

FINAL  
PENN STATE ALTOONA CAMPUS AND VICINITY TRAFFIC IMPACT STUDY  
ALTOONA, PENNSYLVANIA

SUBMITTED TO:  
BLAIR COUNTY PLANNING COMMISSION

SUBMITTED BY:



*Orth - Rodgers* *Associates, Inc.*  
TRANSPORTATION ENGINEERS and PLANNERS

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**TABLE OF CONTENTS**

**I. INTRODUCTION ..... I-1**

    A. Existing Transportation Conditions .....I-1

    B. Existing Roadway Conditions.....I-1

**II. EXISTING AND FUTURE CONDITIONS TRAFFIC ANALYSIS ..... II-1**

    A. Existing Traffic Volumes .....II-1

    B. Future Design Year 2026 Volumes.....II-8

    C. Levels of Service.....II-13

    D. Signal Warrant Review .....II-21

    E. Speed Study .....II-22

    F. Project Needs .....II-22

**III. RECOMMENDATIONS ..... III-1**

    A. Recommendations Summary .....III-1

    B. Anticipated Level of Service Improvement .....III-13

    B. Anticipated Level of Service Improvement .....III-13

    C. Implementation Program.....III-14

    D. Policy Initiatives .....III-15

**APPENDIX A - DATA COLLECTION**

**APPENDIX B - TRAFFIC ANALYSIS**

**APPENDIX C - PUBLIC COMMENTS**

## LIST OF TABLES

Table II-1 Manual Turning Movement Count Locations .....	II-1
Table II-2 Total Peak Hour Intersection Volumes .....	II-3
Table II-3 Classification Count Location.....	II-8
Table II-4 Classification Counts .....	II-8
Table II-5 Study Area Developments.....	II-9
Table II-6 Study Area Trip Generation .....	II-10
Table II-7 Level of Service and Expected Delay for Unsignalized Intersections .....	II-13
Table II-8 Level of Service for Signalized Intersections.....	II-14
Table II-9 Intersection Peak Hour Level of Service .....	II-15
Table II-10 Warrant 11 – Peak Hour Volume Signal Warrant Analysis .....	II-21
Table II-11 Speed Study Summary .....	II-22
Table II-12 Study Area Needs.....	II-25
Table III-1 Study Area Recommendations.....	III-1
Table III-2 Anticipated Level of Service Improvement .....	III-13
Table III-3 Implementation Program .....	III-15

**LIST OF FIGURES**

Figure I-1 Study Area .....I-4

Figure II-1 Existing Year 2006 AM Peak Hour Traffic Volumes .....II-4

Figure II-2 Existing Year 2006 PM Peak Hour Traffic Volumes.....II-5

Figure II-3 Existing Year 2006 AM and PM Peak Pedestrian Volumes .....II-6

Figure II-4 Study Area Transit Routes and Stops .....II-7

Figure II-5 Design Year 2026 AM Peak Hour Traffic Volumes .....II-11

Figure II-6 Design Year 2026 PM Peak Hour Traffic Volumes.....II-12

Figure II-7 Existing Year 2006 AM Peak Hour Level of Service .....II-17

Figure II-8 Existing Year 2006 PM Peak Hour Level of Service.....II-18

Figure II-9 Design Year 2026 AM Peak Hour Level of Service .....II-19

Figure II-10 Design Year 2026 PM Peak Hour Level of Service.....II-20

Figure III-1 Study Area Recommendations .....III-2

Figure III-2 Roadway Recommendations for Projects 1 & 5.....III-6

Figure III-3 Roadway Recommendations for Projects 2 & 7.....III-7

Figure III-4 Roadway Recommendations for Project 5 .....III-8

Figure III-5 Roadway Recommendations for Project 6 .....III-9

Figure III-6 Roadway Recommendations for Project 8 .....III-10

Figure III-7 Roadway Recommendations for Project 9 & 10 .....III-11

Figure III-8 Roadway Recommendations for Project 13.....III-12



## I. INTRODUCTION

Orth-Rodgers & Associates Inc. (ORA) in association with Pinto Engineering have been retained by the Blair County Planning Commission to address transportation concerns in and around the Penn State University (PSU) Altoona Campus and vicinity. Traffic congestion and safety concerns are reviewed in this report as a basis for preparing recommended improvements along the corridor.

### A. Existing Transportation Conditions

The traffic study for the Altoona Campus and vicinity area spans two municipalities: the City of Altoona and Logan Township both in Blair County, Pennsylvania. The Penn State Altoona Campus is the main focus for the influence of the study area. The Campus is a thriving element of the community, with over 3,600 students. The campus is bounded by Rider Farm Road to the West, Juniata Gap Road to the South, Gwin Road/Wehnwood Road to the North (There is a also section of the campus located to the north of the main campus – north of Gwin Road). Two public transportation routes operate within the study area. The primary land uses are a mix of institutional, commercial, and residential land uses. Many of the buildings in the commercial and residential properties are located close to the edge of the roadway with minimal set backs although some set backs can be observed in large commercial properties.

### B. Existing Roadway Conditions

A review of existing conditions within the study area was conducted to provide a basis for assessment of existing operational and geometric conditions. Significant roadways in the study area are illustrated in Figure I-1. The existing characteristics of the study roadways, including the study intersections, are described below.

Wopsononock Avenue/Grandview Road (SR 4015) is a north-south roadway providing one travel lane per direction. North of Broadway, the roadway is referred to as Grandview Road (SR 4015) and south of Broadway the roadway is called Wopsononock Avenue. Mass transit utilizes Wopsononock Avenue within the study area. The posted speed limit is 25 miles per hour. There are four study area intersections along Wopsononock Avenue: Juniata Gap Road (signalized), Wehnwood Road (unsignalized), Broadway (unsignalized), and 25th Avenue (unsignalized).



25<sup>th</sup> Avenue is a north-south roadway carrying two travel lanes per direction. The posted speed limit within the study area is 25 miles per hour. The intersection of 25<sup>th</sup> Avenue and Juniata Gap Road is signalized. The intersections of 25<sup>th</sup> Avenue and Broadway, 25<sup>th</sup> Avenue and Ivyside Drive, and 25<sup>th</sup> Avenue and Wopsononock Avenue are unsignalized. No shoulder is provided along the 25<sup>th</sup> Avenue intersections within the study area.



Gwin Road/Wehnwood Road is an east-west roadway providing one travel lane per direction. Wehnwood Road is the northern boundary to the PSU Altoona main campus. There is also a section of campus north of Wehnwood Road, which contains student housing. The intersections of Rider Farm Road/Gwin Road and Grandview Road/Wehnwood Road are unsignalized. Pedestrian activity is heavy crossing this roadway.

Rider Farm Road is a north-south roadway with one travel lane per direction. Rider Farm Road serves as the western boundary of the PSU Altoona Campus. The intersections of Rider Farm Road/Juniata Gap Road and Rider Farm Road/Gwin Road are unsignalized. The intersection of Rider Farm road/Juniata Gap Road serves as the access to University parking lots/campus. The posted speed limit along Rider Farm Road in the study area is 25 miles per hour.



Broadway is an east-west roadway providing one travel lane per direction. The intersections of Broadway/Grandview Road and Broadway/25<sup>th</sup> Avenue are unsignalized. The posted speed limit on Broadway within the study area is 25 miles per hour.

Juniata Gap Road (SR 4017) is an east-west, two lane arterial roadway which serves as the southern boundary of the PSU Altoona Campus. There are six study area intersections along Juniata Gap Road. The intersections of Juniata Gap Road/Rider Farm Road, Juniata Gap Road/Baker Lane, and Juniata Gap Road/Cherry Avenue are unsignalized. The intersections of Juniata Gap Road/PSU Campus Entrance, and Juniata Gap Road/Wopsononock Avenue, and Juniata Gap Road 25<sup>th</sup> Avenue are signalized.



Cherry Avenue/North 8<sup>th</sup> Avenue is a north-south roadway providing one travel lane per direction. The intersection of Cherry Avenue/North 8<sup>th</sup> Avenue and Juniata Gap Road (SR 4017) is four-leg unsignalized intersection. Cherry Avenue has two-foot shoulders on the eastbound approach.



Bakers Lane is a north south roadway providing one travel lane per direction within the study area. The intersection of Baker Lane and Juniata Gap Road is unsignalized. This is four-way intersection with the Sheetz Family Health Center serving as the southbound approach to this intersection. The Sheetz Family Health Center approach and Baker Lane approach are offset from one another. The posted speed limit on Bakers Lane within the study area is 25 miles per hour.

# Study Area Map

PENN STATE ALTOONA CAMPUS & VICINITY  
BLAIR COUNTY, PENNSYLVANIA



## II. EXISTING AND FUTURE CONDITIONS TRAFFIC ANALYSIS

### A. Existing Traffic Volumes

In order to adequately study the existing transportation conditions of the roadways within the study area, the traffic volume data on the major roadways were collected. Traffic volume data from Existing Year 2006 was available from several sources (SPK Engineering 2006 counts were provided by Blair County Planning Commission, and PennDOT District 9-0) for the following intersections:

Wopsononock Avenue/Grandview Road (SR 4015) at Gwin Road - PM Peak Period

Broadway at 25th Avenue - PM Peak Period

Wopsononock Avenue (SR 4015) at Juniata Gap Road (SR 4017) - PM Peak Period

Juniata Gap Road (SR 4017) at 25th Avenue - PM Peak Period

Juniata Gap Road (SR 4017) at PSU Campus Entrance - AM and PM Peak Periods

In addition to available count data, Pinto Engineering conducted manual turning movement counts on a typical weekday during November and December 2006. Two January 2007 counts were provided by the Blair County Planning Commission. Table II-1 lists the locations where turning movement counts were collected.

**Table II-1 Manual Turning Movement Count Locations**

Location	Municipality	AM Peak Date	PM Peak Date
Gwin Road at Rider Farm Road	Logan Township	Wednesday, November 15, 2006	Tuesday, November 14, 2006
Grandview Road (SR 4015) at Gwin Road	City of Altoona	Wednesday, December 6, 2006	Tuesday, December 5, 2006
Juniata Gap Road (SR 4017) at Cherry Avenue/North 8 <sup>th</sup> Avenue	City of Altoona	Wednesday, November 15, 2006	Tuesday, November 14, 2006
25 <sup>th</sup> Avenue at Ivyside Drive	City of Altoona	Wednesday, November 15, 2006	Tuesday, December 5, 2006
Wopsononock Avenue (SR 4015)/Grandview Road (SR 4015) at Broadway	City of Altoona	Wednesday, November 15, 2006	Thursday, January 12, 2006
25 <sup>th</sup> Avenue at Broadway	City of Altoona	Wednesday, November 15, 2006	Wednesday, January 11, 2006
Wopsononock Avenue (SR 4015) at Juniata Gap Road (SR 4017)	City of Altoona	Thursday, November 16, 2006	Tuesday, January 17, 2006
Juniata Gap Road (SR 4017) at 25 <sup>th</sup> Avenue	City of Altoona	Wednesday, December 6, 2006	Wednesday, January 18, 2006
25 <sup>th</sup> Avenue at Wopsononock Avenue (SR 4015)	City of Altoona	Thursday, November 16, 2006	Estimated
Juniata Gap Road at Rider Farm Road	Logan Township	Estimated	Thursday, February 8, 2007
Juniata Gap Road (SR 4017) at PSU Campus Entrance	Logan Township	Wednesday, January 25, 2006	Wednesday, January 25, 2006
Juniata Gap Road (SR 4017) at Bakers Lane	Logan Township	Estimated	Thursday, February 15, 2007

The manual counts for the intersections shown in Table II-1 were collected for the AM (7:00- 9:00) and PM (3:00-6:00) peak periods. Review of the traffic data collected



revealed that the system wide AM peak hour in the study area occurs between 7:15 AM and 8:15 AM and the system wide PM peak hour occurs between 3:00 PM and 4:00 PM.

As can be seen from Table II-1, three intersections contained volumes which were estimated for one of the peak hours. PM peak hour traffic counts were collected by Blair County Planning Commission at the intersections of Juniata Gap Road at Rider Farm Road and Juniata Gap Road at Bakers Lane. These PM peak hour traffic volumes were used to estimate the AM peak hour traffic volumes by applying an adjustment factor obtained from the Automatic Traffic Recorder that was located in the vicinity of the two intersections and reversing the traffic pattern to match the AM peak hour traffic conditions. PM peak hour traffic volumes at the intersection of 25<sup>th</sup> Avenue at Wopsononock Avenue were estimated by reversing traffic patterns and balancing volumes according to the adjacent intersections.

Figure II-1 and Figure II-2 illustrate the Existing Year 2006 AM and PM peak hour volumes at the study area intersections while Table II-2 summarizes the total intersection volumes during the AM and PM peak hours. It can be observed that peak hour volumes range from 48 to 854 and from 130 to 1280 vehicles per hour during the AM and PM peak hours respectively. The intersection with the lightest peak hour volumes is Gwin Road at Rider Farm Road while Juniata Gap Road at 25<sup>th</sup> Avenue is the intersection with the highest peak hour volumes.

Figure II-3 shows the Existing Year 2006 pedestrian volumes during both peak hours. It can be observed that pedestrian volumes at the study area intersections during the AM and PM peak hours are low. Pedestrian volumes ranged from one to 14 pedestrians during the AM and PM peak hours at the intersections. Several intersections were observed to experience one pedestrian while the intersection of 25th Avenue at Ivyside Drive experienced 14 pedestrians during the PM peak hour. Pedestrian volumes are believed to be higher at times during the day than those observed (Penn State indicated that classes are held between 8:00 AM and 10:00 PM). Several pedestrians (specifically students) are often observed along Gwin Road traveling between the campus and residence halls. Pedestrian activity has also been observed at Penn Avenue/Wehnwood Road and Wopsononock Avenue/Broadway by the student housing. Pedestrian activity is also expected at the intersection of 25th Avenue/Ivyside Drive due to the large number of retail and institutional uses as well as the Amtran Bus Stop at this location. Figure II-4 shows the transit routes and stops that service that study area. Bicycle activity was observed to be minimal throughout the study area.

