Sustainable Airport Master Plan (SAMP) Update

IB Business Community Discussion

June 29, 2016

Port of Seattle®

Discussion outline

- SAMP overview
- Where we are in the planning process
- Gate expansion concepts
- North terminal roadways
- Landside modeling
- Landside people mover alternatives
- Next Steps
- Landside plan elements
- South end roadways

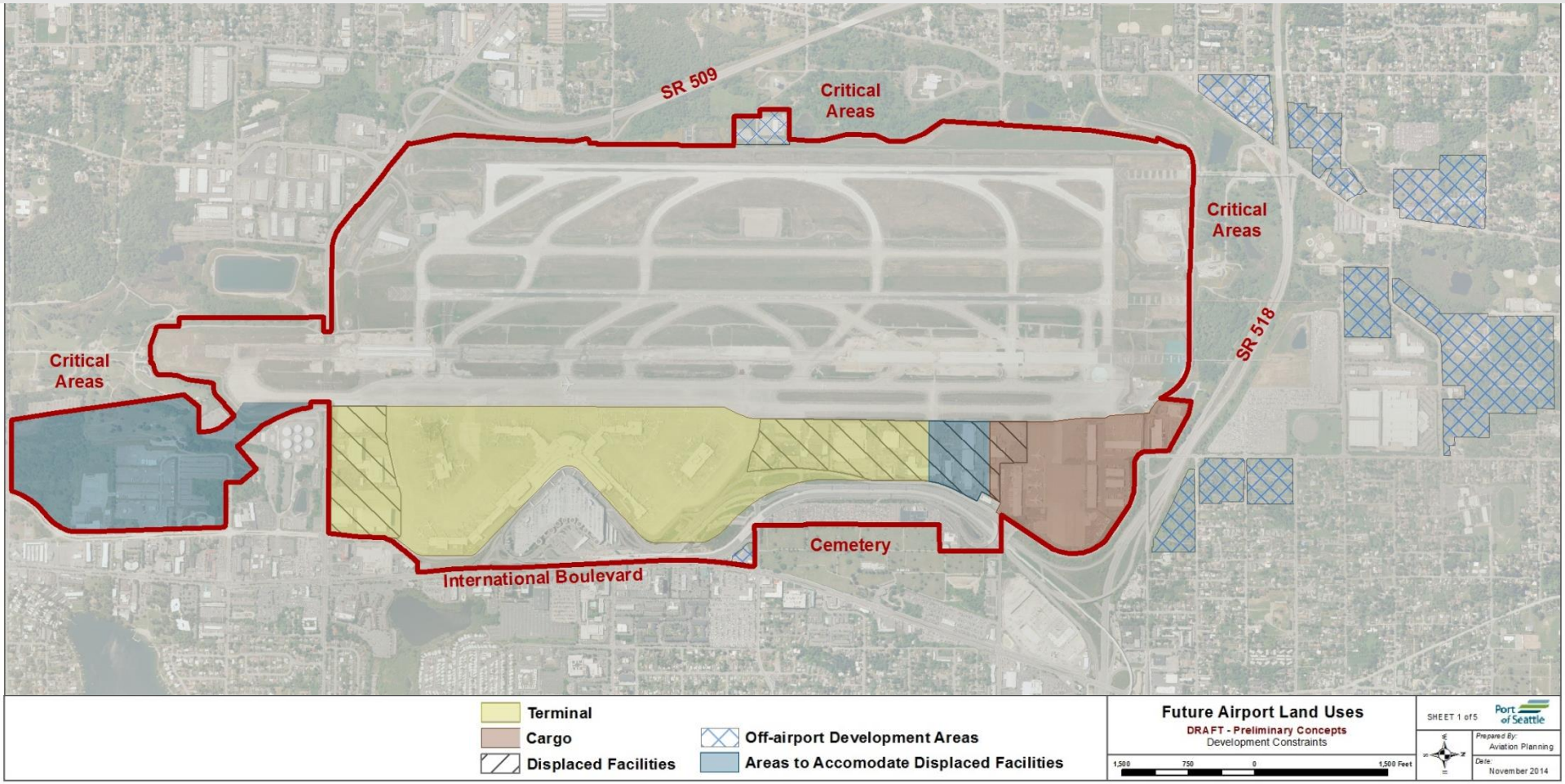
SAMP overview

Plan development *(iterative process)*

- Determine preferred gate expansion concept
- Assess airside capacity and required airfield & terminal facilities
  - Gates
  - Aircraft hold positions
  - Airfield improvements
- Allocate remaining land based on hierarchy
  - Terminal
  - Airfield
  - Landside
  - Cargo
  - Airline support
  - Airport support

SAMP overview

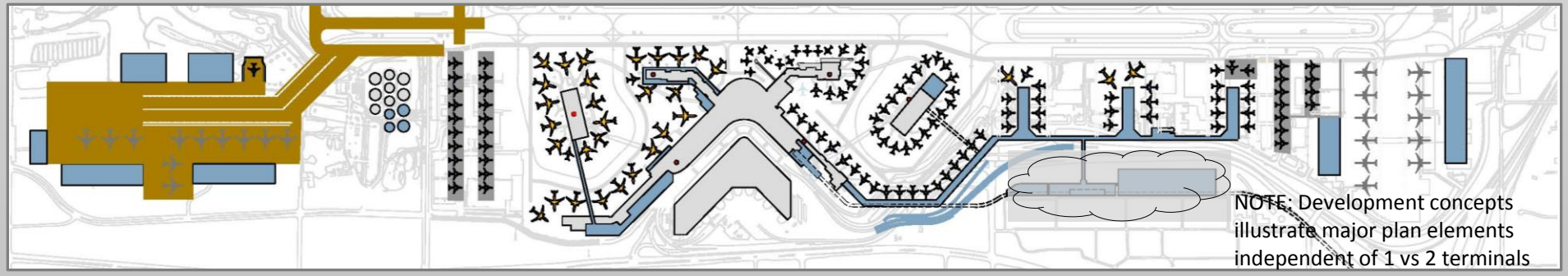
Development constraints & key functional areas



SAMP overview

Concept 4

- Description
  - New widebody capable international gates on Concourse B
  - Extension of Concourse D to three piers to the north
  - Aircraft hold positions provided to the south and north
  - SASA accommodates displaced aircraft maintenance and cargo growth
- Primary concerns/flaws
  - Displaces aircraft maintenance
  - Cost
- Primary advantages
  - Meets all program needs
  - Best operational layout in terms of gate access/distribution of activity



