

SUSTAINABLE AIRPORT MASTER PLAN (SAMP) UPDATE

April 28, 2015

- **The SAMP is the blueprint for facilities development needed at the airport over the next 20 years to meet the air travel and cargo needs of the region.**
- **The SAMP is important because of the fast pace of regional growth and the airport's critical role in providing for the air travel and cargo needs of the region.**
- **The SAMP will determine how to best develop and operate the airport in a sustainable manner that includes economic, environmental and social goals.**



- **Where we are in the planning process**
- **Preliminary gate expansion concept recommended for modeling**
- **Airfield capacity analysis**
- **Hardstand operations challenge 2016-2024**
- **Public outreach**
- **Key findings with implications for SAMP scope & schedule**
- **Sustainability integration**
- **Next steps**

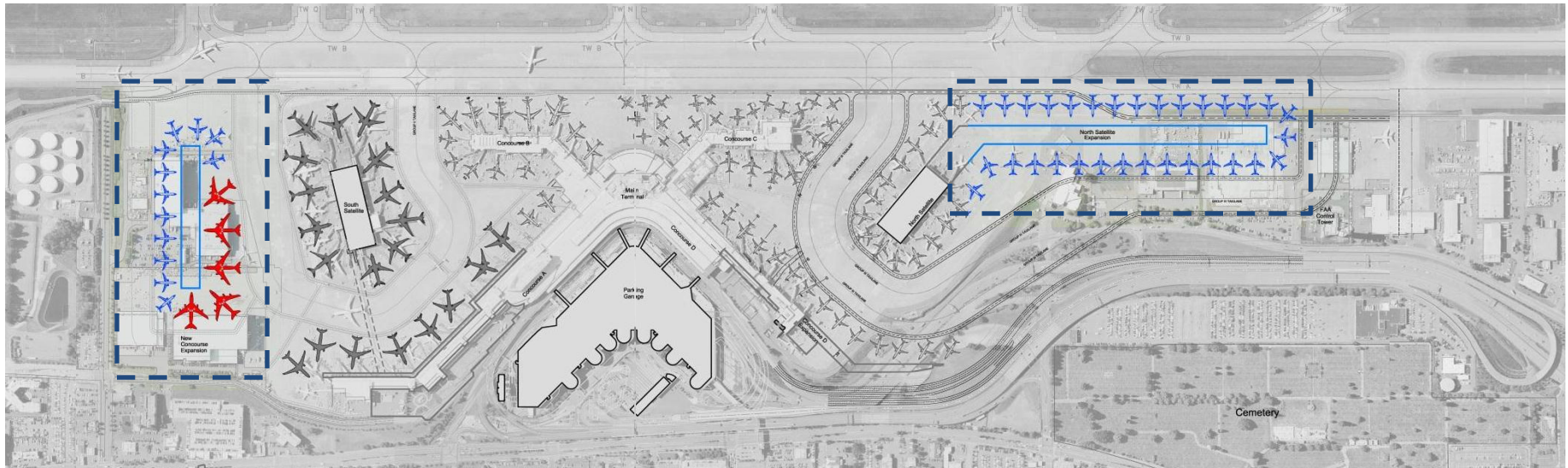
- **Gate expansion concept recommendation from planning team**
- **Forecast complete**
 - Based on regional economic forecast
 - 20-year unconstrained forecast
 - SAMP analyzing if airport can accommodate 20-year demand
- **Beginning airfield modeling (*inputs & assumptions*)**
 - Will test airfield system ability to meet unconstrained 20-year forecast
 - Linked to gate expansion concept
 - Includes simulation of potential airfield improvements (*center taxiway, & end-around taxiways*)
 - Port, FAA and Airline input into the model inputs and assumptions
- **Beginning to explore phasing for gates, terminal and hardstands**

- Meets domestic and international gate requirement
- Dual taxilanes between SSAT & new gates to the south, and between piers at north
- May not require relocation of North Airport Expressway southbound lanes
- Can incrementally phase-in additional gates
- Potential to accommodate widebody aircraft on north end



Recommended gate concept provides needed capacity and incremental expansion

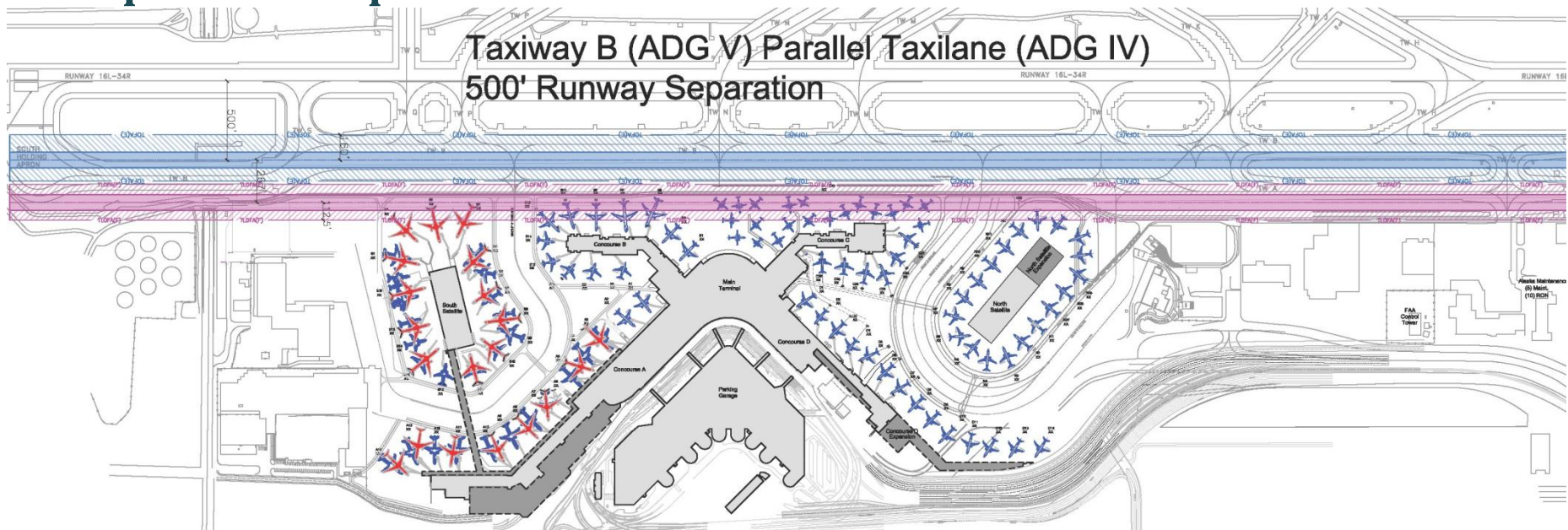
- Gate phasing has greater impact to existing facilities
- Single taxilane between SSAT & new gates to the south
- Requires lidding over S 188th ST
- Pushback onto taxiway from north gates impacts operations
- Requires relocation of North Airport Expressway southbound lanes