**Table II-2 Total Peak Hour Intersection Volumes**

Location	AM Peak Hour	PM Peak Hour
Gwin Road at Rider Farm Road	48	130
Grandview Road (SR 4015) at Gwin Road	300	462
Juniata Gap Road (SR 4017) at Cherry Avenue/North 8 <sup>th</sup> Avenue	775	943
25 <sup>th</sup> Avenue at Ivyside Drive	369	788
Wopsononock Avenue (SR 4015)/Grandview Road (SR 4015) at Broadway	398	618
25 <sup>th</sup> Avenue & Broadway	331	671
Wopsononock Avenue (SR 4015) at Juniata Gap Road (SR 4017)	699	1049
Juniata Gap Road (SR 4017) at 25 <sup>th</sup> Avenue	854	1280
25 <sup>th</sup> Avenue at Wopsononock Avenue (SR 4015)	639	639
Juniata Gap Road at Rider Farm Road	389	610
Juniata Gap Road (SR 4017) at PSU Campus Entrance	487	751
Juniata Gap Road (SR 4017) at Bakers Lane	460	740

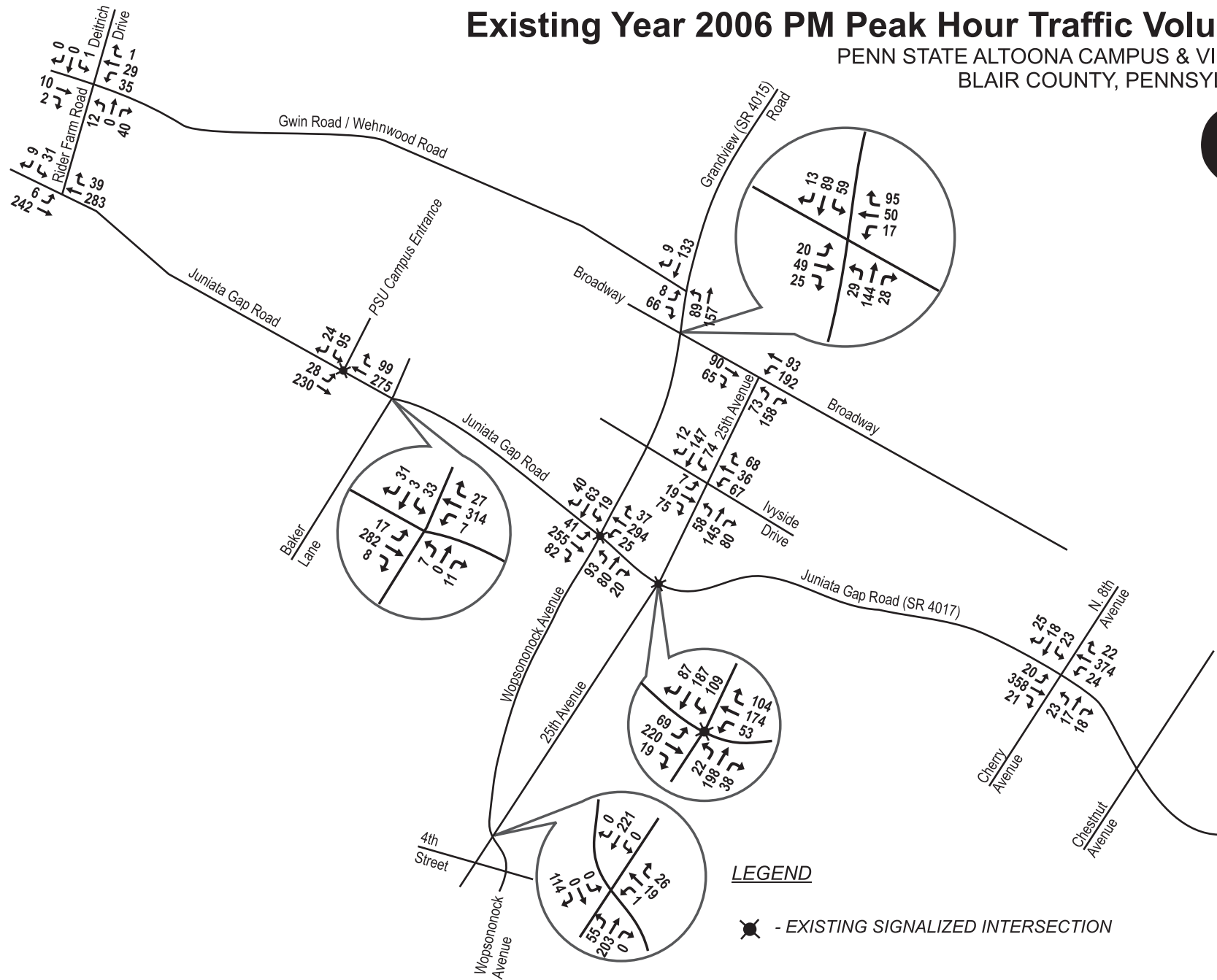
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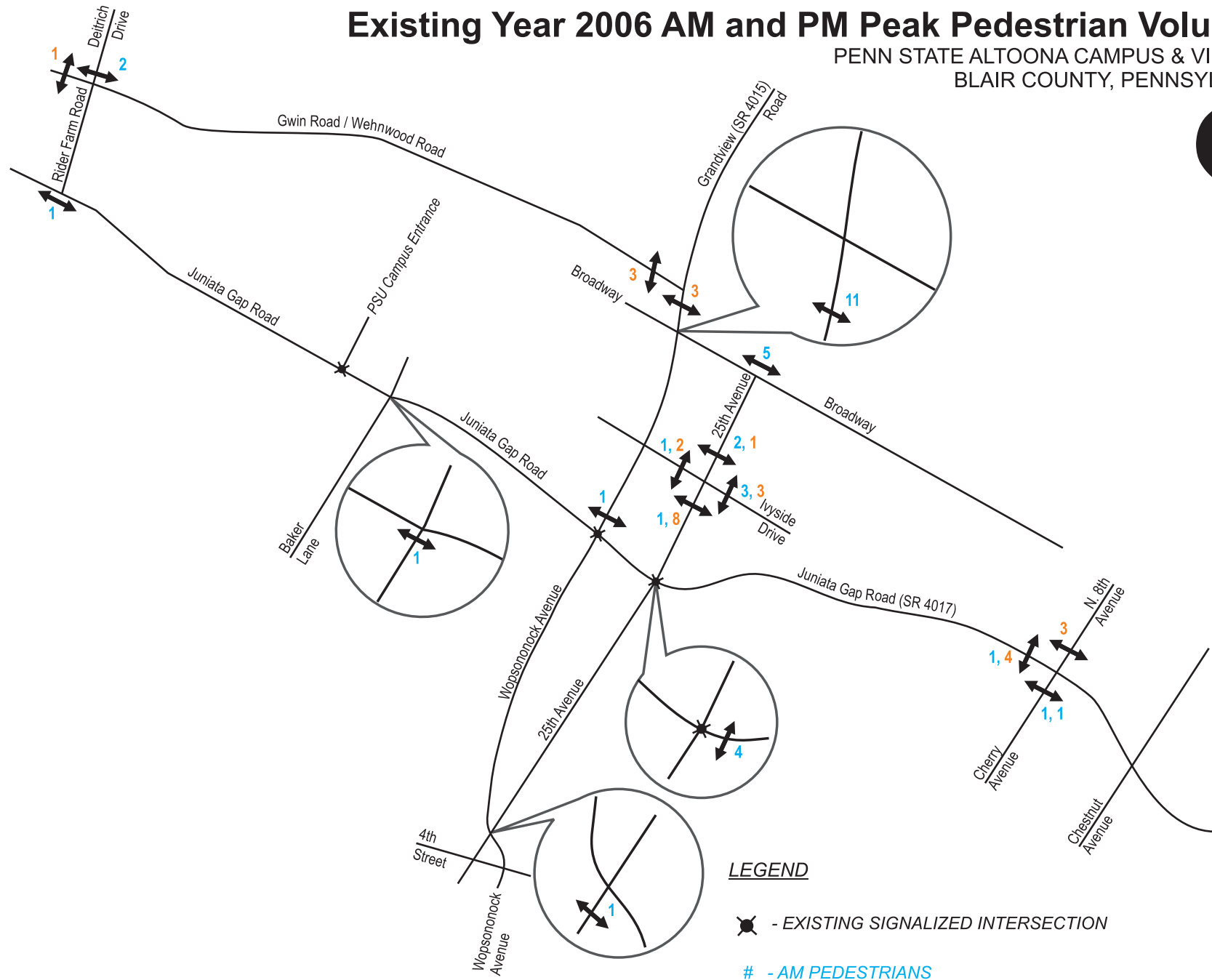
# Existing Year 2006 PM Peak Hour Traffic Volumes

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# Existing Year 2006 AM and PM Peak Pedestrian Volumes

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The map displays the Penn State Altoona Campus and surrounding urban areas. Key features include:

- Yellow Area:** Labeled "PENN STATE ALTOONA CAMPUS" and "Juniata Gap".
- Blue Line:** A path starting near the campus, passing through the city center, and ending near the Wopsononock area.
- Orange Line:** A path starting near the campus, passing through the city center, and ending near the Wopsononock area.
- Purple Line:** A path starting near the campus, passing through the city center, and ending near the Wopsononock area.
- Streets:** Numerous streets are labeled, including Grandview, Wopsononock, Juniata, and various numbered streets (e.g., 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th).
- Legend:** Located in the bottom right corner, it identifies the colored areas and lines.

**BUS SHELTERS**  
**BUS STOPS**  
**LOOP STOPS**

MAP SCALE 1" = 1000'

In addition to manual turning movement counts, 24-hour Automatic Traffic Recorders (ATRs) were utilized to collect vehicle classification counts for a one-week period between Tuesday, November 14, 2006 and Monday, November 20, 2006. The classification counts were conducted to determine the amount of light and heavy truck traffic that exists in the study area roadways.

Table II-3 lists the roadway segments where classification counts were collected.

**Table II-3 Classification Count Location**

Roadway	Location	Direction	Municipality
Juniata Gap Road	West of the Campus Entrance between the PSU Campus Entrance and Rider Farm Road	Eastbound/Westbound	Logan Township
Wopsononock Avenue	North of Juniata Gap Road between Juniata Gap Road and Ivyside Drive	Northbound/Southbound	City of Altoona
Broadway	East of Wopsononock Avenue between Wopsononock Avenue and 25th Avenue	Northbound/Southbound	City of Altoona
Grandview Road	North of Gwin Road between Gwin Road and Woormer Road	Northbound/Southbound	City of Altoona

Table II-4 shows the classification count results obtained along the roadways mentioned above for the entire week and the Average Daily Traffic (ADT). Classifications counts in Table II-4 are summarized by their corresponding PennDOT categories.

**Table II-4 Classification Counts**

Vehicle Classes PennDOT Categories	Roadway			
	Juniata Gap Road	Wopsononock Avenue	Broadway Street	Grandview Road
Motorcycles	0.0%	1.1%	0.3%	0.0%
Passenger cars, pickup trucks, and vans	92.2%	88.1%	91.6%	92.5%
Buses	0.8%	0.4%	0.3%	0.5%
Trucks	3.8%	3.3%	4.6%	5.9%
Unclassified	3.2%	7.1%	3.2%	1.1%
ADT <sup>1</sup>	6,200	3,400	4,400	3,300

Note:

1. Calculated ADT based on data collected for Wednesday, November 15, 2006 and Thursday, November 16, 2006 (i.e., Average Weekday ADT).

The ADT within the study area ranges from 3,300 to 6,200 vehicles per day. The average percentage of heavy vehicles within the study area is approximately 4.3 percent while bus traffic accounts for approximately 0.5 percent. Unclassified vehicles account for approximately 3.6 percent of the total traffic counted.

## B. Future Design Year 2026 Volumes

Design Year 2026 traffic volumes were calculated by applying a 1.8% compound growth rate per year and adding traffic generated by the developments that are likely to occur between the Existing Year 2006 and the Design Year 2026. The 1.8% growth rate provides the most appropriate estimate and was determined as a result of conversation

with PennDOT District 9-0 staff and review of the PENNDOT Traffic Data Handbook. The City of Altoona, Logan Township, Penn State University, PennDOT District 9-0, The Blair County Planning Commission, and The Durbin Companies were contacted to gather information on the additional developments. All entities contacted indicated that minor developments are likely to occur between now and the Design Year 2026. The summary of the developments that are expected to occur between now and the Design Year 2026 is shown in Table II-5.

**Table II-5 Study Area Developments**

Source	Name	Development		
		Type and Size	Location	Status
City of Altoona Dept. of Planning	Juniata Commons Residential Development	12 residential housing units (single family, 4 bedrooms each)	215-217 N. 12th Avenue (N. 12th Avenue/N. 3rd Street)	Included
Logan Township	Logan Township Residential Development	18 residential housing units (single family)	Juniata Gap Road at Castle Farm Road	Included
Penn State University	Misciagna Family Center for Performing Arts	16,000 sq. ft. addition	PSU Campus	Included
	Steve A. Adler Athletic Complex	60,000 sq. ft. addition to Adler Gym	PSU Campus	Included
	Ralph and Helen Force Advanced Technology Center	10,000 sq. ft. addition to the existing engineering building	PSU Campus	Included
	Hawthorne Building	40,000 sq. ft. addition (24 classrooms existing and 15-18 anticipated)	PSU Campus	Included
	Alumni Center	20,000 sq. ft. new	PSU Campus (lower portion of the Community Arts Center Lot adjacent to Spring Run)	Included
	Residents Hall	300 student residence hall new	PSU Campus (Wehnwood/Gwin Roads adjacent to Oak Hall)	Included
	Parking Deck or Garage	at Existing Rider Parking Lot or next to Nittany Point new	PSU Campus (Location would be the existing Rider parking lot for a deck; garage would be located in 27 acre parcel next to Nittany Point)	Not Included
Durbin Companies	Unknown	Company Expansion	Attached to Durbin property (entrance on Wehnwood Road)	Not Included
	Wehnwood Acres (not a Durbin Project)	26-acre parcel sitting dormant	Adjacent to Durbin property (entrance on Wehnwood Road)	Not Included
PennDOT District 9-0	WALMART	WALMART Discount Store	Pinecroft/I-99 Interchange	Not Included

Note:  
Included status means that the development was included as a known development; its trips were estimated and distributed according to the explanation presented in the paragraph above. Not Included means that not enough details are known about the development; traffic generated by these developments is accounted for in the 1.8% per year background traffic growth.

