

ITEM NO: 7b\_Supp

DATE OF MEETING: September 8, 2015

# SUSTAINABLE AIRPORT MASTER PLAN (SAMP) UPDATE

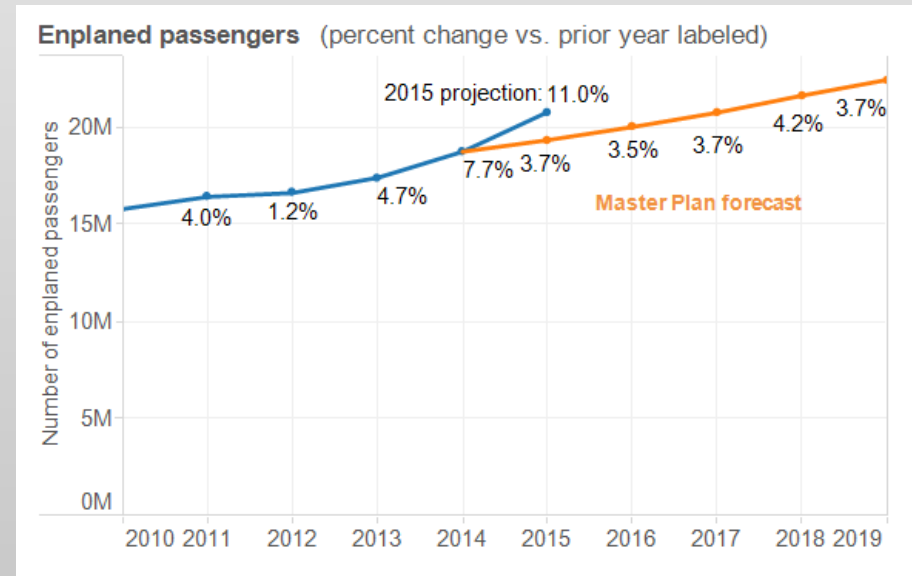
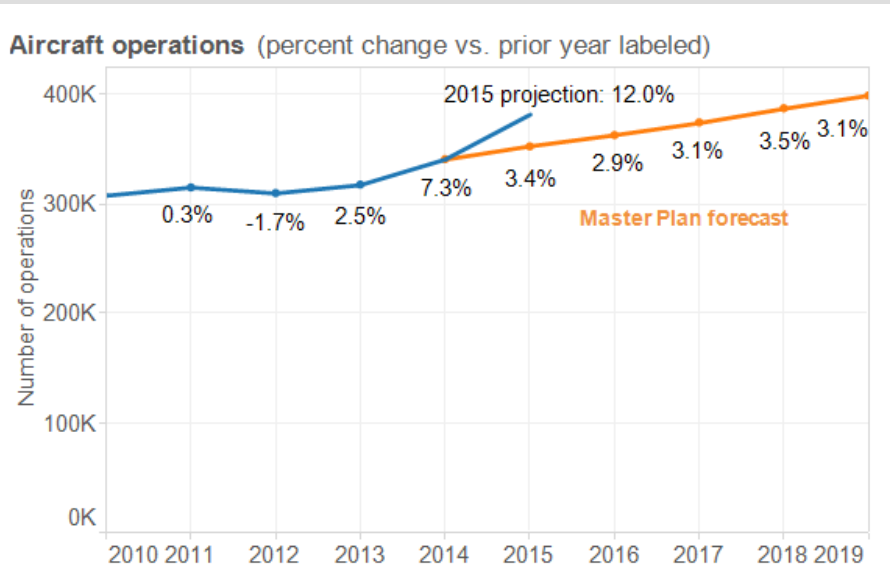
September 8, 2015

# Briefing overview

- Airport activity
- Where we are in the planning process
- Gate expansion concepts
- Airfield simulation modeling
- Landside modeling & concepts
- Public outreach
- Next steps

# Airport activity

- Higher than previously forecasted growth in recent years
- Dramatic growth in 2015
  - **Operations:** 70% of SAMP 5-year forecasted growth anticipated in 2015
  - **Passengers:** 55% of SAMP 5-year forecasted growth anticipated in 2015



Higher than previously forecasted growth in recent years

# Where we are in the planning process

## Analysis complexities

- Gate need
  - Unconstrained 20-year forecast indicates a need for 35 gates
- Airfield modeling will determine airfield capacity
  - Could determine a lower number of operations can be accommodated, even with improvements, resulting in a lower gate requirement
- One vs two terminals
  - Analysis involves balancing airfield, terminal & landside capacity
  - Potentially significant capital cost differences between alternatives
  - Need to determine feasibility of required improvements under each alternative
  - Landside modeling will inform one vs two terminal recommendation

