Chapter 7 | Final Improvement Concepts

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7.1 Final Improvement Concepts

The preliminary transportation improvement concepts have previously been summarized in Chapter 4. Several of these improvement concepts have been modified as a result of feedback received throughout the study process from the public, the Township, and PennDOT. The final version of the improvement concepts are presented in this section. Later in this Chapter, the final concepts are evaluated and then compared to one another based on various, identified measures of effectiveness.

**Lancaster Avenue Concepts**

- Concept 1
- Concept 2
- Concept 3

No changes or modifications were made to the Lancaster Avenue improvement concepts. Refer to Chapter 4 for more description of each concept.

**East Central Avenue Concepts**

- Concept 1
- Concept 3
- Concept 4

Concept 2 was eliminated based on comments given by the public during Open House #2. Integral to Concept 2 was on-street parking, which was disliked by many residents. Refer to Chapter 4 for more description of each concept.

**West Central Avenue Concepts**

- Concept 2

No changes or modifications were made to the West Central Avenue improvement concepts. Refer to Chapter 4 for more description of each concept.
7.1 Final Improvement Concepts

Lancaster Avenue and Paoli Pike Intersection Concepts

Modification to Concepts B and C include allowing cross and left-turn traffic from the existing Paoli Pike approach and the relocated Greenwood Avenue approach. This change promotes better circulation.

N. Valley Road and E./W. Central Avenue Intersection Concepts

Modification to Concepts A and B include a northbound right-turn lane to reduce queuing between the Central Avenue intersections and the new N. Valley Road/Darby Road intersection based on the final analyses.
7.2 Performance Measures

The performance of the various transportation improvement concepts have been evaluated and compared against each other based on a set of criteria, or performance measures, developed from the overall project goals, the community’s feedback and vision for Paoli. Factors related to implementation, impacts, and costs were also considered. These performance measures fall into the following focus areas:

1. **Transportation** - how the transportation improvement concepts efficiently and safely serve all users of the system.
2. **Streetscape and Redevelopment** - how the concepts support the community’s vision of a vibrant “main street” setting along Lancaster Avenue. Along East and West Central Avenues, the measures focus on creating an aesthetically pleasing neighborhood street and integrating traffic calming measures with streetscape features.
3. **Environment** - how stormwater will be managed/mitigated; how green infrastructure will be used; and identifying the impacts to environmental and historic resources based on an initial screening.
4. **Implementation** - how the concepts will impact right-of-way, properties, and utilities; what are the associated costs with each concept.
5. **Community Support** - how much community support the various concepts received at the Community Open House (November 2013); and if the concept satisfies the community’s overall vision for Paoli.

Performance measures were identified for each of the focus areas, which differed slightly based on location, and are summarized below. Also, it is noted that the full scoring of the performance measures for each improvement concept is included in Appendix G.

**Focus on Transportation**

1. **Pedestrian Accommodations and Walk-ability**
   - Pedestrian route connectivity
   - Pedestrian crossings
   - Pedestrian signal heads, timings, phasing
   - ADA accessibility

2. **Bicycle Accommodations and Bike-ability**
   - Type of accommodations such as dedicated bike lane, separate roadside path/trail, wide lanes, or shared lane
   - Presence of on-street parking

3. **Vehicular Mobility and Travel**
   - Intersection operations (levels of service)
   - Arterial operations (levels of service)
   - Queuing accommodations

4. **Safety and Traffic Calming**
   - Measures to reduce speeding
   - Measures to increase pedestrian comfort and safety
   - Countermeasures for identified crash patterns
   - Opportunities for access management (limiting and sharing of driveways)
7.2 Performance Measures

Focus on Streetscape and Redevelopment
1 | Streetscape
   • Streetscape (length along corridor)
   • Desirable sidewalk widths, buffer areas, and amenities

2 | Parking
   • Availability of on-street parking, particularly in front of commercial land uses
   • Impacts to off-street parking (net change)

3 | Supportive of current development and redevelopment
   • Create “main street” feel and potential for redevelopment

Focus on the Environment
1 | Stormwater Management
   • Mitigate additional stormwater related to improvement
   • Provision of green infrastructure

2 | Environmental resources
   • Overall impacts to resources
   • Known historic resources

Focus on Implementation
1 | Impacts
   • Right-of-way, property, and building impacts
   • Impact of above-ground utilities (not subsurface)

2 | Costs
   • Cost of transportation improvements

Focus on Community Support
1 | Community Preferences
   • Preferences identified at the November 2013 Community Open House

2 | Community Vision
   • Satisfaction of the community’s overall vision for Paoli, as identified through the public involvement process
7.3 Comparing Improvement Concepts

Lancaster Avenue Corridor

Each of the transportation improvement concepts for Lancaster Avenue were scored based on the performance measures and are summarized in the table to the right.

Summary

Concept 3 scores highest for transportation as it provides dedicated facilities for all users, including a dedicated bike lane along Lancaster Avenue. All three concepts will provide safety improvements, improve the pedestrian experience, and do well to accommodate future traffic. The provision of on-street parking (Options 2 and 3) will provide a benefit to the existing retail establishments along the corridor, and possibly promote redevelopment or improve occupancy rates at the very least.

