APPENDIX J

PAC AIRPORT MASTER PLAN UPDATE

HARVEY FIELD AIRPORT
SNOHOMISH, WA

Airport Master Plan Update

June 15, 2017

JVIATION®

www.harveyfield.com

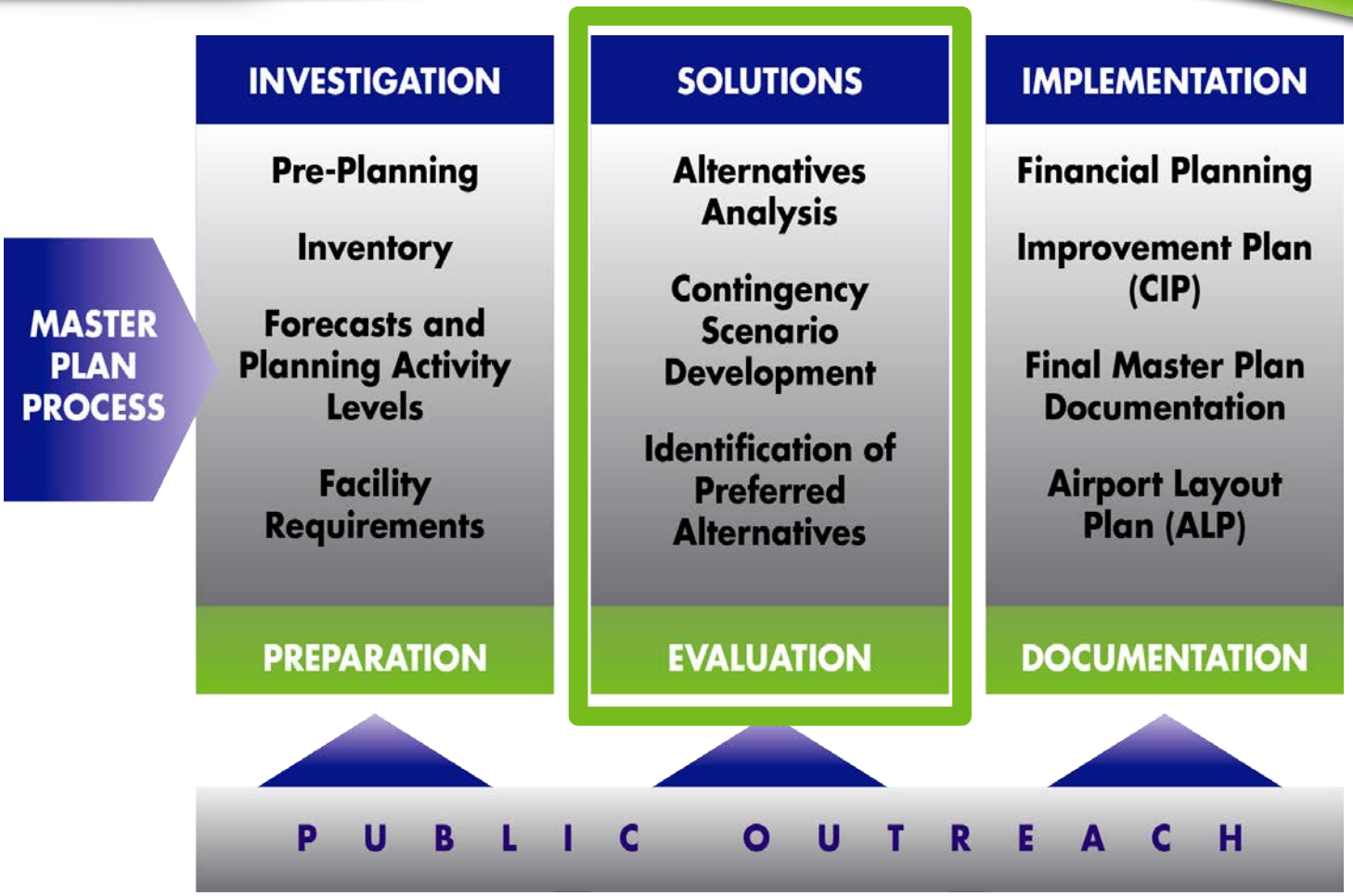
Airport Master Planning

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

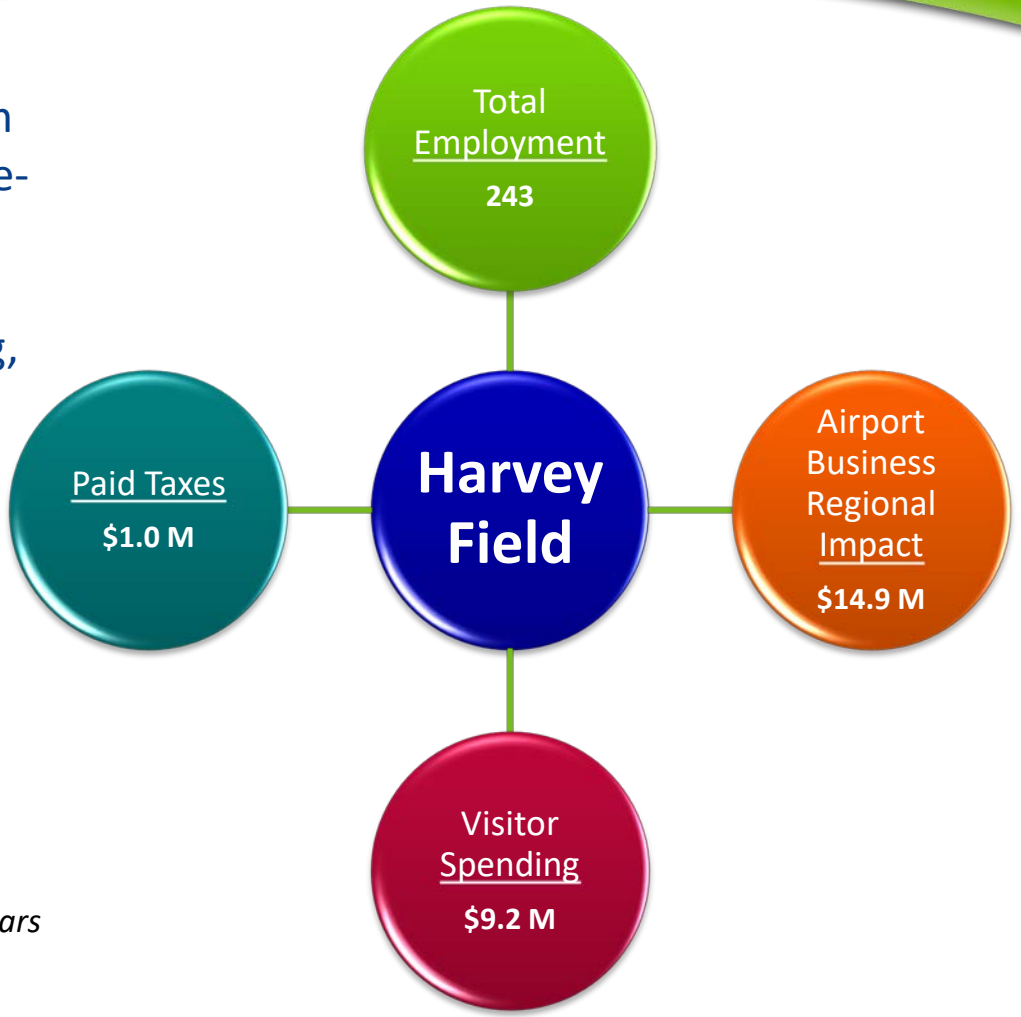
Master Plan Process



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.



Note: All impacts are shown in 2010 dollars

Outreach

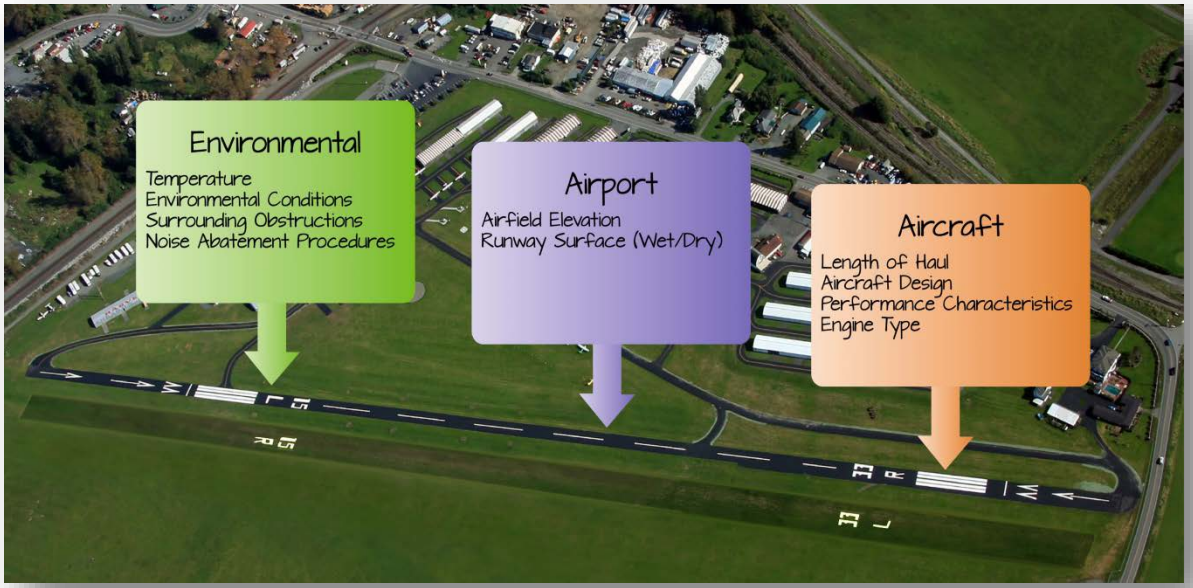
- Planning Advisory Committee
- Website
- Public Open Houses
- Government Briefings
- Focus Groups (Stakeholders)
  - Pilot Group
  - Business Group
  - Noise
  - Floodplain/Hydrology

