

Leigh|Fisher

Master Plan Update

Public Information Meeting

George Bush Intercontinental Airport

February 17, 2015



MASTER PLAN 2035
GEORGE BUSH
INTERCONTINENTAL AIRPORT

Agenda

- Introduction
- Requirements
- Recommendations
 - Airfield
 - Passenger Terminal
 - Roadways
- Environmental considerations
- Next steps



Introduction

Background

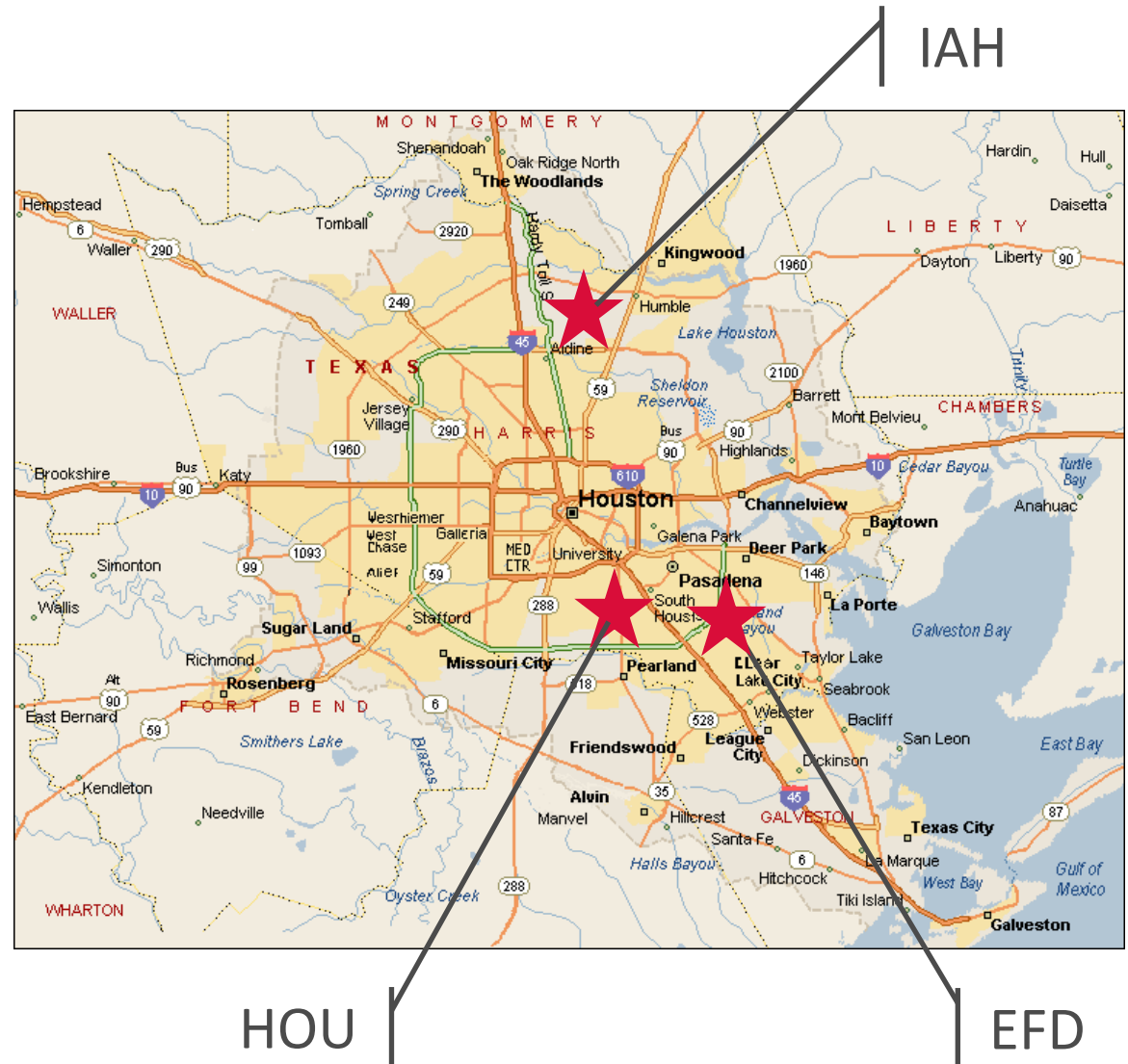
What is a master plan

Master plan process

Master plan goals and objectives

About Houston

- Largest City in Texas
- Fourth largest city in the U.S.
- 2 million people in city limits
- 6 million people in Houston-Galveston region
- Strong energy-based economy



The Houston Airport System owns/operates three airports

- George Bush Intercontinental Airport (IAH) – the city’s largest airport and global gateway, serving over 40 million passengers annually
- William P. Hobby Airport (HOU) –serving over 11 million passengers annually, with international flights to begin in the fall of this year
- Ellington Airport (EFD) – a commerce/aviation center; potential spaceport site



We exist to connect the people, the businesses, the cultures and the economies of the world to Houston.

Houston has nonstop service to 5 continents



International traffic is rapidly growing at IAH

- **2007:** Dubai (Emirates)
- **2008:** Singapore via Moscow (Singapore)
- **2009:** Rio de Janeiro (United); Doha (Qatar)
- **2010:** Monterrey (VivaAerobus)
- **2011:** Lagos (United)
- **2012:** A380 to Frankfurt (Lufthansa)
- **2013:** Third daily London (United); Istanbul (Turkish); Beijing (Air China)
- **2014:** Second daily Tokyo, Munich, and Punta Cana (United); Seoul (Korean); Stavanger (SAS); Guadalajara and Cancun (VivaAerobus); Santiago de Chile (United); Monterrey (Aeromexico and Interjet); A380 to Dubai (Emirates)
- **2015:** Guadalajara (Volaris), Taipei (EVA Air), Tokyo (ANA), Calgary (Westjet)

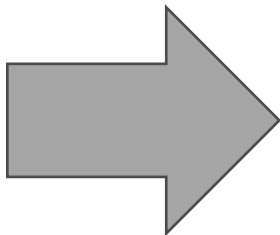


The economic impact of IAH on the City of Houston is substantial

TOTAL ANNUAL ECONOMIC IMPACT	JOBS CREATED	ANNUAL EARNINGS GENERATED
\$22 Billion	172,000 full time equivalent employees	\$6.8 Billion

What is an airport master plan?

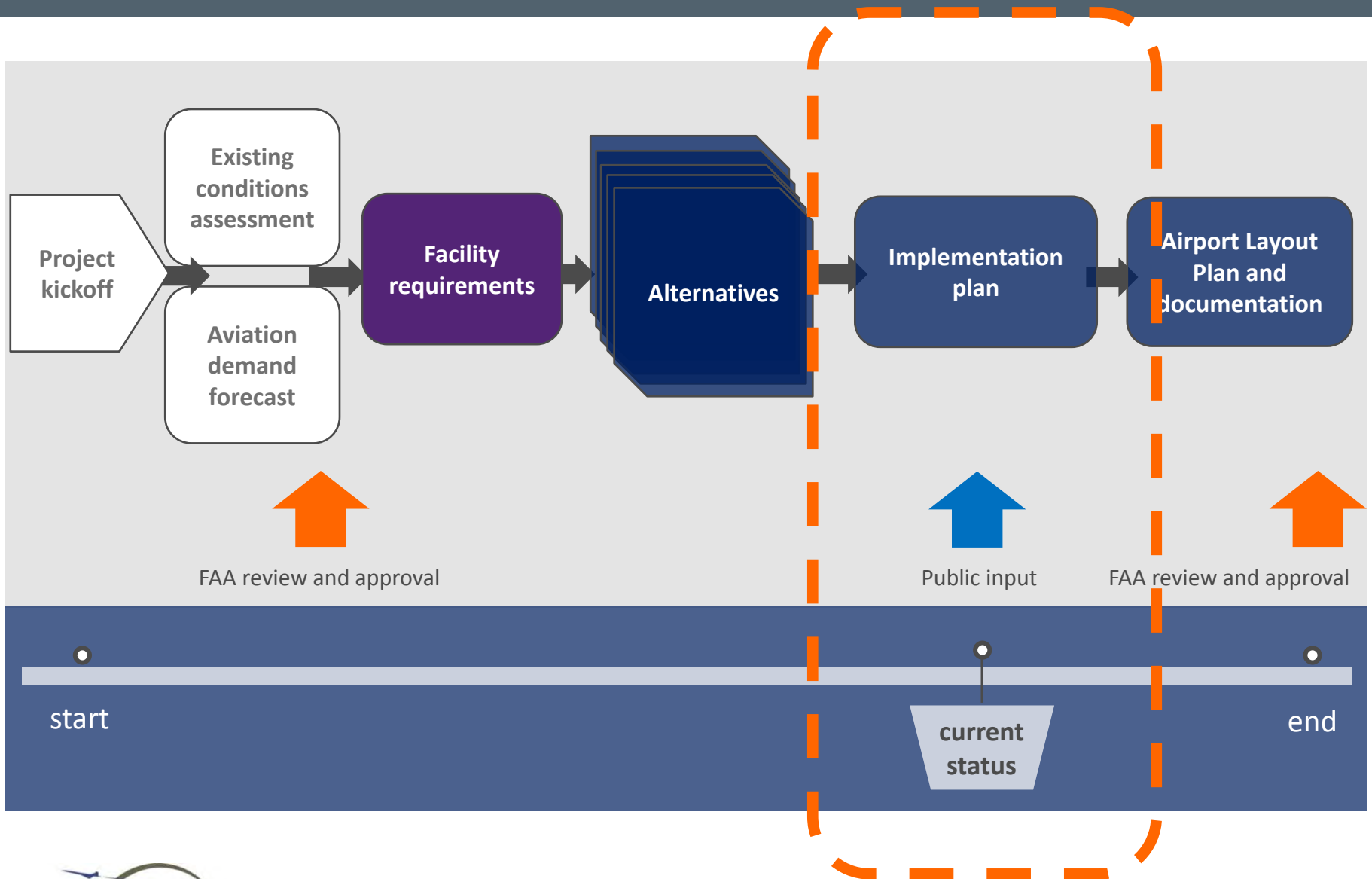
- A long-range guide for the orderly development of the airport, typically looking out about 25 years into the future
- A plan that FAA requires airports to update periodically
- **Primary plan components include:**
 - An FAA approved Airport Layout Plan enabling the airport to receive federal funding for eligible improvements
 - A narrative report documenting the analyses and recommendations



No two are the same

Each airport master plan addresses issues unique to the airport, its community and its environment

Overview of the IAH Master Plan process



IAH Master Plan vision and goals

Master Plan 2035 provides a vision for the airport that is safe and efficient, increasingly cost-competitive, aesthetically pleasing, and highly effective in serving the greater Houston community.

- **Airfield:** plan for a safe and operationally efficient airfield
- **Passenger Terminal:** provide needed gate capacity and improve customer experience throughout the terminal complex
- **Landside/Access:** provide efficient airport access
- **Environment and City:** provide environmentally and socially conscious airport improvements
- **Financial:** provide an affordable plan

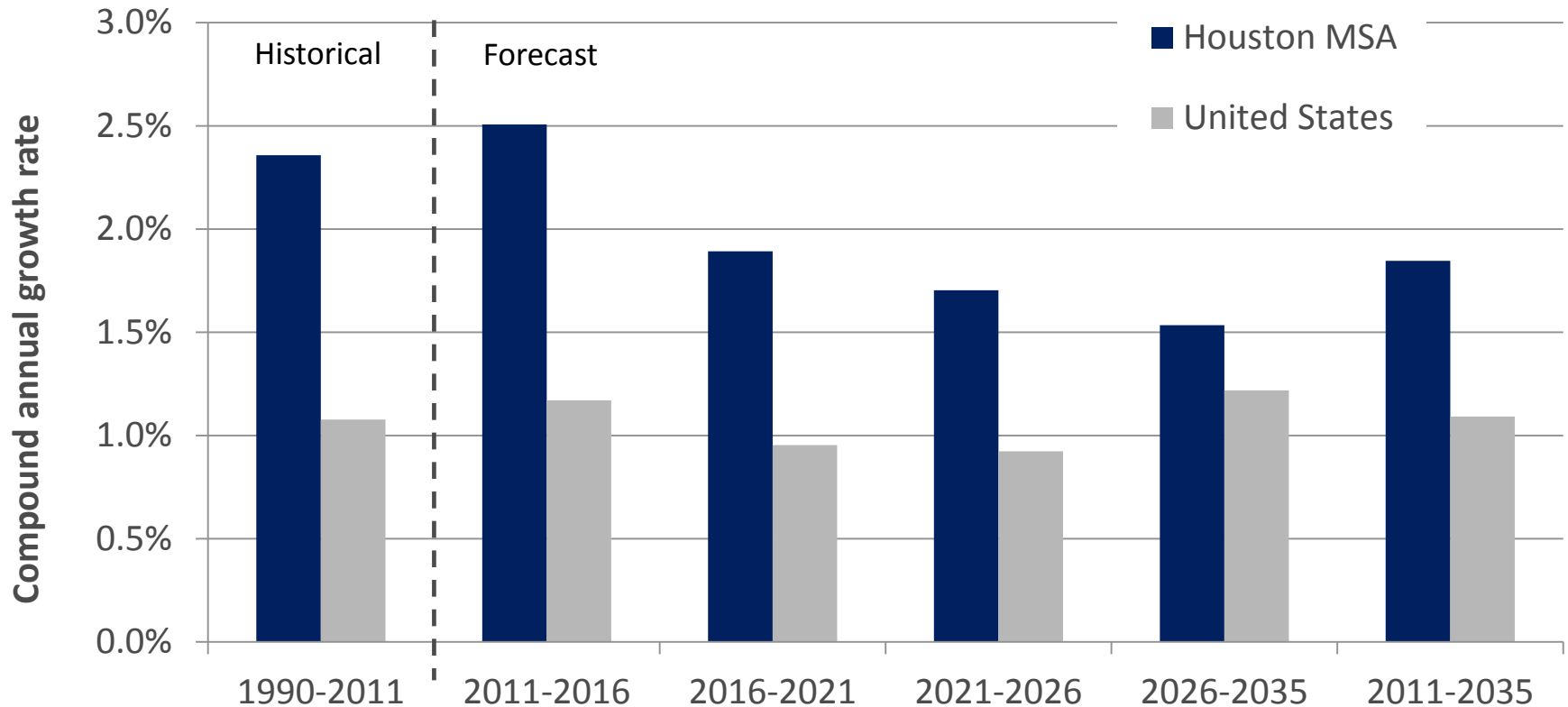
Requirements

Forecast

Summary of requirements

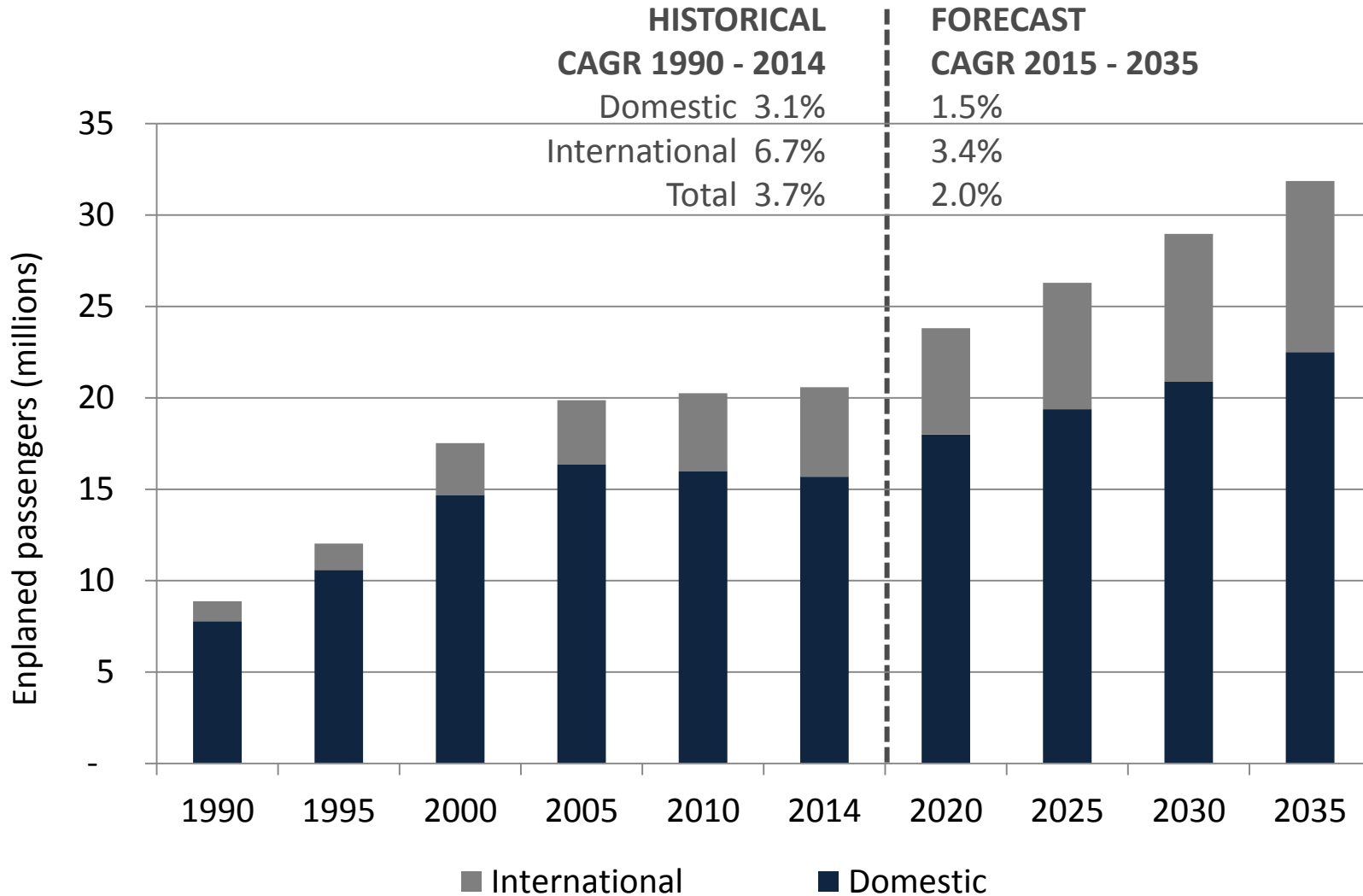
The Houston metro area is expected to grow by 3.4 million people (55%) by 2035

