



**Transportation Information**  
Potomac Yard  
Entertainment District

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*Analysis prepared for the Commonwealth of Virginia*

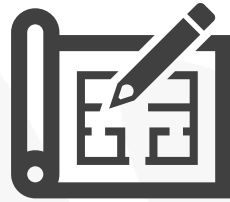
**Kimley»Horn**

February 7, 2024

# Revolutionizing Transportation in Potomac Yard



Potomac Yard has long been poised for growth



Virginia and the localities **planned for it** and have already begun to **deliver strategic transportation investments**



Virginia and the localities will **build on these investments** to take transportation to the next level for a world-class sports and entertainment district

# History of Potomac Yard Development

- **North Potomac Yard Small Area Plan** in 2010 established the vision for redevelopment of the site as a dense, mixed-use community, oriented around a new Metrorail station.
- **2017 Plan Update** built on the 2010 plan and anticipates 7.5M sq. ft. of mixed-use development to include office, hotel, residential, and concentrated areas of retail within ¼ mile of the new Metrorail station.
- **2020 Plan Update** further refined the plan for 7.675M SF of development for North Potomac Yard.
- **The Potomac Yard Metrorail Station** underpinned this updated vision and was completed in May 2023 at a cost of \$370M. It was built to serve the area and included two 800-ft. long platforms, two pavilions, and multiple pedestrian and bicycle bridges. It is substantially underutilized as it waits for development to occur.
- **Monumental Sports** announced in December 2023 their desire to relocate two professional sports teams to the site, resulting in different transportation challenges.
- **Transportation Challenges** associated with both the new Arena development and that envisioned in the 2020 Small Area Plan will stress the existing road and transit infrastructure. Although the peak loads are different, both development options will require improvements. The Arena development includes funding for those improvements that was not included in the previous plan.
- **Planning Level Analysis** was undertaken to determine the transportation improvements necessary to support this new opportunity. Cost ranges for these projects were developed.

**A summary of the analysis findings is provided on the following slides.**

# Key Takeaways

With the multimodal investments and proposed improvements, travel time estimates in the study area with Phase 1 of the proposed arena development are consistent with the previously approved “By-Right” development.

## Investments needed:

- Annual cost of operating improvements = **\$2.5M - \$7.5M**
  - Increased Metro service
  - Other multimodal solutions
- Total cost of capital improvements = **\$135M - \$215M**
  - Targeted Metro station upgrades
  - Targeted intersection improvements

*All cost estimates include contingency (20% Transit operating, 50% Transit capital, 60% Roadway)*

# General Assumptions

- **By-Right** development includes over 7.675M SF of mixed-use development approved in 2020. Trip generation is based on the 2017 North Potomac Yard Small Area Plan, as amended in 2020.
- **Arena** development includes a 20,000-seat arena, concert venue, and other mixed-use development. Trip generation is **based on arena sell-out conditions for all events** and includes the other Phase 1 development impacts.
- **Trip Distribution** for arena traffic is based on developer-provided ticket sales analysis and anticipated travel routes.
- **Mode Split** scenarios were developed based on similarly sized and situated arenas around the country (50% non-auto including transit, walk, and bike).
- **Peak Travel** analysis considered arena inbound traffic during the PM peak (5-6 PM) for auto traffic and post-event travel for transit use **to assess “worst case” conditions**.
- **Parking** includes both on-site (2,500 spaces) and off-site options. Off-site options include ~3,600 spaces in Crystal City served by shuttles and 5,000+ spaces at nearby metro lots and garages.

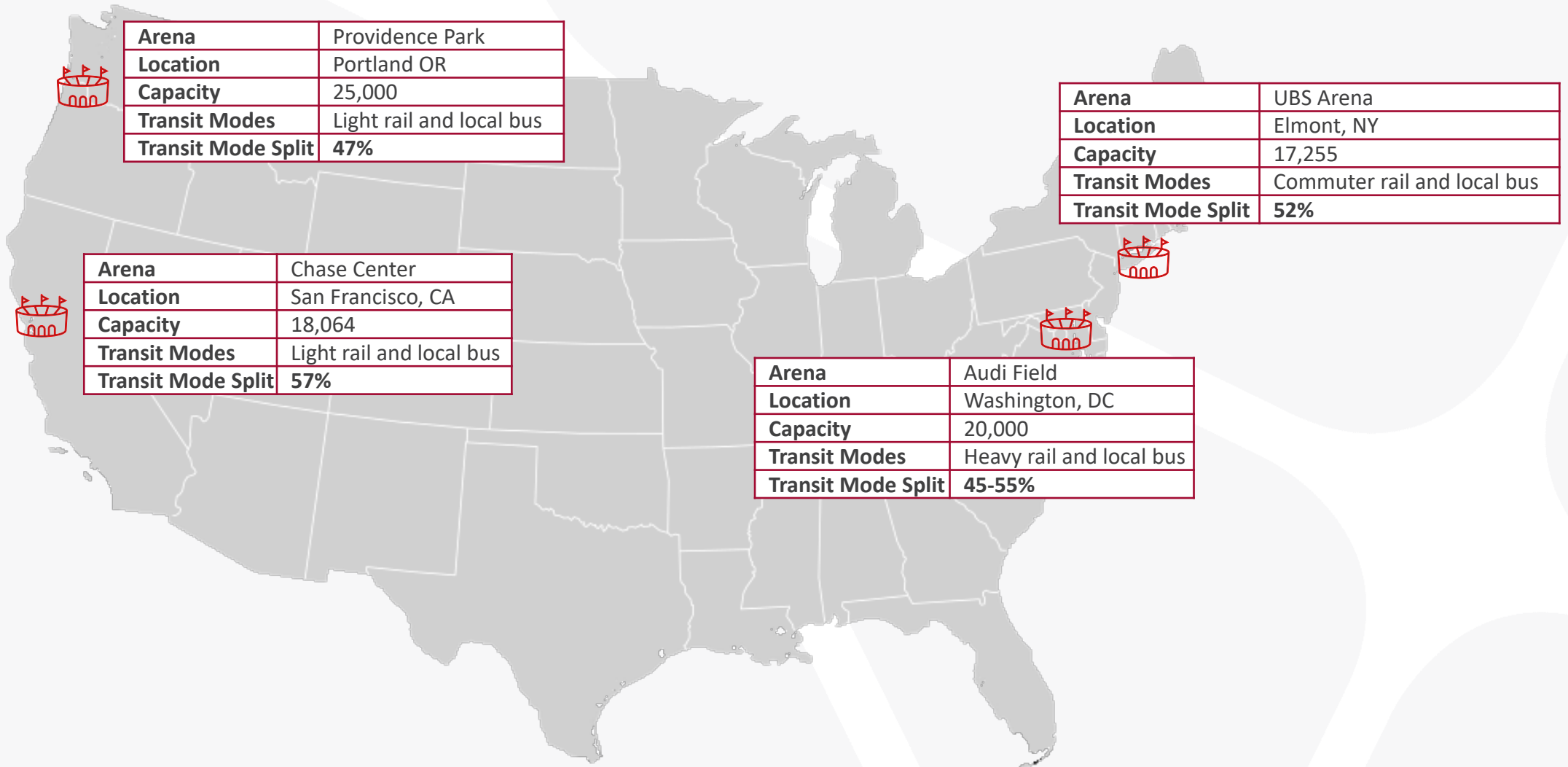
## Traffic Modeling is based on:

