EXHIBIT C

Proposed Elizabethtown Crossings
Transportation Impact Study

Hershey Road (SR 0743)
Mount Joy Township and Elizabethtown Borough
Lancaster County

October 2026

Prepared for:
Elizabethtown Crossings Associates, LLC

Scoping Application No. S0820260072
EPS No. 411064

TRG
TRANSPORTATION RESOURCE GROUP, INC.

Transportation Impact Study

for the

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EXECUTIVE SUMMARY

A summary of key findings is presented below followed by the recommendations.

1. The proposed Elizabethtown Crossings Development is located on the east and west side of Hershey Road (SR 0743) in Mount Joy Township and Elizabethtown Borough, Lancaster County. The proposed development is anticipated to be fully constructed by the year 2031. The development is proposed to consist of the following:

    - 200,200 square foot warehouse (Tract 1)
    - Park and Ride Lot (Tract 2)
    - Hotel with 80 rooms (Tract 3)
    - 24,000 square foot strip retail plaza (Tract 4)
    - 2,950 square foot fast-food restaurant with drive-thru (Tract 5)
    - 6,638 square foot convenience store with 16 fueling positions (Tract 6)
    - 4,805 square foot one tunnel car wash (Tract 7)
    - 200,200 square foot warehouse (Tract 8)
    - 37 townhomes (Tract 9 & 10)

    Access to the proposed development will be provided by extending Buckingham Boulevard (T-333) from Mt Gretna Road (SR 0241) to Hershey Road (SR 0743) and then continuing to Old Hershey Road (T-749). Accesses to the proposed land uses will be from the proposed Buckingham Boulevard Extension (Ext). Also, right-in/right-out only driveways on Hershey Road (SR 0743) are proposed for the proposed strip retail plaza (Tract 4) and in between the proposed car wash (Tract 7) and convenience store (Tract 6). There will also be an access to the proposed warehouse (Tract 1) to Old Hershey Road. A right-in only driveway is proposed on Hershey Road (SR 0743) for the proposed fast-food restaurant (Tract 5). Ironstone Drive will be extended to connect to the proposed townhomes (Tract 9 & 10).

2. The following intersections were selected for detailed analysis as determined by PennDOT, Mount Joy Township and Elizabethtown Borough:

    - North Hanover Street (SR 0743)/Spring Garden Street
    - North Hanover Street (SR 0743)/Highlawn Avenue
    - Hershey Road (SR 0743)/Mt Gretna Road (SR 0241)/Holly Street {signalized}
    - Hershey Road (SR 0743)/Veterans Drive – Driveway {signalized}
    - Hershey Road (SR 0743)/Ammon Avenue – Christy Court
    - Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext
    - Hershey Road (SR 0743)/SR 0238 Eastbound Ramps
    - Hershey Road (SR 0743)/SR 0238 Westbound Ramps {signalized}
    - Hershey Road (SR 0743)/Beverly Road
    - Mt Gretna Road (SR 0241)/Buckingham Boulevard
    - Mt Gretna Road (SR 024)/Ridgeview Run Road
    - Mt Gretna Road (SR 0241)/Oberholtzer Road
    - Mt Gretna Road (SR 0241)/Koser Road (South)

- Mt Gretna Road (SR 0241)/ Koser Road (North)
- Old Hershey Road/Beverly Road
- Old Hershey Road/Proposed Buckingham Boulevard Ext
- Mt Gretna Road (SR 0241) / Ironstone Drive
- Site accesses to Old Hershey Road, Hershey Road (SR 0743) and Proposed Buckingham Boulevard

3. Currently, the study intersections operate at acceptable overall levels of service (LOS D or better) during the weekday AM and PM peak hours as well as the Saturday peak hour, with the exception of the following intersections, which will have long delays for some movements:

   - Hanover Street (SR 0743) / Spring Garden Street
   - Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street
   - Hershey Road (SR 0743)/SR 0283 Eastbound Ramps
   - Hershey Road (SR 0743)/SR 0283 Westbound Ramps
   - Hershey Road (SR 0743) / Beverly Road

4. The growth factor for Lancaster County is 0.46% (urban) as obtained from PennDOT's Growth Factors for August 2025 to July 2026 as agreed upon in the scoping application. Also, the following developments' site traffic and roadway improvements will be added to the background traffic growth:

   - Sheetz located along Veterans Drive

   As part of the proposed Sheetz development, improvements are proposed at the Hershey Road (SR 0743)/Veterans Drive signalized intersection. A northbound left turn lane is proposed on Hershey Road (SR 0743) at Veterans Drive. This improvement will be included in the future traffic analysis.

5. In the year 2036 (Horizon Year) without the proposed development , the study intersections will continue to operate with acceptable overall levels of service during the AM, PM, and Saturday peak hours, with the exception of the following intersections, which will have long delays for some movements:

   - Hanover Street (SR 0743) / Spring Garden Street
   - Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street
   - Hershey Road (SR 0743)/Veterans Drive
   - Hershey Road (SR 0743)/SR 0283 Eastbound Ramps
   - Hershey Road (SR 0743)/SR 0283 Westbound Ramps
   - Hershey Road (SR 0743) / Beverly Road

6. The proposed development at full buildout is anticipated to generate a total of 846 AM (457 new passenger vehicle trips, 12 new truck trips and 377 pass-by passenger vehicle trips), 976 PM (604 new passenger vehicle trips, 16 new truck trips and 356 pass-by passenger vehicle trips), and 971 Saturday

peak hour site trips (670 new passenger vehicle trips, 0 truck trips and 301 pass-by passenger vehicle trips). On a weekday daily basis, an estimated 10,072 trips are estimated to be generated for the entire development.

7. In the year 2036 (Horizon Year) with the proposed development the study intersections will continue to operate with acceptable overall levels of service (LOS D or better) during the AM, PM, and Saturday peak hours, with the exception of the following intersections, which will have long delays for some movements:

    - Hanover Street (SR 0743) / Spring Garden Street
    - Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street
    - Hershey Road (SR 0743)/Veterans Drive
    - Hershey Road (SR 0743)/SR 0283 Eastbound Ramps
    - Hershey Road (SR 0743)/SR 0283 Westbound Ramps
    - Hershey Road (SR 0743) / Beverly Road

8. An improvement analysis was conducted to determine the roadway improvements required to mitigate the proposed development site traffic. The following outlines the required improvements at each intersection:

    <u>Hershey Road (SR 0743) / Proposed Buckingham Boulevard Ext</u>

    A traffic signal warrant analysis was conducted at this intersection assuming full buildout of the proposed development. The signal warrant analysis was conducted per MUTCD and PennDOT Pub 46 guidelines as well as using the PennDOT Signal Warrant Workbook. Based on the analysis, a traffic signal is warranted and justified. Also, the following lanes are proposed at this intersection:

    - Exclusive eastbound left turn lane
    - Shared eastbound through and right turn lane
    - Exclusive westbound left turn lane
    - Shared westbound through and right turn lane
    - Exclusive northbound left turn lane
    - Shared northbound through and right turn lane
    - Exclusive southbound left turn lane
    - Exclusive southbound through lane
    - Exclusive southbound right turn lane

    This signalized intersection is proposed to be coordinated with the proposed traffic signals along Hershey Road (SR 0743) at the SR 0283 interchange ramps. The signal is not proposed to be coordinated with the signals at Veterans Drive nor Mt Gretna Road (SR 0241)/Holly Street because the

Mt Gretna Road (SR 0241) signal causes a higher than needed cycle length and there is approximately ½ mile to Veterans Drive. With the proposed roadway improvements, this intersection will operate with acceptable levels of service in the year 2036 with the proposed development.

Hershey Road (SR 0743)/SR 0283 Eastbound Ramps

An improvement analysis was conducted at the Hershey Road (SR 0743) / SR 0283 Eastbound Ramps intersection due to the long delays expected on the eastbound approach of the SR 0283 Eastbound Ramp. A signal warrant analysis was conducted at the intersection to determine if a traffic signal is warranted. The signal warrant analysis was conducted per MUTCD and PennDOT Pub 46 guidelines as well as using the PennDOT Signal Warrant Workbook. Traffic counts were conducted at this intersection from 6 AM to 6 PM. Based on the traffic signal warrant analysis, Warrants 1 and 2 were met. Therefore, this intersection is proposed to be signalized. To address safety concerns the Township has at the interchange, the existing right turn channelized lane is proposed to be removed and replaced with a typical right turn lane that will be controlled by the traffic signal. This signalized intersection will be coordinated with the adjacent traffic signals along Hershey Road (SR 0743) at Proposed Buckingham Boulevard and at SR 0283 Westbound Ramps. With the proposed improvements, this intersection will operate with acceptable levels of service in the year 2036 with the proposed development.

Hershey Road (SR 0743)/SR 0283 Westbound Ramps

This existing signalized intersection is proposed to be coordinated along with the adjacent new signals along Hershey Road (SR 0743) at the SR 0283 Eastbound Ramp intersection and the Proposed Buckingham Boulevard intersection. With changes to the cycle length and signal timings, this intersection will operate with acceptable levels of service in the year 2036 with the proposed development, with the exception of during the AM peak hour. However, the operation of the intersection with the proposed improvements will be the same or better than in the "Without Development" scenario and therefore, mitigating the proposed development site traffic. Also, to address safety concerns the Township has at the interchange, the existing right turn channelized lane is proposed to be removed and replaced with a typical right turn lane that will be controlled by the traffic signal.

Hershey Road (SR 0743) / Spring Garden Street

This intersection was analyzed to determine if a traffic signal was warranted and justified per PennDOT Publication 46 guidelines. The traffic signal analysis showed that a traffic signal is not warranted nor justified at this intersection.

A gap study was conducted for the AM and PM peak hours to determine if there are sufficient gaps to accommodate the anticipated traffic at the N. Hanover Street (SR 0743) / Spring Garden Street intersection. The gap study was conducted based on the Highway Capacity Manual guidelines and found that there are sufficient gaps to accommodate the minor street traffic onto N. Hanover Street (SR 0743).

Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street

In order to mitigate the proposed development site traffic during the AM Peak hour, the cycle lengths and signal timings will be optimized at the Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street intersection. Since this intersection is coordinated with the Hershey Road (SR 0743)/Veterans Drive intersection, the cycle length and signal timings at Veterans Drive signal will also be optimized during the AM peak hour.

9. A turn lane analysis was conducted at the site accesses on Hershey Road (SR 0743), Old Hershey Road and Proposed Buckingham Boulevard Ext utilizing PennDOT guidelines outlined in Publication 46 Chapter 11.17. The turn lane analysis found that a right turn lane is warranted on Hershey Road (SR 0743) at the proposed right-in/right-out for the strip retail plaza (Tract 4) and for the proposed right-in/right-out between the car wash and convenience store.

   A turn lane analysis was also conducted at the proposed Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext intersection. The turn lane analysis found that northbound and southbound left turn lanes are warranted on Hershey Road (SR 0743).

