SHIPPENSBURG UNIVERSITY TRANSPORTATION STUDY

Prepared for

Shippensburg University
A member of the State System of Higher Education

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Prepared by

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EXECUTIVE SUMMARY

The purpose of this study effort is to identify transportation programs and projects that will provide improved vehicular access to Shippensburg University. The list of proposed transportation programs and/or projects has been stratified by short-term (0-5 years), mid-term (5-10 years), and long-term (10-20 years) to facilitate the evaluation and implementation of improvements in a logical sequence that is within the funding sources available to the University and the region.

Key project stakeholder groups were identified to act as a core Steering Committee to guide the study. It is important to note that this study effort did not attempt to involve the public or student/community stakeholders at this time. Representatives of the stakeholder groups were interviewed individually to determine their perception of the key transportation issues in the Shippensburg area and important access issues related to Shippensburg University. A series of Steering Committee Meetings were held to present findings and gather additional input related to the recommendations. Field observations and review of available background information was also completed.

SHORT-TERM RECOMMENDATIONS

The short-term recommendations are focused on low cost immediate actions that would help reduce travel time for vehicles that must pass through Shippensburg downtown area to access the University. The short-term recommendations include:

- **Improve Communications**
- **Improve Directional Signing**
- **Improve Traffic Signal Coordination**
- **Additional Parking Spaces**

MID-TERM RECOMMENDATIONS

Mid-term recommendations were developed with major emphasis placed upon reducing or eliminating the need for traffic to travel through Shippensburg's downtown area to access the University. The mid-term improvements include:

- **Queen Street Extension**
- **Brookside Avenue Extension**
- **Earl Street Extended**

LONG-TERM CONCEPTS

The long-term concepts are either refinements of mid-term recommendations from this study or projects recommended in other studies. The long-term concepts include:

- **Improved North Access Road**
- **Remove Height Restriction on PA 696**
- **Reconstruct I-81/PA 174 Interchange**
- **Evaluate Inner Loop Road Construction**
- **Evaluate Outer Loop Road Construction**

A. Project Overview

INTRODUCTION

This report summarizes proposed transportation projects and programs that can be implemented in various time periods to help improve access to Shippensburg University. As the University is tied directly to the community in which it exists, any transportation action that affects the University will also impact, as well as benefit, the surrounding community. Shippensburg University is located in Shippensburg Township and is adjacent to Shippensburg Borough. These two municipalities, therefore, play a key role in the success or failure of this effort to identify and implement projects and programs to provide improved access to the University. This report discusses opportunities that exist for the University to work in cooperation with the surrounding community to improve transportation access for all stakeholders.

PROJECT PURPOSE AND GOALS

The purpose of this study effort is to identify transportation recommendations that will provide improved vehicular access to Shippensburg University.

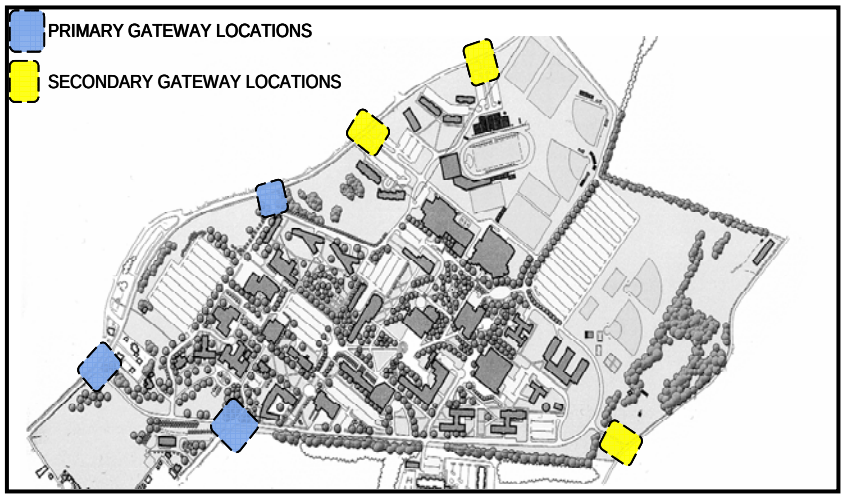
The goal of this study effort is to develop a list of transportation projects and/or programs to provide improved access to Shippensburg University. The list of recommendations will be classified as short-term (0-5 year), mid-term (5-10 year), and long-term (10-20 year). The study will recommend projects and/or programs that can be achieved in the proposed time frame and with the available funding sources. The list of project and/or programs, moreover, should be sensitive to anticipated community and environmental impacts and undertaken in coordination with transportation projects already underway at the University and within the Shippensburg area.

UNIVERSITY FACILITIES MASTER PLAN

A major consideration in this study was to ensure that recommended improvements tied into approved plans and programs at the University. The Shippensburg University *Facilities Master Plan* was completed in 1998 and major portions of this plan have been implemented. The traffic circulation system recommended in the *Facilities Master Plan* includes a perimeter loop road utilizing some existing roads and removing and extending other roads. The purpose of the loop road is to eliminate traffic through the core area of the campus, which will greatly reduce vehicle/pedestrian conflicts and foster a pedestrian oriented campus. The recommendations in this report are intended to maximize access to the perimeter loop road.

The *Facilities Master Plan* recommends that access to the University be restricted to selected Gateway entrances along the outer loop road. The main entrances to the campus would remain located at Earl Street and Prince Street. A new entrance point (new east entrance) to the campus would be established by replacing the existing one-lane bridge that connects to Fogelsanger Road.

One additional improvement, the new east drive, would complete the loop road by extending the access road from the new east entrance past the new Performing Arts Center and around the sports complex to a new intersection with PA 696 (Newburg Road) at the new Conference Center. Funding requests for the two proposed improvements are being prepared to complete the University loop road.



Shippensburg University *Facilities Master Plan*
Loop Road & Access Points

PREVIOUS STUDIES

Transportation studies completed or underway for the Shippensburg area were reviewed to evaluate the transportation issues impacting travel in the region. The recommendations from these studies, moreover, were reviewed to determine their applicability to transportation access issues for Shippensburg University.

The Preliminary Traffic Plan for the Shippensburg Area was completed by Carl Bert & Associates in October 2002 for the Shippensburg Area Chamber of Commerce's Long Range Planning Committee. This report contains a good overview of the transportation network in the Shippensburg area and the associated congestion/engineering design issues associated with this network. The report also identifies several transportation improvement projects that should be evaluated further and general recommendations to improve transportation planning, stakeholder communication, and travel in the region. A number of the projects and programs recommended in the Chamber Study are repeated in this report with minor modifications.

The transportation projects proposed in the Chamber Study emphasize the diversion of traffic away from the King Street corridor. In addition to specific transportation projects, the Chamber Study contains the following recommended actions:

- Develop consensus among stakeholders
- Develop GIS data base and mapping
- Develop Unified Comprehensive Plans, Zoning Ordinances & Transportation Ordinances
- Create a Regional Transportation Planning Commission
- Complete a detailed Traffic Study
- Coordinate with PennDOT on I-81 Interchange Improvements
- Secure additional planning funds

The I-81 Integrated Land Use, Transportation and Economic Development Study was undertaken by Gannett Fleming to evaluate all interchanges on I-81 in Cumberland County. Phase I of this study reviewed all I-81 interchanges and recommended that a more detailed review of possible improvements at Interchange #29 (Walnut Bottom Road) be completed in Phase II of this study. The recommendations from Phase II of this study effort are discussed is the Mid-term Recommendations Section of this report.

A Draft Shippensburg Borough/Shippensburg Township Joint Comprehensive Plan was completed in March 2005 by Spotts, Stevens and McCoy, Inc. The purpose of this planning effort is to allow the two local governments to work together to plan regionally across municipal boundaries using "smart growth principles" to address both development and preservation issues. The Joint Comprehensive Plan contains a transportation component and the major recommendations are discussed in the Mid-term Recommendations Section of this report.

PROJECT STAKEHOLDERS

Key project stakeholder groups were identified in cooperation with University personnel as a core Steering Committee to guide the study. It is important to note that this study effort did not attempt to involve the public or student/community stakeholders at this time. The short-term recommendations, however, note that the successful implementation of any program of transportation improvements will require that the public and student/community stakeholders be given the opportunity to participate. Representatives of the stakeholder groups were interviewed to determine their perception of the key transportation issues in the Shippensburg area and important access issues related to Shippensburg University. Field observations were also completed to supplement the information provided by the stakeholder interviews.

The key stakeholder groups for this study include:

- Shippensburg University
- Shippensburg Borough
- Shippensburg Township
- Southampton Township (Cumberland County)
- Southampton Township (Franklin County)
- Shippensburg Area Chamber of Commerce
- Shippensburg Area School District

Representatives from these stakeholder groups were used as the initial "sounding board" to review and comment on various recommendations to improve transportation access to the University. The interaction with the stakeholder groups was accomplished through presentations at two Steering Committee meetings held in March and May of 2005.

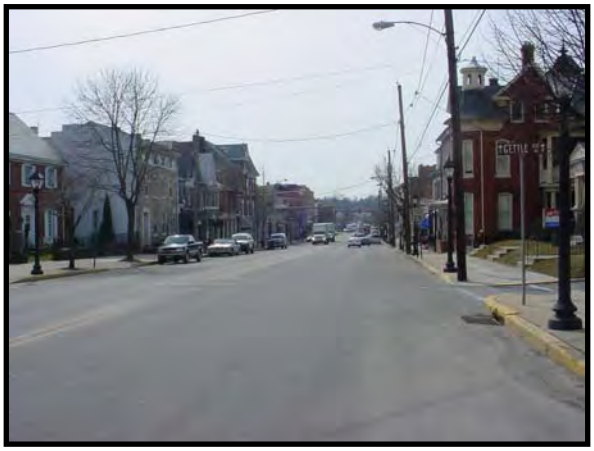
The March 22, 2005 Steering Committee meeting reviewed information contained in this section, as well as short-term recommendations that could be implemented in the 0-5 year time frame. The short-term recommendations are presented in the next section of this report. The key discussion point from this meeting was that all stakeholders agreed that open and effective communications among stakeholders was critical to the success of any program to improve transportation in the region.

A follow-up Steering Committee meeting was conducted on May 31, 2005 to review mid-term (5-10 year) recommendations and long-term (10-20 year) concepts for improved transportation access to the University. These mid-term recommendations and long-term concepts are presented later in this report. The key discussion point from this meeting was that major improvements to access to the University can be achieved with projects that are estimated to cost less than $1 million.

The Steering Committee representatives for this study can be used as the initial membership of a policy committee charged with implementing the recommendations in this report.

TRANSPORTATION CHALLENGES

The Chamber Study by Carl Bert & Associates states that a major transportation issue in the Shippensburg area is that the majority of traffic movements must use King Street, "to go anywhere through, around, or across town". King Street (US Route 11) is a major travel route in the Cumberland Valley and connects Shippensburg to other communities in the Valley. Locally, King Street is the focus of the Shippensburg's downtown, and all the radial roads that serve Shippensburg connect to King Street. I-81 parallels King Street and provides relief from the large volume of trucks and automobiles that travel through the Cumberland Valley. Any major traffic incident on I-81, however, causes a large volume of traffic to divert on to King Street and often causes major traffic congestion in Shippensburg. All travel from Interstate 81 to Shippensburg University, moreover, must travel on some portion of King Street.



King Street in Shippensburg Looking South

The Chamber Study identifies the many challenges inherent in the layout of the transportation network in the Shippensburg region including:

- "Poor configuration" of I-81 Interchange north and south of Shippensburg,
- Restricted roadway cross section on Walnut Bottom Road (PA 174), which is the major route connecting King Street to I-81,
- Inadequate traffic capacity of Burd and Orange Streets, which run parallel to King Street and serve as diversion routes,
- All streets and roads in the region, except I-81, are only one lane in each direction,
- Many intersection radii in the region are inadequate for large trucks,
- Railroad bridge over the major travel route, PA 696, has height and width restrictions, and
- Inadequate capacity on the local network to handle traffic volumes generated by special events related to the University and/or Shippensburg Borough and I-81 incidents.

These network challenges combined with existing and future residential development outside of Shippensburg Borough and anticipated commercial/industrial development associated with the I-81 and PA 174 corridors will require a concerted effort by all local governments and the University to address future transportation access issues in the Shippensburg area. Transportation access will also be impacted by the planned increase in Shippensburg University student enrollment identified in the University's Strategic Plan; the completion of the University Foundation Conference Center on PA 696; and, local initiatives such as the proposed new Shippensburg Area Middle School to be located north of Baltimore Road, immediately outside Shippensburg Borough.

Traffic volumes on I-81 between Exit 24 and Exit 29 are expected to increase from an average daily traffic (ADT) volume of 43,000 in 2005 to over 58,000 ADT in 2015. Traffic volumes on the other major travel routes (US 11 & PA 174) in the Shippensburg area are not expected to increase at the same rate as the I-81 corridor, but any increase of traffic on these two lane roadways will have a major impact on traffic congestion. The US 11 (King Street) corridor in the Borough of Shippensburg is expected to increase from a range of 14,000 to 18,000 ADT in 2005 to a range of 16,000 to 20,000 in 2015. The PA 174 corridor between I-81 and US 11 is expected to increase from a range of 9,000 to 16,000 ADT to a range of 10,000 to 18,000 in the same ten year period.

TRANSPORTATION OPPORTUNITIES

The same transportation network that provides numerous challenges for the Shippensburg area also provides many opportunities to address current and future transportation issues. The King Street corridor, although congested at selected locations and during special events, provides many opportunities through the available cart width and traffic signal controls at numerous intersections. The opportunities to maximize the use of the existing cart width and existing closed-loop traffic signal system in Shippensburg Borough are discussed in detail later in this report.

