

Seattle-Tacoma International Airport

Stan Shepherd
Manager, Airport Noise Programs



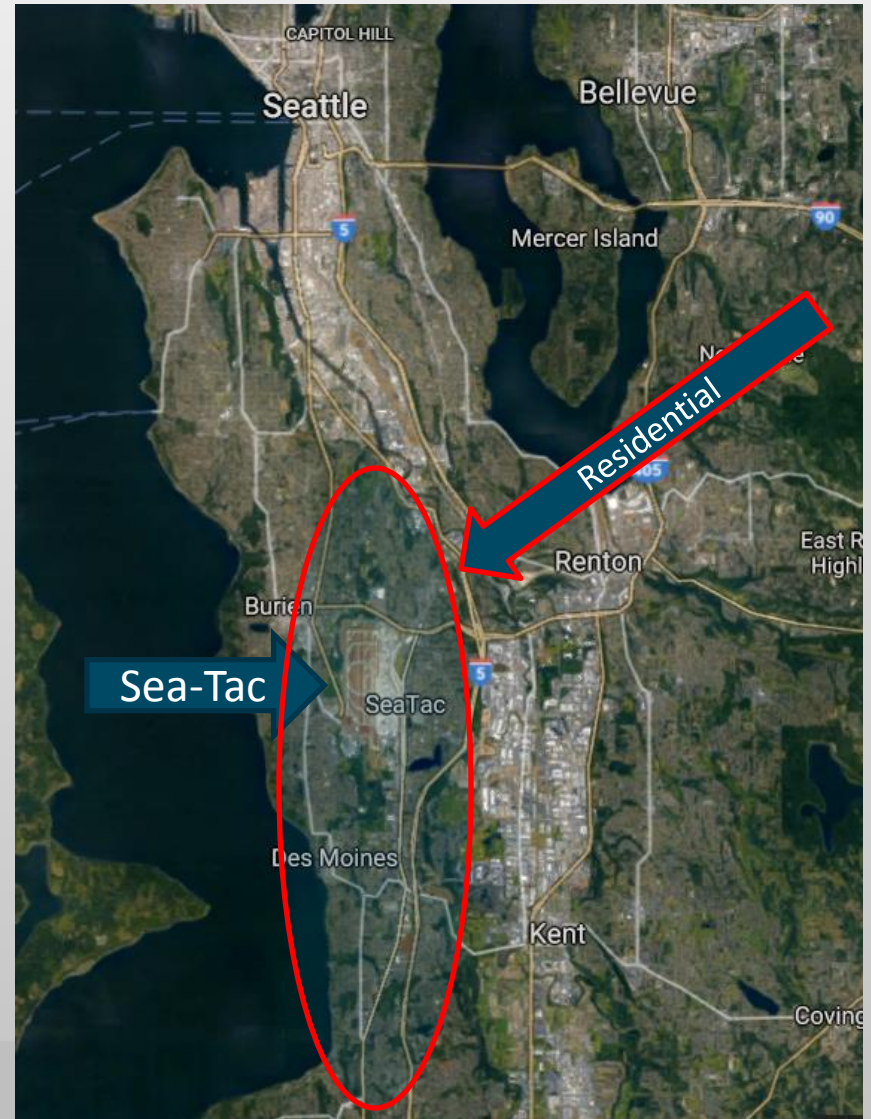
Overview

- Introduction of Sea-Tac Airport
- Sea-Tac's history of noise mitigation
- Greener Skies over Seattle RNP Project
- Challenges with implementation
- Lessons Learned



Sea-Tac Airport

- 2015
 - 381,000 operations
 - 42,340,537 passengers
- Located in the middle of residential communities



Sea-Tac's Approach to Noise

- Noise Mitigation
 - Residential acquisition
 - Sound insulation programs
 - Community Engagement
 - Approximately 2500 complaints per year
- Aircraft Flight Procedures
 - Noise Abatement Flight Corridors
 - Fly Quiet Program
 - Noise Monitoring Stations
 - RNAV/RNP
 - Optimized Profile Descent (OPD)

