

Pedestrian Road Safety Audit Public Document

MD 97 (Georgia Avenue) at Randolph Road

Montgomery County
July 2014



Prepared For:

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1. Introduction

1.1 Objective

The purpose of this document is to summarize the Pedestrian Road Safety Audit (PRSA) that was conducted for the detailed design plans for the MD 97 (Georgia Avenue) at Randolph Road interchange project. The interchange design is a Maryland State Highway Administration (SHA) project for the intersection located in Glenmont, Maryland in Montgomery County, SHA District 3 (Figure 1).

Based on the field observations of existing conditions and review of the proposed design plans, the PRSA team developed a variety of suggestions related to pedestrian, cyclist, and vehicular safety throughout the study area. The suggestions are primarily related to final signing and pavement markings at the proposed weave and merge areas, median design, pedestrian crossings, and traffic signal phasing to reduce pedestrian exposure to vehicles. In addition, recommendations were included to improve safety during construction. These recommendations were reviewed with SHA and incorporated into the final design plans where appropriate.

1.2 Background

The PRSA study area includes MD 97 between Mason Street to the south and Layhill Road (MD 182) to the north, as well as Randolph Road from 400 feet west of Judson Road to 500 feet east of Glenmont Circle, as shown in **Figure 1**. The project area encompasses two of Montgomery County's High Incident Areas (HIA) for pedestrian-related crashes, which were identified as part of the Montgomery County Executives' Pedestrian Safety Initiative. The pedestrian HIA segments include MD 97 from Glenallen Avenue to Mason Street and Randolph Road from Judson Road to Glenallen Avenue. The identification of multiple pedestrian HIAs within the project limits necessitates an emphasis on pedestrian safety and mobility during the construction and final build conditions of the interchange project and is the nexus for conducting the PRSA on the SHA design plans. The SHA project will result in a grade-separated interchange with the through lanes of Randolph Road traveling under MD 97 (Georgia Avenue). Construction of the SHA project began in Spring 2014 and is expected to be completed by Fall 2016.



Figure 1: Project Location Map

The audit team included members from the following disciplines:

- Pedestrian and bicycle safety
- Traffic engineering and traffic signal operations
- Roadway design
- Human factors
- Americans with Disabilities Act (ADA) design
- Public safety (Law enforcement)

1.3 Audit Process

The audit was performed by the Montgomery County Department of Transportation (MCDOT), in conjunction with engineers from the Maryland State Highway Administration and STV Incorporated, as well as a number of area stakeholders. Resources for the PRSA included existing crash data, existing and projected traffic volumes, and proposed roadway improvement and maintenance of traffic (MOT) plans for the interchange design project. The audit consisted of five technical sessions, as follows:

- Sessions I and II, June 12-13, 2012, to review the proposed roadway improvement and traffic signal plans.
- Sessions III and IV, June 20 and June 22, 2012, to review the MOT plans.
- Session V, July 20, 2012, to review the Temporary Traffic Signal plans.

2. Existing Conditions

2.1 Crash Data

Between January 2009 and December 2011, a total of 222 crashes were reported within the study area, **Figure 2**. These included 210 vehicle and 12 pedestrian crashes.

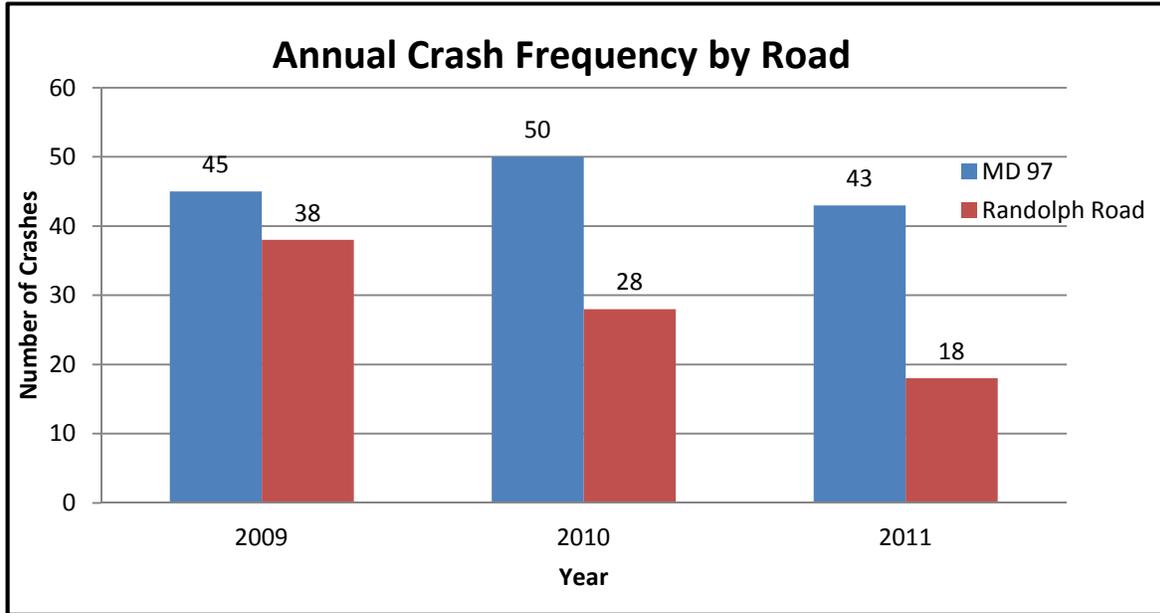


Figure 2: Study Area Crash Frequency (2009 - 2011) by Road

As shown in **Figure 2**, more crashes were reported along MD 97 than Randolph Road. **Figure 3** identifies the study area crashes by type.

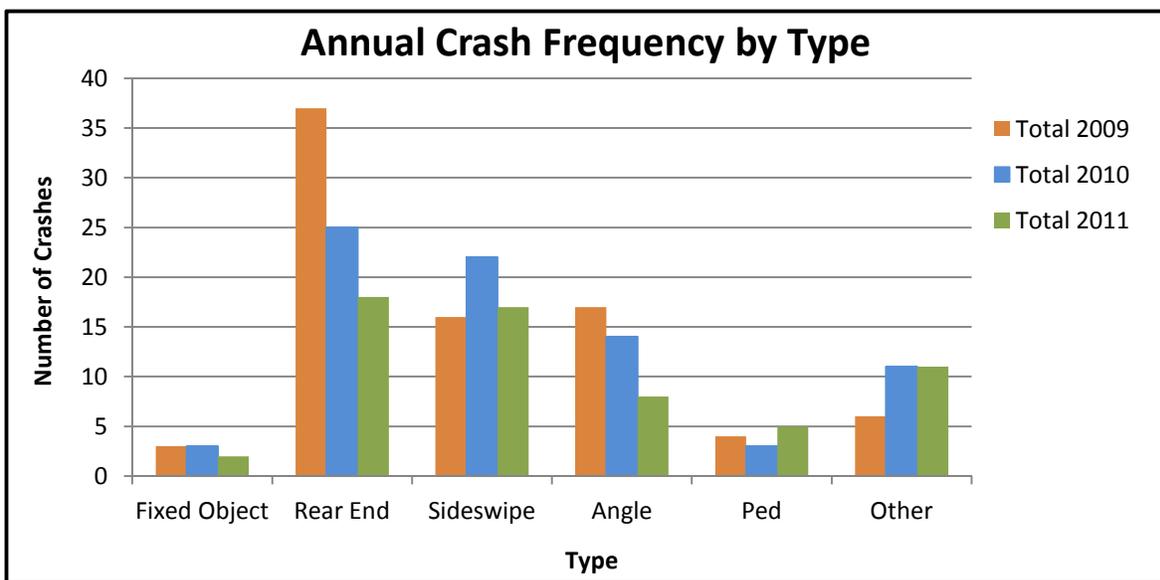


Figure 3: Study Area Crash Frequency (2009 - 2011) by Type

As shown in **Figure 3**, rear end crashes were the most frequent crash type. **Figures 4** and **5** identify the crash types by individual corridor.

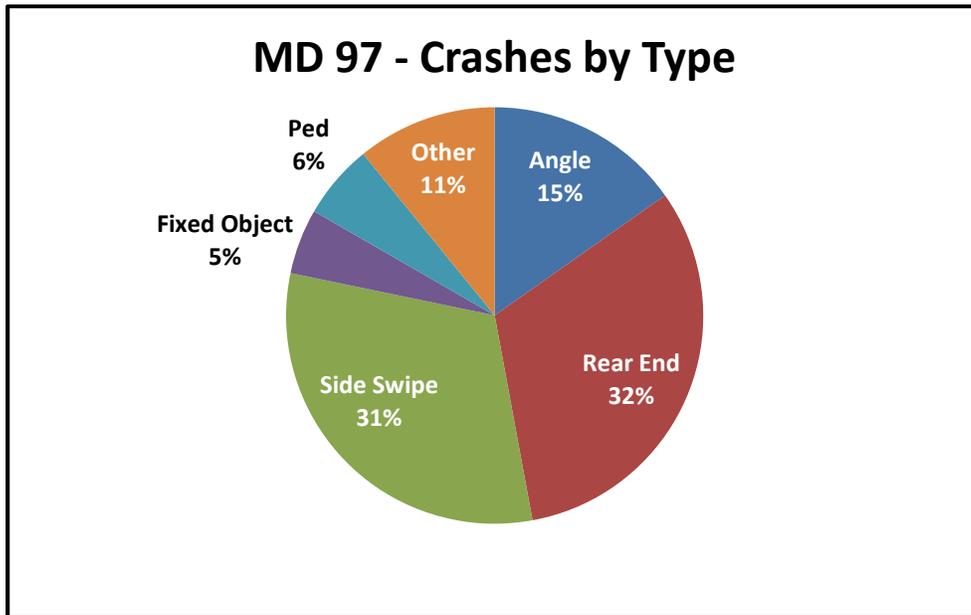


Figure 4: MD 97 Crashes (2009 - 2011) by Type

As shown in **Figure 4**, a majority of the crashes along MD 97 were rear end and side swipe.

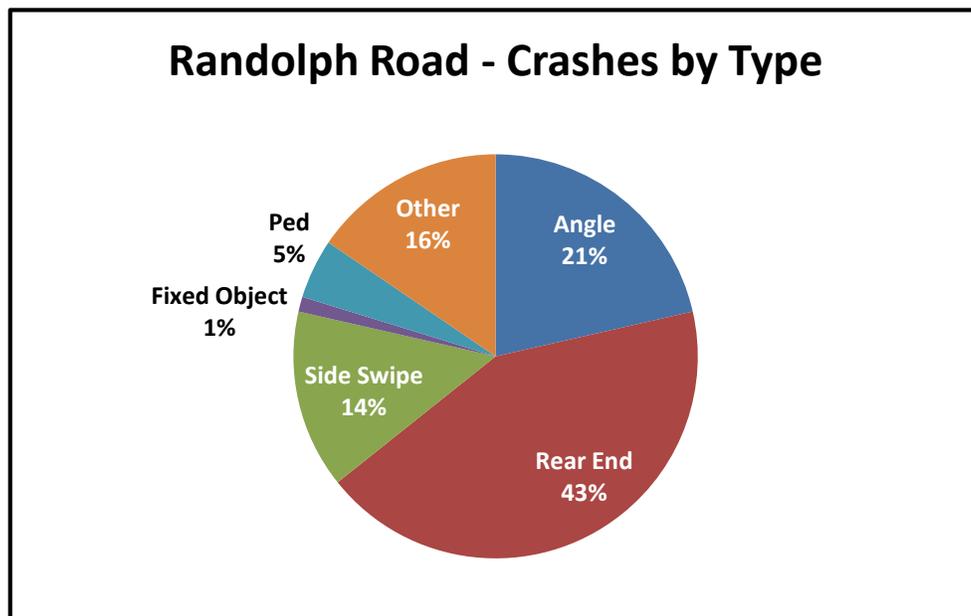


Figure 5: Randolph Road Crashes (2009 - 2011) by Type

As shown in **Figure 5**, rear end and angle crashes were the two most frequent types along Randolph Road.

Of the 12 pedestrian crashes, eight were along MD 97 and the remaining four were along Randolph Road. Pedestrian crash severity is depicted in **Figure 6**.

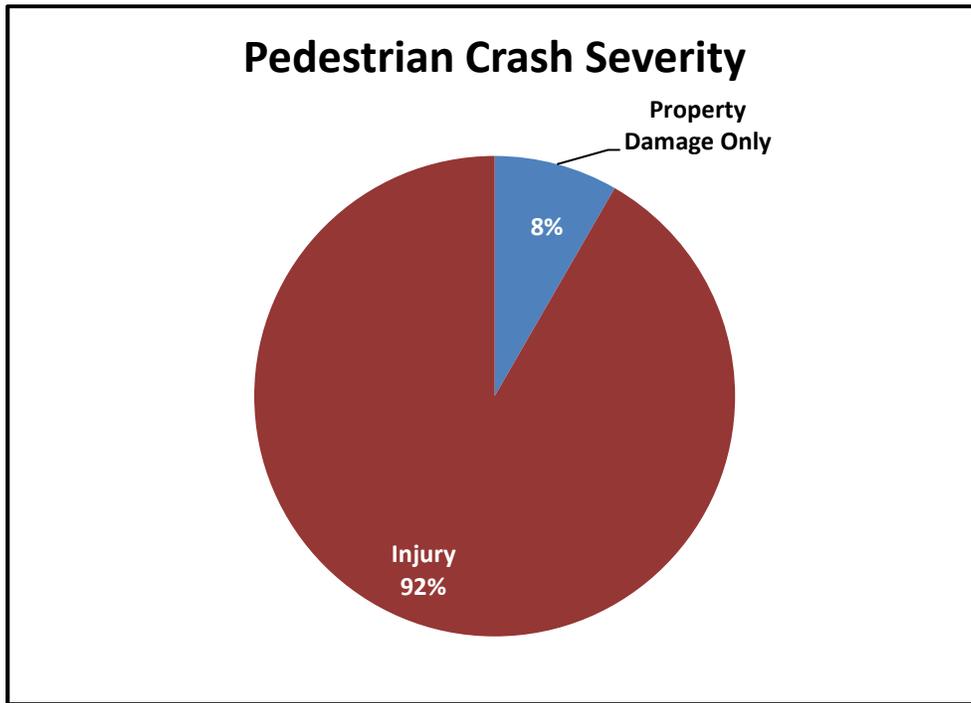


Figure 6: Pedestrian Crashes by Severity (2009 – 2011)

As shown in **Figure 6**, nearly all of the pedestrian crashes resulted in injury.

2.2 Traffic Volumes

MD 97 is a six-lane divided highway, running north-south, and is classified as a major highway within the study area. Randolph Road is an east-west six-lane divided highway classified as a major highway within the study area. The 2011 Average Annual Daily Traffic (AADT) volumes on these roads are summarized in **Table 1** below.

Table 1: Existing Traffic Volumes

| <u>Year</u> | <u>Location</u> | <u>AADT</u> |
|-------------|-------------------------------------|-------------|
| 2011 | MD 97 .10 mi North of Randolph Road | 44,600 vpd |
| 2011 | Randolph Road .20 mi West of MD 97 | 27,300 vpd |

*vpd = vehicles per day

Figure 7 shows existing lane use and peak hour volumes at the MD 97 at Randolph Road intersection.

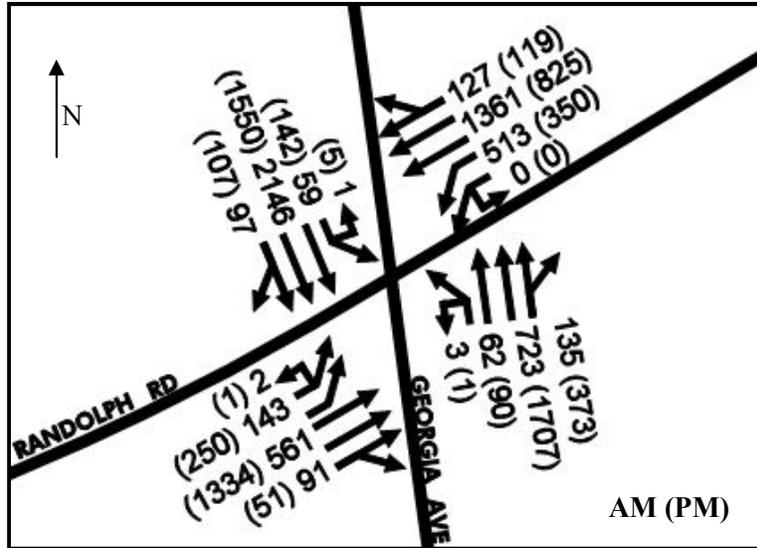


Figure 7: MD 97 at Randolph Road: Existing Lane Use and Peak Hour Volumes

As shown in **Figure 7**, the peak direction of travel along MD 97 is southbound during the AM peak hour and northbound during the PM peak hour. Along Randolph Road, the peak direction of travel is westbound during the AM peak hour and eastbound during the PM peak hour.

The projected 2030 future traffic volumes with the proposed improvement (interchange) at the MD 97 at Randolph Road intersection are presented in **Figure 8**.

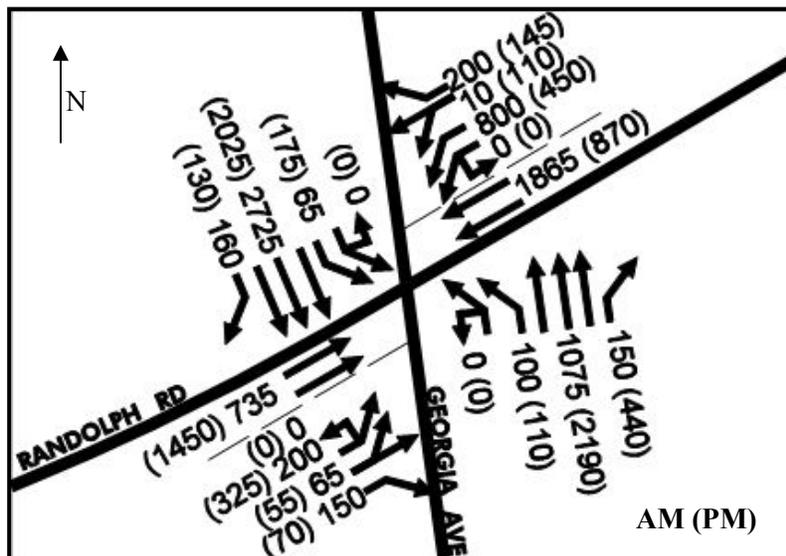


Figure 8: MD 97 at Randolph Road: 2030 Lane Use and Peak Hour Volumes

In addition to vehicular volumes, the 2012 turning movement counts published by SHA indicated that 540 pedestrians crossed at the intersection of MD 97 and Randolph Road during the twelve-hour period from 6:00 AM to 6:00 PM. Within the study area,

pedestrian activity is heavy between the Glenmont Metro Station, which is located 0.3 miles north of the study intersection, and the residential and commercial developments to the south and west of the study area.

