

# Tailored Arrivals

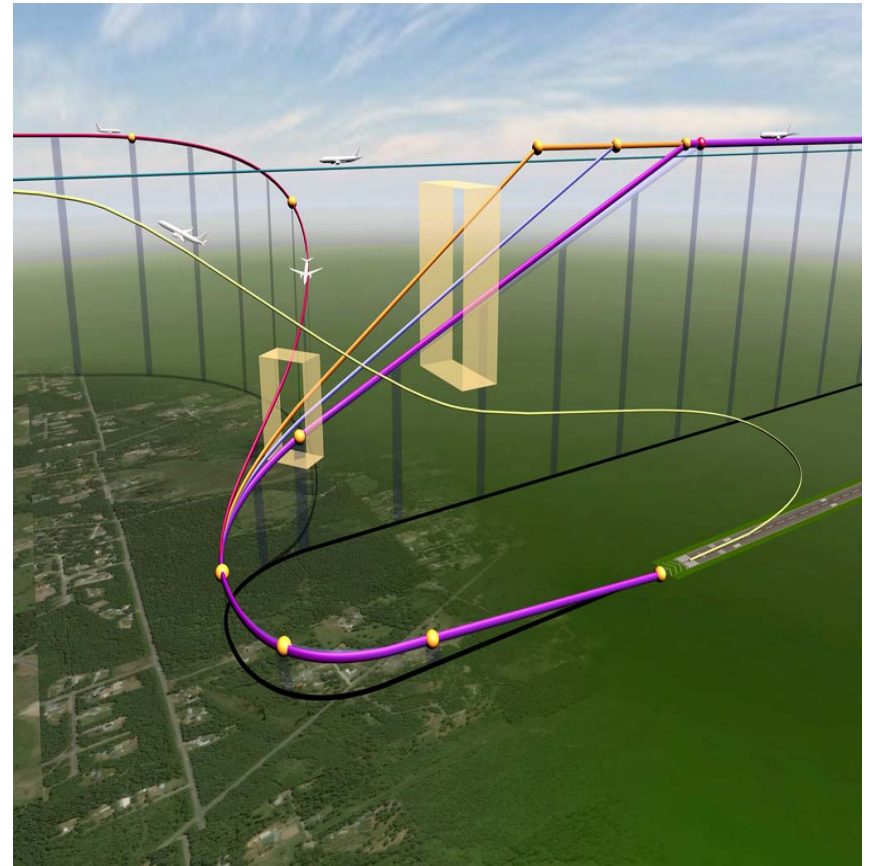
Richard C Lanier, Ph.D.

13 January, 2010

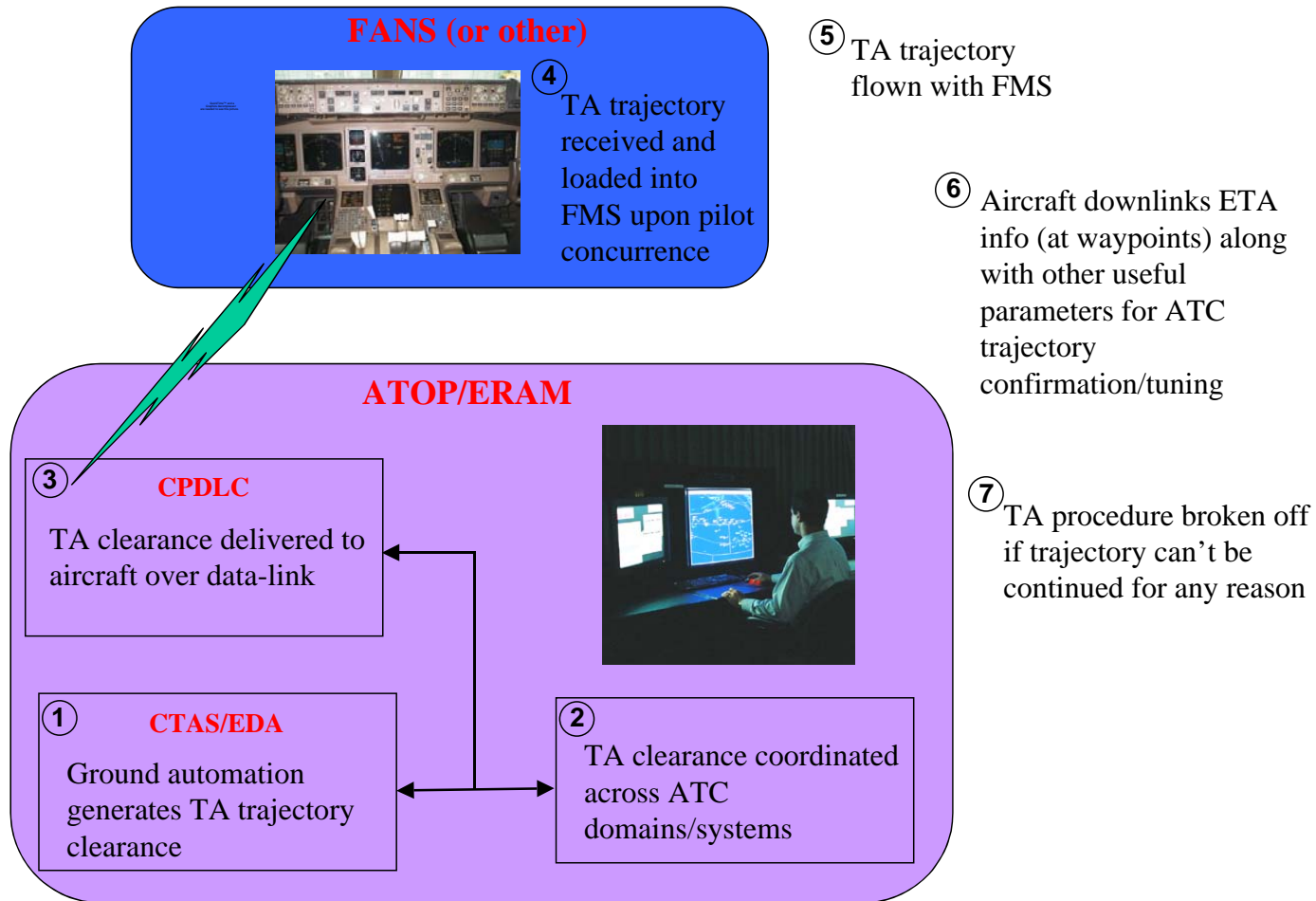
[Richard.C.Lanier@NASA.gov](mailto:Richard.C.Lanier@NASA.gov), 650-604-1996