The trip generation and corresponding trip distribution were estimated based on the Institute of Transportation Engineers publication titled Trip Generation: An Informational Report, 7<sup>th</sup> Edition. Trip distribution patterns were obtained from the Existing Year 2006 peak hour volumes and were applied to the trip generation previously estimated to arrive

at the final turning movement peak hour volumes for each intersection movement. Figure II-5 and Figure II-6 show the Design Year 2026 peak hour traffic volumes.

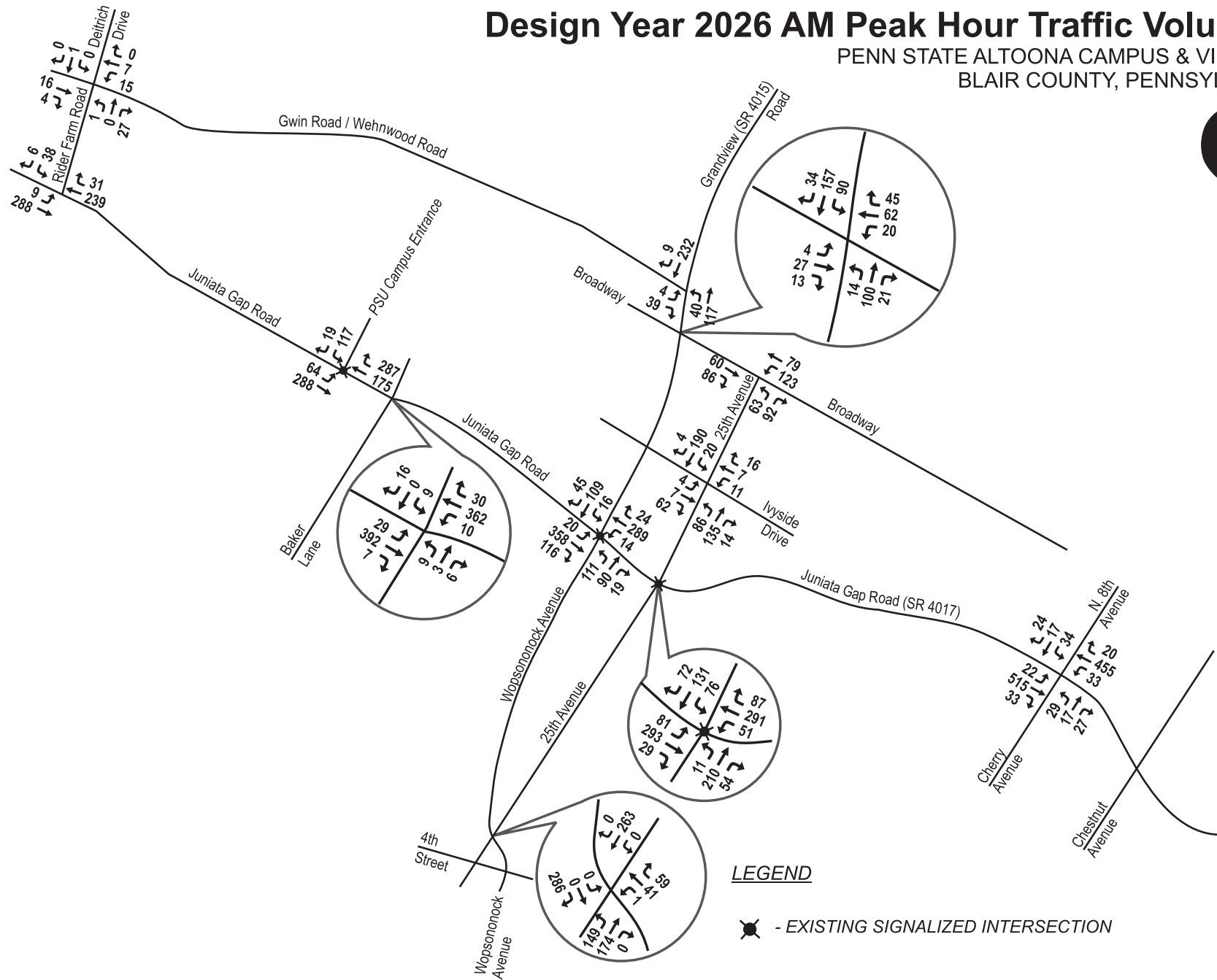
Table II-6 shows the total AM and PM peak hour trip generation volumes that are projected to be generated by the three known development locations within the study area. A total of 280 trips and 542 trips are projected to be generated during the AM and PM peak hours respectively. The Penn State University Altoona Campus is expected to generate 240 trips and 503 trips in the AM and PM peak hours respectively. This accounts for approximately 86% of the total trips added in the AM peak hour and 93% of the total trips in the PM peak hour. Additional details about the trip generation are provided in Appendix A.

**Table II-6 Study Area Trip Generation**

Location	Name	AM			PM		
		Total	In	Out	Total	In	Out
City of Altoona Dept. of Planning	Juniata Commons Residential Development	18	5	13	16	10	6
Logan Township	Logan Township Residential Development	22	6	16	23	14	9
Penn State University	PSU Campus Developments	240	126	114	503	255	248
TOTAL TRIPS ADDED		280	137	143	542	279	263

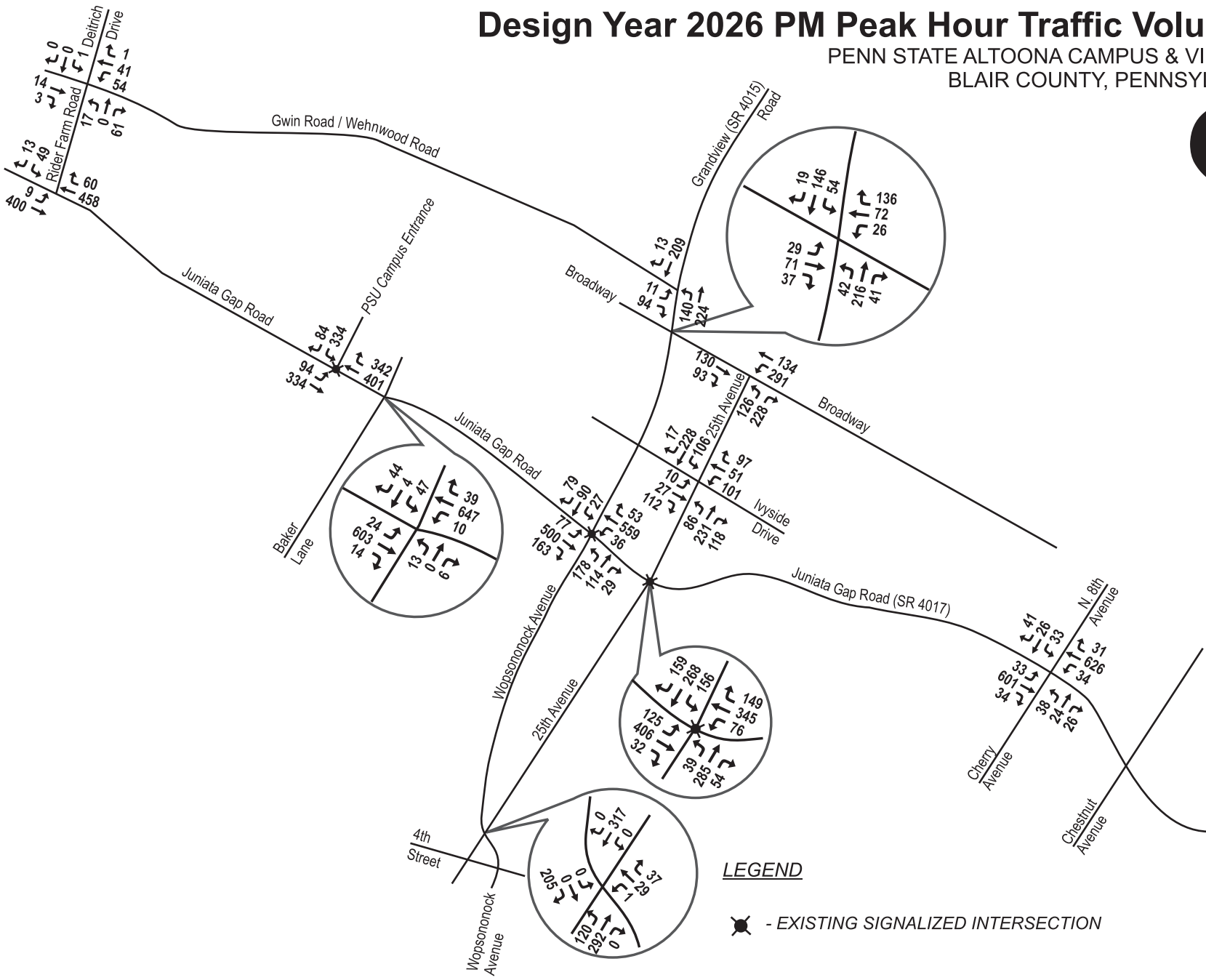
# Design Year 2026 AM Peak Hour Traffic Volumes

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# Design Year 2026 PM Peak Hour Traffic Volumes

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BLAIR COUNTY, PENNSYLVANIA





## C. Levels of Service

While existing traffic volumes provide an important measure of activity on the study area roadway system, evaluating how well the system accommodates those volumes is also very important. A comparison of the peak hour traffic volumes to the constraints of the existing roadway geometry, environment, traffic characteristics, and controls is a good way to gain an understanding of traffic system performance. In general, roadways and intersections in suburban areas such as the Altoona Campus study area are preferred to operate at Level of Service (LOS) D.

Intersections generally control capacity in roadway networks because most traffic conflicts occur at these points where travel paths cross. Because of these conflicts, congestion is most likely to occur at intersections. Therefore, intersections are studied most often when determining the quality of traffic flow on a road network.

An unsignalized intersection on a through route is seldom critical from an overall standpoint. However, it may be of great significance to the capacity of the minor cross roadways and it may influence the LOS on both. In analyzing unsignalized intersections, it is assumed that the through movement on the major street and the right turns from the major street are unimpeded and have the right-of-way over all side street traffic and left turns from the major street. All other movements through the intersection either cross, merge with, or are affected by other flows. A descriptive procedure to calculate the LOS at unsignalized intersections has been developed to obtain the average delay at the intersections on a scale from 'a', indicating an average control delay between zero and ten seconds, to 'f' indicating an average control delay greater than 50 seconds. Table II-7 summarizes the unsignalized intersection level of service criteria.

**Table II-7 Level of Service and Expected Delay for Unsignalized Intersections**

Level of Service	Expected Traffic Delay	Average Control Delay (Seconds/Vehicle)
A	Little or no delay	0 - 10
B	Short traffic delays	> 10 - 15
C	Average traffic delays	> 15 - 25
D	Long traffic delays	> 25 - 35
E	Long traffic delays	> 35 - 50
F	Very long traffic delays	> 50

Source: Transportation Research Board, Highway Capacity Manual 2000, published by the Transportation Research Board, Washington, D.C., 2000

Factors that affect the various approach capacities at signalized intersections include the width of the lanes of the approach, number of lanes, the signal 'green time', the turning volumes, the truck percentages, etc. The traffic condition at the signalized intersections are measured by LOS with different delay thresholds. At signalized intersections LOS 'A' is the best (less than ten seconds of delay), and LOS 'F' is the worst (greater than 80 seconds of delay). Delays cannot be related to capacity in a simple one-to-one fashion. However, operation at capacity can be less than satisfactory since substantial delays or reduced operating speeds are likely. It is possible to have delays in the Level of Service 'F' range without exceeding roadway capacity. Substantial delays can exist without exceeding capacity if one or more of the following conditions exist:

Long signal cycle lengths

A particular traffic movement experiences a long red time

Progressive movement for a particular lane group is poor

Table II-8 shows the level of service thresholds for signalized intersections. All intersection LOS analyses were performed using the HCM Report for Signalized and Unsignalized intersections as obtained from Synchro 6.0.

**Table II-8 Level of Service for Signalized Intersections**

Level of Service	Expected Traffic Delay	Average Control Delay Per Vehicle (Seconds/Vehicle)
A	Very low delay, good progression; most vehicles do not stop at intersection	≤ 10
B	Generally good signal progression and/or short cycle length; more vehicles stop at intersection than Level of Service A	> 10 - 20
C	Fair progression and/or longer cycle length; significant number of vehicles stop at intersection	> 20 - 35
D	Congestion becomes more noticeable; individual cycle failures; longer delays from unfavorable progression, long cycle length, or high volume/capacity ratio; most vehicles stop at intersection	> 35 - 55
E	Usually considered limit of acceptable delay indicative of poor progression, long cycle length, or high volume/capacity ratio; frequent individual cycle failures	> 55 - 80
F	Could be considered excessive delay in some areas, frequently an indication of oversaturation (i.e. arrival flow exceeds capacity), or very long cycle lengths with minimal side street green time. Capacity is not necessarily exceeded under this level of service	> 80

Source: Transportation Research Board, Highway Capacity Manual 2000, published by the Transportation Research Board, Washington, D.C., 2000

Table II-9 shows the AM and PM peak period LOS and the average control delay. Figure II-7 and Figure II-8 show the intersection AM peak hour and PM peak hour Existing Year 2006 LOS respectively while Figure II-9 and Figure II-10 show the intersection AM peak hour and PM peak hour Design Year 2026 LOS respectively.

