



I-495 & I-270 Managed Lane Study

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Agenda

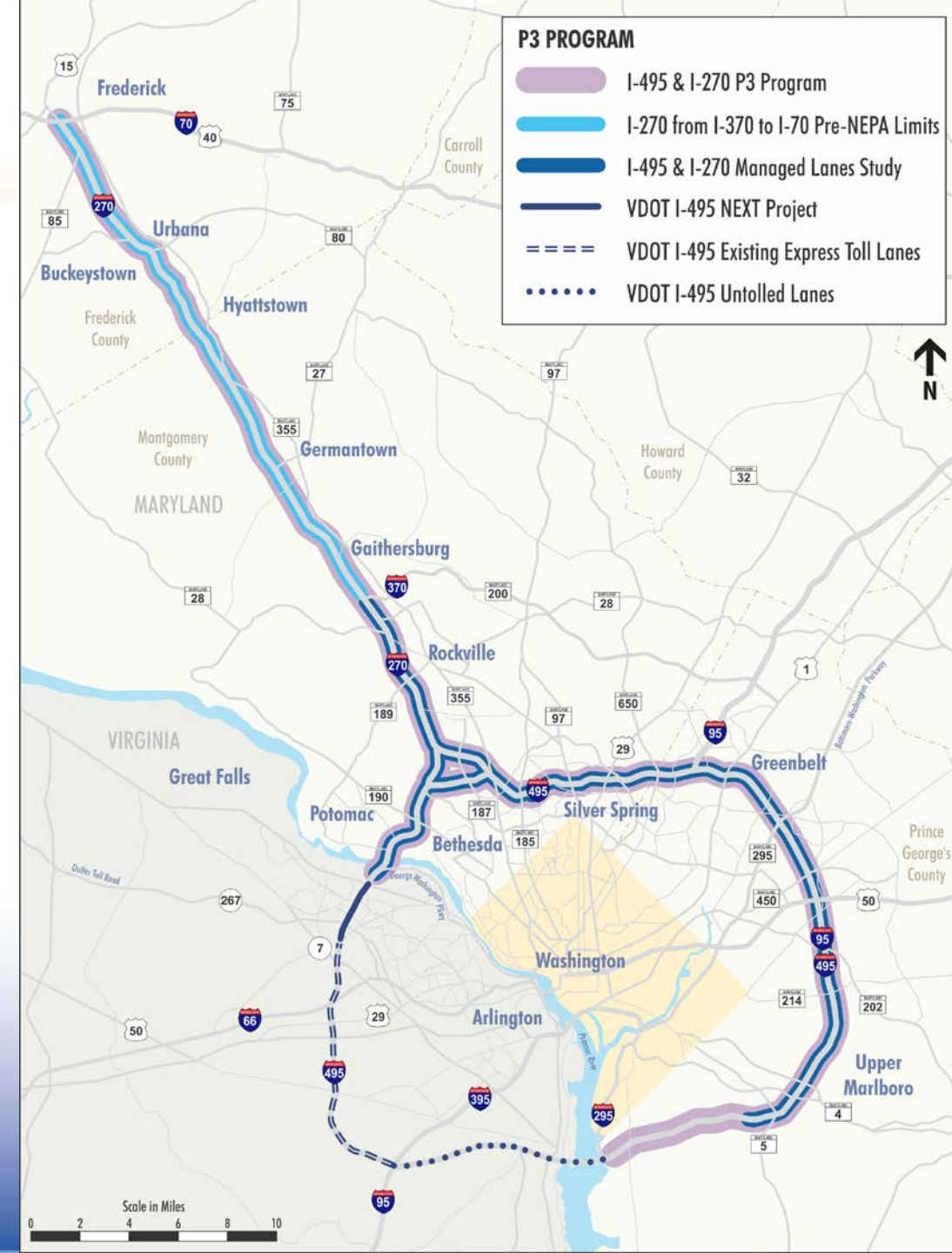
- *Alternatives Retained for Detailed Study (ARDS)*
 - *Study's Purpose and Need*
 - *Alternatives Process*
 - *Alternative 5: One HOT Lane Alternative*
 - *Elements Common to All ARDS*
 - *Regional Transportation Plan Initiatives*
 - *Regional Transit Projects*
 - *Multimodal Mobility and Connectivity*
 - *Direct Access Locations*
 - *Improvements to American Legion Bridge*
- MD 200 (ICC) Diversion Alternative
- Avoidance and Minimization of Impacts
- Next Steps





I-495 & I-270 P3 Program Elements

- Current Studies:
 - I-495 & I-270 Managed Lanes Study (48 miles)
 - I-270 from I-370 to I-70 (Preliminary planning underway - 23 miles)
 - VDOT I-495 NEXT Project Environmental Study underway independently
- Future Study:
 - I-495 from MD 5 to the Woodrow Wilson Bridge





I-495 & I-270 Managed Lanes Study: *Purpose and Need*

The purpose of the I-495 & I-270 Managed Lanes Study is to develop a travel demand management solution(s) that *addresses congestion, improves trip reliability* on I-495 and I-270 within the study limits and *enhances existing and planned multimodal mobility and connectivity*.

Needs:

- Accommodate Existing Traffic and Long-Term Traffic Growth
- Enhance Trip Reliability
- Provide Additional Roadway Travel Choices
- Accommodate Homeland Security
- Improve the Movement of Goods and Services

Goals:

- Financial Viability
- Environmental Responsibility





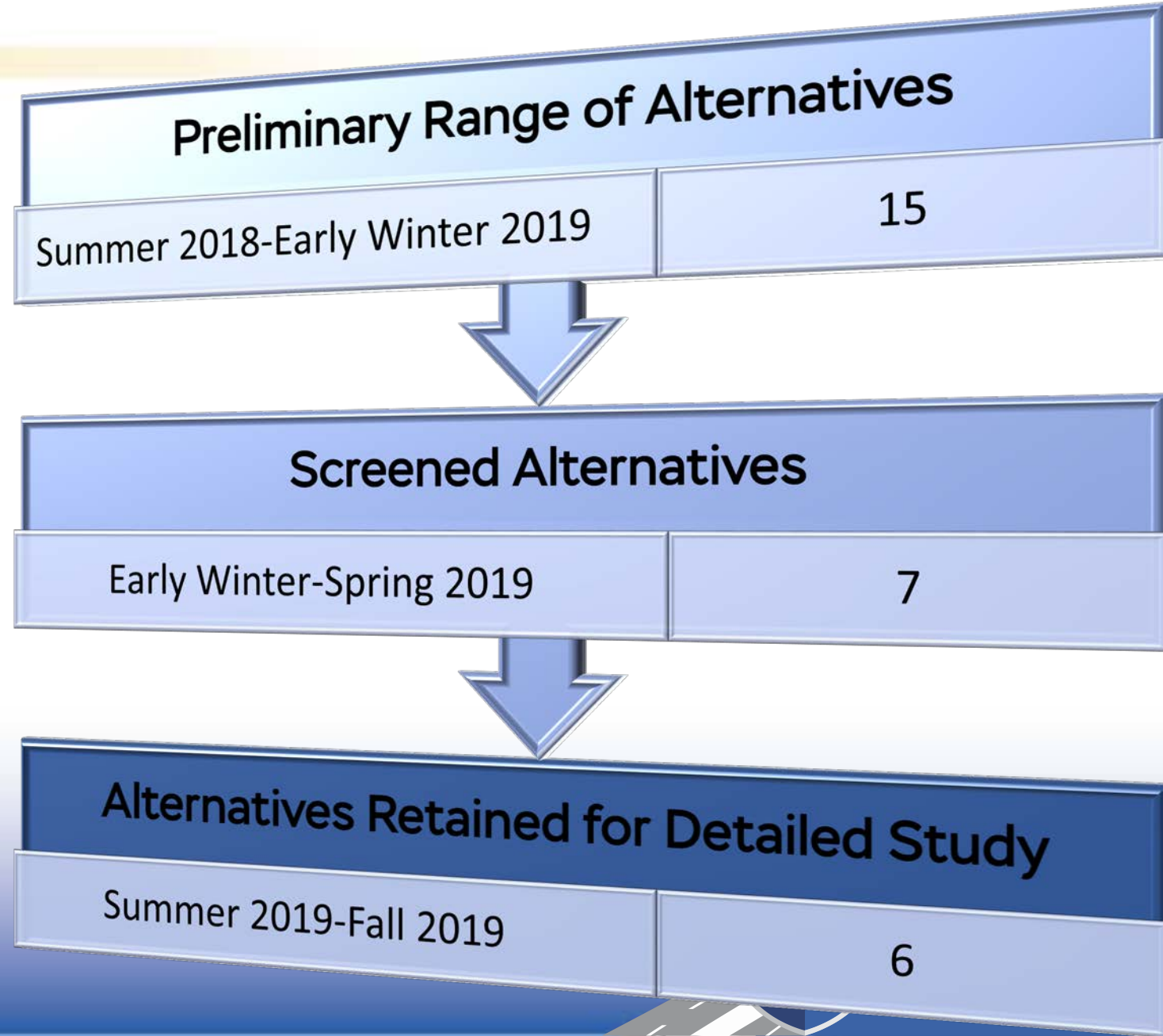
I-495 & I-270 Managed Lanes Study: *Purpose and Need and Alternatives*

- Federal Council on Environmental Quality (CEQ) regulations require the lead agency to “*briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives* including the proposed action”
- Purpose and need is the *foundation of an EIS*
- Key in determining the *range of alternatives* considered
- Alternatives can be dismissed, without detailed study, if it *fails to meet the project’s purpose and need*
- The *lead agency is responsible* for defining the purpose and need and the range of alternatives





