



**Norfolk Thrive – EPA Area-Wide Planning Project
Transportation Recommendations
EC Transportation Meeting II - November 28, 2018**



**Michael Baker
INTERNATIONAL**

EPA's Priority Performance Goals:

- Goal 1: Clean Air
- Goal 2: Clean and Safe Water
- Goal 3: Land Preservation and Restoration
- Goal 4: Healthy Communities and Resiliency
- Goal 5: Compliance and Environmental Stewardship

Office of Brownfields and Land Revitalization (OBLR) Goals for Program:

- ▶ Establishing a “shared vision” for the redevelopment and clean-up of brownfields impacted areas
- ▶ Identifying viable reuse strategies for brownfields
- ▶ Identifying opportunities to strategically reuse or upgrade “dormant” infrastructure for new investment
- ▶ Address environmental justice through urban waterways
- ▶ Create a clear roadmap for implementation

How can the AWP project be best utilized to advance actual implementation at Harbor Park?

- ▶ Brownfields remedial activities should be linked to redevelopment efforts, i.e. remedial design is site preparation, etc.
- ▶ Engineering controls support infrastructure development, including roads, parking, public space/plazas, and stormwater management.
- ▶ Establish an urban design framework that can support near-term economic development opportunities and flexible long-term build out scenarios.
- ▶ The remedial design, their construction, and the increase economic potential become “benefits” in funding applications.
- ▶ The plan can be used as a tool to negotiate and evaluate developer proposals or as the basis of developer RFPs.

How will the AWP set the stage for implementation?

- ▶ Investments will be broken down into subcomponents and prioritized based on environmental recommendations, resiliency actions, and economic development progression.
- ▶ Infrastructure projects will be bundled into “project packages” that leverage available funding to the maximum extent possible.
- ▶ We will provide level-of-magnitude costs for the next steps for high priority projects – this is critical for determining the implementation roadmap.
- ▶ Combine all aspects into a cohesive vision and a clear, concise and user-friendly plan with very specific implementation actions and conform to the U.S. EPA Area-Wide Planning Program guidelines.



DRAFT

Norfolk Thrive – EPA Area-Wide Planning Project
Transportation Network Considerations
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Project Status

What Does the Data Show?

- Current State of Congestion
- Current Parking Supply and Demand
- Traffic Safety Overview

High-Level Site Background Analysis

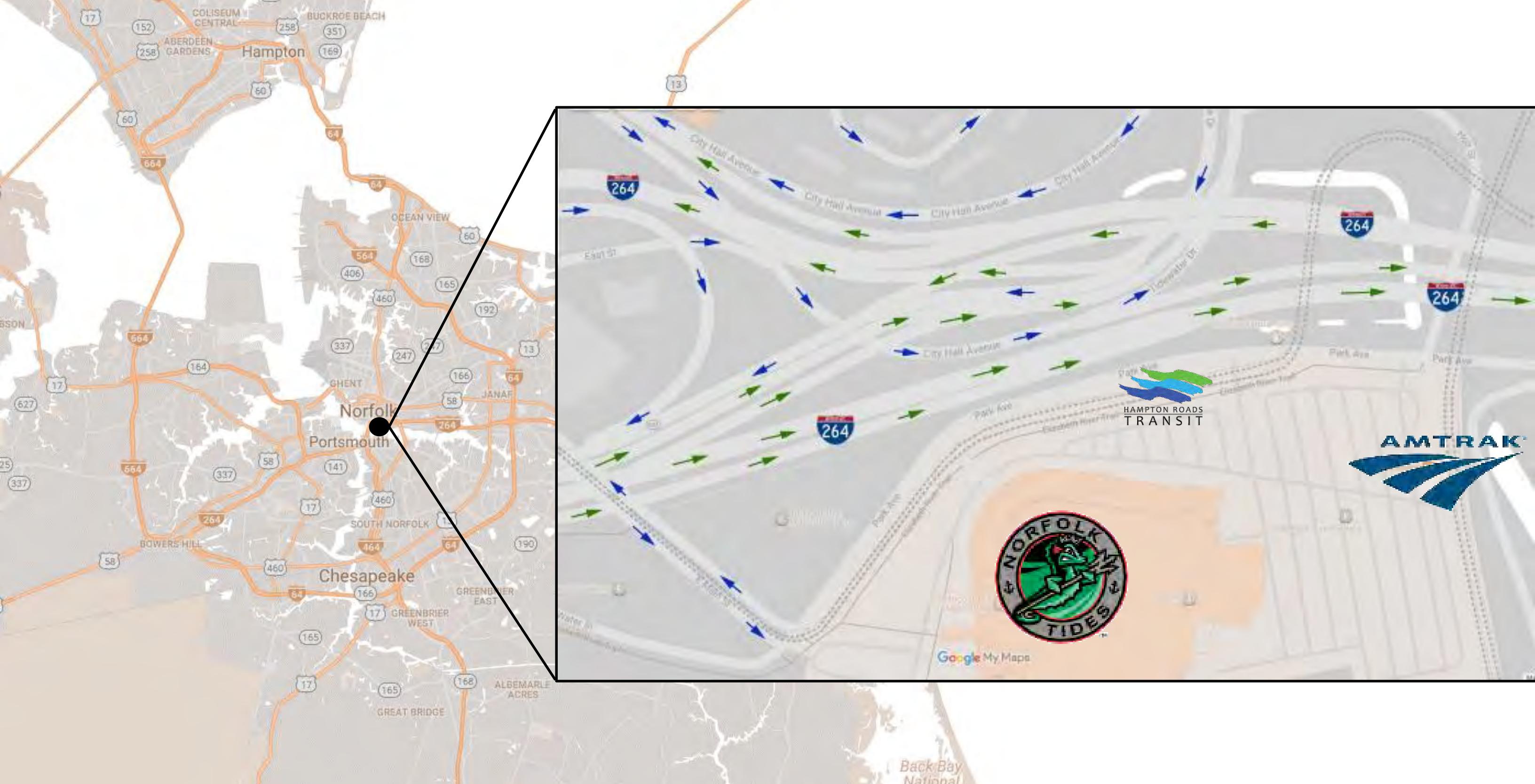
- Inter-modal Connection and Interference
- Relation to Current Planning Initiatives

How to Apply the Findings?

- Identified Limitations Based on Available Data
- Highlights of How This Analysis Will Inform Future Study Tasks

WHAT WE DID SO FAR?



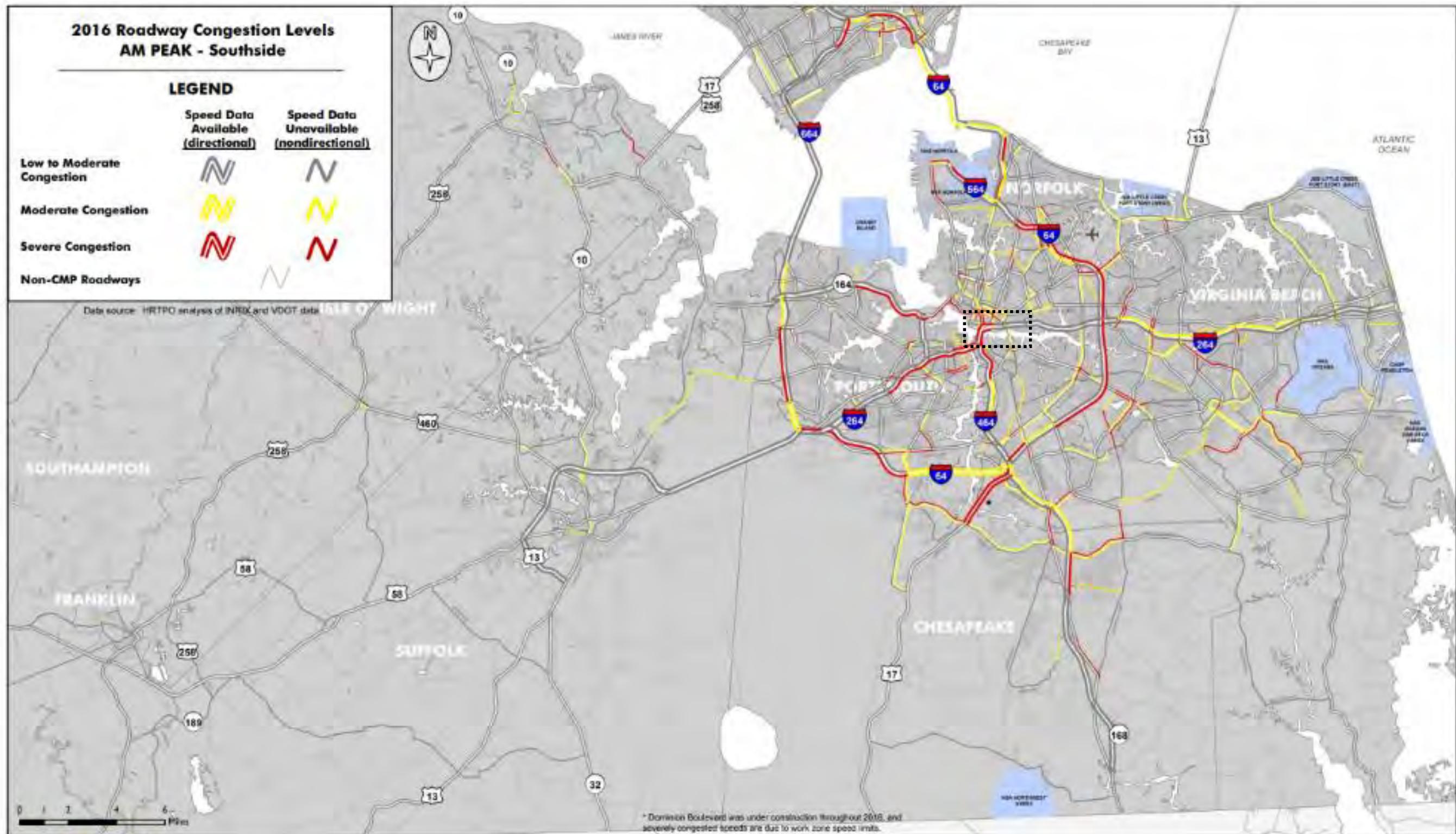


SITE CONTEXT AND CIRCULATION



LANDSCAPE ARCHITECTURE
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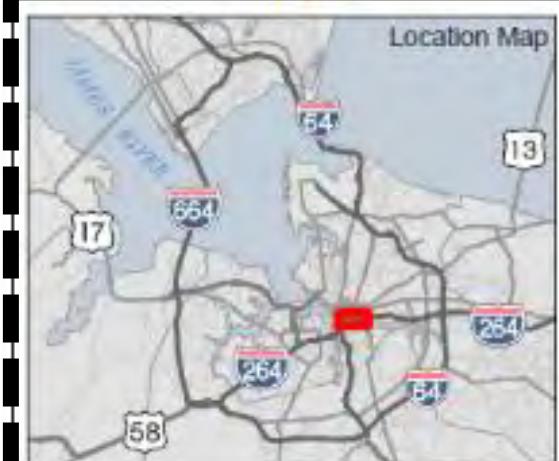
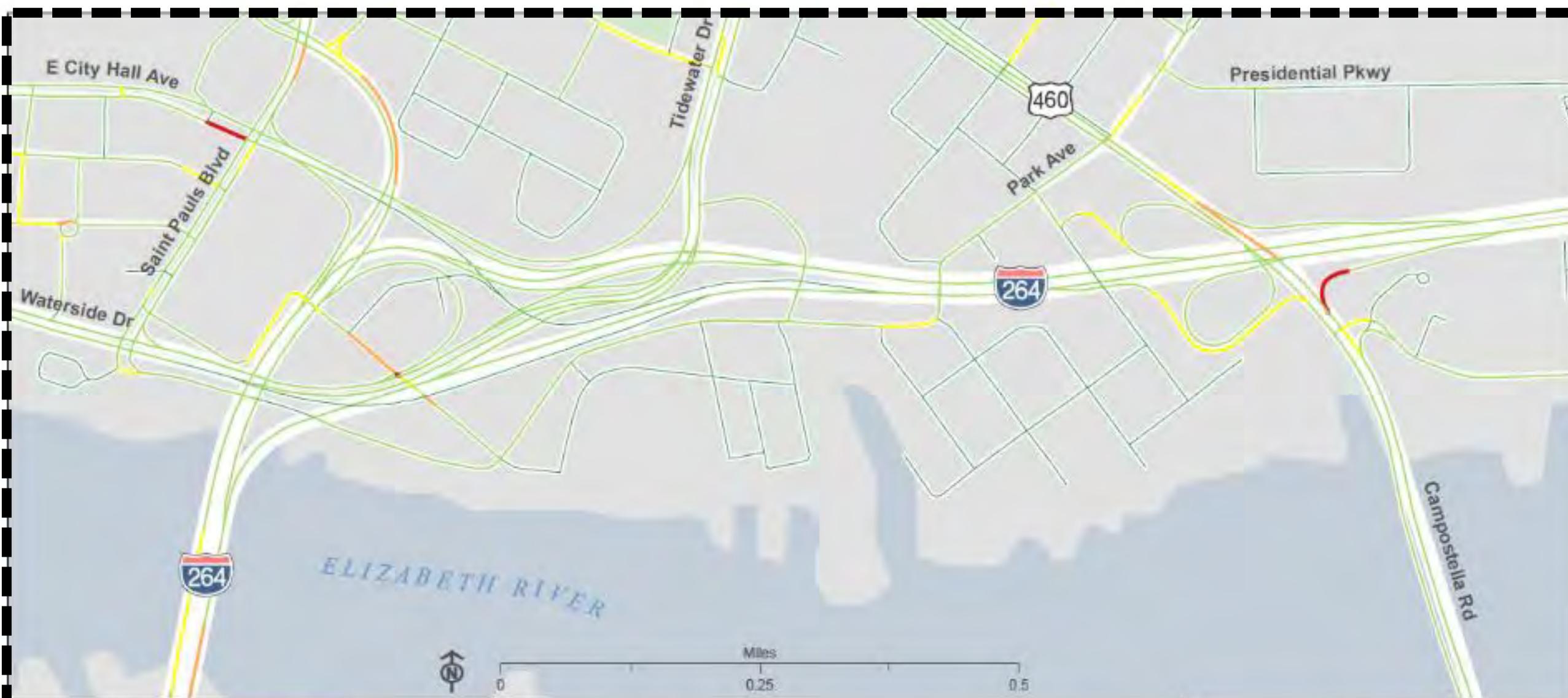
HAMPTON ROADS
TPO
Transportation Planning Organization

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ROAD NETWORK CONGESTION ANALYSIS

S/G/A
LANDSCAPE ARCHITECTURE
URBAN DESIGN

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Travel Time Ratio (AM)

- 1.00
- 1.01 - 1.15
- 1.16 - 1.35
- 1.36 - 1.65
- 1.66 - 3.40

Travel Time Ratio (TTR) is defined as the ratio of commuting travel time to free flow travel time.

Anything above 1 indicates that the commuting travel time is delayed as compared to free flow travel. The higher the number, the greater the delay.

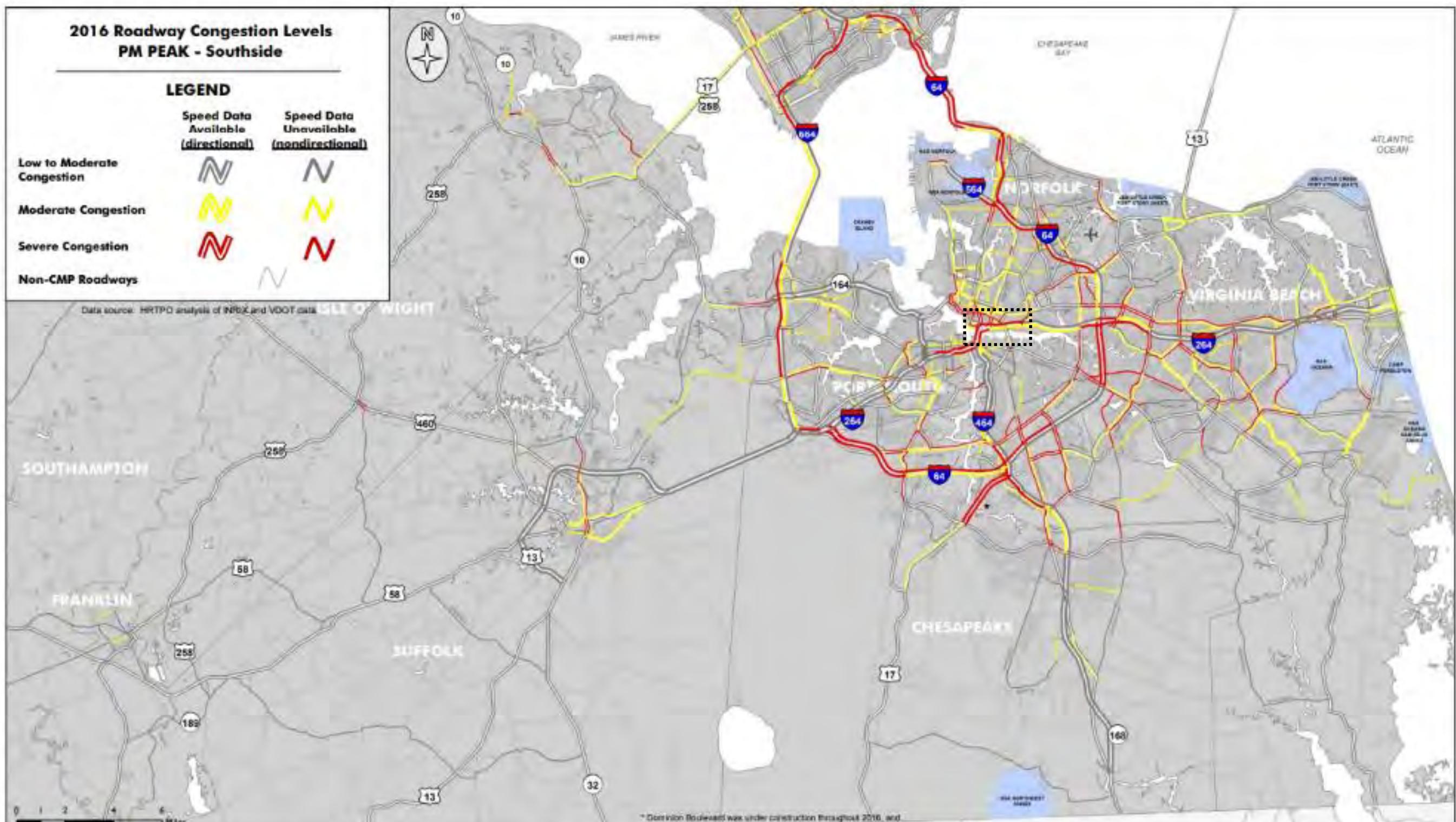
Norfolk Thrive

Congestion

8/24/2018
Data: TomTom 2015

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ROAD NETWORK CONGESTION ANALYSIS



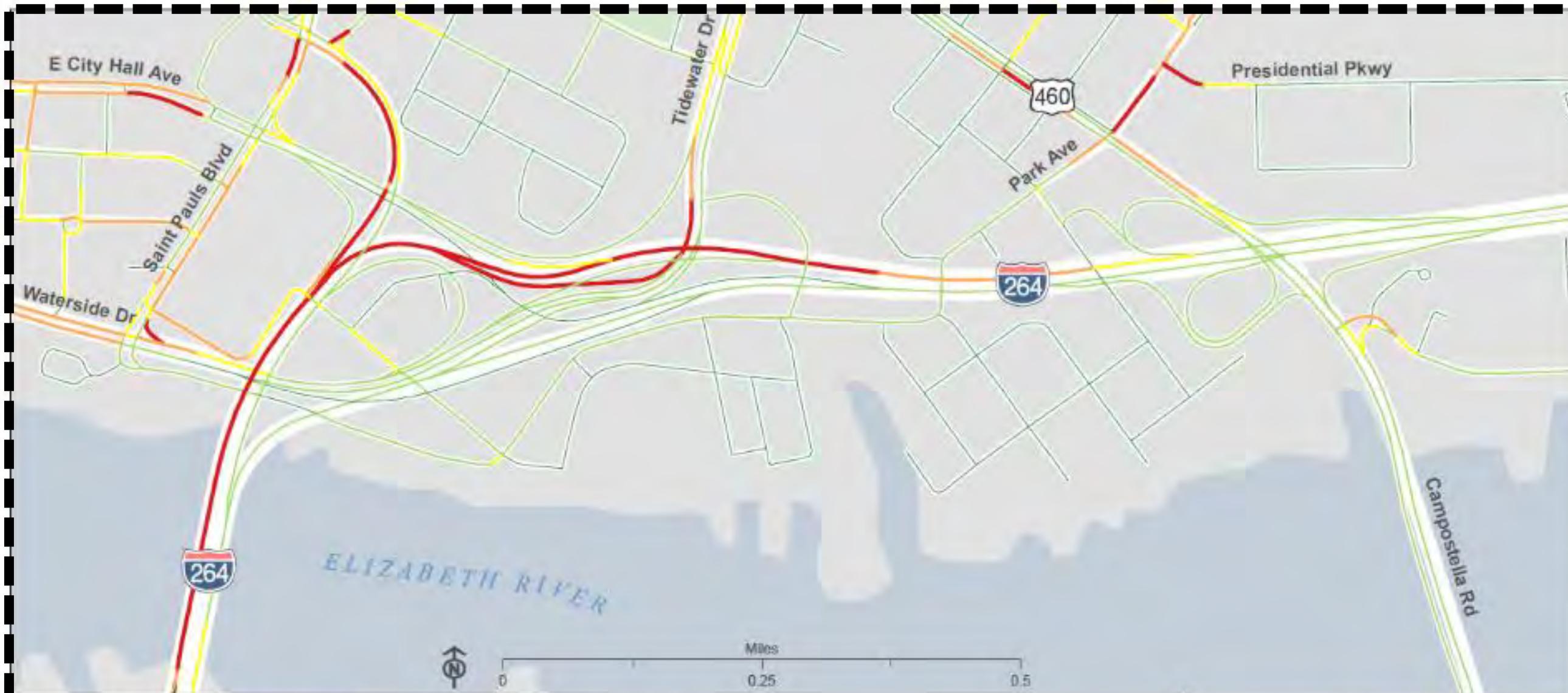
Hampton Roads
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ROAD NETWORK CONGESTION ANALYSIS

S/G/A
LANDSCAPE ARCHITECTURE
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Travel Time Ratio (PM)

- 1.00
- 1.01 - 1.15
- 1.16 - 1.35
- 1.36 - 1.65
- 1.66 - 3.40

Travel Time Ratio (TTR) is defined as the ratio of commuting travel time to free flow travel time.

Anything above 1 indicates that the commuting travel time is delayed as compared to free flow travel. The higher the number, the greater the delay.