# Oceanic Tailored Arrival

- Tailored arrival — key features:
  - Continuous descent from cruise altitude to touchdown
  - Tailored for traffic, environment, ...
  - Controller-to-aircraft datalink\*
  - Definition of flight path in both time and space (4D)
  - Cleared flight path through multiple centers
  - Currently available a/c capabilities
- Benefits:
  - less fuel per flight
  - Noise reduction
  - Emissions reduction
  - Flight duration reduced several min
  - Dramatically reduced VHF voice communication
  - Overall efficiency improved
  - Important step toward modernization of ATM

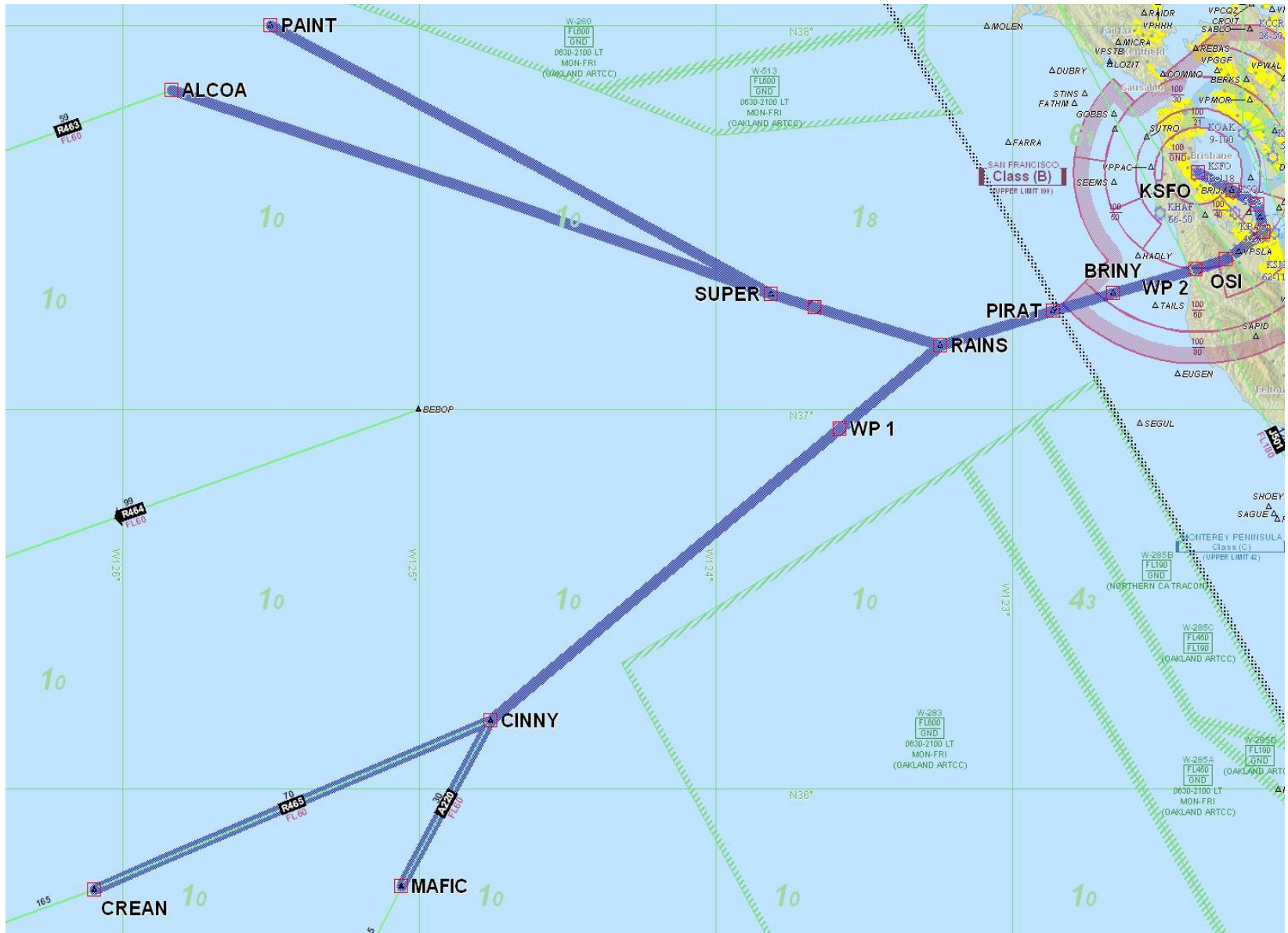


# SFO Tailored Arrivals

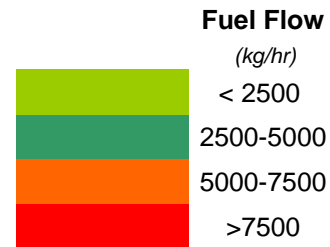
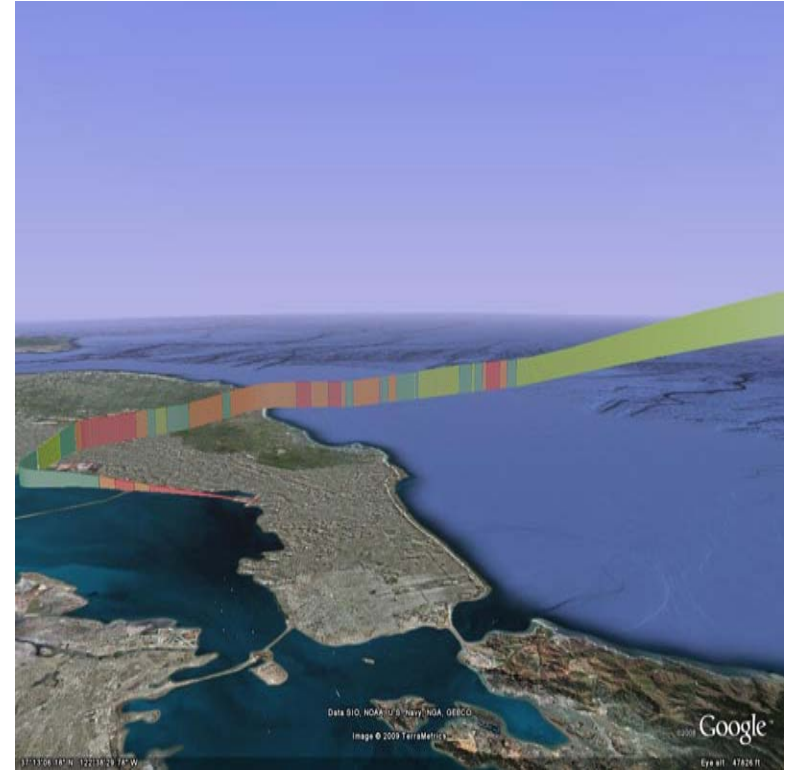
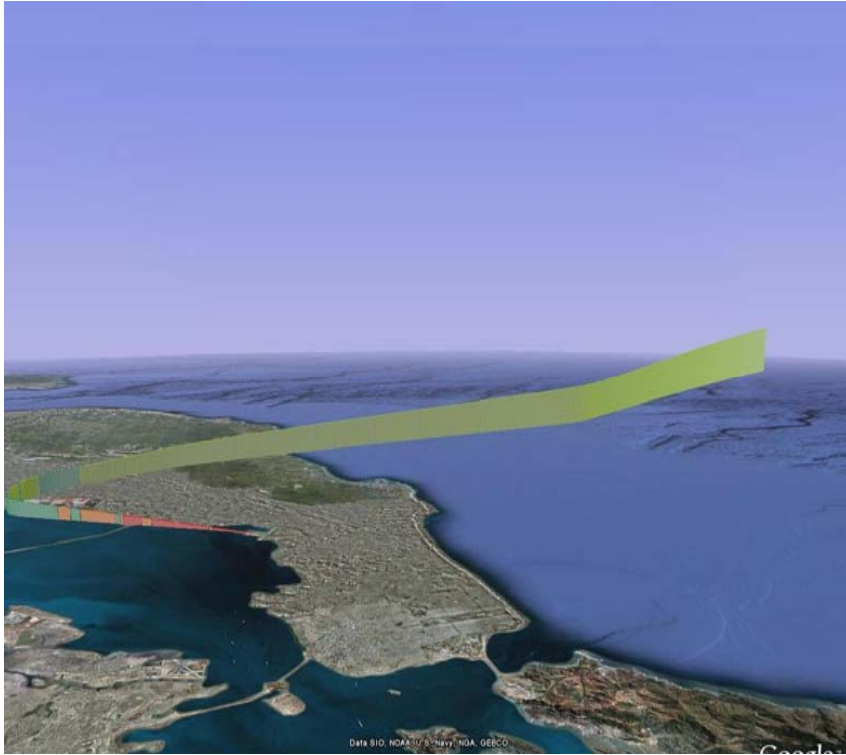