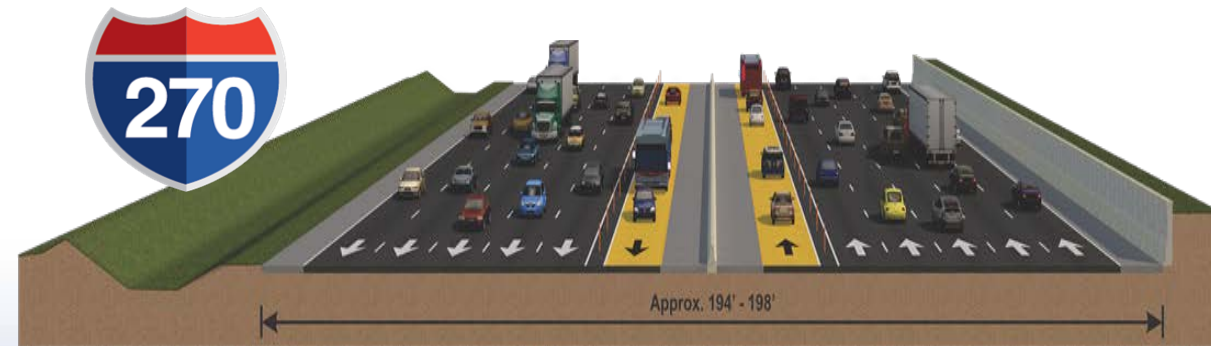
- Additional traffic, environmental and financial analysis completed on Screened Alternatives to determine ARDS
- Eight (8) Public Workshops to present results and recommended ARDS
- Additional studies completed post public workshops in summer 2019





Alternative 5: *One HOT Lane Alternative*

- Alternative 5 consists of adding one HOT lane on I-495 and conversion of the existing HOV lane on I-270 to a HOT lane





Alternative 5: *One HOT Lane Alternative*

- Performed *worst of 7 screened alternatives* in all traffic metrics used to evaluate the alternatives ability to meet purpose and need

| Metric | Criteria |
|--------------------------|--|
| System-Wide Delay | Accommodate Long-Term Traffic Growth |
| Average Speed | |
| Failing (LOS F) Segments | |
| Travel Time Index | Provide Trip Reliability |
| Person Throughput | Improve Movement of Goods and Services |
| Effect on Local Network | |
| Latent Demand Served | Supplemental Metrics |
| Travel Time Savings | |





Alternatives Retained for Detailed Study

| ALTERNATIVE | DESCRIPTION |
|------------------------|---|
| Alternative 1 | No Build |
| Alternative 8 | 2-Lane, ETL Managed Lanes Network on I-495 and 1-ETL and 1-Lane HOV Managed Lane on I-270 |
| Alternative 9 | 2-Lane, HOT Managed Lanes Network on both I-495 & I-270 |
| Alternative 10 | 2-Lane, ETL Managed Lanes Network on I-495 & I-270 plus 1-Lane HOV Managed Lane on I-270 only |
| Alternative 13B | 2-Lane, HOT Managed Lanes Network on I-495; HOT Managed, Reversible Lane Network on I-270 |
| Alternative 13C | 2-Lane, ETL Managed Lanes Network on I-495, ETL Managed, Reversible Lane Network and 1-Lane HOV Managed Lane on I-270 |





Elements Common to all ARDS: *Regional Transportation Plan Initiatives*

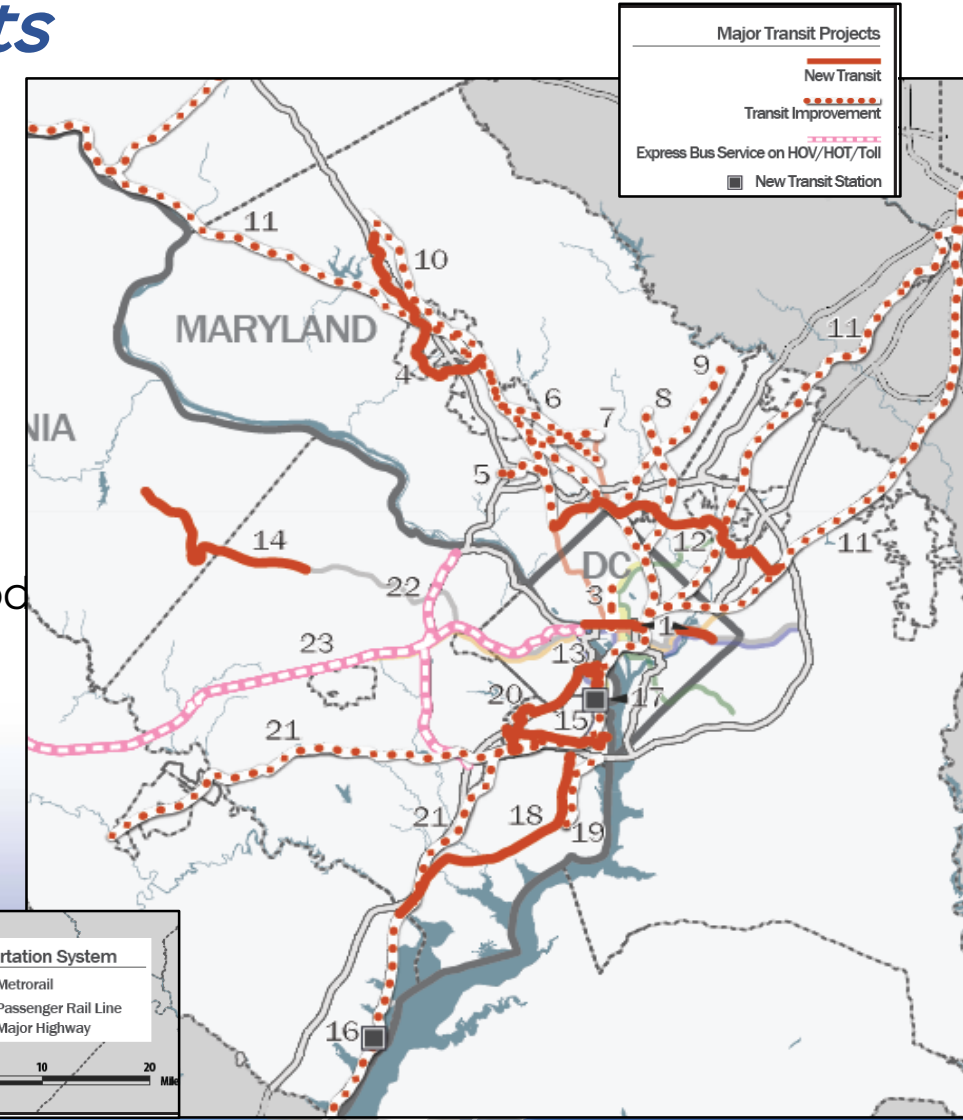
- Visualize 2045 prepared by National Capital Region Transportation Planning Board (TPB) included *Seven Aspirational Initiatives*





Elements Common to all ARDS: *Regional Transit Projects*

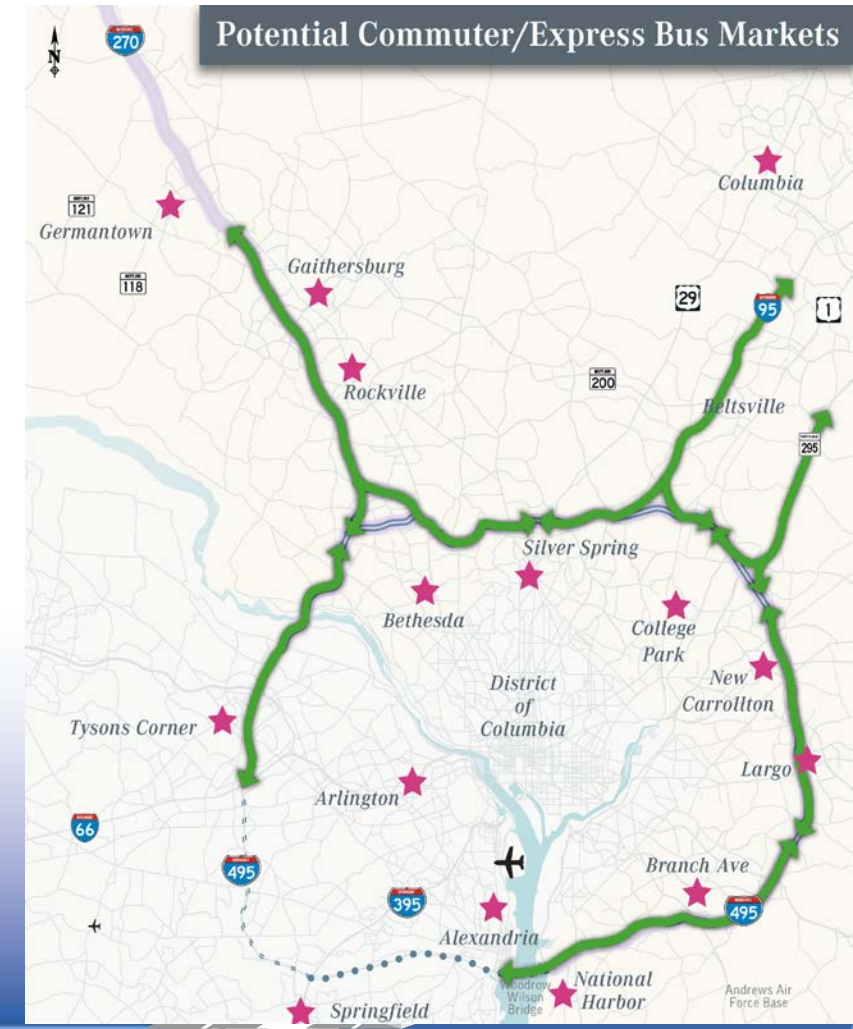
- 2040 MWCOG model includes all projects in Constrained Long-Range Plan (CLRP), such as:
 - Purple Line Light Rail
 - US 29 Bus Rapid Transit (BRT)
 - Randolph Road BRT
 - North Bethesda Transitway
- 2040 land use assumptions in MWCOG model provided by each County
- 2040 traffic will be updated to 2045 using recently approved model
- 2045 MWCOG model includes recently added transportation projects from CLRP including County BRTs:
 - MD 586/Veirs Mill Road BRT
 - MD 650 BRT
 - MD 355 BRT
- Increase MARC trip capacity and frequency





