Technical Working Group
Introduction

Housekeeping

Involvement:
- The Technical Working Group will be the deliberating body. Questions will be taken from those attending as deemed appropriate and timely.

Member participation:
- Use of name tents.

Website: https://www.asevision.com/twg/
- Other working groups will have their own sites.
- Ours and other working groups meeting dates will be posted so that others and public can attend if desired.
- Data related to each meeting will be placed under their particular headings.
- Support data (general) still remains on the web where it resides today.
Meeting Schedule

Meeting 2 - Diving Deep Part 1: Forecasts, Fleet Mix, Design Aircraft Values Scorecard
September 18, Airport Operations Center, 3 – 4pm (Live Burn Event), 4 – 7 pm (Meeting)

Meeting 3 - Diving Deep Part 2: Aircraft Noise and Emissions, Airplane Design Group
October 2\textsuperscript{nd} Aspen Meadows, Doerr-Hoiser, 4 – 7pm

Meeting 4 - Aspen Airfield: Airport Design 101, Non-Standard Conditions, Green and Carbon Neutral Goals
October 16\textsuperscript{th}, Pitkin County Building, Roaring Fork Room, 4 – 7

Meeting 5 – Report: Finalize and Refine Recommendations
October 23\textsuperscript{rd}, Aspen Police Department Building Meeting Room, 4 - 7 pm
Technical Working Group

Meeting #1 – Agenda (4-7pm)

Mission - To meet our community values and goals what is our preferred "design aircraft"?

I. Review of Vision Process Status and TWG Role Going Forward
II. Review Reference Materials
III. Airport Overview / Operational Metrics
IV. Airport Issues External Factors
V. Setting the Stage / Current Available Aircraft
VI. Lighting Round and Discussion
   • Identify Shared Goals and Priorities
   • What do we need in order to address and recommend the following considerations: Design Aircraft, Implications of Status Quo vs. Airplane Design Group II v. III, Green and Carbon Neutral Airfield.
Reference Materials
How do these reference material documents help us guide a discussion and recommendation?

I. Airport Performance Metrics Technical Memo - 2019
II. Airport Master Plan - 2012
III. Airport Layout Plan - 2016
IV. EA - 2015
V. Airspace Impact and Aircraft Feasibility Assessment - 2018
Technical Working Group

Strategic Questions

To meet our community values and goals what is our preferred "design aircraft"?

- How could the existing or future "fleet mix" meet the air pollution reduction, limited enplanement growth, and noise abatement goals established by the ASE Vision process?
- In light of those community goals, what does the future airfield look like in terms of safety and airport design?
- What are the implications of the status quo VS Airplane Design Group II VS Airplane Design Group III? Could any variations exist within these design groups that might help us attain our community goals?
- How could our future airfield be as green and carbon neutral as possible?
Technical Working Group Deliverables
Process Timeline
AVC Guiding Principles

• Reduce overall airport emissions (aircraft & facilities) by 20-30% [Target for Overall Airport Emissions]

• Reduce noise levels by 20-30% [Target for Airport Noise Intensity]

• Accommodate limited growth [Airport Commercial Enplanement Target of .8%]
Deliverables by November to Report Back to the Airport Vision Committee

I. Design Aircraft Values Scorecard
   • Rank available aircraft to community values and goals

II. Answers to Strategic Questions
   • Preferred Design Aircraft, ADG, Green and Carbon Neutral Airfield
   • Identify areas of conflict and areas of group alignment

III. Success Factors for TWG
    • Community Character Lens

IV. Other Recommendations | Considerations
   • Other factors, comments, captured dialogue
Airport Overview
Airport Metrics - Historical

I. Enplanements
II. Aircraft Operations
III. TSA Baggage Screening
IV. Fuel Revenue
Historical Enplanements - Annual 2008 - 2018

Historical Enplanements - Monthly Trends

Monthly Enplaned Passengers
Aspen/Pitkin County Airport

Source: U.S. Department of Transportation, online database, accessed April 2019
Enplanements - Forecast Comparison

ASE Forecast Comparison

- 2018 Terminal Area Forecast Total Enplanements
- 2012 Master Plan Forecasted Total Enplanements (2012-2027)
- 2015 Environmental Assessment Forecasted Total Enplanements (2023-2033)*
- August 2019 Leigh Fisher Forecasted Total Enplanements (2019-2048)
- Actual Enplanements

