



Washington Metropolitan Area Transit Authority



# RTSP Metrorail Strategies:

Split Yellow Line, New Blue Lines, Interline, Enhanced  
Surface Transit, and Walkability

Presentation to the Technical  
Advisory Group

October 21<sup>st</sup>, 2010



## Meeting Agenda

- I. Welcome & Introductions
- II. Public Engagement
- III. Update on Rail Interoperability Study
- IV. Model Runs Completed and Proposed
- V. New Model Results
- VI. Next Steps


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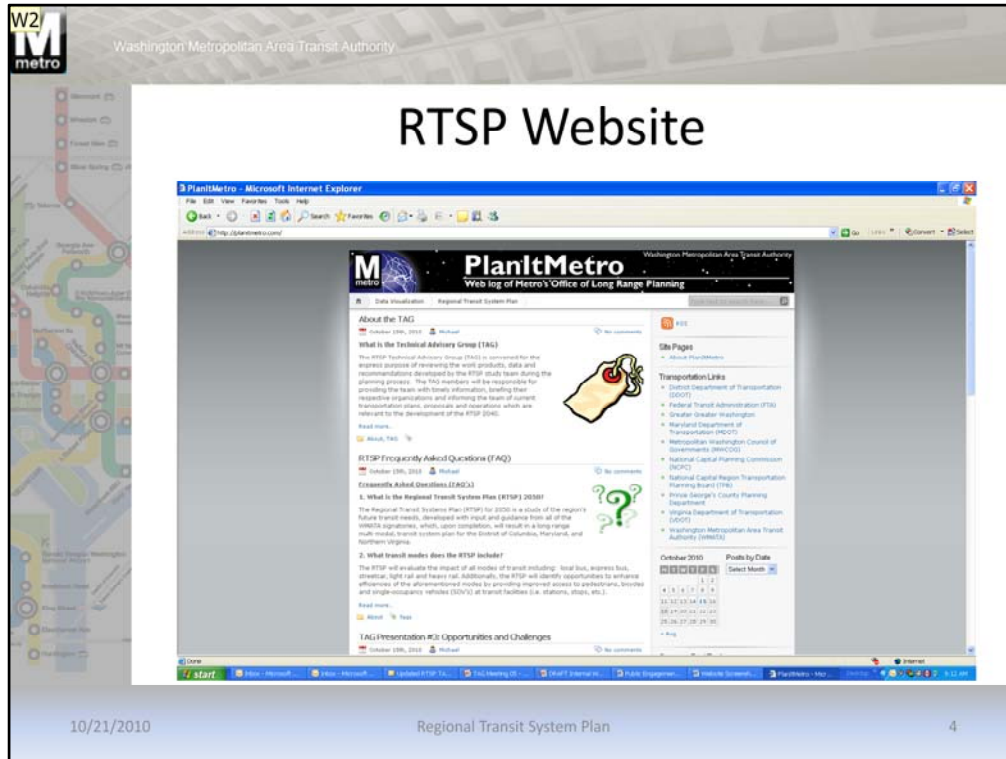
## Public Engagement Strategy

- How will we engage the public?**
  - Jurisdictional Briefings/"Piggy-back" (Jan. – April)**
    - TAG Member requests RTSP Briefing
    - Metro's GOVR staff briefs jurisdictional representative
    - TAG Member & RTSP Staff schedule briefing/piggy-back
  - Metro-hosted Regional Workshops (February-March)**
    - 2 Workshops in each jurisdiction
- What will be discussed at the Workshops?**
  - Background
  - RTSP Purpose/People/Process/Product
  - Current Challenges
  - Transit Mode Characteristics
  - Strategies
  - Scenarios
  - How to Stay Involved

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We have developed two methods to share the RTSP with the stakeholders: Individual briefings or piggy-backing at scheduled meetings at the request of the TAG jurisdictional representative and a series of Metro-hosted workshops. The briefings will be coordinated with Metro's Government Relations Office (GOVR) to ensure the appropriate elected officials are made aware of the RTSP Teams proposed visit to the respective jurisdictions. Upon receiving the appropriate approvals, the RTSP Team will attend a jurisdictional meeting (i.e. Commission meetings, ANC's, community/civic organization meeting) and brief the stakeholder group on the RTSP.

The Metro-hosted workshops will also be scheduled and coordinated with the TAG for each jurisdiction and planned so that we can achieve the maximum participation.



The graphic above is a revised DRAFT of the RTSP Content on the PlanItMetro Blog for the Office of Long Range Planning. Some of the basic information a visitor will be able to get when visiting the RTSP link include: background on the Technical Advisory Group (TAG); Frequently Asked Questions (FAQ's) related to the RTSP; Metro's long range planning history; a description of Metro's current long range plan; and a description of the strategies being considered that may become part of Metro's updated long range plan.


## Slide 4

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**W2**

It may be nice to add a few examples of other content that will be available on the blog, i.e. Metro's long range planning history, description of current long range plan, strategies modeled to offer potential plans for the next 30+ years.

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## Model Runs Completed & Proposed

- “Round 1” – Base Case (2), Yellow Line (2), Rosslyn Interline, Pedestrian Tunnel (2)
- “Round 2” – Yellow Line (3<sup>rd</sup> option), Blue Line (2), Interline (3 more), PCN Bus, Enhanced Walkability
- “Round 3” – To be discussed later on agenda

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This slide provides an overview of the modeling exercises that have been and will be undertaken in future iterations of the RTSP analysis.



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## Overview of New Model Results

- Review of Base Case (Max CLRP)
  - Refer to Attachment 3 for Strategies presented in Round 1
- Definition of Strategies and Impact on Ridership and Capacity (Round 2)
  - Set 1:
    - New Rail Lines Through The Core
      - New Split Yellow Line (2<sup>nd</sup> St SE/NE)
      - New East-West Blue Line M St and New Jersey Ave
      - New East-West Blue Line M St and Constitution Ave
  - Set 2:
    - Rail Enhancements
      - Four Interline Connections
  - Set 3:
    - Enhanced Existing Surface Transit
      - Priority Corridor Network
    - Improved Walkability
- Preliminary Evaluation

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This slide provides more details on the RTSP Strategies that have been modeled in Round 2.



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## REVIEW OF BASE CASE (MAX CLRP)

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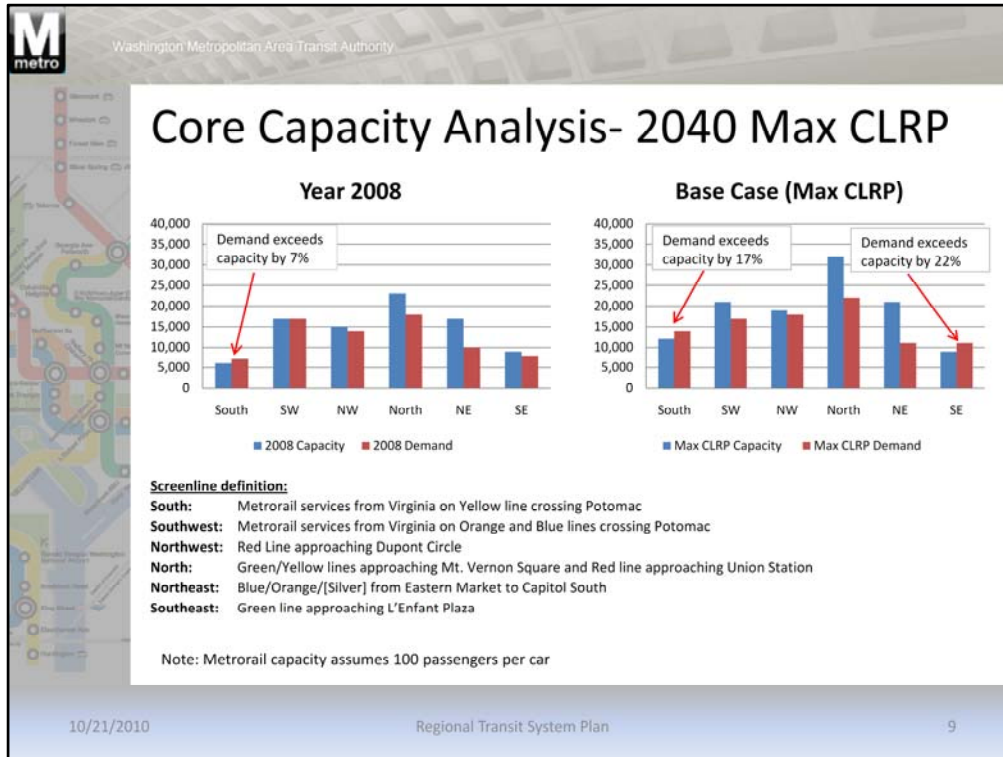
## Base Case (Max CLRP)

- Address CLRP\* issues related to capacity by:
  - Increasing train frequencies to maximum supported by the infrastructure
  - Reallocate Orange/Silver/Blue Line train frequencies to better balance demand
- Improve system understandability by eliminating multiple destinations for single color train
  - Extend Silver Line trains to Largo & route all Orange Line trains to New Carrollton
  - Rename “Blue Line Split” via 14<sup>th</sup> Street Bridge to “Yellow Line”
- Basis for comparing various strategies

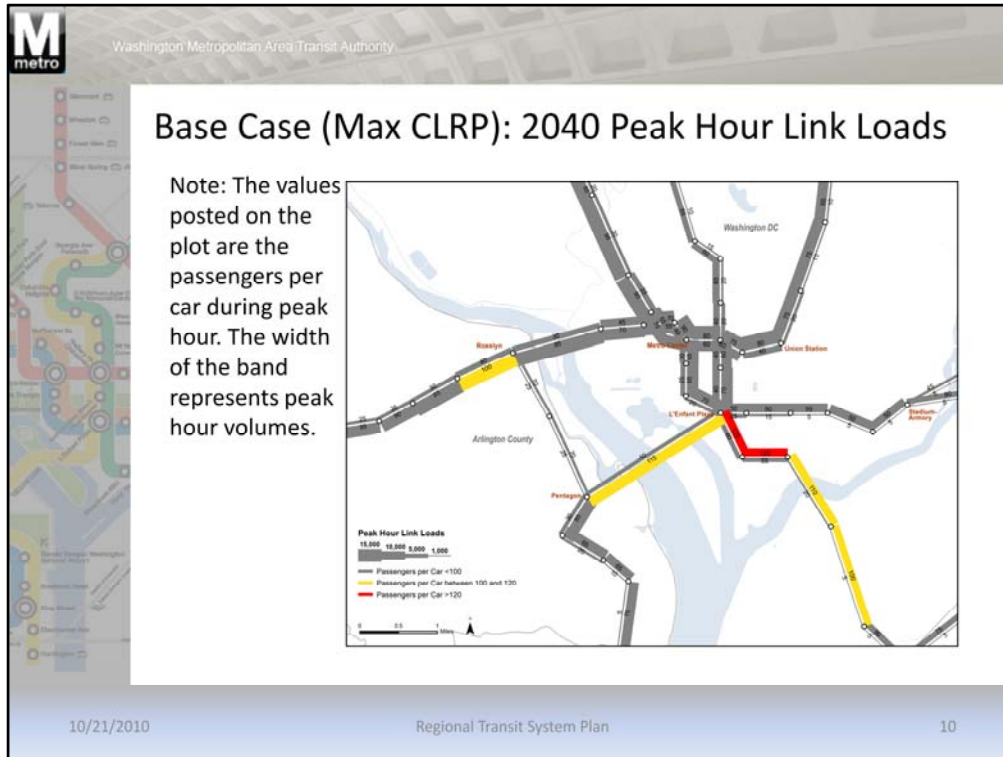
(\*MWCOG 2030 CLRP Modeled with 2040 Land Use)

