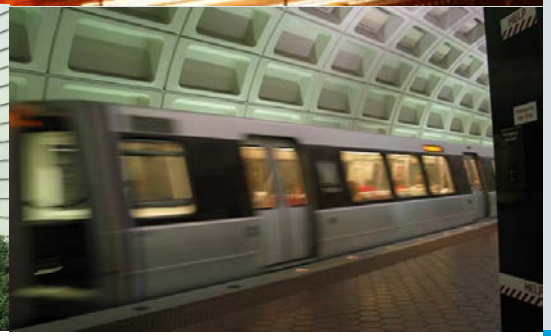


Long-Range Plan Task Force: Update on Analysis Methods, Assumptions, and Measures of Performance

September 20, 2017

Prepared for:
Metropolitan Washington Council of Governments

ICF

Assumptions and Inputs; Tools and Methods

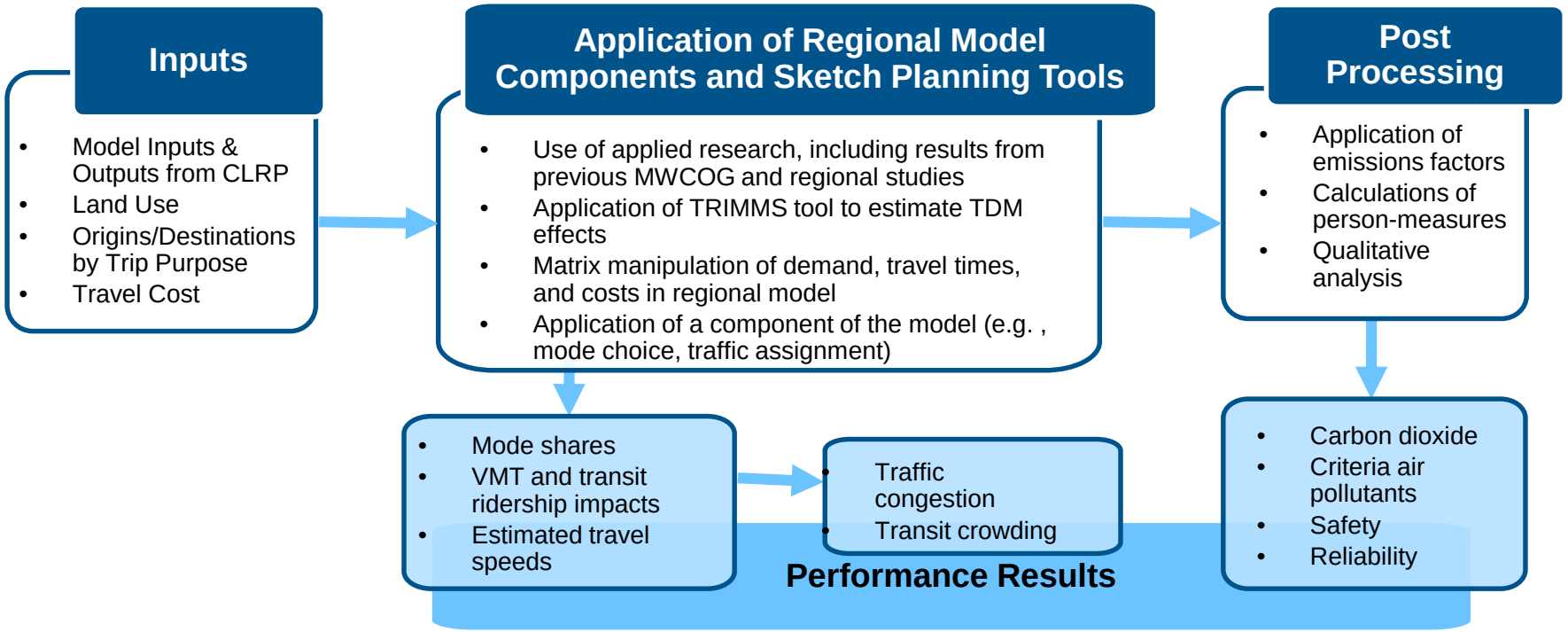
Sketch Planning Approach

- **What is Sketch Planning?**
  - Use of generally simplified methods and tools to conduct analysis, rather than full scale regional land use, travel demand, and emissions modeling
  - Relies on documented research, inputs/outputs/components of modeling tools, and spreadsheet analysis
  - Develops general estimates of effects; not designed to assess individual project alignments or components that would require more detailed project-level studies

- **Why use a Sketch Planning approach here?**
  - Inform Task Force on the high-level impacts of various initiatives within a short time-frame, so that upon review, initiatives can be more thoroughly studied.
  - Allows for vetting policy and investment ideas in a time and cost-effective manner