Analysis of options involves complex trade-offs

# Where we are in the planning process

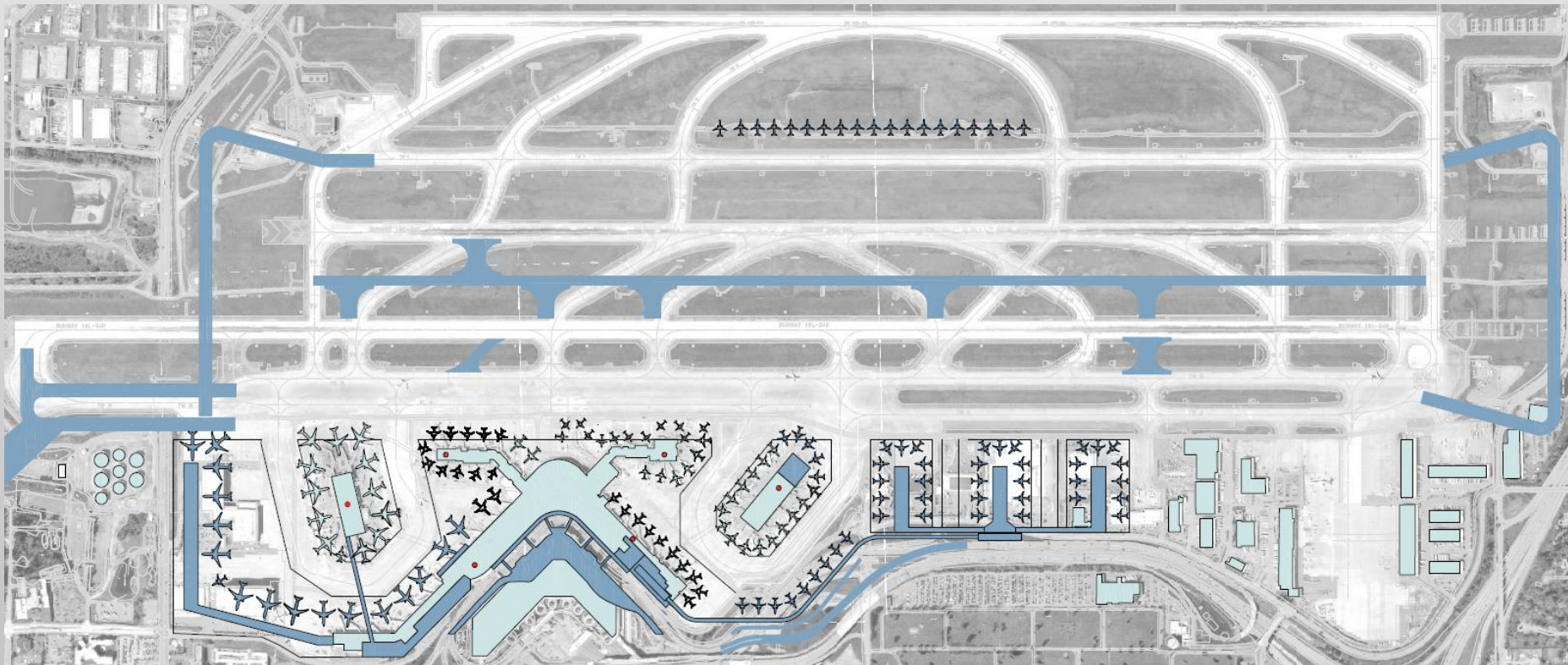
## Current work

- Refined gate expansion concepts
  - Gate layout for each 5-year planning horizon
- On-going work to explore phasing for gates, terminal and hardstands
- Airfield
  - Modeling
    - Calibrated model of existing airfield
    - Currently running model to assess existing airfield with increased activity
  - Assessing impacts of runway/taxiway separation
- Refining landside concepts
  - Iterative process with development of one and two terminal concepts
  - Initial simulation modeling
  - Short list of options based on pros/cons assessment

# Gate expansion concepts

## One terminal

- 100% of 20-year activity accommodated in Main Terminal
- APM required to connect passengers north and south
- Terminal expansion north and east
- Relocate Upper Drive and expand Lower Drive



