

## **ITEM 15 – Notice**

April 19, 2017

Notice of Proposed Amendment to the  
2016 Constrained Long Range Plan (CLRP), As Requested  
by the Maryland Department of Transportation (MDOT)

### **Staff**

**Recommendation:** Review proposed project submission as an amendment to the 2016 CLRP

**Issues:** None

**Background:** As described in the attached materials, MDOT has requested an additional amendment to the 2016 CLRP to include the construction and implementation of the I-270 Innovative Congestion Management project between I-70 and I-495. An amendment to include this project in the Plan requires an air quality conformity analysis and this analysis can occur as part of the off-cycle conformity analysis as identified in Item 9. Following a public comment period which ends on May 13, 2017, the Board will be asked to approve this project submission at the May 17, 2017 meeting. The draft conformity results for all of the projects are scheduled to be released for public comment on September 14, 2017 and the TPB is scheduled to adopt the entire plan amendment and conformity analysis at its October 18, 2017 meeting.





## **MEMORANDUM**

**TO:** Transportation Planning Board  
**FROM:** Lyn Erickson, TPB Plan Coordination and Program Director  
**SUBJECT:** Proposed Additional Amendment to the 2016 Constrained Long-Range Transportation Plan (CLRP)  
**DATE:** April 13, 2017

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The Maryland Department of Transportation (MDOT) has requested that the CLRP be amended to include the construction and implementation of the I-270 Innovative Congestion Management Project between I-70 and I-495. The project had previously been included as a study, as part of a larger study for the I-270/I-495 West Side Corridor being conducted by MDOT. The scope and scale of the project have now been finalized along with a timeline for implementation and construction. This project was not included in the Air Quality Conformity Analysis of the 2016 CLRP Amendment, and TPB staff have determined that this project needs to be included in an updated conformity determination prior to moving forward.

In the attached letter of April 12, 2017, MDOT has proposed that this project be included in the upcoming off-cycle conformity analysis being conducted to include updates to the I-66 Outside the Beltway project and a new off-ramp from the northbound I-95 HOT lanes in Virginia, and the advancement of the Governor Harry W. Nice Bridge Improvement project in Maryland. There is no change proposed to the Scope of Work for the off-cycle conformity analysis. TPB staff agree that this proposal can be accommodated.

### **OPPORTUNITY FOR PUBLIC COMMENT**

All projects included in a conformity determination are subject to public review. On April 13, 2017, the TPB released this project information for a 30-day public comment period which will conclude at 11:59 P.M. on Saturday, May 13. The attached materials contain the project information. Comments may be submitted:

- Online at [www.mwcog.org/TPBcomment](http://www.mwcog.org/TPBcomment)
- Via email at [TPBcomment@mwcog.org](mailto:TPBcomment@mwcog.org)
- By calling (202) 962-3262, TDD: (202) 962-3213
- Or in writing to: The Transportation Planning Board  
777 North Capitol Street, NE, Suite 300  
Washington, DC 20002-4239

The TPB will be asked to approve the project for inclusion in the off-cycle Air Quality Conformity Analysis of the CLRP at the May 17 meeting. A second comment period will be held in September 2017 after the results of the Air Quality Conformity Analysis have been finalized. The TPB will be asked to approve the amendments on October 18, 2017.





**Maryland Department of Transportation**  
The Secretary's Office

**Larry Hogan**  
Governor

**Boyd K. Rutherford**  
Lt. Governor

**Pete K. Rahn**  
Secretary

April 12, 2017

The Honorable Bridget Donnell Newton, Chair  
National Capital Region Transportation Planning Board  
Metropolitan Washington Council of Governments  
777 North Capitol Street, N.E., Suite 300  
Washington DC 20002

Dear Chairman Newton:

The Maryland Department of Transportation (MDOT) is requesting an amendment to the National Capital Region Transportation Planning Board's (TPB) 2016 Constrained Long Range Plan (CLRP), which will require an air quality conformity analysis, to include construction of the I-270 Innovative Congestion Management Project.