- A 100% full arena
- All events occurring during the highest traffic loads

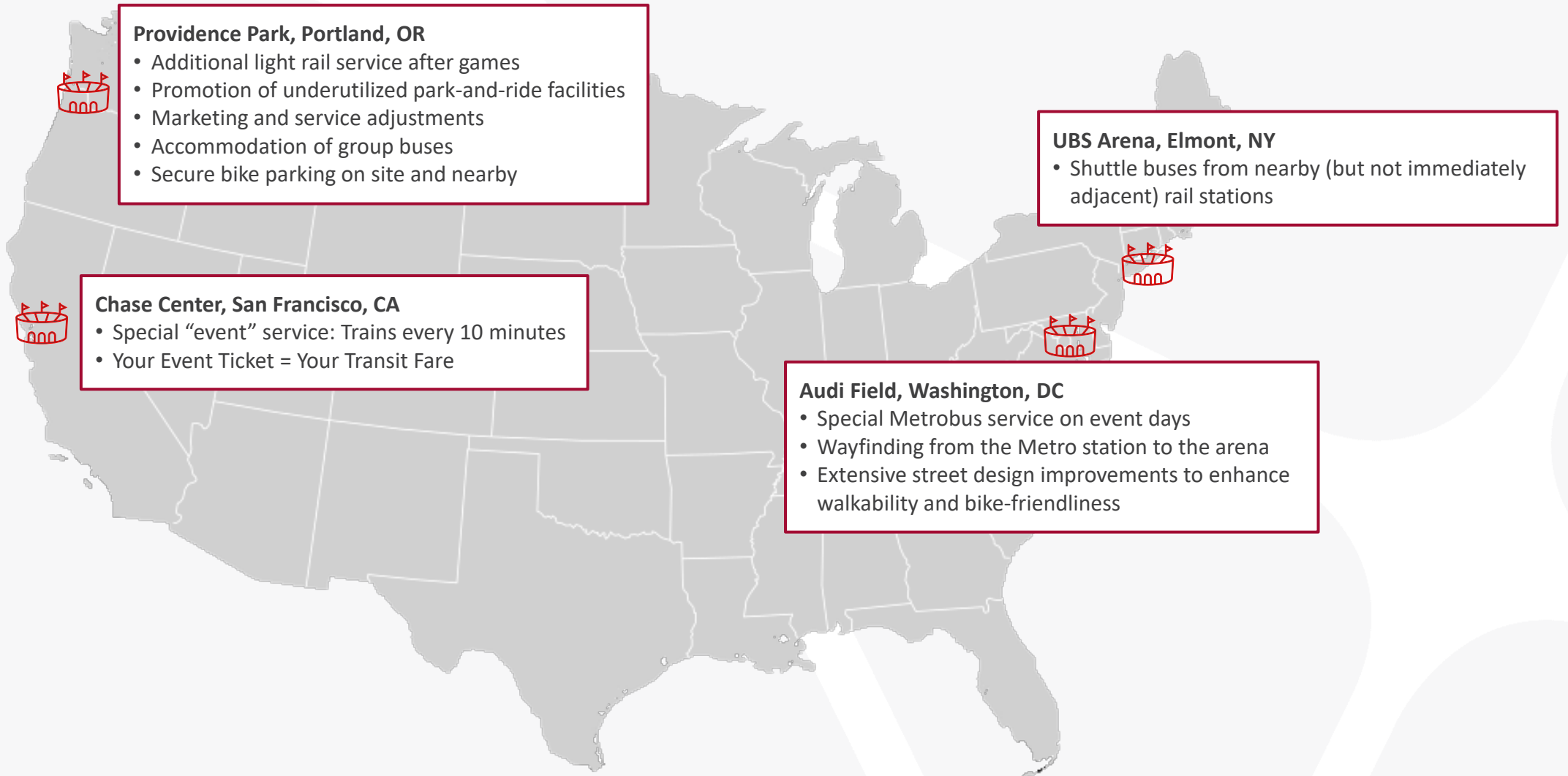
## Recent Data shows:

- Average arena occupancy is 65% across ALL events
- 35% of games occur on Saturday or Sunday

# Peer Arena Transit Mode Split

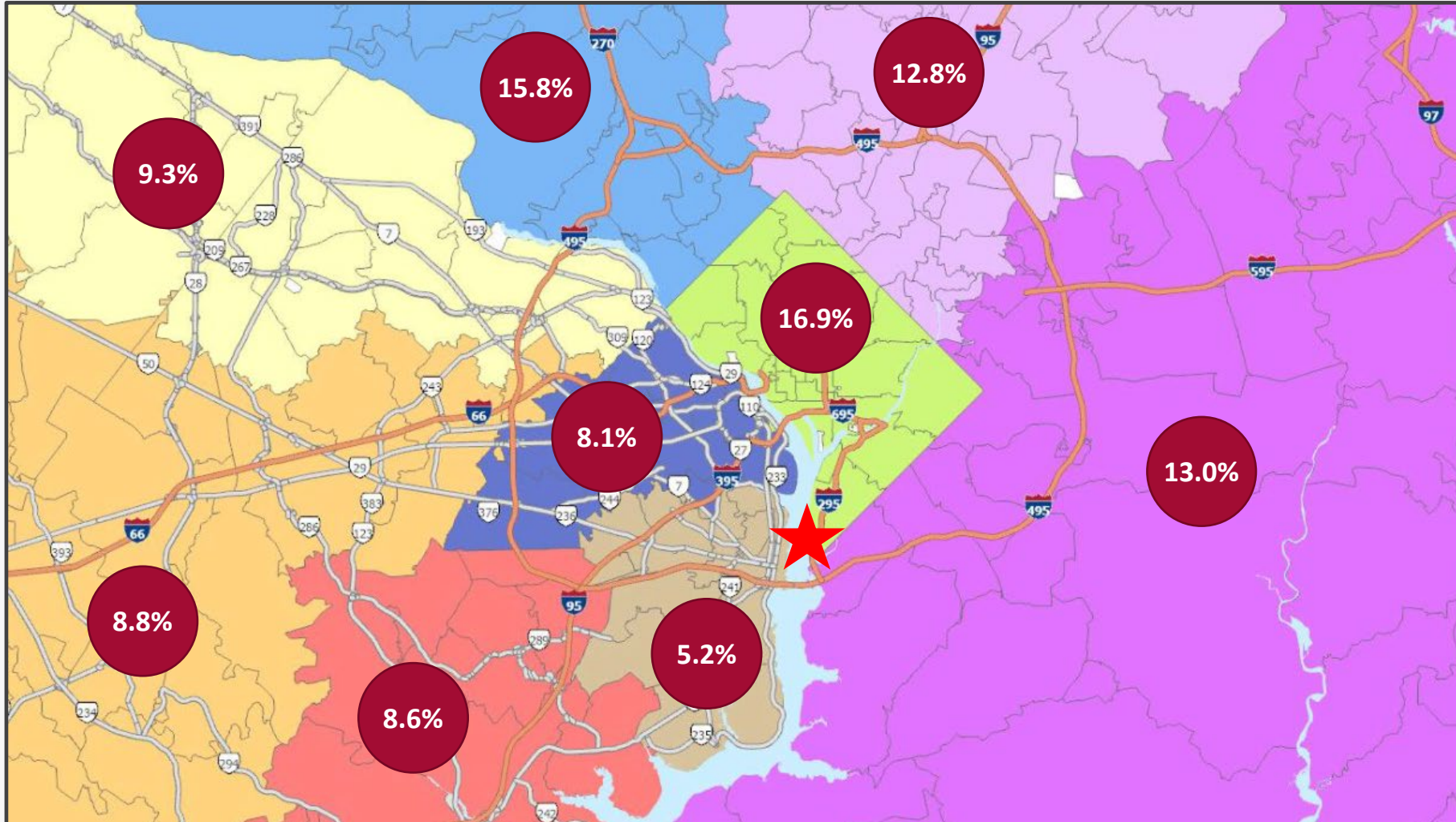


# Peer Arena TDM Strategies





# Traffic Distribution Assumptions



\* Average distribution for Capitals and Wizards tickets (2022-2023)



# Trip Generation and Mode Split Assumptions

PM Peak Hour	Auto (v/hr)			Transit (p/hr)			Bike (p/hr)			Walk (p/hr)		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
By-Right*	1,257	2,135	3,392	1,436	2,226	3,662	356	182	538	355	181	536
Phase 1**	2,970	736	3,706	5,808	1,180	6,987	415	188	603	2,021	1,079	3,100

\*Based on 2040 full build-out scenario, per the 2017 North Potomac Yard Small Area Plan Update, amended 2020

\*\*Trip generation includes other development planned for Phase 1 (e.g., multifamily residential, hotel, general retail)

- Total auto trips during the peak period are similar. The “By-Right” development adds to the peak outbound volume while the arena includes primarily inbound trips.
- Both developments leverage the Commonwealth’s investment in the Potomac Yard Metro station.
- Of the 2,021 walk trips assumed for the Arena Phase 1 development, 960 are associated with the arena. Those trips include internal capture (from office and residential) as well as nearby residential. Over 5% of current ticket holders come from the surrounding area.