10. A queue analysis was conducted at the study intersections to determine if the proposed development will impact the queues. The queue analysis found that the proposed development site traffic will have a minor impact on vehicle queues. The queue analysis found that all the available storage areas are mostly sufficient to accommodate the future queues with the proposed roadway improvements with the following exceptions:

    Hershey Road (SR 0743) / SR 0238 Eastbound Ramps

    The queues on the SR 0283 Eastbound Ramps are anticipated to be long in the year 2036 with the proposed development. With the proposed roadway improvements, the queues on the SR 0283 Eastbound Ramps are anticipated to significantly decrease.

    Hershey Road (SR 0743) / SR 0238 Westbound Ramps

    The queues on the SR 0283 Westbound Ramp and for the northbound left turn lane on Hershey Road (SR 0743) are anticipated to exceed the available storage in the year 2036 with the proposed development. With the proposed development and improvements, the queues are anticipated to be accommodated within the existing storage lengths or be less than the queues in the “Without Development” scenario.

RECOMMENDATIONS

A summary of the recommendations to ensure safe and efficient traffic movements is presented below. All recommended improvements will be constructed to be ADA compliant unless otherwise directed or approved by the Department.

1. The developer will extend Buckingham Boulevard from Mt Gretna Road (SR 0241) to Old Hershey Road. The majority of the proposed Buckingham Boulevard will be a three-lane section; one lane in each direction with a center left turn lane.

2. The developer will signalize the proposed intersection of Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext with advance northbound and southbound left turn phasing (via flashing yellow arrow). This signal will be included in a coordinated system that will consist of this intersection and the adjacent signals at the SR 0283 interchange ramps. The following lane configuration will be provided:

   Eastbound approach (Proposed Buckingham Boulevard)

   - Exclusive left turn lane (120 feet of storage)
   - Shared through/right turn lane

   Westbound approach (Proposed Buckingham Boulevard)

   - Exclusive left turn lane (225 feet of storage)
   - Shared through/right turn lane

   Northbound approach (Hershey Road (SR 0743))

   - Exclusive left turn lane (150 feet of storage)
   - Shared through/right turn lane

   Southbound approach (Hershey Road (SR 0743))

   - Exclusive left turn lane (425 feet of storage)
   - Exclusive through lane
   - Exclusive right turn lane (will be a lane drop from the 2 through lanes at the SR 0283 Eastbound Ramps)

   As part of these improvements, a median will be installed on Hershey Road (SR 0743) from the proposed intersection north and connect to the existing median near the SR 0283 interchange. A median will also

be provided on Hershey Road (SR 0743) to the south to help regulate the turn restrictions for the proposed right-in/right-out for the proposed strip retail plaza (Tract 4).

3. The developer will construct a right-in/right-out driveway (ADT – 570 trips) to PennDOT standards on Hershey Road (SR 0743) for the proposed strip retail plaza (Tract 4). A stop sign will be installed on the eastbound approach of the proposed driveway and adequate sight distance will be maintained. A southbound right turn lane will be installed on Hershey Road (SR 0743). The right turn lane length will be maximized without impacting the adjacent proposed signalized intersection.

4. The developer will construct a right-in driveway (ADT – 320 trips) to PennDOT standards on Hershey Road (SR 0743) for the proposed fast-food restaurant (Tract 5).

5. The developer will construct a right-in/right-out driveway (ADT – 2,270 trips) to PennDOT standards on Hershey Road (SR 0743) between the proposed convenience store (Tract 6) and the proposed car wash (Tract 7). A stop sign will be installed on the westbound approach of the proposed driveway and adequate sight distance will be maintained. A northbound right turn lane will be installed on Hershey Road (SR 0743) at the proposed access. The right turn lane length will be maximized without impacting the adjacent proposed signalized intersection and staying outside the PennDOT Limited Access ROW.

6. The developer will extend existing Ironstone Drive from the existing residential area through Tracts 9 and 10 and connect to the Proposed Buckingham Boulevard.

7. The developer will install a traffic signal at the existing Hershey Road (SR 0743)/SR 0283 Eastbound Ramps to include the following:

    - Remove channelized right turn lane to provide exclusive right turn lane adjacent to the shared left/through lane.
    - Advance southbound left turn phase via a flashing yellow arrow.
    - Incorporate the new traffic signal into a new signal system corridor along Hershey Road (SR 0743) from the Proposed Buckingham Boulevard signal to the SR 0283 Westbound Ramps signal.

8. The developer will construct the following improvements at the Hershey Road (SR 0743)/SR 0283 Westbound Ramps intersection:

    - Remove channelized right turn lane to provide exclusive right turn lane adjacent to the shared left/through lane.
    - Optimize the traffic signal timings to be included in the new system corridor along Hershey Road (SR 0743) from the proposed Buckingham Boulevard to this intersection.

9. The developer will optimize the cycle lengths and traffic signal timings during the AM peak hour at the following intersections:

    - Hershey Road (SR 0743)/Mt Gretna Road (SR 0241)/Holly Street
    - Hershey Road (SR 0743)/Veterans Drive

1. INTRODUCTION

This report describes the transportation impact analysis for the Proposed Elizabethtown Crossings located along Hershey Road (SR 0743) in Mount Joy Township and Elizabethtown Borough, Lancaster County, Pennsylvania. See Figure 1 in the Appendices for the site location.

The proposed Elizabethtown Crossings Development is located on the east and west side of Hershey Road (SR 0743) in Mount Joy Township and Elizabethtown Borough, Lancaster County. The proposed development is anticipated to be fully constructed by the year 2031. The development is proposed to consist of the following:

- 200,200 square foot warehouse (Tract 1)
- Park and Ride Lot (Tract 2)
- Hotel with 80 rooms (Tract 3)
- 24,000 square foot strip retail plaza (Tract 4)
- 2,950 square foot fast-food restaurant with drive-thru (Tract 5)
- 6,638 square foot convenience store with 16 fueling positions (Tract 6)
- 4,805 square foot one tunnel car wash (Tract 7)
- 200,200 square foot warehouse (Tract 8)
- 37 townhomes (Tract 9 & 10)

Access to the proposed development will be provided by extending Buckingham Boulevard (T-333) from Mt Gretna Road (SR 0241) to Hershey Road (SR 0743) and then continuing to Old Hershey Road (T-749). Accesses to the proposed land uses will be from the proposed Buckingham Boulevard Extension (Ext). Also, right-in/right-out only driveways on Hershey Road (SR 0743) are proposed for the proposed strip retail plaza (Tract 4) and in between the proposed car wash (Tract 7) and convenience store (Tract 6). There will also be an access to the proposed warehouse (Tract 1) to Old Hershey Road. A right-in only driveway is proposed on Hershey Road (SR 0743) for the proposed fast-food restaurant (Tract 5). Ironstone Drive will be extended through the proposed townhomes (Tract 9 & 10). Figure 2 in the Appendices shows the proposed site plan.

The purpose of this study is to identify significant traffic problems associated with the ability of the existing roadways to accommodate the volume of traffic anticipated from the development and to assure safe and efficient site access. If necessary, improvements will be recommended to mitigate the impact of development traffic on the surrounding roadway network. This study is prepared in accordance with PennDOT's guidelines on transportation impact studies.

2. DATA COLLECTION

This section summarizes the data collected for the study as well as the methodology used to obtain the data. Based on the characteristics of the proposed development, the weekday AM and PM peak hours and the weekend Saturday peak hour will be analyzed. Manual turning movement counts were conducted at the study intersection during a typical week in April 2025. The counts were conducted during the typical weekday morning hours from 6:00 AM to 9:00 AM and during the typical weekday evening hours from 3:00 PM to 6:00 PM. Counts were also conducted during the Saturday hours from 11:00 AM to 2:00 PM. Counts were recorded in 15-minute intervals, with the peak hour being selected from the four highest consecutive 15-minute periods. The TMC counts are found in the Appendices. The following AM, PM, and Saturday peak hours occurred at the study intersection:

Intersection	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
North Hanover Street (SR 0743)/Spring Garden Street	7:00 -8:00	4:30 – 5:30	11:00 AM – 12:00 PM
North Hanover Street (SR 0743)/Highlawn Avenue	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Hershey Road (SR 0743)/Mt Gretna Road (SR 0241)/ Holly Street	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Hershey Road (SR 0743)/Veterans Drive - Driveway	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Hershey Road (SR 0743)/Ammon Avenue – Christy Court	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Hershey Road (SR 0743)/SR 0283 Eastbound Ramps	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Hershey Road (SR 0743)/SR 0283 Westbound Ramps	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Hershey Road (SR 0743)/Beverly Road	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Mt Gretna Road (SR 0241)/Buckingham Boulevard	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Mt Gretna Road (SR 0241)/Ridgeview Run Road	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Mt Gretna Road (SR 0241)/Oberholtzer Road	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM

Intersection	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Mt Gretna Road (SR 0241)/Koser Road (South)	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Mt. Gretna Road (SR 0241)/Koser Road (North)	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Old Hershey Road/Beverly Road	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM
Mt Gretna Road (SR 0241)/Ironstone Drive	7:00 – 8:00	4:30 – 5:30	11:00 AM – 12:00 PM

Details of the TMC counts can be found in the Appendices.

3. EXISTING STUDY AREA CONDITIONS

This section discusses the existing traffic conditions, land use context, roadway type and traffic controls in the study area. A description of the study area including the roadway network is also included in this section.

Study Area

The study area was selected based on those intersections that will be impacted the greatest by the proposed development. The following intersections were selected for further detailed analysis as determined by PennDOT, Mount Joy Township and Elizabethtown Borough:

- North Hanover Street (SR 0473)/Spring Garden Street
- North Hanover Street (SR 0743)/Highlawn Avenue
- Hershey Road (SR 0743)/Mt Gretna Road (SR 0241)/Holly Street {signalized}
- Hershey Road (SR 0743)/Veterans Drive – Driveway {signalized}
- Hershey Road (SR 0743)/Ammon Avenue – Christy Court
- Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext
- Hershey Road (SR 0743)/SR 0238 Eastbound Ramps
- Hershey Road (SR 0743)/SR 0238 Westbound Ramps {signalized}
- Hershey Road (SR 0743)/Beverly Road
- Mt Gretna Road (SR 0241)/Buckingham Boulevard
- Mt Gretna Road (SR 024)/Ridgeview Run Road
- Mt Gretna Road (SR 0241)/Oberholtzer Road
- Mt Gretna Road (SR 0241)/Koser Road (South)
- Mt Gretna Road (SR 0241)/ Koser Road (North)
- Old Hershey Road/Beverly Road
- Old Hershey Road/Proposed Buckingham Boulevard Ext
- Mt Gretna Road (SR 0241)/Ironstone Drive
- Site accesses to Old Hershey Road, Hershey Road (SR 0743) and Proposed Buckingham Boulevard

Surrounding Land Uses/Land Use Context

The site is located in a residential and commercial area in Mount Joy Township and Elizabethtown Borough. There are some commercial land uses along Hershey Road (SR 0743). There are residential land uses to the east, west and south of the proposed development. SR 0283 is located directly to the north and Elizabethtown Borough is located directly to the south of the proposed development.