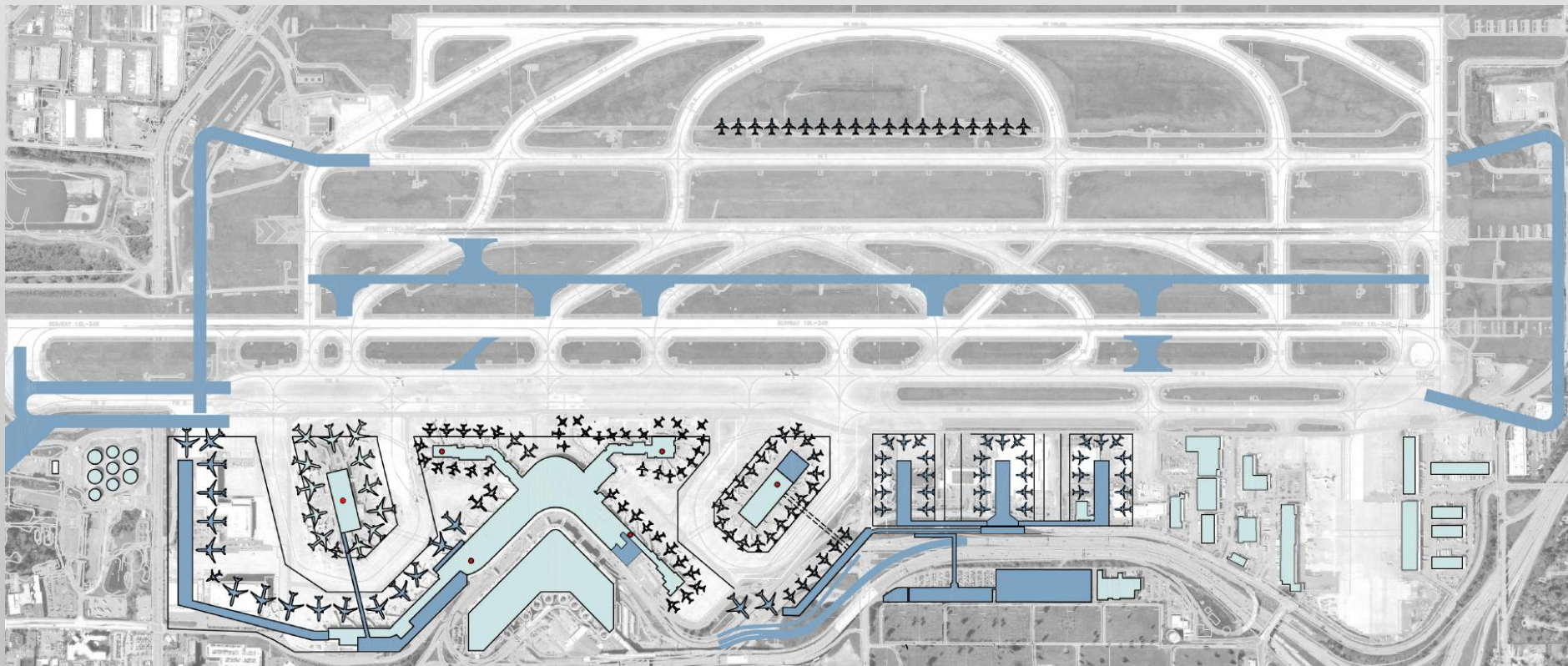
One terminal option includes terminal expansion north & east



# Gate expansion concepts

## Two terminals

- 70% of 20-year activity accommodated in Main Terminal
- 30% of 20-year activity accommodated in North Terminal
- Second terminal and supporting roadways
- Fewer improvements needed at Main Terminal

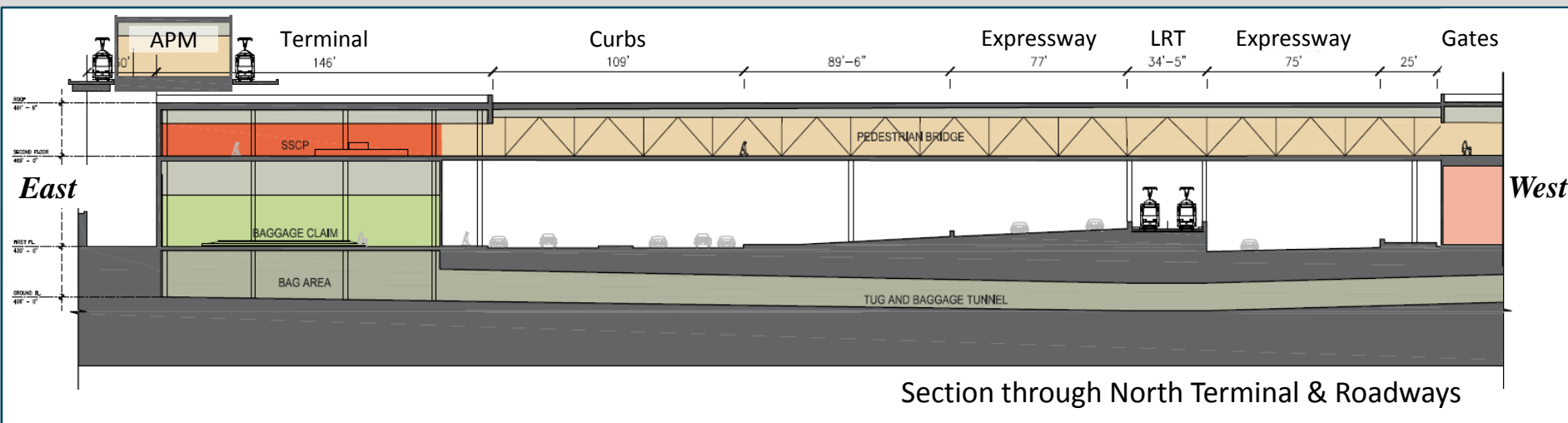


Two terminal option relieves congestion at Main Terminal

# Gate expansion concepts

## North Terminal concept

- Bag claim and check-in on same level
- Potential APM on upper level
- Tunnel connection for baggage & utilities
- Air Cargo Rd either in tunnel or terminates at S 160<sup>th</sup>