# SFO Trials

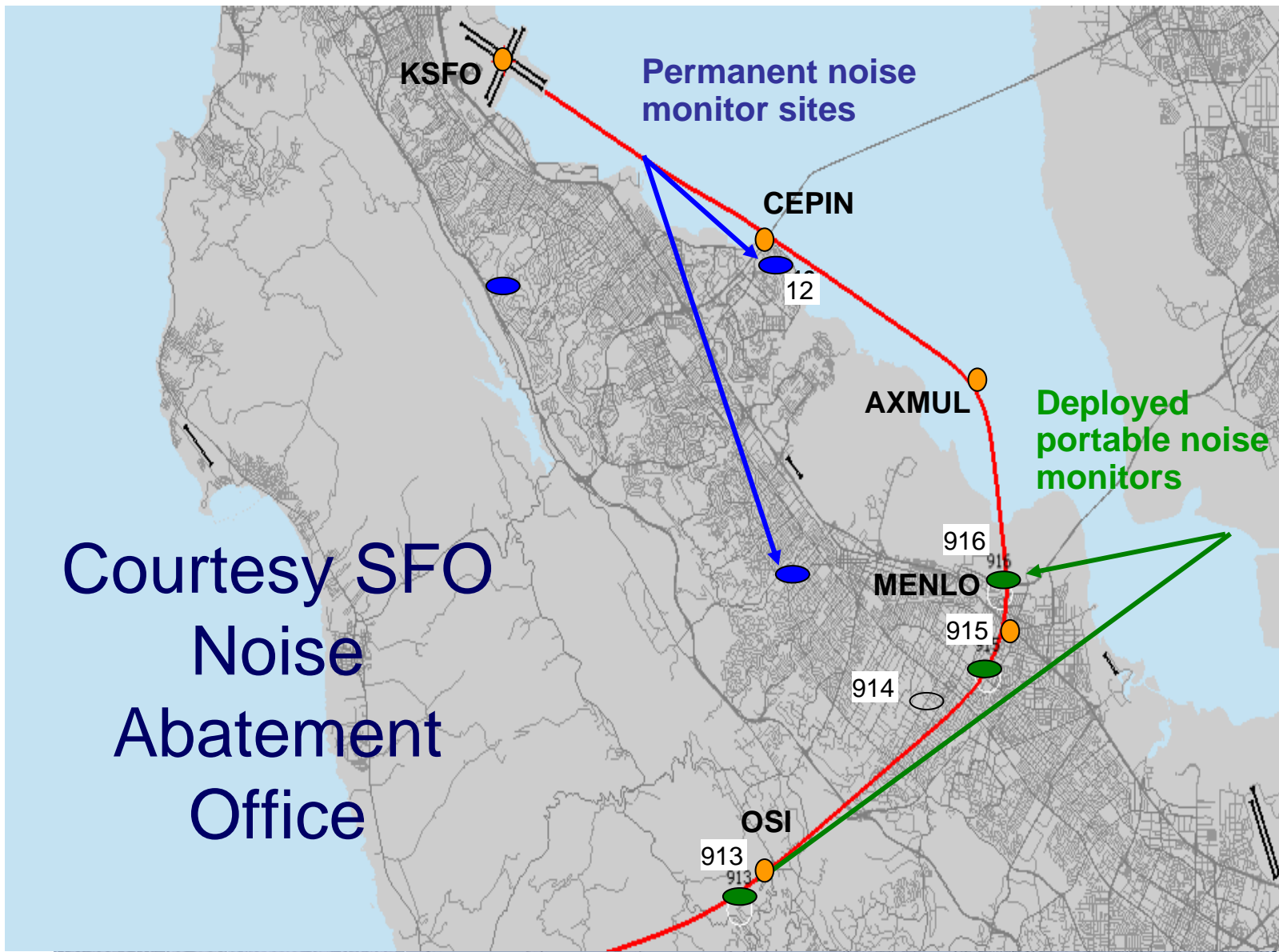




# SFO Tailored Arrival

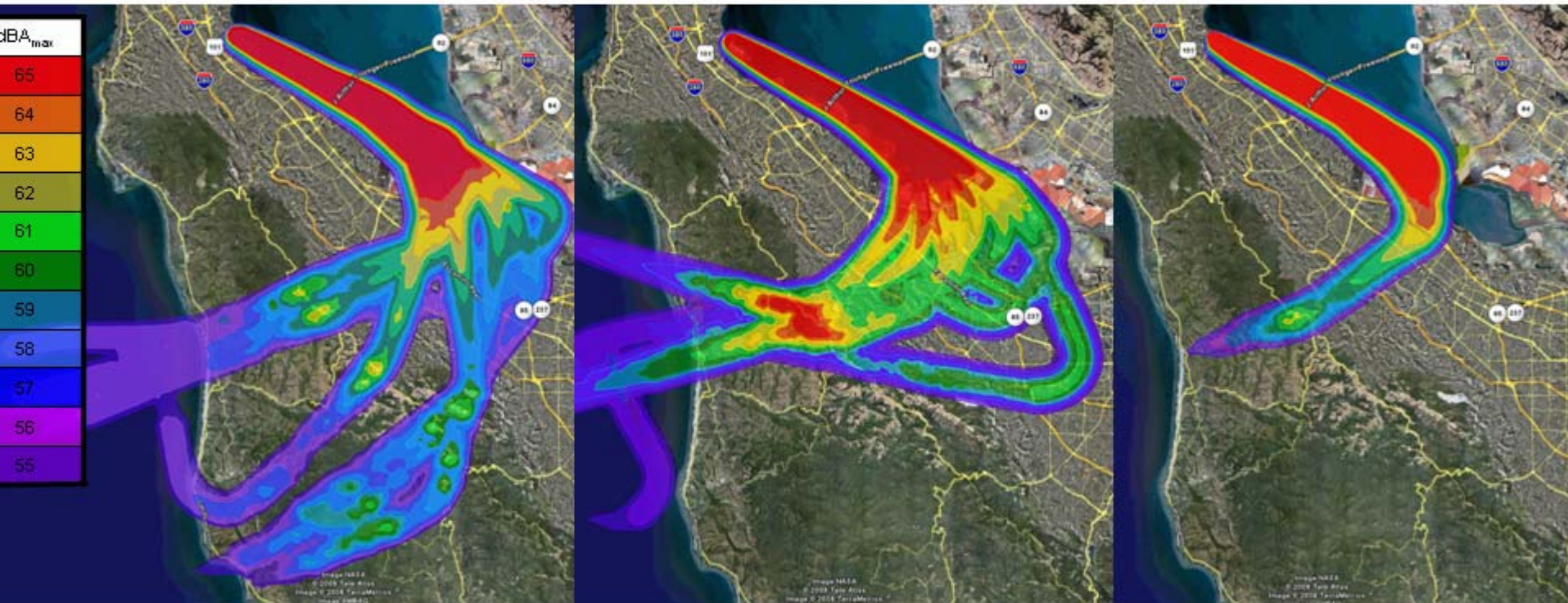


Courtesy SFO  
Noise  
Abatement  
Office



# SEL Noise Contours for Representative Daily Oceanic Arrivals into SFO - 20 747/777 flights

Boeing Technology | Phantom Works



**Partial  
Tailored Arrival**