The I-270 Innovative Congestion Management Project (CLRP #3564) proposes an automated smart traffic system which includes roadway improvements and innovative technologies that will maximize vehicular throughput, minimize vehicle travel times, and create a more predictable commute along I-270 between I-495 and I-70. This project already is included in the current 2016 CLRP as a part of a study for the I-270/I-495 West Side Corridor (CLRP #3281). The state funds for this project are included in the approved FY 2017-2022 Transportation Improvement Program (TIP). The project is now ready for implementation and the scope and scale of the project has been finalized. This amendment will add this project to the CLRP for construction and advance the completion date to 2019.

The proposed amendment to add the I-270 Innovative Congestion Management Project as a new CLRP project (CLRP #3564) reflects the following project elements:

- Fourteen roadway improvements (detailed in the attached CLRP form) that will increase capacity and vehicle throughput and address safety deficiencies by strategically eliminating existing bottlenecks.
- Innovative technologies and techniques, comprised of adaptive ramp metering, active traffic management and virtual weigh stations. These three technologies and techniques constitute an automated smart traffic flow management system that combines real-time communication to drivers, traffic monitoring with cameras and sensors, and intelligent signal systems.
- The limits of this project are from I-495 to I-70 including the east and west spurs of I-270.

My telephone number is \_\_\_\_\_  
Toll Free Number 1-888-713-1414 TTY Users Call Via MD Relay  
7201 Corporate Center Drive, Hanover, Maryland 21076

The Honorable Bridget Donnell Newton  
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The proposed amendment has been determined to be regionally significant for air quality conformity purposes per the TPB's process of applying federal air quality conformity regulations in conducting regional air quality conformity analyses for the CLRP and the TIP. Since this project is estimated to be completed in 2019, MDOT is requesting an off-cycle conformity analysis to meet requirements necessary to meet the construction timeline. MDOT requests that this amendment be included in the off-cycle air quality conformity analysis that is soon to be underway.

The MDOT agrees to partially reimburse the TPB for the costs incurred in processing this CLRP amendment including those costs for revising the regional air quality conformity analyses under MDOT's Technical Assistance portion of the approved FY 2018 Unified Planning Work Program (UPWP).

We appreciate your cooperation in this matter. Should you have additional questions or concerns, please contact Ms. Kari Snyder, MDOT Office of Planning and Capital Programming (OPCP) Regional Planner at 410-865-1305, toll free 888-713-1414, or via e-mail at [ksnyder3@mdot.state.md.us](mailto:ksnyder3@mdot.state.md.us). Ms. Snyder will be happy to assist you.

Sincerely,



Heather Murphy *for*  
Director  
Office of Planning and Capital Programming

cc: Ms. Kari Snyder, Regional Planner, OPCP, MDOT

# FINANCIALLY CONSTRAINED LONG-RANGE TRANSPORTATION PLAN FOR 2040 PROJECT DESCRIPTION FORM



## **BASIC PROJECT INFORMATION**

1. Submitting Agency: **MDOT/State Highway Administration**
2. Secondary Agency:
3. Agency Project ID:
4. Project Type:  Interstate  Primary  Secondary  Urban  Bridge  Bike/Ped  Transit  CMAQ  
 ITS  Enhancement  Other  Federal Lands Highways Program  
 Human Service Transportation Coordination  TERMS
5. Category:  System Expansion;  System Maintenance;  Operational Program;  Study;  Other
6. Project Name: I-270 Innovative Congestion Management

	Prefix	Route	Name	Modifier
7. Facility:	<b>I</b>	<b>270</b>		<b>/I-270Y</b>
8. From ( <input type="checkbox"/> at):	<b>I</b>	<b>70</b>		
9. To:	<b>I</b>	<b>495</b>		

10. Description: The I-270 Innovative Congestion Management Project proposes a two-pronged approach of roadway improvements and innovative technologies and techniques to maximize vehicular throughput, minimize vehicle travel times, and create a more predictable commuter trip along I-270 between I-70 and I-495. While the components address both recurring and nonrecurring congestion, the roadway improvements focus on relieving today's recurring congestion, and the innovative technologies and techniques focus on managing today's recurring and non-recurring congestion and extending the lifespan of the roadway improvements into the future.