North Terminal section view

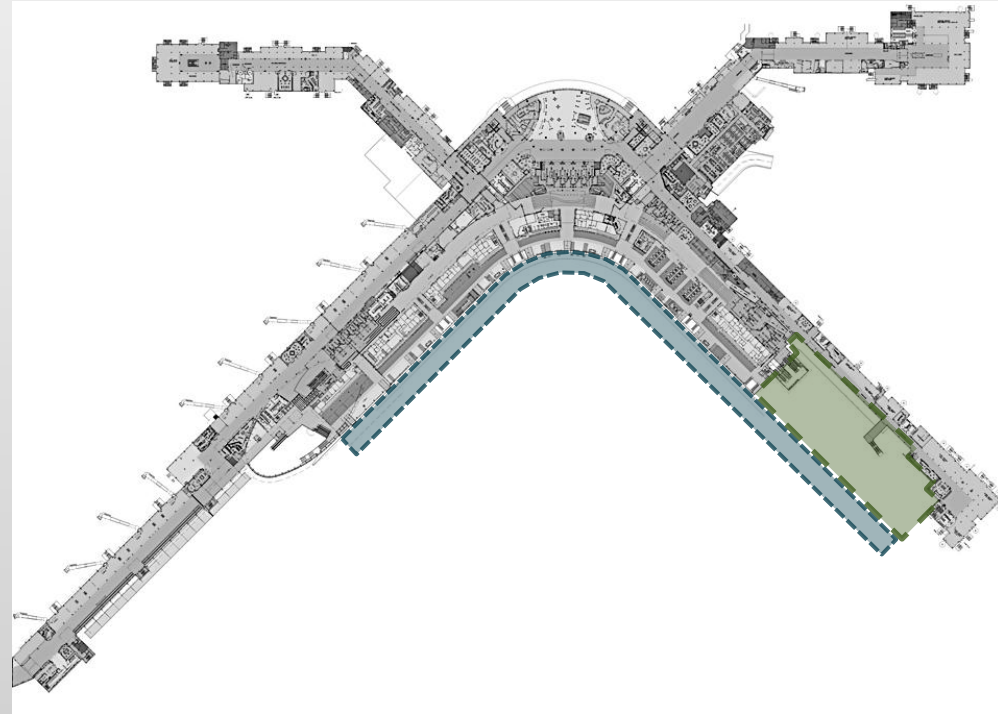


# Terminal facility requirements

## Main Terminal implications

### Ticketing Level

- One terminal concept requires expansion north & east to accommodate 2034 demand for check-in & security screening
- Two terminal concept minimizes ticketing expansion (*no impact to drives*)



Terminal facility requirements		1 Terminal		2 Terminals	
	Main Terminal Existing	Main Terminal 2034	Main Terminal 2034	North Terminal 2034	
Check-in positions	214	250	216	72	
Security screening check-point lanes	31	41	35	12	

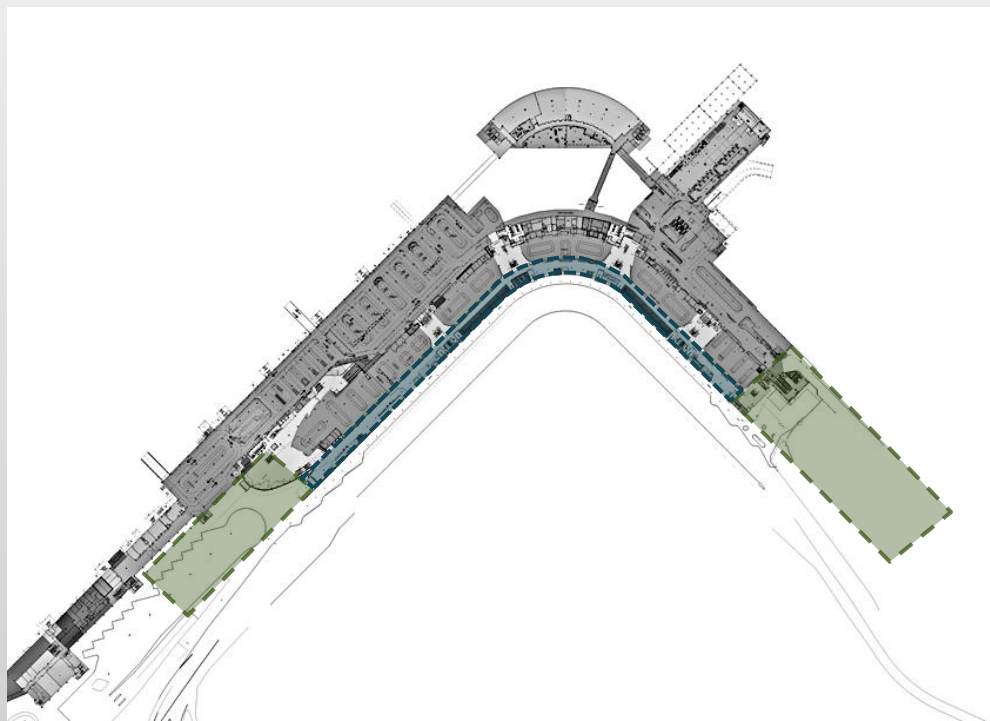
Must expand ticketing north & east under one terminal concept

# Terminal facility requirements

## Main Terminal implications

### Bag claim Level

- One terminal concept requires expansion north & south in addition to removal of ramps in existing claim area to accommodate 2034 demand for baggage facilities
- Two terminal concept minimizes expansion (*no impact to drives*)