Norfolk Thrive

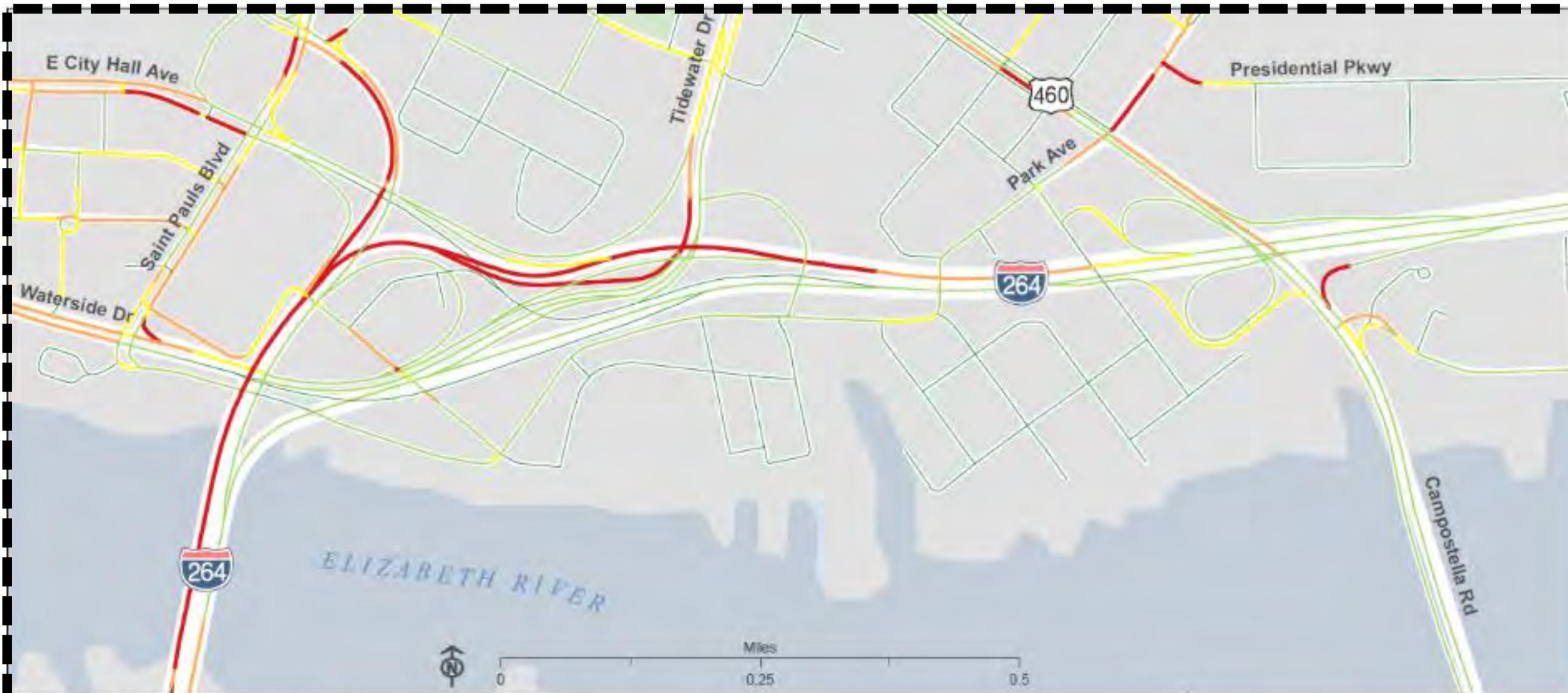
Congestion

8/24/2018

Data: TomTom 2015

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ROAD NETWORK CONGESTION ANALYSIS



Travel Time Ratio (Peak)

- 1.00
- 1.01 - 1.15
- 1.16 - 1.35
- 1.36 - 1.65
- 1.66 - 3.40

Travel Time Ratio (TTR) is defined as the ratio of commuting travel time to free flow travel time.

Anything above 1 indicates that the commuting travel time is delayed as compared to free flow travel. The higher the number, the greater the delay.

Norfolk Thrive

Congestion

8/24/2018

Data: TomTom 2015

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ROAD NETWORK CONGESTION ANALYSIS

2017 Roadway Congestion Levels
AM PEAK - Southside

LEGEND

Speed Data Available (directional) Speed Data Unavailable (nondirectional)

Low to Moderate Congestion



Moderate Congestion



Severe Congestion



Non-CMP Roadways



Data source: MTP/PC analysis of INRIX and MDOT data



0 1 2 3 4 5 Miles

ROAD NETWORK CONGESTION ANALYSIS

S/G/A
LANDSCAPE ARCHITECTURE
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**2017 Roadway Congestion Levels
PM PEAK - Southside**

LEGEND

Speed Data Available (directional) Speed Data Unavailable (nondirectional)

Low to Moderate Congestion



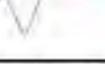
Moderate Congestion



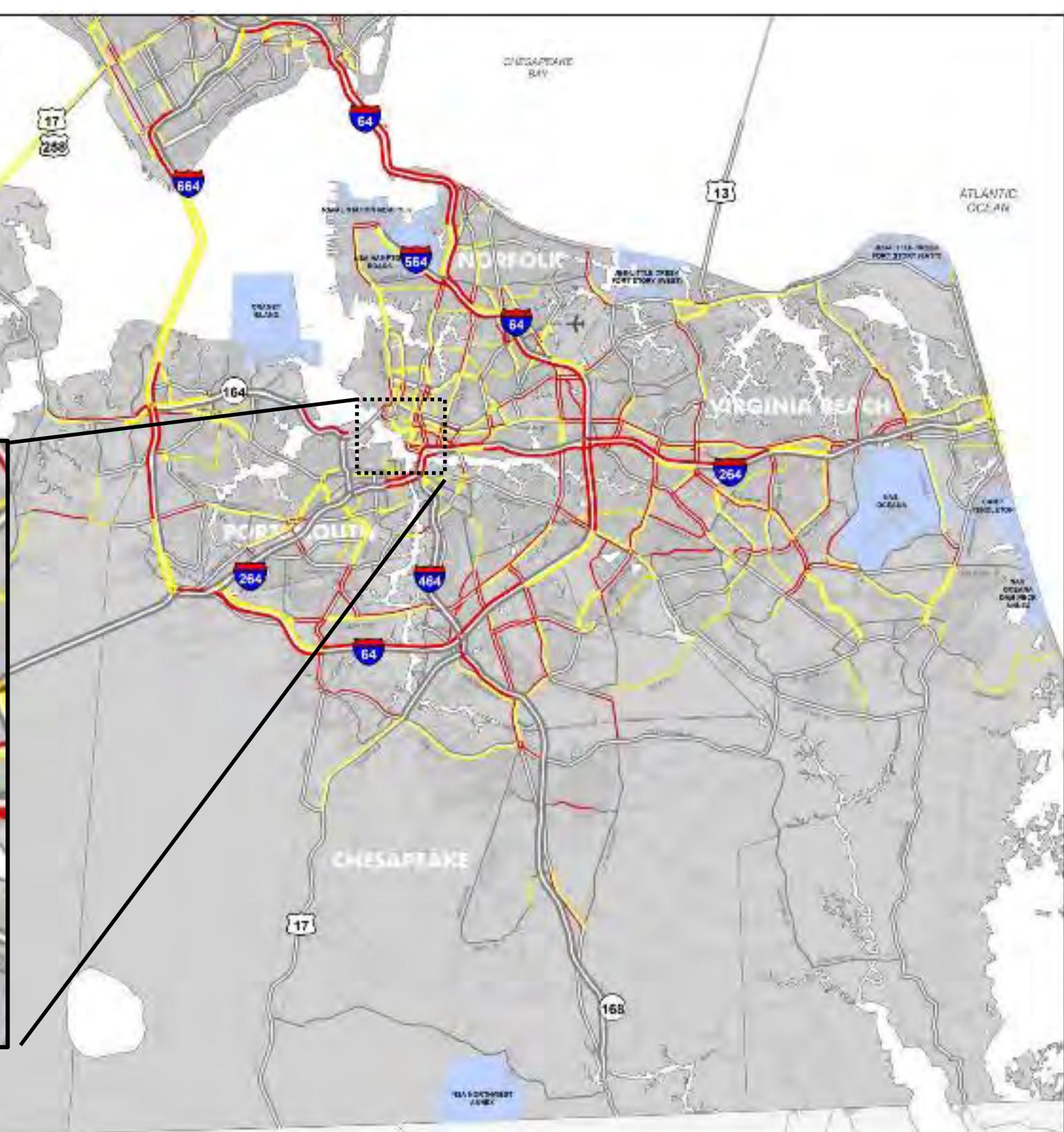
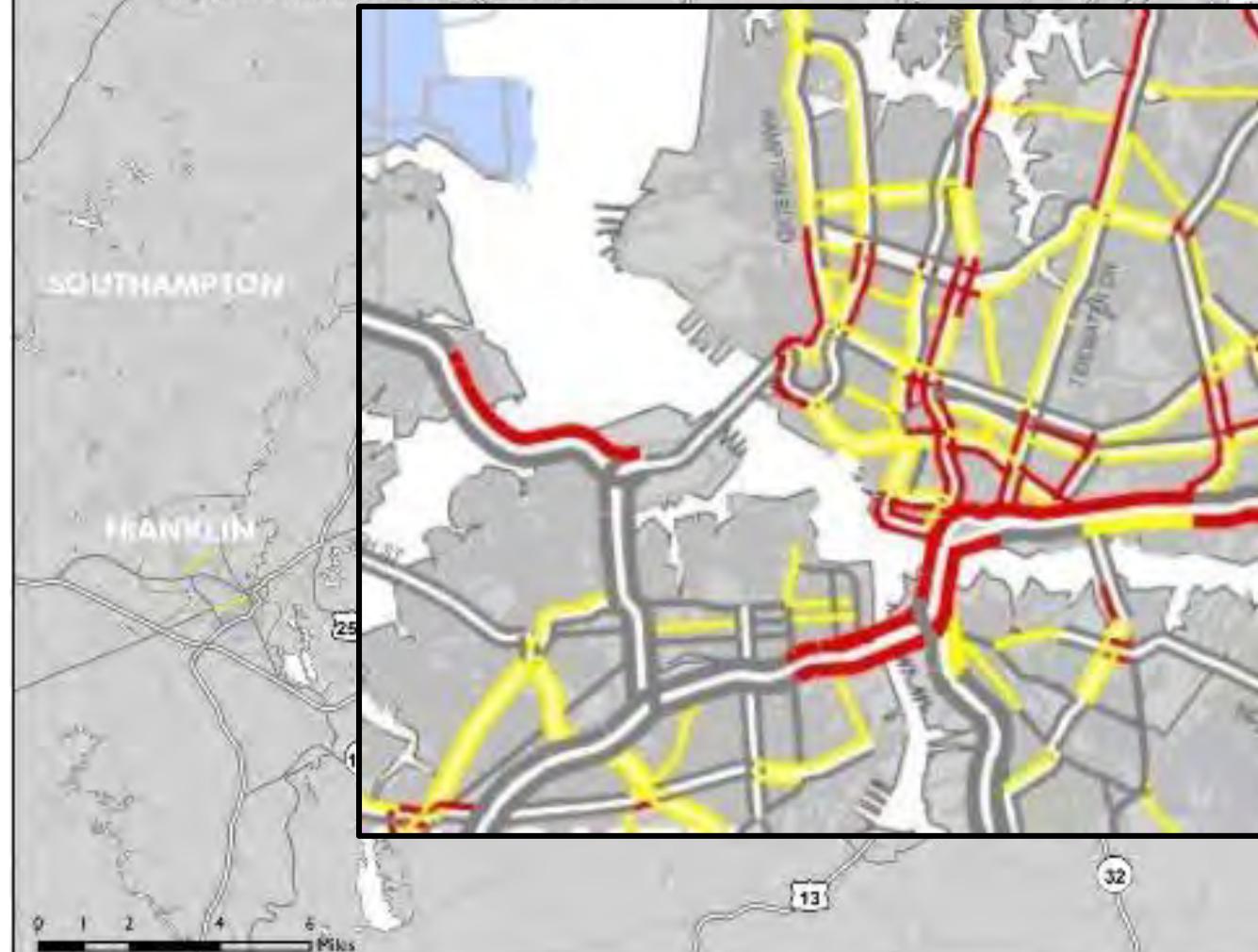
Severe Congestion



Non-CMP Roadways



Data source: HRTPO analysis of NBI and VDOT data



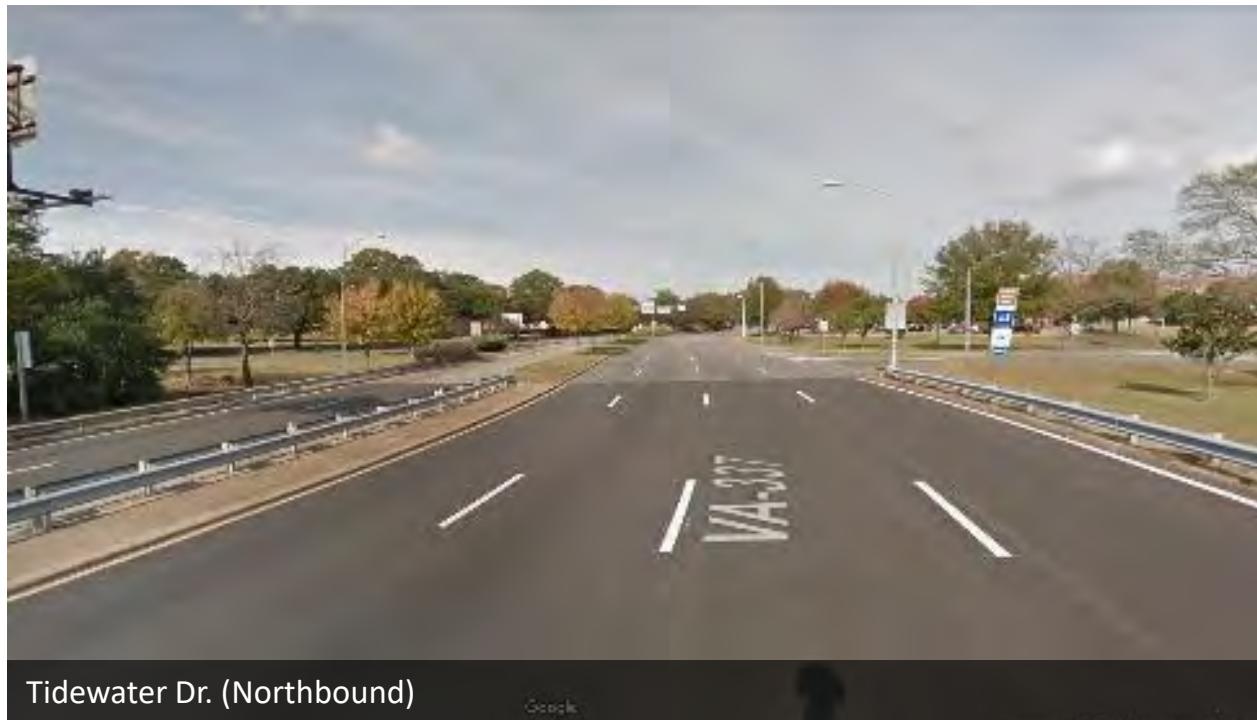
ROAD NETWORK CONGESTION ANALYSIS

S/G/A
LANDSCAPE ARCHITECTURE
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Tidewater Dr. to City Hall Ave. (Eastbound)



Tidewater Dr. (Northbound)

CONGESTION ANALYSIS RESULTS

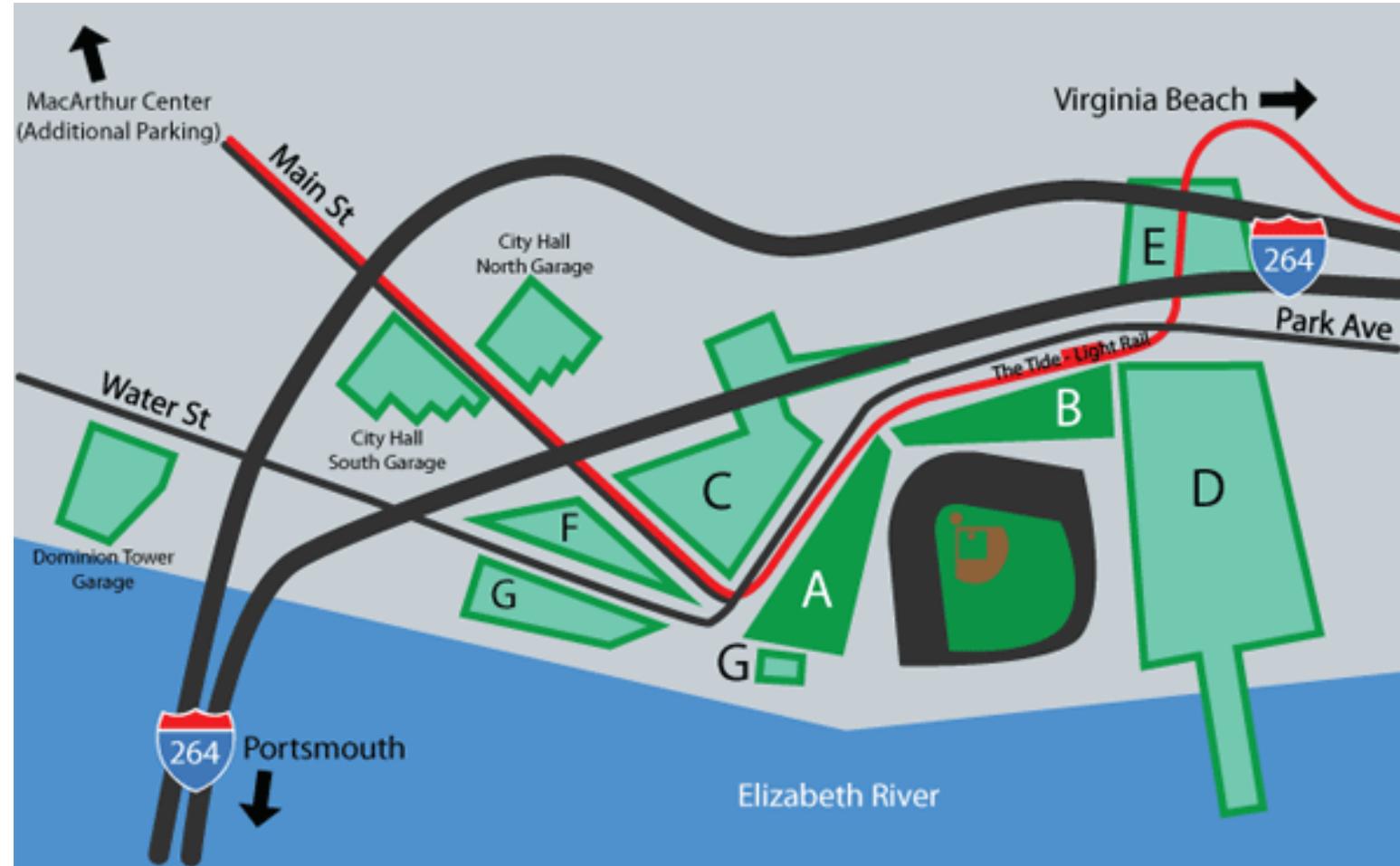
Recurring I-264 congestion in southbound direction:

- Scheduled Elizabeth River bridge openings
- Backup extending on ramps, into study area.

Some roadway segments appear under capacity (road diet potential) due to no observed congestion issues (see photos):

- Tidewater Drive to City Hall Avenue connector eastbound
- Tidewater Drive northbound

ROAD NETWORK CONGESTION ANALYSIS



<u>Surface Parking</u>	<u>Spaces</u>	<u>Garage Parking</u>	<u>Spaces</u>
LOT A	94	CITY HALL NORTH	427
LOT B	144	CITY HALL SOUTH	474
LOT C	285	DOMINION TOWER	744
LOT D	778		
LOT E	176		
LOT F	224		
LOT G	164		



Home Baseball Games

- 66 (2017)

Avg. Baseball Attendance

- 5,443 (2017)

Max. Attendance

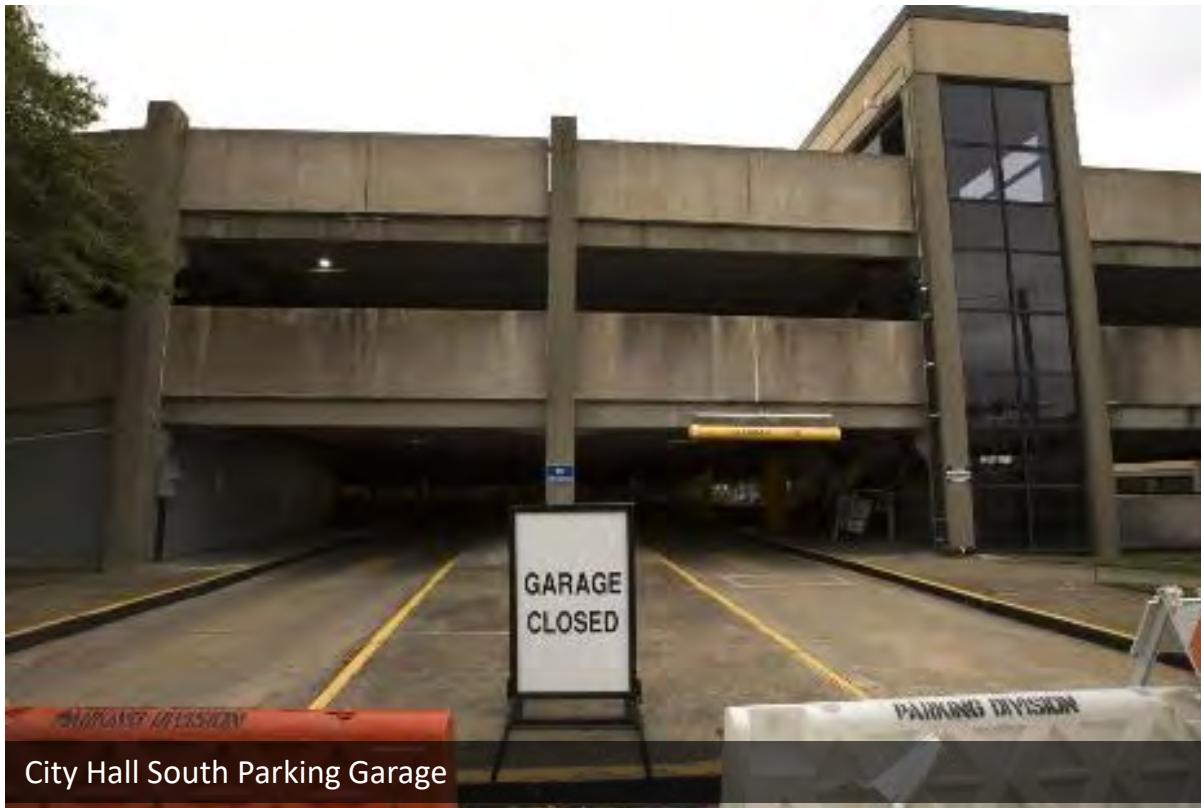
- 14,263 (8/31/96)

Lease Requirement

- City to provide/maintain 1,240 gameday spaces (thru 2022)

Overflow traffic directed to St. Paul's Lot (St. Paul's Blvd.); and the Waterside Garage (Waterside Dr.)