2.3 Intersection Operations

MD 97 at Randolph Road is a typical, four-leg at-grade signalized intersection under existing conditions. The proposed SHA improvement project will upgrade the intersection to a grade separated interchange, with the through movements on Randolph Road traveling under MD 97. The key design elements for the planned improvements include: new merge and weave areas for the through movements, dedicated bike lanes on MD 97, triple left turns from westbound Randolph Road, double left turns from north and southbound MD 97, modified bus transit routing and operation, and traffic signal improvements for the remaining at-grade movements.

Based on a traffic study titled MD 97 at Randolph Road Interchange: Glenmont Circle Alternatives Analysis, dated August 23, 2011, the MD 97 at Randolph Road intersection is projected to operate at LOS C during both the AM and PM peak hours under the future 2030 conditions with the planned grade separation.

3. Road Safety Audit Findings

3.1 Issues and Recommendations

The detailed design plans for the SHA's MD 97 (Georgia Avenue) at Randolph Road interchange project were reviewed by the Audit Team to identify issues related to any deficiencies and recommendations to address those deficiencies. A total of 170 detailed observations/comments and corresponding recommendations were identified by the PRSA team. After receiving and reviewing the suggested recommendations, SHA responded and agreed to incorporate appropriate recommendations into their final contract documents.

For the purposes of this document, the Audit Team's review and findings are grouped into the following categories:

- Pedestrian and Bicycle Safety
- Maintenance of Traffic
- Traffic Signal Operations
- Signage
- Pavement Markings
- Other General Findings

Each of the above categories is discussed in detail in the following sections of the report.

3.1.1 Pedestrian and Bicycle Safety

Based on a review of the design plans, it appeared that the design of the proposed pedestrian facilities may not have been fully compliant with standards with regard to pedestrian accessibility, location of the curb ramps, orientation of the crosswalks, and continuity of the crosswalks/sidewalks. A total of 65 specific observations and corresponding recommendations were identified related to pedestrian and bicycle safety. Some of the specific issues related to pedestrian and bicycle safety are identified below.

3.1.1.1 Accessibility of Pedestrian Paths

Some of the pedestrian paths were obstructed and/or were not ADA accessible as shown on the plans. For example, as shown in **Figure 9**, the sidewalk on the northeast corner of the MD 97 at Randolph Road intersection did not extend around the radius of the curve. This may cause difficulty for the physically disabled to access the ramps and may lead pedestrians into the work zone. Therefore, it was recommended that the sidewalk be extended around the corner. Similar changes were recommended for any other obstructed or non-accessible pedestrian paths. In response, SHA added additional construction fencing and signs to clearly delineate the pedestrian pathway.

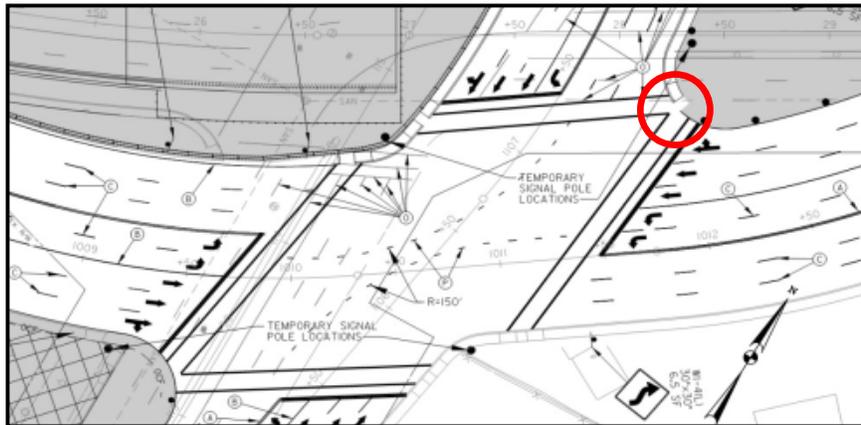


Figure 9: Discontinuity of Pedestrian Path – Phase 2A

3.1.1.2 Crosswalks and Pedestrian-Related Signage

Crosswalks and pedestrian-related signage were not identified at some intersections and crosswalks. For example, during MOT Phase 2A at the Randolph Road at Glenmont Circle intersection, the pedestrian crosswalk on the north leg appeared to be too far removed from the intersection (**Figure 10**). With excess distance between the crosswalk and the intersection, westbound right-turning vehicles may not be aware of pedestrians in the crosswalk. It was suggested that “Watch for Pedestrians” or “Turning Traffic Yield to Peds” signs be installed on the westbound approach, and at any other similar location. In response, SHA added additional signs to notify vehicles of the presence of pedestrians.

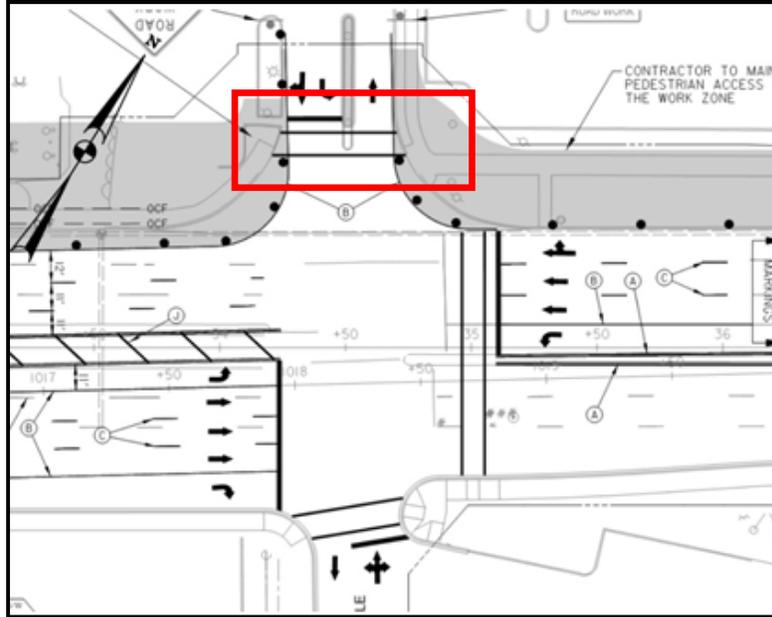


Figure 10: Inadequate Crosswalk and Pedestrian Related Signage

3.1.1.3 Bicycle Facilities

Some of the bicycle facilities were not marked appropriately. For example, pavement markings were not proposed for the southbound bike lane on MD 97 south of Randolph Road (Figure 11). As a result, motorists may not interpret the designated area as a bike lane and may not yield to bicycle traffic. It was recommended that “Bike Lane” pavement markings be installed along southbound MD 97 and any other designated bike lanes which were not marked. In response, SHA reviewed the pavement markings for bike lanes and ensured that all of the pavement markings for bike lanes conformed to SHA’s 2013 Bicycle Policy and Design Guidelines.



Figure 11: Lack of Bicycle-Related Markings

3.1.2 Maintenance of Traffic

Maintenance of Traffic (MOT) plans detail how traffic will be accommodated within the work zone throughout construction of the project. For this project, there are seven main phases of the MOT plans with multiple stages per phase. Based on a review of the MOT plans, some issues were identified regarding the proposed sequence of construction, type of barrier, type of buffers and adequate protection provided for the work zone. A total of 11 specific observations and corresponding recommendations were identified related to MOT. Some of the specific issues related to the MOT are discussed below.

3.1.2.1 Sequence of Construction

The sequence of construction did not show when roadway, sidewalks, or other items were to be constructed in some locations. For example, Phase 3 of the MOT was not consistent with temporary roadway plans for Phase 3A at the intersection of MD 97 at Randolph Road (**Figure 12**). Both the north and south median sidewalks were being constructed in Phase 3A; however, MOT Phase 3 indicated the sidewalks were temporary for pedestrian crossings. Since the sidewalks were not constructed, pedestrian paths under MOT Phase 3 were not clearly defined for the east/west pedestrian path through the intersection. Therefore, it was recommended that the phasing of construction be modified to construct the north median first followed by the south median, so that there will be an east/west path available through the intersection. Any other locations with a similarly unclear path were also recommended for modification. In response, SHA reviewed the sequence of construction to ensure that the contractor will be maintaining pedestrian access through the work zone.

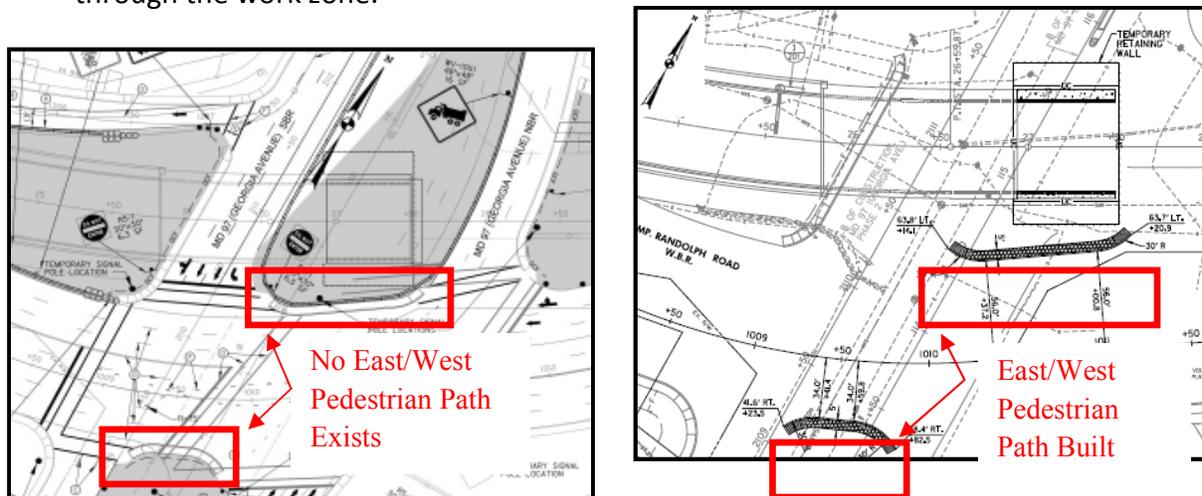


Figure 12: Sequence of Construction (MOT Phase 3 (Left) and Temporary Roadway Plan Phase 3A (Right))

3.1.2.2 Work Area Protection

Adequate protection was not provided for some of the work zone areas. For example, during MOT Phase 5B, there was no crash cushion specified for the western end of the temporary concrete barrier east of the intersection of MD 97 at Randolph Road (**Figure 13**). It was recommended that an impact attenuator be installed at the end facing into the flow of traffic at this location. In response, SHA added an impact attenuator at this location.

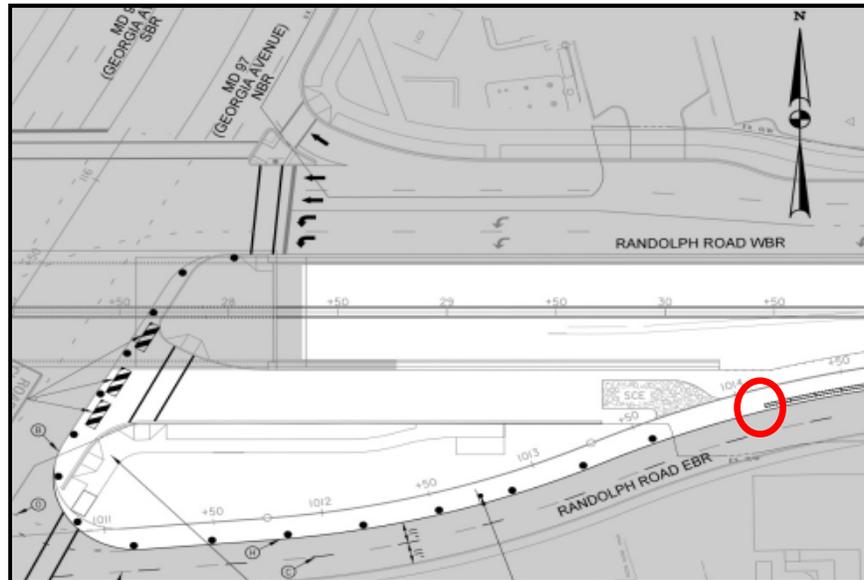


Figure 13: Inadequate Work Zone Protection

3.1.3 Traffic Signal Operation

Traffic signal operations include temporary as well as proposed traffic signal control and operations. Based on a review of the design plans, issues related to traffic signal operations, feasibility of phasing, traffic signal head placement, and intersection movements were reviewed. A total of 11 specific observations and corresponding recommendations were identified related to traffic signal operations. Examples of the specific issues related to the traffic signal operation are identified below.

3.1.3.1 Temporary Traffic Signal Control and Operation

During MOT Phase 3, only one three-section signal head was provided on the near side of the intersection for all through movements at MD 97 at Randolph Road. Due to the curvature of the road and the distance of the traffic signal heads from the opposing intersection approaches, one near sided signal head may not be adequate (**Figure 14**). Therefore, it was recommended that a second near side signal head be installed for through movements on all approaches with curvature. In response, SHA agreed to add an additional near side signal head to the southbound approach.



Figure 14: Need for Additional Signal Indicators

3.1.3.2 Proposed Traffic Signal Control and Operation

At the intersection of Randolph Road at Glenmont Circle, the proposed east and westbound U-turn radii appeared to be limited and may not have been adequate to complete a U-turn maneuver (**Figure 15**). It was suggested that U-turns be prohibited for the east- and westbound directions. In response, SHA altered the traffic signal phasing to include an exclusive east- and westbound left turn movement, removing the need to prohibit U-turn maneuvers.

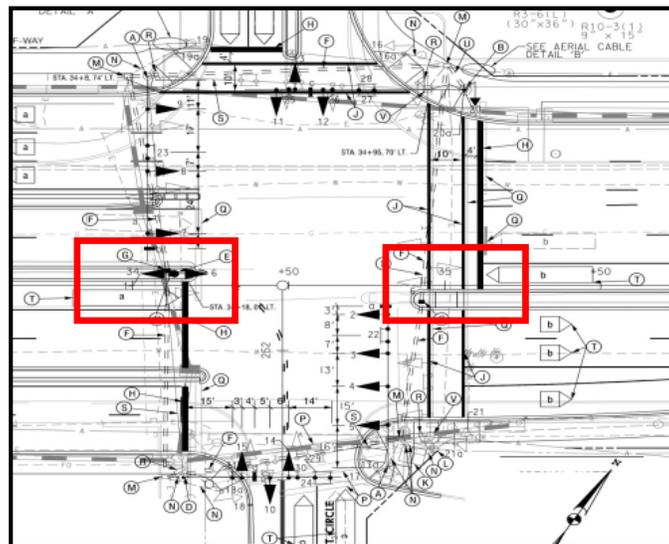


Figure 15: Inadequate Turning Radii

3.1.4 Work Zone Signage

Based on a review of the design plans, signage was inadequate during some phases of the MOT. A total of 35 specific observations and corresponding recommendations were identified related to signage. Some of the issues related to signage included movement prohibitions, detours, and advance work zone signage and are described below.

3.1.4.1 Vehicular Movement Prohibitions

Movement prohibition signage informs drivers of illegal and unsafe turning movements. Lack of appropriate movement prohibition signage or confusing signage may impact safety. For example, the driveways on the east side of MD 97 north of Sheraton Street did not have signage restricting left turns exiting the driveways (**Figure 16**). Since the existing median along MD 97 will be removed during some construction phases, vehicles from the driveways could attempt to make left turns onto southbound MD 97. In order to prevent this maneuver, it was suggested that “No Left Turn” signs and/or “Right Turn Only” signs and “One Way” signs be installed to guide vehicles exiting these driveways. In response, SHA added the additional movement prohibition signage at this location.

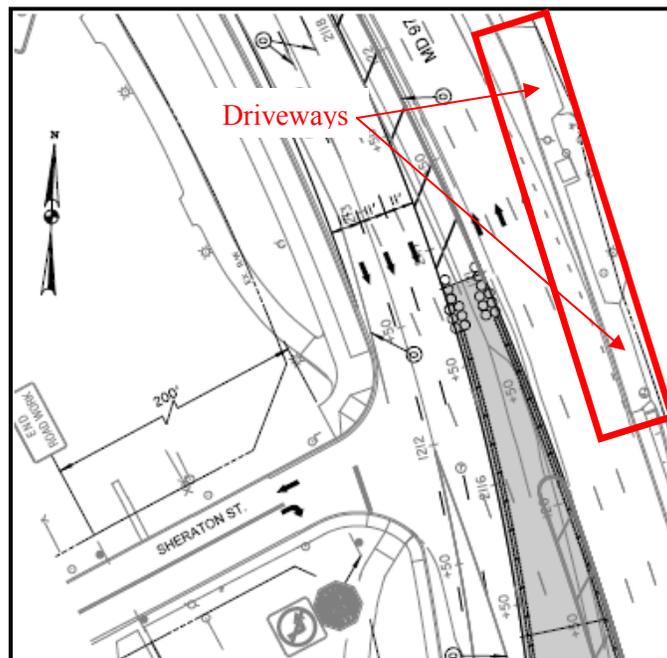


Figure 16: Lack of Signage for Left-Turn Prohibitions

3.1.4.2 Detour Signage

Without appropriate signage, roadway and sidewalk closures may lead to pedestrian and/or driver confusion. One such situation was found on MOT Phase 2A plans at the intersection of MD 97 and Randolph Road. No pedestrian detour signage was proposed between MD 97 (Georgia Avenue) and Judson Road north of Randolph Road, where the

sidewalk will be closed. Without pedestrian detour signage, pedestrians may attempt to cross at an unmarked location and travel through the construction zone to reach Judson Road (**Figure 17**). “Sidewalk Closed” signs were recommended at this location, along with pedestrian detour signs on the northwest corner of the MD 97 and Randolph Road intersection leading pedestrians to access Judson Road from Sheraton Street. Any other similar sidewalk closures and pedestrian detours were recommended for additional signage. In response, SHA added additional signage to detour pedestrians in the westbound direction.

