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**MAY 2014**

**WALTON AVENUE CORRIDOR  
ALTERNATIVES STUDY**

**DERRY TOWNSHIP  
DAUPHIN COUNTY, PENNSYLVANIA**

**HRG Project No. R002484.0448**

**WALTON AVENUE CORRIDOR  
ALTERNATIVES STUDY**

**DERRY TOWNSHIP  
DAUPHIN COUNTY, PA**

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# WALTON AVENUE CORRIDOR ALTERNATIVES STUDY

## EXECUTIVE SUMMARY

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### *General Study Purpose*

There has been ongoing traffic congestion along Walton Avenue between the traffic signals at Hersheypark Drive and Main Street for many years. Previous realignments of Main Street have alleviated some of the congestion; however as traffic volumes increased over time the effectiveness of these improvements has diminished. The two traffic signals are separated by approximately 500 feet. The close proximity of the intersections results in queued vehicles from the Hersheypark Drive intersection impeding the proper traffic operations of the traffic signal at Main Street. Walton Avenue is heavily traveled and is a major ingress / egress roadway for the Borough of Hummelstown. The operating characteristics are complicated by the numerous commercial establishments along Walton Avenue and Main Street. The queuing and congestion from both traffic signals has created undesirable operations. The existing traffic signal phasing and operations at the intersection of Walton Avenue and Hersheypark Drive prohibits pedestrian crossings even though there is a significant pedestrian demand that should be accommodated.

The deficient issues within the corridor prompted the Tri-County Regional Planning Commission to provide a Regional Connections Grant to Derry Township and the Borough of Hummelstown to complete this Alternatives Study. The purpose of this study is to identify improvements to alleviate the deficiencies in the existing infrastructure and determine Short-Term, Mid-Term, and Long-Term improvements to provide pedestrian and multimodal accommodations throughout the corridor and affect positive changes that alleviate vehicular congestion for all modes of transportation. The study includes the following intersections:

- Hersheypark Drive and Walton Avenue / Mae Street
- Walton Avenue and Main Street

As a part of this study, key stakeholders and local officials were included in order to identify basic concepts for further evaluation. The coalition consists of representatives from the following entities:

- Derry Township
- Hummelstown Borough
- Dauphin County
- Tri-County Regional Planning Commission (TCRPC)
- PennDOT

This study evaluates the impacts of potential growth, recommends improvements to the existing infrastructure to facilitate multimodal traffic movements and access to the study area, achieves congestion management and safety improvements, and creates an environment conducive to economic growth. This

study also identifies programming-level cost estimates and an implementation schedule of the recommended improvements.

### ***Summary and Recommendation***

As a result of the Engineering Alternative Development and Environmental Overview Analysis process, the following alternatives were identified for the Short-Term, Mid-Term, and Long-Term improvements.

#### **Short-Term Improvements (5 Years)**

- Install a pedestrian crossing across the northern leg of the intersection of Hersheypark Drive and Walton Avenue / Mae Street. This crossing will include pedestrian push buttons, countdown pedestrian signals and curb ramps.
- Construct sidewalk along the northern side of Walton Avenue and the northern side of Mae Street in order to connect from Hersheypark Drive to the existing sidewalk.
- Install bicycle “Share the Road” signage and “Shared Lane” pavement markings along Walton Avenue.
- Re-establish the interconnection link between the traffic signals along Walton Avenue at Hersheypark Drive and Main Street. Additional event and seasonal timing plans should be developed to process seasonal traffic fluctuations.
- Install protected / prohibited left turn phasing along Walton Avenue / Mae Street at Hersheypark Drive. This will restrict left turning vehicles from Walton Avenue or Mae Street from turning while the opposing through movement has the green indication, thereby improving the overall intersection safety and pedestrian safety.
- Restripe the eastbound approach of Walton Avenue at the intersection of Hersheypark Drive in order to provide a second eastbound left turn lane. This will entail some minor widening and modification to the existing channelization island.
- Restripe the eastbound approach of Walton Avenue at the intersection of Main Street in order to convert the right turn lane into a shared through-right lane.
- Provide emergency vehicle preemption along each approach of the intersection of Hersheypark Drive and Walton Avenue / Mae Street and the intersection of Walton Avenue and Main Street.

#### **Mid-Term Improvements (10 Years)**

- Close the Bob Evans Driveway along Walton Avenue and install a connection from Bob Evans to the Metro Bank / Holiday Inn Express driveway providing full access to Walton Avenue. This

will allow turns to / from Bob Evans to be made at the signalized intersection of Walton Avenue and Main Street.

- Allow a right turn movement directly from Main Street onto Route 322 westbound (as previously identified as a Long-Term improvement in the US 322 Improvements Feasibility Study).
- Consider installing a right-in driveway along Hersheypark Drive south of Walton Avenue connecting to Main Street.
- Evaluate the effectiveness of an Adaptive or Traffic Responsive Signal System for the Walton Avenue Corridor.
- Install the following pedestrian improvements:
  - Sidewalk along the proposed Metro Bank / Holiday Inn Express driveway, extending through the Bob Evans site, connecting to a multi-use pedestrian/bicycle path which will travel through the abandoned culvert underneath the railroad, and along Hersheypark Drive to Sweet Street and into the Hershey Park Camping Resort.
  - A multi-use pedestrian/bicycle path along the eastern side of Hersheypark Drive between Mae Street and Old West Chocolate Avenue.
  - Pedestrian accommodations across the southern and eastern legs of the intersection of Hersheypark Drive and Old West Chocolate Avenue / Sweet Street. Note that pedestrian accommodations across the northern and western legs are currently provided.
  - Install sidewalk along the north side of Walton Avenue and the north side of Main Street from the shopping plaza into Hummelstown, filling-in the existing gaps and ensuring ADA compliance.

### **Long-Term Improvements (20 Years)**

- Widen Walton Avenue to the north to provide an additional lane between Hersheypark Drive and Main Street. This will yield a six-lane section; one westbound left turn lane, one westbound shared through-right lane, two eastbound left turn lanes, one eastbound through lane and an eastbound right turn lane.
- Widen Mae Street to provide dual westbound left turn lanes.
- Widen Hersheypark Drive in order to provide dual northbound left turn lanes and a northbound right turn lane.
- Install the following pedestrian improvements:

- Sidewalk along the south side of Walton Avenue between Main Street and Hersheypark Drive.
- Pedestrian crossings along all four legs of the intersection of Hersheypark Drive and Walton Avenue / Mae Street.
- Widen the center median along the north leg Hersheypark Drive at the intersection of Walton Avenue / Mae Street to provide a pedestrian refuge.
- Sidewalk along the south side of Mae Street from Hersheypark Drive to the existing sidewalk along Mae Street.

