CHAPTER 4 - EXISTING TRANSPORTATION SYSTEM

4.1 Introduction

Having a clear understanding of the current transportation system is vital to the planning process because the existing system is the starting point from which changes will occur. The region's current transportation system includes the following:

- Highways, local roads and streets
- Sidewalks
- Trails
- Public transit (bus and PRT)
- Intercity bus transportation
- Railroad
- River
- Morgantown Municipal Airport

The Morgantown Monongalia Metropolitan Planning Organization (MMMPO) planning area (see Figure 4-1) is made up of both urban and rural areas. Below is a definition of what is considered the "urbanized" area.

Definition of the Urbanized Area

According to the 2010 U.S. Census Bureau data, the region's *Urbanized Area* includes Granville, Morgantown, Star City, and Westover. *Census Designated Places* include Cheat Lake, Brookhaven, and Cassville. A *Census Designated Place* is defined by the U.S. Census Bureau as a location with a settled concentration of population that is identifiable by name but not legally incorporated under the laws of the state in which it is located.

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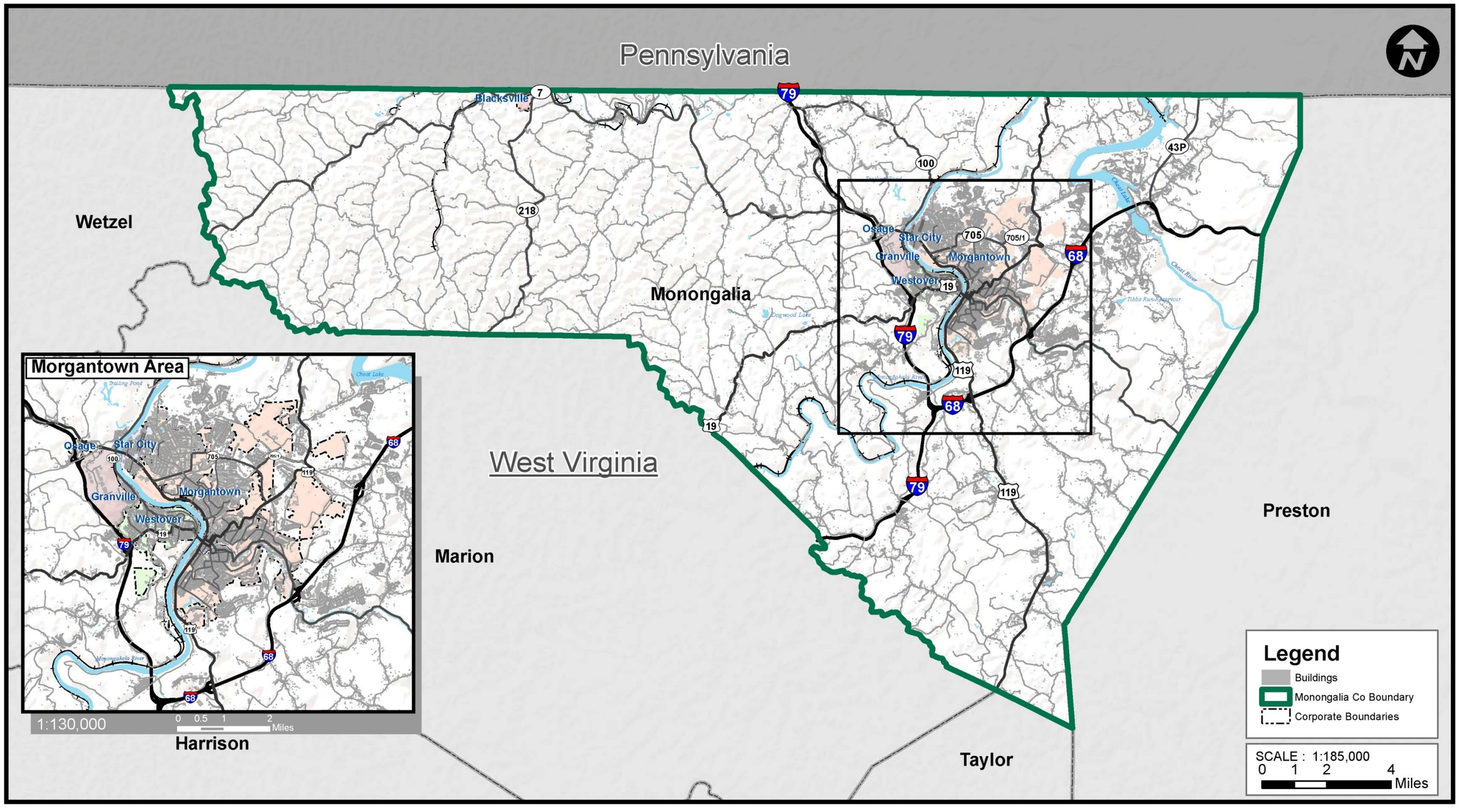
Figure 4-1. MPO Coverage Area



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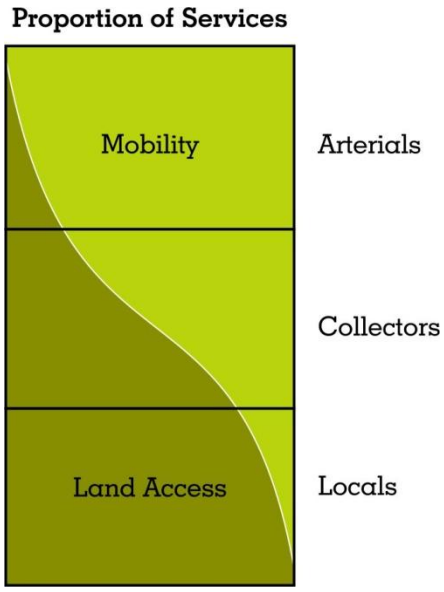
4.2 Functional Classifications

Roadway functional classifications group streets and highways according to the service they are intended to provide and the role each street or road will play in serving the traffic in a region. In general the streets in an urbanized area have one of two primary functions:

Access – Providing transportation access to land
Mobility – Moving vehicles between points



These two functions can compete with one another in that travel mobility will decline as the level of access increases. A high level of travel mobility cannot be accomplished with a high level of property access.

In West Virginia, there are two functional classification systems. A federal classification system called the *National Highway Functional Classification System (NFCS)* established through the National Highway Act of 1973, and a state functional classification system that was established by the West Virginia State Legislature in 1967.

National Highway Functional Classification System (NFCS)

Through the NFCS, regions/jurisdictions are addressed as urban and rural. While the classification system applications in urban and rural areas use a very similar terminology, there are fundamental differences in the roadway characteristics relative to density and types of land use, travel patterns, and the number of streets or highways in the category.

The rural street system includes:

- Principal Arterials
  - Interstates
  - Other Principal Arterials
- Minor Arterials
- Major Collectors
- Minor Collectors
- Local Streets

The urban street system includes:

- Urban Arterials
- Minor Arterials
- Collectors
- Local Streets

The West Virginia Department of Transportation's (WVDOT) definition of these street types is documented in the following sections.

Urban Functional Classification Definitions

Principal Arterial System
This system serves the major centers of activity of a metropolitan area, highest traffic volume corridors, majority of trips entering and/or leaving an urban area, and through movements to bypass the central city. Principal Arterial routes carry intra-urban and inter-city bus travel, travel between major inner city communities, and travel between central business districts (CBD).

The Principal Arterial system includes almost all fully and partially controlled access facilities, stratified into three subsystems:

- *Interstate* – multi-lane routes with access fully controlled, which serve the national defense and connect the nation's principal metropolitan areas;
- *Other Freeways and Expressways* – non-Interstate Principal Arterials with access fully controlled; and
- *Other Principal Arterials* – arterial routes with no or less than full control of access.

Minor Arterial System

The urban Minor Arterial system provides the following functions:

- It interconnects with and supplements the urban Principal Arterial system.
- Provides service to trips of moderate length.
- Distributes travel to subareas of the county or the state (relative to the Principal Arterial system).

Land access and travel mobility are relatively balanced in priority in the Minor Arterial classification.

Urban Collector System
The Urban Collector roadways provide land access service and traffic circulation within residential neighborhoods, commercial areas, and the county.

Urban Local System
The primary function of the Urban Local System is to provide direct access to abutting land and access to and between adjacent properties and the higher order systems. Local routes offer the lowest level of mobility and are not intended to provide service to through traffic movement.

Rural Functional Classification Definitions

Rural Principal Arterial System
The rural Principal Arterial system forms a connected network of continuous routes that serve corridor movements having trip length and travel density characteristics indicative of substantial intrastate or interstate travel. The rural Principal Arterial system is stratified into two subsystems:

- *Interstate* – All designated routes of the Interstate System; and
- *Other Principal Arterials* – All non-Interstate Principal Arterials.

Rural Minor Arterial System
The rural Minor Arterial system links cities and larger towns and other larger travel generators such as resort areas capable of attracting travel over similarly long distances. They also provide a support network for the interstate and inter-county service routes.

Rural Collector System
The rural Collector system primarily serves intra-county travel and is made up of those routes on which predominant travel distances are shorter than on arterial routes. The rural Collector system is classified into two subsystems:

- *Major Collector* – Provide service to any county seat or larger town not on an arterial route and to other traffic generators of equivalent intra-county importance (schools, county parks, etc); and
- *Minor Collector* – Provide service to smaller communities not on an arterial route and collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road.

Rural Local System
This system provides access to adjacent or abutting lands and provides service to travel over relatively short distances.

West Virginia Legal Functional Classification System

The West Virginia Legal Functional Classification System identifies each roadway over which it has jurisdiction as an Expressway (X), a Trunkline (T), a Feeder (F), or a State Local Service (SLS) route. This classification, commonly known as the X-T-F classification, is based on the assumed trip length characteristics and both the present and expected level-of-service (LOS).

A brief description of each of these functional systems follows:

- *Expressways (X)* – Serve metropolitan areas and provide major interstate and intrastate travel corridors;
- *Trunklines (T)* – Intrastate network intended to serve smaller cities;
- *Feeders (F)* – Serve smaller towns and industrial and recreational areas not served by the higher systems, while collecting traffic for the higher systems; and
- *State Local Service (SLS)* – Localized arterial and spur roads which provide access and socioeconomic benefits to abutting properties. Due to the large range of service this classification provides, it is necessary to further sub-classify routes as follows:
  - *Essential Arterial* – Provides primary access between small population centers or localities;
  - *Collector* – Collects travel from the lower systems and distributes it to the higher systems;
  - *Land Access* – Provides access to any land area or associated improvement and includes the following two subsystems:
    - *Delta Road System* – Consists of those roads in the public domain by virtue of common public use over a long period of time, where title to the right-of-way is indeterminate.

      While these routes are considered to be part of the SLS System, due to the lack of title to the right-of-way, delta roads are eligible only for routine maintenance and may not necessarily meet the standards set for SLS routes.

The state is currently eliminating this classification by either including these roads in the county route system or removing them from the state road inventory;

- *State Park and Forest Roads* – Provide access within areas for recreational and/or commercial (e.g., logging, mining, etc.) purposes; and
  - *Occasional Use* – Represents the lowest classification of a local road. These routes provide access to a rural area on a low-volume basis.

National Functional Classification of the Current System

Within the study area, the roadways are grouped into six general functional categories from both the urban and rural systems:

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local

The current NFCS developed by the WVDOT is displayed in Figure 4-2 for the county. Figure 4-3 shows average daily traffic volumes on the NFCS. The facility mileage by functional class is documented in Table 4-1 as well as the average mileage by functional classification observed throughout the state.

A comparison with the state system highlights how different Monongalia County is when compared to the statewide average. Only 9 percent of the state system is classified as urban. In contrast, almost 23 percent of Monongalia County roads are classified using the urban definitions. This distinguishes the county from the rest of the state and how its transportation system operates.

Table 4-1. Facility Mileage by Functional Class

Functional Classification		WV Statewide System		Monongalia County System	
		Roadway Mileage	Percent of the System	Roadway Mileage	Percent of the System
Urban	Principal Arterial System				
	Interstate (including the WV Turnpike)	186.50	0.51%	12.56	1.40%
	Other Freeways and Expressways	10.30	0.03%	0.00	0.00%
	Other Principal Arterials	334.78	0.92%	21.86	2.44%
	Minor Arterial System	742.95	2.05%	34.28	3.82%
	Collector System	736.25	2.03%	53.62	5.98%
	Local System	1,386.29	3.82%	82.96	9.25%
	Subtotal	3,397.07	9.37%	205.28	22.89%
Rural	Principal Arterial System				
	Interstate (including the WV Turnpike)	368.09	1.02%	23.12	2.58%
	Other Principal Arterials	1,068.11	2.95%	28.10	3.13%
	Minor Arterial System	1,340.11	3.70%	15.31	1.71%
	Major Collector System	5,652.59	15.59%	98.38	10.97%
	Minor Collector System	2,216.64	6.11%	526.81	58.73%
	Local System	22,206.79	61.26%		
	Subtotal	32,852.33	90.63%	691.72	77.11%
	TOTAL: Urban and Rural	36,249.40	100.00%	897.00	100.00%

Source: *WV DOH 2010 Annual Roadway Statistics*, West Virginia Department of Transportation, Division of Highways, Program Planning and Administration Division, April 2011.

Figure 4-2. Monongalia National Highway Functional Classification System

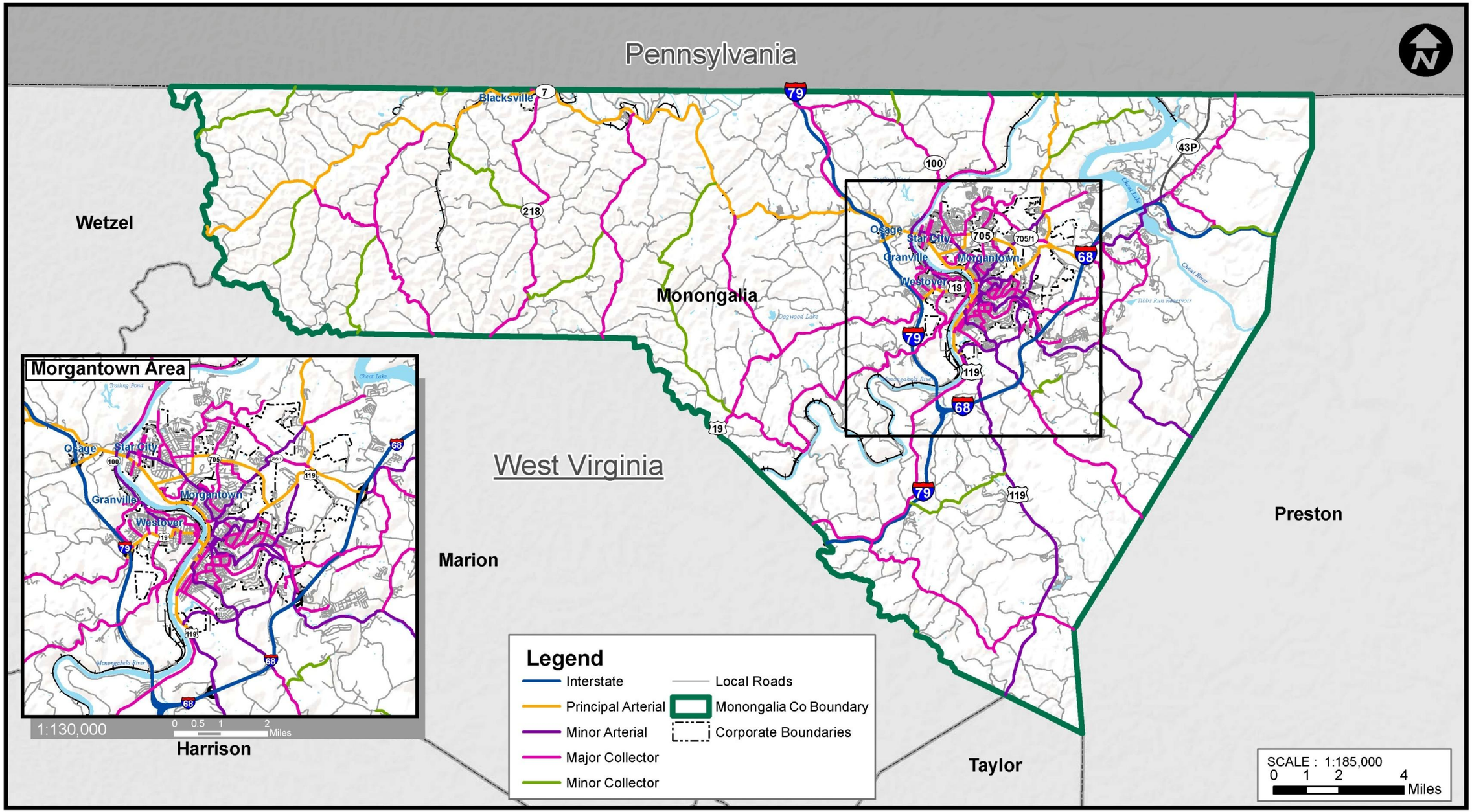
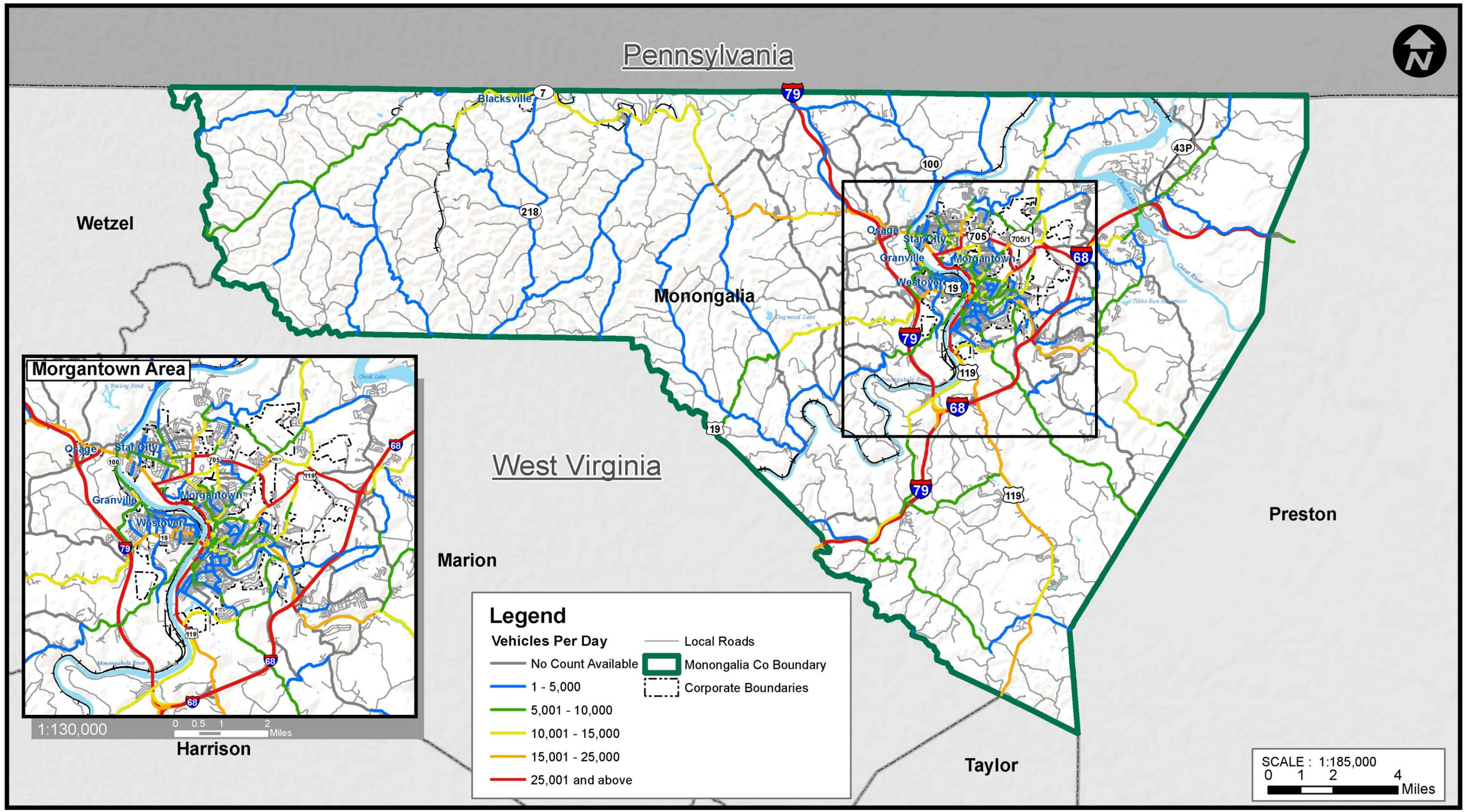


Figure 4-3. Traffic Volumes on the National Highway System in the Urbanized Area



4.3 Roadway Character

The mountainous nature of the region has resulted in many narrow roadways with steep grades and curvature. This creates undesirable conditions for traffic safety and lowers the roads ability to carry traffic. The hilly topography makes widening existing roadways and constructing new roadways difficult and costly compared to regions with flatter topography. Consequently, the region is left with very few direct and convenient roadway connections, and it is difficult and costly to improve the roadway system.