Airport Overview

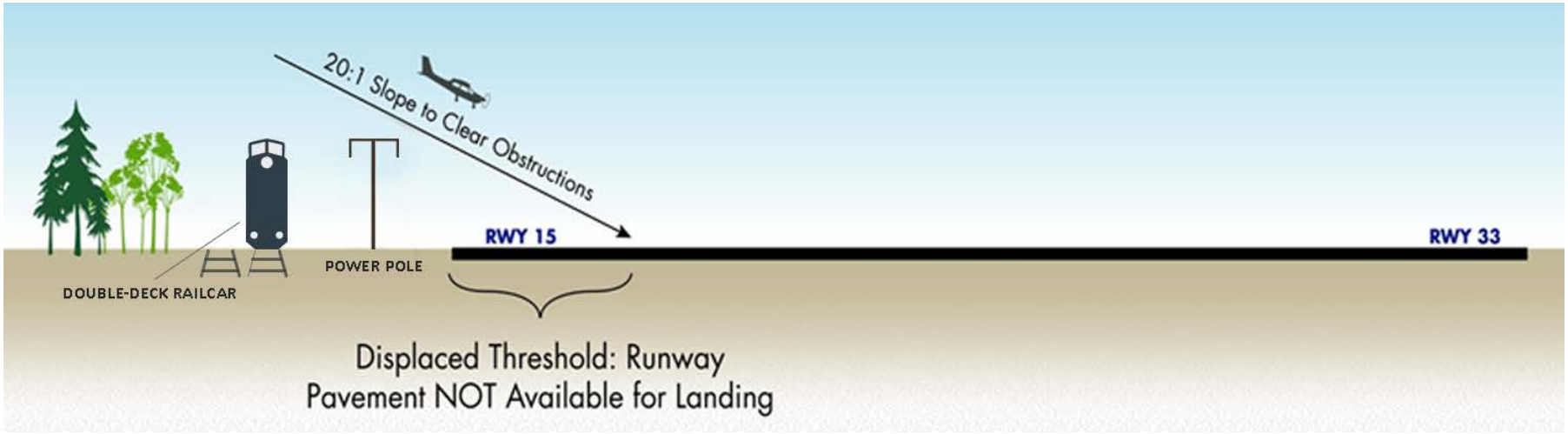
Runway Length

- **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.



