



Planning, Development and Real Estate Committee

Board Information Item VIII-A

April 24, 2008

Future Metrorail Capacity Needs

**Washington Metropolitan Area Transportation Authority
Board Action/Information Summary**

<input type="checkbox"/> Action <input checked="" type="checkbox"/> Information	MEAD Number:	Resolution: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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PURPOSE

To brief the Board on Metrorail ridership growth trends over the next 25 years, to discuss the adequacy of system and station capacity to handle projected ridership growth, and to describe capital improvements needed to enhance system capacity.

DESCRIPTION

Metro recently completed a systemwide study of future passenger demand versus available capacity. Based on regional land use forecasts and travel trends, Metrorail daily ridership is expected to grow by 42% between 2005 and 2030, reaching roughly 970,000 passengers by 2030. Continued growth in ridership requires expansion of system capacity to carry more passengers during peak hours and expansion of station facilities to handle passenger flow within the stations, as well as expansion of facilities to support auto, bus, and pedestrian access to stations.

System capacity was evaluated for the AM peak hour at the maximum passenger load point on each line. If Metro is unable to expand the fleet of rail cars beyond the currently funded 50% 8-car trains, several of the rail lines will approach or exceed capacity by 2020. 100% 8-car trains are needed by 2020 in order to provide adequate system capacity through 2030.

Capital improvement needs were identified to address system and station capacity. In the 2010 to 2020 timeframe, recommended improvements include expanding the rail fleet and constructing the necessary power system and storage yard facilities; improving station access by expanding parking, bus access, and bicycle and pedestrian facilities; implementing station improvements such as additional stairs and escalators; and expanding the region's bus service and integrating with planned streetcar and light rail lines to supplement Metrorail capacity in major corridors. After 2020, more significant core capacity improvements will be needed, including line connections and system expansion.

FUNDING IMPACT

There is no funding impact for this information item.

NEXT STEPS

Staff anticipates briefing the Board in July 2008 on Metro's total capital improvement needs for the 2011 through 2020 timeframe. This capital improvement plan will address both the "state of good repair" and capacity enhancement needs for Metrorail, Metrobus, and MetroAccess.



Future Metrorail Capacity Needs

Presented to the Board of Directors:

Planning, Development and Real Estate
Committee

April 24, 2008





Purpose

- Discuss Metrorail ridership growth trends projected for the next 25 years
- Examine the adequacy of Metrorail system and station capacity to handle the expected growth
- Identify capital improvements needed to enhance Metrorail system and station capacity



Benefits/Costs

- **Benefits**

- Provision of sufficient Metrorail system capacity to satisfy growing demand
- Relief of passenger crowding during peak periods and provision of a better ride for our customers
- Improved customer access to Metrorail
- Preparation for long-term system capacity expansion

- **Costs**

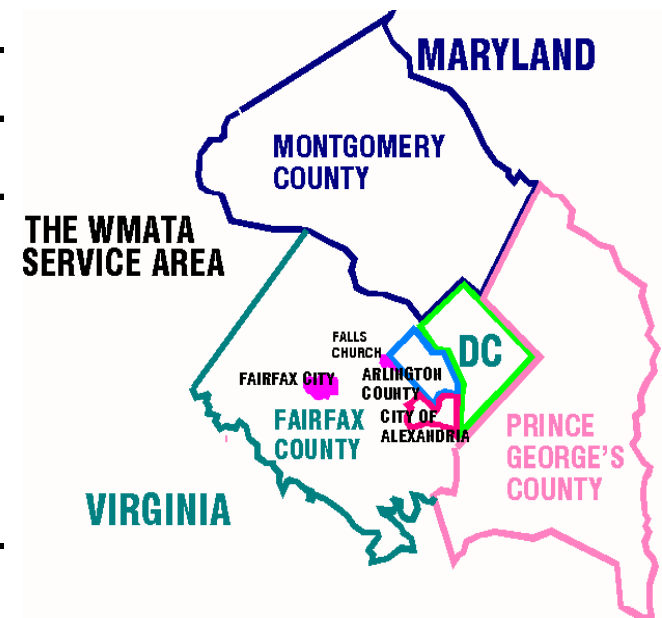
- Cost of expanding use of 8-car trains and support facilities beyond currently funded level, from 50% up to 100% of peak period trains
- Cost of station access and capacity improvements including escalators, stairways, parking and feeder bus services
- Cost of long-term system capacity expansion



