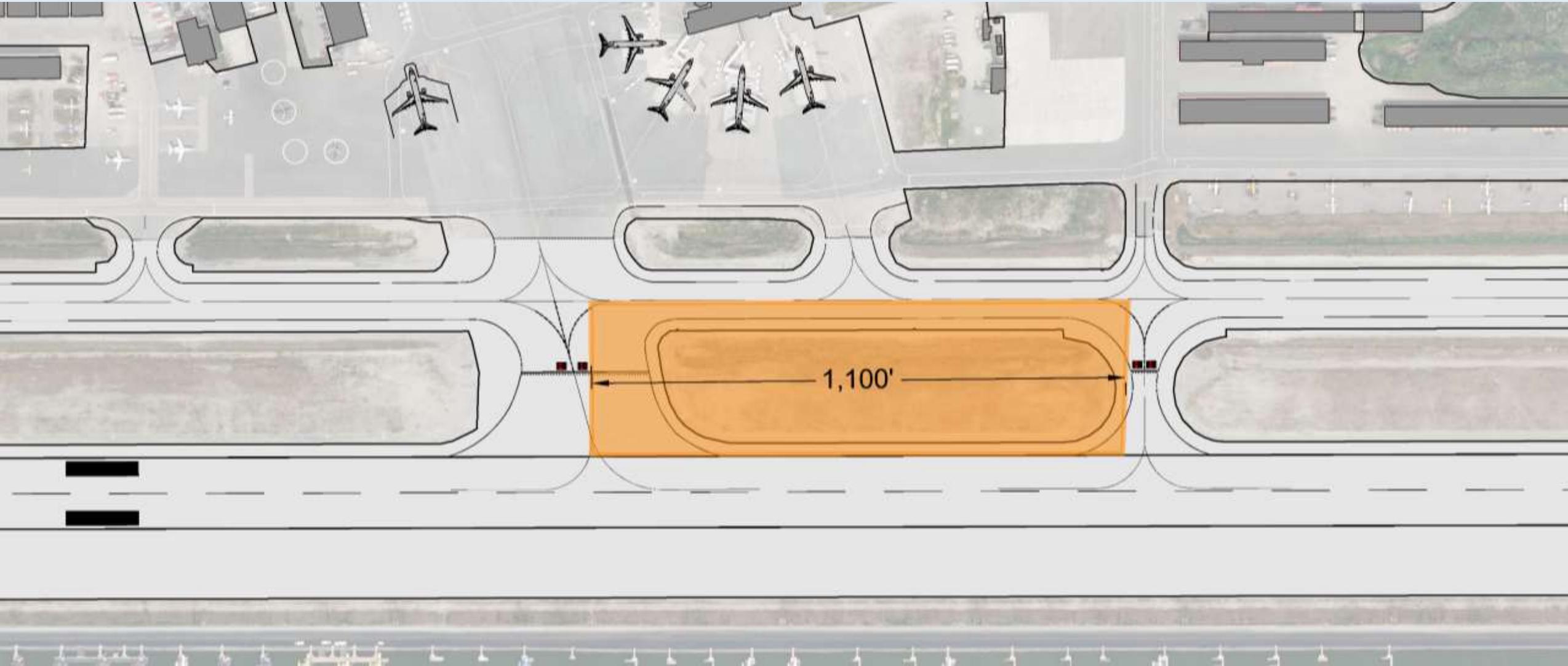
# Runway 26 – Exiting Aircraft Utilization



*\*Utilization under wet conditions*



# Optimal Location for Exit Taxiway





# Potential Mitigation



# Potential Mitigation

## ➔ Non-Construction Mitigation

- » New Training Programs
- » New Communication Protocol
- » Revised Operational Procedures

## ➔ Construction Mitigation

- » Signs, Lighting, Markings,
- » Taxiway Nomenclature
- » Taxiway Geometry



Exhibit Produced By: RS&H, 2016

# Potential Mitigation Non-Construction

## ➔ Air Traffic Controllers

- » Encourage use of correct terminology and proper voice cadence.

## ➔ Pilots

- » Maintaining a sterile cockpit during taxiing, departing, and preparing for arrival.

## ➔ Airport Personnel

- » Promote the use of effective communication and encourage educational seminars for operating on an airfield.



Source: wiki.media.org, 2016

# Potential Mitigation Construction

- ➔ Airfield Design Standards
  - » Surface Painted Signs
  - » Lighting Enhancements
  - » Taxiway Nomenclature
  - » Taxiway Geometry
- ➔ Master Plan Solutions
  - » Taxiway E, D, and C



