Washington Metropolitan Area Transit Authority

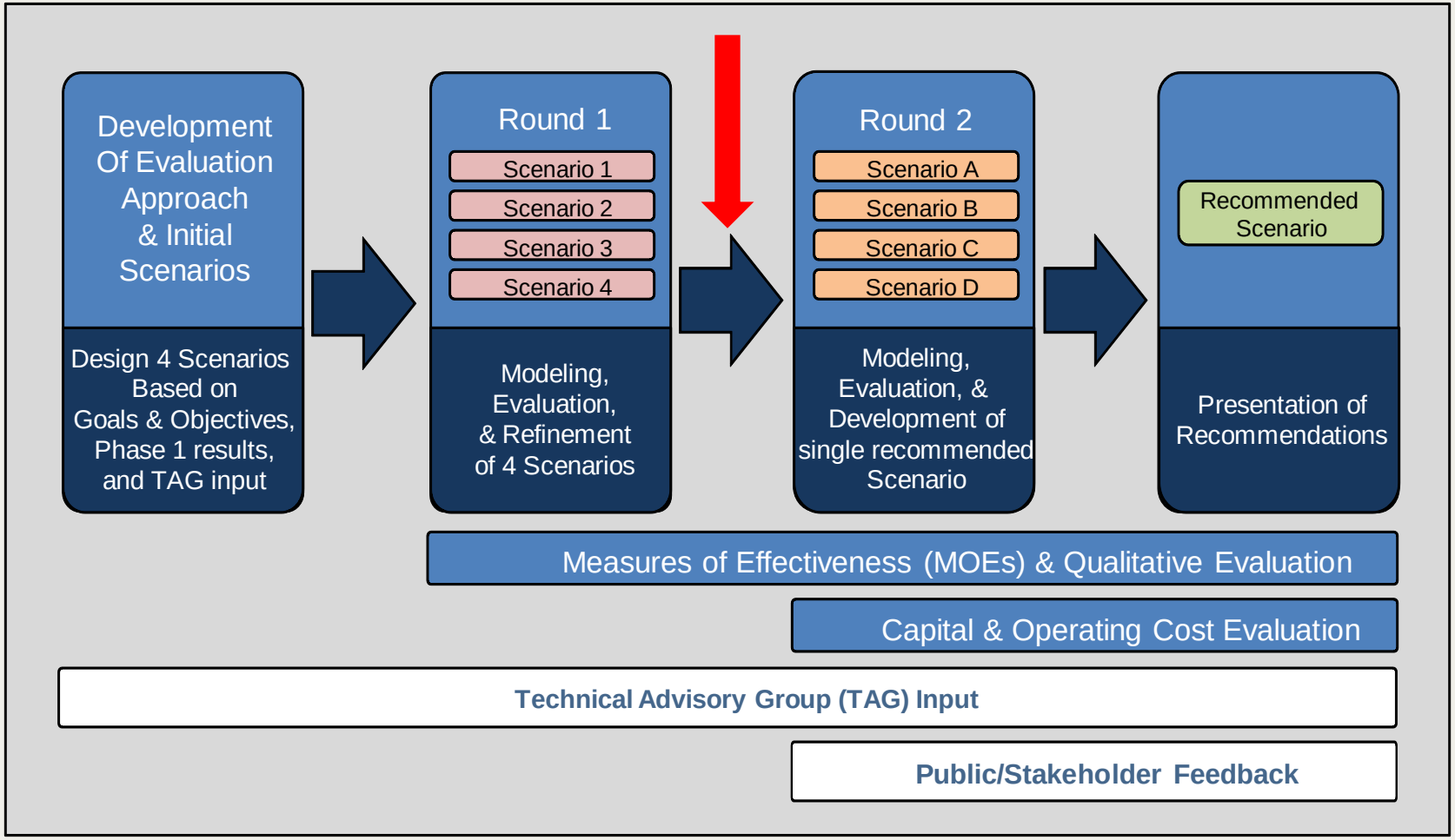
RTSP Phase II: Review of Round 1 Scenarios Preliminary Results

Draft Presentation to the Technical Advisory Group

For September 20, 2012 Meeting

Regional Transit System Plan

Process Overview



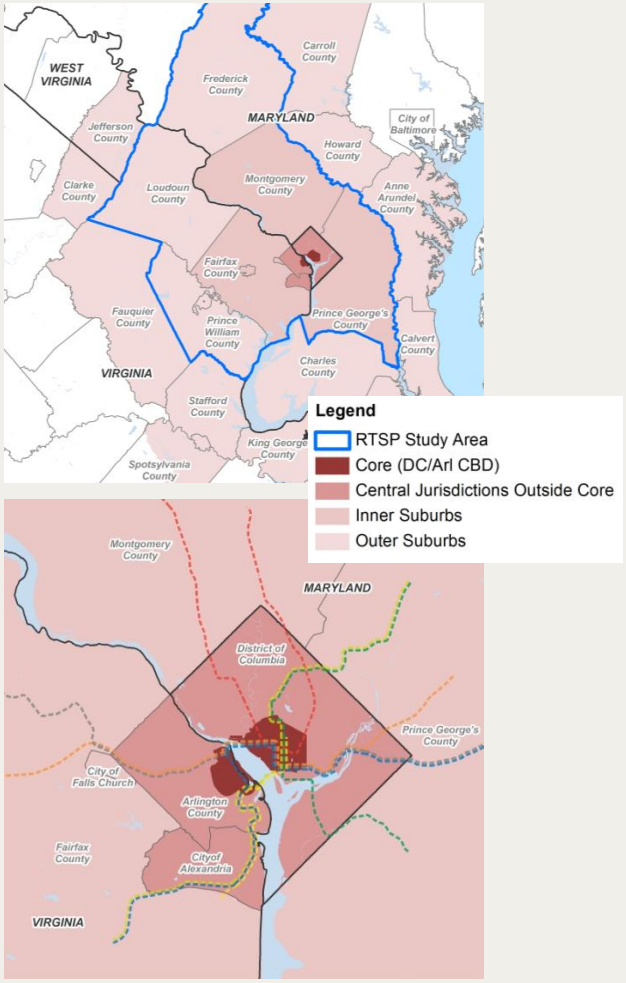
We are here

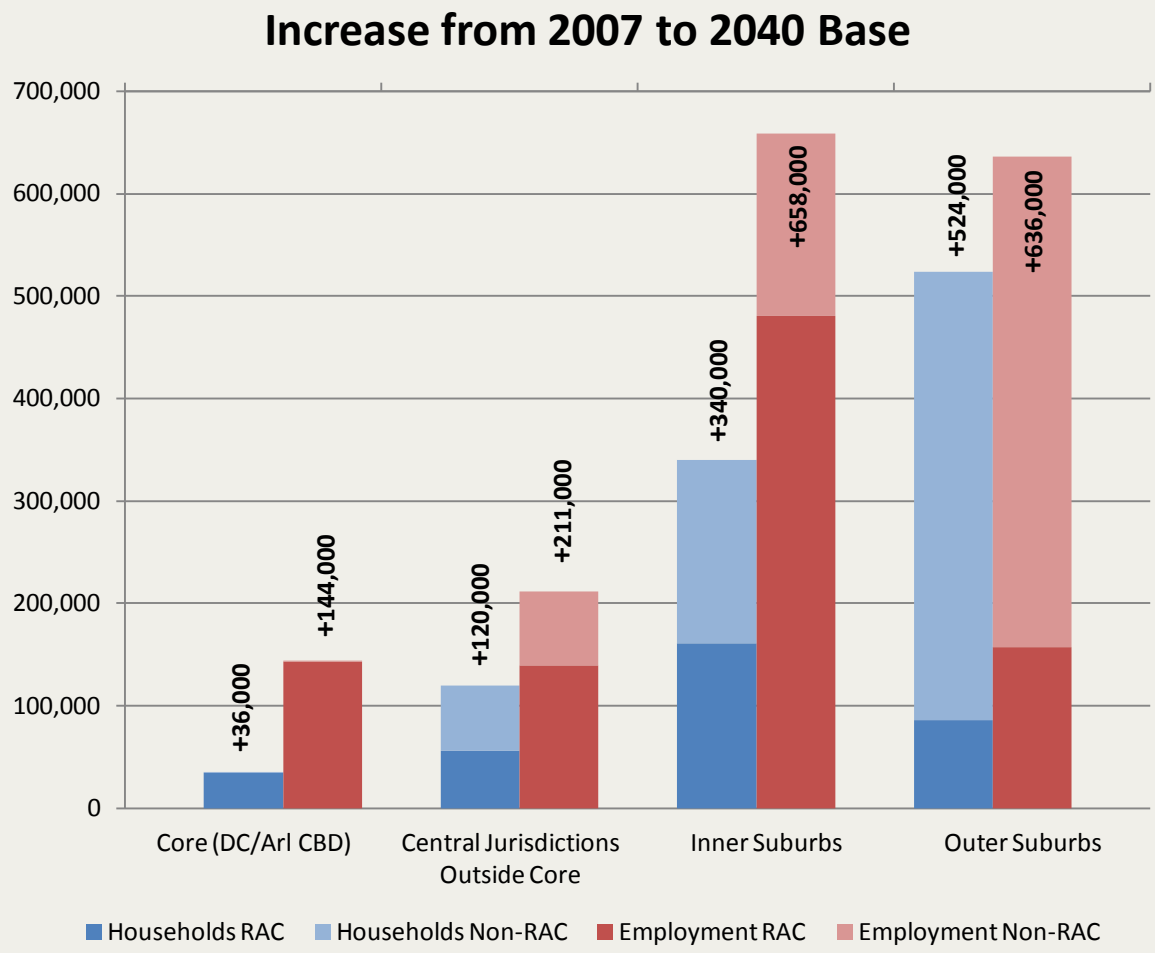
Change to 2040 Base Case

- Round 8.0 COG Cooperative land use forecasts (vs Round 7.2A Phase 1)
- TPB's Version 2.3 Travel Forecasting Model
- Extend Silver Line to Largo (peak only)
- Constrained parking at Metrorail stations
- TIGER-Grant funded Bus Priority Projects

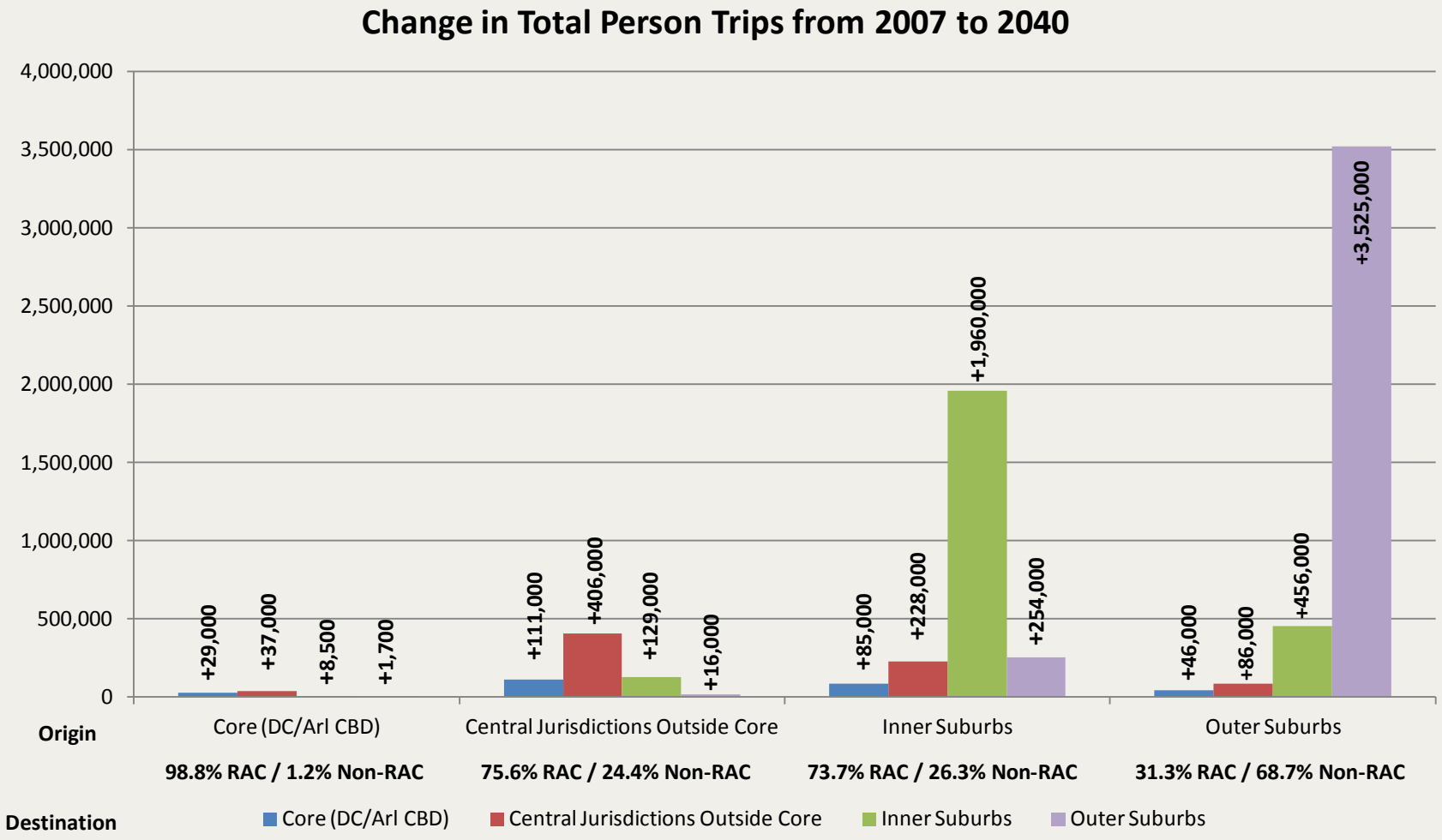
- CLRP Updates since RTSP Phase 1:
  - District of Columbia
    - Anacostia Streetcar Phase 2
    - H St./Benning Rd NE Streetcar
    - K St. NW Transitway
  - Virginia
    - Fairfax County/Franconia/Springfield Pkwy HOV
    - I-95 Express lanes, new bus service
    - BRT from Van Dorn to Pentagon
  - Maryland
    - Bus enhancements, University Blvd & Veirs Mill Rd (*removed*)