Approximately \$400 million U.S. spent to date on noise mitigation

History of Greener Skies over Seattle

RNAV/RNP

- Started as an idea in 2008 between Alaska Airlines and Sea-Tac Airport

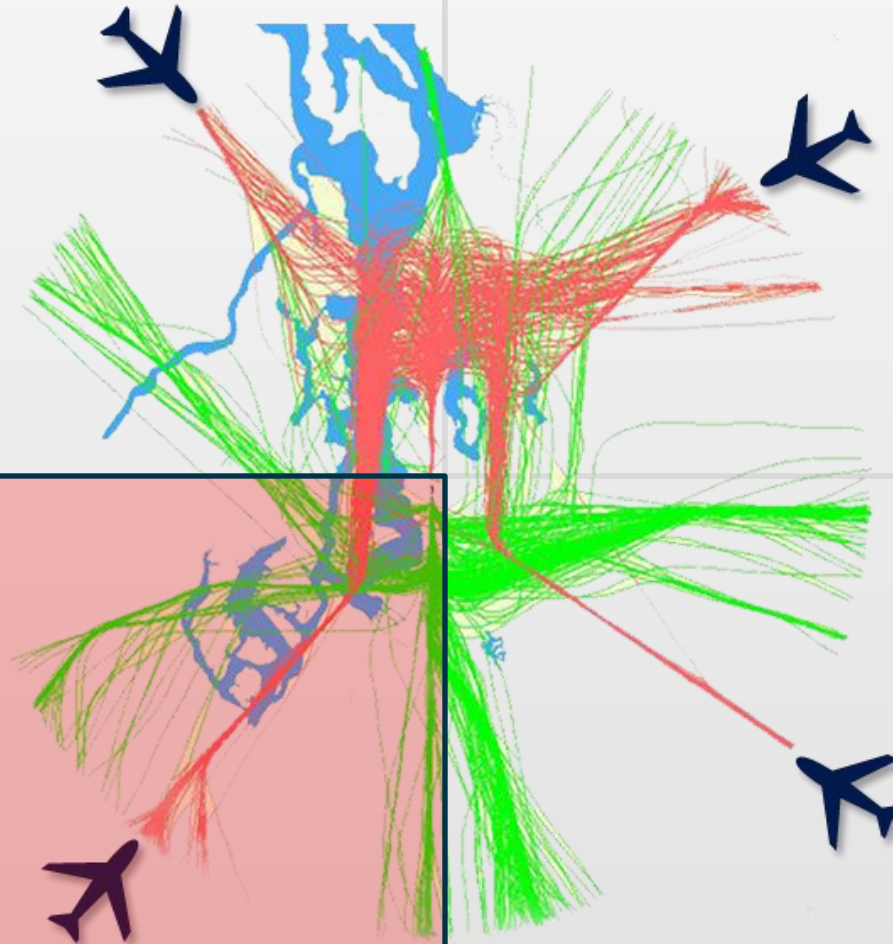


Opportunities to reduce fuel burn, emissions and noise

10%

Percent of arrival traffic
Red – Arrivals
Green – Departures

20%



50%

20%

Identified Opportunities

- West side approaches only
- Reduced number of people impacted by aircraft noise (overflown)
- Reduced emissions
- Reduced fuel
- Reduced flight time



Project Support

- Initial project support was less than optimal
- Began political outreach with local elected officials
- Began discussions with the Federal Aviation Administration
- Gained some community support through continued outreach

Fuel prices increased project support



Average 737-8/9 burns 1 drum of fuel in 3 minutes 54 seconds

Increased FAA Role

- 2010 – The Federal Aviation Administration agreed to take on Greener Skies as a NextGen project
- 2010-2013 meetings were held with the project team to develop procedures

Project Team

- Project Development Team
 - FAA – Project lead
 - Alaska Airlines
 - Sea-Tac Airport
 - The Boeing Company
- Essential to have the airport involved in the process
 - Airport staff are knowledgeable about the community and noise concerns
 - Airport staff can help with the outreach