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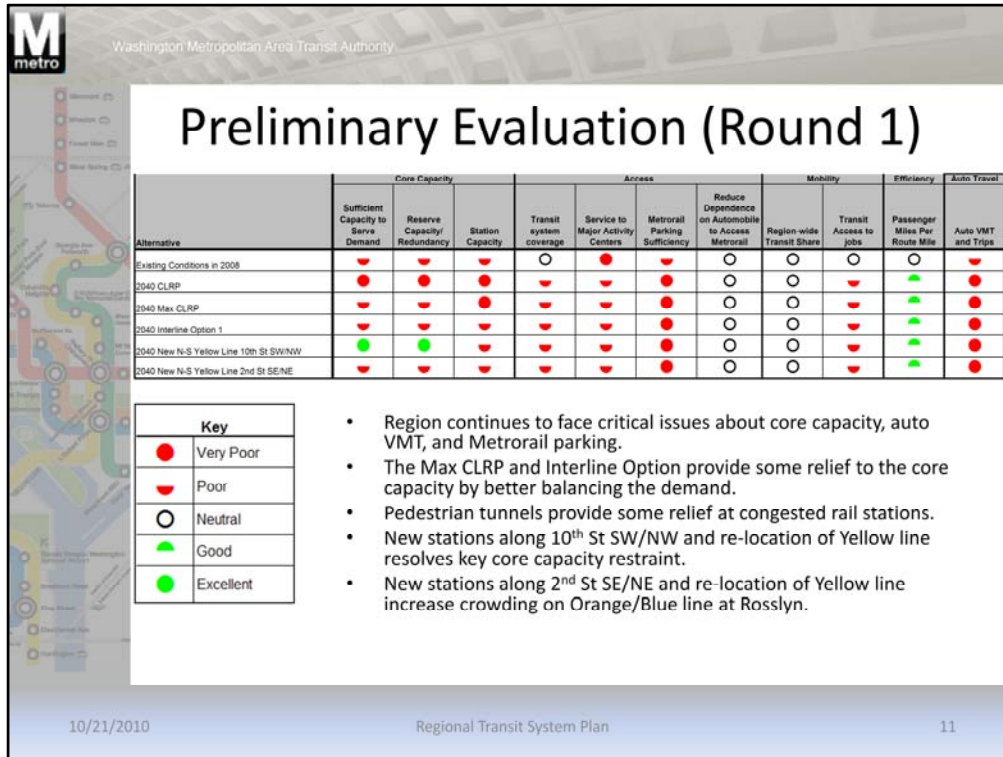
The Base Case (Max CLRP) of analysis included the assumptions above.



The graphics above show demand and capacity in 2008 and under the Max CLRP in 2040.



The graphic above shows the peak hour link loads on Metrorail trains in 2040, under the base case scenario (Max CLRP). The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car and the red represents over 120 passengers per rail car.



The chart above shows how each strategy performed according to the Measures of Effectiveness which relate the primary goals of the plan to system performance.



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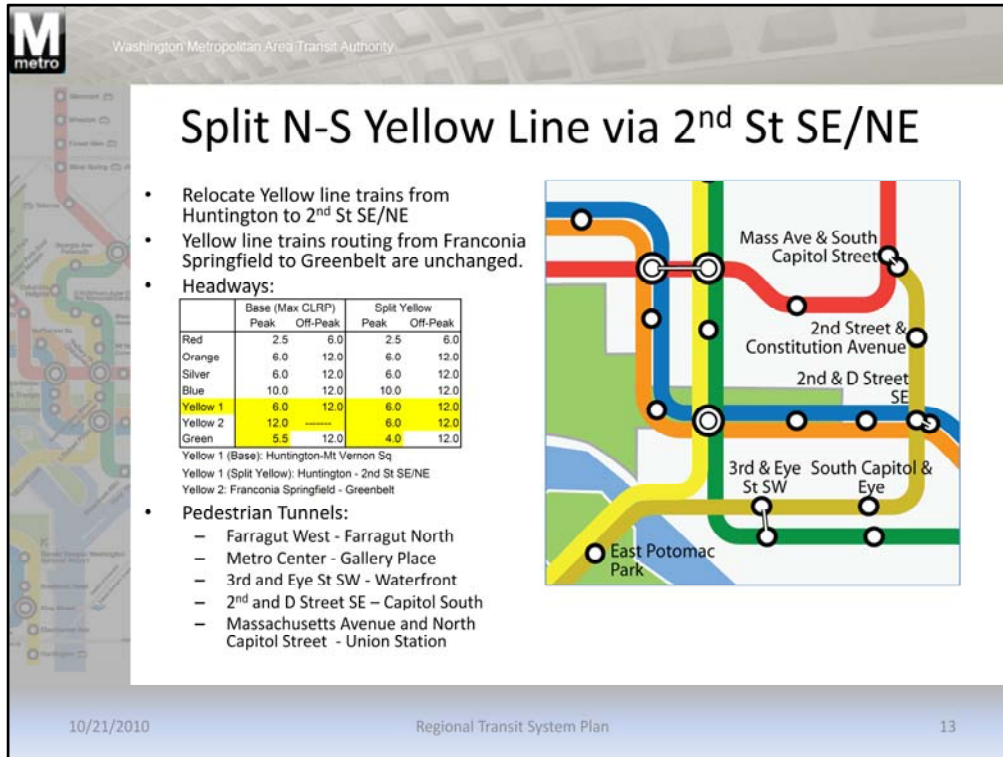
## **DEFINITION OF STRATEGIES**

### **NEW RAIL LINES THROUGH THE CORE (ROUND 2)**

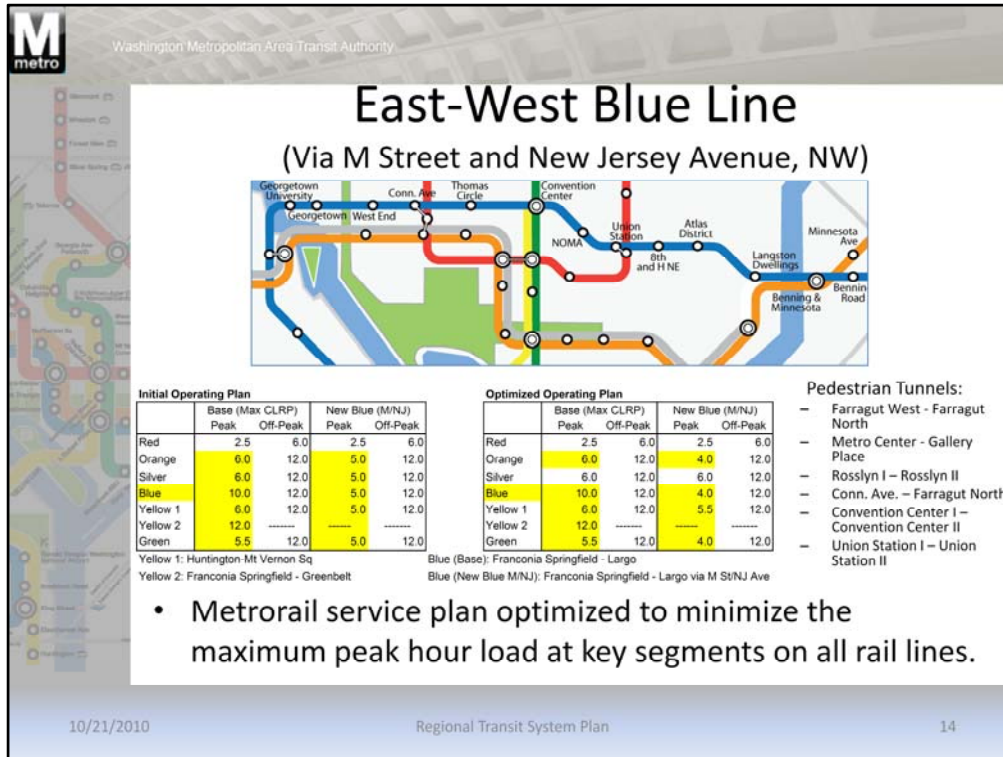
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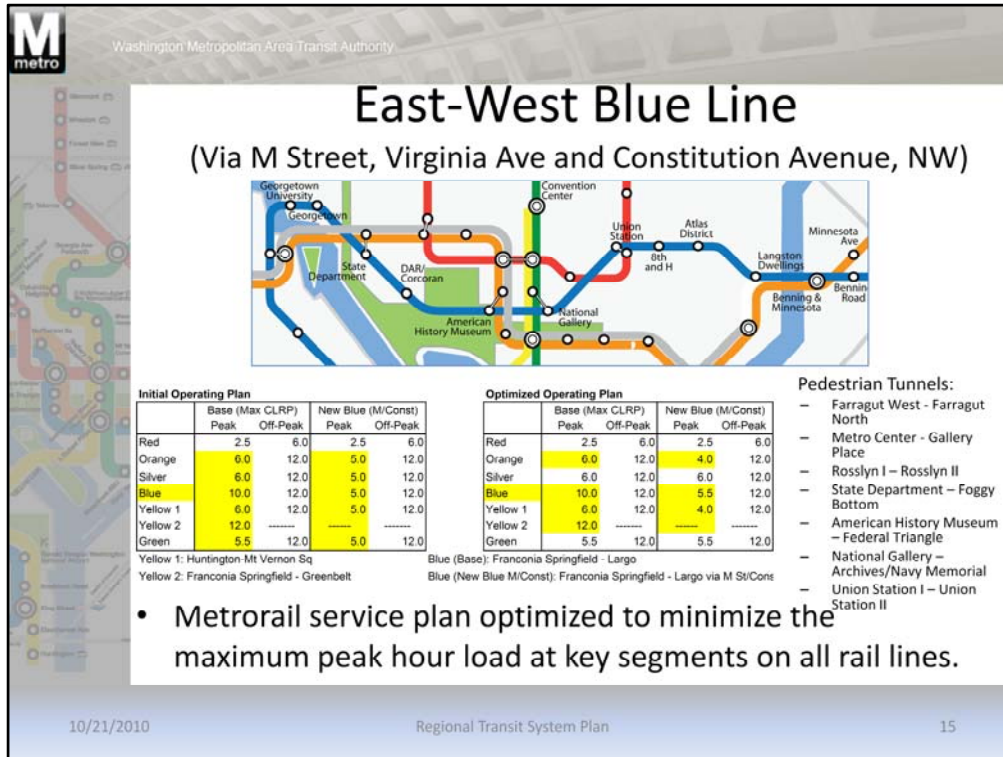


The graphic above shows a new N-S Yellow Line via 2<sup>nd</sup> Street, SE/NE. This proposed alignment follows M Street, SW, serving the Near Southeast neighborhood and Union Station. This strategy assumes several pedestrian tunnels to facilitate improved pedestrian access.



The graphic above shows a new E-W Blue Line operating along M Street and Massachusetts Ave, NW and the impact of an optimized service plan on Metrorail. This strategy assumes several pedestrian tunnels to facilitate improved pedestrian access.





The graphic above shows a new E-W Blue Line operating along M Street and Constitution Avenue, NW and the impact of an optimized service plan on Metrorail. This strategy assumes several pedestrian tunnels to facilitate improved pedestrian access.