Land Use in Modeling Area



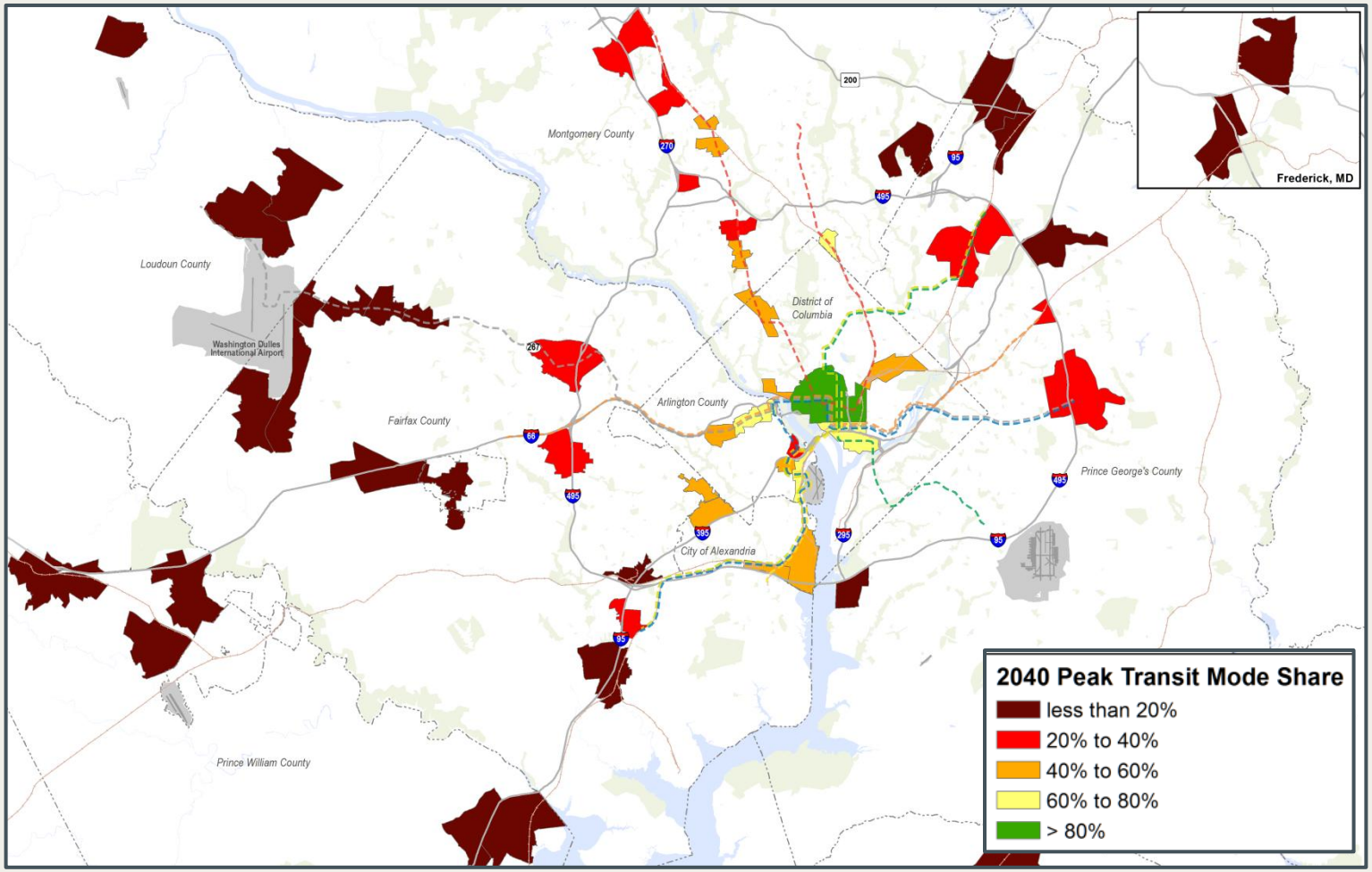


Change in Person Trips



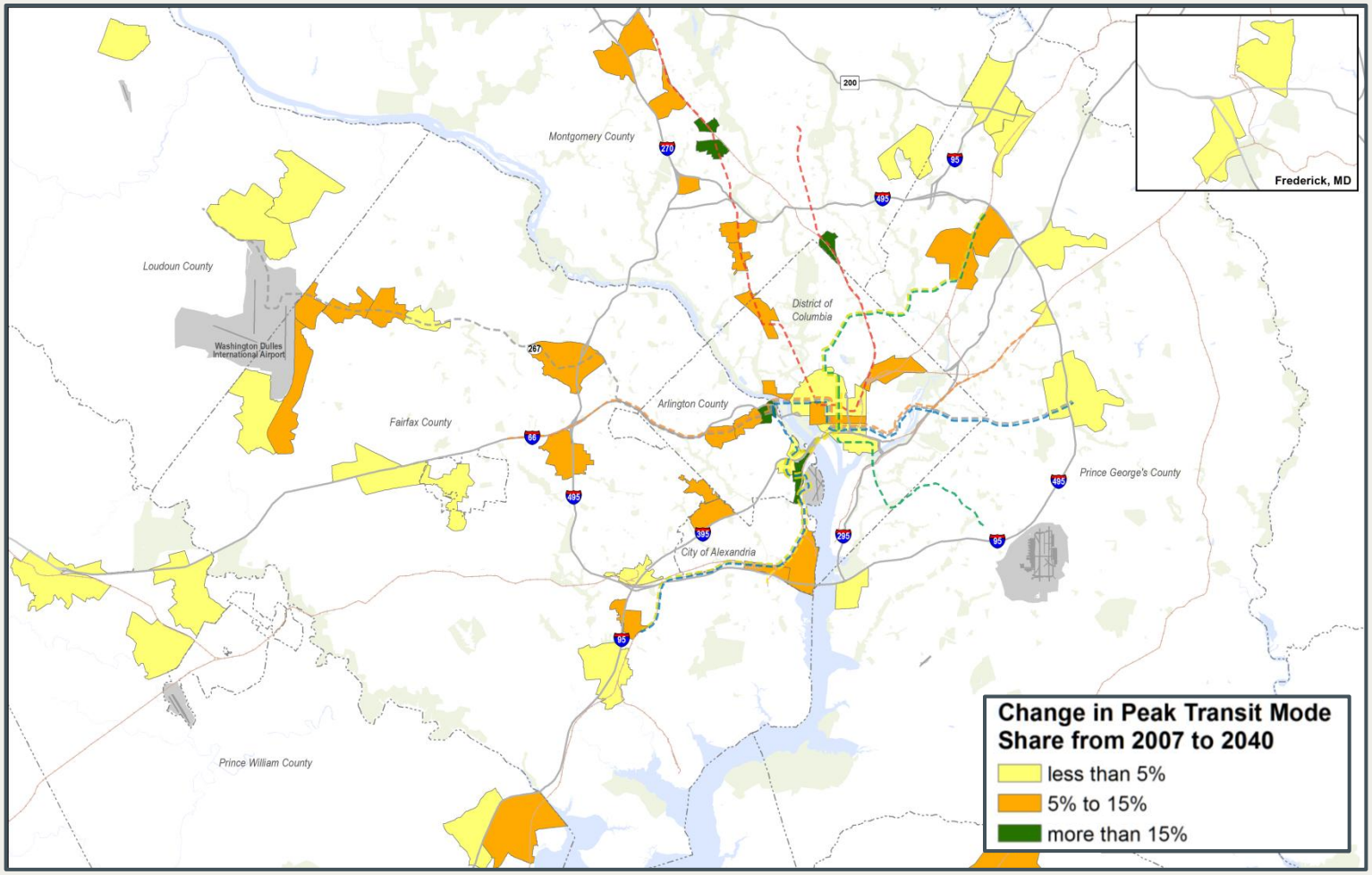
2040 Transit Peak Mode Share

2040 Base Peak Period Transit Mode Share for RACs



2007 Compared to 2040 Base Case

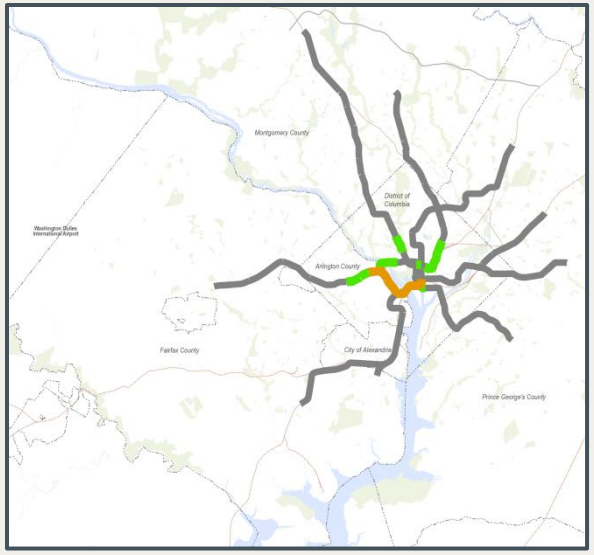
Change in Peak Transit Mode Share in RACs from 2007 to 2040



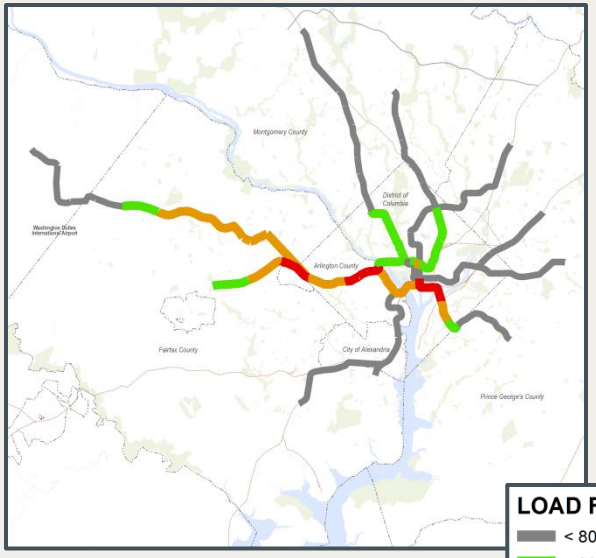
2007 and 2040 Base Case Peak Link Loads

What is the result of 100% 8-car trains?

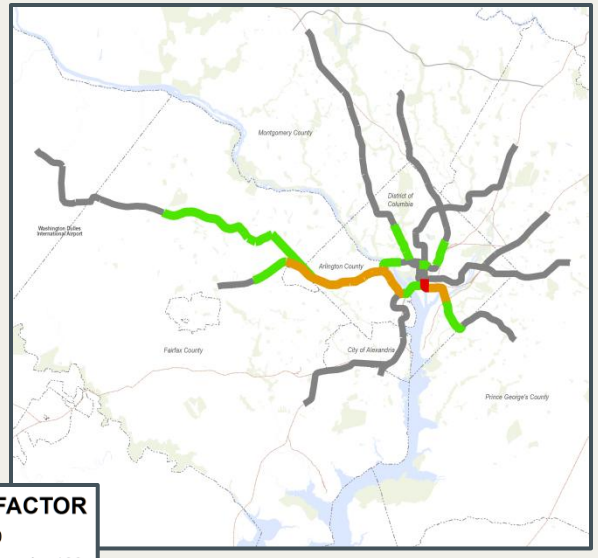
Mix of 6/8 Car Trains (2007)



50% 8 Car Trains (2040)



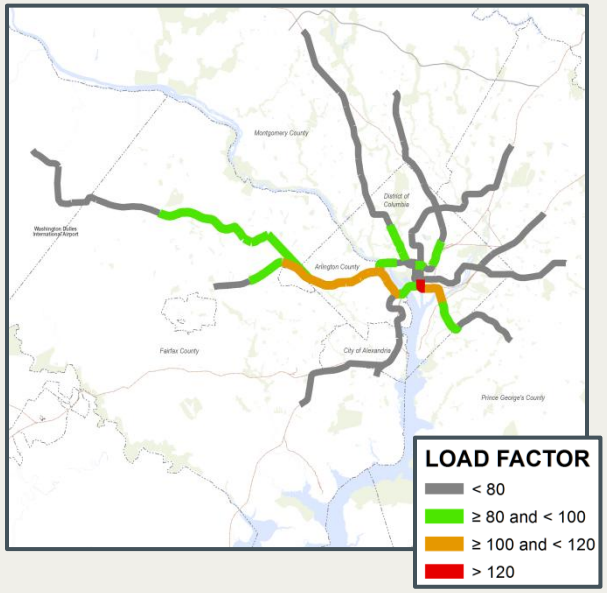
100% 8 Car Trains (2040)



Key Findings – Base Case

- CLRP primarily supports residents in non-core central jurisdictions and inner suburbs.
  - Increases direct RAC-RAC connections
  - Increases percentage of jobs and HH within ½ of high-frequency/high-speed transit
- 50%+ increase of linked transit trips, of which 60% will occur on Metrorail
- 100% 8-car trains plus additional surface transit increases ridership and mode share, but overcrowding remains.
  - More pressure on transfer stations and park and ride lots

100% 8 Car Trains (2040)



Components of the Scenarios

Summary of Scenarios

1. Maximize existing infrastructure
2. Expand surface transit – no increase in Metro track
3. Address core capacity only
4. Expand surface and Metrorail

STRATEGIES	SCENARIO			
	1	2	3	4
Premium Bus				
Priority Corridor Network Plan			X	
Enhanced Priority Corridor Network	X	X		X
Transitway to Charles County	X	X		X
Enhanced Commuter Bus Network	X	X		X
Streetcar and LRT				
LRT Expansion including Purple Line Extension to Virginia and to White Oak, MD		X		
Streetcar network with extensions and cross jurisdictional connections		X		
Streetcar Network as planned by jurisdictions			X	
Metrorail				
Pedestrian Tunnels at the Farraguts and Metro Center	X	X	X	X
Infill Station at St Elizabeth's	X		X	X
Infill Station at Kansas Avenue	X			X
Interline Connection to bypass Rosslyn	X		X	
Interline Connection to bypass Pentagon			X	
Relocated Yellow Line via 10th Street to Thomas Circle			X	
Relocated Yellow Line via 2nd St SE/NE, extended via N Capitol & Georgia to Silver Sp				X
New Blue Line on M St NW, NJ Ave, H St NE				X
Pedestrian Tunnels along relocated Blue/Yellow Lines			X	X
Metrorail Extensions on Orange (MD & Va) and Blue Lines (Va)				X
Beltway Line Links across Potomac River				X
Commuter Rail				
Commuter Rail Service Enhancements	X	X	X	X
Commuter Rail Extensions – VRE to Haymarket and MARC across the Potomac	X	X		X
Park and Ride				
Remote Park and Ride Lot				X

Round 1 Scenario Results: Regional Measures

RTSP Goals

Goal 1: Enhance Environmental Quality, Improve Energy Efficiency, and Protect Human Health and Safety

Goal 2: Facilitate Transit-Oriented, Mixed-Use Communities that Capture Employment and Household Growth, Providing Choices in where to Live, Work, and Play

Goal 3: Maximize Access to and Availability of Integrated and Convenient Transit Choices

Goal 4: Provide a High-Quality Transit System that Accommodates and Encourages Future Ridership Growth

Goal 5: Provide a Financially Viable and Sustainable Transit System that is Efficient and Effective for the Region

Overview of Measures of Effectiveness

Differentiator MOEs

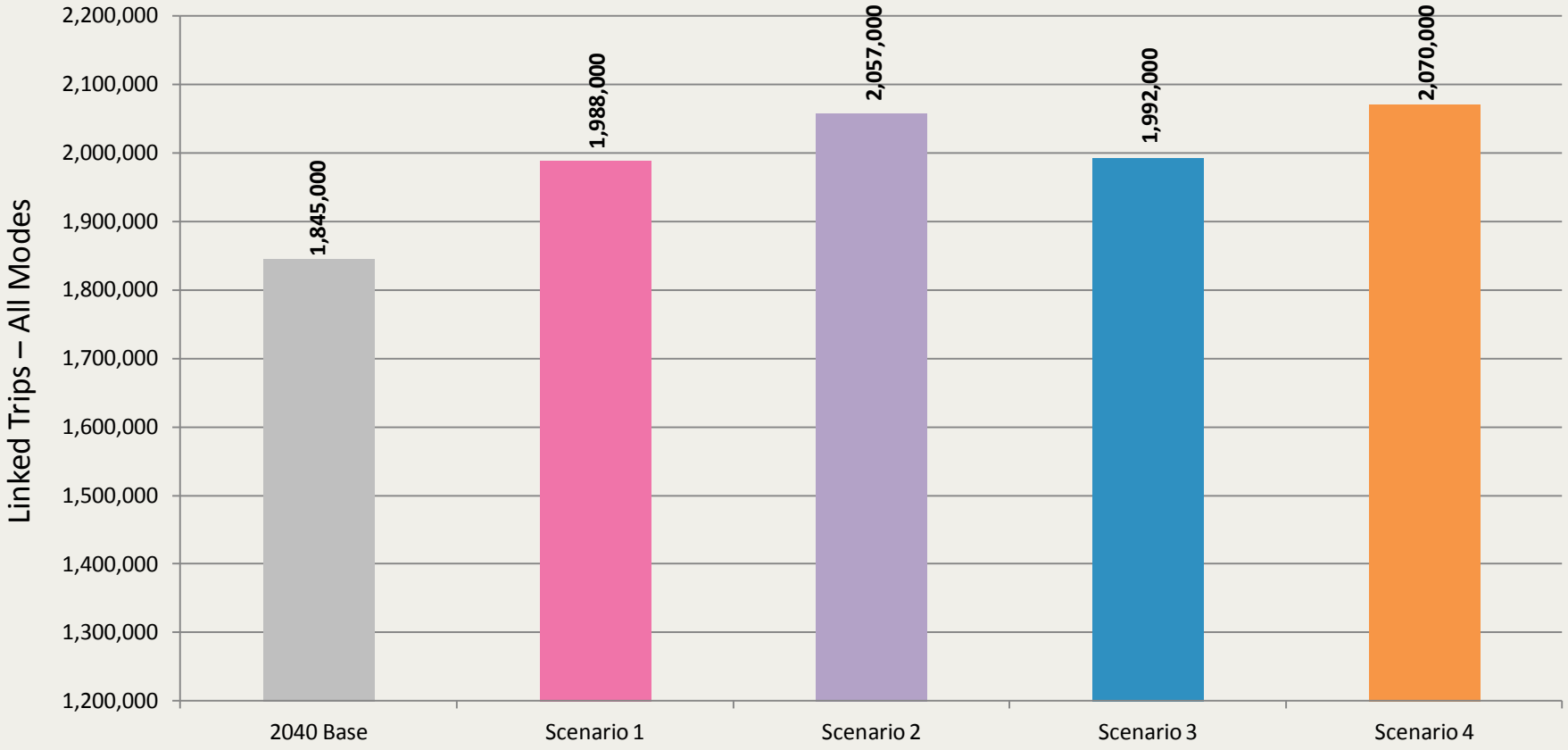
- **Total transit linked trips**
- **Transit mode share to/from RACs**
- **Transit mode share outside RACs**
- **Households and jobs within 1/2 mile of high-frequency/higher-speed transit stops**
- **Vehicle-miles traveled**
- **User benefits inside and outside RACs** (travel time savings)
- **Number of RACs served by high-frequency/higher-speed transit service**
- **Number of direct connections between RACs**
- **Transit link congestion/capacity**
- **Metrorail transfer capacity**
- **Transit peak orientation factor**
- **Metrorail parking availability**

Non-Differentiator MOEs

- **Households that can be reached by transit and auto within 45 minutes from employment**
- **Incidents per 1 million passenger miles**
- **Congested person-miles of travel**
- **Transit utilization**
- **Households within 1/2 mile of any transit**
- **Jobs within 1/2 mile of any transit**
- **Transit mode share by subregion**
- **Evenness of distribution of user benefits**
- **Platform volume to capacity ratio** (Round 2)
- **Capital and operating costs/passenger mile** (Round 2)

Total Transit Linked Trips

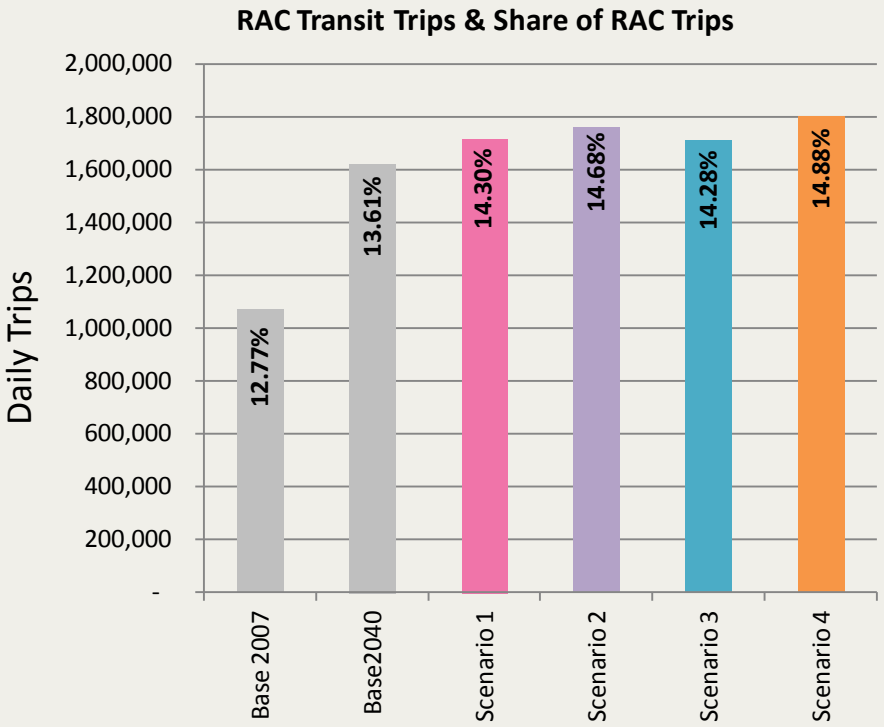
Objective 3.1-Maximize transit network coverage and improve mobility throughout the region for residents, employees and visitors

