

# TRANSITWAY CORRIDOR FEASIBILITY STUDY



High Capacity Transit Corridor Work Group  
September 15, 2011 Meeting

Corridor A Preliminary Transitway Concepts



T&ES



Kimley-Horn  
and Associates, Inc.

## *Meeting Agenda*

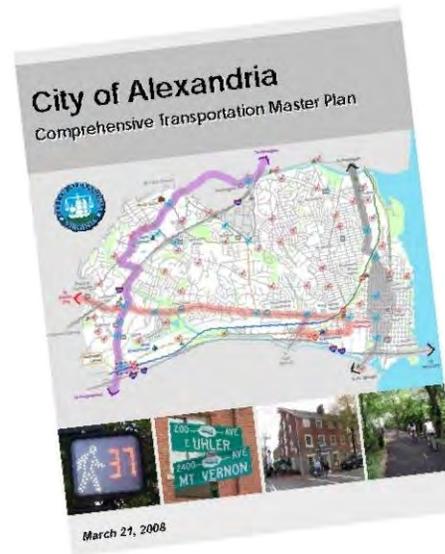
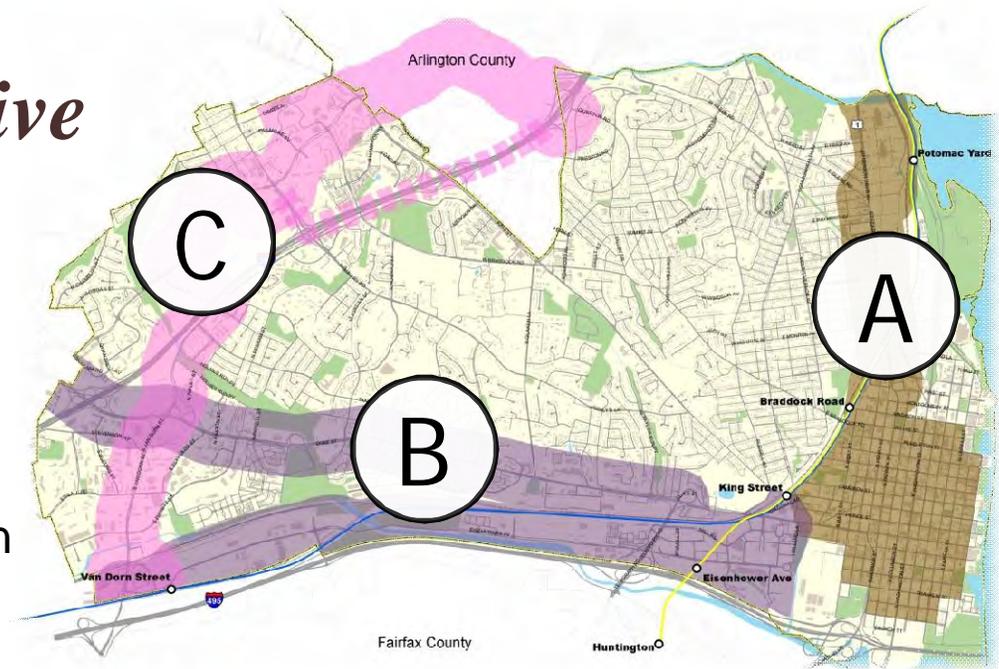
- Introduction and Background
- Corridor A Discussion
  - Corridor origin and purpose
  - Existing Conditions and Land Use
    - CWG and Public Input
  - Screening Criteria, Alignment, Connections, Runningway, and Mode
    - CWG and Public Input
- Next Steps



## *City Transitway Initiative*

Transitways identified by Transportation Master Plan

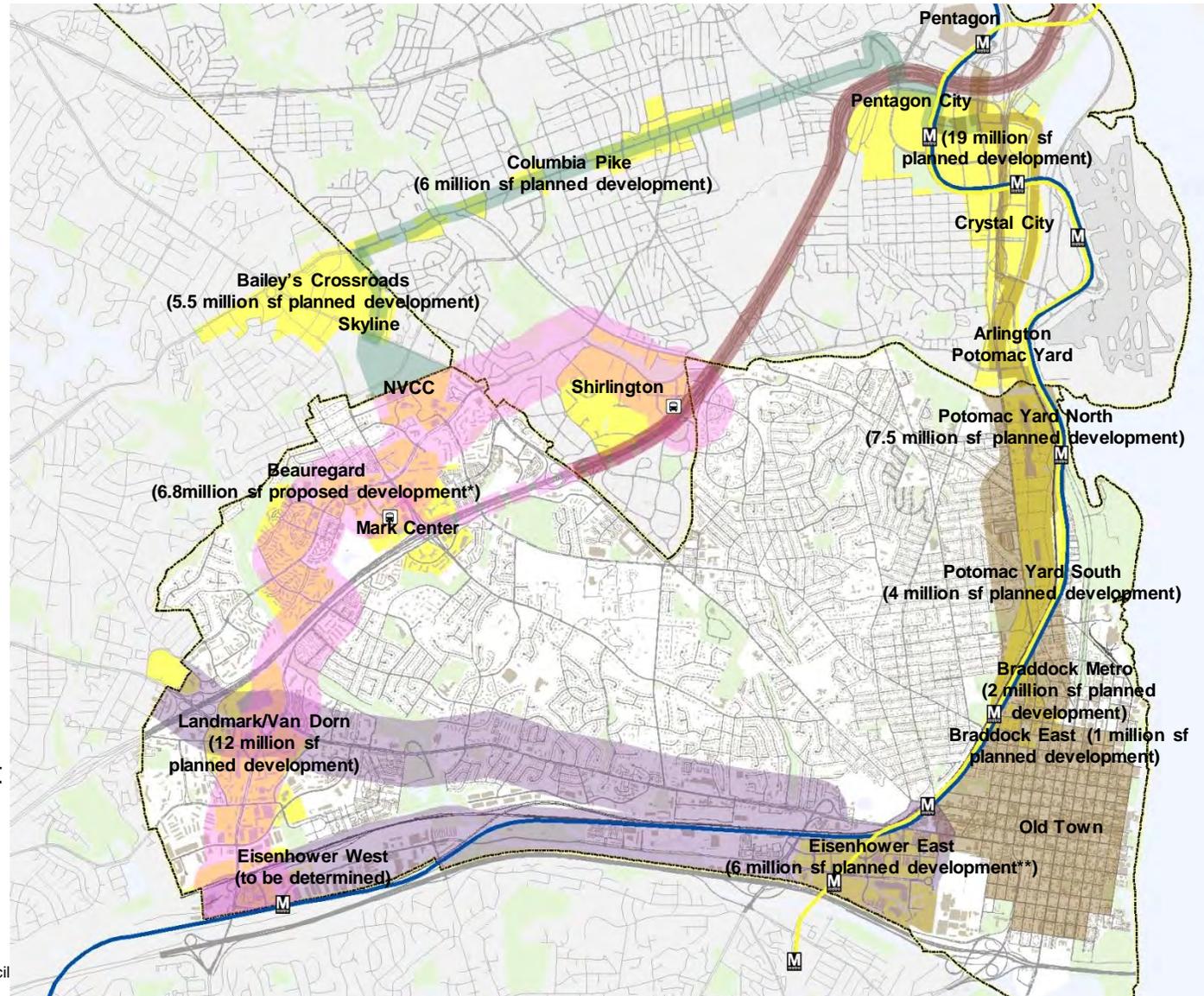
- Corridor A: North-South
- Corridor B: Duke/Eisenhower
- Corridor C: Beauregard/Van Dorn



# TRANSITWAY CORRIDOR FEASIBILITY STUDY

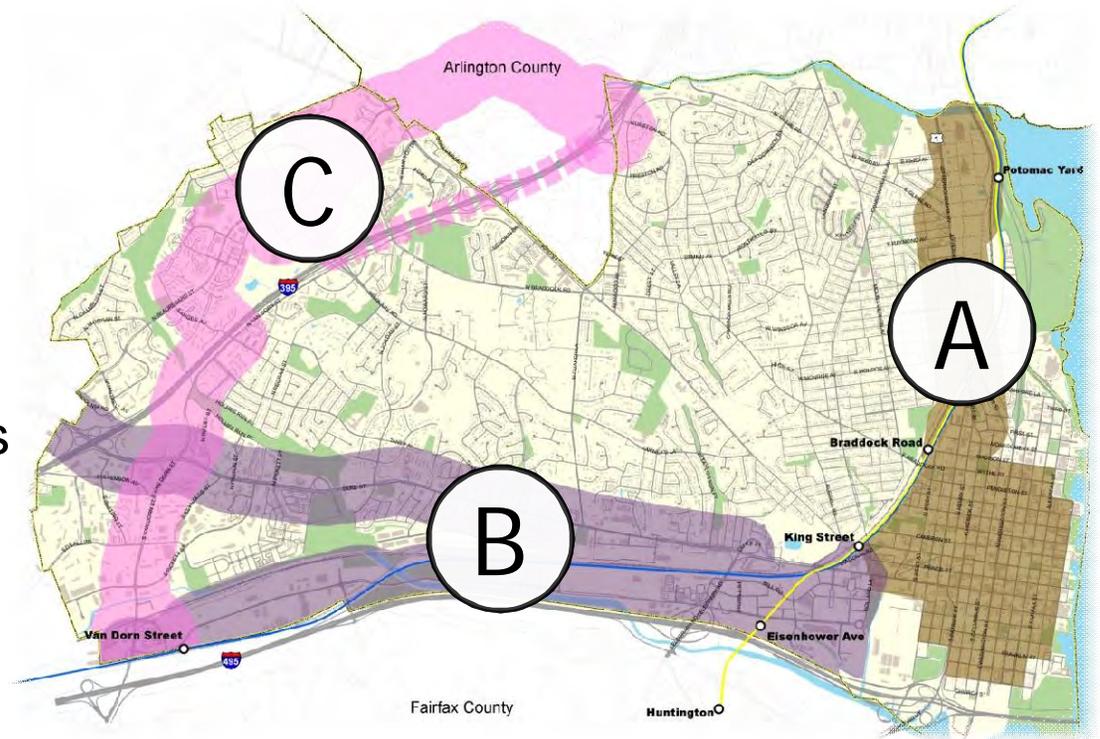
## *Land Use and Transportation Connectivity*

- Beaugard corridor plan
- Braddock Metro & Braddock East plans
- Columbia Pike Initiative
- Crystal City plan
- Eisenhower East plan
- Eisenhower West area development
- Landmark/Van Dorn corridor plan
- Mark Center plan
- Metrorail Blue & Yellow lines
- NVCC Community College master plan
- Old Town
- Pentagon
- Pentagon City development
- Potomac Yard plans (Arlington and Alexandria)
- Shirlington



## *Objectives of this Planning Study*

- For each transitway
  - General configuration
  - Preferred transit mode technology
  - Operating plan
  - Potential station locations
  - Action plan  
(environmental documentation, funding levels/request, design, operations, governance, etc.)



