

MORGANTOWN REGIONAL

BIKE AND PEDESTRIAN TRANSPORTATION PLAN



ACKNOWLEDGMENTS

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PROJECT PARTNERS

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This plan was prepared by Alta Planning + Design and Stantec.



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1. EXECUTIVE SUMMARY

The Morgantown Regional Bike and Pedestrian Transportation Plan (Plan) identified projects to improve pedestrian safety and to fill in gaps in the sidewalk network, accessibility improvements to comply with the American with Disabilities Act of 1990 (ADA), and a network of trails and on-road bicycle facilities to enhance overall connectivity.

1.1 EXISTING CONDITIONS

Four analyses provided a foundation for the development of the region’s recommended walking and bicycling network:

Equity Analysis - Identified areas that demonstrate a relative need for transportation investments based on concentrations of historically vulnerable populations, including Sunnyside, Woodburn, Suncrest, Greenmont, portions of First Ward, and residential areas in Westover and Granville.

Demand Analysis - Estimated the relative demand for walking and bicycling trips based on concentrations of where people live, work, play, shop, learn, and access transit. Downtown Morgantown, South Park, Sunnyside, and the WVU campuses represent areas with high concentrations of trip generators.

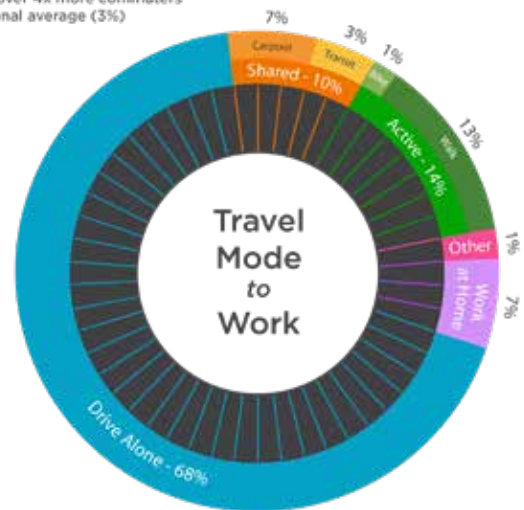
Safety Analysis - Analyzed intersections and roadway segments in which pedestrian- or bicyclist-involved crashes occurred and identified potential countermeasures to help prevent future crashes, such as improved sidewalks, shoulders, sight lines, and crossings; reducing travel speeds; or increasing the frequency of signalized crossings. Between 2013 and 2017, approximately 116 total pedestrian- or bicyclist-involved crashes were reported in the region, with five pedestrian fatalities reported between 2013 and 2018.

Connectivity Analysis - Identified gaps and missing links for pedestrians and bicyclists in the on-road and trail network.

1.2 GEOGRAPHIC & DEMOGRAPHIC ANALYSIS

To help the project team better understand the needs of the community, a base-level geographic and demographic analysis was conducted. Characteristics researched included regional geography, population, education, commute mode, poverty levels, vehicle availability, and public health. The land use and geography of the greater Morgantown area is a mix of urban, suburban, and semi-rural areas connected by a network of state and local roads that can be a challenge for walking and bicycling. A number of compact areas on and around the WVU campuses and downtown Morgantown contain an environment that, with improved pedestrian and bicycle facilities and programs, offer the opportunity to replace many short automobile trips with walking and bicycle trips. Much of the landscape, including the Mon River Valley and the nearby rolling hills and mountains, is remarkably scenic and provides opportunities to promote additional recreational riding and bicycle tourism as well. The following demographic summary includes analysis of Census data at the Census Block Group level for the incorporated areas of Morgantown, Star City, Granville, and Westover.

Walking is a popular way to get to work in Morgantown, representing over 4x more commuters than the national average (3%)



Source: American Community Survey, Table B08301: Means of Transportation to Work, 2013-2017 five-year estimate (employed population estimate = 12,570)

Demographic summary of residents in the Study Area:

Population: 39,047 residents (2018).

Education: 7% of adults with no high school diploma, and 67% of adults with at least some college education (2015).

Commute Mode Choice: 30% of area residents work from home or walk, bicycle, ride transit, or carpool to work.

Race + Ethnicity: 88% of residents identified as White, 5% identified as Black or African-American, 4% identify as Asian, and 2% identified as two or more races.



1.3 PUBLIC ENGAGEMENT

The MMMPO Bike and Pedestrian Transportation Plan Steering Committee (see list on the Acknowledgments page) provided oversight and critical input to the consultant team throughout the planning process. Other public engagement activities included:

PUBLIC OPEN HOUSES

Three community workshops/meetings were held throughout the year-long planning process at various locations throughout in Morgantown. At the events, community members were able to review mapping and analyses developed to date. This typically included boards that highlighted the benefits of improved pedestrian and bicycling conditions in Morgantown, large scale maps for marking up, and interactive exercises. The meetings were supplemented by outreach events at the Mountainlair, Morgantown Bike-to-Work Day and the 2019 Family Safety and Fitness event at WVU.

STAKEHOLDER INTERVIEWS

The core project team conducted interviews with 15 stakeholders from a variety of backgrounds and organizations to gather input and insight into existing conditions, and proposed facility ideas.

ONLINE SURVEY

The 13-question survey was open from mid-December, 2018 to mid-October, 2019 and received 568 individual responses.

The survey included a mix of questions related to barriers to walking and bicycling, primary purposes for and frequency of bike and walk trips, confidence level when riding a bicycle,

factors that prevent more walk and bike trips, perceived effectiveness of a variety of infrastructure and program improvements, and open-ended responses seeking info on specific roadways that need either bike or walk facilities.

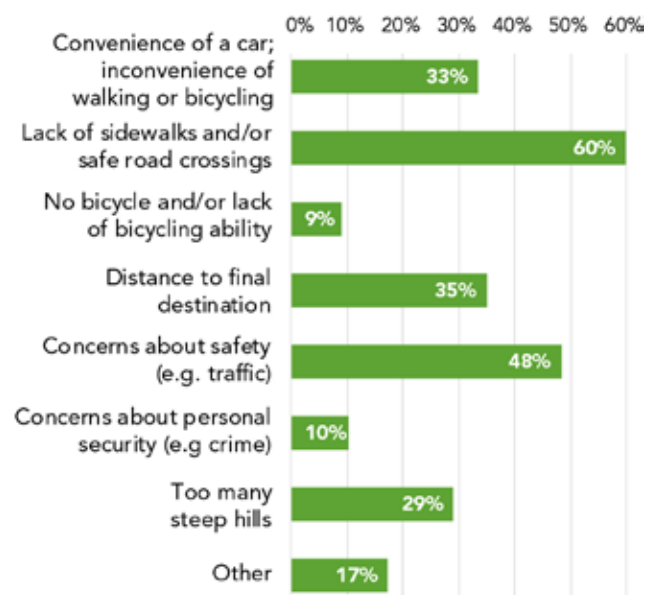
ONLINE PUBLIC INPUT MAP

The interactive online public input map was developed concurrently with the project website and online survey. Map users were asked to place a marker or point on the map to identify:

- the neighborhood where a map user lives
- a destination that the map user would like to access by bike or on foot
- a bicycling or walking route that needs improvement
- a barrier to biking or walking, such as a busy intersection

Online Survey Question 5

Highest ranked barriers to walking and biking



VISION STATEMENT

SAFETY AND EFFICIENCY OF PEDESTRIAN AND BICYCLE TRAVEL WILL BE A HIGH PRIORITY IN THE MORGANTOWN REGION.

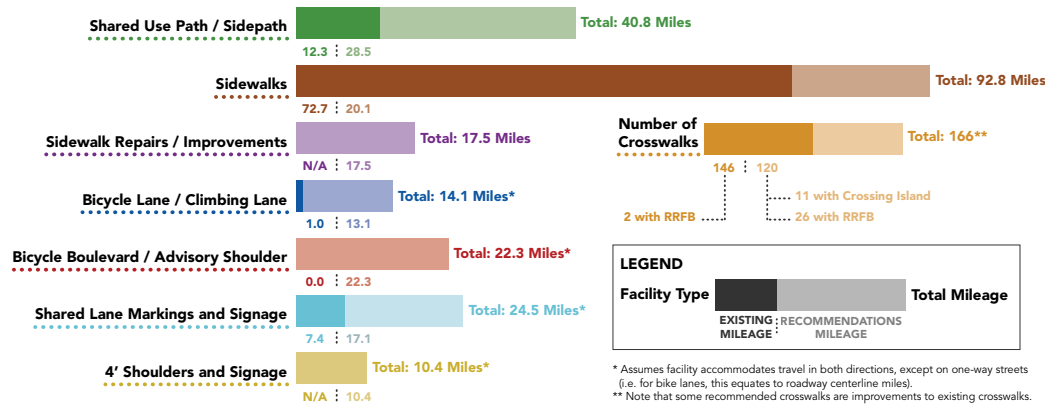
Implementation of the Regional Bike and Pedestrian Transportation Plan will make the Morgantown area a national leader in bicycling and walking safety and accessibility. Active transportation will be fully integrated into local and regional policies, programs and infrastructure projects, helping to safely connect destinations throughout the region. New streets and roadway projects will be designed to encourage people of all ages and abilities to choose walking and bicycling for both transportation and recreation.

1.4 PROJECT GOALS

The eight goals listed below help support the Plan’s vision statement:

- **Goal 1: Safety** - Increase pedestrian and bicyclist safety with projects, policies, and programs
- **Goal 2: Connectivity** - Link the region’s network of walking and bicycling routes, especially with transit
- **Goal 3: Design** - Reduce the pedestrian and bicyclist Level of Stress on state and local roads
- **Goal 4: Policy** - Develop stronger local policies that promote walking and bicycling
- **Goal 5: Equity** - Promote equity in pedestrian and bicycle planning and project funding
- **Goal 6: Economy** - Leverage walking and bicycling to promote economic development and quality of life
- **Goal 7: Feasibility** - Plan walking and bicycling projects that minimize engineering/funding challenges
- **Goal 8: Health** - Improve public health through increased walking and bicycling

SUMMARY OF THE RECOMMENDED PEDESTRIAN & BICYCLIST NETWORK



1.5 PEDESTRIAN NETWORK

Available linear and crossing treatments to improve the pedestrian network included:

- **Shared-use Path/Sidepath:** Shared-use paths are 8'-10' off-road paths made of asphalt or crushed stone surface. Sidepaths are located parallel to a roadway and provide a separated space for pedestrians, bicyclists, and other vulnerable users.
- **Sidewalk:** Sidewalks provide a dedicated space for pedestrian travel that is safe, comfortable, and accessible. Sidewalks need to be 5' wide (minimum) and are physically separated from the roadway by a curb and/or a landscaped buffer.
- **Crosswalks:** Highly-visible, painted crossing to increase safety and comfort.
- **Curb Extensions:** Improve visibility and reduce pedestrian crossing distances.
- **Median Refuge Islands:** Protected spaces placed in the center of the roadway to facilitate safer crossings.
- **Curb Ramps:** Provide smooth transitions from sidewalk to the street, especially for people with limited mobility or strollers.
- **Pedestrian Countdown Signals:** Indicate how much time remains for pedestrians to cross an intersection.
- **Leading Pedestrian Interval:** Increases visibility of pedestrians with a 3-5 second head start at crosswalks.
- **Rectangular Rapid Flashing Beacons:** Increase motorist yield-to-pedestrian compliance at designated crosswalks.

RECOMMENDED PEDESTRIAN NETWORK

The recommended pedestrian network shown on the maps on the following pages is a result of public input, existing conditions analyses, and input from the project Steering Committee. The recommended pedestrian facilities intend to create a safe and connected pedestrian network, closing gaps in the existing network to link neighborhoods and popular destinations throughout the Morgantown region.

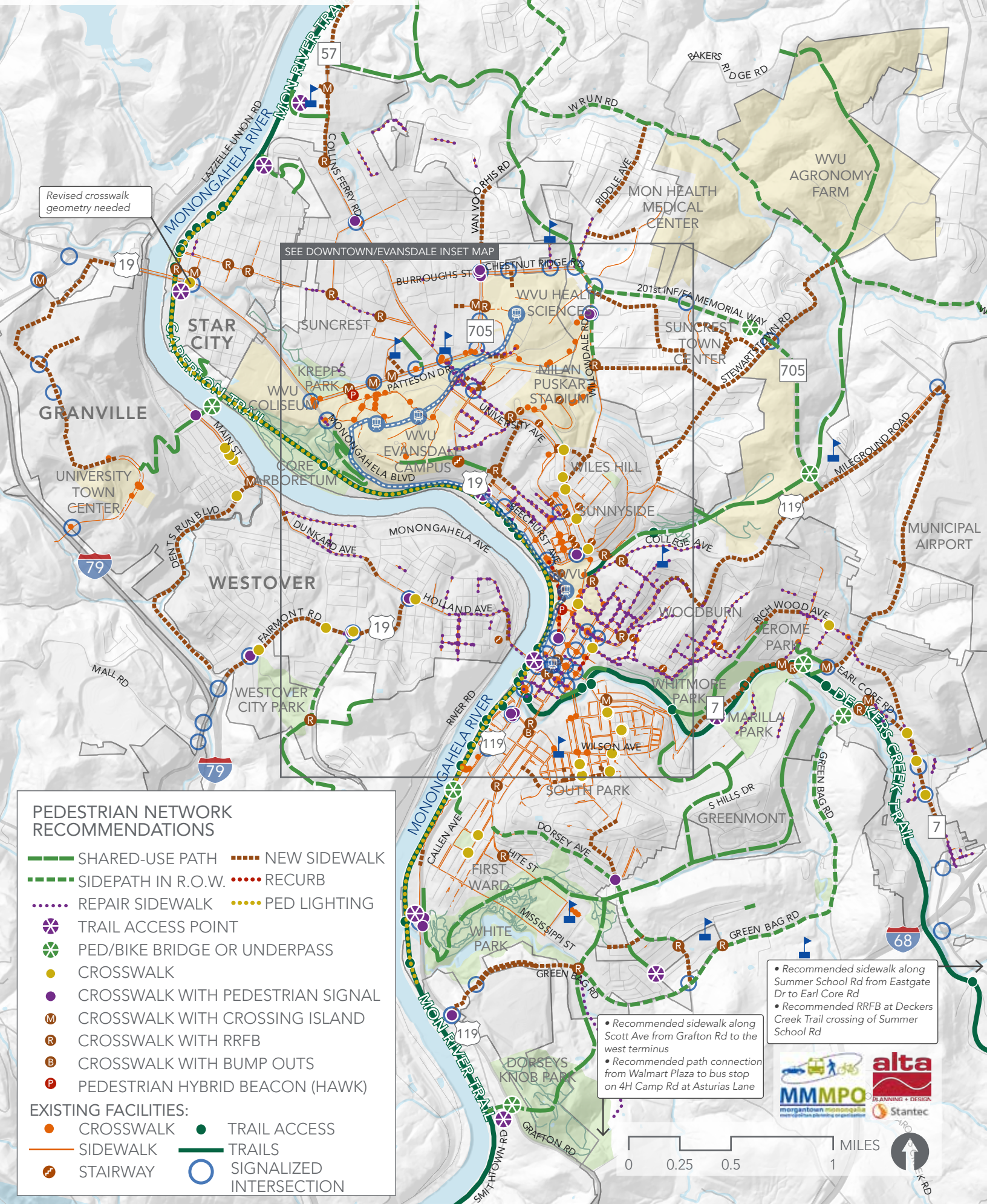


Median refuge island



Pedestrian countdown signal with a leading pedestrian interval

MAP 1: PEDESTRIAN NETWORK (REGION)



Revised crosswalk geometry needed

SEE DOWNTOWN/EVANSDALE INSET MAP

PEDESTRIAN NETWORK RECOMMENDATIONS

- SHARED-USE PATH
- NEW SIDEWALK
- - - SIDEPATH IN R.O.W.
- - - RECURB
- - - REPAIR SIDEWALK
- - - PED LIGHTING
- TRAIL ACCESS POINT
- PED/BIKE BRIDGE OR UNDERPASS
- CROSSWALK
- CROSSWALK WITH PEDESTRIAN SIGNAL
- CROSSWALK WITH CROSSING ISLAND
- CROSSWALK WITH RRFB
- CROSSWALK WITH BUMP OUTS
- PEDESTRIAN HYBRID BEACON (HAWK)

EXISTING FACILITIES:

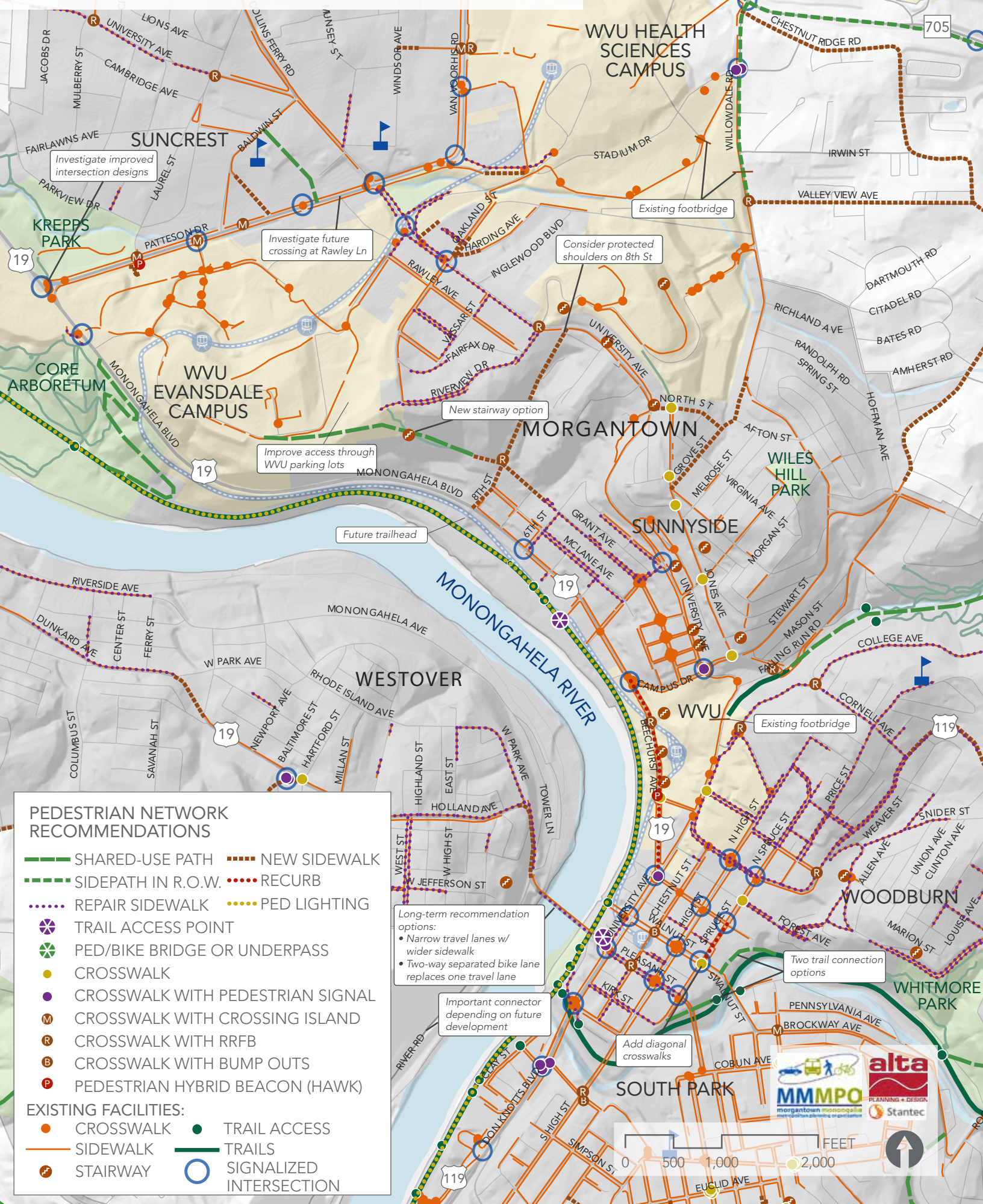
- CROSSWALK
- TRAIL ACCESS
- SIDEWALK
- TRAILS
- STAIRWAY
- SIGNALIZED INTERSECTION

- Recommended sidewalk along Summer School Rd from Eastgate Dr to Earl Core Rd
- Recommended RRFB at Deckers Creek Trail crossing of Summer School Rd

- Recommended sidewalk along Scott Ave from Grafton Rd to the west terminus
- Recommended path connection from Walmart Plaza to bus stop on 4H Camp Rd at Asturias Lane



MAP 2: PEDESTRIAN NETWORK (DOWNTOWN/EVANSDALE)



PEDESTRIAN NETWORK RECOMMENDATIONS

- SHARED-USE PATH
- - - - SIDEPATH IN R.O.W.
- REPAIR SIDEWALK
- TRAIL ACCESS POINT
- ⊗ PED/BIKE BRIDGE OR UNDERPASS
- CROSSWALK
- CROSSWALK WITH PEDESTRIAN SIGNAL
- M CROSSWALK WITH CROSSING ISLAND
- R CROSSWALK WITH RRFB
- B CROSSWALK WITH BUMP OUTS
- P PEDESTRIAN HYBRID BEACON (HAWK)
- - - - NEW SIDEWALK
- RECURB
- PED LIGHTING
- ⊗ TRAIL ACCESS POINT
- ⊗ PED/BIKE BRIDGE OR UNDERPASS
- CROSSWALK
- CROSSWALK WITH PEDESTRIAN SIGNAL
- M CROSSWALK WITH CROSSING ISLAND
- R CROSSWALK WITH RRFB
- B CROSSWALK WITH BUMP OUTS
- P PEDESTRIAN HYBRID BEACON (HAWK)

EXISTING FACILITIES:

- CROSSWALK
- - - - SIDEWALK
- ⊗ STAIRWAY
- TRAIL ACCESS
- TRAILS
- SIGNALIZED INTERSECTION

Long-term recommendation options:
 • Narrow travel lanes w/ wider sidewalk
 • Two-way separated bike lane replaces one travel lane

Important connector depending on future development

Add diagonal crosswalks

Two trail connection options



1.6 BICYCLE NETWORK

Available linear treatments to improve the bicycle and trail network included:

- **Shared-use Path/Sidepath** - Shared-use paths are 8'-10' off-road paths made of asphalt or crushed stone surface. Sidepaths are located parallel to a roadway and provide a separated space for pedestrians, bicyclists, and other vulnerable users.
- **Bike Lanes** - Designate an exclusive 5'-6'-wide space for bicyclists on both sides of a road through the use of roadway striping, stencils, and signage.
- **Climbing Lane** - Bicycle lanes on one side of the road in the uphill direction and accompanied by shared lane markings in the downhill direction.
- **Advisory Shoulder** - Priority areas for bicyclists defined by broken white lines, separated from a 14'-18' central, two-way travel area.
- **Bike Boulevard** - Use of traffic calming elements such as speed humps, and inclusion of shared lane markings, signage and branding to improve the bicycling environment on lower-volume streets.
- **Shared Lane Markings and Signage** - These markings and signage provide a visual reminder that the roadway's travel lanes are shared by bicyclists and motorists.
- **4' Wide Paved Shoulder and Signage** - Occur on the edge of roadways and serve as a functional space for bicyclists, typically in more rural areas.