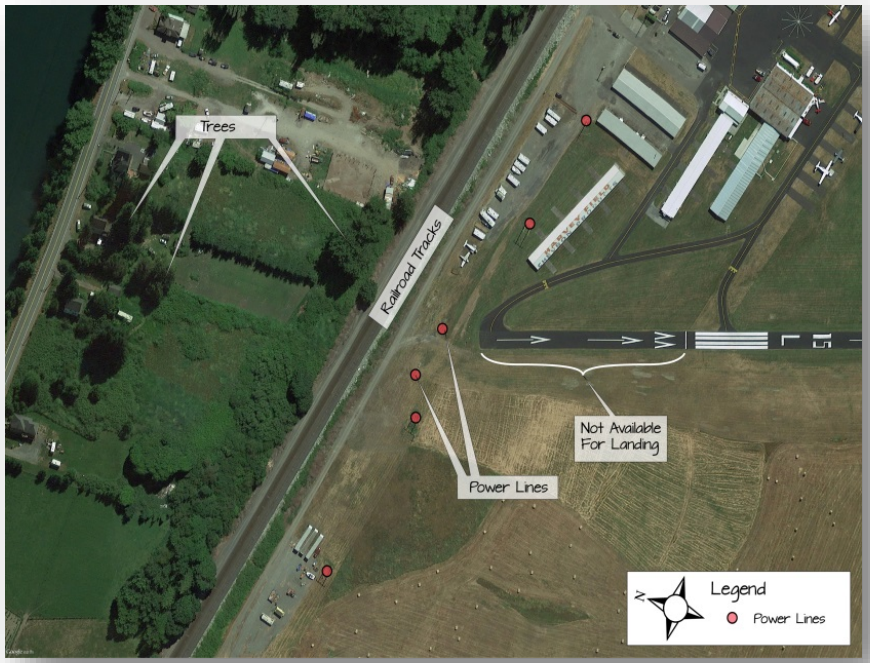
Displaced Threshold



Obstructions – Reason for Displaced Thresholds

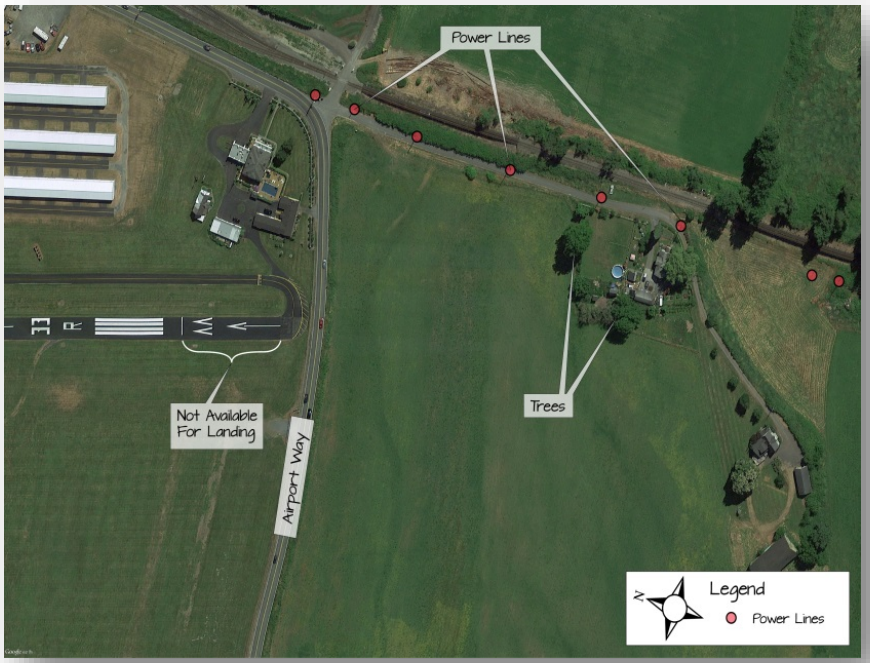
Runway 15L

- Railroad tracks
- Power Lines
- Trees



Runway 33R

- Airport Way
- Power Lines
- Trees



Where We Are Today

- 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

Recommendation

- 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….***

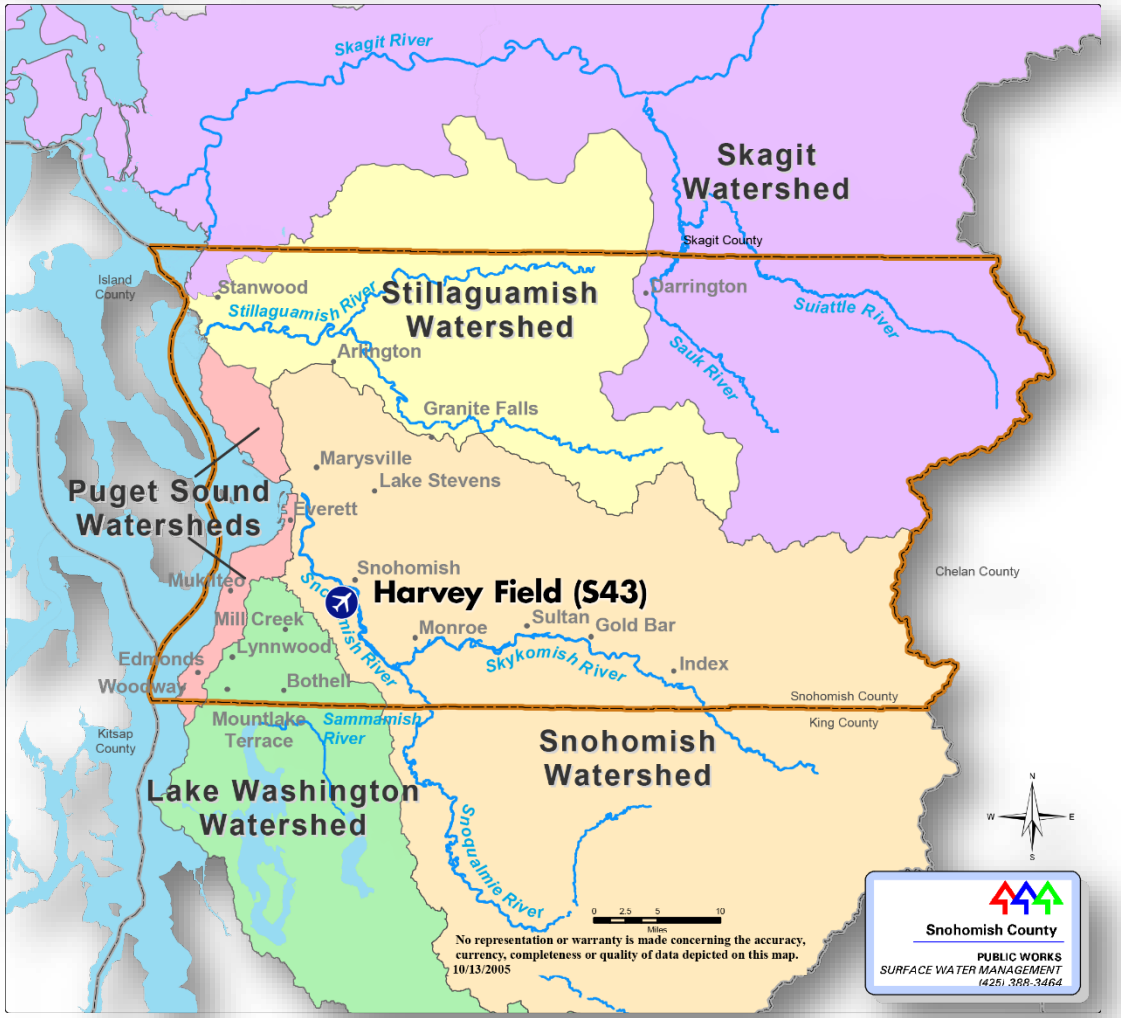
Environmental Inventory

Environmental Categories Inventoried for Harvey Field

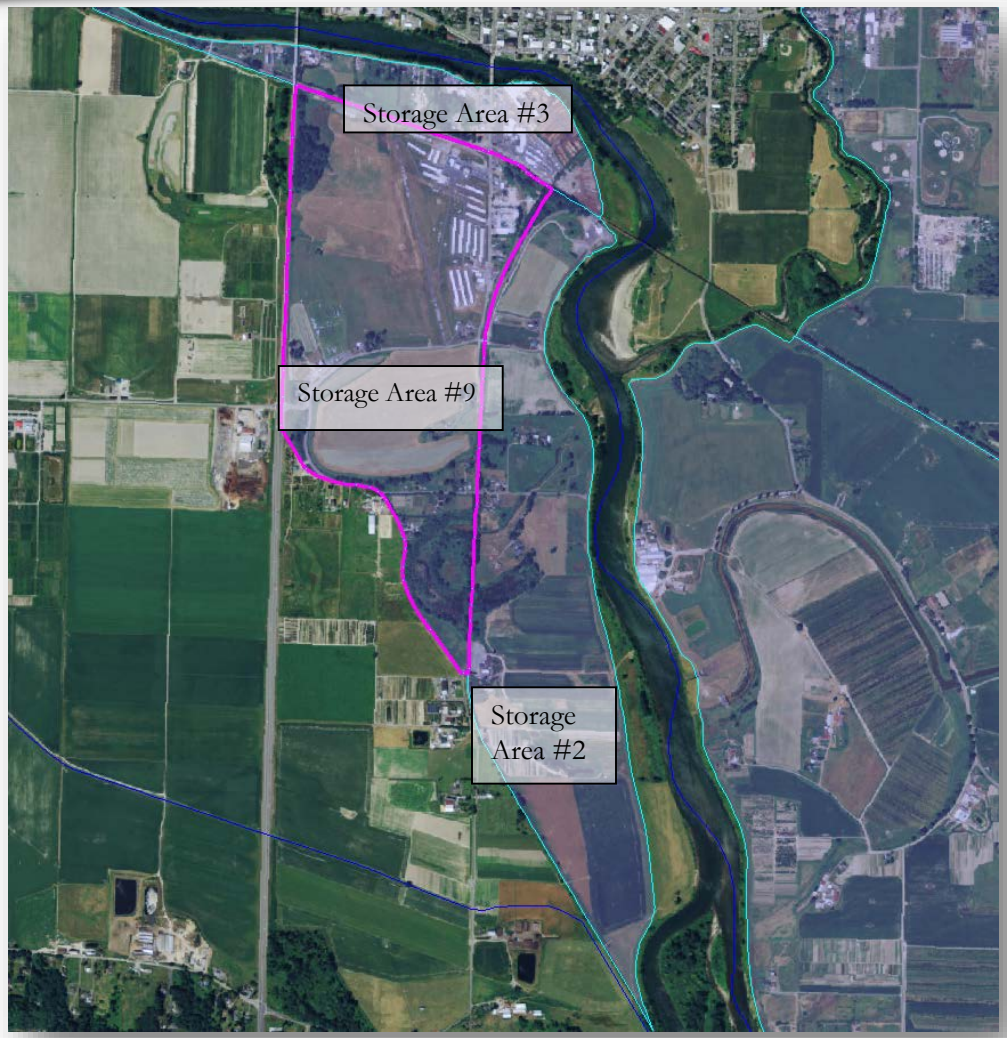
- ✓ Air Quality
- ✓ Coastal Resources
- ✓ Compatible Land Uses
- ✓ Construction Impacts
- ✓ Department of Transportation Act 4(f)
- ✓ Farmlands
- ✓ Fish, Wildlife, and Plants
- ✓ Floodplains
- ✓ Hazardous Material, Pollution Prevention, and Solid Waste
- ✓ Historical, Architectural, Archaeological, and Cultural Resources
- ✓ Light Emissions and Visual Impacts
- ✓ Noise
- ✓ Secondary (Induced) Impacts
- ✓ Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks
- ✓ Wetlands
- ✓ Wild and Scenic Rivers

Prior to the construction of any improvement, projects must undergo required local, state and/or federal environmental review and approval processes

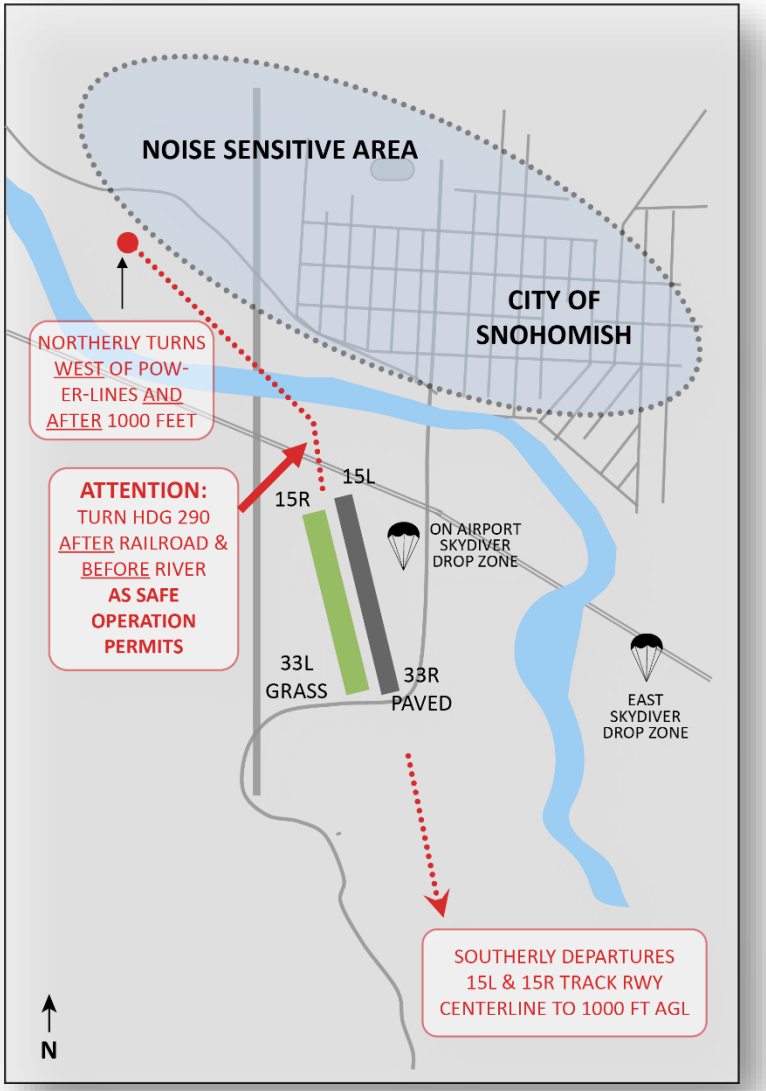
Snohomish County Watersheds



Snohomish River Storage Area Map

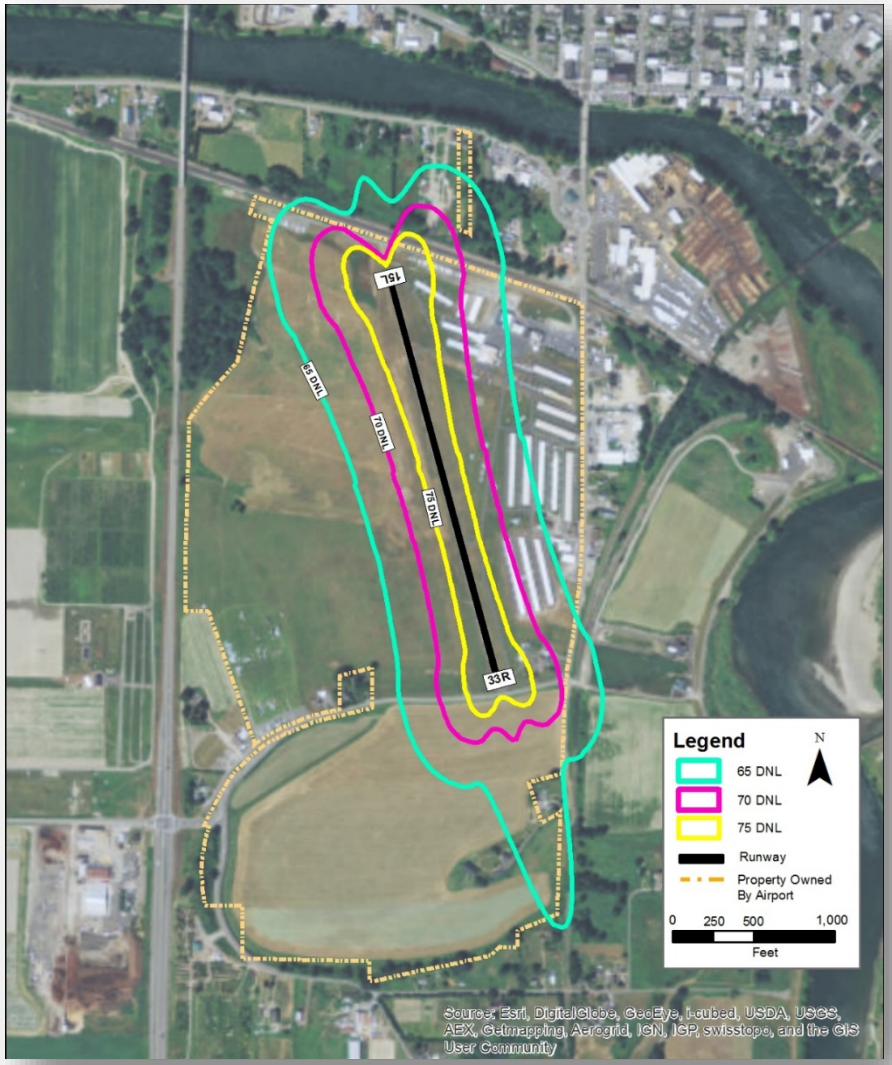


Noise Abatement Procedures



- Long-standing procedures in place at Harvey Field
- Ongoing pilot education
- Noise Hotline -
  - 360-568-1541, ext. 261
- Information at www.harveyfield.com

Existing Noise Contours



Alternatives Evaluation

Time to Find Workable Options

- Local & FAA standards and regulations
- Planning and engineering standards
- Environmental and floodplain regulations

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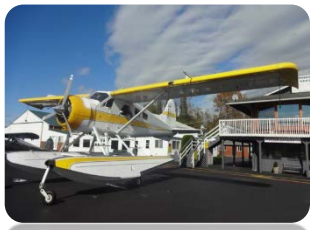
FAA Safety Standards for Aircraft Currently at Harvey Field

RUNWAY DESIGN CODE (RDC)

FREQUENT FLYERS AT S43


Cessna Caravan 208B


DeHavilland DHC-2 Beaver


DeHavilland Twin Otter (DHC-6)


