APPENDIX 10 | REGIONAL AND LOCAL TRANSPORTATION

To: File

From: **Pennoni, Associates, Inc.**
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RE: Shippensburg University Facilities Master Plan
Regional and Local Transportation Access and Circulation
WTWR0701

Date: February 1, 2008

Introduction

From August 28, 2007 through January 25, 2008, research, meetings, field views, and analyses have been conducted as part of an ongoing effort to support the Shippensburg University Facilities Master Plan. This work focused on transportation related issues within the University campus, as well as the Greater Shippensburg area. Transportation issues of interest included (in order of investigation):

- Access and Circulation
- Regional Transportation Impacts
- Limited Vehicle Access Pedestrian Streets at Cumberland, Dauphin, and York Drives
- Limited Vehicle Access Pedestrian Street at Dauphin Drive and Left-turn-Lane Feasibility Along Adams Drive

The research, meetings, field views, and analyses conducted to date resulted in four memos to file, each of which articulated the details of specific tasks. The purpose of this memo is to synthesize the results of those four tasks into a more comprehensive view of the transportation issues impacting the larger planning effort in and around Shippensburg University.

The analyses completed to date consider the transportation issues in and around Shippensburg University from differing levels, so this synthesis will begin with the highest level issues and progressively drill down to the most specific issues raised thus far. This narrative will begin with:

- a discussion of the *Shippensburg Regional Transportation Network*;
- move to the issue of *Access and Circulation* to and through the Shippensburg University campus, and finally;
- consider the *Conversion of Several Campus Streets to Limited Vehicle Access Pedestrian Streets*.

Shippensburg Regional Transportation Network

The greater Shippensburg region is anticipating significant residential and commercial growth, which will be largely driven by the nearby Interstate 81 (I-81) corridor.

Approximately 2,600 new houses are in the land development process in Southampton Township, which surrounds Shippensburg. CSX Railroad has built an intermodal center in Chambersburg, spawning the potential development of large distribution centers along I-81 near Exits 24 and 29. Three potential distribution centers of one million square feet each near I-81 Exit 29 are currently in the land development process. Exit 24 lies at the intersection of Olde Scotland Road (SR 0696) with I-81 just south of Shippensburg, and Exit 29 lies at the intersection of Walnut Bottom Road (SR 0174) with I-81 just east of Shippensburg.

Based on documentation stemming from a 2005 meeting, Shippensburg University intends to increase its student enrollment by 2,500 persons over the next ten years. How these additional students will impact the sufficiency of the transportation network on campus and beyond will largely be determined by the locus of housing for those students. If those students are housed on-campus, or off-campus but in an area near the campus such as downtown Shippensburg, then the additional student census should have minimal impact to the transportation network at peak hours. However, if students are unable to be housed on-campus or near campus, then those additional students will be commuting to the University, effectively adding their trips to the greater Shippensburg transportation network and the demands on its capacity.

The potential growth from these combined sources – residential, commercial, and Shippensburg University – will significantly impact the transportation network around and within Shippensburg. The *Preliminary Traffic Plan for Shippensburg Area (Plan)*, prepared for the Shippensburg Area Chamber of Commerce's Long Rang Planning Committee by Carl Bert & Associates in October, 2002, describes the existing roadway network. That document suggests that at the time of its writing the transportation network around and through Shippensburg was essentially adequate, except for the occasional diversion of traffic from I-81 onto King Street due to emergencies, and special events held at Shippensburg University. It may well be that the higher traffic volumes produced by these special events demonstrated the inadequacies of the transportation network and revealed a potential future condition if normal volumes were to increase significantly.

According to the Chamber of Commerce's *Plan*, the foundational characteristic of the greater Shippensburg area transportation network is the location and function of King Street in Shippensburg. This particular street acts as a central hub, with streets radiating out from it. Also, the roads that intersect with I-81 at Exits 24 and 29 essentially function to bring traffic from I-81 into King Street. Other than township roads and alleys known by locals, most traffic coming into or passing through Shippensburg will most likely use at least some portion of King Street.

Further complicating the layout of the transportation network in the greater Shippensburg area is the inadequate capacity due to all streets and roadways in the region, other than I-81, being a single lane in each direction. This combined with constraints due to residential and commercial driveways on roadways without turn lanes, intersection radii inadequate for truck traffic, and bridges with height or weight restrictions, further limit the capacity of the

network. As traffic volumes increase because of development, the limitations of the network will become increasingly apparent.