## *Potential Next Steps in Project Development*

- Alternatives Analysis (FTA)
- NEPA
- Application for funding
- Preliminary engineering
- Procurement method selection
- Final engineering/ROW acquisition/construction
- Operation



Corridor A

# ***EXISTING CONDITIONS REVIEW***



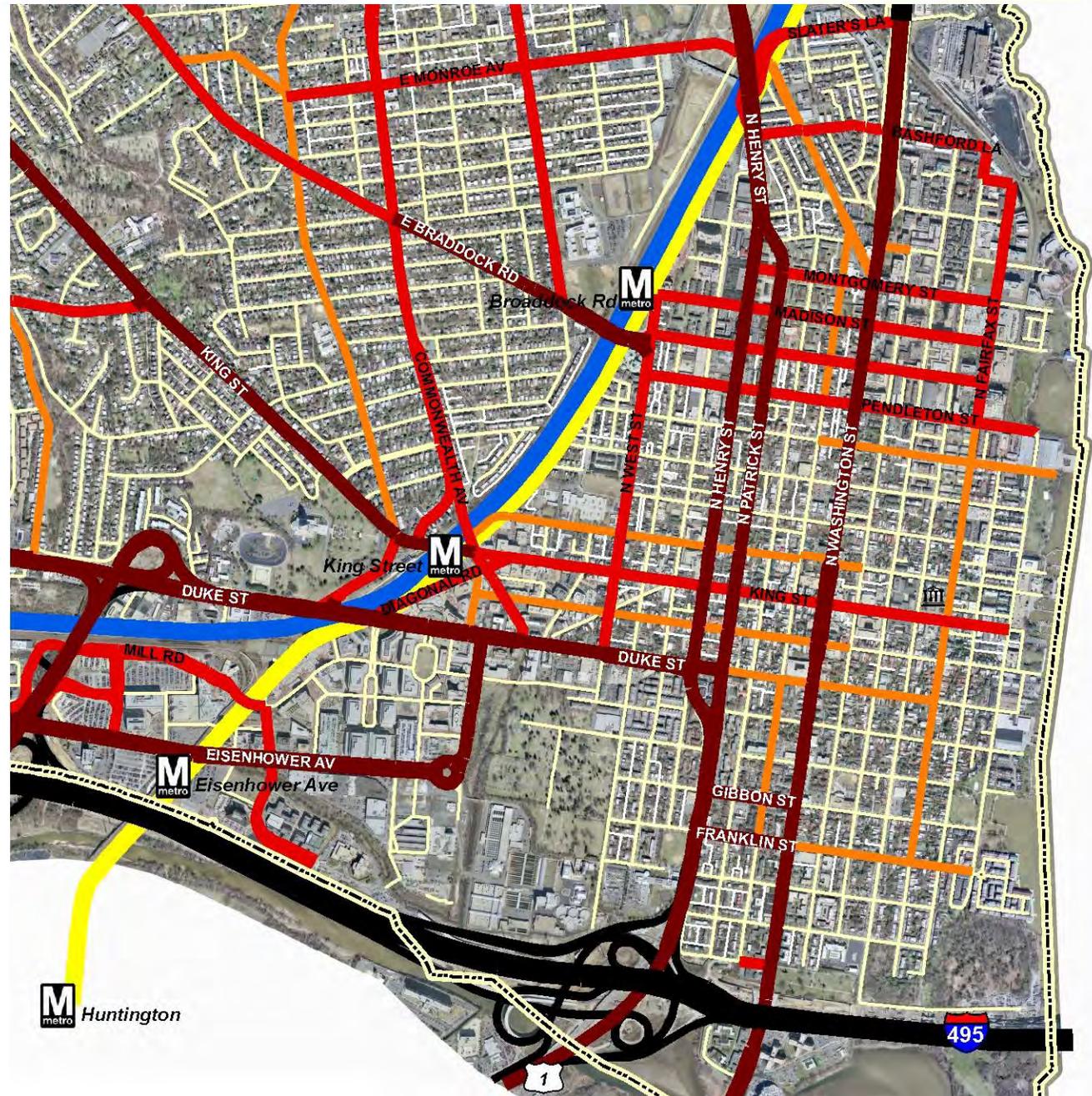
# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## *Functional Classification*

### Legend

#### Road Classification

-  Expressway
-  Ramp
-  Arterial
-  Primary Collector
-  Residential Collector



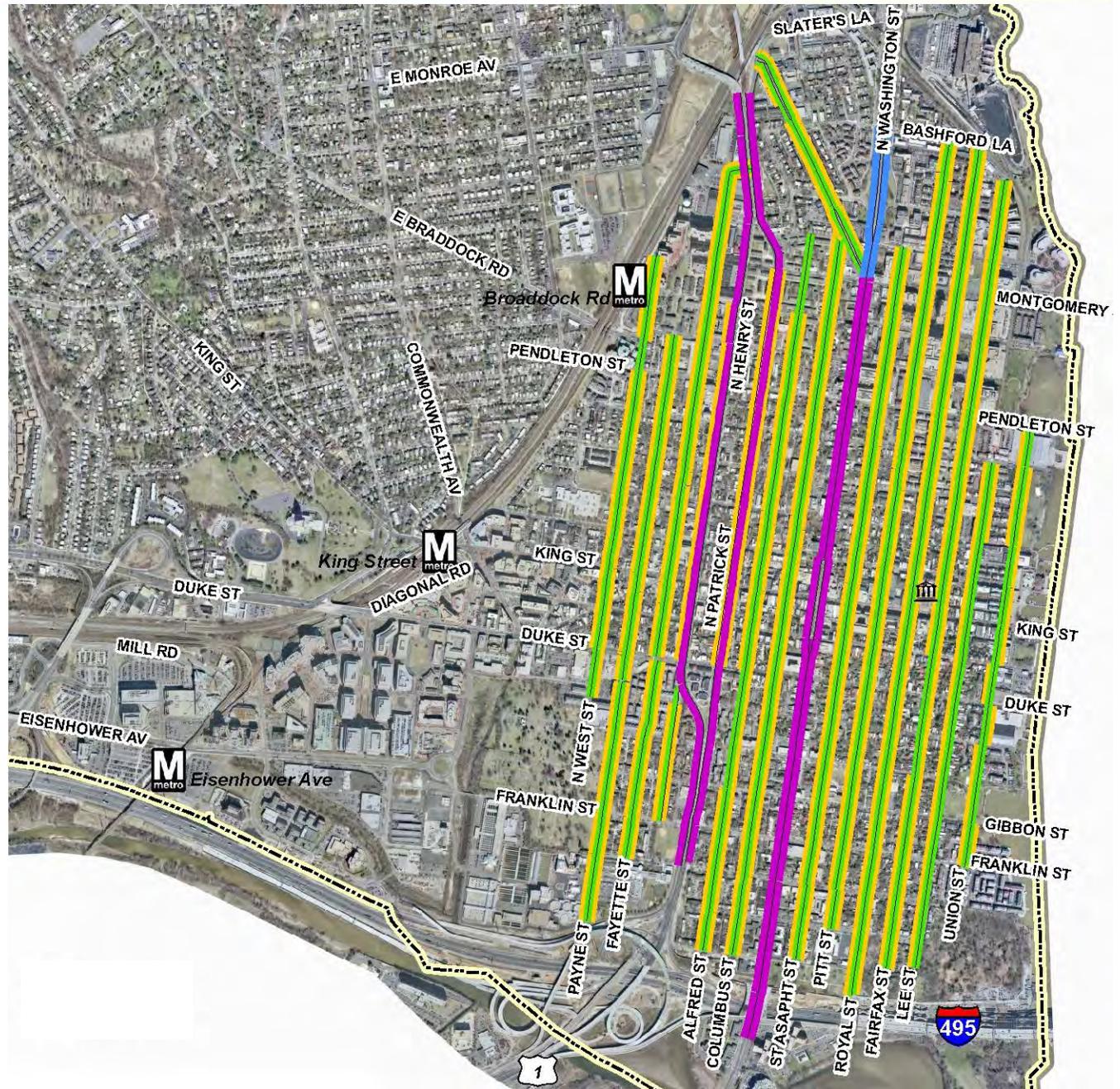
# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## *Number of Lanes and On-street Parking*

### Legend

Lanes (directional)

-  3 lanes
-  2 lanes
-  1 lane
-  On-street parking



# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## *Street Width (Curb to Curb)*

### Legend

#### Approximate Street Width

-  Up to 30 feet
-  31 to 40 feet
-  41 to 50 feet
-  51 to 60 feet
-  61 to 70 feet
-  71 feet and up



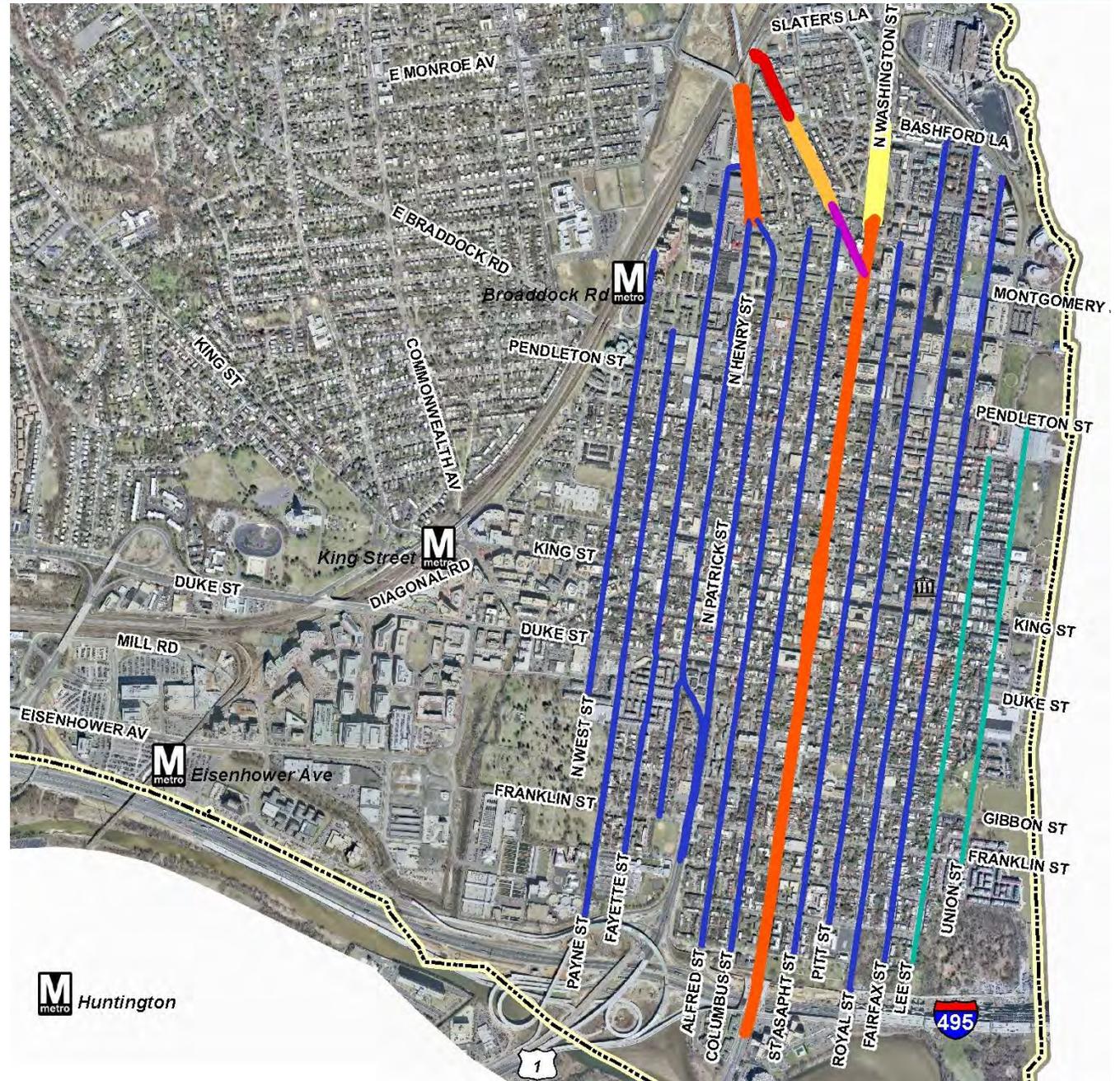
# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Right-of-Way Width

### Legend

#### Approximate Right-of-way

- 50 feet
- 66 feet
- 75 feet
- 90 feet
- 100 feet
- 130 feet
- 160 feet or more



# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## West Street General Existing Conditions:

- Roadway Section – 2 Lanes Undivided
- Curb to Curb Width – 40'
- ROW Width – 66'
- On-street Parking – Both Sides



Source: Google Maps

*Looking Northbound between Oronoco and Pendleton*



Source: Google Maps

*Looking Northbound between Cameron and Queen*

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Henry Street General Existing Conditions:

- Roadway Section – 3 Lanes Undivided in the southbound direction, 1-lane is HOV 2 only in the p.m. peak period (4 p.m. to 6 p.m.)
- Curb to Curb Width – 40'
- ROW Width – 66'
- On-street Parking – West Side



*Looking Northbound between Pendleton and Wythe*



*Looking Northbound between Cameron and Queen*

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Patrick Street General Existing Conditions:

- Roadway Section – 3 Lanes Undivided in the northbound direction, 1 Lane is HOV 2 only in the a.m. peak period (7 a.m. to 9 a.m.)
- Curb to Curb Width – 46'
- ROW Width – 66'
- On-street Parking – Both Sides



*Looking Northbound between Pendleton and Wythe*



*Looking Northbound between Cameron and Queen*

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Washington Street General Existing Conditions:

- Roadway Section – 6 Lanes Divided & 6 Lanes Undivided, 1 Lane is HOV 2 in the a.m. (northbound) and p.m. (southbound) peak period
- Curb to Curb Width – 60' to 70' (varies)
- ROW Width – 100' or more
- On-street Parking – Off-peak



*Looking Northbound between Pendleton and Wythe*



*Looking Northbound between Cameron and Queen*

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Fairfax Street General Existing Conditions:

- Roadway Section – 2 Lanes Undivided
- Curb to Curb Width – 38'
- ROW Width – 66'
- On-street Parking – Both Sides