Source: 20/20 HeinSite, 2016

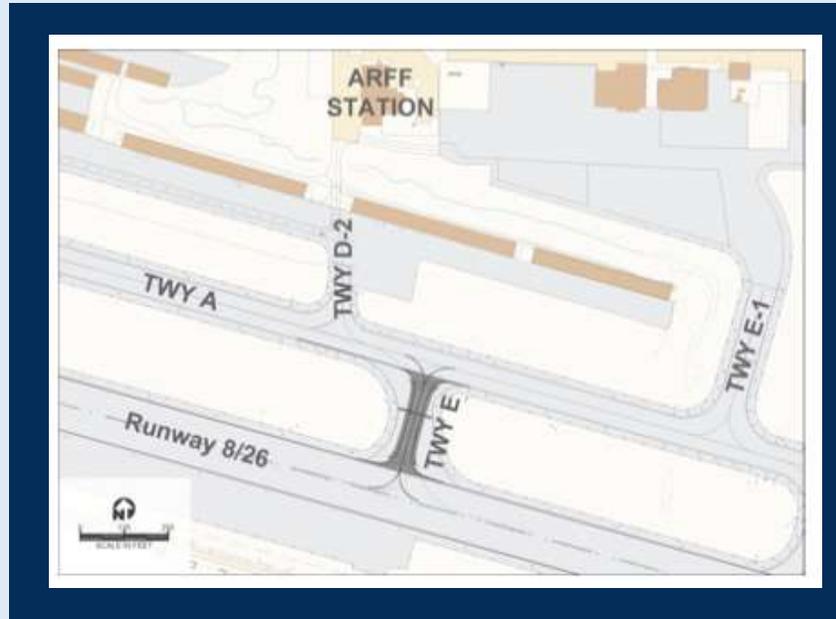


# Master Plan Solutions for Taxiway E

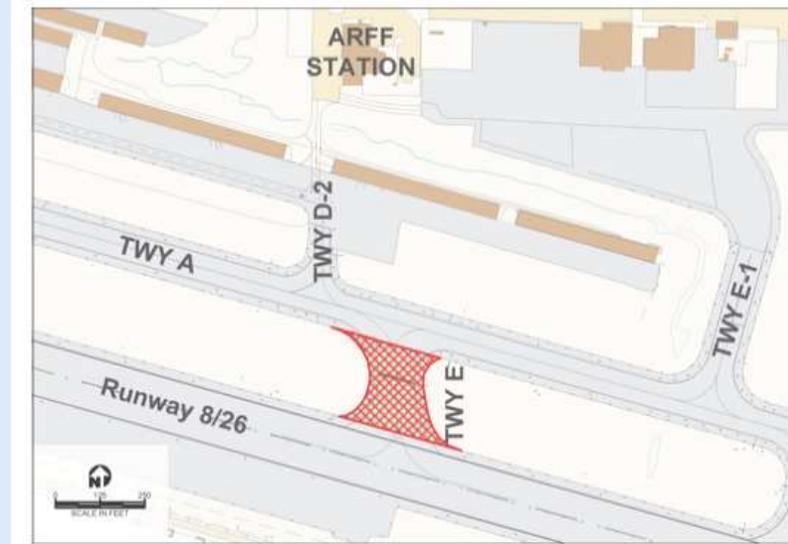
Exhibits prepared by URS Corporation.



Alternative 1 – Do-Nothing



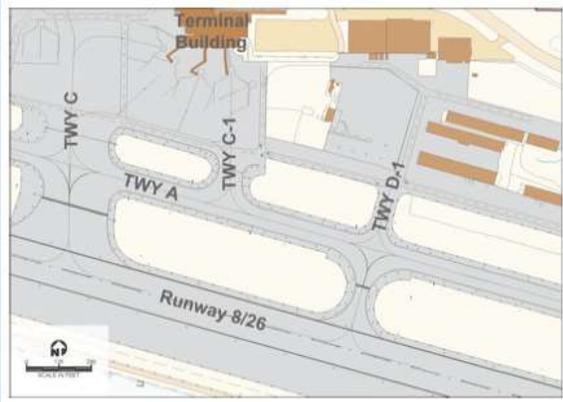
Alternative 2 – Realign and Remark Taxiway



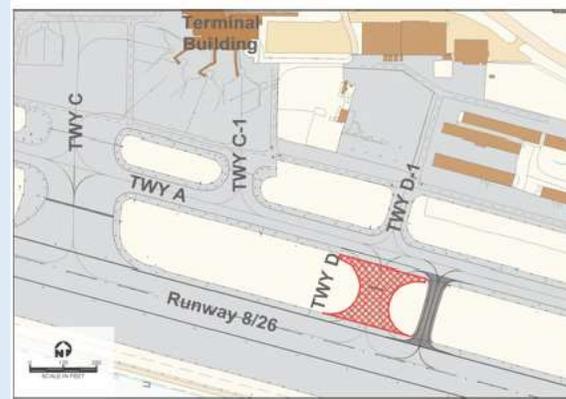
Alternative 3 – Close Taxiway E

# Master Plan Solutions for Taxiway D

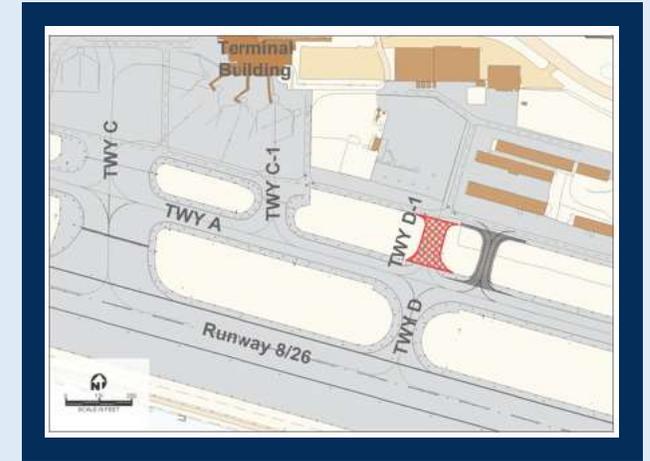
Exhibits prepared by URS Corporation.



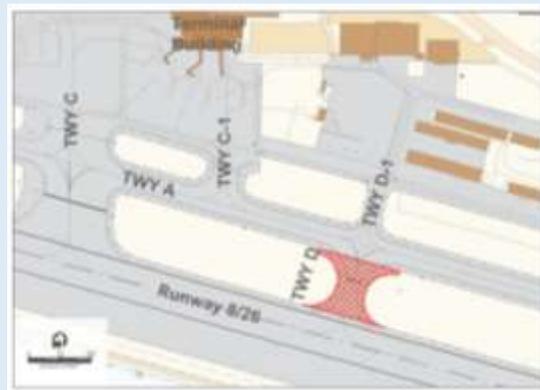
Alternative 1 - Do-Nothing



Alternative 2 - Reposition  
Taxiway D



Alternative 3 - Reposition  
Taxiway D-1



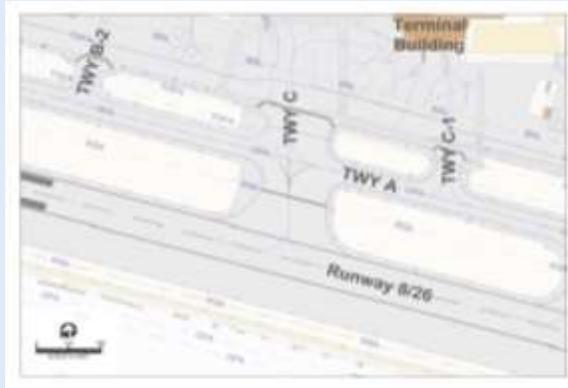
Alternative 4 - Close Taxiway D



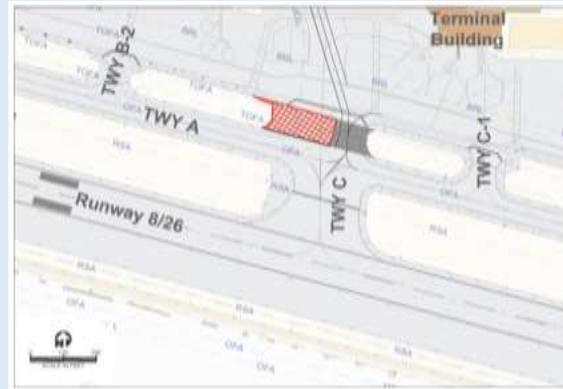
Alternative 5 - Close Taxiway D-1

# Master Plan Solutions for Taxiway C

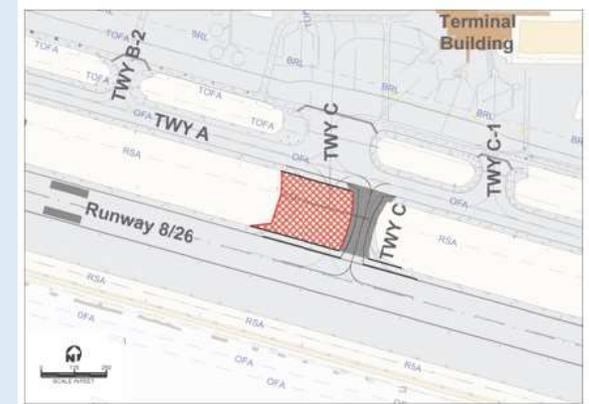
Exhibits prepared by URS Corporation.