The alternate routes for King Street (Burd Street and Queen Street) have restricted cart widths and parking issues. These alternate routes, however, provide a starting point to begin the development of incident management plans to safely move vehicles through the Borough.

Perhaps the most important opportunity to address transportation issues is a willingness by stakeholders to cooperate that has been expressed by participants in this study. This improvement in effective communications is critical to the success of this study effort and is discussed in more detail later in this report.

An additional opportunity to address transportation issues may be found in the development community that is implementing the increase in economic growth in the region. The residential, commercial and industrial development in the region can not be successful unless transportation issues are acknowledged and addressed.

B. Short-term Recommendations

Short-term recommendations developed through this study effort focus on projects and programs that will improve transportation access to the University in the immediate 0-5 year time period.

Four short-term recommendations were developed with major emphasis placed on low cost immediate actions that would help reduce travel time for traffic that must pass through the Shippensburg downtown area to access the University. The short-term recommendations include:

- **Improve Communications**
- **Improve Directional Signing**
- **Improve Traffic Signal Coordination**
- **Additional Parking Spaces**

A description of the steps necessary to implement the short-term recommendations and cost estimates, where appropriate, has been identified.

IMPROVE COMMUNICATIONS

The most important recommendation developed by this study effort is that all stakeholders in the Shippensburg Area must make a concerted effort to communicate with each other to identify, evaluate and resolve issues of mutual concern. The emphasis in this study is placed upon addressing the transportation access issues of Shippensburg University, but the recommendation to improve communication among stakeholders as a way to resolve issues should not be limited to transportation.

Everyone involved in the stakeholder interviews and stakeholder meetings for this study has agreed there is a need to improve communications in order to resolve issues, but until a serious effort is made to begin the process, the effort will not proceed past the "talking stage".

A goal is something you actively pursue by writing it in clear, concise language and developing a detailed written action plan to achieve it. The goal to improve travel in the Shippensburg area and to resolve transportation access issues to the University can be used by all stakeholders as the starting point, or first step exercise, to begin a formalized and proactive process to "begin talking" to each other to identify, analyze, and resolve issues of mutual concern. This report can be used as the initial action plan to reach these goals.

There are many roadblocks to improving communications, including the misperception that communications will somehow take care of themselves and the perception that our schedules are already filled with more important things to consider. Past experiences, or "baggage", among stakeholders - both good and bad – is often an obstacle to improving communications. Transportation activities are a starting point to begin the process to improve communications to resolve issues. After all, almost everyone experiences "traffic" in their daily travels and desires to see it improved.

Effective communications should involve three distinct groups:

- Policy makers who have the authority to implement decisions,
- Technicians who have the knowledge to evaluate issues, and
- Constituents who are provided the opportunity to participate in the decision-making process.

The first step in any process is an agreement to begin. A policy group of effective decision makers must be empowered to make decisions and implement programs to address transportation issues. This policy group can be an existing committee of the University or the surrounding area, such as the Transportation Committee of the Chamber of Commerce, or a new committee. The important consideration is that the committee includes all appropriate stakeholders and that the members are empowered to make decisions for their respective organizations. The information in this report can be used as a starting point or initial agenda to begin the dialogue.

Technical assistance to evaluate key transportation issues may be provided by staff members of the participating municipalities or the University, or from qualified consultants. A feedback mechanism must be established to provide the traveling public and the affected community the opportunity to voice their concerns with any proposed solutions. The existing web sites of the University, the participating municipalities, and/or the Shippensburg Chamber of Commerce may be the appropriate vehicle to solicit input from the University, residential, business and industrial community members.

The two major concerns with the movement of traffic in the Shippensburg area are the everyday occurrence of travel, and the special events or incidents that disturb travel patterns. Everyday travel will be improved through implementation of the directional signing program, parking program, and improvements to the traffic signal coordination that are discussed later in this section. These programs of improvement will also help traffic circulation during special events, but a more immediate action program can be implemented to address special events related to the University and Shippensburg Borough.

These immediate actions could involve several items such as:

- Selective use of fire/police personnel to help direct traffic through and around the downtown area,
- Preplanned routing of traffic for recurring events,
- Temporary one-way designation of selected streets combined with temporary parking restrictions,
- Temporary signing for entry and exit routing for major events, and
- Preparation of incident management plans for safe movement of pedestrians and vehicles.

A low cost improvement that should be considered by the policy committee is the use of fire/police personnel to direct traffic to and from the University on predetermined routes during major events. One possible route is the use of Queen Street to provide both access and egress to the University. The use of Queen Street would help to reduce the traffic impact to the downtown area.
Motorists traveling to the University from the north could be directed by fire/police personnel or temporary directional signing to turn onto Queen Street at the signalized

intersection of Queen and King Streets. From this point motorists would be directed to use Britton Road to the intersection of Britton Road with the access road to the University long-term parking lot adjacent to the Spiritual Center. Access to Adams Drive on the University would be provided from the access road through the gate that separates the Spiritual Center parking lot from the University long-term parking lot.

This routing would provide a direct access to Adams Drive and the parking lots associated with the Performing Arts Center and the sports complex of the University. The driveway to the Spiritual Center, however, crosses over the joint use trail and access issues across this trail must be addressed. Traffic exiting the University major events could utilize Adams Drive to Prince Street to Richard Street and then to Queen Street to access the intersection of Queen and King Streets. This is only one possible routing plan that could be evaluated as part of the short-term recommendations.

Richard Street Looking South Toward Prince Street

In addition, the short-term items listed above should be evaluated further by the policy and technical committees to determine low cost improvement projects to address transportation access.

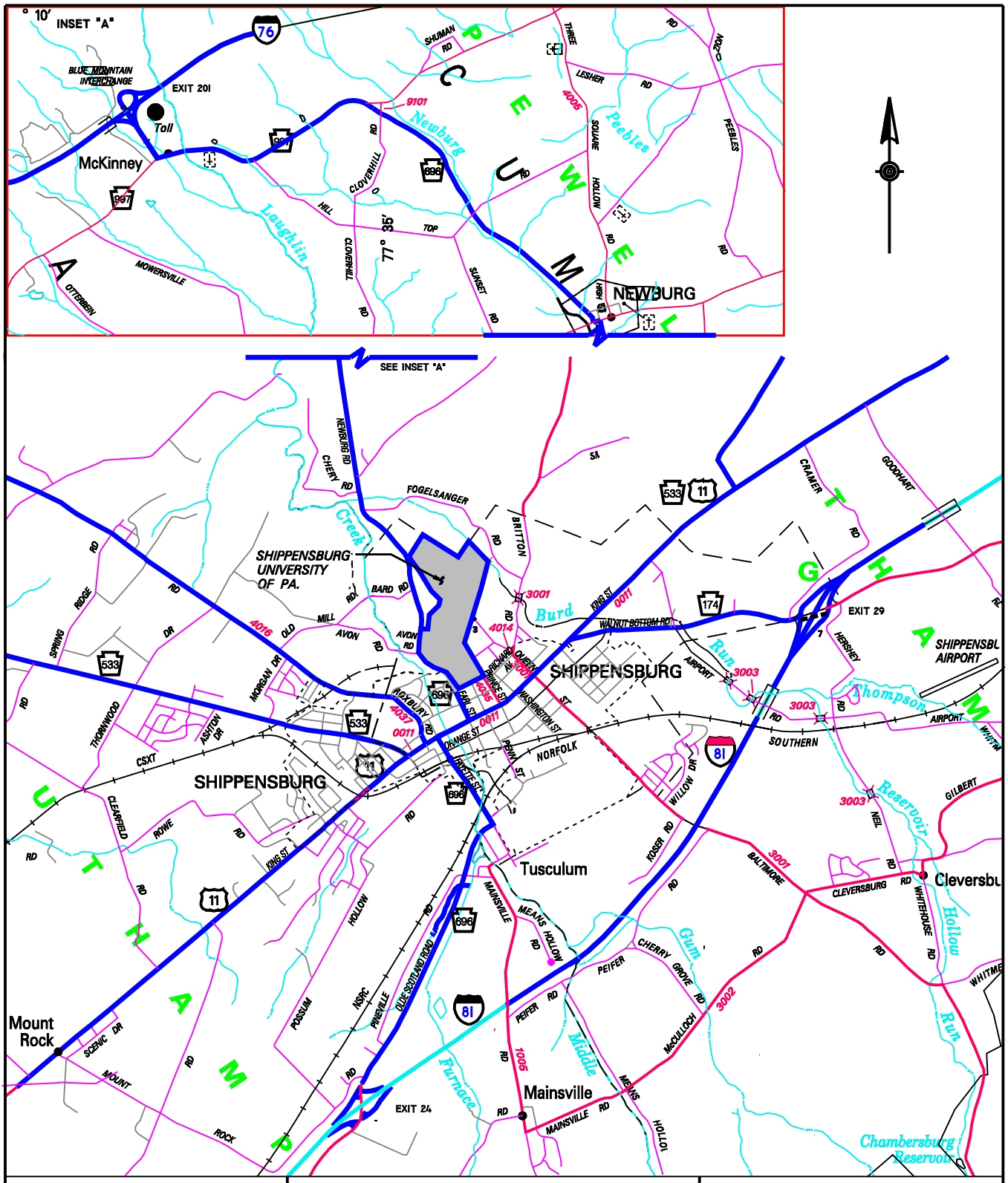
IMPROVE DIRECTIONAL SIGNING

Description and Purpose:

Clear and concise directional signing for motorists traveling to Shippensburg University from nearby freeways and major arterial streets will improve the ease of access to the University. Currently, there are few signs to direct motorists to the University, especially via the most direct travel route to designated parking areas associated with major attractions on the University campus. This statement is also true for major attractions in the surrounding areas of Shippensburg Borough and Shippensburg Township.

Existing Directional Signing Along PA 696

As shown in the figure on page 10, the freeways providing access to the Shippensburg Area and the University Campus include I-76 (the Pennsylvania Turnpike) and I-81. Specifically, from I-76 Exit 201 (Blue Mountain), motorists access the campus by traveling on PA 997 to PA 696, which becomes North Earl Street in the vicinity of the University.



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From southbound I-81, Exit 29 is generally used to access the campus via PA 174 (Walnut Bottom Road) to US Route 11 (King Street). There are several local cross streets (including the most commonly used Prince Street) that motorists may traverse from US Route 11 to the University. US Route 11 is the primary route for traffic accessing the University. From northbound I-81, Exit 24 connects motorists to the campus via PA 696.

Therefore, the major route segments and nodes to consider directional signing improvements are:

- I-76 (Pennsylvania Turnpike), specifically near Exit 201
- I-81, specifically near Exits 24 and 29
- PA 997 between I-76 and PA 696
- PA 696 between PA 997 and the campus
- PA 696 between I-81 and the campus
- PA 174 between I-81 and US Route 11
- US Route 11 from PA 174 to the appropriate cross street campus access points

Both the University and surrounding communities, such as Shippensburg Borough, house several points of interest. The Shippensburg community (the University, Borough, and Shippensburg Township) should consider implementing a destination signing program to create a network of signs to guide the traveling public from major highway gateways to key civic, cultural, visitor, recreational, and commercial destinations.

The program would consist of permanent signs to direct traffic to University locations, such as:

- Admissions Office
- Sports Complex
- Performing Arts Center
- Conference Center

These signs could also include other local destinations in historic Shippensburg and the surrounding community. Motorists would be signed to the designated parking area closest to the attraction or event.

In addition, Temporary Variable Message Signs (TVMS) could be used during major University and community events to direct traffic at key decision points in the transportation network. The implementation of directional signing will provide positive information to the traveling public to direct them to specific locations within the University Complex and the general Shippensburg Area.

Temporary Variable Message Sign

Challenges:
There are challenges to successfully implementing a destination signing program, such as:

- Funding
- Installation
- Maintenance
- Government sponsorship
- Stakeholder coordination
- Agency approval / permitting

A majority of the permanent signs and all the TVMS's will need to be located on municipal or PennDOT right-of-way. Coordination efforts will be necessary with Shippensburg Borough, possibly the surrounding Townships, and PennDOT to address all issues related to the signing program.

Cost:
An engineering study and bid plans should be prepared in order to install permanent directional signs. The study and bid plan preparation is estimated to cost approximately **$40,000** to comprehensively sign the Shippensburg region.

Installation of permanent signs is estimated at $1,000 per sign on arterials and local roads. A preliminary estimate of the number of permanent signs by location to direct motorists to the University is illustrated in the following table. Additional permanent signs will be necessary to identify Shippensburg community destinations. It is estimated that 21 permanent signs on various roadways directing motorist to the University will cost approximately **$25,000**. Variable Message Signs can be rented at a cost of $100 per day. Present estimate is for three TVMS for a total daily cost of **$300**. Maintenance cost and cost of TVMS can be absorbed into existing Maintenance & Operations budget of University, but may require a Memorandum of the Understanding for the University to access Borough, Township and/or PennDOT property.

Approximation of Required Permanent Directional Signing for Shippensburg University

Roadway Segment/ Node	Approximate Sign Locations	# of Signs Needed	Installation Cost
PA 997 between I-76 and PA 696	-@ intersection with PA 696	1	$1,000
PA 696 between PA 997 and the campus	-2 confirmation signs -@ Fogelsanger Road -@ new east access at Conference Center -2 campus entrance points as per the Facilities Master Plan	6	$6,000
PA 696 between I-81 and the campus	-1 confirmation sign -@ Fayette Street -@ King Street -@ Earl Street (3 entrance points) -@ Prince Street	7	$7,000
PA 174 between I-81 and US Route 11	-@ US Route 11 (King Street)	1	$1,000
US Route 11 from PA 174 to the appropriate cross street campus access points	-@ Queen Street -@ Prince Street -@ Earl Street	3	$3,000
Fogelsanger Entrance miscellaneous signing	-Ingress from both directions -Egress	3	$3,000
Subtotal - Permanent Signing		**21**	**$21,000**
Contingency (20%)			**$4,000**
Total Permanent Signing			**$25,000**

Next Steps:

PennDOT has a number of formal signing programs with specific guidelines. However, some of the programs are in a moratorium, (such as the Wayfinding Signing Program) as they are under review and may be changed. At this stage, it is not clear which of the signing programs would be most applicable for the Shippensburg region. The following next steps are recommended to ensure the desired goals for the Shippensburg area destination signing program are met:

- Inventory existing signs. An inventory of the existing directional signing should be conducted and summarized on an area map. This would mark the beginning of the engineering study and bid plan preparation noted in the costs above.