RECOMMENDED NETWORK

The recommended bicycle network was produced based on the needs identified during public engagement efforts, analyses done during the existing conditions inventory, and input from the project Steering Committee. The recommended bicycle facilities intend to create a safe and connected bicycle network throughout the Study Area, linking popular destinations, employment hubs, schools, transit stops, and residential areas.

Most bicycle-related improvements can be done at low cost since many project recommendations require only paint and signage. For example, proposed bike lanes cost \$100,00-\$125,000 per mile (both sides of the road) and bicycle climbing lanes cost \$75,000-\$90,000 per mile. Excluding the Mileground Road bike lanes—which could require road widening—all 11.5 miles of recommended bike lane projects could be implemented for approximately \$1 million.

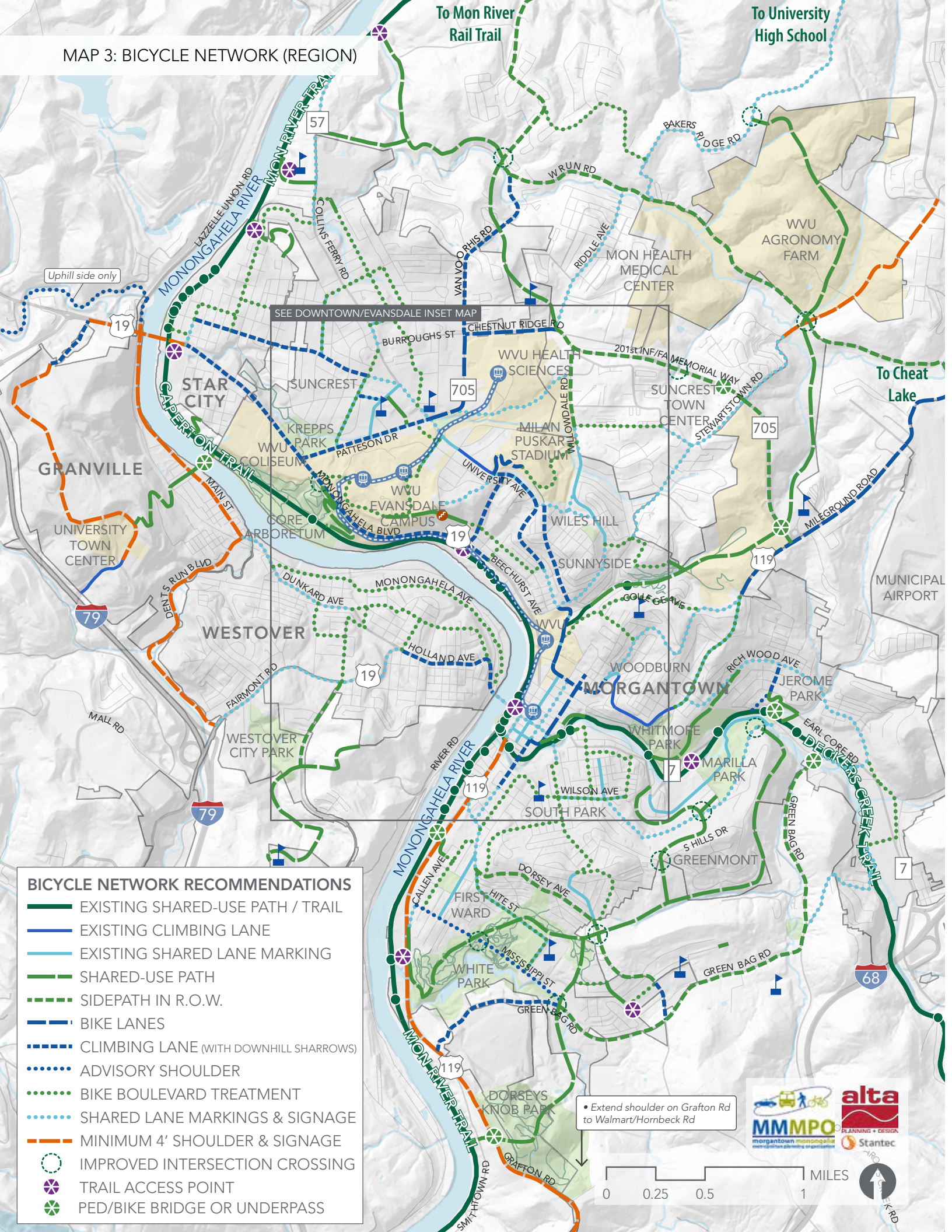


Recommended bicycle lanes on Chestnut Ridge Rd



Bike Boulevard on Jr Avenue in Morgantown

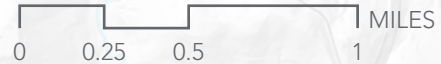
MAP 3: BICYCLE NETWORK (REGION)



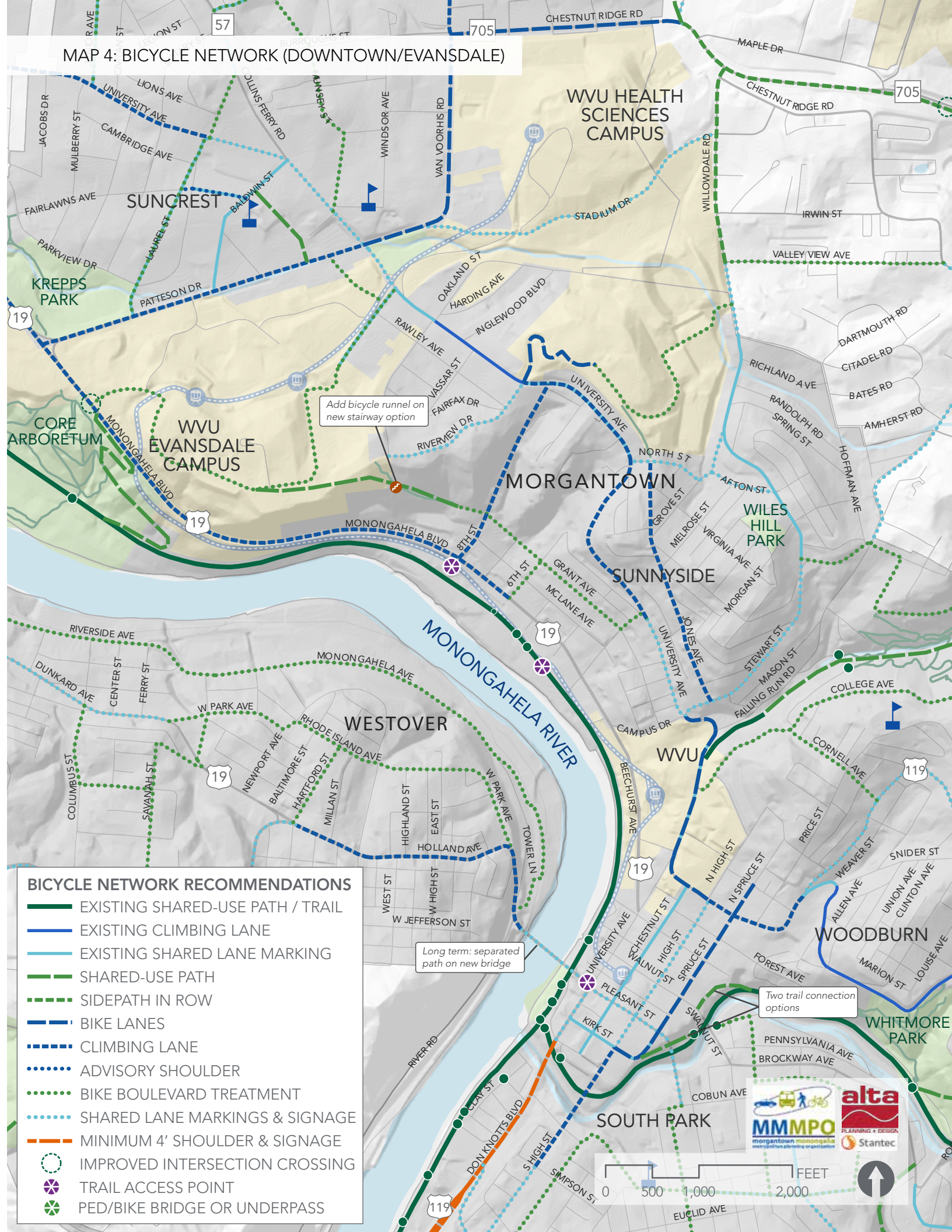
BICYCLE NETWORK RECOMMENDATIONS

- EXISTING SHARED-USE PATH / TRAIL
- EXISTING CLIMBING LANE
- EXISTING SHARED LANE MARKING
- SHARED-USE PATH
- SIDEPATH IN R.O.W.
- BIKE LANES
- CLIMBING LANE (WITH DOWNHILL SHARROWS)
- ADVISORY SHOULDER
- BIKE BOULEVARD TREATMENT
- SHARED LANE MARKINGS & SIGNAGE
- MINIMUM 4' SHOULDER & SIGNAGE
- IMPROVED INTERSECTION CROSSING
- TRAIL ACCESS POINT
- PED/BIKE BRIDGE OR UNDERPASS

• Extend shoulder on Grafton Rd to Walmart/Hornbeck Rd



MAP 4: BICYCLE NETWORK (DOWNTOWN/EVANSDALE)



Add bicycle runnel on new stairway option

Long term: separated path on new bridge

Two trail connection options

BICYCLE NETWORK RECOMMENDATIONS

- EXISTING SHARED-USE PATH / TRAIL
- EXISTING CLIMBING LANE
- EXISTING SHARED LANE MARKING
- SHARED-USE PATH
- SIDEPATH IN ROW
- BIKE LANES
- CLIMBING LANE
- ADVISORY SHOULDER
- BIKE BOULEVARD TREATMENT
- SHARED LANE MARKINGS & SIGNAGE
- MINIMUM 4' SHOULDER & SIGNAGE
- IMPROVED INTERSECTION CROSSING
- TRAIL ACCESS POINT
- PED/BIKE BRIDGE OR UNDERPASS



1.7 PRIORITIZATION

In order to help the Morgantown region prioritize its hundreds of recommended bicycle and pedestrian treatments, the Plan used five criteria to evaluate and score each project based on GIS-based data sources. These criteria were derived from the planning goals established early on the process and include:

- **Safety:** number of crashes within 1000' of the recommended project.
- **Connectivity:** pedestrian or bicycle project that connects to existing sidewalk, trail access point, bike lane, bus stop, school, PRT station, or university campus within 1000' of the recommended project.
- **Design:** ability of project to reduce level of "traffic stress" for pedestrians and bicyclists (qualitative score).
- **Equity:** use of the equity score of the area where the recommended project lies.
- **Economy:** weighted average of employment and population densities.

Based on feedback from the Steering Committee, all criteria were weighted equally. The tables in Appendix A display all recommended projects sorted by municipality and presented in descending order, from the highest scoring to the lowest. A selection of 20 of the highest-ranked projects include:

STATE ROADWAYS

- Bike Lane (with buffer) on Spruce Street
- Sidewalk repairs on Willey St between Price St and Prospect St
- Bike Boulevard on College Ave between University Ave and Willey St
- Climbing Lane on Willey St between High St and Richwood Ave
- Crosswalk with bumpouts across Walnut St at Chestnut St
- Crosswalk with flashing beacon on College Ave at Cornell Ave
- Crosswalk with median island across Brockway Ave at Kingwood St
- Pedestrian underpass below SR 705 from Sun View to the Suncrest Town Centre
- Two critical high-priority projects were developed to a conceptual design level:
 - » Crosswalk with median island across Rt. 7 between Mineral Ave and Deckers Creek Blvd (includes improved link to the trail)
 - » Widened sidewalk along the Westover Bridge with improved connections to the rail trail and Monongahela Ave

LOCAL ROADWAYS

- Multiple sidewalk repair projects in downtown Morgantown and elsewhere
- Sidewalk on Harding between Oakland and the WVU University Park/Oakland Hall
- Sidewalk on Oakland between Harding and the WVU University Park/Oakland Hall
- Climbing lane on Jones Ave between North St and Stewart St
- Bike Boulevard on Kingwood St between Deckers Creek Ave and Wilson Ave
- Bike Boulevard on Grant Ave between 8th St and 3rd St
- Sidewalk on Tacoma St between Baldwin St and Patteson Dr
- Shared Lane Markings and Signage on Stewart St between Willowdale Rd and Campus Dr
- Bike Boulevard on W Park/Rhode Island Ave between Dunkard Ave and Holland Ave in Westover
- Bike Boulevard on Hartford St from Rhode Island Ave to Holland Ave in Westover

1.8 SIDEWALK MAINTENANCE & FUNDING POLICY

One of the ongoing challenges to improving pedestrian safety and accessibility is funding sidewalk repair and construction. In consequence, a number of gaps in the sidewalk network persist in Morgantown, Westover, Star City and Granville. Additionally, many sidewalks are in need of repair, but either municipalities are not informing property owners of their responsibility to have the sidewalk fixed, or property owners lack the resources to pay for the repairs. During the course of the planning work, the team researched sidewalk maintenance policy and funding best practices from other U.S. cities to determine credible ideas for funding the expansion of the local sidewalk network.

The findings from the research indicated that many cities have taken over responsibility for sidewalk maintenance from property owners. Many larger cities have used voter-approved bond measures or Transportation User Fees to pay for the program. Currently, the City of Morgantown has a \$3/week Municipal Service Fee for those who work in the City. The money generated is not enough to fund a robust program of new and repaired sidewalks, and sidewalk maintenance is still the responsibility of adjacent property owners.

While shifting 100% of sidewalk-maintenance responsibility to the public sector could be a major challenge in the Morgantown region, an approach that takes much of the pressure off of property owners is recommended. Potential policy changes could include:

- Municipalities should have a small number of contractors on retainer to expedite residents' ability to find a qualified contractor. To lower costs and improve efficiency, a 30-to-90 day delay should be incorporated to provide time for additional property owners within the same Ward to hire the same contractor for sidewalk repair or construction.
- Establishment of prioritization criteria in order to score new and repaired sidewalks. Criteria should include development density, proximity to schools, and proximity to bus stops within 1000' of the property. Equity issues could also be considered so that income levels of a particular neighborhood are taken into account.
- The cost to repair or build sidewalks will need to be lowered for the individual property owner, which may include:
 - » A city or regionwide referendum for a dedicated tax levy or bond measure to help pay for sidewalks (could potentially be expanded to include trails and bike facilities too)
 - » Municipal reimbursement for sidewalk repairs based on the sidewalk project "score" as described above, with compensation of 1%-100% of the sidewalk project cost.

- » Municipal reimbursement could also be based entirely on property's distance from a public school, library, commercial area, bus/PRT stop or park, with compensation of 1%-100% of the project cost.



Sidewalks in need of repair on Willey Street in Morgantown

1.9 PERFORMANCE MEASURES

Performance Measures are data-driven benchmarks intended to help the MPO, the City of Morgantown, and other jurisdictions gauge progress towards the Regional Bicycle and Pedestrian Transportation Plan’s goals and

objectives. Hitting the target established within each performance measure could also inspire more-aggressive fundraising and/or political support for proposed improvements to the pedestrian and bicycling network.

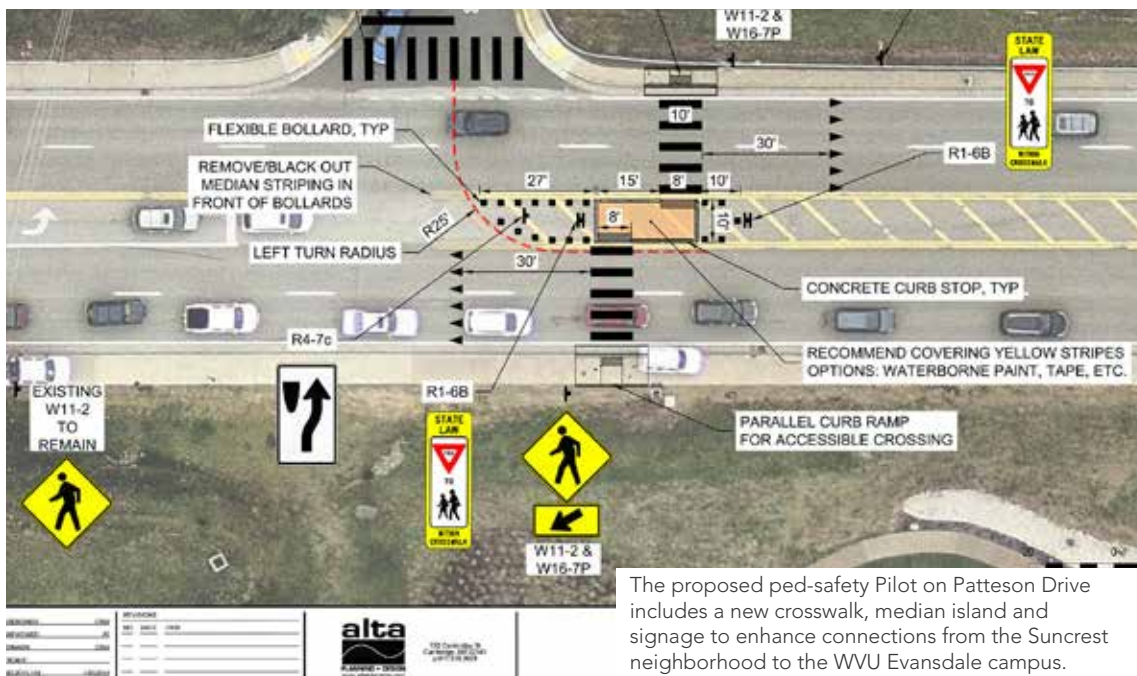
Table 1: Summary of Performance Measures

GOAL	PERFORMANCE MEASURE	2/7 YEAR TARGETS	LEAD AGENCIES/ GROUPS
Safety	Reduction in the pedestrian and bicycle-related crash rates that include an injury or fatality	<ul style="list-style-type: none"> • 25% by 2022 • 50% by 2027 	WV DOH, MMMPO, Monongalia County and municipalities
	Number of intersections and new pedestrian crossings outfitted with safety improvements such as flashing beacons, median islands or bump outs	<ul style="list-style-type: none"> • 5 by 2022 • 20 by 2027 	WV DOH, MMMPO, Monongalia County and municipalities
Connectivity	Percent increase in miles of the regional bicycle network (trails/paths and on-street bicycle facilities combined)	<ul style="list-style-type: none"> • 50% by 2022 • 100% by 2027 	MMMPO, Municipalities and Mon River Trails Conservancy
	Number of new sidewalk projects that eliminate network gaps	<ul style="list-style-type: none"> • 5 by 2022 • 15 by 2027 	WV DOH, MMMPO, and municipalities
	Percentage increase in trail users at automated count locations	<ul style="list-style-type: none"> • 25% by 2022 • 100% by 2027 	MMMPO, Municipalities and Mon River Trails Conservancy
Policy	Percentage increase in local funding for capital projects and maintenance related to new/ improved sidewalks	<ul style="list-style-type: none"> • 25% by 2022 • 100% by 2027 	MMMPO and Municipalities
	Percentage increase in the number of children walking and bicycling to school on a regular basis (average of 3X/week)	<ul style="list-style-type: none"> • 15% by 2022 • 50% by 2027 	Municipalities and local school departments
Equity	Percentage of implemented projects in areas within the highest-need quartile according to the Plan’s equity analysis	<ul style="list-style-type: none"> • 25% by 2022 • 25% by 2027 	MMMPO
Feasibility	Annual number of temporary projects designed to test-out pedestrian and bicycle-related safety improvements	<ul style="list-style-type: none"> • 1/yr by 2022 • 3/yr by 2027 	MMMPO and Municipalities
Health	Percentage of commuters who report walking or bicycling to work as their primary means, per ACS data (currently 13% for walking, 0.5% for bicycling)	<ul style="list-style-type: none"> • 16% walk/1% bike by 2022 • 20% walk/2% bike by 2027 	MMMPO and Municipalities

1.10 IMPLEMENTATION STRATEGY

Transforming the Morgantown area into a more walk- and bike-friendly region requires a strong implementation strategy and a concerted effort by a number of key stakeholders. Expansion of the region’s sidewalk and trail network, along with development of an on-street bike network for the first time, is intended to enhance safety, boost economic development, and improve the quality of life for residents, visitors, and WVU students and staff. The following multi-step process will enable this transformation:

- The Plan has been adopted by the MMMPO Policy Board and should be adopted by the City of Morgantown and WVU Board of Governors.
- A long-term strategy for funding and maintaining the Plan’s high-priority projects—and sidewalks in particular—must be developed to ensure ongoing implementation of new facilities intended to improve pedestrian and bike safety.
- The MMMPO should establish regular coordination meetings between West Virginia DOH, City of Morgantown, Monongalia County, and WVU to discuss ongoing implementation of recommended projects on state roads. These projects are critical to improving pedestrian safety, especially for those trying to cross state highways.
- A handful of high-priority bicycle and pedestrian safety projects should be expedited to establish highly-visible improvements that will increase the community’s confidence that the region is moving in the right direction. A great place to start would be to implement a ped-safety pilot project along Patteson Drive as shown in the graphic below.
- Project development should include both pedestrian and bicycle projects within all municipalities—along with unincorporated portions of Monongalia County—and improve safety and mobility within a range of neighborhoods throughout the region.



1.11 MPO POLICY BOARD IMPLEMENTATION STRATEGY

After completion of the Steering Committee’s final draft Morgantown Regional Bike & Pedestrian Transportation Plan, the MPO Policy Board adopted the Plan in late November 2019. Subsequently, the consultant team worked with the Policy Board to develop an implementation strategy for the MPO staff to follow as the MPO seeks to implement the area’s transportation plan*. The focus of the implementation strategy was narrowing the hundreds of project recommendations from the Steering Committee’s Plan into a much smaller number of projects to be prioritized by MPO staff. To complement the highest-ranking projects that resulted from the Prioritization Process, a work session was held in January 2020.