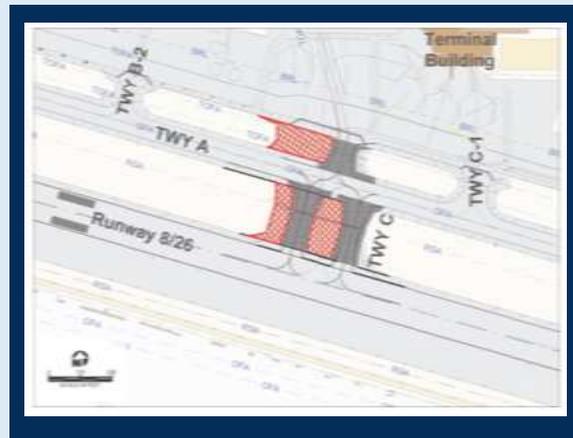
Alternative 1 – Do-Nothing



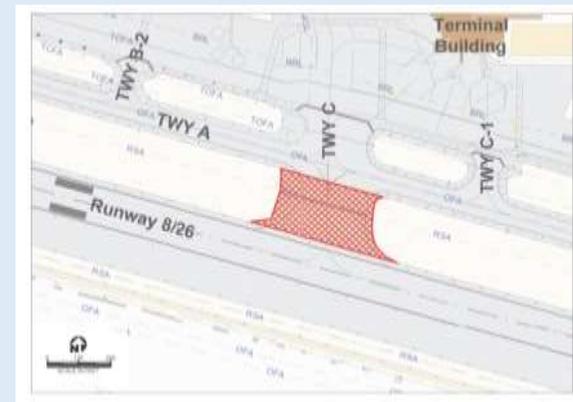
Alternative 2 – Realign Ramp Connection



Alternative 3 – Realign Runway Connection



Alternative 4 – Mark as Dual Taxiway

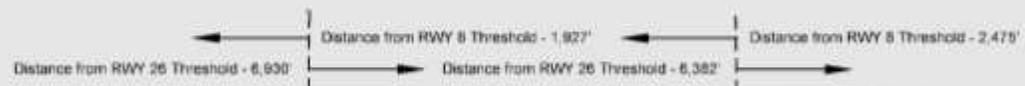
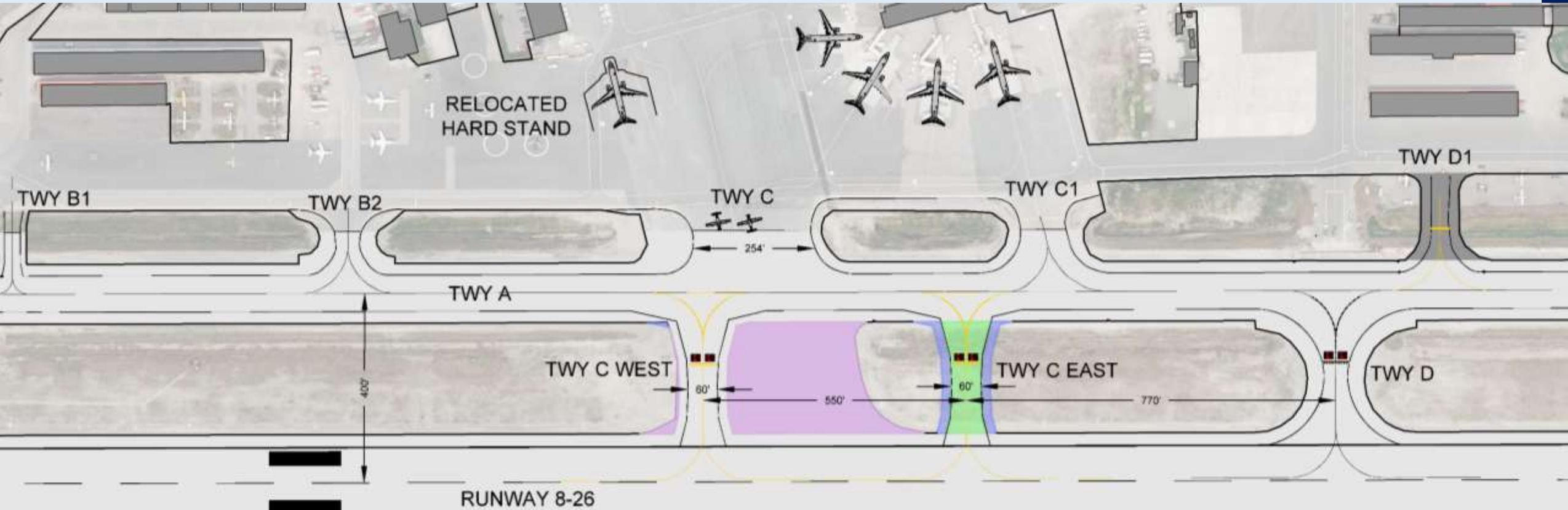


