Washington Metropolitan Area Transit Authority

RTSP Phase II Update

Presentation to the Technical Advisory Group

July 18, 2013 Meeting

Regional Transit System Plan

Presentation Outline

- RTSP Integration with Momentum
- RTSP Process Overview
- Brief Review of Round 1 Scenarios and Results
- Round 2 Scenario Features and Results
- Methodology to Evaluate and Prioritize Future High Capacity Transit Corridors

RTSP Integration with Momentum

Relationship between *Momentum* and RTSP

Momentum

- Metro only
- Both short-term infrastructure and non-infrastructure needs
- Timeframe: 2025

RTSP

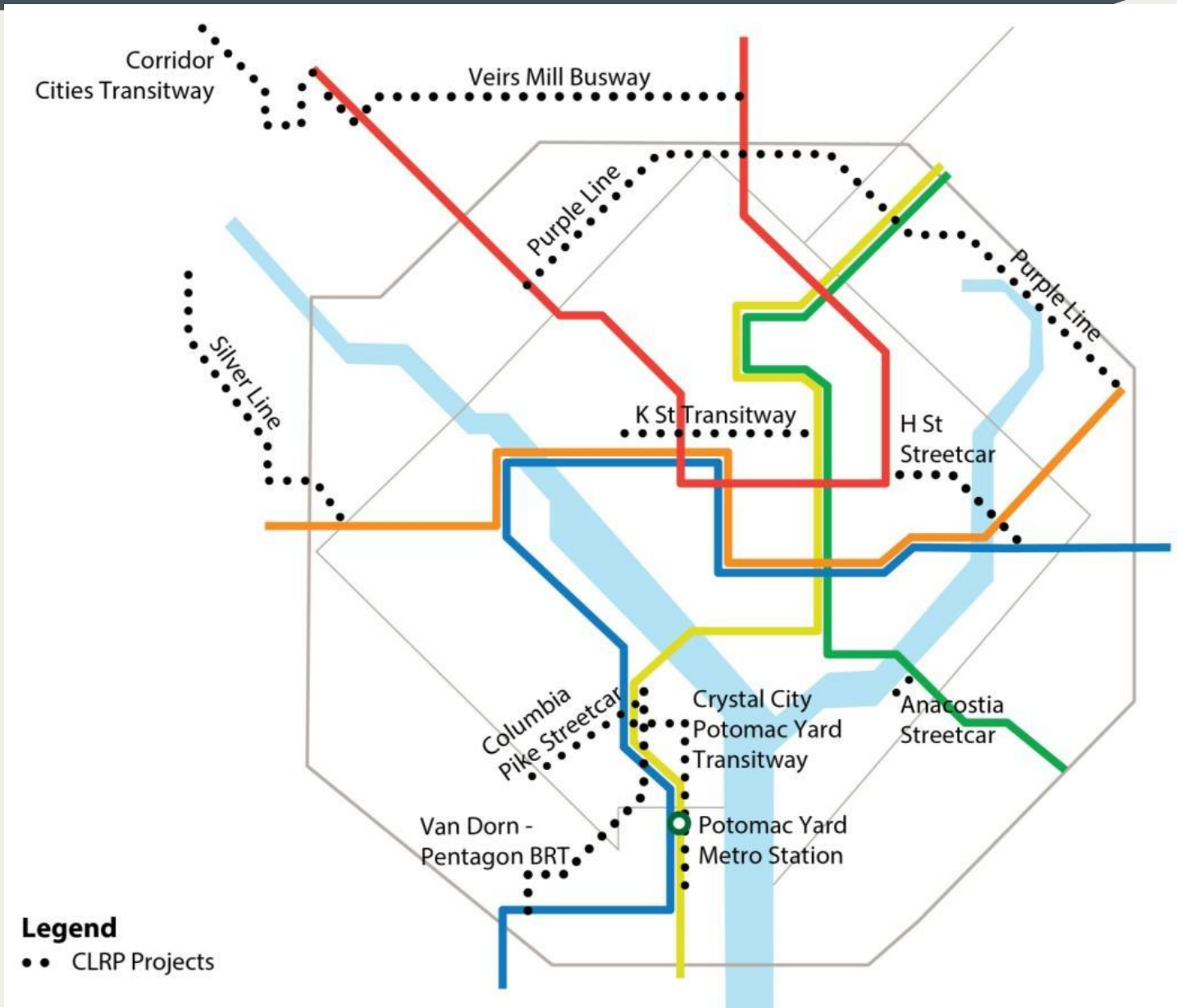
- All transit; Operator-neutral
- Only long-term infrastructure needs
- Timeframe: 2040

Momentum and RTSP

- Address core-capacity needs
- Connect communities as per *Region Forward*
- Lay the groundwork for improved surface transit in the region

Region's Financially Constrained Long-Range Plan

- $7 Billion for transit projects
- Does not include Metro 2025 or RTSP projects



Momentum: Metro 2025

Longest possible trains to provide more seats

More cars + power improvements and maintenance facilities to operate all 8-car trains during rush hours

Improved flow through major stations

More escalators, stairs and mezzanine space added at transfer Stations to accommodate more riders more comfortably

More reliable, faster bus service (Priority Corridor Network)

Bus-only lanes along major corridors, additional limited-stop and express service, and more buses will upgrade bus service

Momentum: Metro 2025

More timely, reliable customer information

Metro will provide a network for region-wide transit information and fare collection, giving customers information when and how they want it

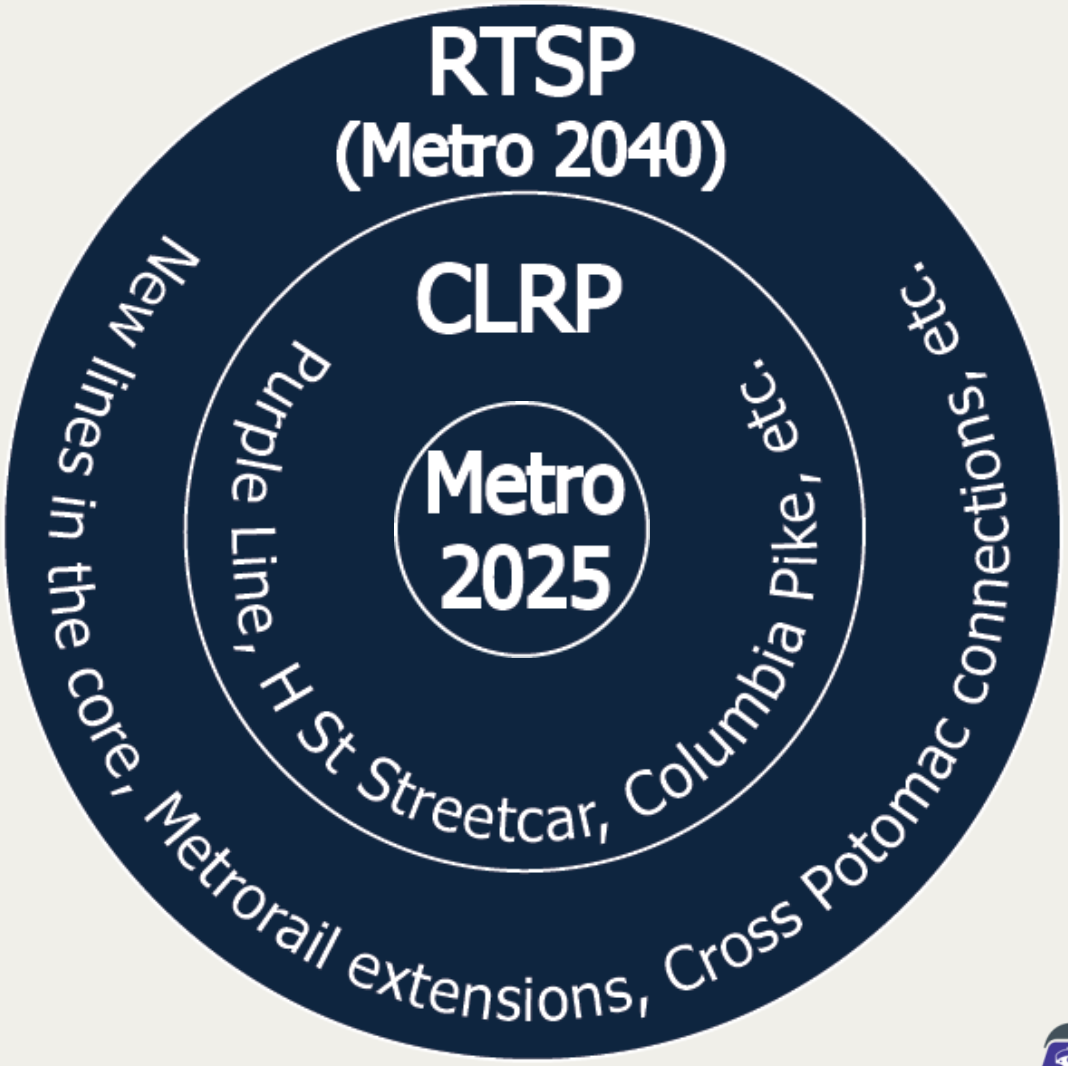
Improve reliability of rail system

New connections will allow trains to more easily be routed around delays and get back on-time more quickly

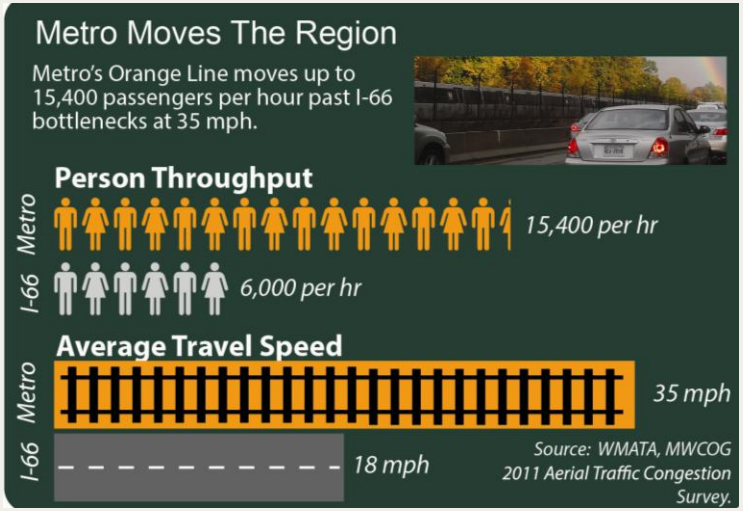
Increase rush hour service on the Blue Line

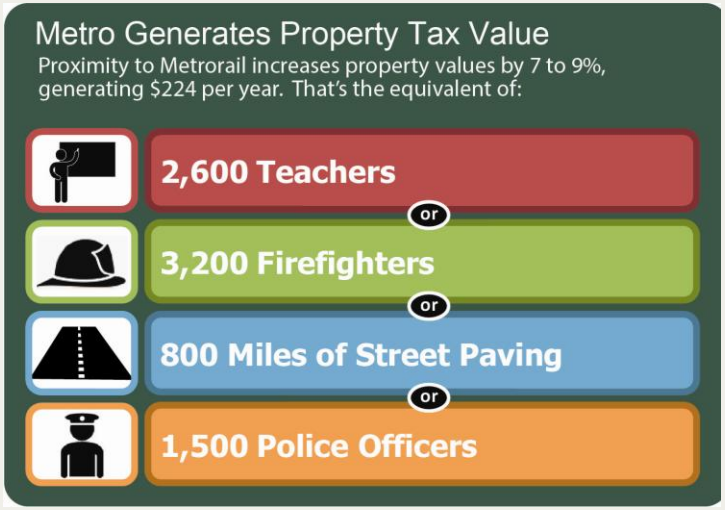
New track connections or a new station at Rosslyn will allow for more frequent Blue Line service during rush hours

The Region's Transit Plans



Benefits of *Momentum*



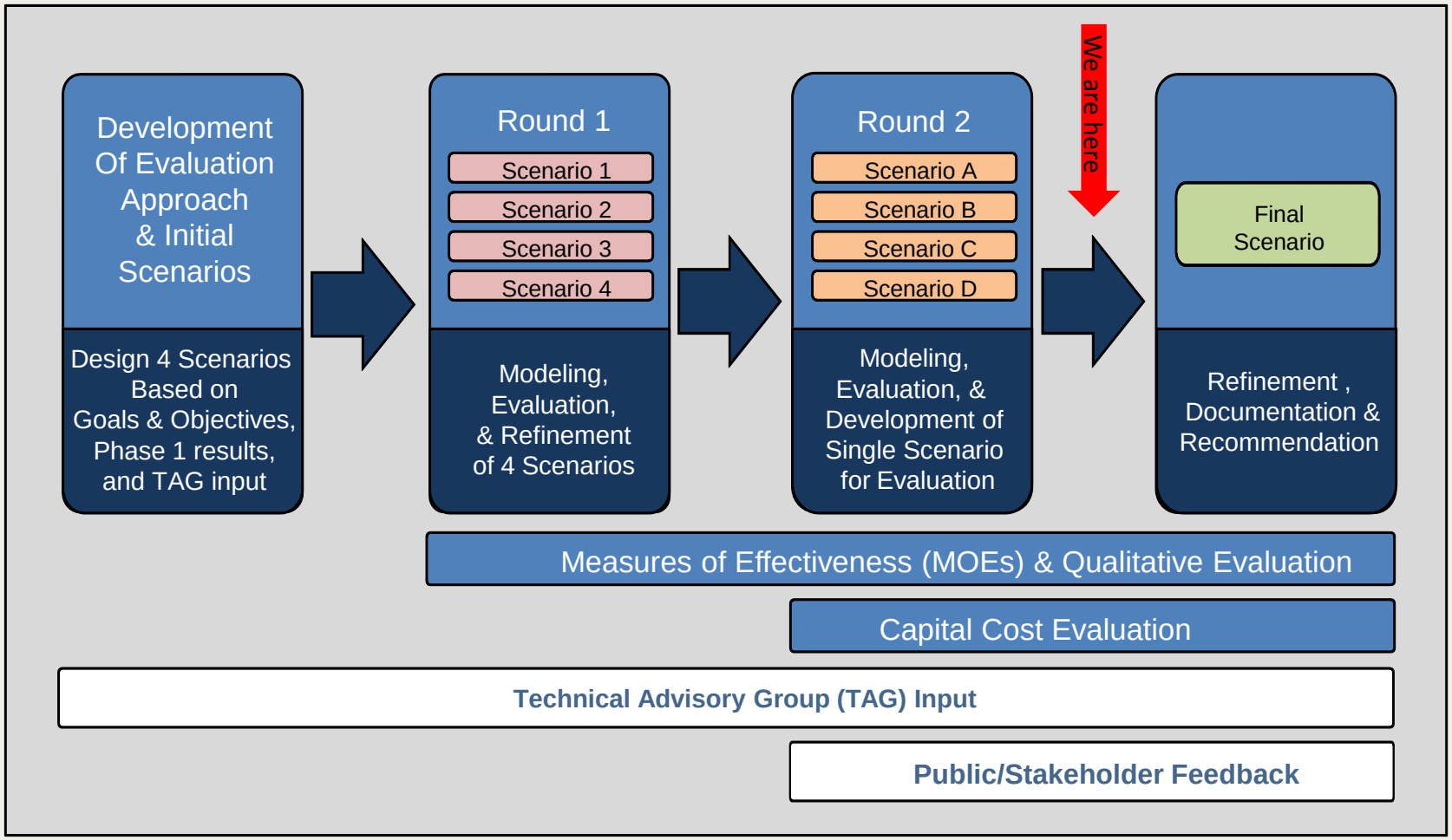


Discussion of Round 2 Scenario Results

Outline

- RTSP Process Overview
- Brief Review of Round 1 Scenarios and Results
- Round 2 Scenario Features
- Effects of Aspirations Land Use
- Scenario modeling results in terms of:
  - LRT vs. BRT across Wilson, Legion Bridge
  - VA and DC streetcar extensions
  - Metrorail Core configurations

