



PABT International Design + Deliverability Competition: *Designing for the Future of New York*

APTA Bus and Paratransit Conference
May, 2017

Sam Schwartz

Sam Schwartz

Transportation Consultants

Transportation Planning + Design

Traffic Engineering

Transit Services

Construction Engineering + Inspection

Transportation Infrastructure

Public Outreach + Communications

Research + Policy

Shared Mobility + Transportation Technologies

- Leader in Transit and Transportation Planning and Engineering
- Specialists in developing context-sensitive solutions for government, private-sector, not-for-profit, and community clients
- Designed several successful transit facilities and bus terminals across the United States
- Headquarters in New York City, with branches in Washington, DC and nationwide
- Over 100 employees across the country

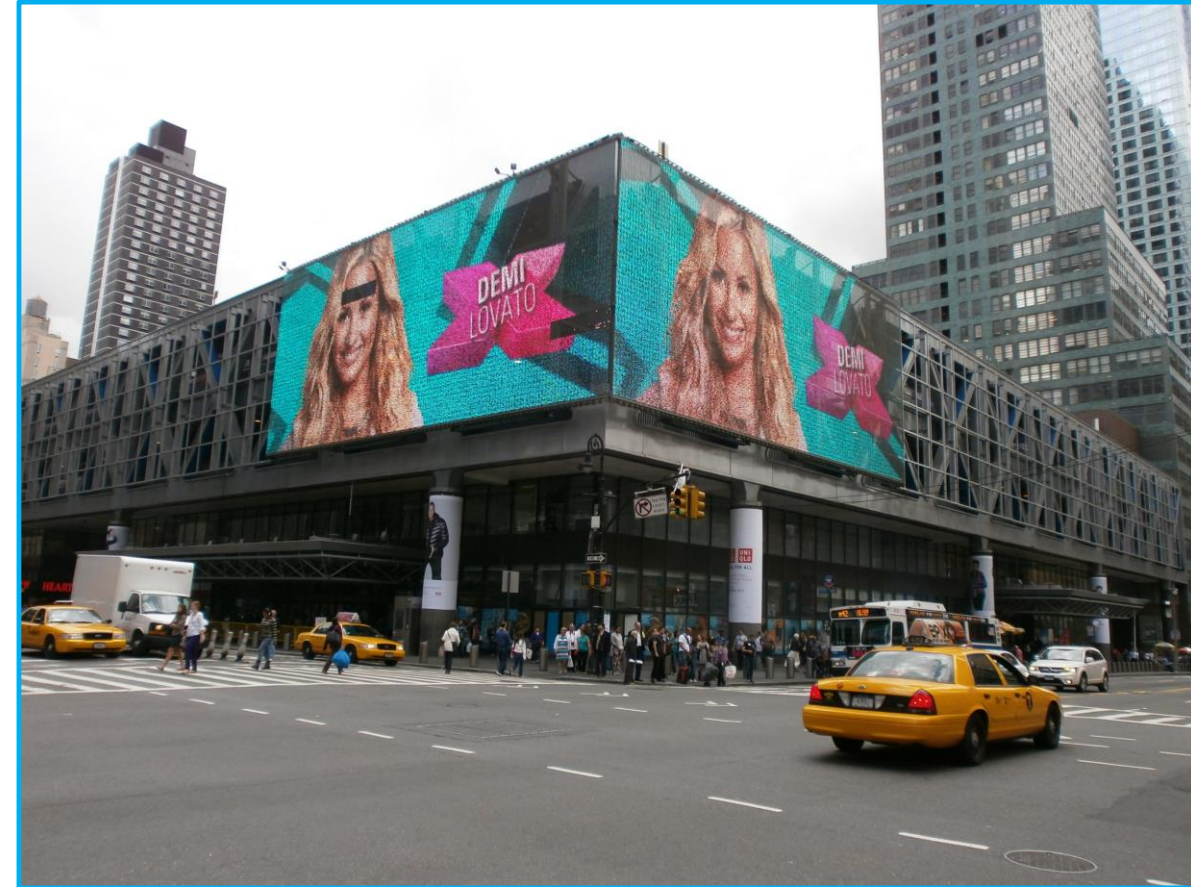
Disclaimer: *This presentation describes Arcadis' submittal in the PABT International Design + Deliverability Competition, however, it is not a representation of the Port Authority's plans with respect to replacement of the PABT. The Competition was part of a pre-planning exercise by the Port Authority. Sam Schwartz was part of the Arcadis of New York, Inc. team, which was 1 of the 5 Competition finalists. Please see www.pabtcompetition.com to review the findings of the competition's independent panel of experts. All images and information relating to competition concepts were submitted to the Port Authority as part of the competition by the Arcadis team and are used with permission of the Port Authority. Opinions expressed are those of Sam Schwartz Engineering, not the Port Authority. The Port Authority does not endorse this presentation.*