Regional Growth Trends

Regional Growth:2005-2030

	2005-2030	
	Employment	Population
Metropolitan Total	39%	33%
Metro Service Area	34%	24%
Inside Beltway	23%	26%
Outside Beltway	41%	23%
Outer Suburbs	65%	62%



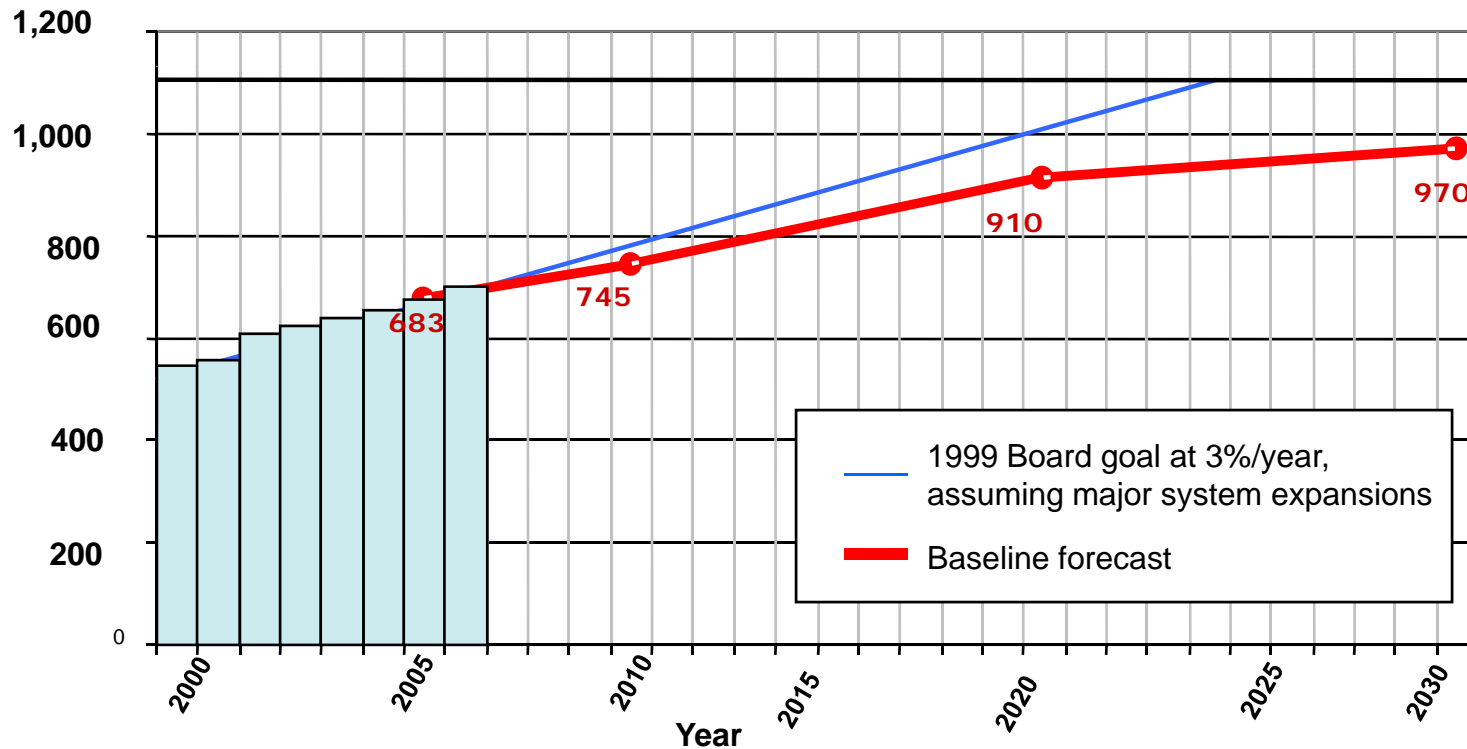
Source:
MWCOC Round 7.0 Cooperative Land Use Forecasts, 2006