Process Overview



Plan Overview

- RTSP analyzed transit improvement/expansion project in two phases
- Components of the future plan can be organized into four major elements:
  1) Future Base Case Network
  2) Core Capacity Improvements
  3) Future High-Capacity Transit Corridors
  4) Land Use and Access Improvements

Round 1 Scenarios

1. Maximize Existing Infrastructure (basis for Metro 2025)
   - What happens from moderate changes to the existing system?
2. Expand Surface Transit
   - What happens if there is a substantial increase in connected surface transit?
3. Expand Transit Core Capacity
   - What scale of improvement is needed to resolve core capacity?
4. Expand Transit Systemwide
   - What happens to mode share and vehicles miles traveled with a substantial increase of heavy rail?

Findings from Round 1 Scenarios

Measure of Effectiveness	% Change from 2040 Base			
	1	2	3	4
Total Transit Linked Trips	7.8%	11.5%	8.0%	12.2%
Reduction in Vehicle Miles Traveled	-0.7%	-1.0%	-0.7%	-1.2%
Transit Mode Share	7.8%	11.5%	8.0%	12.3%
Number of regional activity centers served by high-frequency, high-speed transit	8.0%	8.0%	0%	10.0%
Number of Direct Connections between RACs	22.6%	19.8%	17.6%	32.3%
Households within 1/2 mile of high-frequency – high speed transit	54.4%	69.4%	9.3%	63.0%
Jobs within 1/2 mile of high-frequency – high speed transit	32.8%	41.6%	5.8%	37.6%
Reduction in Person Hours of Travel on Congested/Crowded Links	-38.1%	-38.6%	-43.2%	-66.3%
Transit Peak Orientation Factor	-0.4%	0.4%	-8.5%	-12.4%
Metrorail Parking Availability	27.8%	33.3%	16.7%	55.0%

Round 2 Scenarios: The Core

A: Small Blue/Yellow loop in the core

- What happens if the focus is only on the current core?

B: Large Blue/Yellow loop in the core

- What are the results to the core and Yellow Line if Yellow Line serves SW/SE and Union Station?

C: Small Blue/Yellow loop in the core with Express Orange/Silver Line

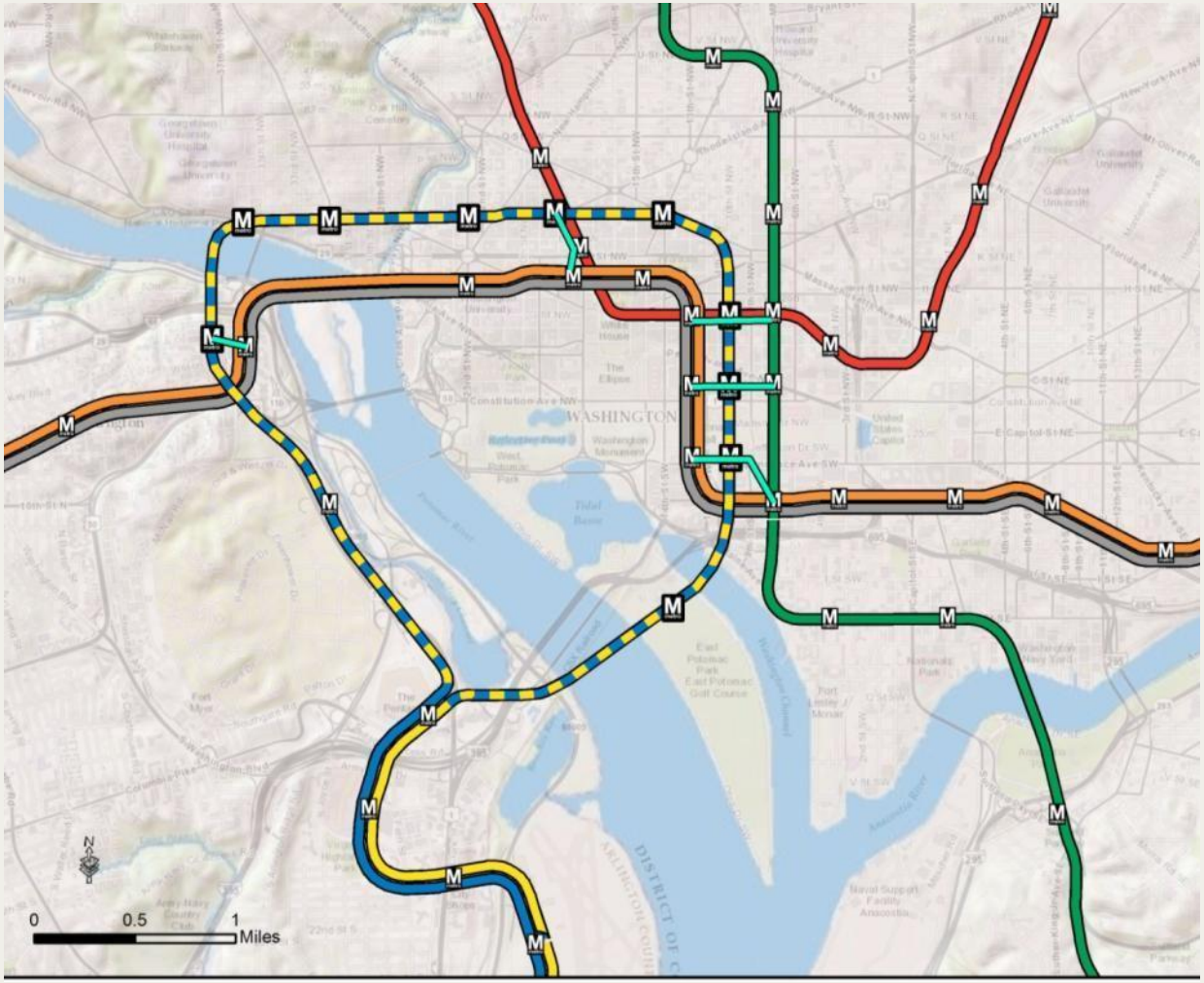
- What are the impacts of the Express Orange/Silver to address future constraints in current Orange Line corridor?

D: Blue Line, Yellow Line, and LRT across Potomac

- Can a new Blue Line and LRT sufficiently meet demand at Union Station?