TBM 700

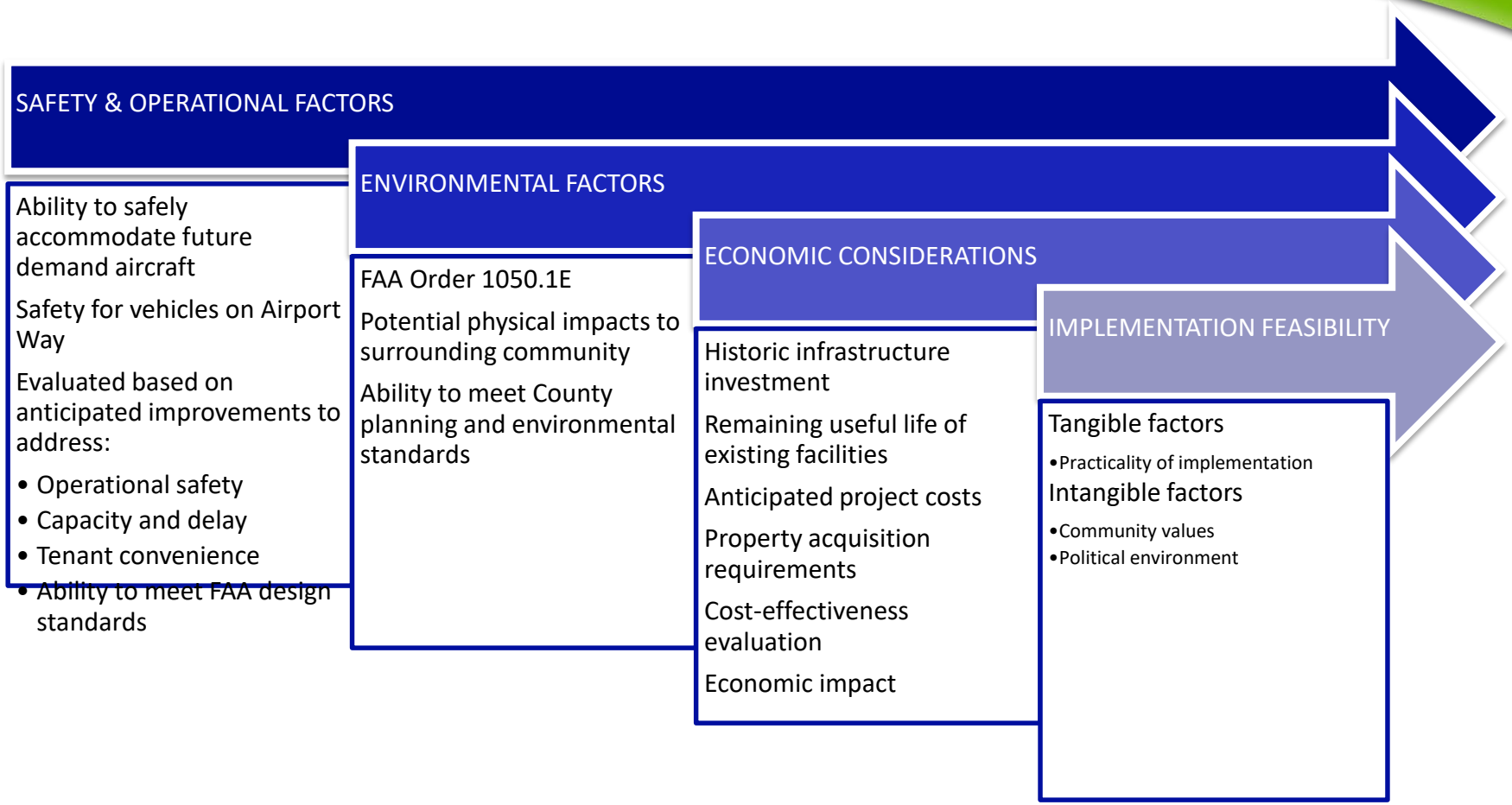

Quest Kodiak


KingAir 200

Design Goals

- 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

Evaluation Criteria



Density Fringe Area: Max Allowable Obstruction SCC 30.65.255

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

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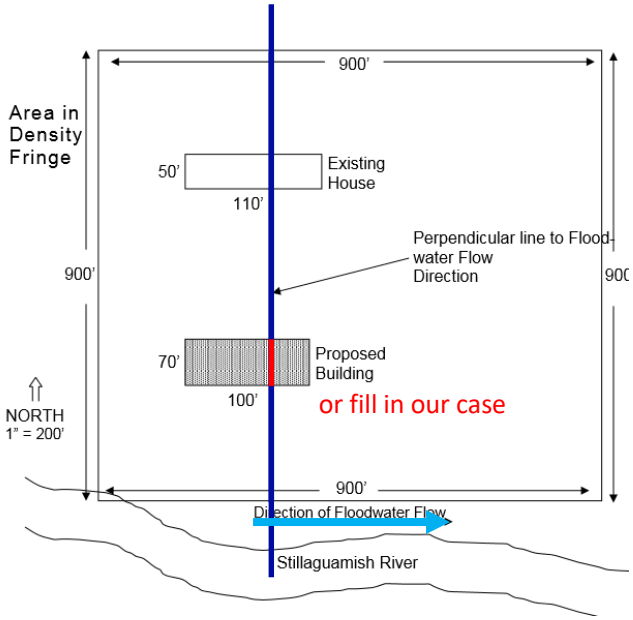
Density Fringe: Max Allowable Obstruction SCC 30.65.255

Example: Flow Obstruction and Blockage Calculations

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%



900' property width

70' new obstruction width

70'/900' = 7.8% < 15 %

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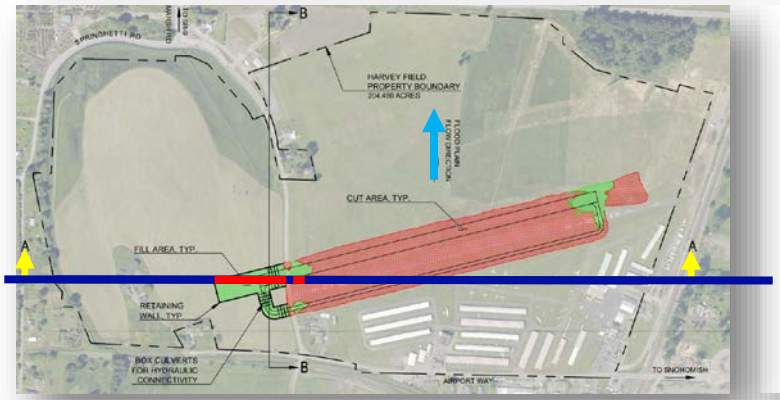
Flow Obstruction/Blockage Calculations



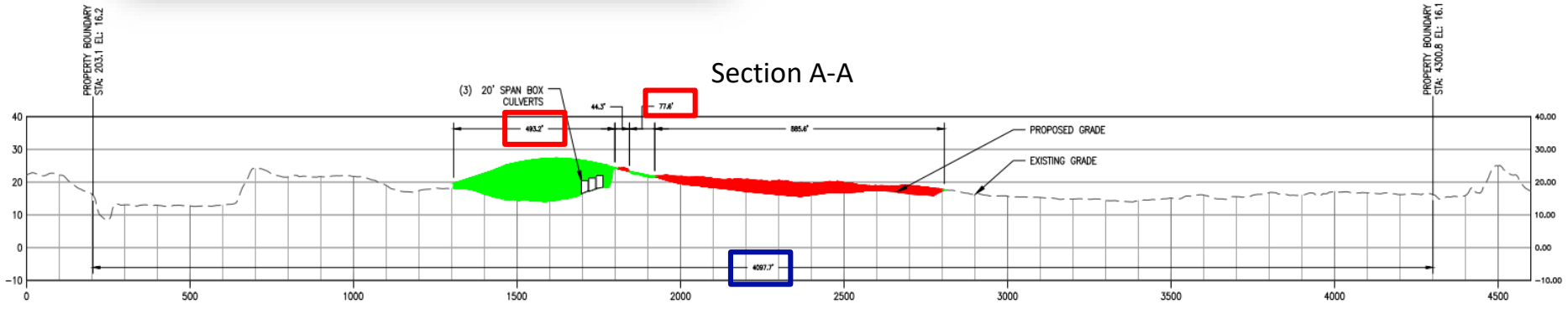
SECTION A–A		
FEATURE	WIDTH	% OF PROPERTY WIDTH
PROPERTY WIDTH	4097.7'	–
NEW FILL	570.8'	13.9%
NEW CUT	929.9'	22.7%
CULVERT OPENINGS	60.0'	1.5%
FILL – CULVERTS	510.8'	12.5%

4098’ property width

571’ new obstruction width

571’/4098’ = 13.9% < 15 %

Section A-A



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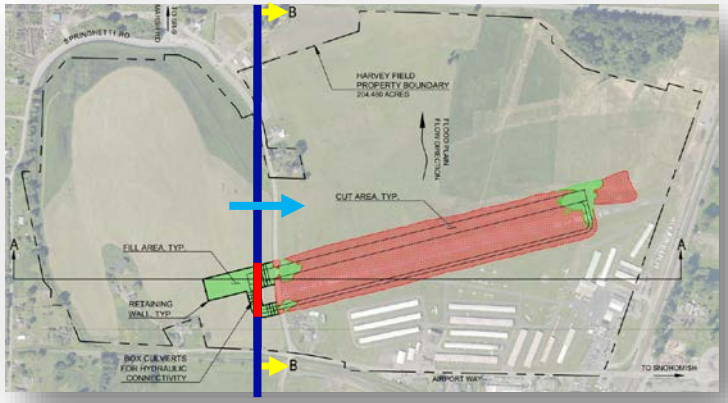
Flow Obstruction/Blockage Calculations



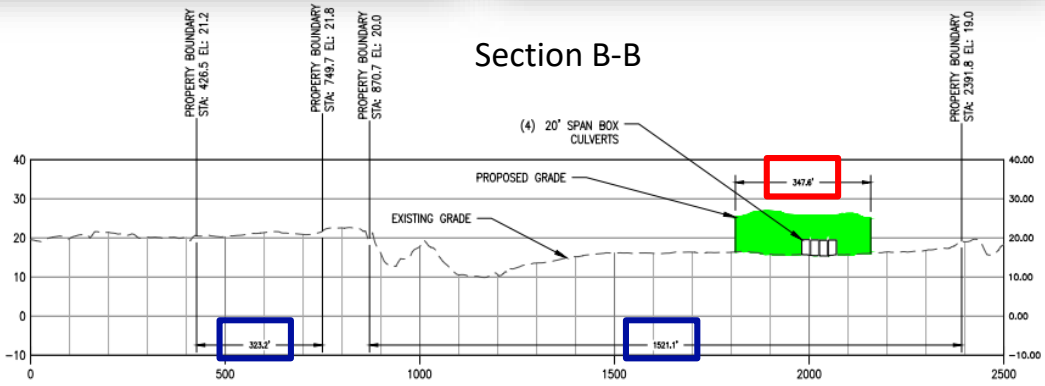
SECTION B–B		
FEATURE	WIDTH	% OF PROPERTY WIDTH
PROPERTY WIDTH	1844.3'	–
NEW FILL	347.6'	18.8%
NEW CUT	0.0'	0.0%
CULVERT OPENINGS	80.0'	4.3%
FILL – CULVERTS	267.6'	14.5%

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%

Section B-B



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Density Fringe Area: Max Allowable Density SCC 30.65.250

*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?