# Multimodal Analysis

# Multimodal Improvements: Overall Objectives

The multimodal strategies seek to achieve at least a 50% non-auto mode-share by:



Aligning the **timing and amount of rail and bus service** with the demand of event attendees and staff



Identifying **potential pinch-points in Metro capacity** during peak event flows



Improving **pedestrian and bicycle infrastructure and access**



Maximizing use of **available parking at Metro stations** and other **off-site shuttle-accessible locations**



Facilitating safe and efficient flow of buses/shuttles through **dedicated lanes and signal technology**



Leveraging technology to provide **clear, real-time transit and travel information**

# Existing Multimodal Assets

- 2 Metro lines (Blue and Yellow Lines)
- 1 bus rapid transit line (Metroway)
- 3 local bus routes (Alexandria DASH)
- 2 rail lines (VRE Fredericksburg and Manassas Lines)

## Current Challenges

- Constrained Metro capacity
- Bus access: limited bus bays at Potomac Yard Metro Station
- VRE service operates in peak direction/time only and requires transfer to Metrorail or bus
- Lack of access from George Washington Pkwy and trail

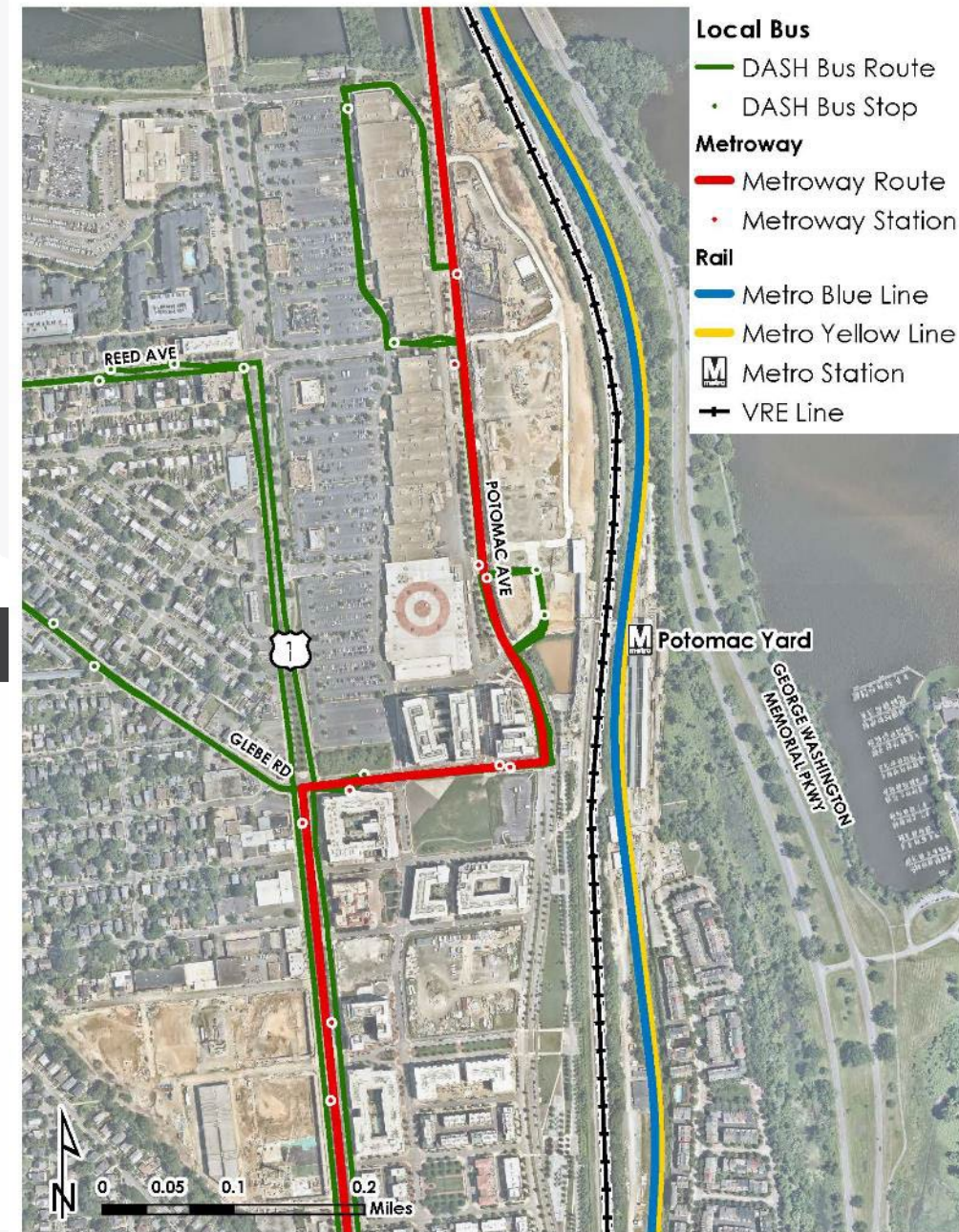
## Opportunities

### Near-Term

- Expand access and increase service to best-in-class Potomac Yard Metro station
- Leverage Metroway and existing dedicated transit lanes
- Enhance bicycle and pedestrian network
- Leverage ample parking at other Metro stations

### Long-Term (2030 and Beyond)

- Future bi-directional VRE service
- Future bike/ped connection to GW Trail

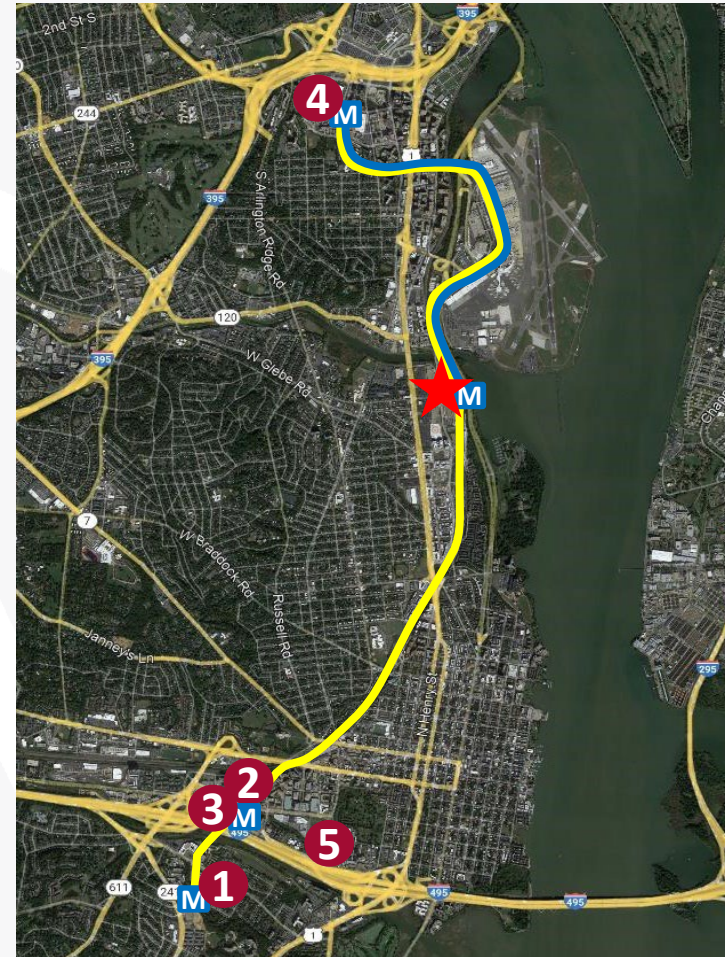




# Existing Assets: *Metro-Accessible Parking Locations*

ID	Location	Spaces
1	Huntington Metro Station Garages	3,600
2	Hoffman Town Center Garage	2,500
3	Eisenhower Metro Station Lots	650
4	Pentagon City Mall	4,500
5	Century Center Parking Garage	TBD
<b>Total</b>		<b>11,250+</b>