Rejected gate concepts have greater impact to operations and existing facilities

FAA Group V aircraft separation

- **Runway and taxiway separation does not meet FAA requirement for Group V aircraft in poor weather**
 - Several other large airports also do not comply with separation requirement
 - Numerous measures in place to ensure safety
 - Currently operating under a modification to standards
- **Will work with FAA to establish permanent exemption to Group V separation requirement**



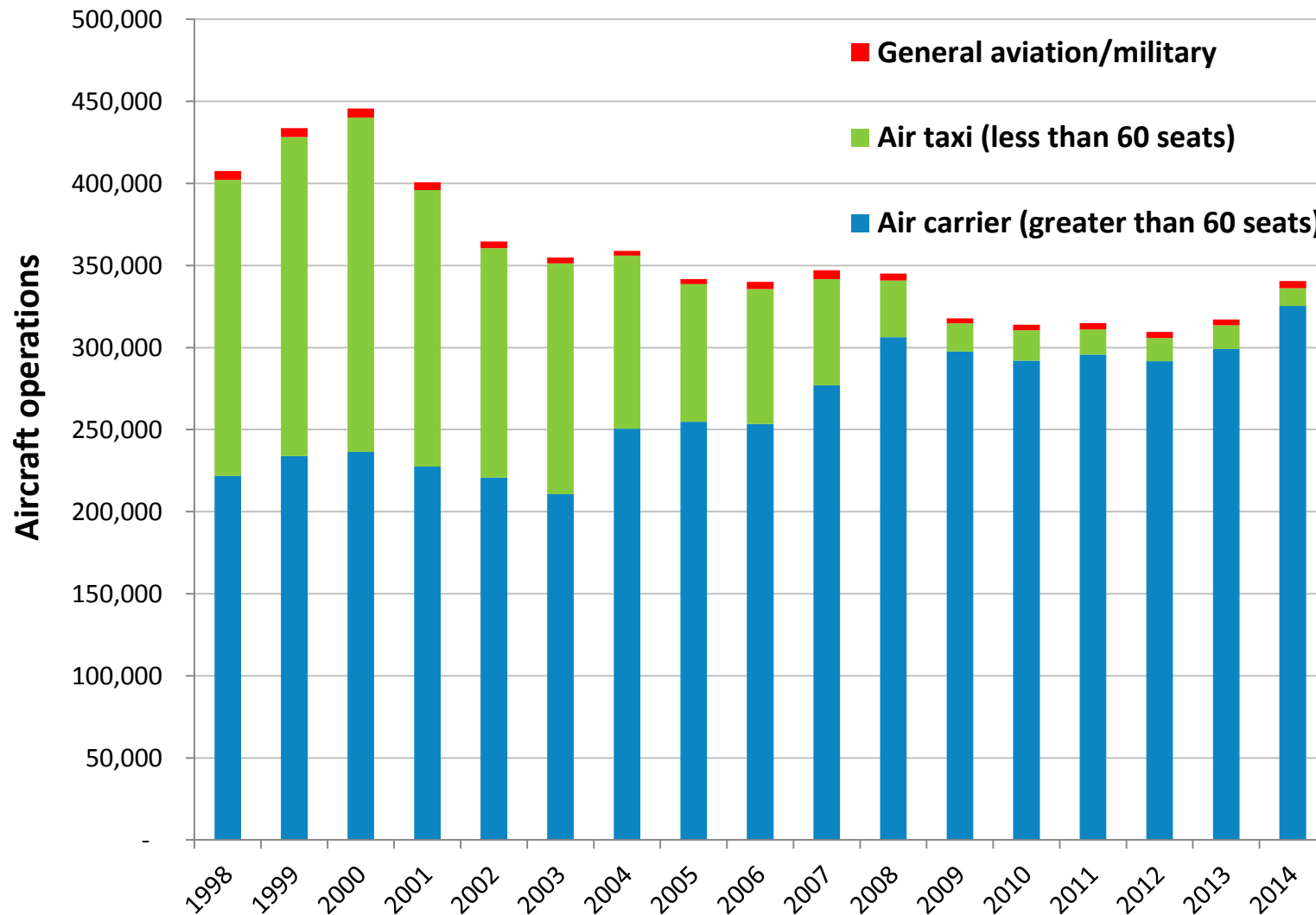
SAMP assumes SEA is a Group V airport

SEA Airside Capacity Analyses <i>Summary of past planning studies</i>	Annual aircraft operations	Average annual delay per aircraft operation (in minutes)	Methodology
1997 Master Plan Update (MPU)	600,000-630,000	15-20	Based on FAA simulation modeling and airline delay data
2002 Airfield Simulation Study	587,000	20	Simulation modeling of airfield system
2006 Comprehensive Development Plan (CDP)	550,000	16	Simulation modeling of airfield system
2015 Sustainable Airport Master Plan (SAMP)	540,000	TBD	20-year unconstrained forecast - capacity analysis pending

■ **Current early analysis indicates reduced capacity (*high level analysis*)**

- Previous airfield capacity estimates consistent with current forecasted 20-year demand
- Factors that have changed to reduce airfield capacity
 - Fleet mix shift to larger aircraft
 - Improved FAA tracking technology and greater enforcement of separation standards
 - Single departure stream for jet aircraft based on use of 3 runways

