

ITEM NO: 7a Supp

DATE OF MEETING: July 12, 2016

SUSTAINABLE AIRPORT MASTER PLAN (SAMP) UPDATE

July 12, 2016

Port 
of Seattle®

Briefing overview

- Where we are in the planning process
- Gate expansion concepts
- North terminal roadways
- Landside people mover alternatives
- Aircraft maintenance facilities
- South Aviation Support Area (SASA)
- Next Steps
- Public outreach
- Sustainability integration
- Environmental review

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 People Movers

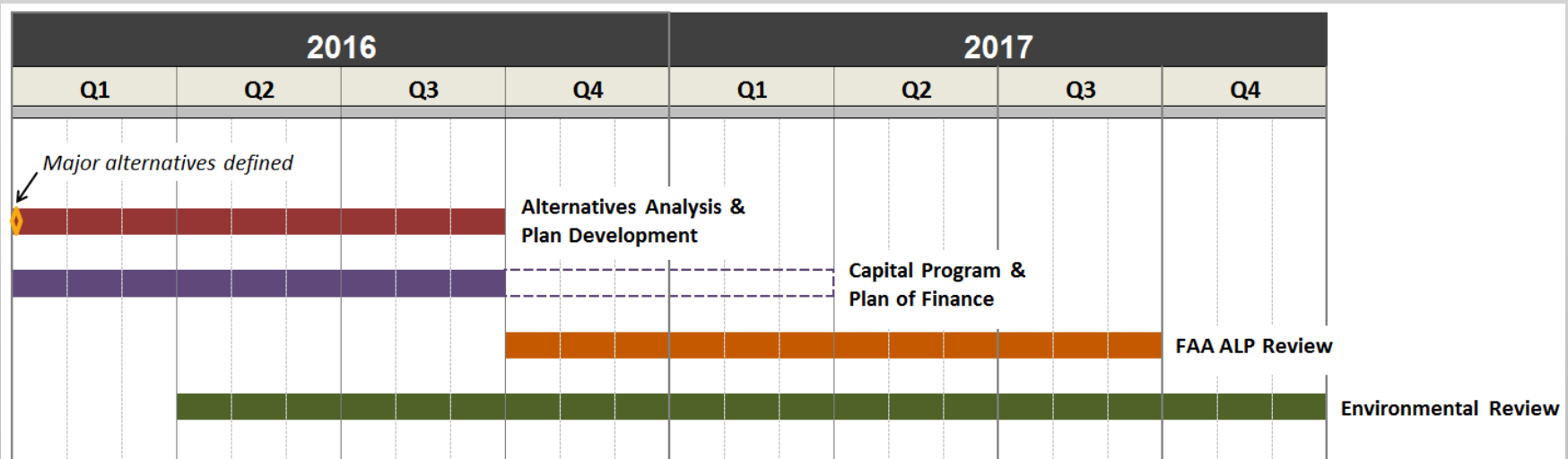
Where we are in the planning process

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

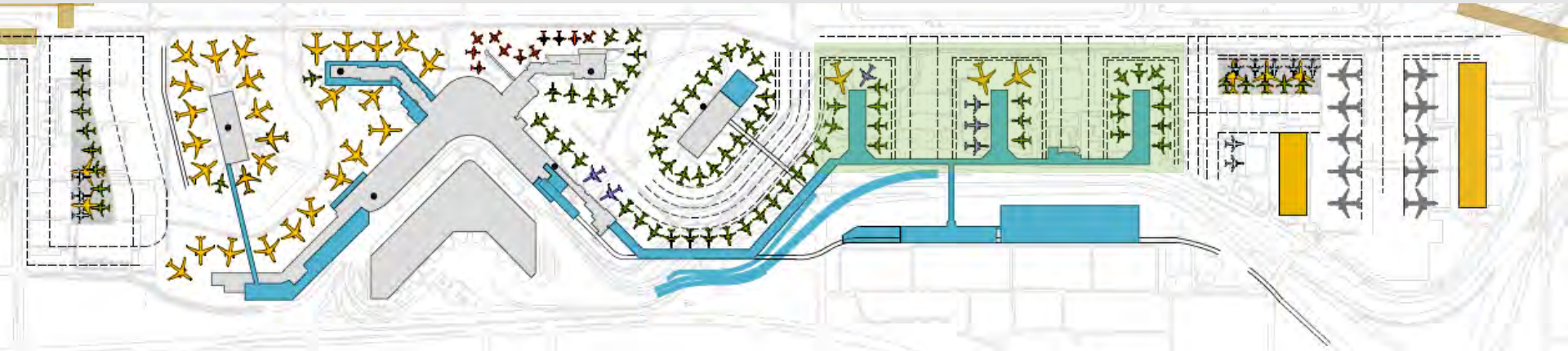
- Alternatives analysis & development alternatives(s) for major elements *(Q4 2014 – Q4 2015)*
 - Iterative process, finalizing facility requirements and defining development alternatives
 - Commission engagement at key decision points
- Development of integrated preferred alternative(s) *(Q1 2016 – 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)*