Baseline Ridership Forecast

Ridership expected to grow by 42% between 2005 and 2030, reaching 970,000 by 2030

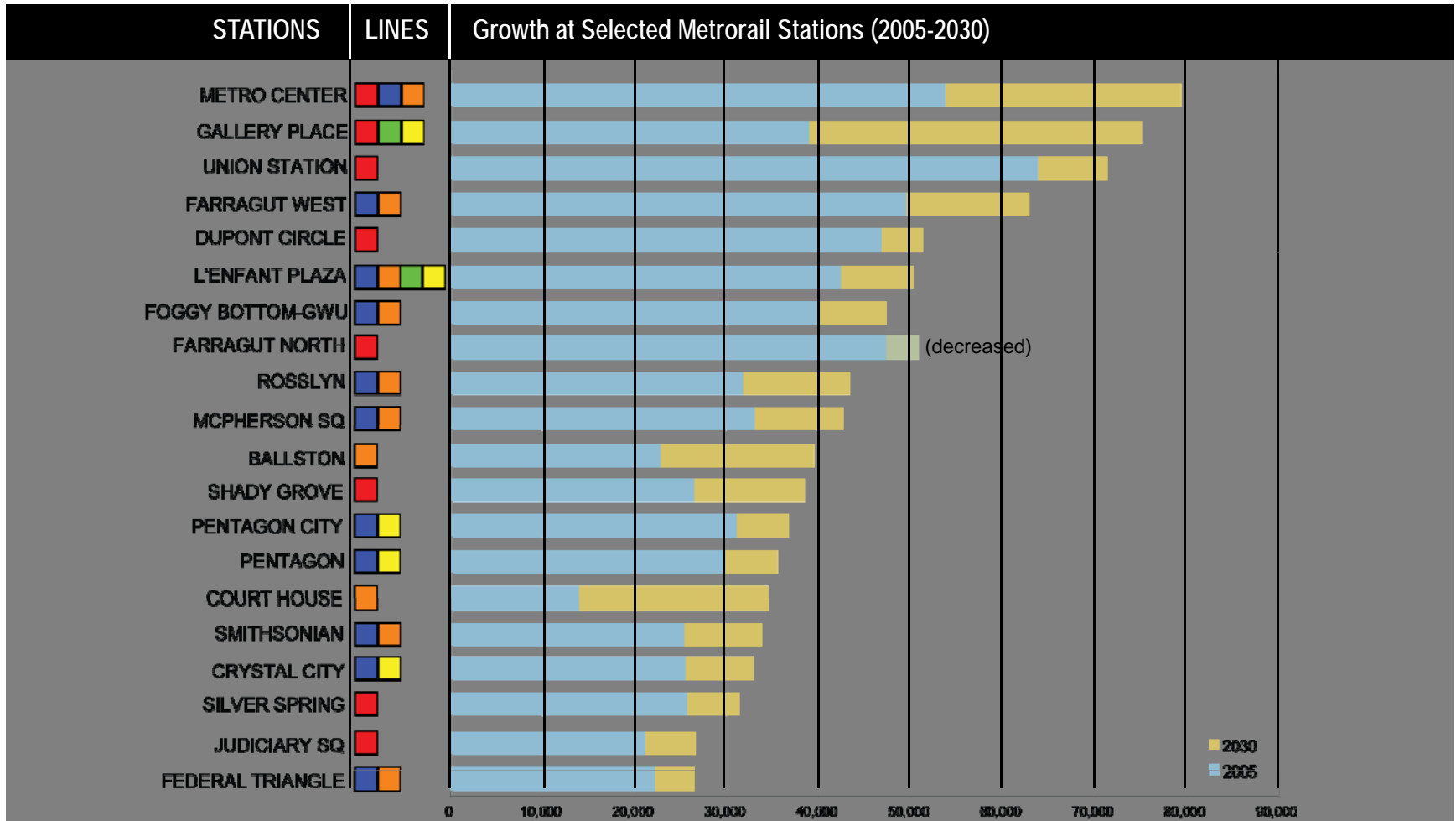
Weekday Metrorail Ridership Growth (in thousands)