- Current flood maps indicate that BFE is 26.63'
- Virtually all of Harvey Field is lower than 26.63'…so SCC applies everywhere
- 2% of 204.48 (Harvey Field property) = 4.090 acres
- 2% Area limit *does NOT apply* to public uses, such as roads, specifically, Airport Way (*SCC 30.65.260)*
- *However, FEMA's BFE requirement*

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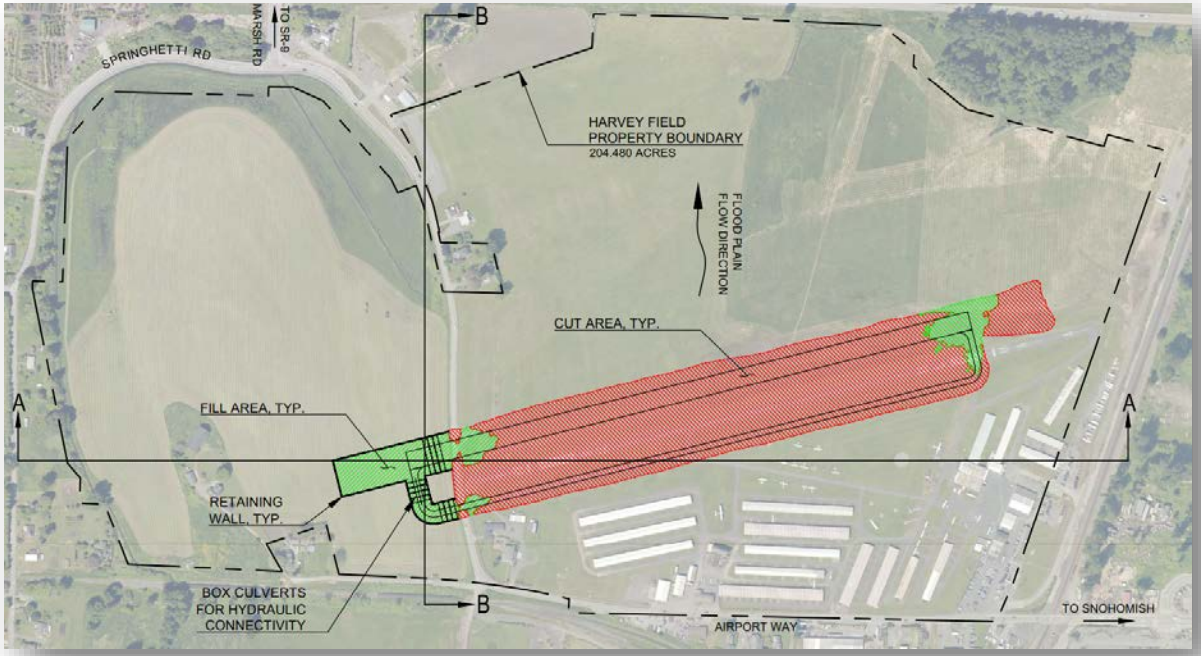
Fill & Cut Area Calculations



Green = Fill Area
Red = Cut Area

CUT/FILL AREAS			
FEATURE	AREA (AC.)	% OF PROPERTY AREA	VOLUME (CU. YD.)
HARVEY FIELD PROPERTY	204.480	–	–
NEW FILL	3.927	1.92%	33,940
NEW CUT	18.872	9.23%	57,760
CULVERT OPENINGS	0.448	0.22%	2,890
FILL – CULVERTS	3.479	1.70%	31,050

Density Fringe Area: Exceptions to Max Allowable Density & Obstruction Limits SCC 30.65.260

*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

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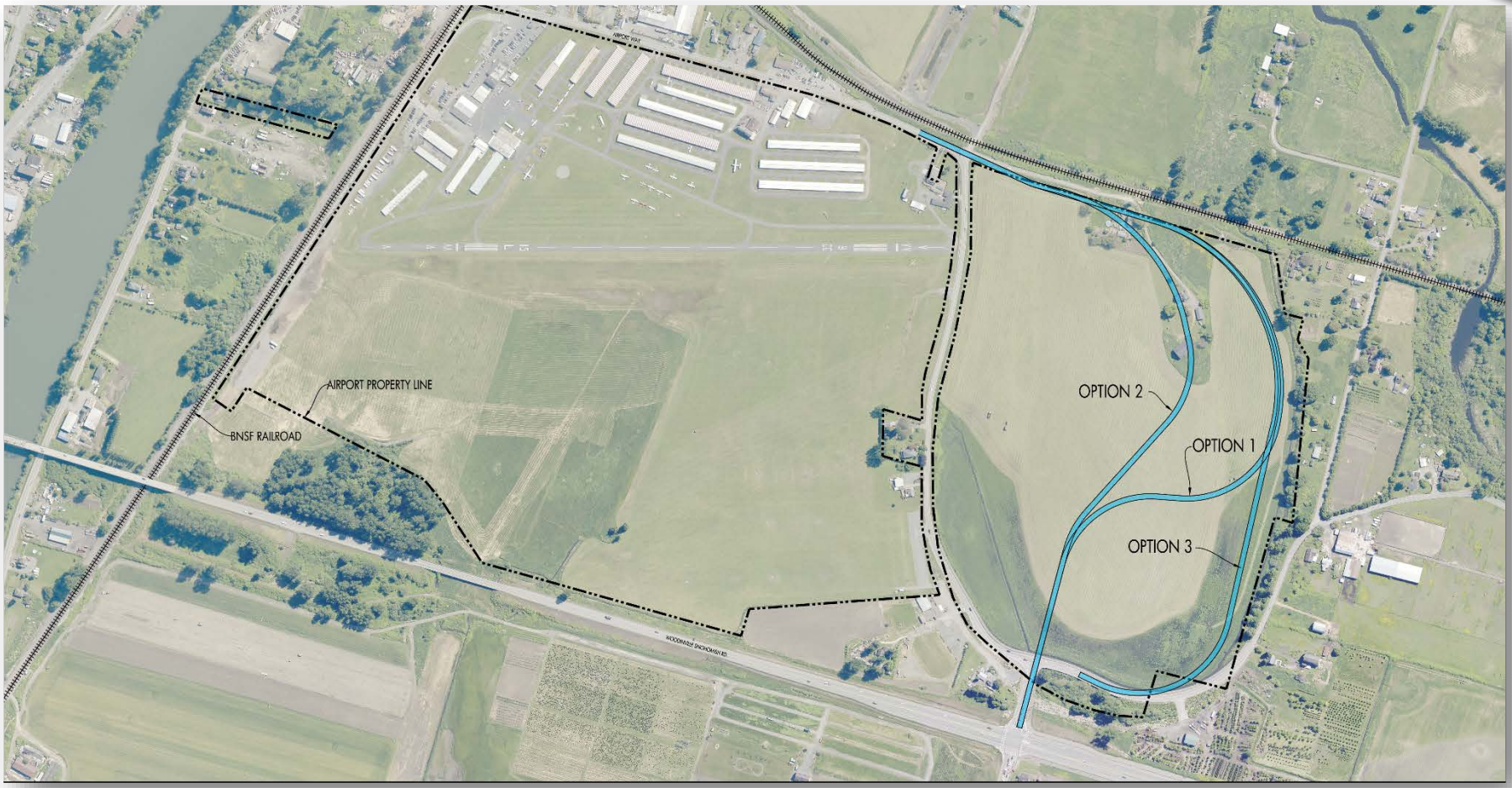
Density Fringe Area: Exceptions to Max Allowable Density & Obstruction Limits SCC 30.65.260

"...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"

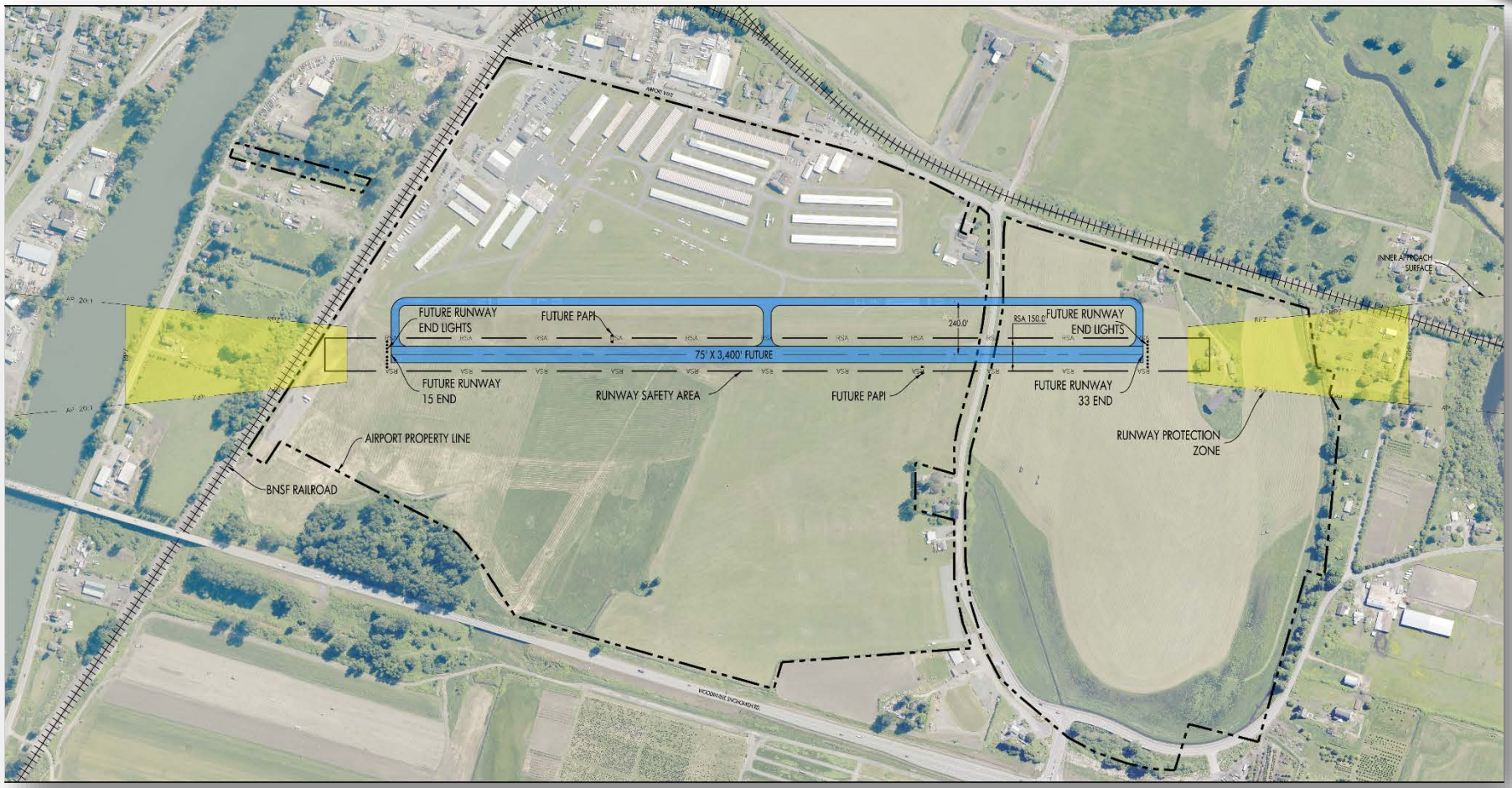
- Base Flood = the 100-year flood elevation, as shown on the current FEMA Flood Insurance Rate Maps (FIRMs)
- Floodwater displacement means that for every piece of material placed in construction of the road will take up some space that was previously available for water storage or conveyance during 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

