



Washington Metropolitan Area Transit Authority



RTSP Metrorail Strategies:

Parking Capacity Relief, CLRP Aspirations Land Use, In-Fill
Stations, Metro Extensions

Presentation to the Technical
Advisory Group

January 6th, 2011



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Meeting Agenda

- I. Welcome & Introductions
- II. Public Engagement
- III. New Model Results
- IV. Next Model Runs
- V. Next Steps

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Meeting Agenda


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Public Engagement Strategy


- How will we engage the public?**
 - Jurisdictional Briefings/"Piggy-back" (Jan. – April 2011)
 - TAG Member requests RTSP Briefing
 - Metro's GOVR staff briefs jurisdictional representative
 - TAG Member & RTSP Staff schedule briefing/piggy-back
 - Metro-hosted Regional Workshops (March/April 2011)
 - 2 Workshops in each jurisdiction
- What will be discussed at the Workshops?**
 - RTSP Purpose/People/Process/Product
 - Ice Breaker Exercise
 - Participant Break-out & Planning Team Exercises
 - Planning Team Presentations
 - RTSP Next Steps
 - Open House/Project Board Review






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Proposed Public Engagement Strategy for the RTSP



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Overview of New Model Results

- Review of Base Case (Max CLRP)
- Definition of Strategies and Impact on Ridership and Capacity (Round 3)
 - Set 1:
 - Parking Capacity Relief
 - Set 2:
 - CLRP Aspirations Land Use
 - Set 3:
 - Rail Enhancements
 - In-fill Stations
 - Metro Extensions Run A
- Preliminary Evaluation

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Overview of Recent Model Results and Preliminary Evaluation



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REVIEW OF BASE CASE (MAX CLRP)

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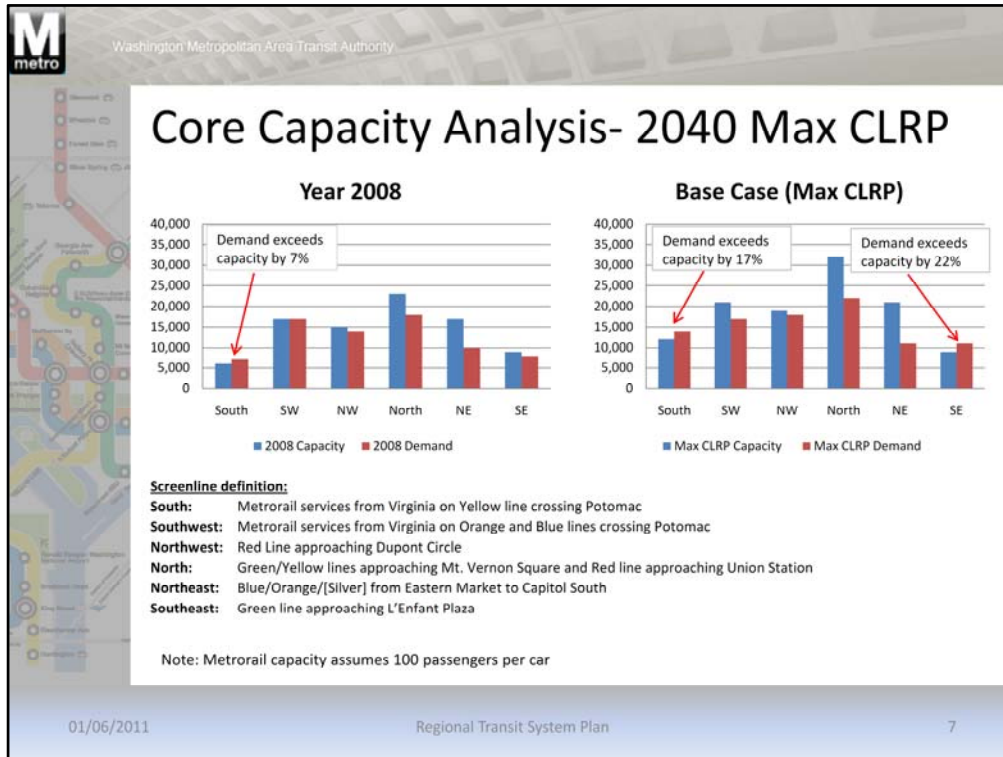
Base Case (Max CLRP)

- 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 14th Street Bridge to “Yellow Line”
- Basis for comparing various strategies

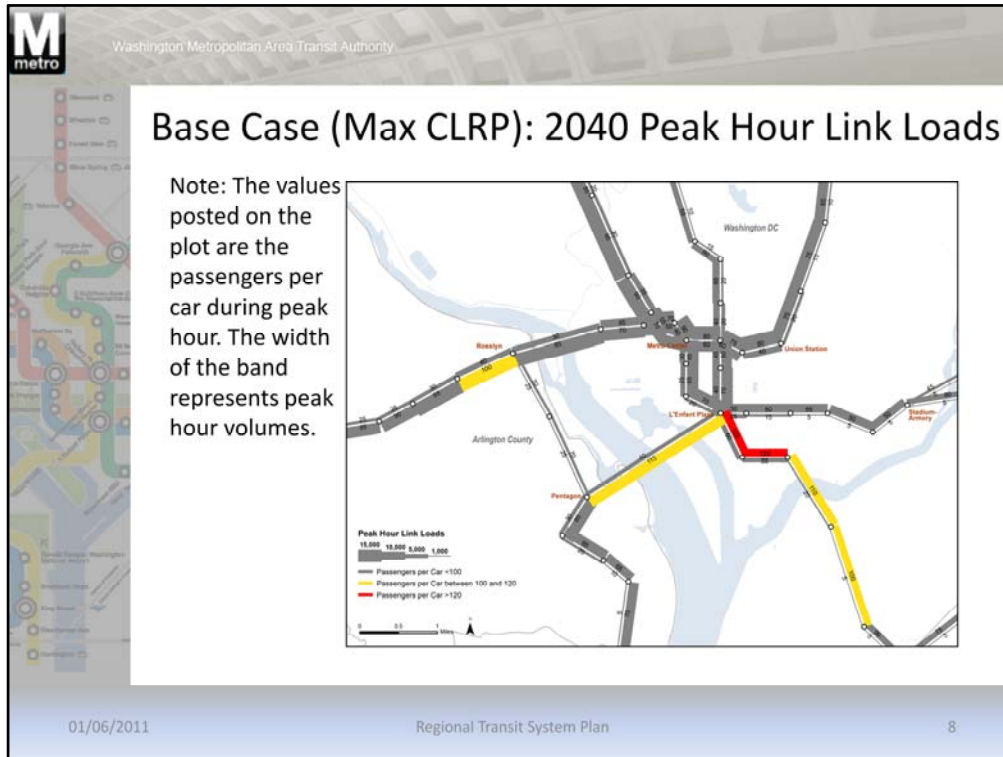
(*MWCOG 2030 CLRP Modeled with 2040 Land Use)

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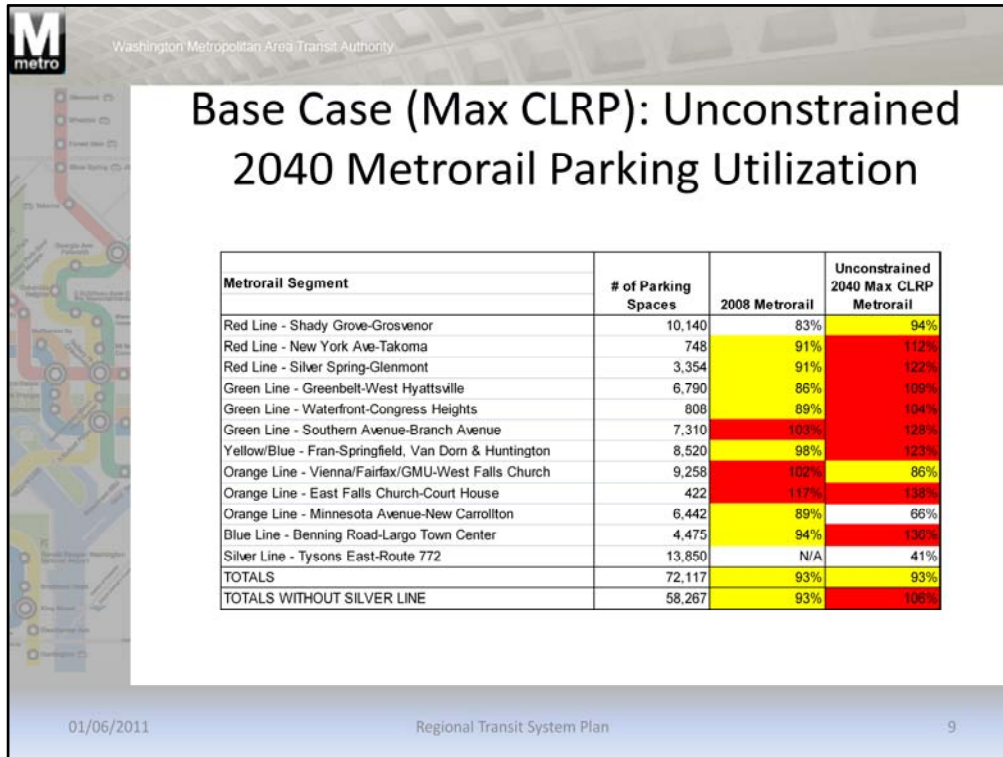
The Base Case (Max CLRP) of analysis included the assumptions above.