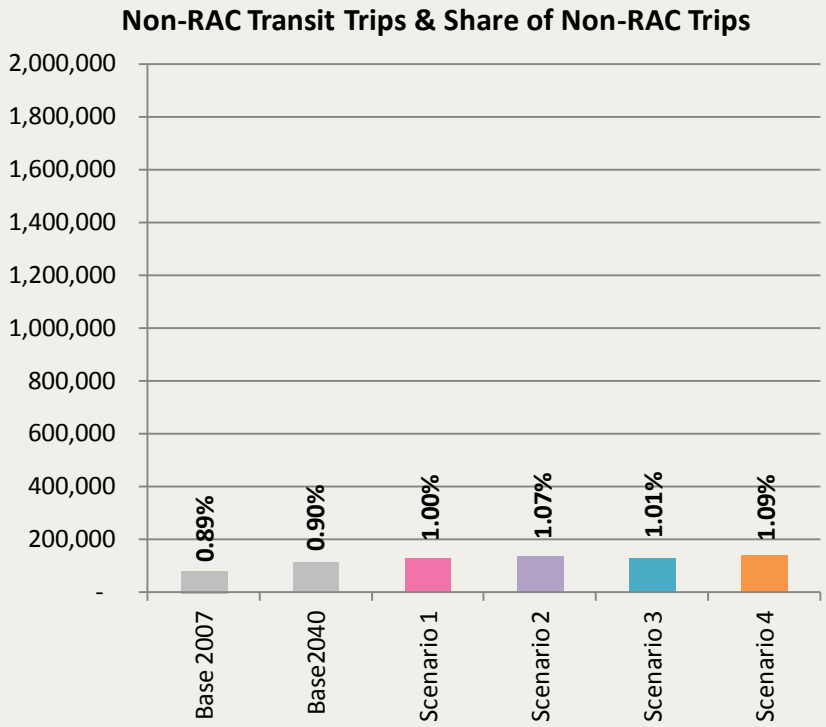


2007 Base = 1,161,000

Transit Mode Share To/From RACs and Outside RACs

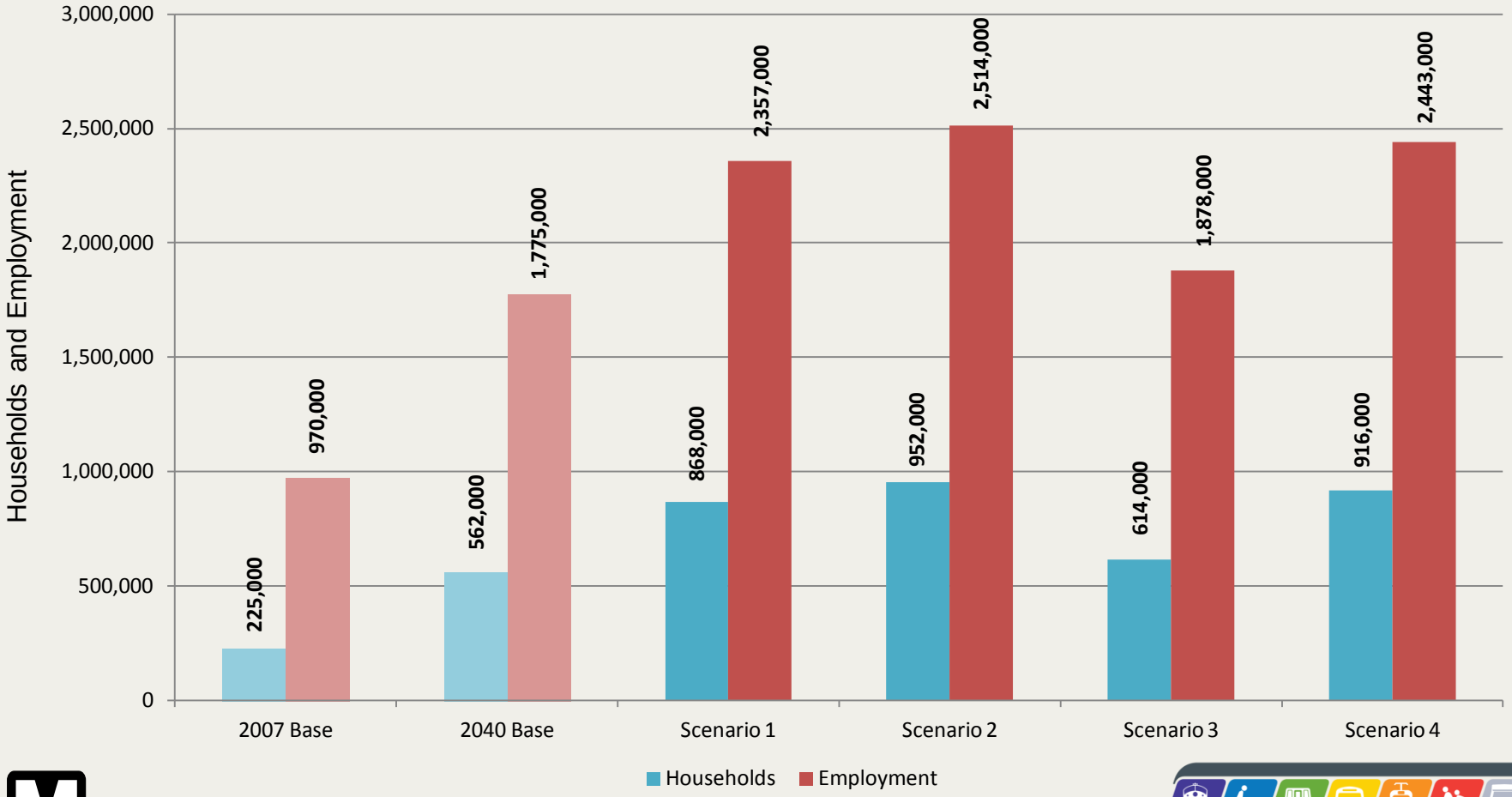
Objective 2.1 – Provide highly desirable transit choices that support household and employment growth in Regional Activity Centers and mixed-use corridors
Objective 2.2 – Continue to provide attractive transit options to support existing and planned development outside of Regional Activity Centers



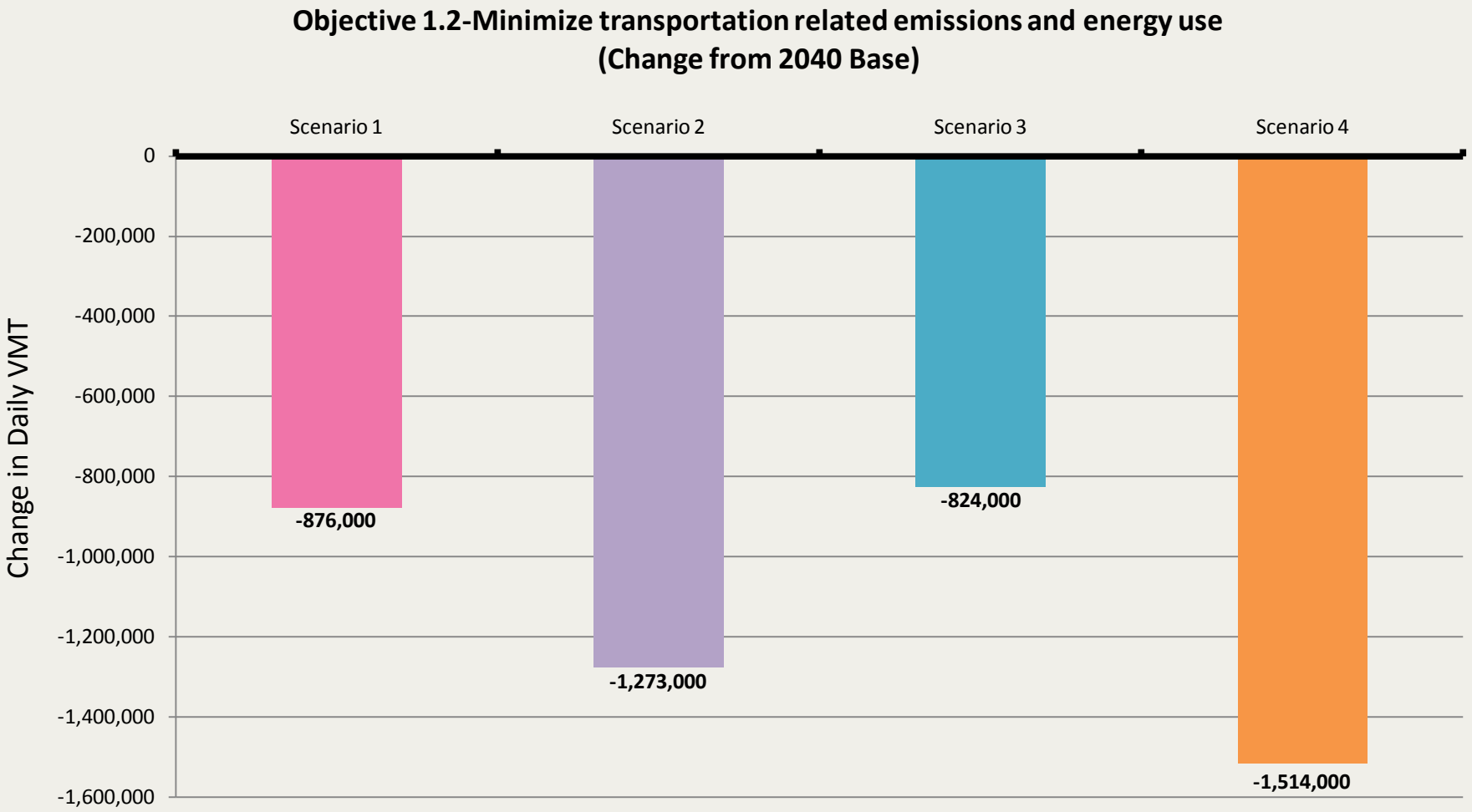


HH & Jobs Within ½ Mile of High Frequency-High Speed Transit

Objective 3.2 – Improve availability of and multimodal access to transit stations and stops served by high-frequency, higher-speed service



Vehicle Miles Traveled

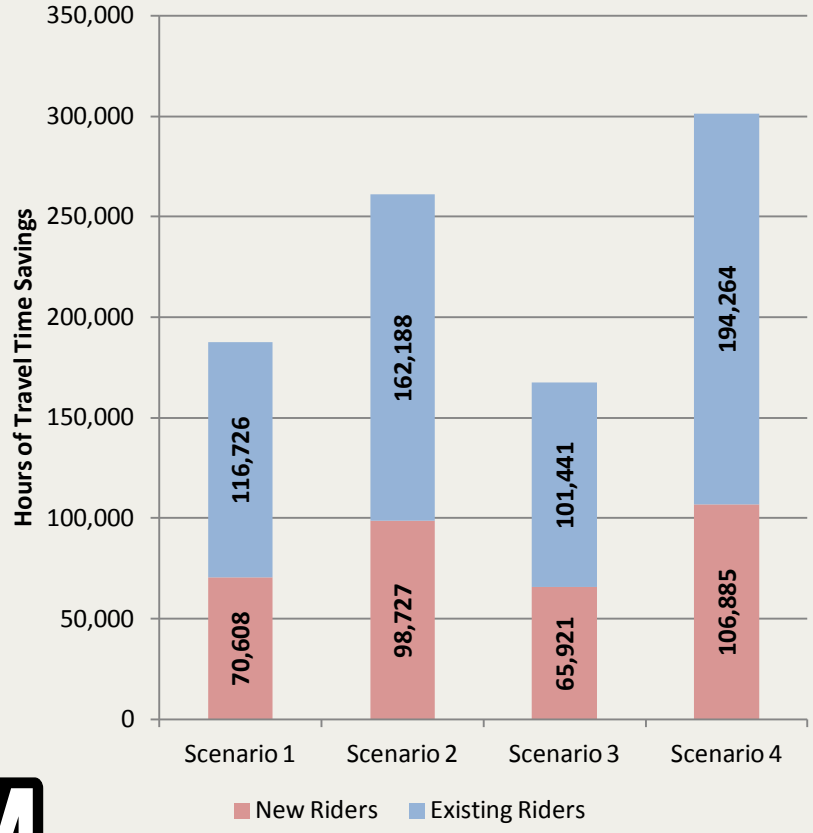


User Benefits

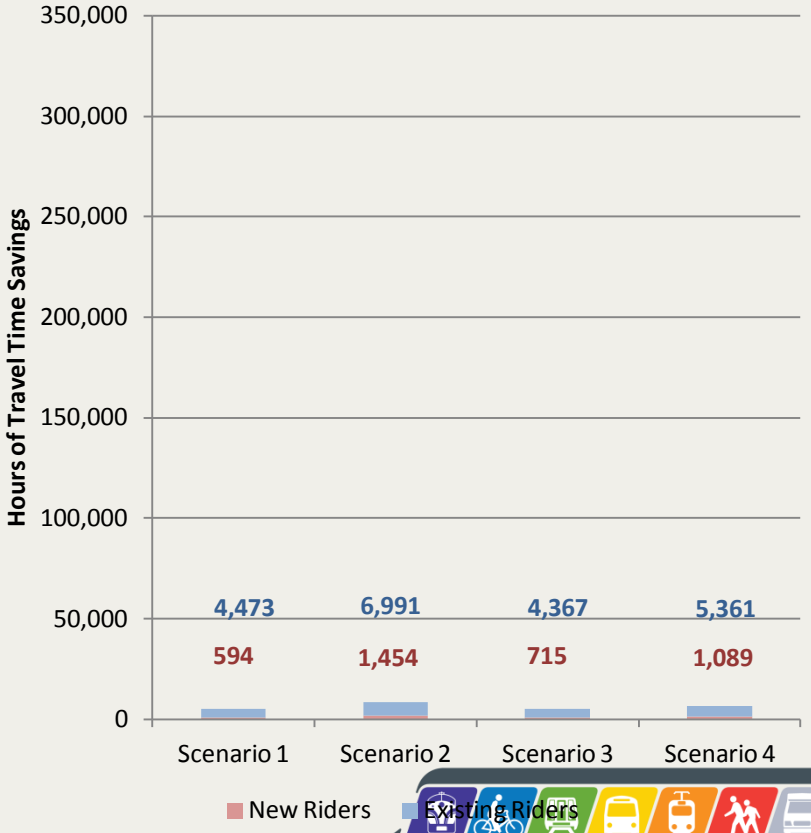
Objective 2.1 – Provide highly desirable transit choices that support household and employment growth in Regional Activity Centers and mixed-use corridors

Objective 2.2 – Continue to provide attractive transit options to support existing and planned development outside of Regional Activity Centers

Daily travel time savings for trips with one or both ends in RACs



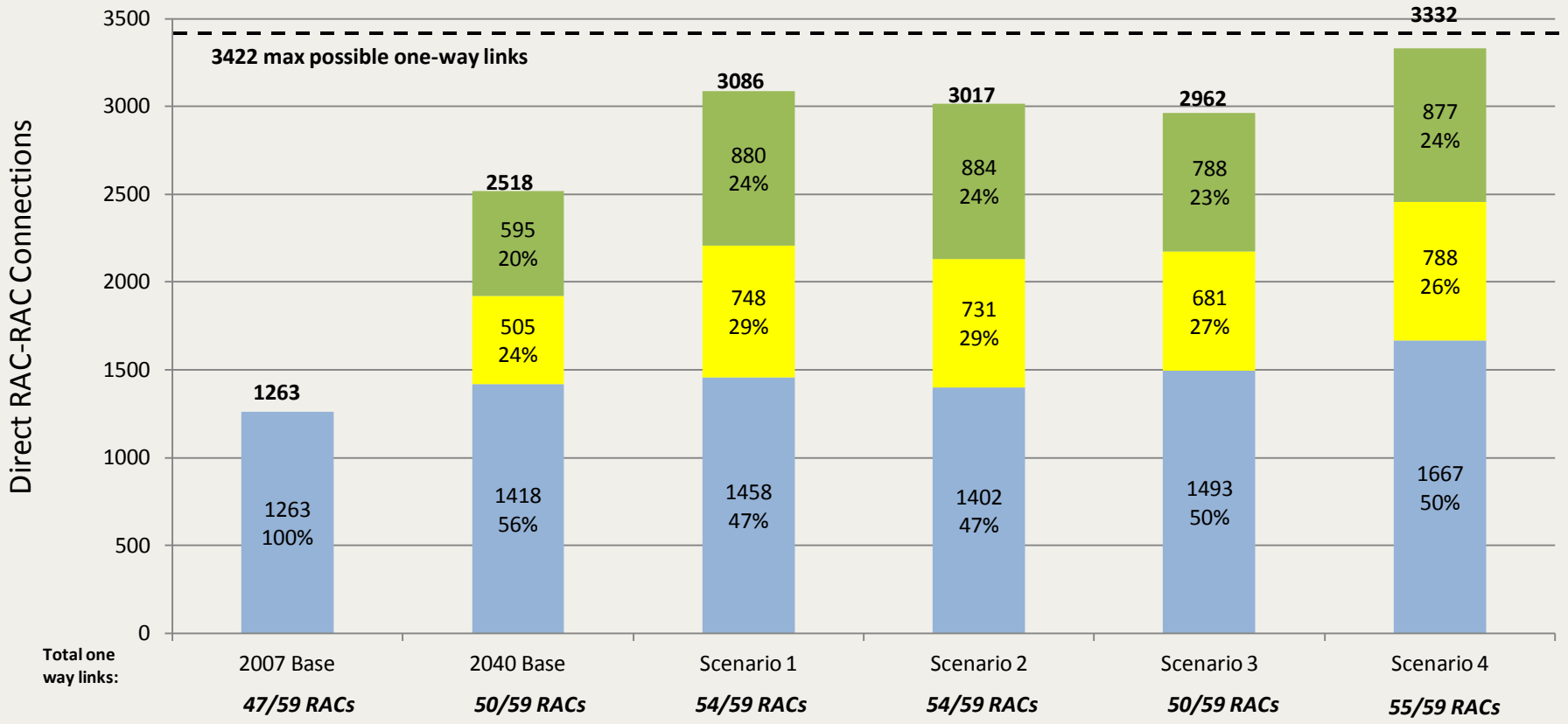
Daily travel time savings for trips with both ends outside RACs