- Develop a schematic of the desired locations of future signs. The table above may be a starting point for a discussion around the future signing for the region. Destinations to be signed and the appropriate locations for signs to be placed should be noted.

- Existing signing should be evaluated and compared to the future signing for the region. Gaps between the existing and future signing should be noted and summarized.

- Meet with PennDOT Bureau of Highway Safety and Traffic Engineering. A meeting should be held with PennDOT in order to review the desired destination

signing improvements in the region, determine the appropriate signing program to implement the destination signing, and discuss approvals and funding for engineering and installation.

IMPROVE TRAFFIC SIGNAL COORDINATION

Description and Purpose:

Currently, Shippensburg Borough operates a closed-loop traffic signal system (refer to the short-term improvements in Appendix B for an aerial photo showing the signalized intersections in the project area). By analyzing the traffic signal system and completing traffic signal timing updates and traffic signal timing additions, the performance of the transportation network in the Borough and in the vicinity of the University may be improved. Updating signal timings and improving signal coordination are a cost-effective method of increasing capacity during peak periods.

In addition to updating signal timings during peak periods, special event signal timings can also be developed to help facilitate the flow of traffic in the Borough, and to and from the University. Special events, such as graduation, sporting, civic and cultural events occur often enough that traffic patterns can be predicted and traffic signal timing plans developed. The signal timing plans can be programmed into the traffic signal system for use during these special time periods. In addition, timing plans can be developed to accommodate traffic incidents that impact the Borough and the University, such as an I-81 closure.

Traffic signals at intersection of King and Queen Streets

Challenges:

The central challenges to gaining the most efficiency from the operations of the closed-loop signal system are:

- Understanding the traffic patterns, volumes, and issues under various conditions, including the traffic patterns before, after, and during special events. This activity will require formal traffic studies.

- Maintaining and updating the timing plans on a regular basis.

- Coordination among stakeholders impacted and the Borough who is responsible for the maintenance of the traffic signal timings. The Borough should establish a feedback mechanism to coordinate with all stakeholders when updates and/or improvements to the traffic signal timing are required.

- Completing necessary traffic studies to evaluate possible expansion of the closed-loop traffic signal system to traffic signals outside the Borough limits, where applicable.

Cost:
The initial cost is a study to gather the necessary traffic data and determine the short and long range signal timing improvements. After the study is complete and approved, signal permit plans and coordination sheets will need to be updated and submitted to PennDOT for the issuance of a revised traffic signal permit for each intersection. Assuming approximately ten (10) intersections and four (4) event timing scenarios, the update will cost approximately $144,000, including study, design, updated signal permit plans, and implementation of signal timing adjustments.

Signal Timing and Coordination Adjustment Costs.

Task	Subtasks	Approximate Cost
Traffic Signal System Study	-data collection under various conditions and special events -analysis -proposed timing changes	$80,000
Traffic Signal Permits	-update timings on drawings -update timings on coordination sheets -submit to PennDOT for permitting	$20,000
Implementation of Timing Plans and Fine Tuning the System	-assume no new equipment is necessary -implement and refine in field in real-time	$20,000
Subtotal Signal Coordination Improvements		**$120,000**
Contingency (20%)		**$24,000**
Total Signal Coordination Improvements		**$144,000**

Next Steps:
The next steps to improving traffic signal coordination include:

- Securing study and implementation funding.
- Forming a Task Force (PennDOT, University, Borough & Township) to finalize the goals and objectives.
- Selecting a consultant to complete the necessary study and signal permit plans.

ADDITIONAL PARKING SPACES

Description and Purpose:
A University on-campus parking study, *Parking Evaluation and Development Study was* completed in January 2002 by GWSM, Inc. Landscape Architects. This study identified the University on-campus parking shortfall as:

- Approximately 200 resident student parking spaces and
- Approximately 200 commuter student parking spaces

The *Parking Evaluation and Development Study* makes recommendations in order to mitigate this shortfall on-campus. However, until the University can move forward with the implementation of the recommendations, there will continue to be a strain on the off-campus parking as well.

There are two off-campus parking opportunities to assist with the parking deficiencies:

- *Queen Street 'Mud Lot'* – The Queen Street 'Mud Lot' is an area adjacent to an existing parking lot on Queen Street between Adams Drive and Britton Road. This area is used by both Borough residents and University students for short-term parking and is known as the 'Mud Lot' because it is currently not a paved surface. The University is investigating the purchase of the 'Mud Lot' for use by commuters for off-campus parking.

- Hoffman Mills Property – The recently vacated Hoffman Mills Property on the southwest corner of the Earl Street and Fort Street intersection also affords an opportunity for off-campus student parking in proximity to the University. The owners of the property are currently evaluating the value of the property.

Queen Street 'Mud Lot'

Hoffman Mills Property

Appendix A provides an aerial view of the location of these potential parking areas. Both areas are in proximity (walking distance) to the University. Specifically, at the Hoffman Mills Property there is an opportunity to extend the Cumberland Valley Rails-to-Trails joint use trail from Prince Street to Earl Street. This would provide a direct walking path from the Hoffman Mills Property to the University.

Another issue facing the Shippensburg community in regard to parking is the deficiency of resident on-street parking spaces at certain times of the day. A residential permit parking program could be instituted in order to give limited on-street parking control and access on selected streets to adjoining residential property owners. The parking permit program would restrict the use of designated on-street parking areas during designated time periods to those vehicles showing the required residential permit.

Challenges:

The Queen Street 'Mud Lot' and the Hoffman Mills Property present similar opportunities and challenges. Both properties or a portion of the properties, if possible, would need to be acquired or leased by the University. The University would need to adhere to applicable subdivision and land development ordinance requirements for the use of the property.

Programs, such as a residential permit parking program, have the potential to be contentious and may cause undesirable results. Restriction of on-street parking to a particular group of people, without mitigation of parking to the other users can be unpopular and cause a divide between local residents and commuting students. The resulting conflicts may also become an enforcement issue and could create police staffing problems for the local municipality.

Next Steps:
The next step to address the University parking deficiencies is to perform an off-campus parking study. Through this study, the University should work with Shippensburg Borough to evaluate the merits of permit parking areas for Borough residents and evaluate the feasibility of securing additional parking for University or joint use, such as the Queen Street 'Mud Lot' and Hoffman Mills Property. This may require the development of a parking committee in conjunction with the Borough.

The study should also address:

- Pedestrian walking routes from proposed off-campus parking areas to the University
- Expansion of transit route service from the proposed off-campus parking areas to the University
- Development of programs to encourage bicycle usage for students who reside off- campus

I-81 Park and Ride Lot:
An additional off-campus parking opportunity may exist at the I-81 Interchange with PA 174. The I-81 Corridor Study, which is reviewed in the ONGOING STUDIES Section of this report, recommends that a Park and Ride Lot be constructed in the I-81/PA 174 Interchange area. This study notes that the Park and Ride Lot could serve commuter and special event traffic and is estimated to cost $80,000 for a 50-space, lighted facility. The study further notes that this facility would be an opportunity for complementary adjacent development and expanded use of transit service by the Raider Regional Transit (RRT) to provide shuttle service to the University and downtown for special events.

One opportunity for adjacent development could be the implementation of this park and ride facility in the northwest quadrant of the Interchange in the area of the Cramer Road intersection with PA 174. Representatives from Southampton Township have noted that ProLogis is constructing a large terminal facility on PA 174 and has committed to relocate the intersection of Hershey Road and PA 174 in the southeast quadrant of the Interchange. The present location of the Hershey Road intersection, similar to the Cramer Road intersection, is too close to the exit and entrance ramps for I-81 and additional traffic demand from the new development will increase the safety concerns at this intersection.

The Cramer Road intersection with PA 174 could be relocated as part of the construction of the park and ride facility. The location of the park and ride facility would also address the issue of future use of the land presently occupied by the PennDOT Maintenance Facility, which was a former landfill area owned by Shippensburg Borough. PennDOT has intentions to relocate this maintenance facility in the near future. An additional

benefit to relocating the Cramer Road intersection with PA 174 would be to property owners along Cramer Road through enhancing the economic value and development potential of land along Cramer Road. The economic viability of this land is limited at this time because of the present location of the intersection of Cramer Road and PA 174.

The implementation of the park and ride lot facility at this location could be a short-term joint development recommendation involving several stakeholders.

C. Mid-term Recommendations

While the short-term recommendations focused on projects and programs to improve transportation access to the University in the immediate 0-5 year time period, the mid-term recommendations emphasize specific transportation improvement projects that can be implemented in the 5-10 year time frame.

Three mid-term recommendations were developed with major emphasis placed on reducing or eliminating the need for traffic to travel through the Shippensburg downtown area to access the University. The mid-term improvements include:

- **Queen Street Extension**
- **Brookside Avenue Extension**
- **Earl Street Extended**

Appendix B contains an aerial photograph of each project site and a detailed cost estimate.

Mid-term recommendations, moreover, in addition to being reasonable, or achievable, in terms of total cost, and community and environmental impacts, must also be considered in coordination with transportation projects already underway in the region. In addition, the mid-term recommendations should also consider the ongoing transportation studies that will be used as a guide by community stakeholders to develop future transportation improvement programs. The following ongoing projects and ongoing studies were reviewed to help develop mid-term recommendations that would be achievable and in concert with the recommendations of community stakeholders.

ONGOING PROJECTS

There are two significant ongoing projects that will impact traffic circulation on the transportation network in the Shippensburg area, as well as provide direct access to the University:

- PA 174 Reconstruction
- Completion of University Loop Road

PA 174 Westbound Approaching Kmart Entrance

PA 174 Reconstruction

The PA 174 (Walnut Bottom Road) improvement project includes the reconstruction of the existing two lane roadway and shoulder area and the addition of a continuous center left-turn lane. The project limits extend from just west of the existing intersection with Cramer Road to the area just east of the existing intersection with US Route 11 (King Street). The intersection of Cramer Road and PA 174 is very close to the intersection of PA 174 with the

southbound off ramp and southbound on ramp of I-81Exit 29. PA 174 intersects with US Route 11 at an acute angle and has a limited turning radius for large trucks.

Engineering for this project is underway with a scheduled construction letting in February 2006. However, the project has not yet received environmental clearance, and the scheduled letting date may be delayed.

The PA 174 reconstruction project will provide improved access to the numerous commercial developments along this route and will improve traffic flow for through movements. The majority of trips to and from Shippensburg University, moreover, utilize the I-81, PA 174, and King Street corridor. The I-81 exit at PA 174 is signed for Shippensburg University access. The proposed improvement of the PA 174 portion of this route will have a positive impact on access to the University. The improvement project that is under design, however, does not include the two existing intersections on PA 174 at I-81(Cramer Road) and US Route 11 (King Street)

Intersection of Pa 174 & US 11

The lack of improvements at the US Route 11 intersection particularly impacts truck access to King Street and Shippensburg University. In addition, the delay in implementing this project should be addressed by the elected officials from the three municipalities directly impacted. It would be appropriate for these elected officials to send a letter to the PennDOT District Executive at Engineering District 8-0 in Harrisburg requesting a meeting to discuss the project implementation schedule and procedures that can be used to move this project to completion.

University Loop Road

The University Loop Road concept was initiated in the *Facilities Master Plan* prepared for Shippensburg University in 1998. The purpose of the loop road system is to eliminate traffic through the core areas of campus and improve on-campus vehicular circulation while increasing safety for pedestrians and cyclists. Two significant improvements are needed to complete the University Loop Road:

- New access bridge at Fogelsanger Road (New East Entrance)
- Extension of Access Road to Conference Center (New East Drive)

Existing University Access Bridge from Fogelsanger Road

Currently, funding requests are being prepared in order to complete the University Loop Road. The estimated cost for these two projects is approximately $1.7 million.

ONGOING STUDIES

In addition to the projects, there are two ongoing studies that may impact Shippensburg University as they move forward with the implementation of transportation improvements:

1. *Shippensburg Borough and Shippensburg Township Joint Comprehensive Plan* prepared by Spotts, Stevens and McCoy, Inc.

2. *Cumberland County I-81 Corridor Integrated Land Use, Transportation, and Economic Development Study* prepared by Gannett Fleming for the Cumberland County Planning Commission.

Both of these studies have been reviewed and their impacts on Shippensburg University are noted below.

Shippensburg Borough / Shippensburg Township Joint Comprehensive Plan (Draft March 2005)
The purpose of the *Joint Comprehensive Plan* is for Shippensburg Borough and Shippensburg Township to jointly plan for 'smart growth' in the region. Acts 67 and 68, which were passed in 2000, allow for the development of such a plan. The transportation goal noted in the plan is to *provide a safe and efficient transportation circulation system that will enhance pedestrian and bicycle movement, ease vehicular travel, minimize impacts on residential development, and enhance safety of the regions road corridors*.

