



Final Report

Adopted March 23, 2017

I-79 Access Study

Morgantown Monongalia Metropolitan
Planning Organization (MMMPO)



April
2017



Acknowledgements

This project has been a collective effort guided by local, state, and federal officials, planners, and policy makers. With the invaluable input of local representatives from the community, businesses, and special interest groups, as well as robust public involvement, this study was able to successfully recommend an alternative to be carried forward.

Project Team

Morgantown-Monongalia MPO

Bill Austin, Executive Director, AICP
Jing Zhang, AICP, PTP, LEED AP ND

HDR Engineering, Inc.

Amy Staud, P.E., PTOE
Jason Carbee, AICP
Matt Selhorst, AICP
Elliott Hair, EIT
Christine Shiring

Alpha Associates, Inc.

Rick Colebank, P.E., P.S.
Chuck Branch, P.E.
Samantha Boling

The Project Team would like to thank all of those listed below for their time, dedication, and input.

Invited Steering Committee

Alison Rogers (FHWA)
Chandra Inglis-Smith (FHWA)
Brian Carr, P.E. (WVDOH)
Elwood Penn, P.E. (WVDOH)
Delegate Joe Statler (WV House of Delegates)
Senator Bob Beach (WV State Senate)
Mayor Marti Shamberger (City of Morgantown)
Mayor Patricia Lewis (Town of Granville)

Damien Davis, P.E., CFM (City of Morgantown)
Chris Fletcher, AICP (City of Morgantown)
Eldon Callen (Monongalia County Commission)
Richard Wood, AICP (Monongalia County Planning Commission)
Kelly Kimble (Morgantown Area Chamber of Commerce)
Dave Bruffy, CCTM (Mountain Line Transit Authority)
John Thompson (WVU)

Invited Stakeholder Committee

Senator Bob Beach (WV State Senate)
Holly Childs
Jason Donahue
Pat Esposito
Zach Fowler
Marc Glass
Larry Harris
Michael Hohn
Aaron Humberson
Ron Justice

Joe Kanosky
Pete Klemkowsky
Ryan Lynch
Gary Murdock
Alan Neptune
Jenny Selin (Morgantown City Council)
Delegate Joe Statler (WV House of Delegates)
Steve Tancin
Narvel Weese



Executive Summary

The purpose of the I-79 Access Study is to comprehensively evaluate how the current transportation network in the Morgantown Monongalia Metropolitan Planning Organization (MMMPO) area is meeting the existing and future connectivity needs between northern Morgantown, major transportation facilities, key employment centers, and West Virginia University (WVU) campuses to Interstate 79 (I-79). The first step of this study was to evaluate the operational and safety performance of the existing connections to I-79 and to identify if there is a purpose and need for improved connections. This evaluation was documented through the Existing and Future Conditions Report (E&FC) dated November 2015. The E&FC report demonstrated a need for improved connections, thereby setting the Vision for this project. This Access Study documents opportunities for improvements along existing corridors, and evaluates new corridors which may involve a new river crossing over the Monongahela River.

The study area is defined as Monongalia County from the West Virginia/Pennsylvania State Line in the north to the US 19/Westover Bridge in the south. To the west, the study area is bounded by I-79 and the on-going development in the western portion of Monongalia County. The eastern boundary is US 119 (Point Marion Road). Several key findings from the E&FC Report are:

- Monongalia County employment is projected to grow by 1.4% through 2019, exceeding the statewide average of 0.9% and keeping pace with the national average of 1.5%.
- More than one-third of the roadway sections analyzed currently operate at LOS F during peak periods. This amounts to over 3 miles of failing roadway segments.
- By Year 2040, almost two-thirds of roadway segments will operate at LOS E or F during peak periods. This amounts to 13 miles of failing roadway segments.
- Half of the roadway segments analyzed exceeded the statewide crash rate.

Integral aspects of this Access Study include:

- Defining the project's Purpose and Need statement.
- Identifying and evaluating the no-build, transportation system management (TSM) strategy, and multiple build Alternatives.
- Updating the MMMPO's Travel Demand Model (TDM) to support the evaluation of potential alternatives.
- Facilitating a strong public engagement program.

Prior to the identification and evaluation of alternatives, the Project Team, under the direction of the Steering Committee, and with input from the Stakeholder Committee, developed the project's Purpose and Need to be:

- Improve mobility and access to major transportation facilities and key employment centers in northern Morgantown.
- Improve traffic operations and safety.
- Support on-going and projected growth areas.
- Enhance multi-modal opportunities to reduce single-occupancy trips.

To improve overall access to I-79, the alternatives focused on several key areas including capacity, safety, and connectivity improvements, while considering the community and environment, environmental regulations, and financial criteria. The active engagement and participation of the Steering Committee, Stakeholder Committee, and general public throughout the study was an essential element in developing successful, feasible, and context-sensitive alternatives.

Using the Purpose and Need as a benchmark, this study evaluates twelve (12) alternatives, a transportation system management (TSM) strategy, and no-build alternative to determine their operational performance, community and environmental impact, regulatory environmental impacts, and financial implications. Five (5) alternatives were dismissed from further evaluation beyond this study; however, they have been evaluated and included for documentation.

Based on the findings of this study and specific evaluation criteria, Alternative 12 provides the greatest regional, corridor, and local operations and connectivity improvements, and is recommended to move forward to the next phases of this project. This context sensitive alternative scored best in the Evaluation Matrix.

The recommended alternative was presented to the MMMPO Policy Board and adopted on March 23, 2017. It is included in MMMPO's *2017-2045 Metropolitan Transportation Plan Update* as "Tier 1 Project 6: I-79 Access Improvements Phase I" and "Tier 2 Project 6: I-79 Access Improvements Phase II." The *2017-2045 Metropolitan Transportation Plan Update* also identifies the Phase I I-79 Access Improvements as the top priority of the Tier 1 Projects.



Table of Contents

1	Introduction and Project Background	1-1
1.1.	Study Area Description	1-1
1.2.	Existing Transportation Network	1-2
1.3.	Demographics and Projected Growth	1-3
1.4.	Existing Multimodal Transportation Network	1-5
1.5.	Special Transportation Considerations	1-7
1.6.	Historic Districts/Sites	1-10
1.7.	Previous Studies	1-10
2	Existing and Future Transportation Conditions	2-1
2.1	Existing Traffic Volumes	2-1
2.2	Existing Origin and Destination Flows	2-1
2.3	Crash Analysis	2-2
2.4	Corridor Travel Time	2-5
2.5	Planning-level Traffic Operations	2-8
2.6	Summary	2-12
3	Travel Demand Modeling	3-1
3.1	Model Development Background	3-1
3.2	Model Application	3-2
3.3	Key Existing + Committed Projects and Improvements (E+C)	3-3
4	Alternative Development	4-1
4.1	Typical Section	4-1
4.2	Description of Alternatives	4-2
4.3	Ancillary Improvements	4-5
4.4	Phased Implementation Options	4-6
4.5	Alternatives Eliminated from Consideration	4-7
4.6	Alternatives Evaluation	4-9
4.7	Cost Estimates	4-18
4.8	Evaluation of Alternatives	4-19
5	Stakeholder Engagement	5-1
6	Conclusions and Recommendations	6-1
6.1	Recommendations	6-2
6.2	Next Steps	6-2



Table of Tables

Table 2-1: Summary of Corridor Crash Rates	2-4
Table 2-2: Travel Time Summary	2-7
Table 2-3: Level of Service Evaluation Criteria.....	2-9
Table 2-4: Existing and Future Corridor Levels of Service.....	2-11
Table 4-1: Transportation System Performance Results	4-11
Table 4-2: Comparison of Vehicle Travel Times (minutes)	4-14
Table 4-3: Comparison of River Crossing Volumes (ADT)	4-16
Table 4-4: Alternative Conceptual Cost.....	4-18

List of Exhibits

Exhibit 2-1: Level of Service Illustrations	2-8
Exhibit 4-1: Summary of Bridge Volumes	4-17
Exhibit 5-1: Stakeholder Engagement Summary	5-1

List of Figures

Figure 1-1: Study Area	
Figure 1-2: 2017-2045 MTP Update Project Map	
Figure 2-1: Origin-Destination Overview	
Figure 2-2: Crash Intensity Map	
Figure 2-3: Corridor Crash Clusters	
Figure 2-4: 2015 Levels of Service	
Figure 2-5: 2040 Levels of Service	
Figure 4-1: Typical Sections	
Figure 4-2: Alternative 2 Environmental Features	
Figure 4-3: Alternative 2 Volume Change Comparison	
Figure 4-4: Alternative 3 Environmental Features	
Figure 4-5: Alternative 3 Volume Change Comparison	
Figure 4-6: Alternative 6 Environmental Features	
Figure 4-7: Alternative 6 Volume Change Comparison	
Figure 4-8: Alternative 7 Environmental Features	
Figure 4-9: Alternative 7 Volume Change Comparison	
Figure 4-10: Alternative 10 Environmental Features	
Figure 4-11: Alternative 10 Volume Change Comparison	
Figure 4-12: Alternative 11 Environmental Features	
Figure 4-13: Alternative 11 Volume Change Comparison	
Figure 4-14: Alternative 12 Environmental Features	
Figure 4-15: Alternative 12 Volume Change Comparison	
Figure 4-16: Phased Option A Environmental Features	
Figure 4-17: Phased Option A Volume Change Comparison	
Figure 4-18: Phased Option B Environmental Features	
Figure 4-19: Phased Option B Volume Change Comparison	
Figure 4-20: Environmental Features: Eliminated Alternatives	
Figure 4-21: Volume Change Comparison: Eliminated Alternatives	
Figure 4-22: Evaluation Matrix	



Appendices

Appendix A – Miscellaneous Traffic Analyses

Appendix B – Alternatives Analyses

Appendix C – TDM Documentation

Appendix D – Conceptual Cost Estimate

Appendix E – Public Meeting #3 Comments and Project Press

1 Introduction and Project Background

The I-79 Access Study is an initiative of the Morgantown Monongalia Metropolitan Planning Organization (MMMPO) through the *2017-2045 Metropolitan Transportation Plan Update* (MTP Update), adopted March 2017, and in response to recommendations set forth by the *2040 Long Range Transportation Plan* (2013 LRTP), adopted in 2013. Those recommendations were listed as “Priority Strategy 1 – Number 8: Monongahela River Crossing Study”. The first step of the Access Study was to develop the Vision for the project by comprehensively evaluating how the current transportation network in the MMMPO area is meeting the existing and forecasted future connectivity needs in the study area. The findings and methodology of these analyses were documented in the Existing and Future Conditions (E&FC) Report dated November 2015, which detailed the current and projected conditions of the Morgantown area’s multi-modal transportation network connecting the city’s urban core and I-79.

The E&FC Report demonstrated that some type of improved connection between the urban core and I-79 would provide reduced travel delays and potentially safer connectivity. This improved connection could be a series of improvements to an existing corridor, such as a transportation system management project, or one of the new corridor alternatives discussed in this Access Study.

With an understanding of existing and future conditions and a need for improved connections established, this Access Study identifies and evaluates the opportunities for improvements along existing corridors, and evaluates new corridors which may involve a new river crossing connecting northern Morgantown to I-79. This study further includes:

- Defining the project’s Purpose and Need.
- Identifying and evaluating multiple build alternatives, plus a transportation system management (TSM) strategy and no-build alternative.
- Updating the MMMPO’s Travel Demand Model (TDM) to support the evaluation of potential alternatives.
- Facilitating a strong public engagement program.

1.1. Study Area Description

As shown in Figure 1-1, the study area is defined as Monongalia County from the West Virginia/Pennsylvania State Line in the north to the US 19/Westover Bridge in the south. To the west, the study area is bounded by I-79 in the western portion of

Monongalia County. The eastern boundary is US 119 (Point Marion Road). This study area is a refinement from that of the E&FC Report, which evaluated the existing connections to I-79 from Morgantown's urban core. Three corridors were evaluated in the E&FC Report:

- **Corridor 1** (Star City/Evansdale area): This corridor carries traffic from the intersection of Chestnut Ridge Road/Burroughs Street and WV 705, along WV 705 (Patteson Drive), to the intersection of I-79 and CR 19/24.
- **Corridor 2** (Urban core and Westover): This corridor carries traffic on US 19 from the US 119 (University Avenue) and Pleasant Street intersection to I-79 at Exit 152.
- **Corridor 3** (southern Morgantown): This corridor carries traffic from CR 857 (Green Bag Road) to its intersection with US 119 (Don Knotts Boulevard). The corridor then follows US 119 to I-68 WB to access I-79.

1.2. Existing Transportation Network

Four interchanges provide access from I-79 to Morgantown. At the time of the E&FC Report, Exit 153 was still under construction, but has since been opened. These exits include:

- Exit 155 at Chaplin Hill Road (CR 19/24) serves as one of the main gateways to Morgantown.
- Exit 153 at University Town Centre Drive provides access to University Town Centre to the east and to the under-development area to the west.
- Exit 152 at US 19/Fairmont Road services Westover.
- Exit 148, the southernmost I-79 interchange, provides access to I-68.

As noted previously and shown in Figure 1-1, three main corridors provide access to I-79 from Morgantown. Of the three existing connections to I-79, Corridor 1 is most heavily used primarily due to its role circulating traffic on the Evansdale and Health Science Campuses, key employment centers, as well as its connection to both Mountaineer Field and the Coliseum. Patteson Drive (WV 705) is highly developed with a variety of destinations. Ranging from the WVU Rec Center and Creative Arts Center (CAC), to the Engineering, Agricultural Sciences, and Health Sciences Campuses, Patteson Drive plays a critical role in providing access to northern Morgantown. Additionally, Patteson Drive is highly developed commercially with a

mixture of fast food and casual dining locations, local businesses, and parking facilities. For many system users, Corridor 1 provides the most familiar and direct connection between I-79 and Morgantown.

Corridor 2 connects the urban core and the Westover area to I-79. For users living and working in Morgantown's urban core, this route provides the most direct access to the I-79. The urban core is home to WVU's Downtown Campus, and is highly developed with a mixture of University buildings, housing, local business, retail, dining, social, and office destinations.

Corridor 3 provides direct access to I-79 from southern Morgantown and the Green Bag Road corridor via US 119 and I-68. The Green Bag Road corridor (CR 857) portion of Corridor 3 is more industrial in use; however, residential neighborhoods and commercial destinations are located in the area as well. Drivers accessing the southern portion of Morgantown from I-68 generally use this Corridor; however, travelers do rely on this connection during heavy traffic events.

1.3. Demographics and Projected Growth¹

Morgantown (population of 30,666² people) lies at the heart of Monongalia County, population of approximately 103,463³, and is home to WVU, the largest West Virginia land-grant institution. With an estimated student population of 29,500 and over 6,700⁴ faculty and staff, WVU is considered the heart of the Morgantown area. At a regional scale, Monongalia County is expected to grow at 1.4%⁵ per year - adding more than 10,000 people to the area by 2030, while West Virginia as a whole is expected to lose 19,500 people in the same timeframe.

From an employment⁶ and economic perspective, the presence of West Virginia University, WVU Hospitals, Mon General Health System, Mylan, and several other public sector entities (e.g., NIOSH and DOE National Energy Technology Laboratory) has driven regional employment growth in recent years and will continue to do so in the foreseeable future. The healthcare sector, comprised mainly of the Ruby Memorial and Mon General Hospital systems, employs more than 8,000 people regionally. At a larger scale, the Morgantown Metropolitan Statistical Area (MSA) has an employment

¹ Statistics as of submission of Existing and Future Conditions Report, November 2015

² US Census Bureau, 2013 estimate

³ US Census Bureau, 2014 estimate

⁴ WVU BBER *Morgantown Economic Outlook 2015*

⁵ WVU BBER *Population Trends in West Virginia through 2030*

⁶ Employment data and growth info from WVU BBER *Morgantown Economic Outlook 2015*

of over 62,000 people (as of 2014), with an expected growth of 1.4% per year in Morgantown through 2019. This forecasted growth is significantly higher than the West Virginia statewide average of 0.9% and is on par with the national average of 1.5%. Helping fuel the regional employment growth, the education and health services sectors are forecasted to grow at an annual rate of 2.8%.

Expansion of WVU and WVU Hospitals will contribute significantly to the growth of the area. In the midst of WVU's 10-year campus master plan, approved in December of 2012, the University is realizing more than \$320 million⁷ in new facilities, infrastructure, and renovations. WVU Hospitals is also expanding with the construction of a 114-bed tower at Ruby Memorial and a new outpatient care facility, as is Mon General with the addition of several dedicated outpatient and surgical care locations.

Another part of the study area experiencing significant growth is University Town Centre on the east side and adjacent development located on the west side of I-79 near Exit 153. The Morgantown Area Economic Partnership (MAEP) highlights the key findings of the Morgantown Metropolitan Statistical Area (MSA) 2015 Economic Outlook as related to growth along the I-79 corridor. University Town Centre, located in Granville, is experiencing continued development of 100 plus acres of commercial real estate overlooking I-79 and downtown Morgantown. This growth includes the completion of the \$21 million Monongalia County Ballpark, a 3500 seat venue home to both WVU baseball and the New York-Penn League West Virginia Black Bears. Also completed, a new 110,000 square foot, \$52 million West Virginia University Healthcare (WVUH) Outpatient Center provides orthopedic, family medicine, and other primary and secondary care services. While in varying phases of development, further expansion of University Town Centre includes over 339,000 square feet of office space, approximately 200,000 square feet of retail space, 25,000 square feet of casual and fast food dining, and over 100,000 square feet of hotel space.

Exit 153 provides direct access to University Town Centre to the east and a new business park development to the west. The MMMPO estimates that 40% of all growth is to occur in this area. With 332 raw acres to be developed, work has begun on the business park; however, details on site mapping and occupancy are preliminary. Development plans tentatively include over 890,000 square feet of office space; 230,000 square feet of big box retail; 75,000 square feet of medium size and strip

⁷ WVU 2020 Strategic Plan – Realization 2: Campus Facilities

retail; 20,000 square feet of hotel space; 150,000 square feet of WVU space; and various restaurant and commercial space. Also to the west of I-79, the Chaplin Hill Business Park, located between CR 46/3 and CR 46, is expected to grow with the addition of several new office buildings including Triad Engineering (15,000 square feet), CTL Engineering (15,000 square feet), and Tiefenbach North America, LLC (20,000 square feet). To the northwest of Exit 155, the Gateway development (57 acres) continues to grow with a mix of commercial, dining, and hotel accommodations. There is also the potential for a 20,000 square feet car dealership.

While the I-79 corridor is projected to experience significant growth, several developments throughout Morgantown are in various stages of commitment and planning, and are presented in the *University Avenue Complete Street Corridor Study*. As the University continues to expand, new/redeveloped student housing opportunities will be necessary to accommodate an increase in student population. Development efforts throughout Morgantown include:

- American Campus Communities –134 units (536 beds) located in the Sunnyside area along University Avenue in the vicinity of 3rd Street and North Street.
- Glenn Ridge Apartments – 149 units (157 beds) located along Willowdale Road.
- Various WVU Academic Buildings, including three new facilities at the intersection of Falling Run Road and University Avenue adjacent to the Life Sciences Building and College of Business and Economics.
- 12-story student housing complex at Willey and Spruce Streets.
- 5,000 additional beds on campus which are currently under construction.

1.4. Existing Multimodal Transportation Network

Morgantown offers two main modes of public transportation: the Personal Rapid Transit (PRT) System and the Mountain Line Transit Authority bus system. The PRT System⁸ was first put in service in 1975, and is an automated people-mover that services WVU students, faculty, staff, and visitors. Over the past 40 years, the PRT has provided over 83 million passenger trips without injury and has greatly reduced the number of vehicles using Morgantown's increasingly congested roadway network. With five stops across campus (Health Sciences, Evansdale Residential Complex, Engineering Sciences, Beechurst Avenue, and Walnut Street), the PRT makes 15,000-

⁸ WVU PRT background and facts courtesy of WVU Transportation and Parking: <http://transportation.wvu.edu/prt>

20,000 trips per day and is a favored mode of transport for students travelling between campuses. Students and faculty may ride by swiping their WVU ID cards, while visitors can pay a fare of 50 cents. Due to its aging infrastructure and technology, the PRT is currently undergoing a three-phase modernization:

- Phase one (approved in September 2012), estimated at \$15 million, includes the replacement of on-board vehicle computer system.
- Phase two (initially scheduled to wrap up by Fall 2016), estimated at \$52.6 million, includes the redesign and replacement of the Automatic Train Control (ATC) System, replacement of substation and electrical gear, and the repair of the Health Sciences tunnel.
- Phase three (initially scheduled to begin design in late 2016) is estimated to cost \$34.3 million and involves a complete replacement of the PRT vehicle fleet, as well as a thorough inspection of the system's structural components.

MMMPO's *2017-2045 Metropolitan Transportation Plan Update* includes three PRT extension projects (not part of the fiscally-constrained plan) to be considered when alternative funding sources are available: Project 31 PRT Extension from University Health Sciences to Mon General Hospital (estimated \$57 million), Project 32 PRT Extension from Mon General Hospital to Glenmark Centre (estimated \$103 million), and Project 35 PRT Connection New Business Park to Evansdale Campus (estimated \$80 million).

The Mountain Line Transit Authority provides the greater Morgantown area 20 bus routes⁹ covering all three of WVU's campuses; most off-campus housing locations; Downtown, Sabraton, Westover; shopping destinations around Morgantown, and outlying areas including Park & Ride locations. Most routes run Monday through Saturday while classes are in session, from around 6:00 or 7:00 am to 5:00 or 6:00 pm, with select nightly routes running 6:00 pm to midnight. Dedicated University bus routes run extended hours on weekdays (from 7:00 am to 9:00 pm) and weekend evenings (6:00 pm to 2:30 am). Additional shuttle services run during WVU home football games, and summer services operate at reduced hours and frequency. The Grey Line runs twice a day, year-round, connecting Morgantown, Fairmont, and

⁹ Please see detailed routing information available at www.busrider.org/Maps-Schedules.

Clarksburg in WV to Waynesburg, Washington, Pittsburgh Greyhound Station, and Pittsburgh International Airport in PA.

The level of pedestrian accessibility and availability of pedestrian facilities varies depending on location throughout Morgantown. Although there is a significant amount of bicycle activity, no on-roadway bicycle facilities (such as protected or shared use bike lanes) currently exist in the transportation network. However, the Mon River, Caperton, and Deckers Creek Trails provide 48 miles of walking, cycling, and jogging paths¹⁰. With a mixture of paved and gravel facilities, area trails are used primarily for recreation and fitness; however, some users utilize them to commute to class or work destinations. The Mon River/Caperton trails parallel University Avenue and Beechurst Avenue and are accessible at several locations along the way, including the Hazel Ruby McQuain Riverfront Park, Star City riverfront, and WVU Core Arboretum (near the Coliseum). The Deckers Creek Trail is accessible at several locations within the Sabraton area.

1.5. Special Transportation Considerations

In addition to the daily transportation needs, there are several special transportation considerations related to reoccurring special events, privately provided transit for residential housing complexes, truck traffic, and signing for non-familiar drivers. Each of these has an impact to the overall traffic flow within the study area.

Game Days and Special Events

As the home of WVU, Morgantown transforms into a high energy, densely populated city as students return in August for the start of another academic year. With this great influx of activity comes thousands of new vehicles and increased stress on the City's transportation network. Work week and school week trips combine resulting in a steady flow of traffic throughout the area and especially around campus. Evening peak hours result in congested roadway conditions along many of the major arterials, most notably Patteson Drive/Chestnut Ridge Road (WV 705), Monongahela Boulevard/Beechurst Avenue (US 19/WV 7), and University Avenue.

The start of the fall semester also signifies the beginning of Mountaineer football season in Morgantown. With a seating capacity of 60,000, students, alumni, and fans from across the state and region converge on Morgantown to cheer on the

¹⁰ Trail information courtesy of Mon River Trails Conservancy

Mountaineers at Mountaineer Field. On most game day weekends, fans begin arriving Friday evening; however, the majority of patrons arrive starting in the early hours of Saturday. Currently, two main corridors serve as routes to the stadium and tailgate/parking destinations throughout town. Fans travelling from the east follow I-68 westbound to Exit 7 (WV 705 – Airport/Pierpont Road). From Pierpont Road, signing directs users to Mountaineer Field via CR 857/Mileground Road and WV 705. For fans entering Morgantown from the north or south along I-79, Exit 155 (WV 7 – West Virginia University) to WV 7/US 19 (Monongahela Boulevard) carries traffic to the Coliseum (free parking on game days) as well as to Patteson Drive (WV 705) and beyond.

While not as intense as football-related traffic, basketball season also places pressure on the WV 7/US 19 (Monongahela Boulevard) corridor. Fans are currently permitted to park along the eastern side of Monongahela Boulevard (north of the signalized intersection with Patteson Drive) and along the west side to the south of the intersection. Additional special events that place great stress on the area's transportation network include graduation weekends and University recesses. As families and friends converge on Morgantown to celebrate thousands of graduations (the class of 2015 graduated approximately 4,500) over a weekend in May (and a weekend in December), capacity and operational deficiencies occur along many of the area's major corridors.

Recesses at Fall, Thanksgiving, Winter, and Spring Breaks intensify several of the existing capacity and operations deficiencies within the transportation network. Thanksgiving and Spring Recesses, in particular, result in severe congestion along the existing corridors leading to I-79 and I-68, as the majority of students have classes and exams that prevent them from leaving earlier in the week. With thousands of students leaving over a span of only a few hours, travel times to reach I-79 from campus can exceed one hour. While these extreme traffic conditions exist only a few times a year, they demonstrate the need for additional, reliable capacity in the existing transportation network, especially when placed in the context of an emergency or disaster response scenario.

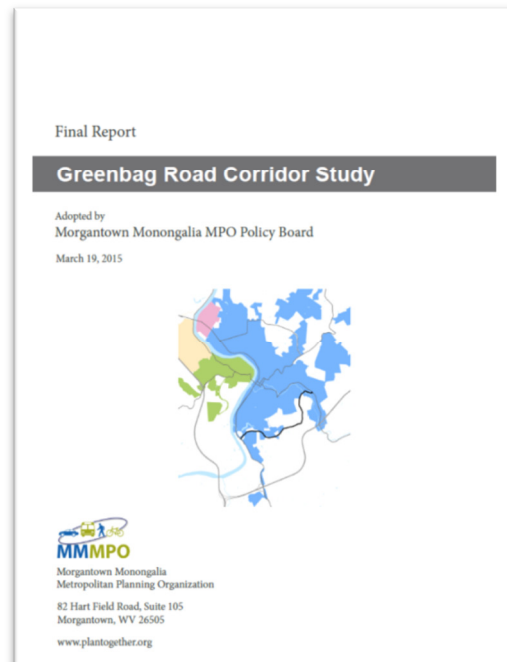
Private Transit for Residential Housing Complexes

In addition to the PRT and Mountain Line, Morgantown's transit system includes privately operated shuttle services for popular student housing apartment/townhome

complexes. These shuttles provide weekday and weekend routes to WVU campuses, as well as downtown Morgantown and popular shopping destinations throughout the study area. While the Mountain Line services most of these housing complexes, the private shuttles offer residents a free alternative to driving to and from class or work.

Heavy Truck Traffic

Several roadway segments throughout the study area experience significant heavy truck traffic. WV 7/US 19 (University Avenue, Beechurst Avenue, and Monongahela Boulevard) serves as a main travel route for trucks carrying limestone and coal from Greer Limestone's facility on WV 7 in the Sabraton area to nearby power plants, including the Morgantown Energy Facility located adjacent to Beechurst Avenue in the vicinity of 6th Street. Trucks use Pleasant Street and Walnut Street in the urban core to travel between the Greer facility and their destinations. Trucks also utilize Green Bag Road (CR 857) as a north-south bypass of the urban core as they travel between Sabraton and southern Morgantown. The *Greenbag Road Corridor Study*, adopted by the MMMPO in March 2015, discusses the presence of heavy vehicles using Green Bag Road and presents several solutions for better facilitating heavy vehicle movement in anticipation of forecasted economic and population growth.