POPULATION GROWTH RATES



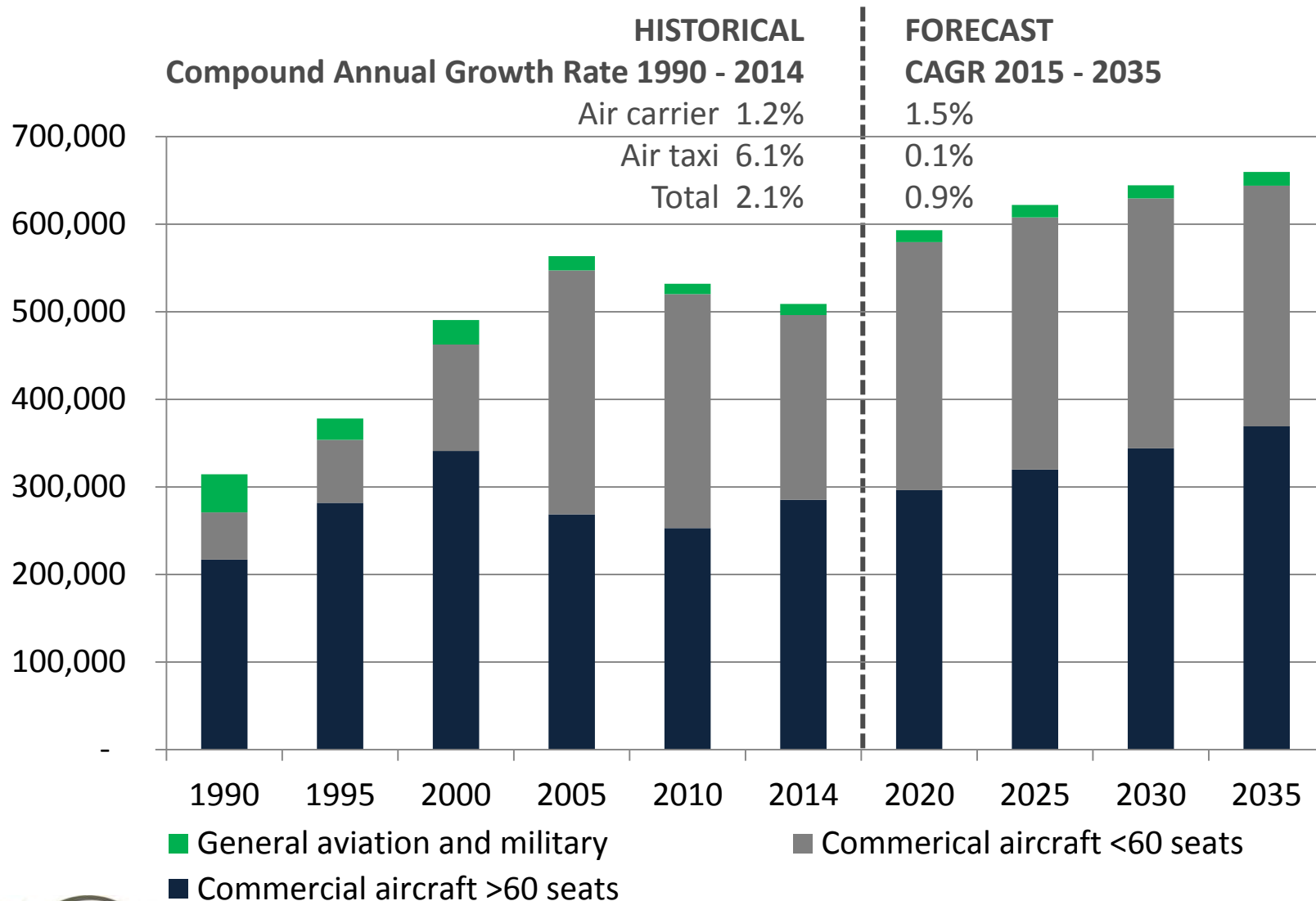
Sources: Houston MSA: Houston-Galveston Area Council; U.S.: Woods & Poole, Economic and Demographic Projections, 2011.

Annual enplaned passengers could grow to over 30 million by 2035



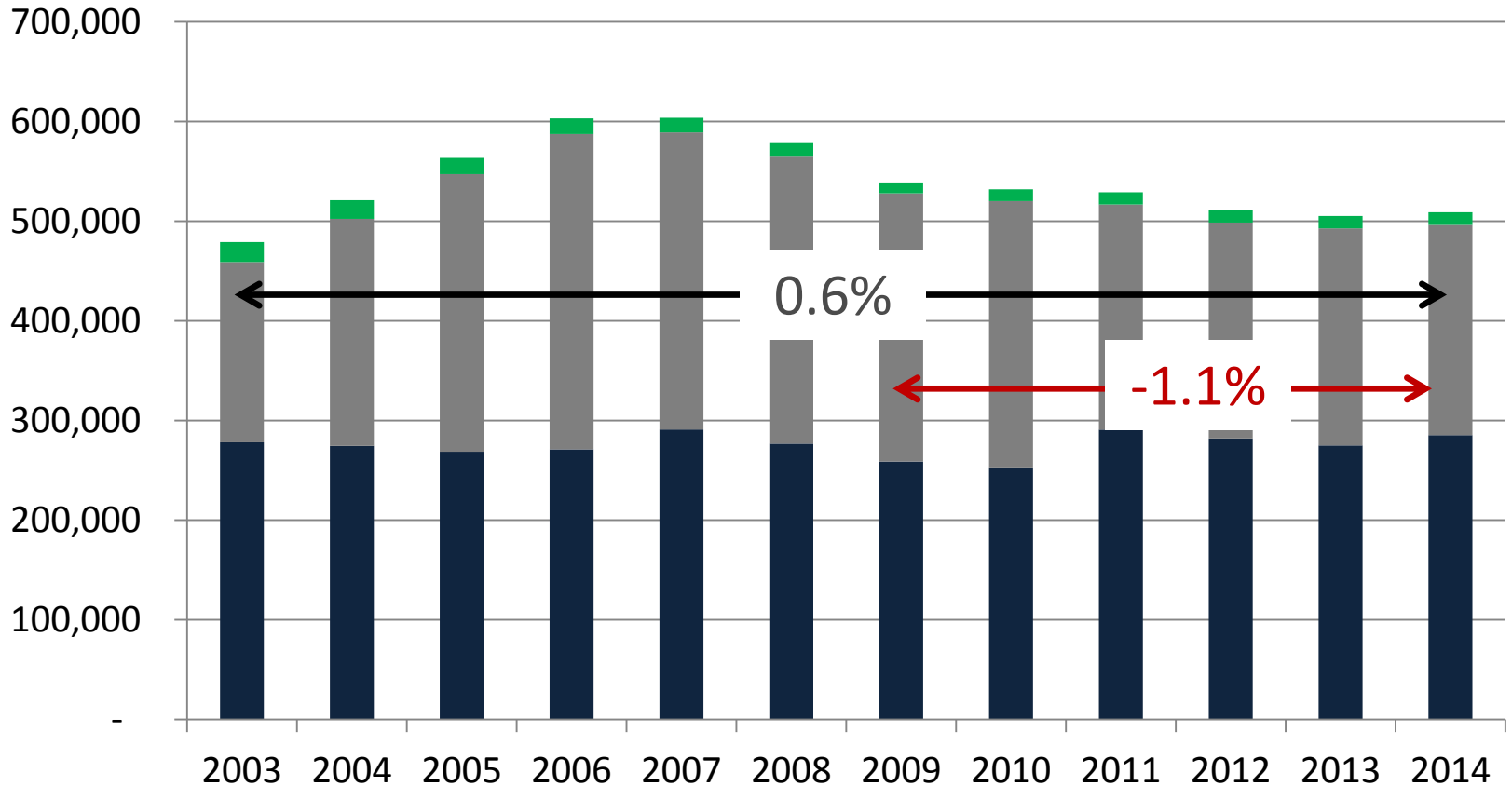
Source: Master Plan Forecasts, slow-growth scenario.

Annual aircraft takeoffs and landings could grow to over 600,000 by 2035



Source: Master Plan Forecasts, slow-growth scenario.

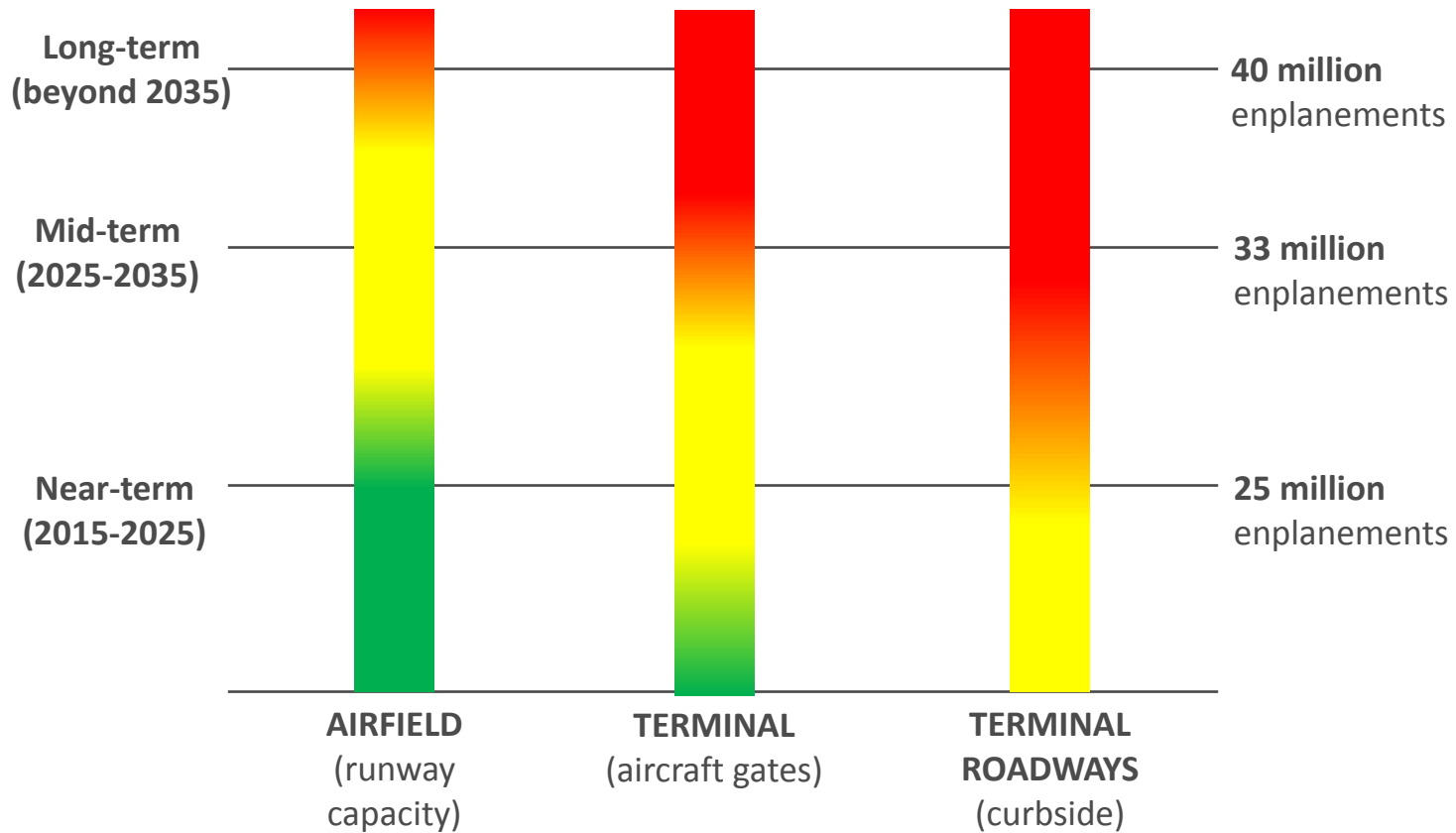
Aircraft operations have been flat the last several years after peaking in 2007



■ General aviation and military ■ Commercial aircraft <60 seats ■ Commercial aircraft >60 seats

Source: FAA ATADS database, accessed February 2015.

The runway capacity is sufficient for the next 20 years

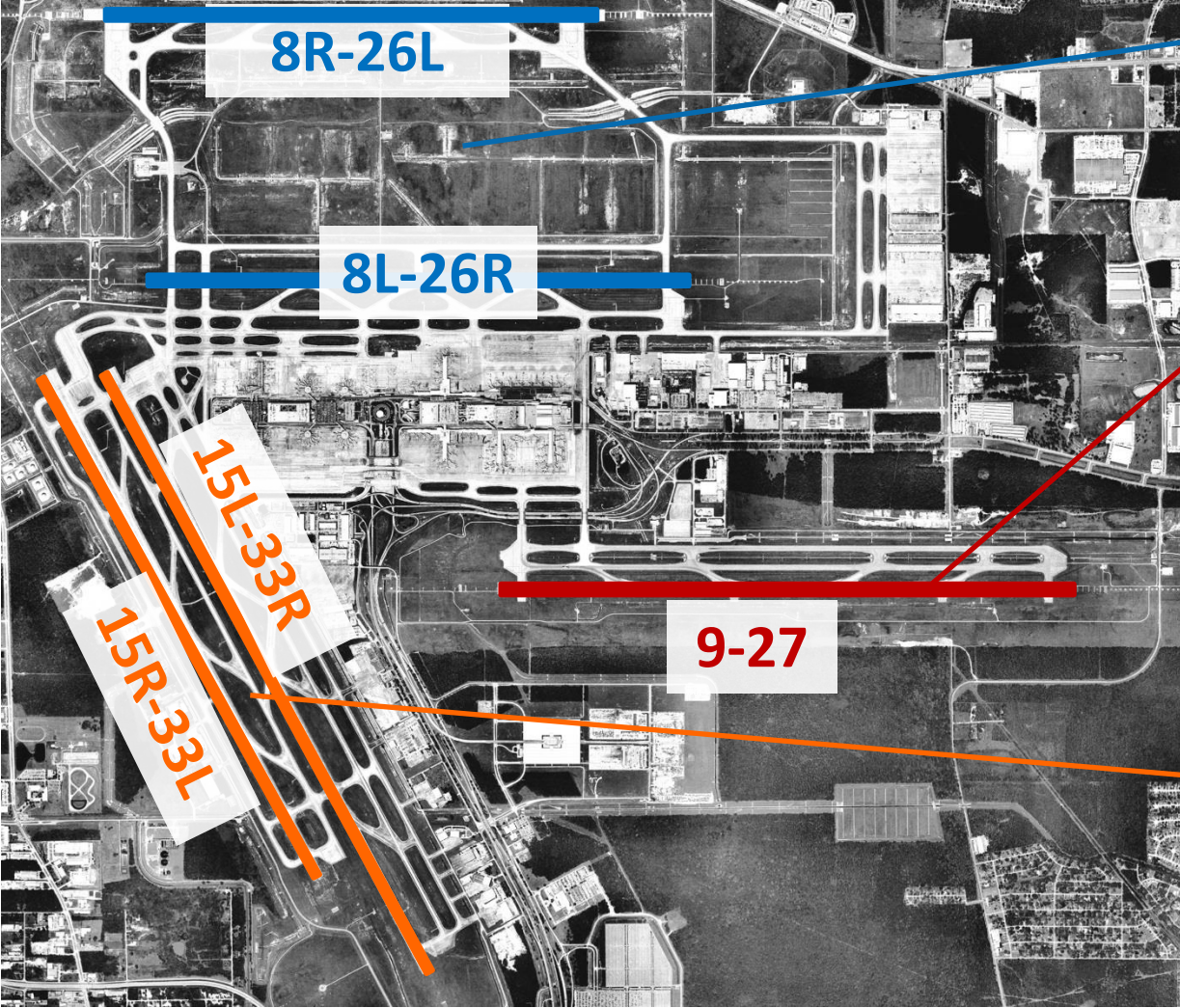


Legend – Level of service during peak periods



Airfield recommendations

Overview of the existing airfield – 5 runways



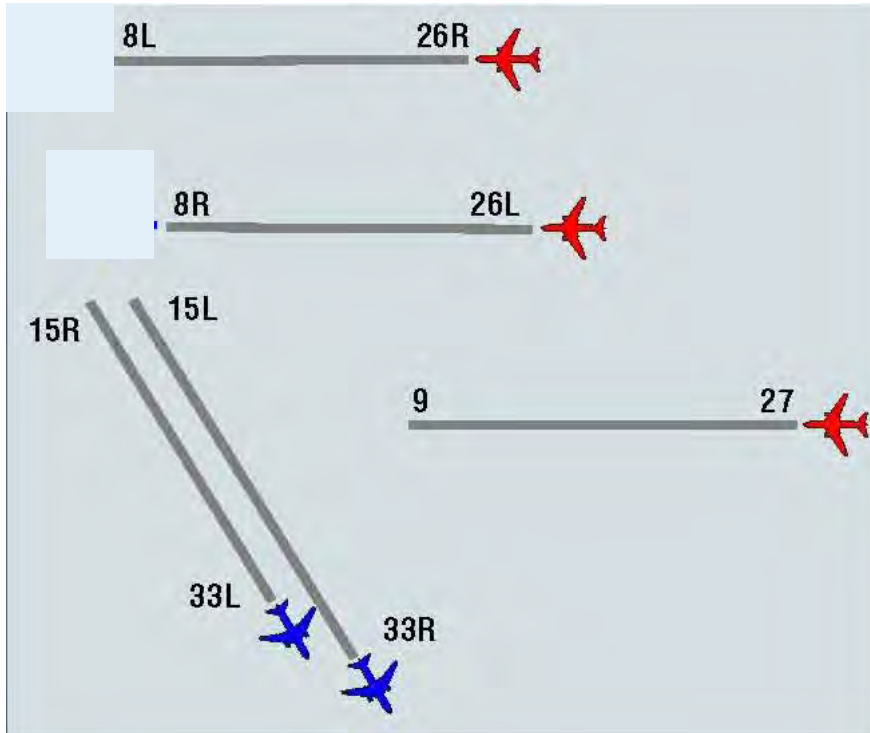
North Airfield (arrivals)