A Sheetz convenience store is proposed along Veterans Drive. As part of the proposed Sheetz, a northbound left turn lane is proposed on Hershey Road (SR 0743) at Veterans Drive. The proposed Sheetz site traffic and roadway improvements will be assumed as part of the future analysis. Details of the Sheetz development are included in the Other Development Information section in the Appendices.

Existing Transportation System

The major roadway system in the study area is mostly comprised of state and local/private roadways. The following is a summary of the traffic control of the existing study area intersections:

Hanover Street (SR 0743)/Spring Garden Street is a four-legged intersection controlled by a stop sign on the minor street approaches of Spring Garden Street. All approaches are single lanes. There are crosswalks across all four legs of the intersection.

Hanover Street (SR 0743)/Highlawn Avenue is a T-intersection controlled by a stop sign on the minor street approach of Highlawn Avenue. All approaches are single lanes. The southeast corner has sidewalk and a pedestrian ramp, but there are no other pedestrian facilities at this intersection.

Hershey Road (SR 0743)/Mt Gretna Road (SR 0241)/Holly Street is a five legged intersection controlled by a traffic signal. The northbound and southbound approach of Hershey Road (SR 0743) have an exclusive left turn lane. The other approaches have a single lane. Pedestrian crossings are prohibited across Mt Gretna Road (SR 0241) and the north leg of Hershey Road (SR 0743). There are pedestrian pushbuttons and signal heads for the other crossings.

Hershey Road (SR 0743)/Veterans Drive – Driveway is a four-legged intersection controlled by a traffic signal. The eastbound approach of Veterans Drive has an exclusive left turn lane. As part of the proposed Sheetz near this intersection, a northbound left turn lane is proposed on Hershey Road (SR 0743). Pedestrians are restricted from crossing Hershey Road (SR 0743). There are no pushbuttons or pedestrian signal heads at this intersection.

Hershey Road (SR 0743)/Ammon Avenue – Christy Court is a four-legged intersection controlled by stops signs on the minor street approaches. All approaches are single lane and there is sidewalk/ramps provided on the northwest corner and southeast corner of the intersection.

Hershey Road (SR 0743)/SR 283 Eastbound Ramps is a four-legged intersection controlled by a stop sign on the SR 0283 Eastbound Off Ramp. The eastbound approach is a single lane approach with a channelized right turn. The northbound approach has two through lanes with a channelized right turn. The southbound approach has an exclusive left turn lane and two through lanes. There are no pedestrian facilities at this intersection.

Hershey Road (SR 0743)/SR 283 Westbound Ramps is a four-legged intersection controlled by a traffic signal. The westbound approach is a single lane approach with a channelized right turn. The northbound approach has an exclusive left turn lane and two through lanes. The southbound approach has two through lanes with a channelized right turn. While this signal is currently part of the Hershey Road (SR 0743) signal corridor, this signal operates as Free during the peak hours. Pedestrians are restricted at this intersection.

Hershey Road (SR 0743)/Beverly Road is a four-legged intersection controlled by stop signs on the minor street approaches of Beverly Road. There are no turn lanes present at this intersection and no pedestrian facilities.

Mt Gretna Road (SR 0241)/Buckingham Boulevard is currently a T-intersection controlled by a stop sign on the Buckingham Boulevard approach. There are no turn lanes currently present at this intersection on any approaches. As part of the proposed development, Buckingham Boulevard will be extended from Mt Gretna Road (SR 0241) through Hershey Road (SR 0743) to Old Hershey Road.

Mt Gretna Road (SR 0241)/Ridgeview Road is currently a T-intersection controlled by a stop sign on the Ridgeview Road approach. There are no turn lanes currently present at this intersection on any approaches. There are no pedestrian facilities at this intersection.

Mt Gretna Road (SR 0241)/Oberholtzer Road is a T-intersection controlled by a stop sign on the Oberholtzer Road approach. This intersection is located on a curve on Mt Gretna Road (SR 0241). There are no turn lanes currently present at this intersection on any approaches. There are no pedestrian facilities at this intersection.

Mt Gretna Road (SR 0241)/Koser Road (South) is a T-intersection. The intersection is controlled by a stop sign on the Koser Road approach and there are no turn lanes currently for any approach at this intersection. There are no pedestrian facilities at this intersection.

Mt Gretna Road (SR 0241)/Koser Road (North) is a T-intersection. The intersection is controlled by a stop sign on the Koser Road approach and there are no turn lanes currently for any approach at this intersection. There are no pedestrian facilities at this intersection.

Old Hershey Road/Beverly Road is a T-intersection controlled by a stop sign on the minor street approach of Beverly Road. There are no turn lanes at this intersection and no pedestrian facilities.

Mt Gretna Road (SR 0241)/Ironstone Drive is a T-intersection controlled by a stop sign on the minor street approach of Ironstone Drive. There are sidewalks along Ironstone Drive to this intersection but there are no crosswalks present. There are not turn lanes at this intersection.

Table 1 lists the roadway system characteristics for the study area road network.

Table 1: Roadway System Characteristics

Road Name	Orientation	Number of Lanes	Roadway Material	Speed Limit	ADT	Functional Class
Hershey Road (SR 0743)	N-S	2-4	Asphalt	30-45 mph	11,523	Minor Arterial
SR 0283	E-W	4	Asphalt	65 mph	43,609	Freeway/Expressway
Mt Gretna Road (SR 0241)	N-S	2	Asphalt	35 mph	2,819	Major Collector
Old Hershey Road (T-749)	N-S	2	Asphalt	35 mph	330	Local Road
Spring Garden Street (Boro)	E-W	2	Asphalt	25 mph	390-910	Local Road
Highlawn Avenue (Boro)	N-S	2	Asphalt	35 mph	2,090	Local Road
Veterans Drive (Twp)	E-W	2-3	Asphalt	25 mph	2,710	Local Road
Buckingham Boulevard (T-316)	E-W	2	Asphalt	25 mph	1,237	Major Collector
Ridgeview Road (T-318)	E-W	2	Asphalt	35 mph	805	Minor Collector
Oberholtzer Road (SR 4023)	E-W	2	Asphalt	40 mph	505	Local Road
Koser Road (T-318 and T-303)	E-W	2	Asphalt	40 mph	1,330	Local Road
Ironstone Drive (Twp)	E-W	2	Asphalt	25 mph	342	Local Road
Beverly Road (T-871)	E-W	2	Asphalt	35 mph	240 – 1,800	Local Road

The ADT volumes for the state roadways were obtained from PennDOT's website. The ADT on the local roadways was determined utilizing the PM peak hour trips and a “k” factor of 10.

Based on traffic characteristics of the development, weekday AM, PM and Saturday peak hours were selected as the peak hours of operation. Existing peak hour traffic volumes were obtained from TMC counts conducted by TRG as discussed in the Data Collection section. Figure 3 in the Appendices shows the existing typical weekday AM, PM and Saturday peak hour traffic volumes at the study area intersections.

Multi-Modal Transportation

A summary of the multimodal facilities follows:

- Pedestrians – Sidewalks currently exist along some sections of Hershey Road (SR 0743). In the immediate area of the proposed development, there are no sidewalks. Internal sidewalks will be provided along the Proposed Buckingham Boulevard Ext.
- Bicycle – There are no bike lanes in the immediate area of the proposed development.
- Transit – There are no fixed routes for Red Rose Transit in the area of the proposed development. With the proposed development, the developer should contact Red Rose Transit for future opportunities of transit servicing the area.

Level of Service/Capacity Analysis

This section discusses the existing levels of service and capacity analysis at the study intersections. The Synchro software and HCM 7th methodology was used to determine level of service (LOS) and capacity for intersections. Unsignalized intersections are rarely at capacity from an overall standpoint. Traffic movements from minor crossroads and major road left turns are largely affected by the distribution of gaps in the major street traffic stream, and motorist judgment in choosing gaps through which to execute their maneuvers. Gaps in the traffic stream depend on several factors, including the type of maneuvers being executed, type of minor street control, the average speed of the major street and geometric and environmental conditions. LOS criteria for unsignalized and signalized intersections are based on control delay (in seconds per vehicle) to motorists. Various factors affect delay, including traffic volumes, lane configurations and widths, traffic signal phasing and cycle lengths, trucks percentages, etc.

LOS ranges from "A" to "F" with "A" having the most favorable performance. PennDOT's "Policy and Procedures for Transportation Impact Studies" suggests new intersections must be designed to at least operate at an LOS C or better for rural conditions and an LOS D or better for urban conditions. Also, the overall intersection LOS for "With Development" scenarios should be no worse than "Without Development" scenarios per PennDOT's guidelines. Level of service ranges for unsignalized and signalized intersections can be found in Table 2.

Table 2: Level of Service Ranges – Unsignalized and Signalized Intersections

Level of Service	Expected Traffic Delay	Average Control Delay [1]	Control Delay [2]
A	Little or No Delay	<10	<10
B	Short Traffic Delays	>10 and ≤15	>10 and ≤ 20
C	Average Traffic Delays	>15 and ≤ 25	>20 and ≤ 35
D	Long Traffic Delays	>25 and ≤ 35	>35 and ≤ 55
E	Very Long Traffic Delays	>35 and ≤ 50	>55 and ≤ 80
F	Failure, Extreme Congestion	>50	>80

[1] UNSIGNALIZED – SEC/VEH
[2] SIGNALIZED – SEC/VEH

Synchro Version 12.3.1.19 software was used to determine the level of service/queue results.

Table A in the Appendices shows the results of the existing level of service analysis. Figure 4 in the Appendices shows the existing level of service results at the study area intersections. Due to the 5-legged geometry at the Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street intersection, HCM 2000 results were used instead. As the table and figure shows, the study intersections will operate at acceptable overall levels of service (LOS D or better) during the weekday AM and PM peak hours as well as the Saturday peak hour, with the exception of the following intersections, which will have long delays for some movements:

- Hanover Street (SR 0743) / Spring Garden Street
- Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street
- Hershey Road (SR 0743)/SR 0283 Eastbound Ramps
- Hershey Road (SR 0743)/SR 0283 Westbound Ramps
- Hershey Road (SR 0743) / Beverly Road

Details of the level of service analysis can be found in the Appendices.

4. HORIZON YEAR (2036) TRAFFIC CONDITIONS WITHOUT DEVELOPMENT

This section discusses the horizon year 2036 traffic conditions without the proposed development. This section includes traffic volumes and level of service analysis at the study intersections.