EVENTS, PARKING, AND MULTIMODAL CONNECTIONS



City Hall South Garage

- Total capacity: 474
- Closed as of October 2017
- No plans to reopen or replace
- Around 400 City Hall employees are now parking at the Harbor Park

AMTRAK Parking

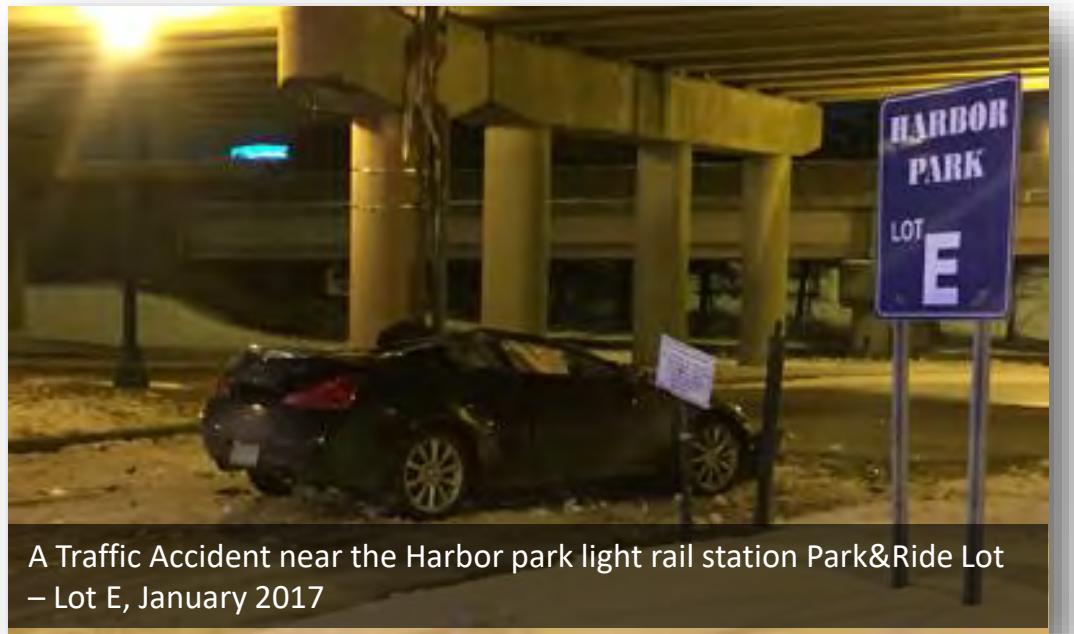
- Total capacity of Lot D: 778
- 130 spaces available for overnight parking
- 30-minute pick-up and drop-off spaces available

Harbor Park Lots

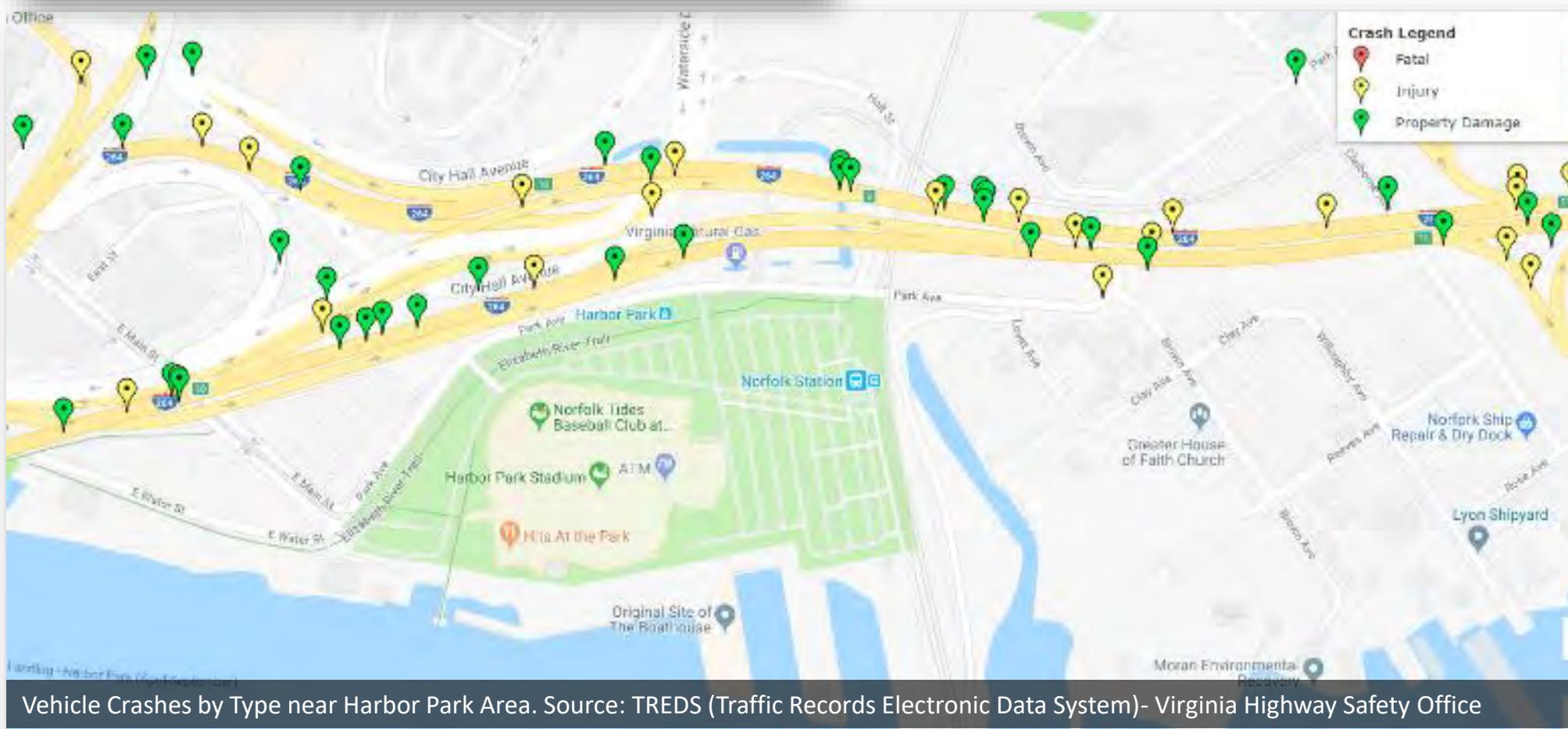
- Lots **A&B** are for Reserved Parking-only
- Lot **E** is a Park&Ride Lot for Harbor Park Station
- Total Combined Capacity of Lots **CFG** : 673
- Parking fee increased to \$6 in March 2018



EVENTS, PARKING, AND MULTIMODAL CONNECTIONS



A Traffic Accident near the Harbor park light rail station Park&Ride Lot – Lot E, January 2017

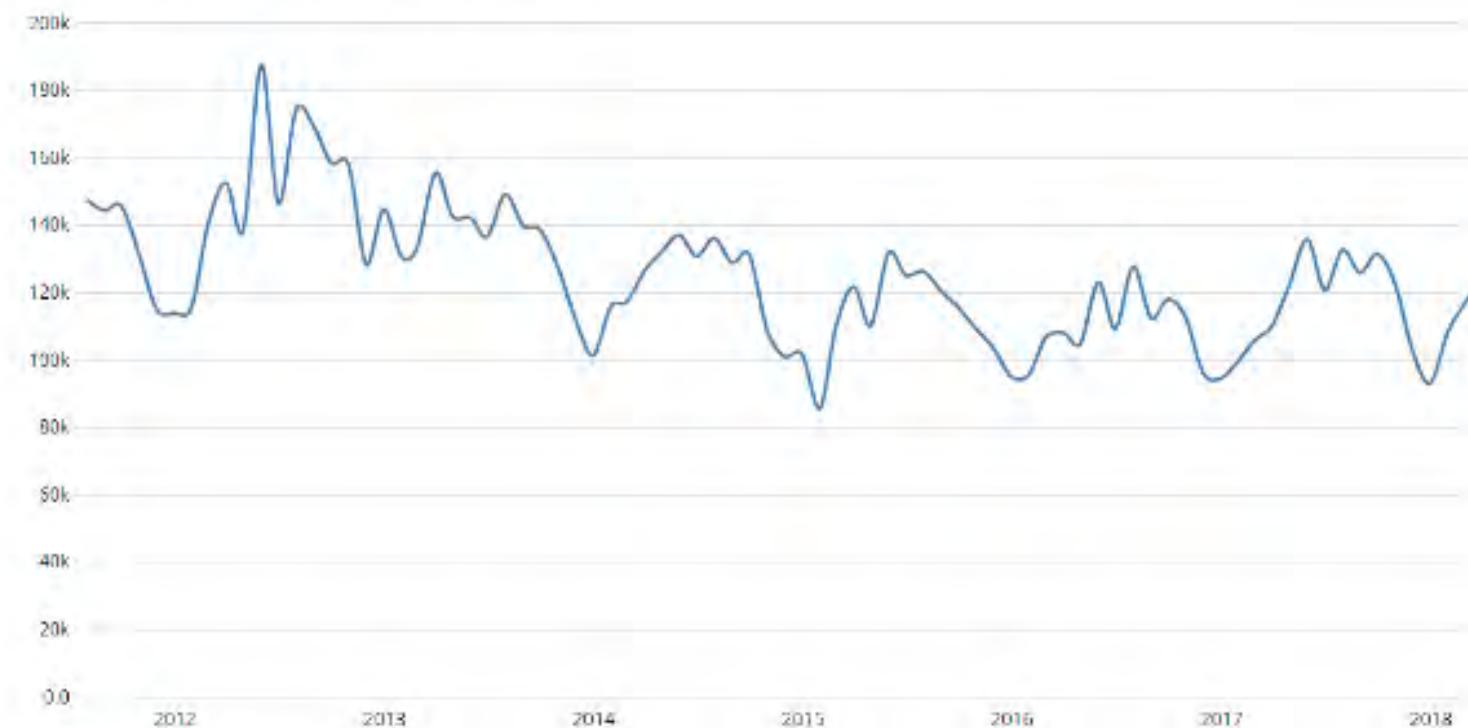


Traffic Safety in the Area

- Complex roadway and railroad network
- Abrupt change in US 460 off-ramp speed limits
- High traffic volume
- A total of 40 crashes in the area in 2017
- 14 caused injuries and 26 caused property damage, no fatal crashes

EVENTS, PARKING, AND MULTIMODAL CONNECTIONS

The Tide's monthly ridership



Built by Will Teup | The Virginian-Pilot

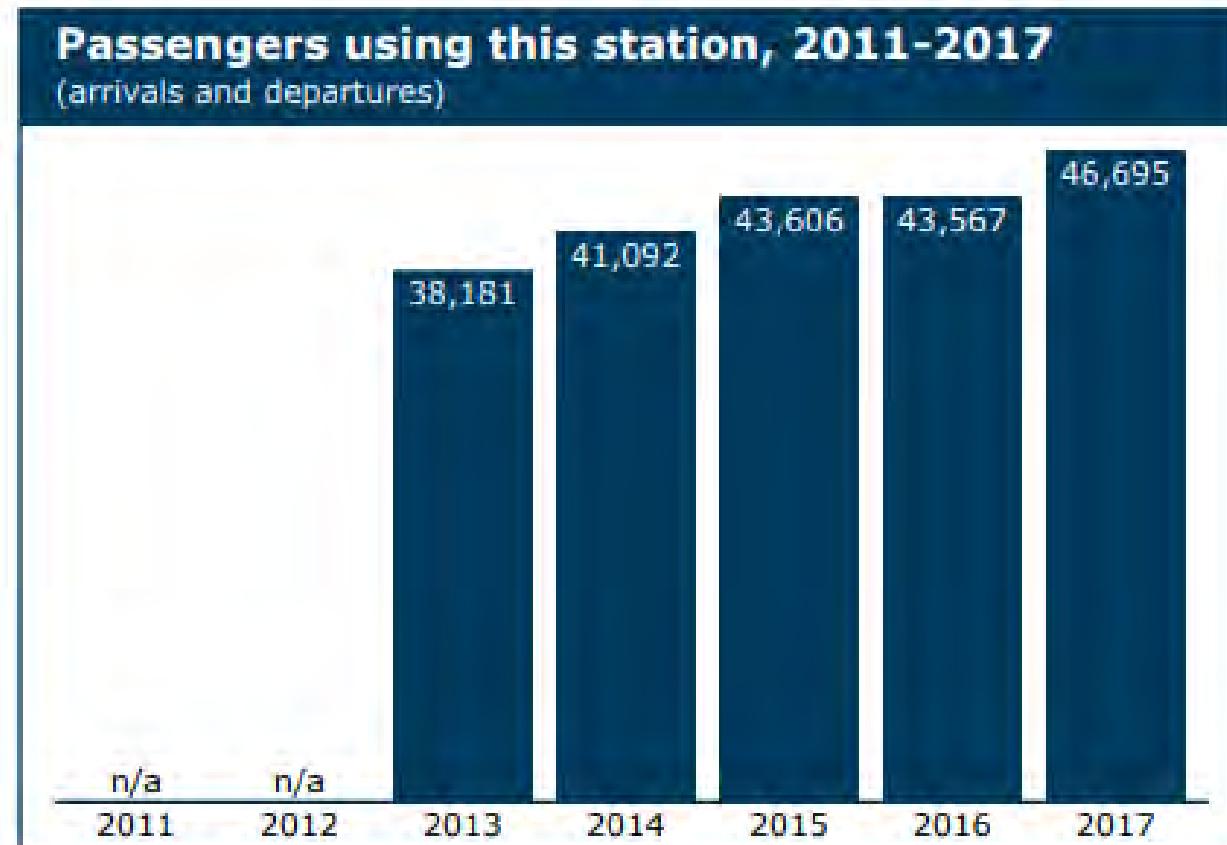


Tide Light Rail Facts:

- Harbor Park Station owned by City of Norfolk
- No connecting bus routes to Harbor Park Station.
- 176 space park & ride lot.
- Dominion Virginia Power underground electrical relocation required during construction within the Harbor Park Station area.

EVENTS, PARKING, AND MULTIMODAL CONNECTIONS

Amtrak service in Norfolk, VA



DRPT priority improvements include adding two additional round-trip passenger trains to Norfolk by extending two existing trains from Richmond (est. 2021).



Service Provided:

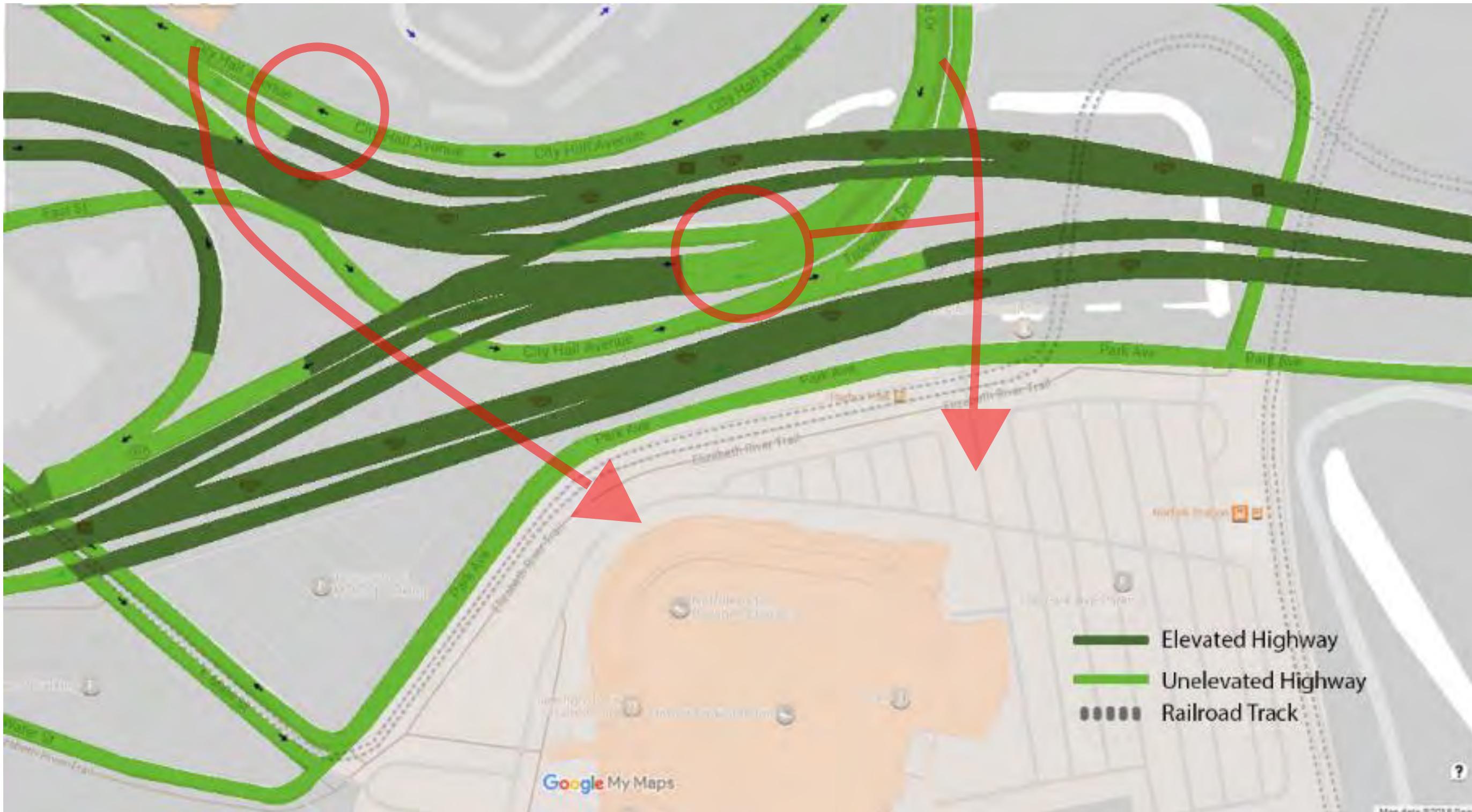
- One round-trip train to Petersburg/Washington D.C.
- Two bus connections to Newport News Amtrak train arrivals/departures.

Other Facts:

- Seven percent increase in boardings (2016-2017).
- Free overnight parking for Amtrak patrons at Harbor Park Lot D (130 spaces).

EVENTS, PARKING, AND MULTIMODAL CONNECTIONS

VERTICAL CLEARANCE / RAMP RECONFIGURATIONS NEEDED TO MAKE CONNECTIONS



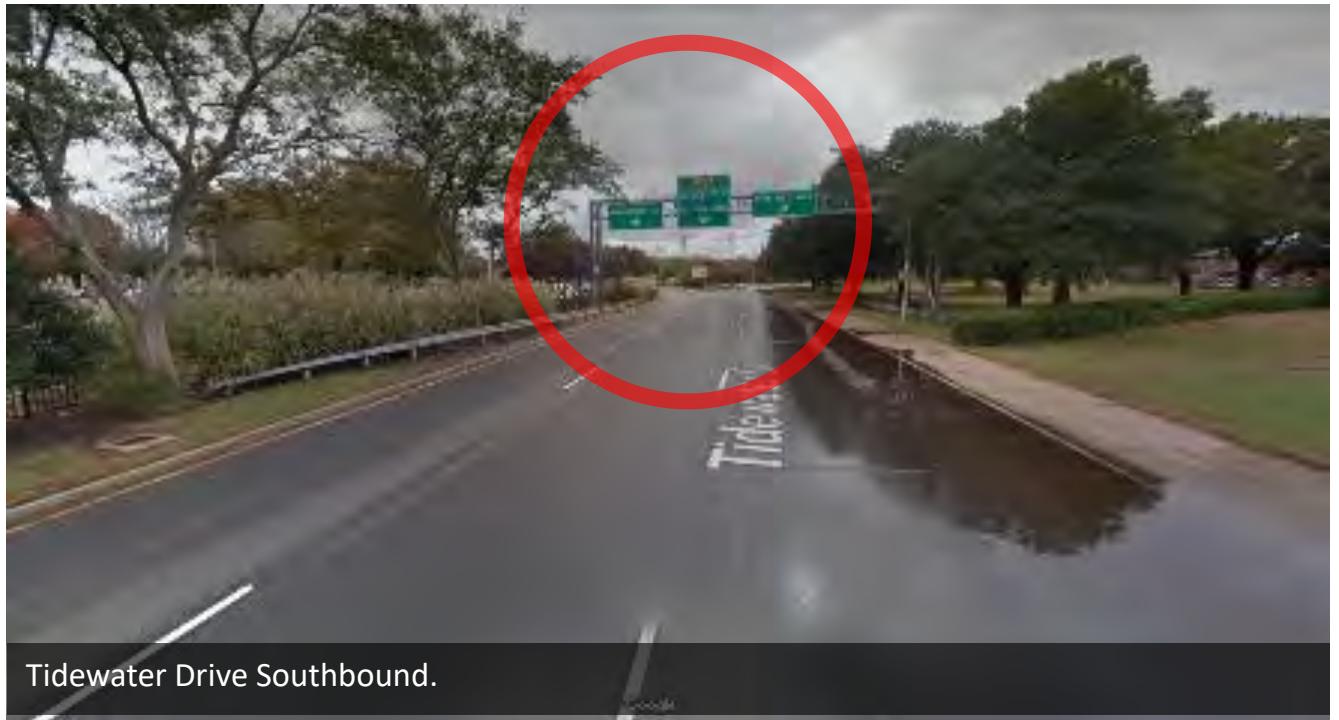
PHYSICAL/DESIGN CONSIDERATIONS

SKEW OF BRIDGE PIERS IMPACTS POTENTIAL ROAD GEOMETRY UNDER I-264



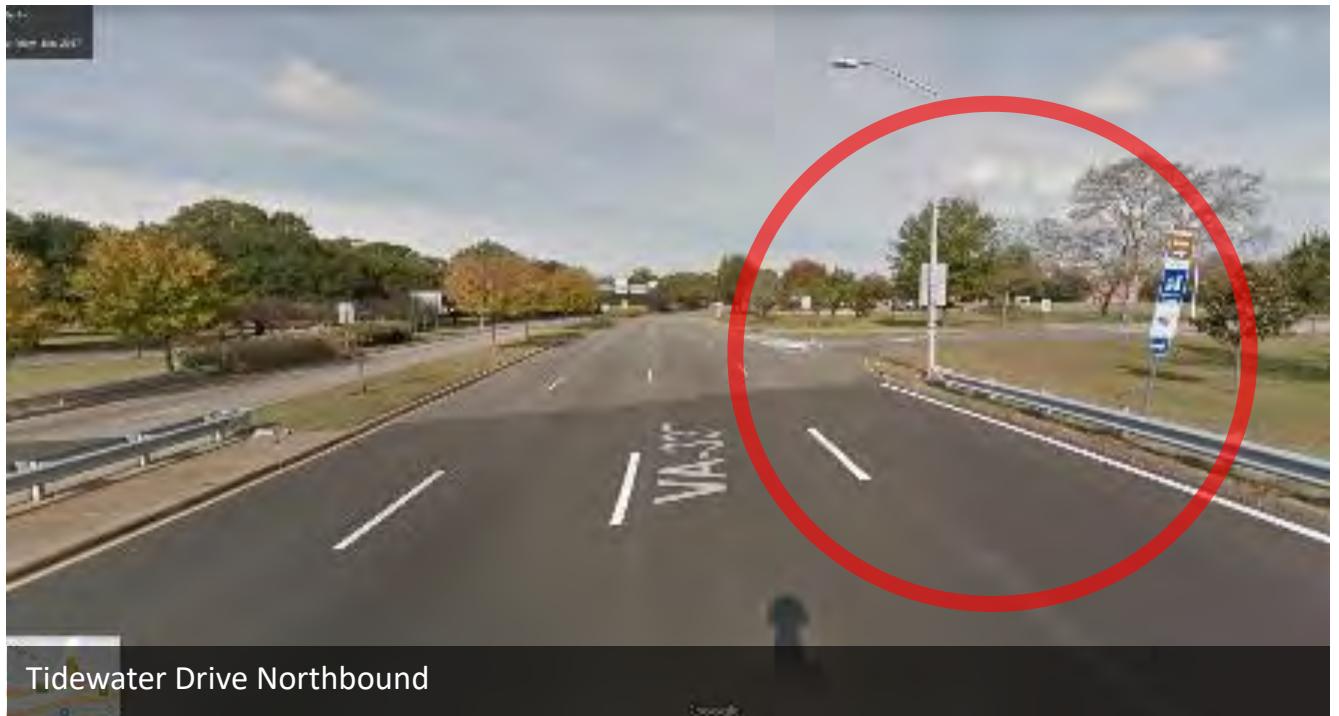
Tidewater Drive, looking south toward study site.