Facilitated by the consultant team, discussion focused on the 45 highest-scoring projects that included a mix of pedestrian, bicycle and trail projects on state roadways within the four cities and towns, and in Monongalia County. The results of the work session led to the winnowing of the 45 projects into 13 specific projects that form the Policy Board’s Implementation Strategy. The Policy Board also expressed the desire to focus on general initiatives aimed at improving safety and connectivity for pedestrians primarily (see Table 2 and 3 on the following page).

*Note that in the next few years, the Morgantown Monongalia Metropolitan Planning Organization will update its multi-modal transportation plan, which will fully incorporate the recommendations in the Steering Committee’s Plan.

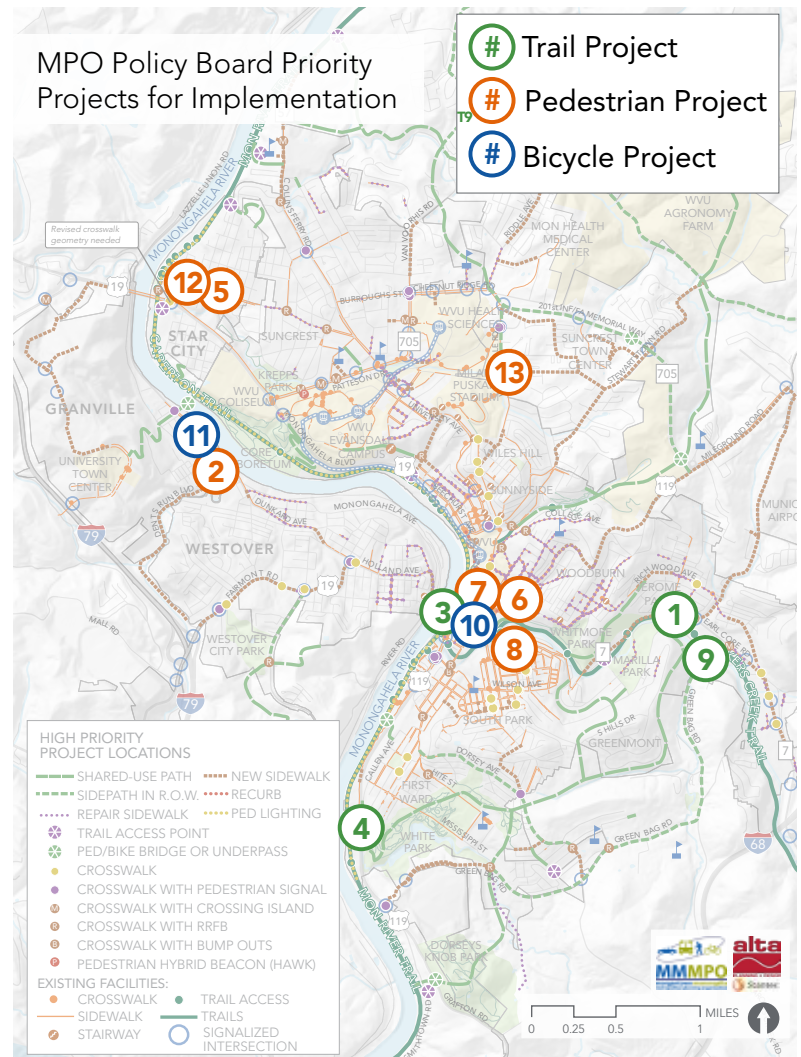


Table 2: MPO Policy Board Priority Projects for Implementation

MAP #	JURISDICTION	PROJECT DESCRIPTION	COST ESTIMATE	POLICY BOARD VOTES
1	Morgantown	Crosswalk with Crossing Island on Route 7 at Deckers Creek Blvd/Mineral Ave (see pages 91-92)	\$9,000	6
	Morgantown	Sidewalk on Route 7 from Mineral Ave to Deckers Creek Blvd	\$118,000	
2	Granville	Crosswalk with Crossing Island on Dents Run Rd at Dave Bean Cir	\$7,000	5
3	Morgantown	Trail Access from the Westover Bridge to Caperton Rail Trail (see pages 101-103)	\$40,000	4
4	Morgantown	Trail Access to the Caperton Rail Trail across Don Knotts Blvd from White Park (see page 104)	\$66,000	4
5	Star City	Crosswalk with RRFB at the intersection of University Ave and Herman Ave (see page 99)	\$18,000	4
6	Morgantown	Sidewalk Replacement on Willey St from Price St to Prospect St (north side only)	\$44,000	3
7	Morgantown	Crosswalk with Bumpouts at the intersection of Walnut St and Chestnut St (see page 93)	\$9,000	3
8	Morgantown	Crosswalk with Crossing Island at the intersection of Brockway Ave and Kingwood St (see page 94)	\$9,000	3
9	Morgantown	Ped/Bike Bridge from Green Bag Rd future path to Deckers Creek Trail	\$182,000	3
10	Morgantown	Shared Lane Markings and Signage on High St from Willey St to Pleasant St	\$42,000	2
11	Granville	Paved Shoulder and Signage on Main St from Every St to Dents Run Rd	\$258,000	2
12	Star City	Crosswalk with RRFB at the intersection of University Ave and Springdale Ave	\$18,000	2
13	Unincorporated Mon. County	Crosswalk with RRFB at the intersection of Willowdale Rd and Valley View Ave	\$18,000	2

Table 3: MPO Policy Board Safety Initiatives

SAFETY INITIATIVE	VOTES
Implementation of Crosswalks	8
Pedestrian Lighting	6
Pedestrian Refuge Islands	6
Neighborhood Connections to Downtown	4
Protected Bicycle Lanes	4
Connections Between Communities	2
Buffered Bike Lanes	-4*

*A total of 4 negative votes were cast to express concern about 5'-6' wide striped bicycle lanes recommended on Chestnut Ridge Road, Van Voorhis Road and Spruce Street.

MPO POLICY BOARD PREFERRED INITIATIVES

The Policy Board also expressed their preferences for general safety and connectivity initiatives that should be emphasized over others. The Policy Board's intent is that these preferences be taken into account when MPO staff and individual jurisdictions in the region implement recommended projects that form the Steering Committee's Plan.



2. INTRODUCTION

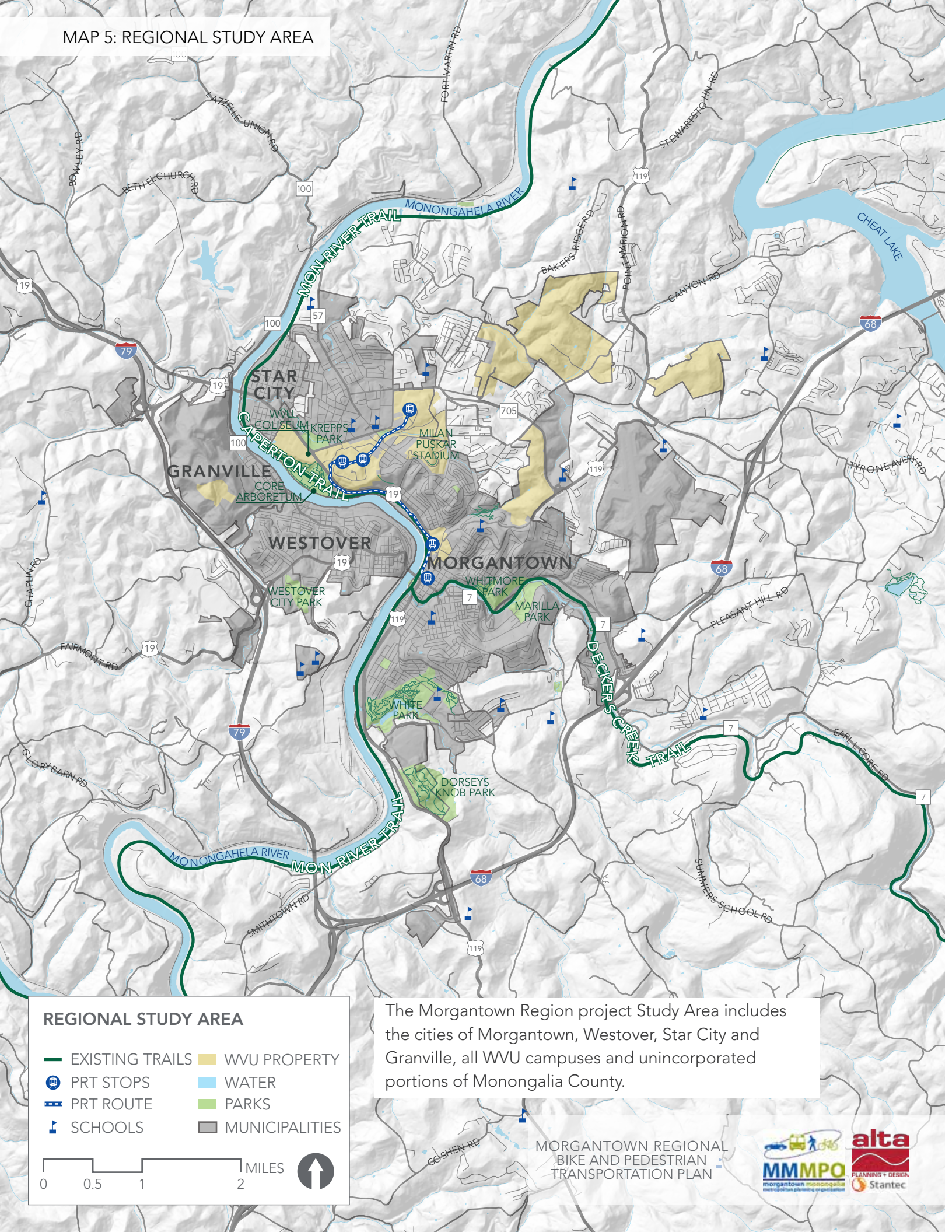
The Morgantown Regional Bike and Pedestrian Transportation Plan (the Plan) report focuses on existing and desired conditions related to bicycle and pedestrian transportation in the Morgantown region. This includes the cities of Morgantown and Westover, the towns of Star City and Granville, and unincorporated portions of Monongalia County. Critical focal areas of the Plan include identification of intersections and pedestrian crossing locations in need of safety enhancements and ADA improvements, and prioritization of sidewalk repair and new sidewalks. Supplementing the pedestrian-related analysis and recommendations are those related to expansions of the regional bicycle network, and access improvements to the rail-trail system. The Plan builds on previous planning work by the Morgantown Monongalia Metropolitan Planning Organization (MMMPO), the City of Morgantown, and efforts by the City's Pedestrian Safety Board and Bicycle Board.

As a plan formally adopted by the MMMPO, it is intended to serve as a guide for state agencies, the MPO, local municipalities, WVU and non-

profit stakeholders to work together to provide a transportation system that safely accommodates pedestrians and bicyclists in a coordinated and holistic manner. The Plan helps to bridge the gap between current conditions and what residents, employees, and visitors would expect for safe, comfortable, and connected facilities for walking and bicycling. In aggregate, the region's first formal pedestrian and bicycle transportation plan includes:

- benefits of pedestrian and bicycle facilities
- an assessment of existing pedestrian and bicycle facilities
- analyses of demographics, equity, walk/bike demand and crashes
- a summary of the Plan's public engagement
- the Vision, Goals and Objectives for walking and bicycling in the region
- a recommended network of pedestrian and bicycle facilities
- prioritization and phasing of the recommended facilities
- design details for some of the highest ranked projects
- an implementation plan that includes cost estimates and funding opportunities

MAP 5: REGIONAL STUDY AREA



REGIONAL STUDY AREA

- EXISTING TRAILS
- WVU PROPERTY
- ⊕ PRT STOPS
- WATER
- PRT ROUTE
- PARKS
- ⚡ SCHOOLS
- MUNICIPALITIES

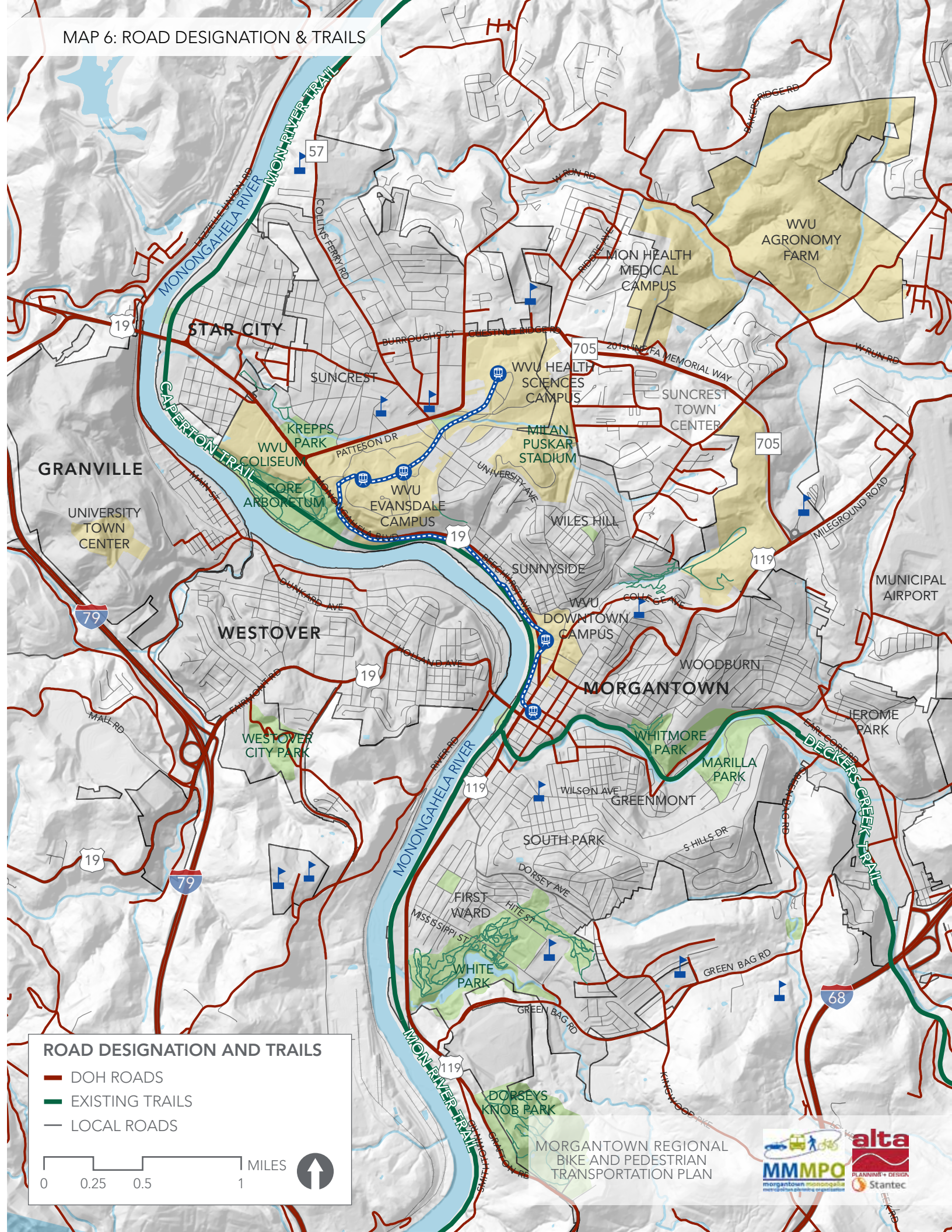


The Morgantown Region project Study Area includes the cities of Morgantown, Westover, Star City and Granville, all WVU campuses and unincorporated portions of Monongalia County.

MORGANTOWN REGIONAL
BIKE AND PEDESTRIAN
TRANSPORTATION PLAN



MAP 6: ROAD DESIGNATION & TRAILS



ROAD DESIGNATION AND TRAILS

- DOH ROADS
- EXISTING TRAILS
- LOCAL ROADS

0 0.25 0.5 1 MILES

MORGANTOWN REGIONAL
BIKE AND PEDESTRIAN
TRANSPORTATION PLAN



BENEFITS OF ACTIVE TRANSPORTATION

The Morgantown Monongalia region strives to increase safety and accessibility for pedestrians and bicyclists who live, work, study or visit the region. Improvements to the active transportation network will bring significant benefits for the Morgantown area and for all users of local and state roadways, some of which include:

TRANSPORTATION BENEFITS

- Pedestrian and bicycle facilities help promote mobility options for those who do not have access to a car due to age (children and seniors), economic status, disability, or temporary impairment, and for those who do not wish to use a car
- In the U.S., 40% of motor vehicle trips are under two miles in length and many travelers would access destinations by bicycle or on foot if comfortable facilities were provided; thereby minimizing road deterioration¹

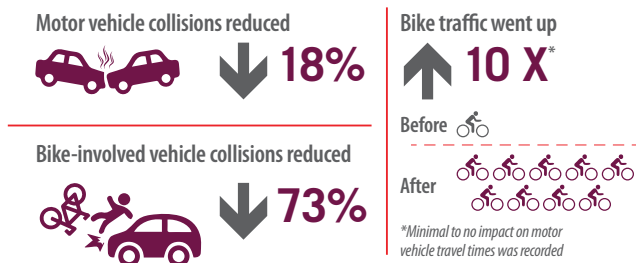


SAFETY BENEFITS

- Pedestrian and bicycle infrastructure improvements—e.g. bicycle lanes, on-street parking with bump outs, and median islands—help to moderate traffic speeds, reducing the severity of crashes (see above graphic)
- Based on FHWA’s desktop reference of Crash Reduction Factors, installing a sidewalk along a roadway can reduce pedestrian crashes 65-89%, and installing pedestrian countdown signals at intersections can reduce pedestrian crashes by 25%²
- Installing a raised median island at a crosswalk can reduce pedestrian crashes by 46%³
- Improved pedestrian and bicycle facilities have led to an increased number of walkers and bicyclists and decreased number of crashes, injuries and fatalities through the “safety in numbers” effect, due to an enhanced awareness of vulnerable users by motorists⁴

IN DOWNTOWN TORONTO (B)

After a pair of four-lane roads were reduced to three lanes with separated bike lanes:



ECONOMIC BENEFITS

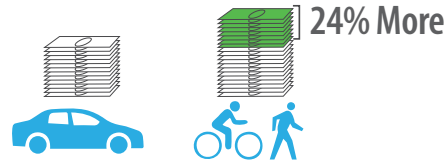
- When new separated bike lanes were added to Broadway in Salt Lake City, retail sales the following year went up 8%, despite the 30% reduction in on-street parking; over 80% of business owners were supportive or neutral about the new bike lanes and other streetscape improvements⁶
- Along four greenway corridors in North Carolina, every \$1.00 spent on trail construction supports \$1.72 annually from local business revenue, sales tax revenue, and benefits related to health and transportation. (https://itre.ncsu.edu/wp-content/uploads/2018/03/NCDOT-2015-44_SUP-Project_Final-Report_optimized.pdf)

HEALTH BENEFITS

- Walking and bicycling provide an opportunity for people to integrate 150 minutes of weekly aerobic activity into their daily lives, the amount recommended in 2015 by the Centers for Disease Control for improved health; this is a critical need in West Virginia, which has the highest rate of adult obesity (38%) in the U.S.⁷
- In Morgantown, a survey of trail users found that 47% reported getting their recommended physical activity through trail use alone, and 23% did not exercise regularly before deciding to use the local trails⁸
- Walking and bicycling have a significant net benefit for an individual's health; a study from the Netherlands found the health benefits of bicycling outweighed the risks by a 9:1 ratio⁹

NON-MOTORISTS SPEND MORE

Studies have shown that pedestrians and bicyclists make more frequent trips and spend more money overall per month



REDUCED HEALTH COSTS ^(G)

For every \$1 invested in bicycle and pedestrian trail construction, there is a \$3 cost savings in direct medical expenses for users



Incorporating walking into one's daily routine can improve personal health



3. EXISTING CONDITIONS

Documenting existing conditions in the Morgantown region allows the planning team to understand the pedestrian and bicycle facilities currently used by residents and visitors. The core of the active transportation network is the 75 miles of sidewalks that are found along roadways throughout the region, though most lie in the City of Morgantown. The region features a trail network that runs along old rail beds adjacent to rivers and creeks. On-street bicycle infrastructure is the final component but is limited to a few short stretches of bicycle lanes and shared lane markings.

3.1 TRAIL INFRASTRUCTURE

There are two primary shared-use paths, as well as smaller networks of trails throughout the Study Area. These trails act as major recreation opportunities as well as alternative transportation options for residents and visitors.

There is a shared-use path (rail-trail) that travels north-south along the Monongahela River between the West Virginia/Pennsylvania state line in the north and Prickett's Fort State Park to the south. The rail trail is referred to as the Monongahela River Trail (Mon River Trail) to the north and south of the City of Morgantown boundaries and the Caperton Trail within City limits.