Traffic Volumes

Some level of external traffic growth on the roadway system can be expected even without the proposed development. This growth can be attributed to a nominal increase in through traffic and traffic generated by developments outside the study area. As agreed upon during scoping, a 0.46 percent average annual growth rate was used to factor the 2025 traffic counts to the year 2036 as recommended by PennDOT Bureau of Planning and Research's Table "Growth Factors for August 2025 to July 2026." The site trips from the Proposed Sheetz were added to the background traffic growth. Also, the improvements to Hershey Road (SR 0743)/Veterans Drive intersection as part of the Proposed Sheetz were assumed in the future traffic analysis. Figure 5 in the Appendices shows the weekday AM, PM and Saturday horizon year (2036) without development traffic volumes at the study intersections.

Level of Service/Capacity Analysis

A level of service analysis was conducted at the study intersections for the horizon year (2036) without development scenario to determine the level of service without the proposed development. Table A in the Appendices shows the results of the level of service analysis.

As shown in the analysis, the study intersections operate at acceptable overall levels of service (LOS D or better) in the horizon year 2036 with development, with the exception of the following intersections, which will have long delays for some movements:

- Hanover Street (SR 0743) / Spring Garden Street
- Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street
- Hershey Road (SR 0743)/Veterans Drive
- Hershey Road (SR 0743)/SR 0283 Eastbound Ramps
- Hershey Road (SR 0743)/SR 0283 Westbound Ramps
- Hershey Road (SR 0743) / Beverly Road

Figure 6 in the Appendices shows the level of service results for the horizon year (2036) without development during the typical weekday AM, PM and Saturday peak hours at the study intersections. Details of the level of service analysis can be found in the Appendices.

5. DEVELOPMENT DESCRIPTION

Proposed Development

The proposed Elizabethtown Crossings Development is located on the east and west side of Hershey Road (SR 0743) in Mount Joy Township and Elizabethtown Borough, Lancaster County. The proposed development is anticipated to be fully constructed by the year 2031. The development is proposed to consist of the following:

- 200,200 square foot warehouse (Tract 1)
- Park and Ride Lot (Tract 2)
- Hotel with 80 rooms (Tract 3)
- 24,000 square foot strip retail plaza (Tract 4)
- 2,950 square foot fast-food restaurant with drive-thru (Tract 5)
- 6,638 square foot convenience store with 16 fueling positions (Tract 6)
- 4,805 square foot one tunnel car wash (Tract 7)
- 200,200 square foot warehouse (Tract 8)
- 37 townhomes (Tract 9 & 10)

Access to the proposed development will be provided by extending Buckingham Boulevard (T-333) from Mt Gretna Road (SR 0241) to Hershey Road (SR 0743) and then continuing to Old Hershey Road (T-749). Accesses to the proposed land uses will be from the proposed Buckingham Boulevard Extension (Ext). Also, a right-in/right-out only driveway on Hershey Road (SR 0743) is proposed for the proposed strip retail plaza (Tract 4) and in between the proposed car wash (Tract 7) and convenience store (Tract 6). There will also be an access to the proposed warehouse (Tract 1) to Old Hershey Road. A right-in only driveway is proposed on Hershey Road (SR 0743) for the proposed fast-food restaurant (Tract 5). Ironstone Drive will be extended through the proposed townhomes (Tract 9 & 10).

Sight Distance Analysis

A sight distance analysis was performed at the proposed Buckingham Boulevard Extended where it intersects Hershey Road (SR 0743), Old Hershey Road and Mt Gretna Road (SR 0241) to determine if the available sight distance will exceed the minimum and desirable intersection sight distance based on the AASHTO guidelines for local roads and PennDOT Criteria for driveways. Also, a sight distance analysis was conducted for the proposed right-in/right-out driveways along Hershey Road (SR 0743) based on PennDOT's guidelines for driveways. The available sight distance for the proposed accesses exceed the minimum and desirable sight distance as shown in Table 3.

Table 3: Sight Distance Analysis

Condition	Posted Speed	Direction	Grade	Sight Distance		
				Available	ISD	SSSD
Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext. (West)						
Case B2 and 3: Right Turn and crossing from Minor Road	45 mph	To Left	0%	1000'+	430'	383'
Case F: Left Turn from Major Road	45 mph	Looking Ahead	0%	1000'+	365'	383'
Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext. (East)						
Case B2 and 3: Right Turn and crossing from Minor Road	45 mph	To Left	2%	1000'+	430'	370'
Case F: Left Turn from Major Road	45 mph	Looking Ahead	2%	1000'+	365'	370'
Mt Gretna Road (SR 0241)/Proposed Buckingham Boulevard Ext.						
Case B1: Left Turn from Minor Road	35 mph	To Left	1%	645'	390'	245'
		To Right	-1%	675'	390'	252'
Case B2 and 3: Right Turn and crossing from Minor Road	35 mph	To Left	1%	645'	335'	245'
		To Right	-1%	675'	335'	252'
Case F: Left Turn from Major Road	35 mph	Looking Ahead	1%	645'	285'	245'
Old Hershey Road / Proposed Buckingham Boulevard Ext.						
Case B1: Left Turn from Minor Road	30 mph	To Left	0%	1000'+	335'	196'
		To Right	0%	500'	335'	196'
Case B2 and 3: Right Turn and crossing from Minor Road	30 mph	To Left	0%	1000'+	290'	196'
		To Right	0%	500'	290'	196'
Case F: Left Turn from Major Road	30 mph	Looking Ahead	0%	1000'	245'	196'
Hershey Road (SR 0743)/Proposed RIRO Driveway for Tract 4						
Case A: Right Turn from Driveway	45 mph	To Left	2%	1000'+	--	370'

Condition	Posted Speed	Direction	Grade	Sight Distance		
				Available	ISD	SSSD
Hershey Road (SR 0743) / Proposed RIRO Driveway for Tract 6 & 7						
Case A: Right Turn from Driveway	45 mph	To Left	0%	1000'+	--	383'
Old Hershey Road / Proposed Driveway for Tract 1						
Case A: Left Turn from Driveway	30 mph	To Left	4%	1000'+	--	187'
		To Right	-4%	355'	--	207'
Case B and C: Left Turn from Major Road	30 mph	Looking Ahead	4%	1000'+	--	187'
		From Rear	-4%	340'	--	207'

Details of the sight distance evaluations can be found in the Appendices.

Site Trip Generation

The level of traffic likely to be generated by the proposed development has been estimated using procedures in the Institute of Transportation Engineers (ITE) Trip Generation Manual (12th Ed.) to determine the potential traffic impact on the study intersections. The trip generation was approved as part of the scoping application. Land use code Land use code 215 (Single Family Attached Housing) was utilized for the residential portion (townhomes – Tract 9 & 10) of the development with the number of units used as the independent variable. Land use code 822 (Strip Retail Plaza <40K) was used for the retail space (Tract 4) with the square footage as the independent variable. Land use code 945 (Convenience Store with Gas Pumps) was used for the convenience store (Tract 6) assuming the more conservative independent variable between square footage and fueling positions. Land use code 310 (Hotel) was used for the hotel (Tract 3) with the number of rooms used as the independent variable. Land use code 934 (Fast-Food Restaurant with Drive-Through Window) was used for the proposed restaurant (Tract 5) with the square footage of the building used as the independent variable. For the proposed warehouses, PennDOT's guidelines on warehouses from SOL 494-25-07 was used to determine the estimate site trips for Tracts 1 and 8. Trip generation for the proposed car wash (Tract 7) was obtained from a local trip generation study that was performed for similar car washes.

Generators such as restaurants, grocery stores, convenience markets, and banks attract a portion of their trips from passing traffic on the street enroute to their destination. In order to account for "pass-by" trips, the site trip generation in Table 3 was adjusted. Pass-by trip percentages were obtained from the Institute of Transportation Engineers (ITE) website. Pass-by trips for the convenience store (Tract 6) were assumed to be 76% during the AM peak, 75% during the PM peak and 65% during the Saturday peak. Pass-by trips for the proposed fast-food restaurant with drive-thru (Tract 5) were assumed to be 50% during the AM peak,

55% during the PM peak and 45% for the Saturday peak. Figures are included in the Appendices that show the new trips and pass-by trips.

The proposed development will consist of both residential, industrial and commercial land uses which there is expected to be some interaction between the land uses. To be conservative, no internal capture was assumed for the trip generation for this development.

The trip generation was approved as part of the scoping application by PennDOT and the Township. Details of this trip generation analysis can be found in the Appendices.

Table 4 summarizes the estimated site trip generation for the proposed development during the typical weekday AM and PM peak hours, Saturday peak hour and during the typical weekday.

Table 4: Estimated Trip Generation

Land Use (Code)	Size	Trip Type	AM Peak Hour			AM Peak Hour of Generator			PM Peak Hour			Daily Trips
			Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	
Warehouse 1 (West) (150)	200,200 sf	Passenger Vehicles	31	11	42	11	35	46	28	16	44	425
		Trucks	3	3	6	4	4	8	0	0	0	80
		Total	34	14	48	15	39	54	28	16	44	505
Warehouse 2 (East) (150)	200,200 sf	Passenger Vehicles	31	11	42	11	35	46	28	16	44	425
		Trucks	3	3	6	4	4	8	0	0	0	80
		Total	34	14	48	15	39	54	28	16	44	505
Hotel (310)	80 Rooms	Total	14	13	27	19	19	38	19	19	38	467
Townhomes (215)	37 Units	Total	4	13	17	11	8	19	8	9	17	243
Fast-Food with Drive-Through Window (934)	2,950 sf	New Passenger Vehicles	25	24	49	22	20	42	42	40	82	1,322
		Pass-By Passenger Vehicles	25	24	49	26	25	51	35	33	68	
		Total	50	48	98	48	45	93	77	73	150	

Land Use (Code)	Size	Trip Type	AM Peak Hour			AM Peak Hour of Generator			PM Peak Hour			Daily Trips
			Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	
Strip Retail Plaza (<40k) (822)	24,000 sf	Total	52	42	94	76	75	151	81	78	159	1,307
Car Wash (Local Data)	1 Tunnel	Total	44	39	83	82	79	161	80	80	160	1,457
Convenience Store/Gas Station (16 pumps) (945)	6,638 sf	New Passenger Vehicles	53	51	103	51	51	101	63	63	126	4,266
		Pass-By Passenger Vehicles	167	160	328	152	152	305	116	117	233	
		Total	220	211	431	203	203	406	179	180	359	
Development Total		New Passenger Vehicles	254	204	457	283	322	604	349	321	670	9,912
		Pass-By Passenger Vehicles	192	184	377	178	177	356	151	150	301	
		Trucks	6	6	12	8	8	16	0	0	0	160
		Total	452	394	846	469	507	976	500	471	971	10,072

Modal Split

Because there is not sufficient pedestrian and transit facilities provided within the study area, a trip reduction due to modal split is not applicable and was not assumed for this study.