Sketch Planning Approach

- **Use of multiple tools**



Approach to Developing Assumptions

- Consistent with text approved by the Long-Range Task Force
- Focus on broad *regional* initiatives, generally with bold assumptions
- Build upon previous analyses (e.g., TPB “all build” and aspirations scenarios) and previously identified concepts
- In addition to Initiative #8 – Optimize Regional Land Use Balance, land use changes are assumed with initiatives that add new transportation infrastructure:
  - Initiative #3 – Additional Northern Bridge Crossing / Corridor
  - Initiative #4 – Regionwide Bus Rapid Transit and Transitways
  - Initiative #7 – Transit Rail Extensions
- All initiatives assume state of good repair of transit and road infrastructure

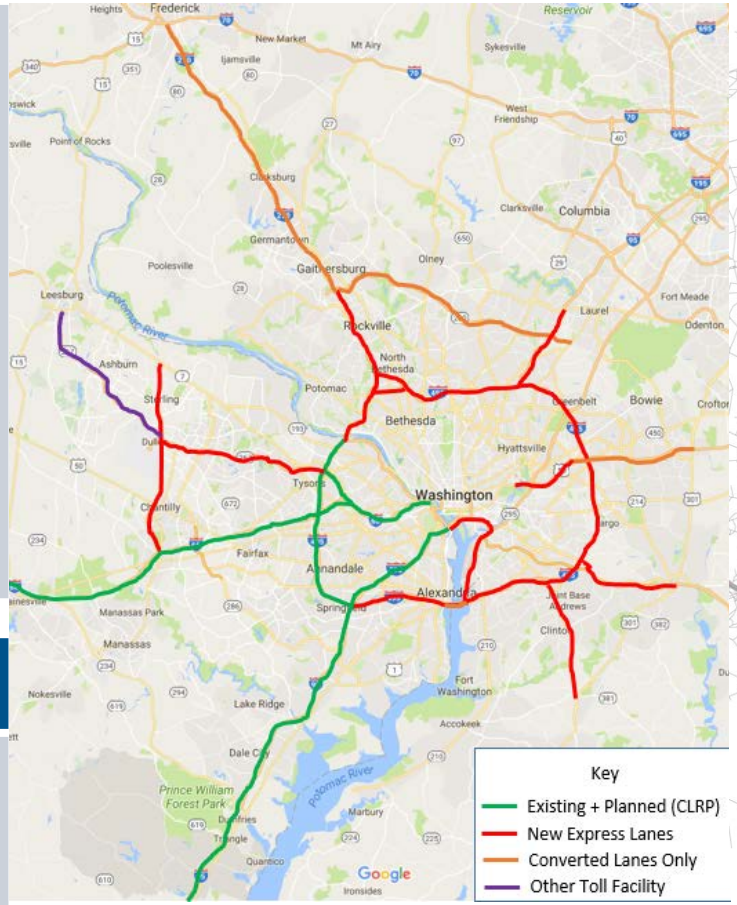
Initiative 1. Regional Express Travel Network

Components

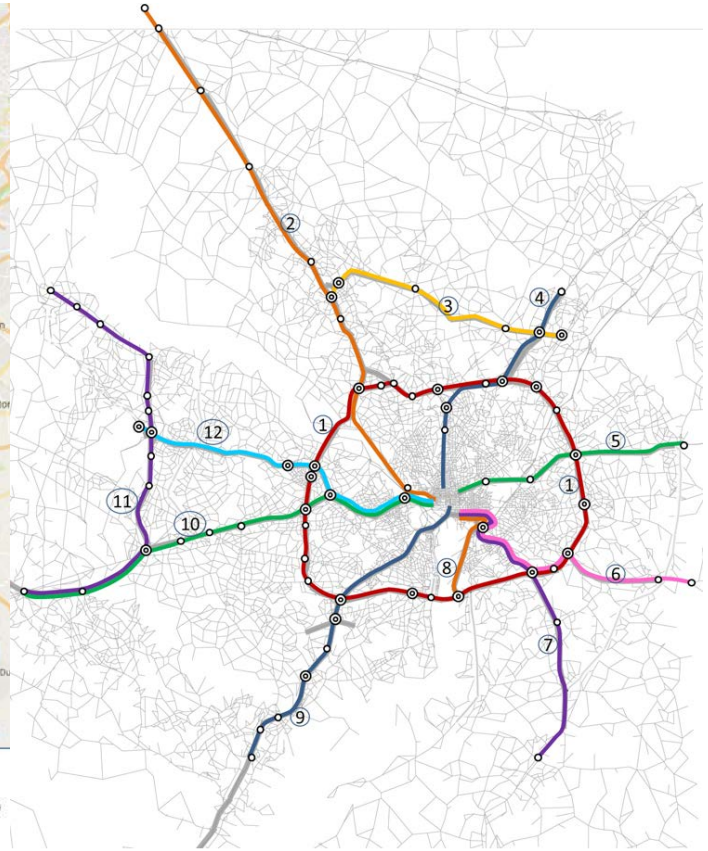
- Express toll lanes network on existing limited access highways
  - Through combination of new capacity and HOV lane conversion
- Expanded American Legion Bridge
  - 2 new express lanes in each direction
- Express bus services
  - Operating at 10 min headways peak, 20 min off-peak