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



The graphic above shows the peak hour link loads on Metrorail trains in 2040. 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 graphic above shows the Metrorail Parking Utilization on several Metrorail segments under the Base Case and the Unconstrained 2040 Max CLRP.



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DEFINITION OF STRATEGIES

PARKING CAPACITY RELIEF

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Parking Capacity Relief

- Add direct shuttle bus service between remote parking location and Metrorail station.
- Shuttle service at 10 minute peak and 20 minute off-peak frequency.
- Shadow price oversubscribed Metrorail park-and-ride lots (Base Case and Strategy).

Metrorail Segment	# of Parking Spaces	Unconstrained 2040 Max CLRP 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	122%	Burtonsville and Calvert County Fairgrounds	US 29 & MD 198/Calvert County Fairground	Glenmont Metrorail
Green Line - Waterfront-Congress Heights	808	104%	Equestrian Center	MD 4 & Water Street	Branch Avenue Metrorail
Green Line - Southern Avenue - Branch Avenue	7,310	128%	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	123%	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	86%	Stone Road-US 29; Stringfellow Road; Sully Station; Bull Run @ 234/Sudley Road; VA 234 Bypass @ US 29; and Haymarket @ US 15	VA Bypass & US 29; VA 234 Bypass/Cushing Road; VA 234 & Sudley Road; Stone Road-US 29; US 15 in Haymarket	Vienna Metrorail Station
Blue Line - Benning Road-Largo Town Center	4,475	136%	Harry S. Truman	Harry S. Truman & Riva Road	Largo Town Center Metrorail

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The Parking Capacity Relief Strategy consists of Metrobus shuttles with the above service frequencies between various park-and-ride lots and end-of-the-line Metrorail Stations.


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Parking Capacity Relief

- Shadow price applied to oversubscribed Metrorail Park-and-ride lots for Base Case and for strategy alternative.
- Shadow price expressed in \$; converted to impedance at \$10/Hour value of time

Metrorail Segment	Shadow Price (\$)	
	Peak	Off Peak
Red Line - New York Ave-Takoma	\$ 2.00	\$ 1.00
Red Line - Silver Spring-Glenmont	\$ 2.00	\$ 1.00
Green Line - Greenbelt-West Hyattsville	\$ 1.50	\$ 1.00
Green Line - Waterfront-Congress Heights	\$ 2.00	\$ 1.00
Green Line - Southern Avenue-Branch Avenue	\$ 2.50	\$ 1.00
Yellow/Blue - Fran-Springfield, Van Dorn & Huntington	\$ 2.00	\$ 1.00
Orange Line - East Falls Church-Court House	\$ 2.00	\$ 1.00
Blue Line - Benning Road-Largo Town Center	\$ 2.00	\$ 1.00

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The Shadow Price is applied to those Metrorail Park-and-Ride Lots which are oversubscribed. Another way to look at the shadow price is the use of congestion pricing policies.



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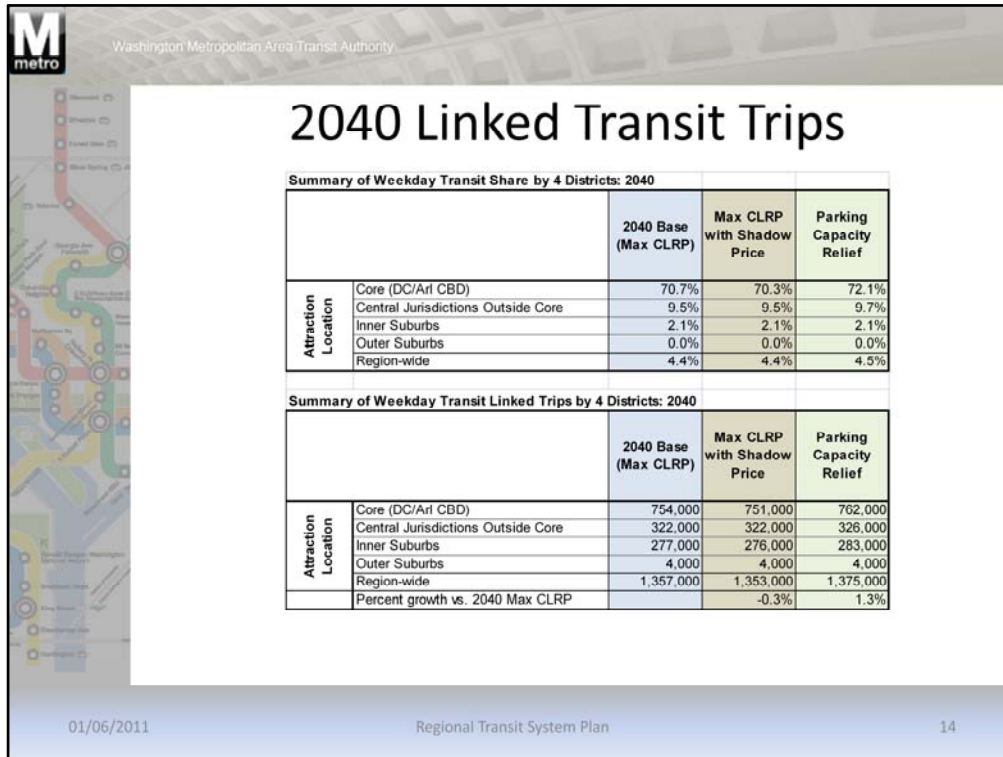
IMPACT ON RIDERSHIP AND CAPACITY