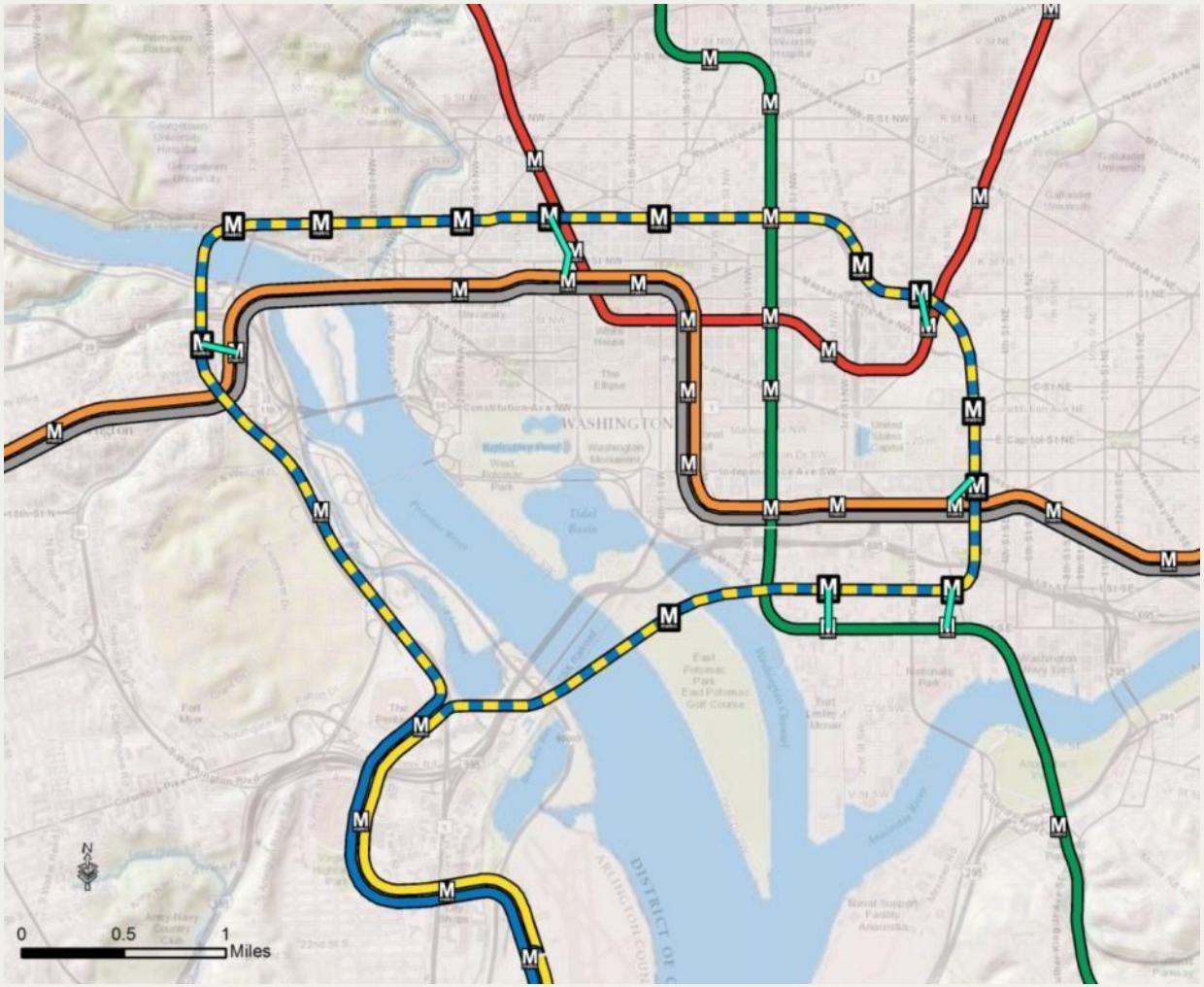
Round 2 Scenario A

A: Smaller Blue/Yellow Loop with connection near Thomas Circle



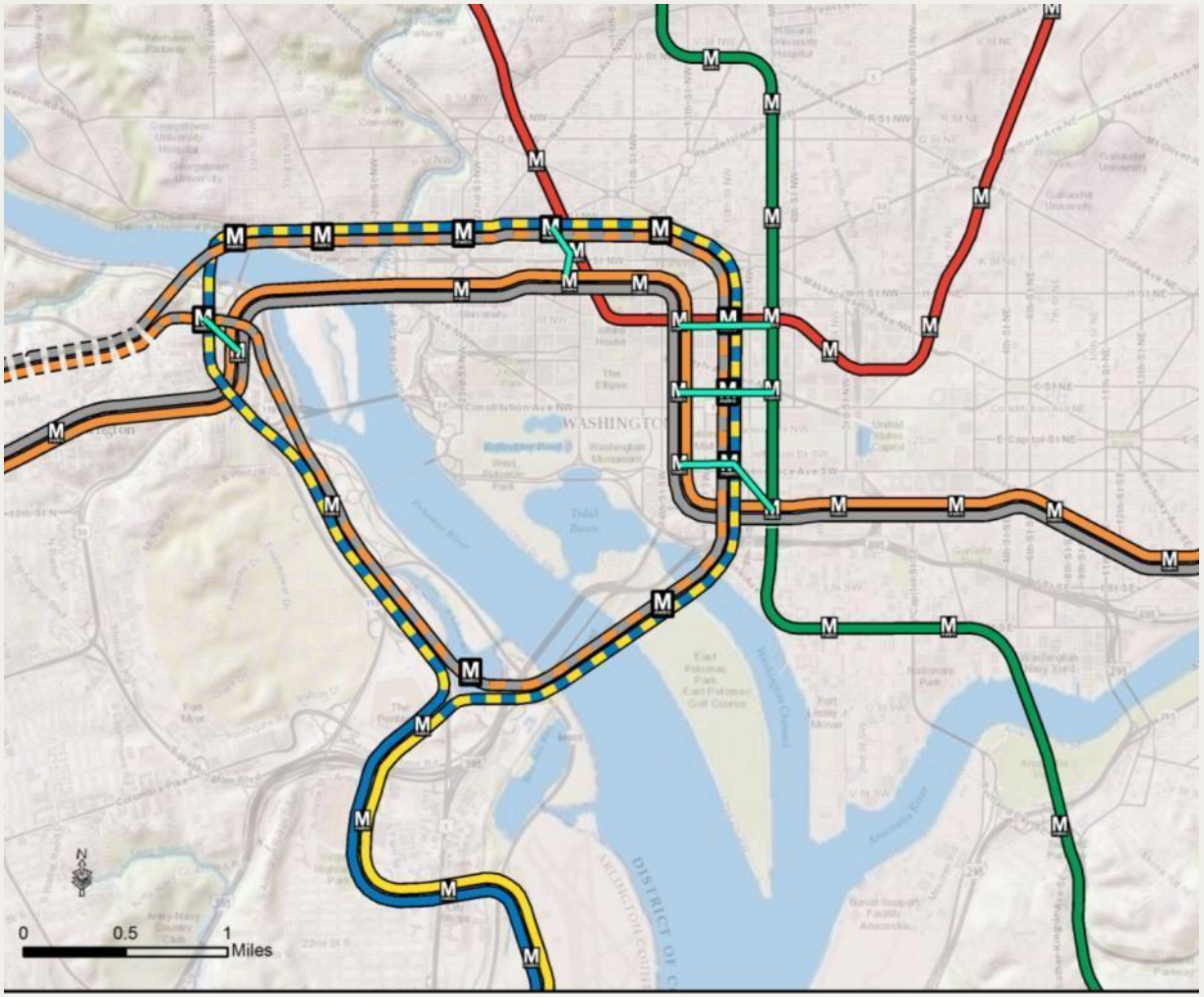
Round 2 Scenario B

B: Larger Blue/Yellow Loop with connection near Union Station

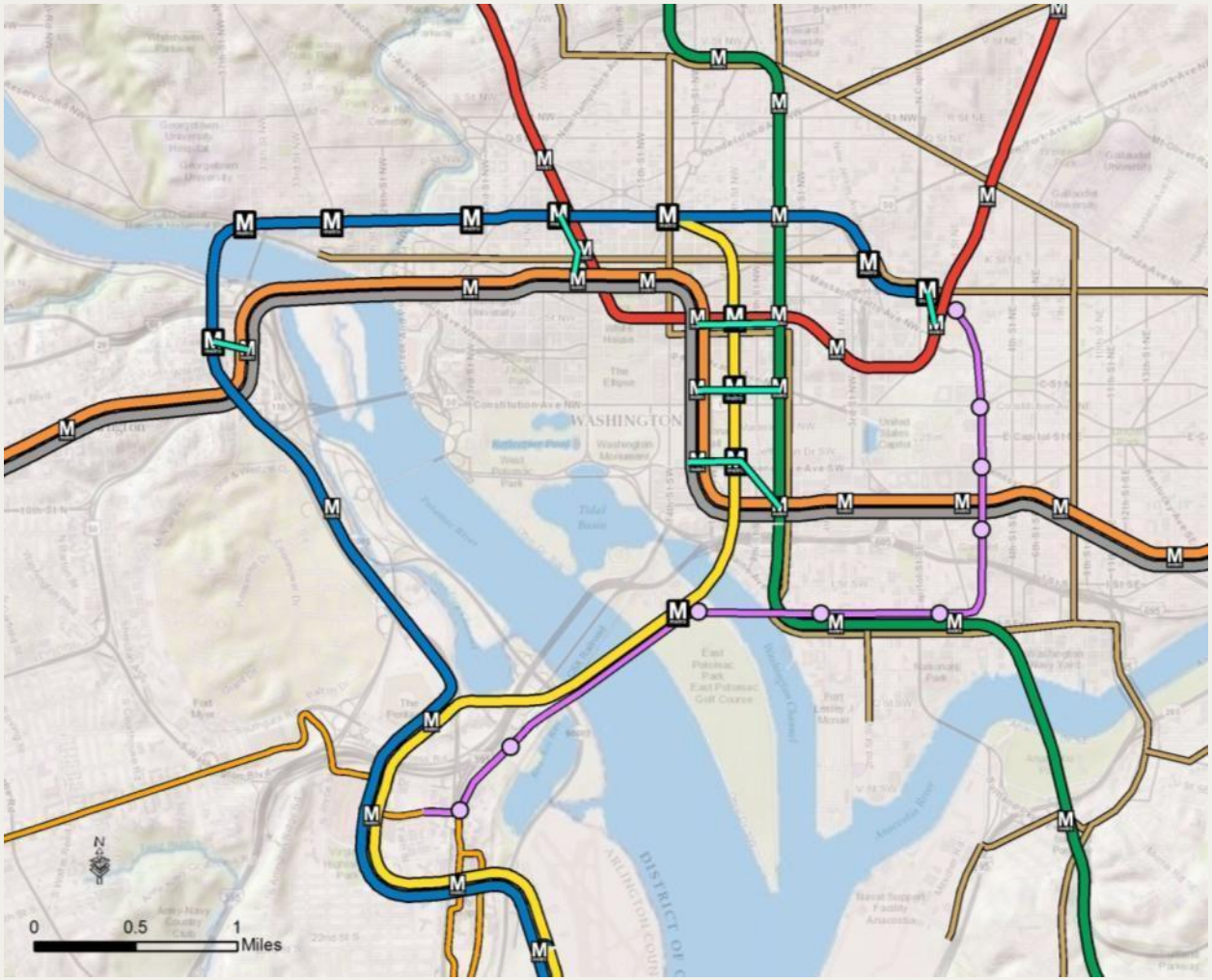


Round 2 Scenario C

C: Smaller Loop with Orange/Silver Express in Virginia



Round 2 Scenario D



D: Blue Line to Union Station , Yellow on 9th St, with LRT across Potomac thru SW, SE to Union Station

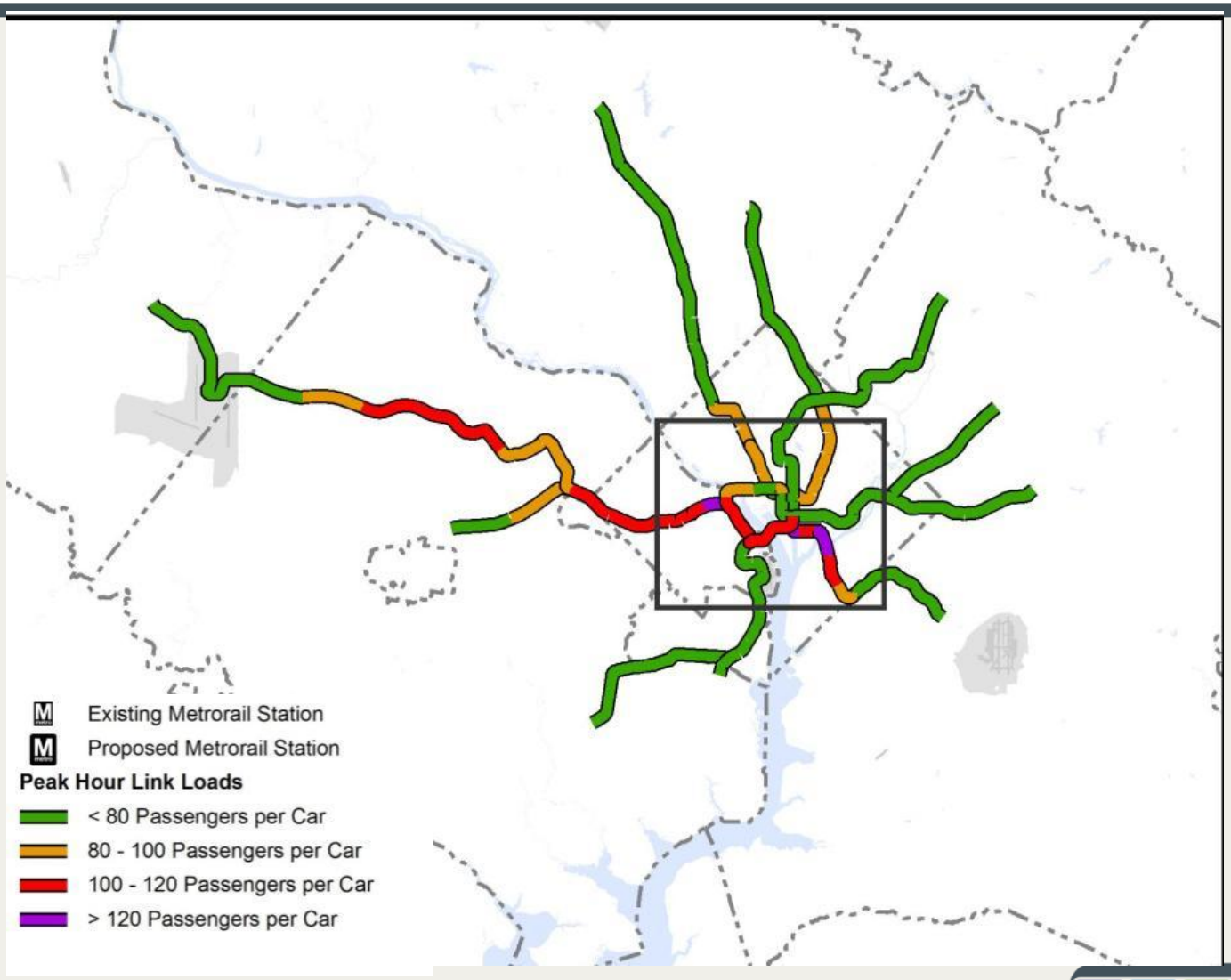
Round 2 Scenarios: Surface Transit

	Scenario A	Scenario B	Scenario C	Scenario D
LRT across Wilson and Legion Bridges	X		X	
BRT across Wilson and Legion Bridges		X		X
LRT to White Oak	X		X	
DC/VA Streetcar extensions across Key Bridge, 14th Street Bridge and to Silver Spring, Tysons and Lincolnia		X	X	
Pentagon City/SW DC/Union Station LRT				X
PCN, DC Streetcar, MontCo BRT, Commuter Rail, Commuter Bus, NoVa BRT	X	X	X	X

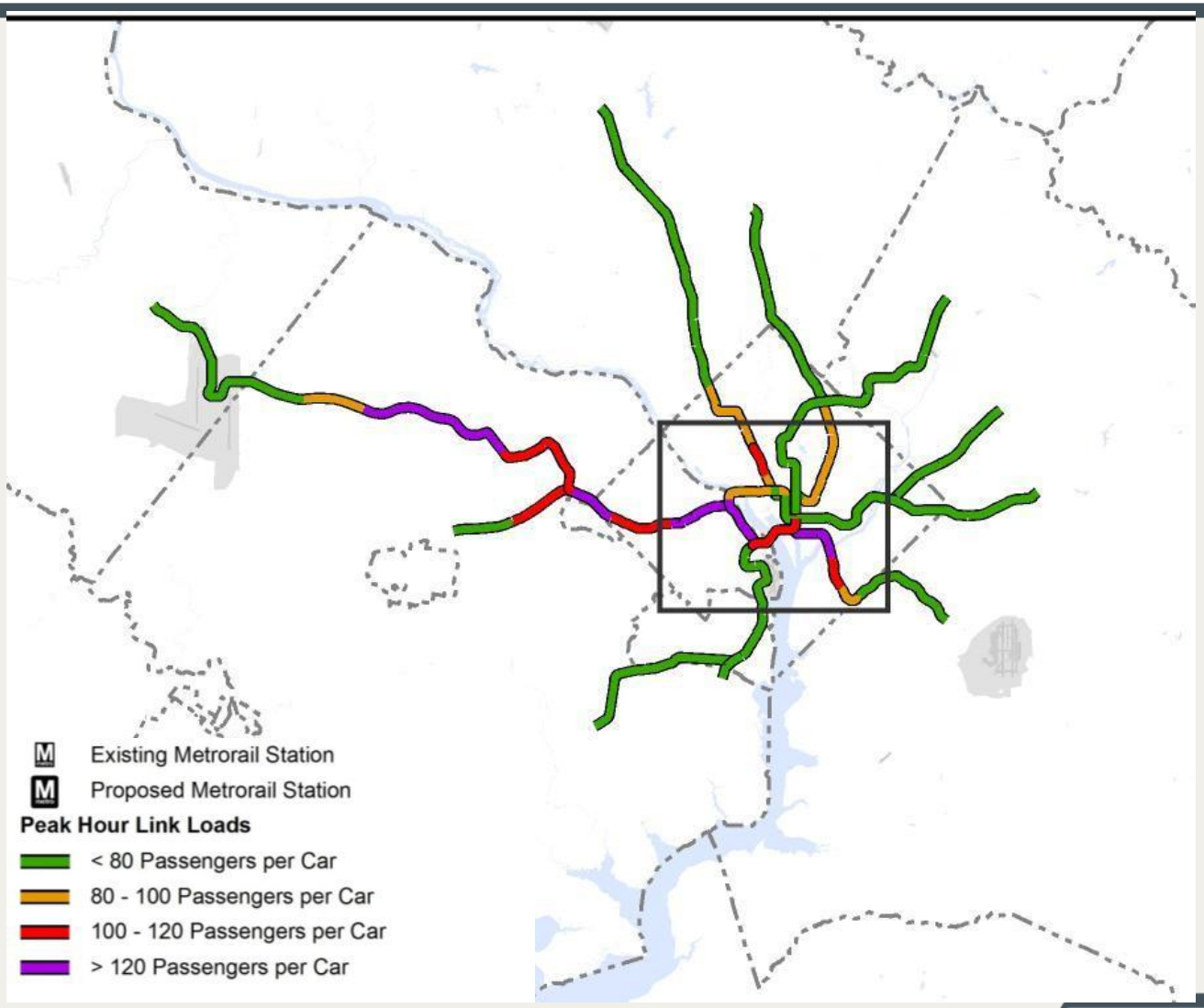
Effects of Aspirations Land Use compared to Round 8.1

- Increases Total Regional Trips 1% to 2%
- Greater increase in Compact Area:3 to 4%
- Transit trips increase by about 8%
- Lower ratio of peak-hour, peak-direction riders to total daily riders: 26% vs. 27%
- Metrorail transfer volumes increase by more than 8%, with 25+% increase at Metro Center to >100k