**Table II-9 Intersection Peak Hour Level of Service**

Location	Approach/ Movement		Existing 2006		Design 2026	
			AM	PM	AM	PM
Gwin Rd at Rider Farm Rd	NB	LTR	a(9)	a(9)	a(9)	a(9)
	SB	LTR	a(9)	b(10)	a(10)	b(12)
	EB	LTR	a(0)	a(0)	a(0)	a(0)
	WB	LTR	a(5)	a(4)	a(5)	a(4)
Grandview Rd at Gwin Rd	NB	LT	a(2)	a(3)	a(2)	a(4)
	SB	TR	a(0)	a(0)	a(0)	a(0)
	EB	LR	a(10)	b(10)	b(11)	b(12)
Juniata Gap Rd at Cherry Av/North 8th Av	NB	LTR	c(23)	c(25)	<b>f(223)</b>	<b>f(389)</b>
	SB	LTR	c(25)	d(25)	<b>f(185)</b>	<b>f(351)</b>
	EB	LTR	a(1)	a(1)	a(1)	a(1)
	WB	LTR	a(1)	a(1)	a(2)	a(1)
25 <sup>th</sup> Av at Ivyside Dr	NB	LTR	a(3)	a(2)	a(3)	a(2)
	SB	LTR	a(1)	a(3)	a(1)	a(3)
	EB	LTR	b(10)	b(14)	b(12)	d(33)
	WB	LTR	b(12)	d(33)	c(16)	<b>f(562)</b>
Wopsononock Av/Grandview Rd at Broadway	NB	LTR	a(1)	a(1)	a(1)	a(1)
	SB	LTR	a(3)	a(3)	a(3)	a(3)
	EB	LTR	b(12)	c(22)	c(16)	<b>f(180)</b>
	WB	LTR	b(14)	c(16)	c(21)	<b>f(71)</b>
25 <sup>th</sup> Av at Broadway	NB	LR	b(11)	c(20)	b(14)	<b>f(304)</b>
	EB	TR	a(0)	a(0)	a(0)	a(0)
	WB	LT	a(5)	a(6)	a(5)	a(7)
Wopsononock Av at Juniata Gap Rd	NB	LTR	B(16)	C(25)	C(23)	<b>F(285)</b>
	SB	LTR	B(13)	B(17)	B(14)	C(29)
	EB	LTR	A(9)	B(11)	B(20)	<b>F(266)</b>
	WB	LTR	A(5)	A(6)	B(11)	B(16)
	Overall		B(10)	B(13)	B(17)	<b>F(151)</b>
Juniata Gap Rd at 25 <sup>th</sup> Av	NB	LTR	B(18)	C(26)	C(35)	<b>E(63)</b>
	SB	LTR	B(15)	B(19)	C(22)	C(32)
	EB	LTR	B(16)	B(19)	B(19)	D(52)
	WB	LTR	B(20)	C(22)	C(33)	<b>F(90)</b>
	Overall		B(18)	C(21)	C(28)	<b>E(58)</b>
25 <sup>th</sup> Av at Wopsononock Av	NB	LTR	a(4)	a(2)	a(5)	a(3)
	SB	LTR	a(0)	a(0)	a(0)	a(0)
	EB	LTR	b(11)	b(10)	c(16)	b(13)
	WB	LTR	b(13)	b(12)	c(23)	c(17)
Juniata Gap Rd at Rider Farm Rd	SB	LR	b(11)	c(15)	b(13)	d(33)
	EB	LT	a(0)	a(0)	a(0)	a(0)
	WB	TR	a(0)	a(0)	a(0)	a(0)

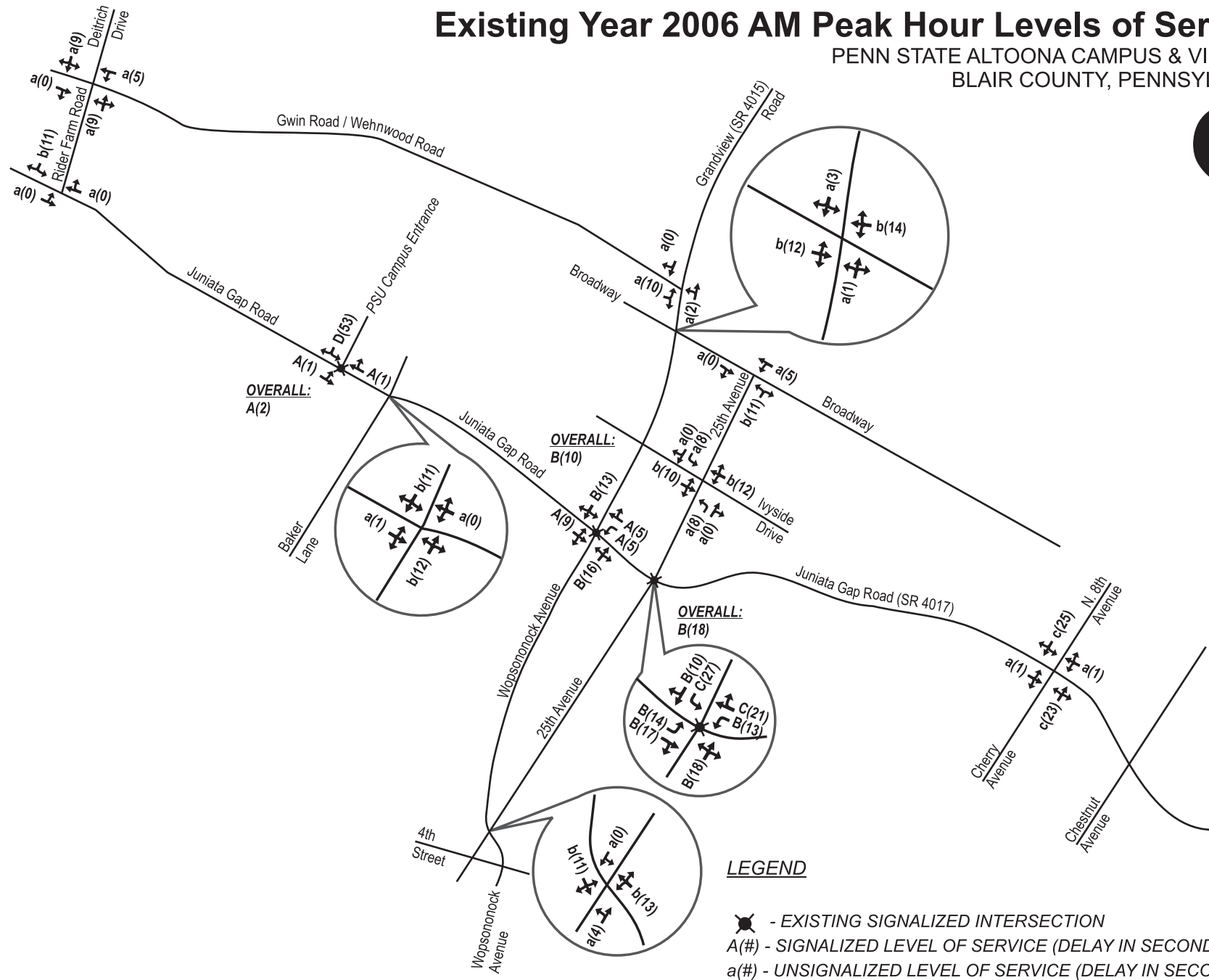
Location	Approach/ Movement		Existing 2006		Design 2026	
			AM	PM	AM	PM
Juniata Gap Rd at PSU Campus Entrance	SB	LR	D(53)	B(18)	B(18)	D(43)
	EB	LT	A(1)	A(4)	A(5)	D(41)
	WB	TR	A(1)	A(5)	A(5)	B(18)
	Overall		A(2)	A(7)	A(7)	C(31)
Juniata Gap Rd at Bakers Ln	NB	LTR	b(12)	b(14)	c(19)	<b>f(81)</b>
	SB	LTR	b(11)	c(17)	c(15)	<b>f(292)</b>
	EB	LTR	a(1)	a(1)	a(1)	a(1)
	WB	LTR	a(0)	a(0)	a(0)	a(0)

Notes: a (#): Unsignalized intersection approach Level of Service (seconds of delay per vehicle)  
A(#): Signalized intersection Level of Service (seconds of delay per vehicle)  
Bold items represent deficient Levels of Service (d/D or worse)

As shown in Table II-9, all approaches and intersections are estimated to operate at acceptable LOS d/D or better under the Existing Year 2006 traffic. As expected, traffic conditions under the Design Year 2026 considerably deteriorate from their Existing Year 2006 conditions at all intersections with the exception of the intersections of Gwin Road at Rider Farm Road, Grandview Road at Gwin Road, 25<sup>th</sup> Avenue at Wopsononock Avenue, Juniata Gap Road at Rider Farm Road, and Juniata Gap Road at PSU Campus Entrance. All other study area intersections have at least one approach operating at LOS f/F.

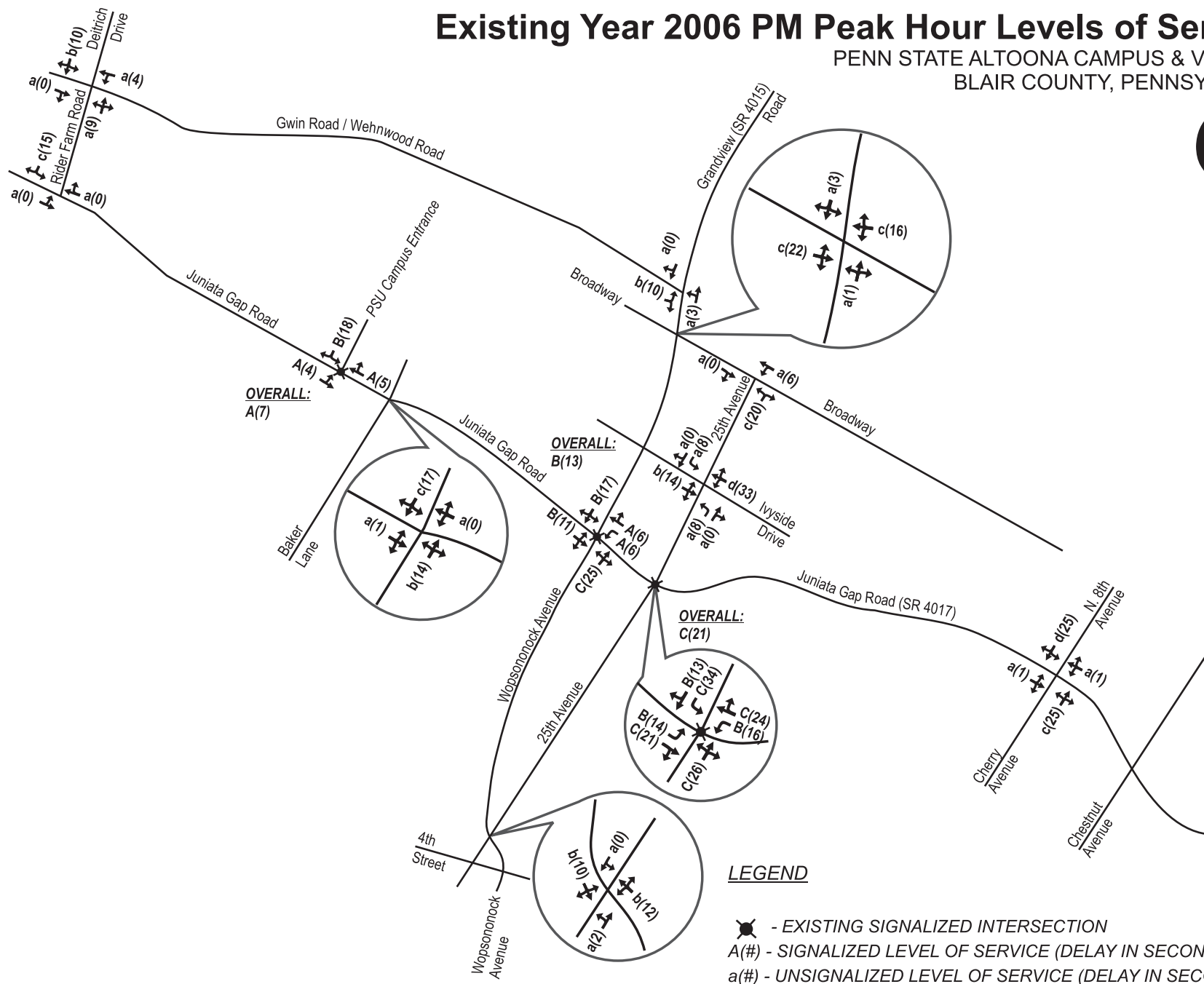
# Existing Year 2006 AM Peak Hour Levels of Service

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# Existing Year 2006 PM Peak Hour Levels of Service

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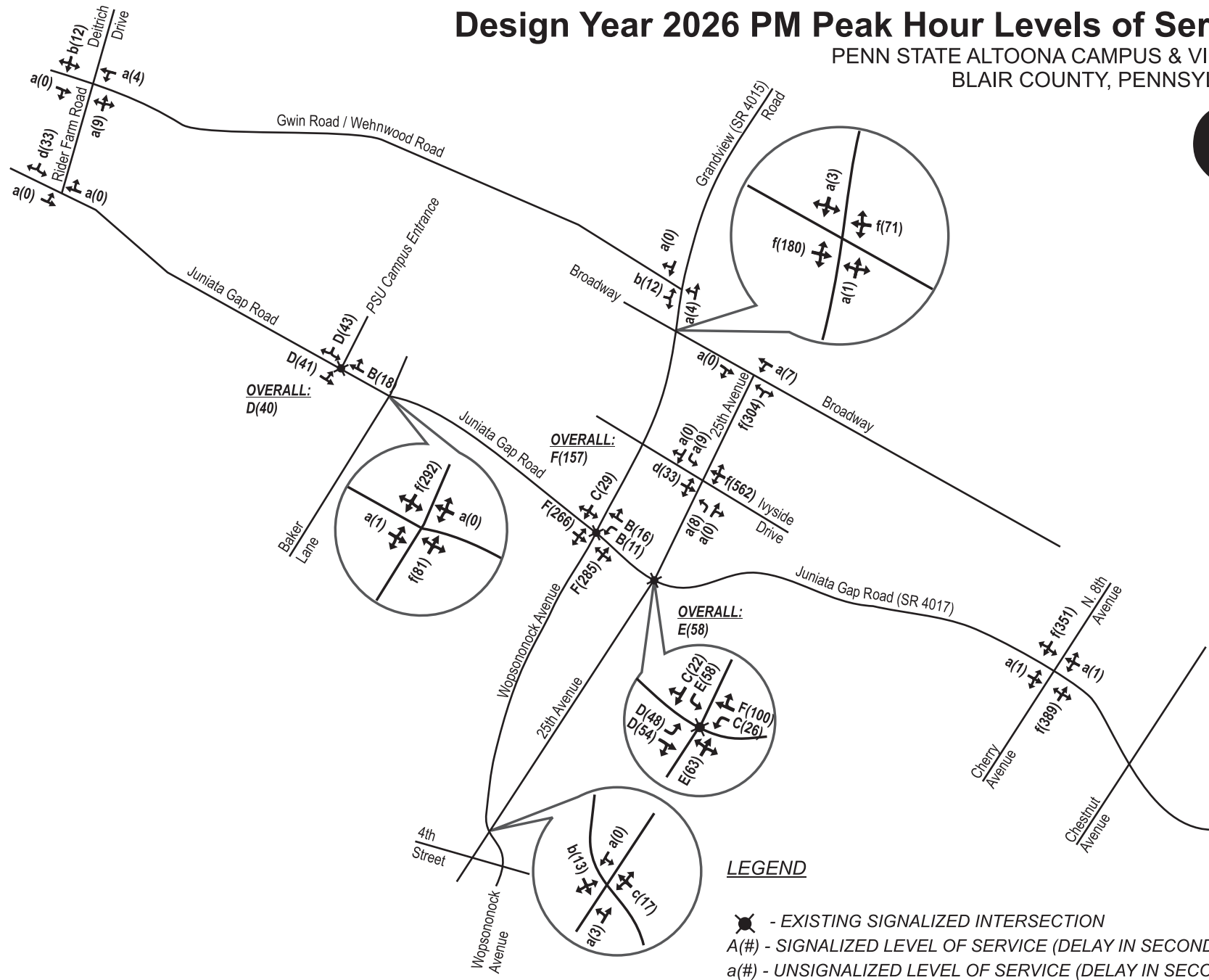


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# Design Year 2026 PM Peak Hour Levels of Service

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## D. Signal Warrant Review

A peak hour signal warrant study was conducted to verify if traffic signals should be installed at the following study area intersections:

Gwin Road at Rider Farm Road,  
Grandview Road at Gwin Road,  
Juniata Gap Road at Cherry Avenue/North 8th Avenue,  
25th Avenue at Ivyside Drive,  
Wopsononock Avenue/Grandview Road at Broadway,  
25th Avenue at Broadway,  
25th Avenue at Wopsononock Avenue,  
Juniata Gap Road at Rider Farm Road, and  
Juniata Gap Road at Bakers Lane.