***Estimated Programming Costs and Timing***

The following estimated programming costs are in order of magnitude based on planning level studies, photographs and investigations. These estimates are for planning purposes only and should be refined with detailed engineering designs, surveys, plans, and testing. Also, estimates are in 2014 dollars and should be escalated to the appropriate year of expenditure.

| <b>Item</b>  | <b>Short-Term (2019)</b> | <b>Mid-Term (2024)</b> | <b>Long-Term (2034)</b> |
|--|--------------------------|------------------------|-------------------------|
| <b>Preliminary Engineering and Environmental Clearance</b> | \$26,250                 | \$250k – \$300k        | \$400k – \$450k         |
| <b>Final Design</b>  | \$21,000                 | \$200k – \$250k        | \$300k – \$350k         |
| <b>Utilities</b>   | \$5,000                  | \$150k – \$200k        | \$150k – \$200k         |
| <b>Right-of-Way</b>  | \$5,000                  | \$250k – \$300k        | \$200k – \$250k         |
| <b>Construction</b>  | \$175,000                | \$2M – \$2.5M          | \$3M – \$4M             |
| <b>Total</b>   | <b>\$232,250</b>         | <b>\$3M – \$3.5M</b>   | <b>\$4M – \$5.5M</b>    |

# WALTON AVENUE CORRIDOR ALTERNATIVES STUDY

## **INTRODUCTION**

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There has been ongoing traffic congestion along Walton Avenue between the traffic signals at Hersheypark Drive and Main Street for many years. Previous realignments of Main Street have alleviated some of the congestion; however as traffic volumes increased over time the effectiveness of these improvements has diminished. The two traffic signals are separated by approximately 500 feet. The close proximity of the intersections results in queued vehicles from the Hersheypark Drive intersection impeding the proper traffic operations of the traffic signal at Main Street. Walton Avenue is heavily traveled and is a major ingress / egress roadway for the Borough of Hummelstown. The operating characteristics are complicated by the numerous commercial establishments along Walton Avenue and Main Street. The queuing and congestion from both traffic signals has created undesirable operations. The existing traffic signal phasing and operations at the intersection of Walton Avenue and Hersheypark Drive prohibits pedestrian crossings even though there is a significant pedestrian demand that should be accommodated.

The deficient issues within the corridor prompted the Tri-County Regional Planning Commission to provide a Regional Connections Grant to Derry Township and the Borough of Hummelstown to complete this Alternatives Study. The purpose of this study is to identify improvements to alleviate the deficiencies in the existing infrastructure and determine Short-Term, Mid-Term, and Long-Term improvements to provide pedestrian and multimodal accommodations throughout the corridor and affect positive changes that alleviate vehicular congestion for all modes of transportation. The study includes the following intersections:

- Hersheypark Drive and Walton Avenue / Mae Street
- Walton Avenue and Main Street

As a part of this study, key stakeholders and local officials were included in order to identify basic concepts for further evaluation. The coalition consists of representatives from the following entities:

- Derry Township
- Hummelstown Borough
- Dauphin County
- Tri-County Regional Planning Commission (TCRPC)
- PennDOT

This study evaluates the impacts of potential growth, recommends improvements to the existing infrastructure to facilitate traffic movements and multimodal access to the study area, achieves congestion management and safety improvements, and creates an environment conducive to economic growth. The improvements have been evaluated based on current PennDOT Design Criteria. This study also identifies programming-level cost estimates and an implementation schedule of the recommended improvements.

## ENGINEERING ALTERNATIVE DEVELOPMENT

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### *Overview*

The Walton Avenue corridor is located within Derry Township, but facilitates access to the Borough of Hummelstown and is an important arterial roadway within Dauphin County. There has been ongoing traffic congestion along this corridor for many years. The operating characteristics are complicated by the numerous commercial establishments along Walton Avenue and Main Street and by spikes in the traffic volumes associated with local events and Hersheypark traffic. Previous realignments of Main Street have alleviated some of the congestion; however as traffic volumes increased over time, the effectiveness of these improvements has diminished. Consequently, a permanent solution to address these issues has been elusive. A study area location map is shown on Figure 1.

The approach to this study process was to involve both municipalities and local planning partners to jointly identify and develop alternatives through a systematic process based on objective engineering data and analysis. Equipped with the following engineering data and analysis, the representatives from both municipalities and the local planning partners participated in a half-day Conceptual Alternative Workshop facilitated by HRG transportation engineers. The attendees were provided with the following information (see below for a detailed explanation of the data provided in each category):

- Data collection results detailing the existing study area traffic and roadway characteristics
- Existing and future traffic volumes on the existing study area road system
- Capacity analysis of key existing intersections
- Conceptual Alternative Workshop Map depicting readily available information regarding existing conditions and relevant features within the study area

The workshop was held September 20, 2013 and identified various Short-Term, Mid-Term, and Long-Term solutions to improve safety and mobility along the Walton Avenue corridor. Following this workshop, HRG further analyzed the mutually agreed upon conceptual solutions in order to evaluate feasibility and make specific recommendations. The primary factors considered in this analysis were:

- ***Right-of-Way Impacts:*** Right-of-way acquisition will be required to construct some of the improvements. Types of required right-of-way include PennDOT Limited Access, PennDOT Controlled Access, and Local Township Roadway.
- ***Utility Impacts:*** The impacts to any major above and belowground facilities were considered.
- ***Drainage Impacts:*** Due to the study area's proximity to a tributary of the Swatara Creek and existing flooding problems in parts of the study area, the impacts to the drainage system warranted consideration.
- ***Constructability:*** Construction of the recommended improvements was considered, especially with regard to Maintenance and Protection of Traffic and maintaining access to existing facilities.

- **Signing and Pavement Marking:** Pavement marking schematics were developed for each recommended improvement and associated signing was considered.
- **Structures:** The study considered impacts to existing structures and identifies major structures (> 10 foot span) associated with the recommended improvements.
- **Traffic Impacts:** Lane configurations for each intersection have been recommended and the levels of service are provided for the recommended conditions in order to document the anticipated operational characteristics. Anticipated queue lengths were also considered and analyzed during the evaluation.
- **Substandard Design Elements:** Any deviations from current design criteria are noted and the nature and extent of the substandard elements were considered.

### ***Data Collection***

#### ***Background Materials***

To determine the possible effects of future development of the study area, several studies, reports, and plans were obtained and reviewed. The following is a list of the background materials obtained to assist in identifying existing conditions and evaluating the future traffic demands:

- Derry Township Comprehensive Plan
- Derry Township Zoning Ordinance
- Dauphin County GIS Mapping
- US 322 Improvements Feasibility Study
- Sheetz Highway Occupancy Permit Plans

The Dauphin County GIS Mapping, including property boundaries, was used as the base mapping for the conceptual drawings. In addition to reviewing the Derry Township Zoning Ordinance and Comprehensive Plan, there was coordination with Derry Township to determine other nearby proposed developments that may impact the study area. Derry Township indicated that the old bank building next to Panera Bread in the K-Mart Plaza (adjacent to Mae Street) is going to be replaced with a 5,625 square foot, 268 seat, high-turnover sit-down restaurant.

#### ***Study Area***

The study area consists of the following intersections:

- Hersheypark Drive and Walton Avenue
- Walton Avenue and Main Street

#### ***Study Area Roadway Description***

Walton Avenue is a 2-lane State roadway classified as a minor arterial with an average daily traffic volume of approximately 11,000 vehicles within the study area. The roadway connects Hersheypark

Drive (Route 39) to the Borough of Hummelstown. The posted speed limit is 35 miles per hour within the study area.

Hersheypark Drive is a 4-lane State roadway classified as a minor arterial with an average daily traffic volume of approximately 26,000 vehicles per day within the study area. Hersheypark Drive runs parallel to US Route 422 between the US Route 322 / US Route 422 Interchange and Lingle Avenue. The posted speed limit is 35 miles per hour within the study area.

Mae Street is a Township roadway that provides local access to the eastern side of Hersheypark Drive across from Walton Avenue. The posted speed limit is 25 miles per hour along Walton Avenue.

Main Street is a Township roadway that provides local access to the western side of Hersheypark Drive south of Walton Avenue. The posted speed limit is 25 miles per hour along Main Street.

*Existing Traffic Volumes*

Two-way automatic traffic recorder (ATR) counts were performed at the following locations in May 2013. The counts were performed for a minimum of 24-hours and provided volume, speed, and class data.