Source: Google Maps

*Looking Northbound between Pendleton and Wythe*



Source: Google Maps

*Looking Northbound between Cameron and Queen*

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Zoning

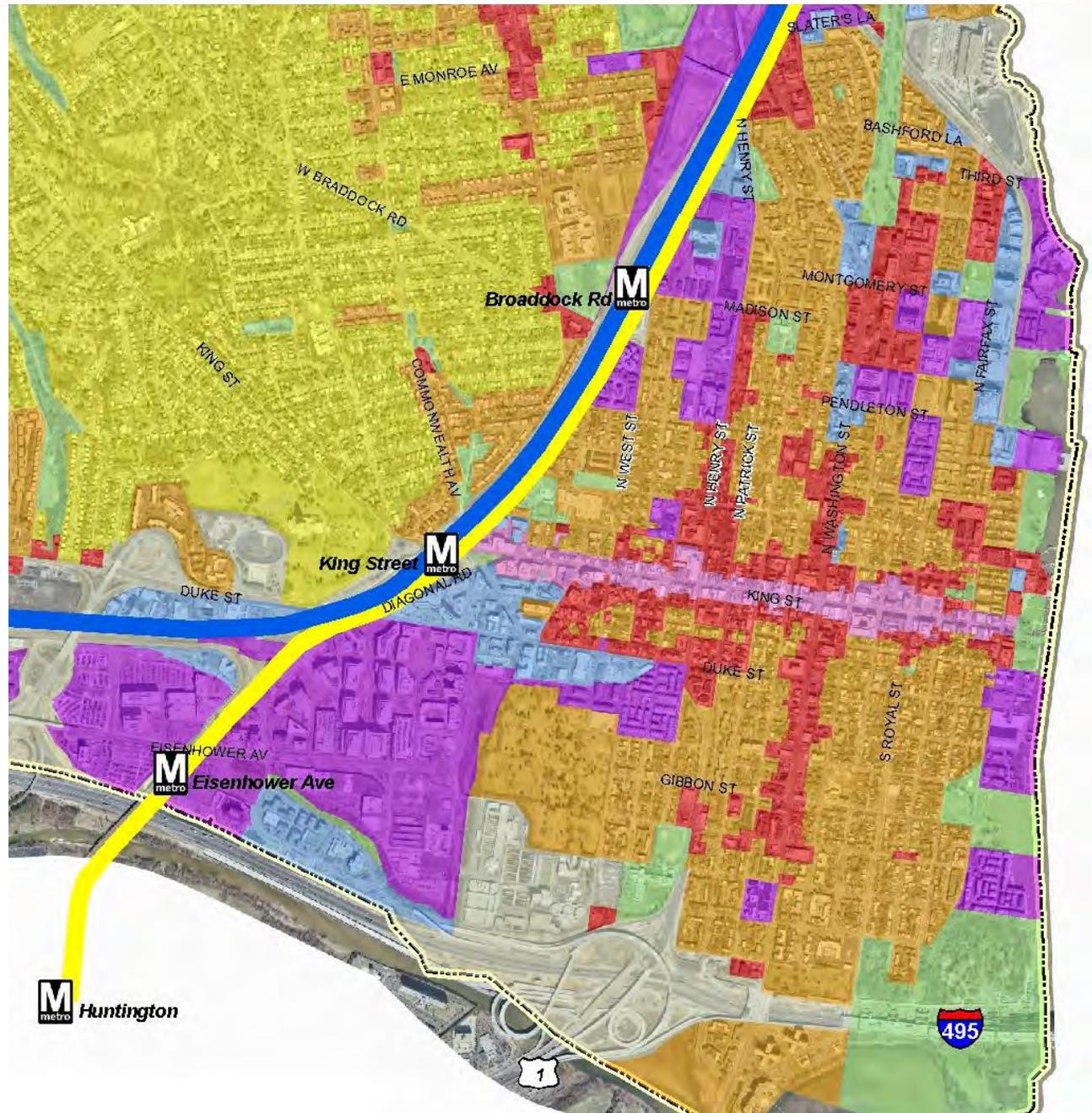
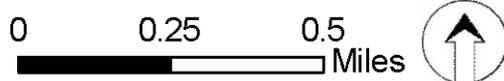
### Legend

#### Zoning

- Commercial
- Industrial
- Mixed-use
- Office
- Park
- Single-family Residential
- Multi-family Residential
- Retail
- Utilities and Transportation
- City of Alexandria Line

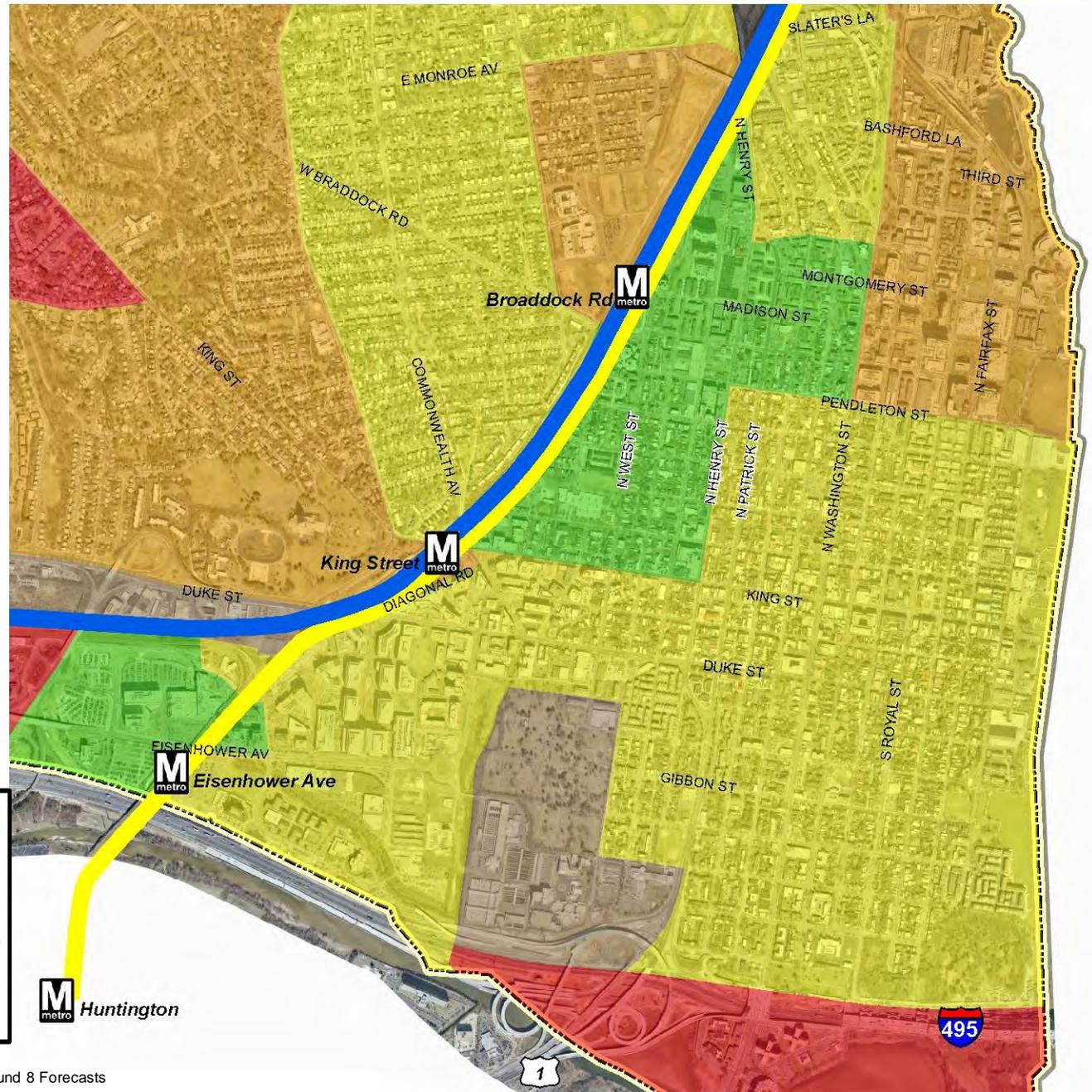
#### Metrorail

- Yellow Line
- Blue Line



# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Population Density (2010)



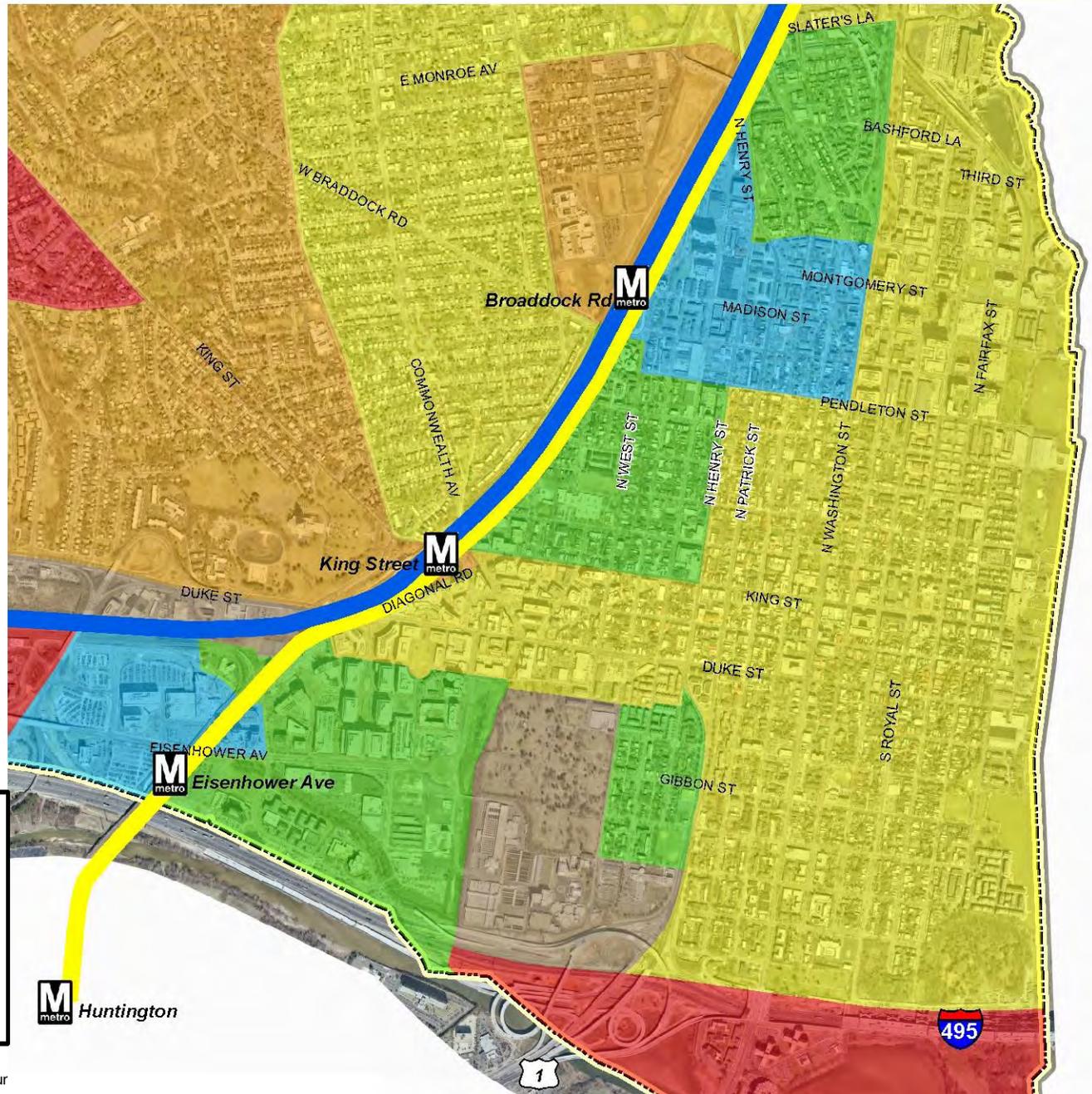
### Legend

Population/Square Mile	
	4,000 to 6,666
	6,667 to 14,999
	15,000 to 24,999
	25,000 and up
	0
	1 to 999
	1,000 to 3,999
	Metrorail Station

Source: Metropolitan Washington Council of Governments Round 8 Forecasts

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Population Density (2030)



