City of Lewisburg
Transportation Management

Final Report

Submitted by

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June 2007

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I. INTRODUCTION

A. Background and Purpose of Study

The City of Lewisburg has hired JMT to perform a Transportation Management Study. The analysis will address vehicular traffic issues, parking, pedestrian and bicycle issues, signing and wayfinding.

The study will identify and analyze physical and operational deficiencies of the existing infrastructure and develop short-term, mid-term and long-term improvement strategies to address these deficiencies. Additionally, potential future deficiencies that will likely arise as a result of future growth and development will be examined.

B. Description of the Study Area

The study examines the area within and immediately around Lewisburg (see Figure 1-1). To the north, the study area includes Interstate 64 and US 219 northward to the City limit. To the west, it includes the area along Fairview Road, the downtown area, and along US 60 to the City limit. To the south, it extends along US 219 to Fairlea. To the east, it runs along US 60 to the City limit.

C. Goals and Objectives

JMT met with the City to review the Comprehensive Plan and to develop/refine the goals and objectives for the various elements of this Transportation Management Study Following are the goals and objectives that were developed for this project:

- To identify and evaluate strategies to improve vehicular traffic congestion within Lewisburg.
- To identify and evaluate strategies to improve pedestrian and bicycle circulation within Lewisburg.
- To develop a wayfinding strategy that coordinates signing for vehicular and pedestrian traffic, and minimizes sign clutter.
- To identify and evaluate strategies to improve parking facilities within Lewisburg.
- To address transportation issues that may arise from changes in land use in the corridor.
- Examine the potential and suitability for development in the corridor, including the need for access improvements, infrastructure extensions, land use regulations and design guidelines.
- To provide land use guidance and develop and/or modify zoning regulations, including scale and intensity of uses, that will manage growth and development in the City.
- To investigate and evaluate potential regulatory solutions to noise issues in the downtown area, such as re-routing trucks or prohibiting use of compression brakes.

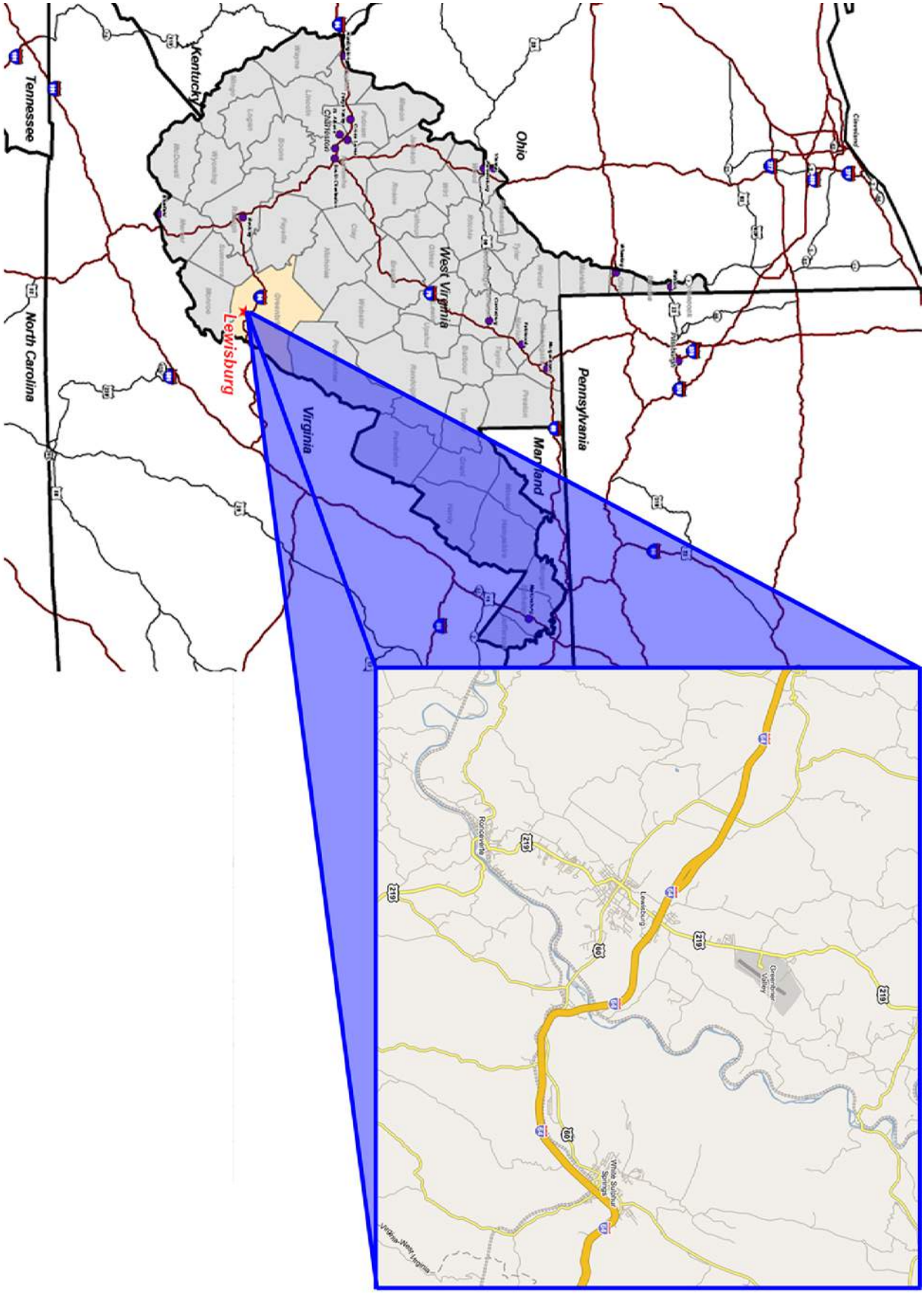

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Figure 1-1
Location Map

As a result of the detailed data collection, inventory, and evaluation of these existing facilities, implementation strategies and recommended implementation phasing plans were developed to generate prioritized lists of facility improvements for short-term, mid-term, and long-term time frames.

The prioritized lists of improvements were also developed from data and information obtained from close coordination with the City of Lewisburg staff, the Advisory Group, Greenbrier Historic Society, and the Lewisburg Historic Landmarks Commission. The Advisory Group consisted of key members of the Department of Public Works, fire department, police department, and the Planning and Zoning Commission. JMT augmented this valuable information with field observations, detailed facility site evaluations, and additional data collection.

The improvement strategies identified in the May 2004 Comprehensive Plan were utilized as a benchmark for the focus of the study area and the facility elements to be evaluated. The goals and objectives of the Comprehensive Plan were evaluated and refined to provide a more detailed analysis and to better prioritize improvement strategies.

EXISTING TRANSPORTATION FACILITIES

II. EXISTING TRANSPORTATION FACILITIES

In order to evaluate the study area and develop recommendations, it is important to begin with an analysis of the current conditions and to identify existing problems or deficiencies, due to roadway geometry, traffic congestion, and safety hazards.

Therefore, early on in the project, study team members met with the City to gather information and gain insight into the concerns for this project. Copies of information obtained during this study included the following:

- City of Lewisburg Comprehensive Plan, dated May 7, 2004
- City of Lewisburg Existing Conditions, dated October 2, 2003
- Gateway Commons Traffic Impact Analysis, dated September 2003
- Existing traffic signal plans and timings

A. Description of Existing Facilities

Key Highways and Streets

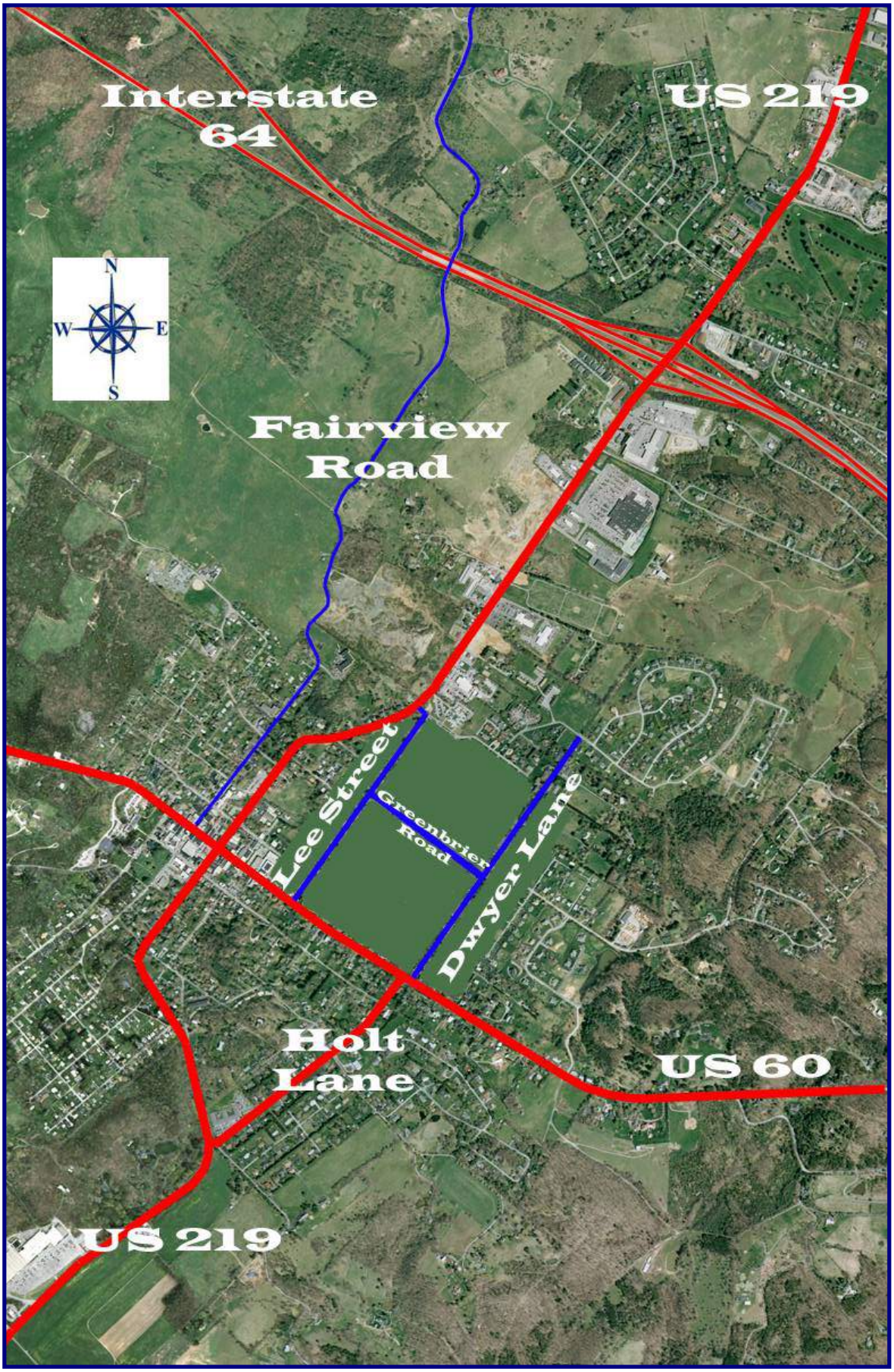
The main roadways within the study area are described below and shown in Figure 2-1.

Interstate 64 runs east-west along the north side of the downtown area. The Lewisburg interchange (Exit 169) provides a connection to US 219. Access from northbound US 219 to westbound I-64 is controlled by a traffic signal.

US 219 (Jefferson Street) is an arterial for north-south traffic throughout the region. Within the study area, the roadway is undivided with one travel lane in each direction. A center turn lane is present along most of the section of roadway from just north of Silo Lane to near the northern limit of the study area. On-street parking lanes are present in the downtown area from Foster Street to Randolph Street. Land use through the study area is a mixture of commercial and residential. From south to north, traffic signals are present at Holt Lane, Foster Street, US 60 (Washington Street), the Gateway Commons/Wal-Mart intersection, Coleman Drive, and at the westbound ramps of I-64.

US 60 (Washington Street) is an arterial for east-west traffic throughout the region. Within the study area, the roadway is undivided with one travel lane in each direction. On-street parking lanes are present in the downtown area from just west of Church Street to near Lee Street. Land use through the study area is a mixture of commercial and residential. From west to east, traffic signals are present at Court Street and at US 219 (Jefferson Street).

Holt Lane provides a connection from US 219 south of the downtown area to US 60 east of the downtown area. The roadway is 2-lane undivided. Land use is primarily residential. Holt Lane is heavily used as a bypass alternative to avoid the downtown area and is currently signed as a truck bypass for northbound trucks headed to eastbound US 60 and from westbound US 60 to southbound US 219.



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Existing Highway Network in the Lewisburg Study Area

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Figure 2-1

Not to Scale

Several City streets in the downtown area are frequently used as alternative routes for motorists who wish to avoid the Jefferson Street/Washington Street intersection. **Church Street, Court Street** and **Lafayette Street** run parallel to US 219 (Jefferson Street), and **Foster Street, Randolph Street** and **Arbuckle Lane** run parallel to US 60 (Washington Street). A flashing traffic signal is located at the intersection of Court Street and Foster Street.

Other City streets that are frequently used as shortcuts include **Lee Street/Silo Lane** (to get from westbound US 60 to US 219 north of downtown) and **Silo Lane/Greenbrier Street/Dwyer Lane** (to get from southbound US 219 to US 60 east of downtown).

North of the downtown area, Court Street becomes **Fairview Road**, which runs northward parallel to US 219, crossing I-64 and continuing northward approximately five miles, ending at its intersection with Richlands-Carol Hill Road. Arbuckle Lane (not to be confused with the Arbuckle Lane in the downtown area) connects Fairview Road to US 219 in the vicinity of the Greenbrier Valley Airport. Fairview Road is currently a narrow roadway with sharp curves and sparse residential development, although a few new housing developments appear to be underway.

Existing Parking Facilities

Within the downtown area, there are approximately 421 public parking spaces available. Four (4) parking lots provide approximately 139 spaces, while curbside parallel parking spaces provide approximately 282 spaces. A parking accumulation was conducted for this study; the location of the parking facilities and the results of the parking accumulation are discussed in greater detail in the following sections.

Existing Pedestrian Facilities

Within the City of Lewisburg sidewalks are primarily provided on the two main intersecting routes in the downtown sector comprised of Jefferson Street and Washington Street. Very few other blocks, aside from the downtown city core, have sidewalks and the continuity of the downtown sidewalk network greatly diminishes even one block away from the downtown commercial/retail core, see Figure 2-2.

The remainder of the existing sidewalk network consists of many sidewalks that have missing segments, sections with steps and/or raised sidewalk joints, little or no curb reveal, and some sections with sidewalk material that has heaved and shifted over time that can provide tripping hazards and inaccessible ADA routes. Additionally, many sections of the existing sidewalk network lack effective ADA curb ramps or are not in compliance with ADA requirements for vertical elevation change.

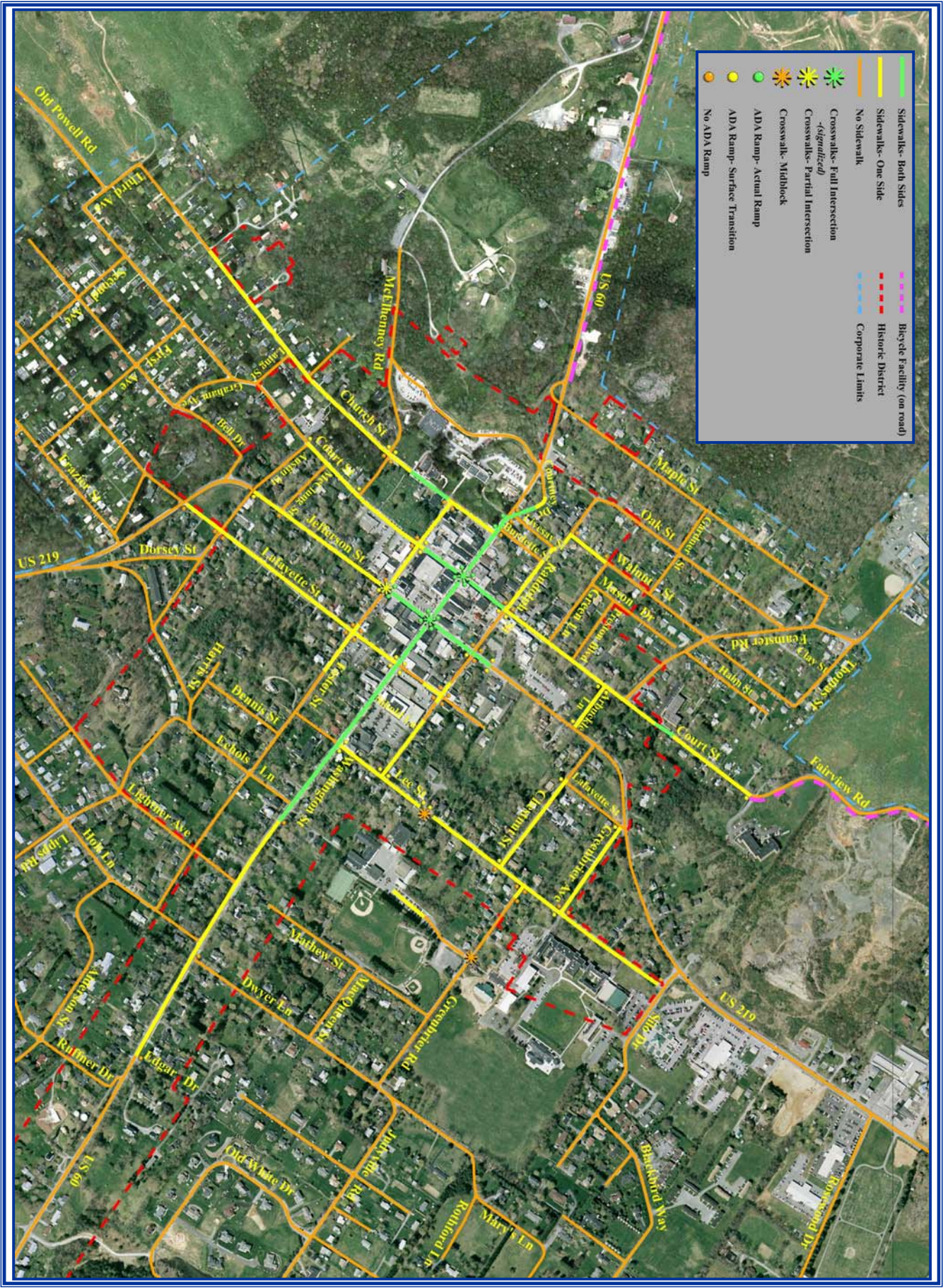

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Figure 2-2

Ped/Bike Facility Existing Conditions

Striped crosswalks are provided at the Washington Street/Court Street intersection and at the Washington Street/Jefferson Street intersection. New push-button activated pedestrian crossing signals have been installed with the recent signal improvements project. Notable efforts have been made to install ADA curb ramps at these intersections without total reconstruction of each intersection corner.

The only other crosswalks in the city are located in front of the Lewisburg Elementary School on Lee Street and at the Greenbrier Road entrance to the school and Hollowell Park. Both of these crosswalks are essentially located at a mid-block crossing situation.

Existing Bicycle Facilities

There are no dedicated bicycle lanes or separated shared-use paths within the city.

Shared on-road bicycle facilities exist on Fairview Road and on W. Washington Street (US 60) west of downtown, see Figure 2-2. The Fairview Road facility is signed in the northbound direction with the bicycle warning sign and the "share the road" supplemental plaque and the US 60 bicycle facility is signed in the westbound direction.

The Greenbrier River Trail (GRT) is located approximately 4 miles east of downtown Lewisburg. This is a shared-use rail trail facility adjacent to the Greenbrier River and located along the west bank of the river in the Lewisburg vicinity. Preliminary plans are being developed to extend the rail trail facility south to Ronceverte and the feasibility is being evaluated to provide a connection to downtown Lewisburg via this extended rail trail segment.

Existing Wayfinding Facilities

Current wayfinding type signage consists of interstate service signs and standard arterial roadway directional guide signs to destinations such as the airport, hospital, downtown, library, and other locations like the Lost World Caverns. The brown directional guide type signage to the Civil War Cemetery is located on W. Washington Street. Additionally, the Midland Trail signs are posted as mile markers through downtown Lewisburg along Washington Street (US 60).

An information kiosk has been installed at the new downtown Center Green and the historic district, landmarks, and historic places are identified in the Walking Tour of Historic Lewisburg booklet.

B. Data Collection

Traffic Volume Data

Existing conditions data were obtained through various sources. Existing traffic signal information was provided by WVDOH. This data included traffic signal plans and the signal phasing and timing information. Lane use configurations and general roadway geometry (number of lanes, lane widths, turn lane lengths, etc.) at each study area intersection were verified through field reconnaissance.

Historic traffic volume data in the vicinity of the study area were obtained from the WVDOH. An extensive traffic count program was developed and conducted for this project to obtain existing base traffic data throughout the study area. The count program included manual intersection turning movement counts (TMCs) and 24-hour, automated traffic recorder (ATR) counts. Figure 2-3 shows the locations included in the count program.

The ATRs were used to collect 24-hour traffic data during the week beginning May 21, 2006 at the 5 locations shown on Figure 2-3. These counts recorded vehicular traffic volume data (classed by vehicle type) 24 hours a day by 15-minute intervals over a 48-hour period.

The TMCs were performed at 20 intersections as shown on Figure 2-3. These counts were conducted from Monday, May 22, 2006 through Wednesday, May 24, 2006 during the morning (7:00-9:00 AM), midday (11:30 AM-1:30 PM) and evening (4:00-6:00 PM) peak periods. Traffic was observed and recorded in 15-minute intervals by movement. Recent intersection turning movement count data was obtained from WVDOH for the US 219/Westbound I-64 ramps and US 219/Coleman Drive intersections. A copy of the Traffic Impact Study report for the Gateway Commons development was also obtained; this document contained peak hour traffic volume data for the US 219/WalMartGateway Commons intersection.