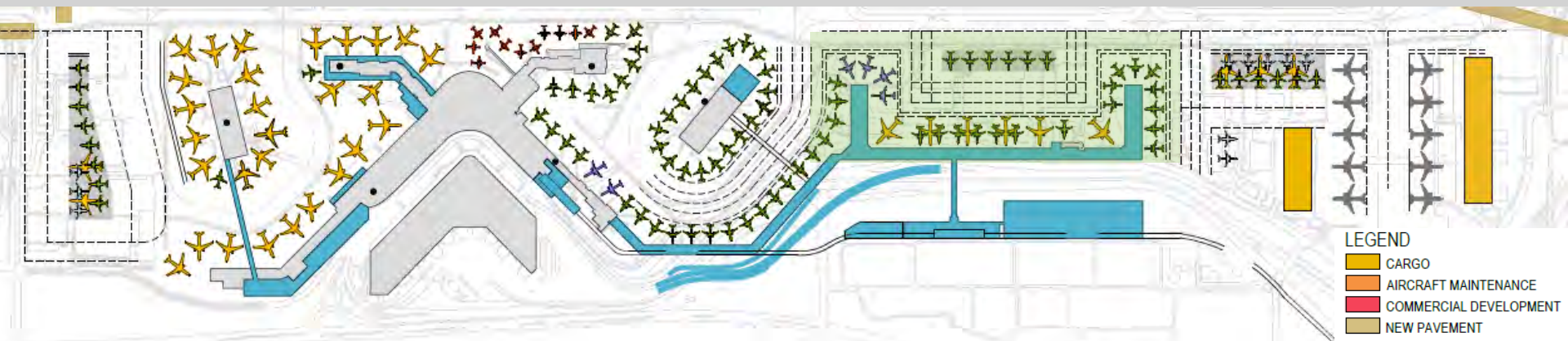
Gate expansion concepts

Variations on gate expansion

- Three pier gate expansion to the north



- U-shaped gate expansion to the north



Variations on gate expansion involve pros and cons

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



Three pier concept provides no additional aircraft hold positions

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

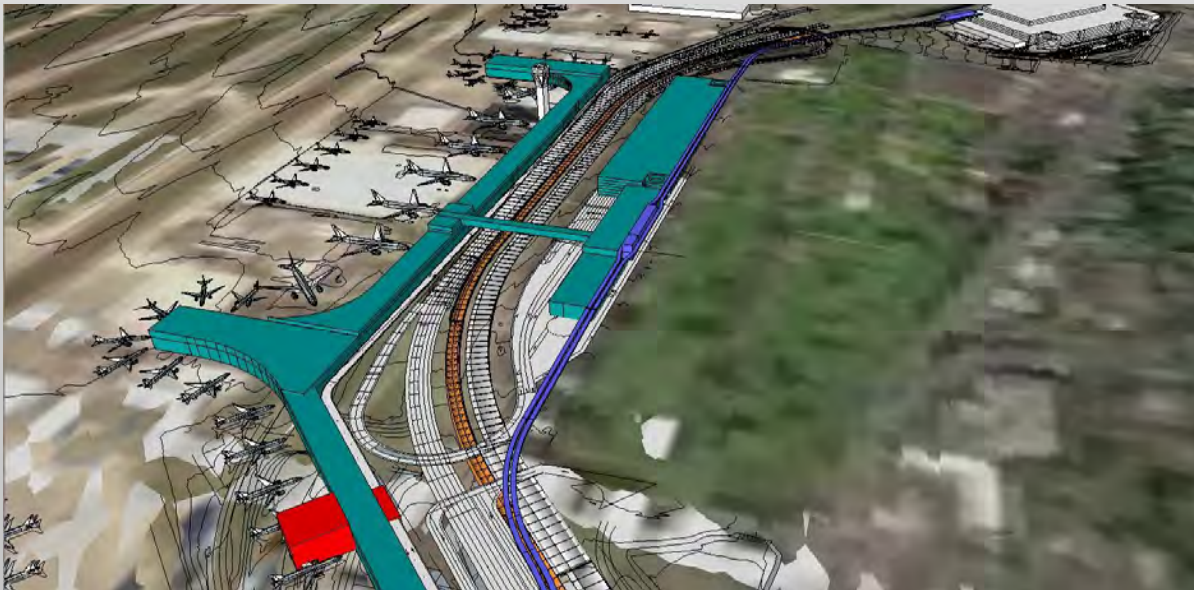


U-shaped concept provides additional aircraft hold positions and operational flexibility

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)

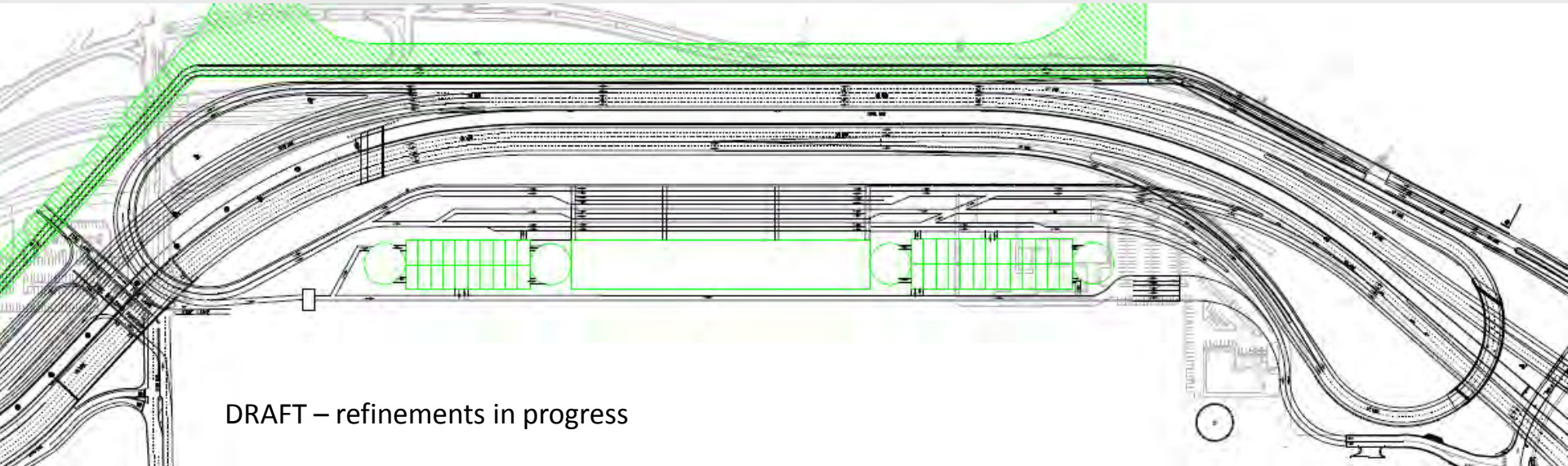


Building 3-D model in AutoCAD to set geometry of facilities in North Terminal area

Integration of gate expansion and roadways is challenging due to space constraints

North terminal roadways

Latest iteration of roadway system plan



DRAFT – refinements in progress

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

Integration of gate expansion and roadways is challenging due to space constraints