High Frequency-High Speed Transit to RACs

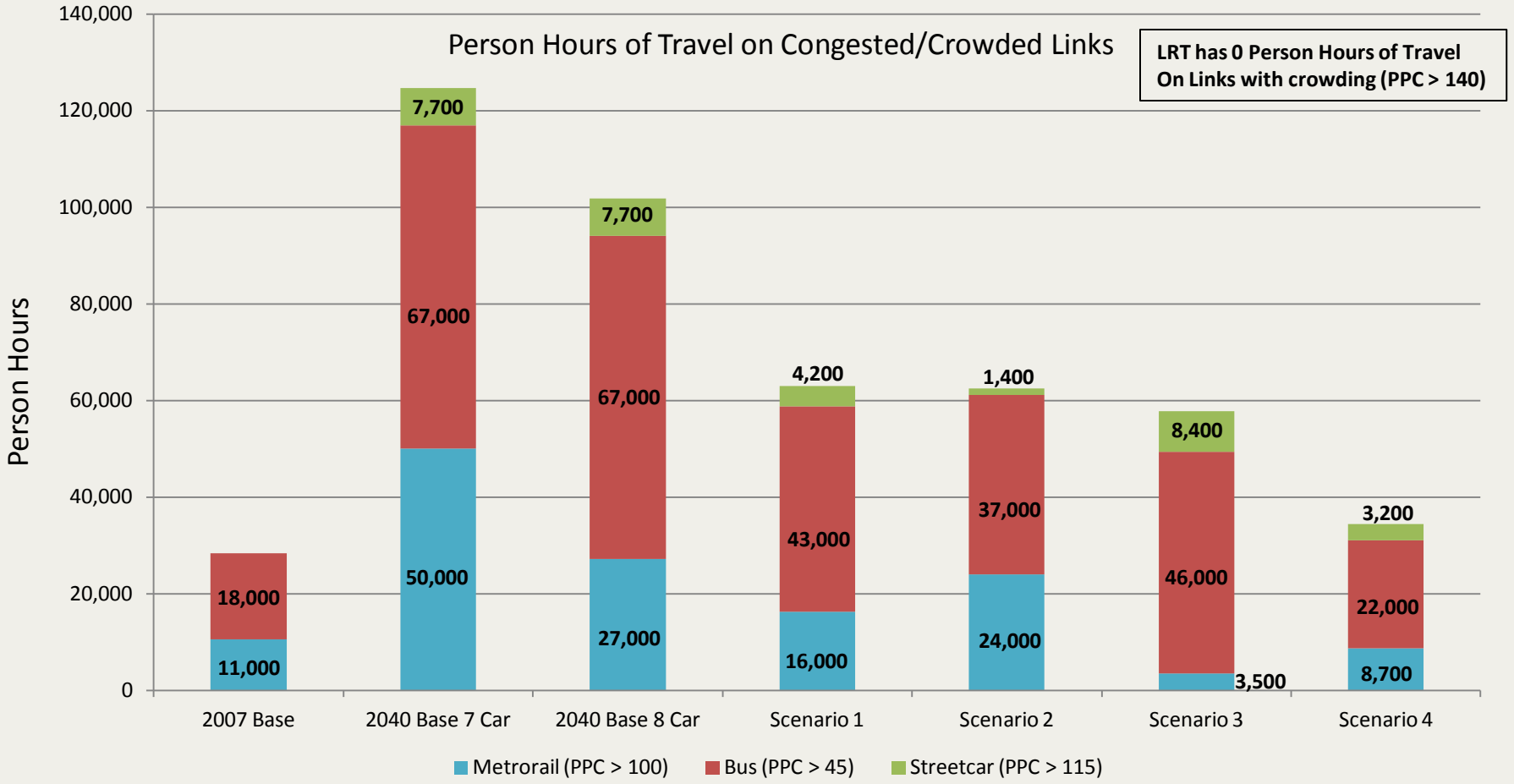
Objective 2.1 – Provide highly desirable transit choices that support household and employment growth in Regional Activity Centers and mixed-use corridors

Number of direct RAC-to-RAC connections within 45 minutes and number of RACs served by high-quality transit



Transit Link Congestion

Objective 4.1 – Provide sufficient capacity to serve future demand

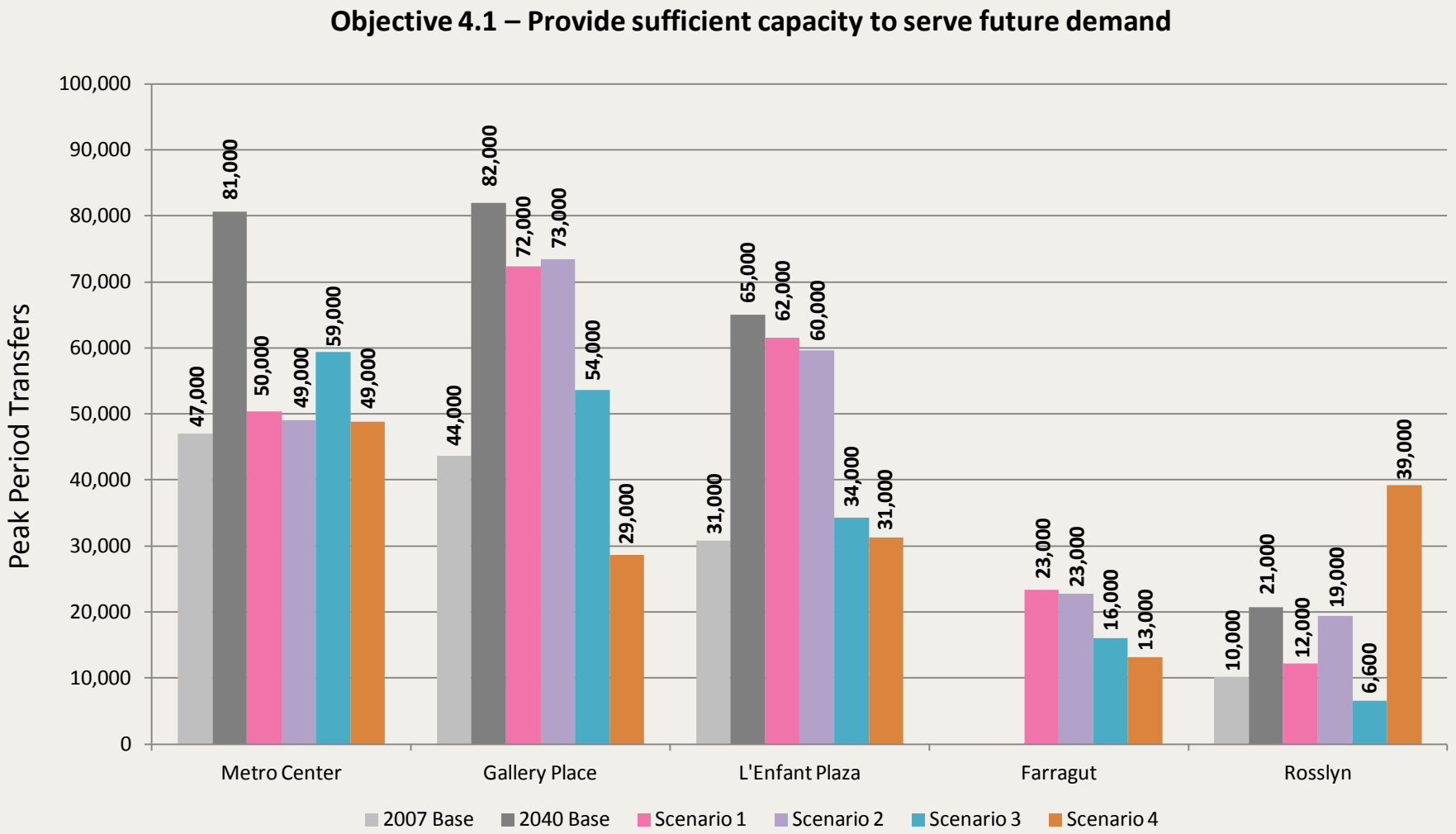


Key Findings – Regional MOEs

- All scenarios show measured improvement over 2040 Base Case
- Scenarios 2 and 4 meet the plan objectives better than Scenarios 1 and 3
- By most measures, Scenario 4 shows more potential than Scenario 2:
  - Scenario 4 offers 67% improvement over the base case in transit link congestion compared to 37% in Scenario 2
  - Scenario 4 offers 32% improvement over the base case in the number of direct RAC connections compared to 20% in scenario 2
  - Scenario 4 offers 40K more hours in daily travel time savings and 240K less daily VMT than scenario 2
  - For inter and intra-RAC trips, Scenario 4 shows a 12% increase in daily trips over the base case compared to 9% in Scenario 2 - 50K additional daily trips than Scenario 2
- Significant surface transit strategies (S2) and significant rail strategies (S4) both supply the region with a robust transit network that connects communities and improves availability of premium transit while reducing congestion, energy use and travel time, and increasing transit ridership and mode share.
- Increased and enhanced surface transit may realize potential benefits in the short to medium term while new rail lines and extensions may tap the full potential of the regional in the long term

Round 1 Scenario Results: Core Capacity Measures

Peak Period Key Metrorail Station Transfers

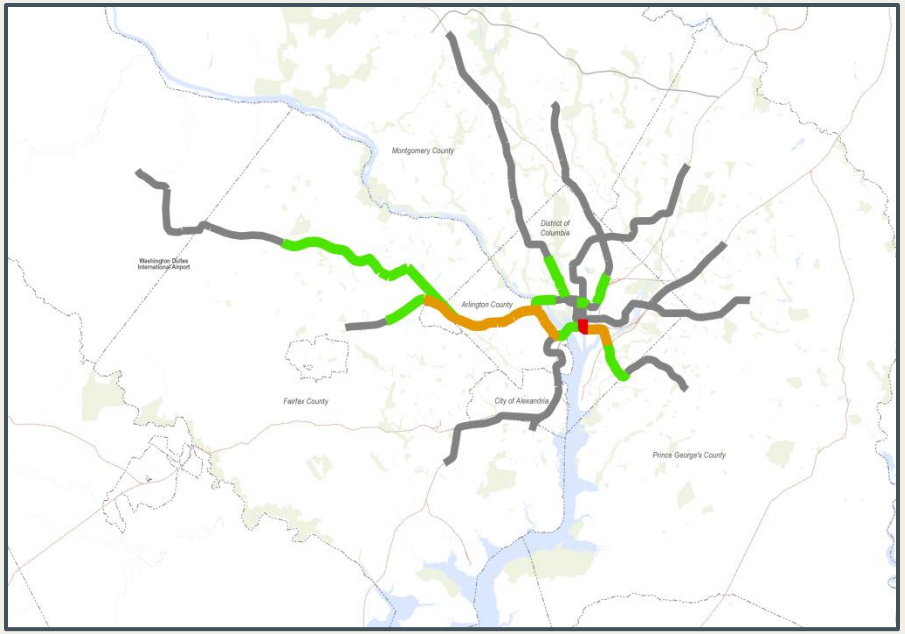


Scenario 1 Metrorail Link Capacity

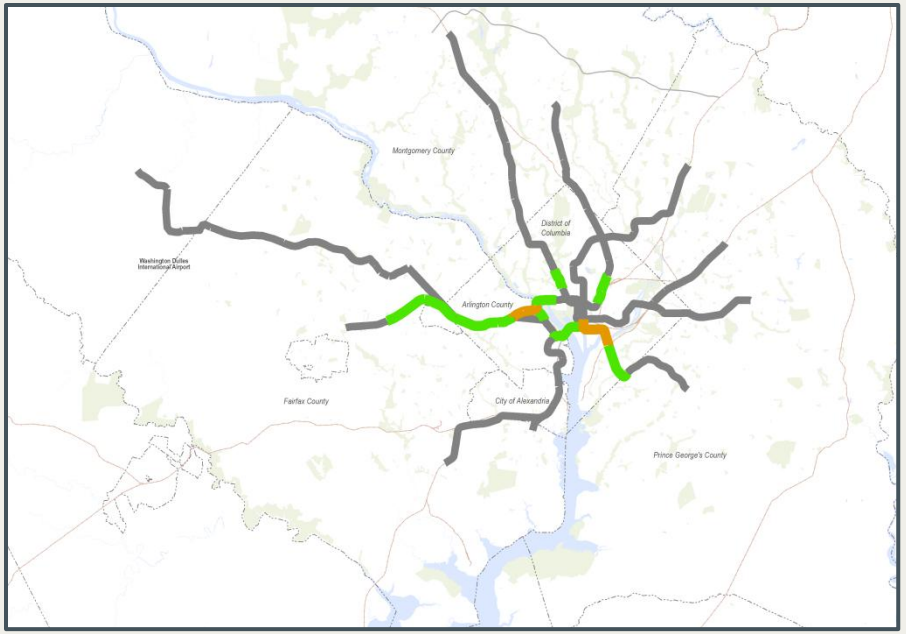
Objective 4.1 – Provide sufficient capacity to serve future demand

Transit Capacity Utilization (passengers per car)

2040 Base (8 car trains)



Scenario 1



LOAD FACTOR

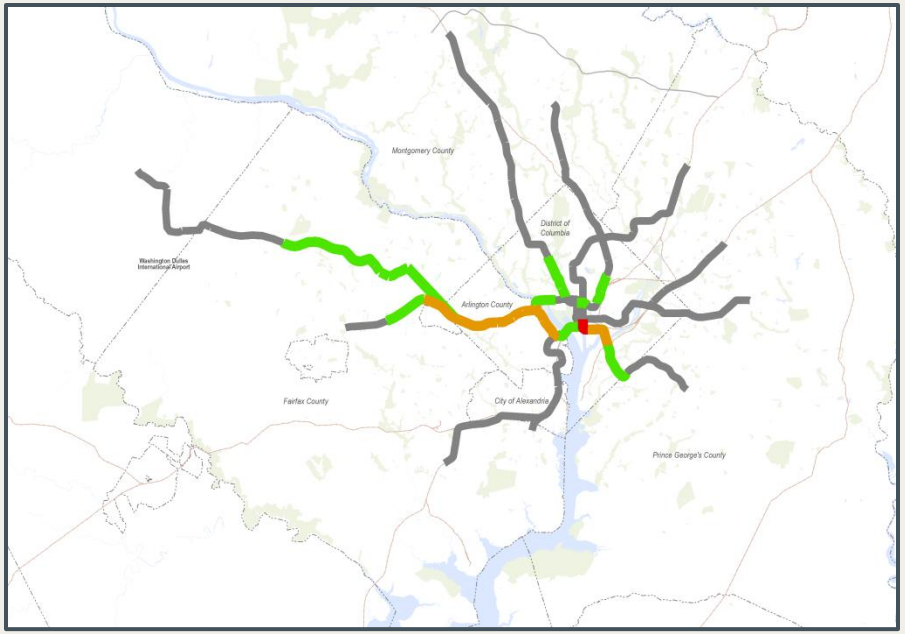
- < 80
- ≥ 80 and < 100
- ≥ 100 and < 120
- > 120

Scenario 2 Metrorail Link Capacity

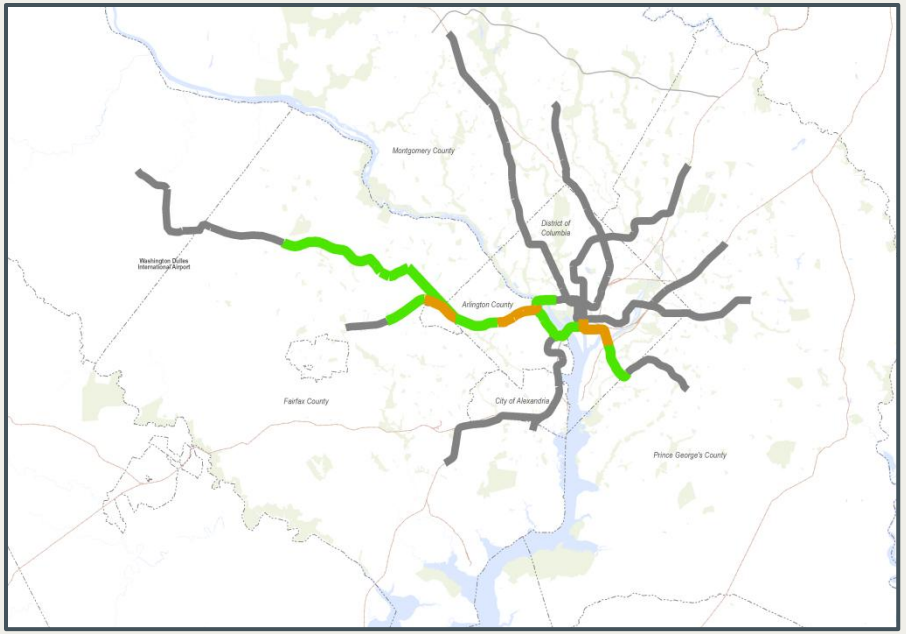
Objective 4.1 – Provide sufficient capacity to serve future demand