A preliminary environmental review of each of the concepts indicates that the improvements can be mitigated from a stormwater management perspective and that green infrastructure elements can be employed. With increasing widths of sidewalk and roadway under each consecutive concept, Concept 1 will have the least property impacts and Concept 3 will have the most. However, most property impacts will not create a significantly adverse condition and those impacts can be reduced in the interim until redevelopment of the property occurs in the future, if ever.

At the November 2013 Open House, Concept 2 was the most popular improvement scenario to the community, as it was the preferred selection with 53 percent of the respondents. It is also noted that there was significant public support for improved sidewalks and on-street parking (89 percent) when combining Concepts 2 and 3.

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<th>Concept 1</th>
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<td>Transportation</td>
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<td>Community Support</td>
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Each of the transportation improvement concepts for East Central Avenue were scored based on the performance measures and are summarized in the table to the right.

Summary

Concept 4 scores highest for transportation as it provides dedicated facilities for all users, including a separate roadside multi-use trail and narrowing of the excessively wide East Central Avenue. All three concepts will provide streetscape and safety improvements, provide traffic calming measures to reduce speeding, improve the pedestrian experience, and accommodate future traffic. These improvements will create the ability for neighbors to feel safe walking or biking to/from and around their neighborhood and the center of Paoli, which was a common desire noted at the initial community outreach events.

A preliminary environmental review of each of the concepts indicates that the improvements can be mitigated from a stormwater management perspective and that green infrastructure elements can be employed. The optional sidewalk provided on the north side of the roadway (if ultimately provided) will be located south of the existing curbline for some concepts, and therefore, will not significantly impact properties. The multi-use trail will be located within the existing right-of-way.

At the November 2013 Open House, Concept 4 was the most popular improvement scenario to the community, as it was the preferred selection with 67 percent of the respondents.
7.3 Comparing Improvement Concepts

West Central Avenue

Each of the transportation improvement concepts for West Central Avenue were scored based on the performance measures and are summarized in the table to the right.

Summary

Concept 1 scores best for transportation as it provides improved sidewalks with buffers, streetscape and a painted shoulder that can be used by bicyclists. It is noted that the four-foot wide shoulder is too narrow to be designated as an official bike lane, but will provide separation nonetheless. Both concepts will provide safety and traffic calming improvements, enhance the pedestrian experience, and accommodate future traffic.

A preliminary environmental review of each of the concepts indicates that the improvements can be mitigated from a stormwater management perspective and that green infrastructure elements can be employed. The impacts to properties will be relatively minor.

At the November 2013 Open House, Concept 1 was the most popular improvement scenario to the community, as it was the preferred selection with 80 percent of the respondents.

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<tr>
<th>Summary</th>
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<td>Concept 1 scores best for transportation</td>
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<td>Concept 1 provides improved sidewalks</td>
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<td>Concept 1 provides safety</td>
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<td>Concept 1 provides traffic calming</td>
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<td>Concept 1 enhances pedestrian experience</td>
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<td>Community Support</td>
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7.3 Comparing Improvement Concepts

**North Valley Road and E./W. Central Avenue Intersection**

Each of the transportation improvement concepts for North Valley Road and E./W. Central Avenue intersection were scored based on the performance measures and are summarized in the table to the right.

**Summary**

Concept C will function better in terms of traffic operations compared to the other two concepts, improve safety, and accommodate pedestrians and bicyclists. Peak hour queuing on northbound North Valley Road will extend to the new North Valley Road/Darby Road intersection with the Concept A and Concept B improvements during the commuter peak hours. The analysis of traffic operations of each scenario assumes a collector roadway through the Amtrak Rail Yards property is constructed upon development of the property.

A preliminary environmental review of each of the concepts indicates that the improvements can be mitigated from a stormwater management perspective and that green infrastructure elements can be employed. The property impacts are significant for each intersection improvement concept due to roadway widening, with the roundabout requiring the most right-of-way.

At the November 2013 Open House, Concept C was the most popular improvement scenario to the community, as it was the preferred selection with 60 percent of the respondents. Earlier community feedback indicated support for Concept B (realignment and signalization); however, favorability shifted to the roundabout option, perhaps once the public learned more about the operations of such an intersection.

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7.3 Comparing Improvement Concepts

**Lancaster Avenue and Paoli Pike Intersection**

Each of the transportation improvement concepts for Lancaster Avenue and Paoli Pike intersection were scored based on the performance measures and are summarized in the table to the right.

**Summary**

Both Concepts B and C will greatly improve the functionality of the intersection, reduce congestion along the corridor, and provide convenient crossings for pedestrians. These concepts also promote better traffic circulation, distribute traffic more effectively, and improve access management in the immediately surrounding area.

A preliminary environmental review of each of the concepts indicates that the improvements can be mitigated from a stormwater management perspective and that green infrastructure elements can be employed. The property impacts of Concepts B and C are significantly more, as compared to the minimal improvements associated with Concept A.