The signal warrant study was conducted using the Existing Year 2006 and Design Year 2026 peak hour traffic volumes. Table II-10 shows the results of the signal warrant analysis which indicated that signals are not warranted under the Existing Year 2006 traffic conditions. A traffic signal at the intersection of 25<sup>th</sup> Avenue and Broadway is warranted under the Design Year 2026 traffic conditions.

**Table II-10 Warrant 11 – Peak Hour Volume Signal Warrant Analysis**

Intersection		Existing Year 2006 Signal Warrant Status	Design Year 2026 Signal Warrant Status
Major Approach Roadway	Minor Approach Roadway		
Gwin Rd	Rider Farm Rd	NO	NO
Grandview Rd	Gwin Rd	NO	NO
Juniata Gap Rd	Cherry Av/ North 8 <sup>th</sup> Av	NO	NO
25th Av	Ivyside Dr	NO	NO
Wopsononock Av/Grandview Rd	Broadway	NO	NO
25th Av	Broadway	NO	<b>YES</b>
25th Av	Wopsononock Av	NO	NO
Juniata Gap Rd	Rider Farm Rd	NO	NO
Juniata Gap Rd	Bakers Ln	NO	NO

A detailed signal warrants study was prepared for the intersections of Wopsononock Avenue/Grandview Road at Broadway and 25th Avenue at Ivyside Drive. Warrants 1 – Minimum Vehicular Volume, Warrant 2 - Interruption of Continuous Traffic, Warrant 7 – Systems, Warrant 8 – Combination, Warrant 9 – ADT Volume, and Warrant 12 – Four Hour Volume were investigated. Daily traffic volumes approaching the intersections were estimated by applying hourly distribution factors (obtained from the ATR count data) to the AM and PM peak hour traffic volumes approaching the intersection. Non-traffic volume related Warrant 3 – Minimum Pedestrian Volume, Warrant 4 – School Crossings, and Warrant 6 – Accident Experience were also reviewed. It was found that both intersections do not meet the warrants.

## E. Speed Study

As mentioned previously, automatic traffic recorders were utilized to obtain classification counts for a one-week period between Tuesday, November 14, 2006 and Monday, November 20, 2006. In addition to recording classification information, speed data for the study area roadways was also collected to determine if a speeding problem exists in the study area.

Roadway jurisdictions generally agree speed limits should reflect the speed of most drivers. All states and most local agencies use the 85<sup>th</sup> percentile speed of free-flowing traffic as the basic factor used to set speed limits. This is the speed that the majority of vehicles find acceptable for a given roadway and also falls within the speed range where the accident risk is the lowest.

An effective method to determine whether a speeding problem exists in a given roadway segment is comparing the 85<sup>th</sup> percentile speed of the roadway segment against the posted speed limit. Table II-11 shows the 85<sup>th</sup> percentile speed and posted speed limit for the four locations studied. It can be seen that at all four locations the 85<sup>th</sup> percentile speeds are higher than the posted speed limits. Approximately 82 percent of the total vehicles travel at speeds higher than the posted speed limit and 16 percent travel at speeds higher than the 85<sup>th</sup> percentile speed.

**Table II-11 Speed Study Summary**

Travel Speeds (mph)	Juniata Gap Road		Wopsononock Avenue		Broadway		Grandview Road	
	Number of Vehicles at Speed (mph)							
	Direction		Direction		Direction		Direction	
	EB	WB	SB	NB	EB	WB	SB	NB
85 <sup>th</sup> %	46	45	34	35	37	37	49	45
Speed Limit	35	35	25	25	25	25	25	25
Difference	+11	+10	+9	+10	+12	+12	+24	+20

Note:

The travel speed classification counts shown above were obtained during an entire week as discussed in the previous page

As previously mentioned, all vehicles traveling at or above the 85<sup>th</sup> percentile speed do so exceeding the posted speed limit. A clear correlation about the time of the day when speeding occurs was not evident. Speeding appears to occur throughout the day.

Speeding along these corridors might increase the likelihood of crashes and create unsafe conditions for pedestrians and bicyclists. Therefore, it is recommended that this information is used by the police jurisdictions responsible for speed enforcement purposes along these corridors. Random speed targeting might prove to be beneficial when aiming at reducing speeding in the study area.

## F. Project Needs

This Chapter has presented the results obtained from the traffic analysis conducted for the Existing Year 2006 which included LOS analysis at critical intersections, signal warrant

analysis, and a speed study. In addition, a LOS analysis for the Design Year 2026 traffic conditions was conducted as well.

The LOS analysis showed that several approaches or intersections within the study area will operate at unacceptable LOS under the projected Design Year 2026 traffic conditions. The signal warrant study indicated that a traffic signal will be warranted at the intersection of 25<sup>th</sup> Avenue and Broadway under the Design Year 2026 traffic conditions which will help to improve traffic operations at this intersection.

The Speed Study demonstrated that a speeding problem exists in the study area. All studied locations exhibited 85<sup>th</sup> percentile speeds higher than the posted speed limit creating unsafe conditions for pedestrians, bicyclists, and others motorists.

It is evident that there is a need to address safety, capacity, and growth concerns in the study area. Safety and capacity concerns can be addressed by implementing the preliminary recommendations shown in Figure II-11 which are expected to offer the possibility of improving safety while improving traffic operations by separating conflict areas and helping to simplify the driving tasks. The study area preliminary needs as well as potential directions for recommendation are as follows:

#### Safety Needs

Insufficient sight distance at the following locations:

- Juniata Gap Road at Rider Farm Road – looking southbound from Rider Farm Road to make a right onto Juniata Gap Road
- Juniata Gap Road at Baker Lane – looking northbound from Baker Lane to make a right turn onto Juniata Gap Road
- Wehnwood Road at Grandview Road – Both Grandview Road and Wehnwood Road at this intersection are hilly/steep slopes. Sight distance is impaired on eastbound Wehnwood Road looking north and south on Grandview Road.
- Grandview Road at Broadway – looking from Broadway to Grandview Road

Address missing crosswalks and sidewalks to facilitate pedestrian activity at:

- Gwin Road/Wehnwood to encourage students crossing between the main campus and residence halls to cross at specific locations. This also assists vehicular drivers in knowing where to expect pedestrians.
- Juniata Gap Road at Baker Lane
- Juniata Gap Road at Cherry Avenue/North 8<sup>th</sup> Avenue
- 25<sup>th</sup> Avenue at Ivyside Drive
- Wopsononock Avenue/Grandview Road at Broadway
- Wopsononock Avenue at Ivyside Drive (not a study area intersection)
- Wopsononock Avenue at Elm Street (not a study area intersection)
- Broadway at Penn Avenue (not a study area intersection)

- Speeding enforcement and education programs to address speeding concerns through the study area along with traffic calming recommendations
- Improve roadway features along Wehnwood Road (guiderail shoulder, crosswalks, sidewalk) to address pedestrian and motorist safety. Pedestrians have been observed to walk on the roadway creating hazardous situations for both pedestrians and motorists.

#### Capacity Needs

- Install a traffic signal at the intersection of 25<sup>th</sup> Avenue and Broadway to improve traffic operations
- Traffic signal coordination and optimization to improve traffic flow along Juniata Gap Road

Roadway capacity improvements to improve traffic operations as follows:

- Juniata Gap Road at Rider Farm Road
- Juniata Gap Road at PSU Campus Entrance
- Juniata Gap Road at Baker Lane
- Juniata Gap Road at Wopsononock Avenue
- Juniata Gap Road at 25<sup>th</sup> Avenue
- Juniata Gap Road at Cherry Avenue/N. 8<sup>th</sup> Street
- 25<sup>th</sup> Avenue at Broadway
- 25<sup>th</sup> Avenue at Ivyside Drive
- Wopsononock Avenue/Grandview Road at Broadway

#### Growth Needs

- Install additional bus shelters in an as needed basis to encourage public transportation usage at high transit ridership locations such as 25<sup>th</sup> Avenue at Ivyside Drive
- Establish a Traffic Advisory Committee that meets regularly to oversee and coordinate development proposals and traffic improvements within the study area
- Develop a target speed enforcement program

Table II-12 provides a summary of the study area needs related to safety and capacity described above.

**Table II-12 Study Area Needs**

Project ID	Roadway/Intersection	Need	Issue
1	Gwin Road/Wehnwood Road between Rider Farm Road and Grandview Road	Safety	Missing crosswalks and sidewalks; Roadway revisions
2	Broadway	Safety	Missing sidewalks
3	Juniata Gap Road	Safety	Heavy summertime bicycle activity
4	Gwin Road at Rider Farm Road	---	No changes proposed
5	Grandview Road at Wehnwood Road	Safety	Poor sight distance → eastbound Wehnwood Road looking north and south on Grandview Road
6	Juniata Gap Road at Cherry Avenue/North 8 <sup>th</sup> Avenue	Safety	Missing crosswalks
		Capacity	Future LOS deficiency
7	25 <sup>th</sup> Avenue at Ivyside Drive	Safety	Missing crosswalks
		Capacity	Future LOS deficiency
8	Wopsononock Avenue/Grandview Road at Broadway	Safety	Poor sight distance → From Broadway to Grandview Road; Missing crosswalks
		Capacity	Future LOS deficiency
9	25 <sup>th</sup> Avenue at Broadway	Capacity	Future LOS deficiency
10	Wopsononock Avenue at Juniata Gap Road	Capacity	Future LOS deficiency
11	Juniata Gap Road at 25 <sup>th</sup> Avenue	Capacity	Future LOS deficiency
12	25 <sup>th</sup> Avenue at Wopsononock Avenue	---	No changes proposed
13	Juniata Gap Road at Rider Farm Road	Safety	Poor sight distance – From Rider Farm Road southbound to make a right onto Juniata Gap Road; Missing crosswalks
14	Juniata Gap Road at Baker Lane	Capacity	Future LOS deficiency
15	Juniata Gap Road at PSU Campus Entrance	Capacity	Future LOS deficiency

### III. RECOMMENDATIONS

The purpose of this chapter is to describe the recommendations and to develop the costs of the program and the priority or recommended timing of the implementation of the recommended improvements.

#### A. Recommendations Summary

Based upon a detailed traffic engineering analysis, a series of field views, and consultations with the Project Steering Committee, a program of recommendations was developed. These recommendations address the needs presented in the previous section and are described in Table III-1. Figure III-1 shows the location of the recommended improvements. The previous chapters presented the study area description and the traffic operations analysis conducted for the Altoona Campus Traffic Impact Study Area as well as the project needs. Table III-1 presents a summary of the safety and capacity recommendations for the study area roadways.

**Table III-1 Study Area Recommendations**

Project No.	Roadway/Intersection	Recommendation
1	Gwin Road/Wehnwood Road between Rider Farm Road and Grandview Road	Reconstruct and widen to a 26-foot cross-section; Provide textured crosswalks at intersections; Provide sidewalk along both sides.
2	Broadway	Install sidewalk along Broadway from 25 <sup>th</sup> Avenue to the PSU Campus Entrance and provide traffic calming.
3	Juniata Gap Road	Upgrade shoulders to a consistent six-foot width between the PSU Campus Entrance and Wopsononock Avenue.
4	Grandview Road at Wehnwood Road	Realign to straighten the horizontal and vertical curve to improve sight distance; Re-grade slope on the eastern side of Grandview Road also to improve sight distance; Realign the intersection of Grandview and Wehnwood Road to provide intersection sight distance and acceptable geometry.
5	Juniata Gap Road at Cherry Avenue/North 8 <sup>th</sup> Avenue	Provide crosswalks across each approach; Widen the Cherry Avenue and North 8 <sup>th</sup> Avenue approaches to provide separate left turn lanes.
6	25 <sup>th</sup> Avenue at Ivyside Drive	Provide crosswalks across all approaches; Widen the westbound approach of Ivyside Drive to provide a separate left turn lane.
7	Wopsononock Avenue/Grandview Road at Broadway	Provide crosswalks for all approaches; Widen Wopsononock Avenue to provide separate right turn lanes on both the eastbound and westbound approaches.
8	25 <sup>th</sup> Avenue at Broadway	Signalize; Widen Broadway to provide a separate westbound left turn lane.
9	Wopsononock Avenue at Juniata Gap Road	Widen Wopsononock Avenue to provide a northbound and southbound left turn lane; Widen Juniata Gap Road to provide an eastbound left turn lane and a second eastbound and westbound through lane.
10	Juniata Gap Road at 25 <sup>th</sup> Avenue	Widen 25 <sup>th</sup> Avenue to provide northbound and southbound right turn lanes; Widen Juniata Gap Road to provide a second eastbound and westbound through lane.
11	Juniata Gap Road at Rider Farm Road	Cutback trees to improve sight distance.
12	Juniata Gap Road at Baker Lane	Provide cross walks for all approaches; Restripe the Medical Center driveway to include a separate southbound left turn lane; Widen Juniata Gap Road to provide a separate westbound right turn lane.
13	Juniata Gap Road and PSU Campus Entrance	Widen westbound Juniata Gap Road to provide a separate right turn lane and widen the PSU campus exit to provide two approach lanes.