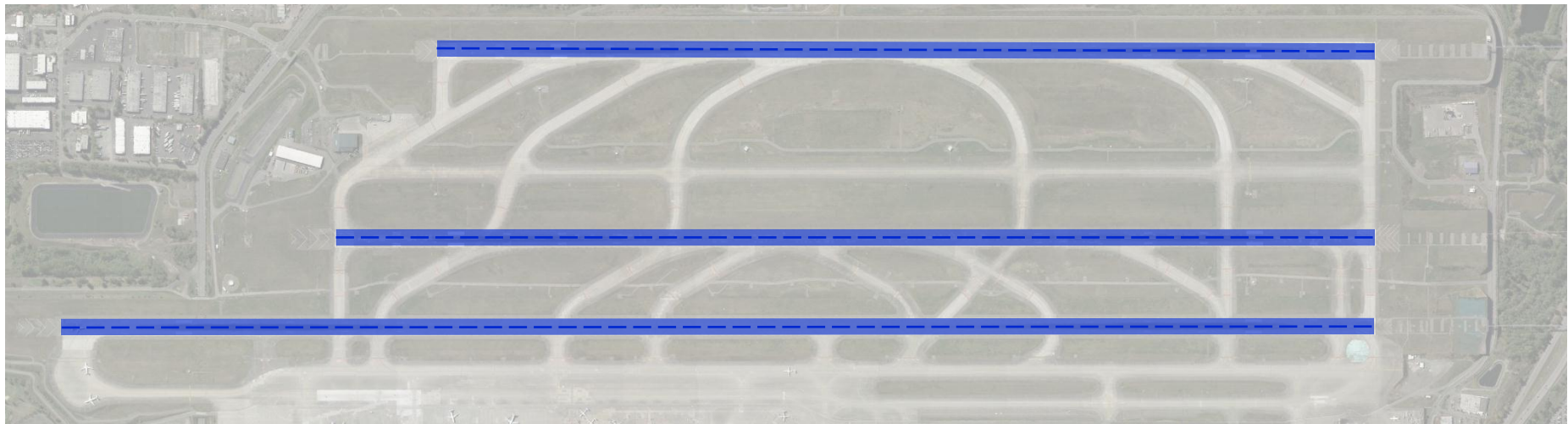
Change in fleet mix



Increase in larger aircraft has reduced airfield operations capacity

Spreadsheet calculation of runway capacity

- **Capacity/delay analysis has focused on runway capacity**
 - FAA & ACRP spreadsheet calculations
 - Industry accepted high level capacity assessment method for early planning
 - Only analyzes runway capacity - additional delay likely from several sources (*e.g. runway crossings, taxiways & gate constraints/congestion...*)
- **Analysis suggests the current runway system, with no improvements, will reach capacity well before 2034**



Early indication of capacity problem prompts need for detailed simulation modeling

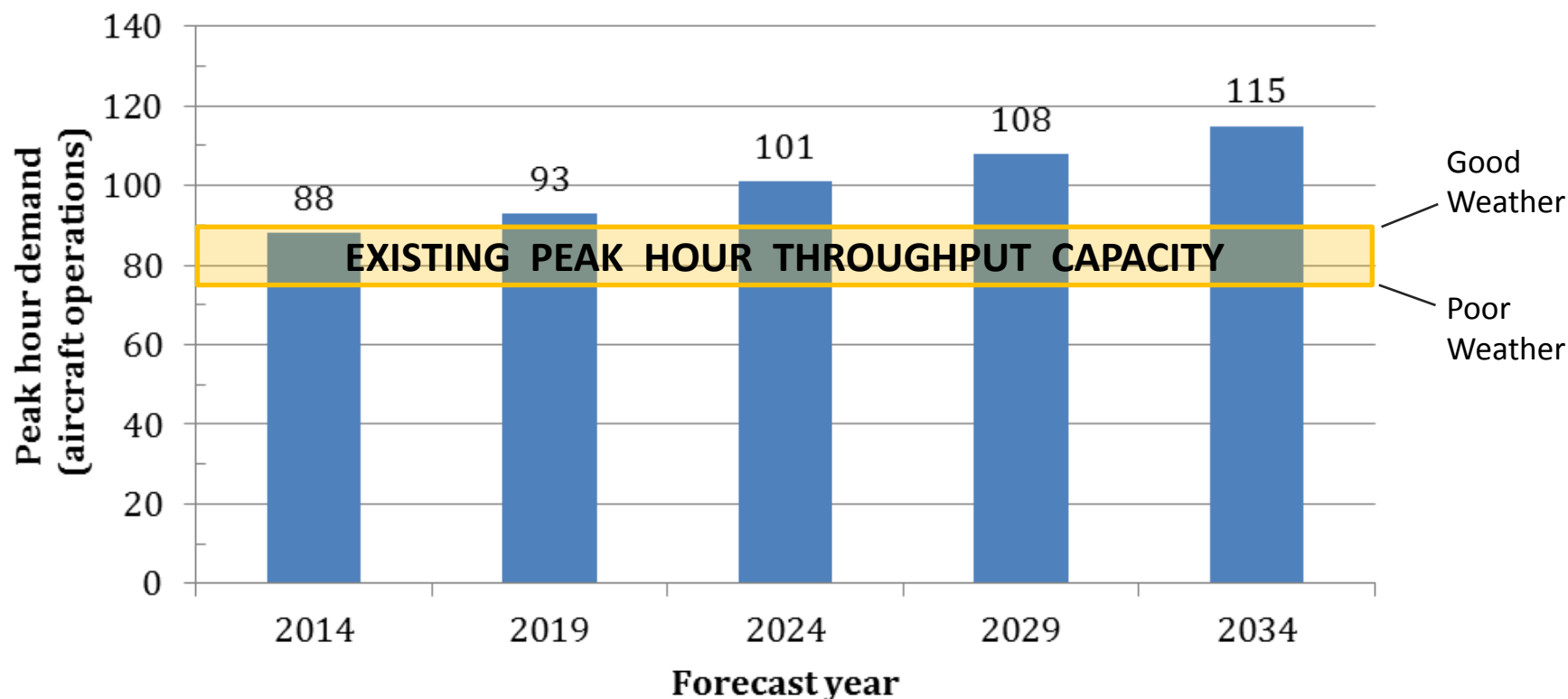
Video: simulation animation

Questions to be answered

- **What is the capacity of airfield system?** (*with and without improvements*)
 - Benefits of potential centerfield and end-around taxiways
 - Performance of gate expansion concept
 - Efficiency of aircraft flow patterns between runways and gates
 - Information for follow-on benefit-cost analysis of improvements
- **Which is a bigger capacity constraint; the runways or taxiway circulation?**
- **Is increased taxi time using end-around taxiways offset by reductions in delay?**
- **What is the timing of need for potential improvements?**