Signage and Wayfaring

The role of guide signs in a community is to direct system users along streets, and to direct them to cities and other important destinations. Good guide signs typically provide sufficient information to guide these users to destinations in a simple, direct manner. While current signage at the existing I-79 interchanges direct users to WV7/US19 and US 119, little wayfaring exists to guide unfamiliar users to the urban core and downtown Morgantown. Prior to the Westover Bridge, signage does indicate that users are entering Morgantown; a City of Morgantown welcome sign greets users

travelling south on WV 7/US 19 near the Coliseum; and a Historic Downtown sign greets those travelling north on US 119.

1.6. Historic Districts/Sites

Morgantown is home to a variety of historic sights and registered places as shown in Figure 1-1. The urban core includes five nationally registered historic districts: Downtown Morgantown Historic District; Morgantown Wharf and Warehouse Historic District; Chancery Hill Historic District; South Park Historic District; and Greenmont Historic District.

1.7. Previous Studies

To better understand the background and purpose of this project, a thorough review of several previous studies and MMMPO efforts was conducted. Technical memos were prepared summarizing the key findings and recommendations of each study, and those most applicable to this project are included below.

The City of Morgantown Comprehensive Plan, prepared by Planning NEXT and Burgess & Niple (adopted June 2013), was a collaborative effort between the MMMPO and the adjacent Town of Star City. The study updated the City's 1999 Comprehensive Plan and served as a basis for each respective municipality's comprehensive plan and the region's Long Range Transportation Plan. The study also identified several transportation-related issues that are applicable to the scope of the I-79 Access Study. A relevant issue identified in that study was the need to improve City connectivity to I-79, I-68, and the airport by increasing roadway linkages within and around the City, especially for out-of-town commuters travelling from the north along I-79. Other pertinent issues identified by the Comprehensive Plan included reducing traffic congestion, diversifying transportation modes like the Mountain Line Transit Authority and WVU PRT System through expanded routes and hours, and reducing heavy truck traffic within the city by re-routing heavy trucks around the urban core and interior corridors.

The *2040 Long Range Transportation Plan*, adopted in 2013, was prepared by the Morgantown Monongalia Metropolitan Planning Organization and identified a Regional Transportation Systems Management Strategy and a Monongahela River Crossing Study as Priority 1 Strategies.

The 2013 LRTP included projects in two categories:

- Tier 1 or “Fiscally-Constrained” Projects - These are the highest-priority projects for the region to be implemented through the 2040 planning horizon, and can reasonably be funded with currently-forecasted funding sources.
- Tiers 2 through 4 - These are high-value projects that cannot be funded with currently-forecasted funding sources.

Chapter 4 of the 2013 LRTP detailed the existing conditions of the MMMPO’s transportation system, including safety and operations deficiencies within the three study corridors described above. In the 2013 LRTP, these identified deficiencies helped support the initial purpose and need for a Monongahela River Crossing Study:

- Failing levels of service (LOS) along US 19 (Monongahela Boulevard) from Chaplin Hill Road to Boyers Avenue.
- Failing LOS along WV 705 (Van Voorhis Road/Chestnut Ridge Road) from University Avenue to Pineview Drive.
- Crash rate of 5.90 crashes per million entering vehicles (MEV) at intersection of Patteson Drive and Monongahela Boulevard.
- Crash rate of 1.88 crashes per MEV at the intersection of University Avenue at Beechurst Avenue and Fayette Street.

As a part of the alternatives analysis process for the I-79 Access Study, three 2013 LRTP-identified new road and bridge construction projects will be assessed:

- New Bridge over Monongahela River and Roadway Connection to I-79 (Tier 1 Project 6).
- Beechurst Avenue geometric improvements to increase capacity and improve pedestrian and bicycle flow (Tier 1 Project 8).
- Greenbag Road widening and intersection improvements to make routes more accompanying of truck traffic (Tier 1 Project 18).

MMMPO recently completed the *2017-2045 Metropolitan Transportation Plan Update*. This document, adopted March 23, 2017, updates the 2013 LRTP by confirming the transportation needs of the MMMPO area, assessing the projects detailed in the 2013 LRTP, and programming new projects. The MTP Update included multiple 2013 LRTP Tier 1 projects, and incorporated the recommendations of the I-79 Access Study as “Tier 1 Project 6: I-79 Access Improvements Phase I” and “Tier 2 Project 6: I-79

Access Improvements Phase II.” The MTP Update also identifies the Phase I I-79 Access Improvements as the top priority of the Tier 1 Projects. Figure 1-2 provides a location overview of the MTP Update’s projects.

The WV 705 Connector – Falling Run Corridor – Beechurst Avenue Detailed Traffic Operations Analysis, prepared by URS in 2008, studied the operations of three arterial improvements identified in the Regional Transportation Plan. Of particular importance to the I-79 Access Study, the widening of Beechurst Avenue and South University Avenue (8th Street to Pleasant Street) to five-lane sections is consistent with the 2013 LRTP Tier 1 Project 6C for a new I-79 access connecting 8th Street to Monongahela Avenue via a new river crossing that would continue on towards a new I-79 interchange. The study recommended several roadway improvements for the stretch of Beechurst Avenue from 8th Street to North 3rd Street including the addition of another through lane in each direction. Recommendations of this study are included in the *2017-2045 Metropolitan Transportation Plan Update* as part of “Programmed Project 8: Beechurst Ave. Improvements.”

The *Greenbag Road Corridor Study*, adopted by MMMPO Policy Board on March 19, 2015, was a recommendation of the *2040 Long Range Transportation Plan* with an objective of addressing safety, mobility, community, economic growth, and the environment. The study recommended widening and resurfacing the two-lane sections of Greenbag Road to better accommodate the high volumes of truck traffic travelling from WV 7 to US 119 westbound via Greenbag Road. An additional long-term recommendation included the addition of a center two-way left-turn lane to reduce merging conflicts. The study further recommended intersection improvements (at US 119 - the addition of dedicated left-turn for westbound approach, improving turning radii, and signal optimization) as well as pedestrian, bicycle, and transit improvements. The recommendations of this project are listed in the *2017-2045 Metropolitan Transportation Plan Update* as “Programmed Project 18: Greenbag Rd. Improvements Phase I” and “Tier 2 Project 18: Greenbag Rd. Improvements Phase II.”

The *University Avenue Complete Streets Corridor Study* is a recently completed MMMPO initiative to address the multimodal transportation deficiencies along University Avenue. A critical corridor that connects WVU’s Downtown Campus to the Evansdale and Health Science Campuses, University Avenue varies greatly in land use, from energetic student housing to quiet residential neighborhoods. This study’s

main goal is to evaluate a 1.8-mile stretch of University Avenue from Beechurst Avenue to WV 705 near the Erickson Alumni Center for solutions to providing accessibility and connectivity for every type of user. The recommendations of this study are included in the *2017-2045 Metropolitan Transportation Plan Update* as “Tier 1 Project 9: University Ave. Complete Street Improvements Phase I” and “Tier 2 Project 9: University Ave. Improvements Phase II.”

The Mountain Line Transit Authority (MLTA) recently completed the process of studying bus route efficiency and vehicle maximization. Through the *Route Efficiency & Vehicle Maximization Study*, MLTA evaluated the existing bus system performance including routing efficiency, ridership, trip preference, and fare policy. Based on this evaluation, MLTA engaged WVU transit authorities, formed a steering committee, and compared services offered to similar peer transit systems in university towns across the country to provide cost effective solutions while maintaining reliable operations for the Morgantown area.

The Mon River Trails Conservancy (MRTC) is a non-profit organization tasked with constructing, managing, and maintaining the Mon River and Deckers Creek Rail-Trails. The MRTC has several recently completed and planned trail projects within the study area, particularly in northern Morgantown¹¹. Completed in 2016, the Van Voorhis Trailhead is located on a remediated brownfield site and includes a restroom, 30-car parking lot, trailhead and signs, and rail-trail access and kayak/canoe launch.

The Collins Ferry Connector Trail is a planned half-mile connector trail linking the neighborhoods along Collins Ferry Road to the Mon River Rail-Trail. According to the MRTC’s website, “this trail will become a formal walk/bike right-of-way with the Department of Energy (NETL) and make the route easier and safer with new compacted stone surface, drainage improvements, and safety fencing”. This project has yet to be designed or constructed.

The MRTC is also working with local and regional trail agencies to expand the region’s rail-trail network. The proposed Sheepskin Rail-Trail would connect the Mon River Rail-Trail at the WV/PA state line to the Great Allegheny Passage in Connellsville, PA. This trail would extend 34 miles; however only a 2.1 mile segment has been constructed at the northern end to Dunbar, PA and the section connecting the WV/PA

¹¹ All rail-trail information/plans gathered from MRTC’s website: <http://www.montrails.org/trail-projects/>



state line to Point Marion, PA was expected to be built by the end of 2016. At a larger scale, the MRTC is an active member of the Industrial Heartland Trails Coalition (IHTC), which is working to create a nearly continuous 1,400 mile multi-use trail through PA, NY, OH, and WV¹². The Mon River Rails-Trails are part of the Parkersburg to Pittsburgh (P2P) corridor linking the North Bend Rail-Trail, West Fork River Trail, Sheepskin Rail-Trail, and the Great Allegheny Passage.

¹² More detailed information available on IHTC's website: <http://ihearttrails.org/>

Figure 1-1
STUDY AREA

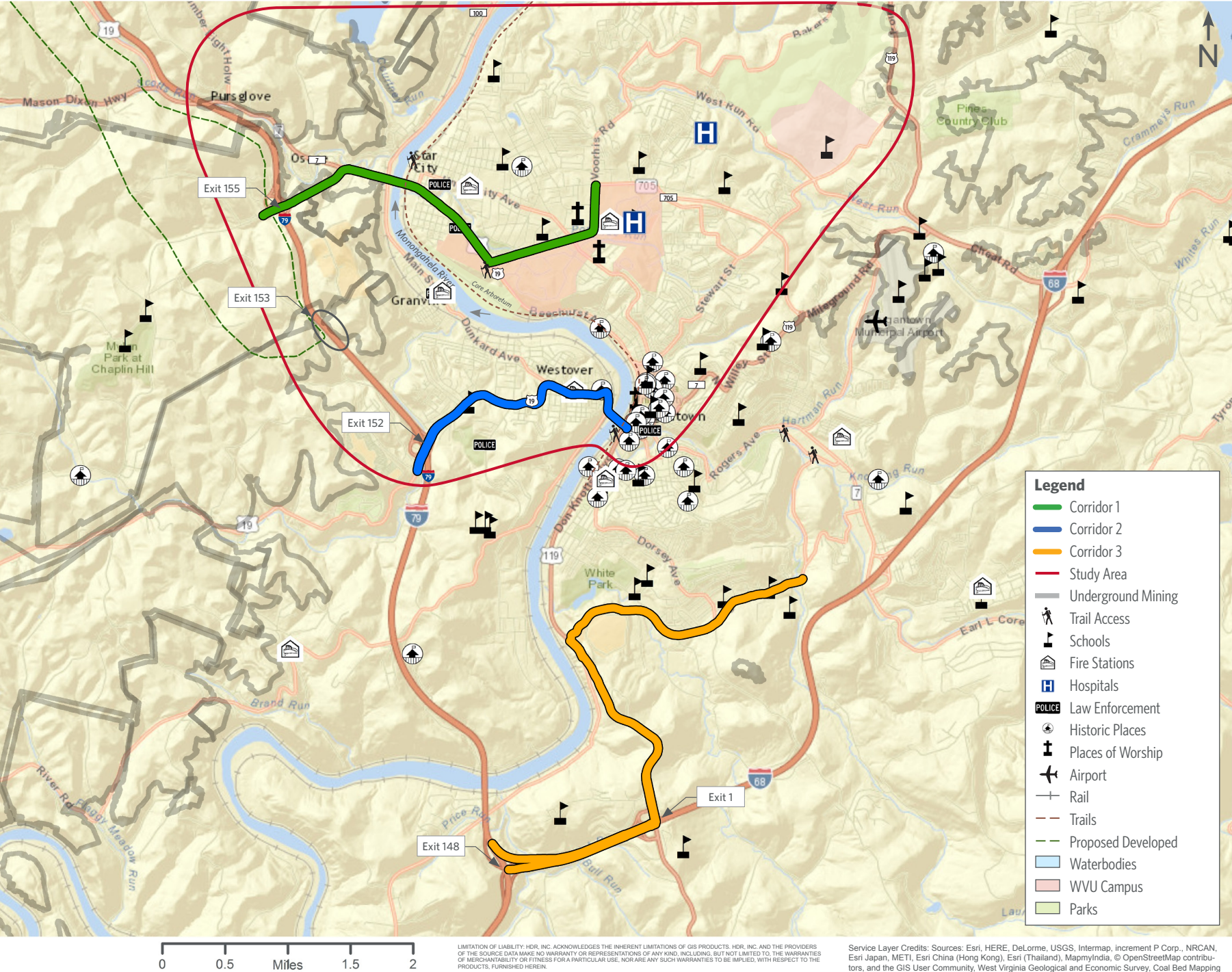
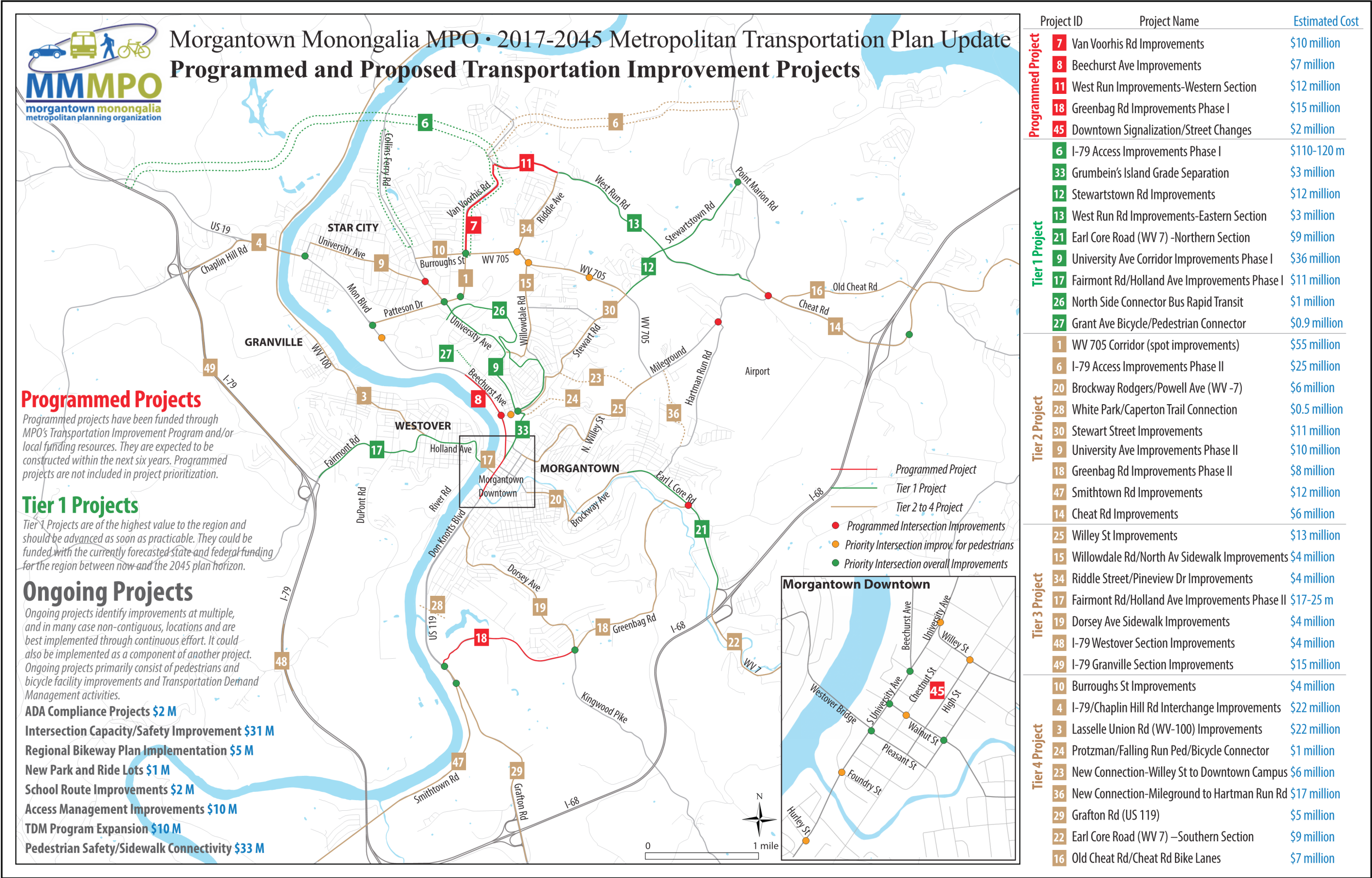


Figure 1-2
2017-2045 MTP UPDATE PROJECT MAP



2 Existing and Future Transportation Conditions

To understand the existing and future conditions of the study area and primarily the three corridors providing access to I-79, an evaluation of the existing transportation network was conducted. This included reviewing the available traffic data and volumes, origin-destination of trips, crash analyses, corridor travel times, and planning-level operational analyses.

2.1 Existing Traffic Volumes

Existing traffic data were provided by the MMMPO for their 2015 traffic count locations. Volumes from the WVDOT 2014 Average Daily Traffic Map for Monongalia County were used as a supplement for areas lacking MMMPO collection coverage. The following summarizes the existing traffic volumes along the main corridors within the study area:

- WV 705 from Chestnut Ridge Road/Burroughs Street to WV 7/US 19 (Monongahela Boulevard) - 36,100 vehicles per day (vpd).
- WV 7/US19 from Patteson Drive to the I-79 interchange – 32,000 vpd.
- US 19 from Westover Bridge to I-79 interchange – 14,800 vpd.
- CR 857 from Dorsey Avenue to US 119 – 11,600 vpd.
- US 119 from CR 857 to I-68 interchange – 18,500 vpd.
- I-79 from I-68 (Exit 148) to Exit 155 (Chaplin Hill Road) – 57,700 vpd.

2.2 Existing Origin and Destination Flows

To capture origin-destination (O-D) data, AirSage data were obtained to supplement the analysis capabilities of MMMPO's regional travel demand model. AirSage provides origin-destination data based on an anonymous aggregation and tracking of wireless signals from a sample of mobile phone carriers in the region. The AirSage product was statistically adjusted and expanded to estimate the travel (between origins and destinations) of all regional residents. The data were used to refine and enhance the MMMPO travel demand model.

This trip distribution data plays a critical role in updating the travel demand model to better reflect existing and future travel flows. See Figure 2-1 for an illustration of the AirSage data and the main “desire lines” within the study area.

2.3 Crash Analysis

The West Virginia Department of Transportation (WVDOT) provided crash data for the three corridors providing access to I-79. The data for the period between January 1, 2012 and December 31, 2014, were reviewed and analyzed to identify high-crash areas along these critical routes. The corridors were divided into segments representing the type of facility and crashes were totaled in each of these segments. Logical separation points were chosen based on changes in roadway geometry (i.e. decrease in number of lanes) and signalized intersections. Corridor crash rates, which are reported in crashes per hundred million vehicle miles (HMVM) traveled, were then compared to the most recent published statewide data (WVDOT 2003). The following statewide rates were used for comparison:

- Total Interstate: 95 crashes per HMVM
- US and WV Routes (non-expressway): 306 crashes per HMVM
- County Routes: 380 per HMVM

Figure 2-2 displays the corridor crash rates, and Table 2-1 provides the crash rate data in another form, as well as compares the calculated corridor crash rates to the statewide average. Figure 2-3 displays segmented crash clusters along the main study corridors. Of the 14 segments analyzed, 7 exceeded the statewide crash rate. The segment of US 19/WV 7 from 8th Street to the Westover Bridge (Pleasant Street, US 19/WV7 and US 119) had a total of 163 crashes over three years, for a crash rate of 610 crashes per hundred million vehicle miles, and exceeding the statewide crash rate of 306 crashes per HMVM.

- The study area segment with the highest crash-rate was WV 705 (Patteson Drive) from CR 59/2/Burroughs Street to US 19/WV 7 (Monongahela Boulevard). As stated previously, this is one of the most heavily travelled corridors in Morgantown. Over three years, 340 crashes occurred on this segment of WV 705, for a crash rate of 670 crashes per HMVM. This exceeds the statewide average of 306 crashes per HMVM. The higher crash rate is likely a consequence of poor traffic capacity and operations, as well as frequent conflicts caused by shortly spaced adjacent driveways and side roads. Long delays at signalized intersections, coupled with congested conditions and high egress/digress activity as often occurs along Patteson Drive, can cause drivers to become more aggressive and lead to higher crash rates.

- Another corridor with a high crash rate is US 19 from the Westover Bridge to the I-79 interchange. With 77 crashes occurring between the Westover Bridge and DuPont Road, and 83 crashes occurring between DuPont Road and I-79, respectively, the crash rates along US 19 exceeded the statewide average for the entire length connecting the urban core and I-79. The segment between DuPont Road and I-79 had the third highest crash rate in the study area, with 619 crashes per HMVM.

Overall, only one interstate segment analyzed exceeded the statewide crash rate: the segment of I-68 between the US 119 interchange (Exit 1) and the I-79 interchange (Exit 148). Over three years, this segment had 56 crashes, for a crash rate of 100 crashes per HMVM and exceeding the statewide average of 95 crashes per HMVM.



Table 2-1: Summary of Corridor Crash Rates

	From		To		# of Crashes (total)	Crash Rate (per HMVM)	2003 Statewide Average (per HMVM)	Exceeds Statewide Average?
	Description	MP	Description	MP				
UTC to I-68	US 19/WV 7 & CR 19/24	14.80	8th St. and Beechurst Ave. (US 19/WV 7)	12.33	333	429	306	YES
	8th St. and Beechurst Ave. (US 19/WV 7)	12.33	Pleasant St., US 19 & WV 7, US 119 (Westover Br.)	11.26	163	610	306	YES
	US 119 & Dorsey Ave	13.56	Smithtown Road/WV 73 & US 119	11.9	76	220	306	NO
	Smithtown Road/WV 73 & US 119	11.9	I-68 WB Ramps & US 119	10.37	38	125	306	NO
WV 705	WV 705, US 19 & WV 7 (Mon. Blvd.)	0.00	CR 59/2, Burroughs St	1.23	340	670	306	YES
US 19	Pleasant St., US 19 & WV 7, US 119 (Westover Br.)	11.26	US 19 & DuPont Rd.	10.02	77	362	306	YES
	US 19 & DuPont Rd.	10.02	US 19 & I-79	9.16	83	619	306	YES
CR 857	US 119 and Greenbag Road/CR 857	0.00	Distributor Dr. & CR 857	0.65	11	116	306	NO
	Distributor Dr. & CR 857	0.65	Deckers Creek Blvd. & CR 857	3.32	46	145	306	NO
I-68	I-68 WB at US 119	1.00	I-68 & I-79 I/C (Exit 148)	0.00	56	100	95	YES
I-79	I-68 & I-79 I/C (Exit 148)	148	Exit 152 - US 19 Westover	152	161	67	95	NO
	Exit 152 - US 19 Westover	152	Exit 155 - WV 7 WVU	155	86	45	95	NO
	Exit 155 - WV 7 WVU	155	WV-PA State Line	160	54	32	95	NO

*Note: Crash data provided by WVDOT for 01/2012 to 12/2014

2.4 Corridor Travel Time

The Mountain Line Transit Authority utilizes Shadow Tracker technology to track and record the travel of its buses. Both GPS-based live-tracking and historical data are available for the Mountain Line buses. To represent a typical day of corridor travel time conditions, Shadow Tracker data was reviewed for a Wednesday in October, 2014, to determine travel time data during AM peak hours (7:00-9:00 am), Mid-day peak hours (11:00 am–1:00 pm), PM peak hours (3:00-6:00 pm), and Off-Peak peak hours (7:00-9:00 pm). Table 2-2 summarizes the travel times along several segments within the study corridors. This data reflects the transit time of buses running the primary segments of study corridor; average transit time and distance travelled were calculated for duplicate trips.

AM Peak Hour

- Common route from the urban core to Evansdale covering Westover, University Town Centre, and Patteson Drive took over half an hour (36 minutes).
- Travelling between Evansdale and urban core via Beechurst Avenue and University Avenue took 14 minutes.
- Trip from Westover to I-68 via US 19 and US 119 took 17 minutes.

Mid-Day Peak Hour

- Travelling from urban core to Evansdale with coverage of Morgantown Mall (vicinity of I-79 interchange), University Town Centre, and Patteson Drive took a similar amount of time as did the AM trip (35 minutes mid-day).
- Trip between Evansdale and urban core via Beechurst Avenue and University Avenue took approximately 3 minutes longer than the same trip during AM peak hour.
- Round trip from urban core to I-68 via US 19 and US 119 took about 24 minutes.

PM Peak Hour

- Travelling from urban core to Evansdale with coverage of Morgantown Mall, University Town Centre, and Patteson Drive took approximately 5 minutes longer than the same trip during AM and Mid-day peak hours.
- Trip between Evansdale and urban core via Beechurst Avenue and University Avenue took about the same amount of time as the same trip during the AM peak hour.



- Round trip from urban core to I-68 via US 19 and US 119 took about 2 minutes longer than the Mid-day trip.

Off-Peak Peak Hour

- Travelling from Westover to Evansdale via University Avenue (with coverage of Morgantown Mall) took 14 minutes.
- Trip between Evansdale and Downtown Campus via Valley View Avenue and Stewart Street took only 4 minutes, which is about 10 minutes shorter than similar trips throughout the day.



Table 2-2: Travel Time Summary

From	To	Travel Time	Distance	Speed
		(hh:mm:ss)	(mi)	(mph)
AM Peak Hour (7:00-9:00 am)				
Urban Core	Evansdale (via I-79, UTC, CR 19/24, WV 7/US 19, WV 705)	0:36:00	12.7	21
Evansdale	Urban Core (via WV 7/US 19, University Ave)	0:14:00	4.2	18
Westover	Urban Core	0:04:00	1.3	20
Urban Core	Waterfront Place and Back	0:10:00	2.6	16
Westover	I-68 (via US 19 and US 119)	0:17:00	5.8	20
I-68	Morgantown Mall/I-79 (via US 119 and US 19)	0:37:00	12.9	21
Mid-Day Peak Hour (11:00 am-1:00 pm)				
Urban Core	Morgantown Mall/I-79 (via US 19)	0:11:00	3.7	20
Morgantown Mall/I-79	Evansdale (via I-79, UTC, CR 19/24, WV 7/US 19, WV 705)	0:25:00	8.9	21
Evansdale	Urban Core (via WV 7/US 19, University Ave)	0:17:00	4.3	15
Urban Core	Evansdale (via I-79, UTC, CR 19/24, WV 7/US 19, WV 705)	0:36:00	12.8	21
Urban Core	Morgantown Mall/I-79 (via US 19), round trip	0:26:00	7.6	18
Urban Core	I-68 (via US 119), round trip	0:24:00	10.2	26
Waynesburg, PA	Westover (via I-79 SB)	0:31:00	24.5	47
PM Peak Hour (3:00 pm-6:00 pm)				
Urban Core	University Town Centre (via US 19 and I-79 NB)	0:22:00	8.7	24
University Town Centre	Evansdale (via CR 19/24, WV 7/US 19, WV 705)	0:18:00	5.2	17
Urban Core	Evansdale (via I-79, UTC, CR 19/24, WV 7/US 19, WV 705)	0:33:00	12.00	22
Evansdale	Urban Core (via WV 7/US 19, University Ave)	0:15:00	4.1	16
Urban Core	Health Science Campus Area	0:11:00	3.2	17
Health Science Campus Area	Mount Morris, PA (via WV 705, WV 7/US19, CR 19/24, I-79N)	0:16:00	11.1	42
Urban Core	I-68 (via US 119), round trip	0:26:00	10.2	24
Urban Core	Morgantown Mall/I-79 (via US 19), round trip	0:25:00	7.7	18
Off-Peak Peak Hour (7:00 pm-9:00 pm)				
Urban Core	Morgantown Mall/I-79 (via US 19)	0:14:00	4.3	18
Urban Core	Evansdale (via University Avenue)	0:04:00	1.5	23
Evansdale	Urban Core (via Valley View Avenue and Stewart Street)	0:12:00	3.3	17

2.5 Planning-level Traffic Operations

Based on the input of the MMMPO's 2015 Average Daily Traffic (ADT) data and projected 2040 ADTs¹³, HCS 2010 ARTPLAN/FREEPLAN for planning-level operational analysis was used to analyze the existing and future operations of the corridors to I-79. Traffic operations results presented in this document represent typical weekday peak hour conditions, with Level of Service (LOS) letter grades ranging from LOS "A" for good or "free flow" traffic operations conditions, to LOS "F" for worst congestion conditions with significant breakdowns in travel flow. Exhibit 2-1 illustrates LOS in the context of a typical arterial corridor with varying degrees of congestion.