# Study Area Recommendations

PENN STATE ALTOONA CAMPUS & VICINITY  
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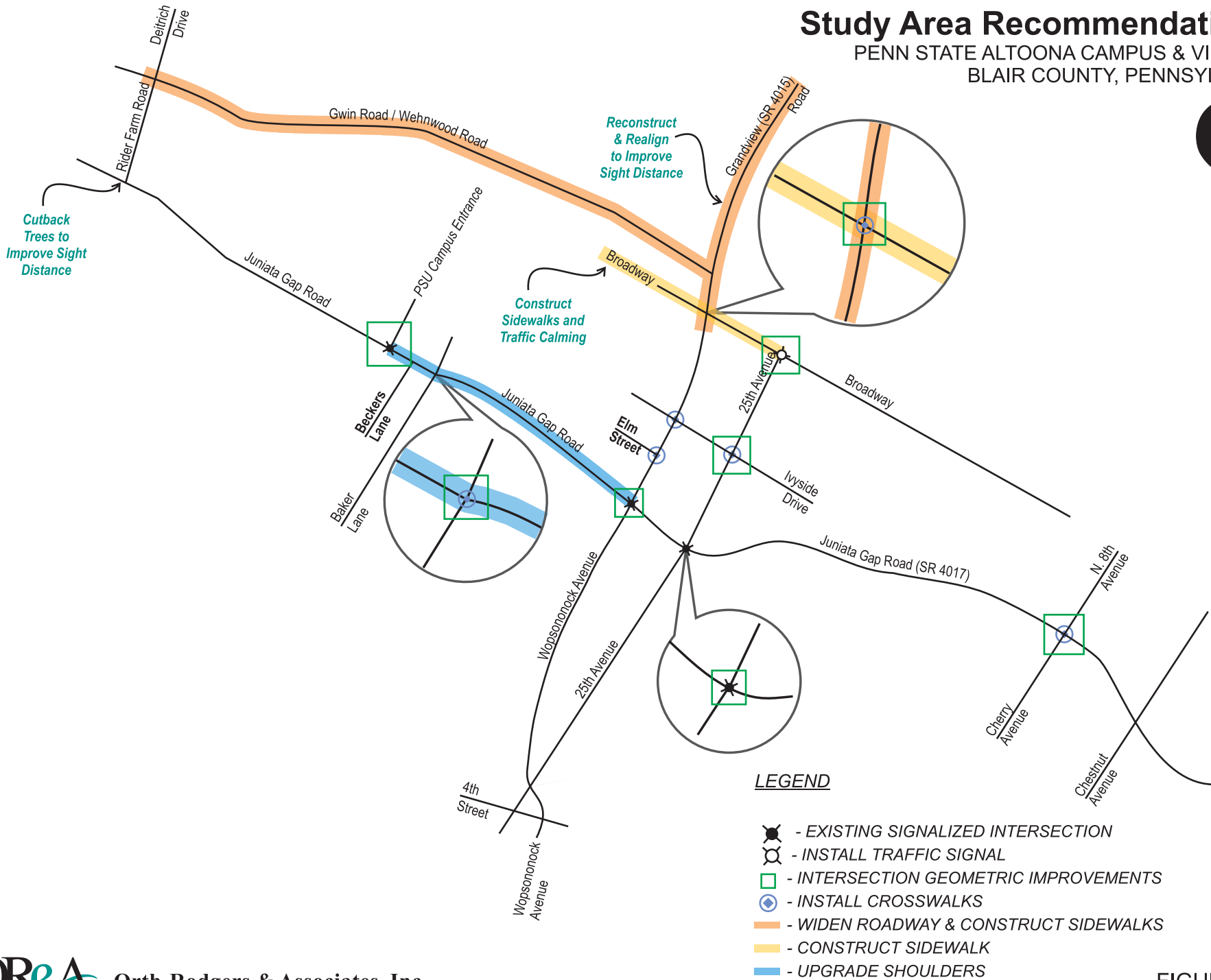


FIGURE III-1

The following paragraphs provide details regarding the recommendations.

1. Gwin Road/Wehnwood Road between Rider Farm Road and Grandview Road – This section of Gwin Road/Wehnwood Road is substandard in width and alignment for the vehicular and pedestrian demands it must accommodate. From field views, it was noted that students create their own paths to cross Gwin Road/Wehnwood Road creating unsafe conditions for pedestrians and motorists. Guiderail and sidewalks are not provided forcing students walk on the roadway. The Project Steering Committee considered a series of alternatives, including connections to Broadway to bypass the worst of the segments as well as totally reconstructing the roadway to bring it up to current collector road standards. After considering the evidence, including the proposed developments in the vacant land fronting the western section of the roadway and the potential for increased traffic, it was recommended that Gwin Road/Wehnwood Road between Rider Farm Road and Grandview Road be brought up to current design standards. Further, to emphasize the level of pedestrian movements between the Penn State Campus and the student housing along the roadway, textured pedestrian crosswalks are recommended along with sidewalks on both sides of the roadway. Figure III-2 illustrates the typical section of the improved roadway.
2. Broadway from 25th Avenue to the PSU Campus Entrance – Broadway is a residential street but it also serves as a major campus access. It also serves the needs of pedestrians walking to and from the campus as well as within the residential neighborhood. Pedestrian traffic is high enough that pathways due to pedestrian traffic are in evidence. Accordingly, it is recommended that traffic calming and sidewalks be installed along Broadway as shown in Figure III-3. As with any traffic calming initiatives, this recommendation must be reviewed with and approved by the local residents and the City of Altoona.
3. Juniata Gap Road between Rider Farm Road and Wopsononock Avenue – Juniata Gap Road serves as the main street between North Altoona and the Penn State Campus. The section west of Wopsononock Avenue and Rider Farm Road has variable width shoulders. To provide safe passage for pedestrians and bicycles as well as a cross section meeting current design standards, it is recommended that the shoulders be widened to a consistent paved width of six feet.
4. Grandview Road at Gwin/Wehnwood Road – Sight distance is limited in this section between 3rd Street and Broadway due to steep grades and horizontal curves. It is recommended that the roadway be realigned to provide sufficient sight distance for its intersections with Gwin/Wehnwood Road and Broadway. The horizontal and vertical curves in this section must be realigned and the cut-slope on the south side of Grandview Road should to be flattened to improve sight distances. The intersection of Gwin/Wehnwood Road with Grandview Avenue must be realigned as part of this project. This is a major improvement and requires additional right of way. The ultimate design must be sensitive to the access needs of adjacent property



owners. As a short term improvement, a warning sign noting the curvature of Grandview Road and the intersection configuration at Gwin Road and Broadway should be installed and equipped with flashers.

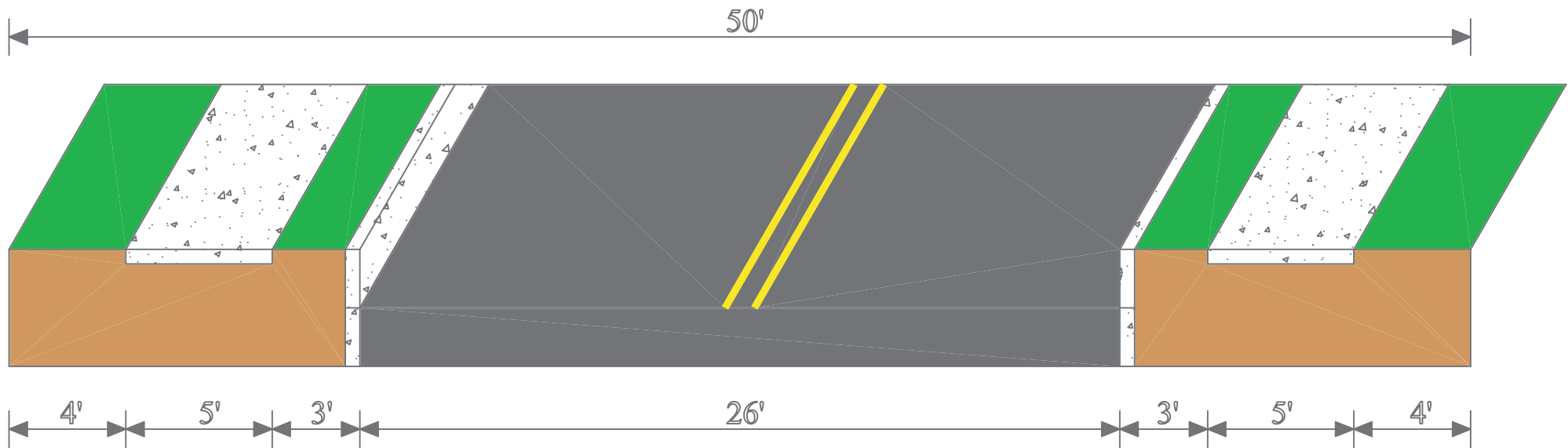
5. Juniata Gap Road and Cherry Avenue/North 8th Avenue – To achieve acceptable traffic operations at this unsignalized intersection, the Cherry Avenue and North 8th Avenue approaches must be widened to provide separate left turn lanes. Figure III-4 illustrates this change.
6. 25<sup>th</sup> Avenue at Ivyside Drive – This intersection is lacking adequate crosswalks. It is also projected to operate at deficient levels of service in the design year. Accordingly, it is recommended that crosswalks be marked and the westbound Ivyside approach be widened to provide a separate left turn lane. These recommendations are illustrated in Figure III-5.
7. Wopsononock Avenue/Grandview Road at Broadway – Crosswalks are a key improvement at this intersection to accommodate the large number of pedestrians. Pedestrian crossing signs are recommended at this location as well. In addition, to insure acceptable traffic operations at this intersection, it is recommended that both Broadway approaches be widened and striped to provide separate right turn lanes. Furthermore, it is recommended that traffic volumes and operations at the intersection be monitored to establish the need to modify the traffic control at the intersection to all-way stop traffic control.
8. 25<sup>th</sup> Avenue at Broadway – This intersection is projected to operate at an unacceptable LOS under the design year 2026 traffic conditions. Marked pedestrian crosswalks are recommended due to the pedestrian activity observed at the intersection, see Figure III-6. In addition, to achieve acceptable traffic operations at the intersection in the design year, it is recommended that the intersection be signalized and the westbound Broadway approach be widened to provide a separate left turn lane.
9. Wopsononock Avenue at Juniata Gap Road – This intersection is projected to operate at a deficient level of service in the design year. To address the level of service deficiencies, it is recommended to widen the northbound and southbound Wopsononock Avenue approaches to provide a separate left turn lane. It is also recommended to widen the eastbound and westbound Juniata Gap Road approaches to provide a second through lane and a separate eastbound left turn lane. Figure III-7 illustrates these changes.
10. Juniata Gap Road at 25<sup>th</sup> Avenue – This intersection is adjacent to the Wopsononock Avenue intersection on Juniata Gap Road and will also operate with level of service deficiencies in the design year. It is recommended that the northbound and southbound 25<sup>th</sup> Avenue approaches be widened to provide separate right turn lanes. It is also recommended that the second through lanes recommended for Juniata Gap Road at the Wopsononock Avenue intersection be continued through the 25<sup>th</sup> Avenue intersection. Figure III-7 illustrates these recommendations.

11. Juniata Gap Road and Rider Farm Road – This intersection is affected by poor sight distance due to vegetation in the northwest corner. It is recommended that the vegetation affecting sight distance be trimmed to improve motorist safety.
12. Juniata Gap Road at Baker Lane – The Project Steering Committee discussed several recommendations to improve this intersection. These alternatives included realigning the medical center driveway with Baker Lane and relocating Baker Lane opposite the medical center driveway. Field investigations indicate that land would need to be purchased to relocate the driveway and Baker Lane and there are environmental constraints that may make permitting the relocation of Baker Lane difficult to permit. Accordingly, it was decided to achieve acceptable levels of service in the design year by widening Juniata Gap Road to provide a separate right turn lane into the medical center and re-striping the driveway of the medical center to provide a two lane exit.
13. Juniata Gap Road and PSU Campus Entrance – To achieve acceptable levels of service in the design year, it is recommended that the exit from the campus be widened to provide two lanes and a right turn lane be constructed on the westbound Juniata Gap Road approach. This improvement requires that the brick walls at the entrance must be relocated. Figure III-8 illustrates this improvement.

It should be noted that recommended roadway improvements would be carried out through ‘context sensitive’ design. This approach is typically a cooperative effort amongst vested parties to provide transportation solutions that consider community Character. The Pennsylvania Department of Transportation publishes guidance relative to context sensitive design and regularly updates their library of such publications. These publications stress that designers must consider the community when setting the design speed for a roadway improvement project. For example, in a residential community, such as the study area, a design speed in excess of 35 miles per hour would be inappropriate and the designer should consider retaining curves and implementing other design features such as landscaping to create an environment for motorists conducive to slower speeds.