PABT International Design + Deliverability Competition

- PABT one of the largest and busiest bus terminals in the world
- Originally constructed in 1950, expanded in 1963 & 1979
- Further expansion not likely, new facility or reconstruction needed
- The PA Board directed the Executive Director to conduct an international competition to solicit conceptual designs

Today's PABT Facility

- Two levels of ticketing & concourse
- Three levels of active bus gates
- ~600 commuter and 50 intercity departures/hour PM peak hour
- 225,000 passengers/day

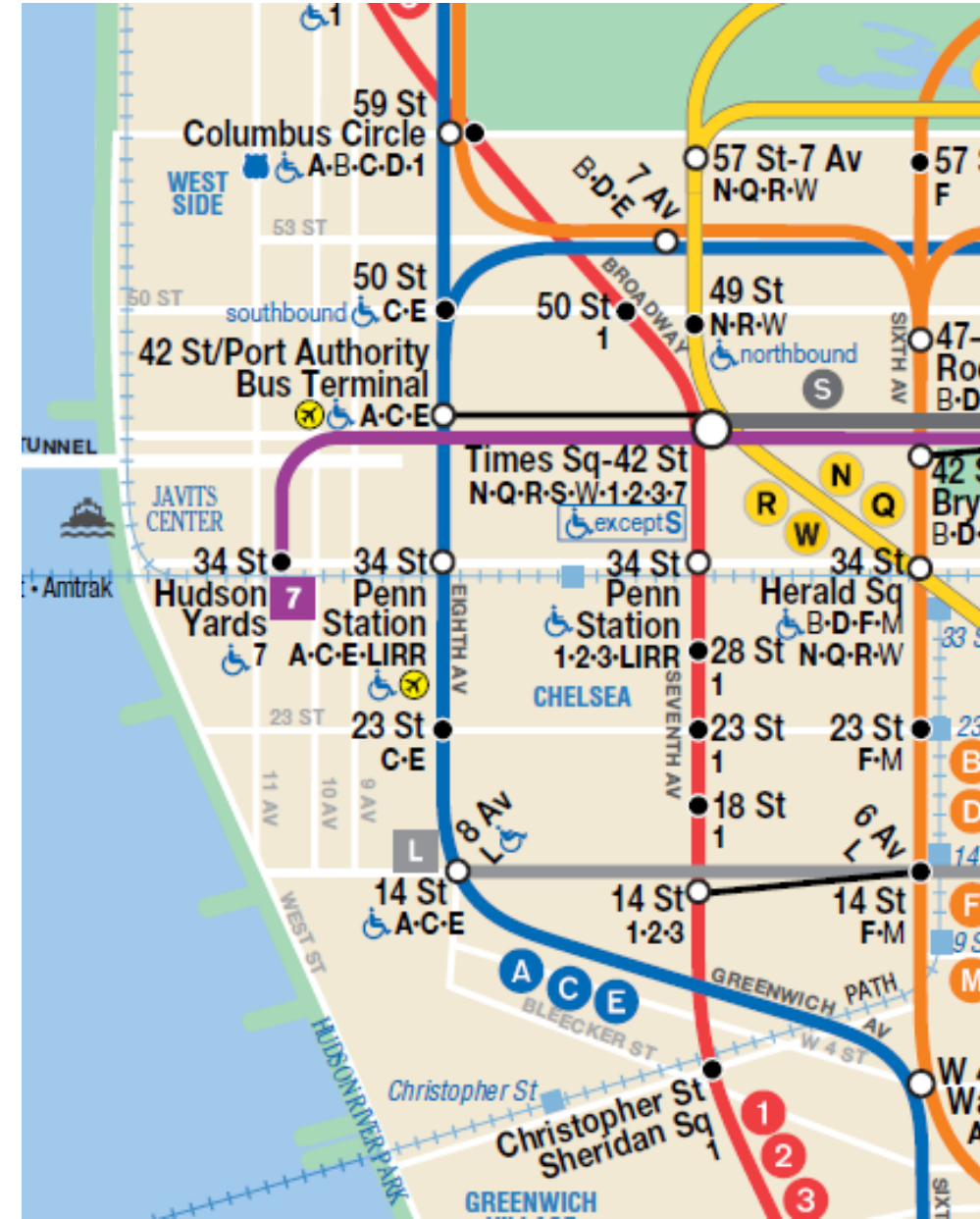


PABT Ramp System



Role in NYC Transportation Network

- Portal for all bus travel from New Jersey and points north
- Located at a nexus of several subway lines
- Easy transfers to subway without the need to use city streets
- Only terminal in operation following Superstorm Sandy



Motivation for Expansion and Competition

- Operating at or above capacity
- Bus volumes projected to increase 35% and passengers 50% over next 25 years
- Redundancy for aging Amtrak tunnels needed
- Minimize disruption to NYC transportation during major capital project



Competition Goals

- Implementable, practical conceptual design accommodating projected 2040 bus and passenger volumes
- Focus on “deliverability” – Is it constructible and how?
- Multi-disciplinary considerations – Operations, Civil, Structural, Security, Utilities, Technology, etc.
- Capital cost

Competition Criteria and Guidance

- Site west of 9th Avenue preferred
- Sequential construction of key elements
- Scalable for future needs
- Pedestrian connections to mass transit
- Minimizes traffic impacts to local streets
- Sensitive to community concerns and needs



The Arcadis of New York Team



CALLISONRTKL
A DESIGN CONSULTANCY OF ARCADIS

BNT HMC RVL



And many others...