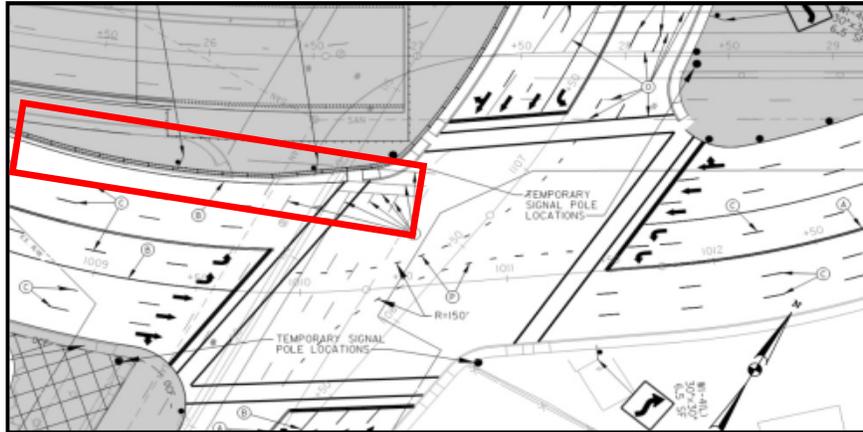


Figure 17: Lack of Pedestrian Detour Signage

3.1.4.3 Advance Work Zone Signage

During MOT Phase 1A, the “Road Work Ahead” sign proposed on the westbound approach of the Layhill Road intersection with MD 97 appeared to be too close to the intersection (**Figure 18**). This may not have given adequate advanced notice regarding the work zone for motorists, in particular the westbound left-turning vehicles, to be prepared for the change in conditions. The “Road Work Ahead” sign on the westbound approach was recommended to be moved further ahead of the intersection. In response, SHA identified the offset dimension from the intersection to the sign and added clarification on the sign in the median of Layhill Road.

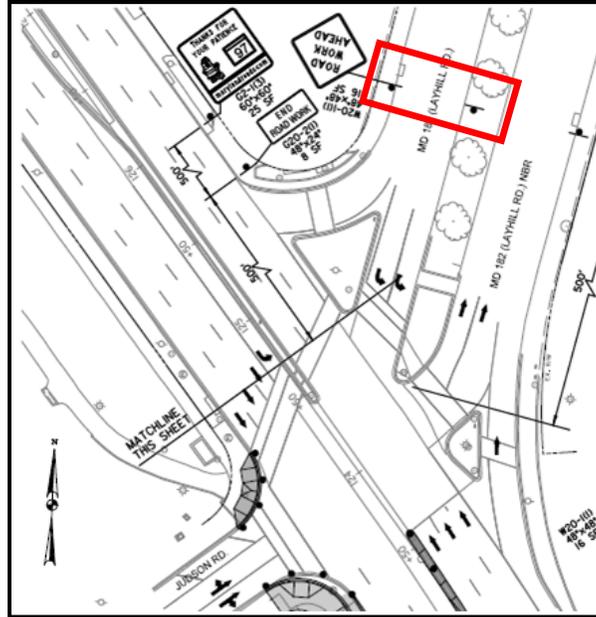


Figure 18: Work Zone Signage Location

3.1.5 Pavement Markings

Pavement markings inform drivers of lane widths, assignments, and curvature of the road. Lack of, or improper, markings are likely to create driver confusion, which may impact safety. Based on a review of the design plans, it appeared that the pavement markings might have been inadequate during some phases of the MOT and final design. A total of 19 specific observations and corresponding recommendations were identified related to pavement markings. Specific issues related to the pavement markings are identified below.

3.1.5.1 Intersections

During MOT Phase 1B at the intersection of MD 97 at Randolph Road, no temporary lane line extension markings were provided for the westbound dual left-turn lanes (**Figure 19**). Without designated lane markings, there was potential that two westbound left turning vehicles in adjacent lanes could collide. Therefore, it was recommended that lane line extension markings be installed through the intersection to provide positive guidance for the westbound left-turning movements. In response, SHA added temporary lane extension pavement markings for the westbound dual left turn lanes.

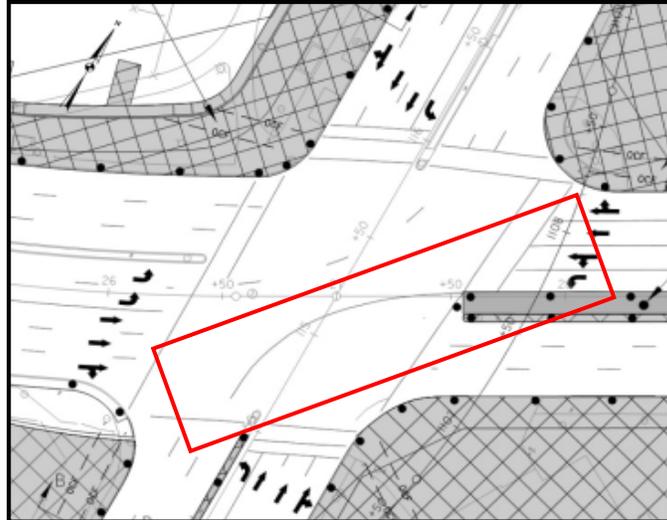


Figure 19: Example of Lack of Pavement Markings

3.1.5.2 Roadway Segments

During MOT Phase 2A the westbound through lanes shift slightly through the intersection of Randolph Road at Glenmont Circle (**Figure 20**). An unexpected shift in lanes can lead to side swipe collisions. It was suggested that lane line extension markings be installed through the intersection for the westbound through lanes. In response, SHA reviewed the alignment of westbound through movements and determined that lane line extension markings were not necessary.

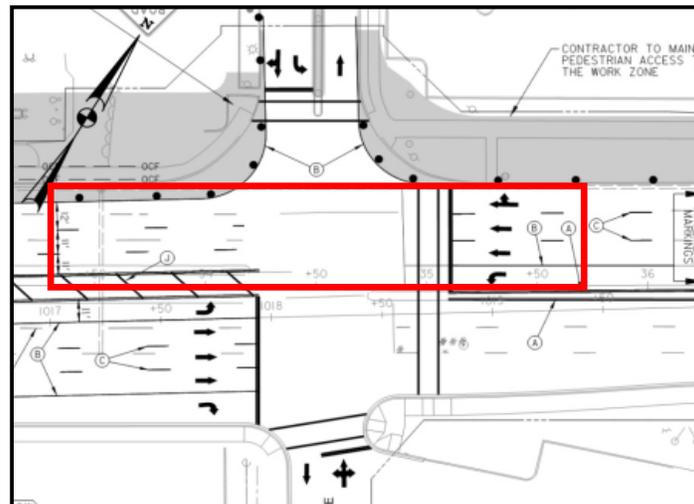


Figure 20: Lack of Pavement Markings for Lane Shift

3.1.6 Other Findings

Other areas of review included access management, transit accessibility, landscaping, and lighting. A total of 29 specific observations and corresponding recommendations were identified related to other areas. Examples of these issues are outlined below.

3.1.6.1 Access Management

Access to commercial properties and driveways was not clearly defined during some of the MOT phases. For example, the commercial driveways on the east side of MD 97 north of Mason Street were shown as part of the work zone area during MOT Phase 4A (**Figure 21**). Drums to delineate access to all commercial businesses were recommended throughout the work zone for this and any other similar areas. In response, SHA added additional drums to identify driveways and maintain access.

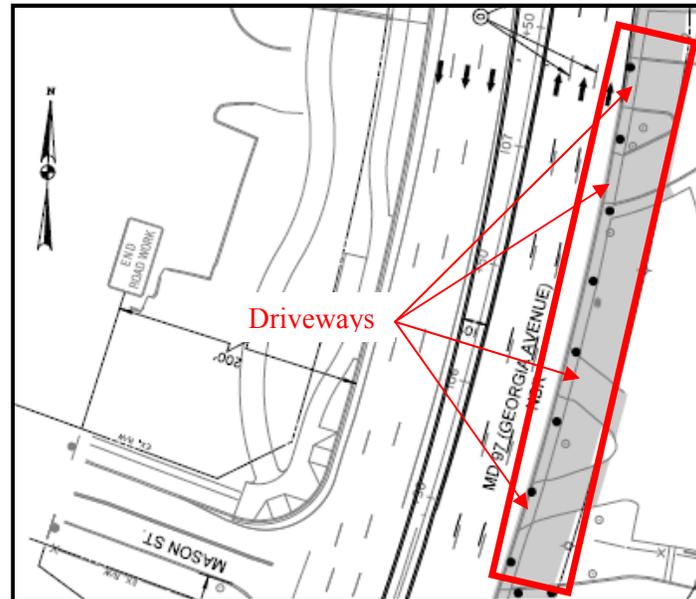


Figure 21: Lack of Driveway Access

3.1.6.2 Transit Accessibility

Based on a review of the design plans, several bus stop locations were impacted by the work zone. However, it was not clearly identified if and how these facilities would be maintained. As an example, during MOT Phase 1A on Randolph Road near Judson Road, there are existing bus stops located in the work zone (**Figure 22**). Improper or inadequate waiting areas and paths may block the sidewalk for pedestrians, and riders wanting to board the bus may have to traverse the construction zone. It was recommended for this location and any other similar locations, that waiting areas and clear access to/from the bus be provided. In response, SHA coordinated with Montgomery County and WMATA, and all temporary and permanent bus stops have been modified as necessary to provide appropriate access.

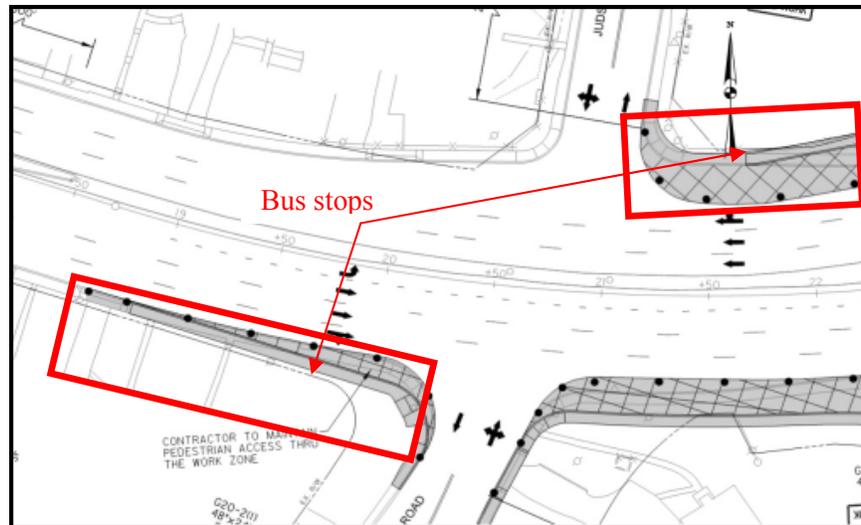


Figure 22: Accessibility Issues to Bus Stop

3.1.6.3 Landscaping and Lighting

Some of the landscaping and lighting details on the design plans appeared to potentially interfere with pedestrian/vehicular traffic operations. For example, the proposed trees in the landscaping plans along north- and southbound MD 97 appear to be in close proximity to the roadway (**Figure 23**). Given the proportion of large vehicles using this roadway, trees may be struck by trucks, potentially leading to sudden avoidance maneuvers and damage to street trees. Therefore, it was recommended that appropriate species of trees and foliage be chosen to minimize encroachment on the roadway, and/or consider the feasibility of relocation (or removal) of the proposed trees to avoid interference with large vehicles for this and any other similarly situated plantings. In response, SHA reviewed the proposed tree placement and changed the placement to reduce encroachment on the roadway.

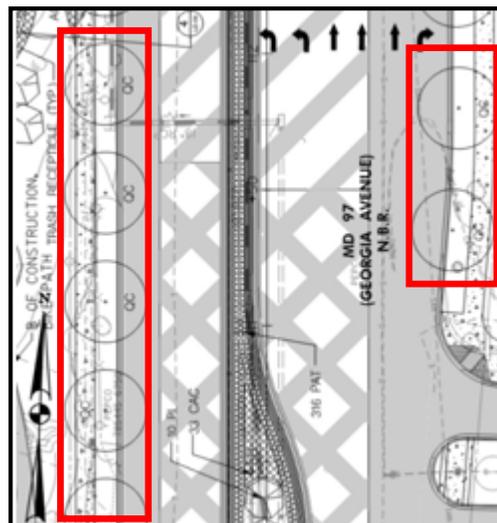


Figure 23: Landscaping Interference with Pedestrian/Vehicle Operations

3.2 Summary of Findings

As described above, a total of 170 issues and corresponding recommendations were noted during the audit. A comprehensive list of the issues identified by the PRSA team including the various observations, suggestions, and the SHA response to each is included as part of **Appendix A**. A brief summary of the issues identified by the PRSA team, as discussed in the above sections of this report, and the associated suggestions to address them is provided in **Table 2**.

Table 2 – Summary of Findings

| Issue | Suggestions |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pedestrian Accessibility, Crosswalk Signage, and Bicycle Facilities | <ul style="list-style-type: none"> • Provide continuity by extending and/or delineating pedestrian paths. • Install pedestrian crossing related signage. • Install pavement markings to designate bicycle facilities. |
| Maintenance of Traffic | <ul style="list-style-type: none"> • Modify the sequence of construction to include only one side of the intersection at a time to maintain pedestrian paths. • Install impact attenuators to protect the work zone. |
| Signal Operations | <ul style="list-style-type: none"> • Install additional near side traffic signal heads at locations where the roadway curvature may create visibility issues. • Change traffic signal operations and signage to prohibit U-turns where intersection geometry limits the turning radii on opposite approaches. |
| Signage | <ul style="list-style-type: none"> • Install appropriate turn prohibition signs to avoid potential conflicting movements. • Install appropriate detour signage where the sidewalk is either unavailable or the pedestrians are detoured. • Install advanced warning signs regarding the work zone, where appropriate. |
| Pavement Marking | <ul style="list-style-type: none"> • Install lane line extension markings through the intersection to better define the travel path and reduce the potential for side swipe collisions. |
| Other General Issues | <ul style="list-style-type: none"> • Delineate the commercial driveways within the work zone. • Provide appropriate bus stop waiting areas and access paths to bus loading areas as feasible. • Choose appropriate species and location of the plantings to avoid interference with larger vehicles. |

4. Conclusions

This pedestrian road safety audit was conducted for the detailed design plans for the Maryland State Highway Administration's (SHA) MD 97 (Georgia Avenue) and Randolph Road interchange project located in Glenmont in Montgomery County, SHA District 3. The length of the SHA project is approximately 0.4 miles on MD 97 (Georgia Avenue) and 0.3 miles on Randolph Road. The goal of the audit is to improve safety, mobility, and accessibility for multiple modes of travel. The project area encompasses two of Montgomery County's High Incident Areas (HIA) for pedestrian-related crashes, which were identified as part of the Montgomery County Executives' Pedestrian Safety Initiative.

The identification of multiple pedestrian HIAs within the project limits necessitates an emphasis on pedestrian safety and mobility during the construction and final build conditions of the interchange project and is the nexus for conducting the PRSA on the SHA design plans. The pedestrian conflicts at the intersection of MD 97 at Randolph Road result from high through and turning vehicular volumes, long crossing distances, and significant pedestrian activity in the area. The land uses surrounding the study area are a mix of high-density and single family residential and commercial developments. Pedestrian activity is heavy between the Glenmont Metro Station, which is located 0.3 miles north of the study intersection, and the residential and commercial developments to the south and west of the study area.

A 2012 turning movement count published by SHA indicates that 540 pedestrians crossed at the intersection of MD 97 and Randolph Road during the twelve-hour period from 6:00 AM to 6:00 PM. The highest pedestrian volume occurred on the east leg crosswalk, and the proposed grade separation will reduce the long crossing distances on the east and west legs of the intersection. Between January 2009 and December 2011, a total of 222 crashes were reported within the study area. These included 210 vehicular crashes and 12 pedestrian crashes. The most prevalent vehicle movement leading to a pedestrian crash was the through movement. Eleven of the 12 pedestrian crashes resulted in injury; however, no fatalities were reported. Seven of the 12 pedestrian crashes occurred when the pedestrian was crossing in the east-west direction; therefore, the proposed grade separation will reduce pedestrian-vehicle conflicts and enhance safety at this intersection.

The pedestrian road safety audit was performed by the Montgomery County Department of Transportation (MCDOT), in conjunction with engineers from the Maryland State Highway Administration and STV Incorporated, as well as a number of area stakeholders. The audit consisted of five technical sessions conducted over several days. A number of issues were identified during these technical sessions, which potentially impact pedestrian and vehicular safety, including issues with pedestrian accessibility, pedestrian crossings, signing and pavement marking, median design, and

traffic signal phasing. A total of 170 detailed observations/comments were identified by the PRSA team, which were grouped into the following categories:

- Pedestrian and Bicycle Safety (65 observations)
- Maintenance of Traffic (11 observations)
- Traffic Signal Operations (11 observations)
- Signage (35 observations)
- Pavement Markings (19 observations)
- Other General Findings (29 observations)

Based on the review of existing conditions and the proposed design plans, the PRSA team concluded that a number of additional steps should be taken to further enhance safety for all modes of travel, such as addressing midblock pedestrian crossing activity and various vehicular conflicts. The team developed a variety of suggestions related to pedestrian and vehicular safety throughout the study area. The suggestions identified by the team were related to signing and marking at the proposed weave and merge areas, median design, pedestrian crossings, and traffic signal phasing to reduce pedestrian exposure to vehicles, as well as for vehicular, transit, and bicycle safety during construction and in the full build condition. After reviewing the PRSA team's list of approximately 170 recommendations, SHA responded and agreed to incorporate the majority of the recommendations into their final plans. As a result of the grade separation, which will reduce the number of conflicting movements at the intersection, and the recommendations implemented by SHA resulting from this PRSA, it is anticipated that the safety of all modes will improve at the intersection of MD 97 (Georgia Avenue) at Randolph Road.