South Airfield (arrivals)

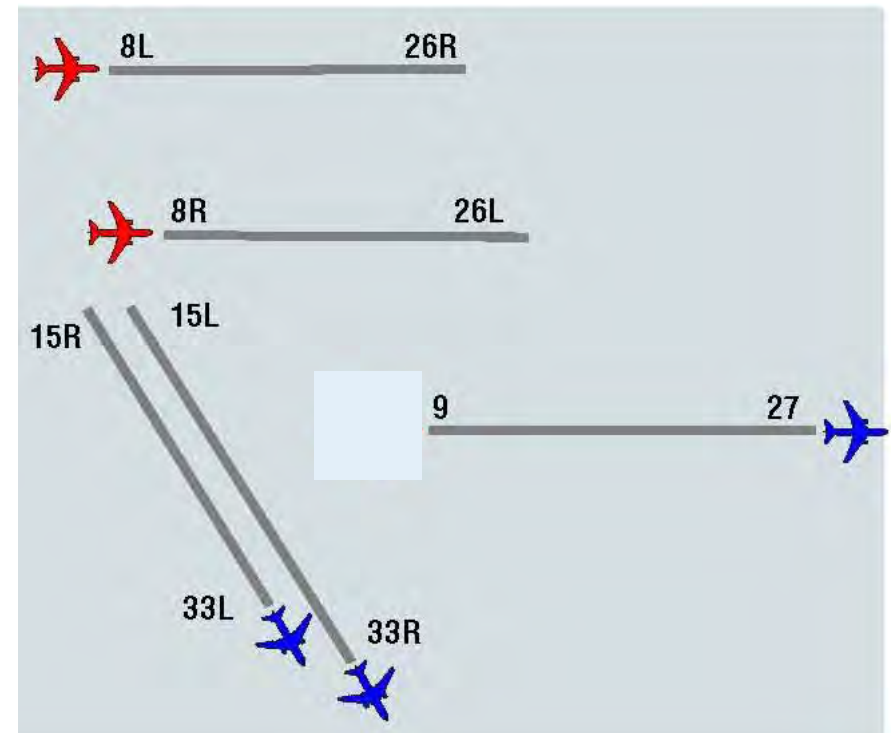
West Airfield (departures)

Airfield Flow Diagrams


West flow (70% of the time)




East flow (30% of the time)



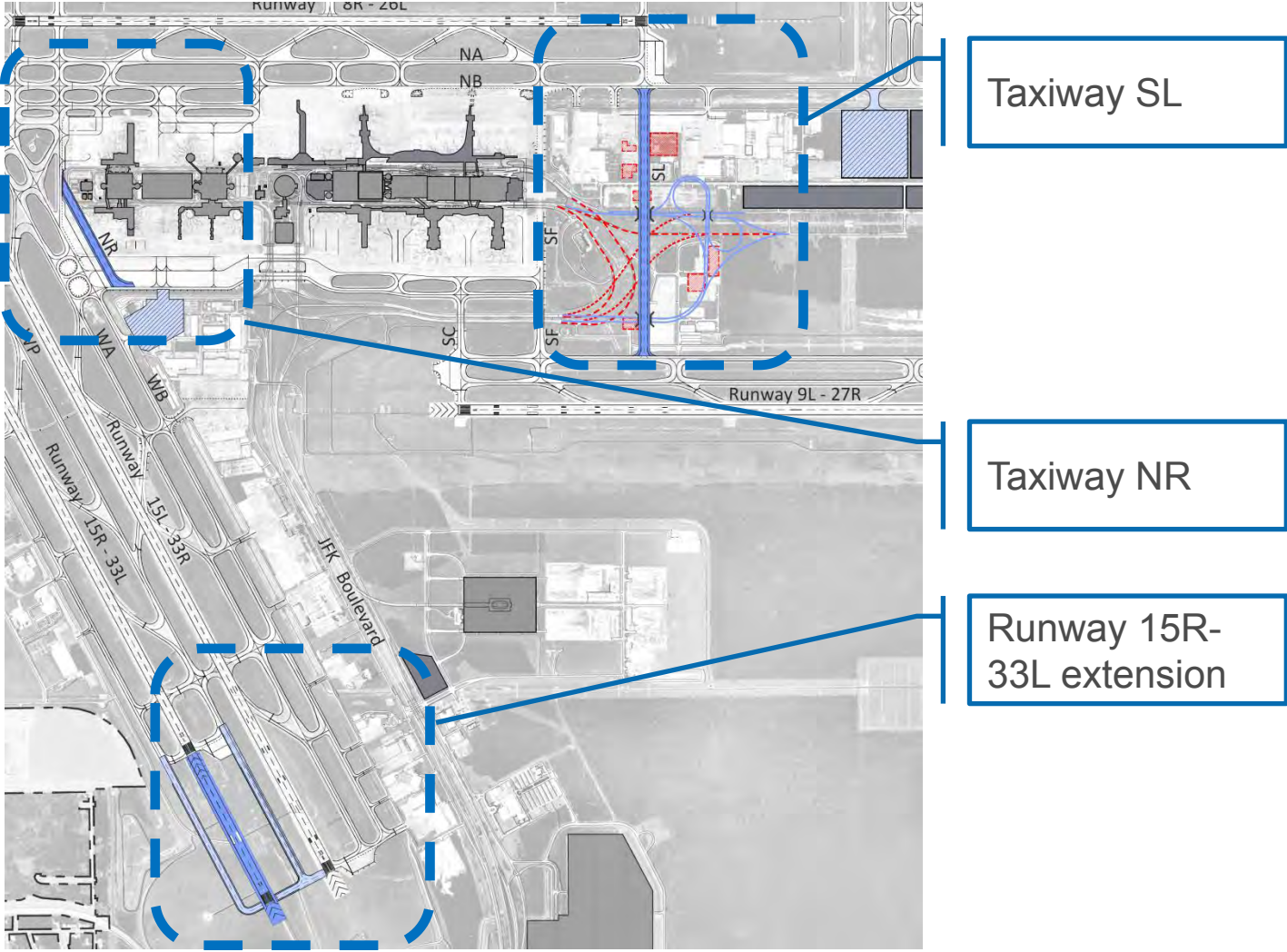
LEGEND

 Primary departure

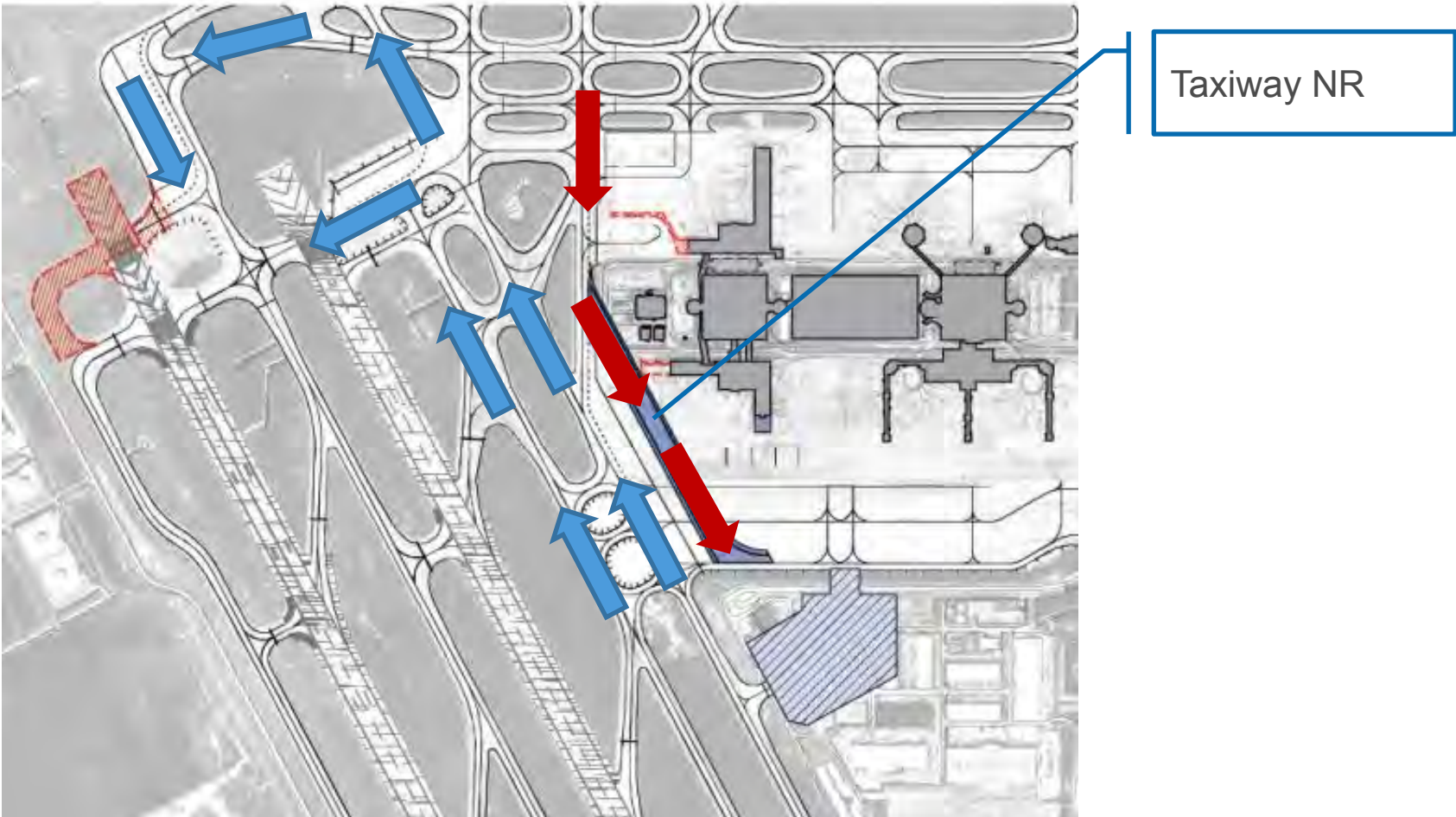
 Primary arrival

Source: Leigh Fisher, based on discussions with IAH Airport Traffic Control Tower, December 2012.