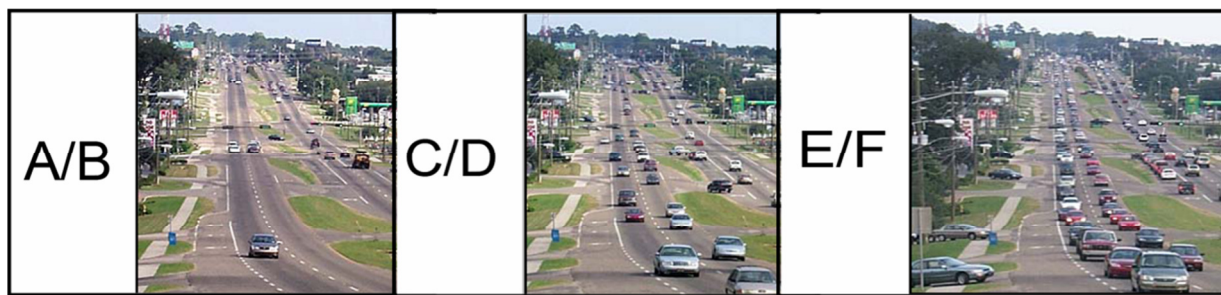


Exhibit 2-1: Level of Service Illustrations

Level of Service Criteria

A Policy on Geometric Design of Highways and Streets, 2011 6th Edition, by The American Association of State Highway and Transportation Officials (AASHTO) provides guidelines for the selection of design LOS. As per AASHTO Table 2-5, for a suburban principal arterial like WV 705 or a suburban minor arterial like US 119, the acceptable LOS is C or D. These design LOS values are used to determine the scale of transportation network improvements necessary for providing adequate operations and capacity.

ARTPLAN's segment LOS criteria is based on the combination of travel time delay due to signal control and the speed traveled below the free-flow speed of each segment. Class 1 arterials have a posted speed greater than or equal to 40 mph, while Class 2 arterials have a posted speed less than 40 mph. FREEPLAN's basic freeway segment LOS criteria is based on segment density, or the number of vehicles occupying a given length of highway, typically reported as passenger cars per mile per lane (pcpmpl). Table 2-3 summarizes the threshold values used in the corridor-level LOS evaluation.

¹³ Compounded growth rates were determined using the 2010 input and 2040 output values generated by the transportation demand model.

Table 2-3: Level of Service Evaluation Criteria

LOS	ARTPLAN		FREEPLAN
	Class 1 Arterial Average Speed (mph)	Class 2 Arterial Average Speed (mph)	Basic Freeway Segment Density (pcpmpl)
A	> 40	> 28	0 – 11
B	> 31 and ≤ 40	> 22 and ≤ 28	> 11 – 18
C	> 23 and ≤ 31	> 17 and ≤ 22	> 18 – 26
D	> 18 and ≤ 23	> 13 and ≤ 17	> 26 – 35
E	> 15 and ≤ 18	> 10 and ≤ 13	> 35 - 45
F	< 15	< 10	> 45

The results of the 2015 and 2040 planning-level operations analysis are summarized in Table 2-4. Figures 2-4 and 2-5 display the levels of service along the corridors to I-79 for the 2015 existing and 2040 no-build scenarios, respectively. Each corridor is summarized in more detail below.

Corridor 1 – Evansdale Area Corridor

As one of the most travelled corridors in Morgantown, Corridor 1 operates at generally poor levels of service during peak conditions. All three segments of Patteson Drive (WV 705) between major signalized intersections, currently operate at LOS F. The combination of signalized intersections, multiple driveway accesses, and heavy traffic volumes causes significant delays, especially during morning and evening peak hours. Operations improve to LOS B along WV 7 /US 19 (Monongahela Boulevard) from the intersection with Patteson Drive to Boyers Avenue, as the roadway widens to four lanes and the speed limit increases to 45 mph. Between Boyers Avenue and CR 19/24, operations decline to LOS F with traffic often queuing across the Star City Bridge during evening peak hours. Traffic generated by the University Town Centre Development and all related shopping, dining, and commercial destinations, cause this segment, as well as the segment between CR 19/24 with WV 7 and CR 19/24 and University Town Centre Drive, to experience some of the highest traffic volumes on a daily basis.

With the anticipated growth and increase in volumes in 2040, Corridor 1 is expected to operate at failing levels of service along most of its length. Operations along the segment of WV 7/US 19 between Patteson Drive (WV 705) and Boyers Avenue will

decline from a LOS B to LOS F, while operations between CR 19/24 with WV 7 and CR 19/24 and I-79 are expected to operate at the same LOS B or C.

Corridor 2 – Urban Core and Westover

Corridor 2 operates at a failing LOS across the Westover Bridge until reaching the signalized intersection of US 19 (Holland Avenue) and WV 100, where operations increase to LOS C and D along US 19 (Fairmont Road) to the I-79 interchange due to decreased traffic volumes and increased roadway capacity.

Levels of service along Corridor 2 are also expected to deteriorate with anticipated traffic growth. US 119 through Morgantown's urban core, and US 19 through Westover are expected to operate at LOS D or F.

Corridor 3 – Southern Morgantown

Corridor 3 along Green Bag Road (CR 857) and US 119 operates at acceptable levels of service, ranging from LOS B to D. Corridor 3 also consists of I-68 and I-79 and operates at LOS C or better. With three existing interchanges and one under construction, I-79 currently operates at or above the acceptable LOS of C or D. However, the segment of Corridor 3 that is US 119 between Scott Avenue and I-68 operates at LOS F.

As with Corridor 1 and Corridor 2, operations along Corridor 3 are expected to congest with projected traffic growth. Operations will decline along Green Bag Road to LOS E or worse, while US 119 is expected to operate at LOS F from the intersection with CR 857 (Green Bag Road) to the I-68 interchange. Interstate 79 will also experience a decline in operations, especially between the interchange with I-68 (Exit 148) and Exit 155 (Chaplin Hill Road). This portion of I-79 includes the new I-79 interchange at Exit 153 and is expected to operate at LOS E or worse.



Table 2-4: Existing and Future Corridor Levels of Service

From	To	ARTPLAN/FREEPLAN			
		2015 ADT (vpd)	Segment LOS	2040 ADT (vpd)	Segment LOS
Corridor 1					
Chestnut Ridge Rd./Burroughs St. & WV 705	Elmer Prince Dr. & WV 705	37,500	F	45,000	F
Elmer Prince Dr. & WV 705	University Ave. & Patteson Dr.	37,500	F	44,000	F
University Ave. & WV 705 (Patteson Dr.)	WV 7/US 19 (Mon. Blvd.) & WV 705 (Patteson Dr.)	33,300	F	38,000	F
WV 7/US 19 (Mon. Blvd.) & WV 705 (Patteson Dr.)	WV 7/US 19 & Boyers Ave.	31,000	B	35,000	F
WV 7/US 19 & Boyers Ave.	WV 7/US 19 & CR 19/24 (Chaplin Hill Rd.)	44,000	F	53,000	F
WV 7/US 19 & CR 19/24 (Chaplin Hill Rd.)	CR 19/24 & University Town Centre Dr.	34,000	C	48,000	C
CR 19/24 & University Town Centre Dr.	CR 19/24 & I-79	19,100	B	28,000	B
Corridor 2					
US 119 & US 19/WV 7 (Pleasant Street)	US 19 (Holland Ave.) & WV 100	18,900	F	24,000	F
US 19 (Holland Ave.) & WV 100	US 19 & DuPont Rd.	12,300	D	17,000	D
US 19 & DuPont Rd.	US 19 (Fairmont Rd.) & Commerce Dr.	12,300	C	18,000	D
US 19 (Fairmont Rd.) & Commerce Dr.	US 19 & I-79	15,800	D	23,000	D
Corridor 3					
Dorsey Ave. (CR 81) & CR 857 (Green Bag Rd.)	CR 857 & Mountaineer Mall	10,200	B	16,000	F
CR 857 & Mountaineer Mall	CR 857 & US 119 (Don Knotts Blvd.)	13,100	D	21,000	E
CR 857 & US 119 (Don Knotts Blvd.)	US 119 & Scott Ave.	18,500	B	25,000	F
US 119 & Scott Ave.	US 119 & I-68	18,500	F	25,000	F
US 119 & I-68	I-68 & I-79 (Exit 148)	52,000	B	70,000	B
I-68 & I-79 (Exit 148)	I-79 Exit 152 (Westover)	56,000	C	76,000	E
I-79 Exit 152 (Westover)	I-79 Exit 155 (Chaplin Hill Rd.)	59,400	C	87,000	F

2.6 Summary

The key findings of the existing and future conditions can be summarized by the following statements:

- Monongalia County employment is projected to grow by 1.4% through 2019, exceeding the statewide average of 0.9% and keeping pace with the national average of 1.5%.
- More than one-third of the roadway sections analyzed currently operate at LOS F during peak periods. This amounts to over 3 miles of failing roadway segments.
- By Year 2040, almost two-thirds of roadway segments will operate at LOS E or F during peak periods. This amounts to 13 miles of failing roadway segments.
- Half of the roadway segments analyzed exceeded the statewide crash rate.

With an understanding of existing and future conditions and a need for improved access and connectivity to I-79, the remainder of this study identifies and evaluates the opportunities for improvements along existing and new corridors, including the potential for a new river crossing connecting Morgantown to I-79.

Figure 2-1
ORIGIN-DESTINATION OVERVIEW

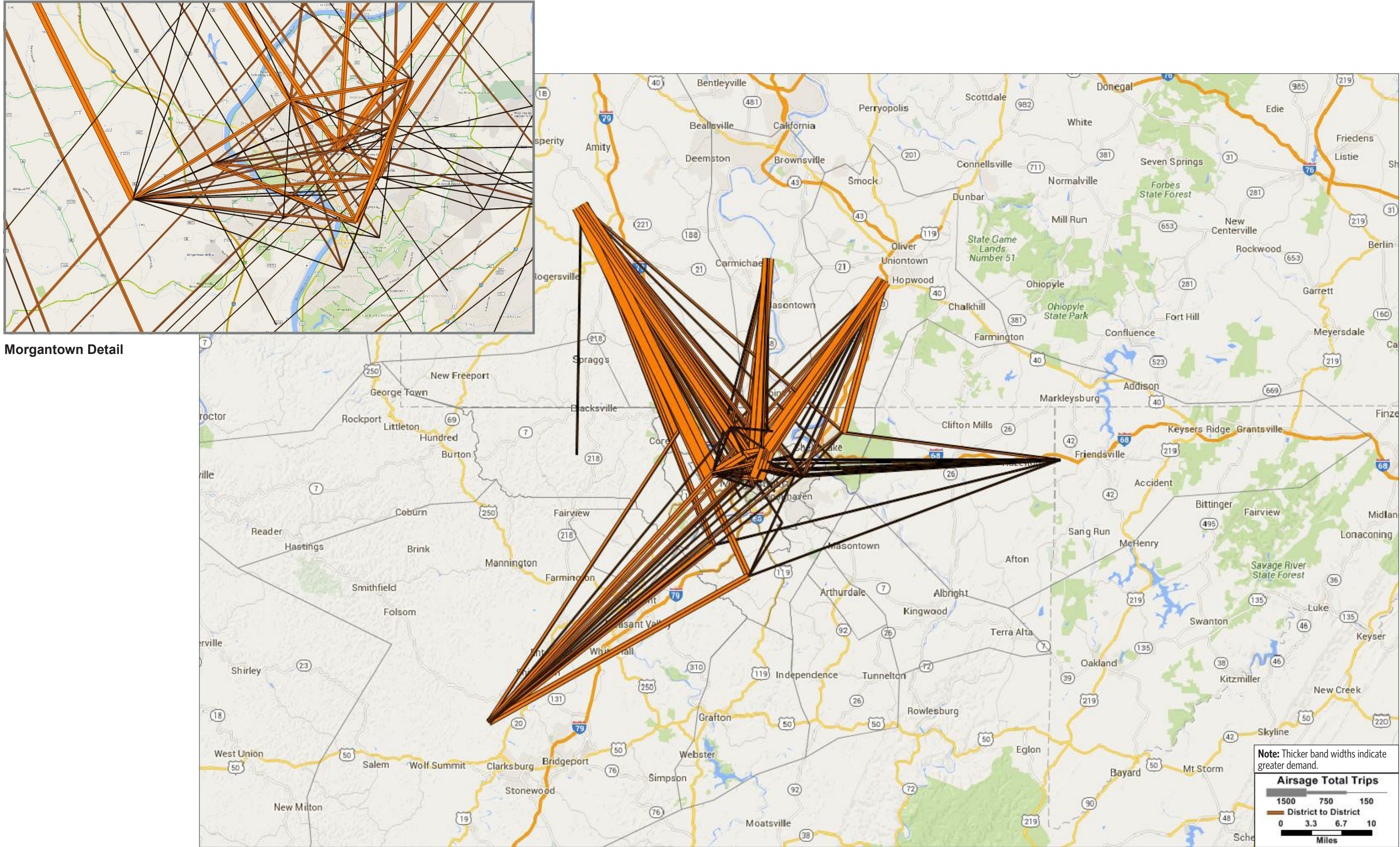


Figure 2-2
CRASH INTENSITY MAP

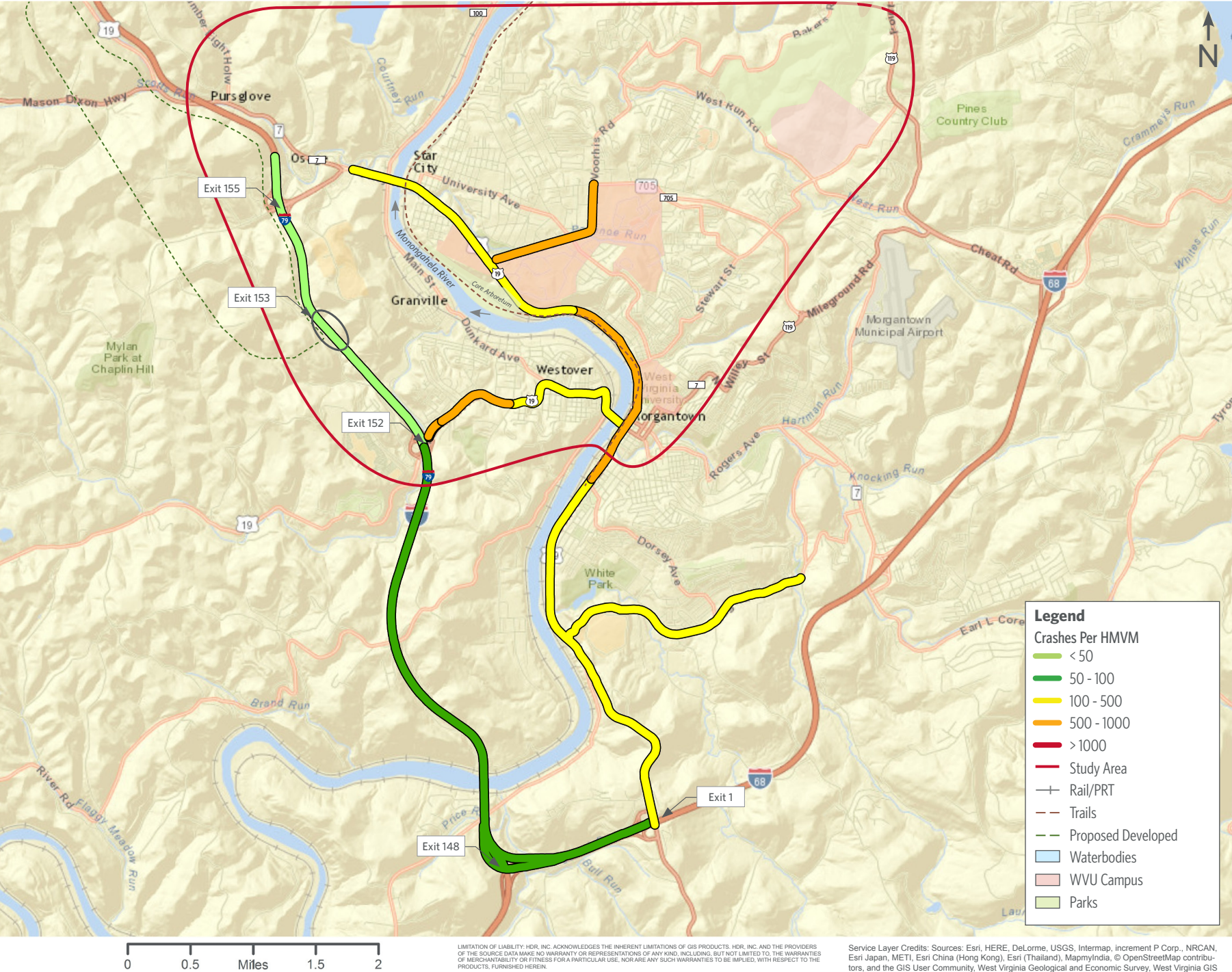
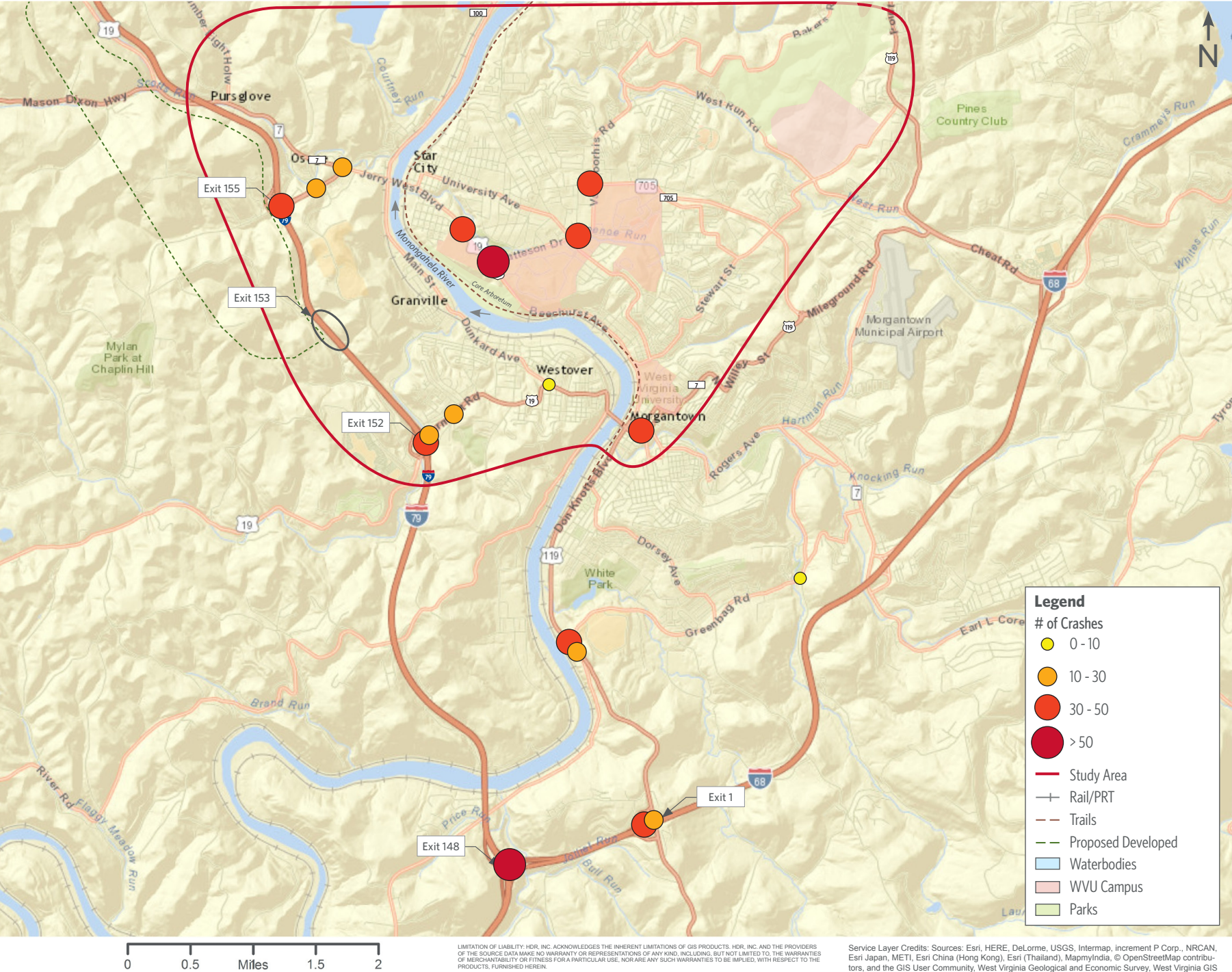


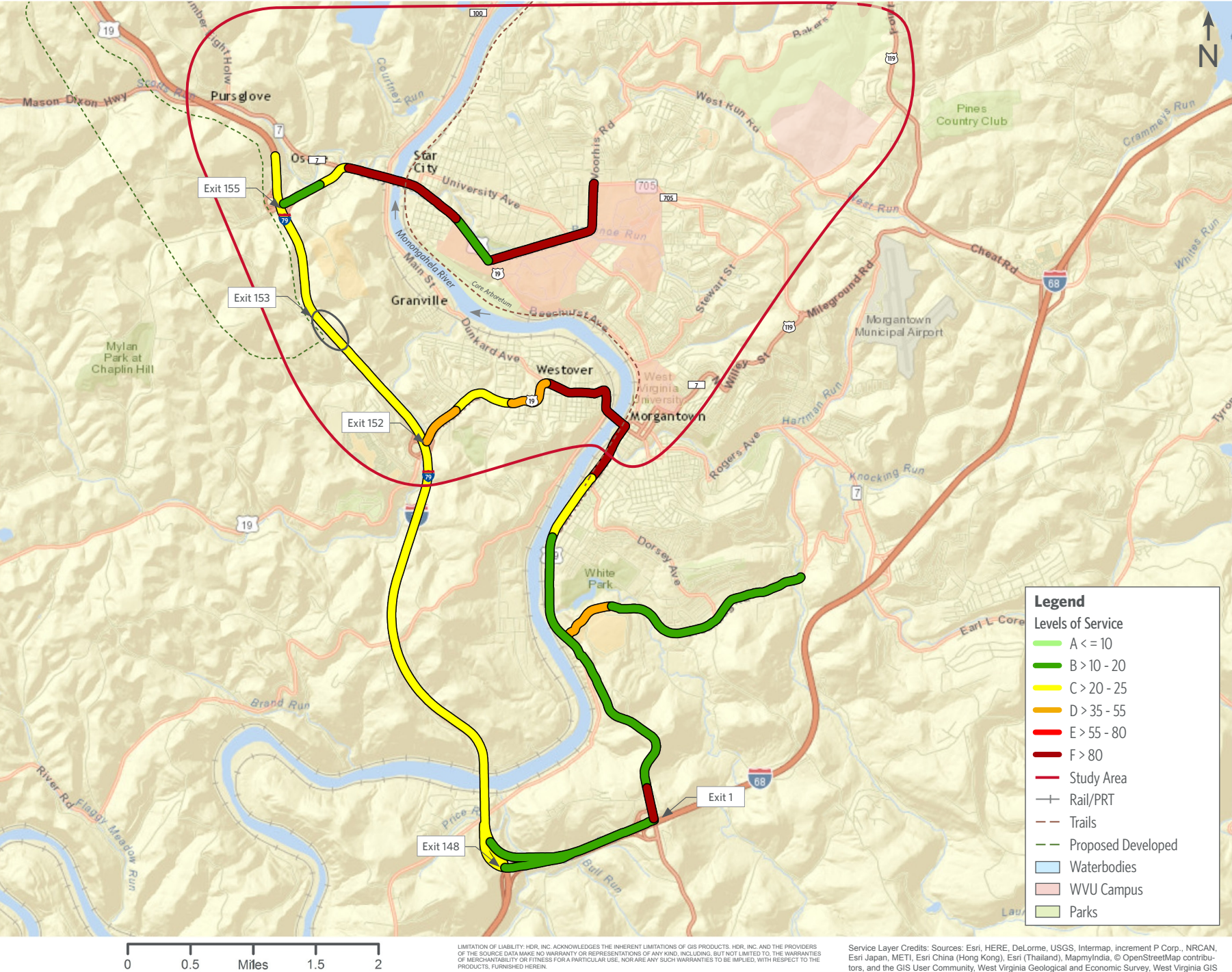
Figure 2-3
CORRIDOR CRASH CLUSTERS



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

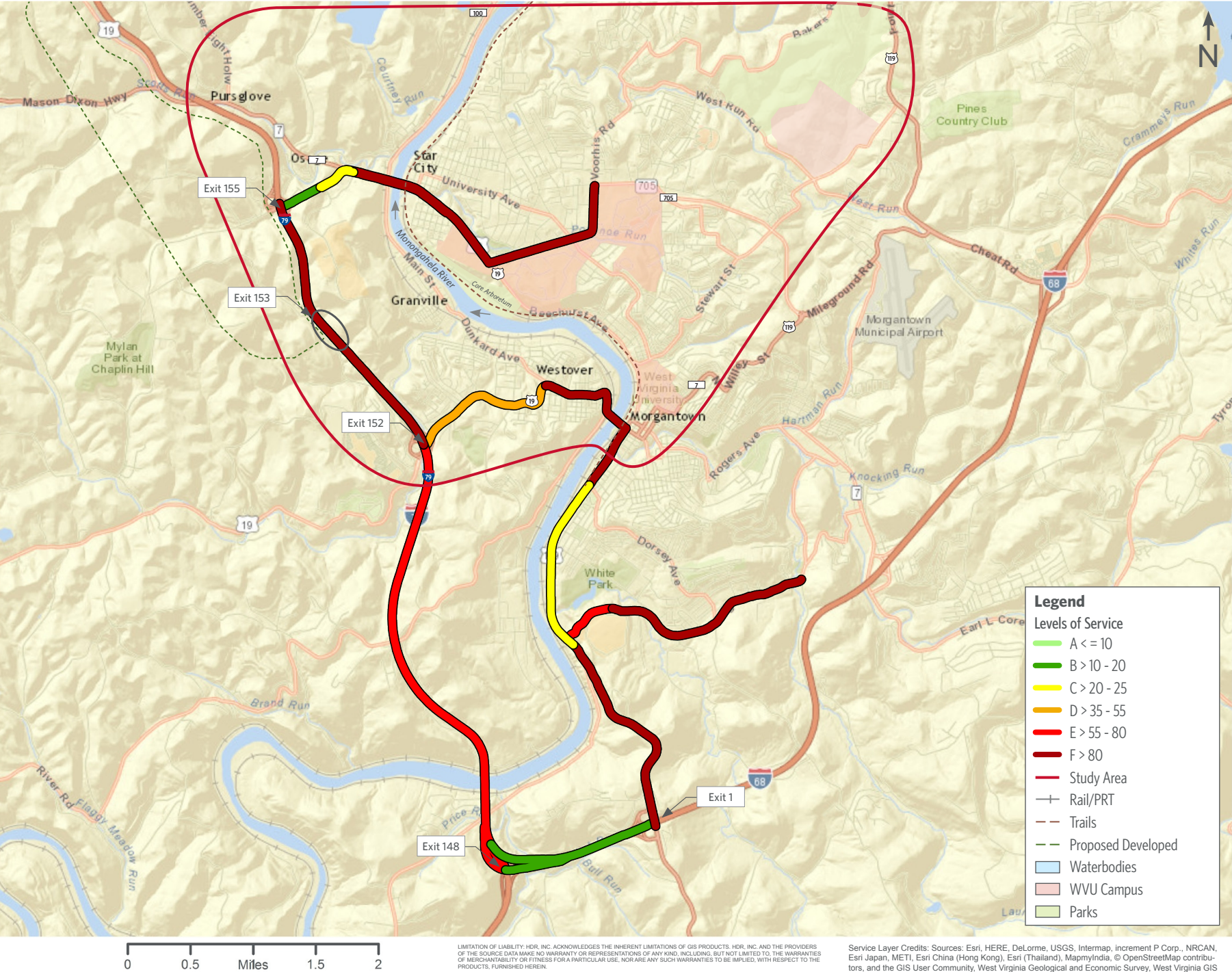
Figure 2-4
2015 LEVELS OF SERVICE



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

Figure 2-5
2040 LEVELS OF SERVICE



3 Travel Demand Modeling

3.1 Model Development Background

As part of this study, an update and revalidation of the MMMPO travel demand model (TDM) was conducted. The TDM is a computer simulation that evaluates the interaction of development patterns and the transportation system. The model is the primary tool used for assessing future conditions on the Morgantown area transportation system. The model estimates travel demand by evaluating the location and amount of population and employment by geographic location, and understanding the capacity, travel speed and connectivity offered by the street and roadway system.

