



Workshop #3

Design to Improve Airport Safety

The LAX South Airfield Case

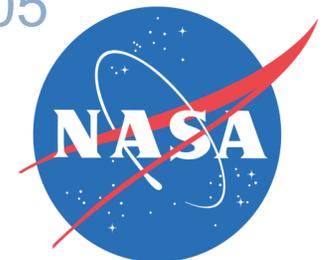
NASA/Industry Airport Planning
Workshop

NASA Ames Research Center

Moffett Field, CA

September 8, 2005

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General Planning Principles – Airfield Layouts

- FAA Recommended Planning/Design Criteria
- Advisory Circulars and FAA Orders
- Long-range Plans
- Aircraft Operating Characteristics
- Site Constraints/Local Conditions
- Goals “Efficiency and Safety”
- Pilot’s Perspectives
- Airlines/Operators Needs

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Alternatives

- Consider alternative scenarios
- Develop framework for alternatives
- Develop parameters for evaluation and evaluation tools
- Conduct evaluation and rank alternatives based on their ability to the pre-established framework
- Use subjective and objective criteria
 - Computer simulation/modeling
 - Use BCA – where applicable
 - Assess safety factors

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Preferred Layouts

- Simple (Not-Confusing)
- Direct Taxi Routes
- Minimal Runway Crossings
- Ample Separations
 - Adjacent Operating Surfaces
 - Objects
 - Vehicular Roads

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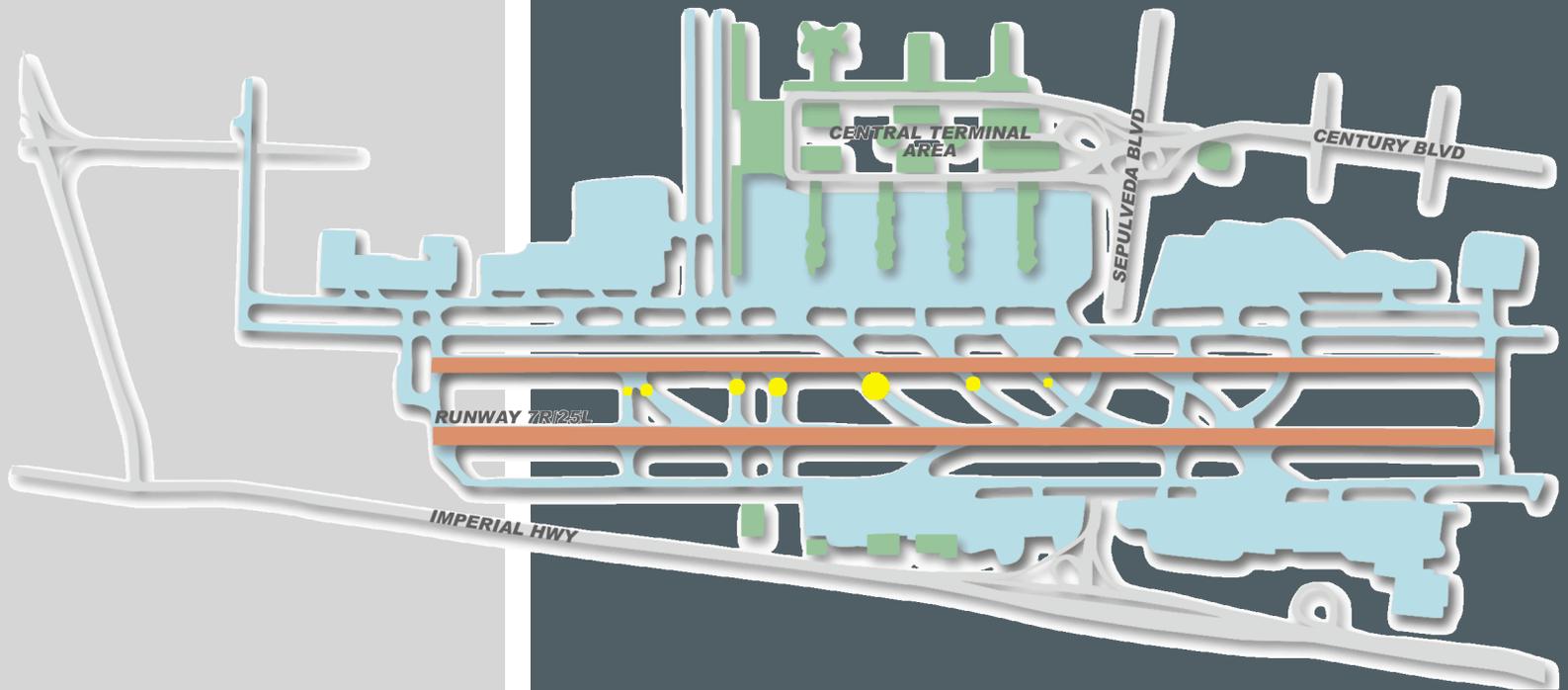
The LAX Case