Source for Baseline forecast:
Assume Dulles extension by 2020 and COG Round 7.0 land use forecasts



Highest Ridership Stations

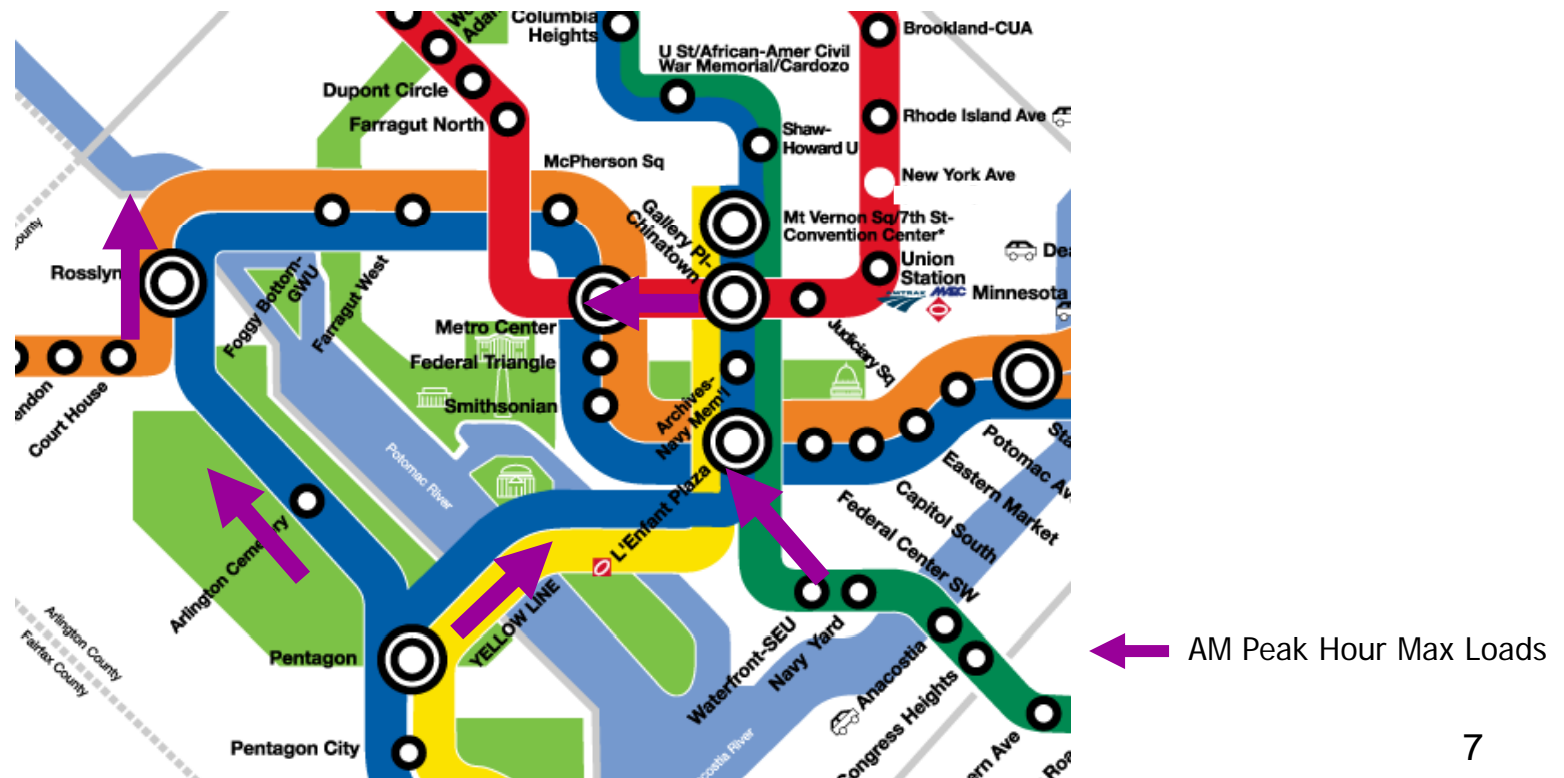


Year 2030 Average Daily Passenger Volume
(Total of Daily Entries and Exits)



