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Federal Aviation Administration

An Update:

Greener Skies Over Seattle

Thinking Globally… Acting Locally

To: Port of Seattle Commissioners

David C. Suomi
Acting Regional Administrator
Northwest Mountain Region

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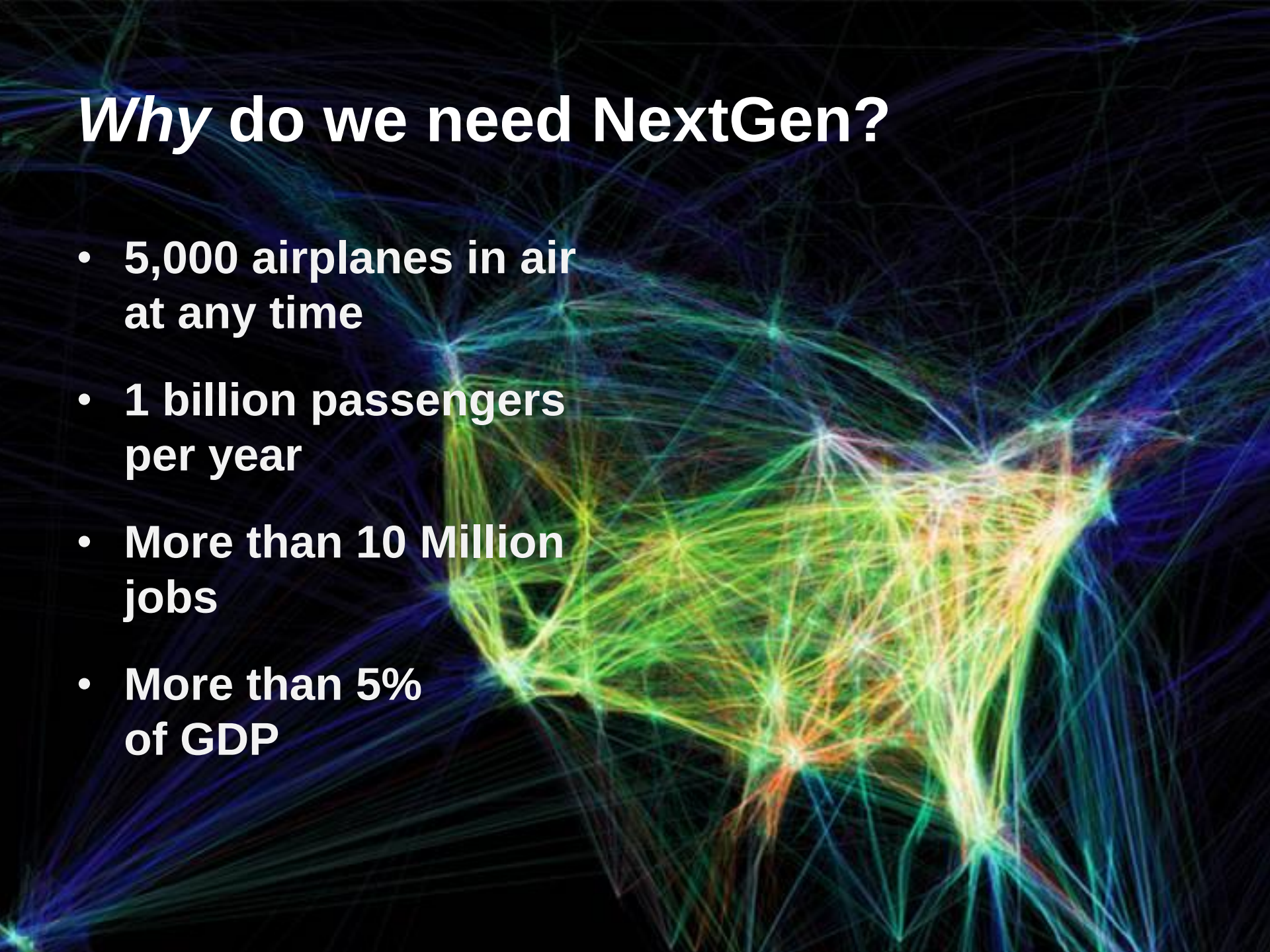
What is NextGen?