In the next 10 years, the airfield requires additional taxiway infrastructure

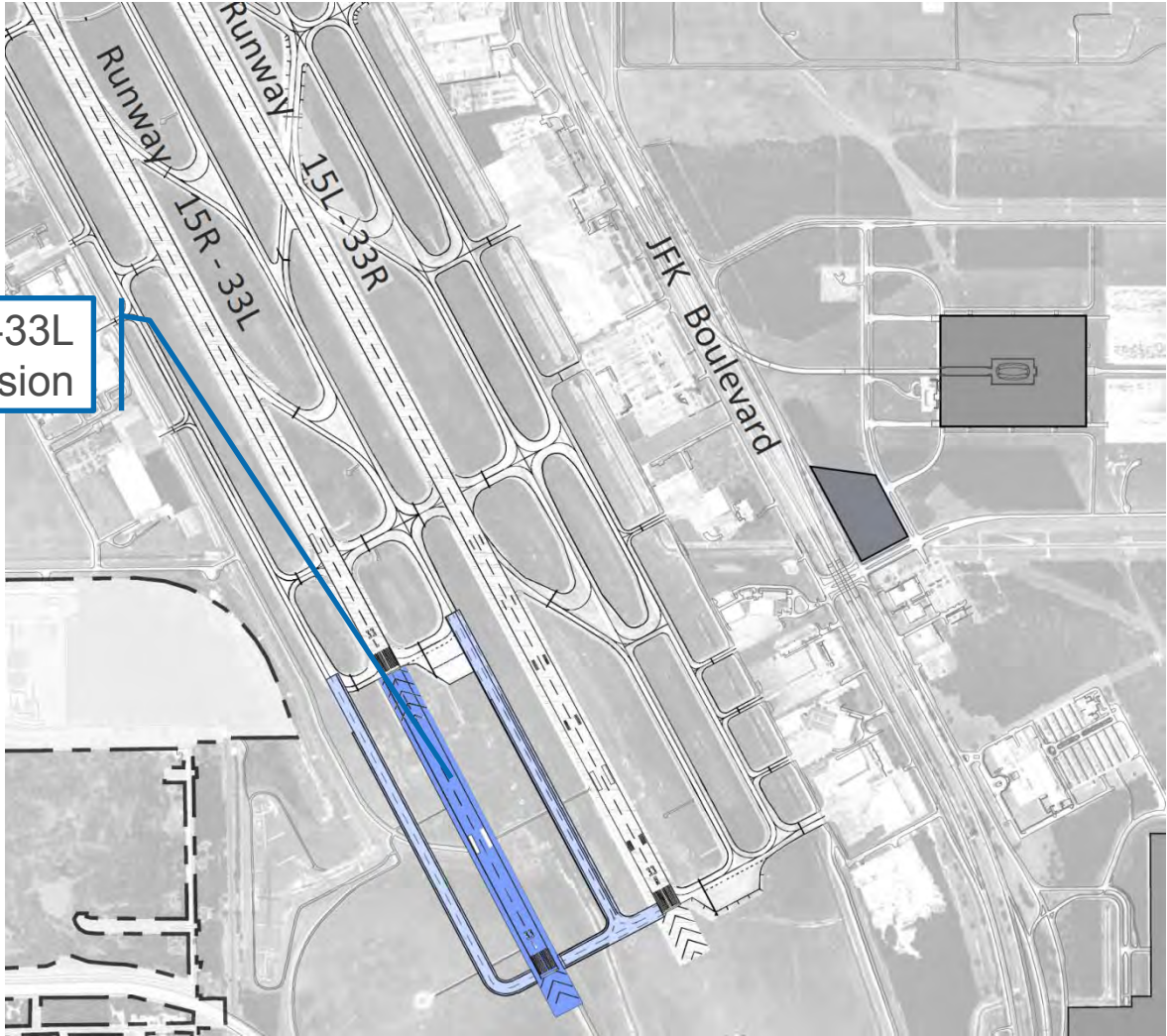


Taxiway NR enables shorter taxi distances from the north airfield

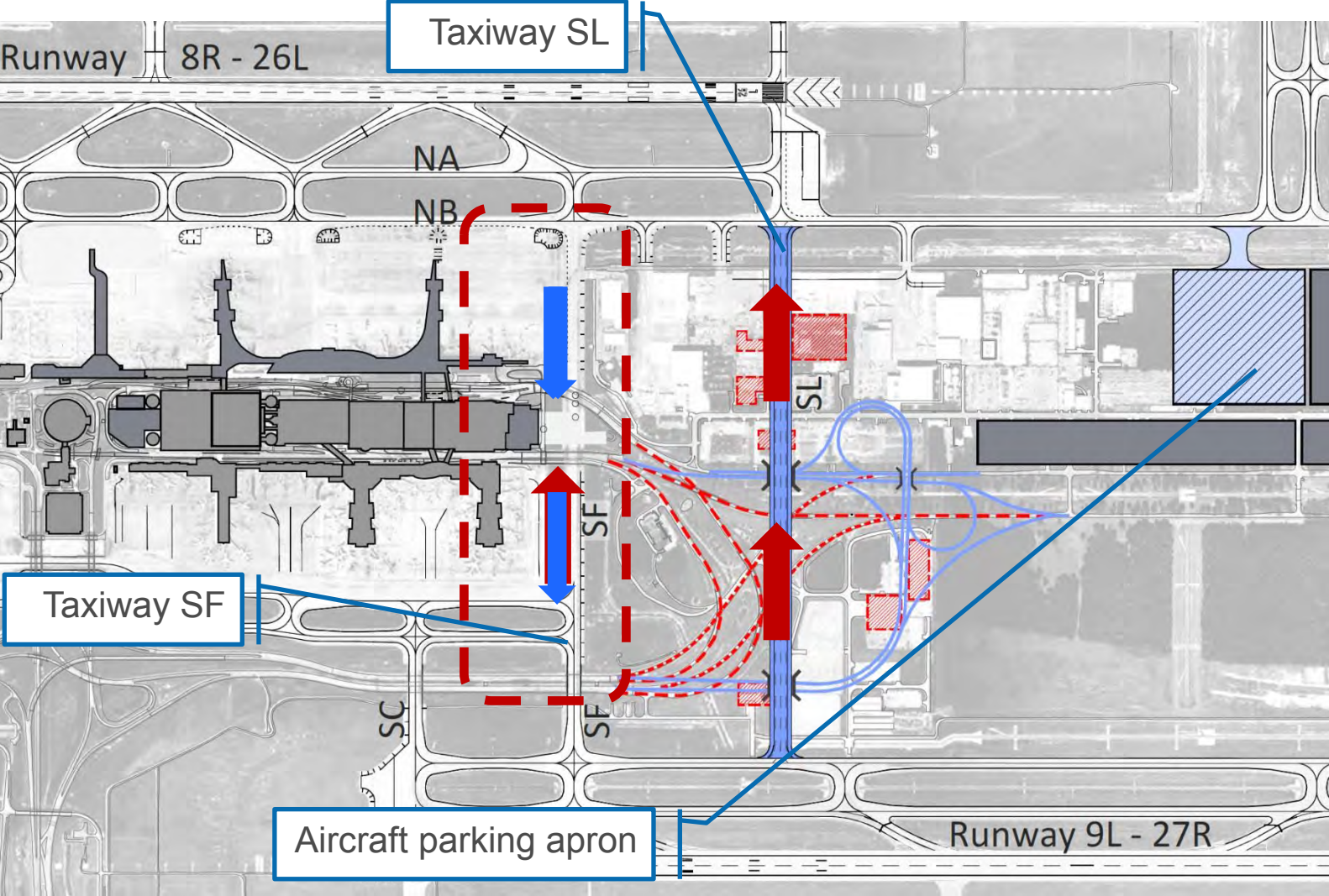


Runway 15R-33L extension provides needed redundancy for long haul departures

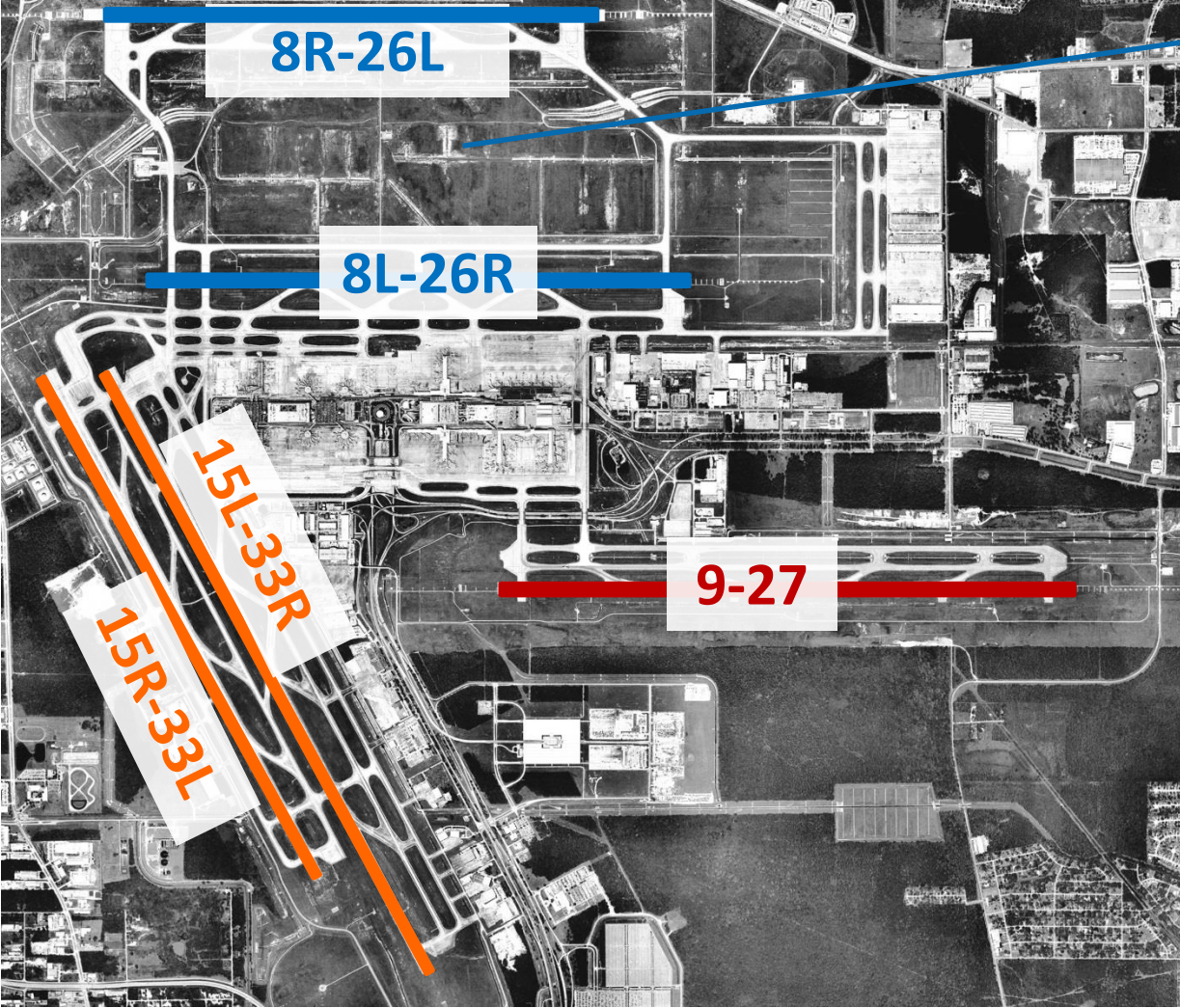
Runway 15R-33L
2,000' extension



Taxiway SL provides additional crossfield connectivity

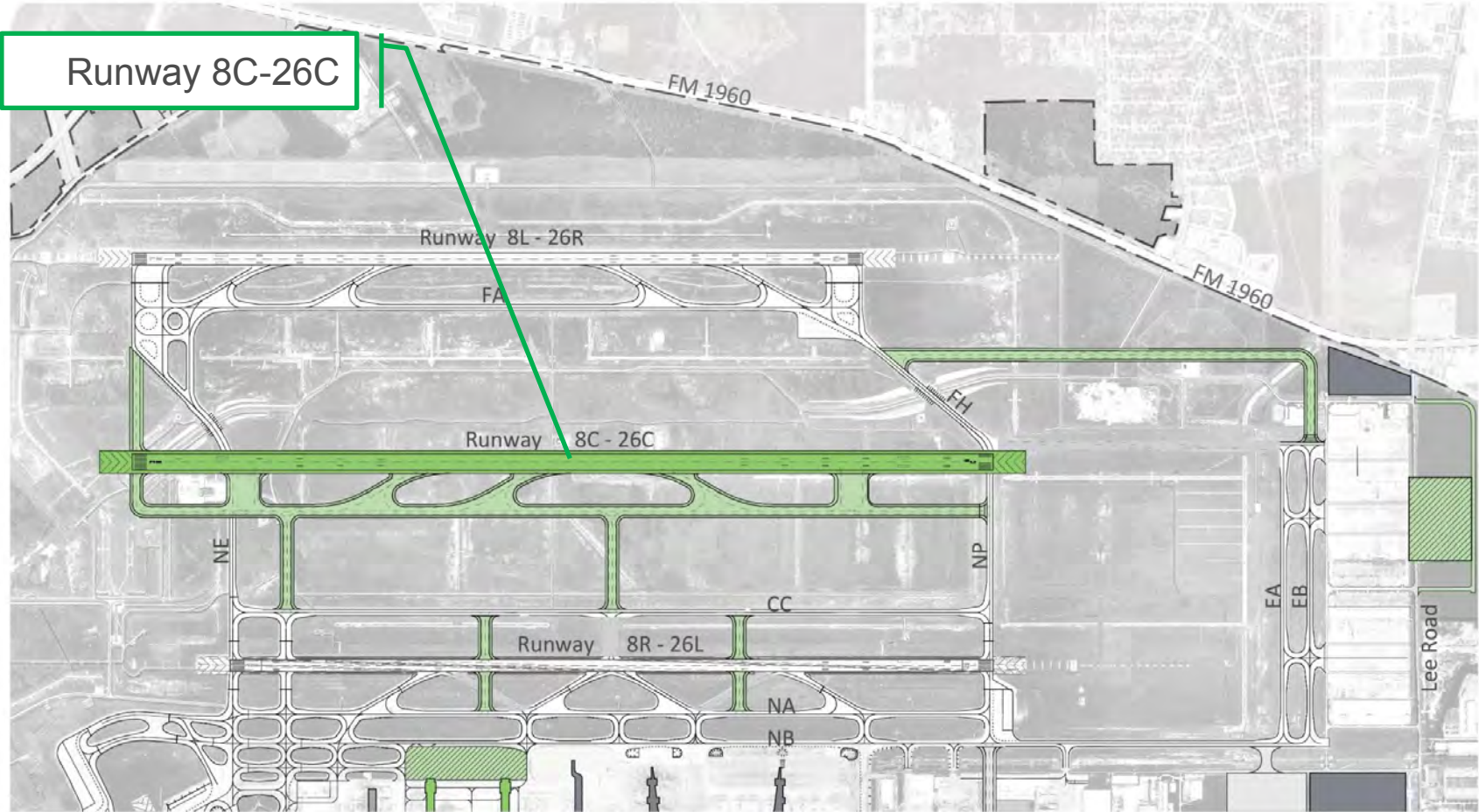


Revisit the overview of the existing airfield

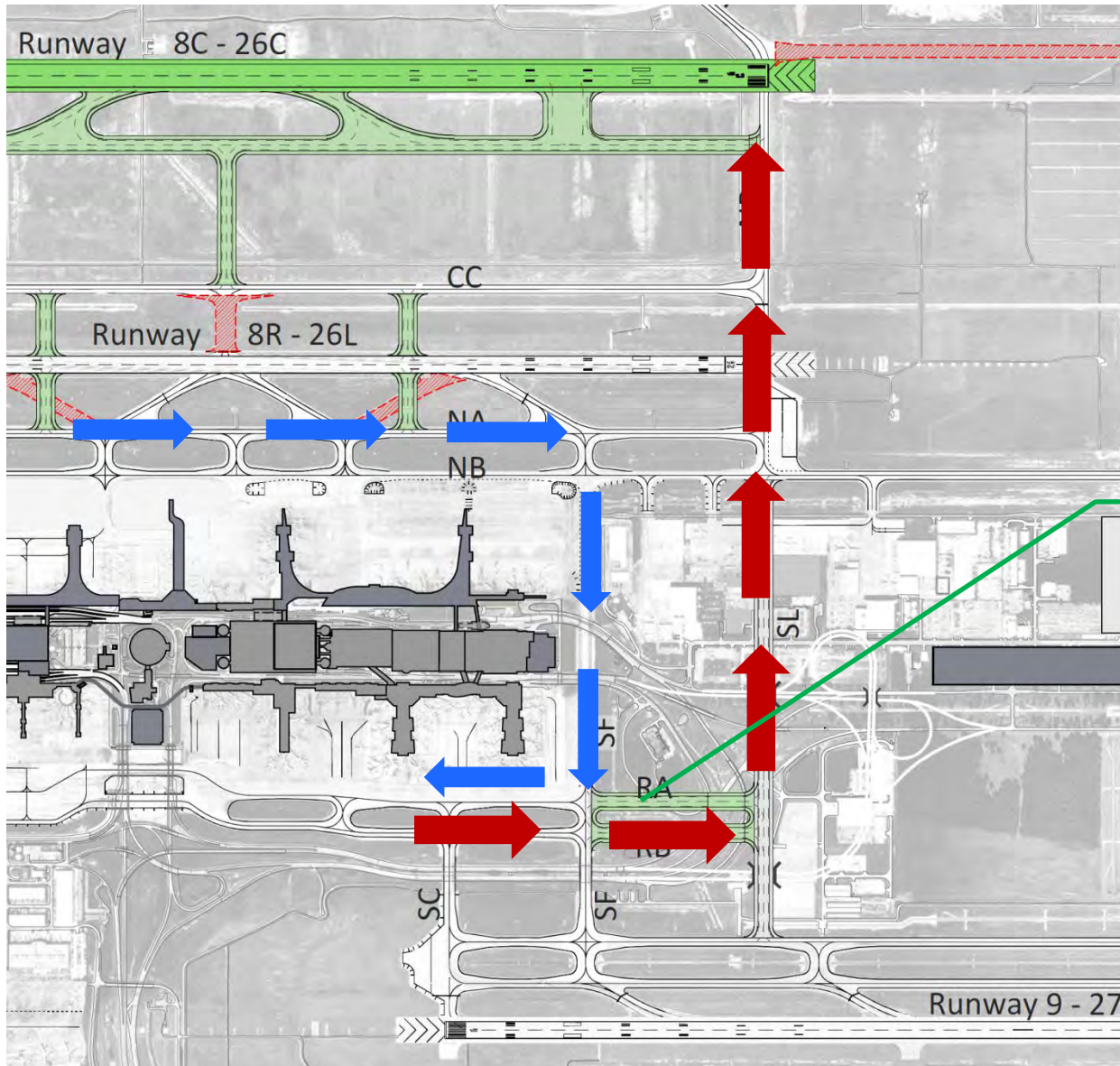


North Airfield (arrivals)