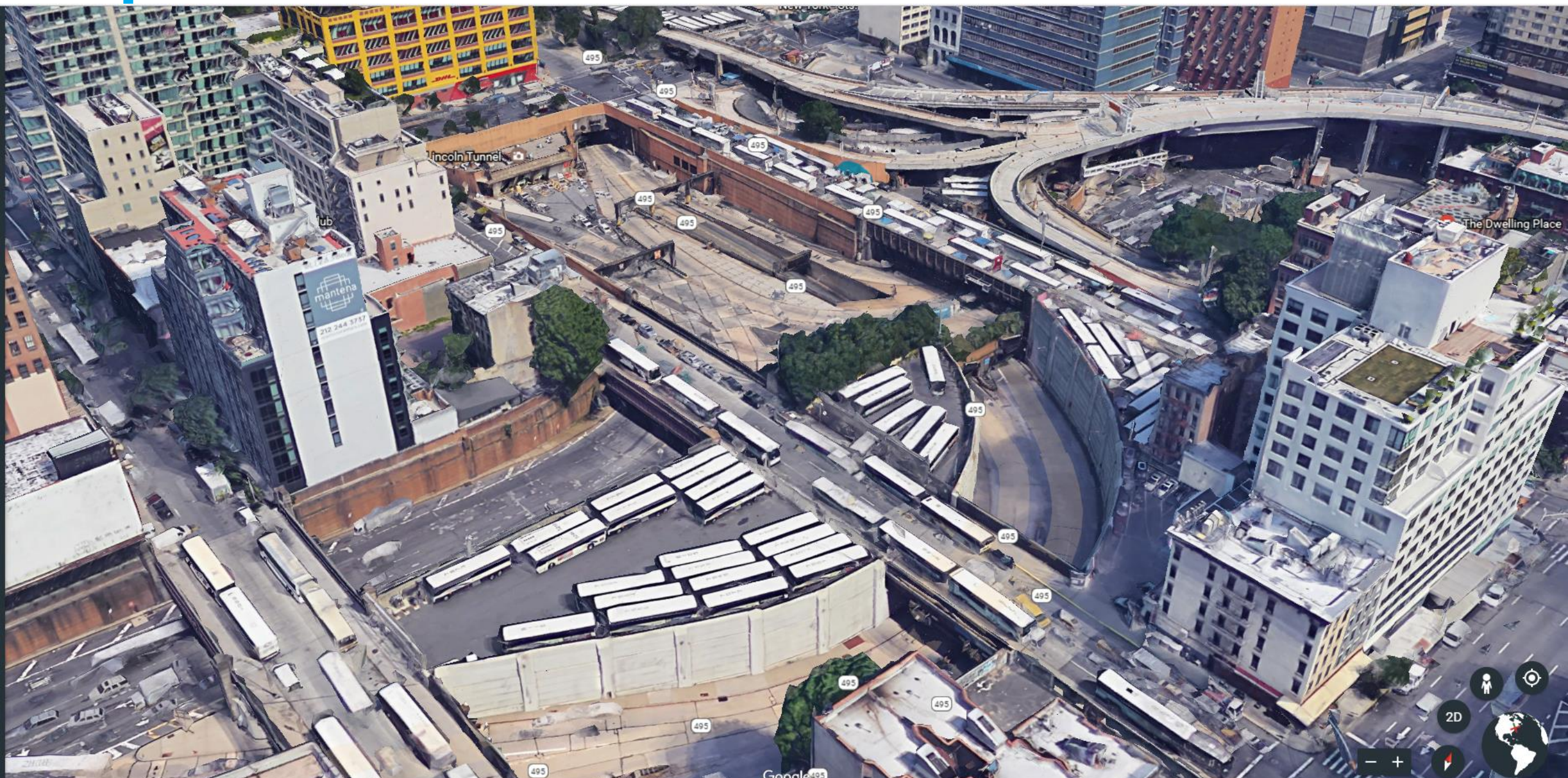
Selecting the Site



Selecting the Site



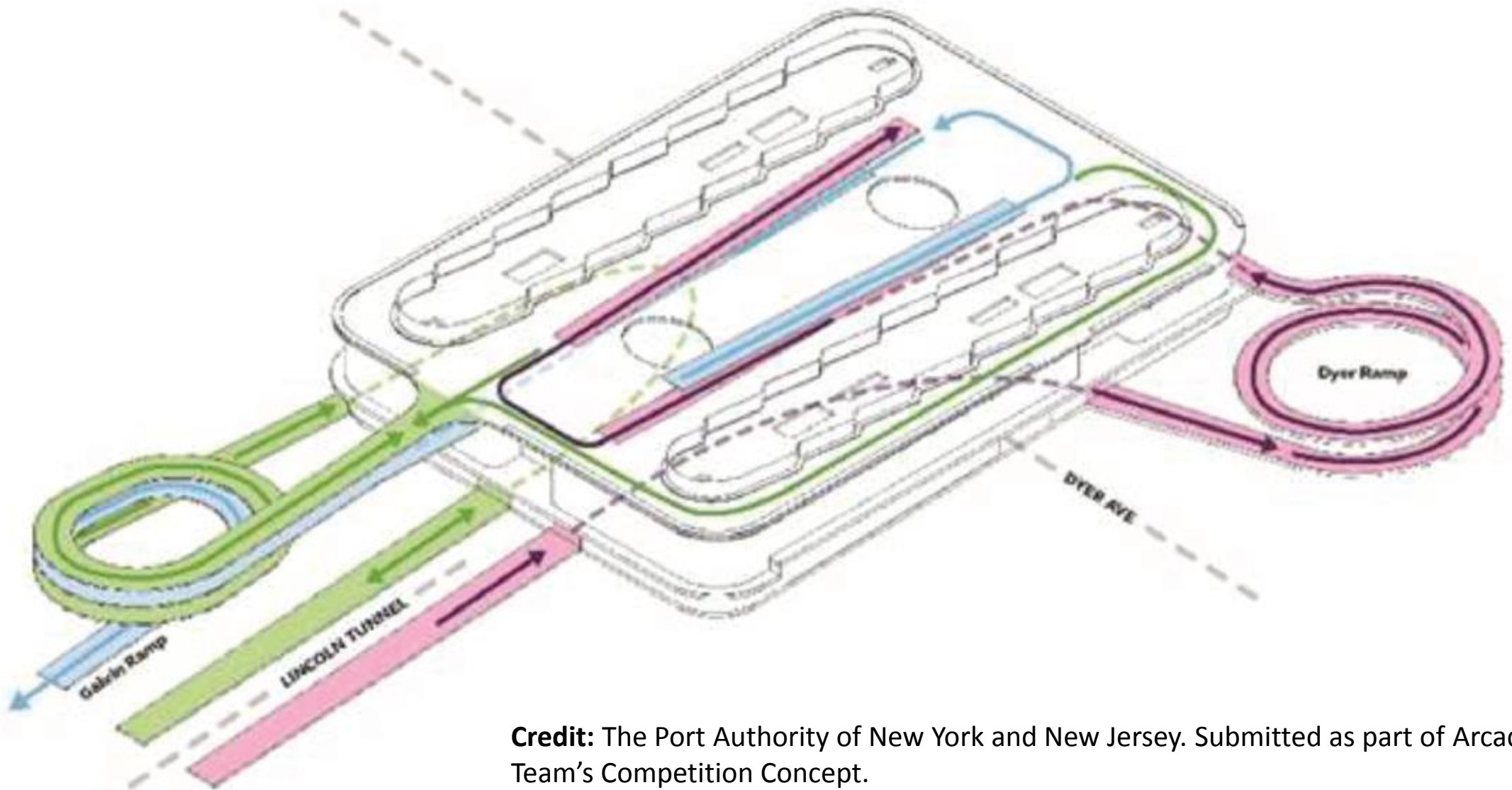
Site Elevation



Designing the Access/Egress Ramps

- Access/Egress ramps a critical feature
- Requires sufficient capacity and redundancy
- Direct access to and from the Lincoln Tunnel in very short distance
- 1 dedicated outbound, 1 dedicated inbound, 1 reversible
- Goal for all ramps to each be two lanes wide
- Ramps become driver of overall facility design

