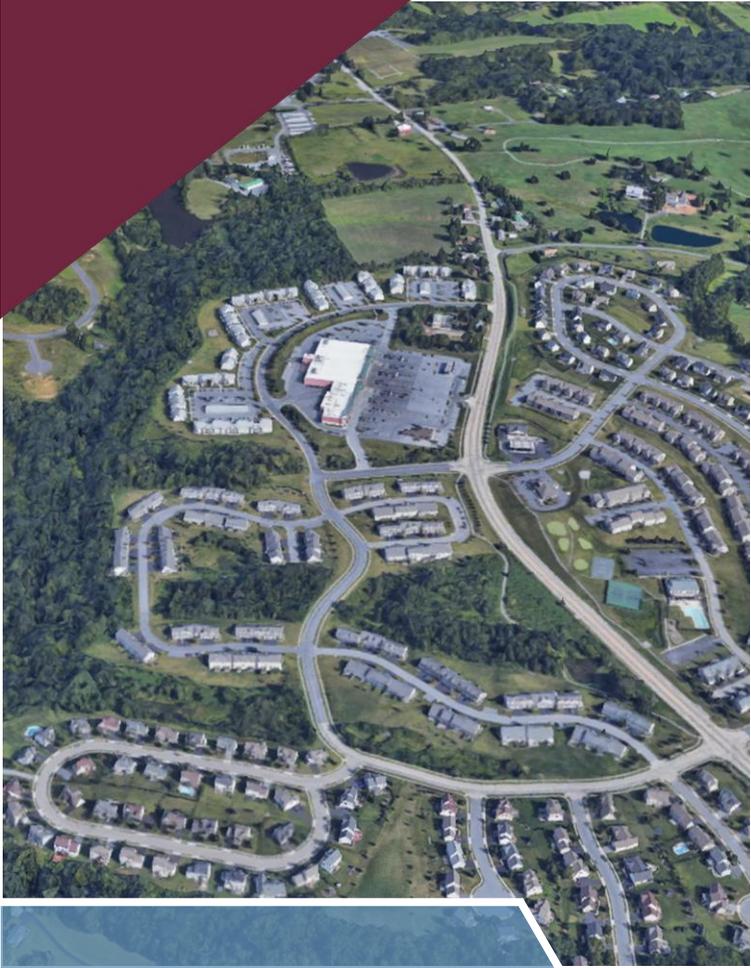


HRG

Herbert, Rowland & Grubic, Inc.
Engineering & Related Services

AN EMPLOYEE-OWNED COMPANY

ROUTE 39 & 743 CORRIDOR LAND USE & TRANSPORTATION STUDY



Submitted to:

TRI-COUNTY REGIONAL PLANNING COMMISSION
112 Market Street, 2nd Floor
Harrisburg, Pennsylvania 17101-2015



DAUPHIN COUNTY COMMISSIONERS
2 South Second Street, 4th Floor
Harrisburg, Pennsylvania 17101



Submitted by:

HERBERT, ROWLAND & GRUBIC, INC.
369 East Park Drive
Harrisburg, PA 17111
717.564.1121

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Executive Summary

Overview

The purpose of the Routes 39 & 743 corridor study is to address land use and transportation concerns presented to the Herbert, Rowland & Grubic, Inc. Project Team by the key stakeholder Steering Committee, Tri-County Regional Planning Commission, the public, and representatives of municipalities within the study area. The corridor study is driven by the need to accommodate the growth of the surrounding communities while maintaining safe and efficient mobility for all modes of transportation. The transportation and land use recommendations have been developed to accommodate the growth with consideration to the values and concerns provided by public and regional stakeholders. It is paramount that the local, county and state governmental organizations collaborate to adopt policies to properly plan for the future infrastructure needs and growth.

The public concerns primarily consisted of capacity and safety concerns, expressing a chief need for additional through lanes along portions of Route 39 to accommodate traffic volumes and alleviate congestion. Safety concerns were also noted, most scenarios involved poor or limited sight distance, problematic vertical and horizontal curves, poor access management, and lack of facilities to accommodate bicyclists and pedestrians. Additionally, areas of substantial congestion along the primary routes tend to divert traffic to the secondary routes. Typically, secondary routes within the study area are not intended for higher traffic volumes and travel speeds. The public has identified excessive speeding along Route 743, on secondary collector roadways, and in residential areas. With all public input surveyed, it is clear that there are significant safety, capacity, and connectivity issues throughout the corridor that need addressed while concurrently adopting future land use and transportation connectivity and improvement recommendations.

Study Purpose and Limitations

- This 20-year plan focuses on the geometric intersection configurations while noting that actual future traffic patterns may deviate from the projections.
- This study was prepared with the fundamental goal of identifying anticipated future development and quantifying potential roadway widening that may be required to mitigate future traffic congestion. Potential mitigating strategies identified herein will be used for future consideration to preserve rights-of-way, identify locations for new or relocated utilities, and for long-range budgeting and funding procurement.
- The scope of the study was focused on identifying potential “Supply Side” infrastructure strategies, specifically “potential roadway infrastructure mitigations” as a planning tool to alleviate future traffic congestion associated with future potential development growth in the study area.
- Infrastructure Supply Side strategies are just one tool in planning for mitigating traffic congestion and should be considered in conjunction with “Demand Side” strategies, such as transit improvements, off-site parking/shuttle services, ride-share services, etc.

- Many of these “potential roadway infrastructure mitigations” generate concerns over right-of-way and potential environmental impacts. Each municipality should manage growth and evaluate alternative methods of accommodating the travel demand (i.e., manage development and/or applying “demand side” strategies).
- While this study is solely focused on “Supply Side” strategies, the Route 39/743 Transportation and Land Use Study is one of several planning tools available for the local municipalities and planning agencies to utilize in the future transportation project development process (Refer to Figure 1.1 below from PennDOT Design Manual 1).
 - In order for potential mitigation strategies identified in this report to be implemented, several additional planning and programming steps are necessary, especially for the larger, more impactful measures.
 - Planning partners including PennDOT and Tri-County Regional Planning Commission also identify potential transportation problems and evaluate alternative and mitigating measures. While the potential mitigating measure identified within this report would be considered, the exact improvements identified are unlikely to be realized verbatim.
 - During any project development process, the project planners will identify additional potential alternatives and determine appropriate improvements with respect to the transportation needs, environmental responsibility, property impacts, funding limitations, et cetera.

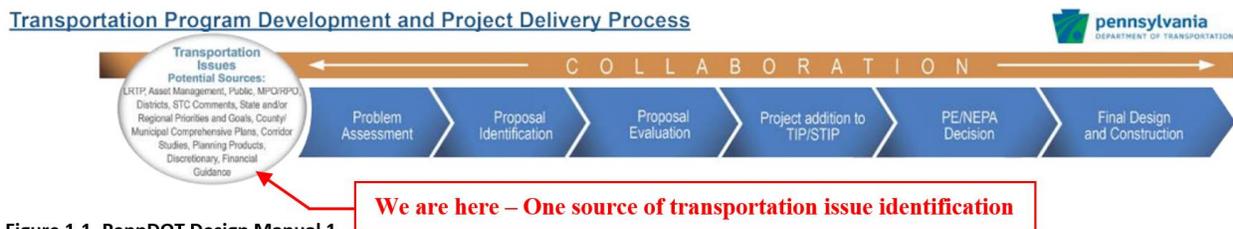


Figure 1.1, PennDOT Design Manual 1

Project Objectives and Goals

Three primary study objectives were identified at the onset of the study:

- **Objective 1:** Identify capacity and/or safety needs and potential mitigating measures along the Route 39 and 743 corridors.
- **Objective 2:** Evaluate surrounding land uses and zoning and prepare recommendations to ensure future development does not compromise the integrity of the transportation network.
- **Objective 3:** Evaluate the surrounding secondary roadway network to determine opportunities for improvement to provide a cohesive roadway network, safely and efficiently supporting land uses within the corridor. Identify if an improved secondary roadway system would alleviate congestion and other concerns along the Route 39 and Route 743 corridors.

Through the community outreach and visioning process, the following goals were identified for the Route 39/743 Transportation and Land Use Study:

- Reduce congestion and delay
- Improve safety and efficiency
- Provide for multimodal activity, especially bicycles and pedestrians
- Improve access management by limiting unsignalized access points
- Improve secondary roadway system
- Improve interconnectivity
- Preserve the functionality and character of the Linglestown Village
- Effectively accommodate traffic between I-81 and Hershey
- Ongoing business activity
- Establish a consistent community theme
- Sustainable transportation recommendations to support growth
- Strategic implementation plan
- Ongoing collaboration between regional stakeholders

Route 39 and 743 Corridor study identifies land use and zoning recommendations, as well as roadway and multi-modal mobility improvements that can help mitigate congestion and various safety concerns. When coordinated with complementary land use and development decisions, transportation investments can improve the primary and secondary roadway networks and enhance mobility choices, and in turn, will promote increased economic prosperity and enhanced community life along Route 39 and 743 corridors.

Corridor Overview

- ▶ The Route 39 corridor study area extends from Front Street in Susquehanna Township to the northern Derry Township line and through large portions of Lower Paxton, West Hanover, and South Hanover Townships. The Route 743 corridor study area extends within East Hanover Township from Derry Township to Route 443.
- ▶ Route 39 and Route 743 are classified as Minor Arterials per PennDOT's Federal functional class map; however, there are variable width lane configurations throughout the corridor.
 - Three (3) to five (5)-lane configuration from Front Street to Patton Road
 - Three (3) lanes from Patton Road to Linglestown Village
 - Two (2) lanes within Linglestown Village to the I-81 interchange area
 - Five (5) lanes through I-81 interchange area
 - Two (2) lanes from Jonestown Road to the Derry Township municipal boundary line, with some locations with a center turn lane

Due to the changing roadway and land use patterns along the Route 39 and Route 743 corridors, the roadways were segmented into eight "Character Areas" (See Map 1) and are generally summarized as follows:

Table ES-1: Route 39 and 743 Corridors Character Area			
Character Area	Roadway Length	Location of Roadway	Municipality
1	1.64	Front Street to Crooked Hill Road	Susquehanna Township
2	3.48	Crooked Hill Road to Colonial Club Drive	Susquehanna Township Lower Paxton Township
3	1.47	Colonial Club Drive to Wenrich Street	Lower Paxton Township
4	2	Wenrich Street to Houcks Contractor Driveway	Lower Paxton Township West Hanover Township
5	2.64	Houcks Contractor Driveway to Allentown Boulevard	West Hanover Township
6	4.02	Allentown Boulevard to Derry Township Line	West Hanover Township South Hanover Township
7	3.38	Swatara Creek / Derry Township Line to north of Colt Drive	East Hanover Township
8	2.69	North of Colt Drive to Mountain Road (Route 443)	East Hanover Township
Total	21.33		

- Character Areas 1 and 2 (western portion of the Route 39 corridor) are largely developed in Residential and Commercial Land Uses with pockets of infill development patterns. There are some development and redevelopment opportunities within these Character Areas.
- Character Areas 3 and 4 along the Route 39 corridor runs through the Village of Linglestown that provides the most pedestrian oriented portion of the corridor. This portion also has the lowest traffic volumes and travel speeds along Route 39.
- Character Area 5 along the Route 39 corridor has an interchange area with Interstate 81 and intersects Route 22 with typical highway commercial uses located within close proximity of them.
- Character Area 6 (Route 39, south of Route 22) services various small commercial and residential land uses.
- Character Area 7 (Route 743, south of Route 22) is largely undeveloped and contains mostly natural and agricultural landscapes. This area has higher travel speeds.
- Character Area 8 along Route 743 provides access to I-81, Route 22, and Hollywood Casino.

Public Outreach

Public outreach included a multi-pronged approach, including interviews with municipal officials and stakeholders, a series of stakeholder meetings, public meetings, key focus group discussions, and questionnaires. Additional input was obtained via the Project StoryMap website

and project information on municipal websites. In addition to the ongoing interviews and discussions, the following key meetings were held to obtain public input and concerns within the study area corridor:

- ▶ Lower Paxton Township Town Hall Meeting – June 12, 2017
- ▶ Stray Winds Area Neighbors Meeting #1 – October 24, 2017
- ▶ Steering Committee Meeting #1 – December 11, 2017
- ▶ Dauphin County Commissioners Meeting #1 – May 9, 2018
- ▶ Focus Group Meeting – May 14, 2018
- ▶ Steering Committee Meeting #2 – May 30, 2018
- ▶ Public Meeting #1 – June 05, 2018
- ▶ HATS Bicycle & Pedestrian Meeting – June 26, 2018
- ▶ Hollywood Casino / Penn National Meeting – October 23, 2018
- ▶ Steering Committee Meeting #3 – October 30, 2018
- ▶ Public Meeting #2 – December 3, 2018
- ▶ Dauphin County Staff Meeting – January 29, 2019
- ▶ Stray Winds Area Neighbors Meeting #2 – March 4, 2019
- ▶ Dauphin County Commissioners Meeting #2 – July 24, 2019
- ▶ Tri-County Regional Planning Commissioners Meeting – July 25, 2019
- ▶ Route 39 Public Officials Meeting – September 18, 2019
- ▶ Capital Region Economic Development Corporation – November 11, 2019
- ▶ East Hanover Township Board Meeting – December 17, 2019
- ▶ Dauphin County Commissioners Meeting #3 – April 15, 2020
- ▶ Dauphin County and Tri-County Staff Meeting – February 22, 2021
- ▶ Dauphin County Commissioners Meeting #4 – October 13, 2021

On October 8, 2021, a draft of the final report was distributed to Tri-County Planning Commission, Dauphin County, and the five municipalities (Susquehanna, Lower Paxton, West Hanover, South Hanover and East Hanover Townships) for staff and elected official review. Comments received were then incorporated into the final draft report, which was submitted for public comment from January 12, 2022 through February 28, 2022.

Potential Mitigation

To mitigate the projected traffic deficiencies and improve multimodal connectivity, potential roadway improvements and future land use planning should be considered to maintain acceptable traffic flow. However, due to evolving transportation issues and trends and their unknown effect on long range regional transportation planning, several items should be further considered prior to implementing the potential mitigation. These include:

- “Demand-side” strategies
- Long-term effects of COVID-19
- Mobile navigation applications
- Autonomous vehicles

- I-81 to PA Turnpike connection (East of Hershey)
- Environmental impacts
- Private property impacts
- Transit enhancements
- Significant variations from future land use assumptions

Land use projections and considerations are summarized in Table ES-2. Potential Improvements for Mitigation are identified in Table ES-3. Some of the more significant measures are summarized as follows:

- Character Area 1
 - “Supply Side” infrastructure strategies
 - Widen Route 39 (Route 322 to Crooked Hill Road) to provide 2 through lanes in each direction. Consider narrower travel lanes (10’ lanes).
 - Install a median that will preclude left turns except for signalized intersections; emphasize access management.
 - Provide bike lanes on both sides of the road and sidewalk along at least one side of the road.
 - Land Use Strategies
 - Character area is mostly developed; modest additional development can be mitigated.
 - Facilitate additional low to medium density residential development, discourage non-residential development.
 - Maintain low and medium density residential developments aligned with the existing neighborhoods. Encourage low-density neighborhoods that consist of single-family homes or a mix of single-family with attached residential such as townhomes or row homes.
 - Design neighborhoods with an interconnected street and pedestrian network and limit the use of cul-de-sac streets.
- Character Area 2
 - “Supply Side” infrastructure strategies
 - Widen Route 39 (Crooked Hill Road to Patton) to provide 2 through lanes in each direction and a center left turn lane.
 - Provide bike lanes on both sides of the road and sidewalk along at least one side of the road.
 - Consider extension of Continental Drive to connect neighborhoods north of Route 39.
 - Emphasize access management for new or redeveloped sites.
 - Land Use Strategies
 - Character Area is largely developed or under development. Modest additional commercial and residential development can be mitigated.
 - The town center area will help to promote a compact, walkable, mixed use, and transit-friendly development.
 - Provide pedestrian walkways through parking lots and between uses.

- Character Area 3
 - “Supply Side” infrastructure strategies
 - This area is a highlight of the corridor, with a successful intermingling of pedestrian, bicycle, and vehicular traffic.
 - Consider on-road markings for bicycle traffic.
 - Land Use Strategies
 - Encourage small business and supporting residential along the Route 39 frontage.
 - Significant development surrounding the corridor should be discouraged.
 - Connect all non-residential parking lots to reduce the amount of traffic along SR 0039.
 - To create more open space within new Village development a minimum of 20% needs to be set aside for open space with half of the total located within the middle of the development on a common green or landscaped median.
 - Village Center neighborhoods should have smaller lot sizes with buildings close to each other to promote walkability.

- Character Area 4
 - “Supply Side” infrastructure strategies
 - Discourage traffic-intensive development in this area as significant development would overburden the Linglestown Village area.
 - Provide a shared use path along one side of the road for pedestrian and bicycle use in this area.
 - Land Use Strategies
 - Intensive development of this character area should be discouraged.
 - Consider zoning changes for decreased development intensity.

- Character Area 5
 - “Supply Side” infrastructure strategies
 - Widen to provide a consistent center turn lane for the entire corridor.
 - Provide bike lanes in both directions of Route 39.
 - Provide continuous sidewalk on both sides of Route 39 within I-81 interchange area.
 - Land Use Strategies
 - Continued development within the interchange area can be supported - industrial uses and interchange service facilities.
 - Consolidate driveways to reduce the traffic conflicts off SR 0039; encourage abutting commercial property interconnections between parking areas.

- Character Area 6
 - “Supply Side” infrastructure strategies
 - Widen to provide a consistent center turn lane for the entire corridor.
 - Provide bike lanes along both sides of Route 39 north of Shetland Drive
 - Provide a continuous shared use path south of Shetland Drive
 - Consider a new roadway link from Red Top Road to Hayshed Road

- Land Use Strategies
 - Low to Medium Density Neighborhoods: Promote walkable low density neighborhoods that consist of single-family homes or a mix of single-family with attached residential such as townhomes.
 - Design neighborhoods with an interconnected street and pedestrian network and limit the use of cul-de-sac streets.
 - Consider location of industrial development in proximity to residential and environmental impacts to community

- Character Area 7
 - “Supply Side” infrastructure strategies
 - Intersections generally do not meet traffic signal warrants. Consider roundabouts at several locations to improve access from the side streets and calm traffic.
 - Manage vehicular speeds and truck traffic.
 - Consider a bypass from I-81 to Hershey and/or Pennsylvania Turnpike
 - Land Use Strategies
 - Character Area is largely undeveloped, with minimal development/market pressures anticipated within the 20-year projection.
 - Provide design flexibility to allow agriculture, conservation, and homes to be placed on a tract where they best meet community preservation goals.
 - Reduce road design standards that permit wide streets to save on road maintenance, promote rural lifestyle and improve stormwater management.
 - Internal trails and collector trails should be promoted through this character area to keep the rural lifestyle of the area.

- Character Area 8
 - “Supply Side” infrastructure strategies
 - Consider roundabouts at key intersections.
 - Provide pedestrian and bicycle connectivity.
 - Consider a bypass from I-81 to Hershey and/or Pennsylvania Turnpike
 - Land Use Strategies
 - Development opportunities without significant corridor impacts due to the proximity to the I-81 Interchange; encourage non-residential development.
 - Provide pedestrian and vehicular access to abutting residential properties to offer relief from having to access commercial properties only through Route 743

Table ES-2: Land Use Summary

Character Area	Municipalities	Percent Developed	20-Year Projections		Land Use Considerations
			Additional Housing Units	Non-Residential Development (SF)	
1	Susquehanna	93%	195	30,000	Mostly developed; with recommended zoning and transportation improvements, traffic impact from additional development can be mitigated. Suggested zoning changes to facilitate additional residential development and discourage non-residential development.
2	Susquehanna & Lower Paxton	92%	2,593	738,130	Mostly developed; with recommended zoning and transportation improvements, traffic impact from additional development can be mitigated. Suggested zoning changes to facilitate modest additional residential and commercial development.
3	Lower Paxton	88%	208	0	Mostly developed; modest opportunities for additional residential development. Significant development should be discouraged.
4	Lower Paxton & West Hanover	66%	353	0	Intensive development of this corridor should be discouraged due to traffic impacts within the Linglestown Village. Consider zoning changes for decreased development intensity.
5	West Hanover	54%	500	1,466,200	Development opportunities without significant corridor impact due to proximity to I-81 interchange. Suggested zoning changes to facilitate additional non-residential development.
6	West Hanover and South Hanover	65%	1,148	76,000	With recommended zoning and transportation improvements, traffic impact from additional development can be mitigated. Minor zoning changes recommended for consideration.
7	East Hanover	30%	3	0	Largely undeveloped; minimal development/market pressures anticipated within the 20-year projections. Minor zoning changes recommended for consideration.
8	East Hanover	73%	0	2,000,000	Development opportunities without significant corridor impact due to proximity to I-81 interchange. Suggested zoning changes to facilitate additional non-residential development.

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 1)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
SR 0039 & Sixth Street	Susquehanna	Capacity	Install a traffic signal and restripe SR 0039 to provide a westbound left turn lane	\$250k - \$300k	Mid
SR 0039 & Industrial Road / Rt 322 EB Ramp	Susquehanna	Capacity	Add a northbound right turn lane on Industrial Road (currently under construction) Add a southbound right turn from the 322 eastbound ramp	\$200k - \$250k	Mid
SR 0039 - Route 322 to Fargreen Road	Susquehanna	Capacity/Safety	Implementation of frontage access roads to divert traffic from SR 0039	Redevelopment effort	Long
SR 0039 & Fargreen Road	Susquehanna	Capacity	Widen to add a second through lane in each direction	\$2M - \$2.5M	Long
SR 0039 & Deer Path Road	Susquehanna	Capacity	Widen to add a second through lane in each direction	\$1.5M - \$2M	Long
SR 0039 & Crooked Hill Road	Susquehanna	Capacity	Widen to add a second westbound through lane	\$750k - \$1M	Long
Front Street - SR 0039 to Parkway Road	Susquehanna	Pedestrian	Install sidewalk with grass buffer to the east to allow for pedestrian access to residence, hotel, and riverfront businesses	\$350k - \$450k	Short
SR 0039 - Front Street to Sixth Street	Susquehanna	Pedestrian	Install shared use path to provide connectivity to other pedestrian-friendly facilities	Currently under construction	Short
Sixth Street - Division St to SR 0039	Susquehanna	Bicycle	Install on-road markings/sharrows and signage for shared lane bicycle travel	\$25k - \$50k	Short
Industrial Road - SR 0039 to Wildwood Park	Susquehanna	Bicycle	Install shared use path from SR 0039 to Wildwood Park Provide crossing at Wildwood Park	Currently under construction	Short
SR 0039 - Industrial Road to Crooked Hill Road	Susquehanna	Bicycle	Install designated 5' bicycle lanes on both sides of the SR 0039	\$25k - \$50k	Short
SR 0039 - Rt 322 to Crooked Hill Road	Susquehanna	Pedestrian	Install sidewalk on the north side of SR 0039 to provide connectivity to residential neighborhoods, businesses, and Thomas W. Holtzman Elementary School	\$750k - \$1M	Mid
Crooked Hill Road	Susquehanna	Bicycle/Pedestrian	Install shoulder improvements to allow for a 5' minimum travel area for bicyclists where sight distance is limited Consider adjusting speed limit to allow for on-road sharrows in Susquehanna Provide connectivity to SR 0039, Paxton Church Road and Elmerton Avenue	\$50,000 - \$100,000 per curve	Long
SR 0039 & Front Street	Susquehanna	Access Management	Restrict northern driveway entrance to the Exxon/Uni-Mart along Front Street Restrict western driveway entrance along SR 0039	Property owner cost	Short
Industrial Road	Susquehanna	Safety	Improved highway lighting	\$10-\$20k	Mid
SR 0039 - US 22/322 Westbound to Eastbound Ramps	Susquehanna	Safety	Improved highway lighting	\$10-\$20k	Mid
SR 0039 - Crooked Hill to Blue Mountain Commons	Susquehanna	Access Management	Align driveways on the north and south sides of SR0039 to reduce potential conflicts	Ongoing thru redevelopment efforts	Long
SR 0039 - Route 322 to Crooked Hill Road	Susquehanna	Safety	Provide center boulevard median	Incorporated with other widening projects	Long

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 2)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
SR 0039 & Progress Avenue	Susquehanna	Capacity	Construct a southbound right turn lane; Adjust right turn lanes to include continuous bike lanes through intersection; widen to extend westbound through lane from Sturbridge	\$1M - \$1.5M	Mid
SR 0039 & Progress Avenue	Susquehanna	Capacity	Construct improvements recommended by Susquehanna Union Green: add a second northbound left turn lane and a northbound right turn lane; install median along N Progress Avenue; extend dual eastbound through lanes to Sturbridge Drive	Developer costs; under construction	Short
SR 0039 & Sturbridge Drive	Susquehanna	Capacity	Plan for future access to the north side of the intersection Widen to provide dual thru lanes in each direction; maintain 250' eastbound right turn lane	\$1.5 - \$2M	Long
SR 0039 & Oakhurst Boulevard	Susquehanna	Capacity	Widen to add a second through lane in each direction	\$3M - \$3.5M	Long
SR 0039 & Crums Mill Road	Lower Paxton	Capacity	Install improvements recommended by Blue Ridge Village: construct 4th leg and signalize; construct northbound left turn lane and westbound right turn lane	Improvements recently constructed	Short
SR 0039 & Crums Mill Road	Lower Paxton	Capacity	Widen to add a second through lane in each direction	\$2M - \$2.5M	Long
SR 0039 & Versailles Road / Dover Road	Lower Paxton	Capacity	Widen to add a second through lane in each direction	\$1M - \$1.5M	Long
SR 0039 & Forest Hills Drive / Ringneck Drive	Lower Paxton	Capacity	Widen to add a second through lane in each direction	\$1.5 - \$2M	Long
SR 0039 & Colonial Road	Lower Paxton	Capacity	Construct a 275' northbound right turn lane Construct an additional eastbound and westbound through lane	\$3M - \$3.5M	Long
SR 0039 & Woodview / Patton Road	Lower Paxton	Capacity	Widen to provide a second westbound through lane	\$600k - \$800k	Long

SR 0039 - Entire Character Area 2	Lower Paxton	Bicycle	Install designated 5' bicycle lanes on both side of the Linglestown Road (SR 0039)	\$75k - \$100k	Long
SR 0039 - Crooked Hill Road to Patton Road	Lower Paxton	Pedestrian	Install sidewalk on both sides of the roadway to provide connectivity to other pedestrian-friendly facilities	\$4M - \$5M	Mid
Paxton Church Road - Crooked Hill Road to Crums Mill Road	Susquehanna	Bicycle	Install shoulder improvements to allow for a 5' minimum travel area for bicyclists; Provide connectivity to existing shared use paths installed for residential connectivity Provide necessary signage	\$3M - \$4M	Long
Progress Avenue - SR 0039 to I-81	Susquehanna	Bicycle	Install 5' designated bicycle lanes in the northbound and southbound directions	\$100k - \$125k	Mid
Progress Ave - SR 0039 to Paxton Church Road	Susquehanna	Pedestrian	Provide sidewalk on the east side of Progress Avenue	Partial developer funded; remaining \$500k - \$750k	Mid
Progress Ave - Paxton Church Road to Elmerton Avenue	Susquehanna	Pedestrian	Provide sidewalk on both sides of Progress Avenue	\$2.5M - \$3.5M	Long
Crums Mill Road - SR 0039 to Paxton Church Road	Lower Paxton	Bicycle	Construct shoulders to facilitate bicycles	\$1M - \$1.5M	Mid
Crums Mill Road - SR 0039 to Paxton Church Road	Lower Paxton	Pedestrian	Install sidewalk on east side of roadway for connectivity to residential developments and shared use paths at Stray Winds	\$750k - \$1M	Mid
Colonial Road - SR 0039 to Crums Mill	Lower Paxton	Bicycle	Install 5' designated bicycle lanes in the northbound and southbound directions	\$100k - \$125k	Mid
Colonial Road - just north of SR 0039	Lower Paxton	Pedestrian	Install missing gap of sidewalk on east side of roadway	\$100k - \$200k	Short
Colonial Road to Continental Drive	Lower Paxton	Bicycle	Provide on-road markings to allow bicyclists adequate connectivity to Linglestown Road (SR0039) from Continental Drive	\$10k - \$20k	Short
Colonial Road - SR 0039 to McIntosh Road	Lower Paxton	Pedestrian	Install sidewalk on west side of roadway for connectivity to residential developments and shared use paths at Stray Winds	\$750k - \$1M	Mid
McIntosh Road - near Colonial Road	Lower Paxton	Bicycle	Provide connectivity from recommended designated bicycle facilities along Colonial Road to the residential shared use paths	\$125k - \$175k	Short

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 2)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
Patton Road - just north of SR 0039	Lower Paxton	Pedestrian	Install missing gap of sidewalk on both sides of roadway	\$500k - \$600k	Mid
SR 0039 at Fairway Lane	Lower Paxton	Bicycle	Widen right turn lane to provide bike lane between turn lane and through lane	\$75k - \$100k	Mid
SR 0039 - Patton Road to Blue Mountain Parkway	Lower Paxton	Pedestrian	Install sidewalk on portions of the north or south sides of SR 0039 to provide connectivity to Linglestown Village, residential developments, businesses, attractions/amenities	\$1M - \$1.5M	Mid

Progress Avenue & Paxton Church Road	Susquehanna	Safety	Improve vertical geometry at intersection and approaches to gain more sight distance for turning vehicles	\$2M - \$2.5M	Long
Crums Mill Road & McIntosh Road	Lower Paxton	Safety	Improve sight distance by clearing and grubbing; maintain regularly as needed	\$10k - \$25k	Short
Colonial Road SR 0039	Lower Paxton	Access Management	Modify driveway locations of 3B Ice Cream and Arooga's to reduce conflict points	\$200 - \$300k; or through redevelopment efforts	Mid
Continental Drive	Susquehanna	Safety	Install traffic calming measures to limit cut-through traffic and speeding	\$25k - \$200k	Short
Colonial Road to Continental Drive	Lower Paxton	Safety	Install traffic calming measures to reduce speeding	\$25k - \$200k	Short
Colonial Road & Sheetz driveway	Lower Paxton	Safety	Improve sight distance by clearing vegetation	\$10k - \$25k	Short
Colonial Road & Crestview Road	Lower Paxton	Safety	Improve sight distance by clearing vegetation and grading to the north on either side of the roadway Further improve sight distance with utility pole relocations	\$75k - \$100k	Mid
McIntosh Road	Lower Paxton	Safety	Install traffic calming measures to reduce speeding	\$25k - \$200k	Short
McIntosh Road & Colonial Road	Lower Paxton	Safety	Improve sight distance by clearing vegetation and grading to the north on either side of the roadway; Further improve sight distance by re-profiling Colonial Road to the north	\$1M - \$1.5M	Long

Continental Drive	Susquehanna / Lower Paxton	Other	Consider benefits of connectivity following additional residential development (Progress Avenue to Forest Hills Drive and Patton Road to Parkway West)	\$10M - \$12M	Long
Crums Mill Road	Lower Paxton	Other	Provide horizontal and vertical geometry improvements, shoulder improvements to improve sight distance around curves	Varies based on specific improvement locations	Long
Colonial Club Drive	Lower Paxton	Other	Provide horizontal and vertical geometry improvements, shoulder improvements to improve sight distance around curves	Varies based on specific improvement locations	Long
Doehne Road	Susquehanna/Lower Paxton	Other	Consider pavement improvements	\$200k - \$250k	Mid/Long

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 3)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
SR 0039 & N Mountain Road	Lower Paxton	Capacity	Limit future land uses to limit traffic increases and preserve the functionality of the roundabouts	Policy	Long
SR 0039 - Linglestown Village	Lower Paxton	Bicycle	Implement on-road markings / sharrows and signing to direct bicyclists through the village and roundabouts	\$10k - \$15k	Short
Blue Mountain Parkway	Lower Paxton	Bicycle	Provide on-road markings to allow bicyclist adequate connectivity to/from Linglestown Road (SR0039) and off-road shared use path	\$5k - \$10k	Short
Blue Mountain Parkway - SR 0039 to St Thomas Blvd	Lower Paxton	Pedestrian	Install sidewalk along one side to connect residential development to SR 0039	\$300k - \$500k	Mid
N Mountain Road	Lower Paxton	Bicycle/Other	Install 5' designated bicycle lanes in the northbound and southbound direction from Linglestown Road (SR 0039) to north of I-81 ramps	\$75k - \$100k	Mid
Mountain Road - SR 0039 to I-81	Lower Paxton	Pedestrian	Install sidewalk along both sides of roadway	\$1.5M - \$2.5M	Long
Blue Ridge Ave - Mountain Road to Piketown Road	Lower Paxton	Pedestrian	Install sidewalk along one side of roadway	\$1.5M - 2M	Long
Blue Ridge Ave - Mountain Road to Piketown Road	Lower Paxton	Bicycle	Install on-road pavement markings / sharrows	\$20k - \$30k	Short
N Mountain Road & Blue Ridge Avenue	Lower Paxton	Safety	Improve sight distance by clearing vegetation and grading to the north and south; further improve sight distance with re-profiling of N Mountain Road to the south	\$600k - \$800k	Long
Wenrich Street	Lower Paxton	Other	Provide horizontal and vertical geometry improvements	Varies based on specific improvement locations	Long

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 4)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
SR 0039 - Balthaser St to Wenrich St	Lower Paxton	Pedestrian	Install sidewalk on one side of SR 0039	\$500k - \$750k	Mid
SR 0039 - Balthaser St to Wenrich St	Lower Paxton	Bicycle	Install on-road markings/sharrows and signage for shared lane bicycle travel	\$5k - \$10k	Short
SR 0039 - Wenrich St to Piketown Road	Lower Paxton	Bicycle / Pedestrian	Install Shared Use Path along one side of roadway	\$1.5 - \$2M	Mid
Piketown Road - Central Dauphin High School to Blue Ridge Ave	Lower Paxton	Pedestrian	Install sidewalk on east side of roadway for connectivity to residential developments, Central Dauphin High School and shared use paths along SR 0039	\$500k - \$750k	Mid
Piketown Road	West Hanover	Bicycle	Provide on-road markings and signage to allow bicyclists adequate connectivity from Blue Ridge Avenue and Jonestown Road; widen shoulders where sight distance is limited	\$20 - \$30k	Short
SR 0039 - Walnut Ave to Royal Terrace	West Hanover	Pedestrian	Install sidewalk on south side of SR 0039 for connectivity to residential developments from Central Dauphin High School and shared use paths	\$400k - \$600k	Mid
SR 0039 - Walnut Ave to Manor Drive	West Hanover	Bicycle	Install shoulder improvements to allow for a 5' bike lane	\$750k - \$1M	Long
SR 0039 - Manor Drive to Quality Circle	West Hanover	Bicycle	Install shoulder improvements to allow for a 5' bike lane	\$1.5 - \$2M	Long
Blue Ridge Avenue & Wenrich Street	Lower Paxton	Safety	Improve sight distance by clearing vegetation and grading to the west	\$50k - \$75k	Mid