The reduced traffic count data collected from the count program are contained in Appendix A of this report.

Origin-Destination Surveys

Origin-Destination (O-D) data was obtained through random car-following surveys and through a mailback postcard survey. The random car-following surveys were conducted on May 23, 2006 and May 24, 2006 during the morning, midday and evening peak periods (this data is contained in Appendix B). The mailback postcard survey was conducted on September 19, 2006 from 7:30 AM through 5:30 PM.

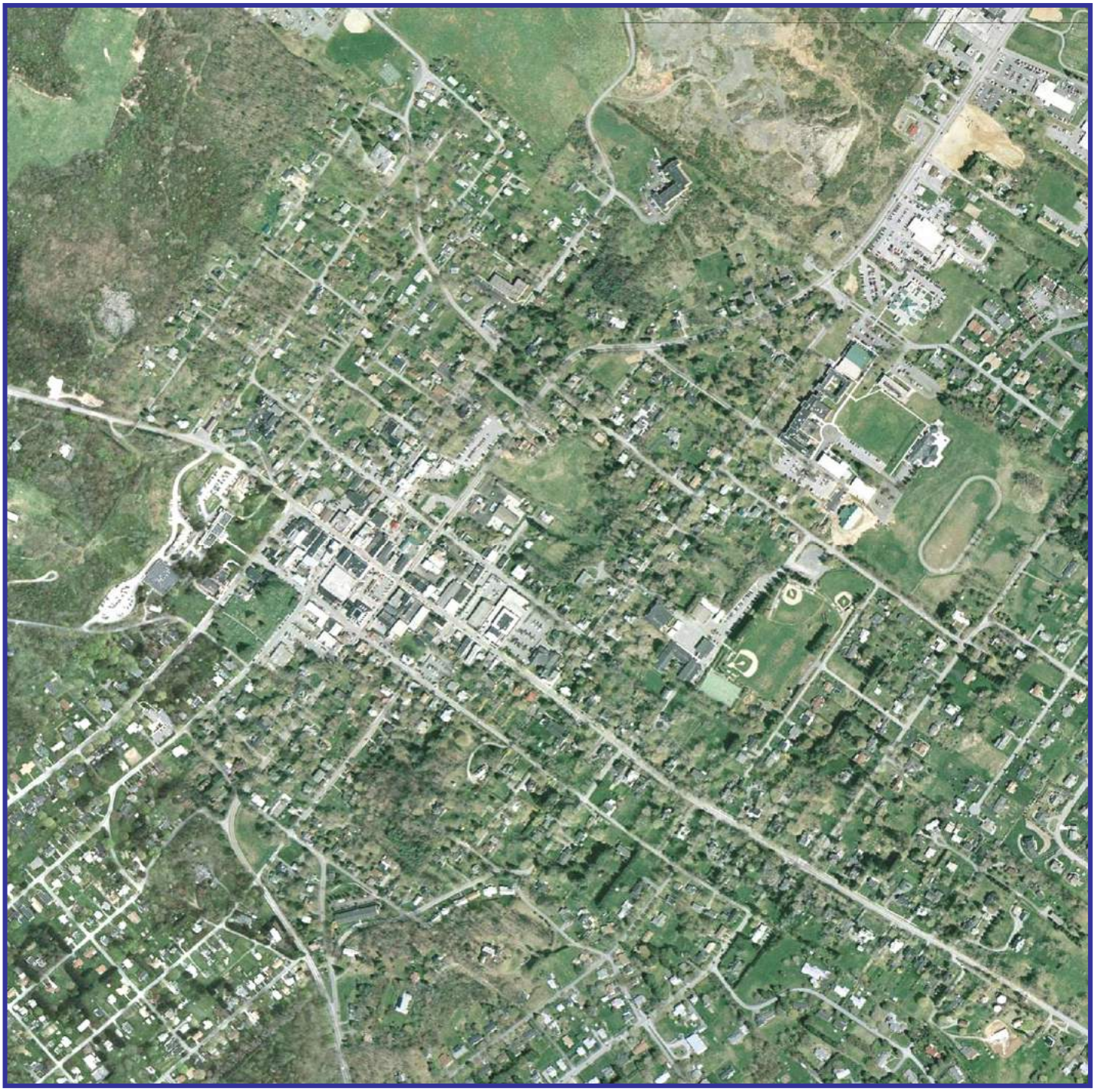
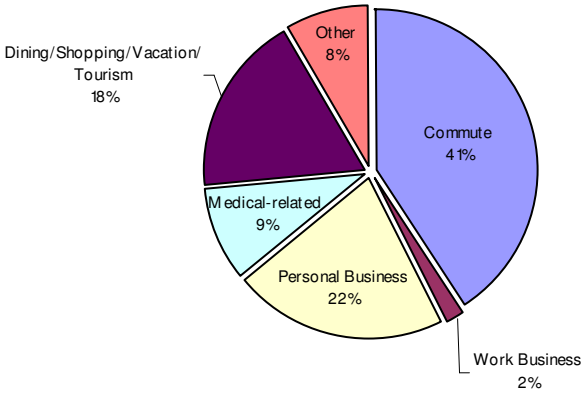


FIGURE 2-3. TRAFFIC COUNT PROGRAM

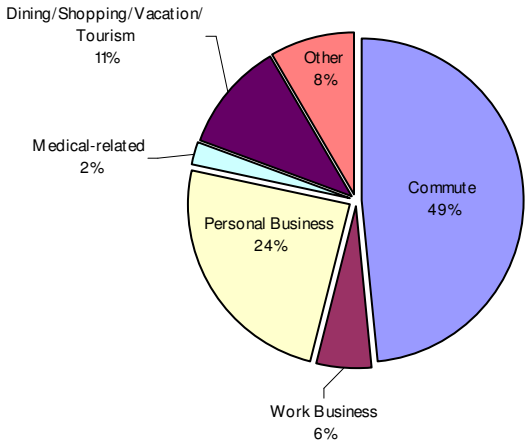
As shown on Figure 2-3, 1,596 postage-paid, mailback surveys were distributed at two (2) locations; 1,000 on US 219 southbound between Randolph Street and 596 on US 60 eastbound between Court Street and US 219. Of the 1,000 forms distributed on US 219 southbound, 250 responses were received (25.0% return rate), while 180 of the 596 (30.2% return rate) surveys distributed on US 60 eastbound were received.

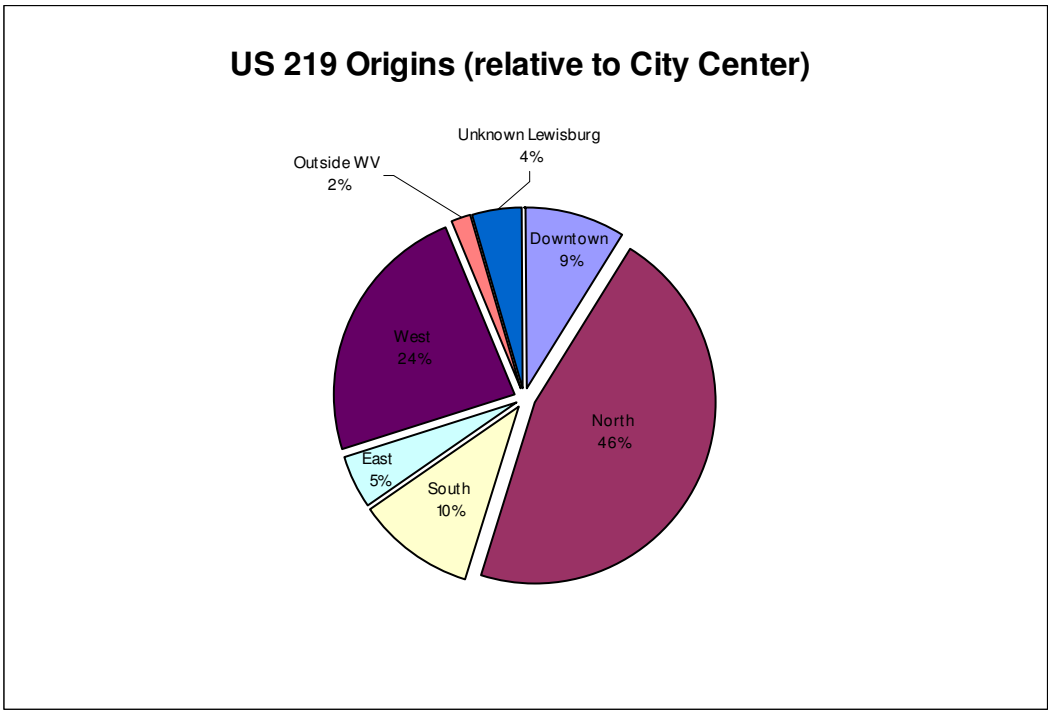
The charts below illustrate the trip purpose, origins and destinations obtained from the survey responses.

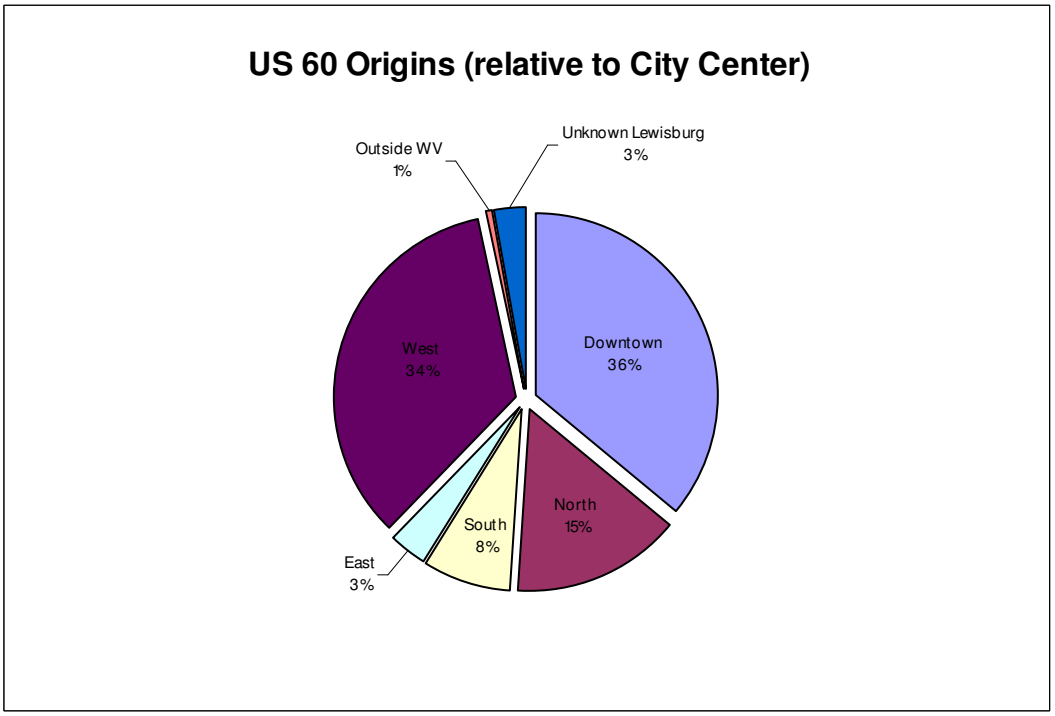
US 219 Primary Trip Purpose

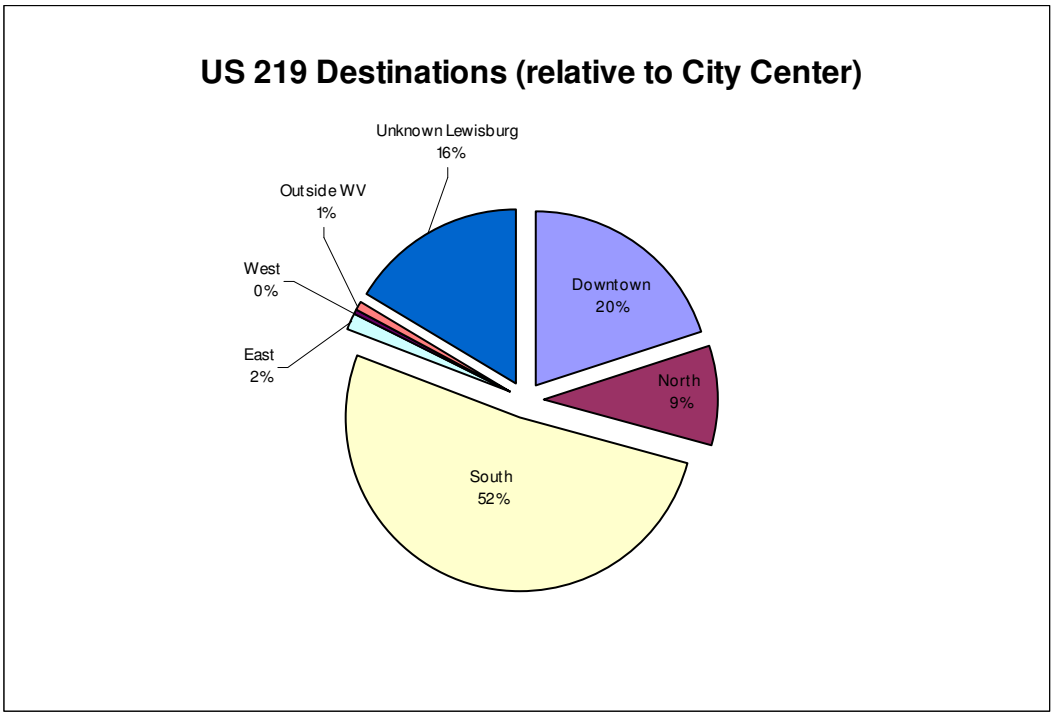


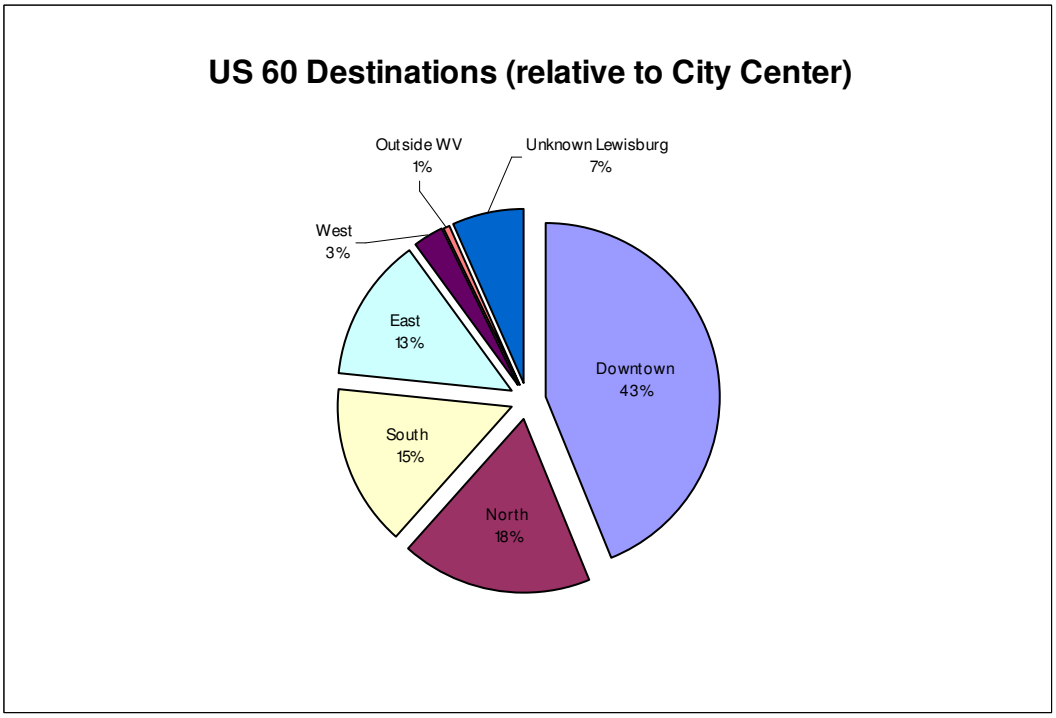
US 60 Primary Trip Purpose

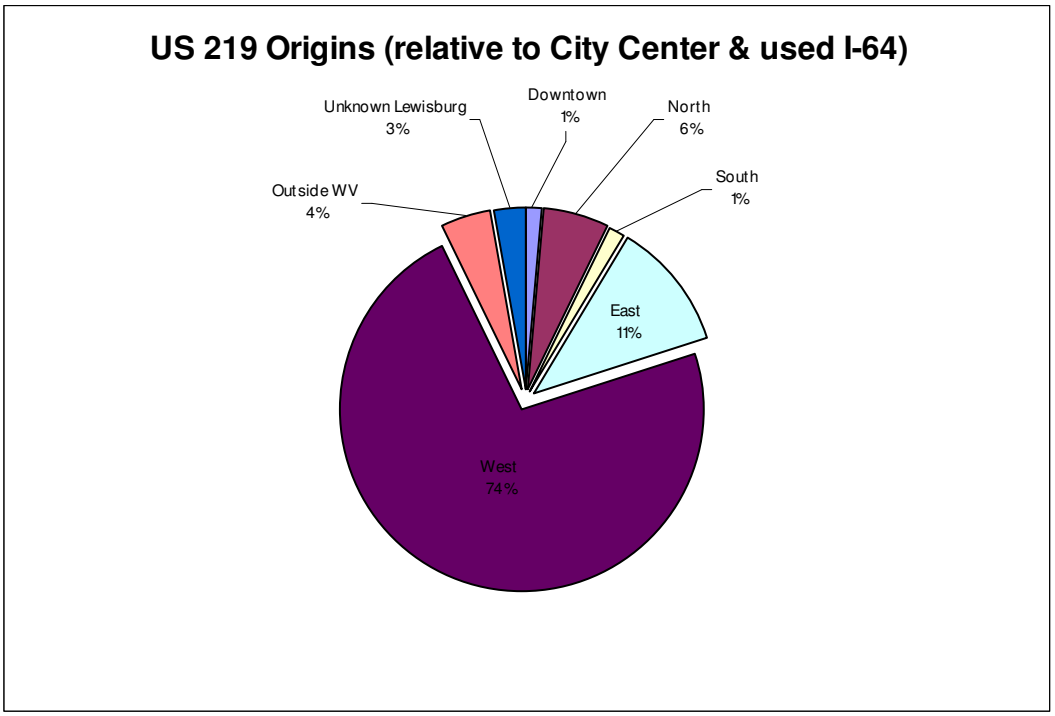


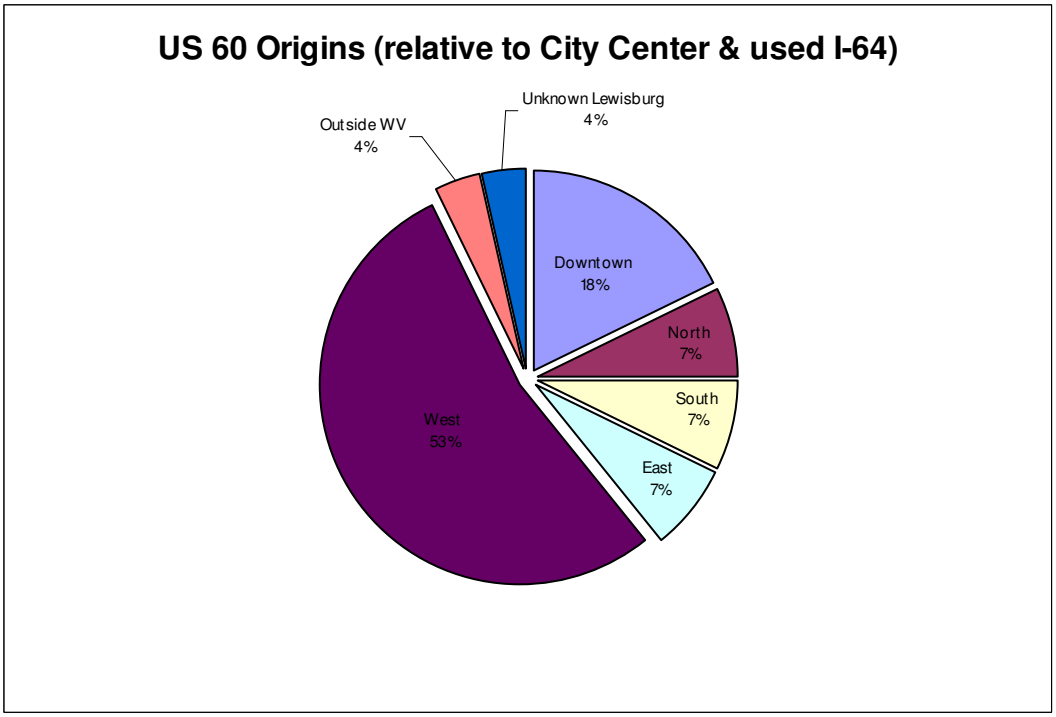

US 219 Origins (relative to City Center)
Unknown Lewisburg
4%
Outside WV
2%
Downtown
9%
West
24%
North
46%
East
5%
South
10%