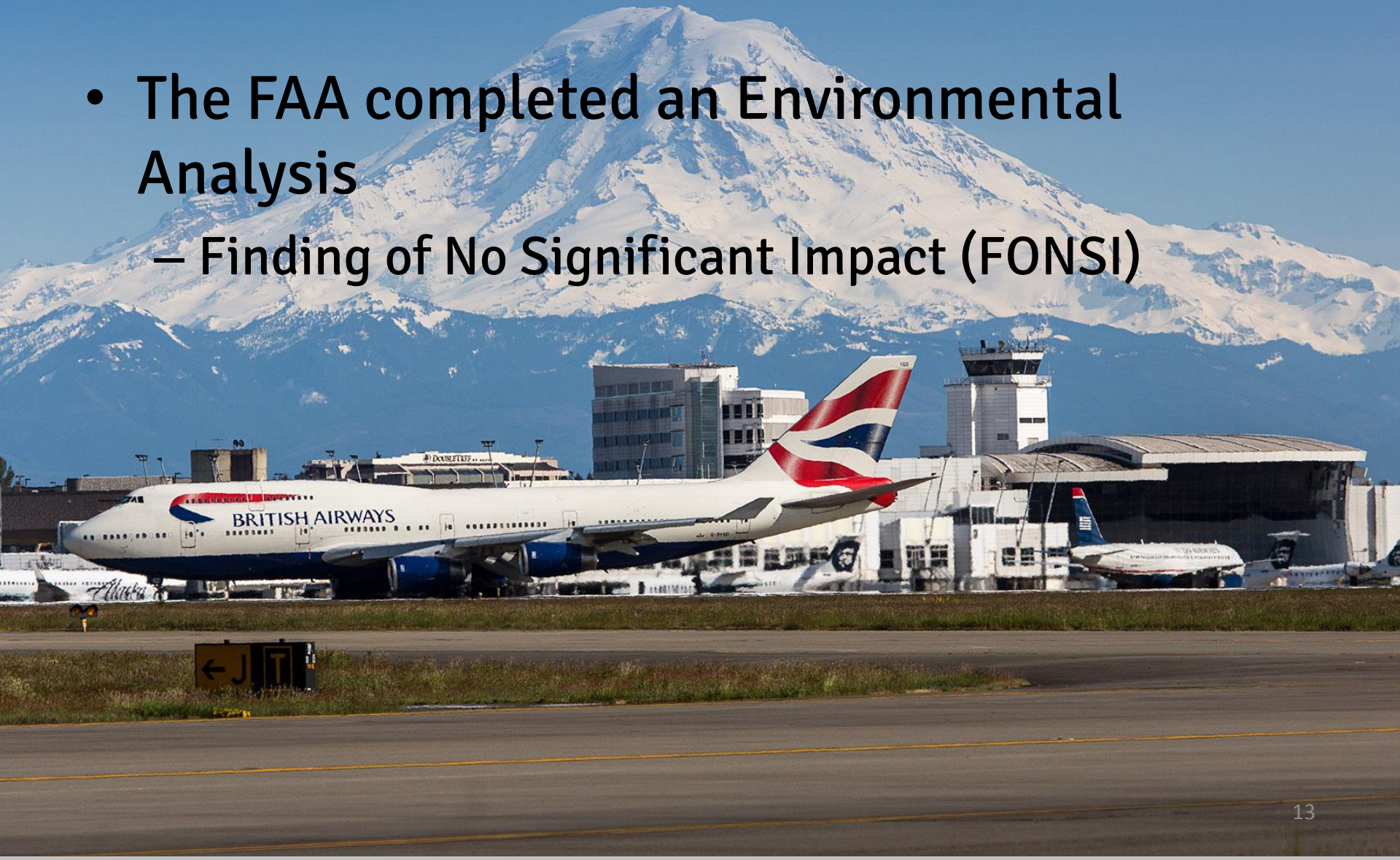
Other Airline Team Participants

- Southwest Airlines
- Delta Airlines
- American Airlines
- United Airlines



Environmental Analysis (EA)

- The FAA completed an Environmental Analysis
 - Finding of No Significant Impact (FONSI)



FAA Community EA meetings

- Held two community meetings
- Presented data showing insignificant noise changes
- Identified one area north of the airfield that had a slight increase of 0.1 to 0.2 DNL

Community Outrage

- They felt the project was for airline profit
- They didn't understand DNL
- The message heard was changing flight paths and increasing noise