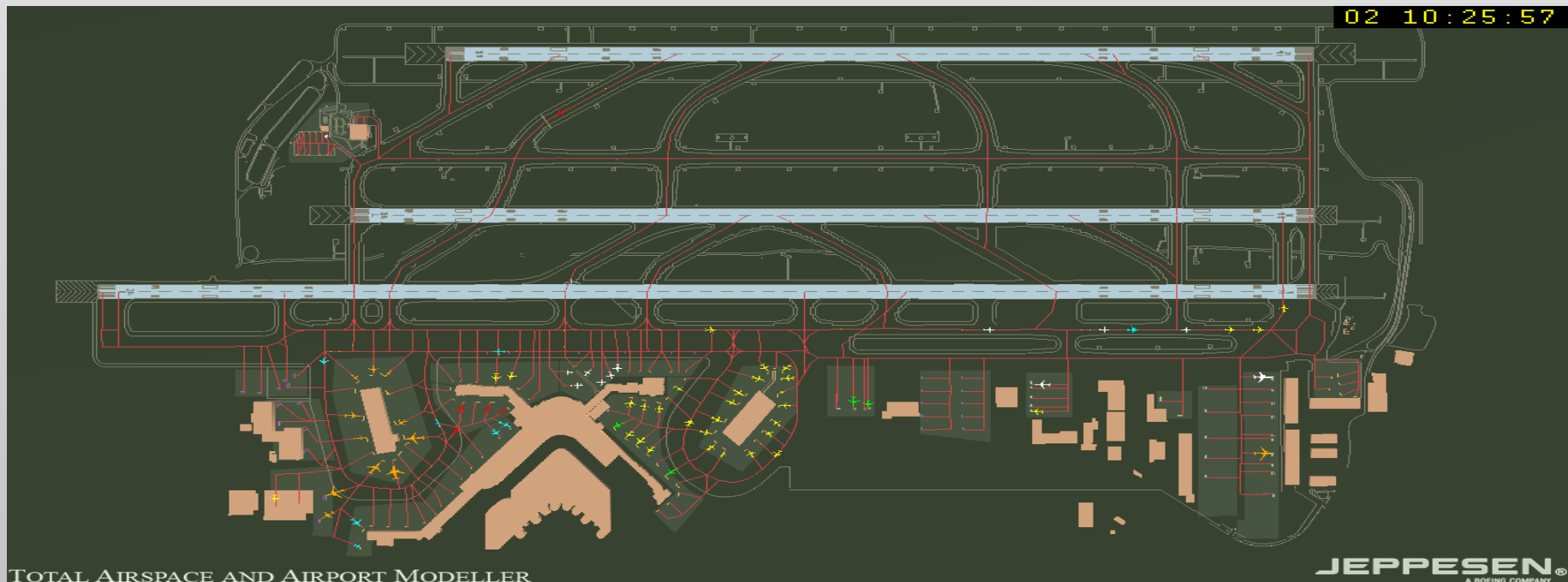
Terminal facility requirements		1 Terminal		2 Terminals	
	Main Terminal Existing	Main Terminal 2034	Main Terminal 2034	North Terminal 2034	
Domestic bag claim devices	16	25	22	7	
Domestic bag claim frontage (feet)	2,619	4,093	3,530	1,177	

Must expand bag claim south & north under one terminal concept

# Airfield simulation modeling

## Objectives

- Determine airfield capacity with almost 60% more annual aircraft operations in 2034
- Determine timing and benefit of potential airfield improvements
- Determine number of gates needed in 2034 based on airfield capacity
- Quantify benefit of operational procedures for FAA tower and airlines