*Off-site parking locations are within walking distance of Metro stations or are directly Metro-accessible*



# Addressing Metro Constraints: *Potomac Yard Metro Station*



- Opened in May 2023—\$370M investment
- 100,000 Square Feet—Designed to accommodate planned development in Potomac Yard area (“By-Right”). Currently, substantially underutilized.
- 98<sup>th</sup> rail station in the system, only 2<sup>nd</sup> infill station (built between existing stops)
- Anticipated to become one of the first rail stations in the country to become LEED certified
- Art in Transit installations create a sense of place



# Addressing Metro Constraints: *Existing Metrorail Service Levels*



- YL** Yellow Line Frequency
  - PM Rush (4-6 PM): 6 min
  - Off Peak: 8 min
  - Late Night (9:30 PM to close): 8 min
- BL** Blue Line Frequency
  - PM Rush (4-6 PM): 10 min
  - Off Peak: 12 min
  - Late Night (9:30 PM to close): 15 min



# Addressing Metro Constraints: *Metrorail Line Capacity Analysis*

## Additional Metrorail Service is Needed

- Conducted sensitivity tests to explore different mode split and origin-destination scenarios for up to 220 annual events
- Post-game analysis shows northbound demand exceeding available capacity
- Pre-game demand could exceed capacity if there is a higher-than-expected Metrorail mode share or more arena trips originating from the north

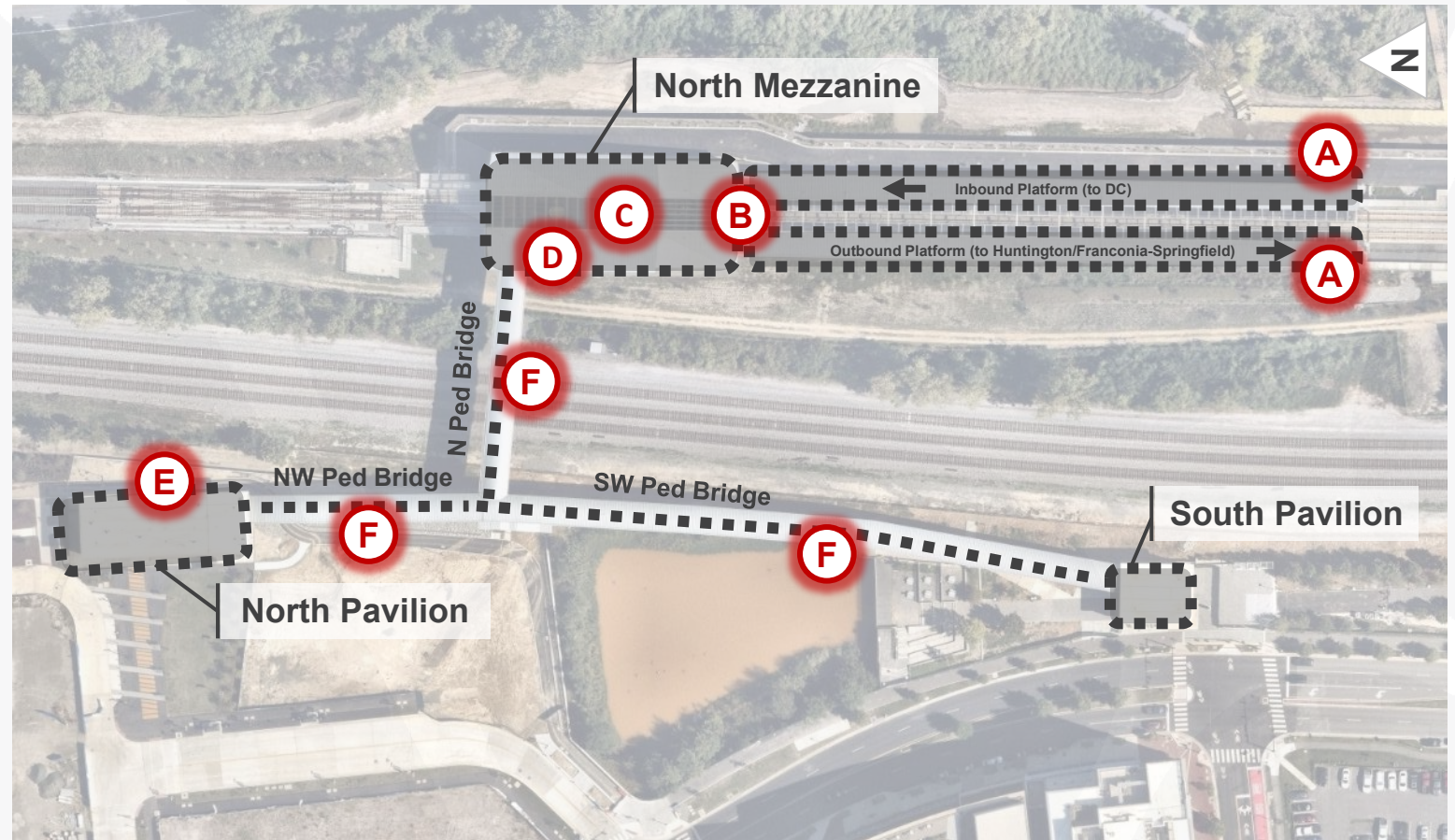
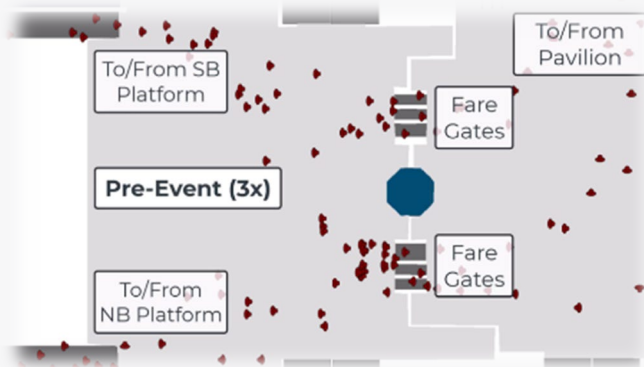
ID	Metrorail Mode Split (% of total site trips)	Post-Event NB Split	Pre-Event SB Additional Trains	Post-Game NB Additional Trains	Estimated Annual Operating Cost
A	30%	60%	0	0	--
<b>Base</b>	<b>35%</b>	<b>73%</b>	0	1	\$260,000
B	40%	80%	1	2	\$870,000
C	45%	85%	2	3	\$1,490,000
D	50%	90%	4	4	\$2,460,000

*Notes: Current year (2024) dollars; Costs assume one-way revenue service for 100 peak event days; Additional service levels can range depending on the type of event and not all events would require additional service.*