### Legend

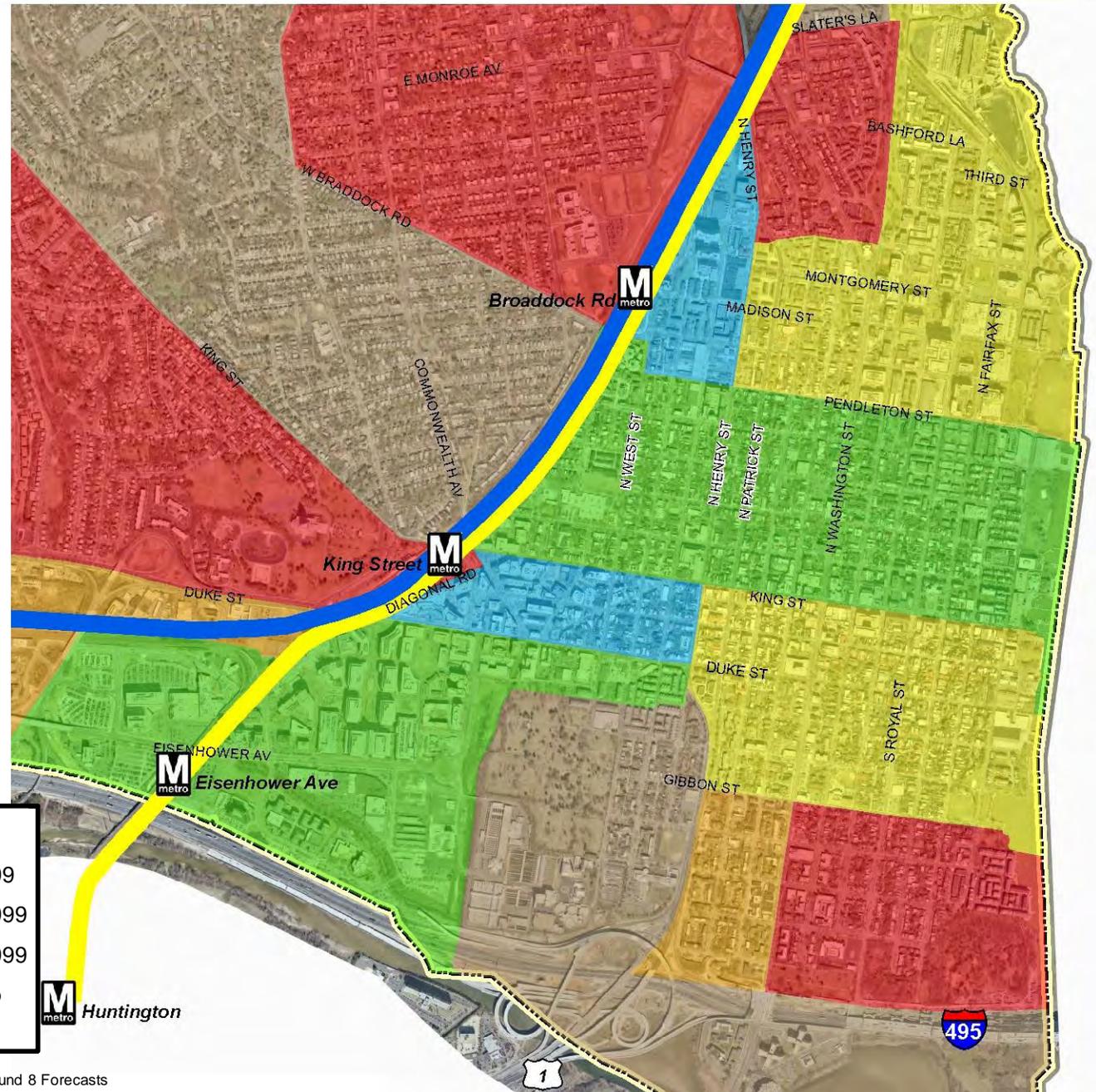
Population/Square Mile	Color	Range
0	Grey	0
1 to 999	Light Brown	1 to 999
1,000 to 3,999	Red	1,000 to 3,999
4,000 to 6,666	Orange	4,000 to 6,666
6,667 to 14,999	Yellow	6,667 to 14,999
15,000 to 24,999	Green	15,000 to 24,999
25,000 and up	Blue	25,000 and up

Metrorail Station

Source: Metropolitan Washington Council of Governments Rour

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Employment Density (2010)



### Legend

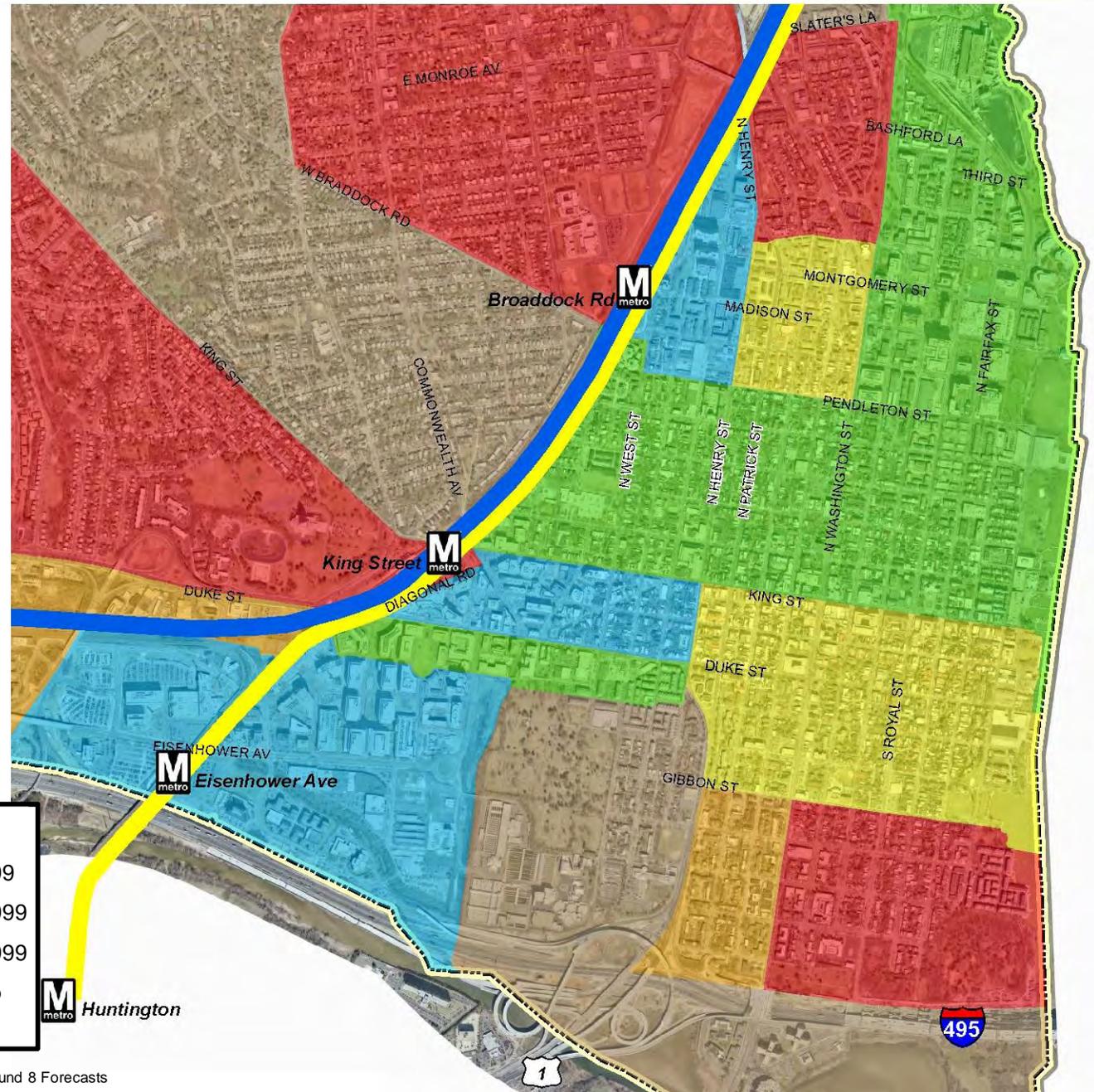
Employment/Square Mile	Color	Range
0	Grey	0
1 to 1,249	Brown	1 to 1,249
1,250 to 5,999	Red	1,250 to 5,999
6,000 to 12,499	Orange	6,000 to 12,499
12,500 to 24,999	Yellow	12,500 to 24,999
25,000 to 49,999	Green	25,000 to 49,999
50,000 and up	Blue	50,000 and up

Metrorail Station

Source: Metropolitan Washington Council of Governments Round 8 Forecasts

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Employment Density (2030)



### Legend

Employment/Square Mile	Color	Range
0	Grey	0
1 to 1,249	Brown	1 to 1,249
1,250 to 5,999	Red	1,250 to 5,999
6,000 to 12,499	Orange	6,000 to 12,499
12,500 to 24,999	Yellow	12,500 to 24,999
25,000 to 49,999	Light Green	25,000 to 49,999
50,000 and up	Light Blue	50,000 and up

 Metrorail Station

Source: Metropolitan Washington Council of Governments Round 8 Forecasts

# North-South Corridor Transit Service

## Legend

City of Alexandria Line

### Metro rail

Yellow Line

Blue Line

### Bus

DASH Bus

Metrobus

Metrobus REX

0 0.25 0.5 Miles



## Existing Area Transit Ridership

Average Weekday Metrorail Ridership: 58,400

Average Weekday VRE Ridership: 650 (approx.)

### Average Weekday Bus Ridership

Routes AT2 (King St, Fairfax St, others): 2,035

Routes AT3 (Washington St, Royal/Fairfax, Pendleton St, others): 976

Route AT4 (N. Fairfax St, others): 912

Route AT5 (King St, Fairfax St, Madison/Montgomery, others): 2,063

Route AT7 (King, Payne/Royal, Eisenhower Ave): 1,015

Route AT8 (Duke St, Royal St): 2,628

Route AT 10 (Commonwealth Ave, Mt Vernon Ave, others): 731

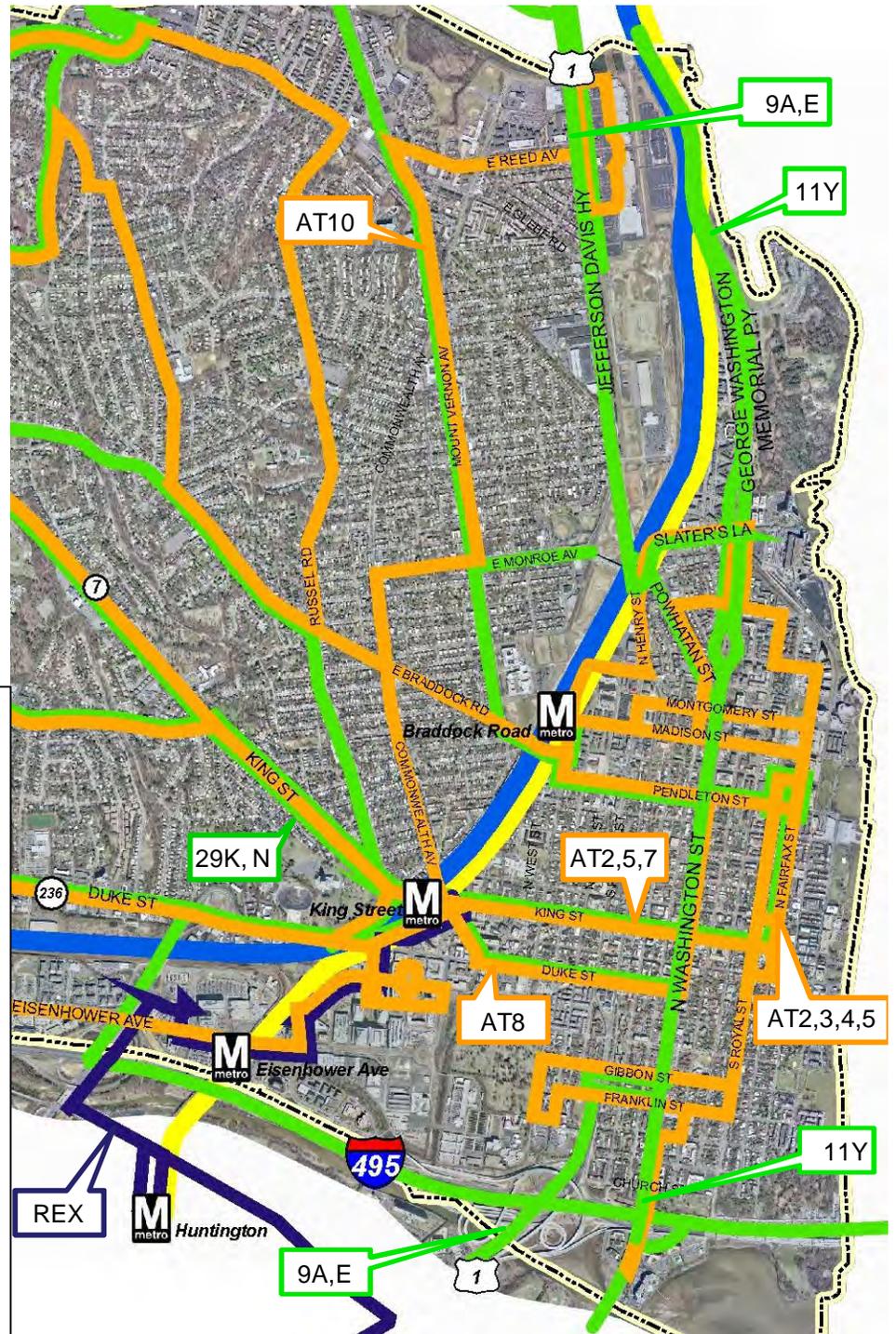
Metrobus Route 9A-E (Washington St, Jefferson Davis Hwy): 1,788

