

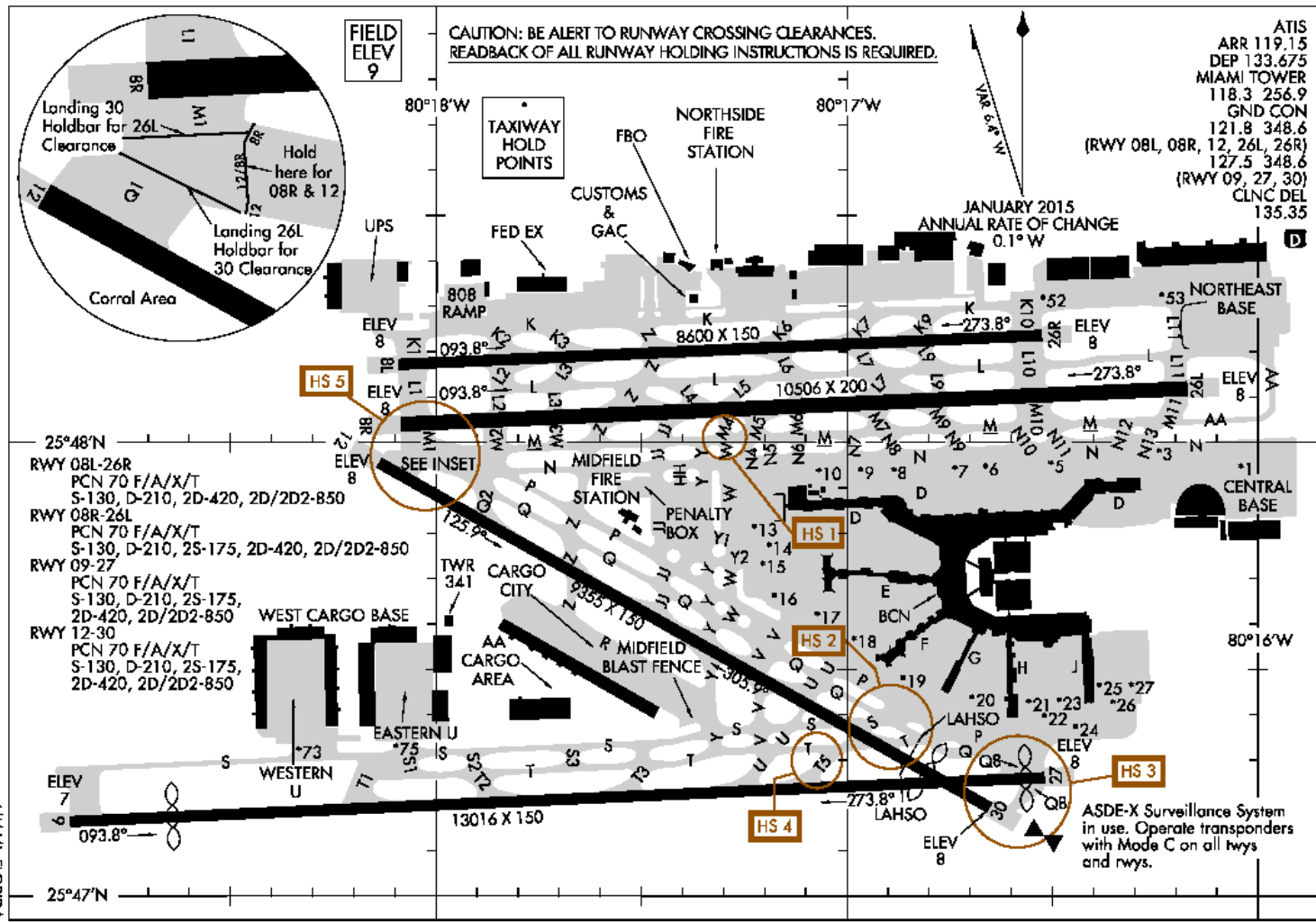
# Session

## Airport Challenges and Runway *Incursions*

### Geometries!!!

# HOT SPOTS and US Airport Diagrams

15064  
AIRPORT DIAGRAM



15064  
AIRPORT DIAGRAM

AL-257 (FAA)

MIAMI INTL (MIA)  
MIAMI, FLORIDA

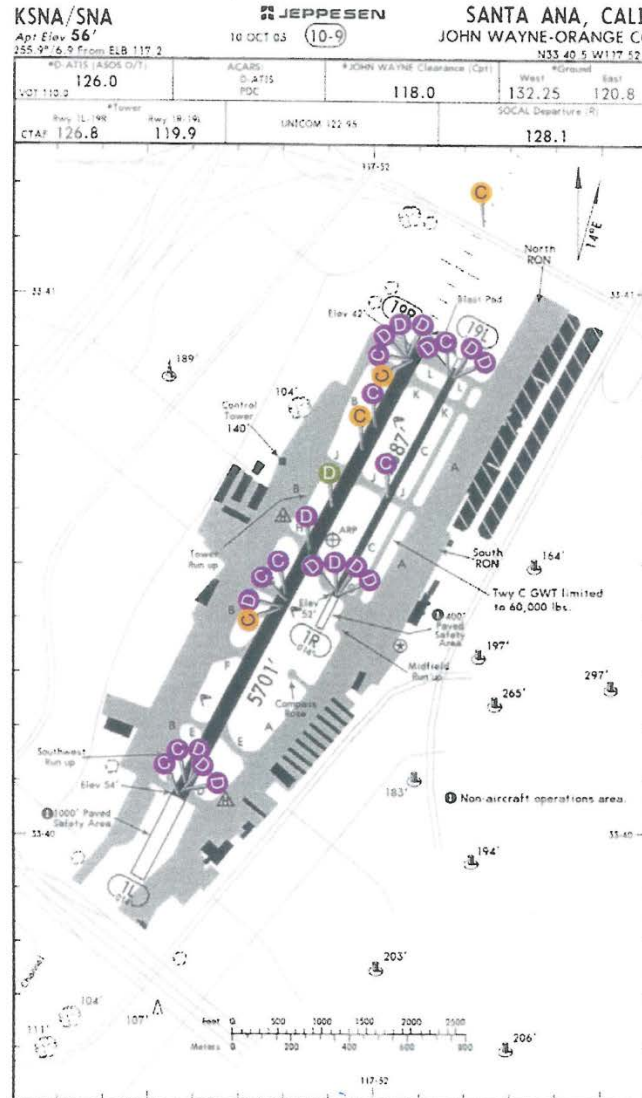
# FY 2000 through FY 2003 Runway Incursions John Wayne - Orange County Airport

Operational Errors / Deviations

Pilot Deviations

Vehicle / Pedestrian Deviations

*What  
“common”  
taxiway  
geometries  
are prone to  
Runway  
Incursions?*



## FY 2000 through FY 2003 Runway Incursions Santa Barbara Municipal Airport

● Operational Errors / Deviations    
 ● Pilot Deviations    
 ● Vehicle / Pedestrian Deviations

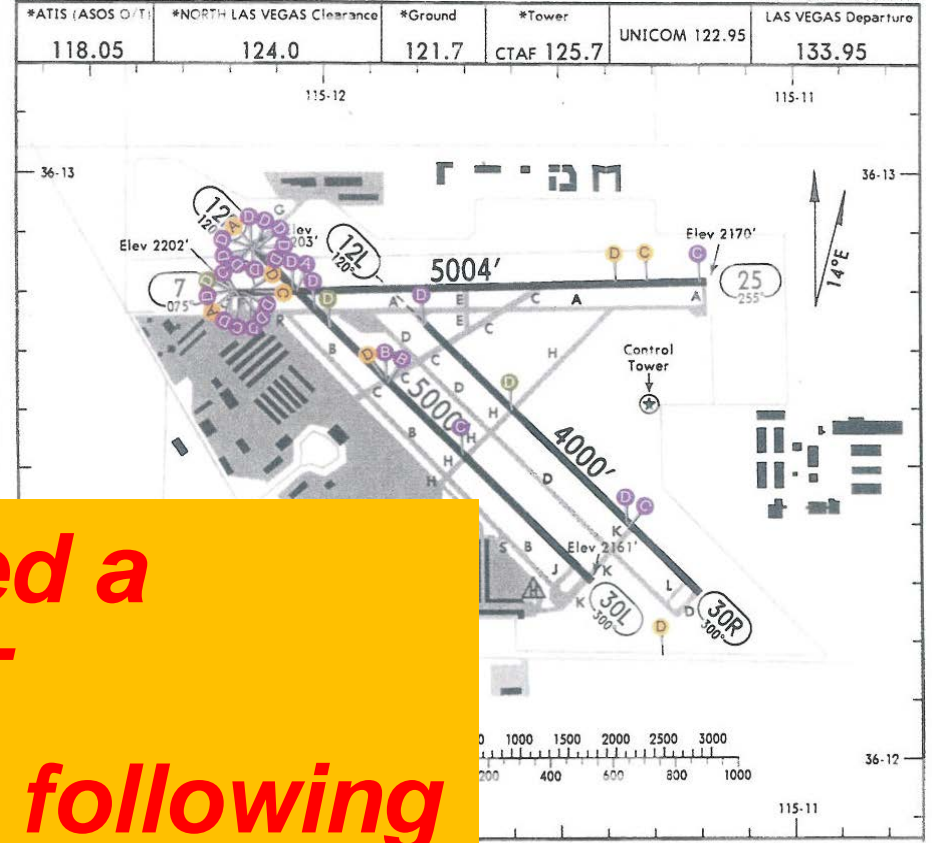
**KSBA/SBA**     **JEPPESEN SANTA BARBARA, CALIF**  
 Apt Elev 10'     28 FEB 03 (11-1)     SANTA BARBARA MUN  
 200.6°/6.1 From RZS 114.9     N34 25.6 W119 50.4



## FY 2000 through FY 2003 Runway Incursions North Las Vegas Airport

● Operational Errors / Deviations    
 ● Pilot Deviations    
 ● Vehicle / Pedestrian Deviations

**KVGT/VGT**     **JEPPESEN**     **LAS VEGAS, NEV**  
 Apt Elev 2205'     28 MAR 03 (28-1)     NORTH LAS VEGAS  
 332.6°/8.1 From LAS 116.9     N36 12.7 W115 11.7