Land Use

- 2040 CLRP Round 9.0 Cooperative Land Use Forecasts (unchanged)



Express Lane Network



Express Bus Network

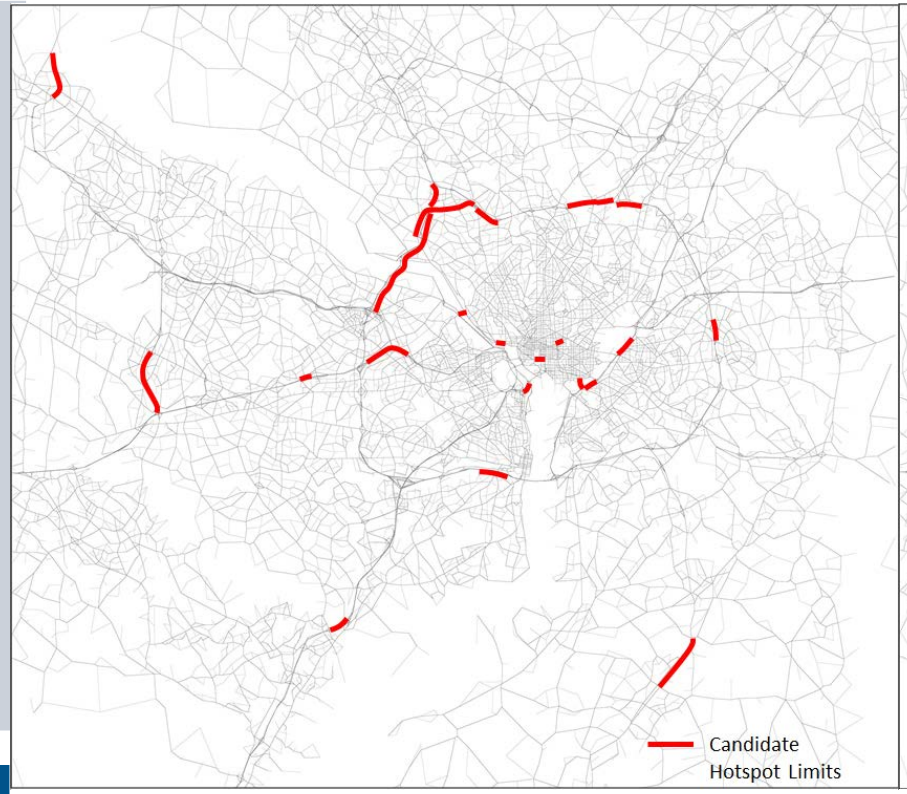
Initiative 2. Regional Roadway Congestion Hotspot Relief

Components

- Top congestion hot spots
  - Application of technology & enhanced system operations strategies plus limited capacity enhancements
- Reversible lanes
  - Non-expressway segments with 3+ lanes with high directional volumes
- Enhanced incident management, ATM, and ICM
  - Assumed improvement in effective capacity on major corridors
- Demand-responsive services