The three trail segments run for a total of 30 miles along the Monongahela River and the individual segment mileages and surface-types are as follows:

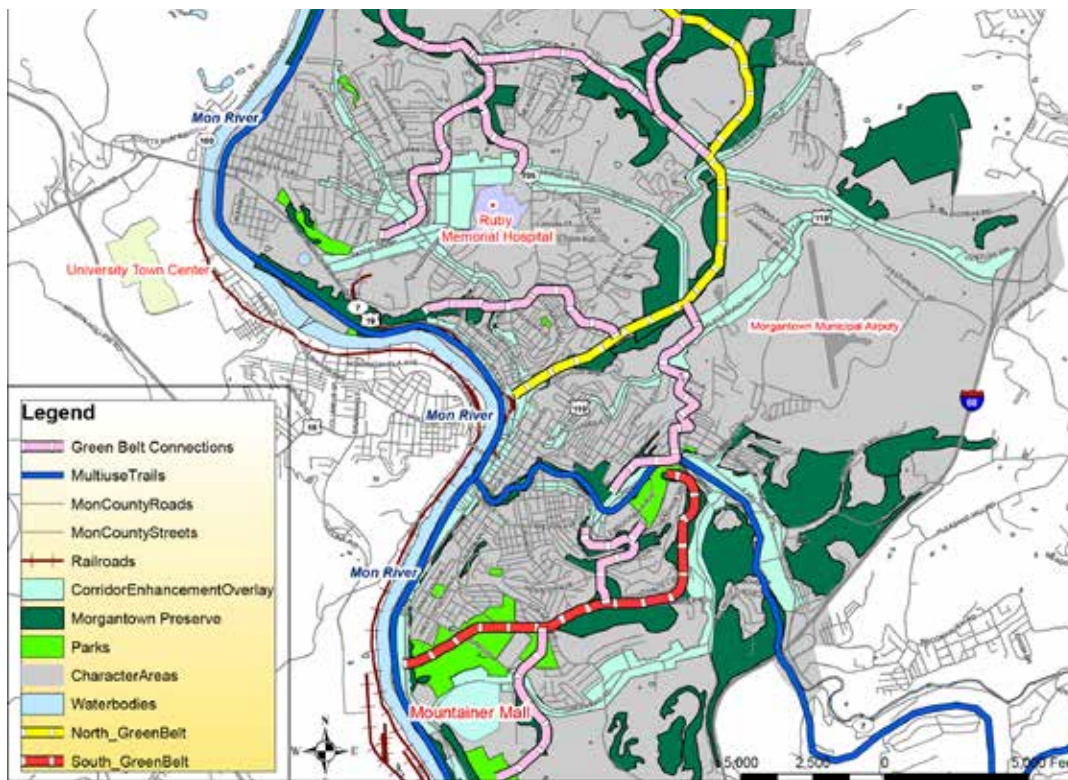
- Mon River Trail (North): 6 miles of compacted limestone
- Caperton Trail: 6 miles of asphalt
- Mon River Trail (South): 18 miles of compacted limestone

The Deckers Creek Trail is adjacent to Deckers Creek for 19 miles from the City of Morgantown to the Town of Reedsville. The trail is a combination of asphalt (3 miles) and compacted limestone (16 miles) and provides a key east-west trail connection to the Caperton Trail and downtown Morgantown. Trail access points to the neighborhoods along Deckers Creek

exist in a handful of locations, including two pedestrian/bike bridges to Marilla Park and to the Greenmont neighborhood.

Additional trail systems located in parks and green space throughout the region provide valuable recreation opportunities and connections to key destinations. These trail systems can be found in the Core Arboretum, White Park, Dorsey's Knob Park, Whitmore Park, and along Falling Run.

In addition to the existing trails, there is a proposed green belt trail system throughout the Study Area. This green belt system, proposed and advocated for by the Mon Valley Greenspace Coalition, would provide a connected trail system between neighborhoods, destinations, and existing trail infrastructure that is currently lacking trail connections.



Mon Valley Greenspace Coalition's Green Belt Plan

3.2 BICYCLE INFRASTRUCTURE

On-road bicycle infrastructure in the City of Morgantown is largely comprised of shared roadways designated with shared lane markings (SLM), also referred to as “sharrows,” used to encourage bicycle travel and proper positioning within the travel lane. Shared lane markings are typically placed appropriately to encourage bicyclists to ride outside of the ‘door zone’ of parked vehicles. The following roads in Morgantown feature shared lane markings:

- University Avenue
- Willowdale Road
- Richwood Avenue
- Killarney Drive
- Laurel Street
- Baldwin Street
- West Virginia Avenue
- Ross Street
- Green Street
- East Brockway Avenue
- Chestnut street



Laurel Street in the Suncrest neighborhood features both shared-lane markings and speed humps

In addition to the shared lanes, two bicycle climbing lanes have been implemented in the City of Morgantown and one in Granville. Bicycle climbing lanes are located on the side of the road with an incline and are usually coupled with a marked shared lane (sharrow) in the opposing downhill travel lane. The climbing lane is intended to provide a dedicated space for bicyclists traveling slowly up a hill. Bicycle climbing lanes have been implemented on:

- The west side of Richwood Avenue from Snider Street to Pearl Avenue
- The south side of University Avenue from Oakland Street to Riverview Drive
- At University Town Center in Granville, from the I-79 interchange to just east of Fusion Street



Climbing Bicycle Lane on University Avenue

3.3 PEDESTRIAN INFRASTRUCTURE

SIDEWALKS

To date, there are roughly 75 miles of sidewalks within the Study Area. Sidewalk density is highest downtown and in parts of some residential neighborhoods such as South Park and Sunnyside. Other sidewalks can be found along major roadways within Suncrest, Star City, Woodburn, First Ward, Westover, and Granville.

It's important to note, however, that many of these sidewalks are in need of repair, are of sub-standard width, or do not include ADA-accessible curb ramps and tactile warning panels. Improving these sidewalks can be a challenge based on current City of Morgantown policy that puts the burden of sidewalk repair or construction on adjacent property owners. However, the City of Morgantown has recently installed roughly 553 ADA-accessible curb ramps at intersections throughout the city, funded by the City's Municipal Service Fee. Additionally, there is some reluctance from West Virginia DOT's Division of Highways (DOH) to provide pedestrian infrastructure on some state roadways, due to cost issues and other concerns.

CROSSWALKS

Current data reveals 146 individual crosswalks in the Study Area. A majority of the crosswalks are located within the downtown area as well as the WVU Evansdale Campus. Data currently shows no crosswalks in Westover and just one crosswalk in Star City, located at the intersection of Monongahela Boulevard and Boyers Avenue. Striping of 30 additional crosswalks are included in the City's 2019 Paving Plan.



Some of Morgantown's older neighborhoods - South Park in particular - feature a well-connected network of sidewalks

TOPOGRAPHY

The topography in Morgantown is a challenge to pedestrian (and bicycle) travel. Over the years, a number of stairways have been built throughout the Study Area to facilitate pedestrian travel up and down steep slopes. Many of the stairways connect to University Avenue in Sunnyside as well as the PRT station at the WVU Downtown campus. Other stair connections can be found at the intersection of Washington Street and Maple Avenue, the extension of E Prospect St and Richwood Ave, and elsewhere. Due to the topography of some streets, stepped sidewalks are incorporated to enable access to the properties, e.g. Gem Street, Pietro Street, and others.

The region's steep topography creates a challenging environment for bicycle travel as well. Roadways with grades that become noticeable for most bicyclists lie throughout Morgantown and surrounding communities.

For some, the steep topography is enough of a barrier to discourage bicycling for transportation, except to destinations that lie along the Mon River Trail or the Deckers Creek Trail. In later stages of this planning study, policy and project recommendations will be made to help overcome the challenges associated with hilly roadways in the Morgantown area.



Stairway connection at the west end of E Prospect Street provide a pedestrian link to Willey Street

FLASHING BEACONS

In 2019, two Rectangular Rapid Flashing Beacons (RRFB) were installed for the first time in Morgantown. The RRFBs now sit at two popular pedestrian crossing locations along University Avenue: at the intersection of Falling Run Road near the WVU Downtown Campus and just south of the Evansdale Drive intersection (in front of Pizza Al's). The pedestrian actuated beacons are intended to improve safety by alerting motorists to the presence of crossing pedestrians on the approach to a crosswalk. Recommended locations for additional RRFBs at existing and proposed crosswalks can be found later in this plan document.



Rapid flashing beacon at the University Avenue crosswalk at Falling Run Road

3.4 TRANSIT & ROAD INFRASTRUCTURE

The two main forms of public transit in the Morgantown area are the Personal Rapid Transit (PRT) system operated by WVU and the bus system operated by the Mountain Line Transit Authority. Many people who depend on public transit do not own an automobile and therefore rely on walking or bicycling for access. Providing improved bike and pedestrian connections to PRT stations and bus stops can be an important step to expanding the bike and pedestrian transportation network in the region.

The PRT, which has been in operation since 1975, is primarily used by WVU students and travels between downtown Morgantown and the Evansdale Campus, with five stops along its 3-mile length. The south terminus is located at Walnut Street in downtown Morgantown and stops at Beechurst Avenue before reaching stations at the Engineering campus, Towers, and HSC/Medical buildings on the WVU Evansdale Campus. While the system is operated and primarily utilized by students, the system is open to the general public. The PRT carries approximately 15,000 people a day during the school year.¹²

The Mountain Line Transit Authority (MLTA) aims to “serve the public transit need of our community in a safe, efficient, and effective manner.”¹³ The MLTA currently operates 27 routes in the greater Morgantown region to provide bus service for residents and visitors between residential neighborhoods and major destinations throughout the region.



Mountain Line buses provide access throughout the region, including the WVU campuses (Source: <https://iserve.wvu.edu/>)



Walnut Street PRT Station



4. ANALYSIS OF EXISTING CONDITIONS

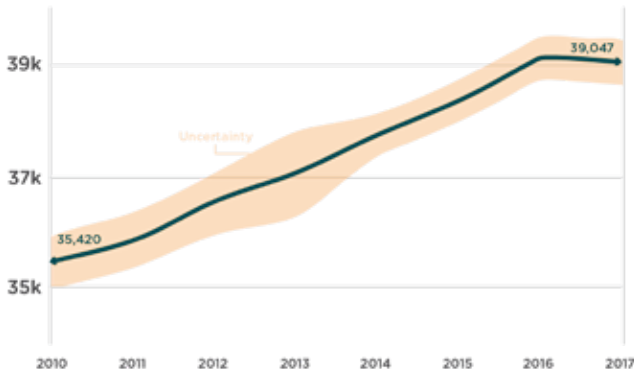
4.1 DEMOGRAPHICS

To help the project team better understand the needs of the community, a base-level demographics analysis was conducted. Characteristics researched included regional geography, population, education, commute mode, poverty levels, vehicle availability, and public health. The land use and geography of the greater Morgantown area is a mix of urban, suburban, and semi-rural areas connected by a network of state and local roads that can be a challenge for walking and bicycling. A number of compact areas on and around the WVU campuses and downtown Morgantown contain an environment that, with improved pedestrian and bicycle facilities and programs, offer the opportunity to replace many short automobile trips with walking and bicycle trips. Much of the landscape, including the Mon River Valley and the nearby rolling hills and mountains, is remarkably scenic and provides opportunities

to promote additional recreational riding and bicycle tourism as well. The following demographic summary includes analysis of Census data at the Census Block Group level for the incorporated areas of Morgantown, Star City, Granville, and Westover (the "Study Area").

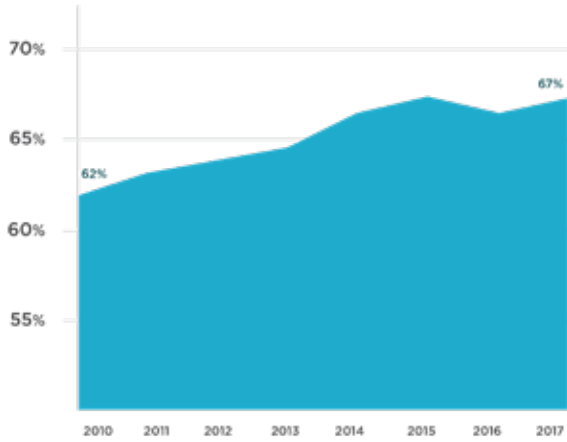
- **Population** - 39,047 residents (2018).
- **Education** - 7% of adults with no high school diploma, and 67% of adults with at least some college education (2015).
- **Race + Ethnicity** - 88% of residents identified as White, 5% identified as Black or African-American, 4% identify as Asian, and 2% identified as two or more races.
- **Poverty** - 19% of West Virginians live in poverty

The study area population grew 10% between 2010 and 2017, while West Virginia's population slightly declined over the same time period



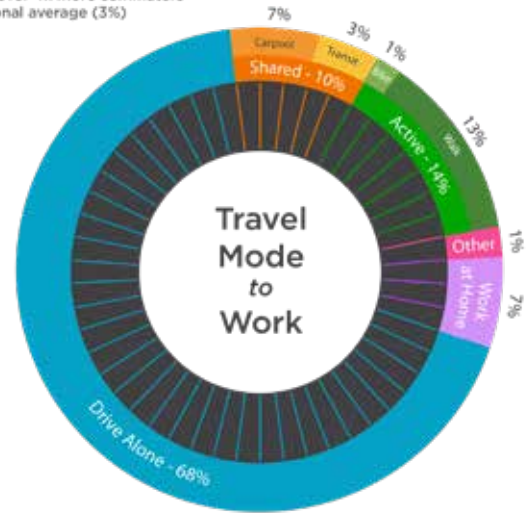
Source: American Community Survey, Table B01003: Total Population, five-year estimates

The percent of adults with at least some college education increased 5 percentage points between 2010 and 2015, while the number of adults with no high school diploma decreased four percentage points over the same time period (11% to 7%)



Source: American Community Survey, Table S1501: Educational Attainment, five-year estimates (estimates of population 25 years and over = 2010 - 15,636; 2011 - 16,929; 2012 - 17,800; 2013 - 18,226; 2014 - 19,470; 2015 - 20,490; 2016 - 20,526; 2017 - 20,710)

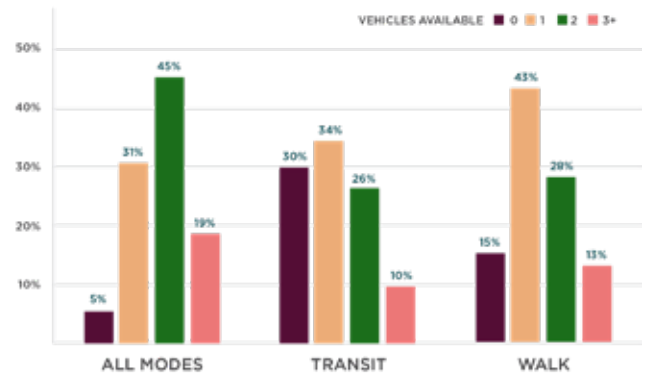
Walking is a popular way to get to work in Morgantown, representing over 4x more commuters than the national average (3%)



Source: American Community Survey, Table B0650: Means of Transportation to Work, 2013-2017 five-year estimate (employed population estimate = 17,570)

Residents who walked or rode transit to work were more likely not to have access to a car compared to other commute modes

(Note: per the data, a relatively high proportion of people—41%—who walk to work have access to two or more cars)



Source: American Community Survey, Table B0814: Means of Transportation to Work by Vehicles Available, 2013-2017 five-year estimates (employed population estimate = 33,034)

4.2 VEHICLE AVAILABILITY AND COMMUTING

According to ACS data, in the Morgantown Study Area, 5% of commuters responded that they do not have access to a motor vehicle. Of the 95% of workers who have access to at least one motor vehicle, 31% have access to one, 45% have access to two, and 19% have access to three or more vehicles.¹⁷ Commuters who do not have access to a motor vehicle are more likely to use public transportation, walk, or bike.

Approximately 68% of Morgantown Study Area residents responded that they commute to work by driving alone. Additionally, 7% carpool, 3% use public transportation, and 7% work from home. According to the ACS, approximately 14% of people commuted to work by walking or biking¹⁸, with 13% walking, and 1% biking. This high percentage of commuters choosing to walk to work is more than four times higher than the national average of 3%. However, it is also important to note that a higher percentage of non-commute trips are typically taken by

walking and bicycling. Therefore, the 13% figure does not paint a complete picture related to the amount of walking and bicycling that occurs on a daily basis throughout the Study Area.

4.3 PUBLIC HEALTH AND ACTIVE TRANSPORTATION

Besides improved mobility options, both walking and bicycling have the added benefit of providing direct health benefits, including reduced obesity. The state of West Virginia currently has the highest adult obesity rate of any state in the nation, 38.1%.¹⁹ The obesity rate has increased by over 10% between 2005 and 2018. The obesity epidemic is not confined to the adult population, as 19.5% of high school students are obese.²⁰ Creating enhanced walking and bicycling environments on streets and highways throughout the Study Area can provide an opportunity for recommended levels of physical activity and combat the problems associated with obesity such as chronic diseases. An article from West Virginia Metro News regarding the findings of the obesity report

28.5%

of adults in West Virginia reported that they had not participated in any leisure-time physical activity in the last week.²³

48.0%

of adults in West Virginia engaged in at least 150 mins of moderate-intensity or 75 minutes of vigorous intensity exercise in the last week.²⁴

32.8%

of adults in West Virginia achieved at least 300 mins of moderate-intensity or 150 mins of vigorous intensity exercise.²⁵

23.4%

of students in grades 9 – 12 achieved one hour or more of moderate-intensity to vigorous-intensity physical activity.

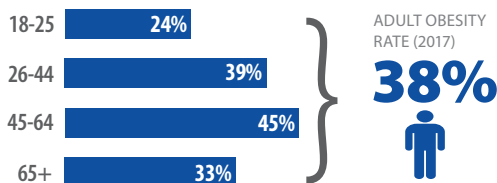
mentions income inequality, access to affordable food, and a lack of opportunity for physical activity as some of the factors contributing to the obesity crisis.²¹ The U.S. Department of Health and Human Services recommends the following levels of activities by age group:²²

- Children and adolescents (ages 6 through 17 years) should engage in 60 minutes or more of moderate-to-vigorous daily physical activity.
- Adults should engage in 150 minutes to 300 minutes of weekly moderate-intensity aerobic physical activity or 75 minutes to 150 minutes of weekly vigorous-intensity aerobic physical activity.
- When older adults cannot do 150 minutes of moderate-intensity aerobic physical activity per week because of chronic conditions, they should be as physically active as their abilities and conditions allow.

IN WEST VIRGINIA

West Virginia has the highest rate of adult obesity in the nation.

OBESITY RATE BY AGE (2017):



Despite these recommendations, state-level results from the Centers for Disease Control and Prevention’s Behavioral Risk Factor Surveillance System showed that:

- Throughout the Study Area, more and better-connected pedestrian and bicycle facilities will encourage and promote active transportation, enabling both adults and adolescents to reach the recommended activity levels as part of their daily routines. New trails, sidewalks, pedestrian-friendly intersections, and on-street bikeways are a perfect way to promote walking and bicycling for both utility and recreational trips and promote a more active lifestyle that can improve public health outcomes throughout Morgantown and Monongalia County.

4.4 COMMUNITY EQUITY ANALYSIS

One of the primary outputs of the Bike and Pedestrian Transportation Plan will be a recommended network of bicycle and pedestrian facilities throughout the Study Area. To help inform the network recommendations, four analytical tools were employed. The results of the Community Equity, Bike/Walk Demand, Safety, and Connectivity Analysis provide the foundation for the development of the recommended bike and walking network in the Morgantown area.

Without access to transportation, people in the Morgantown area have a harder time getting to work, buying healthy food, seeing a doctor, going to school, or connecting with others. While all communities offer a variety of ways to get around, not everyone has equal access to a wide range of convenient, safe, and affordable means of transportation. Many communities rely on a variety of modes to connect to basic services that are necessary to live productive, fulfilling, and healthy lives. Referenced here as “communities of concern”, the following analysis considers populations who have been historically disadvantaged or are otherwise considered vulnerable to unsafe, disconnected, or incomplete active transportation facilities. These communities—which may experience poor financial, health, and housing circumstances, and/or physical or communication limitations — are prevented from fulfilling basic needs without safe, convenient transportation options.

In this analysis, the pursuit of equitable outcomes in planning has two steps:

- Understanding the historic situations that have disadvantaged certain communities
- Seeking to reduce the impact of those disadvantages by providing these populations with resources to live more healthy lives

When cities and regions have the resources to provide mobility options, communities can experience improved access to jobs, housing, and other critical services. Equity recognizes that different people experience different

barriers to securing their needs.²⁶ Working towards equity may mean prioritizing active transportation funding in areas with a greater concentration of disadvantaged populations instead of distributing funding equally based on geography.

AREAS IN NEED OF EQUITABLE TRANSPORTATION

The Composite Equity Map identifies areas that demonstrate a relative need for transportation investments based on concentrations of historically vulnerable populations. While this analysis does not directly assess access to existing walking and bicycling facilities, the results identify areas where more facilities may be needed, or where access to existing facilities should be improved. The project team will use the resulting composite equity map to identify focus areas for new investments that may address equity needs.

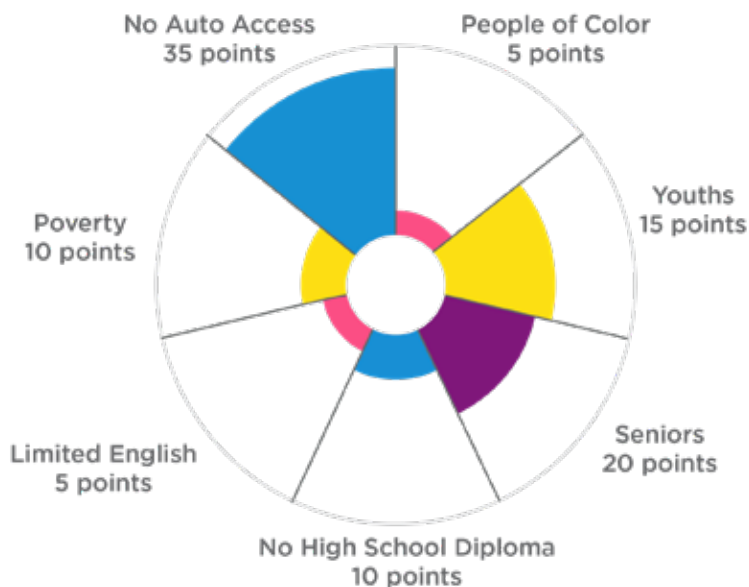
Areas with varying equity needs can be found throughout the Study Area. The areas with the highest need for equitable transportation options based on the equity indicators include Sunnyside, Woodburn, Suncrest, Greenmont, portions of First Ward, and residential areas in Westover and Granville. Additional equity hot spots can be found throughout the Study Area, primarily along major roadways or in high-density residential areas.

Investing in active transportation facilities in these areas of highest need will likely improve access to health and economic advancing opportunities.