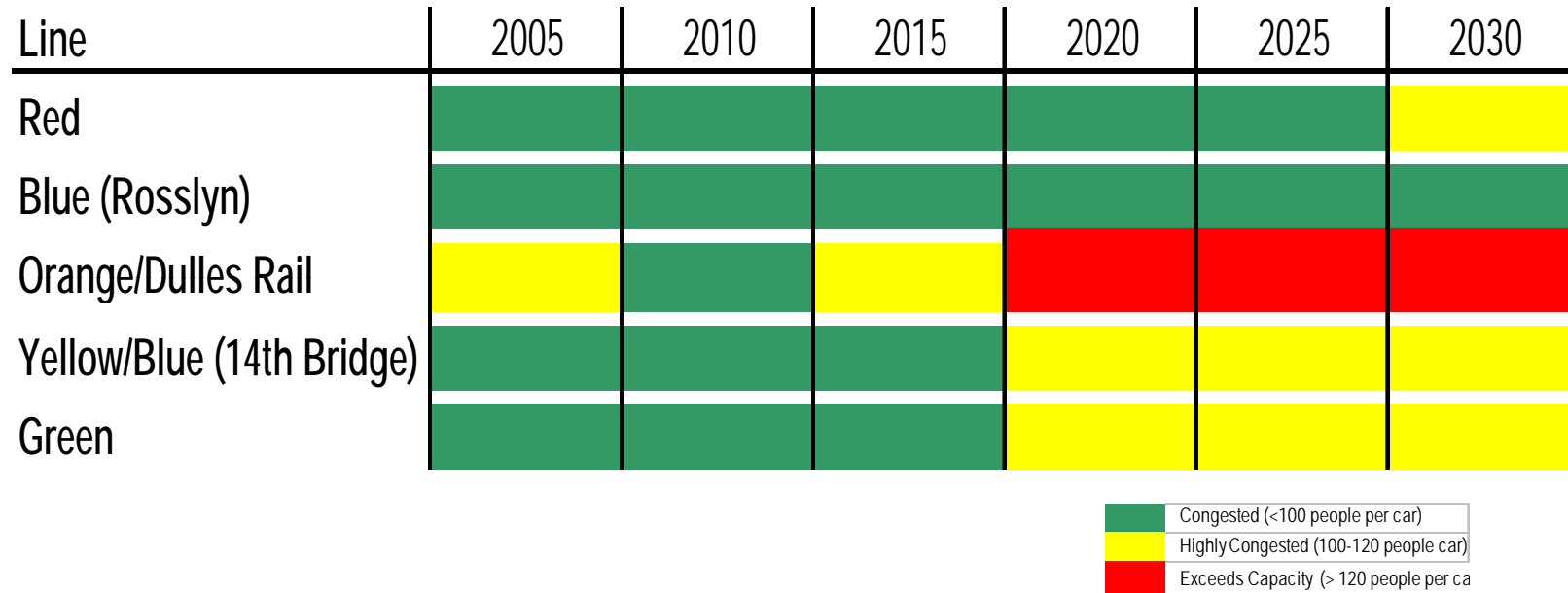
Metrorail Capacity Analysis

- System capacity is evaluated for the AM peak hour at the maximum passenger load point on each line
- Assumes Blue Line Realignment by 2010 and Dulles Extension built before 2020