We created a  
**LIST**  
 Avoid the following  
*taxiway geometries*

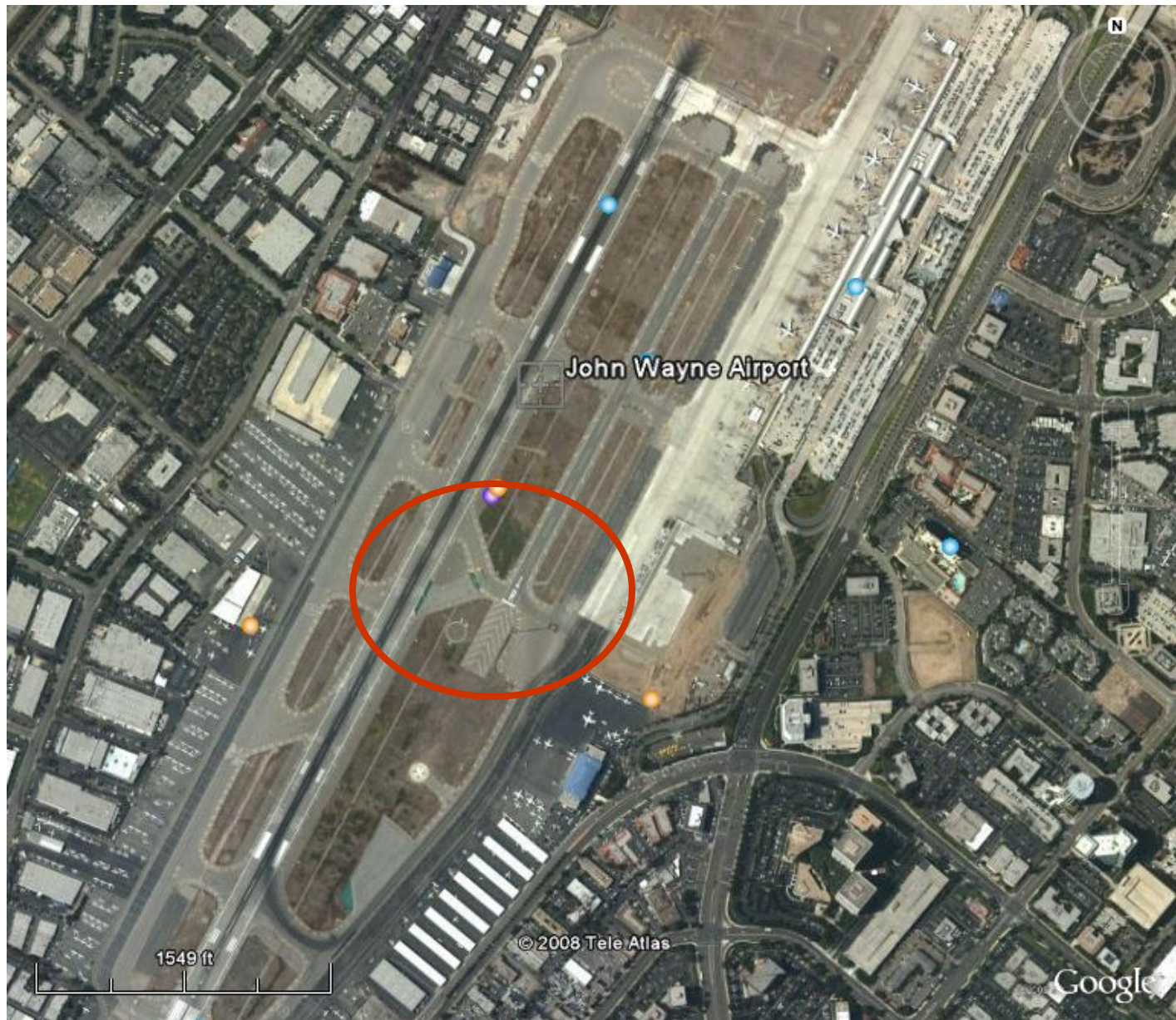


***“Y-Shape”***

*Taxiway Connector  
across  
a Runway*

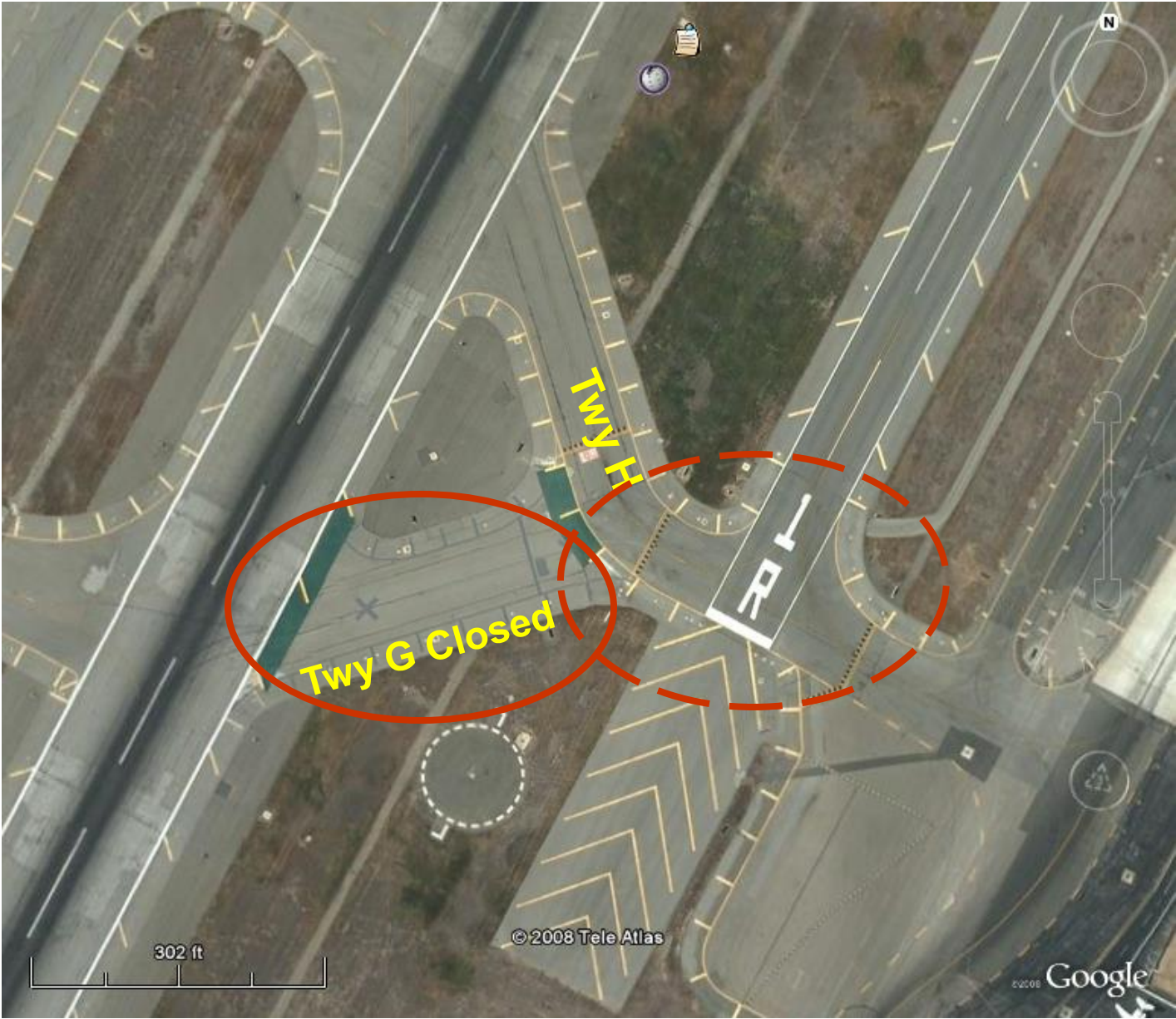


# SNA – Santa Ana/John Wayne Arpt





# SNA: Total 15 Runway Incursions (Yrs. 1997-2000)





# SLC - Salt Lake City Intl Arprt





# SLC: 3-PDs (Yrs. 1997-2000)





# Partial Listing: Airports with Y-Shape Taxiway Connectors

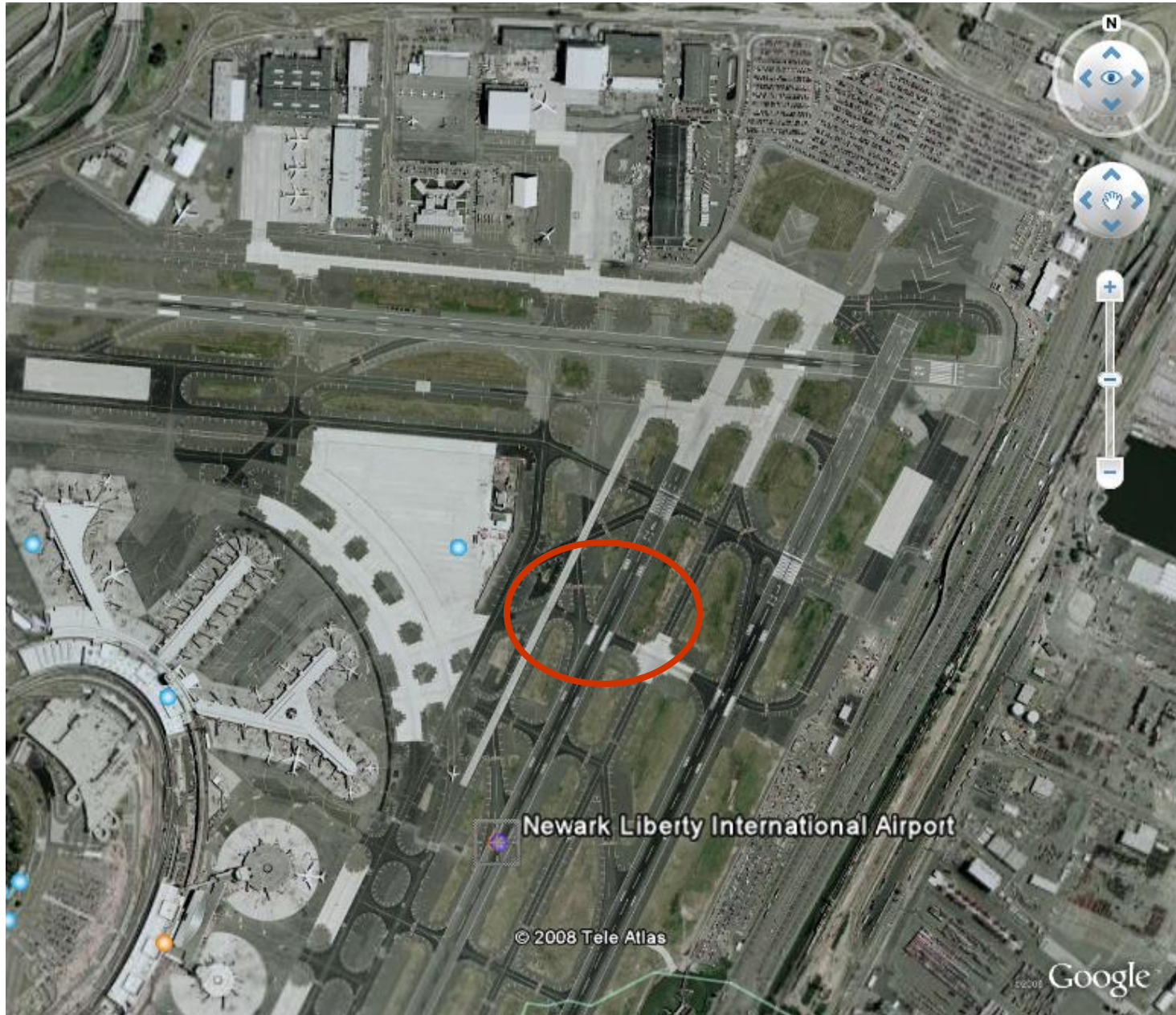
- STL [variant]: 1-PD, 1-OE; 1-V/PD, 2-OEs
- MEM: 1-PD
- LGB: Closed the Y-Taxiway/Rwy 6R/34L
- LGA: 1-PD, 1-V/PD; 1-PD; 2-OEs
- JFK: 1-PD
- FLL: 1PD; 1-PD, 1-OE, 1-V/PD
- DAB: 1-PD, 2-OEs
- CVG: 1-PD, 2-OEs - Now resigned
- BWI: 1-PD
- BOS: 4-PD, 2-OEs - redesigned
- SFO; HNL; DTW; DCA; CMH