APPENDIX

A

Summary of Findings, Recommendations, and SHA Responses

SUMMARY OF FINDINGS AND POTENTIAL IMPROVEMENT SUGGESTIONS

| Sheet <u>17/19</u> of 309 | | Roadway Plan | |
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| Observation | Issue | Suggestion | Response |
| A. Pedestrian/bicycle safety on Randolph Road. | | | |
| <p>1. The medians on Randolph Road west of Judson Road and east of Glenmont Circle are not designed to discourage pedestrian crossing at the mid-block location.</p> <p>2. There are no measures to prohibit pedestrians from entering the tunnel.</p> | <p>1. The medians could encourage mid-block crossings, which create potential pedestrian and vehicle conflicts.</p> <p>2. In the absence of adequate signage, pedestrians may enter the tunnel using the median or raised shoulder area within the tunnel where they may be exposed to unexpected motorists.</p> | <p>1.1. Consider installing “non-traversable” plant material or fencing to discourage mid-block pedestrian crossings.</p> <p>1.2. Consider installing a median that is designed (i.e., sloping, rounded curb) to discourage mid-block pedestrian crossings.</p> <p>2. Consider installing graphical “No Pedestrians” sign (R9-3a) at the entrance to the tunnel.</p> | <p>1. The medians have been designed to be consistent with the existing conditions and the sections of roadway immediately adjacent to the limits of work. The median design at these locations will not be changed.</p> <p>2. The current plans propose "NO PED CROSSING - USE CROSSWALK" signs (R9-3(1)) on each side of Randolph Road at the Judson Road intersection. Installation of a graphical "No Pedestrian Crossing" sign (R9-3a) in the median near Sta. 20+50 will be coordinated with District Traffic and OOTS.</p> |
| B. Vehicular safety at the MD 97 and Randolph Road intersection. | | | |
| <p>1. The deceleration and storage lengths for the EB right-turning lane at the MD 97 & Randolph Road intersection appear to be inadequate.</p> | <p>1. Inadequate deceleration and storage lengths may contribute to queue spill back on through lanes and may cause rear-end collisions.</p> | <p>1. Determine the feasibility and constructability of extending the EB right-turn lane, per the design standards.</p> | <p>1. The auxiliary lane analysis will be verified.</p> |

| Sheet <u>20</u> of 309 | | Roadway Plan | |
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| Observation | Issue | Suggestion | Response |
| C. Vehicular safety at the MD 97 and Randolph Road intersection. | | | |
| <p>1. The deceleration and storage lane lengths for the dual NB left-turn lanes appear to be inadequate.</p> | <p>1. Same as Issue B.1.</p> | <p>1. Determine the feasibility and constructability of extending the NB left-turn lanes, per the design standards.</p> | <p>1. The auxiliary lane analysis will be verified.</p> |

| Sheet 21 of 309 | | Roadway Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>D. Vehicular safety at the MD 97 and Sheraton Street intersection.</p> <p>1. NB left from MD 97 onto Sheraton Street is prohibited. However, there are no geometric elements that prohibit these movements.</p> <p>2. All movements are allowed from the driveway on the east side of MD 97.</p> | <p>1. Motorists travelling NB on MD 97 may try to slow down in the inner through lane and attempt to turn left onto Sheraton Street, creating a potential for rear-end and left-turn crashes.</p> <p>2. WB left and through movements may attempt to cross multiple lanes of conflicting and opposing traffic.</p> | <p>1.1./2.1. Determine the feasibility and constructability of extending the median on south leg of the intersection.</p> <p>1.2./2.2. Determine the feasibility and constructability of modifying the island on the west side of MD 97 to allow only SB right-turn movement.</p> <p>1.3./2.3. Determine the feasibility and constructability a median similar to "Maryland T-intersection" that allows WB left-turn movement but prohibits WB through movement.</p> | <p>1.1./2.1. The median on the south leg of the intersection cannot be extended/modified because left turns in and out of shopping center are permitted.</p> <p>1.2./2.2. The island at Sheraton Avenue will be modified to discourage northbound vehicles on MD 97 from attempting to turn left onto Sheraton Avenue.</p> <p>1.3./2.3. The island at Sheraton Avenue will be modified to discourage through movements from the shopping center to Sheraton Avenue. Proposing something similar to a "Maryland T-intersection" is not feasible due to safety concerns associated with the potential of the acceleration lane conflicting with the SB left turn lanes at the intersection of Randolph Road.</p> |

| Sheet 65 of 309 (Phase 1A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>E. Pedestrian safety at the Randolph Road and Judson Road intersection and points east.</p> <p>1. Signs are located within the sidewalk along Judson Road on the north side of Randolph.</p> <p>2. The SW ramp leads to a construction zone.</p> <p>3. At Sta. 21+50 and Sta. 19+75, the bus stops are located in the work zone.</p> | <p>1. The signs create an obstacle within the sidewalk, which could force pedestrians into traffic.</p> <p>2. Pedestrians do not have access to cross Judson Road and access Grandview Avenue.</p> <p>3.1. The waiting areas for bus stops are part of the five foot sidewalk (within the OCF), which may block the sidewalk for pedestrians.</p> <p>3.2. The pedestrians wanting to board the bus may have to traverse the construction zone to reach the bus.</p> | <p>1. Consider relocating the signs off of the sidewalk.</p> <p>2. Consider installing a temporary pedestrian path to cross Judson Road and access Grandview Avenue.</p> <p>3.1./3.2. Consider the feasibility of providing the waiting areas outside the sidewalk and clear access to/from the waiting areas to bus stops.</p> | <p>1. The signs will be located outside the sidewalk.</p> <p>2. The contractor shall maintain pedestrian access though the work zone as noted on the plans and shown on Section A-A Typical on Sheet 65.</p> <p>3.1/3.2 All temporary and permanent bus stops have been coordinated and approved by Montgomery County and WMATA. The changes will be reflected on the PS&E submittal.</p> |
| <p>F. Vehicular safety at the Randolph Road and Judson Road intersection.</p> <p>1. Left and through movement arrows are shown on Judson Road on north and southbound approaches although these movements are currently restricted.</p> | <p>1.1. Allowing currently prohibited movements may create driver confusion in addition to left turn crashes at the intersection.</p> <p>1.2. Allowing left and through movements creates additional conflict points.</p> | <p>1.1./1.2. Consider installing flex posts and/or temporary barriers along Randolph Road to prohibit left turning and through movements from Judson Road.</p> | <p>1. Flex posts were installed as part of the Utility Advance Breakout Project (UABP) and are already part of the existing conditions preventing vehicles from advancing through or turning left from Judson Road. The through and left movement traffic flow arrows shown on the plan will be removed and replaced with right only arrows. The changes will be reflected on the PS&E submittal.</p> |

| Sheet 66 of 309 (Phase 1A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>G. Pedestrian/bicycle safety at the MD 97 and Randolph Road intersection.</p> <p>1. On the east leg of the intersection, the work zone and drum appear to be in the pedestrian crosswalk, across Randolph Road.</p> <p>2. Bus stops in the SE, NE, and NW corners of the intersection are located in the work zone.</p> | <p>1. The work area and drum creates an obstacle within the pedestrian path, which could force pedestrians into traffic.</p> <p>2. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Determine the feasibility of providing pedestrian path through/around the work zone.</p> <p>2. Same as Suggestion E.3.1./E.3.2.</p> | <p>1. The contractor shall maintain pedestrian access though the work zone as noted on the plans. Drum placement is symbolic and will be moved to avoid blocking pedestrians.</p> <p>2. All temporary and permanent bus stops have been coordinated and approved by Montgomery County and WMATA. The changes will be reflected on the PS&E submittal.</p> |

| Sheet 67 of 309 (Phase 1A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>H. Pedestrian safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. Crosswalks are not identified on any of the approaches at this intersection and no connectivity is provided to the bus stops located on the SE and NE corners of the intersection from the north and south, respectively.</p> <p>2. There may not be sufficient space to maintain pedestrian access to the south leg crosswalk when constructing the SE corner ramps.</p> <p>3. Bus stop on the SE corner is located in the work zone.</p> | <p>1. Without marked crosswalks, pedestrians may cross the road mid-block and create additional vehicular-pedestrian conflict points.</p> <p>2. Pedestrians will have to travel through the work zone to access south leg crosswalk.</p> <p>3. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Consider providing marked crosswalks for the appropriate legs of the intersection to maintain accessibility and connectivity to the bus stop.</p> <p>2. Evaluate the feasibility of constructing the ramps in the SE corner in different stages to maintain access to the south leg crosswalk.</p> <p>3. Same as Suggestion E.3.1/E.3.2.</p> | <p>1. Existing and temporary crosswalks will be shown. All temporary and permanent bus stops have been coordinated and approved by Montgomery County and WMATA. The changes will be reflected on the PS&E submittal.</p> <p>2. The contractor shall maintain pedestrian access though the work zone as noted on the plans.</p> <p>3. All temporary and permanent bus stops have been coordinated and approved by Montgomery County and WMATA. The changes will be reflected on the PS&E submittal.</p> |
| <p>I. Vehicular safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. Median on the east leg extends beyond the stop line.</p> | <p>1. Extended median reduces the turning radius for the WB left-turning and U-turning movements and creates potential for rear end and angle collisions.</p> | <p>1.1. Consider installing "Skip" marks to define path for the WB left-turning vehicles.</p> <p>1.2. Consider prohibiting U-turns from the WB approach.</p> | <p>1. The work shown in the median is to replace the existing curbed median with temporary pavement during this phase of construction. The extended median matches existing conditions. In the ultimate conditions, the median nose is pulled back.</p> |

| Sheet 68 of 309 (Phase 1A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| J. Pedestrian safety on the east side of MD 97. | | | |
| <p>1. No sidewalk is identified on the east side of MD 97 between Sta. 109+50 and Sta. 110+00.</p> | <p>1. Pedestrians may walk through the work zone without any protection or walk in the travel lane to get around the work zone.</p> | <p>1. Determine the feasibility of delineating a temporary pedestrian path through the work zone using OCF.</p> | <p>1. The contractor shall maintain pedestrian access through the work zone as noted on the plans.</p> |

| Sheet 69 of 309 (Phase 1A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| K. Vehicular safety along MD 97. | | | |
| <p>1. Access/driveway to McDonalds along NB MD 97 at Sta. 119+00 is in the proposed work zone.</p> <p>2. Same as Observation D.1.</p> <p>3. Same as Observation D.2.</p> <p>4. "Stop" sign is not provided on the EB approach at Sheraton Street.</p> | <p>1. Vehicles will have to travel through the work zone to enter/exit the McDonalds. This may likely create potential vehicular conflicts with the work zone and/or pedestrians.</p> <p>2. Same as Issue D.1.</p> <p>3. Same as Issue D.2.</p> <p>4. Motorists may attempt to enter SB MD 97 without stopping for conflicting traffic.</p> | <p>1. Consider delineating a vehicular path to access McDonald's driveway within the work zone, or providing a detour to an alternate access via the entrance to the shopping center at Sta. 120+50.</p> <p>2. Same as Suggestion D.1.</p> <p>3. Same as Observation D.2.</p> <p>4. Consider installing "Stop" sign on the EB Sheraton Street.</p> | <p>1. Access to the driveway will be delineated with drums and shown on the plan.</p> <p>2. See Response D.1.</p> <p>3. See Response D.2.</p> <p>4. The existing stop sign will be used. Existing signs are not shown on the MOT plans.</p> |
| L. Vehicle safety at the MD 97 and Layhill Road intersection. | | | |
| <p>1. The "Road Work Ahead" sign proposed on the WB approach of Layhill Road intersection appears to be too close to the intersection and may be only on the north side of Layhill Road.</p> | <p>1.1. The drivers may not get adequate advance notice regarding the work zone ahead.</p> <p>1.2. The left-turning vehicles may not be able to see the (Road Work Ahead) sign and may not be prepared adequately for the change in conditions.</p> | <p>1.1. Consider installing the "Road Work Ahead" sign on the WB approach further ahead of the intersection.</p> <p>1.2. Consider installing the "Road Work Ahead" sign in the median for the WB left-turning vehicles.</p> | <p>1.1. A dimension will be provided to offset the sign from the intersection.</p> <p>1.2. A leader will be added to the proposed sign in the median.</p> |

| Sheet 70 of 309 (Phase 1B) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>M. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. Construction activity on the median encroaches into the crosswalk on the east and south legs of the intersection.</p> <p>2. Same as Observation E.3.</p> | <p>1. The work zone is an obstacle within the pedestrian path that limits the useable width of the crosswalk to less than 10' and could force pedestrians into traffic.</p> <p>2. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Determine the feasibility and constructability of cutting the median nose back to maintain a 10' crosswalk, and then continue construction on the median.</p> <p>2. Same as Suggestion 3.1./E.3.2.</p> | <p>1. The contractor shall maintain pedestrian access through the work zone as noted on the plans.</p> <p>2. See Response E.3.1./3.2.</p> |
| <p>N. Vehicle safety at the MD 97 and Randolph Road intersection.</p> <p>1. No temporary skip markings are provided for the WB dual left-turn lanes.</p> | <p>1. Without clear path, WB dual left-turns may create a potential for side swipe crashes.</p> | <p>1. Consider installing skip markings for the WB left-turning movements.</p> | <p>1. Temporary lane extension pavement markings will be added to the plans.</p> |

| Sheet 71 of 309 (Phase 2A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>O. Pedestrian safety at the Judson Road and Randolph Road intersection.</p> <p>1. There is no access for pedestrians across Judson Road on the north side of the intersection.</p> <p>2. At Sta. 21+75, the bus stops are located in the work.</p> <p>3. Same as Observation E.1.</p> | <p>1. Due to closure of Judson Road's north leg, pedestrians may attempt to cross Judson Road at midblock.</p> <p>2. Same as Issue E.3.1. and E.3.2.</p> <p>3. Same as Issue E.1.</p> | <p>1. Determine the feasibility of providing a temporary pedestrian crossing through the work zone, which can be defined by OCF and supplemented by appropriate signage.</p> <p>2. Same as Suggestion E.3.1./3.2.</p> <p>3. Same as Suggestion E.1.</p> | <p>1. The contractor shall maintain pedestrian access through the work zone as noted on the plans.</p> <p>2. See Response E.3.1/3.2</p> <p>3. See Response E.1.</p> |
| <p>P. Vehicular safety at the Randolph Road and Judson Road intersection.</p> <p>1. "Left-turn Prohibition" (R3-2) sign from EB Randolph Road onto Judson Road appears to be placed ahead of the intersection instead of at the intersection.</p> | <p>3. Since the sign is not at the intersection, EB vehicles may attempt to turn left onto Judson Road and may become trapped.</p> | <p>3. Determine the feasibility of relocating the left-turn prohibition sign further east, closer to the Judson Road intersection.</p> | <p>1. The sign will be moved closer to the intersection.</p> |

| Sheet 72 of 309 (Phase 2A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| Q. Pedestrian safety at the MD 97 and Randolph Road intersection. | | | |
| <p>1. The temporary sidewalk on the NE corner of the intersection terminates at a mid-block location.</p> <p>2. No pedestrian detour signage is proposed for accessing Judson Road on the NW corner.</p> <p>3. The sidewalk on the NE corner does not extend around the radius of the curve.</p> <p>4. The ramp and crosswalk on the SE corner crossing the east leg is located approximately 20 feet offset to the east intersection.</p> <p>5. Bus stops on the NE and NW corners are located in the work zone.</p> | <p>1. Pedestrians may attempt to cross MD 97 at the mid-block location instead of at the intersection, creating a potential conflict point with the north- and southbound vehicles travelling on MD 97.</p> <p>2. Without pedestrian detour signage, pedestrians may attempt to cross at an unmarked location and go through the construction zone to reach Judson Road.</p> <p>3. Due to the discontinuity of the sidewalk, it may be difficult for the disabled to access the ramps and may lead pedestrians into the work zone.</p> <p>4. The sight distance for the NB right-turning vehicles may not be adequate to see pedestrians.</p> <p>5. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Consider installing pedestrian detour signage on the NE corner of the intersection directing the pedestrians to/from the crosswalk at the intersection of MD 97 and Randolph Road.</p> <p>2.1. Consider installing "Sidewalk Closed" signs to indicate that the sidewalk along Randolph Road is closed.</p> <p>2.2. Consider installing pedestrian detour signs on the NW corner of the intersection to lead pedestrians to the crossing south of Sheraton Street to access Judson Road.</p> <p>3. Consider extending the sidewalk around the corner.</p> <p>4.1. Consider installing "Turning Traffic Yield to Peds" (R10-15(1)) sign in the SE corner.</p> <p>4.2. Determine the feasibility of limiting right-turn-on-red movements during the peak periods.</p> <p>5. Same as Suggestion E.3.1./E.3.2.</p> | <p>1. Additional signage will be added to discourage midblock crossings.</p> <p>2. Additional signage will be added to detour pedestrians to WB direction.</p> <p>3. Additional construction fence and signs will be added to delineate the pedestrian pathway.</p> <p>4. Moving the ramp and crosswalk closer to the intersection will be investigated.</p> <p>5. See Response E.3.1./3.2.</p> |

| Sheet 73 of 309 (Phase 2A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>R. Pedestrian safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. No pedestrian guidance signage is proposed on the NW corner to detour pedestrians to access Randolph Road crosswalk on the east leg of the intersection.</p> <p>2. Pedestrian path is not delineated through the work zone on the east leg of the intersection.</p> <p>3. The crosswalk on the north leg of the intersection is not aligned with the curb ramp in the NE corner.</p> <p>4. Pedestrian crosswalk on the north leg is too far from the WB right-turning vehicles.</p> <p>5. Bus stop on the NE corner is located in the work zone.</p> | <p>1. Without guidance, pedestrians on the NW corner may attempt to cross Randolph Road on the west leg of the intersection under a potentially unsafe condition.</p> <p>2. Pedestrians may cross into work zone.</p> <p>3. Pedestrians with disabilities may leave the crosswalk to access the pedestrian ramp.</p> <p>4. Due to the curb layout in the NE corner and the location of the stop bar for the WB approach, WB right-turning vehicles may not be aware of the presence of pedestrians in the crosswalk.</p> <p>5. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Consider installing a pedestrian detour with appropriate signage in the NW and NE corner and extend the OCF to the crosswalk.</p> <p>2. Consider delineating the pedestrian path using the OCF.</p> <p>3. Consider relocating crosswalk to align with the curb ramp in the NE corner.</p> <p>4. Consider installing "Watch for Pedestrians" (W11-2) or "Turning Traffic Yield to Peds" (R10-15(1)) signs on the WB approach.</p> <p>5. Same as Suggestion E.3.1./3.2.</p> | <p>1. The construction fence will be extended to the crosswalk.</p> <p>2. The plans will be updated to show the existing crosswalk accessing pedestrian ramps. The contractor shall maintain pedestrian access through the work zone as noted on the plans.</p> <p>3. The plans will be updated to show the crosswalk accessing pedestrian ramps. The contractor shall maintain pedestrian access through the work zone as noted on the plans.</p> <p>4. Additional signs will be added.</p> <p>5. See Response E.3.1./3.2.</p> |
| <p>S. Vehicle safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. Proposed excavation work creates a drop off of > 6 inches in work area.</p> <p>2. The WB through lanes shift slightly through the intersection.</p> <p>3. The median areas on the east and west legs of the intersection are not rounded/closed.</p> | <p>1. Barrels may not provide adequate protection from drop off for vehicles.</p> <p>2. An unexpected shift in lanes may lead to side swipe collisions.</p> <p>3. The NB and SB left-turning vehicles may have difficulty in identifying the travel path without closed/rounded medians.</p> | <p>1. Consider installing temporary concrete barrier.</p> <p>2. Consider installing skip markings through the intersection for the WB through lanes.</p> <p>3. Consider installing hatched bullet nose medians on the east and west legs of the intersection.</p> | <p>1. Standard drop off procedures will be followed by the contractor.</p> <p>2. The shift will be investigated to determine if lane extension markings are necessary.</p> <p>3. Additional markings will be added.</p> |