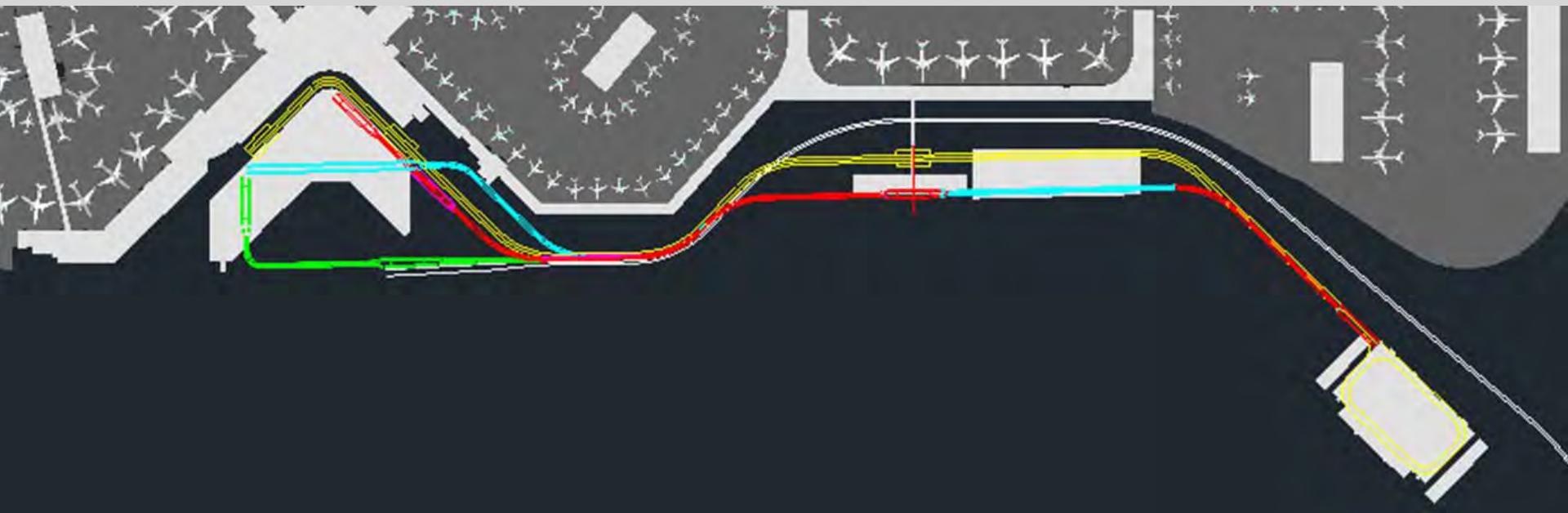
Landside people mover alternatives

- 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

Will study airside people mover options & short list of landside options

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

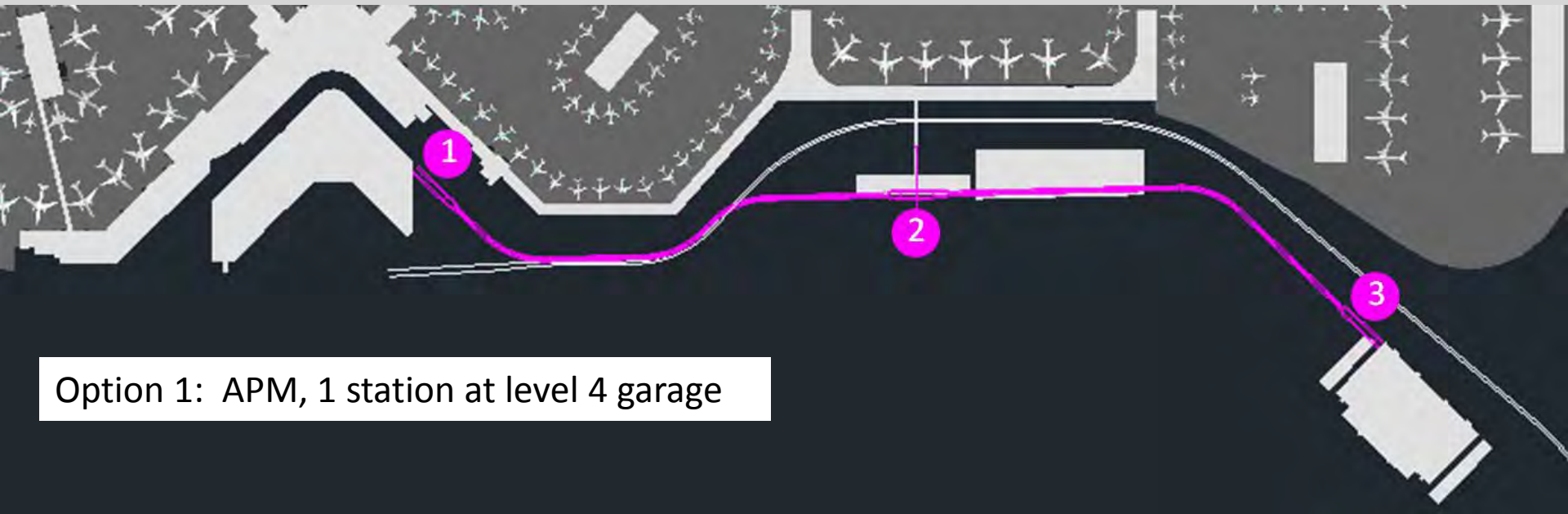
Option 1: APM, 1 station at level 4 garage (NW corner)

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

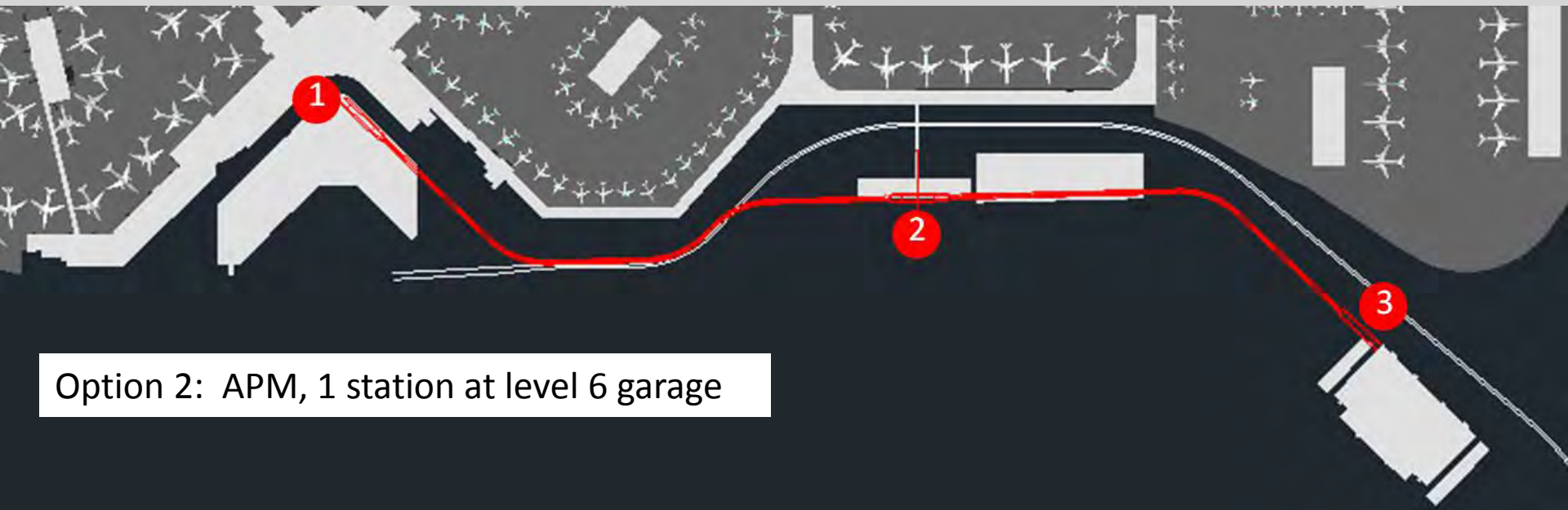
Option 2: APM, 1 station at level 6 garage (center, west edge)