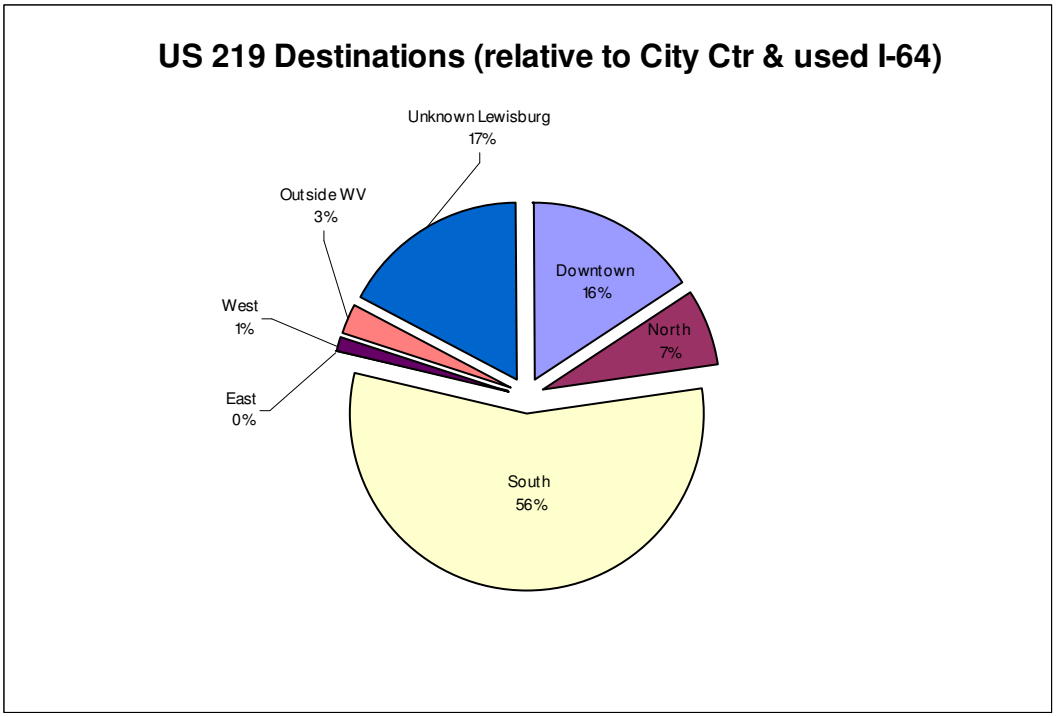

US 60 Origins (relative to City Center)
Outside WV
1%
Unknown Lewisburg
3%
West
34%
Downtown
36%
North
15%
South
8%
East
3%

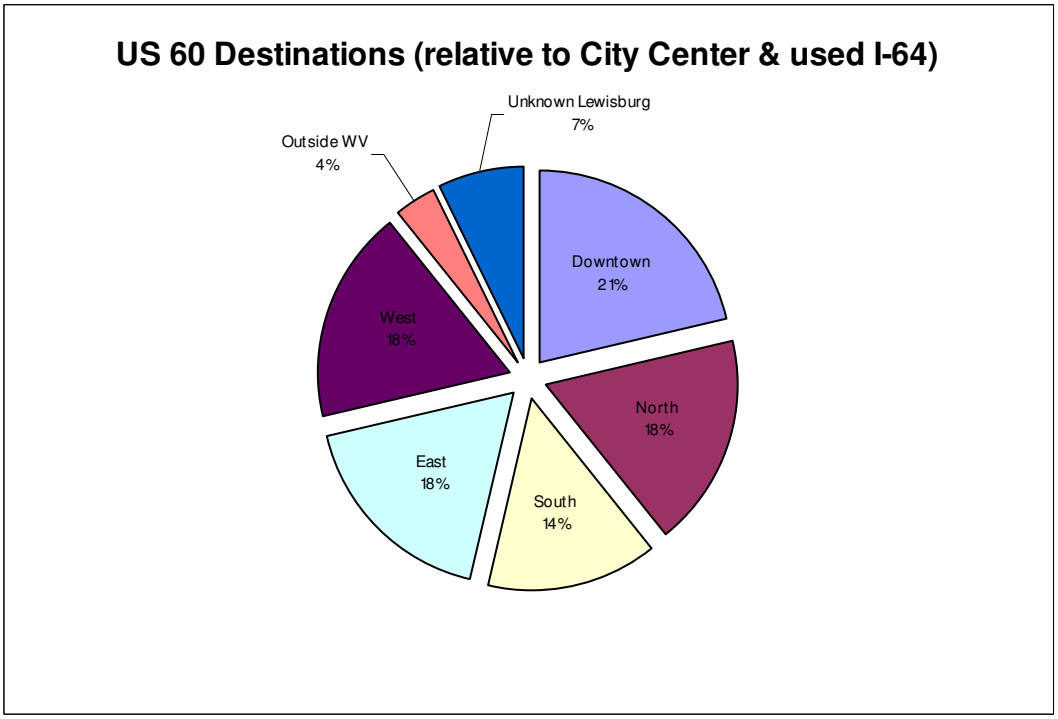

US 219 Destinations (relative to City Center)
Unknown Lewisburg
16%
Outside WV
1%
West
0%
East
2%
Downtown
20%
North
9%
South
52%


US 60 Destinations (relative to City Center)
Outside WV
1%
Unknown Lewisburg
7%
West
3%
East
13%
Downtown
43%
South
15%
North
18%


US 219 Origins (relative to City Center & used I-64)
Unknown Lewisburg 3%
Downtown 1%
North 6%
South 1%
Outside WV 4%
East 11%
West 74%


US 60 Origins (relative to City Center & used I-64)
Unknown Lewisburg 4%
Outside WV 4%
Downtown 18%
North 7%
South 7%
East 7%
West 53%


US 219 Destinations (relative to City Ctr & used I-64)
Unknown Lewisburg
17%
Outside WV
3%
West
1%
East
0%
Downtown
16%
North
7%
South
56%


US 60 Destinations (relative to City Center & used I-64)
Unknown Lewisburg
7%
Outside WV
4%
West
18%
Downtown
21%
North
18%
East
18%
South
14%

Parking Accumulation

Parking Lots

Four public parking lots in the downtown area were examined. For each lot, the total number of available spaces was counted and recorded in a table. Observations were made each hour from 10:00 AM until 6:00 PM. The number of occupied spaces was counted in each lot and recorded for each hour of observation. The table for each parking lot shows how many spaces were occupied each hour by number of vehicles and by percentage of capacity. The data was collected on Wednesday, August 9, 2006.

FIGURE 2-4. DOWNTOWN PARKING LOTS

Parking Lot # 1 (13 spaces): This facility is located on the north side of Washington Street near the Church Street intersection. The photo below shows the existing parking lot. There are 13 marked parking spaces in this facility.

TABLE 2-1
WEEKDAY USAGE OF PARKING LOT #1

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

Time of Day	Parking Spaces Filled	
	Number	%
10 AM	4	31%
11 AM	5	38%
12 NOON	12	92%
1 PM	13	100%
2 PM	6	46%
3 PM	1	8%
4 PM	4	31%
5 PM	5	38%
6 PM	6	46%

Parking Lot # 2 (12 spaces): This facility is located on the west side of Jefferson Street at the Andrew Lewis Park. The photo below shows the existing parking lot. There are 12 marked parking spaces in this facility.

TABLE 2-2
WEEKDAY USAGE OF PARKING LOT #2

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

Time of Day	Parking Spaces Filled	
	Number	%
10 AM	2	17%
11 AM	2	17%
12 NOON	2	16%
1 PM	2	17%
2 PM	3	25%
3 PM	3	25%
4 PM	3	25%
5 PM	1	8%
6 PM	2	17%

Parking Lot # 3 (64 spaces, *not counting the church spaces)**:*** This facility is located on the north side of Washington Street just east of the Post Office. The photo below shows the existing parking lot. There are 64 marked parking spaces in this facility, excluding the church spaces.

TABLE 2-3
WEEKDAY USAGE OF PARKING LOT #3

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

Time of Day	Parking Spaces Filled	
	Number	%
10 AM	23	36%
11 AM	29	45%
12 NOON	28	44%
1 PM	27	42%
2 PM	25	39%
3 PM	27	42%
4 PM	23	36%
5 PM	19	30%
6 PM	14	22%

Parking Lot # 4 (50 spaces): This facility is located on the northeast corner of the Lafayette Street and Foster Street intersection. The lot may be accessed from both Lafayette and Foster. The photo below shows the existing parking lot. There are approximately 50 unmarked parking spaces in this facility.

TABLE 2-4
WEEKDAY USAGE OF PARKING LOT #4

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

Time of Day	Parking Spaces Filled	
	Number	%
10 AM	34	66%
11 AM	32	64%
12 NOON	32	64%
1 PM	29	58%
2 PM	33	66%
3 PM	34	66%
4 PM	33	66%
5 PM	29	58%
6 PM	23	46%

On-Street Parking

On-street parking spaces were inventoried along several streets in the downtown area, including:

- Washington Street from Lee Street to just west of Church Street.
- Church Street from Washington Street to McElhenny Street
- Court Street from McElhenny Street to Green Lane
- Randolph Street from Jefferson Street to Lafayette Street
- Lafayette Street from Randolph Street to Foster Street
- Foster Street from Lafayette Street to Church Street
- Jefferson Street from Foster Street to Randolph Street

A total of **282 spaces** were counted. Observations were made each hour from 10:00 AM until 6:00 PM. The number of spaces occupied was counted on a block-by-block basis and recorded for each hour of observation. Table 2-5 shows how many spaces were occupied each hour by number and by percentage. The data was collected on Wednesday, August 9, 2006.

TABLE 2-5
WEEKDAY USAGE OF ON-STREET PARKING

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

Time of Day	Parking Spaces Filled	
	Number	%
10 AM	183	65%
11 AM	190	67%
12 NOON	184	65%
1 PM	200	71%
2 PM	196	70%
3 PM	169	60%
4 PM	150	53%
5 PM	92	33%
6 PM	72	26%

Comprehensive Downtown Parking Inventory

The following table contains all the data for the four parking lots, as well as a block-by-block breakdown of the on-street parking. The last row of data indicates the percentage of available parking spaces that are utilized throughout the downtown area for each hour observed.

TABLE 2-6
WEEKDAY USAGE OF DOWNTOWN PARKING

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

PARKING AREA	CAPACITY	Number of Spaces Occupied								
		10 AM	11 AM	12 NOON	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM
Lot # 1	13	4	5	12	13	6	1	4	5	6
Lot # 2	12	2	2	2	2	3	3	3	1	2
Lot # 3	64	23	29	28	27	25	27	23	19	14
Lot # 4	50	34	32	32	29	33	34	33	29	23
Washington from Lee to Lafayette	34	6	10	9	10	4	5	7	7	3
Washington from Lafayette to Jefferson	20	13	18	16	16	19	11	11	10	11
Washington from Jefferson to Court	16	12	9	11	15	11	9	9	10	8
Washington from Court to Church	22	18	16	21	22	18	15	16	13	15
Church from Washington to McElhenny	43	28	29	37	33	32	27	21	6	7
Court from McElhenny to Foster	16	14	14	14	14	14	9	8	3	2
Court from Foster to Washington	14	14	13	11	13	14	13	7	5	5
Court from Washington to Randolph	11	9	9	8	8	9	7	9	7	6
Court from Randolph to Green Lane	13	10	9	9	12	9	11	6	0	0
Randolph from Jefferson to Lafayette	8	8	8	6	8	8	8	5	5	3
Lafayette from Randolph to Washington	14	5	13	11	11	10	10	6	5	2
Lafayette from Washington to Foster	9	3	4	5	4	6	4	4	1	0
Foster from Lafayette to Jefferson	9	9	9	6	5	9	9	9	5	0
Foster from Jefferson to Court	5	2	2	1	2	3	3	4	0	0
Foster from Court to Church	21	21	21	14	19	22	20	20	9	3
Jefferson from Foster to Washington	15	9	4	4	4	4	7	5	5	4
Jefferson from Washington to Randolph	12	2	2	1	4	4	1	3	1	3
Total Spaces Available	**421**									
Total Spaces Occupied		**246**	**258**	**258**	**271**	**263**	**234**	**213**	**146**	**117**
% of Available Spaces Occupied		**58%**	**61%**	**61%**	**64%**	**62%**	**56%**	**51%**	**35%**	**28%**

In general, the combination of on-street parking and the four public parking lots seem to be adequate for the downtown area. Although on-street parking in the heart of the downtown area is at or near capacity throughout much of the day, alternative parking locations are available within a short walking distance. If more parking is desired in the central downtown area, the idea of converting parallel parking to angle parking on South Court Street may be viable. This concept is presented on page 26 of the Comprehensive Plan.

The following tasks were conducted to collect baseline data for the development of the existing facility evaluations and improvement strategy recommendations for pedestrian, bicycle, and wayfinding facilities:

Existing Pedestrian Facilities

Existing sidewalk width, slope, and overall condition within the city limits was documented and a photographic library was developed of typical sections along each roadway in the downtown area. The sidewalk inventories are listed by north-south streets and by east-west streets and are shown in Table 2-7 and Table 2-8, respectively. See Appendix C for the photographs and descriptions of existing pedestrian facilities along the streets within the study area. Sidewalk dimensions were mapped by general categories of width and crosswalks were also located and mapped, see Figure 2-5.

Overall connectivity, using the existing pedestrian sidewalk network, between primary origins and destinations was also inventoried and evaluated. ADA accessible routes and compliance was also inventoried and evaluated. Additionally, the historic district and the National Register of Historic Places listing were verified with the Greenbrier Historic Society to identify critical areas within any potential pedestrian or ADA improvement recommendation, see Figure 2-6 for the boundaries of the historic district.

Existing Bicycle Facilities

Existing bicycle facilities within the city limits were identified and evaluated and a photographic library was developed of the existing conditions, see Figure 2-2. See Appendix D for the photographs and descriptions of existing bicycle facilities within the study area. Field investigations were conducted to document all on-road and off-road facilities. Additionally, evaluations were conducted to identify potential connections to other existing key destinations and trail facilities inside and outside the city limits.

NORTH/SOUTH STREETS- *SIDEWALK INVENTORY*

STREET	BLOCK	SIDEWALK (East/West Side)	WIDTH (Average)	RUNNING SLOPE (Average)	MATERIAL	CONDITION	ADA COMPATIBILITY	ROADWAY WIDTH (Average)	NOTES
Walnut Street	*Randolph St. to Green Ln.*	**West**	**5.5'**	**0-2%**	**Stone**	**Poor**	**Poor**	**20'**	
Church Street	*McElwain Dr. to McElhenny Rd.*	**West**	**4'**	**0-2%**	**Concrete**	**Good**	**Fair/Good**	**24'**	
Church Street	*McElhenny Rd. to Foster St.*	**Both**	**5-8'**	**0-2%**	**Conc/Stone**	**Good/Excel**	**Fair/Good**	**30'**	
Church Street	*Foster St. to Washington St.*	**West**	**5-6'**	**0-2%**	**Conc/Stone**	**Good/Excel**	**Good**	**30'**	
Court Street	*Austin St. to McElhenny Rd.*	**West**	**4'**	**0-2%**	**Concrete**	**Fair/Good**	**Fair/Good**	**22'**	
Court Street	*McElhenny Rd. to Foster St.*	**West**	**4'**	**0-2%**	**Concrete**	**Poor**	**Poor**	**19'**	
Court Street	*Foster St. to Washington St.*	**Both**	**5-8'**	**2-5%**	**Concrete**	**Good**	**Fair/Good**	**27'**	
Court Street	*Washington St. to Randolph St.*	**Both**	**6-10'**	**2%**	**Conc/Brick**	**Fair/Good**	**Poor/Fair**	**27'**	**west S.W. Poor/Fair**
Court Street	*Randolph St. to Green Ln.*	**East**	**5'**	**0-2%**	**Concrete**	**Good**	**Fair/Good**	**27'**	
Court Street	*Green Ln. to Arbuckle Ln.*	**East**	**5'**	**0-2%**	**Concrete**	**Good**	**Fair/Good**	**27'**	
Court Street	*Arbuckle Ln. to Feamster Rd.*	**East**	**5'**	**0-2%**	**Concrete**	**Good**	**Fair/Good**	**27'**	
Court Street	*Feamster Rd. to Fairview Rd.*	**East**	**4'**	**5%**	**Concrete**	**Fair/Good**	**Fair**	**19'**	
Jefferson Street	*Austin St. to Foster St.*	**East**	**3.5-5'**	**0-2%**	**Conc/Stone**	**Fair/Good**	**Fair/Poor**	**29'**	
Jefferson Street	*Foster St. to Washington St.*	**Both**	**5.5'**	**0-3%**	**Concrete**	**Good**	**Fair/Good**	**29'**	
Jefferson Street	*Washington St. to Randolph St.*	**Both**	**5.5'**	**0-5%**	**Concrete**	**Fair/Good**	**Fair**	**36'**	
Jefferson Street	*Randolph St. to terminus*	**Both**	**4-5'**	**8-10%**	**Conc/Asphalt**	**Poor/Fair**	**Poor**	**36'**	**Steep Slopes**
Lafayette Street	*Austin St. to midblock*	**East**	**4'**	**0-2%**	**Concrete**	**Fair/Good**	**Fair/Good**	**19'**	
Lafayette Street	*midblock to Foster St.*	**West**	**4'**	**0-2%**	**Concrete**	**Fair/Good**	**Poor/Fair**	**19'**	
Lafayette Street	*Foster St. to Washington St.*	**West**	**4'**	**2-3%**	**Concrete**	**Fair/Good**	**Fair/Good**	**29'**	
Lafayette Street	*Washington St. to midblock*	**None**	**n/a**	**0-8%**	**n/a**	**n/a**	**n/a**	**29'**	
Lafayette Street	*midblock to Randolph St.*	**West**	**5'**	**8-12%**	**Concrete**	**Good**	**Poor**	**41'**	**Steep Slopes/ Steps**
Lee Street	*Washington St. to Randolph St.*	**West**	**5-6'**	**0-2%**	**Concrete**	**Fair/Good**	**Fair/Good**	**19'**	
Lee Street	*Randolph St. to Chestnut St.*	**West**	**4'**	**0-2%**	**Concrete**	**Fair/Good**	**Poor**	**19'**	
Lee Street	*Chestnut St. to Greenbrier Rd.*	**East**	**4.5'**	**0-2%**	**Concrete**	**Fair/Good**	**Poor**	**19'**	
Lee Street	*Greenbrier Rd. to Greenbrier Ave.*	**East**	**4'**	**0-2%**	**Concrete**	**Good/Excel**	**Fair**	**19'**	
Lee Street	*Greenbrier Ave. to Silo Ln.*	**West**	**4'**	**0-2%**	**Concrete**	**Fair/Good**	**Poor**	**19'**	

EAST/WEST STREETS- *SIDEWALK INVENTORY*

STREET	BLOCK	SIDEWALK (North/South Side)	WIDTH (Average)	RUNNING SLOPE (Average)	MATERIAL	CONDITION	ADA COMPATIBILITY	ROADWAY WIDTH (Average)	NOTES
Greenbrier Avenue	*Lafayette St. to Lee St.*	South	4'	0-2%	Concrete	Good	Fair/Good	19'	
Greenbrier Road	*Lee St. extended one block*	North	4'	6-8%	Concrete	Excelent	Poor	19'	Steep Slopes
Chestnut Street	*Lafayette St. to Lee St.*	South	4'	0-2%	Concrete	Good	Fair/Good	19'	
Arbuckle Lane	*Court St. to Jefferson St.*	South	4'	0-2%	Stone	Fair/Good	Poor/Fair	27'	
Randolph Street	*Walnut St. to Burdette St.*	North	4'	2-4%	Stone	Poor	Poor	19'	
Randolph Street	*Burdette St. to Court St.*	South	5'	9-10%	Brick	Fair/Good	Poor	26'	Steep Slopes
Randolph Street	*Court St. to Jefferson St.*	None	n/a	9-10%	n/a	n/a	n/a	n/a	n/a
Randolph Street	*Jefferson St. to midblock*	None	n/a	6-8%	n/a	n/a	n/a	24'	n/a
Randolph Street	*midblock to Lafayette St.*	North	4'	9-11%	Concrete	Fair	Poor	39'	Steep Slopes/Steps
Randolph Street	*Lafayette St. to midblock*	North	4'	11-12%	Concrete	Fair	Poor	42'	Steep Slopes
Randolph Street	*midblock segment*	None	n/a	11-12%	n/a	n/a	n/a	29'	n/a
Randolph Street	*midblock to Lee St.*	North	4'	11-12%	Concrete	Good	Fair/Good	35'	Steep Slopes
Courtney Drive	*midblock segment*	North	4'	11%	Stone	Fair	Poor	25'	Steep Slopes
Courtney Drive	*midblock to Washington St.*	Both	4'	11%	Stone	Poor/Fair	Poor	25'	Steep Slopes
Washington Street	*Courtney Dr. to Church St.*	Both	5'	7-10%	Conc/Stone	Fair/Good	Fair/Good	36'	Steep Slopes
Washington Street	*Church St. to Court St.*	Both	8-10'	2-7%	Concrete	Good	Good	36'	
Washington Street	*Court St. to Jefferson St.*	Both	8-10'	2-5%	Concrete	Good	Good	36'	
Washington Street	*Jefferson St. to Lafayette St.*	Both	8-10'	2-6%	Concrete	Good	Good	36'	
Washington Street	*Lafayette St. to Lee St.*	Both	5-6'	6-9%	Concrete	Good	Fair/Good	36'	Steep Slopes
Washington Street	*Lee St. to Edgar Dr.*	North	4-5'	9-12%	Conc/Stone	Poor/Fair	Poor	36'	Steep Slopes/Steps
Foster Street	*Chruch St. to Court St.*	North	4'	9%	Concrete	Fair	Poor	40'	Steep Slopes/Steps
Foster Street	*Court st. to midblock*	South	3.5-4'	0-2%	Concrete	Poor/Fair	Poor	40'	
Foster Street	*midblock to Jefferson St.*	North	5'	1-3%	Concrete	Good	Poor/Fair	40'	
Foster Street	*Jefferson St. to Lafayette St.*	None	n/a	4-9%	n/a	n/a	n/a	28'	n/a
Foster Street	*Lafayette St. to midblock*	South	4'	9%	Concrete	Poor/Fair	Poor	28'	Steep Slopes