Alternative 5 – Close Taxiway

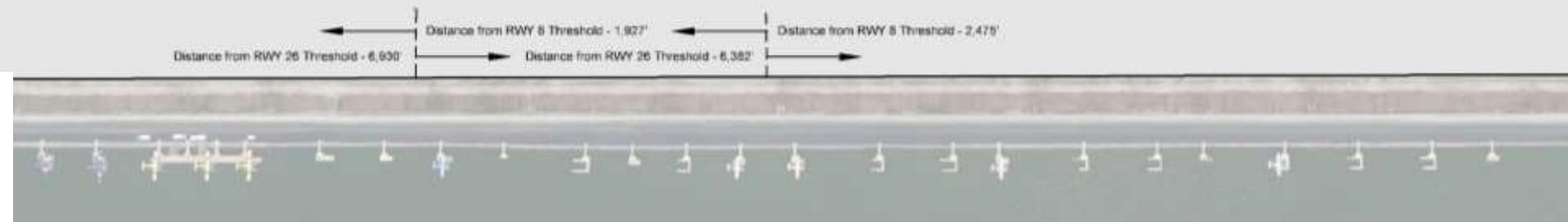




# Option 1



-  Removed Pavement
-  New Taxiway Pavement
-  New Taxiway Shoulder Pavement

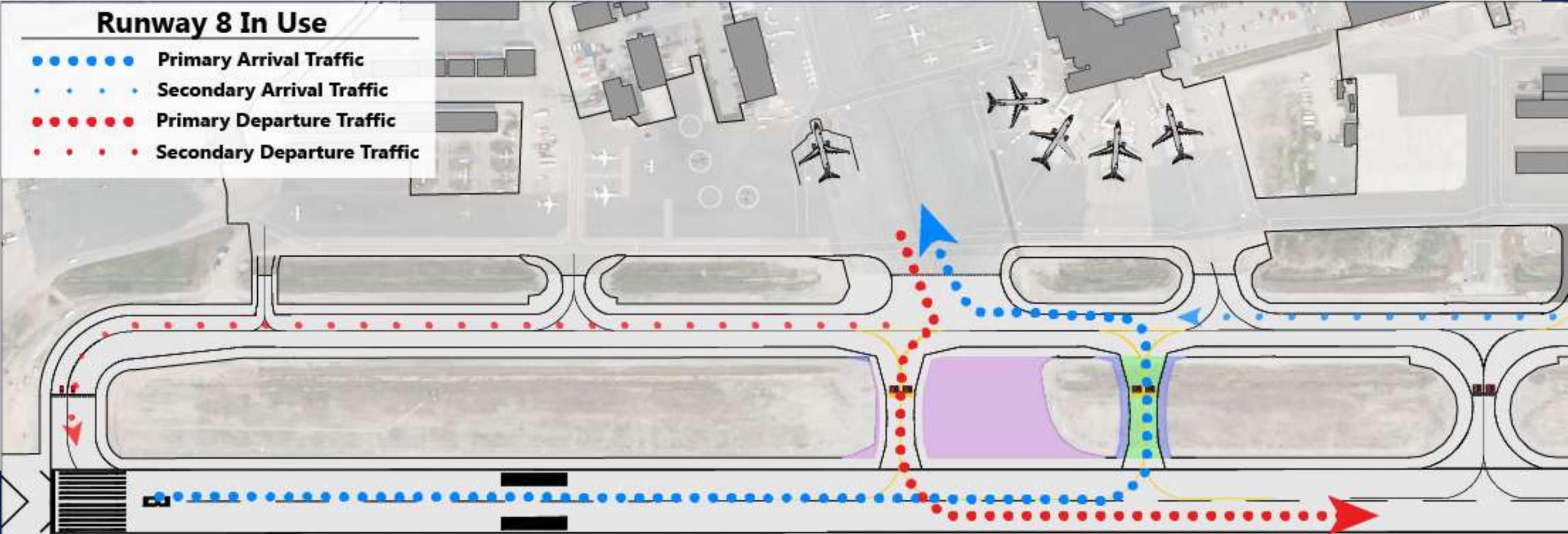




# Potential New Taxiway Flow – Runway 8

## Runway 8 In Use

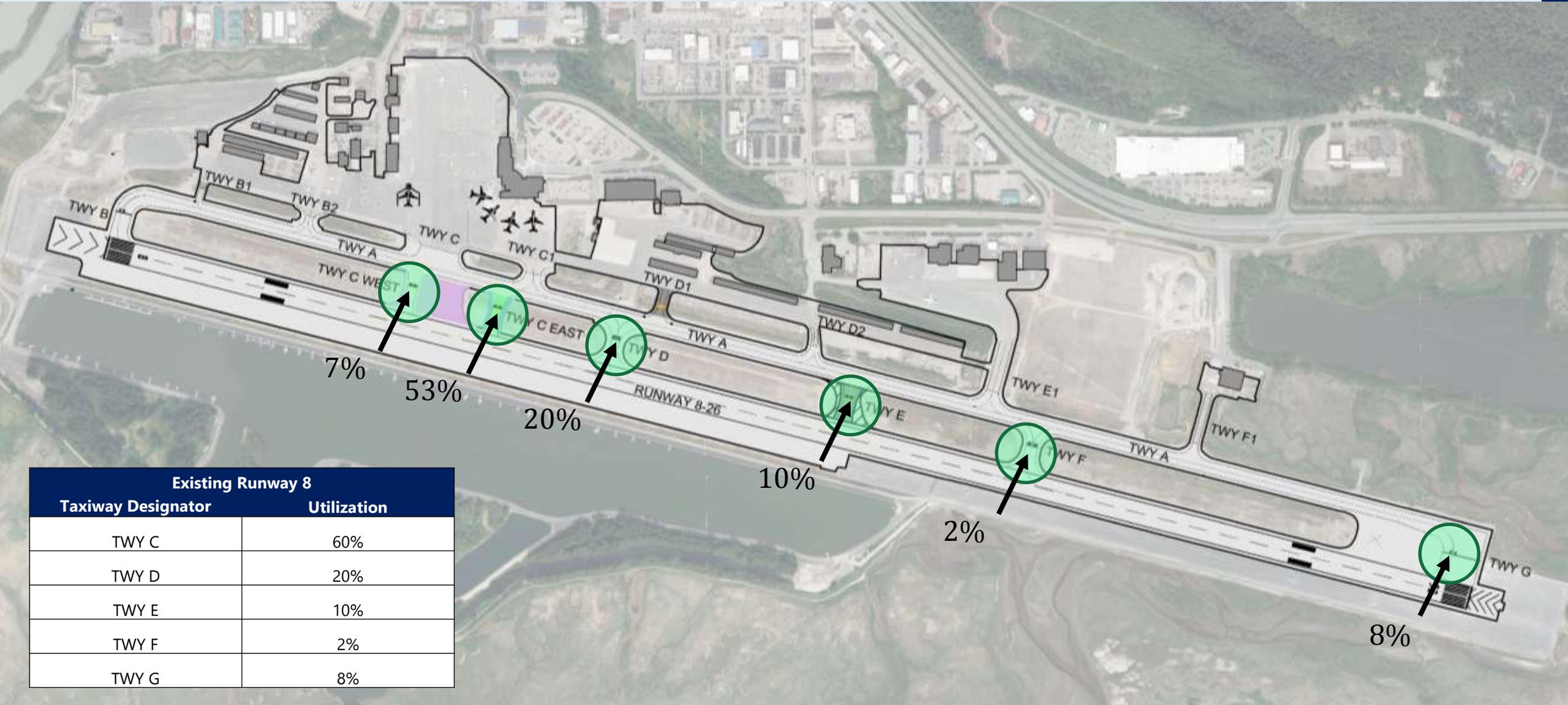
- Primary Arrival Traffic
- Secondary Arrival Traffic
- Primary Departure Traffic
- Secondary Departure Traffic