In about 25 years, Runway 8C-26C would add a third departure runway

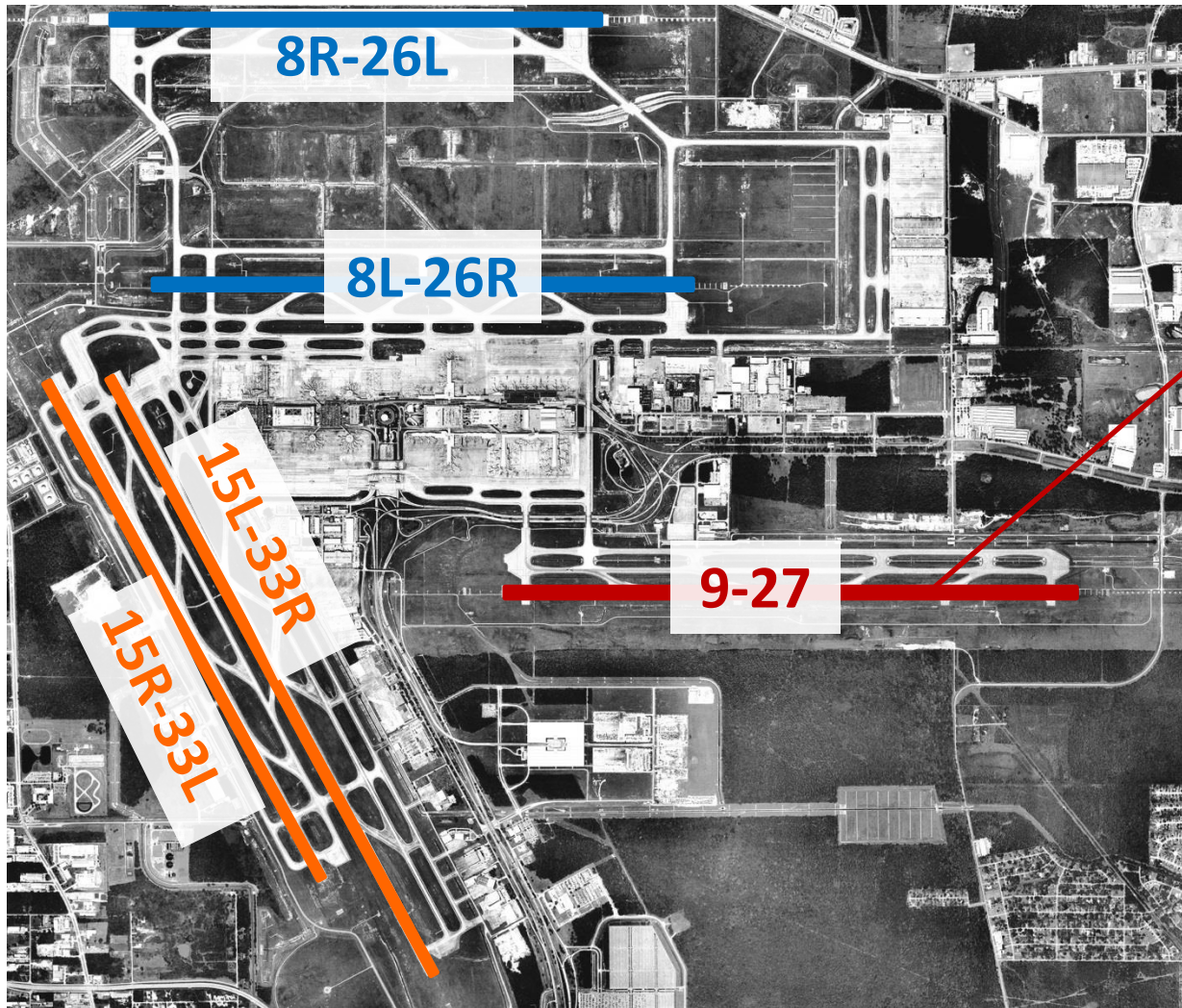


Taxiway RA and RB require extensions to serve Runway 8C-26C



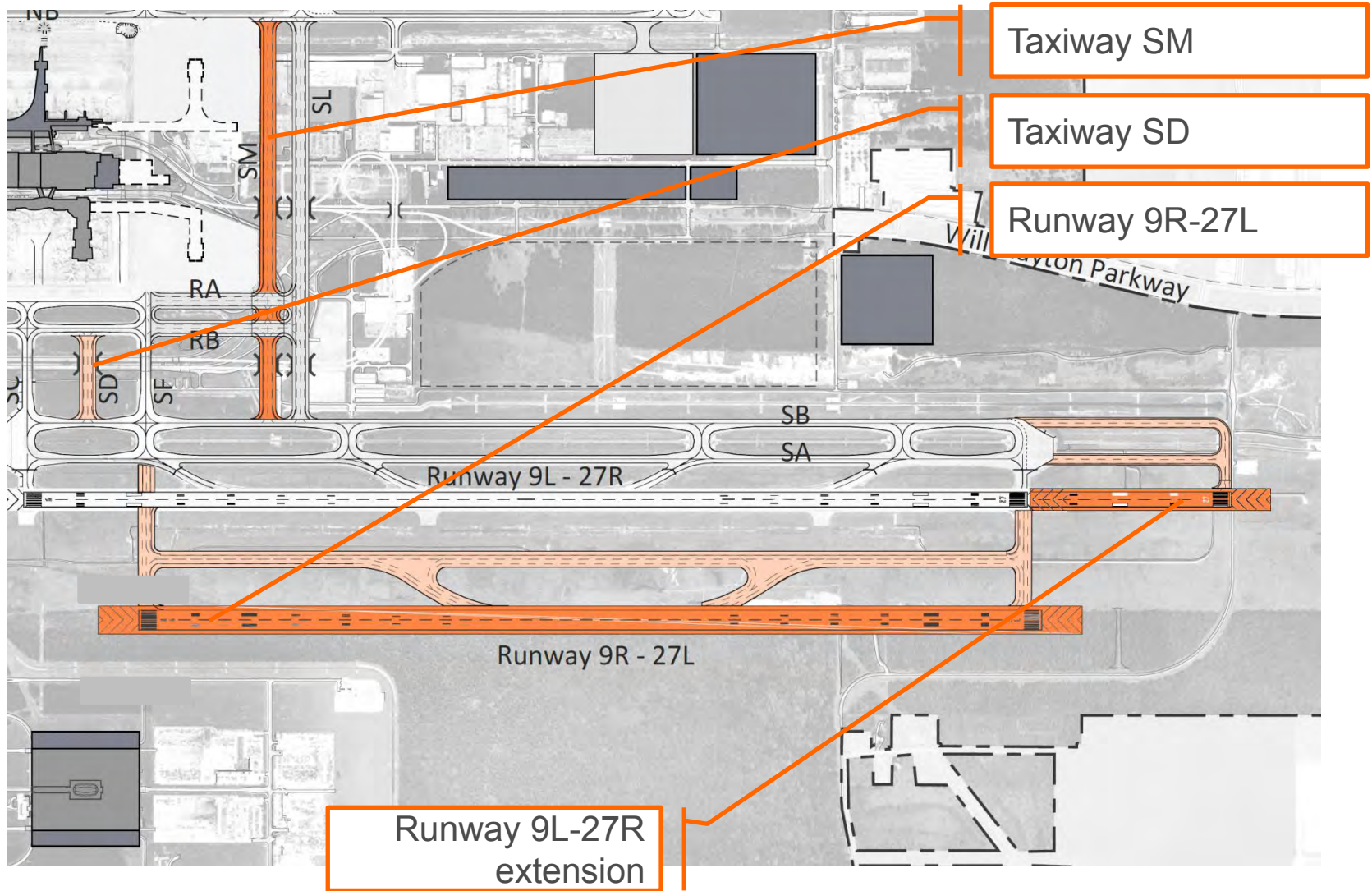
Taxiways RA and RB

Now, for the long-term, we have a few improvements to the south airfield



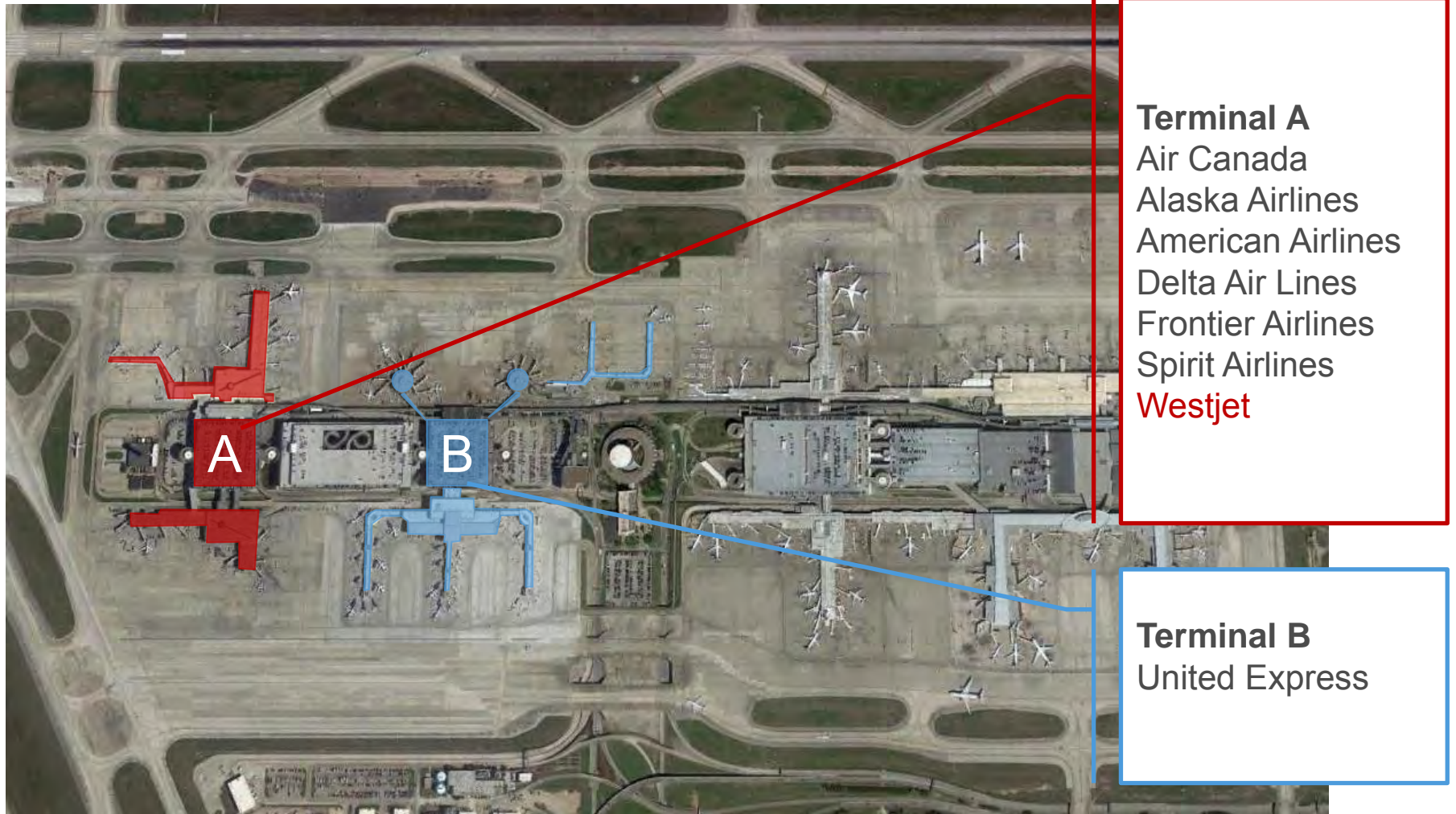
South Airfield (arrivals)

In 2050, the airfield may require an additional runway and associated taxiways

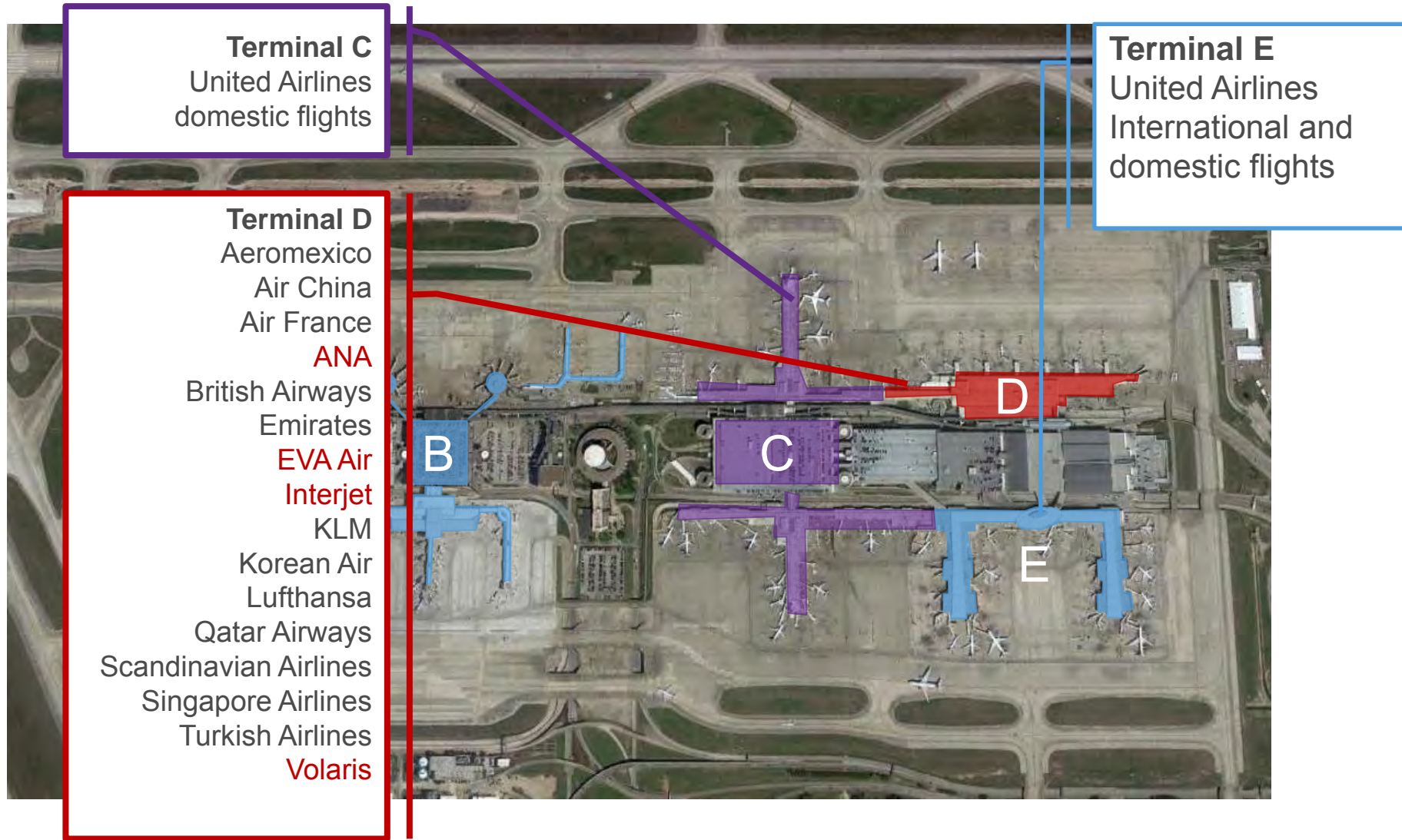


Passenger terminal recommendations

Terminal Complex Overview



Terminal Complex Overview



Passenger terminal requirements

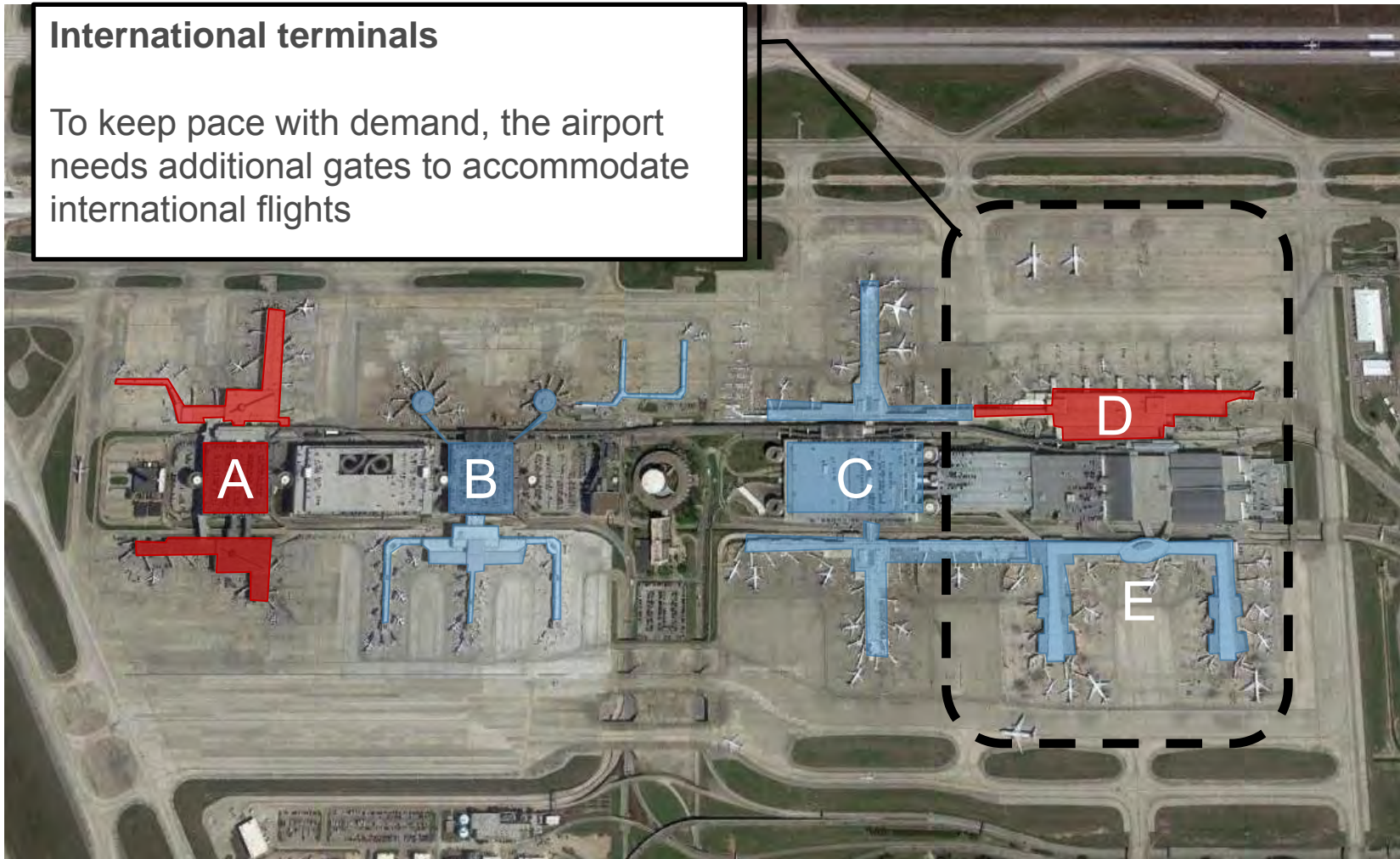
- More aircraft gates to provide for growing domestic and international service offerings
- Modernized facilities and a consistent customer experience regardless of terminal
- Additional space on the concourses
- Investment in aging infrastructure to reduce operational costs



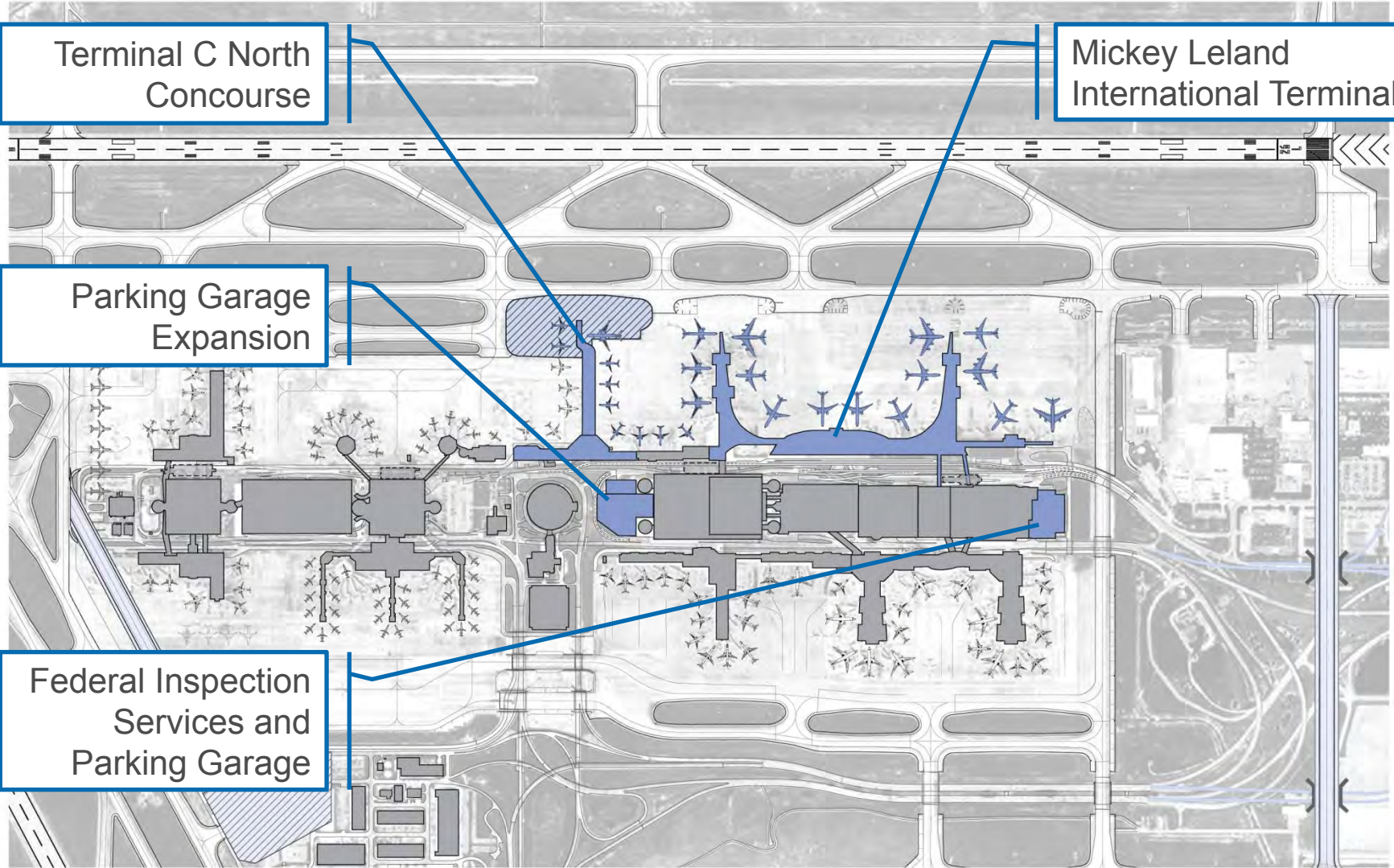
United Airlines in blue; all other airlines in red.