The TDM's base year is 2010, with forecasts of future travel conditions for 2040. The update included adding new model features and a revalidation to year 2010 conditions. The model features that were added include:

- **Model Script and User Interface:** this provides a streamlined model code and user-friendly application of the model, with the assurance of repeatable results.
- **Traffic Analysis Zone (TAZ) Additions:** TAZs are the basic unit of geography for the TDM. Three (3) new TAZs were added during this 2015 TDM update by MMMPO staff, along with socio-economic data reallocations to account for the new zone structure.
- **Time-of-Day Model Component:** The previous version of the TDM had a single, daily time period considered for traffic assignment, which results in a single set of travel costs (congested travel times on the network) for the entire day. Adding the time-of-day (TOD) component to the model, allows the updated TDM to consider the varying travel time levels (congestion) that occur in Morgantown in peak- and off-peak periods. The model now has four different time periods: Morning (7:00 AM to 9:00 AM), Mid Day (11:00 AM to 1:00 PM), Afternoon (3:00 PM to 6:00 PM) and Off Peak (the rest of the day).
- **West Virginia University Trip Distribution Application:** To better reflect the travel patterns to and from WVU campuses, a set of district-based trip distribution factors were developed. The adjustment factors that were applied were based on mobile-phone based data purchased for the Morgantown area, which provided origin-destination data based on an anonymous aggregation and tracking of wireless signals from a sample of mobile phone carriers in the region.

- **Other Model Adjustments:** Additional model validation adjustments were made to better reflect conditions in the MMMPO area. Model performance was examined through an iterative process at each model step, with a particular focus on traffic assignment results and TOD factors. Those outlier locations where traffic volumes deviated the most from observed counts were those locations that received the most attention for additional model adjustments.

At the end of the model updates, the model was validated against available traffic observations to provide confidence in model performance. With the updates to the model, it was determined that the added model functions had also improved overall model performance.

A detailed technical documentation of the MMMPO travel demand model is included in Appendix C.

3.2 Model Application

The 2040 conditions used as the baseline for the future needs analysis in the I-79 Access Study reflect an “existing-plus-committed” (E+C) network scenario. The 2040 E+C scenario assumes no improvements to the base year roadway network beyond those major capacity projects built since 2010, or are currently included in the MPO’s Transportation Improvement Program (TIP). The 2040 E+C scenario traffic forecasts assumed that in addition to the base year roadway network, two major roadway projects would be completed by 2040:

- The Mon-Fayette Expressway/Highway 43: This connection between I-68 at Cheat Lake and the Pennsylvania border was completed after 2010.
- Beechurst Avenue, Campus Drive to Hough Street: This segment of Beechurst Avenue was recently converted from a street with one northbound travel lane, one southbound travel lane, and one center two-way left-turn lane to a street with two southbound through lanes and one northbound travel lane.

The TDM was used to evaluate the relative performance of the range of study roadway alternatives, using this E+C network scenario as the baseline. The alternatives model runs involved coding in the relative characteristics of each corridor alternative, including:

- Geographic location / extent of each alternative corridor.
- Capacity / number of travel lanes.

- Assumed posted speed.
- Network connections to other corridors.

3.3 Key Existing + Committed Projects and Improvements (E+C)

For the TDM evaluation, the following projects are some of the key E+C projects and improvements that are currently included in the TDM and programmed in MMMPO's TIP:

- The Mon-Fayette Expressway/Highway 43: This connection between I-68 at Cheat Lake and the Pennsylvania border was completed after 2010.
- Beechurst Avenue, Campus Drive to Hough Street: This segment of Beechurst Avenue was recently converted from a street with one northbound travel lane, one southbound travel lane, and one center two-way left-turn lane to a street with two southbound through lanes and one northbound travel lane.
- Mileground Widening Airport Road – Easton Elementary: Widen US 119 from Donna Avenue to Cheat Road.
- Green Bag Road (CR 857): Intersection improvement and widening.
- Van Voorhis Road Widening.
- Beechurst Avenue (US 19): Spot improvements beginning at 6th Street.
- West Run Road (CR 67/1) widening.

4 Alternative Development

The existing and future conditions detailed the need for improved access and connectivity to I-79 established, the Project Team under the guidance of the Steering Committee and with input from the Stakeholder Committee, set the Vision for the project through the development of the Purpose and Need Statement.

A project's Purpose and Need is the benchmark criteria to which every alternative developed is compared. Following the Vision set by Purpose and Need, the alternatives development process can eliminate and recommend feasible and effective alternatives that will be carried forward through future phases. Through extensive review and consideration, the Purpose and Need was developed to the following:

- Improve mobility and access to major transportation facilities and key employment centers in northern Morgantown.
- Improve traffic operations and safety.
- Support on-going and projected growth areas.
- Enhance multi-modal opportunities to reduce single-occupancy trips.

To carry out the Vision and improve overall access to I-79, the alternatives development process focused on several key areas including capacity, safety, and connectivity improvements, while considering the community and environment, environmental regulations, and financial criteria. The active engagement and participation of the Steering Committee, Stakeholder Committee, and general public throughout the study was an essential element in developing successful, feasible, and context-sensitive alternatives.

4.1 Typical Section

For the planning-level scale of this study, conceptual typical sections were developed for the new roadway improvements. As shown in Figure 4-1, each alternative corridor assumed an impact area of 100 feet allowing for shared-use paths, trees, lawns, and/or clear zones, with typical sections falling under two main categories: major roadways and local/residential roadways as described below.

- Major roadways consist of four-lane sections with shoulder, sidewalk, and boulevard improvements being implemented individually or in combination based on location and corridor context. For example, the new US 119 connection that is part of several alternatives, would be a four-lane section with shoulder in the undeveloped

segments, with the transition to a four-lane with boulevard section in more developed areas with the option for additional bicycle facilities. Speed limits would range between 40-45 mph.

- Local/residential roadways consist of three-lane sections with sidewalk and boulevard improvements being implemented individually or in combination based on location and corridor context. For example, the Collins Ferry Road extension that is part of several alternatives would be a three-lane, 35 mph section.

4.2 Description of Alternatives

The following alternatives were developed to address the Purpose and Need. There are two accompanying figures for each alternative to illustrate the changes in travel patterns and environmental features for each corridor.

The change in traffic volumes, as compared to the 2040 No-Build (E+C) scenario show the increase (orange and red colors) or decrease (green colors) in traffic throughout the roadway network. The volume changes are reported as 2040 average daily traffic (ADT). Potential environmental, historical, community, and property impacts for each alternative were also identified. A 100 foot corridor was used as a planning-level alternative footprint to identify impacts and environmental red flags, including parks, historic places, wetlands, floodplains, farmland, neighborhoods, noise, public facilities, etc.

Alternative 2: US 119 (Point Marion) to New Pursglove Interchange (Figures 4-2/4-3)

This alternative includes a new connection between US 119 (Point Marion Road) and a new I-79 interchange in Pursglove. This new roadway is an improved four-lane, 40 mph section, with a four-lane crossing over the Monongahela River at 50 mph. The new river crossing intersects WV 100 and a new four-lane, 55 mph roadway connects to the new interchange in Pursglove. This alternative also includes an extension of Collins Ferry Road to connect to the new northern bridge crossing at WV 100 as a three-lane, 35 mph roadway, and an improved three-lane Stewartstown Road between WV 705 and US 119 (Point Marion Road). This alternative is expected to impact mostly undeveloped property in northern Morgantown and Pursglove, however residential impacts in the West Run area are likely. The new bridge crossing to WV 100 will also impact the Monongahela River.

Alternative 3: US 119 (Point Marion) to New Pursglove Interchange + Patteson Drive to University Town Centre Interchange (Exit 153) (Figures 4-4/4-5)

This alternative includes a new connection between US 119 (Point Marion Road) and a new I-79 interchange in Pursglove. This new roadway is an improved four-lane, 40 mph section, with a four-lane crossing over the Monongahela River at 50 mph. The new river crossing intersects WV 100 and a new roadway connects WV 100 to the new interchange in Pursglove. This new northern connection is a four-lane, 55 mph section. Additionally, this alternative includes a new river crossing connecting WV 705 (Patteson Drive) to the new interchange at Exit 153 (University Town Centre). Further upgrades include an extension of Collins Ferry Road to connect to the new northern bridge crossing at WV 100 as a three-lane, 35 mph roadway, and an improved three-lane Stewartstown Road between WV 705 and US 119 (Point Marion Road). Similar to Alternative 2 this alternative is expected to impact mostly undeveloped property in northern Morgantown and Pursglove, however the southern bridge crossing at WV 705 will likely impact the Core Arboretum and residential areas in Granville. The new bridge crossings will impact the Monongahela River in two locations.

Alternative 6: Van Voorhis/West Run to Collins Ferry to Exit 155 + US 119 (Point Marion) Connection (Figure 4-6/4-7)

This alternative includes a new connection between Van Voorhis/West Run and Collins Ferry Roads with a connection to US 119 (Point Marion Road) and new river crossing to WV 100. The connections between Van Voorhis and WV 100, and US 119 to Van Voorhis/West Run are both improved four-lane, 40 mph sections. The new river crossing is a four-lane, 50 mph section, and the alternative also includes an improved three-lane, 30-35 mph, Collins Ferry Road and connection to the new northern bridge crossing at WV 100. WV 100 and Scott's Run Road will be widened to four-lanes and provide access to Exit 155 via the intersection of CR 19/24 (Chaplin Hill Road) and WV 7/US 19. This alternative is expected to mostly impact undeveloped property in northern Morgantown and Pursglove, as well as residential areas along Van Voorhis and West Run Roads. The new bridge crossing to WV 100 will also impact the Monongahela River.

Alternative 7: Patteson Drive to University Town Centre Interchange (Exit 153) (Figures 4-8/4-9)

This alternative is listed in MMMPO's *2040 Long Range Transportation Plan* as Alternative 6B (Direct Roadway Connection from New I-79 Interchange to Monongahela Boulevard), and includes the extension of Patteson Drive and a new river crossing connecting to the new interchange at University Town Centre (Exit 153). Both the Patteson Drive extension and new bridge are four-lane, 40 mph sections. This alternative is expected to impact the Core Arboretum and may impact residential areas in Granville. The new bridge crossing to Exit 153 will also impact the Monongahela River.

Alternative 10: Van Voorhis/West Run to New Pursglove Interchange (Figures 4-10/4-11)

This alternative includes a new connection between Van Voorhis/West Run and Collins Ferry Roads with a new river crossing to WV 100 and roadway connection to a new I-79 interchange in Pursglove. The new connection between Van Voorhis/West Run and WV 100 is an improved four-lane, 40 mph section with a four-lane bridge at 50 mph, while the new northern interchange connection is a four-lane, 55 mph section.

This alternative also includes an extension of Collins Ferry Road to connect to the new northern bridge crossing as a three-lane, 35 mph roadway and an improved three-lane Stewartstown Road between WV 705 and US 119 (Point Marion Road). This alternative is expected to impact mostly undeveloped property in northern Morgantown and Pursglove, as well as residential areas along Van Voorhis and West Run Roads. The new bridge crossing to WV 100 will also impact the Monongahela River.

Alternative 11: US 119 (Point Marion) to New Pursglove Interchange + 8th Street to Westover Interchange (Exit 152) (Figures 4-12/4-13)

This alternative includes a new connection between Van Voorhis/West Run and Collins Ferry Roads, a new connection to US 119 (Point Marion Road), a new river crossing to WV 100 and roadway connection to a new I-79 interchange in Pursglove, and a new river crossing and improved connection between 8th Street and Exit 152 via US 19 in Westover. The connections between Van Voorhis and WV 100, and US 119 to Van Voorhis/West Run are both improved four-lane, 40 mph sections with a four-lane bridge at 50 mph, while the new northern interchange connection is a four-lane, 55 mph

section. The 8th Street Bridge is a four-lane, 40 mph section with an improved four-lane, 30-35 mph roadway connection to US 19 and Exit 152.

This alternative also includes an extension of Collins Ferry Road to connect to the new northern bridge crossing as a three-lane, 35 mph roadway and an improved three-lane Stewartstown Road between WV 705 and US 119 (Point Marion Road). This alternative is expected to impact mostly undeveloped property in northern Morgantown and Pursglove as well as residential areas in the core of Westover. The new bridge crossings will impact the Monongahela River in two locations.

Alternative 12: US 119 (Point Marion) to Van Voorhis/West Run to Collins Ferry + Connection to New Pursglove Interchange (Figures 4-14/4-15)

This alternative includes a new connection between Van Voorhis/West Run and Collins Ferry Roads with a connection to US 119 (Point Marion Road), a new river crossing to WV 100 and roadway connection to a new I-79 interchange in Pursglove. The connections between Van Voorhis and WV 100, and US 119 to Van Voorhis/West Run are both improved four-lane, 40 mph sections. The new river crossing is a four-lane, 50 mph section, while the new northern interchange connection is a four-lane, 55 mph section.

This alternative also includes an extension of Collins Ferry Road to connect to the new northern bridge crossing as a three-lane, 35 mph roadway and connection to the new northern bridge crossing at WV 100, as well as an improved three-lane Stewartstown Road between WV 705 and US 119 (Point Marion Road). This alternative is expected to impact mostly undeveloped property in northern Morgantown and Pursglove, as well as residential areas along Van Voorhis and West Run Roads. The new bridge crossing to WV 100 will also impact the Monongahela River.

Due to the size and scope of improvements included in this alternative, construction will occur in two phases. Construction Phase 1 includes a new Pursglove interchange, Pursglove connection, northern bridge crossing, and improving Collins Ferry Road and Van Voorhis Road. Construction Phase 2 includes building the US 119 (Point Marion Road) connection.

4.3 Ancillary Improvements

After reviewing the results of the alternatives, ancillary improvements were identified to address changes in travel patterns and enhance traffic operations outside of the corridor footprint. These types of improvements vary by alternative and include traffic

signal and system upgrades, turn lane modifications, and minor widening to accommodate the changes in travel patterns. As an example, Alternative 7 provides a direct connection from WV 705 to I-79 Exit 153. Additional improvements would be required along Patteson Drive to accommodate the additional traffic. These include traffic signal optimization and turn lanes at the intersection with US 19.

4.4 Phased Implementation Options

The alternatives developed in this study are major transportation investments. Based on funding availability and limitations, the following phased options breakout two of the infrastructure improvements corresponding to a new northern interchange in Pursglove. Similarly, it is advantageous to note that alternatives involving multiple new bridge crossings can be programmed and implemented in phases. For example, Alternative 3 can be programmed into several phases: construct new Pursglove interchange, construct new river crossing and connection to Exit 153, construct new river crossing to WV 100 and extend Collins Ferry Road, and construct US 119 (Point Marion Road) connection. Detailed project funding and programming will be a key step as the recommendations of this study are carried forward through future phases.

Phased Implementation Option A (Figures 4-16/4-17)

This Phased Implementation Option is applicable to Alternatives 2, 3, 10, 11, and 12 allows for the evaluation of staged construction and implementation based on project priority and funding availability. This option includes the construction of a new I-79 interchange at Pursglove and an upgraded connection to US 19. This option is expected to have minimal environmental impacts.

Phased Implementation Option B (Figures 4-18/4-19)

This Phased Implementation Option is applicable to Alternatives 2, 3, 10, 11, 12 and allows for the evaluation of staged construction and implementation based on project priority and funding availability. This option includes the construction of a new I-79 interchange at Pursglove and a new roadway connection to WV 100. This new roadway connection is a four-lane, 55 mph section. This alternative is expected to impact mostly undeveloped property in Pursglove, however the Monongahela River will not be impacted as a new bridge crossing is not required.

4.5 Alternatives Eliminated from Consideration

The following five (5) alternatives were eliminated from further evaluation and are included in Figures 4-20 and 4-21. These alternatives have been included in the tables and figures; however they are not discussed in detail.

Alternative 1: US 119 (Point Marion) to Exit 155

This alternative includes a new connection between US 119 (Point Marion Road) and WV 100. This new roadway is an improved four-lane, 40 mph section, with a four-lane crossing over the Monongahela River at 50 mph. Upgrades also include the widening of WV 100 and Scott's Run Road to four-lanes providing access to Exit 155 via the intersection of CR 19/24 (Chaplin Hill Road) and WV 7/US 19.

This alternative was eliminated from further study as it does not meet the project's Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.

Alternative 4: Van Voorhis/West Run to Exit 155

This alternative is listed in MMMPO's *2040 Long Range Transportation Plan* as Alternative 6A (West Run Extension and Lazelle Union Road (WV 100) Connection to US 19), and includes a new connection between Van Voorhis/West Run Road and a new river crossing to WV 100. This new roadway is an improved four-lane, 40 mph section with a four-lane bridge at 50 mph. This alternative also includes the widening of WV 100 and Scott's Run Road to four-lanes providing access to Exit 155 via the intersection of CR 19/24 (Chaplin Hill Road) and WV 7/US 19.

This alternative was eliminated from further study as it does not meet the project's Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.

Alternative 5: Van Voorhis/West Run to Collins Ferry to Exit 155

This alternative includes a new connection between Van Voorhis/WV 705 and Collins Ferry Roads with a new river crossing to WV 100. This new roadway is an improved four-lane, 40 mph section with a four-lane bridge at 50 mph, and an improved and extended Van Voorhis Road with a four-lane, 40 mph connection between WV 705 and the new northern bridge corridor. This alternative also includes an extension of Collins Ferry Road to connect to the new northern bridge crossing as a three-lane, 35 mph roadway as well as widening of WV 100 and Scott's Run Road to four-lanes providing

access to Exit 155 via the intersection of CR 19/24 (Chaplin Hill Road) and WV 7/US 19.

This alternative was eliminated from further study as it does not meet the project's Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.

Alternative 8: 8th Street to University Town Centre Interchange (Exit 153)

This alternative is listed in MMMPO's 2040 Long Range Transportation Plan as Alternative 6C (8th Street Bridge over Monongahela River and Roadway Connection to TIF Development Area Interchange to I-79), and includes a new river crossing connecting 8th Street to Westover. The bridge is a four-lane, 40 mph section, and both Monongahela and Dunkard Avenues will be improved to three-lane, 30 mph sections. Upgrades also include improving Dents Run Road to four-lanes and a four-lane roadway connection to the new interchange at University Town Centre (Exit 153). This alternative is expected to impact residential areas of Westover and Granville.

This alternative was eliminated from further study as it does not meet the project's Purpose and Need because of disproportionate property and connectivity impacts to the Westover community, as well as a low cost/benefit ratio of minimal traffic reductions on key corridors. This alternative also has constructability issues pertaining to the steep topography of 8th Street and the existing PRT infrastructure on the east side of the Monongahela River.

Alternative 9: 8th Street to Westover Interchange (Exit 152) (Figures 6-17 and 6-18)

This alternative includes a new river crossing and connection between 8th Street and Exit 152 via US 19 in Westover. The bridge is a four-lane, 40 mph section with an improved four-lane, 30-35 mph roadway connection to US 19 and Exit 152. This alternative is expected to impact residential areas of Westover.

This alternative was eliminated from further study as it does not meet the project's Purpose and Need because of disproportionate property and connectivity impacts to the Westover community, as well as a low cost/benefit ratio of minimal traffic reductions on key corridors. Similar to Alternative 8, this alternative also has constructability issues pertaining to the steep topography of 8th Street and the existing PRT infrastructure on the east side of the Monongahela River.

4.6 Alternatives Evaluation

The remaining seven (7) alternatives were evaluated from a regional network (Table 4-1), corridor (Table 4-2), and local (Table 4-3 and Exhibit 4-1) perspective. All results are reported for 2040, and the data for the five (5) eliminated alternatives are included for reference.

Regional Operations

Network performance results are summarized in Table 4-1. The two key metrics used for comparison are Vehicle Miles Travelled (VMT) and Vehicle Hours Travelled (VHT). To help make the results relatable, Table 4-1 provides the daily and annual difference in both VMT and VHT. Please note, an increase in VMT alone does not indicate a decrease in operations, and an increase in speed throughout the network is a positive sign of improvement as congestion is relieved and users travel at higher speeds.

Regionally, Alternative 11 and Alternative 3 have the largest decreases in VHT as they include two new connections to I-79. Alternative 11 saves the network almost 2,300 VHT daily and over 834,000 VHT annually, while Alternative 3 saves over 2,100 VHT and over 771,000 VHT, on a daily and annual basis, respectively. Of the alternatives with one new river crossing, those including the northern bridge to WV 100 and connection to a new interchange in Pursglove (Alternatives 2, 10, 12) provide the largest improvement to network operations. Drivers in the northern Morgantown who rely on the key corridors of Patteson Drive, WV 7/US 19/Monongahela Boulevard), and Star City Bridge to access I-79 are able to use the northern connection to access I-79.

As discussed in the existing conditions section of this report, the origin-destination study showed a significant correlation between northern I-79 traffic commuting from northern Monongalia County, Waynesburg, PA, Washington, PA, and southwestern Pennsylvania, to key employment centers in northern Morgantown, including the University, WVU Healthcare, Mon General, Mylan, and NETL. Further, the new connection from US 119 (Point Marion Road) to the northern river crossing facilitates the movement of traffic to and from Preston County, WV and western Maryland via I-68, and Fayette/Greene Counties and Uniontown, PA via WV/PA 43 (Mon-Fayette Expressway). Alternative 12, which includes the improved connections from Van Voorhis and Collins Ferry Roads to the new US 119 connection and northern river crossing, has the highest reduction in network VHT of all single-bridge crossing alternatives. Annually, this reduces VHT by almost 700,000.



Of the remaining single-bridge alternatives, Alternative 6, which includes a northern bridge crossing to an improved WV 100 and then access to I-79 at Exit 155, reduces network VHT by over 440,000 annually. Alternative 7, which includes an extension of WV 705 (Patteson Drive) and new river crossing and connection to Exit 153, provides no northern connection or improvements, slightly improving network operations with an annual VHT reduction of just over 278,000. Phased Options A and B, which include no new river crossing, are expected to perform similarly to Alternative 7.



Table 4-1: Transportation System Performance Results

2040 Scenario	Daily VMT	Daily VHT	Avg System Speed (mph)	% Difference from No-Build			Daily Difference		Annual Difference	
				VMT (mi)	VHT (hr)	Speed (mph)	VMT (mi)	VHT (hr)	VMT (mi)	VHT (hr)
No-Build	3,547,145	91,100	38.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1 (Elim.)	3,565,077	90,397	39.4	0.51%	-0.77%	1.29%	17,932	-703	6,545,151	-256,595
2	3,552,252	89,291	39.8	0.14%	-1.99%	2.17%	5,107	-1,809	1,863,977	-660,357
3	3,541,324	88,985	39.8	-0.16%	-2.32%	2.21%	-5,821	-2,115	-2,124,542	-771,805
4 (Elim.)	3,555,510	90,685	39.2	0.24%	-0.46%	0.69%	8,365	-415	3,053,196	-151,522
5 (Elim.)	3,558,099	90,350	39.4	0.31%	-0.82%	1.14%	10,954	-750	3,998,148	-273,854
6	3,568,668	89,883	39.7	0.61%	-1.34%	1.97%	21,523	-1,217	7,855,845	-444,378
7	3,547,806	90,337	39.3	0.02%	-0.84%	0.86%	661	-763	241,371	-278,577
8 (Elim.)	3,545,515	90,378	39.2	-0.05%	-0.79%	0.75%	-1,630	-722	-595,095	-263,521
9 (Elim.)	3,538,765	90,412	39.1	-0.24%	-0.76%	0.52%	-8,380	-688	-3,058,729	-251,234
10	3,560,025	89,557	39.8	0.36%	-1.69%	2.09%	12,880	-1,543	4,701,181	-563,088
11	3,536,156	88,813	39.8	-0.31%	-2.51%	2.26%	-10,989	-2,287	-4,011,082	-834,916
12	3,551,468	89,185	39.8	0.12%	-2.10%	2.27%	4,323	-1,915	1,577,914	-699,121
Phased Option A	3,547,177	90,418	39.2	0.00%	-0.75%	0.76%	32	-682	11,765	-249,105
Phased Option B	3,548,465	90,361	39.2	0.00%	-0.75%	0.76%	1,320	-739	481,850	-269,831

	Decrease in VMT or VHT or increase in speed
	No change in VMT, VHT, or speed
	Increase in VMT or VHT or decrease in speed

Corridor Operations

At the corridor level, the alternatives were evaluated to determine the level of increase/decrease in traffic volumes and travel times to I-79, compared to the 2040 No-Build condition, along several key corridors. Key corridors include: WV 705 (Patteson Drive) between University Avenue and WV 7/US 19/Monongahela Boulevard; WV 7/US 19/Monongahela Boulevard east of the Star City Bridge; CR 19/24 (Chaplin Hill Road) between the WV 7/US 19/Monongahela Boulevard intersection and University Town Centre; Van Voorhis Road north of WV 705; Stewartstown Road; West Run Road; and the Mileground Road. The Volume Change Comparison figures accompanying this section display the results of this corridor-level analysis.

Alternative 3, which includes two new river crossings (Figure 4-5), removes the largest amount of traffic from the WV 7/US 19/Monongahela Boulevard corridor (-18,000 vpd) and CR 19/24 corridor (-19,000 vpd) as drivers wanting to access I-79 from the WV 705/Van Voorhis Road area use the northern bridge crossing and Pursglove interchange and those travelling along Patteson Drive and Monongahela Boulevard use the new connection to Exit 153. Additionally, the new Pursglove interchange and northern connection to US 119 draws 12,000 vpd off of WV 7 in Osage. However, the new connection to Exit 153 included in this alternative increases traffic along an already congested Patteson Drive by 2,000 vpd. Alternative 11 (Figure 4-13), which also includes two new river crossings, reduces traffic along the WV 7/US 19/Monongahela Boulevard and CR 19/24 corridors by 11,000 vpd each. However, the new 8th Street Bridge is expected to increase traffic along 8th Street, a steep, two-lane facility on the boundary of dense student housing areas, by 8,000 vpd. As Table 4-2 displays, these two alternatives cause the largest reduction in travel times along the key existing routes to I-79.

Of the single-bridge crossing alternatives, Alternative 12 (Figure 4-15) has the highest reduction in traffic volumes along key corridors. Traffic along both Patteson Drive and WV7/US19/Monongahela Boulevard is reduced by 7,000 vpd, with CR 19/24 falling by 6,000 vpd. The improved Van Voorhis Road connection to the northern bridge and US 119 connection causes traffic to increase by 9,000 vpd as more users from the northern core of Morgantown use this northern access route. Further, the Stewartstown Road upgrade causes traffic along West Run Road to increase by 7,000 vpd as users choose to follow Stewartstown Road to access WV 705 and US 119. Alternatives 2 (Figure 4-3)

and 10 (Figure 4-11) are expected to perform similarly to Alternative 12, with slightly higher reductions along Patteson Drive and Monongahela Boulevard associated with the improved Van Voorhis connection in Alternative 10. Travel times reductions are also similar for these three alternatives.