- NextGen represents the transformation of our national airspace system, making it flexible and sustainable
- It is not a single program or procedure but a comprehensive initiative that integrates new and existing technologies, procedures and policies

Why do we need NextGen?

- 5,000 airplanes in air at any time
- 1 billion passengers per year
- More than 10 Million jobs
- More than 5% of GDP



Broadly…*What do we need?*

An airspace system that will:

- Ease congestion and offer increased capacity to match demand while ensuring safety
- Prepare for the new types of aircraft… UAS and commercial spacecraft, for example
- Reduce impact on the environment without impacting aviation's contribution to our economy

Greener Skies Project

Initiative 1 (i1)

- STARs and RNP/RNAV approaches
- Flight Simulation Trial Results
- Environmental Assessment

Initiative 2 (i2)

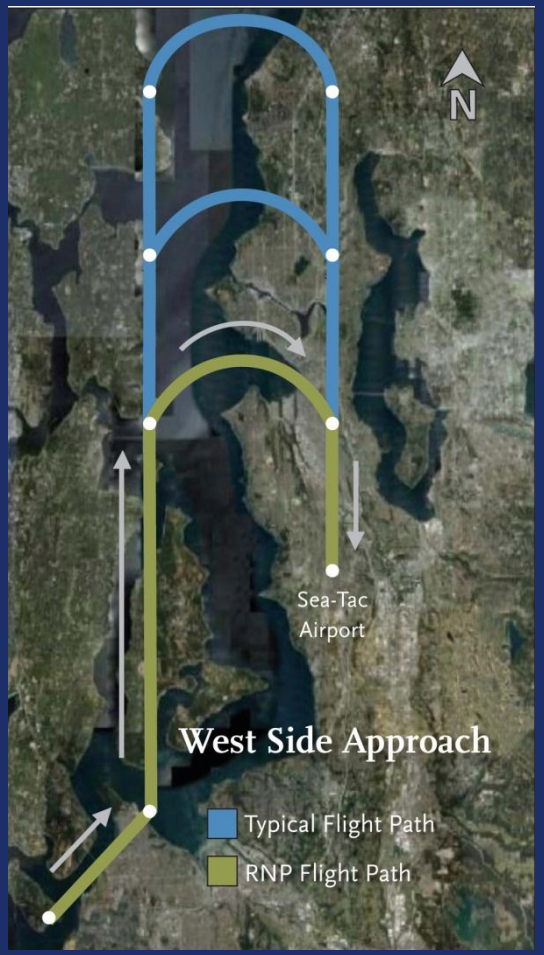
- Research Contract
- “RNP Established”
- Concurrent Approaches SEA / BFI
- Perhaps more…???

Project

- Timeline/Milestones

Required Navigation Performance (RNP) Approaches

- Consistent, controlled approaches
- Substantially shortened flight path length (green vs. blue)
- Noise exposure reductions with accurate routings over less noise sensitive areas (e.g. Elliott Bay)
- Reduced greenhouse emissions
- Minimized operational costs