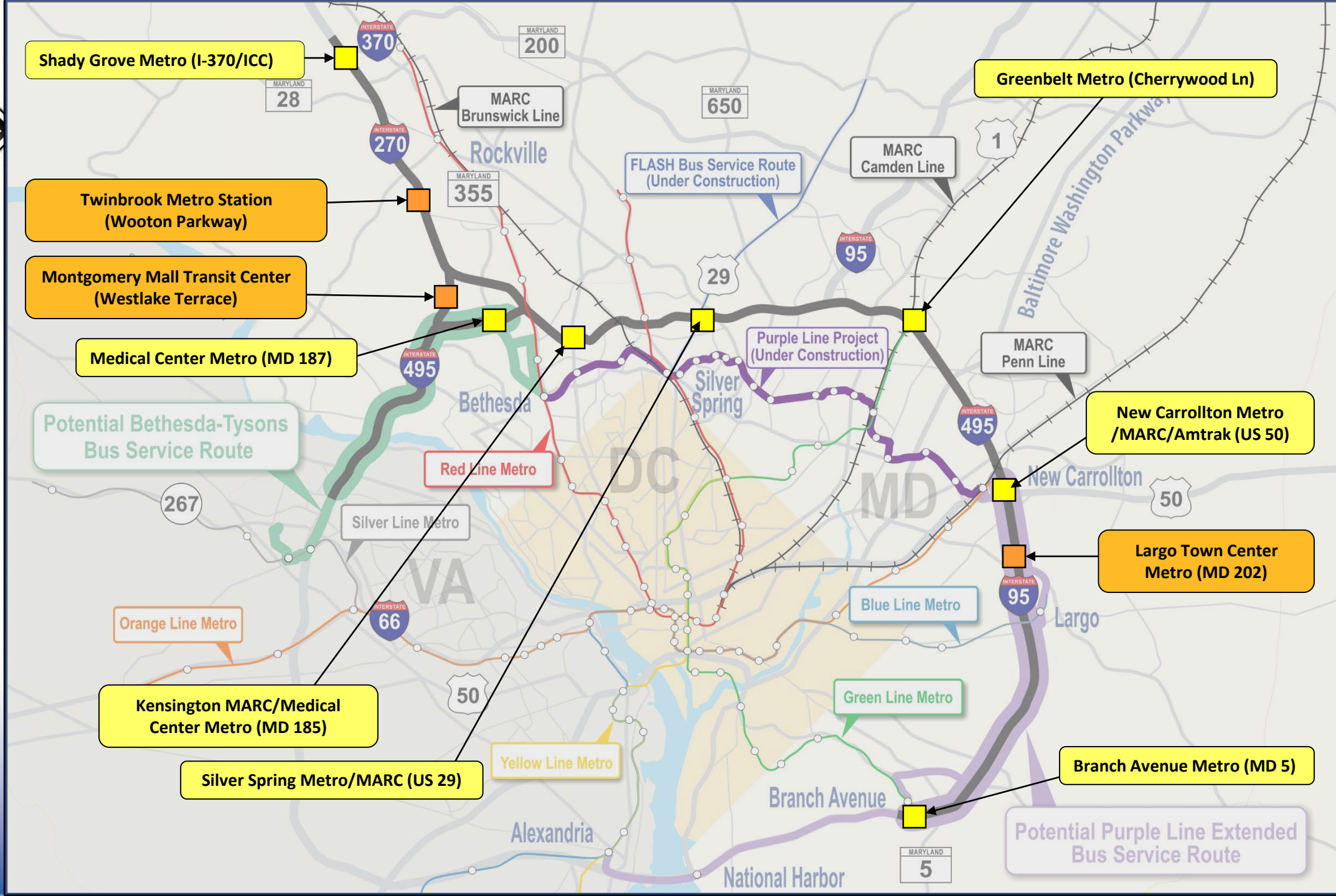
Elements Common to all ARDS: *Multimodal Mobility and Connectivity*

- Opportunities and Potential Benefits for Transit
 - *Free bus transit* on managed lanes
 - *Faster, more reliable* bus trips and *reduced* travel times
 - Potential for *new* express bus routes to VA
 - Service for underserved suburb-to-suburb transit markets
 - Managed lanes can be *new* transit “fixed-guideway”
 - Incentivize new transit service/routes with free use of managed lanes
- HOT, Carpools, Vanpools and Travel Demand Management
 - Free or reduced tolls for HOVs
 - Encourage use of “Commuter Connections” and Incentrip App
 - Cross highway connections for pedestrians and bicyclists





Proposed Managed Lanes access points are based on preliminary traffic and revenue analysis and may change as more detailed analyses are completed.





Elements Common to ARDS *Social Equity*

More Travel Options:

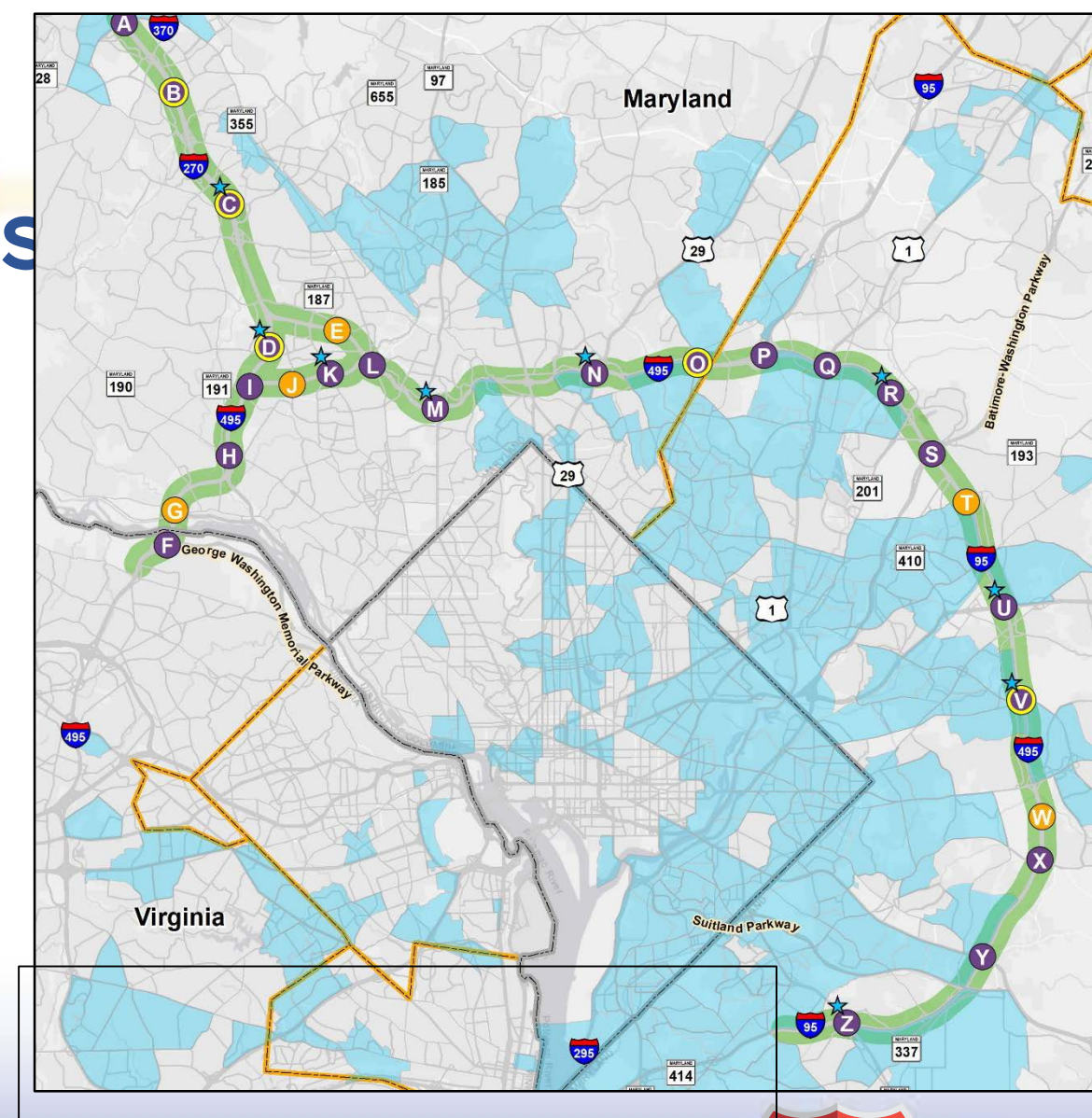
- *Free lanes remain free with less congestion*
- *Free bus usage of managed lanes for faster, more reliable trip*
- Opportunity for *new and expanded* bus transit service
- *Free or reduced* tolls for HOVs (Alts 9 & 13B)

Better Access:

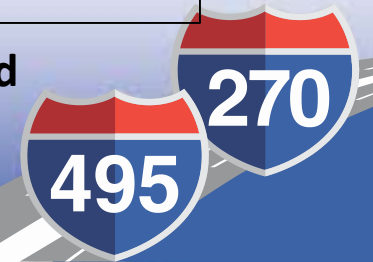
- Direct access to *existing and proposed transit centers* and TOD
- Direct access *supporting transit connections* in *Equity Emphasis Areas*
- Making cross highway *bicycle and pedestrian connections*

Tolling Considerations:

- Set aside for transit improvements
- Opportunities for enhanced participation by low income (MDOT funding of alternative modes, prepaid & multiple payment options)