There was a public survey completed as part of the Joint Comprehensive Plan. However, it was noted that University students and the age group from 18-34 years were significantly underrepresented in the survey responses. Therefore, although the *Joint Comprehensive Plan* noted that *generally, transportation concerns were not particularly pressing for the Borough or Township resident; many of the respondents [to the survey] are retired or have short commutes.*

The transportation recommendations from the *Joint Comprehensive Plan* are summarized in the Future Traffic Circulation figure (Appendix B) and include the following recommendations that may impact transportation at the University:

- Proposed inner loop around the southeast quadrant of the Township, connecting US Route 11 and Olde Scotland Road (PA Route 696), including an extension of Earl Street

- Proposed outer loop through Southampton Township, Cumberland County, north of the University

- Access management along PA Route 174 (Walnut Bottom Road) and US Route 11 (King Street)

- Creation of regional gateways – along US Route 11, PA Route 174, and Baltimore Road

- Traffic calming and other techniques to encourage and allow ease of use by pedestrians and bicyclists

- Collaboration between the University and the Cumberland Valley Rails-to-Trails Council to continue the trail through the University Campus

- Burd Run greenway from the University to Walnut Bottom Road and a similar greenway along the Middle Spring Creek from Sping House Road to Dykeman Road

- Intersection improvements:
    - Walnut Bottom Road (alignment for proposed inner loop intersection)
    - Walnut Bottom Road and East Orange Street (intersection improvement)
    - Walnut Bottom Road and King Street (intersection improvement)
    - King Street and Conestoga Drive (intersection improvement)
    - Baltimore Road (alignment for proposed inner loop intersection)

- 'Smart signage' intended to ensure signing is standard throughout the region, is kept to a minimum (especially in gateway corridors), and clearly indicates the location of public parking areas

- Borough traffic circulation improvements:
    - Synchronize traffic signals along King and Orange Streets
    - Realignment of Earl Street
    - Construction of left-turn lanes on King and Fayette Streets

- Acquisition of more parking lots within the central business district of the Borough to relieve crowded on-street parking

- Identification of trip reduction strategies, including possible expansion of service by the Raider Regional Transit System and discussing ways to reduce the reliance of students and University employees upon personal vehicles

Many of these recommendations are in sync with the recommendations of this plan and may assist the University in reaching its transportation goals.

Cumberland County I-81 Corridor Integrated Land Use, Transportation, and Economic Development Study (I-81 Corridor Study)

One of the other recommendations of the *Joint Comprehensive Plan* is to implement the recommendations of the *I-81 Corridor Study*, specifically:

- Reconstruction of I-81 Exit 29
- Access management along Walnut Bottom Road
- Construction of the Burd Run greenway

The purpose of the I-81 Corridor Study is to integrate land use and transportation planning, and develop a regional plan for the I-81 Corridor in Cumberland County.

The *I-81 Corridor Study* has two phases:

- The Phase I Study examined each I-81 interchange in Cumberland County and the surrounding road system to determine their ability to accommodate future traffic based on existing zoning and development trends. The Phase I Study was completed in April 2004.

- The Phase II Study provides a detailed land use and transportation analysis of Exit 29 (Shippensburg Area) and Exits 48 and 49 (Carisle Area) in order to provide recommendations to municipalities regarding land use ordinances and road improvements necessary to service future development. The study area for each of these interchanges is approximately a one mile radius from the interchange. Therefore, Shippensburg University is not within the study area. The Phase II Study includes the development of three scenarios for analysis – build based on current zoning, a public input build, and a recommended build alternative.

Although the final Phase II Study has not yet been published, many of the results for the Exit 29 portion of the study were released at a public meeting held on April 27, 2005. The land use recommendations stress the management of trip generation and the focusing of development around the interchange to help maintain the rural aesthetic character of the area.

Appendix B contains a figure summarizing the transportation recommendations build scenario improvements for Exit 29:

- *Park-and-Ride and reconstruction of the Exit 29 interchange* – The necessary reconstruction of Exit 29 to accommodate the year 2030 traffic is estimated to cost $55 million for design and construction. Improvements would include bridge widening, on- and off-ramp widening and improvements, and signalization of the ramps. The traffic forecasts prepared in this study estimate that the Exit 29 Interchange has the potential to be a bottleneck to accessing the University without these types of significant improvements.

  The proposed Park-and-Ride lot provides an opportunity for the University's commuting students, faculty, and visitors to benefit. It could help with day-to-day parking mitigation and also be utilized for special events. The Short-term Recommendation section of this report discusses a possible joint use development opportunity for the Park-and-Ride lot in the interchange area.

- *Access management and accommodation of bicycles and pedestrian traffic along Walnut Bottom Road* – From Exit 29, the Walnut Bottom Road corridor is a gateway to Shippensburg and the University from I-81. Improvements to the corridor pose an opportunity to ease access to the University and create a positive experience for visitors using Walnut Bottom Road.

- *Greenway along Burd Run* – In the Phase II Study, the Burd Run Greenway is noted as providing an alternative form of transportation from Shippensburg University to the commercial areas along or adjacent to the Walnut Bottom Road corridor, potentially reducing the vehicular demand on Walnut Bottom Road. No specific reductions in vehicular traffic volumes or evidence to support this prediction were noted. At the very least, the Burd Run Greenway would provide a recreational facility for students of the University and residents of the region.

- *Extension of PA Route 533* – The proposed extension would connect US Route 11 with Walnut Bottom Road (PA Route 174), ideally at its intersection with the proposed inner loop. The potential benefits are the opening of the industrial and commercial properties and orientation of traffic to the Exit 29 Interchange. The estimated cost of the project is $2.4 million.

  Part of the PA Route 533 extension recommendation includes a cul-de-sac to Cramer Road. The University Foundation owns 79 acres of land along Cramer Road and access to this land may be impacted if the recommendation is implemented. The University Foundation should continue to proactively monitor the PA Route 533 extension recommendation to ensure long-term access to this property.

- *Creation of a Transportation Development District (TDD) for funding* – The Transportation Partnership Act (Act 47) enables cooperating municipalities to establish TDD's and levy special property assessments for transportation purposes. The implementation of a TDD would allow the private sector and local municipalities to contribute to the cost of the recommended transportation improvements noted in the study. If a TDD is created, Shippensburg University may want to seek involvement to ensure its interests are recognized.

QUEEN STREET EXTENSION

Existing Terminus of Queen Street at Joint Use Trail with Stairs to Adams Drive/Campus

The Queen Street Extension project involves the construction of a two lane extension of Queen Street from its present terminus at the Foundry Building to Adams Drive on the University campus. The Joint Use Trail runs parallel to Adams Drive at this location and the proposed 300 foot extension of Queen Street would be constructed on fill material over the joint use trail to elevate Queen Street up to Adams Drive. The project is estimated to cost $715,000 and would include five foot sidewalks on each side of the roadway for pedestrian access and a 10 foot by 10 foot box culvert under the new roadway for the continuation of the joint use trail. In addition, a retaining wall along Queen Street of approximately thirty feet would be required in front of the Foundry Building.

This extension of Queen Street to Adams Drive would reduce the number of vehicles that would travel into the downtown area to access the University at Prince Street or Earl Street and provide improved pedestrian access for students utilizing parking lots along Queen Street.

An important challenge for this project is the use of the right-of-way of the joint use trail. The University has made efforts in the past, which have been unsuccessful, to work with

the Rails to Trails Association to address issues of mutual concern to the trail users and the University. A recent change in the leadership of the Rails to Trails Association has raised the possibility of new communication and a successful partnership. The University is also evaluating the purchase of land in the Queen Street corridor that may benefit this proposed project. The extension of Queen Street to Adams Drive would not necessitate any changes to the operations of the intersection of King and Queen Streets, but the signal timing at this intersection, along with the signal timing at all the other intersections on King Street, was recommended for review as part of the short-term recommendations.

BROOKSIDE AVENUE EXTENSION

The Brookside Avenue Extension project would provide access from the PA 174 corridor to the Britton Road/Fogelsanger Road intersection and the new access bridge to the University on Fogelsanger Road. This project, like the Queen Street Extension project, would eliminate the need for University traffic to enter the downtown area. This project should be considered as an alternate to the Queen Street Extension project. The area between PA 174 and Britton Road, however, presents many challenges including existing commercial development, wetlands along Burd Run, and active farmland. Because of these issues, the initial mid-term concept to place this improvement in the Burd Run area was modified to make use of the existing Brookside Avenue that is located adjacent to, but outside of, the wetland area. Both the Joint Comprehensive Plan and the I-81 Corridor Study, moreover, recommend that the Burd Run area be developed as a greenway for pedestrian and bicycle access between the University and the PA 174 commercial areas.

Intersection of Brookside Avenue & Britton Road

Area of Proposed Connection between Brookside Avenue and the Parking Lot of the Toll Gate Restaurant at US 11

The proposed Brookside Avenue Extension would consist of the reconstruction and minor widening of approximately 1300 feet of existing roadway on Brookside Avenue from Britton Road to Martin Alley. The reconstructed Brookside Avenue would be extended for approximately 300 feet from Martin Alley to connect Brookside Avenue to US 11, King Street. The Brookside Avenue Extension is estimated to cost $852,000 and would include a new traffic signal on King Street. The new roadway portion of the project would utilize a grass area east of Martin Alley and a portion of the parking lot of the Toll Gate Restaurant located on King Street.

The extension of Brookside Avenue to King Street would not require any commercial or residential displacements. The reconstruction of existing Brookside Avenue, however, would require partial "strip" takes of right-of-way of properties along Brookside Avenue.

Shippensburg Borough has expressed concerns in the past about safety issues (sight distance) along this section of King Street where the entrance to the Toll Gate Restaurant and the Dollar General Store are located. A new traffic signal on King Street at this location may help resolve this sight distance issue. In addition, the Borough has an ordinance that requires the installation of sidewalks on all new roadways. Brookside Avenue is located in both the Township and the Borough. The safety of school children waiting for the school bus on Britton Road is also a concern. Because of the volume of traffic on Britton Road and the restricted shoulder width, the children use Brookside Avenue at the intersection with Britton Road as a safe location to wait for the school bus. The addition of sidewalk along Brookside Avenue would help to address this safety issue.

EARL STREET EXTENDED

The proposed Earl Street Extension is a modification of the previous S. Earl Street Extension that has been proposed in other studies. This mid-term recommendation would only extend Earl Street to the northwest side of the existing PA 696 underpass of the Norfolk Southern Railroad. The existing height restriction on PA 696 (13' 10") would not be addressed with this mid-term recommendation.

View of Present Terminus of Earl Street Looking Southeast

The proposed project consists of the reconstruction of approximately 1,000 feet of existing Earl Street from the present intersection with Orange Street to an area beyond the baseball fields. This section of Earl Street has a good sub base and is presently used to access the baseball fields and an industrial area north of the ball fields. The project also includes a new two-lane roadway extension of approximately 1,200 feet from the area of the baseball fields to a new intersection with PA 696 west of the Norfolk Southern Railroad underpass. This new roadway extension would use an existing abandoned railroad right-of-way adjacent to the Norfolk Southern Railroad. The project is estimated to cost $950,000.

The final location of the intersection of the new roadway extension and PA 696 will require further evaluation to address sight distance and drainage issues along PA 696. This new intersection may also require the installation of a new traffic signal.

This proposed extension of Earl Street would reduce traffic on Fayette Street and address the issue of inadequate truck turning radius at the intersection of Fayette and King Streets and King and Earl Streets (PA 696) in the Borough for trucks traveling on PA 696.

Location of New Intersection of PA 696 and Earl Street Extended West of the Norfolk Southern Railroad Underpass

D. Long-term Concepts

Five long-term concepts have been identified and will require further extensive evaluation for feasibility, location, cost, and funding probability before proceeding to implementation. These long-term concepts consist of projects that could be implemented in a 10 to 20 year time period if adequate funding were made available from Federal and State resources. The new roadway locations discussed in this section and illustrated in Appendix C are only concepts at this stage of their development and each project will require extensive coordination, review, and analysis to identify a more definitive location. The long-term concepts include:

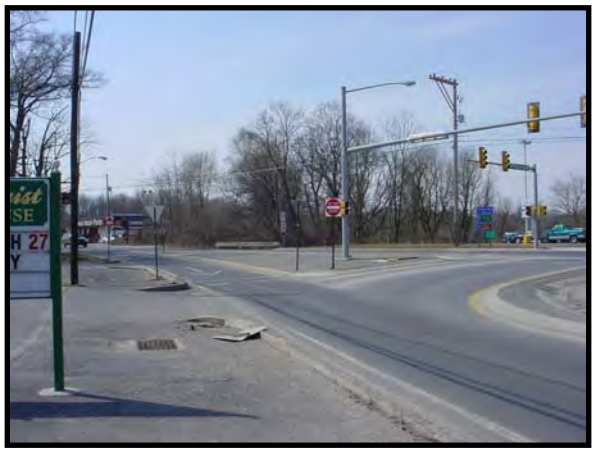
- **Improved North Access Road**
- **Remove Height Restriction on PA 696**
- **Reconstruct I-81/PA 174 Interchange**
- **Evaluate Inner Loop Road Construction**
- **Evaluate Outer Loop Road Construction**

The first three concepts listed above would provide improved access to the University and are recommended for further evaluation. The remaining two long-term concepts have been discussed in previous transportation studies but would not provide any measurable improvement in the access to the University. These two projects (inner and outer loop roads) are listed here for discussion purposes and are not recommended at this time for further evaluation.

Each of the five concepts is identified on an aerial photograph in Appendix C. The I-81 Corridor Study has estimated that the total reconstruction of the I-81 Interchange at PA 174 (Exit 29) will cost approximately $55 million. Cost estimates for the remaining four long-term concepts have been prepared to illustrate the magnitude of the cost for each project. These cost estimates can be used as a planning tool in evaluating the merit of proceeding to the next level of analysis.

IMPROVED NORTH ACCESS ROAD

The Improved North Access Road would be a new two-lane roadway to provide a direct connection from the PA 174/US 11intersection to the area of the new East Entrance to the University off of Fogelsanger Road. This project would supplement the Brookside Avenue Extension project identified in the mid-term recommendations and would eliminate the need for University-bound traffic to enter Shippensburg's downtown. The project would reconstruct the intersection of US 11 (King Street) and PA 174 (Walnut Bottom Road) to address the existing truck turning radius issues at this intersection.