Where we are in the planning process

Current work

- Conducting additional airside modeling with refined rules base for use of aircraft hold positions and gates
  - Estimating the timing of need for aircraft hold positions to inform recommended layout of facilities and phasing plan
  - Continued modeling to estimate delay in outer years and determine benefit of airside improvements
- Developing and assessing options for North Airport Expressway
- Assessing impacts of runway/taxiway separation
- Evaluating options for landside Automated People Mover (APM) and elevated bus guideway

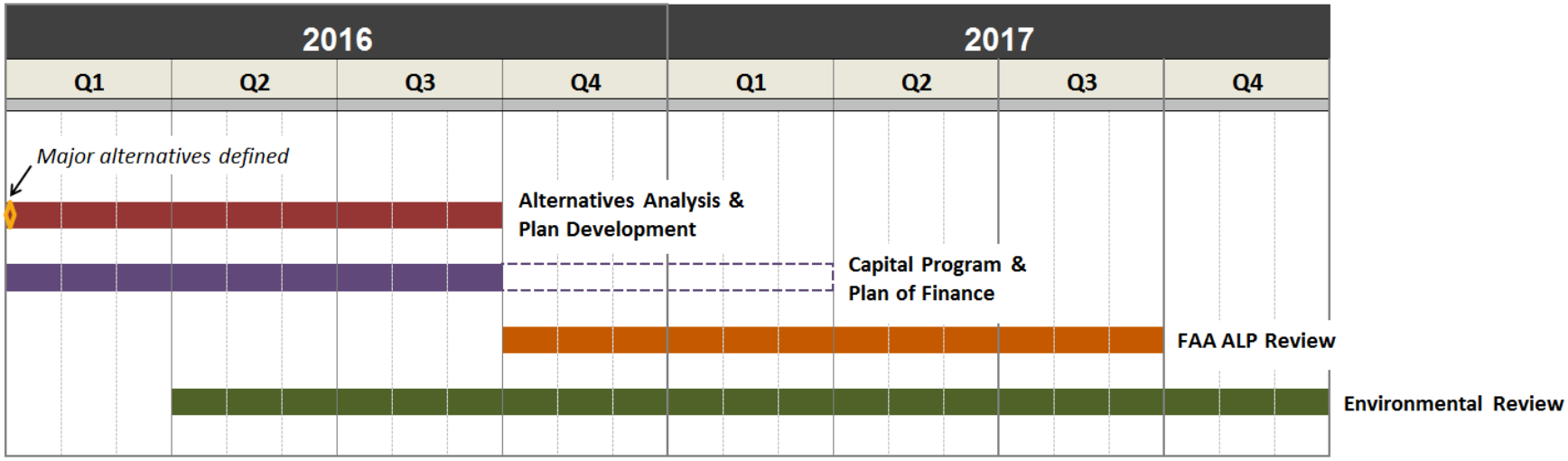
Where we are in the planning process

Current work

- Developing layouts for area west of airfield to accommodate displaced facilities
- Developed alternative layouts for SASA
  - Cargo
  - Aircraft maintenance
  - Commercial development
  - Buffering
- On-going work to explore phasing for gates, terminal and hardstands

SAMP planning schedule

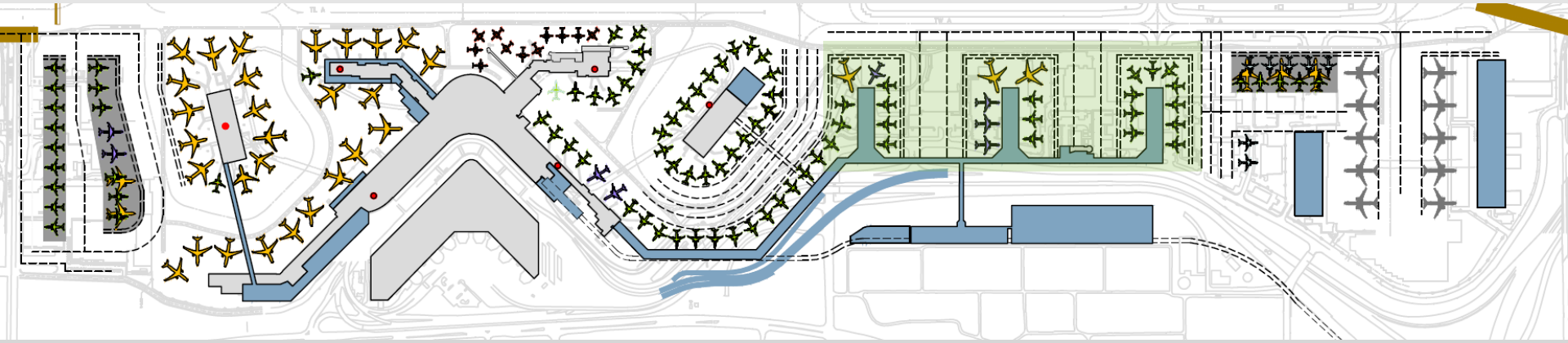
- Alternatives analysis & development alternatives(s) for major elements *(Q4 2014 – Q4 2015)*
  - Iterative process, finalizing facility requirements and defining development alternatives
  - Commission engagement at key decision points
- Development of integrated preferred alternative(s) *(Q1 2016 – Q3 2016)*
  - Constructability assessment
  - Phased implementation plan
  - Planning level cost estimates
- Capital program & plan of finance *(Q1 2016 – Q1 2017)*
- FAA ALP review *(Q4 2016 – Q3 2017)*
- Environmental review *(Q2 2016 – Q4 2017)*