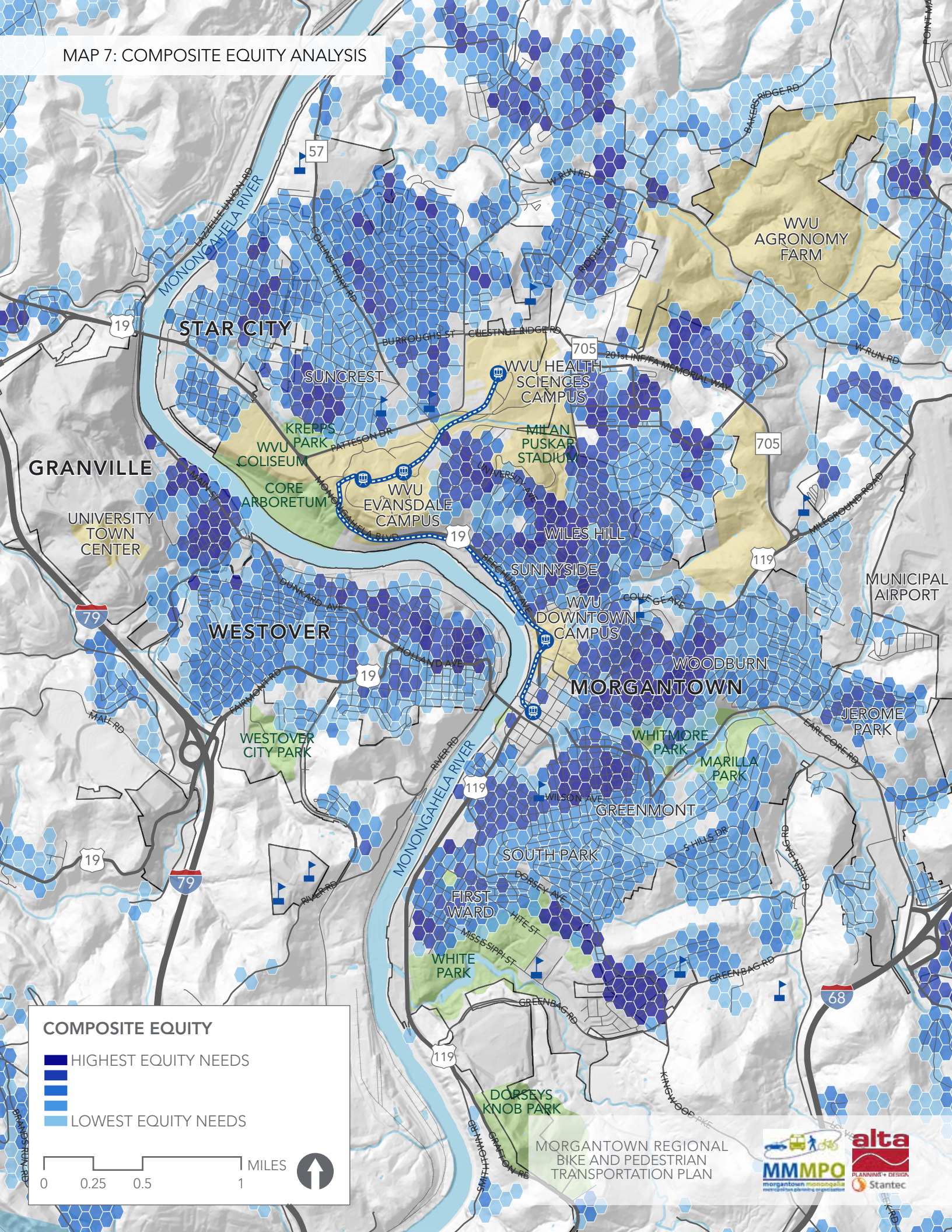
EQUITY INDICATORS USED

- Race: This indicator measures the percentage of the population that identifies as non-white.
- Age: Individuals under the age of 18 and over the age of 65 comprise this indicator. These two age groups are displayed separately to better identify the differing needs of these populations.
- Income: This indicator measures individuals of working age living at or below 200% of the Federal Poverty Level, which is a threshold set by the U.S. Census Bureau and is updated annually.
- Educational Attainment: This indicator represents the percentage of the population over 25 years of age that does not have a high school diploma or equivalent.
- Limited English Proficiency (LEP): This indicator measures the percentage of the population that identifies as not speaking English well or at all.
- Access to a Vehicle: This indicator measures the percentage of household who do not have regular access to a vehicle.

Equity Indicators relative weight out of 100 points



MAP 7: COMPOSITE EQUITY ANALYSIS



COMPOSITE EQUITY

- HIGHEST EQUITY NEEDS
-
-
- LOWEST EQUITY NEEDS



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4.5 BIKE / WALK DEMAND ANALYSIS

DESCRIPTION

To quantify and visualize demand for transportation and recreational activities within the Study Area, the planning team employed a Bike/Walk Demand Analysis. This section summarizes the methods and findings of the analysis for the Study Area.

The Demand Analysis is an objective, data-driven process that estimates the cumulative demand for transportation depending on where people live, work, play, shop, learn, and access transit. This is accomplished by quantifying factors that generate bicycle and pedestrian movement. The resulting Composite Demand Map summarizes the geographic distribution of active transportation demand throughout the Study Area. The results of the analysis will be used to help inform and prioritize recommendations.

METHODOLOGY

The Demand Analysis model provides a general understanding of expected recreational activity by analyzing spatial data representative of origins and destinations in the Study Area. In the model, transportation demand is influenced by where people live, work, play, shop, learn, and access transit. The resulting analyses shows where people are likely to walk, bike, and use mobility devices based upon the demand model inputs.

WHERE PEOPLE LIVE

These locations represent potential trip origin locations. More trips are likely to be made in areas with higher population density if conditions are right.

WHERE PEOPLE WORK

This category represents trip destinations (end-points) for people working in the Study Area, regardless of residency. Depending on the type of job, employment can act as a trip attractor (i.e., retail stores or cafes), trip generator (i.e., office buildings or complexes like NETL), or both.

WHERE PEOPLE PLAY

This category is a combination of recreation land use types and destinations such as existing parks and trails.

WHERE PEOPLE SHOP

This category represents the location of commercial areas in the Morgantown area. In addition to being locations of employment, these areas also serve as trip ends for people, regardless of residency.

WHERE PEOPLE LEARN

This category shows the locations of all educational facilities within the region, including preschools, elementary, middle, and high schools, as well as the WVU campuses.

WHERE PEOPLE ACCESS TRANSIT

This category includes PRT stations and Mountain Line Transit bus stops as well as ridership within the region.

Table 4: Demand Analysis Inputs

DATA INPUT	SOURCE
Live - Population	2016 American Community Survey (ACS), Building Footprints
Work - Employment	2015 Longitudinal Employer-Household Dynamic (LEHD)
Play - Existing Parks and Trails	West Virginia University (WVU) GIS Clearinghouse, Morgantown Monongalia Metropolitan Planning Organization (MMMPO)
Shop - Retail Land Use	Monongalia County
Learn - School Locations and Enrollment and WVU Campus Buildings	Morgantown Monongalia Metropolitan Planning Organization (MMMPO), Public School Review
Access to Transit - PRT and Bus Stop Locations and Ridership	West Virginia University (WVU) Personal Rapid Transit (PRT), Mountain Line Transit

HIGH DEMAND AREAS

The Bike/Walk Demand Analysis’ scoring method is a function of density and proximity. Areas that have more features, and features that are closer together, have higher scores. Low feature density areas, and areas where features are further apart, receive lower scores. Composite demand is calculated by summing all six categories: Live, Work, Play, Shop, Learn, and Access to Transit. All categories are given the same weight in the Composite Demand Map.

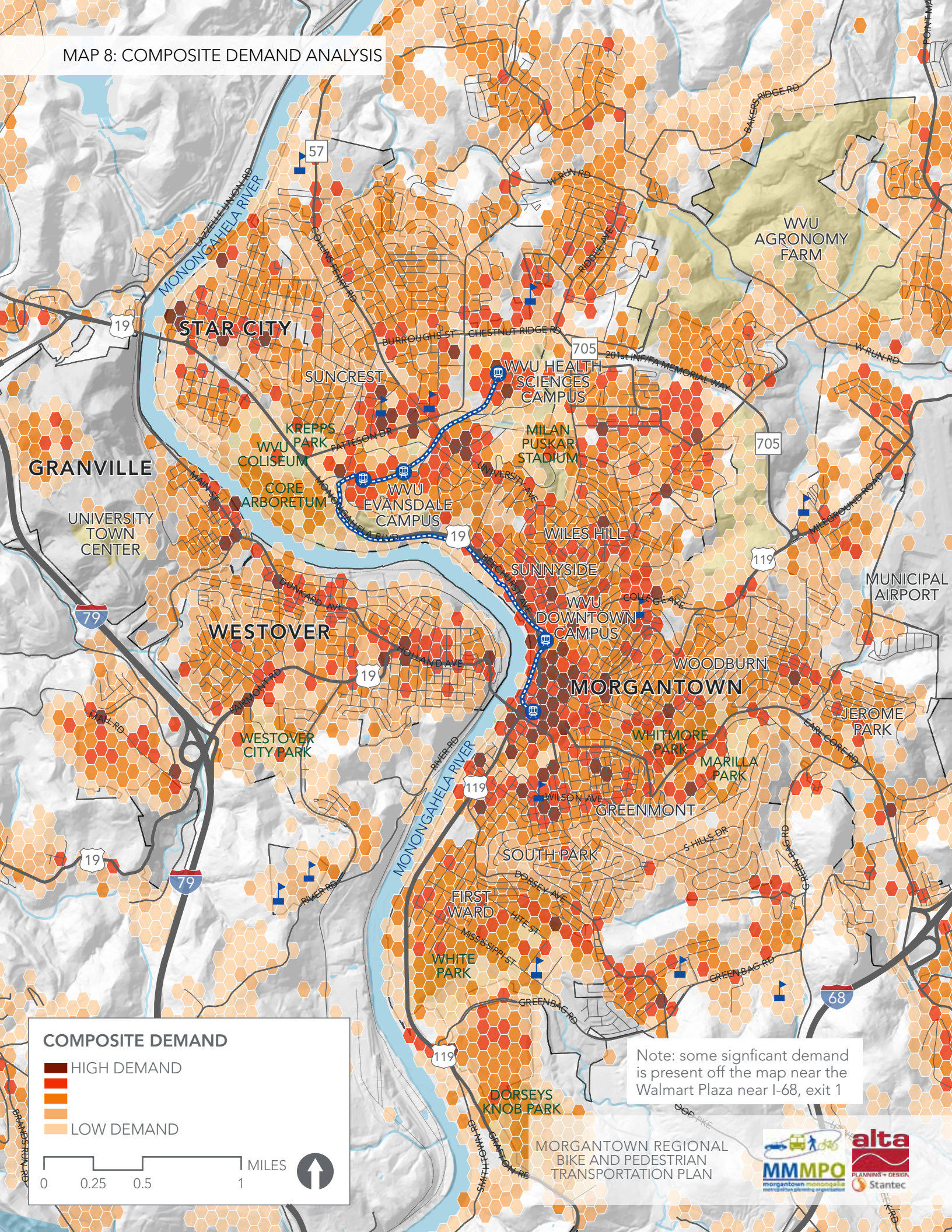
The analysis reveals high demand areas exist throughout the Study Area, yet some areas reveal much higher demand than others. Areas with higher demand concentrations are located in downtown, South Park, Sunnyside, and the WVU Campuses. Additional medium/high demand areas are distributed throughout the Study Area in the First Ward, Greenmont, Woodburn, parts of Westover, and Star City, and the commercial area at Exit 1 on Interstate 68.



Monongalia County Courthouse building and plaza

One of the goals in this Plan is to create a connected active transportation system within the Morgantown area. In addition to identifying existing demand for biking and walking, the Composite Demand Map can be used to determine active transportation recommendations which will help achieve this goal.

MAP 8: COMPOSITE DEMAND ANALYSIS



COMPOSITE DEMAND

- HIGH DEMAND
- MEDIUM DEMAND
- LOW DEMAND



Note: some significant demand is present off the map near the Walmart Plaza near I-68, exit 1

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4.6 SAFETY ANALYSIS

Tracking crashes that involve pedestrians and bicyclists is important to identify potentially hazardous intersections and roadway segments where crashes are more likely to occur, typically due to:

- lack of sidewalk or roadway shoulder
- poor sight lines
- high posted speed limit
- pedestrian crossings of multi-lane roadways
- long blocks with infrequent signalized crossing treatments

Comparing trends can help decision-makers better understand needed safety improvements throughout the region. To this end, the Morgantown Regional Bike and Pedestrian Transportation Plan includes a bike and pedestrian crash map to inform planning-level network recommendations.

The crash map on the following page features data from the State of West Virginia spanning a five-year period, starting on January 1, 2013 through December 31, 2017. The crashes shown here include those reported to the state which involved a non-motorist during this time period. Select crashes from 2018 have been added to the map to supplement the state dataset and further identify key locations in need of safety improvements for pedestrians and bicyclists.

Approximately 116 crashes involving a non-motorist occurred in the Morgantown region during this time period (note that the map illustrates 80 crashes due to missing location data for 36 crashes). Six of these crashes from 2013 through the end of 2017 resulted in pedestrian fatalities, plus one additional pedestrian fatality in 2018. Two of the fatalities occurred at the intersection of Patteson Drive and Morrill Way in 2013 and 2018, one fatality occurred at the intersection of S High Street and Simpson Street in 2013, one fatality took place in 2014 on Monongahela Boulevard just south of Evansdale Drive, and one fatality in 2016 occurred near the intersection of Stewart Street and Wellen Avenue. Two additional pedestrian fatalities have occurred within this time period but are located outside the extents of this map at the intersection of Grafton Road and Goshen Road (2014) and on 1-79 just south of the I-68 junction (2017).

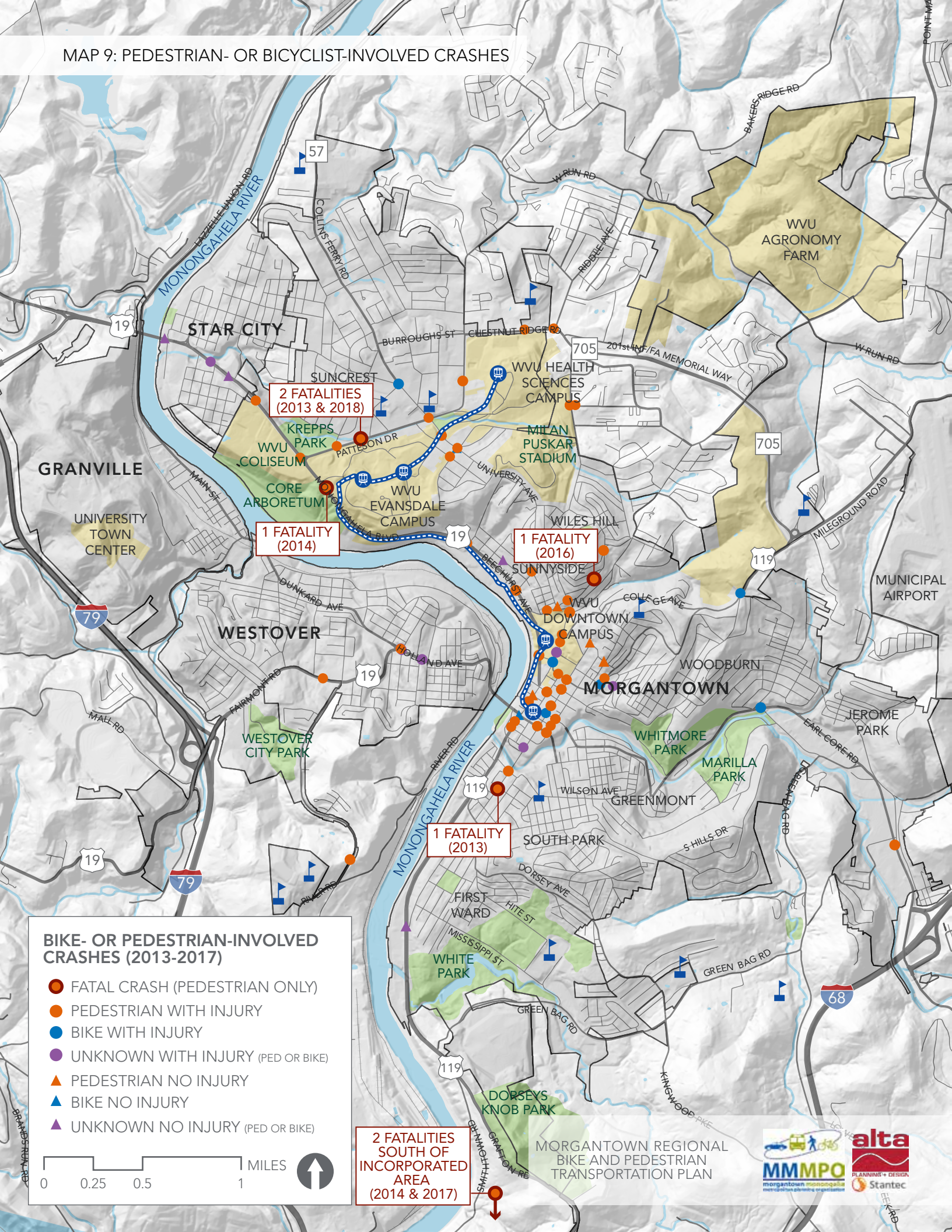
After pedestrian and bicycle facility network recommendations are developed in subsequent phases of this planning efforts, the proximity of crashes will be used as a key criterion when prioritizing the list of projects. Road corridor recommendations will receive higher number of points in the “safety” category where there are recorded crashes within a ¼ mile buffer.

See Appendix D for table of pedestrian and bicycle-related crash characteristics.



In the last five years, the wide intersection of Patteson Drive and Morrill Way has been the site of two pedestrian fatalities (photo source: Google)

MAP 9: PEDESTRIAN- OR BICYCLIST-INVOLVED CRASHES



2 FATALITIES
(2013 & 2018)

1 FATALITY
(2014)

1 FATALITY
(2016)

1 FATALITY
(2013)

2 FATALITIES
SOUTH OF
INCORPORATED
AREA
(2014 & 2017)

BIKE- OR PEDESTRIAN-INVOLVED CRASHES (2013-2017)

- FATAL CRASH (PEDESTRIAN ONLY)
- PEDESTRIAN WITH INJURY
- BIKE WITH INJURY
- UNKNOWN WITH INJURY (PED OR BIKE)
- ▲ PEDESTRIAN NO INJURY
- ▲ BIKE NO INJURY
- ▲ UNKNOWN NO INJURY (PED OR BIKE)



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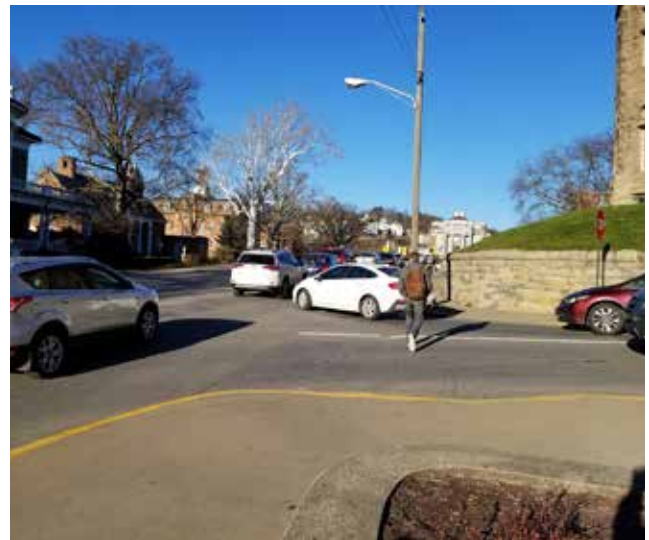
4.7 CONNECTIVITY ANALYSIS

The Connectivity (aka Gap) Analysis identifies missing links in both the on-road and off-road/trail network for pedestrians and bicyclists. The analysis takes into consideration significant destinations throughout the region, such as WVU campuses, schools, trail access points, local parks, transit lines, and major employment/commercial areas. The planning team looked at both gaps along roadway corridors (“corridor gaps”), and more specific locations lacking facilities to accommodate safe and comfortable travel for bicyclists and pedestrians (“spot gaps”). The two types of gaps will come into sharper focus after additional input is received from the Steering Committee, the interactive online input map, and from the general public.

- **Corridor gaps** are missing links of significant length where bicycle and walking facilities are desired but do not exist, or are not adequate based on existing or potential future demand. Corridor gaps may correspond to either a roadway or a desirable trail connection through a park or undeveloped open space.
- **Spot gaps** are most often intersections that are difficult to cross, or short segments between existing sidewalk, bicycle or trail facilities where motorist speed, sight lines, or other factors can make bicycling and walking uncomfortable. Spot gaps are frequently included at locations where access points to the regional greenway trail system would be desirable.



State Route 119 / Mileground Road is a corridor gap that creates challenging conditions for bicycle and pedestrian travel along the commercial corridor



A spot gap exists along University Avenue at Prospect Street where a motor vehicle stop bar and striped crosswalk would improve pedestrian accessibility in the WVU Downtown campus

In the maps on the following pages, the gaps in the Morgantown area's pedestrian and bicycle network are identified by 1) analyzing the existing trail, bicycle and pedestrian facilities (i.e. sidewalks and crosswalks) and 2) by identifying the key destinations for pedestrians and bicyclists in the region. At this point in the planning process, gaps are illustrated on roadways that are a mix of relatively friendly corridors and those that some would consider hostile to walking and bicycling. Designated gaps on bike/walk friendly corridors may benefit ultimately from simple and low-cost enhancements such as signage, shoulder striping, or changes to signal timing.