Intersection of PA 174 and US 11

The area along US 11 and the area between the PA 174/US 11 intersection and the intersection of Fogelsanger Road and Britton Road contain existing and proposed commercial development; active farm properties; and, extensive wetlands along Burd Run. Any proposed improvement in this corridor will require extensive coordination with various stakeholders to address business, community and environmental agency concerns about potential impacts.

The new north access road to the University would extend west across US 11 from an improved PA 174/US 11 intersection. This intersection improvement would require right-of-way impacts to the existing auto dealership at this intersection. The new two-lane roadway would travel on the existing farm access road just north of the CVS Drugstore on US 11. This existing farm road provides access to farmland adjacent to US 11 that is presently owned by William and Mary Craig. At the present time, there are no deed restrictions on this farm property. The portion of this farm located along Burd Run, however, is in the Conservation Reserve Program (CRP) which restricts agricultural activity to provide opportunities for protection of wetlands and wildlife habitat.

The new access road would cross over Burd Run on a new structure located at the present crossing of the access road to the Craig farm. From this point, the new access road could proceed across the Craig farm and the adjacent farm, presently owned by Enosh Hoover to a new intersection with Britton Road, at one of two locations. This new intersection may require the installation of a new traffic signal. In addition, there are sight distance issues at the existing intersection of Britton Road and Fogelsanger Road that should be addressed. University-bound traffic could proceed through this new intersection to Fogelsanger Road and the new East Entrance to the University. This alignment would minimize impacts to the wetlands along the Burd Run corridor, but would cross farmland owned by Enosh Hoover, which has a deed restriction under the *Farmland Preservation Program* of the Pennsylvania Department of Agricultural. In addition, this alignment would separate the Craig farm house and barn from the major portion of their farm property.

Farm Access Road Adjacent to the CVS Drugstore

Intersection of Britton Road & Access Road to Long-term Parking Lot

The alternate route for the improved north access road after crossing over Burd Run on the existing farm access road would be to proceed southwest along the Burd Run corridor to form a new four-way intersection with the existing T-intersection of Britton Road and the access road to the long-term parking lot by the University Spiritual Center.

This new four-way intersection may require the installation of a new traffic signal. Again, University-bound traffic could proceed through this new intersection to the Britton Road/Fogelsanger Road intersection and the new East Entrance to the University. An alternate routing would be to use the access road to the long-term parking lot directly to the University at Adams Drive via the Spiritual Center access across the joint use trail. This alignment would directly impact the wetlands along the Burd Run corridor and would also cross a portion of the deed restricted farmland owned by Enosh Hoover. In addition, this alignment would separate the Craig farm house and barn from their farm pond and the farm area along Burd Run.

Either alignment route for the improved north access road would have to address wetland issues along Burd Run, commercial development along US 11, and farmland issues related to the active farms between US 11 and Britton Road. Extensive coordination would be required if this option is to be studied further.

REMOVE HEIGHT RESTRICTION ON PA 696

The height restricted underpass of PA 696 under the Norfolk Southern Railroad south of the Borough may be difficult and costly to resolve. The present height clearance of 13'10" should be increased to 16'6" to meet Interstate standards.

Height Restriction on PA 696

One possible solution would be to lower the roadway to increase the underpass clearance to 16'6". Any effort to lower the roadway at this location, however, would have to address existing drainage issues and flooding concerns at this underpass where Middle Spring Creek passes under PA 696.

Another possible solution to this restricted underpass is to implement the S. Earl Street Extension project as proposed in the previous Shippensburg Area Chamber of Commerce Study and the Joint Comprehensive Plan Study. This proposed extension of Earl Street would extend existing Earl Street on a route similar to the project described in the mid-term recommendations of this report, but continue the new roadway under the Norfolk Southern Railroad at a new underpass and tie into PA 696 at the present T-intersection of PA 696 (Olde Scotland Road) and Fayette Street. This extension of Earl Street would provide a direct travel route for PA 696 from the intersection with Olde Scotland Road to Earl Street; to the intersection with King Street (via a new underpass of the Norfolk Southern Railroad); and onto the University, and the Pennsylvania Turnpike Interchange Exit 201 with PA 997.

The implementation of this proposed new roadway has numerous impacts to be addressed in the area between the intersection of Olde Scotland Road and Fayette Street and the proposed new underpass of the Norfolk Southern Railroad. These

impacts include residential right-of-way takes at the Olde Scotland Road intersection; wetlands associated with the Dykeman Spring and Wetland Park; possible endangered species habitat in the area of Dykeman Spring; engineering issues related to building a new roadway over Dykeman Spring and under the Norfolk Southern Railroad while maintaining the existing railroad grade; and, the cost and time involved to adequately address these numerous impacts.

A third possible option to address the height restricted underpass would be to construct a new underpass for PA 696 (Olde Scotland Road) under the Norfolk Southern Railroad at a point between the I-81 Interchange and the intersection of Olde Scotland Road with Fayette Street. This option may be able to utilize a portion of the railroad right-of-way on the northwest side of the railroad and would avoid the wetland and habitat issues related to the Dykeman Spring area. This option, however, would require a longer access road northwest of the railroad; right-of-way impacts along Olde Scotland Road; and, the costs associated with constructing a new underpass.

RECONSTRUCT I-81/PA 174 INTERCHANGE

I-81 Looking South at Exit 29 (PA 174)

The interchange of I-81 and PA 174 (Exit 29) is the main access point to the Shippensburg Area and Shippensburg University from the north. The interchange is a diamond configuration with PA 174 extending over I-81 on a two lane structure. This bridge has a slight “hump” that limits the sight distance for vehicles exiting the interstate. The exit and entrance ramps at this interchange, moreover, intersect PA 174 in proximity to the intersections of Cramer Road and Hershey Road with PA 174. The closeness of the on and off ramps to these intersecting roads is an existing safety concern that will expand with the projected increase of traffic volume at this interchange. The I-81 Corridor Study estimates the interchange will accommodate up to 40,000 vehicles a day by the year 2030. Improvement of this interchange is critical to maintaining adequate access to the Shippensburg Area, including the University.

The proposed reconstruction of the I-81/PA 174 interchange #29 has been recommended in previous studies, including the ONGOING STUDIES described in this report. The I-81 Corridor Study has estimated that the total reconstruction of this interchange will cost approximately $55 million. This level of federal and state commitment of funds will require extensive coordination with the Federal Highway Administration (FHWA), PennDOT, and the Harrisburg Area Transportation Study (HATS) to secure funding for this project. The project proposed in the I-81 Corridor Study includes the widening of the existing two-lane bridge over I-81; widening and improvement to all on and off ramps; and, signalization of the interchange ramps. Additional improvements include the relocation of the PA 174 (Walnut Bottom Road) intersections with both Cramer Road and Hershey Road, and the construction of a park and ride lot adjacent to the interchange.

ProLogis is constructing a major terminal facility along PA 174 and have been discussing improvements to this interchange with PennDOT, but no decision to fund any improvements has been made by the State. ProLogis has offered to contribute funding to help construct a new four-lane bridge at the interchange along with other improvements. The recent I-81 Corridor Study, however, has projected the need for a six lane bridge at this interchange. Southampton Township is very concerned with the inaction by the State to address the reconstruction of this interchange.

The I-81 Corridor Study also recommends that a park and ride lot be constructed in the I-81/PA 174 Interchange area. The I-81 Study notes that the park and ride lot could serve commuter and special event traffic and is estimated to cost $80,000 for a 50-space, lighted facility. Representatives from Southampton Township have noted that ProLogis has committed to relocate the intersection of Hershey Road and PA 174 in the southeast quadrant of the interchange. The present location of the Hershey Road intersection, similar to the Cramer Road intersection, is too close to the exit and entrance ramps for I-81. The Cramer Road intersection with PA 174 could be relocated as part of the construction of the park and ride facility. The economic viability of the land in the northwest quadrant of the interchange is limited at this time because of the present location of the intersection of Cramer Road and PA 174.

The implementation of the park and ride lot at this location could be a short-term joint development recommendation involving several stakeholders, including expanded Red Raider transit service to serve the park and ride lot during major University events. The opportunities available in the development of the park and ride lot are discussed in more detail in the Short-term Recommendations Section of this report.

EVALUATE INNER LOOP ROAD CONSTRUCTION

The proposed inner loop road would be a two lane roadway (new and existing) from the Olde Scotland Road (PA 696) and Fayette Street intersection to Baltimore Road to Walnut Bottom Road (PA174) at the present intersection with Airport Road. This new and existing roadway has been recommended in previous studies and there is $500,000 for preliminary engineering included in the proposed federal legislation currently being discussed in Washington, D.C. The construction of the inner loop road, however, will not provide direct improvement to the access to the University and will take considerable time and funding to implement. In addition, any alignment of the proposed inner loop road will require further evaluation of the community and farmland impacts.

The location of the inner loop road will require a new bridge crossing of the Norfolk Southern Railroad and a new signalized intersection with Baltimore Road. The proposed alignment of the inner loop road would tie into Airport Road as close as possible to the existing signalized intersection with PA 174 to reduce the impact on residents along Airport Road.

EVALUATE OUTER LOOP ROAD CONSTRUCTION

The proposed outer loop road would be a two-lane roadway (new and existing) extension of the inner loop road and would extend from US 11 at Conestoga Road through the Trailer Court Park to Britton Road and to Fogelsanger Road. This proposed alignment of the outer loop road is a modification of the outer loop road examined in

previous studies. Previous studies recommended that the outer loop road start at the US 11 intersection with the Newville Road (PA 533) and extend to Britton Road and to the Newburg Road (PA 696). This modification of the previous outer loop road alignment moves the proposed roadway in closer to Shippensburg Township. Both of these alignments, however, have several key issues that must be addressed including community impacts, farmland impacts and possible impacts to the Shippensburg Township Park along Britton Road.

E. Conclusions and Recommendations

Every study effort should identify a realistic course of action to be taken by appropriate stakeholders in order to proceed to the next logical step in the implementation of recommendations proposed in the specific study. The following list of activities was prepared as a guide for the University to pursue and for all appropriate stakeholders to evaluate and eventually implement improvements to the existing transportation system in the Shippensburg area.

ESTABLISH POLICY COMMITTEE

As previously recommended, the Steering Committee representatives for this study can be used as the initial membership of a policy committee charged with evaluating and implementing the recommendations in this report. The policy committee will also review and act on other recommendations that may be generated through further evaluation of the transportation access issues related to the University.

Another option for the formation of the policy committee is to expand an existing committee that would be responsible for addressing transportation issues and the recommendations proposed in this study. The important consideration, however, is for the University to take the lead in opening channels of communication at the policy level within the surrounding municipalities, especially Shippensburg Borough and Shippensburg Township. An equally important step is to identify agencies and/or consultants who will be responsible for all technical evaluations. The third part of this process is to implement a feedback mechanism to receive and address comments and concerns from the public, students, commercial/business interests, and all other interested parties.

IMPLEMENT SHORT-TERM RECOMMENDATIONS

The short-term recommendations are focused on low cost immediate actions that would help reduce travel time for vehicles that must pass through Shippensburg downtown area to access the University. The short-term recommendations include:

- **Improve Communications**
- **Improve Directional Signing**
- **Improve Traffic Signal Coordination**
- **Additional Parking Spaces**

Some of the proposed short-term recommendations, such as the use of fire/police personnel to direct traffic in downtown can be implemented quickly with minimal cost to the participating stakeholders. Other short-term recommendations, however, such as the traffic signal coordination and the improvements to directional signing may require more cost and lead time to implement. The Shippensburg Borough representative on the Steering Committee has expressed an interest in working with the University to evaluate the traffic signal coordination recommendations from this study. The most important recommendation, however, is to improve the communications among stakeholders and begin the process of evaluating and implementing these recommendations.

PRIORITIZE MID-TERM RECOMMENDATIONS

Three mid-term recommendations were developed with major emphasis placed upon reducing or eliminating the need for traffic to travel through Shippensburg's downtown area to access the University. The mid-term improvements include:

- **Queen Street Extension**
- **Brookside Avenue Extension**
- **Earl Street Extended**

The recommendations to extend Queen Street to Adams Drive and to utilize Brookside Avenue (Brookside Avenue Extension) as an alternate route to the University both provide access to the University from King Street north of the downtown area. Over 75% of the travel to and from the University is from the area north of Shippensburg. The I-81, PA 174, King Street corridor and the connection from King Street to the University, therefore, should receive the highest priority of the mid-term recommendations. The implementation of either of these two projects will address this important travel demand corridor.

It may be appropriate to perform a feasibility study of these two recommendations to determine which alternative would have the least impact on community, environmental and business resources, and proceed with the project with the highest potential for success. After this project is implemented, the need for the other project in the mid-term time period can be reevaluated and implemented, if appropriate, or added to the list of long-term concepts for further evaluations.

The Earl Street Extended proposal will provide an alternate route for traffic accessing the University from the south, via Exit 24 (PA 696) on I-81. While this proposal will not resolve the height restriction on Fayette Street (PA 696) at the underpass of the Norfolk Southern Railroad, it will greatly improve the traffic circulation in the immediate downtown area. Implementation of this project should be pursued after funding has been secured for one or both of the other two mid-term recommendations.

EVALUATE FUNDING OPTIONS

Funding for any of the mid-term recommendations should be investigated further with PennDOT, Cumberland County, the appropriate local municipalities, and the University. In addition, all requests for FHWA funding should be presented to the Tri-County Regional Planning Commission, who is responsible for the programming of all federal transportation funds in Cumberland County. The mid-term recommendations were developed to alleviate traffic demand at a reasonable cost to implement. The cost of proposed improvements is very important from the programming aspect because many important projects throughout the County are competing for limited federal and state transportation dollars.