Site Trip Distribution and Assignment

The trip distribution for the proposed Elizabethtown Crossing Development was determined based on a gravity-based distribution model. Separate trip distribution and assignments were conducted for passenger vehicles and trucks for the proposed warehouse uses. Also, separate assignments were made for each land use based on the location of the tracts and the most logical and direct travel paths. With the closeness to SR 0283, the majority of the site traffic is anticipated to use SR 0283 since it is a regional corridor.

Figures 7 in the Appendices shows the new trip distribution percentages for the passenger vehicle and truck site traffic for each land use on the major roadway system. Figures 8 shows the pass-by trip distribution percentages for the convenience store and fast-food restaurant site trips during the AM, PM and Saturday peak hours. Figures 9 in the Appendices shows the new site trips of the each of the proposed land uses in proposed development on the major roadway system at full buildout of the proposed development (passenger vehicles and trucks). Figure 10 shows the total new site trips for the entire development. Figures 11 show the pass-by site trips for the proposed fast-food restaurant and the convenience store while Figure 12 shows the total pass-by site trips for the entire development. Figure 13 shows the total site trips (new and pass-by) for the proposed development.

As part of the proposed development, Buckingham Boulevard will be extended from Mt Gretna Road (SR 0241) to Hershey Road (SR 0743). This connection between Mt Gretna Road (SR 0241) and Hershey Road (SR 0743) will provide an alternative route option for vehicles oriented to/from SR 0283. It is assumed that a portion of the traffic that currently travels along Mt Gretna Road (SR 0241) to Hershey Road (SR 0743) will be rerouted to use the Proposed Buckingham Boulevard Ext. For purposes of the traffic analysis, it was assumed that approximately 70% of the applicable traffic movements at the Hershey Road (SR 0743)/Mt Gretna Road (SR 0241) intersection would utilize the new Buckingham Boulevard Ext. Figure 14 in the Appendices shows the redistributed traffic assumed due to the Proposed Buckingham Boulevard Extension.

Also, there are two (2) businesses (R&R Services Center and Green Gate Auto) on the west side of Hershey Road (SR 0743) that have direct access to SR 0743. Due to possible conflicts with the proposed roadway improvements, it is proposed to restrict the driveways to right-in/right-out only and to provide a reverse frontage road that would connect to the Proposed Buckingham Boulevard Extension. Figure 15 in the Appendices shows the redistribution of the traffic for those two existing businesses.

Details of the site trip distribution and assignment are included in the Appendices.

6. HORIZON YEAR (2036) TRAFFIC CONDITIONS WITH DEVELOPMENT

Traffic Volumes

The horizon year (2036) with development peak hour volumes were derived by combining existing traffic, growth in background and through traffic, site traffic from background developments, and the site trips generated by the proposed development. Figures 16 in the Appendices show the typical weekday AM, PM and Saturday peak hours horizon year (2036) with development traffic volumes at the study intersections.

Level of Service/Capacity Analysis

A level of service analysis was conducted at the study area intersections for the horizon year (2036) with development scenario to determine the level of service with the proposed development. Table A in the Appendices shows the results of the level of service analysis.

As shown in the analysis, the study intersections operate at acceptable overall levels of service (LOS D or better) in the horizon year (2036) with development, with the exception of the following intersections, which will have some failing levels of service:

- Hanover Street (SR 0743) / Spring Garden Street
- Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street
- Hershey Road (SR 0743)/Veterans Drive
- Hershey Road (SR 0743)/SR 0283 Eastbound Ramps
- Hershey Road (SR 0743)/SR 0283 Westbound Ramps
- Hershey Road (SR 0743) / Beverly Road

Figure 17 in the Appendices shows the level of service results for the horizon year (2036) with development during the typical weekday AM, PM and Saturday peak hours at the study intersections. Details of the level of service analysis can be found in the Appendices.

Turn Lane Analysis

The need for turn lanes at the site accesses on Hershey Road (SR 0743), Old Hershey Road and Proposed Buckingham Boulevard Ext utilizing PennDOT guidelines outlined in Publication 46 Chapter 11.17. The turn lane analysis found that a right turn lane is warranted on Hershey Road (SR 0743) at the proposed right-in/right-out for the strip retail plaza (Tract 4) and for the proposed right-in/right-out between the car wash and convenience store.

A turn lane analysis was also conducted at the proposed Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext intersection. The turn lane analysis found that northbound and southbound left turn lanes are warranted on Hershey Road (SR 0743).

Details of the turn lane analysis is included in the Appendices.

Queue Analysis

A queue analysis was conducted at the study intersections to determine if the proposed development site traffic will impact queues. The queue analysis was conducted using the HCM (7th Ed.) and Synchro methodology. The queue analysis found that available storage areas are sufficient to accommodate the future queues, with the following exceptions:

Hershey Road (SR 0743)/SR 0283 Eastbound Ramps

- The eastbound queues on the SR 0283 Eastbound Ramp will exceed the existing available storage area.
- The southbound left turn queues on Hershey Road (SR 0743) will exceed the existing available storage area.

Hershey Road (SR 0743)/SR 0283 Westbound Ramps

- The westbound queues on the SR 0283 Westbound Ramp will exceed the existing available storage area.
- The northbound left turn queues on Hershey Road (SR 0743) will exceed the existing available storage area.

Details of the queue analysis (HCM 7th Ed. And Synchro) can be found in the Appendices.

Traffic Signal Warrant Analysis

Traffic signal warrant analysis was conducted at the unsignalized intersections utilizing the PennDOT Publication 46 guidelines and the PennDOT Traffic Signal Warrant workbook spreadsheet. Based on the signal warrant analysis, the majority of the unsignalized intersection did not meet the traffic signal warrants. The intersection of Hershey Road (SR 0743)/SR 0283 Eastbound Ramps did meet the traffic signal volume warrants and is justified. A traffic signal is assumed at this intersection as part of the Improvement Analysis.

The intersection of Hershey Road (SR 0743)/Beverly Road also marginally meets some traffic signal volume warrants, however the signal is warranted based on existing traffic volumes and the development will only account for a small portion of the traffic at this intersection. Therefore, a traffic signal is not proposed at this intersection at this time.

Details of the signal warrant analysis can be found in the Appendices.

Signal Left-Turn Phasing Analysis

Left turn phasing analysis was conducted at the proposed signalized Hershey Road (SR 0743)/Proposed Buckingham Boulevard intersection as well as the proposed signal at the Hershey Road (SR 0743)/SR 0283 Eastbound Ramps intersection. The left turn phasing analysis was conducted per PennDOT's Pub 46 and 149. The left turn phasing analysis found that a southbound advanced left turn phasing is warranted at the Hershey Road (SR 0743)/Proposed Buckingham Boulevard intersection based on 2036 traffic volumes with the proposed development. Since a southbound advance left turn phase is warranted, a northbound advance left turn phase is also proposed.

At the Hershey Road (SR 0743)/SR 0283 Eastbound Ramps intersection, an advance southbound left turn phase is warranted.

Details of the signal left turn phasing analysis is included in the Appendices.

7. IMPROVEMENT ANALYSIS

An improvement analysis was conducted to determine what improvements are required to mitigate the proposed development site impacts. A discussion of the improvements required and improvements recommended (where feasible) at each intersection are found below.

Hershey Road (SR 0743) / Proposed Buckingham Boulevard Ext

A traffic signal warrant analysis was conducted at this intersection assuming full buildout of the proposed development. The signal warrant analysis was conducted per MUTCD and PennDOT Pub 46 guidelines as well as using the PennDOT Signal Warrant Workbook. Based on the analysis, a traffic signal is warranted and justified. Also, the following lanes are proposed at this intersection:

- Exclusive eastbound left turn lane
- Shared eastbound through and right turn lane
- Exclusive westbound left turn lane
- Shared westbound through and right turn lane
- Exclusive left turn lane
- Exclusive through lane
- Shared through and right turn lane
- Exclusive southbound left turn lane
- Exclusive through lane
- Exclusive right turn lane

This signalized intersection is proposed to be coordinated with the proposed traffic signals along Hershey Road (SR 0743) at the SR 0283 Interchange Ramps. The signal is not proposed to be coordinated with the signals at Veterans Drive nor Mt Gretna Road (SR 0241)/Holly Street because the Mt Gretna Road (SR 0241) signal causes a higher than needed cycle length and Veterans Drive is approximately ½ mile away. With the proposed roadway improvements, this intersection will operate with acceptable levels of service in the year 2036 with the proposed development.

Hershey Road (SR 0743)/SR 0283 Eastbound Ramps

An improvement analysis was conducted at the Hershey Road (SR 0743) / SR 0283 Eastbound Ramps intersection due to the long delays expected on the eastbound approach of the SR 0283 Eastbound Ramp. A signal warrant analysis was conducted at the intersection to determine if a traffic signal is warranted. The signal warrant analysis was conducted per MUTCD and PennDOT Pub 46 guidelines as well as using the PennDOT Signal Warrant Workbook. Traffic counts were conducted at this intersection from 6 AM to 6 PM. Based on the traffic signal warrant analysis, Warrants 1 and 2 were met. Therefore, this intersection is proposed to be signalized. To address safety concerns the

Township has at the interchange, the existing right turn channelized lane is proposed to be removed and replaced with a typical right turn lane that will be controlled by the traffic signal. This signalized intersection will be coordinated with the adjacent traffic signals along Hershey Road (SR 0743) at Proposed Buckingham Boulevard and at SR 0283 Westbound Ramps. With the proposed improvements, this intersection will operate with acceptable levels of service in the year 2036 with the proposed development.

Hershey Road (SR 0743)/SR 0283 Westbound Ramps

This existing signalized intersection is proposed to be coordinated along with the adjacent signals along Hershey Road (SR 0743) at the SR 0283 Eastbound Ramp intersection and the Proposed Buckingham Boulevard intersection. With changes to the cycle length and signal timings, this intersection will operate with acceptable levels of service in the year 2036 with the proposed development, with the exception of during the AM peak hour. However, the operation of the intersection with the proposed improvements will be the same or better than in the "Without Development" scenario and therefore, mitigate the proposed development site traffic. Also, to address safety concerns the Township has at the interchange, the existing right turn channelized lane is proposed to be removed and replaced with a typical right turn lane that will be controlled by the traffic signal.

Hershey Road (SR 0743) / Spring Garden Street

This intersection was analyzed to determine if a traffic signal was warranted and justified per PennDOT Publication 46 guidelines. The traffic signal analysis showed that a traffic signal is not warranted nor justified at this intersection.

A gap study was conducted for the AM and PM peak hours to determine if there are sufficient gaps to accommodate the anticipated traffic at the N. Hanover Street (SR 0743) / Spring Garden Street intersection. The gap study was conducted based on the Highway Capacity Manual guidelines and found that there are sufficient gaps to accommodate the minor street traffic onto N. Hanover Street (SR 0743).

Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street

In order to mitigate the proposed development site traffic during the AM Peak hour, the cycle lengths and signal timings will be optimized at the Hershey Road (SR 0743) / Mt Gretna Road (SR 0241) / Holly Street intersection. Since this intersection is coordinated with the Hershey Road (SR 0743)/Veterans Drive intersection, the cycle length and signal timings at Veterans Drive signal will also be optimized.

Figures 19 show the future 2036 traffic volumes and level of service with the proposed development and improvements. Details of the improvement analysis are included in the Appendices.

8. RECOMMENDATIONS

A summary of the recommendations to ensure safe and efficient traffic movements is presented below. All recommended improvements will be constructed to be ADA compliant unless otherwise directed or approved by the Department.

1. The developer will extend Buckingham Boulevard from Mt Gretna Road (SR 0241) to Old Hershey Road. The majority of the proposed Buckingham Boulevard will be a three-lane section; one lane in each direction with a center left turn lane.

2. The developer will signalize the proposed intersection of Hershey Road (SR 0743)/Proposed Buckingham Boulevard Ext with advance northbound and southbound left turn phasing (via flashing yellow arrow). This signal will be included in a coordinated system that will consist of this intersection and the adjacent signals at the SR 0283 interchange ramps. The following lane configuration will be provided:

   Eastbound approach (Proposed Buckingham Boulevard)

   - Exclusive left turn lane (120 feet of storage)
   - Shared through/right turn lane

   Westbound approach (Proposed Buckingham Boulevard)

   - Exclusive left turn lane (225 feet of storage)
   - Shared through/right turn lane

   Northbound approach (Hershey Road (SR 0743))

   - Exclusive left turn lane (150 feet of storage)
   - Shared through/right turn lane

   Southbound approach (Hershey Road (SR 0743))

   - Exclusive left turn lane (425 feet of storage)
   - Exclusive through lane
   - Exclusive right turn lane (will be a lane drop from the 2 through lanes at the SR 0283 Eastbound Ramps)

   As part of these improvements, a median will be installed on Hershey Road (SR 0743) from the proposed intersection north and connect to the existing median near the SR 0283 interchange. A median will also

be provided on Hershey Road (SR 0743) to the south to help regulate the turn restrictions for the proposed right-in/right-out for the proposed strip retail plaza (Tract 4).

3. The developer will construct a right-in/right-out driveway (ADT – 570 trips) to PennDOT standards on Hershey Road (SR 0743) for the proposed strip retail plaza (Tract 4). A stop sign will be installed on the eastbound approach of the proposed driveway and adequate sight distance will be maintained. A southbound right turn lane will be installed on Hershey Road (SR 0743). The right turn lane length will be maximized without impacting the adjacent proposed signalized intersection.

4. The developer will construct a right-in driveway (ADT – 320 trips) to PennDOT standards on Hershey Road (SR 0743) for the proposed fast-food restaurant (Tract 5).

5. The developer will construct a right-in/right-out driveway (ADT – 2,270 trips) to PennDOT standards on Hershey Road (SR 0743) between the proposed convenience store (Tract 6) and the proposed car wash (Tract 7). A stop sign will be installed on the westbound approach of the proposed driveway and adequate sight distance will be maintained. A northbound right turn lane will be installed on Hershey Road (SR 0743) at the proposed access. The right turn lane length will be maximized without impacting the adjacent proposed signalized intersection and staying outside the PennDOT Limited Access ROW.

6. The developer will extend existing Ironstone Drive from the existing residential area through Tracts 9 and 10 and connect to the Proposed Buckingham Boulevard.

7. The developer will install a traffic signal at the existing Hershey Road (SR 0743)/SR 0283 Eastbound Ramps to include the following:

    - Remove channelized right turn lane to provide exclusive right turn lane adjacent to the shared left/through lane.
    - Advance southbound left turn phase via a flashing yellow arrow.
    - Incorporate the new traffic signal into a new signal system corridor along Hershey Road (SR 0743) from the Proposed Buckingham Boulevard signal to the SR 0283 Westbound Ramps signal.

8. The developer will construct the following improvements at the Hershey Road (SR 0743)/SR 0283 Westbound Ramps intersection:

    - Remove channelized right turn lane to provide exclusive right turn lane adjacent to the shared left/through lane.
    - Optimize the traffic signal timings to be included in the new system corridor along Hershey Road (SR 0743) from the proposed Buckingham Boulevard to this intersection.

9. The developer will optimize the cycle lengths and traffic signal timings during the AM peak hour at the following intersections:

    - Hershey Road (SR 0743)/Mt Gretna Road (SR 0241)/Holly Street
    - Hershey Road (SR 0743)/Veterans Drive

APPENDICES

LEVEL OF SERVICE/QUEUE TABLES

Street (SR 0743) / awn Avenue	WBLR	B (12.7)	B (13.4)	B (14.9)	--	B (11.3)	B (11.8)	B (12.7)	--	B (11.1)	B (11.5)	B (12.7)
	SBL	A (9.6)	A (9.8)	B (10.1)	--	B (10.2)	B (10.4)	B (10.8)	--	A (9.3)	A (9.4)	A (9.8)
	OVERALL	A (1.9)	A (1.9)	A (1.8)	--	A (2.1)	A (2.1)	A (1.9)	--	A (1.3)	A (1.3)	A (1.1)
	EB	D (38.1)	D (37.8)	D (37.8)	C (34.9)	D (44.7)	D (44.3)	D (44.3)	--	D (37.9)	D (37.5)	D (37.5)
	NB	E (57.4)	E (78.3)	F (104.7)	E (65.5)	D (46.0)	E (61.1)	E (55.6)	--	C (26.3)	C (29.6)	C (32.5)
	NBL	C (28.8)	C (29.8)	C (29.2)	C (24.0)	C (25.7)	C (27.2)	C (23.6)	--	B (18.6)	B (19.7)	B (18.9)
	NBTR	E (57.6)	E (78.6)	F (105.1)	E (65.7)	D (46.3)	E (61.6)	E (56.0)	--	C (26.5)	C (29.8)	C (32.8)
over Street - ad (SR 0743) / Mt. oad (SR 0241) / y Street [1*]	SB	C (25.2)	C (34.5)	C (34.3)	C (34.0)	C (24.0)	D (37.0)	C (31.3)	--	B (14.5)	B (14.5)	B (11.2)
	SBL	C (29.1)	E (58.4)	D (51.2)	E (58.0)	D (35.1)	E (66.9)	D (52.9)	--	B (15.0)	B (18.4)	B (16.0)
	SBT	C (23.5)	C (23.8)	C (28.3)	C (25.6)	B (18.2)	C (21.5)	C (24.4)	--	B (14.2)	B (12.8)	A (10.0)
	NWL	E (68.4)	E (77.1)	E (75.6)	E (76.1)	E (60.2)	E (62.4)	E (62.4)	--	D (47.1)	D (48.8)	D (48.8)
	SWL	E (69.8)	E (75.6)	E (70.6)	E (78.0)	E (76.1)	F (83.9)	E (79.3)	--	D (43.1)	D (43.6)	D (43.5)
	OVERALL	D (49.9)	E (61.6)	E (69.2)	E (57.4)	D (39.7)	D (51.3)	D (46.8)	--	C (26.3)	C (27.6)	C (27.1)
	EB	C (27.7)	E (56.3)	E (56.3)	D (52.0)	C (28.2)	E (57.1)	E (57.1)	--	C (24.5)	D (47.5)	D (47.5)
	EBL	C (26.2)	D (53.6)	D (53.6)	D (49.2)	C (25.8)	D (53.1)	D (53.1)	--	C (22.7)	D (45.0)	D (45.0)
	EBTR	C (29.1)	E (58.8)	E (58.8)	D (54.5)	C (29.5)	E (59.4)	E (59.4)	--	C (25.7)	D (49.6)	D (49.6)
	WB	A (0.0)	A (0.0)	A (0.0)	A (0.0)	C (25.1)	D (49.7)	D (49.7)	--	A (0.0)	A (0.0)	A (0.0)
	NB	A (0.7)	A (0.4)	A (0.6)	A (0.5)	A (0.9)	A (1.7)	A (1.6)	--	A (0.6)	A (0.7)	A (0.6)
oad (SR 0743) / rive - Driveway [1]	NBL	--	A (3.7)	A (8.6)	A (4.0)	--	B (10.0)	A (9.7)	--	--	A (3.0)	A (2.1)
	NBTR	--	A (0.2)	A (0.2)	A (0.3)	--	A (0.2)	A (0.2)	--	--	A (0.4)	A (0.4)
	SB	A (3.5)	A (7.5)	C (27.1)	A (8.0)	A (6.2)	B (13.6)	B (13.4)	--	A (2.5)	A (6.5)	A (1.1)
	OVERALL	A (4.3)	A (9.3)	B (15.6)	A (8.8)	A (5.9)	B (13.4)	B (12.7)	--	A (2.9)	A (8.1)	A (5.4)
	EBLTR	C (21.2)	C (24.2)	D (26.8)	--	C (24.6)	D (28.0)	D (30.0)	--	B (13.4)	B (14.6)	C (16.2)
	WBLTR	C (16.9)	C (18.4)	C (19.9)	--	D (25.5)	D (29.5)	D (32.3)	--	B (14.4)	C (15.9)	C (18.2)
oad (SR 0743) / venue - Christy Court	NBL	A (9.5)	A (9.7)	A (9.8)	--	B (10.9)	B (11.2)	B (11.2)	--	A (9.2)	A (9.4)	A (9.5)
	SBL	B (10.9)	B (11.2)	B (11.5)	--	A (9.9)	B (10.1)	B (10.4)	--	A (9.5)	A (9.7)	B (10.1)
	OVERALL	A (0.4)	A (0.4)	A (0.4)	--	A (0.3)	A (0.3)	A (0.3)	--	A (0.4)	A (0.4)	A (0.4)
	EB	B (10.9)	B (13.1)	C (16.1)	D (50.7)	F (564.4)	F (1022.1)	F (2115.6)	D (48.7)	A (9.9)	B (10.6)	B (11.5)
	EBLT	--	--	--	C (28.9)	--	--	--	C (23.7)	--	--	--
	EBR	--	--	--	D (52.0)	--	--	--	D (51.9)	--	--	--
	NB	--	--	--	B (15.2)	--	--	--	C (23.9)	--	--	--
ad (SR 0743) / SR EB Ramps [2]	NBT	--	--	--	B (15.2)	--	--	--	C (23.9)	--	--	--
	NBTR	--	--	--	B (15.2)	--	--	--	C (23.9)	--	--	--
	SB	--	--	--	A (3.7)	--	--	--	C (21.6)	--	--	--
	SBL	C (15.6)	C (17.1)	C (19.4)	A (7.7)	C (16.6)	C (18.7)	C (24.2)	C (23.8)	B (11.0)	B (11.4)	B (12.6)
	SBT	--	--	--	A (0.1)	--	--	--	B (19.5)	--	--	--
	OVERALL	A (4.6)	A (5.1)	A (5.5)	B (14.5)	F (97.8)	F (174.8)	F (357.0)	C (27.3)	A (4.2)	A (4.3)	A (4.1)
	WB	F (379.6)	F (498.7)	F (835.1)	F (150.5)	D (39.9)	D (44.7)	E (61.2)	D (39.8)	C (26.2)	C (27.8)	C (32.9)
	WBLT	--	--	--	F (284.1)	--	--	--	C (21.5)	--	--	--
	WBR	--	--	--	F (89.2)	--	--	--	D (53.1)	--	--	--
	NB	C (29.4)	C (32.1)	D (37.5)	D (40.8)	B (17.0)	B (18.5)	C (23.9)	B (15.9)	B (12.0)	B (13.3)	B (17.1)
ad (SR 0743) / SR WB Ramps [1]	NBL	D (46.1)	D (50.4)	E (59.8)	D (53.7)	D (40.1)	D (42.1)	D (48.9)	D (37.7)	C (24.4)	C (25.9)	C (31.1)
	NBT	A (6.8)	A (6.5)	A (6.2)	C (22.7)	A (4.5)	A (5.0)	A (6.4)	A (0.6)	A (2.8)	A (3.1)	A (4.1)
	SB	C (24.8)	C (25.9)	C (28.3)	D (51.0)	B (15.4)	B (17.6)	C (25.2)	D (47.5)	B (10.1)	B (11.3)	B (15.8)
	SBT	C (24.8)	C (25.9)	C (28.3)	D (51.0)	B (15.4)	B (17.6)	C (25.2)	D (47.5)	B (10.1)	B (11.3)	B (15.8)
	SBTR	C (24.8)	C (25.9)	C (28.3)	D (51.0)	B (15.4)	B (17.6)	C (25.2)	D (47.5)	B (10.1)	B (11.3)	B (15.8)
	OVERALL	E (76.6)	F (97.9)	F (168.3)	F (87.0)	C (20.1)	C (22.6)	C (31.6)	D (37.1)	B (13.1)	B (14.6)	B (19.5)
	EBLTR	D (25.5)	D (27.3)	D (30.4)	--	E (36.7)	E (42.6)	F (50.3)	--	C (20.0)	C (21.5)	C (24.7)
	WBLTR	F (52.3)	F (69.2)	F (88.8)	--	E (37.7)	E (46.1)	F (57.7)	--	C (20.8)	C (22.9)	D (26.8)
oad (SR 0743) / erly Road	NBL	A (9.8)	A (9.9)	B (10.1)	--	B (11.6)	B (11.8)	B (12.1)	--	A (9.5)	A (9.6)	A (9.8)
	SBL	B (11.6)	B (11.9)	B (12.1)	--	B (10.5)	B (10.6)	B (10.9)	--	A (9.8)	A (9.9)	B (10.1)
	OVERALL	A (3.6)	A (4.6)	A (5.6)	--	A (1.8)	A (2.1)	A (2.4)	--	A (1.5)	A (1.6)	A (1.7)
	WBLR	A (8.6)	A (8.6)	A (9.0)	--	A (8.3)	A (8.3)	A (8.5)	--	A (8.2)	A (8.2)	A (8.3)
y Road / Beverly Road	SBL	A (8.1)	A (8.1)	A (8.3)	--	A (8.0)	A (8.0)	A (8.1)	--	A (8.1)	A (8.1)	A (8.1)
	OVERALL	A (4.0)	A (3.7)	A (1.6)	--	A (4.0)	A (3.7)	A (2.3)	--	A (2.7)	A (2.2)	A (1.2)
	WBLR	A (9.0)	A (9.1)	A (9.1)	--	A (9.2)	A (9.3)	A (9.3)	--	A (8.7)	A (8.8)	A (8.8)
Road (SR 0241) / eview Road	SBL	A (8.4)	A (8.4)	A (8.4)	--	A (8.4)	A (8.4)	A (8.4)	--	A (8.2)	A (8.3)	A (8.3)
	OVERALL	A (2.3)	A (2.3)	A (2.3)	--	A (2.4)	A (2.3)	A (2.3)	--	A (2.3)	A (2.2)	A (2.2)
	WBLR	A (9.0)	A (9.1)	A (9.1)	--	A (8.9)	A (8.9)	A (8.9)	--	A (8.5)	A (8.6)	A (8.6)
Road (SR 0241) /	SBL	A (8.5)	A (8.5)	A (8.5)	--	A (8.4)	A (8.4)	A (8.4)	--	A (8.2)	A (8.3)	A (8.3)