| Sheet 74 of 309 (Phase 2A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>T. Pedestrian safety at the MD 97 and Mason Street intersection.</p> <p>1. The pedestrian trail is not complete on the NW corner of the intersection.</p> | <p>1. The incomplete pedestrian trail may leave pedestrian stranded inside the work zone.</p> | <p>1. Consider installing "Sidewalk Closed" sign on the NW corner of the intersection to alert pedestrians that the trail is under construction.</p> | <p>1. Additional signage will be added to close the trail to pedestrian traffic until the trail has been completely constructed.</p> |
| <p>U. Vehicular safety north of the MD 97 and Mason Street intersection.</p> <p>1. The "Stop" sign (R1-1) and the "Left Turn Prohibition" (R3-2) signs for the Glenmont Circle driveway are not aligned with the stop bar.</p> <p>2. No Signage restricting left turns from MD 97 onto Glenmont Circle is proposed.</p> | <p>1. Vehicles may stop at the stop bar in front of the Left Turn Prohibition" (R3-2) sign and overlook the prohibited turning movement creating potential conflict points and angle collisions.</p> <p>2. In the absence of a physical barrier during construction, motorists may attempt to turn left onto Glenmont Circle.</p> | <p>1. Determine the feasibility of aligning the stop bar in line with the "Stop" sign (R1-1) and "Left Turn Prohibition" (R3-2) sign or vice versa.</p> <p>2. Consider installing a "No Left Turn" sign on SB MD 97 at its intersection with Glenmont Circle.</p> | <p>1. The location of the sign will be moved.</p> <p>2. Additional signage will be added.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>V. Pedestrian safety at the MD 97 and Sheraton Street intersection.</p> <p>1. Pedestrians do not have advance warning that the sidewalk on the NW corner of MD 97 and Randolph Road intersection is closed.</p> | <p>1. Pedestrians may continue to the MD 97 and Randolph Road intersection attempting to go west and get stranded because the sidewalk is closed. They may attempt to cross the construction zone, since they are unlikely to retrace path.</p> | <p>1. Consider installing appropriate pedestrian detour signs that direct pedestrians to access either Randolph Road or Judson Road via crossing south of Sheraton Street.</p> | <p>1. Additional pedestrian detour signage will be added.</p> |
| <p>W. Vehicular safety at the MD 97 intersections with Sheraton Street and Layhill Road.</p> <p>1. Gore area marking and construction drums on SB MD 97 in front of Sheraton Street goes beyond the corner of the intersection.</p> <p>2. Stop bar and "Stop" sign (R1-1) on WB Sheraton Street are not aligned.</p> <p>3. Same as Observation D.1.</p> <p>4. Same as Observation D.2.</p> <p>5. No advanced signage is proposed at the MD 97 and Layhill Road intersection to guide the WB left-turning vehicles to access Judson Road ramp.</p> | <p>1. EB Right-turning vehicles from Sheraton Street, destined to Randolph Road, may have to travel through the gore area and drums to go south on MD 97.</p> <p>2. Vehicles may stop at the "STOP" sign, which will put them further from the intersection to complete the right turn movement.</p> <p>3. Same as Issue D.1.</p> <p>4. Same as Issue D.2.</p> <p>5. Without advanced signage, vehicles from the inside WB left-turn lane may try to move several lanes and create weaving conflicts, in order to access the Judson Road ramp on SB MD 97.</p> | <p>1. Consider restriping gore area markings to allow a clear path for the EB right-turning vehicles.</p> <p>2. Determine the feasibility of aligning the stop bar in line with the "Stop" sign (R1-1) or vice versa.</p> <p>3. Same as Suggestion D.1.</p> <p>4. Same as Suggestion D.2.</p> <p>5. Consider installing signs for "MD 97 Only" and "Judson Road" with arrows indicating inside and outside left-turn lanes, respectively, from WB Layhill Road.</p> | <p>1. The gore will be modified to allow Sheraton Street access to SB MD 97.</p> <p>2. The location of the sign will be moved.</p> <p>3. See Response D.1.</p> <p>4. See Response D.2.</p> <p>5. Additional signage will be added on MD 182.</p> |

| Sheet 76 of 309 (Phase 2B) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| X. Pedestrian safety at the Randolph Road and Judson Road intersection. | | | |
| 1. No signage is provided on the NE and NW corners to indicate that pedestrian crossings on the north leg of the intersection are not allowed. | 1. Without appropriate signage, pedestrians may walk through the work zone and present a potential conflict in the path of WB free-flow traffic. | 1.1. Consider installing a "Crosswalk Closed" sign on the NE and NW corners of the intersection. 1.2. Consider installing appropriate pedestrian detour signage at the upstream and downstream intersections to avoid this crossing. | 1. The contractor shall maintain pedestrian access through the work zone as noted on the plans. |
| 2. At Sta. 21+75, the bus stops are located in the work. | 2. Same as Issue E.3.1. and E.3.2. | 2. Same as Suggestion E.3.1./E.3.2. | 2. See Response E.3.1./3.2. |
| 3. Same as Observation E.1. | 3. Same as Issue E.1. | 3. Same as Suggestion E.1. | 3. See Response E.1. |
| Y. Vehicular safety at the Randolph Road and Judson Road intersection. | | | |
| 1. The work zone east of the intersection and to the north of the WB access road to Judson Road is not adequately separated from the travel way. | 1. Barriers and/or barrels are not provided to separate the WB access road from the work zone and may allow vehicles to enter the work zone. | 1. Consider installing barriers or barrels to separate WB access road from the work zone. | 1. Additional barrels will be added and standard drop off procedures will be followed by the contractor. |
| 2. The "Turn" advisory (W1-1(R)) sign for the WB right turning traffic appears to be on the north side of the work zone while the travel lane is located on the south side. | 2. The "Turn" advisory sign may not be visible to the WB right-turning drivers due to the presence of work zone between the travel lane and the sign location. | 2. Determine the feasibility of relocating the "Turn" sign closer to the travel lane. | 2. The sign will be relocated. |
| 3. Same as Observation P.1. | 3. Same as Issue P.1. | 3. Same as Suggestion P.1. | 3. See Response P.1. |

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| Observation | Issue | Suggestion | Response |
| Z. Pedestrian safety at the MD 97 and Randolph Road intersection. | | | |
| 1. Same as Observation Q.2. | 1. Same as Issue Q.2. | 1. Same as Suggestion Q.2. | 1. See Response Q.2. |
| 2. Bus stops on the NE and NW corners are located in the work zone. | 2. Same as Issue E.3.1. and E.3.2. | 2. Same as Suggestion E.3.1./3.2. | 2. See Response E.3.1./3.2. |

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| Observation | Issue | Suggestion | Response |
| AA. Pedestrian safety at the Randolph Road and Judson Road intersection. 1. Same as Observation E.1. | 1. Same as Issue E.1. | 1. Same as Suggestion E.1. | 1. See Response E.1. |
| BB. Vehicle safety at the Randolph Road and Judson Road intersection. 1. Same as Observation P.1. | 1. Same as Issue P.1. | 1. Same as Suggestion P.1. | 1. See Response P.1. |

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| Observation | Issue | Suggestion | Response |
| CC. Pedestrian safety at the MD 97 and Randolph Road intersection. 1. No pedestrian warning signage is proposed for the pedestrian crossing across the SB channelized right-turn lane. 2. Phase 3 in the MOT is not consistent with the temporary roadway plans for Phase 3A and Phase 3B. 3. Bus stops on the NW corner are located in the work zone. | 1. Without warning signs, drivers may not be prepared to stop/yield for crossing pedestrians. 2. The north and south median sidewalks are both being constructed in Phase 3A. Pedestrian paths under MOT Phases 3 are not clearly defined. 3. Same as Issue E.3.1. and E.3.2. | 1. Consider installing "Pedestrian Crossing" sign along with a supplemental arrow pointing down at the SB channelized right-turn. 2. Consider the feasibility of constructing the north median first followed by the south median, so pedestrians will have an east/west path through the intersection. 3. Same as Suggestion E.3.1./3.2. | 1. Additional signage will be added. 2. The Sequence of Construction will be revised to clarify the placement and removal of the temporary sidewalk proposed in the median of the MD 97 at the Randolph Road intersection during Phase 3. The contractor shall maintain pedestrian access through the work zone as noted on the plans. 3. See Response E.3.1./3.2. |

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| Observation | Issue | Suggestion | Response |
| DD. Vehicular safety at the Randolph Road and Glenmont Circle intersection. 1. Same as Observation S.1. | 1. Same as Issue S.1. | 1. Same as Suggestion S.1. | 1. See Response S.1. |
| EE. Pedestrian safety at the Randolph Road and Glenmont Circle Intersection. 1. Bus stop on the NE corner is located in the work zone. | 1. Same as Issue E.3.1. and E.3.2. | 1. Same as Suggestion E.3.1./3.2. | 1. See Response E.3.1./3.2. |

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| Observation | Issue | Suggestion | Response |
| FF. Pedestrian safety at the MD 97 and Mason Street intersection. 1. There are no signs to prohibit pedestrian crossings across MD 97 on the north leg which is not open in this phase. | 1. Pedestrians may attempt to cross MD 97 on the north leg without a designated crosswalk. 1.2. Pedestrians that attempt to cross the north leg may have to transverse through the work zone. | 1.1/1.2. Consider installing “No Pedestrian Crossing/Use Crosswalk” sign (R9-3(1)) on the NW and NE corners of the intersection directing pedestrians to the south leg crossing. | 1. There is an existing crosswalk on the south leg of the intersection, but no crosswalk provided on the north leg. The temporary conditions have been designed to match the existing conditions at the Mason Street intersection. Additional channelization devices will be added to close the sidewalk ramp in the NW corner for the north leg crossing. |

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| Observation | Issue | Suggestion | Response |
| GG. Pedestrian safety at the MD 97 and Sheraton Street intersection. 1. There appears to be a curb ramp on the west of MD 97 and south of Sheraton Street, between Sta. 1210+50 and Sta. 1211+00. | 1. The curb ramp may cause pedestrian confusion and encourage potential midblock crossings. | 1. Consider removing this curb ramp. | 1. The plans will be modified to remove this pedestrian ramp in this Phase. |
| HH. Vehicular safety at the MD 97 intersections with Sheraton Street and Layhill Road. 1. No signage restricting left turns from the driveways is proposed at or near Sta. 121+50. 2. Same as Observation W.2. | 1. During construction the existing median will be removed. In the absence of signage, vehicles from the driveways may attempt to make left turns into the conflicting traffic. 2. Same as Issue W.2. | 1. Consider installing “No Left Turn” signs and/or “Right Turn Only” signs and “One Way” signs from the commercial driveways onto MD 97 in lieu of the physical barrier. 2. Same as Suggestion W.2. | 1. Additional signage will be added. 2. See Response W.2. |

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| Observation | Issue | Suggestion | Response |
| II. Pedestrian Safety at the Randolph Road and Judson Road intersection. 1. Same as Observation E.1. | 1. Same as Issue E.1. | 1. Same as Suggestion E.1. | 1. See Response E.1. |
| JJ. Vehicle safety at the Randolph Road and Judson Road intersection. 1. Same as Observation P.1. | 1. Same as Issue P.1. | 1. Same as Suggestion P.1. | 1. See Response P.1. |

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| Observation | Issue | Suggestion | Response |
| <p>KK. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. Sidewalk on the east side of MD 97 and immediately north of Randolph Road between Sta. 114+50 and Sta. 116+00 is not shown constructed prior to Phase 4A.</p> <p>2. Sidewalk and curb ramps shown in the SE corner are not shown constructed prior to Phase 4A.</p> <p>3. The pedestrian crosswalk on the east leg of MD 97 is located far from the SE corner of the intersection.</p> <p>4. Bus stops on the NW corner are located in the work zone.</p> | <p>1./2. These pedestrian facilities are not available for use in Phase 4A as they are shown to be constructed in Phase 4 on Sheet 52 for Temporary Roadway Plan. This leaves pedestrians without these facilities in 4A, which may result in pedestrians being “trapped” in these areas, or traversing the work area or roadway to access the available facilities.</p> <p>3. The location of the pedestrian crosswalk on the east leg of the intersection may not be visible to the NB right turning vehicles.</p> <p>4. Same as Issue E.3.1. and E.3.2.</p> | <p>1./2. Determine the feasibility of constructing pedestrian facilities prior to Phase 4A. The following suggestions are made to provide pedestrian facilities for Phase 4A: - Construct the sidewalk on the east side of MD 97, north of Randolph Road between Sta. 114+50 and Sta. 116+00 before Phase 4A (i.e. during Phase 3, potentially overnight). - Construct a temporary sidewalk on the east side of MD 97, south of Randolph Road. (Remove this temporary sidewalk on the SE corner once the permanent sidewalk is constructed in Phase 4A.)</p> <p>3. Consider the feasibility and constructability of relocating the crosswalk closer to the intersection’s SE corner.</p> <p>4. Same as Suggestion E.3.1./3.2.</p> | <p>1./2. The Sequence of Construction will be revised to clarify the placement and removal of the temporary sidewalk proposed on the east side of MD 97 at the Randolph Road intersection during Phase 4. The contractor shall maintain pedestrian access through the work zone as noted on the plans.</p> <p>3. Moving the ramp and crosswalk closer to the intersection will be investigated.</p> <p>4. See Response E.3.1./3.2.</p> |
| <p>LL. Vehicular safety at the MD 97 and Randolph Road intersection.</p> <p>1. No signage is proposed on WB Randolph Road to prohibit the right-turn movement from the through lane.</p> <p>2. No stop bar is proposed for the channelized WB right turn lane.</p> <p>3. The orientation of the “Do Not Enter” sign on the north side of the WB right-turn ramp appears to be facing SW instead of WB.</p> <p>4. The WB right-turn lane has wide opening onto NB MD 97.</p> | <p>1. WB vehicles may attempt to turn right from the through lane and create additional conflict points.</p> <p>2. Without a stop bar, the WB right-turning vehicles may stop in the pedestrian crosswalk creating an unsafe pedestrian crossing.</p> <p>3. Vehicles travelling SB on MD 97 may not be able to see the “Do Not Enter” sign and may attempt to enter the WB right-turn lane.</p> <p>4.1. WB exiting vehicles may use the wide area as storage and try to make a left-turn.</p> | <p>1. Consider installing No Right Turn (R3-1) signage to prohibit the right-turn movement onto MD 97 from WB through lane.</p> <p>2. Consider installing a stop bar for the WB right-turn lane.</p> <p>3. Consider adjusting the orientation of the “Do Not Enter” sign on the north side of the WB right-turn ramp to face WB.</p> <p>4.1. Consider adjusting the barrel locations on NB MD 97 to reduce the wide opening for the WB and better define the WB right-turn channel.</p> | <p>1. Additional signage will be added.</p> <p>2. Additional markings will be added.</p> <p>3. The angle of the sign will be adjusted.</p> <p>4. The opening will be modified to discourage vehicles from attempting left turns at this location.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>MM. Vehicular safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. No directional signage is proposed for the NB left-turning vehicles (from Glenmont Circle) or the SB right-turning vehicles (from shopping center) to lead them to NB/SB on MD 97 and to WB on Randolph Road.</p> <p>2. No directional signage is proposed along WB Randolph Road to guide motorists to the shopping center and Glenmont Circle.</p> <p>3. No signage is proposed to prohibit WB right-turn movement from the WB through lane at the intersection.</p> | <p>1.\2. Lack of appropriate directional signage may create driver’s confusion and may result in longer travel paths with unintended potential conflict points upstream and downstream of the intersection.</p> <p>3. WB vehicles may attempt to turn right from the through lane and create additional conflict points.</p> | <p>1. Consider installing “North MD 97”, “South MD 97” and “Randolph Road” signs, supplemented by appropriate directional arrows, on both NB and SB approaches of the intersection.</p> <p>2. Consider installing supplemental signs indicating “To Shopping Center” along with the “North MD 97” sign and “To Glenmont Circle” along with “Randolph Road Left 2 Lanes” sign.</p> <p>3. Consider installing “No Right Turn” (R3-1) signage to prohibit the right-turn movement onto MD 97 from WB through lane.</p> | <p>1. Additional signage will be added.</p> <p>2. Modification to sign messages will be discussed with OOTS.</p> <p>3. Additional signage will be added.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>NN. Pedestrian safety at the MD 97 and Mason Street intersection.</p> <p>1. Bus stop is located in the work zone at Sta. 106 +75.</p> <p>2. Same as Observation EE.1.</p> | <p>1. Same as Issue E.3.1. and E.3.2.</p> <p>2. Same as Issue EE.1.</p> | <p>1. Same as Suggestion E.3.1.\E.3.2.</p> <p>2. Same as Suggestion EE.2.</p> | <p>1. See Response E.3.1./3.2.</p> <p>2. See Response EE.1.</p> |
| <p>OO. Vehicular safety at the MD 97 and Glenmont Circle intersection.</p> <p>1. Commercial driveways to the east side of MD 97 are shown as part of the work zone.</p> | <p>1. Access to the commercial driveways from MD 97 is blocked.</p> | <p>1. Consider installing drums or barrels to delineate access to all commercial businesses through the work zone.</p> | <p>1. Access to the driveways will be maintained and shown on the plan.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>PP. Vehicular safety along MD 97 south of Layhill Road.</p> <p>1. Commercial driveways on the east side of MD 97 are shown as part of the work zone.</p> <p>2. The diverge area from NB MD 97 onto Layhill Road NB ramp appears to be short.</p> | <p>1. Access to the commercial driveways from MD 97 is blocked.</p> <p>2. Lack of appropriate guide signs may create driver confusion, sudden lane changes and potential conflict points.</p> | <p>1. Consider installing drums or barrels to delineate commercial driveway.</p> <p>2. Consider installing appropriate guide signs for Layhill Road NB ramp along NB MD 97.</p> | <p>1. Access to the driveways will be maintained and shown on the plan.</p> <p>2. Additional signage will be added.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>QQ. Pedestrian safety on the east side of MD 97.</p> <p>1. Bus stops on the NW corner are located in the work zone.</p> | <p>1. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Same as Suggestion E.3.1./3.2.</p> | <p>1. See Response E.3.1./3.2.</p> |
| <p>RR. Vehicular safety north of the MD 97 and Randolph Road intersection.</p> <p>1. No supplemental arrow for the pedestrian crosswalk in the NW corner is proposed.</p> <p>2. The proposed stop bar for the WB channelized right-turning lane appears to be too close to the edge of NB MD 97.</p> | <p>1. In the absence of the supplemental arrow SB right-turning vehicles may not be able to determine of the location of the pedestrian crosswalk.</p> <p>2. If the WB right-turning vehicles stop too close to the edge of NB MD 97, the NB vehicles on MD 97 may slow down and/or attempt a sudden lane shift. This situation may result in rear-end and/or sideswipe crashes.</p> | <p>1. Consider providing a supplemental warning plaque (W16-7P) with the pedestrian crossing sign.</p> <p>2. Consider installing the stop bar in advance of its proposed location.</p> | <p>1. Additional signage will be added.</p> <p>2. The proposed markings will be revised.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>SS. Pedestrian Safety at the Randolph Road and Judson Road intersection.</p> <p>1. There are no marked crosswalks across either the NB or SB approach of Judson Road and Grandview Avenue.</p> <p>2. Same as Observation E.1.</p> | <p>1. Without marked crosswalks, pedestrians may cross the road in the middle of the block and create additional vehicular-pedestrian conflict points.</p> <p>2. Same as Issue E.1.</p> | <p>1. Consider installing crosswalks across the north leg of Judson Road and the south leg of Grandview Avenue.</p> <p>2. Same as Suggestion E.1.</p> | <p>1. The design matches existing conditions. Crosswalks do not exist at these locations and are not necessary. Therefore, crosswalks will not be proposed.</p> <p>2. See Response E.1.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>TT. Pedestrian Safety at the MD 97 and Randolph Road intersection.</p> <p>1. Sidewalk and curb in the SW corner of the intersection appears to be closed during the same time as the crosswalk on the east leg of MD 97 is being constructed.</p> <p>2. No traffic control sign(s) are proposed for the channelized WB right-turn movement.</p> <p>3. Bus stop on the SE corner is located in the work zone.</p> | <p>1. In order to cross Randolph Road, pedestrians may enter the work zone.</p> <p>2. Lack of traffic control sign(s) may lead to driver confusion regarding the movement rights-of-way and may create potential conflict points.</p> <p>3. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Consider the feasibility of relocating the stop bars and crosswalks on the west and south legs further back and allow the pedestrians to walk around the work zone (OR) determine the feasibility and constructability of installing the sidewalk and curb in the SW corner and on the east leg in the following stages: - Using barriers and/or OCF allow pedestrians to cross Randolph Road on the east side. - Construct a temporary sidewalk in the SW corner. - Open the SW corner curb and sidewalk and then complete the crosswalk on the east leg.</p> <p>2. Consider installing "Yield" or "Merge Area" for the channelized WB right-turn movement.</p> <p>3. Same as Suggestion E.3.1./E.3.2.</p> | <p>1. The east leg crossing will be closed during this stage of construction. The west leg crossing will be utilized.</p> <p>2. In the ultimate conditions, "YIELD" with "NO MERGE AREA" signs (R1-2 and W4-3(1)) are proposed at this location. The plans will be revised to show the signs being installed during this phase.</p> <p>3. See Response E.3.1./3.2.</p> |