- Hersheypark Drive north of Walton Avenue
- Hersheypark Drive south of Walton Avenue
- Walton Avenue between Main Street and Hersheypark Drive
- Walton Avenue west of Main Street
- Main Street north of Walton Avenue

Peak-hour times were determined from the 24-hour counts. Turning movement counts at each of the study intersections were conducted during the AM and PM peak periods in May 2013 and during the Saturday peak periods in June 2013. The AM and PM turning movement volumes were then adjusted based on the 24-hour counts to reflect peak traffic associated with Hersheypark. The base 2013 traffic volumes are summarized in Table 1. Exhibit 2 displays the existing 24-hour traffic volumes within the study area. The traffic count data can be found in Appendix A.

| <b>TABLE 1: EXISTING INTERSECTION PEAK HOUR VOLUMES</b> |           |           |            |
|---|-----------|-----------|------------|
| <b>INTERSECTION</b>                                     | <b>AM</b> | <b>PM</b> | <b>SAT</b> |
| Hersheypark Drive and Walton Avenue / Mae Street        | 2,640     | 3,613     | 3,837      |
| Walton Avenue and Main Street                           | 1,219     | 1,751     | 1,589      |

## ***Future Traffic Demands***

### ***Future Traffic Volumes***

In order to establish future traffic volumes before considering the increased traffic volumes from any development, the existing traffic volumes were factored to project the volumes for the design years. The design years are as follows:

- 2019 – Short-Term
- 2024 – Mid-Term
- 2034 – Long-Term

To obtain these future volumes, an annual compound growth factor of 0.75% was used. This growth factor was obtained from PennDOT’s “Growth Factors for September 2012 to July 2013” for urban non-interstate roadways. The 0.75% growth factor accounts for potential traffic from the background growth of the area.

There is currently no proposed development within the study area with the exception of the redevelopment of a 5,625 square foot, 268 seat, high-turnover, sit-down restaurant within the K-Mart Plaza. Traffic from this development is not anticipated to materially impact the study area and has not been directly included in this study.

Based on the above growth factor, the existing traffic volumes were projected to the design years. Table 2 displays the projected 2019, 2024, and 2034 peak hour traffic volumes. The Traffic Forecasts are detailed in Appendix B.

| <b>TABLE 2: TOTAL INTERSECTION PEAK HOUR VOLUMES</b> |                 |           |            |             |           |            |
|--|-----------------|-----------|------------|-------------|-----------|------------|
| <b>Intersection</b>                                  | <b>Existing</b> |           |            | <b>2034</b> |           |            |
|  | <i>AM</i>       | <i>PM</i> | <i>SAT</i> | <i>AM</i>   | <i>PM</i> | <i>SAT</i> |
| Hersheypark Drive and Walton Avenue / Mae Street     | 2,640           | 3,613     | 3,837      | 3,088       | 4,228     | 4,488      |
| Walton Avenue & Main Street                          | 1,219           | 1,751     | 1,589      | 1,428       | 2,048     | 1,859      |

*Capacity Analyses*

Capacity analysis, as defined by the Highway Capacity Manual (1), is a set of procedures used to estimate the traffic-carrying ability of a facility over a range of defined operational conditions. The capacity analysis uses **Levels of Service** (LOS) to describe the operational conditions. Levels of Service are assigned letter designations “A” through “F,” with “A” being the most desirable operating conditions. A Level of Service “E” is considered to be at or near capacity, while a Level of Service “D” is considered acceptable according to the Highway Capacity Manual (1). The LOS criteria for signalized intersections are shown in Table 3.

For signalized intersections, the level of service measures the average control delay time per vehicle. Also, the volume to capacity ratio, which is a ratio of the peak hour traffic volumes for a facility to the theoretical maximum traffic volume the facility can handle, relates to the level of service of a facility.

| <b>TABLE 3: SIGNALIZED INTERSECTIONS – LOS CRITERIA</b> |                         |
|---|-------------------------|
| <b>AVERAGE CONTROL DELAY (SEC/VEH)</b>                  | <b>LEVEL OF SERVICE</b> |
| < 10  | A                       |
| > 10 and < 20   | B                       |
| > 20 and < 35   | C                       |
| > 35 and < 55   | D                       |
| > 55 and < 80   | E                       |
| > 80  | F*                      |

*\*Note: If the volume-to-capacity ratio exceeds a value of 1.0, the level of service is an F regardless of delay.*

Capacity analyses at each of the study intersections were performed using Synchro, Version 8 (2) software. The analyses were performed for both existing and projected design year traffic volumes. For the “Without Improvement” base scenarios, the analyses assumed the existing traffic controls and geometrics. Table 4 provides a summary of the levels of service for both the existing and projected future conditions at the study intersections.

| <b>TABLE 4: EXISTING CONDITIONS LEVEL OF SERVICE SUMMARY</b> |                 |                 |           |            |
|--|-----------------|-----------------|-----------|------------|
| <b>Intersection</b>  | <b>Movement</b> | <b>Existing</b> |           |            |
|  |                 | <b>AM</b>       | <b>PM</b> | <b>SAT</b> |
| <b>Hersheypark Drive &amp; Walton Avenue / Mae Street</b>    |                 |                 |           |            |
| Walton Avenue  | EBL             | D               | F         | E          |
|  | EBT             | D               | D         | E          |
|  | EBR             | A               | A         | A          |
| Mae Street   | WBL             | D               | D         | D          |
|  | WBT             | D               | F         | E          |
|  | WBR             | A               | A         | A          |
| Hersheypark Drive  | NBL             | D               | F         | E          |
|  | NBTR            | B               | C         | B          |
|  | SBL             | D               | E         | F          |
|  | SBT             | B               | C         | C          |
|  | SBR             | B               | C         | C          |
| <b>OVERALL</b>   |                 | <b>C</b>        | <b>D</b>  | <b>D</b>   |
| <b>Walton Avenue &amp; Main Street</b>                       |                 |                 |           |            |
| Walton Avenue  | EBL             | B               | B         | B          |
|  | EBT             | B               | B         | B          |
|  | EBR             | B               | B         | B          |
|  | WBL             | A               | A         | B          |
|  | WBTR            | A               | A         | A          |
| Main Street  | NBLT            | B               | C         | B          |
|  | NBR             | B               | B         | B          |
| Private Driveway   | SBLTR           | B               | C         | B          |
| <b>OVERALL</b>   |                 | <b>B</b>        | <b>B</b>  | <b>B</b>   |

As indicated above, a Level of Service “E” is considered to be at or near capacity, while a Level of Service “D” is considered acceptable according to the Highway Capacity Manual (1). The intersection of Hersheypark Drive and Walton Avenue / Mae Street has various movements that currently operate at level of service “E” or “F”. As future traffic volumes increase, additional deficiencies are anticipated. However, each movement at the intersection of Walton Avenue and Main Street currently operates at level of service “C” or better and is anticipated to continue to operate at level of service “C” or better. Worksheets for the level of service / capacity analyses are included in Appendix C. This level of service is somewhat misleading because, as users of the intersection of Walton Avenue and Main Street can attest, there is significant delay at this intersection caused by the blocking of traffic from the queued vehicles from the Hersheypark Drive intersection. Unfortunately, current analysis level of service

software does not account for this blocking. However, the traffic simulation software, which uses different parameters, does show the queuing issues and blocked traffic.

In addition to the existing level of service concerns, there are traffic queuing issues along the corridor particularly between Main Street and Hersheypark Drive. Eastbound traffic along Walton Avenue frequently backs up through the traffic signal at Main Street. This condition will be exacerbated in the future with the additional projected traffic. Worksheets for the queue analyses are included in Appendix C.

### ***Conceptual Alternative Workshop Map***

In preparation for the Conceptual Alternatives Workshop, HRG prepared a Conceptual Alternative Workshop Map. This map is a compilation of the readily available environmental data collected for the study area and the traffic data. The presented environmental data was a compilation of data from existing sources and is not to be considered an all-inclusive compilation. Any proposed improvement would require thorough examination and research commensurate with established NEPA process and procedures to fully evaluate the environmental impact of a potential improvement. This data is overlain on the study area aerial mosaic. In addition, this map identifies major roadways and parcels of land. The Conceptual Alternatives Workshop Map is included in Figure 2.