- 14 roadway improvements (detailed below) will increase capacity and vehicle throughput and address safety deficiencies by strategically eliminating existing bottlenecks, the key element limiting vehicular throughput along the corridor, coupled with the impact of crashes and other incidents. The strategy takes a "right-sized", practical design approach focused on minimizing impacts to maximize the improvements that can be provided throughout the corridor.
- Innovative technologies and techniques, comprised of adaptive ramp metering, active traffic management (ATM), and virtual weigh stations, that will work as a system to reduce congestion by improving traffic flow and safety. These three technologies and techniques constitute an automated smart traffic flow management system that combines real-time communication to drivers, traffic monitoring with cameras and sensors, and intelligent signal systems.

Implementing this approach will provide I-270 motorists with significant congestion relief and maximize the available budget. The approach addresses recurring congestion by reducing the severity and duration of peak periods, as well as non-recurring congestion by improving safety and providing demand management tools that can help to reduce incident impacts on travel times. As a result, travel time reliability will be improved throughout the corridor.

See attachment for further project details.

# CLRP PROJECT DESCRIPTION FORM

11. Projected Completion Year: **2019**
12. Project Manager:
13. Project Manager E-Mail:
14. Project Information URL:
15. Total Miles:
16. Schematic (file upload): **See attachment**
17. State/Local Project Standing (file upload):
18. Jurisdictions: **Montgomery County, Frederick County, City of Rockville**
19. Baseline Cost (in Thousands): **\$105,000** cost estimate as of **12/1/2016**
20. Amended Cost (in Thousands): cost estimate as of
21. Funding Sources:  Federal;  State;  Local;  Private;  Bonds;  Other

**Regional Policy Framework:** Questions 22-27 address the goals identified in the Regional Transportation Priorities Plan. Question 28 should be used to provide additional context of how this project supports these goals or other regional needs identified in the Call for Projects.

## 22. Provide a Comprehensive Range of Transportation Options

Please identify all travel mode options that this project provides, enhances, supports, or promotes.

- |   |  |   |   |
|---|--|---|---|
| <input checked="" type="checkbox"/> Single Driver | <input checked="" type="checkbox"/> Carpool/HOV          |   |   |
| <input type="checkbox"/> Metrorail                | <input type="checkbox"/> Commuter Rail                   | <input type="checkbox"/> Streetcar/Light Rail |   |
| <input type="checkbox"/> BRT                      | <input checked="" type="checkbox"/> Express/Commuter bus | <input checked="" type="checkbox"/> Metrobus  | <input checked="" type="checkbox"/> Local Bus |
| <input type="checkbox"/> Bicycling                | <input type="checkbox"/> Walking                         | <input type="checkbox"/> Other                |   |

Does this project improve accessibility for historically transportation-disadvantaged individuals (i.e., persons with disabilities, low-incomes, and/or limited English proficiency?)

## 23. Promote Regional Activity Centers

- Does this project begin or end in an Activity Center?
- Does this project connect two or more Activity Centers?
- Does this project promote non-auto travel within one or more Activity Centers?

## 24. Ensure System Maintenance, Preservation, and Safety

- Does this project contribute to enhanced system maintenance, preservation, or safety?

## 25. Maximize Operational Effectiveness and Safety

- Project is primarily designed to reduce travel time on highways and/or transit without building new capacity (e.g., ITS, bus priority treatments, etc.)?
- Does this project enhance safety for motorists, transit users, pedestrians, and/or bicyclists?

## 26. Protect and Enhance the Natural Environment

- Is this project expected to contribute to reductions in emissions of criteria pollutants?
- Is this project expected to contribute to reductions in emissions of greenhouse gases?

## 27. Support Interregional and International Travel and Commerce

Please identify all freight carrier modes that this project enhances, supports, or promotes.

- Long-Haul Truck  Local Delivery  Rail  Air

Please identify all passenger carrier modes that this project enhances, supports, or promotes.

- Air  Amtrak intercity passenger rail  Intercity bus

## 28. Additional Policy Framework Response

Please provide additional written information that describes how this project further supports or advances these and other regional goals or needs.



# CLRP PROJECT DESCRIPTION FORM

## MAP-21 PLANNING FACTORS

29. Please identify any and all planning factors that are addressed by this project:
- Support the **economic vitality** of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
  - Increase the **safety** of the transportation system for all motorized and non-motorized users.
    - Is this project being proposed specifically to address a safety issue?  Yes;  No
    - If yes, briefly describe (in quantifiable terms, where possible) the nature of the safety problem:
  - Increase the ability of the transportation system to support **homeland security** and to safeguard the personal security of all motorized and non-motorized users.
  - Increase **accessibility and mobility** of people.
  - Increase accessibility and mobility of **freight**.
  - Protect and enhance the **environment**, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
  - Enhance the **integration and connectivity** of the transportation system, across and between modes, for people and freight.
  - Promote efficient system **management and operation**.
  - Emphasize the **preservation** of the existing transportation system.