**Equity Emphasis Areas and
Direct Access Locations**





Elements Common to ARDS *Improvements to American Legion Bridge*

- Opened in 1962 – ADT in 2018 was 243,000 vehicles per day
- 5 of top 15 most unreliable highway sections in PM Peak in MD, including #1 at Cabin John Parkway
- #2 (Inner Loop) and #4 (Outer Loop) most congested sections highway sections in PM Peak between I-270 and VA Line
- Critical connection with Virginia's network to support regional transportation improvements
- ARDS assume replacement of the ALB
- Commitment to providing bicycle/pedestrian trail on bridge





MD 200 (ICC) Diversion Alternative: *Purpose*

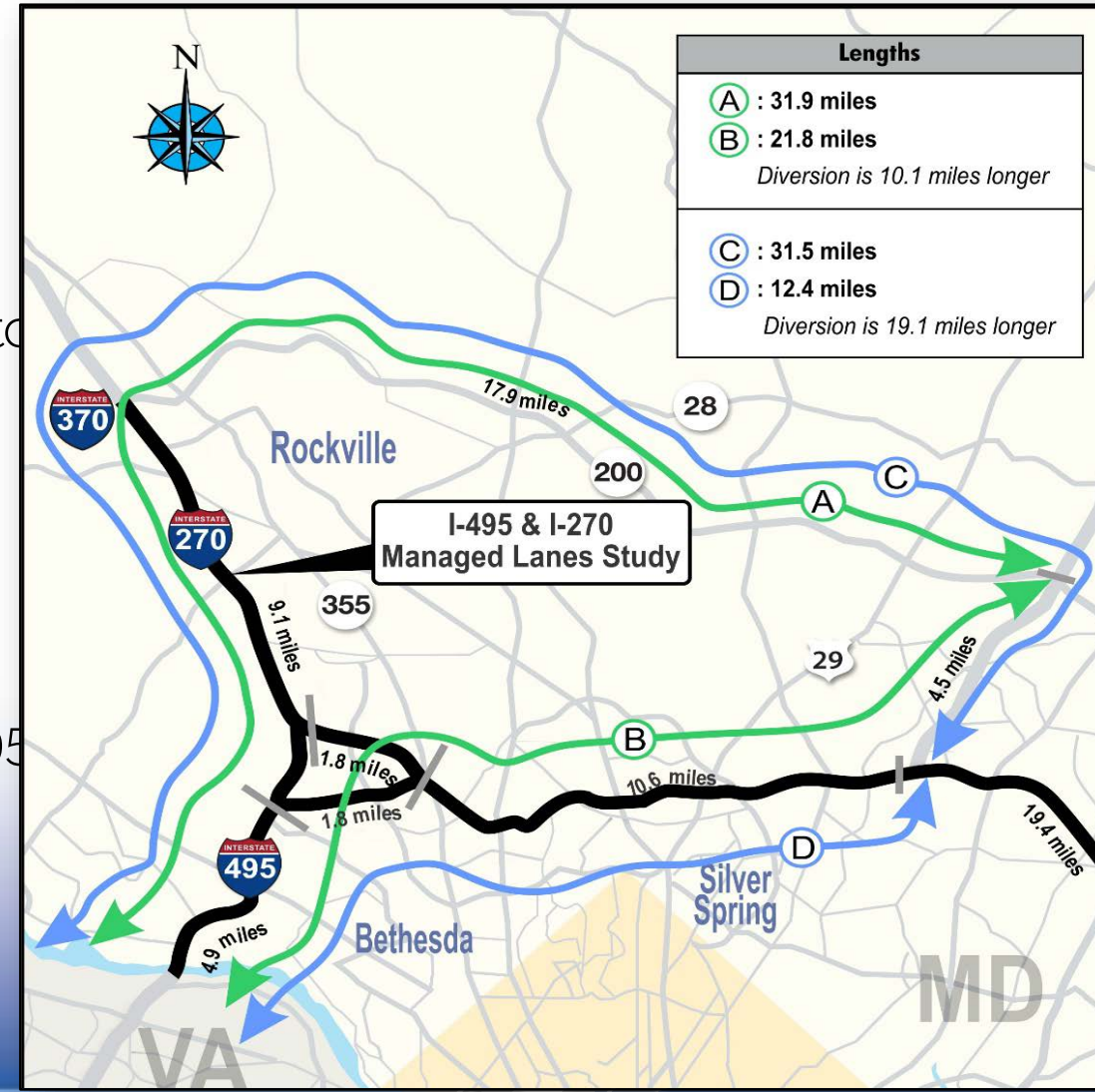
- Responsive to agency requests to evaluate alternative that ***completely avoids*** sensitive and important resources on topside of I-495
- ***Divert traffic*** on topside of I-495 to MD 200 (ICC) express toll highway
- Analyses completed ***to same level of detail*** as Screened Alternatives to determine ability to meet purpose and need
- Determine if alternative would ***meet purpose and need*** and thus be considered ***reasonable alternative*** to carry forward for detailed study in DEIS





MD 200 (ICC) Diversion Alternative

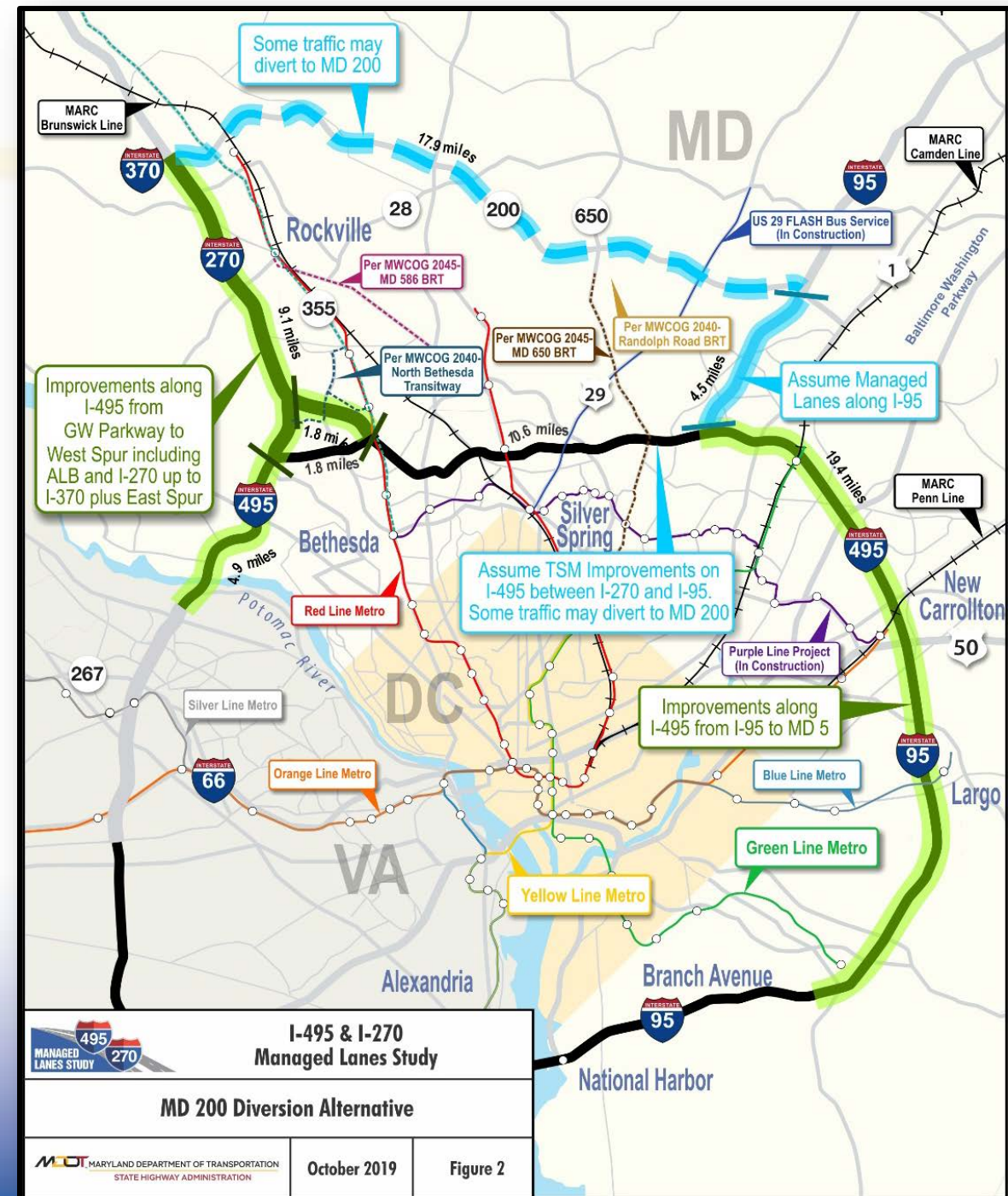
- **Route A/B Diversion (green arrows):**
 - Traffic traveling between I-95 and ALB
 - 15 % of WB AM peak traffic travels from I-95 to ALB
 - 11% of NB PM peak traffic travels from ALB to I-95
- **Route C/D Diversion (blue arrows):**
 - 495 traffic between ALB and I-495 east of I-95
 - 6% of traffic on ALB travels from 495 east of 95 and vice versa