# ***Two “Crisscrossing” Taxiways:***

*High-Speed Runway Exits  
with  
Entrance Taxiways*

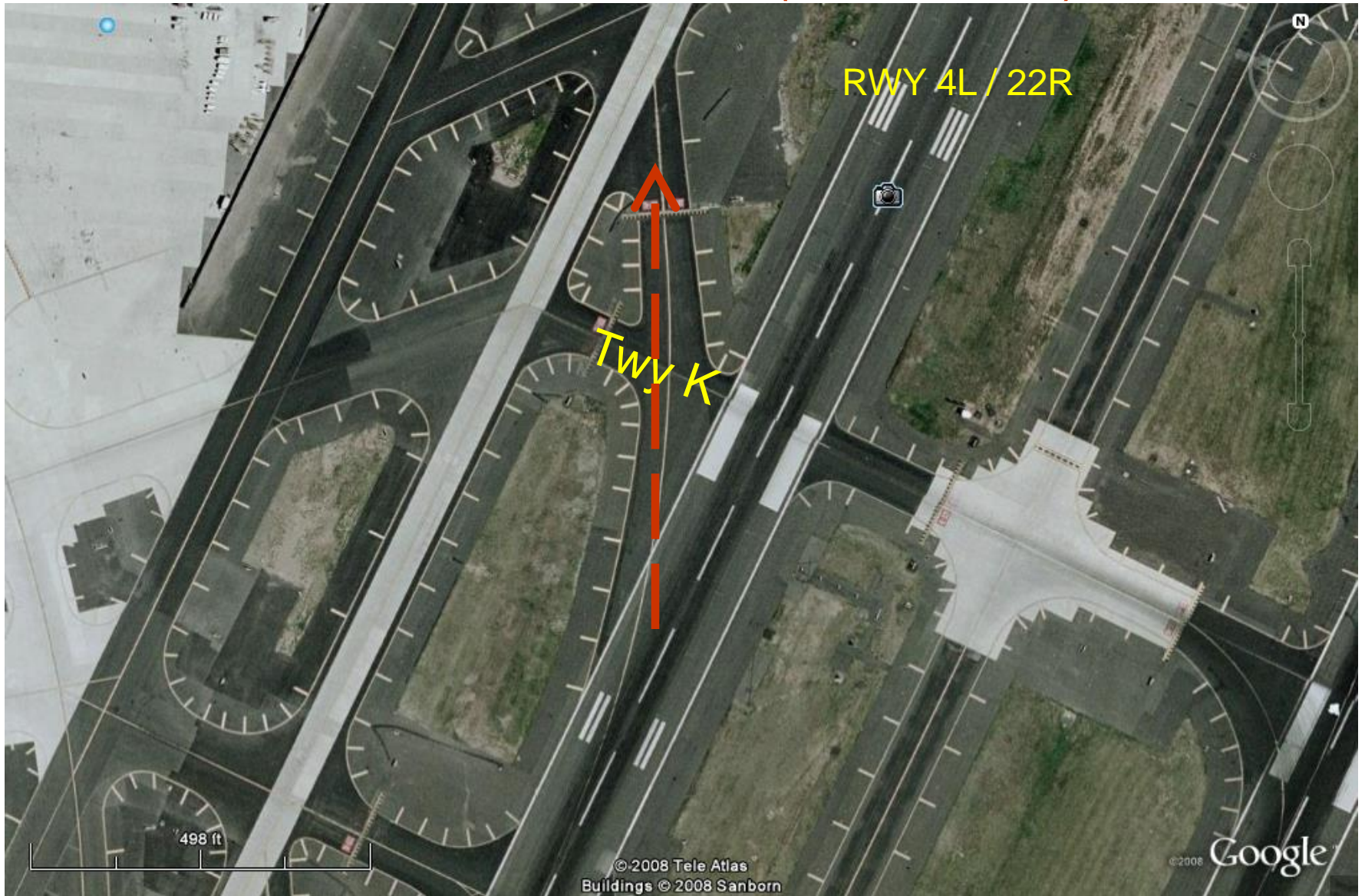


# Newark Intl Airport (ERW)





# EWR: 2-PDs, 2-OEs (1997 – 2000)





# Milwaukee-Mitchell Intl Airport (MKE)





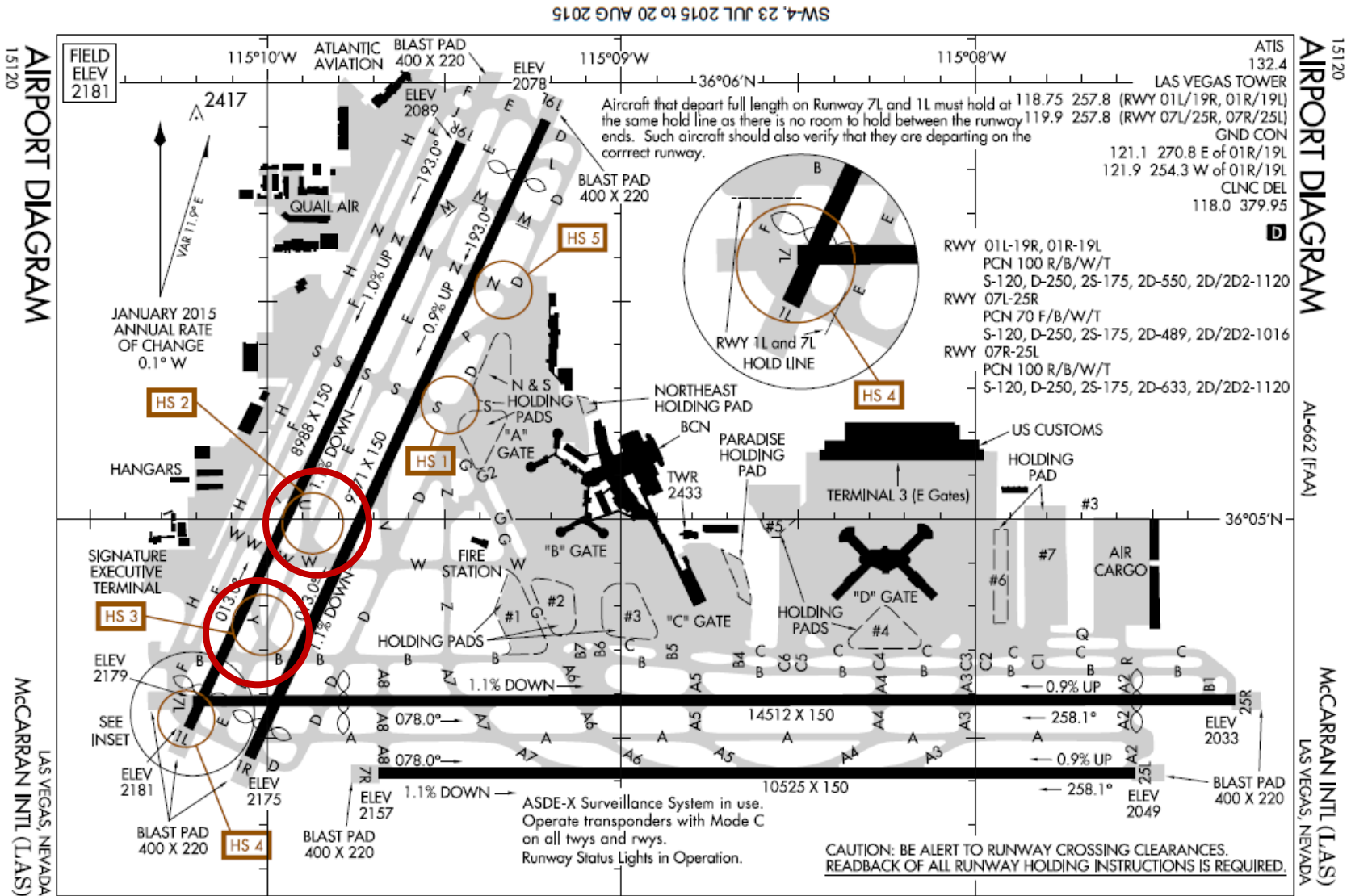
# MKE: 3-PDs

Extra long holdline marking @ 112 meters – HUMAN FACTORS



