The Master Plan is a **20-year plan** to understand the needs of current and future users of the Airport. This is important to ensure that **safe and orderly development** of the Airport occurs in a manner that is **reflective of community values and goals**. This plan is developed through a **purposeful, inclusive, and educational process**.

**Key Features**

- Planning is not prejudicial or constrained – *no predetermined outcomes*
- Plan must be based on current conditions, community input, FAA design standards, and forecasts
Airport Economic Impact – 2012 WSDOT Economic Impact Data

**Multiplier Effect:**
Initial economic impacts from Airport enter economy and re-circulate which generate successive rounds of employment, taxes, spending, and output.

- **Total Employment:** 243
- **Paid Taxes:** $1.0 M
- **Visitor Spending:** $9.2 M
- **Airport Business Regional Impact:** $14.9 M

*Note: All impacts are shown in 2010 dollars*
Potential Project Funding Sources

- **FAA Grants** – provide 90% of the total cost of an eligible capital project
  - FAA Airport Improvement Program grants come from Aviation Trust Fund-funded by aviation system user fees
Outreach

- Planning Advisory Committee
- Website
- Public Open Houses
- Government Briefings
- Focus Groups (Stakeholders)
  - Pilot Group
  - Business Group
  - Noise
  - Floodplain/Hydrology
Airport Overview
Current Runway Length, Width, & Orientation:

- 15L/33R - 2,671 feet x 36 feet
- Displaced Thresholds:
  - Runway 15 – 452’ to south
  - Runway 33 – 241’ to north

A displaced threshold is a runway threshold located at a point other than the physical beginning or end of the runway. The portion of the runway so displaced may be used for takeoff but not for landing.
Displaced Threshold: Runway Pavement NOT Available for Landing
Obstructions – Reason for Displaced Thresholds

**Runway 15L**
- Railroad tracks
- Power Lines
- Trees

**Runway 33R**
- Airport Way
- Power Lines
- Trees
Snohomish County Code (SCC) regarding Density Fringe have been a driving factor since we last met.

Priority has been to resolve safety issues of:

- Runway Displaced Thresholds
  - Current 2671’ runway provides *useable* runway length of 2219’ for landing to the south and 2430’ for landing to the north
  - Full runway length is available for departures

- Airport Way
  - Current roadway alignment is in the runway protection zone and FAA recognizes it as a safety concern
To meeting SCC regulations and meet FAA safety standards, our recommendation is a 2400’ x 75’ runway and a relocation of Airport Way.

This solution serves Harvey Field’s existing aircraft fleet mix, improves aviation safety and improves roadway safety.

Now, how we got here and what it means....
Environmental Inventory
Prior to the construction of any improvement, projects must undergo required local, state and/or federal environmental review and approval processes.
Snohomish River Storage Area Map

- Storage Area #3
- Storage Area #9
- Storage Area #2
**Noise Abatement Procedures**

- Long-standing procedures in place at Harvey Field
- Ongoing pilot education
- Noise Hotline - 360-568-1541, ext. 261
- Information at [www.harveyfield.com](http://www.harveyfield.com)
Existing Noise Contours
Alternatives Evaluation
Time to Find Workable Options

- Local & FAA standards and regulations
- Planning and engineering standards
- Environmental and floodplain regulations
FAA Safety Standards for Aircraft Currently at Harvey Field

**RUNWAY DESIGN CODE (RDC)**

- **A-I**
  - Cessna 150
  - Pilatus PC-12

- **B-I**
  - Beech Baron 58
  - Beech King Air 200

- **B-III**
  - ATR 72
  - Lear 60

- **C-II**
  - CL 604 Challenger
  - Airbus A319

- **D-II**
  - Gulfstream IV (G450)
  - Boeing 757

**FREQUENT FLYERS AT S43**

- **C-I**
  - DeHavilland Twin Otter (DHC-6)

- **C-III**
  - DeHavilland Caravan 208B

- **D-IV**
  - Cessna Caravan 208B

- **D-IV**
  - TBM 700

- **D-IV**
  - Quest Kodiak

- **D-IV**
  - KingAir 200
Airport Way Road Improvement
- Build on Airport Property
- Build at safe distance from Runway
- Meet Density Fringe requirements
- Meet FEMA’s requirement for base flood elevation (BFE) impact
- Meet Snohomish County Road Standards
- Improve substandard curves and shoulder widths
- Avoid wetlands

Runway
- Serve same aircraft as now
- Build at safe distance from Airport Way
- Meet Density Fringe and FEMA BFE requirements
- Clear approaches over BNSF, Airport Way, and power lines
SAFETY & OPERATIONAL FACTORS

