Changes in Mobility
&
How They are Affecting Current PA Airport Redevelopment Programs

Meagan Bornkamp & Jonathan Chan

01.22.2020

PORT AUTHORITY NY NJ

AIR LAND RAIL SEA

Port Authority New York and New Jersey

PANYNJ Overview

- The Port Authority of New York & New Jersey (PANYNJ) conceives, builds, operates and maintains infrastructure critical to the New York/New Jersey region's trade and transportation network.

- These facilities include America's busiest airport system, marine terminals and ports, the PATH rail transit system, six tunnels and bridges between New York and New Jersey, the Port Authority Bus Terminal in Manhattan, and the World Trade Center.

- For more than eight decades, the Port Authority (PA) has worked to improve the quality of life for the more than 17 million people who live and work in New York and New Jersey - a region that supports 8.6 million jobs with an estimated gross regional product of more than $929 billion.

Airport Redevelopment Program

PANYNJ Overview

LaGuardia Airport (LGA)

Period: 2016-2022
Budget: $8 Billion
Redevelopment: Terminals B, C & D

Annual PAX: 30 Million (2018)
Flights: 372,025
Terminals: 4
Gates: 79
Acreage: 680

John F. Kennedy Int'l Airport (JFK)

Period: 2020-2025
Budget: $13 Billion
Redevelopment: Terminals 1, 4 & 6, and Ground Transportation Center (GTC)

Annual PAX: 62 Million (2018)
Flights: 455,529
Terminals: 6
Gates: 131
Acreage: 4,930

Newark Liberty Int'l Airport (EWR)

Period: 2018-2021
Budget: $2.7 Billion
Redevelopment: Terminal 1, followed by AirTrain and Terminal 2

Annual PAX: 46 Million (2018)
Flights: 458,674
Terminals: 3
Gates: 122
Acreage: 2,027

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

LGA Redevelopment

PANYNJ Overview

Redevelopment 2016-2022
- New consolidated terminals
- Two new parking garages
- Six new concourses
- Upgraded roadways
- Expanded taxiways
- AirTrain connection to Long Island Railroad and subway

Construction of the new airport began in 2016
- Same footprint as the existing airport
- Existing airport remains fully operational

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

LGA Redevelopment

PANYNJ Overview

Redeveloped Airport

Redevelopment 2016–2022
- New consolidated terminals
- Two new parking garages
- Six new concourses
- Upgraded roadways
- Expanded taxiways
- AirTrain connection to Long Island Railroad and subway

Construction of the new airport began in 2016
- Same footprint as the existing airport
- Existing airport remains fully operational

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

JFK Redevelopment

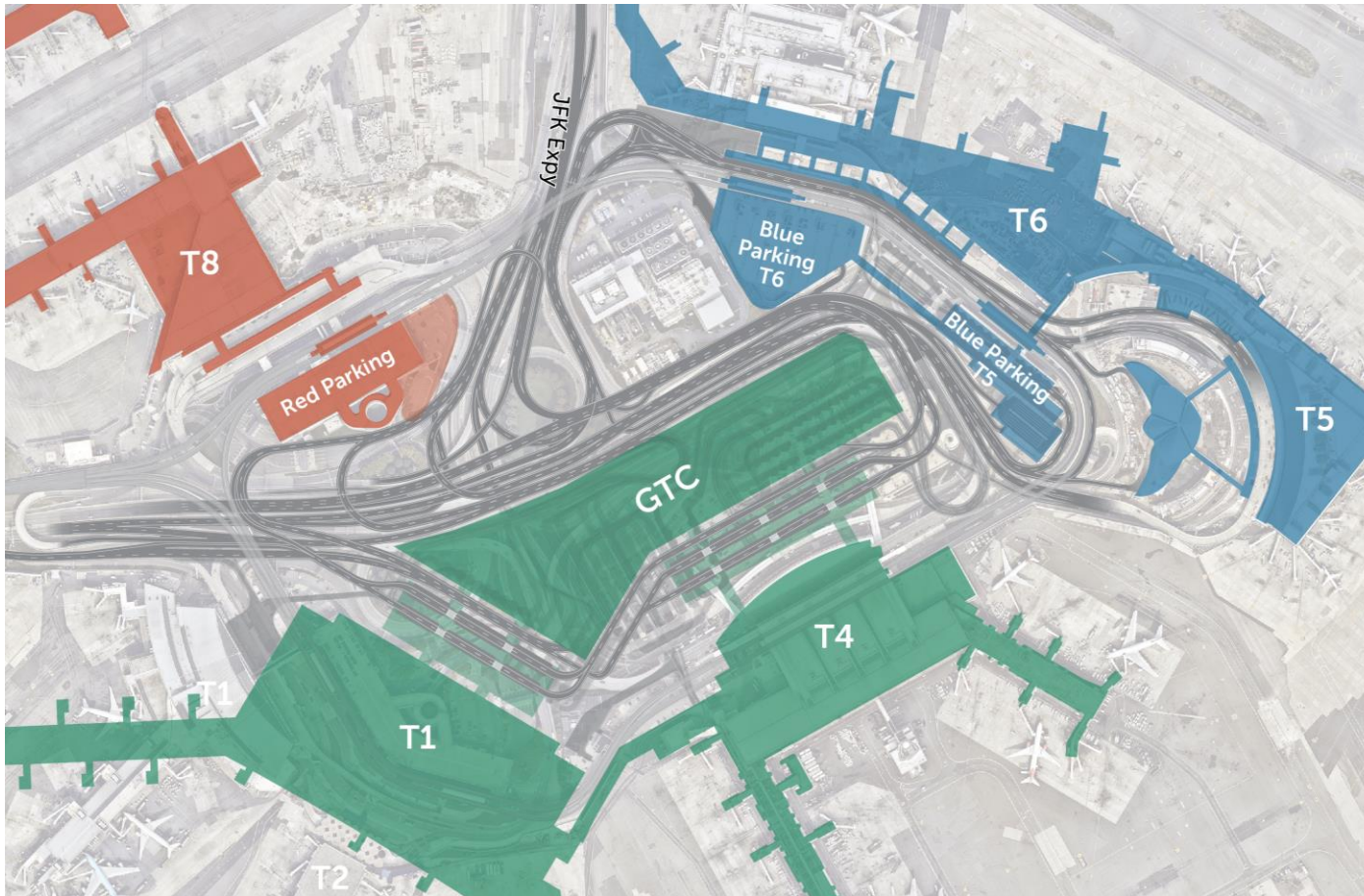## PANYNJ Overview

Redevelopment 2020 – 2025

- New Terminal 1 and headhouse with integrated AirTrain station
- Unification of Terminal 5 headhouse with new Terminal 6
- New parking facility with Ground Transportation Center (GTC)
- Terminal 4 concourse expansion
- Terminal 8 expansion

Construction of the new airport will begin in 2020

- Same footprint as the existing airport
- Existing airport remains fully operational

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

JFK Redevelopment

PANYNJ Overview
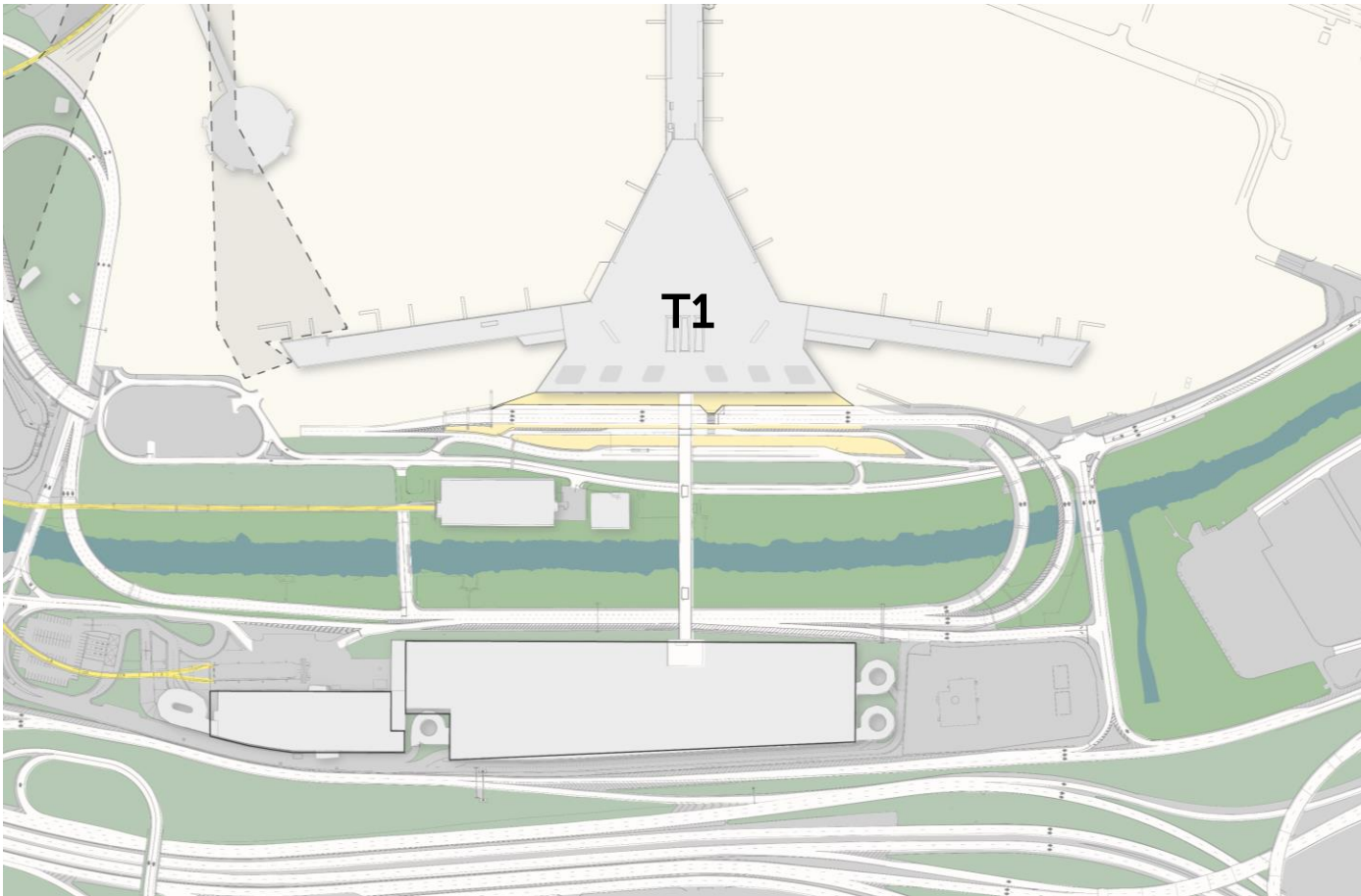

Redevelopment 2020 – 2025

- New Terminal 1 and headhouse with integrated AirTrain station
- Unification of Terminal 5 headhouse with new Terminal 6
- New parking facility with Ground Transportation Center (GTC)
- Terminal 4 concourse expansion
- Terminal 8 expansion

Construction of the new airport will begin in 2020

- Same footprint as the existing airport
- Existing airport remains fully operational

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

EWR Redevelopment

PANYNJ Overview

Redevelopment through 2022
- New Terminal 1 headhouse with 33 gates
- Partial Opening in 2021, with 21 gates.
- New Consolidated Rental Car Facility and Parking structure
- Demolition of Terminal A in 2023

PORT
AUTHORITY
NY NJ

AIR LAND RAIL SEA

EWR Redevelopment | AirTrain

PANYNJ Overview

rendering courtesy of Lea+Elliott

**New Newark AirTrain operational 2026**
- AirTrain EWR is a critical component of the operation of Newark Liberty International Airport (EWR).
- The system carries on average 33,000 passengers per day or approximately 12 million passengers per year.
- The current AirTrain EWR, will be replaced with a new AirTrain system.
- It will meet increasing passenger demands and enable world-class operations for a 21st century customer experience.

PORT
AUTHORITY
NY NJ
AIR LAND RAIL SEA

Trends:
FHVs and
Technologies
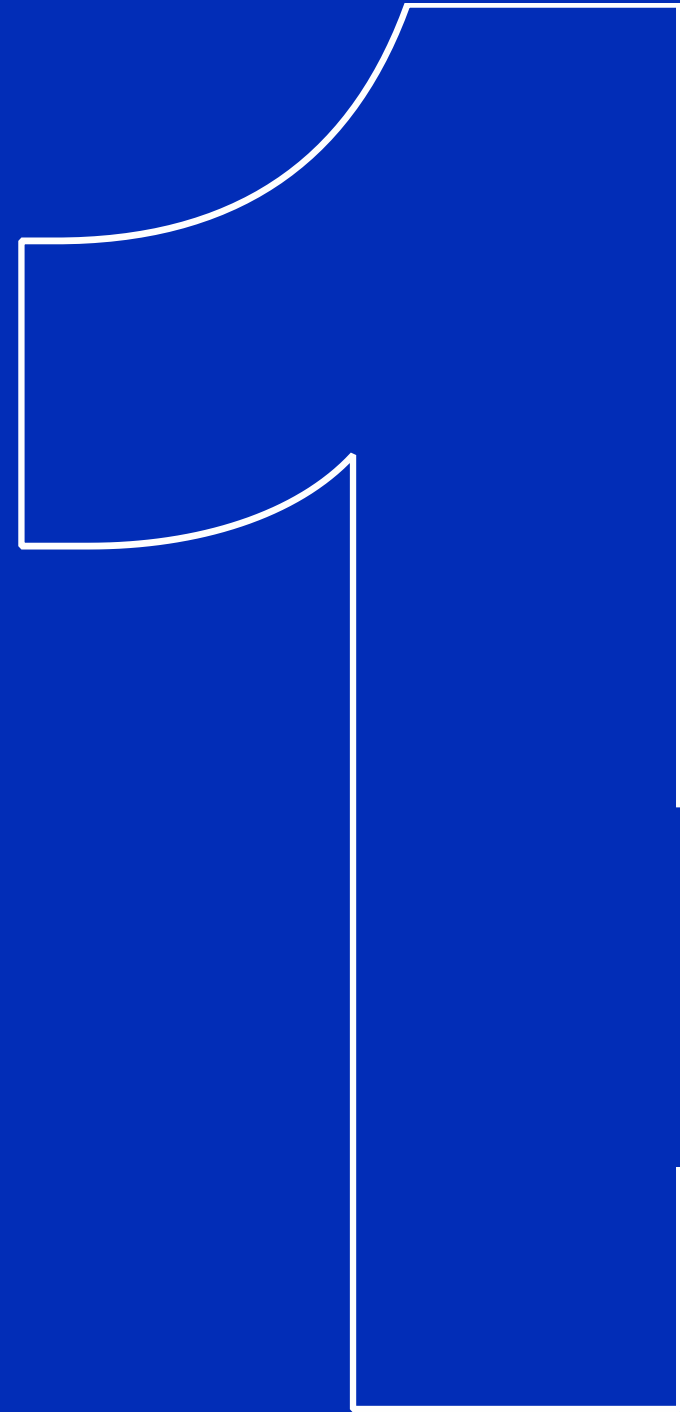
Trends: FHVs and Technologies