On the other hand, designated gaps exist on some roadways that are not well-configured for pedestrian and bicycle travel due to high traffic volumes/speeds and lack of bicycle and pedestrian infrastructure. In these cases, identified system gaps may evolve into longer-term recommendations to improve conditions for pedestrians and bicyclists that include:

- Narrowing existing travel lanes or incorporating a "road diet" in order to create designated space for bicycle lanes
- Building a shared-use path in undeveloped land or within a public roadway's right-of-way
- Building new or improved sidewalks to fill in a gap in the sidewalk system
- Incorporating a new bicycle/pedestrian crossing treatment such as a traffic signal, crosswalk and/or other crossing enhancement such as a pedestrian beacon, bump outs and/or median island

Regarding the sidewalk gaps, while downtown Morgantown and most parts of South Park and Sunnyside feature sidewalks, most other neighborhoods in the Study Area lack pedestrian facilities. Significant gaps in the pedestrian network can be found in:

- Morgantown: Suncrest, Woodburn, Jerome Park, Greenmont, south slope of South Park, and portions of First Ward
- Throughout Westover
- Throughout Granville and parts of the University Town Center
- Throughout Star City
- Throughout unincorporated parts of Monongalia County

PEDESTRIAN NETWORK GAPS



1
Lack of sidewalks and paths between Suncrest Elementary School and Collins Ferry Road creates a gap for children wishing to walk or bike to school (Source: Vaike Haas)



2
Despite the one crosswalk at Van Voorhis and Chestnut Ridge, the intersection is a gap for pedestrians wishing to access the WVU Health Sciences Campus



3
Lack of sidewalks along portions of Elmer Prince Drive also represents a pedestrian gap between the Suncrest neighborhood and the WVU Health Sciences Campus



4
Lack of crosswalks at the intersection of Richwood Ave and Putnam Street create a gap at an important bus stop location

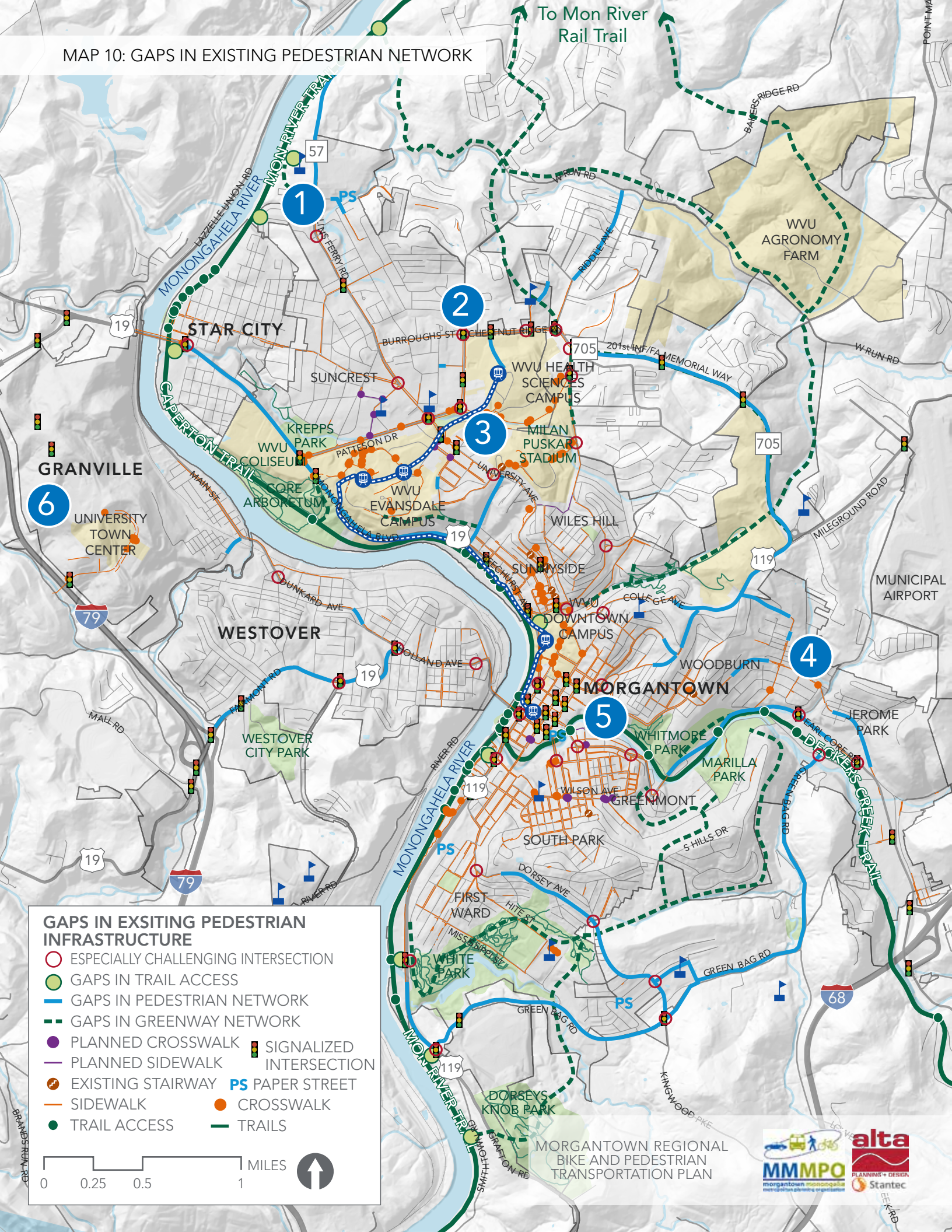


5
A gap between the South Park neighborhood and downtown results from incomplete facilities for pedestrians and bicyclists at the S. Walnut Street / Brockway intersection



6
Though not a pedestrian gap per se, crossing 5-lane-wide University Town Center Drive on foot remains a challenge without additional safety measures other than a striped crosswalk

MAP 10: GAPS IN EXISTING PEDESTRIAN NETWORK



GAPS IN EXSITING PEDESTRIAN INFRASTRUCTURE

- ESPECIALLY CHALLENGING INTERSECTION
- GAPS IN TRAIL ACCESS
- GAPS IN PEDESTRIAN NETWORK
- GAPS IN GREENWAY NETWORK
- PLANNED CROSSWALK
- PLANNED SIDEWALK
- EXISTING STAIRWAY
- SIDEWALK
- TRAIL ACCESS
- TRAILS
- 🚦 SIGNALIZED INTERSECTION
- PS PAPER STREET
- CROSSWALK



BIKE NETWORK GAPS



1 High traffic volumes and speeds on 201st Inf / FA Memorial Way likely necessitates a facility separated from the roadway on the north/east side for pedestrian and bike access



2 A tighter turning radius at the Deckers Creek Boulevard / Powell intersection would improve safety for trail users crossing here



3 Due to the challenging grades on Holland Ave in Westover, a climbing bicycle lane could promote access and safety



4 With the indefinite closure of River Road, only one lane of traffic feeds the Westover Bridge (southbound), where three traffic lanes provide no space for bicyclists

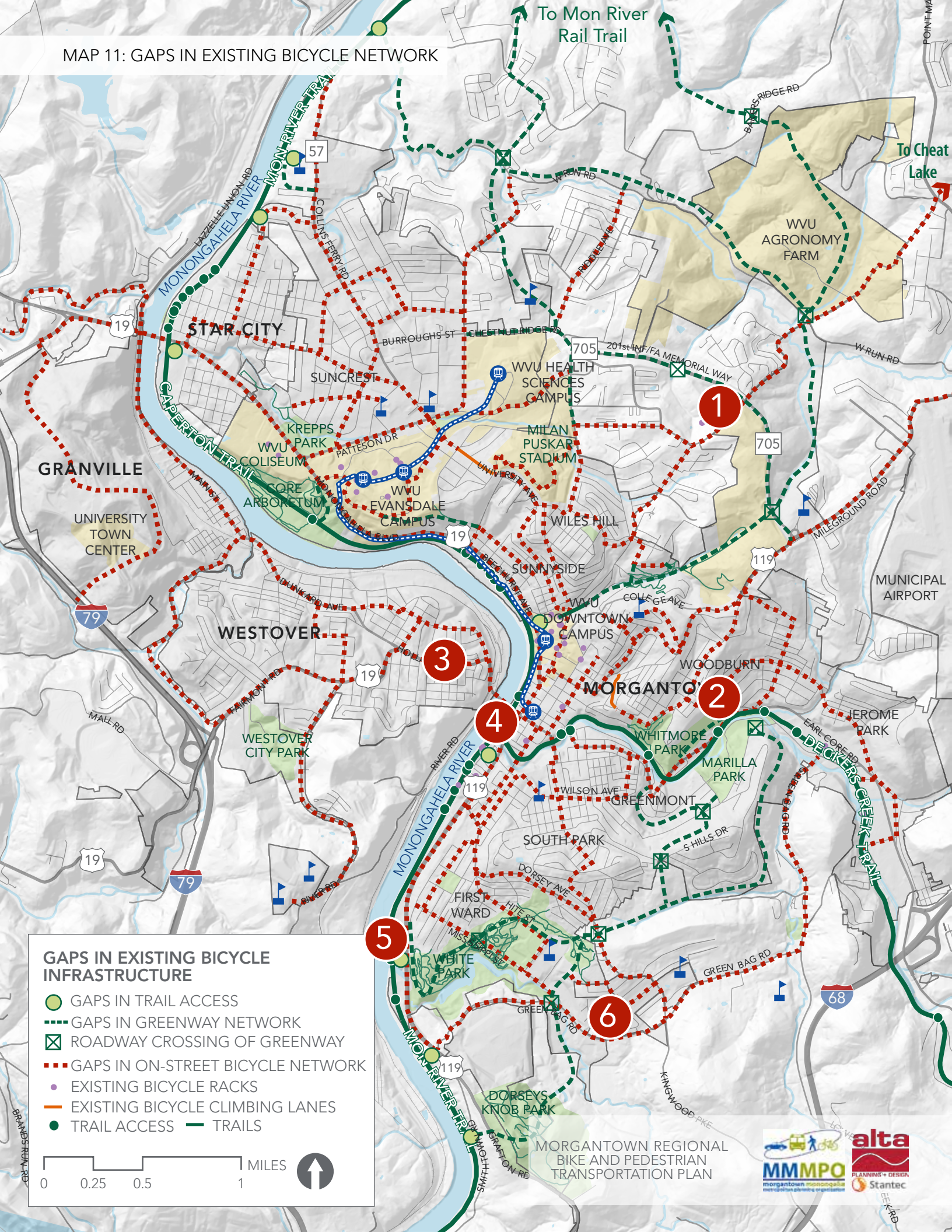


5 The signalized intersection along Don Knotts Boulevard, adjacent to White Park (at left) provides a strong potential link to the Mon River Rail Trail



6 The paper street at the south end of Dorsey Lane provides an opportunity to improve pedestrian and bike connections to both South Middle and Mountainview Elementary

MAP 11: GAPS IN EXISTING BICYCLE NETWORK



GAPS IN EXISTING BICYCLE INFRASTRUCTURE

- GAPS IN TRAIL ACCESS
- - - GAPS IN GREENWAY NETWORK
- ⊠ ROADWAY CROSSING OF GREENWAY
- - - GAPS IN ON-STREET BICYCLE NETWORK
- EXISTING BICYCLE RACKS
- EXISTING BICYCLE CLIMBING LANES
- TRAIL ACCESS — TRAILS



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5. PUBLIC ENGAGEMENT

The MMMPO Bike and Pedestrian Transportation Plan Steering Committee (see list on the next page) provided oversight and critical input to the consultant team throughout the planning process. Other public engagement activities included:

- Public open houses
- Stakeholder interviews
- An online survey
- An online public input map

The input gathered during these engagement activities helped identify community needs and inform plan goals and recommendations.



Public Open House #1 on Feb 5 at the Metropolitan Theater

5.1 STEERING COMMITTEE

The MMMPO Bike and Pedestrian Transportation Plan Steering Committee has provided oversight and critical input to the consultant team. The Steering Committee meets approximately every other month and includes the following individuals:

- Bill Austin, Executive Director, Morgantown Monongalia MPO, Steering Committee Chair
- Christiaan Abildso, WVU Health Research Center
- Ella Belling, Mon Trails Conservancy
- Heather Britton, Disability Community
- Brian Carr, WVDOH Planning
- Matthew Cross, Chairman of the Pedestrian Safety Board
- Damien Davis, City Engineer, City of Morgantown
- Andrew Gast-Bray Dir of Planning, Monongalia County Planning Commission
- Drew Gatlin, Staff Engineer, City of Morgantown
- Marc Glass, City of Westover
- Ron Justice, WVU Government Relations, MPO Policy Board Member
- Bill Kawecki, Mayor of Morgantown, MPO Policy Board Member
- Don Meadows, WVDOT Traffic Operations
- Emily Muzzarelli, Asst. City Manager, City of Morgantown
- Jenny Selin, Morgantown City Council and MPO Policy Board
- Matt Skiles, WVDOT Traffic Operations
- Maria Smith, Mountain Line Transit Authority
- Mary Jo Thompson, Project Manager - Strategic Initiatives, WVU

The Steering Committee provided a list of stakeholders that have been interviewed in order to gather input on critical issues that will need to be addressed in the Plan, including desired pedestrian, bike and trail infrastructure projects. Additionally, the Steering Committee contributed to a discussion exercise where each member's primary goals for walking and biking in Morgantown were discussed and recorded. This process informed the Project Goals.

5.2 PUBLIC OPEN HOUSES

Three community workshops/meetings were held throughout the year-long planning process at various locations throughout Morgantown. At the events, community members were able to review mapping and analyses developed to date. This typically included boards that highlighted the benefits of improved pedestrian and bicycling conditions in Morgantown, large scale maps for marking up, and interactive exercises. The meetings were supplemented by outreach events at the Mountainlair, Morgantown Bike-to-Work Day and the 2019 Family Safety and Fitness event at WVU.

5.3 STAKEHOLDER INTERVIEWS

The core project team conducted interviews with 15 stakeholders from a variety of backgrounds and organizations to gather input and insight into existing conditions, and proposed facility ideas.

5.4 PROJECT WEBSITE

A project website (<http://bikewalkmorgantown.com>) was designed to explain the study and solicit input via an online survey and online public input during the duration of the planning process. Links to the survey, online input map, and other documents including powerpoint presentations from the Open House, Steering Committee, and notes from Stakeholder meetings were available on the website as well.



Public Open House #2 on May 20 at Marilla Park



Public Open House #3 on Oct 16 at Marilla Park



About

Welcome to the Morgantown Regional Bicycle + Pedestrian Transportation Plan web site! The Morgantown Monongalia MPO, with support from Monongalia County, the City of Morgantown, the City of Westover and WVU, invite you to help us plan for the future of bicycling and walking in and around Morgantown. Through the end of summer 2019, we are asking for the public's input on ways that the MPO, the WV Division of Highways, the City of Morgantown and neighboring municipalities can improve safety and connectivity for pedestrians and bicyclists using state and local roads for both recreation and transportation.



Screen shot of the landing page for the project website: <http://bikewalkmorgantown.com/>

5.5 ONLINE SURVEY

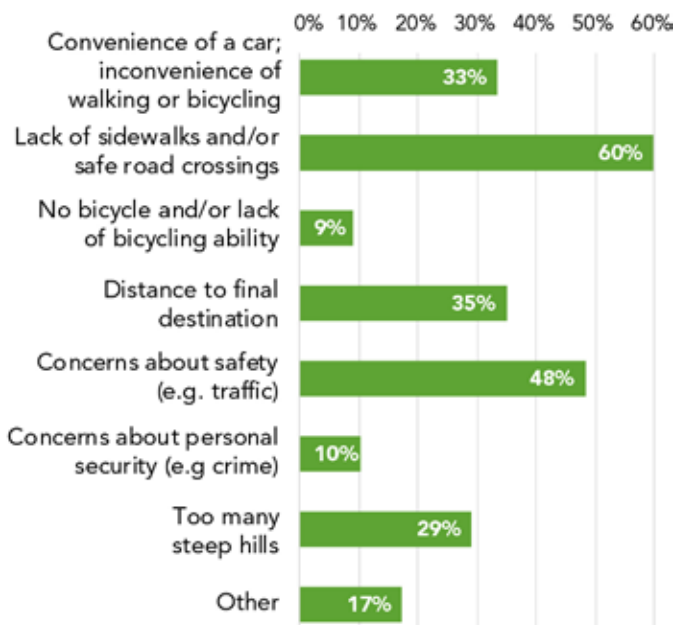
The 13-question survey was open from mid-December, 2018 to mid-October, 2019 and received 568 individual responses.

The survey included a mix of questions related to barriers to walking and bicycling, primary purposes for and frequency of bike and walk trips, confidence level when riding a bicycle, factors that prevent more walk and bike trips, perceived effectiveness of a variety of infrastructure and program improvements, and open-ended responses seeking info on specific roadways that need either bike or walk facilities.

Some graphic results are shown here and on the next page. A full report on the online survey results can be found in Appendix E.

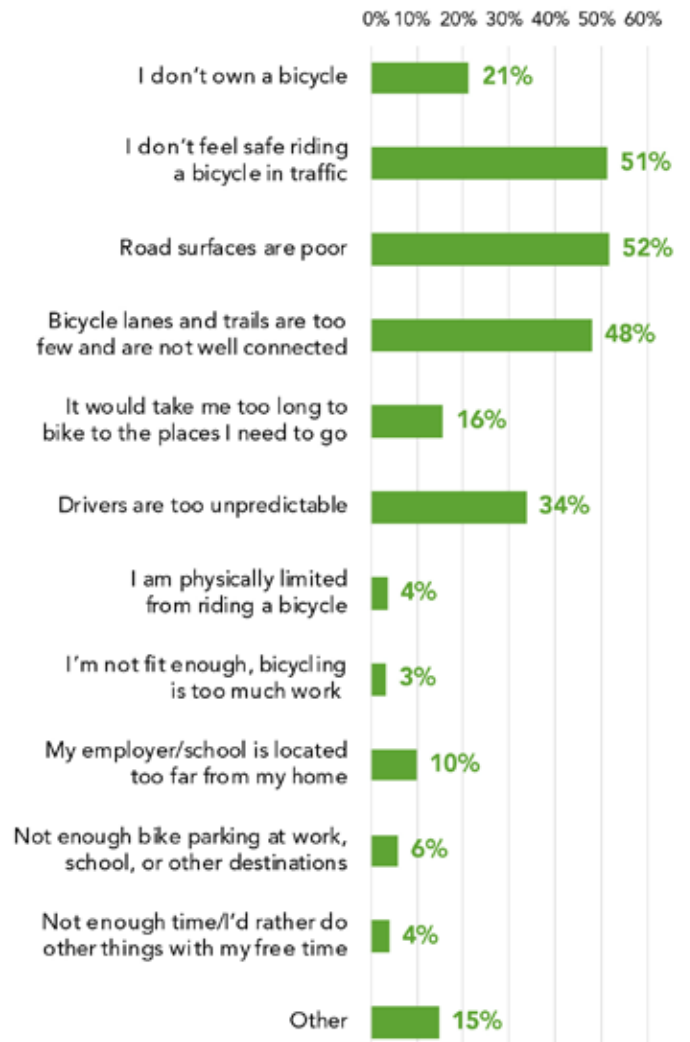
Online Survey Question 5

Highest ranked barriers to walking and biking.



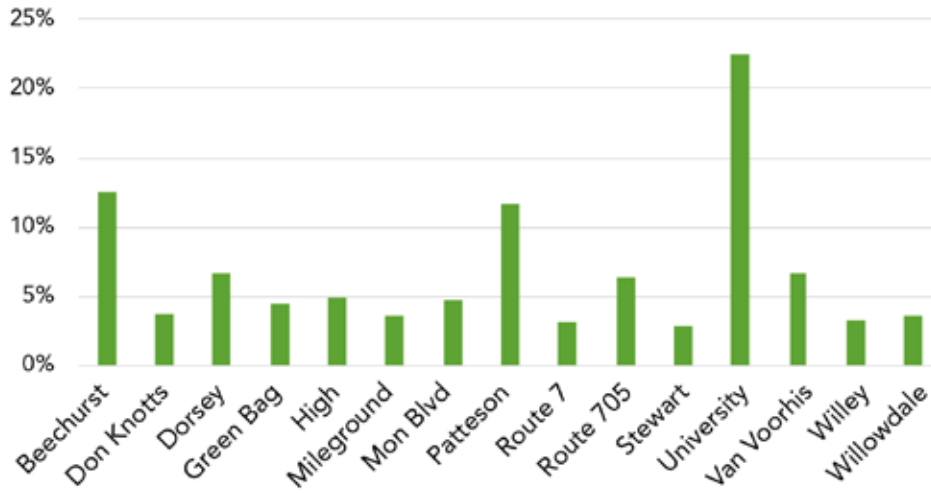
Online Survey Question 10

Reasons survey respondents choose not to bike.



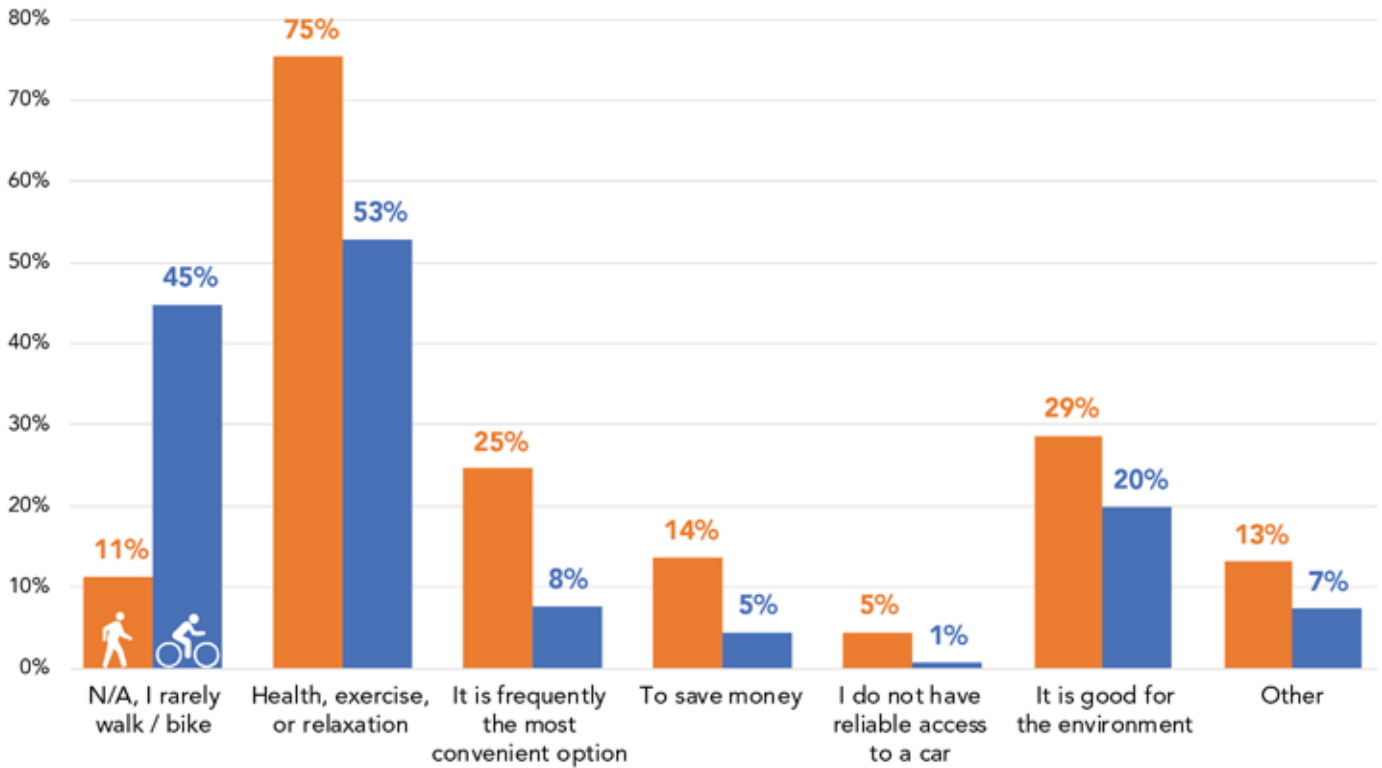
Online Survey Question 13

Bar chart displays the 15 roads that received the vast majority of votes for bike and pedestrian improvements.