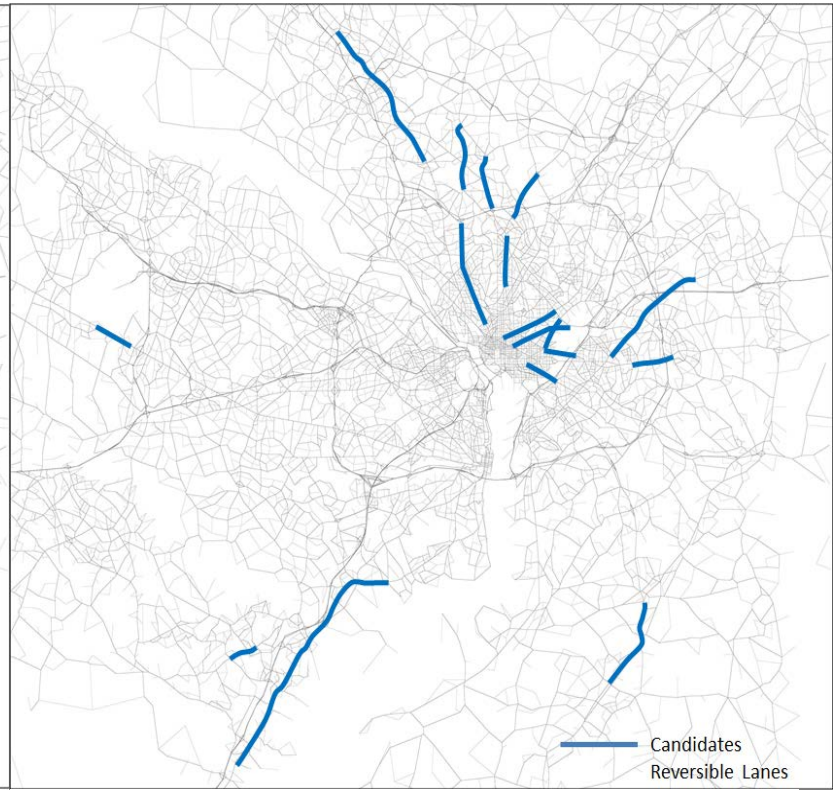
Land Use

- 2040 CLRP Round 9.0 Cooperative Land Use Forecasts (unchanged)



Targeted Hotspot Relief Locations

(Source: Sabra Wang and Associates)



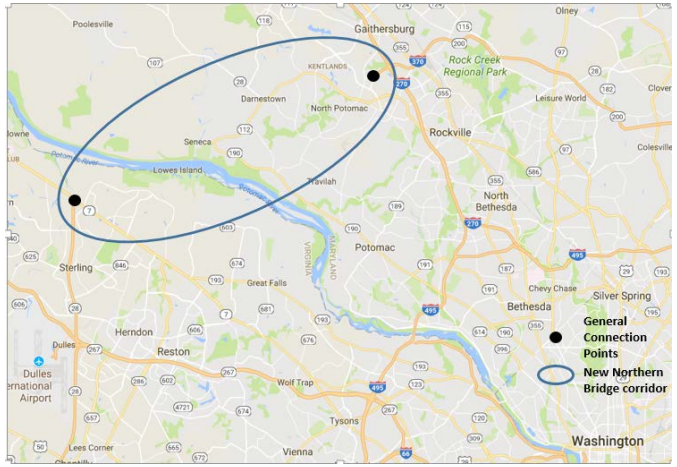
Reversible Lane Candidates

(Source: Sabra Wang and Associates)

Initiative 3. Additional Northern Bridge Crossing /Corridor

Components

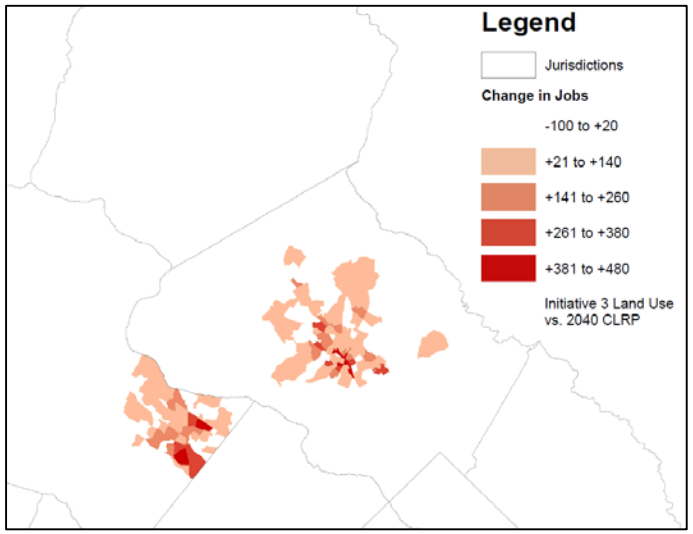
- New toll road (about 14 miles long)
  - Between VA28/VA 7 junction and I 270/I-370 junction (MD-200/Intercounty Connector)
  - 3-lanes each direction
  - Parkway-style facility with no interchanges between terminal points
  - Per-mile toll rates from MD-200
- New express bus service connecting activity centers along the corridor
  - 20 min peak, 30 min off-peak headways



General Connection Points for New Corridor

Land Use

- 2040 CLRP Round 9.0 Cooperative Land Use Forecasts altered
  - Modest increase in households and jobs in areas with existing development areas within Montgomery and Loudoun Counties impacted by the new facility



Location of Assumed Increase in Jobs in Corridor

(Source: Fehr & Peers)

Initiative 4. Regionwide Bus Rapid Transit and Transitways

Components

- Additional bus rapid transit (BRT)/transitway networks in Montgomery County, Prince George's County, Northern Virginia (TransAction 2040), DC, and a transitway from Branch Ave to Waldorf

- Improved bicycle/pedestrian connections and access improvements
  - Bike/ped mode shares altered

Land Use

- 2040 CLRP Round 9.0 Cooperative land Use Forecasts adjusted to have modest increase in employment and household densities in zones with new services
  - Increase densities in zones with new BRT to 5 households/acre and 30 jobs/acre while maintaining the regional control totals