Metrobus Route 11Y (Washington St, George Washington Pkwy): 378

Metrobus Routes 29K,N (Duke St, others): 2,272

Metrobus REX (Eisenhower Ave, Telegraph Rd): 3,685

DASH ridership 2011, WMATA ridership 2009, VRE ridership 2010



# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## DASH Service

### Legend

----- City of Alexandria Line

### Metrail

Yellow Line

Blue Line

### DASH Route

AT1

AT2

AT3

AT4

AT5

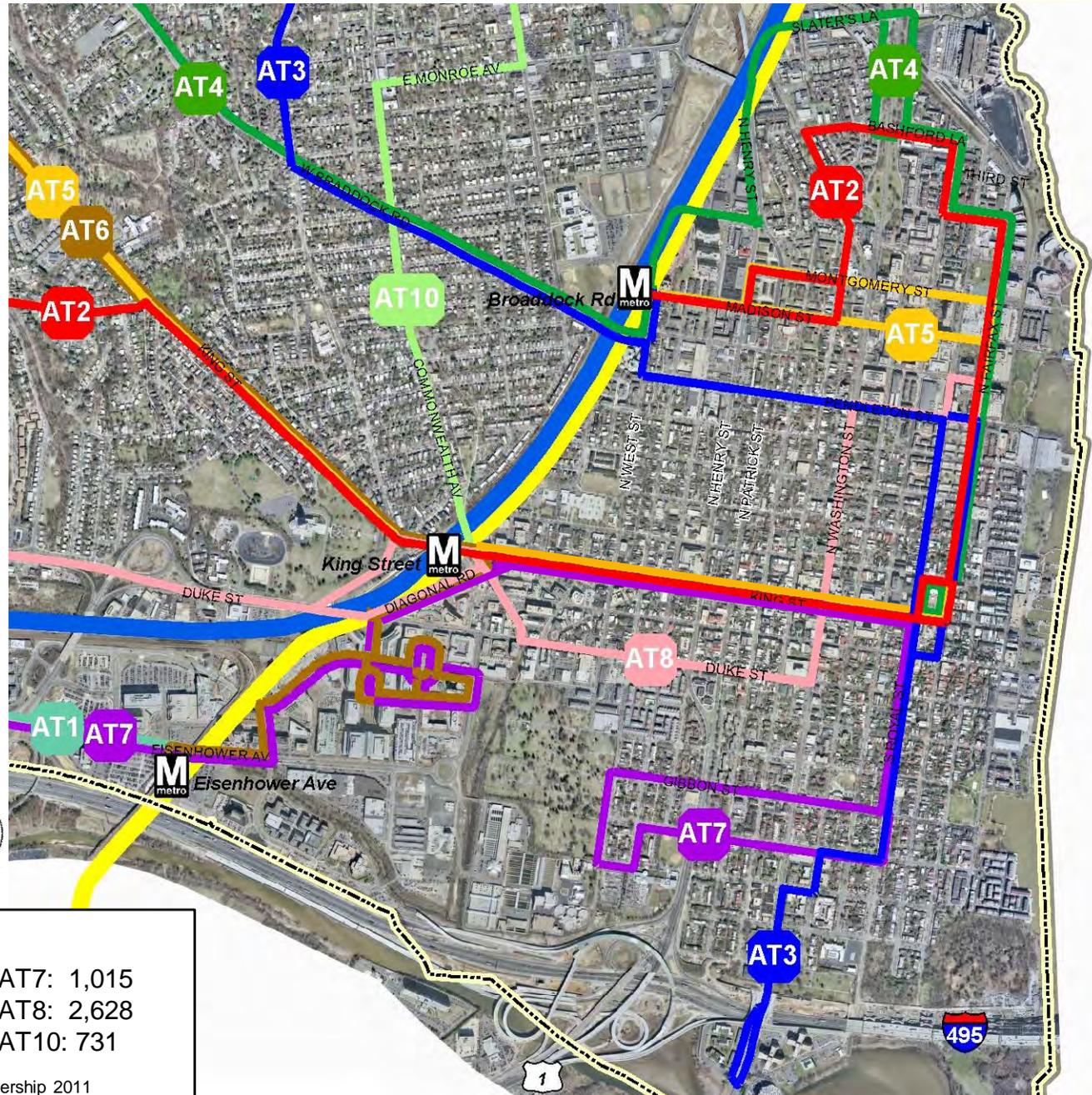
AT6

AT7

AT8

AT10

0 0.25 0.5 Miles



### Average Weekday Bus Ridership

Route AT2: 2,035	Route AT7: 1,015
Route AT3: 976	Route AT8: 2,628
Route AT4: 912	Route AT10: 731
Route AT5: 2,063	

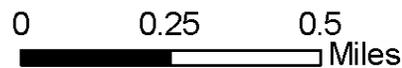
DASH Ridership 2011

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## King Street Trolley

### Legend

-  King Street Trolley
-  Trolley Stop
-  City of Alexandria Line
- Metrorail**
-  Yellow Line
-  Blue Line



- Average daily ridership greater than 2,000
- Runs 7 days/week between 11:30 a.m. and 10:00 p.m.
- 20 minute headways
- Fare free
- A survey of riders found
  - 98% view the trolley as making Alexandria a more desirable place to visit
  - 76% of nonresidents said it increased the number of restaurants and businesses used
  - 24% said they would not have made the trip to Old Town but for the trolley
  - Of the 76% who would have come anyway, 33% would have used a personal car or taxi
- Recommendations for enhancing King Street Trolley service in the 2009 King Street Retail Study
  - Expand the trolley hours to 9:00 am to 11:00 p.m. or later on Friday and Saturday nights
  - Increase the frequency of trolley trips to a headway of 10 to 15 minutes

# TRANSITWAY CORRIDOR FEASIBILITY STUDY

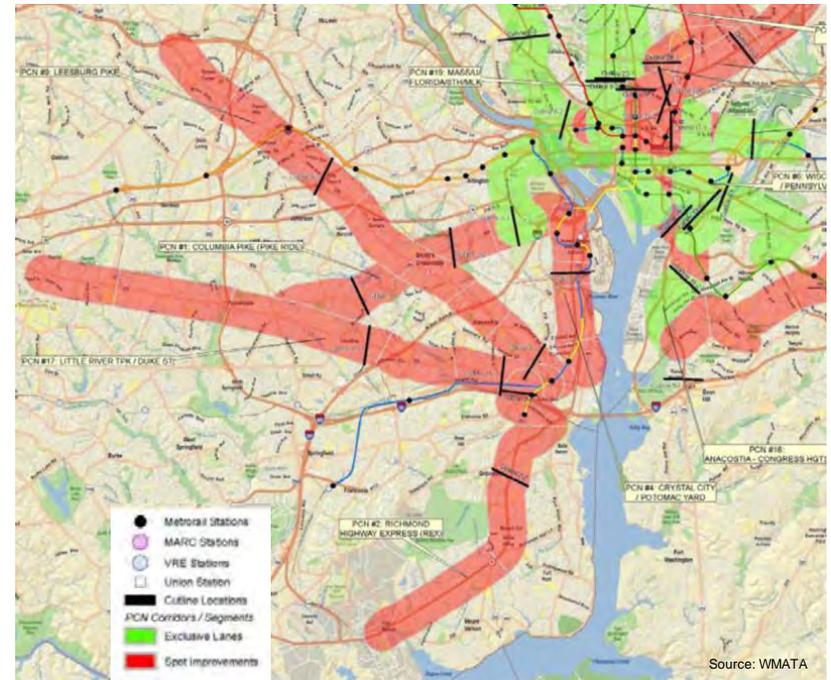
## *Planned Transit Improvements*

### Local

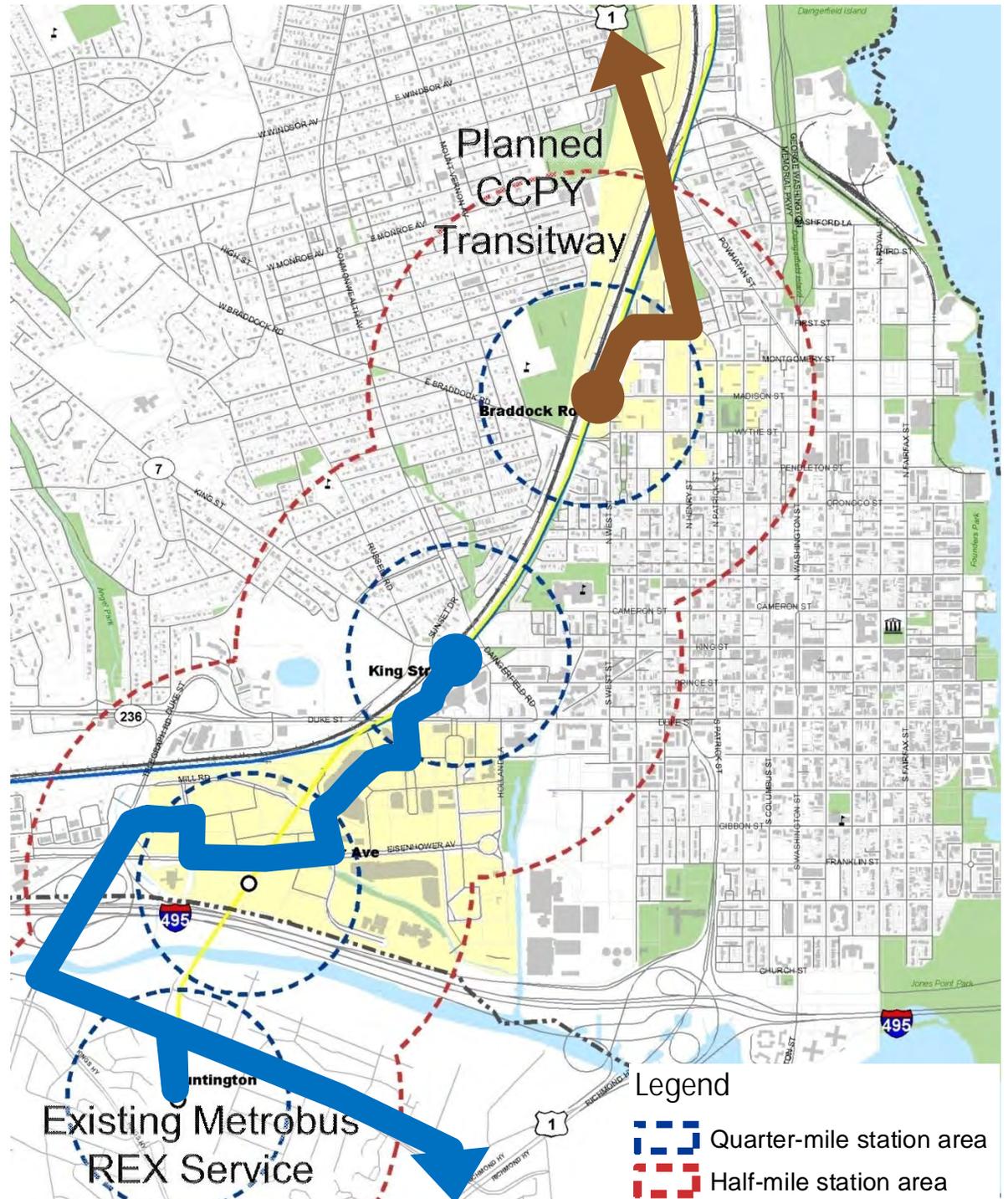
- Crystal City/Potomac Yard Transitway: dedicated lane service from Crystal City to Braddock Road Metrorail station