Online Survey Questions 6 and 7

Bar chart displays highest ranked reasons for walking and biking in Morgantown. Question 6 (walk) answers are in orange, and Question 7 (bike) answers are in blue.



5.6 ONLINE PUBLIC INPUT MAP

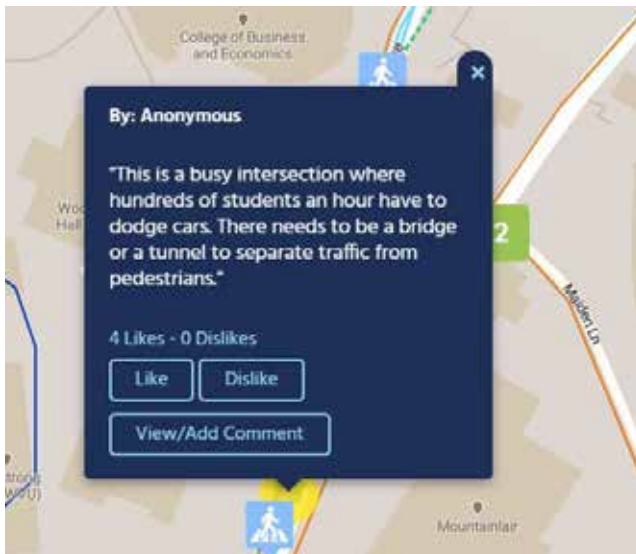
The interactive online public input map was developed concurrently with the website and online survey. There are a variety of ways that users can add input to the map. Map users can place a marker or point on the map to identify:

- the neighborhood where a map user lives
- a destination that the map user would like to access by bike or on foot
- a bicycling or walking route that needs improvement
- a barrier to biking or walking, such as a busy intersection

Interactive map users then have the ability to add a comment to the point or marker that they placed to indicate further issues.

The input map tool currently has 188 markers with no comments, and 392 markers total.

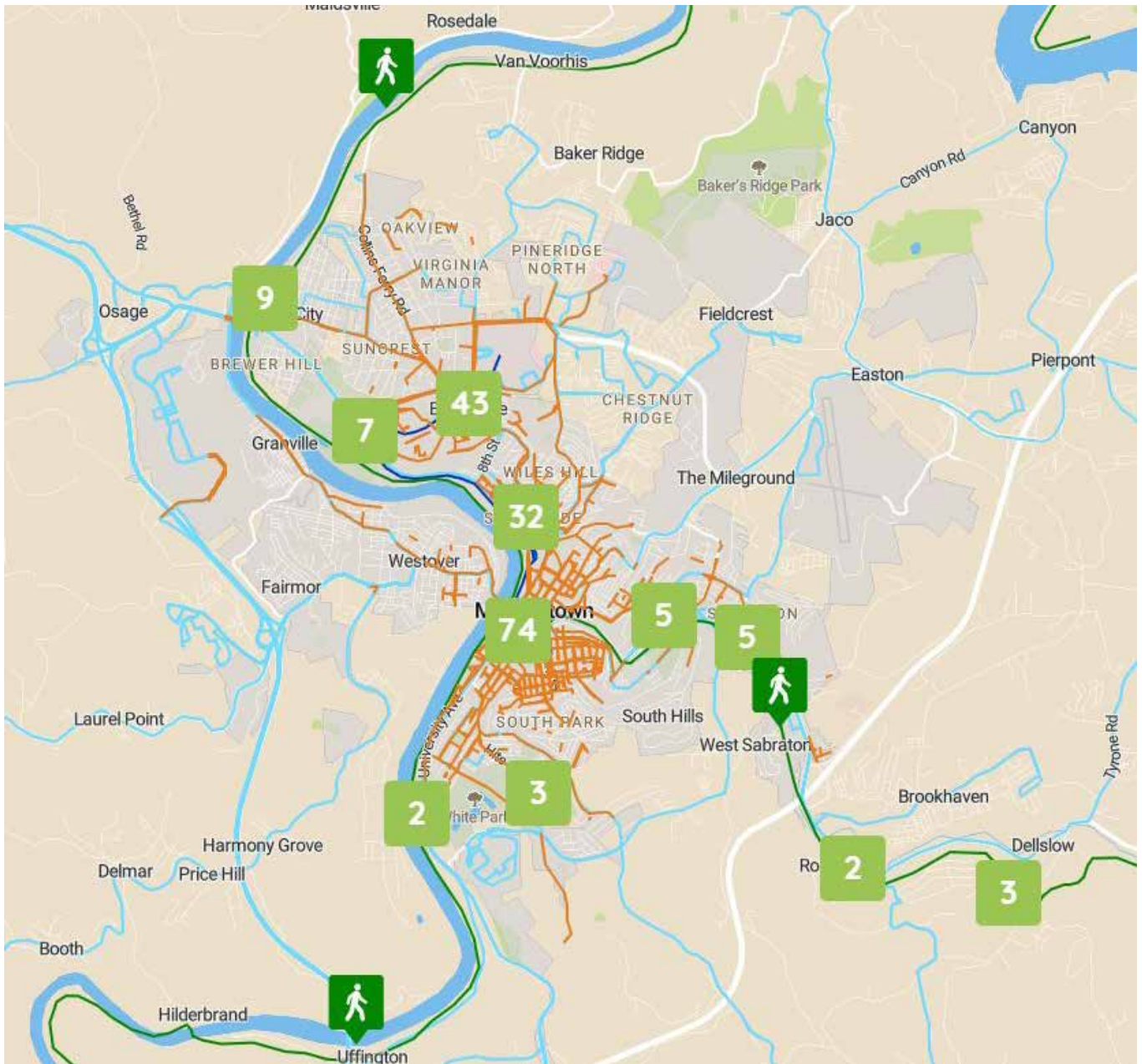
Many of the comments are related to general, neighborhood-level traffic and sidewalk issues, while others offer direct project ideas at specific intersection locations.



Online Public Input Map: This user added a comment about the crossing of University Ave just outside of Mountainlair, which 4 others agreed with by clicking "Like"



Online Public Input Map: This shows the concentration of issue markers and comments in downtown Morgantown



Online Public Input Map: The map tool allows users to place markers and add comments about specific issues related to walking and bicycling destinations and barriers to traveling to those destinations throughout the Morgantown area



6. VISION, GOALS, & OBJECTIVES

The Vision, Goals, and Objectives of the Morgantown Monongalia MPO Regional Bike and Pedestrian Plan (the Plan) will guide the planning, funding, and implementation of bicycle and pedestrian infrastructure that will improve safety for roadway and trail users.

The Vision, Goals, and Objectives were generated through discussions with the Steering Committee and based on comments received at the public open house in February, 2019.

6.1 DEFINITIONS

A **Vision** is a broad aspirational statement for the desired future state of walking and bicycling in the Morgantown region.

Goals are general statements of what the people who live, work, study or visit the Morgantown region hope to achieve over time.

Objectives are more specific action items that will help to achieve the goals.

Performance Measures are typically annual data-driven benchmarks that help an agency gauge progress towards the Plan's goals and objectives.

Responsible Parties are state, regional, and local agencies expected to take the lead in monitoring data points to meet the recommended Performance Measures for each Goal. In some cases, non-profits may be included as a responsible party.

VISION STATEMENT

SAFETY AND EFFICIENCY OF PEDESTRIAN AND BICYCLE TRAVEL WILL BE A HIGH PRIORITY IN THE MORGANTOWN REGION.

Implementation of the Regional Bike and Pedestrian Transportation Plan will make the Morgantown area a national leader in bicycling and walking safety and accessibility. Active transportation will be fully integrated into local and regional policies, programs and infrastructure projects, helping to safely connect destinations throughout the region. New streets and roadway projects will be designed to encourage people of all ages and abilities to choose walking and bicycling for both transportation and recreation.

6.2 PROJECT GOALS

The eight goals listed below help support the Plan's vision statement:

- **Goal 1: Safety** - Increase pedestrian and bicyclist safety with projects, policies, and programs
- **Goal 2: Connectivity** - Link the region's network of walking and bicycling routes, especially with transit
- **Goal 3: Design** - Reduce the pedestrian and bicyclist Level of Stress on state and local roads
- **Goal 4: Policy** - Develop stronger local policies that promote walking and bicycling
- **Goal 5: Equity** - Promote equity in pedestrian and bicycle planning and project funding
- **Goal 6: Economy** - Leverage walking and bicycling to promote economic development and quality of life
- **Goal 7: Feasibility** - Plan walking and bicycling projects that minimize engineering/funding challenges
- **Goal 8: Health** - Improve public health through increased walking and bicycling

Table 5: Goal 1 - Safety

Increase Pedestrian and Bicycle Safety with Projects, Policies and Programs

OBJECTIVE		RESPONSIBLE PARTIES
1.1	Promote "Vision Zero" by working to minimize and, ultimately, to eliminate pedestrian and bicycle-related fatalities, injuries, and collisions through increased speed enforcement, traffic calming measures, and new pedestrian and bicycle facilities	MMMPO, municipalities
1.2	Focus resources on safety improvements for pedestrians at intersections and potentially at mid-block areas where a clear demand for crossing has been shown in the past	DOH, municipalities
1.3	Support third-party pedestrian and bicycle safety and education efforts with funding and/or organizational capacity	MMMPO, City of Morgantown
1.4	Develop a local driver education campaign aimed at improving behavior around pedestrians and bicyclists (see Newport Waves program in Rhode Island)	MMMPO, City of Morgantown
1.5	Work with local police to train officers on safe bicycling practices and current laws related to bicycling	MMMPO, municipalities
1.6	Encourage municipalities to conduct before and after studies of new bicycle and pedestrian facilities to measure effectiveness	Municipalities
1.7	Prioritize pedestrian and bicycle access and safety along roadways within at least one mile of all K-12 schools in the region	Municipalities



Beechurst Avenue at 3rd Street

Table 6: Goal 2 - Connectivity

Link the Region's Network of Walking and Bicycling Routes, Especially with Transit

OBJECTIVE		RESPONSIBLE PARTIES
2.1	Complete regional and local connections through an on-street network that helps to link residential neighborhoods, retail/commercial centers, schools, parks, rural areas, and WVU	MMMPO, municipalities
2.2	Maximize pedestrian and bicycle access and safety in the vicinity of public and private schools	MMMPO, municipalities
2.3	Improve accommodations for people wanting to travel on foot and by bicycle to PRT stations and bus stops	Municipalities, WVU
2.4	Prioritize investments in the walking and bicycling network to meet current, latent and future demand	MMMPO, municipalities
2.5	Expand the rail trail / shared-use path network and points of access to the network	MMMPO, non-profits



Caperton Trail Users

Table 7: Goal 3 - Design

Reduce the Pedestrian and Bicyclist Level of Stress on State and Local Roads

OBJECTIVE		RESPONSIBLE PARTIES
3.1	Provide sidewalks on at least one side of the street and safe crossings on state highways and local arterial/collector streets that run through areas with concentrated commercial and/or residential land uses	MMMPO, DOH
3.2	Facilitate crosswalks on state roadways and local arterial and collector streets with, where warranted, traffic signals, median refuge islands, mid-block crossings, active warning beacons (RRFBs), highly visible marked crosswalks, or pedestrian over/underpasses	MMMPO, DOH
3.3	Reduce travel lanes on local roadways as low as 10' in width to accommodate striped shoulders for bicyclists' use	Municipalities
3.4	Where possible, design "all ages and abilities" bicycle facilities that provide a sense of separation from motor vehicle traffic	MMMPO, municipalities
3.5	Utilize design guidance for roadway projects to ensure consistent treatment of pedestrian and bicycle infrastructure	MMMPO
3.6	Incorporate traffic calming through innovative roadway design elements (e.g. narrower lanes, on-street parking with curb extensions, roundabouts, raised speed reduction medians, horizontal and vertical deflection, changing one-way streets to two-way, etc.)	MMMPO, DOH

Table 8: Goal 4 - Policy

Develop Stronger Local Policies That Promote Walking and Bicycling

OBJECTIVE		RESPONSIBLE PARTIES
4.1	Establish dedicated local funding streams for trails and pedestrian and bicycle-facility projects, as a complement to the federal Transportation Alternatives Program (TAP)	MMMPO
4.2	Develop local policies that establish a consistent funding mechanism to close gaps in the sidewalk network, repair existing sidewalks, and maintain them in the future	MMMPO, municipalities
4.3	Establish policies and funding streams for year-round maintenance on the regional bicycle, pedestrian, and trail network	MMMPO, municipalities
4.4	Adopt a policy and accompanying project checklist that requires appropriate walking and bicycle accommodation in all publicly-funded roadway projects (except limited-access highways)	MMMPO, DOH
4.5	Develop additional encouragement and education materials to promote safe walking and bicycling to schools	Municipalities
4.6	Continue and expand upon current pedestrian and bicycle count locations along trails and within municipalities	Non-profits
4.7	Host national “best practices” trainings for state and local transportation planners and engineers related to pedestrian and bicycle facility design (e.g. NACTO, or the FHWA Small Town and Rural Multimodal Networks)	MMMPO
4.8	Update the Morgantown Regional Bike & Pedestrian Transportation Plan every five or, at most, ten years	MMMPO
4.9	Promote walking and bicycling to work by City, County, and other municipal employees through Transportation Demand Management (TDM) programs that offer financial incentives	MMMPO, municipalities, Monongalia County
4.10	Develop a “Bicycling and Walking Benchmark Report” in order to track implementation of policies, programs and projects, and to quantify changes in the various Performance Measures laid out in this section of the report	MMMPO, City of Morgantown
4.11	Leverage new policies, programs and infrastructure projects in order to improve Morgantown’s ranking within the League of American Bicyclists Bike-friendly Community ranking (as of March 2019, Morgantown is Bronze)	City of Morgantown

Table 9: Goal 5 - Equity

Promote Equity in Pedestrian and Bicycle Planning and Project Funding

OBJECTIVE		RESPONSIBLE PARTIES
5.1	Invest in pedestrian and bicycle facilities in traditionally underserved communities ¹⁰	MMMPO, municipalities
5.2	Distribute projects to all neighborhoods in the Morgantown region, taking into account need, safety hot spots, and future demand	MMMPO

Table 10: Goal 6 - Economy

Leverage Walking and Bicycling to Promote Economic Development & Quality of Life

OBJECTIVE		RESPONSIBLE PARTIES
6.1	Use investments in walking and bicycling facilities to enhance Morgantown’s brand, recruit new businesses and job-seekers, and keep WVU graduates in the city	City of Morgantown
6.2	Encourage local land-use policies and urban design strategies that encourage walkability and bicycling, especially in areas of new construction	MMMPO
6.3	Encourage municipalities to offer regulatory incentives for developers to provide bike parking, consolidate curb cuts, and/or share parking lots	MMMPO, Monongalia County
6.4	Promote Morgantown as a bicycle tourism destination for both road and mountain biking through more-contiguous bicycle routes and promotional programs	MMMPO, City of Morgantown
6.5	Offer incentives through mechanisms such as a trail overlay zone, to promote development along trails and near trail heads	MMMPO, Monongalia County

Table 11: Goal 7 - Feasibility

Plan Walking and Bicycling Projects that Minimize Engineering/Funding Challenges

OBJECTIVE		RESPONSIBLE PARTIES
7.1	Prioritize pedestrian and bicycle-facility projects that provide significant improvement at a low or modest cost (aka “low hanging fruit”) and with minimal maintenance needs	MMMPO, municipalities
7.2	Develop low-cost, interim designs that can be piloted for one year in order to test out the effectiveness of long-term pedestrian and/or bicycle facility improvement concepts	MMMPO, municipalities, DOH
7.3	Incorporate safety data and examples from peer cities when planning road corridor and intersection projects to better accommodate pedestrians and bicyclists	MMMPO, DOH

Table 12: Goal 8 - Health

Improve Public Health Through Increased Walking and Bicycling

OBJECTIVE		RESPONSIBLE PARTIES
8.1	Enable residents and visitors to meet the CDC’s recommended physical activity guidelines ¹¹ through utilitarian walking and bicycle use	MMMPO, municipalities
8.2	Partner with local organizations to promote automobile mode shift to walking and bicycling for personal and public health using public education campaigns	MMMPO, municipalities
8.3	Expand the number and scope of programs that educate students about pedestrian and bicycle safety and its relation to public health in schools	Municipalities, WVU
8.4	Help reduce the State of West Virginia’s 38% adult obesity rate by increasing active transportation options locally	MMMPO, DOH

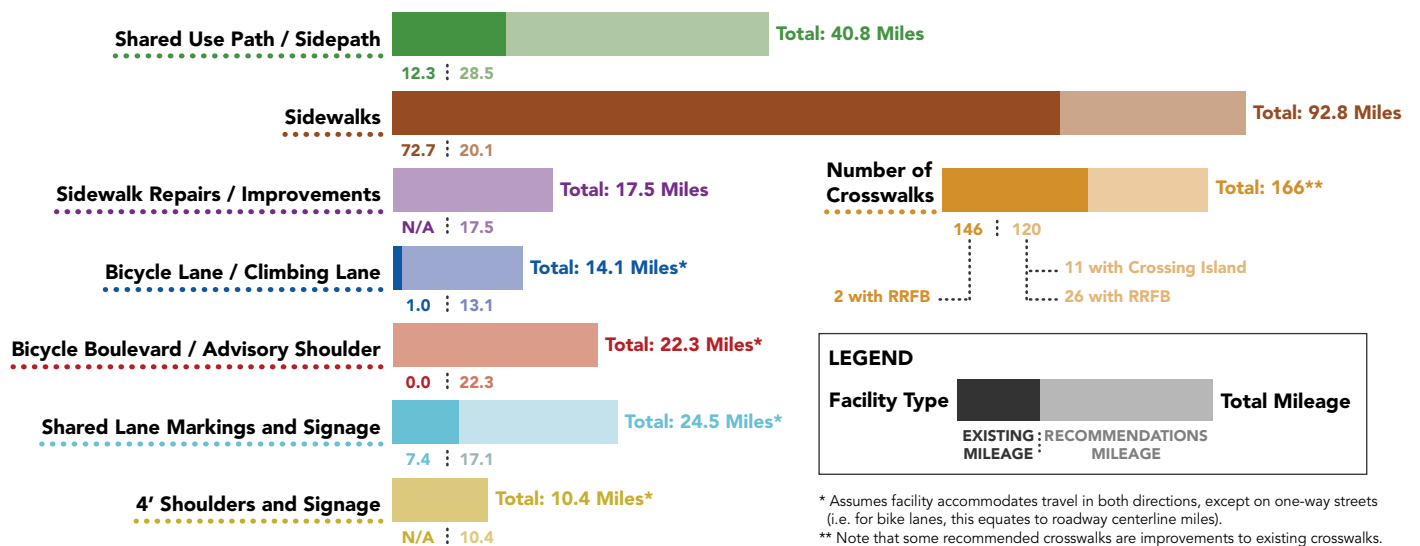


7. NETWORK RECOMMENDATIONS

This chapter features a toolkit of pedestrian- and bicycle-related facilities that are an appropriate fit for the network recommendations for the region. Both the planning team's existing

conditions analysis and public engagement described in earlier chapters informed the network recommendations summarized below and illustrated in maps 12-15.

SUMMARY OF NETWORK RECOMMENDATIONS



7.1 PEDESTRIAN FACILITIES TOOLKIT

The recommended networks will be comprised of pedestrian and bicycle toolkits of infrastructure improvements. Some of the design options presented are extant in the region, while others would be unique in the Morgantown region. All have received approval by FHWA and appear in various manuals and guidelines, including MUTCD, the AASHTO Guide for the Development of Bicycling Facilities, and others.

NEW SIDEWALK

New 5-foot-wide sidewalk, primarily concrete with curb but in some areas may be asphalt and/or with landscaped offset from street

REPAIR SIDEWALK

Repair of sidewalk due to spalling or cracked concrete, broken asphalt, or other significant maintenance issues

RECURB SIDEWALK

New concrete or granite curbing on critical roadways where existing curb is either missing, damaged or very close to street grade

PEDESTRIAN LIGHTING

New pedestrian-scale lighting along rail trail

PEDESTRIAN/BICYCLIST BRIDGE OR UNDERPASS

10- to 14-foot-wide pedestrian/bicyclist bridge over busy roadway with ramps required typically on one side only depending on grade (underpass in one location: at Rt. 705 near Stewartstown Road to link to Suncrest Town Center)

TRAIL ACCESS POINT

Typically a switchback path that provides a connection from an adjacent street, open space, or property to the rail-trail or Decker's Creek Trail



Existing sidewalk downtown



Example pedestrian/bike bridge



Example trail access point

NEW CROSSWALK

Striped crosswalk (continental/piano key style) at an intersection where none exists or - in a few places - midblock, where pedestrian demand can be expected

CROSSWALK WITH PEDESTRIAN SIGNAL

New crosswalk at an existing traffic signal where pedestrian signal head, push button, and countdown timers are missing

CROSSWALK WITH MEDIAN ISLAND

New crosswalk and median island to provide a pedestrian refuge between opposing directions of traffic

CROSSWALK WITH RRFB

New crosswalk with installation of low-cost, solar-powered Rectangular Rapid Flashing Beacon (RRFB) facing each direction of traffic

CROSSWALK WITH BUMP OUTS

New crosswalk with bump outs (aka curb extensions) at each end to reduce the crossing distance and make pedestrians more visible to motorists

PEDESTRIAN HYBRID BEACON (HAWK)

A pedestrian-activated beacon that features a unique yellow and red lighting cycle that requires motorists to stop at the existing or proposed crosswalk location



Example crosswalk with median island



Example of crosswalk with RRFB



Example of crosswalk with Bump out

INTERSECTION IMPROVEMENTS FOR PEDESTRIANS

CROSSWALKS

Crosswalks accommodate pedestrian access and mobility, and if well-designed and appropriately placed, can increase pedestrian safety and comfort. Crosswalks should be installed at grade and across all legs of a signalized intersection, unless pedestrians are prohibited or where there are other extenuating circumstances. To increase accessibility, crosswalks should be paired with curb ramps, detectable warnings, and pedestrian countdown signals. Where crosswalks traverse multi-lane roads, they should be paired with a median refuge island that separates motor vehicle travel directions and shortens the crossing distance for pedestrians.