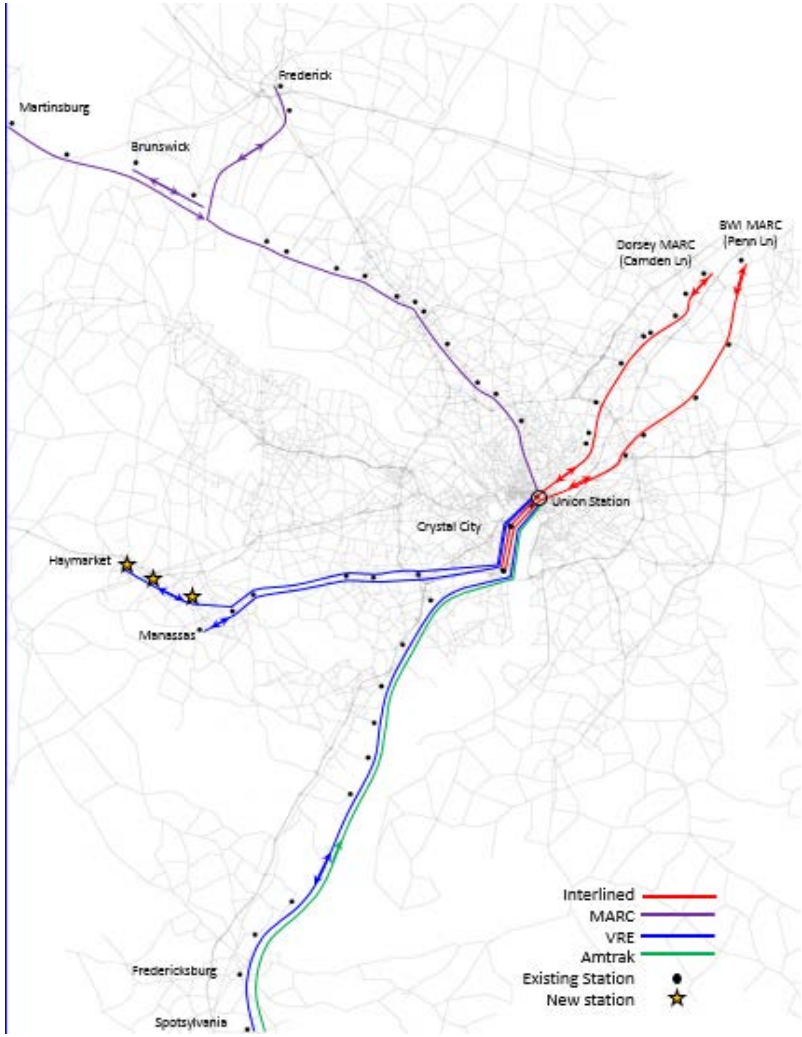
Initiative 5. Regional Commuter Rail Enhancements

Components

- Improvements to MARC and VRE Commuter Rail Systems – Expand upon commuter rail enhancements already in CLRP
  - Upgrading all 60-min, peak-time headways in the CLRP to 30-min headways
  - Upgrading all 30-min headways in the CLRP to 20-min headways.
  - Establishing off-peak service on all MARC and VRE lines, if not already in CLRP.
  - Run-through services of the MARC Camden and Penn lines with VRE to extend to Alexandria.
- Improved bicycle/pedestrian connections and access improvements
  - Bike/ped mode shares altered

Land Use

- 2040 CLRP Round 9.0 Cooperative land Use Forecasts (unchanged)



Initiative 6. Metrorail Regional Core Capacity Improvements

Components

Improvements

- 100% 8-car trains
- Station improvements at high-volume stations
- Improved bicycle/pedestrian connections and access improvements