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 5)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
SR 0039 - Jonestown Road to Allentown Boulevard	West Hanover	Safety/ Capacity	Construct a center left turn lane	\$800k - \$1M	Long
SR 0039 - Entire Character Area 5	West Hanover	Bicycle	Install designated 5' bicycle lanes on both sides of the Linglestown Road (SR 0039)	\$200k - \$250k	Long
SR 0039 - Jonestown Road to Manor Drive (SE)	West Hanover	Pedestrian	Install sidewalk (where missing) on both sides of Linglestown Road/Hershey Road (SR 0039) to provide connectivity	\$2.5M - \$3.5M	Long
Jonestown Road - Allentown Blvd to Sand Beach Road	East / West Hanover	Bicycle	Install on-road pavement markings / sharrows to allow connectivity from Allentown Boulevard and Blue Ridge Avenue to SR 0039, Horseshoe Trail, Sand Beach Road and Lebanon County	\$50k - \$75k	Short
Allentown Boulevard - Jonestown Road to Sand Beach Road	East / West Hanover	Bicycle	Install 5' designated bicycle lanes in both directions	\$120k - \$150k	Mid
SR 0039 - north of Allentown Boulevard	West Hanover	Safety	Improve roadway lighting along the residential neighborhood frontage along Hershey Road	\$75k - \$100k	Mid
SR 0039 - N Fairville Ave to Jonestown Road	West Hanover	Safety	Access Management	Redevelopment effort	Mid
Mill Road & Allentown Boulevard	East Hanover	Safety	Improve sight distance by grading and clearing vegetation	\$75k - \$100k	Mid

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 6)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
SR 0039 & Manor Drive (SE)	West Hanover	Capacity	Install improvements as required by the Fowler Development, including signalization, left turn lanes along SR 0039 and a northbound right turn lane along SR 0039	Developer costs	Long
SR 0039 - Manor Drive (SE) to Shetland Drive	West / South Hanover	Capacity/Safety	Provide center left turn lane	\$5M - \$6M	Mid
SR 0039 & Devonshire Heights Road	West Hanover	Capacity	Install a traffic signal when warranted	\$100k - \$150k	Mid
SR 0039 & Red Top Road	West Hanover	Capacity	Install a traffic signal when warranted (unless Hayshed is extended)	\$300 - \$350k	Mid
SR 0039 & Grandview Drive	South Hanover	Capacity	Install a southbound right turn lane (250' length) Install an eastbound right turn lane (150' length, 50' bay taper)	\$500k - \$750k	Mid
SR 0039 & East Canal Street	South Hanover	Capacity	Install a traffic signal when warranted	\$300 - \$350k	Mid
E Canal Street	South Hanover	Capacity	Bridge Improvement; Overall Condition rating poor	To be determined	Long
SR 0039 - Allentown Blvd to Shetland Drive	West / South Hanover	Bicycle/Pedestrian	Widen to provide five foot bike lane along both sides of SR 0039	\$3M - \$4M	Long
Manor Drive - Allentown Blvd to SR 0039 (SE)	West Hanover	Pedestrian	Install sidewalk on one side of the roadway to provide connectivity from Allentown Boulevard to Hershey Road (SR 0039)	\$750k - \$1M	Long
Red Top Road	West / South Hanover	Bicycle	Widen shoulders for bicyclists where sight distance is limited	\$50,000 - \$100,000 per curve	Long
SR 0039 - Hanshue Road to Hanover Street	South Hanover	Pedestrian	Install off-road shared-use paths on the west side of Route 39 from Hanshue Road to Grandview Drive and on the east side of Route 39 from Patriot Way to Hanover Street to provide connectivity along the route within the township	West side: \$750k - \$1M East side: \$400k - \$600k	Long
Grandview Drive	South Hanover	Bicycle	Provide on-road markings to allow bicyclists adequate connectivity from SR 0039 to Hoernerstown Road, Swatara Creek Trail, and Hummelstown	\$75k - \$100k	Short
Grandview Drive	South Hanover	Pedestrian	Install sidewalk on north/east side of roadway for connectivity to residential developments Evaluate the opportunity to install a walking trail/sidewalk along Grandview Drive to tie into Hummelstown	\$500k - \$750k	Mid
SR 0039 - Swatara Creek Bridge	South Hanover/ Derry	Bicycle/Safety	Widen and raise SR 0039 Bridge over Swatara Creek to prevent flooding; provide 5' bike lane for connectivity with Derry Township	To be determined	Long
Oak Grove Road/ S Hoernerstown Road	West / South Hanover	Safety	Install traffic calming measures	\$25k - \$200k	Short
SR 0039 & Devonshire Heights Road	West Hanover	Safety	Improve sight distance with clearing and grubbing and potential sight line obstruction improvement; re-profile SR 0039 in both directions to further improve sight distance	\$1M - \$1.5M	Long
Red Top Road	West / South Hanover	Safety	Improve roadway geometry	Varies based on specific improvement locations	Long
SR 0039 & Orchard Road	West Hanover	Safety	Improve sight distance looking north by realigning roadway or removing structure and regrading. Intersection radius improvements for better truck access	\$350k - \$500k	Long
Grandview Dr & Union Deposit Rd	South Hanover	Safety	Improve sight distance with grading and clearing vegetation	\$10k - \$25k	Short
Grandview Dr & Union Deposit Rd	South Hanover	Safety	Consider removal of the wall to increase roadway width	\$300k - \$500k	Mid
SR 0039 & North Hanover Street	South Hanover	Safety	Remove channelization and add a southbound right turn lane to slow traffic from Route 39 onto North Hanover Street	\$250k - \$350k	Short
Orchard Road	West / South Hanover	Connectivity	Study benefits of an additional access to businesses and residence along Orchard Hill Road Consider extending Orchard Road to Sand Beach Road or connecting Orchard Road to Shetland Drive	Extending to Sand Beach Road: \$3.5M - \$4M Connecting to Shetland Drive: \$2.5M - \$3M	Long
Hayshed Road	South Hanover	Connectivity	Extend Hayshed Road from SR 0039 to Red Top Road to provide better connectivity to surrounding residential areas	\$3M - \$4M	Long

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 7)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
SR 0743 and Colt Drive	East Hanover	Safety/Capacity	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0743 and Dairy Lane	East Hanover	Safety/Capacity	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0743 and Earlys Mill Road	East Hanover	Safety/Capacity	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0743 and East Canal Road	East Hanover	Safety/Capacity	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
Sand Beach Road (Meadow Lane to Derry Twp line)	East / South Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$3,500 *	Short
Sand Beach Road	East /South Hanover	Bicycle	Install shoulder improvements where sight distance is limited to allow for a 5' minimum travel area for bicyclists; Provide connectivity to existing shared use paths installed for residential connectivity Provide necessary signage	Varies based on specific improvement locations	Long
E Canal Road	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$3,500 *	Mid
Pine Road	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$2,500 *	Mid
Devonshire Heights Road	East / South Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$2,000 *	Long
Earlys Mill Road	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$5,200 *	Long
Trail Road	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$3,000 *	Mid
S Meadow Lane / Pheasant Road (Sand Beach Rd to Earlys Mill Rd)	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$141,267 *	Long
Pheasant Road / S Meadow Lane (Sand Beach Road to Bow Creek)	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$2,000 *	Mid/Long
Jonestown Road (between N Hill Drive and Bow Creek Road)	East Hanover	Pedestrian	Install off-road pedestrian walkway/path *	\$438,950 *	Long
Jonestwon Road (Crawford Rd to Bow Creek Trail)	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$379,120 *	Long
Manad Golf Course Trail	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$126,668 *	Long
I-81 Trail	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$1,121,250 *	Long
Bow Creek Trail	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$2,933,000 *	Long
Community Park Loop Trail	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$756,370 *	Long
Community Park / Sand Beach Trail	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$414,860 *	Long
Union Canal Trail	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$81,830 *	Long
West Hanover Connector Trail	East / West Hanover	Bicycle/Pedestrian	Install shared use path *	\$64,944 *	Long
SR 0743	East Hanover	Safety	Evaluate establishment of a Highway Safety Corridor, if warranted	\$10k - \$20k	Short
SR 0743	East Hanover	Safety	Evaluate traffic signing and calming enhancements - warning signs, conspicuity plaques, etc.	\$20-\$25k	Short
SR 0743 and Earlys Mill Road	East Hanover	Safety	Install overhead flashing yellow lights on SR 0743 approaches	\$75k - \$100k	Mid
Sand Beach Road	East Hanover	Safety	Evaluate traffic signing and calming enhancements - warning signs, conspicuity plaques, etc.	\$20-\$25k	Short
Sand Beach Road	East / South Hanover	Safety	Install traffic calming measures and consider re-grading and including shoulder improvements to improve sight distance around curves	Varies based on specific improvement locations	Mid/Long
Sand Beach Road & E Canal Road	South Hanover	Safety	Improve sight distance at stop sign, looking north (right); Clearing vegetation	\$45k - \$60k	Short
Sand Beach Road (between Crooked Hill Rd and Earlys Mill Rd)	East Hanover	Safety	Provide high-friction pavement and improved signing / striping for horizontal curves	\$60k - \$80k	Mid

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 7)

Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
Sand Beach Road - Near Winfindale	East Hanover	Safety	Provide high-friction pavement and improved signing / striping for horizontal curves	\$40k - \$50k	Mid
Sand Beach Road & Meadow Lane	East Hanover	Safety	Improve sight distance with grading and clearing vegetation to the north and roadway realignment or removal of structure	To Be Determined	Long
SR 0743 & E Canal Road	East Hanover	Safety	Improve sight distance by grading	\$10k - \$20k	Short
SR 0743 (between Shady Ln and Pine Rd)	East Hanover	Safety	Provide high-friction pavement and improved signing / striping for horizontal curves	\$40k - \$50k	Mid
SR 0743 & Earlys Mill	East Hanover	Safety	Improve sight distance by grading and clearing vegetation	\$600k - \$800k	Mid
SR 0743 & Dairy Lane	East Hanover	Safety	Improve sight distance by grading	\$10k - \$20k	Mid
SR 0743 & S Meadow Lane	East Hanover	Safety	Improve sight distance looking north; sight line obstruction by residential house and fence. Relocate roadway or remove structure	\$350k - \$450k	Long
SR 0743 & Colt Drive	East Hanover	Safety	Improve roadway geometry by re-profiling Sight distance may be improved with reprofiling; if necessary grade and clear vegetation	\$250k - \$400k	Long
Bow Creek Road (SR 0743) & Allentown Boulevard	East Hanover	Safety/Access Management	Relocate Sheetz access points further from signal, if feasible; improve intersection radii to accommodate turning trucks	\$75k - \$100k	Mid

Table ES-3: Potential Transportation Improvements for Mitigation (Character Area 8)

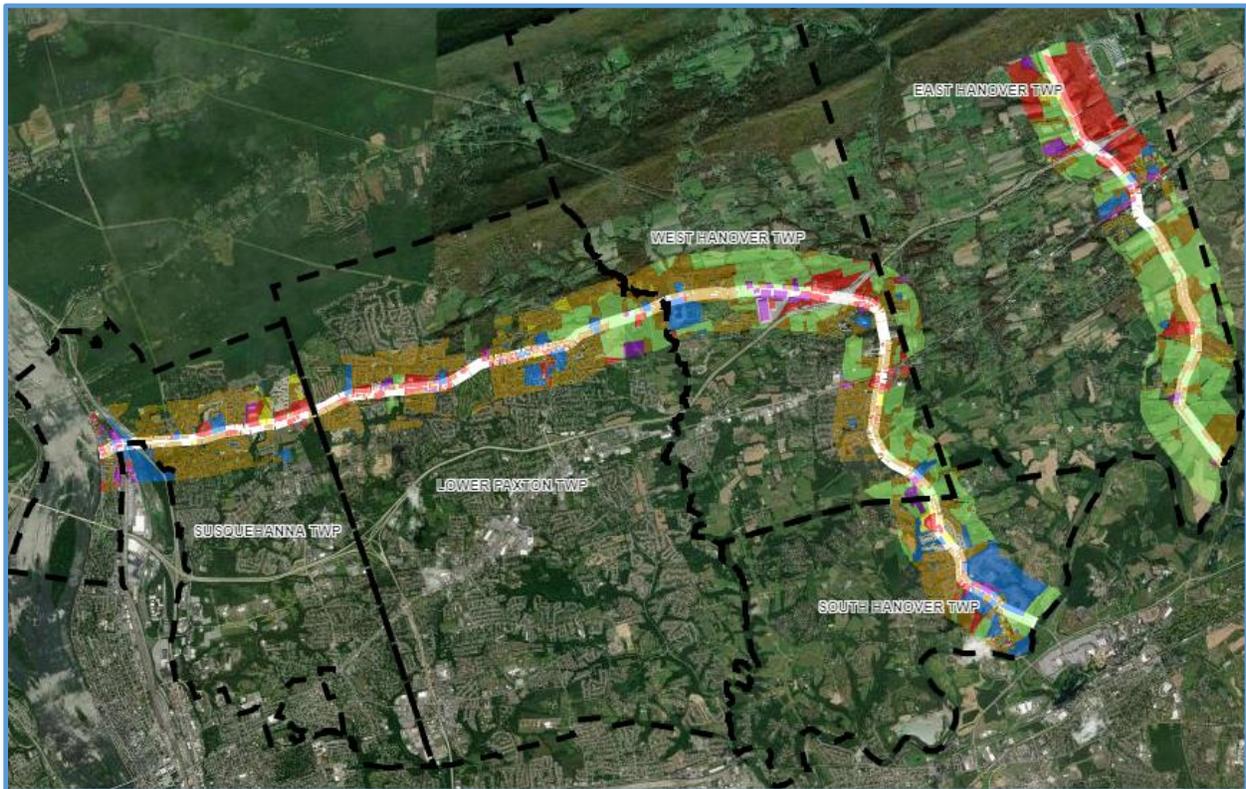
Location	Municipality	Improvement Type	Description	Cost Estimate	Prioritization
Bow Creek Road and Fox Run Road	East Hanover	Safety/Capacity	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0022 and Sandbeach Road	East Hanover	Safety/Capacity	Install Roundabout	\$2.5M - \$3M	Long
SR 0743/Bow Creek Rd (Jonestown Road to I-81)	East Hanover	Safety	Add a center left turn lane along Bow Creek Road	\$2M - \$3M; likely developer costs	Mid
SR 0743 and Route 22	East Hanover	Safety	Consider northbound/southbound left turn phasing	\$10k - \$15k	Short
SR 0743 and Farmer's Market	East Hanover	Safety	Add a southbound left turn lane along SR 743	\$450k - \$600k	Mid
Bow Creek Road (Jonestown Road to Bow Creek residential development)	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$364,540 *	Mid
Bow Creek Road (Mountain Road to I-81)	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$758,550 *	Long
Fox Run Road	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$199,600 *	Long
Allentown Boulevard (Route 22)	East Hanover	Bicycle	Install designated buffered bicycle lanes *	\$205,277 *	Mid
Jonestown Road (Bow Creek Road to Lebanon County Line)	East Hanover	Pedestrian	Install sidewalk *	\$331,010 *	Mid
Jonestown Road (West Hanover Twp to Crawford Rd)	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$2,500 *	Short
Shells Church Road/Sand Beach Road (Allentown Blvd to Dry Run Rd)	East Hanover	Pedestrian	Install sidewalk *	\$157,510 *	Mid
Dry Run Road / Station Road	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$2,500 *	Long
Manada Gap Road	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$2,000 *	Short
Cliff Road / Rabbit Lane	East Hanover	Pedestrian	Install off-road pedestrian walkway/path *	\$176,030 *	Mid
Manada Bottom Road	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$4,500 *	Mid
Firehouse Road (I-81 to Jonestown Road)	East Hanover	Bicycle/Pedestrian	Install on-road bicycle facilities including signage and pavement markings, and off-road pedestrian walkway/path *	\$500 *	Mid
Firehouse Road (Mountain Rd to I-81)	East Hanover	Bicycle/Pedestrian	Install shared use path *	\$430,650 *	Long
Mountain Road (Route 443)	East Hanover	Bicycle	Install on-road bicycle facilities including signage and pavement markings *	\$5,500 *	Short
Mountain Road (Route 443) - Bow Creek Road to Firehouse Road	East Hanover	Pedestrian	Install off-road pedestrian walkway/path *	\$348,150 *	Mid

* Per East Hanover Township Trail & Greenway Master Plan

Chapter 1: Community Vision

Study Objectives

The purpose of the Routes 39 & 743 corridor study is to address land use and transportation concerns presented to the Herbert, Rowland & Grubic, Inc. Project Team by the key stakeholder Steering Committee, Tri-County Regional Planning Commission, the public, and representatives of municipalities within the study area. The corridor study is driven by the need to accommodate the growth of the surrounding communities while maintaining safe and efficient mobility for all modes of transportation. The transportation and land use recommendations have been developed to accommodate the growth with consideration to the values and concerns provided by public and regional stakeholders. It is paramount that the local, county and state governmental organizations adopt policies to properly plan for the future infrastructure needs and growth.



The public concerns primarily consisted of capacity and safety concerns, expressing a chief need for additional through lanes along the western portion of the Route 39 to accommodate traffic volumes and alleviate congestion. Route 743 and portions of Route 39 experience significant delay at unsignalized intersections, occasionally compounded by Hershey event traffic. Safety concerns were also noted; most scenarios involved poor or limited sight distance, problematic vertical and horizontal curves, poor access management, and lack of facilities to accommodate bicyclists and pedestrians. Additionally, areas of substantial congestion along the primary routes tend to divert traffic to the secondary routes. Secondary routes within the study area primarily

consist of local roads that feed to Route 39 or 743 or residential neighborhood roads. Typically, secondary routes within the study area are not intended for higher traffic volumes and travel speeds. The public has identified excessive speeding on secondary collector roadways and in residential areas. With all public input surveyed, there are significant safety, capacity, and connectivity issues throughout the corridor that need addressed while concurrently adopting future land use and transportation connectivity and potential mitigation.

Three primary study objectives were identified at the onset of the study:

- **Objective 1:** Identify capacity and/or safety needs and potential mitigating measures along the Route 39 and 743 corridors.
- **Objective 2:** Evaluate surrounding land uses and zoning and prepare recommendations to ensure future development does not compromise the integrity of the transportation network.
- **Objective 3:** Evaluate the surrounding secondary roadway network to determine opportunities for improvement to provide a cohesive roadway network, safely and efficiently supporting land uses within the corridor. Identify if an improved secondary roadway system would alleviate congestion and other concerns along the Route 39 and Route 743 corridors.

The Project Team's approach to the study includes thorough data collection, analyses and review of information, and developing a list of potential mitigation for the forecasted years with estimated costs associated. Additionally, implementation steps are identified, including action items and prioritization of all potential mitigation within the corridor.

Study Purpose and Limitations

- This study was prepared with the fundamental goal of identifying anticipated future development and quantifying potential roadway safety and capacity improvements that may be warranted to address existing and anticipated future deficiencies. This 20-year plan focuses on the geometric intersection configurations while noting that actual future traffic patterns may deviate from the projections. Anticipated future development is projected consistent with historic development trends and municipal zoning and land use. Future traffic projections were developed using conventional trip generation and traffic projections for the anticipated land uses. If alternate measures are not implemented these roadway improvements are anticipated in order to maintain acceptable traffic flow. Factors outside the scope of this study will likely impact traffic patterns and the major mitigating measures identified may not be necessary. However, this study identifies the roadway improvements that may be necessary to provide acceptable traffic flow, in lieu of other mitigating measures.
- Mitigating traffic congestion involves many strategies consisting of "Supply Side" strategies and "Demand Side" strategies. "Supply Side" strategies include capacity adding infrastructure improvements to roads and bridges. "Demand Side" strategies provide

travelers with enhanced travel choices from Travel mode (i.e. drive/ walk/ bike/transit/carpool) to travel routes to departure times.

- The scope of the study was focused on identifying potential “Supply Side” infrastructure strategies, specifically “potential roadway infrastructure mitigations” as a planning tool to alleviate future traffic congestion associated with future potential development growth in the study area.
- It is recognized that some of these “potential roadway infrastructure mitigations” generate concerns over right-of-way and potential environmental impacts. Each municipality should manage growth and evaluate alternative methods of accommodating the travel demand (i.e., manage development and/or applying “demand side” strategies). Due to large costs and the competition for limited Federal or State funding, project delivery can be many years and even decades away. As such, these infrastructure Supply Side strategies are just one tool in planning for mitigating traffic congestion and should be considered in conjunction with “Demand Side” strategies. The following excerpt from *Mitigating Traffic Congestion: The Role of Demand-Side Strategies*, provides further background on Supply Side and Demand Side strategies. Though this study was published in 2004, it is still relied upon by Transportation professionals and the core concepts remain valid.

“Recognizing the growing burden of traffic congestion and the importance of efficient access and mobility, community leaders and transportation planners are actively working on transportation improvements to alleviate traffic congestion. Much needed roadway, bridge, and transit infrastructure projects – considered transportation “supply” or “capacity” enhancements – are underway across the country to mitigate travel delays and accommodate future growth needs.

As urban areas mature, however, opportunities for further investments in transportation infrastructure are often limited. Urban transportation corridors increasingly lack the physical space to accommodate more lanes. In some areas, communities voice concerns that impacts to private rights-of-way or sensitive environments outweigh the potential benefits of expanding facilities. Many areas simply lack the funds needed to pay for major roadway or transit projects. Competition for limited federal and state funds is intense, and even where needed infrastructure projects are in the planning or construction stages, project completion can still be years away.

Effectively tackling traffic congestion increasingly means employing all available strategies. New infrastructure projects – from roads to bridges to transit facilities – remain a core element of comprehensive transportation improvement programs.

Supplementing these “supply-side” investments are a broad array of “demand-side” strategies intended to make existing transportation facilities work better. Demand-side strategies are designed to better balance people’s need to travel a particular route at a particular time with the capacity of available facilities to efficiently handle this demand. Many people have attended a sporting event or a concert where everyone tries to leave the same place at the same time. While in

the extreme, this is a perfect example of where travel demand exceeds available supply – and severe traffic congestion often results. The focus of demand-side strategies is to provide people with enhanced travel choices – from choices in travel mode (such as driving, using transit or bicycling), to choices in travel route and trip departure-time – and to provide incentives and information for people to make informed travel choices. For example, many sports and concert venues provide incentives for people to arrive a little early or stay a little late, essentially spreading the “peak” of the demand to travel to/from the building, reducing traffic congestion, and improving the visitor’s overall experience.

This contemporary understanding of demand-side strategies is broader in scope than prior, more traditional views of transportation demand management – or TDM. To some, the realm of demand management applications is limited primarily to encouraging alternatives to single-occupant vehicle travel for the commute to work. In practice, however, this narrow view is no longer consistent with the broad applications of demand-side strategies currently underway across the country. Today’s applications are not only limited to facilitating shifts in travel mode – they also address shifts in travel routes and travel departure-times (for all travelers, including single- occupant vehicle drivers). Today’s applications also extend beyond a focus on commute trips. At national parks, sports stadiums, university campuses, and other diverse destinations, transportation and facility managers are implementing demand-side strategies as part of coordinated efforts to reduce congestion. On bridges, and along corridors undergoing roadway reconstruction programs, demand-side strategies are helping travelers avoid congestion by utilizing alternative travel routes, travel times and/or travel modes – or by reducing the need for some trips altogether by facilitating work from home options a few days a month.”¹

(1) Mitigating Traffic Congestion: The Role of Demand-Side Strategies, The Assoc. of Commuter Transportation in partnership with the U.S Department of Transportation Federal Highway Administration, October 2004
https://ops.fhwa.dot.gov/publications/mitig_traf_cong/mitig_traf_cong.pdf

- The Route 39/743 Transportation and Land Use Study focused exclusively on “Supply Side” strategies to establish a baseline on needs to collaborate with project partners and planners. It is recognized that that other supplemental efforts and planning tools and “Demand Side” strategies should be considered in conjunction with the potential “Supply Side” infrastructure strategies identified in the study. These “Demand Side” strategies include but are not limited to the following:
 - Mode Strategies
 - Guaranteed Ride Home
 - Shared Vehicles
 - Bicycle/Pedestrian Facilities
 - Improved Transit
 - Ride-Share Programs
 - Departure Time Strategies
 - Coordinated Event or shift scheduling
 - Work Site Flex Time
 - Trip Reduction Strategies
 - Employer Telework Programs
 - Compressed Work Week Programs
 - Route Strategies
 - Real Time Route Information
 - Navigation App Collaboration
 - Web-Based Route Planning
 - Location/Design Strategies
 - Live near your work
 - Off-site parking/shuttle service

- While the Route 39/743 Transportation and Land Use Study is solely focused on “Supply Side” strategies, this study is one of several planning tools available for the local municipalities and planning agencies to utilize in the future transportation project development process. In order for potential mitigation strategies identified in this report to be implemented, several additional planning and programming steps are necessary, especially for the larger, more impactful measures. Planning partners including PennDOT and Tri-County Regional Planning Commission also identify potential transportation problems and evaluate alternative and mitigating measures. While the potential mitigating measure identified within this report would be considered, the exact improvements identified are unlikely to be realized verbatim. During any project development process, the project planners will identify additional potential alternatives and determine appropriate improvements with respect to the transportation needs, environmental responsibility, property impacts, funding limitations, et cetera.
- This study focuses on “supply side” strategies and geometric improvements to mitigate potential future congestion and is one of several planning tools available for the local municipalities and planning agencies. It is intended that the potential mitigating strategies identified herein will be used for consideration in order to preserve future rights-of-way, identifying locations for new or relocated utilities, and for long-range budgeting and funding procurement.
- As this study is one of several planning tools, it is acknowledged that it is not all-encompassing and has limitations given the scope of the study and future uncertainty. The study does not evaluate “demand-side strategies”, future local or regional transit enhancements, long-term traffic effects of COVID19 or automated vehicles, the traffic impact of navigational apps, or community / environmental impacts.
- This Study is one component of the “Transportation Issues Potential Sources” identified in PennDOT’s Program Development and Project Delivery Process – one component of the initial stage of a project (See Figure 1.1 from PennDOT Design Manual 1). Multiple other planning initiatives are considered when identifying a specific project to advance; several examples at the Local, County, MPO/RPO, State and National Levels are identified in the below table (Figure 2.1 from PennDOT Design Manual 1A). Refer to PennDOT Publication 10 for further details on the transportation project development process.

<http://www.dot.state.pa.us/public/PubsForms/Publications/PUB%2010/Pub%2010%20Title%20Page.pdf>



Table 2.1 Examples of Planning and Planning Products at the Local, County, MPO/RPO, State, and National Levels		
	Long-Range/Sub-Area/Program Planning	Project Planning
Local (Township, Borough, Municipal)	<ul style="list-style-type: none"> • Comprehensive Plan <ul style="list-style-type: none"> ○ Zoning Ordinance ○ Subdivision and Land Development Ordinance ○ Official Map • Stormwater Management Ordinance/Act 167 Plan • Act 537 Plan • Neighborhood Strategic Plan • Recreation and Greenways Related Plans • Transit Improvement District • Bicycle and Pedestrian Plan • Emergency Operations Plan • Redevelopment/"Brownfields" Plan • Historical District/Cultural Resources Plan 	<ul style="list-style-type: none"> • Collaborative Planning Process • PennDOT Scoping Field View • Site Development Plan • Traffic Impact Studies • Highway Occupancy Permit
County	<ul style="list-style-type: none"> • County Comprehensive Plan • Act 167 Plan (SWM) • Transit Improvement District • Greenways/Open Space/Preservation Related Plans • Bicycle and Pedestrian Plan • Emergency Management Plan • Historical/Cultural Resources Plan • Housing Affordability/Availability Plan 	<ul style="list-style-type: none"> • Collaborative Planning Process • PennDOT Scoping Field View • Site Development Plan • Traffic Impact Studies • Highway Occupancy Permit • Project Status Meetings
MPO/RPO	<ul style="list-style-type: none"> • Regional Long Range Transportation Plan • Transportation Improvement Program • Bicycle and Pedestrian Plan • Congestion Related Plans • Regional Transit and Freight Planning Activities • Intelligent Transportation Systems Planning • Multimodal Connections Study • Road Safety Audit • Corridor Planning Study • Travel Demand Models • Regional Air Quality Conformity • Performance-Based Planning and Programming • Asset Management Plan • Public Involvement 	<ul style="list-style-type: none"> • Collaborative Planning Process • Project screening • PennDOT Scoping Field View • Site Development Plan • Project Status Meetings • Travel Demand Models • Project Air Quality Conformity • Public Involvement • Ride Sharing
State	<ul style="list-style-type: none"> • Statewide Long Range Transportation Plan • Comprehensive Freight Movement Plan • State Transportation Improvement Program • Twelve Year Program • Bicycle & Pedestrian Plan • Performance-Based Planning and Programming • Asset Management Plan 	<ul style="list-style-type: none"> • Collaborative Planning Process • PennDOT Scoping Field View • Highway Occupancy Permit • Project Status Meetings • Project Air Quality Conformity • Public Involvement

Table 2.1 Examples of Planning and Planning Products at the Local, County, MPO/RPO, State, and National Levels		
State (continued)	<ul style="list-style-type: none"> • Public Involvement • Inter-city Passenger and Freight Rail Plan • Public Participation Plan for Statewide Planning • ADA Transition Plan • Statewide Airport System Plan • Statewide Highway Safety Plan • Environmental Justice Plan • State Enforcement Plan • Land and Water Trail Network Strategic Plan 	
National	<ul style="list-style-type: none"> • Planning and Environmental Linkages (PEL) • Federal Funding Authorization • National Performance Measures 	<ul style="list-style-type: none"> • Planning and Environmental Linkages (PEL)

Figure 2.1, PennDOT Design Manual 1A

Public Involvement

Due to the nature of this study and the large study area, public feedback is critical to the study. As part of the analyses and review of existing conditions, the Project Team solicited feedback to determine the accuracy of the considerations of study that had driven the study from the beginning. Findings for the study area indicated that there were various considerations for this study, particularly noted by the public and municipal / county officials.

Public outreach included a multi-pronged approach, including interviews with municipal officials and stakeholders, a series of stakeholder meetings, public meetings, key focus group discussions, and questionnaires. Additional input was obtained via the Project StoryMap website and project information on municipal websites. Public outreach was completed in order to obtain public input and concerns within the study area corridor. The information obtained from the public was assessed and considered in the development of the potential mitigation presented within this study.

The stakeholder committee was comprised of representatives from each municipality in the study area, Dauphin County, Tri-County Regional Planning Commission, PennDOT, and various property owners, developers and legislators. The Committee included the following representatives:

- Dave Kratzer, Susquehanna Township
- George Wolfe, Lower Paxton Township
- Janet Hardman, West Hanover Township
- Debra Force, South Hanover Township
- Paul Cornell, East Hanover Township
- Leona Barr, PennDOT
- Michelle Tarquino, PennDOT
- Eric Epstein, SWAN / CD School District
- Mark DiSanto, Triple Crown Corporation
- Alex Hvizda, Hollywood Casino
- Trisha MaGilton, Union Deposit Corporation
- Catherine Prince, Vartan
- Sue Helm, PA House of Representatives
- Ron Marsico, PA House of Representatives
- John DiSanto, PA Senate
- Jeff Haste, Dauphin County
- Jerry Duke, Tri-County Regional Planning
- Andrew Bomberger, Tri-County Regional Planning
- Diane Myers-Krug, Tri-County Regional Planning

In addition to the ongoing interviews and discussions, the following key meetings were held to obtain public input and concerns within the study area corridor:

- Lower Paxton Township Town Hall Meeting – June 12, 2017
- Stray Winds Area Neighbors Meeting #1 – October 24, 2017
- Steering Committee Meeting #1 – December 11, 2017
- Dauphin County Commissioners Meeting #1 – May 9, 2018
- Focus Group Meeting – May 14, 2018
- Steering Committee Meeting #2 – May 30, 2018
- Public Meeting #1 – June 05, 2018
- HATS Bicycle & Pedestrian Meeting – June 26, 2018
- Hollywood Casino / Penn National Meeting – October 23, 2018
- Steering Committee Meeting #3 – October 30, 2018
- Public Meeting #2 – December 3, 2018
- Dauphin County Staff Meeting – January 29, 2019
- Stray Winds Area Neighbors Meeting #2 – March 4, 2019
- Dauphin County Commissioners Meeting #2 – July 24, 2019
- Tri-County Regional Planning Commissioners Meeting – July 25, 2019
- Route 39 Public Officials Meeting – September 18, 2019
- Capital Region Economic Development Corporation – November 11, 2019
- East Hanover Township Board Meeting – December 17, 2019
- Dauphin County Commissioners Meeting #3 – April 15, 2020
- Dauphin County and Tri-County Staff Meeting – February 22, 2021
- Dauphin County Commissioners Meeting #4 – October 13, 2021

On October 8, 2021, a draft of the final report was distributed to Tri-County Planning Commission, Dauphin County, and the five municipalities (Susquehanna, Lower Paxton, West Hanover, South Hanover and East Hanover Townships) for staff and elected official review. Comments received were then incorporated into the final draft report, which was submitted for public comment from January 12, 2022 through February 28, 2022. Public comments are included in Appendix Q.

Other Studies and Projects

Various plans, studies, and projects have been proposed, constructed and incorporated into some record documentation. It was a responsibility to obtain and organize public input, municipality documentation, developer information, and stakeholder dialog established during the review and process of existing land use information. Coordination of meetings, retaining information and the process of gathering existing land use-related information is essential to the success and outcome of this study therefore, the county, municipalities, stakeholders, and the public input is carefully considered throughout the study. Additional resources and information were obtained from the following documentation:

- ▶ Township and County Comprehensive Plans
 - Dauphin County Comprehensive Plan
 - Susquehanna Township (Update underway)
 - Lower Paxton Township (Under review)
 - West Hanover Township
 - South Hanover Township
 - East Hanover Township
- ▶ Township Zoning and Subdivision and Land Development Ordinances
 - Susquehanna Township
 - Lower Paxton Township
 - West Hanover Township
 - South Hanover Township
 - East Hanover Township
- ▶ Pedestrian & Bicycle Documentation
 - East Hanover Township Trail Plan
 - West Hanover Township Trail Plan
 - Dauphin County Bicycle Map

Community Vision

The development adjacent to the Routes 39 and 743 corridors over the past decades has resulted in residential neighborhoods primarily segregated from the places where people work, socialize, and spend leisure time. The development patterns have made it difficult to traverse by means other than driving, especially considering the general lack of pedestrian and bicycle accommodations. Due to the consistent growth and increased traffic volumes, local residents tend to prioritize driving over other means of getting around as there have been few options, which impacts quality of community life through time and financial costs.

Continued growth along the Route 39 and 743 corridors will benefit individuals, businesses, and local governments. Likewise, continued investment and innovation in transportation systems are critical to address automobile congestion and provide mobility options. Future development in the corridor communities is anticipated to bring approximately 5,000 residents, and associated jobs in offices, industry and retail by year 2030. This increase in activity will bring a corresponding increase in travel and mobility needs.

While proposed transportation improvements to the Route 39 and 743 corridors will provide additional roadway capacity, complementary land use planning is needed to ensure that current and future traffic and mobility challenges are appropriately managed in the short-, mid-, and long-term future. Managing the future improvements by land use planning requires focus on development patterns that help reduce the need to travel long distances. Additionally, emphasis on cohesive corridors must be made with investments in all modes of transportation, including public transit and non-motorized mobility, such as bicyclists and pedestrians that can help relieve the pressure on the primary roadway network.

Through the community outreach and visioning process, the following factors were considered with utmost importance:

- Reduce congestion and delay
- Improve safety and efficiency
- Provide for multimodal activity, especially bicycles and pedestrians
- Improve access management by limiting unsignalized access points
- Improve secondary roadway system
- Improve interconnectivity
- Preserve the functionality and character of the Linglestown Village
- Effectively accommodate traffic between I-81 and Hershey
- Ongoing business activity
- Establish a consistent community theme
- Sustainable transportation recommendations to support growth
- Strategic implementation plan
- Ongoing collaboration between regional stakeholders

Route 39 and 743 Corridor study identifies land use and zoning recommendations, as well as roadway and multi-modal mobility improvements that can help mitigate congestion and various safety concerns. When coordinated with complementary land use and development decisions, transportation investments can improve the primary and secondary roadway networks and enhance mobility choices, and in turn, will promote increased economic prosperity and enhanced community life along Route 39 and 743 corridors.