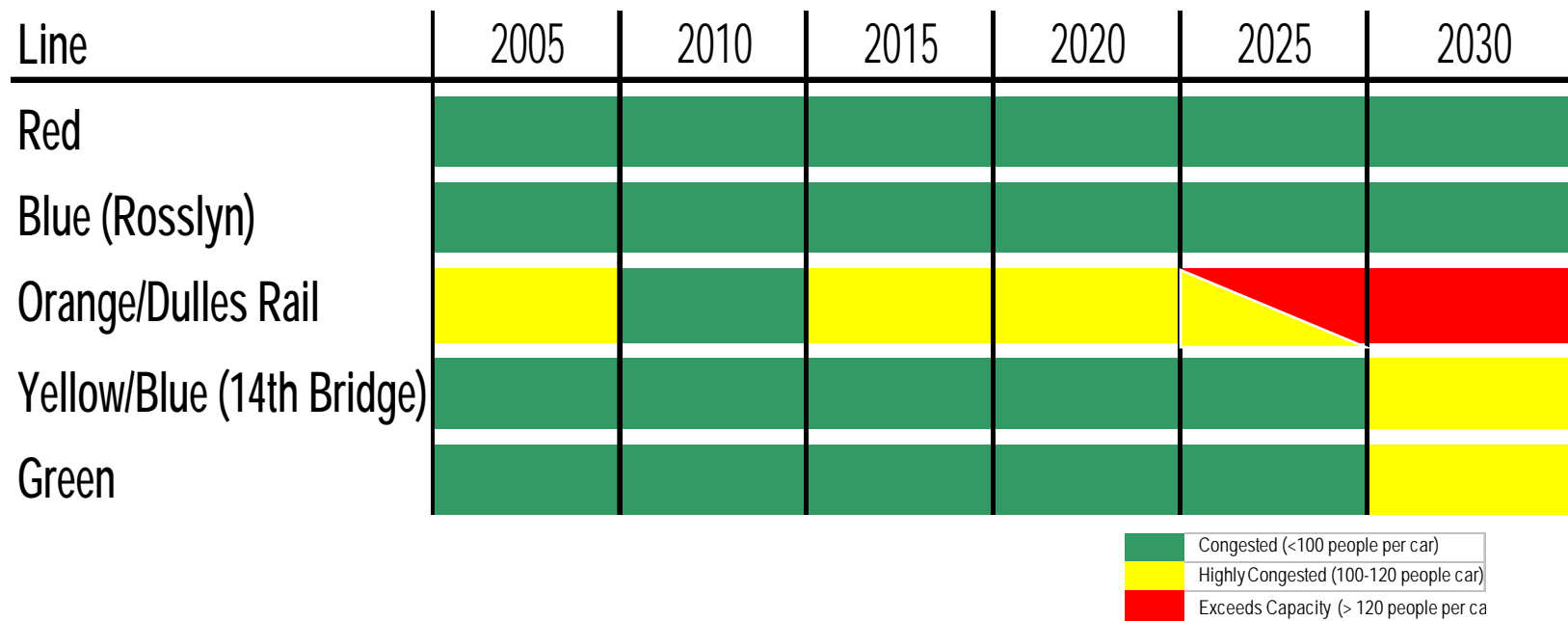
Rail System Capacity – No Additional Fleet Expansion



- Assumes 50% 8-car trains from 2010 through 2030
- In 2010, 50% 8-car trains will bring relief to peak crowding on all lines
- By 2030, entire system is expected to approach capacity
 - By 2020: Orange/Dulles Line will exceed capacity
 - By 2020: Yellow, Blue and Green Lines will become highly congested
 - By 2030: Red Line will become highly congested



Rail System Capacity – With Fleet Expansion



- Assumes 75% 8-car trains by 2015 (130 additional cars) and 100% 8-car trains by 2020 (90 additional cars)
- Extends adequate system capacity out by 5-10 years into the future



Station Capacity Analysis

Stations with critical capacity constraints

- Inside the core:
 - Metro Center
 - Farragut North
 - Gallery Place
 - L'Enfant
- Outside the core:
 - Shady Grove

Station	Mezz	Vertical		Faregate	
		2005	2030	2005	2030
Archives-Navy Memorial-Penn Quarter		○	○		
Bethesda			○		
Branch Ave		○	○		
Cleveland Park					○
Court House			○		○
Farragut North	SE	⊙	⊙		
Farragut West	W	○	○		
Foggy Bottom-GWU		○	○		
Franconia-Springfield			○		
Gallery Pl-Chinatown	N	○	⊙	○	⊙
	W				○
Judiciary Square	E		○		
L'Enfant Plaza	E	○	⊙		
	W		⊙		
Metro Center	N	○	⊙		○
	S	⊙	⊙		
	W		○		
Navy Yard*	E				○
Shady Grove		○	⊙		
Takoma				○	○
Twinbrook					○
White Flint					○
Union Station	S	○	○		
	W	○	○		

