The purpose of the project is to:

- Enhance / improve access to mass transit facilities
- Improve the mobility and safety of pedestrians and bicyclists crossing MD 355 / Rockville Pike and improve traffic operations at the intersection of South Wood Road / South Drive / MD 355
Primary Goals:

- Improve pedestrian mobility between NNMC, NIH, and Medical Center Metrorail Station facilities through improved crossing of MD 355
- Improve pedestrian safety within the project area by minimizing conflicts with vehicular traffic
- Improve traffic operations to and from NNMC and NIH / Medical Center Metrorail Station at the MD 355 / South Wood Road / South Drive intersection
Project Goals and Objectives

Secondary Goals:

- Promote alternative modes of transportation such as rail, bus, car/vanpool, pedestrian, and bicycle commuting
- Improve efficiency with which emergency and transit vehicles move between the NIH and NNMC campuses
Preliminary Alternatives

- Alternative 1 - No-Build
- Alternative 2 - TSM/TDM
- Alternative 3 - Grade Separation of MD 355 Under South Wood Road / South Drive
- Alternative 4 - Diamond Interchange
- Alternative 5 - Double Left Turns with Pedestrian/Bicyclist Crossing Options
- Alternative 6 - Southbound Jug Handle with Pedestrian/Bicyclist Crossing Options
- Alternative 7 - Northbound Jug Handle with Pedestrian/Bicyclist Crossing Options

MD 355 / Rockville Pike Crossing Project
Alternatives Retained for Detailed Study

- Alternative 1 – No-Build
- Alternative 2A – Pedestrian / Bicycle Underpass with At-Grade TSM Improvements
- Alternative 2B – Pedestrian / Bicycle Underpass and Deep Elevators with At-Grade TSM Improvements
- Alternative 3 – Grade Separation of MD 355 Under South Wood Road / South Drive
**Evaluation Criteria**

<table>
<thead>
<tr>
<th>Primary Goals</th>
<th>Impacts and Costs</th>
<th>Secondary Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pedestrian / Bicyclist Efficiency</td>
<td>• Adjacent Projects</td>
<td>• Alternative modes of travel would be more attractive to travelers</td>
</tr>
<tr>
<td>• Pedestrian / Bicyclist Safety</td>
<td>• NNMC Gate</td>
<td>• Emergency vehicle and bus travel between NIH and NNMC would be more efficient</td>
</tr>
<tr>
<td>• Traffic Operations</td>
<td>• Construction Impacts</td>
<td></td>
</tr>
<tr>
<td>• Bus Operations</td>
<td>• Natural Environment</td>
<td></td>
</tr>
<tr>
<td>• Emergency Vehicle Operations</td>
<td>• Cultural Resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cost</td>
<td></td>
</tr>
</tbody>
</table>
Primary Goals
Efficiency of Pedestrian and Bicycle Movements Summary

Alternative 2A
- Decreases travel time for underpass users (68% of 7,530 total users) by 34 seconds
- Total travel time saved = 48.4 hours per day compared to the No-Build (11% improvement)
- Improves access to/from mass transit facility

Alternative 2B
- Improves travel time for underpass and deep elevator users
- Decreases travel time for Metrorail users (78% of 7,530) by over 2 minutes (139 seconds)
- Total travel time saved = 237.4 hours per day compared to the No-Build (52% improvement)
- Provides the shortest average travel time (deep elevator route)
- Improves access to/from mass transit facility

Alternative 3
- Decreases travel time for overpass (all) users (100% of 7,530) by 68 seconds
- Total travel time saved = 142.2 hours per day compared to the No-Build (31% improvement)
- Improves access to/from mass transit facility
- Improves travel time for non-Metro pedestrians crossing MD 355
Alternatives 2A and 2B
- Decreases pedestrian crossing volumes for those using at-grade crosswalk
- Provides opportunity for 100% avoidance of pedestrian/vehicular conflicts
- Reduces number of conflicts between pedestrians and vehicles at the intersection
- Maintains some conflicts with vehicles and wait times for remaining at-grade crossing users (could be safer if at-grade crossing was eliminated)
- Increases safety for underpass and deep elevator users
- Includes additional safety measures such as lighting, video surveillance, and emergency call boxes in the underpass

Alternative 3
- Provides opportunity for 100% avoidance of pedestrian/vehicular conflicts
- Completely eliminates conflict points for pedestrians crossing MD 355 at South Wood Road / South Drive
- Creates new crosswalks at each end of the proposed jug handle
- Increases safety for pedestrians crossing South Wood Road / South Drive over MD 355
Alternatives 2A & 2B

- Minor capacity enhancements provide a slight improvement over No-Build delay conditions.
- Reducing the number of pedestrians crossing MD 355 at-grade would reduce intersection delay during the AM peak.
- At-grade pedestrian crossings would prevent the optimal signal timing enhancements needed to improve overall LOS.
- Overall peak hour network delays will be slightly higher than the No-Build condition.
Alternative 3