PARKING CAPACITY RELIEF

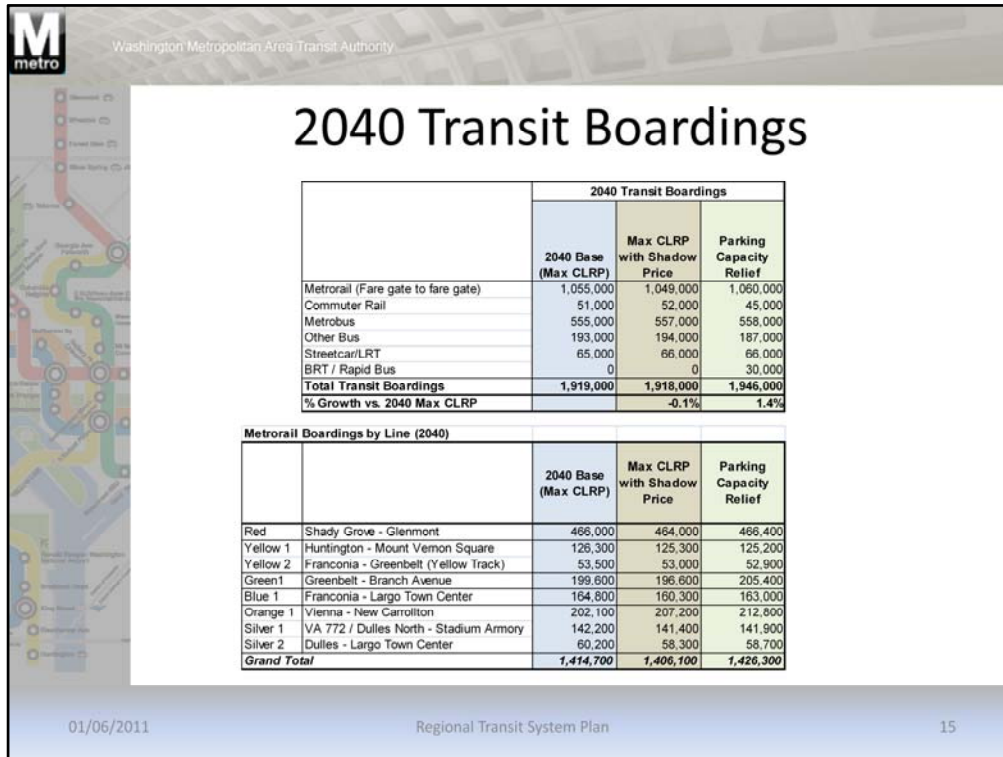
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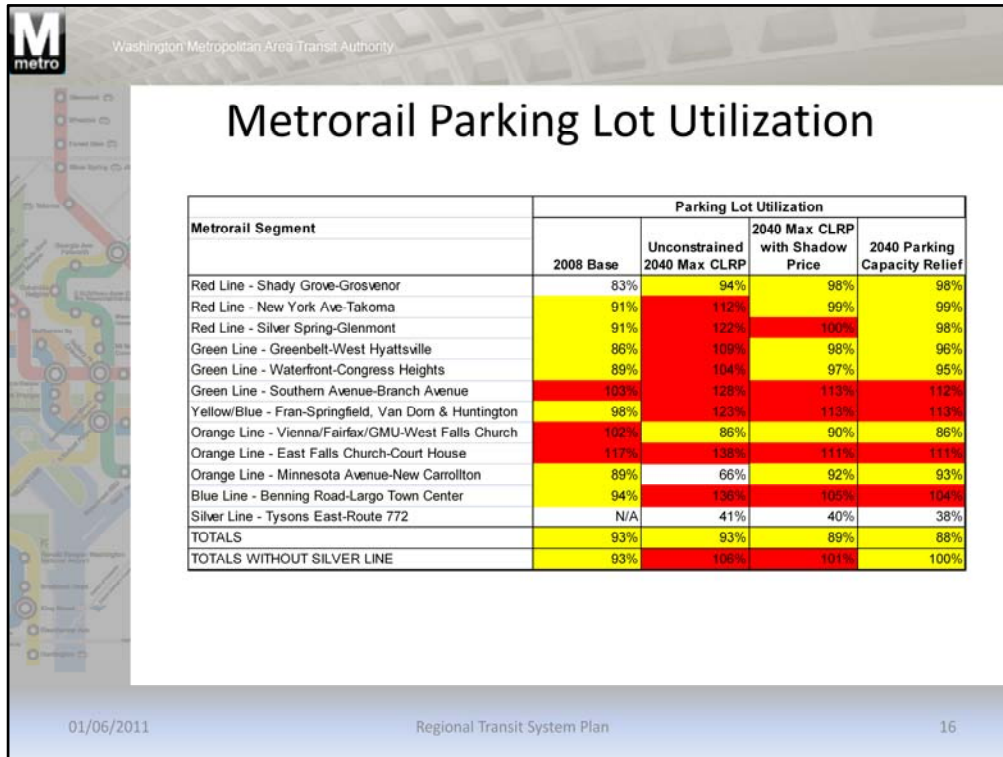
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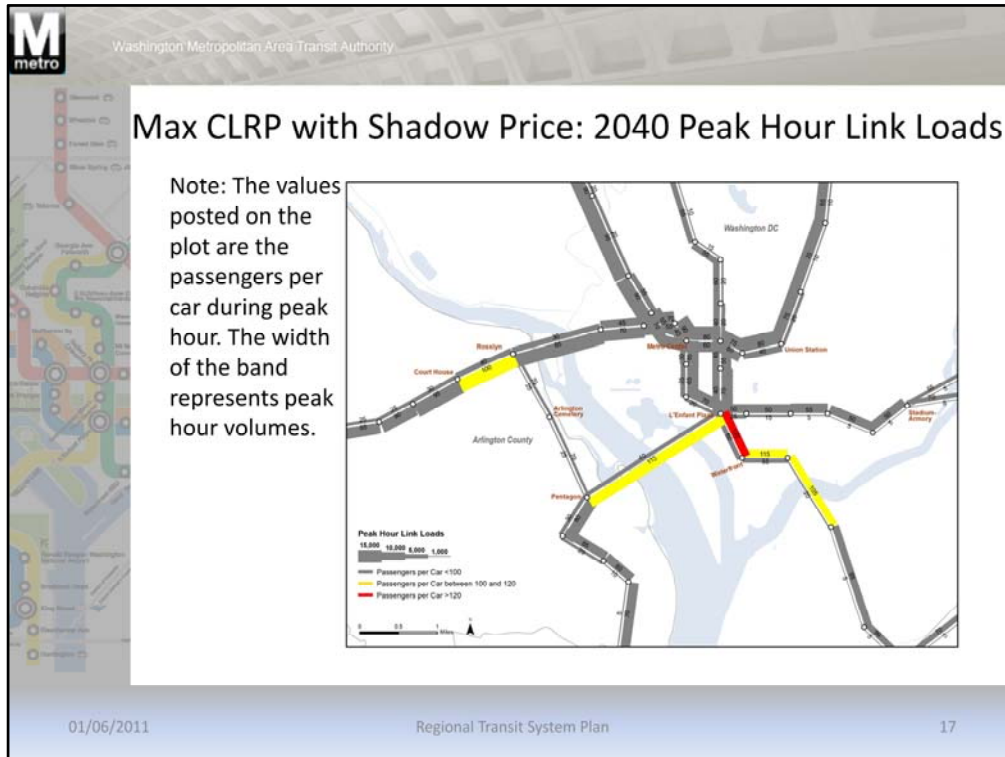
The charts above show the number of linked transit trips for the Base Case, Base Case with Shadow Price and the Parking Capacity Relief.



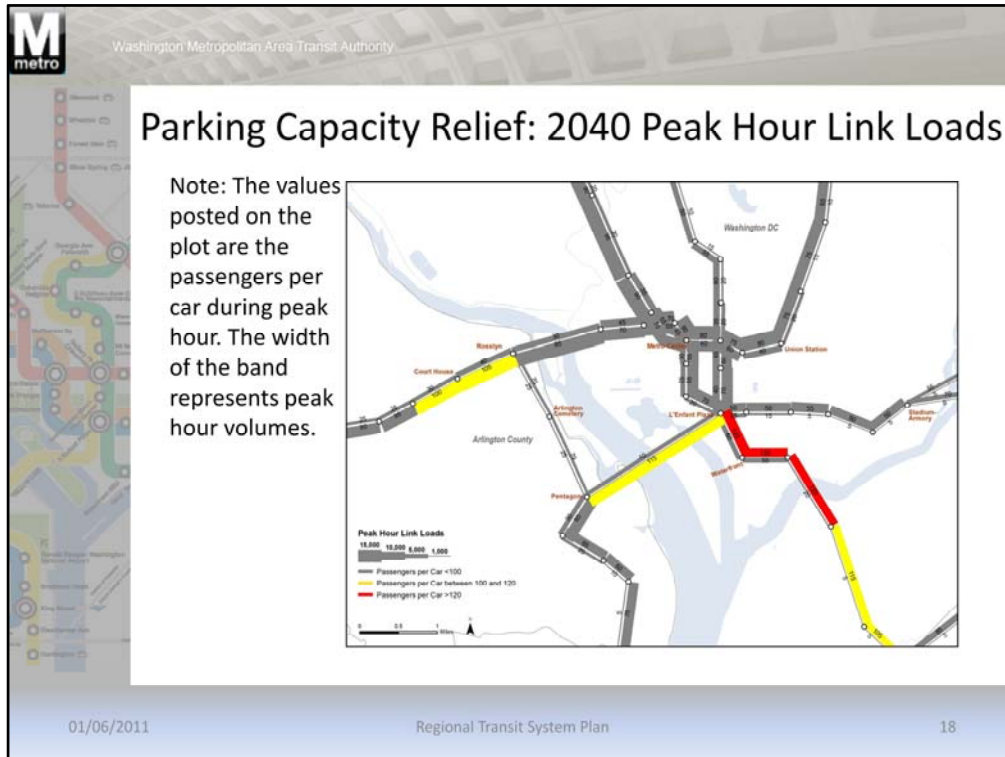
The charts above show the number transit boardings for the 2040 Base Case, Base Case with Shadow Price and the Parking Capacity Relief.



The graphic above shows the Metrorail Parking Utilization on several Metrorail segments under the Base Case, Base Case with Shadow Price and with the Parking Capacity Relief.



The graphic above shows the peak hour link loads on Metrorail trains in 2040 with the Shadow Price. 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 graphic above shows the peak hour link loads on Metrorail trains in 2040 with the Parking Capacity Relief. 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.