# HOT SPOTS HS2 and HS3

## High Speed Runway Exits and Taxiway Connectors



# Entrance Taxiways

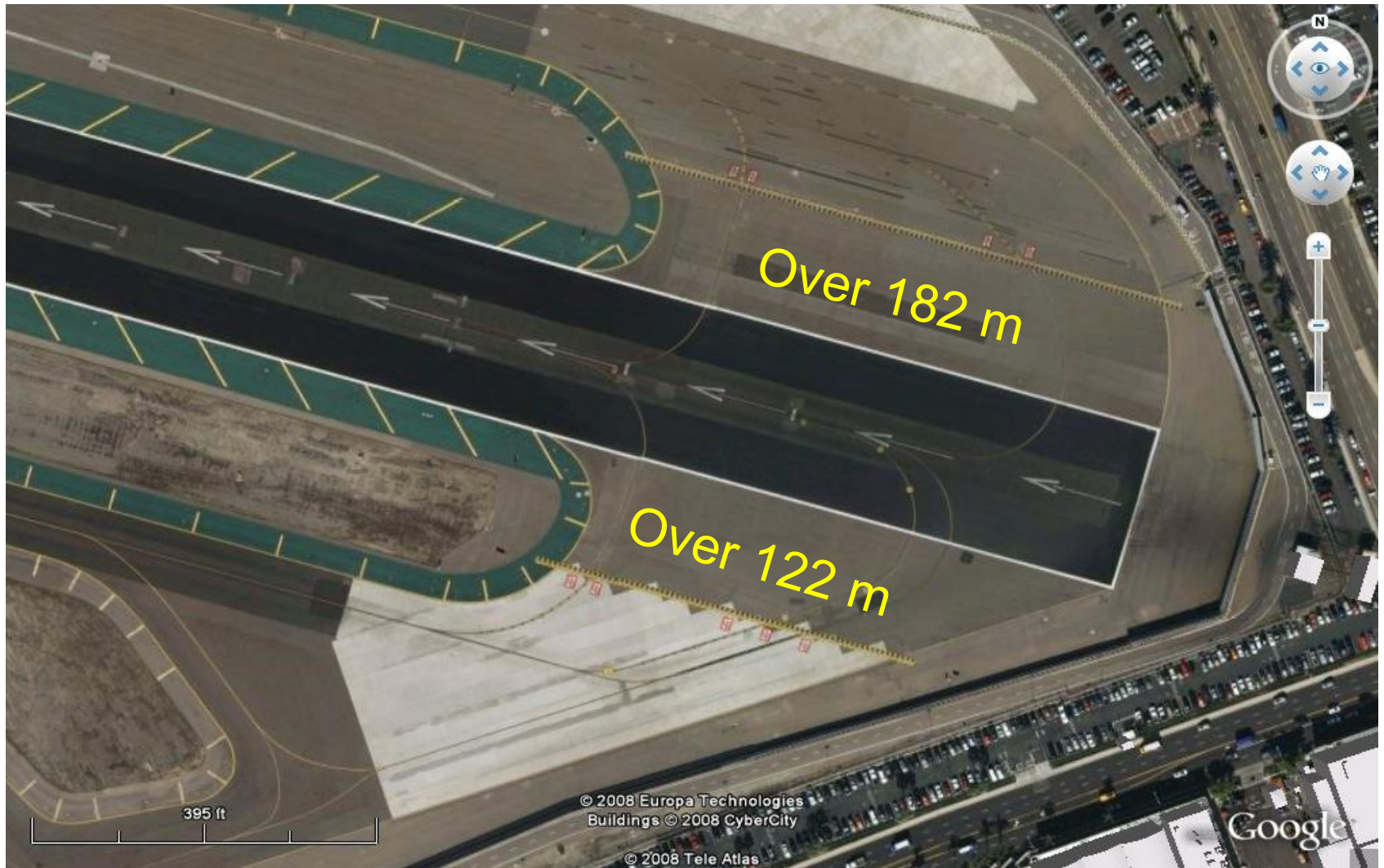
*Taxiway with  
extra-wide paved entrance*

*Also*

*Multi-Taxiways without “grass” island(s)*



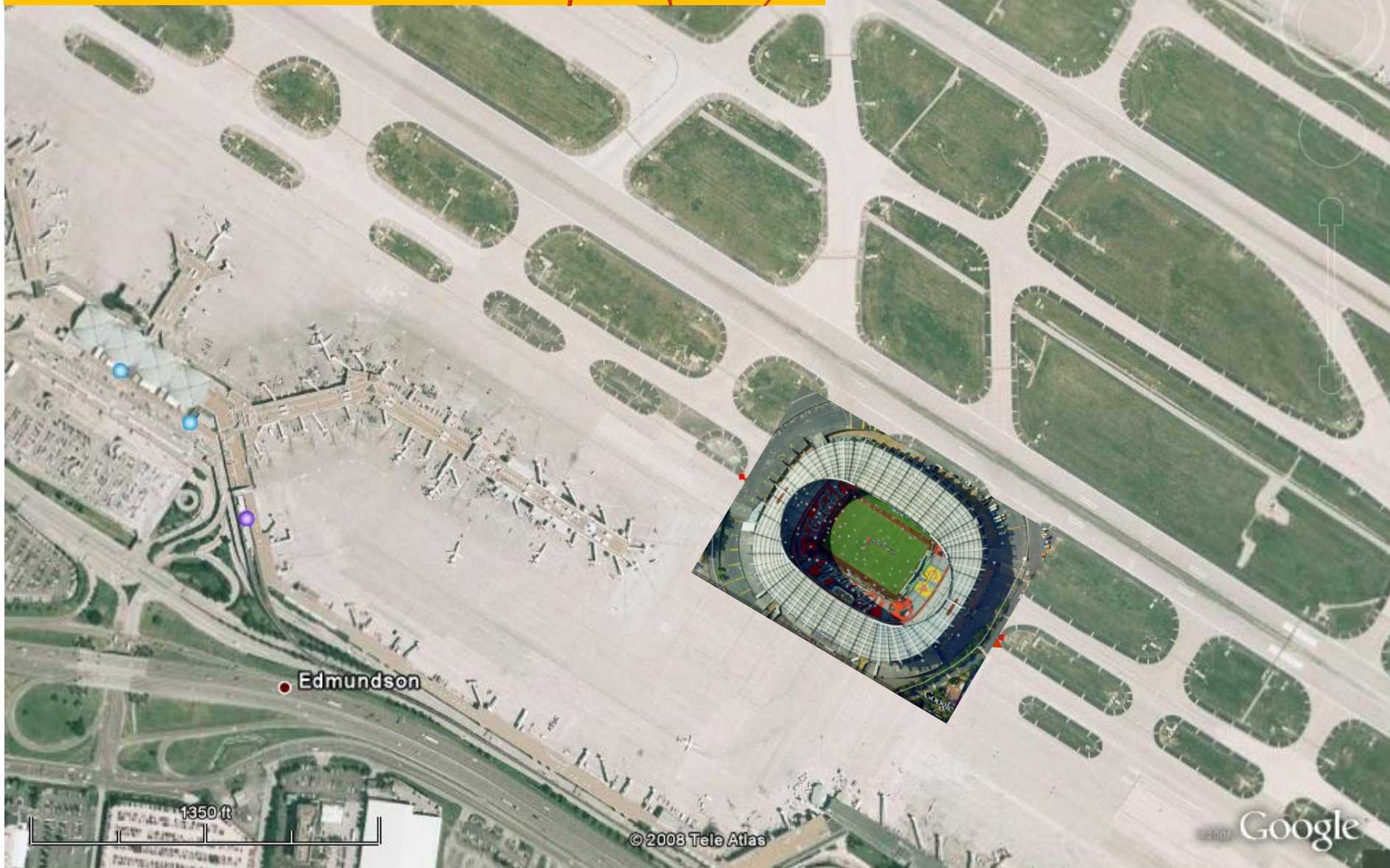
# San Diego Intl Airport (SAN): 2-PDS, 1-OE