Base Case Metrorail Line Loads – Round 8.1



Base Case Metrorail Line Loads – Aspirations Land Use

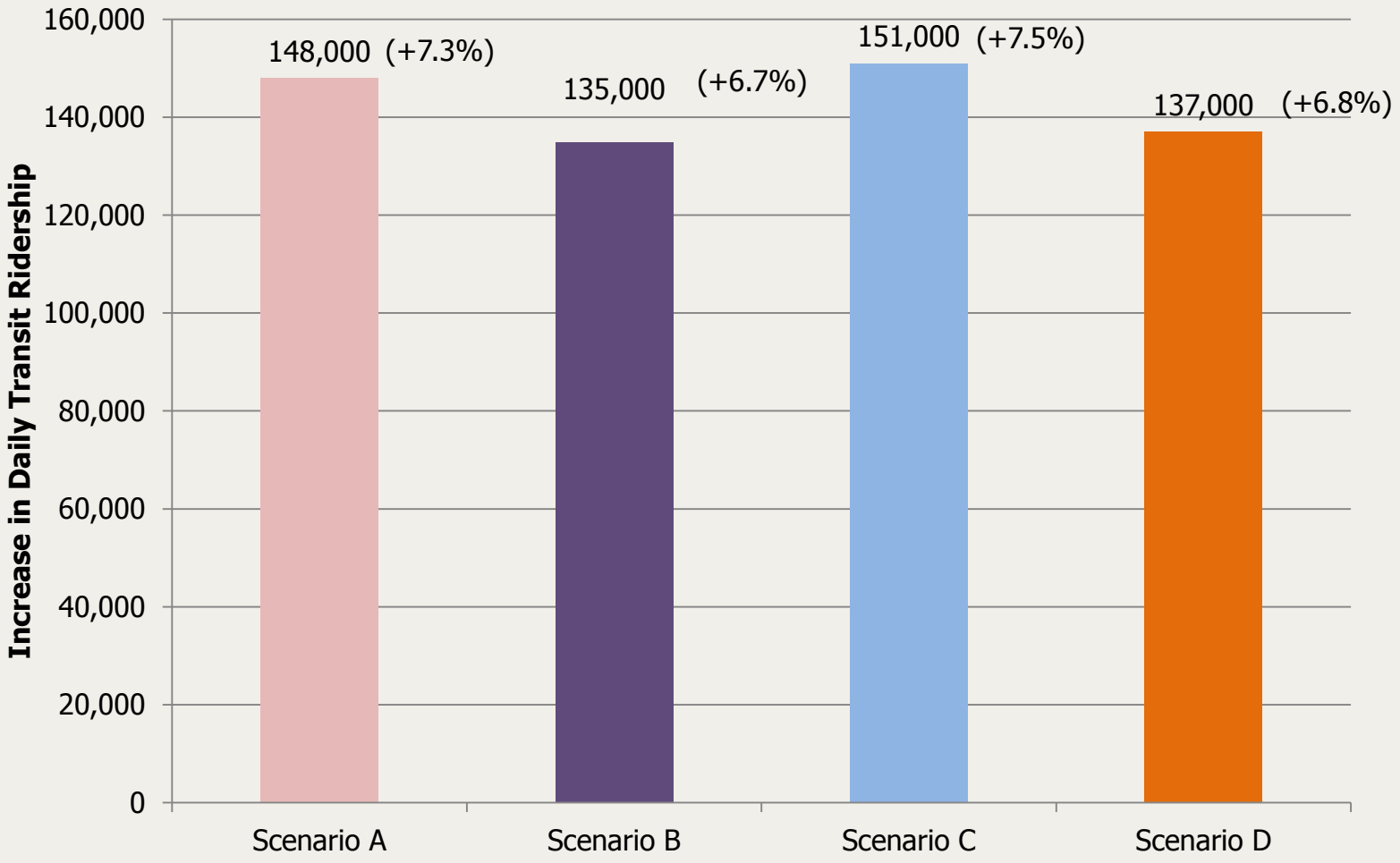


Modeling Results for Round 2 Scenarios

- All results used Aspirations Land Use
- Transit Ridership and VMT
- LRT and BRT across Wilson and Legion Bridges
- Streetcar extensions and connections
- LRT to White Oak and between Union Station and Pentagon City
- Metrorail core configurations

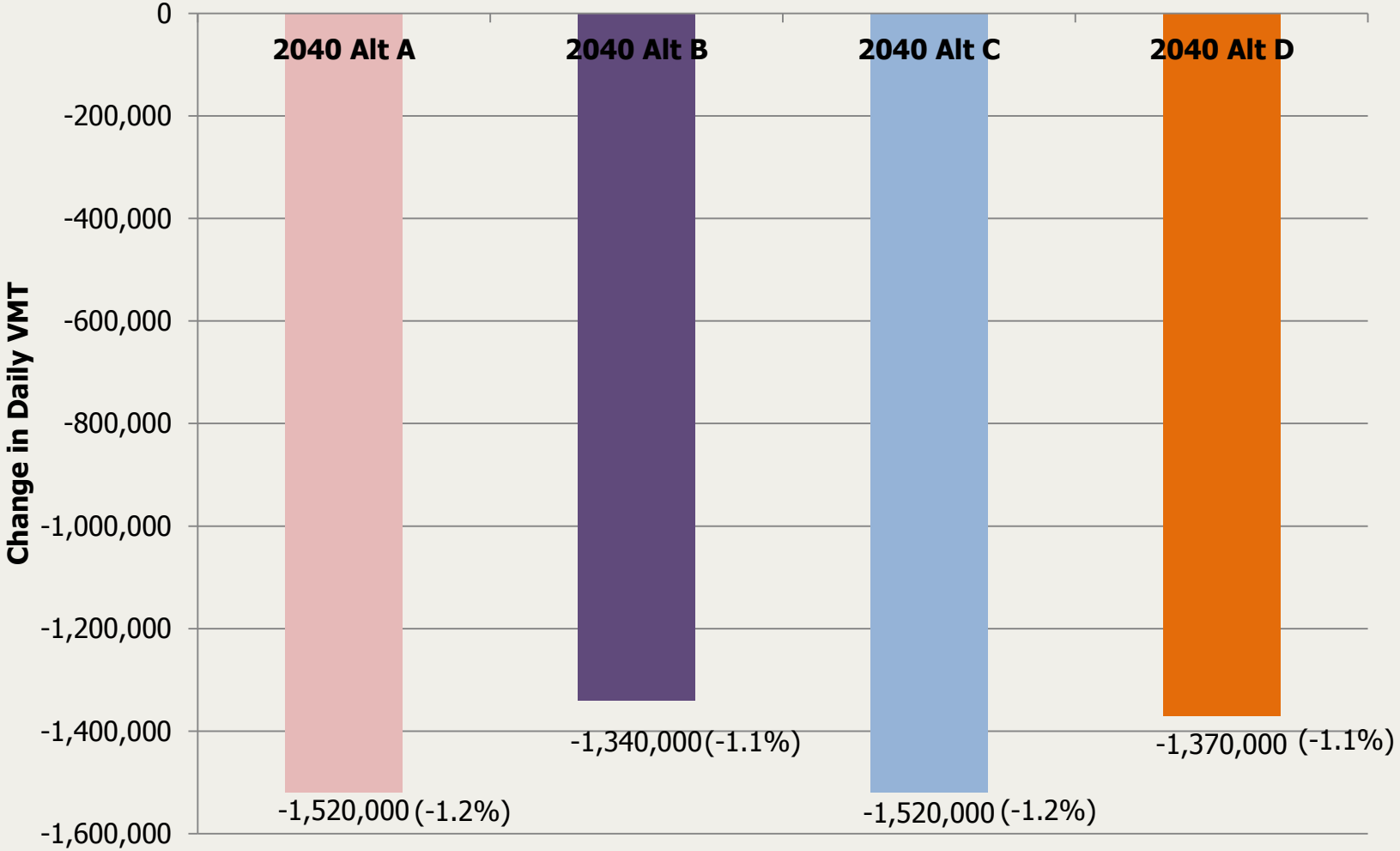
Increase in Transit Ridership

Base with Aspirations Land Use: 2.02 million

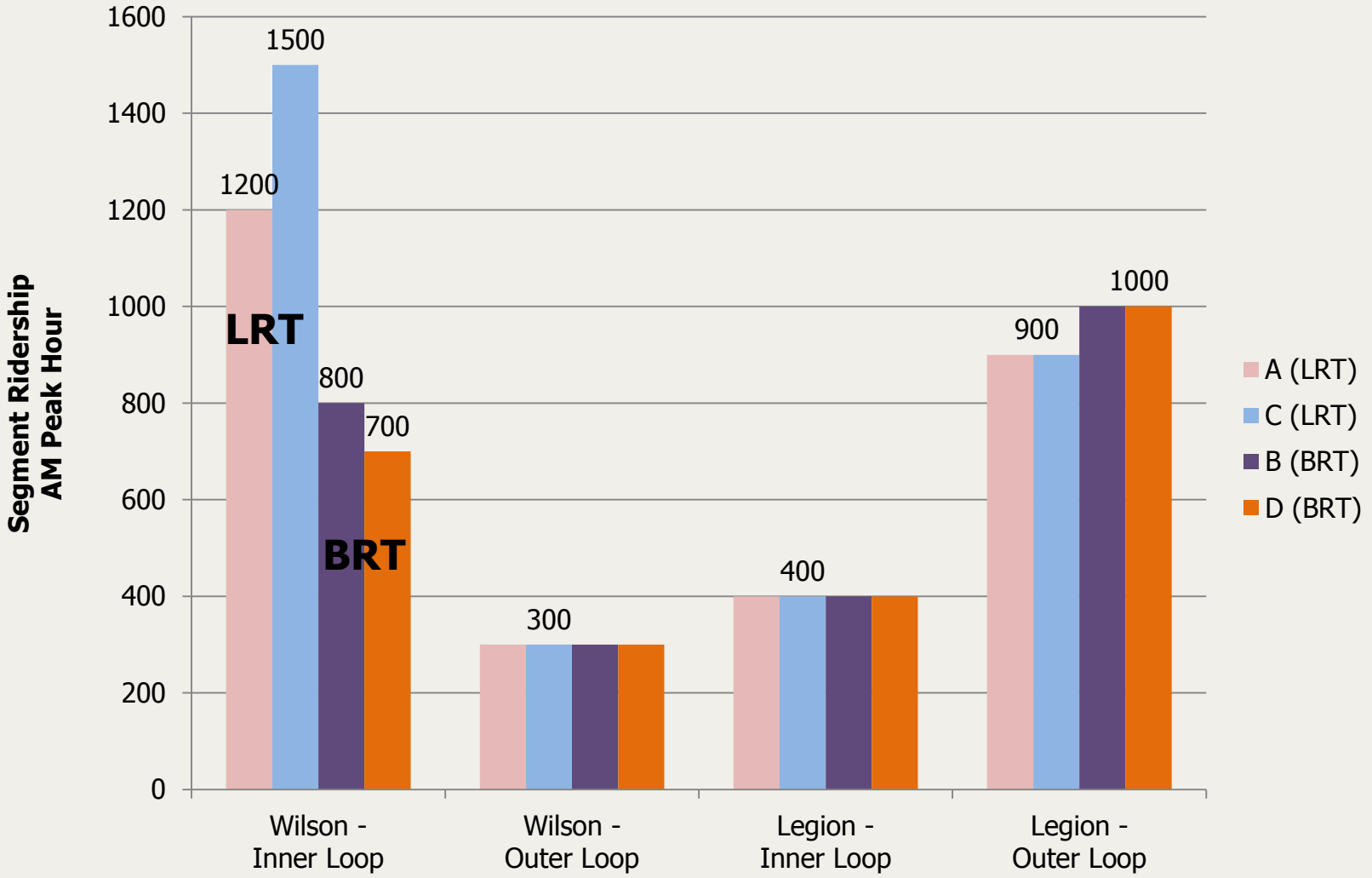


Reduction in Daily Auto Vehicle-Miles of Travel

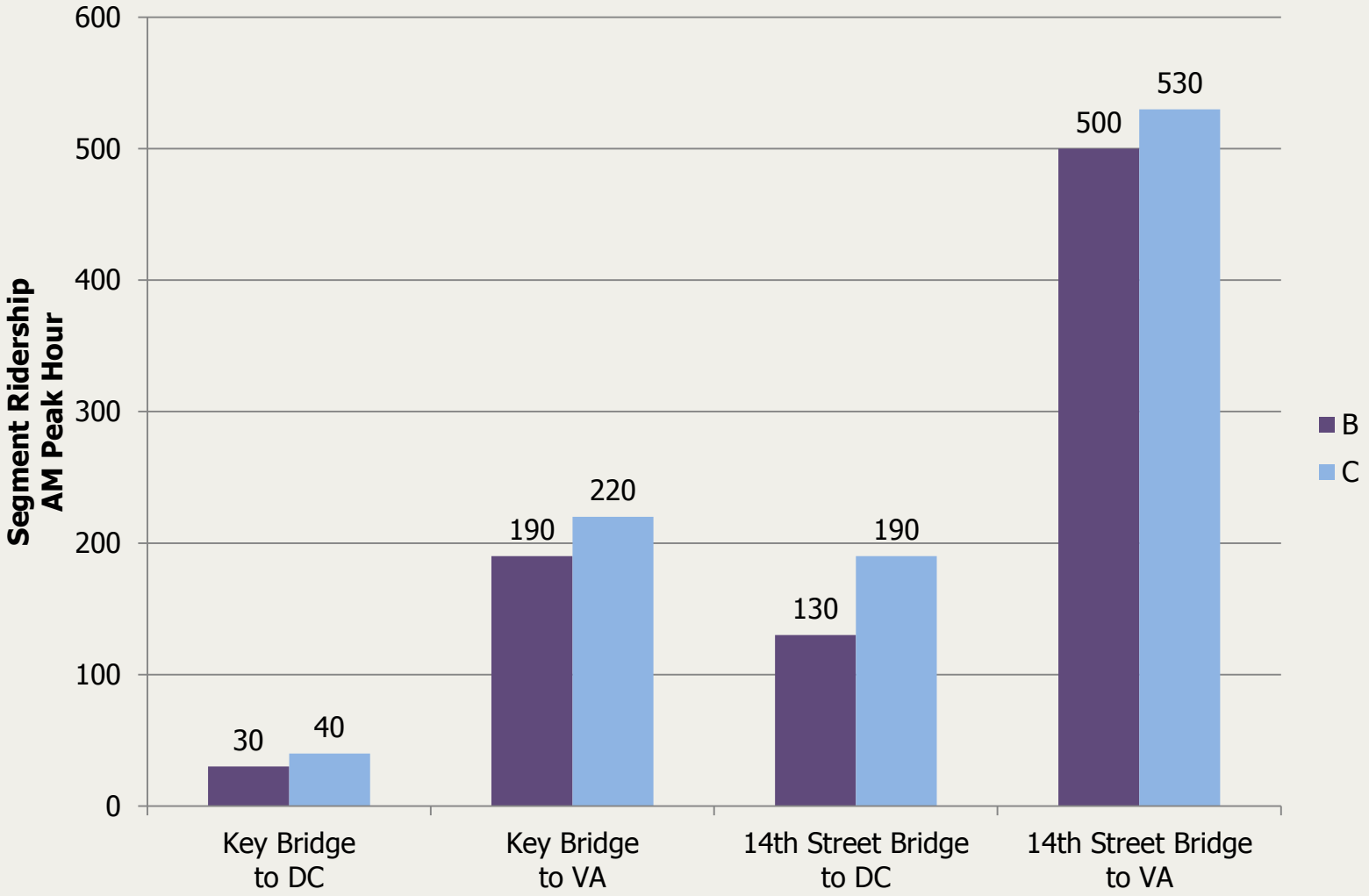
Base with Aspirations Land Use: 122.4 million