- Removed Pavement
- New Taxiway Pavement
- New Taxiway Shoulder Pavement



# Potential Utilization – Runway 8



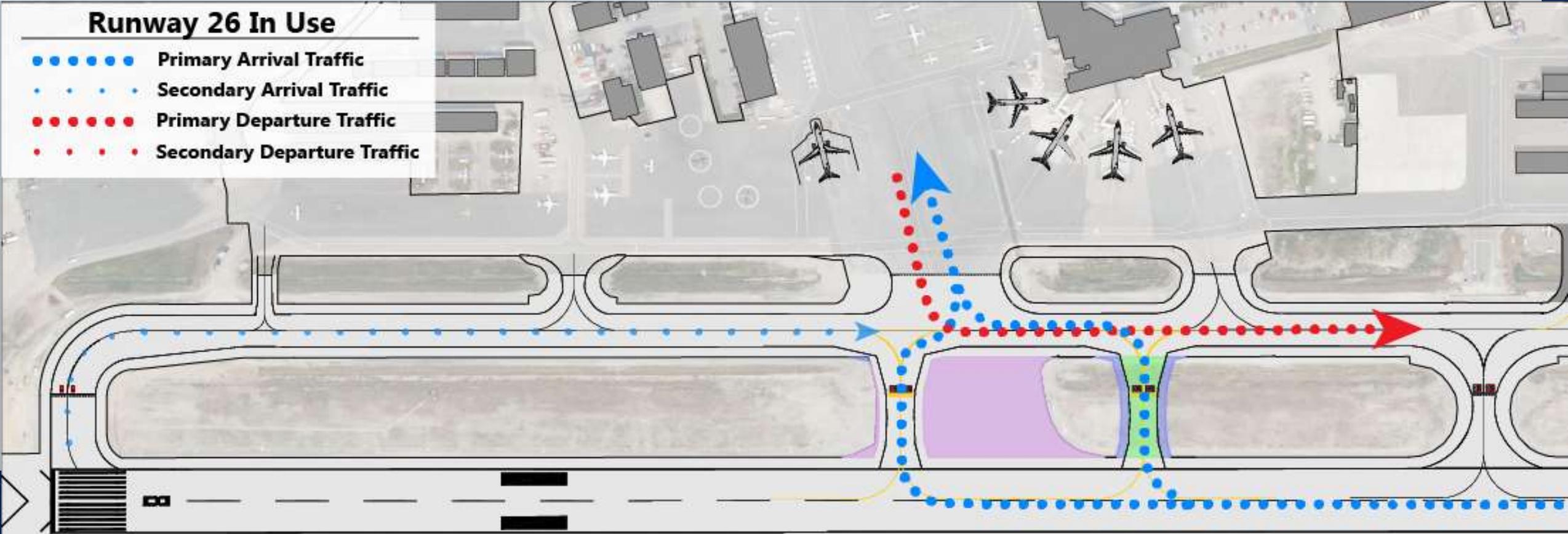
Existing Runway 8	
Taxiway Designator	Utilization
TWY C	60%
TWY D	20%
TWY E	10%
TWY F	2%
TWY G	8%



# Potential New Taxiway Flow – Runway 26

## Runway 26 In Use

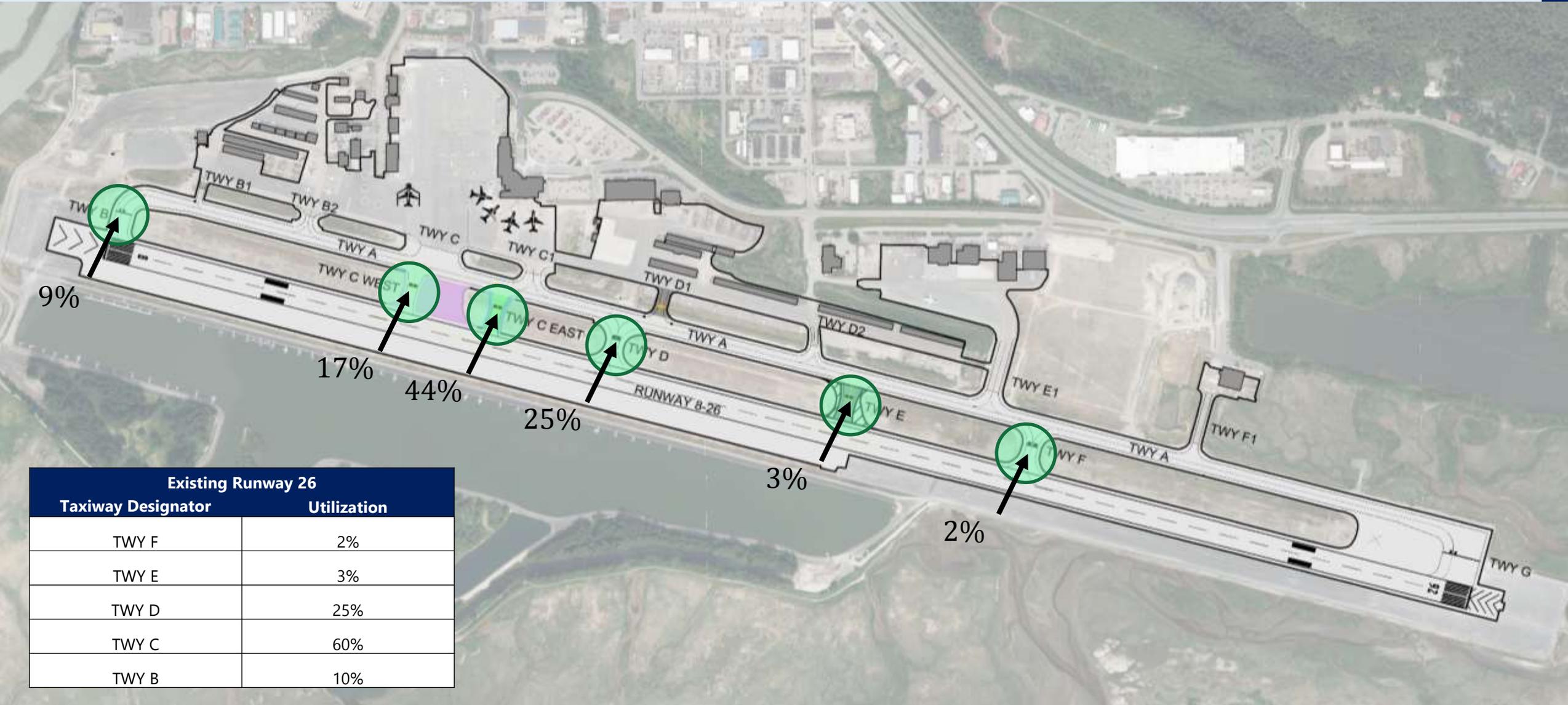
- Primary Arrival Traffic
- Secondary Arrival Traffic
- Primary Departure Traffic
- Secondary Departure Traffic