## ENVIRONMENTAL MITIGATION

30. Have any potential mitigation activities been identified for this project?  Yes;  No
- If yes, what types of mitigation activities have been identified?  
 Air Quality;  Floodplains;  Socioeconomics;  Geology, Soils and Groundwater;  Vibrations;  
 Energy;  Noise;  Surface Water;  Hazardous and Contaminated Materials;  Wetlands

## CONGESTION MANAGEMENT INFORMATION

31. Congested Conditions
- Do traffic congestion conditions necessitate the proposed project or program?  Yes;  No
  - If so, is the congestion recurring or non-recurring?  Recurring;  Non-recurring
  - If the congestion is on another facility, please identify it:
32. Capacity
- Is this a capacity-increasing project on a limited access highway or other principal arterial?  Yes;  No
  - If the answer to Question 32.a was "yes", are any of the following exemption criteria true about the project? (Choose one, or indicate that none of the exemption criteria apply):  
 None of the exemption criteria apply to this project – a Congestion Management Documentation Form is required  
 The project will not use federal funds in any phase of development or construction (100% state, local, and/or private funding)  
 The number of lane-miles added to the highway system by the project totals less than one lane-mile  
 The project is an intersection reconstruction or other traffic engineering improvement, including replacement of an at-grade intersection with an interchange  
 The project, such as a transit, bicycle or pedestrian facility, will not allow private single-occupant motor vehicles  
 The project consists of preliminary studies or engineering only, and is not funded for construction  
 The construction costs for the project are less than \$10 million.
  - If the project is not exempt and requires a Congestion Management Documentation Form, click here to open a blank Congestion Management Documentation Form.

# CLRP PROJECT DESCRIPTION FORM

## RECORD MANAGEMENT

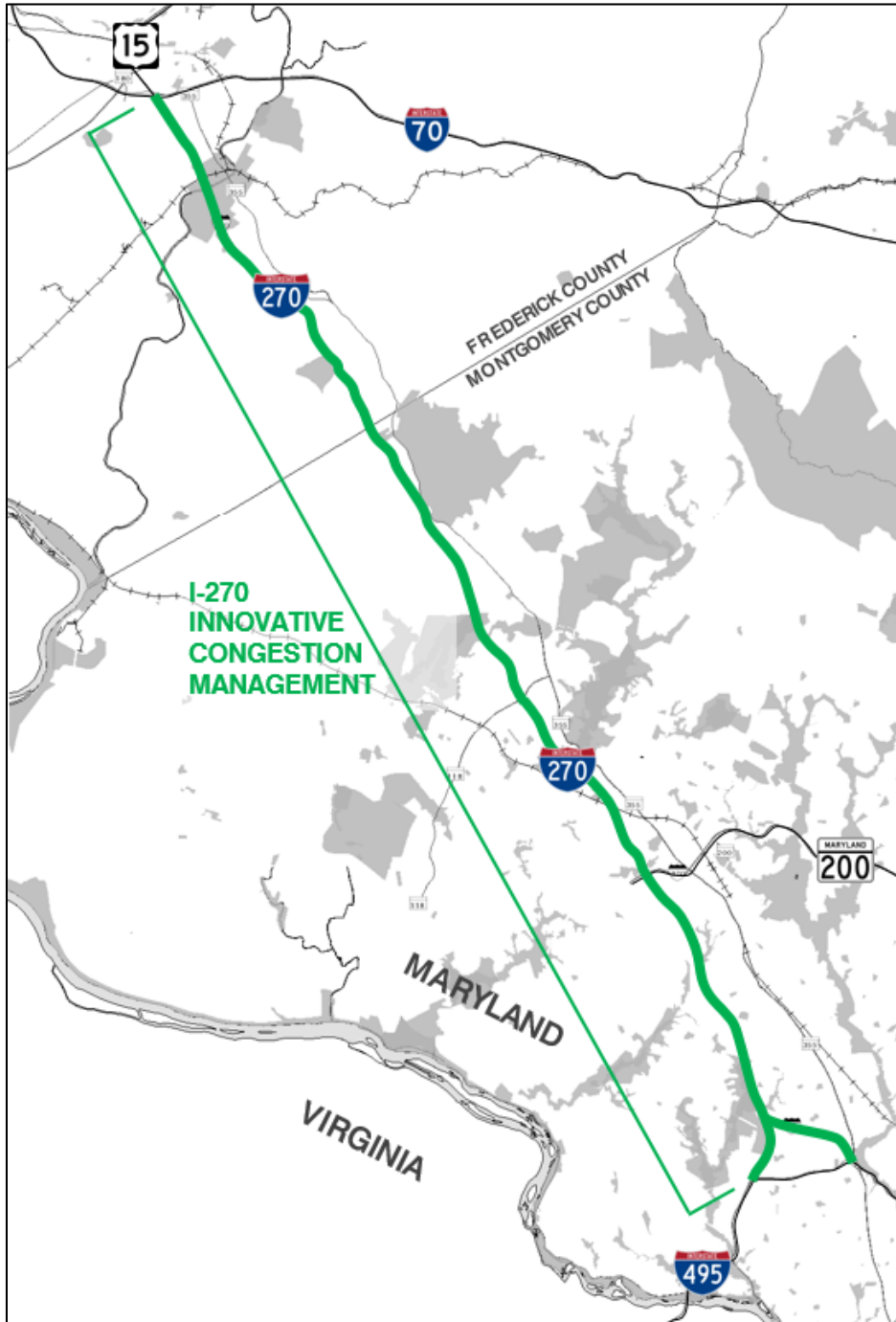
- 33. Completed Year:
- 34.  Project is being withdrawn from the CLRP
- 35. Withdrawn Date:
- 36. Record Creator: **Matt Baker**
- 37. Created On: **4/11/2017**
- 38. Last Updated by: **Matt Baker**
- 39. Last Updated On: **4/12/2017**
- 40. Comments:

# Maryland Department of Transportation

State Highway Administration

I-270 Innovative Congestion Management

The I-270 Innovative Congestion Management Project proposes a two-pronged approach of roadway improvements and innovative technologies and techniques to maximize vehicular throughput, minimize vehicle travel times, and create a more predictable commuter trip along I-270 between I-70 and I-495. While the components address both recurring and nonrecurring congestion, the roadway improvements focus on relieving today's recurring congestion, and the innovative technologies and techniques focus on managing today's recurring and non-recurring congestion and extending the lifespan of the roadway improvements into the future.



- 14 roadway improvements (detailed below) will increase capacity and vehicle throughput and address safety deficiencies by strategically eliminating existing bottlenecks, the key element limiting vehicular throughput along the corridor, coupled with the impact of crashes and other incidents. The strategy takes a “right-sized”, practical design approach focused on minimizing impacts to maximize the improvements that can be provided throughout the corridor.
- Innovative technologies and techniques, comprised of adaptive ramp metering, active traffic management (ATM), and virtual weigh stations, that will work as a system to reduce congestion by improving traffic flow and safety. These three technologies and techniques constitute an automated smart traffic flow management system that combines real-time communication to drivers, traffic monitoring with cameras and sensors, and intelligent signal systems.

Implementing this approach will provide I-270 motorists with significant congestion relief and maximize the available budget. The approach addresses recurring congestion by reducing the severity and duration of peak periods, as well as non-recurring congestion by improving safety and providing demand management tools that can help to reduce incident impacts on travel times. As a result, travel time reliability will be improved throughout the corridor.