	(Movement)	Traffic Volumes	Volumes without Dev	Volumes with Dev	Volumes with Dev and Imp	Traffic Volumes	Volumes without Dev	Volumes with Dev	Volumes with Dev and Imp	Traffic Volumes	Volumes without Dev	Volumes Dev
/ Proposed #1	WBLR	--	--	A (8.4)	--	--	--	A (8.5)	--	--	--	A (8.4
	SBL	--	--	A (8.1)	--	--	--	A (8.1)	--	--	--	A (8.2
	OVERALL	--	--	A (1.2)	--	--	--	A (2.7)	--	--	--	A (1.4
/ Proposed evard Ext.	WBLR	--	--	A (8.3)	--	--	--	A (8.2)	--	--	--	A (8.3
	SBL	--	--	A (8.1)	--	--	--	A (8.2)	--	--	--	A (8.1
	OVERALL	--	--	A (5.8)	--	--	--	A (5.4)	--	--	--	A (5.8
ngham Proposed s #1	EBL	--	--	A (0.0)	--	--	--	A (0.0)	--	--	--	A (0.0
	SBLR	--	--	A (9.4)	--	--	--	A (9.4)	--	--	--	A (0.0
	OVERALL	--	--	A (0.4)	--	--	--	A (0.5)	--	--	--	A (0.0
ngham posed Site 2	WBL	--	--	A (8.1)	--	--	--	A (8.2)	--	--	--	A (8.2
	NBLR	--	--	A (8.3)	--	--	--	A (8.4)	--	--	--	A (8.1
	OVERALL	--	--	A (2.3)	--	--	--	A (2.6)	--	--	--	A (2.8
ngham posed Site 3	EBL	--	--	A (0.0)	--	--	--	A (0.0)	--	--	--	A (0.0
	WBL	--	--	A (8.2)	--	--	--	A (8.3)	--	--	--	A (8.2
	NBLTR	--	--	A (8.4)	--	--	--	A (8.7)	--	--	--	A (8.6
	SBLTR	--	--	A (0.0)	--	--	--	B (10.1)	--	--	--	B (10.
	OVERALL	--	--	A (3.0)	--	--	--	A (3.9)	--	--	--	A (4.0
R 0743) / ccess #4 ed Site IRO)	EBR	--	--	--	--	--	--	--	--	--	--	--
	WBR	--	--	--	--	--	--	--	--	--	--	--
	OVERALL	--	--	--	--	--	--	--	--	--	--	--
R 0743) / ngham Ext.	EB	--	--	D (50.0)	D (36.9)	--	--	D (45.9)	C (34.1)	--	--	D (40
	EBL	--	--	D (52.6)	D (38.8)	--	--	D (48.8)	D (36.3)	--	--	D (43.
	EBTR	--	--	D (45.5)	C (33.7)	--	--	D (39.8)	C (29.7)	--	--	D (35.
	WB	--	--	D (50.8)	D (37.6)	--	--	D (47.2)	D (35.1)	--	--	D (41.
	WBL	--	--	D (52.3)	D (38.5)	--	--	D (50.3)	D (37.3)	--	--	D (43.
	WBTR	--	--	D (48.8)	D (36.4)	--	--	D (41.9)	C (31.3)	--	--	D (38.
	NB	--	--	A (2.8)	B (18.3)	--	--	A (2.0)	B (18.3)	--	--	A (1.1
	NBL	--	--	A (0.7)	A (5.5)	--	--	A (5.2)	B (13.4)	--	--	A (0.5
	NBTR	--	--	A (2.8)	B (18.7)	--	--	A (1.8)	B (18.5)	--	--	A (1.1
	SB	--	--	A (4.7)	A (8.0)	--	--	B (10.8)	B (11.5)	--	--	A (5.0
	SBL	--	--	A (6.4)	B (19.0	--	--	B (13.8)	B (17.8)	--	--	A (6.5
	SBT	--	--	A (4.2)	A (4.1)	--	--	A (9.7)	A (9.2)	--	--	A (4.2
	SBR	--	--	A (2.4)	A (2.3)	--	--	A (4.1)	A (3.6)	--	--	A (2.5
	OVERALL	--	--	A (9.9)	B (17.1)	--	--	B (14.2)	B (17.7)	--	--	B (10.
R 0743) / ccess #6	WBR	--	--	--	--	--	--	--	--	--	--	--
	OVERALL	--	--	--	--	--	--	--	--	--	--	--
ngham posed Site IRO)	WBR	--	--	--	--	--	--	--	--	--	--	--
	OVERALL	--	--	--	--	--	--	--	--	--	--	--
ngham posed Site osed Site 9	EBL	--	--	A (8.6)	--	--	--	A (8.9)	--	--	--	A (8.7
	WBL	--	--	A (8.2)	--	--	--	A (8.4)	--	--	--	A (8.4
	NBLTR	--	--	B (12.6)	--	--	--	C (17.4)	--	--	--	B (14.
	SBL	--	--	B (11.7)	--	--	--	C (15.1)	--	--	--	B (12.
	SBTR	--	--	A (8.7)	--	--	--	A (9.0)	--	--	--	A (8.7
	OVERALL	--	--	A (6.1)	--	--	--	A (6.2)	--	--	--	A (6.5
ngham Proposed s #2	EBL	--	--	A (9.2)	--	--	--	A (8.4)	--	--	--	A (0.0
	SBLR	--	--	A (9.5)	--	--	--	A (9.8)	--	--	--	A (0.0
	OVERALL	--	--	A (0.4)	--	--	--	A (0.3)	--	--	--	A (0.0
ngham posed Site osed Site 1	EBL	--	--	A (8.2)	--	--	--	A (7.3)	--	--	--	A (8.1
	WBL	--	--	A (0.0)	--	--	--	A (0.0)	--	--	--	A (0.0
	NBLTR	--	--	A (9.1)	--	--	--	B (10.1)	--	--	--	A (9.4
	SBLTR	--	--	A (8.4)	--	--	--	A (8.7)	--	--	--	A (8.4
	OVERALL	--	--	A (3.1)	--	--	--	A (2.0)	--	--	--	A (2.3