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- LAX Consistently Ranks the highest airport in the nation in recorded Runway Incursions
- Most of the occurrences have happened in the South Airfield Complex
- The FAA and the NTSB have made the reduction of Runway Incursions a national priority
- LAX has initiated educational and other mitigation programs aimed to reduce runway incursions with limited success

LAX Hot Spots



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Contributing Factors

- Pilot misjudgment of aircraft position
- Stacking of aircraft between runways
- Airfield geometry (Exits and location of the Central Terminal Area - CTA)
- Airfield Congestion
- Gate Capacity

SAIP Background

Study was initiated in January 2003

Goals of Phase I – Study Phase included

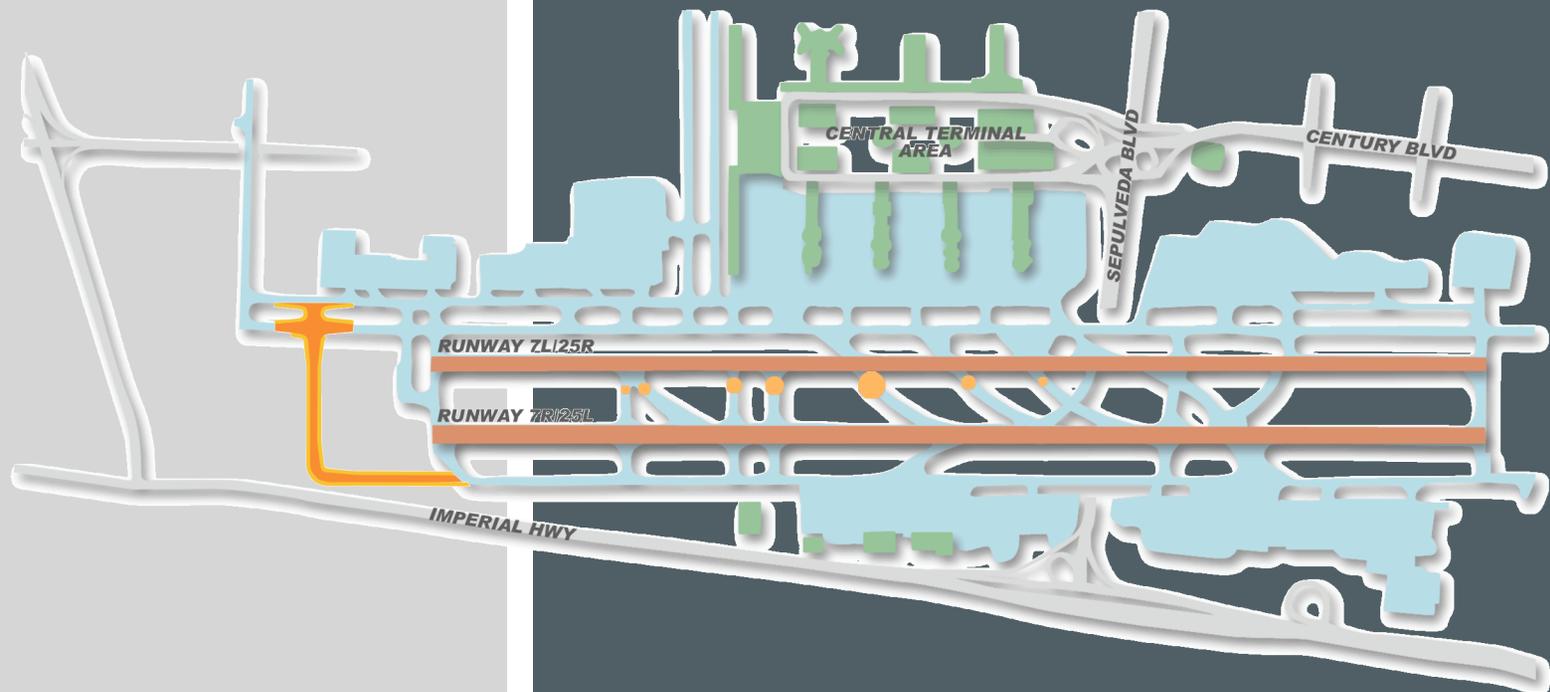
- Identify Causes of Runway Incursions (RI)
- Develop Options to Reduce RI
- Evaluate Effectiveness of Options Using Objective Means
- Develop an Implementation Plan