- Removed Pavement
- New Taxiway Pavement
- New Taxiway Shoulder Pavement



# Potential Utilization – Runway 26

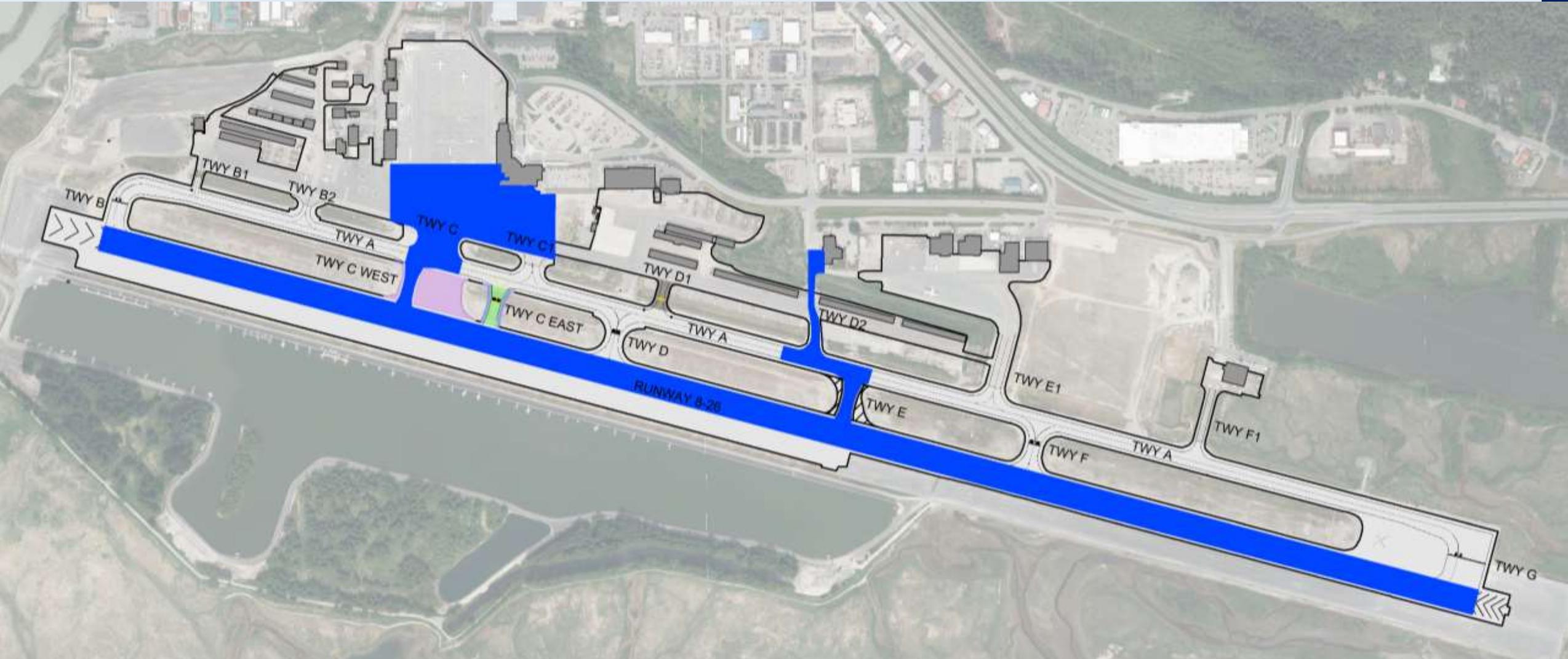


Existing Runway 26

Taxiway Designator	Utilization
TWY F	2%
TWY E	3%
TWY D	25%
TWY C	60%
TWY B	10%



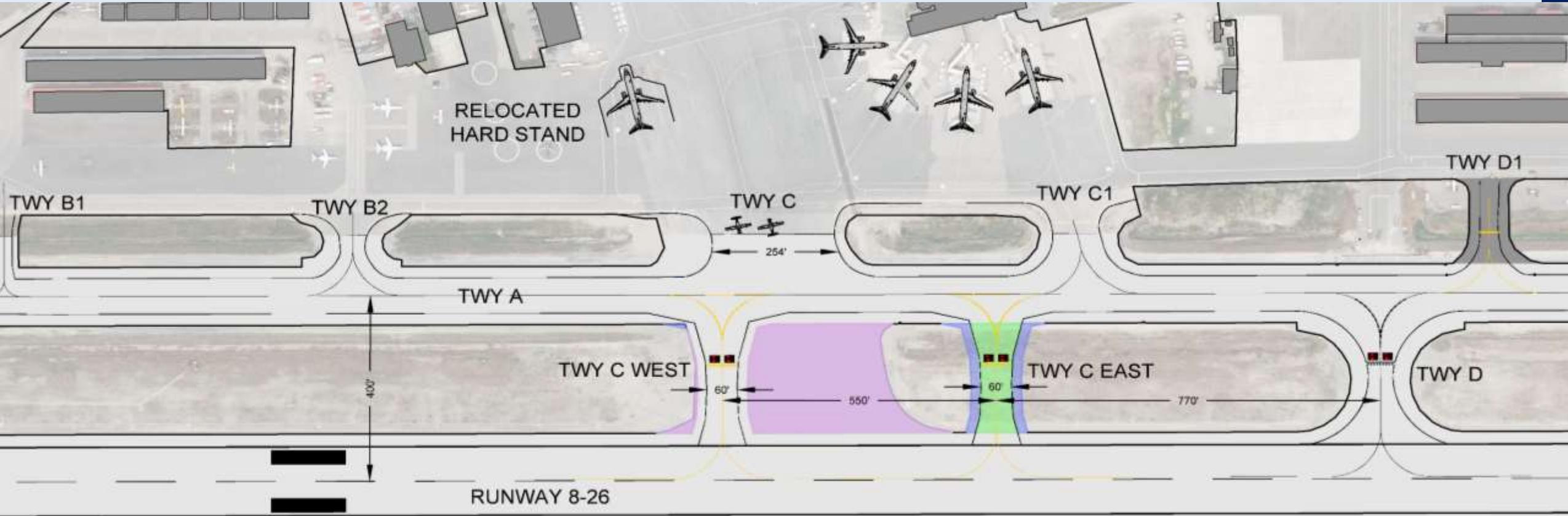
# New Taxiway C - Snow Removal Operations