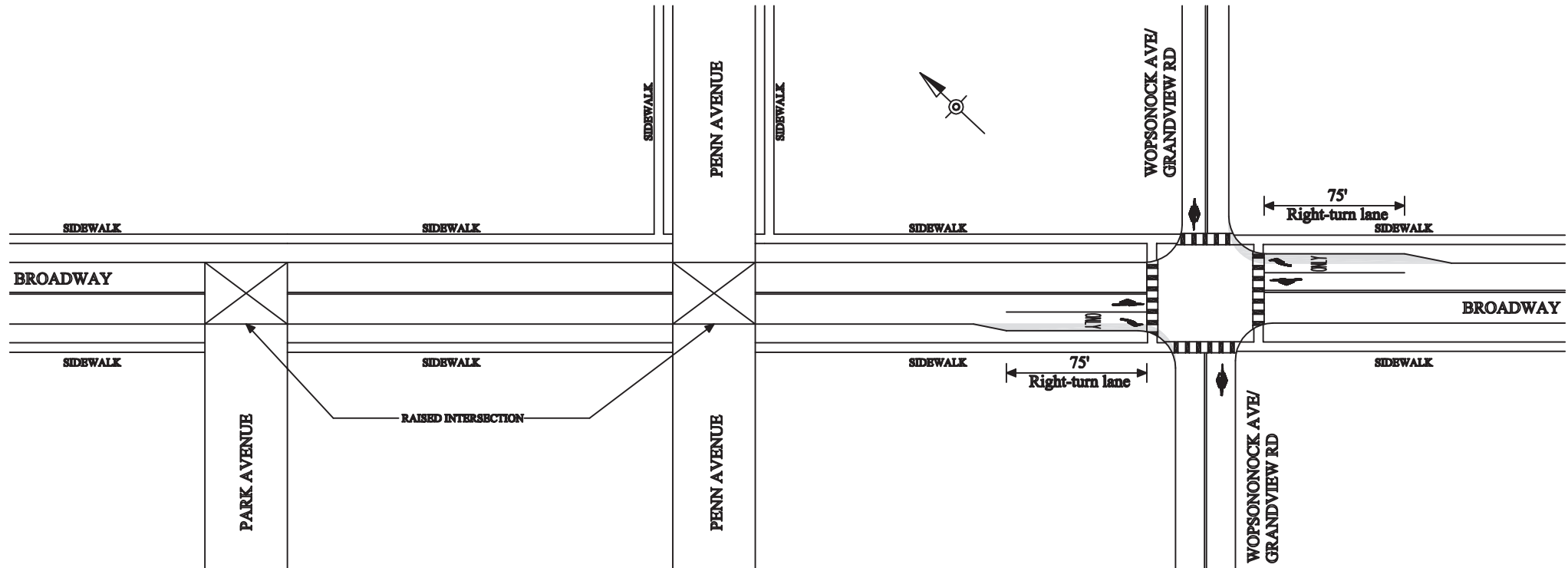
# Roadway Recommendations for Projects 1&5

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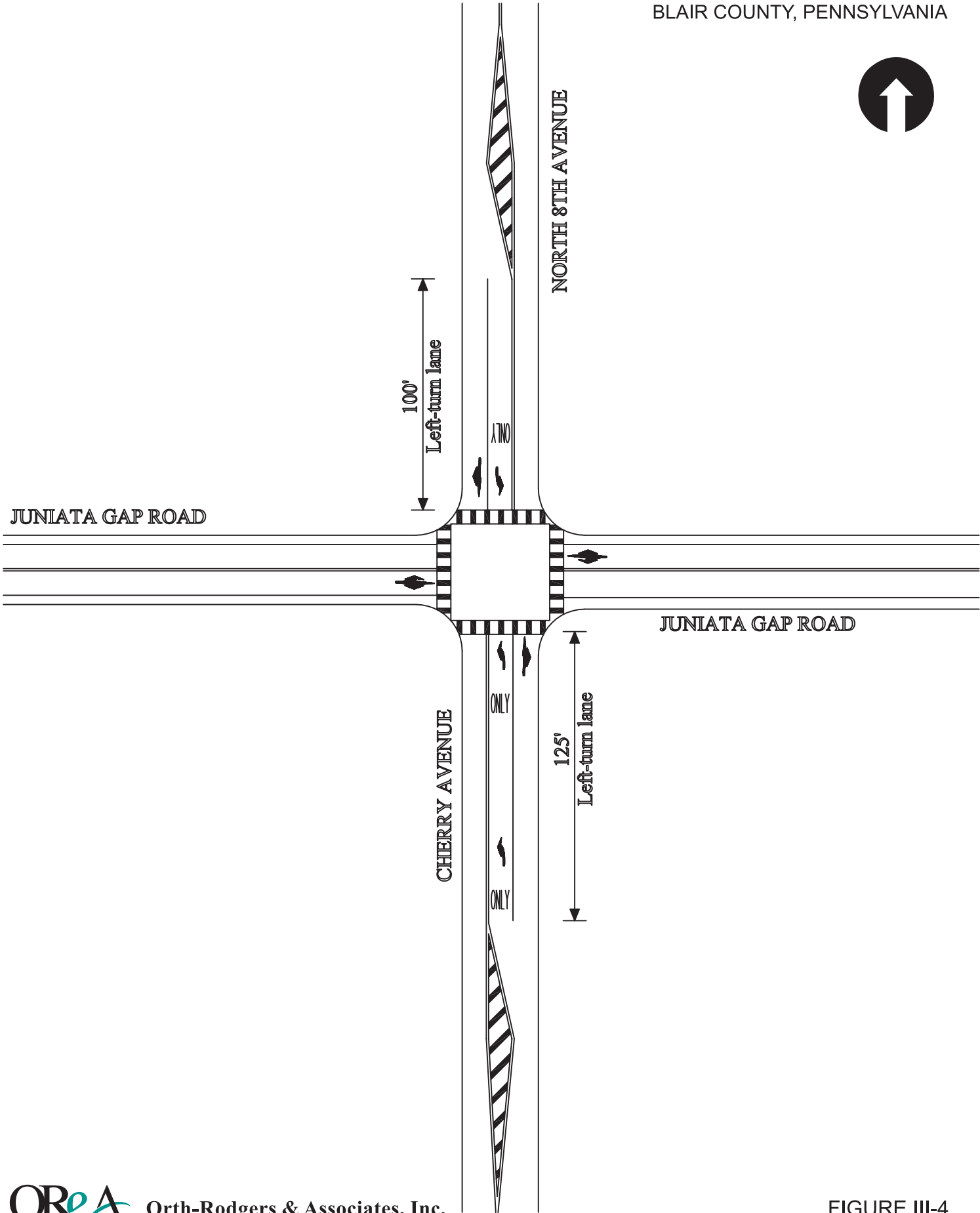
# Roadway Recommendations for Projects 2&7