Community Engagement

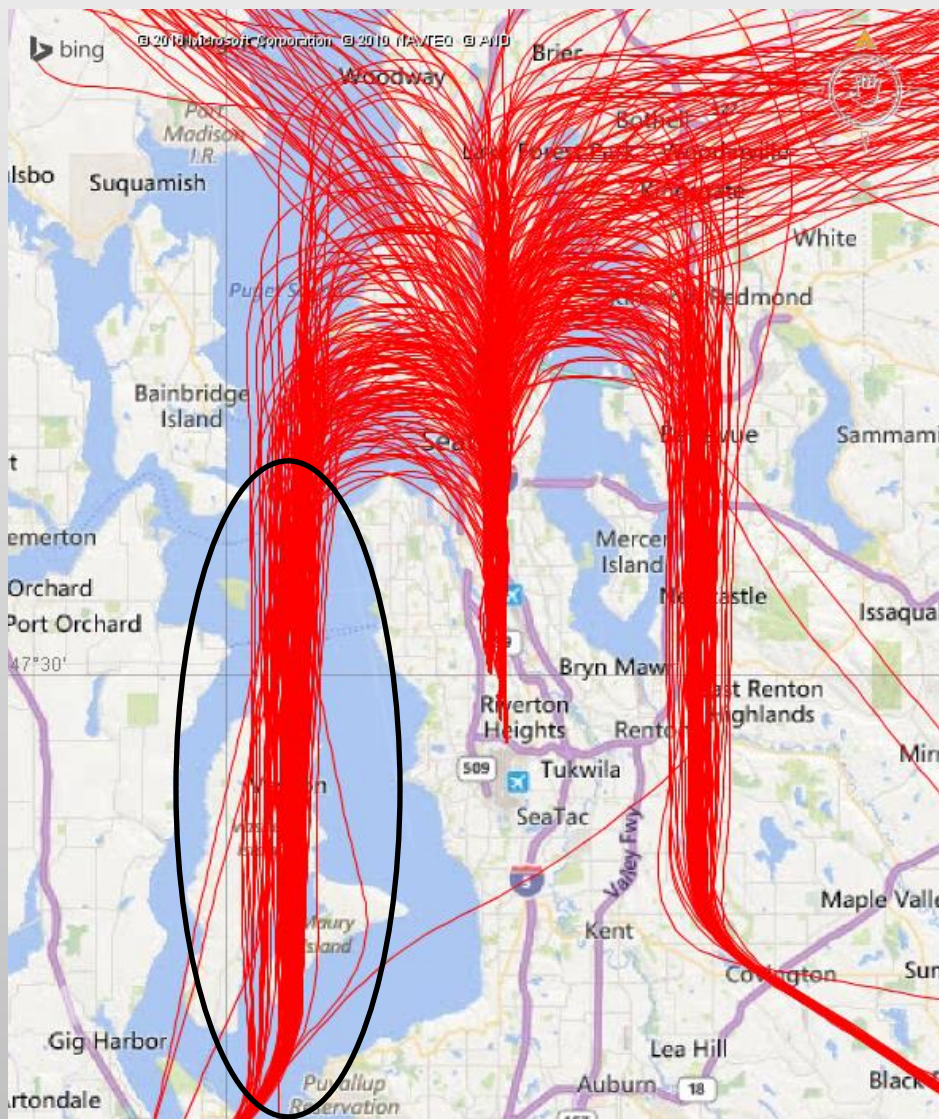
- Airport staff increased community engagement
- Several public meetings were held with the FAA and Airport Staff
- Open house format worked best