PHYSICAL/DESIGN CONSIDERATIONS



Tidewater Drive Southbound.

- ❖ Expressway style signage blurs transition from urban arterial to high-speed roadway. Encourages acceleration above posted speed limit in this area of 35mph.



Tidewater Drive Northbound

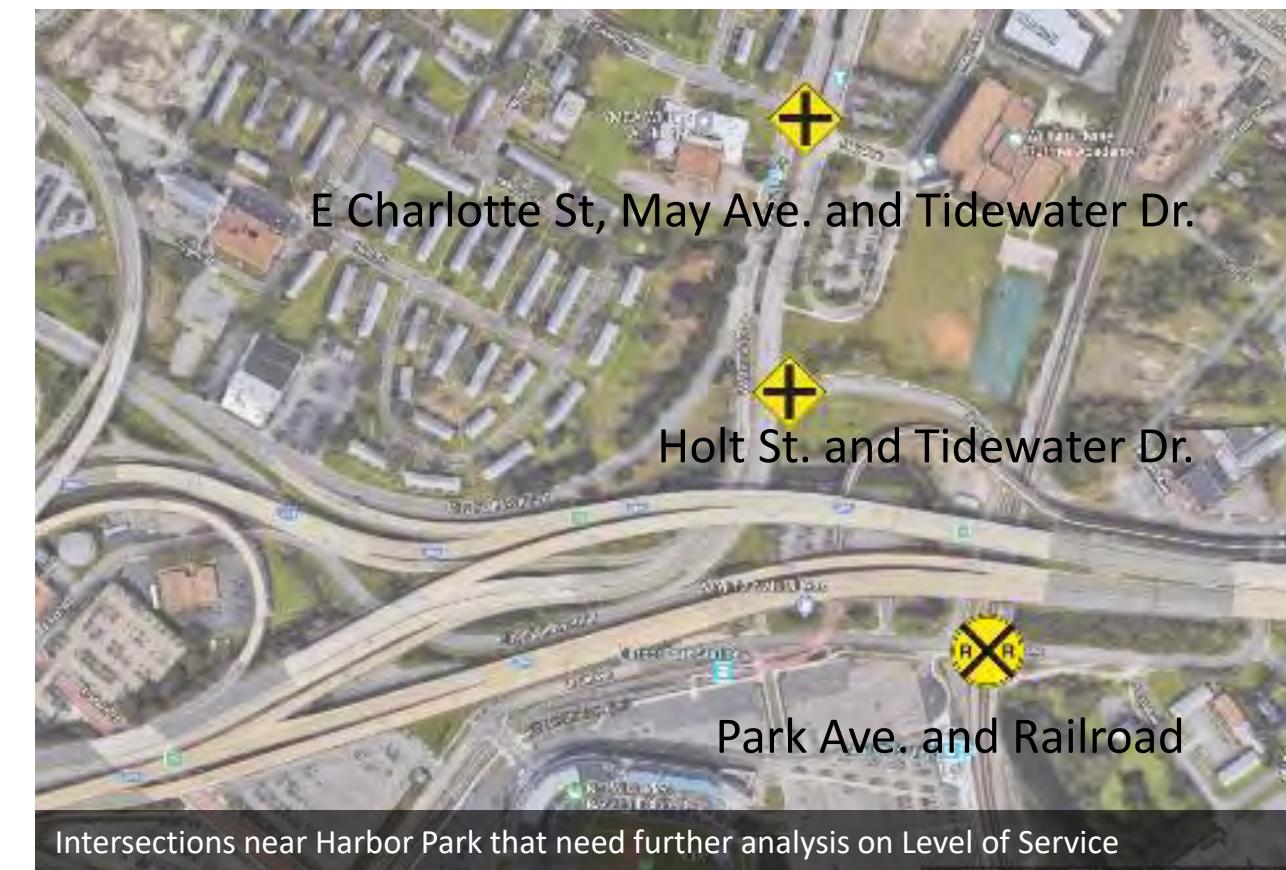
- ❖ Right turn to Holt Drive features limited signage, deceleration opportunity. Transition from high-speed ramp also uncertain at this location, with a 25mph school zone just beyond this intersection.

OTHER CONSIDERATIONS

The Study Should Analyze the Following Metrics as well:

Existing and projected data not available, but would further enhance the condition assessment include:

- **Intersection Level of Service**
 - E Charlotte St - May Ave. and Tidewater Dr.
 - Holt St. and Tidewater Dr.
 - Park St. at NS Railroad Crossing
- **Turning Movements**
- **Residential and Commercial Development**
 - Existing trip generation estimations
- **Pedestrian Conditions**
 - Inventory of existing walkability and safety analysis



WHAT ARE THE LIMITATIONS OF THIS ANALYSIS?

Key Takeaways:

- There appears initial capacity of the local network to support more intense development.
- Introduction of an intersection at the base of the I-264 ramps could experience overflow traffic in the afternoon peak. Design considerations may be needed to prevent vehicle queueing from disrupting local connections.
- The reconfiguration of the local road network or light rail alignment could be used to further defend pedestrian space, lower traffic speeds, and minimize auto/light-rail/pedestrian conflicts.
- Parking management approaches could capitalize on the different timing of parking demand – thereby reducing the overall volume of segregated parking provided.
- Increased local transit connections needed to fully leverage existing transit infrastructure.



KEY TAKEAWAYS

The analysis presented informs the following:

- Preparation of concepts and testing of the local road network changes for enhanced connectivity.
- Assessment of future travel demand for proposed development in regards to highway capacity.
- Determination of transit/parking modifications to accommodate demand.
- Exploration and evaluation of additional improvements to the pedestrian environment, enhancing walkability and safety.



NEXT STEPS



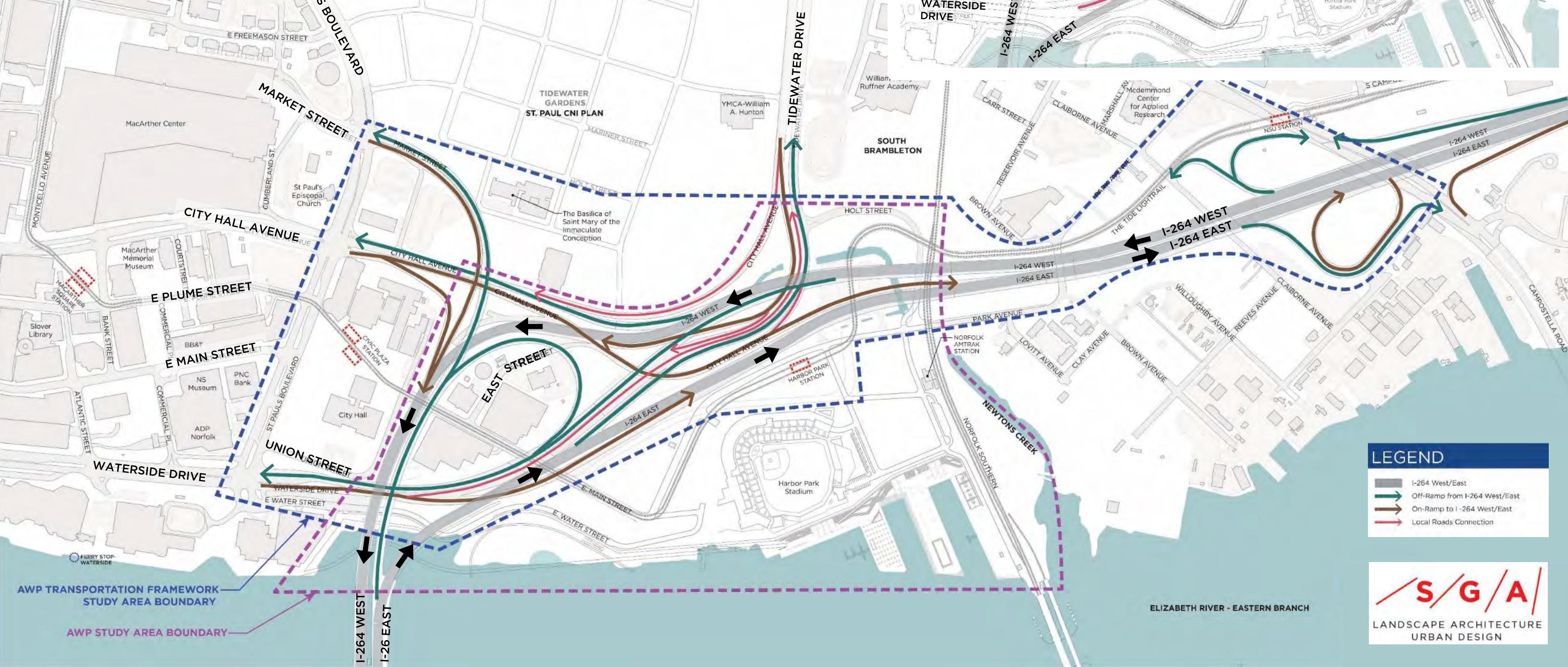
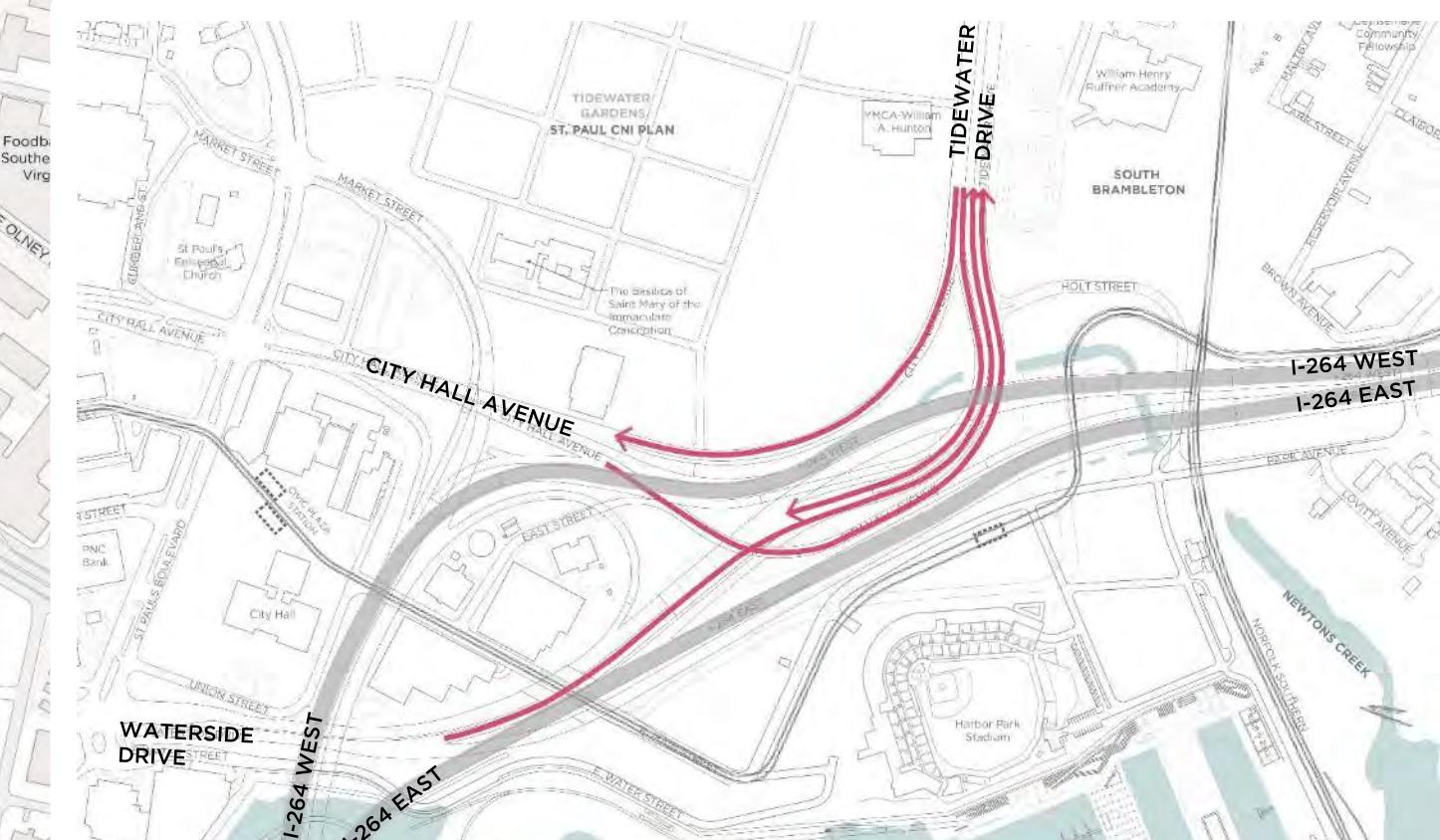
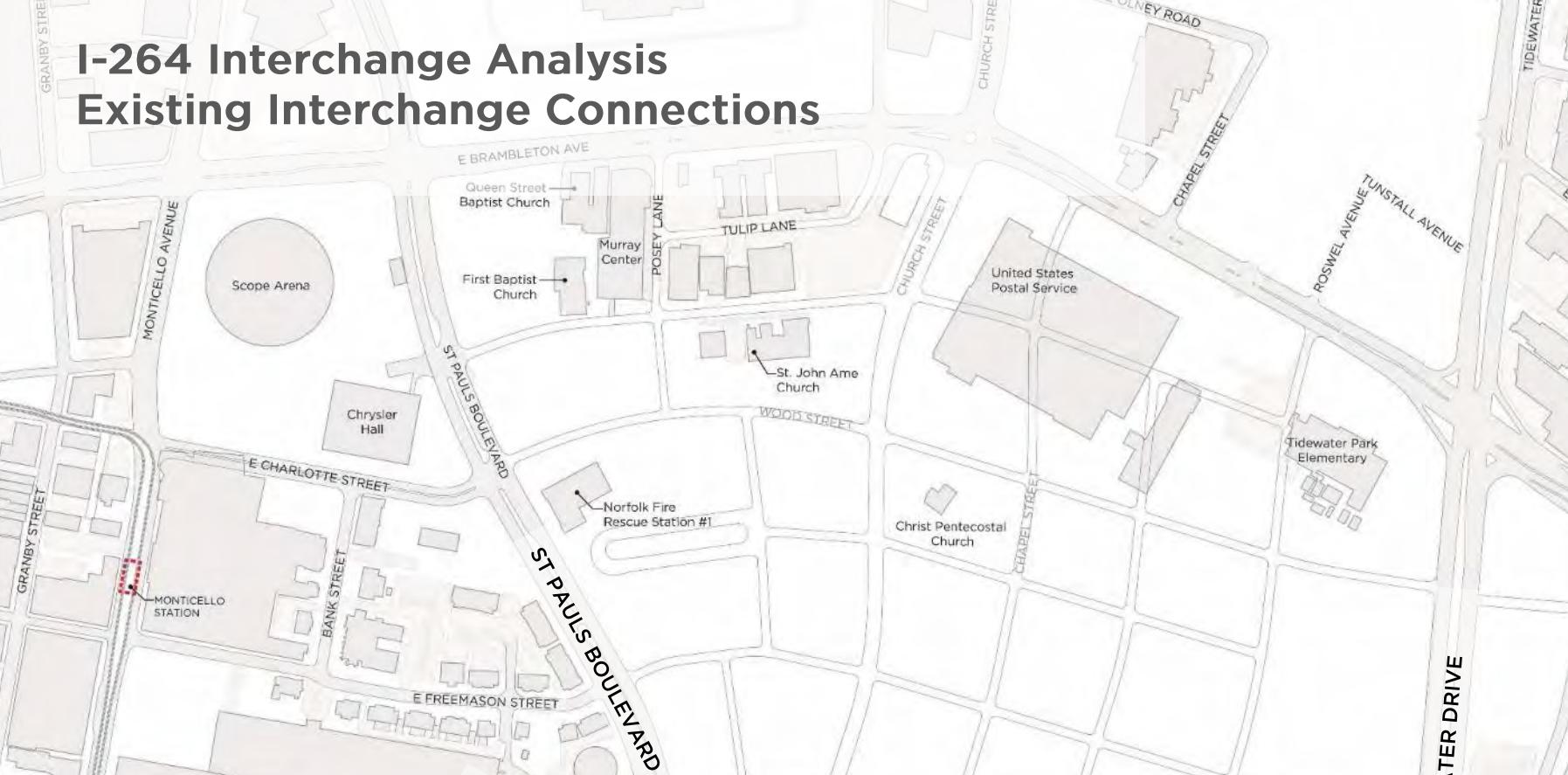
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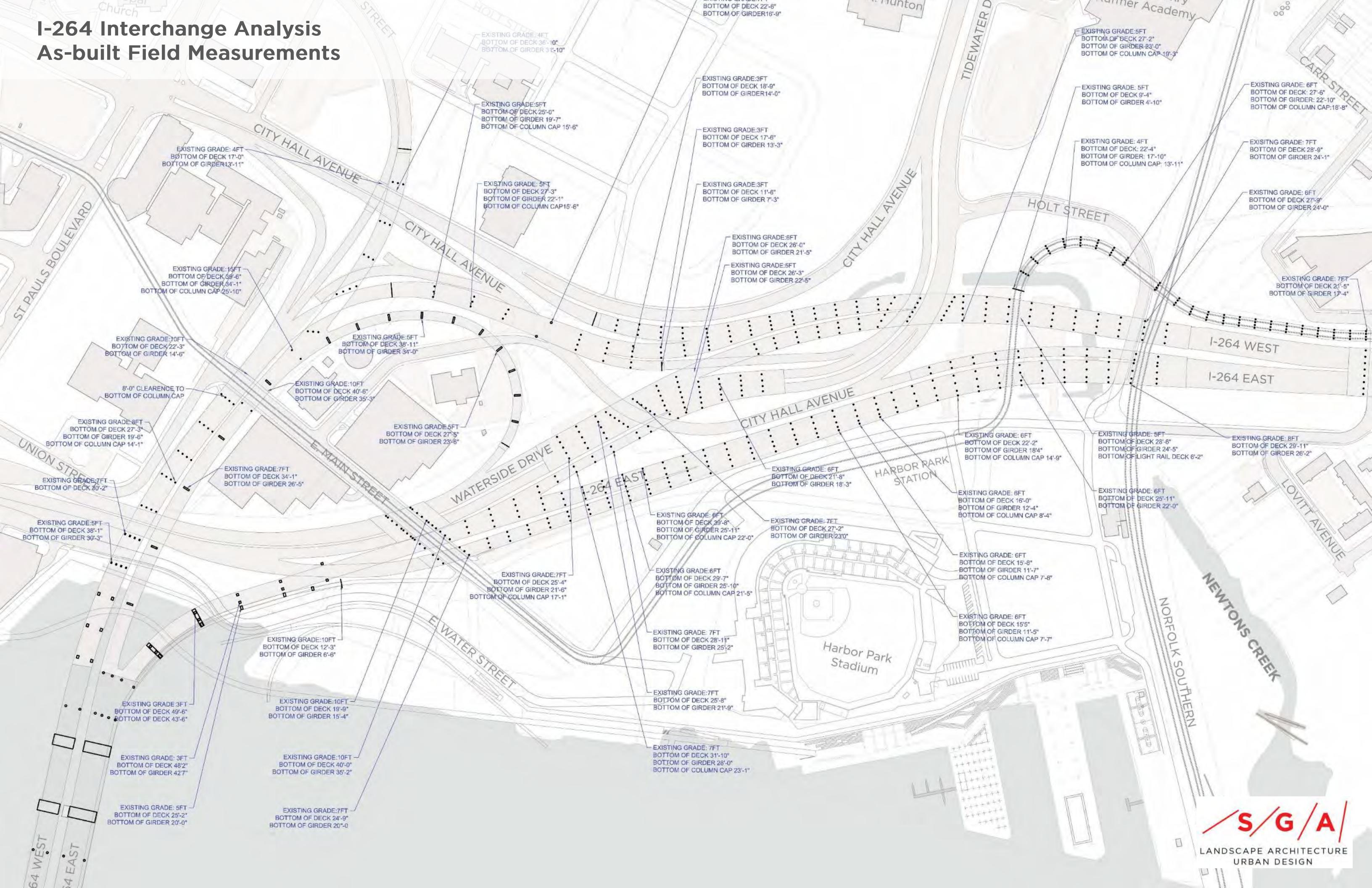
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I-264 Interchange Analysis