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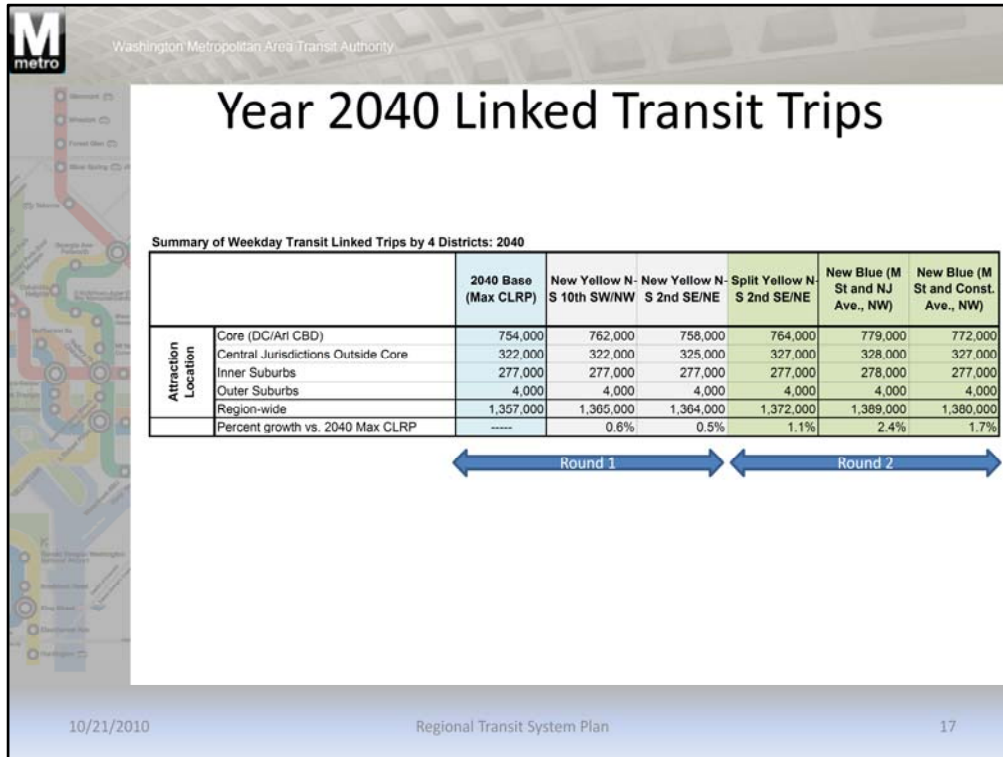
## **IMPACT ON RIDERSHIP AND CAPACITY**

### **NEW RAIL LINES THROUGH THE CORE (ROUND 2)**

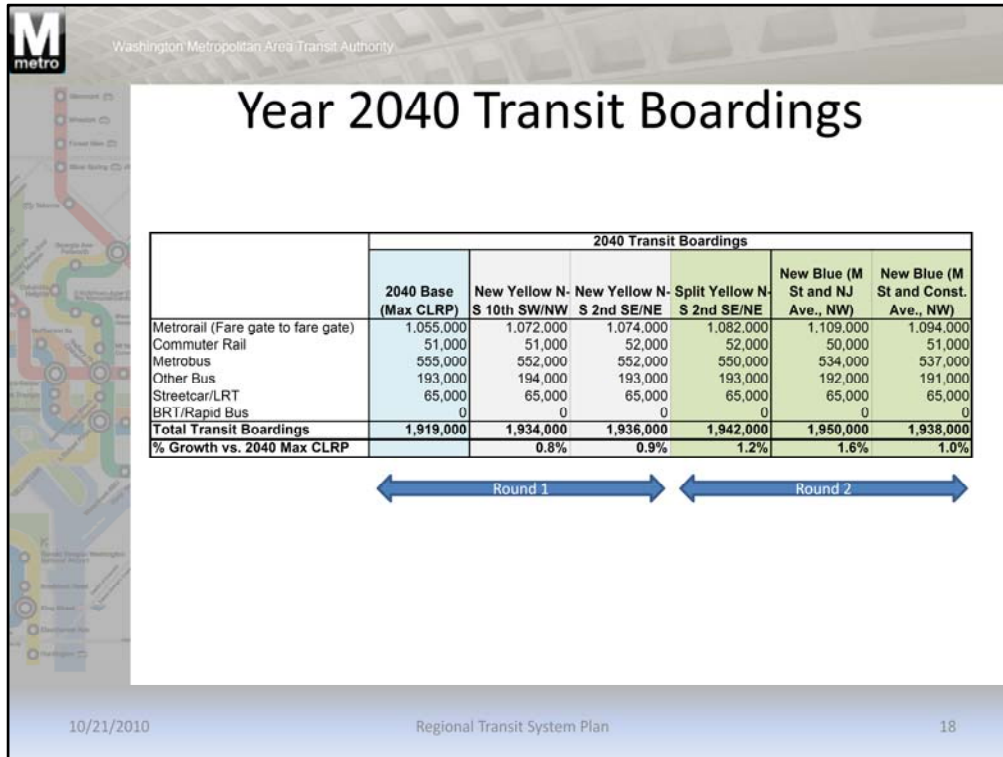
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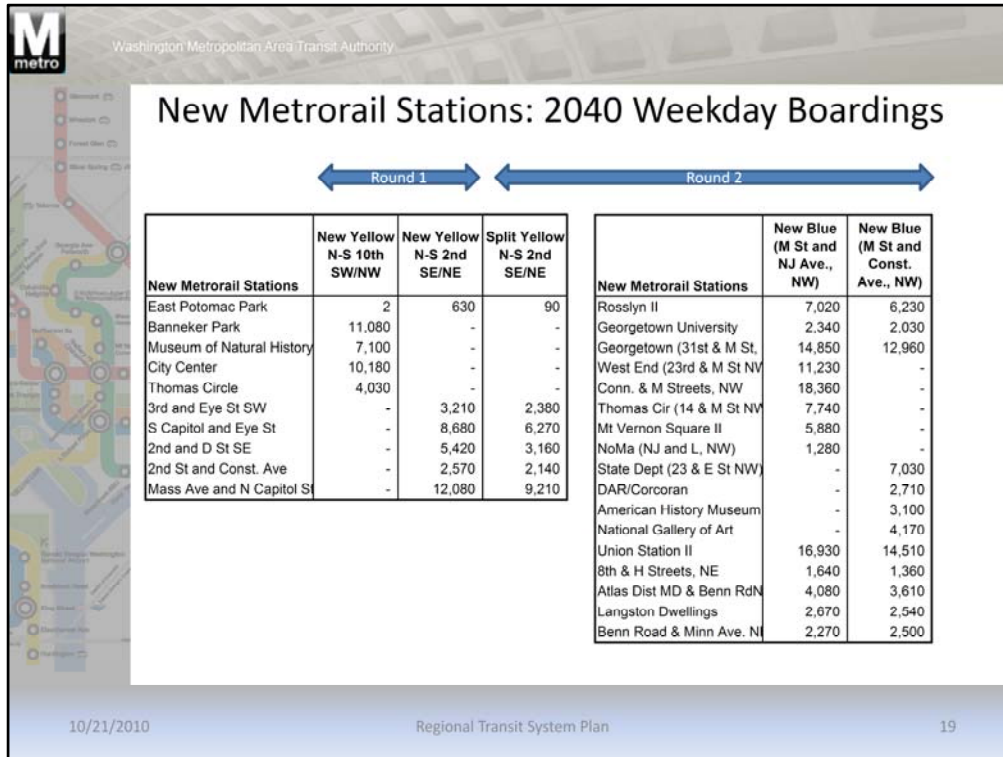
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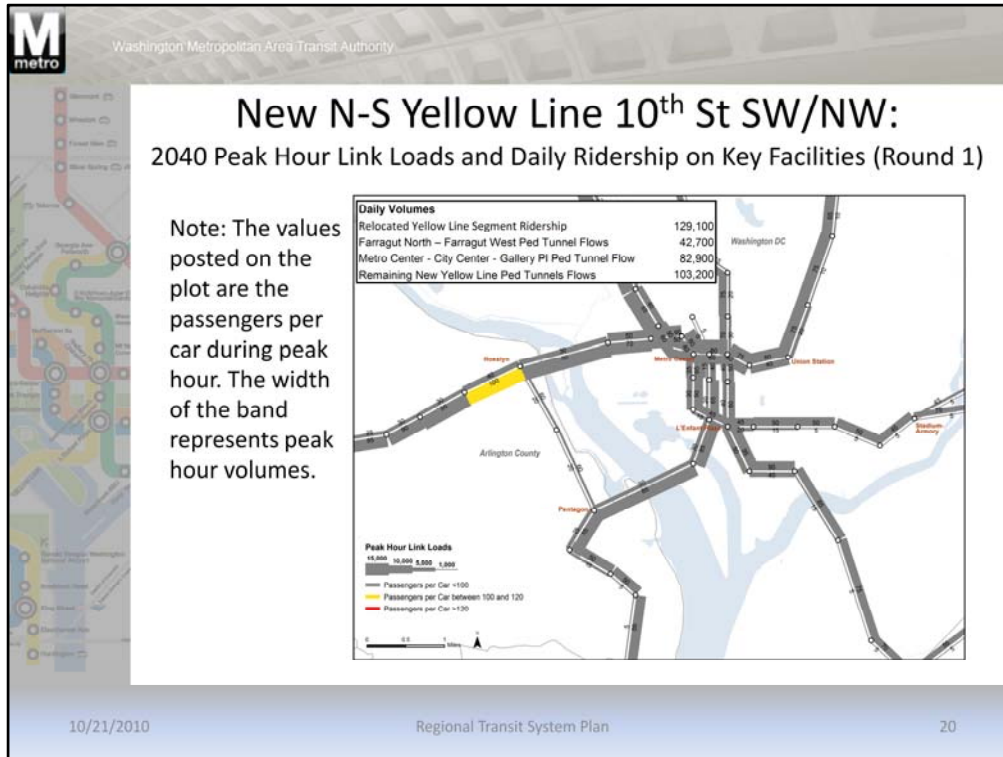
The chart above shows the number of linked transit trips in 2040 for the Base Case and each of the proposed new rail lines.



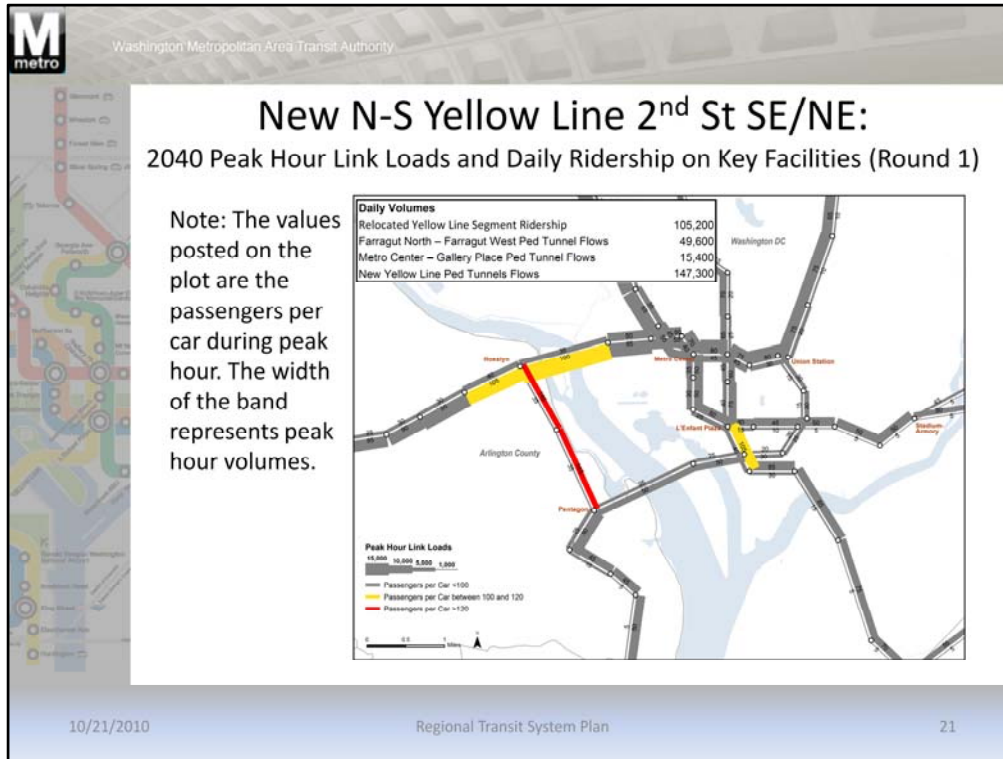
The chart above shows the number of transit boardings in 2040 for the Base Case and each of the proposed new rail lines.