Transit Capacity Utilization (passengers per car)

2040 Base (8 car trains)



Scenario 2



LOAD FACTOR

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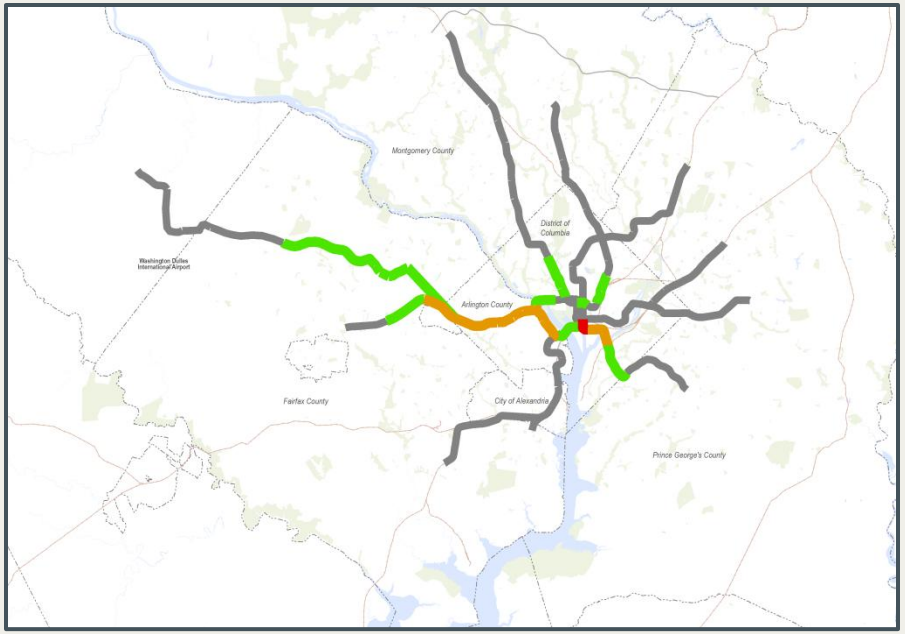
- ≥ 100 and < 120
- > 120

Scenario 3 Metrorail Link Capacity

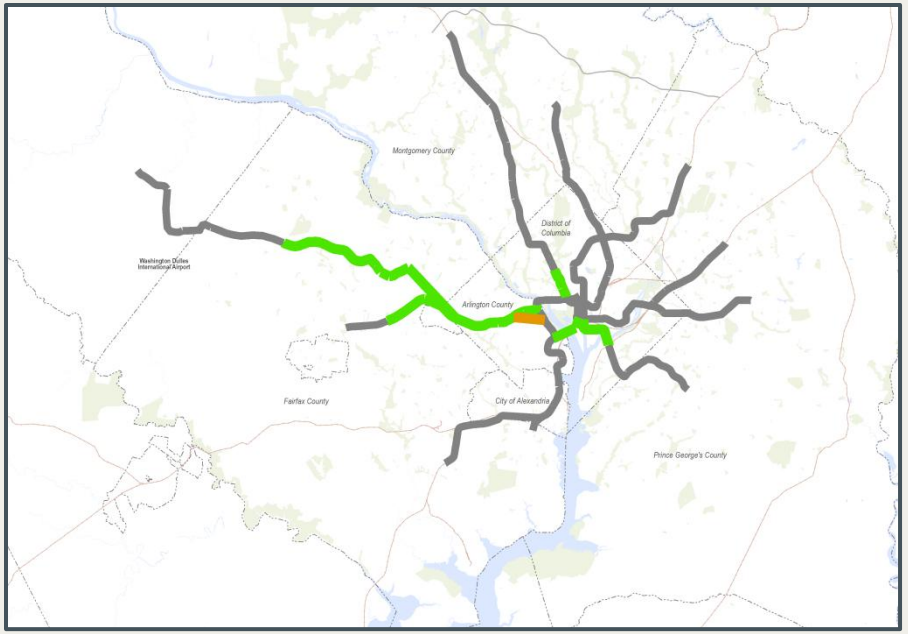
Objective 4.1 – Provide sufficient capacity to serve future demand

Transit Capacity Utilization (passengers per car)

2040 Base (8 car trains)



Scenario 3



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- ≥ 100 and < 120
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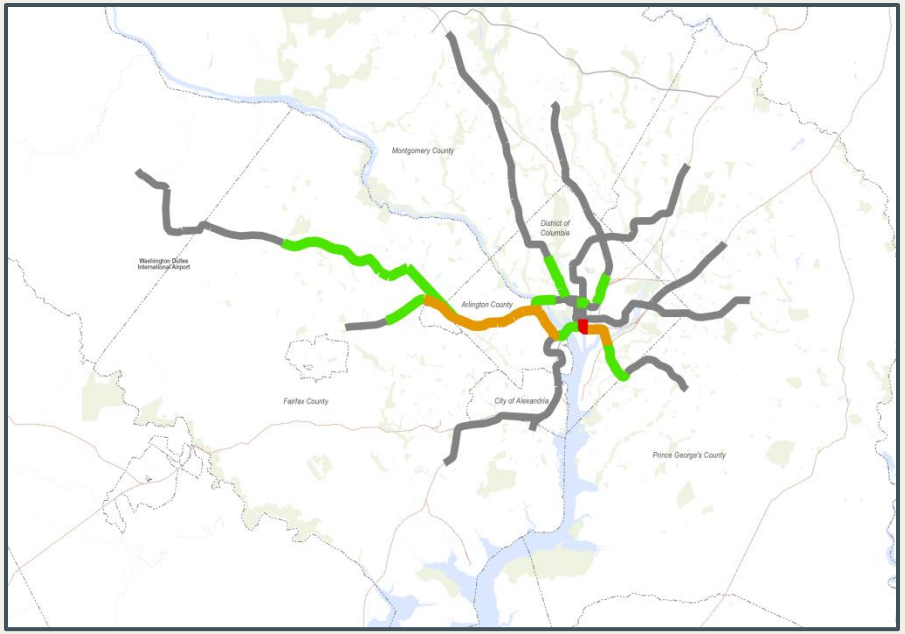
Scenario 4 Metrorail Link Capacity

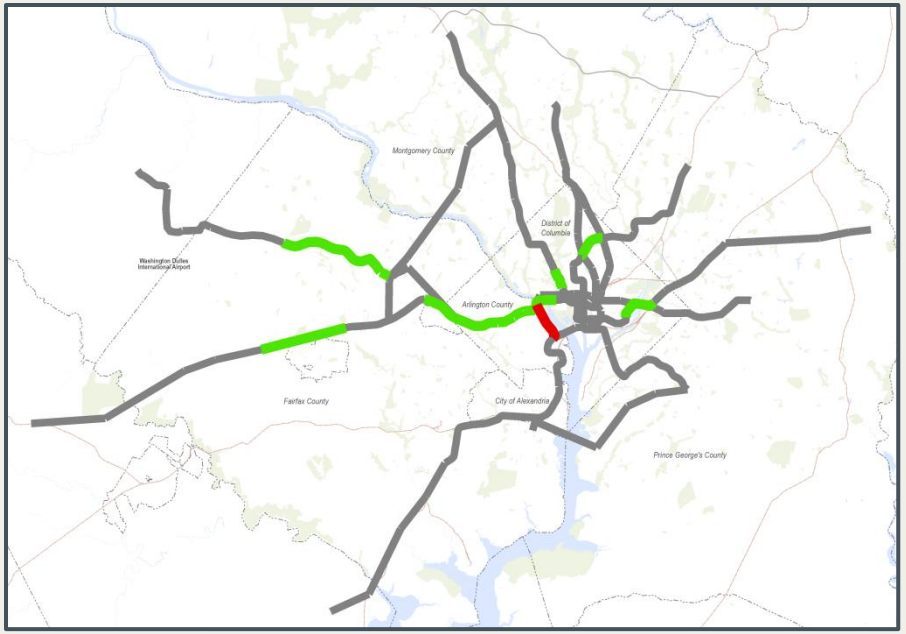
Objective 4.1 – Provide sufficient capacity to serve future demand

Transit Capacity Utilization (passengers per car)

2040 Base (8 car trains)



Scenario 4



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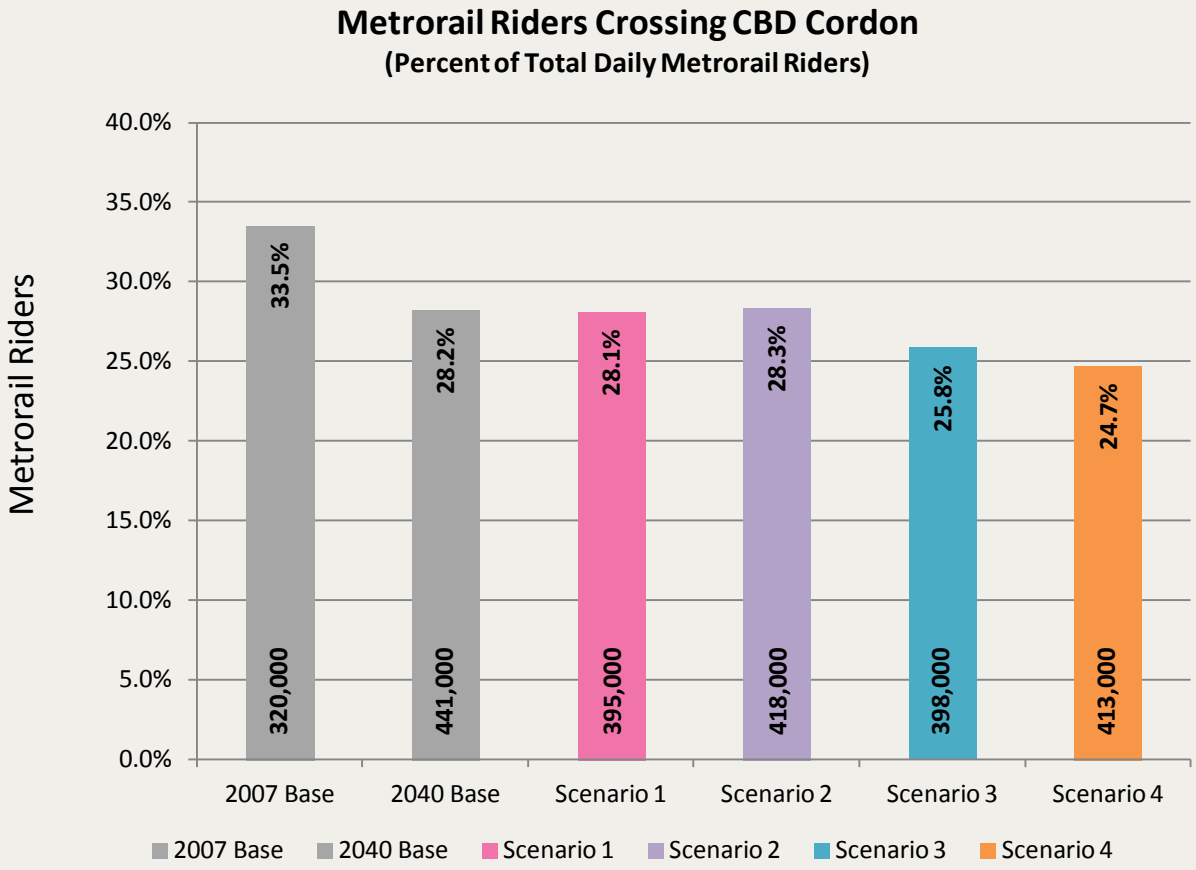
- > 120

Transit Peak Orientation Factor

Objective 5.1 – Provide Transit Service that is the Best Value to the Region



Links Included in CBD Cordon	
From	To
Court House	Rosslyn
Pentagon City	Pentagon
Waterfront	L'Enfant Plaza
Federal Center	L'Enfant Plaza
Union Station	Judiciary Square
Mt Vernon Sq	Gallery Place
Dupont Circle	Farragut North
NoMa/Eckington	Mass Ave/North Capitol St
8th & H St NE	NoMa (H & N Capitol St NE)

Note: Links only included in Scenario 4

Metrorail Parking Availability

Objective 3.2 – Improve availability of and multimodal access to transit stations and stops served by high-frequency, higher-speed service
Objective 4.1 – Provide sufficient capacity to serve future demand

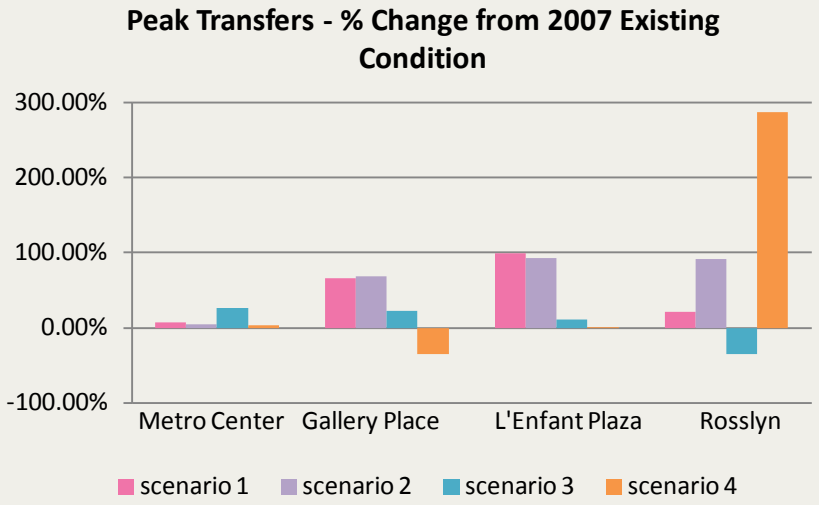
Parking Utilization at Metrorail Park-&-Ride Lots

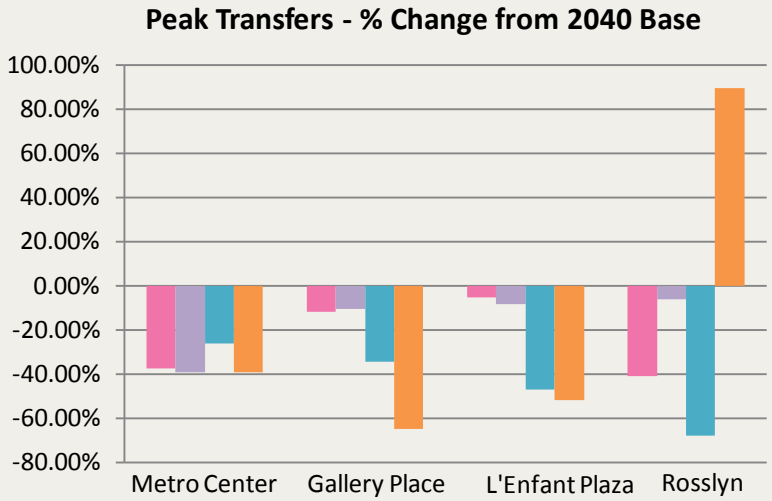
Parking Segments	Base	Alt1	Alt2	Alt3	Alt4
Shady Grove – Grosvenor	114%	99%	97%	111%	84%
Rhode Island – Fort Totten	114%	97%	90%	90%	94%
Silver Spring – Glenmont	113%	93%	121%	111%	100%
Greenbelt – West Hyattsville	103%	95%	68%	107%	100%
Anacostia – Branch Avenue	121%	118%	101%	126%	81%
Franconia – Huntington	95%	81%	80%	85%	65%
Vienna – East Falls Church	92%	90%	76%	86%	69%
Stadium – New Carrollton	68%	68%	81%	66%	22%
Capitol Heights – Largo	95%	84%	85%	81%	53%
Wiehle – Route 772	94%	89%	88%	102%	77%
Gainesville – Fair Oaks					101%
Potomac Mills – Newington					90%
Temple Hills – Oxon Hills					70%
Crain Highway – Woodmoore					140%
Dunn Loring – Montgomery Mall					103%

Total number of Stations with less than 95% occupancy	18 of 46	23 of 46	24 of 46	21 of 46	37 of 61

Key Findings – Metrorail Core Transfer Stations

- Pedestrian tunnels (2) and robust surface transit bring transfer volumes at 3 key DC stations down 20+% vs. 2040 Base
- Farragut tunnel reduces Metro Center transfers to about current volume
- Without additional Metrorail line(s), 50+% increase in transfers at Gallery Place and L'Enfant Plaza
- Second Rosslyn station increases volume of transfers