New Mobility

PORT
AUTHORITY
NY NJ

AIR LAND RAIL SEA
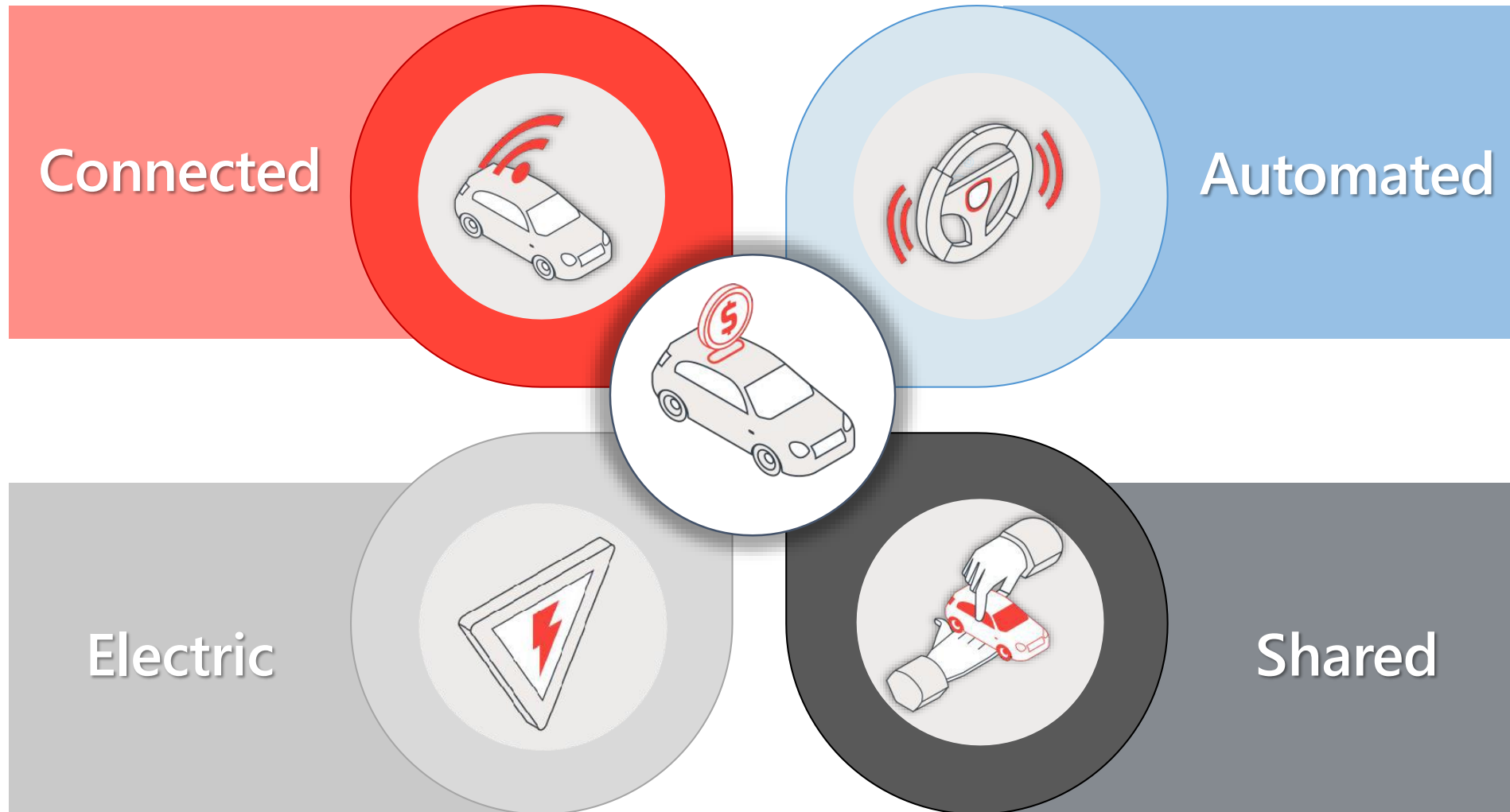
New Mobility Options

Trends: FHVs and Technologies

DISRUPTING THE CAR

Alternatives to car ownership by trip length

Micromobility
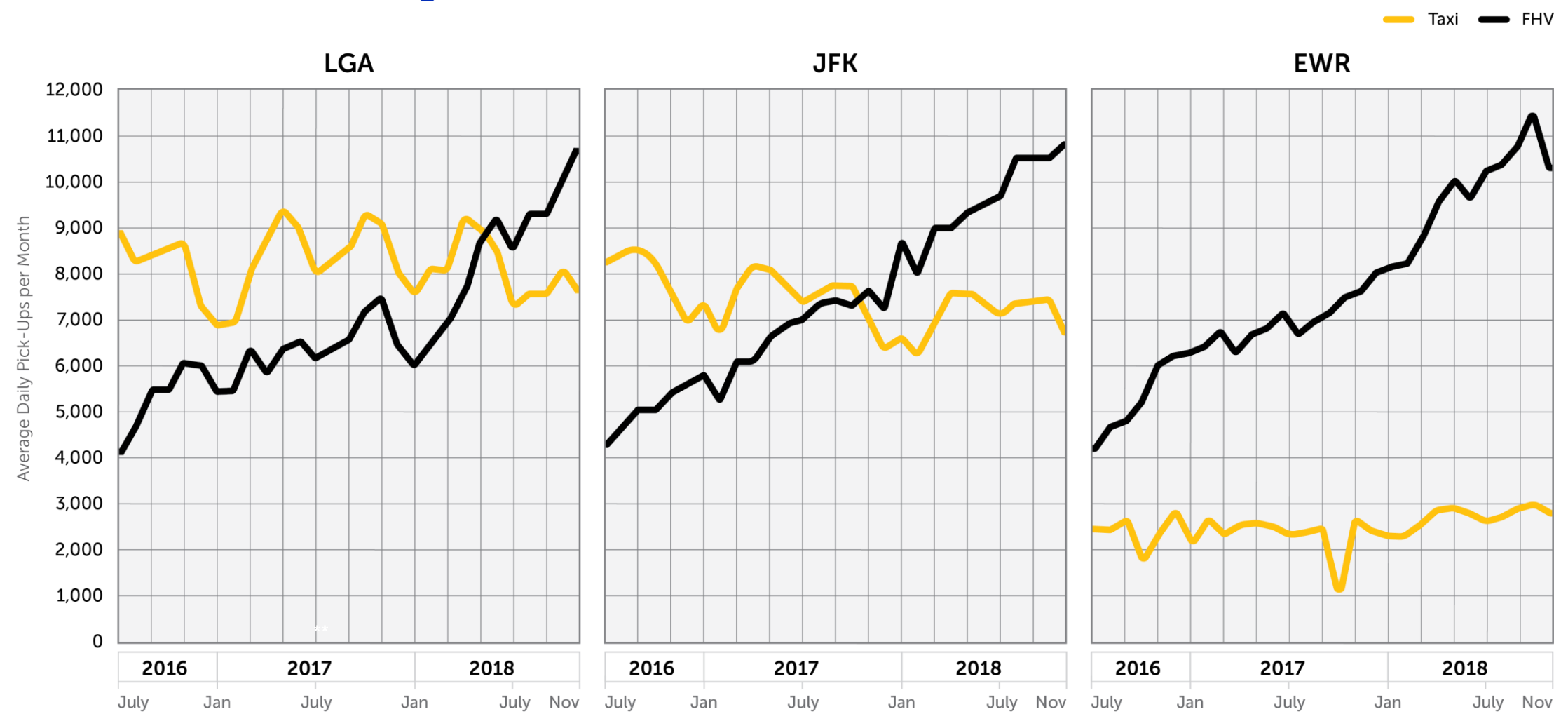0-5 miles

Medium distance
5-15 miles

Long distance
15+ miles

BIKES & SCOOTERS

motivate scoot
Lime SPIN skip
BIRD JUMP Razor

RIDE HAILING

UBER lyft via
Gett

CAR SHARING

MAVEN CAR2GO
Getaround TURO

60% of trips in the US

25% of trips in the US

15% of trips in the US

PORT
AUTHORITY
NY NJ
AIR LAND RAIL SEA

New Mobility Landscape

Trends: FHVs and Technologies

PORT AUTHORITY NY NJ

AIR LAND RAIL SEA
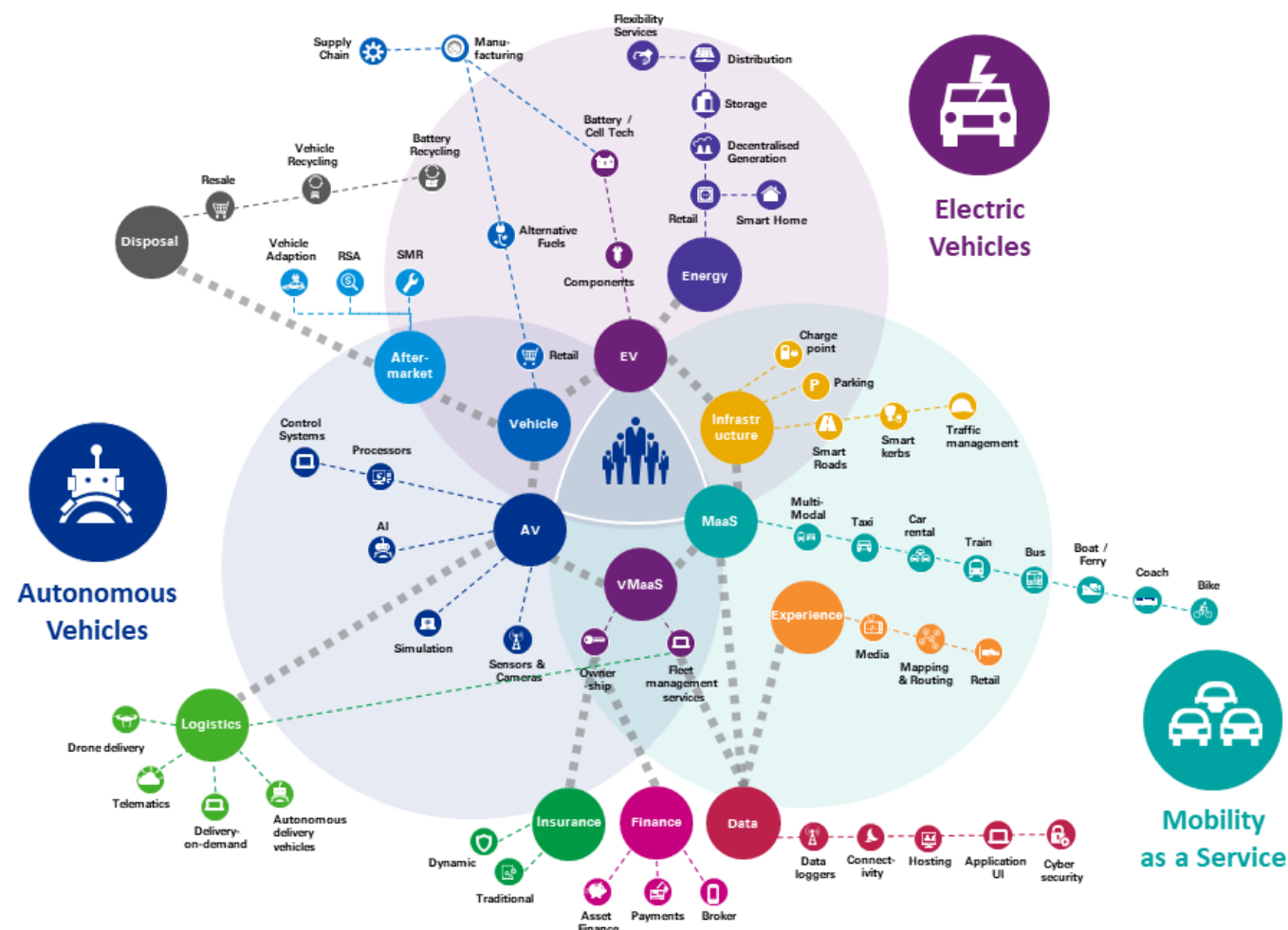
Taxi and FHV Trends
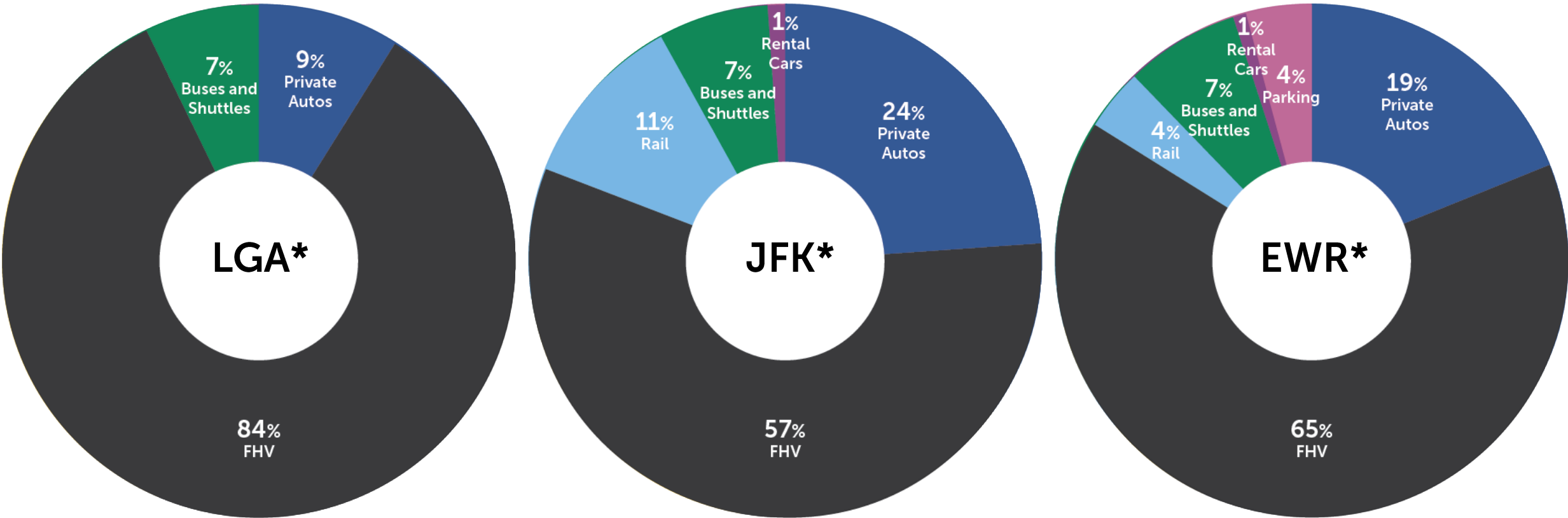
Trends: FHVs and Technologies

Taxi includes yellow and green taxis
FHV includes all App-based companies (Uber, Lyft, Juno, etc)   **Source**: NYC TLC trip data

Customer Mode Choice Trends
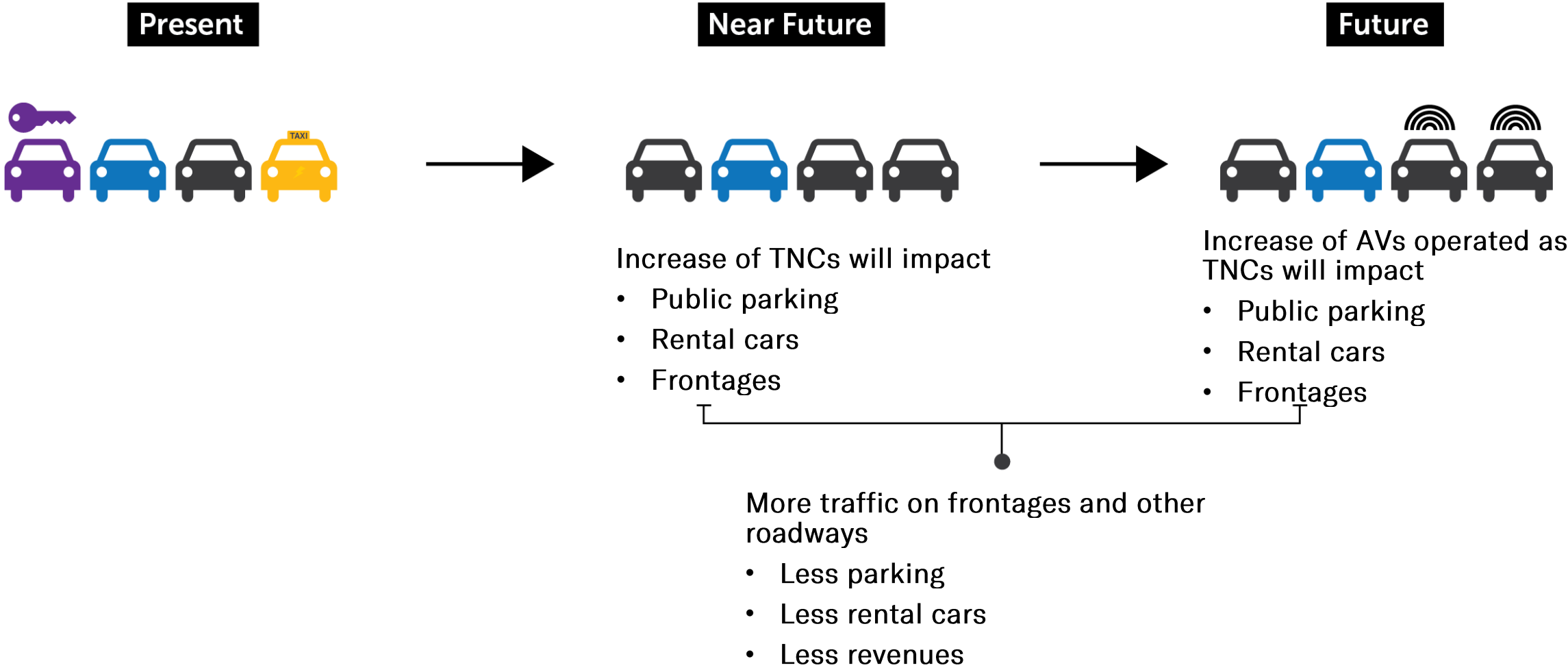
Trends: FHVs and Technologies

2027 – AV Adoption

LGA*
- 9% Private Autos
- 7% Buses and Shuttles
- 84% FHV

JFK*
- 24% Private Autos
- 1% Rental Cars
- 7% Buses and Shuttles
- 11% Rail
- 57% FHV

EWR*
- 19% Private Autos
- 4% Parking
- 1% Rental Cars
- 7% Buses and Shuttles
- 4% Rail
- 65% FHV

*Source: 2017 Annual Passenger Survey, Port Authority
** FHV includes both App-based and Limo services

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

Adaptable and Flexible Operations

Trends: FHVs and Technologies

Present

Near Future

Future

Increase of TNCs will impact

- Public parking
- Rental cars
- Frontages

Increase of AVs operated as TNCs will impact

- Public parking
- Rental cars
- Frontages

More traffic on frontages and other roadways

- Less parking
- Less rental cars
- Less revenues

Operational requirements will evolve quickly, design to provide flexibility.