The Conceptual Alternatives Workshop Map shows the following environmentally sensitive features:

- Streams – A tributary of the Swatara Creek is depicted on the map
- Culverts – Various culverts are depicted on the map
- Wetlands – There are no known wetlands within the study area
- Flood Plains – the 100-year and 500-year flood plains are depicted on the map
- Historic Properties – There are no known historic properties within the study area
- Cemeteries – There are no known cemeteries within the study area
- Major Utilities – Easily identifiable major electric, gas, telephone, and sewer lines are identified along Walton Avenue

### ***Traffic Data***

The following traffic data for the existing study area road system was provided:

- A level of service diagram. Green traffic movement arrows represent good levels of service for a given movement; yellow represent acceptable levels of service; and red represent deficient levels of service.
- The existing hourly traffic volumes at both study intersections are displayed.

## *Conceptual Alternatives Workshop*

HRG organized a Conceptual Alternatives Workshop on September 20, 2013. The attendees worked to develop ideas and suggestions to serve as the basis for the different alternatives further pursued by HRG. The attendees identified common issues, goals, and then developed potential Short-Term, Mid-Term and Long-Term improvements to provide pedestrian and multimodal accommodations throughout the corridor and affect positive changes that alleviate vehicular congestion for all modes of transportation.

HRG presented the Conceptual Alternatives Workshop Map and summarized the existing corridor conditions, highlighting:

1. Walton Avenue Corridor significance
2. Surrounding land uses and pedestrian generators
3. Existing roadway geometry and lane configurations
4. Existing traffic volumes
5. Physical constraints – culverts, swales, embankments, guiderail, railroad
6. Levels of Service – numerous deficiencies at the intersection with Hersheypark Drive
7. Queuing impacts and access controls
8. Sidewalk and bike accommodation deficiencies
9. Intersection operation is greatly impacted by seasonal traffic volumes from Hershey attractions

The meeting attendees collectively identified project goals:

- a. Improve multi-modal mobility, especially pedestrian mobility
- b. Improve corridor safety
- c. Address capacity and queuing concerns
  - i. Along Walton Avenue
  - ii. Along Hersheypark Drive
- d. Optimize traffic signal timing and progression
- e. Improve access management along Walton Avenue and Main Street to remove conflicts and increase safety
  - i. Consider turn restrictions
  - ii. Consider closing or combining driveways

The following Short-Term options were identified for further consideration:

- a. A pedestrian crossing of Hersheypark Drive at Walton Avenue is desirable. A circuitous route across Hersheypark Drive (using the existing crossing at Old West Chocolate Avenue) would not be used by pedestrians between Mae Street and Walton Avenue.
- b. Seek funding for more comprehensive pedestrian and bicycle connections.
- c. The traffic signals should be interconnected. A Traffic Responsive or Adaptive system would be ideal considering the seasonal traffic fluctuations.
- d. Walton Avenue could be restriped and slightly widened to accommodate dual left turn lanes from Walton onto Hersheypark Drive. This would increase the queue length available. The eastbound right turn lane could potentially be combined with the through lane.

- e. Consider removing the right turn overlap and prohibit right turn on red from Main Street onto Walton Avenue in order to help progression and minimize the queuing issues from Hersheypark Drive.
- f. Restripe the shoulder along northbound Hersheypark Drive to provide a right turn lane onto Mae Street (if full-depth pavement and suitable for trucks).

The following Mid-Term options were identified for further consideration:

- a. Provide pedestrian connections from the signal at Main Street to Mae Street, Old West Chocolate Avenue, and into the Hershey Park Camping Resort. Connection from the campground could be either through the existing abandoned culvert or along Hersheypark Drive.
- b. Consider bike lanes along Walton Avenue and Hersheypark Drive.
- c. Provide a vehicular connection between Taco Bell, Metro Bank, and Bob Evans so all facilities have direct access to the traffic signal. Consider turn restrictions at the existing Bob Evans and Taco Bell driveways.
- d. Allow a right turn movement directly from Hersheypark Drive onto Main Street (south of the intersection with Walton Avenue).
- e. Allow a right turn movement directly from Main Street onto Route 322 westbound (comparable to the Long-Term improvement previously identified in the US 322 Improvements Feasibility Study).

The following Long-Term options were identified for further consideration:

- a. Extend and/or widen the center median along Hersheypark Drive to provide a pedestrian refuge.
- b. Potential pedestrian bridge across Hersheypark Drive.
- c. At-grade intersection improvements – Widen Walton Avenue to the north to provide an additional lane. This will impact the existing culvert and channel. Provide a six-lane section at the intersection with Hersheypark Drive – two westbound through lanes, two eastbound left turn lanes, one eastbound through lane and an eastbound right turn lane. Provide dual left turn lanes along northbound Hersheypark Drive and a northbound right turn lane. Provide a five-lane cross section at Main Street – two through lanes in each direction and a center left turn lane. Terminate the second westbound through lane immediately west of the signal.
- d. Grade-separated intersection improvements – It is acknowledged that a grade-separated intersection may not be practical considering the fiscal impacts. However, the following scenario was identified for consideration – the development of a modified Single-Point Urban Interchange (SPUI), where the through movements along Walton Avenue and Mae Street would be elevated, right turn movements would be channelized, and left turn movements would be made at-grade with Hersheypark Drive. It is most practical to elevate Mae Street and Walton Avenue considering the approach grades and the vertical constraints along Hersheypark Drive. As a modified SPUI, a partial cloverleaf could be considered on the southeast corner of the intersection to accommodate westbound left turns and northbound right turns and left turns.

## REFINED ALTERNATIVE ANALYSIS

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The potential improvements identified during the Conceptual Alternatives Workshop were further evaluated and refined. Preliminary design standards and traffic analyses were utilized to determine the feasibility of compliance with established design criteria. Benefits were quantified and cost estimates were developed for each potential improvement. Based on this approach the following Short-Term, Mid-Term, and Long-Term improvements were recommended.

### *Short-Term Improvements (5 Years)*

#### *Recommended Improvements*

- Install a pedestrian crossing across the northern leg of the intersection of Hersheypark Drive and Walton Avenue / Mae Street. This crossing will include pedestrian push buttons, countdown pedestrian signals and curb ramps. The pedestrian phase for this crossing will run concurrently with the eastbound through-right movements along Walton Avenue and the westbound through-right movements along Mae Street. Therefore, the only vehicular conflicts will involve southbound right turns on red from Hersheypark Drive onto Walton Avenue and channelized westbound right movements from Mae Street onto Hersheypark Drive.
- Construct sidewalk along the northern side of Walton Avenue and the northern side of Mae Street in order to connect from Hersheypark Drive to the existing sidewalk.
- Install bicycle “Share the Road” signage and “Shared Lane” pavement markings along Walton Avenue.
- Re-establish the interconnection link between the traffic signals along Walton Avenue at Hersheypark Drive and Main Street. Additional event and seasonal timing plans should be developed to process seasonal traffic fluctuations.
- Install protected / prohibited left turn phasing along Walton Avenue / Mae Street at Hersheypark Drive. This will restrict left turning vehicles from Walton Avenue or Mae Street from turning while the opposing through movement has the green indication, thereby improving the overall intersection safety and pedestrian safety.
- Restripe the eastbound approach of Walton Avenue at the intersection of Hersheypark Drive in order to provide a second eastbound left turn lane. This will entail modification to the existing channelization island and may require minor widening near the intersection.
- Restripe the eastbound approach of Walton Avenue at the intersection of Main Street in order to convert the right turn lane into a shared through-right lane.
- Provide emergency vehicle preemption along each approach of the intersection of Hersheypark Drive and Walton Avenue / Mae Street and the intersection of Walton Avenue and Main Street.