An alternate method of obtaining federal transportation dollars is to coordinate with local Congressional Representatives to obtain federal "demonstration" or "earmarked "dollars for selected projects. These "special federal" funds, however, are not new or additional dollars for the region, but in most cases are taken from the federal and state allocation of transportation dollars to the region.

IMPLEMENT MID-TERM RECOMMENDATIONS

The implementation of any of the three mid-term recommendations will require major coordination between the University, local municipalities and PennDOT. The mid-term recommendations are projects on new locations that will require new roadway construction, as well as major reconstruction of some existing roadway segments. Any project that involves new roadway construction will require extensive public and community coordination, as well as environmental agency coordination to determine project needs and to develop a recommended alignment that eliminates or reduces impacts to the environment. It is critical, therefore, that all stakeholders be involved in the selection of the first mid-term recommendations to implement.

As mentioned above, the Queen Street Extension and the Brookside Avenue Extension should both be evaluated as top priority improvements through a feasibility or impact study. A public meeting could be held to discuss the recommendations of this report or a discussion of the report recommendations could be added to the agenda of a regularly scheduled Borough and/or Township Meeting. It is important that input from the public be made available to the policy committee before a decision is made on the first mid-term recommendation to implement.

REFINE LONG-TERM CONCEPTS

The long-term concepts identified in this study are either refinements of mid-term recommendations from this study or projects recommended in other studies. The important consideration is that the five long-term concepts must be implemented in stages and it will be necessary for the local governments to agree on the sequence in which the projects will be evaluated and implemented.

The long-term concepts include:

- **Improved North Access Road**
- **Remove Height Restriction on PA 696**
- **Reconstruct I-81/PA 174 Interchange**
- **Evaluate Inner Loop Road Construction**
- **Evaluate Outer Loop Road Construction**

The most critical concern to the Shippensburg area is safe access to I-81 and the maintenance of the I-81 corridor as a viable route for commerce and industry to serve the expanding needs of the region. Economic development is occurring all along the I-81 corridor and Shippensburg has begun to experience this development. The improved communications established to address access issues for the Shippensburg University can be used as a vehicle to review these long-term concepts and decide the sequence in which the long-term recommendations should be evaluated.

Appendix A

Short - term Recommendations

LEGEND

- TRAFFIC SIGNALS
- SHORT TERM RECOMMENDATIONS
- SHORT TERM PROJECT

Pennoni

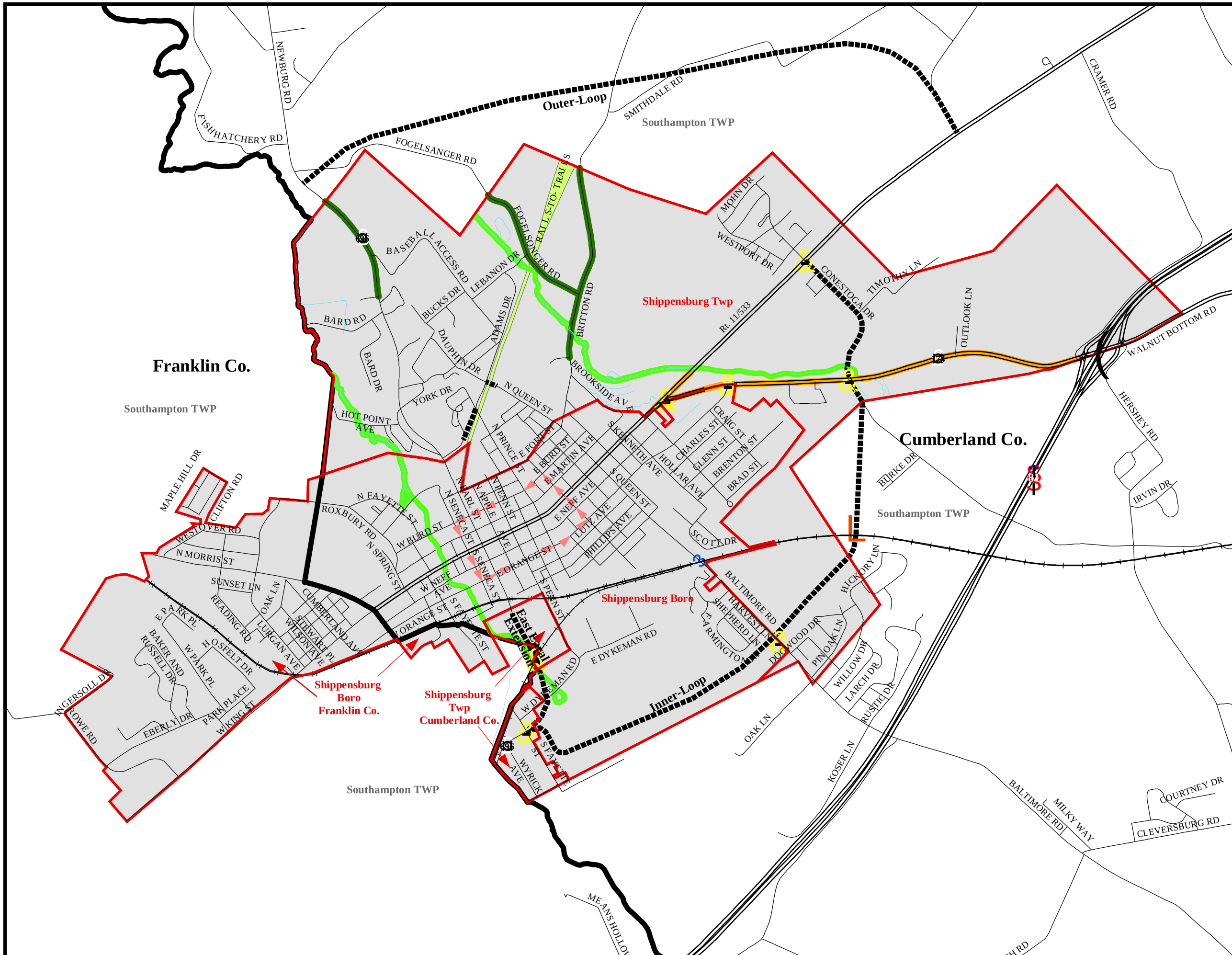
PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Appendix B

Ongoing Studies &

Mid - term Recommendations

Shippensburg Borough and Shippensburg Township Joint Comprehensive Plan
Figure 8.1
Future Traffic Circulation



Intersection Alignment / Improvement
Proposed Railroad Bridge
Proposed Pedestrian Bridge
Interchange Improvement
Access Management Problems / Enhancements
New Roads or Road Connections
Scenic Road
Recommended Greenway Corridors - Cumberland County Greenway Study
Rails to Trails
One way street arrows
Roads
Major Roads
Rail Road
Stream/Run
Study Area
County Boundary

Data source: Cumberland County GIS; PenDot 2003; SSM

SSM
Spotts, Stevens and McCoy, Inc.
1047 N. Park Rd. P.O. Box 6307
Reading, PA 19610-0307
Tel: 610-621-2000 Fax: 610-621-2001

04/20/05

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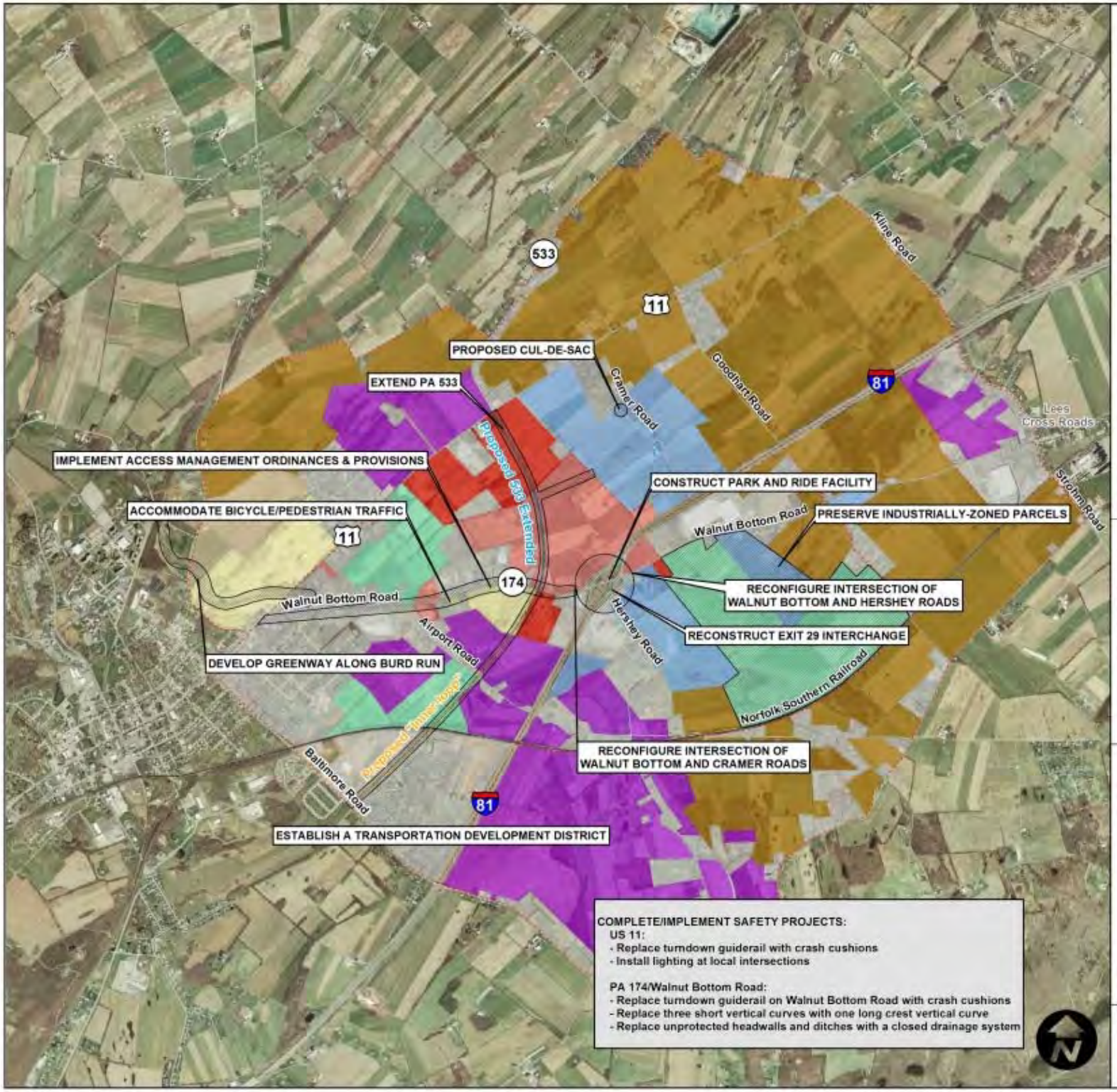
Interstate 81 Exit 29 Transportation Recommendations



Legend

- Railroads
- Planned Projects
- Developed Parcels

Shippensburg Township Zoning

- Agriculture
- Commercial
- Residential

Southampton Township Zoning

- Agriculture
- Commercial
- Commercial/Manufacture Center
- Village

Map Notes:

The base mapping consists of aerial photography flown in April 2003 provided by PAMAP

The mapping was compiled in Pennsylvania State Plane South coordinate system with units in feet and a horizontal datum of NAD 83. Parcel boundaries were provided by Cumberland County, and Zoning information was provided by the individual municipalities.

0 0.25 0.5 1 Miles

Prepared By:

Gannett Fleming

207 Senate Avenue, Camp Hill, PA 17011

April 2005

NEW ROAD EXTENSION

SHIPPENSBURG UNIVERSITY
TRANSPORTATION STUDY

QUEEN STREET EXTENSION

Pennoni

PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
Queen Street Extension
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
MOBILIZATION	LS			$20,000
CONST. SURVEYING, TYPE D	LS			$5,000
CLEARING AND GRUBBING	LS	-	-	$1,000
FILL	CY	2,860	$35.00	$100,100
BOX CULVERT (10' X10')	LF	50	$4,000	$200,000
SUBGRADE	SY	1,340	$25.00	$33,500
RETAINING WALL (50' X4')	SF	200	$80.00	$16,000
ASPHALT	SY	940	$25.00	$23,500
SIDEWALKS	CY	333	$40.00	$13,320
GUIDE RAIL, TYPE 2-S	LF	600	$20.00	$12,000
GUIDE RAIL END TREATMENT	EACH	4	$1,000.00	$4,000
TOPSOIL, FURNISH & PLACE	CY	10	$40.00	$400
SEEDING & SOIL SUPPL., FORMULA B	LB	15	$18.00	$270
MULCHING-HAY	TON	1	$180.00	$180
DRAINAGE	LS	-	-	$10,000
SIGNING & PAVEMENT MARKING	LS	-	-	$1,000
EROSION CONTROL	LS	-	-	$2,000
RIGHT OF WAY & UTILITIES	LS	-	-	$50,000
			SUB TOTAL	$492,270
		CONTINGENCY	20%	$98,454
		TOTAL CONSTRUCTION COST		$590,724
		ENGINEERING	10%	$59,072
		TOTAL CONSTRUCTION COST		$649,796
		INSPECTION	10%	$64,980
		TOTAL PROJECT COST		$714,776

RECONSTRUCT EXISTING ROAD

NEW ROAD EXTENSION

SHIPPENSBURG UNIVERSITY TRANSPORTATION STUDY

BROOKSIDE AVENUE EXTENSION

Pennoni

PENNONI ASSOCIATES INC.

CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
Brookside Avenue Extension
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
CLEARING AND GRUBBING	LS	-	-	$7,500
CLASS 1 EXCAVATION	CY	1,108	$12.00	$13,296
SUBBASE, 10" DEPTH (NO. 2A)	SY	2,156	$18.00	$38,808
SUPERPAVE BASE CRSE., 5" DEPTH	SY	2,156	$15.00	$32,340
SUPERPAVE WEAR CRSE., 1.5" DEPTH	SY	5,334	$6.00	$32,004
SUPERPAVE BINDER CRSE., 2" DEPTH	SY	5,334	$6.00	$32,004
MOBILIZATION	LS	-	-	$30,000
INSPECTOR FIELD OFFICE, TYPE C	LS	-	-	$10,000
CONST. SURVEYING, TYPE D	LS	-	-	$12,000
GUIDE RAIL, TYPE 2-S	LF	1,500	$20.00	$30,000
GUIDE RAIL END TREATMENT	EACH	4	$1,000.00	$4,000
TOPSOIL, FURNISH & PLACE	CY	100	$40.00	$4,000
SEEDING & SOIL SUPPL., FORMULA B	LB	150	$18.00	$2,700
MULCHING-HAY	TON	5	$180.00	$900
CURB & SIDEWALK (PROJECT LENGTH X2)	LF	1600	$90.00	$144,000
MAINT. & PROTECTION OF TRAFFIC	LS	-	-	$15,000
TRAFFIC SIGNAL (AT U.S. 11)	LS	-	-	$75,000
DRAINAGE	LS	-	-	$54,000
SIGNING & PAVEMENT MARKING	LS	-	-	$5,000
EROSION CONTROL	LS	-	-	$20,000
R/W (FRONTAGE TAKE & PARKING LOT)	LS	-	-	$50,000
			SUB TOTAL	$612,552
			CONTINGENCY (15%)	$91,883
			TOTAL CONSTRUCTION COST	$704,435
			ENGINEERING (10%)	$70,443
			TOTAL CONSTRUCTION COST	$774,878
			INSPECTION (10%)	$77,488
			TOTAL PROJECT COST	$852,366

RECONSTRUCT EXISTING ROAD

NEW ROAD EXTENSION

SHIPPENSBURG UNIVERSTIY TRANSPORTATION STUDY

EARL STREET EXTENSION

Pennoni

PENNONI ASSOCIATES INC.

CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
Earl Street Extension
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
CLEARING AND GRUBBING	LS	-	-	$7,500
CLASS 1 EXCAVATION	CY	2,500	$12.00	$30,000
SUBBASE, 10" DEPTH (NO. 2A)	SY	4,900	$18.00	$88,200
SUPERPAVE BASE CRSE., 5" DEPTH	SY	4,900	$15.00	$73,500
SUPERPAVE WEAR CRSE., 1.5" DEPTH	SY	7,400	$6.00	$44,400
SUPERPAVE BINDER CRSE., 2" DEPTH	SY	7,400	$6.00	$44,400
MOBILIZATION	LS	-	-	$40,000
INSPECTOR FIELD OFFICE, TYPE C	LS	-	-	$10,000
CONST. SURVEYING, TYPE D	LS	-	-	$12,000
TOPSOIL, FURNISH & PLACE	CY	200	$40.00	$8,000
SEEDING & SOIL SUPPL., FORMULA B	LB	150	$18.00	$2,700
MULCHING-HAY	TON	5	$180.00	$900
MAINT. & PROTECTION OF TRAFFIC	LS	-	-	$15,000
TRAFFIC SIGNAL (AT SR 0696)	LS	-	-	$75,000
DRAINAGE	LS	-	-	$50,000
SIGNING & PAVEMENT MARKING	LS	-	-	$5,000
EROSION CONTROL	LS	-	-	$40,000
R/W (PURCHASE OF RAILROAD R/W)	LS	-	-	$30,000
R/W (PURCHASE PROPERTY AT SOUTH END)	LS	-	-	$100,000
			SUB TOTAL	$676,600
			CONTINGENCY (15%)	$101,490
			TOTAL CONSTRUCTION COST	$778,090
			ENGINEERING (10%)	$77,809
			TOTAL CONSTRUCTION COST	$855,899
			INSPECTION (10%)	$85,590
			TOTAL PROJECT COST	$941,489

Appendix C

Long - term Recommendations

MID-TERM RECOMMENDATIONS

LONG-TERM CONCEPTS

SHIPPENSBURG UNIVERSITY
TRANSPORTATION STUDY

IMPROVED NORTH ACCESS ROAD

Pennoni

PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
North Access Long Term
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
CLEARING AND GRUBBING	LS	-	-	$25,000
CLASS 1 EXCAVATION	CY	4,797	$12.00	$57,564
SUBBASE, 10" DEPTH (NO. 2A)	SY	9,334	$18.00	$168,012
SUPERPAVE BASE CRSE., 5" DEPTH	SY	9,334	$15.00	$140,010
SUPERPAVE WEAR CRSE., 1.5" DEPTH	SY	9,334	$6.00	$56,004
SUPERPAVE BINDER CRSE., 2" DEPTH	SY	9,334	$6.00	$56,004
STRUCTURE (BRIDGE OVER CREEK)	EACH	1	$750,000.00	$750,000
MOBILIZATION	LS	-	-	$30,000
INSPECTOR FIELD OFFICE, TYPE C	LS	-	-	$10,000
CONST. SURVEYING, TYPE D	LS	-	-	$12,000
GUIDE RAIL, TYPE 2-S	LF	1,500	$20.00	$30,000
GUIDE RAIL, BRIDGE TERMINAL SECTION	EACH	4	$100.00	$400
GUIDE RAIL END TREATMENT	EACH	4	$1,000.00	$4,000
TOPSOIL, FURNISH & PLACE	CY	100	$40.00	$4,000
SEEDING & SOIL SUPPL., FORMULA B	LB	150	$18.00	$2,700
MULCHING-HAY	TON	10	$180.00	$1,800
MAINT. & PROTECTION OF TRAFFIC	LS	-	-	$15,000
DRAINAGE	LS	-	-	$20,000
SIGNING & PAVEMENT MARKING	LS	-	-	$5,000
EROSION CONTROL	LS	-	-	$75,000
R/W TAKE	LS	-	-	$50,000

SUB TOTAL	$1,512,494
CONTINGENCY (15%)	$226,874
TOTAL CONSTRUCTION COST	$1,739,368
ENGINEERING (10%)	$173,937
TOTAL CONSTRUCTION COST	$1,913,305
INSPECTION (10%)	$191,330
TOTAL PROJECT COST	$2,104,635

LONG-TERM CONCEPTS

SHIPPENSBURG UNIVERSITY
TRANSPORTATION STUDY

REMOVE HEIGHT RESTRICTION
ON PA 696

Pennoni

PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
Clearance Adjustment
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
CLASS 1 EXCAVATION	CY	514	$12.00	$6,168
SUBBASE, 10" DEPTH (NO. 2A)	SY	1,000	$18.00	$18,000
SUPERPAVE BASE CRSE., 5" DEPTH	SY	1,000	$15.00	$15,000
SUPERPAVE WEAR CRSE., 1.5" DEPTH	SY	1,000	$6.00	$6,000
SUPERPAVE BINDER CRSE., 2" DEPTH	SY	1,000	$6.00	$6,000
MOBILIZATION	LS	-	-	$30,000
INSPECTOR FIELD OFFICE, TYPE C	LS	-	-	$10,000
CONST. SURVEYING, TYPE D	LS	-	-	$12,000
GUIDE RAIL, TYPE 2-S	LF	400	$20.00	$8,000
GUIDE RAIL, BRIDGE TERMINAL SECTION	EACH	4	$100.00	$400
GUIDE RAIL END TREATMENT	EACH	4	$1,000.00	$4,000
TOPSOIL, FURNISH & PLACE	CY	100	$40.00	$4,000
SEEDING & SOIL SUPPL., FORMULA B	LB	75	$18.00	$1,350
MULCHING-HAY	TON	1	$180.00	$180
MAINT. & PROTECTION OF TRAFFIC	LS	-	-	$50,000
DRAINAGE	LS	-	-	$15,000
SIGNING & PAVEMENT MARKING	LS	-	-	$5,000
EROSION CONTROL	LS	-	-	$75,000
			SUB TOTAL	$266,098
			CONTINGENCY (15%)	$39,915
			TOTAL CONSTRUCTION COST	$306,013
			ENGINEERING (10%)	$30,601
			TOTAL CONSTRUCTION COST	$336,614
			INSPECTION (10%)	$33,661
			TOTAL PROJECT COST	$370,275

LONG-TERM CONCEPTS

SHIPPENSBURG UNIVERSTIY
TRANSPORTATION STUDY

SOUTH EARL STREET EXTENSION

Pennoni

PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
S. Earl St. Extension
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
CLEARING AND GRUBBING	LS	-	-	$25,000
CLASS 1 EXCAVATION	CY	6,338	$12.00	$76,056
SUBBASE, 10" DEPTH (NO. 2A)	SY	12,334	$18.00	$222,012
SUPERPAVE BASE CRSE., 5" DEPTH	SY	12,334	$15.00	$185,010
SUPERPAVE WEAR CRSE., 1.5" DEPTH	SY	12,334	$6.00	$74,004
SUPERPAVE BINDER CRSE., 2" DEPTH	SY	12,334	$6.00	$74,004
STRUCTURE (BRIDGE UNDER RAILROAD)	EACH	1	$1,000,000.00	$1,000,000
MOBILIZATION	LS	-	-	$30,000
INSPECTOR FIELD OFFICE, TYPE C	LS	-	-	$10,000
CONST. SURVEYING, TYPE D	LS	-	-	$12,000
GUIDE RAIL, TYPE 2-S	LF	1,500	$20.00	$30,000
GUIDE RAIL, BRIDGE TERMINAL SECTION	EACH	8	$100.00	$800
GUIDE RAIL END TREATMENT	EACH	4	$1,000.00	$4,000
TOPSOIL, FURNISH & PLACE	CY	100	$40.00	$4,000
SEEDING & SOIL SUPPL., FORMULA B	LB	150	$18.00	$2,700
MULCHING-HAY	TON	15	$180.00	$2,700
CURB & SIDEWALK	LF	1200	$105.00	$126,000
MAINT. & PROTECTION OF TRAFFIC	LS	-	-	$15,000
TRAFFIC SIGNAL (AT FAYETTE ST.)	LS	-	-	$75,000
DRAINAGE	LS	-	-	$50,000
SIGNING & PAVEMENT MARKING	LS	-	-	$5,000
EROSION CONTROL	LS	-	-	$75,000
R/W TAKE	LS	-	-	$100,000
			SUB TOTAL	$2,198,286
			CONTINGENCY (15%)	$329,743
			TOTAL CONSTRUCTION COST	$2,528,029
			ENGINEERING (10%)	$252,803
			TOTAL CONSTRUCTION COST	$2,780,832
			INSPECTION (10%)	$278,083
			TOTAL PROJECT COST	$3,058,915