The following table provides descriptions of the proposed program of roadway improvements:

Improvement	Description
Southbound (SB) 1	<p><b>Extend acceleration and deceleration lanes at MD 80:</b> This improvement consists of two distinct components: extending the length of the deceleration lane for the exit to MD 80 and extending the length of the acceleration lane for the entrance from MD 80. The existing merge location at the MD 80 entrance ramps is an identified bottleneck during the AM peak period. Under this concept, a longer distance for entering traffic to merge is provided. The deceleration lane from southbound I-270 to MD 80 is identified as a frequent crash area. By extending the length of the deceleration lane, vehicles are provided a longer, safer distance to reduce their speeds.</p>
SB 2	<p><b>Extend acceleration lane at MD 109:</b> This improvement involves extending the length of the acceleration lane for the entrance from MD 109 to southbound I-270. The existing acceleration length does not meet AASHTO design guidelines and the reduced speed of entering traffic from MD 109 at the merge with high speed traffic on I-270 contributes to congestion during the AM peak period. This concept provides a longer distance for entering traffic to accelerate and merge.</p>
SB 5A	<p><b>Reconfigure exit lanes to I-370:</b> This improvement involves restriping southbound I-270 approaching the exit to I-370 so the outside lane becomes the right lane on the two-lane exit ramp to I-370. The interior lane next to the right lane on I-270 will become a choice lane for vehicles to exit on the ramp to I-370 or continue south on I-270. In the existing configuration where no choice lane is provided, vehicles in the right lane reduce speed approaching the exit ramp and contribute to congestion on this section of I-270. This concept eliminates the need to develop a deceleration lane for the exit to I-370 and vehicles will not need to slow down on I-270 approaching the exit.</p>
SB 6	<p><b>Create auxiliary lane in local lanes south of Shady Grove Road:</b> This improvement involves creating a third local lane by providing an auxiliary lane between the slip ramps south of Shady Grove Road. The entrance slip ramp from the express lanes will be connected to the first exit slip ramp to the express lanes. AM peak period traffic volumes in the local lanes approach capacity of the existing two lane section, resulting in recurring congestion. Under this concept the auxiliary lane will provide additional capacity at this bottleneck.</p>

Improvement	Description
SB 7	<p><b>Create auxiliary lane in local lanes between MD 28 and MD 189:</b>  This improvement involves creating an auxiliary (third) lane in the local lanes by connecting the entrance from MD 28 to the exit to MD 189. AM peak period traffic volumes in the local lanes approach capacity of the existing two lane section, resulting in recurring congestion. Under this concept, the auxiliary lane will provide additional capacity between the two interchanges.</p>
SB 10	<p><b>Maintain three lanes from I-270 and drop right lane on I-495 at I-270/I-495 merge:</b> This improvement involves restriping the I-495 outer loop at the merge with the southbound I-270 west spur. Instead of dropping the inside (left) lane from the I-270 spur, the three lanes from I-270 would continue on I-495 and the right lane on I-495 would drop to maintain five lanes. During the AM peak period, recurring congestion at the I-270/I-495 merge results in queues that spill back onto the I-270 west spur. This improvement maintains capacity in three continuous lanes on the I-270 spur, the heavier traffic movement, and provides an expected merge on the right side of the highway with minimal impacts to I-495 outer loop operations approaching the merge.</p>
SB 12	<p><b>Create additional travel lane between Montrose Road and Democracy Boulevard:</b> This improvement consists of restriping southbound I-270 to provide an additional travel lane within the existing typical section from the slip ramp entrance to the express lanes north of Montrose Road to the interchange at Democracy Boulevard on the west spur, a distance of approximately 3.1 miles. The large volume of weaving movements on the section of southbound I-270 between the express/local lane merge and the Y-split interchange results in substantial friction and reduced speeds during the AM peak period. In addition, the I-270 West Spur operates over capacity during the AM peak. Under this improvement, the added travel lane provides additional capacity on southbound I-270 and the I-270 West Spur. This concept uses performance-based practical design principles to continue to provide a right shoulder throughout the concept area.</p>
Northbound (NB) 1	<p><b>Create additional travel lane between Democracy Boulevard and Montrose Road:</b> This improvement involves restriping northbound I-270 to provide an additional travel lane within the existing typical section between the entrance from Democracy Boulevard on the I-270 West Spur to the slip ramp exit to the local lanes just north of Montrose Road, a distance of approximately 2.7 miles. Traffic volumes on this section of northbound I-270 approach capacity of the existing lanes during the PM peak period. Under this improvement, the added travel lane provides additional capacity on the west spur and on the express lanes on northbound I-270.</p>
NB 2	<p><b>Create auxiliary lane in local lanes between MD 189 and MD 28:</b>  This improvement involves creating an auxiliary (third) lane in the local lanes by connecting the entrance from MD 189 to the exit to MD 28. This concept also involves restriping the northbound express lanes within the existing typical section to create an auxiliary lane by connecting the entrance slip ramp from the local lanes south of MD 28 with the exit slip ramp to the local lanes north of MD 28. Traffic volumes approach capacity of the existing two local lanes between MD 189 and MD 28 during the PM peak period. Under this improvement, the auxiliary lane provides additional capacity between the two interchanges. On northbound I-270 within the MD 28 interchange, traffic volumes exceed capacity of the existing three general purpose express lanes during the PM peak period. This improvement provides additional capacity in this section.</p>