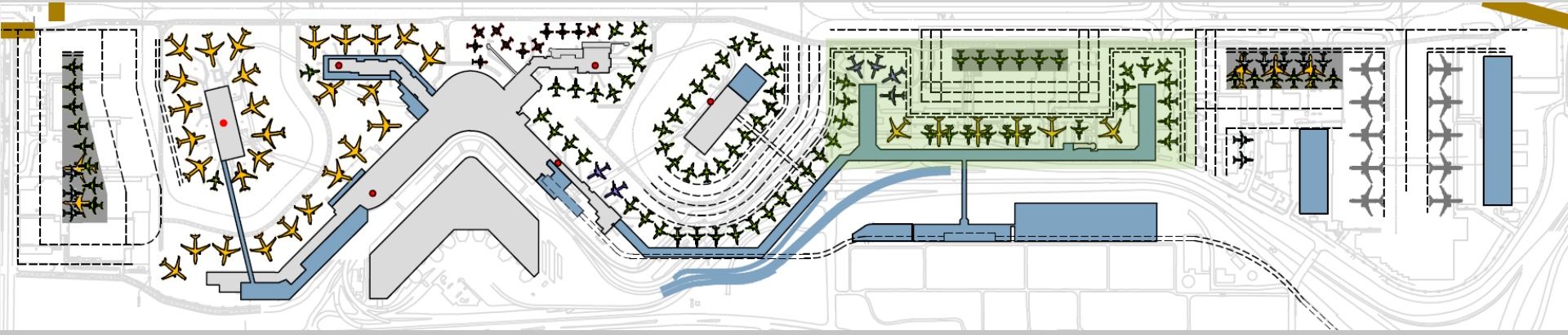
Gate expansion concepts

Variations on gate expansion

- Three pier gate expansion to the north



- U-shaped gate expansion to the north



Gate expansion concepts

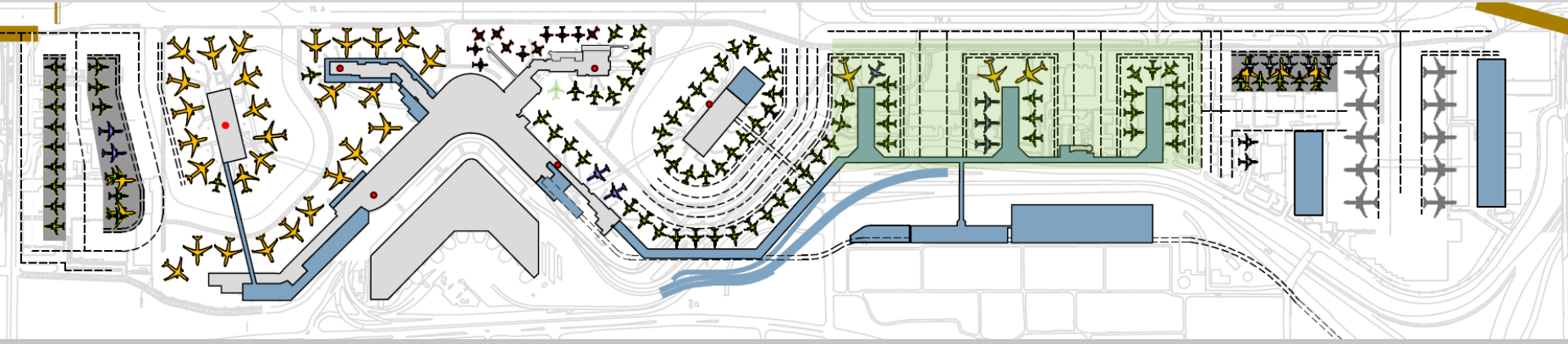
Pros & cons of three pier gate expansion concept

Pros:

- Provides same gate capacity as U-shaped
- Relatively flexible string of dimension from west to east
- Potentially easier to integrate with roadways
- Middle pier provides greater opportunity for shared holdrooms and concessions

Cons:

- Relatively inflexible string of dimensions from south to north
- No additional aircraft hold positions
- Less flexibility for gating airlines
- Less flexibility for phasing in gates



Gate expansion concepts

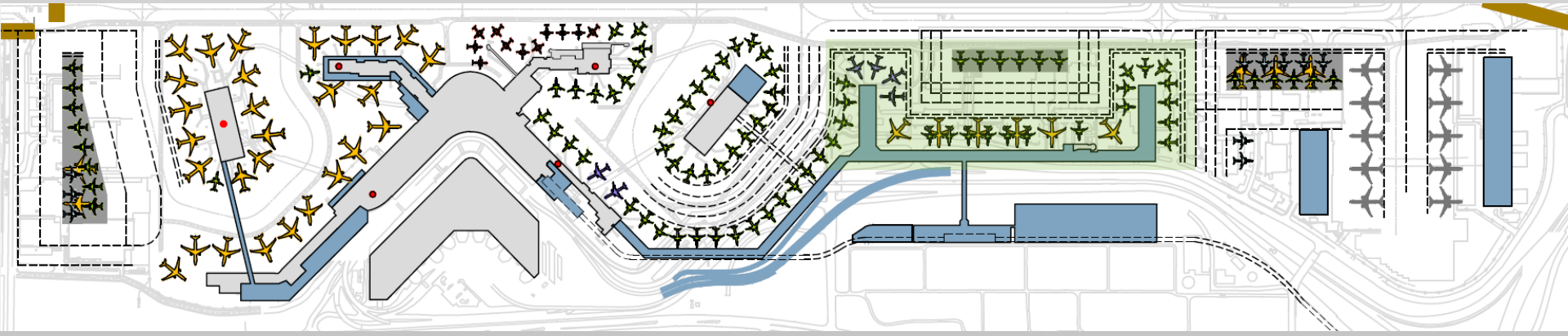
Pros & cons of U-shaped gate expansion concept

Pros:

- Provides same gate capacity as three piers
- Additional aircraft hold positions provided in ideal location west of gates
- Greater flexibility for gating airlines
- Greater flexibility for phasing in gates
- Relatively flexible string of dimension from south to north

Cons:

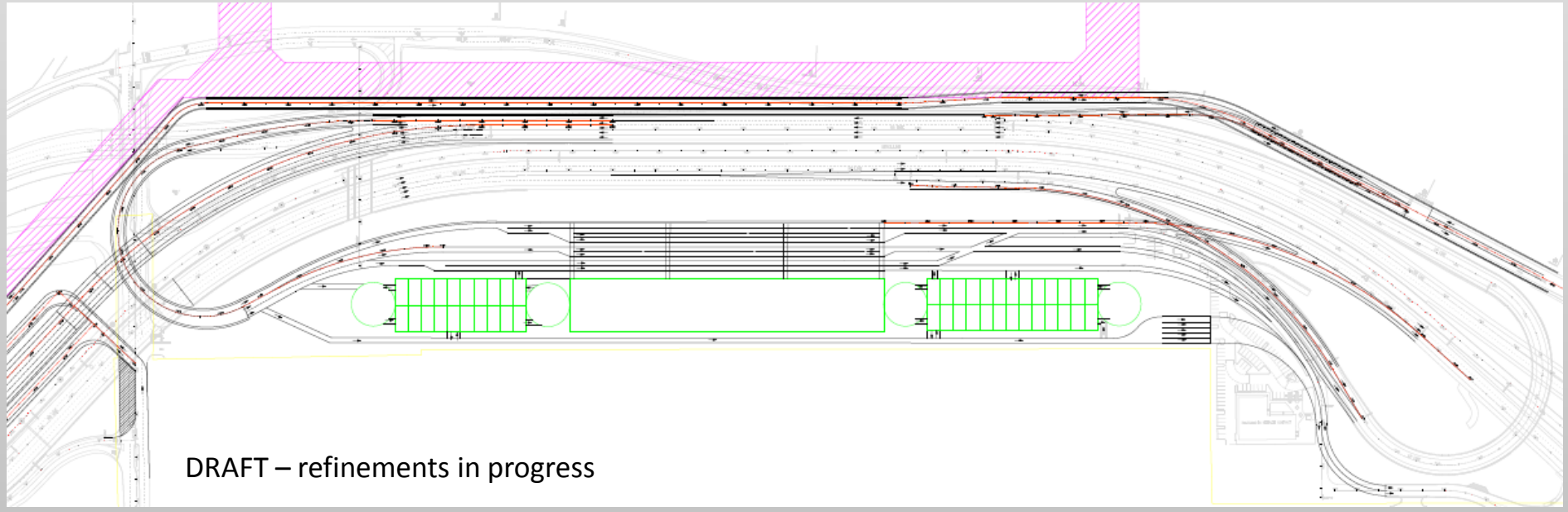
- Relatively inflexible string of dimensions from west to east
- Difficult to integrate with roadways
- Single loaded concourse provides less opportunity for shared holdrooms and concessions



North terminal roadways

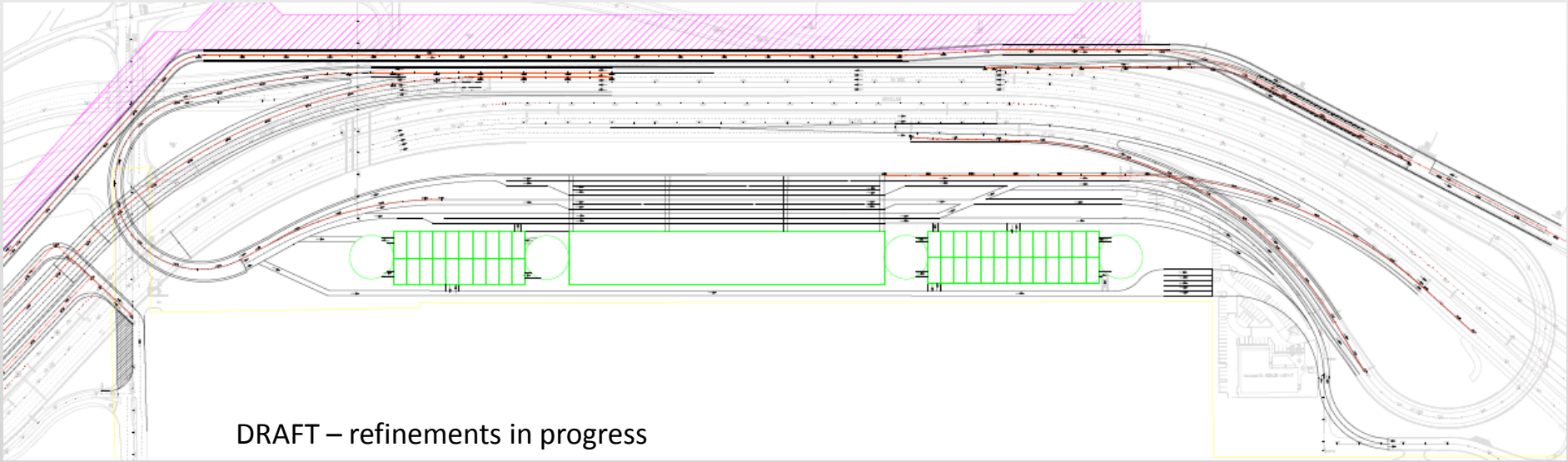
U-shaped gate expansion and roadways challenges

- Provide north terminal ingress and egress
- Determine alignment and elevation of APM or bus guideway and stations
- Optimize regional and local access
- Assess potential trade-offs with north gate expansion
- Provide airside and landside access to relocated ARFF (east of existing)



North terminal roadways

Latest iteration of roadway system plan



Opportunities

- Supports continuous Service Tunnel along Air Cargo Rd alignment
- Slip ramp access to North Terminal & Main Terminal from S. 160th St.

Challenges

- North Terminal egress to WB SR518 difficult due to weave over short distance
- North Terminal parking & some ground transportation egress may be limited to S. 160th St. only
- Access at S 170th St. may be limited to Main Terminal

Landside modeling

VISSIM microsimulation model

- Used in an iterative process to refine roadways concept
  - Tests adequacy of merge and diverge distances
  - Test lane assignments and capacity
- Indicates design performance
  - Vehicle queueing and delay
  - Vehicle density and parking occupancy on curb
  - Travel time
- Inputs
  - flight schedules
  - background traffic from regional travel demand model
  - Port's mode share survey