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

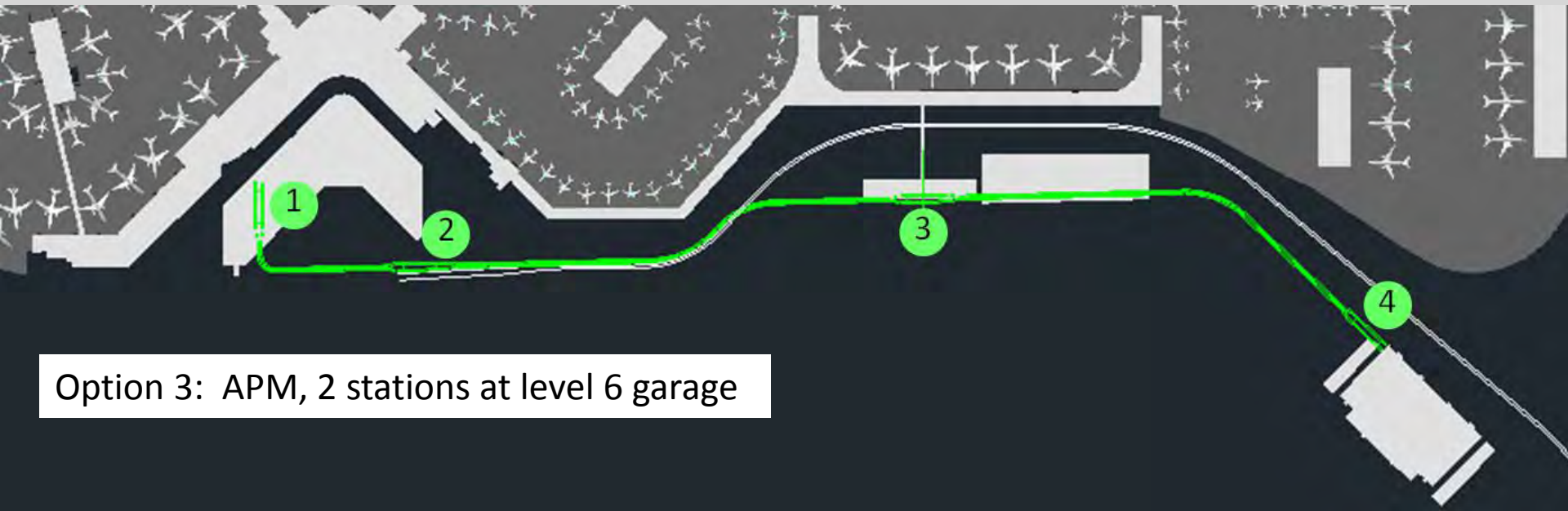
Option 3: APM, 2 stations at level 6 garage (NE corner & SE corner)