PORT AUTHORITY NY NJ

AIR LAND RAIL SEA

Configurations for FHV Operations

Mitigation Measures

FHV Pick-up Procedures	Traditional Pick-up		PIN Pick-up	
	FHV Company Preferences	**Frontage Infrastructure Needs**	**FHV Company Preferences**	**Frontage Infrastructure Needs**

Geofenced Lot	• Pre-Dispatch	• Single lane pick-up (linear, sawtooth or angled)
		• Clear space at the frontage in a numbered or zone system
			• Dedicated Frontage PIN Station
			• Pre-Dispatch
				• Multiple TNC PIN Stations:
				  • 3 to 5 single lane pick-up spots (linear)
				  • Space for 6 to 10 vehicles to queue
				  • Overall 200' to 300'
				• Room for Passenger Queuing

No Lot	• Drop-off and pick-up on Departures level
	• Re-match
		• Single lane pick-up (linear, sawtooth or angled)
		• Additional Frontage Length to address surge in vehicular demand (Calculated Length + 20%)
			• Dedicated Frontage PIN Station
			• Re-Match
				• Multiple TNC PIN Stations:
				  • 3 to 5 single lane pick-up spots (linear)
				  • Space for 9 to 15 vehicles to queue
				  • Overall 250' to 400'
				• Room for Passenger Queueing

PORT AUTHORITY NY NJ

AIR LAND RAIL SEA

Impacts During Construction

&

Innovative Mitigation Measures

LGA Lessons Learned

Frontage capacity reduced

Taxis relocated to west of Terminal B

Major changes at 94th St. airport entrance/exit

Rental Car Facilities Consolidated at Lot P6

FHV pick-ups relocated to remote frontage

Terminal B Daily Parking captured

Emergency GCP entrance ramp opened

| Aug 2016 | Sept | Oct | Nov | Dec | Jan 2017 | Feb | Mar | Apr | May | June | July |

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA
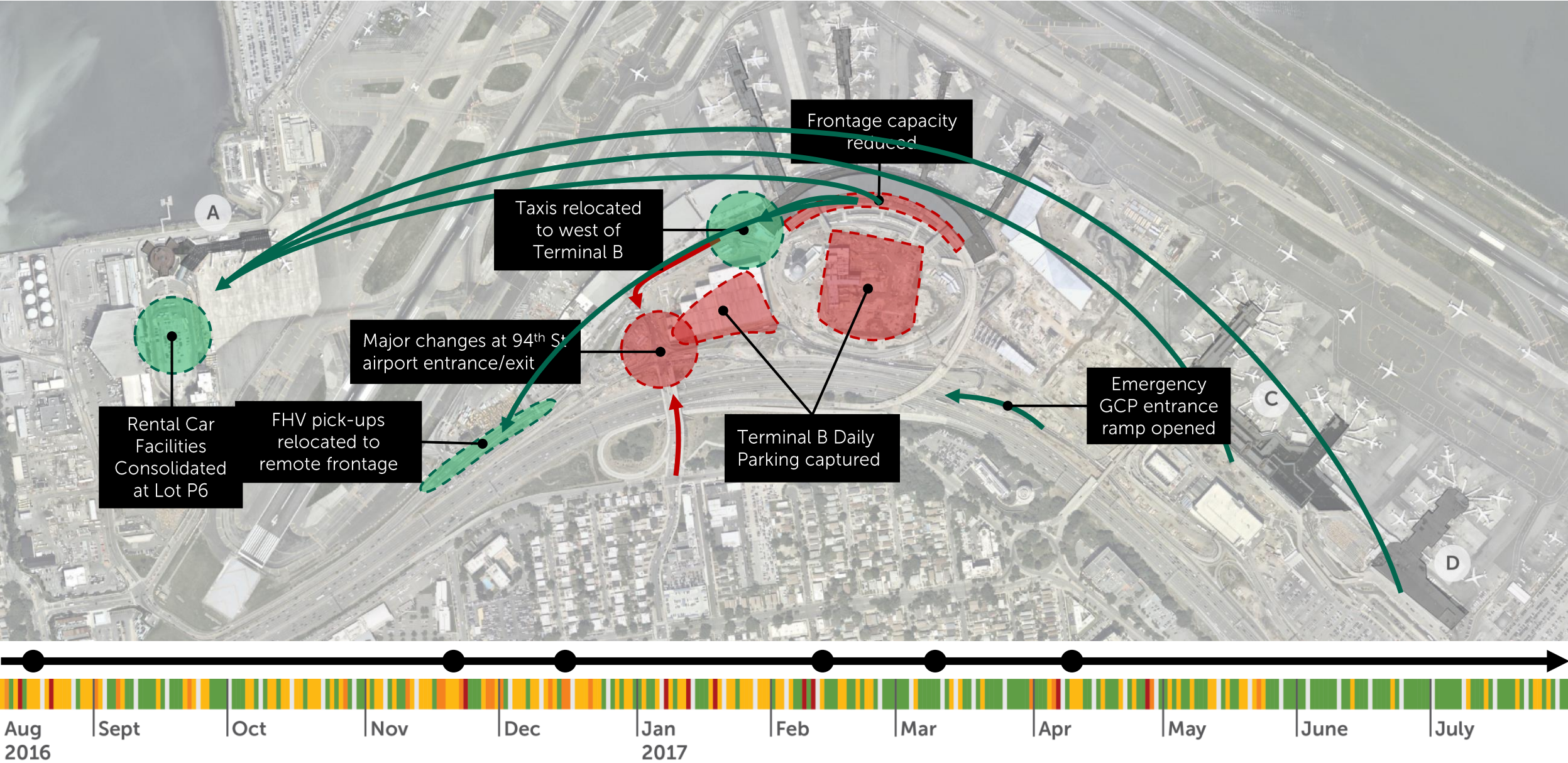
Remote FHV Pick-Up at LGA Terminal B

Mitigation Measures

Lot P10 (FHV Staging)

Arriving passengers board shuttle buses

Pedestrians 10 min walk

Passengers transfer from shuttle buses to FHV/TNC at GP1

Shuttle bus 3-5 min ride

Runway Drive

94th St

Grand Central Pkwy
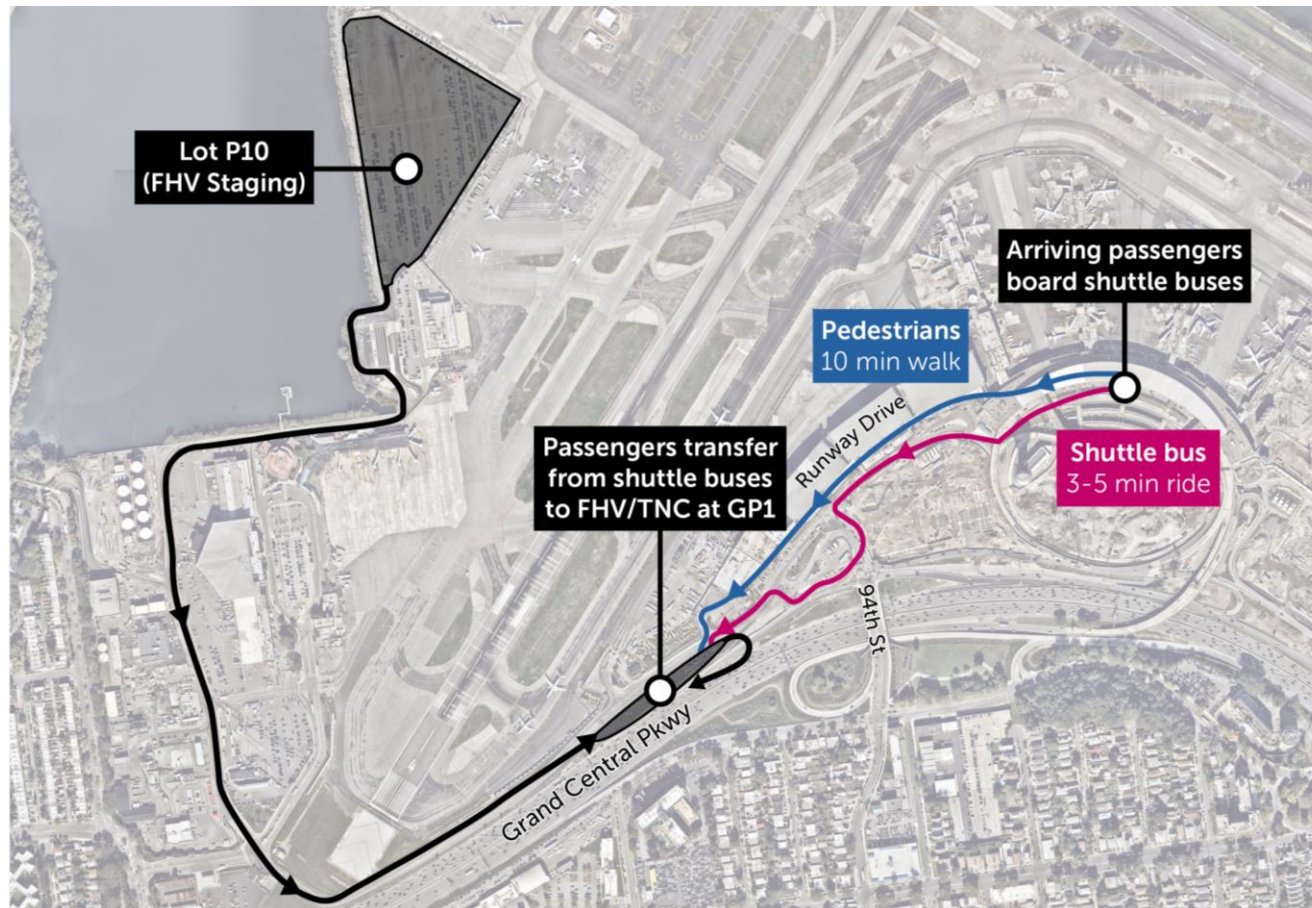
No longer in place

April 2017 – April 2018:

FHV pick-up for Terminal B was relocated to a remote lot to reduce demand and congestion on the terminal frontage

- Shuttle buses connected customers to the lot from the terminal frontage

- Customers could also walk 10 minutes to access the lot

- Staging and pick-up routing for FHVs avoided CTA roadways

- A direct egress to the GCP allowed FHVs to quickly exit the airport

PORT AUTHORITY NY NJ
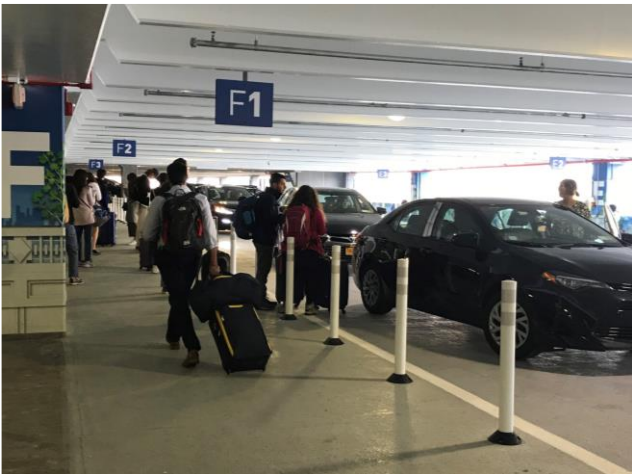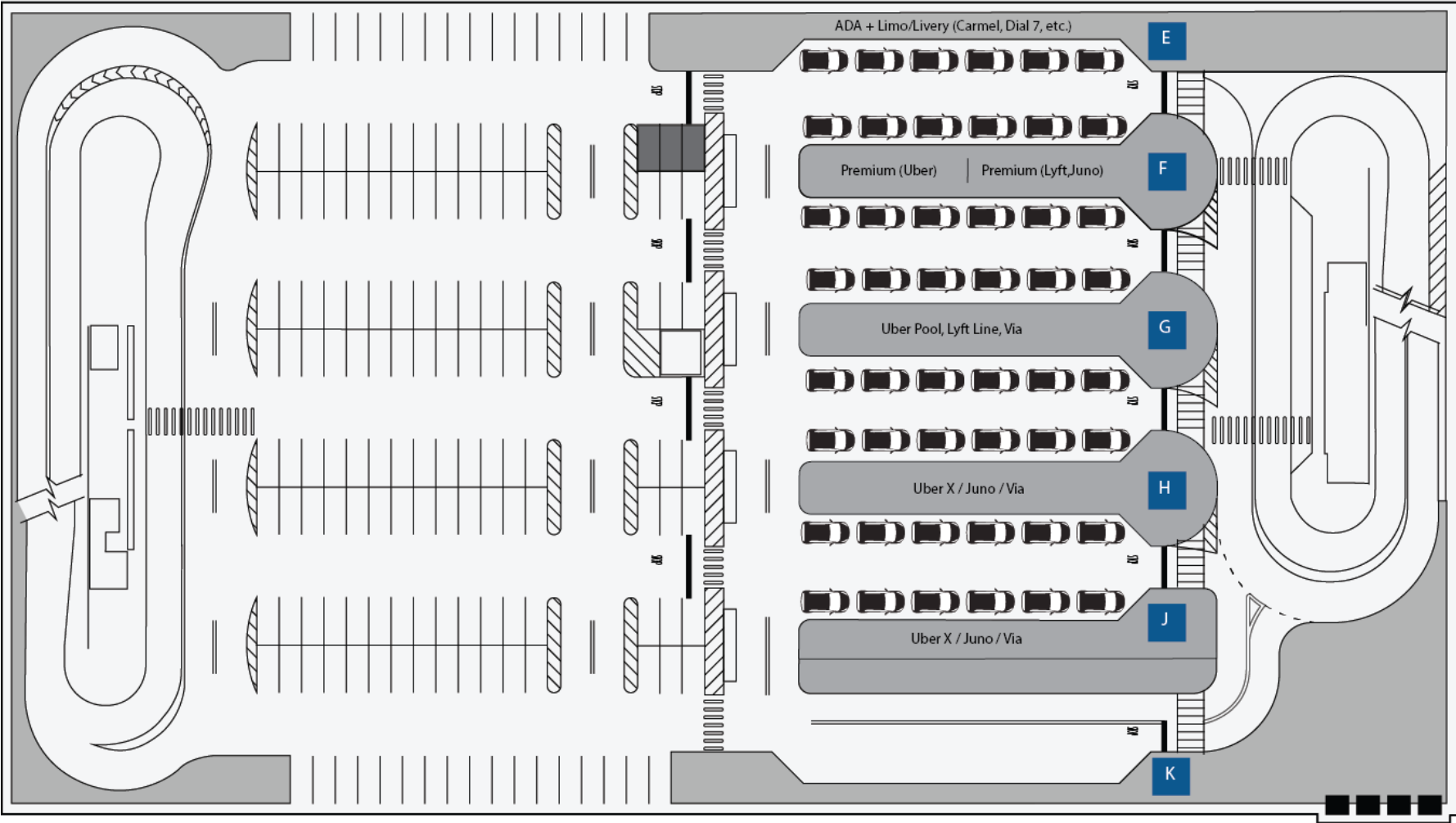AIR LAND RAIL SEA

LGA Terminal B Layout

Mitigation Measures | Remote FHV Pick-Up at LGA Terminal B
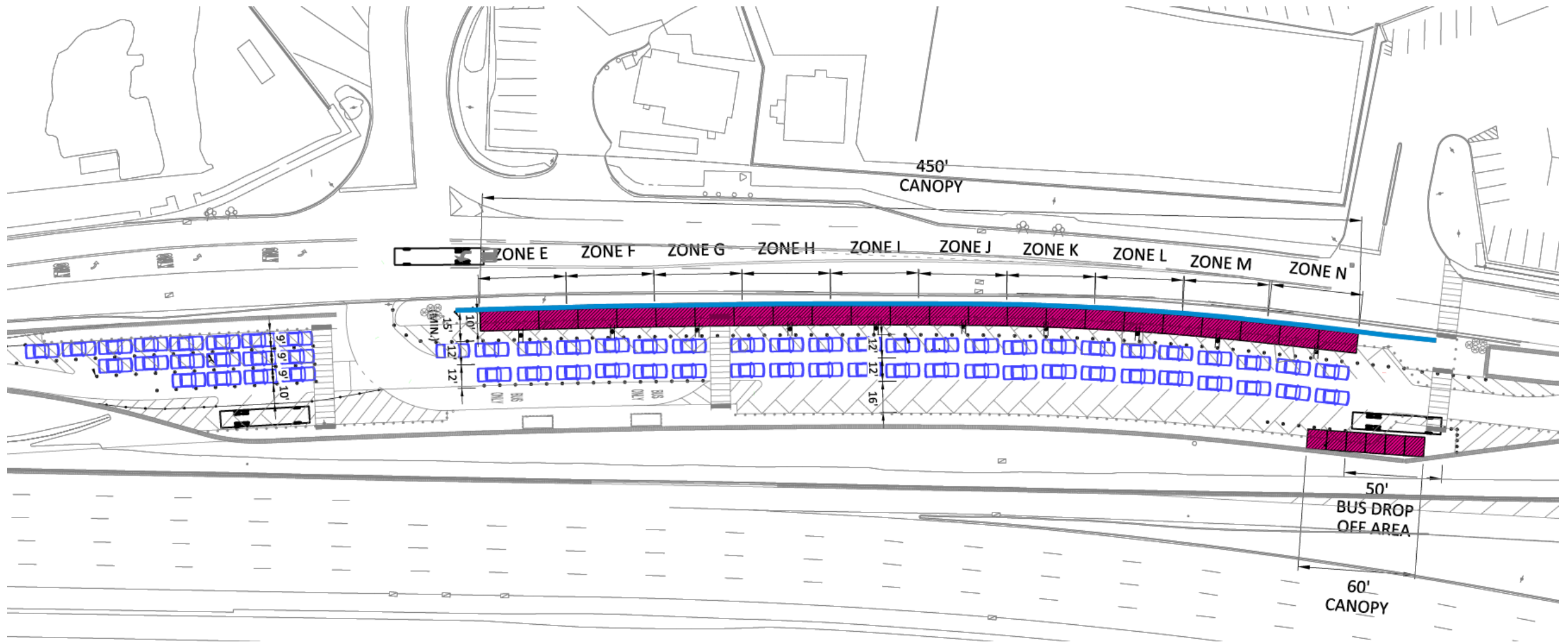
LGA Terminal B Garage Operations