International terminals

To keep pace with demand, the airport needs additional gates to accommodate international flights

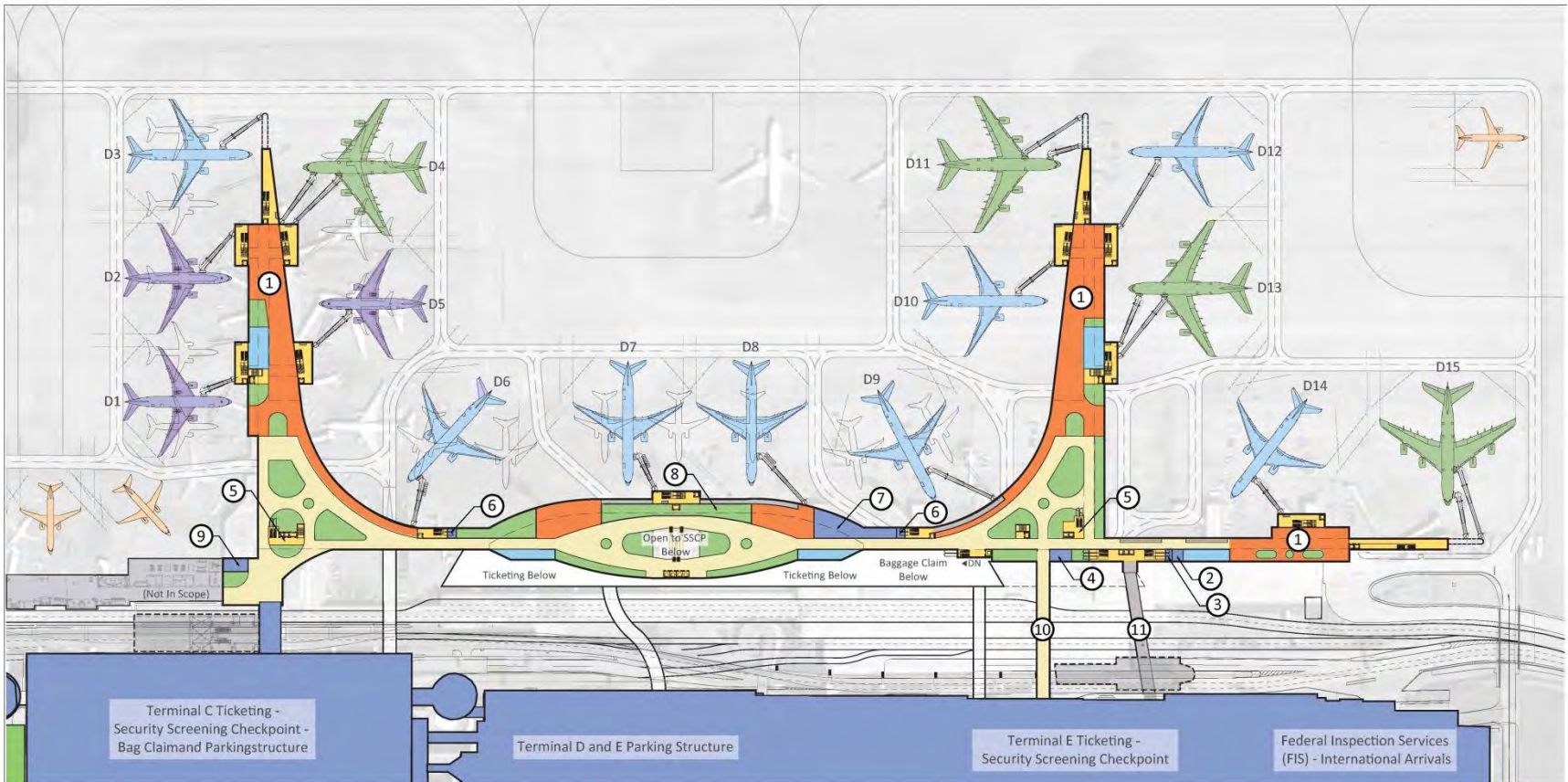


Terminal plans: 2015 - 2025



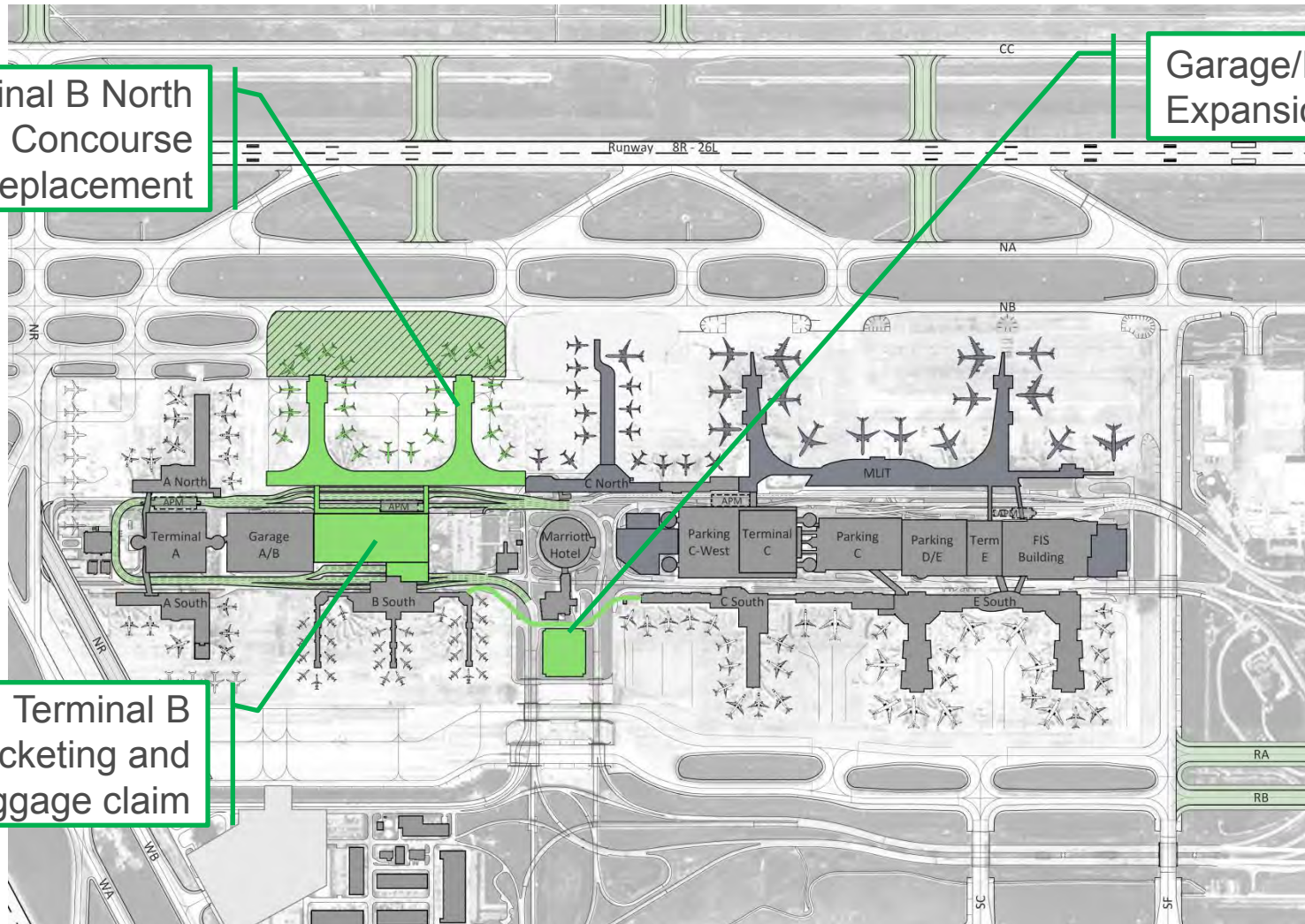
Mickey Leland International Terminal will replace Terminal D

- Accommodates 15 widebody or 27 narrowbody aircraft parking positions
- Construction scheduled to begin in 2016 for a 2020 opening