4.4 Current Traffic Volumes

Existing traffic volume data is available from several sources including the MMMPO, the City of Morgantown, WVDOT, and West Virginia University (WVU). All of the counts provided by the MPO, the City, and WVU are dated from spring 2010 to fall 2011. The most recent count data available from WVDOT at the time of this writing was collected in 2008.

Morgantown area traffic volumes and operating conditions are highly influenced by activities at WVU. The level of traffic on area roads increases dramatically when classes are in session relative to non-session periods. To account for this type of variation, seasonal and day of the week fac`tors have been applied to the volumes to obtain an average daily traffic volume estimate. The applied factors were developed by the WVDOT and were obtained directly from the MMMPO. The countywide average daily traffic volume data from all sources is illustrated in Figure 4-4. Figure 4-5 displays the average daily traffic volume data within the urbanized area.

Roads with average daily traffic volumes greater than 25,000 vehicles per day (vpd) are listed below:

- I-79
- I-68
- CR 19/24 (Chaplin Hill Road) from the I-79 Interchange to US 19 (Monongahela Blvd)
- US 19 (Monongahela Blvd) from Chaplin Hill Road to CR 55/7 (Chipps Hollow Road)
- US 19/WV 7 (Beechurst Avenue) south of Campus Drive
- US 19/WV 7 (University Avenue) south of Foundry Street
- US 19 (Don Knotts Blvd) south of Dorsey Avenue
- WV 705 (Patteson Drive) from Laurel Street to east of CR 67 (Stewartstown Road)

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Figure 4-4. Average Daily Traffic Volumes for Monongalia County

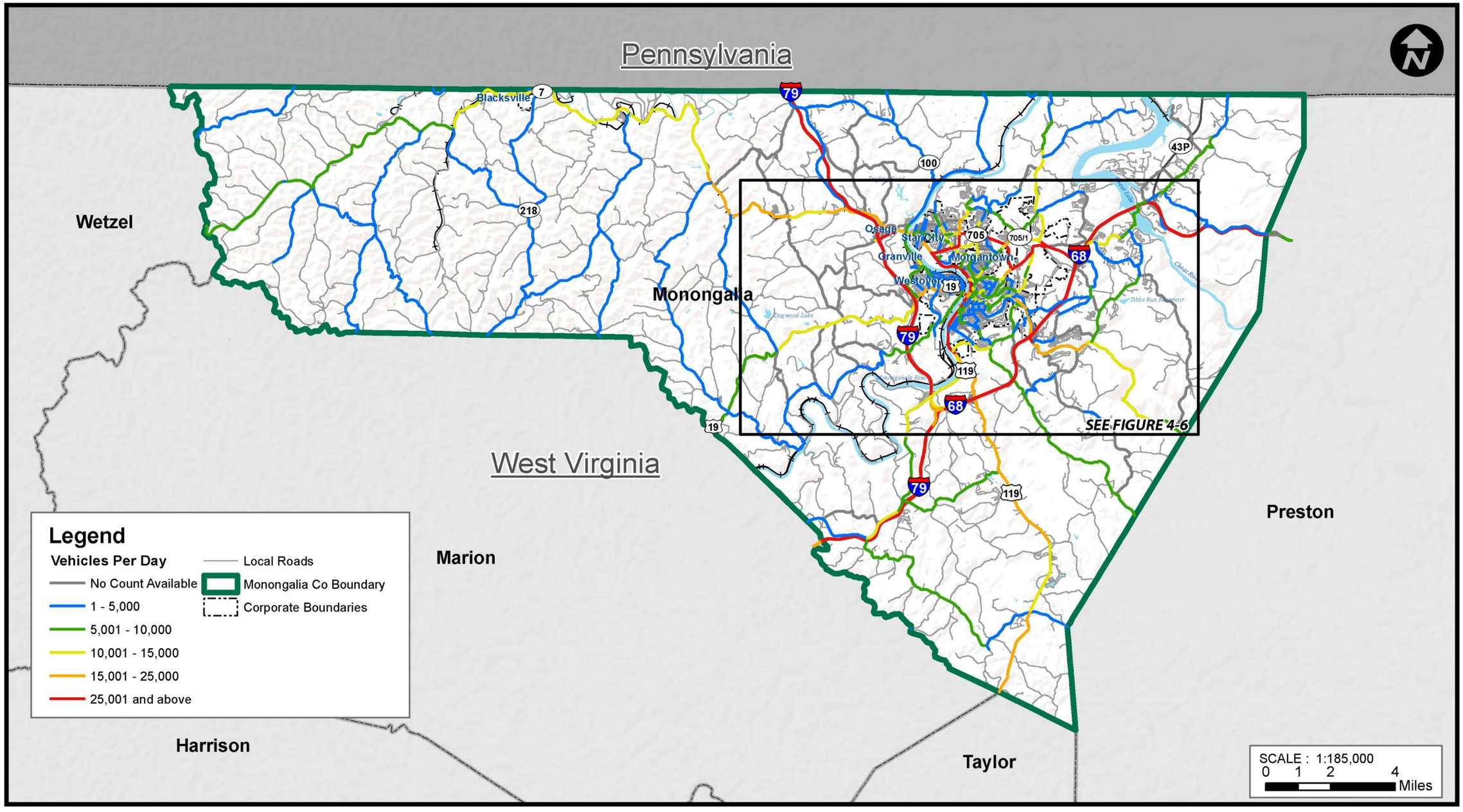
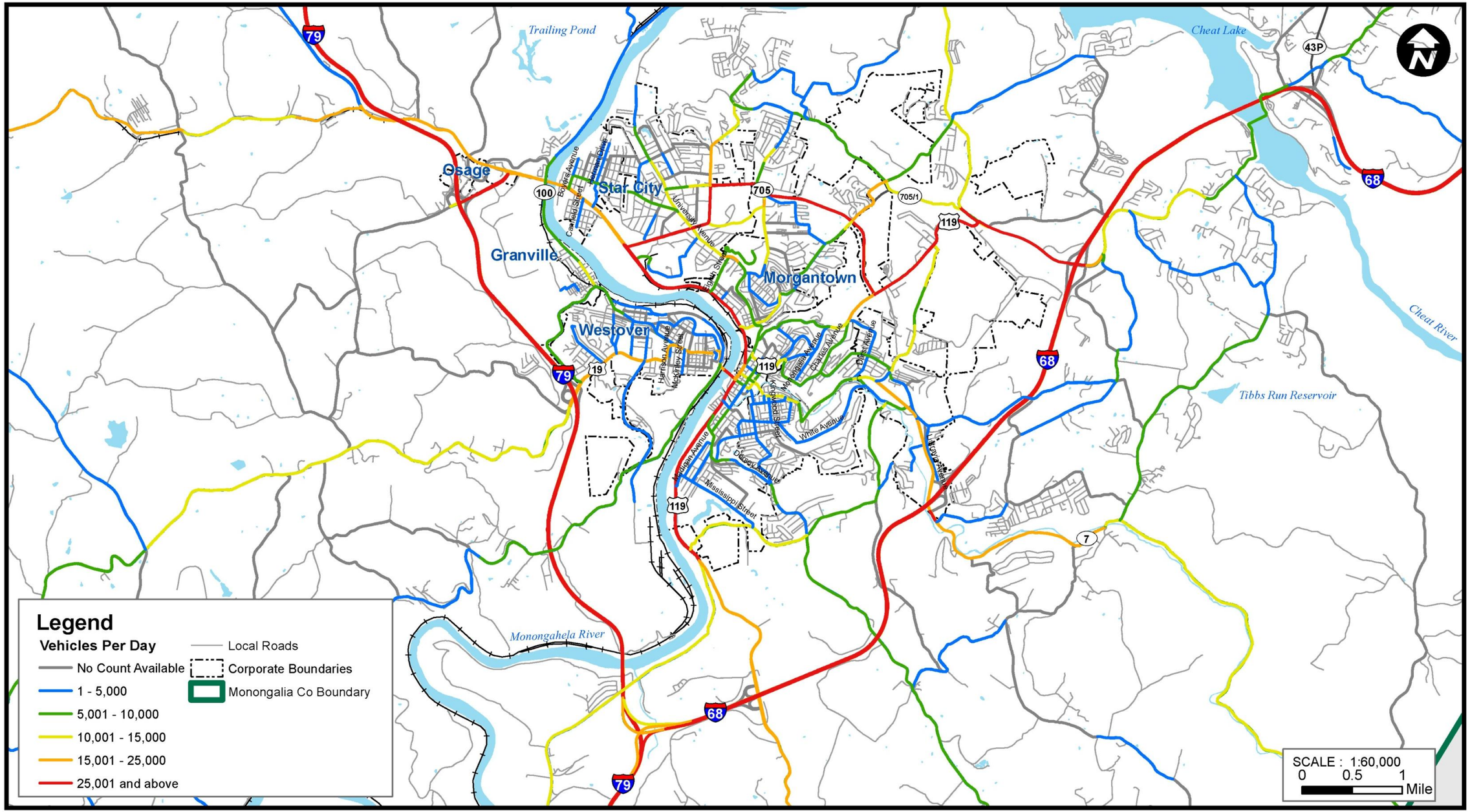


Figure 4-5. Average Daily Traffic Volumes (Inset)



4.5 Existing Roadway Capacities and Levels of Service

Capacity

Each roadway in the transportation network has a finite vehicle carrying capacity. Capacity is defined as the maximum number of vehicles that can traverse a given roadway length within a specified time frame. This capacity is affected by the speed of the facility, the width of the lanes, the number of lanes, and other roadway characteristics.

The primary factor that impacts the capacity of a roadway in an urbanized area is the operation and capacity of its intersections, which typically are the bottlenecks on an urban roadway. Roadways in Morgantown also experience a vehicle capacity reduction in key locations due to the large number of pedestrians crossing the roadway. For example, Grumbeins Island in the WVU Downtown Campus is a busy pedestrian crossing that drastically reduces vehicular capacity. Travel time increases on University Avenue during class change periods throughout the day.

Level of Service (LOS)

Level of Service (LOS) is a measure of the acceptability of roadway delay to the traveler. As defined in the Institute of Transportation Research Board's Highway Capacity Manual (HCM), when a roadway has a traffic volume that equals its maximum capacity, the travel delay incurred is typically more than is considered acceptable to the typical traveler.

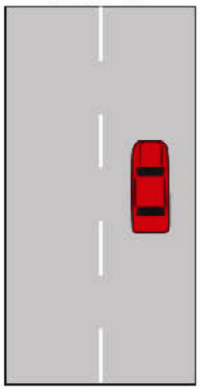
Level of Service (LOS) is the measure of effectiveness that is most often used in transportation planning to quantify the quality of service a particular roadway provides (i.e. the amount of delay experienced). For this LRTP, the LOS is evaluated based on the volume of traffic on the roadway versus established thresholds for capacities for different levels of service.

LOS is quantified using a grading system similar to what is used in schools, where "A" is the best service and "F" is the worst and often considered "failing." Table 4-2 and Figure 4-6 define and illustrate the definitions of LOS used in this LRTP.

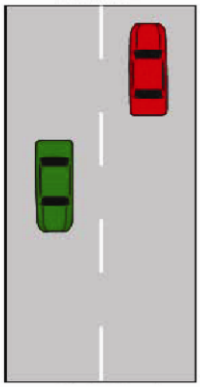
Table 4-2. Intersection LOS Definitions

LOS	Definition
A	*Free Flow, Insignificant Delays.* Very little, if any, delay incurred at intersections (< 10 seconds per vehicle). Corridor travel speed is within 10% of the free-flow operating speed (travel speed without any outside influences controlling any one driver's decision as to how fast to drive).
B	*Stable Operation, Minimal Delays*. Described as reasonably unimpeded operations. A driver's ability to maneuver within the traffic stream is only minimally restricted by other vehicles. Operating speeds are within approximately 30 percent of the free-flow speed. Typical intersection delay is between 10 and 20 seconds per vehicle.
C	*Stable Operation, Acceptable Delays.* Operations within the corridor are stable, however, a driver's ability to maneuver between lanes or make a turn, may be restricted due to needing to yield to other vehicles. Not all vehicles during every signal cycle clear the intersection (cycle failures). The average delay per vehicle at a controlled intersection ranges from 20 to 35 seconds.
D	*Restricted Flow, Regular Delays.* Reflects the limits of stable flow, and a slight change in vehicle flow may result in substantial increases in delay. The average vehicle travel speed is approximately 40 percent of the estimated free-flow speed. Queues may develop but dissipate rapidly, without excessive delays. The average intersection delay per vehicle ranges from 35 to 55 seconds.
E	*Maximum Capacity, Extended Delays*. Volumes at or near the finite capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection. Typical operating speeds in the corridor are less than 35 percent of the free-flow speed and intersection delay ranges from 55 to 80 seconds per vehicle.
F	*Forced Flow, Excessive Delays*. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

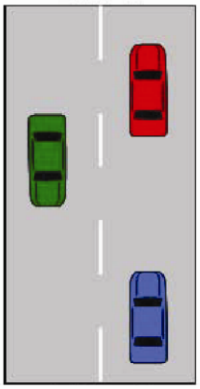
Figure 4-6. Traffic Flow Characteristics by Level of Service



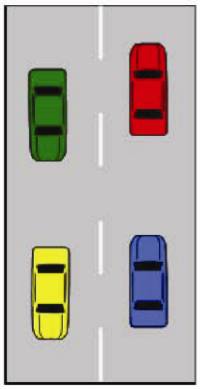
LOS A
Free flowing traffic. Your driving habits/choices are unaffected by others.



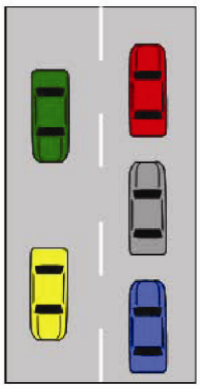
LOS B
"Stable" traffic flow – not a lot of starting and stopping or braking to maintain a comfortable distance. Driving patterns of others are noticeable.



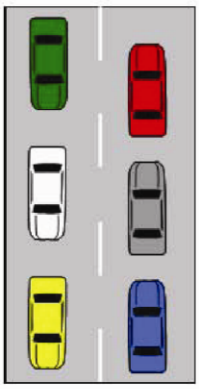
LOS C
Flow is still "stable", but many more adjustments to account for habits/ presence of other vehicles/ pedestrians. Queues form at signals, but generally clear in one cycle.



LOS D
Dense, but fairly stable flow. Your freedom to maneuver from lane to lane or through an intersection is severely restricted. Your trip comfort and convenience are highly influenced by others on the road.



LOS E
Conditions reflect "capacity" – Very few, if any additional vehicles can be accommodated. Comfort and convenience are extremely poor and driver frustration is high.



LOS F
Approaching gridlock. It takes several cycles to move through an intersection.

Source: 2000 Highway Capacity Manual, Transportation Research Board, Washington, DC

Capacity Thresholds

Estimated capacities for different facilities are documented in Table 4-3. The table includes separate capacity volumes for urbanized areas versus rural areas.

In urbanized areas, the vehicle carrying capacity of a roadway is generally expected to be lower than in other areas because of delays caused by:

- Greater number of intersections and driveways
- More traffic signals
- Greater number of pedestrian crossings
- More turns at each intersection
- More parking maneuvers

The levels of service threshold volumes are based on planning applications of the Highway Capacity Manual (HCM). The primary source used was the "2009 FDOT Quality/Level of Service Handbook" (Tables 1 and 3).

Table 4-3. Estimated Daily Roadway Capacity at Specified Level of Service

Functional Classification		Number of Thru Lanes	Level of Service Threshold Maximum Vehicles per Day			
			E	D	C	B
Urban	Interstate	4	79,400	73,600	59,800	43,500
		6	122,700	110,300	90,500	65,300
	Principal Arterial	2	*	16,500	15,400	9,600
		4	*	36,700	35,500	29,800
	Minor Arterial	2	16,200	15,200	10,500	**
		4	35,100	33,200	25,000	**
	Major Collector	2	14,900	11,900	5,100	**
		4	31,900	28,200	12,600	**
	Minor Collector	2	13,410	10,710	4,590	**
Rural	Interstate	4	63,700	59,900	50,800	37,100
		6	98,300	89,900	76,400	56,500
	Principal Arterial	2	27,600	13,800	8,100	4,500
	Minor Arterial	2	27,600	13,800	8,100	4,500
	Major Collector	2	27,600	13,800	8,100	4,500
	Minor Collector	2	27,600	13,800	8,100	4,500

*Not applicable for that level of service letter grade. Volume greater than LOS D became LOS F because intersection capacities have been reached.
**Cannot typically be achieved under urban signalized conditions.