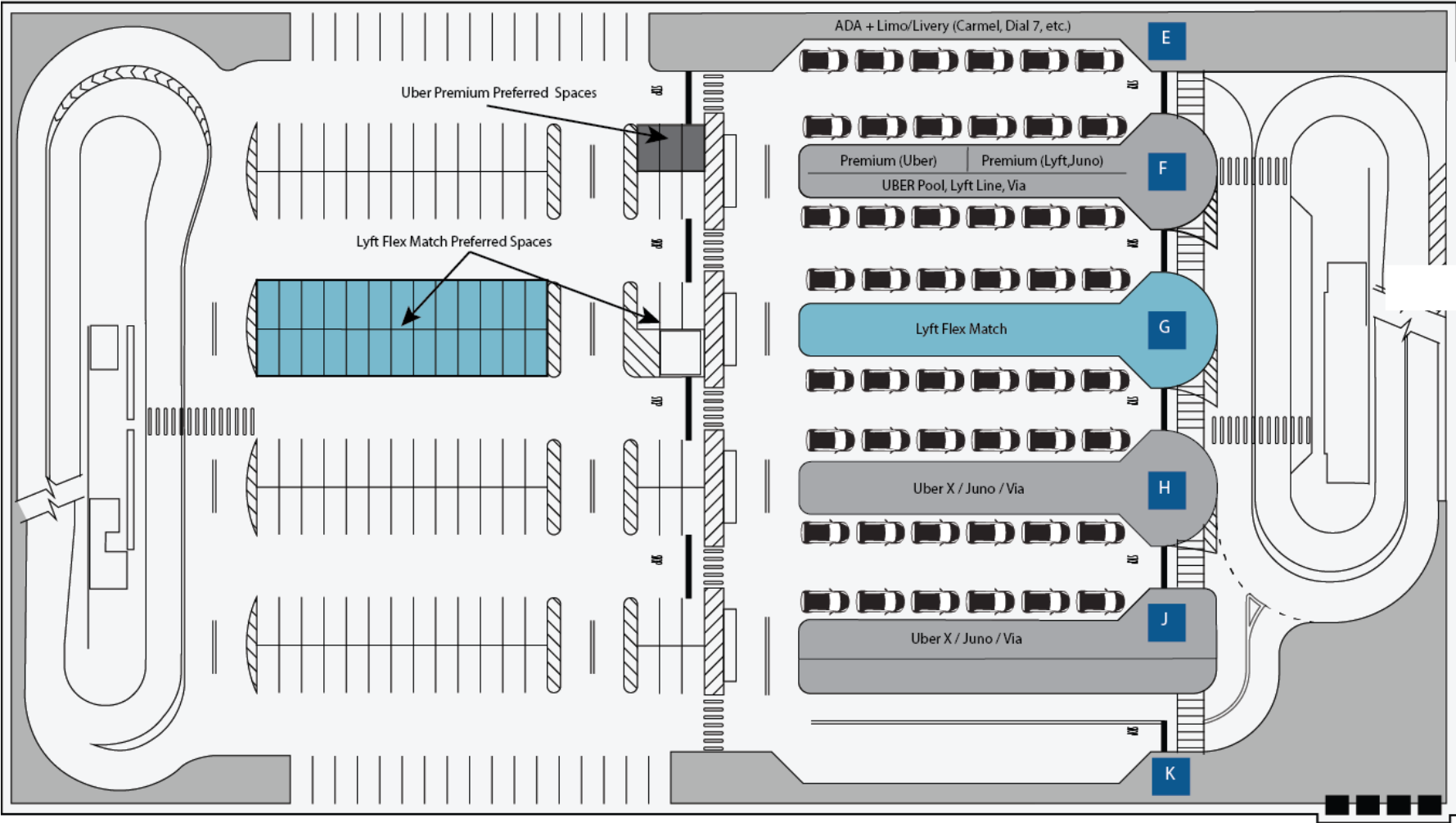Mitigation Measures | Remote FHV Pick-Up at LGA Terminal B

Initial Operations | May 2018 – June 2019

LGA Terminal B Garage Operations with PIN

Mitigation Measures | Remote FHV Pick-Up at LGA Terminal B |

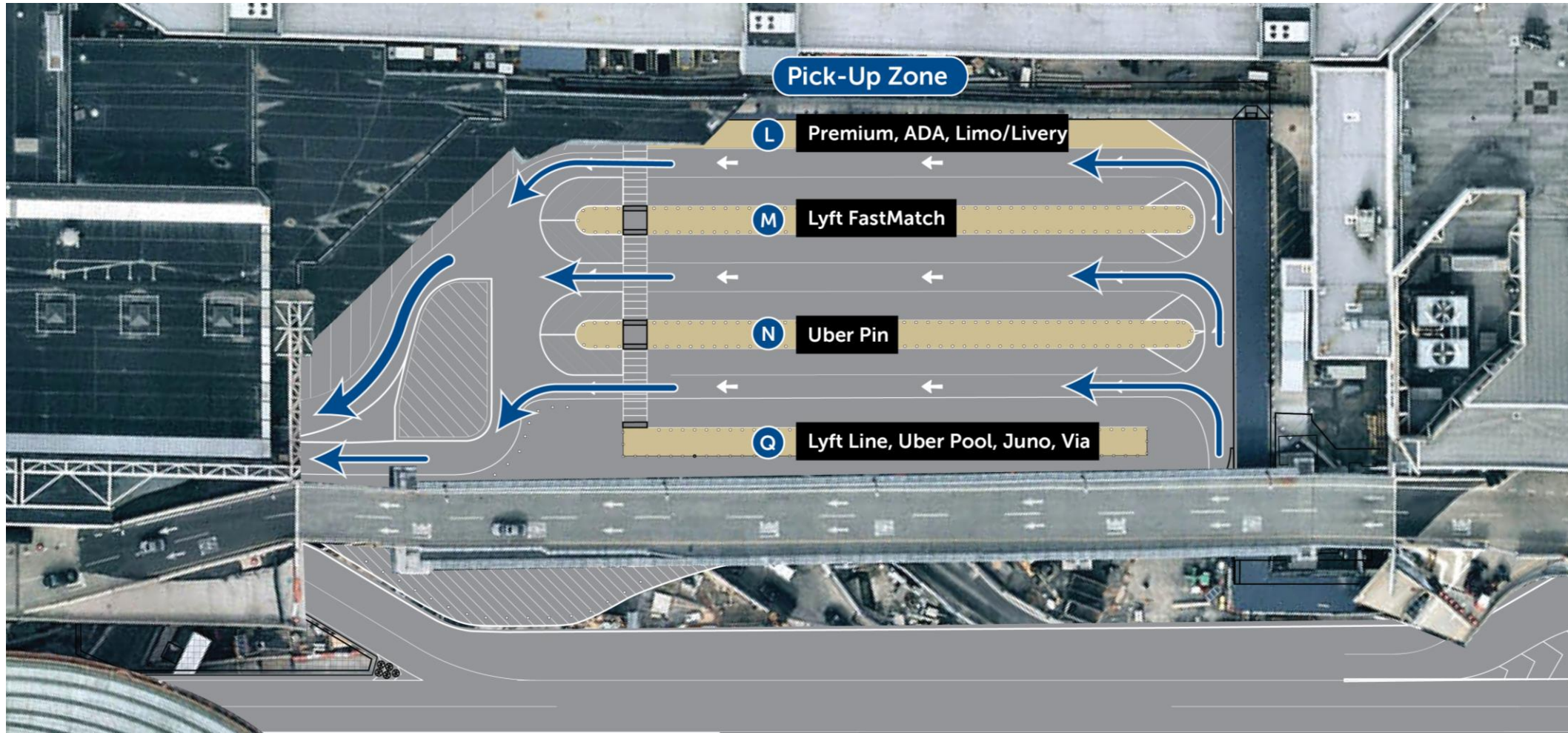### Current Operations with Flex Match | June 2019 - Present

	Before Flex Match	After Flex Match
Customer Wait (Avg)	2:27 min	0:37 min
Customer Wait (Max)	18:45 min	6:37 min
Vehicle Dwell (Avg)	2:00 min	0:47 min
Vehicle Dwell (Max)	23:18 min	1:30 min

LGA Terminals C & D with PIN Operations

Mitigation Measures | Remote FHV Pick-Up at LGA

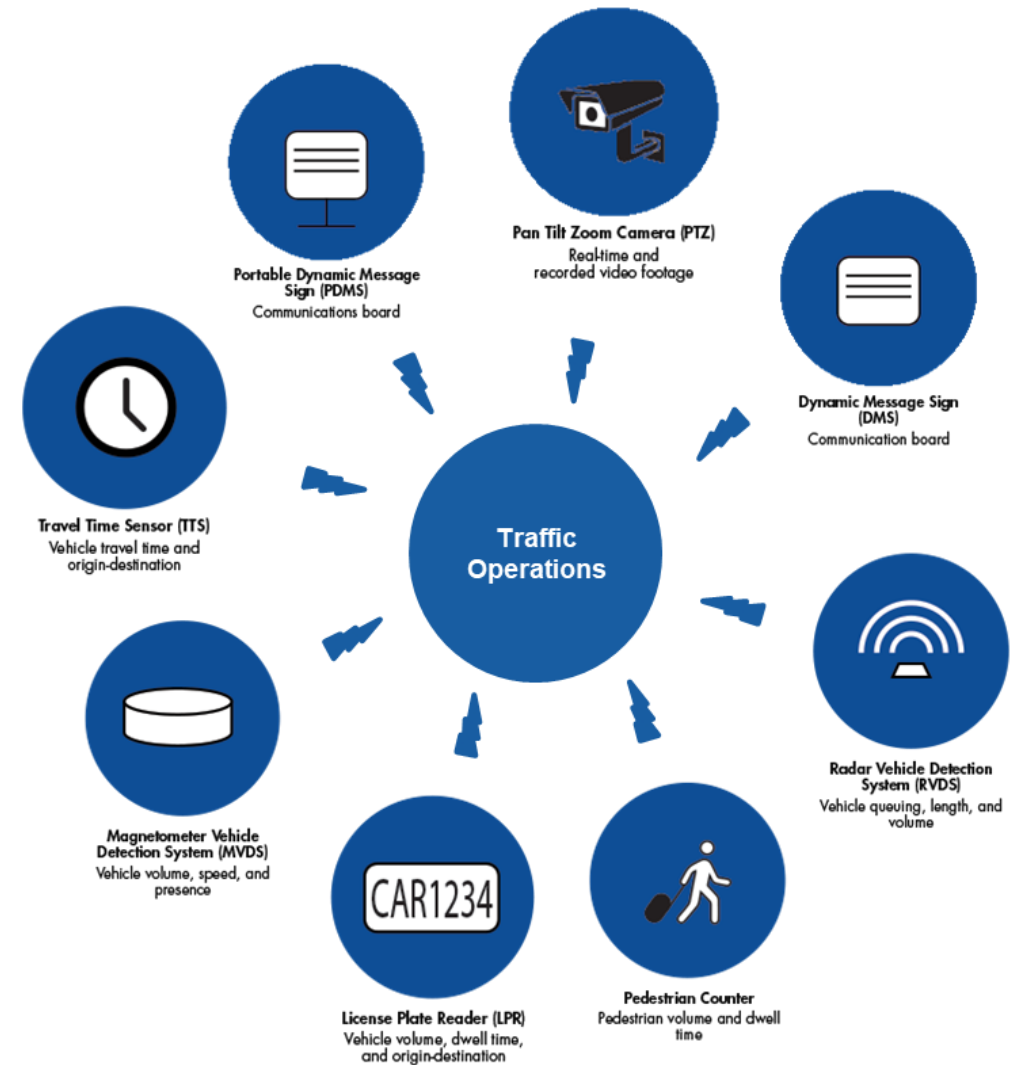# Transportation Technologies & Management

3

Early Action ITS Deployment at JFK
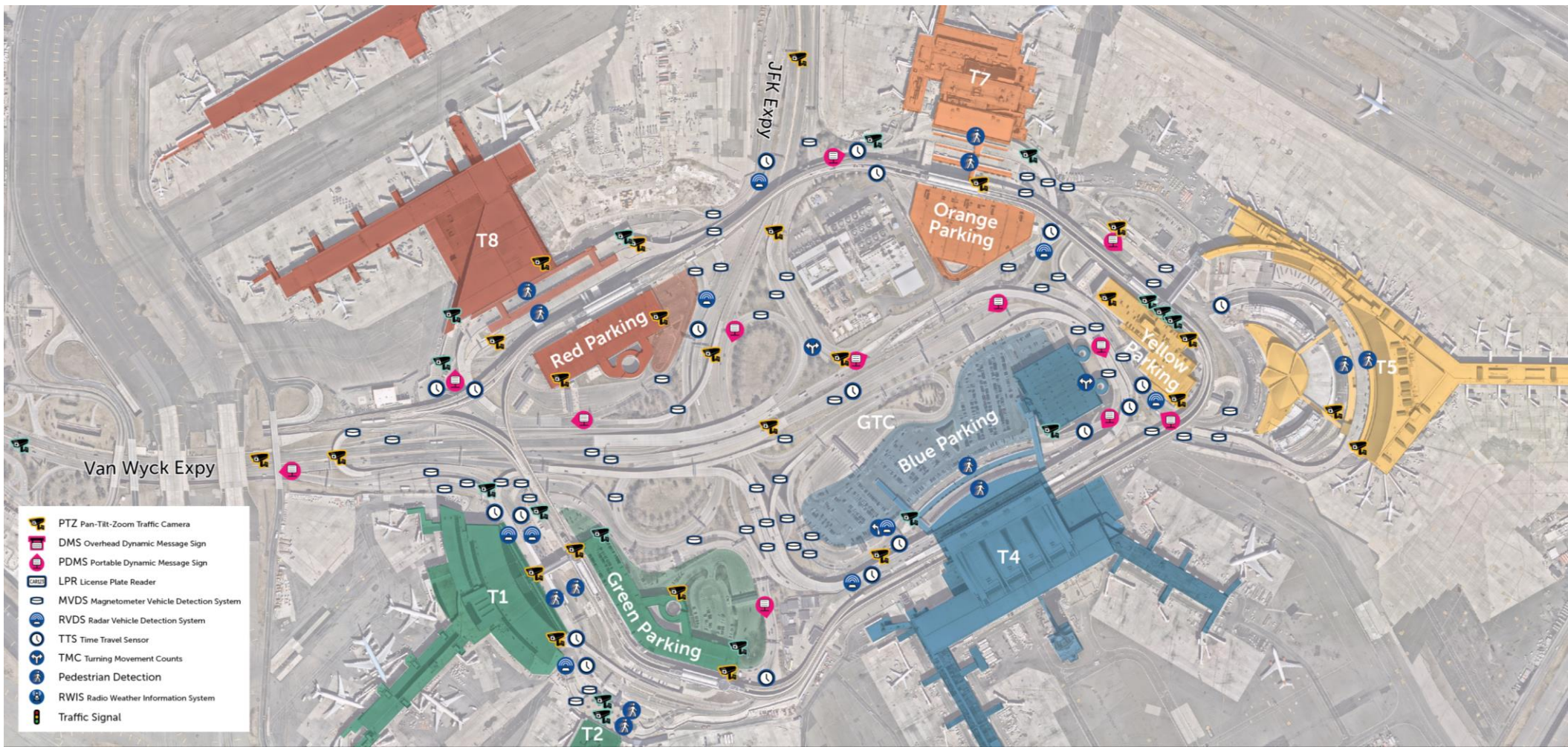
Transportation Technologies

Early Action ITS Deployments
- Dynamic Message Signs
- Portable
- Permanent
- Traffic Cameras
- Travel Time Sensors
- Vehicle Detection
- Magnetometer
- Radar
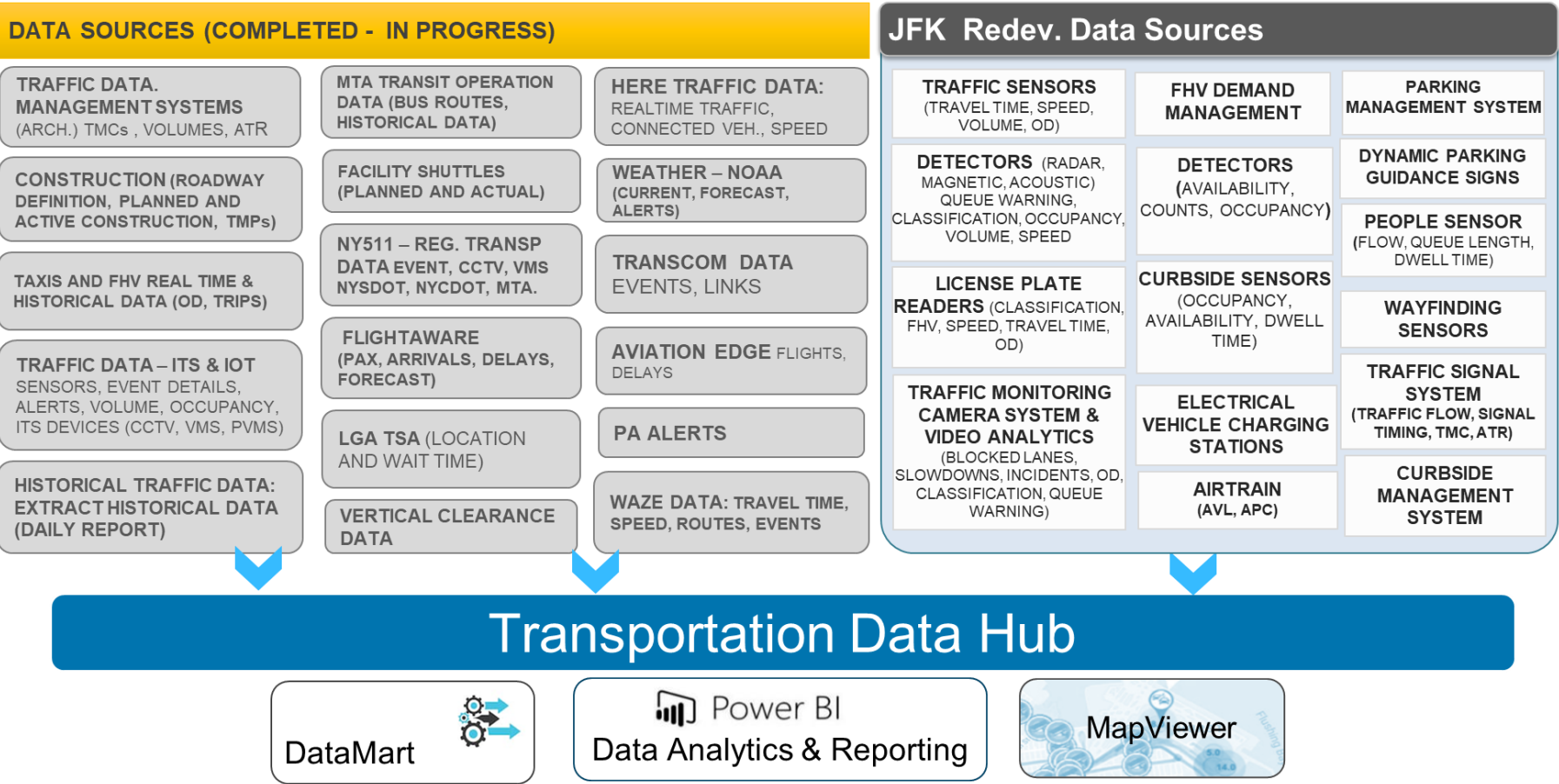- Image
- License Plate Readers
- Pedestrian Analytics

