

Oakland Air Route Traffic Control Center

ISPACG 22 Meeting

User Preferred Routes

Presented By: FAA, Oakland ARTCC
Airspace and Procedures

Date: March 11-14, 2008



**Federal Aviation
Administration**



ICAO STRATEGIC OBJECTIVES

• In Support of ICAO'S Strategic Objectives

- ✓ Minimize the adverse effect of Global Civil Aviation on the environment
- ✓ Enhance the efficiency of aviation operations

• FAA in conjunction with South Pacific ANSPs has been supporting UPRs to/from the South Pacific since December 2000.

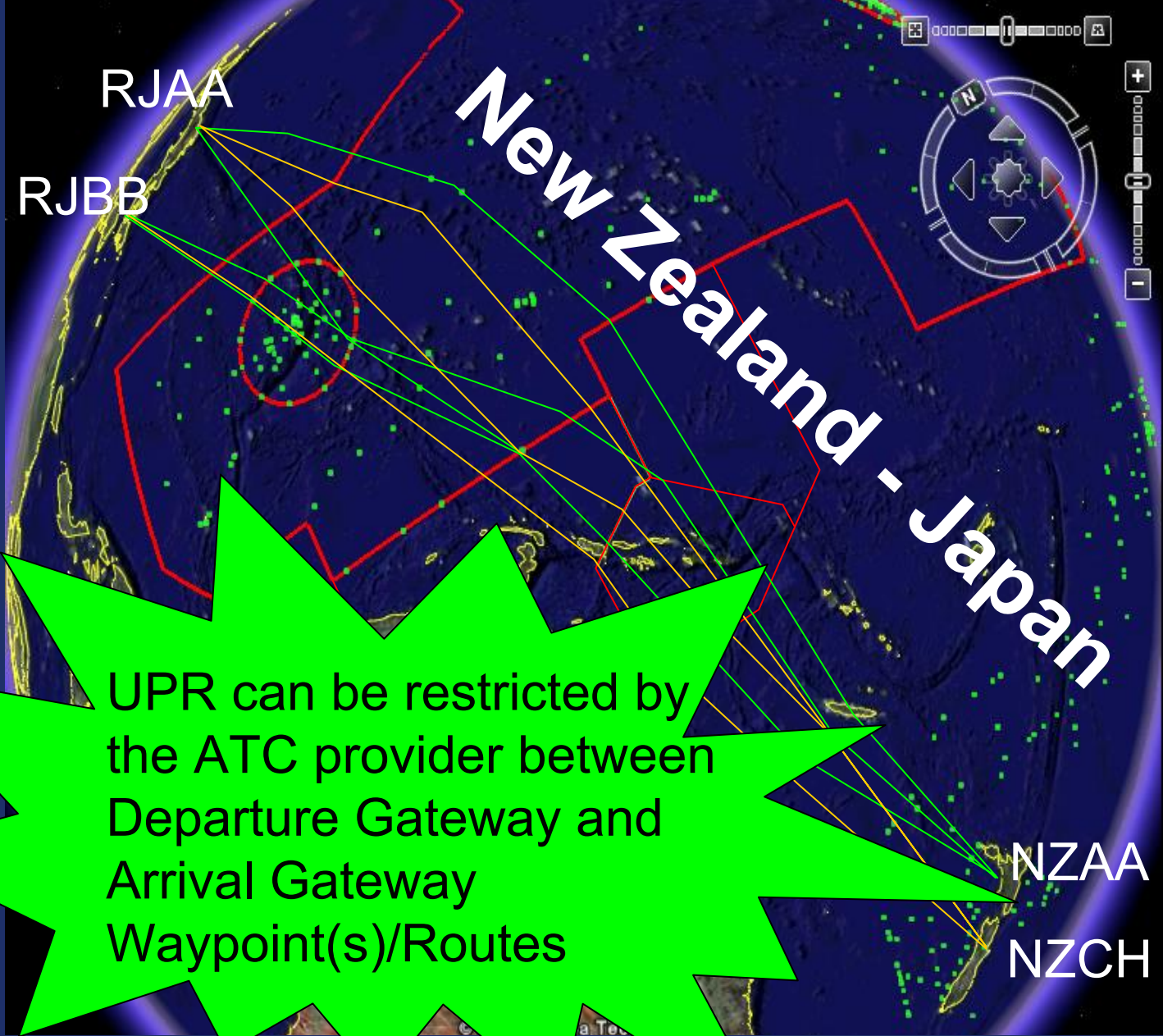
UPR Description

- **A User Preferred Routes is a routing that is filed in an aircraft's FPL which allows the aircraft to flight plan the most efficient route for their flight.**

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UPR can be restricted by the ATC provider between Departure Gateway and Arrival Gateway Waypoint(s)/Routes