**Non Tailored  
Arrival**

**Tailored  
Arrival**



# Emissions Reduction

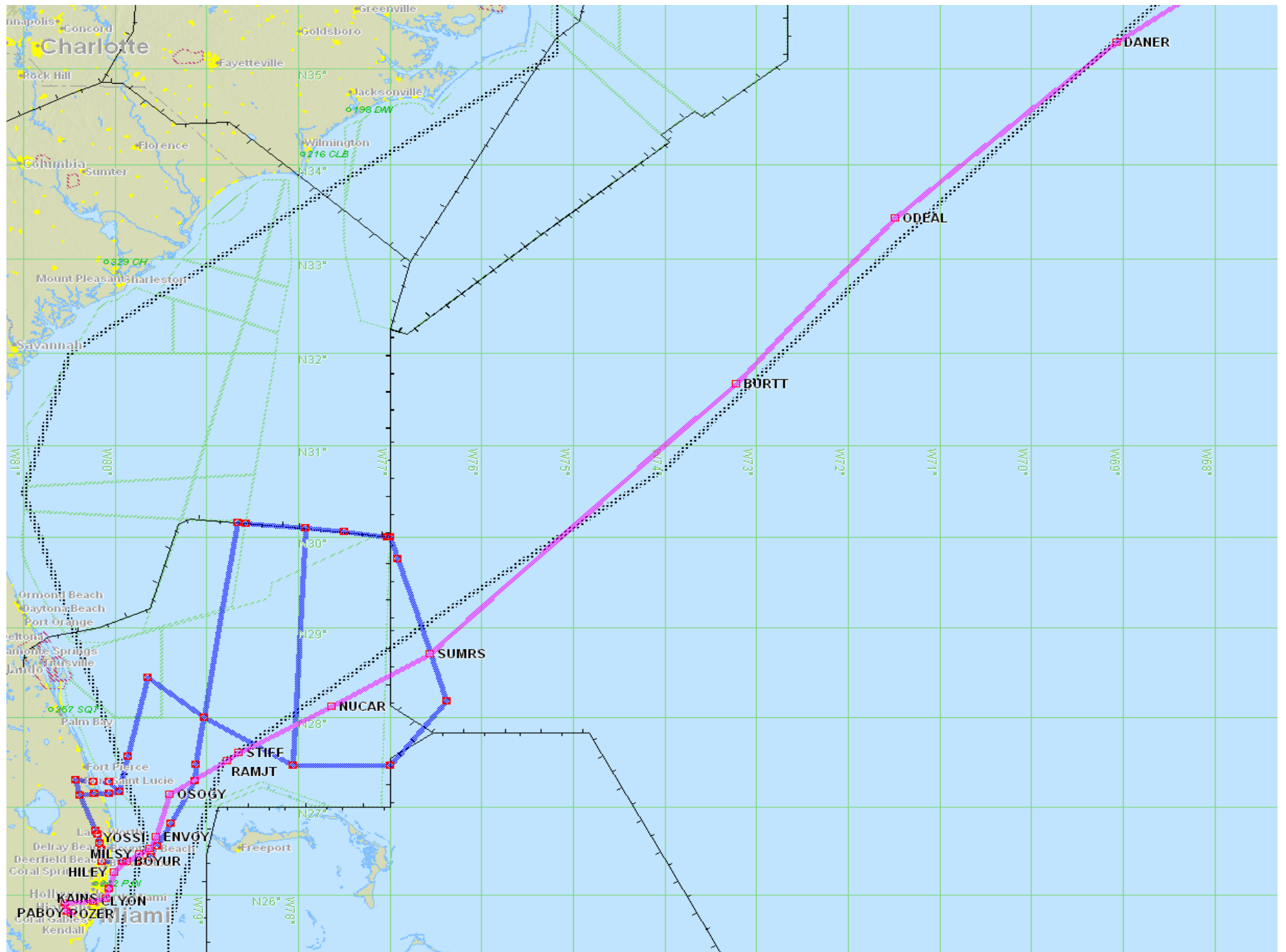
		Emissions from CREAN to SFO				
		CO (lbs)	NO <sub>x</sub> (lbs)	C <sub>x</sub> H <sub>x</sub> (lbs)	CO <sub>2</sub> (lbs)	CO <sub>2</sub> Savings (lbs)
<b>Tailored Arrivals</b>		17.5	134.0	0.77	23,618	
<b>Baseline</b>	Light	19.1	135.6	0.82	24,333	<b>715</b>
	Med	19.3	138.1	0.84	24,746	<b>1,128</b>
	Heavy	19.7	238.6	0.95	36,782	<b>13,164</b>

# SFO Fuel Saving Avg.

	<b>777-200/GE90-85B</b>	<b>747-400/PW4056</b>
<b>Full TA</b>	<b>1,303 lbs</b>	<b>2,291 lbs</b>
<b>Partial TA</b>	<b>379 lbs</b>	<b>1,100 lbs</b>