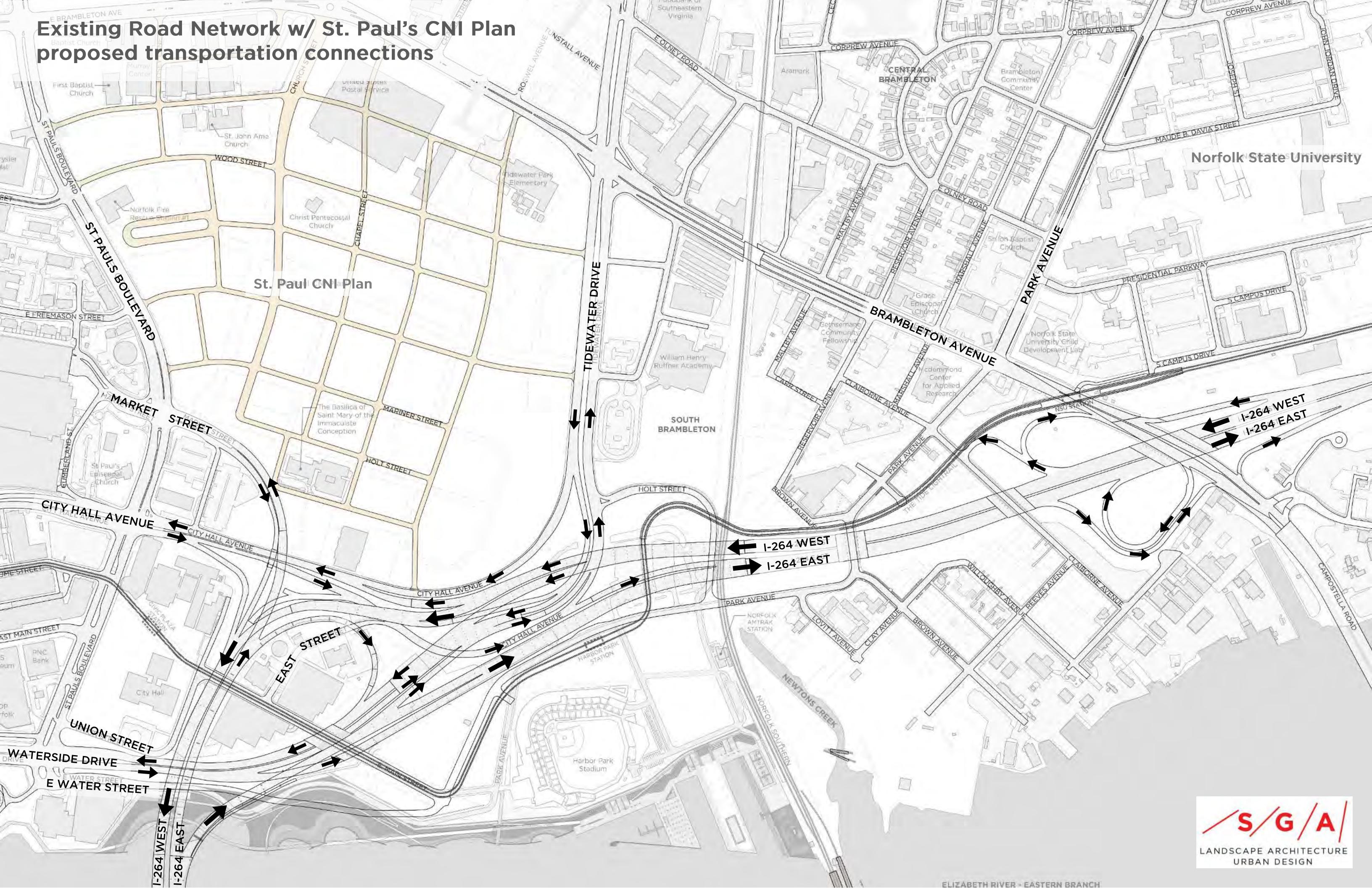
Existing Interchange Connections



I-264 Interchange Analysis As-built Field Measurements

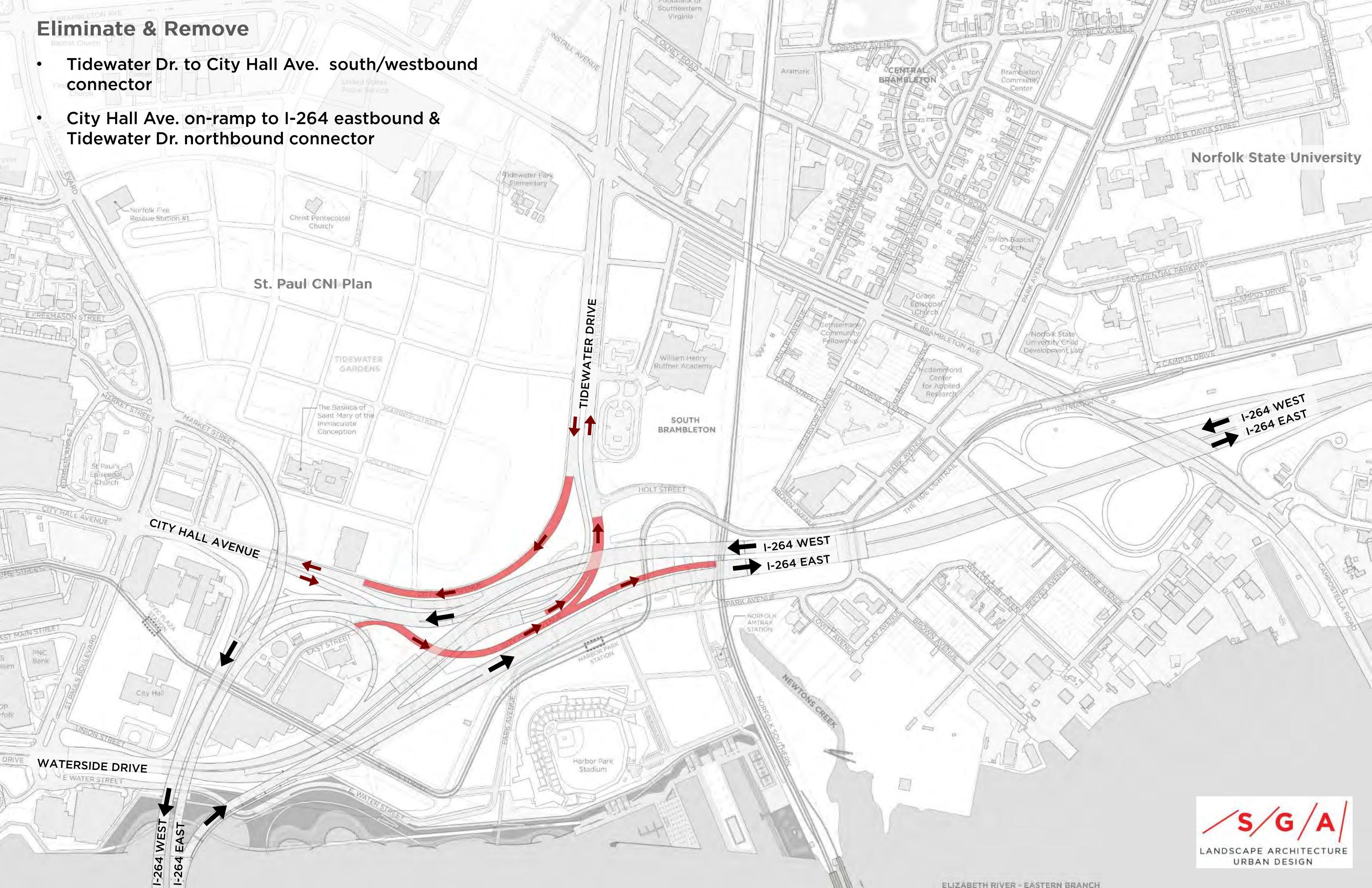


Existing Road Network w/ St. Paul's CNI Plan proposed transportation connections



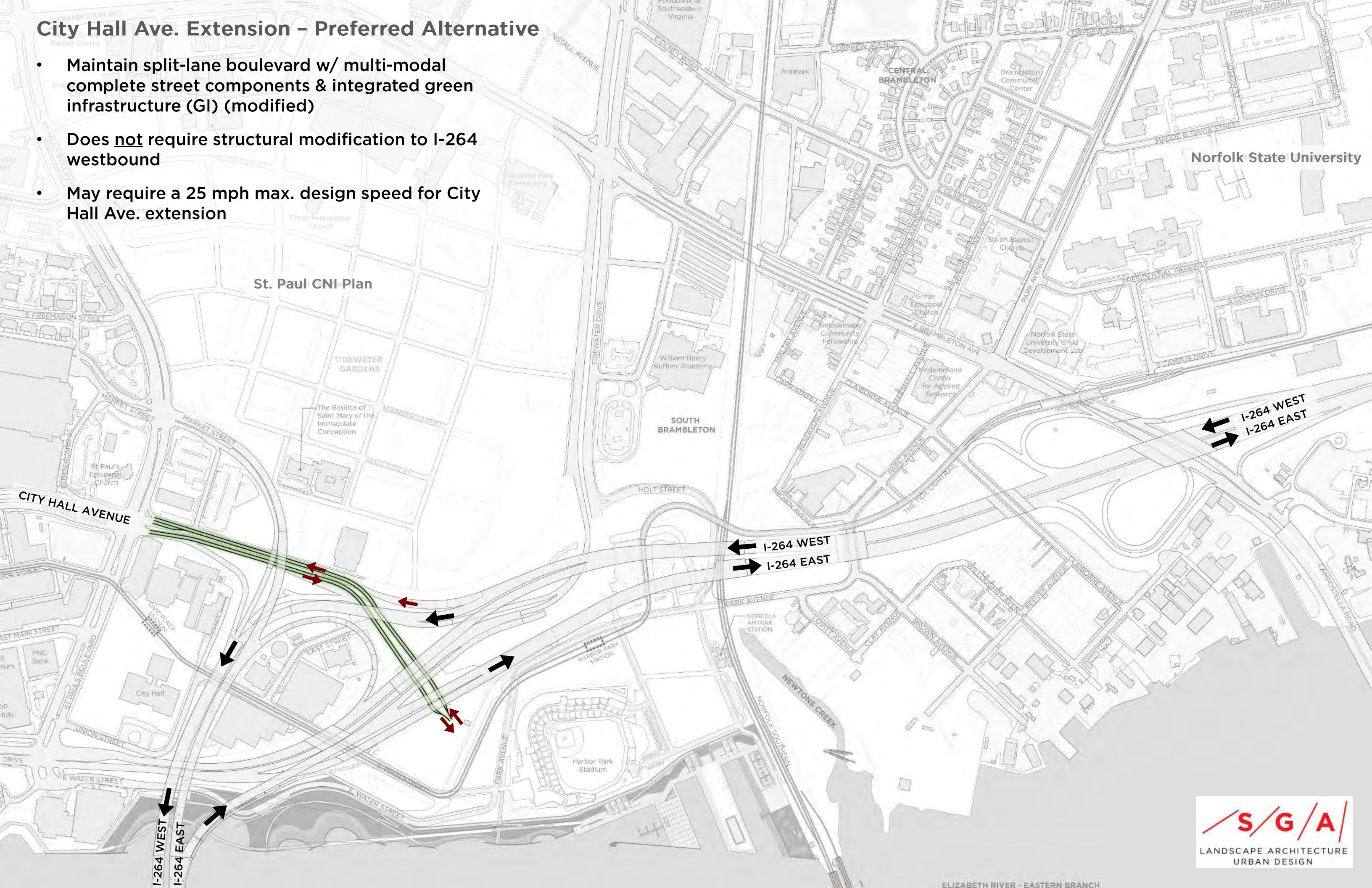
Eliminate & Remove

- Tidewater Dr. to City Hall Ave. south/westbound connector
- City Hall Ave. on-ramp to I-264 eastbound & Tidewater Dr. northbound connector



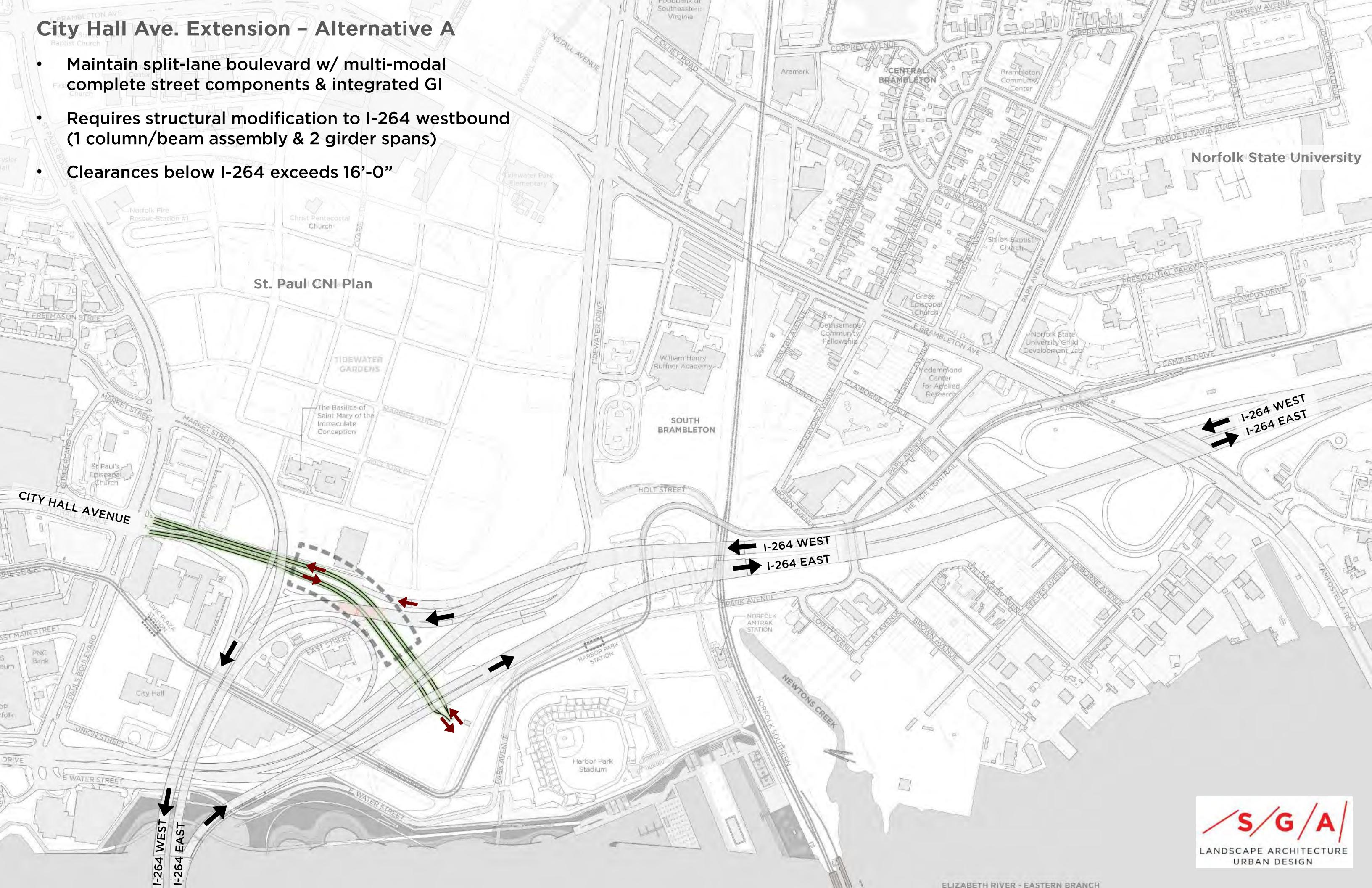
City Hall Ave. Extension – Preferred Alternative

- Maintain split-lane boulevard w/ multi-modal complete street components & integrated green infrastructure (GI) (modified)
- Does not require structural modification to I-264 westbound
- May require a 25 mph max. design speed for City Hall Ave. extension



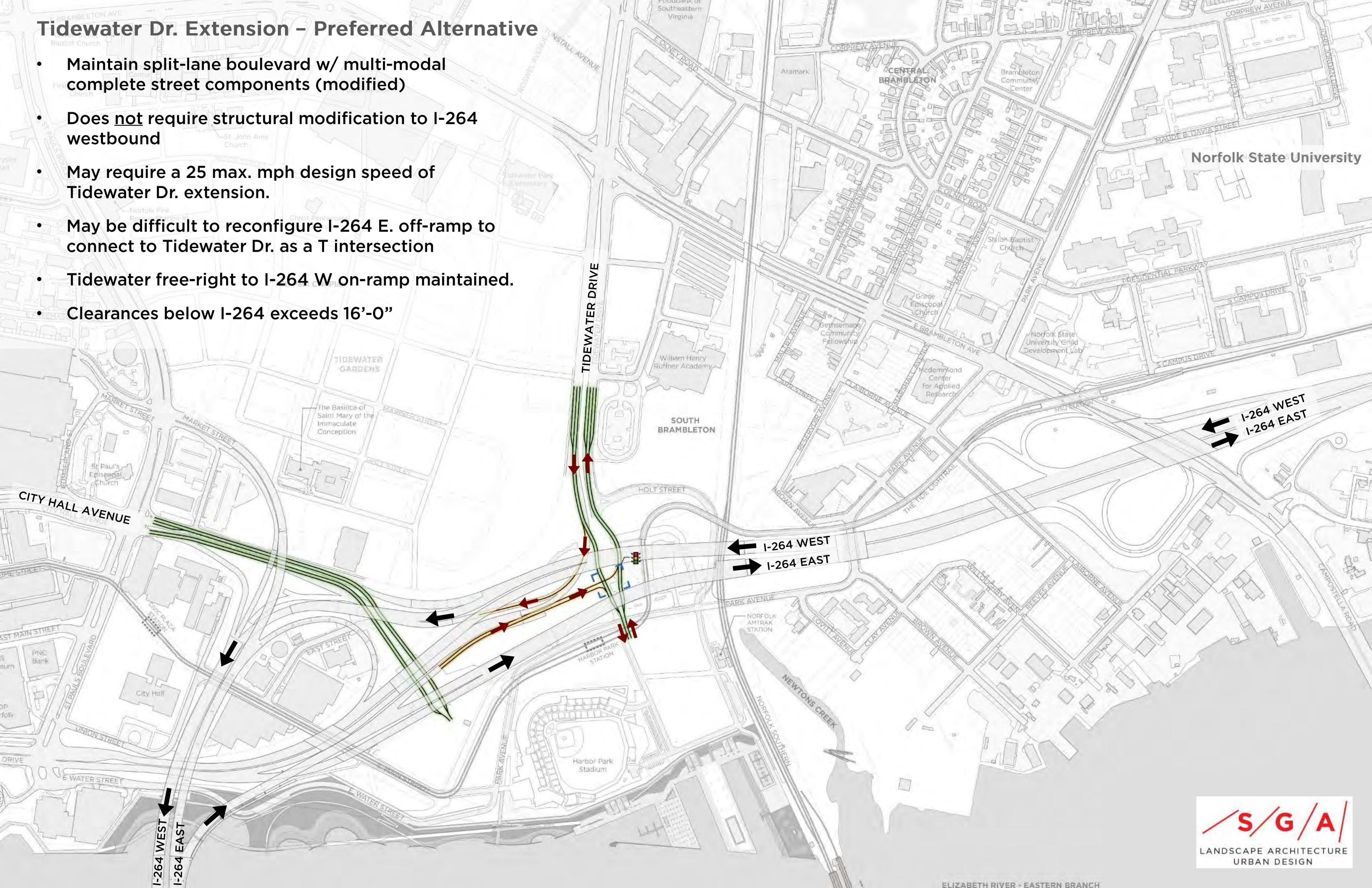
City Hall Ave. Extension – Alternative A

- Maintain split-lane boulevard w/ multi-modal complete street components & integrated GI
- Requires structural modification to I-264 westbound (1 column/beam assembly & 2 girder spans)
- Clearances below I-264 exceeds 16'-0"



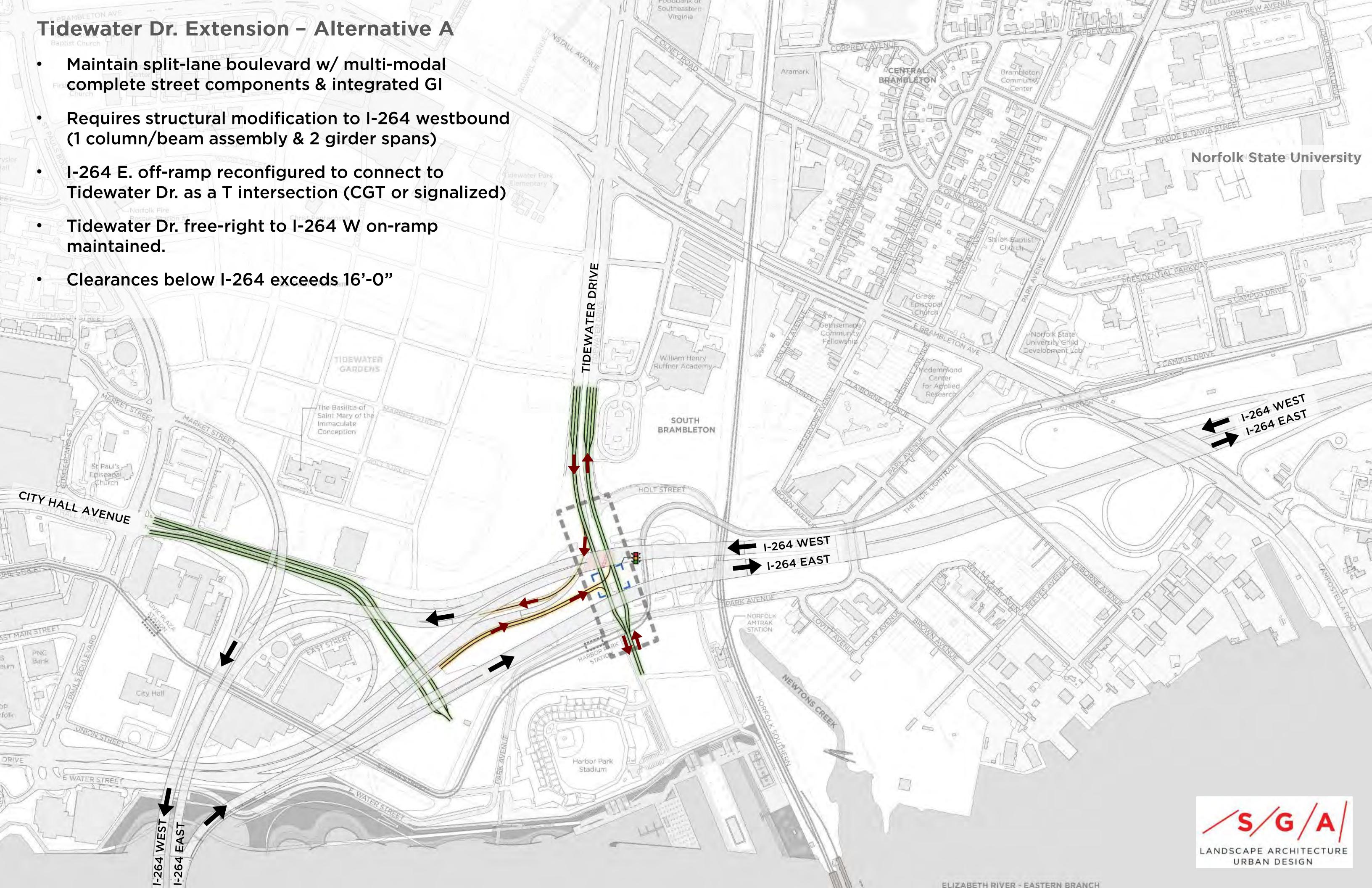
Tidewater Dr. Extension – Preferred Alternative