New Zealand - Japan

U
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RJAA
RJBB

•Guam requires
ATS
Routes


•Moresby Center
supports UPRs in
part of their
airspace

Different FIRs
can have
different
restrictions for
aircraft to file
UPRs

•Auckland,
Brisbane and Nadi
Centers support
UPRs for FANS
equipped aircraft

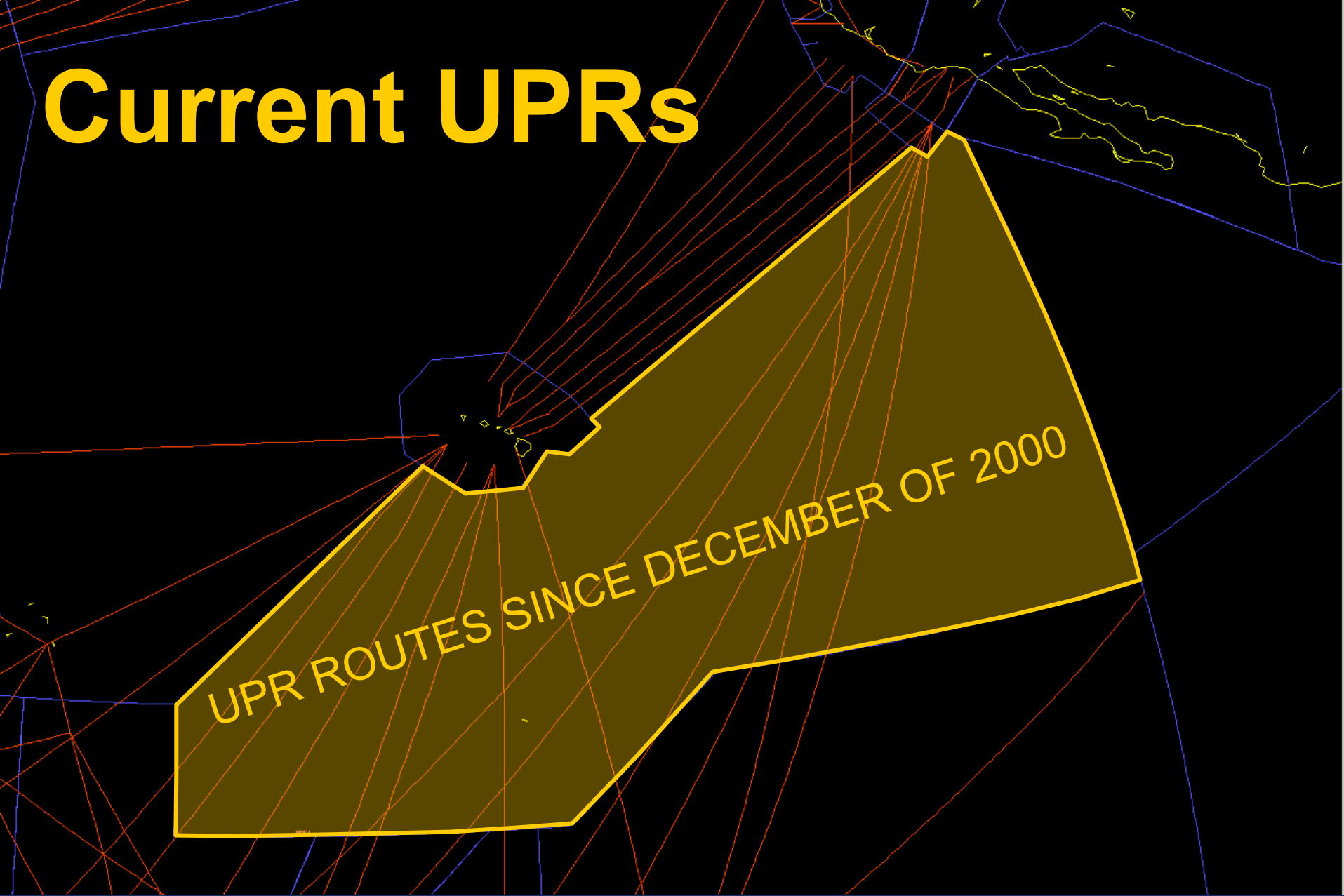
NZAA
NZCH

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**Flight follows ATC
Clearance the same as any
other Non-UPR Flight**

Current UPRs



UPR ROUTES SINCE DECEMBER OF 2000

The image shows a map of the Pacific region with a large yellow shaded area. Inside this area, numerous orange lines radiate from a central point, representing flight routes. The text 'UPR ROUTES SINCE DECEMBER OF 2000' is written across the shaded area in yellow. The background of the map is black with blue and yellow lines representing other geographical features or routes.