Capacity Deficiencies

For the MMMPO region, the following thresholds of acceptable roadway capacity are assumed:

- For corridors within the urbanized area, "C" is the target LOS, but "D" is an acceptable LOS in corridors that have restricted right-of-way.
- For rural portions of the study area, LOS "C" is the minimum acceptable level of operations.

Based on the 2008 – 2011 traffic volumes and the existing roadway network, capacity deficiencies were calculated and are displayed in Figure 4-7 (County) and Figure 4-8 (urbanized area).

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Figure 4-7. Existing Capacity Deficiencies for Monongalia County

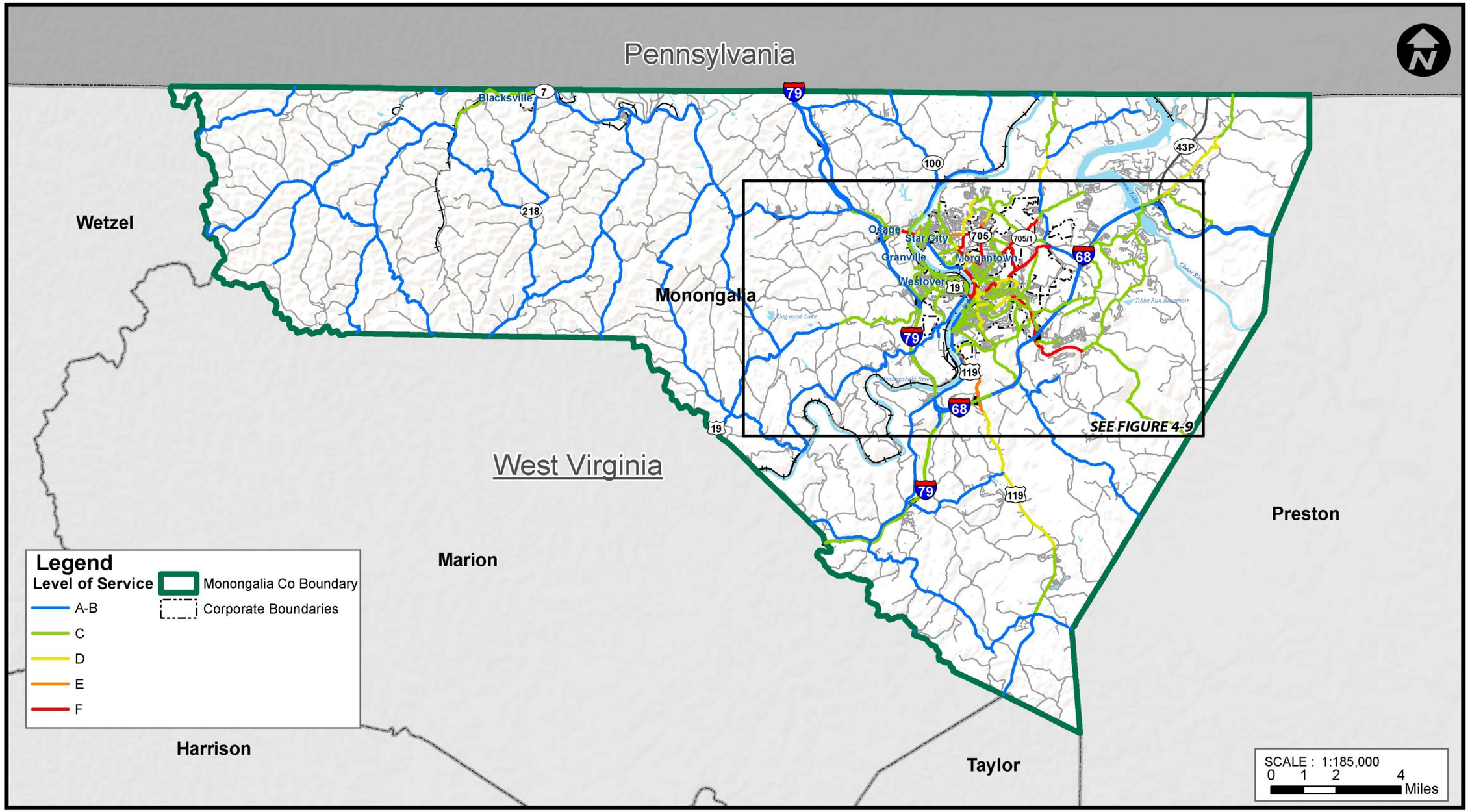
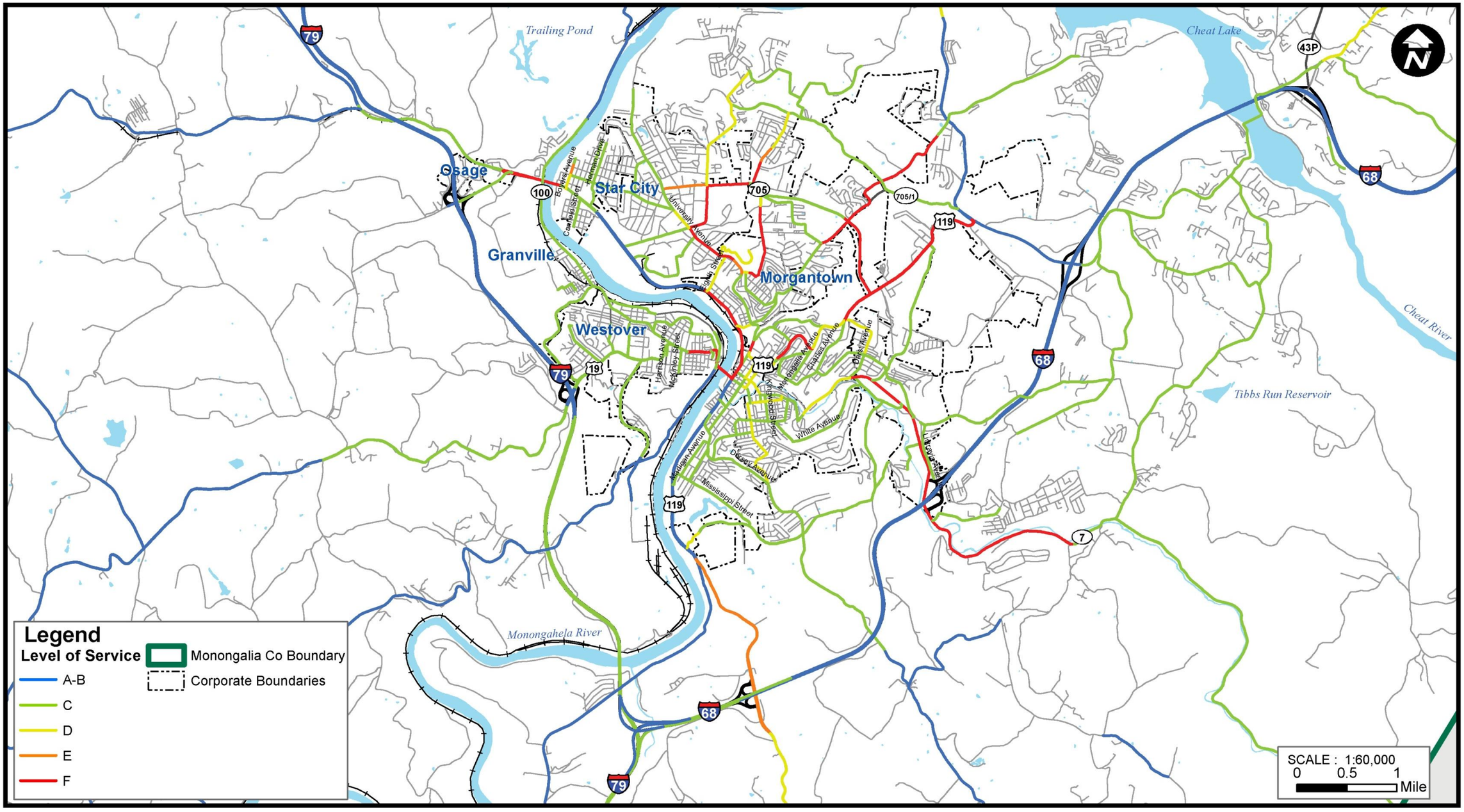


Figure 4-8. Existing Capacity Deficiencies (Inset)



Traffic operations analyses were conducted using data available from existing sources. Because there is not 100 percent coverage of the system, there are additional locations that travelers observe to be congested that are not highlighted in the figures. These locations are listed later in this chapter, based on public input received.

Table 4-4 shows the number of miles by level of service for each functional classification. The following observations of the information were noted:

- All interstate facilities operate at an acceptable LOS
- Less than 12 percent of all roadways across the functional classifications operate at a LOS D or worse
- Over half of the roadways operate in the LOS A – B range

Through analysis of the information included in the capacity deficiency figures, it was concluded that the following corridors are operating at either a LOS E or F:

- US 19 (Monongahela Blvd.) from Chaplin Hill Rd. to Boyers Ave.
- US 19 (Beechurst Ave.) from 8th St. to Pleasant St.
- US 19 (Pleasant St./Westover Bridge/Holland Ave.) from University Ave. to Lane St.
- US 119 (Mileground Rd.) from Cheat Rd. to Hampton Ave.
- US 119 (N. Willey St.) from Monongalia Ave. to Richwood Ave.
- US 119 (Grafton Rd.) from Smithtown Rd. to Fairview Cemetery
- WV 705 (Van Voorhis Rd./Chestnut Ridge Rd.) from University Ave. to Pineview Dr.
- WV 705 from Stewartstown Rd. to US 119 (Mileground Rd.)
- WV 7 (Earl Core Rd.) from Deckers Creek Blvd. to Beulah Rd.
- CR 67 (Stewartstown Rd.) from Chestnut Ridge Rd. to south of US 119 (Point Marion Rd.)
- Boyers Ave. between University Ave. and Stafford St.
- Burroughs St. from University Ave. to WV 705 (Van Voorhis Rd.)
- Pineview Drive from WV 705 (Chestnut Ridge Rd.) to Riddle St.
- Riddle St. from Pineview Dr. to Hickory St.
- Willowdale Rd. from Grove St. to Medical Center Dr.

- University Ave. from WV 705 (Patteson Dr./Van Voorhis Rd.) to North Ave.
- University Ave. from College Ave. to Willey St.

Table 4-4. Existing Mileage by Level of Service

Functional Classification	Mileage by Level of Service Category				
	A/B	C	D	E/F	Total
Interstate	45.1	22.0	0.0	0.0	67.1
Principal Arterial	38.5	16.7	2.1	9.9	67.2
Minor Arterial	5.5	32.2	13.2	11.7	62.6
Major Collector	104.2	51.0	7.8	2.3	165.3
Minor Collector	41.4	0.0	0.0	0.0	41.4
TOTAL	234.7	121.9	23.1	23.9	403.6

Functional Classification	Percentage of Mileage by Level of Service Category				
	A/B	C	D	E/F	Total
Interstate	67.2%	32.8%	0.0%	0.0%	100.0%
Principal Arterial	57.3%	24.9%	3.1%	14.7%	100.0%
Minor Arterial	8.8%	51.4%	21.1%	18.7%	100.0%
Major Collector	63.0%	30.9%	4.7%	1.4%	100.0%
Minor Collector	100.0%	0.0%	0.0%	0.0%	100.0%

Source Data from: MMMPO, WVDOT, the City of Morgantown, and WVU

Crash Data and Safety Assessment

Safety conditions for motorized vehicles in the urbanized area were assessed using crash record information obtained from the City of Morgantown who obtained the information from WVDOT. At the time of this writing crash data for areas outside the City of Morgantown were unavailable. The MMMPO has received this data from WVDOH and is in the process of updated the list of locations to include those areas outside of the City. The data used in this analysis is from June 2008 to December 2011. Table 4-5 includes the number of crashes by year as well as a daily crash rate. Out of the 4,060 crashes, there were 20 that occurred within a work zone. Table 4-6 breaks down the percentage of crashes that occurred by type of crash.

Table 4-5. Crash Totals

Date Range	Number of Crashes	Crash Rate (per day)
6/19/2008 – 12/31/2008	637	3.250
1/1/2009 – 12/31/2009	1,148	3.145
1/1/2010 – 12/31/2010	1,168	3.200
1/1/2011 – 12/11/2011	1,107	3.209
TOTAL CRASHES	4,060	3.194

Table 4-6. Crashes by Type

Crash Type	Number of Crashes	Percentage
Rear End	1,350	33.2%
Angle/Right Angle	885	21.8%
Sideswipe/Angle Same Direction	616	15.2%
Single Vehicle	561	13.8%
Sideswipe/Angle Opposite Direction	434	10.7%
Head-on	120	3.0%
Backing	94	2.3%
TOTAL CRASHES	4,060	100.0%

The key findings of the accident data review are summarized below:

- During the years analyzed, a total of 4,060 crashes occurred throughout the planning area. This equates to 3 to 4 crashes per day.
- The regional crash rate has remained steady.
- The majority of incidents are related to congestion and intersections.

Intersection Crashes

Figure 4-9 displays the crash frequency and rate results for intersections where crash data and count data were available for the assessment period. The crash information provided did not include a breakdown of crashes by severity, property damage, injury, or fatality. Table 4-7 includes the 20 intersections with the highest crash rates.

Table 4-7. Intersection Crash Frequencies and Rates

Top Crash Rate Locations			
Intersection		**Crashes**	**Crash Rate**
Top 10 Crash Intersections	Patteson Drive at Monongahela Blvd.	188	5.90
	Stewart St. at CR-67/Van Guilder St.	26	3.62
	Spruce St. at Walnut St.	49	2.05
	University Ave. at Beechurst Ave. at Fayette St.	64	1.88
	Spruce St. at Pleasant St.	35	1.80
	Patteson Drive at Laurel St.	54	1.66
	Van Voorhis Rd. at Chestnut Ridge Rd./Burroughs St.	95	1.52
	High St. at Walnut St.	31	1.37
	Fayette St. at High St.	25	1.36
	University Ave. at Stewart St./Campus Dr.	24	1.29
Other Intersections of Interest	High St. at Willey St.	27	1.28
	Earl L Core Rd. at WV-857/WV-7	41	1.20
	VanVoorhis Rd. at Christy St.	51	1.17
	VanVoorhis Rd./Patteson Dr. at University Ave.	72	1.04
	University Ave. at College Ave.	21	1.04
	University Ave. at 8th Ave.	29	1.04
	University Ave. at Pleasant St.	36	0.92
	High St. at Pleasant St.	19	0.88
	University Ave. at Walnut St	37	0.86
	Van Voorhis Rd. at Elmer Prince Dr.	41	0.77

Source: WVDOT (June 2008 - December 2011)

Crash rate is determined as the number of crashes per million vehicles entering the intersection.

Roadway Section Crashes

Table 4-8 shows the roadway sections with the highest frequency of crashes.

Table 4-8. Roadway Section Crashes

Roadway Corridor	Length (miles)	Number of Crashes	Crashes per Mile
US 119 from Cheat Road to Smithtown Road	5.5	720	130.9
From Cheat Road to Spruce Street	3.0	95	36.5
From the intersection of Willey Street at Spruce Street to Don Knotts Boulevard at Foundry Street	0.7	497	710.0
Don Knotts Boulevard from Foundry Street to Smithtown Road	1.8	128	71.1
WV 705 from US 19 to Pineview Drive	1.7	698	410.6
Patteson Drive from US 19 to Van Voorhis Road	0.7	358	511.4
Van Voorhis Road from Patteson Drive to Chestnut Ridge Road	0.5	184	368.0
Chestnut Ridge Road from Van Voorhis Road to Pineview Drive	0.5	273	546.0
US 19 from Chaplin Hill Road to Patteson Drive	3.7	627	169.5
Monongahela Boulevard from Chaplin Hill Road to Patteson Drive	1.4	68	48.6
Beechurst Avenue from Patteson Drive to University Avenue	1.8	286	158.9
University Avenue from Beechurst Avenue to West Park Avenue	0.5	273	546.0
WV 7 from I-68 EB on ramp to University Avenue	3.3	503	152.4
Earl Core Road from I-68 EB on ramp to WV 857 (Hartman Run Road)	1.5	170	113.3
Earl Core Road/Rogers Avenue/East Brockway Avenue/Brockway Avenue from WV 857 to University Avenue	1.8	333	185.0

It should be noted that several of these corridors overlap each other, so a particular crash may be included in more than one corridor.