At the November 2013 Open House, Concept B was the most popular improvement scenario to the community, as it was the preferred selection with 68 percent of the respondents. It is also noted that 84 percent of the community favored the more substantive improvements of Concepts B and C.

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16% 68% 16%
Flexibility in Design

As previously noted, there exists some flexibility in the ultimate design of the various transportation improvement concepts to address various project needs or reduce project impacts. These adjustments can occur as individual projects move forward and more detailed engineering is completed. One example would be an adjustment to Concept C for the Lancaster Avenue/Paoli Pike intersection. As shown in the exhibit to the right, the new roadway connection between Lancaster Avenue and Paoli Pike can be shifted eastward along the property line to balance the impacts between adjoining properties. This variation on Concept C results in minimal changes to the operations and various performance measures, and therefore, no additional evaluations were completed.

7.3 Comparing Improvement Concepts
7.4 Streetscape Plan

A streetscape plan has been prepared to show how the potential improvements to the study area roadways and intersections can incorporate both the transportation and streetscape elements. As this Study does not designate a preferred improvement concept for the study roadways and intersections, the streetscape plans utilized the most popular concepts from the final Open House event.

**Streetscape Elements**

*Lancaster Avenue* will be transformed through a combination of pedestrian scaled elements. The walkable sidewalks will be defined by a decorative paver utility strip along the street edge that will contain place-making elements such as street trees, benches, street lights, trash receptacles, planters, bicycle racks and signage. Pedestrian crossings will be clearly marked by wide stamped asphalt crosswalks. Landscape opportunities within corner curb bump-outs (extensions) will soften the street edge and provide opportunities for rain gardens and stormwater management.

The major component of the streetscape along *East Central Avenue* is the accommodation of pedestrians and bicyclists with the multi-use trail. This 10 foot wide trail on the south side of the street, will be lined with street trees and decorative street lights, providing definition and a buffer to the roadway. The type of street trees will be determined based on their location. Lower flowering trees will be provided under overhead utility lines and shade trees in open areas. Infill street trees will be provided along the north side of the street. Raised stamped asphalt crosswalks at intersections will connect the north and south side of the street and act as a traffic calming component. On grade crosswalks will traverse the side streets defining east-west crossings for the multi-use trail and northern sidewalk.

The streetscape of *West Central Avenue* will be improved with the addition of flowering trees located between the curb and new sidewalk in a grass buffer area. Decorative street lights will reinforce the street edge. On grade stamped asphalt crosswalks will provide safe definable north-south and east-west pedestrian connections.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the PaDOT Intermodal Transportation Center Project, from PaNCDOT plans, and from GIS data obtained from Tredyffrin Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or title deed research.

LEGEND:
- Proposed Roadway
- Proposed Stamped Asphalt Crosswalk
- Proposed Sidewalk
- Proposed Brick Pavers
- Proposed Vegetation
- Proposed Street Tree
- Proposed Pedestrian Scale Lighting

Scale: 1" = 50'

Church Of The Good Samaritan

STAMPED ASPHALT CROSSWALK
PROPOSED RIGHT-OF-WAY
EXISTING RIGHT-OF-WAY
PEDESTRIAN SCALE LIGHT
STREET TREES (40'-50' O.C.)
4' WIDE BRICK PAVER BUFFER AREA
5' WIDE CONCRETE SIDEWALK
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from PA DOT plans, and from GIS data obtained from Radcliff Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or title or deed research.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from PlanDOT plans, and from GIS data obtained from Tredyffrin Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or title deed research. Station square information shown on these plans has been obtained from SEPTA, April 2014.
7.4 Streetscape Plan
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from Paoli DOT plans, and from GDB data obtained from Tredyffrin Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or title deed research.
7.4 Streetscape Plan

Note: Right of way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from Penn DOT plans, and from GIS data obtained from Tredyffrin Township and Chester County. Right of way and property lines have not been independently verified through field survey or title search research.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the PaDOT Intermodal Transportation Center Project, from PennDOT plans, and from CBA data obtained from Tredyffrin Township and Chester County. Right-of-way and property line data have not been independently verified through field survey or recorded research.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Improvement Transportation Center Project, from PennDOT plans, and from GIS data obtained from Washington Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or title/escrow research.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from PennDOT plans, and from GIS data obtained from Tredyffrin Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or third party research.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from PennDOT plans, and from GIS data obtained from Thorofare Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or test plats/research.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from PennDOT plans, and from GIS data obtained from Tredyffrin Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or title deed research.
7.4 Streetscape Plan

Note: Right-of-way information shown on these plans is based on data obtained from the Paoli Intermodal Transportation Center Project, from PennDOT plans, and from GIS data obtained from Thyghrin Township and Chester County. Right-of-way and property lines have not been independently verified through field survey or title deed research.
7.5 Implementation Plan

Numerous resources will need to be identified, mobilized, and synchronized in order to implement the recommendations and infrastructure improvements of this Study. Therefore, it is important that an initial action plan be clearly identified and put into use immediately in order to lay the groundwork for these changes. The action plan should be re-evaluated periodically as individual projects/initiatives are completed or as funding sources and levels change.