Due to evolving transportation issues and trends and their unknown effect on long range regional transportation planning, several items should be further considered prior to implementing the potential mitigation. These include:

- “Demand-side” strategies
- Long-term effects of COVID-19
- Mobile navigation applications
- Autonomous vehicles
- I-81 to PA Turnpike connection (East of Hershey)
- Environmental impacts
- Private property impacts
- Transit enhancements
- Significant variations from future land use assumptions

Chapter 2: Existing Land Use Assessment

Introduction

The land use assessment of the study focuses on property parcels and rights-of-way that are serviced by Route 39 and Route 743, as well as the secondary roadway collector system within the corridor study areas. Since the study area encompasses such a large area, a variety of different development patterns and characteristics exist across the municipalities that account for the study area. As a result of the diversity in the communities, land use goals cannot be uniformly assigned across the entire corridor. Instead, the corridor is calibrated into smaller land use character areas with similar physical appearances. The use of the Character Areas allows for coordinated planning and balanced land use on a smaller scale rather than the entirety of the study corridor. The study area was broken down into Character Areas numbered 1 through 8. These Character Areas will encourage the municipalities to work together to achieve common goals and optimal outcomes for each character area. Refer to Map 1 for the overall corridor map with a breakdown by Character Area.

Data Collection

The Route 39 and 743 corridor study area encompasses a mixture of public and private property within the corridors, shown on Map 2. To best establish a knowledgeable basis of the existing land uses of the corridor, the Project Team gathered GIS database information from Dauphin County and reviewed Comprehensive Plans and ordinances from the corridor municipalities. In conjunction with Approved Land Development traffic studies, the aforementioned retained planning information was compiled into an inventoried breakdown of land uses throughout the corridors. The maps of land usage for each municipality are shown in Appendix B.

To best convey the study area's composition, each Character Area is described with respect to the area's general boundaries, size, character, general land use, urban framework, and preliminary thoughts on the potential areas of the development or redevelopment focus. As a part of this study and the inventory of existing conditions, zoning data for each municipality was also collected and reviewed. A map of the corridor's existing zoning classifications can be seen in Appendix C. Each Character Area contains assets to be protected, constraints to overcome, opportunities for growth to be explored in order to make optimal use of the Route 39 and 743 corridors.

Character Area 1

Susquehanna Township (93% developed)

Character Area 1 starts in the western portion of the corridor, at the Susquehanna River, and is solely located in Susquehanna Township (with a small portion abutting the City of Harrisburg). Primarily in this western area of Character Area 1, commercial land uses dominate the corridor with various access points onto Front Street and properties facing the Susquehanna River.

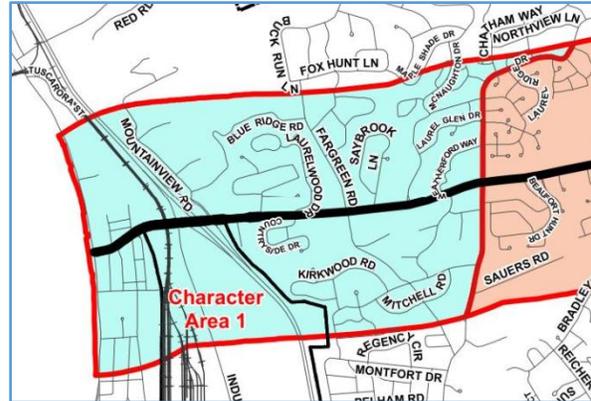


Figure 2-1

Extending east towards Route 322 Interchange, the corridor has a mix of residential buildings that have been converted to office spaces, municipal owned land, commercial storage and right-of-way associated with the railroad that cuts below Route 39. East of the Route 322 Interchange, Character Area 1 is primarily low density residential with pockets of office park and public/semi-public uses located at the intersection of Crooked Hill Road. Numerous driveway access points directly connecting into the north side of Route 39 complicate safety and traffic flow as compared to low density residential that fronts on a local road network flowing into a series of access roads connecting to Route 39. In some cases, providing connectivity between low density residential and a federal functional class PennDOT roadway via a local road network may improve flow of traffic.

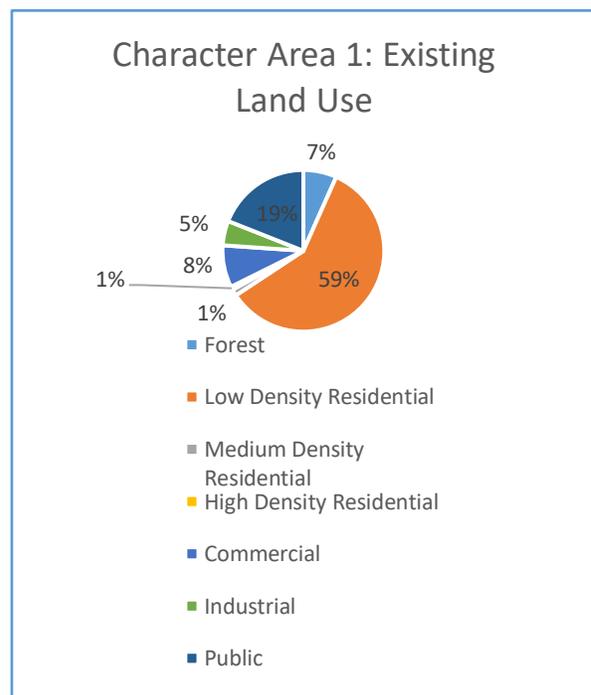


Figure 2-2

The low density residential pattern with subdivisions flowing into access roads, continues along the southern portion of the corridor. Prior to the Fargreen intersection, to the north, low and medium density residential begin to follow the same pattern, though along the direct frontage of Route 39, there are some office and religious institutions. To the east of Fargreen Road, up to Crooked Hill Road and the limit of Character Area 1, accessing the corridor from a collector road network is necessary as there are no direct driveway access points within the roadway segment. While this is an improvement, the lack of east/west roadway connections is noticeable which isolates development patterns and forces traffic on to the Route 39 corridor.

On the northern side of Route 39 from Deer Path Road to Crooked Hill Road, a multiple-story office park, municipal and elementary school campus is introduced with medium to low density residential behind office land use frontage. Sidewalks are introduced in the development patterns

behind the corridor but are not present along the corridor. An exhibit of Character Area 1 is shown in Appendix A, which shows the existing land use types, importance study intersections, and a breakdown of roadway segments. Additionally, refer to the Figure 2-2, for a distribution of land use types within Character Area 1.

Potential Opportunities

- ✓ Potential extensions of access roads along the northern portion of Route 39 to improve connectivity
- ✓ Provide connections to increase road redundancy and move traffic off of Route 39
- ✓ Lack of density makes introduction of other modes of transportation to offset traffic demand difficult
- ✓ Potential areas for park and ride lots with designated transit route should be considered

Character Area 2

Susquehanna and Lower Paxton Townships (92% developed)

Beginning east of the Crooked Hill Road intersection and continuing east, the northern portion of Character Area 2 is comprised of multi-story office buildings on the frontage of the corridor with curvilinear streets and cul-de-sacs further away from the corridor. Some parking lots are connected between office buildings but not all are connected. All the office buildings are full access onto Route 39 in this area. Sidewalks are introduced along the northern portion of Character Area 2, though gaps in the network make it difficult for pedestrians to utilize. Continuing east along the northern side of the corridor a Giant Shopping Center, a drive-through restaurant, gas station and bank fronts Route 39 and a commercial storage facility located behind the shopping center. The Giant Shopping Center is heavily landscaped to buffer from the adjacent residential land uses however, no direct road connections are provided to the residential subdivisions. Medium density residential developments extend between

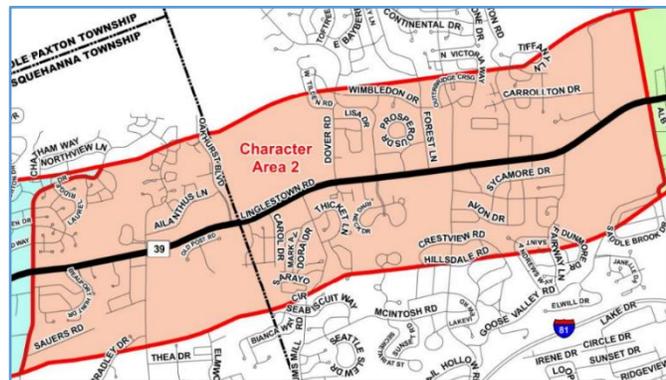


Figure 2-3

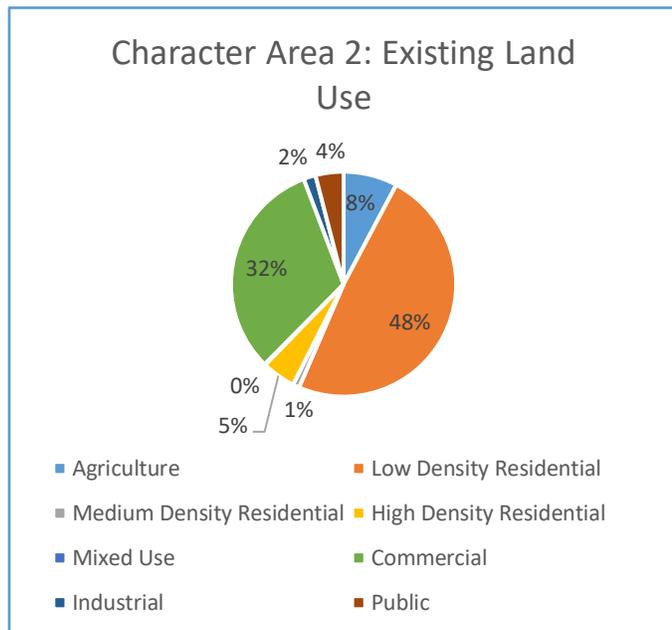


Figure 2-4

the Giant Shopping Center to Progress Avenue and the same scenario continues with car-centric commercial enterprises along the Character Area, up to the intersection with Oakhurst.

Continuing further east along the northern portion of the corridor lies the former Blue Ridge Golf Course that has recently been redeveloped as Blue Ridge Village. Blue Ridge Village is a mixed use development, with approximately 400 dwelling units ranging in densities that include assisted living units to single family residential homes, along with over 80,000 square feet of commercial retail sits fronting on Route 39. A new traffic signal at Crums Mill Road was installed as part of the construction of Blue Ridge Village. The remainder of the northern portion of Route 39, within this Character Area, contains a mixture of office uses, auto-dependent commercial along the corridor with low and medium density residential behind the corridor frontage. Forest Hills Commons is another planned development of 13 acres north of Route 39 that will add over 65,000 square feet of non-residential uses located adjacent to the corridor.

The southern portion of Route 39, starting at Crooked Hill Road and extending east is a mixture of auto-dependent commercial uses and office structures with suburban, low density residential subdivisions lying behind the commercial frontage up to Sturbridge Drive.

Susquehanna Union Green, currently under construction, is a traditional neighborhood development anticipated to provide approximately 270 residential units and nearly over 300,000 square feet of commercial retail. This development is anticipated to provide sidewalk connectivity within and connect to adjacent properties along with a public transit stop. Formalized signalized intersection at Sturbridge and Linglestown Road provides better access and pedestrian sidewalks into a commercial center. The Custer Development is another infill development approximately half the size of Forest Hills Commons that will provide an additional 30,000 square feet of non-residential land uses to the corridor.

The southern portion of the character area continues with a mix of low density residential that either accesses the corridor directly or through a series of internal subdivision road network along with highway commercial opportunities. This segment of the character area contains many opportunities for new growth along with regeneration parcels. Character Area 2 spans Susquehanna and Lower Paxton Townships, which will require municipal cooperation in order to strategically implement improvements. An exhibit showing Character Area 2 is provided in Appendix A. Refer to the Figure 2-4 for a comparison of land use types within Character Area 2.

Character Area 2 also contains three (3) significant residential developments that are planned or have been approved, located outside of the 1-mile buffer area that was analyzed as part of this study. The three developments include Autumn Oaks north of Linglestown Road along with Traditions of America and Stray Winds Farm south of the Character Area that introduces over 900 dwelling units that will influence Linglestown Road traffic patterns.

Potential Opportunities

- ✓ Provide connections to increase road redundancy and move traffic off of Linglestown Road
- ✓ Increased density within this section provides opportunities for other modes of transportation but better connections are needed.
- ✓ This area is prime for mixed-use redevelopment of several significant parcels and to blend land use and transportation infrastructure to reduce the reliance on cars.
- ✓ Gaps in the sidewalk network make it difficult for pedestrians to navigate.
- ✓ Opportunities for parking lot connections and access roads exist to reduce traffic along the Linglestown corridor.
- ✓ Vertical development is more common within this area and could lend to easier transition for mixing of uses and higher densities.

Character Area 3

Lower Paxton Township (88% developed)

The Village of Linglestown is characterized with pedestrian-level, low density, small lot residential and commercial land uses with minimal front yard setbacks. This Character Area 3 is solely located in Lower Paxton Township and is a departure from all other development styles within the study corridors. See Appendix A for the exhibit of Character Area 3.

The road network is more gridiron-style and restrictive within the village; more so than any other portions along the corridor. Traffic calming applications, are located at the eastern, western, and center of the village, along with on-street parking and pedestrian crosswalk applications that require slower automotive speeds. The gridiron roadway network contains noticeable gaps in its segments that need to be filled out to provide road redundancy.

The remainder of the Village not previously summarized consists of low density residential on small lots with some office and small-scale commercial intrusions. It is also noted that significant agricultural land lies north of Character Area 3 that, if developed, could complicate traffic along Route 39, specifically located at the roundabouts within the Village.

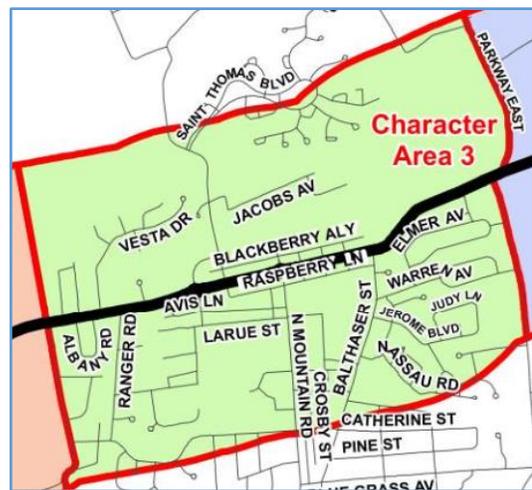


Figure 2-5

Character Area 3: Existing Land Use

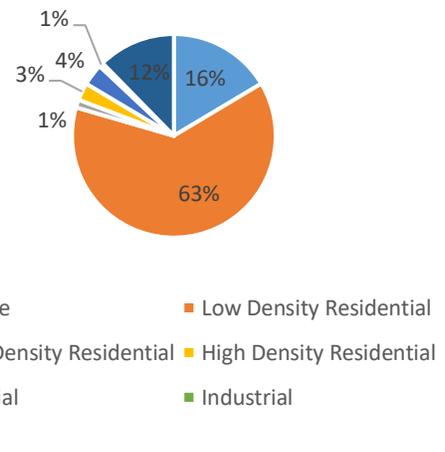


Figure 2-6

Refer to the Figure 2-6 for a comparison of land use types within Character Area 3.

Potential Opportunities

- ✓ Opportunities exists to complete the gridiron roadway pattern to provide road redundancy.
- ✓ Redevelopment and new development potential exists that could support the village concept with more density
- ✓ Sidewalk network is mature with few gaps in the pedestrian network.
- ✓ Large agricultural lands north of the Village of Linglestown if developed could influence the functionality of the roundabout within Linglestown.

Character Area 4

Lower Paxton and West Hanover Townships
(66% developed)

East of the Village of Linglestown is primarily characterized with low density larger lot residential and rural landscapes. Character Area 4 spans Lower Paxton Township into portions of more rural, West Hanover Township. It is noted, there is more agricultural use present than the previous character areas. There are notable breaks in the characteristic patterns of this Character Area, one instance being the public use at the Piketown Road intersection designated to the Lower Dauphin High School campus.

Another notable break, unique to this within the Character Area 4 pattern is the intersection of Royal Terrace, associated with the Winslett residential subdivision where improved intersections with pedestrian crosswalks and access roads into residential subdivisions exist. Winslett development anticipates an additional 66 dwelling units within the existing subdivision through planned phase buildout. Refer to the Figure 2-8 for Character Area 4 land use type description breakdown.



Figure 2-7

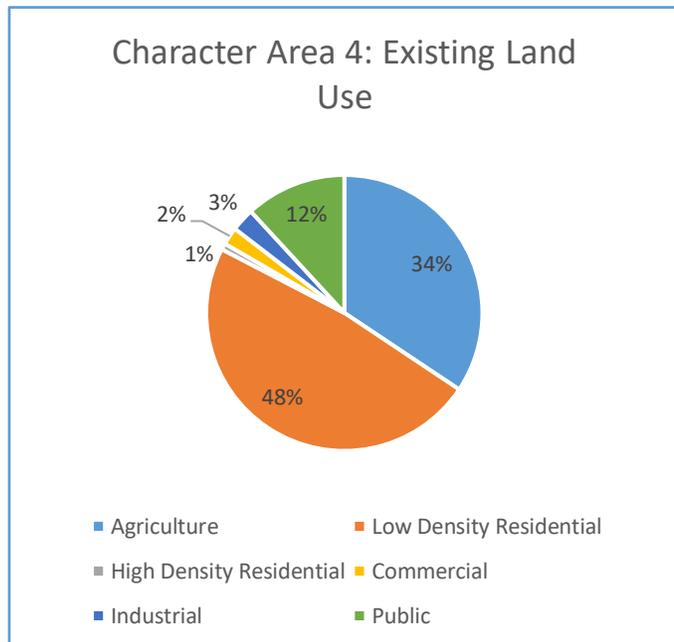


Figure 2-8

This character area’s open space provides a stark contrast to the Village of Linglestown. See Appendix A for the exhibit of Character Area 4. Environmental constraints within the area prove to be more challenging, in terms of landscape, than any other portion of the corridor. To the south of the Character Area 4 boundaries, Brookview residential development anticipates an additional 44 dwelling units to its existing development that would influence traffic patterns along this portion of the corridor.

Potential Opportunities

- ✓ Large amount of open space opportunities with some environmental constraints.

Character Area 5

West Hanover Township
(54% developed)

Large warehouse distribution centers and highway commercial uses are introduced as the corridor approaches Interstate 81 (corridor expands to include three lanes and eventually five lanes). Character Area 5 is solely located in West Hanover Township and is shown in an exhibit as part of Appendix A.

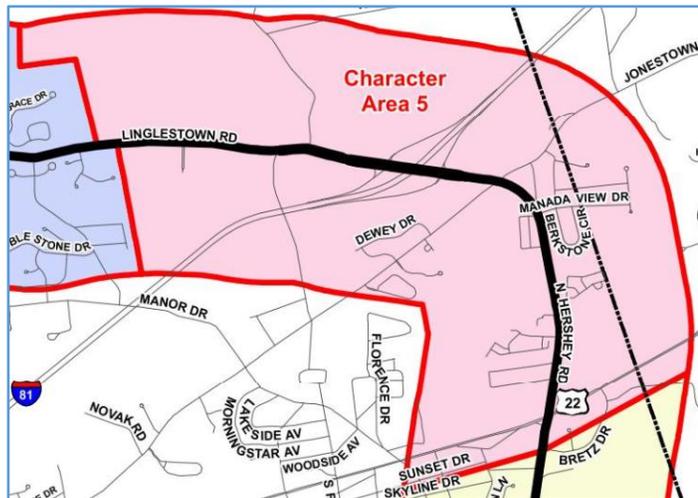


Figure 2-9

Significant sidewalk infrastructure was invested within this portion of the corridor but lack connectivity to residential or commercial communities. Large agricultural land remains present to the north in Character Area 5, which could lead to significant development impacts to the Route 39 corridor. Adjacent to the Interstate 81 Interchange typical highway commercial uses are present that lack connectivity with each other. Scattered residential development including high density with some curb cuts and access roads along with highway commercial uses are typical between Interstate 81 and SR 22.

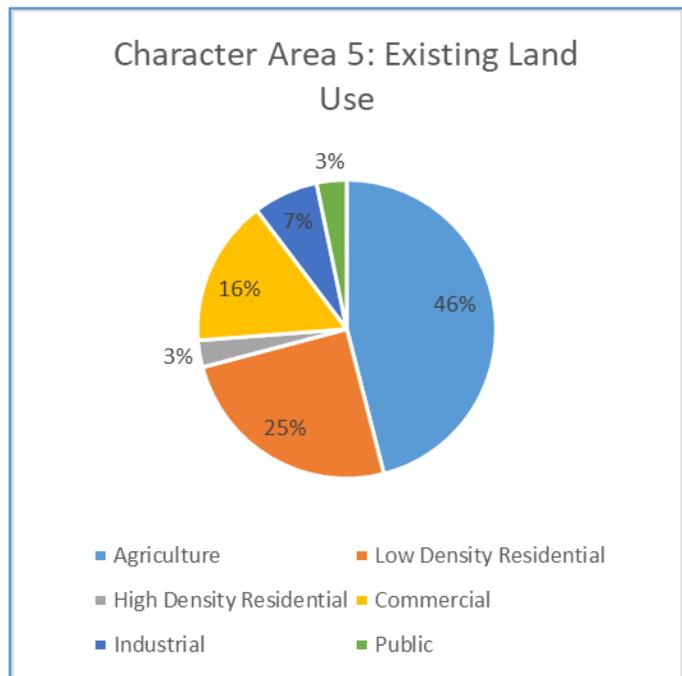


Figure 2-10

The Reserve at Manada Hills is located within this Character Area, which includes 200 dwelling units and 5,000 square feet of non-residential uses. The intersection of Route 22 contains significant development parcels vacant on three of the four corners, with an auto dealership present at the southeastern corner. Refer to the Figure 2-10 for Character Area 5 land use type description breakdown.

Potential Opportunities

- ✓ Significant future development parcels exist around the Intersection of Route 22 and Route 39 with improvements recently completed at this interchange.
- ✓ Industrial development should be planned with consideration to existing residential properties and environmental impacts.
- ✓ Areas between the intersection of Interstate 81 and Route 22 could benefit through improved access management.

Character Area 6

West Hanover and South Hanover Townships (65% developed)

The final Character Area along the Route 39 corridor includes land in both West Hanover and South Hanover Townships. South of the intersection of Route 39 and Route 22, the proposed Fowler development is planned, which consists of a proposed signalized intersection and pedestrian crosswalks, with nearly 50,000 square feet of commercial uses along the Route 39 frontage, and a mix of 260 medium and low density units.

Heading south along Route 39, at the intersection of Hayshed Road is a commercial shopping plaza, called Meadows Marketplace, along with other highway commercial uses. Residential development is present immediately behind these commercial use frontages.

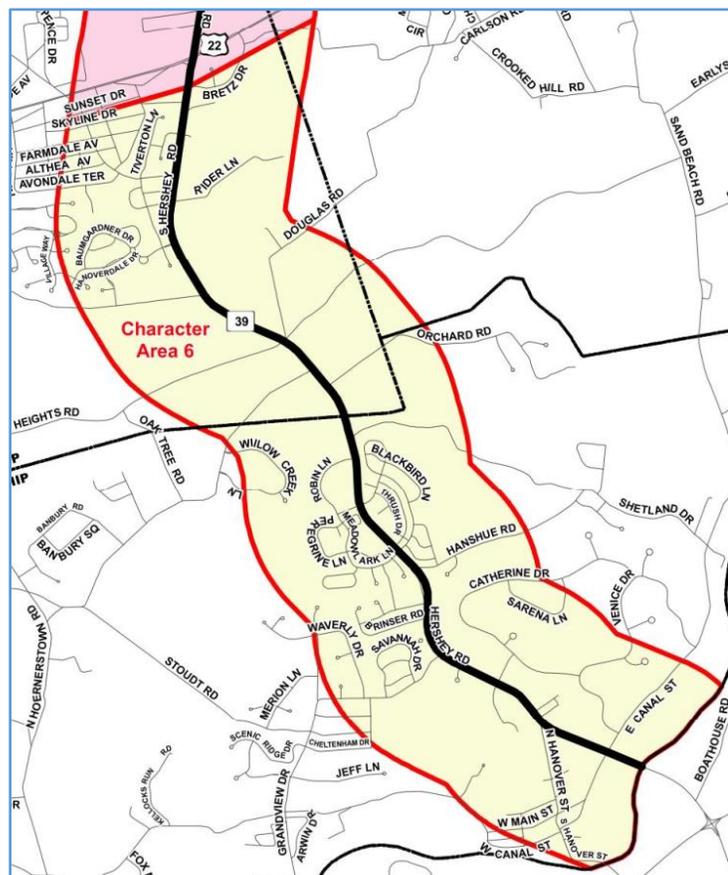


Figure 2-11

The intersection at Hanoverdale (Route 39 and Devonshire Heights) is difficult to maneuver and leads to stacking. The intersection has recently been reconfigured and improved; however, there are still sight distance deficiencies and long delays on the side street approach. The intersection

contains multiple residential uses close to the roadway. Extending south along Route 39 within Character Area 6, a new municipal campus is present to the west of Route 39, prior to the Village of Union Deposit. Refer to the Figure 2-12 for Character Area 6 land use type description breakdown. See Appendix A for the exhibit of Character Area 6.

The Crossings at Hershey is a planned 252 unit independent living and personal care community that is located west of the Character Area, between the Village of Union Deposit and Route 39. This portion of the Corridor lies directly adjacent to Derry Township and downtown Hershey, and still contains significant land for development both along and outside the 1-mile study character area that could heavily influence traffic patterns along Route 39 if developed.

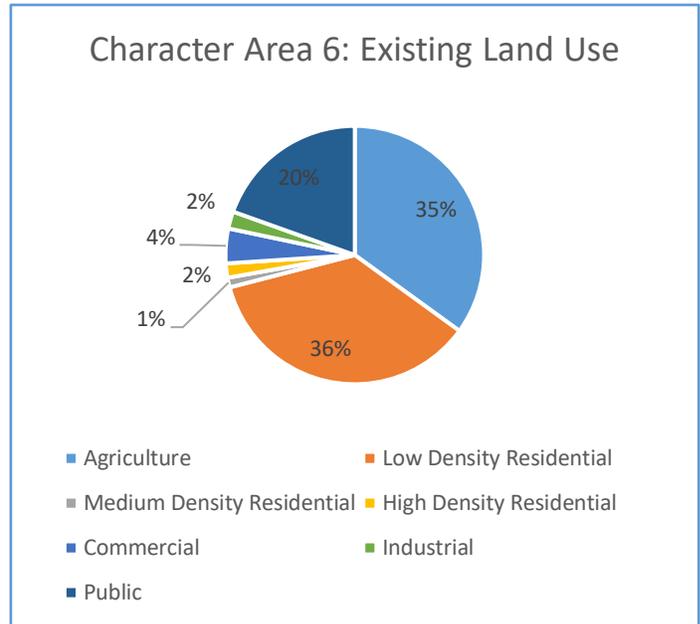


Figure 2-12

Potential Opportunities

- ✓ Large amount of open space opportunities with some environmental constraints.

Character Area 7

East Hanover Township (30% developed)

The southern portion of the Route 743 corridor is classified as Character Area 7. From the Derry Township line, heading north through East Hanover Township on Route 743, the landscape is primarily agricultural with sporadic driveway cuts located directly onto the corridor. These cuts are mostly associated with the low density residential land uses introduced north of Canal Road. Small scale commercial uses are introduced as the roadway continues north.

Varying property setbacks provide some consistency throughout the Character Area, with regard to less encroachment to the study corridor route. Additionally, due to the property setbacks along Route 743, safety concerns are more likely to arise due to embankments, or vegetation unlikely to be maintained. There is opportunity in this area for improvement to safety features while utilizing the vast amounts of open space in the area. As shown in Figure 2-14, Agricultural land use is significant throughout Character Area 7.

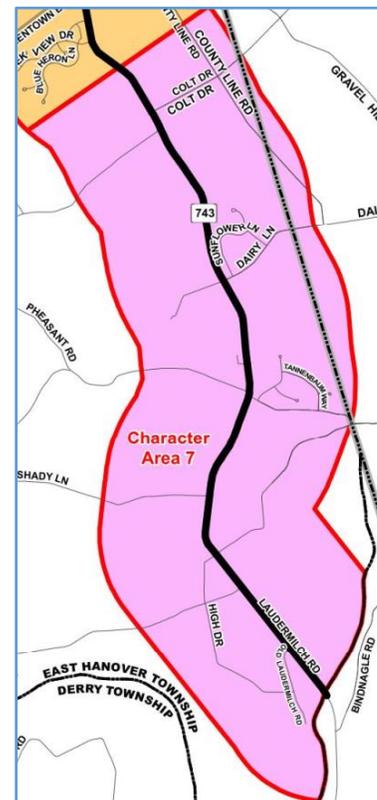


Figure 2-13

The potential for non-motorized mobility improvements is a viable option, as part of the potential improvements for this area, due to the previously developed Dauphin County Bicycle Map and East Hanover Master Trail Plan.

Potential Opportunities

- ✓ Large amount of open space opportunities exists within this area
- ✓ No public water or sewer infrastructure exists

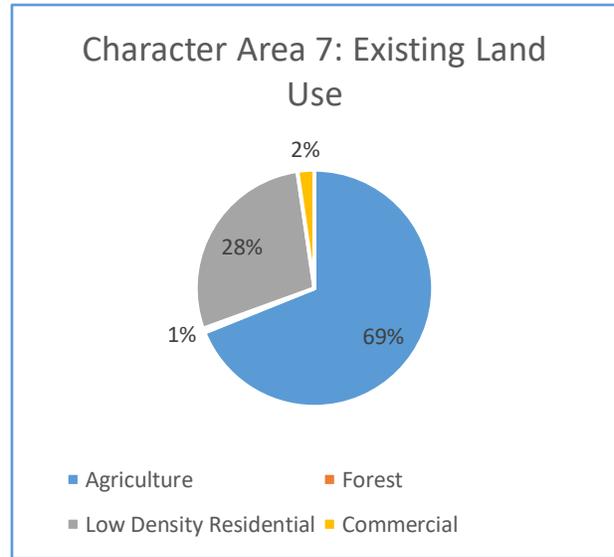


Figure 2-14

Character Area 8

East Hanover Township (73% developed)

The northern portion of the Route 743 corridor is the final analyzed study Character Area. Extending north along Route 743, modern subdivisions are introduced with access streets to protect the corridor, however, curvilinear streets complicate the road network. Highway commercial uses appear at the four-corner intersection with Route 22. Hotels and gas stations with convenience stores are located around the Interstate 81 Interchange however, a lot of vacant land remains undeveloped. The potential for development is greater along Route 743, due to the portions of agriculture to still remaining open. North of the interchange of Interstate 81 and Route 743 lies Hollywood Casino but quickly changes back to a rural agricultural landscape until Route 743 terminates at Route 443.

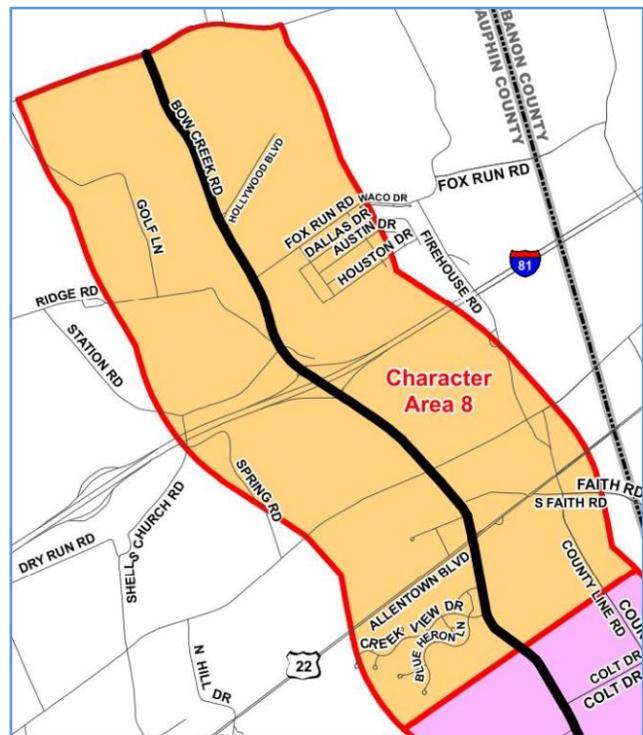


Figure 2-15

Similar to Character Area 7, the potential for non-motorized mobility improvements will be assessed as part of the potential improvements for this area, due to the review and incorporation of East Hanover Township's Master Trail Plans. Secondary roadways within this Character Area 8, fit the criteria for on-road markings, designated facilities, and what the Township specifies as off-road trail development and sidewalk implementation. Refer to Appendix A for the exhibit of Character Area 8 with respect to land uses, roadway segments, township boundary lines, corridor limits, and prioritized study intersections. A breakdown of the existing land uses can be seen in Figure 2-16.

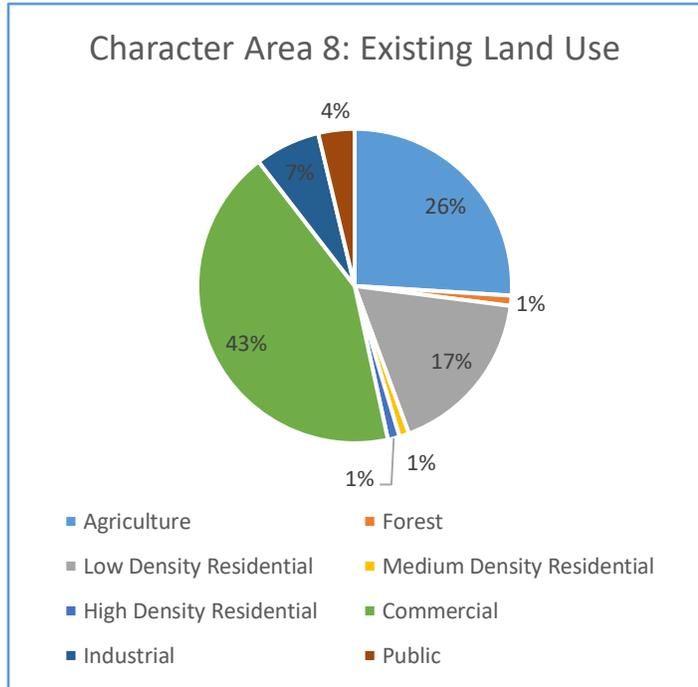


Figure 2-16

Potential Opportunities

- ✓ Large amount of open space opportunities with some environmental constraints.

Chapter 3: Existing Transportation Assessment

Introduction

The Route 39 and 743 corridors consist of over 21 miles of roadway within five (5) municipalities of Dauphin County: Susquehanna Township, Lower Paxton Township, West Hanover Township, South Hanover Township, and East Hanover Township. An overall Location Map of the included study area is shown on Map 1. Route 39 and Route 743 are both classified as minor arterial highways per PennDOT's Federal Functional Class Map. There are varying ADTs throughout the study corridors, as depicted on Maps 4 and 6.

As a part of the planning efforts, the existing corridor has been divided into eight (8) Character Areas which are outlined by roadway description in Table 3-1. As described in the Existing Land Use section, the character areas are defined by certain existing conditions – more specifically existing land use, roadway characteristics and community framework. The transportation systems and roadway network through these character areas should complement the surrounding land uses and vice versa. Within each character area, the existing roadway segment configurations vary and the transitions between roadway segments are sporadic and not well integrated throughout the Route 39 corridor.

Table 3-1: Route 39 and 743 Corridors Character Area Limits		
Character Area	Roadway Length	Location of Roadway
1	1.64	Front Street to Crooked Hill Road
2	3.48	Crooked Hill Road to Colonial Club Drive
3	1.47	Colonial Club Drive to Wenrich Street
4	2	Wenrich Street to Houcks Contractor Driveway
5	2.64	Houcks Contractor Driveway to Allentown Boulevard
6	4.02	Allentown Boulevard to Derry Township Line
7	3.38	Swatara Creek / Derry Township Line to Colt Drive
8	2.69	Colt Drive to Mountain Road (Route 443)
Total	21.33	

The objectives of the existing transportation assessment are to evaluate the Route 39 and 743 corridor roadway network and evaluate the geometric layout, capacity, and safety with respect to current design standards. The assessment was also completed with consideration given to public input and feedback received through public meetings, surveys and the project website / email.