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

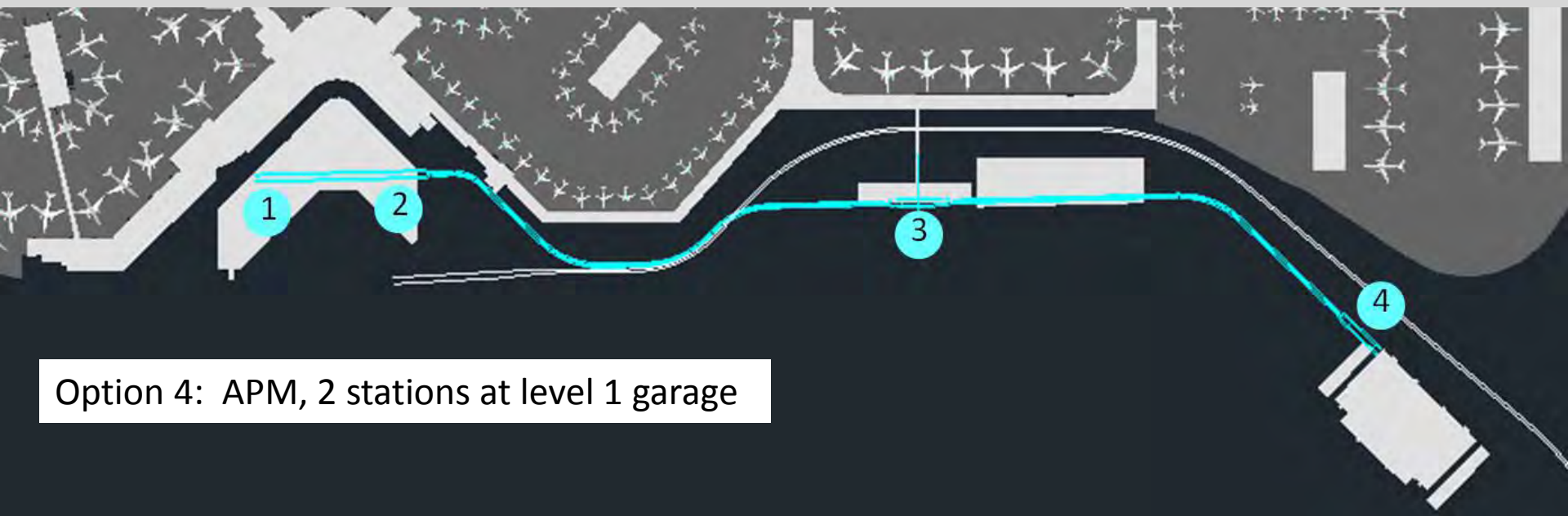
Landside people mover alternatives

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

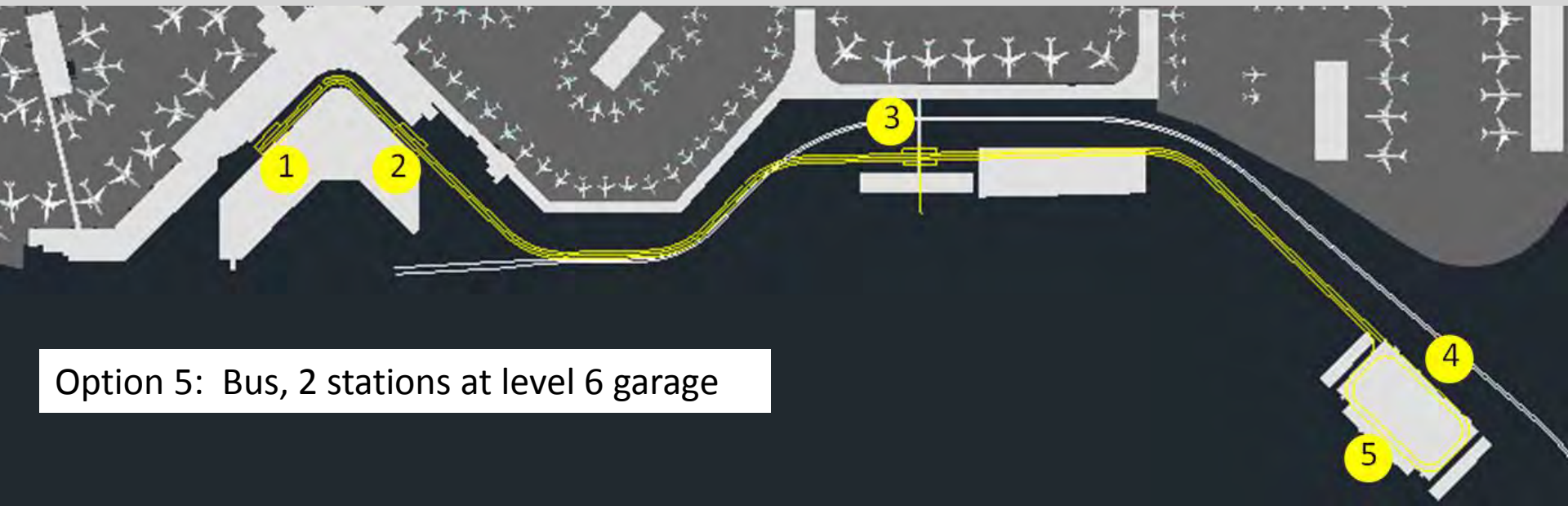
Option 5: Bus, 2 stations at level 6 garage (between upper drive & garage)

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

Aircraft maintenance facilities

Aircraft maintenance facilities relocation

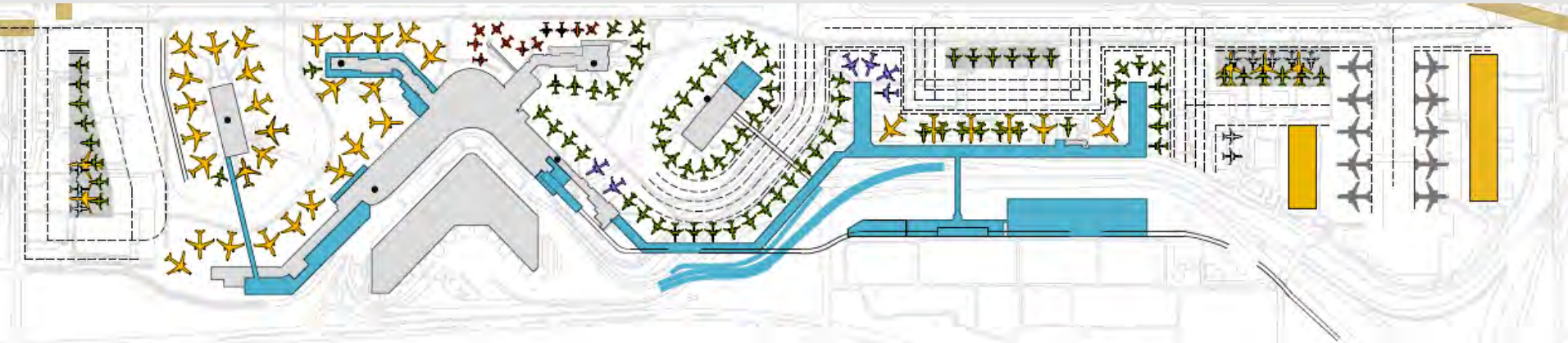
- Estimating timing of need for aircraft hold positions through airside simulation modeling
 - Informs construction phasing and relocation of aircraft maintenance hangars
- Full south end hardstands are also needed for Remain Over Night (RON) parking for passenger aircraft

Full south end hardstands are needed for RON parking for passenger aircraft

Aircraft maintenance facilities

Variations on aircraft maintenance locations

- All aircraft maintenance in SASA



- Aircraft maintenance split between SASA and north cargo area

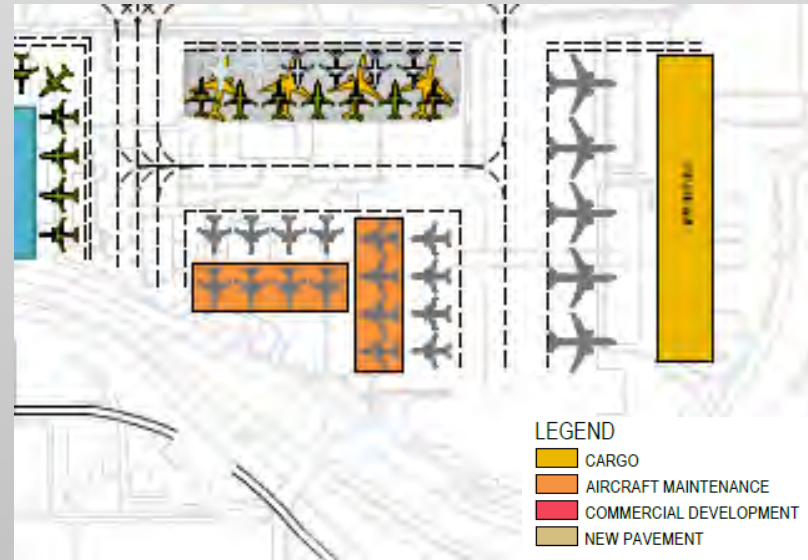
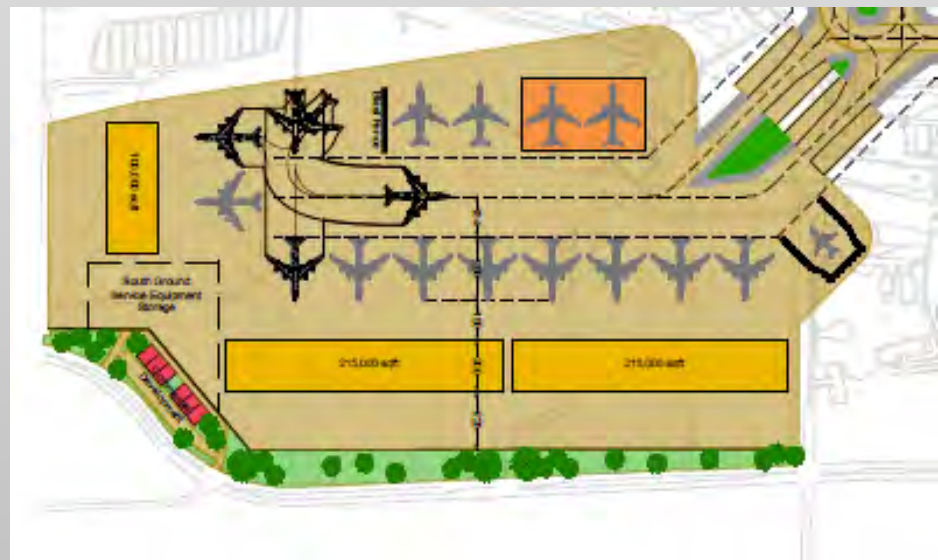