**Lack of "GRASS ISLANDS" - Missing Vertical Sign**

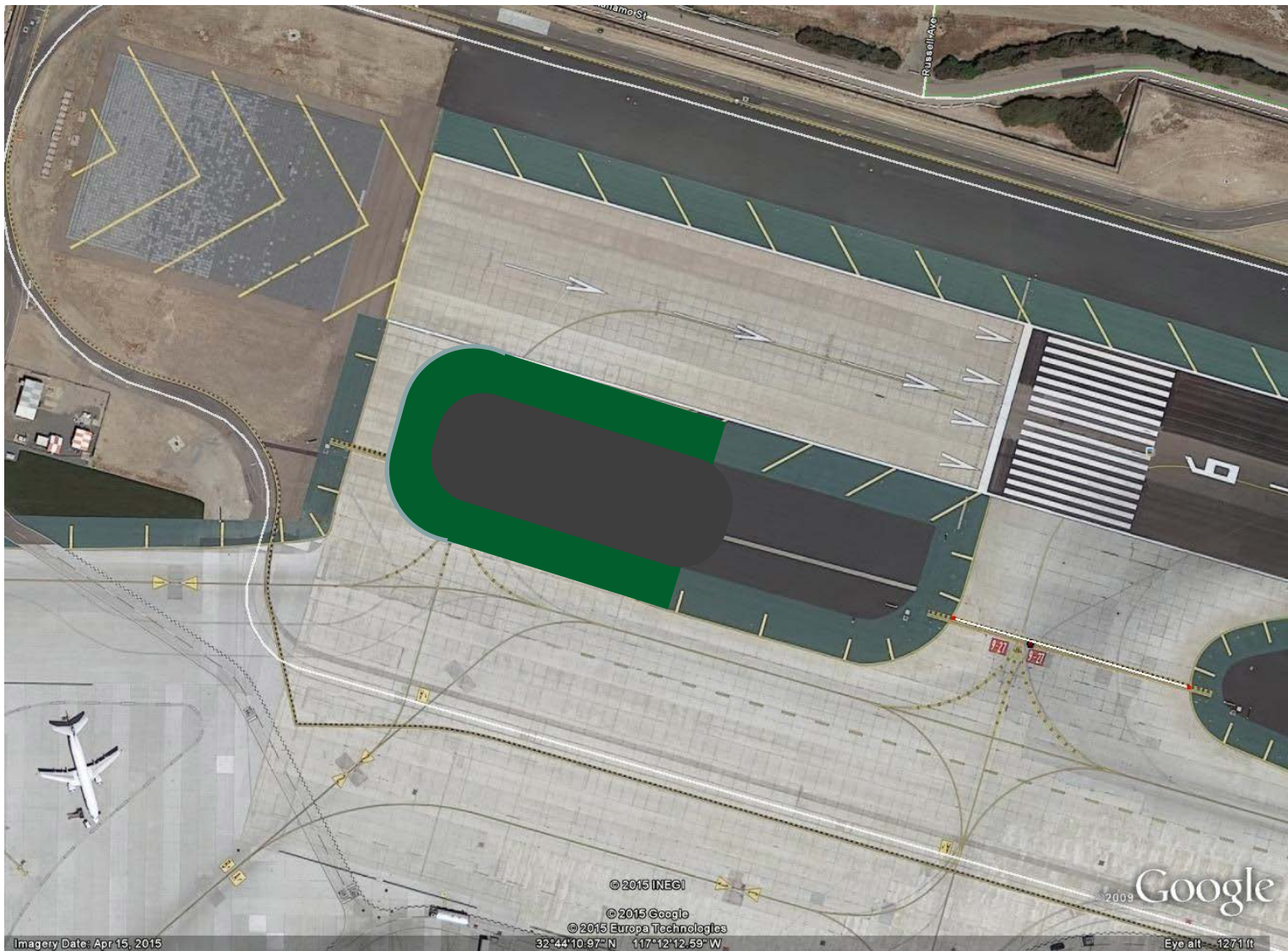


# St. Louis Lambert Intl Airport (STL)



*Extra Width of Entrance Approx. 365 meters*





Imagery Date: Apr 15, 2015

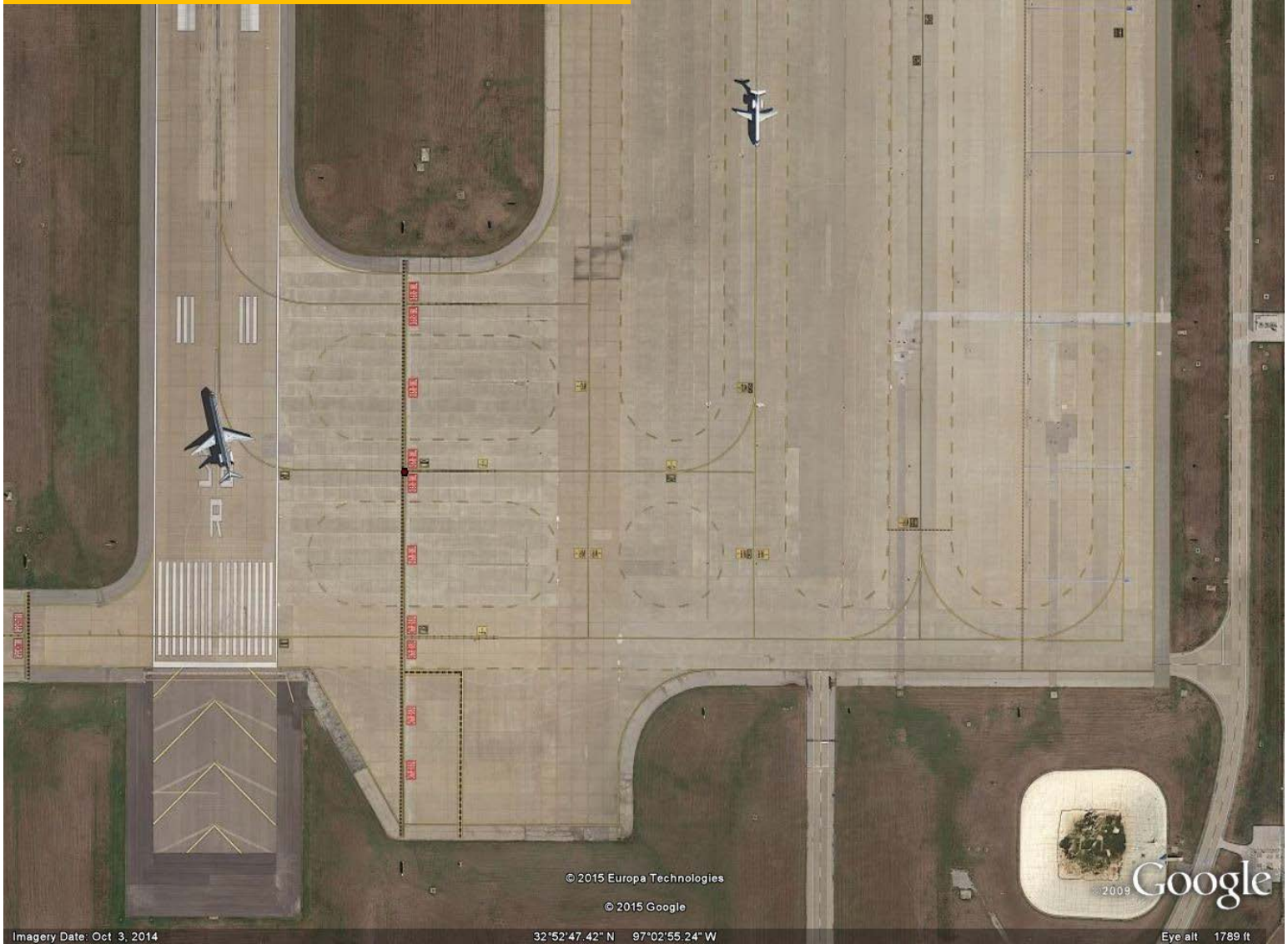
© 2015 INEGI  
© 2015 Google  
© 2015 Europa Technologies  
32°44'10.97" N 117°12'12.59" W