Recommendations for improving the greater Shippensburg area transportation network were suggested in the Chamber of Commerce *Plan,* and in The *Shippensburg University Transportation Study*, prepared by Pennoni Associates Inc. for Shippensburg University in July 2005. Specific recommendations may be found in these documents, and in the letter to file dated November 20, 2007, which presented a comparison and contrast of the two planning documents.

Generally, the planning documents suggested short-, mid-, and long-term recommendations to the transportation network needs. The prioritization of potential improvements depended upon such factors as the urgency of the needs, funding, and applicability of the improvements to the growing inadequacies. For example, signing improvements and signal coordination and timing for events were suggested first, with roadway extensions and bridge rehabilitations/replacements following next, and a potential new interchange with I-81 and new roadways around Shippensburg projected later in the plan.

More recently, cursory analysis of placing a new interchange on I-81 at its intersection with Baltimore Road suggests that the interchange may not be feasible due to interchange spacing and other factors, costs would far outweigh the benefits, and that this particular component of a larger transportation network remediation plan should not be pursued.

Access and Circulation – Shippensburg University

On August 28, 2007, a field view of the Shippensburg University campus was conducted, with the observations recorded in a memo to file dated August 31, 2007. Generally, that field view revealed that the campus is a nexus of vehicular and pedestrian traffic, with the traffic control sometimes failing to give clear and safe direction to drivers or pedestrians.

University faculty, staff, and commuter students travel to Shippensburg using the greater Shippensburg transportation network. Additional vehicular traffic enters the campus during morning and afternoon hours delivering and retrieving children from the Luhr's University Elementary School located on campus. The primary roads into Shippensburg are Walnut Bottom Road and Olde Scotland Road, both intersecting with I-81, US Route 11, which becomes King Street in Shippensburg, and Newburg Road from the north.

Within Shippensburg, the primary roads to campus are North Prince Street from the south and Newburg Road from the north. North Queen Street ends just prior to entering campus at an abandoned railroad grade that parallels Adams Drive. Pedestrian steps from the end of North Queen Street to Adams Drive allow pedestrian access to the campus from North Queen Street.

Just south of the University campus North Prince Street intersects Fort Street, a one-way alley. This intersection is three-way stop-controlled; the stop signs on North Prince Street

cause queuing during peak hours. A cursory analysis of the intersections suggests the stop signs on North Prince Street may not be warranted, and may have been placed to slow University traffic as it moves between the University and King Street. As these signs are off-campus, the University would have to appeal to the Borough of Shippensburg for their removal.

The University Campus is essentially bounded by Newburg Road on the west/northwest, Adams Drive on the south, and Fogelsonger Road on the east. Access points are: York Drive and Old Main Drive off of Newburg Road; North Prince Street to Adams Drive, with Dauphin Drive and Cumberland Drive off Adams Drive; and Burd Run Road off Fogelsonger Road.

The Burd Run Road access has been limited in its value due to the one-lane bridge over Burd Run, which lies between Fogelsonger Road and Loop Road (an extension of Adams Drive), and has been occasionally gated to limit access to the campus. That one-lane bridge is now being replaced with a two-lane bridge, which could effectively make Burd Run Road an important campus access from the east, with traffic able to easily access the commuter parking lots, the performing arts center and the athletic facilities via Loop Road.

Another campus access has been planned off Newburg Road in the northern quadrant of the campus in the vicinity of the athletic facilities. This potential access uses the driveway adjoining the S. U. Foundation Conference Center, and extends that drive to connect to Baseball Access Drive near the commuter parking lots. This driveway would allow direct access to the largest parking fields, as well as the athletic facilities from the north.

All roadways within the University campus are owned and operated by the University. While ownership has allowed the University control of speeds – posted at 15 MPH – and access, it has also used signing and pavement markings that are inconsistent with standards used by state or municipal government, with the potential of causing driver confusion.