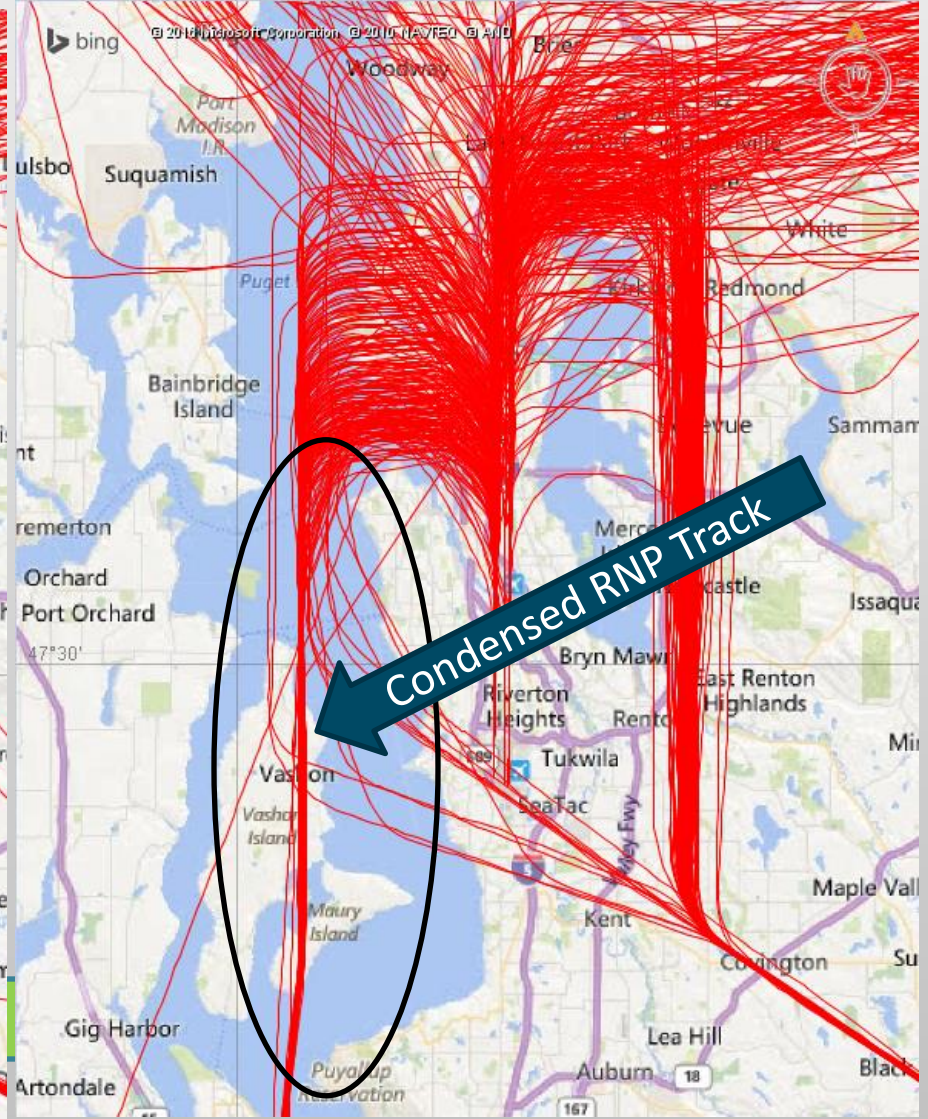
2016

- After implementation, very few noise complaints received that were actually associated with RNP
- Due to FAA spacing rules not all aircraft fly RNP to the runway – vectored off before final approach

March 2013



March 2016



Benefits

- Boeing 2015 Greener Skies report comparing a typical 737-800W aircraft

ARRIVALS TO KSEA RWY 16R					Estimated Benefits Re: HAWKS RNAV (RNP) Z			
Arrival	Distance (nmi)	Time (min)	Fuel (lb)	CO ₂ (lb)	Distance (nmi)	Time (min)	Fuel (lb)	CO ₂ (lb)
RNAV (RNP) Z RWY 16R ASA 537 – HAWKZ	122.1	24.7	839	2,647	Baseline			
Earliest Approach Vector Turn Flight 548 – HAWKZ	126.8	28.7	1,137	3,587	4.7	4.0	297	937
Typical Approach Vector Turn ASA Flight 593 -OLYMPIA	141.1	33.5	1,428	4,505	19.0	8.8	589	1,858
Bad Weather Vector Turn ASA Flight 559 – HAWKZ	145.6	31.9	1,585	5,000	23.5	7.2	746	2,354

*2015 Boeing Report: Precise Approaches at Seattle-Tacoma International Airport Enhance Rout and Fuel Efficiency