Without a new connection and interchange in Pursglove, Alternative 6 (Figure 4-7) relies on an improved WV 100 and existing route to Exit 155 along WV 7 and CR 19/24. This causes traffic along WV 100 to increase by 4,700 vpd, traffic along CR 19/24 to increase by 2,000 vpd, a reduction of 2,000 vpd along Patteson Drive and Monongahela Boulevard, and an increase of 9,000 vpd along Van Voorhis Road. Alternative 7 (Figure 4-9), which provides access to I-79 via a new river crossing and connection to Exit 153 and no northern improvements, causes traffic along Patteson Drive to increase by 7,000 vpd but greatly reduces traffic along WV 7/US 19/Monongahela Boulevard and CR 19/24 by 11,000 vpd and 14,000 vpd, respectively. This alternative also causes traffic along I-79 to increase by 9,000 vpd between Exit 155 and Exit 153 as more drivers use the interstate, rather than inter-city corridors to travel. Both of these alternatives cause travel times along key existing routes to I-79 Exit 155 to decrease by more than a minute, with Alternative 7 also reducing travel times to Exit 152 by over a minute.

Table 4-2: Comparison of Vehicle Travel Times (minutes)

2040 Scenario	Existing Routes			Alternate Routes		
	WV 705 to I-79 (Exit 155)	8 th Street to I-79 (Exit 155)	8 th Street to I-79 (Exit 152)	WV 705 to I-79 (Exit 155 or Pursglove)	WV 705 to I-79 (Exit 153)	8 th Street to I-79 (Exit 153)
Existing	6.0	5.1	8.2	-		
No-Build	8.1	7.0	10.0	-		
1 (Elim.)	7.2	6.2	9.4	10.7	-	-
2	5.8	5.0	9.1	7.0	-	-
3	5.5	4.1	8.1	7.0	5.1	-
4 (Elim.)	6.6	5.6	9.1	9.0	-	-
5 (Elim.)	6.6	5.7	9.3	8.5	-	-
6	6.7	5.7	9.2	8.6	-	-
7	6.4	4.7	8.5	-	5.7	-
8 (Elim.)	7.2	5.8	4.5	-	-	4.5
9 (Elim.)	6.9	5.5	3.2	-	-	6.5
10	5.8	5.0	9.2	6.1	-	-
11	5.3	4.5	3.0	6.7	-	6.1
12	5.7	5.0	9.0	6.3	-	-
Phased Option A	8.1	6.9	10.1	9.7	-	-
Phased Option B	8.1	6.8	10.0	9.9	-	-

	Decrease in travel time > 1 minute when compared to the No-Build
	Approximately the same travel time (<1 minute) as the No-Build
	Increase in travel time compared to the No-Build

Local Operations

Local operational impacts mainly focus on the existing river crossings at Star City and Westover, as the corridors that feed these bridges are some of the most congested in the study area. Table 4-3 and Exhibit 4-1 summarize the individual and total bridge crossings for each alternative. The orange lines in Exhibit 4-1 indicate the 2040 No-Build crossing volume to help establish a comparison value. Corresponding to the regional and corridor improvements realized by Alternatives 3 and 11, these two reduce traffic on the Star City Bridge by 22,000 vpd and 15,000 vpd, respectively. Both of the new northern bridges associated with these alternatives are expected to carry over 22,000 vpd, with another 22,000 vpd expected to use the 8th Street Bridge included in Alternative 11. The Westover Bridge reductions are consequently higher in Alternative 11, with 8,000 vpd fewer using this route to travel between I-79, Westover, and downtown Morgantown.

Of the northern bridge and connection alternatives, Alternative 12 is expected to reduce traffic on the Star City Bridge the most (-10,000 vpd) as the new northern bridge is projected to carry 28,000 vpd, making it the second most travelled bridge in Morgantown. Alternatives 2 and 10 each reduce Star City Bridge traffic by over 8,000 vpd as more drivers utilize the new northern bridge but the variance in improved connections from Van Voorhis Road and US 119 (Point Marion Road) limits the attractiveness of this route compared to Alternative 12.

Without the Pursglove interchange, Alternative 6 follows previous trending, and locally pulls less traffic (-3,000 vpd) than the other three single, northern bridge crossing alternatives. Without a southern river crossing, these four alternatives (Alternatives 2, 6, 10, and 12) only slightly improve local conditions on the Westover Bridge, with volumes decreasing by 2,000 vpd. or less. It is interesting to note, however, that Alternative 7, while increasing an already congested Patteson Drive, does remove 13,000 vpd (the 2nd highest single-bridge reduction) from the Star City Bridge as the new bridge and connection to Exit 153 is expected to carry 31,000 vpd making the distribution of river crossings almost equal.

Table 4-3: Comparison of River Crossing Volumes (ADT)

2040 Scenario	Star City Bridge	Westover Bridge	Proposed Bridge(s)	Total
No-Build	45,000	26,000	N/A	71,000
1 (Elim.)	43,000	25,000	13,000	81,000
2	37,000	24,000	26,000	87,000
3	23,000	22,000	51,000	96,000
4 (Elim.)	43,000	25,000	11,000	79,000
5 (Elim.)	42,000	24,000	14,000	80,000
6	42,000	24,000	15,000	81,000
7	32,000	23,000	31,000	86,000
8 (Elim.)	42,000	20,000	19,000	81,000
9 (Elim.)	39,000	19,000	25,000	83,000
10	36,000	25,000	22,000	83,000
11	30,000	18,000	45,000	93,000
12	35,000	24,000	28,000	87,000
Phased Option A	45,000	26,000	N/A	71,000
Phased Option B	45,000	26,000	N/A	71,000

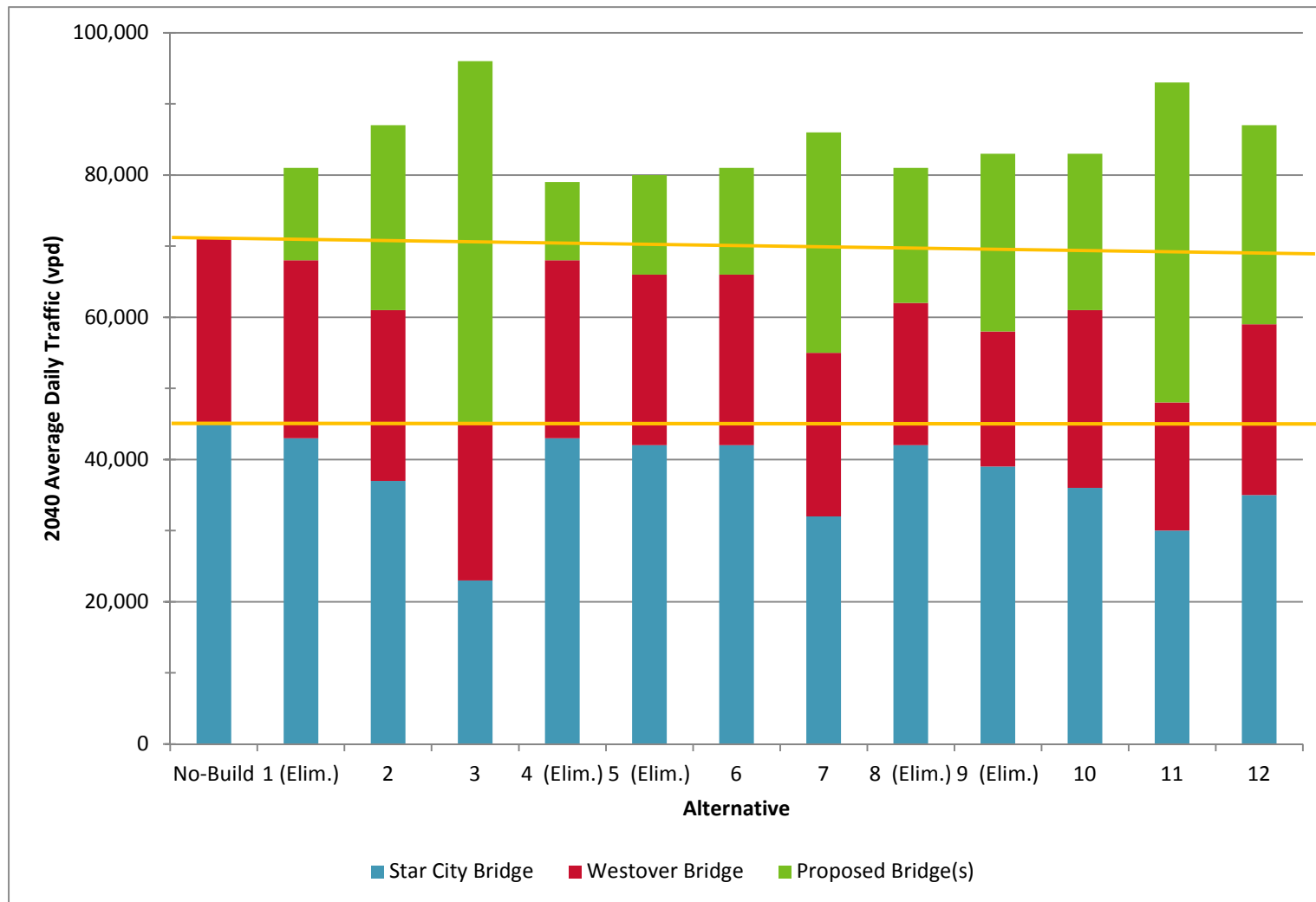


Exhibit 4-1: Summary of Bridge Volumes

4.7 Cost Estimates

Conceptual construction cost estimates were prepared for each alternative. General categories were developed for easily calculated items. The major categories and their corresponding units included roadway (guardrail, drainage, miscellaneous improvements, in yd²), bridge (ft²), ramp (guardrail, drainage, miscellaneous improvements, in yd²), signal improvements (each), lighting improvements (each), and intersection improvements (each). Additionally, planning level property impacts were included for commercial, residential, and undeveloped rural land uses (acre). The cost estimates also include the ancillary improvements that would be necessary to address changes in travel patterns. A 20% contingency was added to the total construction cost.

It should be noted that the construction cost estimates provided in this study are conceptual and only intended to provide the relative magnitude of the cost. Quantities are based on estimates obtained from the conceptual layout of alternatives. It should be noted that these costs are based on 2016 dollars and do not include utility relocations, major earthwork, environmental, preliminary and final design, and construction inspection and testing services, which will add to the overall cost of each alternative.

Table 4-4 presents the conceptual cost estimate for the alternatives. Additional information for the conceptual cost estimate can be found in Appendix D.

Table 4-4: Alternative Conceptual Cost

Alternative	Total
No-Build	\$0
TSM	\$10-15M
1	Eliminated
2	\$115-125M
3	\$240-250M
4	Eliminated
5	Eliminated
6	\$125-135M
7	\$135-145M
8	Eliminated
9	Eliminated
10	\$110-120M
11	\$200-210M
12	Phase 1: \$110-120M
	Phase 2: \$25M

4.8 Evaluation of Alternatives

A comparison matrix, shown in Figure 4-22, was developed as a basis for evaluating the alternatives and to assist in determining which alternatives should be carried forward through the MTP Update and TIP update, NEPA process, and Design Study phase for more detailed evaluation.

The alternatives comparison matrix provides a concise summary of significant differentiating factors regarding performance, impacts, and characteristics of each alternative. The Steering Committee was actively engaged in determining the evaluation criteria and in assigning the respective category weights. The evaluation matrix is categorized in five areas: Operations, Connectivity, Community/Environmental, Regulatory Environmental, and Financial. The Operations and Connectivity categories test the alternative's adherence to the benchmark set by the project's Purpose and Need.

Operations

- Reduces travel times to I-79
- Improves bottlenecks, reduces traffic, enhances safety
- Supports transit opportunities
- Supports bicycle/pedestrian opportunities

Connectivity

- Improves mobility to key destinations
- Improves access in northern Morgantown
- Encourages smart growth principles

Community/Environmental

- Property/neighborhood impacts
- Public facility impacts
- Farmland impacts
- Floodplain/wetland impacts
- Cumulative and secondary impacts

Regulatory Environmental

- Section 4(f) and 6(f) – Parks, recreation impacts
- Section 106 – Cultural resource impacts

- Environmental Justice Impacts
- Noise Impacts

Financial

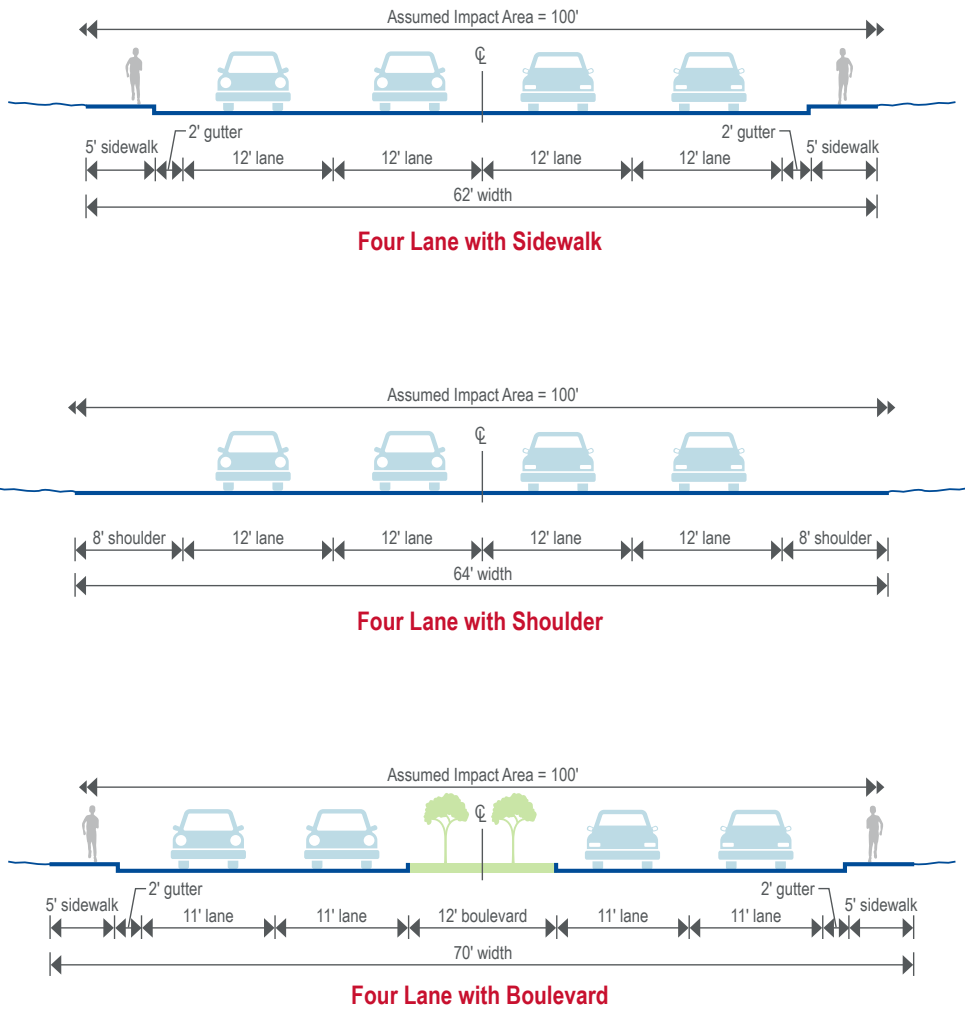
- Future maintenance cost
- Funding potential
- Project cost

Key members of the Project Team held a working session to rank each alternative in the categories. Each factor was ranked as good, average, or poor and provided a score from 1 to 5 based on impacts, with 1 being good and 5 being poor. A poor ranking indicates a high impact, cost, or does not satisfy the project goals. An average ranking indicates a moderate impact, cost, or satisfies the criteria. An average ranking also indicates no significant change in the category when compared to the existing conditions. A good ranking indicates a low impact, cost, or generally satisfies the criteria.

Based on the Evaluation Matrix, Alternative 7 scored the highest with a ranking of 3.6. The alternatives with two new bridge crossings, Alternatives 3 and 11, scored at 3.3 and 3.5, respectively. The lowest three scores all involved alternatives with a northern bridge crossing and improved connections from Collins Ferry and Van Voorhis Roads. Alternatives 10 and 12 both include a new northern Pursglove interchange, while Alternative 12 adds on the US 119 (Point Marion Road) connection. It is useful to note that the combination of Alternative 6 (without improving WV 100) and Alternative 10 is Alternative 12. From a project funding and programming perspective, this demonstrates that these two alternatives on their own rank close (score of 2.5, each) to their combination in Alternative 12 (score of 2.3).

Figure 4-1
TYPICAL SECTIONS

Major Roadways



Local/Residential Roadways

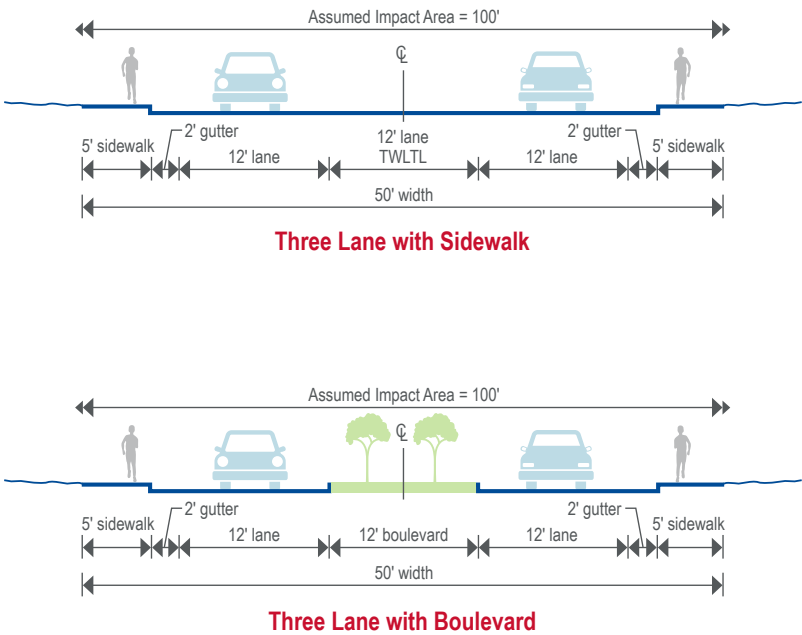
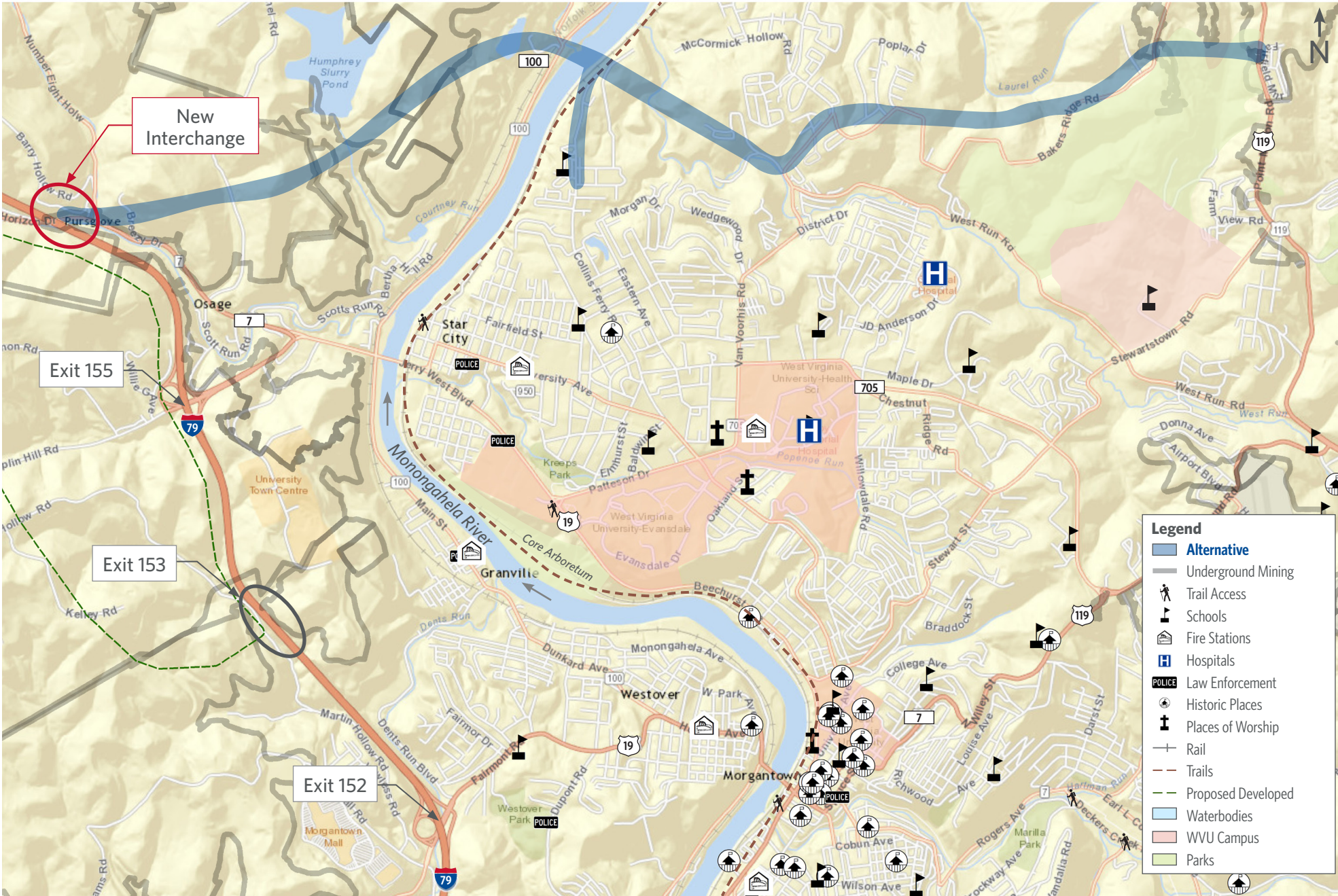