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Options Studied

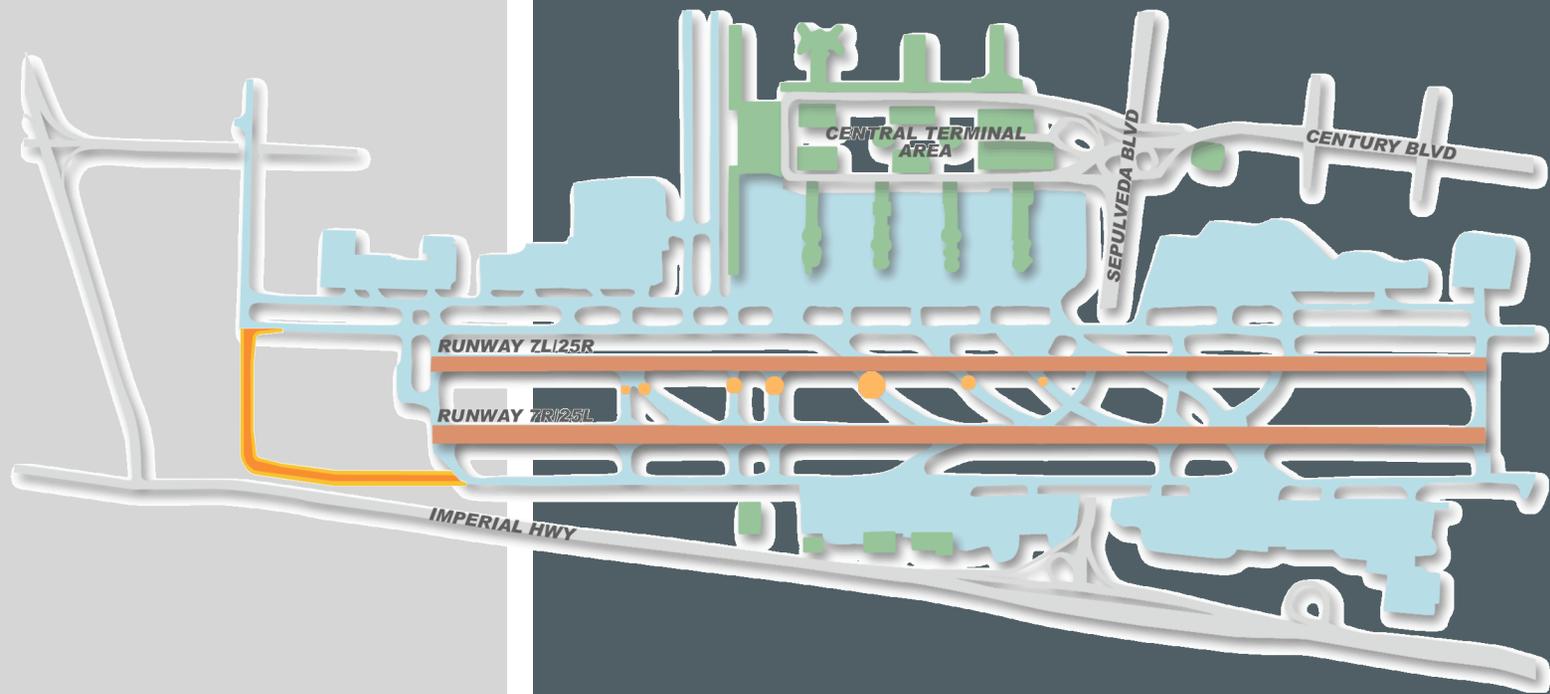
- Technology and Operational Changes
- End-Around Alternatives
 - Sub Alternatives
- Center Taxiway
 - Sub Alternatives