# Addressing Metro Constraints: *Station Capacity Analysis*

## Assessing Pinch Points

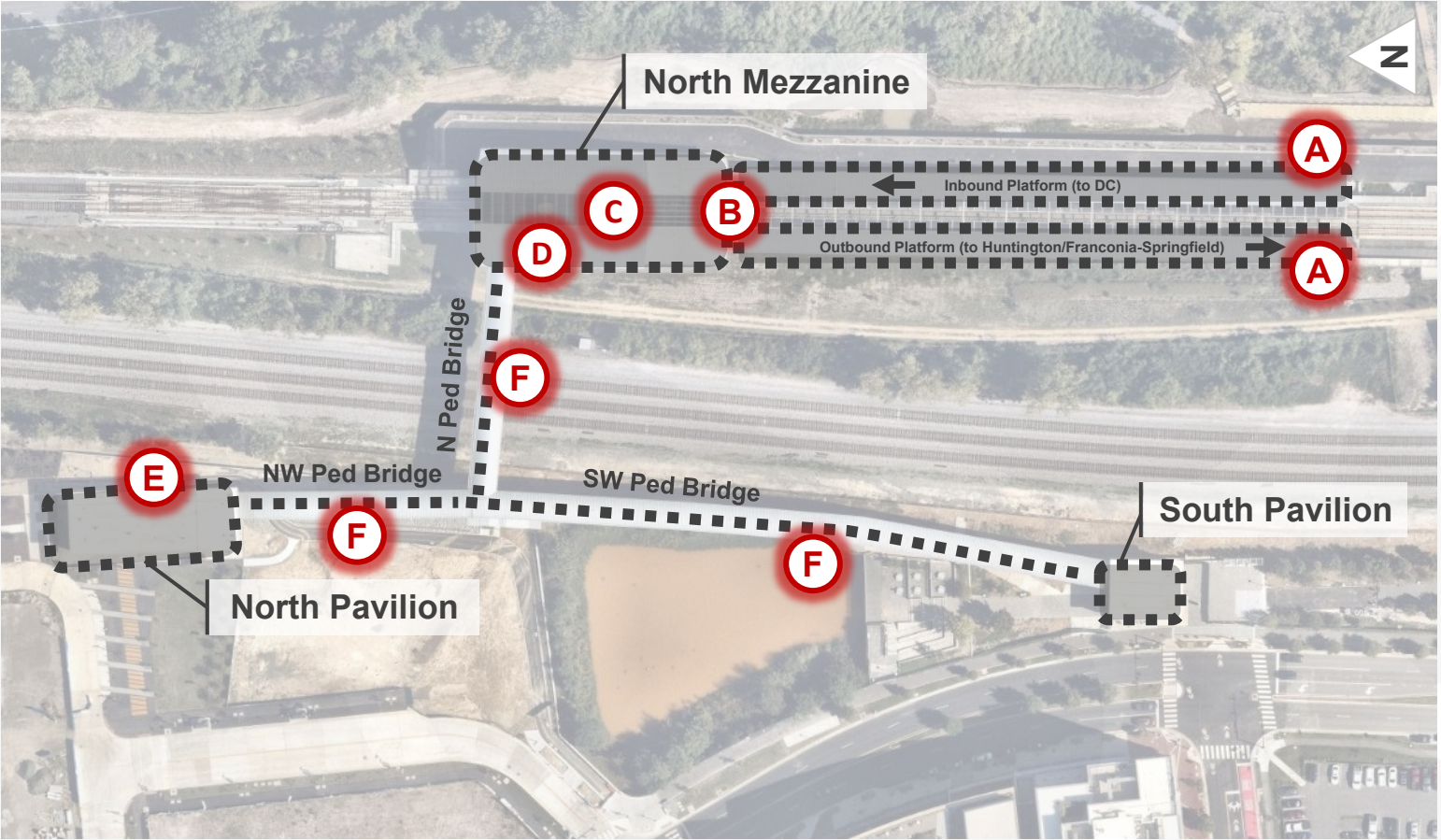
- A. Platforms
- B. Platform ↔ Mezzanine Escalators
- C. Faregates (6)
- D. Ticket Machines (3)
- E. North Pavilion
- F. Corridors





# Addressing Metro Constraints: Station Capacity Analysis – Existing Service Levels

Station Element	Pre-Event	Post-Event
A. Platforms	●	●
B. Platform ↔ Mezzanine Escalators	●	●
C. Faregates	●	●
D. Ticket Machines	●	●
E. North Pavilion	●	●
F. Corridors	●	●
South Pavilion	●	●



Capacity refers to an element’s ability to move people through the station without crowding or excessive queuing.

# Addressing Metro Constraints: *Station Capacity Analysis and Solutions*

- With current infrastructure and service levels the station would be unable to handle the number of anticipated passengers, with extreme crowding lasting 60-90 minutes
- In addition to service enhancements, funding will address pinch points, and minimize delay times to manage capacity:
  - Add faregates, additional escalators, and ticket vending machines
  - Widen bridge over CSX and bridge to North Pavilion
- With improvements the station will be able to handle anticipated passengers but will be crowded for ~30-45 minutes post game
- DRPT will work with WMATA to finalize and implement necessary improvements



# Other Multimodal Strategies

- Additional service hours and frequency for Metroway and DASH bus pre- and post-event
- Improved bicycle/pedestrian infrastructure
- Additional self-service bike and scooter storage
- Event shuttles and Metro connecting off-site parking lots
- Prioritized carpool parking
- Real-time travel and transit information
- Incentivization of transit use

# Multimodal Capital Improvements and Transit Service Enhancements

## Multimodal Capital Improvements: \$35M - \$70M

- Improvements to faregates and escalators at PY Metro station
- Improvements to bridges at PY Metro station
- Other multimodal solutions including bus enhancements, bike/ped infrastructure, transit-accessible parking, etc.

*Capital cost estimates include 50% contingency*



## Transit Service Enhancements: \$2.5M - \$7.5M annually

- Up to 4 additional pre-event and up to 4 additional post-event Metrorail trains, increased bus service frequency, other multimodal strategies

*Operating cost estimates include 20% contingency*



# Multimodal Strategies:

## *Summary of Takeaways and Next Steps*

**With investments in transit service, multimodal infrastructure, and technology, the development will achieve desired non-auto mode split of at least 50% within the stated budget**

- Post-event Metrorail service will require additional northbound trains to meet demand
- Pre-event Metrorail demand could exceed southbound capacity if there is a higher-than-expected Metrorail mode share or more trips to arena originate from the north
- Detailed strategy assumptions and implementation responsibilities will need to be determined in further study
- WMATA will need to further analyze station capacity and potential physical improvements
- Proposed multimodal scenarios will require upfront capital investments and continuing annual operations commitments



# Traffic Analysis

# Traffic Analysis Assumptions (1 of 2)

- **PM Peak:** the PM peak hour (5-6 PM) will overlap with arena traffic arrivals with 60% of arena traffic assumed to arrive during the PM peak
- **Trip Distribution** for arena traffic is based on developer-provided analysis of ticket sales and anticipated travel routes. For auto traffic, this results in the following distribution:
  - 55% of traffic approaches the arena from the north on Route 1/Crystal Drive/Potomac Ave
  - 25% of traffic approaches the arena from the south on Route 1
  - 20% of traffic approaches the arena from the west on Glebe Road
- **Background Traffic** for all study intersections were taken from a variety of sources including Arlington County and the City of Alexandria, prior studies, and VDOT. Background traffic refers to the expected traffic volumes without the development in place.
- **Growth Rate** of 1% annually was applied to base traffic volumes consistent with previously approved traffic analyses in this area

# Traffic Analysis Assumptions (2 of 2)

- **Signal Timings** were obtained from the existing Synchro files provided by Arlington County and the City of Alexandria
- **Auto Occupancy** is assumed to be 2.5 people/vehicle for arena traffic, which is less than national data that shows occupancy for similar venues averages 2.8 people/vehicle. Sensitivity analyses were run using both 2 people/vehicle and 3 people/vehicle in addition to 2.5.
- **Ride Share** is anticipated to account for 10% of arena trips. These trips involve both an inbound and outbound trip during the peak period.