- ⊙ Needs improvement ($v/c \geq 0.75$)
- Needs study ($0.5 \leq v/c < 0.75$)



Near-Term Capacity Needs: 2010-2020

- Complete 75% 8-car trains by 2015 and 100% 8-car trains by 2020, including power systems and storage facilities
- Implement Blue Line realignment to increase capacity at Rosslyn Portal
- Construct station connection pedestrian tunnels: Farragut North to Farragut West and Metro Center to Gallery Place
- Add escalators and stairways at core stations
- Expand station access including parking, bus service, and bicycle and pedestrian facilities
 - Maintaining current auto access mode share would require 36,000 more parking spaces by 2030
- Expand the region's bus service and integrate with planned streetcar and light rail lines to supplement Metrorail capacity in major corridors

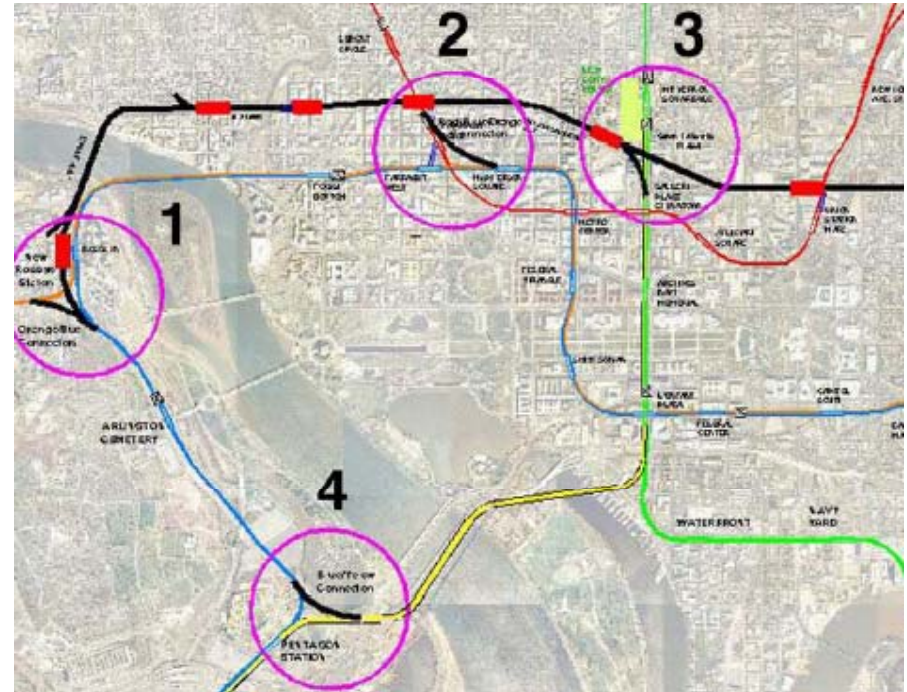


Station Connection Tunnel Concept



Long-Term Capacity Needs: 2020-2030

- Build pocket tracks to add storage and turnaround track
- Construct inter-line connections to improve system flexibility
- Plan and design new Potomac river crossing between Rosslyn and Georgetown with new line to downtown



Source: 2002 Core Capacity Study



Next Steps

- | | |
|-----------|--|
| July 2008 | Present the Board the 2011-2020 Capital Improvement Plan – “State of Good Repair” and Capacity Enhancement Needs |
| 2009 | Develop capital funding agreement to begin July 2010 |
| 2009-2010 | Begin engineering and project development activities for rail car, power systems and storage facilities |
| 2011-2015 | Implement power and facility improvements and rail car procurement |
| 2015-2020 | Expand rail fleet to allow 75% and 100% 8-car train service |