 Priority One



# Option 1 -

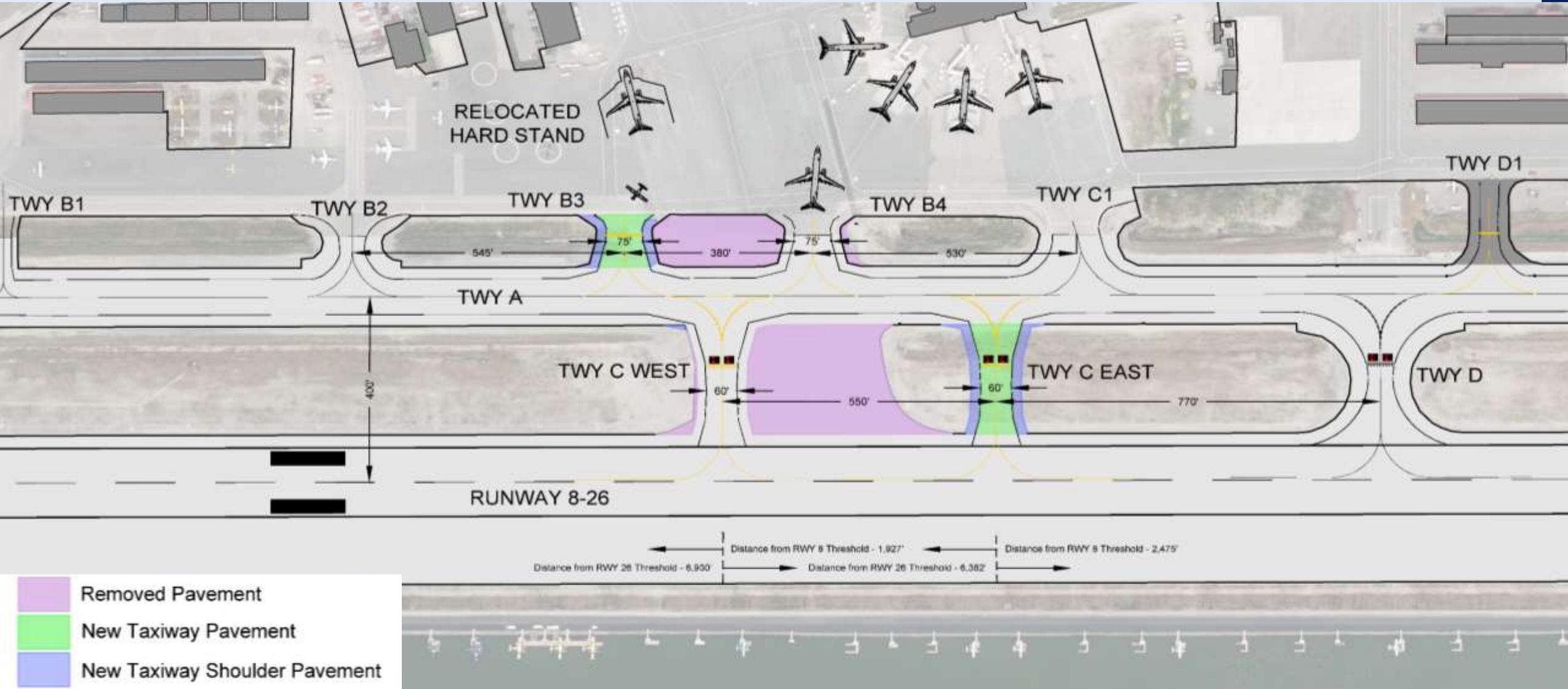


-  Removed Pavement
-  New Taxiway Pavement
-  New Taxiway Shoulder Pavement





# Option 2 -

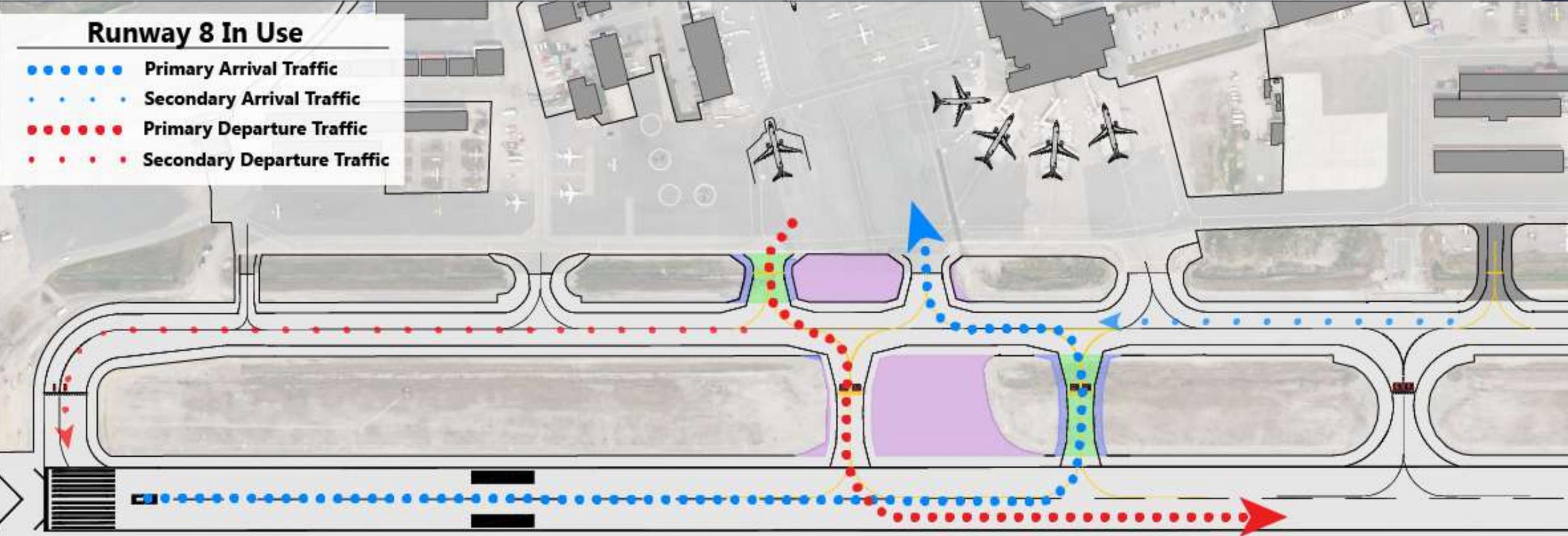




# Potential New Apron Flow – Runway 8

## Runway 8 In Use

- Primary Arrival Traffic
- Secondary Arrival Traffic
- Primary Departure Traffic
- Secondary Departure Traffic