# Traffic Analysis Distribution Assumptions During Peak Hour (5-6 PM)



Distribution by Regional Network	Distribution
To/from the north via Rt 1/Crystal Drive and Potomac Ave	55%
To/from the south via Rt 1	25%
To/from the west	20%
<b>Total</b>	<b>100%</b>

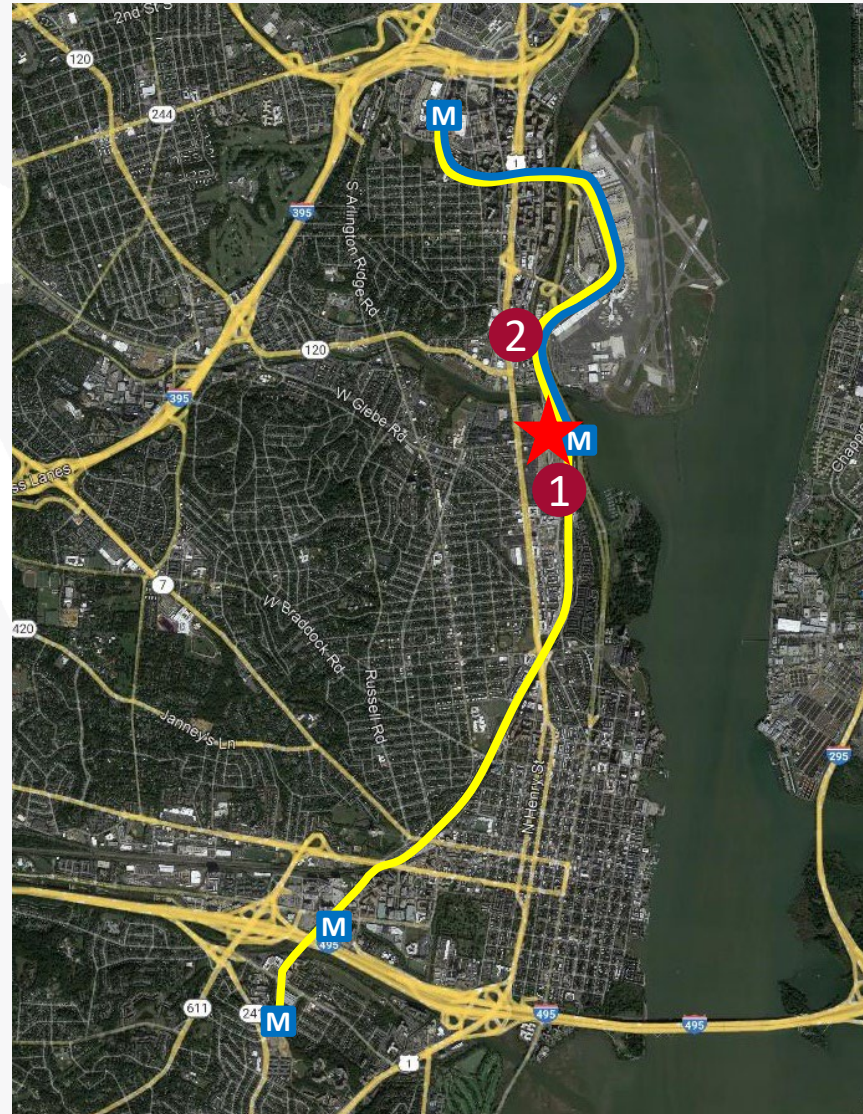


# Adjacent Parking Locations

ID	Location	Spaces
1	On-site Provided Parking	2,500
2	Crystal City Garages	~3,600
<b>Total</b>		<b>6,000+</b>

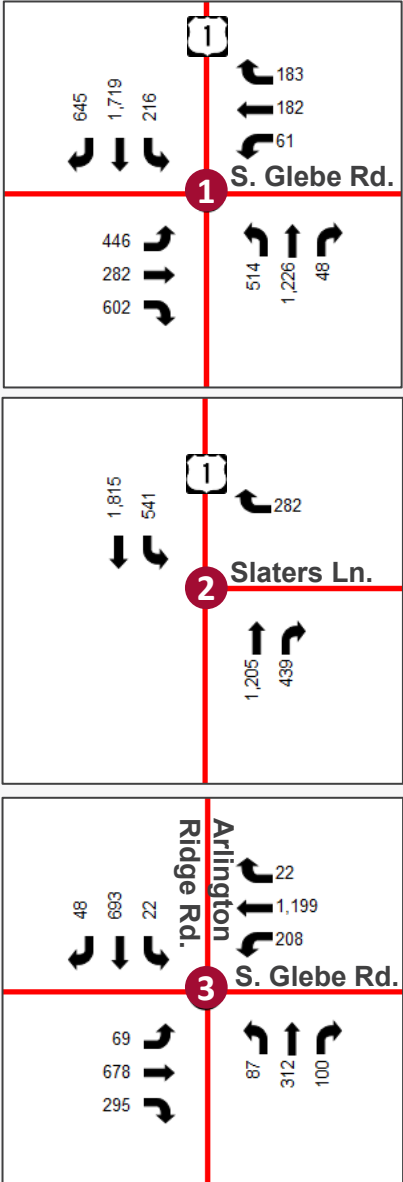
The number of adjacent parking spaces accessible to the arena, in combination with parking management strategies (e.g., resident permits, enforcement) in the city will mitigate neighborhood impacts.

**Note: the number of adjacent available spaces exceeds anticipated auto trips by more than 1,500 spaces.**

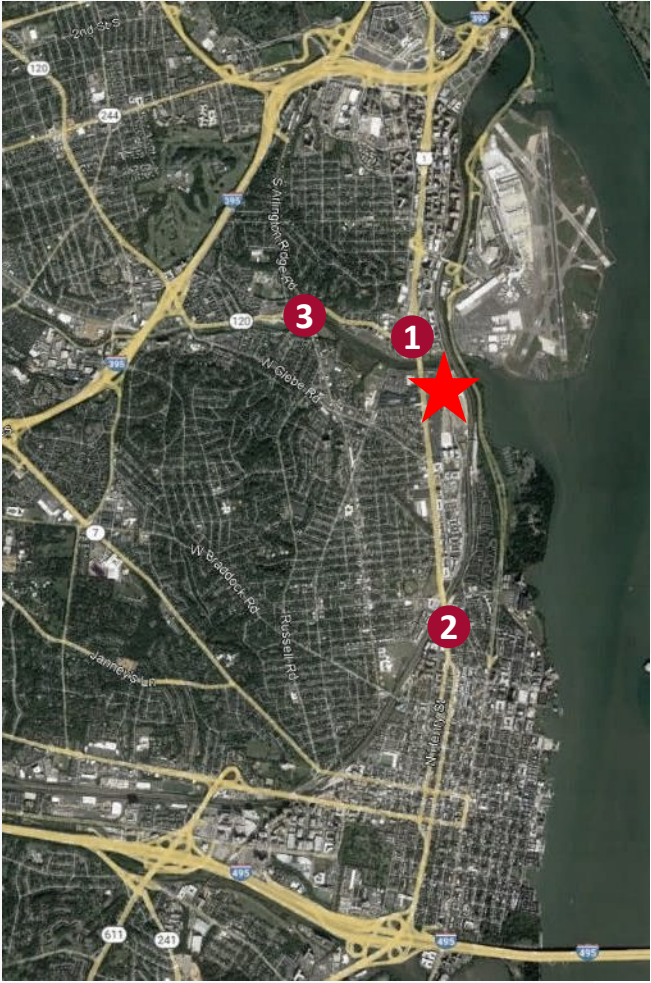
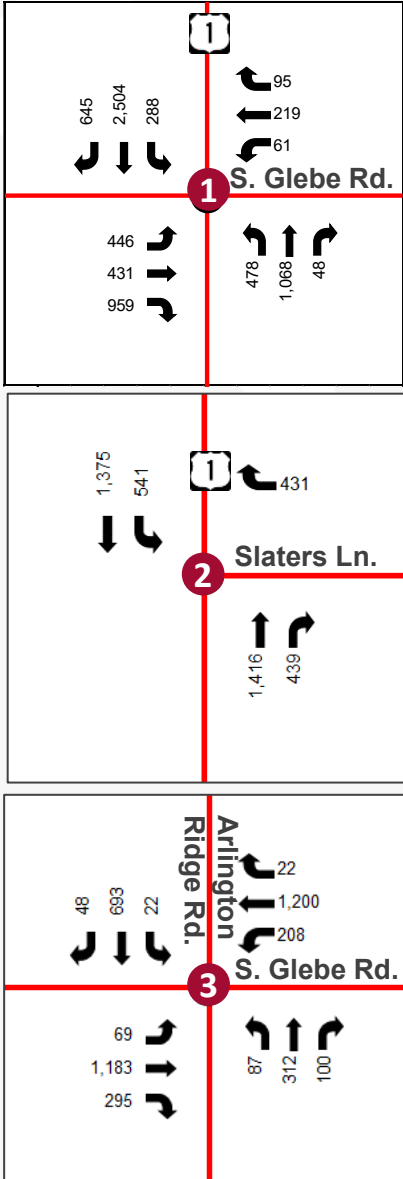


