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
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

We are here
Process

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

- **Group Includes:**
  - Airlines, Airport Staff, Air Traffic Controllers, FAA and Pilots
- **Vital to have those most familiar with the operations at JNU**
- **We **NEED** the feedback to develop solutions that work**
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)

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

Operational Incidents 13%
Vehicle / Pedestrian Deviation 28%
Pilot Deviation 59%
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**
- 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.
Wide Expanse of Pavement

Width 440’ – non standard

Width 100’ - complies with TDG 3 design standards
Geocode 8

_direct Taxiing Access to Runway from the Ramp_
Geocode 13

✈️ Taxiway Intersects Runway at Other Than Right Angle

- Acute angle taxiway alignment – non standard
- Perpendicular taxiway alignment (90°) – complies with standards
Geocode 14

✈ Short Taxi Distance From Ramp to Runway

Length 455’ - 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

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

**Total Operations:** 27,425

*Operation numbers exclude rotorcraft and float planes

Source: Juneau International Airport Master Plan, 2016

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


### 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 – Exiting Aircraft Utilization

*Taxiway C utilization includes back taxiing operations

**Utilization under wet conditions
Runway 26 – Existing Taxiway C Flow
Runway 26 – Exiting Aircraft Utilization

*Utilization under wet conditions
Optimal Location for Exit Taxiway
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.mediac.org, 2016
Potential Mitigation Construction

ёт Airfield Design Standards
  » Surface Painted Signs
  » Lighting Enhancements
  » Taxiway Nomenclature
  » Taxiway Geometry

ёт 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
Taxiway C – Operational Considerations

- Apron is very congested during peak periods (queuing of departing aircraft).
- Location of facilities (helicopters, hardstand, terminal) contribute to apron congestion.
- Taxiway C is a high priority during snow events.
- 2-way traffic happens everyday
- Small aircraft exit Runway 8/26 and conduct intersection takeoffs at Taxiway C
Option 1

Potential New Taxiway Flow – Runway 8
Potential Utilization – Runway 8

Existing Runway 8

<table>
<thead>
<tr>
<th>Taxiway Designator</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWY C</td>
<td>60%</td>
</tr>
<tr>
<td>TWY D</td>
<td>20%</td>
</tr>
<tr>
<td>TWY E</td>
<td>10%</td>
</tr>
<tr>
<td>TWY F</td>
<td>2%</td>
</tr>
<tr>
<td>TWY G</td>
<td>8%</td>
</tr>
</tbody>
</table>
Potential New Taxiway Flow – Runway 26
Potential Utilization – Runway 26

<table>
<thead>
<tr>
<th>Taxiway Designator</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWY F</td>
<td>2%</td>
</tr>
<tr>
<td>TWY E</td>
<td>3%</td>
</tr>
<tr>
<td>TWY D</td>
<td>25%</td>
</tr>
<tr>
<td>TWY C</td>
<td>60%</td>
</tr>
<tr>
<td>TWY B</td>
<td>10%</td>
</tr>
<tr>
<td>TWY A</td>
<td>9%</td>
</tr>
<tr>
<td>TWY B1</td>
<td>17%</td>
</tr>
<tr>
<td>TWY B2</td>
<td>25%</td>
</tr>
<tr>
<td>TWY A</td>
<td>44%</td>
</tr>
<tr>
<td>TWY C WEST</td>
<td>2%</td>
</tr>
<tr>
<td>TWY C EAST</td>
<td>3%</td>
</tr>
<tr>
<td>TWY D</td>
<td>2%</td>
</tr>
</tbody>
</table>
New Taxiway C - Snow Removal Operations
Option 1 -
Option 2 -
Potential New Apron Flow – Runway 8
Potential New Apron Flow – Runway 26
New Taxiway C - Snow Removal Operations
Next Steps
Next Steps

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

Source: Airliners.net, 2016