Max aircraft PER HOUR without delay

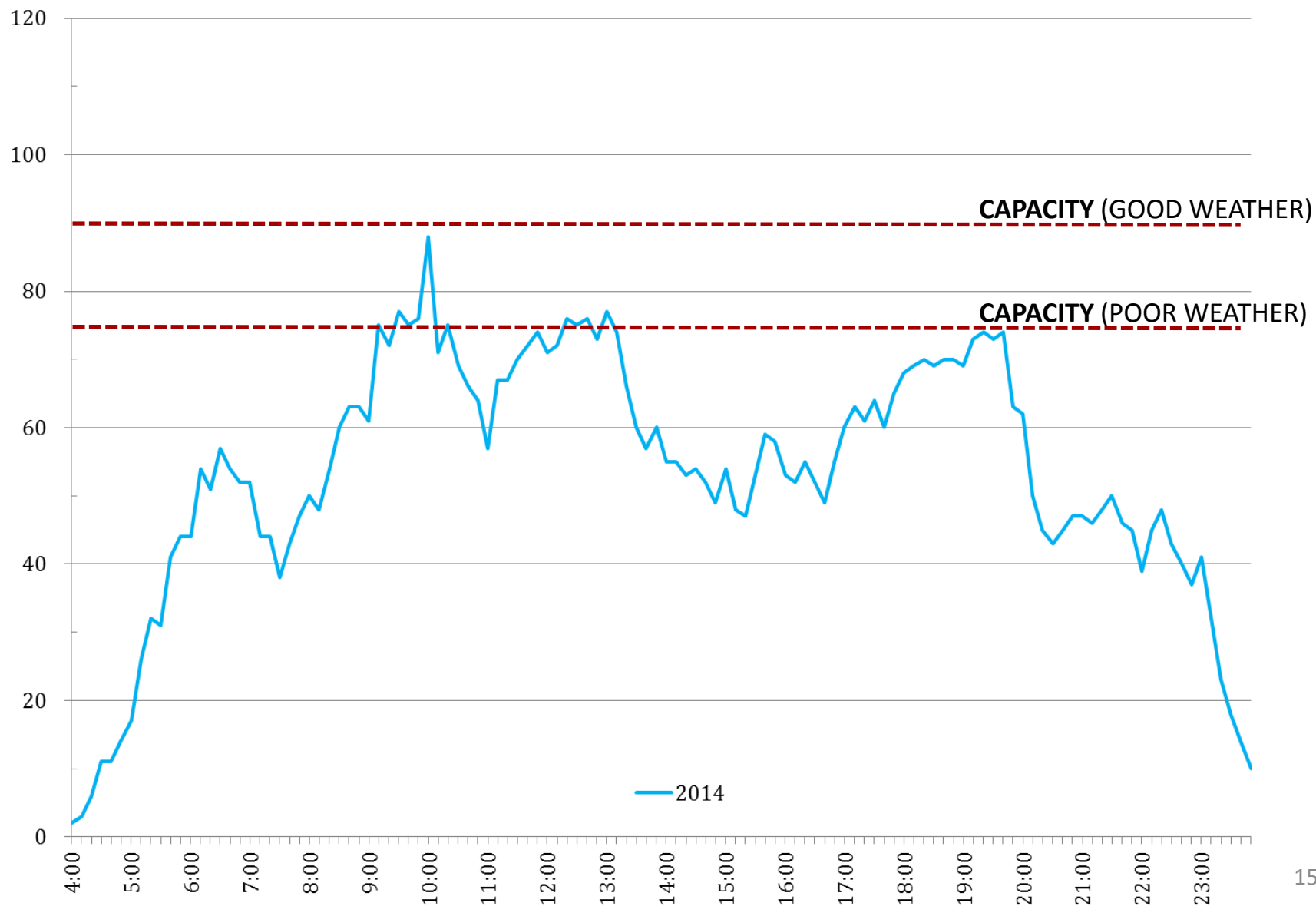
- Existing airfield has a maximum capacity of approximately 90 operations per hour in good weather, down to 76 operations per hour in poor weather
- Begin to experience airspace delay when throughput capacity is reached



Capacity varies in different weather conditions

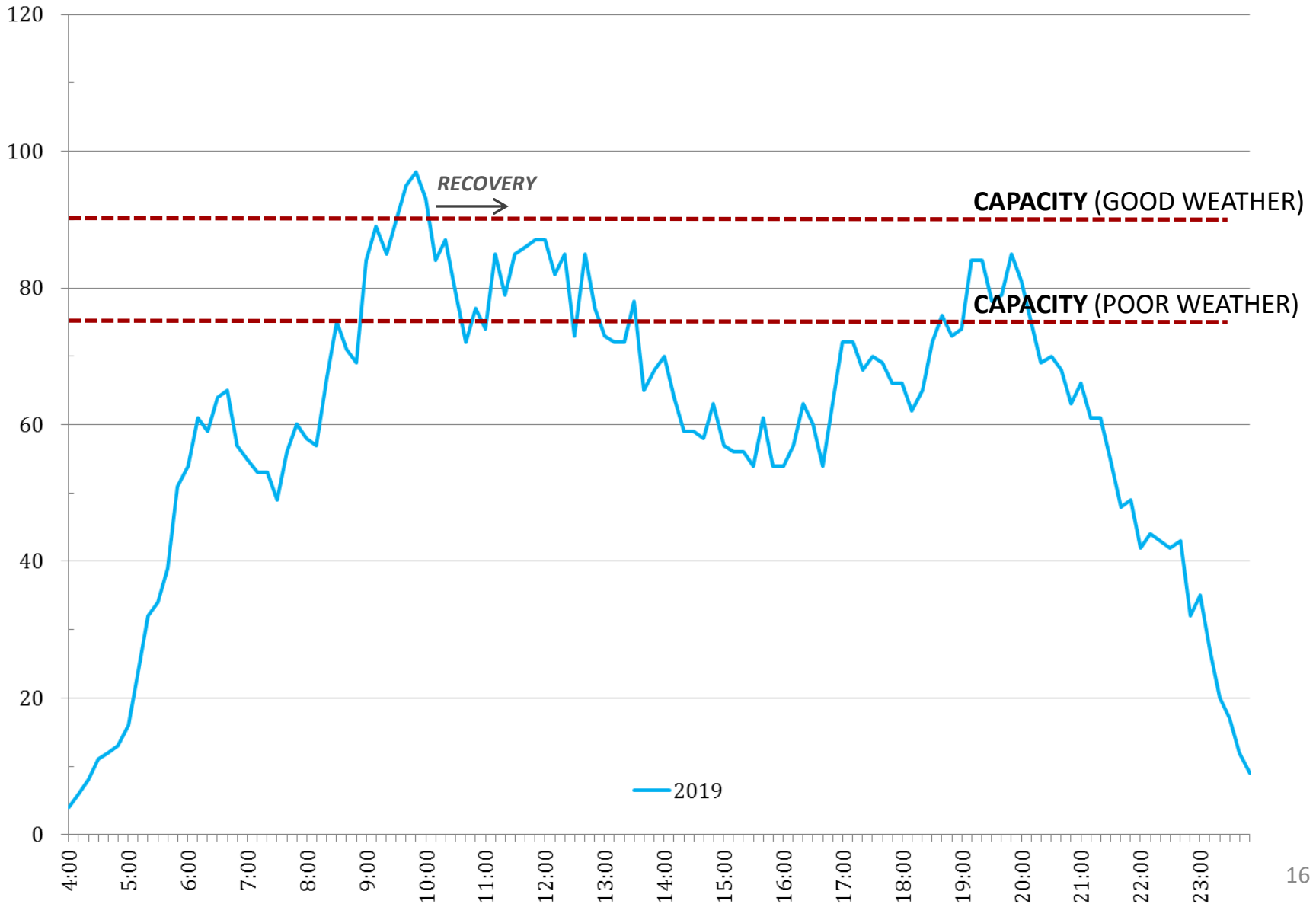
Airfield capacity analysis – throughput capacity