The most notable traffic circulation issues are traffic volumes along Adams Drive, the queuing along Adams Drive at its intersection with Prince Street and Old Main Drive, and the queuing along Adams Drive at its intersection with Dauphin Drive and the nearby entrance to parking at the Auditorium and the Luhr's University Elementary School. Also of concern are the pedestrian/vehicular traffic conflicts along interior campus roadways, due largely to the volumes of pedestrian traffic, which tends to cross roadways where convenient, rather than at marked crosswalks.

The University has placed a no left turn restriction from Dauphin Drive to Adams Drive from 7:00 AM to 5:00 PM to try to relieve the congestion there. The University also reports posting an officer to assist with traffic circulation at the entrance to Luhr's University Elementary School.

Several intersections exhibit unusual traffic control. Examples include:

- At the intersection of Adams Drive with North Prince Street and Old Main drive, Adams Drive is stop-controlled heading southbound leaving campus causing queuing along Adams Drive. Consideration should be given to removing the stop sign on Adams Drive and instead placing a stop sign on Old Main Drive.
- There is a three-way stop at the four-legged intersection of Cumberland Drive and Adams Drive. This signing may not be warranted, and could be confusing to motorists expecting the northeast-bound traffic on Adams Drive to stop. The stop sign on Adams Drive should be considered for removal.
- The channelized northeast-bound right turn from Lancaster Drive onto York Drive is unusual.

Conversion of Several Campus Streets to Limited Vehicle Access Pedestrian Streets

To address the issues of pedestrian/vehicular traffic conflicts and vehicular traffic volumes leading to queuing at certain intersections, two qualitative analyses were conducted. The first analysis, focusing on the question of potentially converting several vehicular streets to pedestrian streets with limited vehicular access was recorded in a memo to file on January 7, 2008. The second analysis, reassessing one of the street conversions suggested in the first analysis, as well as several intersections and a potential left-turn lane on Adams Drive was recorded in a memo to file on January 25, 2008.

Generally, the impacts to the Shippensburg University campus by the conversion of several roadway segments to limited vehicular traffic are positive. Most significant is the increase in campus safety due to the reduction of pedestrian-vehicle conflicts in the vicinity of several high-usage buildings on campus, such as the Cumberland Union Building and the Reisner Dining Hall. Another positive impact is the potential for reduced congestion at Adams and Dauphin Drives.

There are several negative impacts, although these are minor. One negative impact is the potential for increased response times for emergency vehicles along those roadway segments converted to limited vehicular access. A second negative impact is the limiting of access between the campus entrance and the large commuter parking lots near the athletic facilities to a single roadway – Adams Drive to Loop Road – thereby increasing the traffic volumes and potential for congestion along those roadways.

The conversion of these roadways appears to present little potential impact to convenience. While some faculty/staff parking is impacted by these roadway conversions, as well as other campus construction plans such as the West Residence Hall project, the loss of these parking facilities appears to have been mitigated as part of the overall improvement plan.

A left-turn lane analysis was performed along Adams Drive at the Dauphin Drive intersection and the elementary school access. Since the speed limit is low along Adams Drive, the *Guidelines for Left-Turn Lanes* prepared by the Institute of Transportation Engineers (ITE) was used for the analysis. A speed limit of 25 mph (the lowest in the guidelines) was used for the analysis. The warrants take into account the left-turn volume,

the percentage of left-turns, the advancing through volume, and the opposing through traffic volume. Based on the analysis, a left-turn lane would not be warranted at Dauphin Drive or at the elementary school for the A.M. peak period. Traffic volumes were not obtained in the P.M. peak period and therefore could not be analyzed. However, based on observations of left-turns into the auditorium parking area and the elementary school, it does not appear that a turn lane would be warranted. Even with the increase in volumes along Adams Drive, if Dauphin Drive were permanently closed, it does not appear that a turn lane into the auditorium or elementary school parking areas would be warranted. Based on the number of left-turns (~100 in the AM and the PM) entering Dauphin Drive, a left-turn lane may be warranted under certain conditions with the existing volumes or in the future. However, while not warranted, there does appear to be sufficient area to construct a left-turn lane on Adams Drive at the elementary school.

If Dauphin Drive remains open and excessive queues are observed, consideration should given to constructing a left-turn lane on Adams Drive. The number of pedestrians crossing in this area should also play a role in the final decision, as a turn lane would increase the walking distance for pedestrians and the visibility of pedestrians will be decreased with standing left-turn queues.