- Maintain split-lane boulevard w/ multi-modal complete street components (modified)
- Does not require structural modification to I-264 westbound
- May require a 25 max. mph design speed of Tidewater Dr. extension.
- May be difficult to reconfigure I-264 E. off-ramp to connect to Tidewater Dr. as a T intersection
- Tidewater free-right to I-264 W on-ramp maintained.
- Clearances below I-264 exceeds 16'-0"



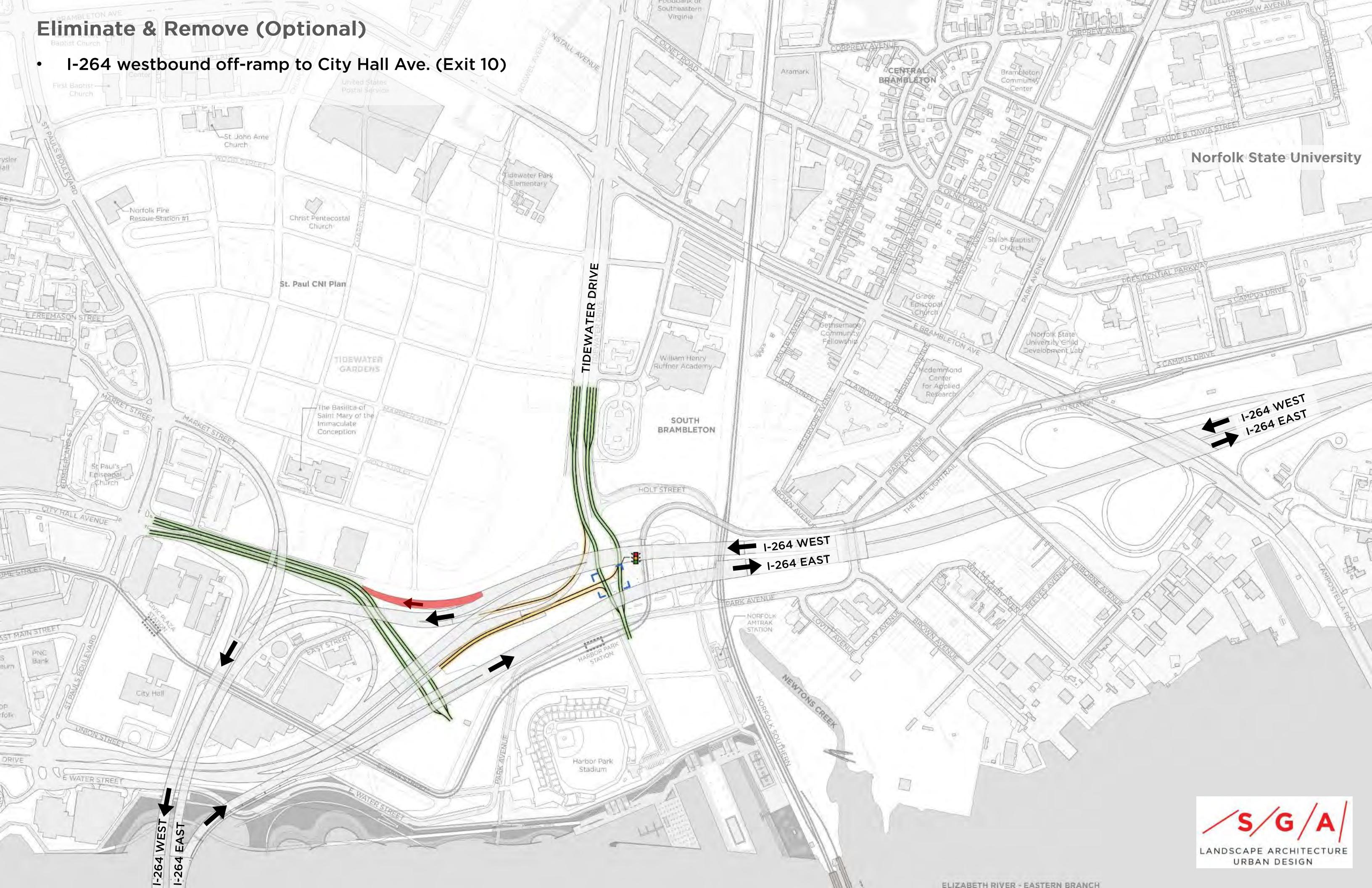
Tidewater Dr. Extension – Alternative A

- Maintain split-lane boulevard w/ multi-modal complete street components & integrated GI
- Requires structural modification to I-264 westbound (1 column/beam assembly & 2 girder spans)
- I-264 E. off-ramp reconfigured to connect to Tidewater Dr. as a T intersection (CGT or signalized)
- Tidewater Dr. free-right to I-264 W on-ramp maintained.
- Clearances below I-264 exceeds 16'-0"



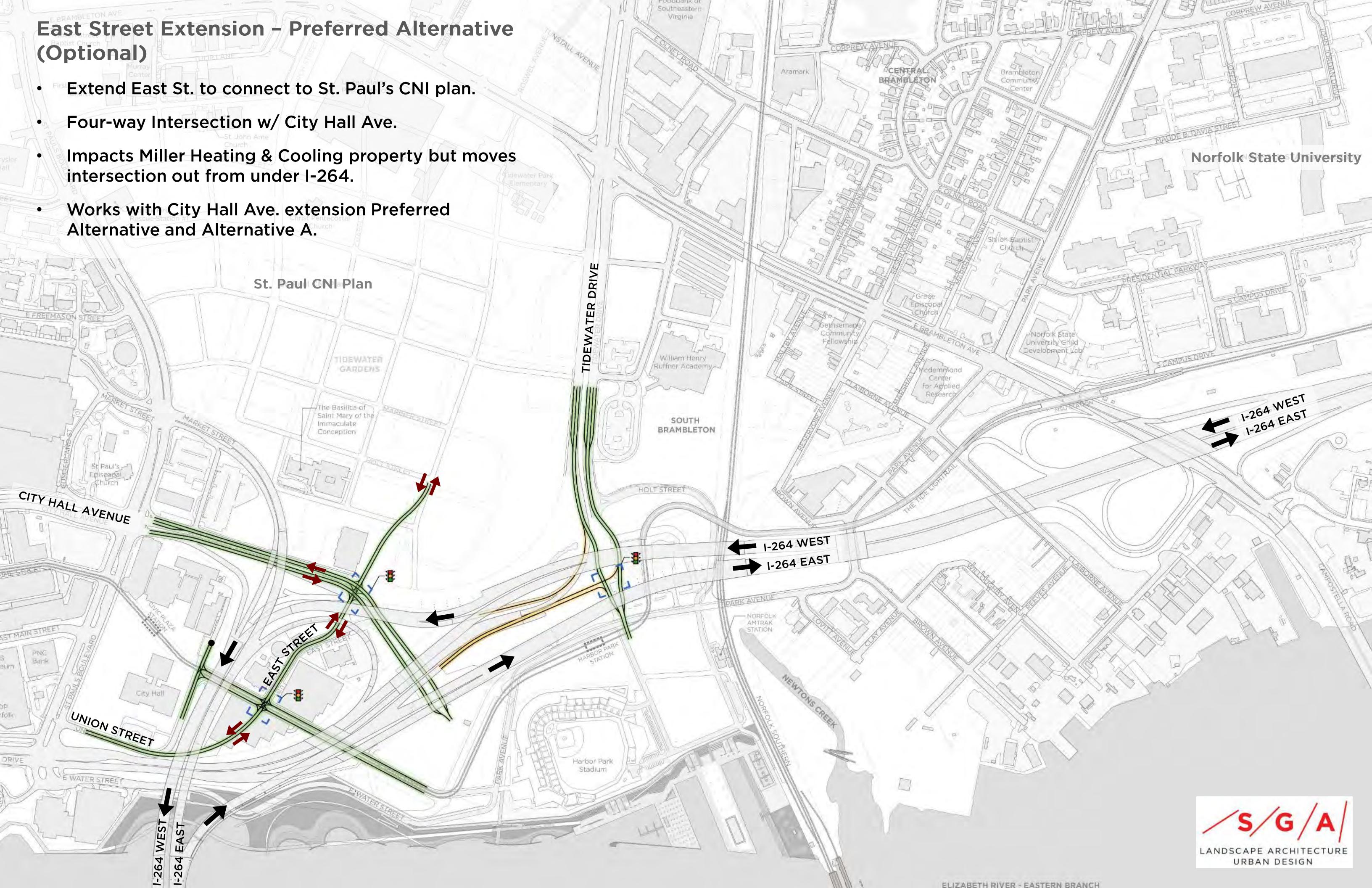
Eliminate & Remove (Optional)

- I-264 westbound off-ramp to City Hall Ave. (Exit 10)



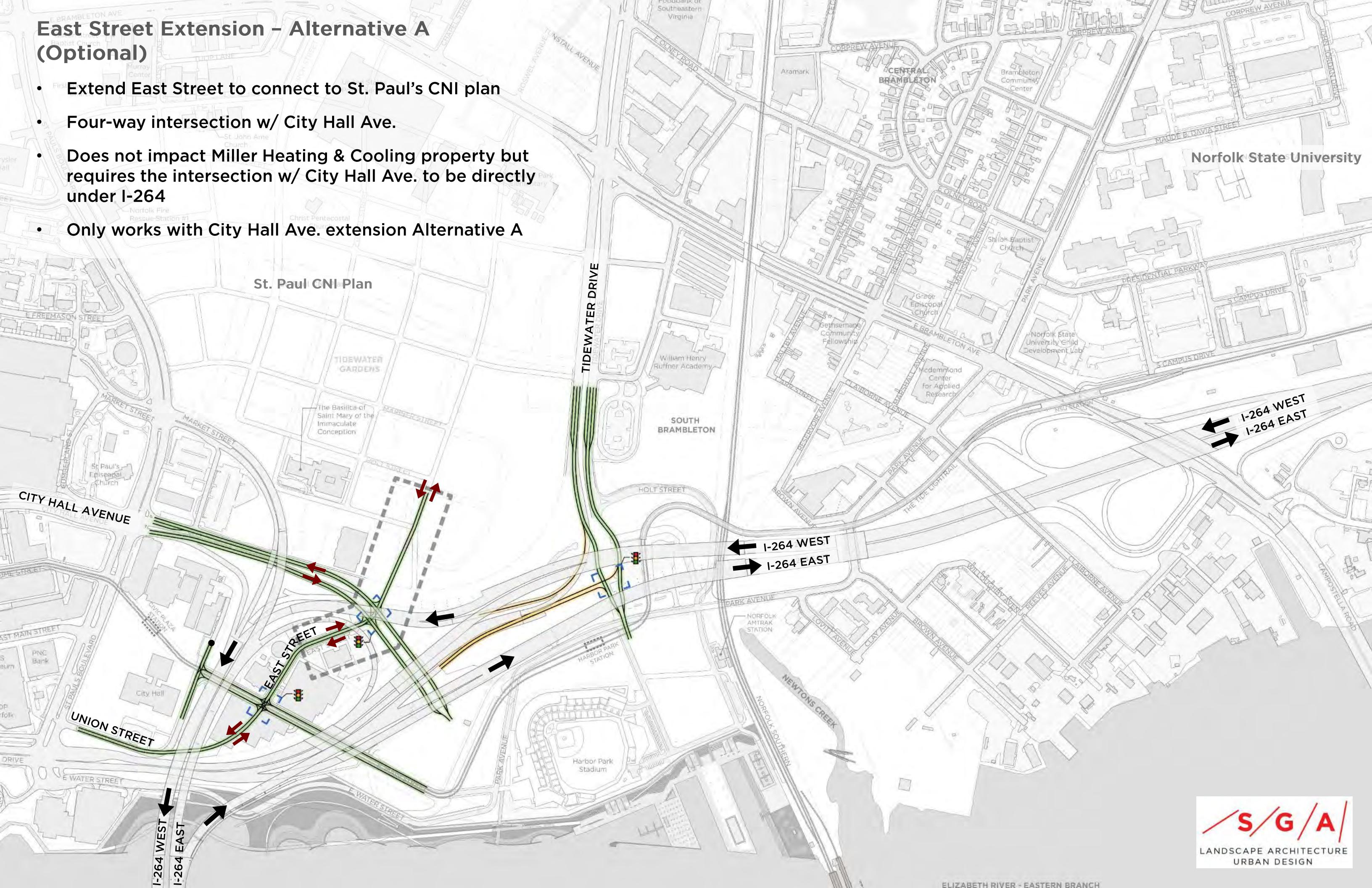
East Street Extension – Preferred Alternative (Optional)

- Extend East St. to connect to St. Paul's CNI plan.
- Four-way Intersection w/ City Hall Ave.
- Impacts Miller Heating & Cooling property but moves intersection out from under I-264.
- Works with City Hall Ave. extension Preferred Alternative and Alternative A.



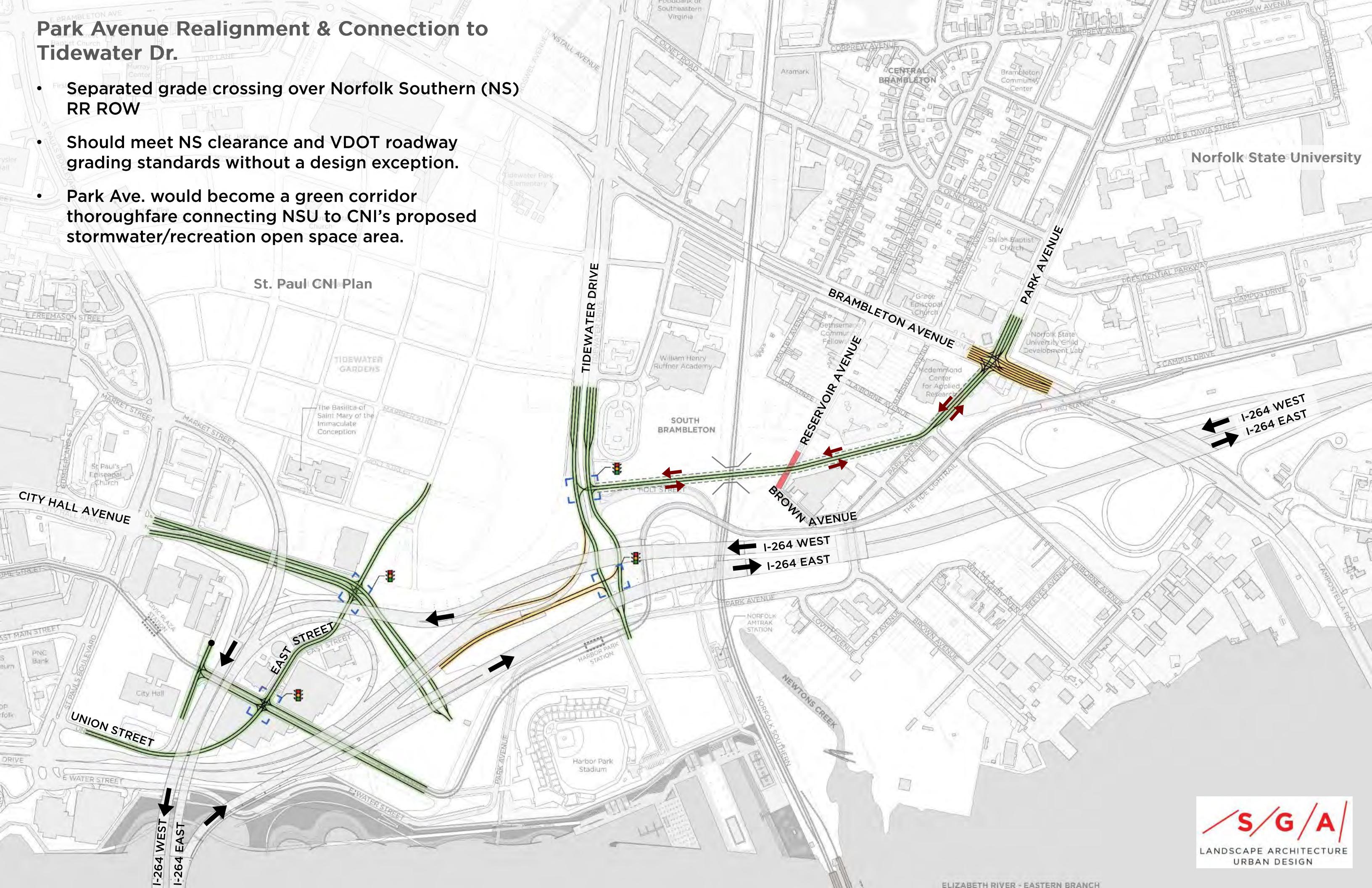
East Street Extension – Alternative A (Optional)

- Extend East Street to connect to St. Paul's CNI plan
- Four-way intersection w/ City Hall Ave.
- Does not impact Miller Heating & Cooling property but requires the intersection w/ City Hall Ave. to be directly under I-264
- Only works with City Hall Ave. extension Alternative A



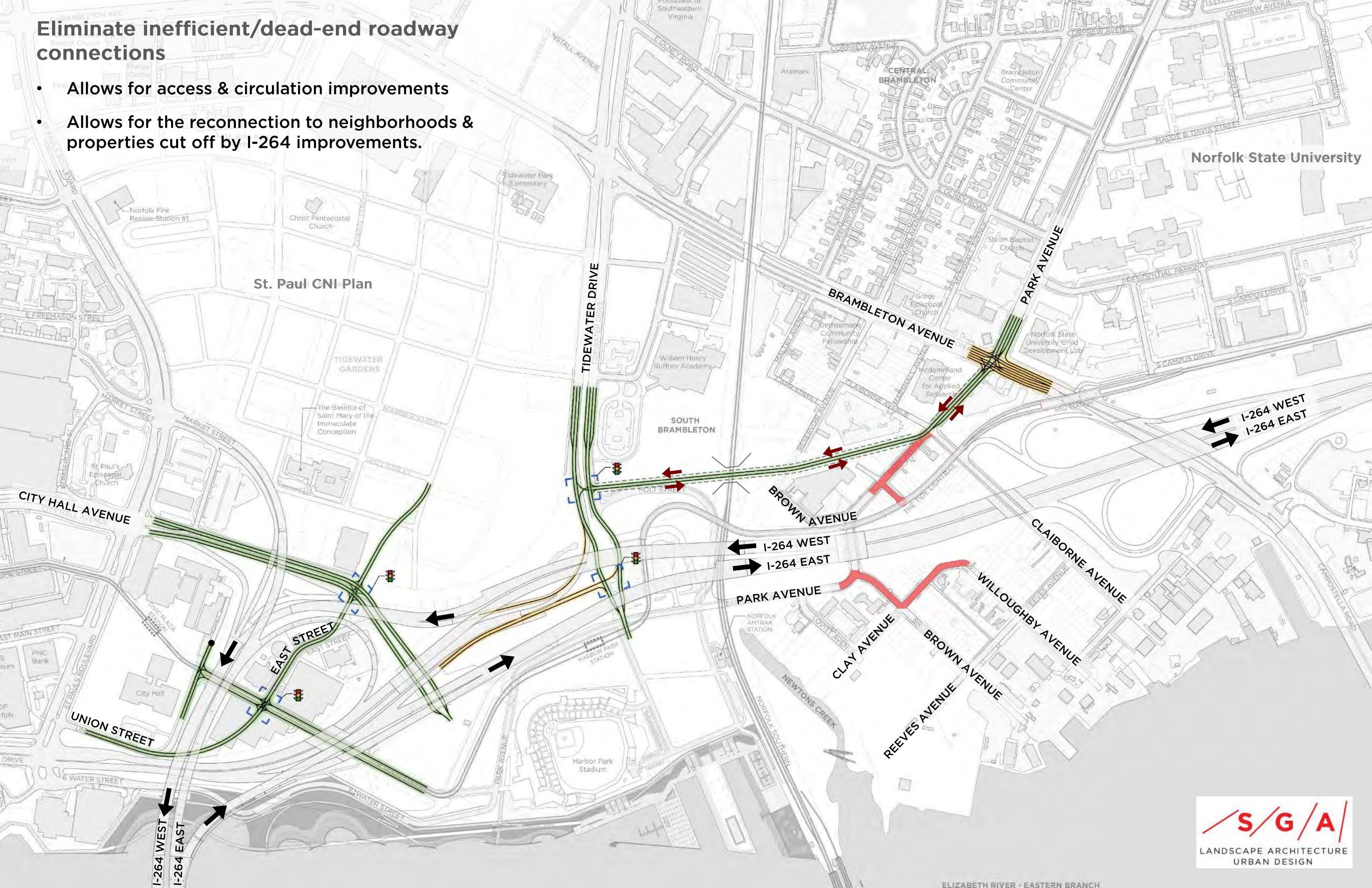
Park Avenue Realignment & Connection to Tidewater Dr.

- Separated grade crossing over Norfolk Southern (NS) RR ROW
- Should meet NS clearance and VDOT roadway grading standards without a design exception.
- Park Ave. would become a green corridor thoroughfare connecting NSU to CNI's proposed stormwater/recreation open space area.