Aircraft maintenance in north cargo area involves trade-offs with cargo

South Aviation Support Area

SASA alternative facilities layouts

- Aircraft maintenance split between SASA and north cargo area
 - Would reduce the overall number of cargo aircraft parking positions
 - GRE not located in convenient place for north end maintenance



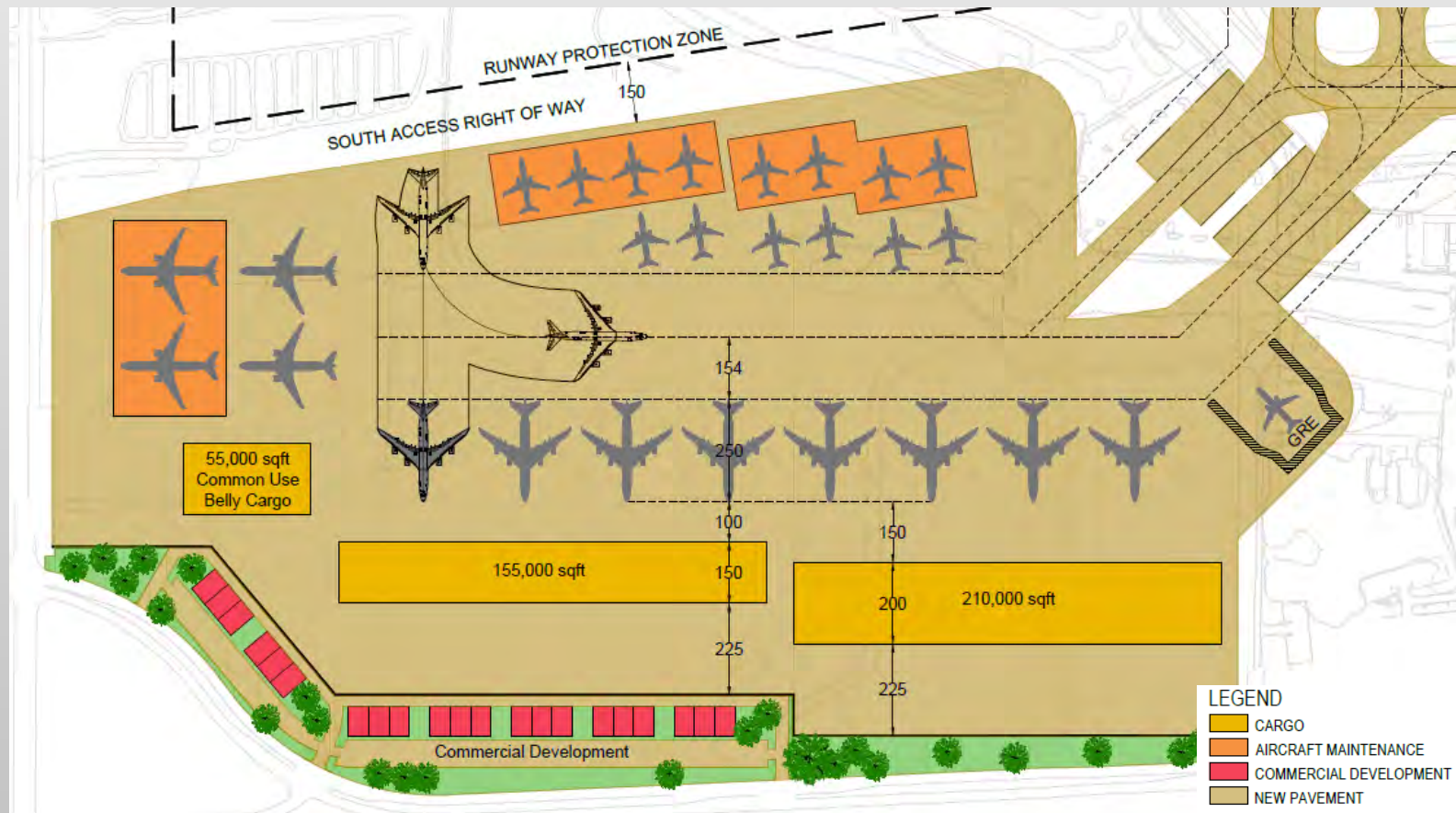
LEGEND
■ CARGO
■ AIRCRAFT MAINTENANCE
■ COMMERCIAL DEVELOPMENT
■ NEW PAVEMENT

Aircraft maintenance in north cargo area involves trade-offs with cargo

South Aviation Support Area

SASA alternative facilities layouts

- Option 1: Commercial development on east side with buffer extending north and reduced cargo area