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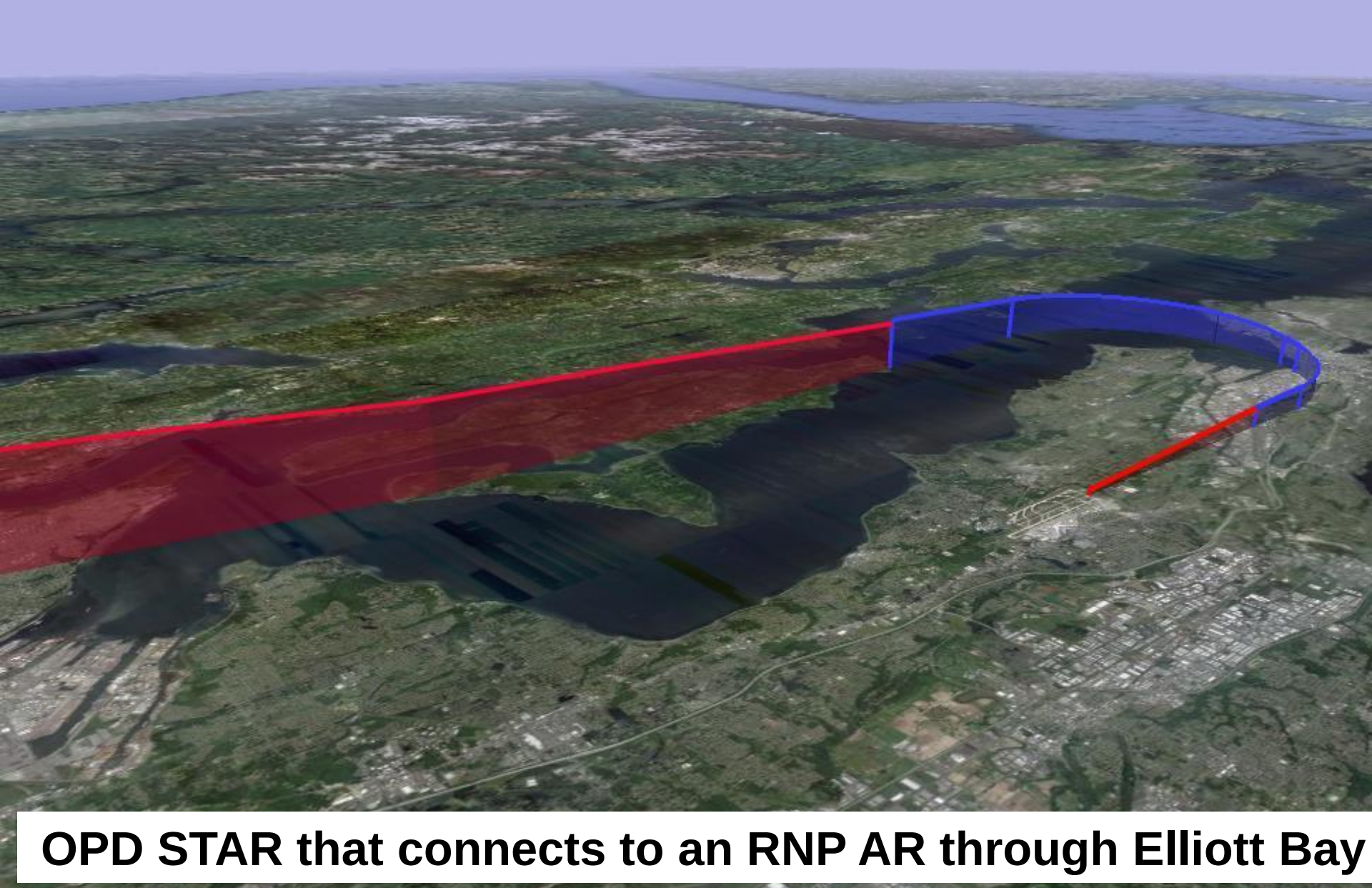


OPD STAR that connects to an RNP AR through Elliott Bay

Seattle Greener Skies Goals and Objectives

- Reduce track mileage to minimum possible distance
- Optimized Profile Descents (No level-offs, flown at idle thrust from cruise until established on final)
- Absorb delays at cruise altitude
- Reduce/eliminate low altitude radar vectoring
- Reduce fuel burn
- Identify and implement the tools, technologies and practices that enable achievement of these goals

Understanding Optimized Profile Descent (OPD) Operations

Optimized Profile Descent Operations:

- **Are enabled by airspace design, procedure design, and ATC facilitation**
- **Allow aircraft to descend continuously**
- **Employ minimum engine thrust, in a low drag configuration**
- **Objective: Usable by 85% of aircraft, 85% of the time**

Optimum OPD

An optimum OPD starts from the top of descent while:

Reducing

- ATC/Pilot communication
- segments of level flight
- noise
- fuel burn
- emissions