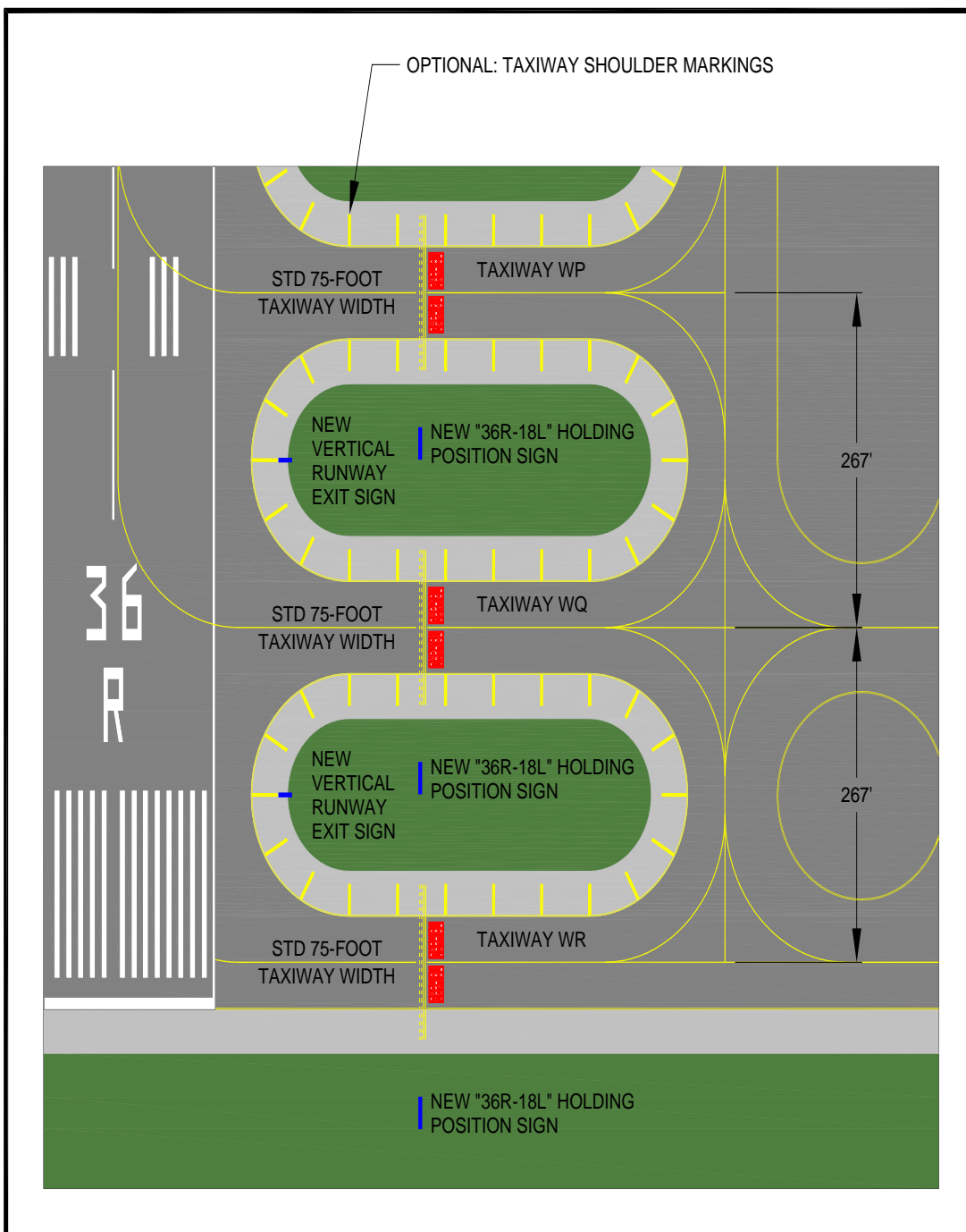
2009 Google

Eye alt - 1271 ft



Vertical Signs are 307 m apart





*Now you have Signage at ALL Twy entrances*

*Now EACH TWY has a Name*

*Mixing Pavement Materials:*

*Visual Factors*

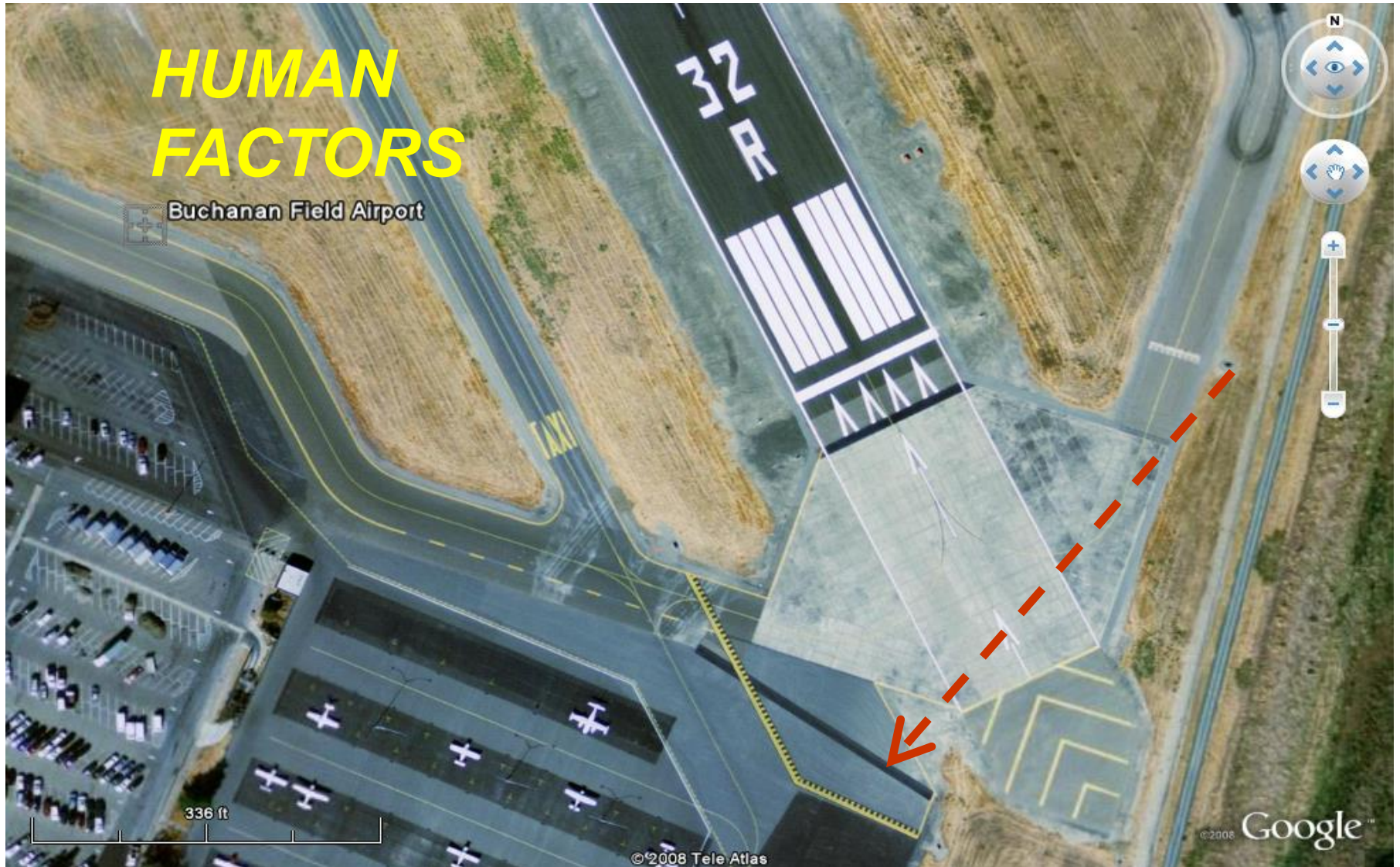
*Asphalt with Portland Cement  
Concrete*



# Concord-Buchanan Field (CCR): 5-PDs, 2-OEs (1997 -2000)

## HUMAN FACTORS

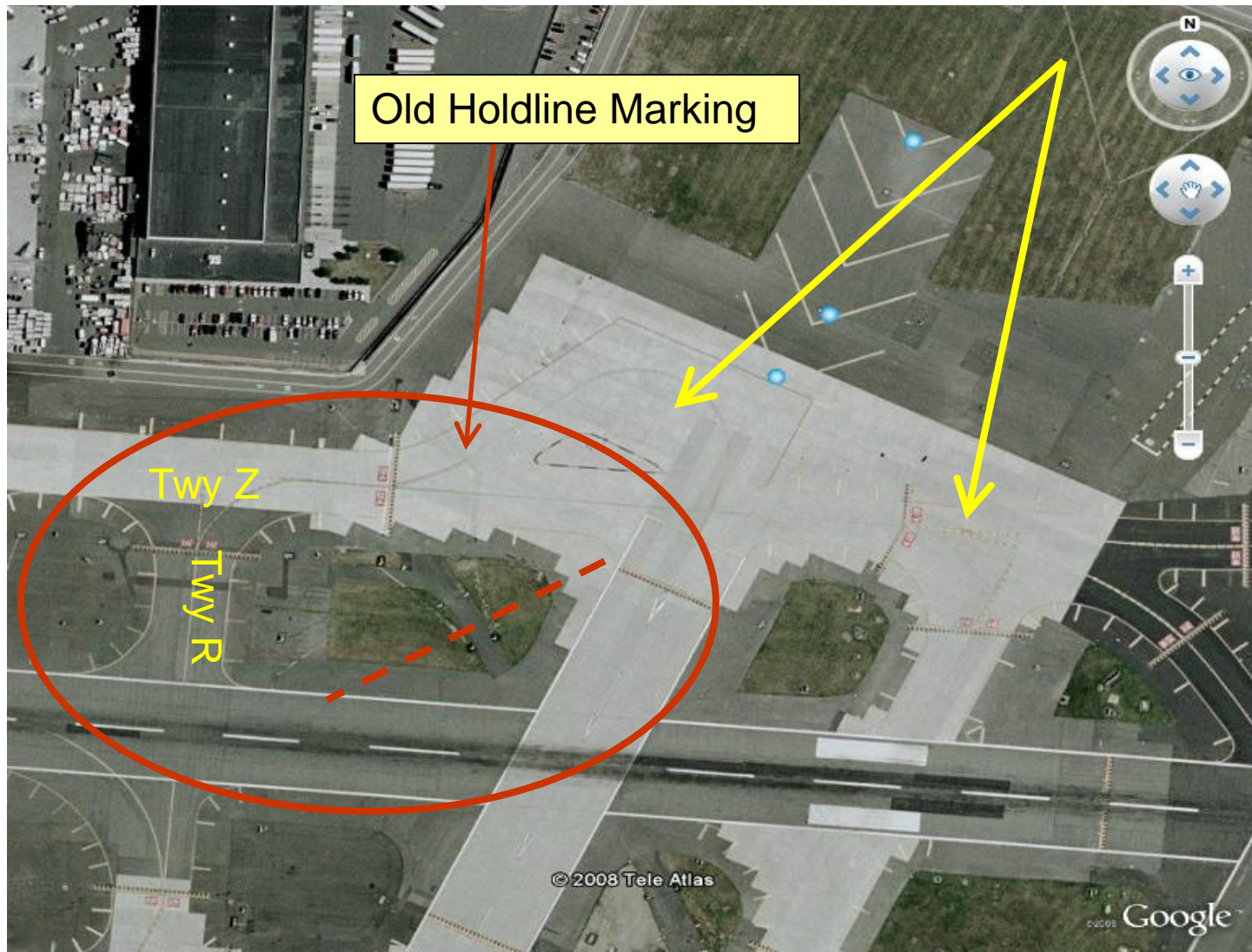
Buchanan Field Airport



*Asphalt vs Concrete vs Asphalt*

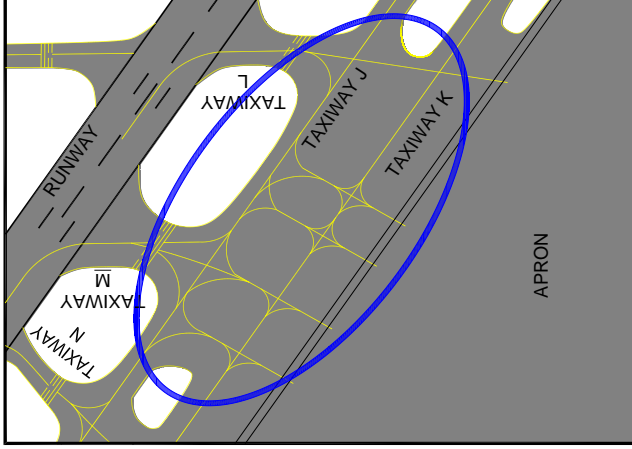


# ERW During Old Configuration - 5 PD, 1 OE

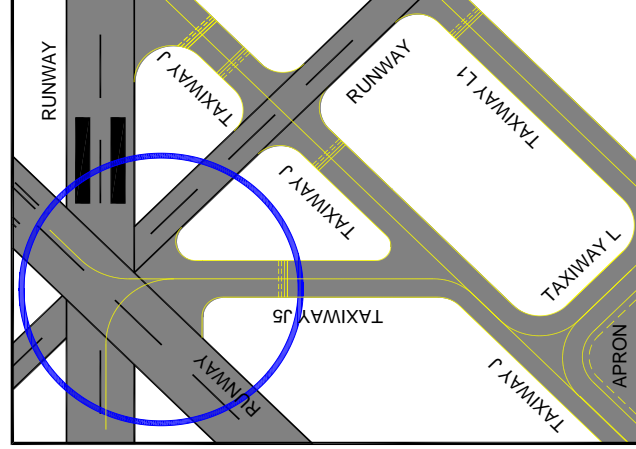


*Still Problems – Concrete/Asphalt Mixtures ?*

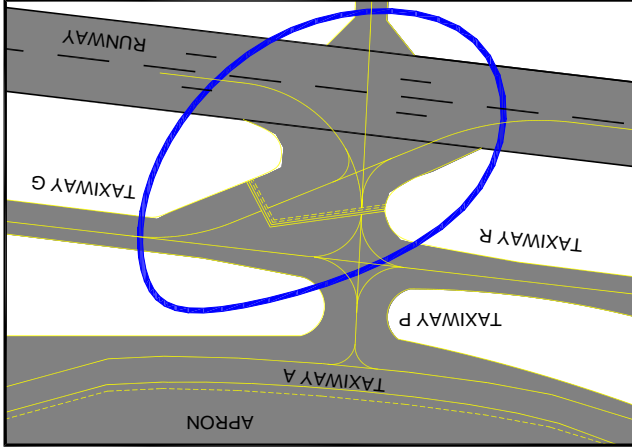
# FAA AC 150/5300-13A



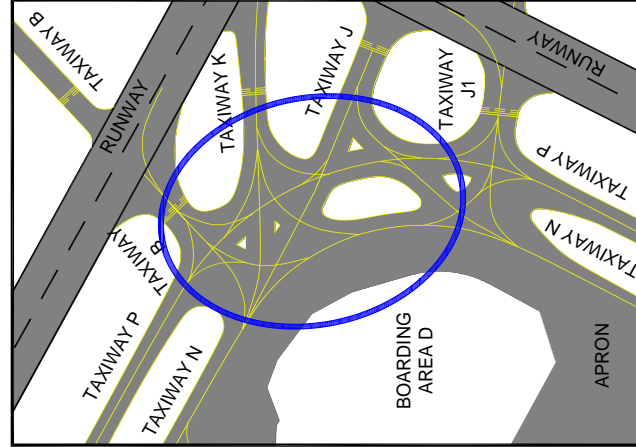
(b) Extra-wide throated taxiway leading from the apron directly to parallel taxiways and runways