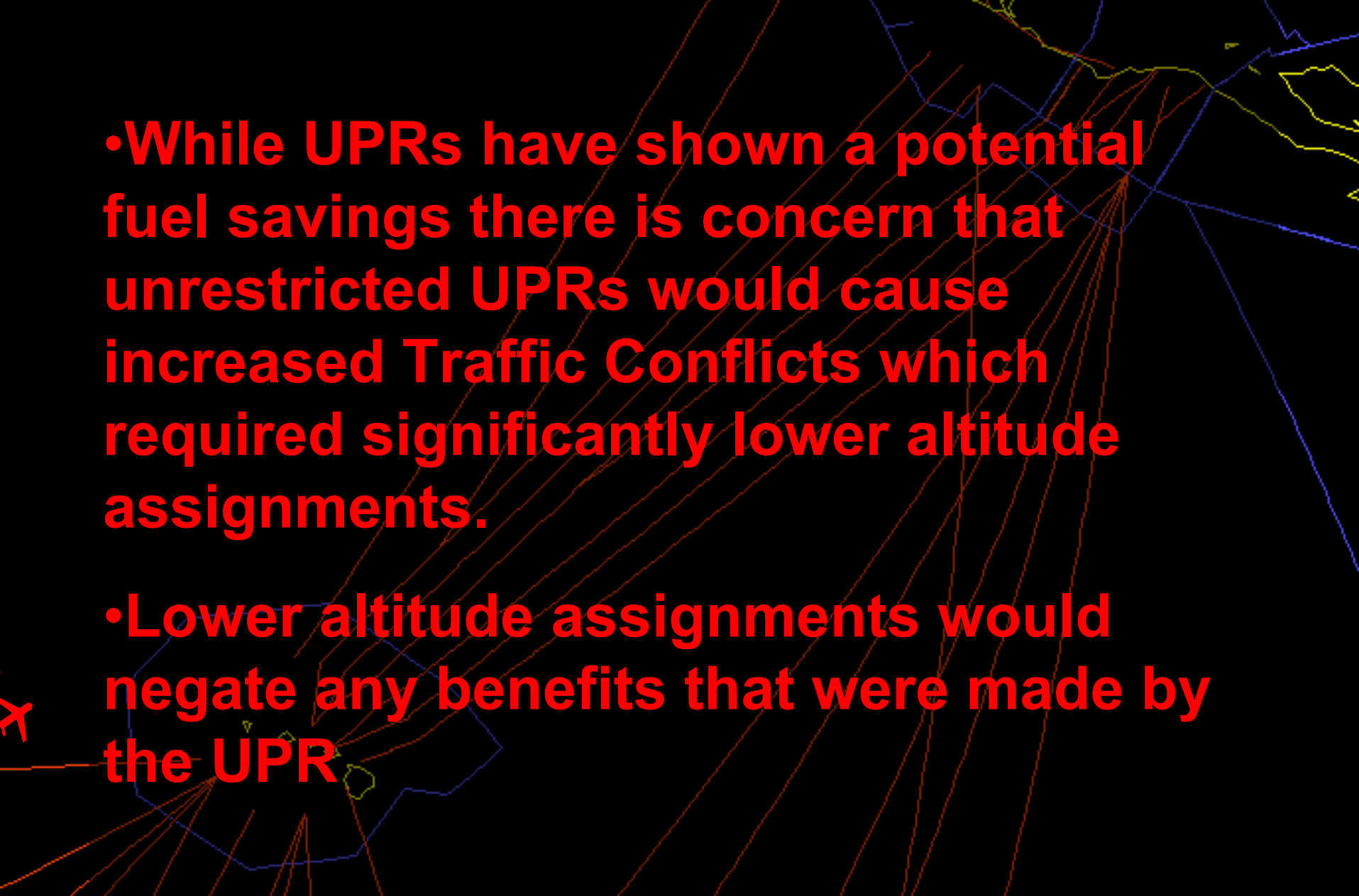
CEP UPR Trials



UPR Trials in the CEP

Airborne UPR Trials
have shown savings of
over 3100 LBS of Fuel

The CEP
consists of
7 fixed ATS
Routes