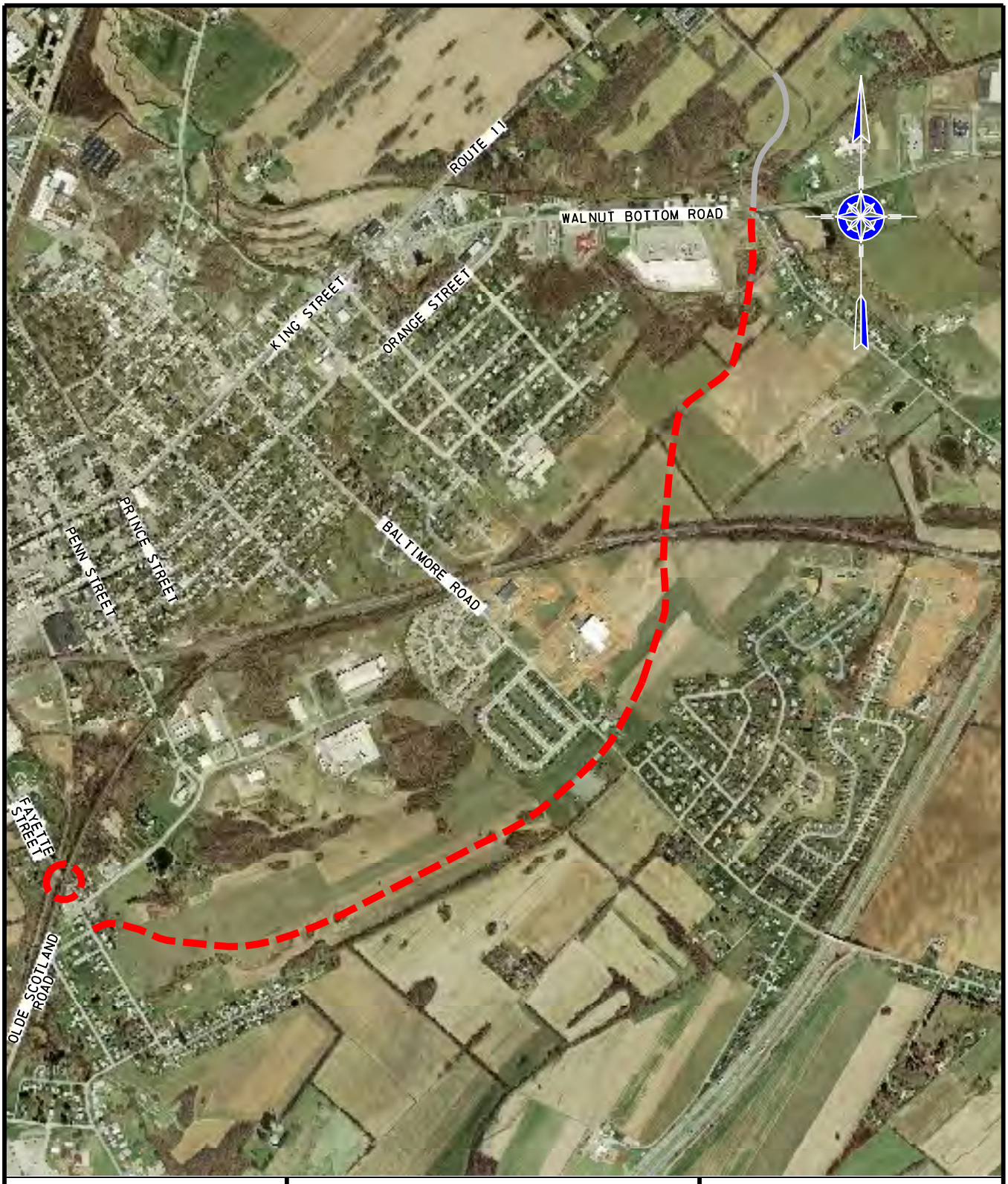
LONG-TERM CONCEPTS

SHIPPENSBURG UNIVERSTIY
TRANSPORTATION STUDY

RECONSTRUCT I-81/PA 174 INTERCHANGE

Pennoni

PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS



LONG TERM CONCEPTS

SHIPPENSBURG UNIVERSITY
TRANSPORTATION STUDY

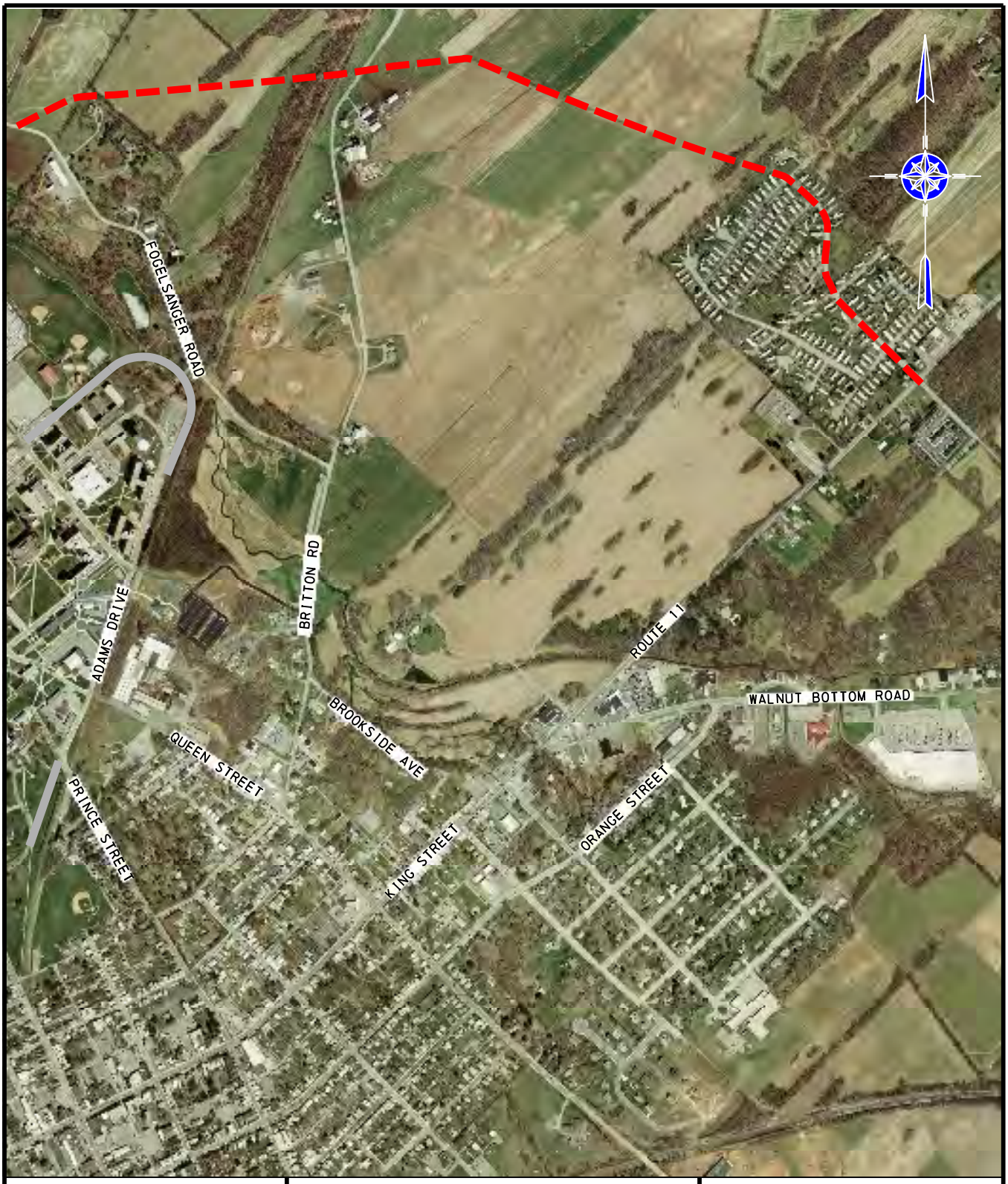
EVALUATE INNER LOOP CONSTRUCTION

Pennoni

PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
Inner Loop
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
CLEARING AND GRUBBING	LS	-	-	$25,000
CLASS 1 EXCAVATION	CY	17,815	$12.00	$213,780
SUBBASE, 10" DEPTH (NO. 2A)	SY	34,667	$18.00	$624,006
SUPERPAVE BASE CRSE., 5" DEPTH	SY	34,667	$15.00	$520,005
SUPERPAVE WEAR CRSE., 1.5" DEPTH	SY	34,667	$6.00	$208,002
SUPERPAVE BINDER CRSE., 2" DEPTH	SY	34,667	$6.00	$208,002
STRUCTURE (BRIDGE OVER RAILROAD)	EACH	1	$1,250,000.00	$1,250,000
MOBILIZATION	LS	-	-	$30,000
INSPECTOR FIELD OFFICE, TYPE C	LS	-	-	$10,000
CONST. SURVEYING, TYPE D	LS	-	-	$12,000
GUIDE RAIL, TYPE 2-S	LF	1,500	$20.00	$30,000
GUIDE RAIL, BRIDGE TERMINAL SECTION	EACH	4	$100.00	$400
GUIDE RAIL END TREATMENT	EACH	4	$1,000.00	$4,000
TOPSOIL, FURNISH & PLACE	CY	100	$40.00	$4,000
SEEDING & SOIL SUPPL., FORMULA B	LB	150	$18.00	$2,700
MULCHING-HAY	TON	10	$180.00	$1,800
MAINT. & PROTECTION OF TRAFFIC	LS	-	-	$15,000
TRAFFIC SIGNALS	EACH	3	$75,000.00	$225,000
DRAINAGE	LS	-	-	$50,000
SIGNING & PAVEMENT MARKING	LS	-	-	$5,000
EROSION CONTROL	LS	-	-	$75,000
R/W TAKE	LS	-	-	$200,000
			SUB TOTAL	$3,713,695
			CONTINGENCY (15%)	$557,054
			TOTAL CONSTRUCTION COST	$4,270,749
			ENGINEERING (10%)	$427,075
			TOTAL CONSTRUCTION COST	$4,697,824
			INSPECTION (10%)	$469,782
			TOTAL PROJECT COST	$5,167,607



LONG TERM CONCEPTS

SHIPPENSBURG UNIVERSITY
TRANSPORTATION STUDY

EVALUATE OUTER LOOP ROAD
CONSTRUCTION

Pennoni

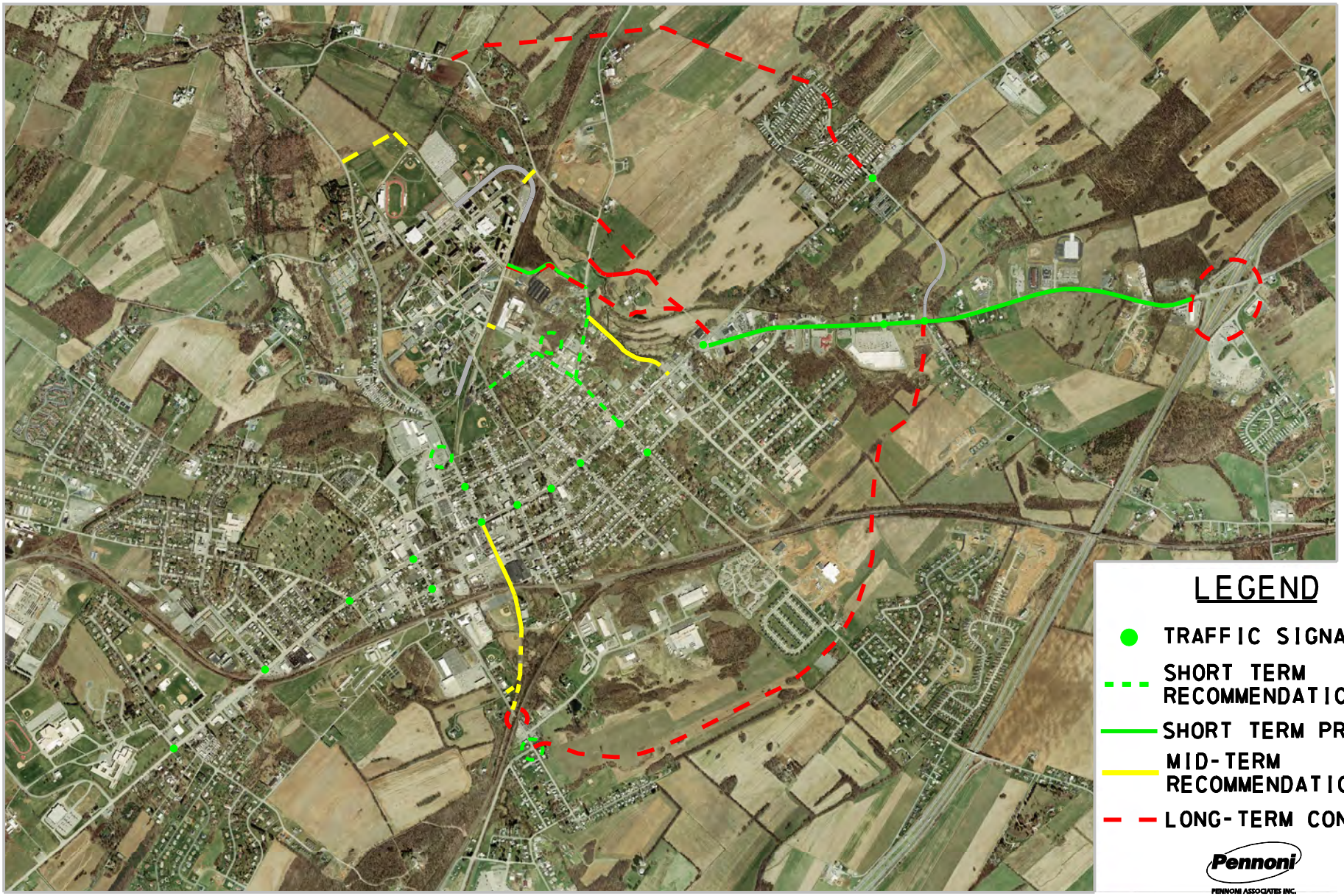
PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Cumberland County
Shippensburg University Transportation Study
Outer Loop
Cost Estimate

DESCRIPTION	UNITS	QUANTITY	UNIT COST	ITEM COST
CLEARING AND GRUBBING	LS	-	-	$25,000
CLASS 1 EXCAVATION	CY	12,848	$12.00	$154,176
SUBBASE, 10" DEPTH (NO. 2A)	SY	25,000	$18.00	$450,000
SUPERPAVE BASE CRSE., 5" DEPTH	SY	25,000	$15.00	$375,000
SUPERPAVE WEAR CRSE., 1.5" DEPTH	SY	25,000	$6.00	$150,000
SUPERPAVE BINDER CRSE., 2" DEPTH	SY	25,000	$6.00	$150,000
STRUCTURE (BRIDGE OVER RAILROAD)	EACH	1	$750,000.00	$750,000
MOBILIZATION	LS	-	-	$30,000
INSPECTOR FIELD OFFICE, TYPE C	LS	-	-	$10,000
CONST. SURVEYING, TYPE D	LS	-	-	$12,000
GUIDE RAIL, TYPE 2-S	LF	1,500	$20.00	$30,000
GUIDE RAIL, BRIDGE TERMINAL SECTION	EACH	4	$100.00	$400
GUIDE RAIL END TREATMENT	EACH	4	$1,000.00	$4,000
TOPSOIL, FURNISH & PLACE	CY	100	$40.00	$4,000
SEEDING & SOIL SUPPL., FORMULA B	LB	150	$18.00	$2,700
MULCHING-HAY	TON	10	$180.00	$1,800
MAINT. & PROTECTION OF TRAFFIC	LS	-	-	$15,000
TRAFFIC SIGNAL	EACH	3	$75,000.00	$225,000
DRAINAGE	LS	-	-	$50,000
SIGNING & PAVEMENT MARKING	LS	-	-	$5,000
EROSION CONTROL	LS	-	-	$75,000
R/W TAKE	LS	-	-	$100,000
			SUB TOTAL	$2,619,076
			CONTINGENCY (15%)	$392,861
			TOTAL CONSTRUCTION COST	$3,011,937
			ENGINEERING (10%)	$301,194
			TOTAL CONSTRUCTION COST	$3,313,131
			INSPECTION (10%)	$331,313
			TOTAL PROJECT COST	$3,644,444

Appendix D

Total Study Recommendations



LEGEND

- TRAFFIC SIGNALS
- SHORT TERM RECOMMENDATIONS
- SHORT TERM PROJECT
- MID-TERM RECOMMENDATIONS
- LONG-TERM CONCEPTS

Pennoni

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CONSULTING ENGINEERS