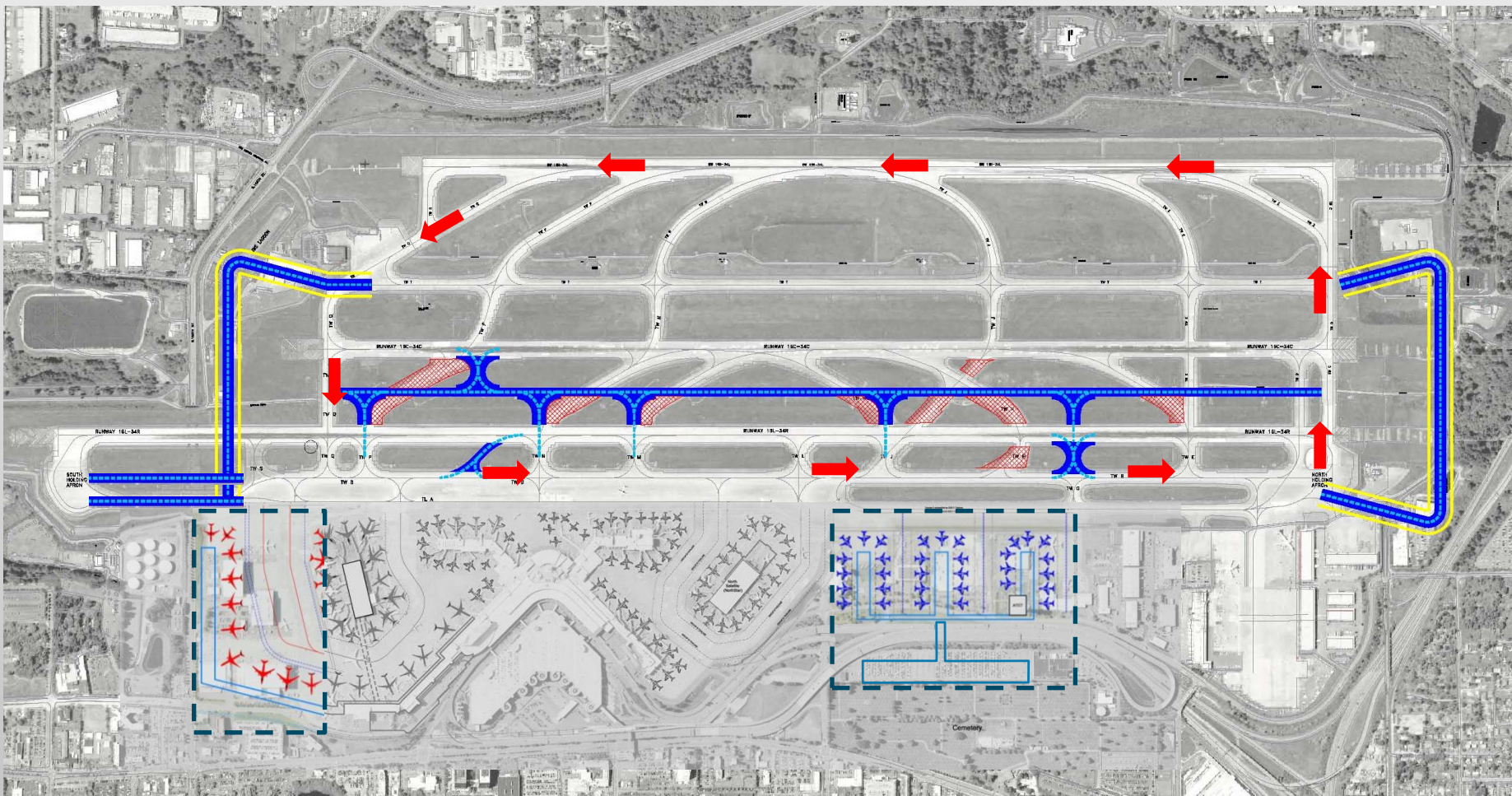


Airfield modeling will determine airfield capacity



# Airfield simulation modeling

## Potential airfield improvements and procedures



Capacity determined by airfield layout and procedures

# Landside

## Landside modeling

- Current work
  - Calibrated existing base-year model
  - Simulated future demand on existing roadway system for one terminal
- Next steps
  - Simulate one terminal roadway improvement concepts
  - Simulate two terminal roadway concepts
  - Adjust model if airfield capacity is limited
  - Modeling complete in Fall 2015

Landside modeling complete in Fall 2015



# Landside

## Landside modeling

- Existing roadways
  - Existing roadway gridlocks between 10- and 15-year timeframes
- Potential improvements will be developed & modeled
  - Determine curb capacity
  - Relieve bottlenecks on roadways



Existing roadway gridlocks between 10- and 15-year timeframes



# Landside

## Landside options for one terminal concept

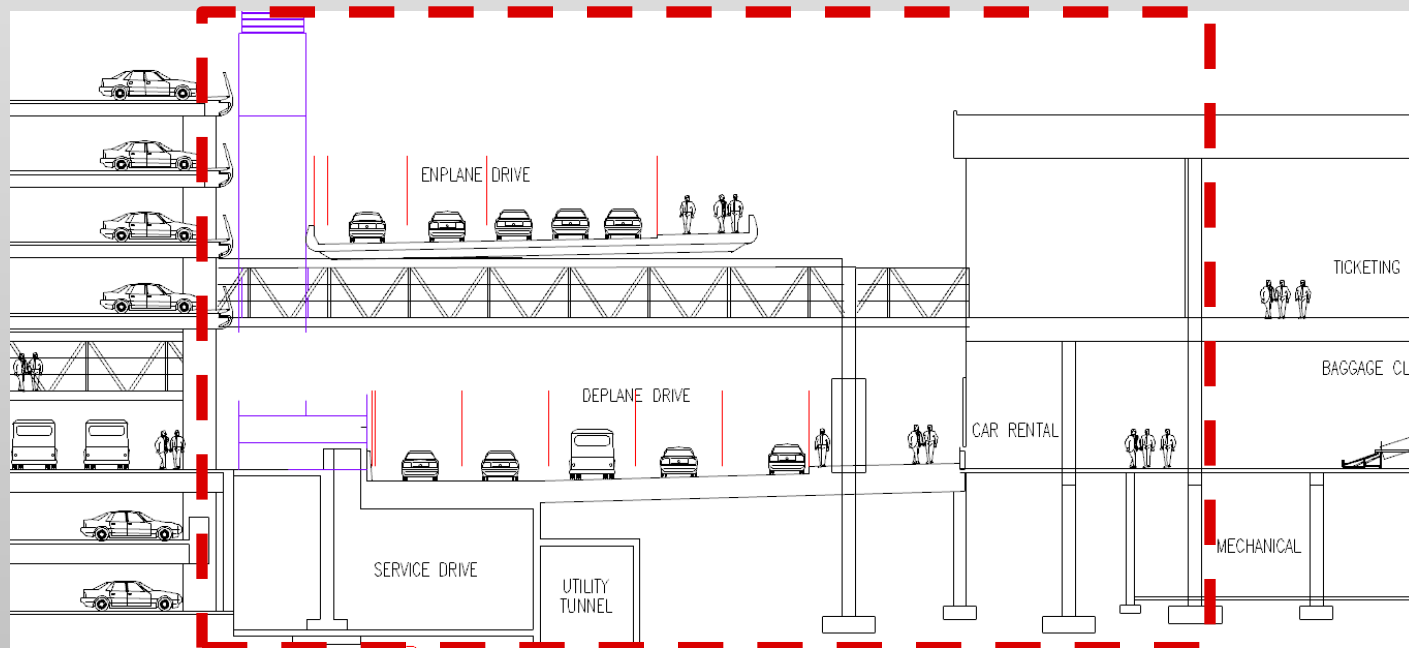
- Challenges
  - Terminal expansion to the east at check-in level impacts Upper Drive
  - Removing bag claim ramps requires raising Lower Drive
  - Requires significant capacity improvements for both the Upper & Lower Drives
  - Challenging and costly to construct curbs and roadway connections while maintaining operations
  - Capacity of access roadways needs to be enhanced
- Opportunities
  - Less confusing for departing passengers (*i.e. which terminal?*)