- Removing the right turn overlap and prohibiting right turns on red from Main Street onto Walton Avenue in order to help progression and minimize the queuing issues from Hersheypark Drive was considered, but is not recommended. If implemented, this change would shift the queuing impacts from Walton Avenue to Main Street. These queues could impact nearby driveways along Main Street. Additionally, the existing queuing issues along Walton Avenue should be improved by the other recommended Short-Term improvements.

### *Traffic Impacts*

The above capacity improvements can be installed by interconnecting the traffic signals and restriping Walton Avenue. These low cost improvements will allow each movement at both intersections to operate under acceptable levels of service during a period of typical traffic. However, many of these levels of service are near the threshold of being deficient. During events and other periods of increased traffic, there will be capacity issues. Queuing is also projected to be generally acceptable during periods of typical in-season traffic. Traffic along Walton Avenue will be notably improved, but during events and other periods of increased traffic, queues will extend farther and may create deficient conditions. These Short-Term improvements will provide a Short-Term solution, but as traffic continues to increase after 2019, additional Mid-Term and Long-Term improvements will be necessary to maintain acceptable operational conditions.

The projected 2019 levels of service with these improvements are provided in the following table in addition to the 2019 without improvement levels of service previously discussed.

| <b>TABLE 5: SHORT-TERM IMPROVEMENTS LEVEL OF SERVICE SUMMARY</b> |                 |                                  |           |            |                               |           |            |
|--|-----------------|----------------------------------|-----------|------------|-------------------------------|-----------|------------|
| <b>Intersection</b>  | <b>Movement</b> | <b>2019 Without Improvements</b> |           |            | <b>2019 With Improvements</b> |           |            |
|  |                 | <b>AM</b>                        | <b>PM</b> | <b>SAT</b> | <b>AM</b>                     | <b>PM</b> | <b>SAT</b> |
| <b>Hersheypark Drive &amp; Walton Avenue / Mae Street</b>        |                 |                                  |           |            |                               |           |            |
| Walton Avenue  | EBL             | D                                | F         | F          | D                             | D         | D          |
|  | EBT             | D                                | E         | E          | D                             | D         | D          |
|  | EBR             | A                                | A         | A          | A                             | A         | A          |
| Mae Street   | WBL             | D                                | D         | D          | D                             | D         | D          |
|  | WBT             | D                                | F         | E          | D                             | D         | D          |
|  | WBR             | A                                | A         | A          | A                             | A         | A          |
| Hersheypark Drive  | NBL             | D                                | F         | E          | D                             | D         | D          |
|  | NBTR            | B                                | C         | B          | B                             | C         | C          |
|  | SBL             | D                                | E         | F          | D                             | D         | D          |
|  | SBT             | C                                | C         | C          | C                             | C         | D          |
|  | SBR             | C                                | C         | C          | C                             | D         | C          |
| <b>OVERALL</b>   |                 | <b>C</b>                         | <b>D</b>  | <b>D</b>   | <b>C</b>                      | <b>D</b>  | <b>D</b>   |
| <b>Walton Avenue &amp; Main Street</b>                           |                 |                                  |           |            |                               |           |            |
| Walton Avenue  | EBL             | B                                | B         | B          | B                             | B         | B          |
|  | EBT             | B                                | B         | B          | B                             | B         | B          |
|  | EBR             | B                                | B         | B          | B                             | B         | B          |
|  | WBL             | A                                | B         | B          | A                             | A         | A          |
|  | WBTR            | A                                | A         | A          | A                             | A         | A          |
| Main Street  | NBLT            | B                                | C         | B          | C                             | C         | D          |
|  | NBR             | B                                | B         | B          | C                             | C         | D          |
| Private Driveway   | SBLTR           | B                                | C         | B          | C                             | C         | D          |
| <b>OVERALL</b>   |                 | <b>B</b>                         | <b>B</b>  | <b>B</b>   | <b>B</b>                      | <b>B</b>  | <b>C</b>   |

*Right-of-Way Impacts*

Due to the nature of the proposed improvements, right-of-way acquisition is not required for the Short-Term conditions.

*Utility Impacts*

Due to the nature of the proposed improvements, utility impacts are not anticipated for the Short-Term conditions.

### *Drainage Impacts*

Due to the nature of the proposed improvements, there are no drainage impacts for the Short-Term conditions.

### *Constructability*

“Constructability” is a measure of the difficulty in construction of a project and is an important aspect to consider. Typical roadway constructability issues include maintenance and protection of traffic, utility coordination, drainage and erosion control, geotechnical problems, and coordination between Municipal Officials, Federal and State Officials, and the local general public. The Short-Term improvements do not present any significant constructability challenges.

### *Structures*

There are no proposed structures associated with the Short-Term improvements; however, there will be the need to add structure mounted guiderail to the existing culvert structure in the northwest quadrant of the intersection.

### *Substandard Design Elements*

The proposed restriping along the eastbound approach of Walton Avenue involves reducing 12 foot and 11 foot lanes to 10 feet. This reduction in lane width conforms to PennDOT’s Resurfacing, Restoration and Rehabilitation (3R) Design Criteria. A Purpose and Need Study was submitted to PennDOT in January 2014 in order to obtain concept approval for the reduced lane widths.

Additionally, along the north side of Walton Avenue near Hersheypark Drive has existing guiderail. In order to facilitate the proposed sidewalk and access to the crosswalk, it will be necessary to relocate the guiderail to the back side of the proposed sidewalk. This guiderail placement is not desirable and could limit its functionality. This concept has been included in the Purpose and Need Study that was submitted to PennDOT in order to gain concept approval for this configuration.

### *Natural Resource Impacts*

- Wetlands - The proposed Short-Term improvements are not projected to have any impact to wetlands.
- Flood Plains – Although there has been flooding in the area associated with an unnamed tributary to Swatara Creek, the proposed improvements are not located within a flood plain. Accordingly, there is no required permitting.
- Hazardous Materials – There are no known hazardous materials within the area of the proposed improvements. During design, a search should be performed to verify.

- Soils – Some of the soils in the study area may be classified as “Prime Farmland”, “Farmland of Statewide Importance”, or “Farmland of Local Importance”. If any of these soils are located within the area of the improvements, coordination with the U.S. Department of Agriculture will be required, but mitigation should not be necessary.
- Noise/Air - A noise and air quality evaluation is not expected to be required.
- Endangered Species – Based on a PNDI Project Environmental Review search, there is a plant, a Jeweled Shooting-Star, which is threatened and may be located within the project limits. A botanist may be required to survey the project area. The presence of the plant within the project limits and / or mitigation is unlikely.

### *Socioeconomic Resources*

- Parks and Public Recreation Areas - There are no parks or public recreation areas that will be affected by the project.
- Community Facilities - The improvements will improve accessibility between Hummelstown and Hersheypark Drive and improve response time of emergency vehicles.
- Commercial Facilities - The project will increase and enhance accessibility to existing commercial sites, notably development along Walton Avenue just west of Hersheypark Drive. Pedestrian mobility between the commercial facilities will be improved. Also, the proposed improvement will enhance and encourage development of the other potential commercial sites.
- Residential Facilities - Traffic volumes along Walton Avenue are not expected to increase as a direct result of the proposed improvements; therefore, the improvements should not negatively impact residential properties along Walton Avenue. These residences will also benefit from improved accessibility between Hummelstown and Hersheypark Drive.

### *Cultural Resources*

A recent project near the study area found that there are no archaeological sites within the study area, but there may be a historical property. The Pennsylvania Historical and Museum Commission (PHMC) should be contacted during design in order to confirm that there will not be impacts to any cultural resources. Even if there is a historical property present, there will likely be no impact to that property.