End-Around Alternative Options



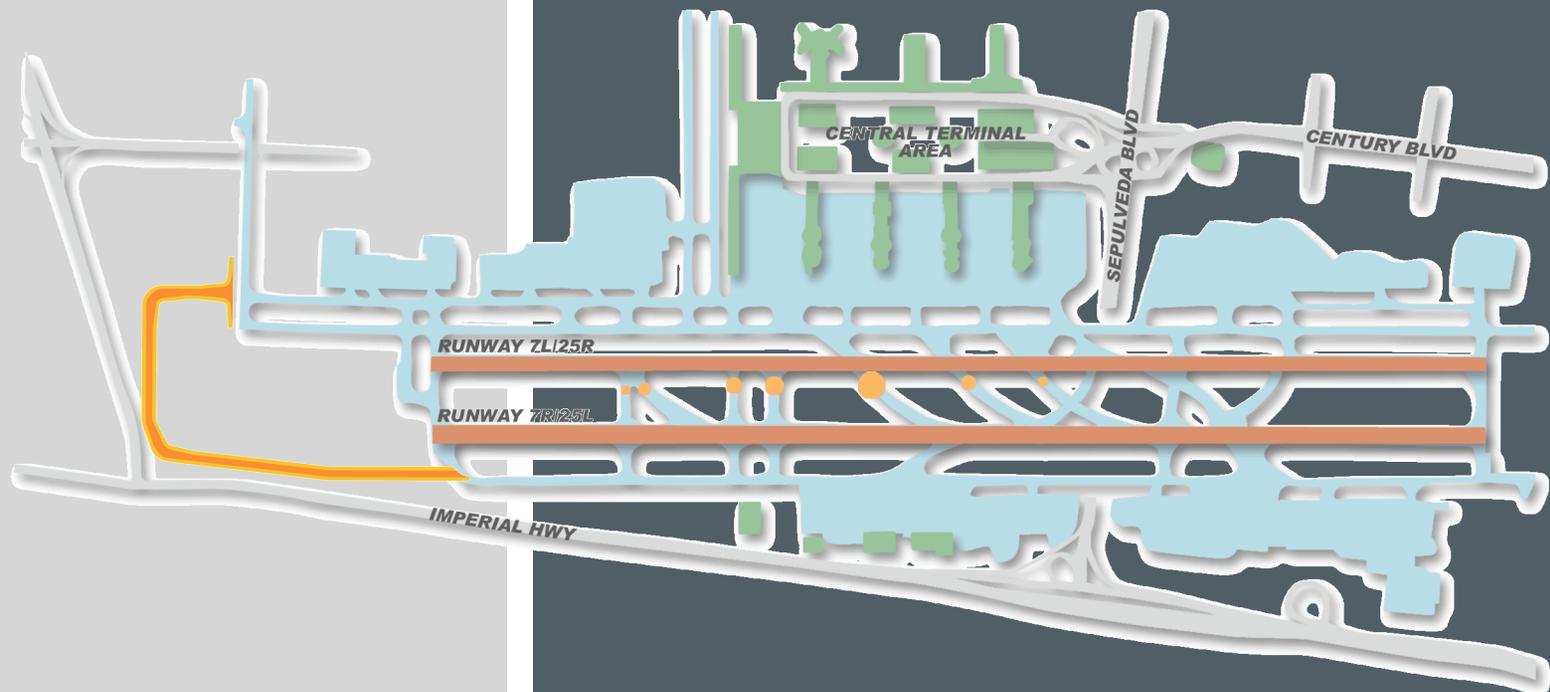
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End-Around Alternative Options