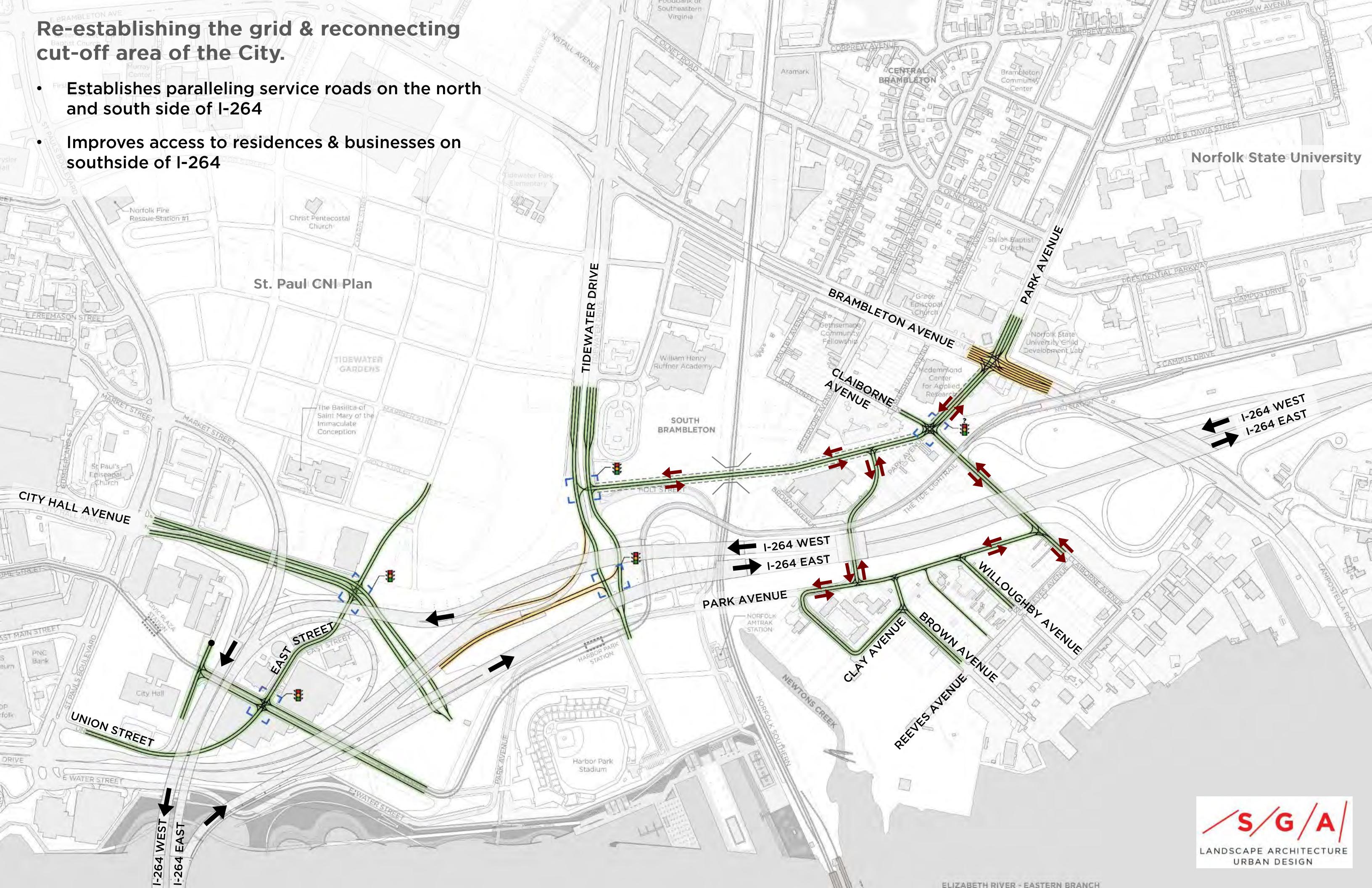
Eliminate inefficient/dead-end roadway connections

- Allows for access & circulation improvements
- Allows for the reconnection to neighborhoods & properties cut off by I-264 improvements.



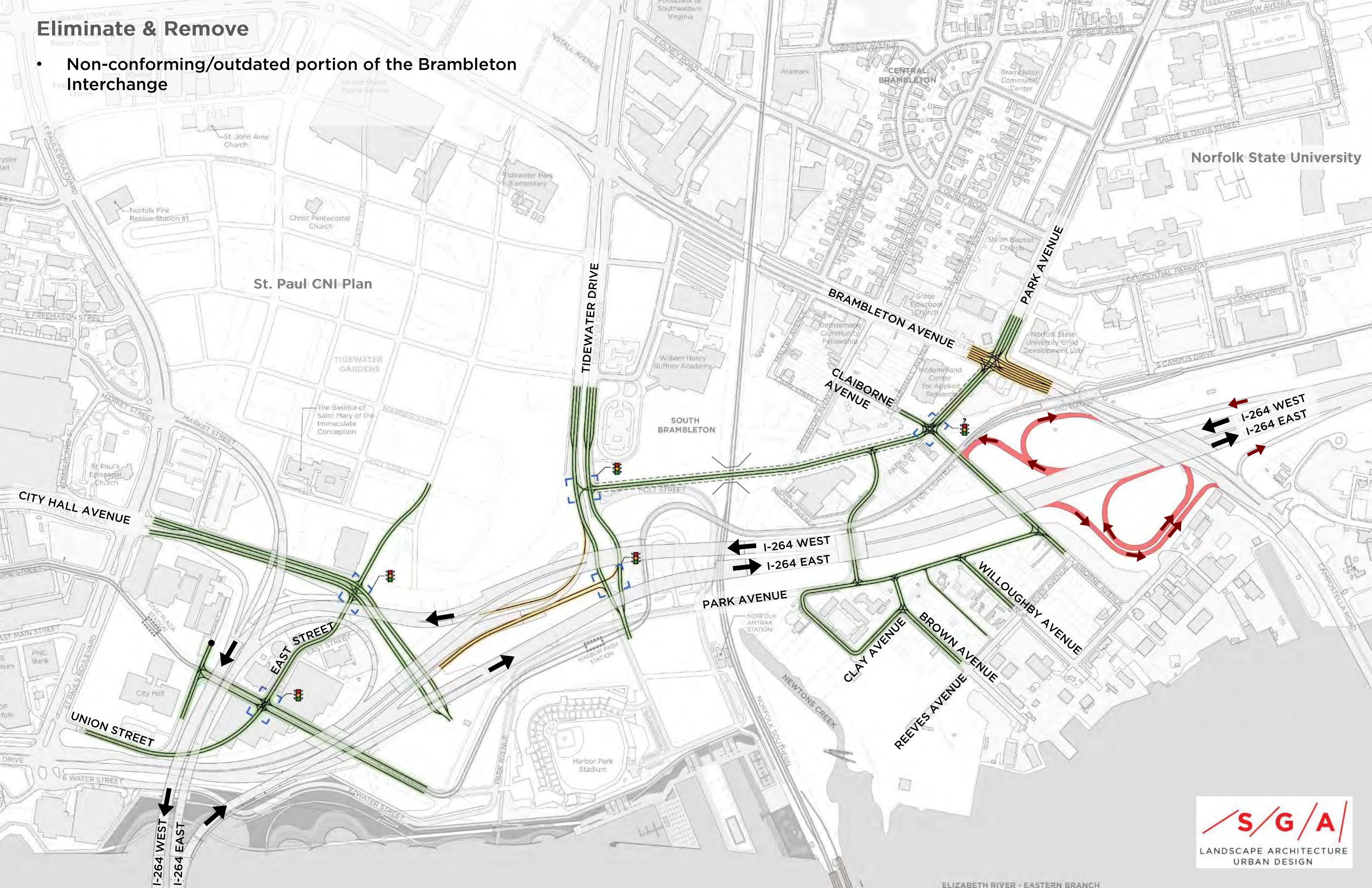
Re-establishing the grid & reconnecting cut-off area of the City.

- Establishes paralleling service roads on the north and south side of I-264
- Improves access to residences & businesses on southside of I-264



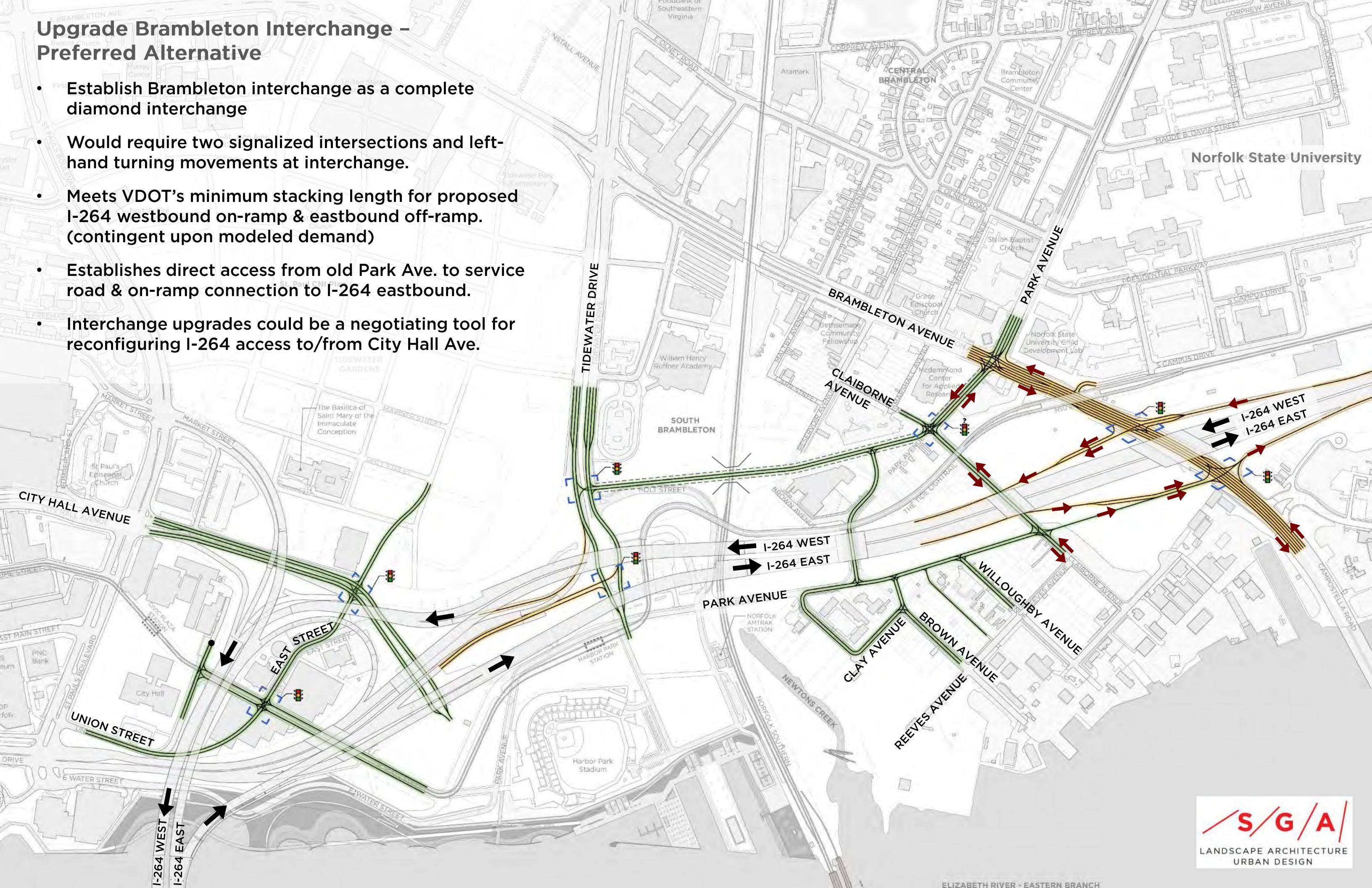
Eliminate & Remove

- Non-conforming/outdated portion of the Brambleton Interchange



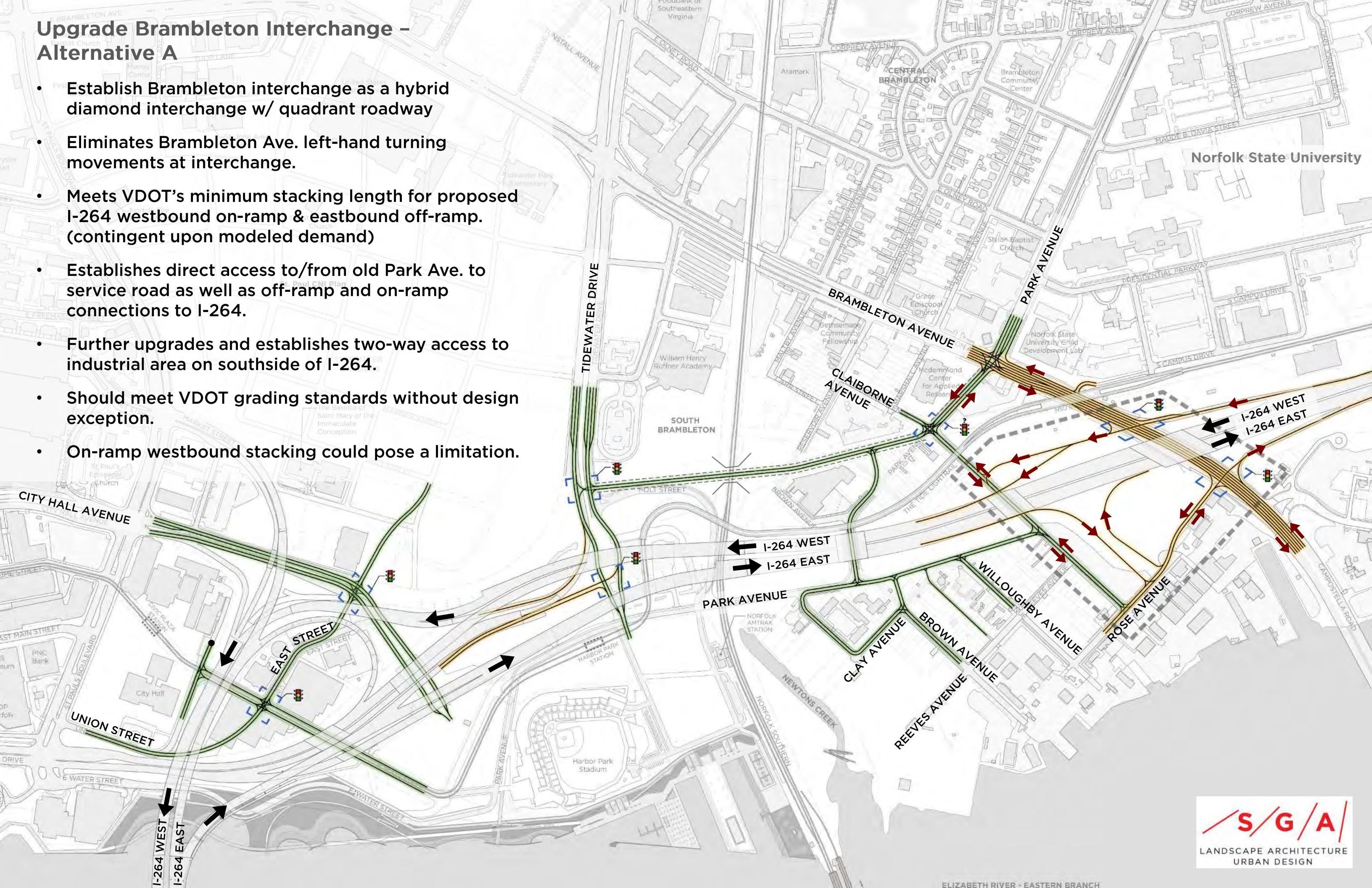
Upgrade Brambleton Interchange – Preferred Alternative

- Establish Brambleton interchange as a complete diamond interchange
- Would require two signalized intersections and left-hand turning movements at interchange.
- Meets VDOT's minimum stacking length for proposed I-264 westbound on-ramp & eastbound off-ramp. (contingent upon modeled demand)
- Establishes direct access from old Park Ave. to service road & on-ramp connection to I-264 eastbound.
- Interchange upgrades could be a negotiating tool for reconfiguring I-264 access to/from City Hall Ave.



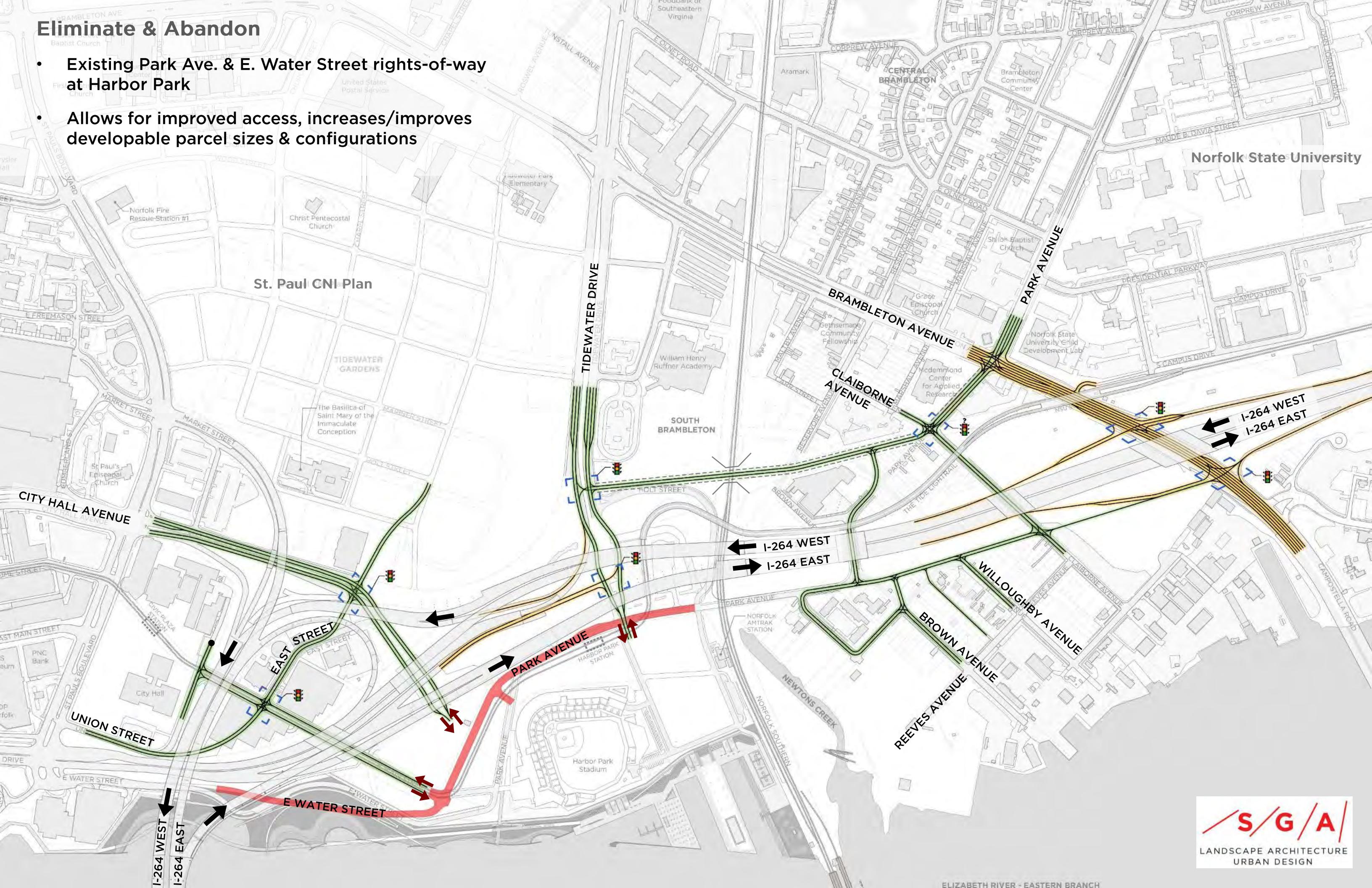
Upgrade Brambleton Interchange – Alternative A

- Establish Brambleton interchange as a hybrid diamond interchange w/ quadrant roadway
- Eliminates Brambleton Ave. left-hand turning movements at interchange.
- Meets VDOT's minimum stacking length for proposed I-264 westbound on-ramp & eastbound off-ramp. (contingent upon modeled demand)
- Establishes direct access to/from old Park Ave. to service road as well as off-ramp and on-ramp connections to I-264.
- Further upgrades and establishes two-way access to industrial area on southside of I-264.
- Should meet VDOT grading standards without design exception.
- On-ramp westbound stacking could pose a limitation.