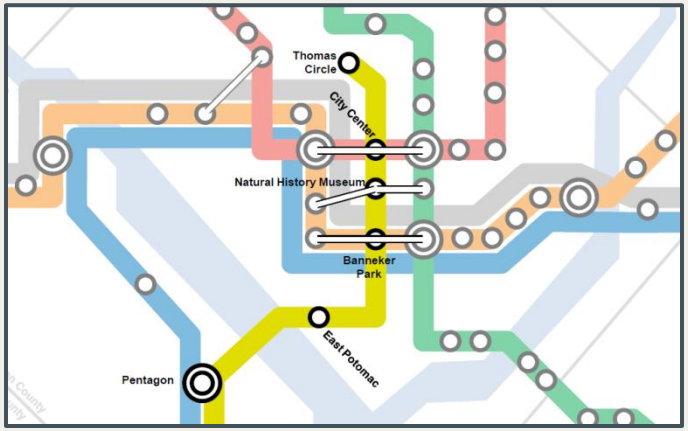




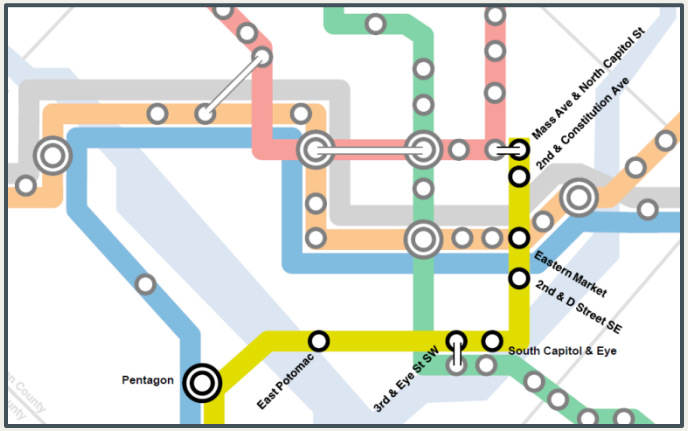
Key Findings – Metrorail Line Loads @ L'Enfant

- Separating the Yellow and Green Lines south of L'Enfant can avert congestion and potentially accommodate development beyond Round 8 forecasts for 2040
- Interline connections to bypass Rosslyn and Pentagon can feed Orange/Silver riders to Yellow Line to better balance Orange/Silver/Yellow/Green volumes from south and west
- A separated Yellow Line parallel to the existing line under 7th Street (below left) attracts more riders than one further east connecting to Union Station (below right) (109,000 riders vs. 82,100 riders)

Separated Yellow Line under 7th Street



Separated Yellow Line connecting to Union Station



Key Findings – Metrorail Line Loads at Rosslyn

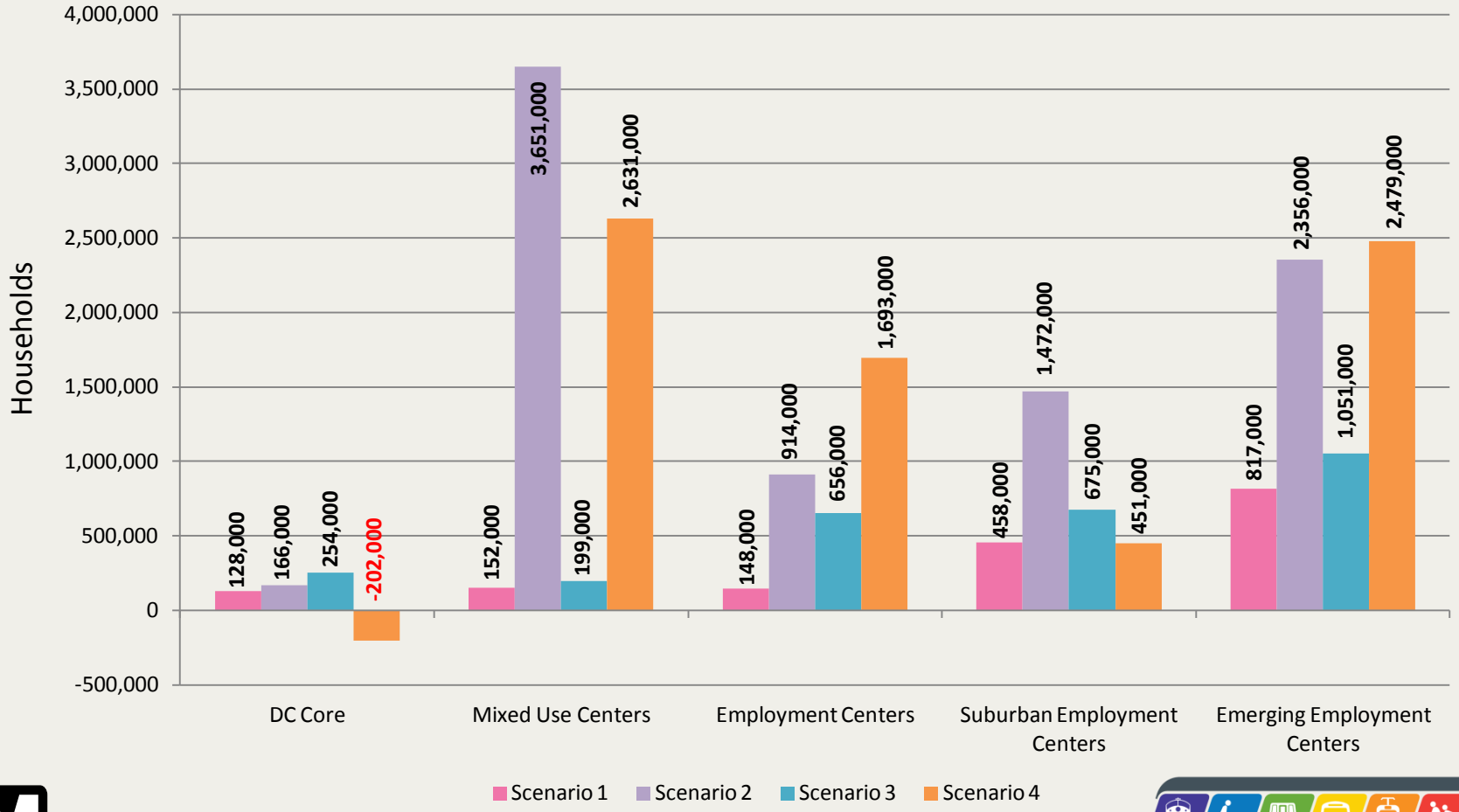
- Rosslyn interline alleviates some Blue Line congestion and allows more operational flexibility, especially when combined with the Pentagon bypass
- Effective use of Pentagon bypass requires both the Rosslyn bypass and separating the Green and Yellow Lines in the core.
- Despite benefits of interline connections, volume on combined Orange/Silver/Blue lines approaching Rosslyn requires some separation of them
- Separating the Blue Line at Rosslyn results in congestion between Pentagon and Rosslyn, but that could be resolved through operational changes
- Especially with an extension of the Orange Line west of Vienna, even with the Blue Line relocated from the existing Rosslyn station, Orange/Silver volumes approach capacity
- None of the four scenarios in Round 1 provide satisfactory line capacity so Round 2 scenarios will need to consider other configurations and service plans

Appendix Data

Households within 45 minutes of Jobs in RACs

Objective 4.2 – Maximize transit's competitiveness versus the automobile

(numbers represent sums of households within 45 minutes of jobs, summed for the 24 clusters of RACs)

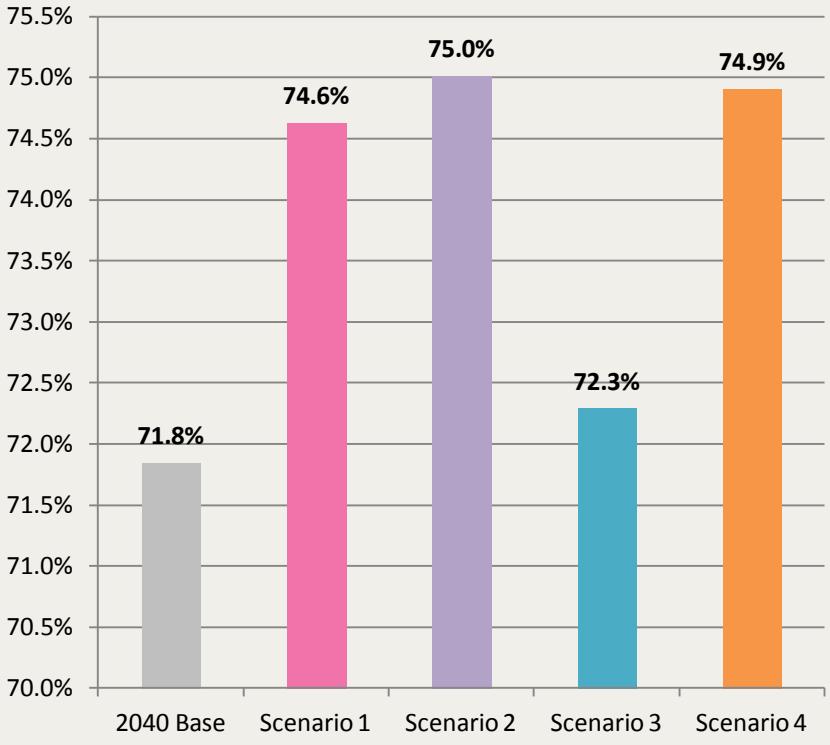


Protecting Health and Safety

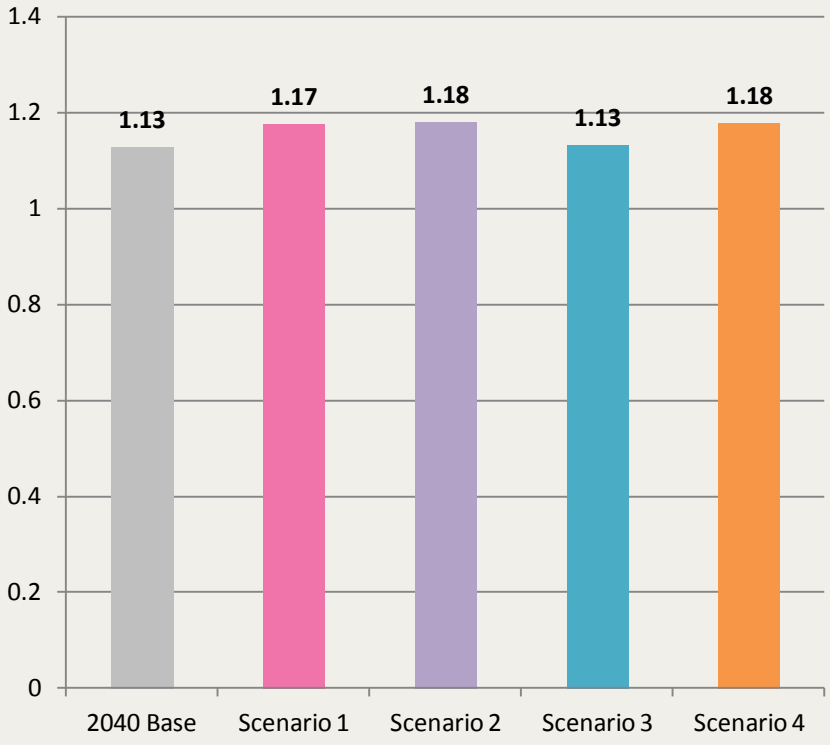
Congested Travel

Objective 1.2-Minimize transportation related emissions and energy use

Percentage of Passenger Miles on Congested Roadways



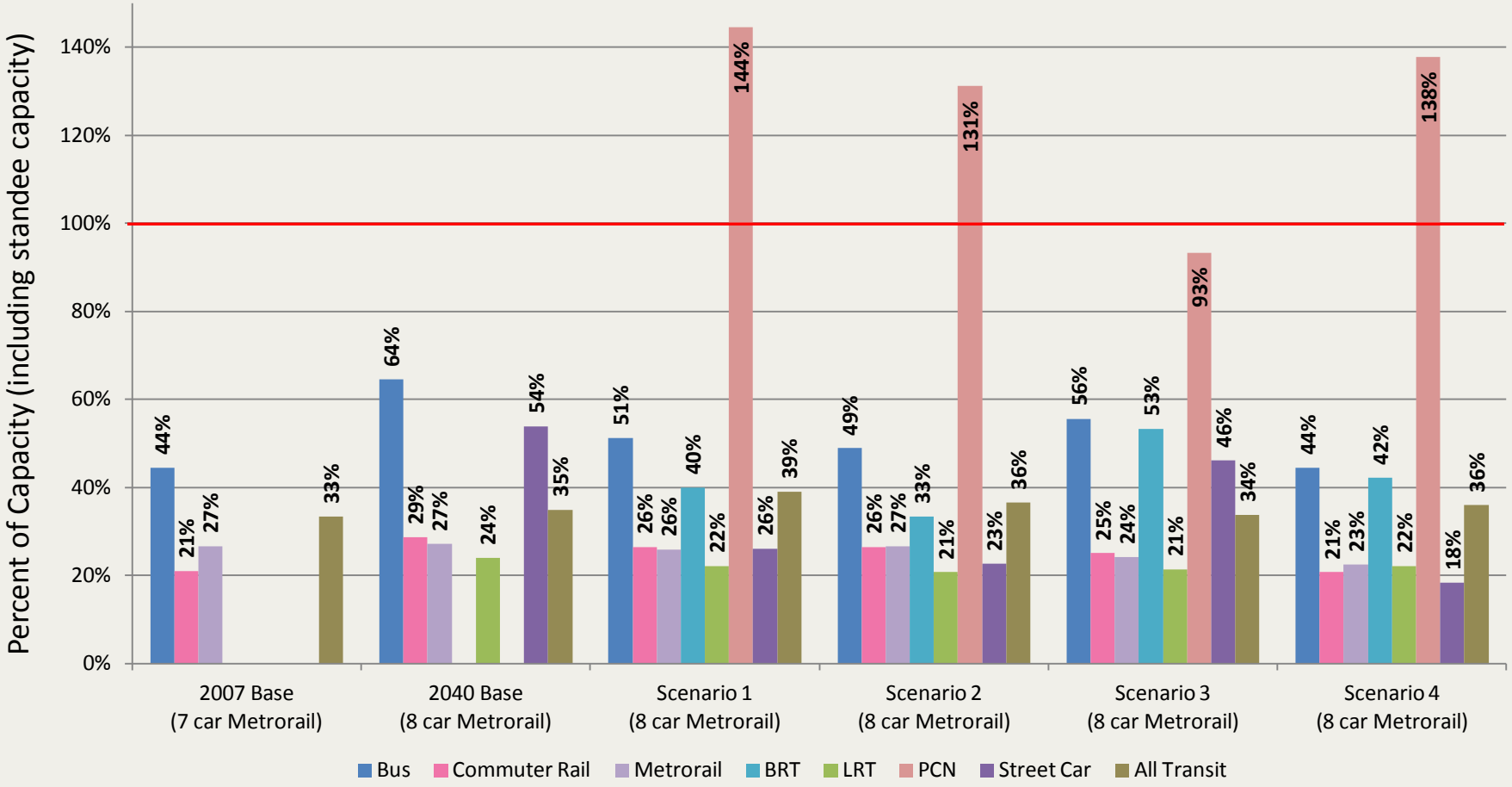
Passenger Miles on Congested Roadways per Vehicle Mile Traveled



Transit Utilization

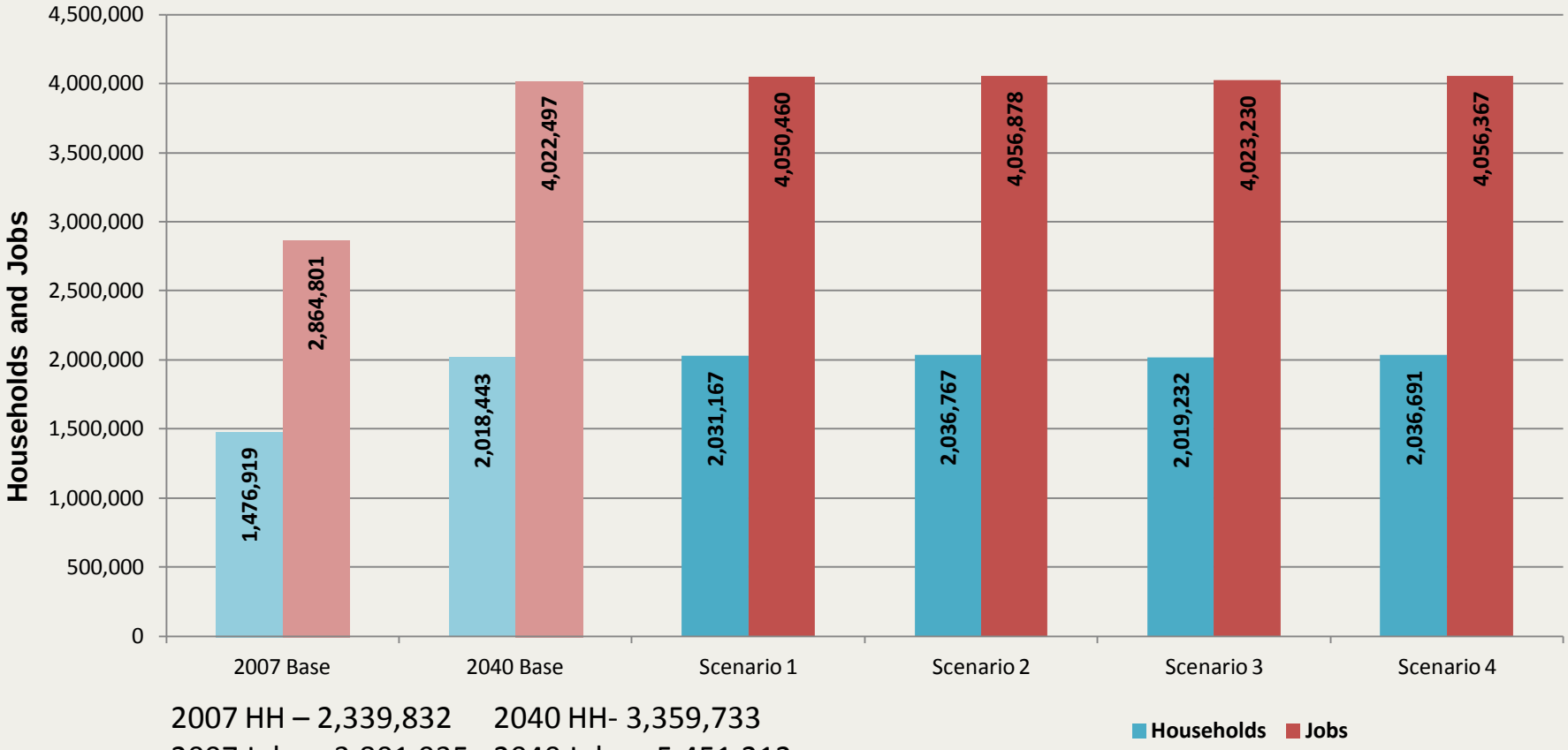
Objective 5.1 – Provide transit service that is the best value to the region