The action plan for this Study is broken down into four categories: 1) organizational, 2) regulatory, 3) financial, and 4) future studies, design, engineering. Responsible parties for each action item are shown in the action plan as well.

Organizational Actions

1. Select the Preferred Improvement Concepts. Using the evaluation of improvement concepts contained in this study, the Board of Supervisors should select the preferred improvement concepts for each study roadway and intersection. [BOS, PennDOT]

2. Coordinate with adjacent municipalities. Corridor-wide traffic signal improvements along Lancaster Avenue, development of the Rail Yards property, bike route planning, and consistency of improvements to West Central Avenue will necessitate coordination with Willistown Township. [BOS, STAFF]

3. Coordinate with Chester County Planning Commission (CCPC) and Delaware Valley Regional Planning Commission (DVRPC). CCPC and DVRPC both play key roles in programming federal and state funds for transportation improvement projects. Coordinate with CCPC regarding the inclusion of priority capital improvement needs on the County’s Transportation Improvements Inventory (TII). Coordinate with both CCPC and DVRPC regarding potential federal and state transportation funding for improvements, including competitive grant programs and updates to the region’s Transportation Improvement Program (TIP). It is noted that several Paoli projects are currently on the TIP. [BOS, STAFF]

4. Coordinate with PennDOT. PennDOT plays a key role for both capital improvements and maintenance of state owned roadways. Coordination with PennDOT is important for both capital projects and development projects, which may require a Highway Occupancy Permit (HOP) from PennDOT. [STAFF]

5. Coordinate with SEPTA. A key factor in the advancement of the Paoli Intermodal Transportation Center and other transportation improvements will rely on this SEPTA project. The Township should continue to coordinate and collaborate to advance these improvements for Paoli. The Township should also coordinate with SEPTA as other improvements move forward to design in order to accommodate transit users with bus stops, bus shelters, etc. [BOS, STAFF, SEPTA]

6. Coordinate with Amtrak. The redevelopment of the Rail Yards property will be a significant project in the heart of Paoli. As traffic improvements will be needed to mitigate development traffic, the Township must ensure that the site accesses and internal roadway infrastructure is designed properly and accommodates all users. [BOS, STAFF, AMTRAK]

7. Coordinate with key stakeholders. Property owners, business owners, and developers are key partners for implementation. For capital improvement projects, it will be important to coordinate with property and business owners on design details and construction schedules. Additionally, for improvements that can be implemented through the land development process, it will be important to coordinate with developers regarding the integration of the preferred transportation improvements into land development plans. Lastly, the Township can be proactive in acquiring additional right-of-way and easements, as necessary. [BOS, STAFF]
7.5 Implementation Plan

Regulatory Actions

1. Modify the Township SALDO to incorporate the previously identified recommendations. Some specific changes to the SALDO have been suggested in the Study (Chapter 5.2) while other general recommendations have also been provided. [BOS, STAFF, PC, LEGAL]

2. Modify the Township’s Zoning Ordinance to incorporate the previously identified recommendations, including form-based code provisions. Some specific changes to the ordinance have been suggested in the Study (Chapter 5.2) while other general recommendations have also been provided. [BOS, PC, STAFF, LEGAL]

3. Adopt an Official Map of the Township that depicts the preferred transportation improvements, including current and future roadways, rights-of-ways, and on-road/off-road public trails/paths. [BOS, STAFF, PC, LEGAL]

4. Acquire necessary right-of-way for the preferred transportation improvements. [BOS, STAFF, PC, LEGAL, PO]

5. Update the Comprehensive Plan to incorporate the recommendations of this Study, as appropriate. [BOS, PC]

6. Develop a parking management program for both the commercial corridor and nearby residential neighborhoods. [BOS, STAFF, CONSULTANT, LEGAL, POLICE, PO]

7. Incentivize access management, shared parking, cross-access easements, bus stop shelters, and secure bike parking. [BOS, PC, CONSULTANT, LEGAL, PO]

Financial Actions

1. Identify and track funding sources, which have historically changed based on Federal and State priorities and legislation. Additional funding sources are identified later in this section and are based on current potential funding sources. [BOS, STAFF, SEPTA]

2. Pursue grants to assist in the funding of further engineering, studies, and construction of the preferred transportation improvements and policies. [BOS, STAFF]

3. Identify funding resources to advance the preferred transportation improvement recommendations, once selected by the Township, and priorities. Local match dollars can make grant applications more competitive. In some cases, services (i.e., engineering, planning, right-of-way acquisition, etc.) in lieu of a monetary contribution can be considered. [BOS, STAFF]

4. Combine construction of preferred improvements (or elements of those concepts) and accommodations during routine maintenance projects, when feasible. [BOS, STAFF]

5. Identify opportunities for public-private partnerships, which can often provide a savings to all involved parties. Engineering and acquisition of right-of-way can often be considered as a local match obligation for certain grants. By prioritizing and dedicating funding, the Township will demonstrate its commitment to the project. [BOS, STAFF]

Additional Studies, Design, Engineering Actions

1. Each of the preferred transportation improvements will need to be fully engineered beyond the conceptual feasibility level completed for this Study. The engineered plans will then need to be permitted through appropriate governmental agencies. [BOS, STAFF, CONSULTANT]