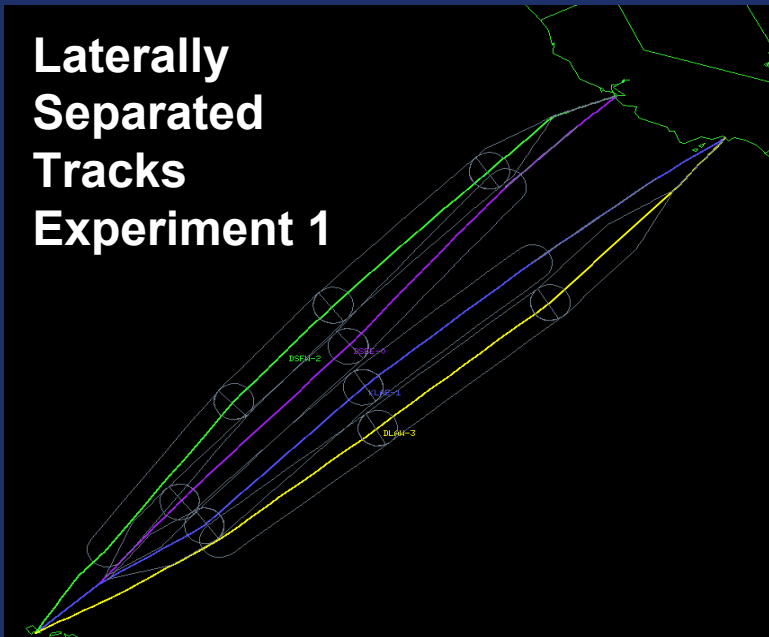
•While UPRs have shown a potential fuel savings there is concern that unrestricted UPRs would cause increased Traffic Conflicts which required significantly lower altitude assignments.