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DEFINITION OF STRATEGIES

CLRP ASPIRATIONS LAND USE

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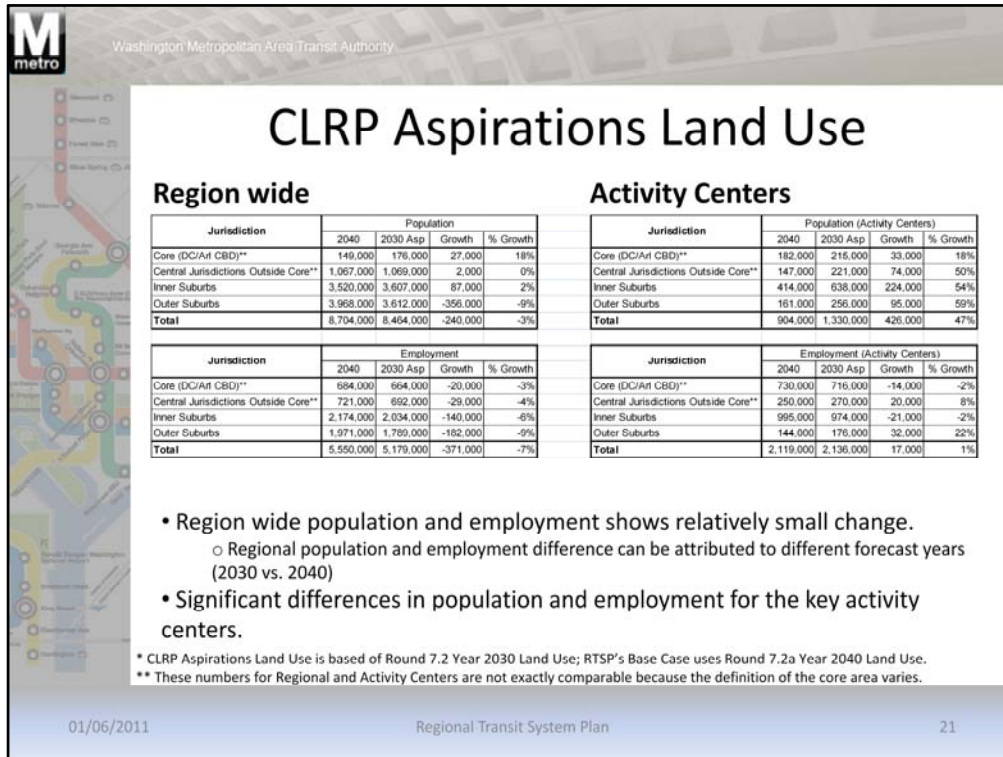
CLRP Aspirations Land Use

- CLRP Aspirations Land Use data developed by MWCOG for Year 2030 is used.
- 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.

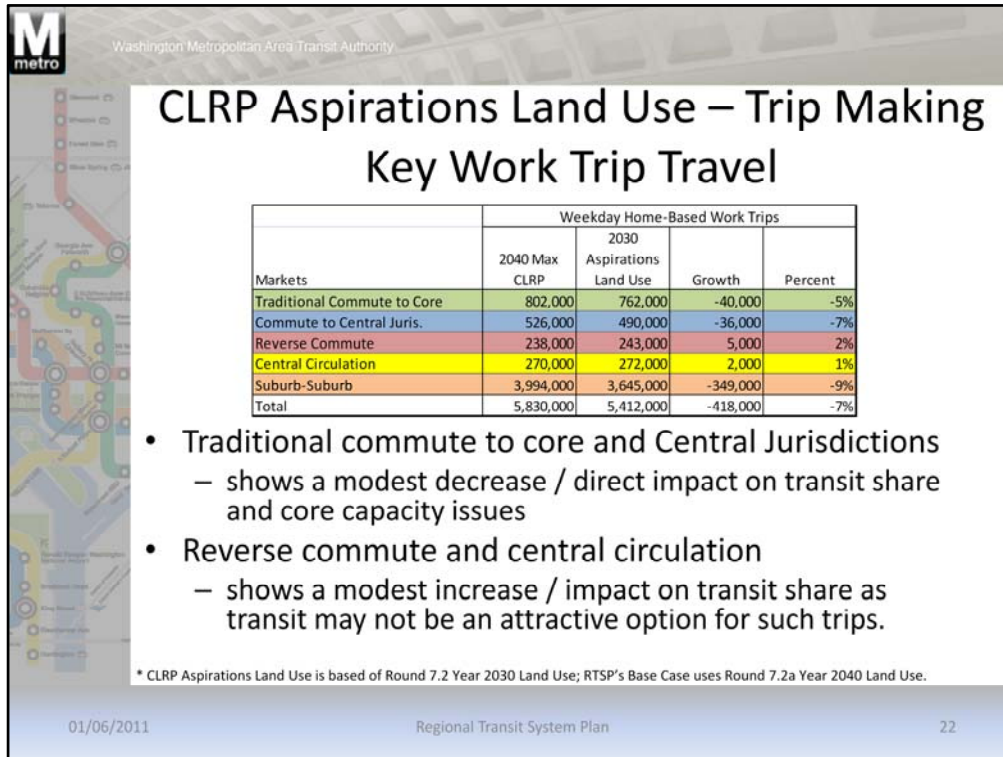
* CLRP Aspirations Land Use is based of Round 7.2 Year 2030 Land Use; RTSP's Base Case uses Round 7.2a Year 2040 Land Use.

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The CLRP Aspirations Land Use Strategy uses the Land Use data developed by the MWCOG for the Year 2030 and attempts to balance the regions jobs and housing using the above assumptions.



The slide above shows the region's population, employment and activity center growth for the 2030 and 2040 forecast years.



The chart above shows the Key Work Trip Travel for the 2030 CLRP Aspirations Land Use Study and the 2040 Max CLRP.



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CLRP Aspirations Land Use – PEF Update Rule

- Identify activity centers with population growth > 100% (vs. 2010) and forecast year population > 10,000
- Categorize Activity Centers into two groups:
 1. **Group 1** = Inside or near the Capital Beltway with **PEF = 150** (comparable to Clarendon or Ballston):
 2. **Group 2** = Outside the Capital Beltway with **PEF = 100** (comparable to Silver Spring or Greenbelt Town Center):
- Exclude Activity Centers in DC Core

* CLRP Aspirations Land Use is based of Round 7.2 Year 2030 Land Use; RTSP's Base Case uses Round 7.2a Year 2040 Land Use.

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The CLRP Aspirations Land Use Strategy was also analyzed using the Pedestrian Environment Factor (PEF) Update.



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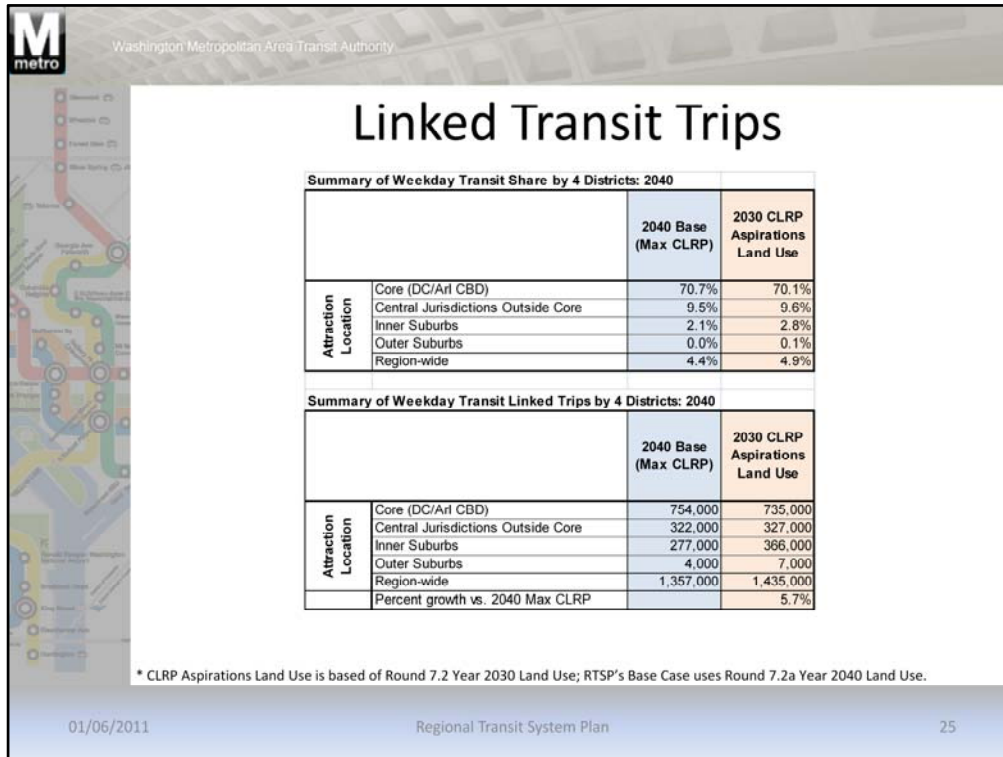
IMPACT ON RIDERSHIP AND CAPACITY