2. Traffic signal permits will need to modified to address short- and long-term improvements. [BOS, STAFF, CONSULTANT]

3. Transportation impact studies for significant development projects, or redevelopment, will need to identify the traffic impacts of each project. The impact studies should consider multi-modal impacts to all users (i.e., pedestrians, bicyclists, transit users) in addition to vehicular mobility and traffic operations. [BOS, STAFF, CONSULTANT, others]
7.5 Implementation Plan

**Funding**

The Paoli Roadway Improvements will likely be implemented in a phased approach over time, depending upon the availability of funding and other factors. Additionally, implementing roadway improvements will likely require a combination of several different funding sources from the federal, state, and local levels. Below is a summary of potential funding sources for Paoli Roadway Improvements based on current legislation and grant programs.

**Federal**

Programming of federal transportation funds for specific projects is completed at a regional level, with some projects awarded federal funds through competitive grant processes. Federal funds are programmed on the region’s Transportation Improvement Program (TIP). Most federal funding programs require 20% of the project costs to be funded through non-federal sources, such as state and local funds. Moving Ahead for Progress in the 21st Century Act (MAP-21) is the federal transportation bill that was signed into law in July 2012 for fiscal years (FY) 2013 and 2014. Since MAP-21 expired in October 2014, future federal transportation funding programs are unknown. However, Paoli Roadway Improvements are eligible for federal funding through several current core federal funds set aside for the Transportation Improvement Program (TIP). Most federal funding programs require 20% of the project costs to be funded through non-federal sources, such as state and local funds. Moving Ahead for Progress in the 21st Century Act (MAP-21) is the federal transportation bill that was signed into law in July 2012 for fiscal years (FY) 2013 and 2014. Since MAP-21 expired in October 2014, future federal transportation funding programs are unknown. However, Paoli Roadway Improvements are eligible for federal funding through several current core federal funding programs highlighted below. Although these programs may change with future federal transportation bills, it is likely that identified improvements will continue to be eligible for federal transportation funding.

- **National Highway Performance Program (NHPP):** The NHPP program provides funding for improvements to the National Highway System (NHS), which includes Lancaster Avenue (U.S. 30) through Paoli. Additionally, North Valley Road (between Lancaster Avenue and East Central Avenue) and East Central Avenue (between North Valley Road and PA Route 252) are designated as Intermodal Connectors and are considered part of the NHS because they provide critical access to the Paoli Train Station. Eligible activities include roadway reconstruction and improvements, safety improvements, and bicycle transportation and pedestrian walkway improvements along NHS corridors. NHPP funds are programmed on the region’s TIP.

- **Surface Transportation Program (STP):** The STP program provides flexible funding for improvements on federal-aid highways, bridges and tunnels on any public road, bicycle and pedestrian infrastructure, and transit capital projects. A portion of the STP funds are set aside for the Transportation Alternatives program described below. All Paoli Roadway Improvement projects are potentially eligible for STP funding, which is programmed on the region’s TIP.

- **Highway Safety Improvement Program (HSIP):** The HSIP program provides funding for improvements that address a safety problem and are consistent with the State Strategic Highway Safety Plan (SHSP) and based on data, such as crash rates.

- **Transportation Alternatives Program (TAP):** The TAP program provides funding to support a variety of alternative modes of transportation, including walking and bicycling. Eligible activities include planning, design, and construction of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990. TAP requires the project sponsor to fund all pre-construction activities and provides federal funding for construction.

Paoli Roadway Improvement projects potentially eligible for CMAQ funding include:

- Lancaster Avenue (U.S. 30) Improvements
- North Valley Road and East/West Central Avenue
- East Central Avenue Improvements
- West Central Avenue Improvements
- East Central Avenue Multi-Use Trail and Pedestrian

Paoli Roadway Improvement projects potentially eligible for CMAQ funding include:

- Lancaster Avenue (U.S. 30) Improvements
- North Valley Road and East/West Central Avenue
- East Central Avenue Improvements
- West Central Avenue Improvements

Paoli Roadway Improvement projects potentially eligible for TAP funding include:

- East Central Avenue Multi-Use Trail and Pedestrian
7.5 Implementation Plan

- Lancaster Avenue (U.S. 30) Sidewalk and Streetscape Improvements
- West Central Avenue Improvements

In April 2014, Tredyffrin Township submitted a TAP application for East Central Avenue improvements, including a multi-use trail on the south side, enhanced pedestrian crossings, and stormwater management BMPs.

- Transportation Investment Generating Economic Recovery (TIGER): TIGER is a competitive discretionary grant program appropriated by Congress and administered by the US Department of Transportation (USDOT). The program was created to fund multi-modal and multi-jurisdictional projects that may not be eligible for funding through traditional DOT programs. The program is very flexible in terms of eligibility, but is also highly competitive. For 2014, the minimum grant amount is $10 million and a minimum of 20% matching funds. Pursuing a TIGER grant for multi-modal transportation improvements in the Paoli area should be coordinated among the various project partners, including PennDOT, SEPTA, Amtrak, and Tredyffrin Township.