### ***Mid-Term Improvements (10 Years)***

#### *Recommended Improvements*

- Close the Bob Evans Driveway along Walton Avenue and install a connection from Bob Evans to the Metro Bank / Holiday Inn Express driveway providing full access to Walton Avenue. This

will allow turns to / from Bob Evans to be made at the signalized intersection of Walton Avenue and Main Street.

- Allow a right turn movement directly from Main Street onto Route 322 westbound (as previously identified as a Long-Term improvement in the US 322 Improvements Feasibility Study).
- Consider installing a right-in driveway along Hersheypark Drive south of Walton Avenue connecting to Main Street.
- Evaluate the effectiveness of an Adaptive or Traffic Responsive Signal System for the Walton Avenue Corridor.
- Install the following pedestrian improvements:
  - Sidewalk along the proposed Metro Bank / Holiday Inn Express driveway, extending through the Bob Evans site, connecting to a multi-use pedestrian/bicycle path which will travel through the abandoned culvert underneath the railroad, and along Hersheypark Drive to Sweet Street and into the Hershey Park Camping Resort.
  - A multi-use pedestrian/bicycle path along the eastern side of Hersheypark Drive between Mae Street and Old West Chocolate Avenue.
  - Pedestrian accommodations across the southern and eastern legs of the intersection of Hersheypark Drive and Old West Chocolate Avenue / Sweet Street. Note that pedestrian accommodations across the northern and western legs are currently provided.
  - Install sidewalk along the north side of Walton Avenue and the north side of Main Street from the shopping plaza into Hummelstown, filling in the existing gaps and ensuring ADA compliance.

### *Traffic Impacts*

The operational analyses for the Mid-Term improvements presumed a conservative scenario that the Bob Evans driveway along Walton Avenue will be closed and that all of the turns to / from Bob Evans will be made at the traffic signal located at the intersection of Walton Avenue and Main Street. This traffic signal is able to accommodate this additional traffic. Eliminating or modifying the existing Bob Evans driveway along Walton Avenue will greatly improve access management along the corridor by eliminating turns to / from Walton Avenue between Hersheypark Drive and Main Street. Due to grade differences, it is not recommended to tie-into the Taco Bell property to the west of the hotel.

The Mid-Term improvements scenario assumed an additional five years of background growth. Based on this additional traffic and the assumed closure of the Bob Evans driveway along Walton Avenue, the projected delays within the study area are slightly longer than the delays associated with the Short-Term

scenario. However, each movement at both intersections is expected to continue to operate under acceptable levels of service during a period of typical traffic. As indicated in the Short-Term improvements traffic impacts section, many of these levels of service are near the threshold of being deficiencies. During events and other periods of increased traffic, there may be capacity issues. Queuing is also projected to be generally acceptable during periods of typical traffic, but during events and other periods of increased traffic, queues may extend farther and may create deficient conditions. Additional Long-Term improvements will be necessary to maintain acceptable operational conditions.

The projected 2024 levels of service with these improvements are provided in the following table in addition to the 2024 without improvement levels of service previously discussed.

| <b>TABLE 6: MID-TERM IMPROVEMENTS LEVEL OF SERVICE SUMMARY</b> |                 |                                  |           |            |                               |           |            |
|--|-----------------|----------------------------------|-----------|------------|-------------------------------|-----------|------------|
| <b>Intersection</b>  | <b>Movement</b> | <b>2024 Without Improvements</b> |           |            | <b>2024 With Improvements</b> |           |            |
|  |                 | <b>AM</b>                        | <b>PM</b> | <b>SAT</b> | <b>AM</b>                     | <b>PM</b> | <b>SAT</b> |
| <b>Hersheypark Drive &amp; Walton Avenue / Mae Street</b>      |                 |                                  |           |            |                               |           |            |
| Walton Avenue  | EBL             | E                                | F         | F          | D                             | D         | D          |
|  | EBT             | D                                | E         | E          | D                             | D         | D          |
|  | EBR             | A                                | A         | A          | A                             | A         | A          |
| Mae Street   | WBL             | D                                | D         | D          | D                             | D         | D          |
|  | WBT             | D                                | F         | E          | D                             | D         | D          |
|  | WBR             | A                                | A         | A          | A                             | A         | A          |
| Hersheypark Drive  | NBL             | D                                | F         | E          | D                             | D         | D          |
|  | NBTR            | B                                | C         | B          | B                             | C         | C          |
|  | SBL             | D                                | E         | F          | D                             | D         | D          |
|  | SBT             | C                                | C         | D          | C                             | D         | D          |
|  | SBR             | C                                | C         | C          | C                             | D         | C          |
| <b>OVERALL</b>   |                 | <b>C</b>                         | <b>E</b>  | <b>D</b>   | <b>C</b>                      | <b>D</b>  | <b>D</b>   |
| <b>Walton Avenue &amp; Main Street</b>                         |                 |                                  |           |            |                               |           |            |
| Walton Avenue  | EBL             | B                                | B         | B          | A                             | B         | B          |
|  | EBT             | B                                | B         | C          | B                             | B         | B          |
|  | EBR             | B                                | B         | B          | B                             | B         | B          |
|  | WBL             | B                                | B         | B          | A                             | A         | A          |
|  | WBTR            | A                                | A         | A          | A                             | A         | A          |
| Main Street  | NBLT            | C                                | C         | B          | C                             | C         | D          |
|  | NBR             | B                                | B         | B          | C                             | B         | C          |
| Private Driveway   | SBLTR           | B                                | C         | B          | C                             | C         | D          |
| <b>OVERALL</b>   |                 | <b>B</b>                         | <b>B</b>  | <b>B</b>   | <b>B</b>                      | <b>B</b>  | <b>B</b>   |

### *Right-of-Way Impacts*

Connection from Bob Evans to Holiday Inn Express property - A cross access easement will be needed for the connection between the Bob Evans property and the Holiday Inn Express / Metro Bank driveway. Temporary easements will be necessary for construction of the connection. A sidewalk easement will be needed from Holiday Inn Express and Bob Evans for the sidewalk located along their property.

Route 322 Westbound Connection from Main Street – Right-of-way will be required from the shopping center for the alignment adjustment to Main Street. Additional right-of-way may be required for the widening and embankment grading for the connection onto Route 322.

Sidewalk connections – Sidewalk easements will be required across several residential and commercial properties for connections along the north side of Walton Avenue and Main Street.

### *Utility Impacts*

Due to the nature of the proposed improvements, utility impacts are not envisioned for the Mid-Term conditions.

### *Drainage Impacts*

A culvert will have to be installed across the unnamed tributary to Swatara Creek in order to complete the connection between the Bob Evans property and the Holiday Inn Express / Metro Bank driveway. The culvert will be designed to ensure that upstream water will not back-up. This culvert design will require a Joint Permit for Small Projects. This will necessitate approval from the Department of Environmental Protection.

### *Constructability*

“Constructability” is a measure of the difficulty in construction of a project and is an important aspect to consider. Typical roadway constructability issues include maintenance and protection of traffic, utility coordination, drainage and erosion control, geotechnical problems, and coordination between stakeholders, Municipal Officials, Federal and State Officials, and the local general public. The Mid-Term improvements do not present any significant constructability challenges. The connection between the Bob Evans property and the Metro Bank / Holiday Inn Express driveway must be completed first and then the existing Bob Evans driveway along Walton Avenue will be closed. The connection from Main Street onto Route 322 westbound will require excavation along an embankment.

### *Structures*

As indicated above, there is a proposed culvert to be installed in the unnamed tributary to Swatara Creek in order to complete the connection between the Bob Evans property and the Holiday Inn Express / Metro

Bank driveway. Additionally, once the Bob Evans driveway along Walton Avenue is closed, the existing culvert in the unnamed tributary to Swatara Creek should be removed.

### *Substandard Design Elements*

There are no substandard design elements associated with the Mid-Term improvements.