New Additions

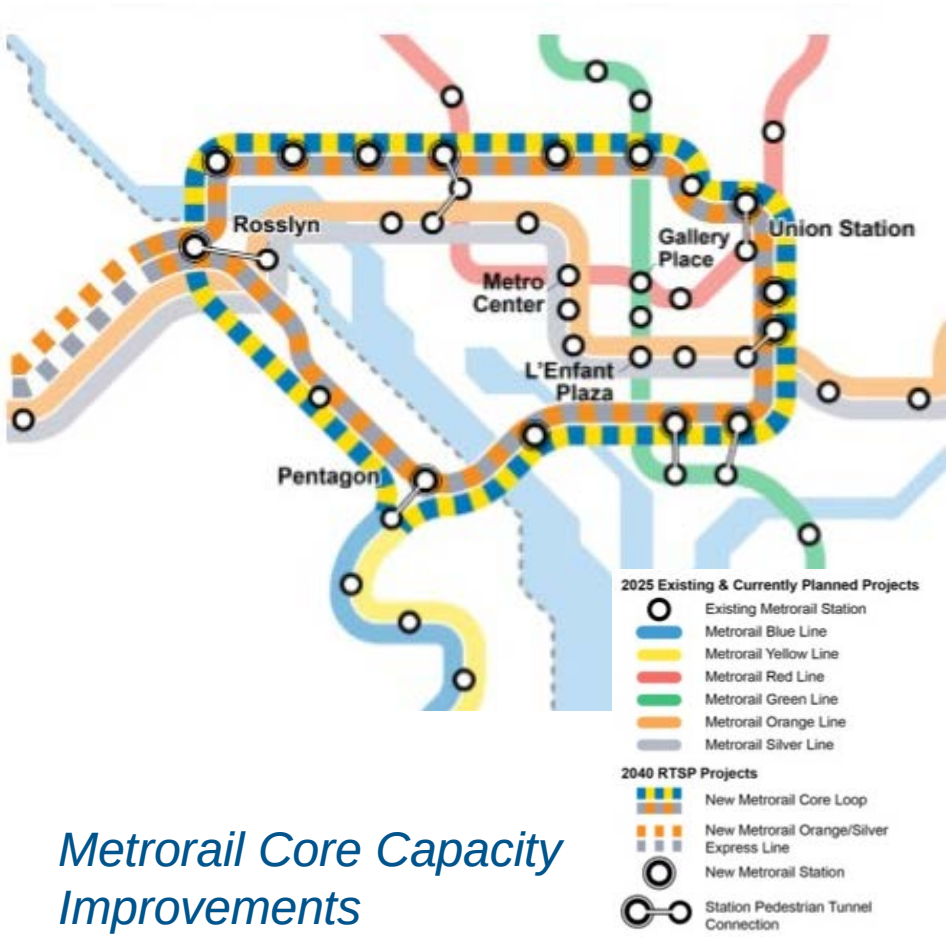
- Second Rosslyn station
- New Metrorail core line to add capacity across Potomac River (based on WMATA Momentum 2040).

Analysis Approach

- *Core capacity constraint in the model removed*
- *New stations and new lines are being added to the MWCOG model network with a simplified approach.*

Land Use

- 2040 CLRP Round 9.0 Cooperative land Use Forecasts (unchanged)



Metrorail Core Capacity Improvements

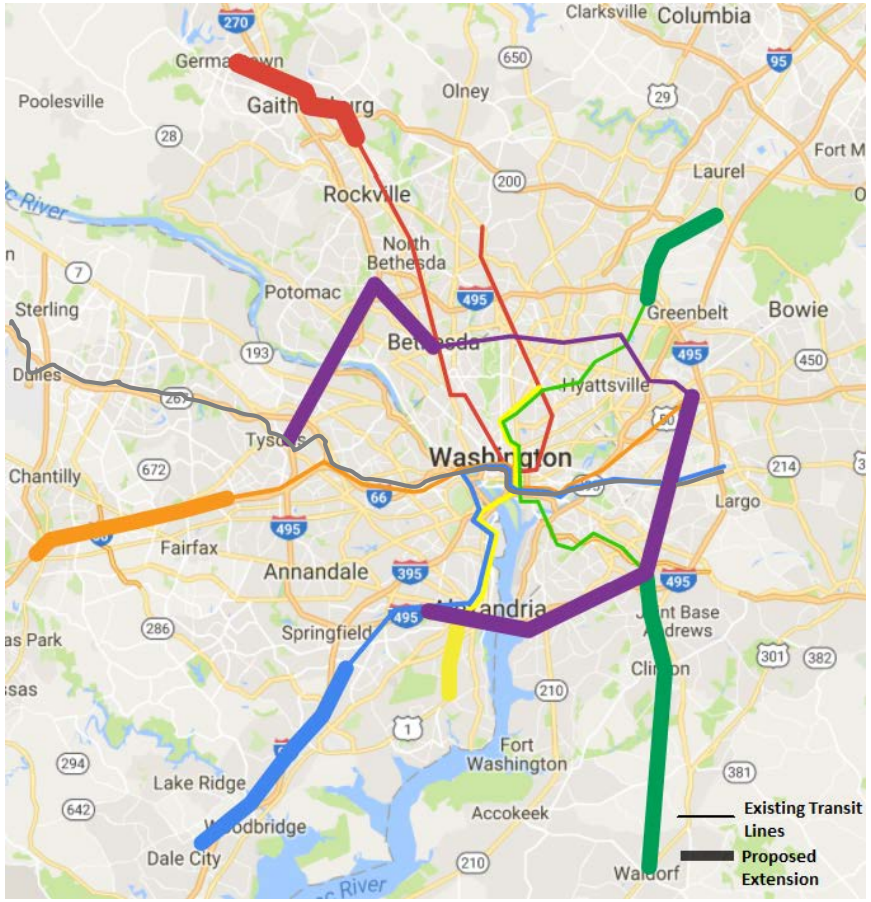
Initiative 7. Transit Rail Extensions

Components

- Extensions to all existing Metro lines (except Silver), with existing fare structures (cap on maximum fares)
- Purple Line light rail extension (as specified by Task Force to Tysons and Eisenhower Ave.)
- New light-rail from Branch Ave to Waldorf
- Improved bicycle and pedestrian connections and access improvements to rail stations