Passenger Miles per Seat Mile in Revenue Service



Households & Jobs Within ½ Mile of Any Transit

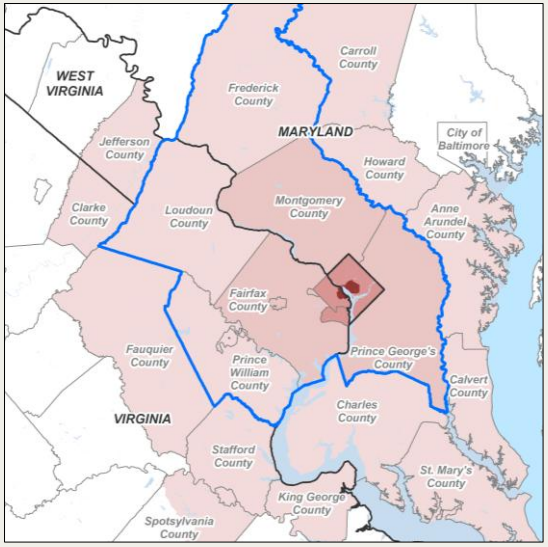
Objective 3.1 – Maximize transit network coverage and improve mobility throughout the region for residents, employees, and visitors



2007 HH – 2,339,832 2040 HH- 3,359,733
2007 Jobs – 3,801,935 2040 Jobs – 5,451,212

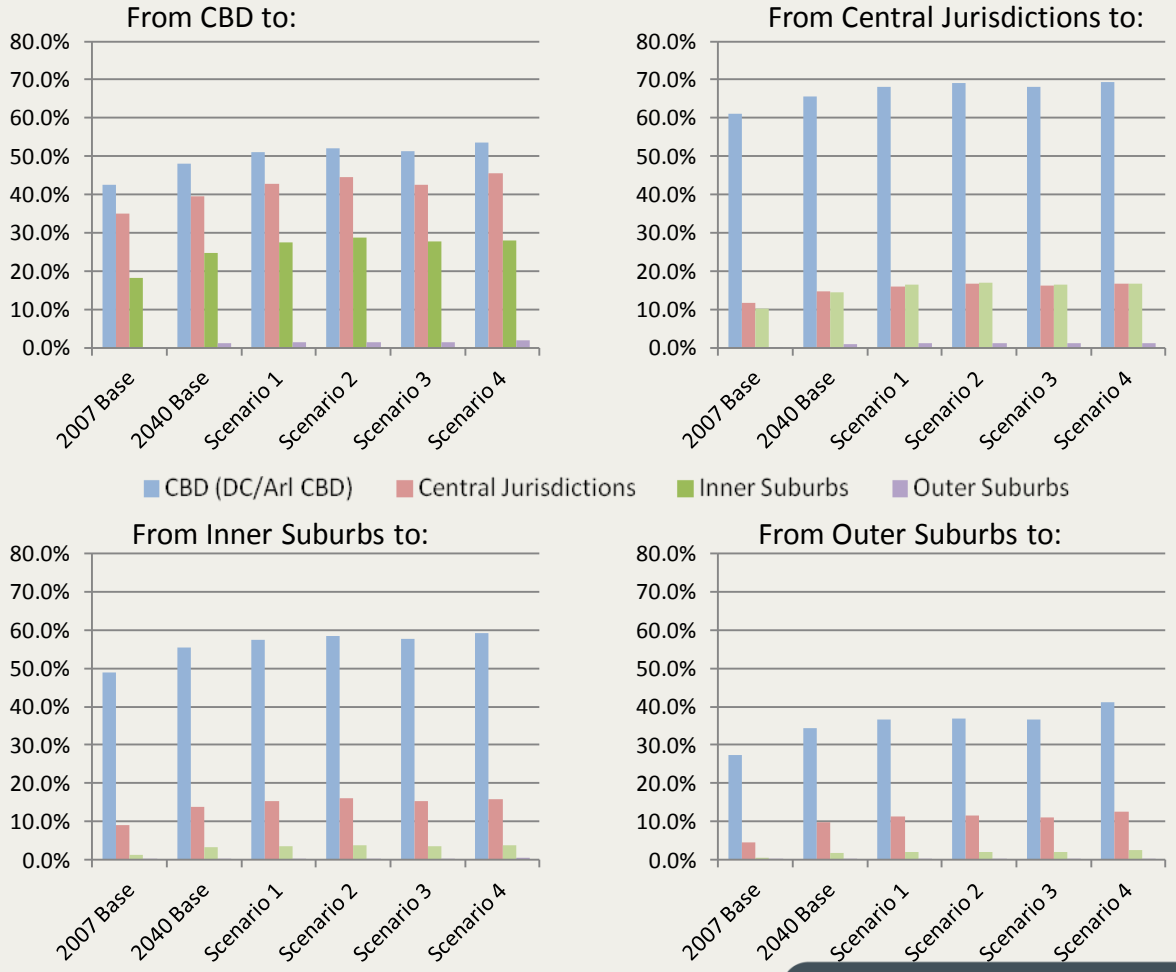
Transit Mode Share by Subregion

Objective 4.2 – Maximize transit's competitiveness versus the automobile



Legend

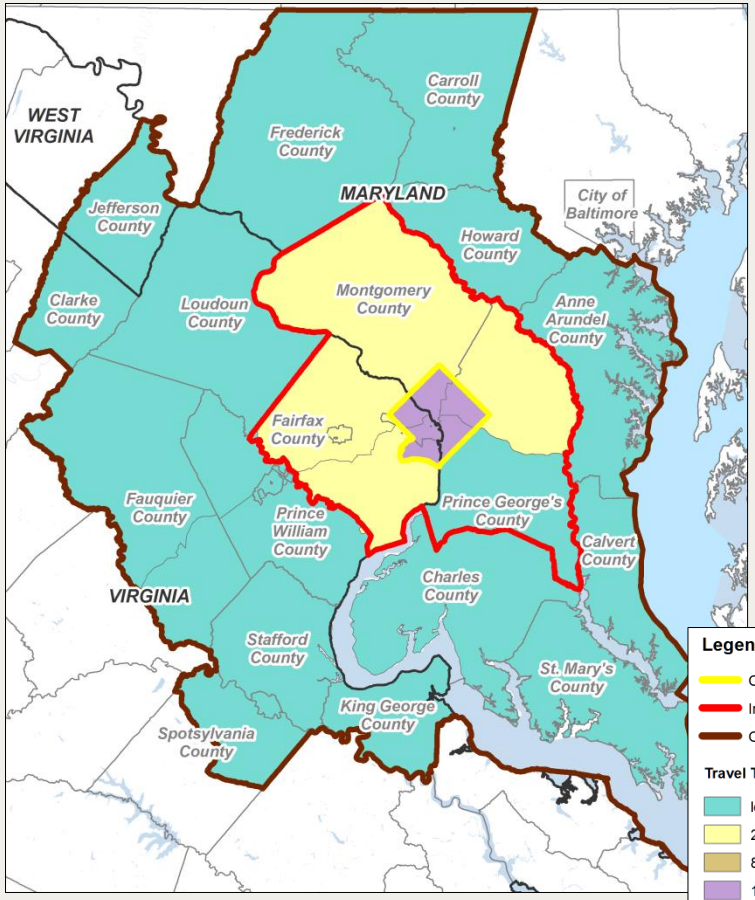
- RTSP Study Area
- Core (DC/Arl CBD)
- Central Jurisdictions Outside Core
- Inner Suburbs
- Outer Suburbs



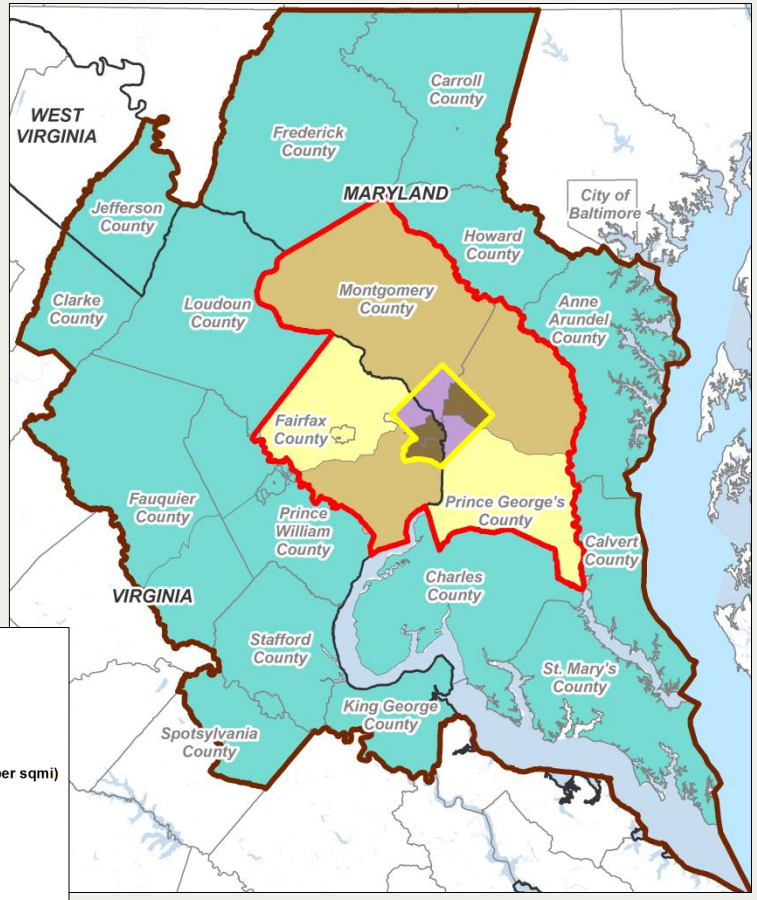
Distribution of Benefits – All Riders/Productions

Objective 3.3 – Ensure that the travel time benefits of transit service are distributed widely to residents throughout the region

Scenario 1



Scenario 2



Legend

- Core & Central
- Inner Suburbs
- Outer Suburbs

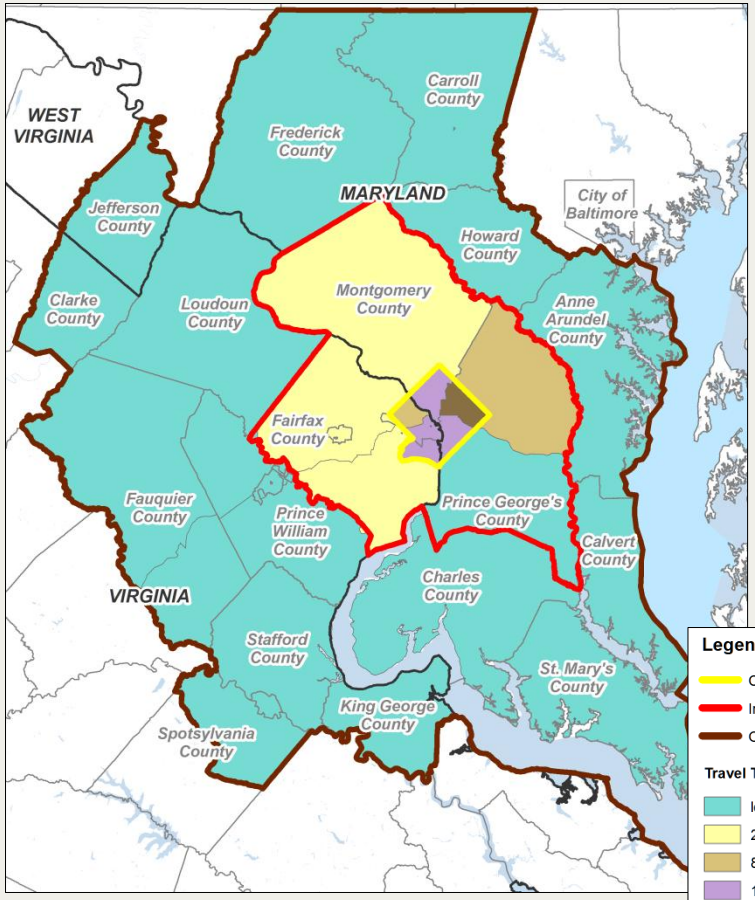
Travel Time Savings (hrs per sqmi)

- less than 20
- 20 - 80
- 80 - 160
- 160 - 1000
- more than 1000

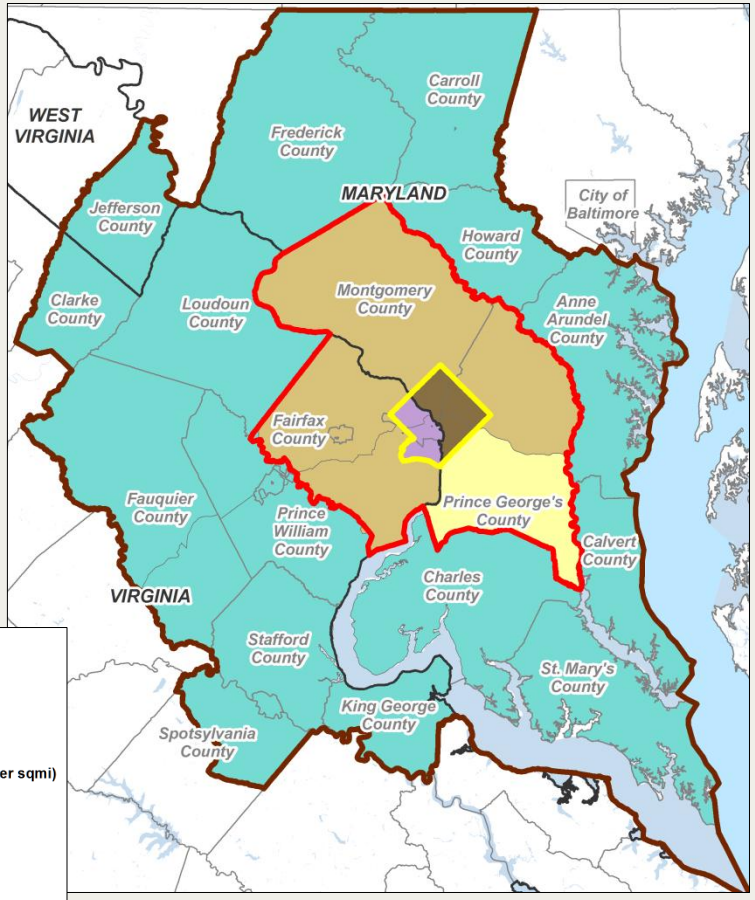
Distribution of Benefits – All Riders/Productions

Objective 3.3 – Ensure that the travel time benefits of transit service are distributed widely to residents throughout the region

Scenario 3



Scenario 4



Legend

- Core & Central
- Inner Suburbs
- Outer Suburbs

Travel Time Savings (hrs per sqmi)

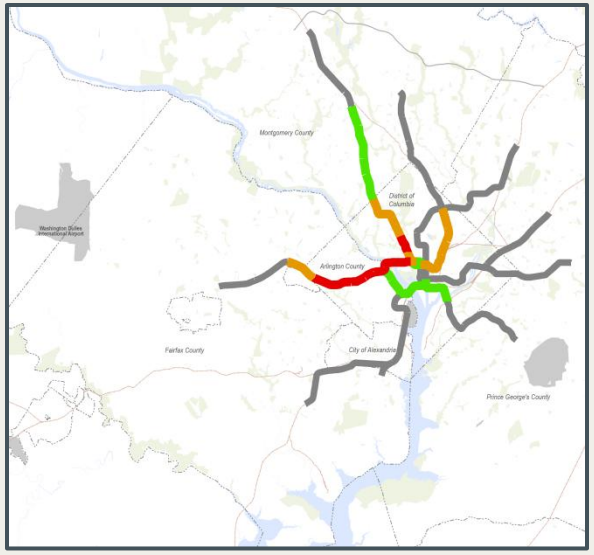
- less than 20
- 20 - 80
- 80 - 160
- 160 - 1000
- more than 1000

2007 and 2040 Base Case Peak Line Loads

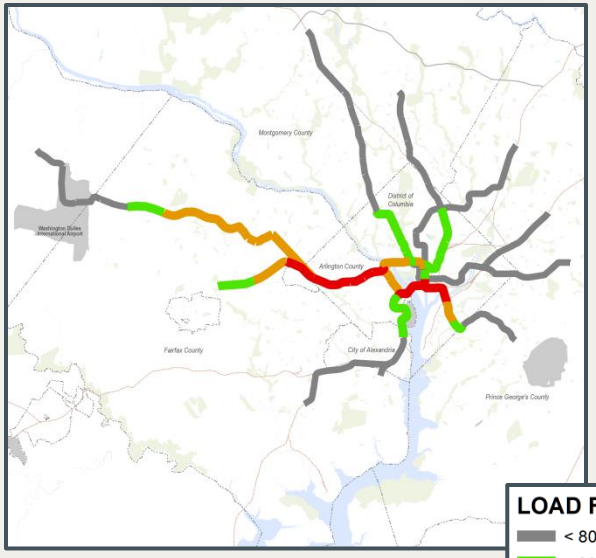
What is the result of 100% 8-car trains?