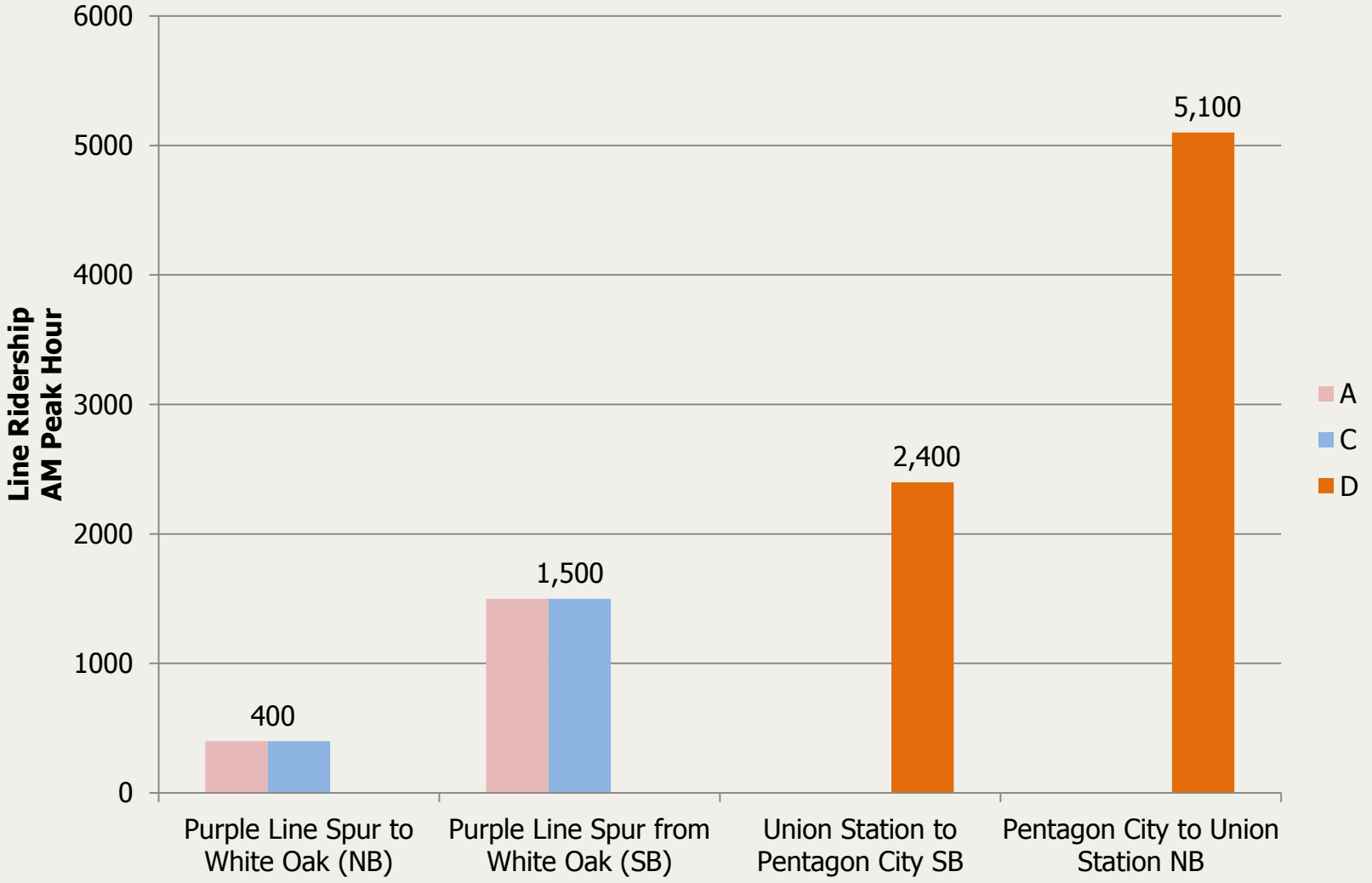
LRT vs. BRT on Legion & Wilson Bridges - AM Peak Hour Ridership on Specific Segments



Streetcar Extensions – AM Peak Hour Ridership on Specific Segments



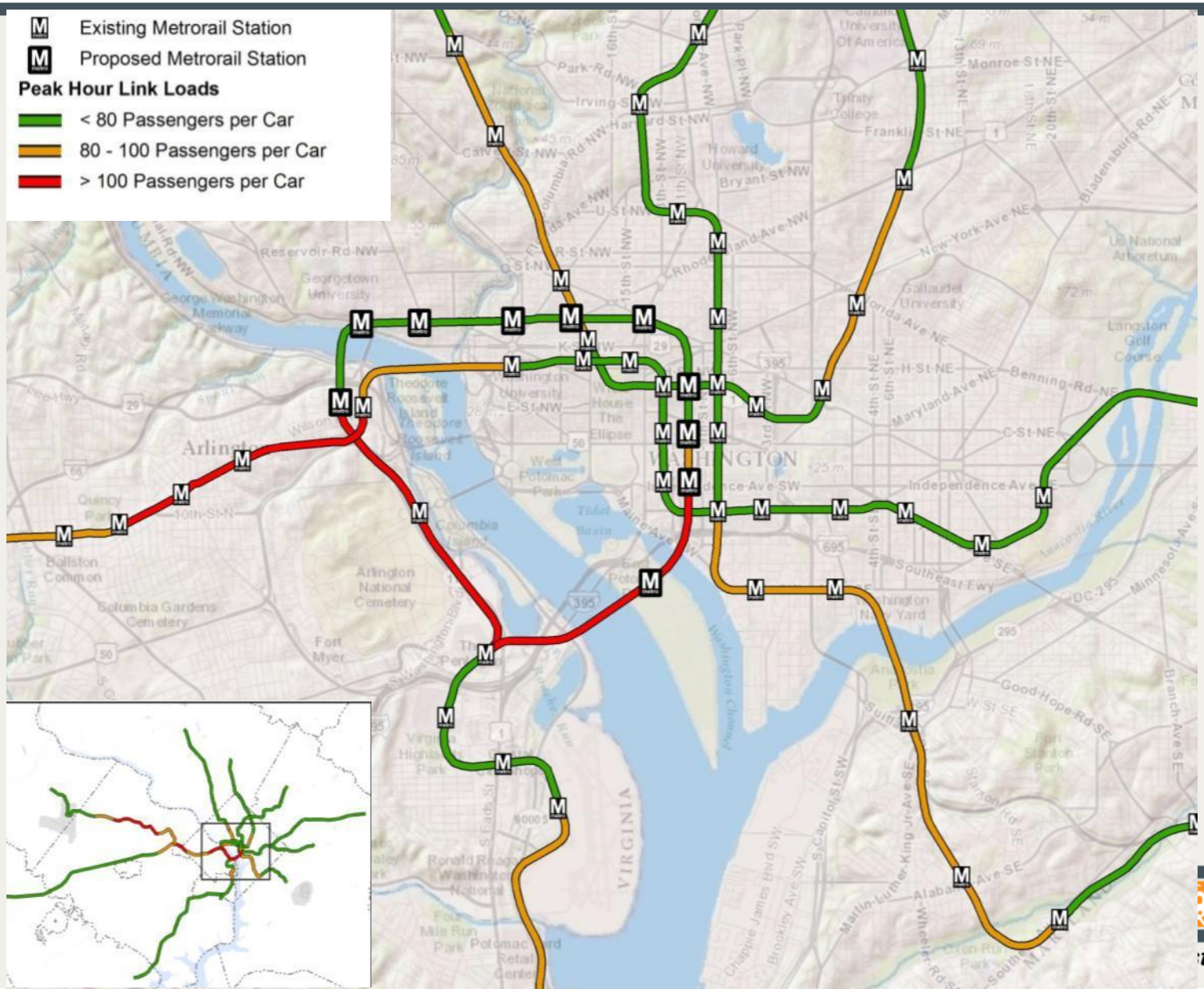
LRT: White Oak and Union Station/Pentagon City – AM Peak Hour Ridership on Entire Line



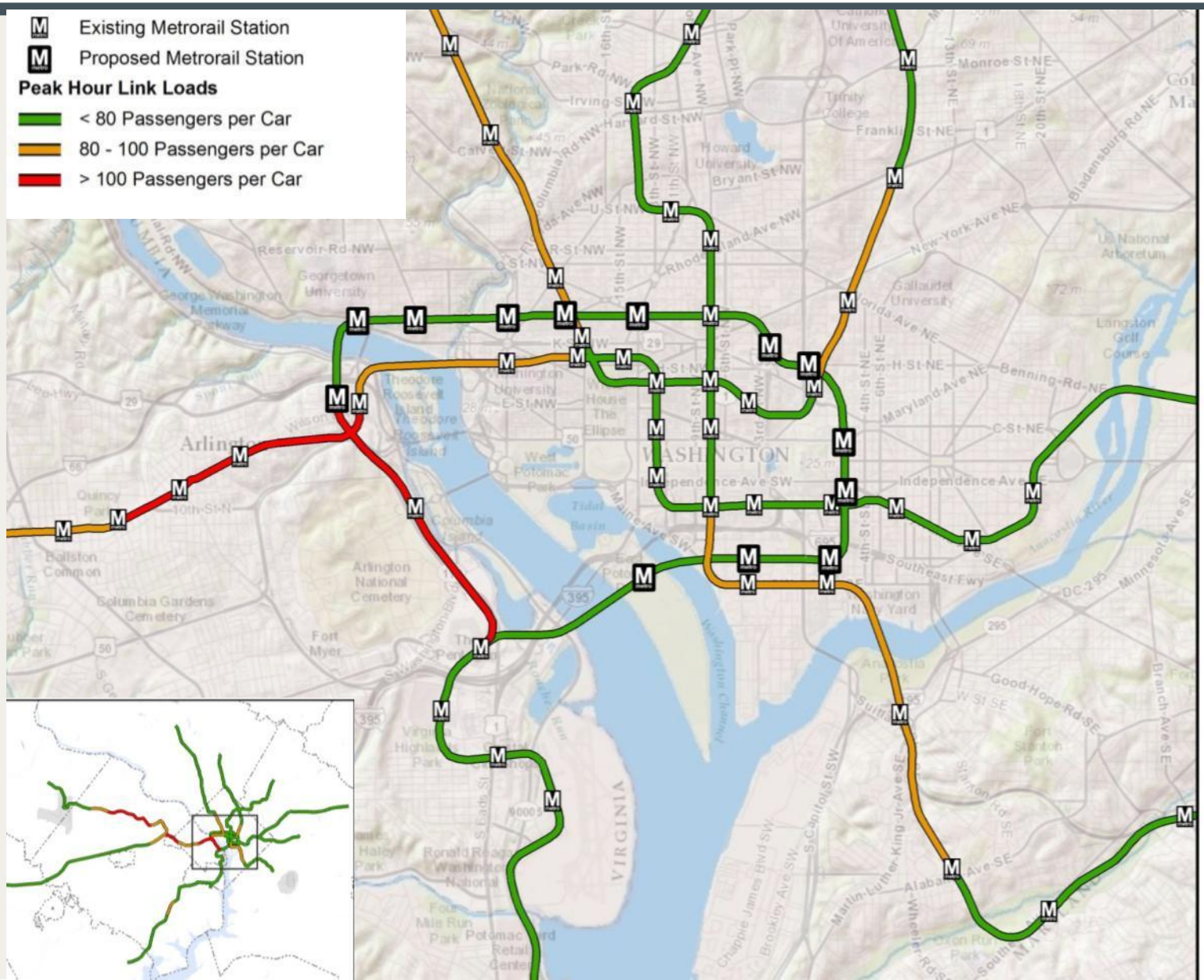
Modeling Results of Core Configurations

- Crowding on Metrorail Lines
- Passenger Miles of Travel on Crowded Trains
- Transfer Volumes at Key Stations