CLRP ASPIRATIONS LAND USE

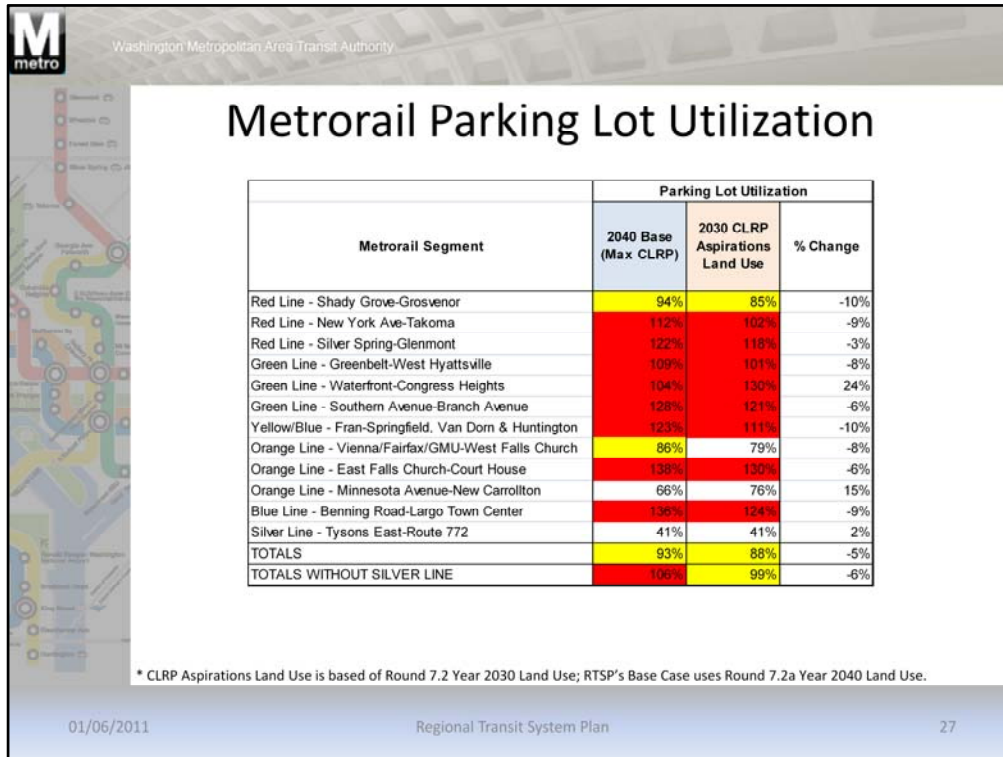
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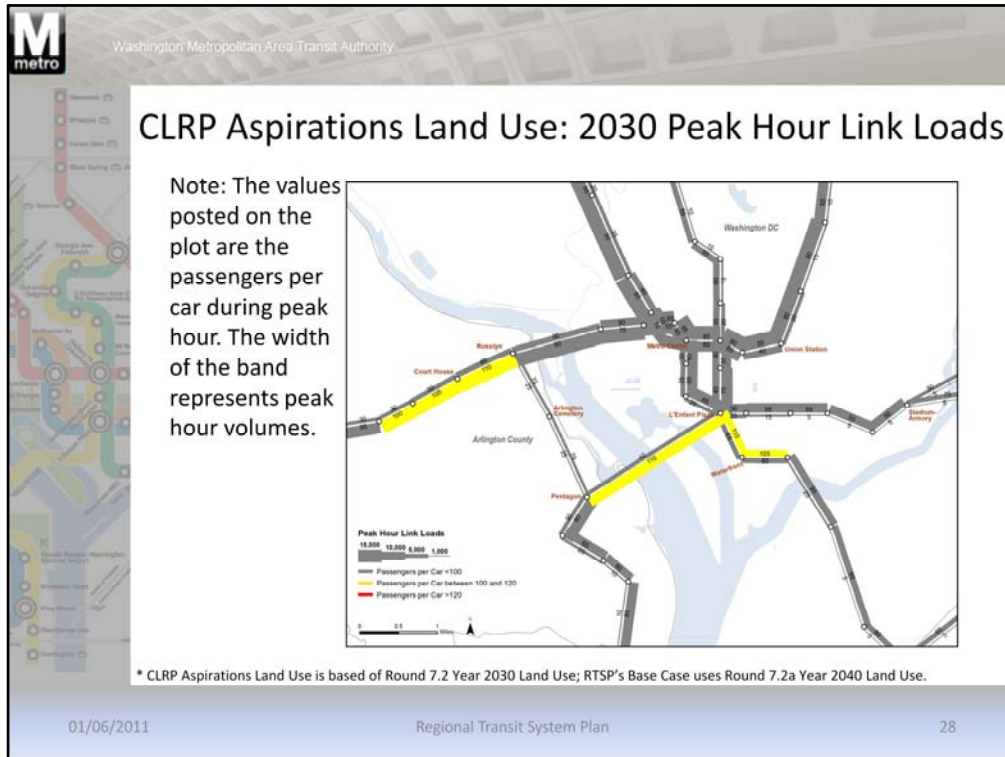
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The charts above show the number of linked transit trips for the Base Case and the 2030 CLRP Aspirations Land Use.



The graphic above shows the Metrorail Parking Utilization on several Metrorail segments under the Base Case and the 2030 CLRP Aspirations Land Use and the percentage change in parking lot utilization between the two.



The graphic above shows the peak hour link loads on Metrorail trains in 2030 for the CLRP Aspirations Land Use 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.



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DEFINITION OF STRATEGIES

RAIL ENHANCEMENTS (ROUND 3)

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In-fill Stations

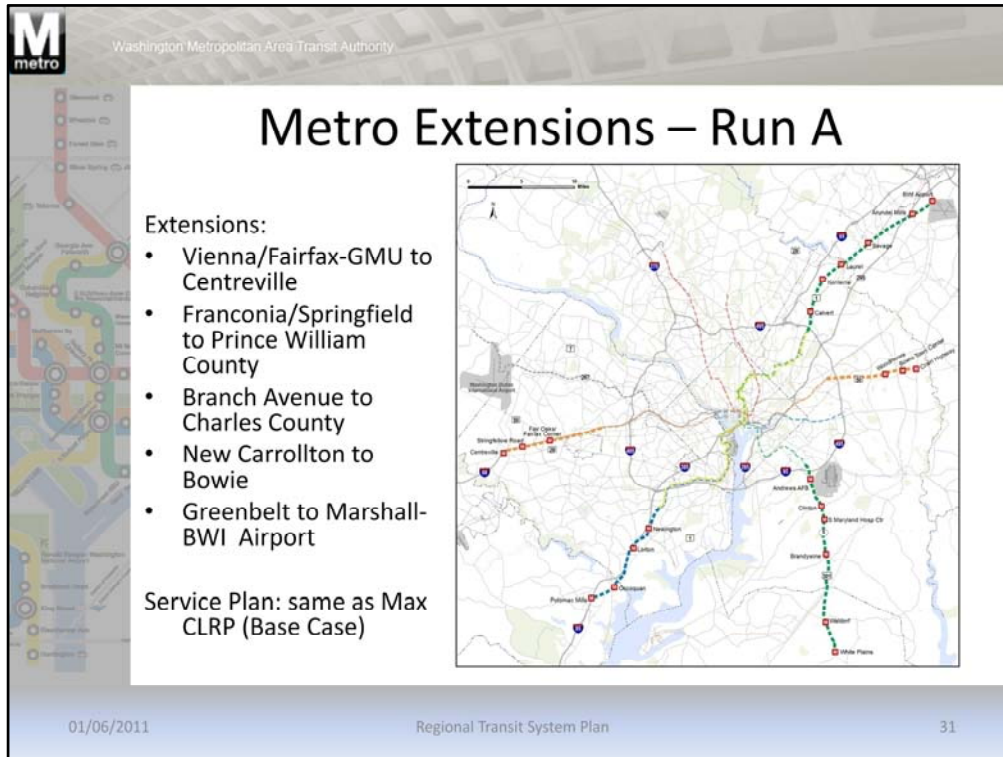
In-fill Stations:

- Eisenhower Avenue Valley between King Street & Van Dorn Stations;
- St. Elizabeth's Hospital (West Campus) between Anacostia and Congress Heights Stations;
- Oklahoma Ave NE and Benning Road;
- Kansas Avenue, NW between Fort Totten and Takoma Stations;
- Montgomery College, between Shady Grove and Rockville



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The In-fill Station Strategy is designed to increase access by incorporating a new rail station between two existing rail stations. The locations listed above are potential in-fill stations.



The map above represents the first model run of the Metrorail Extensions Strategy - Run A - which identifies several potential extensions of Metrorail Service from the existing end-of-the-line stations.