(d) Taxiway intersecting multiple runways

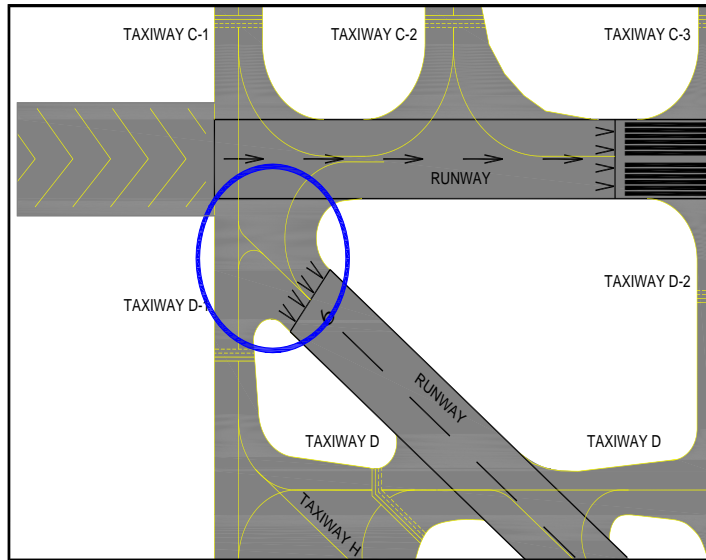


(a) Taxiway crossing high-speed exit and wide throated runway entrance



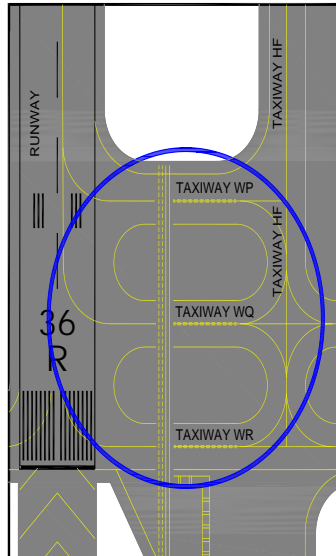
(c) Taxiway intersection exceeds "3-node" concept



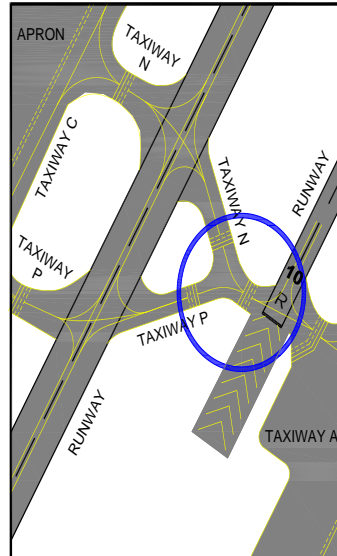


(e) Aligned taxiway between two closely spaced runway ends

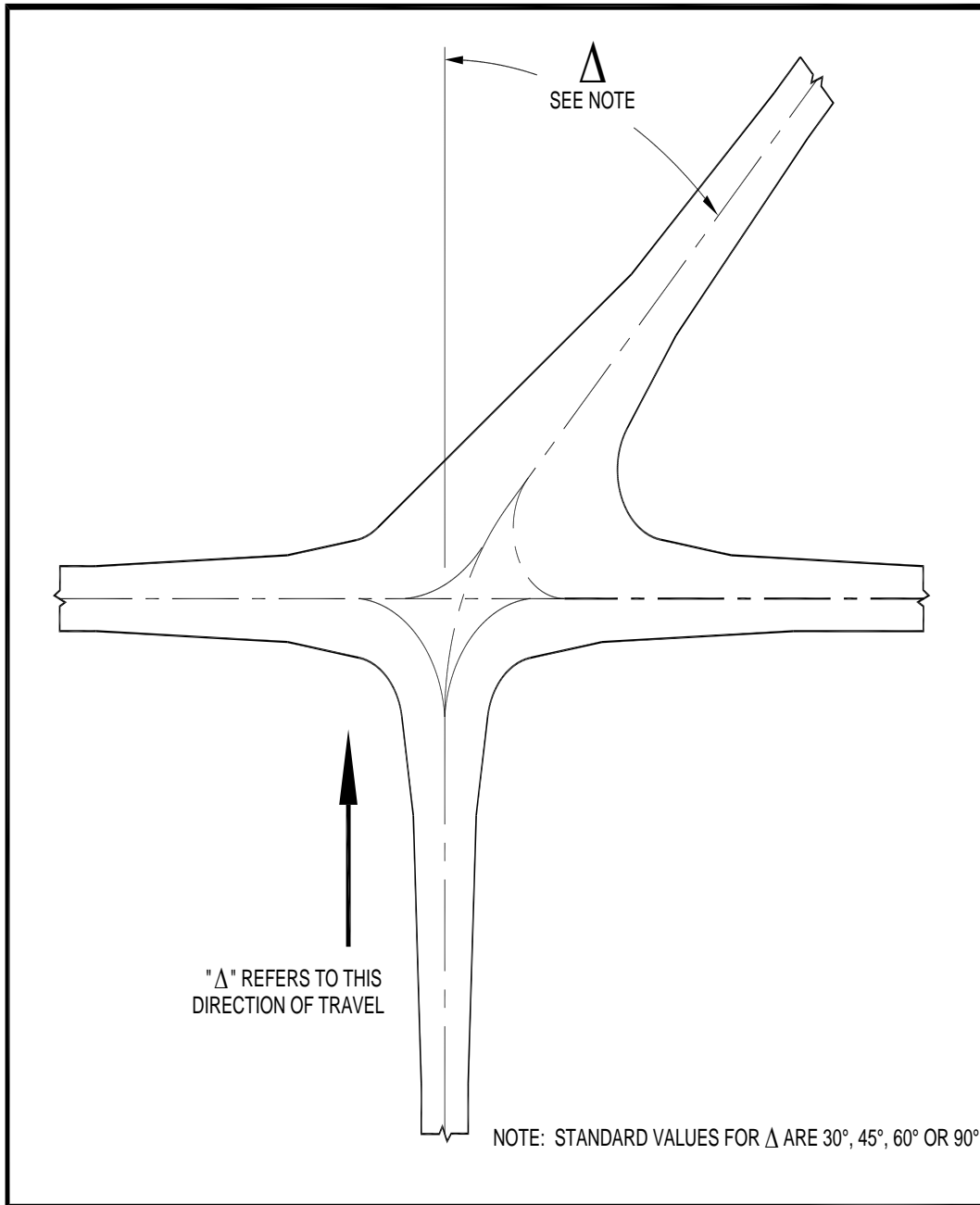
***PROHIBITED***  
***Aligned Taxiway***



(f) Two or more taxiway entrances lacking "No Taxi" islands



(g) "Y" Shaped taxiway crossing a runway



**3-NODE  
Principle  
Plus  
Angles**

**30-45-  
60-90  
degrees**

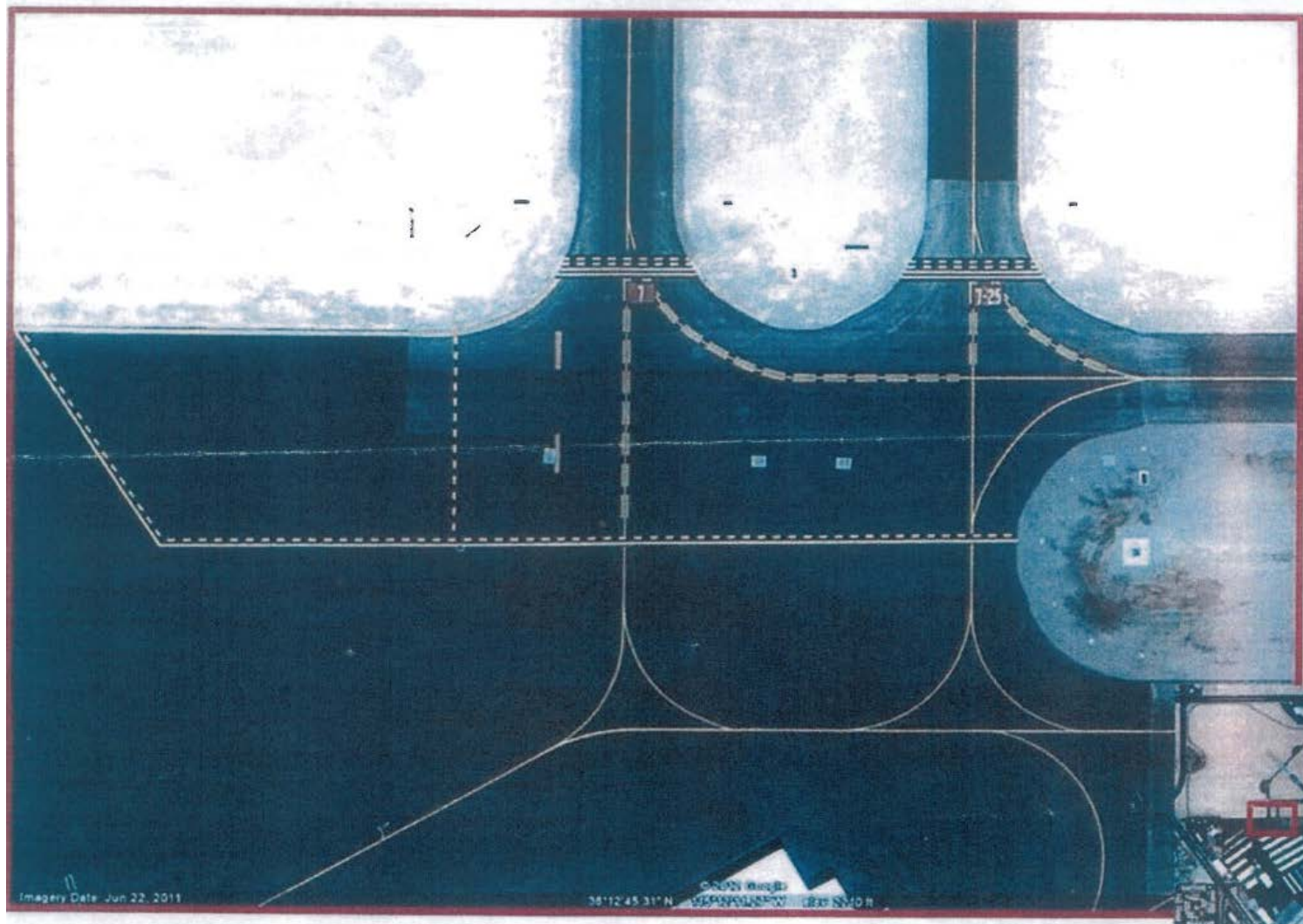
Let's go back to  
North Las Vegas  
Solutions?