State
- Act 89: Pennsylvania’s Transportation Funding Bill, known as Act 89 of 2013, provides stable and long-term funding for Pennsylvania’s transportation system, including highways, roads, bridges, mass transit and other modes. In addition to providing an overall increase in state funds for transportation, the bill includes several specific programs relevant to the Paoli Roadway Improvements.

Funded Projects in Paoli

The Delaware Valley Regional Planning Commission’s FY2015 - FY2018 Transportation Improvement Program includes federal and state funding for three projects in Paoli. This initial phase of improvements will address existing deficiencies and improve access to the current and future Paoli Train Station.

Paoli Intermodal Transportation Center

The FY2015 TIP includes $24 million in FY15—FY18 for engineering and construction of the first phase of improvements to the Paoli Train Station. In addition, Amtrak has committed $12 million for the project, bringing the total funding to $36 million for the first phase. This project will improve accessibility of station facilities with construction of a pedestrian overpass, a new high level center platform, and the installation of three elevators linking the inbound and outbound parking lots. Additional funding is needed for future phases of the project, including a new parking garage.

Darby Road Extension Bridge and Paoli Transportation Center Roadway Improvements

The FY2015 TIP includes almost $16 million in FY15—FY18 for design on the new Darby Road Extension Bridge, in conjunction with the planned improvements for the Paoli Intermodal Transportation Center. The existing North Valley Road Bridge is functionally obsolete and has substandard vertical geometry. The proposed Darby Road Extension Bridge will replace the North Valley Road Bridge and improve access to the Intermodal Transportation Center. The TIP also includes over $19 million for construction of the new bridge and associated roadway improvements in later fiscal years.

Lancaster Avenue (SR 0030) Adaptive Signal System

Tredyffrin Township was awarded approximately $565,000 through PennDOT’s Automated Red Light Enforcement (ARLE) Grant Program to upgrade and provide adaptive traffic control for signals along Lancaster Avenue (U.S. Route 30) between Plank Avenue and PA Route 252 through the heart of Paoli, as well as adjacent signals on PA Route 252. This technology provides real-time optimization of traffic signal operations in order to reduce congestion, improve safety, and promote mobility. Red light enforcement cameras are not proposed as part of the project.

Liquid Fuels: The amount of Liquid Fuels allocations to municipalities will increase more than 60% over the next five years. For example, in FY13 - FY14, Tredyffrin Township will receive an additional $47,000 in Liquid Fuels allocations over the previous year. Liquid Fuels funds can be used for improvements and maintenance for Township roads, such as East Central Avenue.

Multimodal Transportation Fund: PennDOT and the Department of Community and Economic Development (DCED), with direction from the Commonwealth Financing Authority (CFA), administer the Multimodal Transportation Fund to encourage economic development and safe and reliable transportation. Eligible projects include bicycle and pedestrian facilities and improvements
related to transit-oriented development. Annual grants are awarded on a competitive basis and require a local match of at least 30% of the non-federal share of the project costs.

Traffic Signal Maintenance Agreements: PennDOT and municipalities can enter into agreements for the upgrade and synchronization of signals in a designated traffic corridor. Up to $40 million in grant money (by state fiscal year 2016-17) will be available to coordinate traffic signals to alleviate congestion. PennDOT and municipalities each contribute 50% of costs. This might be an option for signals along Lancaster Avenue (U.S. 30).

- Automated Red Light Enforcement (ARLE) Grant Program: PennDOT administers a competitive grant program to distribute a portion of the revenue generated by Automated Red Light Enforcement (ARLE) in the state. The ARLE grant program is focused on improving safety and mobility and there is an annual application period. Eligible projects include roadway capacity upgrades, such as auxiliary turning lanes, and pedestrian safety and mobility improvements. The ARLE grant program does not require a local match, but all project funding must be identified at the time of the application.

- Community Recreation and Conservation Program: The Department of Conservation and Natural Resources (DCNR) provides grants for trail and greenway projects through two Community Conservation Partnerships Program (C2P2) grant programs. There is an annual application period for both C2P2 grants.
  - C2P2—Community Recreation and Conservation Program requires a 50% match and eligible projects include land acquisition for trails and new development and rehabilitation of parks, trails and recreation facilities.
  - C2P2—Recreational Trails Program requires 20% match (except for land acquisition projects, which require a 50% match) and eligible projects include construction of new recreational trails and acquisition of easements/right-of-ways for trails.

Paoli Roadway Improvement projects potentially eligible for C2P2 funding include:
- East Central Avenue Multi-Use Trail and Pedestrian Crossings
- West Central Avenue Improvements

- Act 13 (Marcellus Shale Impact Fee) - Greenways, Trails and Recreation Program (GTRP): The Commonwealth Financing Authority (CFA) administers the Greenways, Trails, and Recreation Program (GTRP) for the development, rehabilitation and improvements to public parks, recreation areas, greenways, and trails utilizing Act 13—Marcellus Shale Impact Fees. Grants are awarded annually and most projects require a 50% local match for the total project cost.