### *Natural Resource Impacts*

- Wetlands – Based on a recent project within the study area, wetlands are not anticipated within the area of the improvements. The presence of any wetlands will have to be confirmed during design.
- Flood Plains – Although there has been flooding in the area associated with an unnamed tributary to Swatara Creek, the proposed improvements are not located within a flood plain. Accordingly, there is no required permitting.
- Hazardous Materials – There are no known hazardous materials within the area of the proposed improvements. During design, a search should be performed to verify.
- Soils – Some of the soils in the study area may be classified as “Prime Farmland”, “Farmland of Statewide Importance”, or “Farmland of Local Importance”. If any of these soils are located within the area of the improvements, coordination with the U.S. Department of Agriculture will be required, but mitigation should not be necessary.
- Noise/Air - A noise and air quality evaluation is not expected to be required.
- Endangered Species – Based on a PNDI Project Environmental Review search, there is a plant, a Jeweled Shooting-Star, which is threatened and may be located within the project limits. A botanist may be required to survey the project area. The presence of the plant within the project limits and / or mitigation is unlikely.

### *Socioeconomic Resources*

- Parks and Public Recreation Areas – The proposed bicycle and pedestrian facilities will enhance access to / from the Hersheypark Camping Resort.
- Community Facilities – The proposed bicycle and pedestrian facilities will greatly improve accessibility.
- Commercial Facilities - The project will increase and enhance accessibility to the Bob Evans property by making left turns into and out of the site much easier. Also, the proposed pedestrian and bicycle improvements will increase bicycle and pedestrian traffic to existing commercial facilities and enhance and encourage development of other potential commercial sites.

- Residential Facilities – The proposed bicycle and pedestrian facilities will enhance connections to residential facilities within the study area.

### *Cultural Resources*

A recent project near the study area found that there are no archaeological sites within the study area, but there may be a historical property. The Pennsylvania Historical and Museum Commission (PHMC) should be contacted during design in order to confirm that there will not be impacts to any cultural resources. Even if there is a historical property present, there will likely be no impact to that property.

### ***Long-Term Improvements (20 Years)***

#### *Recommended Improvements*

- Widen Walton Avenue to the north to provide an additional lane between Hersheypark Drive and Main Street. This will yield a six-lane section; one westbound left turn lane, one westbound shared through-right lane, two eastbound left turn lanes, one eastbound through lane and an eastbound right turn lane.
- Widen Mae Street to provide dual westbound left turn lanes.
- Widen Hersheypark Drive in order to provide dual northbound left turn lanes and a northbound right turn lane.
- Install the following pedestrian improvements:
  - Sidewalk along the south side of Walton Avenue between Main Street and Hersheypark Drive.
  - Pedestrian crossings along all four legs of the intersection of Hersheypark Drive and Walton Avenue / Mae Street.
  - Widen the center median along the north leg Hersheypark Drive at the intersection of Walton Avenue / Mae Street to provide a pedestrian refuge.
  - Sidewalk along the south side of Mae Street from Hersheypark Drive to the existing sidewalk along Mae Street.

### *Traffic Impacts*

By 2034, there are significant deficiencies due to the additional projected traffic. Even with the Short-Term and Mid-Term improvements, various deficiencies would remain. Accordingly, substantial improvements are required at the intersection of Hersheypark Drive and Walton Avenue / Mae Street. With the addition of these improvements, each movement at both intersections is expected to operate

under acceptable levels of service during a period of typical traffic. During events and other periods of increased traffic, there may still be capacity and queuing issues, but these issues will be greatly reduced.

The projected 2034 levels of service with these improvements are provided in the following table in addition to the 2034 without improvement levels of service previously discussed.

| <b>TABLE 7: LONG-TERM IMPROVEMENTS LEVEL OF SERVICE SUMMARY</b> |                 |                                  |           |            |                               |           |            |
|---|-----------------|----------------------------------|-----------|------------|-------------------------------|-----------|------------|
| <b>Intersection</b>   | <b>Movement</b> | <b>2034 Without Improvements</b> |           |            | <b>2034 With Improvements</b> |           |            |
|   |                 | <b>AM</b>                        | <b>PM</b> | <b>SAT</b> | <b>AM</b>                     | <b>PM</b> | <b>SAT</b> |
| <b>Hersheypark Drive &amp; Walton Avenue / Mae Street</b>       |                 |                                  |           |            |                               |           |            |
| Walton Avenue   | EBL             | F                                | F         | F          | D                             | D         | D          |
|   | EBT             | D                                | E         | E          | C                             | D         | D          |
|   | EBR             | A                                | A         | A          | A                             | A         | A          |
| Mae Street  | WBL             | D                                | D         | D          | D                             | D         | D          |
|   | WBT             | D                                | F         | E          | D                             | D         | D          |
|   | WBR             | A                                | A         | A          | A                             | A         | A          |
| Hersheypark Drive   | NBL             | E                                | F         | F          | D                             | D         | D          |
|   | NBT             | B                                | C         | B          | B                             | C         | C          |
|   | NBR             |                                  |           |            | B                             | B         | B          |
|   | SBL             | E                                | E         | F          | D                             | D         | D          |
|   | SBT             | C                                | C         | D          | C                             | C         | D          |
|   | SBR             | C                                | C         | C          | B                             | C         | B          |
| <b>OVERALL</b>  |                 | <b>C</b>                         | <b>E</b>  | <b>D</b>   | <b>C</b>                      | <b>C</b>  | <b>D</b>   |
| <b>Walton Avenue &amp; Main Street</b>                          |                 |                                  |           |            |                               |           |            |
| Walton Avenue   | EBL             | B                                | B         | B          | D                             | D         | D          |
|   | EBT             | B                                | C         | C          | B                             | C         | C          |
|   | EBR             | B                                | B         | B          | B                             | C         | C          |
|   | WBL             | B                                | B         | B          | D                             | D         | D          |
|   | WBTR            | A                                | A         | A          | A                             | B         | B          |
| Main Street   | NBLT            | C                                | C         | C          | C                             | C         | D          |
|   | NBR             | B                                | B         | B          | C                             | B         | B          |
| Private Driveway  | SBLTR           | B                                | C         | C          | D                             | D         | D          |
| <b>OVERALL</b>  |                 | <b>B</b>                         | <b>B</b>  | <b>B</b>   | <b>C</b>                      | <b>C</b>  | <b>C</b>   |

### *Right-of-Way Impacts*

There are various right-of-way impacts associated with the proposed Long-Term improvements at the intersection of Hersheypark Drive and Walton Avenue / Mae Street and along the north side of Walton Avenue. Specifically, right-of-way may be required from seven commercial properties and two residential properties.

### *Utility Impacts*

There will be some overhead utility impacts adjacent to the intersection of Walton Avenue and Main Street. Manholes and various water / gas valves will need to be adjusted. Some underground utilities may need to be relocated. During design the depths of all underground facilities in the area of the proposed widening will need to be verified.

### *Drainage Impacts*

The culvert underneath the intersection of Hersheypark Drive and Walton Avenue / Mae Street will need to be extended or replaced. The culvert will be designed to ensure that upstream water will not back-up. The culvert design will require approval from the Department of Environmental Protection and the Army Corps of Engineers. Additionally, the unnamed tributary to Swatara Creek adjacent to Walton Avenue will need to be relocated in order to accommodate the proposed widening. The stream relocation will require a Joint Permit.