MD 200 (ICC) Diversion Alternative

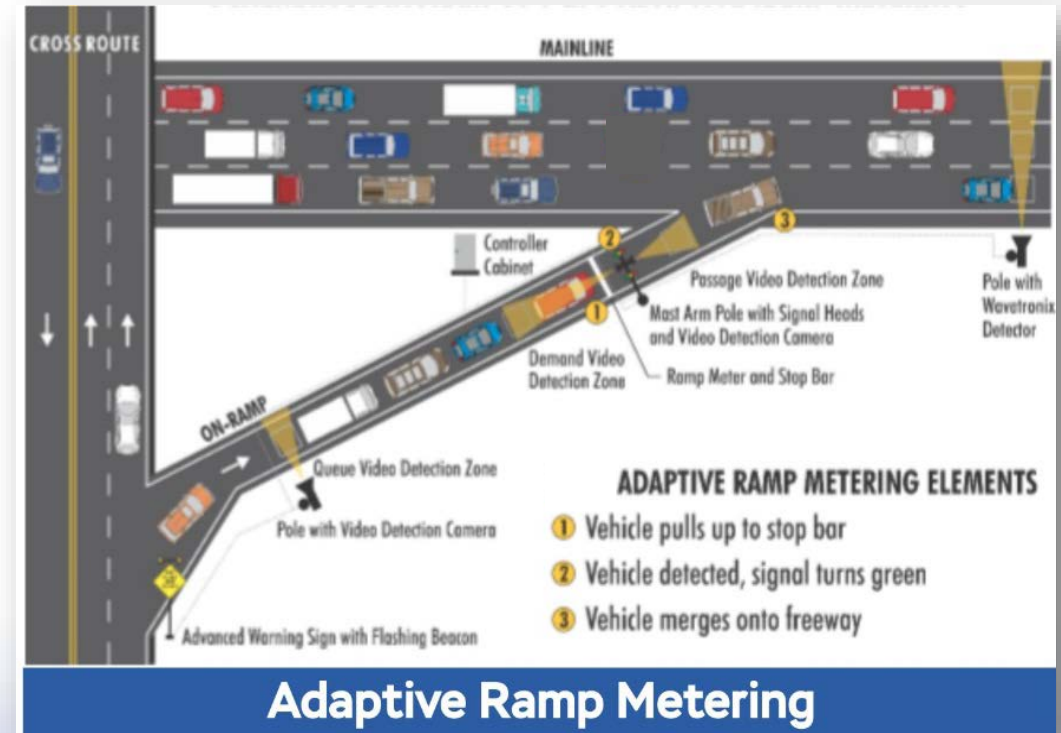
- I-495 West Side (green) – 2 managed lanes
- I-495 East Side (green) – 2 managed lanes
- I-270 (green) – convert HOV lanes, add managed lane
- I-95 (blue) – 2 managed lanes
- I-495 between I-270 and I-95
 - No widening
 - Include Ramp Metering and Signal Optimization

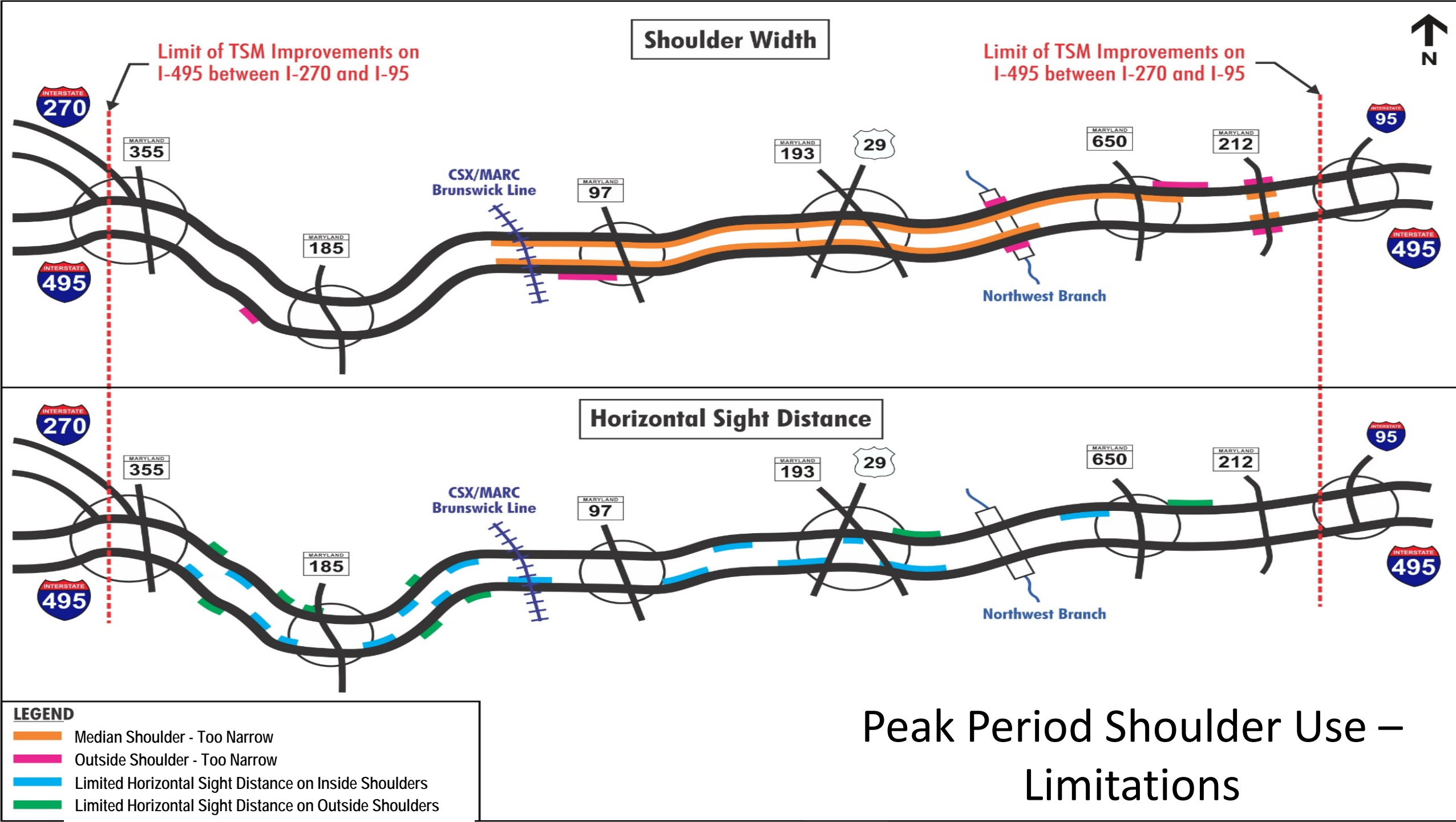




MD 200 Diversion Alternative: *Transportation System/Demand Management (TSM/TDM)*

- Feasible TSM improvements help, but not enough in the long-term
 - Ramp Metering
 - Signal Timing Optimization
- Some TSM improvements not feasible within existing ROW
- Peak period shoulder use studied but not feasible due to narrow shoulders and limited horizontal sight distance







MD 200 (ICC) Diversion Alternative: *Traffic Methodology*

- Detailed traffic analysis performed at *same level as Screened Alternatives* to determine ability to meet purpose and need using same metrics and screening criteria

| Metric | Criteria |
|--------------------------|--|
| System-Wide Delay | Accommodate Long-Term Traffic Growth |
| Average Speed | |
| Failing (LOS F) Segments | |
| Travel Time Index | Provide Trip Reliability |
| Person Throughput | Improve Movement of Goods and Services |
| Effect on Local Network | |
| Latent Demand Served | Supplemental Metrics |
| Travel Time Savings | |





MD 200 (ICC) Diversion Alternative: *Traffic Results*

- Detailed traffic analysis performed at *same level as Screened Alternatives*
- **Does not meet Purpose and Need** based on traffic metrics and screening criteria

| Metric | Rank Among Screened Build Alternatives |
|--------------------------|--|
| System-Wide Delay | 7 of 7 |
| Average Speed | 7 of 7 |
| Failing (LOS F) Segments | 7 of 7 |
| Travel Time Index | 6 of 7 |
| Person Throughput | 6 of 7 |
| Effect on Local Network | 2 of 7 |
| Latent Demand Served | 7 of 7 |
| Travel Time Savings | 7 of 7 |





MD 200 Diversion Alternative: *Traffic Details*

- **System-wide delay**
 - Performs worst of all build screened alternatives
 - Would save 3 to 7% compared to No Build Alternative (vs. 20 to 35% for the build screened alternatives)

| Alternatives | 2040 AM Peak | 2040 PM Peak |
|------------------|-------------------------|-------------------------|
| | % Decrease vs. No Build | % Decrease vs. No Build |
| 2040 No Build | 0% | 0% |
| Alternative 5 | 20% | 22% |
| Alternative 8 | 24% | 33% |
| Alternative 9 | 34% | 33% |
| Alternative 10 | 35% | 35% |
| Alternative 13B | 27% | 22% |
| Alternative 13C | 26% | 35% |
| MD 200 Diversion | 3% | 7% |

* Includes all vehicles on I-495, I-270, and Interchange Ramps





MD 200 Diversion Alternative: *Traffic Details*

- Corridor travel time and speed
 - Lowest average speed in GP lanes compared to build screened alternatives
 - HOT lanes on Inner Loop would not achieve federally-mandated average speed of 45 mph due to congestion spillback from GP lanes

| Weighted Average Speed (MPH) | 2040 No Build | 2040 Alt 5 | 2040 Alt 8 | 2040 Alt 9 | 2040 Alt 10 | 2040 Alt 13B | 2040 Alt 13C | 2040 Diversion Alt |
|------------------------------|---------------|------------|------------|------------|-------------|--------------|--------------|--------------------|
| General Purpose Lanes | 25 | 36 | 39 | 41 | 40 | 40 | 39 | 32 |





MD 200 Diversion Alternative: *Traffic Details*

- **Density and Level of Service (LOS)**
 - Highest number of lane miles operating at LOS F
 - Highest percentage of failing lane-miles amongst build screened alternatives

| Average | Existing | 2040 No Build | 2040 Alt 5 | 2040 Alt 8 | 2040 Alt 9 | 2040 Alt 10 | 2040 Alt 13B | 2040 Alt 13C | 2040 Diversion |
|--------------------------|----------|------------------|---------------|---------------|---------------|----------------|-----------------|-----------------|-------------------|
| % Lane miles of LOS F | 30% | 41% | 20% | 14% | 12% | 14% | 13% | 15% | 21% |