2014 rolling hour demand vs capacity



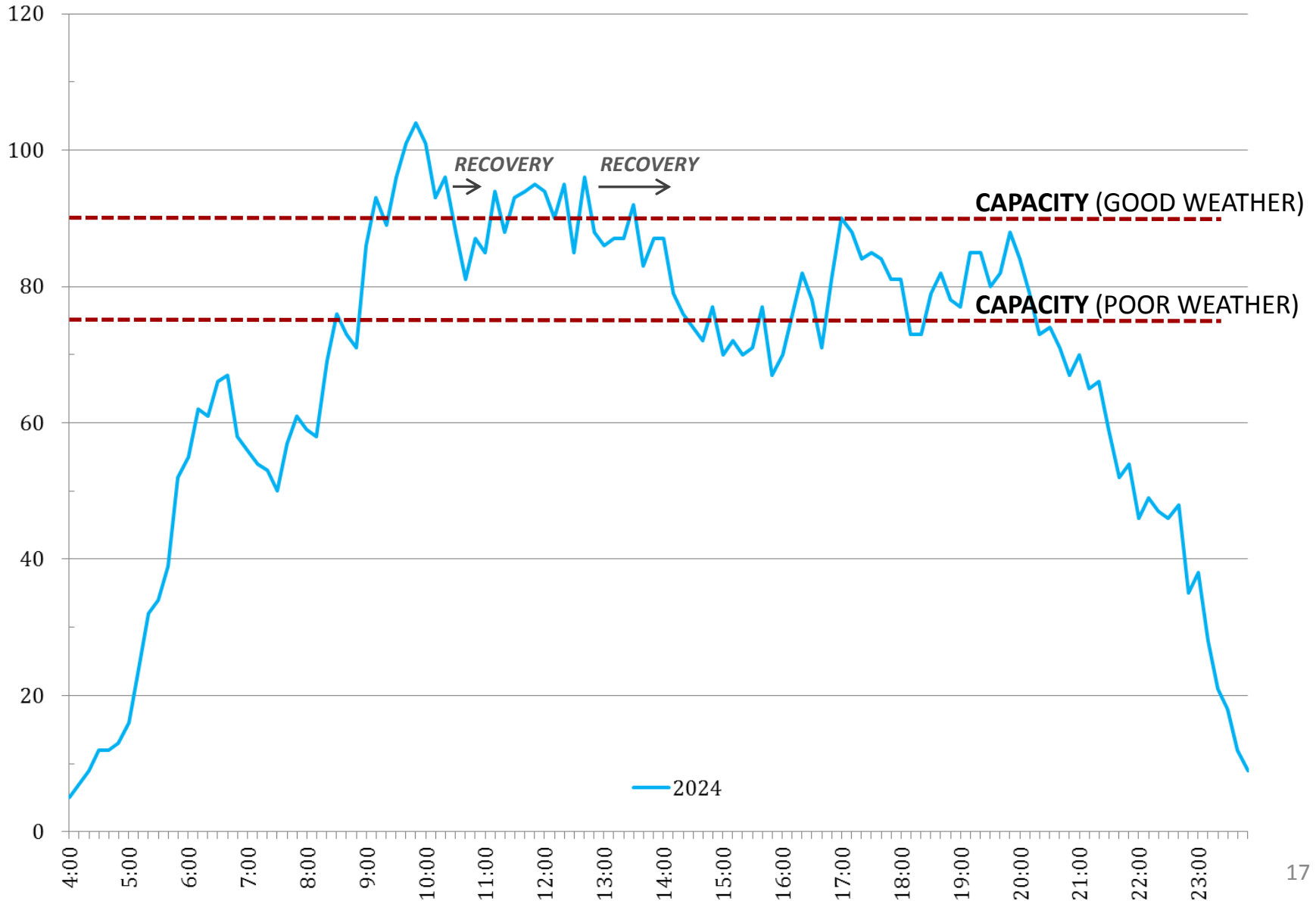
Airfield capacity analysis – *throughput capacity*