•Lower altitude assignments would negate any benefits that were made by the UPR

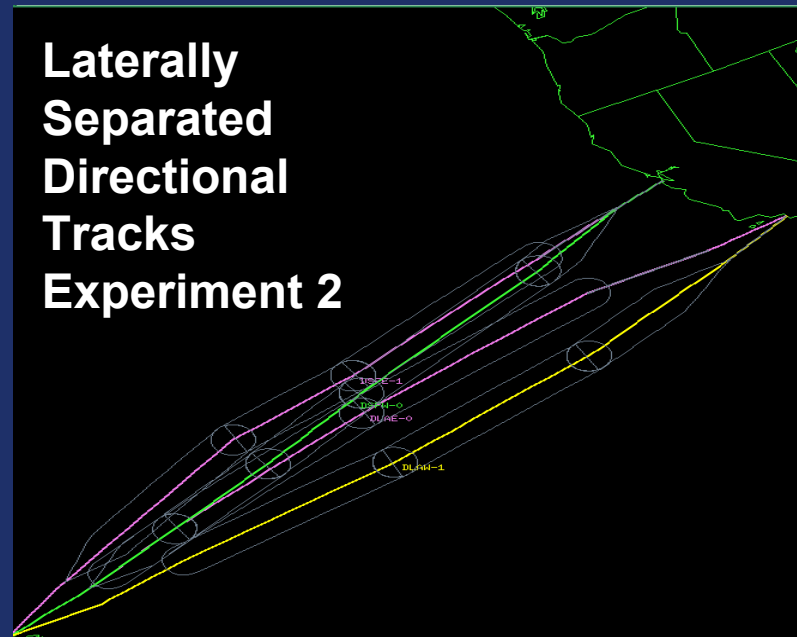
CEP Flexible Tracks

- Can Flexible Tracks in the CEP provide a savings
- MITRE CAASD conducted a study and predicted:
 - Fuel savings of .8 % for separated tracks
 - Fuel savings of 1.7 % for Same direction separated tracks

Laterally
Separated
Tracks
Experiment 1



Laterally
Separated
Directional
Tracks
Experiment 2



CEP Summary

- **Flexible laterally separated tracks are more fuel efficient than fixed tracks**
 - **Actual benefit could average more than one-half percent fuel burn savings per flight**
 - **More than 15 million pounds of fuel per year all flights**
- **Several factors still need to be addressed:**
 - City Pairs
 - Changing wind conditions
 - Compacting of traffic
 - Different Aircraft types/weights.
- **Operator input is needed**

CEP Next Steps.....

- **Oakland is making the changes to the CEP Airspace on April 10, 2008.**
- **Oakland Traffic Management is updating and improving the DOTS+ network to reflect the airspace changes.**
- **Oakland Traffic Management is best suited to generate flexible routes with DOTS+.**



Flexible Track Evaluation

- **Propose to run a Paper Trial in the end of April.**
 - Oakland would generate separated flexible track TCMs and transmit them to the operators for evaluation.
 - The TCMs would be generated every Monday for a 4 week period.
 - Operators would compare the TCM flexible tracks against the current fixed ATS Routes.
 - The Operators would transmit their comparison results to Oakland Center.
 - Need to have one voice representing the Operators to say if flexible tracks are a benefit.
- **Discuss the results of the Paper Trial at the next Oceanic Work Group Meeting, June 18, 2008 @ ARINC in Livermore CA.**



Asia – New Zealand/Caledonia UPRs

- Air New Zealand projects an annual savings of over 1 million kg of fuel.
- ATC constraints are limiting the savings.

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New Zealand/Caledonia - Japan

RJAA

RJBB

A337

G205

Effective July 19, 2007

NZAA

NZCH

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Japan – Hawaii UPRs

- **PACOTS Tracks 11, 12, A, B Traffic**
 - **PACOTS Tracks J and K were a factor.**
- **Paper Trial conducted December 1-15, 2007**
- **3 Operators submitted daily UPRs**
- **The data was used to develop Dynamic Simulation (DYSIM) ATC problems.**

Japan – Hawaii UPRs

- **Fuel Savings varied over the trial.**
- **Overall the paper trial projected a savings of:**
 - **Over 2.27 million kilograms of fuel annually, based on the operators that participated**
 - **6.81 million kilograms of reduced CO₂ emissions**
 - **2 million US dollars in annual operator savings**

Dynamic Simulation Results

- **FAA determined that the data supported the implementation of UPRs between Japan and Hawaii in the Oakland FIR.**

RJAA to YSSY/YBBN UPRs

- Potential 4100 lbs of fuel savings for a flight.
- Proposed Paper Trial to test operational feasibility and efficiencies.
- Paper Trial Participants
 - JCAB
 - FAA
 - ???



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