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| Observation | Issue | Suggestion | Response |
| UU. Vehicular safety at the Randolph Road and Glenmont Circle intersection. | | | |
| <p>1. The innermost WB through lane becomes “Left Only” lane after crossing the intersection.</p> <p>2. The “Left Lane Must Turn Left AT MD 97” sign (R3-7(1)L) at Sta. 39+50 may be misleading.</p> <p>3. The NB and SB left-turning vehicle paths appear too close.</p> <p>4. “Do Not Enter” sign (R5-1) in the median, on the west leg of the intersection, appears too far inside the work zone.</p> | <p>1. The lack of advance notice may create driver confusion and result in aggressive lane changes on the west leg of the intersection.</p> <p>2. Since the WB left-turn lane ends at Glenmont Circle, this sign may create driver confusion and unsafe lane shifts at the intersection.</p> <p>3. If allowed concurrently, insufficient NB/SB left-turning radii may lead to sideswipe crashes.</p> <p>4. Due to the location of the barricades and potential stopped vehicles in the EB left-turn lane, this sign may not be visible.</p> | <p>1. Consider installing appropriate signage to alert motorists about the change in lane configuration at the downstream intersection.</p> <p>2.1. Consider removing the “Left Lane Must Turn Left At MD 97” sign.</p> <p>2.2. Consider installing “Left Only” (R3-5L) sign along with “Glenmont Circle” sign.</p> <p>3. Consider providing “Split” phases for the NB and SB movements.</p> <p>4. Consider relocating this sign in line with the barricades.</p> | <p>1. Signage will be added to the top of the new retaining wall dividing the at-grade ramps from the depressed lanes of Randolph Road. The signage will clarify the lane usage.</p> <p>2. Modification to sign messages will be discussed with OOTS.</p> <p>3. The signal phasing will be revised to include Side Street Split Phasing.</p> <p>4. The sign will be located per M.U.T.C.D. standards.</p> |

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| Observation | Issue | Suggestion | Response |
| VV. Pedestrian Safety at MD 97 and Mason Street intersection. | | | |
| <p>1. Same as Observation FF.1.</p> | <p>1. Same as Issue FF.1.</p> | <p>1. Same as Suggestion FF.1</p> | <p>1. See Response FF.1.</p> |

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| Observation | Issue | Suggestion | Response |
| WW. Pedestrian safety at the Randolph Road and Layhill Road intersection. | | | |
| <p>1. No pedestrian crossing is designated across the channelized NB right-turn lane from MD 97.</p> | <p>1. Without a designated crossing, pedestrians cross the NB right-turning lane under potentially unsafe conditions.</p> | <p>1. Consider installing pedestrian crossing across NB channelized right-turn lane, along with appropriate signage and pedestrian ramps.</p> | <p>1. Additional markings will be added.</p> |

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| Observation | Issue | Suggestion | Response |
| XX. Pedestrian Safety at the Randolph Road and Judson Road intersection. | | | |
| 1. Same as Observation E.1. | 1. Same as Issue E.1. | 1. Same as Suggestion E.1. | 1. See Response E.1. |
| YY. Vehicular safety on Randolph Road. | | | |
| 1. Length of merging taper along EB Randolph Road from Sta. 16+00 to Sta. 18+00 appears to be inadequate. | 1. Insufficient merging taper may contribute to rear end and sideswipe crashes during peak periods. | 1. Determine the feasibility of providing adequate length for merging taper. | 1. A sufficient taper length for the merging lanes will be provided. |
| 2. The taper and deceleration lengths for the dual left turn lanes on EB Randolph Road from Sta. 1004+00 to Sta. 1005+00 appear to be inadequate. | 2. Inadequate taper and deceleration lengths for the turn lanes may contribute to rear end and sideswipe crashes during peak periods. | 2. Determine the feasibility of providing adequate taper and deceleration lengths for the EBL turn lanes. | 2. The auxiliary lane analysis will be verified and a sufficient taper length for the left turn lanes will be provided. |
| 3. The "Reverse Curve" sign (W1-4L) is depicting a left reverse curve where the roadway is a right reverse curve. | 3. The sign may be misleading and may lead to sideswipe collisions. | 3. Propose the correct "Reverse Curve" Sign (W1-4R) to reflect the geometry of the road. | 3. The curve signing will be re-evaluated and updated as necessary. |

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| Observation | Issue | Suggestion | Response |
| ZZ. Pedestrian safety at the MD 97 and Randolph Road intersection. | | | |
| <p>1. Sign posts are located within the island and ramps on the NE and SE corners.</p> <p>2. An island on the west leg appears to be constructed in phase 5B, which was not identified on previous phases.</p> <p>3. No delineation is proposed for the pedestrian path through the medians on the east and west legs of the intersection.</p> <p>4. Bus stop on the SE corner is located in the work zone.</p> | <p>1. These signs create an obstacle in the pedestrian paths.</p> <p>2. Access to sidewalks and crosswalk on the NW and SW corners and on west leg will not be available at the same time as the construction of the median on east leg.</p> <p>3. Due to the lack of defined paths, pedestrians may cross into the work area.</p> <p>4. Same as Issue E.3.1. and E.3.2.</p> | <p>1. Consider the feasibility of relocating the signs outside of the pedestrian paths.</p> <p>2.1. Determine the feasibility and constructability of medians on the east and west legs in the following stages: - Using barriers and/or OCF allow pedestrians to cross Randolph Road on the east side. - Construct sidewalk and crosswalk on the NW and SW corners corner and west median. - Open the NW and SW corners and west leg for pedestrian crossing and construct the median on the east leg.</p> <p>2.2. Consider installing signage that states sidewalks and crosswalk are closed during appropriate locations corresponding to the construction phases supplemented by pedestrian detour signs.</p> <p>3. Consider providing temporary pedestrian paths on the east and west medians using OCF.</p> <p>4. Same as Suggestion E.3.1./3.2.</p> | <p>1. These signs will be removed from the plan.</p> <p>2. The west leg crossing is closed during this phase of construction. The proposed crosswalk will be removed from the plans for the PS&E submittal. The east leg crossing will be utilized by all pedestrians crossing Randolph Road at the MD 97 intersection during this phase.</p> <p>3. The west leg crossing is closed during this stage of construction. The proposed crosswalk will be removed from the plans for the PS&E submittal. The east leg crossing will utilize the ultimate sidewalk and ramp condition.</p> <p>4. See Response E.3.1./3.2.</p> |
| AAA. Vehicular safety at the MD 97 and Randolph Road intersection. | | | |
| <p>1. The temporary concrete barrier starting at Sta. 1014+00 appears to have no crash cushion.</p> <p>2. Skip marks to guide the NB and SB left-turning vehicles through the intersection overlap each other.</p> | <p>1. There may be no protection for the vehicles from hitting the beginning of the temporary concrete barrier.</p> <p>2. While running concurrently, NB and SB left-turning vehicles may result in angle collisions.</p> | <p>1. Consider installing an impact attenuator at the beginning of the temporary concrete barrier.</p> <p>2. Determine the feasibility of eliminating concurrent NB/SB left-turn phasing.</p> | <p>1. A crash attenuator will be added to the plans.</p> <p>2. The signal phasing will be revised to be lead-lag left turns for MD 97 and Randolph Road.</p> |

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| Observation | Issue | Suggestion | Response |
| BBB. Vehicular safety at the MD 97 and Glenmont Circle intersection. 1. Work zone on the west leg is not adequately protected. | 1. Vehicles may enter the work zone. | 1. Consider installing an additional Type 3 barricade along with a "Do Not Enter" sign. | 1. Standard drop off procedures will be followed by the contractor. |

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| Observation | Issue | Suggestion | Response |
| CCC. Pedestrian Safety at the Randolph Road and Judson Road intersection. 1. Same as Observation E.1. | 1. Same as Issue E.1. | 1. Same as Suggestion E.1. | 1. See Response E.1. |
| DDD. Vehicular safety at the Randolph Road and Judson Road intersection. 1. No guide signs are provided for the vehicles approaching the tunnel to access MD 97 and Randolph Road. | 1. Lack of appropriate guide signs may create driver confusion, sudden lane changes and potential conflict points. | 1. Consider installing "To Randolph Road" and "To MD 97" signs along appropriate EB Randolph Road lanes. | 1. The Sequence of Construction calls for the installation of the ultimate cantilever structures with guide signs during this phase. |

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| Observation | Issue | Suggestion | Response |
| EEE. Pedestrian safety at the MD 97 and Randolph Road intersection. 1. Same as Observation ZZ.3. 2. Same as Observation TT.1. | 1. Same as Issue ZZ.3. 2. Same as Issue TT.1. | 1. Same as Suggestion ZZ.3. 2. Same as Suggestion TT.1. | 1. See Response ZZ.3. 2. See Response TT.1. |
| FFF. Vehicle safety at the MD 97 and Randolph Road intersection. 1. Same as Observation AAA.2. 2. Proposed excavation work creates a drop off of about 18 inches. | 1. Same as Issue AAA.2. 2. Barrels may not provide adequate protection from drop off for vehicles. | 1. Same as Suggestion AAA.2. 2. Consider installing temporary concrete barrier. | 1. See Response AAA.2. 2. Standard drop off procedures will be followed by the contractor. |

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| Observation | Issue | Suggestion | Response |
| <p>GGG. Vehicle safety along Randolph Road.</p> <p>1. There are no pavement markings or physical barriers to prevent vehicles from entering diverging area on the east leg.</p> | <p>1. Lack of standard marking or physical barriers may reduce visibility of the diverge area separating the travel lanes.</p> | <p>1. Consider installing barrels and/or Type 3 barricades at the beginning of the diverging area, or pavement markings throughout the diverge area.</p> | <p>1. Additional barrels will be added.</p> |

| Sheet <u>102</u> of 309 (Phase 6B) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>HHH. Pedestrian safety at the Randolph Road and Judson Road intersection.</p> <p>1. No safety measures are proposed for pedestrians crossing Randolph Road at the beginning of the work zone around Sta. 17+00.</p> <p>2. Same as Observation E.1.</p> | <p>1. In the absence of any physical restriction, pedestrians may attempt to cross Randolph Road at the beginning of the work zone at unmarked location.</p> <p>2. Same as Issue E.1.</p> | <p>1. Determine the feasibility and constructability of installing temporary pedestrian-actuated beacons (i.e., HIBs) approaching Livingston Street based on the anticipated increase in the use of existing crossing and alert motorists in advance of the potential pedestrian presence.</p> <p>2. Same as Suggestion E.1.</p> | <p>1. The proposed conditions match the existing conditions, providing crosswalks at the MD 97 and Livingston Road intersections without designated crossings in between. Therefore, an increase in use of the existing crosswalk at Livingston Road is not anticipated and no additional safety measures will be proposed.</p> <p>2. See Response E.1.</p> |

| Sheet 103 of 309 (Phase 6B) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>III. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. Sidewalks on the SE and SW corners are included in the work zone at the same time.</p> <p>2. Crosswalk across the EB right-turn lane appears close to the intersection.</p> | <p>1. Including sidewalks in the work zone on both SE and SW corners at the same time may limit the pedestrian access crossing MD 97.</p> <p>2. The eastbound right-turning motorists may have to look to their left for the southbound through vehicles and also watch out for the crossing pedestrians at the same time.</p> | <p>1.1. Consider constructing the island in the SE corner of the intersection and re-routing pedestrians to the SW corner followed by constructing the sidewalk in the SW corner and re-routing the pedestrians to the SE corner or vice versa.</p> <p>1.2. Consider identifying details of how the pedestrian path will be maintained during this phase.</p> <p>2. Determine the feasibility of making the movement stop controlled and relocating the stop bar further back from the proposed location.</p> | <p>1. The contractor shall maintain pedestrian access through the work zone as noted on the plans.</p> <p>2. The crosswalk was aligned to provide pedestrians the most direct pathway adjacent to MD 97.</p> |
| <p>III. Vehicular safety at the MD 97 and Randolph Road intersection.</p> <p>1. Skip marks for the SB single left-turn lanes are not shown on the plan.</p> | <p>1. Drivers might turn into oncoming traffic since there is a large median present.</p> | <p>1. Consider installing skip marks for the SB left-turning movements.</p> | <p>1. Additional markings will be added.</p> |

| Sheet <u>104</u> of 309 (Phase 6B) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| KKK. Vehicular safety at the Randolph Road and Glenmont Circle intersection. 1. The WB left-turn movement is aligned with the EB through movement. | 1. The alignment could cause head on or sideswipe collisions. | 1. Consider the feasibility of reducing the width of the diverging gore area and shifting the WB left-turn lane to the north. | 1. The eastbound through movement is not aligned with the westbound left turn lane. Additional markings will be added to the plans to clearly delineate the through lane through the intersection. |