### *Constructability*

“Constructability” is a measure of the difficulty in construction of a project and is an important aspect to consider. Typical roadway constructability issues include maintenance and protection of traffic, utility coordination, drainage and erosion control, geotechnical problems, and coordination between stakeholders, Municipal Officials, Federal and State Officials, and the local general public. The Long-Term improvements present significant constructability challenges. The stream can be relocated prior to widening along Walton Avenue and without disturbance to the existing traffic. However, replacement / extension of the existing culvert underneath the intersection of Hersheypark Drive and Walton Avenue / Mae Street will require an extensive traffic control plan. During construction, the median area along Hersheypark Drive may need to be converted to temporary pavement. This will allow traffic to be shifted along Hersheypark Drive while the culvert is constructed in stages.

### *Structures*

As indicated above, the culvert underneath the intersection of Hersheypark Drive and Walton Avenue / Mae Street is to be replaced or extended. An overhead sign structure will be impacted by the widening along Hersheypark Drive and will need to be replaced. Additional overhead signing may be appropriate along Walton Avenue to properly assign lane utilization.

### *Substandard Design Elements*

There are no substandard design elements anticipated with the Long-Term improvements.

### *Natural Resource Impacts*

- Wetlands – Based on a recent project within the study area, wetlands are not anticipated within the area of the improvements. The presence of any wetlands will have to be confirmed during design.
- Flood Plains – Although there has been flooding in the area associated with an unnamed tributary to Swatara Creek, the proposed improvements are not located within a flood plain. Accordingly, there is no required permitting.
- Hazardous Materials – There are no known hazardous materials within the area of the proposed improvements. During design, a search should be performed to verify.
- Soils – Some of the soils in the study area may be classified as “Prime Farmland”, “Farmland of Statewide Importance”, or “Farmland of Local Importance”. If any of these soils are located within the area of the improvements, coordination with the U.S. Department of Agriculture will be required, but mitigation should not be necessary.
- Noise/Air - A noise and air quality evaluation is not expected to be required.
- Endangered Species – Based on a PNDI Project Environmental Review search, there is a plant, a Jeweled Shooting-Star, which is threatened and may be located within the project limits. A botanist may be required to survey the project area. The presence of the plant within the project limits and / or mitigation is unlikely.

### *Socioeconomic Resources*

- Parks and Public Recreation Areas – The proposed pedestrian facilities will enhance access to / from the Hershey Park Camping Resort.
- Community Facilities – The proposed vehicular and pedestrian facilities will improve accessibility.
- Commercial Facilities - The project will increase and enhance accessibility to commercial facilities along Walton Avenue and Mae Street. Also, the proposed pedestrian improvements will increase pedestrian traffic to existing commercial facilities and enhance and encourage development of other potential commercial sites.
- Residential Facilities – The proposed vehicular and pedestrian facilities will enhance travel and connections to residential facilities within the study area.

### *Cultural Resources*

A recent project near the study area found that there are no archaeological sites within the study area, but there may be a historical property. The Pennsylvania Historical and Museum Commission (PHMC) should be contacted during design in order to confirm that there will not be impacts to any cultural resources. Even if there is a historical property present, there will likely be no impact to that property.

## GOALS MATRIX

The following matrix illustrates how the Project Goals, as collectively identified by the coalition during the Conceptual Alternatives Workshop, are satisfied:

| <b>TABLE 8: GOALS MATRIX</b>   |  |   |   |
|--|--|---|---|
| <b>Goals</b>   | <b>Short-Term</b>  | <b>Mid-Term</b>   | <b>Long-Term</b>  |
| Improve multi-modal mobility, especially pedestrian mobility   | Goal is partially met by providing pedestrian connections along the north side of Walton Ave / Mae St and improved bicycle signing     | Goal is met with the construction of additional pedestrian and bicycle facilities between Walton Ave / Mae St and Sweet St / Old West Chocolate Ave | Goal is met with the construction of additional pedestrian and bicycle facilities along Walton Ave, Mae St, and Hersheypark Dr  |
| Improve corridor safety  | Goal is partially met with improved pedestrian / bicycle accommodations and vehicular operational phasing conditions                   | Goal is partially met with additional pedestrian and bicycle facilities and the relocation of the Bob Evans driveway                                | Goal is met with additional pedestrian facilities and bicycle facilities and geometric roadway improvements                     |
| Address capacity and queuing concerns<br>i. Along Walton Ave<br>ii. Along Hersheypark Dr   | Goal is partially met with traffic signal coordination and restriping along Walton Ave   | Queuing concerns are minimized with the relocation of the Bob Evans driveway  | Goal is met with geometric roadway improvements   |
| Optimize traffic signal timing and progression   | Goal is met with the coordination of the traffic signals along Walton Ave  | Progression is improved with the relocation of the Bob Evans driveway and potential adaptive signal system  | Goal is met with improved progression associated with various capacity movements  |
| Improve access management along Walton Ave and Main St to remove conflicts and increase safety<br>i. Consider turn restrictions<br>ii. Consider closing or combining driveways | Goal is partially met due to the geometric improvements resulting in shorter queue lengths and improved accessibility of the driveways | Goal is met with additional the relocation of the Bob Evans driveway  | Goal is met due to the Mid-Term improvements and shortened queue lengths that result in improved accessibility of the driveways |

### ***Estimated Programming Costs and Timing***

The following estimated programming costs are in order of magnitude based on planning level studies, photographs and investigations. These estimates are for planning purposes only and should be refined with detailed engineering designs, surveys, plans, and testing. Also, estimates are in 2014 dollars and should be escalated to the appropriate year of expenditure. Details of the cost estimates are included in Appendix D.

| <b>TABLE 9: PROGRAMMING COSTS</b>                          |                          |                        |                         |
|--|--------------------------|------------------------|-------------------------|
| <b>Item</b>  | <b>Short-Term (2019)</b> | <b>Mid-Term (2024)</b> | <b>Long-Term (2034)</b> |
| <b>Preliminary Engineering and Environmental Clearance</b> | \$26,250                 | \$250k – \$300k        | \$400k – \$450k         |
| <b>Final Design</b>  | \$21,000                 | \$200k – \$250k        | \$300k – \$350k         |
| <b>Utilities</b>   | \$5,000                  | \$150k – \$200k        | \$150k – \$200k         |
| <b>Right-of-Way</b>  | \$5,000                  | \$250k – \$300k        | \$200k – \$250k         |
| <b>Construction</b>  | \$175,000                | \$2M – \$2.5M          | \$3M – \$4M             |
| <b>Total</b>   | <b>\$232,250</b>         | <b>\$3M – \$3.5M</b>   | <b>\$4M – \$5.5M</b>    |

### **IMPLEMENTATION SCHEDULE**

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Short-Term (1-5 year implementation), Mid-Term (5-10 year implementation), and Long-Term (15-20 year implementation) improvements have been recommended in order to allow a phased implementation. The Short-Term improvements have been developed in order to be low-cost, but have a dramatic and immediate impact on the operational and safety characteristics of the corridor. Potential funding sources for the Short-Term improvements may include the Dauphin County Infrastructure Bank, ARLE Funding, or Transportation Alternatives Program Funding.

The Mid-Term improvements are more costly than the Short-Term improvements. MAP-21 funding may be appropriate for some of the improvements. Some of these improvements could become the responsibility of a developer. When justified by the Municipal Land Development approval process, Traffic Impact Studies should be completed for each proposed land development in order to further evaluate the study intersections. If improvements are required, the applicability of the recommended Mid-Term improvements should be considered. The US Route 322 / Hersheypark Drive (Route 39) Interchange project is currently listed on the Transportation Improvement Program. The right-out connection from Main Street onto the US Route 322 eastbound On-Ramp should be included in that project.

The Long-Term improvements are by far the most costly. These improvements will require substantial funding. An application should be completed in order to recommend that this project be added to the Transportation Improvement Program.

## **LIST OF REFERENCES**

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1. 2010 Highway Capacity Manual, Transportation Research Board, Washington D.C., 2010.
2. SYNCHRO 8.0, Traffic Signal Coordination Software, Transportation Research Board, Washington D.C., 2013.