Ability to safely accommodate future demand aircraft
Safety for vehicles on Airport Way
Evaluated based on anticipated improvements to address:
- Operational safety
- Capacity and delay
- Tenant convenience
- Ability to meet FAA design standards

ENVIRONMENTAL FACTORS

FAA Order 1050.1E
Potential physical impacts to surrounding community
Ability to meet County planning and environmental standards

ECONOMIC CONSIDERATIONS

Historic infrastructure investment
Remaining useful life of existing facilities
Anticipated project costs
Property acquisition requirements
Cost-effectiveness evaluation
Economic impact

IMPLEMENTATION FEASIBILITY

Tangible factors
- Practicality of implementation

Intangible factors
- Community values
- Political environment
The maximum width (sum of widths) of all new construction, substantial improvements or other development **shall not exceed 15 percent** of the length of a line drawn perpendicular to the known floodwater flow direction at the point where the development(s) is located. The length of said line shall not extend beyond the property boundary or the edge of the density fringe area, whichever is less. The limitations of this section shall not apply to those uses listed in SCC 30.65.260.

- All of Harvey Field property is within the Density Fringe
- New construction is Fill – anything that diverts or blocks Flood flows
- Sum of Fill widths / Total property width = 15% or less
Example from County Flood Permit Application:

- Determine the general floodplain flow direction
- Draw a line perpendicular to the flow direction
- Draw the line where it intersects the largest width of new construction as a percentage of property width.
- Sum of Fill widths/Total property width must be less than 15%

Example: Flow Obstruction and Blockage Calculations

900’ property width
70’ new obstruction width
70’/900’ = 7.8% < 15%
Flow Obstruction/Blockage Calculations

- **4098’ property width**
- **571’ new obstruction width**
- **571’/4098’ = 13.9% < 15%**

### Section A-A

#### Table: Section A-A

<table>
<thead>
<tr>
<th>Feature</th>
<th>Width</th>
<th>% of Property Width</th>
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<tbody>
<tr>
<td>Property Width</td>
<td>4097.7'</td>
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<tr>
<td>New Fill</td>
<td>570.8'</td>
<td>13.9%</td>
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<tr>
<td>New Cut</td>
<td>929.9'</td>
<td>22.7%</td>
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<tr>
<td>Culvert Openings</td>
<td>60.0'</td>
<td>1.5%</td>
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<tr>
<td>Fill - Culverts</td>
<td>510.8'</td>
<td>12.5%</td>
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</tbody>
</table>
Flow Obstruction/Blockage Calculations

1844’ property width
348’ new obstruction
width less 80’ culvert
opening areas from new
obstruction width = 268’

348’-80’ = 268’

268’/1844’ = 14.5% < 15%
The land area occupied by any use or development permitted by this chapter located in the density fringe area that will displace floodwaters shall not exceed two percent of the land area of that portion of the lot. The limitations of this section shall not apply to those uses listed in SCC 30.65.260.

*What does 2% mean with regard to Harvey Field?*

- All of Harvey Field is within the Density Fringe...so SCC applies everywhere
- 2% of 204.48 (Harvey Field property) = 4.090 acres
Fill & Cut Area Calculations

Green = Fill Area
Red = Cut Area

<table>
<thead>
<tr>
<th>CUT/FILL AREAS</th>
<th>AREA (AC.)</th>
<th>% OF PROPERTY</th>
<th>VOLUME (CU. YD.)</th>
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</thead>
<tbody>
<tr>
<td>HARVEY FIELD PROPERTY</td>
<td>204.480</td>
<td>-</td>
<td>-</td>
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<tr>
<td>NEW FILL</td>
<td>3.927</td>
<td>1.92%</td>
<td>33,940</td>
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<td>NEW CUT</td>
<td>18.872</td>
<td>9.23%</td>
<td>57,760</td>
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<td>CULVERT OPENINGS</td>
<td>0.448</td>
<td>0.22%</td>
<td>2,890</td>
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<tr>
<td>FILL - CULVERTS</td>
<td>3.479</td>
<td>1.70%</td>
<td>31,050</td>
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</table>
The following uses shall be exempt from the maximum allowable density and obstruction limitations of SCC 30.65.250 and 30.65.255:

(1) Water-dependent utilities; (2) Dikes; (3) Utility facilities; and (4) Public Works, when the project proponent demonstrates that the floodwater displacement effects of the proposal when considered together with the maximum potential floodwater displacement allowed by SCC 30.65.250 and 30.65.255 shall not cause a cumulative increase in the base flood elevation of more than one foot.