Increasing

- predictability to ATC/Pilots
- flight stability

Traditional Approach

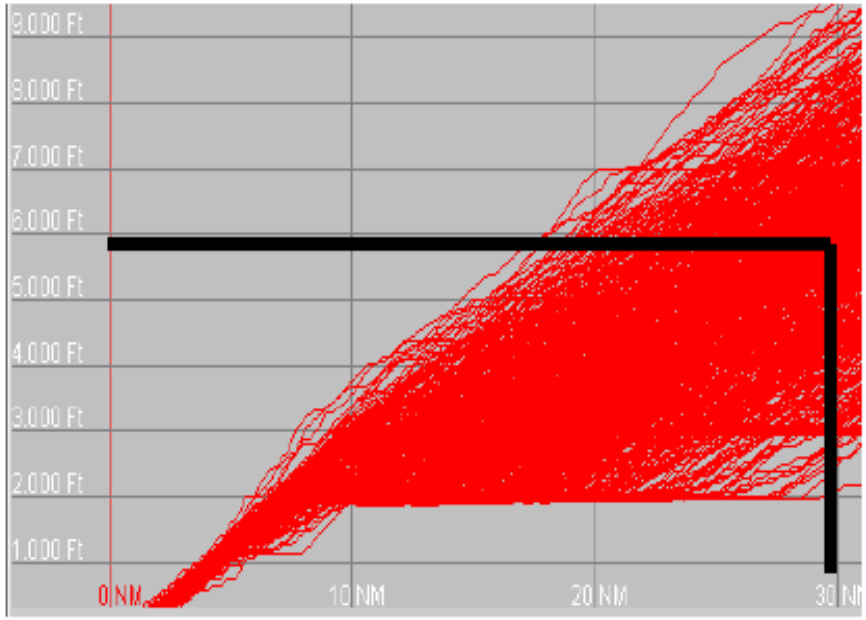
- High noise levels
- High CO emissions

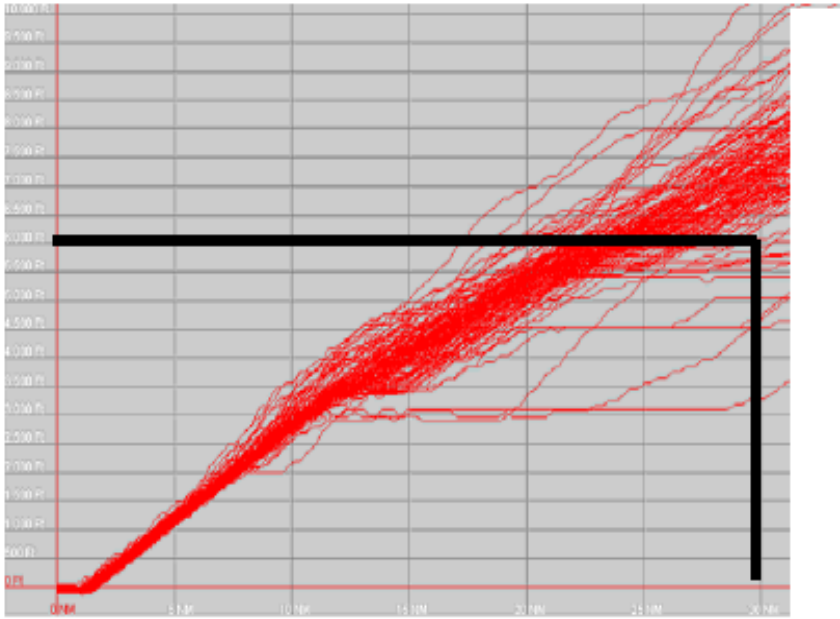
Inefficient
Freq Communications

Optimized Profile Descent Approach

- Reduced noise
- Reduced emissions
- Highly efficient
- Reduced Communication

Actual CDO Operation



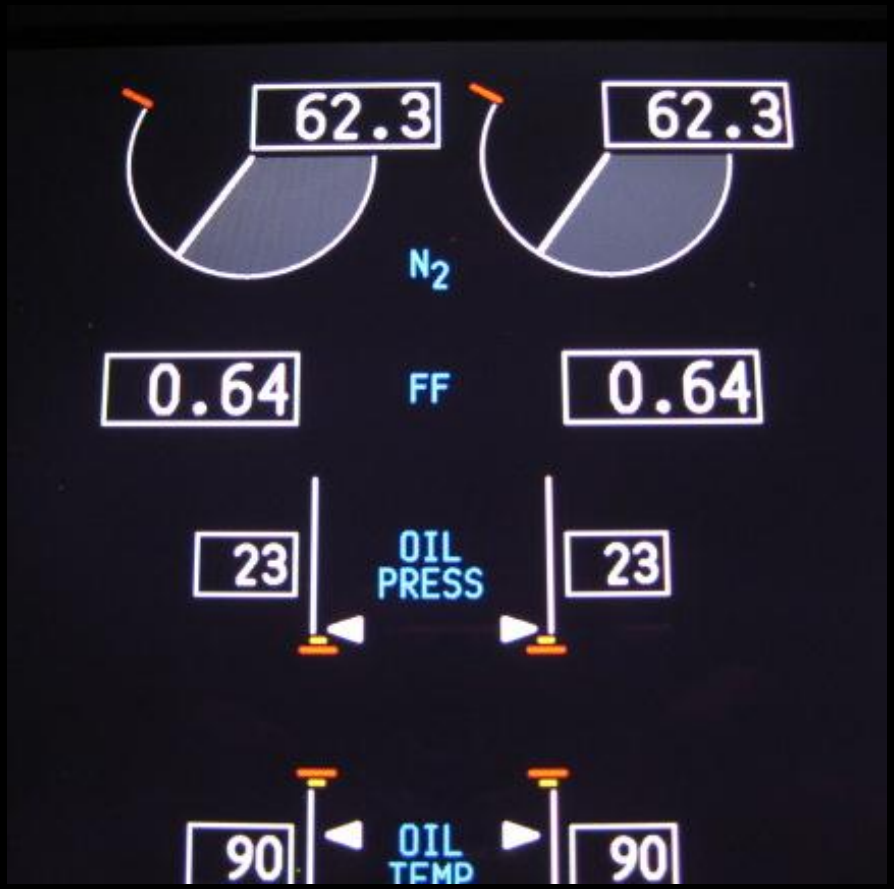


Flight tracks before OPD

Flight tracks after OPD

Importance of an Idle Descent

- Idle Descent
- 640 lbs/hr/engine
- 1280 lbs/hr
- 3.2 gal/min



Level-offs Use 4-5 Times More Fuel Than Idle Descent!

Idle Descent

x 3.7=

Level, 210 kt, flaps up

x 4.0=

Level, 180 kt, flaps 5

x 4.4=

Level, 170 kt flaps 10

x 5.5=

Level, 160 kt, flaps 15

Quantifiable Annual Benefits

- **4,800 less flight hours**
  - $20.4M savings
- **2.9M gallons less fuel used**
  - $7.3M savings
- **30,500 metric tons less CO2 emissions**
  - equivalent to removing 5,600 cars annually from the Seattle region


Rwy 16 Arrivals
Google

Why Seattle?

- A clear, decisive early "win" with NextGen *anywhere* will incentivize airports and airlines to move forward with embracing the transition.
- Any carrier successfully using OPDs and RNPs in a given market will have a competitive tool that other carriers will have to embrace to remain competitive.
- Seattle represents a fit, willing and able local lead carrier (Alaska/Horizon), and a committed airport operator (Port of Seattle).
- Seattle represents complex, *but not saturated,* airspace, thus a good environment to demonstrate the wide range of NextGen capabilities.

Why Seattle? (con't)

- Seattle represents extremely high existing equipage of operators, over 80%, thus assuring an easier transition with remaining legacy equipment operators.
- Seattle has intense local, Congressional, and Administrator support. (Sen Murray, Chair Senate Transportation Appropriations, Sen Cantwell, Chair, Aviation Operations)
- Excellent facility Bargaining Unit rapport, both between TRACON and ARTCC, and between facilities and procedure designers.
- Seattle represents the highest possibility of success in a single market, and thus to "bootstrap" Next Gen in a wider venue.

Benefits

- More efficient use of airspace and arrival route placement
- More consistent flight paths and stabilized approach paths
- Reduction in both pilot and controller workload
- Reduction in the number of required radio transmissions
- Cost savings and environmental benefits through reduced fuel burn
- Reduction of controlled flight into terrain (CFIT) incidents
- Noise sensitive operations

Thank You

Federal Aviation Administration