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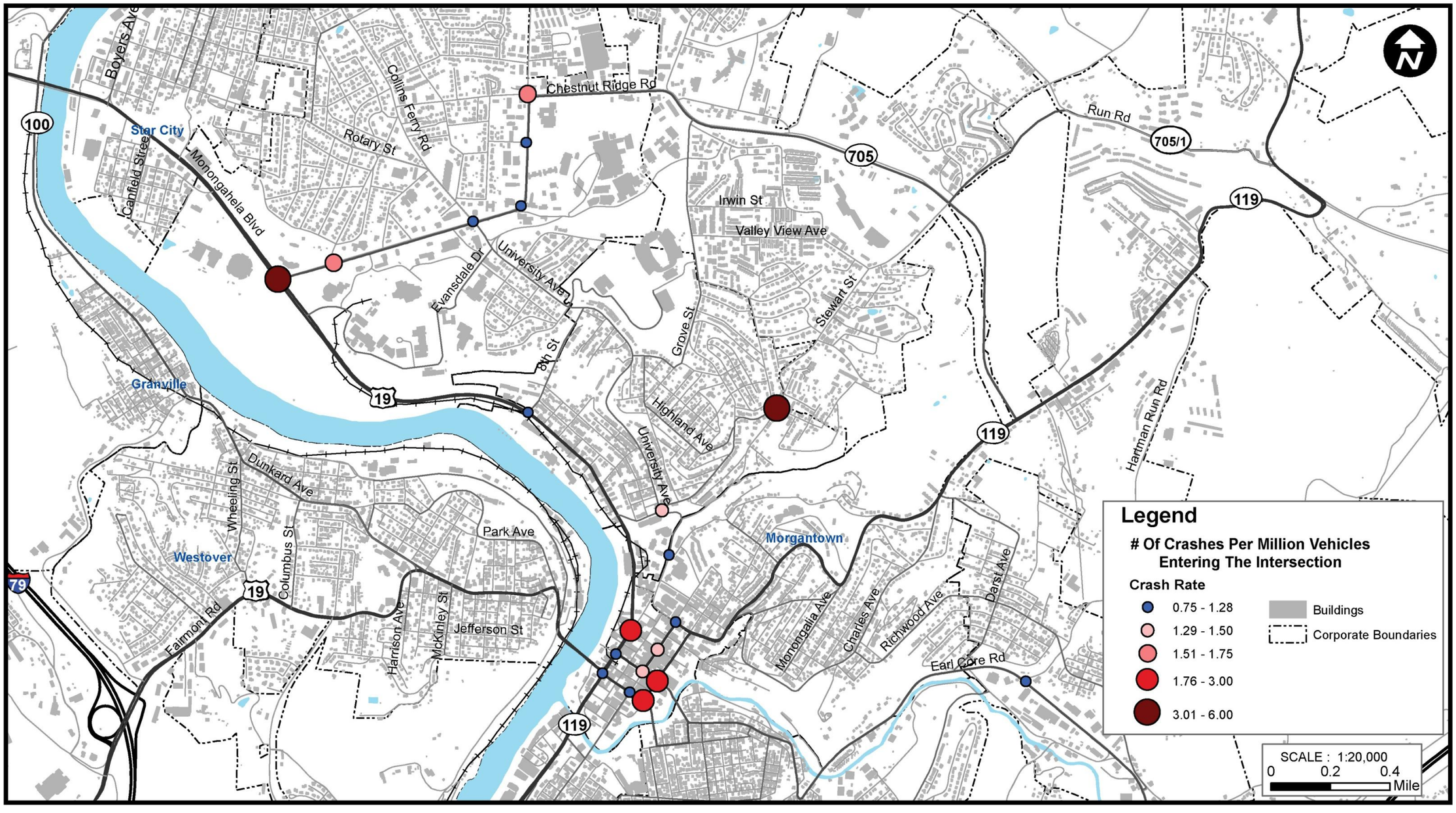
Figure 4-9. Crash Locations



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4.6 Public Transportation

Overview

The Mountain Line Transit Authority (MLTA) is the primary provider of public transportation service within Morgantown and Monongalia County offering deviated fixed-route, flex-route, and dial-a-ride service seven days a week, 365 days a year. West Virginia University (WVU) also provides public transportation service within Morgantown and Monongalia County offering a variety of shuttles and buses as well as a unique fixed-guideway system known as Personal Rapid Transit (PRT). The following section provides an evaluation of the existing MLTA and WVU services in terms of service coverage, hours of operation, and service frequency as well as a brief description of other transit services in the area.

Mountain Line Transit Authority (MLTA)

The MLTA was established in 1996 as a merger between the City of Morgantown Transit service and the Monongalia Transit service. The MLTA is governed by a seven member Board of Directors appointed by the City of Morgantown and the Monongalia County Commission. The MLTA receives additional input from a citizen's advisory committee and the general public during monthly board meetings. Meeting minutes dating back to October 1997 are available on the MLTA website at www.busride.org. MLTA is publicly supported and funded. The Federal Transit Authority (FTA), WVU, the Monongalia County Commission, and Morgantown City Council subsidize the cost of each ride.

Fixed Routes Service

MLTA operates 20 deviated fixed-routes within Morgantown and Monongalia County. All MLTA fixed-route buses provide for deviations from the fixed-routes of up to three-quarters of a mile to pick up patrons at a location of their choosing. Patrons can call as little as 15 minutes before pickup to request the deviation.

Most routes operate Monday through Friday between 6:00 a.m. and 6:00 p.m. with limited service provided on Saturdays and Sundays. The current fixed-routes are illustrated in Figure 4-10.

The following is a summary of MLTA's fixed route services.

Rural Service. MLTA has three routes that connect the smaller communities and rural areas of Monongalia County with Morgantown. Each route is offered only a few times each day with several hours between each trip.

- Crown Bus Route 13 serves the western part of the County, traveling west along Fairmont Road through Westover, then east along River Road through Everettville and Booth. Service is offered three times daily, Monday through Friday, beginning at 7:00 a.m., 1:00 p.m., and then in reverse direction at 5:15 p.m.
- Mountain Heights Bus Route 14 serves the southeastern part of the County, traveling east along Summer School Road, then west along Kingwood Pike. Service is offered five times a day, Monday through Friday, beginning at 8:05 a.m., 11:30 a.m., 1:30 p.m., 2:05 p.m., and then in reverse direction at 4:15 p.m. Service is also offered twice on Saturday beginning at 8:05 a.m. and 2:05 p.m.
- Grafton and Fairmont Road Bus Route 15 serves the southern part of the County, traveling south along Grafton Road, west along Halleck Road, then north along Smithtown Road. Service is offered twice a day, Monday through Friday, beginning at 9:10 a.m. and then in reverse direction at 3:05 p.m.

There are at least three other routes that provide service between the rural areas of Monongalia County and Morgantown, including Tyrone Road Bus Route 8, Cassville Bus Route 11, and the Blue Line Bus Route 12. Given the hours of service and service frequencies offered by these routes, as well as their primary service areas within the urban area of Morgantown, they are evaluated along with the urban core routes.

Urban Core Service. MLTA has nine routes that serve the densely populated areas of Morgantown. Most of the urban core service routes operate Monday through Friday between 6:00 a.m. and 6:00 p.m. on 60 to 120 minute headways depending on the route and the time of day. Hours of service and service frequencies are reduced on those routes that offer Saturday service. Table 4-9 summarizes the MLTA's urban core routes.

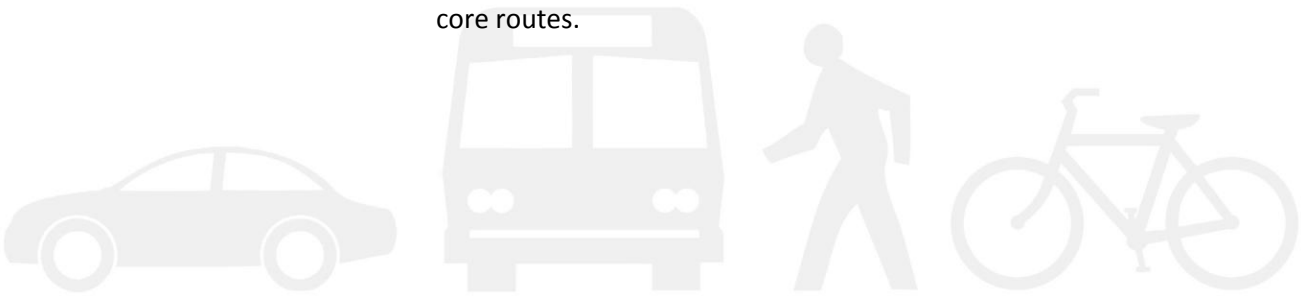

Table 4-9. MLTA Urban Core Routes

Route No.	Route Name	Days	Hours of Service	Service Frequency (Min)
3	Green Line	Mon thru Sat	8:00 a.m. to 6:04 p.m.	60[1]
6	Gold Line Hospital Bus	Mon thru Sat	6:00 a.m. to 5:55 p.m.	60[1]
8	Tyrone Road	Mon thru Sat	6:30 a.m. to 6:14 p.m.	90[1]
9	Purple Line	Mon thru Sat	7:00 a.m. to 5:50 p.m.	80[1]
10	Brown Line	Mon thru Fri	8:00 a.m. to 4:45 p.m.	120
11	Cassville	Mon thru Sat	6:00 a.m. to 5:55 p.m.	30[1]
12	Blue Line	Mon thru Sat	6:30 a.m. to 5:47 p.m.	60[1]
16	Pink Line	Mon thru Sat	7:40 a.m. to 5:00 p.m.	80[1]
30	West Run Express	Mon thru Fri	7:10 a.m. to 5:10 p.m.	20

1. Hours of service and service frequency are reduced on Saturday.

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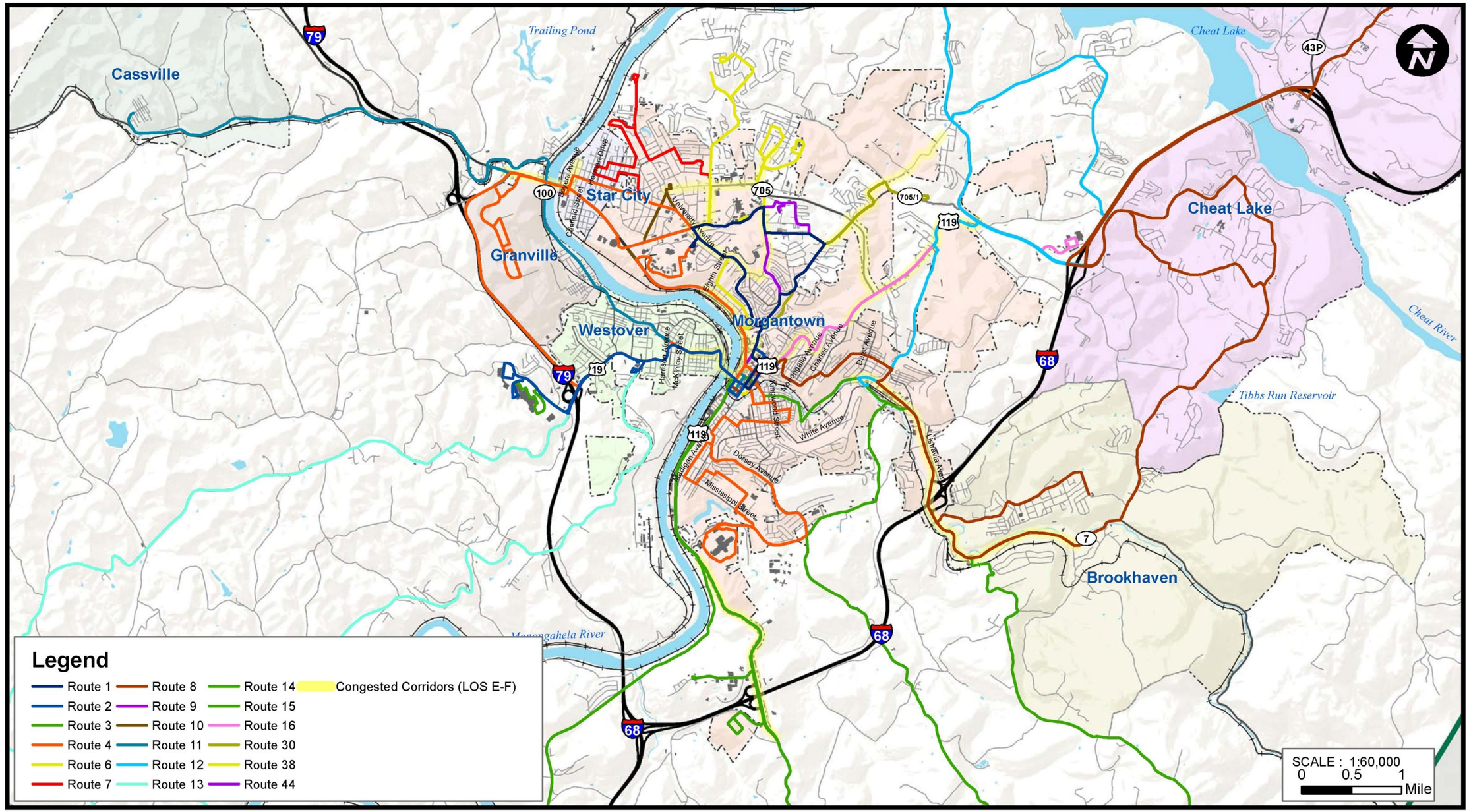
Figure 4-10. MLTA Fixed-Route Service



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Service to WVU Campuses. MLTA has seven routes that connect WVU students, faculty and staff to key on- and off-campus locations. Similar to MLTA's urban core routes, hours of service and service frequencies vary by route and by time of day. However, three routes – Campus PM, Blue & Gold, and Valley View – operate on 10 to 15 minute headways throughout most of the day providing frequent service between campus locations. Table 4-10 summarizes the MLTA's WVU routes.

Table 4-10. MLTA WVU Routes

Route No.	Route Name	Days	Hours of Service	Service Frequency (Min)
1	Campus PM	Thu thru Sat	6:00 p.m. to 3:10 a.m.	10
2	Downtown Mall PM	Mon thru Sat	6:00 p.m. to 12:12 a.m.	60
4	Orange Line	Mon thru Sat	7:00 a.m. to 11:08 p.m.	60
6	Gold Line Mountain Valley	Mon Thru Fri	6:30 a.m. to 9:48 p.m.	60
7	Red Line	Mon thru Sat	6:20 a.m. to 5:45 p.m.	80[1]
38	Blue & Gold	Mon thru Sun	6:40 a.m. to 8:50 p.m.	20[2]
44	Valley View	Mon thru Fri	7:30 a.m. to 2:30 p.m.	15

1. Hours of service and service frequency are reduced on Saturday.
2. During regular WVU sessions, Route 38 operates on 10 minute headways between 8:10 a.m. to 3:10 p.m.

While a majority of the routes shown in Table 4-9 also provide service to WVU campus locations, the routes shown in Table 4-10 have been specifically designed to accommodate the needs of WVU students, faculty, and staff. MLTA also provides a "quick-start guide," including a map and schedule of the WVU routes for reference.

Pittsburgh Airport Service. Grey Line Bus Route 29 is an intercity route that provides service to the Pittsburgh Airport. The route operates two trips per day, 365 days a year. The route begins in Westover at 6:15 a.m., travels south on I-79 to Clarksburg, then returns north stopping in Fairmont, Westover, Morgantown, WV, and Waynesburg, PA before continuing to the Pittsburgh Airport.

Transit Stops

MLTA primarily operates as a flag stop system, in which passengers can board a bus anywhere along a route by flagging down the driver as the bus approaches. The timetables MLTA provides for each route represent scheduled time points during which passengers can expect a bus along a route. The only exceptions are Mountain Line's two express routes: the West Run Express Route 30 and the Blue & Gold Connector Route 38. Both buses only stop at designated stops to maintain schedules.

Flex-Route & Dial-a-Ride Service

MLTA's NewFit program consolidates all of the flex-route, dial-a ride, and on-demand services available to residents of Morgantown and Monongalia County under one organization. NewFit provides curb-to-curb and door-to-door services to medical appointments and work/training opportunities to all residents and residents with disabilities are given priority. NewFit operates Monday through Friday from 6:00 a.m. to 5:30 p.m.

Transit Ridership

MLTA provided ridership projections for 12 of their 20 existing routes and services as well as their NewFit program. Based on the projections, ridership is expected to increase by 15 percent between 2013 and 2014 and then by an additional 6 percent between 2014 and 2015.

Proposed Route Changes for 2013

MLTA has proposed the addition of several new routes for 2013. Many of the routes combine components of existing routes while increasing service hours and frequency. The following is a summary of the proposed route changes for 2013.

- The proposed Blue Line will combine portions of the Purple Line Bus Route, Tyrone Bus Route 8, and others. The new route will provide service between downtown Morgantown, Evansdale, and eastern Monongalia County, Monday through Friday between, 7:30 a.m. and 11:00 p.m. on 30-minute headways.
- The proposed Brown Line will combine portions of the Cassville Bus Route 11 and the Blue Line Bus Route 12. The new route will provide service between Cassville and northern Monongalia County, Monday through Friday, between 5:30 a.m. and 9:00 p.m. on 30 minute headways.
- The proposed Green Line will combine portions of the Grafton-Fairmont Road Bus Route 15, Tyrone Road Bus Route 8, and others. The new route will provide service between the southern part of Monongalia County and Brookhaven, Monday through Friday, between 6:30 a.m. and 9:42 p.m. on 30-minute headways. This represents a significant increase in the amount of service to southern Monongalia County from two trips per day to 30.
- The proposed Orange Line follows essentially the same route as the existing Orange Line, with the exception of the current Day-Time

Orange segment that serves the Westover Terminal and the Morgantown Mall. This segment of the existing route has been removed. Additional route changes include the expansion of service hours and reduced headways. The Orange Line will operate from 6:30 a.m. to 11:30 p.m. on 30-minute headways.

- The Proposed Pink Line will combine the Pink Line Bus Route 16 with the Crown Line Bus Route 13. The new route will operate Monday through Friday between 6:30 a.m. and 9:25 p.m. on 60-minute headways. This represents a significant increase in service along the existing Crown Line from three routes per day to 14.
- The proposed Silver Line will combine components of the Mountain Heights Bus Route 14 and the Grafton-Fairmont Road Bus Route 15. The new Route will provide service between the southern part of Monongalia County and downtown, Monday through Friday, from 7:00 a.m. to 10:55 p.m. on 30-minute headways.

West Virginia University (WVU)

Personal Rapid Transit (PRT). WVU's PRT system is an Automated Guideway Transit (AGT) system that uses small computer driven cars to transport passengers to one of five stations located along its 8.7-mile route. The stations include the Walnut Street and Beechurst Avenue stations located on WVU's downtown campus, and the Engineering Science, Evansdale Residential Complex, and Health Sciences stations located on WVU's Evansdale campus. During peak time periods the cars operate on a fixed schedule.

During off-peak times the cars operate on demand and will arrive at a station within five minutes of swiping a University-affiliated Mountaineer Card or employee ID. The PRT operates Monday through Friday, from 6:30 a.m. to 10:15 p.m., and on Saturdays from 9:30 a.m. to 5:00 p.m. Service is not provided on Sundays, University holidays or during WVU break periods. According to WVU, approximately 15,000 people ride the PRT during the school year every day.

Shuttles and Buses. In addition to the PRT, WVU operates two campus shuttles. The Sunday Shopping Shuttle operates during Fall and Spring semester to and from various shopping and entertainment destinations around Morgantown. The shuttle operates on Sunday from 12:00 p.m. to 9:27 p.m. on 60-minute headways. The Coliseum/Engineering PRT Shuttle operates between the Morgantown Coliseum and the Engineering PRT Station, Monday through Friday, between 7:30 a.m. and 6:00 p.m. on 10-minute

headways. Service is not provided on Sundays, major holidays or when WVU is out of session.

PRT Facilities Master Plan. WVU prepared the PRT Facilities Master Plan in June 2010. The plan provides an assessment of the PRT's impact on the transportation system as well as an evaluation of various alternatives for improving and potentially expanding service. The plan concludes with recommendations to replace the existing PRT vehicles, purchase a new Automatic Trains Control System, and update the guideway and PRT Stations. The plan also includes a financing component that provides an overview of potential funding sources for improving and expanding the PRT system.