Portable Dynamic Message Sign (PDMS)
Communications board

Pan Tilt Zoom Camera (PTZ)
Real-time and recorded video footage

Dynamic Message Sign (DMS)
Communication board

Travel Time Sensor (TTS)
Vehicle travel time and origin-destination

Traffic Operations

Radar Vehicle Detection System (RVDS)
Vehicle queuing, length, and volume

Magnetometer Vehicle Detection System (MVDS)
Vehicle volume, speed, and presence

License Plate Reader (LPR)
Vehicle volume, dwell time, and origin-destination

Pedestrian Counter
Pedestrian volume and dwell time

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

CTA Locations

Transportation Technologies | Early Action ITS Deployment at JFK

Data Hub

Transportation Technologies

Transportation Data Hub, Analytics and Reporting Solution

DATA SOURCES (COMPLETED - IN PROGRESS)

TRAFFIC DATA. MANAGEMENT SYSTEMS (ARCH.) TMCs , VOLUMES, ATR

CONSTRUCTION (ROADWAY DEFINITION, PLANNED AND ACTIVE CONSTRUCTION, TMPs)

TAXIS AND FHV REAL TIME & HISTORICAL DATA (OD, TRIPS)

TRAFFIC DATA – ITS & IOT SENSORS, EVENT DETAILS, ALERTS, VOLUME, OCCUPANCY, ITS DEVICES (CCTV, VMS, PVMS)

HISTORICAL TRAFFIC DATA: EXTRACT HISTORICAL DATA (DAILY REPORT)

MTA TRANSIT OPERATION DATA (BUS ROUTES, HISTORICAL DATA)

FACILITY SHUTTLES (PLANNED AND ACTUAL)

NY511 – REG. TRANSP DATA EVENT, CCTV, VMS NYSDOT, NYCDOT, MTA.

FLIGHTAWARE (PAX, ARRIVALS, DELAYS, FORECAST)

LGA TSA (LOCATION AND WAIT TIME)

VERTICAL CLEARANCE DATA

HERE TRAFFIC DATA: REALTIME TRAFFIC, CONNECTED VEH., SPEED

WEATHER – NOAA (CURRENT, FORECAST, ALERTS)

TRANSCOM DATA EVENTS, LINKS

AVIATION EDGE FLIGHTS, DELAYS

PA ALERTS

WAZE DATA: TRAVEL TIME, SPEED, ROUTES, EVENTS

JFK Redev. Data Sources

TRAFFIC SENSORS (TRAVEL TIME, SPEED, VOLUME, OD)

DETECTORS (RADAR, MAGNETIC, ACOUSTIC) QUEUE WARNING, CLASSIFICATION, OCCUPANCY, VOLUME, SPEED

LICENSE PLATE READERS (CLASSIFICATION, FHV, SPEED, TRAVEL TIME, OD)

TRAFFIC MONITORING CAMERA SYSTEM & VIDEO ANALYTICS (BLOCKED LANES, SLOWDOWNS, INCIDENTS, OD, CLASSIFICATION, QUEUE WARNING)

FHV DEMAND MANAGEMENT

DETECTORS (AVAILABILITY, COUNTS, OCCUPANCY)

CURBSIDE SENSORS (OCCUPANCY, AVAILABILITY, DWELL TIME)

ELECTRICAL VEHICLE CHARGING STATIONS

AIRTRAIN (AVL, APC)

PARKING MANAGEMENT SYSTEM

DYNAMIC PARKING GUIDANCE SIGNS

PEOPLE SENSOR (FLOW, QUEUE LENGTH, DWELL TIME)

WAYFINDING SENSORS

TRAFFIC SIGNAL SYSTEM (TRAFFIC FLOW, SIGNAL TIMING, TMC, ATR)

CURBSIDE MANAGEMENT SYSTEM

Transportation Data Hub

DataMart

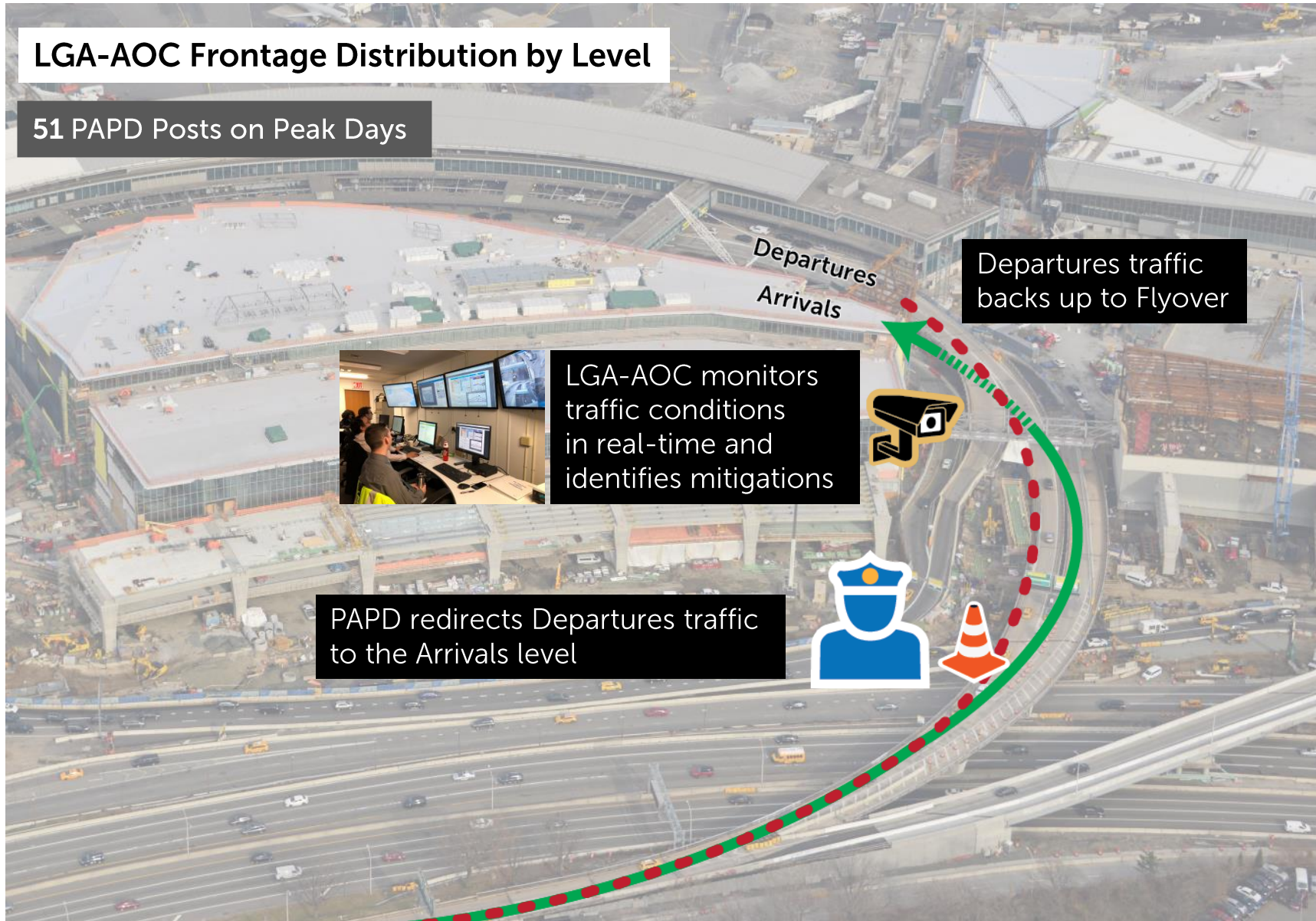Power BI — Data Analytics & Reporting

MapViewer

LGA Airport Operations Center (LGA-AOC)

- PANYNJ established the Landside Transportation Mobile Command Center (LTMCC) to actively manage traffic at LGA in real-time

- The LGA-AOC is staffed by core representatives from PANYNJ Traffic Engineering, LGA Operations, PAPD, LGP, and Delta Airlines

- During busier days, multiple staff members from other groups are in attendance to expedite the decision making process for incident response.

- The LGA-AOC uses tools such as on-site cameras (EarthCam, iCones, Google Maps, and Flight Aware to assist with real-time traffic monitoring.

- Staff developed both the Playbook, which includes standard operating procedures and traffic mitigation plans, as well as a guide book, which provides more details on the operations.

Operational Flexibility

LGA-AOC Frontage Distribution by Level

51 PAPD Posts on Peak Days

Departures
Arrivals

Departures traffic backs up to Flyover

LGA-AOC monitors traffic conditions in real-time and identifies mitigations

PAPD redirects Departures traffic to the Arrivals level

Operational flexibility required to accommodate peak demand and incidents:

- Real-time traffic management
- Customization of ground transportation and parking operations
- Programmatic yet temporary modifications to roadway network

All mitigations tailored to demand intensity and patterns (time-of-day, day-of-week, etc), plus location criticality and sensitivity

PORT AUTHORITY NY NJ

AIR LAND RAIL SEA

PA Agency Operations Center (PA-AOC)

Transportation Management

- Single Point of Contact for Traffic at entire Port Authority

- Incident Management and Coordination with local and regional transportation agencies

- Staffed 24-7

- Provide Real-time traveler information
  - 511 NY
  - Coordination with JTMC and Google/Apple Maps

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

PA Agency Operations Center (PA-AOC)

Transportation Management
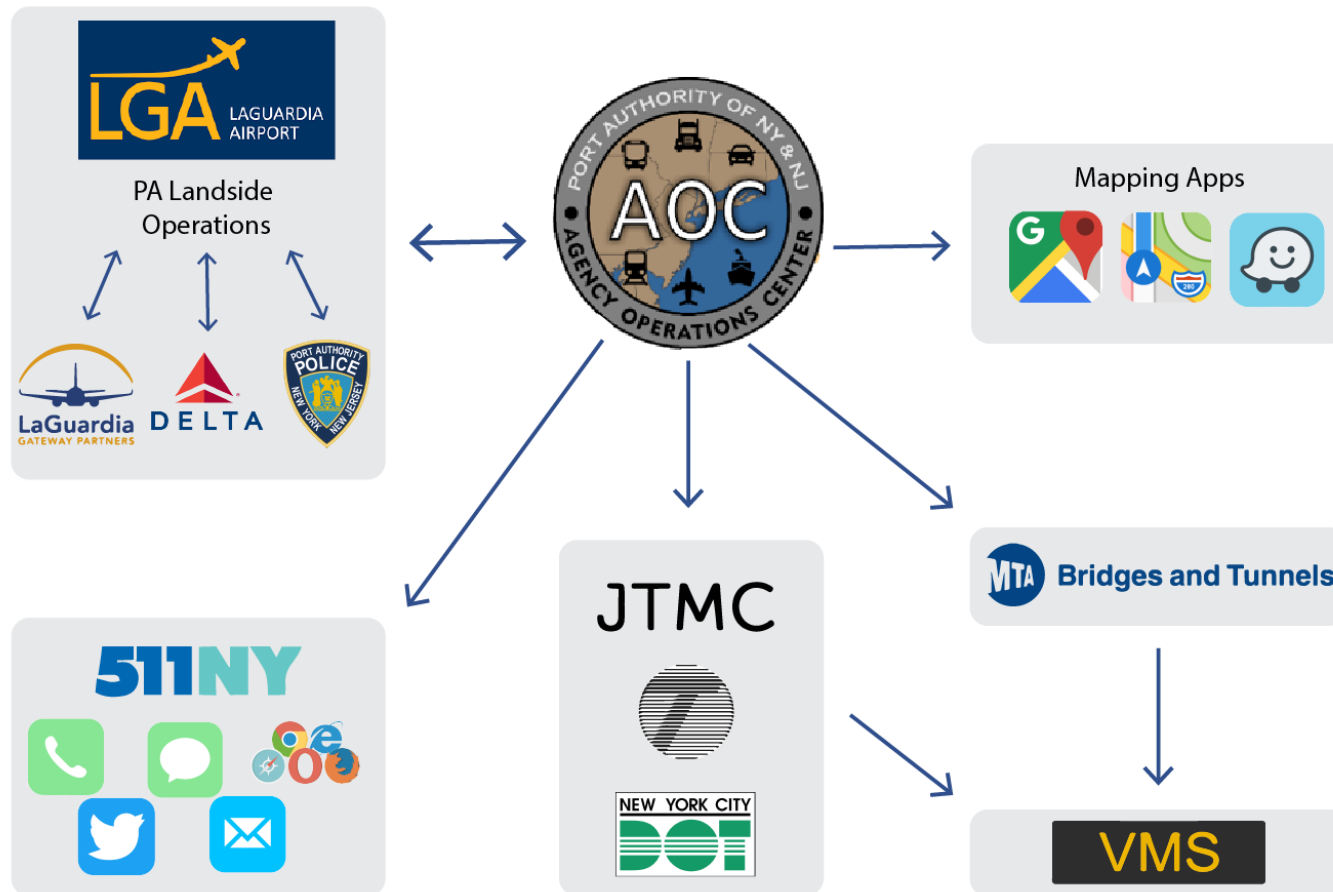
The Port Authority's experience shows that:

- Developing partnerships opens the door to valuable data for situational awareness, analysis, performance management, informed decision-making, and even safety applications.

- Investing in these partnerships is essential.

- Transferring data and information among a network of peer agencies, travelers, and private companies is the basis for informed decision-making both by customers and by the agencies that are managing traffic.

- We continue to develop partnerships and look forward to expanding their use in communications and operations.

MAPS influences driver behavior changing roadway conditions

Real life travel conditions influence driver behavior

3rd Party Partnerships

Current PANYNJ Mapping Partners Ecosystem

AOC adds roadway status; MAPS updates 8 nav apps

Mobile mapping apps convert phones to probes/ nav

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA
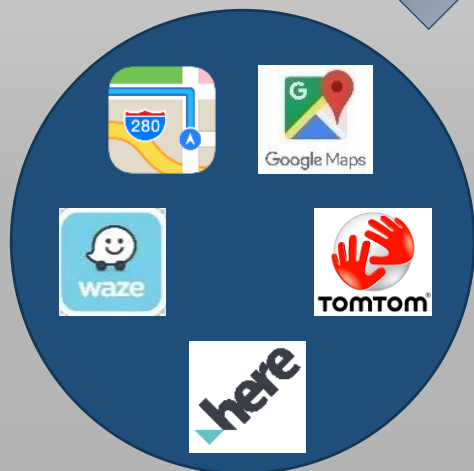
Proposed JFK-AOC Flow Chart

Transportation Technologies
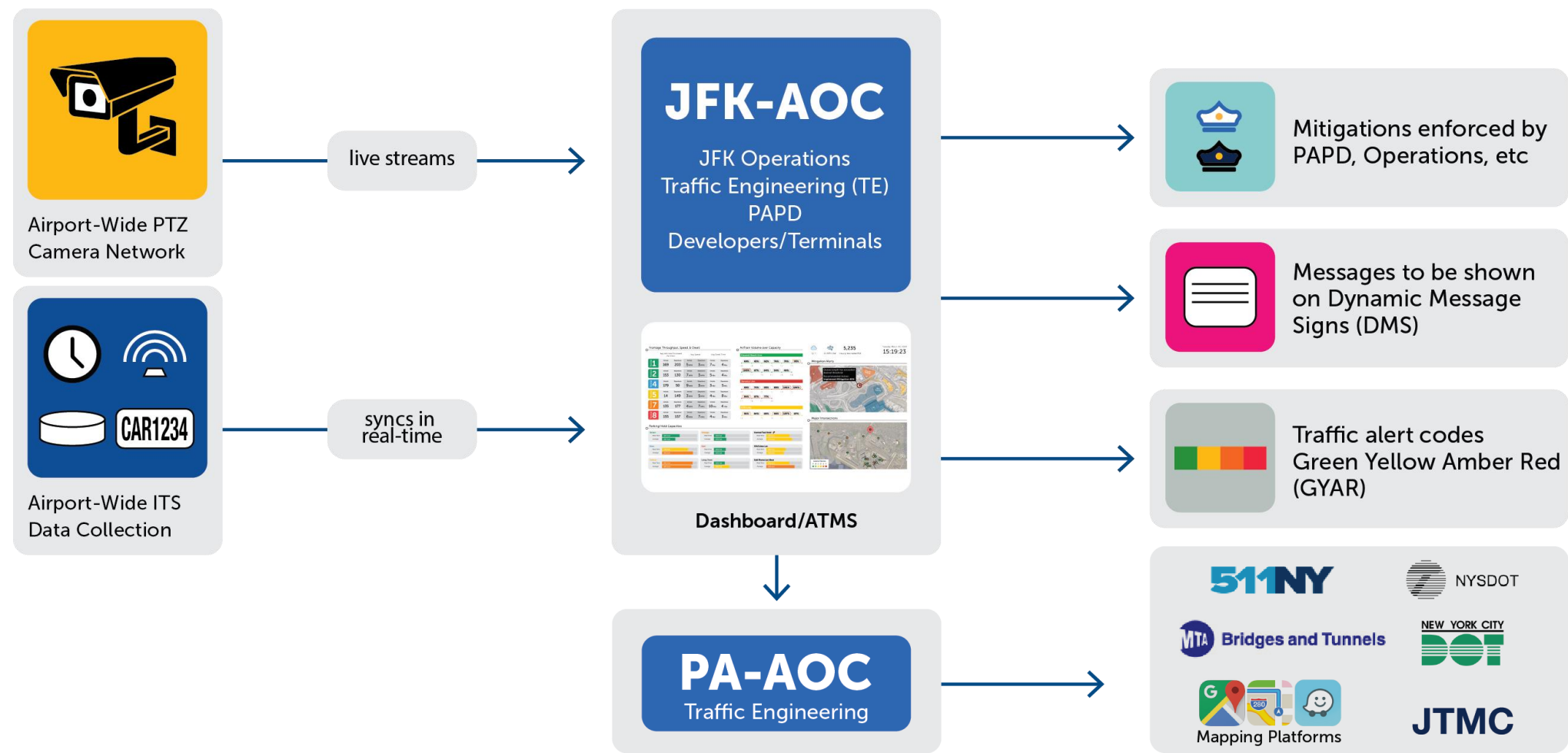
Real-Time Dashboard