Snohomish County confirmed “Public Works” includes Airport Way as a public road
“...demonstrates that the floodwater displacement effects of the proposal when considered together with the maximum potential floodwater displacement allowed by SCC 30.65.250 and 30.65.255”

- **Base Flood** = the 100-year flood elevation, as shown on the current FEMA Flood Insurance Rate Maps (FIRMs)
- Floodwater displacement means that for every piece of material placed in construction of the road will take up some space that was previously available for water storage or conveyance during a flood.
- Road relocation floodwater displacement calculation assumes that the maximum 2% area and 15% blockages will eventually occur on all properties located in the floodplain.
- WEST Consultants ran the same model including all of the proposed improvements (Runway, Taxiway, and Airport Way).
- SCC only requires BFE modeling for Public Works projects, i.e. Airport Way.
- **Our approach included road, runway, and taxiway improvements.**
- **The model shows an 0.00’ rise in the base flood elevation.**
Alternatives
Airport Way Relocation Options
Alternative 1: New 3,400-foot Runway Using Existing Runway as Taxiway
Alternative 1A: New 2,850 Runway Using Existing Runway as Taxiway
Alternative 1B: New 2,400-foot Runway Using Existing Runway as Taxiway
Alternative 2: New 3,400-foot Runway and Taxiway
Alternative 3: New 3,400-foot Runway and Move Airport Way South
Alternative 4: New 2,400-foot Runway and Move Airport Way South
# Summary of Runway Alternatives

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<tr>
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<tbody>
<tr>
<td>Description</td>
<td>Existing runway remains</td>
<td>New 3,400-ft Rwy 15/33 240' west of existing Rwy15L/33R</td>
<td>New 3,400-ft Rwy 15/33 240' west of existing partial parallel twy</td>
<td>New 3,400-ft Rwy 15/33 660' south of BNSF &amp; relocated Airport Way</td>
<td>New 2,400-ft Rwy 15/33 &amp; relocated Airport Way</td>
</tr>
<tr>
<td>Advantages</td>
<td>No cost</td>
<td>Meets runway length requirements for design category fleet</td>
<td>Meets runway length requirements for design category fleet</td>
<td>Meets runway length requirements for design category fleet</td>
<td>Meets runway length requirements for existing and forecast aircraft</td>
</tr>
<tr>
<td></td>
<td>Meets density fringe requirements</td>
<td>Re-uses existing runway as parallel taxiway</td>
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<td></td>
<td>Meets FAA design standards</td>
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<tr>
<td>Disadvantages</td>
<td>Does not meet key FAA runway design standards (displaced threshold on both ends, obstructions)</td>
<td>Exceeds SCC limits for fill in Density Fringe.</td>
<td>Exceeds SSC limits for fill in Density Fringe</td>
<td></td>
<td>Meets SCC Density Fringe requirements</td>
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<tr>
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<td></td>
<td>Flood water storage capacity impact less than 0.00'. Flow blockage less than 15% limit. *</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Displaced thresholds remain</td>
<td>Unlikely to receive permits from Snohomish County.</td>
<td>Unlikely to receive permits from Snohomish County</td>
<td>Unlikely to receive permits from Snohomish County.</td>
<td>SCC Density Fringe Fill permit feasible</td>
</tr>
</tbody>
</table>
**Recommendation**

- **Alternative 4 (2,400 Runway) with Option 1 for Airport Way South**
  - **Airport Way**
    - Build on Airport Property
    - Build at safe distance from Runway
    - Meet Density Fringe requirements
    - Meet Snohomish County Road Standards
    - Improve substandard curves and shoulder widths
    - Minimizes wetlands impact
  - **Runway**
    - Serve same aircraft as now
    - Build at safe distance from Airport Way
    - Meet Density Fringe requirements
    - Clear approach over BNSF and Airport Way
    - Shorter runway with safety areas
Current Runway Length, Width, & Orientation

- 15L/33R - 2,671 feet x 36 feet
- Displaced Thresholds:
  - Runway 15 – 452’ to south
  - Runway 33 – 241’ to north

Recommended Alternative 4: Runway Length, Width, & Orientation

- 15L/33R - 2,400 feet x 75 feet
- Clear approaches
Per FAA guidance, residences within the 65 dnl are eligible for noise mitigation. Abatement procedures for south departures will be evaluated by Airport management and the Noise Abatement Committee.
Schedule & Next Steps
Next Steps

- Complete Implementation Plan
- Finalize Airport Layout Plan
- Submit documentation for County and FAA approval process
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