### Regional

- WMATA Priority Corridor Network
- MWCOG Priority Bus Transit Corridor



*Corridor A  
Existing and  
Planned  
High-Capacity  
Transit*



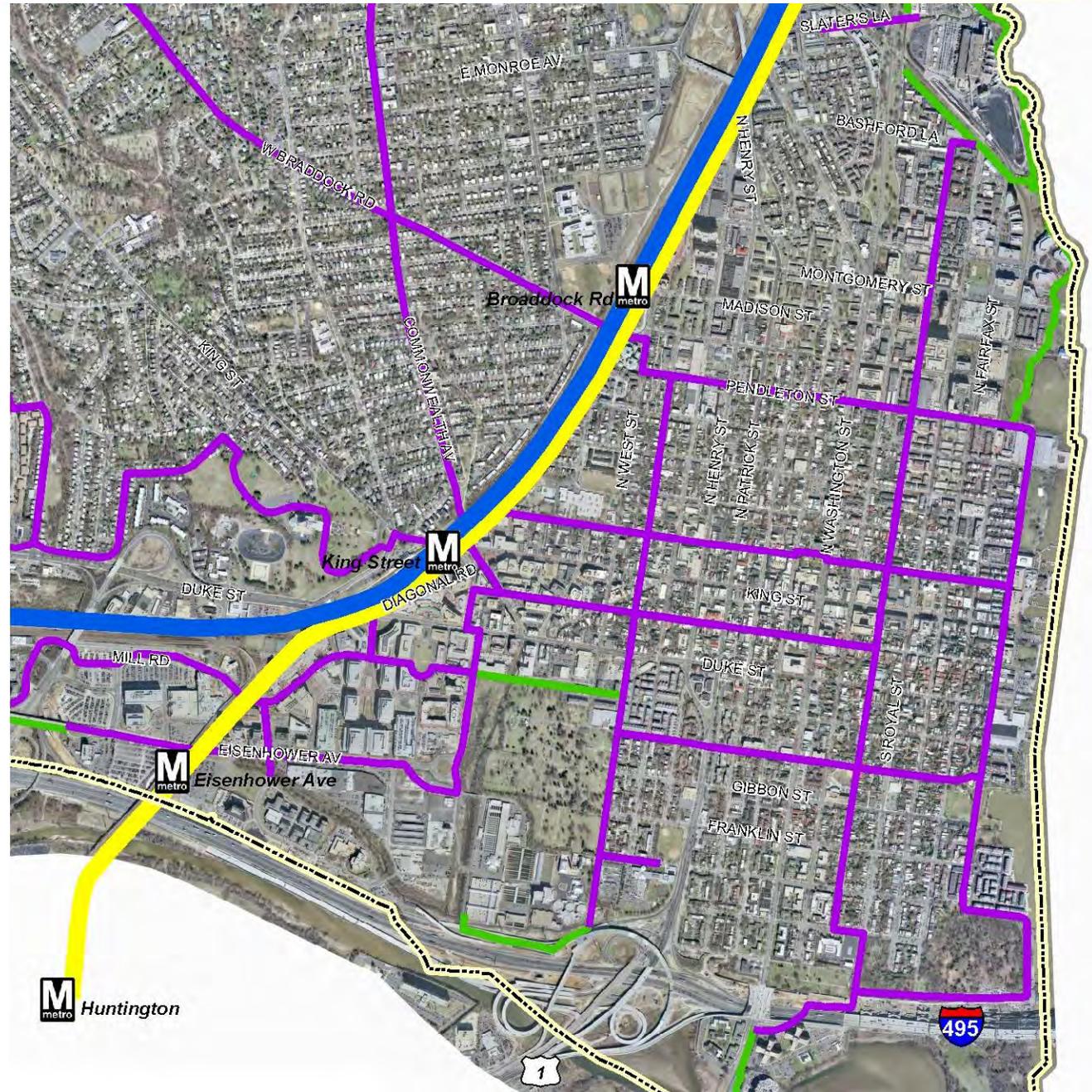
# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## *Bicycle and Pedestrian Access*

### Legend

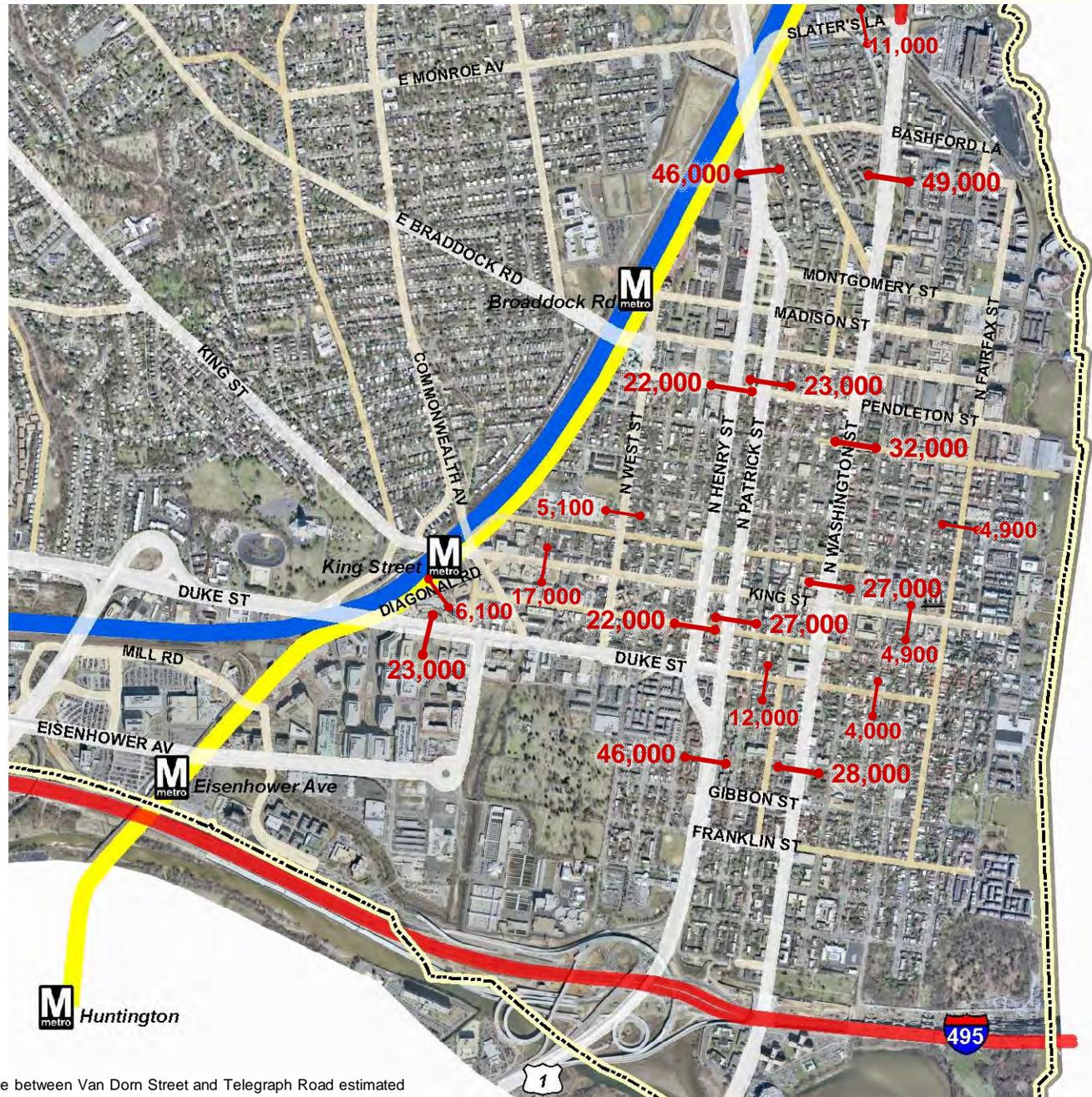
#### Bicycle Facility

- Off Street
- On Street



# TRANSITWAY CORRIDOR FEASIBILITY STUDY

## Daily Traffic Volumes



Source: 2009 VDOT AADT, \*Daily traffic on Eisenhower Avenue between Van Dorn Street and Telegraph Road estimated



## *Arlington to Monroe Avenue Bridge A.M. Peak Period Travel Time*

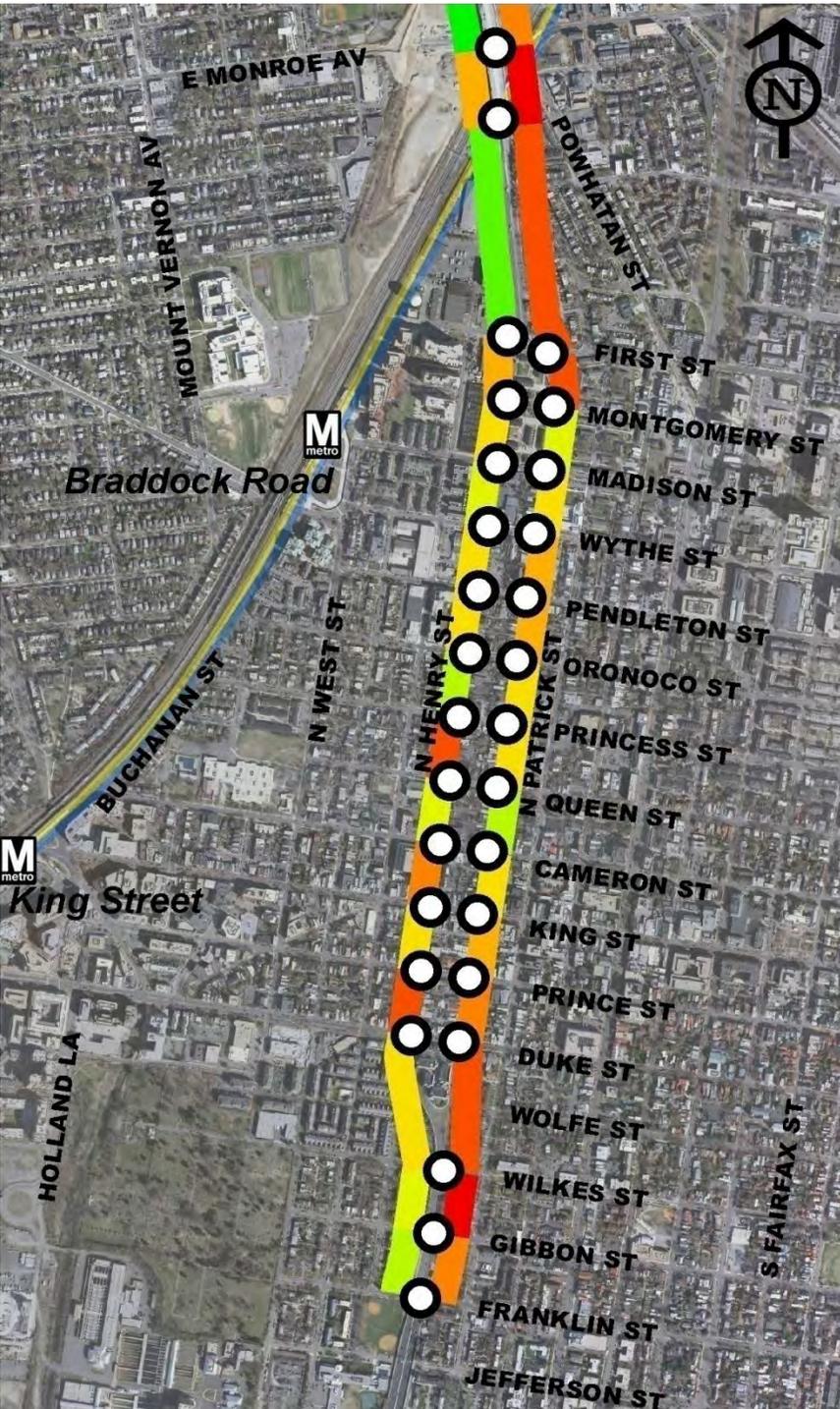
- Distance: 1.6 miles
  - Northbound: 12 minutes
  - Southbound: 4 minutes

Data Collected: Fall 2010

### Legend

- Signalized Intersection
- Corridor Travel Speed Range
- Low (less than 20 mph)
- Moderate
- High (greater than 25 mph)





# *Monroe Avenue Bridge to Franklin Street A.M. Peak Period Travel Time*

- Distance: 1.7 miles
  - Northbound: 7 minutes
  - Southbound: 5 minutes

Data Collected: Fall 2010

### Legend

- Signalized Intersection
- Corridor Travel Speed Range
- Low (less than 20 mph)
- Moderate
- High (greater than 25 mph)