# Anticipated Intersection Volume Comparison

2030 By-Right



2030 Arena Build

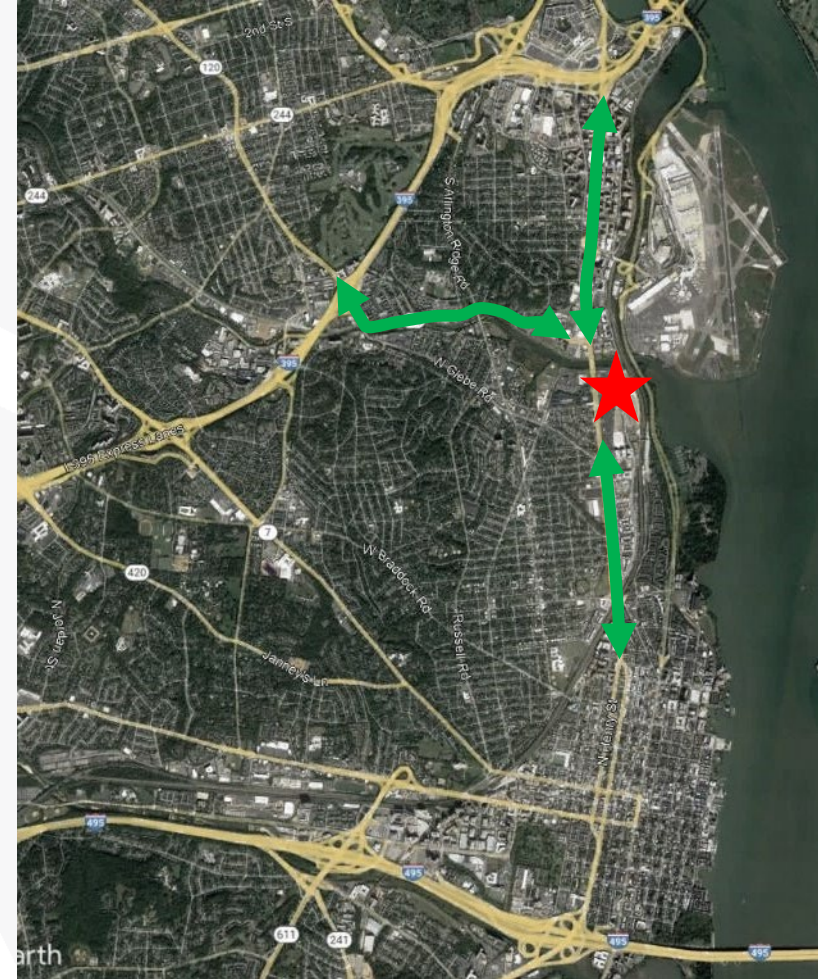


\* Volumes shown are for a typical weekday during the PM peak hour (5-6 PM)



# Analysis Methodology

- Evaluated estimated travel time to/from the development site along multiple routes
- Evaluated scenarios with both in-place and future proposed Route 1 Urban Boulevard project
- Evaluated multiple values of mode split and auto occupancy





# Development-Wide Capital Improvements





# Development-Wide Capital Improvements

## Multimodal Capital Improvements \$35M - \$70M

- Improvements to faregates and escalators at Potomac Yard Metro station
- Improvements to Bridges at Potomac Yard Metro Station
- Other Multimodal Solutions including bus enhancements, bike/ped infrastructure, transit-accessible parking, etc.

*Includes 50% contingency*



## Base Package of Roadway Improvements \$65M - \$100M

- Route 1/Slaters Lane intersection
- Route 1/Potomac Avenue intersection
- Route 1/S. Glebe Road intersection
- Additional Route 1 intersections

*Includes 60% contingency*



## Glebe Road Upgrades: \$35M - \$45M

S. Glebe Road intersection improvements and I-395 interchange with Glebe Road  
*Includes 60% contingency*



## JBG Site Related Intersections: Paid by Others

Planned improvements to intersections adjacent to the site

**Total Capital Investment:  
\$135M - \$215M**

*Includes 50-60% contingency*

# Traffic Analysis Results – “By-Right” vs. Arena Phase 1

## PM Peak Hour (5:00 - 6:00 PM) Travel Time Estimates (minutes)

Route	2030 (By-Right)	2030 (Arena Phase 1)	
	With Urban Blvd	Before Urban Blvd	With Urban Blvd
A: SB Route 1 from I-395 to Four Mile Run (1.6 mi)	11 - 21	15 - 25	13 - 23
A: NB Route 1 from Four Mile Run to I-395 (1.6 mi)	7 - 13	6 - 12	5 - 11
B: EB S. Glebe Rd from I-395 to Four Mile Run (1.7 mi)	7 - 15	6 - 14	6 - 14
B: WB S. Glebe Rd from Four Mile Run to I-395 (1.7 mi)	16 - 25	10 - 19	10 - 19
C: NB Route 1 from First Street to E. Glebe Road (1.2 mi)	5 - 9	5 - 9	5 - 9
C: SB Route 1 from E. Glebe Road to First Street (1.2 mi)	8 - 12	6 - 10	6 - 10

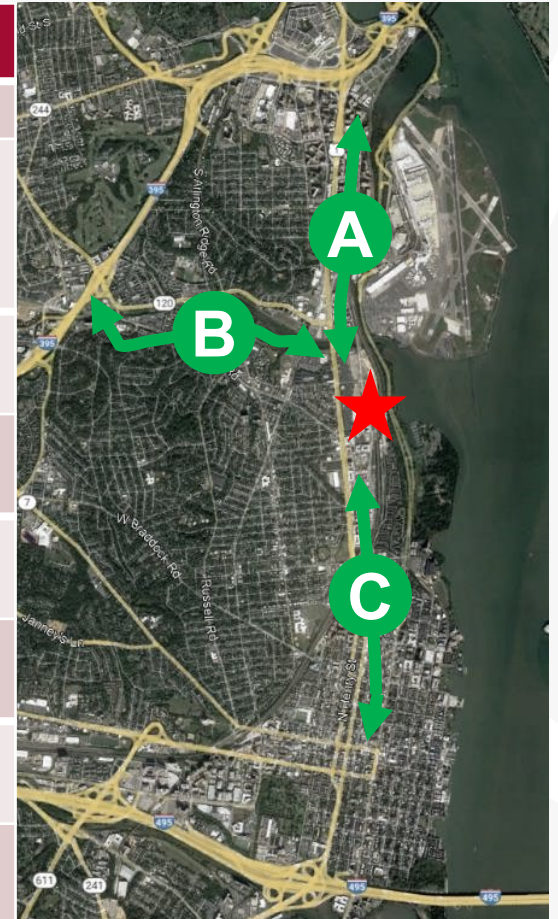


All scenarios assumed 60% of arena traffic arrives during the PM peak hour (5-6 PM)