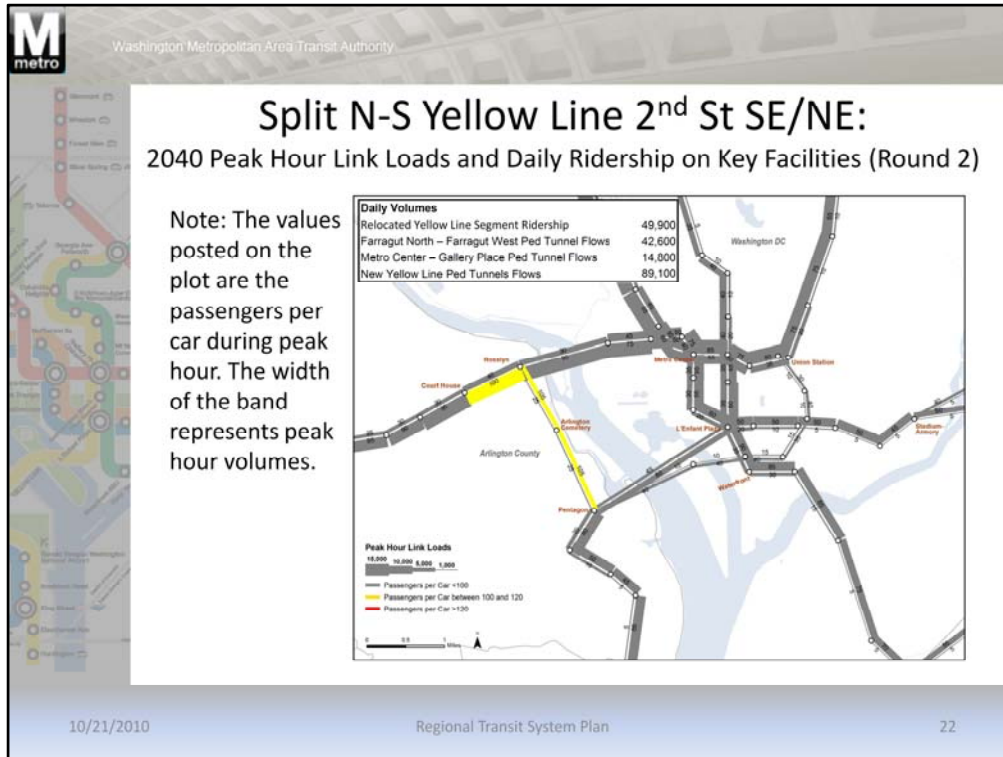
The chart above shows the 2040 weekday boardings at some of the new stop locations on each of the proposed new rail lines.



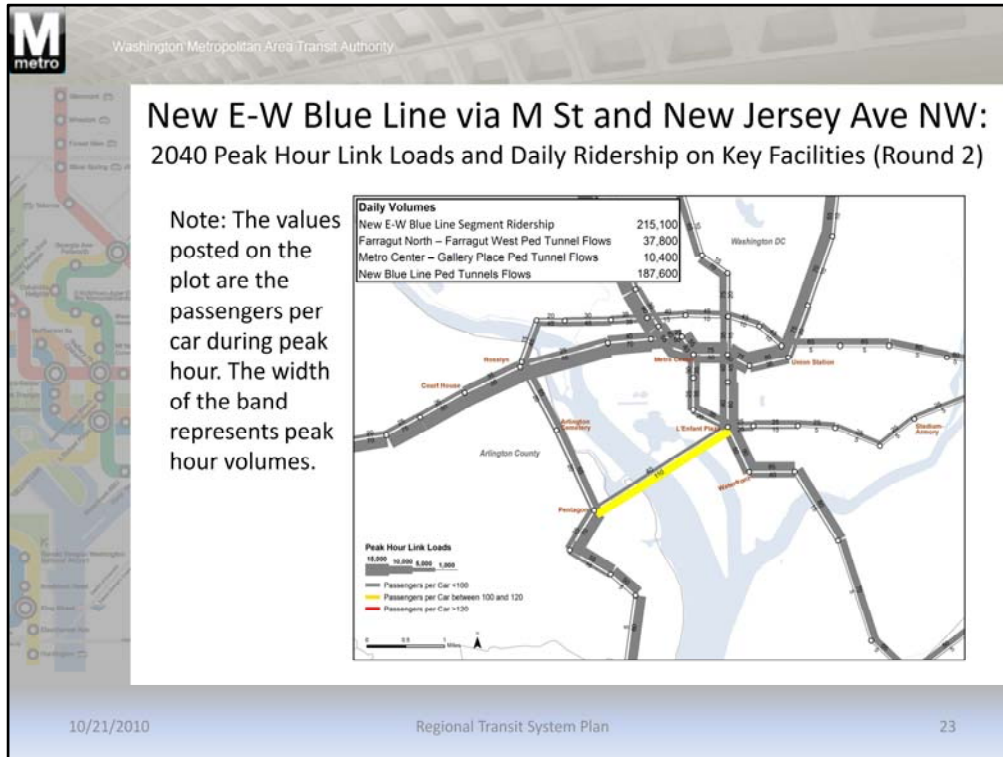
The graphic above shows the AM peak hour link loads on Metrorail cars and daily ridership at several locations in 2040 with the new North-South Yellow Line on 10<sup>th</sup> Street, SW/NW. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car, and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.



The graphic above shows the AM peak hour link loads on Metrorail cars and daily ridership at several locations in 2040 with the new North-South Yellow Line on 2<sup>nd</sup> Street, SE/NE. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car, and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.

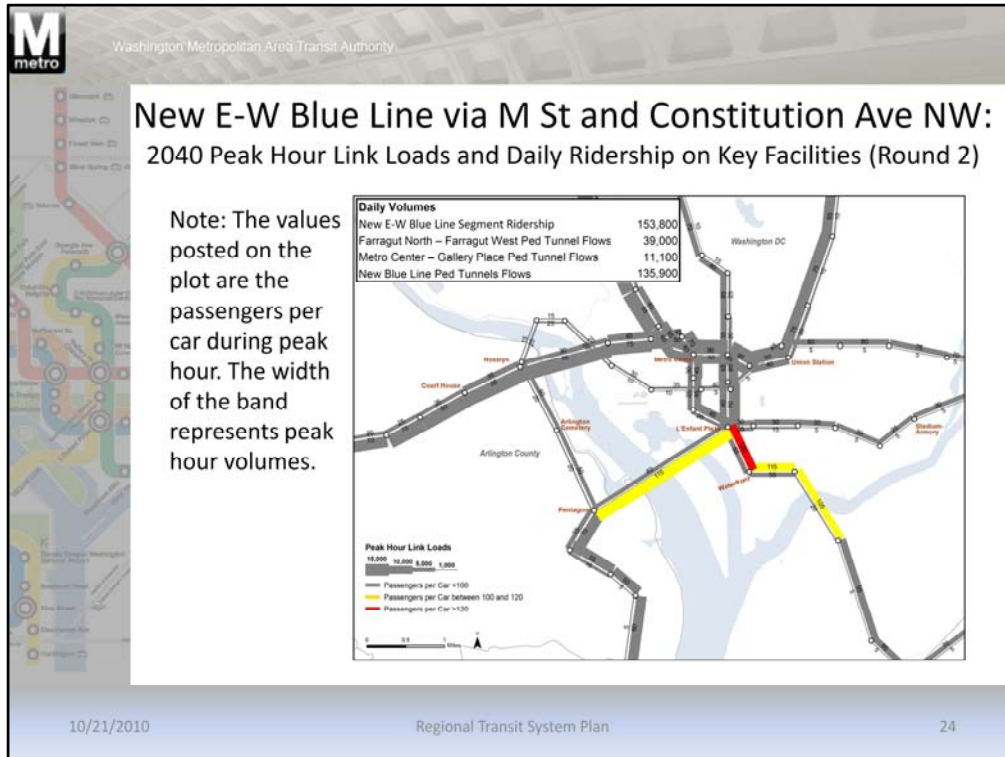


The graphic above shows the **AM** peak hour link loads on Metrorail cars and daily ridership at several locations in 2040 with the new North-South Yellow Line on 2<sup>nd</sup> Street, SE/NE. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car, and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.



The graphic above shows the AM peak hour link loads on Metrorail cars and daily ridership at several locations in 2040 with the new E-W Blue Line via M Street and Massachusetts Ave, NW. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car, and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.





The graphic above shows the AM peak hour link loads on Metrorail cars and daily ridership at several locations in 2040 with the new E-W Blue Line via M Street and Constitution Ave., NW. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car, and the red represents over 120 passengers per rail car. Right-side link load values represent inbound passengers.



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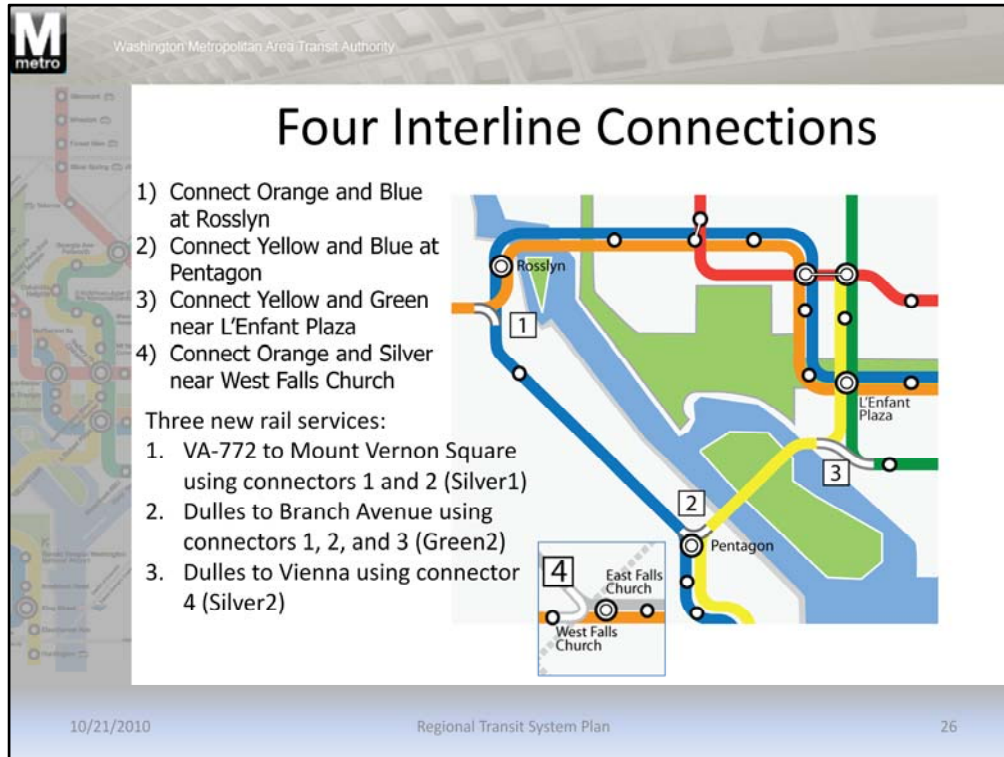
## DEFINITION OF STRATEGIES

### RAIL ENHANCEMENTS (ROUND 2)

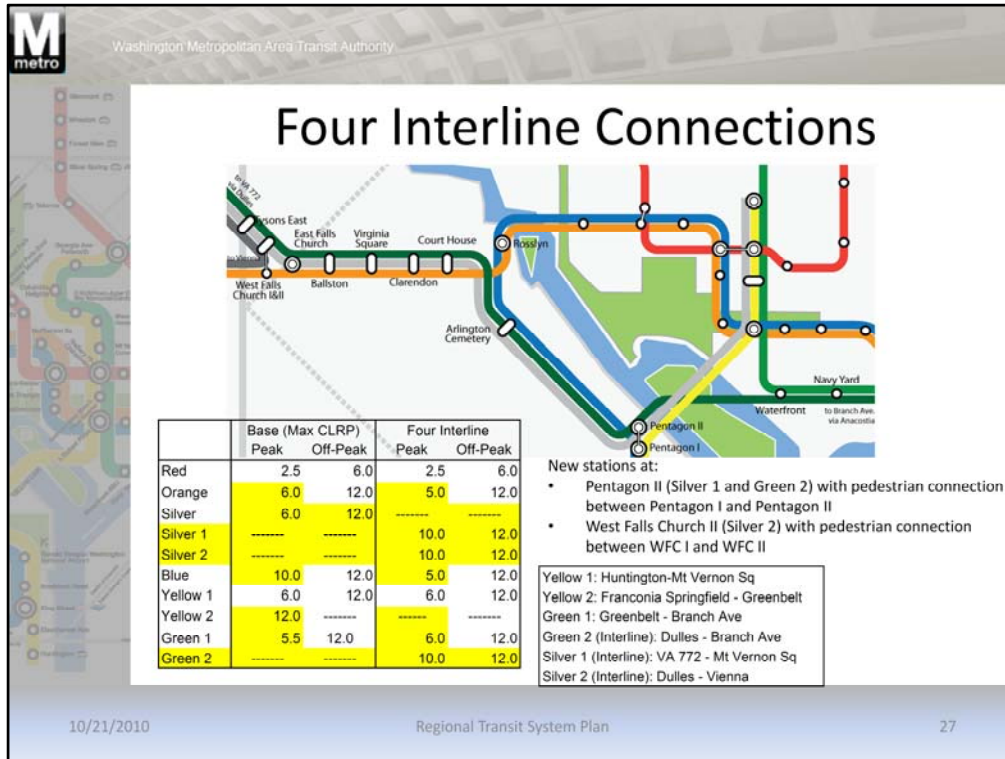
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The graphic above shows four locations where rail “interlining” (Definition: When different trains operate on the same route or line.) can occur to relieve some of the pedestrian congestion at high transfer/ridership Metrorail Stations.