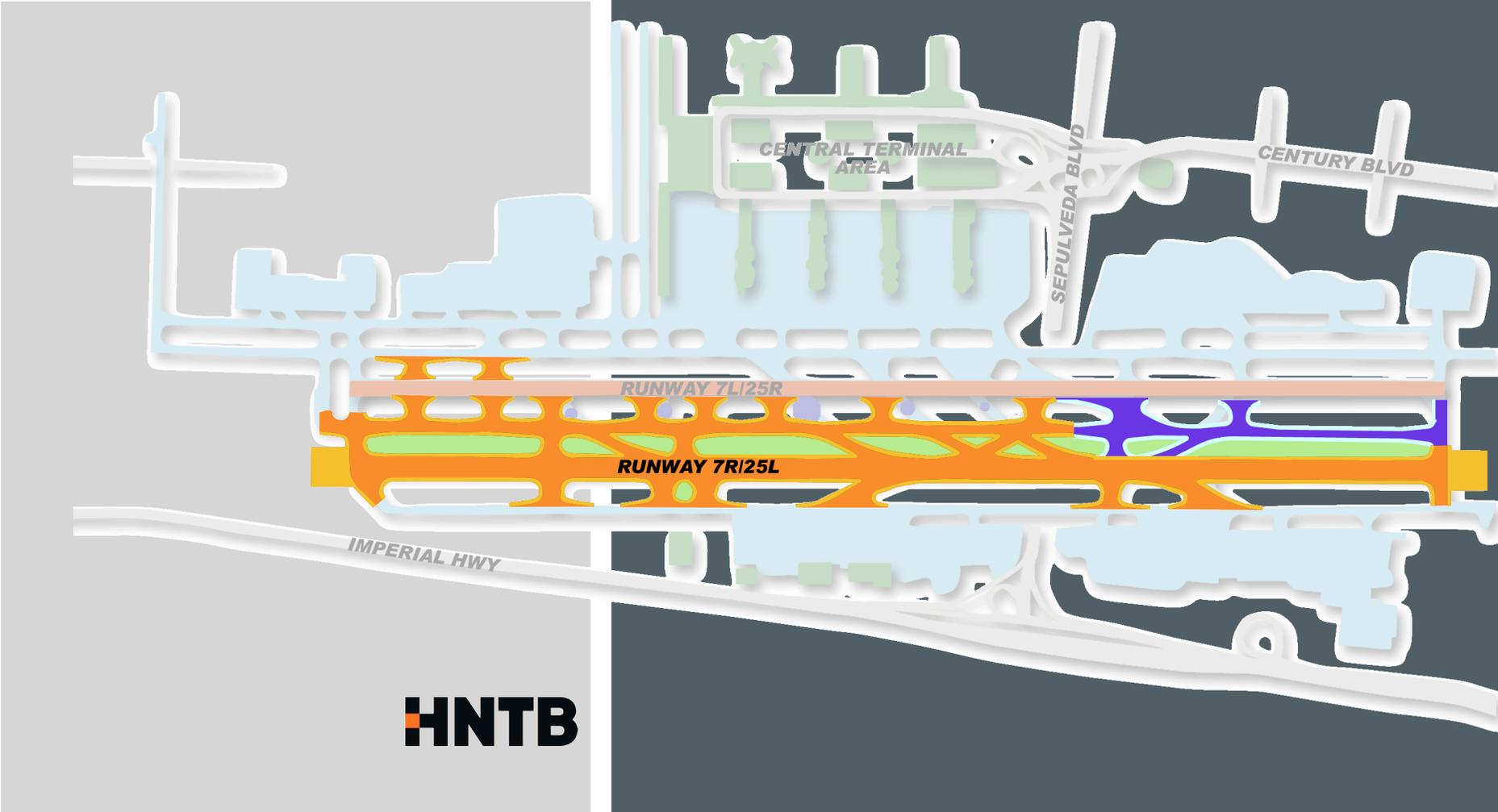
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End-Around Alternative Options



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Center Taxiway Option



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Evaluation Factors

- Safety Enhancements (Potential and Severity of Collision)
- Computer Modeling
- Delay and Operating Costs
- Noise Exposure to Surrounding Communities
- Other Environmental Factors (Qualitative Air Quality Analysis)
- Other Simulation (Virtual Tower)