Other Transit Service Providers

Buckwheat Express. The Buckwheat Express provides public transportation service to residents of Preston County, West Virginia, including one fixed-route service that transports residents to Morgantown. The Kingwood-Morgantown-Terra Alta route operates Monday through Friday and arrives at the Mountain Line Depot at 9:50 a.m., 2:40 p.m. and 5:10 p.m.

Fairmont-Marion County Transit Authority. The Fairmont-Marion County Transit Authority (FMCTA) provides public transportation service to residents of Fairmont and Marion County, West Virginia, including one fixed-route service that transports residents to Morgantown. The Ruby Memorial Bus operates Monday through Friday and arrives at the Mountain Line Depot at 7:40 a.m., 11:25 a.m., 3:35 p.m. and 5:40 p.m. The Ruby Memorial Bus has three additional stops located within Morgantown, including the Ruby Memorial Hospital, the Health Sciences Center at West Virginia University, and the Morgantown Courthouse.

Fayette Area Coordinated Transportation. Fayette Area Coordinated Transportation (FACT) provides public transportation service to residents of Fayette County, PA, including one route that transports residents to Morgantown. The Morgantown route operates Monday through Friday and arrives at the Mountaineer Station, located adjacent to WVU, at 7:30 a.m., 9:30 a.m., and 5:00 p.m.

In Touch and Concerned. In Touch and Concerned is a nonprofit agency that provides door to door transportation service to appointments and the grocery store for the elderly within Morgantown and Monongalia County.

Transit Level-of-Service

The transit level-of-service analysis is based on the methodology described in the Transportation Research Board's *TCRP Report 100: Transit Capacity and Quality of Service Manual* (*TCQSM*). Chapter 3 of the TCQSM provides an extended discussion on quality of service, which is the evaluation of transit service from the passenger's point of view.

The *TCQSM* uses six measures to quantify service quality. Each of these measures is assigned a letter value, where LOS A represents the best service from the passenger perspective and LOS F represents the worst service. *(Note that high LOS values, such as LOS A or B, may not reflect optimal service from the transit agency's perspective, because the market may not support those service levels. The development of agency service standards helps to bridge the gap between the kind of service passengers would ideally want and the kind of service that is reasonable to provide, given available resources.)*

The transit LOS approach mirrors the system commonly used for streets and highways, and allows a speedy comparison of service performance to transit passenger desires. Of the six available measures, three were selected for this analysis as being most relevant to a long-range planning effort. Table 4-11 summarizes the TCQSM measures used and the ranges of values used to determine the LOS result for each measure.

Table 4-11. Transit Capacity and Quality of Service Manual - Level of Service (LOS) Measures

Level of Service	Transit Capacity and Quality of Service Measures		
	Frequency (minutes)	Hours of Service	Service Coverage
LOS A	<10	19-24	90.0-100.0%
LOS B	10-14	17-18	80.0-89.9%
LOS C	15-20	14-16	70.0-79.9%
LOS D	21-30	12-13	60.0-69.9%
LOS E	31-60	4-11	50.0-59.9%
LOS F	>60	0-3	<50.0%

Service Frequency. From the user's perspective, service frequency determines how many times an hour a user has access to the transit mode, assuming that transit service is provided within acceptable walking distance (measured by service coverage) and at the times the user wishes to travel (measured by *hours of service*). Service frequency also measures the convenience of transit service to choice riders and is one component of overall transit trip time (helping to determine the wait time at a stop).

- At LOS A, passengers are assured that a transit vehicle will arrive soon after they arrive at a stop. The delay experienced if a vehicle is missed is low.
- At LOS B, service is still relatively frequent, but passengers will consult schedules to minimize their wait time at the transit stop.
- Service frequencies at LOS C still provide a reasonable choice of travel times, but the wait involved if a bus is missed becomes long.
- At LOS D, service is only available about twice per hour and requires passengers to adjust their routines to fit the transit service provided.
- The threshold between LOS E and F is service once per hour; this corresponds to the typical analysis period and to the minimum service frequency applied when determining hours of service LOS. Service at frequencies greater than 1 hour entails highly creative planning or considerable time wasted on the part of passengers.

Table 4-12 summarizes the transit LOS analysis results for service frequency. As shown, a majority of MLTA's existing routes currently operate at LOS E.

Table 4-12. Service Frequency Level-of-Service Analysis

Routes	Service Frequency (Min)	Composite LOS
Campus PM Route 1	10	B
Downtown Mall PM Route 2	60	E
Green Line Route 3	60	E
Orange Line Route 4	60	E
Gold Line Route 6 – Mountain Valley	60	E
Gold Line Route 6 – Hospital Bus	60	E
Red Line Route 7	80	F
Tyrone Bus Route 8	90	F
Purple Line Bus Route 9	80	F
Brown Line Bus Route 10	120	F
Cassville Bus Route 11	30	D
Blue Line Bus Route 12	60	E
Pink Line Bus Route 16	80	F
Blue & Gold Bus Route 38	20	C
Valley View Bus Route 44	15	C

Hours of Service. Hours of service, also known as "service span," is simply the number of hours during the day when transit service is provided along a route, a segment of a route, or between two locations. It plays as important a role as frequency and service coverage in determining the availability of transit service to potential users. If transit service is not provided at the time of day a potential passenger needs to take a trip, it does not matter where or how often transit service is provided the rest of the day.

- At LOS A, service is available for most or all of the day. Workers who do not work traditional 8-to-5 jobs receive service and all riders are assured that they will not be stranded until the next morning if a late-evening bus is missed.
- At LOS B, service is available late into the evening, which allows a range of trip purposes other than commute trips to be served. Bus service runs only into the early evening at LOS C levels, but still provides some flexibility in one's choice of time for the trip home.
- Service at LOS D levels meets the needs of commuters who do not have to stay late and still provides service during the middle of the day for others.
- At LOS E, midday service is limited or non-existent and/or commuters have a limited choice of travel times. Finally, at LOS F, transit service is offered only a few hours per day or not at all.

Table 4-13 summarizes the transit level-of-service analysis results for hours of service. As shown, a majority of MLTA's existing routes currently operate at LOS E.

Table 4-13. Hours of Service Level-of-Service Analysis

Routes	Hours of Service	Composite LOS
Campus PM Route 1	9	E
Downtown Mall PM Route 2	6	E
Green Line Route 3	10	E
Orange Line Route 4	16	C
Gold Line Route 6 – Mountain Valley	15	C
Gold Line Route 6 – Hospital Bus	12	D
Red Line Route 7	11	E
Tyrone Bus Route 8	12	D
Purple Line Bus Route 9	11	E
Brown Line Bus Route 10	9	E
Cassville Bus Route 11	12	D
Blue Line Bus Route 12	11	E
Pink Line Bus Route 16	9	E
West Run Express Bus Route 30	10	E
Blue & Gold Bus Route 38	14	C
Valley View Bus Route 44	7	E

Service Coverage

Service coverage is a measure of the area within walking distance of transit service. Based on the TCQSM, areas must be within 1/4-mile of a bus stop (or route in the case of MLTA) or 1/2 mile of a transit station to be considered an area served by transit. As with the other availability measures, service coverage does not provide a complete picture of transit availability by itself, but when combined with frequency and hours of service, it helps identify the number of opportunities people have to access transit from different locations

Service coverage LOS evaluates the percentage of **transit-supportive areas (TSA)**—areas that would typically produce the majority of a system's ridership—that are served by transit.

To qualify as a transit-supportive area (TSA) one of the following thresholds must be met:

- Minimum population density of three households/gross acre; or
- Minimum job density of four employees/gross acre.

Figure 4-11 displays the population density of Morgantown and the surrounding area. Areas with a population density of less than three households per acre are shown in white, while areas with a population density of three or more households per acre are shown in dark red. The areas shown in dark red are TSAs.

Similarly, Figure 4-12 displays the workforce density as well as the locations of major employers of Morgantown and the surrounding area. Areas with a workforce density of less than four jobs per acre are shown in white and areas with a workforce density of four or more jobs per acre are shown in dark red. Areas shown in dark red are TSAs.

Figure 4-13 displays the TSAs served within Morgantown. Areas defined as transit supportive that have service are shown in green. Areas defined as transit supportive but are lacking service are shown in red. Areas that have transit service, but do not qualify as a TSA, are shown in orange.

The large area shown in red located north of WV 705 is currently undeveloped forest land (the population and employment densities within the census block that incorporate this area are sufficient to support transit with the entire area). However, if this area develops it would require additional transit routes, or new pathway connections to existing transit routes, to be served.

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Figure 4-11. Population Density

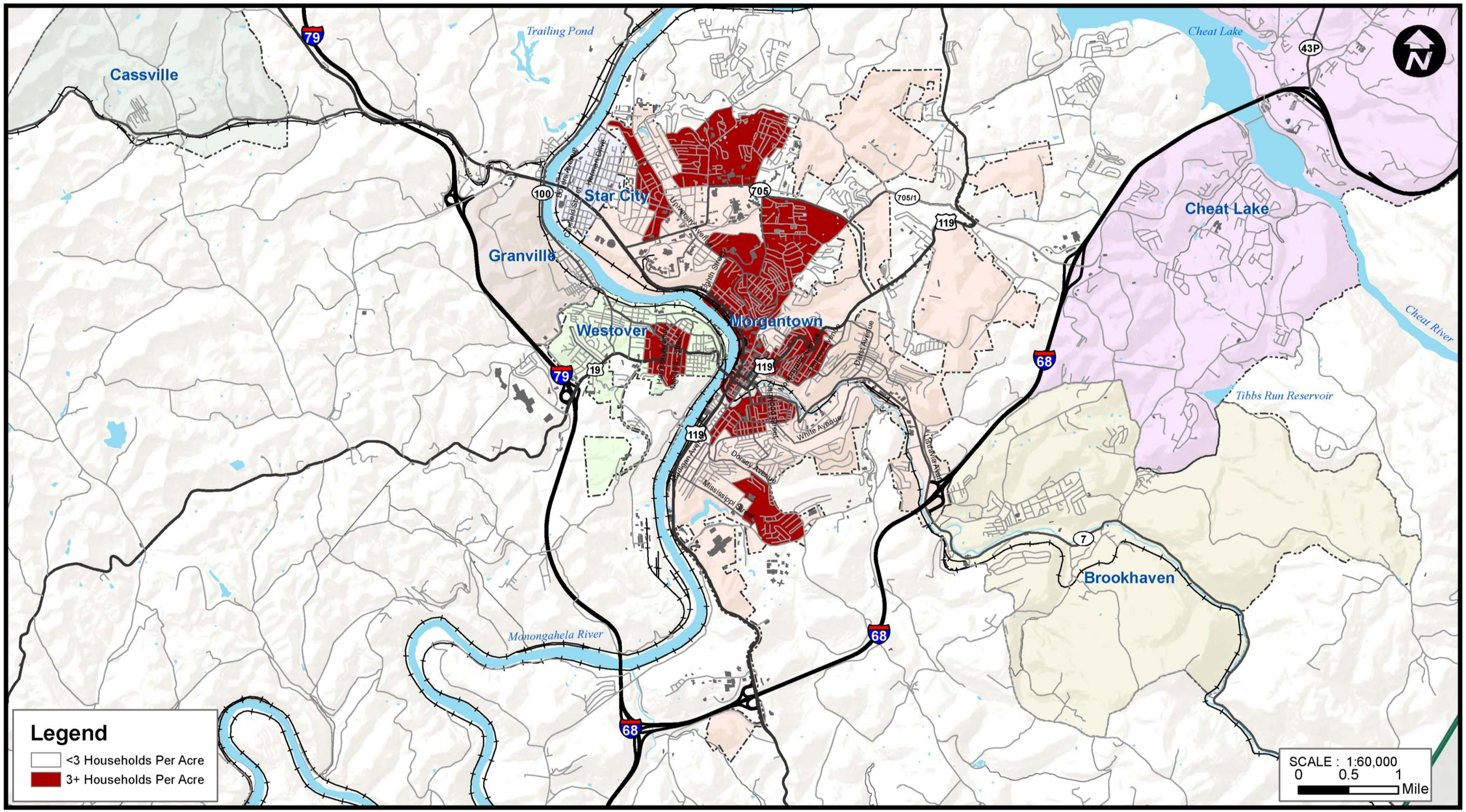


Figure 4-12. Employment Density

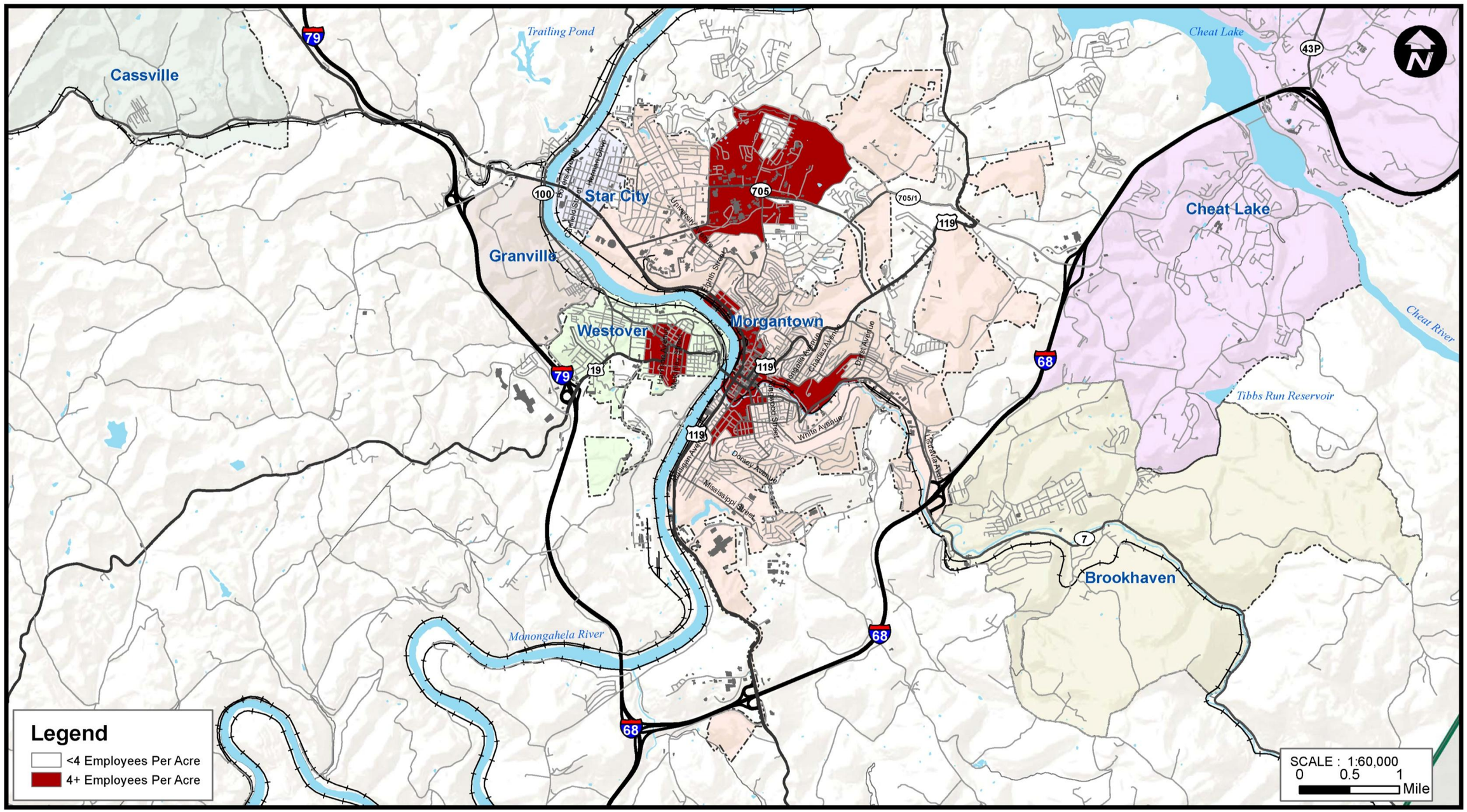
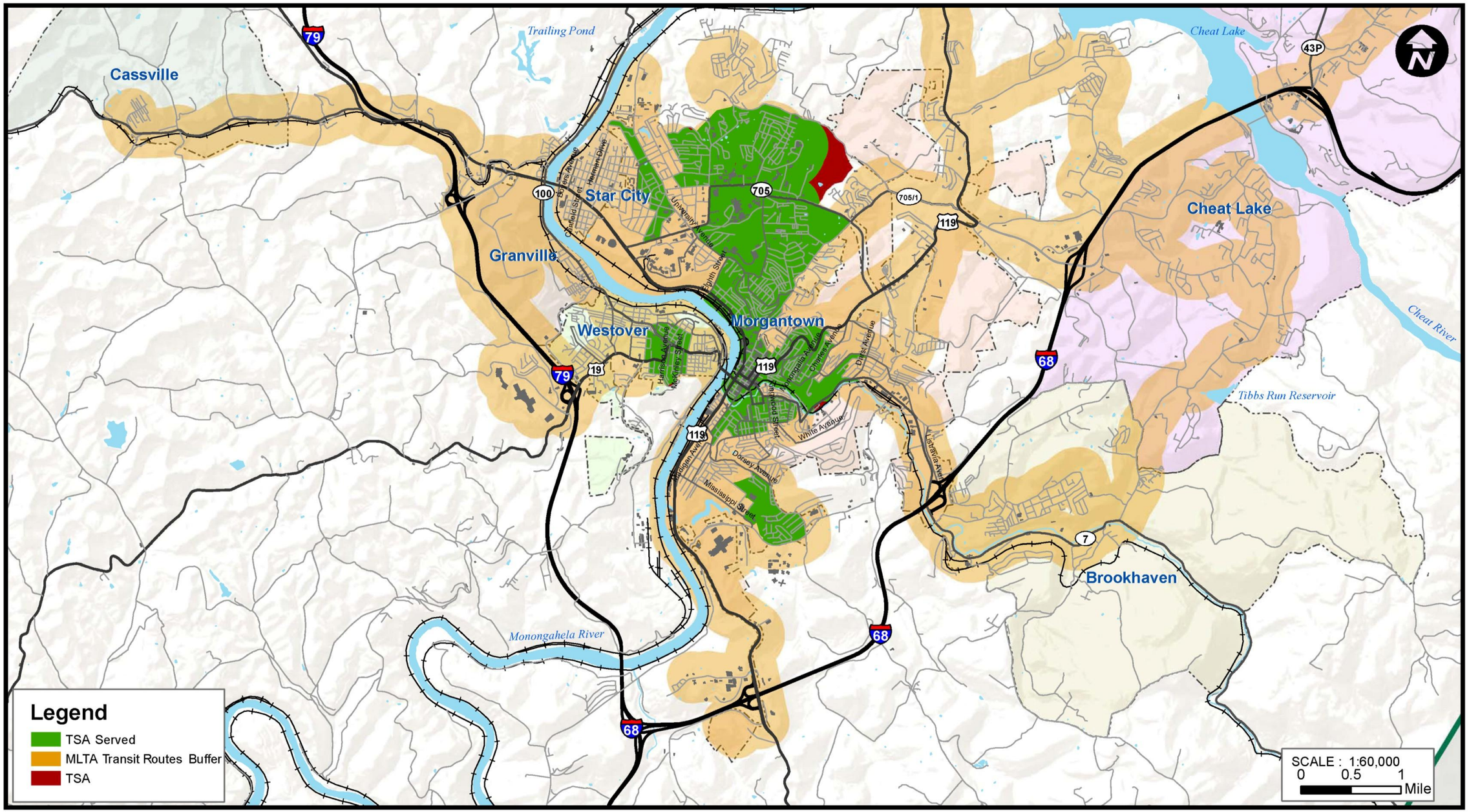


Figure 4-13. Transit Service Coverage



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Service coverage is an all-or-nothing issue for transit riders—either service is available for a particular trip or it is not. As a result, there is no direct correlation between service coverage LOS and what a passenger would experience for a given trip. Rather, service coverage LOS reflects the number of potential trip origins and destinations available to potential passengers. At LOS A, 90 percent or more of the TSAs have transit service; at LOS F, less than half of the TSAs have service.