Geometric Evaluation

The roadway segments within each character area were evaluated based on their general layout, function, travel speeds, daily traffic, etc. PennDOT provides a functional classification for each state-owned roadway; both the Route 39 and Route 743 corridors are classified as minor arterials. Additionally, PennDOT provides guidance to further classify each roadway with respect to land use and transportation context. Consideration of both land use and transportation contexts facilitates an integrated approach to applying design standards for the roadway elements, roadside elements, and desired operating speeds. These elements are defined within PennDOT’s Smart Transportation Guidebook and Design Manual Part 2 – Highway Design. Each Character Area has been designated an appropriate land use context and roadway typology and was then evaluated against design standards for each classification. Table 3-2 details the PennDOT classification, land use context and roadway typology for each character area.

Table 3-2: Route 39 and 743 Roadway Classifications				
Character Area	PennDOT Urban/Rural Classification	PennDOT Functional Classification	Land Use Context	Roadway Typology
1	Urban	Minor Arterial	Suburban Corridor	Community Arterial
2	Urban	Minor Arterial	Suburban Corridor	Community Arterial
3 (Linglestown Village Area)	Urban	Minor Arterial	Village Neighborhood	Community Collector
3 (Outside Village Area)	Urban	Minor Arterial	Suburban Neighborhood	Community Collector
4	Urban/Rural Boundary	Minor Arterial	Rural	Community Collector
5	Urban	Minor Arterial	Suburban Corridor	Community Arterial
6	Urban/Rural Boundary	Minor Arterial	Suburban Neighborhood	Community Arterial
7	Rural	Minor Arterial	Rural	Community Arterial
8 (South of I-81)	Urban	Minor Arterial	Suburban Corridor	Community Arterial
8 (North of I-81)	Rural	Major Collector	Rural	Community Collector

Capacity Evaluation

Existing operational conditions were identified by conducting capacity analyses for each of the study intersections. Capacity can be defined as “the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions”. Capacity is generally described by Level of Service (LOS), which represents a qualitative measure that characterizes “operational conditions within a traffic stream and their perception by motorists and passengers”.

LOS for signalized and unsignalized intersections is determined by the of average control delay per vehicle. Capacity analysis calculations were completed using the existing traffic volumes initially collected. The Synchro traffic analysis and simulation software program was utilized to aid in the categorization of level of services which is defined below for signalized intersections below in Table 3-3a.

Table 3-3a: Signalized Intersections – LOS Criteria		
Level of Service	Average Control Delay (sec/veh)	Expected Delay to Minor Street Traffic
A	< 10	Very low delay. Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all.
B	> 10 and ≤ 20	Occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A.
C	> 20 and ≤ 35	Higher delays result from fair progression and/or long cycle lengths. Individual cycle failures may begin to appear in this level. Significant numbers of vehicles stop although many still pass through the intersection without stopping.
D	> 35 and ≤ 55	Longer delays may result from unfavorable progression, long cycle lengths and/or high volume to capacity (v/c) ratios. Many vehicles stop and the proportion of vehicles not stopping declines.
E	> 55 and ≤ 80	Considered the limit of acceptable delay, these high delay values generally indicate poor progression, long cycle lengths and high v/c ratios. Individual cycle failures are frequent occurrences.
F	> 80	Considered unacceptable to most drivers, this condition often occurs with over-saturation. It may also occur at high v/c ratios below 1.00 with many individual cycle failures.

As for unsignalized intersections, Table 3-3b outlines the general characteristics for Level of Service classification.

Level of Service	Average Control Delay (sec/veh)	Description
A	≤ 10	Little or no delay.
B	> 10 and ≤ 15	Short traffic delays.
C	> 15 and ≤ 25	Average traffic delays
D	> 25 and ≤ 35	Long traffic delays
E	> 35 and ≤ 50	Very long traffic delays.
F	> 50	Extreme delays and possible severe congestion.

Morning and evening manual traffic turning movement counts were obtained at 33 study intersections to determine existing traffic volumes. SYNCHRO was used to perform capacity analysis at each of the intersections as listed. In addition to intersection levels of service, roadway segment capacity and consistency was also considered. 24-hour counts were conducted at 17 locations within the study area. This data provided daily traffic, truck classification, and speed data. Detailed count data can be found in Appendix D and Appendix E and is also summarized in Appendix F.

The purpose of SYNCHRO is to determine the existing levels of service (LOS) for each movement at each intersection during the peak AM and PM hours of a typical weekday. Capacity analyses are based on existing traffic volumes, roadway geometries and traffic controls. In addition to the traffic count information, the capacity analyses considered data from existing signal permit plans, field views and previous traffic studies and documentation.

Safety Audit

The Project Team obtained crash data from the Pennsylvania Department of Transportation (PennDOT). A five-year history of reportable crashes was obtained including vehicular, bicyclists, and pedestrian incidents. A reportable crash is one in which an injury or fatality occurs or if at least one of the vehicles involved required towing from the scene. The type of information provided includes number of injuries and fatalities, date, time of day, weather and roadway conditions, and type of crash. For the purposes of this study, any location with five or more reportable crashes per year was considered a high crash location. In addition to the data provided by PennDOT, HRG considered Tri-County Regional Planning Commission’s Regional Transportation Plan, which identifies high-crash locations throughout the Tri-County area. HRG also solicited public feedback and field observations to help identify potential safety concerns that may not be evident from reviewing crash history.

Pedestrian and Bicycle Facilities

- ▶ Sidewalk and pedestrian paths are provided throughout the Route 39 corridor, but these facilities are disjointed in some areas, lacking adequate connections and linkages. Many of the facilities do not comply with ADA accessibility requirements. Majority of newer housing developments and residential areas along the corridor have consistent networks of sidewalk with the potential to connect along Route 39 to provide more accessibility to pedestrians.
- ▶ A bicycle lane is not provided anywhere along either corridor. The existing shoulders can accommodate bicycles along parts of the corridor. Locations of wide shoulders or bicycle access as well as shared use paths are outlined on the Bicycle Facilities exhibit in the Appendix.

Transit Facilities

Capital Area Transit (CAT) and Lebanon Transit public bus transit systems operate within portions of the corridor. Applicable routes are shown on the provided Public Transit Exhibits. The following potential limitations have been identified:

- ▶ Corridor generally lacks bus shelters or other transit facilities
- ▶ Lack of continuity of transit routes along the corridor
- ▶ Limited frequency and lack of late night routes
- ▶ Significant portions of the corridors do not have any access to transit facilities

Public transit can reduce the impact that passenger vehicles have on the existing roadway network and provide a greener transportation option to residents of the region. As the region grows and demographics change, public opinion should be monitored to determine if additional mass transit would be successfully utilized by the public. Additionally, there have been steps taken towards a potential merger of Capital Area Transit (CAT) and Rabbit Transit as they consider the advantages of regionalization. Due to the evolving landscape of transit service and demands, transit agencies should monitor needs in the region on an ongoing basis and identify opportunities for improvement.

Influence of Navigation Apps and Real-Time Traffic Updates on Existing Road Network

In recent years, motorists have become more dependent on navigation apps, specifically ones that provide real-time updates on traffic conditions. The users of these apps see a reduced travel time to arrive at their destination because these apps route the user to avoid congested roads and intersections. While this seems great from the driver's perspective, it is causing a cluster of issues for transportation agencies, engineers, and citizens of residential neighborhoods all throughout the country. Some of the challenges that real-time navigation apps are as follows:

- Impacts in residential neighborhoods – To avoid highly congested areas, traffic is being re-routed from higher classification highways, such as arterials, to residential streets. This is resulting in noise and safety concerns within these residential neighborhoods.
- Impacts on rural collectors and local roads – These minor roadways were designed to accommodate certain volumes of traffic. When these volumes exceed what the road was designed for, it will result in pavement deterioration. Increased speeds within these rural collectors and local roads has also become a safety concern linked to real-time navigation apps.
- Impacts of re-routed truck traffic – Truck traffic being diverted through residential neighborhoods and on local roadways presents its own set of safety, noise, and pavement deterioration issues.

When designing a roadway network, the goal is to keep the majority of the traffic on the higher classification highways, such as arterials, until they near their destination and only then access minor roadways, such as collectors and local roads. As drivers become more dependent on navigation apps, this design tactic is becoming more difficult to achieve as we see a significant increase in traffic volumes to these minor roadways.

Specifically in this study area, we are seeing increased levels of traffic using minor roadways and local roads to access surrounding major roadways such as I-81, Route 322, Route 22, and Hersheypark Drive rather than using Route 39 and Route 743. When there is congestion on Route 39 or Route 743, these navigation apps will route vehicles through residential neighborhoods, local roads, and minor collector roads.

Unfortunately, under current legislation, other than making public transportation more available and convenient, the primary way to counteract the effects of these navigation apps is to improve the preferred roads, making them faster, or alter the non-preferred routes, making them slower. If the desirable major roadways are improved to accommodate a greater capacity of traffic, the navigation apps are more likely to route vehicles onto it. Likewise, if the less desirable minor roadways, are altered with truck restrictions or traffic calming measures, the navigation apps are more likely to not route vehicles to these roads.

This is an ongoing issue that continues to present new challenges. Many of the recommendations in this study will improve travel time on the preferred routes or better accommodate traffic on the secondary roadway system.

Character Area 1

Character Area 1, located entirely in Susquehanna Township, extends from Front Street to Crooked Hill Road. Comprised of four (4) different lane configurations, this Character Area has varying segments totaling approximately 1.64 miles of the primary Route 39 corridor. Within Character Area 1, Route 39 is classified as a Suburban Corridor Community Arterial.

The land uses within Character Area 1 contribute to the traffic along the Route 39 corridor, though much of the traffic is generated outside the corridor, accessing the Route 322 interchange. Additionally, the location of some of the abutting land uses are close in proximity resulting in safety and access management concerns. Inconsistent pedestrian facilities are provided throughout Character Area 1 as part of the original site development of property or locations where ordinances required it. Summarized below is an inventory of the Project Team’s existing transportation findings for Character Area 1.

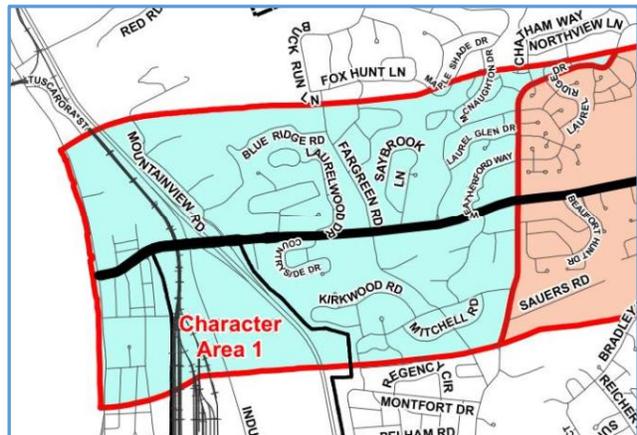


Figure 3-1



Geometric Evaluation

Table 3-4: Roadway Segments – Character Area 1			
Segment	Length	Description	Limits
C1.1	0.17	3-Lane Highway (2 Westbound Lanes)	From Front Street (Susquehanna River) to N 6th Street
C1.2	0.38	4-Lane Highway	From N 6th Street to just east of 322W Off-Ramp
C1.3	0.16	5-Lane Highway (Center Turn Lane)	From east of 322W Off-Ramp to Terrace Drive
C1.4	0.92	3-Lane Highway (Center Turn Lane)	From Terrace Drive to Crooked Hill Road
Total	1.64		

Table 3-4 details each roadway segment lengths, lanes and extents. Character Area 1 connects to Front Street at the Susquehanna River, which provides off-road path/trail connectivity for pedestrian and bicycle traffic traversing the corridor along the river on the existing off-road paths and the Capital Area Greenbelt.

- Segment C1.1: Route 39 is a three- lane section from Front Street to N 6th Street, including two westbound travel lanes which transition to turn lanes at the Front Street intersection.
- Segments C1.2 and C1.3: Between N 6th Street and Terraced Drive, Route 39 is a four-lane roadway with two through lanes in each direction. There is a 5th lane to provide a left turn lane within the Route 322 interchange area.
- Segment C1.4: A center left turn lane is provided east of the Route 322 Interchange to accommodate driveways and cross streets within this portion of Route 39.

Typical design values for a Suburban Corridor Community Arterial are provided in Table 3-5, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in **red text**.

Table 3-5: Existing Roadway Conditions Summary - Character Area 1		
Roadway Parameter	Suburban Corridor Community Arterial	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 25,000	18,000 to 25,000
Desired Operating Speed	35 to 50 mph	35 mph posted speed limit (west of Route 322); 41 to 45 mph measured 85th percentile speeds. 45 mph posted speed limit (east of Route 322); 49 to 51 measured 85th percentile speeds.
Lane Width	11' to 12'	11'
Shoulder Width	8' to 10'; or 5' to 6' Bike Lane	2' to 10'; Generally exceeds 5' where shared-use path is not provided
Median	12' to 18' for center turn lane; or 6' to 8' for pedestrians	13' center turn lane; 6' median where provided
Sidewalk Width	5' to 6'	10' to 13' shared-use path west of Industrial; No sidewalk east of Industrial
Sidewalk Buffer	5' to 10' grass area	4' curbed divisor
Major Intersection / Signal Spacing	1,320'	1,000' to 1,500'
Driveway/Access Spacing	400'	100' west of Terrace Drive; 400'+ east of Terrace Drive

Capacity Analyses

With the exception of Intersection 2, N 6th Street, the other intersections within this area operate at acceptable levels of service (LOS) during the AM and PM peak hours. At Intersection 2, 6th Street has failing movements classified as LOS F in both the AM and PM peak. This unsignalized intersection can be considered over capacity and delays will increase as Route 39 traffic volumes increase.

Refer to Table 3-6 for the results of the capacity analyses for Character Area 1. Intersections with deficient movements are highlighted in red text (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix G for the capacity analysis of existing traffic conditions and Appendix O for a more detailed breakdown of the existing Levels of Service.

Table 3-6: Existing Level of Service Summary - Character Area 1			
Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
1	Route 39 / Front Street	B	C
2	Route 39 / N 6th Street	B	E
3	Route 39 / Eastbound Route 322 & Industrial Road	C	C
4	Route 39 / Westbound Route 322	A	A
5	Route 39 / Fargreen Road	A	A
6	Route 39 / Deer Path Road	B	B
7	Route 39 / Crooked Hill Road	B	B

Safety Audit

During review of Character Area 1, some similarities observed for a majority of incidents at signalized intersections are angle-type crashes. Crashes at unsignalized intersections are commonly recorded as rear-end crashes, involving vehicles waiting to execute turning maneuvers or angle-type crashes due to lack of visibility and sight distance. Also, the crashes at unsignalized locations are generally more intense, involving more than two vehicles.

Crash trends were apparent at the following intersection within Character Area 1:

- Intersection 3 - Route 39 / Eastbound Route 322 & Industrial Road
 - Rear-end trend has developed in the southbound direction
 - Also note, improper turn movements and driver confusion is apparent from the reports.

Emerging crash trends and safety concerns noted during public outreach and field observations are shown on the Susquehanna Township Existing Crash Analysis Exhibit in Appendix H. No pedestrian incidents were recorded from the crash history data obtained.

Non-Motorized Mobility

The sidewalk and pedestrian accommodations throughout Character Area 1 were recently enhanced. The Capital Area Greenbelt Association has recently constructed pedestrian and bicycle-friendly improvements along Front Street, Route 39, up to and including Industrial Road which provides connection to Wildwood Park. There is no sidewalk east of Industrial Road. At the intersections listed previously for Character Area 1, there are no readily accessible pedestrian crossings or ADA compliance.

Most of the existing sidewalk to the south of the corridor is present in a residential land use setting. Many of the existing sidewalk shown in the Exhibits have tie-in locations that align with the major secondary roadway network. Paxton Church Road and Crooked Hill Road may provide more connectivity in Character Area 1. To the north of the corridor, there is sidewalk located in the residential areas as well. These networks of sidewalk lack practical connectivity to Route 39 by less than 100 linear feet in some areas. Refer to Appendix I for Exhibits of existing sidewalk locations.

There are no designated bicycle facilities along Route 39, though the recent CAGA improvements provided a shared use path west of Industrial Road that ties into the Capital Area Greenbelt to the west. Although shoulder widths in several locations along Route 39 are adequate for bicycle traffic, the condition of the shoulders (pavement / debris) are not ideal for bicyclists. An improved bicycle network would allow people to traverse the study area in the east-west direction as well as in the north- south along the secondary roads. Refer to the exhibits in Appendix J for more information on the bicycle-friendly facilities within the study area.

Public/Alternate Transit Facilities

An inventory of routes in Character Area 1 is provided on the exhibits included in Appendix K. There are few public transit routes within Character Area 1. Capital Area Transit (CAT) bus routes and Lebanon Area Transit routes pass through the limits of the study corridor. For CAT, Route 3 (Third Street) and Route 23 (Elizabethville via Millersburg and Halifax) have routes that travel through the Character Area 1 of the study area. For Lebanon Area Transit, Commute King – Express Service to Harrisburg runs via I-81 along the southern-most roadway limit of Character Area 1.

Additional Considerations

Highway Lighting: Public feedback resulted in the consideration for improved highway lighting around the Route 322 Interchange ramps. This area is generally well-maintained, though the traffic patterns can be confusing for some drivers and it can be difficult to see the Route 322 On-ramps during nighttime conditions. The lack of roadway length available between the ramps, some driving maneuvers prove to be difficult, especially in the evening and late hours. Highway lighting improvements are one of the many potential improvements recommended for consideration.

Speeding: Speeding in the Deer Path residential neighborhood along the north side of Route 39. Traffic calming measures can be impactful and cost efficient, especially as a short-term improvement. If pursued, further evaluation would be necessary by Susquehanna Township to assess the actual travel speeds, survey the neighborhoods, and identify the community-desired traffic calming measures.

Access Management: As noted in Table 3-5, property access drives are generally located too close to one another. During roadway improvement project design and/or development/redevelopment efforts, Susquehanna Township should work with abutting property owners to eliminate/consolidate driveways and gain the desired 400' minimum spacing between access points.

Character Area 2

Character Area 2 spans portions of Susquehanna and Lower Paxton Townships between Crooked Hill Road and Colonial Club Drive. Character Area 2 is a mixture of a 3-lane and 5-lane roadway, spanning a total of approximately 3.5 miles. Within Character Area 2, Route 39 is classified as a Suburban Corridor Community Arterial.

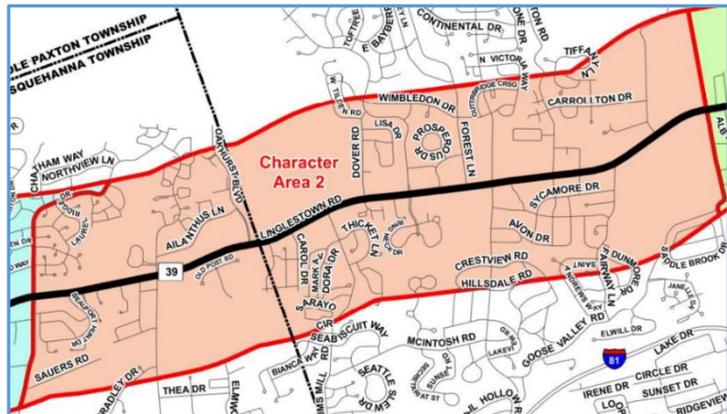


Figure 3-2



Geometric Evaluation

Table 3-7: Roadway Segments - Character Area 2			
Segment	Length	Description	Limits
C2.1	0.67	5-Lane Highway	From Crooked Hill Road to east of Progress Avenue
C2.2	2.81	3-Lane Highway	From east of Progress Avenue to Colonial Club Drive
Total	3.48		

As shown in Table 3-7, Character Area 2 transition between a 3-lane roadway and a 5-lane roadway, including a center left turn lane. This area is more commercial/office in nature. Typical design values for a Suburban Corridor Community Arterial are provided in Table 3-8, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in **red text**.

Table 3-8: Existing Roadway Conditions Summary - Character Area 2		
Roadway Parameter	Suburban Corridor Community Arterial	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 25,000	22,000
Desired Operating Speed	35 to 50 mph	45 mph posted speed limit 43 to 46 mph measured 85th percentile speeds
Lane Width	11' to 12'	11' to 12'
Shoulder Width	8' to 10'; or 5' to 6' Bike Lane	4' to 8', where provided; shoulder is not present along right turn lanes at most major intersections
Median	12' to 18' for center turn lane; or 6' to 8' for pedestrians	12' center turn lane
Sidewalk Width	5' to 6'	4' to 5', where provided. Lots of gaps in the existing sidewalk system
Sidewalk Buffer	5' to 10' grass area	4' to 6' in most areas; some locations do not provide sidewalk buffer
Major Intersection / Signal Spacing	1,320'	1,500'
Driveway/Access Spacing	400'	200' ; driveways are spaced further in some locations

Capacity Analyses

Individual movement deficiencies occur under existing conditions at the Route 39/Progress Avenue and Route 39/Colonial Road intersections. We note that side-street deficiencies are also present in the existing analysis for the Route 39/Crums Mill intersection; however, that analysis was conducted as a stop-controlled intersection. The intersection has recently been signalized through land development efforts and now operates acceptably during both peak hours.

Refer to Table 3-9 for the results of the capacity analyses for Character Area 2. Intersections with deficient movements are highlighted in **red text** (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix G for the capacity analysis of existing traffic conditions and Appendix O for a more detailed breakdown of the existing Levels of Service.

Table 3-9: Overall Level of Service Summary - Character Area 2			
Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
8	Blue Mountain Commons	B	C
9	Progress Avenue	C	D
10	Sturbridge Drive	A	B
11	Oakhurst Boulevard	A	B
12	Crums Mills Road	A	A
13	Dover Road / Versailles Road	A	A
14	Forest Hills Drive / Ringneck Drive	A	A
15	Colonial Road	C	D
16	Patton Road	B	B

Safety Audit

The review of Character Area 2 crash history reports shows an apparent crash trend at the following intersection:

- Intersection 9 - Route 39 / Progress Avenue
 - Angled crashes are significant from the turn lanes
 - Various crash types are primarily caused by the northbound flow of traffic

Emerging crash trends and safety concerns noted during public outreach and field observations are shown on the Susquehanna Township Existing Crash Analysis Exhibit in Appendix H. Three pedestrian incidents were recorded from the crash history data obtained.

Non-Motorized Mobility

The sidewalk and pedestrian accommodations throughout Character Area 2 are generally lacking in regard to connectivity, though sidewalk is present from Crooked Hill Road to Pleasant Hills Estates on the north side and from Progress Avenue to Oakhurst Boulevard along the south side of Route 39. The inconsistency in sidewalk throughout Character Area 2 makes it difficult for pedestrians to safely traverse Route 39, even in the most commercial locations. Refer to Appendix I for Exhibits of existing sidewalk locations.

The secondary roadways have similar sidewalk layouts, in that the inconsistencies and general lack of sidewalk creates unsafe walking conditions for pedestrians. During field views of the corridor and confirmed from public feedback and input from municipalities, it is typical for pedestrians to walk along shoulders, if wide enough.

As shown in Appendix J, the entirety of Character Area 2, along Route 39, is wide enough to accommodate bicycle traffic, except near major / signalized intersections where the shoulder is generally removed in favor of a turn lane. This condition can create conflicts and safety concerns for bicycle and vehicular traffic. Progress Avenue and Colonial Road can generally accommodate north-south bicycle traffic. There are no bicycle pavement markings or signing within Character Area 2.

Public/Alternate Transit Facilities

An inventory of routes in Character Area 2 is provided on the exhibits included in Appendix K. There are few public transit routes within Character Area 2. Capital Area Transit (CAT) bus routes and Lebanon Area Transit routes pass through the limits of the study corridor. For CAT, Route 3 (Third Street) travel through the Character Area 2 of the study area. For Lebanon Area Transit, Commute King – Express Service to Harrisburg runs via I-81 along the southern-most corridor limit which runs along Interstate 81.

Additional Considerations

Unsignalized Access: During peak hours, it can be difficult to make left turning movements from stop-controlled side streets, such as at Beaufort Hunt Drive, Cumberland Avenue, Holly Hills Drive, and Kota Avenue. Progress Avenue and Thea Drive is another unsignalized intersection with capacity concerns, as noted by the public and documented in other traffic studies. The Project Team also noted that access to commercial and office buildings may be restricted due to long queues from the signalized intersections at Crooked Hill Road, Blue Mountain Commons, and Progress Avenue.

Roundabouts: As part of the public feedback for this Character Area 2, the Project Team received several requests for consideration of additional roundabouts along Route 39, either to replace existing traffic signals or to avoid new traffic signals.

Secondary Roadways: In addition to congestion concerns along Route 39, lots of public feedback in Character Area 2 was received regarding sight distance concerns and geometric deficiencies along the secondary roadway network. Many of the secondary roadways in the character area are surrounded by planned and/or approved developments. Increased traffic from these developments along the secondary roadway system will exacerbate horizontal and vertical geometric deficiencies, limited sight distance, insufficient traffic calming measures and/or ineffective signing and pavement markings. Due to the imminent growth, the secondary roadway network as the primary Route 39 corridor must adequately accommodate increased vehicular traffic.

Sight Distance: Noted intersections with limited sight distance were field viewed by the Project Team in order to determine the best action of resolution to improve visibility issues at each intersection. Refer to Appendix H for pictures of the deficient sight distance locations. Sight distance limitations were identified at the following locations:

- Progress Avenue and Paxton Church
- McIntosh Road and Crums Mill Road
- Colonial Road and Crestview Road
- Colonial Road and McIntosh Road
- Colonial Road and Sheetz Convenience / Gas driveway

Speeding: Speeding is a public concern along secondary roadways, specifically residential areas such as Continental Drive in the north and McIntosh Road to the south.

Access management: Access management is clear concern from the public standpoint and supported by the substandard access spacing noted in Table 3-9.

- The number and spacing of driveway accesses between Crooked Hill Road and Progress Avenue can create issues for drivers making difficult turning maneuvers during peak hours, especially with consideration to the center left turn lane. The commercial, residential, and office properties in this area all maintain separate driveways.
- Another location access management problem is at the southeastern quadrant of the Colonial Road and Route 39 intersection. 3B Ice Cream, Aroogas, and the close proximity these two (2) driveways have to the signal for the northbound traffic on Colonial proves to be difficult when traffic queues are backed up past the driveway entrances. To improve flow of traffic and reduce safety concerns, access management can have significant impact on the operation of a corridor.

Character Area 3

Character Area 3 is located entirely within Lower Paxton Township, spanning from Colonial Club Drive, through the Village of Linglestown, to Wenrich Street. The Village of Linglestown includes sidewalk on both sides of the road, locations with parallel or angle parking, and bulb-outs to shorten pedestrian crossing distances. This character area has the lowest speeds along Route 39 and lower traffic volumes than most other areas. Due to the building layout and design within the Village area, additional right-of-way is limited and widening this area is not practical without severely altering the character of the Village. Within Character Area 3, Route 39 varies from a Neighborhood Community Collector and a Suburban Neighborhood Community Collector.

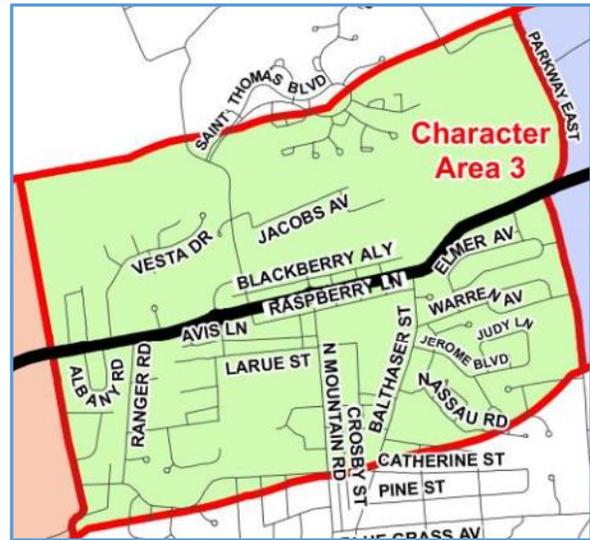


Figure 3-3



Geometric Evaluation

Segment	Length	Description	Limits
C3.1	0.44	3-Lane Highway (Center Turn Lane)	From Colonial Club Drive to west of Blue Mountain Parkway roundabout
C3.2	1.03	2-Lane Highway	West of Blue Mountain Parkway to Wenrich Street
Total	1.47		

Character Area 3 begins at the Colonial Club Drive intersection and extends the three-lane section carrying Route 39 through from Character Area 2 up to the Blue Mountain Parkway West roundabout. Prior to the roundabout, the lanes transition back to a two-lane section. From the Village of Linglestown to the eastern extents, Route 39 is a two-lane roadway. Two roundabouts highlight the Village area, serving to help traffic access Route 39 and to calm traffic. There are chicanes east of Mountain Road, one in each direction, that serve for traffic calming.

Due to the drastic change in roadway function and character within the Village area, this character area was separated into two different land use contexts and roadway typologies. Within the Village area (Blue Mountain Parkway to Balthaser St), Route 39 is considered a Village Neighborhood Community Collector. East and west of the Village area, Route 39 is a Suburban Neighborhood Community Collector. Typical design values for these roadway types are provided in Tables 3-11 and 3-12, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in red text.

Table 3-11: Existing Roadway Conditions Summary - Character Area 3 Linglestown Village (Blue Mountain Pkwy to Balthaser St)		
Roadway Parameter	Village Neighborhood Community Collector	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 15,000	10,000 to 15,000
Desired Operating Speed	25 to 30 mph	25 mph posted speed limit 28 to 29 mph measured 85th percentile speeds
Lane Width	14'	14'
Shoulder Width	7' to 8' parking lane	7' parking lane
Median	6' for pedestrians	10' at roundabouts for pedestrians
Sidewalk Width	5' to 6'	5'
Sidewalk Buffer	4' to 5' grass area	5' to 7'
Major Intersection / Signal Spacing	660' to 1,320'	1,500'
Driveway/Access Spacing	200'	200'

**Table 3-12: Existing Roadway Conditions Summary - Character Area 3
Outside of Linglestown Village**

Roadway Parameter	Suburban Neighborhood Community Collector	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 15,000	10,000 to 15,000
Desired Operating Speed	25 to 30 mph	40 to 45 mph posted speed limit 45 to 46 mph measured 85th percentile speeds
Lane Width	10' to 12'	12' west of Village 11' east of Village
Shoulder Width	4' to 8'; or 5' Bike Lane	4' to 7'
Median	12' to 16' for center turn lane; or 6' for pedestrians	12' turn lane west of Village
Sidewalk Width	4' to 5'	Sidewalk not present
Sidewalk Buffer	5' grass area	Sidewalk not present
Major Intersection / Signal Spacing	660' to 1,320'	1,200' to 1,500'
Driveway/Access Spacing	200'	200'

As shown in Table 3-11, the Linglestown Village is a well-designed multi-modal roadway that is well integrated and supportive of the surrounding land use. The roadway characteristics align with design criteria for the roadway type. The roadway widths, on-street parking, traffic calming measures and overall character are effective at slowing traffic, thereby making the roadway safe for in-lane bicycles and pedestrian crossings. The traffic volumes are low enough in this area to make the roadway and intersections functional with one lane in each direction.

Table 3-12 indicates that the posted speed limit immediately outside the Village area is higher than typical for this type of roadway. It may be prudent to consider a transitional 35 mph speed limit and additional sidewalks to better transition from the higher speeds within Character Areas 2 and 4.

Capacity Analyses

All unsignalized intersection in Character Area 3 are operating at acceptable Levels of Service. Refer to Table 3-13 for the overall results of the capacity analyses for Character Area 3. See Appendix G for the capacity analysis of existing traffic conditions and Appendix O for a more detailed breakdown of the existing Levels of Service.

Table 3-13: Overall Level of Service Summary - Character Area 3

Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
17	Route 39 / Blue Mountain Parkway West & Pennsylvania Avenue	B	B
18	Route 39 / Mountain Road	C	C
19	Route 39 / Balthaser Street	A	A

Safety Audit

The review of Character Area 3 crash history reports shows no significant crash trends or potentials for trend development. One (1) pedestrian incident is shown on the Existing Safety Analysis exhibits in Appendix H.

Non-Motorized Mobility

In Character Area 3, sidewalk on both sides is present in the Village of Linglestown. There are portions of sidewalk on either side of the roadway at Colonial Club Drive as well as prior to the Blue Mountain Parkway West roundabout. Refer to Appendix I for Exhibits of existing sidewalk locations. Sidewalk and shared use paths are shown on the exhibits, and clearly depict the lack of connectivity from the residential land uses to Route 39. Sidewalk on one side of Mountain Road, though not connected to the Village, allows pedestrians to traverse from Linglestown to Jonestown Road and/or Allentown Blvd via sporadic sidewalk and wide, 4-foot shoulders.

As shown in Appendix J, the Character Area 3 can accommodate bicycle traffic due to the width of the shoulders in all areas except the Village; within the Village area, travel speeds are low enough that bicyclists can safely ride within the travel lane. Wider shoulders east of the Village would better accommodate bicycle traffic. In addition to the shoulder widths along Route 39, Mountain Road has shoulders that can potentially accommodate bicycle traffic, however, the inconsistent striping, shoulder widths/parking areas, and driveways present challenges for bicyclists.

Public/Alternate Transit Facilities

Similar to Character Area 1 and 2, there are few public transit routes within Character Area 3. Capital Area Transit (CAT) bus route and Lebanon Area Transit route continue to pass through the limits of the study corridor. For CAT, Route 39 (Colonial park and Linglestown) and for Lebanon Area Transit, Commute King – Express Service to Harrisburg. Note that park and ride locations are also provided within the exhibits in Appendix K.

Additional Considerations

Feedback from the public for Character Area 3 is primarily focused on safety concerns such as geometric deficiencies, speeding concerns, and sight distance and visibility issues.

Sight Distance: Of particular concern due to the amount of side street traffic, sight distance limitations were identified at the following locations:

- Mountain Road and Blue Ridge Avenue
- Wenrich Street and Blue Ridge Avenue

See Appendix H for pictures of the deficient sight distance locations.

Capacity Limitations: Though not specifically analyzed, public input and field observations indicate capacity restrictions at the intersection of Mountain Road and Blue Ridge Avenue, which can be exacerbated due to the limited sight distance.

Speeding: Speeding concerns are present along Route 39 east of the Linglestown Village. Traffic calming measures, specifically a series of chicanes, exist as an attempt to slow traffic heading into the Village and the roundabouts. As noted above, a transitional area may further help reduce travel speeds in this area of Route 39.

Character Area 4

Character Area 4 includes portions in Lower Paxton Township and West Hanover Township, extending from Wenrich Street to Manor (NW) Drive. This portion of Route 39 is more rural in nature, with pockets of residential housing, agricultural lands and the Central Dauphin High School. This roadway segment spans approximately two miles, consisting of two lanes – one for each direction of travel. Within Character Area 4, Route 9 is classified as a Rural Community Collector.



Figure 3-4



Geometric Evaluation

Character Area 4 begins at the Wenrich Street intersection and extends across the two-lane section to the Houck contractors property line, which is about 1,400 feet east on Manor Drive (NW). The only deviation from a two-lane section along Route 39 in this corridor is at the Piketown Road intersection where separate turn lanes are provided.

Segment	Length	Description	Limits
C4.1	1.97	2-Lane Highway	Wenrich Street to Manor (NW) Drive
Total	1.97		

Typical design values for a rural community collector are provided in Table 3-15, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in red text.