Improvement	Description
NB 3	<p><b>Close loop ramp from NB Shady Grove Road to NB I-270; close slip ramp to express lanes north of Shady Grove Road:</b></p> <p>This improvement involves closing the existing loop ramp from northbound Shady Grove Road to northbound I-270. Northbound Shady Grove Road will be reconfigured to provide dual left turn lanes in the median north of the existing bridge over I-270, and a new left turn spur will be constructed at the existing intersection to connect with the existing entrance ramp from southbound Shady Grove Road. The existing configuration of ramp and slip ramp entrances within the Shady Grove Road interchange contributes to considerable friction and recurring traffic congestion during the PM peak period. This improvement eliminates the friction by removing a merge point on northbound I-270. This improvement also involves closing the slip ramp exit from the local lanes on northbound I-270 to the express lanes south of the I-370 interchange. The left (third) local lane that drops at the slip ramp in the existing configuration will be extended to connect with the exit to I-370. PM peak volumes approach capacity of the existing two local lanes between the exit slip ramp and I-370 and there is a short weaving movement between the Shady Grove Road entrance ramp and the exit to the express lanes. These improvements will eliminate the weave and provide additional capacity.</p>
NB 4	<p><b>Create auxiliary lane between MD 124 and Watkins Mill Road and between Watkins Mill Road and WB Middlebrook Road:</b></p> <p>This improvement consists of two improvements: an auxiliary lane will be provided in the northbound local lanes by connecting the entrance from MD 124 to the exit at the new Watkins Mill Road interchange and an auxiliary lane will be provided along northbound I-270 by connecting the entrance from Watkins Mill Road with the exit to westbound Middlebrook Road (loop ramp). Traffic volumes on northbound I-270 between MD 124 and Middlebrook Road exceed capacity of the existing three general purpose lanes during the PM peak period. Under this improvement, the added travel lane will provide additional capacity in the general purpose lanes.</p>
NB 5	<p><b>Extend third lane to Comus Road overpass:</b></p> <p>This improvement extends the right (third) lane drop from its current location north of MD 121 to Comus Road, a distance of approximately 0.8 miles. The additional lane will be provided by widening into the median. The lane drop north of MD 121 is a major source of congestion during the PM peak period. Extending the point of the lane drop, including further separating it from the end of the HOV lane will provide more distance for vehicles to merge into the two lane section.</p>
NB 7	<p><b>Extend deceleration lane at MD 118:</b></p> <p>This improvement involves extending the length of the deceleration lane for the exit to eastbound MD 118. The existing deceleration length is substandard and the exit is identified as a frequent crash area. Extending the deceleration lane will provide additional length for vehicles to slow down off of the through lanes.</p>

The proposed program of technology/ATM improvements are as follows:

**Active Traffic Management (ATM)** strategies involve the use of technologies to dynamically manage recurring and non-recurring congestion based on prevailing and predicted traffic conditions. The specific ATM strategies proposed for I-270 include:

- **Dynamic speed limits (DSL)**, also known as variable speed limits, to adjust speed limit displays based on real-time traffic, roadway, and/or weather conditions. DSL can be speed advisories or regulatory limits, and they will be applied to an entire roadway segment. This “smoothing” process helps minimize the differences between the lowest and highest vehicle speeds.
- **Queue warning (QW)** to provide real-time displays of warning messages (on DMS) along I-270 to alert motorists that queues or significant slowdowns are ahead. QW is also used to provide additional information to motorists as to why the speed limit is being reduced.

**Adaptive Ramp Metering** will automatically set the optimum vehicle rate of release at each ramp based on a variety of parameters including mainline traffic flow conditions in the vicinity of the ramp, mainline traffic flow conditions along other segments along I-270 both upstream and downstream of the ramp, queue length at the ramp, and queue lengths at other metered ramps located within the corridor. Time-of-day/day-of week scheduling can be implemented as necessary.