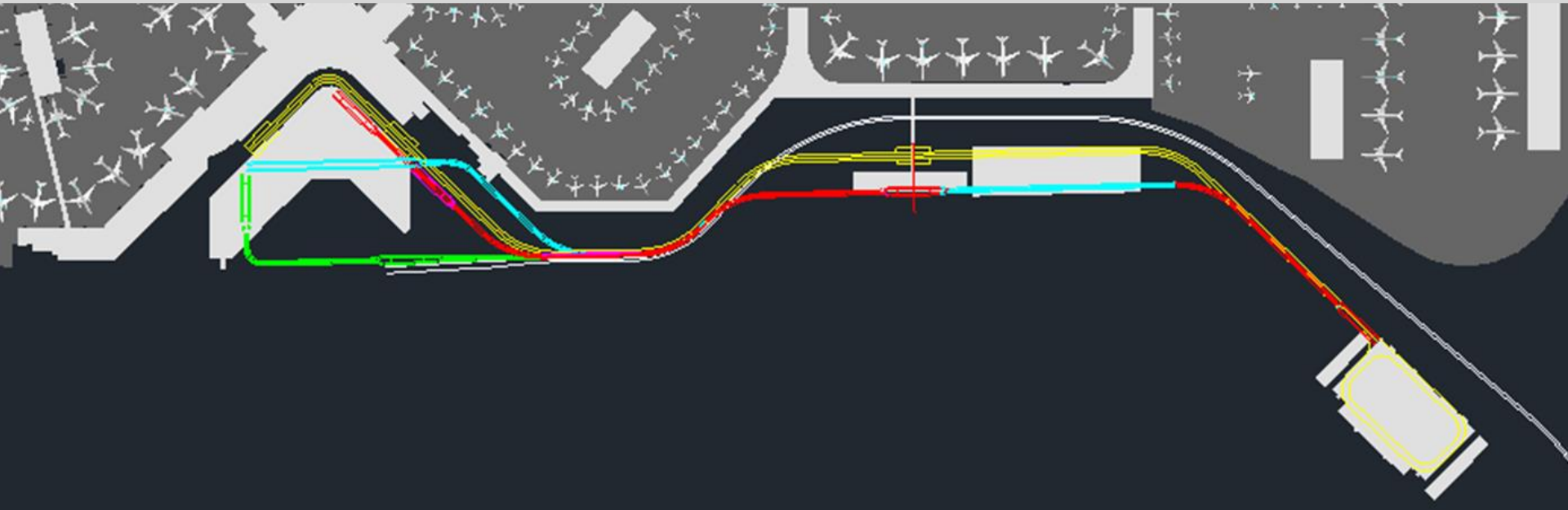
View AVI file of VISSIM model

Landside people mover alternatives

- Preliminary landside options
  - Developed 4 APM options and 1 elevated busway option
  - Conducted decision analysis to screen options
- Further study
  - Will recommend shortlist of landside options for further study by SAMP consultant
  - Study will also include assessment of airside people movers:
    - Passenger flow analysis
    - Diagrammatic layout concepts for APM, power walks and busing
    - Identify airside options for connecting North Satellite and future gates
    - Capacity analysis for APM, power walks and busing
    - Transfer time evaluation for pax between international and domestic flights
    - Capacity assessment of existing Satellite Transit System (STS) trains

Landside people mover alternatives

- Option 1: APM, 1 station at level 4 garage (NW corner)
- Option 2: APM, 1 station at level 6 garage (center, west edge)
- Option 3: APM, 2 stations at level 6 garage (NE corner & SE corner)
- Option 4: APM, 2 stations at level 1 garage (NW corner & SW corner)
- Option 5: Bus, 2 stations at level 6 garage (between upper drive & garage)



Landside people mover alternatives

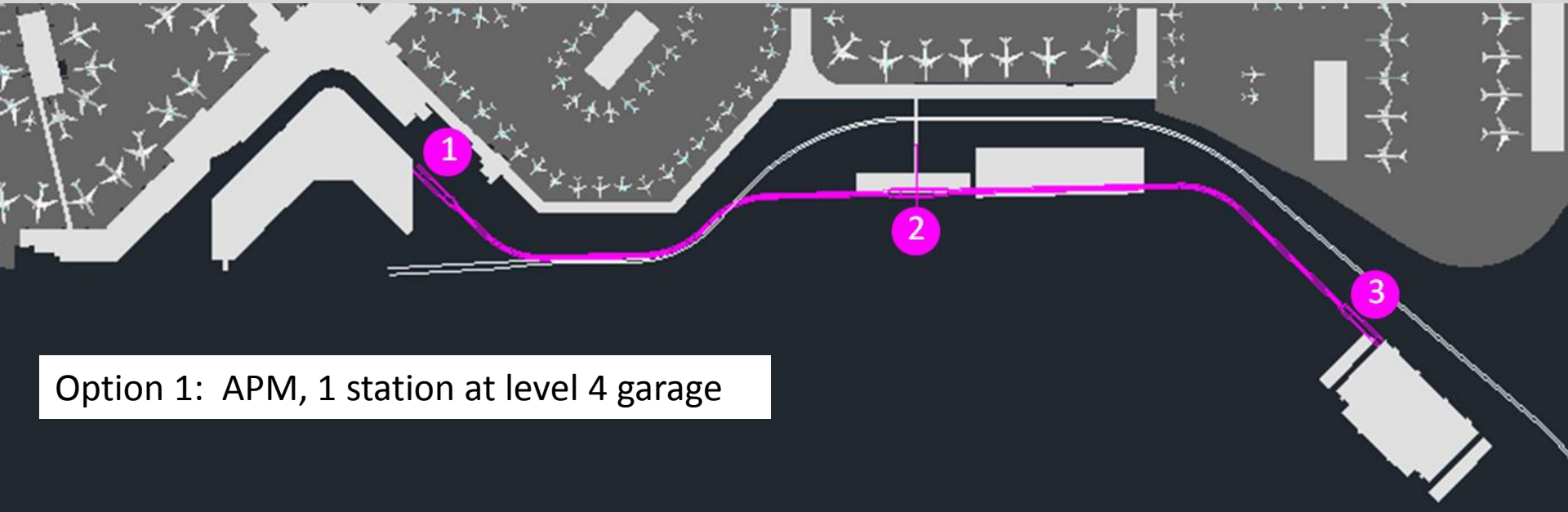
Option 1: APM, 1 station at level 4 garage (NW corner)

Pros:

- Relatively open, greenfield site at main terminal

Cons:

- Difficult wayfinding from the south
- Long walking distance from the south



Option 1: APM, 1 station at level 4 garage

Landside people mover alternatives

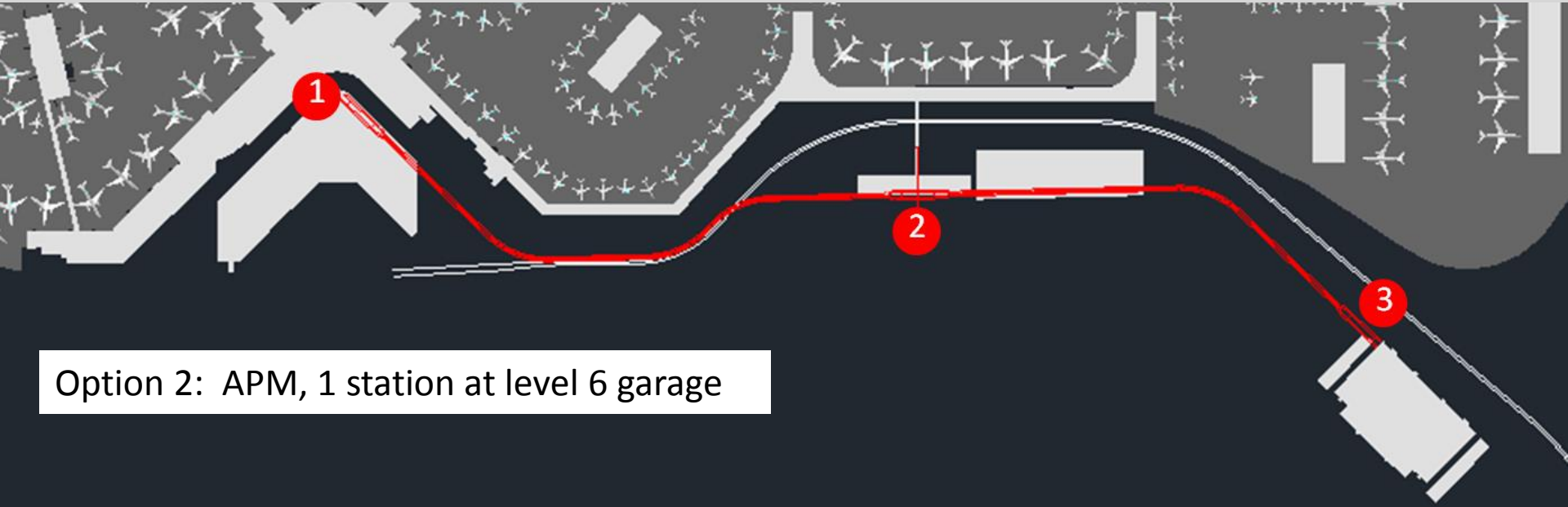
Option 2: APM, 1 station at level 6 garage (center, west edge)

Pros:

- Visible location, centrally located and adjacent to terminal

Cons:

- Relatively high initial cost
- Complexities with maintaining operations with construction in garage



Option 2: APM, 1 station at level 6 garage

Landside people mover alternatives

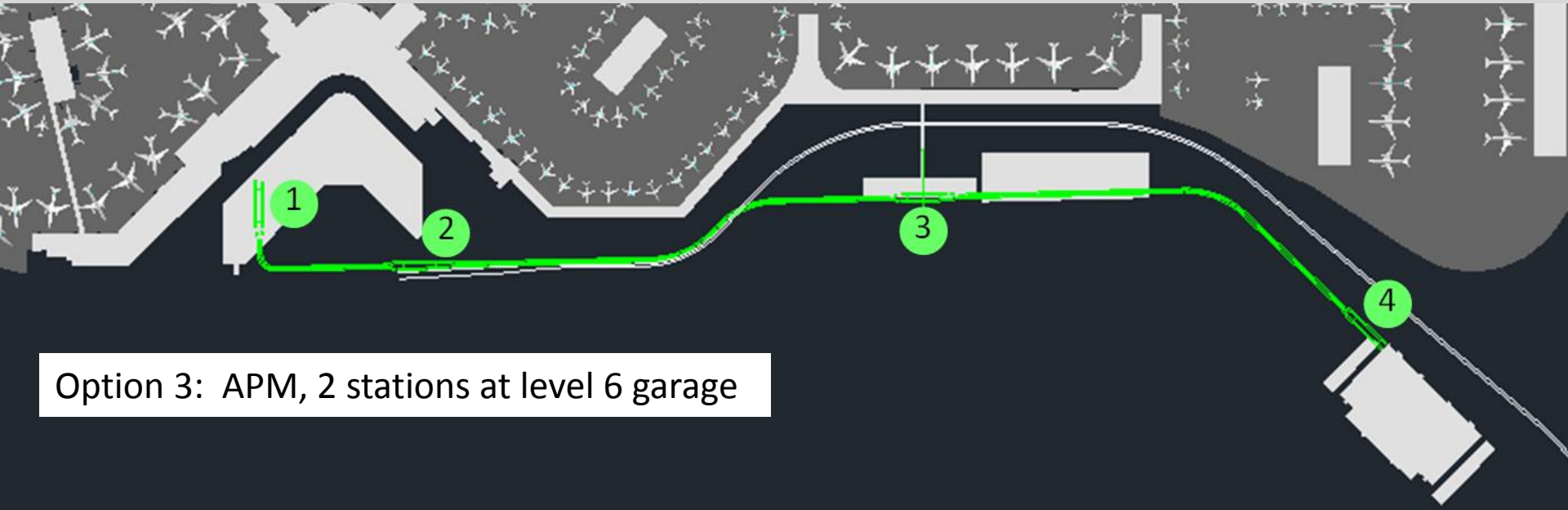
Option 3: APM, 2 stations at level 6 garage (NE corner & SE corner)

Pros:

- Most direct access from main terminal and light rail station

Cons:

- Difficult wayfinding
- Relatively high initial cost
- Complexities with maintaining operations with construction in garage
- Significant reduction in parking capacity