Challenging and costly to construct while maintaining operations

# Landside

## Options for one terminal concept

- **Option 1:** Relocate Upper Drive to above relocated pedestrian bridge and level with 6th floor of garage
  - Requires rebuild of Lower Drive, Service Tunnel & Main Terminal support structure
  - Requires expensive relocation of garage vent stacks
  - Creates viaduct structure over Lower Drive with limited natural light

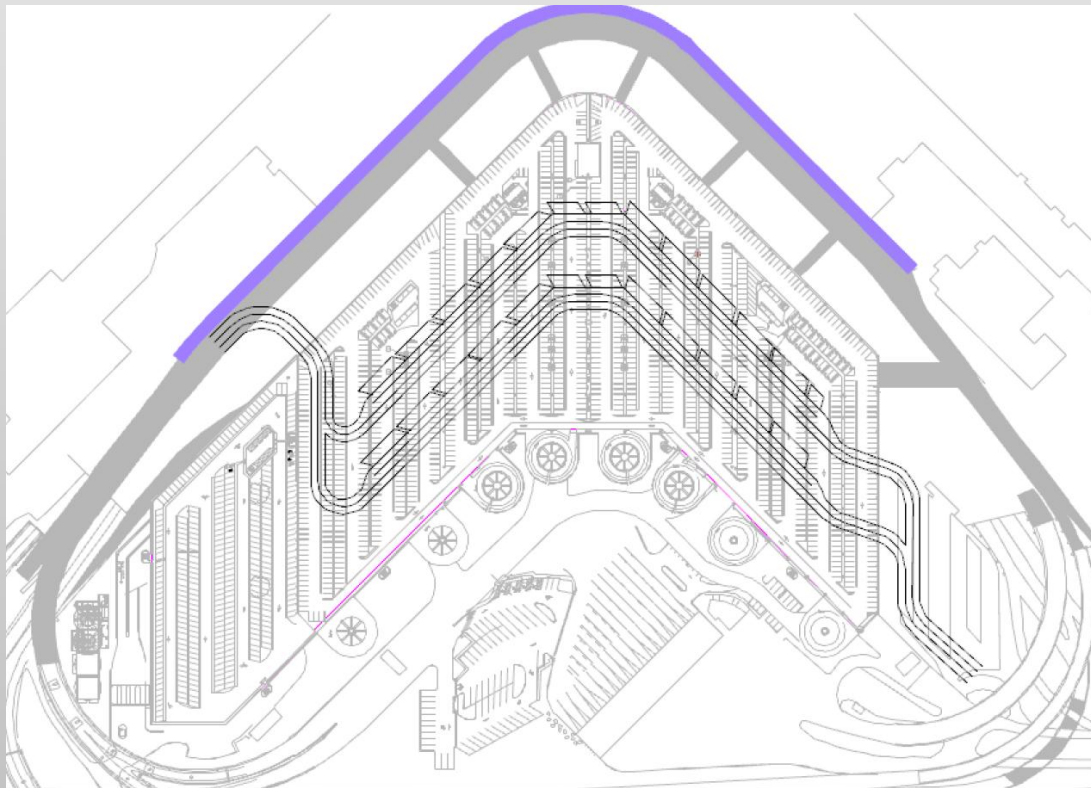


Expensive & difficult to construct drives improvements

# Landside

## Options for one terminal concept

- **Option 2:** Relocate Upper Drive into 5th floor of garage
  - Does not provide adequate Upper Drive capacity
  - Not feasible due to constraint within garage: column spacing, vertical clearance...