Paoli Roadway Improvement projects potentially eligible for Act 13 - GTRP funding include:
- East Central Avenue Multi-Use Trail and Pedestrian Crossings
- West Central Avenue Improvements

- Redevelopment Assistance Capital Program (RACP): The Office of the Budget administers the RACP state grant program for the acquisition and construction of regional economic, cultural, civic, recreational, and historical improvement projects. RACP funds can only be used for land acquisition or construction. Additionally, it is a reimbursement program and requires 50% matching funds from non-state sources. Funding is awarded competitively when construction will begin within one year. Highways and bridges are generally ineligible projects, unless they are associated with an economic development project.

The Paoli Transportation Center has two RACP grant allocations totaling $28 million from Capital Budget Acts from 2004 and 2010. Utilization of the grants requires development of a business plan and further coordination with the Office of Budget, particularly to determine if funding for roadway improvements would be an eligible project.

- Infrastructure Development Program (IDP): The Department of Community and Economic Development (DCED) administers the IDP program to provide grants and loans for specific infrastructure improvements necessary to complement capital investment by private companies and private developers. Additionally, the grants must support job creation of at least one new full-time job for every $25,000 or 10 new full-time jobs within five years of the awarded funding. Eligible projects include transportation facilities supporting access to a private investment site, such as roadway, bridge, and sidewalk improvements. Grants are limited to $1.25 million and the private-to-public match requirement is 2:1. Paoli Roadway Improvements may be eligible for an IDP grant or loan, depending upon adjacent development proposals and private developer investments.
7.5 Implementation Plan

**Regional**
The Delaware Valley Regional Planning Commission (DVRPC) has historically sponsored or administered several competitive grant programs for municipalities and other entities in the Greater Philadelphia region based on federal, state, and private funding programs. Two previous regional competitive grant programs that may be applicable for Paoli Roadway Improvements are the Transportation Alternatives Program (TAP) and Congestion Mitigation and Air Quality (CMAQ) program. Both programs utilize a portion of the region’s share of federal funds and general eligibility are described in the Federal funding section above.

DVRPC announces specific grant rounds when funding is available and coordinates project applications and selection. In previous funding rounds, grants have required local matching funds and/or local funding for all pre-construction activities. Additionally, previous grant rounds have included deadlines for project completion. The specific requirements must be considered when identifying potentially eligible projects.

**Local**
In addition to general and capital funds, municipalities in Pennsylvania have several options to fund transportation improvements. Summarized are two opportunities that can be considered for Paoli Roadway Improvements.

- **Act 209 Transportation Impact Fee:** The Pennsylvania Municipalities Code (MPC) authorizes municipalities to enact transportation impact fee ordinances and charge impact fees based on traffic generated by new land development. The impact fees can be used to implement necessary capital improvements due to the increased demand associated with new development. Tredyffrin Township does not currently have an impact fee ordinance. Given the anticipated development of the Paoli Rail Yard and other redevelopment opportunities in the Paoli area, a transportation impact fee could be considered for the Paoli area to implement roadway improvements that support the new development.
7.5 Implementation Plan

Projects

It is expected that the transportation improvements within Paoli will be implemented through multiple projects over time, with different project leads. In some cases, the Township or PennDOT may take responsibility for moving a project forward. In other situations, the transportation improvements may be provided as part of development or redevelopment projects, and the exact scope of the needed improvements will be determined by review of the transportation impact studies prepared for each project.

Project: Paoli Intermodal Transportation Center (PITC)
Responsible Party: SEPTA/PennDOT
Summary: Numerous transportation improvements are planned to occur with the new PITC, which will bring about a significant change to the transportation landscape within the heart of Paoli. Replacement and relocation of the N. Valley Road bridge with the extension of Darby Road, new parking structures, improved sidewalks near the station will provide benefits to all users.
Recommendation: This project should provide the future cross-section of the selected/preferred improvement concept for Lancaster Avenue between N./S. Valley Road and Darby Road as needed to transition between the existing and new cross-sections to the extent feasible. The Darby Road extension and new bridge should be accessible to all users. The southern garage deck should provide access to the Darby Road extension to the extent feasible. The Darby Road extension intersection with N. Valley Road should connect between N. Valley Road and West Central Avenue near N. Cedar Hollow Road. A transportation connection to the south side of Paoli using the existing underpass on the western end of the property should also be explored. Additional off-site traffic improvements will be needed to mitigate new traffic generated by this project. At a minimum, it would be expected that this development would provide improvements to the N. Valley Road and E./W. Central Avenue intersection or a portion thereof. If other projects occur in the area (i.e., redevelopment of the Paoli Square) concurrent with the schedule of the Rail Yards redevelopment, then it would be recommended that these parties share in the costs of the intersection improvements.