# *Arlington to Monroe Avenue Bridge P.M. Peak Period Travel Time*

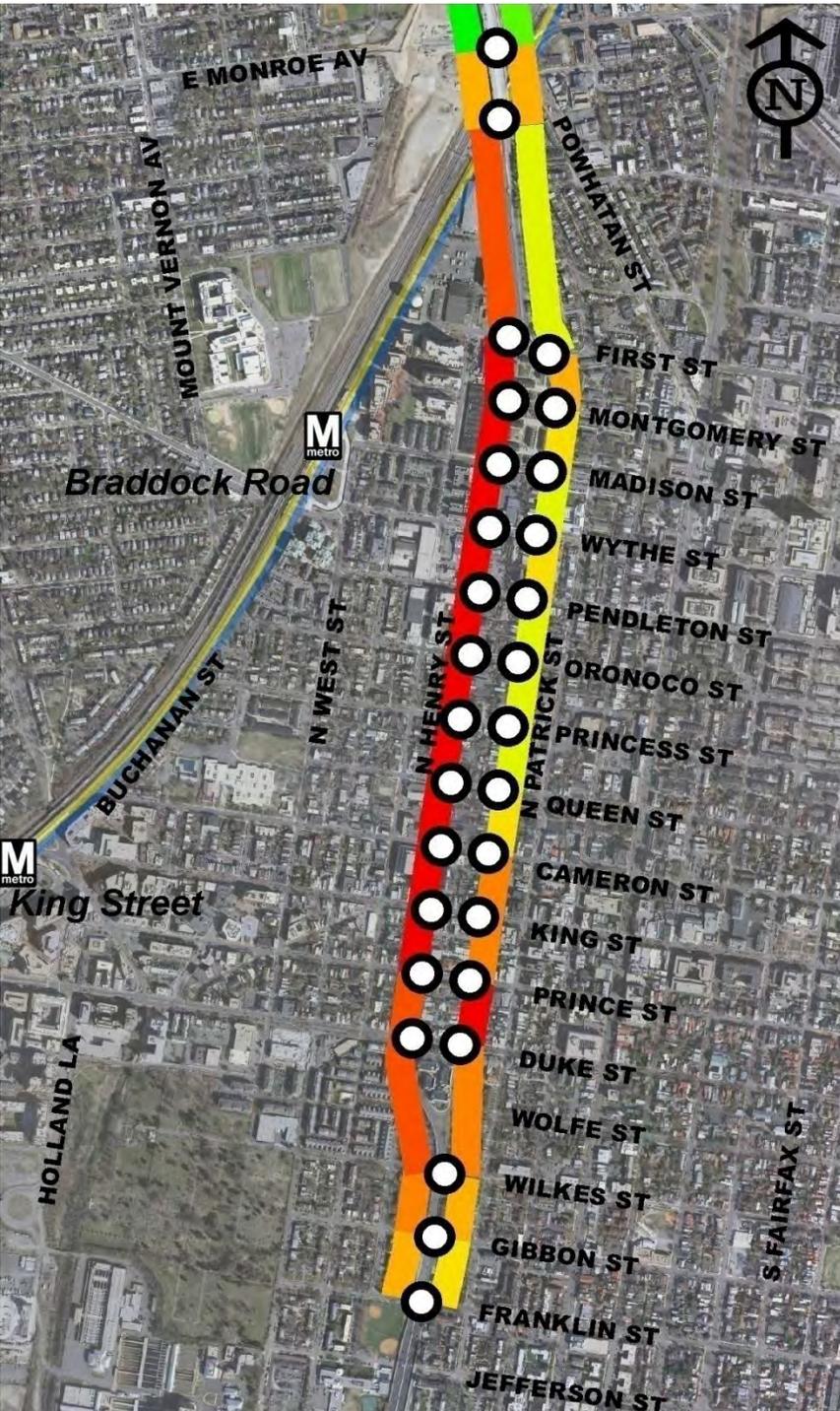
- Distance: 1.6 miles
  - Northbound: 6 minutes
  - Southbound: 5 minutes

Data Collected: Fall 2010

### Legend

- Signalized Intersection
- Corridor Travel Speed Range
- Low (less than 20 mph)
- Moderate
- High (greater than 25 mph)





## *Monroe Avenue Bridge to Franklin Street P.M. Peak Period Travel Time*

- Distance: 1.7 miles
  - Northbound: 5 minutes
  - Southbound: 25 minutes

Data Collected: Fall 2010

### Legend

- Signalized Intersection
- Corridor Travel Speed Range
- Low (less than 20 mph)
- Moderate
- High (greater than 25 mph)



# *DISCUSSION*

Project information is available at  
[www.alexandriava.gov/HighCapacityTransit](http://www.alexandriava.gov/HighCapacityTransit)



## *Screening and Evaluation*

- Two Levels of Concept Consideration
  - Screening. Goal: Narrow the list of possible concepts
    - Alignment
    - Connections
    - Runningway concept (mixed, dedicated, hybrid, widening, no widening...)
    - Transit mode technology (bus, rapid bus, BRT, streetcar, other)
  - Evaluation. Goal: Identify preferred alternative for Corridor A
    - Compare specific alternatives



# Evaluation Criteria

General Evaluation Criteria Grouping	Criteria Sub-Group	Evaluation Criteria	For Use in Screening (Concepts & Alignments)	For Use in Comparative Evaluation of Concepts	Measurement Method
<b>Effectiveness -</b> Addresses stated transportation issues in the corridor	Coverage	Service to Regional Destinations		✓	Notation of regional destinations directly served
		Service to Population, Employment, and Other Destinations		✓	Tabulate population, employment, key destinations, and similar, served by option
		Transit Connectivity		✓	Access to other transit services (existing and planned)
	Operations	Running-way Configuration(s)		✓	Quantify amount of runningway that is dedicated and amount that is mixed flow
		Corridor Length		✓	Measured length of the corridor (mi or feet)
		Capacity		✓	Potential corridor capacity (hourly) based on mode technology, headways, and other conditions
		Interoperability		✓	Identification of whether the chosen runningway configuration and transit mode technology are compatible with regionally planned systems
		Avoidance of Congestion		✓	Number and locations of LOS E/F intersections avoided
		Transit Travel Time		✓	Transit travel time
		Intersection Priority		✓	Percent of intersections where TSP is needed and can be implemented successfully - notation of where it cannot be implemented successfully
	Alignment	Ridership		✓	Forecast number of riders
		Geometrics		✓	Geometric quality of alignment
		Runningway Status		✓	Percent of corridor to be located on new or realigned roadway
Phasing	Phasing		✓	Identification of ability to phase operations and implementation	
<b>Impacts -</b> Extent to which economics, environment, community, transportation are affected	Economic	Development Incentive		✓	Perceived value of transit mode technologies with regard to development potential
	Natural Environmental	Natural Environment		✓	Summary of key environmental conditions affected (wetlands, floodplains, T&E, streams, and similar)
		Parks and Open Space		✓	Summary of parks and/or open spaces affected
	Neighborhood and Community	Property		✓	Number, use type, and quantity of properties impacted with anticipated level of impact (ROW only, partial take, total take)
		Streetscapes		✓	Impact to existing streetscapes
		Community Resources		✓	Identify number and location of historical, cultural, community, archaeological resources affected
		Demographics		✓	Identification of impacts to special populations
	Transportation	Noise and Vibration		✓	Summarize relative noise and vibration impacts of different mode types and corridor configurations
		Traffic Flow Impact		✓	Effect of transit implementation on vehicular capacity of corridor
		Traffic Signals		✓	Number of existing signalized intersections affected by transit, identification of need for new signal phases, and number/location of new traffic signals needed to accommodate transit
Multimodal Accommodation			✓	Impacts to, and ability to accommodate bicycles and pedestrians	
<b>Cost Effectiveness -</b> Extent to which the costs are commensurate with their benefits	Cost	Parking		✓	Impacts to parking
		Capital cost		✓	Order of magnitude capital cost for corridor (stations, runningway, etc.)
		Operating cost		✓	Order of magnitude operating cost
<b>Financial Feasibility -</b> Cost of system/concept is in alignment with available funding	Funding	Cost Per Rider		✓	Order of magnitude operating cost per rider
		Funding		✓	Availability to specific funding sources
		Private Capital Incentive		✓	Judgment as to whether the concept has the potential to attract private capital investment and innovative procurement

## *Potential Preliminary Screening Criteria*

### **Corridor C Criteria**

- Service to Regional Destinations
- Service to Population, Employment, and Retail in the Corridor
- Transit Connectivity
- Transit Travel Time
- Alignment Quality
- Property Impacts
- Traffic Flow Impact
- Capital Cost

### **Corridor B Criteria**

- Transit Travel Time
- Transit Connectivity
- Runningway Configuration
- Avoidance of Congestion
- Priority
- Phasing
- Streetscape
- Open Space Impacts
- Property Impacts
- Noise and Vibration
- Traffic Flow
- Multimodal Accommodation
- Parking
- Cost
- Funding



# *DISCUSSION*

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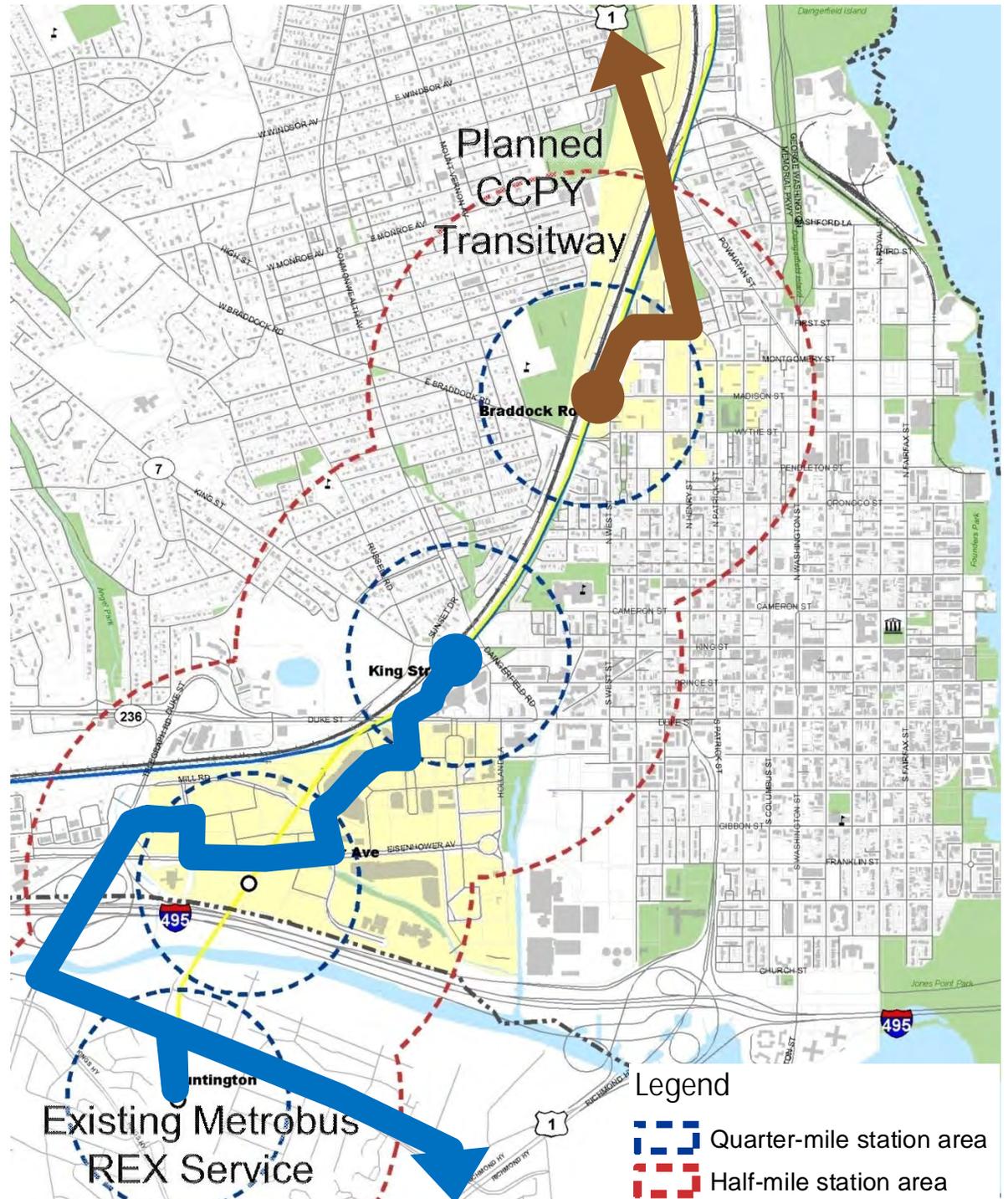
## *Key Considerations for Preliminary Concepts*