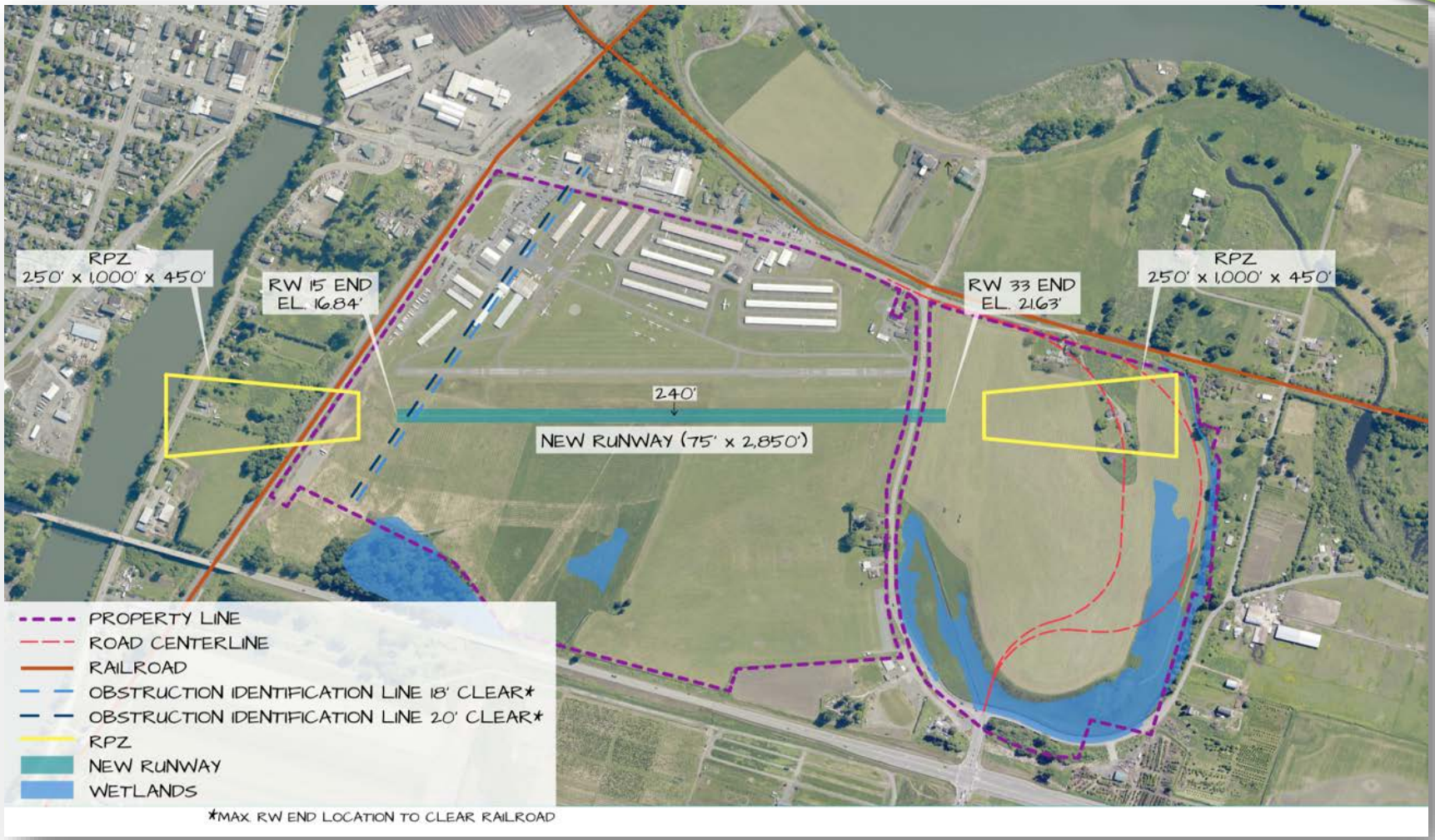
Airport Way Relocation Options



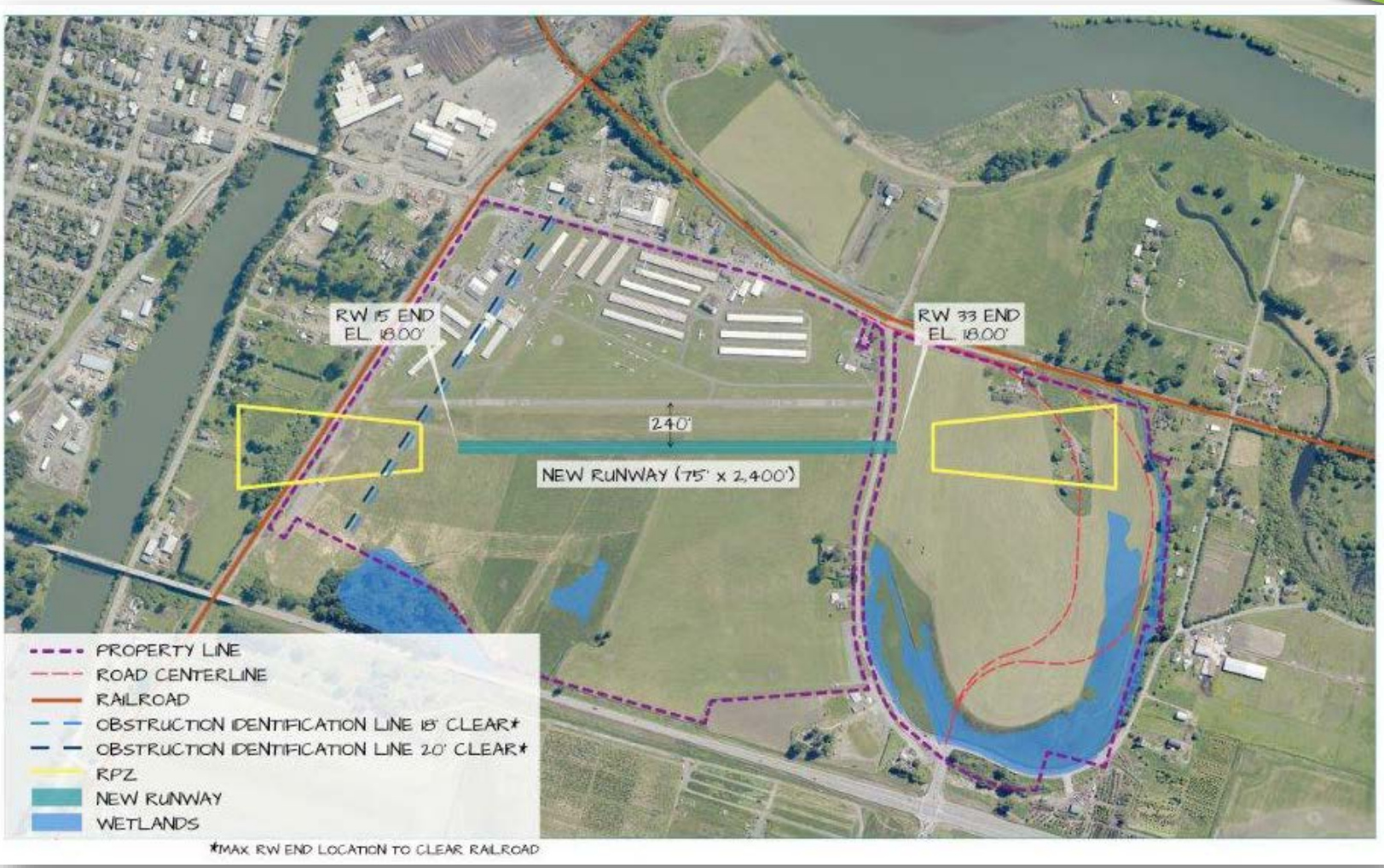
Alternative 1: New 3,400-foot Runway Using Existing Runway as Taxiway



