NextGen Briefing

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Federal Aviation Administration

FAA Mission and Vision

Safety – The foundation of everything we do

- **Mission**
  - Our continuing mission is to provide the safest, most efficient aerospace system in the world.
- **Vision**
  - We strive to reach the next level of safety, efficiency, environmental responsibility and global leadership. We are accountable to the American public and our stakeholders.

Why Do We Need NextGen?

- Delivers a better travel experience through safer skies and fewer delays
- Accommodates increasing demand in the National Airspace System (NAS)
- Reduces fuel consumption and engine exhaust emissions
- Saves money for aircraft operators, traveling public and the FAA

NextGen Programs

Communication

- ***Data Communications (DataComm)***
- NAS Voice System (NVS)

Navigation

- ***Performance Based Navigation (PBN) (including Metroplex)***

Surveillance

- ***Automatic Dependent Surveillance–Broadcast (ADS-B)***

Automation

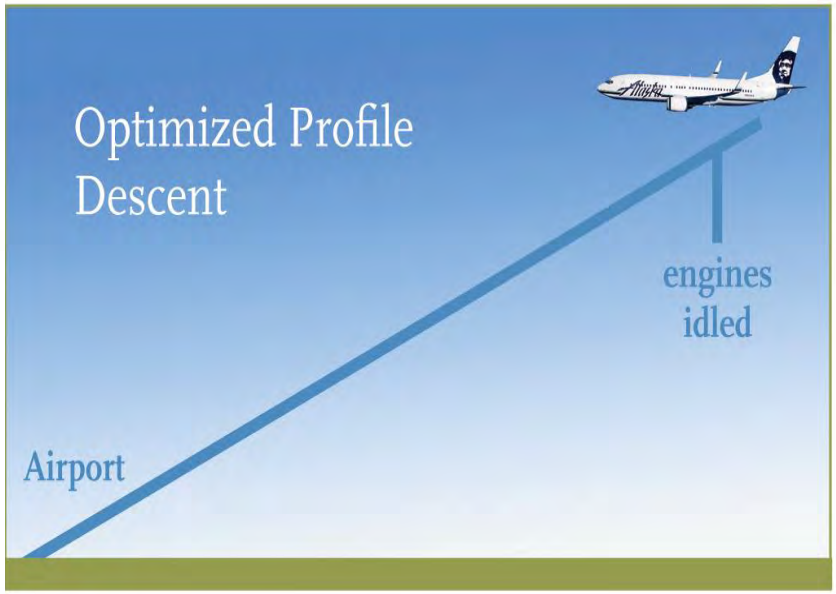
- En Route Automation Modernization, (ERAM)
- Terminal Automation Modernization and Replacement (TAMR)
- Collaborative Air Traffic Management Technologies (CATM)
- Time Based Flow Management (TBFM)
- Traffic Flow Management System (TFMS)
- Terminal Flight Data Manager (TFDM)
- NextGen Weather Processor (NWP)

Enterprise Information Management

- System Wide Information Management (SWIM)