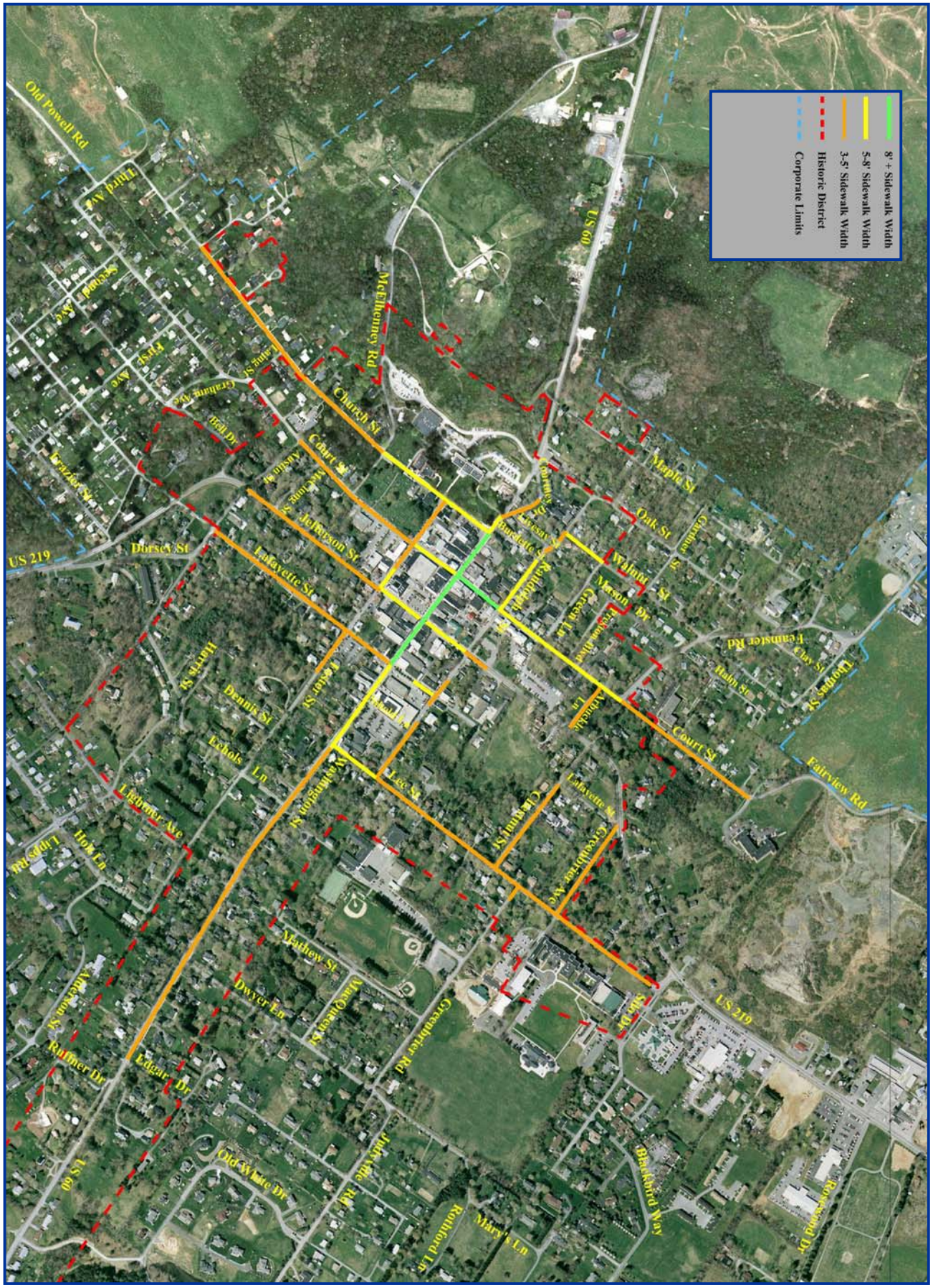


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Figure 2-5

Sidewalk Network Evaluation

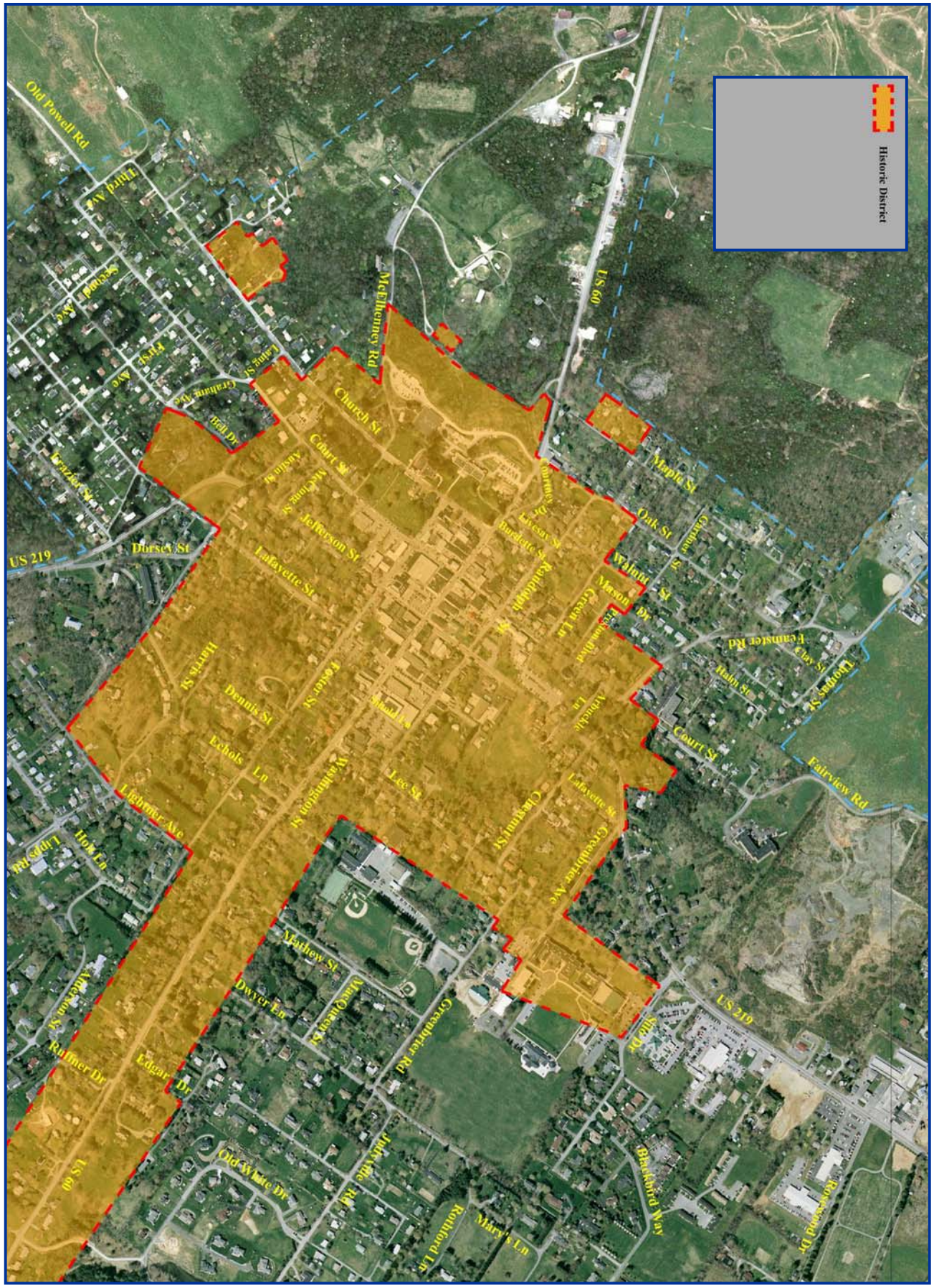

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Figure 2-6
Historic District

Existing Wayfinding Facilities

All orientation and directional type signage pertaining to vehicular and pedestrian traffic was documented and evaluated along the primary routes throughout the downtown area to/from key origin and destination points. All primary gateways into the corporate limits and the historic district boundaries were also visited, evaluated, and a photographic library was developed of the existing conditions of each. See Appendix E for the photographs and descriptions of existing signage, wayfinding, and gateway treatments within the study area.

Additionally, a cursory evaluation of other general directional, warning, and regulatory signing within the downtown area was also conducted to provide preliminary recommendations for potential consolidation or elimination of signage to reduce unnecessary visual clutter and user confusion.

C. Evaluation of Existing Facilities

Vehicular Traffic Demand

The existing count data (ATRs and TMCs) were reviewed to determine the AM, Midday and PM peak hour volumes. Review of the data found that the peak hour in the morning for the study area intersections was 7:00 AM to 8:00 AM, 12:30 to 1:30 PM for the Midday, and from 4:30 PM to 5:30 PM in the evening. The existing AM and PM peak hour traffic volumes at each of the study area intersections are contained in Appendix F.

Future Baseline Traffic

Future traffic volumes were projected for two future years (2015 and 2025) based upon WVDOH historical traffic volume growth for the study area. An annual compound growth rate of 2.1% was used. This growth rate was obtained from the Traffic Impact Analysis performed for the Gateway Commons development.

Capacity Analysis

The Synchro/SimTraffic software (Version 6.0) was utilized for the capacity analysis of this study. The Synchro generated HCM Reports implement the methods of the Highway Capacity Manual 2000 (HCM2000) to calculate the Level of Service at each key intersection.

Existing traffic signal plans for all signalized intersections on Jefferson Street (US 219) and Washington Street (US 60) were obtained from WVDOH. WVDOH also provided the current programmed traffic signal timings. Lane configurations for the signalized locations were field verified and lane configurations for the unsignalized intersections were gathered in the field. Utilizing this data, a Synchro model of the study area roadway network was created.

Utilizing the Synchro/SimTraffic software results in a best estimate for the operation of actuated traffic signals. This is especially important for the analysis of future conditions, as Synchro can be used to determine the optimum cycle length and splits for isolated intersections or to optimize operations for a network of two or more intersections.

There are seven signalized and 13 unsignalized intersections included in the study area. It should be noted that even though the intersection of Court Street and Foster Street currently has a flashing red traffic signal (all-way, stop-controlled intersection) it is evaluated as an unsignalized intersection. The existing traffic signal plans and timing data provided by WVDOH showed that six of the seven signalized intersections are operated on two separate, coordinated signal systems, and the intersection of Jefferson Street (US 219) / Holt Lane operates as an isolated intersection. The two existing coordinated signal systems are as follows:

DOWNTOWN CORE

- US 219 / Foster Street
- US 219 / US 60
- US 60 / Court Street

US 219 NORTH

- US 219 / WalMart – Gateway Commons
- US 219 / Coleman Drive
- US 219 / Westbound I-64 Ramps

Intersection analyses were performed utilizing the methodologies of the HCM2000 published by the Transportation Research Board. The HCM analysis provides a calculated average control delay per vehicle in seconds and the corresponding Level of Service (LOS). The LOS for the unsignalized and signalized intersections is based on the control delay per vehicle. Typically, a LOS A, B or C (under capacity conditions) is desirable for an intersection while LOS D (near capacity) is deemed acceptable. The theoretical capacity for an intersection is LOS E while LOS F is over capacity. The LOS criteria for signalized and unsignalized intersections as set forth by the 2000 Highway Capacity Manual are shown in Table 2-9.

Table 2-10 shows the overall intersection Level of Service (LOS) and Stopped Signal Delay for the signalized intersections within the study area. Table 2-11 shows the LOS and delay for the unsignalized intersections within the study area. A detailed listing of the Existing Conditions LOS and delay for each movement at each study area intersection are shown in the tables included in Appendix G.

TABLE 2-9
LEVEL OF SERVICE (LOS) CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (seconds)	
	Signalized	Unsignalized
A	Less than or equal to 10.0	Less than or equal to 10.0
B	>10.0 and ≤ 20.0	>10.0 and ≤ 15.0
C	>20.0 and ≤ 35.0	>15.0 and ≤ 25.0
D	>35.0 and ≤ 55.0	>25.0 and ≤ 35.0
E	>55.0 and ≤ 80.0	>35.0 and ≤ 50.0
F	Greater than 80.0	Greater than 50.0

Reference: 2000 Highway Capacity Manual (HCM)

TABLE 2-10
SIGNALIZED INTERSECTION LOS/DELAY(1) SUMMARY
EXISTING & FUTURE BASELINE CONDITIONS

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Existing		2015 Baseline		2025 Baseline	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 / U.S. RTE 60	C / 27.8	C / 27.5	E / 57.7	E / 65.5	F / 126.1	F / 176.3
U.S. RTE 219 / FOSTER STREET	C / 22.3	B / 15.3	D / 37.7	C / 25.8	F / 110.3	F / 84.7
U.S. RTE 60 / COURT STREET	B / 11.1	B / 15.3	B / 18.9	B / 16.2	B / 17.9	B / 16.9
U.S. RTE 219 / HOLT LANE	C / 34.6	C / 25.8	C / 30.5	C / 26.5	E / 68.6	E / 60.3
U.S. RTE 219 / WALMART - GATEWAY COMMONS	B / 16.3	D / 38.4	B / 16.3	E / 79.0	E / 58.5	F / 168.4
U.S. RTE 219 / COLEMAN DRIVE	B / 15.6	C / 20.5	C / 35.0	E / 59.0	F / 97.2	F / 143.4
U.S. RTE 219 / WESTBOUND I-64 RAMPS	D / 37.9	D / 43.3	D / 53.5	F / 83.6	F / 157.0	F / 173.5

(1) Seconds of Signal Stopped Delay

As shown in Table 2-10, most of the signalized intersections currently operate at LOS C or better during both the AM and PM peak hours. However, based upon field observations, the lack of left turn lanes at the downtown core intersections (particularly at US 219 / US 60) often results in congested conditions caused by the queuing of blocked vehicles behind a left turning vehicle.

TABLE 2-11
UNSIGNALIZED INTERSECTION LOS/DELAY(1) SUMMARY
EXISTING & FUTURE BASELINE CONDITIONS

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Existing		2015 Baseline		2025 Baseline	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 / **RANDOLPH STREET**	C / 25.0	E / 43.2	E / 39.2	F / 408.8	F / 95.0	F / *(3)
U.S. RTE 219 / **ARBUCKLE LANE**	D / 26.3	E / 38.3	E / 42.5	F / 89.0	F / 111.1	F / 951.4
U.S. RTE 219 / **SILO LANE**	C / 18.7	F / 79.4	D / 32.6	F / 295.6	F / 152.6	F / 820.4
COURT STREET / FOSTER STREET	A / 8.1	A / 8.7	A / 8.5	A / 9.4	A / 9.1	B / 10.6
COURT STREET / RANDOLPH STREET	A / 7.6	A / 8.1	A / 7.8	A / 8.5	A / 8.1	A / 9.1
COURT STREET / ARBUCKLE LANE	A / 7.5	A / 8.0	A / 7.7	A / 8.3	A / 7.9	A / 8.8
LAFAYETTE STREET / FOSTER STREET	A / 7.3	A / 7.8	A / 7.4	A / 8.0	A / 7.5	A / 8.4
U.S. RTE 60 / LAFAYETTE STREET	B / 12.4	C / 16.0	B / 13.8	C / 20.3	C / 16.1	D / 31.4
RANDOLPH STREET / LAFAYETTE STREET	A / 7.4	A / 7.5	A / 7.3	A / 7.7	A / 7.5	A / 8.0
U.S. RTE 60 / HOLT LANE	C / 21.0	E / 35.2	F / 56.7	F / 154.7	F / 327.4	F / 573.2
U.S. RTE 60 / DWYER LANE	C / 17.7	C / 21.5	D / 28.1	E / 43.5	F / 94.2	F / 199.3
CHURCH STREET / FOSTER STREET	A / 7.2	A / 7.6	A / 7.3	A / 7.8	A / 7.4	A / 8.1
U.S. RTE 60 / CHURCH STREET	B / 11.2	B / 13.1	B / 12.1	C / 15.5	B / 13.7	C / 21.3

(1) Average Stopped Delay per vehicle.
(2) Overall LOS and Delay not applicable for two-way stop-controlled intersection; LOS and Delay shown are for critical side street approach (the critical approach is highlighted in the intersection name).
(3) V/C ratio exceeds maximum threshold of 3.0; delay is not calculable.

The capacity analyses of future baseline conditions show a significant degradation in the LOS at several of the signalized intersections. By the Year 2015, all three of the US 219 signalized intersections in the vicinity of the I-64 interchange and the US 219 / US 60 intersection will operate at or over capacity during the AM and/or PM peak hours. In Year 2025, all but the intersection of US 60 / Court Street will operate at LOS F during the AM and PM peak hours. Since the existing midday peak hour volumes are similar to the evening peak hour, it is anticipated that significant congestion will also occur at most of the signalized intersections in both future analysis years.

The results of the unsignalized intersection analyses presented in Table 2-11 show at or over capacity conditions currently occur during the PM peak hour at the three unsignalized intersections with US 219 and at the US 60 / Holt Lane intersection. With increased mainline traffic volumes, these conditions will only be exacerbated in Year 2015 and Year 2025 and will result in excessive delays and congestion.

Geometric / Capacity Deficiencies

Through review of the existing condition data and field observation, several locations were identified as having limited roadway geometry, non-standard conditions, or an existing configuration that could confuse the motorist. The locations and their associated concerns are shown on Figure 2-5 and are described below:

Lack of Left Turn Lanes on Jefferson Street (US 219) and Washington Street (US 60)
The lack of exclusive left turn lanes on both Jefferson Street (US 219) and Washington Street (US 60) severely restricts the capacity of the intersections in the downtown core. One left turning vehicle on an approach can "hang up" all the vehicles behind it.

Jefferson Street (US 219) / Washington Street (US 60)
Field measurements indicated narrow parking (approx. 6.5 feet) and travel lane widths (approx. 11 feet) on all intersection approaches. Field observations at this intersection also noted small corner turning radii on all quadrants of this intersection. Also, markings on the building in the northeast corner indicate that it has been struck.

In addition, the uphill grade for southbound vehicles on the north approach and the significant heavy vehicle percentage also restricts the capacity of this approach.

Jefferson Street (US 219) @ I-64 Interchange
During the PM peak hour there is a heavy left turn volume from northbound US 219 to westbound I-64 (heading towards Beckley). Field observations noted that the queuing of these vehicles exceeds the storage capacity of the exclusive northbound left turn lane. This results in the blocking of northbound thru vehicles, and impacts the operations at adjacent intersections.

Jefferson Street (US 219) / Randolph Street
Field observations noted corner sight distance restrictions on the east approach of Randolph Street.

Washington Street (US 60) / Holt Lane and Dwyer Lane Intersection Complex
Even though an exclusive westbound left turn exists at Holt Lane, queues of westbound vehicles on this approach extend beyond Dwyer Lane. Also, there is no exclusive left turn lane on US 60 for eastbound left turning vehicles onto Dwyer Lane.

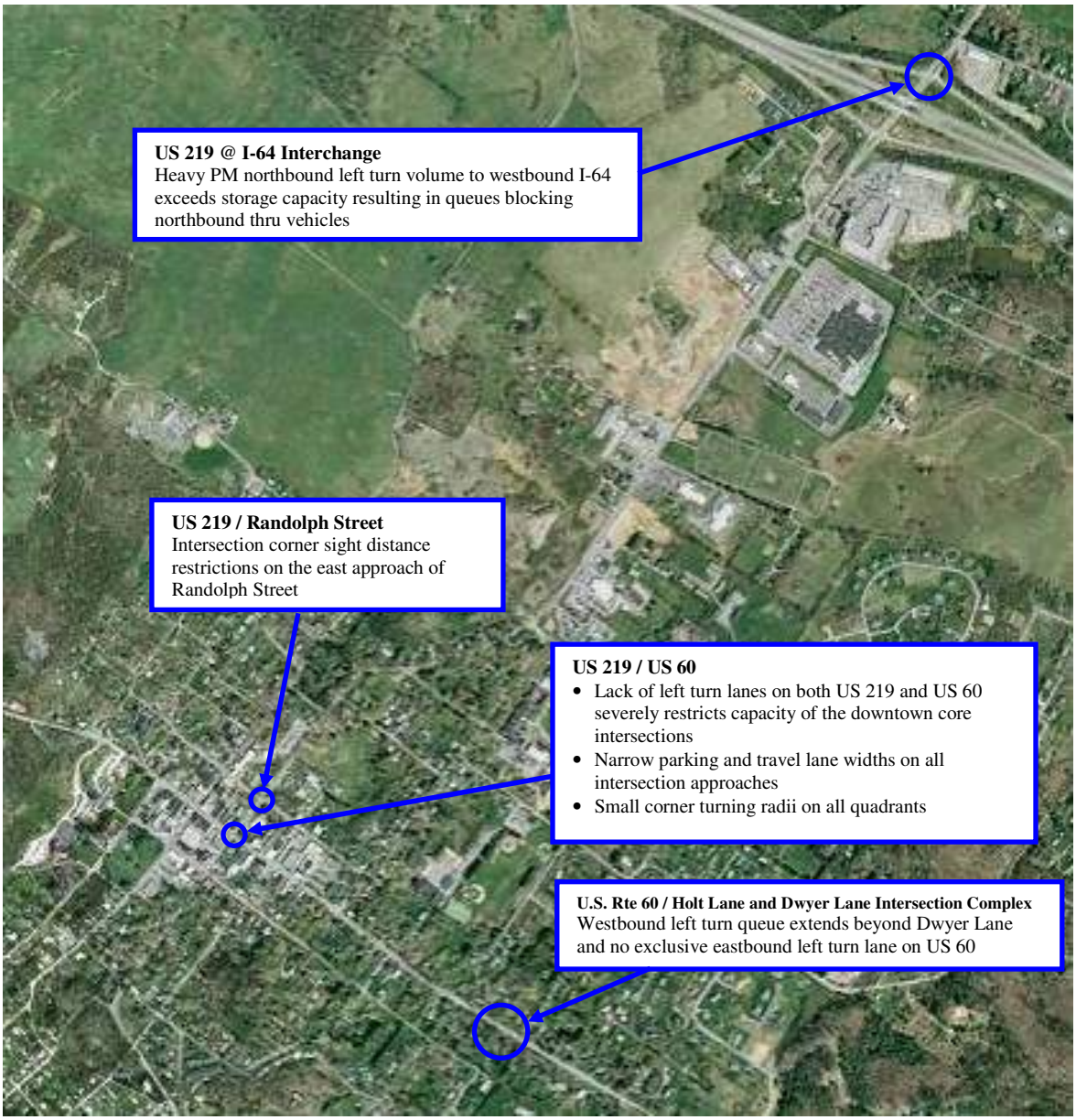

FIGURE 2-7. GEOMETRIC / CAPACITY DEFICIENCIES

Pedestrian Facilities

Pedestrians must walk within many of the downtown streets and neighborhood roadways or along the edge of road to access the limited existing sidewalk network of the downtown area. This is the case not only from remote residential areas in the town but also from only one block away from Washington and Jefferson Streets in many instances. The lack of dedicated pedestrian facilities often makes walking undesirable and unsafe and can detract from the perception of a vibrant, pedestrian-oriented downtown historic district.