# Traffic Analysis Results – Arena Sensitivity Analysis

PM Peak Hour (5:00 - 6:00 PM) Travel Time Estimates (minutes)

Route	2030 (Arena Phase 1)		2030 (Arena Phase 1 with Urban Blvd)			
	Before Urban Blvd	With Urban Blvd	Occupancy		Mode Split	
	2.5 per/veh 50% mode shift	2.5 per/veh 50% mode shift	2 per/veh 50% auto mode shift	3 per/veh 50% auto mode shift	2.5 per/veh 40% auto mode split	2.5 per/veh 60% auto mode split
A: SB Route 1 from I-395 to Four Mile Run (1.6 mi)	15 - 25	13 - 23	16 - 26	11 - 21	10 - 20	15 - 25
A: NB Route 1 from Four Mile Run to I-395 (1.6 mi)	6 - 12	5 - 11	6 - 12	5 - 11	5 - 11	6 - 12
B: EB S. Glebe Rd from I-395 to Four Mile Run (1.7 mi)	6 - 14	6 - 14	6 - 14	5 - 13	5 - 13	6 - 14
B: WB S. Glebe Rd from Four Mile Run to I-395 (1.7 mi)	10 - 19	10 - 19	10 - 19	9 - 18	9 - 18	10 - 19
C: NB Route 1 from First Street to E. Glebe Road (1.2 mi)	5 - 9	5 - 9	5 - 9	5 - 9	5 - 9	5 - 9
C: SB Route 1 from E. Glebe Road to First Street (1.2 mi)	6 - 10	6 - 10	6 - 10	6 - 10	6 - 10	6 - 10



All scenarios assumed 60% of arena traffic arrives during the PM peak hour (5-6 PM)



# Traffic Analysis Results – *Post-Event*

Post-Event Peak Hour (10:00 - 11:00 PM)  
Travel Time Estimates (minutes)

Route	2030 (Arena Phase 1)	
	Before Urban Blvd	With Urban Blvd
A: SB Route 1 from I-395 to Four Mile Run (1.6 mi)	4 - 10	4 - 10
A: NB Route 1 from Four Mile Run to I-395 (1.6 mi)	5 - 11	5 - 11
B: EB S. Glebe Rd from I-395 to Four Mile Run (1.7 mi)	4 - 12	4 - 12
B: WB S. Glebe Rd from Four Mile Run to I-395 (1.7 mi)	5 - 14	5 - 14
C: NB Route 1 from First Street to E. Glebe Road (1.2 mi)	4 - 8	4 - 8
C: SB Route 1 from E. Glebe Road to First Street (1.2 mi)	4 - 8	4 - 8

*Assumes 36% of PM peak hour (10-11 PM) network volumes  
Assumes 80% of arena traffic exiting during post-event peak hour*

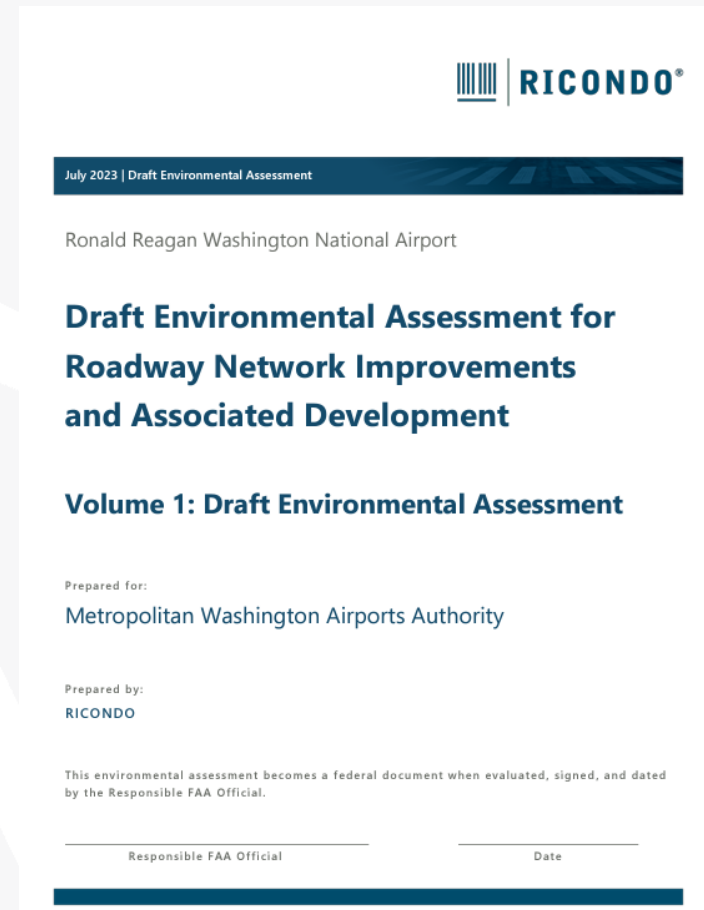


# Other Operational Improvements Planned

- **Signal Timing Enhancements** that prioritize the mainline during the peak flows can further reduce travel times by approximately 2-5 minutes.
- **Enhanced Traffic Management** including the deployment of the Regional Multi-Modal Mobility Program (RM3P – see [RM3PVirginia.org](http://RM3PVirginia.org)) will further improve travel in the region through better traveler information (including location and availability of parking) and an AI-based decision support system for traffic management. An incentivization component can be leveraged to encourage additional transit use.
- **Limiting Impacts to Reagan National Airport** can be achieved with temporary traffic control. The George Washington Parkway is not currently assumed to carry a significant amount of southbound traffic and there is currently no exit from GWP to Route 1 between I-395 and Slaters Lane. Cut through traffic attempting to use roadways in or adjacent to National Airport can be discouraged and/or prevented with temporary traffic control.

# Airport Access Roads

Traffic attempting to use George Washington Parkway to access Route 1 at the airport would use the airport access roads. Movements are currently discouraged using speed humps, constrained roadway widths, and low speed limits.



*Roadway Network Improvements and Associated Development Environmental Assessment currently underway by MWAA ([https://www.mwaa.com/sites/mwaa.com/files/2023-07/dca\\_roadway\\_ea\\_v1\\_draft\\_ea\\_20230725.pdf](https://www.mwaa.com/sites/mwaa.com/files/2023-07/dca_roadway_ea_v1_draft_ea_20230725.pdf)) to study a reconfiguration of the airport's access roads. Coordination with MWAA should occur to discourage potential cut-through traffic.*



# Key Takeaways

With the multimodal investments and proposed improvements, travel time estimates in the study area with Phase 1 of the proposed arena development are consistent with the previously approved “By-Right” development.

## Investments needed:

- Annual cost of operating improvements = **\$2.5M - \$7.5M**
  - Increased Metro service
  - Other multimodal solutions
- Total cost of capital improvements = **\$135M - \$215M**
  - Targeted Metro station upgrades
  - Targeted intersection improvements

*All cost estimates include contingency (20% Transit operating, 50% Transit capital, 60% Roadway)*



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