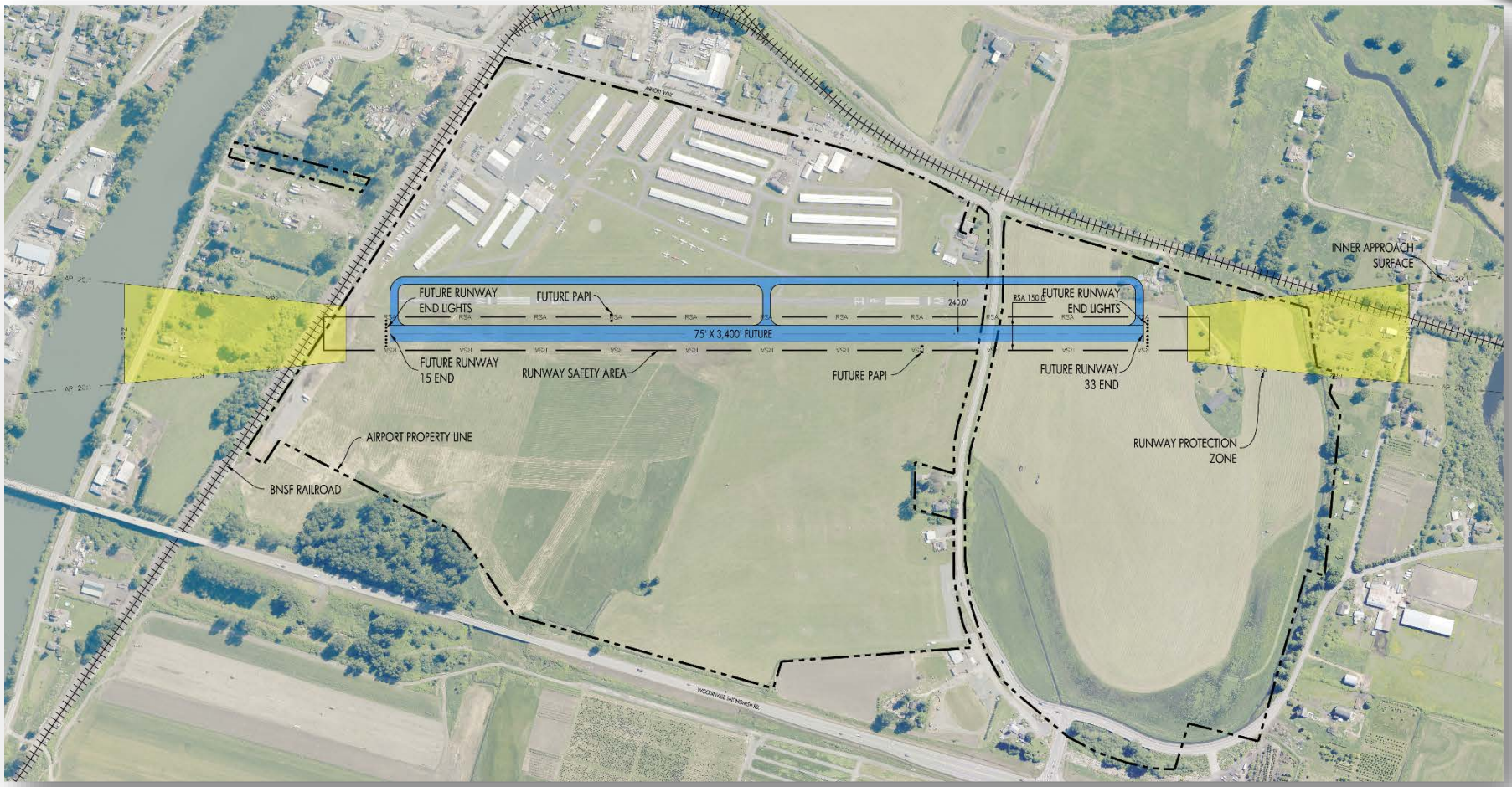
Alternative 1A: New 2,850 Runway Using Existing Runway as Taxiway



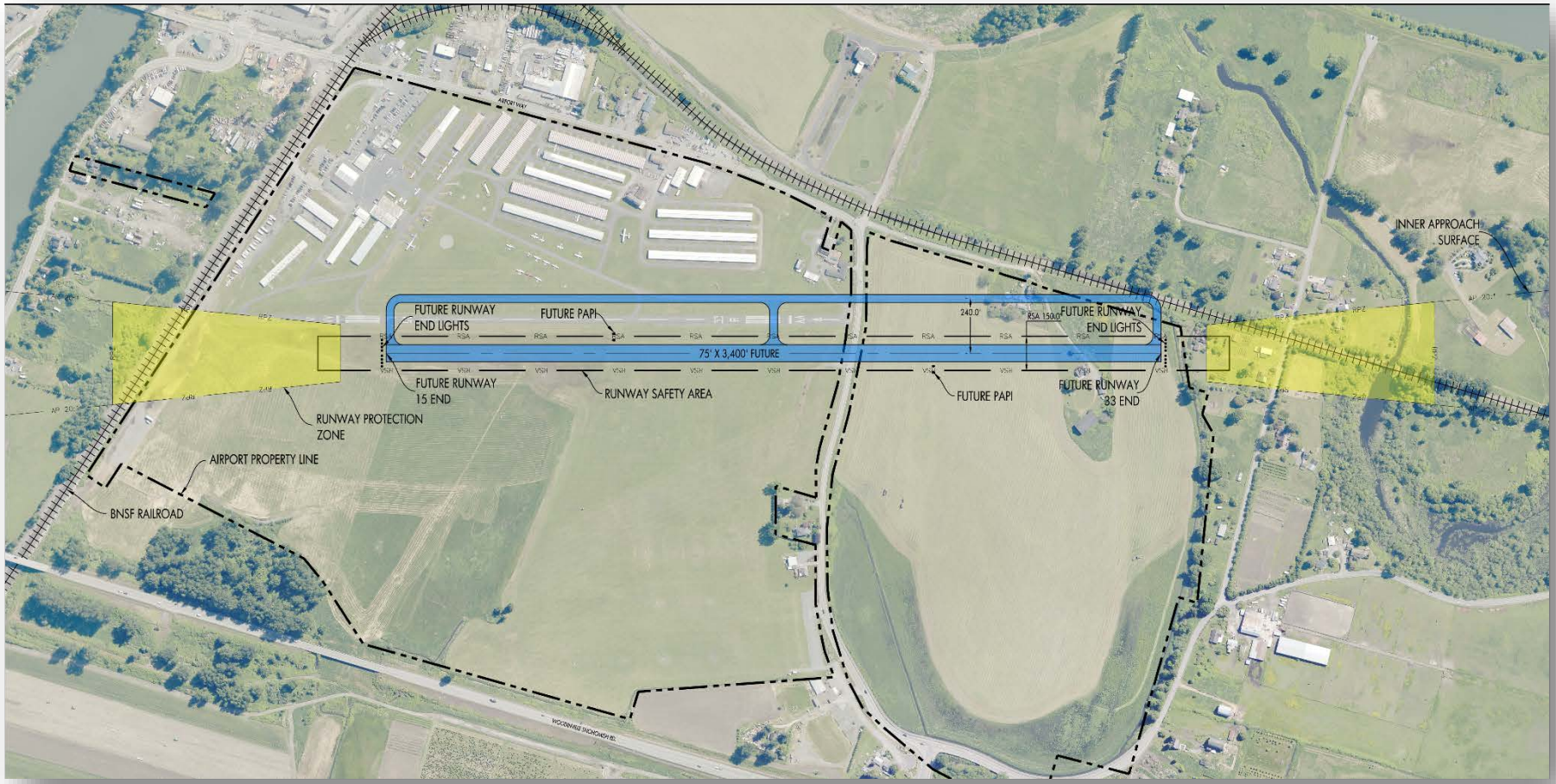
Alternative 1B: New 2,400-foot Runway Using Existing Runway as Taxiway



Alternative 2: New 3,400-foot Runway and Taxiway



Alternative 3: New 3,400-foot Runway and Move Airport Way South



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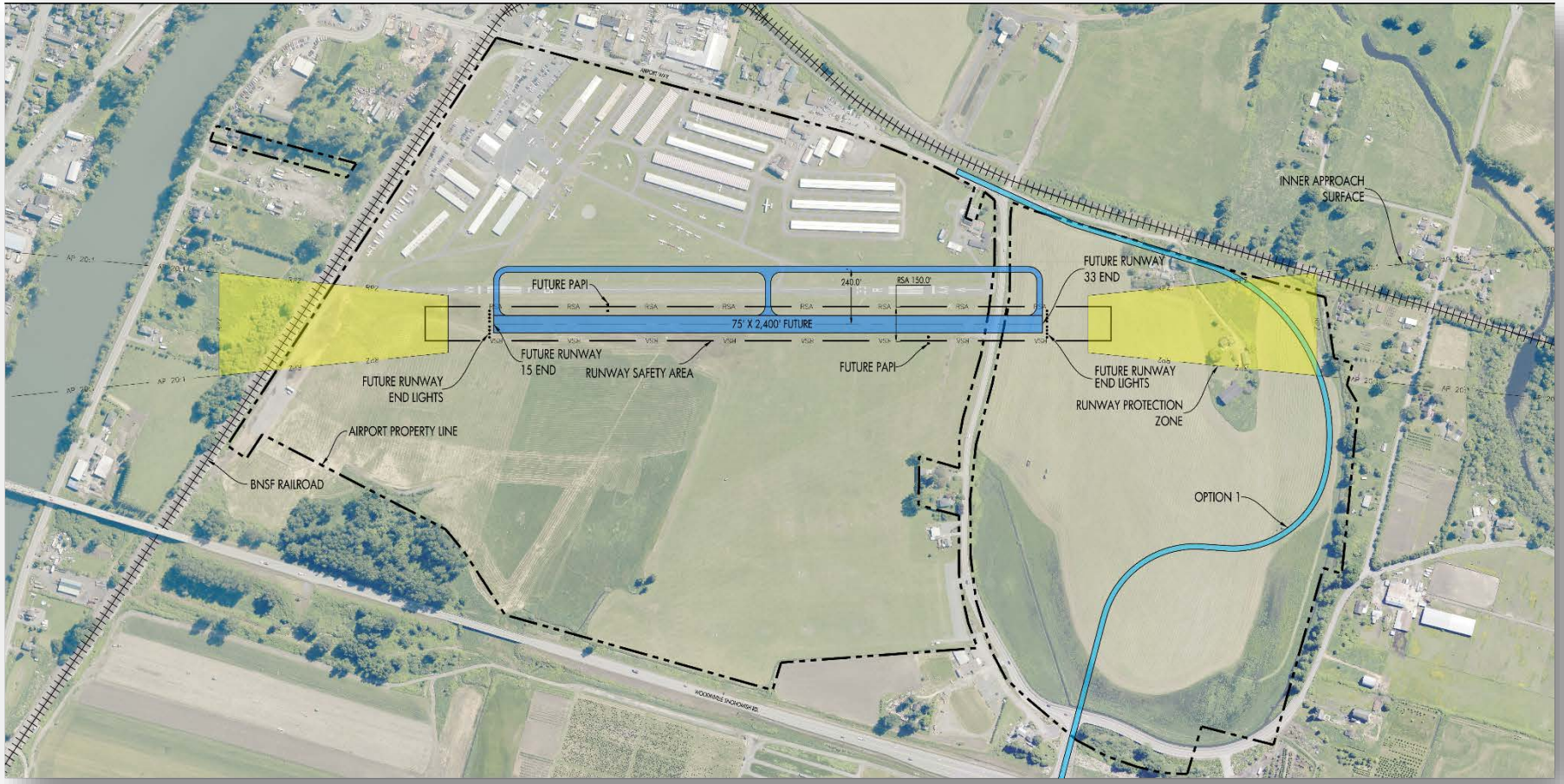
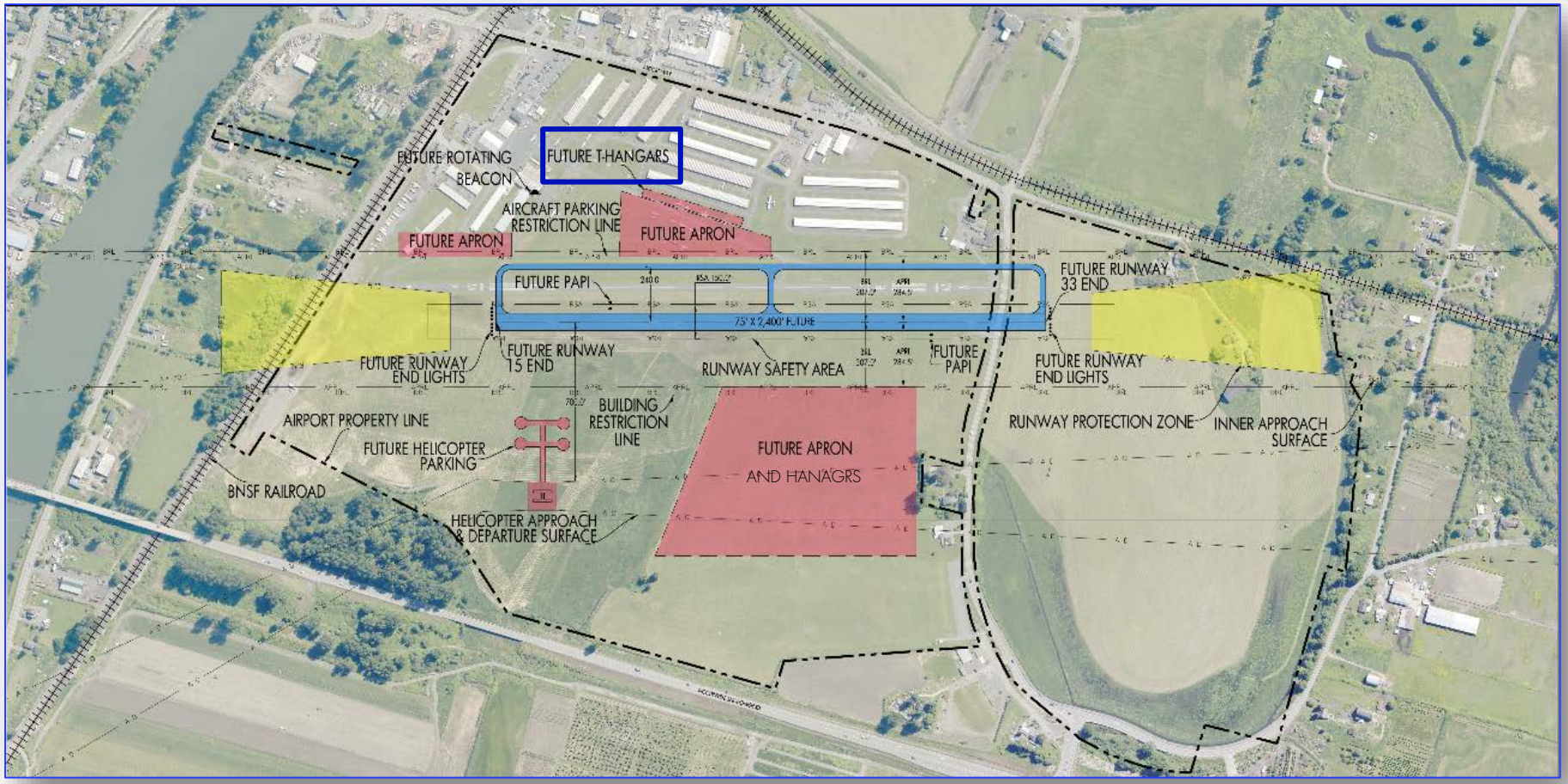
Alternative 4: New 2,400-foot Runway and Move Airport Way South