2019 rolling hour demand vs capacity and time to recover operations



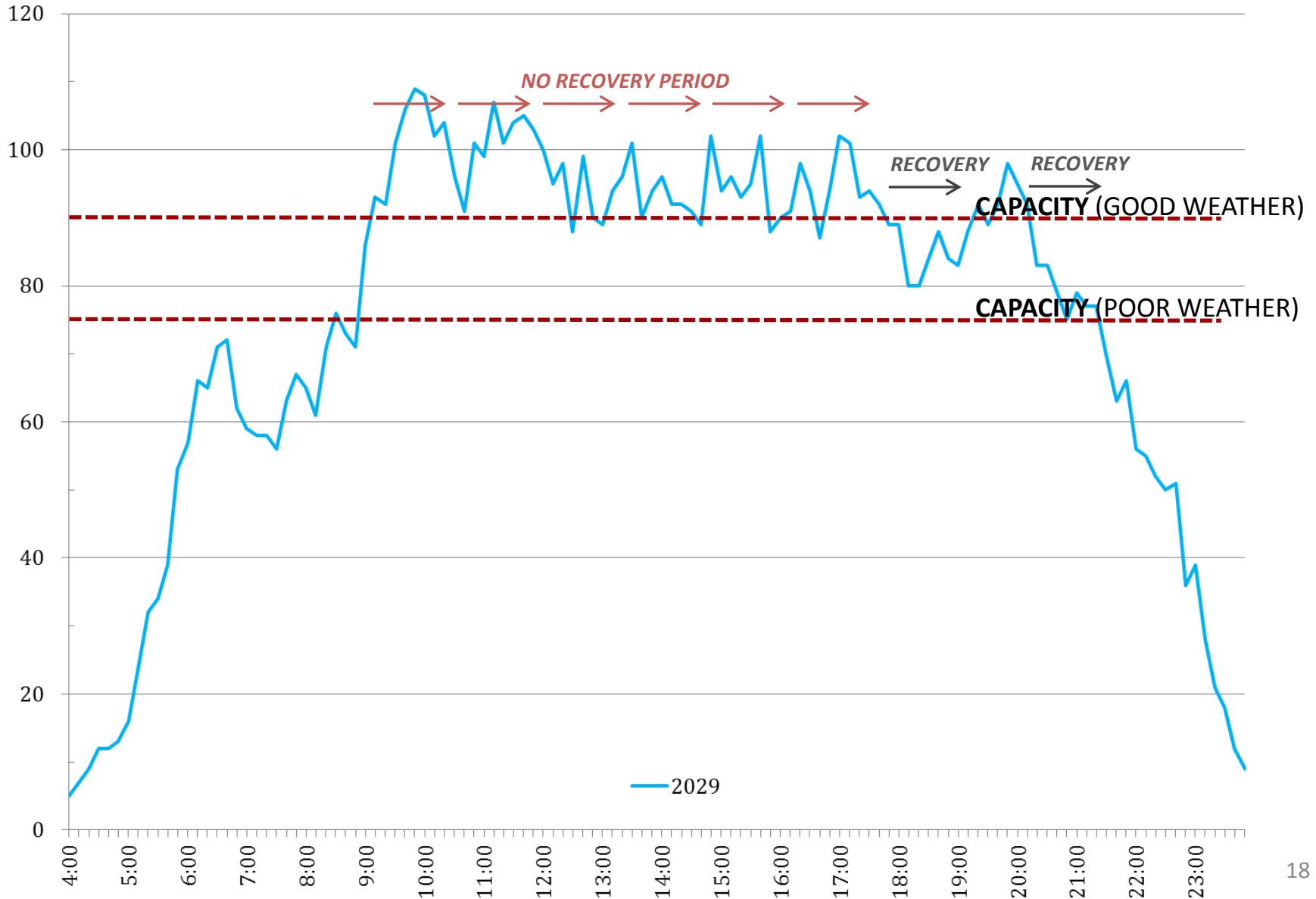
Airfield capacity analysis – *throughput capacity*

2024 rolling hour demand vs capacity and time to recover operations



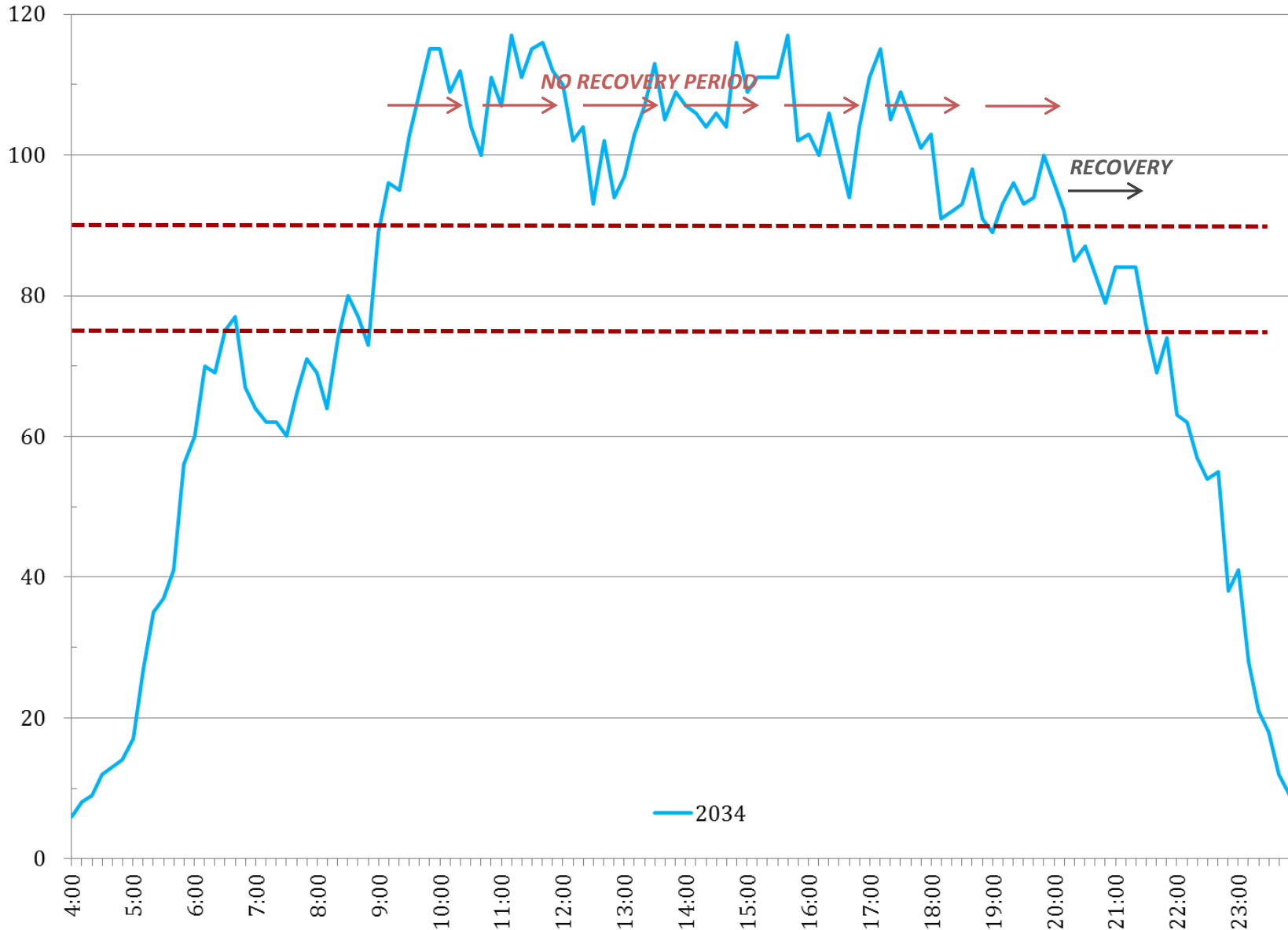
Airfield capacity analysis – throughput capacity