Land Use

- Assume some shift of land use to Activity Centers in these corridors
  - Increase densities in TAZs with new LRT to 7 households/acre and 45 jobs/acre
  - Increase densities in TAZs with new Metrorail to 15 households/acre and 90 jobs/acre
  - Maintain regional control totals, shift within jurisdictions

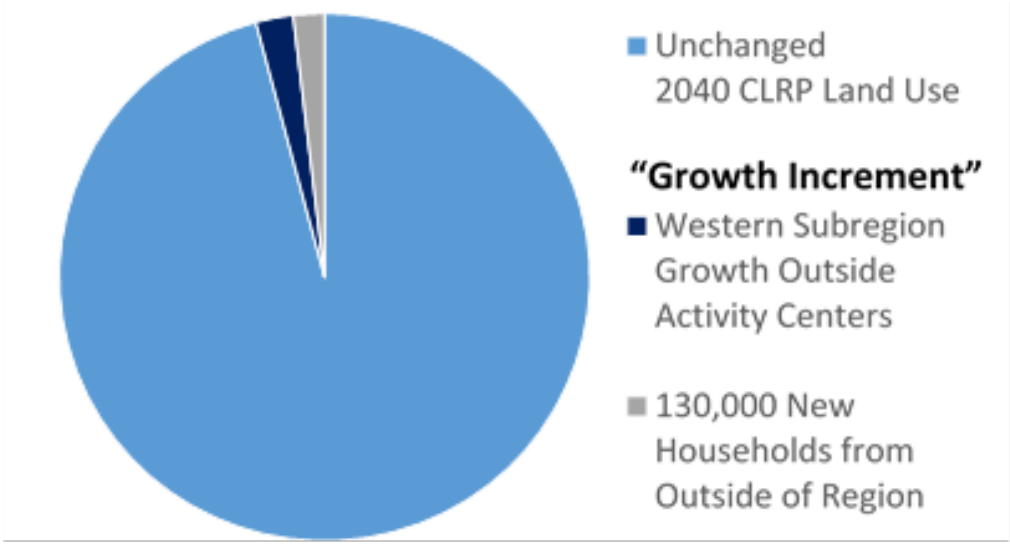


Existing Metrorail and Proposed Rail Extensions

Initiative 8. Optimize Regional Land-Use Balance

Land Use

- Add 130,000 more households from outside region (with adjustment to external travel).
- Allocate 2025-2040 growth increment to balance job/household ratio between eastern and western subregions, shifting jobs from outside of activity centers
- Within each subregion, allocate growth increment to individual jurisdictions to approach regional job/household region and factor activity centers with high capacity transit



Jurisdiction	2040 CLRP			Initiative 8 Land Use		
	HH	Jobs	Ratio	HH	Jobs	Ratio
Eastern Subregion	1,054,764	1,604,039	1.52	1,107,094	1,702,578	1.54
Western Subregion	1,513,958	2,546,274	1.68	1,591,628	2,447,735	1.54
TPB Planning Region Total	2,568,722	4,150,313	1.62	2,698,722	4,150,313	1.54

Initiative 9. Transit Fare Policy Changes

Components

- **Reduced Off-Peak Fares** – Metrorail fares reduced for off-peak direction during peak period and on underutilized segments. Fares set to the non-peak rates for the off-peak direction, even during peak travel times.
- **Reduced Fares for Low-Income Residents** – Metrorail fares for low-income residents reduced to zero. The low-income group is assumed to be the lowest income quartile from the MWCOG model.

Land Use

- 2040 CLRP Round 9.0 Cooperative Forecasts (no change)

Initiative 10. Amplified Employer-based Travel Demand Management

Components

- Expanded employer-based transit/vanpool benefits
  - Transit/vanpool subsidies averaging $50 per month are provided by 80% of employers
- Increase in priced parking in major activity centers
  - 90% of parking for work-trips in activity centers is priced, with parking costs assumed to range from $4/day minimum (could reflect employer-provided parking cash out).
- Substantial increase in telework and flexible schedule adoption
  - 20% telework share (from current 10% share)
  - Teleworkers come proportionately from other modes (drive alone, carpool, transit, etc.)