Most of the sidewalks on Washington Street and Jefferson Street, in the immediate downtown core, have sidewalks on both sides of the street and appear to be wide enough to accommodate the current pedestrian volumes of the downtown commercial/retail area. Most of the remaining streets that have sidewalk facilities only have them on one side and range in width from three feet (3') to five feet (5') which are not wide enough to safely and efficiently accommodate two-way pedestrian traffic in a built-up downtown environment, see Tables 2-7 and 2-8 and Figure 2-5.

Additionally, the noncontiguous sidewalk network creates missing segments to vital pedestrian connections to primary origins and destinations throughout the downtown area such as the library, parks, schools, parking lots, shopping centers, institutional locations, and safe access to the downtown area as a whole, see Figure 2-8.

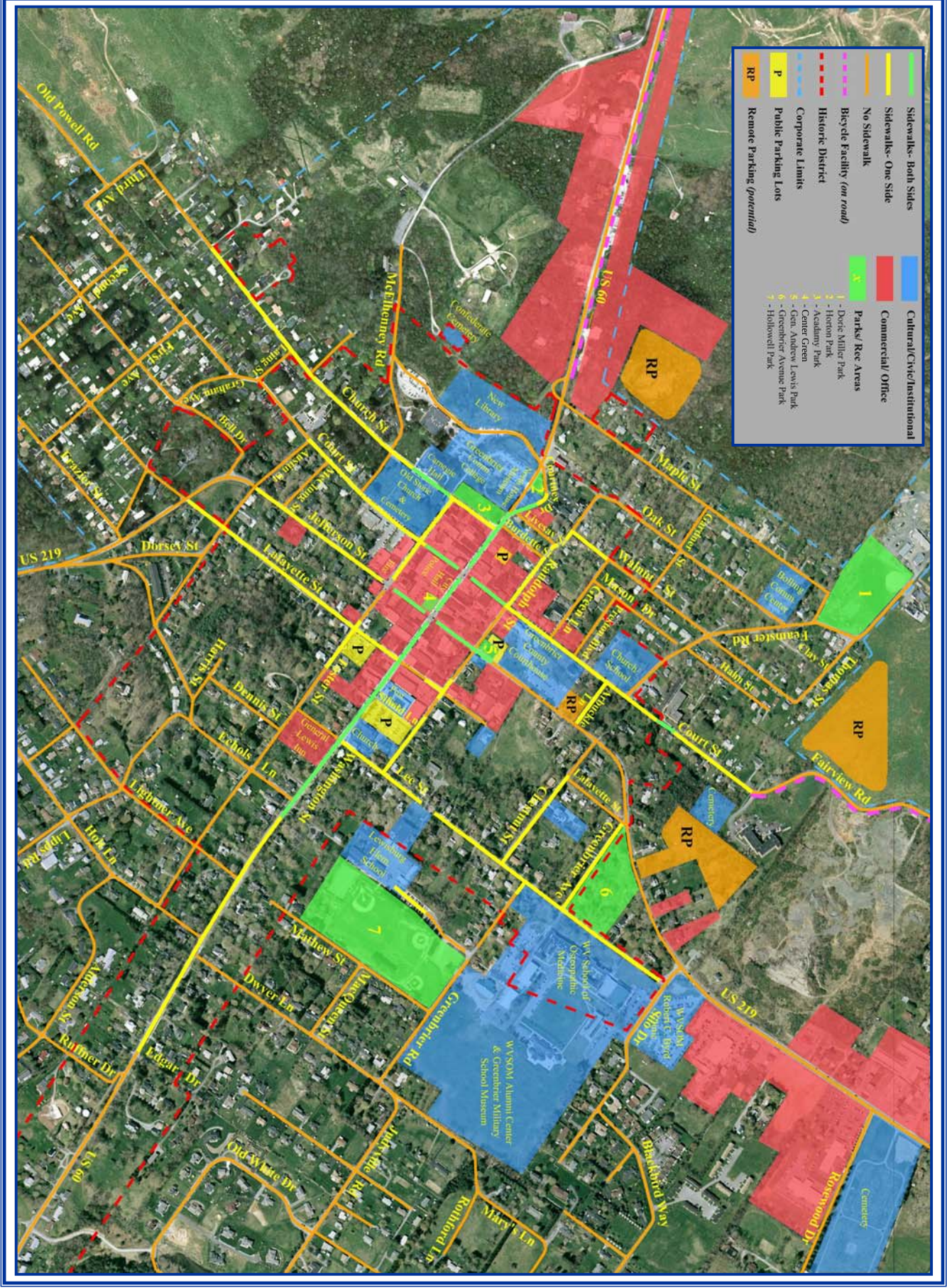

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Figure 2-8

Ped/Bike Facility Existing Connectivity

Existing conditions and facilities located within the sidewalk at some of the intersection corners required that some of the ADA ramps and crosswalks be placed further away from the paralleling curb line than the typical four foot (4') offset. Due to the location of these particular crosswalks, it has been frequently observed that motorists will stop on or creep into the crosswalk area while waiting for the signal change or to make a turning movement. The location of these crosswalks can also create a potential safety risk for pedestrians that enter the crosswalk that are not observed by a turning motorist.

Newly striped crosswalks and pedestrian crossing signals have been installed at the Washington Street/Court Street intersection and at the Washington Street/Jefferson Street intersection in the core of the downtown area. These pedestrian facility improvements were installed during the recent Washington Street signal and lighting improvements project. Only two other striped crosswalks are provided throughout the downtown area.

A striped crosswalk is located on Lee Street in front of the Lewisburg Elementary School and is identified with a pedestrian crossing warning sign and striping. The other striped crosswalk is located at the Lewisburg Elementary School access road crossing on Greenbrier Road and is signed in both directions but the westbound sign is heavily obscured with tree branches and the striping is significantly worn. Visibility of these warning signs should be maintained at all times by ensuring vegetation and other potential obstructions are clear from the face of the sign.

Other constraints of existing sidewalk facilities and locations for potential sidewalk facilities is the topography of the Lewisburg area which can create situations with sidewalks that have a running slope that exceed ADA tolerances and the existing subterranean/cave drainage system can greatly influence the cost of providing drainage structures required for a closed-system

sidewalk network. In many instances it may be more feasible to provide sidewalks along one side of the street to maintain an open drainage section along the opposite side. Additionally, many of the existing streets without sidewalks have very mature trees at the roadway edge which can increase the difficulty of developing sidewalks in these areas due to high costs for removal, public opposition to tree removal, and/or due to the need for negotiations, agreements, and cost for potential easements or property acquisition to successfully negotiate around these trees.

Bicycle Facilities

The lack of existing dedicated on-road bicycle lanes or separated shared-use paths within the city requires all skill levels of bicyclists to share roadway space with motorists and in many instances with pedestrians as well. This situation greatly increases the risk of conflicts between all three user types.

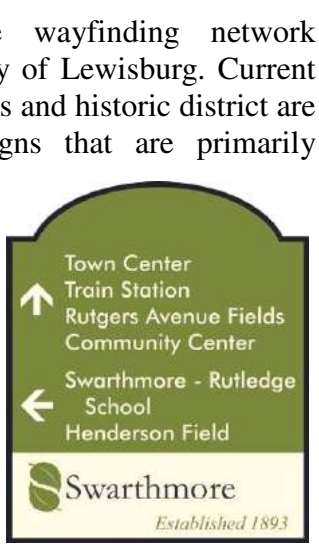
On-road bicycle facilities are signed on Fairview Road north of downtown and on W. Washington Street (US 60) west of downtown. Additionally, Old Powell Road is frequently utilized by on-road cyclists and is currently not signed as an on-road facility such as Fairview Road and W. Washington Street. The Fairview Road facility is signed in the northbound direction with the bicycle warning sign and the "share the road" supplemental plaque and the US 60 bicycle facility is similarly signed in the westbound direction. These facilities are signed within reasonable distances to the corporate limits due to the potential for higher volumes of bicyclists in the vicinity of the downtown area as opposed to more remote rural areas. These on-road facilities should be signed, within a reasonable distance, on the inbound approach to town as well as in the outbound direction as they are now. There is an equal possibility of a bicyclist entering the downtown area within this reasonable distance as there are users exiting the downtown area.

The Greenbrier River Trail (GRT) is located approximately four miles east of downtown Lewisburg. Existing pedestrian/bicycle access to the GRT does not exist. The most direct route to the GRT from downtown Lewisburg is along E. Washington Street (US 60) which consists of almost 4 miles of extreme slopes for bicycling along a high-speed two-lane road. Currently, the

most common means of access to the nearest GRT trailhead is by automobile. Currently there are no transit shuttles that provide transportation services for pedestrians and/or bicyclists to/from downtown Lewisburg and the GRT. Preliminary plans are being developed to extend the rail trail facility south to Ronceverte and the potential exists for a connector trail to be developed that would provide a connection to downtown Lewisburg via this extended rail trail segment to Ronceverte.

Wayfinding and Signage Facilities

A context sensitive comprehensive wayfinding network currently does not exist within the City of Lewisburg. Current wayfinding signage within the city limits and historic district are typical arterial roadway direction signs that are primarily oriented to the motorist. Other forms of custom signage can be more sensitive to the downtown historic district and can be very effective at efficiently directing pedestrian and vehicular traffic to primary destinations within and throughout the downtown area and historic district. Better wayfinding signage can also be very effective at increasing pedestrian and motorist confidence of their travels and eliminating misdirection and unnecessary traffic in the downtown area.



A potential added benefit of the increased awareness that effective wayfinding networks create is increased acceptance of motorists to park at off-street parking lots or remote parking lots by having a more informed idea of where point A and point B are, figuratively. Inconsistent wayfinding types, like those to the Confederate Cemetery, can create confusion and misdirection because the user typically anticipates a progression of similar signage types and styles.

The current identification and awareness of the historic district boundaries to pedestrians and motorists is by the mapping provided at the information kiosk located at the new Center Green and by the Walking Tour of Historic Lewisburg booklet. Other intersecting streets to the historic district boundary are currently not identified by signage with the exception of the following locations. Ornamental gateway signs are placed at the entry to the historic district from East and West Washington Street and on North Jefferson Street. The ornamental gateway sign on South Jefferson Street is placed at the Holt Lane intersection rather than at the historic district boundary north of Holt Lane.

Other traditional gateway welcome signs with organizational signs and logos are located in the vicinity of the downtown area. The sign structure framing and chain-link backing are painted green, which help the sign structure blend into the background. The N. Jefferson Street gateway welcome sign is located in the Gateway Commons area, the S. Jefferson Street sign is located at the Holt Lane intersection, the W. Washington Street is located west of Maple Street near the old limestone quarry, and the E. Washington Street sign is located at the historic district boundary with the ornamental welcome sign. There appears to be space at these ornamental and gateway welcome sign locations to possibly create a combined ornamental welcome sign that is sensitive to the historic district and that accommodates the ornamental images and organizational signs of both types.

Redundant and/or excessive signage has been observed at some locations in the downtown area and the historic district that can add to the visual clutter in the downtown area as well as emphasize a more vehicle oriented thoroughfare rather than a vibrant, pedestrian oriented, commercial/retail city center. Signage on the secondary streets appears to be adequate and well organized with the exception of a very few locations where the sign placement should be reevaluated. The most notable example of potential sign consolidation is at the intersection of Washington Street and Jefferson Street. The existing route and interstate directional signs located on all four corners of this intersection create a strong visual impact to the historical and aesthetic character of the downtown area as well as reinforcing a more vehicle oriented environment at a key intersection that represents the heart of the downtown commercial/retail center of the City of Lewisburg.

IMPROVEMENT STRATEGIES

III. IMPROVEMENT STRATEGIES

A. Traffic and Parking Improvement Strategies

Chapter 2 identified several locations where geometric deficiencies exist, with a description of the observed deficiencies. The following discussion provides suggested improvements at each of the locations, shown on Figure 2-5.

DOWNTOWN CORE

Alternative 1 – Left Turn Restrictions on US 219 and US 60

This alternative would involve restricting left turns on all approaches at the US 219 / US 60 intersection. This would require the installation of one (1) overhead No Left Turn sign (R3-2) on each of the traffic signal mast arms. Additional directional signing would also be needed to direct motorists to US 219 and US 60 via other city roads. Enforcement of the left turn restrictions will be needed (particularly in the first several weeks of implementation) to ensure the turn restrictions are being adhered to.

Capacity analyses of the US 219 / US 60 and adjacent intersections with revised traffic volumes were performed to evaluate the effectiveness of this alternative on traffic operations. The tables below show the results of these analyses.

TABLE 3-1
SIGNALIZED INTERSECTION LOS/DELAY(1) SUMMARY
IMPROVEMENT ALTERNATIVE 1 – LEFT TURN RESTRICTIONS

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Year 2006		Year 2015		Year 2025	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 / U.S. RTE 60	C / 26.4	C / 30.0	D / 51.7	E / 65.3	F / 108.7	F / 151.6
U.S. RTE 219 / FOSTER STREET	C / 20.0	B / 19.5	D / 52.7	D / 39.6	F / 129.9	F / 119.5
U.S. RTE 60 / COURT STREET	B / 16.1	B / 13.8	B / 19.6	B / 16.7	C / 22.5	B / 19.0

(1) Seconds of Signal Stopped Delay

Implementation of left turn restrictions at the US 219 / US 60 intersection will not significantly impact existing intersection operations at any of the signalized intersections. In 2015 and 2025, when compared to the baseline conditions, the capacity analyses show that:

- average vehicle delay at the US 219/US 60 intersection will be reduced (by approximately 5 seconds in 2015 and 20 to 25 seconds in 2025);

- average vehicle delay at the US 219/Foster Street intersection could increase by 15 to 30 seconds;
- average vehicle delay at the US 60/Court Street intersection will slightly increase in 2015 and by approximately 3 to 5 seconds in 2025.

TABLE 3-2
UNSIGNALIZED INTERSECTION LOS/DELAY(1) SUMMARY
IMPROVEMENT ALTERNATIVE 1 – LEFT TURN RESTRICTIONS

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Year 2006		Year 2015		Year 2025	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 / **RANDOLPH STREET**	C / 23.3	E / 44.7	E / 45.5	F / 686.1	F / *(3)	F / *(3)
COURT STREET / FOSTER STREET	A / 8.1	A / 8.8	A / 8.6	A / 9.6	A / 9.2	B / 11.0
COURT STREET / RANDOLPH STREET	A / 7.7	A / 8.2	A / 7.9	A / 8.6	A / 8.2	A / 9.3
LAFAYETTE STREET / FOSTER STREET	A / 7.3	A / 8.0	A / 7.4	A / 8.4	A / 7.6	A / 9.0
U.S. RTE 60 / **LAFAYETTE STREET**	B / 12.0	C / 15.4	B / 13.1	C / 19.8	C / 15.2	E / 35.6
RANDOLPH STREET / LAFAYETTE STREET	A / 7.2	A / 7.6	A / 7.4	A / 7.8	A / 7.5	A / 8.1

(1) Average Stopped Delay per vehicle.
(2) Overall LOS and Delay not applicable for two-way stop-controlled intersection; LOS and Delay shown are for critical side street approach (the critical approach is highlighted in the intersection name).
(3) V/C ratio exceeds maximum threshold of 3.0; delay is not calculable.

The results of the unsignalized intersection analyses presented in Table 3-2 show that the implementation of left turn restrictions on all approaches at the US 219 / US 60 intersection will severely increase delays on Randolph Street at its intersection with US 219 under existing and future traffic volumes. Also, in 2025, the Lafayette Street approach at US 60 is expected to experience LOS E conditions in the PM peak hour.

Alternative 2 – Add Left Turn Lanes on US 219 and US 60

Under this alternative exclusive left turn lanes would be installed on the US 219 and US 60 approaches at the three (3) signalized intersections in the downtown core on US 219 and US 60:

- US 219 / US 60
- US 219 / Foster Street
- US 60 / Court Street

Even though these intersections operate as a coordinated traffic signal system, the coordinate is inefficient due to the lack of exclusive left turn lanes along US 219 and US 60. One left turning vehicle waiting to make its maneuver reduces the traffic flow,

which creates a bottleneck situation and queuing between intersections. In addition, on-street parking maneuvers are also difficult to make, particularly during peak midday and evening peak times.

Table 3-3 contains a summary of the results of the intersection capacity analysis of the three downtown core signalized intersections with the implementation of exclusive left turn lanes on US 219 and US 60.

TABLE 3-3
SIGNALIZED INTERSECTION LOS/DELAY(1) SUMMARY
IMPROVEMENT ALTERNATIVE 2 – ADD LEFT TURN LANES

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Year 2006		Year 2015		Year 2025	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 / U.S. RTE 60	B / 17.8	B / 16.1	C / 32.5	C / 26.2	E / 66.2	E / 62.9
U.S. RTE 219 / FOSTER STREET	B / 18.4	B / 14.5	D / 39.2	C / 23.4	F / 100.0	E / 56.9
U.S. RTE 60 / COURT STREET	B / 12.4	B / 12.2	B / 16.5	B / 15.5	C / 22.4	B / 16.6

(1) Seconds of Signal Stopped Delay

As shown in Table 3-1, providing exclusive left turn lanes along the US 219 and the US 60 approaches at the downtown core signalized intersections, will improve traffic operations and reduce delays and queuing. All intersections will operate at acceptable levels of service through Year 2015. In 2025, even with the exclusive left turn lanes, the US 219 / US 60 and US 219 / Foster Street intersections will operate at or over capacity during the AM and/or PM peak hours.

The queue reports generated by Synchro were reviewed to estimate the required lengths of the left turn storage lanes needed. A minimum of 75-feet will be needed to accommodate trucks. The only volume warranting a longer storage length is the left turn on the west approach at the US 219 / US 60 intersection for the eastbound US 60 left turns onto northbound US 219; the Year 2015 volume shows the length should be approximately 100 feet and the Year 2025 volume shows a 150-foot turn lane would be needed.

The installation of left turn lanes will impact the amount of on-street parking along US 219, between Foster Street and Randolph Street and along US 60, between Church Street and Layfayette Street. Curb-to-curb, there is approximately 325 feet between intersections along US 219 and US 60. Subtracting approximately 20 feet at each intersection approach to accommodate turning radii, results in approximately 285 feet remaining. The total length required to accommodate left turn lanes and tapers is approximately 250 feet (75-foot turn lanes and 100-foot taper). This results in approximately 35 feet remaining (roughly 2 parking spaces) on each side of the road for on-street parking.

It is estimated that 32 of the 58 on-street parking spaces along US 60 would need to be eliminated to accommodate the left turn lanes at Court Street and US 219. To install left turn lanes on US 219, it is estimated that the on-street parking along US 219 would be reduced from 27 to 9 spaces. The total number of on-street parking spaces that would be eliminated with this improvement alternative is 50 spaces.

The eliminated parking spaces would be those that are the most utilized. The parking accumulation data shows that there are available parking spaces (on-street or parking lots) within a one to three block walking distance.

Alternative 3 – North-South One-way Pairs

This alternative would involve the conversion of US 219 and Court Street from two-way operation to one-way operation to form north-south one-way pairs. In addition, some other operational changes to the street network in the downtown core will also be needed, which include the following:

- Installing a traffic signal at the intersection of Court Street / Foster Street;
- Installing a traffic signal at the intersection of Court Street / Arbuckle Lane;
- Converting Foster Street to one-way eastbound between Court Street and Lafayette Street;
- Converting Court Street to one-way southbound between Foster Street and McElhenney Road;
- Converting Arbuckle Lane to one-way westbound between US 219 and Court Street.

Providing one lane southbound on Court Street was evaluated. However, it was found that only providing one lane on Court Street at Court Street / Randolph Street would result in near or at-capacity conditions under current traffic volumes.

Capacity analyses of the downtown core intersections with revised traffic volumes were performed to evaluate the effectiveness of this alternative. Table 3-4 and Table 3-5 show the results of these analyses.

As shown in Table 3-4, with the conversion of US 219 and Court Street to northbound-southbound one-way pairs, all signalized intersections are anticipated to operate at LOS C or better during both the AM and PM peak hours in Year 2015. In Year 2025, all signalized intersections will operate at LOS E or LOS F during the AM and/or PM peak hours, with the exception of the intersection of Court Street / Arbuckle Lane, which would operate at LOS C or better.