SUMMARY OF FINDINGS AND POTENTIAL IMPROVEMENT SUGGESTIONS

| Sheet <u>106</u> of 309 (Phase 7A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| LLL. Pedestrian safety at the MD 97 and Randolph Road intersection. 1. Island on the NE corner and sidewalk on the NW corner are being constructed at the same time. | 1. Parallel construction in the NE and NW corners may limit the pedestrian accessibility on the north side of the intersection. | 1.1. Consider constructing the island in the NE corner of the intersection and re-routing pedestrians to the NW corner followed by constructing the sidewalk in the NW corner and re-routing the pedestrians to the NE corner or vice versa. 1.2. Consider identifying details of how the pedestrian path will be maintained during this phase. | 1. The contractor shall maintain pedestrian access through the work zone as noted on the plans. |

| Sheet <u>108</u> of 309 (Phase 7A) | | Maintenance of Traffic Plan | |
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| Observation | Issue | Suggestion | Response |
| MMM. Pedestrian safety at the Randolph Road and Judson Road intersection. 1. No sidewalk closed sign or a pedestrian path is proposed through the work zone on the NW corner of the intersection. 2. Same as Observation E.1. | 1. Pedestrians may walk along the road or enter the work zone. 2. Same as Issue E.1. | 1. Consider the feasibility of installing a pedestrian path using OCF through the work zone. 2. Same as Suggestion E.1. | 1. The contractor shall maintain pedestrian access through the work zone will be noted on the plans. 2. See Response E.1. |

| Sheet <u>164</u> of 309 (Phase 2A) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>NNN. Pedestrian Safety at the MD 97 & Randolph Road Intersection.</p> <p>1. Pedestrian signal heads are either bagged or removed in this phase.</p> | <p>1. Absence of the pedestrian signal heads may confuse pedestrians (particularly in the NE corner where traffic signal heads are far away) as to when to proceed across the intersection.</p> | <p>1.1. Determine the feasibility of installing temporary pedestrian signal heads and retaining pedestrian phasing.</p> <p>1.2. Determine the feasibility and constructability of passive pedestrian detection (video, microwave, etc.), if pushbuttons cannot be provided.</p> <p>1.3. Consider the feasibility of community outreach program prior to the construction.</p> | <p>1. The signal equipment in Phase 2A is installed in the beginning of the phase and will be operational. The remaining pedestrian equipment is installed after the traffic is shifted for Phase 2A. The sequence of construction will clarify this.</p> |
| <p>OOO. Vehicle safety at the MD 97 and Randolph Road intersection.</p> <p>1. Only one near sided three section signal head for through movements is provided on all approaches.</p> <p>2. The stop bar orientation for Randolph Road EB, WB and SB MD 97 (due to the curvature of the road) seems to block the line of sight for right-turning vehicles.</p> | <p>1. Because of the curvature of the road and the distance of the signal heads from the opposing intersection approaches, one near sided signal head may not be adequate.</p> <p>2. Vehicles may not have adequate visibility to safely complete the turning maneuver.</p> | <p>1. Consider installing a second near side signal head for through movements on all approaches.</p> <p>2. Consider the feasibility of prohibiting Right-Turn-On-Red for Randolph Road EB, WB and SB MD 97.</p> | <p>1. Adding additional signal heads will be discussed with OOTS.</p> <p>2. The intersection sight distance will be analyzed. Determination if "Right Turn on Red" shall be permitted will be discussed with OOTS.</p> |

| Sheet <u>166</u> of 309 (Phase 2B) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>PPP. Pedestrian Safety at the MD 97 & Randolph Road Intersection.</p> <p>1. Existing signal pole in the SE corner appears to encroach into the sidewalk.</p> | <p>1. Signal pole may obstruct the pedestrian path.</p> | <p>1. Determine the feasibility and constructability of relocating the signal pole outside of the sidewalk.</p> | <p>1. The signal pole will be located to avoid conflicts with the sidewalk.</p> |
| <p>QQQ. Vehicle safety at the MD 97 and Randolph Road intersection.</p> <p>1. Same as Observation OOO.1.</p> <p>2. Same as Observation OOO.2.</p> | <p>1. Same as Issue OOO.1.</p> <p>2. Same as Issue OOO.2.</p> | <p>1. Same as Suggestion OOO.1.</p> <p>2. Same as Suggestion OOO.2.</p> | <p>1. See Response OOO.1.</p> <p>2. See Response OOO.2.</p> |

| Sheet 168 of 309 (Phase 3) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>RRR. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. Pushbutton on the north median is behind concrete barrier.</p> | <p>1. Due to the location of the push button behind the concrete barrier, disabled persons may not be able to actuate pushbutton.</p> | <p>1. Determine the feasibility and constructability of relocating the pushbutton outside of the concrete barrier.</p> | <p>1. The pushbutton's location will be coordinated with the concrete barrier to ensure it is accessible.</p> |
| <p>SSS. Vehicle Safety at the MD 97 and Randolph Road intersection.</p> <p>1. NB and SB left-turning radius appears to be limited while showing concurrent phasing.</p> <p>2. The construction barrier on the north leg seems to block the line of sight for SB right-turning vehicles.</p> | <p>1. The constrained geometry of the intersection may not give adequate separation distance to run the NB and SB left-turn phases concurrently without the possibility of angle collisions.</p> <p>2. Same as Issue OOO.2.</p> | <p>1. Determine the feasibility of eliminating concurrent phasing for the NB/SB left turns.</p> <p>2. Consider the feasibility of prohibiting Right-Turn-On-Red for MD 97 SB.</p> | <p>1. The feasibility of concurrent left turns will be evaluated and the signal phasing will be adjusted if needed.</p> <p>2. See Response OOO.2.</p> |

| Sheet 170 of 309 (Phase 4) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>TTT. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. The proposed pushbutton on the SE corner is in the center of the pedestrian path.</p> <p>2. The pedestrian signal head in the SE corner for the east leg crosswalk is not oriented in the direction of pedestrians crossing from the NE corner.</p> | <p>1. Pushbutton pedestal may be an obstacle in the pedestrian path (OCF) and may force pedestrians into the work zone.</p> <p>2. The orientation of the signal head may not be seen by pedestrians who are trying to cross the street.</p> | <p>1. Determine the feasibility of relocating pushbutton outside of the pedestrian path.</p> <p>2. Consider rotating the signal head, so pedestrians in the NE corner can see the signal.</p> | <p>1. The pushbutton's location will be coordinated to avoid obstruction with the pedestrian path.</p> <p>2. The pedestrian signal head will be angled in the direction the pedestrians are crossing in conjunction with Response KK.3.</p> |
| <p>UUU. Vehicle safety at the MD 97 and Randolph Road intersection.</p> <p>1. Same as Observation SSS.1.</p> <p>2. The construction barrier on the north leg seems to block the line of sight for SB right-turning vehicles.</p> | <p>1. Same as Issue SSS.1.</p> <p>2. Same as Issue OOO.2.</p> | <p>1. Same as suggestion SSS.1.</p> <p>2. Consider the feasibility of prohibiting Right-Turn-On-Red for MD 97 SB.</p> | <p>1. See Response SSS.1.</p> <p>2. See Response OOO.2.</p> |

| Sheet 172 of 309 (Phase 5) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| VVV. Pedestrian safety at the MD 97 and Randolph Road intersection. 1. Pedestrian signal heads are not provided on the corners of the medians on the east and west legs of the intersection. | 1. It may be difficult for the pedestrians to cross Randolph Road without pedestrian signal heads in the median. | 1. Consider the feasibility of installing pedestrian signal heads and pushbuttons on the corners of the east and west medians. | 1. Special Note 1 provides clarification on the plan. |
| WWW. Vehicle Safety at the MD 97 and Randolph Road intersection. 1. Same as Observation SSS.1. 2. Same as Observation OOO.2. | 1. Same as Issue SSS.1. 2. Same as Issue OOO.2. | 1. Same as Suggestion SSS.1. 2. Same as Suggestion OOO.2. | 1. See Response SSS.1. 2. See Response OOO.2. |

| Sheet 174 of 309 (Phase 6A) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| XXX. Pedestrian safety at the MD 97 and Randolph Road intersection. 1. Same as Observation TTT.1. | 1. Same as Issue TTT.1. | 1. Same as Suggestion TTT.1. | 1. See Response TTT.1. |
| YYY. Vehicle safety at the MD 97 and Randolph Road intersection. 1. Same as Observation SSS.1. 2. Same as Observation SSS.2. | 1. Same as Issue SSS.1. 2. Same as Issue SSS.2. | 1. Same as Suggestion SSS.1. 2. Same as Suggestion SSS.2. | 1. See Response SSS.1. 2. See Response SSS.2. |

| Sheet 176 of 309 (Phase 6B) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>ZZZ. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. Pedestrian pushbuttons on the NE and SW corner islands are not separated by 10 feet.</p> <p>2. Pedestrian pushbuttons located in the east median face away from the intersection.</p> <p>3. The mast arm pole in the south median is unprotected.</p> <p>4. Pedestrian pushbutton pole on the SW corner island is close to the pedestrian path.</p> | <p>1. The audible pedestrian pushbuttons closer than 10' may confuse and misguide blind pedestrians.</p> <p>2. It may be difficult to the pedestrians who use wheelchairs to maneuver and access pushbuttons facing away from the intersection.</p> <p>3. The unprotected mast arm in the median may cause safety issue for both the pedestrians and vehicles.</p> <p>4. The pedestrian pushbutton pole may create an obstacle in the pedestrian path.</p> | <p>1. Determine the feasibility of moving pushbuttons to be at least 10' apart.</p> <p>2. Consider the feasibility of moving pushbuttons so that they face the intersection.</p> <p>3. Consider the feasibility of providing barrier around the pedestal pole.</p> <p>4. Consider the feasibility of relocating the pedestrian pushbutton pole to an appropriate location.</p> | <p>1. The ultimate locations will be revised to provide the minimum 10 ft. separation between pushbuttons.</p> <p>2. The pushbuttons will be relocated to face the intersection.</p> <p>3. The ultimate curb will be constructed prior to the signal pole installation. The location of the mast arm will be verified to ensure its placement meets current SHA standards.</p> <p>4. The pushbutton's location will be coordinated to avoid obstruction with the pedestrian path, but maintain accessibility.</p> |

| Sheet 178 of 309 (Phase 7) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>AAAA. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. Same as Observation ZZZ.2.</p> | <p>1. Same as Issue ZZZ.2.</p> | <p>1. Same as Suggestion ZZZ.2.</p> | <p>1. See Response ZZZ.2.</p> |
| <p>BBBB. Vehicular safety at the MD 97 and Randolph Road intersection.</p> <p>1. There is a mast arm pole in the median on the north and south legs of the intersection.</p> | <p>1. Adequate clearance may not be provided on both sides of the mast arm pole which may cause safety concerns for the vehicles.</p> | <p>1. Consider the feasibility of adding protection around the signal pole.</p> | <p>1. The location of the mast arm will be verified to ensure its placement meets current SHA standards.</p> |

| Sheet <u>180</u> of 309 (Phase 1) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| CCCC. Pedestrian safety at the Randolph Road and Glenmont Circle intersection. 1. Pedestal pole in the SE corner is within the ramps. | 1. The pedestal pole is an obstacle to the pedestrian in the SW corner. | 1. Consider the feasibility of relocating the pedestal pole to an appropriate location. | 1. The pushbutton's location will be coordinated to avoid obstruction with the pedestrian path. |

| Sheet <u>184</u> of 309 (Phase 4) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| DDDD. Vehicle safety at the Randolph Road and Glenmont Circle intersection. 1. Concurrent phasing is proposed for the side-street traffic. | 1. Left turning vehicles from the side streets have limited turning radius and concurrent phasing may cause sideswipe crashes. | 1. Consider the feasibility of providing split phasing for the side-street traffic to reduce the potential for left-turn conflicts. | 1. The signal phasing will be revised to include Side Street Split Phasing. |

| Sheet <u>186</u> of 309 (Phase 5) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| EEEE. Vehicle safety at the Randolph Road and Glenmont Circle intersection. 1. Same as Observation CCCC.1. | 1. Same as Issue CCCC.1. | 1. Same as Suggestion CCCC.1. | 1. See Response CCCC.1. |

| Sheet <u>188</u> of 309 (Phase 6) | | Temporary Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| FFFF. Vehicle safety at the Randolph Road and Glenmont Circle intersection. 1. There is an east bound "No Right Turn" (Sign 22) is proposed for the EB through lane. 2. Same as Observation CCCC.1. | 1. Sign may confuse vehicles making EB left-turning and through movement. 2. Same Issue CCCC.1. | 1. Consider installing positive guidance, using "Through Only" (R3-5a) sign instead of "No Right Turn" sign. 2. Same as Suggestion CCCC.1. | 1. Proposed signage will be reviewed for conformance with the Manual on Uniform Traffic Control Devices (MUTCD). 2. See Response CCCC.1. |

| Sheet 203 of 309 | | Landscape Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>GGGG. Vehicle safety on Randolph Road.</p> <p>1. The tree placement along the north and south sides of Randolph Road appear to be in close proximity to the roadway.</p> | <p>1.1. Given the proportion of large vehicles along this roadway, tree branches may be struck by trucks and buses, potentially leading to sudden avoidance maneuvers and/or roadway debris.</p> <p>1.2. As trees mature, sight distance may be limited for motorists from SB Judson Road, NB Grandview Avenue, and various residential driveways.</p> | <p>1.1.a./1.2.a. Consider installing appropriate species of trees and foliage.</p> <p>1.1.b/1.2.b. Consider evaluating the impact of the proposed trees on the line of sight at full maturity.</p> <p>1.2.c. Consider the feasibility of relocation (or removal) of the proposed trees to promote adequate visibility and to avoid interference with large vehicles.</p> | <p>1. Tree placement and selection will be reviewed for conformance with the MDSHA's Landscape Design Guide. Sight distances will be reviewed to verify the minimum criteria is met for the roadway's design speed.</p> |

| Sheet 204 of 309 | | Landscape Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>HHHH. Pedestrian safety on MD 97.</p> <p>1. The plant selection for the medians appears to be not appropriate.</p> <p>2. Trees are proposed on all approaches, and in particular south side of Randolph Road between Sta 24+50 and Sta 25+50, north side of Randolph Road between Sta 28+50 to Sta 30+00, and near the driveway at Sta 30+00.</p> | <p>1. The plant selection may not discourage pedestrian crossing MD 97 at the mid-block locations.</p> <p>2. As the trees mature, they may limit the sight distance for pedestrians crossing from the NE, SE and SW corners of the intersection and also vehicular sight distance at the driveway near Sta 30+00.</p> | <p>1.1. Consider installing measures to help plants reach full maturity (i.e. fencing) and to discourage pedestrian crossings.</p> <p>1.2. Consider installing a median that is designed (i.e., sloping, rounded curb) to discourage mid-block pedestrian crossings.</p> <p>1.3. Consider installing continuous planter boxes along the east and west sides of MD 97 to discourage mid-block pedestrian crossings.</p> <p>2.1. Evaluate the impact of the proposed trees on the sight distance at full maturity.</p> <p>2.2. Consider the selection of the appropriate species of trees and foliage.</p> <p>2.3. Consider the relocation (or removal) of the proposed trees to promote longer sight distance.</p> | <p>1. Plant selection for the medians will be reviewed for conformance with the MDSHA's Landscape Design Guide.</p> <p>2. Sight distances will be reviewed to verify the minimum criteria is met for the roadway's design speed.</p> |

| Sheet <u>205</u> of 309 | | Landscape Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>III. Pedestrian safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. Median on Randolph Road east of Glenmont Circle is not designed to discourage pedestrian crossings at the mid-block.</p> | <p>1. The median along Randolph Road east of Glenmont Circle may be used as a refuge area by pedestrians crossing at mid-block location.</p> | <p>1.1. Consider installing measures to help plants reach full maturity (i.e. fencing) and to discourage pedestrian crossings.</p> <p>1.2. Consider installing a median that is designed (i.e., sloping, rounded curb) to discourage mid-block pedestrian crossings.</p> <p>1.3. Consider installing continuous planter boxes along the north and south sides of Randolph Road to discourage mid-block pedestrian crossings.</p> | <p>1. The medians have been designed to be consistent with the existing conditions and the sections of roadway immediately adjacent to the limits of work. The median design at these locations will not be changed.</p> |
| <p>III. Vehicle safety on Randolph Road.</p> <p>1. Same as Observation GGGG.1.</p> | <p>1. Same as Issue GGGG.1.1. and GGGG.1.2.</p> | <p>1. Same as Suggestions GGGG.1.1.a./1.2.a., 1.1.b./1.2.b., and 1.2.c.</p> | <p>1. See Response GGGG.1.</p> |

| Sheet <u>206/207</u> of 309 | | Landscape Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>KKKK. Vehicle and pedestrian safety on MD 97.</p> <p>1. Trees are proposed along the median on MD 97 on sheet 206 between Sta. 109+00 and Sta. 110+50 and on sheet 207 between Sta. 119+00 and Sta. 123+50.</p> <p>2. Trees along the east and west sides of MD 97 are proposed to be placed in close proximity to the roadway.</p> | <p>1.1. The proposed signage between Sta. 109+00 and Sta. 110+50 may be blocked by foliage, obstructing pertinent information from view for various modes.</p> <p>1.2. Trees and plants may not discourage pedestrian crossings until they are fully mature.</p> <p>2. Given the proportion of large vehicles along this roadway, trees may be struck by trucks, potentially leading to sudden avoidance maneuvers and/or roadway debris.</p> | <p>1.1.a. Consider evaluating the impact of the proposed trees on visibility at full maturity.</p> <p>1.1.b./1.2.a. Consider the selection of appropriate species of trees and foliage for clear visibility of the proposed signage as well as to discourage pedestrians from using median as the refuge area for crossing mid-block.</p> <p>1.2.b. Consider installing measures to help plants reach full maturity (i.e. fencing) and to discourage pedestrian crossings.</p> <p>2.1. Consider the selection of appropriate species of trees and foliage.</p> <p>2.2. Consider the feasibility of relocation (or removal) of the proposed trees to avoid interference with large vehicles.</p> | <p>1. Sight distances will be reviewed to verify the minimum criteria is met for the roadway's design speed.</p> <p>2. Tree placement and selection will be reviewed for conformance with the MDSA's Landscape Design Guide.</p> |

| Sheet 280 of 309 | | Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>LLLL. Vehicular safety at the MD 97 and Randolph Road intersection.</p> <p>1. One of the two EB and WB receiving lanes is a "Right Only" lane.</p> <p>2. Near side signal on the south median is incorrectly labeled.</p> | <p>1. NB and SB left-turning vehicles may not be aware of the "Right Only" lane and may create weaving conflicts.</p> <p>2. Incorrect signal heads may lead to driver confusion and vehicular conflicts.</p> | <p>1. Consider installing "Judson Road" and "Glenmont Circle" to the NB and SB outside left-turn lane assignment signs, respectively.</p> <p>2. Consider updating the "Existing Signals To Remain" legend on the sheet to correctly identify the signal head (#1) on the south median.</p> | <p>1. Proposed signage will be reviewed for conformance with the Manual on Uniform Traffic Control Devices (MUTCD).</p> <p>2. The signal head labels will corrected.</p> |
| <p>MMMM. Pedestrian safety at MD 97 and Randolph Road intersection.</p> <p>1. The pedestrian crossing distances for both Randolph Road and Georgia Avenue appear to be long.</p> <p>2. The proposed median ramp located on Randolph Road east leg for crossing WB Randolph Road is located too close to the corner parapet wall/ pilaster.</p> | <p>1. Longer crossing distances require longer pedestrian phase times. If timings are not adequate, pedestrians may not be able to clear the intersection safely.</p> <p>2. Pedestrians may not be able to fully access the ramp and may cross the road outside of the crosswalk.</p> | <p>1. Consider evaluating the ability to provide adequate phase timings to allow pedestrians to safely clear the intersection.</p> <p>2. Determine the feasibility and constructability of moving the median ramp in question to the west and realigning the crosswalk and stop bar.</p> | <p>1. Throughout the various stages of construction, adequate timing for the pedestrian clearances will be determined by Montgomery County prior to installation of each signal.</p> <p>2. The pedestrian ramp will be modified.</p> |