CAGR:
- 1.79% CAGR 2006-
- 1.89% CAGR 2015-
- 1.5% CAGR 2018-
- 0.8% CAGR 2018-

Total Enplanements

Year


0 50000 100000 150000 200000 250000 300000 350000 400000 450000 500000
Aircraft Operations

**Historical Aircraft Operations**

Aspen/Pitkin County Airport

<table>
<thead>
<tr>
<th>Year</th>
<th>Air carrier</th>
<th>Air taxi</th>
<th>Commuter</th>
<th>Total</th>
<th>General aviation</th>
<th>Military</th>
<th>Total aircraft operations</th>
<th>Percent increase (decrease)</th>
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<tbody>
<tr>
<td>2000</td>
<td>7,632</td>
<td>7,199</td>
<td>14,831</td>
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<td>48,818</td>
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<td>9,098</td>
<td>15,996</td>
<td>29,930</td>
<td>121</td>
<td>46,447</td>
<td>-5.7%</td>
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<td>6,902</td>
<td>10,374</td>
<td>16,556</td>
<td>29,977</td>
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<td>46,441</td>
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<td>5,224</td>
<td>12,646</td>
<td>17,870</td>
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<td>5,223</td>
<td>12,622</td>
<td>17,745</td>
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<td>12,786</td>
<td>19,166</td>
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<td>20,598</td>
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<td>19,171</td>
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<td>9,465</td>
<td>8,797</td>
<td>18,262</td>
<td>18,493</td>
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<td>9,926</td>
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<td>9,674</td>
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<td>18,060</td>
<td>237</td>
<td>39,124</td>
<td>10.7%</td>
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<td>9,310</td>
<td>10,248</td>
<td>19,558</td>
<td>21,448</td>
<td>334</td>
<td>41,340</td>
<td>5.5%</td>
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<tr>
<td>2017</td>
<td>9,926</td>
<td>10,865</td>
<td>20,491</td>
<td>21,509</td>
<td>251</td>
<td>42,425</td>
<td>2.6%</td>
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<tr>
<td>2018</td>
<td>11,590</td>
<td>9,514</td>
<td>21,104</td>
<td>19,867</td>
<td>267</td>
<td>41,238</td>
<td>2.8%</td>
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<td>January-March</td>
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<td>3,004</td>
<td>8,137</td>
<td>5,677</td>
<td>56</td>
<td>13,850</td>
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<td>3,323</td>
<td>7,766</td>
<td>5,216</td>
<td>28</td>
<td>13,010</td>
<td>6.1%</td>
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</table>

### Compound average percent increase (decrease)

- 2000-2010: 2.4% (1.0%) (1.8%) (5.1%) (6.8%) (12.9%)
- 2010-2018: 2.3 (2.3) (2.3) (0.0) (10.7) 1.2
- 2000-2018: 2.3 (1.6) 2.0 (2.9) 0.6 (6.9)

Note: Includes arrivals and departures.

TSA Bags Screened

Note: *2019 data only includes baggage count from January-April 2019
Fuel Flowage Revenue

Annual Fuel Flowage Fee Revenue at ASE

Note: *2019 data only includes fuel sales from January-March 2019
Airport Issues
External Factors
Airport Issues / External Factors

What external factors are important to know and consider?

I. Aging Commercial Service Aircraft
II. Design Standards
   ▪ Runway/Taxiway Separation (320 vs. 400 feet)
   ▪ Pavement Strength – Approx. 150,000 Landing Weight
III. NexGen
IV. Electric Aircraft
Setting the Stage... for a deeper discussion on design aircraft
Available Aircraft

What aircraft are available to serve ASE?