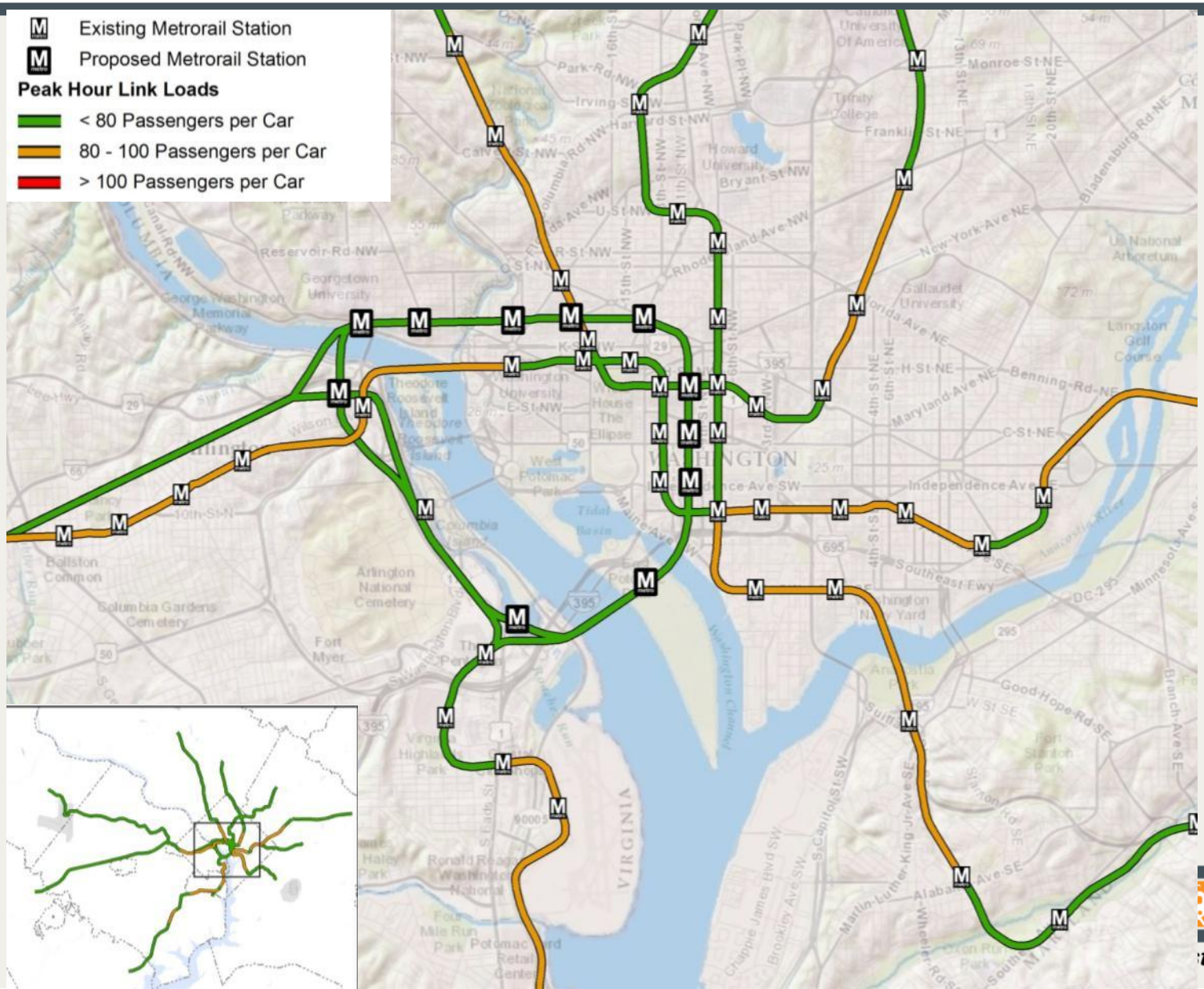
Scenario A Metrorail Line Loads



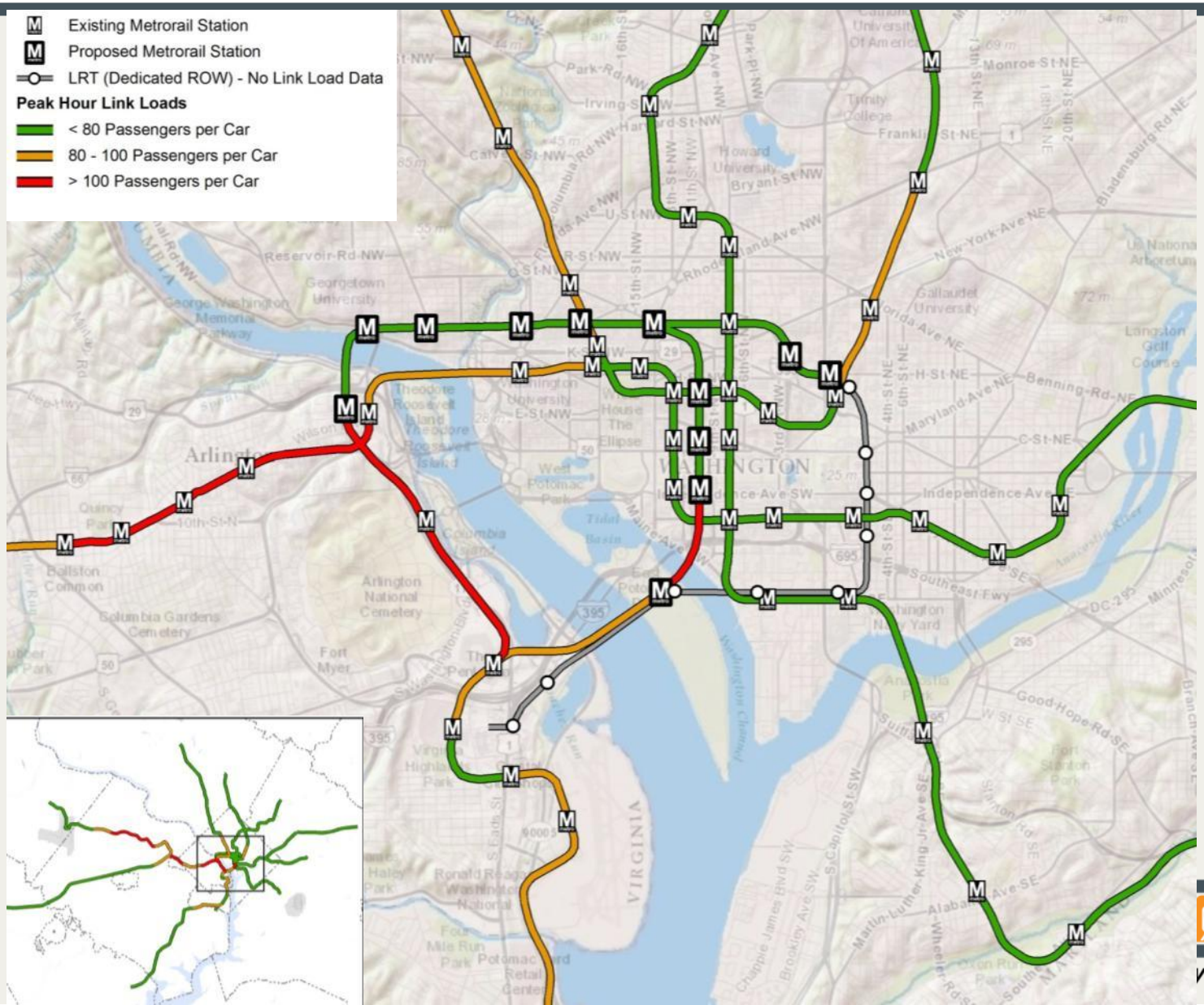
Scenario B Metrorail Line Loads



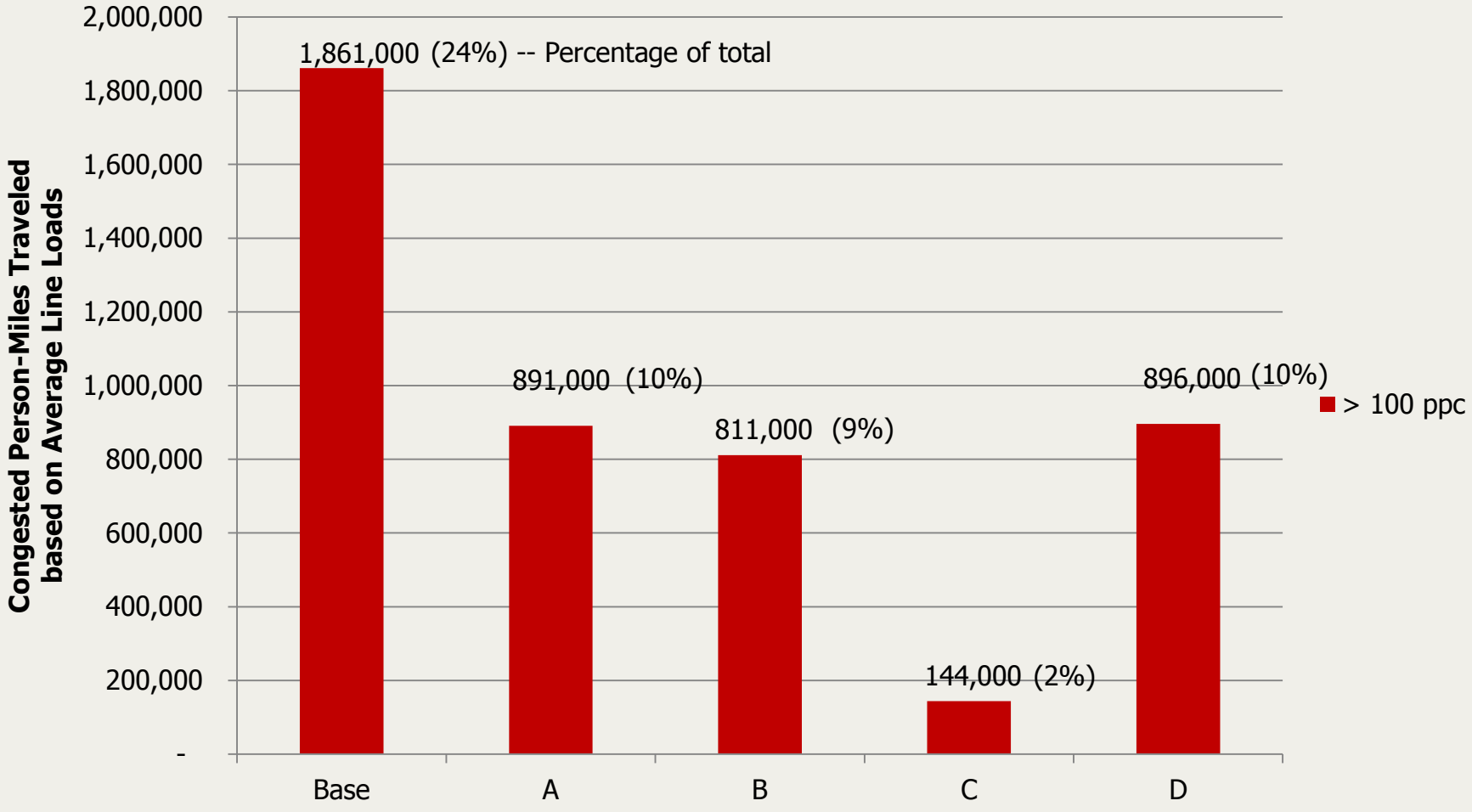
Scenario C Metrorail Line Loads



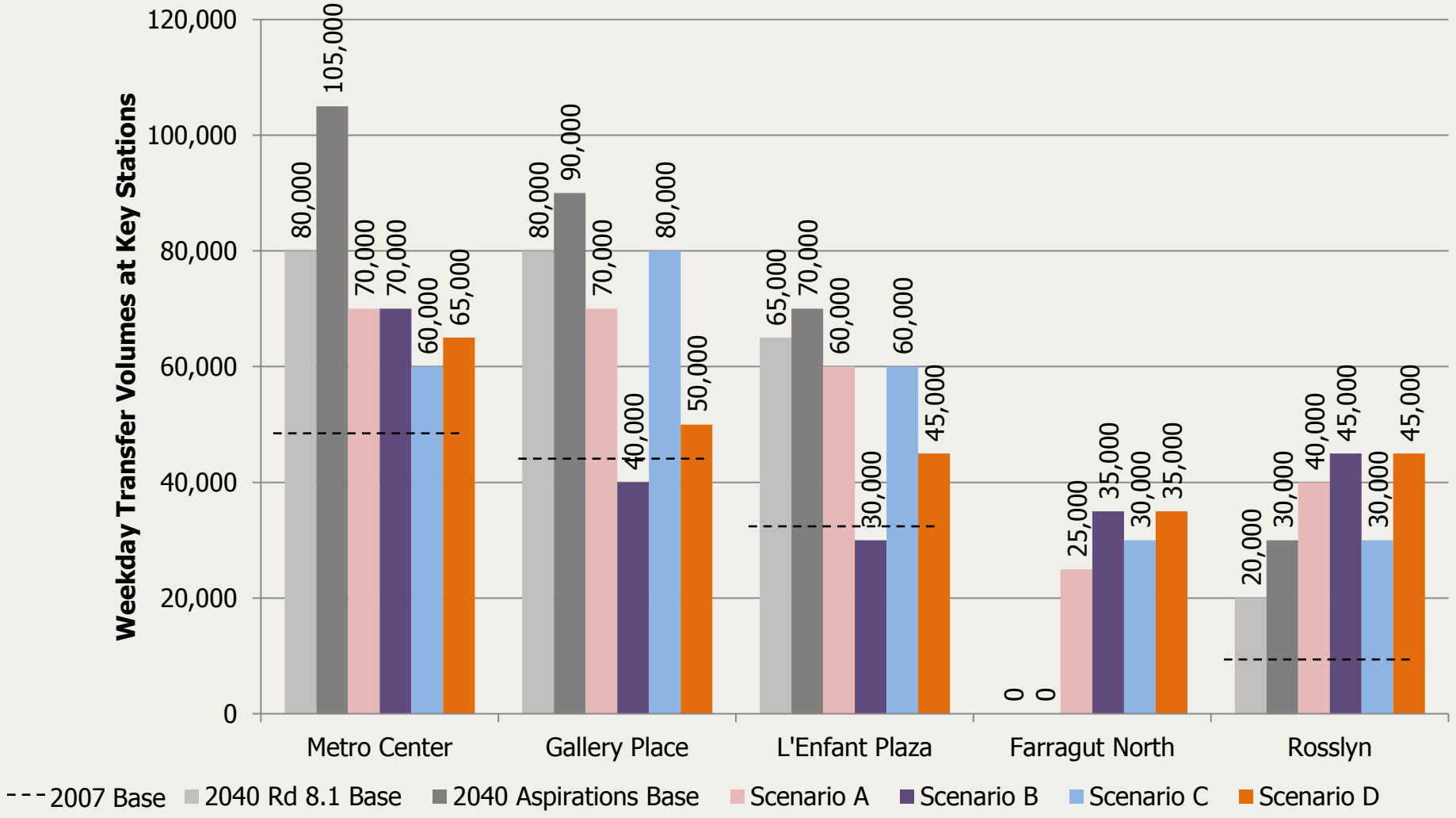
Scenario D Metrorail Line Loads



Congested Passenger-Miles on Metrorail



Daily Transfer Volumes at Key Metrorail Stations

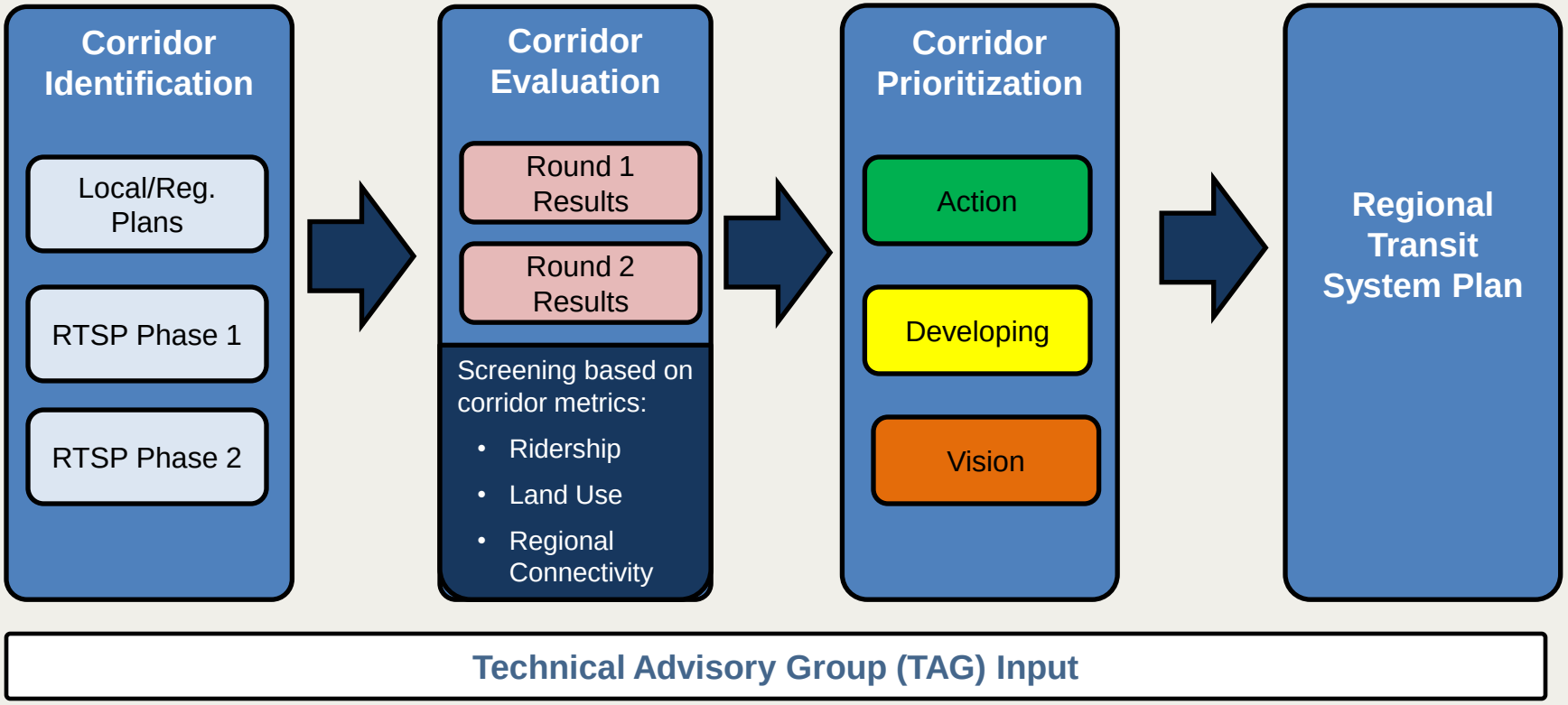


Approach to Evaluate and Prioritize RTSP High-Capacity Transit Corridors

Overview

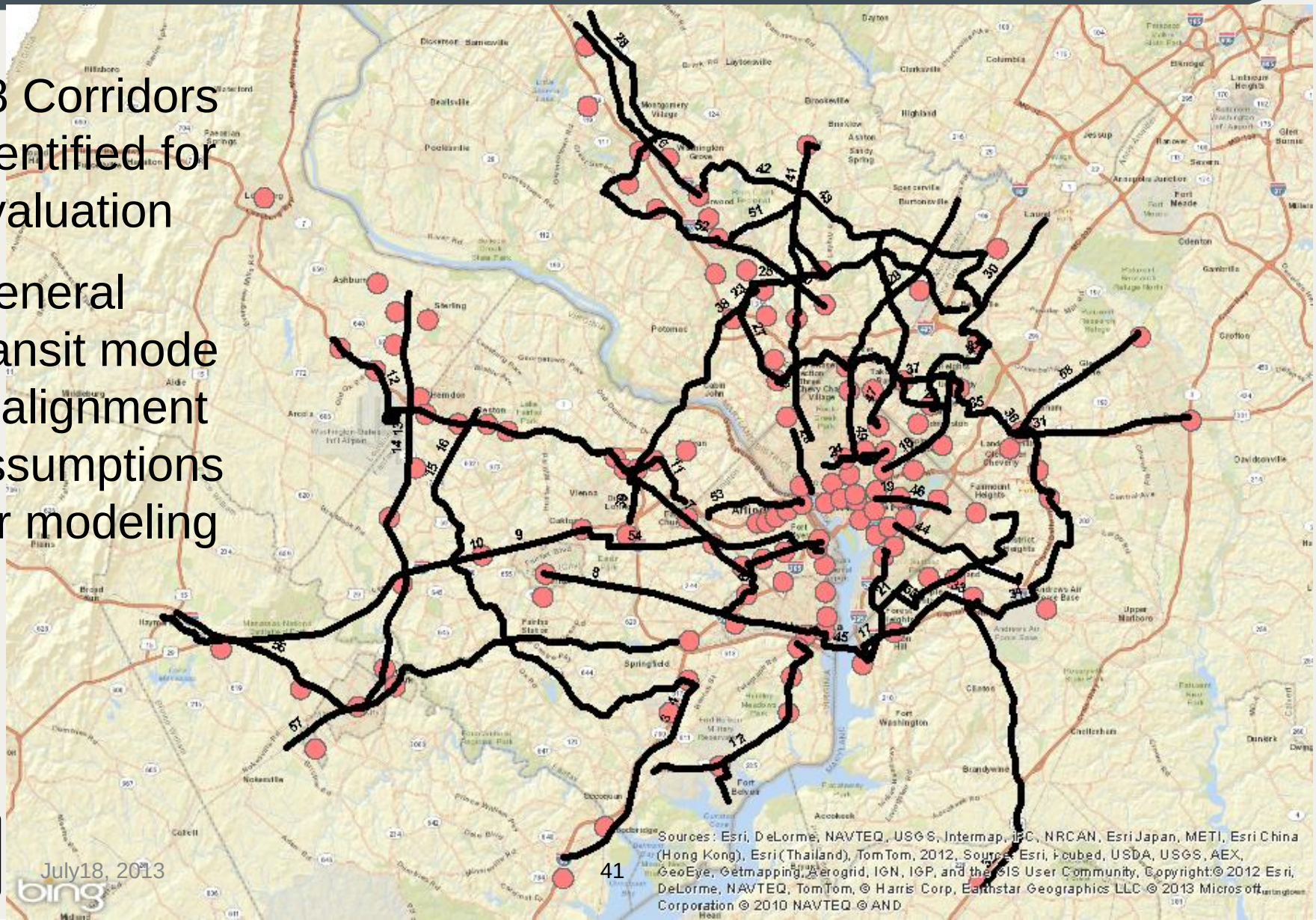
- RTSP analyzed transit improvement/expansion project in two phases
- Components of the future plan can be organized into four major elements:
  1) Future Base Case Network
  2) Core Capacity Improvements
  3) Future High-Capacity Transit Corridors
  4) Land Use and Access Improvements

Corridor Network Development



Corridor Identification

- 58 Corridors identified for evaluation
- General transit mode & alignment assumptions for modeling



Corridor Evaluation

Evaluate Corridor-Specific Metrics

- Ridership
  - Total ridership/mile
  - Ridership within/between Regional Activity Centers (RACs)
- Transit Supportive Land
  - 2040 HH/net acre
  - 2040 Jobs/net acre
- Regional Network Connectivity
  - No. of RACs connected/mile

Corridor Evaluation

Thresholds for Supporting High-Capacity Transit

1. Land Use