- LOS and delay for both AM and PM peak periods will improve compared to 2030 No-Build and Alternatives 2A and 2B.
- Improving South Wood Road / South Drive traffic operations may impact the network and nearby cross streets.
- Congestion and associated operational issues would be “redistributed,” providing relief for some movements, but potentially worsening others.
- Overall peak hour network delays are projected to increase approximately 10 percent due to the redistribution of traffic patterns.
Compatibility with Bus Operations Summary

Alternative 2A / 2B
- Shuttle routes remain the same as the No-Build condition
- Trips from the north experience slightly higher travel times compared to No-Build
- Trips from the south experience slightly lower travel times compared to No-Build
- East/west trips experience slightly lower travel times compared to No-Build except for the PM period

Alternative 3
- Routes to and from Medical Center Metro Station are different from No-Build
- Reduction in travel time for buses is due to the removal of pedestrian and bicycle movements
- Trips from the north experience shorter travel time compared to No-Build
- Trips from the south experience longer travel time compared to No-Build
- East/west trips experience significant decreases in travel times compared to No-Build except for PM congestion from the east
Emergency Vehicle Operations Summary

Alternatives 2A and 2B
- Routes and travel times same as No-Build

Alternative 3
- Decreases travel time from the north
- Increases travel time from the south
Impacts and Costs
Compatibility with Adjacent Projects Summary

Coordination with the following project teams will need to continue for the duration of the project:

State Highway Administration Intersection Improvement Projects:
- MD 355 (Rockville Pike) and Cedar Lane
  - All build alternatives are compatible with the proposed improvements at the intersection
- MD 355 (Rockville Pike) and Jones Bridge Road
  - Alternative 2A/2B: Requires minor limited disruptions associated with MOT and temporary reconstruction of the MD 355 median
  - Alternative 3: Requires a temporary reconstruction of the channelized right-turn lane proposed by SHA

Montgomery County Facilities Study:
- Pedestrian / Bicycle and Transit Stop Enhancements
  - All build alternatives require temporary relocation and reconstruction of pedestrian facilities along the east side of MD 355
Compatibility with NNMC Gate Operations

Summary

- Storage provided under existing conditions is insufficient to meet demand.
- Storage provided for processing with Alternatives 2A and 2B is insufficient.
- Storage provided for processing with Alternative 3 is sufficient.
- Alternatives 2A and 2B operate the same as the No-Build when the MD 355/South Wood Road/South Drive intersection is considered in isolation.
- Alternative 3 performs better than the No-Build when the new intersections (MD 355/Jug handle and South Drive/Jug handle) are analyzed in isolation.
- The network delay is increased with all alternatives compared to No-Build.
Compatibility with NNMC Gate Operations - Results

Required Storage Analysis

- Current Gate Location (Existing)
  - Guard house is approximately 285 feet from the MD 355/South Wood Road intersection
  - Single lane approach to guard house in AM and PM peak period
  - Observed traffic queues from the gate to the MD 355/South Wood Road intersection
  - Observed southbound MD 355 left turning vehicles sometimes queuing into the southbound MD 355 through lanes during the AM peak period

- Proposed Gate Location (2030 No-Build)
  - Guard house will be approximately 125 feet from the MD 355/South Wood Road intersection
  - Two lanes approaching guard house in AM peak period only
  - Available queue storage would decrease below the already insufficient approach to the gate
  - Creating two service lanes approaching NNMC gate may present operational issues between southbound left turning and northbound right turning vehicles

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Gate Location</th>
<th># of Lanes</th>
<th>Storage Provided (Feet per Lane)</th>
<th>Calculated Storage Required (Feet per Lane)</th>
<th>% of Required Storage Provided</th>
</tr>
</thead>
<tbody>
<tr>
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<td>All Traffic Using NNMC Gate</td>
<td>SB Lefts Using NNMC Gate</td>
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<td>Existing</td>
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<td>884</td>
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<tr>
<td>2030 No-Build</td>
<td>Relocated</td>
<td>2</td>
<td>125</td>
<td>510</td>
<td>371</td>
</tr>
</tbody>
</table>
### Compatibility with NNMC Gate Operations – Results

#### Required Storage Analysis

- **Proposed Gate Location (Alternatives 2A and 2B)**
  - Guard house will be approximately 125 feet from the MD 355/South Wood Road intersection
  - Two lanes approaching guard house in AM peak period only
  - Available queue storage would decrease below the already insufficient approach to the gate
  - Creating two service lanes approaching NNMC gate may present operational issues between southbound left turning and northbound right turning vehicles