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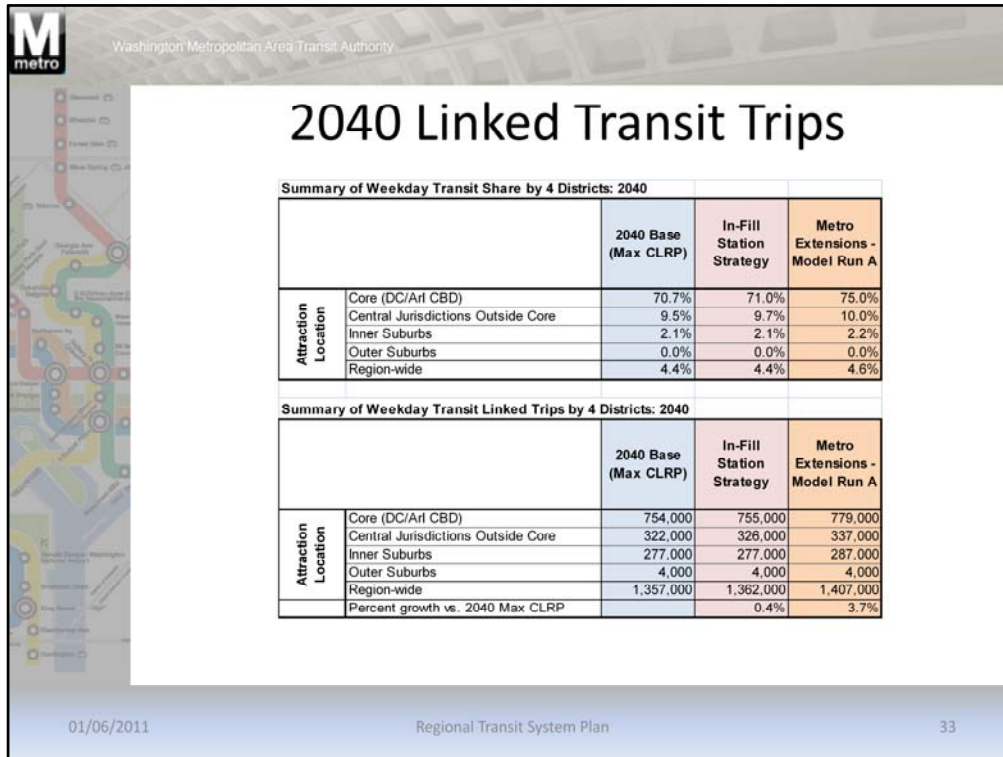


IMPACT ON RIDERSHIP AND CAPACITY RAIL ENHANCEMENTS (ROUND 3)

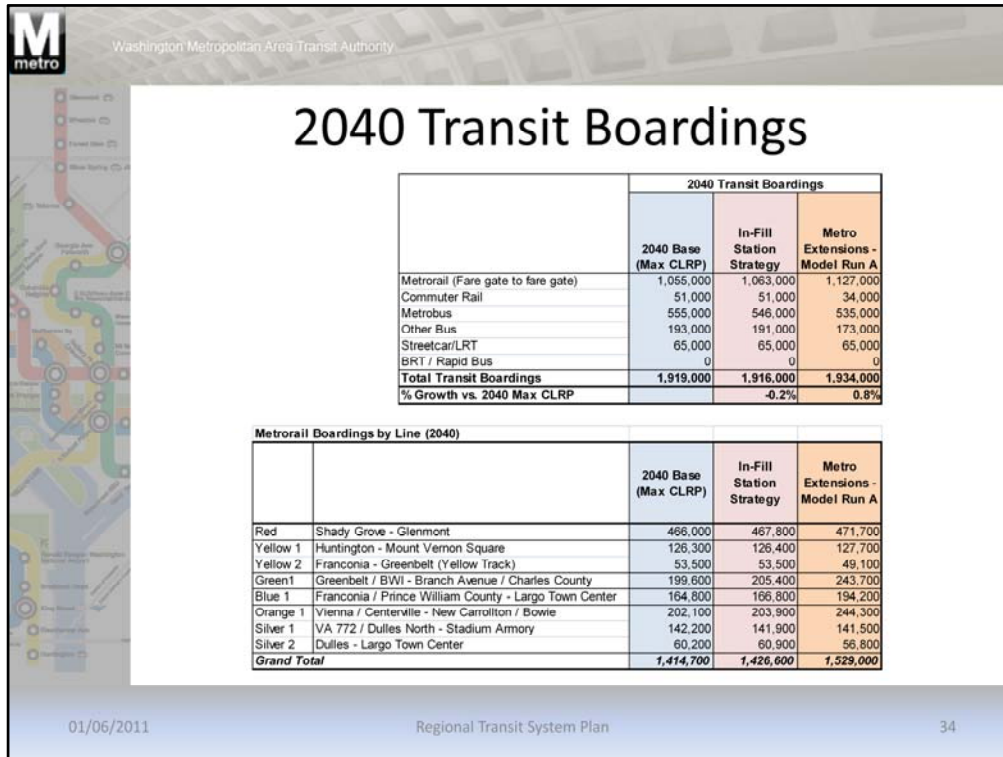
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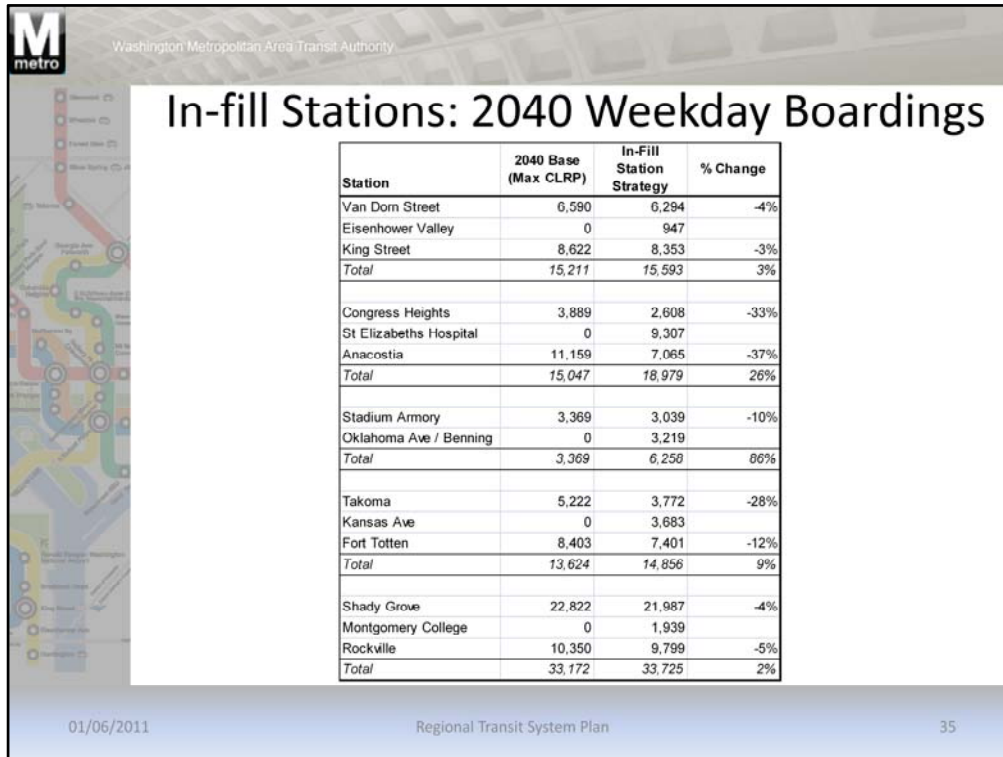
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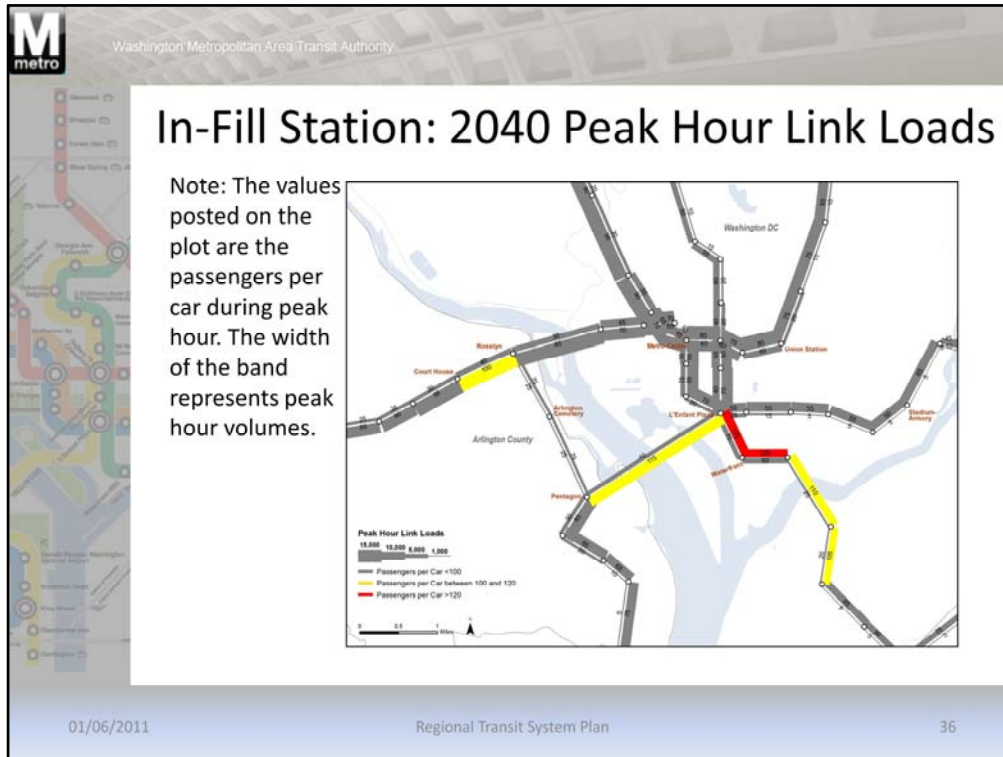
The charts above show the number of linked transit trips for the Base Case, In-Fill Station and Metro Extensions – Model Run A Strategies.