The percentage of TSAs served within Morgantown and the corresponding LOS has been identified using the Transit Level of Service (TLOS) methodology. As shown in Table 4-14, the percent of transit supportive population areas served is 99 percent and the percent of transit supportive employment areas served is 97 percent. The corresponding LOS is A according to TLOS methodology. However, this should be understood as a metric that does not always consider real-world conditions such as topography, directness of routes to transit stops, and other factors that affect the user experience. Although TLOS methodology suggests a high level of service for Morgantown's TSAs, the actual user experience may be different.

Table 4-14. Service Coverage Analysis

Area Type	Population	Employment
Transit Supportive Area (TSA)[1]	28,011	18,747
Transit Supportive Areas Served[2]	27,592	18,129
Percent TSA Served by Transit	99%	97%
Level of Service	A	A
Transit Supportive Areas without service	419	618

1. Area shown in green and red Figure 4-13.
2. Area shown in green in Figure 4-13.

As shown in Table 4-14, 419 people and 618 jobs are located within TSAs that do not have transit service. These areas currently have a population and/or employment density that can support transit service and therefore should be included in future efforts to improve service routes and stop locations.

Table 4-15. Service Coverage Analysis (continued)

Area Type	Population	Employment
Transit Area Served[1]	55,132	30,225
Transit Supportive Areas Served	27,592	18,129
Additional Areas Served	27,540	12,096

1. Area shown in green and orange in Figure 4-13

As shown in Table 4-15, 55,132 people within Monongalia County, or approximately 57 percent of the total population (total population 96,300), are currently served by transit. Of the total area served, 27,540 people and 12,096 jobs are located within areas that have transit service, but currently do not have the population and/or job density necessary to support transit service.

Level-of-Service (LOS) Summary

Deficiencies within the MLTA's transit system are discussed in three areas: service frequency, service hours, and service coverage.

- Service Frequency: MLTA's fixed-route service currently operates at LOS E throughout the day with respect to frequency. Although the LOS E is typical of a city with a population of less than 50,000, if headways are decreased, service will become more appealing to a broader range of users, and ridership should increase.
- Service Hours: MLTA's fixed-route service currently operates at LOS E throughout the day with respect to hours of service. Service at this level is generally used only by those who have no other transportation alternative, such as WVU students. Increasing the hours of service will make bus service usable for a broader range of trip purposes. In contrast, an insufficient service span can cause unwanted time constraints on daily activities or trips because of the limited time available in which to make trips.
- Service Coverage: The current population and employment service coverage is LOS A. The area located north of WV 705, which is not currently served by transit, may require additional transit routes or additional transportation facilities in order to be served. This area, however, is currently undeveloped.

4.7 Pedestrian System

The region's pedestrian system consists primarily of sidewalks and off-street multi-use trails. There is added complexity due to Morgantown's topography, the separation of WVU's principal campuses, and the high degree of non-motorized travel demand typical of university cities.

Very little data has been collected or analysis has been performed on the pedestrian system outside of the City of Morgantown. Thus, most information in the LRTP on the pedestrian system is focused on the City of Morgantown. Similar deficiencies and needs exist in adjacent urban areas.

Morgantown's plan articulates a vision of what its pedestrian system should do for the community as well as the goal the community aspires to achieve. The principal accomplishments of these efforts thus far have been to better understand the nature of pedestrian safety conditions and to prioritize projects.

Inventory of Existing Pedestrian Conditions and Facilities

Morgantown's efforts to improve pedestrian infrastructure in the City are not based solely on a general interest in promoting walking as a means of travel—they are based largely on a significant demand for this infrastructure as evident by current travel patterns. Based on a 2000 survey by the West Virginia Department of Transportation, Division of Highways, Morgantown had the highest percentage of persons walking to work in the state. According to the survey, 16.8 percent of Morgantown residents walk to work, compared to a State average of 2.5 percent. Many residents also walk for exercise and enjoy the use of multi-use paths and trails, such as those along the Monongahela River and Deckers Creek. The existing pedestrian facilities and standards in Morgantown are described below.

Sidewalks/Other Pedestrian Facilities. Generally, many of Morgantown's downtown streets and major thoroughfares in other parts of the City include sidewalks, though their configuration in the street cross-section varies. The 2030 Regional Transportation Plan includes a map of sidewalks and paved shoulders along urban arterials from 2005. As noted in this map, there are sidewalks on several arterials, particularly in the downtown area and near WVU. Certain neighborhoods in Morgantown have buffered sidewalks and narrow street widths, including South Park, Greenmont, Chancery Hill, and sections of Woodburn, Wiles Hill, First Ward and Evansdale. Other areas (such as neighborhoods near Dorsey Avenue, Willowdale Road, and

Sabraton) lack pedestrian connections to downtown or local schools. The Morgantown Pedestrian Safety Plan (2010) also notes the following problems with existing pedestrian infrastructure:

- Non-connecting sidewalks;
- Narrow sidewalks adjacent to high speed traffic;
- Need for sidewalk replacement and repair;
- Lack of sidewalks on pedestrian corridors;
- Lack of crosswalks; and
- Inadequate provisions for pedestrian safety.

Trails. As reported in the Morgantown Pedestrian Safety Plan, *Prevention* magazine listed Morgantown as the city in West Virginia with the highest proportion of its population who walk for exercise. This may be due to the variety of multi-use trails providing both recreational and commuting opportunities.

The Caperton Trail and the Decker's Creek Trail provide nearly ten miles of paved pathways throughout the City, mainly running along the Monongahela River and through southeast Morgantown. Several of the City's parks include natural surface trails, with approximately five miles of trails at White Park, two miles at University Farm, ten miles at Cooper Rock, five miles at Snake Hill Wildfire Management Area, and additional trails on unregulated private land.

While these park-based trails are not likely to be used for true transportation or commuting purposes, they do add to an overall inventory and may offer an opportunity to increase the non-motorized infrastructure network by serving as key links between developed areas and attractions that are difficult to connect with purely on-street facilities.

Current Policies and Standards for Pedestrian System Additions

As mentioned previously, many of Morgantown's streets feature sidewalks; however, the design and configuration of these sidewalks varies, as does their general condition. According to observations in Morgantown's Pedestrian Safety Plan, sidewalks built since 1940 are generally narrower and feature less buffer space from vehicular traffic. This was confirmed by field observation in areas of Central Morgantown where many principal thoroughfare streets feature relatively narrow sidewalks that are attached to the roadway curb. In addition, while some sidewalks are in good condition, many of the City's sidewalks have not been sufficiently maintained and have fallen into disrepair.

Morgantown requires infrastructure contributions from private developers along with any new construction project, similar to many other local governments. While there has been a great deal of sidewalk construction completed as part of new multi-family and commercial developments across the City in recent years, prior to 2006 several new construction projects successfully sought exemptions from the City Code requirements to include sidewalks as part of project plans. As a result, few contributions were made to support Morgantown's infrastructure. Morgantown's Pedestrian Safety Plan, discussed more extensively in the following section, defines a stronger apparatus of sidewalk and crosswalk policies as a top priority for the City.

Pedestrian Safety

The WVU Injury Control Research Center analyzed crash data from 1998 through 2008, identifying 226 reported pedestrian injuries occurring between January 1998 and June 2008. The following intersections have the highest number of reported pedestrian injuries (noted in parentheses):

- Spruce & Walnut (9)
- High & Willey (8)
- S. University & Pleasant (8)
- University & College (8)
- N. Willey & Prospect (7)
- Spruce & Pleasant (5)
- University/Beechurst/Fayette (5)
- Beechurst & Campus (5)
- Chestnut Ridge/Van Voorhis (5)
- High & Walnut (4)
- High & Fayette (4)
- University & Prospect (4)

In addition, police report data from 2005 through 2011 identifies a total of 144 crashes within the City limits involving pedestrians. Of these crashes, 35 occurred on City streets, 15 on private roads or parking lots, and 94 on County, State, or US routes.

What is noteworthy about these two sets of statistics is the relatively consistent number of average yearly accidents involving pedestrians, between 20 and 25 per year. This suggests that particularly problematic locations or corridors likely experience consistent patterns of accident activity.

When these accidents are considered in the context of corridors, the following feature the greatest number of incidents for both pedestrians and bicyclists combined (number of crashes provided in parentheses):

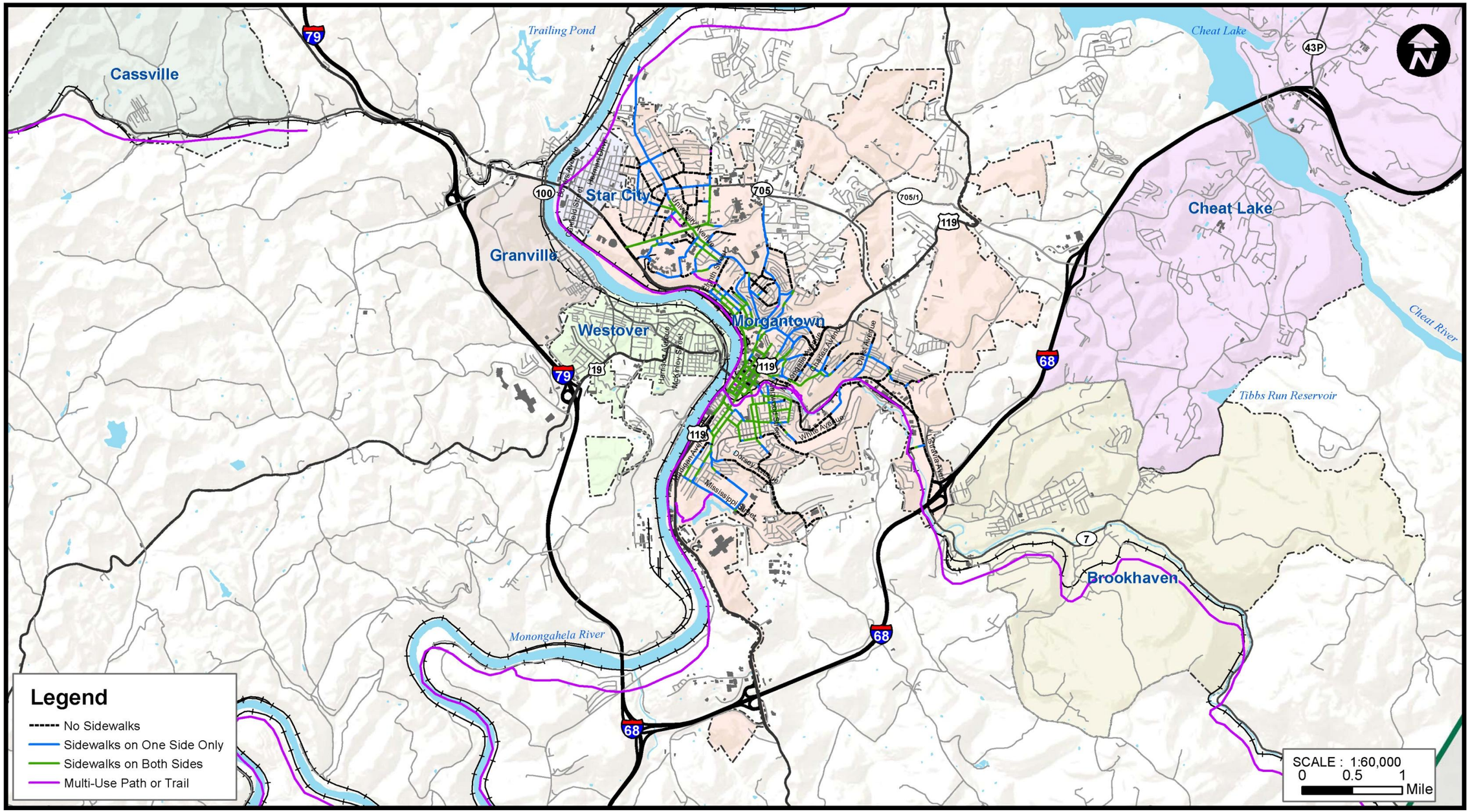
- University (26)
- Willey (14)
- Spruce (8)
- Beechurst (12)
- S University (1)
- Don Knotts (4)
- Walnut (2)
- Richwood (2)
- Dorsey (1)
- WV 705 - Patteson (3)
- Van Voorhis (5)
- Chestnut Ridge Road (4)

Pedestrian Infrastructure Plan

The Pedestrian Infrastructure Plan identifies steps to improve the walkability of the City and sets forth a general master plan for a connected network based on prioritized improvement projects. For planning purposes, the Infrastructure Plan establishes a hierarchy of facility types and classes, defining sidewalks located along arterial and collector streets as connecting network sidewalks (CNS), which are essential to present and future safe, connective pedestrian travel. CNS-level capital project opportunities are the highest priority for building connective pedestrian infrastructure throughout Morgantown, due presumably to their alignment along heavily-used routes connecting different areas of the city.

Second in importance are neighborhood access sidewalks (NAS), which are vital feeders to the CNS, intended to connect residential neighborhoods to the rest of the city. Figure 4-14 illustrates the CNS system along with the city's rail trails and pedestrian greenways.

Figure 4-14. Connecting Network Streets, Rail Trails, and Pedestrian Greenways



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4.8 Bicycle System

Like for the pedestrian system, there is very little available information related to the bicycle system outside of the City of Morgantown.

Morgantown has taken significant steps in the past few years to support progress towards improving bicycling in the city, including the creation of a Bicycle Board in 2006, the development of the Greater Morgantown Bicycle Plan (2012), and the adoption of a "Complete Streets" policy.

As with its recent steps to plan for and pursue pedestrian projects, its principle bicycle efforts thus far have been the formal creation of this Board and Plan, both of which have focused on learning and understanding best practices, identifying needs and safety challenges, and issuing more specific recommendations to Morgantown elected officials. The efforts of the Bicycle Board, particularly the educational efforts, have led to Morgantown's 2012 designation as a Bronze Level Bicycle Friendly Community by the League of American Bicyclists.

Inventory of Existing Bicycle Conditions and Facilities

The region currently has limited bicycle infrastructure, in part because of the challenges noted in the Greater Morgantown Bicycle Plan (2012) with the hilly geography and limited rights-of-way on roadways. However, the City has some trails for cycling and other bike facilities, which are detailed below.

Roadways. City streets do not have paved shoulders, and few of the state routes do. There are no on-street bicycle lanes in the region. Although this suggests that a formal inventory of bicycle-specific facilities may not be feasible, the Morgantown Bicycle Board has developed a working "Commuter Map" of on-road routes typically used by cyclists to connect locations. Streets are color-coded based on their bikeability, according to the following codes[1]:

- Green – Pleasant: Low motor traffic volume and slow speed;
- Blue – OK: Moderate motor traffic and slow to moderate speed;
- Brown – Scary: Moderate to heavy motor traffic and moderate speed; and
- Red – Dangerous: Heavy, high speed motor traffic.

[1] Credit to Morgantown Municipal Bicycle Board

The Bicycle Board notes that streets that are not colored are not necessarily worse, just not yet rated on the map. The "Commuter Map" is shown in Figure 4-15. This map illustrates several roadways rated "Pleasant" or "OK" in the vicinity of WVU and the downtown area. There are few highly-rated roadways connecting these areas to the residential areas in Morgantown, or connecting the three sub-campuses of WVU.

Trails. The region has a variety of off-street shared use trails for biking that provide both recreational and commuting opportunities. The Caperton Trail and the Decker's Creek Trail provide nearly ten miles of paved pathways throughout the City, mainly running along the Monongahela River and through southeast Morgantown. Several of Morgantown's parks include natural surface trails, with approximately five miles of trails at White Park, two miles at University Farm, ten miles at Cooper Rock, five miles at Snake Hill Wildfire Management Area, and additional trails on unregulated private land. The Morgantown trails are illustrated in Figure 4-16.

End of Trip Facilities. Morgantown has numerous bicycle parking racks throughout the City. The Bicycle Board has mapped some of the existing bike parking, which is shown in Figure 4-17. West Virginia University also provides bicycle racks at many of its buildings, also shown in Figure 4-17. Bike service centers are noted in the figure as well.

In 2010, City Council approved funding to implement a plan for bicycle parking rings on downtown parking meters. The City has not adopted design standards for bicycle rack facilities or development standards requiring new bicycle rack facilities as part of new retail, commercial, or residential developments.