Table 3-15: Existing Roadway Conditions Summary - Character Area 4		
Roadway Parameter	Rural Community Collector	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 15,000	6,000 to 10,000
Desired Operating Speed	35 to 55 mph	40 mph posted speed limit 46 to 50 mph measured 85th percentile speeds
Lane Width	11' to 12'	11'
Shoulder Width	4' to 8'	2'-4'
Median	N/A	N/A
Sidewalk Width	N/A	N/A
Sidewalk Buffer	N/A	N/A
Major Intersection / Signal Spacing	1,540'	5,000'
Driveway/Access Spacing	200'	200'

Capacity Analyses

All intersection in Character Area 4 are operating at acceptable Levels of Service. Refer to Table 3-16 for the results of the capacity analyses results for Character Area 4. See Appendix G for the capacity analysis of existing traffic conditions and Appendix O for a more detailed breakdown of the existing Levels of Service.

Table 3-16: Overall Level of Service Summary - Character Area 4			
Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
20	Route 39 / Piketown Road	B	B
21	Route 39 / Manor Drive (NW)	A	A

Safety Audit

The review of Character Area 4 crash history reports shows no significant crash trends or potentials for trend development. Refer to the Existing Safety Analysis exhibits in Appendix H for more information on public feedback.

Non-Motorized Mobility

In Character Area 4, there is minimal sidewalk provided, though there are some sidewalk networks within several residential developments. There is also a portion of trail along the south side of Route 39 near Piketown Road (near Central Dauphin High School) and near Manor (NW) Drive (near Winslett). Refer to Appendix I for Exhibits of existing sidewalk locations.

The roadway shoulders in this area of Route 39 vary in width from 2' to 4', and therefore do not adequately accommodate bicycle traffic. The trail near Central Dauphin High School and Winslett has the potential to be used by some bicycle traffic in these small segments; but the trail is narrow and should be connected to improve bicycle connectivity. Refer to Appendix J for exhibits of existing bicycle-friendly accommodations.

Public/Alternate Transit Facilities

The only public transit route passing through Character Area 4 is for the Lebanon Area Transit, Commute King – Express Service to Harrisburg. Refer to Appendix K for an exhibit showing the corridor public transit routes.

Additional Considerations

Widening for center turn lane or bike lane: The public requested consideration to bike accommodations and a center left turn lane for this corridor. There are several accesses along both sides of Route 39; however, these access points are generally spaced appropriately and considering the roadway volume, a center left turn lane is not required under existing conditions. Utility poles line both sides of the roadway through much of the Character Area, which would make widening for bike lanes or a center left turn lane expensive. An off-road multi-use trail on the other side of the utility poles may be more appropriate in this area, though this would have a greater right-of-way impact.

Character Area 5

Located entirely in West Hanover Township, Character Area 5 spans 2.6 miles from east of Manor Drive to Allentown Blvd. This portion of Route 39 generally serves interchange support services and industrial uses, with some residential neighborhoods across the corridor. Character Area 5 is split by Interstate 81 ramps. Within Character Area 5, Route 39 is classified as a Suburban Corridor Community Arterial.

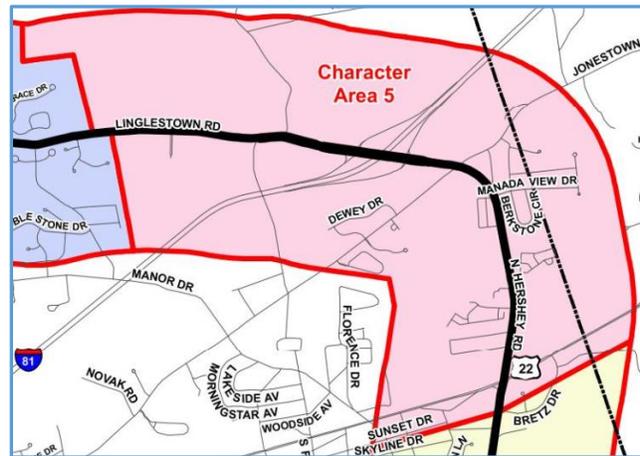


Figure 3-5



Geometric Evaluation

Segment	Length	Description	Limits
C5.1	0.33	2-Lane Highway	From Manor (NW) to Quality Circle
C5.2	0.48	3-Lane Highway (Center Left Lane)	Quality Circle to N Fairville Avenue
C5.3	0.73	5-Lane Highway (Median/Center Left Lane)	N Fairville Avenue to Jonestown Road
C5.4	1.11	2-Lane Highway	Jonestown Road to Bretz Drive
Total	2.64		

As shown in Table 3-17, Character Area 5 consists of varying travel lanes as it transitions through the I-81 Interchange.

- Segment C5.1: Route 39 is a two-lane highway with curb and sidewalk along at least one side of the road.
- Segment C5.2: A center left turn lane is provided in this segment, with curbing and sidewalk along both sides of Route 39.
- Segment C5.3: This segment provides two through lanes in each direction and provides a median or center left turn lane. Both sides of Route 39 have curb and sidewalk, except within the interchange area.
- Segment C5.4: The roadway transitions back to a 2-lane roadway with no curb/sidewalk and wider shoulders.

Typical design values for a Suburban Corridor Community Arterial are provided in Table 3-18, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in red text.

Table 3-18: Existing Roadway Conditions Summary - Character Area 5		
Roadway Parameter	Suburban Corridor Community Arterial	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 25,000	10,000 to 14,000
Desired Operating Speed	35 to 50 mph	40 to 45 mph posted speed limit 53 and 55 mph measured 85th percentile speeds
Lane Width	11' to 12'	11' to 12'
Shoulder Width	8' to 10'; or 5' to 6' Bike Lane	5' to 7'
Median	12' to 18' for center turn lane; or 6' to 8' for pedestrians	12' center lane where provided; 6' median where provided
Sidewalk Width	5' to 6'	4', where provided. No sidewalk provided across the I-81 bridge, minimal sidewalk south of Jonestown Rd
Sidewalk Buffer	5' to 10' grass area	2'
Major Intersection / Signal Spacing	1,320'	800' to 1,000'
Driveway/Access Spacing	400'	100' to 200' near interchange; 400'+ in other locations

Capacity Analyses

Due to the recently widened and reconstructed interchange area, recent improvements at Route 22/Route 39, and field-observed under-capacity conditions, Character Area 5 capacity analyses were not included in the study. We note that, due to the substandard signal spacing noted in Table 3-5, signal progression is important for this Character Area. Field observations have indicated that the corridor timing should be updated to improve signal progression.

Safety Audit

The review of Character Area 5 crash history reports shows no significant crash trends or potentials for trend development. One (1) pedestrian incident is shown on the Existing Safety Analysis exhibits at the Quality Circle intersection in Appendix H.

Non-Motorized Mobility

In Character Area 5, there is sidewalk on one or both sides of Route 39, north of Jonestown Road, except across the I-81 bridge. There is very little sidewalk present along the secondary roadway network. Refer to Appendix I for Exhibits of existing sidewalk locations.

Wide shoulders are present throughout most of Character Area 5. The presence of right turn lanes and multiple driveways, particularly near the interchange area, can present challenges for bicyclists. There are no bicycle facilities provided through the character area along the secondary networks. Refer to Appendix J for exhibits of existing bicycle-friendly accommodations.

Public/Alternate Transit Facilities

The only public transit route passing through Character Area 5 is for the Lebanon Area Transit, Commute King – Express Service to Harrisburg. Refer to Appendix K for an exhibit showing the corridor public transit routes.

Additional Considerations

As noted in Table 3-18, accesses are closely spaced in the interchange area. This is particularly concerning on the south/east side of the interchange where a center left turn lane is provided instead of a median. Left turn movements into and out of the center lane can create safety concerns and potential conflicts if driveways are not properly spaced. The municipality shall work with the property owners during development or redevelopment efforts to consolidate and eliminate driveways to improve the spacing. Alternatively, the median from I-81 could be extended to Jonestown Road to eliminate the left turn movements and safety concerns.

Table 3-18 also indicates that the signals in the interchange area are closer than desirable for this type of roadway. In order to maximize traffic flow given the existing substandard configuration, traffic signal timing and progression is important in this corridor, particularly considering the under-capacity intersections. An adaptive traffic signal system should be considered.

Through the public outreach, the Project Team received comments to consider a center left turn lane within both 2-lane sections of Character Area 5. Though Route 39 is widened near most major intersections to provide a left turn lane, several lower-volume roadways and driveways do not have a turn lane. Providing a center turn lane may provide a safety benefit, though this can also lead to higher speeds along this portion of Route 39.

There have been ongoing issues near the I-81 interchange related to truck traffic. There are several truck-oriented service facilities along Route 39 in this area. However, there have been frequent occurrences of truck traffic creating property damage and safety concerns:

- Errant trucks have damaged residential property (mailboxes, rutting in front yard, etc.) by exiting the roadway when turning around;
- Trucks frequently travel on roadways with posted truck restrictions;
- Trucks frequently get stuck on the barrier radius at the intersection of Route 39 and Jonestown Road.

The public noted concerns with industrial development in the area, resulting in more truck traffic. Industrial development should be considered holistically with consideration to existing residential uses and environmental impacts, as well as the transportation discussions included herein.

The public also noted that there are safety concerns near the Umberger/Slepian intersections with Route 39, as this area can be very dark at nighttime and the intersections can be difficult to see. Highway lighting improvements should be considered here.

Sight distance limitations were noted at the intersection of Route 22 and Mill Road. This location was field viewed by the Project Team in order to determine the best action of resolution to improve visibility issues. Refer to Appendix H for pictures of the deficient sight distance locations.

Character Area 6

Character Area 6, including portions of West Hanover and South Hanover Townships, extends from Route 22 to the Derry Township Line at the Swatara Creek. This portion of Route 39 is a primary connection between I-81 and Hershey and also services several residential neighborhoods and a few commercial uses. Traffic volumes along this portion of Route 39 can be severely impacted by events in Hershey. These 4 miles of Route 39 are primarily 2-lanes, with portions widened for left turn lanes at several major intersections. Within Character Area 6, Route 39 is classified as a Suburban Neighborhood Community Arterial.

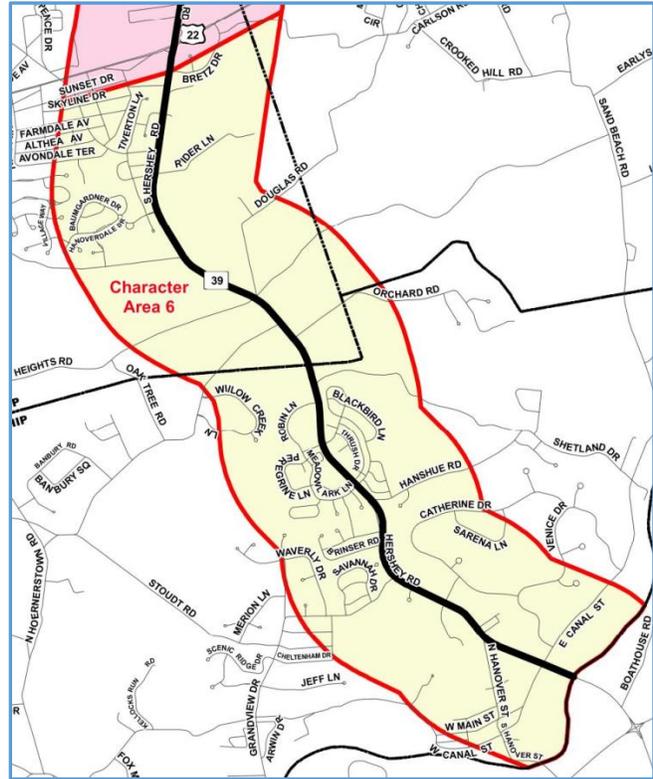


Figure 3-6



Geometric Evaluation

Segment	Length	Description	Limits
C6.1	4.02	2-Lane Highway (Turn lane at some locations)	Bretz Drive to Swatara Creek / Derry Township Line
Total	4.02		

Character Area 6 is comprised of one lane in each direction. The roadway is widened to provide a center left turn lanes at many major intersections; however, several major access points (primarily north of Shetland) do not provide a turn lane along Route 39.

Typical design values for a Suburban Neighborhood Community Arterial are provided in Table 3-20, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in red text.

Roadway Parameter	Suburban Neighborhood Community Arterial	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 25,000	14,000 to 18,000
Desired Operating Speed	30 to 35 mph	40 to 45 mph posted speed limit 45 to 51 mph measured 85th percentile speeds
Lane Width	10' to 12'	11'
Shoulder Width	4' to 8'; or 5' to 6' Bike Lane	2' to 10'
Median	12' to 18' for center turn lane; or 6' to 8' for pedestrians	N/A
Sidewalk Width	5'	5'+ where provided
Sidewalk Buffer	6'	5'+
Major Intersection / Signal Spacing	1,320'	1,500'
Driveway/Access Spacing	400'	400'+ in most locations; 150' to 200' in a few locations

Capacity Analyses

The signalized intersections within this Character Area operate at acceptable levels of service. However, though not apparent in reviewing the overall levels of service, stop-controlled approaches at several intersections experience significant delay, resulting in LOS D, LOS E or LOS F. Specifically, the intersections with Devonshire Heights Road, Red Top Road and Canal Street all have deficiencies along the side-street approach to Route 39.

Refer to Table 3-21 for the results of the capacity analyses for Character Area 6. Intersections with deficient movements are highlighted in red text. (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix G for the capacity analysis of

existing traffic conditions and Appendix O for a more detailed breakdown of the existing Levels of Service.

Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
22	Route 39 / Manor Drive (SE)	A	A
23	Route 39 / Green Hill Road	A	A
24	Route 39 / Devonshire Heights Road	A	A
25	Route 39 / Red Top Road	A	A
26	Route 39 / Grandview Road	C	C
27	Route 39 / Hanover Street	A	A
28	Route 39 / Canal Street	A	A

Safety Audit

During review of Character Area 6, a crash trend involving more than two vehicles, was apparent at the following intersections:

- Intersection 22 – Route 39 and Manor Drive (SE)
 - Rear-end crash trend present in the northbound direction
 - This is a result of vehicles waiting to make a northbound left turn movement and could be avoided by the installation of a left turn lane along Route 39
- Intersection 28 - Route 39 and Canal Street
 - Significant trend of angled crashes in the eastbound and westbound direction all involved a northbound or southbound through movement
 - Significant one or more vehicle accidents via head-on collisions or by hitting fixed objects
 - Crash types typically susceptible to correction by alternate traffic control (ie, traffic signal or roundabout)

Potential trend locations are also shown on the Existing Crash Analysis exhibit in Appendix H. Note that public feedback and additional areas of safety concern are included in this Appendix. No pedestrian incidents were reported within Character Area 6.

Non-Motorized Mobility

As the corridor transitions from rural to suburban residential development incorporates a system of sidewalks and shared use paths that run parallel with a majority of Route 39 in Character Area 6, particularly in the southern portion. Some commercial land uses make it desirable to use non-motorized mobility if designated pedestrian facilities are provided with a buffer from the roadway. This provides a safety factor for the pedestrian. There are a few connections missing along portions of Route 39 that make non-motorized travel into Hershey challenging. Refer to Appendix I for Exhibits of existing sidewalk locations.

There are shared-use paths available for bicycle use for much of the southern portion of the corridor, though there are some missing gaps. The shoulders lack consistency through Character Area 6 and there are several locations where shoulders are narrow and a shared-use path is not present, making bicycle mobility throughout the corridor challenging. Refer to Appendix J for exhibits of existing bicycle-friendly accommodations.

Though there is sidewalk provided within several residential neighborhoods in Character Area 6, the secondary collector roadway system provides minimal, if any, sidewalk and bicycle accommodations.

Public/Alternate Transit Facilities

There are no public transit routes available currently in this Character Area. Please refer to Appendix K for more exhibits depicting the locations of public transit routes within the study area.

Additional Considerations

Access Management: There are isolated locations along this portion of Route 39 where non-residential driveways on both sides of the roads are closely spaced. Access management should be a point of consideration during future development and redevelopment activities to consolidate driveways and encourage shared access points.

Center Left Turn Lane: The public expressed a desire for a center left turn lane along Route 39, especially north of Shetland Drive. This need is further supported by the crash data, which indicates several rear-end accidents involving vehicles waiting to turn left. A center turn lane, in conjunction with properly spaced driveway access points, would increase the safety and traffic flow along this corridor and may also keep bicyclists safer within the shoulder areas (where provided).

Speeding: Speeding is a public concern along secondary roadway network, specifically along N Hoernerstown Road and Sand Beach Road, which run parallel to Route 39 and provide connection to Hershey. This is of particular concern along the secondary roadway system that does not provide pedestrian/bicycle accommodations and has substandard horizontal and vertical curve geometry. As noted in the Navigation Apps discussion earlier in the chapter, Hershey events can result in increased traffic along the secondary roadway system, especially along Sand Beach Road and Hoernerstown Road as both of these routes can provide alternate access into Hershey.

Sight Distance: Noted intersections with limited sight distance were field viewed by the Project Team in order to determine the best action of resolution to improve visibility issues at each intersection. Refer to Appendix H for pictures of the deficient sight distance locations. Sight distance limitations were identified at the following locations:

- Route 39 and Devonshire Heights Road
- Route 39 and Red Top Road
- Sand Beach Road and S Meadow Lane

Limited Access Bypass: Several members of the public expressed the desire for a limited-access highway to bypass both Route 39 and Route 743 to connect I-81 to Hershey and potentially the Pennsylvania Turnpike and PA 283 further south. Though outside the scope of this study, this connection would significantly alter the type and volume of traffic within Character Area 6. Such an improvement would be quite costly and unlikely to occur in the near-term; however, the costs/benefits should be evaluated to determine if this connection is cost-efficient and worthwhile.

Character Area 7

Character Area 7, located entirely in East Hanover Township, includes 3.4 miles of Route 743 from the Derry Township Line to Route 22. This rural portion of Route 743 is a two-lane highway that primarily serves agricultural land and a few residential developments. Similar to Character Area 6, this portion of Route 743 is the other primary connection between I-81 and Hershey, making it susceptible to traffic volume fluctuations during Hershey events. Additionally, Route 743 provides access to an industrial portion of Derry Township, adding truck traffic to the highway between I-81 and the industrial uses in Derry Township. Within Character Area 7, Route 743 is classified as a Rural Community Arterial.

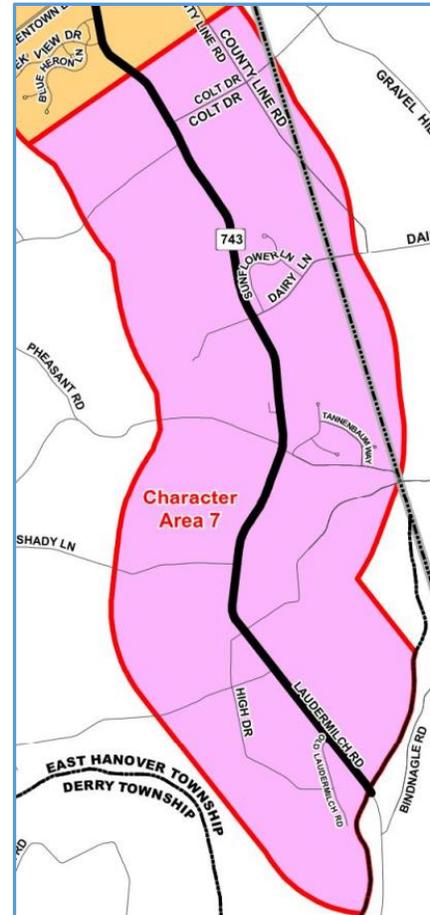


Figure 3-7

Geometric Evaluation

Segment	Length	Description	Limits
C7.1	3.38	2-Lane Highway	Swatara Creek / Derry Township Line to Route 22
Total	3.38		

Character Area 6 is comprised of one lane in each direction – left turn lanes are not provided at any intersection south of Route 22. Typical design values for a Suburban Neighborhood Community Arterial are provided in Table 3-23, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in **red text**.

Table 3-23: Existing Roadway Conditions Summary - Character Area 7		
Roadway Parameter	Rural Community Arterial	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 25,000	13,000
Desired Operating Speed	35 to 55 mph	45 to 55 mph posted speed limit 51 to 53 mph measured 85th percentile speeds
Lane Width	11' to 12'	11' to 12'
Shoulder Width	8' to 10'	3' to 4'
Median	4' to 6'	N/A
Sidewalk Width	N/A	N/A
Sidewalk Buffer	N/A	N/A
Major Intersection / Signal Spacing	1,540'	2,000'+
Driveway/Access Spacing	400'	400'

Capacity Analyses

Capacity analyses within Character Area 7 were not included as part of this study.

Safety Audit

The review of Character Area 7 crash history reports shows no significant crash trends or potentials for trend development. Though not qualifying as a “trend”, there were several crashes noted at the intersection of Route 743 and Earlys Mill Road, generally involving a vehicle exiting Earlys Mill Road. Causation factors include limited sight distance at the intersection as well as travel speeds along Route 743. Refer to the Existing Safety Analysis exhibits in Appendix H for more information on public feedback and emerging crash trend locations.

Non-Motorized Mobility

There is no sidewalk present along Route 743 in rural East Hanover Township.

Shoulders that may accommodate bicyclists in Character Area 7 are disjointed within the Character Area, with widths varying from 3' to 4'. Due to the amount of truck traffic and limited shoulder widths along Route 743, bicyclists do not currently often use this route to travel. As noted in Table 3-23, this type of roadway should normally provide a minimum 8' shoulder, which would provide for safer non-motorized travel. Refer to Appendix J for exhibits of existing bicycle-friendly accommodations.

The secondary roadway network provides minimal sidewalk and bicycle accommodations.

Discussions with East Hanover Township has indicated a desire to improve the Township's trail system to better accommodate leisurely pedestrians and bicycle traffic. Through separate effort, the Township has completed the East Hanover Township Master Trail Plan, which has extensive recommendations for bicycle and pedestrian accommodations throughout the Township. Refer to Appendix I for exhibits of existing sidewalk in the Route 743 corridor. Implementation of shared use paths will comply with the Master Trail Plan developed by East Hanover Township.

Public/Alternate Transit Facilities

There are no public transit routes available currently in Character Area 7.

Additional Considerations

Unsignalized Intersections: Though not specifically analyzed, public comment has indicated several unsignalized intersections are difficult to traverse, especially for a vehicle entering Route 743 from a stop sign on the side street. This is compounded when there are increased traffic volumes along Route 743 due to a Hershey event. The side street approaches within Character Area 7, however, do not have enough traffic volume to warrant signalization.

Sight Distance: Noted intersections with limited sight distance were field viewed by the Project Team in order to determine the best action of resolution to improve visibility issues at each intersection. Refer to Appendix H for pictures of the deficient sight distance locations. Sight distance limitations were identified at the following locations:

- Route 743 and Colt Drive
- Route 743 and S Meadow Lane
- Route 743 and Dairy Lane
- Route 743 and Earlys Mill Road
- Route 743 and E Canal Road

Roundabouts: The Township and residents have indicated a desire for roundabouts along the Route 743 corridor. Several unsignalized intersections currently experience operational issues due to the volume and speed of traffic along Route 743, limited sight distance, and lack of turn lanes. These intersections do not satisfy the warrants for signalization. Roundabouts can be an effective alternative to improve side street access while calming traffic along Route 743.

Sand Beach Road: Sand Beach Road generally runs parallel to Route 743 and can provide alternate connection into Hershey. Sand Beach Road has portions with substandard horizontal and vertical geometry, as well as portions with narrow shoulders, which pose problems for pedestrians, bicyclists and vehicular travel. Traffic volumes along Sand Beach Road have doubled over the past decade, with a current ADT of approximately 2,200 vehicles per day. While there is a truck restriction posted along Sand Beach Road between Route 22 and Hersheypark Drive (trucks with trailers greater than 30' prohibited), Sand Beach Road has 4% truck traffic, which may indicate a need for better enforcement. Particularly with the increased use of navigational apps with real-time traffic data, Sand Beach Road has experienced drastic increase in traffic volume during Hershey events.

Warning Signing: The public has indicated a need for increased signing along Route 743 and Sand Beach Road. While a detailed sign inventory was not completed as part of this project, a further evaluation would be prudent to evaluate locations where signs could be added, or existing signage could be enhanced (ie, conspicuity plaques, reflective signs/posts). Additionally, overhead warning signs with flashing lights could be considered at key intersections where sight distance is limited.

Speeding: Speeding is a public concern along Route 743 and Sand Beach Road. As shown in Table 3-23, the speed data collected as part of this study did not indicate a large variation between the speed limit and actual travel speeds along Route 743. However, further evaluation may be prudent to determine if there are localized portions of the roadway where speeds are increased. Speeding is of particular concern in Character Area 7 as the roadway system does not provide pedestrian/bicycle accommodations and has substandard horizontal / vertical curve geometry and sight distance limitations. As noted in the Navigation Apps discussion earlier in the chapter, Hershey events can result in increased traffic along both roadways, exacerbating speed concerns. It may be appropriate to work with PennDOT for consideration of establishing a "Highway Safety Corridor" for the purpose of decreasing speeds with the risk of double fines for speeding.

Limited Access Bypass: Several members of the public expressed the desire for a limited-access highway to bypass both Route 39 and Route 743 to connect I-81 to Hershey and potentially the Pennsylvania Turnpike and PA 283 further south. Though outside the scope of this study, this connection would significantly alter the type and volume of traffic within Character Area 7. Such an improvement would be quite costly and unlikely to occur in the near-term; however, the costs/benefits should be evaluated to determine if this connection is cost-efficient and worthwhile.

Character Area 8

Character Area 8, located entirely in East Hanover Township, includes 2.7 miles of Route 743 / Bow Creek Road from Route 22 to Mountain Road (Route 443). The State Route 743 designation ends at Jonestown Road; between Jonestown Road and Mountain Road, Bow Creek Road is Township-owned. This portion of Bow Creek Road provides connections between US Route 22, the I-81 interchange, and Hollywood Casino. Within Character Area 8, Bow Creek Road varies from a Suburban Corridor Community Collector (south of I-81) and a Rural Community Collector (north of I-81).

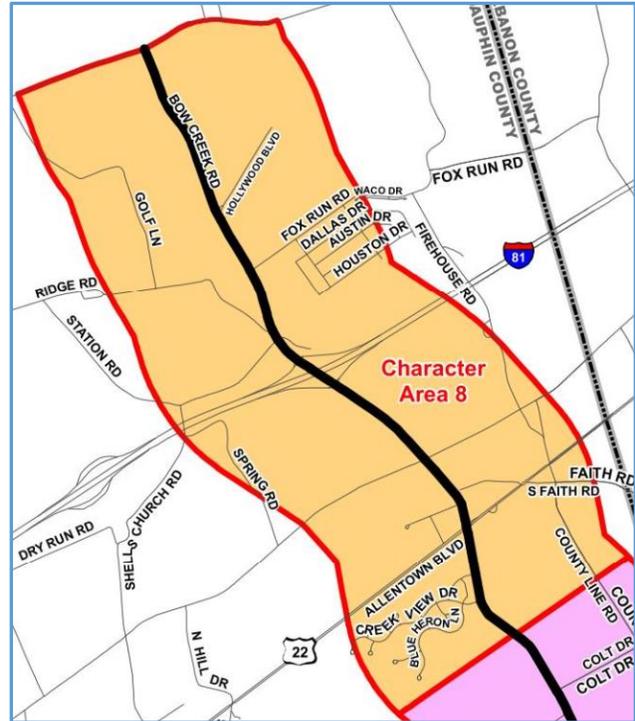


Figure 3-8



Geometric Evaluation

Segment	Length	Description	Limits
C8.1	2.69	2-Lane Highway	Route 22 to Mountain Road (Route 443)
Total	2.69		

Within Character Area 8, Bow Creek Road is generally a two-lane roadway, widened with left turn lanes at Route 22, the Sheetz driveway, and the I-81 interchange. Due to the drastic change in roadway function and character north and south of the I-81 interchange, this character area was further separated into two different land use contexts and roadway typologies. South of I-81, PennDOT classifies the region as suburban and the roadway functions as an arterial, warranting the designation as a Suburban Corridor Community Collector. North of I-81, the region is more rural and the roadway functions as a collector, classifying as a Rural Community Collector. Typical design values for these roadway types are provided in Tables 3-25 and 3-26, with a comparison to the actual existing conditions along the roadway. Noteworthy deficiencies are highlighted in red text.

Table 3-25: Existing Roadway Conditions Summary - Character Area 8 (South of I-81)		
Roadway Parameter	Suburban Corridor Community Arterial	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 25,000	13,000
Desired Operating Speed	35 to 50 mph	40 to 45 mph posted speed limit 47 mph measured 85th percentile speeds
Lane Width	11' to 12'	11'
Shoulder Width	8' to 10'; or 5' to 6' Bike Lane	4' to 10'
Median	12' to 18' for center turn lane; or 6' to 8' for pedestrians	Not present
Sidewalk Width	5' to 6'	Not present
Sidewalk Buffer	5' to 10' grass area	N/A
Major Intersection / Signal Spacing	1,320'	1,500'
Driveway/Access Spacing	400'	100' to 400'

Table 3-26: Existing Roadway Conditions Summary - Character Area 8 (North of I-81)		
Roadway Parameter	Rural Community Collector	
	Design Values	Existing Conditions
Daily Traffic Volume (ADT, veh per day)	5,000 to 15,000	10,000
Desired Operating Speed	35 to 55 mph	40 mph posted speed limit 46 to 48 mph measured 85th percentile speeds
Lane Width	11' to 12'	11'
Shoulder Width	4' to 8'	10'
Median	N/A	N/A
Sidewalk Width	N/A	N/A
Sidewalk Buffer	N/A	N/A
Major Intersection / Signal Spacing	1,540'	1,500'
Driveway/Access Spacing	200'	100' to 200'

Capacity Analyses

All intersections in Character Area 8 are operating at acceptable Levels of Service. Refer to Table 3-23 for the overall results of the capacity analyses. See Appendix G for the capacity analysis of existing traffic conditions and Appendix O for a more detailed breakdown of the existing Levels of Service.

Table 3-23: Overall Level of Service Summary - Character Area 8			
Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
29	Route 743 / Route 22 (Allentown Blvd)	B	B
30	Route 743 / Jonestown Road	A	A
31	Route 743 / I-81 NB Ramps	A	B
32	Route 743 / I-81 SB Ramps	B	A
33	Route 743 / Mountain Road (Route 443)	A	A

Safety Audit

During review of Character Area 8, a crash trend involving more than two vehicles, was apparent at the following intersection:

- Intersection 29 - Route 743 and Route 22 (Allentown Boulevard)
 - A number of angled crashes occurred in the turn lanes of this intersection
 - Primarily in the northbound and westbound directions
 - Consider left turn arrows for northbound and southbound approaches

Emerging crash trend locations and additional areas of safety concern are shown on the exhibit in Appendix H. No pedestrian incidents were recorded from the crash history data retained.

Non-Motorized Mobility

Similar to Character Area 7, there is very little sidewalk present along Bow Creek Road, though the Bow Creek residential development includes sidewalk. Refer to Appendix I for exhibits of existing sidewalk in the Route 743 corridor.

Shoulders within Character Area 8 are generally sufficient to accommodate bicycle traffic, though there is a small portion south of Jonestown Road where the shoulders are inadequate for bicycle use.

Discussions with the East Hanover Township has indicated a desire to improve the Township's trail system to better accommodate leisurely pedestrians and bicycle traffic. Through separate effort, the Township has completed the East Hanover Township Master Trail Plan, which has extensive recommendations for bicycle and pedestrian accommodations throughout the Township. Refer to Appendix I for exhibits of existing sidewalk in the Route 743 corridor. Implementation of shared use paths will comply with the Master Trail Plan developed by East Hanover Township.

Public/Alternate Transit Facilities

The only public transit route passing through Character Area 8 is for the Lebanon Area Transit, Commute King – Express Service to Harrisburg. Refer to Appendix J for an exhibit showing the corridor public transit routes.

Additional Considerations

Access Management – As noted in Table 3-25, portions of Bow Creek Road have substandard driveway spacing, particularly just south of the I-81 Interchange. As development/redevelopment occurs in the Interchange area and extending southward toward Jonestown Road and Route 22., driveways should be consolidated or eliminated to achieve the desired driveway spacing. A center left turn lane should also be considered in this area in order to separate turning movement from through movements.

Route 22 and Sand Beach Rd: Operational concerns were noted at the intersection of Route 22 and Sand Beach Road, specifically requesting consideration for alternate traffic control to improve side street access and pedestrian mobility/crossings. This intersection should be evaluated for potential signalization or roundabout.

Chapter 4: Future Land Use Projections

Introduction

While the existing land uses on or around Route 39 and 743 were studied, it is important to project what they will look like in order to properly analyze future traffic conditions. To properly plan and project future land uses within the study area, sites that had the most potential to undergo significant land use change were focused on. These “Future Land Use Hot Spots” were most probable to impact each corridor’s character areas and traffic conditions.

To identify these Future Land Use Hot Spots, the following several factors were considered:

- If a subdivision or land development plan has been under review at the local municipality or has been approved.
- If an area within local comprehensive plans has a future land use that differs from the existing land use.
- If an area is along or within close proximity of the corridor where land development or redevelopment is likely to occur.

All Future Land Use Hot Spots that were derived from the third factor above were selected through an independent process which considered proximity to corridor, availability of public sewer and water, and environmental constraints. All Future Land Use Hot Spots were confirmed through individual municipal meetings with representatives from the Townships over the course of September and October 2018. Refer to Map 4 for an overall map with all Future Land Use Hot Spots.

Character Area 1

Based on current zoning requirements, buildout conditions were projected for each Future Land Use Hot Spot. With the existing zoning, the Future Land Use Hot Spots located in Character Area 1 is projected to yield 41 new residential units and approximately 90,000 square feet of non-residential land. These values are shown below in Table 4-1.

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
1	Susquehanna	33	
30	Susquehanna	8	
31	Susquehanna		90,000

The Future Land Use Hot Spots associated with the proposed residential subdivisions and land developments were also analyzed where some of the Future Land Use Hot Spots had increased density utilizing the existing zoning ordinance or a new zoning designation was proposed. The proposed zoning changes are based on information obtained from the local comprehensive plan, public feedback provided as part of the Corridor Study, market trends and existing zoning district densities. Table 4-2 shows that with the proposed zoning amendments, the Future Land Use Hot Spots in Character Area 1 could produce 195 residential units and approximately 30,000 square feet of non-residential land.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
1	Susquehanna	Urban Infill	40**	30,000 **
30	Susquehanna	Open Space	50	
31	Susquehanna	Vertical MF	105	

** Redevelopment Site

Character Area 2

The land development projects in Table 4-3 reflect the Future Land Use Hot Spots in Character Area 2 that are either approved or officially planned. The table shows that these hot spots account for approximately 1,088 acres with 1,613 residential units and 493,130 S.F. non-residential growth.

Future Land Use Hot Spot	Acreage	Description	Municipality	Residential Units	Non-residential Square Feet
2	59.60	Susquehanna Union Green	Susquehanna	272	312,200
5	306.65	Blue Ridge Village	Lower Paxton	425	82,630
17	313.00	Autumn Oaks	Lower Paxton	200	
19	149.00	Traditions of America	Lower Paxton	267	
20	244.00	Stray Winds Farm	Susquehanna/ Lower Paxton	449	
21	13.00	Forest Hills Commons	Lower Paxton		68,300
28	2.8	Custer Development	Susquehanna		30,000

The Future Land Use Hot Spots projected with the existing zoning in Character Area 2 are shown on Table 4-4. It is shown that 717 residential units, along with 190,000 square feet of non-residential land is anticipated for this character area under current zoning restrictions.