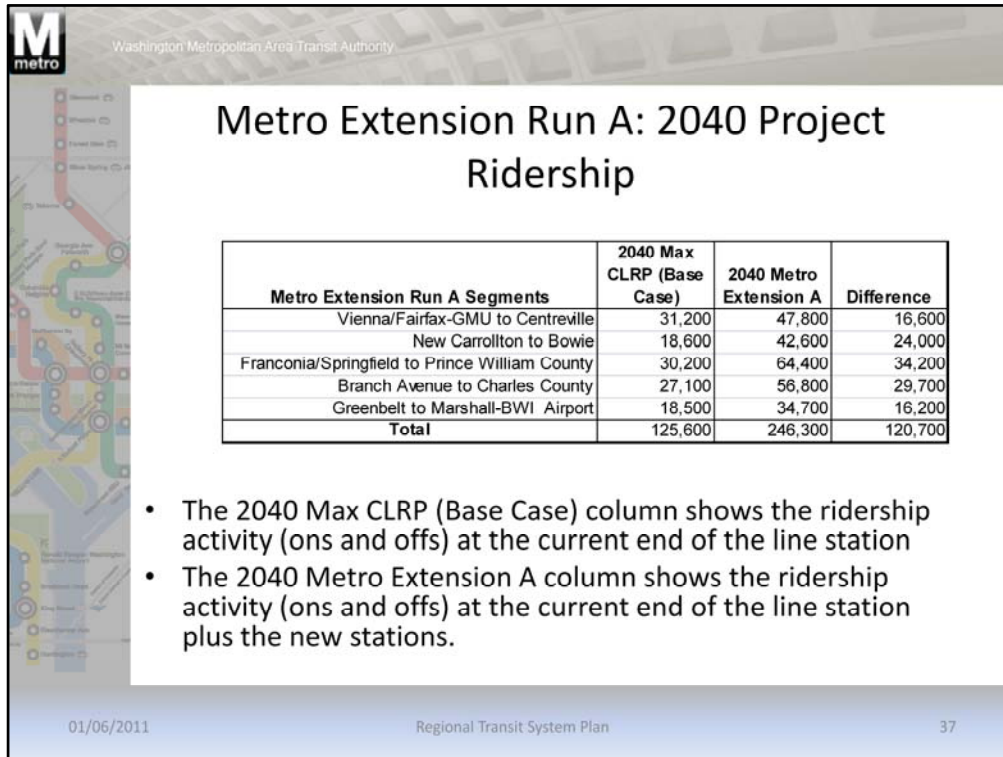
The charts above show the number of transit boardings for the Base Case, In-Fill Station and Metro Extensions – Model Run A Strategies.



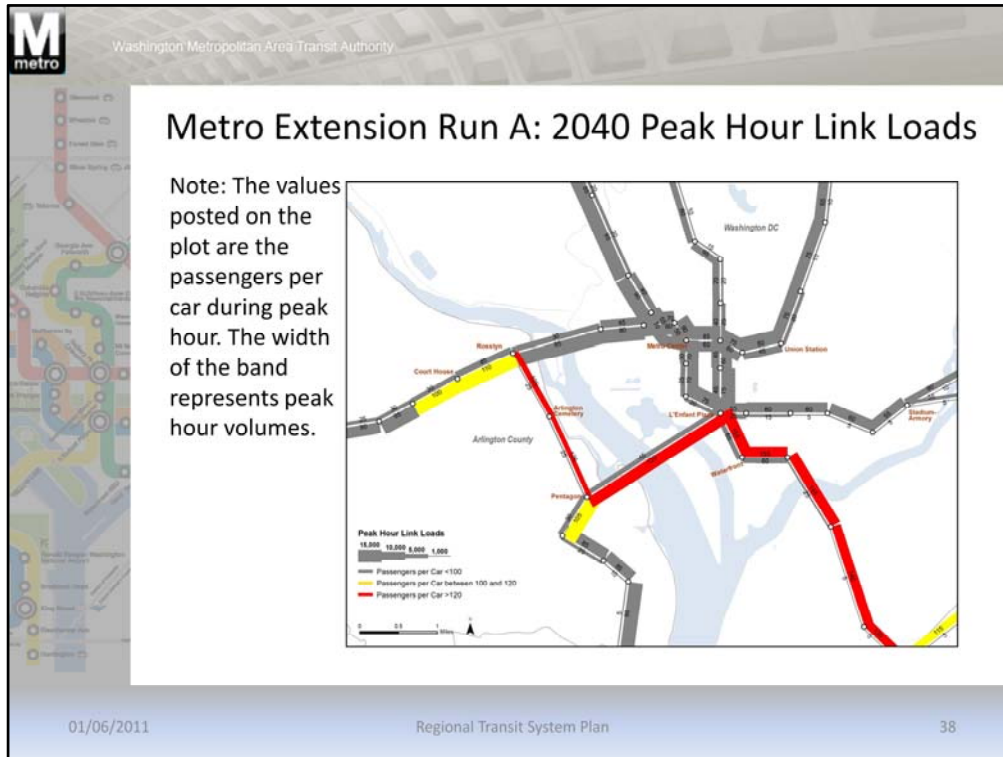
The graphic above shows the number of weekday boardings for the Base Case and the In-Fill Station Strategy at the proposed in-fill station locations.



The graphic above shows the peak hour link loads on Metrorail trains for the In-fill Station 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 chart above shows the ridership activity for several segments under the Base Case and the Metrorail Extensions Strategy.



The graphic above shows the 2040 peak hour link loads on Metrorail trains for the Metro Extension - Model Run A 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.



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PRELIMINARY EVALUATION

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Key Findings – Parking Capacity Relief

- Shadow pricing of over subscribed park-and-ride lots for capacity restraint results in a slight decrease in Metrorail and transit patronage.
- Significant reduction in parking overflow at several Metrorail park-and-ride lots.
- Shuttle buses result in modest increase in Metrorail and transit patronage due to new market accessing transit via walk/kiss and ride access

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The above slide lists some of the key findings related to the Parking Capacity Relief Strategy.



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Key Findings – CLRP Aspirations Land Use

Strategy	Pros	Cons
CLRP Aspirations Land Use	<ul style="list-style-type: none"> ➤ Improved walkability and denser land use near activity centers leads to higher transit patronage (5.7% increase) and transit share ➤ Reduced crowding on Green and Yellow Lines due to fewer trips to Core ➤ Increased reverse peak flows – better utilization of Metrorail capacity ➤ Increased transit trips to non-core activity centers ➤ Reduced parking overflow at several Metrorail parking lots 	<ul style="list-style-type: none"> ➤ Base-case capacity issues (peak hour link loads on Orange Line between Ballston and Rosslyn and on lines into L'Enfant; parking overflow) not resolved.

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The above slide lists some of the key findings related to the CLRP Aspirations Land Use Strategy.




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Key Findings – In-fill Station

- Without good connections to high-demand land use (planned or potential) in the station vicinity, the net ridership gains are limited
- Low usage for Eisenhower Valley Metro station due to physical barriers around the station
- St. Elizabeth's Hospital station shows high usage due to planned development in the vicinity of the station
- Montgomery College station shows relatively low demand due to low density land use in the station vicinity
- Oklahoma/Benning station shows good ridership potential, if the station is well accessible from Benning Road.
- Kansas Ave station shows relatively high usage due to existing development and 2040 projected land use, but net ridership depends on redevelopment

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The above slide lists some of the key findings related to the In-fill Strategy.