Seattle RNP

2015 Boeing Report

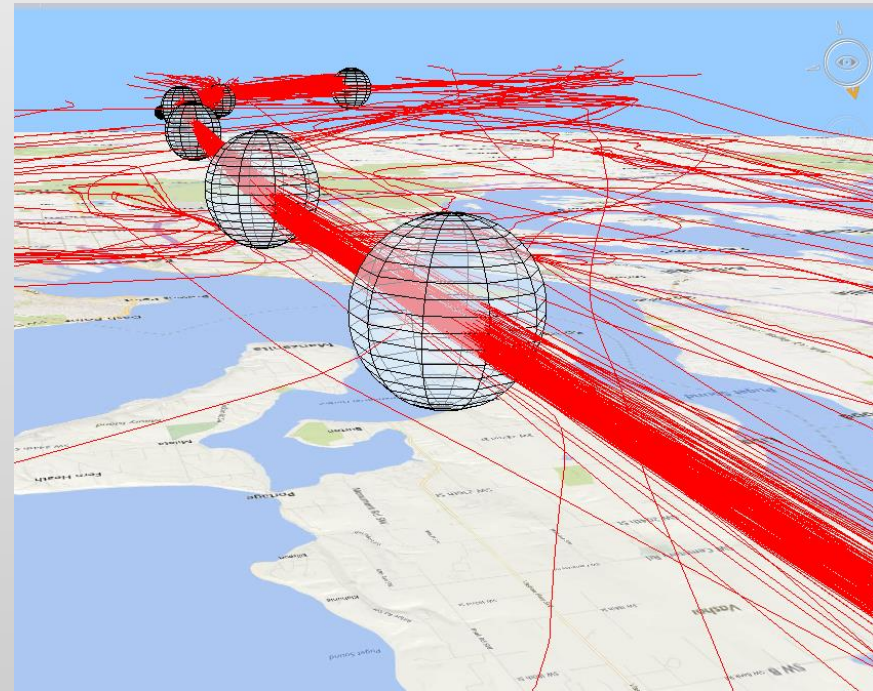
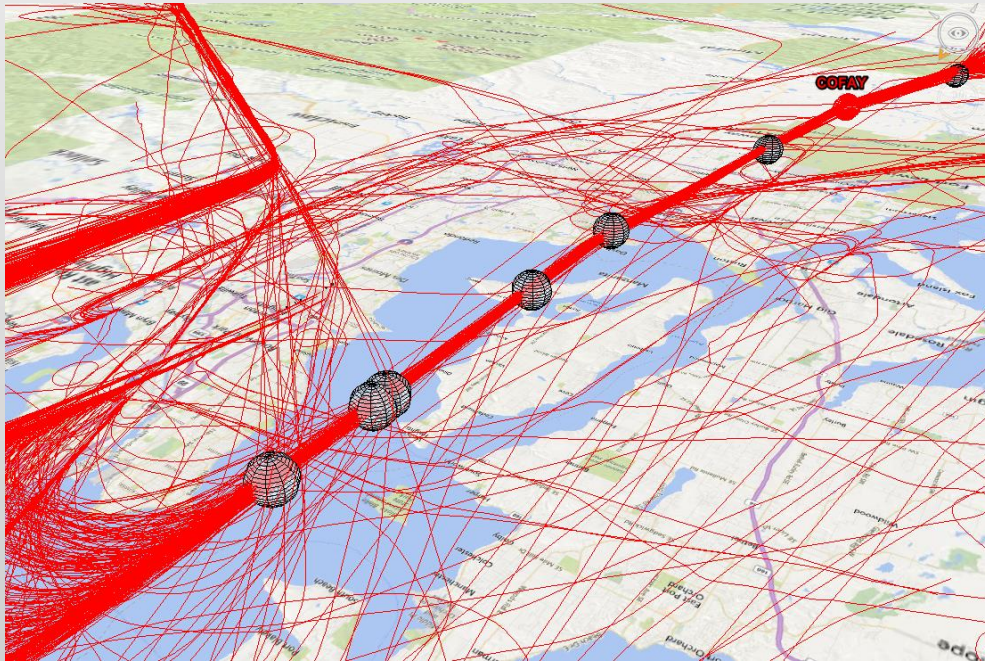
If all equipped airlines at Sea-Tac used the Greener Skies procedures on all flights from the southwest landing south:

- Reduce fuel consumption by 2.7 million gallons a year
- Reduce carbon emissions by 25,600 metric tons, the equivalent of taking 5,400 cars off the road each year.

*2015 Boeing Report: Precise Approaches at Seattle-Tacoma International Airport Enhance Route and Fuel Efficiency

RNP Flight Tracking

(Approximately 200 flights per day)



RNP tracks are identified by passing through spheres

What did we learn?

- Having airport staff knowledgeable about airspace and community relations is essential on the development team
- Community outreach is essential
 - Understandable information
 - Present the benefits
 - Present the impacts
 - Condensed flight tracks are a noise concern

Thank you