Designing the Access/Egress Ramps

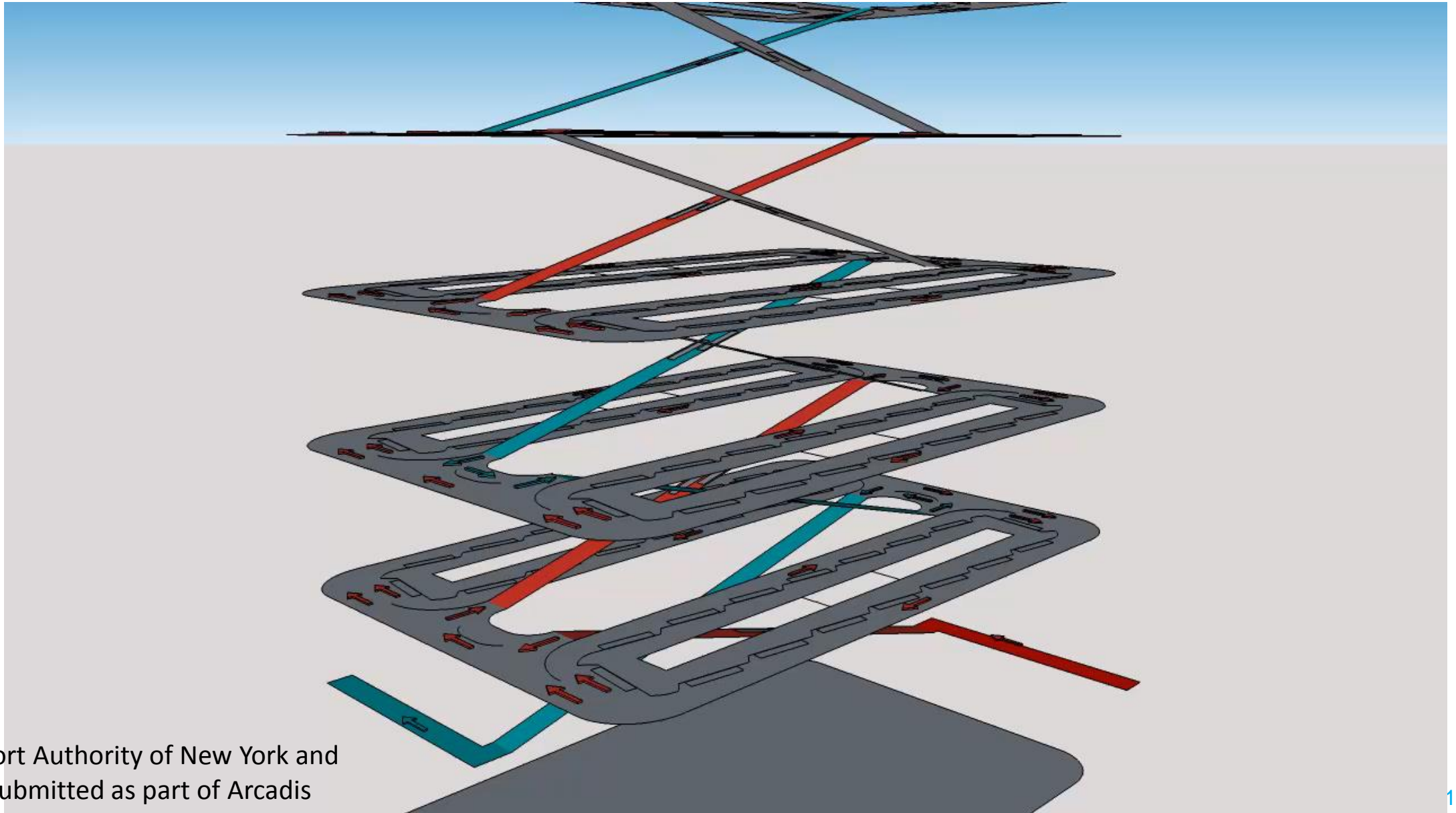


Credit: The Port Authority of New York and New Jersey. Submitted as part of Arcadis Team's Competition Concept.

Internal Vertical Circulation

- Current facility lacks ability to travel between levels
- A breakdown or other issue will bring operations to a halt
- New facility needs to increase flexibility
- Straight ramps allow for higher capacity at greater safe speeds
- Provide potential for reverse direction