ring Garden Street	NBL	800'	5	0	0	5	0	0	5	0	0	-	-
	SBL	900'	0	0	0	0	0	0	0	0	0	-	-
over Street (SR 0743) / Highlawn Avenue	WBLR	345'	15	8	5	18	8	8	20	10	8	-	-
	SBL	1,000'+	8	18	5	8	20	5	8	20	5	-	-
er Street - Hershey Road 3) / Mt. Gretna Road (SR 41) / Holly Street [1]*	EBLTR	75'	-	-	-	-	-	-	-	-	-	-	-
	NBL	175'	-	-	-	-	-	-	-	-	-	-	-
	NBTR	1,000'+	-	-	-	-	-	-	-	-	-	-	-
	SBL	100'	-	-	-	-	-	-	-	-	-	-	-
	SBT	1,000'+	-	-	-	-	-	-	-	-	-	-	-
	NWLTR	915'	-	-	-	-	-	-	-	-	-	-	-
	SWLTR	1,000'+	-	-	-	-	-	-	-	-	-	-	-
hey Road (SR 0743) / ans Drive - Driveway [1]	EBL	150'	43	28	13	128	90	65	128	90	65	115	-
	EBTR	500'	50	58	23	145	163	85	145	163	85	133	-
	WBLTR	75'	0	0	0	0	3	0	0	3	0	0	-
	NBLTR	1,000'+	13	13	10	-	-	-	-	-	-	-	-
	NBL	150'	-	-	-	8	43	8	18	40	8	8	-
	NBTR	1,000'+	-	-	-	3	3	8	3	5	8	3	-
	SBLTR	1,000'+	30	80	10	203	443	143	565	435	15	213	-
hey Road (SR 0743) / Avenue - Christy Court	EBLTR	100'	5	3	3	5	3	3	8	5	3	-	-
	WBLTR	130'	3	3	3	3	3	3	3	3	3	-	-
	NBL	1,000'+	0	0	0	0	0	0	0	0	0	-	-
	SBL	1,000'+	0	0	0	0	0	0	0	0	0	-	-
y Road (SR 0743) / SR 283 EB Ramps [2]	EBLTR	1,000'+	23	680	15	35	880	20	58	1,188	35	-	-
	EBLT	1,000'+	-	-	-	-	-	-	-	-	-	13	35
	EBR	400'	-	-	-	-	-	-	-	-	-	265	380
	NBT	1,000'+	-	-	-	-	-	-	-	-	-	180	175
	NBTR	1,000'+	-	-	-	-	-	-	-	-	-	180	175
	SBL	100'	85	133	43	100	160	48	115	208	55	85	283
	SBT	450'	-	-	-	-	-	-	-	-	-	3	213
y Road (SR 0743) / SR 283 WB Ramps [1]	WBLTR	1,000'+	598	260	85	735	303	108	1,095	448	200	-	-
	WBLT	1,000'+	313	150	90	358	180	115	448	280	200	725	253
	WBR	525'	35	30	8	38	35	10	43	58	23	745	515
	NBL	250'	313	150	90	358	180	115	448	280	200	355	163
	NBT	400'	35	30	8	38	35	10	43	58	23	113	5
	SBT	1,000'+	230	238	65	250	275	80	283	375	133	340	460
	SBTR	1,000'+	230	238	65	250	275	80	283	375	133	340	460
hey Road (SR 0743) / Beverly Road	EBLTR	1,000'+	5	3	3	8	3	3	8	5	3	-	-
	WBLTR	1,000'+	75	38	20	95	48	3	113	58	30	-	-
	NBL	1,000'+	0	3	0	0	3	0	0	3	0	-	-
	SBL	900'	5	5	3	5	5	3	5	5	3	-	-
hey Road / Beverly Road	WBLR	1,000'+	0	3	0	0	3	0	0	3	0	-	-
	SBL	700'	0	0	0	0	0	0	3	0	0	-	-
etna Road (SR 0241) / Ridgeview Road	WBLTR	1,000'+	5	5	3	5	5	3	5	5	3	-	-
	SBL	1,000'+	3	3	0	3	3	0	3	3	0	-	-

d / Proposed ss #1	WBLR	75'	-	-	-	-	-	-	0	3	3	-	
	SBL	1,000'+	-	-	-	-	-	-	0	0	0	-	
d / Proposed ulevard Ext.	WBLR	75'	-	-	-	-	-	-	3	3	3	-	
	SBL	500'	-	-	-	-	-	-	3	3	3	-	
ckingham / Proposed ess #1	EBL	75'	-	-	-	-	-	-	0	0	0	-	
	SBLR	75'	-	-	-	-	-	-	0	0	0	-	
ckingham Proposed Site #2	WBL	75'	-	-	-	-	-	-	0	3	3	-	
	NBLR	75'	-	-	-	-	-	-	0	3	3	-	
ckingham Proposed Site #3	EBL	75'	-	-	-	-	-	-	0	0	0	-	
	WBL	75'	-	-	-	-	-	-	3	3	3	-	
	NBLTR	75'	-	-	-	-	-	-	3	5	5	-	
	SBLTR	75'	-	-	-	-	-	-	0	0	0	-	
(SR 0743) / Access #4 d Site Access RO)	EBR	75'	-	-	-	-	-	-	-	-	-	-	
(SR 0743) / ckingham d Ext.	EBL	120'	-	-	-	-	-	-	60	118	78	43	8
	EBTR	215'	-	-	-	-	-	-	33	50	38	23	3
	WBL	225'	-	-	-	-	-	-	153	220	145	110	16
	WBTR	250'	-	-	-	-	-	-	115	115	100	85	8
	NBL	150'	-	-	-	-	-	-	0	10	3	8	1
	NBTR	1000'+	-	-	-	-	-	-	50	35	18	470	37
	SBL	425'	-	-	-	-	-	-	60	195	73	120	15
	SBT	850'	-	-	-	-	-	-	115	330	83	80	25
	SBR	850'	-	-	-	-	-	-	5	5	5	5	5
(SR 0743) / Access #6 O)	WBR	75'	-	-	-	-	-	-	-	-	-	-	
ckingham Proposed Site pposed Site #9	EBL	75'	-	-	-	-	-	-	10	15	13	-	
	WBL	75'	-	-	-	-	-	-	0	0	0	-	
	NBLTR	75'	-	-	-	-	-	-	8	13	15	-	
	SBL	75'	-	-	-	-	-	-	3	5	5	-	
	SBTR	75'	-	-	-	-	-	-	8	13	8	-	
ckingham / Proposed ess #2	EBL	75'	-	-	-	-	-	-	0	0	0	-	
	SBLR	75'	-	-	-	-	-	-	0	0	0	-	
ckingham	EBL	75'	-	-	-	-	-	-	3	0	3	-	

Table C

Queue Analysis (In Feet) - Synchro

ersection	Approach (Movement)	Existing Storage / Proposed Storage (in feet)	Existing Traffic Volumes						2036 Traffic Volumes without Development						2036 Traffic Volumes with Development						2036 Traffic Volumes with Development and Imp				
			AM Peak		PM Peak		Sat Peak		AM Peak		PM Peak		Sat Peak		AM Peak		PM Peak		Sat Peak		AM Peak		PM Peak		S
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th
	EBLTR	75'	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--
	NBL	175'	2	10	4	17	4	17	2	10	4	16	4	17	2	10	4	17	4	17	1	8	--	--	--
Street - Hershey	NBTR	1,000'+	382	642	398	626	208	341	460	713	486	698	247	389	557	833	495	834	308	538	425	667	--	--	--
743) / Mt. Gretna	SBL	100'	71	120	139	235	50	84	118	204	233	351	48	110	101	184	155	228	21	62	82	203	--	--	--
41) / Holly Street [1]	SBT	1,000'+	202	270	258	335	116	165	163	273	263	433	107	161	223	310	341	504	78	145	286	418	--	--	--
	NWL	915'	215	365	122	195	82	165	233	400	131	219	90	188	233	400	131	219	90	188	214	383	--	--	--
	SWL	1,000'+	192	336	153	280	80	133	207	367	166	306	87	145	196	345	158	292	85	141	183	344	--	--	--
	EBL	150'	23	52	15	38	7	24	71	122	50	94	36	74	71	122	50	94	36	74	64	120	--	--	--
	EBTR	500'	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--
	WBLTR	75'	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--
oad (SR 0743) /	NBLRT	1,000'+	113	438	63	434	28	62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
rive - Driveway [1]	NBL	150'	--	--	--	--	--	--	7	10	9	15	6	12	7	8	8	14	11	27	0	1	--	--	--
	NBTR	1,000'+	--	--	--	--	--	--	270	358	76	145	53	98	249	341	94	155	124	280	46	181	--	--	--
	SBLTR	1,000'+	64	142	127	294	40	83	188	334	398	711	126	227	155	264	287	722	97	187	199	290	--	--	--
	EBLTR	1,000'+	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	EBLT	1,000'+	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	24	24	46	17
	EBR	400'	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	70	84	167	0
ad (SR 0743) / SR	NBT	1,000'+	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	236	392	113	186	142
EB Ramps [2]	NBTR	1,000'+	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	236	392	113	186	142
	SBL	100'	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	237	331	31	494	58
	SBT	450'	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	58	0	124	26
	WBLTR	1,000'+	972	1,613	567	965	160	403	1,181	1,800	667	1,110	200	494	1,438	2,023	833	1,338	337	688	--	--	--	--	--
	WBLT	1,000'+	167	294	83	159	66	134	189	349	97	183	79	156	236	443	150	274	120	220	258	317	192	248	151
	WBR	525'	27	43	35	51	26	43	29	44	37	53	28	44	34	50	44	61	34	52	49	166	81	191	0
ad (SR 0743) / SR	NBL	250'	167	294	83	159	66	134	189	349	97	183	79	156	236	443	150	274	120	220	189	394	32	172	27
WB Ramps [1]	NBT	400'	27	43	35	51	26	43	29	44	37	53	28	44	34	50	44	61	34	52	11	75	18	80	13
	SBT	1,000'+	192	276	245	360	103	164	215	292	270	396	112	178	240	313	320	450	137	217	217	378	314	514	113
	SBTR	1,000'+	192	276	245	360	103	164	215	292	270	396	112	178	240	313	320	450	137	217	217	378	314	514	113
	EBL	120'	--	--	--	--	--	--	--	--	--	--	--	--	31	65	63	107	41	79	--	--	--	--	--
	EBTR	215'	--	--	--	--	--	--	--	--	--	--	--	--	13	38	18	47	16	43	--	--	--	--	--
	WBL	225'	--	--	--	--	--	--	--	--	--	--	--	--	84	138	125	186	80	133	--	--	--	--	--
	WBTR	250'	--	--	--	--	--	--	--	--	--	--	--	--	15	60	18	61	16	57	--	--	--	--	--
oad (SR 0743) /	NBL	150'	--	--	--	--	--	--	--	--	--	--	--	--	2	8	3	12	0	2	--	--	--	--	--
d Buckingham	NBTR	1000'+	--	--	--	--	--	--	--	--	--	--	--	--	131	223	82	335	6	16	--	--	--	--	--
evard Ext.	SBL	425'	--	--	--	--	--	--	--	--	--	--	--	--	51	201	135	417	52	147	--	--	--	--	--