Source: TRB Transit Capacity and Quality of Service Manual, 3rd Edition, 2013

Transit Service	Minimum Residential Density	Commercial/Office Density
Local Bus, 2 bus/h	7 du/acre	8-20M sqft.
BRT/LRT, 5 min peak headway	9 du/acre in 25-100 mi^2 corridor	20-50M sqft.
Heavy Rail, 5 min peak headway	12 du/acre in 100-150 mi^2 corridor	> 50M sqft.

2. Ridership

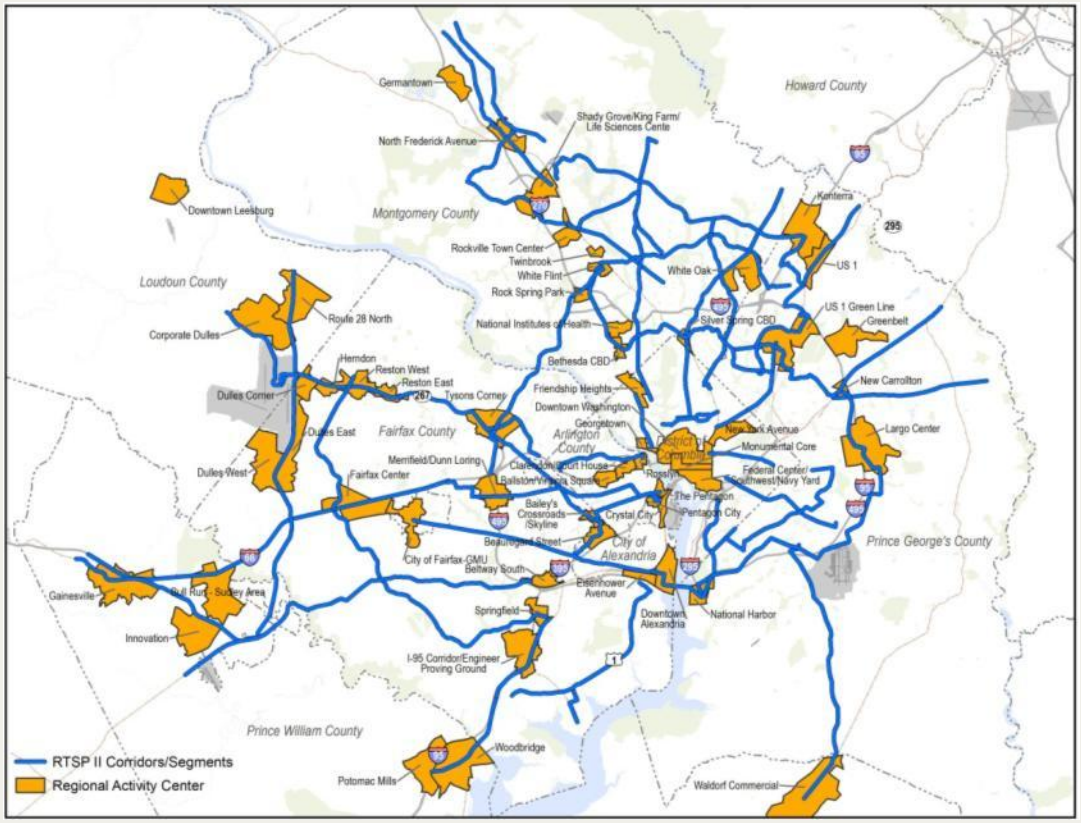
Mode	Weekday Trips/Directional Route Mile
Local Bus	75
Commuter Rail	220
Heavy Rail	7,375
BRT/LRT/Streetcar	1,025

Source: 2010 data, APTA 2012 Public Transportation Fact Book
Note: BRT/LRT based on data for LRT only; weekday trips scaled from system annual trip data

Corridor Evaluation

Thresholds for Supporting High-Capacity Transit

3. Regional Network Connectivity



- Regional Activity Centers per Corridor Mile
- MWCOG to release updated RACs map summer 2013

Corridor Prioritization

Prioritize into tiers based on corridor evaluation

1. Action High Capacity Transit Corridors

Corridors that are most viable for high capacity transit implementation in the near to mid-term.

2. Developing High Capacity Transit Corridors

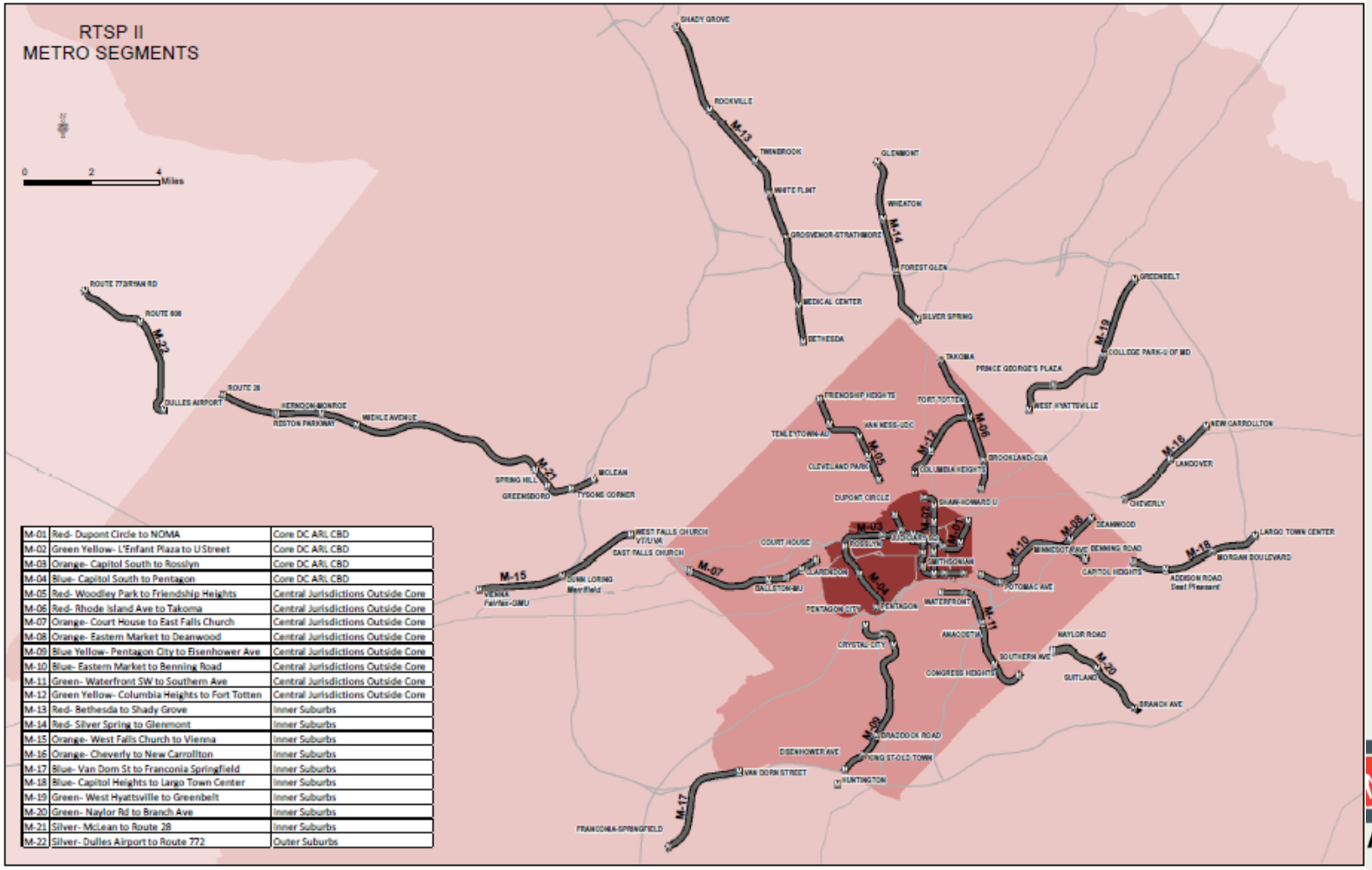
Corridors where projected land use and ridership potential are not supportive of high capacity transit, but which have long-term potential due to political aspirations to create supportive land uses.