Current DataComm Sites

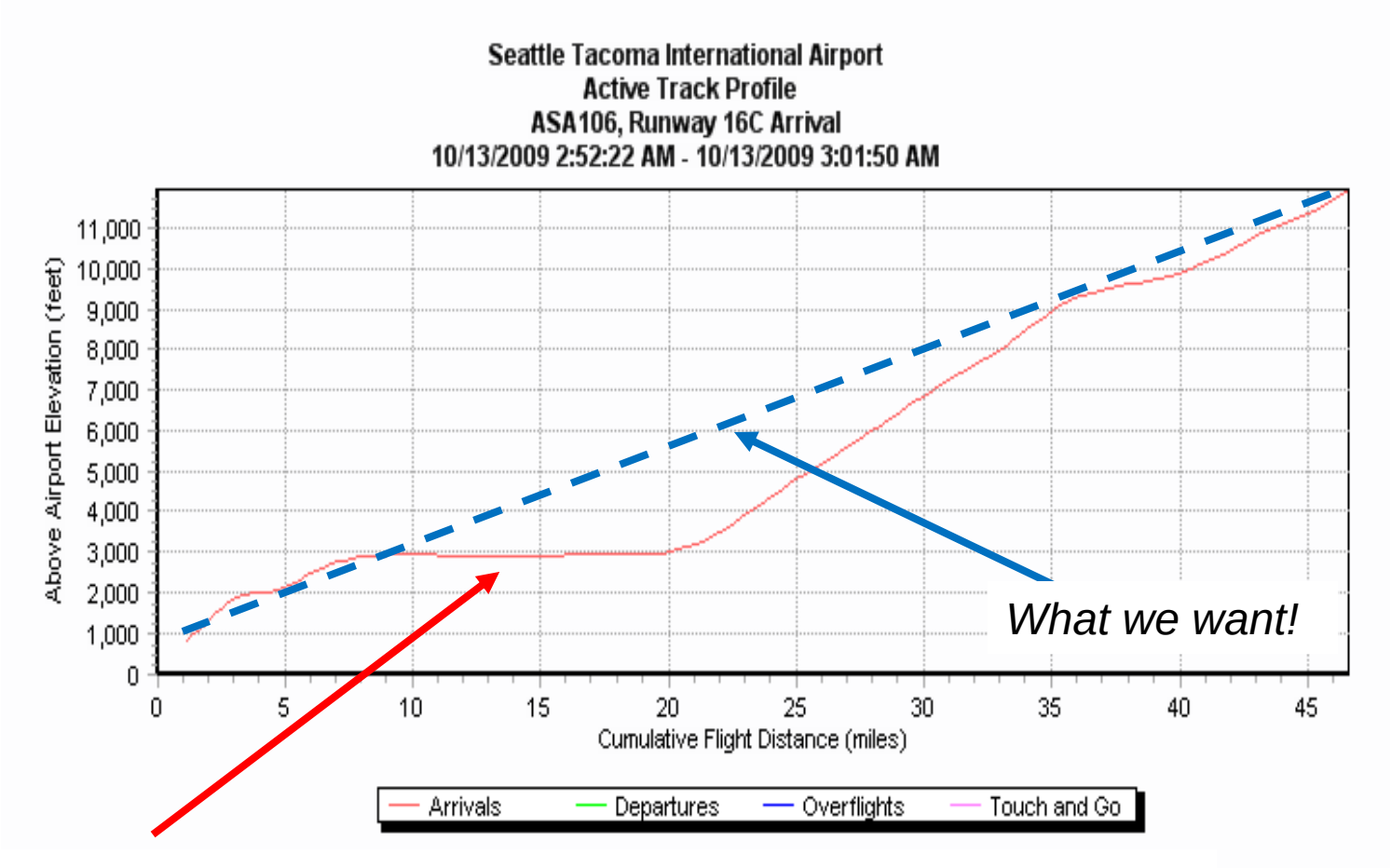
Performance Based Navigation (PBN) Procedures



High noise levels
High CO emissions
Inefficient
Frequent Communications

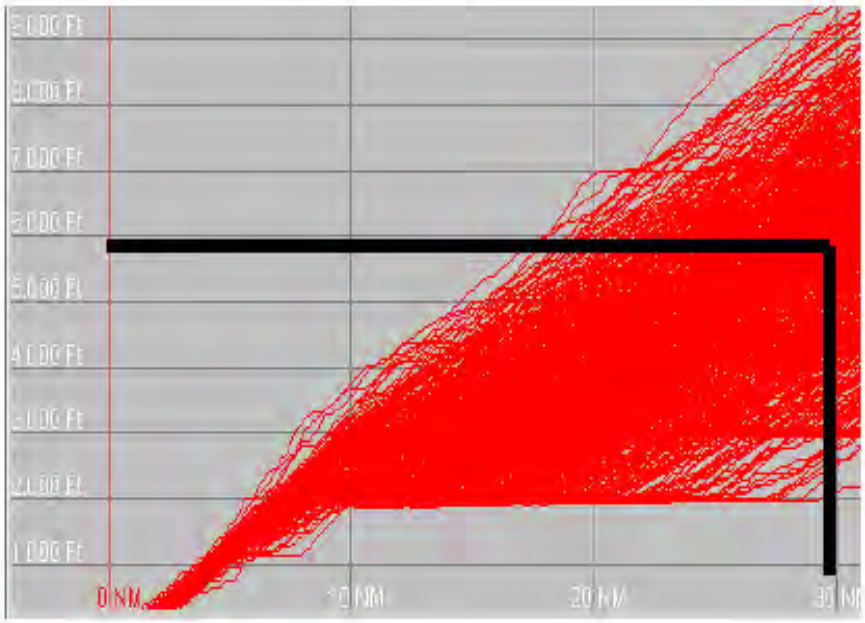
Reduced noise
Reduced emissions
Highly efficient
Reduced Communication