MD 200 Diversion Alternative: *Traffic Details*

- Travel time index (TTI)
 - Average TTI on GP lanes is second worst of the build screened alternatives
 - Two segments of Inner Loop projected to have TTI values that exceed 2.0 during PM peak - considered “severe” congestion

| | Existing | 2040 No Build | 2040 Alt 5 | 2040 Alt 8 | 2040 Alt 9 | 2040 Alt 10 | 2040 Alt 13B | 2040 Alt 13C | 2040 Div Alt |
|---------------------|----------|------------------|---------------|---------------|---------------|----------------|-----------------|-----------------|-----------------|
| Overall Average TTI | 1.78 | 2.28 | 1.69 | 1.54 | 1.40 | 1.36 | 1.46 | 1.44 | 1.61 |



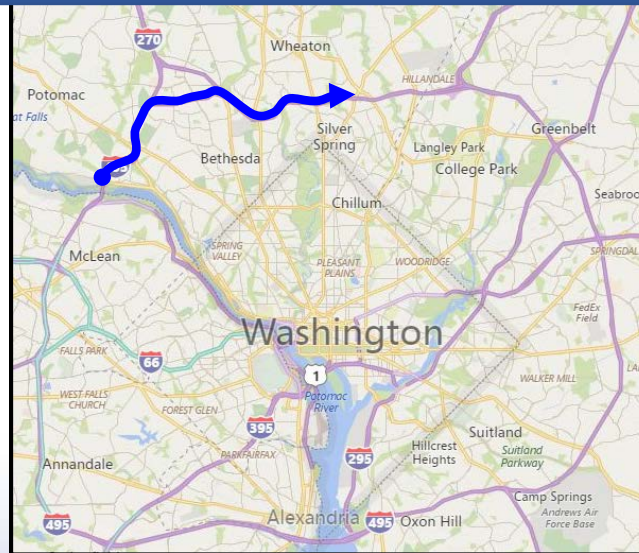


MD 200 (ICC) Diversion Alternative: *Traffic Results*

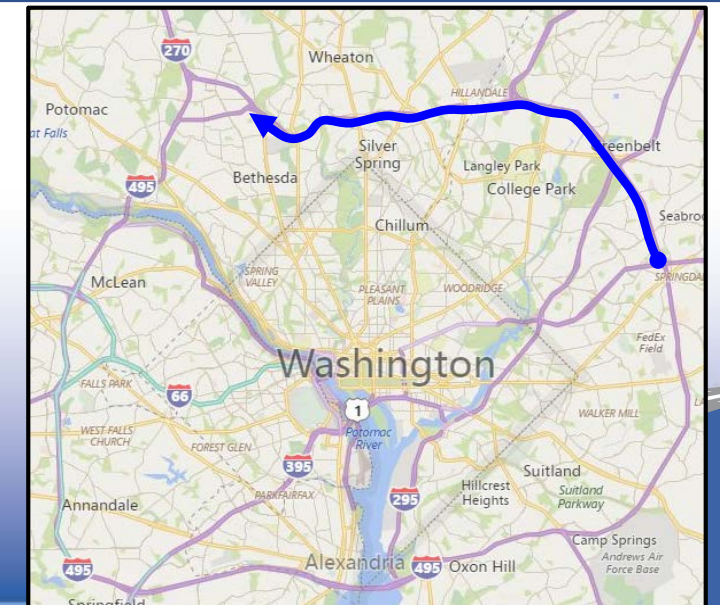
- How would MD 200 Diversion Alternative affect travel in other areas of I-495?

Increases commute times significantly compared to ARDS

Clara Barton Parkway to US 29 – 57 minutes vs. 28 minutes



US 50 to MD 355 – 54 minutes vs. 20 minutes (worse than No Build)

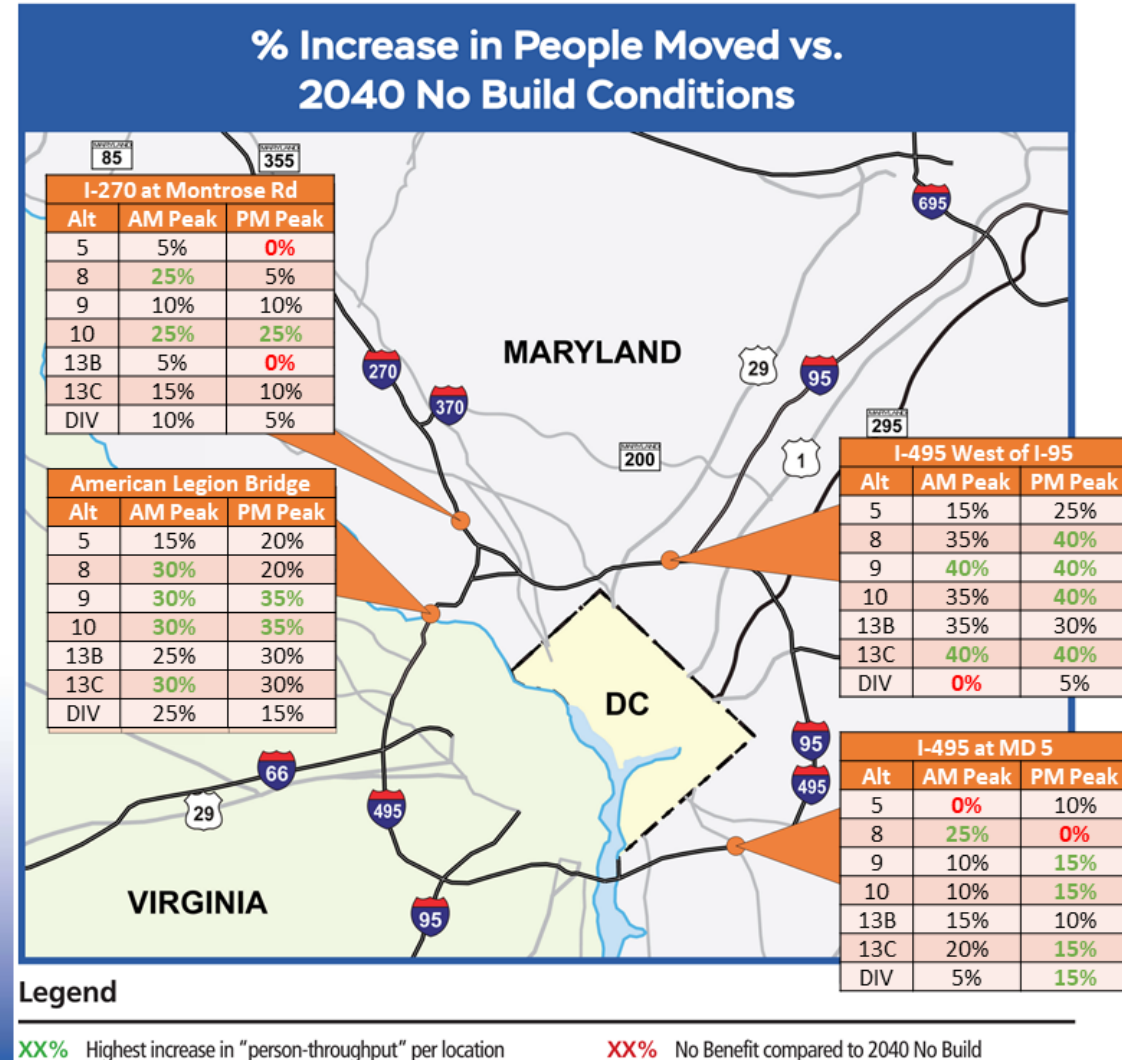




MD 200 (ICC) Diversion Alternative: *Traffic Results*

■ Person throughput

- Top side of I-495 – similar to No Build due to capacity constraints
- Less benefit than other build alternatives in managed lane sections
- Across American Legion Bridge in PM – only 15% increase compared to 35%, despite identical footprint
- Overall, similar average throughput to Alternative 5





MD 200 (ICC) Diversion Alternative: *Traffic Results*

- Effect on local roadway network
 - *Reduction of north-south arterial delay* due to proposed widening along I-95, particularly in Prince George's County

| Alternatives | Description | Total Vehicle-Hours Daily Delay Local Roads | % Decrease Daily Delay Local Roads |
|-------------------------|--|---|------------------------------------|
| Alternative 1 | <i>No Build</i> | 596,800 | 0% |
| Alternative 5 | <i>I-495: 1 HOT Lane I-270: 1 HOT Lane</i> | 574,900 | 3.7% |
| Alternative 8 | <i>I-495: 2 ETLs I-270: 1 ETL & 1 HOV</i> | 557,625 | 6.6% |
| Alternative 9 | <i>I-495: 2 HOT Lanes I-270: 2 HOT Lanes</i> | 554,775 | 7.0% |
| Alternative 10 | <i>I-495: 2 ETLs I-270: 2 ETLs & 1 HOV</i> | 557,900 | 6.5% |
| Alternative 13B | <i>I-495: 2 HOT Lanes I-270: 2 Reversible HOT Lanes</i> | 556,225 | 6.8% |
| Alternative 13C | <i>I-495: 2 ETLs I-270: 2 Reversible ETLs & 1 HOV</i> | 558,700 | 6.4% |
| MD 200 Diversion | <i>I-495: 2 HOT, Except I-95 to I-270 I-270: 2 HOT Lanes I-95: 2 HOT Lanes, ICC to I-495</i> | 555,675 | 6.9%** |

* Includes All Arterials in Montgomery County, Prince George's County, and Washington, D.C.