| Sheet 282 of 309 | | Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>NNNN. Pedestrian/bicycle safety at the MD 97 and Layhill Road/Judson Road intersection.</p> <p>1. The cut through in the north leg median of MD 97 appears to be oriented at a different angle than the north leg crosswalk.</p> <p>2. The proposed island geometry in the SE corner of the intersection may not be adequate to slow down the northbound traffic turning right onto eastbound Layhill Road.</p> <p>3. There are no pedestrian crossing signs on the NE corner of the intersection for the WB to NB channelized right-turn movement.</p> | <p>1. Disabled pedestrians using the north leg crosswalk may be misdirected into traffic by the cut through.</p> <p>2. The ability of vehicles to maintain relatively high speeds at the pedestrian crossing between the curb ramp and the island may cause an unsafe situation for crossing pedestrians.</p> <p>3. WB right-turning vehicles from Layhill Road onto NB MD 97 may not yield/stop for the crossing pedestrians.</p> | <p>1. Determine the feasibility and constructability of turning the refuge area to go parallel with the pedestrian crosswalk.</p> <p>2.1. Determine the feasibility and constructability of increasing the size and/or revising the geometry of the island to reduce speeds for the NB right-turning vehicles.</p> <p>2.2. Consider installing supplemental Pedestrian Crossing (W11-2) warning sign with downward sloping arrow plaque (W16-7P) at the crosswalk location.</p> <p>3. Consider installing pedestrian crossing signs with a directional arrow (W16-7P) signs.</p> | <p>1. The cut through will be angled to parallel the direction of the crosswalk.</p> <p>2.1. The geometry of the island has been designed to be consistent with the existing conditions. The island will not be changed.</p> <p>2.2. The existing signs will be removed and new signs installed to the south.</p> <p>3. Additional signage will be added.</p> |

| Sheet 284 of 309 | | Traffic Signal Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>OOOO. Vehicular safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. EB and WB u-turn radii appears to be limited.</p> <p>2. Same as Observation CCCC.1.</p> <p>3. The NB right-turning vehicles may have limited sight distance to the vehicles emerging from EB ramp on Randolph Road.</p> | <p>1. The EB and WB left-turning radii may not be adequate to complete a safe u-turn maneuver.</p> <p>2. Same as Issue CCCC.1.</p> <p>3. The NB right-turning vehicles may attempt to turn onto the far lane on EB Randolph Road against heavy conflicting traffic instead of turning onto the closer EB through lane on Randolph Road.</p> | <p>1. Consider installing "No U-turn" (R3-4) prohibitions for the EB and WB left-turns.</p> <p>2. Same as Issue CCCC.1.</p> <p>3. Consider prohibiting RTOR for the NB approach.</p> | <p>1. The phasing of the signal will be changed to split phasing. The feasibility of allowing U-turns at the intersection will be evaluated and proper signage proposed as needed.</p> <p>2. See Response CCCC.1.</p> <p>3. The addition of the jughandle will eliminate the ramp's right turn lane at this intersection. The intersection sight distance will be analyzed to determine if right turn on red shall be permitted.</p> |

| Sheet 287 of 309 | | Signing and Marking Plan | |
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| Observation | Issue | Suggestion | Response |
| <p>PPPP. Pedestrian safety at the Randolph Road and Judson Road intersection.</p> <p>1. The proposed signs #116 and #105 on the NW and SW corners, respectively, may be misleading and may not clearly restrict pedestrians from crossing Randolph Road.</p> <p>2. Crosswalks are not proposed on the north and south legs of the intersection.</p> | <p>1. Pedestrians may possibly cross Randolph Road at the Judson Road intersection, having to cross six lanes of traffic. They also do not clearly guide pedestrians to the adjacent crosswalk at MD 97.</p> <p>2. Pedestrians may attempt unsafe crossings across the north and south legs of the intersection.</p> | <p>1. Consider installing a "No Pedestrian Crossing Sign" (R9-3a) plus supplemental signs directing pedestrians to the crosswalk at MD 97.</p> <p>2. Consider installing crosswalks on the north and south legs of the intersection.</p> | <p>1. Adding graphical "No Pedestrian Crossing" signs (R9-3a) to the median near Sta. 20+50 will be coordinated with District Traffic and OOTS. The wording of signs #105 and #116 will be reevaluated.</p> <p>2. The design matches existing conditions. The feasibility of proposing marked crosswalks at these locations will be discussed with District Traffic and OOTS.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>QQQQ. Pedestrian safety at the MD 97 and Randolph Road intersection.</p> <p>1. The Pedestrian Traffic (W11-2) sign in the NE and SW corners are proposed for the through crosswalks but not for the channelized movements.</p> <p>2. The medians on the east and west legs of the interchange have offset ADA ramps joined by a continuous concrete surface.</p> | <p>1. Vehicles making the channelized rights will not be properly warned of potential crossing pedestrians.</p> <p>2.1. The lack of direct alignment between the ramps on the east & west medians may create a challenge for blind pedestrians in identifying the adjoining ADA ramp.</p> <p>2.2. The lack of direct alignment between the ramps on the east median may cause pedestrians to cross away from the ramp (and thus the crosswalk), when crossing EB Randolph Road.</p> | <p>1. Consider installing pedestrian crossing signs for the crosswalks at the channelized movements in the NE and SW corners.</p> <p>2.1./2.2. Determine the feasibility and constructability of alternative hardscape materials to delineate a path between the two ADA ramps.</p> | <p>1. Additional signage will be added.</p> <p>2. The ramps are positioned to provide the safest crosswalk locations feasible.</p> |
| <p>RRRR. Vehicular safety at the Randolph Road and MD 97 intersection.</p> <p>1. Triple left-turn movement from the WB Randolph Road approach onto SB Georgia Avenue is proposed.</p> | <p>1. Sideswipe crashes may occur given the constrained geometry and significant distance to complete the movement.</p> | <p>1. Consider installing recessed delineators along with the skip markings to properly delineate triple left-turning movement.</p> | <p>1. Lane extension markings will be installed as shown on the plans.</p> |

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| <p>2. The medians along the NB and SB approaches are extended beyond the stop bars.</p> <p>3. Same as Observation LLLL.1.</p> <p>4. Sign 224 (Left Lane Must Turn Left) is placed on the right side of WB travel lanes on the east leg.</p> <p>5. Bus stops are located in the right-turn lane on NB, SB and WB approaches.</p> <p>6. NB and SB left-turns radii are limited.</p> | <p>2. The extended medians along NB and SB approaches limit the U-turn maneuverability and may contribute to rear end collisions and exposing U-turning vehicles to opposing/conflicting movements.</p> <p>3. Same as Issue LLLL.1.</p> <p>4. Sign #224 may confuse the motorists in the shared through/left WB lane.</p> <p>5.1. The location of the bus stops may block the right-turn lanes.</p> <p>5.2. Re-entry of the bus into the traffic stream may be difficult.</p> <p>5.3. Stopped bus may block the line of sight for the crossing pedestrians.</p> <p>6. The NB and SB left-turning radii may not be adequate to complete a safe u-turn maneuver.</p> | <p>2. Consider installing "No U-Turn" (R3-4) signs on the north and south legs.</p> <p>3. Same as Suggestion LLLL.1.</p> <p>4. Determine the feasibility of relocating or eliminating sign #224.</p> <p>5.1./5.2./5.3. Determine the feasibility of relocating the bus stops to the far side of the intersection approaches.</p> <p>6. Consider installing "No U-turn" (R3-4) prohibitions for the EB and WB left-turns.</p> | <p>2. The medians will remain extended to provide pedestrian refuge as shown. The feasibility of allowing U-turns at the intersection will be evaluated and proper signage proposed as needed.</p> <p>3. See Response LLLL.1.</p> <p>4. The "Left Lane Must Turn Left" sign will be relocated accordingly.</p> <p>5. All bus stop locations have been coordinated and approved by Montgomery County and WMATA. The changes will be reflected on the PS&E submittal.</p> <p>6. The feasibility of allowing U-turns at the intersection will be evaluated and proper signage proposed as needed.</p> |
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| Observation | Issue | Suggestion | Response |
| <p>SSSS. Pedestrian safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. Pedestrian ramp on the SE corner of the intersection appears not to be ADA compliant.</p> | <p>1. Non ADA compliant ramps may limit the pedestrian accessibility.</p> | <p>1. Consider installing ADA compliant pedestrian ramp on the SE corner of the intersection.</p> | <p>1. The sidewalk ramp is ADA compliant. A detail has been provided on Sheet 11.</p> |
| <p>TTTT. Vehicular safety at the Randolph Road and Glenmont Circle intersection.</p> <p>1. Taper and storage lengths for the EB left-turning lane appear to be too short.</p> <p>2. Deceleration length provided for the WB left-turning lane may not be adequate.</p> <p>3. "School Speed Limit 35 When Flashing" sign appears to be redundant since the posted speed limit is 35.</p> | <p>1./2. Inadequate taper and storage lengths for the turning lanes are likely to cause queue spill back on the through lanes and contribute to rear-end crashes.</p> <p>3. Improper/excessive use of warning signs may lead motorists to disregard the speed limit.</p> | <p>1./2. Determine the feasibility and constructability of increasing taper and storage lengths.</p> <p>3. Consider evaluating whether the "school zone" advisory speed limit is warranted in this area- and if a lower advisory speed is warranted.</p> | <p>1./2. The auxiliary lane analysis will be verified.</p> <p>3. The "school zone" advisory speed limit sign is an existing sign. The possibility of revising or removing this sign will be coordinated with Montgomery County DOT.</p> |

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| <p>4. The egress from the driveway at Sta. 38+00 is posted with “word-based” signage indicating “Right Turn Only”.</p> | <p>4. Signs with words may take longer to read and understand information than signs with standardize symbols.</p> | <p>4. Consider installing diagrammatic “Right Turn Only” (R3-5R) sign or “No Left” (R3-2) sign for the egress from the driveway at Sta. 38+00.</p> | <p>4. Proposed signage will be reviewed for conformance with the Manual on Uniform Traffic Control Devices (MUTCD).</p> |
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| Observation | Issue | Suggestion | Response |
| <p>UUUU. Pedestrian/bicycle safety at the MD 97 and Mason Street intersection and points north.</p> <p>1. There is a gap between the median nose and crosswalk on the south leg at Mason Street.</p> <p>2. The relocated NB bus stop is located on the near side of the intersection at Mason Street (SE corner).</p> <p>3. Unnecessary “School Crossing” warning signs are proposed on the north leg of the intersection.</p> <p>4. Sign #403 along NB MD 97 at Sta. 106+50 incorrectly indicates that “Bike Lane Ends”.</p> <p>5. Pavement markings are not proposed for the SB bike lane on MD 97.</p> <p>6. Unsignalized pedestrian crossings are proposed on both the north and south legs at Mason Street.</p> | <p>1. Without median refuge area, pedestrians may be stranded in the crosswalk without any protection.</p> <p>2. The stopped bus may block the visibility of NB traffic from crossing pedestrians.</p> <p>3. Improper/unnecessary use of warning signs may lead to disregard by motorists.</p> <p>4. Use of incorrect sign may lead to confusion among cyclists and/or improper lane use by road users.</p> <p>5. Motorists may not interpret designated area as bike lane; and may not yield to or anticipate bicycle traffic, leading to unexpected conflicts.</p> <p>6. The pedestrian crossing on the north leg may introduce additional pedestrian/vehicle conflict points in a heavily-congested area.</p> | <p>1. Evaluate the feasibility and constructability of extending the median and/or reorienting the crosswalk to provide a median refuge the crosswalk on the south leg of the intersection.</p> <p>2. Consider the feasibility of not relocating the existing NB bus stop.</p> <p>3. Determine the feasibility of eliminating unnecessary “School Crossing” warning signs.</p> <p>4. Consider replacing sign #403 with “Bike Lane Begins” sign.</p> <p>5. Consider installing “Bike Lane” pavement markings on SB MD 97.</p> <p>6. Determine the feasibility of maintaining a pedestrian crossing on the south leg only, with appropriate pedestrian detour signs on the north leg.</p> | <p>1. The feasibility and constructability of providing pedestrian refuge on the south leg of the intersection will be investigated.</p> <p>2. All bus stop locations have been coordinated and approved by Montgomery County and WMATA. The changes will be reflected on the PS&E submittal.</p> <p>3. Proposed signage will be reviewed for conformance with the Manual on Uniform Traffic Control Devices (MUTCD).</p> <p>4. The text on the sign will be corrected.</p> <p>5. Pavement markings for bike lanes will be revised in accordance with the MD SHA’s Policy on Marked Bicycle Lanes.</p> <p>6. Maintaining one pedestrian crossing will be discussed with District Traffic.</p> |

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| <p>VVVV. Vehicular safety at the MD 97 and Mason Street intersection.</p> <p>1. “Speed Limit 25 / Fines Doubled” sign (#412) may be unnecessary/ inappropriate.</p> <p>2. A 35-mph speed limit is posted within 800’ of the existing 25-mph speed limit posted near Sta. 112+00.</p> <p>3. NB “Metro Ahead” guide signage (sign #409) is located in the median, close to the dual NB dual left-turn lanes.</p> | <p>1. Improper/unnecessary use of regulatory signs may lead to disregard by motorists.</p> <p>2. This condition may increase speed variance among motorists and lead to disregard by motorists (i.e., lack of respect).</p> <p>3. Placing the sign in the median may cause driver confusion.</p> | <p>1./2. Consider evaluating the appropriate speed limit for this section of MD 97.</p> <p>3. Consider the feasibility of relocating sign #409 to the right side of NB MD 97.</p> | <p>1./2. The sign should list 35 MPH as the speed limit and will be corrected.</p> <p>3. The location of the sign will be coordinated with District Traffic and OOTS.</p> |
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| Observation | Issue | Suggestion | Response |
| <p>WWWW. Pedestrian/bicycle safety at the MD 97 and Layhill Road/Judson Road intersection.</p> <p>1. The existing crosswalk on the west leg (i.e., Judson Road) is not aligned with the proposed ADA ramps.</p> <p>2. Existing pedestrian safety signs are not reflected in the signage and pavement marking plans.</p> | <p>1. Curb ramps may lead pedestrians into the vehicular travel way.</p> <p>2. An important pedestrian safety message that may improve pedestrian safety has been eliminated.</p> | <p>1. Consider installing stop line and crosswalk markings for the EB approach (i.e., Judson Road) that align with the ADA ramps.</p> <p>2. Consider maintaining the existing “Cross Like Your Life Depends on It” sign.</p> | <p>1. The markings at the intersection will be revised.</p> <p>2. Additional signage will be added.</p> |
| <p>XXXX. Vehicle safety at the MD 97 and Sheraton Street intersection.</p> <p>1. Same as Observations D.1. and D.2.</p> | <p>1. Same as Issues D.1. and D.2.</p> | <p>1. Same as Suggestions D.1.1./2.1., 1.2./2.2., and 1.3/2.3.</p> | <p>3. See Response D.1. and D.2.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>YYYY. Vehicular safety on Randolph Road, west of the interchange.</p> <p>1. The EB lane marking signage (C-1A/C-1B) for Randolph Road and MD 97 is approximately 350’ from the gore splitting the tunnel and the ramp traffic.</p> | <p>1. The spacing of the signage from the tunnel entrance may not provide sufficient forewarning for motorists, leading to unexpected weaving and merging maneuvers.</p> | <p>1. Consider evaluating whether the spacing between the proposed signage and the tunnel is adequate, and whether additional signage is warranted west of Livingston Street.</p> | <p>1. Proposed signage will be reviewed for conformance with the Manual on Uniform Traffic Control Devices (MUTCD).</p> |

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| Observation | Issue | Suggestion | Response |
| <p>ZZZZ. Pedestrian safety at the Randolph Road and Glenallan Avenue intersection.</p> <p>1. Existing pedestrian crossing sign is located in the sidewalk on the SW corner of the intersection.</p> | <p>1. Existing sign in the sidewalk will obstruct the pedestrian path.</p> | <p>1. Determine the feasibility of relocating the existing pedestrian crossing sign outside of the sidewalk on the SW corner of the intersection.</p> | <p>1. The existing sign is located outside this projects limits of work. Therefore, relocating this sign will be discussed with District Traffic and OOTS.</p> |
| <p>AAAAA. Vehicular safety at the Randolph Road and MD 97 east of Glenmont Circle.</p> <p>1. The WB lane marking signage (C-2A/C-2b) for Randolph Road is approximately 200' from the gore splitting the tunnel and the ramp traffic.</p> | <p>1. The spacing of the signage from the tunnel entrance may not provide sufficient forewarning for motorists, leading to unexpected weaving and merging maneuvers.</p> | <p>1. Consider evaluating whether the spacing between the proposed sign and the tunnel is adequate, and whether additional advanced signing is warranted east of split.</p> | <p>1. Proposed signage will be reviewed for conformance with the Manual on Uniform Traffic Control Devices (MUTCD) and concurred with District Traffic and OOTS.</p> |

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| Observation | Issue | Suggestion | Response |
| <p>BBBBB. Pedestrian/bicycle safety at the MD 97 and Randolph Road intersection.</p> <p>1. The street and decorative lighting in the vicinity of the pedestrian refuge/waiting areas may not be sufficient.</p> <p>2. The decorative lighting in the SW quadrant of the interchange is located within the Glenmont Greenway path.</p> | <p>1. Insufficient lighting may limit the visibility of pedestrians' presence during the periods of darkness.</p> <p>2. The proposed lighting placement may obstruct the path of pedestrians and cyclists.</p> | <p>1. Consider reviewing the "photometric" analysis to determine whether adequate lighting is proposed for pedestrian refuge/waiting areas.</p> <p>2. Update the drawing to not show the existing lighting which is being eliminated.</p> | <p>1. The proposed additional lighting will be discussed with OOTS.</p> <p>2. The proposed lighting locations will be coordinated to avoid obstruction with the pedestrian path.</p> |