# Secondary Improvements





# AFR090 24 Sep

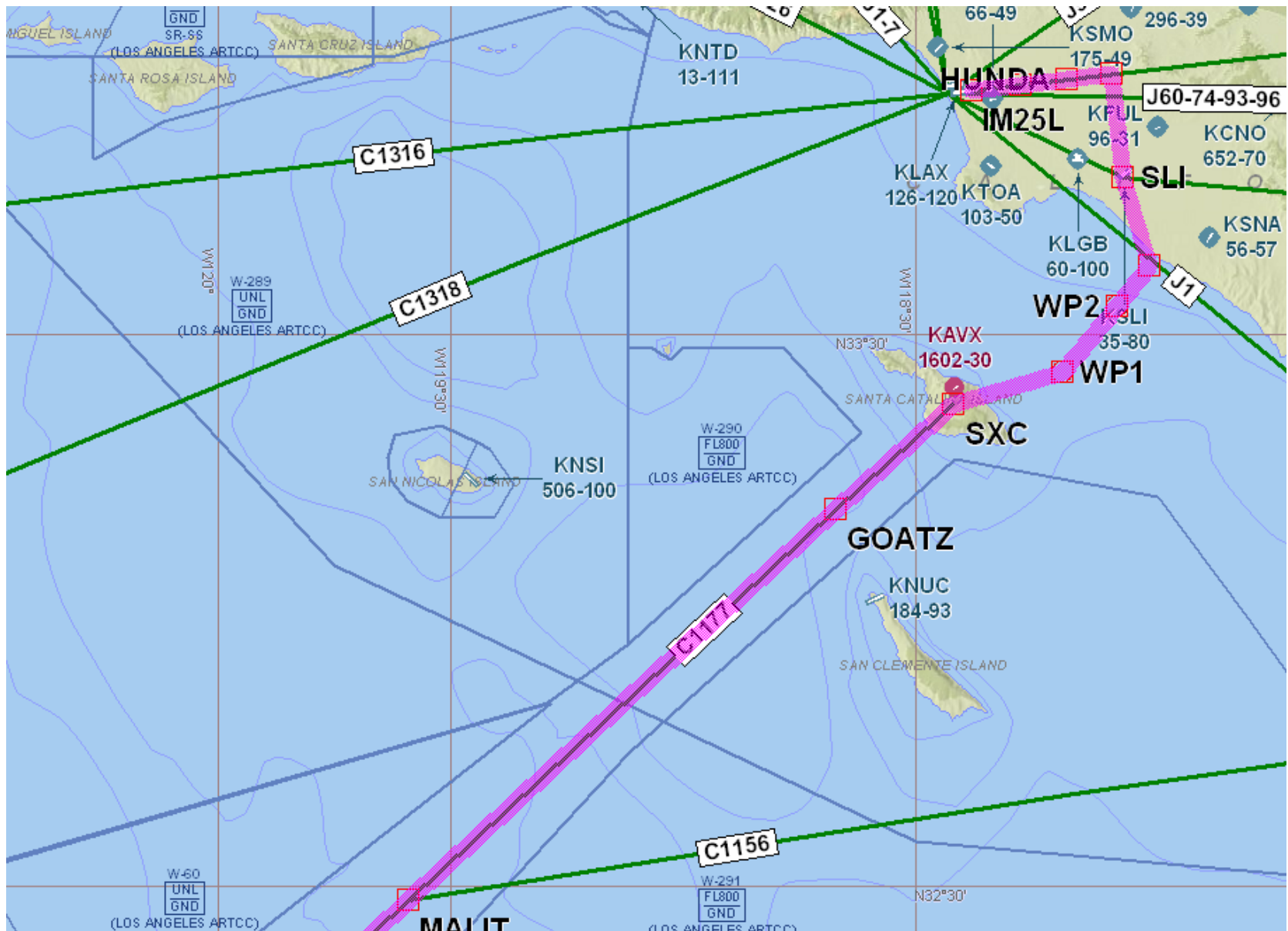


# LAX Trials



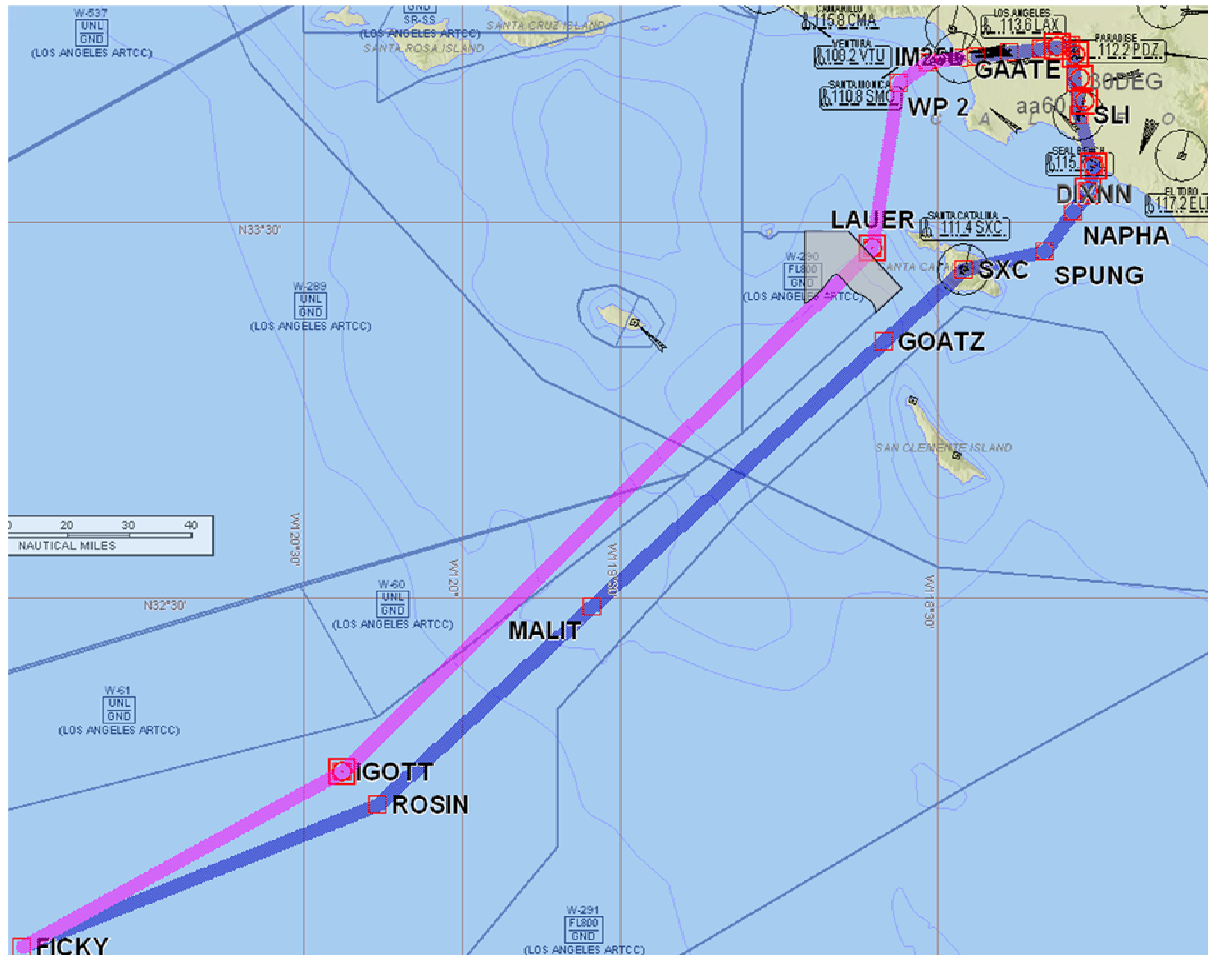