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Evaluation Tools

- Computer Simulation
 - SIMMOD – Capacity/Delay
 - Taxi Time
 - Taxi Distance
 - Taxi Delay
 - Location/Frequency of Crossings
 - INM
 - SEL
 - NASA's FutureFlight Center (Virtual Tower)

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Evaluation Results



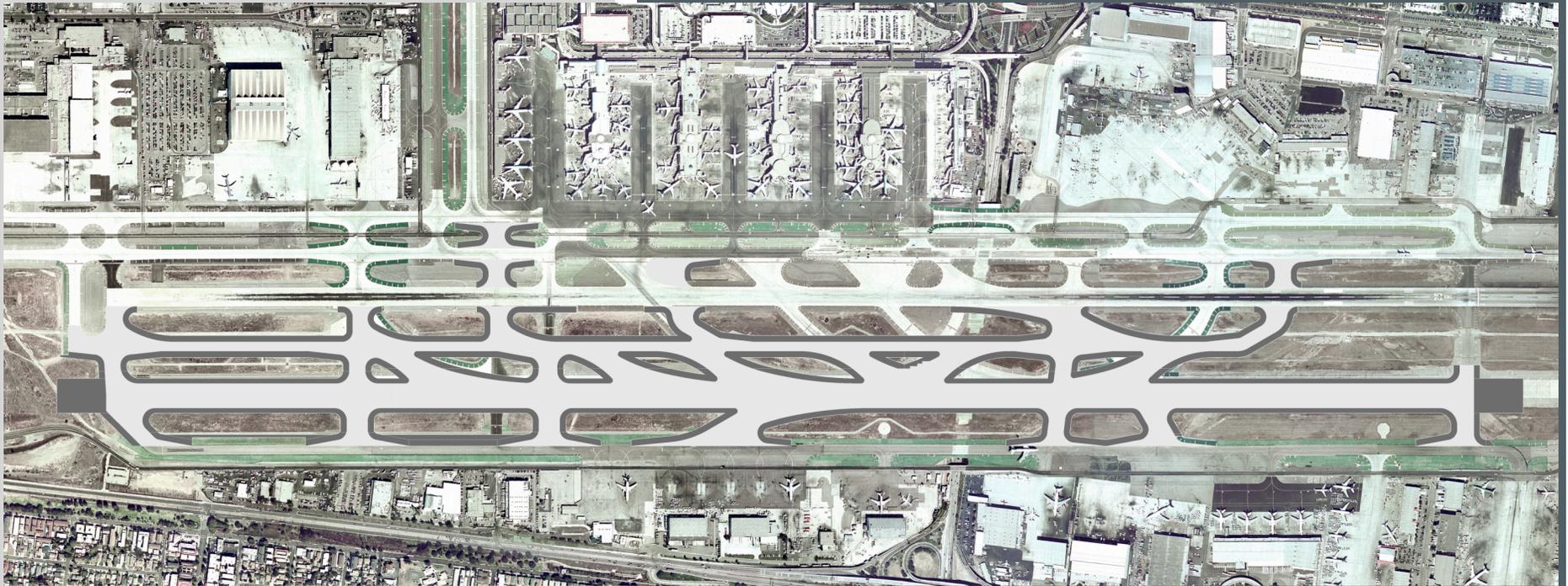
- End-around taxiways concepts:
 - reduce runway crossings; however pose other safety concerns (aircraft over-flights)
 - lead to airfield congestion and delays
 - North Field and 25L arrivals conflict
 - Additional taxi time/delay
 - Increase Noise and air quality exposure to Airport neighbors to the south

Evaluation Results

- Center Taxiway Concept
 - Improves and enhances runway exiting patterns
 - Mitigates “hot spots”
 - Provides ATC operational flexibility (queuing), thus improving safety
 - Reduces delays
 - Environmentally responsible
 - Provides a long-term viable and effective option to reduce Runway Incursions

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Proposed Improvements (SAIP)



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Project Status

- Design is complete
- LAWA accepted construction bids for the \$240-\$290M Project
- DEIR Public Review Period will close 9/15
- Anticipated Notice-to-Proceed for Construction date of January '06
- Closure of Runway 25L for 8 months
- Total construction duration of 26 months

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Questions?

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