The graphic above shows the impact of the Rail Interlining Strategy on each rail line and the Base Case. This strategy includes several new stations as well.



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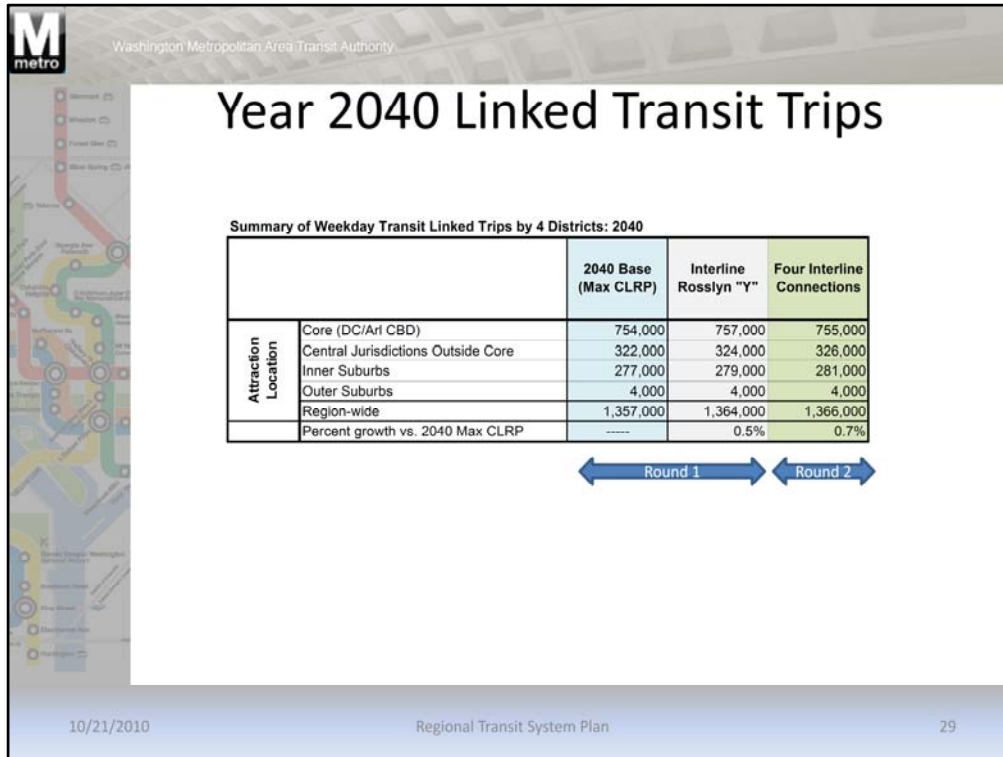
## **IMPACT ON RIDERSHIP AND CAPACITY**

### **RAIL ENHANCEMENTS (ROUND 2)**

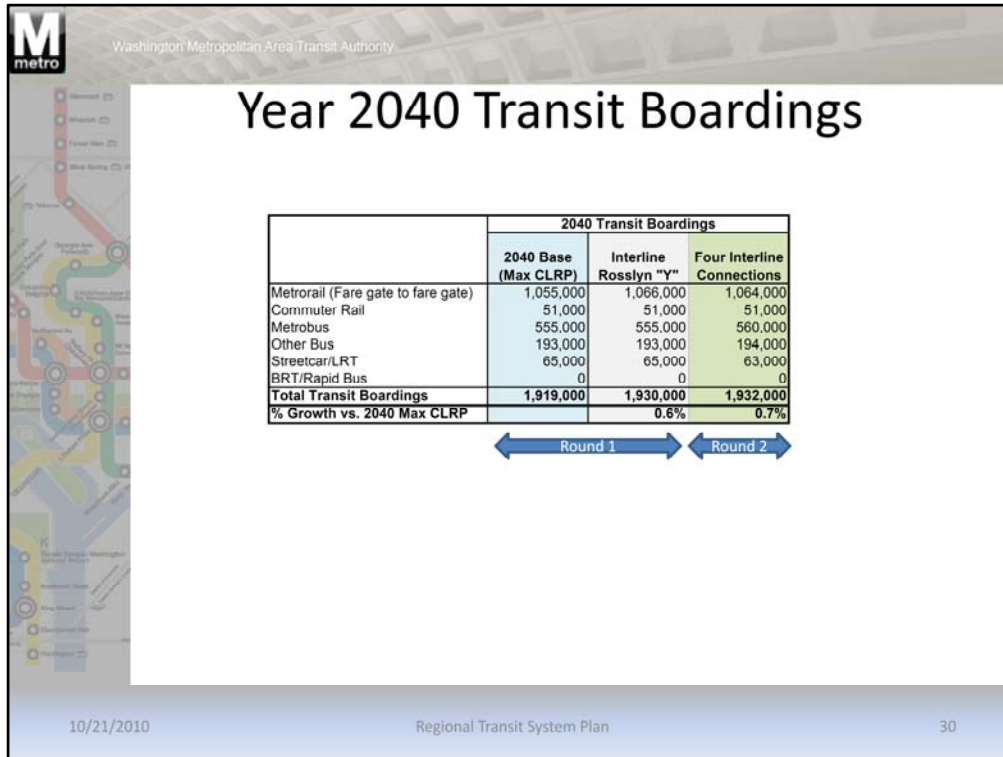
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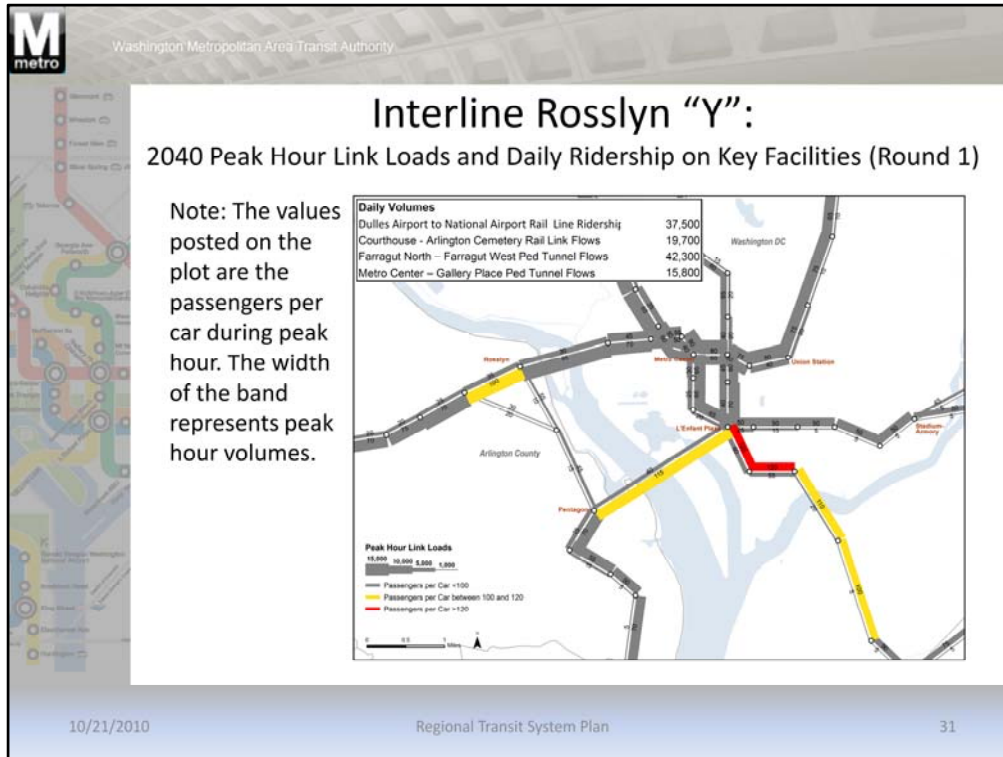
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The chart above shows the number of linked transit trips in 2040 for the Base Case, a single Interline option "Rosslyn Y", and all four Interline Connections.

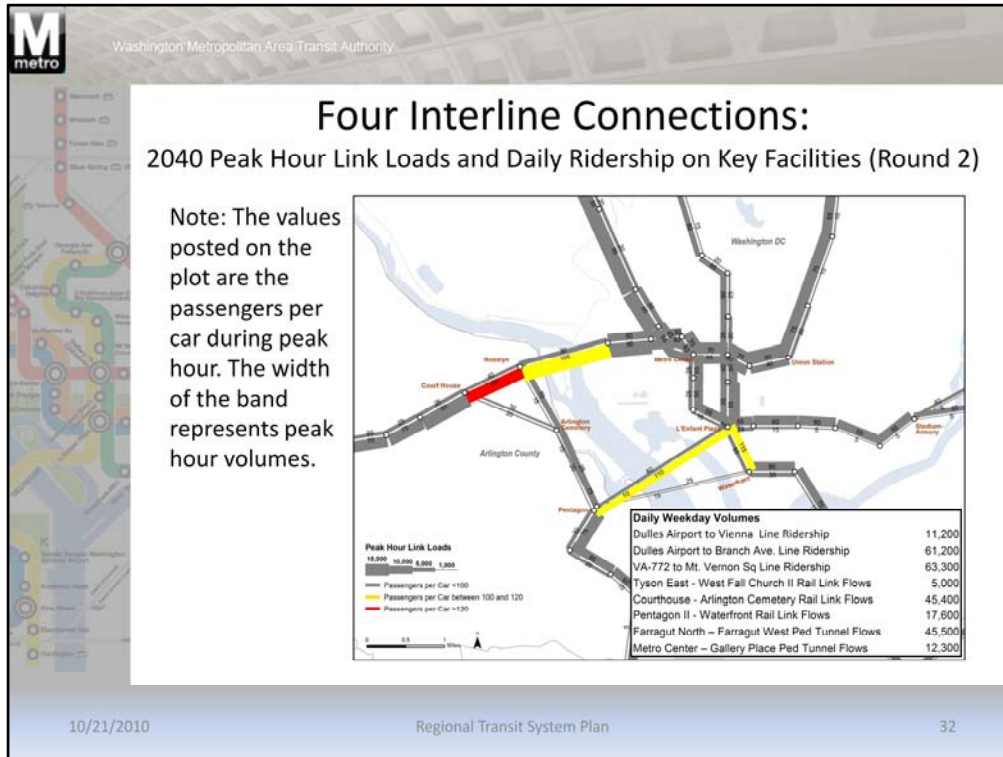


The chart above shows the number of 2040 Transit Boardings for the Base Case, a single Interline option "Rosslyn Y", and all four Interline Connections.



The graphic above shows the AM peak hour link loads on Metrorail cars and daily ridership at several locations in 2040 with the Interline Rosslyn "Y" Strategy. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.





The graphic above shows the AM peak hour link loads on Metrorail cars and ridership volumes at several locations in 2040 with Four Interline Connections Strategy. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.