2029 rolling hour demand vs capacity and time to recover operations



Airfield capacity analysis – throughput capacity

2034 rolling hour demand vs capacity and time to recover operations

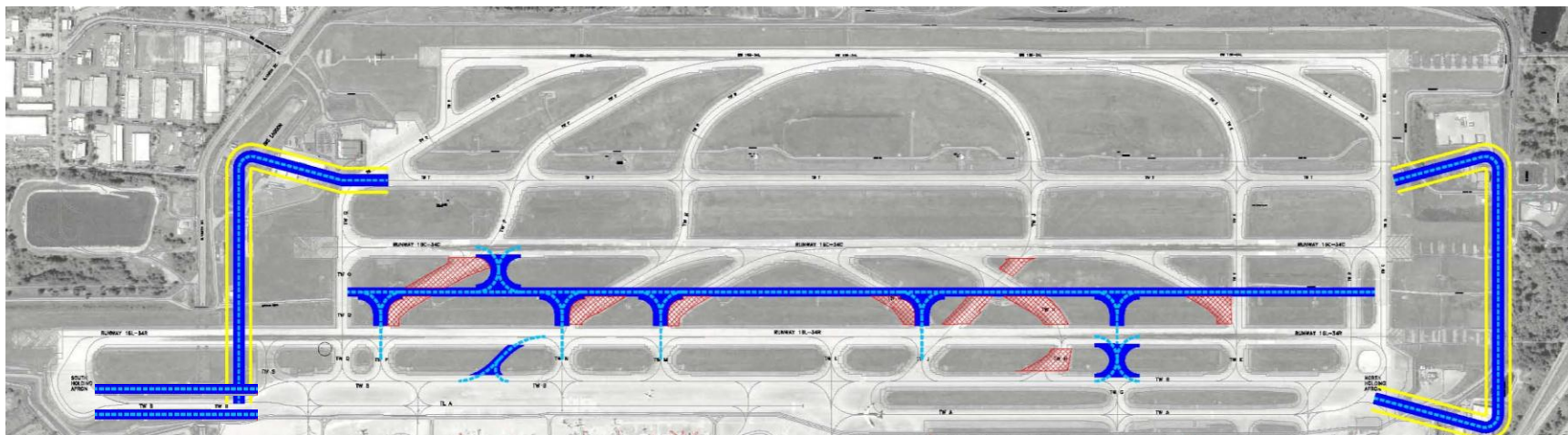


■ Potential airfield improvements include

- End-around taxiways
- Centerfield taxiway
- Dual taxiways A & B south of terminal

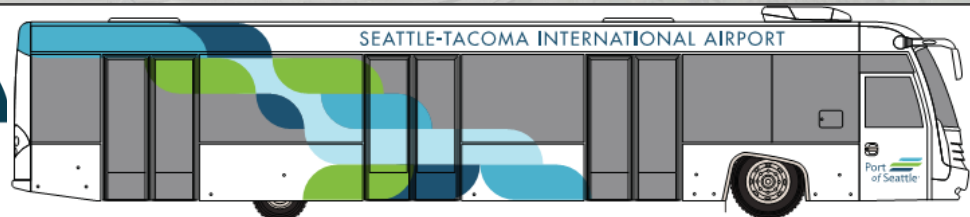
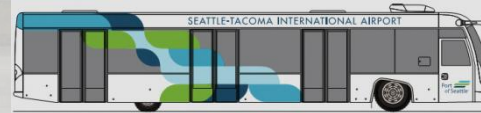
■ Complex development issues for end-around taxiways

- Development issues
 - Impact to existing facilities
 - Permitting
 - Topography
- FAA regulatory issues
 - Taxiing aircraft tail cannot penetrate runway air surface
 - End-around taxiway limited to Group III



Suite of airfield improvements: End-around taxiways would be challenging to build

Hardstand operations challenge 2016-2024



Rapid growth

- **Rapid growth in recent years**
 - Passengers: up 4.7% in 2013 & 7.5% in 2014
 - Aircraft operations: up 2.5% in 2013 & 6.9% in 2014
- **Even higher increases projected for 2015** (*based on year to date volumes*)
 - Passengers: 10% over 2014
 - Aircraft operations: 11% over 2014

Facilities requirements

- **Hardstands** (*requirements assume 737 narrowbody equivalent*)
 - First scheduled hardstand operations anticipated in 2016
 - 4 gates out of service 2016-2019 due to IAF construction
 - 11-13 parking positions required in 2020
 - 13-15 parking positions required in 2024

- **Holdrooms**
 - Will need a combination of additional capacity in existing terminal and remote holdroom locations(s)

- **Support equipment**
 - COBUS vehicles and maintenance facilities
 - Fueling trucks
 - Airstairs

- **Currently working to define phasing of hardstand and holdroom construction and timing of need for support equipment**

Holdroom capacity deficit in 2024 equivalent to Concourse A

Facilities requirements

▪ Hardstands

- Existing capacity: 18 aircraft parking positions (“stands”) (*737 equivalent*)
 - Busing operations at hardstands will reduce aircraft parking capacity
 - Existing hardstands currently accommodate remain overnight (RON) parking for passenger aircraft



Facilities requirements

■ Hardstands

- Existing capacity: 18 aircraft parking positions (“stands”) (*737 equivalent*)
 - Busing operations at hardstands will reduce aircraft parking capacity
 - Existing hardstands currently accommodate remain overnight (RON) parking for passenger aircraft
- Potential for new hardstands at end of Concourse D and at Cargo VI