- **Proposed Gate Location (Alternative 3)**
  - Guard house will be approximately 675 feet from the proposed South Drive intersection with the jughandle
  - Two lanes approaching guard house in both AM and PM peak periods
  - Available queue storage approaching the gate would increase
  - Creating two dedicated service lanes approaching NNMC gate does not present additional operational issues

#### Table: Scenario Analysis

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Gate Location</th>
<th># of Lanes</th>
<th>Storage Provided (Feet per Lane)</th>
<th>Calculated Storage Required (Feet per Lane)</th>
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<tr>
<td></td>
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<td>Relocated</td>
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<td>125</td>
<td>510</td>
<td>371</td>
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<tr>
<td>2030 Alt. 3</td>
<td>Relocated</td>
<td>2</td>
<td>450 *</td>
<td>510</td>
<td>N/A</td>
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</tbody>
</table>

*After 450 feet with two lanes, one lane is provided for an additional 225 feet*
Alternatives 2A, 2B, and 3

- All existing travel lanes will be maintained during weekday peak hours on MD 355 (some lane closures during off-peak hours would be necessary).
- Compliance with design requirements (including ADA) will be maintained throughout construction.
- Efforts will be made to relocate existing bus stops disturbed during construction.
- No gate closures are proposed at any time during any construction phase.
- Alternatives 2A and 2B require a smaller construction footprint than Alternative 3.
- Alternative 3 will require a temporary bridge to be constructed.
- MOT costs range from:
  - $1-2M (Alternative 2A)
  - $2-3M (Alternative 2B)
  - $6-7M (Alternative 3)
Environmental Impacts Summary

- Natural environment
  - No impacts to wetlands, streams, floodplains, or parks
  - All alternatives cause impacts to trees
- Cultural resources
  - Alternatives 2A and 2B have 0.8 acres of historic property impacts (likely No Adverse Effect)
  - Alternative 3 has 1.3 acres of historic property impacts (could result in an Adverse Effect)
ROW Impacts and Cost Estimates – Summary

- No displacements, relocations, or impacts to residential or commercial properties anticipated.
- Costs include property acquisition, damages, and contingencies to cover unforeseen future costs.
- Costs include final design, roadway construction, right-of-way, maintenance of traffic, and utility relocation costs.
- Costs do not include operations and maintenance costs.
- Pedestrian underpass and elevator construction costs based on July 2009 WMATA Medical Center Metrorail Station Access Improvement Study.

MD 355 / Rockville Pike Crossing Project
## ROW Impacts and Cost Estimates - Results

<table>
<thead>
<tr>
<th>Feature</th>
<th>Alternative 2A</th>
<th>Alternative 2B</th>
<th>Alternative 3</th>
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<tbody>
<tr>
<td><strong>Right-of-Way Impacts</strong></td>
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</tr>
<tr>
<td>NIH Right-of-Way (acres)</td>
<td>0.60</td>
<td>0.60</td>
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<td>NNMC Right-of-Way (acres)</td>
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<td>Total Right-of-Way (acres)</td>
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<td>Design Cost (millions)</td>
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<td>NNMC Right-of-Way Cost (millions)</td>
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<td>$1 - 4</td>
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<tr>
<td>Total Right-of-Way Cost (millions)</td>
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<td>$4 - 8</td>
<td>$15 - 25</td>
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<tr>
<td>Construction Cost (millions)</td>
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<td>$38 - 42</td>
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<tr>
<td>Total Cost (millions)</td>
<td>$25 - 31</td>
<td>$48 - 58</td>
<td>$58 - 70</td>
</tr>
</tbody>
</table>
Secondary Goals
Accommodating Alternative Modes of Transportation Summary

**Alternative 2A**
- Decreases travel time for Metrorail users, pedestrians, and bicyclists crossing MD 355
- Improves access to/from mass transit facility
- Reducing the number of pedestrians crossing MD 355 at-grade would reduce intersection delay during the AM peak

**Alternative 2B**
- Significantly decreases travel time for Metrorail users crossing MD 355
- Decreases travel time for pedestrians and bicyclists
- Improves access to/from mass transit facility
- Reducing the number of pedestrians crossing MD 355 at-grade would reduce intersection delay during the AM peak

**Alternative 3**
- Decreases travel time for Metrorail users, pedestrians, and bicyclists crossing MD 355
- Improves access to/from mass transit facility
- Completely eliminating conflicts between pedestrians and vehicles would reduce intersection delay
Connectivity Between NNMC and NIH

MD 355 / Rockville Pike Crossing Project
Connectivity Summary

Alternatives 2A and 2B
- Proposed improvements are similar to the No-Build condition

Alternative 3
- Proposed improvement creates a direct connection between NIH and NNMC
Next Steps

- Present Team Recommendation at the BIC meeting on December 21, 2010
- Finalize MHT/Section 106 Coordination
- Complete Environmental Document and submit to FHWA in February 2011
- Meeting to determine lead agency for design/build and development of a MOU for implementation