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## DEFINITION OF STRATEGIES

ENHANCED EXISTING SURFACE TRANSIT, WALKABILITY

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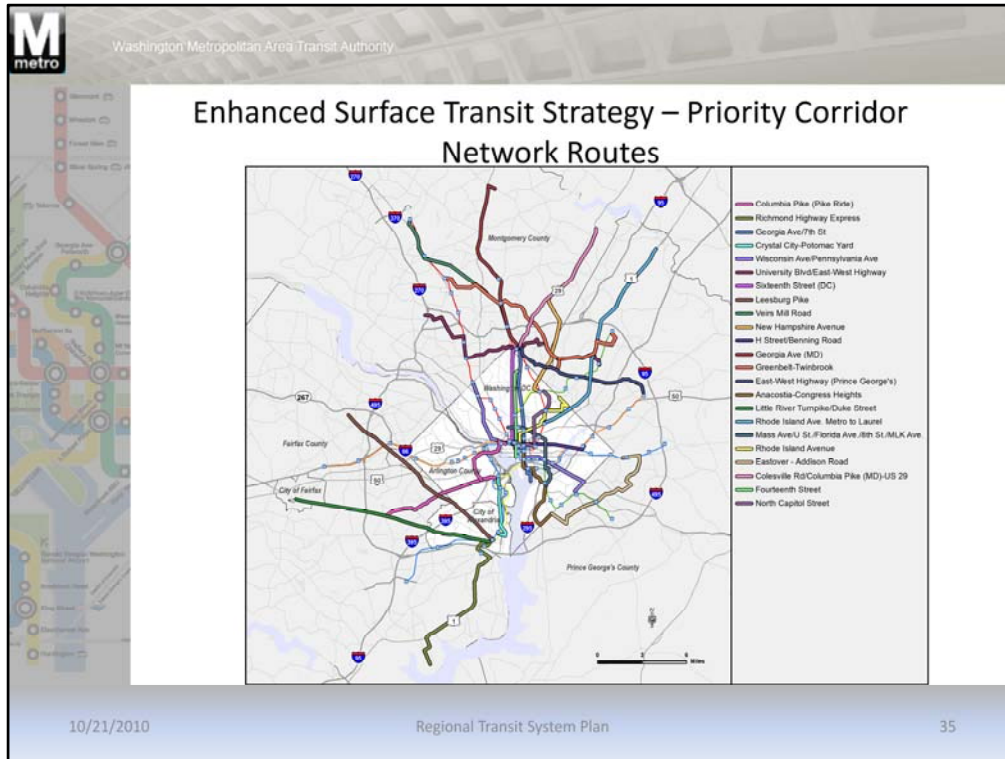
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## Enhanced Surface Transit Strategy – Priority Corridor Network


- Based on networks developed for Priority Corridor Network (PCN) study
  - New routes coded as a limited stop BRT mode
  - Improved running times for existing background bus service as per PCN
- PCN Routes operated at 10-minute peak and 15-minute off-peak frequency
- Average speed for PCN Routes improved by 2 MPH
- Overlay the Metrorail operating plan from Max CLRP alternative

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The Enhanced Surface Transit Strategy includes in the baseline Metro's Priority Corridor Network and assumes the bulleted elements described in the slide.



The graphic above shows the Priority Corridor Network Routes.



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## Improved Walkability Strategy

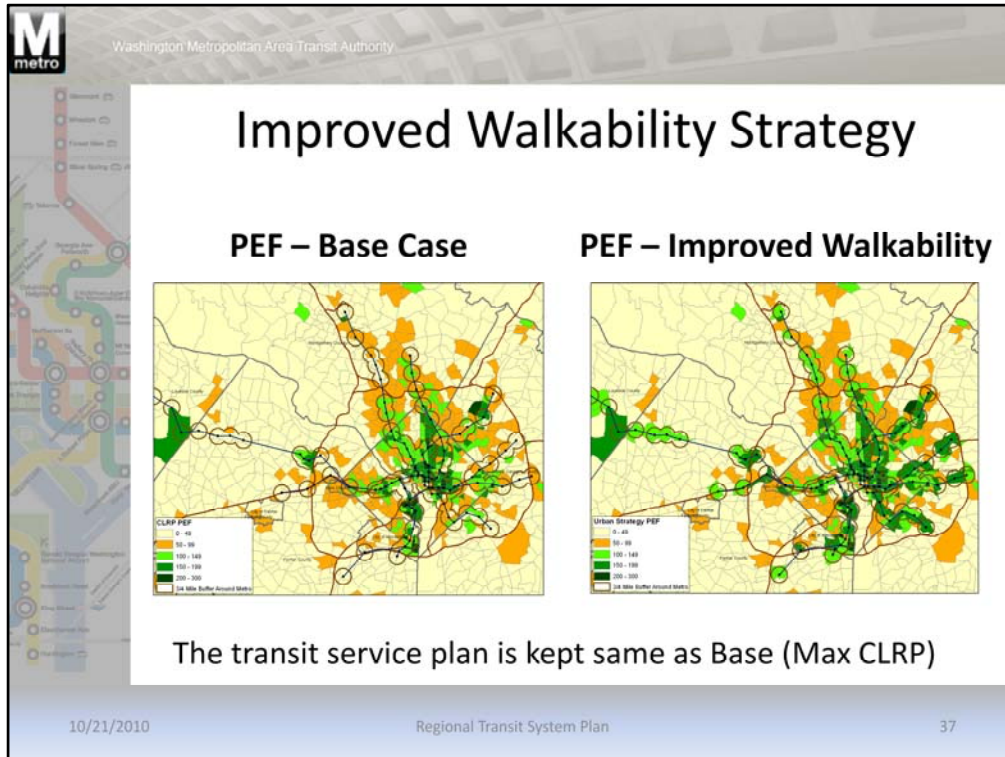
Identify TAZs within 3/4<sup>th</sup> mile of a Metrorail station with the potential for development;

Categorize the TAZs into two groups:

- Group 1** = TAZs inside or near the Capital Beltway with **PEF = 150** (comparable to Clarendon or Ballston Stations):
  - High volume of walk access;
  - Development oriented towards transit access.
- Group 2** = TAZs outside the Capital Beltway with **PEF = 100** (comparable to Silver Spring or Greenbelt Town Center):
  - High volume of drive access;
  - Low density development at transit stations.

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The Improved Walkability Strategy will show the influence of improved pedestrian infrastructure (sidewalks) on transit use. In order to determine the impact more walkability would have on increasing transit use, we will utilize the Pedestrian Environment Factor (PEF), which informs an individual's mode of access to a transit trip to model walkability. The PEF is a measure of walkability of an area or location. We categorized the PEF's into two categories for the purposes of the RTSP study.



The graphic above shows the PEF of our base case and that with improved walkability.



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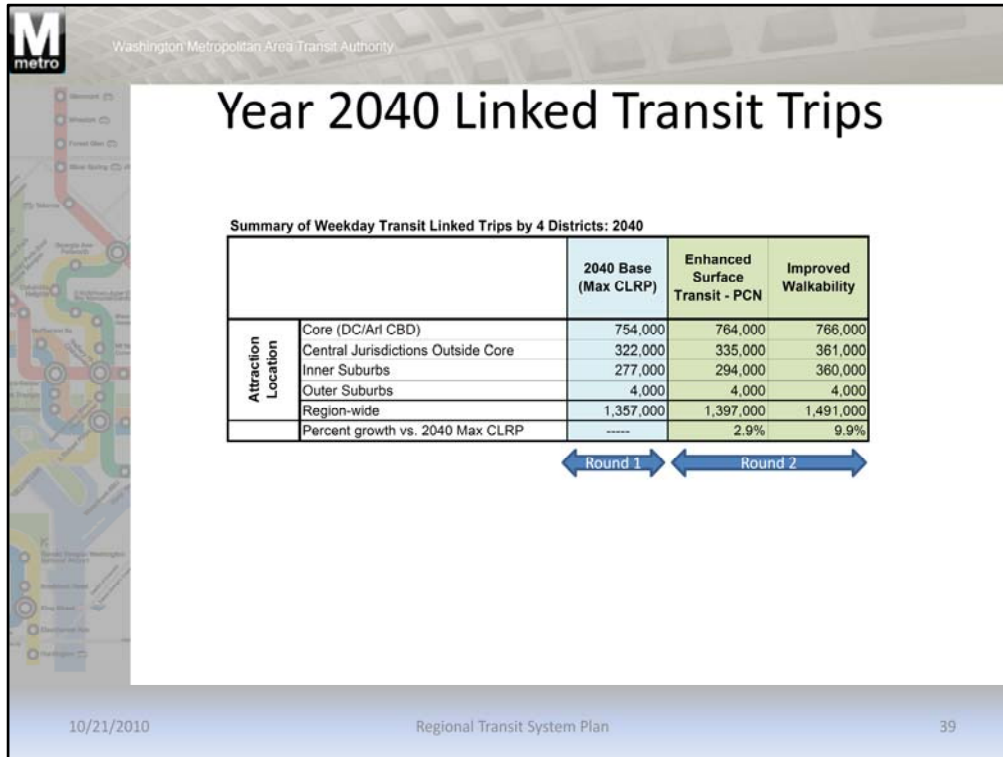
## **IMPACT ON RIDERSHIP AND CAPACITY**

ENHANCED EXISTING SURFACE TRANSIT, WALKABILITY

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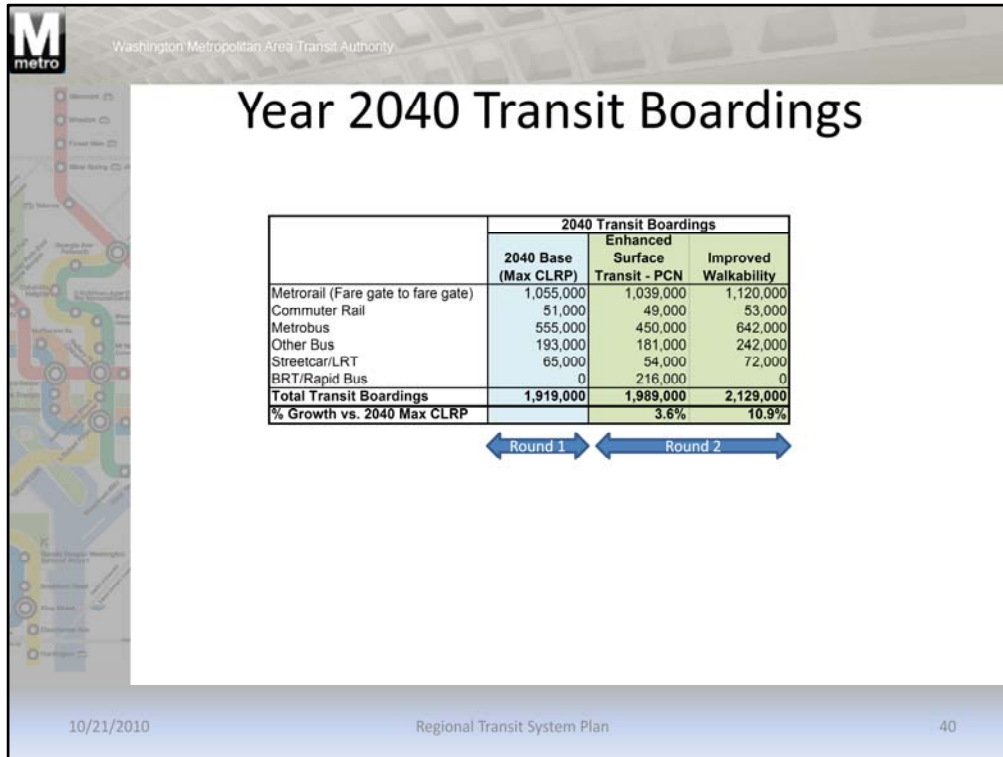
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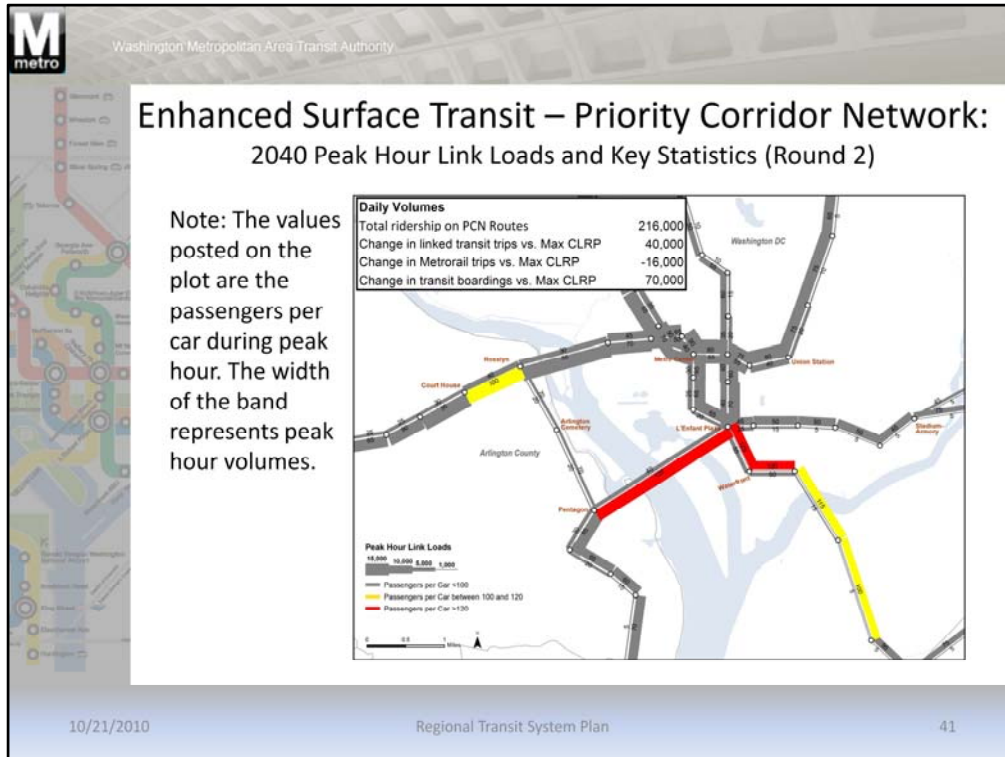