Transportation Technologies
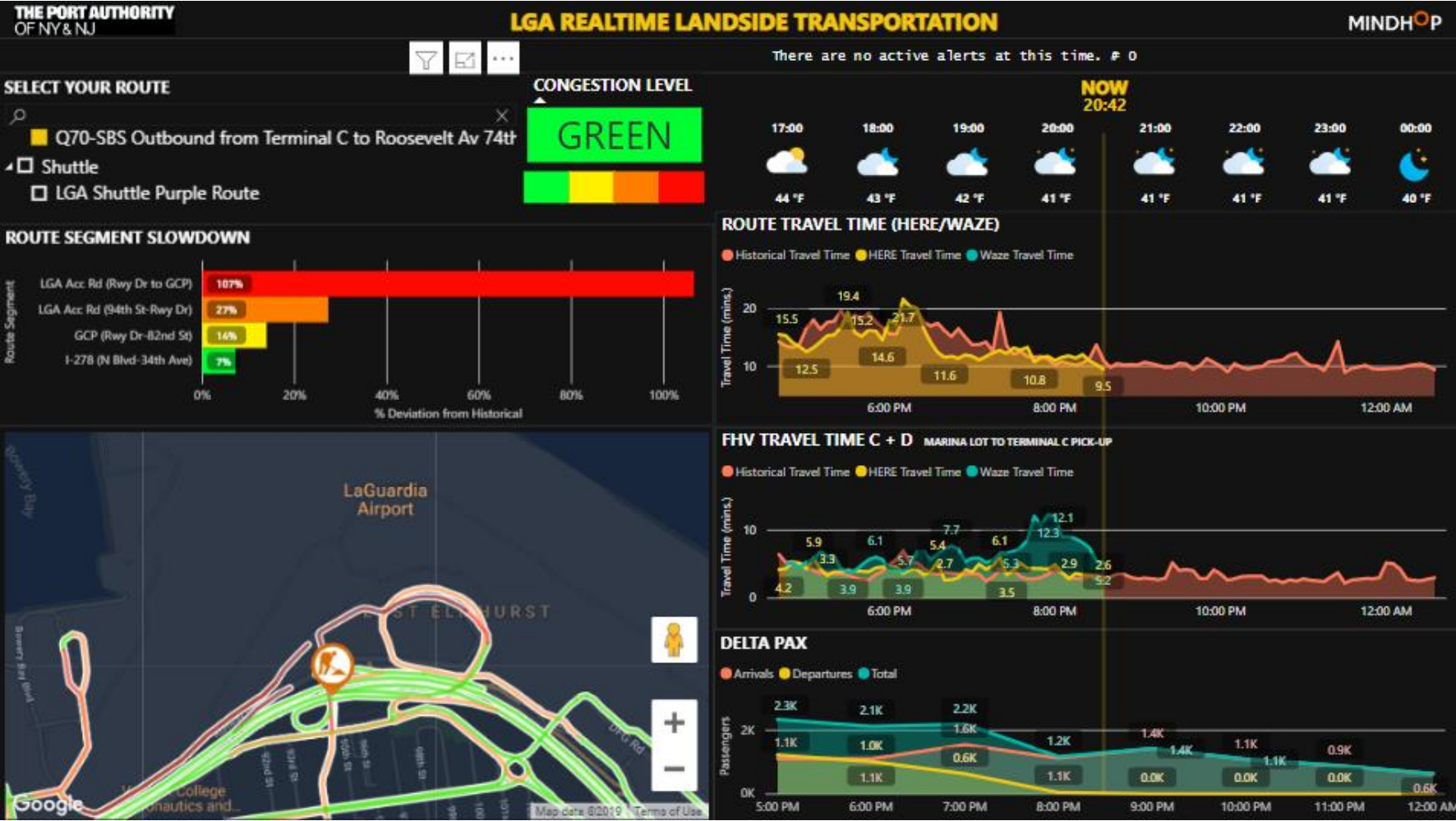
LGA Weekly Airport Performance Monitoring

Planning & Reporting

Weekly Performance | **10.22 – 10.29**

					Closing
A: 7 / D: 7	🌧️	Tue 10/22		81,538 PAX	1:00 AM
A: 0 / D: 0	☀️	Wed 10/23		86,452 PAX	1:00 AM
A: 10 / D: 7	☀️	Thu 10/24		101,832 PAX	1:00 AM
A: 6 / D: 8	⛅	Fri 10/25		108,856 PAX	1:00 AM
A: 0 / D: 1	⛅	Sat 10/26		62,588 PAX	12:00 AM
A: 4 / D: 3	🌧️	Sun 10/27		92,880 PAX	1:00 AM
A: 1 / D: 2	⛅	Mon 10/28		96,162 PAX	1:00 AM
A: 6 / D: 4	🌧️	Tue 10/29		77,280 PAX	12:00AM

Time axis: 4am 6 8 10 12pm 2 4 6 8 10 12am 2

Projected Daily Enplanements:	1 < 47,000	1 2 47,000 – 50,000	1 2 3 50,000 – 53,000	1 2 3 4 > 53,000
Actual Daily Enplanements:	1 < 47,000	1 2 47,000 – 50,000	1 2 3 50,000 – 53,000	1 2 3 4 > 53,000

Daily Weather Conditions: ☀️ Sunny   ⛅ Partly Cloudy   🌦️ Light Rain/Snow   🌧️ Heavy Rain/Snow   ⛈️ Thunderstorms   🌬️ Windy

Daily Flight Cancellations: ✈️ Departures Arrivals

36

PORT AUTHORITY NY NJ

AIR LAND RAIL SEA

LGA Traffic Management

Planning & Reporting
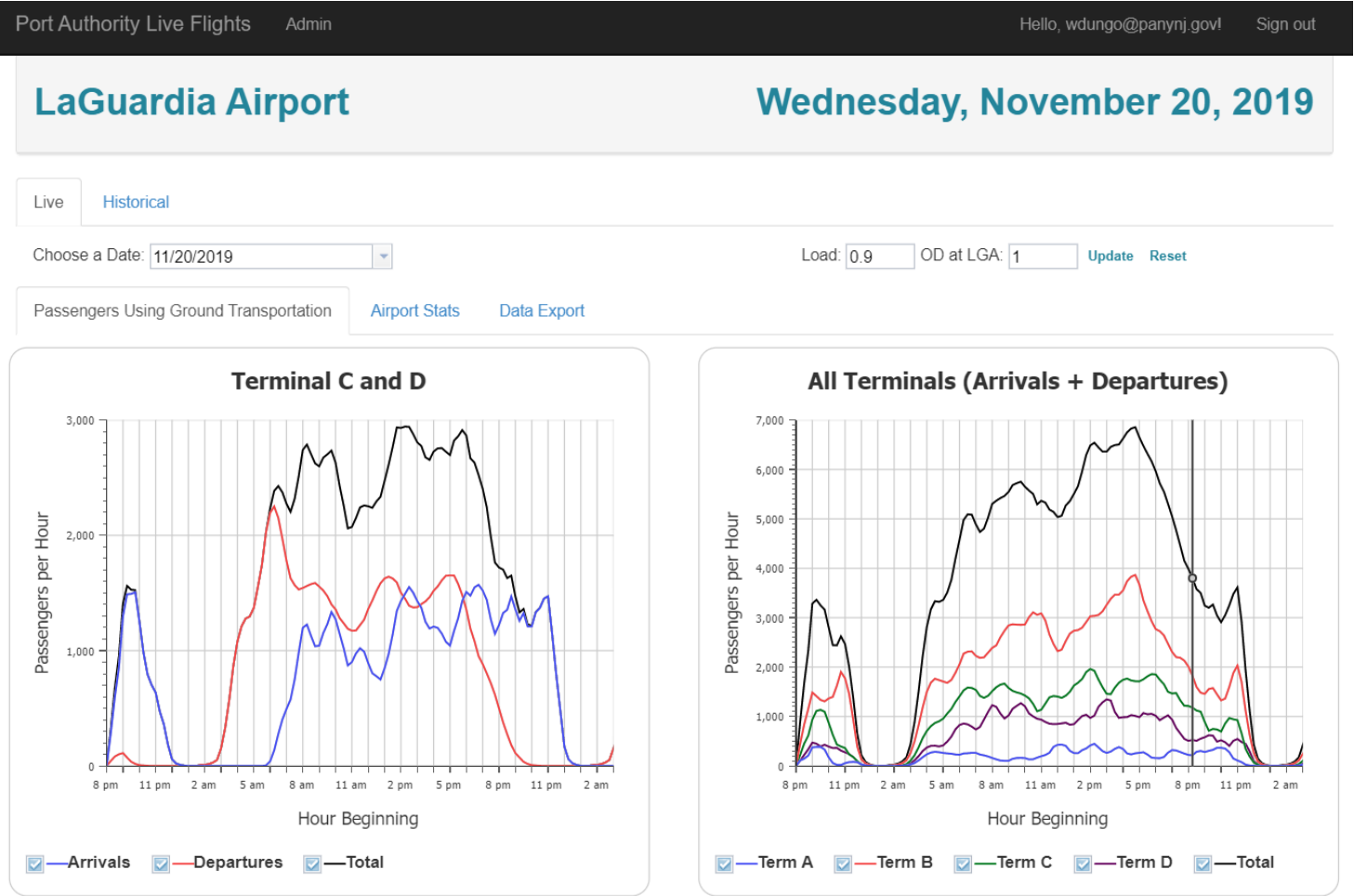
LGA Waze Analysis

Planning & Reporting

2019 Waze Analysis - Calculated Speeds - Thursday, October 17th
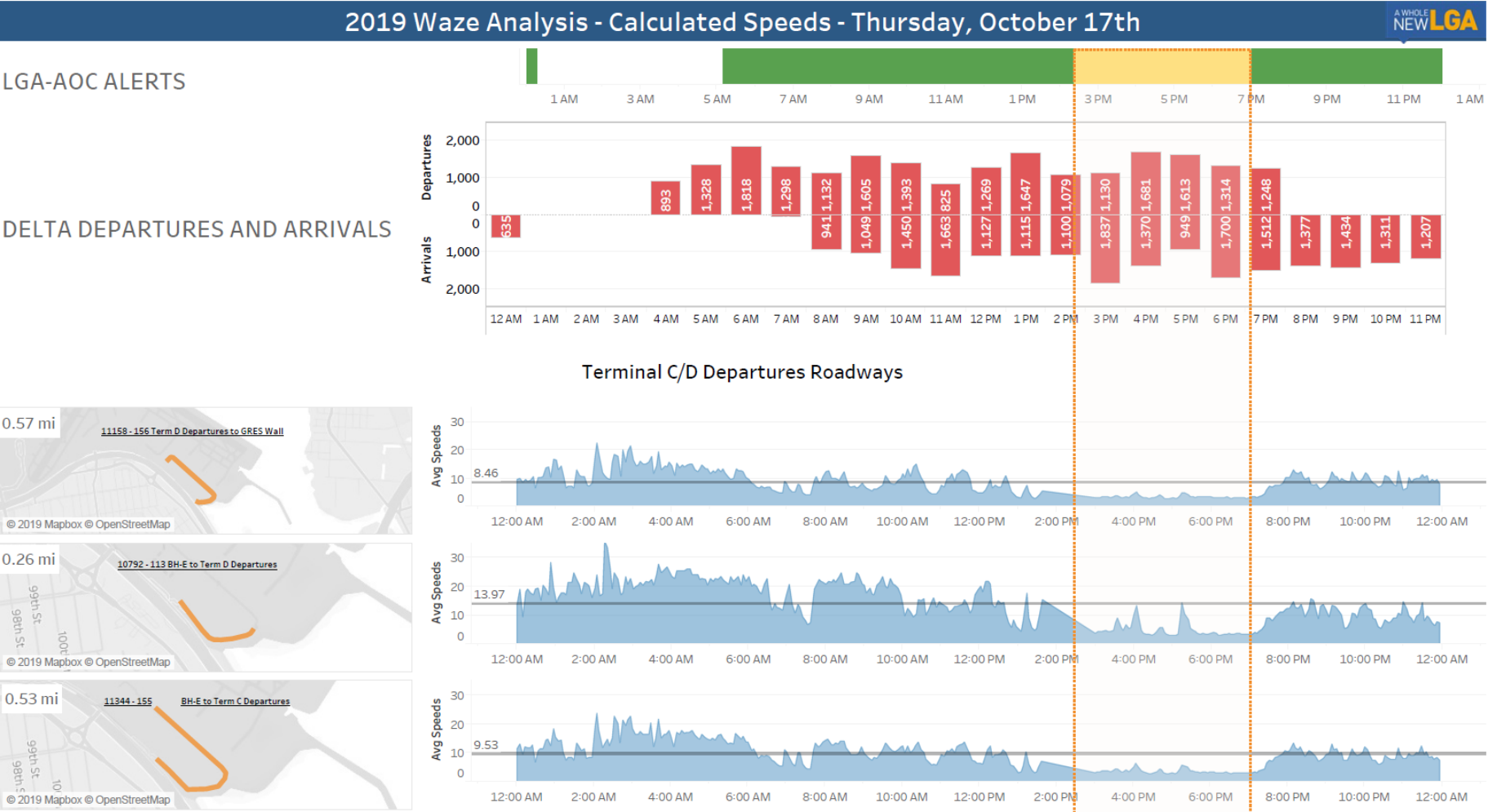
Mitigations Analysis Tool

Planning & Reporting | Pre-Construction Analysis
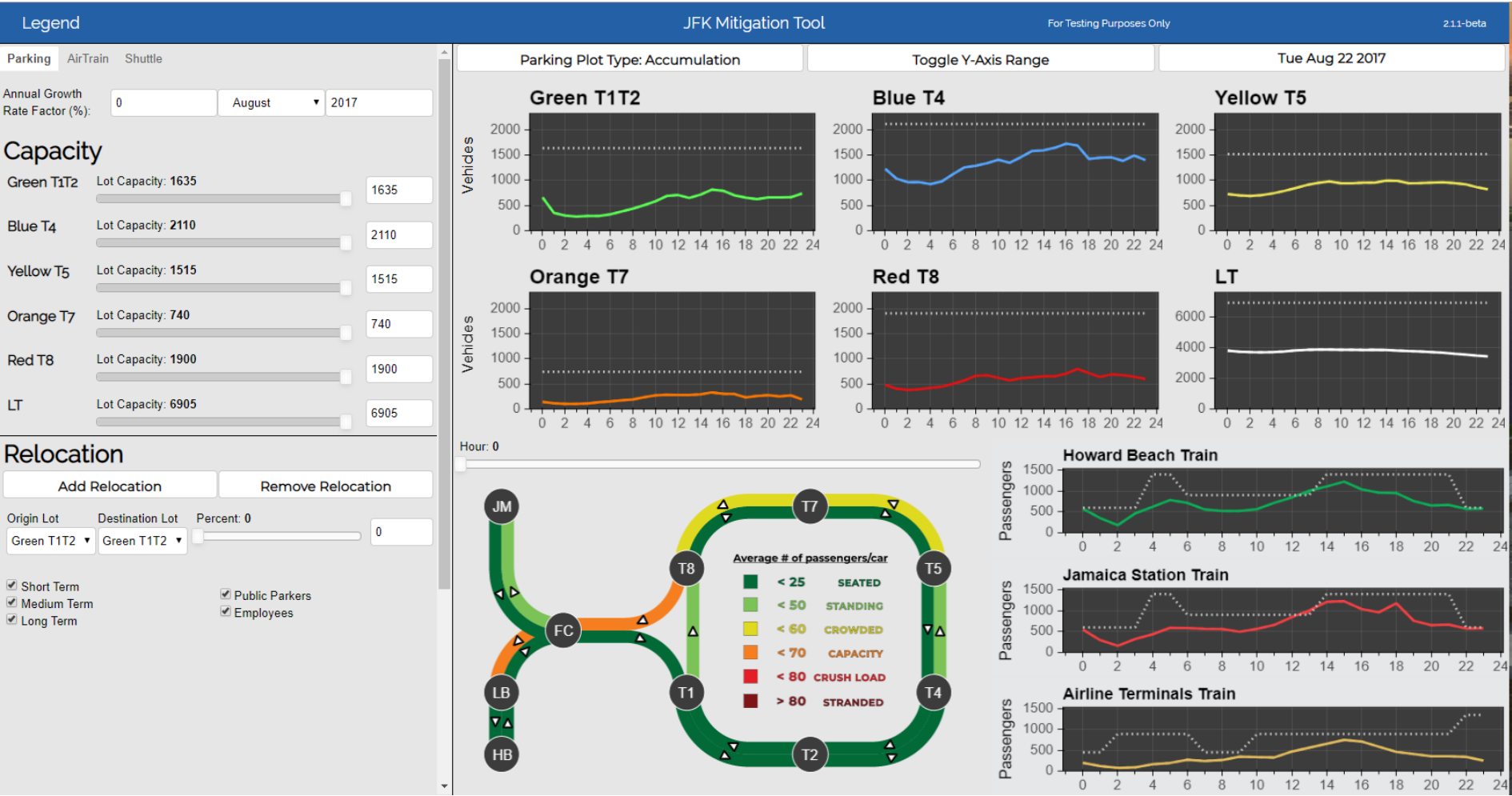
Planning for the Future