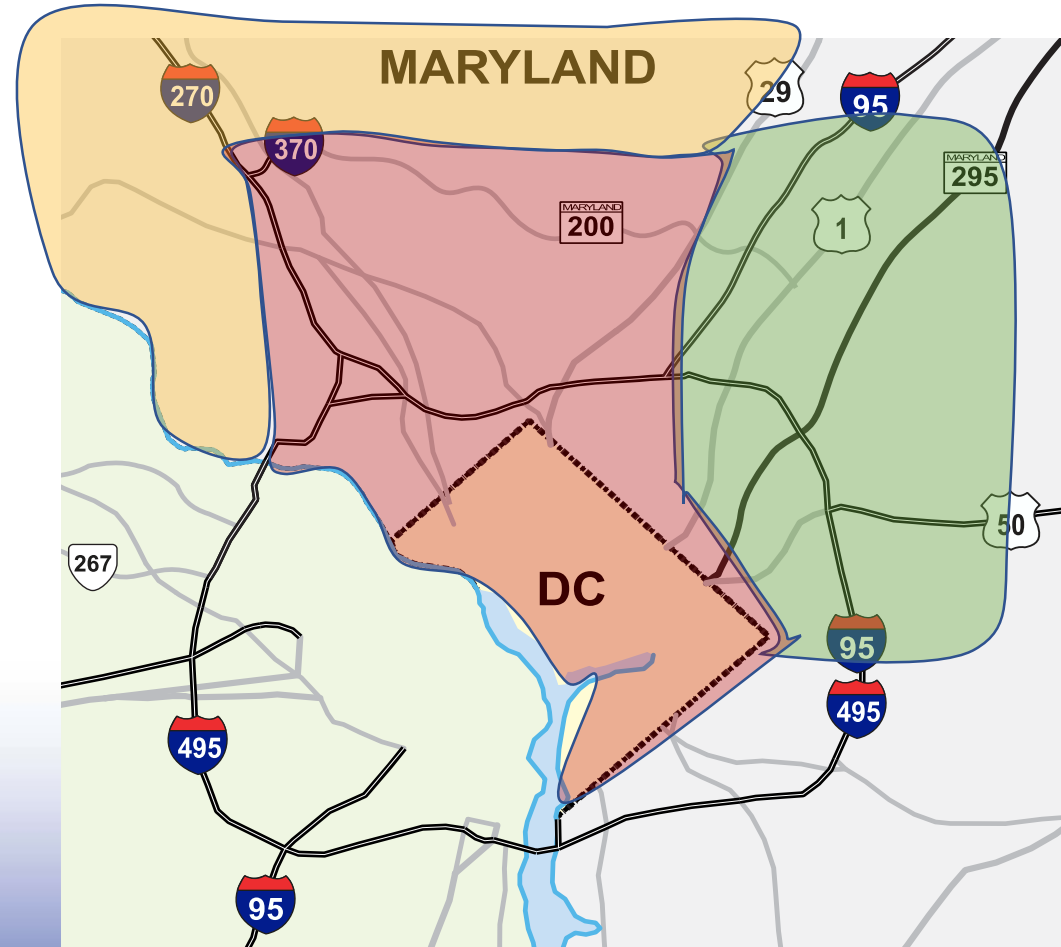
** Drops to 4.9% without proposed I-95 managed lanes





MD 200 (ICC) Diversion Alternative: *Traffic Results*

- How would MD 200 Diversion Alternative affect travel on local roads?
 - *Reduced benefit on east-west arterials* in Montgomery County and the District of Columbia
 - *Washington DC:* Over 6,500 more vehicle-hours of delay vs. the Alternatives Retained for Detailed Study (ARDS)





MD 200 (ICC) Diversion Alternative: *Traffic Results*

■ *Latent demand*

- Latent demand trips are not new trips or “induced travel” but are trips that would otherwise happen on other routes or at other times
- They could be accommodated on highway during peak hour with new capacity
- Serves *only 19%* of latent demand *compared to 26-44%* served by other build alternatives
- Net result of new capacity to accommodate latent demand – shortened duration of “rush hour” conditions and traffic diverted off surrounding local roads

■ *Annual average hours of savings per commuter*

- Would save approximately *19 hours*
- Compared to Alternatives 9 and 10 that would save commuters *73 and 72 hours*, respectively

| | Alternative 1 No Build | Alternative 5 | Alternative 8 | Alternative 9 | Alternative 10 | Alternative 13B | Alternative 13C | MD 200 Diversion |
|--|---------------------------|---------------|---------------|---------------|----------------|-----------------|-----------------|---------------------|
| Annual Average Hours of Savings per Commuter | 0 | 45 | 59 | 73 | 72 | 65 | 64 | 19 |



MD 200 (ICC) Diversion Alternative: *Traffic Results*

- Why is Diversion Alternative insufficient as a long-term solution?
 - Does not address worst-performing segments in Maryland
 - MD 200 cannot sufficiently accommodate excess demand





MD 200 (ICC) Diversion Alternative: *Fails to Address Worst Performing Highway Sections*



AM Most Congested Freeway Sections

- ★ Outer Loop from I-95 to US 29

PM Most Congested Freeway Sections

- ★ Inner Loop from East Spur to MD 97

AM Most Unreliable Freeway Segments (based on Planning Time Index)

- ◇ 1 Outer Loop @ MD 650
- ◇ 2 Outer Loop from MD 650 to MD 193
- ◇ 3 Outer Loop from I-95 to Prince George's County Line

Source: 2018 Maryland State Highway Mobility Report





MD 200 (ICC) Diversion Alternative: *MD 200 Projected Capabilities*

- ICC was designed to accommodate 2030 traffic
- Traffic growth is on pace with projections
 - Some sections expected to reach capacity in 2027
 - Remaining sections expected to reach capacity by 2040
- Consequently, limited capacity on MD 200 to accommodate traffic diverting from I-495 in 2040





MD 200 (ICC) Diversion Alternative: *Environmental Results*

- General **decrease** in environmental and property impacts; but new impacts along I-95
- **Park Properties**
 - 12 park properties avoided including Rock Creek SVP, Sligo Creek Park/Parkway, Northwest Branch SVP
 - Not total avoidance because 35 other parks still impacted
- **Reduces Impacts**
 - 1 acre less of wetland impacts
 - 30,000 linear feet less stream
 - 250 acres less forest impact
- **New Impacts**
 - 42 linear feet of new impact to Paint Branch
 - 153 acres more of Sensitive Species Review Area along I-95





MD 200 (ICC) Diversion Alternative: *Conclusion*

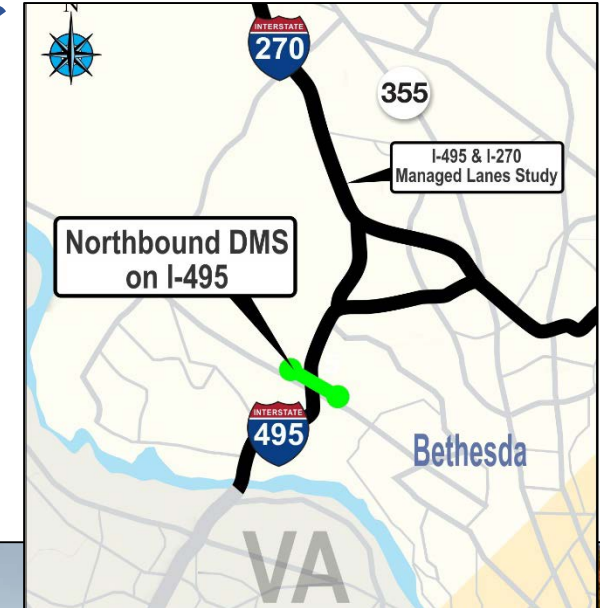
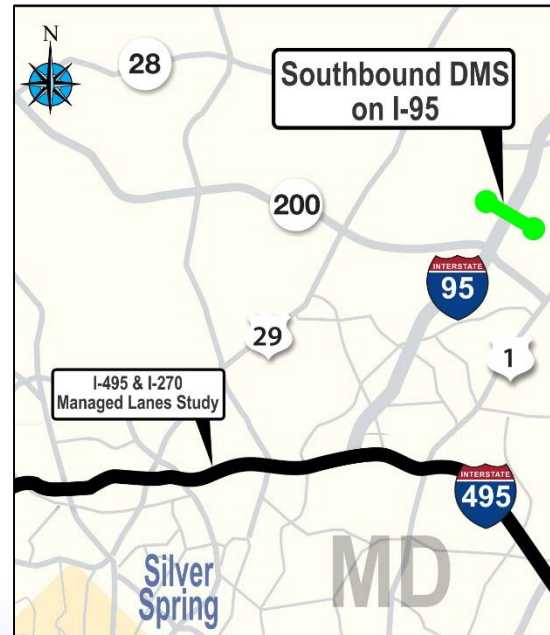
- Performed *extensive analyses over 3 months* using multiple engineering teams to determine reasonableness
- *Does not meet* Purpose and Need
- Performs *worse than all build screened alternatives* in most metrics
- *Not considered a reasonable alternative* to be retained for analysis in DEIS
- In the near term, to communicate options to travelers, MDOT SHA and MDTA are coordinating implementation of DMS messaging





MD 200 (ICC) Diversion Alternative: *MD 200 Existing Capabilities*

- Use existing dynamic message signs (DMS) to communicate options for travelers to/from Virginia
 - Existing DMS on SB I-95 north of ICC
 - Existing DMS on I-495 Inner Loop north of River Road





Avoidance and Minimization of Environmental Impacts

- Further evaluation of ARDS, direct access locations and additional coordination with regulatory agencies, has resulted in **refinement of LOD**
- Continued avoidance and minimization measures have included:
 - Retaining walls
 - Modifying direct access locations
 - Modifying ramp design
 - Slight alignment shifts
 - Underground stormwater facilities
- Overall reduction in impacts from April include:
 - 25 acres less in right-of-way
 - 20 acres less in Section 4(f) properties
 - 4 acres less in wetlands
 - 10 acres less in floodplains