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
3	Susquehanna		40,000
4	Susquehanna/Lower Paxton	160	150,000
6	Lower Paxton	257	
29	Susquehanna	300	

With the proposed zoning amendments, the Future Land Use Hot Spots are projected to yield 980 residential units and 245,000 square feet of non-residential land in Character Area 2. These values are shown below in Table 4-5 along with the proposed zoning classification of each Future Land Use Hot Spot.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
3	Susquehanna	Urban Infill		40,000
4	Susquehanna/Lower Paxton	Office Building and Multi-Family	180	120,000
6	Lower Paxton	Retirement Community w/Commercial	500	85,000
29	Susquehanna	Multifamily	300	

Character Area 3

The Future Land Use Hot Spots in Character Area 3 are projected to include 208 residential units under current zoning restrictions. No new non-residential areas are projected for this character area from the Future Land Use Hot Spots. These values can be seen in Table 4-6.

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
7	Lower Paxton	35	
8	Lower Paxton	143	
18	Lower Paxton	30	

The Future Land Use Hot Spots in Character Area 3 are projected to produce 285 more (493 total) residential units with the zoning amendments desired by the municipality. There are no new non-residential areas projected with proposed zoning amendments. These figures are shown on Table 4-7.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
7	Lower Paxton	Low Density	35	
8	Lower Paxton	Village	428	
18	Lower Paxton	Cluster	30	

Highlighted Hot Spots represent locations where the municipality indicated a desire for rezoning to facilitate development; however, rezoning these parcels is not recommended due to traffic impact.

As noted in Chapter 6 (Potential Mitigation), intensive development in this Character Area (outside of the Village Frontage) is not desired due to traffic impacts within the Village Area. As such, the rezoning to promote development of Future Land Use Hot Spot 8 is not recommended.

Character Area 4

Table 4-8 shows the planned Winslett and Brookview developments are anticipated to produce 110 new residential units, covering roughly 61.5 acres, within Character Area 4. These two developments are not expected to produce any non-residential expansion.

Future Land Use Hot Spot	Acreage	Description	Municipality	Residential Units	Non-residential Square Feet
22	43.56	Winslett	West Hanover	66	
23	17.96	Brookview	West Hanover	44	

Using existing zoning classifications, the Future Land Use Hot spots in Character Area 4 that are not officially planned yet are anticipated to yield 243 residential units. These Future Land Use Hot Spots are not expected to produce and non-residential growth, which can be seen in Table 4-9.

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
9	Lower Paxton	145	
10	Lower Paxton	47	
35	West Hanover	51	

With the zoning amendments suggested by the municipality, these Future Land Use Hot Spots are projected to produce over double the amount of residential units (562 total) than the existing zoning would allow. Just as the existing zoning hot spot projections show, no new non-residential is anticipated in this character area with the potential re-zoning. The projected zoning figures for Character Area 4 are shown in Table 4-10.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
9	Lower Paxton	R-1	385	
10	Lower Paxton	R-1	126	
35	West Hanover	Residential Low Density	51	

Highlighted Hot Spots represent locations where the municipality indicated a desire for rezoning to facilitate development; however, rezoning these parcels is not recommended due to traffic impact.

As noted in Chapter 6 (Potential Mitigation), intensive development in this Character Area (outside of the Village Frontage) is not desired due to traffic impacts within the Village Area. As such, the rezoning to promote development of Future Land Use Hot Spots 9 and 10 are not recommended.

Character Area 5

At the start of the study process, the only officially planned development in Character Area 5 was the Reserve at Manada Hills. Table 4-11 shows that this development will cover 41.75 acres and contain 200 residential units with 5,000 square feet of non-residential growth. We note that since the study has commenced, a portion of property located at 7600 Linglestown Road has been rezoned and a 1.1 MSF warehouse is planned (known as the “Prologis Warehouse”). Though not directly included in the analysis, this warehouse is anticipated to generate approximately 160

peak hour trips, including 20-35 peak hour truck trips. This development is not anticipated to change the results or recommendations of this study, but should be considered with future rezoning or development applications.

Future Land Use Hot Spot	Acreage	Description	Municipality	Residential Units	Non-residential Square Feet
24	41.75	The Reserve at Manada Hills	West Hanover	200	5,000

The Future Land Use Hot Spots in Character Area 5 that have not been officially planned yet are shown in Table 4-12. These developments are primarily expected to be non-residential. Under current zoning ordinances, these 5 developments are expected to produce 300 residential units and just over 750,000 square feet of non-residential land usage.

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
11	West Hanover		650,000
34	West Hanover		11,200
37	West Hanover		50,000
38	West Hanover	300	
39	West Hanover		40,000

Table 4-13 displays that the proposed zoning amendments for Character Area 5 are very similar to the existing zoning with the exception of there being more industrial land usage planned. While the number of residential units are expected to be the same, the non-residential growth is anticipated to almost double with the proposed zoning amendments.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
11	West Hanover	Warehousing		650,000
34	West Hanover	Commercial		11,200
37	West Hanover	Commercial		50,000
38	West Hanover	Residential Medium Density	300	
39	West Hanover	Industrial		750,000

Character Area 6

Character Area 6 has 2 developments that are officially planned (shown in Table 4-14). These two developments combined are being planned to produce 512 new residential units with 46,000 square feet of non-residential area and will cover just under 146 acres.

Future Land Use Hot Spot	Acreage	Description	Municipality	Residential Units	Non-residential Square Feet
12	125.50	Fowler Development	West Hanover	260	46,000
15	20.20	The Crossings At Hershey	South Hanover	252	

The Future Land Use Hot Spots within Character Area 6 that are not being officially planned yet are primarily expected as residential units. Using existing zoning guidelines, these hot spots are projected to produce 495 residential units and 35,000 square feet of non-residential land uses. The values are shown in Table 4-15.

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
13	South Hanover	248	
14	South Hanover	37	
26	West Hanover	210	25,000
36	West Hanover		10,000

It can be shown in Table 4-16 the proposed zoning amendments will allow slightly more residential growth in this character area than the zoning permits. With new zoning, these hot spots are expected to yield 636 residential units and only 30,000 square feet of non-residential area.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
13	South Hanover	Residential Cluster	248	
14	South Hanover	Single Family Detached	148	
26	West Hanover	Neighborhood Commercial	240	20,000
36	West Hanover	Commercial		10,000

Character Area 7

While no developments are officially being planned for Character Area 7, there is one Future Land Use Hot Spot that is anticipated. Under the existing zoning ordinances, this development would produce 30 residential units and no non-residential area (shown in Table 4-17).

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
33	East Hanover	30	

It can be seen in Table 4-18, with the proposed zoning amendments, this Future Land Use Hot Spot would only produce 3 residential units and no non-residential growth.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
33	East Hanover	Effective Ag	3	

Character Area 8

Like Character Area 7, there are no developments officially being planned in Character Area 8. With the existing zoning restrictions, there are 2 Future Land Use Hot Spots anticipated for this character area. Table 4-19 shows that these developments are expected to produce 25 residential units and 500,000 square feet of non-residential growth.

Future Land Use Hot Spot	Municipality	Residential Units	Non-residential Square Footage
27	East Hanover	25	
32	East Hanover		500,000

Table 4-20 shows a significant change in land use with the proposed zoning amendments within this character area. While it is still expected to add 25 residential units, a Future Land Use Hot Spot is anticipated to include a redevelopment effort that would remove 330 residential units and add 120,000 square feet of non-residential growth under the proposed interchange commercial zoning. Zoning amendments in Character Area 8 are also projected to allow the construction of 2,000,000 square feet of non-residential area that falls under industrial land use.

Future Land Use Hot Spot	Municipality	Proposed Zoning Classification	Residential Units	Non-residential Square Footage
16	East Hanover	Interchange Commercial	-330	120,000**
27	East Hanover	Residential Medium Density	25	
32	East Hanover	Industrial		2,000,000

** Redevelopment Site

Overall Corridor Future Hot Spot Comparison

To check the reasonableness of the land use projections and market needs, we compared the housing projections to Tri-County Regional Planning Commission (TCRPC) residential projections. TCRPC projects an additional 4,286 housing units for the corridor municipalities from 2020 to 2040. Note that these projections are for the entire municipality, not specifically the Route 39 / 743 corridor nor the identified study area. Presumably, some of the projected residential demand would be satisfied in locations within the Township outside the study area. Table 4-21 shows the breakdown of projected household units by municipality.

Geographic Area	Census		Projections			Increase
	2000	2010	2020	2030	2040	2020-2040
Susquehanna Twp.	9,187	10,825	11,522	12,095	12,397	875
Lower Paxton Twp.	18,584	20,085	21,257	22,324	23,447	2,190
West Hanover Twp.	2,502	3,742	4,195	4,578	4,881	686
South Hanover Twp.	1,706	2,351	2,631	2,867	3,054	423
East Hanover Twp.	1,966	2,226	2,283	2,346	2,395	112
Total	33,945	39,229	41,888	44,210	46,174	4,286

Source: Tri-County Planning Commission

The projected residential units identified within the Future Land Use Hot Spots were compared to the TCRPC projections. Tables 4-23 provides a corridor-wide summarized comparison per municipality and Table 4-22 provides the comparison per Hot Spot. As shown in Table 4-23, the existing zoning provides sufficient opportunity to support the projected residential development within the corridor as a whole (4,286 total housing units). The recommended rezoning provides additional flexibility for the specific location of the residential development. Even though rezoning within Hot Spots 8, 9 and 10 is not recommended, the projections indicate there will be an adequate opportunity to satisfy the residential demand within Lower Paxton Township at locations that are less impactful to the corridor traffic.

Table 4-22: TCRPC Projections vs. Future Land Use Hot Spot Projection Comparisons					
Township	TCRPC 20-year Projected Units	Future Land Use Hot Spot	Potential Residential Units within Hot Spots		
			Existing Zoning	Zoning Suggested by Municipality	Recommended Zoning
Susquehanna Township		1	33	40	40
Susquehanna Township		2	272	272	272
Susquehanna Township		4	90	60	60
Susquehanna Township		20	65	65	65
Susquehanna Township		29	300	300	300
Susquehanna Township		30	8	50	50
Susquehanna Township		31		105	105
Susquehanna Township	875		768	892	892
Lower Paxton Township					
Lower Paxton Township		4	90	60	60
Lower Paxton Township		5	425	425	425
Lower Paxton Township		6	257	500	500
Lower Paxton Township		7	35	35	35
Lower Paxton Township		8	143	428	143
Lower Paxton Township		9	145	385	145
Lower Paxton Township		10	47	126	47
Lower Paxton Township		17	200	200	200
Lower Paxton Township		18	30	30	30
Lower Paxton Township		19	267	267	267
Lower Paxton Township		20	384	384	384
Lower Paxton Township	2190		2023	2840	2236
West Hanover Township					
West Hanover Township		12	260	260	260
West Hanover Township		22	65	65	65
West Hanover Township		23	44	44	44
West Hanover Township		24	200	200	200

Township	TCRPC 20-year Projected Units	Future Land Use Hot Spot	Potential Residential Units within Hot Spots		
			Existing Zoning	Zoning Suggested by Municipality	Recommended Zoning
West Hanover Township		26	210	240	240
West Hanover Township		35	51	51	51
West Hanover Township		38	300	300	300
West Hanover Township	686		1130	1160	1160
South Hanover Township		13	248	248	248
South Hanover Township		14	37	148	148
South Hanover Township		15	252	252	252
South Hanover Township	423		537	648	648
East Hanover Township		27	25	25	25
East Hanover Township		33	30	3	3
East Hanover Township	112		55	28	28
Regional Corridor Totals	4,286		4,513	5,568	4,964

Highlighted Hot Spots represent locations where the municipality indicated a desire for rezoning to facilitate development; however, rezoning these parcels is not recommended due to traffic impact.

Municipality	TCRPC 20-Year Projected Units	Potential Residential Units within Hot Spots	
		Existing Zoning	Recommended Zoning
Susquehanna Township	875	768	892
Lower Paxton Township	2190	2023	2236
West Hanover Township	686	1130	1160
South Hanover Township	423	537	648
East Hanover Township	112	55	28
Regional Corridor Totals	4,286	4,513	4,964

Chapter 5: Future Transportation Capacity Analysis

Introduction

One of the goals of this study is to determine what improvements may be necessary to accommodate future traffic projections along both Route 39 and 743 corridors. In order to properly assess future conditions along both of these corridors, several factors must be taken into account. When comparing existing conditions to future conditions, factors such as growth rates, future land use projections, and new or re-development are used in determining what future traffic volumes will look like. Once these factors have been incorporated into the study, proper future analyses were performed and assisted in determining what improvements may be needed to provide acceptable Levels of Service along Route 39 and 743.

Traffic Forecasting

Traffic volumes were forecasted to 2040 by growing the existing volumes, adding traffic from approved developments, and adding traffic from projected developments and future land uses. For the projected developments, analysis was completed assuming projections under the existing zoning restrictions, as well as with the zoning conditions suggested by each municipality. Traffic volumes along the state routes were grown by PennDOT's growth rate to account for the general growth of traffic not attributable to any particular development. The PennDOT traffic growth rate for Dauphin County that was used is 0.54%, which was from the 2017-2018 growth year. Due to the large study area and number of developments specifically included within the traffic projections, the background growth rate was reduced to 0.27% and utilized for study intersections south of the I-81 interchange area. No growth rate was applied to existing traffic volumes to and from local roads or private developments as any of these additional volumes will be accounted for in future development trips. Future traffic volumes from new developments within the study area are accounted for using Trip Generation, Trip Distribution, and Trip Assignment.

We note that several factors may impact the future traffic volume projections; actual future conditions should be monitored and evaluated prior to implementing the potential mitigation. Some factors that may impact the long-range traffic volume projections include:

- “Demand-side” strategies
- Long-term effects of COVID-19
- Mobile navigation applications
- Autonomous vehicles
- I-81 to PA Turnpike connection (East of Hershey)
- Transit enhancements
- Significant variations from future land use assumptions

Trip Generation

To forecast the additional traffic generated by approved developments and projected future developments, trip generations were calculated using the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10th Edition*. For proposed future developments that already have a Traffic Impact Study, the trip generation for the development was taken directly from the study.

Primary trips and pass-by trips both were calculated for developments as applicable. A primary trip is defined as a trip from an origin, to a destination, and back to the origin. Pass-by trips are defined as trips made by users that make a trip to the development while in route to their destination. Thus, pass-by trips do not add to the overall traffic in the study area, but merely redirect a portion of the existing traffic volume into development driveways. Pass-by trip reductions were applied to future developments if pass-by rates were provided in the ITE's *Trip Generation Handbook, 3rd Edition*. Pass-by trips are typical for restaurants, coffee shops, banks, etc. Land uses that do not have pass-by trips include residential land uses, office buildings, warehouses, etc. Future development trip generations are summarized in Appendix L.

Trip Distribution and Assignment

Distribution and assignment of trips that were being generated from developments with approved Traffic Impact Studies were taken directly from those studies. Anticipated traffic volumes from projected future developments were distributed throughout the roadway network using a model based on existing traffic volumes and surrounding population/employment centers.

The roadway network was set up graphically using Synchro Version 10 and includes Route 39 from Front Street to Canal Street, Route 743 from Route 22 to Mountain Road, and all intersecting roads at each study intersection. The trip distribution and assignment of future developments is summarized in Appendix M.

Future Roadway Network

Throughout the comprehensive study of Route 39 and 743, new roadway connections have been considered. Though none of these proposed connections connect directly to Route 39 or 743, they could produce some benefits for both corridors. Exhibits depicting some of these potential roadway connections can be found in Appendix P.

- Potential connections of Continental Drive could keep some traffic off of Route 39 in some areas of Susquehanna Township and Lower Paxton Township. These proposed connections have been suggested from Progress Avenue to Forrest Hills Drive and from Patton Road to Parkway West. This would allow vehicles traveling north on Progress Avenue to access surrounding residential neighborhoods and Blue Mountain Parkway without having to drive along Route 39.
 - Note: While this link would provide convenience to neighborhood residents to traverse east-west without using Route 39, this link would not provide a material decrease in traffic volumes along Route 39; improvements identified along Route 39 are recommended for consideration with or without this connection.

- An extension of Hayshed Road from Route 39 to Red Top Road would help alleviate the projected failing eastbound movement at the intersection of Red Top Road and Route 39.
 - Note: This connection would eliminate the need to make a left turn movement from Red Top Road onto Route 39. In lieu of the potential improvements identified in Chapter 6, the intersection of Route 39 and Red Top Road could be modified to implement left turn restriction(s) if this connection to Hayshed Road is completed.
- Providing alternate access to Orchard Road would provide better connectivity between East, West, and South Hanover. The proposed connections would either be to extend Orchard Road to Sand Beach Road or connect Orchard Road to Shetland Drive.
 - Note: This connection improves connectivity and emergency access; however, it will not have a material effect on the traffic volumes along Route 39.
 - Note: Prior to pursuing alternate access to Orchard Road, we recommend extensive community input from the residents and business owners that access via Orchard Road. Though there are numerous advantages to provide alternate access, this could also have negative impacts on the community. Additional outreach and education are recommended.

Capacity Analyses of Future Traffic Conditions

Once traffic volumes and projected land uses for 2040 were established, intersection capacity analyses were performed for all study intersections. While using SYNCHRO for the analysis of all study intersections, HCM 2010 results were used in determining each intersections Level of Service (LOS) and delay during the peak AM and PM hours of a typical weekday. It should be noted that HCM 6th Edition and SimTraffic results were also used for analyses pertaining to roundabouts. A description of Levels of Service is provided in Chapter 3 - Existing Transportation Assessment. All projected future capacity analyses can be found in Appendix N.

Character Area 1

Several intersections within Character Area 1 are projected to have deficient movements without roadway improvements, with generally longer delays in the PM peak hour compared to the AM peak hour. Deficiencies are generally projected along the side street approaches to enter Route 39, both at signalized and unsignalized intersections.

Refer to Table 5-1 for the overall capacity analyses results for future traffic conditions with the municipally-suggested zoning and without roadway improvements. Intersections with deficient movements are highlighted in **red text** (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix N for the capacity analysis of future traffic conditions and Appendix O for a more detailed breakdown of the individual movement Levels of Service.

Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
1	Route 39 / Front Street	B	C
2	Route 39 / N 6th Street	C	F
3	Route 39 / Eastbound Route 322 & Industrial Road	C	D
4	Route 39 / Westbound Route 322	A	A
5	Route 39 / Fargreen Road	B	B
6	Route 39 / Deer Path Road	B	C
7	Route 39 / Crooked Hill Road	B	B

Character Area 2

Several intersections within Character Area 2 are projected to have deficient movements without roadway improvements, with generally longer delays in the PM peak hour compared to the AM peak hour. With the intersection at Progress Avenue is currently being upgraded, the worst levels of service are projected at the Sturbridge Drive, Oakhurst Boulevard and Colonial Road intersections.

Refer to Table 5-2 for the overall capacity analyses results for future traffic conditions with the municipally-suggested zoning and without roadway improvements. Intersections with deficient movements are highlighted in red text (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix N for the capacity analysis of future traffic conditions and Appendix O for a more detailed breakdown of the individual movement Levels of Service.

Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
8	Blue Mountain Commons	A	B
9	Progress Avenue	C	D
10	Sturbridge Drive	A	E
11	Oakhurst Boulevard	B	C
12	Crums Mills Road	B	C
13	Dover Road / Versailles Road	A	A
14	Forest Hills Drive / Ringneck Drive	A	A
15	Colonial Road	C	E
16	Patton Road	C	B

Character Area 3

The two roundabouts within Character Area 3 are projected to have deficient movements without roadway improvements. Due to the geometric constraints with expanding the roundabouts, the analysis was conducted using alternate methods, specifically HCM 6th Edition methodology and a SimTraffic simulation. All three methodologies indicated deficient movements at the roundabouts under projected future conditions. The projected delays are significantly higher at the Mountain Road intersection.

Refer to Table 5-3 for the overall capacity analyses results for future traffic conditions with the municipally-suggested zoning and without roadway improvements. Intersections with deficient movements are highlighted in red text (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix N for the capacity analysis of future traffic conditions and Appendix O for a more detailed breakdown of the individual movement Levels of Service.

Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
17	Route 39 / Blue Mountain Parkway West & Pennsylvania Avenue	C	D
18	Route 39 / Mountain Road	F	F
19	Route 39 / Balthaser Street	A	A

Character Area 4

Both study intersections within Character Area 4 are projected to operate at acceptable levels of service without roadway improvements.

Refer to Table 5-4 for the overall capacity analyses results for future traffic conditions with the municipally-suggested zoning and without roadway improvements. Intersections with deficient movements are highlighted in red text (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix N for the capacity analysis of future traffic conditions and Appendix O for a more detailed breakdown of the individual movement Levels of Service.

Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
20	Route 39 / Piketown Road	C	B
21	Route 39 / Manor Drive (NW)	A	A

Character Area 5

There are no study intersections within Character Area 5, therefore, no capacity results are available for this character area.

Character Area 6

Several intersections within Character Area 6 are projected to have deficient movements without roadway improvements, with most unsignalized intersections experiencing long side street delays. Additionally, the signalized intersection analysis at Grandview Drive yields deficient levels of service along both the Grandview Drive and southbound Route 39 approaches.

Refer to Table 5-5 for the overall capacity analyses results for future traffic conditions with the municipally-suggested zoning and without roadway improvements. Intersections with deficient movements are highlighted in red text (Note: movements may be deficient even though the overall level of service is acceptable). See Appendix N for the capacity analysis of future traffic conditions and Appendix O for a more detailed breakdown of the individual movement Levels of Service.

Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
22	Route 39 / Manor Drive (SE)	A	A
23	Route 39 / Green Hill Road	A	A
24	Route 39 / Devonshire Heights Road	D	F
25	Route 39 / Red Top Road	C	D
26	Route 39 / Grandview Road	E	D
27	Route 39 / Hanover Street	A	B
28	Route 39 / Canal Street	A	F

Character Area 7

There are no study intersections within Character Area 7, therefore, no capacity results are available for this character area.

Character Area 8

The study intersections within Character Area 8 are projected to operate at acceptable levels of service without roadway improvements.

Refer to Table 5-6 for the overall capacity analyses results for future traffic conditions with the municipally-suggested zoning and without roadway improvements. Intersections with deficient movements are highlighted in red text. See Appendix N for the capacity analysis of future traffic conditions and Appendix O for a more detailed breakdown of the individual movement Levels of Service.

Table 5-6: Overall Level of Service Summary - Character Area 8			
Intersection Number	Intersection	AM Peak Hour	PM Peak Hour
29	Route 743 / Route 22 (Allentown Blvd)	C	C
30	Route 743 / Jonestown Road	A	B
31	Route 743 / I-81 NB Ramps	B	B
32	Route 743 / I-81 SB Ramps	B	A
33	Route 743 / Mountain Road (Route 443)	A	A

Chapter 6: Potential Mitigation

Overview

As detailed in Chapter 1, three primary study objectives were identified at the onset of the study:

- **Objective 1:** Identify capacity and/or safety needs and potential mitigating measures along the Route 39 and 743 corridors.
- **Objective 2:** Evaluate surrounding land uses and zoning and prepare recommendations to ensure future development does not compromise the integrity of the transportation network.
- **Objective 3:** Evaluate the surrounding secondary roadway network to determine opportunities for improvement to provide a cohesive roadway network, safely and efficiently supporting land uses within the corridor. Identify if an improved secondary roadway system would alleviate congestion and other concerns along the Route 39 and Route 743 corridors.

Further, through the community outreach and visioning process, the following factors were considered with utmost importance:

- Reduce congestion and delay
- Improve safety and efficiency
- Provide for multimodal activity, especially bicycles and pedestrians
- Improve access management by limiting unsignalized access points
- Improve secondary roadway system
- Improve interconnectivity
- Preserve the functionality and character of the Linglestown Village
- Effectively accommodate traffic between I-81 and Hershey
- Ongoing business activity
- Establish a consistent community theme
- Sustainable transportation recommendations to support growth
- Strategic implementation plan
- Ongoing collaboration between regional stakeholders

To carry out the goals and objectives of this study, potential mitigation efforts were evaluated. The suggested mitigating improvements were developed to address concerns and desires expressed by the five municipalities, input provided by the public, and/or to address the existing / projected deficiencies detailed in Chapter 3 and Chapter 5.

The potential mitigation recommendations in this chapter were made to allow traffic to efficiently move about these corridors with future conditions, increase safety for vehicles, pedestrians and bicycles, and provide better connectivity for pedestrian and bicycle facilities throughout this entire study area. It is vital that the involved municipalities work together with County and PennDOT planning agencies to further evaluate and implement the potential mitigating measures.

Limitations

As noted in Chapter 1, factors outside the scope of this study will likely impact future traffic patterns and transportation needs. Prior to the implementation of the larger mitigating improvements, planning partners should assess the actual transportation system needs and balance against factors such as environmental responsibility, property impacts, funding limitations, etc. Specifically, due to evolving transportation issues and trends and their unknown effect on long range regional transportation planning, several items should be further considered prior to implementing the potential mitigation. These include:

- “Demand-side” strategies
- Long-term effects of COVID-19
- Mobile navigation applications
- Autonomous vehicles
- I-81 to PA Turnpike connection (East of Hershey)
- Environmental impacts
- Private property impacts
- Transit enhancements
- Significant variations from future land use assumptions

Future Land Use Considerations

The assignment of land uses to specific parcels within the Route 39 and 743 corridors is a local land use decision based on local priorities and market conditions. The strategies included in this chapter present a suite of development typologies and best practices for each Character Area for municipalities to consider. The typologies include basic information about land uses, densities and intensities and specific development standards. They also integrate thoughtful guidance on land use design and planning, while considering the long-term impact on the transportation network. Specific recommendations for each Character Area are detailed later in the chapter; general considerations for each Character Area are summarized in Table EC-2 in the Executive Summary.

Access Management Considerations

An effectively implemented access management plan provides a safer roadway network with less congestion. As detailed in PennDOT Publication 574, studies show that crash rates increase and travel speed decreases as driveway density increases. Some of the additional benefits of access management include:

- Fewer vehicular crashes
- Fewer traffic delays
- Safer walking routes due to fewer conflict points and pedestrian refuges/medians
- Safer bicycle routes due to fewer conflict points and improved predictability
- Improved community appearance and attractiveness

Some access management principles that are applicable to the Route 39 and Route 743 corridors are described as follows:

- **Limit number of driveways:** Discourage, restrict, or prohibit multiple driveways for the same property or development. If a property abuts Route 39/Route 743 and another roadway, access should be restricted to the side street, with consideration to a right-in/right-out driveway along Route 39/Route 743 depending on site conditions. Encourage joint or cross-access driveways to serve multiple properties through a single driveway.
- **Access Spacing:** Spacing between traffic signals is critical for vehicle queuing, proper development of turn lanes, and traffic progression. New, signalized access points should adhere to the minimum spacing suggested in Table 6-1. Likewise, spacing between driveways can greatly affect the safety of a roadway. Driveways on opposite sides of the road should generally be aligned or meet the minimum separation distance from Table 6-1. Driveway spacing is especially critical in locations with a two-way center left turn lane, as mis-aligned or closely spaced driveways can result in driver confusion and head-on, sideswipe and/or rear-end crashes within the center turn lane.

Character Area	Township	Driveway Spacing	Major Intersection / Signal Spacing
1	Susquehanna	400'	1,320'
2	Susquehanna and Lower Paxton	400'	1,320'
3	Lower Paxton	200'	660' to 1,320'
4	Lower Paxton and West Hanover	200'	1,540'
5	West Hanover	400'	1,320'
6	West Hanover and South Hanover	400'	1,320'
7	East Hanover	400'	1,540'
8	East Hanover	400' (south of I-81)	1,320' (south of I-81)
		200' (north of I-81)	1,540' (north of I-81)

- **Driveways near traffic signals:** New driveways should not be permitted within the functional area of an intersection unless no other reasonable access is available. The “functional area” of a signalized intersection includes the area where approaching drivers are making the decision about the upcoming intersection/traffic signal; accordingly, the functional area includes the vehicle queues, turn lanes and tapers, and immediately downstream from a signal. Driveways within the functional area can lead to issues as drivers are negotiating the intersection and turn lanes, and ingress/egress traffic from a driveway can be unexpected. Driveways should also be prohibited or left turns restricted where traffic signal queues may block the driveway or impede sight distance. If a property has access to a signalized intersection from the side-street approach, direct access onto Route 39/Route 743 should be restricted or prohibited.

- Driveway definition: Driveways should be well-defined and clear to motorists, bicyclists, and pedestrians. Driveways should be limited in width and provide an adequate throat for exiting queues. Providing a proper radius helps facilitate smooth ingress and egress movements. A well-defined driveway limits vehicular conflicts, as well as providing a clear point of conflict for bicyclists and pedestrians.

Roundabout Considerations

There are two roundabouts along the Route 39 corridor (in Linglestown/Character Area 3). These roundabouts function well, though they are a bit smaller than other roundabouts in the area. There is significant public interest in creating more roundabouts along both the Route 39 and Route 743 corridors. The popularity of roundabouts continues to rise as the benefits they provide are becoming more apparent. Roundabouts are often used as an alternative to signalized or stop-controlled intersections.

Roundabouts provide benefit to intersection safety, delay, environmental impacts, and maintenance costs. Unlike traffic signals, there are no defined warrants for a roundabout since they result in minimal delay during off-peak times; accordingly, they can be a useful tool to improve side street access at lower-volume locations. However, they can also be useful treatments at intersections that do meet traffic signal warrants. Per PennDOT Publication 578, roundabouts provide approximately 30% more capacity during peak hours compared to a traditional signalized intersection.

Safety benefits of roundabouts are well documented. Roundabouts can have a traffic calming effect within a portion of a corridor, as demonstrated within Linglestown Village. Traffic within a roundabout is generally traveling slower and crashes are typically less-severe compared to stop-controlled or signalized intersections. All traffic entering a roundabout turns right, which reduces the number of conflict points. Additionally, pedestrians crossing a roundabout do not have to negotiate turning traffic and roundabout design provides a center refuge area, meaning pedestrians only need to look one direction for vehicle conflicts, usually only crossing one lane of traffic at a time. Per PennDOT Publication 578, studies have shown the following safety benefits of roundabouts, compared to signalized intersections:

- 90% reduction in fatal crashes
- 75% reduction in injury crashes (both those involving serious and minor injuries)
- 30-40% reduction in pedestrian crashes
- 10% reduction in bicycle crashes

Roundabouts generally require more right-of-way at the intersection, compared to signalized intersections, but often require less right-of-way along the approaches to the intersection as turn lanes are not required for roundabouts. Roundabouts can be used within a signalized corridor; however, these should be analyzed closely and implemented cautiously – queuing from signals into roundabouts can affect or prohibit traffic flow from all approaches into the roundabout.

There were several intersections within the study area where roundabouts were considered, based on input from the public or municipality. The following summarizes the findings and whether they may be an appropriate treatment to pursue further.

Table 6-2: Roundabout Considerations

Character Area	Township	Intersection	Candidate for Roundabout?	Considerations
1	Susquehanna	Route 39 and N 6th St	No	Roundabout not recommended due to proximity to other signalized intersections and queuing concerns
2	Susquehanna	Progress Ave and Thea Dr	Yes	Consider roundabout in lieu of signalization to improve side street access
2	Susquehanna	Route 39 and Oakhurst Blvd	No	Roundabout not recommended due to proximity to other signalized intersections, queuing concerns, and physical constraints
2	Lower Paxton	Route 39 and Forest Hills Dr / Ringneck Dr	Yes	Consider a multi-lane roundabout with removal of existing signal; ensure queuing from adjacent signals does not interfere with roundabout
2	Lower Paxton	Route 39 and Parkway West	Yes	Candidate for roundabout to improve side street access
3	Lower Paxton	Route 39 and Colonial Club Dr	Yes	Candidate for roundabout to improve side street access
7	East Hanover	Route 743 and Colt Dr	Yes	Candidate for roundabout to improve side street access and help traffic calming along Route 743
7	East Hanover	Route 743 and S Meadow Ln	No	Roundabout not recommended due to physical constraints
7	East Hanover	Route 743 and Dairy Ln	Yes	Candidate for roundabout to improve side street access and help traffic calming along Route 743
7	East Hanover	Route 743 and Earlys Mill Rd	Yes	Candidate for roundabout to improve side street access and help traffic calming along Route 743
7	East Hanover	Route 743 and E Canal Rd	Yes	Candidate for roundabout to improve side street access and help traffic calming along Route 743
8	East Hanover	Bow Creek Rd and Fox Run Rd	Yes	Candidate for roundabout in lieu of signalization to improve side street car and truck access
8	East Hanover	Route 22 and Sandbeach Rd	Yes	Candidate for roundabout to improve side street access and better accommodate pedestrian trail crossing of Route 22

Limited Access Bypass Considerations

As a part of other transportation planning efforts in the Harrisburg region, a new limited access freeway could be considered from Route 283 to I-81 with an interchange on the PA Turnpike I-76. This new freeway connection would provide more direct access for Hershey event and seasonal traffic and reduce traffic volumes along both Route 39 and Route 743, particularly in Character Areas 6, 7 and 8. This connection would also improve overall regional connectivity.

This freeway could possibly be located near the Dauphin and Lebanon County boundary. While the impacts of this connection are outside the scope of this study, a new freeway would have inter-regional effects on traffic. The potential roadway improvements in this study may need to be reevaluated if a new limited access roadway gains traction.

Traditionally, an investment of this magnitude would involve the Long Range Planning process through HATS. However, other planned freeway improvements already underway (I-81 widening) will likely preclude federal funding for this concept for an extended time. However, this concept could be advanced through a Public-Private Partnership (P3) initiative. Local agencies should work together with Tri-County Regional Planning Commission to evaluate the benefits of this connection, as well as consideration to the project impacts and costs.

Character Area 1

Susquehanna Township

Character Area 1 Overview

Character Area 1 contains two distinct landscapes; the Front Street Corridor west of Route 322 and Neighborhood Corridor east of Route 322. The Front Street Corridor provides adequate bicycle and pedestrian facilities, with an off-road multi-use path that connects with the Capital Greenbelt. The roadway section in this portion is generally acceptable, though one potential mitigating measure includes signalization and a dedicated left turn lane at the N 6th Street intersection. Improved highway lighting is also suggested in this area.

The Neighborhood Corridor, from Route 322 to Crooked Hill Road is recommended to be widened to provide two through lanes in each direction. Additionally, a median is suggested in this portion to restrict left turns, except for major intersections. This median can provide a pedestrian refuge at crossing locations. Frontage or service roads can be provided for access to individual parcels, while minimizing number of access locations. Sidewalk is recommended along at least the north side of Route 39 with bike lanes in both directions through this area.

Land Use Approach

This Character Area is mostly (93%) developed, with some opportunities for new development or redevelopment. The suggested mitigating transportation improvements will accommodate the additional traffic generated by the development or redevelopment. Suggested modifications to facilitate additional residential development and discourage intensive non-residential development.

The Front Street corridor provides a strong opportunity to co-locate commercial and medium to high-density residential uses for office and neighborhood commercial and walkable residential typologies. The recently adopted Sustainable Susquehanna 2030 Comprehensive Plan prepared for the Township promotes redevelopment the Front Street Area as a destination.

Site and Design Recommendations

Front Street Neighborhood Corridor

- ✓ Encourage setbacks that range from 40 to 60 feet adjacent to Front Street that respect the flood plain.
- ✓ Consider building height bonuses within the Front Street Neighborhood for buildings that provide first floor parking as this will reduce the impacts of flooding and provide a better perspective of the Susquehanna River.
- ✓ Design overall Front Street Neighborhood to be sensitive to the Susquehanna River providing building breaks and streets that terminate to the river.
- ✓ Create shared community open spaces, plazas, or greens that enhance the character of the neighborhoods and provide opportunities for special events.

- ✓ Discourage parking lots within the front yard and provide incentives for parking as part of the building or within the rear of the building.
- ✓ Encourage shared parking lots to reduce space allotted and improve financial feasibility of developments.
- ✓ Encourage connecting parking lots to promote additional capacity within the Corridor.
- ✓ Look to provide public transit structure with a pull-off.