Figure 4-2
ALTERNATIVE 2 ENVIRONMENTAL FEATURES

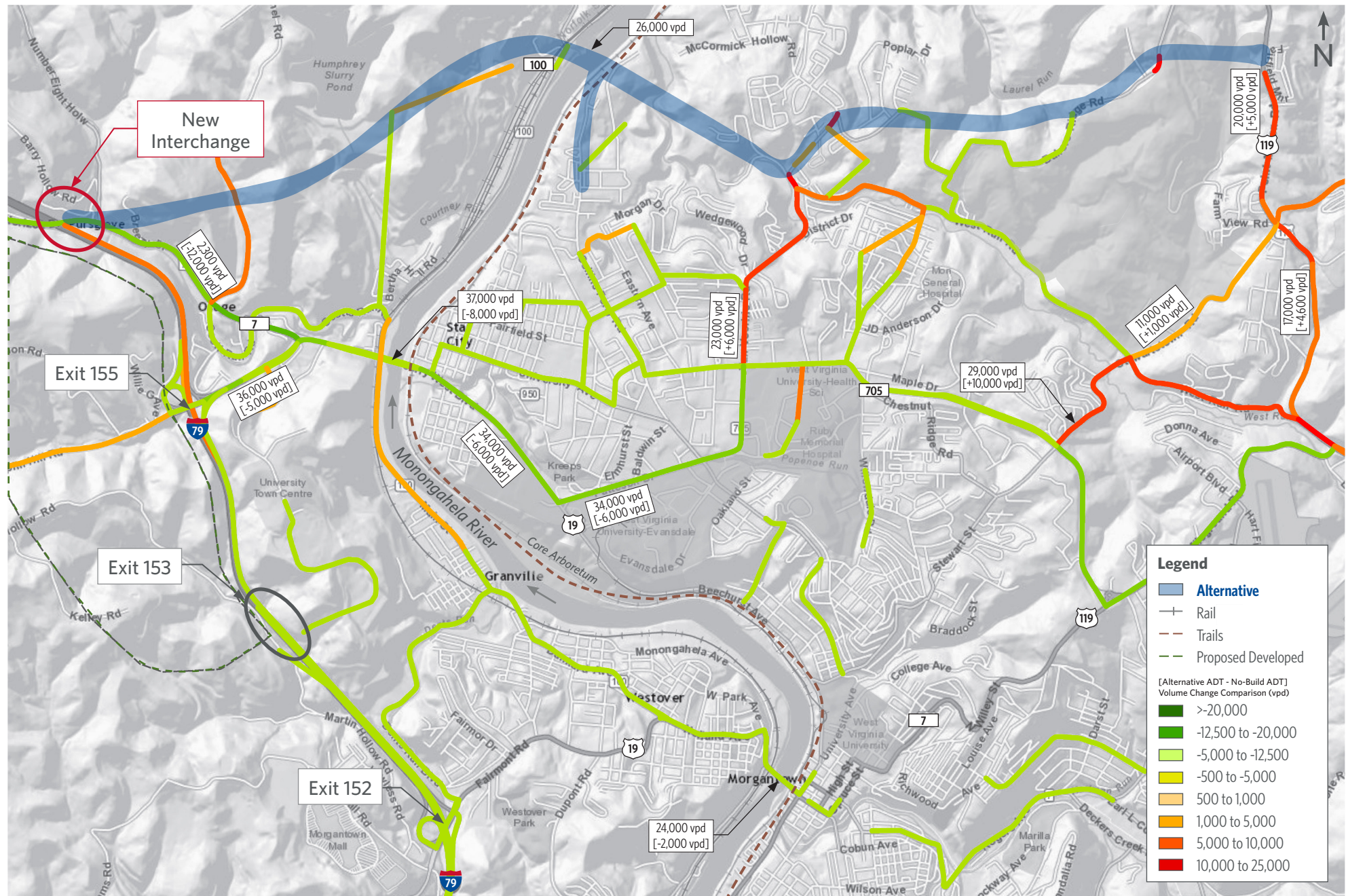


LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

Figure 4-3

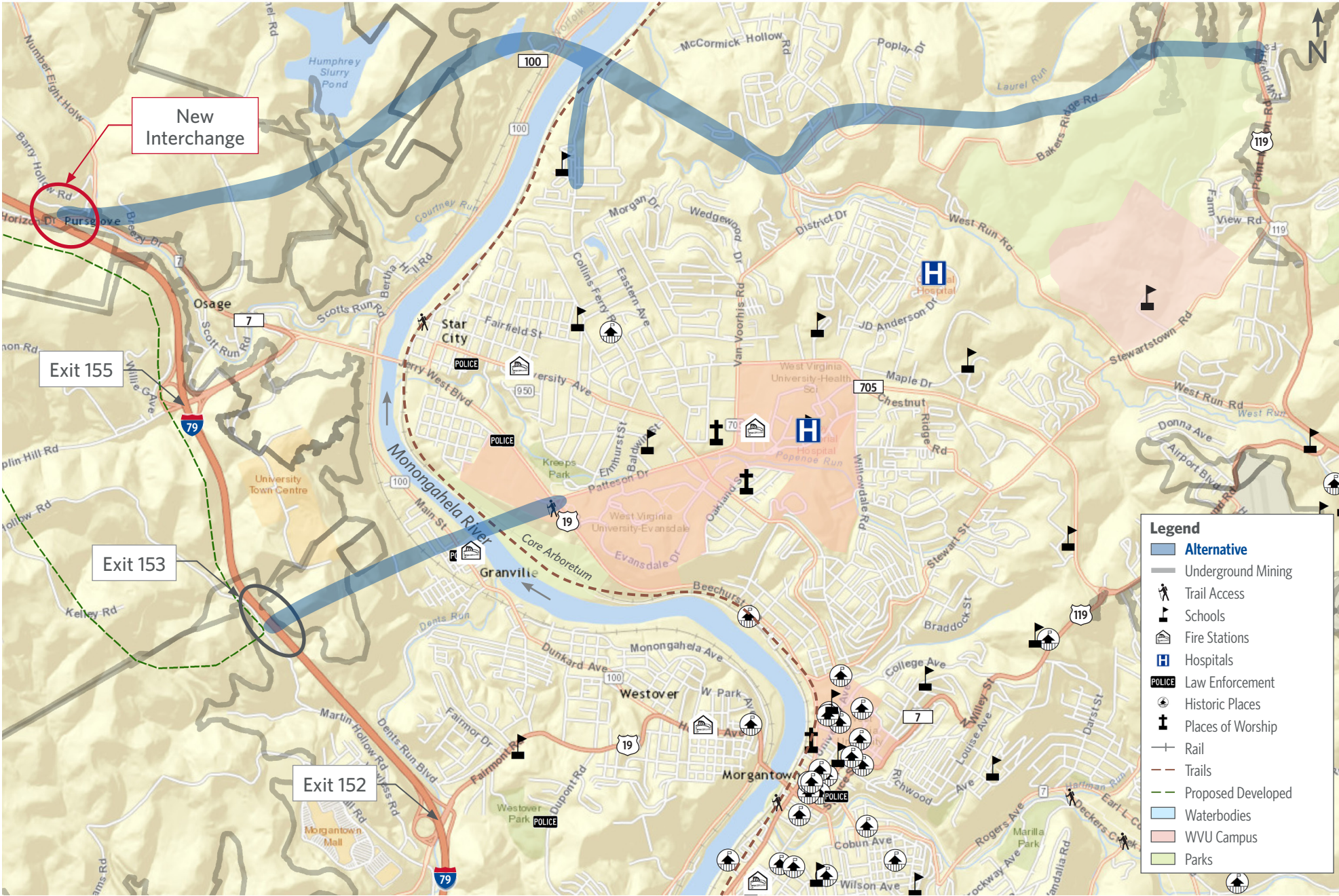
ALTERNATIVE 2 VOLUME CHANGE COMPARISON



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

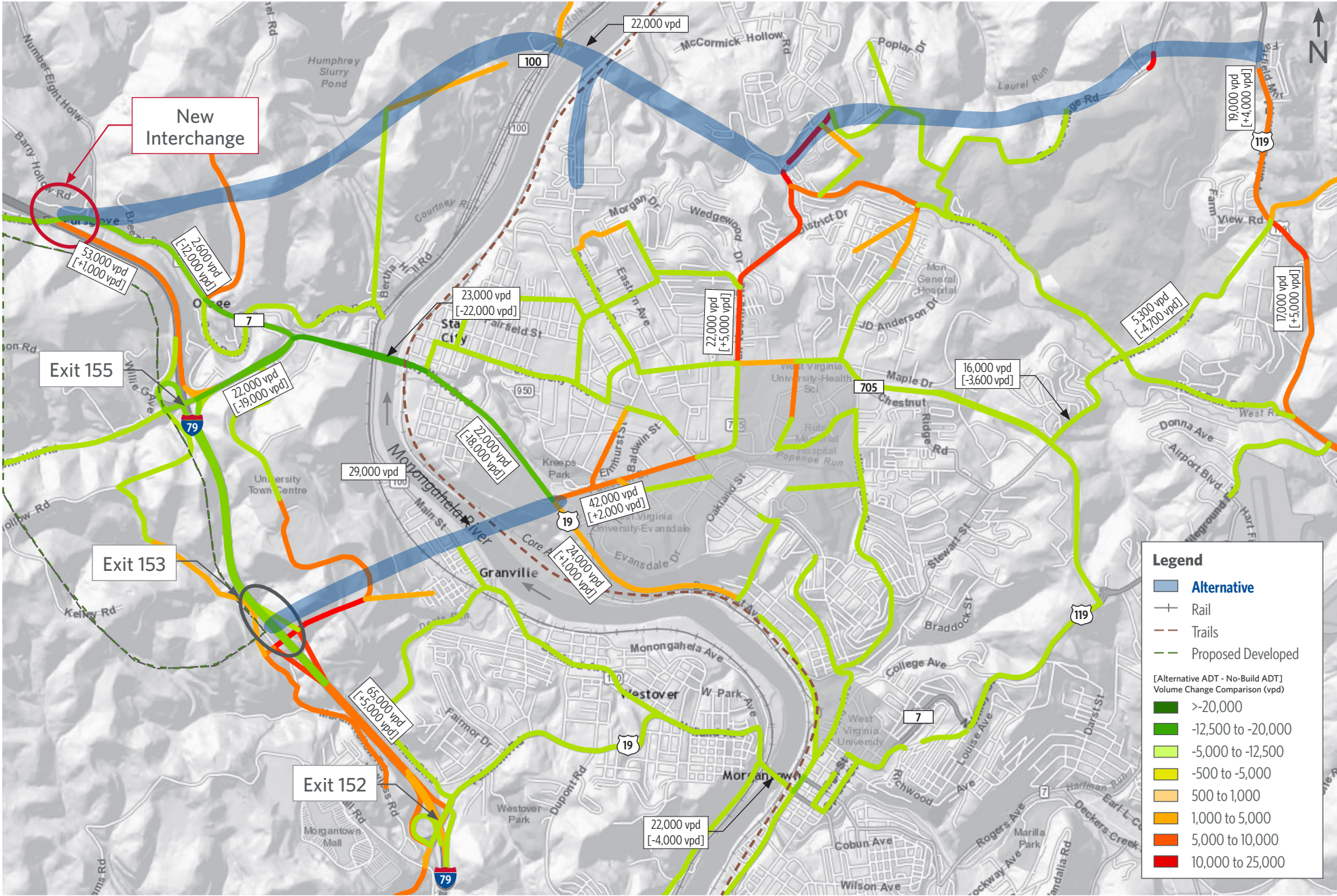
Figure 4-4
ALTERNATIVE 3 ENVIRONMENTAL FEATURES



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

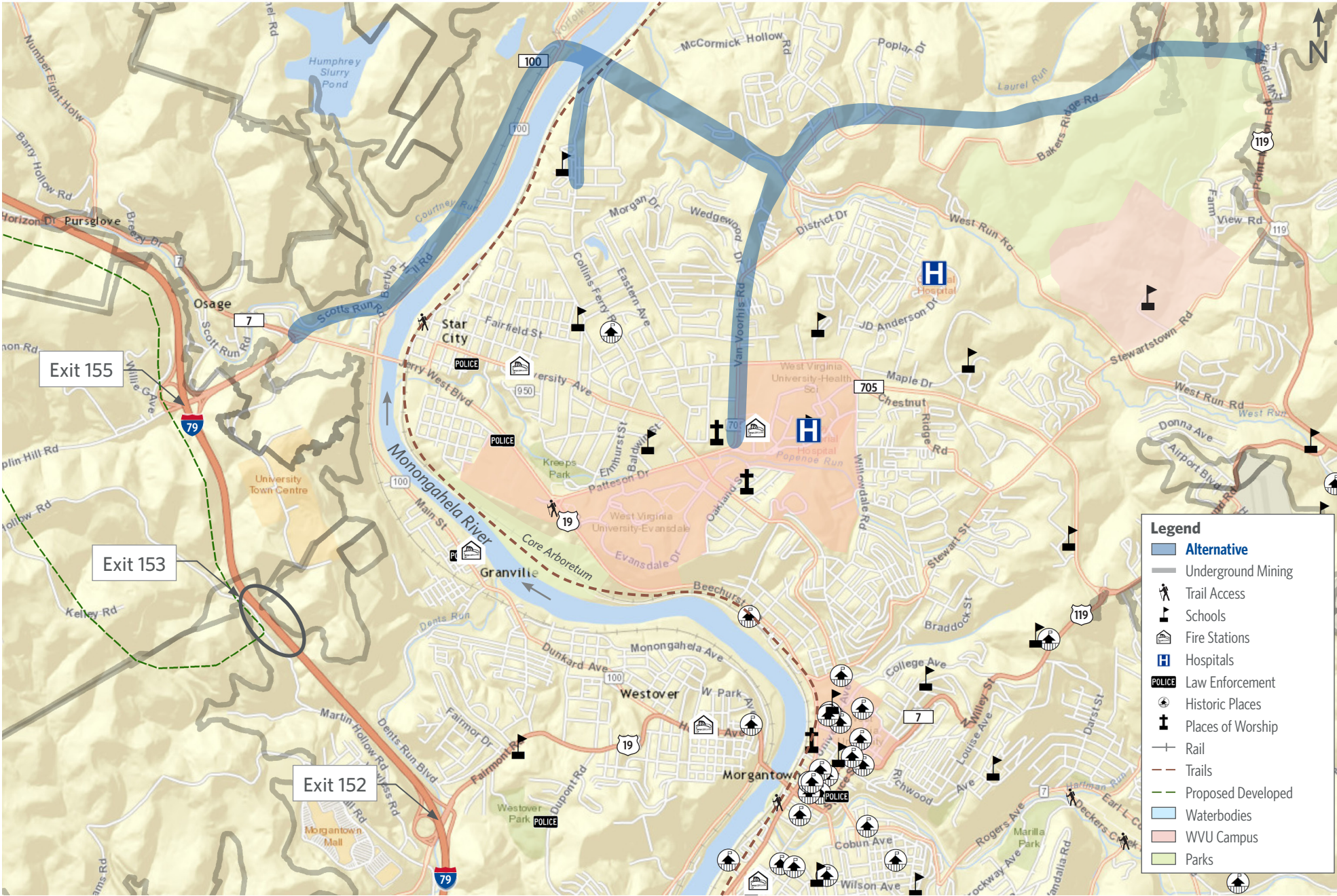
Figure 4-5
ALTERNATIVE 3 VOLUME CHANGE COMPARISON



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

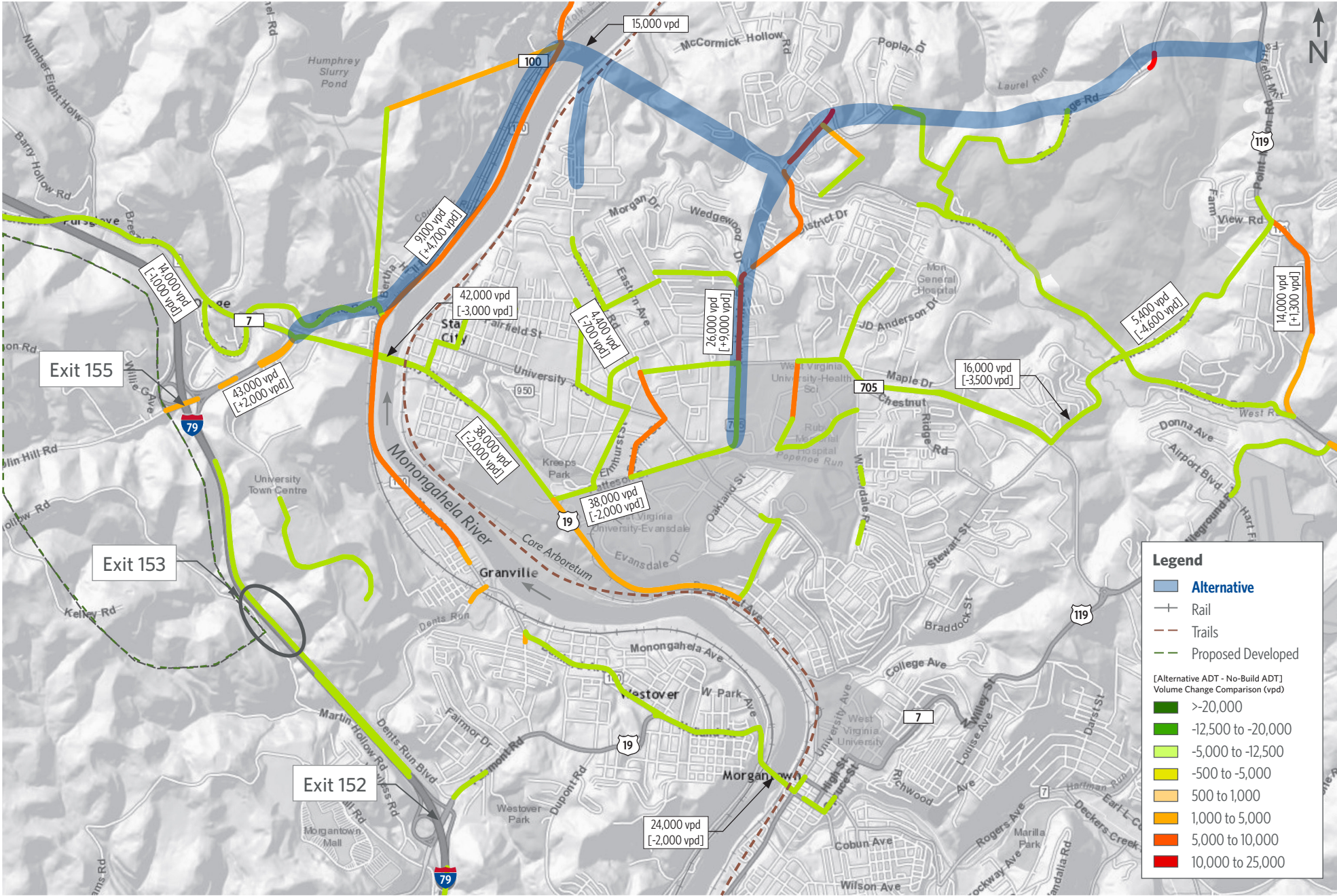
Figure 4-6
ALTERNATIVE 6 ENVIRONMENTAL FEATURES



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

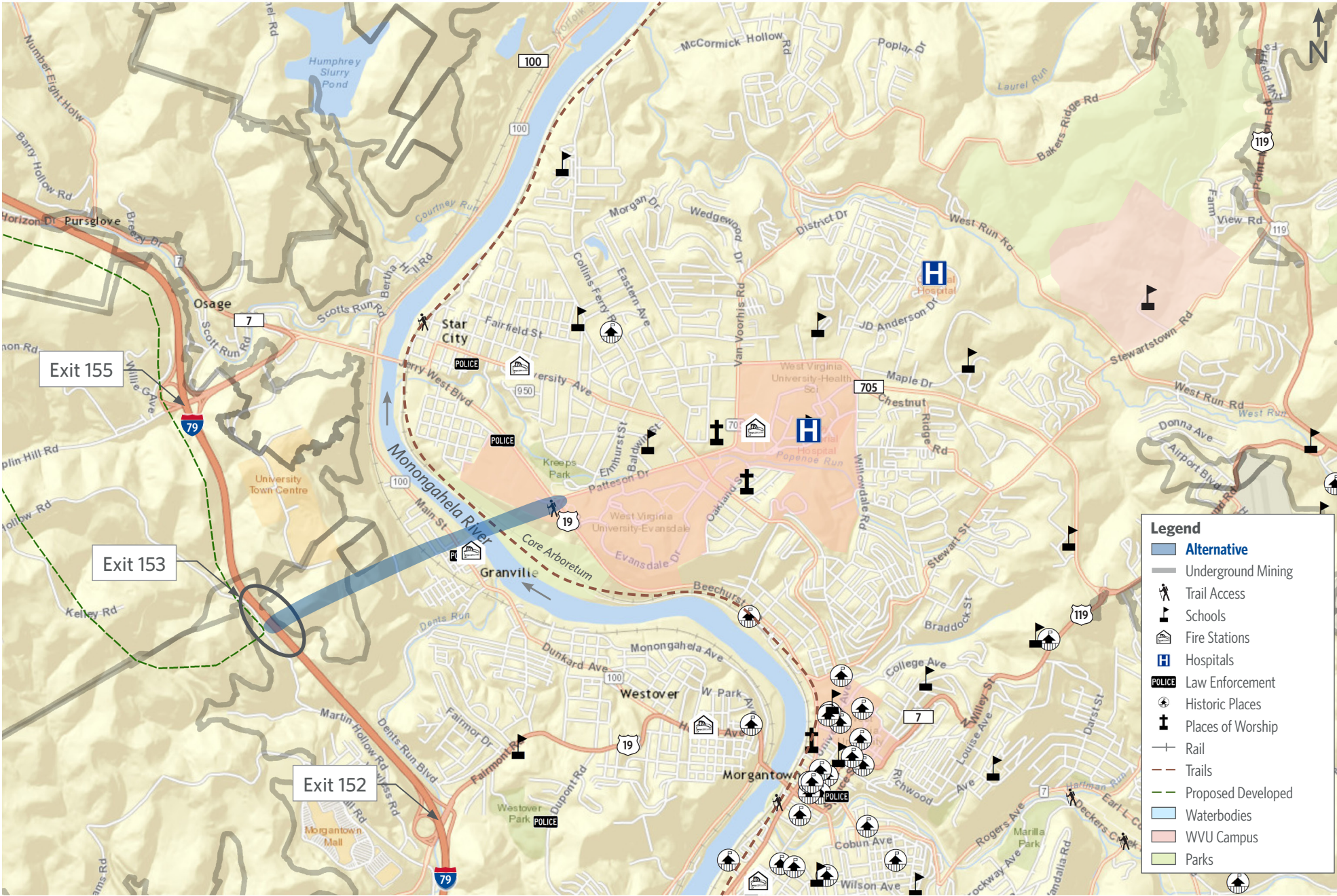
Figure 4-7
ALTERNATIVE 6 VOLUME CHANGE COMPARISON



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

Figure 4-8
ALTERNATIVE 7 ENVIRONMENTAL FEATURES



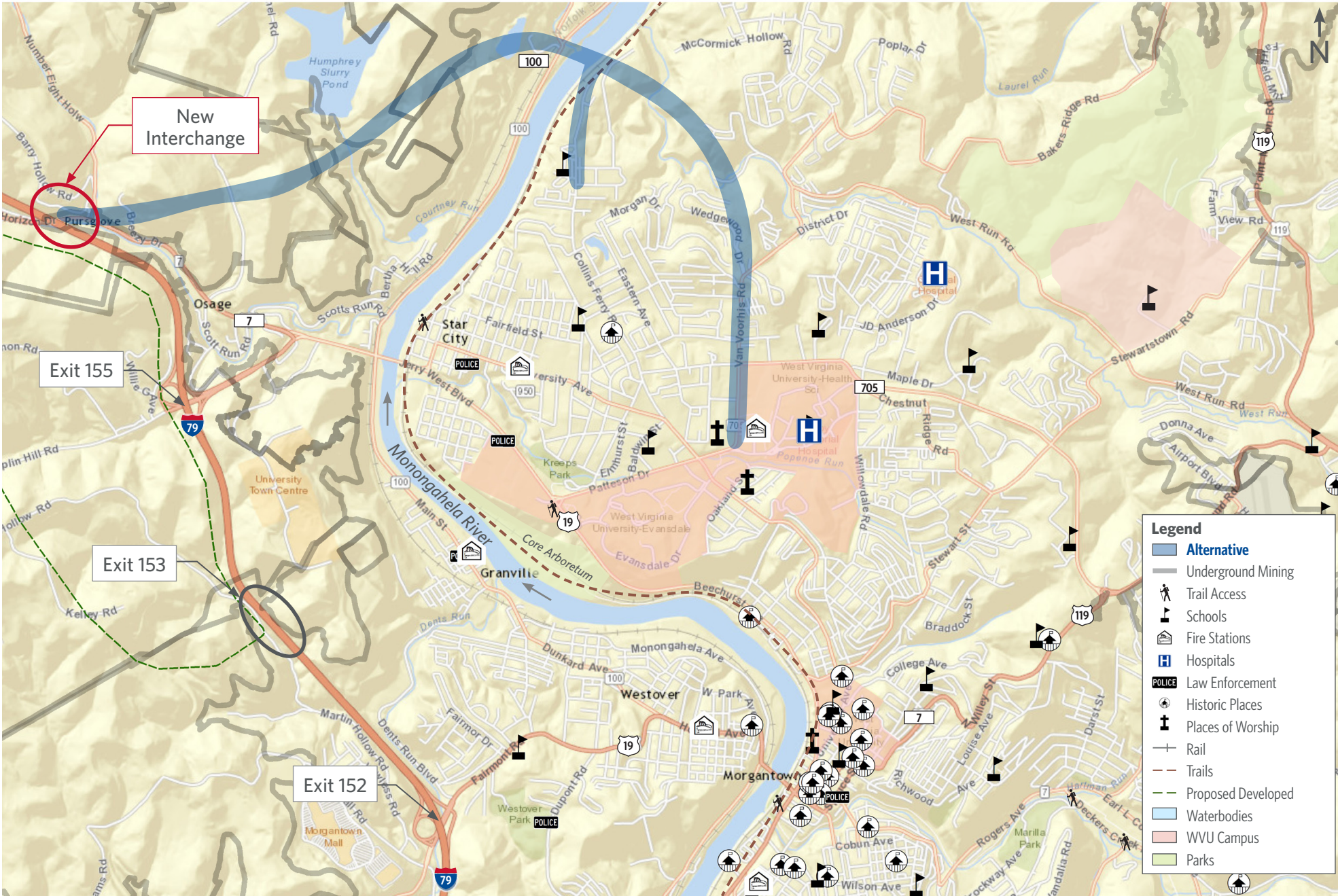
LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

Figure 4-9
ALTERNATIVE 7 VOLUME CHANGE COMPARISON



Figure 4-10
ALTERNATIVE 10 ENVIRONMENTAL FEATURES



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

Figure 4-11
ALTERNATIVE 10 VOLUME CHANGE COMPARISON

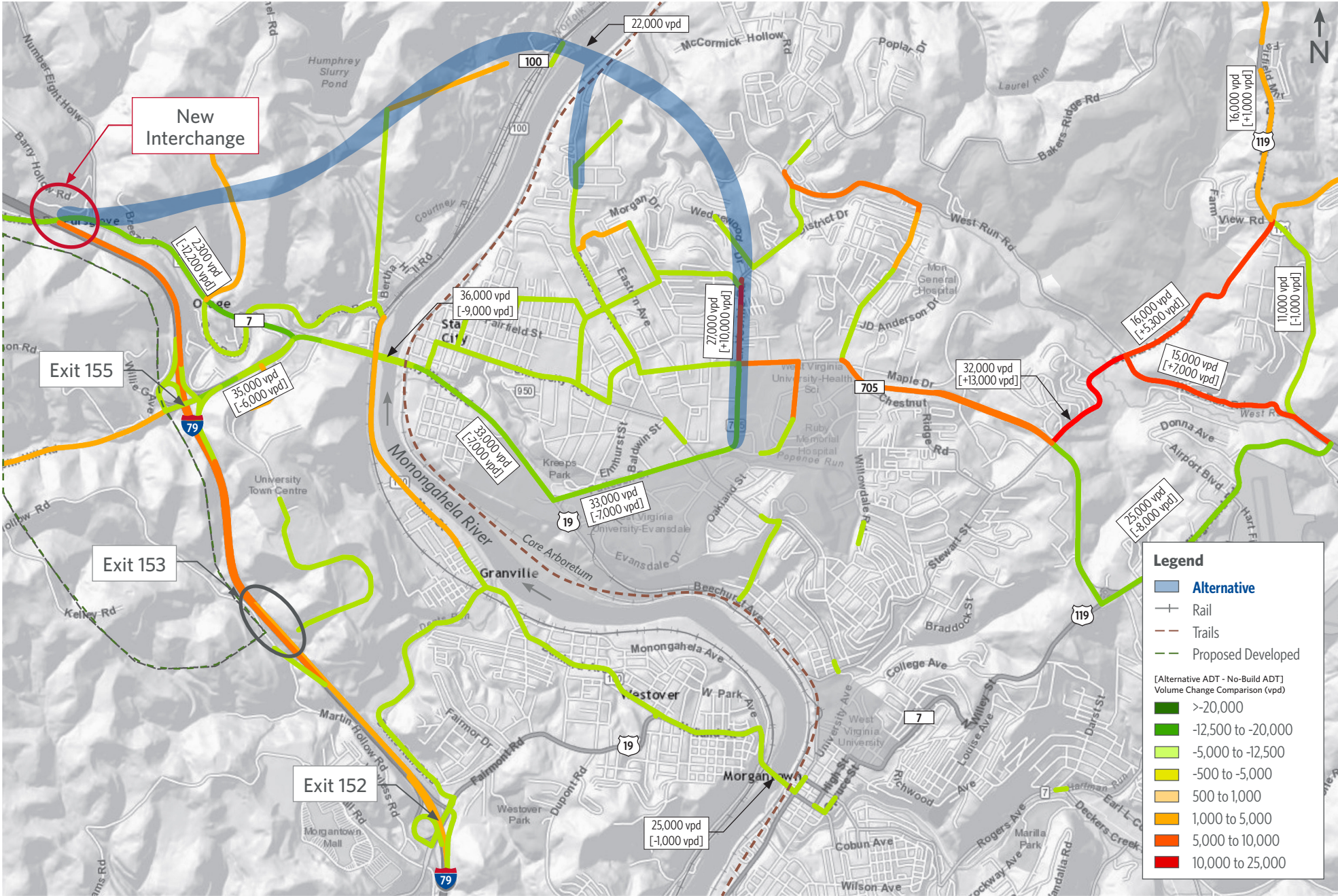
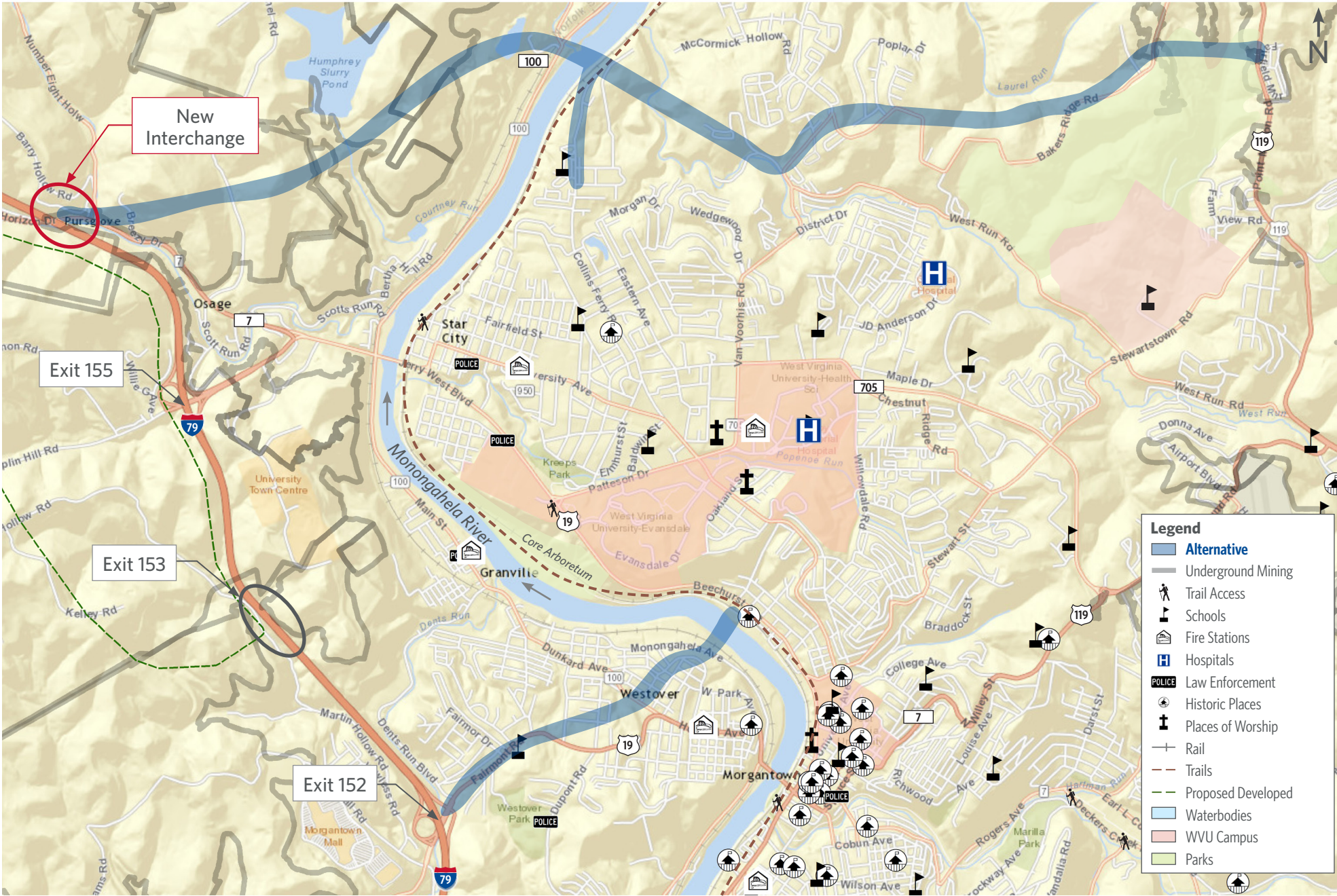