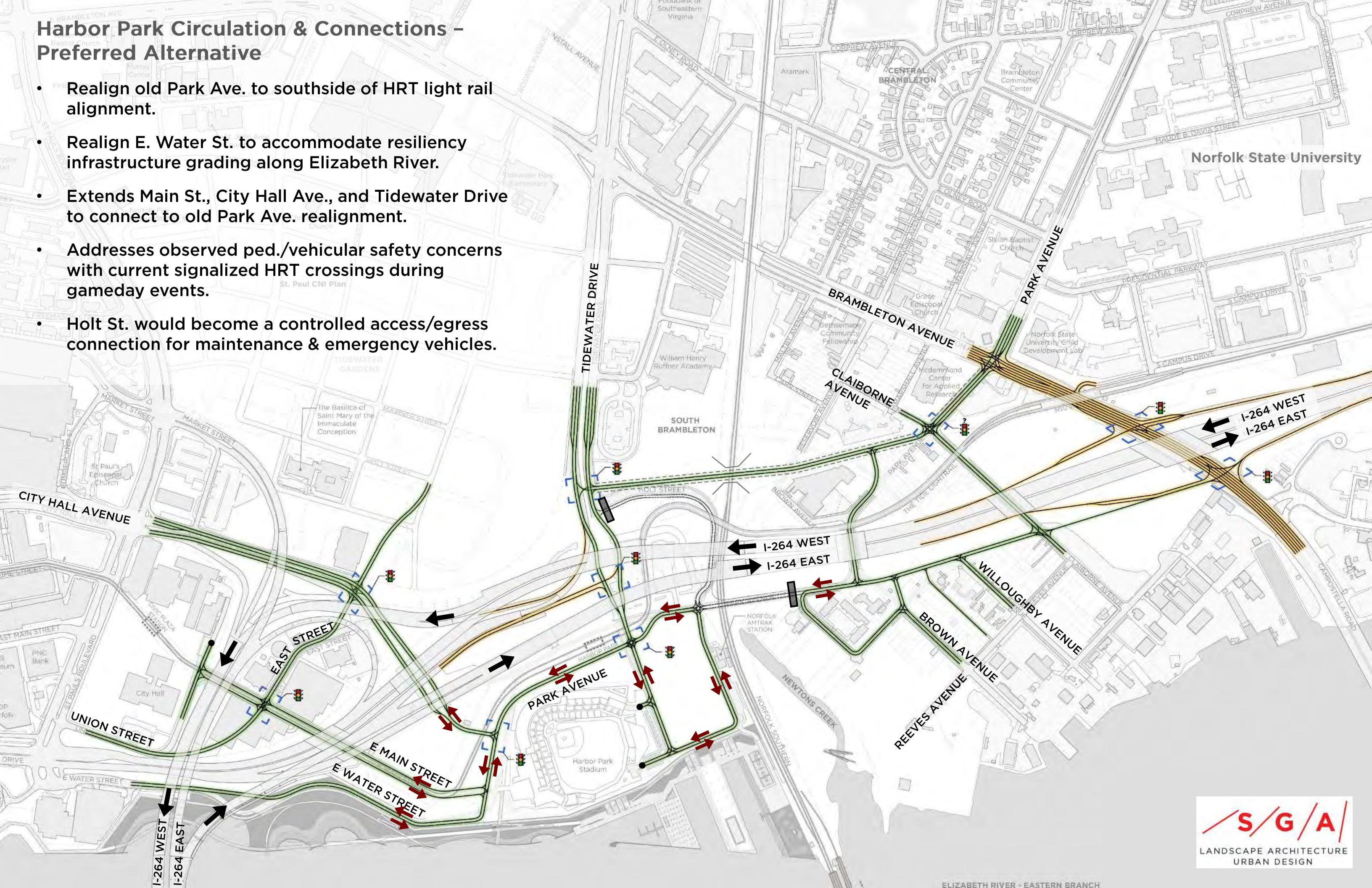
Eliminate & Abandon

- Existing Park Ave. & E. Water Street rights-of-way at Harbor Park
- Allows for improved access, increases/improves developable parcel sizes & configurations



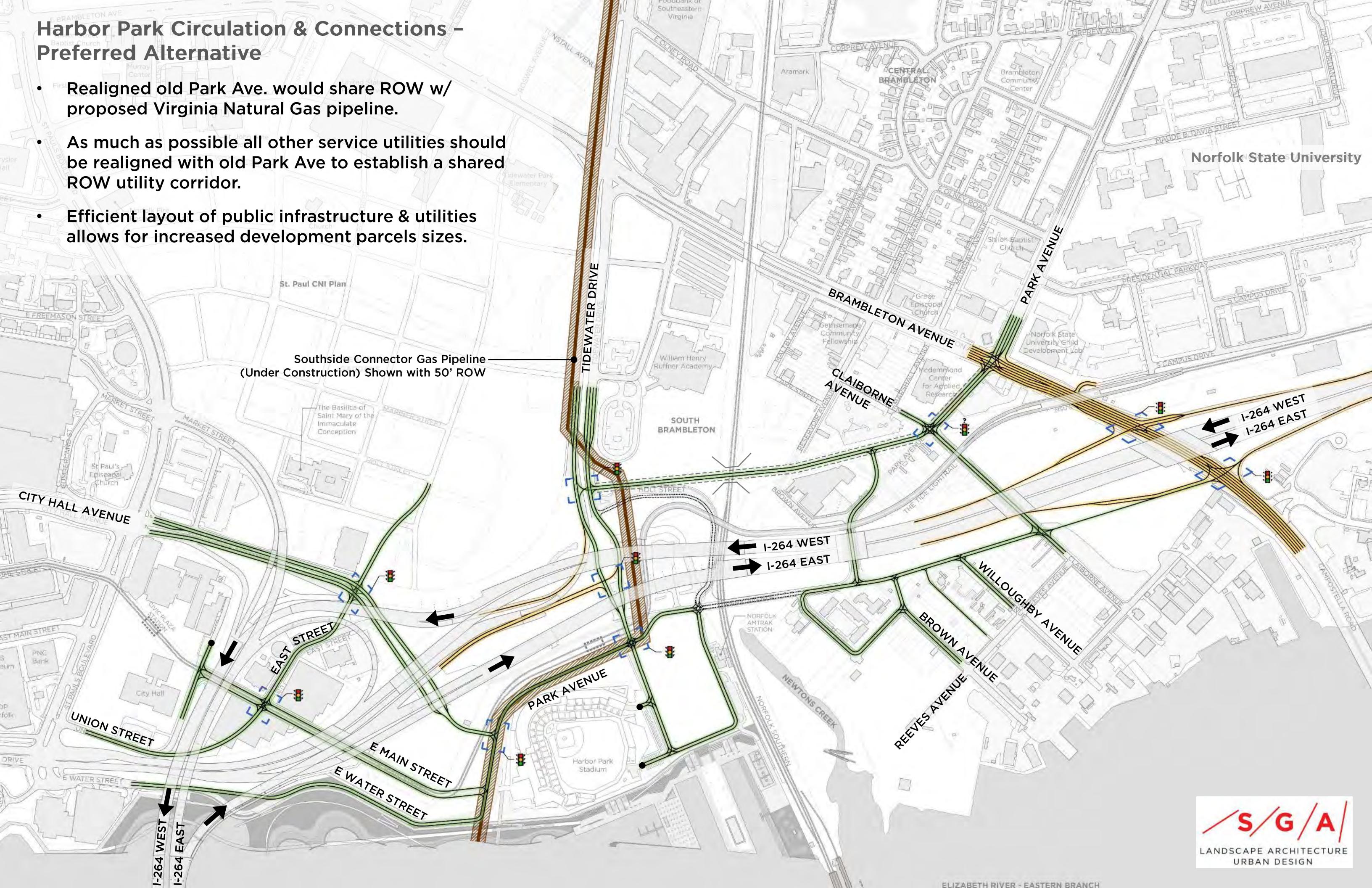
Harbor Park Circulation & Connections – Preferred Alternative

- Realign old Park Ave. to southside of HRT light rail alignment.
- Realign E. Water St. to accommodate resiliency infrastructure grading along Elizabeth River.
- Extends Main St., City Hall Ave., and Tidewater Drive to connect to old Park Ave. realignment.
- Addresses observed ped./vehicular safety concerns with current signalized HRT crossings during gameday events.
- Holt St. would become a controlled access/egress connection for maintenance & emergency vehicles.



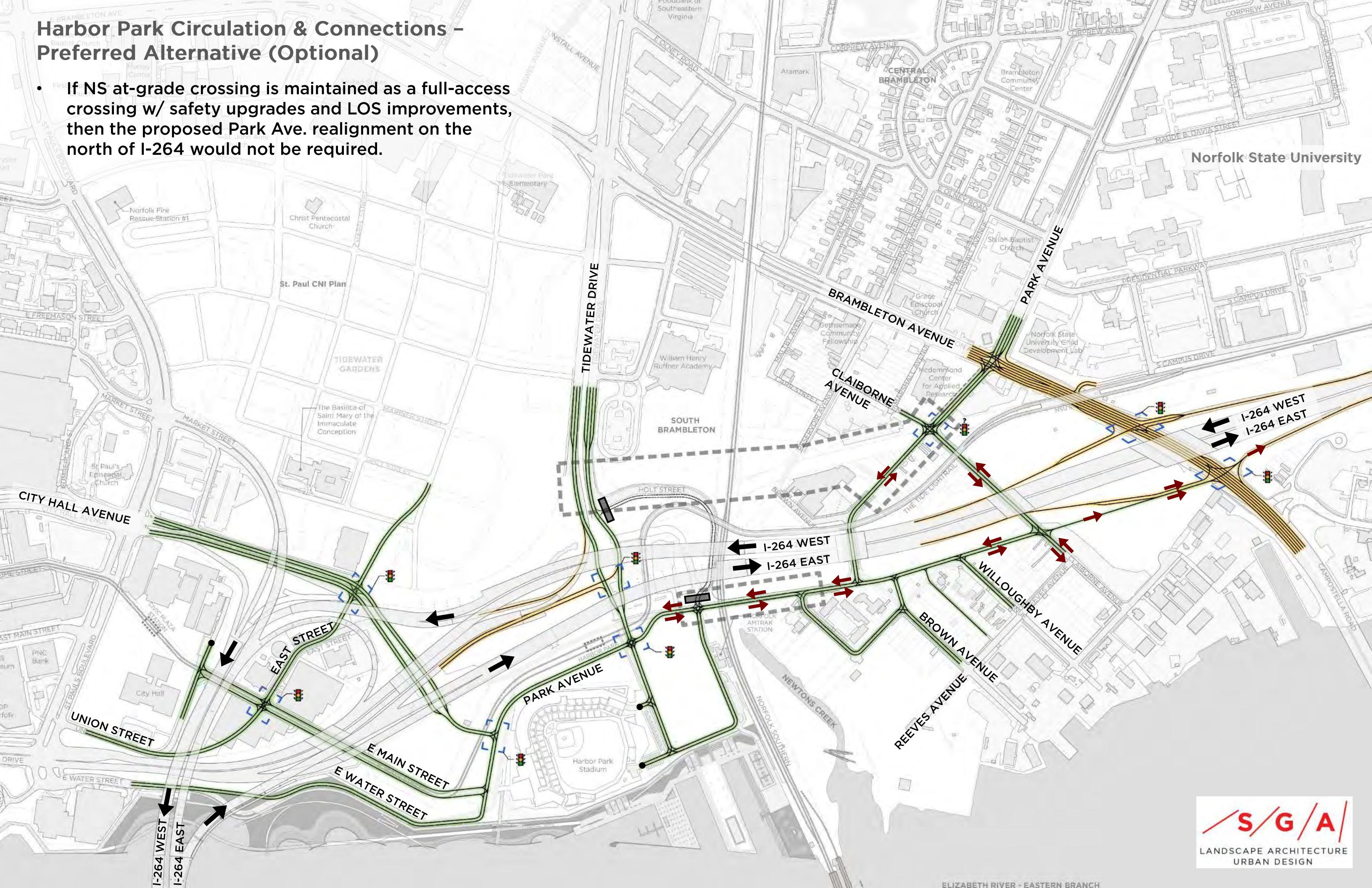
Harbor Park Circulation & Connections – Preferred Alternative

- Realigned old Park Ave. would share ROW w/ proposed Virginia Natural Gas pipeline.
- As much as possible all other service utilities should be realigned with old Park Ave to establish a shared ROW utility corridor.
- Efficient layout of public infrastructure & utilities allows for increased development parcels sizes.



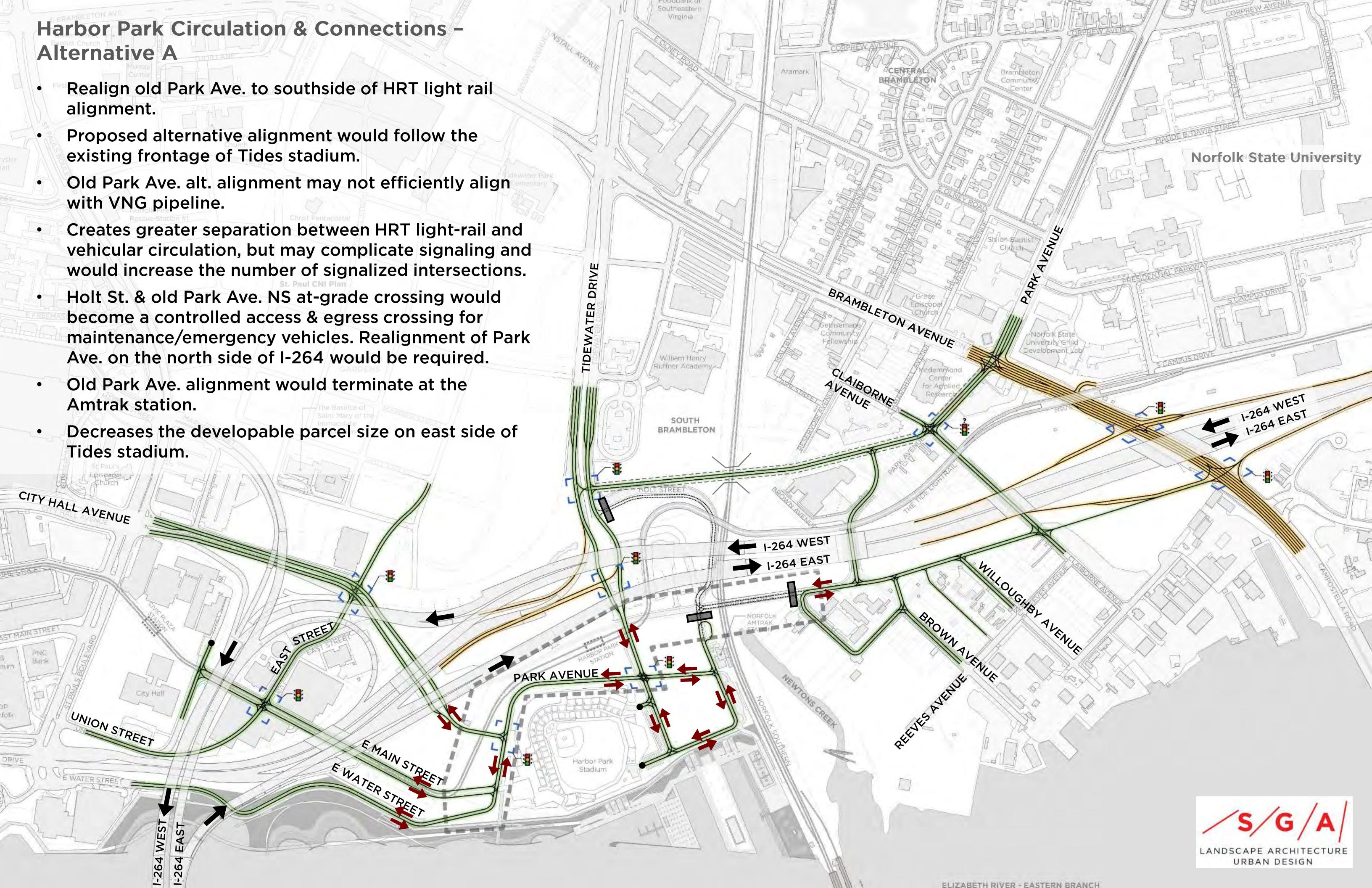
Harbor Park Circulation & Connections – Preferred Alternative (Optional)

- If NS at-grade crossing is maintained as a full-access crossing w/ safety upgrades and LOS improvements, then the proposed Park Ave. realignment on the north of I-264 would not be required.



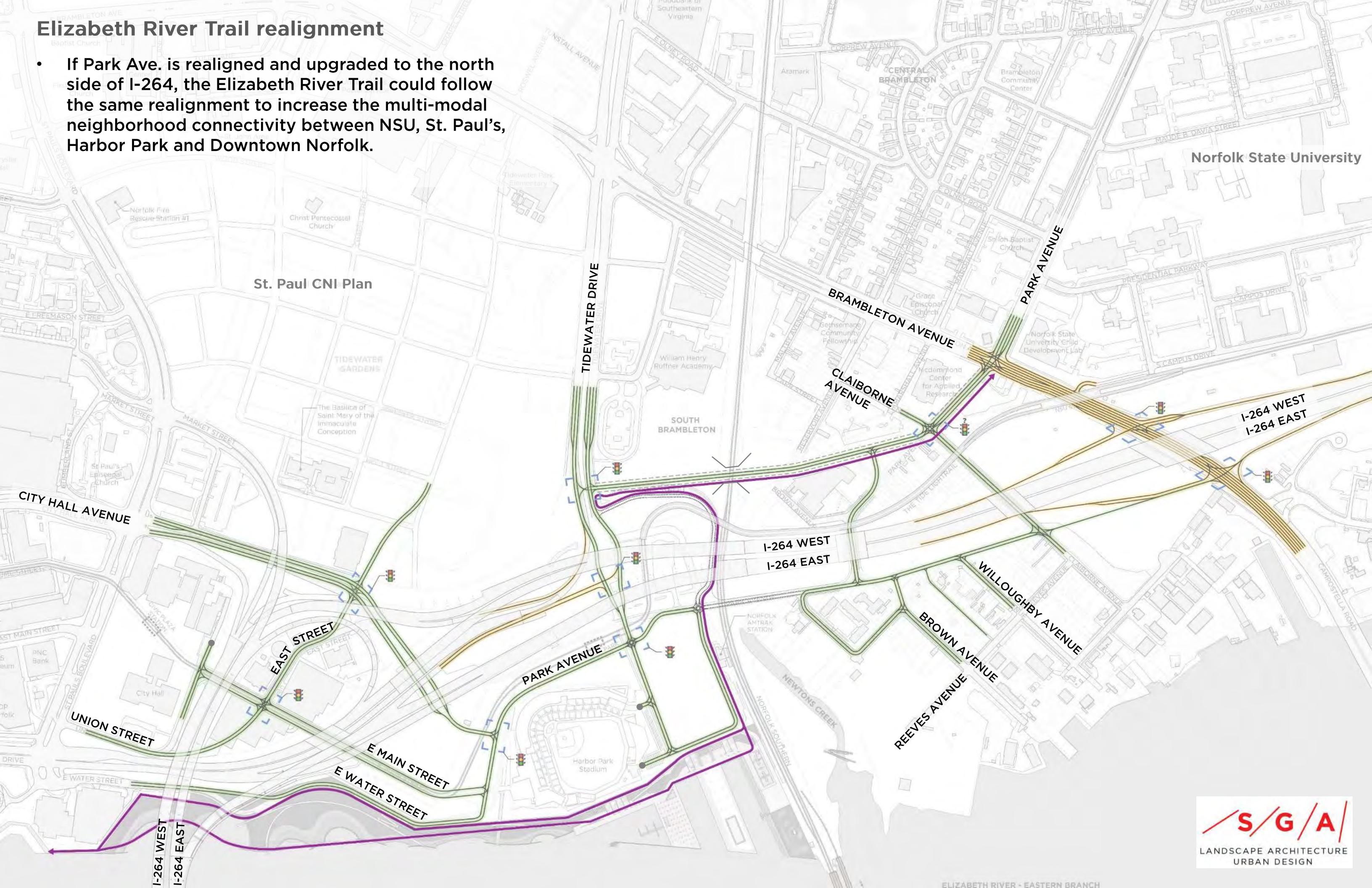
Harbor Park Circulation & Connections – Alternative A

- Realign old Park Ave. to southside of HRT light rail alignment.
- Proposed alternative alignment would follow the existing frontage of Tides stadium.
- Old Park Ave. alt. alignment may not efficiently align with VNG pipeline.
- Creates greater separation between HRT light-rail and vehicular circulation, but may complicate signaling and would increase the number of signalized intersections.
- Holt St. & old Park Ave. NS at-grade crossing would become a controlled access & egress crossing for maintenance/emergency vehicles. Realignment of Park Ave. on the north side of I-264 would be required.
- Old Park Ave. alignment would terminate at the Amtrak station.
- Decreases the developable parcel size on east side of Tides stadium.



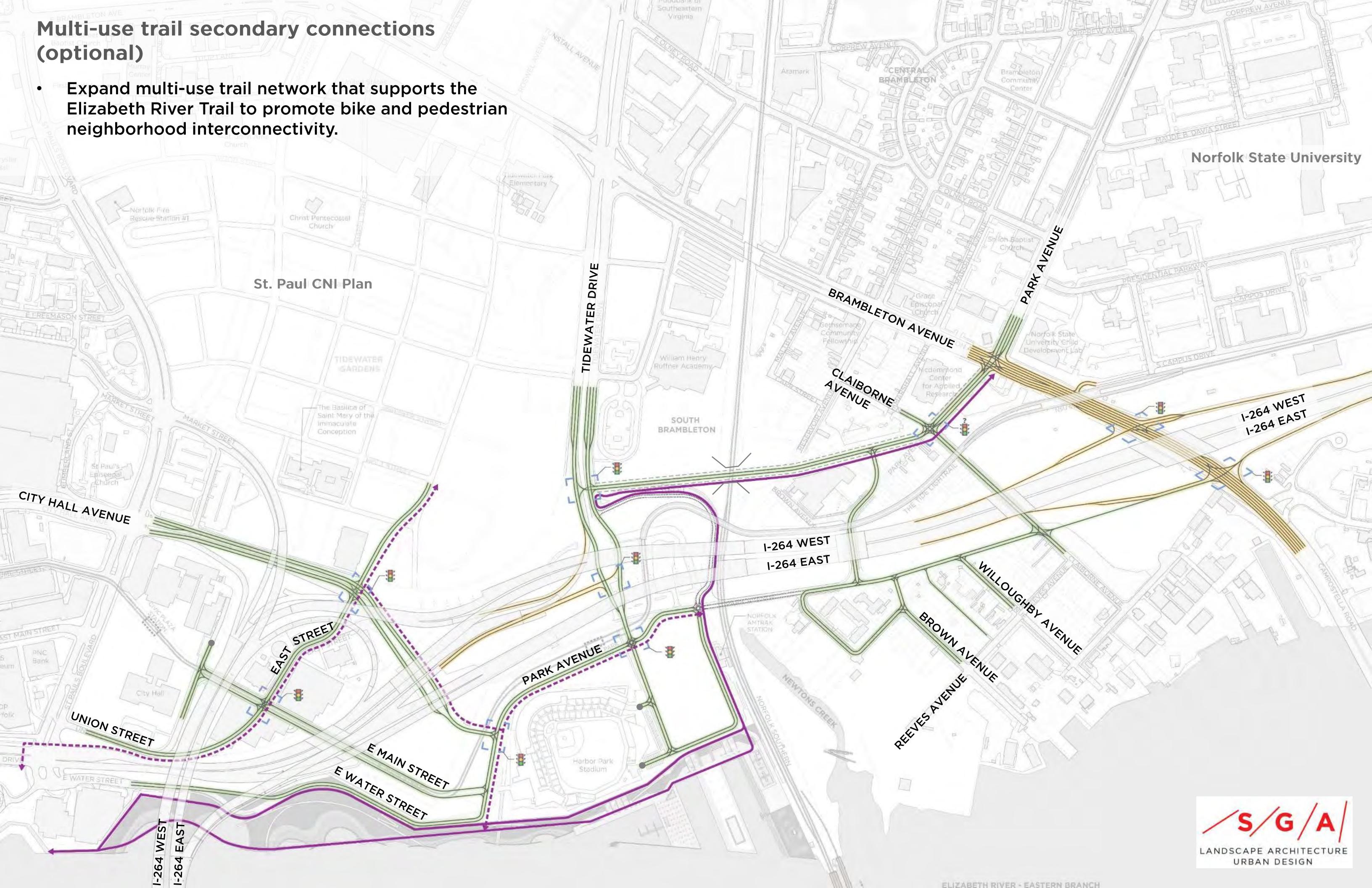
Elizabeth River Trail realignment

- If Park Ave. is realigned and upgraded to the north side of I-264, the Elizabeth River Trail could follow the same realignment to increase the multi-modal neighborhood connectivity between NSU, St. Paul's, Harbor Park and Downtown Norfolk.



Multi-use trail secondary connections (optional)

- Expand multi-use trail network that supports the Elizabeth River Trail to promote bike and pedestrian neighborhood interconnectivity.



Expand surface lot parking under I-264 interchange.

- Would establish an enlarged permitted lot for Tides stadium parking on gamedays (540 spaces).
- Would support old Park Ave. being realigned on southside of HRT light rail.
- Parking would be partly shaded and covered from elements.
- Note: Current lease with Tides requires the City to maintain 1240 spaces during game day (lease potentially renews 2022).