Project: Rail Yards Redevelopment
Responsible Party: Amtrak/Paoli Transit Associates.
Summary: This project is planned to include a multi-use transit-oriented development. Access to the local roadway network will be required and it is expected that access would be proposed to North Valley Road, opposite the new Darby Road extension, and West Central Avenue.
Recommendation: The redevelopment should provide for multi-modal transportation infrastructure within the community to accommodate pedestrians, bicyclists, and transit (busses and shuttles). In order to reduce traffic impacts on the surrounding roadways, a new collector road should connect between N. Valley Road and West Central Avenue near N. Cedar Hollow Road. A transportation connection to the south side of Paoli using the existing underpass on the western end of the property should also be explored. Additional off-site traffic improvements will be needed to mitigate new traffic generated by this project. At a minimum, it would be expected that this development would provide improvements to the N. Valley Road and E./W. Central Avenue intersection or a portion thereof. If other projects occur in the area (i.e., redevelopment of the Paoli Square) concurrent with the schedule of the Rail Yards redevelopment, then it would be recommended that these parties share in the costs of the intersection improvements.

Project: Lancaster Avenue and Paoli Pike Intersection Improvements
Responsible Parties: To be determined.
Summary: The intersection improvement will provide capacity improvements to the intersection and corridor, improve pedestrian access, and potentially create improved circulation routes and access management.
Recommendation: As development or redevelopment occurs, it is recommended that those projects implement the transportation improvements and new connections as those projects occur. Due to the scope of the overall improvements at the intersection, this portion of the project may be phased to occur over time.

Project: Paoli Plaza
Responsible Parties: To be determined.
Summary: Paoli Plaza offers a significant opportunity to provide better circulation and distribute traffic throughout the surrounding roadway network. This roadway can potentially connect the new Intermodal Transportation Center (ITC) to Lancaster Avenue in Willistown, which will draw traffic, destined to/from the ITC and retail uses, off of Lancaster Avenue and thereby improve traffic conditions on the larger network.
Recommendations: If Concept 2 or 3 is selected for the long-term improvement of this intersection, then property and right-of-way acquisition will be required. It is anticipated that these improvements (and obtaining the necessary rights-of-way) would be implemented as surrounding properties redevelop.
7.5 Implementation Plan

Project: N. Central Avenue & E/W Central Avenue
Responsible Parties: Adjacent/Nearby Developments

Summary: The various intersection improvements will provide an operational and safety benefit to the roadway network. Regardless of which improvement concept is selected, right-of-way and property acquisition will be necessary to accommodate the widening for turn lanes, re-alignment, or roundabout.

Recommendations: It is anticipated that these improvements (and obtaining the necessary rights-of-way) would be implemented as surrounding properties redevelop or in conjunction with nearby developments such as the Railyards redevelopment, the new ITC, or other major projects.
Priorities

As previously noted, the various roadway and intersection improvements will likely be implemented in a phased approach over time, depending upon various factors. Due to the likelihood of a phased implementation of improvements, as well as the fact that the Township will select the preferred transportation improvements after this Study is completed, the implementation plan only provides a general outline of how projects may be phased or implemented without a defined schedule.

As the Township has not yet selected their preferred transportation improvements for each location, a detailed priority plan can not be developed. However, the priorities shown on this page should be considered in order to advance the various transportation improvements in Paoli regardless of what improvement concepts are ultimately selected.

Recommended Project Priorities/Actions

**Short-term** | Recommendations to be completed within the next four years:

1. The Township should select its preferred transportation improvements in order to expand this priority list and identify a specific action plan to implement each project. If appropriate, select elements of the transportation projects that can be advanced (phased) in order to provide a transportation benefit before full completion of the project. ●

2. Modify regulatory policies and ordinances to permit, and in some cases incentivize, changes to Paoli that are in keeping with the community’s overall vision and the transportation recommendations herein. ●

3. Identify (and allocate, if possible) short-term and long-term funding sources in order to advance the various transportation projects. Coordinate with DVRPC, Chester County, and PennDOT to move appropriate projects onto long-range plans with secured funding. ●

4. Begin to provide traffic calming and pedestrian improvements in advance of larger transportation projects, as feasible. ●●

5. Develop a parking management program to address current and future needs. Collaborate with existing commercial property owners to promote shared parking, bus stop shelters, and bike parking, as well as improved sidewalks and streetscape elements. ●●

**Intermediate** | Recommendations to be completed within the next four to eight years:

1. Secure needed rights-of-way and easements, to the extent feasible, in advance of the transportation improvement projects. Coordination with property owners will be required. In some cases, this action and cost can be considered part of a local match obligation for some funding sources. ●●●

2. Continue to implement elements of the preferred transportation improvements to the extent feasible. ●●

**Long-term** | Recommendations to be completed beyond the next eight-year period:

1. Complete the selected transportation improvements within the study area. Implementation may occur as a public driven project, be provided as part of future (re)development, or as part of a public-private partnership. ●●●

**Ongoing** | Recommendations require continual effort or undertaken on an as-needed basis are shown below:

1. Provide maintenance to roadways and sidewalks to improve travel conditions for pedestrians and bicyclists, as well as the motoring public. ●●

2. Monitor land development in order to ensure that elements of the overall transportation improvement projects are incorporated into associated plans, or at a minimum, do not preclude these future improvements. ●

**KEY:**
- ● Organizational
- ●● Regulatory
- ●●● Future Studies
- ● Financial