- Alignment
  - US Route 1, Washington Street, Other, Combination
- Connections
  - Extension of CCPY or connection to CCPY, Extension of REX or connection to REX, Connect to Metrorail stations
- Runningway Configuration
  - Dedicated, mixed, shared transit/HOV, or combination
- Mode
  - Rapid Bus
  - Bus Rapid Transit (BRT)
  - Streetcar

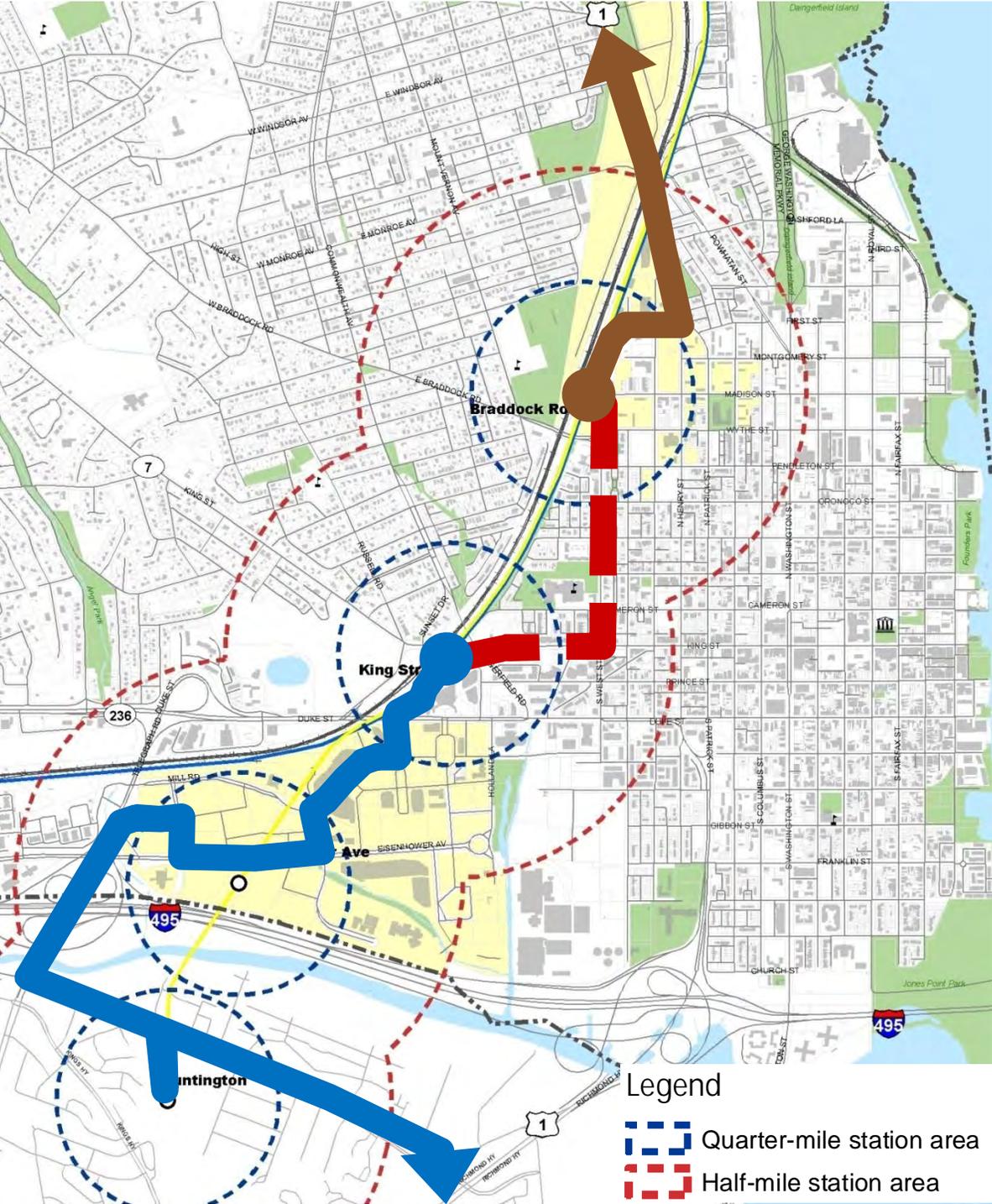


# *ALIGNMENT STARTER IDEAS*

*Corridor A  
Existing and  
Planned  
High-Capacity  
Transit*



# West Street

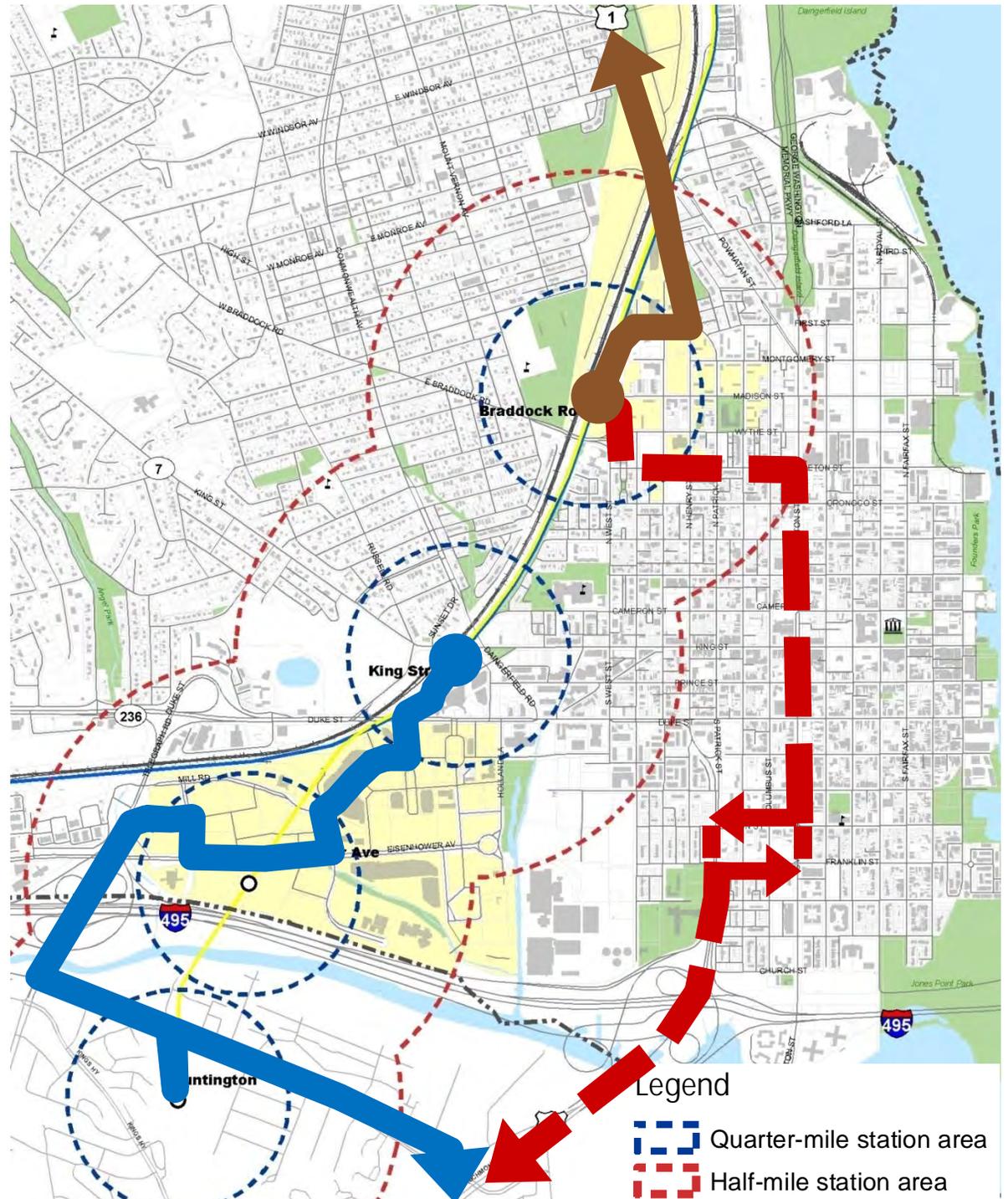




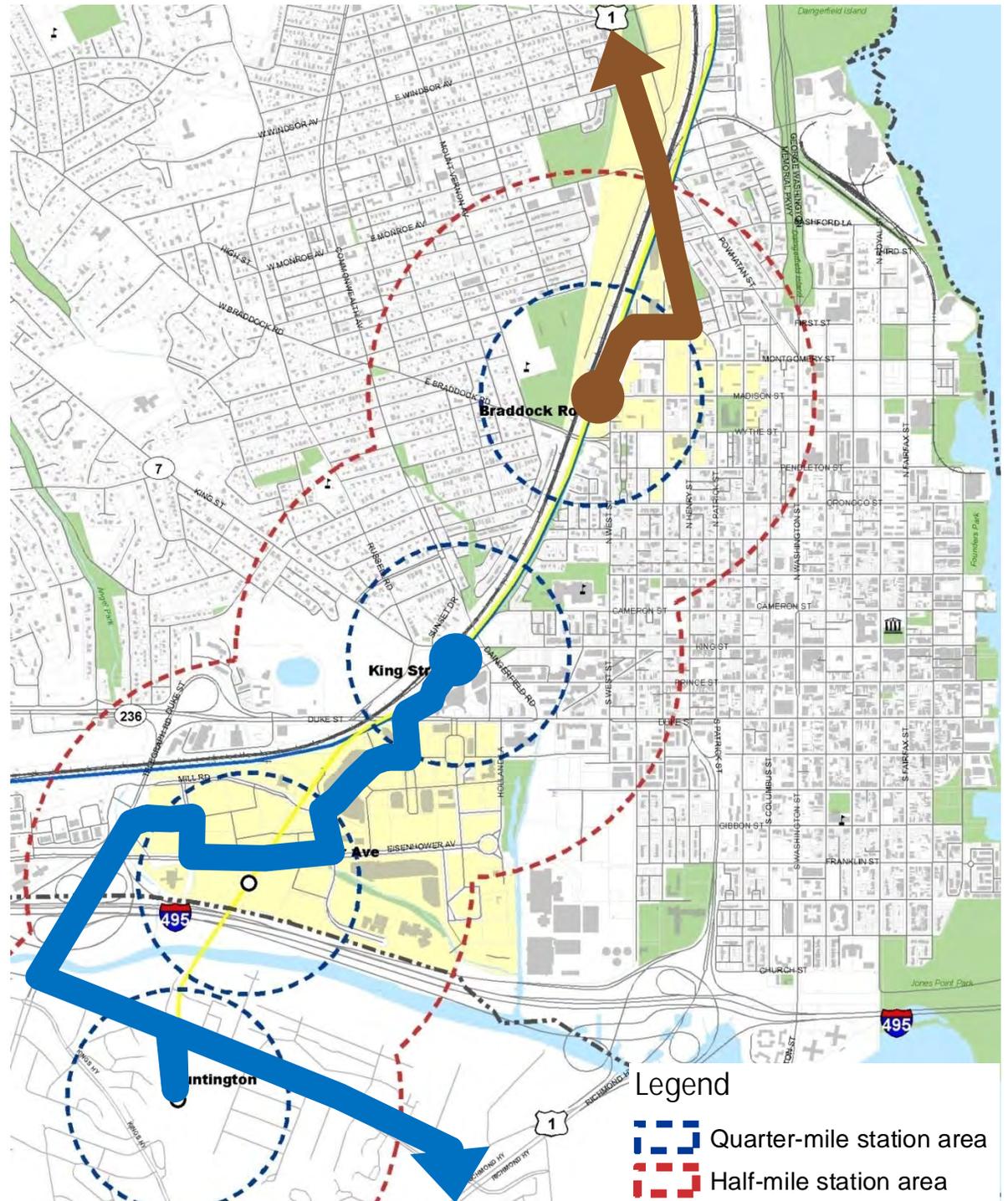
# Washington Street

## Starter Options

- CCPY (Route 9X) Extension
- REX Extension/Spur
- Convert HOV lane to HOV 3+ and transit
- Convert HOV lane to transit only



*Other?*



# *DISCUSSION*

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## *Next Steps*

- Corridor A
  - Concepts and screening
  - Discussion on concepts
  - Identification of concepts for further study
- Corridor B Meeting on October 20<sup>th</sup>



***THANK YOU!***

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