TABLE 3-4
SIGNALIZED INTERSECTION LOS/DELAY[(1)] SUMMARY
IMPROVEMENT ALTERNATIVE 3 – NORTH-SOUTH 1-WAY PAIRS

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Year 2006		Year 2015		Year 2025	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 / U.S. RTE 60	B / 15.5	B / 18.0	B / 18.3	C / 26.9	C / 22.4	E / 72.7
U.S. RTE 219 / FOSTER STREET	A / 10.0	B / 14.9	B / 12.8	C / 27.2	B / 19.3	E / 67.8
U.S. RTE 60 / COURT STREET	C / 25.0	C / 22.7	C / 32.4	C / 32.1	E / 71.2	F / 99.5
COURT STREET / FOSTER STREET	B / 10.8	B / 12.2	B / 15.7	B / 14.3	C / 22.3	B / 19.0
COURT STREET / ARBUCKLE LANE	B / 13.4	B / 11.5	B / 18.5	B / 14.5	C / 34.0	B / 17.6

(1) Seconds of Signal Stopped Delay

TABLE 3-5
UNSIGNALIZED INTERSECTION LOS/DELAY[(1)] SUMMARY
IMPROVEMENT ALTERNATIVE 3 – NORTH-SOUTH 1-WAY PAIRS

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Year 2006		Year 2015		Year 2025	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 / **RANDOLPH STREET**	C / 16.1	C / 20.8	C / 20.6	D / 31.3	D / 32.8	F / 78.0
U.S. RTE 219 / ARBUCKLE LANE	A / 9.7	A / 9.6	B / 10.6	B / 10.4	B / 12.2	B / 11.9
COURT STREET / RANDOLPH STREET	B / 12.5	B / 11.8	C / 16.6	C / 15.2	D / 29.6	D / 25.4
LAFAYETTE STREET / FOSTER STREET	A / 7.2	A / 7.6	A / 7.3	A / 7.9	A / 7.4	A / 8.2
U.S. RTE 60 / LAFAYETTE STREET	B / 12.3	C / 15.0	B / 13.9	C / 18.5	C / 16.0	D / 32.0
RANDOLPH STREET / LAFAYETTE STREET	A / 7.3	A / 7.5	A / 7.4	A / 7.7	A / 7.6	A / 8.0
CHURCH STREET / FOSTER STREET	A / 7.2	A / 8.1	A / 7.3	A / 8.2	A / 7.4	A / 8.8
U.S. RTE 60 / CHURCH STREET	B / 11.2	B / 13.1	B / 12.1	C / 15.5	B / 13.8	C / 21.3

(1) Average Stopped Delay per vehicle.
(2) Overall LOS and Delay not applicable for two-way stop-controlled intersection; LOS and Delay shown are for critical side street approach (the critical approach is highlighted in the intersection name).
(3) V/C ratio exceeds maximum threshold of 3.0; delay is not calculable.

As shown in Table 3-5, in Year 2015 with the conversion of US 219 and Court Street to northbound-southbound one-way pairs, all unsignalized intersections are anticipated to operate at LOS D or better during both the AM and PM peak hours. In Year 2025, most unsignalized intersections will operate at acceptable levels of service (LOS D or better). The minor street approaches at the unsignalized intersections of US 219 / Randolph

Street and US 60 / Lafayette Street are expected to operate at or over capacity during the PM peak hour in Year 2025.

US 219 / I-64 INTERCHANGE AREA

This section of US 219 includes three signalized intersections (WalMart-Gateway Commons, Coleman Drive, and westbound I-64 interchange ramps), which experiences congested conditions in the peak periods, particularly in the evening. As previously mentioned, field observations revealed that the queuing of northbound left turning vehicles from northbound US 219 to westbound I-64 exceeds the storage capacity of the exclusive northbound left turn lane. This queuing results in the blocking of northbound thru vehicles, which contributes to queuing on northbound US 219 that was observed to extend back to Arbuckle Lane.

Various lane configuration improvements were examined to identify viable solutions to remedy this congestion. The various configurations included:

- A reversible lane configuration south of Coleman Drive (two southbound lanes in the AM and two northbound lanes in the PM);
- Widening U.S. 219 to provide a 5-lane section (two lanes in each direction plus left turn lanes; this would include two northbound left turn lanes and one thru lane at the westbound I-64 interchange ramps intersection).

The results of the capacity improvements are summarized in Table 3-6.

As shown in Table 3-6, the Reversible Lanes concept would improve intersection operations at the WalMart-Gateway Commons and Coleman Drive intersections due to the increased roadway capacity. A slight reduction in average vehicle delay at the westbound I-64 ramps intersection would result due to the improved coordination; however, in Year 2015 this intersection will operate at LOS E during the PM peak hour and it will operate over capacity in Year 2025.

Table 3-6 also shows that widening US 219 to a 5-lane section (2 lanes in each direction with left turn lanes) will provide acceptable levels-of-service at all intersections in Year 2015 and Year 2025. This alternative would consist of a 2-lane widening from south of the WalMart-Gateway Commons intersection through the I-64 interchange; requiring replacement of the I-64 mainline bridges over US 219, and a significant impact to the retaining wall along the east side and the rock wall along the west side at the Coleman Drive intersection.

The Reversible Lanes alternative would consist of a 1-lane widening from south of the WalMart-Gateway Commons intersection to the Coleman Drive intersection; requiring a significant impact to the retaining wall along the east side and/or the rock wall along the west side at the Coleman Drive intersection.

TABLE 3-6
SIGNALIZED INTERSECTION LOS/DELAY[(1)] SUMMARY
US 219 / I-64 INTERCHANGE AREA
IMPROVEMENT ALTERNATIVES

CITY OF LEWISBURG TRANSPORTATION MANAGEMENT STUDY

INTERSECTION	Year 2006		Year 2015		Year 2025	
	AM	PM	AM	PM	AM	PM
U.S. RTE 219 REVERSIBLE LANE (2 SB LANES AM; 2 NB LANES PM)						
U.S. RTE 219 / WALMART - GATEWAY COMMONS	B / 10.3	C / 22.9	B / 13.2	C / 31.1	B / 16.9	D / 49.5
U.S. RTE 219 / COLEMAN DRIVE	A / 7.3	A / 8.0	B / 10.2	B / 10.1	B / 17.9	C / 21.3
U.S. RTE 219 / WESTBOUND I-64 RAMPS	B / 19.0	C / 27.4	D / 36.2	E / 71.7	F / 133.1	F / 164.7
U.S. RTE 219 WIDENING (5-LANE SECTION)						
U.S. RTE 219 / WALMART - GATEWAY COMMONS	A / 8.6	B / 17.2	A / 9.4	C / 23.7	B / 10.9	C / 31.8
U.S. RTE 219 / COLEMAN DRIVE	A / 5.4	A / 6.6	A / 6.1	A / 5.6	A / 7.6	A / 7.4
U.S. RTE 219 / WESTBOUND I-64 RAMPS	B / 15.2	B / 15.4	B / 16.8	C / 28.1	C / 23.0	D / 51.0

(1) Seconds of Signal Stopped Delay

B. Pedestrian/Bicycle Improvement Strategies

Pedestrian Facilities

The primary strategy for improving the sidewalk network within the downtown area is to initially focus on safety and ADA compliant improvements at intersections, crosswalks, and other areas where pedestrians are required to cross the street because the sidewalks shift from one side of the street to the other. Secondary improvement efforts are to provide pedestrian connections from existing and proposed parking facilities to the primary commercial, retail, cultural, and institutional locations. These improvements include the construction of new additional sidewalk facilities as well as reconstruction and upgrade of existing sidewalks. Another primary objective is to provide safe and efficient pedestrian facility networks to schools and recreational sites throughout the City of Lewisburg from the downtown areas as well as the surrounding residential areas.

Additional strategies include closing gaps between existing sidewalk facilities to complete the downtown commercial/retail sidewalk network as well as extend new logical sidewalk facility networks into the adjacent and surrounding residential areas. Another underlying strategy to all levels of improvement include new and upgraded ADA facilities such as continuous accessible routes, entrance improvements, and sidewalk surface improvements.

Improvement strategies should also include consideration of adopting new development codes that require sidewalk facility provisions to be included in new site development. This can assist in creating safe sidewalk networks throughout the developed site as well as help complete vital links to adjacent and other more comprehensive sidewalk networks.

Sidewalk improvement projects should be evaluated and well coordinated with potential existing or future roadway and/or site development projects that may be currently in the planning process or that may result from this study.

Bicycle Facilities

On-road bicycle improvements include validating the extent/range of the existing signage on Fairview Rd. and W. Washington St. and provide new additional signage on the inbound routes with the bicycle warning sign with the "share the road" supplemental plaque. Also, provide the same signs in the northbound and southbound directions along Old Powell Rd. for and acceptable distance. This will provide an adequate north/south on-road bicycle facility along lesser traveled rural routes in the Lewisburg area.

The City of Lewisburg currently does not have any separated or off-road, shared-use pedestrian/bicycle facilities. According to the national standards identified in the Comprehensive Plan, Lewisburg should have approximately four (4) miles of shared-use trail facilities in or around the vicinity of the city.

The feasibility of providing these types of facilities can be quite difficult due to the sensitivity and layout of historic districts and downtowns such as Lewisburg regardless of the limited development potential due to topography. Due to these types of circumstances it is often more feasible to use a segmented approach and develop potential path/trail sections that are the most logical and feasible to construct and then extend or complete gaps as other site development occurs. This approach typically requires zoning/development codes that require these facilities to be completed within a site development project.

The first strategy approach could be to consider adopting these types of development codes and then begin examining the periphery of the existing developed area around the City of Lewisburg for potential trail alignments to be acquired or reserved for path/trail development. A potential path/trail facility in the vicinity of the current perimeter of the developed area of Lewisburg would be reasonably close to the downtown core and existing areas. As future development occurs in the outlying areas of the corporate limits this potential path/trail alignment would ultimately become a much more internal network of ped/bike transportation and recreational facilities.

Additionally, the type and surface elevation of existing drainage grates should be evaluated throughout the city. Bicycle friendly drainage grates should be provided at all locations to prevent bicycle wheels and wheelchair wheels from getting stuck and causing the user to fall or flip over. The elevation of the top of the drainage grate

should be flush with the pavement surface. Sometimes the surface elevation is changed due to roadway resurfacing and the elevation of the drainage grates is not adjusted. The drainage grates within the city should be examined for risk exposure to determine which ones should be updated or reset within a reasonable timeframe or ones that can be improved in future roadway improvement/resurfacing projects.

Currently, safe ped/bike access to the Greenbrier River Trail (GRT) is not reasonable or practical along the US 60 corridor between downtown and the GRT trailhead. Potential immediate strategies to provide ped/bike access to/from the trailhead and downtown are by providing an on-call or scheduled transit shuttle system that is best accommodated with transit shuttle vehicles that have vehicle mounted bicycle racks, which may only require retrofitting these bike racks to existing shuttle vehicles and providing telephone services at the trailhead (for on-call concept).

Providing a separated trail facility between downtown and the trailhead in the vicinity of the US 60 corridor would be quite expensive due to trail design requirements and necessary land easements and acquisitions needed to negotiate the steep topography between the downtown area and the Greenbrier River. Preliminary plans for an extension of the GRT to Ronceverte are being developed and it is understood that there advocates and key stakeholders involved in the planning process that may increase the feasibility of providing a downtown connector trail to the GRT via the proposed extension to Ronceverte. The City of Lewisburg should continue to pursue their interest in this effort.

Bicycle improvement projects should be evaluated and well coordinated with potential existing or future roadway and/or site development projects that may be currently in the planning process or that may result from this study.

C. Wayfinding and other Signage Improvement Strategies

Generally, the roadway and regulatory signage throughout the town is adequate and placement is logical. Signage improvement strategies should include reviewing the regulatory signage throughout the town for repetition or excess. Primary signage improvements should involve the route and directional signs located at the approach to the Washington Street and Jefferson Street intersection to reduce the aesthetic impact and vehicular orientation at the center of the downtown and historic district. Currently the route sign mast provides primary route signs and supplemental directional plaques for each direction of travel. Due to this location clearly being a 4-way intersection, this type of sign cluster could be greatly reduced by eliminating the route and

directional plaques for the forward direction or placing them further in advance of the intersection and by consolidating the intersecting routes signs to be one single route designation sign with one set of direction and arrow plaques above and below the route sign for each intersecting direction.

Gateway sign improvements strategies should include evaluating the potential to consolidate the welcome gateway signs with the ornamental gateway signs at the same location. This could be accomplished by providing one ornamental sign structure that effectively accommodates the artistic ornamental gateway signs as well as the organizational signs and plaques. It appears that at each of the existing locations of both gateway sign types that there would be enough physical space to provide one consolidated gateway sign at the entry from each cardinal direction to downtown which would be more sensitive to the character of the historic district.

A comprehensive wayfinding plan should be developed to provide the framework for the design, location, and installation of more effective individual and consolidated wayfinding signs throughout the corporate limits, downtown area, and historic district of the City. The plan should also establish the parameters for selection of the types of destinations to be displayed at each sign location along the progression of wayfinding signs at the arterial and local level.

Wayfinding signage is most effective when it follows a logical hierarchy of destination type and direction for motorists and pedestrians at the arterial and local level roadway networks. The difference in orientation between the motorists and pedestrians is influenced by the sign type, size, and location as well as lettering font size and possible design detail on the sign itself.

Additionally, the signage improvement strategies should consider possible location of pedestrian scale signage to identify the boundaries of the historic district at intersecting streets to the historic district boundaries.

D. Potential Federal/State Funding Mechanisms for Ped/Bike Facilities

Following is a brief summary for some of the primary funding sources available through the Federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) program.

The ***Transportation Enhancement (TE) Program*** has been a popular funding source for local community development. This is an 80% federal, 20% local reimbursement grant program for non-traditional transportation related projects. Examples include pedestrian and bicycle facilities, rail trails, and landscaping.

Description of TE Eligible Activities:

1. Provision of facilities for pedestrians and bicycles
2. Provision of safety and educational activities for pedestrians and bicyclists
3. Acquisition of scenic easements and scenic or historic sites (including historic battlefields)
4. Scenic or historic highway programs (including the provision of tourist and welcome center facilities)
5. Landscaping and other scenic beautification
6. Historic preservation
7. Rehabilitation and operation of historic transportation buildings, structures, or facilities (including historic railroad facilities and canals)
8. Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian or bicycle trails)
9. Inventory, control and removal of outdoor advertising
10. Archaeological planning and research
11. Environmental mitigation to address water pollution due to highway runoff or reduce vehicle-caused wildlife mortality while maintaining habitat connectivity
12. Establishment of transportation museums.

The ***Recreational Trails Fund (RTP) Program*** is available for the construction, upgrade or maintenance of both motorized and non-motorized recreational trails. This is an 80% federal, 20% local reimbursement program that may recognize “in-kind” matches for the local share.

Description of RTP Eligible Activities:

1. Maintenance and restoration of existing trails
2. Development and rehabilitation of trailside and trailhead facilities and trail linkages
3. Purchase and lease of trail construction and maintenance equipment
4. Construction of new trails (with restrictions for new trails on Federal lands)
5. Acquisition of easements or property for trails
6. State administrative costs related to this program (limited to a maximum of seven percent (7%) of each respective State’s funds)
7. Operation of educational programs to promote safety and environmental protection related to trails (limited to a maximum of five percent (5%) of each respective State’s funds)
8. Assessment of trail conditions for accessibility and maintenance.

The ***National Scenic Byway (NSB) Program*** makes funds available for certain approved projects related to officially designated Byways and Backways such as the Midland Trail. This also is an 80% federal, 20% local reimbursement grant program that may recognize "in-kind" matches for the local share.

Description of NSB Eligible Activities:

1. Development and implementation of a Corridor Management Plan (CMP) to maintain the scenic, historical, recreational, cultural, natural, and archaeological characteristics of a byway corridor while providing for accommodation of increased tourism and development of related amenities.
2. Administrative funds for roads designed as a National Scenic Byway or All-American Road.
3. Safety improvements to a State scenic byway, National Scenic Byway, or All-American Road to the extent that the improvements are necessary to accommodate increased traffic and changes in the types of vehicles using the highway as a result of the designation as a State scenic byway, National Scenic Byways, or All-American Road.
4. Construction along a scenic byway of a facility for pedestrians and bicyclists, rest areas, turnouts, highway shoulder improvements, passing lanes, overlooks, and interpretive facilities.
5. Improvements to the scenic byway that will enhance access to an area for the purpose of recreation, including water-related recreation.
6. Protection of scenic, historical, recreational, cultural, natural, and archaeological resources in an area adjacent to a scenic byway.
7. Developing and providing tourist information to the public, including interpretive information about the scenic byway.
8. Development and implementation of a scenic byway marketing program.

The ***Safe Routes to School (SRTS) Program*** provides funds to West Virginia to substantially improve the ability of primary and middle school students (grades K-8) to walk and bicycle to and from school safely.

Eligible Infrastructure-Related Projects, the **Engineering** component, include funding for the planning, design, and construction of Infrastructure-Related Projects that will substantially improve the ability of students to walk and bicycle to school, may include:

1. Sidewalk Improvements: new sidewalks, sidewalk widening, sidewalk gap closures, sidewalk repairs, curbs, gutters, and curb ramps.
2. Traffic Calming and Speed Reduction Improvements: roundabouts, bulb-outs, speed humps, raised crossings, raised intersections, median refuges, narrowed traffic lanes, lane reductions, full- or half-street closures, automated speed enforcement, and variable speed limits.
3. Pedestrian and Bicycle Crossing Improvements: crossings, median refuges, raised crossings, raised intersections, traffic control devices (including new or upgraded traffic signals, pavement markings, traffic stripes, in-roadway crossing lights, flashing beacons, bicycle-sensitive signal actuation devices, pedestrian countdown signals, vehicle speed feedback signs, and pedestrian activated signal upgrades), and sight distance improvements.
4. On-Street Bicycle Facilities: new or upgraded bicycle lanes, widened outside lanes or roadway shoulders, geometric improvements, turning lanes, channelization and roadway realignment, traffic signs, and pavement markings.
5. Off-Street Bicycle and Pedestrian Facilities: exclusive multi-use bicycle and pedestrian trails and pathways that are separated from a roadway.

6. Secure Bicycle Parking Facilities: bicycle parking racks, bicycle lockers, designated areas with safety lighting, and covered bicycle shelters.
7. Traffic Diversion Improvements: separation of pedestrians and bicycles from vehicular traffic adjacent to school facilities, and traffic diversion away from school zones or designated routes to a school.

Eligible Non-Infrastructure-Related Activities include funding for the four supporting components, specifically:

1. Education – Teaching children about the broad range of transportation choices, instructing them in important lifelong bicycling and walking safety skills, and launching Driver safety campaigns in the vicinity of schools. School teachers, health professionals, law enforcement officers, and certified bicycle safety instructors may provide education. Photocopying, duplicating, and mailing and printing costs, including pedestrian and bicycle safety education CDs, DVDs. Conduct of Safe Routes to School Workshops that target school and community-level audiences will be scheduled with the Safe Routes to School Coordinator.
2. Encouragement – Using events and activities to promote walking and bicycling. Examples are Annual Walk to School; Walking School Buses; Bicycle Trains; Golden Sneaker Award; and modest incentives such as water bottles, pens, pencils, markers, highlighters, colored pencils, chalk, Frisbees, fluorescent zipper pulls and slap bracelets, wash off tattoos, balloons, stickers, certificates, banners, foam board, signs, maps, light refreshments, and pedometers.
3. Enforcement – Partnering with local law enforcement to ensure traffic laws are obeyed in the vicinity of schools, which includes enforcement of speeds, yielding to pedestrians in crossings, proper walking and bicycling behaviors, and initiating community enforcement such as adult crossing guard programs. This may include equipment such as Class 2 safety vests, hand-held stop paddles, reflective fluorescent traffic cones, driver speed feedback monitors, and adult crossing guard training.
4. Evaluation – Monitoring and documenting outcomes and trends through the collection of data before and after the intervention(s) using standardized student and parent surveys, including costs for data gathering, analysis, and evaluation reporting.

E. Regulations/Zoning Ordinance Strategies

This section outlines considerations for changes to the zoning ordinance with respect to the Scenic Corridor Overlay applied to both US 219 and US 60. These changes for consideration by the City are based upon the results of the study analysis. Suggested changes are referenced by Article and Section number. Suggested changes are highlighted in yellow and are in the form of draft ordinance language for further review and analysis by the City prior to adoption.

Article III Zoning Districts and Zoning Map

1. Consider the following amendment.

Section 19: Overlay District Established

(b) The SC (Scenic Corridor Overlay) district is intended to preserve important visual qualities and scenic appeal of community entryways and manage traffic flow and site access along US 60 and US 219 through regulation of site development and tree preservation guidelines.

Article VI Supplemental Use Regulations

1. Consider the following amendments

Section 47: Scenic Corridor Overlay District: Delineation

Scenic Corridor overlay district shall include all parcels having frontage on or contiguous to those portions of US 219 and US 60 including outparcels or parcels contiguous to lands within the district which will gain direct access or share access from US 219 and US 60 in areas which are designated as entry ways to historic downtown Lewisburg and the Lewisburg Historic District (HD). The boundaries of this zoning district shall be shown on the Official Zoning Map of the City.

2. Consider the following amendments to add new development standards to achieve improvements along the corridor. It is suggested that consideration be given to adding a new subsection 7 and 8 as follows.

Section 49: Scenic Corridor: Development Standards

7. A Traffic Impact Study shall be required to demonstrate that development is of a design to safely regulate traffic flow and access to and from the site, reduce congestion along the corridor, provide for safe pedestrian flow and access and manage access along the corridor. A Traffic Engineer must study and address the following:

   (a) Description. An introduction providing an overview of the development and an inventory of the surrounding transportation network will be provided. This description should including but not limited to, existing traffic volumes, surface conditions, and posted speed limits, and a location map showing the site in relation to surrounding areas.

   (b) Traffic. A description of trip generation information for all proposed buildings and uses. This information should include how many employees, customers and vendors will visit the site during a typical week by vehicle type. In addition to the trip information, the most current edition of the Institute of Transportation Engineers "Trip Generation" must be referenced. The proposed hours of operation must be stated. The Traffic Engineer will provide a capacity analysis (A.M. and P.M. Peak for weekdays, midway

peak for peak hour(s) of operation for use) for the appropriate intersections identified by the City Engineer. The most recent version of the Highway Capacity manual and accompanying software must be used.

(c) Traffic Accident Data. The Traffic Engineer will evaluate reportable traffic accident data for a five-year period for appropriate mid-block segments and intersections to identify clustering and accident patterns, and provide recommendations to increase pedestrian and vehicular traffic safety.

(d) Loading. Describe the loading and unloading activity. The description must include time(s), type and size of vehicles used and frequency of visits during the typical week. The Traffic Engineer must evaluate loading areas and activities with respect to safety and access issues.