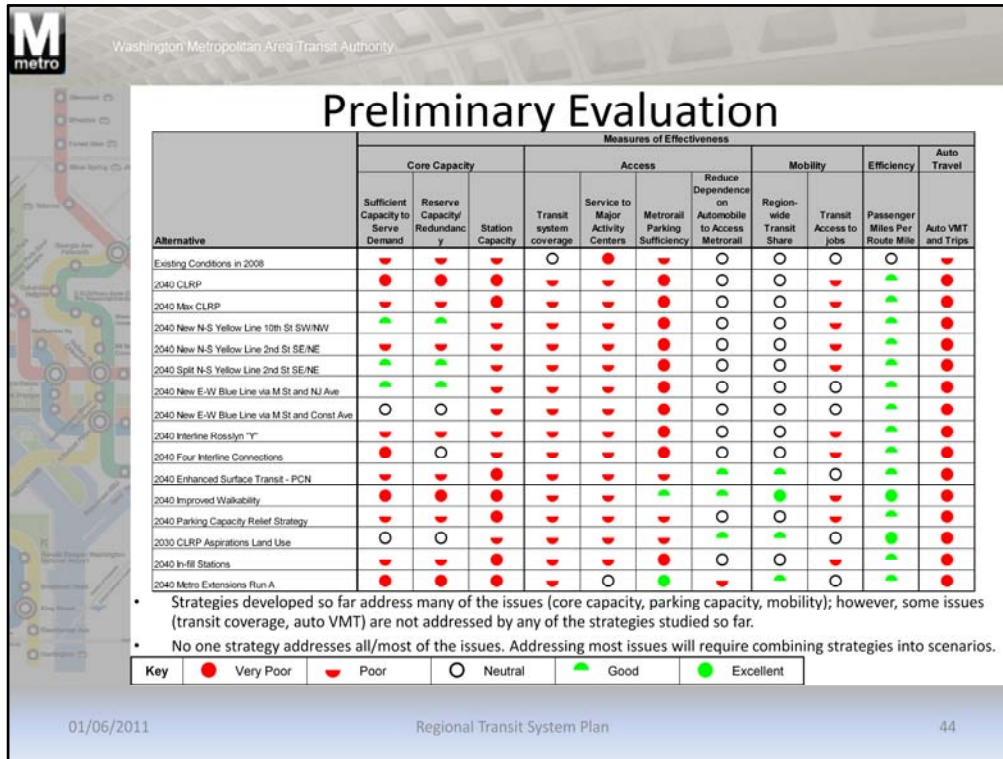

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Key Findings – Metro Extensions Run A

Strategy	Pros	Cons
Metro Extensions Run A	<ul style="list-style-type: none"> ➤ Metro Extensions to outer suburbs results in 50,000 new transit trips and 73,000 new Metrorail boardings ➤ Addition of new Metrorail parking at new stations results in parking capacity relief at many existing Metrorail park-and-ride lots ➤ Fewer transfers to Metrorail from other modes (Commuter Rail, Express Bus, Feeder Bus) leads to better transit ride experience. 	<ul style="list-style-type: none"> ➤ Severe impact on Metrorail core capacity: <ul style="list-style-type: none"> ○ Peak hour loads as high as 155 passengers per car on Green Line ○ Peak hour loads on Blue Line to Rosslyn as high as 125 passengers per car ○ Higher peak loads on Orange Line between Clarendon and Rosslyn ○ Higher peak loads on Yellow lines approaching L'Enfant

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The above slide lists some of the key findings related to the Metro Extensions Run A Strategy.



The chart above reflects the preliminary evaluation of the strategies against the Measures of Effectiveness.



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UPCOMING MODEL RUNS

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Enhanced Surface Transit – PCN+

- Improve the PCN network strategy by implementing the following:
 - Add Fairfax and Montgomery County BRT networks
 - 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
 - VRE bi-directional service

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The Enhanced Surface Transit – PCN+ Strategy model run will include the assumptions above.

A map of the Washington Metropolitan Area Transit Authority (WMATA) rail system, showing various lines and stations. The map is color-coded by line: Red Line (red), Yellow Line (yellow), Silver Line (blue), and Blue Line (blue). The map shows the current rail network and proposed extensions. The extensions are highlighted in a darker shade of their respective line colors. The map includes labels for major stations and areas, such as Silver Spring, Gaithersburg, and Rockville.

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Rail Extensions-Model Run B

- Red Line to Metropolitan Grove, along I-270
- Yellow Line from Huntington to Fort Belvoir or Lorton, following Rt. 1
- Relocated Yellow Line from Union Station to Silver Spring
- Silver Line to Leesburg
- Blue Line to Bowie


NOTE: Extensions may impact core capacity

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The Rail Extensions – Model Run B will include the above extension segments.

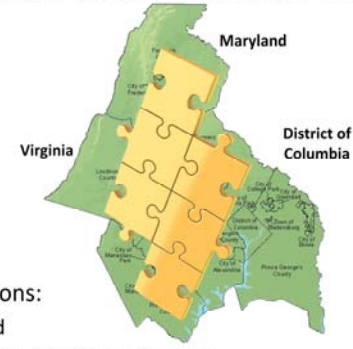


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Streetcar and LRT Model Run


- Purple Line Extension from New Carrollton to Eisenhower Avenue with connections to Largo Town Center & Branch Avenue
- MD 650/New Hampshire Ave from Takoma/Langley Transit Center to White Oak
- DC Streetcar, remainder of 37-mile network
- DC Streetcar Extensions:
 - From SW to Pentagon City;
 - Georgetown to Rosslyn;
 - Georgia Avenue to Silver Spring
- Columbia Pike Streetcar Extensions:
 - From Skyline west along VA7
 - From Skyline south to Van Dorn
- Crystal City/Potomac Yard Transitway Extensions:
 - From Potomac Yard to Ballston via Glebe Road
 - From Potomac Yard south along US 1 Corridor to Eisenhower Avenue
 - Connection to Fairfax City via VA236
- VA 28 Corridor from VA7 to VA234 (Manassas)



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Streetcar and LRT modes will be included in the PCN+ Model Strategy.

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Others??

Brown Line:

- Friendship Heights to Silver Spring via Wisconsin Avenue and N. Capitol Street
- or
- Friendship Heights to Mt. Rainier or Cheverly

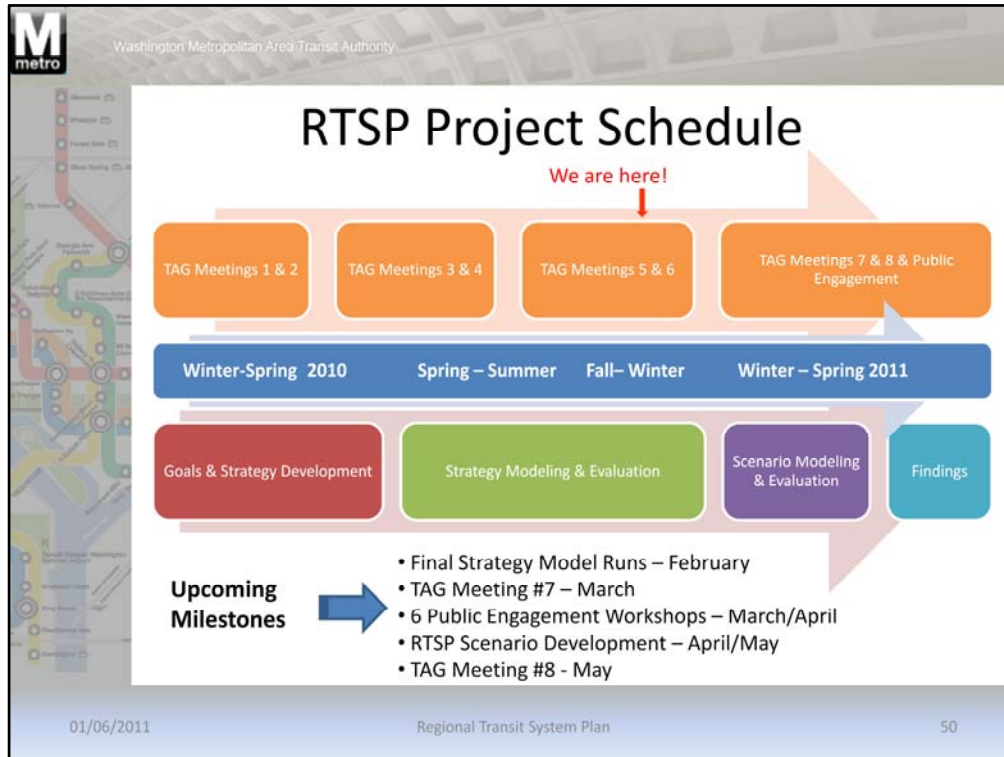
Beltway Line:

- Branch Avenue to Eisenhower Avenue
- Eisenhower Avenue to Dunn Loring
- Dunn Loring to Medical Center
- Medical Center to Silver Spring or Forest Glen
- Silver Spring or Forest Glen to New Carrollton
- New Carrollton to Branch Avenue




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We solicited other Model Runs from the TAG to reflect other potential transit services they were interested in analyzing.



The schedule above reflects upcoming RTSP Milestones. This schedule is subject to change without notice.



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Frequent Posts on RTSP Website

<http://planitmetro.com>

Recent Posts

- About the TAG
- RTSP Goals
- RTSP Strategy Descriptions
- Metro's Planning, From the Beginning
- TAG Meeting 1, 2, 3, and 4 Presentations



Future Posts

- Implementation of the Transit System Expansion Plan of 1999
- National Long Range Plan Comparisons
- Additional RTSP Strategy Descriptions
- RTSP in Terms of Region Forward's Goals & Targets

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Future RTSP Blog Posts and links to PlanitMetro.com for additional information.