Conceptual Development Plan

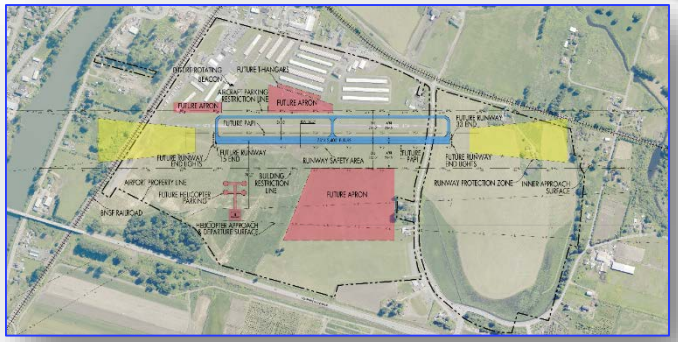


Summary of Runway Alternatives

Option	No Action	Alternative 1: New 3,400-ft Rwy & Use Existing Rwy as Twy	Alternative 2: New 3,400-ft Rwy & New Twy	Alternative 3: New 3,400-ft Rwy & Move Airport Way South	Alternative 4: New 2,400-ft Rwy & Move Airport Way South
Description	Existing runway remains	New 3,400-ft Rwy 15/33 240' west of existing Rwy15L/33R	New 3,400-ft Rwy 15/33 240' west of existing partial parallel twy	New 3,400-ft Rwy 15/33 660' south of BNSF & relocated Airport Way	New 2,400-ft Rwy 15/33 & relocated Airport Way
Advantages	– No cost – Meets density fringe requirements	– Meets runway length requirements for design category fleet – Re-uses existing runway as parallel taxiway	– Meets runway length requirements for design category fleet	– Meets runway length requirements for design category fleet	– Meets runway length requirements for existing and forecast aircraft – Meets FAA design standards – Meets SCC Density Fringe requirements – Flood water storage capacity impact less than 0.00'. Flow blockage less than 15% limit. *
Disadvantages	Does not meet key FAA runway design standards (displaced threshold on both ends, obstructions)	Exceeds SCC limits for fill in Density Fringe.	Exceeds SSC limits for fill in Density Fringe	– Exceeds SCC limits for fill in Density Fringe – Does not allow for relocated Airport Way on County ROW/Harvey property	Does not re-use existing runway pavement as parallel taxiway
Feasibility	Displaced thresholds remain	Unlikely to receive permits from Snohomish County.	Unlikely to receive permits from Snohomish County	Unlikely to receive permits from Snohomish County.	SCC Density Fringe Fill permit feasible

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

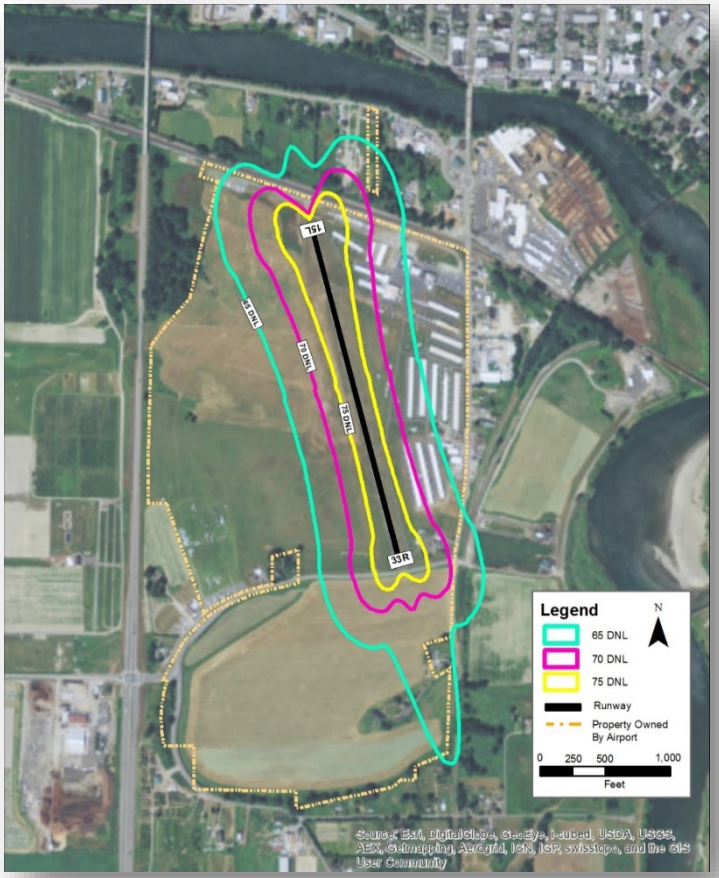


Runway

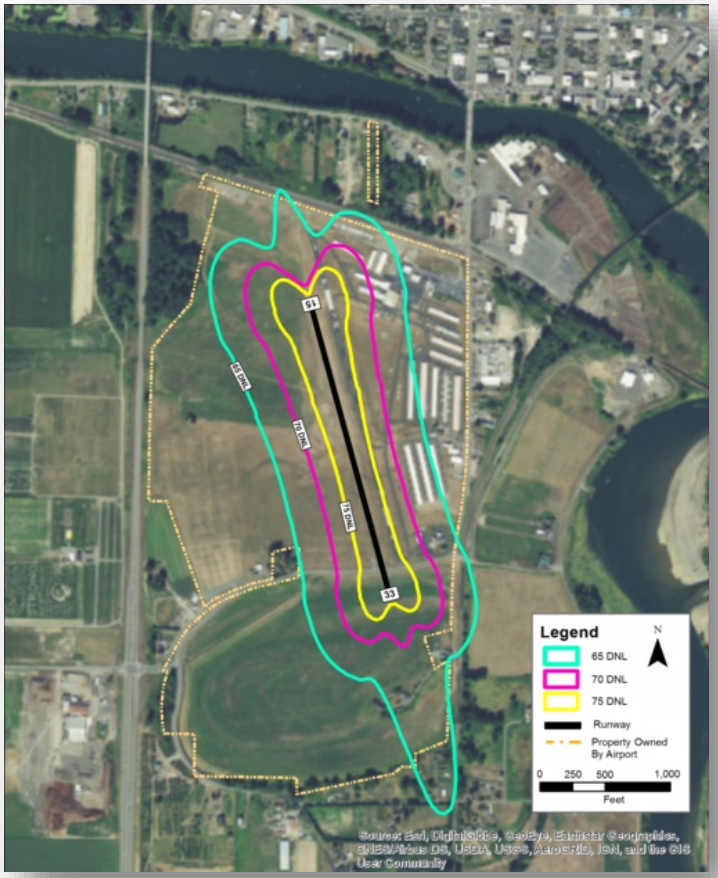
- **Current Runway Length, Width, & Orientation**
  - 15L/33R - 2,671 feet x 36 feet
  - Displaced Thresholds:
    - Runway 15 – 452’ to south
    - Runway 33 – 241’ to north
- **Recommended Alternative 4: Runway Length, Width, & Orientation**
  - 15L/33R - 2,400 feet x 75 feet
  - Clear approaches

Noise Contour Comparison

Current Contours



Alternative 4 Contours



Per FAA guidance, residences within the 65 dnl are eligible for noise mitigation

Schedule & Next Steps

Next Steps

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

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

Questions, Comments?

Chapters are on website (www.harveyfield.com)

HARVEY FIELD AIRPORT
SNOHOMISH, WA

Thank You!

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