The graphic above shows the linked transit trips for the 2040 Base, Enhanced Surface Transit and Improved Walkability Strategies in 2040.

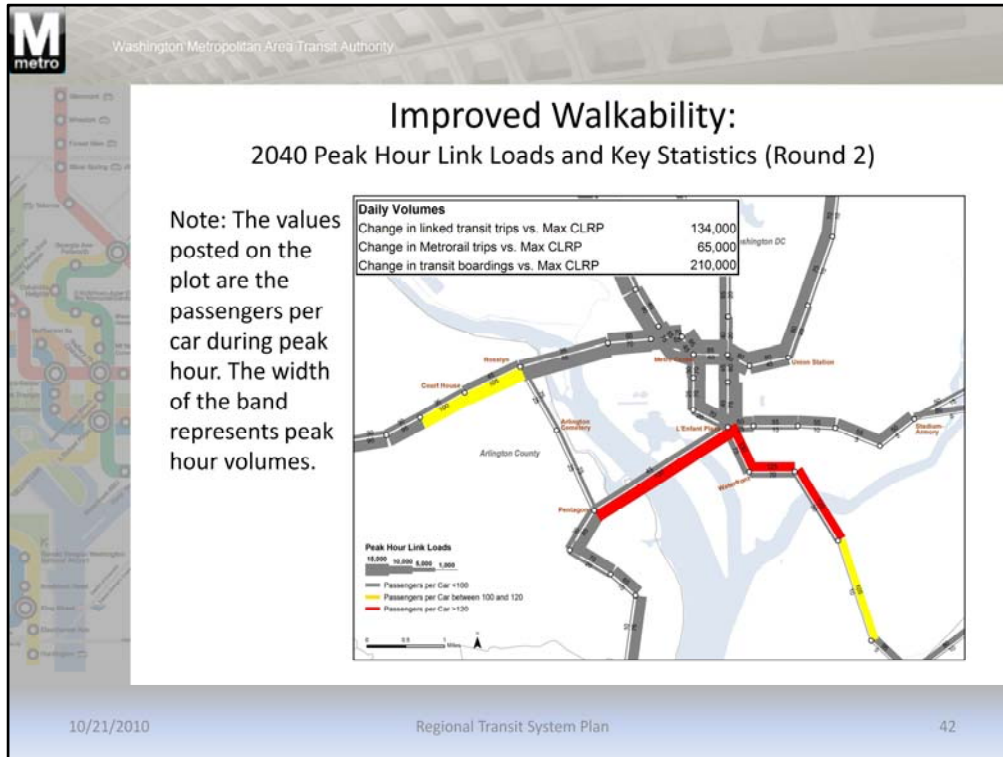




The graphic above shows the transit boardings for the 2040 Base, Enhanced Surface Transit and Improved Walkability Strategies in 2040.



The graphic above shows the AM peak hour link loads on Metrorail trains in 2040 under the Enhanced Surface Transit Strategy. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.



The graphic above shows the AM peak hour link loads on Metrorail trains in 2040 under the Improved Walkability Strategy. The gray color represents fewer than 100 passengers per car; yellow indicates between 100 and 120 passengers per car and the red represents over 120 passengers per rail car. The higher link-load values represent passengers traveling to the core during the AM peak hour.



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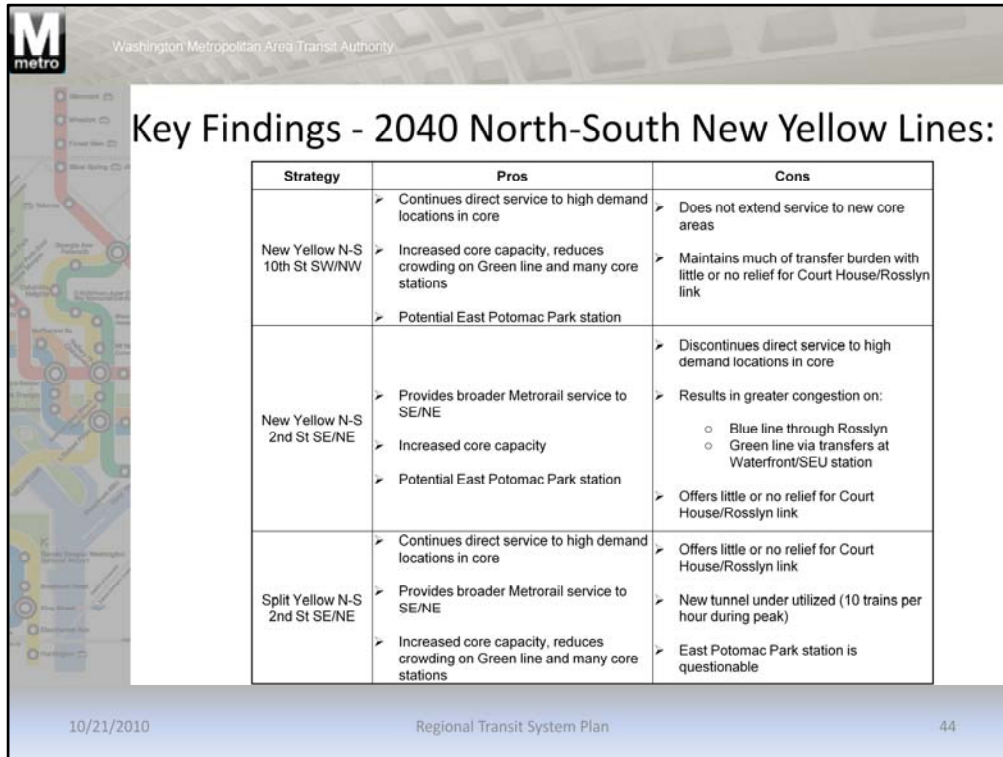


## PRELIMINARY EVALUATION


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The chart above shows the key findings for the 2040 North-South New Yellow Lines.



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## Key Findings - 2040 East-West New Blue Lines:

Strategy	Pros	Cons
New E-W Blue via M St / New Jersey Ave.	<ul style="list-style-type: none"> <li>➤ Increased core capacity, reduces crowding on Orange, Silver, and Green lines and many core stations</li> <li>➤ Increases Metrorail coverage and transit share to core areas with moderately-high levels of demand</li> </ul>	<ul style="list-style-type: none"> <li>➤ New tunnel under utilized (15 trains per hour during peak)</li> <li>➤ Offers little or no relief for Yellow/Green lines at L'Enfant Plaza</li> </ul>
New E-W Blue via M St / Constitution Ave.	<ul style="list-style-type: none"> <li>➤ Increased core capacity, reduces crowding on Orange and Silver lines</li> <li>➤ Increases Metrorail coverage and transit share to core areas with moderately-low levels of demand</li> </ul>	<ul style="list-style-type: none"> <li>➤ Crowding continues to be an issue on both Yellow and Green lines</li> <li>➤ Requires more rail-to-rail transfers</li> <li>➤ New tunnel under utilized (11 trains per hour during peak)</li> </ul>

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The chart above shows the key findings for the 2040 East-West New Blue Lines.

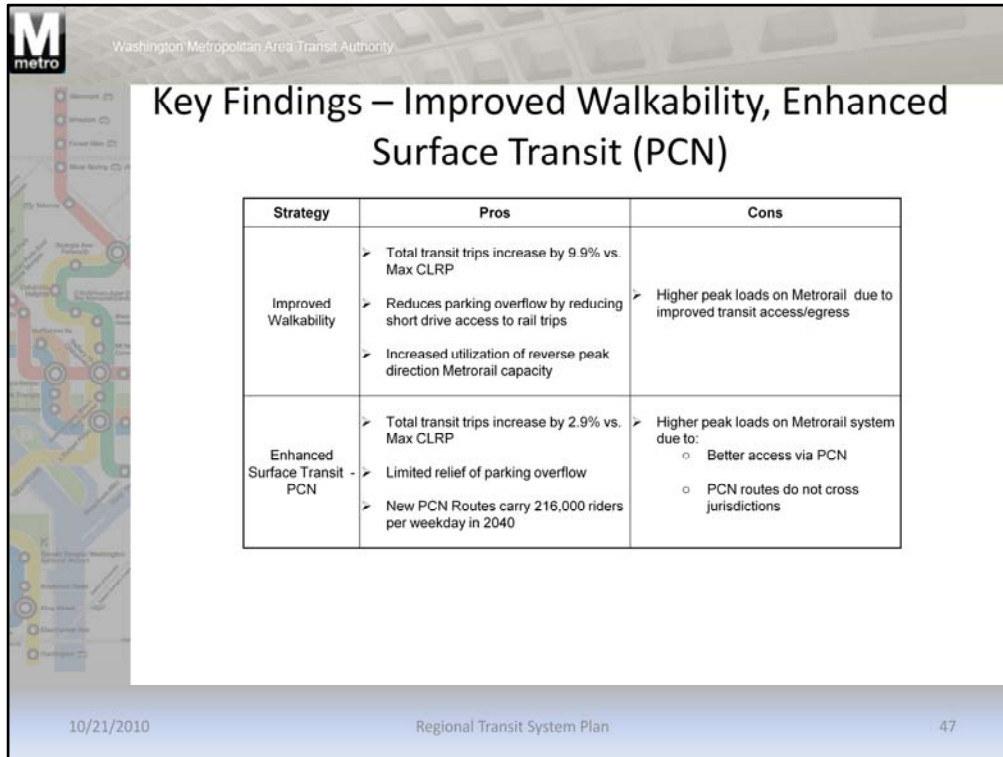

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## Key Findings – Rail Interline Options:

Strategy	Pros	Cons
Interline options – Rosslyn “Y”	<ul style="list-style-type: none"> <li>Better intra-Virginia service</li> <li>Reduces transfer volumes at Rosslyn</li> <li>Provides some flexibility in rail operations</li> </ul>	<ul style="list-style-type: none"> <li>Does not address core capacity</li> <li>Loads on service using interline do not justify 8-car trains</li> </ul>
Four Interline Connections	<ul style="list-style-type: none"> <li>Better intra-Virginia service</li> <li>Reduces transfer volumes at Rosslyn</li> <li>Provides considerable flexibility in rail operations</li> </ul>	<ul style="list-style-type: none"> <li>Aggravates peak congestion problem at Rosslyn</li> <li>Increases transfer volumes at more stations</li> <li>Does not address core capacity</li> <li>Loads on new rail lines do not justify 8-car trains</li> </ul>