Metrics

World-Class Landside Operations
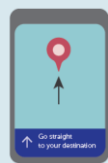
Information Availability

- ✓ Wayfinding Static Signs
- ✓ Dynamic Signs with Real-Time Information
- ✓ Personalized Trip Guidance

Quality of Pedestrian Experience

- ✓ Short Walk
- ✓ Covered or Enclosed
- ✓ Safe and Protected

Seamless Connection

- ✓ Minimal Wait Time
- ✓ Proactive FHV Operations
- ✓ Informed Multi-Modal Options

Organized Frontage

- ✓ Separation of Modes
- ✓ Access to Curb
- ✓ Dedicated Space
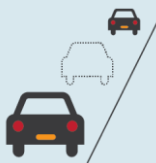
Transportation Demand Management

- ✓ Frontage Management Strategies
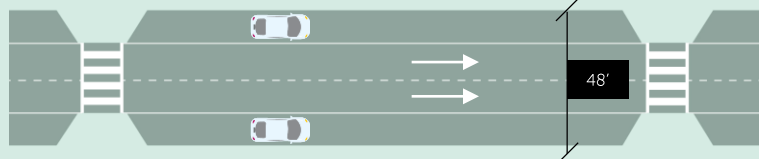- ✓ Alternative Pick-Up Area
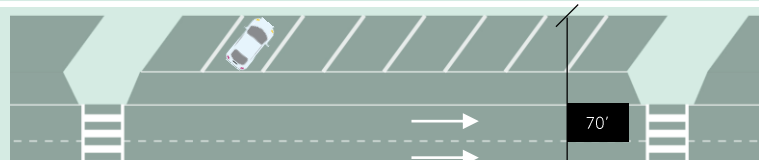- ✓ Public Transportation Incentive
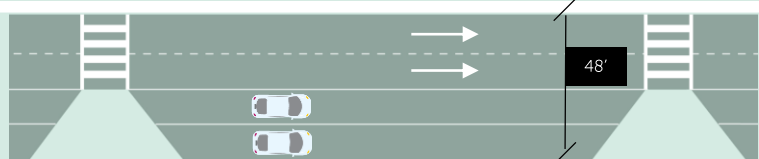
Airport Rankings

World-Class Landside Operations

	Information Availability	Quality of Pedestrian Experience	Seamless Connection	Organized Frontage	Transportation Demand Management	Airport Overall Score
London (LHR)	●●●●	●●●○	●●○○	●●●●	●●●○	70%
Munich (MUC)	●●●○	●●●●	●●○○	●●●●	●●●○	65%
Orlando (MCO)	●●○○	●●●○	○○○○	●●●○	●●●●	61%
Incheon (ICN)	●●●●	●●●○	○○○○	●●●○	●●○○	60%
Hong Kong (HKG)	●●●●	●●●●	●○○○	●●●○	●●●○	58%
Singapore (SIN)	●●●○	●●●●	●●○○	●●●○	●●○○	57%
Zurich (ZRH)	●●●○	●●●●	●●●○	●●●●	●●●○	55%
Istanbul (IST)	●●●●	●●●○	●●○○	●●●○	●○○○	55%
Amsterdam (AMS)	●●●○	●●●○	●●○○	●●●○	●●●○	52%
Portland (PDX)	●●○○	●●●●	●●○○	●●●●	●●○○	51%

Frontage Configurations

World-Class Landside Operations
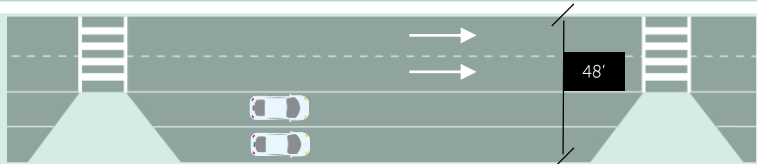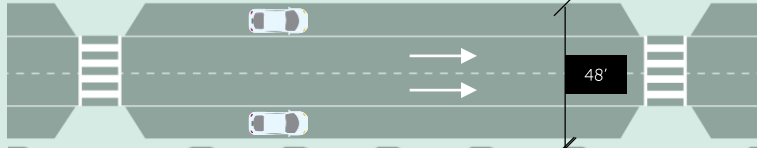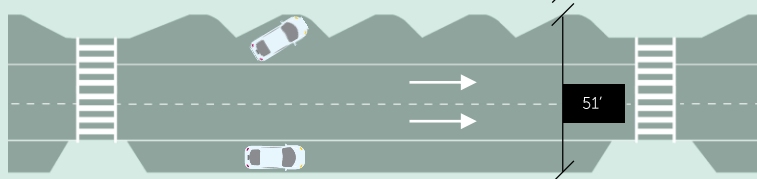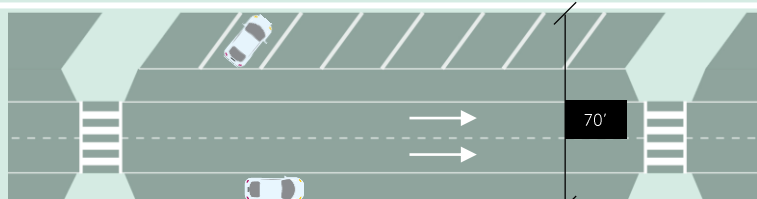
Frontage Configuration	Lane Configuration		Considerations	
			Benefits	Limitations
Linear Curbside		**2** Loading Lanes **2** Travel Lanes **4** Total Lanes	• Intuitive for drivers • Minimal dwelling • High throughput	• Double parking • Boarding in thru lanes • Chaotic appearance
Two-Sided Linear Curbside		**2** Loading Lanes **2** Travel Lanes **4** Total Lanes	• More curb space • Reduced double parking • More space for customers	• Additional walking distance for far-side curb • Increased risk of ped mid-block crossings
Two-Sided Relaxed Sawtooth		**2** Sets Sawtooth **2** Travel Lanes **4** Total Lanes	• Defined vehicle spaces • No need for backing out	• Reduced number of spaces • Potential for confusion and longer dwell times
Two-Sided Linear and Relaxed Sawtooth		**1** Set Sawtooth **1** Loading Lane **2** Travel Lanes **4** Total Lanes	• Combines the benefits of linear for POVs and relaxed sawtooth for FHV and taxis	• Potential for confusion and longer dwell times
Two-Sided Linear and Angled Parking		**1** Set Angled Bays **1** Loading Lane **2** Travel Lanes **4** Total Lanes	• Increased capacity • Defined vehicle spaces • Combination with linear is more intuitive for POVs	• Backing out required for Angled parking

Parking space linear footprint dimensions: Linear: 25'/space ; Relaxed Sawtooth: 40'/space ; Angled: 14'/space

PORT AUTHORITY NY NJ

AIR LAND RAIL SEA

Frontage Configurations

World-Class Landside Operations

(Source: Aug. 2017 JFK CTA Data Collection Program)

Frontage Configuration	Lane Configuration	Linear Frontage Length = 500'		
		Effective Spaces	Dwelling Capacity (veh/hr)	% Difference in Dwelling Cap. (vs Linear)
Linear Curbside	**2** Loading Lanes **2** Travel Lanes **4** Total Lanes	26	440	–
Two-Sided Linear Curbside	**2** Loading Lanes **2** Travel Lanes **4** Total Lanes	36	675	+53%
Two-Sided Relaxed Sawtooth	**2** Sets Sawtooth **2** Travel Lanes **4** Total Lanes	22	365	-17%
Two-Sided Linear and Relaxed Sawtooth	**1** Set Sawtooth **1** Loading Lane **2** Travel Lanes **4** Total Lanes	29	495	+12%
Two-Sided Linear and Angled Parking	**1** Set Angled Bays **1** Loading Lane **2** Travel Lanes **4** Total Lanes	50	800	+82%

Parking space linear footprint dimensions: Linear: 25'/space ; Relaxed Sawtooth: 40'/space ; Angled: 14'/space; Typical dwell time assumed = ~2 minutes for both Departures and Arrivals

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

Airport Digital Ecosystem

World-Class Landside Operations

BI Toolkit

Cloud Operations

Integrated Operations

Performance Based Ops

Performance Based Operations

Mobility Companion

Airport Digital Ecosystem

IoT

Sensors

Autonomous Vehicles

Smart Parking

Shared Mobility Services

Realtime & Forecasted Flight Info

Electric Vehicle Charging

Luggage Tracking

Self-Service & Automation

Digital Traveler Experience

Biometrics

Robotics & Automation

Mobility Companion

World-Class Landside Operations |

Shared Rides
Carpooling, vanpooling, and real-time ridesharing services. Via

For-Hire-Vehicles (FHVs)
Livery services, limousines. Uber, Lyft

Taxis

Car Rental
Conventional rental car services: Avis, Budget, Dollar, National, Hertz, Enterprise

High Occupancy Vehicles (HOVs)
Express buses. Golden Touch, Supershuttle, Go Airlink NYC, ETS Airport Shuttle

AirTrain & Transit
AirTrain (MTA, NYCT), LIRR, Metro-North

Shared Rides
TNCs
Taxis
Car Rental
Real-time Travel & Operations Data
Public Transportation
Integrated Payment
Incentives
Smart Parking
Trip Planning & Navigation services
Support

Connected Traveler

Digital Mobility Companion

Real-time Travel & Operations Data
Includes public agency and private sector traffice data

Augmented Reality
Allows users to navigate easily and efficiently

Incentives
Rewards and incentives users for good travel choices

Smart Parking
Allows users to reserve and pay for parking using a mobile app

Trip Planning & Navigation services
• Predictive Calendar
• Airline Data

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

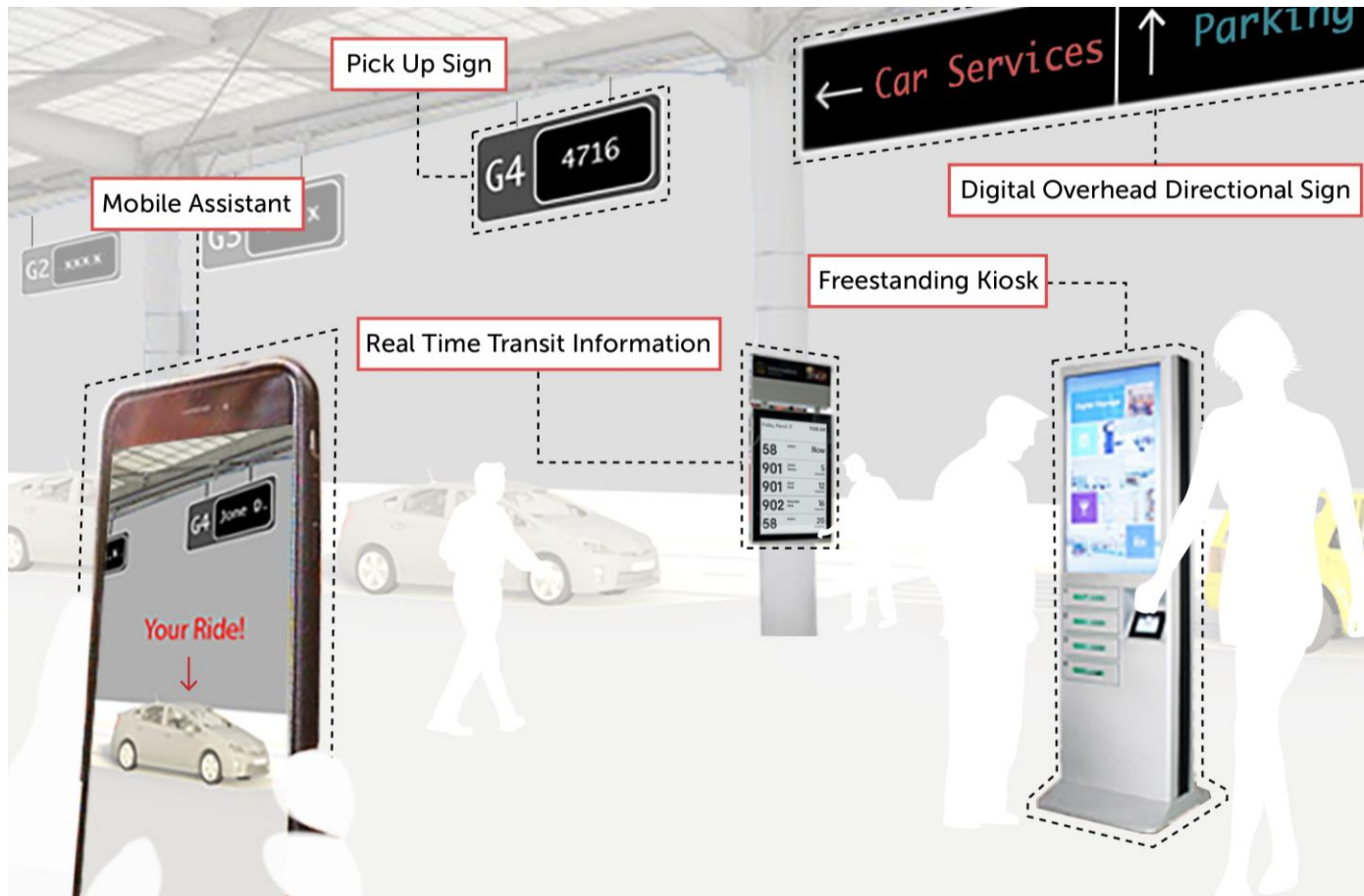# Personalized Mobile Information and Wayfinding

World-Class Landside Operations | Future Focus Areas
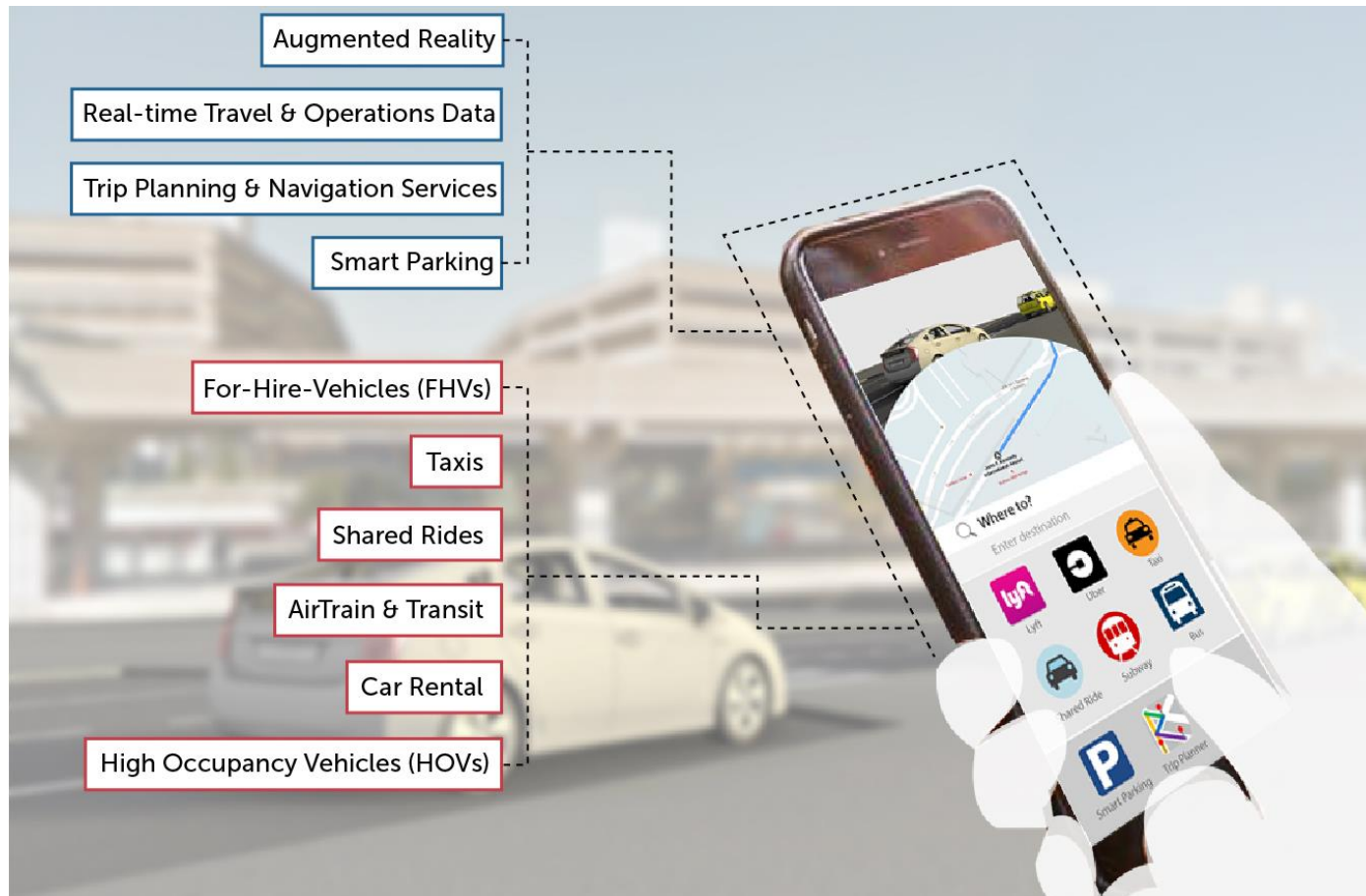
- Mobile technology provides customized information and wayfinding for customers