Figure 4-15. Regional Bicycle Commuter Map

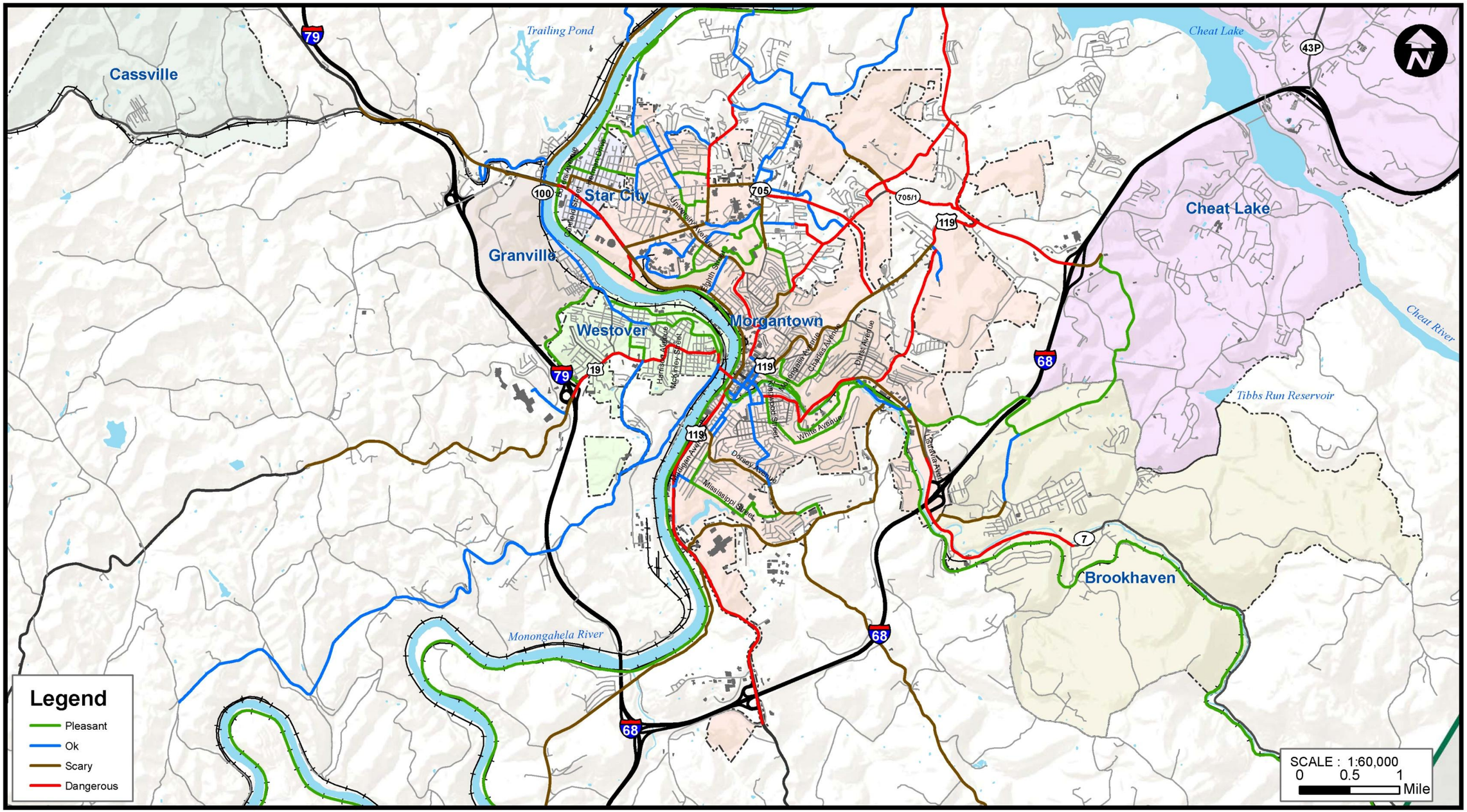


Figure 4-16. Regional Trails

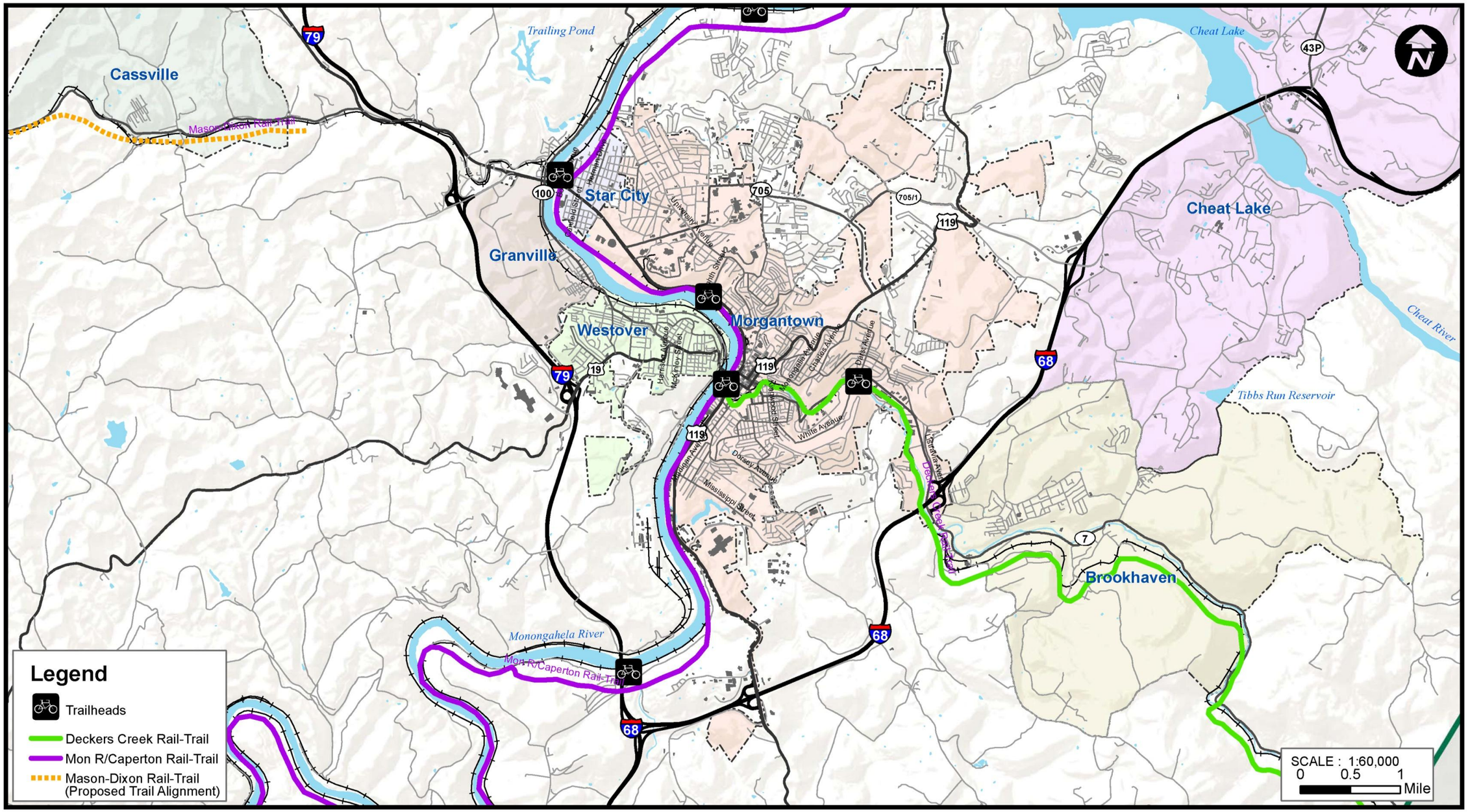
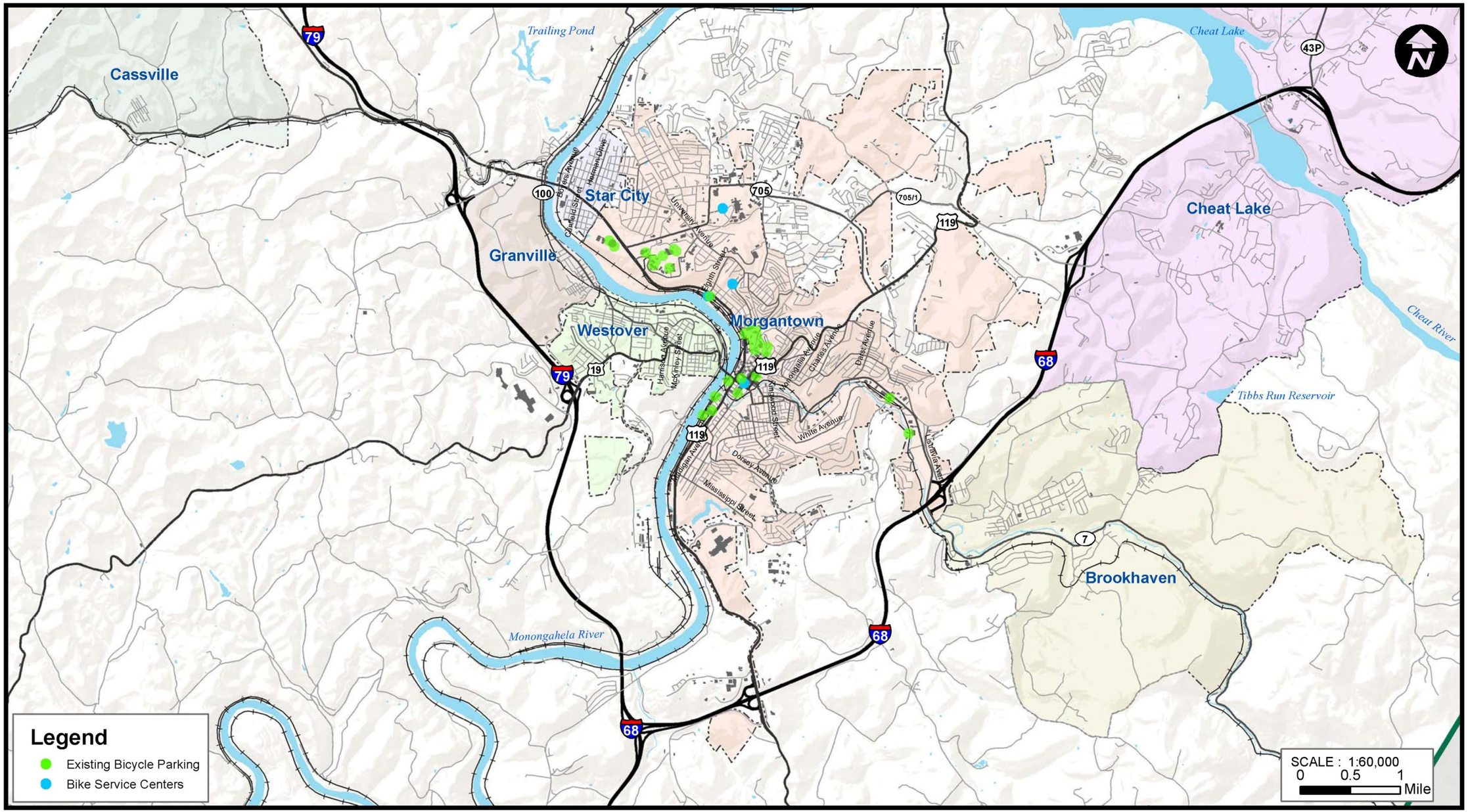


Figure 4-17. Bicycle Parking & Service Centers



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Existing Bicycle Trip Generators/Attractors

The Morgantown Bicycle Board has developed a list of principal destinations for cyclists. These are mapped in Figure 4-18, along with other destinations that are likely to attract bicyclists, such as schools, commercial centers, and trailheads.

WVU's approximately 30,000 students generate a large number of trips. The campus is divided into three sub-campuses, creating the need for some students to commute between the Downtown Campus (on the northern fringe of Morgantown), the Evansdale Campus (located a mile and a half north of the Downtown Campus), and the Health Sciences Campus (located near Mountaineer Field). Bicycle facilities in the vicinity of WVU and between campuses could help encourage students, staff and faculty to commute by bike.

The downtown business district of Morgantown includes numerous shops, restaurants, and other attractions. Bicycle facilities between residential areas and the downtown business district would increase accessibility for bicyclists.

Bicycle Safety

The Morgantown Bicycle Board has collected data for bicycle related crashes. There have been nine reported bicycle crashes in the last five years (2007-2011) in Morgantown, which are mapped in Figure 4-19 and listed in Table 4-16. Based on accounts from the Bicycle Board, the current process for reporting bicycle crashes is very tedious and lacks support. Therefore, this number could under represent the true number of bicycle collisions and may not reveal all bicycle-related safety concerns.

Table 4-16. Reported Bicycle Crashes within Morgantown (2008-2011)

Location	Date	Type Involved	Sidewalk Cycling?	Report Number
Dalton St.	5/2/2007	Bicycle	Unknown	2007-15369
Sabraton Ave	8/11/2008	Bicycle	Unknown	2008-26434
US-119	9/18/2008	Bicycle	Y	2008-25297
Jones Ave & Sharon Ave	8/31/2009	Bicycle	N	2009-75462
209 Chestnut St	11/13/2009	Bicycle	Y	2009-98715
1632 Sabraton Ave	11/18/2009	Bicycle	N	2009-100369
Unlisted	4/25/2011	Bicycle	N	2011-42129
High St & Fayette St	8/16/2011	Bicycle	Y	2011-84039
Beechurst Ave & 6th St	8/23/2011	Bicycle	Y	2011-87348

As noted in Table 4-16, at least four of the reported crashes involved cyclists riding on the sidewalk. This suggests a lack of roadway bicycle facilities or comfort among bicyclists for riding on the road. The Greater Morgantown Bicycle Plan notes that, besides being illegal, riding on the sidewalk in high-traffic locations can actually place bicyclists at greater risk, particularly at intersections. It suggests that bicycle routes with low traffic volume, bike lanes on arterial streets, and completely separated trails can benefit cyclists that would otherwise ride on the sidewalk.

Figure 4-18. Bicycle Trip Generators

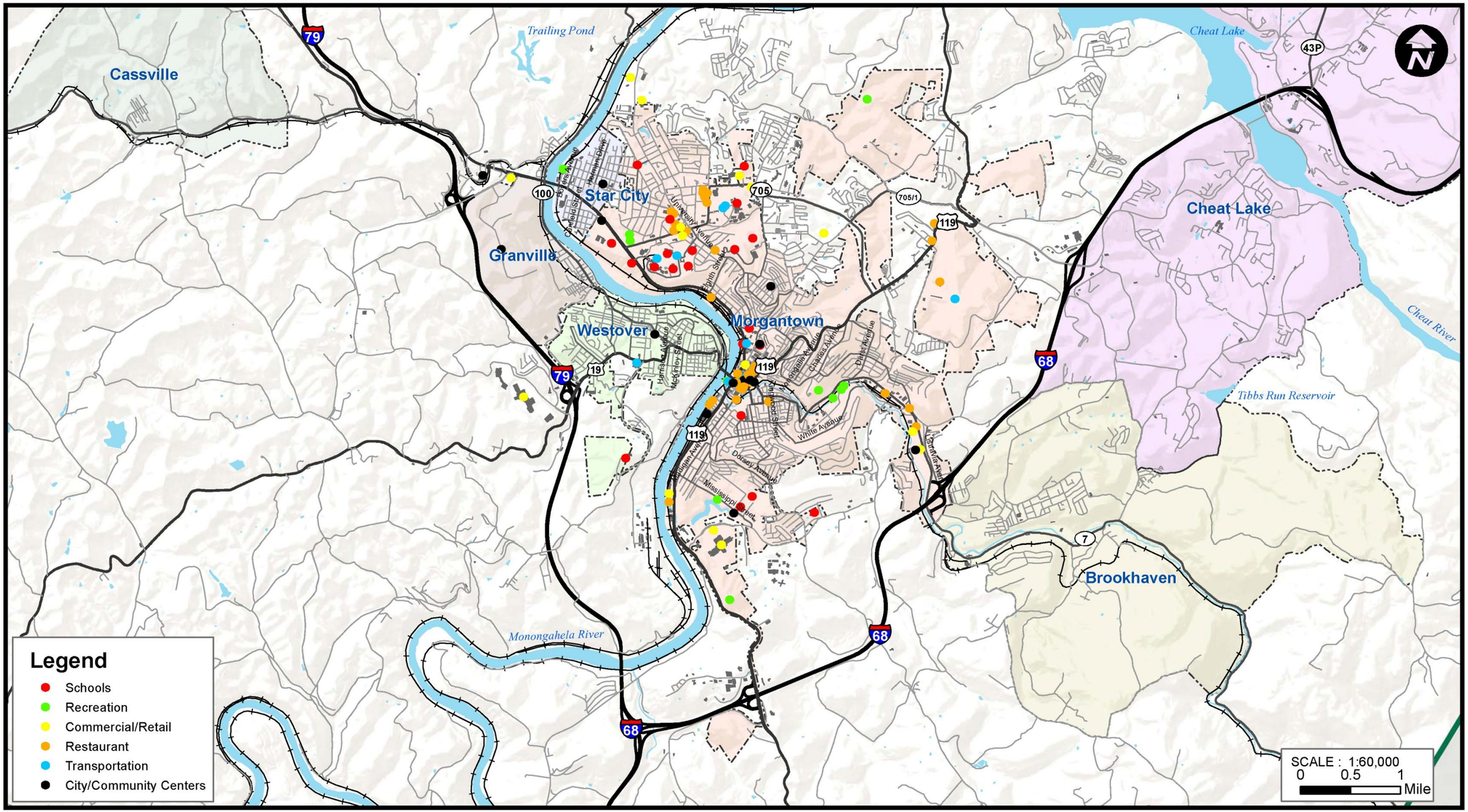
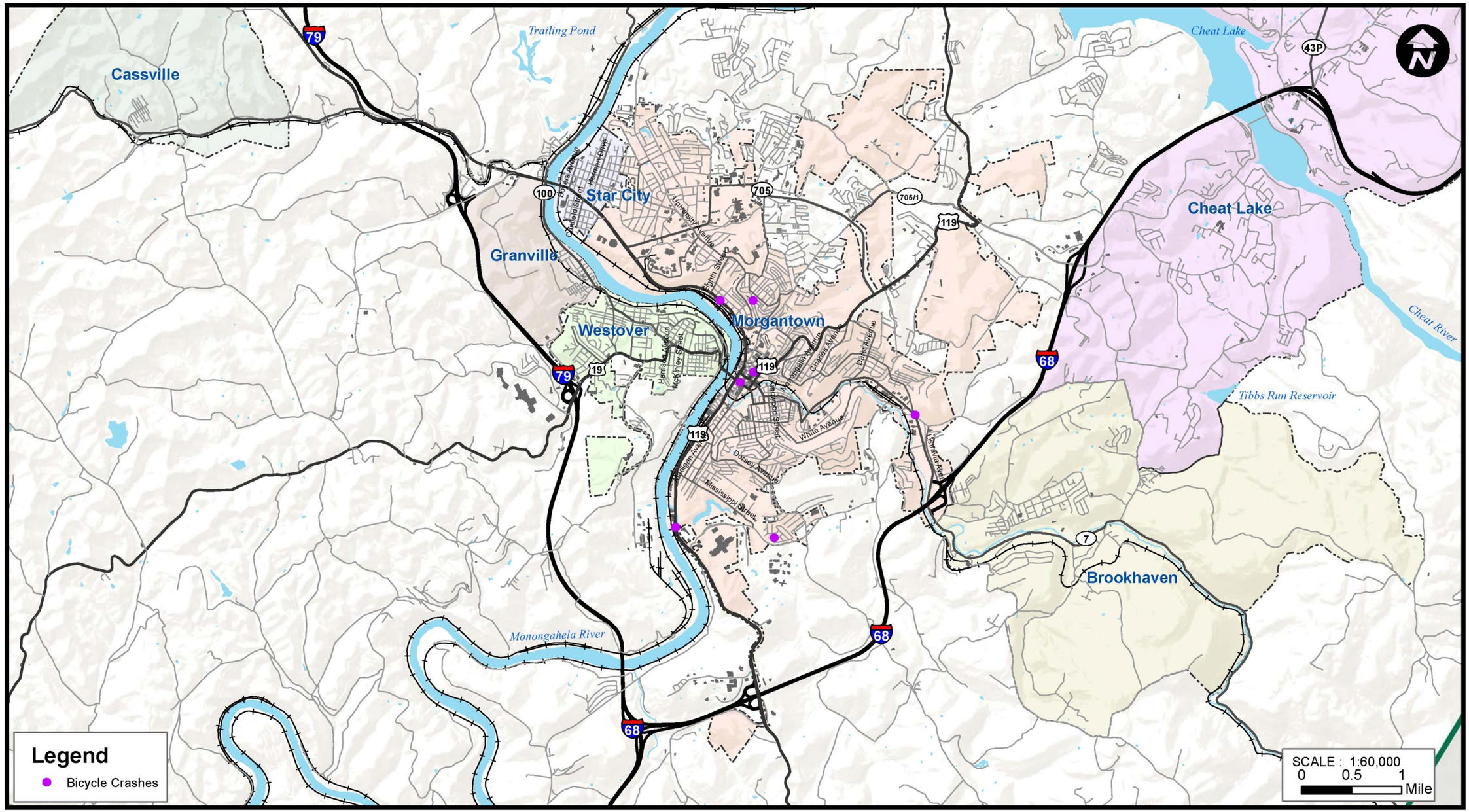