Ramp metering in other states has been shown to reduce mainline congestion and overall delay, while increasing mobility through the freeway network and traffic throughput. Travel times, even when considering time in queue on the ramp, have generally been reduced when ramp metering is implemented. Many regions have experienced increased travel time reliability (reduced variations in day to day travel times) due to ramp metering.

Ramp meters help break up platoons of vehicles that are entering the freeway and competing for the same limited gaps in traffic. By allowing for smooth merging maneuvers, collisions on the freeway can be avoided. Many regions have reported significant reductions in crash rates after implementing ramp metering.

Ramp metering is adaptive to provide effective ramp queue management. This adaptive metering can prevent queues from spilling onto the adjacent arterial and clogging up the local street network with stopped vehicles that are waiting to enter the freeway.

Ramp meters smooth the flow of traffic entering the freeway so vehicles can merge with mainline traffic with minimal disruption to traffic flow. Eliminating prolonged periods of stop and go conditions due to congestion can reduce vehicle emissions and fuel consumption on the freeway. Though difficult to measure, many regions have attributed reductions in carbon emissions and fuel consumption to ramp metering implementation.

**Virtual Weigh Stations (VWS)** are used to pre-screen trucks at highway speeds for weight and height violations. Scaling equipment embedded in the pavement of the travel lanes and adjacent height sensors measure the weight and height of a vehicle and an infrared camera photographs the vehicle and the license plate. Within seconds, a report is transmitted wirelessly to the computer of an enforcement officer located downstream of the VWS so the officer can determine if the vehicle is violating any regulations. If the vehicle is in violation, the officer can choose to pull over the vehicle for inspection and/or static weighing.

## **Transit**

The proposed improvements will not only benefit the vehicles utilizing I-270, but transit routes, such as WMATA's Metrobus I-270 Express Line. Transit routes utilizing I-270 will see reduced travel time and increased travel time reliability which will provide better service to riders along with the potential ability to increase the number of service trips without the need for additional buses.

## **Schedule**

Improvements with no environmental, right-of-way or utility impacts are generally scheduled for design completion within 6 to 12 months from Notice to Proceed (NTP). Improvements requiring more rigorous regulatory agency review, or with utility impacts, are scheduled for design completion within 12 to 18 months from NTP. Construction is expected to begin as early as winter of 2017-2018, and be completed by the end of 2019.

## **Federal Environmental Review (NEPA) Process**

The program of improvements will likely be implemented as a series of distinct and separate projects. This approach affords the opportunity to streamline the process ensuring swift approvals. The design-builder will support MDOT by recommending an appropriate purpose and need addressing logical termini and critical elements such as noise analysis and Section 4(f)/park land coordination. The MDOT will ensure that all stakeholders are involved throughout the process. Also, coordination will occur with the environmental regulatory agencies. Any impacts that are unavoidable in the design process will be mitigated as required by environmental regulatory agencies.

## **Transportation Management Plan**

Consistent with MDOT's commitment to keeping traffic flowing during construction in a safe and efficient manner, a Transportation Management Plan (TMP) will be developed with stakeholder input, including input from local jurisdictions, emergency responders, transit service providers, etc.

## **Coordination with Other Projects**

The program of improvements is fully compatible with the Watkins Mill Interchange, located about 2,000 feet north of the I-270/MD 124 interchange. No modifications to I-270/Watkins Mill Interchange configuration are proposed; however, ramp meters will be evaluated to be added to the project. Along northbound I-270, an auxiliary lane between MD 124 and Middlebrook Road will be constructed. Some of this pavement will overlap pavement to be constructed as part of the Watkins Mill Interchange. It will be necessary to coordinate construction schedules between the two projects to determine the most effective manner to complete construction.

## **Public Involvement**

A comprehensive Public Involvement Plan (PIP) will be provided. The plan will include regular progress updates, public meetings, displays to communicate proposed improvements, a website, etc. The project includes Maryland's first application of adaptive ramp metering as part of an active traffic management system; therefore, public education will be an important component of the PIP to familiarize the public with the technology and how to safely and efficiently navigate the new system in accordance with traffic laws.