# *North Las Vegas Airport (VGT) 2002/2003*



*Nov 18, 2010*  
*NO-TAXI Islands Removed*



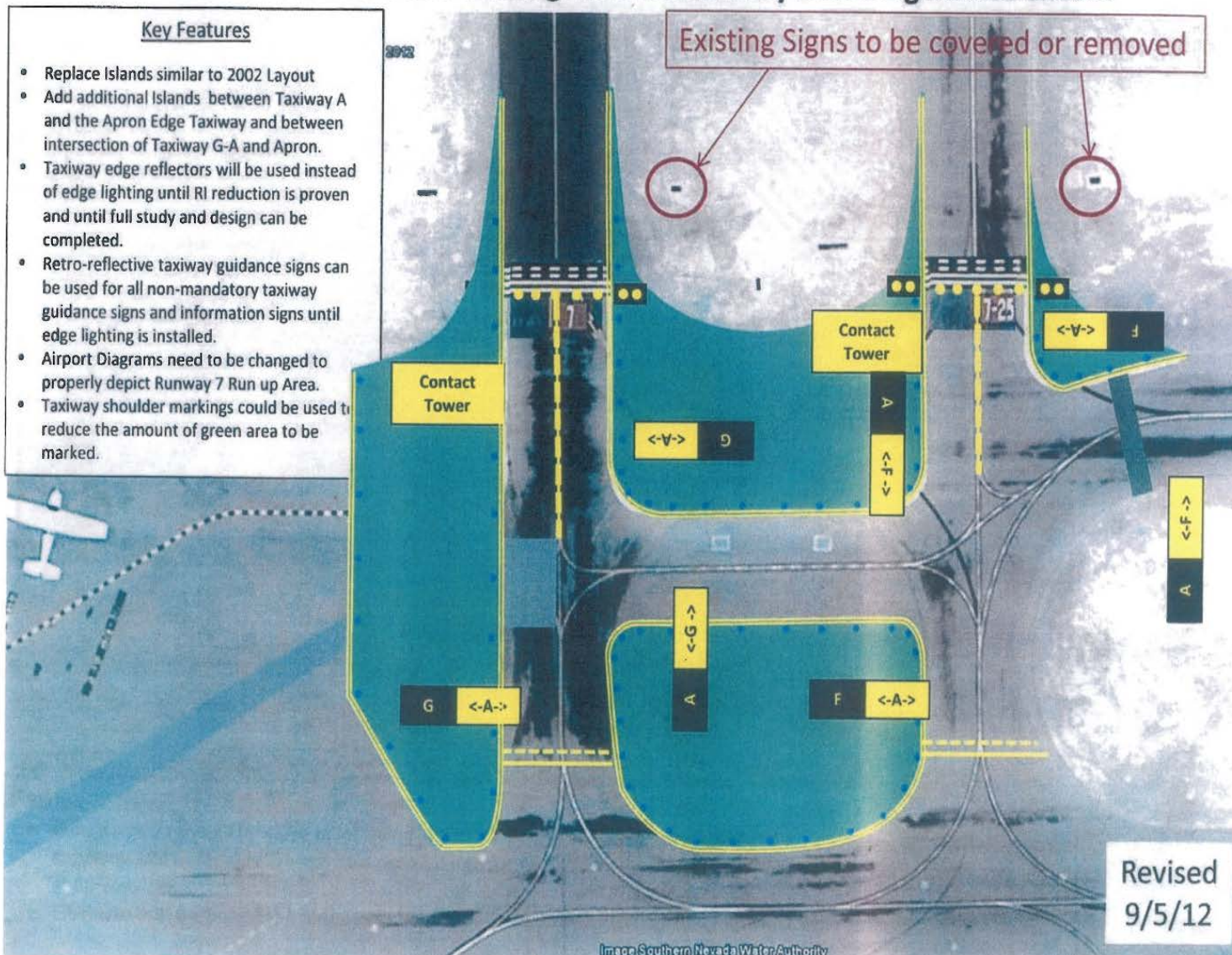
## *Result of Removal ?*

- *2010*
  - *1 RI (Nov 26 – Dec 31, 2010)*
- *2011*
  - *12 RIs*
- *2012*
  - *10 RIs*
- *2013 (Thru October)*
  - *8 RIs*
- ***TOTAL***
  - ***31 IRs at Twy G/Twy F***



# Proposed Corrective Actions

## Additional Taxiway and Information Signs (Retro-Reflective in Phase 1) New In-Pavement and Existing Elevated Runway Guard Lights also shown



# *RIs Dropped 2014 – 2015*

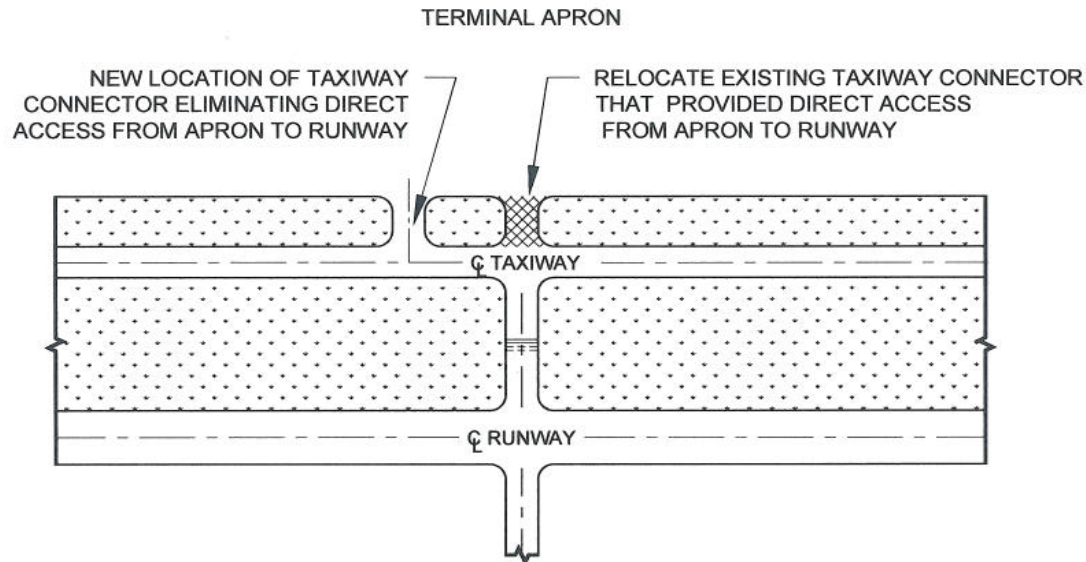
## *Two Events*





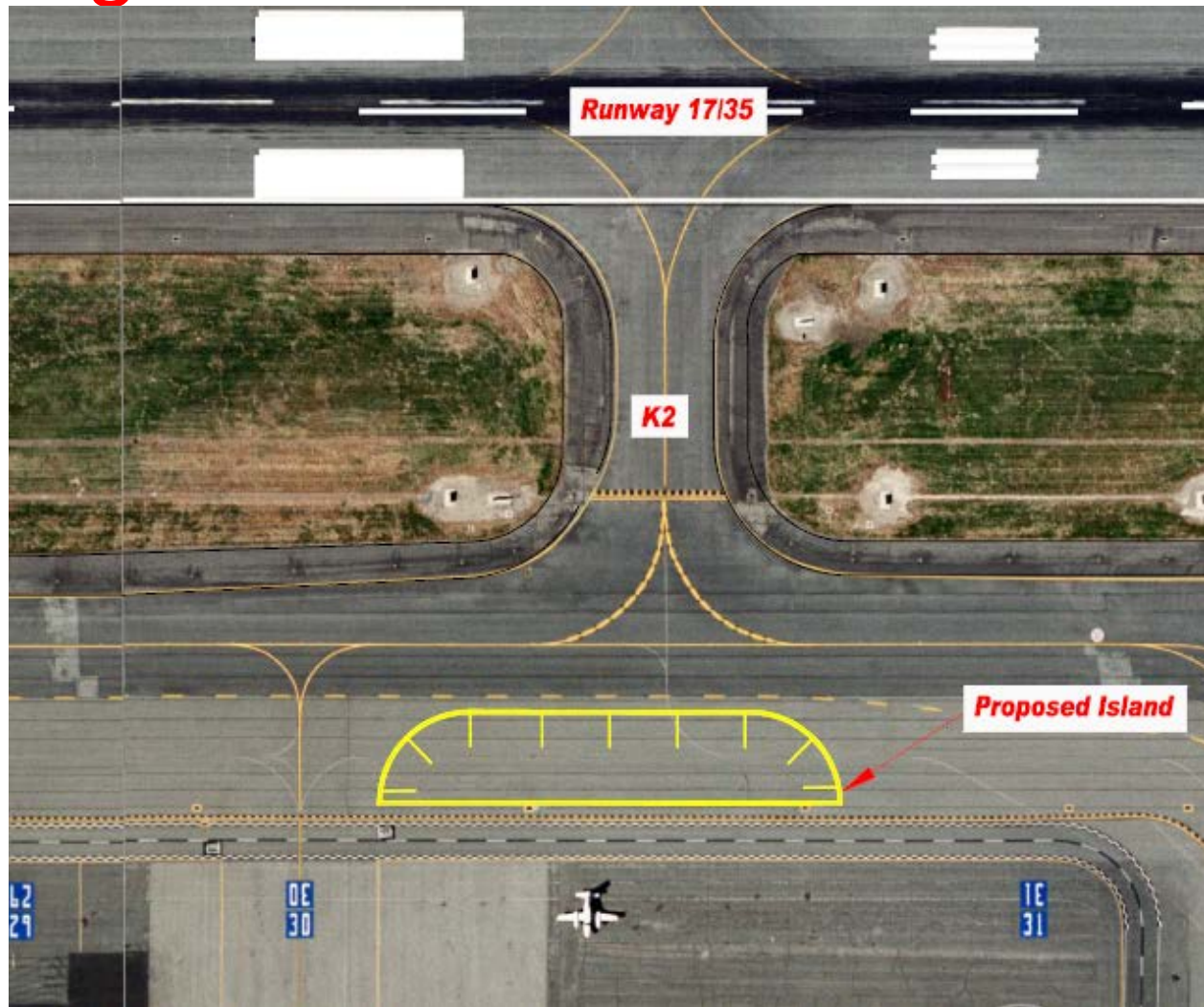
# Design Standard – Apron Access to Runways

- Do **not design** entrance taxiways that provide direct access from an apron to a runway, especially extra wide entrances
- Avoid wide expanses of pavement
- Configure taxiways as shown





# Mitigation – Paint No-Taxi Island



# End of Session