Option 3: APM, 2 stations at level 6 garage

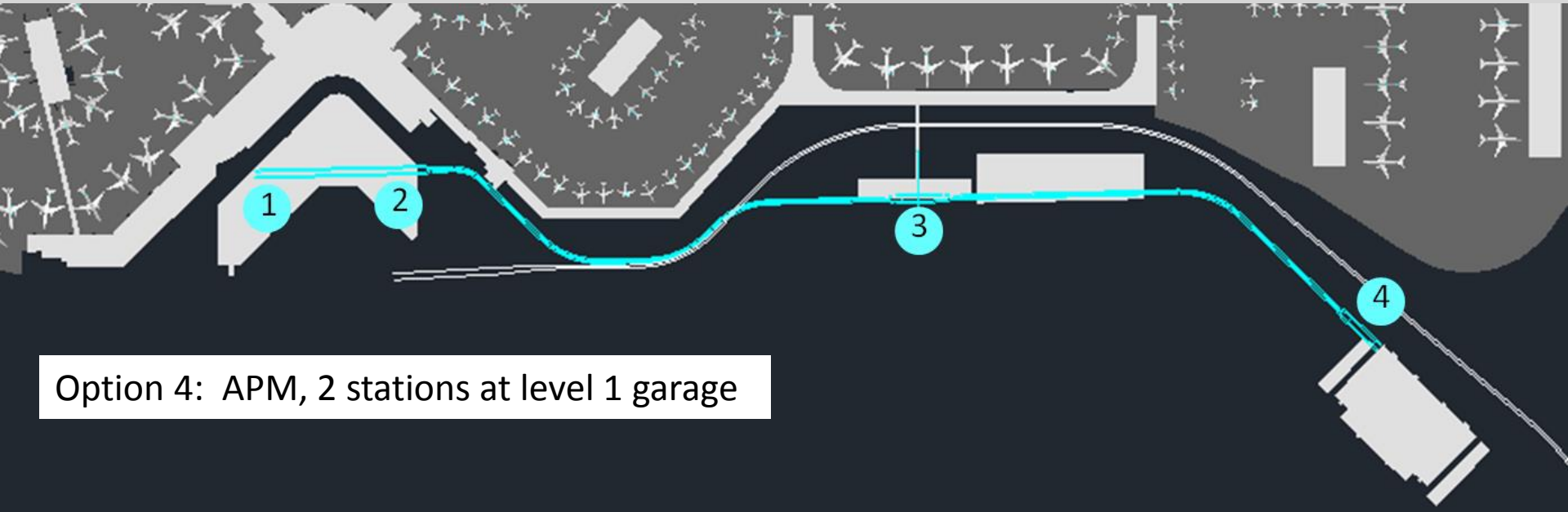
Landside people mover alternatives

Option 4: APM, 2 stations at level 1 garage (NW corner & SW corner)

Pros:

Cons:

- Difficult wayfinding
- Relatively high initial cost
- Greater number of level changes
- Significant reduction in parking capacity



Option 4: APM, 2 stations at level 1 garage

Landside people mover alternatives

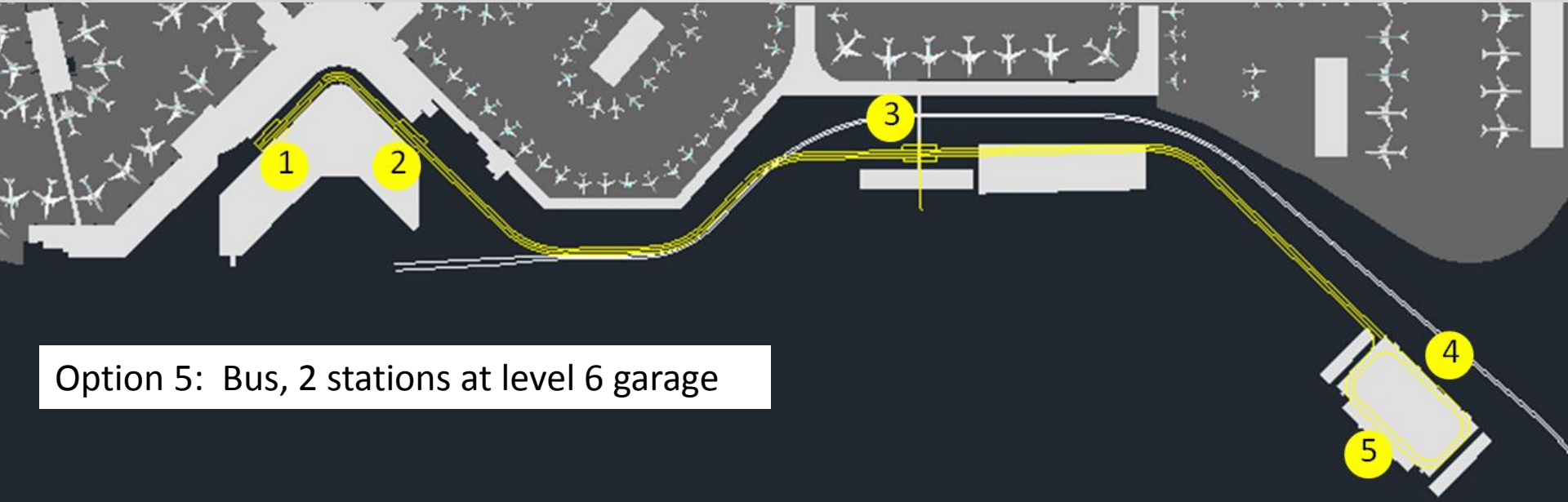
Option 5: Bus, 2 stations at level 6 garage (between upper drive & garage)

Pros:

- Visible location, centrally located and adjacent to terminal
- Ability to incorporate guideway into RCF busing design
- Relatively short walking distances
- Less level changes at RCF
- Relatively low initial cost

Cons:

- High operator cost makes on-going cost comparable to other options
- Complexities with maintaining operations with construction adjacent to Lower Drive and garage
- Would limit ability to widen Upper Drive



Option 5: Bus, 2 stations at level 6 garage

Next steps

Critical path to preferred alternative

- Refine North Airport Expressway (NAE) concept
  - Optimize regional and local access
  - Develop high level phasing plan for roadway construction
- Develop implementation plan and plan of finance
  - Phasing plan for gate expansion and hardstand construction
  - Assess benefit/cost and constructability of airside improvements
  - Refine cost estimates and develop finance scenarios
- Seek Commission guidance
  - <u>August 23 meeting:</u> Review progress toward preferred alternative
    - draft implementation plan and order of magnitude cost
  - <u>September 27 meeting:</u> Review progress toward preferred alternative
    - Implementation plan refinements, cost estimate refinements and potential means of financing capital program

Landside plan elements

Key Assumptions

- No major mode changes in the future
  - RCF busing transfers to Landside APM
  - For planning purposes, provides a “worst case” for facility requirements
  - Supports continued growth with Seattle cruise operations
- Landside activity forecast based upon passenger growth
- Landside modeling based upon gated schedule (24-hour model)
- Some ground transportation modes may serve both Terminals
  - Airporters
  - Courtesy Vehicles
  - Public Transit

Landside plan elements

Curbside/Parking Facilities

Facility	Existing (1) (37 MAP)	Single Terminal (66 MAP)	Two Terminals (2)	
			Main (40-46 MAP)	North (20-26 MAP)
Departures Curbside	4 Lanes 1,200 LF	8 Lanes 1,200 LF *	4 Lanes 1,200 LF	4 Lanes 520 LF
Arrivals Curbside (3)	5 Lanes 1,050 LF	5 Lanes 1,200 LF	5 Lanes 1,200 LF	4 Lanes 460 LF
Parking	12,800	14,600 *	12,100	2,500
Off-Site Parking	18,500	TBD	TBD	

Notes:
(1) Existing reflects facilities that are currently provided
(2) Demand is split 60-70% to Main Terminal, 30-40% to North Terminal
(3) Does not include RCF and Public Transit curbs

Landside plan elements

Ground Transportation – On-Demand Services

Facility	Existing (1) (37 MAP)	Single Terminal (66 MAP)	Two Terminals (2)	
			Main (40-46 MAP)	North (20-26 MAP)
Taxi Pick-Up	10 Stalls	20 Stalls	14 Stalls	8 Stalls
Taxi Staging	80 Veh.	170 Veh.	120 Veh.	70 Veh.
Taxi Holding	98 Veh.	190 Veh.	190 Vehicles	
Limo Pick-Up	6 Stalls	10 Stalls	7 Stalls	4 Stalls
Limo Staging	6 Veh.	10 Veh.	7 Veh.	4 Veh.
DTD Pick-Up	7 stalls	10 Stalls	7 Stalls	4 Stalls
DTD Staging	7 Veh.	10 Veh.	7 Veh.	4 Veh.