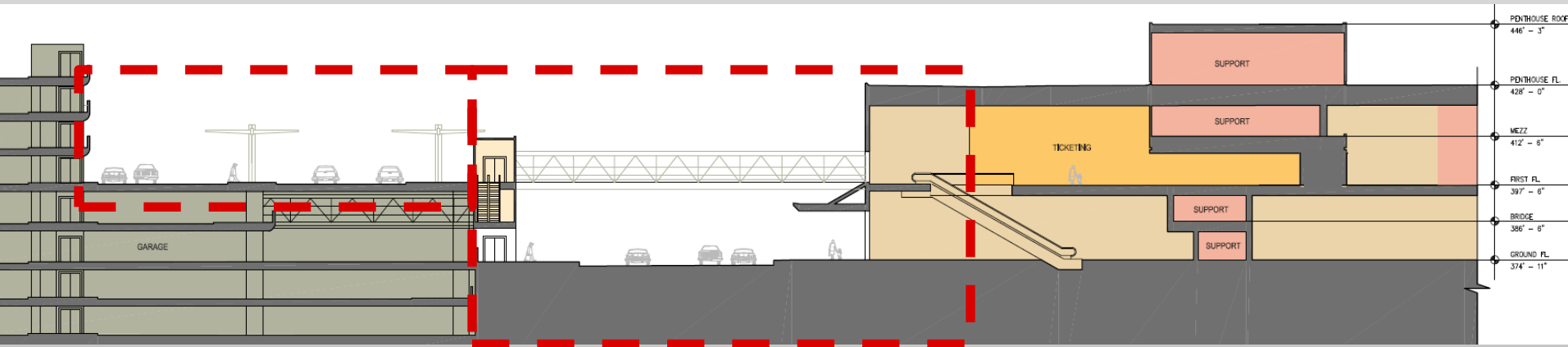


Not feasible due to constraints within garage

# Landside

## Options for one terminal concept

- **Option 3:** Relocate Upper Drive into 5th floor of garage + remove floors 6-8 above
  - Adequate Upper & Lower Drive capacity
  - Requires rebuild of Lower Drive, Service Tunnel & Main Terminal support structure
  - Requires relocation of elevator cores
  - Loss of long-term parking stalls and revenue



Expensive to provide capacity & loss of garage revenue

# Landside

## Landside options for two terminal concept

- **Challenges**
  - Requires second roadway system to new terminal
    - Crosses Airport Expressway and Light Rail
    - Difficult connections to 160<sup>th</sup> Loop and SR 518
  - Busing and/or APM required to transport passengers from 2<sup>nd</sup> terminal to existing terminal and Light Rail station
- **Opportunities**
  - 30% of vehicles diverted to 2<sup>nd</sup> terminal – and off of existing terminal drives
  - Potentially requires no capacity improvements to Upper & Lower Drives
  - Easier to construct curbs and roadway connections while maintaining operations

Easier to maintain operations during 2<sup>nd</sup> terminal landside construction

# Landside

## Options for two terminal concept

- **Option 1:** Ingress crosses over Light Rail & Expressway



- **Option 2:** Ingress crosses under Light Rail & Expressway



Need more technical analysis of north terminal roadways



# Public Outreach

- **Community open houses designed to engage regional audiences**
  - 1st Series: SAMP process, goals, forecast, and development concepts
    - Des Moines, Seattle, Bellevue locations (Spring 2015)
  - 2nd Series: Preliminary Alternatives (Fall 2015)
  - 3rd Series: Preferred Development Alternative (Winter 2015)
- **Federal, state, regional & local government briefings to date**
  - Airport-area city councils (5)
  - South King County councilmembers (2)
  - Congressional delegation – Senate (2) and House (4)
  - State Legislature Joint Transportation Committee
  - Washington State Transportation Commission
  - Puget Sound Regional Council Transportation Policy Board
  - South King County Area Transportation Board, SeaShore Subarea Group
  - King County Department of Health
- **Ongoing engagement with tenants, operators, FAA, & TSA**

# Public Outreach

- **Forums and focus groups to reach specialized audiences**
  - Local & regional planners on transportation issues
    - Airport-area cities, WSDOT, Sound Transit, King County
  - Targeted audiences on sustainability and triple bottom line
    - Forums and small-group meetings Q3 2015
    - Environment, economic and social community emphasis
- **Business outreach and economic development**
  - Upcoming survey of airport-area economic development managers, followed by business forums in the cities
  - Regional business forum(s) on port-centered economic development, including lodging, concessions, land redevelopment, workforce needs
  - Engagement with regional business, labor, contracting
- **Engagement with local and regional communities and associations**
  - Airport-area and Puget Sound: chambers, EDCs,
  - Area Rotaries and Kiwanis, ports association, labor & business

Focus on Community and Economic Opportunity

# Next steps

- Airfield
  - Determine airfield capacity
  - Test benefits of potential airfield improvements
- Gates
  - Refine gate layouts & phasing
- Terminal
  - Continued analysis of one vs two terminal concepts
- Landside
  - On going capacity analysis through modeling
  - Develop roadway layouts and assess challenges
- Support facilities
  - Incorporate support facilities into overall land use plan