Figure 4-12
ALTERNATIVE 11 ENVIRONMENTAL FEATURES

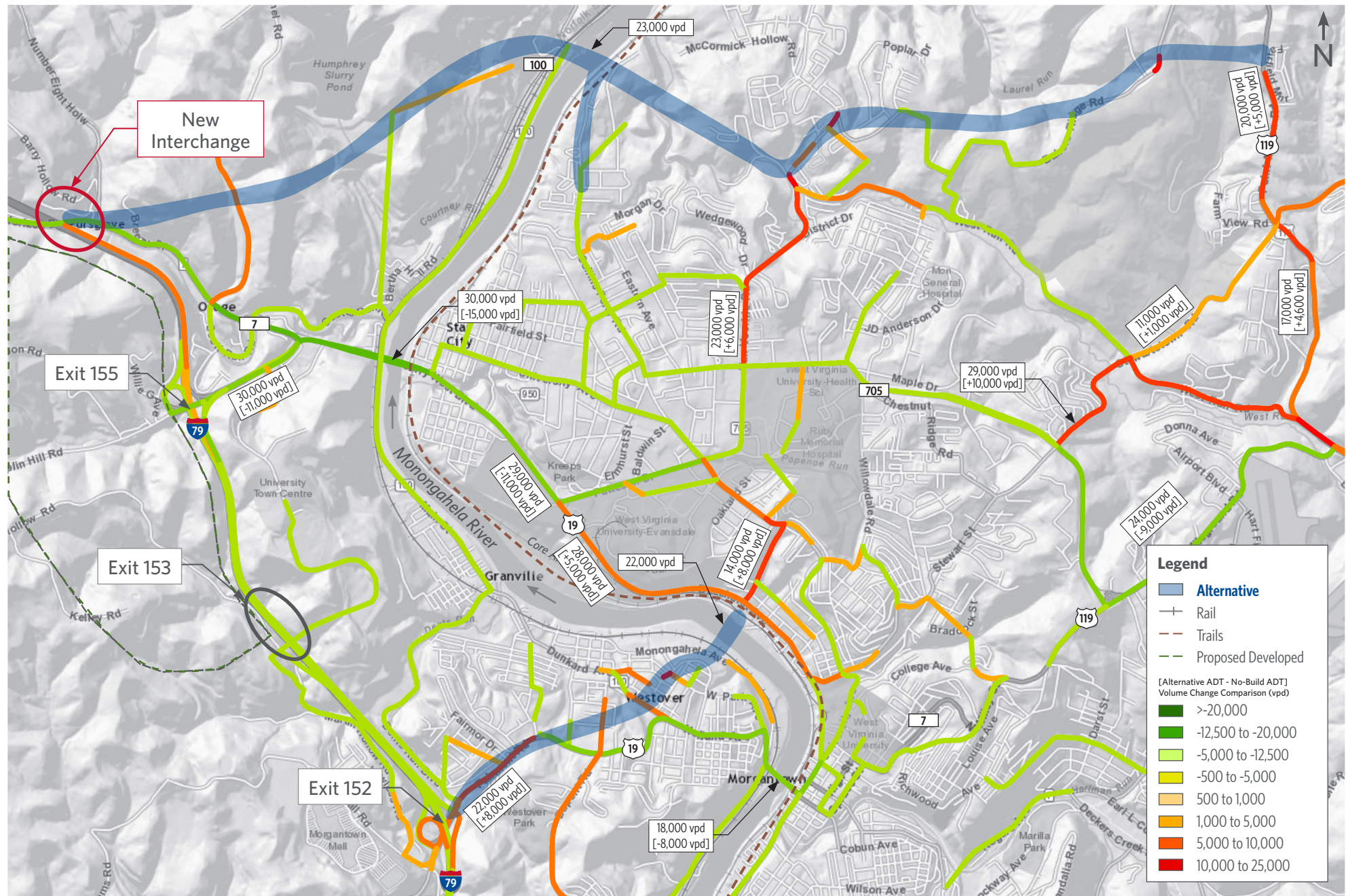


LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

Figure 4-13

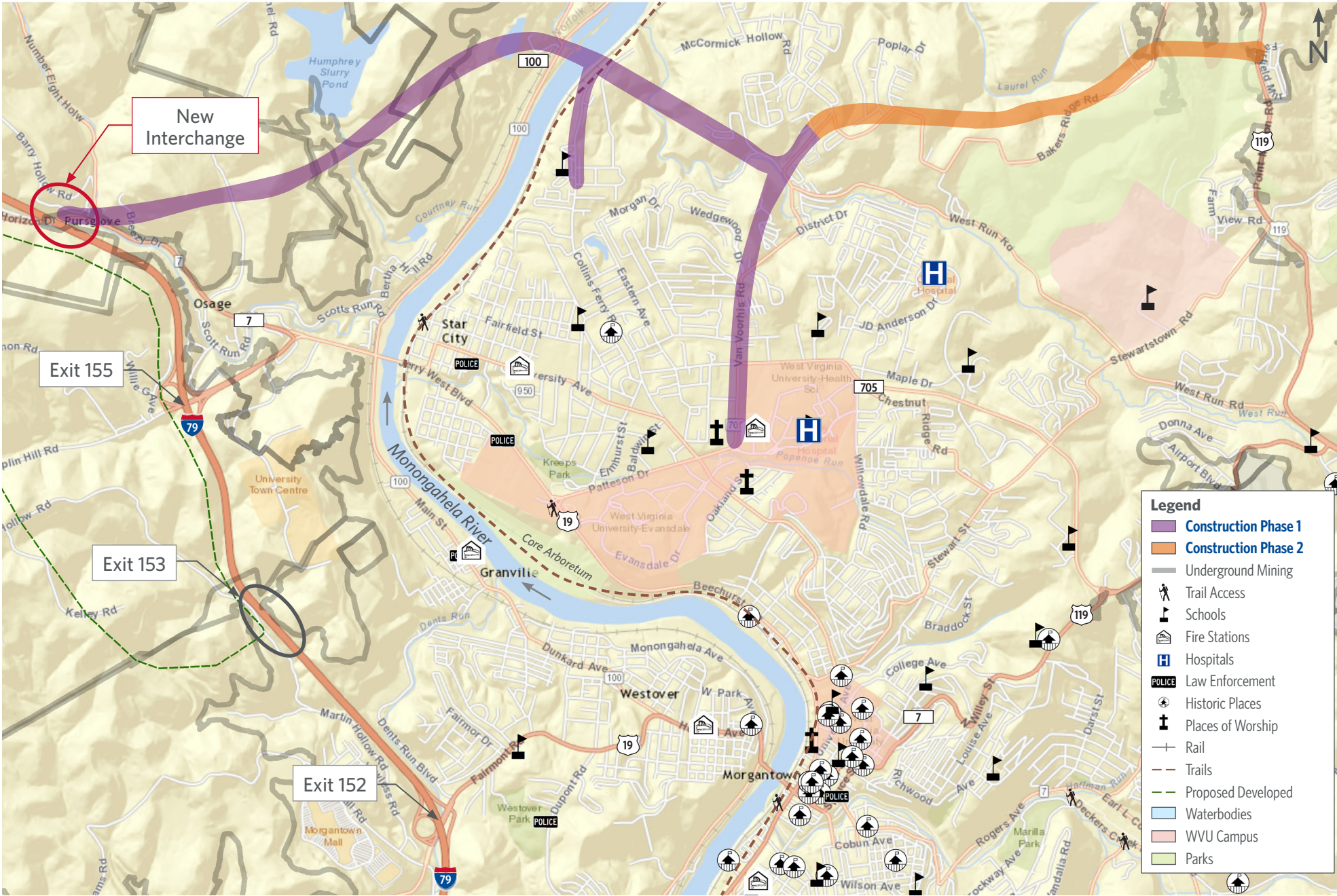
ALTERNATIVE 11 VOLUME CHANGE COMPARISON



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

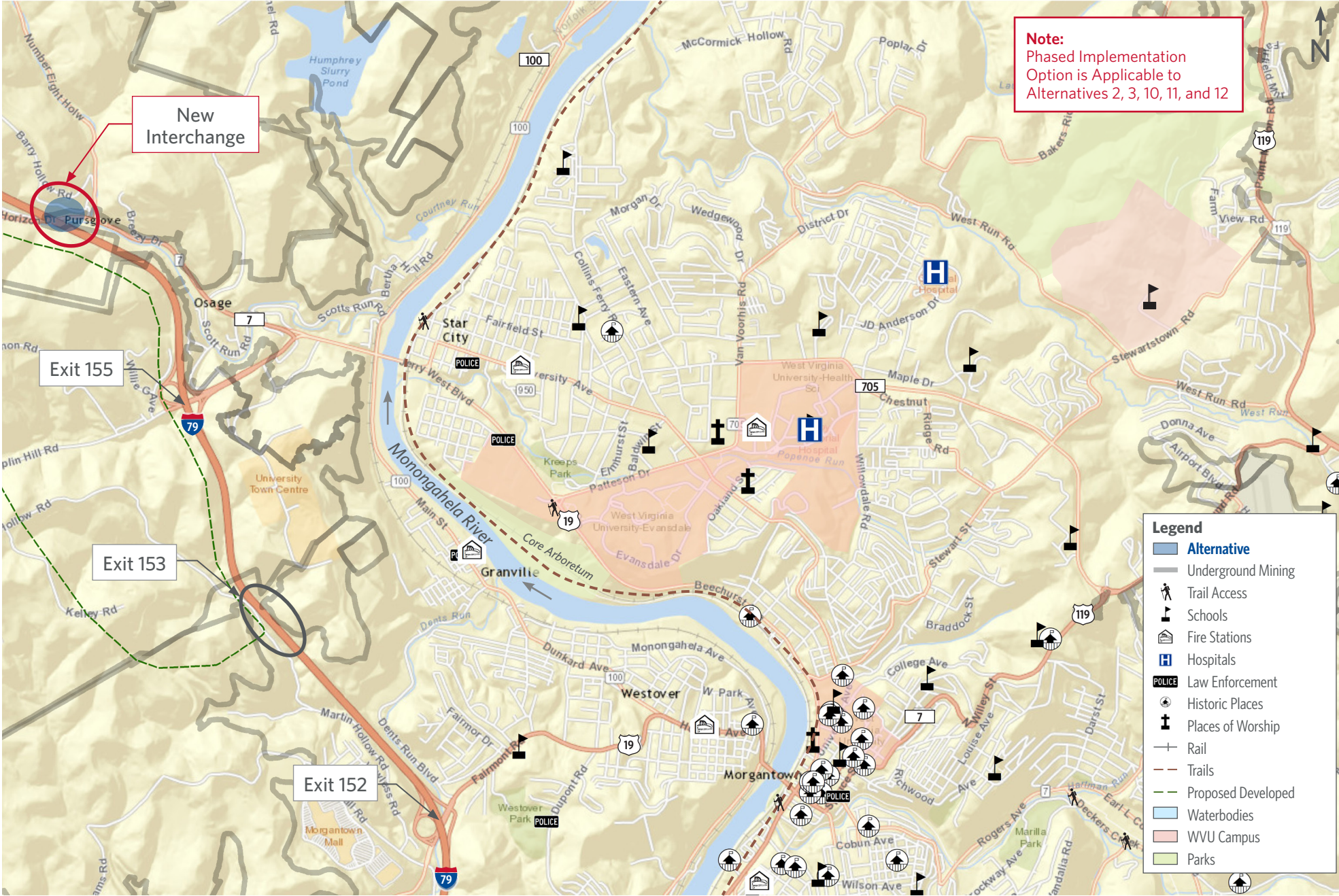
Figure 4-14
ALTERNATIVE 12 ENVIRONMENTAL FEATURES



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

Figure 4-16
PHASED IMPLEMENTATION OPTION A ENVIRONMENTAL FEATURES



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

Figure 4-17

PHASED IMPLEMENTATION OPTION A VOLUME CHANGE COMPARISON

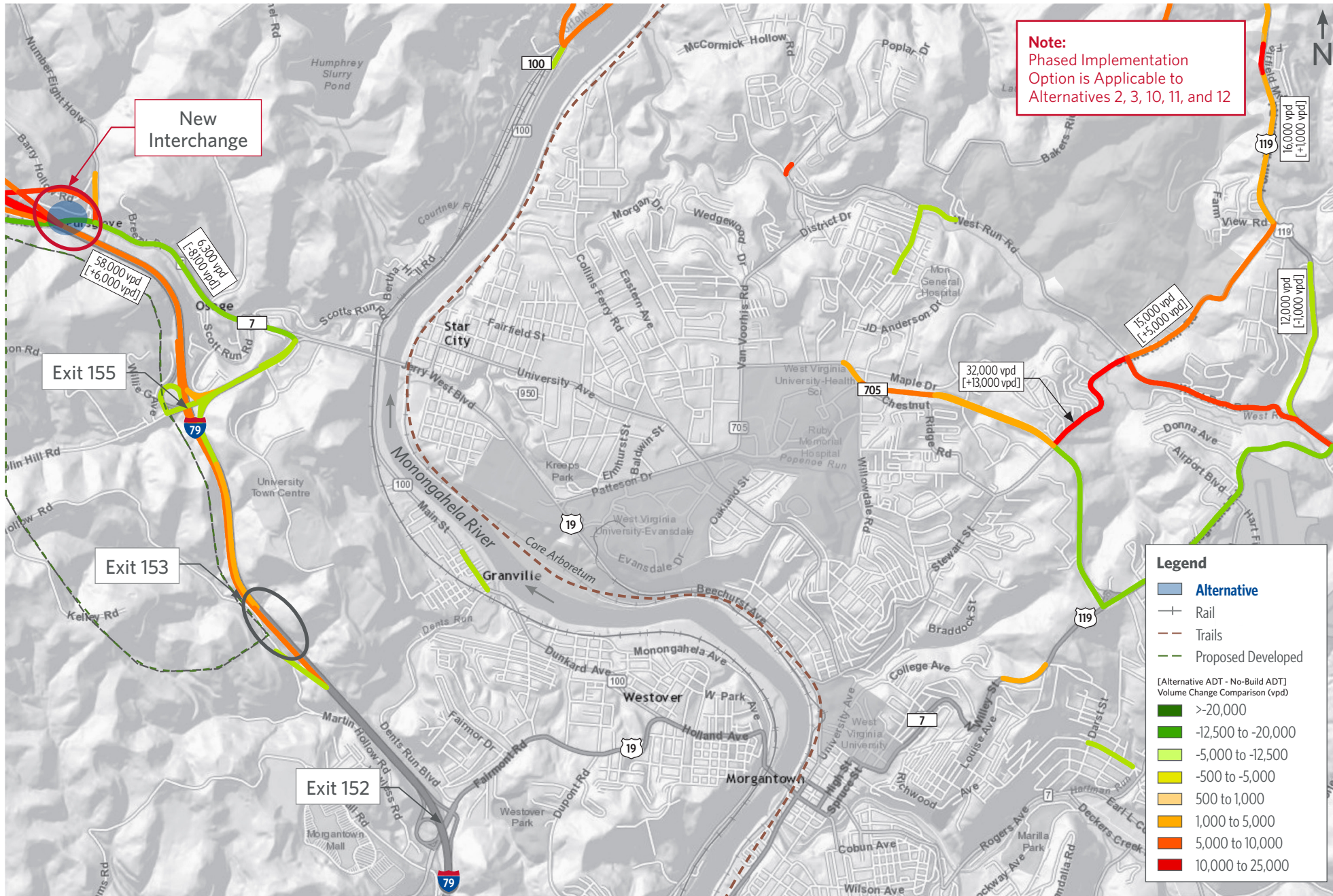
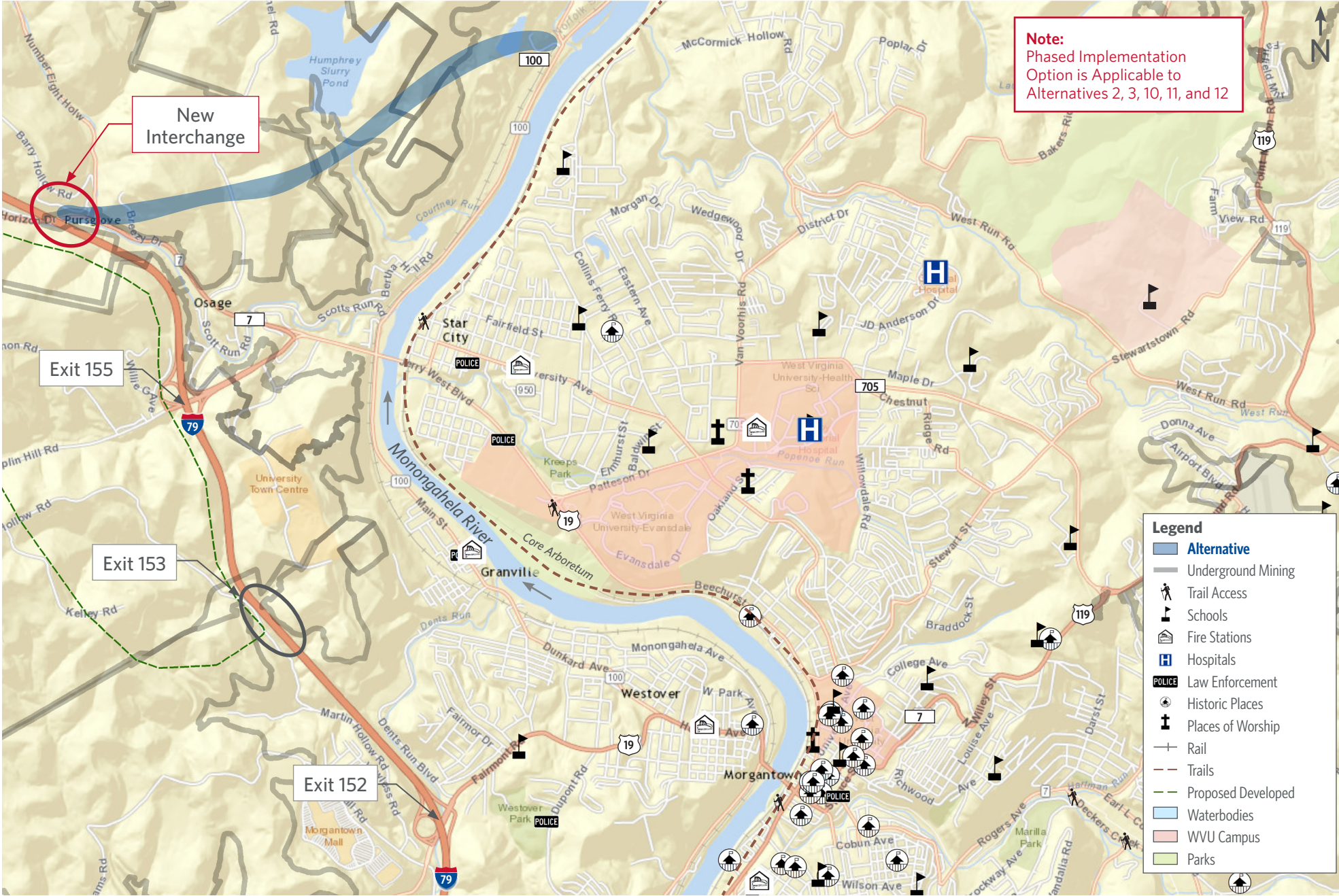


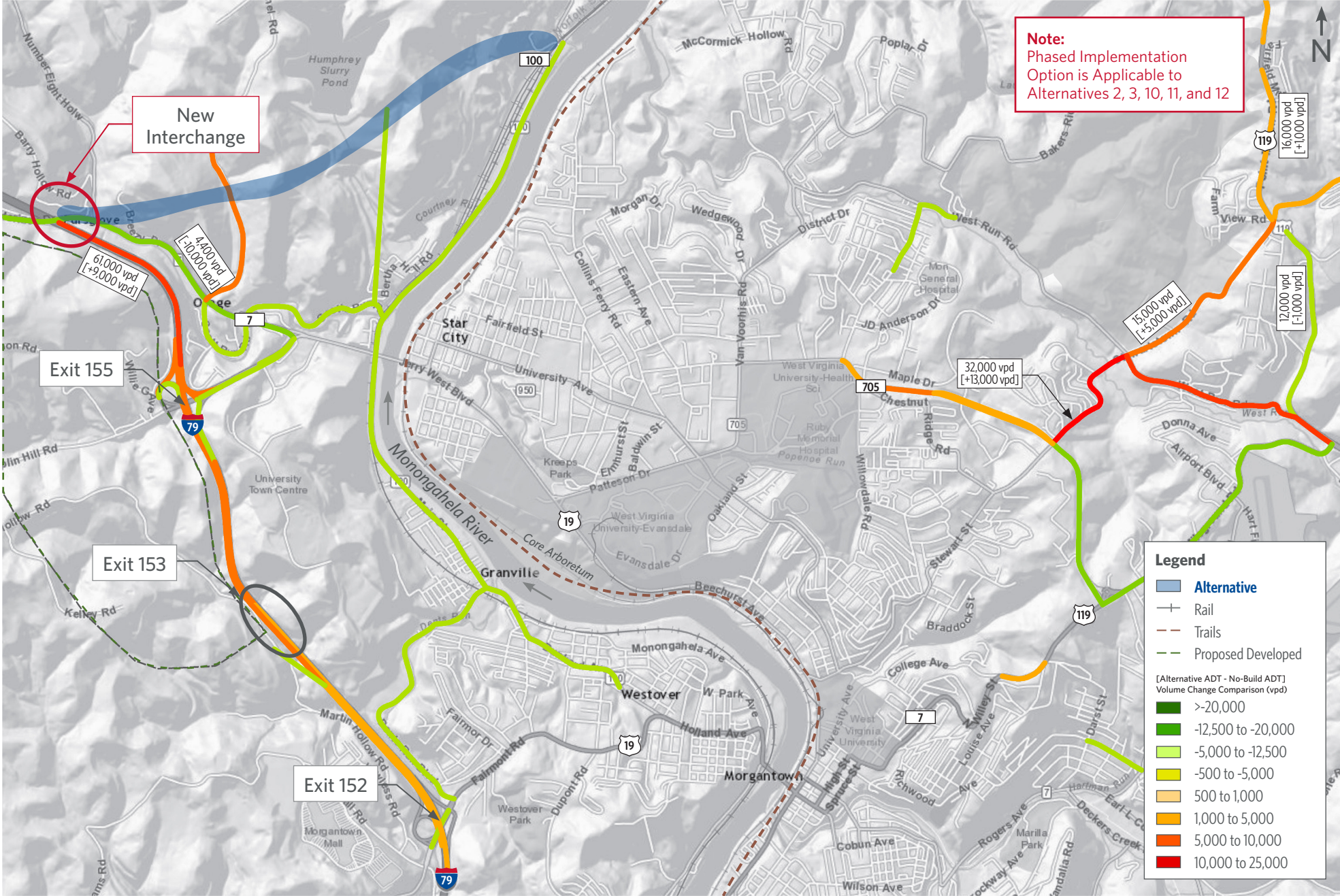
Figure 4-18
PHASED IMPLEMENTATION OPTION B ENVIRONMENTAL FEATURES



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

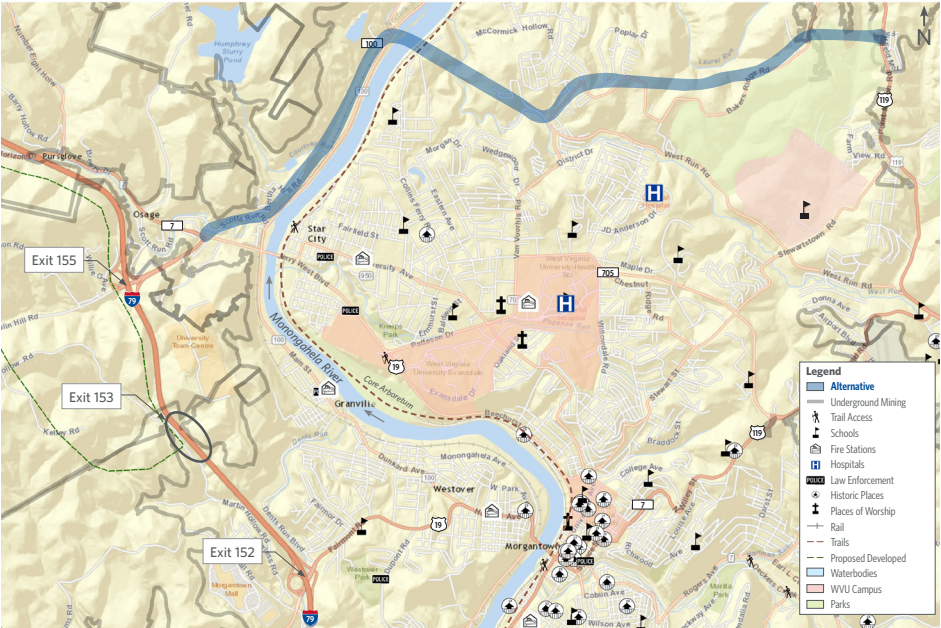
Figure 4-19
PHASED IMPLEMENTATION OPTION B VOLUME CHANGE COMPARISON



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

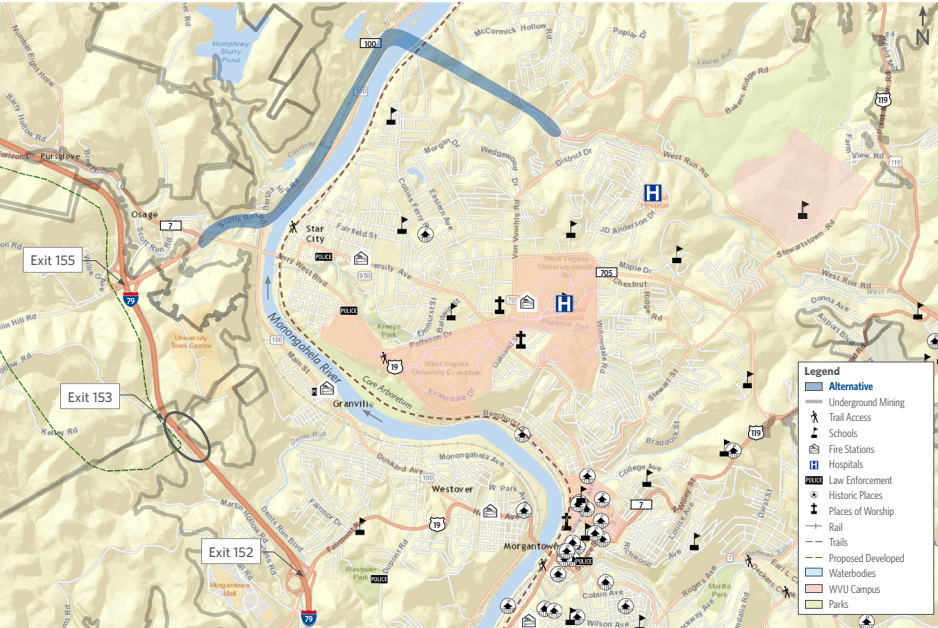
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

Figure 4-20
ENVIRONMENTAL FEATURES: ELIMINATED ALTERNATIVES



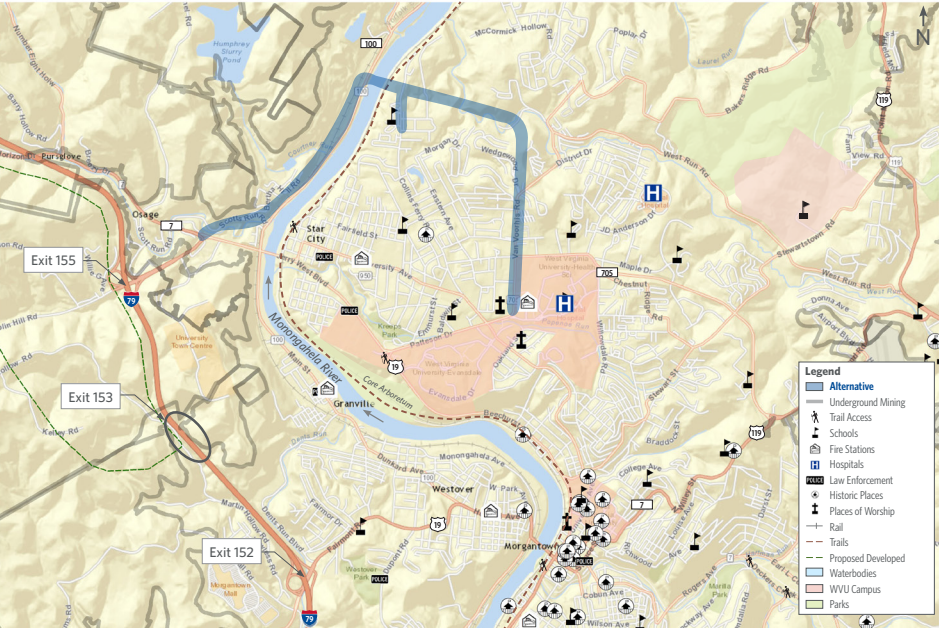
▲
ALTERNATIVE 1

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.