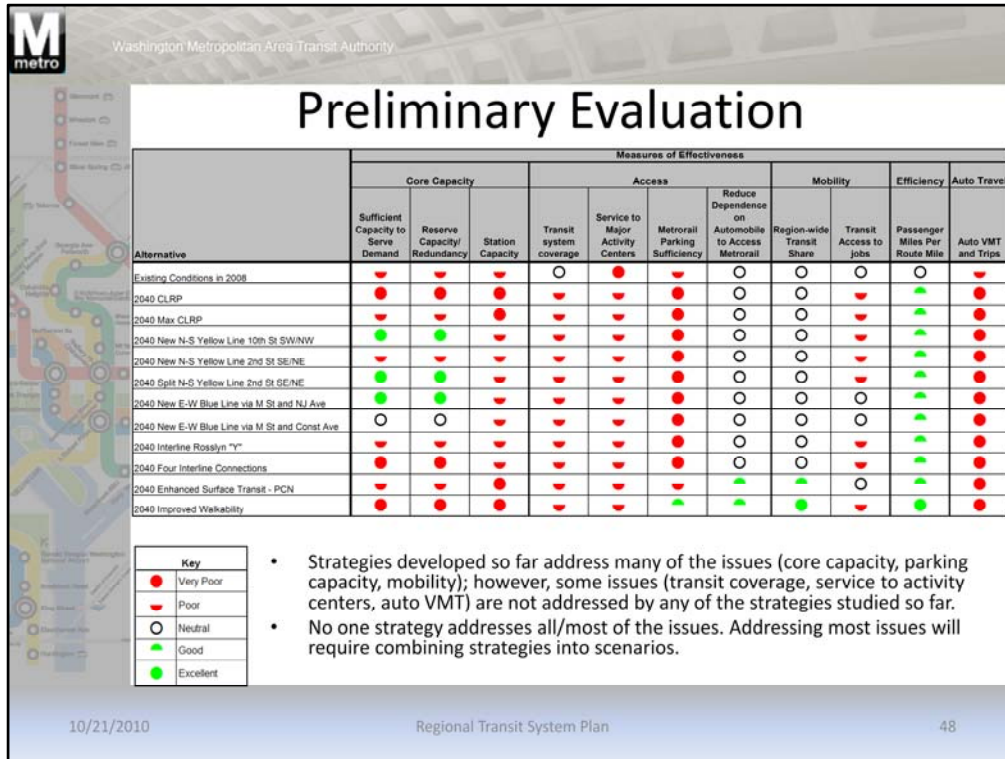
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The chart above shows the key findings for the 2040 Rail Interline Strategies.



The chart above shows the key findings for the 2040 Improved Walkability and Surface Transit Strategies.





The chart above shows how each strategy performed according to the Measures of Effectiveness.



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## UPCOMING MODEL RUNS


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## Parking Capacity Relief Strategy - 1

- Add direct shuttle bus service between remote parking location and Metrorail station.
- Shuttle service at 15 minute peak and 30 minute off-peak frequency.
- Shadow price oversubscribed Metrorail park-and-ride lots.

Metrorail Segment	# of Parking Spaces	2040 Metrorail Parking Utilization	Park-and-Ride Lot	Location	Shuttle To
Red Line - Shady Grove - Grosvenor	10,140	94%	Urbana (South Lot)	MD 80 & I-270	Shady Grove Metrorail
Red Line - Silver Spring - Glenmont	3,354	123%	Burtonsville and Calvert County Fairgrounds	US 29 & MD 195/Calvert County Fairground	Glenmont Metrorail
Green Line - Waterfront-Congress Heights	808	102%	Equestrian Center	MD 4 & Water Street	Branch Avenue Metrorail
Green Line - Southern Avenue - Branch Avenue	7,310	126%	St. Charles Towne Ctr @ JC Penney and Dick's Sporting Goods and behind JoAnn's	11110 Mall Circle and MD 301 & Smallwood Drive	Branch Avenue Metrorail
Yellow/Blue Line - Fran-Springfield, Van Dorn & Huntington	8,520	121%	Fredericksburg (NEW) ; Prince William Pkwy Transit Center (PRTC) (NEW); Massaponax (NEW);	Fredericksburg (Rte 17 & RT 1); Massaponax (I-95 & Spotsylvania Pkwy); Prince William Pkwy Transit Center (PRTC) (I-95 & Telegraph Road)	Franconia-Springfield Metrorail
Orange Line- Vienna/Fairfax - West Falls Church	9,258	87%	Stone Road-US 29; Stringfellow Road; Sully Station; Bull Run @ 234/Gudley Road; VA 234 Bypass @ US 29; and Haymarket @ US 15	VA Bypass & US 29; VA 234 Bypass/Cushing Road; VA 234 & Gudley Road; Stone Road-US 29; US 15 in Haymarket	Vienna Metrorail Station
Blue Line - Benning Road-Largo Town Center	4,475	133%	Harry S. Truman	Harry S. Truman & Riva Road	Largo Town Center Metrorail

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The Parking Capacity Relief Strategy will evaluate potential park-n-ride locations in the region and the potential for Metro-operated shuttle buses to service those parking lots at frequencies of 15 minutes during the peak and 30 minutes during the off-peak periods.




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## CLRP Aspirations Strategy

- **Households**
  - Moves 69,000 additional households into the region;
  - Relocates 205,000 households to activity centers and transit station areas.
- **Jobs**
  - Moves 22,000 additional jobs into the region;
  - Shifts 240,000 jobs to activity centers and transit station areas.

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The CLRP Aspirations Strategy will evaluate the impact of specific land use and transportation goals as defined under the CLRP Aspirations Study for the 2040 forecast year.





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## In-fill Station Strategy

**Potential In-fill Stations:**

- Eisenhower Avenue Valley between King Street & Van Dorn Stations;
- St. Elizabeth's Hospital (West Campus) between Anacostia and Congress Heights Stations;
- Kansas Avenue, NW between Fort Totten and Takoma Stations;
- Others?




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The Infill Station Strategy will evaluate the impact of the incorporation of new Metrorail Stations in areas not currently well-served between existing Metrorail Stations. Potential Stations include those listed above.



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## Enhanced Surface Transit – PCN+

- Improve the PCN network strategy by implementing the following:
  - Extend select premium buses to core to relieve Metrorail peak load points
  - Interline existing PCN routes where possible
  - Identify PCN corridors with opportunity for:
    - Express BRT
    - Off-Board Fare Collection
  - Commuter Rail Enhancements:
    - MARC to Crystal City
    - Bi-directional service

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The Enhanced Surface Transit - PCN+ Strategy incorporates extended premium buses, opportunities for Express BRT and Off-Board Fare Collection and Commuter Rail enhancements, such as bi-directional service.

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## Rail Extensions-Combo of up to 5

- Greenbelt to BWI-Marshall Airport
- Vienna to Centreville/Rte. 28
- New Carrollton to Bowie
- Springfield to Dale City
- Branch Avenue to Waldorf

**NOTE: Extensions may impact core capacity**



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The Rail Extensions Strategy will evaluate the impact of extensions of the existing Metrorail System to points north, east, south and west and the resultant impacts in the year 2040.

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## Rail Extensions- additional ones

- Shady Grove/Glenmont Closed Loop;
- Yellow Line relocated continuing north via North Capitol;
- St. Elizabeth's Hospital to National Harbor;
- Richmond Highway;
- Leesburg;
- Brown Line:
  - Bethesda/Friendship Heights via Massachusetts Avenue ;
  - Georgetown to Mt. Rainier or North Capitol Street Corridor.


**NOTE: Extensions may impact core capacity**



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The Rail Extensions Strategy will evaluate the impact of extensions of the existing Metrorail System to points north, east, south and west and the resultant impacts in the year 2040. We have also asked the TAG members to advise of additional corridors where they would like to evaluate Metrorail extensions.



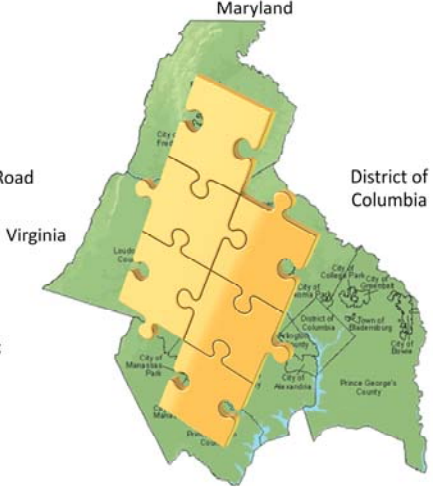


Washington Metropolitan Area Transit Authority

## LRT/BRT Connections-First Run

- Purple Line in Md to Va Connections**
  - Grosvenor to Dunn Loring;
  - New Carrollton to Eisenhower Avenue.
- Virginia to DC Connections**
  - Fairfax City and Vienna via Chain Bridge Road to DC;
  - Pentagon City to DC;
  - Rosslyn to Georgetown.
- Intra-Virginia Connections:**
  - Dulles to Manassas;
  - Potomac Yard to Ballston via Glebe Road;
  - Tysons Corner to Alexandria via Route 7.

**NOTE: Extensions may impact core capacity**

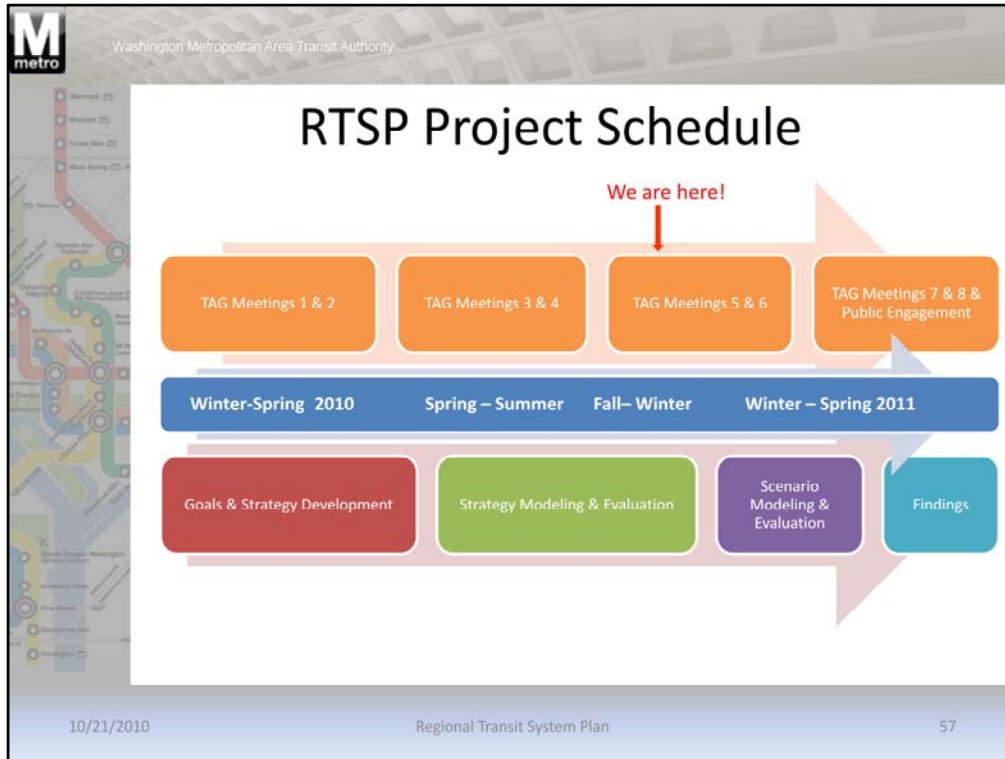


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The LRT/BRT Connections Strategy will evaluate the impact of connections to Streetcar and LRT systems in the region to include such projects as the Purple Line, DC Streetcar, and Columbia Pike Streetcar.



The graphic above outlines our Project Schedule with key milestones and meetings.