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BLAIR COUNTY, PENNSYLVANIA



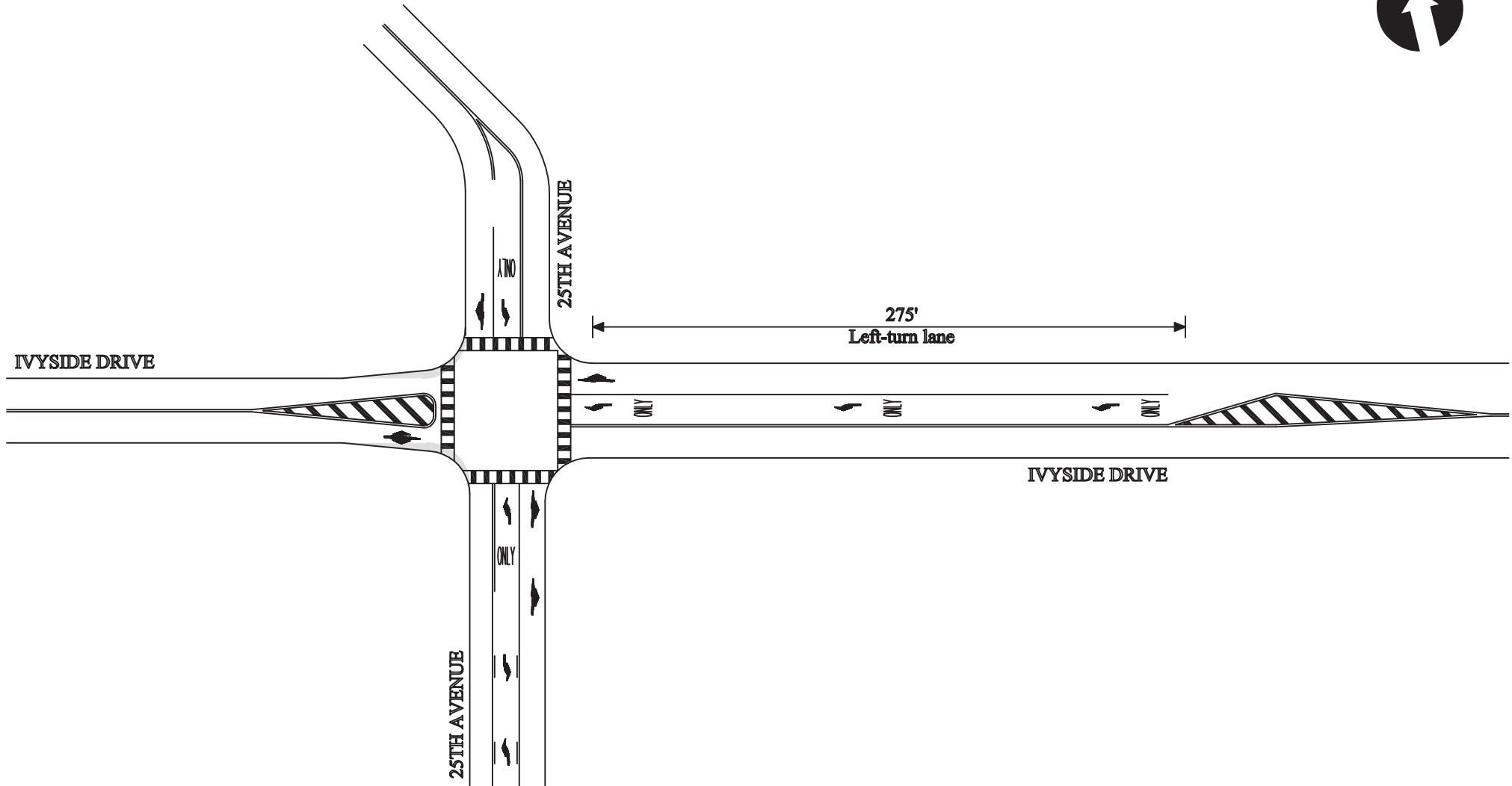
# Roadway Recommendations for Project 5

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BLAIR COUNTY, PENNSYLVANIA



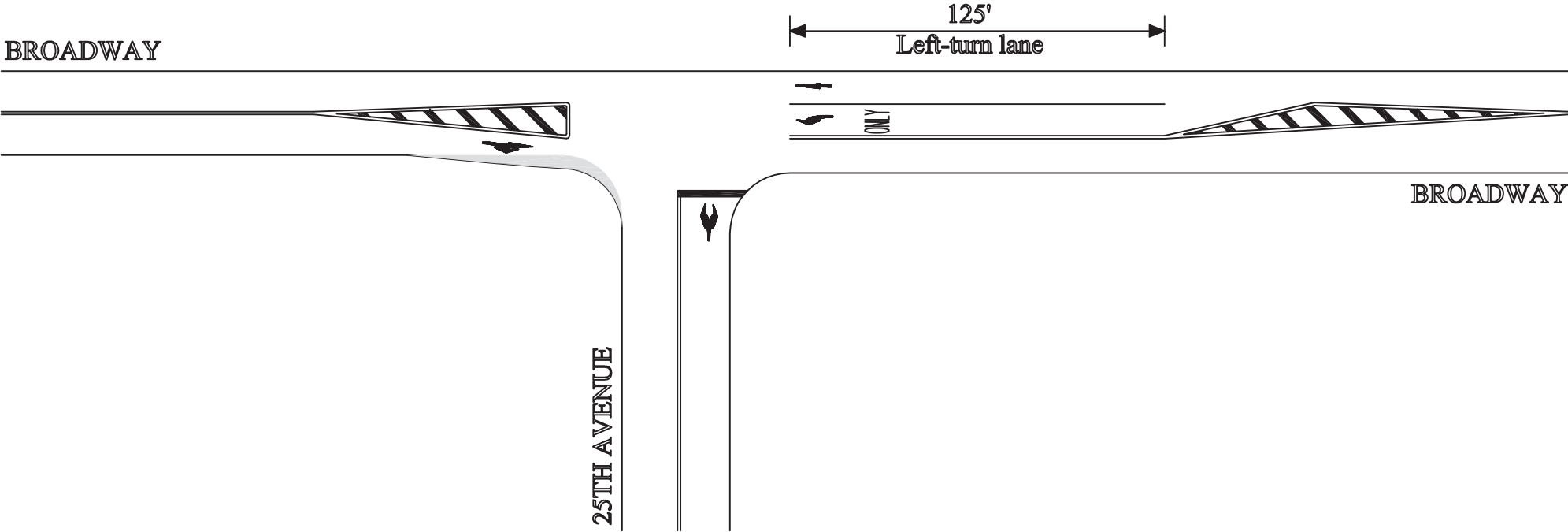
# Roadway Recommendations for Project 6

PENN STATE ALTOONA CAMPUS & VICINITY  
BLAIR COUNTY, PENNSYLVANIA



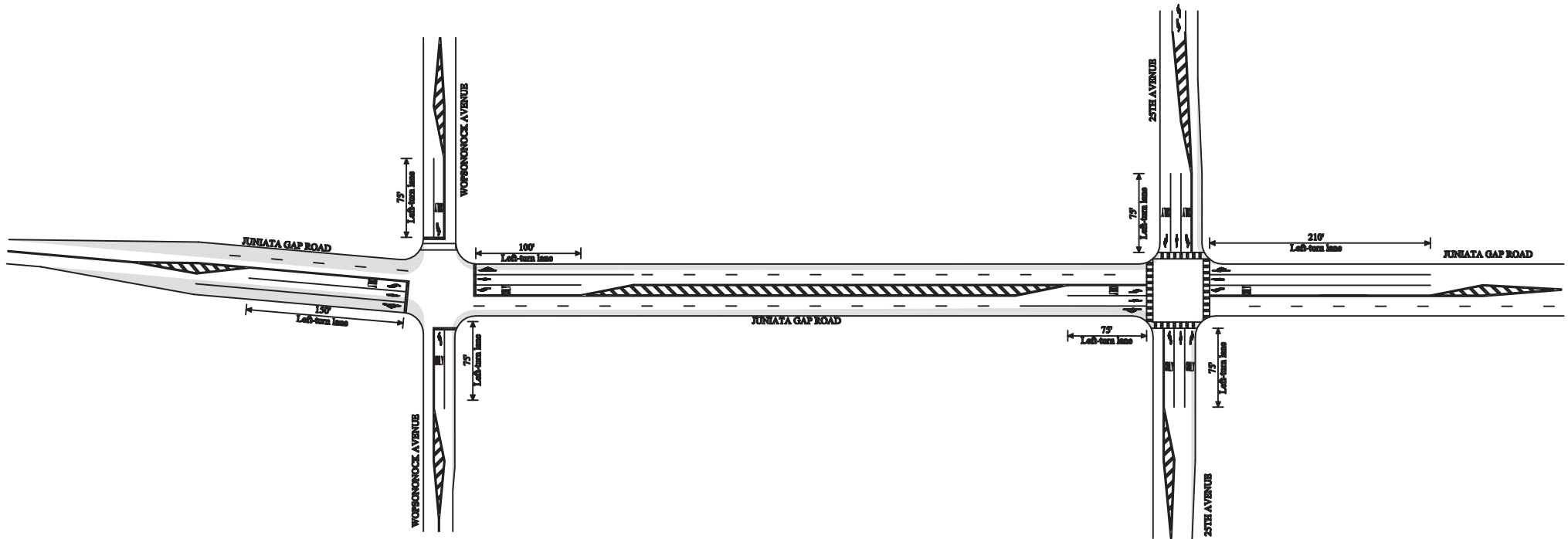
# Roadway Recommendations for Project 8

PENN STATE ALTOONA CAMPUS & VICINITY  
BLAIR COUNTY, PENNSYLVANIA



# Roadway Recommendations for Projects 9&10

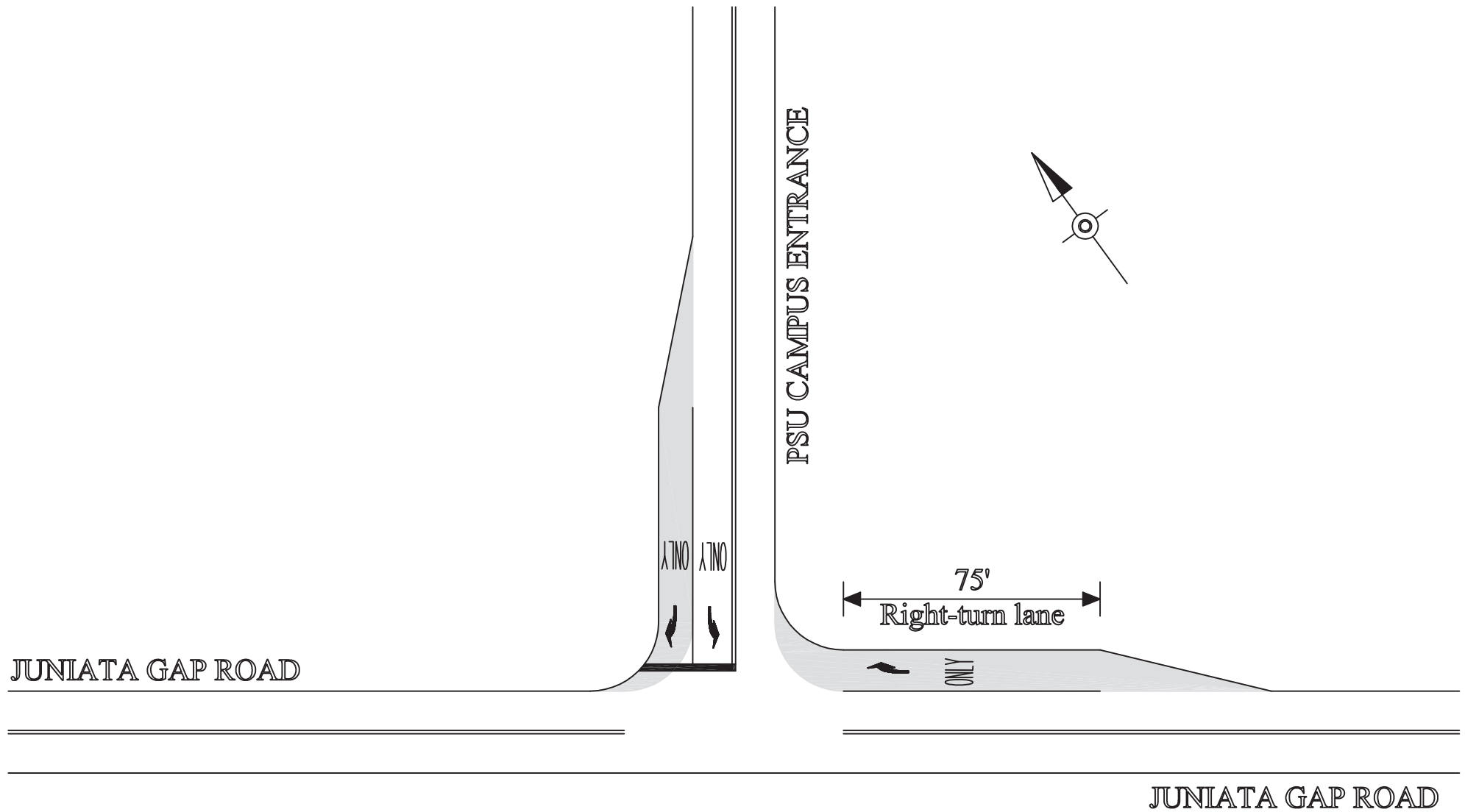
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# Roadway Recommendations for Project 13

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BLAIR COUNTY, PENNSYLVANIA



## B. Anticipated Level of Service Improvement

Table III-2 illustrates the levels of service for each study area intersection without improvements and with the proposed improvements. As shown in Table III-2, the recommended improvements are projected to considerably improve traffic conditions within in the study area. The recommended improvements are expected to reduce delay by 39 percent and 67 percent in the Design Year 2026 AM and PM peak hours respectively. In terms of delay time, reductions in delay of eight (8) hours per vehicle in the AM peak and nineteen (19) hours per vehicle in the PM peak can be expected. However, it should be noted that the recommended improvements will not completely offset effects of traffic growth in the study area that create the unacceptable traffic operations.

**Table III-2 Anticipated Level of Service Improvement**

Location	Approach/ Movement		2026 Design		2026 Improved	
			AM	PM	AM	PM
Gwin Rd at Rider Farm Rd	NB	LTR	a(9)	a(9)		
	SB	LTR	a(10)	b(12)		
	EB	LTR	a(0)	a(0)		
	WB	LTR	a(5)	a(4)		
Grandview Rd at Gwin Rd	NB	LT	a(2)	a(4)		
	SB	TR	a(0)	a(0)		
	EB	LR	b(11)	b(12)		
Juniata Gap Rd at Cherry Av/North 8th Av	NB	LTR	<b>f(223)</b>	<b>f(389)</b>	<b>f(90)</b>	<b>f(175)</b>
	SB	LTR	<b>f(185)</b>	<b>f(351)</b>	<b>f(99)</b>	<b>f(113)</b>
	EB	LTR	a(1)	a(1)	a(1)	a(1)
	WB	LTR	a(2)	a(1)	a(2)	a(1)
25 <sup>th</sup> Av at Ivyside Dr	NB	LTR	a(3)	a(2)	a(3)	a(2)
	SB	LTR	a(1)	a(3)	a(1)	a(3)
	EB	LTR	b(12)	d(33)	b(12)	d(33)
	WB	LTR	c(16)	<b>f(562)</b>	b(15)	<b>f(176)</b>
Wopsononock Av/Grandview Rd at Broadway	NB	LTR	a(1)	a(1)	a(1)	a(1)
	SB	LTR	a(3)	a(3)	a(3)	a(3)
	EB	LTR	c(16)	<b>f(180)</b>	c(15)	<b>f(122)</b>
	WB	LTR	c(21)	<b>f(71)</b>	c(18)	d(30)
25 <sup>th</sup> Av at Broadway	NB	LR	b(14)	<b>f(304)</b>	A(4)	B(14)
	EB	TR	a(0)	a(0)	B(10)	A(6)
	WB	LT	a(5)	a(7)	B(12)	B(10)
Wopsononock Av at Juniata Gap Rd	NB	LTR	C(23)	<b>F(285)</b>	B(14)	D(35)
	SB	LTR	B(14)	C(29)	B(12)	B(17)
	EB	LTR	B(20)	<b>F(266)</b>	A(9)	B(11)
	WB	LTR	B(11)	B(16)	A(5)	A(8)
	Overall		B(17)	<b>F(151)</b>	A(9)	B(15)

Location	Approach/ Movement		2026 Design		2026 Improved	
			AM	PM	AM	PM
Juniata Gap Rd at 25 <sup>th</sup> Av	NB	LTR	C(35)	<b>E(63)</b>	C(20)	C(27)
	SB	LTR	C(22)	C(32)	B(14)	C(20)
	EB	LTR	B(19)	D(52)	B(18)	C(24)
	WB	LTR	C(33)	<b>F(90)</b>	B(14)	B(17)
	Overall		C(28)	<b>E(58)</b>	B(16)	C(22)
25 <sup>th</sup> Av at Wopsononock Av	NB	LTR	a(5)	a(3)		
	SB	LTR	a(0)	a(0)		
	EB	LTR	c(16)	b(13)		
	WB	LTR	c(23)	c(17)		
Juniata Gap Rd at Rider Farm Rd	SB	LR	b(13)	d(33)		
	EB	LT	a(0)	a(0)		
	WB	TR	a(0)	a(0)		
Juniata Gap Rd at PSU Campus Entrance	SB	LR	B(18)	D(43)	B(18)	B(16)
	EB	LT	A(5)	D(41)	A(5)	B(12)
	WB	TR	A(5)	B(18)	A(4)	A(9)
	Overall		A(7)	C(31)	A(6)	B(12)
Juniata Gap Rd at Bakers Ln	NB	LTR	c(19)	<b>f(81)</b>	c(18)	<b>f(78)</b>
	SB	LTR	c(15)	<b>f(292)</b>	b(15)	<b>f(138)</b>
	EB	LTR	a(1)	a(1)	a(1)	a(1)
	WB	LTR	a(0)	a(0)	a(1)	a(1)

## C. Implementation Program

The estimated cost of the recommended improvements in 2007 dollars is presented in Table III-3. It should be noted that the cost estimates are planning level and refinement of the estimates must await further design development. Also, Table III-3 provides the anticipated implementation schedule based upon immediacy of project need and the time required to design and construct the individual improvements. Short term means implement by 2010, and longer term means by 2015. Finally, projects are grouped into logical packages for implementation.

As shown in the table, the six projects represent a total transportation investment of approximately \$5,690,000. Three of the projects represent capital level improvements. Project A is on a local roadway and must be added to the Federal-Aid System to be eligible for federal funding. If it is added to the Federal-Aid System, there will most likely be a local match component of 20% or approximately \$543,800. If Gwin/Wehnwood Road is added to the Federal-Aid System, it would need to be recommended by the Blair County Planning Commission and approved by the Metropolitan Planning Organization (MPO) to be funded through the Transportation Improvement Program. Projects for Juniata Gap Road and Grandview Road are located on state highways and thus could be funded through the Transportation Improvement Program (TIP).

Project D is a local project including sidewalks and traffic calming elements. Similarly, Project E, also a local project involves some widening. This project could be allocated to

a developer as the improvements are typical of the type of improvement normally so allocated. Project F is a traffic signal and widening project. It could also be undertaken through a combination of developer action and local funding.

**Table III-3 Implementation Program**

Project ID		Roadway/Intersection	Estimated Cost				Schedule
			Engineering	Construction	Construction Inspection	Total	
A	1	Gwin Road/Wehnwood Road between Rider Farm Road and Grandview Road	326,000	2,175,000	218,000	2,719,000	Longer Term
B	2, 7	Broadway	15,000	100,000	10,000	125,000	Short Term
C	3, 5, 9, 10, 11, 12,13	Juniata Gap Road	116,000	776,000	78,000	970,000	Longer Term
D	4	Grandview Road	188,000	1,250,000	125,000	1,563,000	Longer Term
E	6	25th Avenue at Ivyside Drive	11,000	75,000	8,000	94,000	Longer Term
F	8	25th at Broadway	26,000	175,000	18,000	219,000	Longer Term
Totals			682,000	4,551,000	457,000	5,690,000	

Note: Estimated costs do not include ROW acquisition

## D. Policy Initiatives

While the roadway improvements represent a comprehensive approach to the current and future transportation needs of the Penn State Altoona Campus area, it is not sufficient just to identify the improvements. A management and policy structure must be in place to insure implementation as well as to monitor and manage changing conditions to insure that the investments made for the improvements derived from this study represent a lasting investment. Accordingly, two actions are recommended.

1. Establish a Traffic Advisory Committee
2. Investigate the feasibility of establishing a Traffic Improvement District
3. Develop a targeted speed enforcement program.

### 1. Establish a Traffic Advisory Committee

The Project Steering Committee established to guide this study is an ideal vehicle to address this recommendation. This group should meet semi-annually following approval of the study recommendations, setting an agenda designed to accomplish the following functions:

- Work with PennDOT, Blair County, the City of Altoona, Logan Township, AMTRAN, and the University, adding developers as they enter the picture to implement the recommendations of the study.
- Monitor changing conditions in the study area such as new developments, transportation issues such as new points of congestion, safety situations,

- pedestrian and bicycle patterns and other issues that affect the study area. As situations arise, the Committee should develop a funding plan to address the situation.
- Act as a clearing house for all transportation related issues – issue reviews of developments, negotiate with developers as a united front as opposed to letting developers set the agenda, develop funding scenarios, advocate for the study area projects, and coordinate intergovernmental relations.
  - Work with the University to address transportation related issues affecting the surrounding community.

## 2. Investigate the Feasibility of Establishing a Traffic Improvement District

Pennsylvania law enables governments to establish Traffic Improvement Districts even across municipal borders. Traffic Improvement Districts have been found to be a useful vehicle for funding transportation improvements during times of funding shortages at the state level. Essentially, a Transportation Improvement District is a geographically defined area in which landowners decide to assess themselves in proportion to the level of benefit derived from the improvements funded by the district.

Funds are typically derived through property tax assessments, cash contributions at the time of development approval or special assessments. The District must have the approval by the owners of more than 50% of the assessed property value in the District to meet the legal requirement for formation. The level of contribution, if not based upon property value, is based upon the amount of traffic each assessed property adds to the roadway system or to the individual improvement.

Establishing a Traffic Improvement District is a way sanctioned by law of generating a local match for a transportation project eligible for a level of outside funding or eligible for no outside funding at all.

## 3. Develop a Targeted Speed Enforcement Program

The City of Altoona and Logan Township should develop a targeted speed enforcement program for the study area given the high percentage of speeders in the traffic stream.