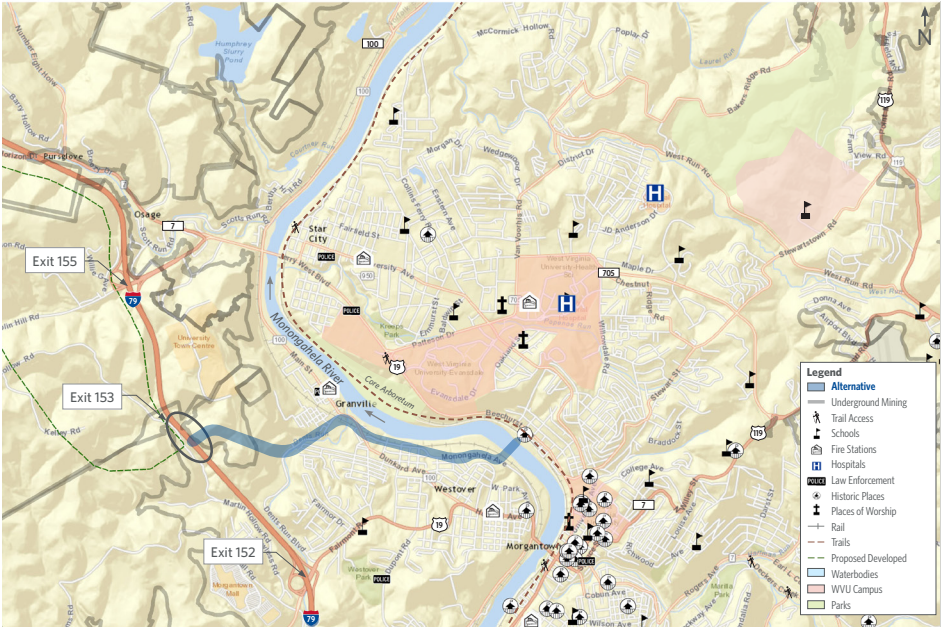
▲
ALTERNATIVE 4

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.



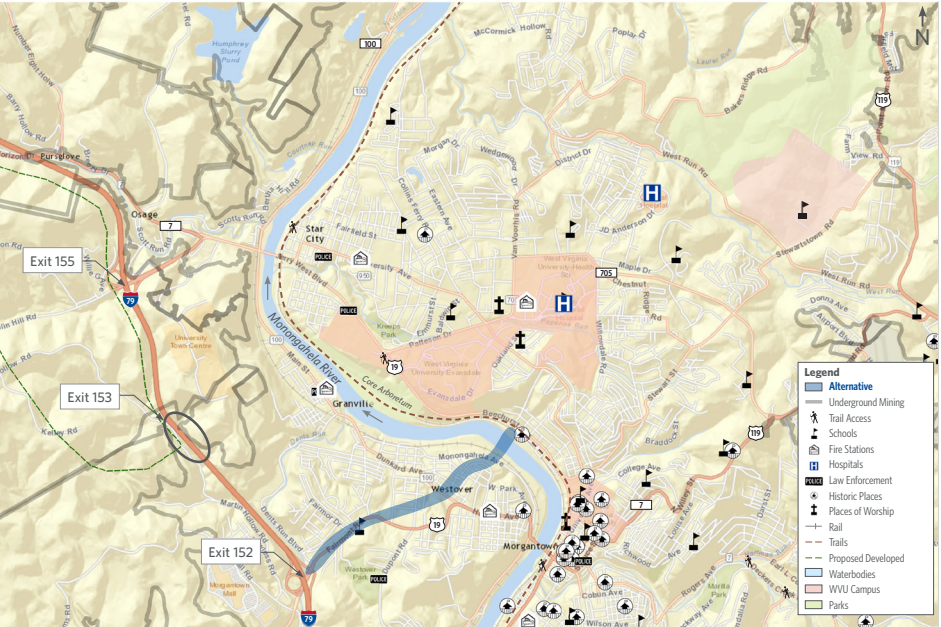
▲
ALTERNATIVE 5

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.



▲
ALTERNATIVE 8

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of disproportionate property and connectivity impacts to the Westover community, as well as a low cost/benefit ratio of minimal traffic reductions on key corridors.



▲
ALTERNATIVE 9

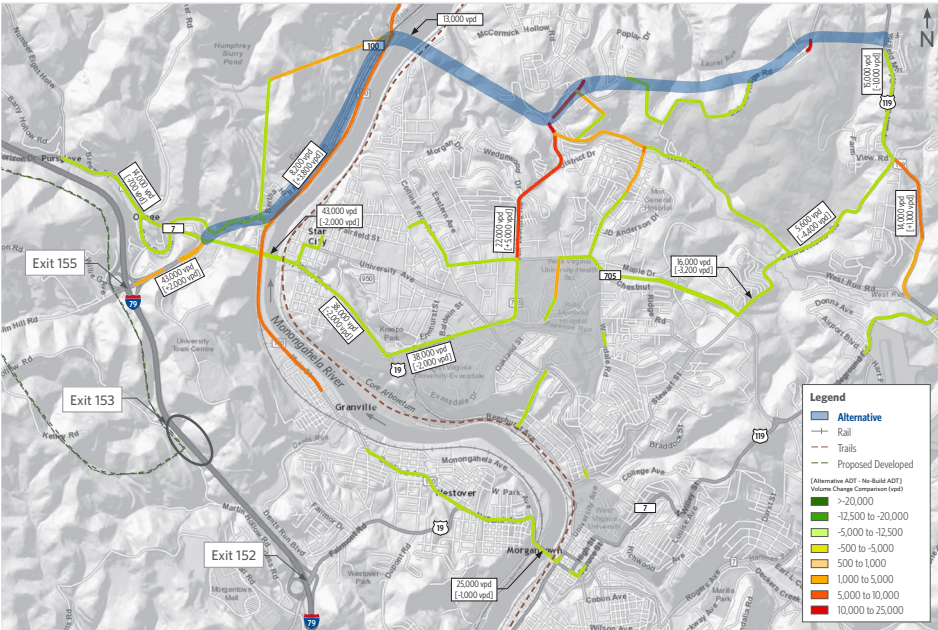
This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of disproportionate property and connectivity impacts to the Westover community, as well as a low cost/benefit ratio of minimal traffic reductions on key corridors.



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. HDR AND ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

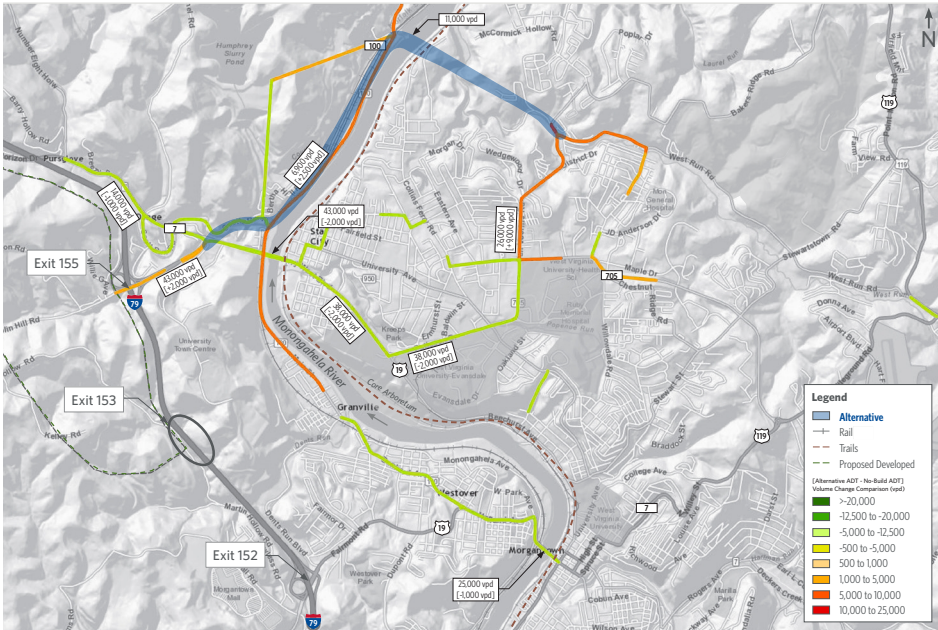
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, Coal Bed Mapping Project (CBMP) Pittsburgh map service, West Virginia GIS Technical Center (WVGISTC).

Figure 4-21
VOLUME CHANGE COMPARISON: ELIMINATED ALTERNATIVES



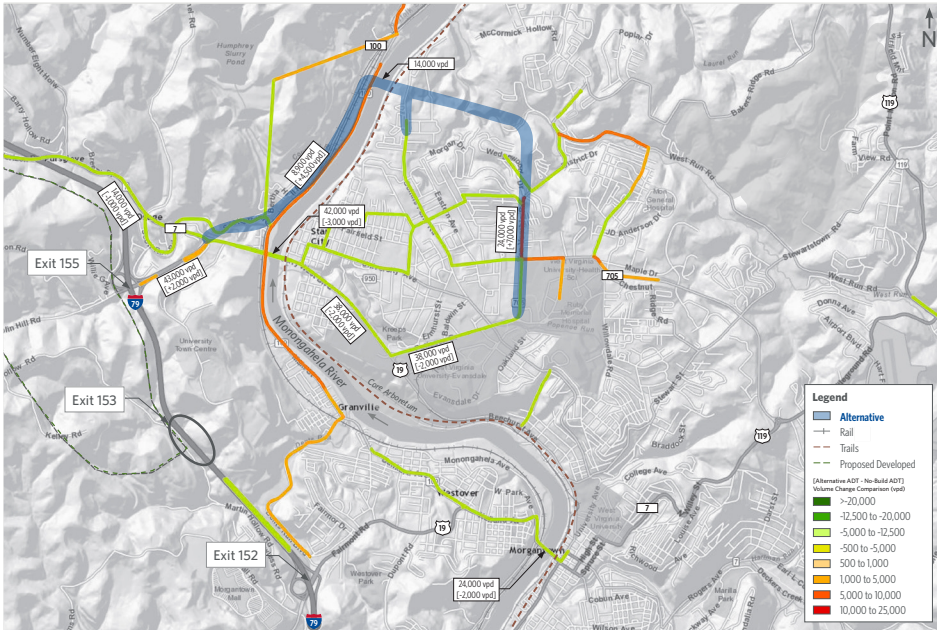
▲
ALTERNATIVE 1

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.



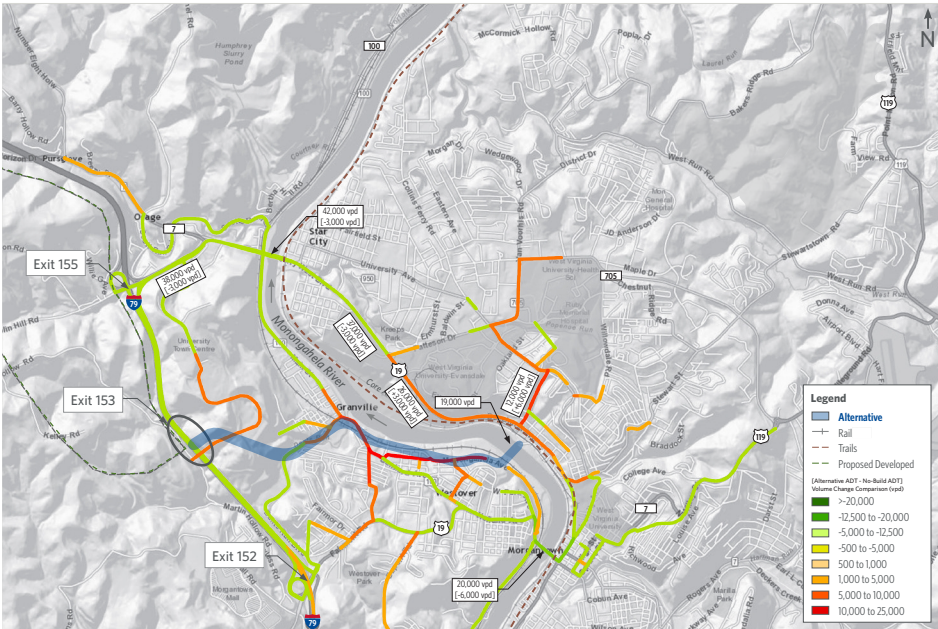
▲
ALTERNATIVE 4

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.



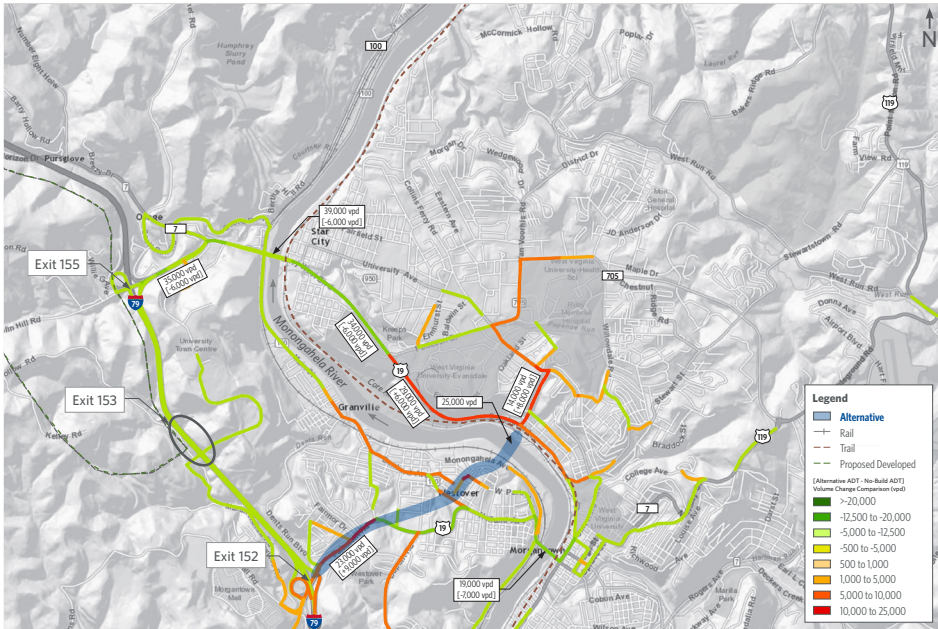
▲
ALTERNATIVE 5

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of a low cost/benefit ratio of minimal traffic reductions on key corridors.



▲
ALTERNATIVE 8

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of disproportionate property and connectivity impacts to the Westover community, as well as a low cost/benefit ratio of minimal traffic reductions on key corridors.



▲
ALTERNATIVE 9

This alternative was eliminated from further study as it does not meet the project’s Purpose and Need because of disproportionate property and connectivity impacts to the Westover community, as well as a low cost/benefit ratio of minimal traffic reductions on key corridors.



LIMITATION OF LIABILITY: HDR, INC. ACKNOWLEDGES THE INHERENT LIMITATIONS OF GIS PRODUCTS. HDR, INC. AND THE PROVIDERS OF THE SOURCE DATA MAKE NO WARRANTY OR REPRESENTATIONS OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, NOR ARE ANY SUCH WARRANTIES TO BE IMPLIED, WITH RESPECT TO THE PRODUCTS, FURNISHED HEREIN.

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, West Virginia Geological and Economic Survey, West Virginia GIS Technical Center (WVGISTC).

Figure 4-22



Evaluation Criteria		Weighted Value	No-Build	TSM	Build Alternative													
					1	2	3	4	5	6	7	8	9	10	11	12		
Operations	Reduces travel times to I-79	30%	5	4	Eliminated from further consideration	2	1	Eliminated from further consideration	Eliminated from further consideration	3	4	Eliminated from further consideration	Eliminated from further consideration	2	1	1		
	Improves bottlenecks, reduces traffic, enhances safety		5	4		3	4			2	4			2	3	1		
	Supports transit opportunities		5	2		2	2			1	2			1	4	1		
	Supports bicycle/pedestrian opportunities		5	5		3	3			2	4			2	3	2		
Connectivity	Improves mobility to key destinations	25%	5	4		4	4			2	5			2	5	2	3	1
	Improves access in northern Morgantown		5	5		3	3			2	5			3	3	1		
	Encourages smart growth principles		5	5		3	3			2	4			3	3	3		
Community/ Environmental	Property/neighborhood impacts	15%	5	3		3	4			1	1			4	4	3	4	3
	Public facility impacts		1	1		3	3			1	1			3	4	3		
	Farmland impacts		1	1		3	3			3	1			2	3	3		
	Floodplain/wetland impacts		1	1		2	4			3	2			3	4	3		
	Cumulative and secondary impacts		4	4		4	5			3	4			4	5	4		
Regulatory Environmental	Section 4(f) and 6(f) - Parks, recreation impacts	20%	1	1	3	5	3	5	2	2	3	4	2					
	Section 106 - Cultural resource impacts		1	1	2	2	3	4	3	5	3							
	Environmental Justice impacts		1	1	3	4	5	2	4	5	5							
	Noise impacts		1	1	3	3	3	2	3	4	3							
Financial	Future maintenance cost	10%	1	2	3	5	2	4	4	4	3	5	3					
	Funding potential		1	1	2	4	3	4	3	4	3							
	Project cost		1	1	3	5	4	4	3	5	4							
Weighted Score			3.4	2.9		2.9	3.3			2.5	3.6			2.5	3.5	2.3		
1 to 2	Lowest likely impacts, addresses elements with good conformance to project goals, presents low construction/maintenance cost.																	
3	Mid-range of impacts, addresses elements to somewhat conform to project goals, medium construction/maintenance cost																	
4 to 5	High likely impacts, does not address elements or conform with project goals, high construction/maintenance cost																	

5 Stakeholder Engagement

The key to delivering a comprehensive and successful study is the engagement and active participation of the community. Following the submission of the Existing and Future Conditions Report in November 2015, a meeting was held with MMMPO to discuss the findings and identify the project stakeholders. To help guide the alternatives development process and assist in the decision making, a Steering Committee was formed consisting of local and elected officials, MMMPO Policy Board members, public agency officials, Mountain Line Transit Authority, WVU, Morgantown Area Chamber of Commerce, WVDOT, and FHWA. To represent the voice and concerns of the public, a Stakeholder Committee was formed consisting of residents at large, business leaders, developers, and healthcare officials. Exhibit 5-1

provides a detailed timeline of the stakeholder engagement process throughout the project.

The first public meeting was held in December 2015 with over 50 people in attendance. The meeting introduced the project purpose and goals, presented the findings of the Existing and Future Conditions Report, and gathered input and ideas from the public. Over 400 written comments were submitted and the comment period was extended at the request of the public. The key themes emphasized alternative transportation solutions (PRT, public transportation, bike/ped), smart growth, vehicle access restriction, and the role of development in the project. Concerning specific bridge locations, an overwhelming majority

Steering Committee Meeting #1 – October 2015

- Project background/introduction presented.
- Transportation concerns identified.
- Existing and Future Conditions Report findings presented.

Public Meeting #1 – December 2015

- Project purpose and goals discussed.
- Existing and Future Conditions Report findings presented.
- Public asked to provide input and ideas throughout comment period.

Steering Committee Meeting #2 – January 2016

- Summary of Public Meeting #1 comments presented.
- Overall Project Goals revisited and reaffirmed.
- Purpose and Need discussed and revised.
- Alternatives brainstorming.

Stakeholder Committee Meeting #1 – March 2016

- Project overview and work done to date presented.
- Purpose and Need presented.
- List of alternatives presented.

MMMPO – WVDOT Coordination Meeting #1 – June 2016

- Overview of alternatives presented and model enhancements discussed.
- Project funding mechanisms discussed leading to the addition of phasing options.

Steering Committee Meeting #3 – July 2016

- Eliminated several alternatives from further consideration. Remaining alternatives reviewed and confirmed to be carried forward in the study.
- Evaluation matrix discussed and category weights assigned.

Stakeholder Committee Meeting #2 – August 2016

- Recap and review of alternatives presented.
- Evaluation matrix criteria and category weights revealed.

Steering Committee Meeting #4 – September 2016

- Alternative impacts presented.
- Alternatives evaluation matrix reviewed and approved.
- Draft Public Meeting #2 materials presented for review.

Stakeholder Committee Meeting #3 – September 2016

- Alternative impact results and evaluation matrix presented.
- Draft Public Meeting #2 materials presented.

Public Meeting #2 – October 2016

- Findings of Draft I-79 Access Study presented.
- Project Purpose and Need discussed.
- Alternatives and their impacts presented.
- Criteria and ranking in alternatives evaluation matrix presented.

MMMPO – WVDOT Coordination Meeting #2 – December 2016

- Summary of alternatives studied and evaluation matrix.
- Presentation of recommended alternative.

Public Meeting #3 – January 2017

- Recommended alternative presented
- Evaluation matrix presented.

Exhibit 5-1: Stakeholder Engagement Summary

(315 comments) of comments expressed concern over any potential connection impacting the Core Arboretum, while several reflected support of a new bridge at 8th Street (29 comments).

The Steering and Stakeholder Committees were continuously engaged starting in October 2015 and throughout the alternatives development and evaluation process, with meetings occurring at critical junctures in January 2016, March 2016, July 2016, August 2016, and lastly in September 2016 where the following were discussed:

- Formalizing Project Purpose and Need.
- Preliminary presentation of alternatives.
- Elimination of alternatives and confirmation of alternatives to be evaluated.
- Evaluation Matrix discussion and category weight assignment.
- Review of Evaluation Matrix results.
- Review of Draft Public Meeting #2 materials.

Additionally, a coordination meeting between MMMPO and WVDOT was held in June 2016 to present an overview of alternatives and discuss TDM enhancements with WVDOT leadership. Funding mechanisms were also discussed, including the consideration of project phasing options.

Following the submission of the Draft I-79 Access Study in October 2016, a second public meeting was held on October 11, 2016 to present the findings, discuss the Project Purpose and Need, present the criteria and rankings in the Alternatives Evaluation Matrix, and get input on the alternatives. Over 50 people were in attendance, with 30 formal comments received. The comments continued to oppose any alternative impacting the Core Arboretum (Alternatives 3 and 7), however many comments supported the northern alternatives and urged protection/maintenance of the Mon River Trail access and facilities.

A second coordination meeting between MMMPO and WVDOT was held in December 2016 to present the findings of the Draft Access study and to summarize the comments from Public Meeting #2.

A third and final public meeting was held on January 26, 2017 to present the Access Study's recommended alternative and to gather public input on the recommended alternative. Over 60 people were in attendance and over 80 comments were received. The comments voiced support of the project, process, and recommended alternative, while numerous comments



continued to urge preservation of the Core Arboretum. Appendix E contains a matrix summarizing these comments, as well as articles discussing the project.

Throughout the process, the I-79 Access Study project website (<http://www.i79accessstudywv.com/>) has been updated to include:

- Project overview.
- Schedule.
- Meeting agendas.
- Public meeting displays and handouts.
- Public comment form.
- Reports.

Content has continuously been approved by MMMPO, and content migration to the MMMPO's website will occur after the project is completed.

6 Conclusions and Recommendations

The I-79 Access Study is an initiative of the Morgantown Monongalia Metropolitan Planning Organization (MMMPO) through the *2017-2045 Metropolitan Transportation Plan Update* (MTP Update) and in response to recommendations initially set forth by the *2040 Long Range Transportation Plan* (2013 LRTP). The 2013 LRTP recommendations listed this study as “Priority Strategy 1 – Number 8: Monongahela River Crossing Study,” and the recommendations of the I-79 Access Study have been included in the MTP Update as “Tier 1 Project 6: I-79 Access Improvements Phase I” and “Tier 2 Project 6: I-79 Access Improvements Phase II.” The MTP Update also identifies the Phase I I-79 Access Improvements as the top priority of the Tier 1 Projects.

The first step of the Access Study was to develop the Vision for the project by comprehensively evaluating how the current transportation network in the MMMPO area is meeting the existing and forecasted future connectivity needs in the study area. The Existing and Future Conditions Report gathered and analyzed traffic volume data, demographic and employment information, and plans for current and future development, to evaluate the current operations and safety of Morgantown’s transportation network. Traffic conditions were projected to Year 2040 to identify future operational and capacity deficiencies to set the stage for evaluating the sufficiency of the current connections between the urban core and I-79, and the potential development of alternatives in the I-79 Access Study. Several key findings of this study include:

- Monongalia County employment is projected to grow by 1.4% through 2019, exceeding the statewide average of 0.9% and keeping pace with the national average of 1.5%.
- More than one-third of the roadway sections analyzed currently operate at LOS F during peak periods. This amounts to over 3 miles of failing roadway segments.
- By Year 2040, almost two-thirds of roadway segments will operate at LOS E or F during peak periods. This amounts to 13 miles of failing roadway segments.
- Half of the roadway segments analyzed exceeded the statewide crash rate.

With an understanding of existing and future conditions and a need for improved connections established, this Access Study identified and evaluated the opportunities for improvements along existing corridors, and evaluated new corridors which may involve a new river crossing in Morgantown connecting to I-79. Under the direction of the Steering

Committee, with input from the Stakeholder Committee, the Purpose and Need for this project was finalized as:

- Improve mobility and access to major transportation facilities and key employment centers in northern Morgantown.
- Improve traffic operations and safety.
- Support on-going and projected growth areas.
- Enhance multi-modal opportunities to reduce single-occupancy trips.

Using this Purpose and Need as a benchmark, this study evaluated twelve (12) alternatives options plus a transportation system management (TSM) strategy and no-build alternative to determine their operational performance, community and environmental impact, regulatory environmental impacts, and financial implications. Five (5) alternatives were dismissed from further evaluation beyond this study; however they have been evaluated and included for documentation in this study.

6.1 Recommendations

The purpose of this study was to recommend an alternative or series of alternatives, rooted in the Purpose and Need, that can be carried forward to the next phases. Based on the findings of this study and the Alternatives Evaluation Matrix found in Figure 4-22, Alternatives 6, 10, and 12 scored similarly at 2.5, 2.5, and 2.3, respectively. Alternative 12 combines Alternatives 6 (without improving WV 100) and Alternative 10, and can be constructed in phases. Phase 1 includes a new Pursglove interchange, Pursglove connection, northern bridge crossing, and improving Collins Ferry Road and Van Voorhis Road. Phase 2 includes constructing the US 119 (Point Marion Road) connection. For these reasons, it is recommended that Alternative 12 be carried forward for further evaluation.

6.2 Next Steps

The recommended alternative was presented to the MMMPO Policy Board for resolution and adopted on March 23, 2017. With resolution, the recommendation will be carried forward to the next phases. These future phases include the preparation of NEPA documentation, detailed design, and eventual construction. As noted above, the recommendations have been included in the MMMPO's *2017-2045 Metropolitan Transportation Plan* as "Tier 1 Project 6: I-79 Access Improvements Phase I" and "Tier



2 Project 6: I-79 Access Study Improvements Phase II” , and are included in Phase 2 of Governor Justice’s recently released transportation infrastructure plan.



2416 Pennsylvania Avenue
Weirton, WV 26062
304.748.8740

hdrinc.com

We practice increased use of sustainable
materials and reduction of material use.

© 2017 HDR, Inc., all rights reserved.