3. Vision High Capacity Transit Corridors

Corridors where projected land use and ridership are not supportive of high capacity transit, but may be viable if supportive planning and policy actions are implemented.

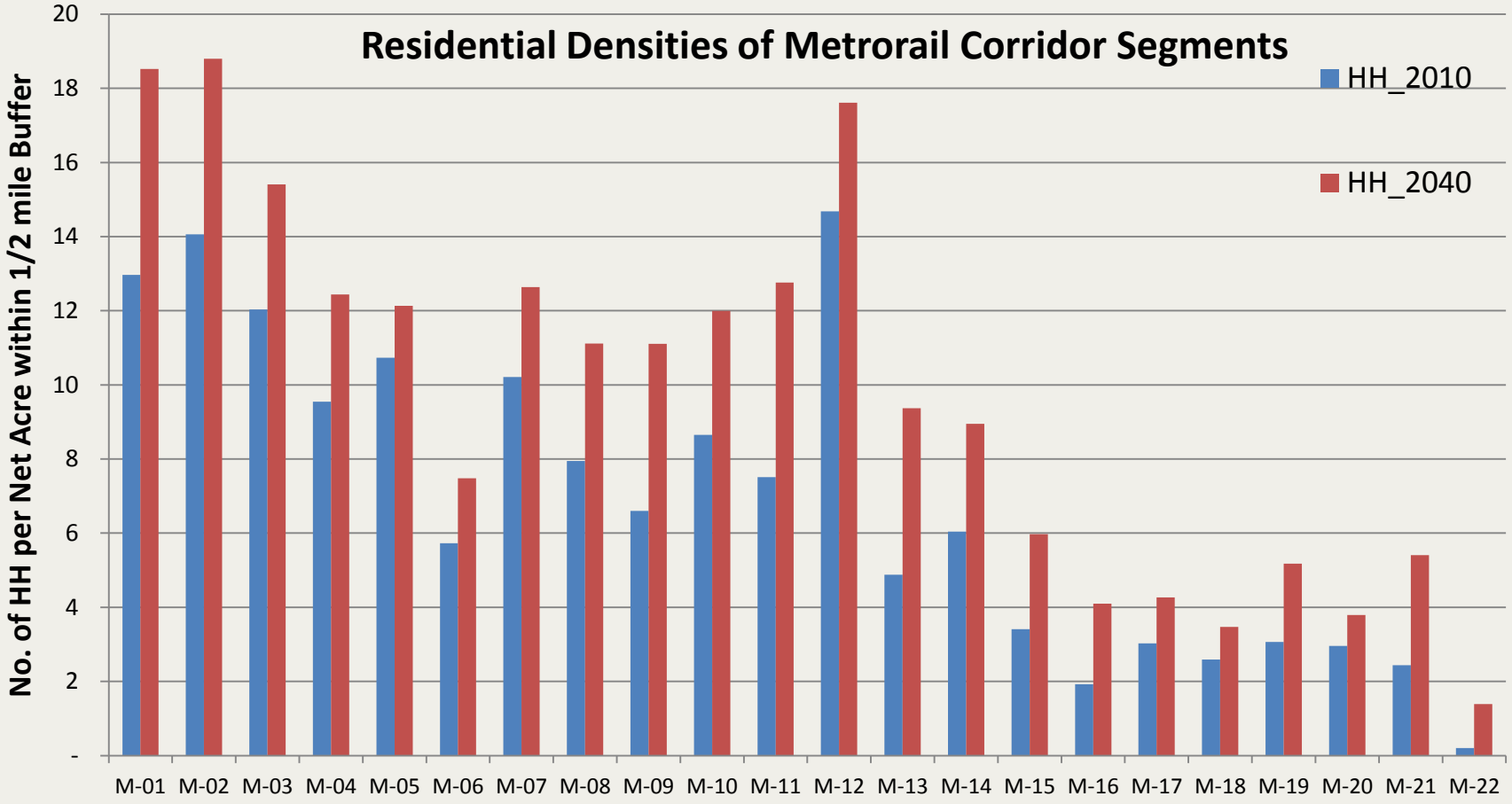
Preliminary Evaluation

Metrorail Corridors as Benchmarking Measure for Transit Supportive Land Use



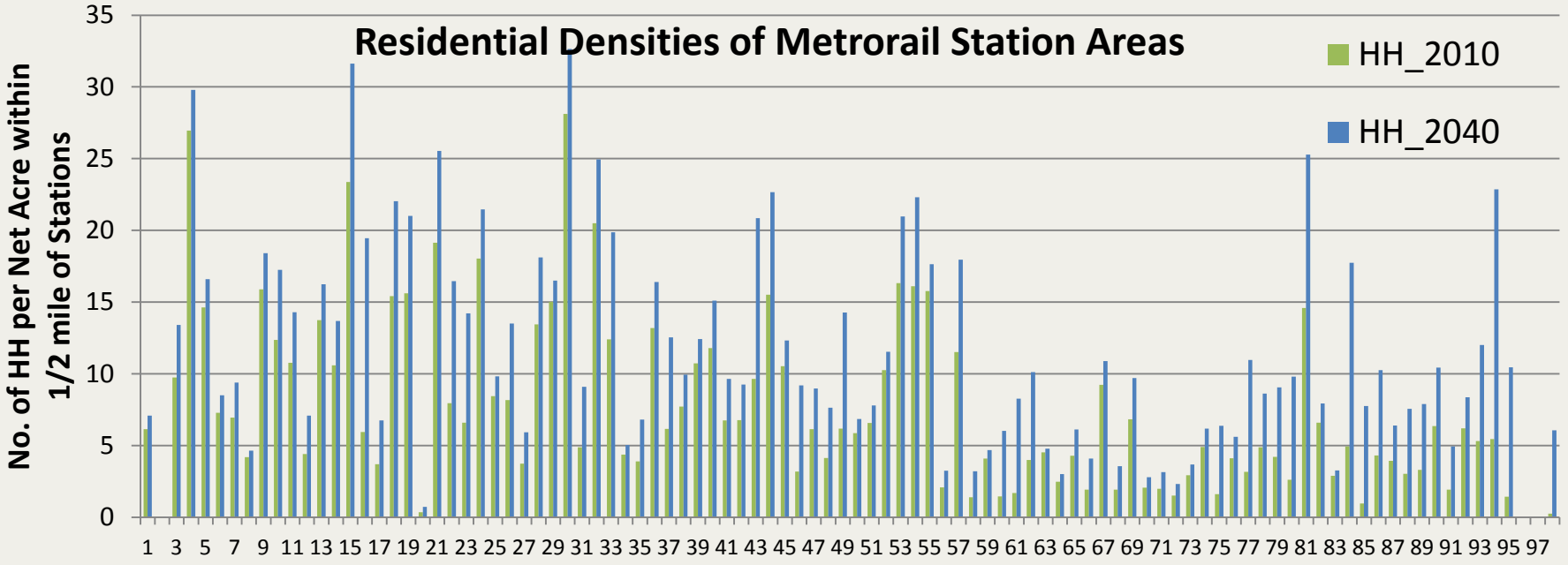
Preliminary Evaluation – Corridor Benchmarks

Metrorail Corridors as Benchmarking Measure



Preliminary Evaluation – Station Benchmarks

Metrorail Stations as Benchmarking Measure



Area	2040 Households Per Acre
Urban Core Average	15
Central Jurisdictions Average	14
Suburban Average	8
System Average	**11**

RTSP – Next Steps

- Summer
  - Meetings with jurisdictions and agencies on final scenario
- Fall
  - Board 2025 Committee presentation
  - Testing of final scenario with Rd 8.1 and Aspirations
- Winter/Spring
  - Final report
  - Board 2025 Committee presentation

Appendix

2040 Weekday Person Trips

	Round 8.1 (thousands)		Aspirations (thousands)	
	Productions	Attractions	Productions	Attractions
Core	525	1,750	575	1,775
Central	2,850	3,000	2,925	3,075
Inner	11,125	10,725	11,550	11,150
Outer	10,450	9,500	10,225	9,300
Total	24,950		25,275	

2040 Weekday Transit Trips

	Round 8.1 (thousands)		Aspirations (thousands)	
	Productions	Attractions	Productions	Attractions
Core	225	1,000	250	1,025
Central	750	500	800	550
Inner	875	475	975	550
Outer	125	-	150	-
Total	1,975		2,150	

2040 Transit Trips by Scenario

	Total Trips	Difference from Base	Metrorail Boardings
Scenario A	2,164,000	148,000	1,352,000
Scenario B	2,151,000	135,000	1,344,000
Scenario C	2,167,000	151,000	1,356,000
Scenario D	2,153,000	137,000	1,297,000
Base with Aspirations	2,016,000	-	1,370,000
Base without Aspirations	1,979,000		

Operating Plan: Round 2 Base

Line Name	Mode	Origin	Destination	Type	Direction	Peak Frequency	Off Peak Frequency
Red	Metro	SHADY GROVE STATION	GLENMONT STATION	Two Way	North-South	2.5	6
Orange	Metro	VIENNA	NEW CARROLLTON	Two Way	East-West	6	12
Silver	Metro	VA772 STATION	LARGO	Two Way	East-West	6	12
Green	Metro	GREENBELT STATION	BRANCH AVE STATION	Two Way	North-South	5	12
Blue	Metro	FRANCONIA/SPRINGFIELD	LARGO	Two Way	South - North - East	10	12
Yellow 1	Metro	MT VERNON SQUARE	HUNTINGTON STATION	Two Way	North-South	6	-
Yellow 2	Metro	FORT TOTTEN	HUNTINGTON STATION	Two Way	North-South	-	12
Yellow 3	Metro	FRANCONIA/SPRINGFIELD	GREENBELT	Two Way	North-South	15	-

Operating Plan: Scenario A

Line Name	Mode	Origin	Destination	Type	Direction	Peak Frequency	Off Peak Frequency
Red	Metro	SHADY GROVE STATION	GLENMONT STATION	Two Way	North-South	2.5	6
Orange	Metro	GAINESVILLE STATION	CRAIN HIGHWAY	Two Way	East-West	4	12
Silver	Metro	VA772 STATION	LARGO	Two Way	East-West	6	12
Green	Metro	GREENBELT STATION	BRANCH AVE STATION	Two Way	North-South	4	10
Blue 1	Metro	POTOMAC MILLS	POTOMAC MILLS	Small Loop	Clockwise	5	12
Yellow	Metro	HUNTINGTON STATION	HUNTINGTON STATION	Small Loop	Counter-clockwise	8.6	12
Blue 2	Metro	FRANCONIA/SPRINGFIELD	FRANCONIA/SPRINGFIELD	Small Loop	Counter-clockwise	8.6	-

Operating Plan: Scenario B

Line Name	Mode	Origin	Destination	Type	Direction	Peak Frequency	Off Peak Frequency
Red	Metro	SHADY GROVE STATION	GLENMONT STATION	Two Way	North-South	2.5	6
Orange	Metro	GAINESVILLE STATION	CRAIN HIGHWAY	Two Way	East-West	4	12
Silver	Metro	VA772 STATION	LARGO	Two Way	East-West	6	12
Green	Metro	GREENBELT STATION	BRANCH AVE STATION	Two Way	North-South	4	10
Blue 1	Metro	POTOMAC MILLS	POTOMAC MILLS	Large Loop	Counter-clockwise	6	12
Yellow	Metro	HUNTINGTON STATION	HUNTINGTON STATION	Large Loop	Clockwise	6	12
Blue 2	Metro	FRANCONIA/SPRINGFIELD	FRANCONIA/SPRINGFIELD	Large Loop	Clockwise	10	-

Operating Plan: Scenario C

Line Name	Mode	Origin	Destination	Type	Direction	Peak Frequency	Off Peak Frequency
Red	Metro	SHADY GROVE STATION	GLENMONT STATION	Two Way	North-South	2.5	6
Orange 1	Metro	GAINESVILLE STATION	CRAIN HIGHWAY	Two Way	East-West	6	12
Silver 1	Metro	VA772 STATION	LARGO	Two Way	East-West	6	12
Green	Metro	GREENBELT STATION	BRANCH AVE STATION	Two Way	North-South	4	10
Blue 1	Metro	POTOMAC MILLS	POTOMAC MILLS	Small Loop	Clockwise	6	12
Yellow	Metro	HUNTINGTON STATION	HUNTINGTON STATION	Small Loop	Counter-clockwise	6	12
Blue 2	Metro	FRANCONIA/SPRINGFIELD	FRANCONIA/SPRINGFIELD	Small Loop	Counter-clockwise	10	-
Silver 3	Metro	VA772 STATION	VA772 STATION	Small Loop	Clockwise	6	-
Orange 2	Metro	GAINESVILLE	GAINESVILLE	Small Loop	Counter-clockwise	6	-
Silver 2	Metro	DULLES AIRPORT	DULLES AIRPORT	Small Loop	Clockwise	-	12

Operating Plan: Scenario D

Line Name	Mode	Origin	Destination	Type	Direction	Peak Frequency	Off Peak Frequency
Red	Metro	SHADY GROVE STATION	GLENMONT STATION	Two Way	North-South	2.5	6
Orange	Metro	GAINESVILLE STATION	CRAIN HIGHWAY	Two Way	East-West	4	12
Silver	Metro	VA772 STATION	LARGO	Two Way	East-West	6	12
Green	Metro	GREENBELT STATION	BRANCH AVE STATION	Two Way	North-South	4	10
Blue	Metro	POTOMAC MILLS	UNION STATION	Two Way	North-South	4	12
Yellow	Metro	HUNTINGTON STATION	THOMAS CIRCLE	Two Way	North-South	6	12