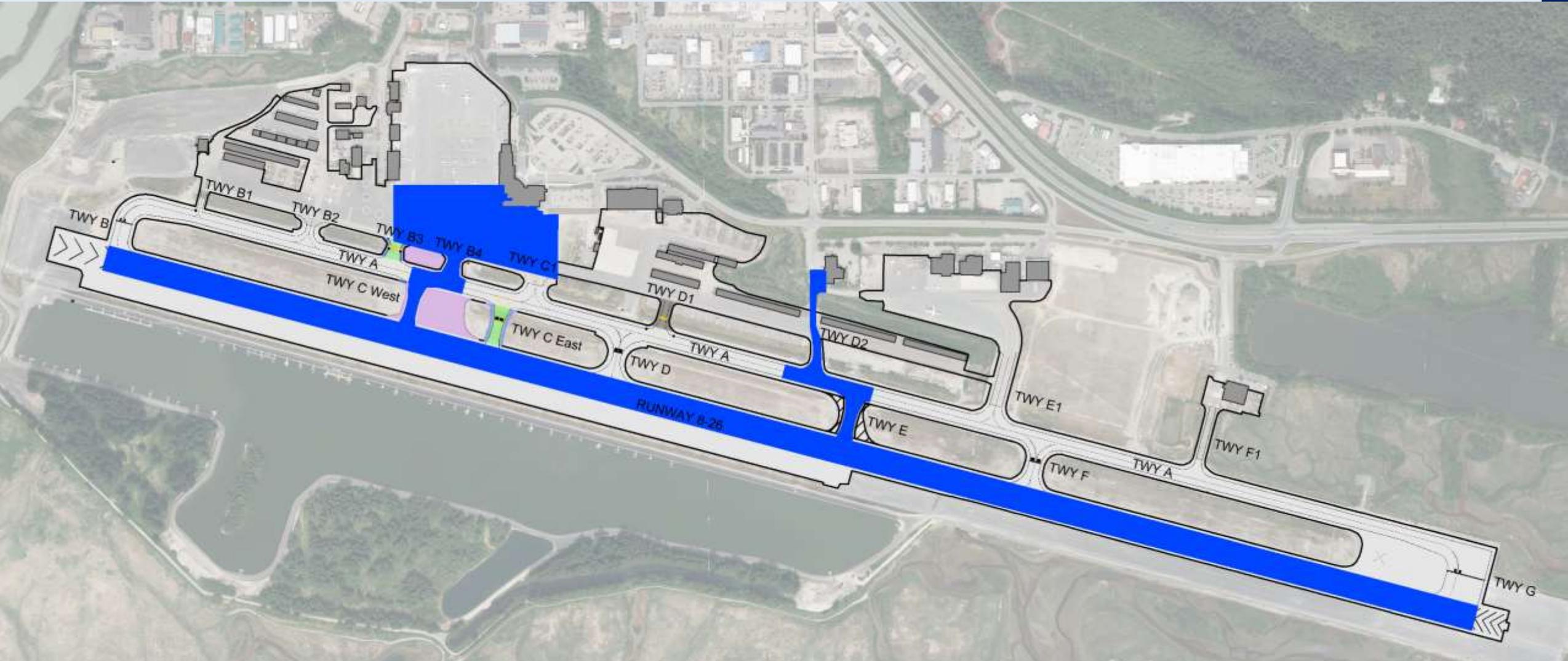


- Removed Pavement
- New Taxiway Pavement
- New Taxiway Shoulder Pavement





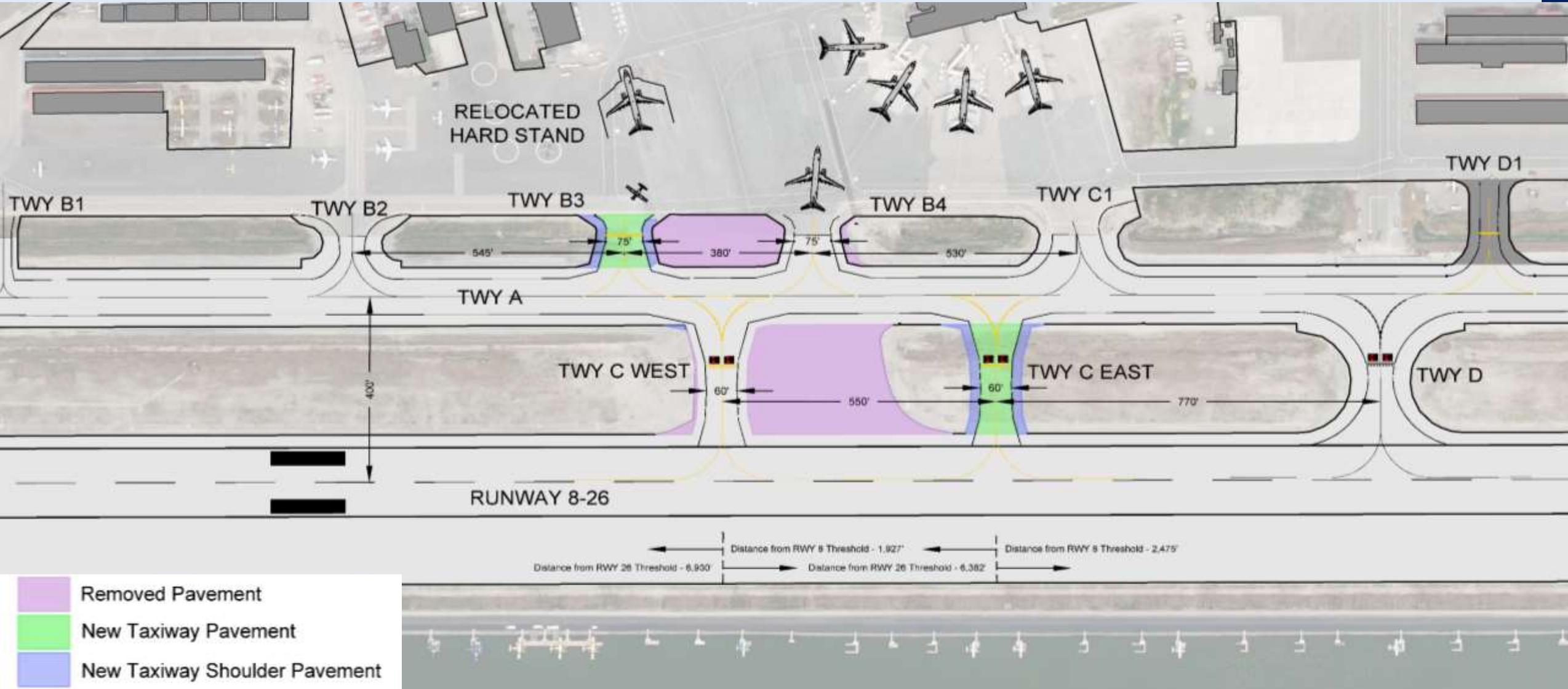
# New Taxiway C - Snow Removal Operations



 Priority One



# Option 2 -





# Next Steps





# Next Steps

- Next Stakeholder meeting in March
- Finish Analysis
- SRM panel be conducted in late March / Early April.



Source: Airliners.net, 2016