Notes:
(1) Existing reflects facilities that are currently provided
(2) Demand is split 60-70% to Main Terminal, 30-40% to North Terminal

Landside plan elements

Ground Transportation – Pre-Arranged Limos/Trans. Network Cos.

Facility	Existing (1) (37 MAP)	Single Terminal (66 MAP)	Two Terminals (2)	
			Main (40-46 MAP)	North (20-26 MAP)
Limo Pick-Up	Arrivals	Arrivals	Arrivals	Arrivals
Limo Staging	106 Stalls	160 Stalls	112 Stalls	64 Stalls
TNC Pick-Up	57 Stalls	80 Stalls	56 Stalls	32 Stalls
TNC Holding	43 Stalls	80 Stalls	80 Stalls	

Notes:
(1) Existing reflects facilities that are currently provided
(2) Demand is split 60-70% to Main Terminal, 30-40% to North Terminal

Landside plan elements

Ground Transportation – Courtesy Vehicles / Airporters / Crew

Facility	Existing (1) (37 MAP)	Single Terminal (66 MAP)	Two Terminals (2)	
			Main (40-46 MAP)	North (20-26 MAP)
CV Drop-Off & Pick-Up	210 LF (3)	280 LF (3)	280 LF (3)	280 LF
Airporter Pick-Up	6 Vans 3 Buses	9 Vans 5 Buses	9 Vans 5 Buses	9 Vans 5 Buses
Airporter Holding	6 Vans 3 Buses	9 Vans 5 Buses	9 Vans 5 Buses	
Crew Vans	6 Veh.	10 Veh.	7 Veh.	4 Veh.

Notes:
(1) Existing reflects facilities that are currently provided
(2) Demand is split 60-70% to Main Terminal, 30-40% to North Terminal
(3) Two stops at Main Terminal, curb length is for each stop

Landside plan elements

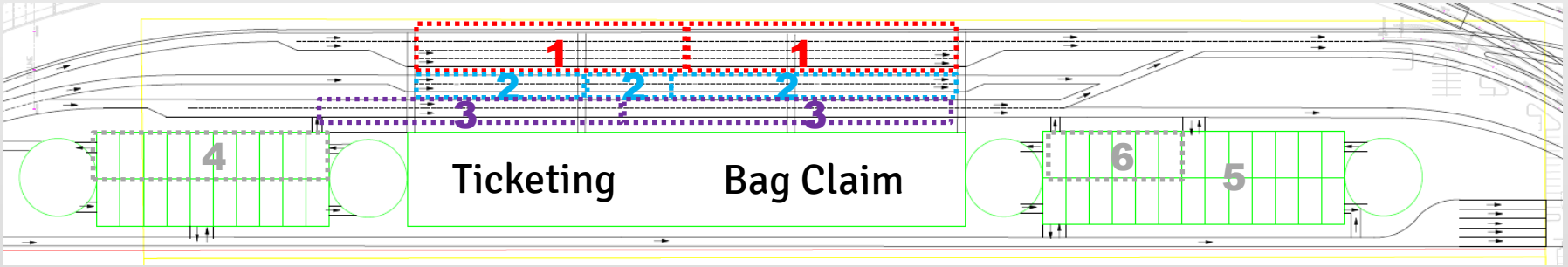
Ground Transportation – Charter Buses / Public Transit

Facility	Existing (1) (37 MAP)	Single Terminal (66 MAP)	Two Terminals (2)	
			Main (40-46 MAP)	North (20-26 MAP)
Cruise DO	8 Buses	12 Buses	8 Buses	5 Buses
Cruise PU	10 Buses	16 Buses	11 Buses	6 Buses
Bag Trucks	6 Trucks	10 Trucks	7 Trucks	4 Trucks
Charter PU	2 Buses	4 Buses	3 Buses	2 Buses
Public Transit	2 Buses (3)	2 Buses (3)	2 Buses (3)	2 Buses (3)
Combined Bus Holding	20 Buses	32 Buses	32 Buses	

Notes:
(1) Existing reflects facilities that are currently provided
(2) Demand is split 60-70% to Main Terminal, 30-40% to North Terminal
(3) Drop-off and Pick-up at same stop

Landside plan elements

North Terminal Landside



North Terminal Facilities:

1) Outer 4-Lane Curbside for Departures (360 LF*) and Arrivals (360 LF*)
2) Middle 2-Lane Curbside for Courtesy Vehicles (210 LF*), Crew Vans (100 LF), and Airporter Pick-Up (460 LF*)
3) Inner 2-Lane Curbside for Public Transit/Charter Drop-Off (6 Buses), On-Demand Pick-Up (8 taxis stalls, 4 limo stalls, 4 DTD van stalls)
4) On-Demand Staging provided in South Garage (76 vehicles) with access to inner curbside
5) Pre-Arranged Limo and TNC staging in North Garage (130 stalls). Entrance through parking, exit to S 160th St.
6) Charter Bus Pick-Up in North Garage (8 Buses, 4 Trucks). Entrance through Inner Curbside and exit to S 160th St.

South end roadways

- SR 509 extension to I-5 *(WSDOT)*
  - Scheduled to open 2031
  - Shared funding and coordinated implementation/construction plan with SR 167
  - Currently in practical design process with stakeholders to identify package of improvements that fit within $1.87B budget
  - Assumes tolling of new WSDOT facilities
- Interim South Access
  - Connecting 28th/24th *(CoST)*
    - Completes 28th/24th corridor and connects to SR 509 extension
  - South Link *(POS)*
    - Improvements north of S 188th St
    - Would close S 182nd St and open new airport access at S 188th St/28th Ave S
- Full South Access *(POS)*
  - Would close S 182nd St and open new airport access at S 188th St/28th Ave S
  - Would provide new direct connection to SR 509

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  - Would provide new direct connection to SR 509

South end roadways

Full South Access would close S 182nd