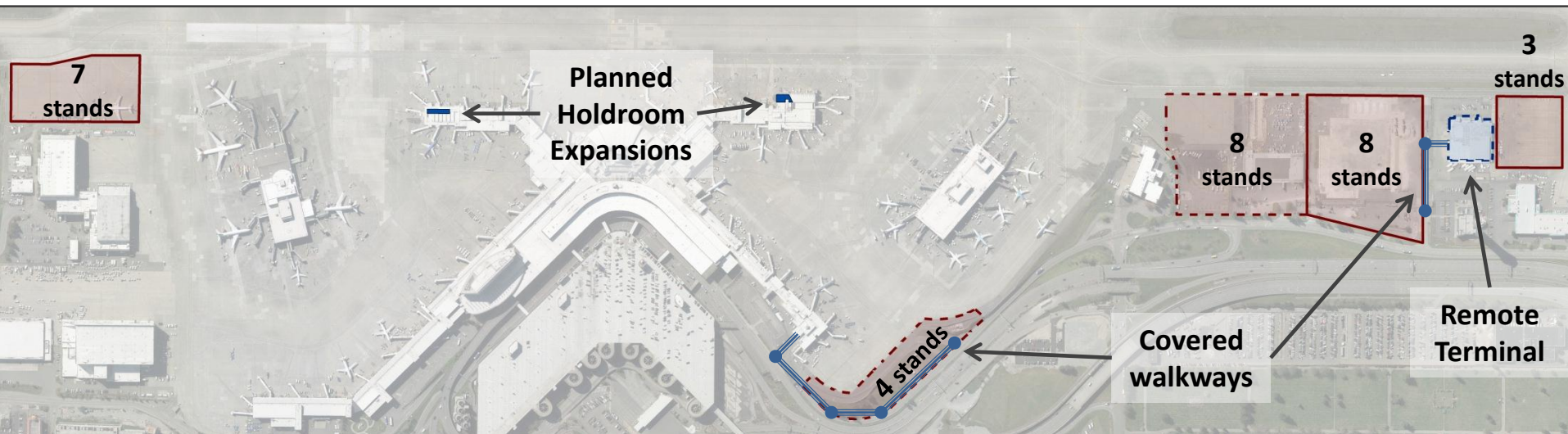
Urgent need for hardstands may require streamlined project delivery

Facilities requirements

▪ Holdrooms

- Opportunity for remote terminal at former United Airlines cargo building
- Holdroom expansion projects planned at Concourses B & C
- Shortage of capacity in near-term (*even with identified opportunities*)

▪ Will be back to Commission for further discussion



Shortage of holdroom capacity to accommodate hardstand operations

Airport-area outreach

▪ Briefings and presentations

- City Council presentations in Burien, Des Moines, SeaTac
- Port of Seattle/City of SeaTac JAC Updates
- Highline Forum briefings
- Chamber presentations – informal and scheduled program
- PSRC - Transportation Policy Board
- Regional, community and business organization presentations

▪ Other outreach

- Airmail, Sea-Tac's community newsletter
 - Readership – 32,000 single family households within the airport communities
- Connections, tenants and operators, stakeholders, business interests
 - Online and print distribution
- Port website postings, social media, email blasts & press release

Regional and local government outreach

■ Community open houses designed to engage regional audience

— 1st Series: SAMP process, goals, forecast, and development concepts

✓ March 4, Mount Rainier High School , 5 – 7 p.m. (65 attendees)

✓ March 19, Seattle Central Library , 5 – 7 p.m. (27 attendees)

✓ April 2, Bellevue Public Library, 5 - 7 p.m. (31 attendees)

— 2nd Series (Summer 2015): Preliminary Alternatives

— 3rd Series (Fall 2015): Preferred Development Alternative

■ Transportation Review Committee

— Engage local & regional planners on transportation issues in SAMP

— Engage local & regional planners on improvements to ease congestion

— 1st meeting planned for Q2 of 2015

■ Regional and local government briefings



▪ Outreach focus

- Proactively provide information; seek feedback and engagement
- How does Sea-Tac affect stakeholders – community, business, traveling public
- How can Sea-Tac benefit stakeholders – community, business, traveling public

▪ Feedback summary from first series of open houses

- Open house and display boards were effective to engage public
- Curiosity about what's driving Sea-Tac's growth
- Awareness about growing congestion on airport drives
- Concerns about traffic impacts
- Interest in easier circulation between gates, check-in areas and light rail
- General concerns about aircraft noise
- General concerns about aircraft emissions



WHAT and WHERE We Build

- **First Tier: Alternatives analysis for Sustainability- Plan airport that meets future needs in a way that:**
 - Optimizes efficiency of airport layout
 - Creates efficiency for airlines and passengers
 - Enables airfield and ground movements that reduce fuel burn and emissions
 - Maximizes use of limited real estate
 - Provides future capacity at the appropriate time
 - Minimizes wetland and creek impacts
 - Uses existing facilities where practical, and adds new facilities when needed
 - Optimizes the investments we have made in the airport

HOW We Build (Preferred Airport-Wide Concept)

- **Second Tier: Design and build sustainable new and renewed facilities that include:**
 - LEED
 - Energy efficiency
 - Water conservation
 - Integrate environmentally-preferred building materials
 - Recycling Infrastructure
 - Climate resiliency
 - Stormwater detention and treatment
 - Total cost of ownership

HOW We OPERATE

- **Third Tier: Develop operational sustainability initiatives to meet goals and objectives**
- **Identify gap between projection of 2034 environmental footprint and Century Agenda and S3 goals**
- **Develop sustainability management plan that closes the gap**
 - Energy efficiency
 - Carbon reduction
 - Emission reductions
 - Recycling
 - Water quality
 - Noise abatement

- **Model airfield and terminal ramp area**
 - Determine airfield capacity & benefit of potential airfield improvements
 - Based on determination of airfield capacity, confirm gate requirement and refine gate expansion concepts
- **Determine landside and airport/airline support facility requirements to support preferred terminal concept**
- **Integrate airport facilities into a comprehensive land use plan**
 - Allocate land based on land use prioritization/hierarchy
 - Determine what should be accommodated in the South Aviation Support Area (SASA)
- **Develop phased implementation plan for entire SAMP capital program**
- **On-going Commission guidance**