SOUTHERN CALIFORNIA TRACON





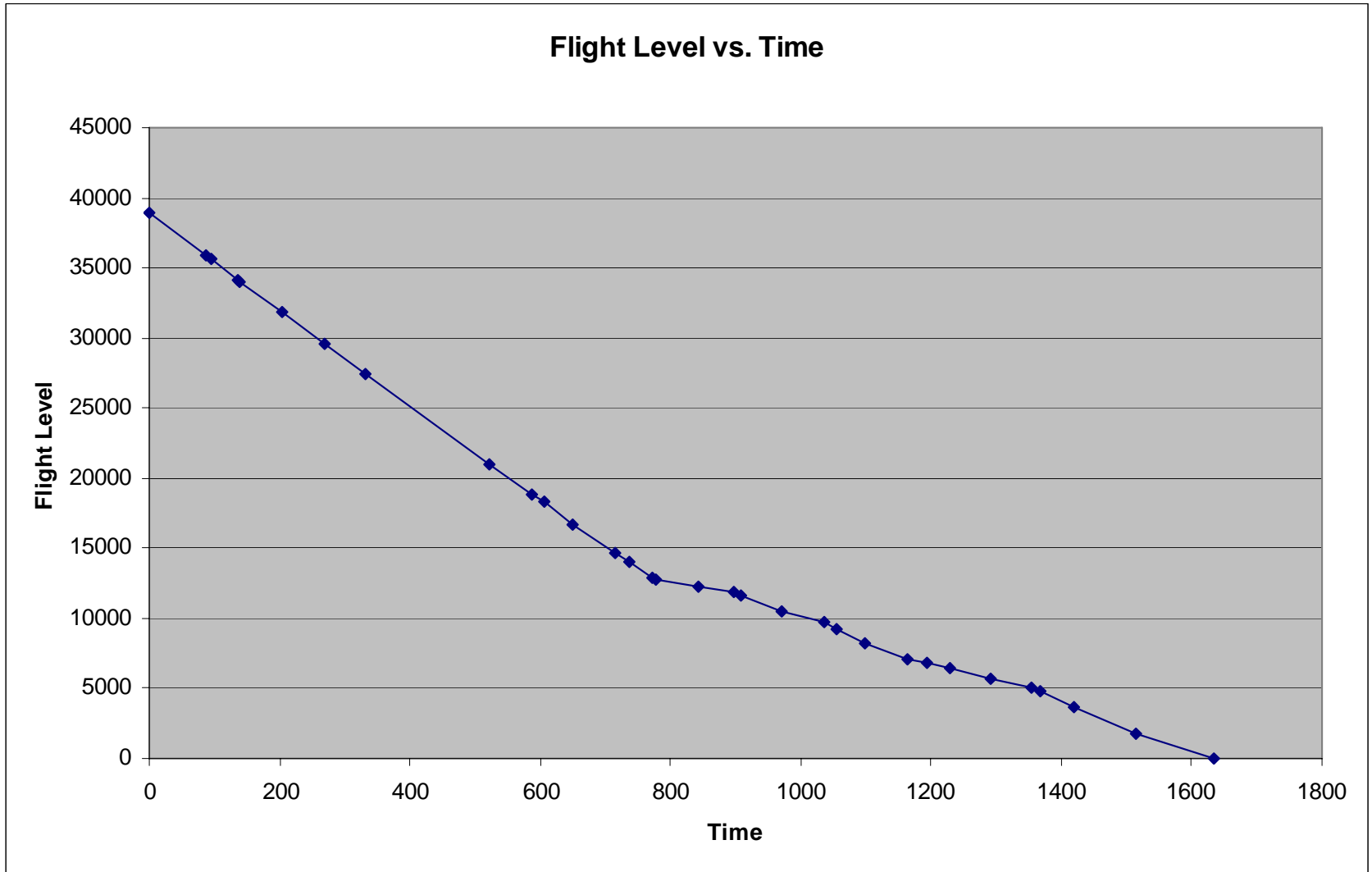
# LAX Arrival and Departure



# UAL840, March 2009



# UAL840



Note: 267 flights total

# Questions?