Internal Vertical Circulation

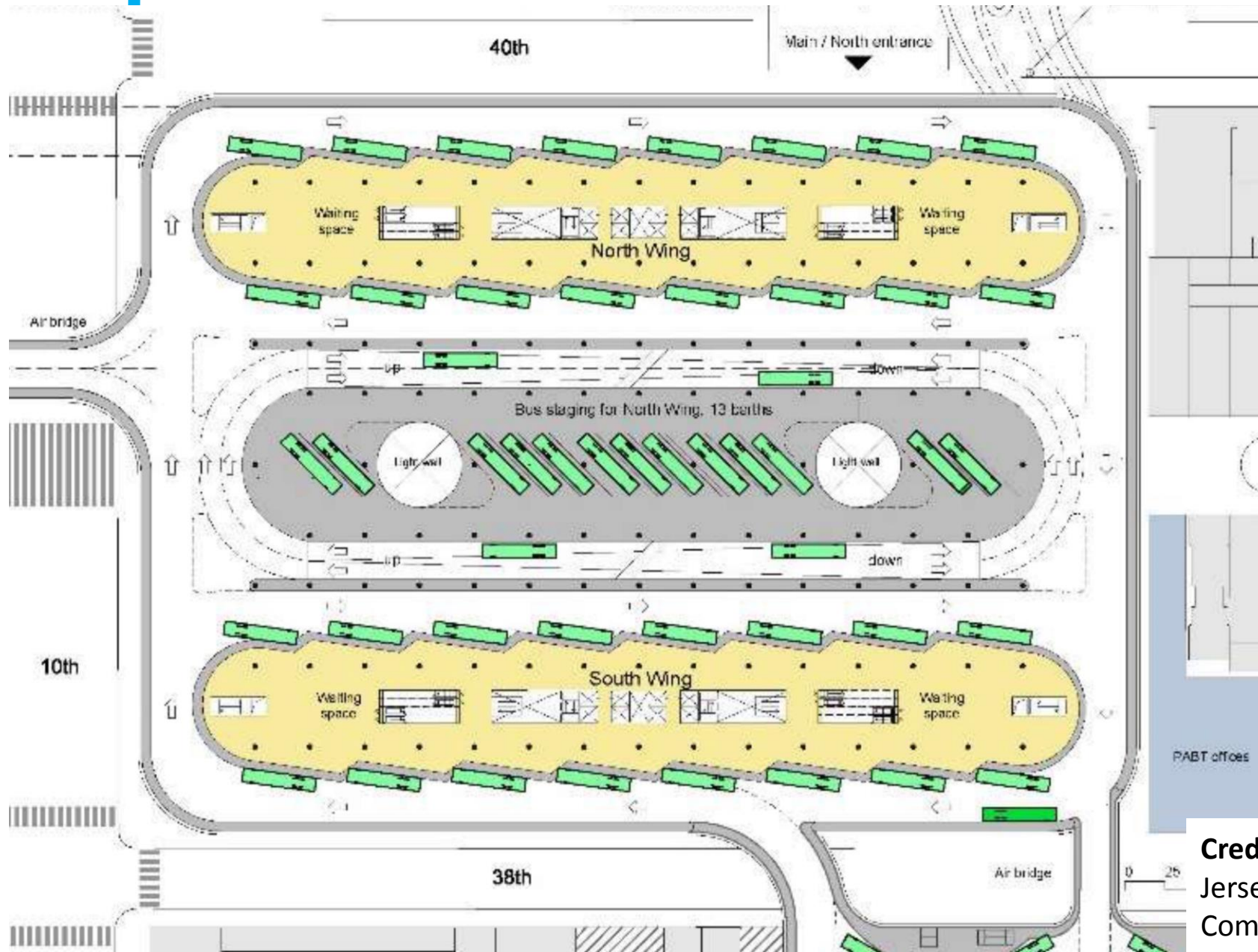


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Facility Capacity and Bus Gates

- 820 departures & 143 arrivals per hour in design year
- Vehicle volumes and levels activity dictate using shallow sawtooth berths
- Bus staging on-site for rapid and timely delivery of buses
- Real-time monitoring and technology to improve efficiency
- Attractive, comfortable waiting areas for passengers
- Allow for flexible operations between carriers