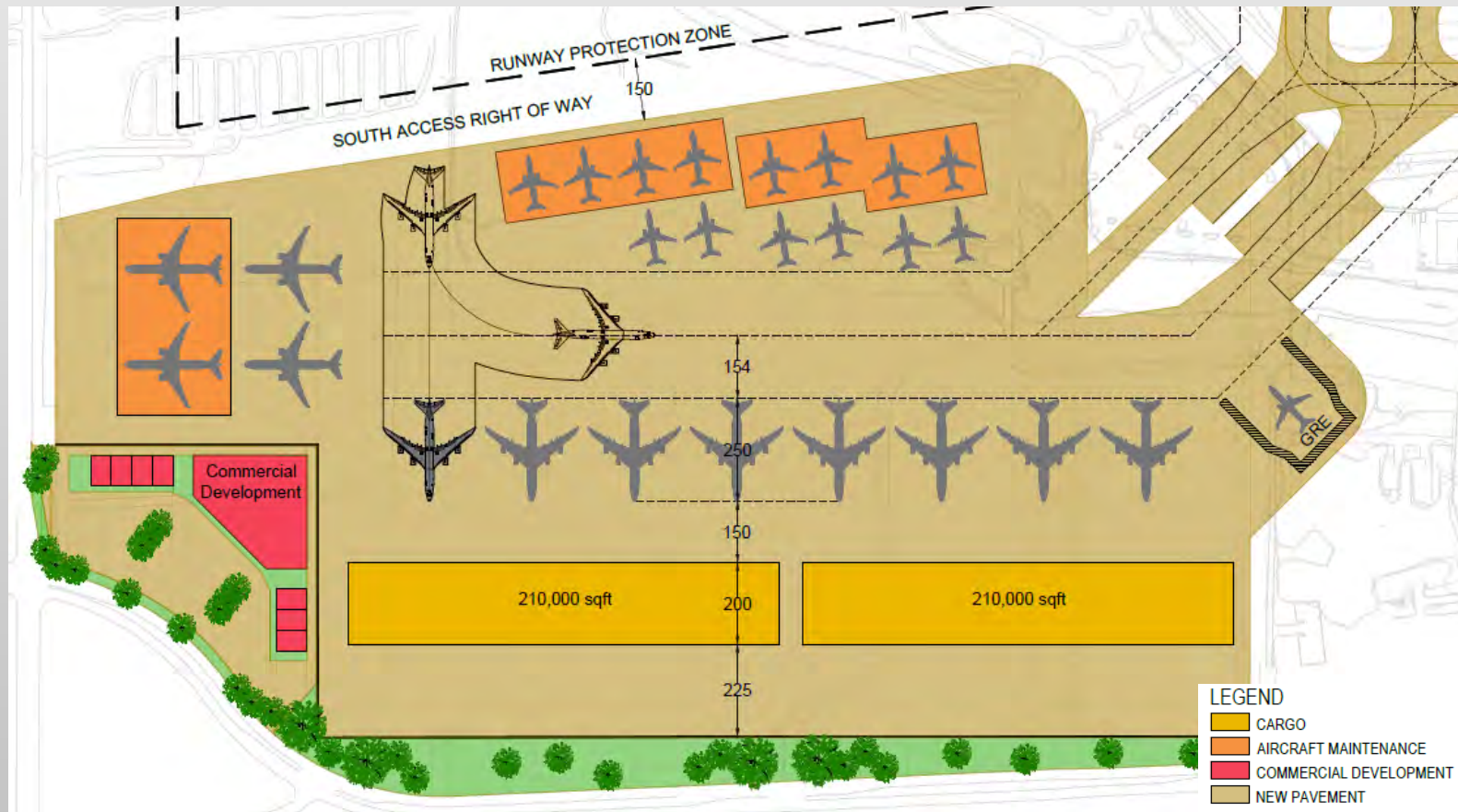


Option 1 reduces cargo area to provide additional commercial development

South Aviation Support Area

SASA alternative facilities layouts

- Option 2: Commercial development in south east corner with buffer extending north and less space for uses such as ground service equipment (GSE) storage

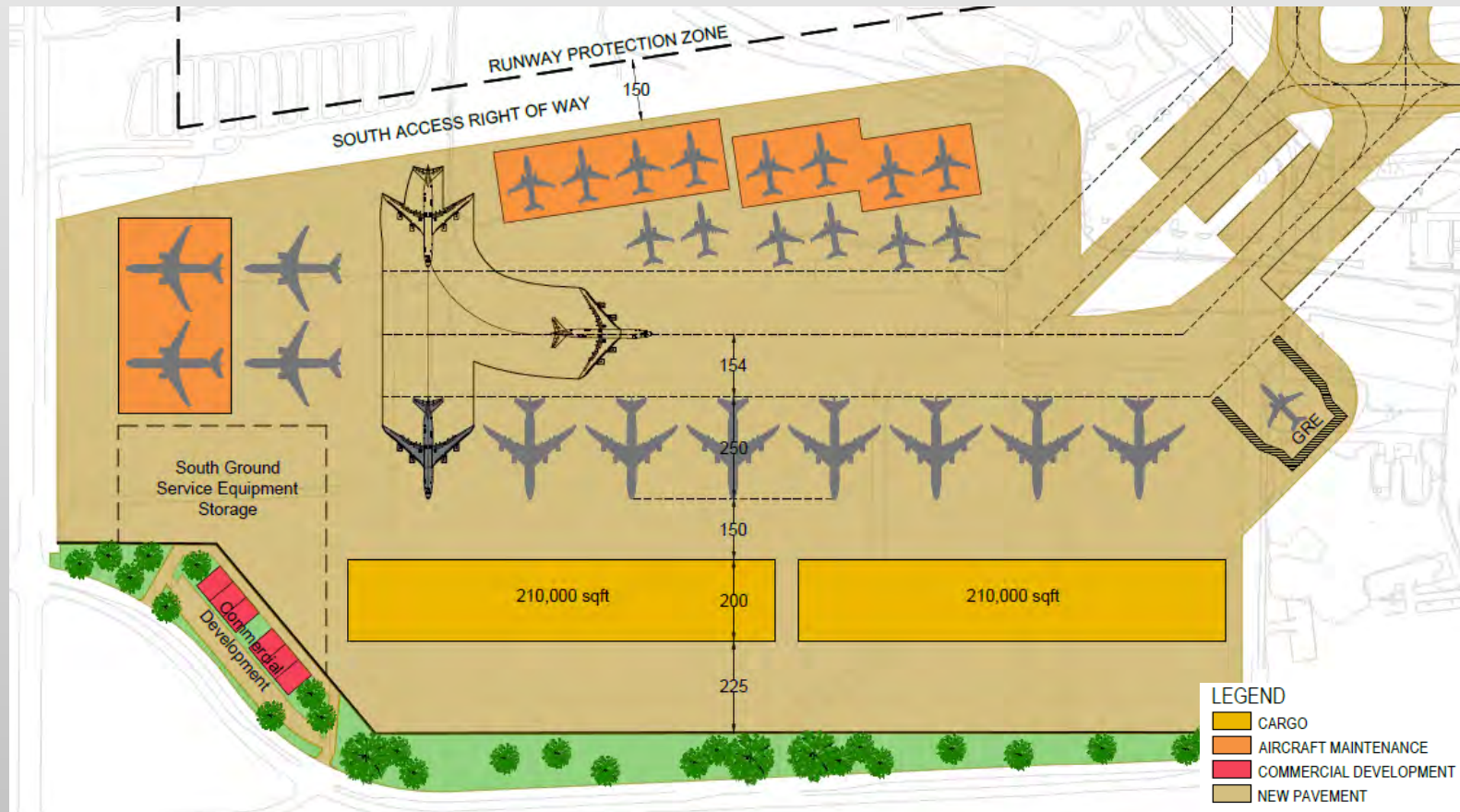


Option 2 provides a greater commercial footprint, but less area for GSE storage

South Aviation Support Area

SASA alternative facilities layouts

- Option 3: Reduced commercial development south east corner with buffer extending north and space provided for uses such as GSE storage