Mickey Leland International Terminal Animation

Terminal plans: 2025-2035

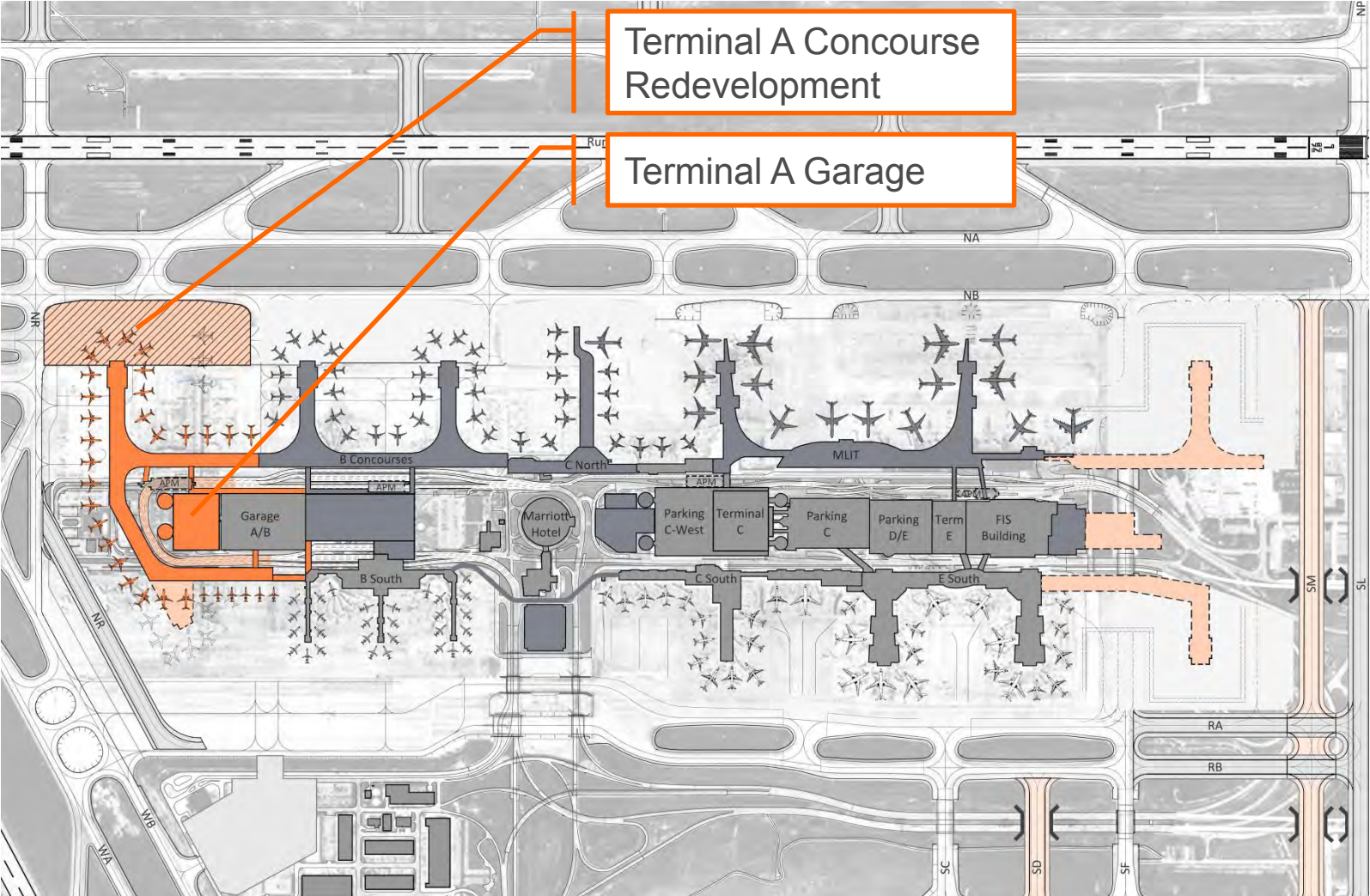


Terminal B North
Concourse
Replacement

Garage/Hotel
Expansion

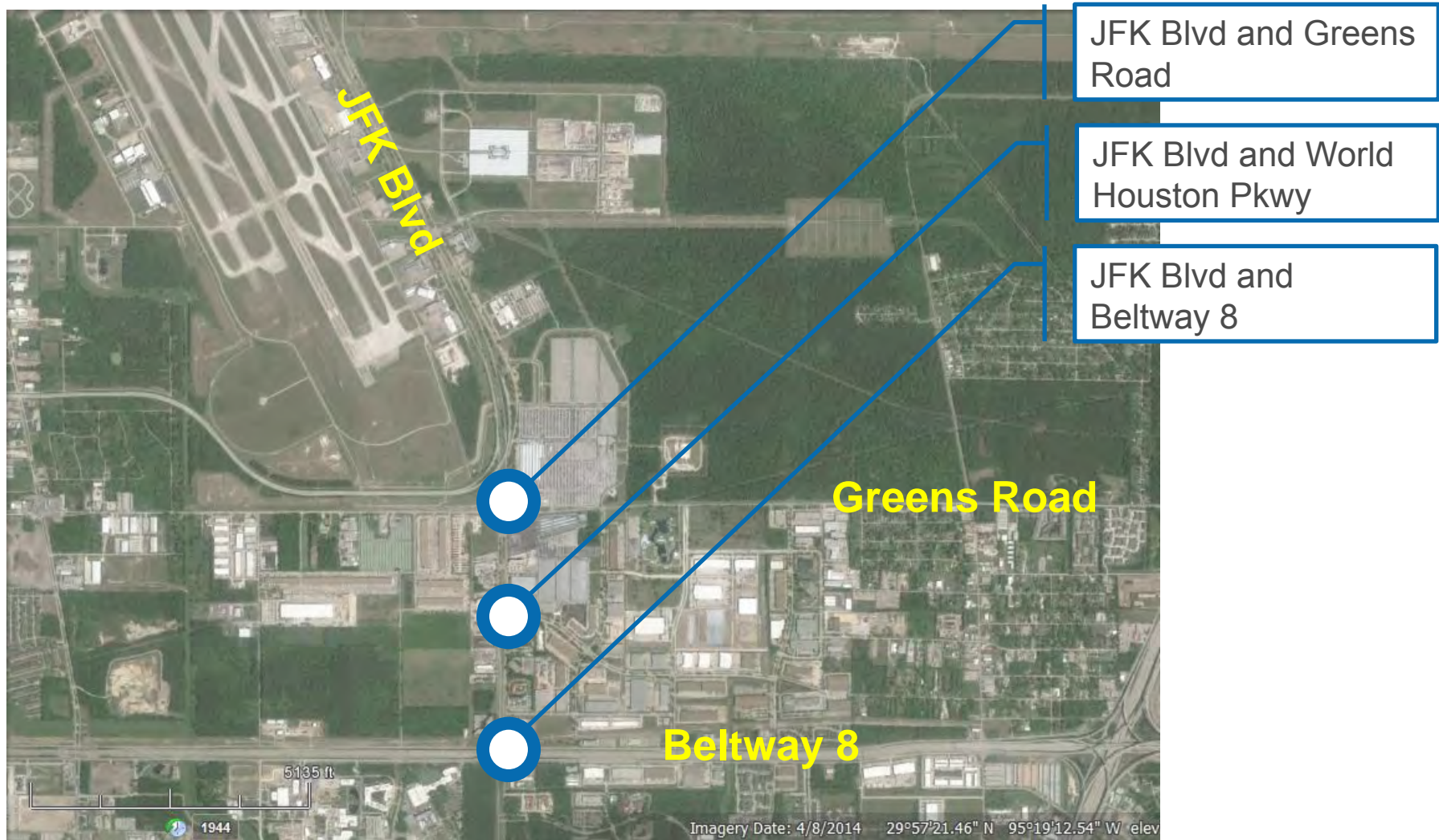
Terminal B
ticketing and
baggage claim

Terminal plans beyond 2035

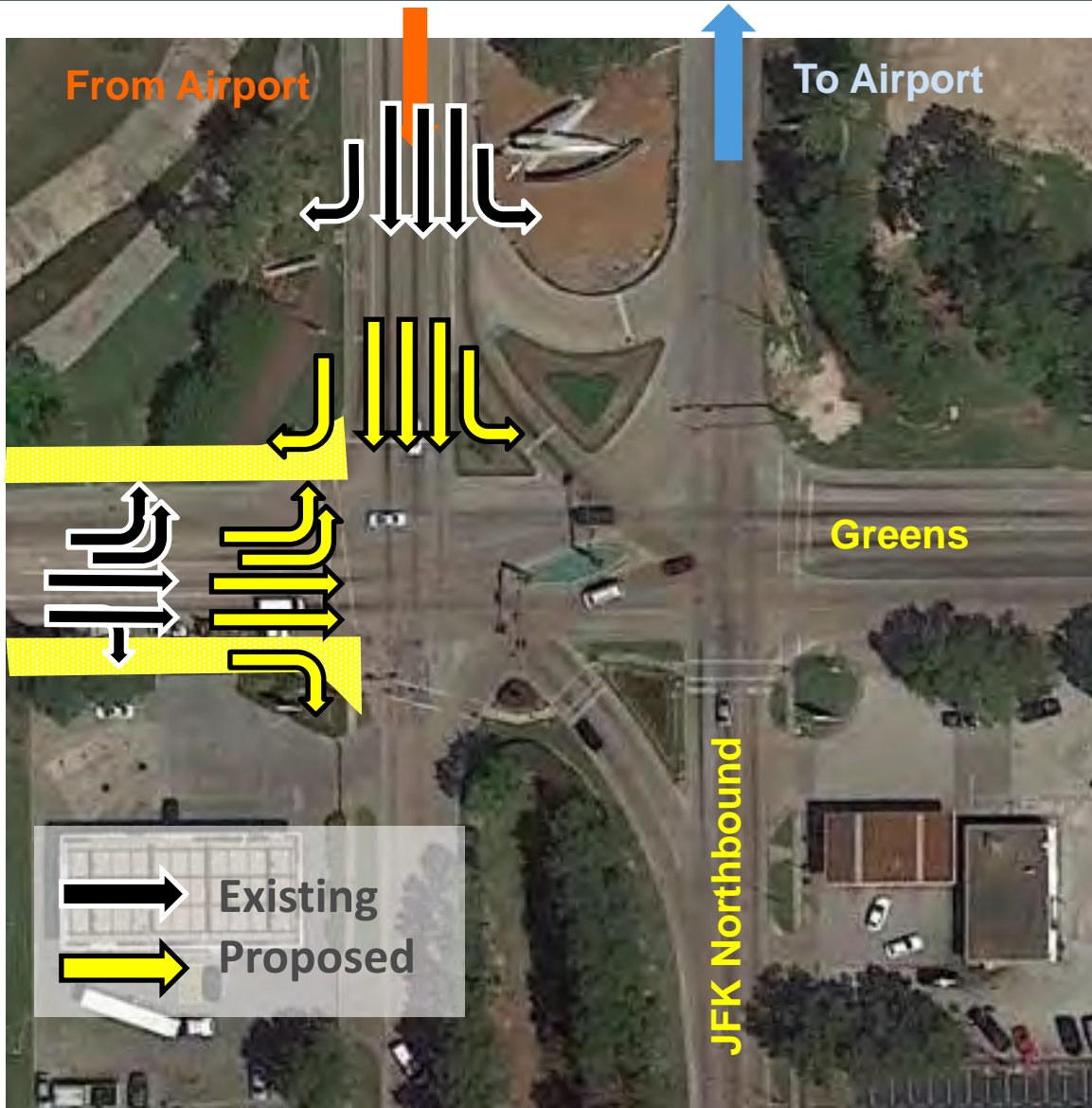


Roadway recommendations

JFK Boulevard intersections studied to determine future improvements

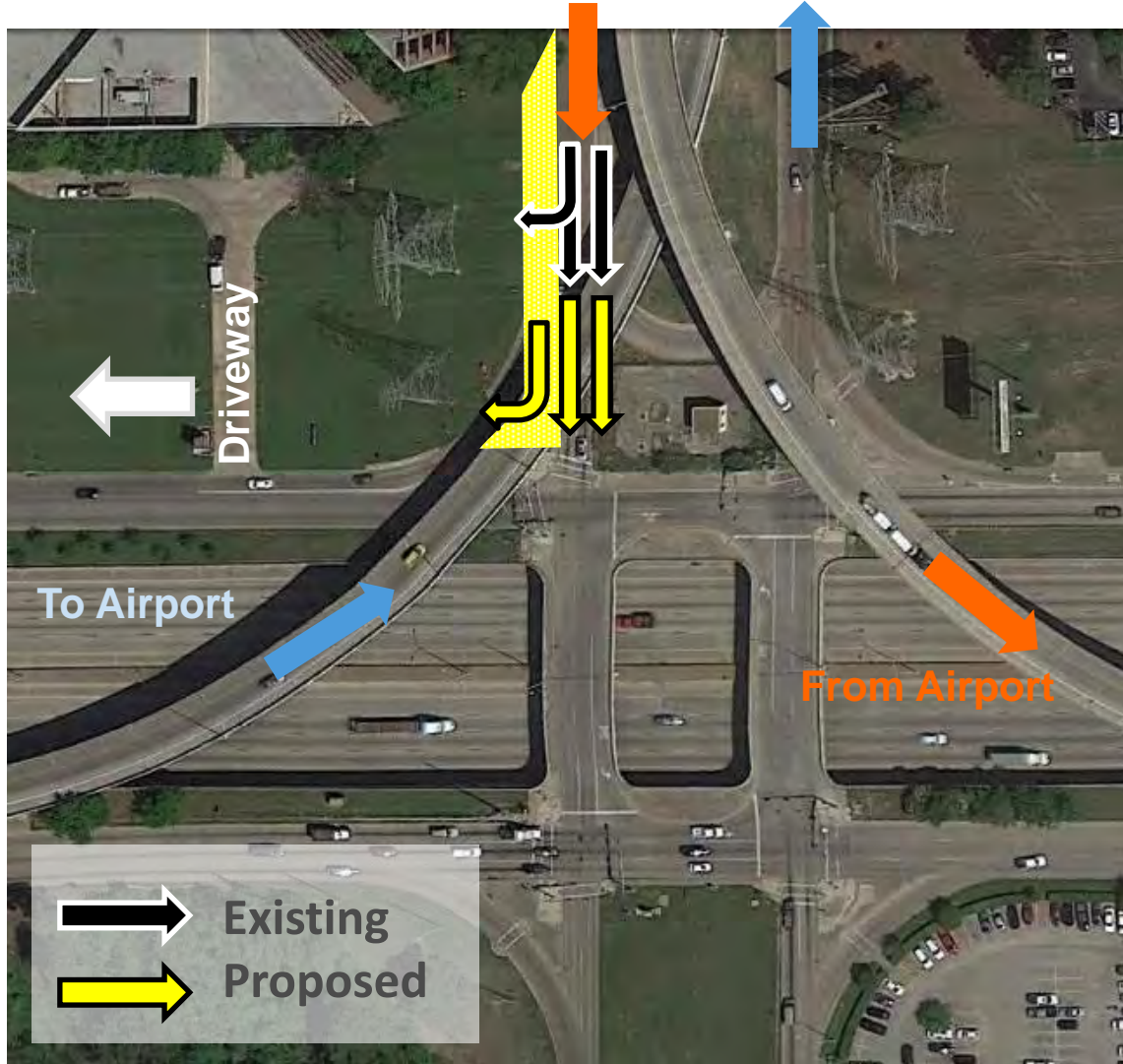


JFK Blvd and Greens Road near-term recommendations



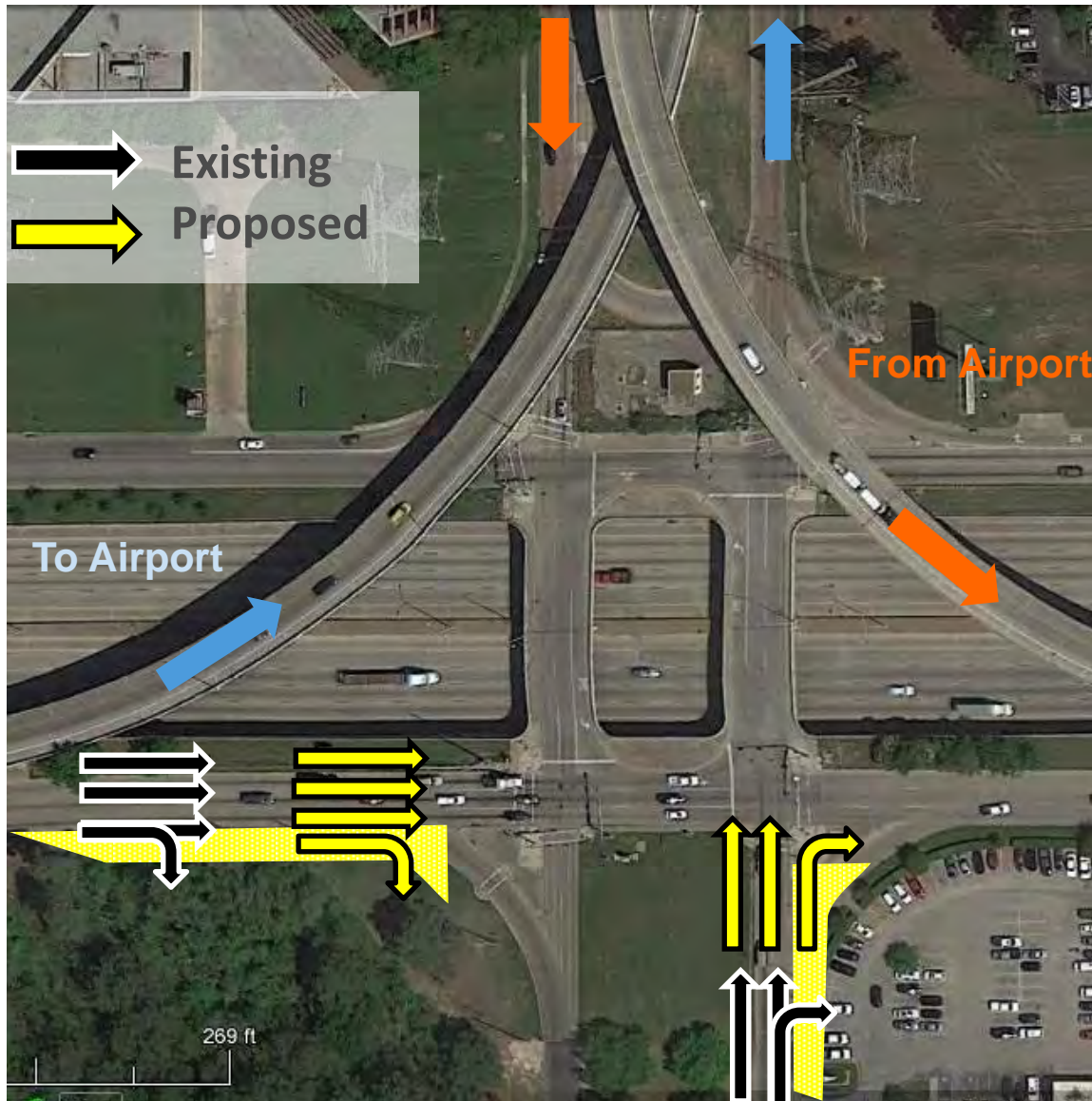
- Provide acceleration lane along westbound Greens Road to facilitate free southbound right turn movement
- Add an exclusive eastbound right-turn lane with channelization (additional right of way would be required)
- Greens Road is to be widened through Houston Public Works and Engineering initiative

JFK and Beltway 8 near-term recommendations



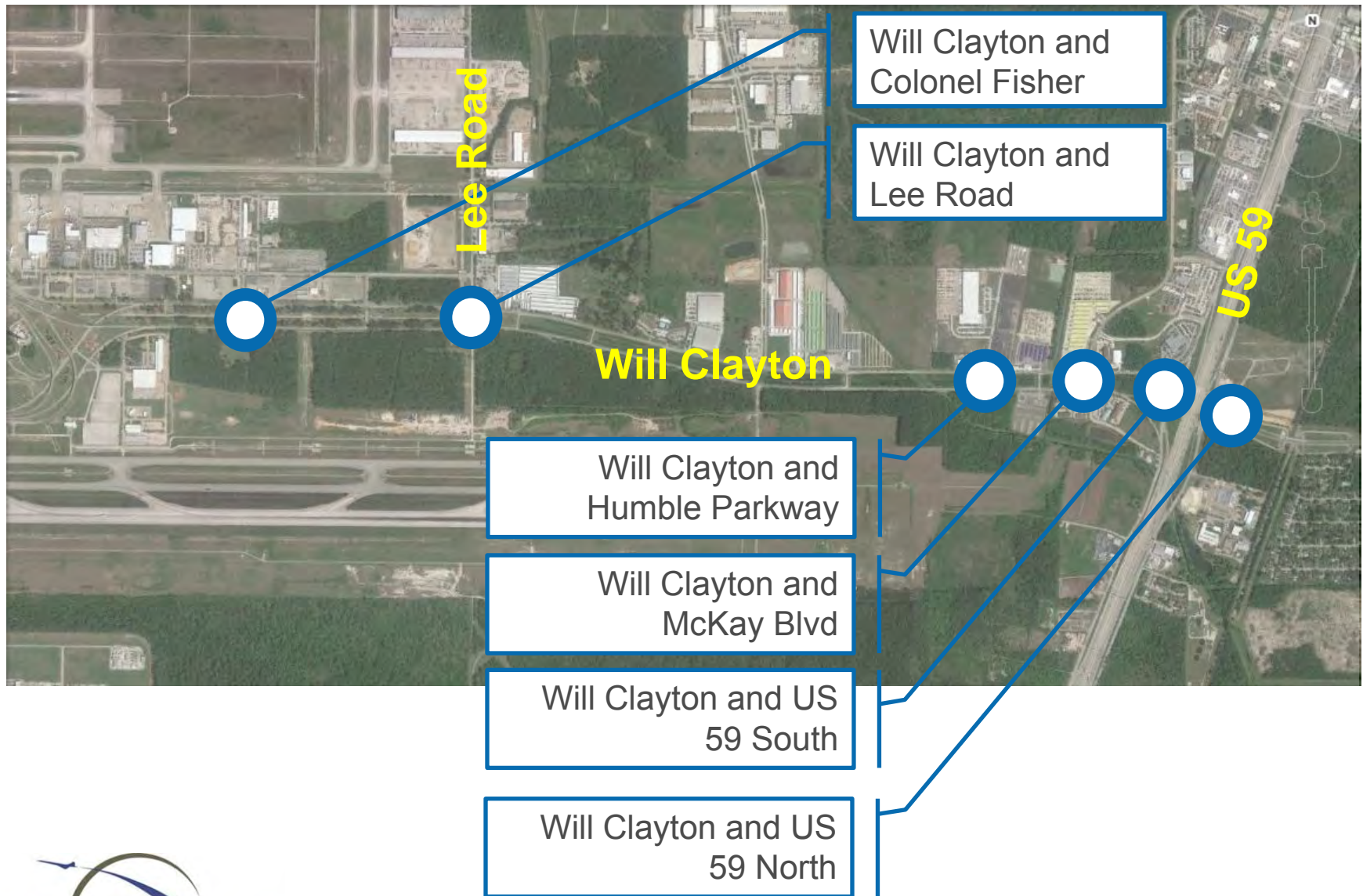
- Add an exclusive southbound right-turn lane with channelization
- Relocate driveway on Beltway 8 westbound Frontage Road further west to provide sufficient distance for new free-flow southbound right-turn acceleration lane

JFK and Beltway 8 near-term recommendations (continued)



- Add an exclusive northbound right-turn lane with channelization.
- Add an exclusive eastbound right-turn lane with channelization.

Several Will Clayton Boulevard intersections were also studied



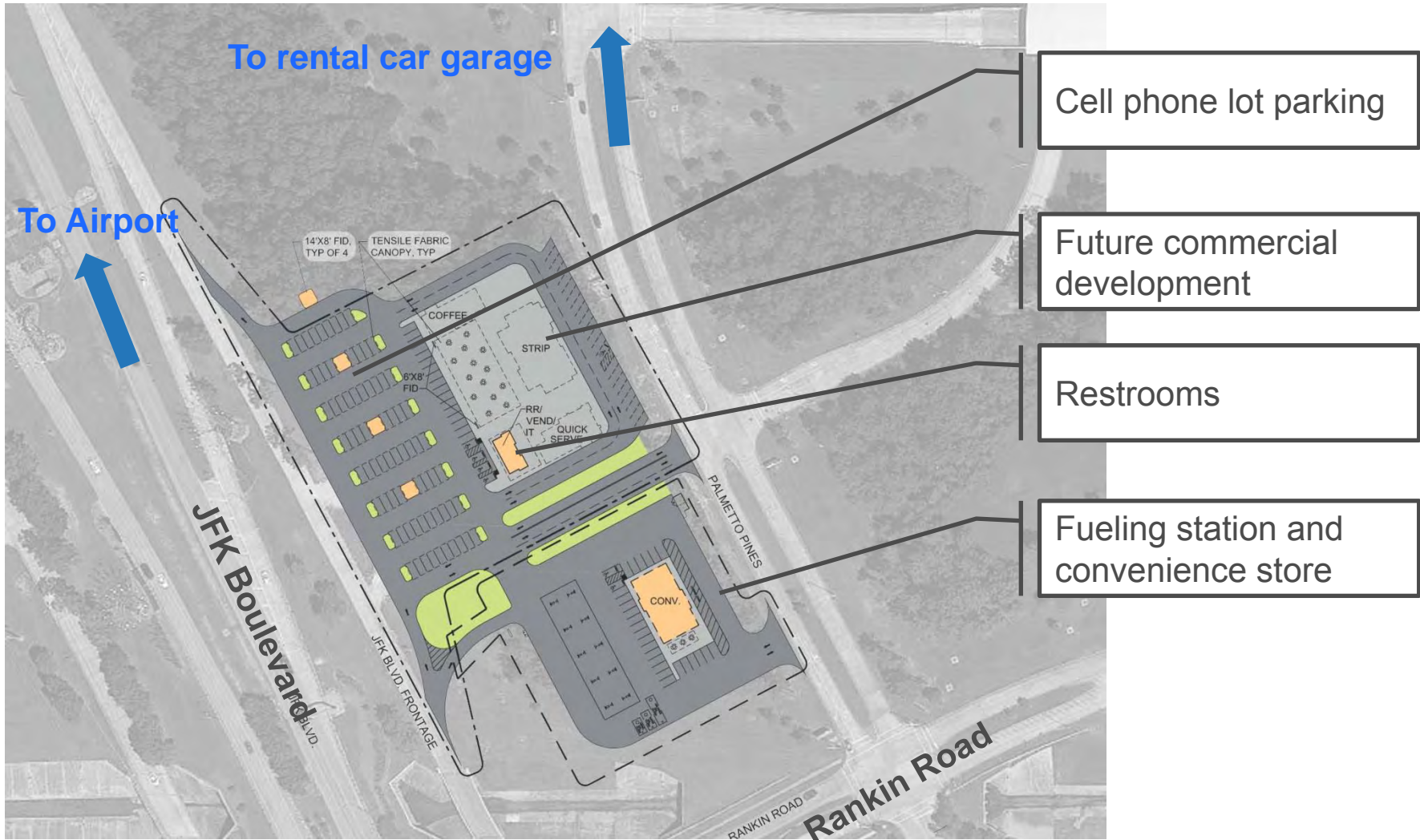
The airport is coordinating with Houston Public Works and Engineering to improve the Kenswick Drive and Will Clayton Intersection