(e) Access. Describe how vehicles will get to and exit the property. Proposed and existing access locations will be examined by the City Engineer for safety, compliance Section requirements and necessity to eliminate unnecessary curb cuts in the City's transportation network. The Traffic Engineer will complete an analysis of all curb cuts and access points and provide recommendations concerning design and the necessity of each curb cut.

(f) Signage. The Traffic Engineer will provide recommendations concerning traffic signage including any necessary turning restrictions.

(g) Circulation. A review of the proposal will include evaluation of internal and external circulation of the parking lot layout.

8. Development shall comply with the following access requirements.

(a) One access shall be permitted for a property and driveways should be spaced as follows depending upon the classification and characteristics along the corridor

Principal Arterial – 600 feet
Minor Arterial – 400 feet
Major Collector – 200 feet

(b) Non-residential uses shall provide a joint or cross access driveway to allow circulation between sites wherever feasible along the corridor. If adjacent properties are not developed, parking lot and site access must be designed to enable joint or cross driveways to be achieved in the future.

(i) Property owners along a joint or cross access driveway shall record an easement with the deed allowing cross access to and from other properties served by the driveway.

(ii) Record an agreement with the City so that future access rights along the driveway shall be granted at the discretion of the City and the design shall be approved by the City Engineer.

(iii) Record a joint agreement with the deed defining the maintenance responsibilities of each of the property owners located along the driveway.

(c) Access to outparcels for purpose of development or phased development shall be served by an internal road that is separate from the main roadway.

(i) All access to outparcels shall be internalized using the internal roadway.

(ii) The driveways for outparcels shall be designed to allow safe and efficient ingress and egress movements from the internal road.

(iii) The internal circulation roads shall be designed to avoid excessive queuing across parking aisles.

(iv) The City may require an access covenant to restrict an outparcel to internal access only as part of a subdivision of land for future development.

Safe sight distance shall be available for all permitted turning movements at all driveway intersections.

F. Access Management

Access management is a means of controlling the ways in which vehicles can access for roadways, using techniques such as limiting the number of driveways and intersections along local roadways. The balancing of local accessibility and the need for overall mobility is sometimes difficult. The National Highway Institute indicates that "an effective access management program can reduce crashes as much as 50 percent, increase roadway capacity by 23 to 45 percent, and reduce travel time and delay as much as 40 to 60 percent." Properly managed access is vital to the safety and efficiency of the City and State's transportation network.

Stakeholders	Benefits of Access Management
Community/ Neighborhoods	▪ Safer transportation system ▪ More attractive roadway corridors ▪ Lower taxes for future roadway investment ▪ Preservation of property values ▪ Safer pedestrian and bicycle travel ▪ Improved appearance of the built environment ▪ Reduced fuel consumption and air emissions
Business Community	▪ More efficient roadway system captures a broader market area ▪ Stable property values ▪ More consistent development environment ▪ Reduced transportation and delivery costs
Pedestrians	▪ Safer walking routes due to fewer conflicts with traffic ▪ Refuge areas created by medians
Bicyclists	▪ Fewer conflicts with traffic ▪ More predictable traffic patterns ▪ Greater choice of alternative travel routes
Transit Riders	▪ Reduced delay and travel times ▪ Safer walking environment for access to stations
Motorists	▪ Fewer traffic conflicts which increases driver safety ▪ Fewer traffic delays
Governmental Agencies	▪ Lower cost of providing a safe and efficient roadway ▪ Improved internal and intergovernmental coordination ▪ More success in accomplishing transportation goals ▪ Lowered accident and accident response costs

Source: PennDOT, Access Management, Model Ordinances for Pennsylvania Municipalities Handbook. Note: PennDOT reference is made because of lack of similar West Virginia documentation and applicability of subject matter.

Access management focuses on balancing mobility and accessibility. Mobility is the movement of traffic while accessibility is the ability of traffic to enter and exit a roadway from adjacent properties. Without applying access management techniques, studies show that corridors experience: diminished roadway capacity, resulting in greater congestion; an increase in the number of crashes with other vehicles, as well as pedestrians and cyclists; reduced community character; an unfriendly environment for those who walk or bicycle; commercial strip development; overburdened arterials resulting in more cut-through traffic in residential areas; homes and businesses adversely affected by a continuous cycle of widening roads; and, increased commute

times, fuel consumption and vehicular emissions. The following table outlines the benefits of access management for various users of the transportation network.

It appears that access management practices have been incorporated into the recent development on US 219 (Lowe's and WalMart). Access management ordinances are designed to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system. The suggested amendments to Article VI Supplemental Use Regulations discussed in the previous section for would address access management for potential development along US 60.

G. Other Issues

Speed Limits on US 219 and US 60

Speed limits on US 219 and US 60 were established and are governed by the West Virginia Division of Highways (WVDOH). The current speed zones have been in place for many years.

Speed limits are determined by a combination of factors including horizontal and vertical alignment of the roadway, shoulder characteristics, roadside development, parking activity, pedestrian activity and accident experience. Periodically, speed limits may need to be reviewed because of changes in variable factors such as traffic volumes, turning movements, increased roadside development, increased pedestrian activity or higher accident frequency.

To consider making changes to an existing speed limit, an engineering study should be performed. The study should include a comprehensive review of the factors listed above. Additionally, speed studies should be conducted to determine the degree of compliance with the existing speed limit. Most drivers adjust their driving speed in response to road and traffic conditions. If a speed limit is reasonable and effective, most drivers (85% is the generally accepted standard) will voluntarily comply with it.

Based on observations and discussion with City officials, the following locations may warrant further study to determine if speed limit changes should be considered:

Approaching Lewisburg on southbound US 219 from the City limit (posted at 55 mph) to near the WVDOH garage (reduced to 35 mph).

This section of roadway has a travel lane in each direction and a shared center turn lane. Extensive roadside development has occurred in recent years, and further development is ongoing. City officials feel that this section of roadway may be experiencing a gradual increase in accident rates compared to previous years. It is recommended that this area should be reviewed to determine whether the reduced speed zone should be extended further northward.

Approaching Lewisburg on westbound US 60 from the crest of the hill near Ruffner Road (posted at 35 mph) to just west of Lee Street (posted at 25 mph).

Although the land use (residential) in this area has not changed recently, traffic volumes have increased over time. Accordingly, turning movements to and from Holt Lane have increased and Dwyer Lane has become an increasingly attractive alternative route for motorists who wish to avoid congestion in the downtown area. While performing traffic turning movement counts, our personnel observed a significant number of vehicles that turned right from Dwyer Lane onto westbound US 60 and turned left onto Holt Lane. Similarly, a significant number of vehicles turn right from Holt onto US 60 east and then left onto Dwyer (or left from Holt to westbound US 60 and right onto Lee Street). This apparent increase in side-street turning movements may warrant consideration of moving the 25 mph speed zone to the east of Dwyer Lane.

Approaching Lewisburg on eastbound US 60 from the crest of the hill near Maple Street (posted at 40 mph) to just west of Courtney Drive (posted at 25 mph).

Traffic volumes will likely continue to increase as further development occurs along US 60 west of the downtown area. Also, turning movements at Courtney Drive and pedestrian activity are likely to increase when the new Library is opened. These factors may warrant consideration of moving the 25 mph zone further westward.

It is also suggested that speed limit reduction advisory signs (W3-5 and W3-5a) be installed on US 219 and US 60 in advance of the Lewisburg City limits.

Engine Brakes

Excessive noise produced by engine compression brakes (often called "jake brakes") is a topic of concern throughout the United States. State and local jurisdictions have tried a variety of approaches to address this issue with varying degrees of success.

Generally speaking, most states have been reluctant to ban the use of engine brakes, since they are considered to be safety equipment. The following text is reprinted from a research report by Janet L. Kaminski, Associate Legislative Attorney for the State of Connecticut. The report provides an excellent overview of the issue and summarizes some of the approaches that state and local jurisdictions have tried. The report can be found at the following web address: www.cga.ct.gov/2004/rpt/2004-r-0741.htm.

SUMMARY

"Jake Brake," a registered trademark of Jacobs Vehicle Systems, Inc. (Jacobs), commonly refers to a brake retarder, which is a supplemental brake used on trucks and buses that assists in slowing down the vehicle. Safety and vehicle maintenance cost savings are cited as reasons for using them. While in use, a brake retarder makes a distinctive staccato sound, which can be quite loud. As a result, citizens have sought to limit their use in populated areas.

Brake retarder use is mostly regulated at the local level. Many municipalities have banned the use of engine compression brakes because of their noise emission, according to the National Highway Traffic Safety Administration (NHTSA).

At a state level, we found four states that have statutes specifically addressing brake retarder use (California, Colorado, Montana, and Oregon). Numerous states address it in regulations (Arkansas, Delaware, Kansas, Montana, New Mexico, Oklahoma, Oregon, Pennsylvania, Utah, West Virginia, and Wyoming). While some place restrictions on the use, many states explicitly permit brake retarder use by certain vehicles or in certain situations.

JAKE BRAKE

"Jake Brake" is a registered trademark of Jacobs Vehicle Systems, Inc. (Jacobs). The term is often used to refer to engine compression release brakes, but actually refers to all of Jacobs' retarding products. A brake retarder is a supplemental brake used on large motor vehicles that slows the vehicle but is not designed to stop it completely. Such devices are common on long haul trucks and buses.

Brake retarder designs include compression release, exhaust, electrical, and mechanical systems, according to the National Highway Traffic Safety Administration (NHTSA). These engine brakes are often activated when the accelerator pedal is released, but a driver may also activate it with a separate control or by applying the brake pedal. The device works by changing the action of the exhaust valves, allowing air to be compressed out of the engine pistons, which slows the vehicle.

Benefits

There are several reasons for using a brake retarder, according to Jacobs. Such a device (1) controls vehicle speed with minimal use of wheel or service brakes on downhill grades and in traffic; (2) minimizes the speed differential between cars and trucks; (3) reduces break fade (overheating and glazing that leads to a loss of wheel brake effectiveness); (4) reduces wear on the engine, tires, and wheel brakes; and (5) reduces vehicle maintenance costs. In many cases, stopping distance will be longer without an engine brake.

Noise

While in use, a brake retarder makes a distinctive staccato sound, which can be quite loud. As a result, citizens have sought to limit their use in populated areas. Engine brake noise is a component of exhaust noise and can be controlled with a functioning muffler. The sound is loudest when used on a vehicle with poorly muffled or unmuffled exhaust systems, according to Jacobs. Most states, including Connecticut, require motor vehicles to be equipped and operated with a muffler in good working order (C. G. S. § 14-80).

BRAKE RETARDER REGULATION

Municipalities

Many municipalities have banned the use of engine compression brakes because of their noise emission, according to NHTSA. For example, Glenwood Springs, Colorado, prohibits as a nuisance any noise caused by operating a motor vehicle with an engine brake engaged within the city (Glenwood Springs Municipal Code § 100. 070. 030(3)). Overland Park, Kansas, prohibits the use of a compression release engine braking system without a muffler (OP Traffic Ordinance § 12. 04. 175. 1). Springdale, Arkansas, prohibits as a nuisance engine brake noise emission, except when such devices are used as a safety device (Springdale County Code § 42-52(13).

Before a municipality can issue an ordinance, it needs to verify that it has authority. For example, the New York Office of Attorney General has opined that a village is not authorized to enact a prohibition of truck engine compression brake use within the village because state law regulates the use of streets and highways. The New York legislature has not delegated such authority to villages (1999 WL 988077 (N. Y. A. G.)).

States

We found four states that have statutes specifically addressing brake retarder use (California, Colorado, Montana, and Oregon). Numerous states address it in regulations. While some place restrictions on the use, many states require or permit brake retarder use by certain vehicles or in certain situations.

California requires fire trucks exceeding 31,000 gross vehicle weight rating to be equipped with a retarder (Cal. Veh. Code §§35002(b)(2) and 521).

Colorado requires commercial vehicles equipped with an engine compression brake device to have a muffler. Any person who violates this requirement is subject to a $ 500 fine (Colo. Rev. Stat. § 42-4-255). Colorado also prohibits passengers of school buses used in mountainous terrain from front row and emergency exit seats unless the bus is equipped with retarders. The general assembly encourages school districts to install electromagnetic or state-of-the-art retarders in school buses (Colo. Rev. Stat. § 42-4-1901).

Kansas prohibits the use of engine-retarder brakes on a special vehicle combination consisting of a truck tractor, semi-trailer, trailer, and trailer (Kan. Admin. Regs. 36-1-31).

Montana requires commercial vehicles equipped with an engine-compression brake device to have a muffler in good working condition. A person operating a commercial vehicle with a factory-installed muffler or equivalent after-market muffler may not be prohibited from using an engine compression brake device (Mont. Code Ann. § 61-9-321). Montana also prohibits "indiscriminate use of engine brake retarders" by drivers of special vehicle combinations consisting of a truck, trailer, and trailer or truck tractor, semi-trailer, trailer, and trailer (Mont. Admin. R. 18. 8. 517).

Oklahoma prohibits "indiscriminate use of engine brake retarders" by special combination vehicle drivers (Okla. Admin. Code § 595: 30-5-4).

Oregon prohibits a person from operating a motor vehicle on a highway with "unmuffled engine brakes," which is defined as an engine brake that is not equipped with a muffler in good working order. A person found in violation commits a Class A traffic violation, which imposes a fine up to $ 720 (Or. Rev. Stat. §§ 811. 492, 801. 263, and 153. 018).

Pennsylvania requires vehicles operating on a highway with a gross weight exceeding 80,000 pounds to be equipped with an engine-, exhaust-, or hydraulic-brake retarder in good working order. A local authority cannot prohibit brake retarder use unless the Department of Transportation gives prior written approval (67 Pa. Code § 179. 10(20)). For additional details on the department's review of prohibition requests, see OLR Report ***2004-R-515*** (copy enclosed).

Other States have regulations that permit school buses to be equipped with brake retarders (Arkansas, Delaware, New Mexico, Oregon, Utah, West Virginia, and Wyoming).

Pennsylvania will allow municipalities to regulate "brake retarders" in some cases, but only after its criteria are followed regarding road features and the crash history for a specific section of highway. Road features **must not include:**

1. downhill grade(s) greater than 4%
2. a posted reduced speed limit for trucks due to a hazardous grade determination
3. posted reduced gear zone(s)
4. posted speed limits over 55 miles per hour, and

5. highway exit ramps with a posted speed limit over 55 miles per hour.

The crash history for the stretch of road a municipality is seeking to keep brake-retarder free must not include:

1. a history of runaway truck crashes over the past three years and
2. a discernible pattern of rear-end crashes over the past three years where the truck was the striking vehicle.

Approved signs read, "Brake Retarders Prohibited Within Municipal Limits." A sign must be posted at the point where trucks may start to use brake retarders again, reading, "End Brake Retarder Prohibition."

(reprinted from www.cga.ct.gov/2004/rpt/2004-r-0515.htm)

As stated in the article above, most states do have enforceable laws regarding muffler systems, and some communities have approached the issue from this angle. Several articles suggest that faulty muffler systems (or bypassing the muffler systems) are more of a problem than the engine brakes themselves.

Like many other states, WVDOH does not permit signing on state routes that prohibit the use of engine brakes. While the West Virginia law does require that vehicles have functional mufflers, its language is not as specific as some other states. The following is reprinted from the West Virginia Code:

§17C-15-34. Mufflers; prevention of noise, fumes and smoke.

(a) Every motor vehicle shall at all times be equipped with a muffler in good working order and in constant operation to prevent excessive or unusual noise. Such muffler shall be the muffler originally installed by the manufacturer of the vehicle or, if a replacement, the equivalent thereof. No person shall use a muffler cutout, bypass, or similar device upon a motor vehicle on a highway.

(b) The engine and power mechanism of every motor vehicle shall be so equipped and adjusted as to prevent the escape of excessive fumes or smoke.

Since several towns in West Virginia seem to be concerned with truck noise problems, it may be beneficial to raise this issue with the State Legislature. It may be possible to update the State code to enable local jurisdictions to pass enforceable ordinances.

Links are provided below to several additional selected documents which are helpful in providing insight for deciding how to approach this issue:

- A technical paper from Jacobs Vehicle Systems (manufacturers of the "Jake Brake"), which also provides a summary of the issue.
  - www.jakebrake.com/about-us/docs/jacobs-engine-exhaust-noise-presentation.ppt#272
- A paper on "Jake Brakes" from the Maine DOT.
  - www.maine.gov/mdot/mlrc/traffic-issues/speed-limit_jakebrake.php
- An article from the Smoky Mountain News (in NC) discussing how towns have addressed truck noise.
  - www.smokymountainnews.com/issues/09_05/09_14_05/fr_ordinance_option.html
- A City ordinance from Peoria, Arizona which bans trucks from certain areas during certain hours.
  - www.peoriaaz.com/CityCode/PDF/Ch14/sec14-76.pdf

H. Bypass Alternative

Figure 4.4 of the Lewisburg Comprehensive Plan illustrates several recommended future community linkages. US 219 provides the most direct north-south connection between downtown Lewisburg (as well as Fairlea and Ronceverte) and I-64 (as well as points further north). The current congestion and delays that occur on US 219 will only be exacerbated in the future with future growth and anticipated growth in traffic volumes.

Based upon the Origin-Destination data collected as part of this study (see Section II.B), it appears that a significant portion of traffic on US 60 and US 219 (e.g. west-to-north traffic and north-to-south traffic) could potentially utilize the future linkages shown in the Comprehensive Plan. These linkages would help to alleviate these conditions by providing alternative facilities for traffic traveling through Lewisburg, and by improving circulation for local traffic.

RECOMMENDED IMPROVEMENT PHASING IMPLEMENTATION

IV. RECOMMENDED IMPROVEMENT PHASING IMPLEMENTATION

A. Short-Term Improvements (0 to 5 years)

- Adopt recommended modifications to the regulations/zoning ordinances to control development impacts.
- Convert Randolph Street to a one-way eastbound operation between US 219 and Lafayette Street to address the limited sight distance from the east approach (Randolph Street) at the US 219 / Randolph Street intersection.
- Convert US 219 to one-way northbound operation and Court Street to one-way southbound operation to form a north-south one-way pair system. Provide two (2) travel lanes on both of these roadways between Foster Street and Arbuckle Lane.
- Convert Arbuckle Lane to one-way westbound operation (needed with the implementation of the one-way pairs alternative)
- Convert Foster Street to one-way eastbound operation (needed with the implementation of the one-way pairs alternative)
- Install a traffic signal at the Court Street / Foster Street intersection (needed with the implementation of the north-south one-way pair system to provide acceptable levels of service).
- Modify the existing traffic signals at the following intersections (as needed for the implementation of the north-south one-way pair system):
  - US 219 / US 60
  - US 219 / Foster Street
  - US 60 / Court Street
- Improve intersection corner turning radii for the following movements (needed with the implementation of the one-way pairs alternative):
  - Southbound right turn from US 219 onto Arbuckle Lane (may require partial right-of-way take)
  - Westbound left turn from Arbuckle Lane onto southbound Court Street (may require partial right-of-way take)
  - Eastbound right turn from Foster Street to southbound US 219 (may require partial right-of-way take)
- Install an actuated traffic signal at the Court Street / Arbuckle Lane intersection (needed with the implementation of the north-south one-way pair system to provide acceptable levels of service).
- Widen US 60 at the Holt Lane-Dwyer Lane intersection complex to provide side-by-side left turn lanes and eliminate back-to-back left turning conflicts and queuing problems.

- Monitor proposed/planned developments to ensure that adequate traffic access and circulation for the proposed/planned development is addressed and is consistent with the City's Comprehensive Plan.
- Investigate accident histories on US 60 eastbound and westbound adjacent to city limits and consider reduction in speed limits. Install speed limit signing

See Table 4-1 an Figure 4-1 for the recommended Short-Term phasing implementation for pedestrian, bicycle, wayfinding, and signage facility improvements.

B. Mid-Term Improvements (5 to 10 years)

- Investigate the operational benefits and potential impacts of installing a roundabout at the US 219 / Holt Lane intersection.
- Upgrade horizontal and vertical geometry on Fairview Road between the Lewisburg Manor Apartment and the I-64 overpass.
- Construct new east-west access road connections between upgraded Fairview Road and US 219 to improve traffic access and circulation.
- Monitor warrants for installation of a traffic signal at the US 60 / Holt Lane-Dwyer Lane intersection complex.
- Monitor proposed/planned developments to ensure that adequate traffic access and circulation for the proposed/planned development is addressed.
- Improve US 219 and I-64 Interchange. Investigate the impacts of providing a direct connection with Fairview Road and potentially a frontage road system between US 219 and Fairview Road.

See Table 4-2 and Figure 4-1 for the recommended Mid-Term phasing implementation for pedestrian, bicycle, wayfinding, and signage facility improvements.

C. Long-Term Improvements (10+ years)

- Monitor traffic volumes at unsignalized intersections to evaluate need for installation of traffic signals.
- Construct a western US 219 bypass of Lewisburg.
- Monitor proposed/planned developments to ensure that adequate traffic access and circulation for the proposed/planned development is addressed.

See Table 4-3 and Figure 4-1 for the recommended Long-Term phasing implementation for pedestrian, bicycle, wayfinding, and signage facility improvements.