Route 39 Neighborhood Corridor

Maintain low and medium density residential developments aligned with the existing neighborhoods. Encourage low-density neighborhoods that consist of single-family homes or a mix of single-family with attached residential such as townhomes or row homes. The medium density district consisting of townhomes to apartment buildings that incorporate smaller building footprints or multiple floor living conditions.

- ✓ Design neighborhoods with an interconnected street and pedestrian network and limit the use of cul-de-sac streets.
- ✓ Eliminate single residential driveway cuts from the Route 39 Corridor and collector roadway systems stemming from the corridor.
- ✓ Create neighborhood gateways with landscaped curb bump-outs at neighborhood entrances.
- ✓ Promote the use of alleys to create pedestrian blocks that are uninterrupted by driveways.
- ✓ Provide housing options that accommodate a range of economic levels, household sizes, and age groups with densities that range from 1 to 4 units per acre for low density and 1 to 8 dwelling units per acre for medium density neighborhoods.
- ✓ Minimize housing setbacks to 10 to 15 feet from roadways to create a stronger neighborhood connection.
- ✓ Maintain 1 to 2 stories residential building height for low-density neighborhoods and up to 3 stories for medium density neighborhoods.
- ✓ Mark advisory bike lanes on low-volume streets without on-street parking.
- ✓ Combine parking requirements for larger, multi-unit residential developments within the medium density neighborhood.

Potential Roadway Characteristics

The Front Street Corridor transitions from a 5-lane section at the Route 322 interchange to a 3-lane section at Front Street. These travel lanes should be maintained with one modification: the conversion of the second westbound through lane into a dedicated left turn lane along Route 39 at the N 6th Street intersection. The existing multi-use trail adequately accommodates bicyclists and pedestrians along Route 39 and should be maintained. Sidewalk facilities could be expanded to better serve businesses along Front Street.

The Neighborhood Corridor along Route 39 should provide a 4-5 lane cross section, with a median, bike lanes on both sides of the road and sidewalk along then north side. A wide landscaped buffer will complement the landscaped median to increase safety and the reinforce the community appearance. Suggested roadway characteristics are identified in Table 6-3.

Table 6-3: Suggested Roadway Characteristics - Character Area 1 (Neighborhood Corridor)		
Roadway Feature	Recommendation	Notes
Number of Lanes	4-5 lanes	Two through lanes for each direction of travel; Left turn lane at major intersections
Travel Lane Width	11' width	Provide additional 1' offset to median
Shoulder Widths	5' bike lanes	Dedicated bike lane for each direction
Median	Min 6' width	Landscaped median with pedestrian refuge at crossings
Sidewalk	5' width	North side only
Sidewalk Buffer	10' width	Landscaped buffer
Minimum Right-of-Way	100' width	Wider where frontage or service roads are provided

Potential Capacity Mitigation

Table 6-4: Potential Capacity Mitigation - Character Area 1				
Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 & Sixth Street	Susquehanna	Install a traffic signal and restripe Route 39 to provide a westbound left turn lane	\$250k - \$300k	Mid
Route 39 & Industrial Road / Rt 322 EB Ramp	Susquehanna	Add a northbound right turn lane on Industrial Road (currently under construction) Add a southbound right turn from the 322 eastbound ramp	\$200k - \$250k	Mid
Route 39 - Route 322 to Fargreen Road	Susquehanna	Implementation of frontage access roads to divert traffic from Route 39	Redevelopment effort	Long
Route 39 & Fargreen Road	Susquehanna	Widen to add a second through lane in each direction	\$2M - \$2.5M	Long
Route 39 & Deer Path Road	Susquehanna	Widen to add a second through lane in each direction	\$1.5M - \$2M	Long
Route 39 & Crooked Hill Road	Susquehanna	Widen to add a second westbound through lane	\$750k - \$1M	Long

Potential Safety Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 & Front Street	Susquehanna	Restrict northern driveway entrance to the Exxon/Uni-Mart along Front Street Restrict western driveway entrance along Route 39	Property owner cost	Short
Industrial Road	Susquehanna	Improved highway lighting	\$10-\$20k	Mid
Route 39 - US 322 Ramps	Susquehanna	Improved highway lighting	\$10-\$20k	Mid
Route 39 - Crooked Hill to Blue Mountain Commons	Susquehanna	Align driveways on the north and south sides of SR0039 to reduce potential conflicts	Ongoing thru redevelopment efforts	Long
Route 39 – Route 322 to Crooked Hill Road	Susquehanna	Provide center boulevard median	Incorporated with other widening projects	Long

Potential Pedestrian and Bicycle Facility Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Front Street - Route 39 to Parkway Road	Susquehanna	Install sidewalk with grass buffer to the east to allow for pedestrian access to residence, hotel, and riverfront businesses	\$350k - \$450k	Short
Route 39 - Front Street to Sixth Street	Susquehanna	Install shared use path to provide connectivity to other pedestrian-friendly facilities	Currently under construction	Short
Sixth Street - Division St to Route 39	Susquehanna	Install on-road markings/sharrows and signage for shared lane bicycle travel	\$25k - \$50k	Short
Industrial Road - Route 39 to Wildwood Park	Susquehanna	Install shared use path from Route 39 to Wildwood Park Provide crossing at Wildwood Park	Currently under construction	Short
Route 39 - Industrial Road to Crooked Hill Road	Susquehanna	Install designated 5' bicycle lanes on both sides of the Route 39	\$25k - \$50k	Short
Route 39 - Rt 322 to Crooked Hill Road	Susquehanna	Install sidewalk on the north side of Route 39 to provide connectivity to residential neighborhoods, businesses, and Thomas W. Holtzman Elementary School	\$750k - \$1M	Mid
Crooked Hill Road	Susquehanna	Install shoulder improvements to allow for a 5' minimum travel area for bicyclists where sight distance is limited Consider adjusting speed limit to allow for on-road sharrows in Susquehanna Provide connectivity to Route 39, Paxton Church Road and Elmerton Avenue	\$50,000 - \$100,000 per curve	Long

Character Area 2

Susquehanna and Lower Paxton Townships

Character Area 2 Overview

Route 39 should be consistently widened from Progress Avenue to Patton Road to provide two through lanes in each direction and a center left turn lane. The widened roadway will accommodate anticipated traffic volumes under existing zoning or the municipally-suggested zoning. However, the widened roadway is counter-productive to the goal of maintaining low vehicular speeds and accommodating pedestrian/ bicycle traffic. Therefore, additional provisions should be implemented to establish and reinforce the community theme, including bike lanes and sidewalks on both sides of the road.

Pedestrian crossings of Route 39 should be limited to signalized intersections; consistent, high-visibility, treatments should be used for each pedestrian crossing within the character area. East of Patton Road, roundabouts should be considered in lieu of traffic signals at key intersections to facilitate side-street access and help transition vehicle speeds / driver expectations approaching the Village of Linglestown.

Connecting Continental Drive to provide an east-west connection would improve connectivity and provide a convenience for residents north of Route 39. However, this connection would not reduce traffic volumes along Route 39 enough to avoid the need for a widened roadway. Additionally, if there are delays on Route 39 (particularly during a Route 322 incident), motorists may use Continental Drive as a cut-through, which could present speeding and safety concerns, given the residential nature of the roadway.

Land Use Approach

Character Area 2 is largely developed or developing, particularly the western portion. The land use and transportation analyses indicated that the corridor should be widened to consistently provide two through lanes in each direction, west of Patton Road. This widening is anticipated to be required regardless of potential zoning changes. Accordingly, the zoning recommendations for this corridor are geared towards providing a walkable, mixed-use environment.

Site and Design Recommendations

Town Center: The town center area will help to promote a compact, walkable, mixed use, and transit-friendly development.

- ✓ Provide a concentration of vertical mix of uses, with commercial uses on the ground floor and residential and office uses on the higher floors.
- ✓ Limit curb cuts off Route 39 into driveways and parking lots.
- ✓ Develop an internal grid or modified grid street pattern to increase efficiency and connectivity between blocks.
- ✓ All streets should be interconnected and extended to adjacent properties
- ✓ Prioritize pedestrian circulation through the development by providing defined crosswalks, countdown timers, curb bump-outs, and enhanced streetscaping.

- ✓ Encourage streetscape elements that enrich the pedestrian experience by adding seating, visual interest, gathering places, and other public amenities.
- ✓ Require greening elements such as hanging baskets, planters and window boxes can provide a decorative accent and adds to the overall attractiveness of an area.
- ✓ Provide pedestrian walkways through parking lots.
- ✓ Encourage parking to be located within the side or rear of the buildings.
- ✓ Provide plazas or green spaces to encourage both formal and informal community gatherings.
- ✓ Encourage outside dining opportunities both in the front and side yards.
- ✓ Provide flexibility in building siting as most of this area will be infill or regeneration of existing developments but ensure building entrances are adjacent to streets and sidewalks and can be clearly identified with prominent entrances.
- ✓ Design major driveways like intersections with pedestrian amenities.
- ✓ Buildings should have minimal setback from pedestrian amenities.
- ✓ Encourage a range of housing types with higher density mixed in vertically with the building and horizontally along the streetscape.
- ✓ Provide frequent, plentiful, and convenient bike parking and amenities for both visitors and residents.
- ✓ Encourage future fixed bus transit routes with stops connect to the pedestrian network. Design distinctive bus shelters that can add to the art of the streetscape.
- ✓ Allow for on-street parking within the center to promote traffic calming.
- ✓ Provide interior loading/employee parking through an alley network
- ✓ Building heights should not exceed 65 feet. Consider requiring a 10-foot building setback for every story above 35 feet.
- ✓ Develop design standards to be at pedestrian scale with horizontal and vertical articulation.
- ✓ Require 65% of first floor to provide clear windows and 30% on upper floors.

Potential Roadway Characteristics

A consistent 5-lane cross section is suggested for Character Area 2, between Crooked Hill Road and Patton Road, providing two through lanes in each direction and a center left turn lane. East of Patton Road, Route 39 should transition to a 3-lane roadway. Bike lanes should be provided in both directions. Unless required for capacity, right turn lanes should be eliminated to reduce property impact of the widening, reduce pedestrian crossing distance and slow travel speeds. Where right turn lanes are provided, the bike lanes should extend between the right turn lane and the through lane. Suggested roadway characteristics are identified in Table 6-7.

Roadway Feature	Recommendation	Notes
Number of Lanes	3 to 5 lanes	Two through lanes for each direction of travel from Crooked Hill Rd to Patton Rd; Center left turn lane with dedicated left turn lane at major intersections; Consider removal of right turn lanes
Travel Lane Width	11' width	
Shoulder Widths	5' bike lanes	Maintain bike lanes between right turn lane and through lanes
Median	12' Center left turn lane	Provide with proper access spacing
Sidewalk	5' width	Both sides of Route 39
Sidewalk Buffer	5' width	
Minimum Right-of-Way	90' width	Wider where right turn lanes provided

Potential Capacity Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 & Progress Avenue	Susquehanna	Construct a southbound right turn lane; Adjust right turn lanes to include continuous bike lanes through intersection; widen to extend westbound through lane from Sturbridge	\$1M - \$1.5M	Mid
Route 39 & Progress Avenue	Susquehanna	Construct improvements recommended by Susquehanna Union Green: add a second northbound left turn lane and a northbound right turn lane; install median along N Progress Avenue; extend dual eastbound through lanes to Sturbridge Drive	Developer costs; under construction	Short
Route 39 & Sturbridge Drive	Susquehanna	Plan for future access to the north side of the intersection Widen to provide dual thru lanes in each direction; maintain 250' eastbound right turn lane	\$1.5 - \$2M	Long
Route 39 & Oakhurst Boulevard	Susquehanna	Widen to add a second through lane in each direction	\$3M - \$3.5M	Long
Route 39 & Crums Mill Road	Lower Paxton	Install improvements recommended by Blue Ridge Village: construct 4th leg and signalize; construct northbound left turn lane and westbound right turn lane	Improvements recently constructed	Short
Route 39 & Crums Mill Road	Lower Paxton	Widen to add a second through lane in each direction	\$2M - \$2.5M	Long
Route 39 & Versailles Road / Dover Road	Lower Paxton	Widen to add a second through lane in each direction	\$1M - \$1.5M	Long

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 & Forest Hills Drive / Ringneck Drive	Lower Paxton	Widen to add a second through lane in each direction	\$1.5 - \$2M	Long
Route 39 & Colonial Road	Lower Paxton	Construct a 275' northbound right turn lane Construct an additional eastbound and westbound through lane	\$3M - \$3.5M	Long
Route 39 & Woodview / Patton Road	Lower Paxton	Widen to provide a second westbound through lane	\$600k - \$800k	Long

Potential Safety Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Progress Avenue & Paxton Church Road	Susquehanna	Improve vertical geometry at intersection and approaches to gain more sight distance for turning vehicles	\$2M - \$2.5M	Long
Crums Mill Road & McIntosh Road	Lower Paxton	Improve sight distance by clearing and grubbing; maintain regularly as needed	\$10k - \$25k	Short
Colonial Road Route 39	Lower Paxton	Modify driveway locations of 3B Ice Cream and Arooga's to reduce conflict points	\$200 - \$300k; or through redevelopment efforts	Mid
Continental Drive	Susquehanna	Install traffic calming measures to limit cut-through traffic and speeding	\$25k - \$200k	Short
Colonial Road to Continental Drive	Lower Paxton	Install traffic calming measures to reduce speeding	\$25k - \$200k	Short
Colonial Road & Sheetz driveway	Lower Paxton	Improve sight distance by clearing vegetation	\$10k - \$25k	Short
Colonial Road & Crestview Road	Lower Paxton	Improve sight distance by clearing vegetation and grading to the north on either side of the roadway Further improve sight distance with utility pole relocations	\$75k - \$100k	Mid
McIntosh Road	Lower Paxton	Install traffic calming measures to reduce speeding	\$25k - \$200k	Short
McIntosh Road & Colonial Road	Lower Paxton	Improve sight distance by clearing vegetation and grading to the north on either side of the roadway; Further improve sight distance by re-profiling Colonial Road to the north	\$1M - \$1.5M	Long

Potential Pedestrian and Bicycle Facility Mitigation

Table 6-10: Potential Pedestrian and Bicycle Facility Mitigation - Character Area 2				
Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 - Entire Character Area 2	Lower Paxton	Install designated 5' bicycle lanes on both side of the Linglestown Road (Route 39)	\$75k - \$100k	Long
Route 39 - Crooked Hill Road to Patton Road	Lower Paxton	Install sidewalk on both sides of the roadway to provide connectivity to other pedestrian-friendly facilities	\$4M - \$5M	Mid
Paxton Church Road - Crooked Hill Road to Crums Mill Road	Susquehanna	Install shoulder improvements to allow for a 5' minimum travel area for bicyclists; Provide connectivity to existing shared use paths installed for residential connectivity Provide necessary signage	\$3M - \$4M	Long
Progress Avenue - Route 39 to I-81	Susquehanna	Install 5' designated bicycle lanes in the northbound and southbound directions	\$100k - \$125k	Mid
Progress Ave - Route 39 to Paxton Church Road	Susquehanna	Provide sidewalk on the east side of Progress Avenue	Partial developer funded; remaining \$500k - \$750k	Mid
Progress Ave - Paxton Church Road to Elmerton Avenue	Susquehanna	Provide sidewalk on both sides of Progress Avenue	\$2.5M - \$3.5M	Long
Crums Mill Road - Route 39 to Paxton Church Road	Lower Paxton	Construct shoulders to facilitate bicycles	\$1M - \$1.5M	Mid
Crums Mill Road - Route 39 to Paxton Church Road	Lower Paxton	Install sidewalk on east side of roadway for connectivity to residential developments and shared use paths at Stray Winds	\$750k - \$1M	Mid
Colonial Road - Route 39 to Crums Mill	Lower Paxton	Install 5' designated bicycle lanes in the northbound and southbound directions	\$100k - \$125k	Mid
Colonial Road - just north of Route 39	Lower Paxton	Install missing gap of sidewalk on east side of roadway	\$100k - \$200k	Short
Colonial Road to Continental Drive	Lower Paxton	Provide on-road markings to allow bicyclists adequate connectivity to Linglestown Road (SR0039) from Continental Drive	\$10k - \$20k	Short
Colonial Road - Route 39 to McIntosh Road	Lower Paxton	Install sidewalk on west side of roadway for connectivity to residential developments and shared use paths at Stray Winds	\$750k - \$1M	Mid
McIntosh Road - near Colonial Road	Lower Paxton	Provide connectivity from recommended designated bicycle facilities along Colonial Road to the residential shared use paths	\$125k - \$175k	Short
Patton Road - just north of Route 39	Lower Paxton	Install missing gap of sidewalk on both sides of roadway	\$500k - \$600k	Mid

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 at Fairway Lane	Lower Paxton	Widen right turn lane to provide bike lane between turn lane and through lane	\$75k - \$100k	Mid
Route 39 - Patton Road to Blue Mountain Parkway	Lower Paxton	Install sidewalk on portions of the north or south sides of Route 39 to provide connectivity to Linglestown Village, residential developments, businesses, attractions/amenities	\$1M - \$1.5M	Mid

Other Potential Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Continental Drive	Susquehanna/ Lower Paxton	Consider benefits of connectivity following additional residential development (Progress Avenue to Forest Hills Drive and Patton Road to Parkway West)	\$10M - \$12M	Long
Crums Mill Road	Lower Paxton	Provide horizontal and vertical geometry improvements, shoulder improvements to improve sight distance around curves	Varies based on specific improvement locations	Long
Colonial Club Drive	Lower Paxton	Provide horizontal and vertical geometry improvements, shoulder improvements to improve sight distance around curves	Varies based on specific improvement locations	Long
Doehne Road	Susquehanna/ Lower Paxton	Consider pavement improvements	\$200k - \$250k	Mid/Long

Character Area 3

Lower Paxton Township

Character Area 3 Overview

The Linglestown Village area within Character Area 3 is a well-designed multi-modal roadway that can accommodate vehicle flow as well as bicycle and pedestrian traffic. In most locations within the Village, buildings are located close to the roadway, immediately behind sidewalk, which reinforces the Village character and helps calm traffic. However, these buildings restrict the practicality of widening the roadway or roundabouts. Accordingly, the existing roadway footprint is a constraint which must be considered when contemplating new development or zoning/land use decisions. Significant development within Character Area 3 and 4 may detrimentally impact the capacity and function of the two existing roundabouts.

Land Use Approach

Traffic intensive development within Character Area 3 should be discouraged in order to preserve the functionality of the roundabouts within the Village of Linglestown. Modest residential development may be supported, as well as low-intensity retail development within the Village. The suggested site and design recommendations include site features that generally support these types of land use. Traffic volumes and capacity within the Village should be a focus as nearby development occurs.

Site and Design Recommendations

Village Center: The village center is an area that contains a variety of residential uses and a variety of low intensity commercial and institutional uses in small traditional buildings.

- ✓ Look to enhance the pedestrian circulation network by filling gaps in the existing sidewalk network
- ✓ Require parking to be located within the side or rear of the building. If parking is located on the side of the building it must be effectively screened through a combination of wall, fence, or landscaping.
- ✓ Connect all non-residential parking lots to reduce the amount of traffic along Route 39.
- ✓ All commercial buildings should provide doors and windows facing streets and parking areas.
- ✓ To create more open space within new Village development a minimum of 20% needs to be set aside for open space with half of the total located within the middle of the development on a common green or landscaped median.
- ✓ Provide opportunity for non-residential buildings on the first floor with residential on upper floor.
- ✓ Village Center neighborhoods should have smaller lot sizes with buildings close to each other to promote walkability.
- ✓ Village density should not exceed six dwelling units per acre.
- ✓ Building setbacks should match the existing building street lines or an average of the buildings on the front street.
- ✓ Require green space in the front yards to discourage development to completely pave it.

- ✓ Residential housing types should be mixed within developments rather than segregated into different areas.
- ✓ All new streets created within the Village center is to be interconnected with an existing or modified street grid.
- ✓ Consider requiring pitched roofs to building styles to promote more of a village character.
- ✓ Non-residential uses should not exceed 7,000 square feet in building footprint size.

Potential Roadway Characteristics

Significant roadway alterations are not suggested within the Village of Linglestown, as much of the area functions well under existing conditions. The Village itself could be enhanced with additional bicycle provisions, such as “Bikes May Use Full Lane” signs and in-road sharrows to increase driver awareness of potential bike traffic.

West of the Village, a roundabout should be considered at the western gateway (Colonial Club Drive) to improve side street access. This may also be an appropriate location to transition from a 45-mph speed limit (west of Colonial Club Drive) to a 35-mph speed limit (from Colonial Club Drive to Blue Mountain Parkway); this portion is currently 45 mph before abruptly dropping to 25 mph approaching the Blue Mountain Parkway roundabout. Traffic calming features could also be considered, such as narrower lanes, bump outs and the aforementioned roundabout.

Bike lanes should be provided along both sides of Route 39 west of Route 39. As development occurs, sidewalk should also be installed along at least one side of Route 39. East of the Village, a shared-use path may be more practical to accommodate both pedestrian and bicycle traffic, as narrow shoulders and utility conflicts would make bike lanes and sidewalk challenging. Suggested roadway characteristics are identified in Table 6-12.

Table 6-12: Suggested Roadway Section - Character Area 3 (Outside of Village Area)		
Roadway Feature	Recommendation	Notes
Number of Lanes	2 to 3 lanes	Two lanes east of the Village; Three lanes with center left turn lane west of the Village
Travel Lane Width	10' width	Reduced lane width to slow speeds approaching Village
Shoulder Widths	5' bike lanes	
Median	12' center left turn lane	Provide with proper access spacing
Sidewalk	5' width	North side of Route 39
Sidewalk Buffer	5' width	
Minimum Right-of-Way	80' width	

Potential Capacity Mitigation

To preserve the function and character of the Linglestown Village Center, capacity improvements are not feasible or desirable. Widening the roundabouts for multi-lane use are not practical and rebuilding the intersections with traffic signal and turn lanes is not desired. **Accordingly, development surrounding the Linglestown Village Center and east of the Village (Character Areas 3 and 4) should be discouraged.** Significant development will negatively impact traffic flow within the Village without the ability to add capacity.

Potential Safety Mitigation

Table 6-13: Potential Safety Mitigation - Character Area 3				
Location	Municipality	Description	Cost Estimate	Prioritization
N Mountain Road & Blue Ridge Avenue	Lower Paxton	Improve sight distance by clearing vegetation and grading to the north and south; further improve sight distance with re-profiling of N Mountain Road to the south	\$600k - \$800k	Long
Wenrich Street	Lower Paxton	Provide horizontal and vertical geometry improvements	Varies based on specific improvement locations	Long

Potential Pedestrian and Bicycle Facility Mitigation

Table 6-14: Potential Pedestrian and Bicycle Facility Mitigation - Character Area 3				
Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 - Linglestown Village	Lower Paxton	Implement on-road markings / sharrows and signing to direct bicyclists through the village and roundabouts	\$10k - \$15k	Short
Blue Mountain Parkway	Lower Paxton	Provide on-road markings to allow bicyclist adequate connectivity to/from Linglestown Road (SR0039) and off-road shared use path	\$5k - \$10k	Short
Blue Mountain Parkway - Route 39 to St Thomas Blvd	Lower Paxton	Install sidewalk along one side to connect residential development to Route 39	\$300k - \$500k	Mid
N Mountain Road	Lower Paxton	Install 5' designated bicycle lanes in the northbound and southbound direction from Linglestown Road (Route 39) to north of I-81 ramps	\$75k - \$100k	Mid
Mountain Road - Route 39 to I-81	Lower Paxton	Install sidewalk along both sides of roadway	\$1.5M - \$2.5M	Long
Blue Ridge Ave - Mountain Road to Piketown Road	Lower Paxton	Install sidewalk along one side of roadway	\$1.5M - 2M	Long
Blue Ridge Ave - Mountain Road to Piketown Road	Lower Paxton	Install on-road pavement markings / sharrows	\$20k - \$30k	Short

Character Area 4

Lower Paxton and West Hanover Townships

Character Area 4 Overview

This Character Area is more rural in nature, currently 54% undeveloped. As discussed in Character Area 3, significant development should be discouraged due to traffic impacts and physical constraints within the Linglestown Village. A shared-use path should be provided through much of the Character Area to facilitate bike traffic and occasional pedestrian usage.

Land Use Approach

Intensive development within Character Area 4 should be discouraged; further, the municipalities may consider changes to the existing zoning for decreased development intensity.

Site and Design Recommendations

Low Density Neighborhood: Promote walkable low-density neighborhoods that consist of single-family homes or a mix of single-family with attached residential such as townhomes or row homes.

- ✓ Design neighborhoods with an interconnected street and pedestrian network and limit the use of cul-de-sac streets.
- ✓ Eliminate single residential driveway cuts from the Route 39 and collector roadway systems stemming from the corridor.
- ✓ Create neighborhood gateways with landscaped curb bump-outs at neighborhood entrances.
- ✓ Provide housing options that accommodate a range of economic levels, household sizes, and age groups.
- ✓ Housing setbacks to 10 to 20 feet from roadways to create a stronger neighborhood connection.
- ✓ Maintain 1 to 2 stories residential building height for low-density neighborhoods.
- ✓ Mark advisory bike lanes on low-volume streets without on-street parking.
- ✓ Work to provide a collector trail system to connect the new developments with the school campus and neighborhood parks.

Potential Roadway Characteristics

Due to the rural character, sidewalk is not necessarily appropriate through much of the corridor. However, there is a demand for bicycle accommodations. Due to the narrow shoulders and utility conflicts, a shared-use path is recommended to accommodate both pedestrian and bicycle traffic through much of Character Area 4. Though narrower than typical for this type of roadway, the 2' shoulder may be acceptable with the off-road bike/pedestrian accommodations. Suggested roadway characteristics are identified in Table 6-15.

Roadway Feature	Recommendation	Notes
Number of Lanes	2 lanes	Left turn lanes at major intersections
Travel Lane Width	11' width	
Shoulder Widths	2'	Provide off-road multi-use trail
Median	N/A	
Sidewalk	8' width	Multi-use trail
Sidewalk Buffer	10' width	
Minimum Right-of-Way	60' width	Wider where turn lanes provided

Potential Capacity Mitigation

As noted in Character Area 3 discussion, significant development within Character Area 4 should be discouraged as it will negatively impact traffic flow within the Linglestown Village Center without the ability to add capacity. There are no anticipated capacity improvements necessary in Character Area 4.

Potential Safety Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Blue Ridge Avenue & Wenrich Street	Lower Paxton	Improve sight distance by clearing vegetation and grading to the west	\$50k - \$75k	Mid

Potential Pedestrian and Bicycle Facility Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 - Balthaser St to Wenrich St	Lower Paxton	Install sidewalk on one side of Route 39	\$500k - \$750k	Mid
Route 39 - Balthaser St to Wenrich St	Lower Paxton	Install on-road markings/sharrows and signage for shared lane bicycle travel	\$5k - \$10k	Short
Route 39 - Wenrich St to Piketown Road	Lower Paxton	Install Shared Use Path along one side of roadway	\$1.5 - \$2M	Mid
Piketown Road - Central Dauphin High School to Blue Ridge Ave	Lower Paxton	Install sidewalk on east side of roadway for connectivity to residential developments, Central Dauphin High School, and shared use paths along Route 39	\$500k - \$750k	Mid
Piketown Road	West Hanover	Provide on-road markings and signage to allow bicyclists adequate connectivity from Blue Ridge Avenue and Jonestown Road; widen shoulders where sight distance is limited	\$20 - \$30k	Short
Route 39 - Walnut Ave to Royal Terrace	West Hanover	Install sidewalk on south side of Route 39 for connectivity to residential developments from Central Dauphin High School and shared use paths	\$400k - \$600k	Mid
Route 39 - Walnut Ave to Manor Drive	West Hanover	Install shoulder improvements to allow for a 5' bike lane	\$750k - \$1M	Long
Route 39 - Manor Drive to Quality Circle	West Hanover	Install shoulder improvements to allow for a 5' bike lane	\$1.5 - \$2M	Long

Character Area 5

West Hanover Township

Character Area 5 Overview

Character Area 5 provides a widened cartway, with a 5-lane cross section in the interchange area. This widened cartway provides increased capacity and opportunities for further development within the Character Area.

Access management is a point of emphasis within this Character Area, as several existing driveways near the interchange are closely spaced. Driveways should be consolidated where practical and joint driveways should be encouraged. Driveway spacing and alignment is particularly critical where a center left turn lane is provided. Additional development is also anticipated at the intersection of Route 22 and Route 39. Care should be taken to ensure access for this development does not interfere with the functional area of the signalized intersection and any new traffic signals are properly spaced.

Due to the close spacing of the existing traffic signals near the interchange, signal progression is especially critical. In the near-term, this corridor should be re-timed. These 5 signals may also be a good candidate for an adaptive traffic signal system; adaptive signal systems can be particularly effective when used at closely spaced, under-capacity intersections.

Land Use Approach

Due to its proximity to the I-81 interchange, this Character Area can support some industrial uses west of the interchange, interchange service facilities near the interchange, and retail uses east/south of the interchange. Zoning changes are suggested to facilitate Interchange Commercial development; however, consideration should be given to the impact on existing residential property owners as well as the environmental and community impacts of rezoning.

Site and Design Recommendations

Interchange Commercial

- ✓ Consolidate driveways to reduce the traffic conflicts off Route 39
- ✓ Encourage abutting commercial property interconnections between parking areas.
- ✓ Delineate pedestrian crosswalks and walkways within landscaped strips.
- ✓ Consider utilizing different paving materials or traffic calming devices within parking lots to reduce speed and increase pedestrian safety.
- ✓ Install landscape berms, walls, or other treatments to reduce the conflict of headlights from parking areas to the drivers along Route 39
- ✓ Provide pedestrian and vehicular access to abutting residential properties to offer relief from having to access commercial properties only through Route 39
- ✓ Require building façade offsets that face public streets to break up the façade.
- ✓ Require access roads from Route 39 for all trucking facilities and distribution centers
- ✓ Any gates associated with truck terminals or distribution centers should be setback to allow stacking to occur on access road not Route 39

Potential Roadway Characteristics

The existing cartway varies from 2-lanes to 5-lanes; the two-lane section between Route 22 and Jonestown Road should be widened to provide a consistent 3-lane section, with the addition of a center left turn lane. Sidewalk should be provided along both sides of the road within the entire Character Area, continuing across the I-81 bridge. Bike lanes should also be provided along both sides of Route 39. In most areas, existing shoulders are wide enough to accommodate the bike lanes; however, they should extend continuously between right turn lanes and through lanes. Suggested roadway characteristics are identified in Table 6-18.

Roadway Feature	Recommendation	Notes
Number of Lanes	3 to 5 lanes	Five lanes in the interchange area; three lanes east and west of the interchange
Travel Lane Width	11' width	
Shoulder Widths	5' bike lanes	Bike lanes should extend between right turn lanes and through lanes, where provided
Median	6' median or 12' center left turn lane	Maintain median in interchange area; Provide 12' center turn lane with proper access spacing
Sidewalk	5' width	Both sides of Route 39 north/west of Jonestown Rd
Sidewalk Buffer	5' width	
Minimum Right-of-Way	100' width	

Potential Capacity Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 - Jonestown Road to Allentown Boulevard	West Hanover	Construct a center left turn lane	\$800k - \$1M	Long

Potential Safety Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 - north of Allentown Boulevard	West Hanover	Improve roadway lighting along the residential neighborhood frontage along Hershey Road	\$75k - \$100k	Mid
Route 39 – N Fairville to Jonestown Rd	West Hanover	Access Management – driveway consolidation	Redevelopment effort	Mid
Mill Road & Allentown Blvd	East Hanover	Improve sight distance by grading and clearing vegetation	\$75k - \$100k	Mid

Potential Pedestrian and Bicycle Facility Mitigation

Table 6-21: Potential Pedestrian and Bicycle Facility Mitigation - Character Area 5				
Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 - Entire Character Area 5	West Hanover	Install designated 5' bicycle lanes on both sides of the Linglestown Road (Route 39)	\$200k - \$250k	Long
Route 39 - Jonestown Road to Manor Drive (SE)	West Hanover	Install sidewalk (where missing) on both sides of Linglestown Road/Hershey Road (Route 39) to provide connectivity	\$2.5M - \$3.5M	Long
Jonestown Road - Allentown Blvd to Sand Beach Road	East Hanover/ West Hanover	Install on-road pavement markings / sharrows to allow connectivity from Allentown Boulevard and Blue Ridge Avenue to Route 39, Horseshoe Trail, Sand Beach Road and Lebanon County	\$50k - \$75k	Short
Allentown Boulevard - Jonestown Road to Sand Beach Road	East Hanover/ West Hanover	Install 5' designated bicycle lanes in both directions	\$120k - \$150k	Mid

Character Area 6

West Hanover and South Hanover Townships

Character Area 6 Overview

Character Area 6 provides a key connection from I-81 to Hershey. As such, traffic volumes can fluctuate greatly before and after Hershey events. Accordingly, maintaining safe and efficient vehicular flow along this corridor is critical. A center left turn lane is recommended throughout the entire Character Area, which will require widening from Route 22 to Shetland Drive. Bike lanes should be provided in both directions of Route 39, north of Shetland Drive. A shared-use path should be provided from Shetland Drive to the Derry Township line; several portions of this path are already in place.

Significant development is anticipated near the Manor Drive intersection; the intersection with Manor Drive should be improved and new accesses near this intersection should not be located within the functional intersection area. As there has been several rear-end accidents along northbound Route 39 at Manor Drive, the installation of a left turn lane at this location should be high priority.

There are sight distance limitations and side-street delays at the intersection of Route 39 and Devonshire Heights Road. Significant reprofiling of Route 39 is recommended to improve the sight distance. Once sight distance is provided, development along Devonshire Heights Road can be encouraged with turn lane widening and signalization of this intersection once warrants are met.

A new roadway connection between Red Top Road and Hayshed Road could improve connectivity and avoid the need for a new traffic signal at the Route 39/Red Top Road intersection. However, this connection would be costly and have significant property and environmental impacts. Further evaluation should be conducted to determine if the benefits of this connection outweigh the costs.

Orchard Road provides sole access to multiple residential dwelling units and a few businesses. It is unusual for such a long road serving so many properties to have only one access in and out; this does not meet current design standards for emergency access purposes. Providing alternate access, for at least emergency vehicles, is recommended. We note that, during the public outreach, some residents voiced concern with providing alternate access. Therefore, prior to pursuing this improvement, we recommend community outreach and education with residents and business owners accessible via Orchard Road to discuss pros and cons of alternate access to confirm whether the community would support this project.

We note that if a limited-access freeway connection comes to fruition between I-81 and Hershey (as discussed earlier in the chapter), the function and character of this roadway would change drastically, and the potential mitigating measures described herein should be re-evaluated.

Land Use Approach

With the suggested mitigating improvements, the transportation system can accommodate additional development within Character Area 6. Some retail development is anticipated along the northern portion of the Character Area, with largely residential development interspersed throughout the entire Character Area.

Site and Design Recommendations

Low to Medium Density Neighborhoods: Promote walkable low-density neighborhoods that consist of single-family homes or a mix of single-family with attached residential such as townhomes or row homes. Medium density district consisting of townhomes to apartment buildings that incorporate smaller building footprints or multiple floor living conditions.

- ✓ Design neighborhoods with an interconnected street and pedestrian network and limit the use of cul-de-sac streets.
- ✓ Eliminate single residential driveway cuts from the Route 39 Corridor and collector roadway systems stemming from the corridor.
- ✓ Create neighborhood gateways with landscaped curb bump-outs at neighborhood entrances.
- ✓ Promote the use of alleys to create pedestrian blocks that are uninterrupted by driveways.
- ✓ Provide housing options that accommodate a range of economic levels, household sizes, and age groups with densities that range from 1 to 8 dwelling units per acre
- ✓ Minimize housing setbacks to 10 to 15 feet from roadways to create a stronger neighborhood connection.
- ✓ Maintain 1 to 2 stories residential building height for low density neighborhoods and up to 3 stories for medium density neighborhoods.
- ✓ Mark advisory bike lanes on low-volume streets without on-street parking.
- ✓ Combine parking requirements for larger, multi-unit residential developments.