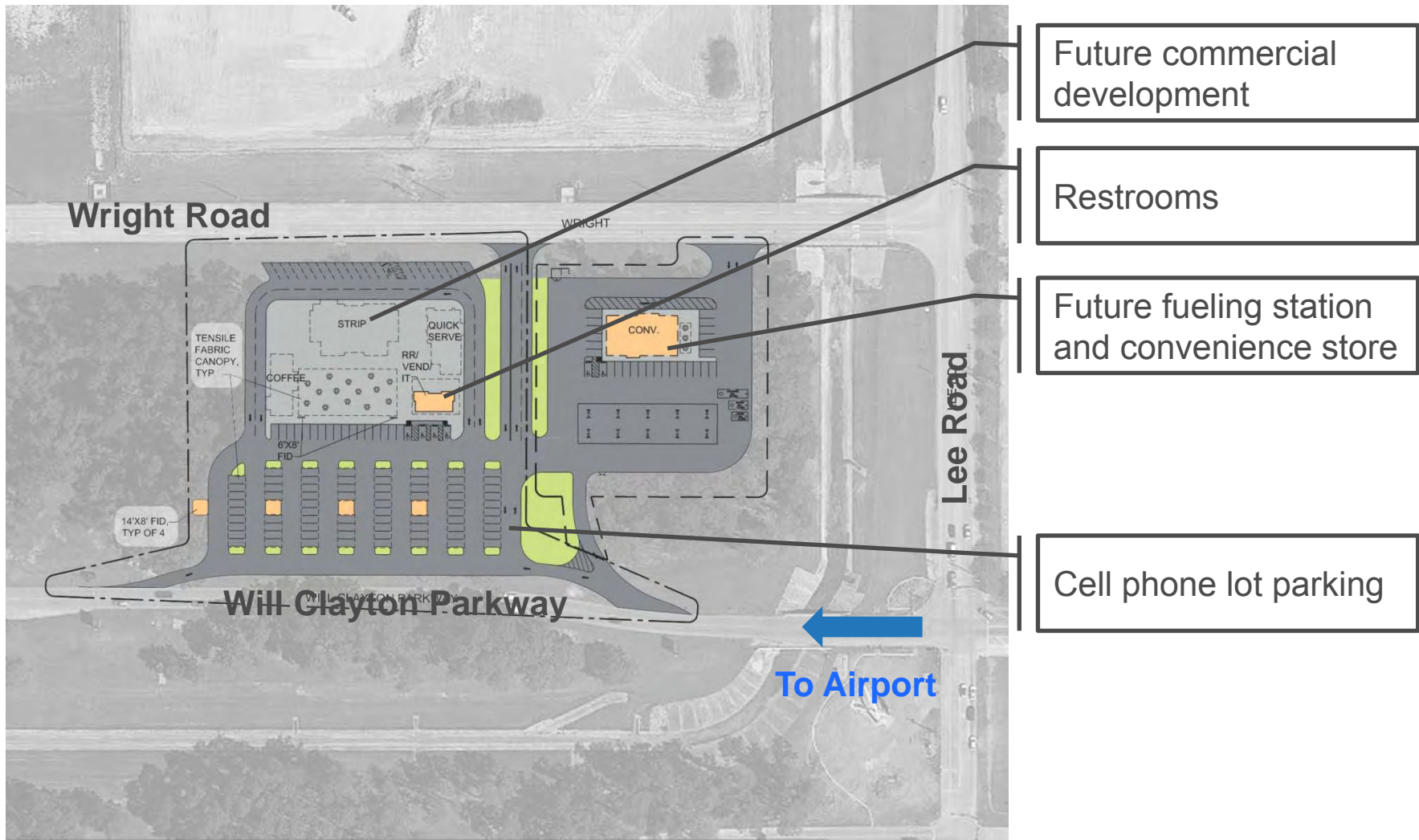
Kenswick Drive extension to connect to eastbound Will Clayton will relieve congestion on Lee Road



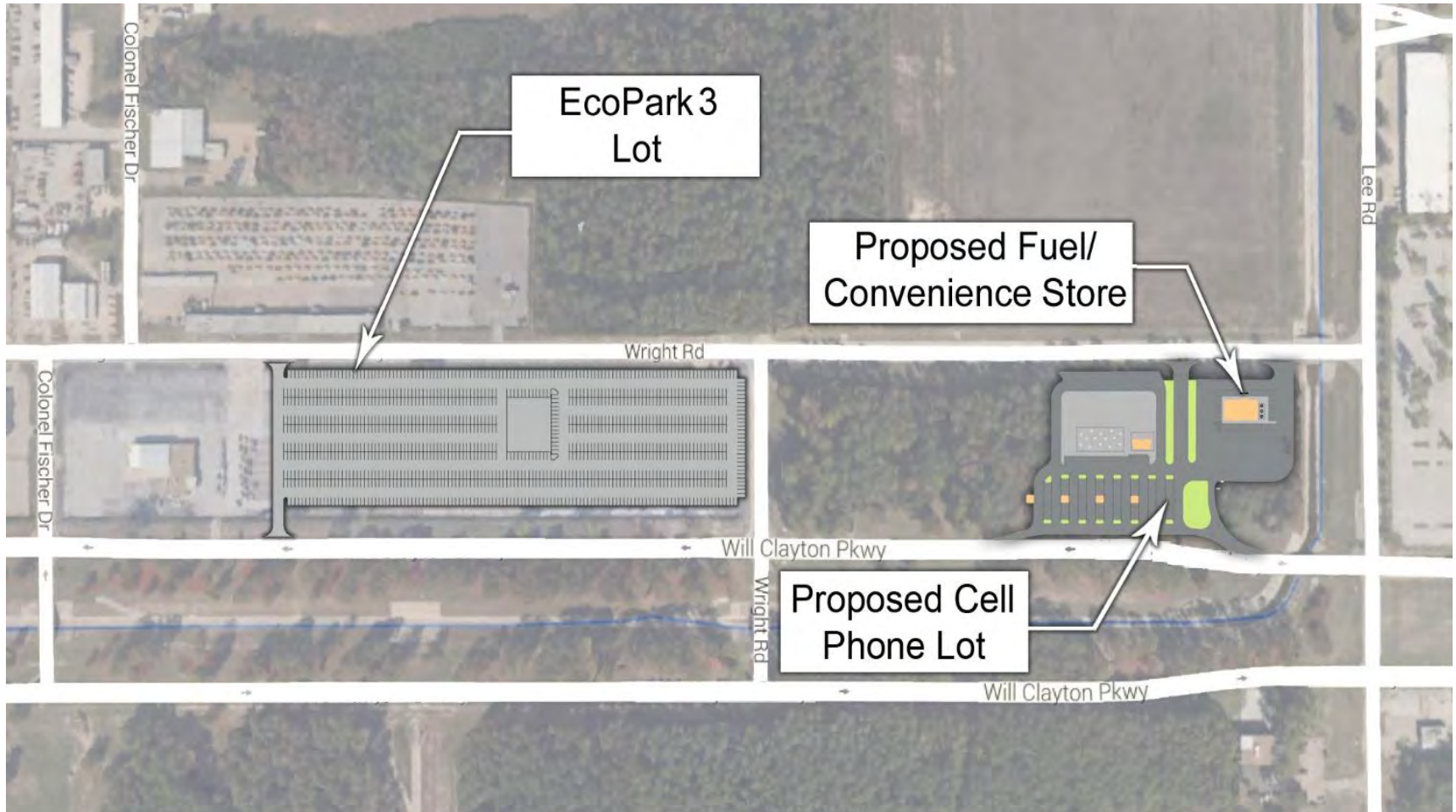
Cell phone lot improvements at JFK Boulevard and Rankin Road



Cell phone lot improvements at Will Clayton Parkway and Lee Road



More public parking will be constructed along Will Clayton Parkway



Environmental considerations

Flooding on the Airport's entry roadways has been addressed

- Drainage improvements have eliminated standing water on the roadways
- Both John F. Kennedy Boulevard and Will Clayton Parkway flooding has been addressed



With the changes in the aircraft fleet, noise exposure areas are shrinking

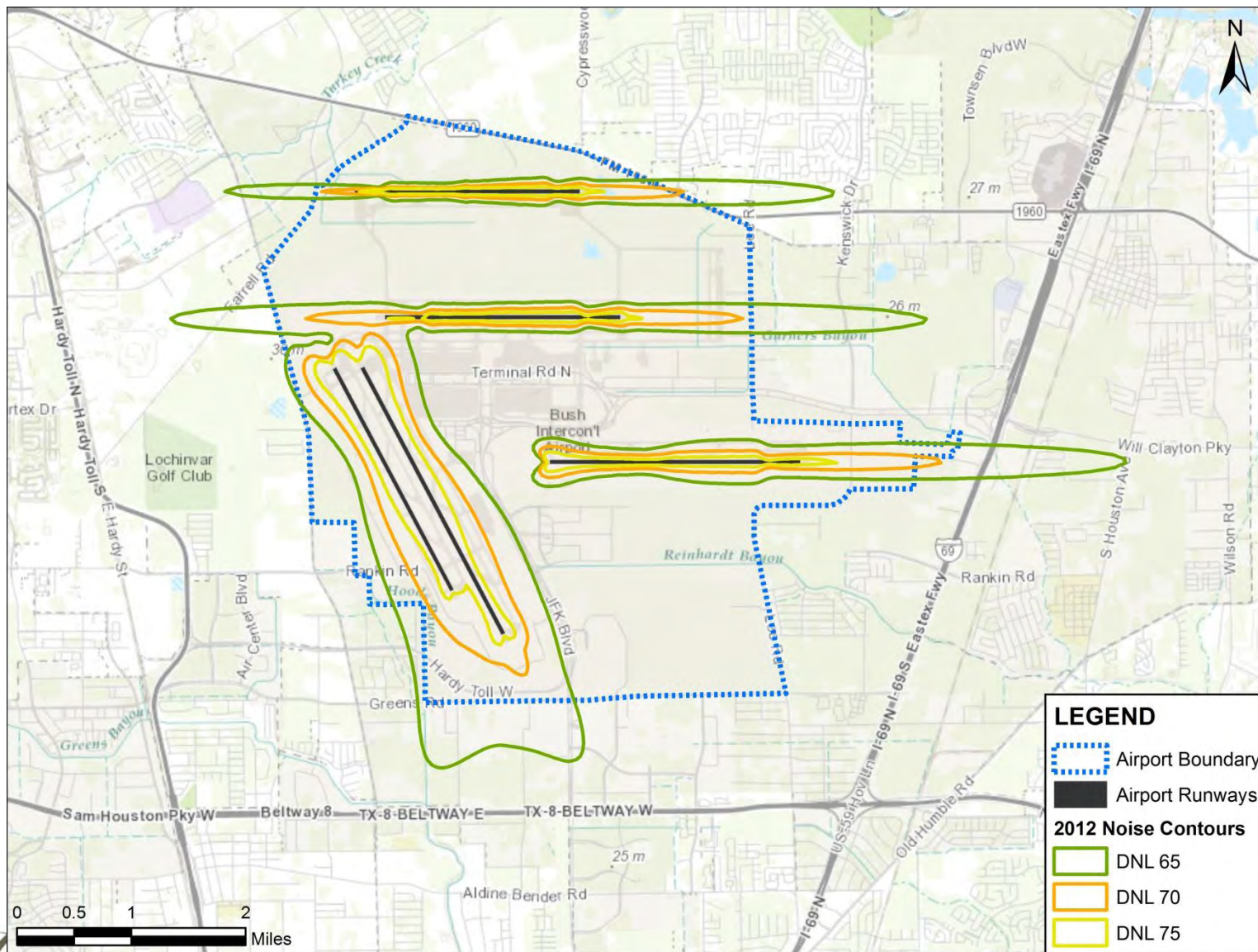
- **FAA established initial noise standards in 1969**

- **FAA introduced aircraft noise categories entitled “STAGES” in 1977**
 - STAGE 1: aircraft have never been shown to meet any noise standards (either by failing or never having been tested)
 - STAGE 2: aircraft meet original limits
 - STAGE 3: aircraft meet more stringent revised limits
 - STAGE 4: effective January 2006

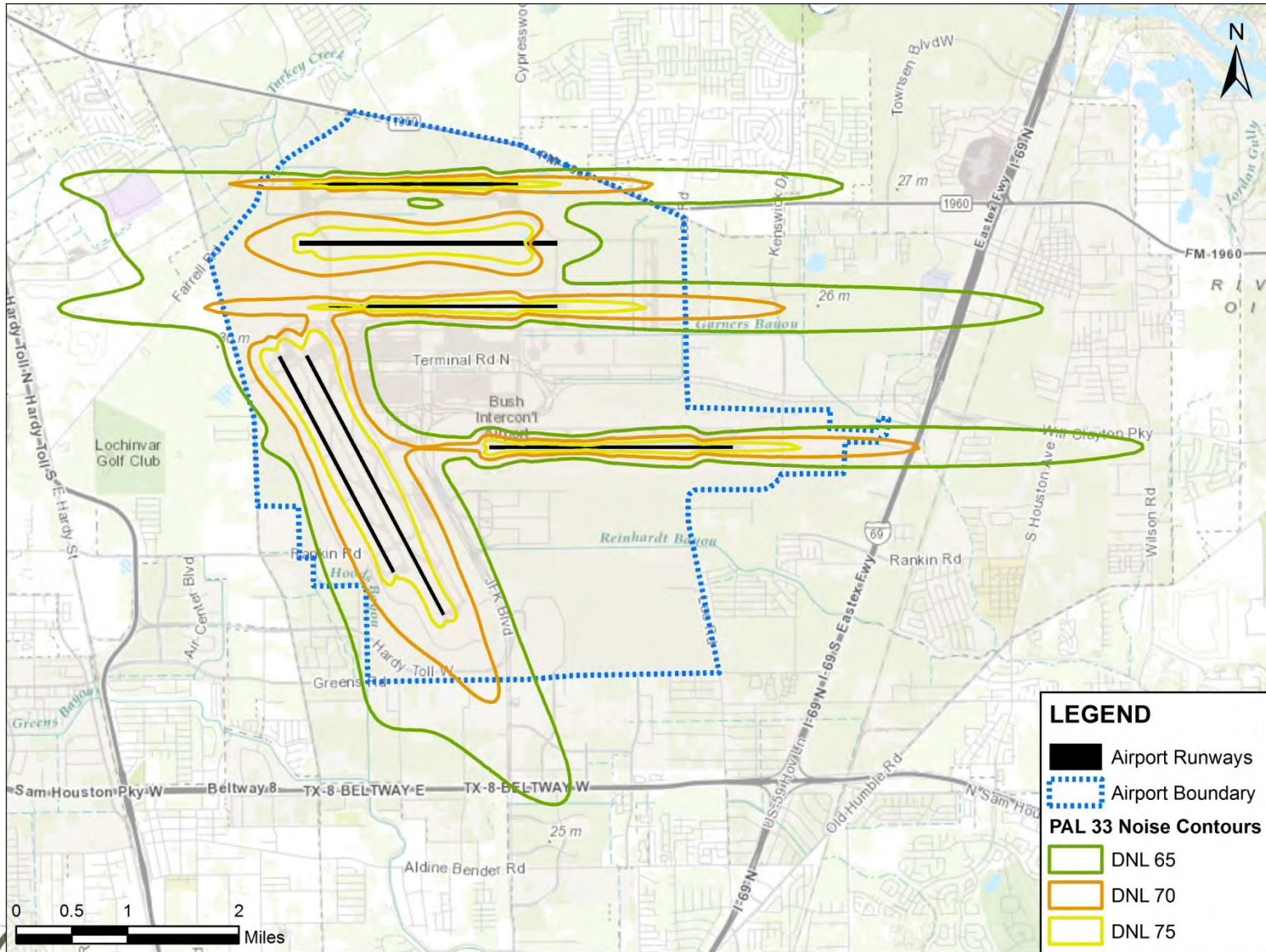
- **By December 15, 2015, all civil jet aircraft must meet STAGE 3 or STAGE 4 standards**

- **STAGE 5 will be introduced in 2017 and 2020, depending on the weight of the aircraft**






2012 noise contours (1,528 daily aircraft operations)



2035 noise contours (2,188 daily aircraft operations) with Runway 8C-26C



LEGEND

-  Airport Runways
-  Airport Boundary
- PAL 33 Noise Contours**
-  DNL 65
-  DNL 70
-  DNL 75

Next steps

The IAH capital improvement program includes approximately \$2.7 billion in planned projects

Ten-year capital improvement program	Total estimated cost (\$millions)
Airfield	\$816
Terminal	1,461
Roadways/parking/commercial ground transportation	97
Airport support/infrastructure	284
TOTAL	\$2,658

Note: The estimated cost for the ten-year capital improvement program is for George Bush Intercontinental Airport projects only and excludes the cost of capital improvements at Ellington and William P. Hobby airports.

What will happen next?

- Houston Airport System will review comments received from public and interested stakeholders
- HAS will prepare an “Airport Layout Plan” to obtain formal FAA approval for recommendations, to obtain federal funding for projects
- Environmental reviews will be conducted before projects are constructed



Summary of today's presentation

- **Houston Airport Systems would like your input**
- **All recommended improvements are located within existing airport property**
- **No new runways are required for the next 20 to 25 years**
- **Taxiway improvements will make the airfield more operationally efficient and flexible**
- **Timing of improvements will be determined by demand**
- **All improvements will be subject to environmental review**
- **Terminal construction will begin this March**

Thank you for your interest