Land Use

- Land use: 2040 CLRP Round 9.0 Cooperative Forecasts (no change)

Performance Measures

Desired Characteristics of MOEs

1. Should address the regional goals and challenges that the task force hopes these initiatives will address.
2. Should reflect best practices in measuring what matters.
3. The number of MOEs should be manageable (ideally no more than about 12-16) to facilitate comparisons and clearly communicate.
4. For some MOEs, it may be more meaningful to present the final results as a percentage change from the CLRP rather than reporting raw numbers.
5. Must be assessable within the context of the rapid sketch planning-level analysis being conducted.

The number of MOEs currently presented may be more than is appropriate for final reporting, and the ICF team seeks the Technical Committee's input on which to prioritize.

Best Practices in Regional Performance Measures

- Moving from traditional traffic congestion measures (focused on vehicle delay and roadway level of performance) to measures that address the perspective of the traveler
- Increasing interest in measuring reliability as a key congestion measure; however, challenging to forecast
- Increasing interest in accessibility and connectivity measures

Recommended MOEs

All 14 challenges will be assessed

- 12 proposed quantitative measures provide information addressing many of these challenges
  - Several include sub-measures
- In addition, qualitative assessments will be provided in relation to several challenges

Checks show relationship (direct and indirect) of measure to each regional challenge

Measures x Challenges	Roadway Congestion	Transit Crowding	Inadequate Bus Service	Unsafe Walking and Biking	Development at Metrorail	Housing and Job Location	Metrorail Repair Needs	Roadway Repair Needs	Incidents and Safety	Ped and Bike Safety	Environmental Quality	Open Space Development	Bottlenecks	Travel Reliability to Airports
Travel Time: average travel time per trip for each mode	✓		✓										✓	
Traditional Congestion: vehicle hours of delay	✓										✓		✓	
Accessibility by Transit: % change in # of jobs accessible within 45 min transit commute	✓	✓	✓		✓	✓							✓	
Accessibility by Auto: % change in # of jobs accessible within 45 min car commute	✓					✓							✓	
Mode Share: non-SOV, transit	✓	✓	✓	✓										
Reliable Trips: share of trips on reliable modes (e.g., express lanes, BRT, etc.)	✓		✓										✓	✓
VMT and VMT per capita	✓					✓			✓		✓			
Rail Transit Crowding: % of person miles on rail transit in crowded conditions		✓											✓	
Transit Options for Households: share of households in high-quality transit zones			✓		✓	✓						✓		
Transit Options for Employment: share of jobs in high-quality transit zones			✓		✓	✓						✓		
Airport Access: Average best travel time (using best available option; e.g., transit, express lanes) to regional airports (from households and jobs)					✓								✓	✓
Emissions: Report separately on VOC, NOx, and CO_2											✓			
Qualitative Assessments (derived from quantitative MOEs, other assessments)				✓			✓	✓	✓	✓	✓	✓		✓

Recommended Quantitative MOEs

Measure	Expressed as
Travel Time	average travel time per trip for each mode
Traditional Congestion	vehicle hours of delay
Accessibility by Transit	% change in # of jobs accessible within 45 min transit commute
Accessibility by Auto	% change in # of jobs accessible within 45 min car commute
Mode Share	non-SOV, transit
Reliable Trips	share of trips on reliable modes (e.g., express lanes, BRT, etc.)
VMT and VMT per capita	Amount of vehicle travel and per capita
Rail Transit Crowding	% of person miles on rail transit in crowded conditions
Transit Options for Households	share of households in high-quality transit zones
Transit Options for Employment	share of jobs in high-quality transit zones
Airport Access	Average best travel time (using best available option; e.g., transit, express lanes) to regional airports (from households and jobs)
Emissions	VOC, NOx, and CO_2

Qualitative Assessments
Unsafe Walking and Biking
Metrorail Repair Needs
Roadway Repair Needs
Incidents and Safety
Ped and Bike Safety
Open Space Development
Environmental Quality*
Travel Reliability to Airports*

*Not fully addressed in quantitative MOEs

Extra Slide

Selection of Initiatives for Further Analysis

- **Principles**
  - Each initiative **goes beyond what is currently included in the existing CLRP**.
  - Each initiative is **regional in nature** and is worthy of analysis to examine whether it has the potential to make noticeable improvements in regional performance
  - **Considerations of the viability (e.g., political or financial) of initiatives were limited** at this point because at this stage the task force is proposing initiatives for further analysis, not for inclusion in the long-range plan
  - Where an initiative requires **multiple components to achieve substantial improvements** and those components all relate sufficiently to each other, they were considered one cohesive initiative (e.g., a mega-project/program/policy).
  - Each initiative is **assumed to include supporting elements**. For example, transit initiatives will be accompanied by improvements in bicycle and pedestrian access and supported by land use policies that focus development around transit stations.