Potential Roadway Characteristics

The roadway should be widened, where applicable, to provide a consistent three-lane cross section and bike lanes along both sides of Route 39 north of Shetland Drive. South of Shetland Drive, a multi-use path should be provided to accommodate pedestrians and bicyclists. Suggested roadway characteristics are identified in Table 6-22.

Roadway Feature	Recommendation	Notes
Number of Lanes	3 lanes	Three lanes including center left turn lane
Travel Lane Width	10' width	
Shoulder Widths	4' to 5'	5' bike lanes on both sides north of Shetland Drive; 4' shoulders south of Shetland Drive
Median	12' Center left turn lane	Maintain proper access spacing
Sidewalk	8' minimum width where provided	No sidewalk north of Shetland Drive; Multi-use trail south of Shetland Drive
Sidewalk Buffer	6' width	
Minimum Right-of-Way	80' width	

Potential Capacity Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 & Manor Drive (SE)	West Hanover	Install improvements as required by the Fowler Development, including signalization, left turn lanes along Route 39 and a northbound right turn lane along Route 39	Developer costs	Long
Route 39 - Manor Drive (SE) to Shetland Drive	West Hanover/ South Hanover	Provide center left turn lane	\$5M - \$6M	Mid
Route 39 & Devonshire Heights Road	West Hanover	Install a traffic signal when warranted	\$100k - \$150k	Mid
Route 39 & Red Top Road	West Hanover	Install a traffic signal when warranted (unless Hayshed is extended)	\$300 - \$350k	Mid
Route 39 & Grandview Drive	South Hanover	Install a southbound right turn lane (250' length) Install an eastbound right turn lane (150' length, 50' bay taper)	\$500k - \$750k	Mid
Route 39 & East Canal Street	South Hanover	Install a traffic signal when warranted	\$300 - \$350k	Mid
E Canal Street	South Hanover	Bridge Improvement; Overall Condition rating poor	To be determined	Long

Potential Safety Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Oak Grove Road/ S Hoernerstown Road	West Hanover/ South Hanover	Install traffic calming measures	\$25k - \$200k	Short
Route 39 & Devonshire Heights Road	West Hanover	Improve sight distance with clearing and grubbing and potential sight line obstruction improvement; re-profile Route 39 in both directions to further improve sight distance	\$1M - \$1.5M	Long
Red Top Road	West Hanover/ South Hanover	Improve roadway geometry	Varies based on specific improvement locations	Long
Route 39 & Orchard Road	West Hanover	Improve sight distance looking north by realigning roadway or removing structure and regrading. Intersection radius improvements for better truck access	\$350k - \$500k	Long
Grandview Dr & Union Deposit Rd	South Hanover	Improve sight distance with grading and clearing vegetation	\$10k - \$25k	Short
Grandview Dr & Union Deposit Rd	South Hanover	Consider removal of the wall to increase roadway width	\$300k - \$500k	Mid
Route 39 & North Hanover Street	South Hanover	Remove channelization and add a southbound right turn lane to slow traffic from Route 39 onto North Hanover Street	\$250k - \$350k	Short

Potential Pedestrian and Bicycle Facility Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Route 39 - Allentown Blvd to Shetland Drive	West Hanover/ South Hanover	Widen to provide 5' bike lane along both sides of Route 39	\$3M - \$4M	Long
Manor Drive - Allentown Blvd to Route 39 (SE)	West Hanover	Install sidewalk on one side of the roadway to provide connectivity from Allentown Boulevard to Hershey Road (Route 39)	\$750k - \$1M	Long
Red Top Road	West Hanover/ South Hanover	Widen shoulders for bicyclists where sight distance is limited	\$50,000 - \$100,000 per curve	Long
Route 39 - Hanshue Road to Hanover Street	South Hanover	Install off-road shared-use paths on the west side of Route 39 from Hanshue Road to Grandview Drive and on the east side of Route 39 from Patriot Way to Hanover Street to provide connectivity along the route within the township	West side: \$750k - \$1M East side: \$400k - \$600k	Long
Grandview Drive	South Hanover	Provide on-road markings to allow bicyclists adequate connectivity from Route 39 to Hoernerstown Road, Swatara Creek Trail, and Hummelstown	\$75k - \$100k	Short
Grandview Drive	South Hanover	Install sidewalk on north/east side of roadway for connectivity to residential developments Evaluate the opportunity to install a walking trail/sidewalk along Grandview Drive to tie into Hummelstown	\$500k - \$750k	Mid
Route 39 - Swatara Creek Bridge	South Hanover/ Derry	Widen and raise Route 39 Bridge over Swatara Creek to prevent flooding; provide 5' bike lane for connectivity with Derry Township	To be determined	Long

Other Potential Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
Orchard Road	West Hanover/ South Hanover	Study benefits of an additional access to businesses and residence along Orchard Hill Road Consider extending Orchard Road to Sand Beach Road or connecting Orchard Road to Shetland Drive	Extending to Sand Beach Road: \$3.5M - \$4M Connecting to Shetland Drive: \$2.5M - \$3M	Long
Hayshed Road	South Hanover	Extend Hayshed Road from Route 39 to Red Top Road to provide better connectivity to surrounding residential areas	\$3M - \$4M	Long

Character Area 7

East Hanover Township

Character Area 7 Overview

Route 743 in Character Area 7 is generally a two-lane rural roadway. Minimal development pressures are anticipated within Character Area 7; as such, the 2-lane cartway width is recommended to be maintained. Under separate efforts, East Hanover Township has developed a Master Trail Plan that identifies planned bicycle and pedestrian accommodations across the Township. In accordance with that plan, bicycle and pedestrian accommodations are not recommended along Route 743.

Side street volume along the Route 743 corridor within Character Area 7 is too low to warrant signalization. However, considering the traffic volume, speeds, and truck volume along Route 743, compounded with limited sight distance at several locations, it can be difficult to enter Route 743. Issues are further exacerbated when Hershey event traffic spikes. As noted earlier in the chapter, roundabouts are recommended for consideration at several intersections to help improve side street access, with a secondary benefit of slowing vehicle speeds.

Several intersections along Route 743 have sight distance limitations and it can be challenging to turn onto Route 743. Complicating matters, there has been an increase in truck traffic and vehicle speeds along Route 743, as the roadway provides a direct connection from I-81 to industrial uses in Derry Township and Hersheypark. Additionally, when there are Hershey events that result in long delays along Route 743 and/or Hersheypark Drive, car and truck drivers have begun to utilize Sand Beach Road more heavily. This is particularly problematic due to existing geometric deficiencies along Sand Beach Road. Several recommendations are made for consideration to help accommodate the car and truck traffic safely:

- Traffic calming - Measures could be implemented along Route 743 to help slow traffic. In addition to the roundabouts suggested at specific locations, some treatments that may be applicable include curb extensions/bumpouts (particularly at the two trail crossing locations) and chicanes.
- Reduced speed limits – The public has indicated a desire for lower speed limits along Route 743. Per PennDOT requirements, the appropriate posted speed limit should be determined by conducting a formal speed study and evaluation of the 85th percentile speeds. Specific speed studies were not conducted throughout the corridor and speed data was only obtained at two locations along Route 743. The Township should coordinate with PennDOT for more localized areas along the corridor to consider a speed reduction.
 - Statutory speed limits – A “Residence District” is one location where a speed study may not be required to post a speed limit. Roadways that satisfy the PA Vehicle Code definition of a “Residence District” may be posted at 25 mph without a speed study if the roadway is classified as a local highway and not assigned a “numbered” route. Neither Sand Beach Road nor Route 743 satisfy these criteria; therefore a speed study would be required to reduce the posted speed limit.

- Warning signing – Both Route 743 and Sand Beach Road should be evaluated for improved warning signage, such as “Intersection Ahead” approaching locations with limited sight distance or curve warning signs and chevrons. Signs at select locations could be enhanced with a “conspicuity” plaque to increase visibility. Conspicuity plaques should be placed on speed limit signs where the speed limit decreases from 55 mph to 45 mph.
- Flashing overhead lights – Flashing overhead lights (yellow on the mainline, red on the side street approaches) should be considered at key intersections along Route 743 where sight distance is limited to increase driver awareness and potentially slow speeds. This would be similar to the treatment implemented at the Route 39/Devonshire Heights Road intersection.
- High-friction Pavement – Locations with substandard horizontal curves could be enhanced with high-friction pavement to reduce the likelihood of an errant vehicle or crash. This can be a relatively low-cost improvement while funding is procured for more extensive improvements.
- Enforcement – Police enforcement can be a tool to help affect driver behavior. We note that enforcement can be challenging along Sand Beach Road and Route 743 due to a lack of suitable shoulders for a police officer to sit and monitor speeds in some locations. However, consistent speed enforcement can result in increased compliance with the speed limit and the Sand Beach Road truck restriction. We recommend coordination with the State Police to emphasize efforts in the area, particularly during Hershey events.
- Hershey Event Traffic – Coordination with Derry Township may help to move traffic more efficiently along Hersheypark Drive during events. When there are long delays along Hersheypark Drive, GPS devices with live traffic updates will re-route traffic onto secondary roads. A partnership with Derry Township to help keep traffic flowing will help to keep the GPS devices using Route 743.

We note that if a limited-access freeway connection comes to fruition between I-81 and Hershey (as discussed earlier in the chapter), the function and character of this roadway would change drastically, and the potential mitigating measures described herein should be re-evaluated.

Highway Safety Corridor

With the Township and resident concerns regarding speeding, the requirements for a Highway Safety Corridor were considered. Establishing a Highway Safety Corridor can be a tool to control travel speeds and increase driver awareness along certain highways by establishing a zone with double fines for traffic violations. Per Pennsylvania Code, Title 67, Chapter 214, “A segment of a highway may be designated as a highway safety corridor in which increased penalties will apply for violations... if the following conditions are satisfied:

(1) A crash analysis of candidate locations indicates that, for the preceding 5 years, crashes related to targeted driving behaviors exceeds thresholds for the number of crashes or the rate of crashes for homogeneous roadways as determined by the Department.

(2) The corridor meets the geometric requirements needed to allow for safe patrolling by law enforcement officers as well as a safe area to stop violators for the issuance of a traffic citation or warning.

(3) The corridor has adequate space for the installation of the traffic signs specified in this chapter.

(4) *There is a written commitment from the local and state law enforcement agencies responsible for highway patrol along the corridor to provide visible, sustained enforcement activity within the limits of the marked corridor.”*

With the Township and resident concerns regarding speeding, the requirements for a Highway Safety Corridor were considered. Due to the lack of existing crash trends, it does not appear this corridor would qualify at this time. However, the accident occurrences should be monitored and if crashes increase, particularly those resulting from speeding, the criteria should be re-evaluated.

Land Use Approach

Character Area 7 is 70% undeveloped with minimal development/market pressures anticipated in the 20-year study period. Site and design recommendations are provided to maintain and preserve the rural character of the area.

Site and Design Recommendations

Agricultural and Conservation

- ✓ Maintain the maximum number of lots on a site is determined by calculating developable acreage using a yield plan
- ✓ Design flexibility to allow agriculture, conservation, and homes to be placed on a tract where they best meet community preservation goals.
- ✓ Consider requiring a central green or boulevard to break up any significant residential development and promote the agricultural and conservation character of the area.
- ✓ Integrate landscape buffers in developments that abut SR 0743 to better integrate development and reduce unwanted views.
- ✓ Reduce road design standards that permit wide streets to save on road maintenance, promote rural lifestyle and improve stormwater management.
- ✓ Internal trails and collector trails should be promoted through this character area to keep the rural lifestyle of the area.

Potential Roadway Characteristics

The existing two-lane roadway should be maintained, though shoulder widening should be provided along Route 743 to provide 8’ shoulders. These widths should be reduced at the trail crossing locations. Suggested roadway characteristics are identified in Table 6-27.

Table 6-27: Suggested Roadway Section - Character Area 7		
Roadway Feature	Recommendation	Notes
Number of Lanes	2 lanes	
Travel Lane Width	11' width	
Shoulder Widths	8' width	Reduce width at pedestrian trail crossings
Median	N/A	
Sidewalk	N/A	
Sidewalk Buffer	N/A	
Minimum Right-of-Way	60' width	

Potential Capacity Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
SR 0743 and Colt Drive	East Hanover	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0743 and Dairy Lane	East Hanover	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0743 and Earlys Mill Road	East Hanover	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0743 and East Canal Road	East Hanover	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long

Potential Safety Mitigation

Location	Municipality	Description	Cost Estimate	Prioritization
SR 0743	East Hanover	Evaluate establishment of a Highway Safety Corridor, if warranted	\$10k - \$20k	Short
SR 0743	East Hanover	Evaluate traffic signing and calming enhancements - warning signs, conspicuity plaques, etc.	\$20-\$25k	Short
SR 0743 and Earlys Mill Road	East Hanover	Install overhead flashing yellow lights on SR 0743 approaches	\$75k - \$100k	Mid
Sand Beach Road	East Hanover	Evaluate traffic signing and calming enhancements - warning signs, conspicuity plaques, etc.	\$20-\$25k	Short
Sand Beach Road	East Hanover/ South Hanover	Install traffic calming measures and consider re-grading and including shoulder improvements to improve sight distance around curves	Varies based on specific improvement locations	Mid/Long
Sand Beach Road & E Canal Road	South Hanover	Improve sight distance at stop sign, looking north (right), Clearing vegetation	\$45k - \$60k	Short
Sand Beach Road (between Crooked Hill Rd and Earlys Mill Rd)	East Hanover	Provide high-friction pavement and improved signing / striping for horizontal curves	\$60k - \$80k	Mid
Sand Beach Road - Near Winfindale	East Hanover	Provide high-friction pavement and improved signing / striping for horizontal curves	\$40k - \$50k	Mid
Sand Beach Road & Meadow Lane	East Hanover	Improve sight distance with grading and clearing vegetation to the north and roadway realignment or removal of structure	To Be Determined	Long

Table 6-29 (Cont.): Potential Safety Mitigation - Character Area 7				
Location	Municipality	Description	Cost Estimate	Prioritization
SR 0743 & E Canal Road	East Hanover	Improve sight distance by grading	\$10k - \$20k	Short
SR 0743 (between Shady Ln and Pine Rd)	East Hanover	Provide high-friction pavement and improved signing / striping for horizontal curves	\$40k - \$50k	Mid
SR 0743 & Earlys Mill	East Hanover	Improve sight distance by grading and clearing vegetation	\$600k - \$800k	Mid
SR 0743 & Dairy Lane	East Hanover	Improve sight distance by grading	\$10k - \$20k	Mid
SR 0743 & S Meadow Lane	East Hanover	Improve sight distance looking north; sight line obstruction by residential house and fence. Relocate roadway or remove structure	\$350k - \$450k	Long
SR 0743 & Colt Drive	East Hanover	Improve roadway geometry by re-profiling Sight distance may be improved with reprofiling; if necessary grade and clear vegetation	\$250k - \$400k	Long
Bow Creek Road (SR 0743) & Allentown Boulevard	East Hanover	Relocate Sheetz access points further from signal, if feasible; improve intersection radii to accommodate turning trucks	\$75k - \$100k	Mid

Potential Pedestrian and Bicycle Facility Mitigation

Table 6-30: Potential Pedestrian and Bicycle Facility Mitigation - Character Area 7				
Location	Municipality	Description	Cost Estimate	Prioritization
Sand Beach Road	East Hanover/ South Hanover	Install shoulder improvements where sight distance is limited to allow for a 5' minimum travel area for bicyclists; Provide connectivity to existing shared use paths installed for residential connectivity Provide necessary signage	Varies based on specific improvement locations	Long
Sand Beach Road (Meadow Lane to Derry Twp line)	East Hanover/ South Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$3,500 *	Short
E Canal Road	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$3,500 *	Mid
Pine Road	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$2,500 *	Mid
Devonshire Heights Road	East Hanover/ South Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$2,000 *	Long
Earlys Mill Road	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$5,200 *	Long

* Per East Hanover Township Trail & Greenway Master Plan

Table 6-30 (Cont.): Potential Pedestrian and Bicycle Facility Mitigation - Character Area 7				
Location	Municipality	Description	Cost Estimate	Prioritization
Trail Road	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$3,000 *	Mid
S Meadow Lane / Pheasant Road (Sand Beach Rd to Earlys Mill Rd)	East Hanover	Install shared use path *	\$141,267 *	Long
Pheasant Road / S Meadow Lane (Sand Beach Road to Bow Creek)	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$2,000 *	Mid/Long
Jonestown Road (between N Hill Drive and Bow Creek Road)	East Hanover	Install off-road pedestrian walkway/path *	\$438,950 *	Long
Jonestown Road (Crawford Rd to Bow Creek Trail)	East Hanover	Install shared use path *	\$379,120 *	Long
Manada Golf Course Trail	East Hanover	Install shared use path *	\$126,668 *	Long
I-81 Trail	East Hanover	Install shared use path *	\$1,121,250 *	Long
Bow Creek Trail	East Hanover	Install shared use path *	\$2,933,000 *	Long
Community Park Loop Trail	East Hanover	Install shared use path *	\$756,370 *	Long
Community Park / Sand Beach Trail	East Hanover	Install shared use path *	\$414,860 *	Long
Union Canal Trail	East Hanover	Install shared use path *	\$81,830 *	Long
West Hanover Connector Trail	East Hanover / West Hanover	Install shared use path *	\$64,944 *	Long

* Per East Hanover Township Trail & Greenway Master Plan

Character Area 8

East Hanover Township

Character Area 8 Overview

Within Character Area 8, Bow Creek Road has differing character and function north and south of I-81. South of I-81, Bow Creek Road can service interchange support facilities and small retail establishments, while also serving as a connection to Derry Township/Hershey. North of the interchange, the roadway is more of a collector roadway, servicing more local destinations.

South of the I-81 Interchange, a center left turn lane is recommended; this should be established with proper access spacing for the businesses located in this area. The left turn lane should be extended just south of Route 22, terminating after the Farmstead Farmer's Market. A multi-use trail is recommended between Jonestown Road and the Bow Creek residential development.

North of the I-81 Interchange, the two-lane roadway should be maintained, and a shared-use path should be provided. A roundabout is recommended for consideration at the intersection of Bow Creek Road and Fox Run Road to facilitate side street access while maintaining traffic flow. This could potentially also act as a "gateway" to the Hollywood Casino located just north of the intersection.

Land Use Approach

There are development opportunities within Character Area 8 without significant corridor impact due to its proximity to the I-81 interchange. There are no significant residential market pressures anticipated in this character area. Accordingly, site and design recommendations are offered for service type facilities and industrial uses.

Site and Design Recommendations

Industrial and Commercial

- ✓ Consolidate driveways to reduce the traffic conflicts off SR 0743
- ✓ Require access roads from SR 0743 for all trucking facilities and distribution centers
- ✓ Any gates associated with truck terminals or distribution centers should be setback to allow stacking to occur on access road not SR 0743
- ✓ Require abutting commercial property interconnections between parking areas.
- ✓ Delineate pedestrian crosswalks and walkways within landscaped strips.
- ✓ Consider utilizing different paving materials or traffic calming devices within parking lots to reduce speed and increase pedestrian safety.
- ✓ Install landscape berms, walls, or other treatments to reduce the conflict of headlights from parking areas to the drivers along Route 743
- ✓ Provide pedestrian and vehicular access to abutting residential properties to offer relief from having to access commercial properties only through Route 743
- ✓ Require building façade offsets that face public streets to break up the façade.

Potential Roadway Characteristics

A center left turn lane should be provided from I-81 to the Farmstead Farmer’s Market, just south of Route 22. An 8’ multi-use trail should be provided from Jonestown Road to the Bow Creek residential development, also just south of Route 22. A multi-use trail should also be provided between I-81 and Mountain Road (Route 443). Once the trail is built, the shoulders along Bow Creek Road (north of I-81) can be reduced to provide a consistent 4’ width. Suggested roadway characteristics are identified in Table 6-31.

Table 6-31: Suggested Roadway Section - Character Area 8 (South of I-81)		
Roadway Feature	Recommendation	Notes
Number of Lanes	3 lanes	Three lanes including center left turn lane
Travel Lane Width	11' width	
Shoulder Widths	8' width	
Median	12' center left turn lane	Provide proper access spacing
Sidewalk	8' multi-use trail	Multi-use trail from Bow Creek development to Jonestown Rd
Sidewalk Buffer	5' width	
Minimum Right-of-Way	80' width	

Table 6-32: Suggested Roadway Section - Character Area 8 (North of -81)		
Roadway Feature	Recommendation	Notes
Number of Lanes	2 lanes	
Travel Lane Width	11' width	
Shoulder Widths	4' width	Maintain wider shoulders until trail is built
Median	N/A	
Sidewalk	8' multi-use trail	Provide along one side of road
Sidewalk Buffer	5' width	
Minimum Right-of-Way	60' width	

Potential Capacity Mitigation

Table 6-33: Potential Capacity Mitigation - Character Area 8				
Location	Municipality	Description	Cost Estimate	Prioritization
Bow Creek Road and Fox Run Road	East Hanover	Install Roundabout for side-street capacity and speed control	\$1.5M - \$2M	Long
SR 0022 and Sandbeach Road	East Hanover	Install Roundabout for side street capacity and pedestrian trail crossing	\$2.5M - \$3M	Long

Potential Safety Mitigation

Table 6-34: Potential Safety Mitigation - Character Area 8				
Location	Municipality	Description	Cost Estimate	Prioritization
SR 0743/Bow Creek Rd (Jonestown Road to I-81)	East Hanover	Add a center left turn lane along Bow Creek Road	\$2M - \$3M; likely developer costs	Mid
SR 0743 and Route 22	East Hanover	Consider northbound/southbound left turn phasing	\$10k - \$15k	Short
SR 0743 and Farmer's Market	East Hanover	Add a southbound left turn lane along SR 743	\$450k - \$600k	Mid

Potential Pedestrian and Bicycle Facility Mitigation

Table 6-35: Potential Pedestrian and Bicycle Facility Mitigation - Character Area 8				
Location	Municipality	Description	Cost Estimate	Prioritization
Bow Creek Road (Jonestown Road to Bow Creek residential development)	East Hanover	Install shared use path *	\$364,540 *	Mid
Bow Creek Road (Mountain Road to I-81)	East Hanover	Install shared use path *	\$758,550 *	Long
Fox Run Road	East Hanover	Install shared use path *	\$199,600 *	Long
Allentown Boulevard (Route 22)	East Hanover	Install designated buffered bicycle lanes *	\$205,277 *	Mid
Jonestown Road (Bow Creek Road to Lebanon County Line)	East Hanover	Install sidewalk *	\$331,010 *	Mid

* Per East Hanover Township Trail & Greenway Master Plan

Location	Municipality	Description	Cost Estimate	Prioritization
Jonestown Road (West Hanover Twp to Crawford Rd)	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$2,500 *	Short
Shells Church Road/Sand Beach Road (Allentown Blvd to Dry Run Rd)	East Hanover	Install sidewalk *	\$157,510 *	Mid
Dry Run Road / Station Road	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$2,500 *	Long
Manada Gap Road	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$2,000 *	Short
Cliff Road / Rabbit Lane	East Hanover	Install off-road pedestrian walkway/path *	\$176,030 *	Mid
Manada Bottom Road	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$4,500 *	Mid
Firehouse Road (I-81 to Jonestown Road)	East Hanover	Install on-road bicycle facilities including signage and pavement markings, and off-road pedestrian walkway/path *	\$500 *	Mid
Firehouse Road (Mountain Rd to I-81)	East Hanover	Install shared use path *	\$430,650 *	Long
Mountain Road (Route 443)	East Hanover	Install on-road bicycle facilities including signage and pavement markings *	\$5,500 *	Short
Mountain Road (Route 443) - Bow Creek Road to Firehouse Road	East Hanover	Install off-road pedestrian walkway/path *	\$348,150 *	Mid

* Per East Hanover Township Trail & Greenway Master Plan

Chapter 7: Funding

Funding strategies will be critical to the successful implementation of the identified improvements. This will require collaboration between the five (5) municipalities, Dauphin County, Tri-County Regional Planning Commission, PennDOT, and the developer community. The funding strategies should include the following potential Funding Programs:

- Federal Funding
 - TIP Funding
 - HATS RTP Implementation Program
 - Bipartisan Infrastructure Bill
 - Other future grant programs (ie, TIGER Grant successor)
- State Funding
 - Transportation Alternatives (TA) Set-Aside Program – For shared use paths, sidewalks, and bicycle facilities
 - DCNR Trail Grants – For shared use paths, sidewalks, and bicycle facilities
 - Greenways, Trail & Recreation Program (GTRP) – For recreational trails
 - Green Light Go – For traffic signal enhancements and improved coordination
 - Automated Red Light Enforcement (ARLE) Grant – Low cost improvements at signalized intersections
 - PennDOT Multimodal Transportation Fund – See below information
 - Commonwealth Financing Authority (CFA) Multimodal Transportation Fund – See below information
 - Redevelopment Assistance Capital Program – See below information
- County Funding
 - Dauphin County Infrastructure Bank
 - Local Share Gaming Grants
 - Transportation Infrastructure Safety Improvement Program
- Other Funding
 - New land development may trigger the need for roadway improvements to mitigate site traffic as determined by a Transportation Impact Study. Typically, these improvements would be the responsibility of the developer.
 - Regional stakeholders collaborate to identify supplemental funding sources.

FEDERAL FUNDING PROGRAMS

Federal Funding for Transportation Projects

Harrisburg Area Transportation Study (HATS) was created as a result of the Federal-Aid Highway Act of 1962, which mandated regional planning as a condition of receiving federal funds for transportation projects. To this day, the planning must be supported through a continuing, comprehensive, coordinated (3C) process.

HATS is a designated Metropolitan Planning Organization (MPO), an organization of federal, state and local agencies, as well as officials from Cumberland, Dauphin and Perry Counties, the City of Harrisburg and Capital Area Transit, all of whom are accountable for the 3C process. Tri-County Regional Planning Commission (TCRPC) serves as the lead staff agency for the Harrisburg Area Transportation Study.

In this role, HATS develops a Regional Transportation Plan (RTP), which documents the current status of transportation projects and programs, identifies long-term needs and recommends projects to meet those needs. The long-range RTP sets a framework and priorities for the expenditure of federal transportation funds over a 25-year period.

The RTP is updated by HATS staff through identification of specific need via submission of an HATS Transportation Need Form. Once a Need Form is received, HATS staff discusses the issue with both the sponsor and the municipality to gather additional information and determine possible funding options. The municipality's presence is essential in these discussions since most federal funding sources require a local match.

The Transportation Improvement Program (TIP) is a comprehensive listing of all federal and state-funded transportation improvement projects in the HATS area over the next four years. HATS develops and updates the TIP every two years with projects derived from the RTP.

Total Funds Available for Award:

- Undetermined (2019-2022 \$59 million Dauphin County)

Eligible Applicants:

- Transportation Agencies and Municipalities

Eligible Uses:

- Surface Transportation Infrastructure

HATS Federal RTP Implementation Program

Grant Amount:

- Local match of 20% of total project cost

Eligible Applicants:

- Municipalities within HATS region
- Transportation Service Provider within HATS region

Total Funds Available for Award:

\$1,000,000 Federal Funds per year for Dauphin County

Eligible Uses:

- Feasibility or planning studies
- Non-motorized trail expansion or enhancements
- Improved transit
- Streetscape projects with traffic calming
- Improved roadway connections
- Redevelopment of existing streets into neighborhood streets
- Improvements to non-motorized mobility
- Low-cost safety or congestion improvements
- Roundabouts
- Safety Improvements

STATE FUNDING PROGRAMS

Transportation Alternatives (TA) Set-Aside Program

Funding Amount:

- \$50,000 to \$1,000,000
- Applicant pays 100% of pre-construction costs
- Projects are funded at 100% of construction cost (including construction inspection)

Eligible Applicants:

- Municipalities and transportation authorities
- Transit agencies
- School district
- Natural resource or public land agency
- Non-profit organizations that oversee the administration of local transportation safety programs

Eligible Uses:

- On-road and off-road sidewalk or trail facilities
- Traffic calming, lighting, other safety-related improvements
- ADA compliance

Total Funds Available for Award:

- \$850 million nationwide

DCNR Trail Grants

Grant Amount:

- Total project cost; varies depending on project type and funding source
- Local match required; varies depending on project type and funding source

Eligible Applicants:

- Municipalities
- Non-Profit Organizations
- For-Profit Organizations

Application Deadline:

- Pre-application Conference required
- April 22, 2020 / Spring of each year

Eligible Uses:

For the development of recreational trails to close priority trail gaps or rehabilitate/upgrade existing trails for use by the public:

- Land Acquisition
- Planning
- Construction, rehabilitation, maintenance
- Development and operation of trail educational programs

Planned Award Announcement Date:

- Fall of each year

Commonwealth Financing Authority – Greenways, Trails and Recreation Program (GTRP)

Grant Amount:

- Up to \$250,000
- Need 15% match of the total project cost

Eligible Applicants:

- Municipalities
- Councils of Government
- Authorized Organizations (not-for-profit)
- Institutions of Higher Learning
- Watershed Organizations
- For-Profit Businesses (other than “producers” of natural gas)

Total Funds Available for Award:

- Varies. (In 2019, \$20.8 million total amount for all 7 programs under Act 13 funding)

Eligible Uses:

Funds may be used for the development, rehabilitation, and improvement for public park and recreation areas; greenways and trails; and rivers conservation projects.

Application Deadline:

- May 31 of each year

Planned Board Approval Date:

- September of each year

Application Fee:

- \$100 non-fundable application fee

PennDOT Multimodal Transportation Fund (MTF)

Grant Amount:

- Minimum project cost of \$100,000
- Maximum grant award of \$3,000,000
- Local match required – at least 30% of the award amount
- Approximately \$40,000,000 total funds available annually

Eligible Applicants:

- Municipalities
- Councils of Government
- Businesses
- Economic Development Organizations
- School Districts
- Non-Profits
- Public Transportation Agency
- Ports

Eligible Uses:

Funds may be used to coordinate local land use with transportation assets to enhance existing communities; related streetscapes, lighting, sidewalk enhancement, and pedestrian safety; improve connectivity or utilization of transportation assets; and related to transit-oriented development.

Application Deadline:

- Fall/Winter of each year

Planned Award Announcement Date:

- Spring/Summer of each year

Commonwealth Financing Authority - Multimodal Transportation Fund (MTF)

Grant Amount:

- Total project cost of \$100,000 - \$3,000,000
- Need 30% match of non-federal share of the total project cost

Eligible Applicants:

- Municipalities
- Councils of Government
- Businesses
- Economic Development Organizations
- Public Transportation Agency
- Ports – Rail/Freight

Eligible Uses:

Funds may be used to coordinate local land use with transportation assets to enhance existing communities; related streetscapes, lighting, sidewalk enhancement, and pedestrian safety; improve connectivity or utilization of transportation assets; and related to transit-oriented development.

Application Deadline:

- July 31 of each year
- \$100 non-refundable application fee

Total Funds Available for award:

Varies (\$79 million awarded in 2019)

Planned Board Approval Date:

- September of each year

PennDOT Automated Red Light Enforcement (ARLE) Grant Program

Grant Amount:

- No funding limits, but should be “relatively low-cost”
- No local match is required, but cost sharing is encouraged

Eligible Applicants:

- Municipalities
- Counties
- Metropolitan Planning Organizations (MPOs)
- Rural Planning Organizations (RPOs)
- County Planning Organizations
- Commonwealth Agencies

Total Funds Available for award:

- Varies (\$13.1 million in 2019)

Eligible Projects:

- Traffic Control Signal Improvements
- Roadway Capacity, Mobility & Safety Upgrades
- Bicycle & Pedestrian Improvements
- Local Technical Assistance Program Projects

Application Period:

- June 1 through June 30 each year

Award Date:

- December of each year

PennDOT Green Light-Go: Pennsylvania’s Municipal Signal Partnership Program

Grant Amount:

- Need 20% match of the total project cost

Municipal and Private Match Options:

- Municipal general funds
- Liquid fuels funds
- Pennsylvania Infrastructure Bank (PIB) loans
- Municipal private loans
- Developer contributions
- Act 209 (Transportation Impact fees)
- In-Kind services
- Act 89 funding (Title 75, County \$5 Fee)

Eligible Applicants:

- Municipalities
- Planning Organizations

Total Funds Available for award:

- Varies (\$5 million in 2019)

Eligible Projects:

- LED Replacement
- Traffic Signal Retiming
- Study and Removal of Unwarranted Traffic Control Signals
- Real-Time and/or Historic Performance Monitoring
- Innovative Technologies
- Communications/Connections Back to Traffic Management Center
- Detection and/or Controller Upgrades
- Modernization Upgrades
- Intelligent Transportation System Applications

Application Period:

- Fall/Winter of each year

Redevelopment Assistance Capital Program (RACP)

Grant / Project Amount:

- Grant amount varies based on available funding for the Capital Project Itemization Bill line item
- Minimum \$1,000,000 total project costs
- Minimum 50% match of total project costs

Eligible Applicants:

- Redevelopment Authorities
- Industrial Development Authorities
- General Purpose Unit of Local Government
- Local Development District
- Public Authority
- Industrial Development Authority

Total Funds Available for award:

Based on available funding for the Capital Project Itemization Bill line item.

Eligible Uses:

Funds may be used for economic development project that is further defined by the Capital Project Itemization Bill line item

Application Deadline:

- Annual deadline varies

Planned Board Approval Date:

- Award announcement varies

Application Fee:

- \$500 non-fundable application fee

COUNTY FUNDING

Dauphin County Infrastructure Bank

Grant Amount:

- Unlimited funding request
- Low-interest loan

Eligible Applicants:

- Dauphin County
- Municipalities within Dauphin County
- Municipal and redevelopment authorities within Dauphin County
- Private entities (including non-profit organizations) with eligible projects located in Dauphin County
- School districts

Eligible Uses:

Projects that will improve the safety and mobility of local surface transportation, are publicly owned and are Liquid Fuels Tax eligible

Local Share Gaming Funds

Grant Amount:

- No set amount. (In 2020, awards ranged from \$2,500 to \$745,000.)

Eligible Applicants:

- East Hanover Township
- Municipalities contiguous with East Hanover Township and located within Dauphin County (Derry, Middle Paxton, Rush, South Hanover, and West Hanover Townships)
- Dauphin County
- Non-contiguous municipalities within Dauphin County may be eligible if sponsored by an eligible local municipality or Dauphin County
- Non-municipal entities may apply if sponsored by an eligible local municipality or Dauphin County

Total Funds Available for award:

- Amount varies and based on gaming revenues. (In 2020, total \$6.3 million was awarded.)

Eligible Uses:

Funds may be used for 1) Human Service costs, infrastructure improvements, facilities, emergency services, and health and public safety expenses related to the licensed gaming facility and 2) health, safety, transportation, and public interest/quality of life projects for the residents and communities.

Application Deadline:

- Early August of each year – Pre-application Conference required
- Early September of each year – Applications due

Planned Board Approval Date:

- Early March of each year

Application Fee:

- None

Transportation Infrastructure Safety Improvement Program (TISIP)

Grant Amount:

- No set amount
- 25% local match required.

Eligible Applicants:

- All 40 Dauphin County municipalities

Total Funds Available for award:

- \$3M in 2023 and 2024

Eligible Uses:

Safety improvement of municipally-owned infrastructure.

Application Deadline:

- April 30, 2023 – Pre-application Conference required
- June 16, 2023 – Applications due

Planned Award Date:

- August 2023