Figure 4-19. Reported Bicycle Crashes within Morgantown (2007-2011)



Bicycle system needs, opportunities, and constraints

As indicated throughout this section, Morgantown has made significant progress toward improving bicycling in the city, including the creation of a Bicycle Board, the development of the Greater Morgantown Bicycle Plan, and the adoptions of a "Complete Streets" policy by the City and the MPO. Also indicated throughout this section:

- There are numerous opportunities within Morgantown to create an environment where residents can enjoy bicycling safely and fearlessly anywhere, anytime, and for any reason.
- Morgantown currently has a variety of recreational biking opportunities, with several miles of trails available along the river and in local parks.
- All of Morgantown's existing roadways currently lack bicycle lanes.
- Many existing roadways also lack paved shoulders, pavement markings, and signs.
- There are limited bicycling facilities in the city to help cyclists reach desired destinations (such as WVU, downtown, commercial centers, trail heads, and residential areas).
- A lack of right-of-way, narrow roadways, and hilly topography creates unique challenges for Morgantown in developing a robust bicycle network.

The creation of the Bicycle Board and Greater Morgantown Bicycle Plan represent significant progress in working towards improving conditions for cycling in the region. The plan includes specific action items the City can take to work towards making Morgantown a Bicycle Friendly Community (BFC). It specifically focuses on action items that contribute to education, enforcement, engineering, encouragement and evaluation (the 5-Es) objectives.

To better identify opportunities to increase bicycle use and reduce crashes, it recommends measuring bicycle use, bicycle crashes, bicycle injuries and bicycle-related citations. In addition to this data, the plan includes an action item to "establish a bicycle route map for the City and classify all streets in terms of their bicycle friendliness." The Bike Board has started this map (see previous Figure 4-15); however, there is further work required to complete this map.

4.9 Freight Movement

Trucks

There are approximately 11 trucking companies in Monongalia County. Most of the companies have more than one transportation classification, including the following:

- Freight trucking (1)
- Heavy duty trucking (6)
- Heavy equipment movers (5)
- Miscellaneous (6)

The following are designated as truck routes in the county: I-68, I-79, US 119, US 19, WV 7, and CR 857.

Rail

There are two active rail lines in Monongalia County. Norfolk Southern (NS) owns both lines while CSX has the right to operate on the lines. Figure 4-20 displays the primary rail corridors in the county. The primary north-south CSX/NS line follows the western side of the Monongahela River along its entire length in Monongalia County. This line originates in Fairmont, Marion County and does not pick up or drop off any product in Monongalia County, while continuing north to Greene County, Pennsylvania.

A rail line in the northwestern portion of the county serves three coal mines: Blacksville No. 1 at Blacksville, Blacksville No. 2 at Wana, and Federal Mine No. 2 at Miracle Run (near Bula). Blacksville No. 2 and Federal No. 2 are active coal mines. Blacksville No. 1 ceased mining operations in 1995, however, one railroad source notes that the rail lines carry fly ash to the mine for disposal in its mineshafts. The line serving the mines continues north to Brownsville, Pennsylvania.

More than 29 million tons of freight were shipped over rail lines in Monongalia County in 2003. Table 4-18 provides a summary of the products and volume of freight that were shipped. Along the Monongahela River line, nearly 6,400 railcars carried 610,000 tons of coal and pulpwood through the county. From the three coal mines in northwestern Monongalia County, NS and CSX moved nearly 289,000 rail cars and 28.7 million tons of coal.

There is one abandoned rail line in Monongalia County. Abandoned in 1968, the former Monongahela Railway alignment extends west from

the Monongahela River at Westover. The former railroad alignment that now comprises the Mon River Trails, Caperton Trail, and Deckers Creek Trail is considered rail-banked property, meaning it could be returned to a railroad use in the future.

Table 4-17. Freight Traffic on Monongalia County Rail Lines in 2003

Railroad	Product Transported	Number of Cars (Yearly)	Freight Tonnage (Yearly)
Monongahela River Line			
Norfolk Southern	Coal	4,800	466,200
CSX	Coal	896	94,000
	Pulpwood	660	50,300
Subtotal		**6,356**	**610,500**
Wana and Miracle Run Lines			
Norfolk Southern	Coal for metallurgical use	1,600	172,400
	Coal for fuel/steam production	174,150	15,800,000
CSX	Coal for fuel/steam production	112,874	12,750,000
Subtotal		**288,624**	**28,722,400**
Total		**294,980**	**29,332,900**

Source: West Virginia State Rail Authority

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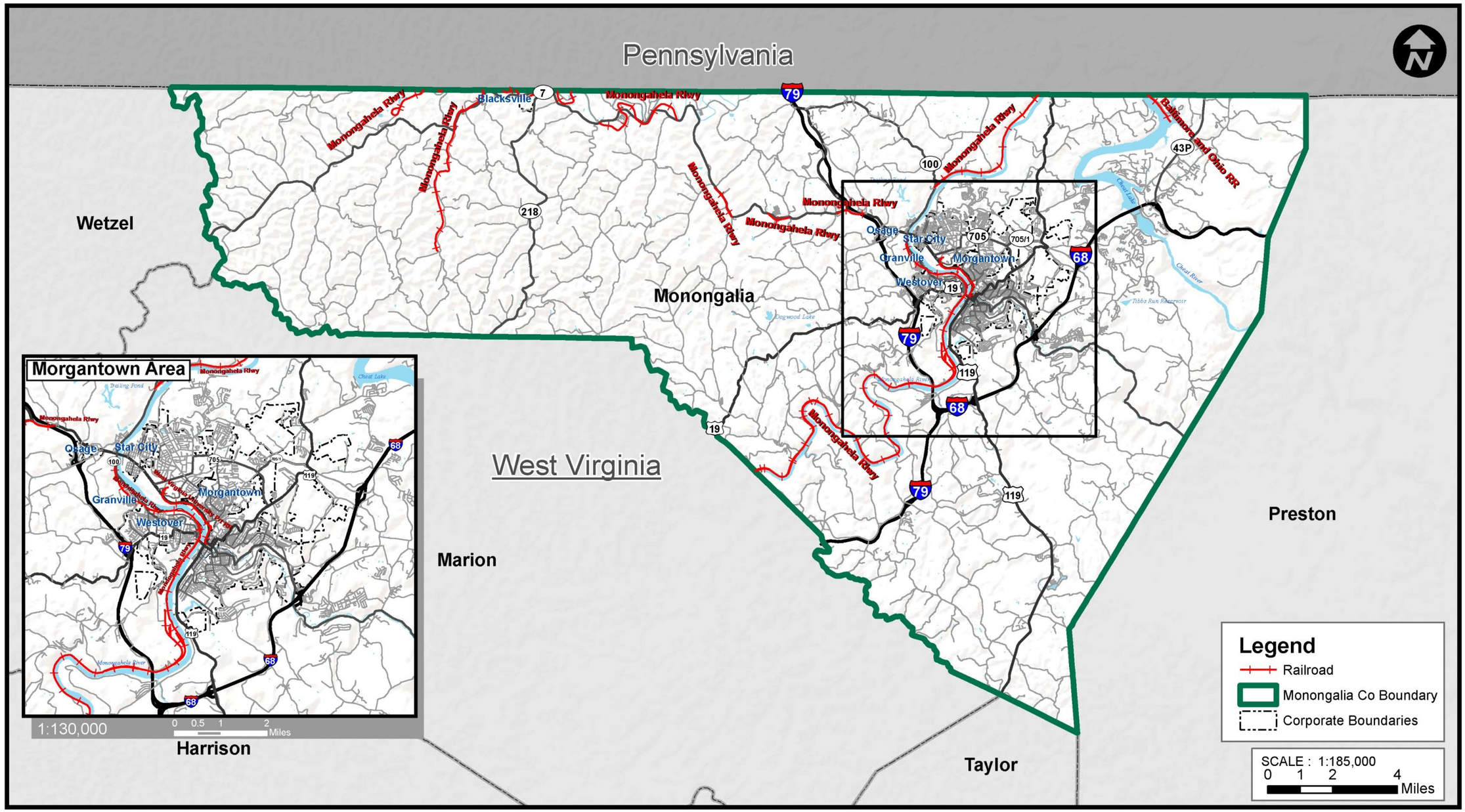
Figure 4-20. Rail Lines Map



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4.10 Air Travel

The Morgantown Municipal Airport is located on Hartman Run Road. Silver Air, Inc., operating as United Airlines Express, offers air-carrier service to Dulles International Airport in Washington, DC. Silver Air took over the service in 2012. In December of 2012 four daily flights were offered, Monday through Friday, one daily flight on Saturday, and three flights are offered on Sunday.

Other air service for the region is provided by Pittsburgh International Airport (approximately 80 miles away), and North Central West Virginia in Bridgeport, WV (approximately 32 miles away).

4.11 River Ports

The Monongahela River is a navigable waterway with a 9-foot channel depth. Along the Monongahela River in Monongalia County, there are 20 ports that are a part of the Port of Pittsburgh system. As shown in Table 4-17, there are 13 active ports and seven inactive ports. Of the active ports, 11 ports facilitate the movement of coal, one port receives petroleum, and one port ships crushed limestone. Eight of the active ports are considered intermodal terminals because they offer connections between transportation modes – water and highway or water and railroad.

The U.S. Army Corps of Engineers (USACE), Pittsburgh District, maintains and operates three locks and dams in Monongalia County. The locks and dams at Morgantown, Hildebrand, and Opekiska are among nine similar facilities on the Monongahela River between Pittsburgh, Pennsylvania and Fairmont, West Virginia. The USACE collects data about the volume of traffic and goods that travel through the locks and dams. As shown in Table 4-18, more than 1.8 million tons of coal, petroleum, and crude materials passed through the three locks and dams in 2004. More than one million tons of freight passed through the lock and dam in Morgantown.

Table 4-18. Ports and Intermodal Terminals on the Monongahela River in Monongalia County

Name of Port	Location			Purpose	Intermodal Terminal Type (Modes Connected)
	River Mile Marker	Bank	Location		
Laurita Energy Dock	95	Left	West Van Voorhis	Shipment of Coal	Highway - Water
Rosedale Coal Co., Dock No. 2	96	Left	Rosedale	Shipment of Coal	Highway - Water
Anker Energy River and Rail Terminal Dock	96	Left	Maidsville	Shipment of Coal	Highway – Rail – Water
Consolidation Coal Co., Humphrey No. 7 Dock	97	Left	Maidsville	Shipment of Coal	No Intermodal
Anker Energy Corp., Scotts Run Dock	98	Left	Scotts Run	Shipment of Coal	Highway - Water
Guttman Oil Co. Dock	98	Right	Star City	Receipt of petroleum products	No Intermodal
Consolidation Coal Co., Granville Dock	98	Left	Granville	Not in use	No Intermodal
Consolidation Coal Co., Arkwright Dock	99	Left	Granville	Shipment of Coal	No Intermodal
Exxon Co., USA, Westover Terminal	100	Left	Riverside	Not in use	No Intermodal
Vance Coal Co. Dock	100	Left	Riverside	Shipment of Coal	Highway – Rail – Water
Greer Limestone Co., Lower Dock	100	Right	Morgantown	Not in use	No Intermodal
Greer Limestone Co., Upper Dock	100	Right	Morgantown	Not in use	No intermodal
Consolidation Coal Co., Westover Mooring	100	Left	Westover	Not in use	No Intermodal
Kosmos Cement Co., Morgantown Dock	103	Right	Morgantown	Shipment of crushed limestone	No Intermodal
Morgantown Industrial Park, Wharf No. 1	103	Left	Morgantown	Shipment of Coal	No Intermodal
Morgantown Industrial Park, Wharf No. 2	103	Left	Morgantown	Shipment of Coal	Highway – Water
Consolidation Coal Co., Weirton Mine Dock	111	Right	Little Falls	Not in use	No Intermodal
Pittswick Coal Co. Dock	114	Left	National	Not in use	No Intermodal
Consolidation Coal Co., Booth Mine Dock	114	Left	Edna	Shipment of Coal	No Intermodal
Mohigan Mining Co., Dock	114	Left	Edna	Shipment of Coal	Highway – Water

Source: US Army Corps of Engineers, 2003
Bureau of Transportation Statistics, USDOT

Table 4-19. Level of Freight Shipped Through Monongahela River Locks and Dams in Monongalia County (2004)

			Lock and Dam		
			Morgantown	Hildebrand	Opekiska
River Location (Mile Marker)			102	108	115.4
Number of Barges		Upbound	816	362	386
		Downbound	820	358	384
Freight Tonnage by Product	Coal	Upbound	4,500	9,300	4,500
		Downbound	377,400	372,600	378,400
	Petroleum	Upbound	0	0	0
		Downbound	2,100	0	0
	Crude Materials	Upbound	131,700	25.600	55,600
		Downbound	495,100	0	0
Total Tonnage			1,010,800	407,500	438,500

Source: U.S. Army Corps of Engineers

Note: Upbound = South direction
Downbound = North direction

4.12 Public Input

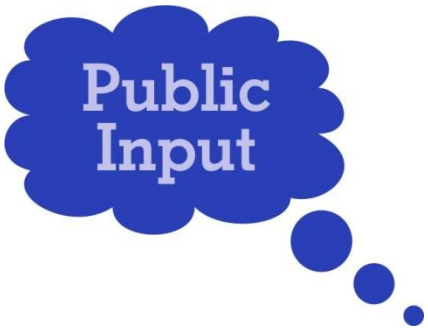
During the *Crossroads* regional visioning process, stakeholders and the public provided valuable input regarding the existing transportation system. Below is a summary of some key points that were received. It should be noted that the ideas expressed in this summary reflect the opinions and perceptions of individuals interviewed and may not be representative of all individuals, or factually accurate.

Business growth and housing development have outpaced the transportation system. This situation has created an environment where the system is incomplete, inadequate, disjointed, and overwhelmed. There are congestion problems due to limited capacity and lack of efficiency.

Transportation system lacks adequate way-finding. This was mentioned for vehicular, pedestrian, and bicycle traffic.

Major transportation issues were consistently defined as:

- Pedestrian traffic at Grumbein's Island impeding vehicular traffic
- Peak congestion periods
- Topography
- Inadequate pedestrian facilities
- Only two N-S corridors and two E-W corridors



- Funding
- Transit schedule and frequency
- Lack of specified bus stops
- County/Cities cooperation/ coordination and politics in the area including at the State level
- Lack of County zoning
- Parking downtown, parking during events, and on street parking that restricts municipal services
- Truck traffic through the CBD
- WVDOH should consider/improve signal synchronization and potential reversible lane locations
- No enforcement at dangerous intersections for pedestrians who cross illegally, or illegal parking
- Negative media representation
- Vehicular mentality
- Lack of adequate biking facilities

Major Congestion Areas. In each interview the Monongahela Boulevard/Beechurst Avenue/University Avenue/Don Knotts Drive corridor, the WV-705 corridor, and Mileground were repeatedly mentioned as highly congested locations. The public input confirms many of the results of the level of service analysis described in Section 4.5 of the LRTP.

Major Safety Concerns. Safety concerns revolved around the specific dangerous intersections listed below as well as pedestrians intermingling with motor vehicles. Grumbein's Island was mentioned most frequently.

- Grumbein's Island
- US 119 at Stewartstown Road
- WV 705 at Stewartstown Road
- Van Voorhis Road at West Run Road
- US 119 at West Run Road
- Cheat Road at Tyrone Avery Road
- Tyrone Road at Tyrone Avery Road
- Don Knotts Blvd at US 119
- Sabraton Road at Greenbag Road
- Mileground at Trinity Church
- Anywhere along WV 705 corridor

While these intersections do not show up as safety concerns in the crash analysis, it should be noted that several of the intersections listed

above are part of the high-crash corridor locations and, as such, will be reviewed in further detail during the transportation planning process.

Transit is Key. Consistently the public and stakeholders felt that transit is an integral part of the overall system and worked well to incorporate pedestrians and bicyclists. Most participants thought transit worked very well in the area except for a few details. They would like to see improved frequency in service, specific bus stop locations, and a schedule that benefits every day workers, not just students.

Lack of Funding. The failed service/user fee developed by the MPO was mentioned several times, along with WVDOH's unwillingness to provide money for projects the locals prefer. Finding a way to have developers contribute to projects was brought up repeatedly as a need.

Transportation Demand Management. Transportation Demand Management (TDM) is supported by the public. It was noted that there is an opportunity for better coordination among all the major employers and the need for additional park-and-ride locations. It was also noted that TDM measures have been implemented in the area by individual employers such as WVU with its WE GO! program, and the National Energy Technology Laboratory (U.S. Department of Energy) and Mylan Pharmaceuticals with their provisions for flex time. The MPO is currently working to expand TDM through van pooling with a Congestion Mitigation and Air Quality Improvement (CMAQ) grant. The public believes that TDM is the most cost effective measure for reducing congestion available and it should continue to be an important part of the MPO's tool kit.