Note: This shows ppc on the highest of the sometimes-multiple lines along each link

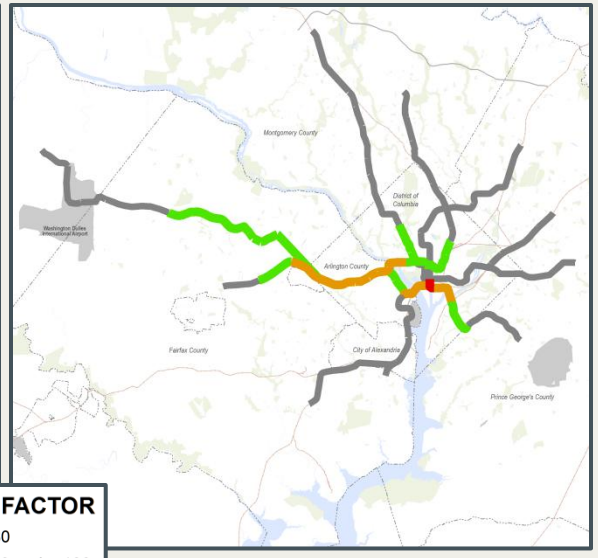
Mix of 6/8 Car Trains (2007)



50% 8 Car Trains (2040)



100% 8 Car Trains (2040)



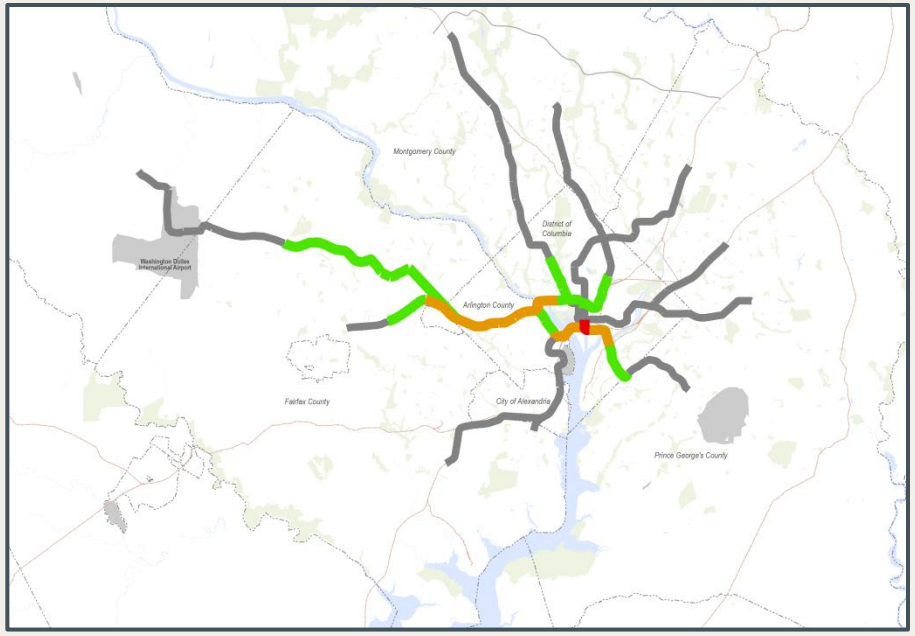
Scenario 1 Metrorail Line Capacity

Objective 4.1 – Provide sufficient capacity to serve future demand

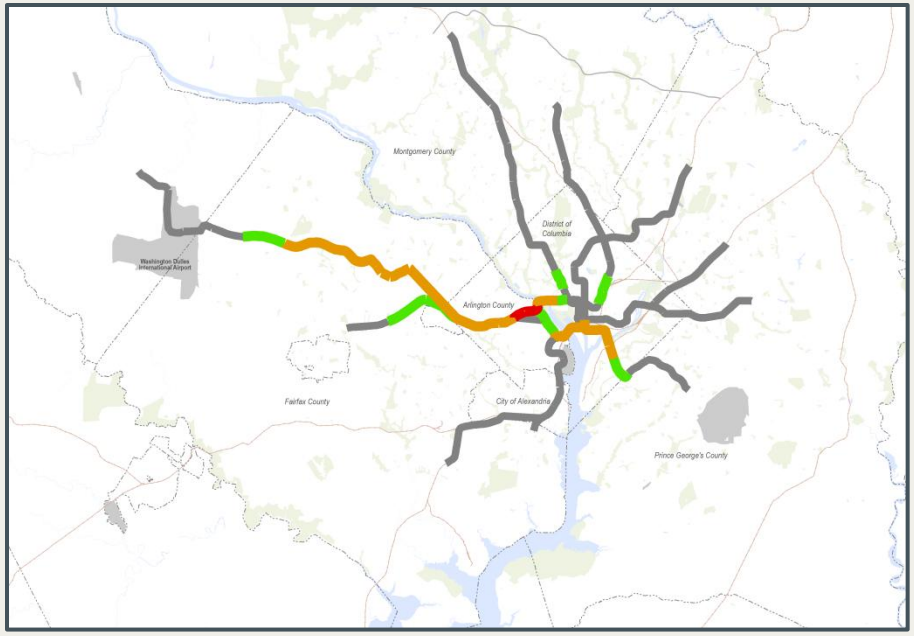
Transit Capacity Utilization (passengers per car)

Note: This shows ppc on the highest of sometimes-multiple lines along each link

2040 Base (8 car trains)



Scenario 1



LOAD FACTOR

- < 80
- ≥ 80 and < 100
- ≥ 100 and < 120
- > 120

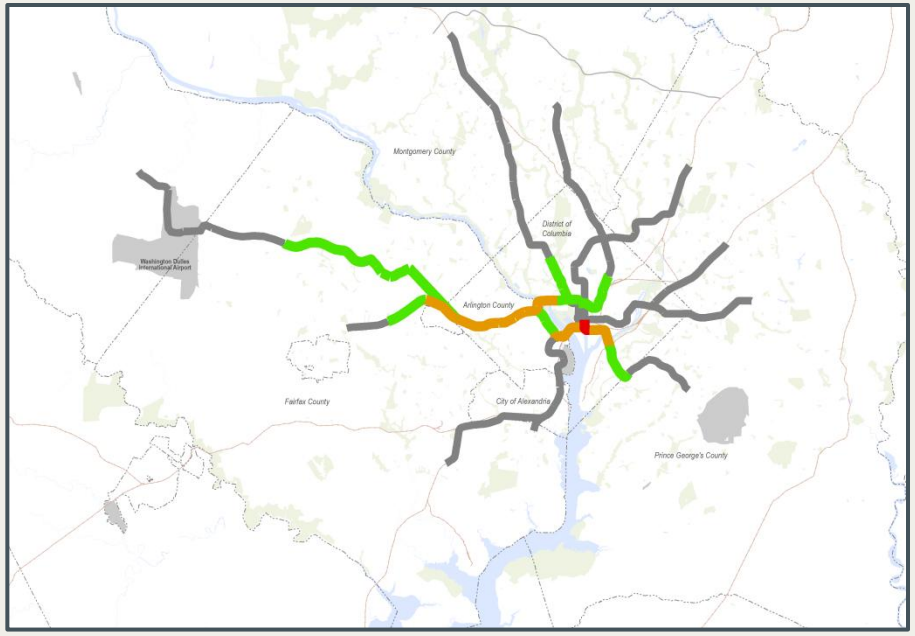
Scenario 2 Metrorail Line Capacity

Objective 4.1 – Provide sufficient capacity to serve future demand

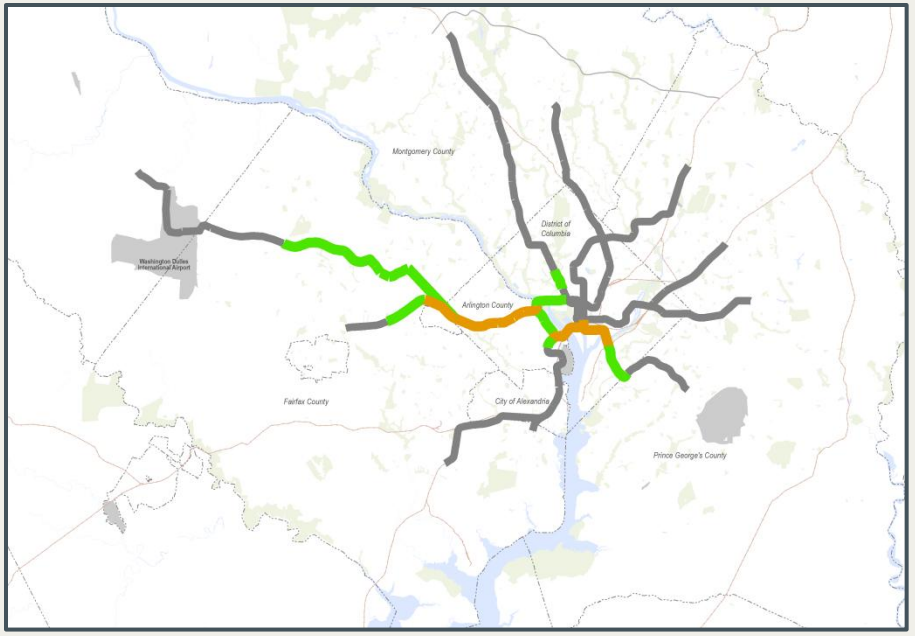
Transit Capacity Utilization (passengers per car)

Note: This shows ppc on the highest of sometimes-multiple lines along each link

2040 Base (8 car trains)



Scenario 2



LOAD FACTOR

- < 80
- ≥ 80 and < 100
- ≥ 100 and < 120
- > 120

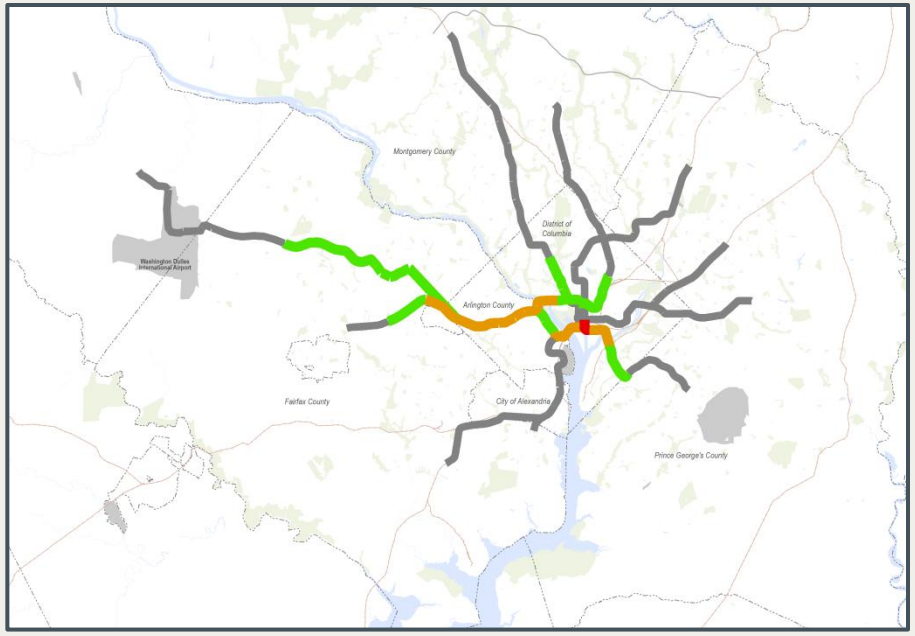
Scenario 3 Metrorail Line Capacity

Objective 4.1 – Provide sufficient capacity to serve future demand

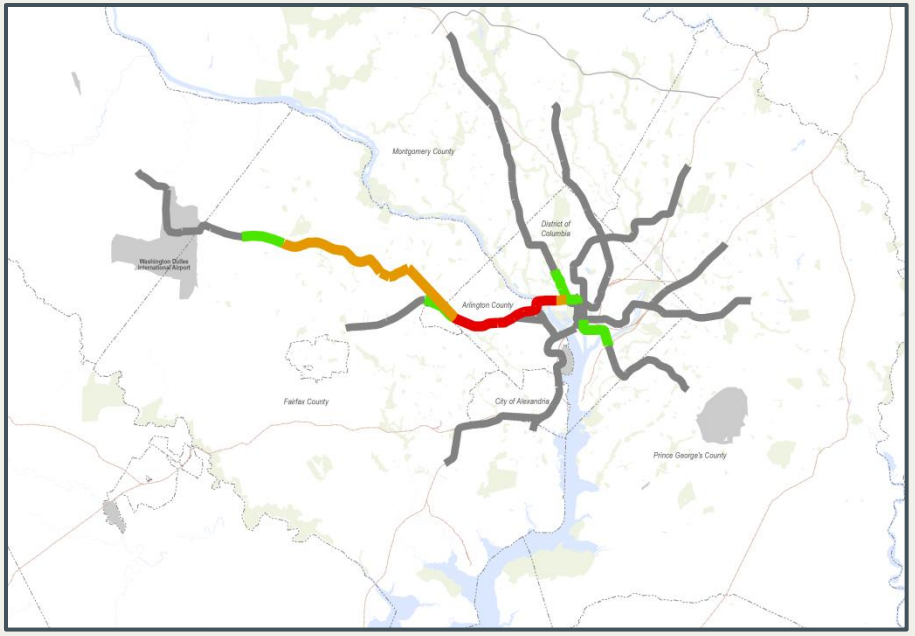
Transit Capacity Utilization (passengers per car)

Note: This shows ppc along the highest of sometimes-multiple lines along each link

2040 Base (8 car trains)



Scenario 3



LOAD FACTOR

- < 80
- ≥ 80 and < 100
- ≥ 100 and < 120
- > 120

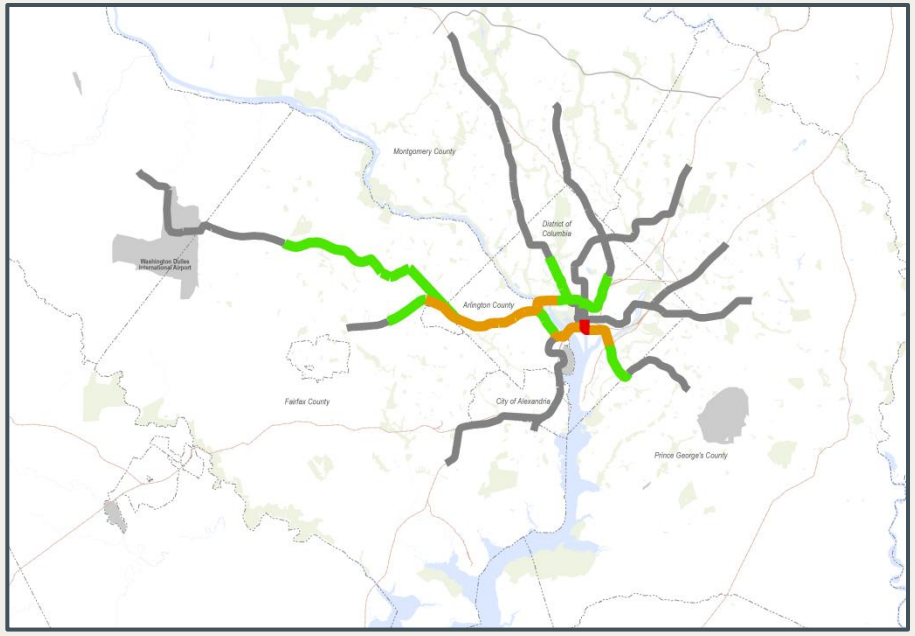
Scenario 4 Metrorail Line Capacity

Objective 4.1 – Provide sufficient capacity to serve future demand

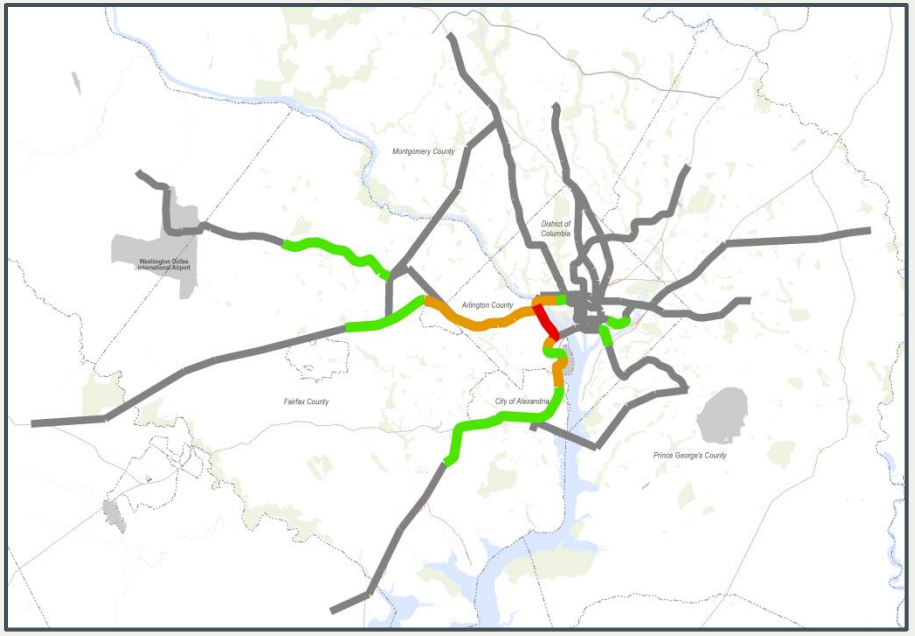
Transit Capacity Utilization (passengers per car)

Note: This shows the highest ppc on sometimes-multiple lines on each link

2040 Base (8 car trains)



Scenario 4



LOAD FACTOR

- < 80
- ≥ 80 and < 100
- ≥ 100 and < 120
- > 120