Option 3 provides smaller commercial footprint and more area for GSE storage

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
 - August 23 meeting: Review progress toward preferred alternative
 - draft implementation plan and order of magnitude cost
 - September 27 meeting: Staff recommendation on preferred alternative
 - Implementation plan refinements, cost estimate refinements and potential means of financing capital program

Continuing public outreach

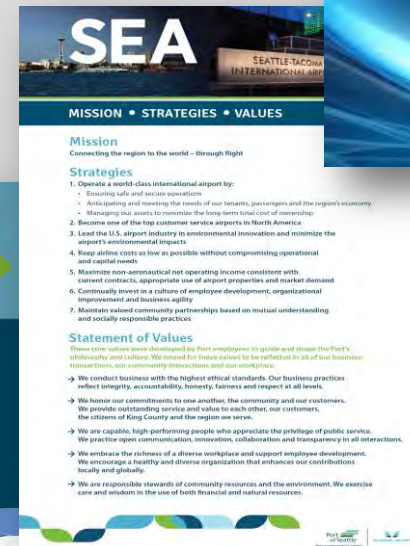
- Community open houses
 - 1st Series: SAMP process, goals, forecast (March 2015)
 - 2nd Series: Major Plan Elements (March 2016)
 - 3rd Series: Preferred Development Alternative (Q3 2016)
- Commission Roundtables
 - February, March, April, June – completed
 - August and September – planning underway
- Targeted engagement with external stakeholders (Q2)
 - Social justice community leaders
 - Airport-area business leaders
- Ongoing engagement with tenants, operators, FAA, & TSA
- Quarterly outreach report and coordination with Port calendars
- Environmental Review begins mid-2016
 - Coordinated outreach program between SAMP and environmental

Gathering input and creating wide public understanding

Sustainability integration

Sustainability goals and objectives

- Master Plan work is designed to meet sustainability goals in the Century Agenda, Airport's strategic goals, and in our new Strategy for a Sustainable Sea-Tac (S3)
- Integrating sustainability in three phases
 - What and where we build
 - How we build
 - How we operate



Sustainability integration

Screening development concepts

Developing concepts for:

- Airfield
- Terminal
- Landside

Defining requirements:

- Meet demand
- No new runways
- Increase efficiency, consistent with sustainability
- Airfield improvements and NextGen to accommodate growth
- Develop airfield simulation for concept

Converting sustainability goals into evaluation criteria

Many planning principles incorporate sustainability

Sustainability integration

What and where we build: Screening example

Criteria
Taxiway operations
Passenger convenience
Incremental expansion
Constructability
Flexibility to assign gates
Ease of adding international gates
Ability to add gates quickly
Reduced taxi/idle/delay
Impact on wetlands/creeks
Limits addition of impervious surfaces
Proximity to noise and light sensitive land uses
Consistency With Zoning

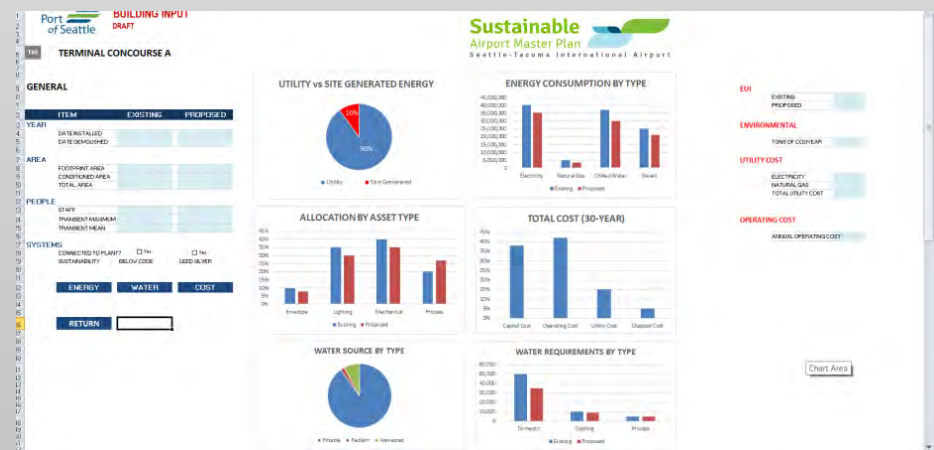
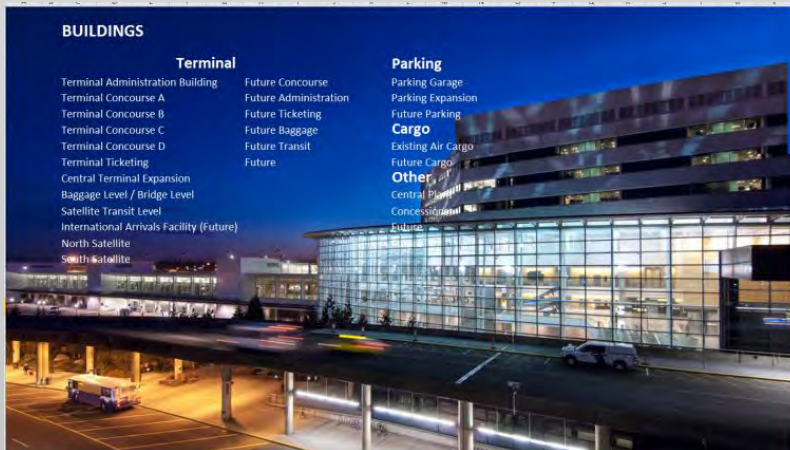


Continue synergy between planning and sustainability principles

Sustainability integration

Green buildings

- Approach for evaluating the gap between goals and future emissions
 - Build spreadsheet model to measure energy, water, GHGs, and operational costs
 - Evaluate building options (BAU, LEED Silver, net zero/neutral)
 - Estimate future emissions based on energy and water use
- Preliminary results
 - 5 to 10% improvement in natural gas use with sustainable building attributes
 - Approximately 70% reduction in lighting energy use with advanced technology



Sustainable building model provides more refined estimates of future Port-owned emissions

Sustainability integration

How we manage: Initiatives and plan

- **Develop Sustainability Management Plan to reduce the gap**
 - Assess a broad range of programs, initiatives, and actions to determine what's feasible/realistic
 - Understand our ability to reach goals
 - Make recommendations and finalize Sustainability Management Plan

High dependence on how we manage compared to how we build

SAMP environmental review

- NEPA will be conducted to comply with FAA requirements
- SEPA will be conducted to comply with Port of Seattle Commission Resolution No. 3650
- 23 environmental categories will be evaluated under NEPA and SEPA
- Landrum and Brown was selected to conduct the environmental review analysis
- Currently evaluating baseline conditions and developing a public and agency outreach strategy
- Expected to be complete in Q4 2017.