Actual Aircraft Flight Profile

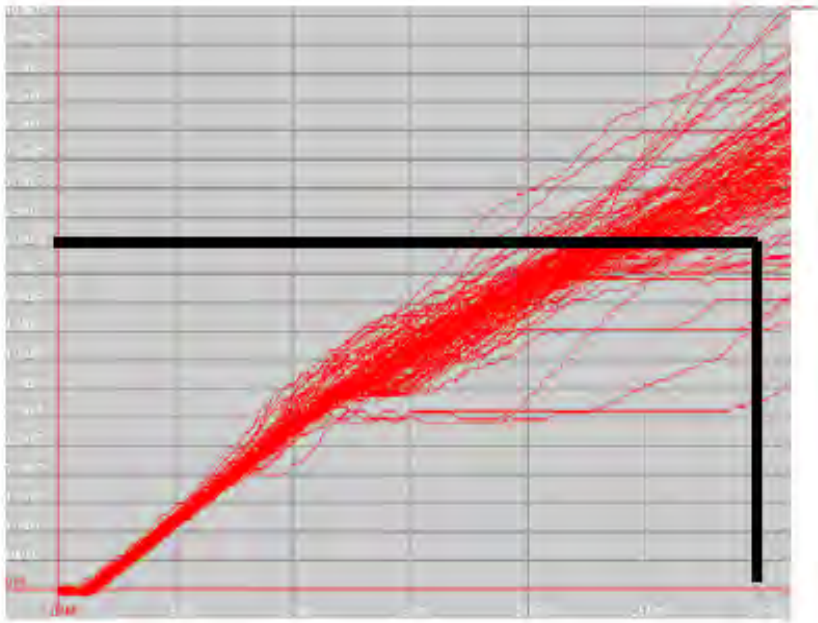


Level-offs burn five times the fuel as idle thrust descents

Actual Optimized Profile Descent (OPD) Operation

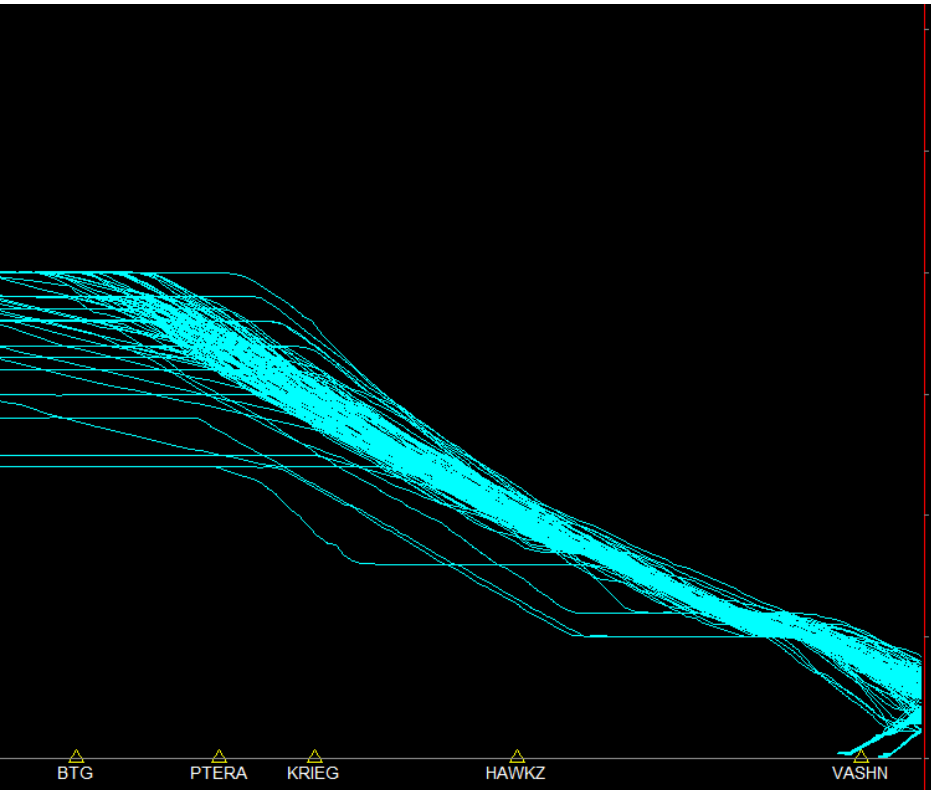


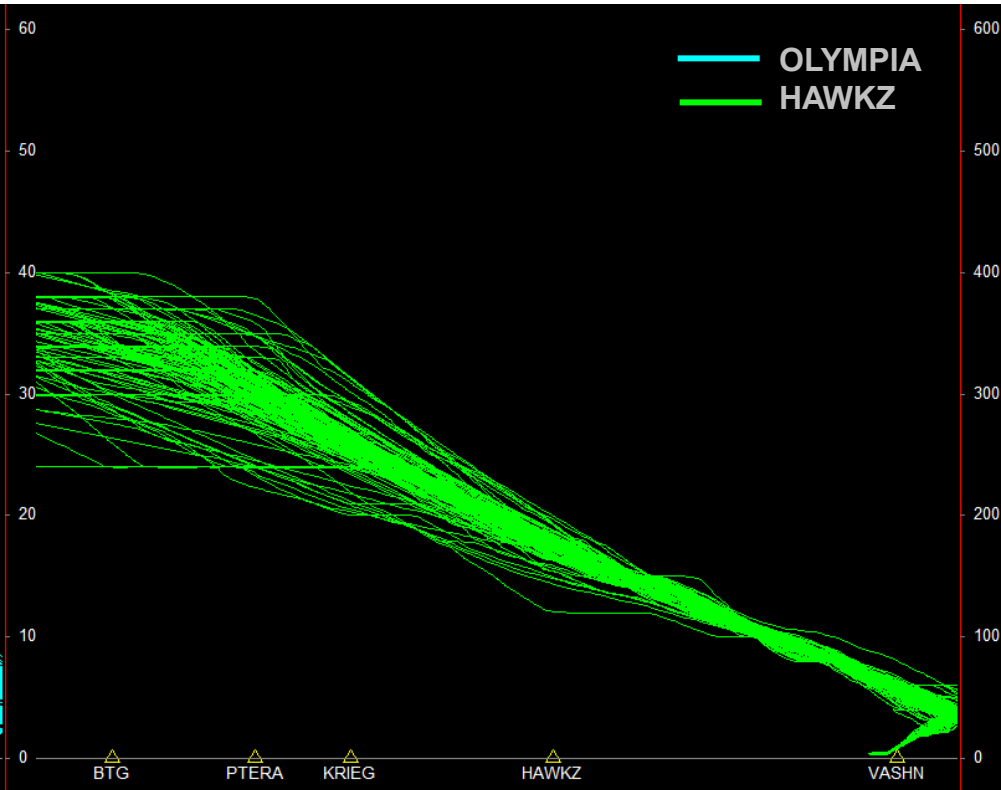
Flight tracks before OPD



Flight tracks after OPD

Seattle HAWKZ and OLM Arrival





Fixes shown are for the HAWKZ arrival

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

Greener Skies - An Example of RNP - - Goals and Objectives -

- Reduce track miles to minimum possible
- Reduce noise exposure and emissions to Seattle / Puget Sound region
- No level-offs - Idle thrust from cruise altitude to final approach
- Absorb delays at cruise altitude
- Reduce/eliminate low altitude radar vectoring
- Reduce fuel burn

Delivering NextGen

Automatic Dependent Surveillance - Broadcast

BUILDING THE FUTURE

ADS-B

- Uses GPS technology to determine an aircraft's location and airspeed, and broadcasts that information to controllers and other equipped aircraft via a nationwide network of ground stations.
- ADS-B provides surveillance where radar can not be deployed, such as remote areas of Alaska and the Gulf of Mexico.
- ADS-B also enables aircraft-to-aircraft surveillance.

Benefits

- Provides more frequent position update-rates than radar = precise location information of aircraft
- Provides in-cockpit traffic and weather information
- Improves safety for pilots

Moving Forward

- Baseline radio stations are in place nationwide
- Surveillance coverage available
  - En Route in 2015 - Complete
  - Terminal and Surface by 2019
- Reduced separation
- Oceanic in-trail altitude changes

What is NextGen?

NextGen is a portfolio of FAA initiatives to modernize the National Airspace System (NAS).

Procedural-based control
based on pilot-location reports via radio

- Landmark navigation
- Radio beacons
- Position reports

Surveillance-based control
based on radar location

- VOR/DME
- Radar

Trajectory-based control
based on precision GPS location

- RNP
- ADS-B
- Data Comm

1930s 1950s Now

Delivering NextGen Improvements

Legacy System		*NextGen System*
Radar	→	Satellite
Inefficient Routes	→	PBN (fuel savings)
Voice Communications	→	Voice & Digital Communications
Disparate Information	→	Automated Decision Support Tools
Fragmented WX Forecasting	→	Integrated Weather Information
Weather Restricted Visibility	→	Improved Access in Low Visibility
Forensic Safety Systems	→	Prognostic Safety Systems
Nationwide Focus	→	Focus on Congested Metroplexes

Benefits in every phase of flight

NextGen 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