SHORT-TERM IMPROVEMENT RECOMMENDATIONS- *(0-5 year outlook)*

Pedestrian Facilities: sidewalk, intersection, and ADA improvements

PRIORITY	STREET	SEGMENT	DESCRIPTION/ IMPROVEMENT RECOMMENDATIONS
1	**Jefferson Street**	*Austin St. to Gateway Commons*	Provide new sidewalk facility from Randolph St. to the Gateway Commons. Provide crosswalk striping, pedestrian crossing signals at all signalized intersections in the Gateway Commons area. Provide ADA curb ramps at all crossings. Upgrade sidewalks and all ADA ramps from Austin St. to Randolph St.
2	**Silo Drive**	*Jefferson St. to Lee St.*	Provide new sidewalk facility between Jefferson St. and Lee St. Provide crosswalk striping, ADA ramps, and signing at both Jefferson St. and Lee St. intersections.
3	**Washington Street**	*North House Museum to new Greenbrier Co. Public Library sidewalk connection*	Provide new sidewalk facility from the north terminus of the existing stone sidewalk to the new library access road and connect to the library sidewalk network.
4	**Greenbrier Road**	*Lee St. to Hollowell Park and access road*	Provide new sidewalk facility from Lee St. to the Hollowell Park parking lot along the north side of Greenbrier Rd. Provide new sidewalk facility along the access road to the Lewisburg Elementary School. Provide crosswalk striping, signage, and ADA ramps at Greenbrier Rd crossing.
5	**Randolph Street**	*Court St. to east of Lafayette St.*	Provide new sidewalk facilities along Randolph St. from Court St. to the west terminus of the existing sidewalk between Lafayette St. and Lee St. Provide ADA curb ramps and crosswalk striping and signage where warranted.
6	**Foster Street**	*Church St. to John Wesley Methodist Church*	Upgrade existing sidewalks and provide new sidewalk segments to provide a continuous sidewalk from Court St. to the historic church. Widen existing sidewalks that are less than 5' wide. Provide new and upgraded ADA ramps at all intersections. Provide pedestrian crossing signs at striped crosswalks.
7	**Court Street**	*McElhenney Rd. to Washington St.*	Upgrade and widen existing sidewalks between McElhenney Rd. and Foster St. Provide ADA ramps, crosswalk striping, and signage at Foster St. and Court St. intersection. Improve drive aprons in sidewalk between Foster St. and Washington St. Consider providing a transit shelter in the vicinity of the Washington St. intersection.
8	**Lafayette Street**	*Foster St. to Randolph St.*	Provide a new sidewalk segment from Washington St. to the south terminus of the existing sidewalk near Randolph St. Provide an accessible route in combination with the existing stepped segment. Provide ADA ramps at intersection corners.
9	**Feamster Road**	*Dorie Miller Park to Court St. & on Oak St. to Bolling Community Center*	Provide an ADA accessible sidewalk from Court St. to the Dorie Miller Park. Provide a sidewalk facility connection to the Bolling Community Center.
10	**Arbuckle Lane**	*Court St. to Jefferson St.*	Provide new ADA accessible sidewalk between Court St. and Jefferson St. To be coordinated with potential remote parking lot development. Provide pedestrian facility improvements at the Jefferson St. intersection consistent with the Jefferson St. sidewalk design and development.
11	**Chestnut Street**	*Jefferson St. to Lee St.*	Provide new sidewalk segment between Jefferson St. and Lafayette St. Provide ADA ramps at the Jefferson St. and Lafayette St. intersection. Provide ADA curb ramp upgrades along existing sidewalk segment between Lafayette St. and Lee St.
12	**Court Street**	*Green Ln. to Fairview Rd.*	Upgrade and widen existing sidewalk and reestablish curb reveal between Green Ln. and Fairview Rd. Provide ADA curb ramps at intersections and driveway aprons.

Bicycle/ Trail Facilities

PRIORITY	FACILITY	LOCATION	DESCRIPTION/ IMPROVEMENT RECOMMENDATIONS
1	**Bicycle (On-Road)**	*Old Powell Rd./ Fairview Rd./ W. Washington St. (US 60)*	Place bicycle warning sings with the "share the road" supplemental plaque along Old Powell Rd. in the northbound and southbound directions. Place the same sign and plaque along Fairview Rd. in the southbound direction and along W. Washington St. (US 60) in the eastbound direction.
2	**Shared-Use Trail**	*W. Washington St. to McElhenney Rd.*	Improve path/trail facility for the Civil War Trail between W. Washington St. and McElhenney Rd. adjacent to the Confederate Cemetery. Provide path/trail connection to the new Greenbrier Co. Public Library.
3	**Greenbrier River Rail Trail**	*from potential GRT extension to Ronceverte*	Continue to pursue Greenbrier River Trail connection to downtown Lewisburg via the potential rail-trail extension to Ronceverte. In the interim, consider a scheduled or on-call transit shuttle, with vehicle mounted bicycle racks, from downtown to Stone House Rd. trailhead.

MID-TERM IMPROVEMENT RECOMMENDATIONS- *(5-10 year outlook)*

Pedestrian Facilities: sidewalk, intersection, and ADA improvements

PRIORITY	STREET	SEGMENT	DESCRIPTION/ IMPROVEMENT RECOMMENDATIONS
1	**Washington Street**	*North House Museum to Lee St.*	Provide ADA curb ramp upgrades at intersections along this segment. Provide pedestrian crosswalk warning signs at striped crosswalks. Reestablish curb reveal in needed areas and attempt to provide ADA accessible building entrances with new sidewalk elevation. Provide sidewalk surface materials sensitive to the historic district and commercial pedestrian environment.
2	**Lee Street**	*Washington St. to Silo Dr.*	Attempt to provide a continuous ADA accessible route along the west side from Washington St. to Silo Dr. Provide ADA curb ramps at all roadway crossings and provide crosswalk striping and signage at warranted locations. Address ADA accessibility to elevated sidewalks.
3	**Randolph Street**	*Oak St. to Court St.*	Provide ADA curb ramps at intersection corners and driveway aprons. Improve/ reset brick and stone sidewalks with appropriate subgrade to provide an ADA and pedestrian friendly sidewalk surface. Consider stockpiling sidewalk stone for other more comprehensive sidewalk projects within the historic district.
4	**Oak Street**	*Randolph St. to Bolling Community Center*	Provide an ADA accessible sidewalk facility from Randolph St. to the Bolling Community Center. Provide ADA curb ramps at intersections and driveway aprons.
5	**Court Street**	*Washington St. to Green Ln.*	Provide/improve ADA curb ramps at intersection corners. Reestablish curb reveal and attempt to provide ADA accessible building entrances with new sidewalk elevation. Improve/reset brick sidewalk sections with appropriate subgrade to provide an ADA and pedestrian friendly sidewalk surface.
6	**Court Street**	*Laing St. to McElhenney Rd.*	Upgrade, widen , and reestablish curb reveal of the existing sidewalk section from Laing St. to Mcelhenney Rd. Provide ADA curb ramps at intersections and driveway aprons.
7	**Greenbrier Road**	*Hollowell Park to Dwyer Ln.*	Continue new sidewalk facilities along Greenbrier Rd. to Dwyer Ln. Coordinate with continued development of the WVSOM Alumni Center & Greenbrier Military School Museum site development.
8	**Dwyer Street**	*Washington St. to Greenbrier Rd.*	Provide ADA accessible sidewalk facility between Greenbrier Rd. and Washington St. to Greenbrier Rd. potentially along the west side. Provide ADA curb ramps at intersections and driveway aprons.
9	**Holt Lane**	*S. Jefferson St. to E. Washington St.*	Provide ADA accessible sidewalk facility between S. Jefferson St. and E. Washington St. Provide ADA curb ramps at intersections and driveway aprons. Provide pedestrian crossing facilities such as striping, signing, and pedestrian crossing signals at the S. Jefferson St. intersection and possible striping and signing at the E. Washington St. intersection.
10	**Fairview Road**	*Court St. to Remote Parking Area*	Provide ADA accessible sidewalk facilities from the north terminus of Court St. along Fairview Rd. to the potential remote parking lot. Provide adequate pedestrian crossing facilities for Fairview Rd. To be coordinated with development of the potential remote parking area.

Bicycle/ Trail Facilities

PRIORITY	FACILITY	LOCATION	DESCRIPTION/ IMPROVEMENT RECOMMENDATIONS
1	**Shared-Use Trail**	*Vicinity of the north, west, and south corporate limits*	Evaluate potential for permanent easements and adoption of new development codes for potential shared-use trail alignment. Coordinate with development of remote parking areas, inclusion in other future site development, and the Greenbrier River Trail connection via the potential GRT extension to Ronceverte. Link to potential Civil War Trail and library improvements.
2	**Remote Connection to Greenbrier River Rail Trail**	*from potential GRT extension to Ronceverte*	Continue to pursue Greenbrier River Trail connection to downtown Lewisburg via the potential rail-trail extension to Ronceverte. Could provide shared-use trail connections between the GRT, Ronceverte and Fairlea activity centers, and to downtown Lewisburg.

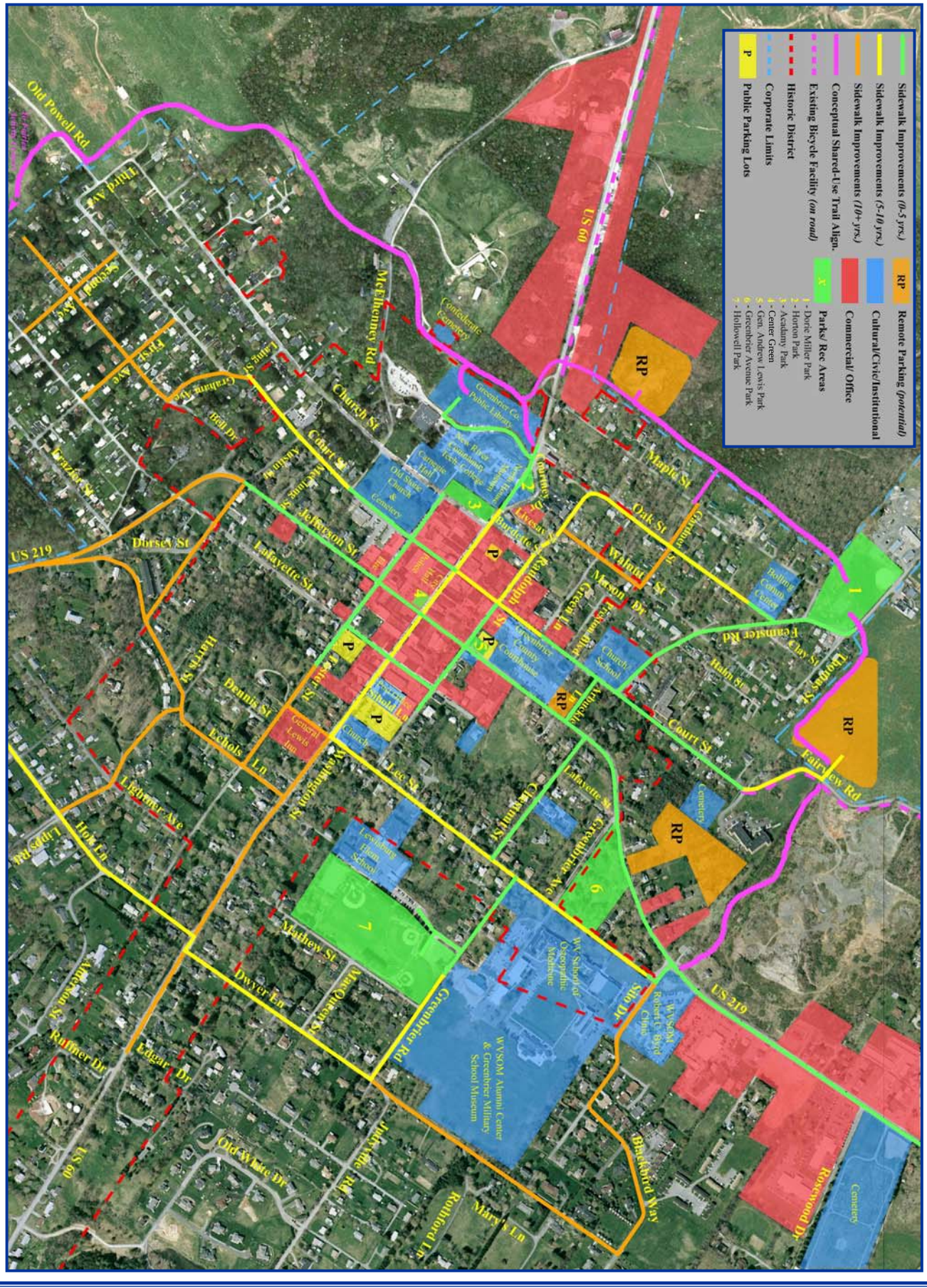
LONG-TERM IMPROVEMENT RECOMMENDATIONS- *(10+ year outlook)*

Pedestrian Facilities: sidewalk, intersection, and ADA improvements

PRIORITY	STREET	SEGMENT	DESCRIPTION/ IMPROVEMENT RECOMMENDATIONS
1	**Silo Drive & Blackbird Way**	*Lee St. to Dwyer Ln.*	Provide new sidewalk facilities along Silo Dr. and Blackbird Way from Lee St. to Dwyer Ln. to provide a sidewalk network from the adjacent neighborhood developments to the commercial/retail sector along N. Jefferson St. and the Gateway Commons. Provide ADA curb ramps at intersection corners and driveway aprons.
2	**Dwyer Lane**	*Greenbrier Rd. to Blackbird Way*	Provide new sidewalk facilities between Greenbrier Rd. and Blackbird Way to create a closed sidewalk network in the northeast quadrant of the town. Provide ADA curb ramps at intersection corners and driveway aprons.
3	**Foster Street**	*John Wesley Methodist Church to Echols Ln.*	Provide new sidewalk facilities between the east terminus of the proposed sidewalks to the John Wesley Methodist Church and Echols Ln. Provide ADA curb ramps at intersection corners and driveway aprons.
4	**Lee Street**	*Foster St. to Washington St.*	Provide new sidewalk facilities between Foster St. and Washington St. to provide a safe pedestrian connection from Foster St. to the existing and proposed Lee St. sidewalk network. Provide ADA curb ramps at the Washington St. and Lee St. intersection corners.
5	**Walnut Street**	*Randolph St. to Gardner St.*	Provide ADA curb ramps at intersection corners and driveway aprons. Improve/ reset stone sidewalks with appropriate subgrade to provide an ADA and pedestrian friendly sidewalk surface. Consider stockpiling sidewalk stone for other more comprehensive sidewalk projects within the historic district and provide a new sidewalk with materials sensitive to the hist. dist.
6	**Gardner Street**	*Maple St. to Walnut St.*	Provide new sidewalk facilities between Maple St. and Walnut St. Provide ADA curb ramps at intersection corners and driveway aprons. Provide crossing striping, signage, and access control elements if a potential shared-use path connector trail is provided opposite of Maple St. from Gardner Lane.
7	**Graham Avenue**	*Laing St. to Bell Dr.*	Provide new sidewalk facilities between Laing St. and Bell Dr. to extend the Court St. sidewalk network into the residential area in the southwest quadrant of downtown Lewisburg. Provide ADA curb ramps at intersection corners and driveway aprons.
8	**Bell Drive**	*South terminus to Graham Ave.*	Provide new sidewalk facilities along Bell Dr. from its southern terminus to Graham Ave. to extend a central mainline sidewalk facility into the southern residential neighborhood. Provide ADA curb ramps at intersection corners and driveway aprons.
9	**First Avenue**	*Court St. to Lafayette St.*	Provide new sidewalk facilities between Court St. and Lafayette St. connecting other north/south residential streets to the proposed more central sidewalk facility along Bell Dr. Provide ADA curb ramps at intersection corners and driveway aprons.
10	**Second Avenue**	*Court St. to Lafayette St.*	Provide new sidewalk facilities between Court St. and Lafayette St. connecting other north/south residential streets to the proposed more central sidewalk facility along Bell Dr. Provide ADA curb ramps at intersection corners and driveway aprons.
11	**Jefferson Street**	*Holt Ln. to Austin St.*	Provide new sidewalk facilities between Holt Ln. and Austin St. to extend the downtown sidewalk network to the corporate limits and potentially extend to the Fairlea activity centers. Provide ADA curb ramps at intersection corners and driveway aprons. Coordinate pedestrian crossing improvements at the S. Jefferson St./Holt Ln. intersection with potential Holt Ln. improvements.
12	**Austin Street**	*Jefferson St. to Echols Ln.*	Provide new sidewalk facilities between S. Jefferson St. and Echols Ln. Provide ADA curb ramps at intersection corners and driveway aprons. Evaluate/consider crosswalk striping and signage at the Austin St./Jefferson St. intersection.
13	**Echols Lane**	*Jefferson St. to Washington St.*	Provide new sidewalk facilities along Echols Ln. to connect internal residential areas of the southeast quadrant of downtown Lewisburg to S. Jefferson St. and E. Washington St. Provide new ADA curb ramps at intersection corners and driveway aprons.
14	**Harris Street**	*Echols Ln. to Holt Ln.*	Provide new sidewalk facilities along Harris St. to provide a centralized connection of the residential areas between Echols Ln. and Holt Ln. Provide ADA curb ramps at intersection corners and driveway aprons.
15	**Washington Street**	*Lee St. to Edgar Dr.*	Provide ADA curb ramps at intersection corners and driveway aprons. Improve/ reset stone sidewalks with appropriate subgrade to provide an ADA and pedestrian friendly sidewalk surface. Consider stockpiling sidewalk stone for other more comprehensive sidewalk projects within the historic district. Attempt to eliminate steps and other ADA barriers where possible.

Bicycle/ Trail Facilities

PRIORITY	FACILITY	LOCATION	DESCRIPTION/ IMPROVEMENT RECOMMENDATIONS
1	**Shared-Use Trail**	*throughout corporate limits of Lewisburg*	Evaluate/consider adopting development codes/ordinance for sidewalk networks and logical shared-use path segments to be provided in new and future site development. Establish long-term goal of extending proposed shared-use path network into the residential and other recreational areas north of I-64 via the Fairview Rd. bridge over I-64.



City of Lewisburg

Greenbrier County, West Virginia

Transportation Management Study

Not to Scale

JOHNSON, MIRMIRAN & THOMPSON

June 2007

Figure 4-1

Ped/Bike Facility Recommendations

EXECUTIVE SUMMARY

V. EXECUTIVE SUMMARY

This report contains the results of JMT's Transportation Management Study for the City of Lewisburg. The analysis addresses vehicular traffic issues, parking, pedestrian and bicycle issues, signing and wayfinding. The study identifies and analyzes physical and operational deficiencies of the existing infrastructure. Additionally, potential future deficiencies that will likely arise as a result of future growth and development are examined. Finally, the report identifies short-term, mid-term, and long-term improvement strategies to address those deficiencies.

A. Vehicular Traffic and Parking

Current conditions were analyzed to identify existing problems or deficiencies due to roadway geometry, traffic congestion, and safety hazards. Most intersections operate at Level of Service (LOS) C or better during AM and PM peak hours. However, the lack of turn lanes at the intersection of US 219 and US 60 causes congestion due to queuing of blocked vehicles behind left turning vehicles. Capacity analysis of future conditions (10 to 20 years) shows a significant decline in LOS at several intersections. In addition to the lack of turn lanes at Washington and Jefferson Streets, several other geometric deficiencies were noted:

- Narrow parking lanes and tight turning radii at Washington and Jefferson Streets
- Inadequate left-turning lane storage for vehicles turning from northbound US 219 to the westbound I-64 ramp
- Inadequate sight distance at the intersection of Jefferson and Randolph Streets
- Inadequate left-turning lane storage from westbound US 60 to Holt Lane
- No left-turn storage lane from eastbound US 60 to Dwyer Lane

Several strategies are available to improve traffic flow, and each of these strategies has positives and negatives associated with it. Some of the strategies could be implemented in a relatively short time while others would be considered mid or long-range approaches.

- Left-turn restrictions at Washington and Jefferson may help the intersection's operation, but may cause delay at other intersections, may confuse motorists who are unfamiliar with the area, and may be difficult to enforce.
- Adding left-turn lanes at Washington and Jefferson would undoubtedly improve traffic flow, but would sacrifice a significant number of prime on-street parking spaces.
- US 219 could be converted to one-way northbound from Foster Street to Arbuckle Lane. In the southbound direction, traffic would utilize Arbuckle Lane, Court Street, and Foster Street (all of which would be converted to one-way in the

affected blocks). This option would improve the LOS in the short term and for several years into the future. However, geometric improvements would be necessary for implementation, possibly including acquisition of properties.

- Providing an alternative north-south route parallel to US 219 would be very beneficial. This could possibly be accomplished by upgrading or reconstructing existing streets/roads or by constructing a new bypass facility. Access controls would be highly desirable. Funding for this approach may not be available for 10 years or perhaps significantly longer.
- Implementing zoning strategies and partnering with private developers may gradually allow for incremental improvements and/or additions to the highway network. This could help relieve current congestion and may also help to mitigate the impacts of future increases in traffic.
- Conduct detailed engineering studies of speed limits at the Lewisburg City limits, including evaluation of accident histories and the review of current operating speeds. Install speed limit reduction advisory signs be installed on US 219 and US 60 in advance of the Lewisburg City limits.

Weekday parking accumulations of downtown on-street parking and four public parking lots showed that there are approximately 150 available existing parking spaces within the downtown area at time of peak demand.

B. Pedestrian and Bicycles

The existing facilities were evaluated, and deficiencies were noted and recorded. Generally speaking, improvements to the system will likely be incremental, and should be prioritized and implemented based on the availability of funding. Some of the types of improvements needed are listed below:

- Safety improvements at intersections such as wheelchair ramps and crosswalks
- Upgrading existing sidewalks
- Closing gaps between existing sidewalk facilities
- Constructing new sidewalks to build an efficient network to serve schools, recreational sites, commercial areas and residential areas
- Implement codes to ensure system continuity in new development areas
- Share-the-road signing for bicycle routes
- Explore pedestrian and bicycle linkages to other trail facilities
- Consider constructing additional roadway width for bicycles in future street and highway projects

C. Signage and Wayfinding

Existing signing is reasonably effective, but improvements may include:

- Reducing sign clutter by eliminating unnecessary or redundant signs (including gateway signs)
- Develop a comprehensive wayfinding plan to provide the framework for the design, location, and installation of more effective individual and consolidated wayfinding signs throughout the City.

D. Conclusion

This report provides an analysis of current and future conditions, and offers a variety of short-term, mid-term and long-term improvement strategies. Some of the strategies can be accomplished relatively quickly and economically, while others will require more time, funding, and perhaps the involvement of other jurisdictions and agencies. The City of Lewisburg will have many decisions to make regarding transportation improvements. Hopefully this analysis and report will be a valuable guideline to assist the City in making those decisions.