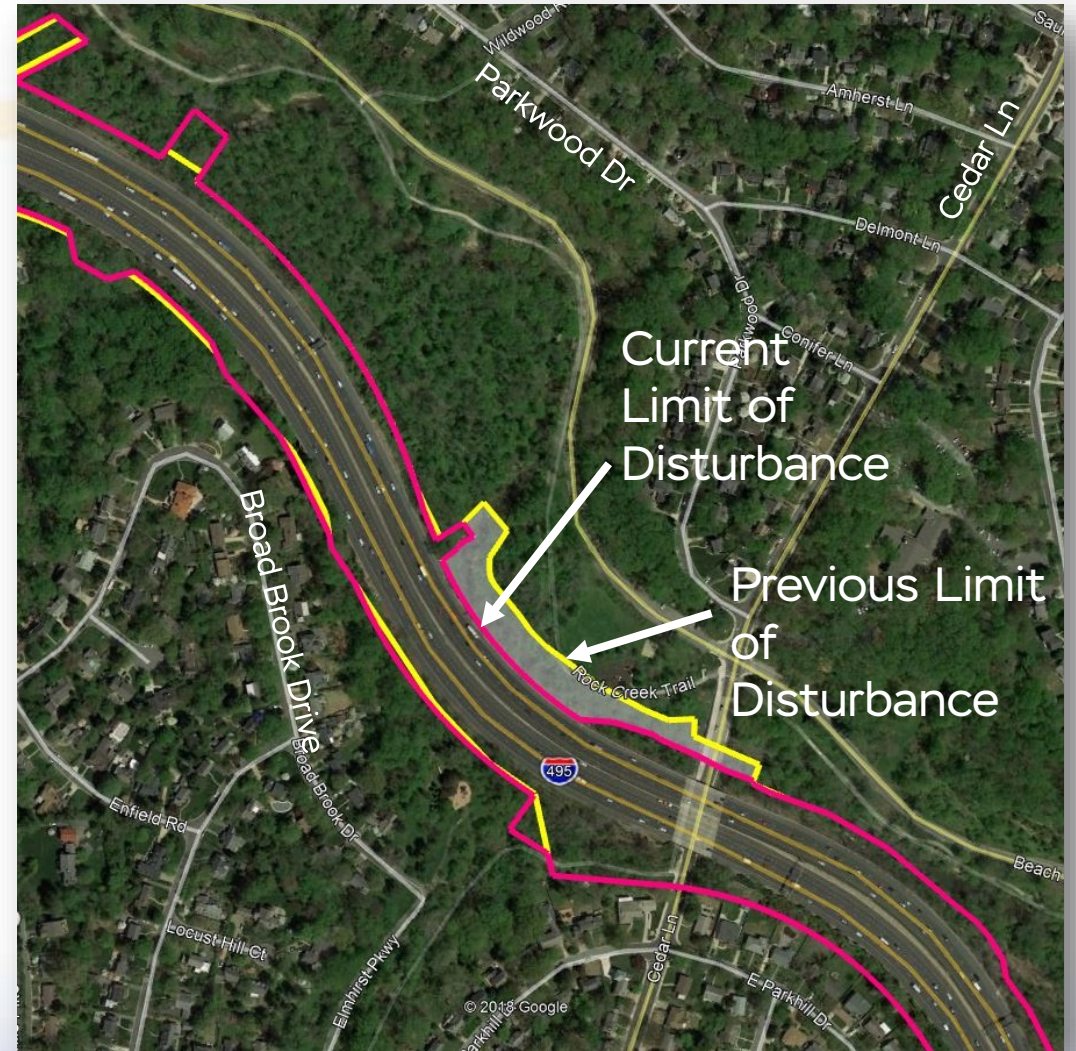
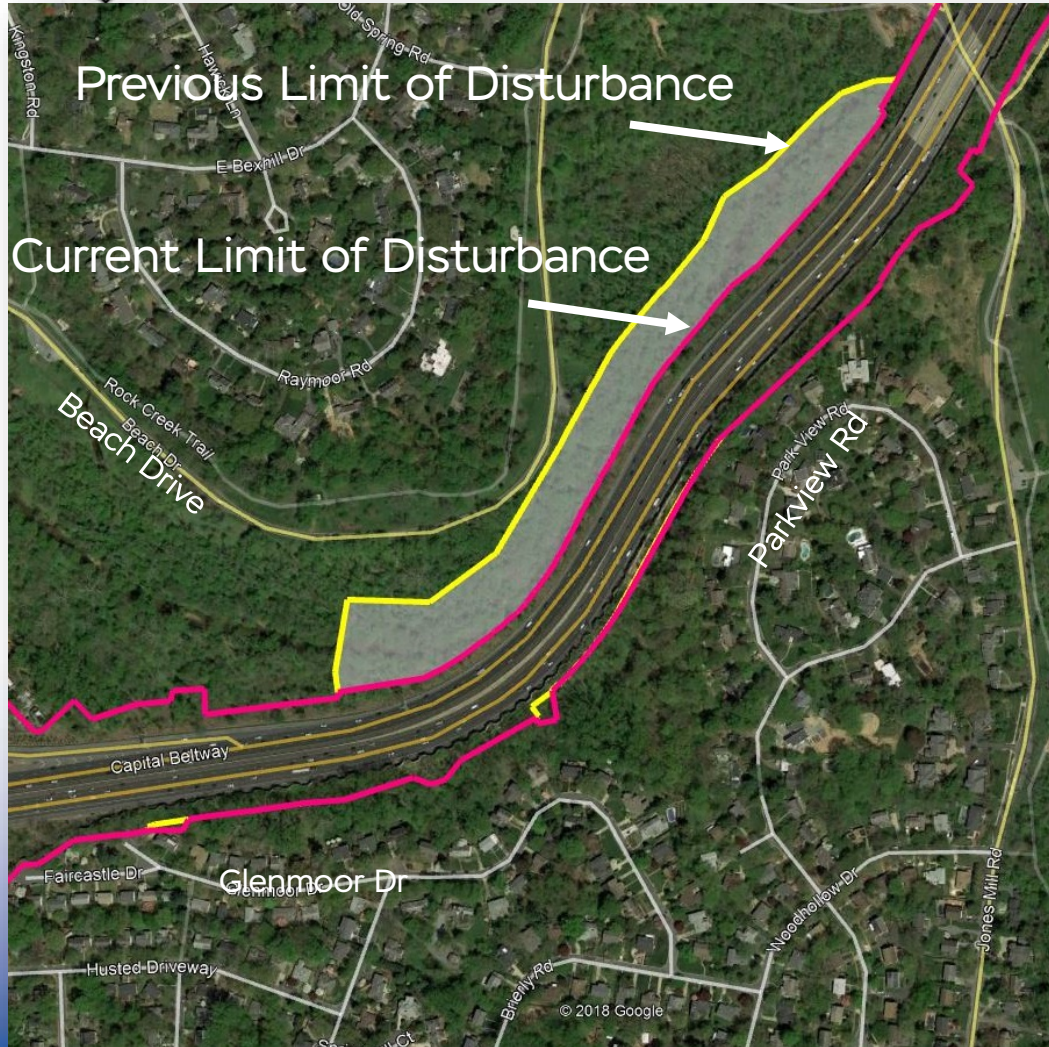


Avoidance and Minimization of Impacts: *Stream Valley Parks*

- Rock Creek Stream Valley Park
 - Slight shift of I-495 toward Inner Loop
 - Retaining walls along both directions
 - Avoidance of relocation of Rock Creek

| Resource | Estimated Reduction |
|-----------------|-----------------------------------|
| Rock Creek Park | 10.8 acres (74% reduction) |
| Wetlands | 0.5 acre (45% reduction) |
| Rock Creek | 3,288 linear feet (88% reduction) |







Avoidance and Minimization of Impacts: *Stream Valley Parks*

- Sligo Creek SVP and Northwest Branch SVP
 - Retaining walls along both directions
 - Avoided more sensitive resources on north side at Northwest Branch SVP
 - Bridge will need to be replaced within 10 years,

| Resource | Total Impacts | Estimated Temporary Impacts | Estimated Permanent Impacts |
|----------------------|---------------|-----------------------------|-----------------------------|
| Sligo Creek SVP | 3.2 acres | 0.6 acre | 2.6 acres |
| Northwest Branch SVP | 3.2 acres | 2.9 acres | 0.3 acre |





MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION





Avoidance and Minimization of Impacts: *M-NCPPC Parkland*

- Working with interdisciplinary team including SWM, natural, and cultural staff; M-NCPPC staff; and regulatory staff to develop avoidance and minimization measures
- Reduction of initial impacts to M-NCPPC Montgomery and Prince George's parkland from 39 acres in May 2019 to 27 acres in September 2019 (12 acre reduction)
- Minimization efforts are continuing in coordination with M-NCPPC staff
- Mitigation for unavoidable impacts will be identified at conceptual level in DEIS and finalized in FEIS/Record of Decision (ROD)





In Summary...

- Alternatives Retained for Detailed Study (ARDS)
 - Five build HOT or ETL alternatives and No Build being carried forward for detailed study in DEIS
- Common Elements of ARDS:
 - Continuing to examine transit/ped/bike opportunities to encourage and support non-SOV travel
 - Providing direct access to encourage and support transit use, approved land use, and major travel demand in consideration of social equity
 - Providing much needed congestion relief at American Legion Bridge
- Conducted thorough analysis of MD 200 (ICC) Diversion Alternative to determine reasonableness to carry forward into DEIS
- Incorporated park minimization options to significantly reduce impacts to M-NCPPEC parkland





Next Steps

- ✓ Continue developing avoidance and minimization measures
- ✓ Identify mitigation for unavoidable impacts
- ✓ Develop DEIS and Section 4(f) Evaluation
- ✓ Identify recommended preferred alternative and seek concurrence from cooperating agencies
- ✓ Publish DEIS/Section 4(f) Evaluation spring 2020
- ✓ Hold series of public hearings spring 2020





Questions

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Jeff Folden, Deputy Director