- Personalized wayfinding and augmented reality

- Informed multi-modal options

- Push alerts based on travel location
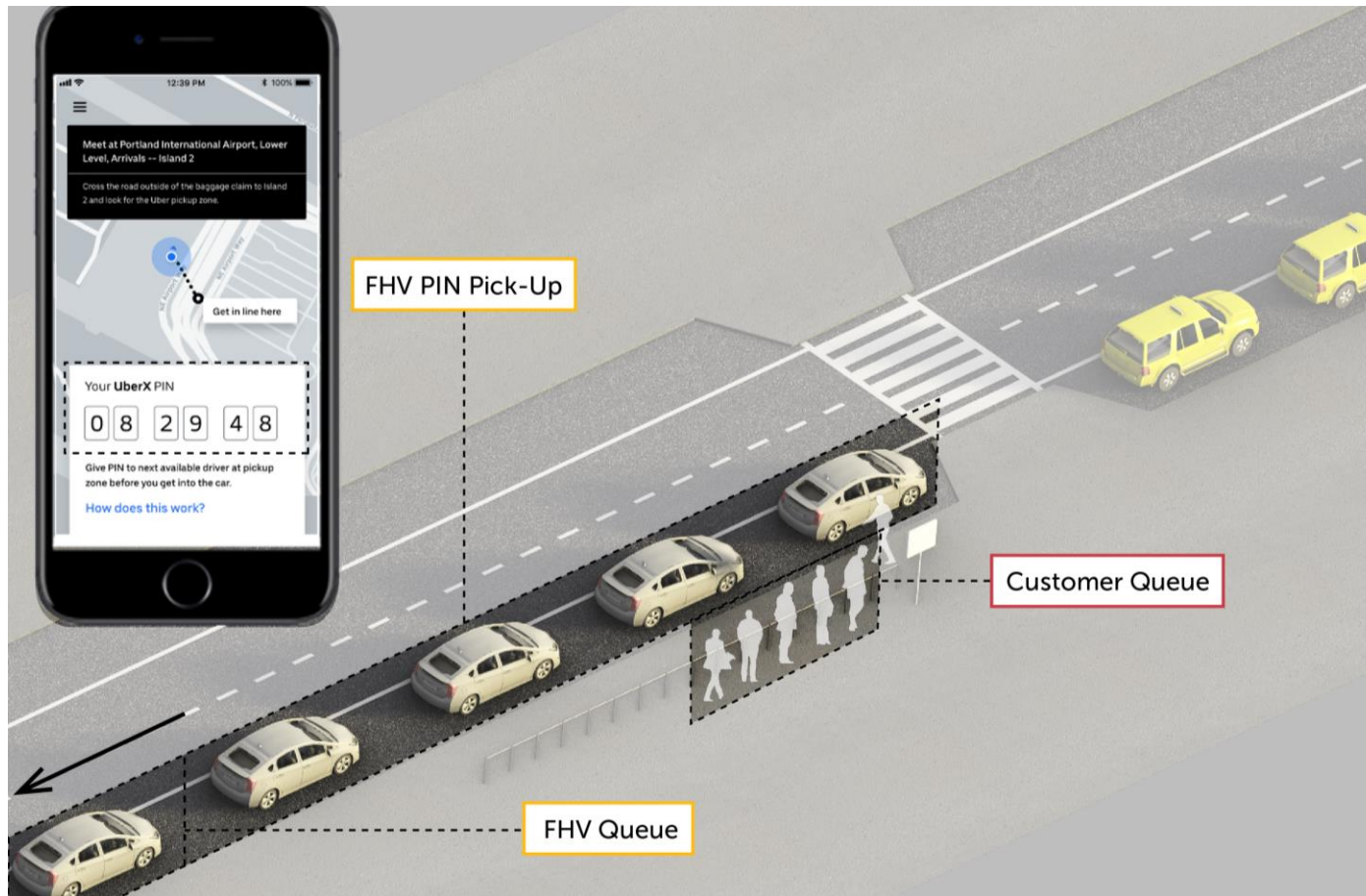
Dynamic Digital Real-Time Wayfinding

World-Class Landside Operations | Future Focus Areas

- Dynamic wayfinding can provide additional flexibility and provide a more customized experience for the customer

- Adjust information and operations in real-time

- Provide real-time information like wait times and ETA of vehicles

- Can be integrated with mobile devices for personalized information

# Proactive FHV Operations to Minimize Wait Times

World-Class Landside Operations | Future Focus Areas

- Technology and operational improvements can help streamline the FHV matching process for customers

- PIN operations provides reduced wait time for customers

- Technology can be leveraged to streamline the customer and vehicle matching

- Pre-match can reduce wait times for customer be ensuring vehicles are nearby

- Working collaboratively with FHV companies can facilitate improved operations

PORT AUTHORITY NY NJ
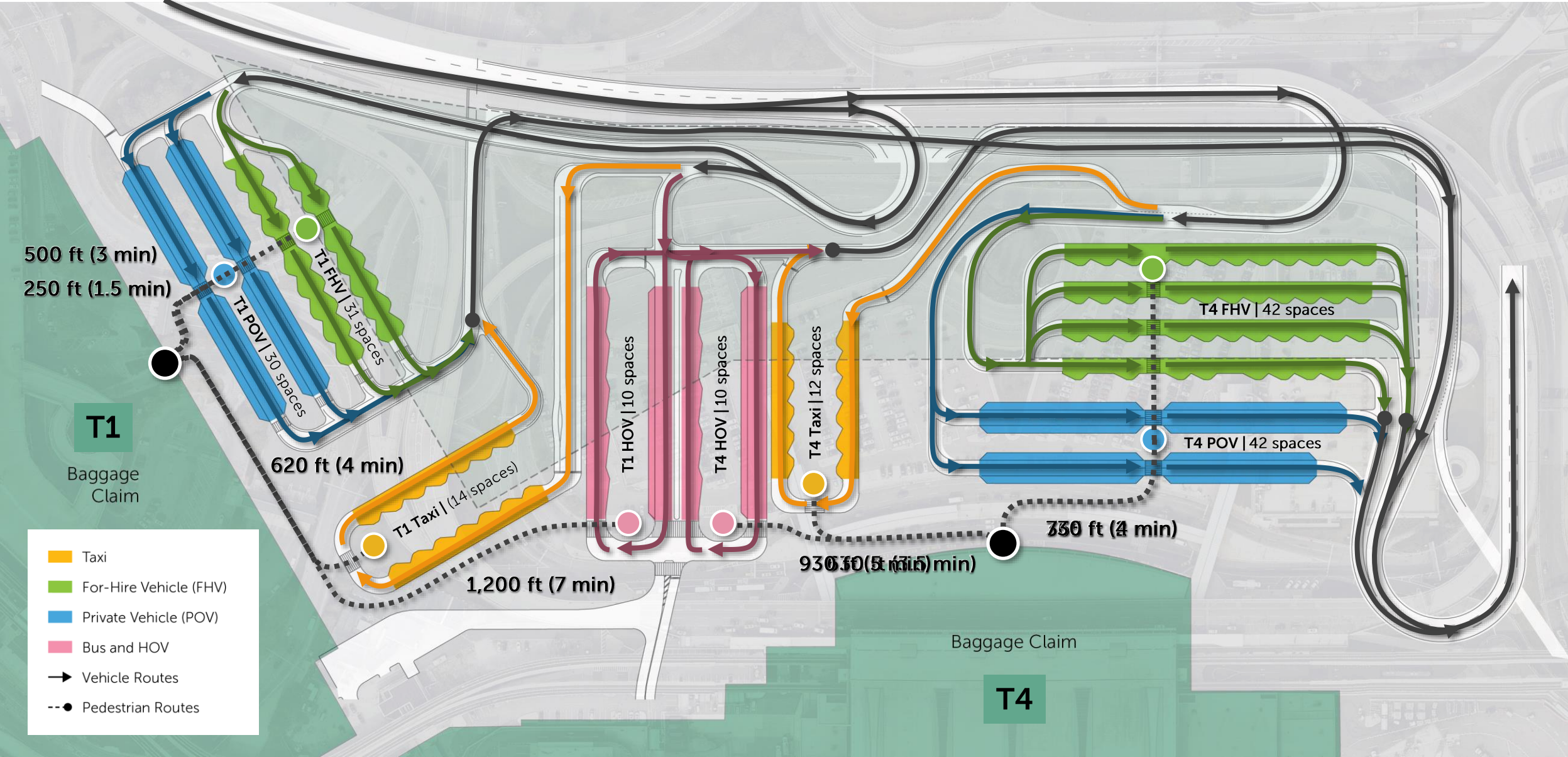AIR LAND RAIL SEA

Adaptable and Flexible Design

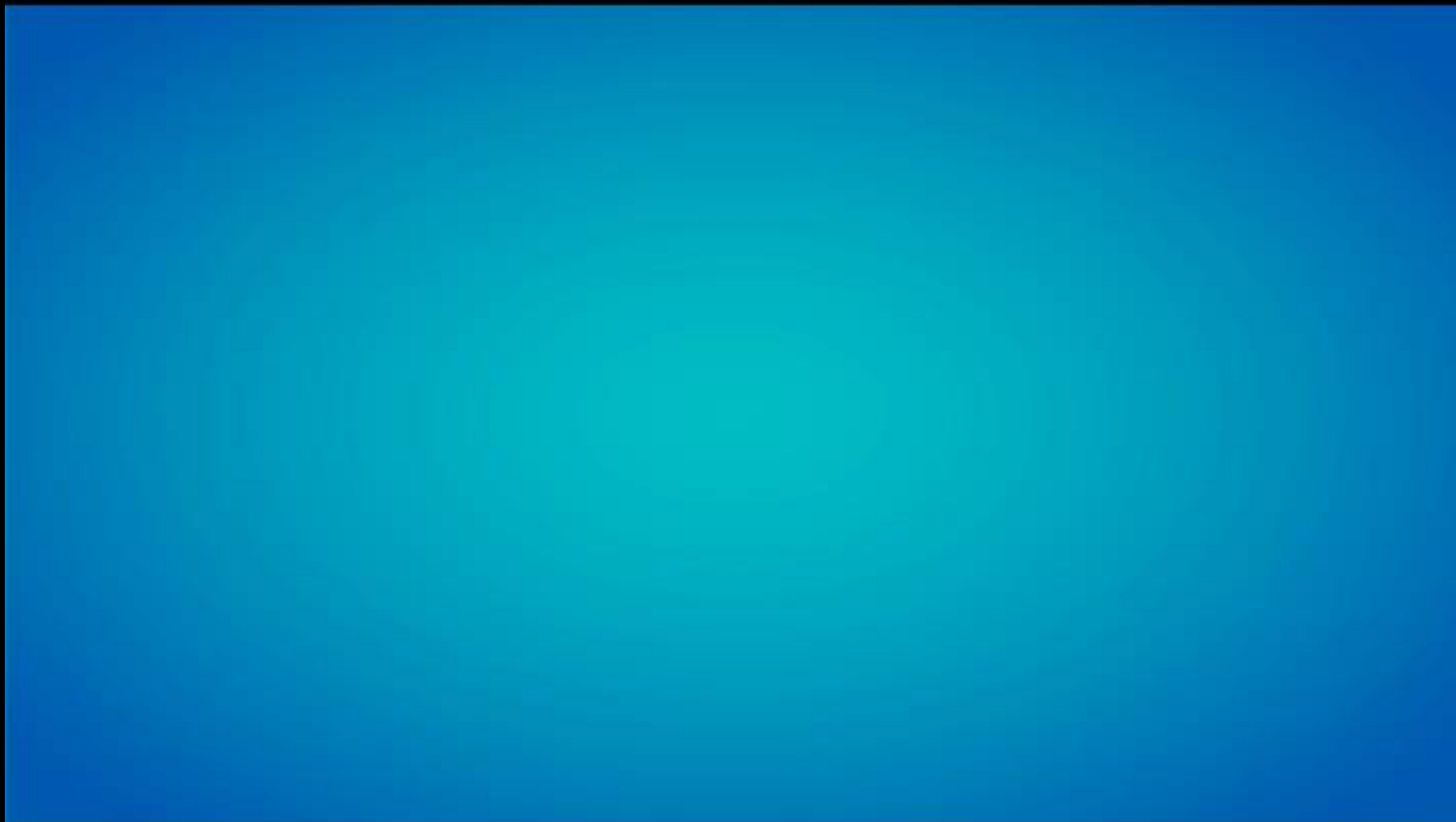## World-Class Landside Operations | Future Focus Areas
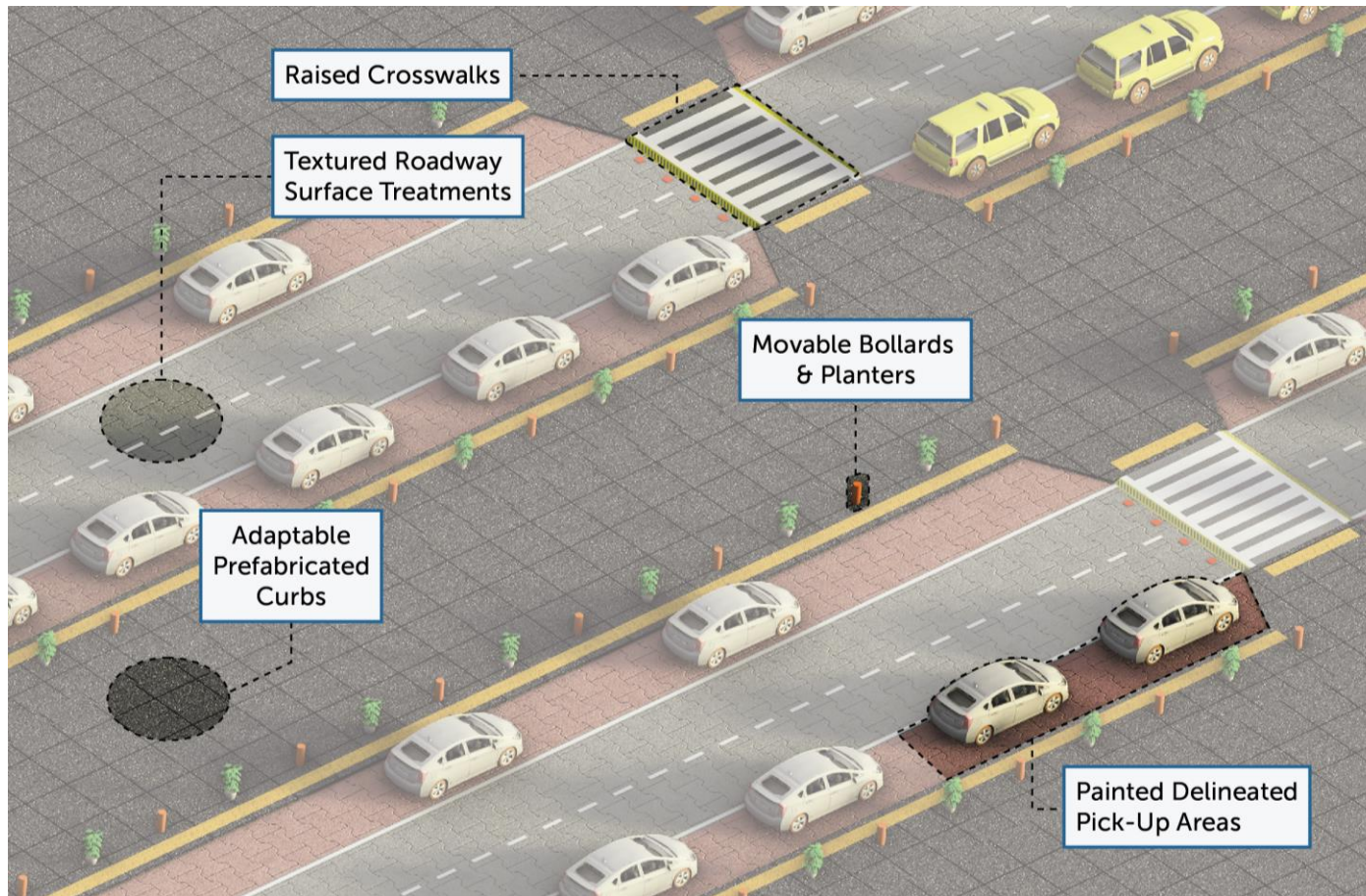
Dynamic wayfinding can provide additional flexibility and provide a more customized experience for the customer

- Adjust information and operations in real-time

- Provide real-time information like wait times and ETA of vehicles

- Can be integrated with mobile devices for personalized information

Arrivals Ground Transportation Center (GTC)

Thank You!

f @panynj 🐦 @panynj 📷 @panynj www.panynj.gov

PORT
AUTHORITY
NY NJ

AIR LAND RAIL SEA