| Aircraft | Manufacturer | Model    | Physical Class (Engines) | AIC | Seating | Weight (lbs) | MTOW | Noise | $\text{EPPA Noise Level}$ | $\text{EPPA Noise Level - Approach}$ | $\text{EPPA Noise Level - Taxi}$ | $\text{ICN Total BLT (Engines)}$ | $\text{ASE Mixed Approach Qualifier Factor}$ | $\text{ASE Operational Capability}$ |
|----------|--------------|----------|--------------------------|-----|---------|--------------|------|-------|---------------------------|--------------------------------------|----------------------------------|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| B737-800 | Boeing       | B737-800 | C                        | C   | 160     | 90,400       | 150  | 85.6  | 85.6                      | 85.6                                 | 85.6                             | 90.2                             | 90.2                             | 90.2                             | 90.2                             |
| A320     | Airbus       | A320     | C                        | C   | 160     | 160,000     | 150  | 85.6  | 85.6                      | 85.6                                 | 85.6                             | 90.2                             | 90.2                             | 90.2                             | 90.2                             |
| A321     | Airbus       | A321     | C                        | C   | 180     | 160,000     | 150  | 85.6  | 85.6                      | 85.6                                 | 85.6                             | 90.2                             | 90.2                             | 90.2                             | 90.2                             |
| A332     | Airbus       | A332     | C                        | C   | 200     | 160,000     | 150  | 85.6  | 85.6                      | 85.6                                 | 85.6                             | 90.2                             | 90.2                             | 90.2                             | 90.2                             |
| A333     | Airbus       | A333     | C                        | C   | 220     | 160,000     | 150  | 85.6  | 85.6                      | 85.6                                 | 85.6                             | 90.2                             | 90.2                             | 90.2                             | 90.2                             |
| A334     | Airbus       | A334     | C                        | C   | 240     | 160,000     | 150  | 85.6  | 85.6                      | 85.6                                 | 85.6                             | 90.2                             | 90.2                             | 90.2                             | 90.2                             |
| A335     | Airbus       | A335     | C                        | C   | 260     | 160,000     | 150  | 85.6  | 85.6                      | 85.6                                 | 85.6                             | 90.2                             | 90.2                             | 90.2                             | 90.2                             |
| Boeing 777 | Boeing     | 777      | C                        | C   | 300     | 250,000     | 150  | 95.6  | 95.6                      | 95.6                                 | 95.6                             | 95.6                             | 95.6                             | 95.6                             | 95.6                             |

ICAO Aircraft Certification - Noise Reference Points

Trajectory and Certification Locations

Certification Points:
- Flyover
- Lateral
- Approach
Combined Noise Data by Aircraft

Source: ICAO Noise Certification Data Base, August 2019
Combined Emissions Per Passenger

Source: ICAO Emissions EASA Data Base, August 2019
Community Values
ASE Community Values Specific to Determining the Preferred Design Aircraft

- Safety in the Air and on the Ground
- Adaptable, Flexible, Future Proof
- Environmental Responsibility
- Economic Vitality
- Efficiency – an airport that works well
Lighting Round and Discussion
Technical Working Group Discussion

I. After the discussion today, let us know what you need in order to address and make a recommendations.

II. How do our community values align with characteristics of design aircraft?

III. How will the TWG define success when we consider an approach to the strategic questions.
Next Steps
Meeting Schedule

Meeting 2 - Diving Deep Part 1: Forecast, Fleet Mix, Design Aircraft Values Scorecard
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Meeting 3 - Diving Deep Part 2: Aircraft Noise and Emissions, Airplane Design Group
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Meeting 4 - Aspen Airfield: Airport Design 101, Non-Standard Conditions, Green and Carbon Neutral Goals
October 16th, Pitkin County Building, Roaring Fork Room, 4 – 7

Meeting 5 – Report: Finalize and Refine Recommendations
October 23rd, Aspen Police Department Building Meeting Room, 4 - 7 pm
Thank You
Are we missing anything?
Flyover Noise by Aircraft

Source: ICAO Noise Certification Data Base, August 2019
Approach Noise by Aircraft

Source: ICAO Noise Certification Data Base, August 2019
Lateral/Full-Power Noise by Aircraft

Source: ICAO Noise Certification Data Base, August 2019
NOx Emissions Per Passenger

Source: ICAO Emissions EASA Data Base, August 2019
CO Emissions Per Passenger

Source: ICAO Emissions EASA Data Base, August 2019
Hydro Carbon Emissions Per Passenger

Hydro Carbon Emission Per Passenger (g/kg)

Source: ICAO Emissions EASA Data Base, August 2019