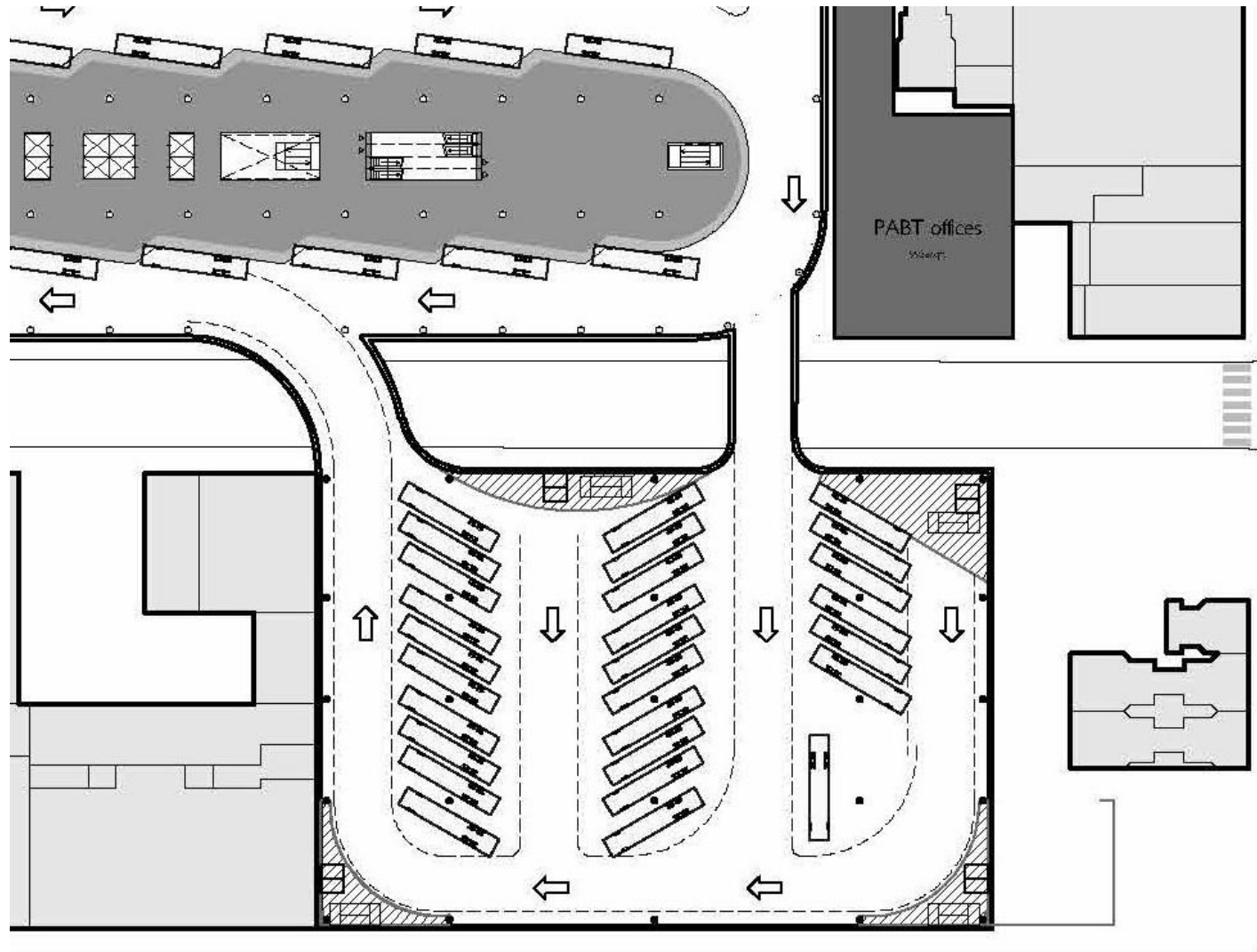
Facility Capacity and Bus Gates



- 32 berths/ level
- 13 buses/level central staging
- Glass enclosed waiting areas
- Vertical circulation

Credit: The Port Authority of New York and New Jersey. Submitted as part of Arcadis Team's Competition Concept.

Facility Capacity and Bus Gates



- Overbuild above Dyer Avenue ramp
- 27 buses/level
- Direct access to bus deck
- Total staging capacity: 40 buses/level

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Pedestrian Access and Experience



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Dynamic Berth Assignment and Dispatching

- Number of berths main driver of size and cost
- Our initial efforts focused on a design goal of 6 departures/hr/berth
- Assumed minimal to no active management of operations
- Currently available technology to drive the terminal of the future

Dynamic Berth Assignment and Dispatching

- Active management and real-time monitoring of all buses
- Mandate GPS AVL technology on all buses operating from PABT
- Assign buses dynamically up to 15-minutes before departure
- Real time gate reporting to smartphones and central display
- Group common routes by level or quadrant to reduce customer uncertainty
- Increasing turnover to 7 departures/hr reduces facility design by a level

Our Concept in Relation to Surrounding Community



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