Raised Crosswalk



Raised crosswalks create a visual cue that forces drivers to slow down as they approach an intersection.

Pedestrian Countdown Signals



Pedestrian Countdown Signals, usually located at signalized intersections, indicate to pedestrians how much time remains for them to cross an intersection.

Lead Pedestrian Interval



A Lead Pedestrian Interval (LPI) is a 3-5 second interval prior to a green light so that pedestrians can begin their crossing movement before turning motor vehicles.

Curb Extensions



Curb extensions improve visibility and reduce pedestrian crossing distances. By reducing turning radius, bulb outs reduce vehicle speeds which increase the chance of survival for a pedestrian in the event of a collision.

Median Refuge Island



Median refuge islands are protected spaces placed in the center of the street to facilitate bicycle and pedestrian crossings. They are especially helpful when placed on wide roadways which may have long crossing times.

Curb Ramps



Curb ramps are needed to improve travel for all residents regardless of ability or age. Smooth transitions to the street with textured warning strips coupled with wide sidewalks provide direct, predictable, and accessible streetscapes.

Pedestrian Hybrid Beacon



Photo: www.news-leader.com

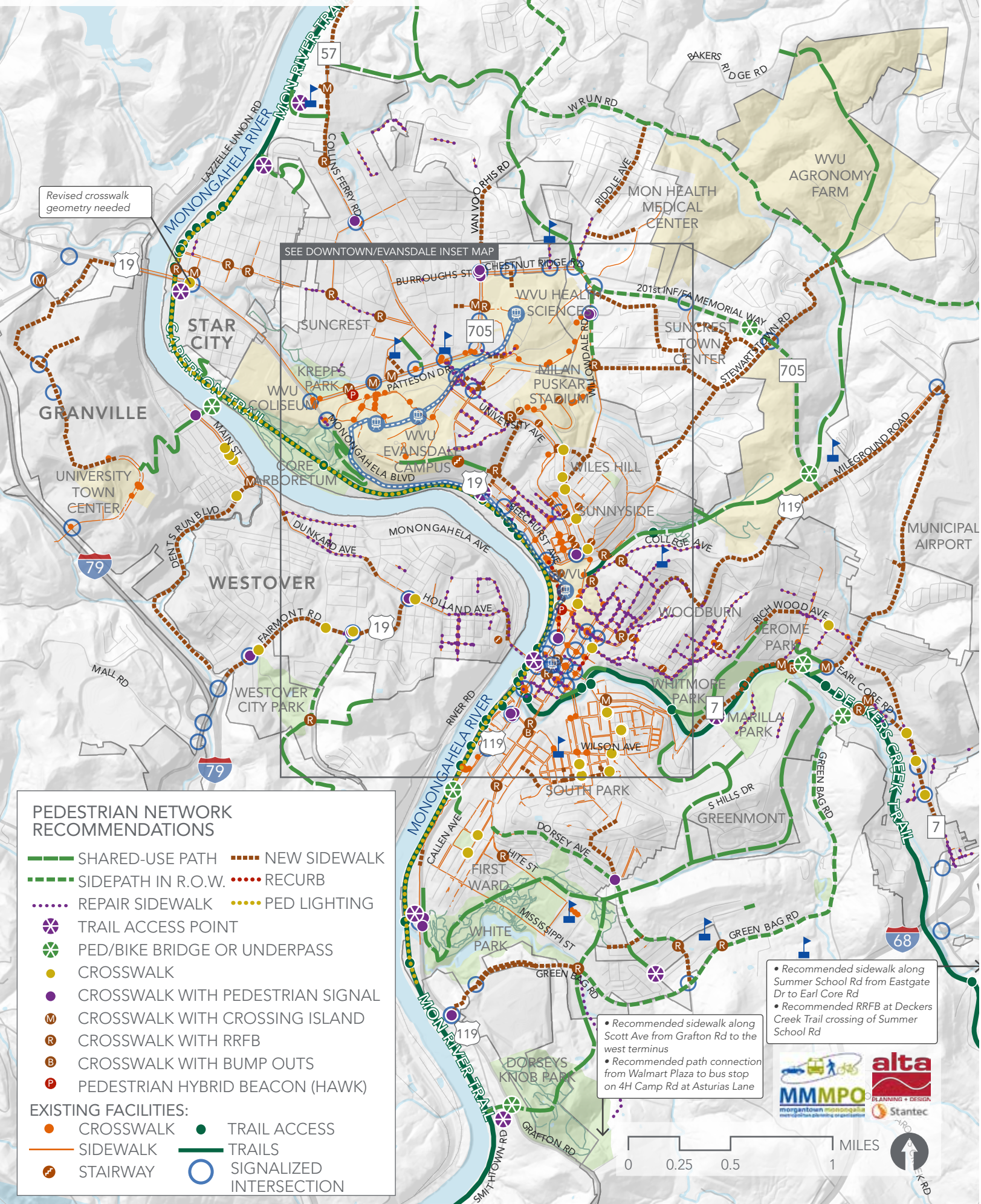
Pedestrian Hybrid Beacons are sometimes called HAWK signals, and are designed to accommodate pedestrian and bicycle crossing of busy or high-speed roadways at midblock crossing points or at uncontrolled intersections.

RRFB



Rectangular Rapid Flashing Beacons (RRFBs) are user-actuated warning beacons located at unsignalized intersections or mid-block crossings.

MAP 12: PEDESTRIAN NETWORK (REGION)



Revised crosswalk geometry needed

SEE DOWNTOWN/EVANSDALE INSET MAP

PEDESTRIAN NETWORK RECOMMENDATIONS

- SHARED-USE PATH
- - - SIDEPATH IN R.O.W.
- ⋯ REPAIR SIDEWALK
- ✳ TRAIL ACCESS POINT
- ✳ PED/BIKE BRIDGE OR UNDERPASS
- CROSSWALK
- CROSSWALK WITH PEDESTRIAN SIGNAL
- M CROSSWALK WITH CROSSING ISLAND
- R CROSSWALK WITH RRFB
- B CROSSWALK WITH BUMP OUTS
- P PEDESTRIAN HYBRID BEACON (HAWK)
- NEW SIDEWALK
- ⋯ RECURB
- ⋯ PED LIGHTING

EXISTING FACILITIES:

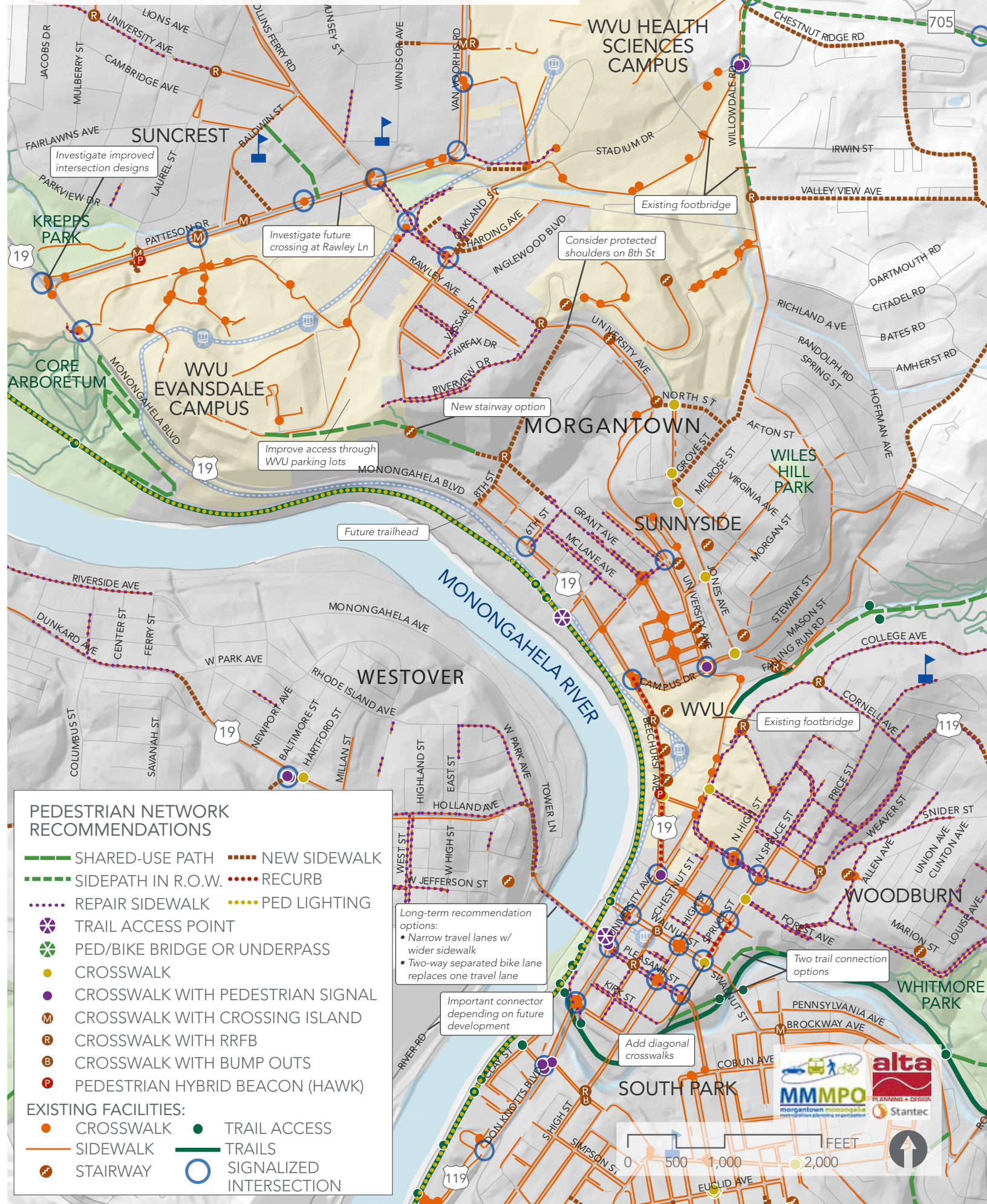
- CROSSWALK
- TRAIL ACCESS
- SIDEWALK
- TRAILS
- STAIRWAY
- SIGNALIZED INTERSECTION

- Recommended sidewalk along Summer School Rd from Eastgate Dr to Earl Core Rd
- Recommended RRFB at Deckers Creek Trail crossing of Summer School Rd

- Recommended sidewalk along Scott Ave from Grafton Rd to the west terminus
- Recommended path connection from Walmart Plaza to bus stop on 4H Camp Rd at Asturias Lane



MAP 13: PEDESTRIAN NETWORK (DOWNTOWN/EVANSDALE)



PEDESTRIAN NETWORK RECOMMENDATIONS

- SHARED-USE PATH
- - - SIDEPATH IN R.O.W.
- ⋯ REPAIR SIDEWALK
- ⊗ TRAIL ACCESS POINT
- ⊗ PED/BIKE BRIDGE OR UNDERPASS
- CROSSWALK
- CROSSWALK WITH PEDESTRIAN SIGNAL
- M CROSSWALK WITH CROSSING ISLAND
- R CROSSWALK WITH RRFB
- B CROSSWALK WITH BUMP OUTS
- P PEDESTRIAN HYBRID BEACON (HAWK)
- - - NEW SIDEWALK
- ⋯ RECURB
- ⋯ PED LIGHTING
- ⊗ STAIRWAY
- TRAIL ACCESS
- TRAILS
- SIGNALIZED INTERSECTION

EXISTING FACILITIES:

- CROSSWALK
- SIDEWALK
- ⊗ STAIRWAY
- TRAIL ACCESS
- TRAILS
- SIGNALIZED INTERSECTION

Long-term recommendation options:
 • Narrow travel lanes w/ wider sidewalk
 • Two-way separated bike lane replaces one travel lane

Important connector depending on future development

Add diagonal crosswalks

Two trail connection options



7.2 BICYCLE FACILITIES TOOLKIT

SHARED-USE PATH

A multi-use, 10-foot-wide paved or crushed stone path for non-motorized users through undeveloped areas or along waterways



Example of shared use path

SIDEPATH IN ROW

A multi-use, 10-foot-wide paved path for non-motorized users within a public right-of-way and immediately adjacent to the roadways



Example of striped bike lane

BICYCLE LANE

A painted 5- to 6-foot-wide travel lane for bicyclists, typically in both directions of travel

CLIMBING BICYCLE LANE

A painted 4- to 5-foot-wide travel lane for bicyclists in the uphill direction with shared lane markings in the downhill direction



Example of bicycle climbing lane

ADVISORY SHOULDER

A broken shoulder lane line that creates space for pedestrians and bicyclists along roadways without room for bicycle lanes and/or sidewalks; motor vehicle use is permitted when pedestrians or bicyclists are not present



Example of advisory shoulder

BICYCLE BOULEVARD

A low-volume and/or low-speed roadway with traffic calming elements such as speed humps, shared lane markings, and signs

SHARED LANE MARKINGS & SIGNAGE

Shared lane markings and signs on roads without space for bicycle lanes

MINIMUM 4-FOOT SHOULDER & SIGNAGE

Shoulder striping on roads with heavy traffic volumes, lacking space for full bicycle lanes, and/or in need of designated shoulder space

IMPROVED INTERSECTION CROSSING

While accommodations for bicyclists should be considered at all intersections, these represent improvements such as bicycle signals, special lighting, and crossing medians at locations where future shared-use paths cross busy roadways or other prominent intersections



Example of bicycle boulevard treatment



Example of signed bike route and shoulder



Example of improved intersection for bicyclists

BICYCLE BOULEVARD

Cities throughout the region could designate a group of neighborhood streets as a Bicycle Boulevard. The goal is to create a low-stress bicycle route by reducing traffic volume and/or speed. Traffic calming elements that slow and divert through-traffic provide a more comfortable environment for a wider variety of bicyclists. A Bicycle Boulevard utilizes a range of context-sensitive bicycle improvements for streets that are typically residential with low traffic volumes/ speeds and run parallel to a busier roadway, e.g. West Park Ave relative to Holland Ave in Westover.



MUTCD R4-11: These signs encourage motorists to defer to bicyclists on low volume streets

HORIZONTAL + VERTICAL DEFLECTION

Horizontal traffic calming devices cause drivers to slow down by constricting the roadway space or by requiring careful maneuvering. Speed humps can also be used to slow traffic, especially when paired with a crosswalk.

Curb Extensions



Curb extensions reduce turn radii, turning speed, and reduce pedestrian crossing distance.

Chokers



Chokers create pinch-points that reduce speeds mid-block.

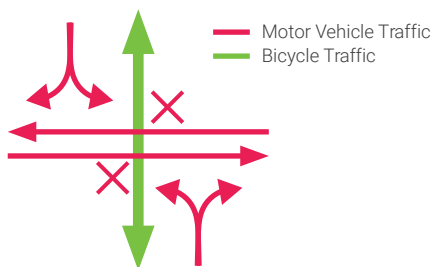
Raised Crossing



Raised crosswalks improve safety for all road users.

VOLUME REDUCTION STRATEGIES

Maintaining motor vehicle volumes below 3,000 per day (1,000-1,500 is ideal) greatly improves bicyclists' comfort. To manage volume, physical or operational measures can be implemented on routes that have been identified as a bicycle boulevard.



Volume management tactics help to divert traffic away from neighborhood residential streets, improving bicyclists' comfort.

Traffic Restriction Signage



The most straightforward traffic volume reduction strategy are signs restricting motor vehicle through movement, including stop signs on side street approaches to favor bike boulevard traffic.

Median Traffic Diverters



Median traffic diverters restrict through motor vehicle movement while providing a refuge for bicyclists to cross the busier roadway in two stages.

INTERSECTION IMPROVEMENTS FOR BICYCLISTS

Intersection Improvements*: Striping bicycle facilities at or through intersections can provide a more comfortable bicycling environment by providing bicyclists with guidance on where to wait for a signal to change or a well-marked route through the intersection to a continuation of the bikeway. By establishing a clear boundary, intersection lane markings effectively mark the paths of travel for through bicyclists and turning bicyclists, as well as through and turning motor vehicles. The use of green colored pavement raises awareness for all road users to potential conflict areas.

Bike Box



A bike box places riders in a designated area ahead of queuing traffic during the red signal phase, also helping to reduce right-hook conflicts.

Two-Stage Turn Box



For bicyclists uncomfortable sharing lanes with turning traffic, a two-stage turn boxes offers a more comfortable left-turn option.

Bicycle Signal

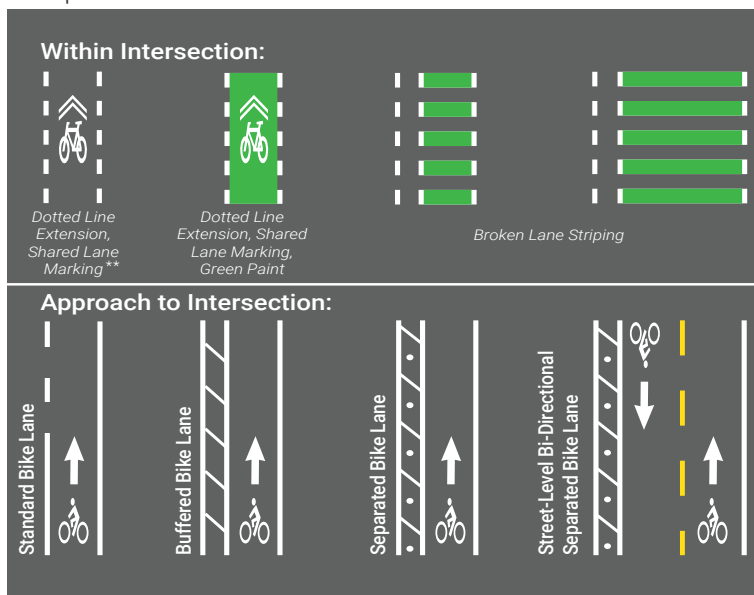


Bicycle signals facilitate bicyclist crossings of roadways by clarifying when to enter and by restricting other movements during the bicycle phase.

*Potential treatments shown here have received Interim Approval from FHWA but are not yet formally incorporated into the Manual of Uniform Traffic Control Devices (MUTCD)

INTERSECTION CROSSING MARKINGS

Intersection crossing markings are extended striped bicycle facilities through intersections, clarifying to motorists where to expect bicyclists. This can be especially important at wide and complex intersections.

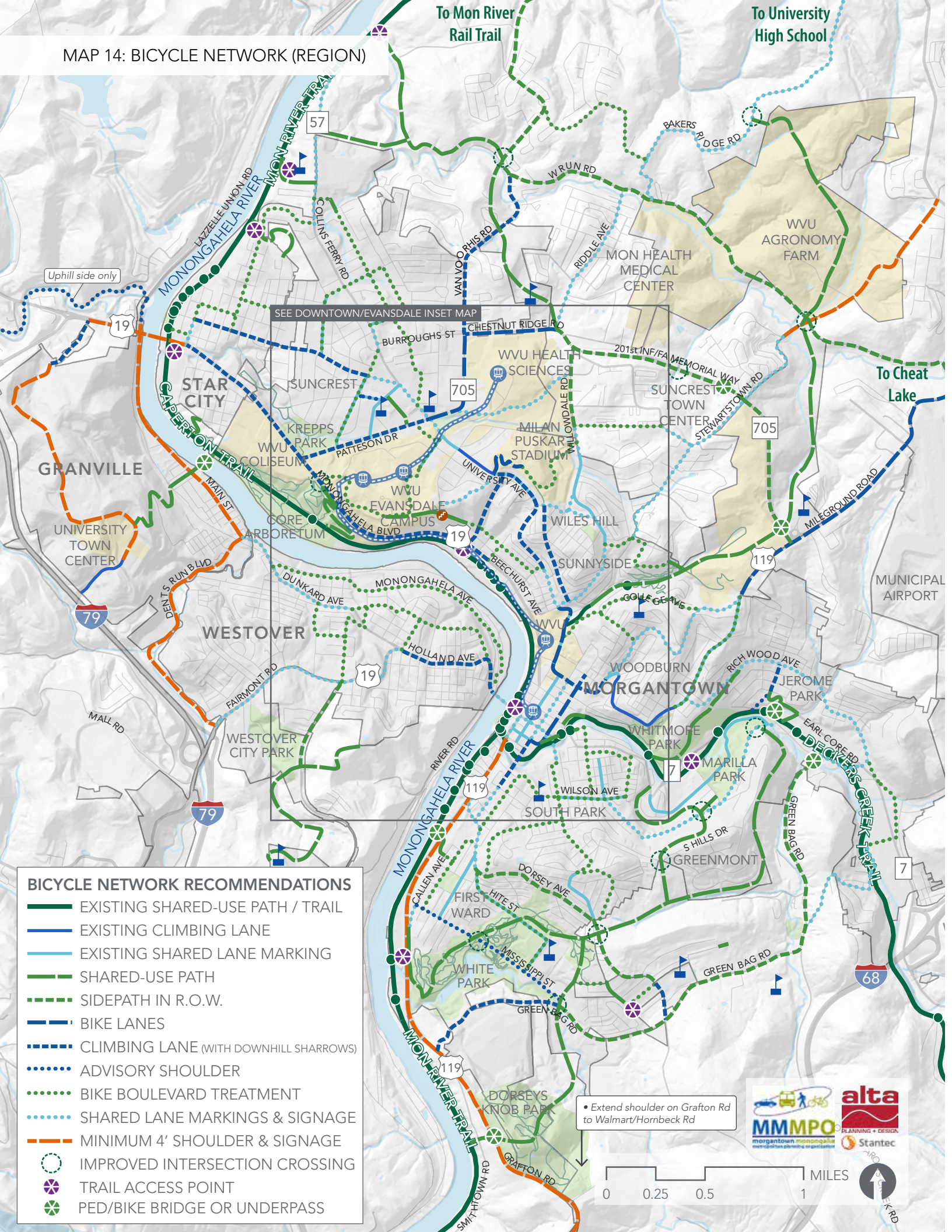


Bikeway Design Guide

DESIGN FEATURES

- Striping adjacent to motor vehicle travel lanes shall be 6" wide
- Broken lane lines should be 2 foot-long lines with 2' to 6' spacing
- Shared lane markings, chevrons, and helmeted rider stencils may be used to increase visibility and awareness of an approaching conflict area, and can be used across the entire intersection
- Crossing lane width should match adjoining bicycle facility width

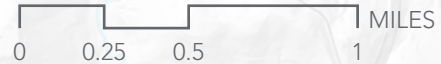
MAP 14: BICYCLE NETWORK (REGION)



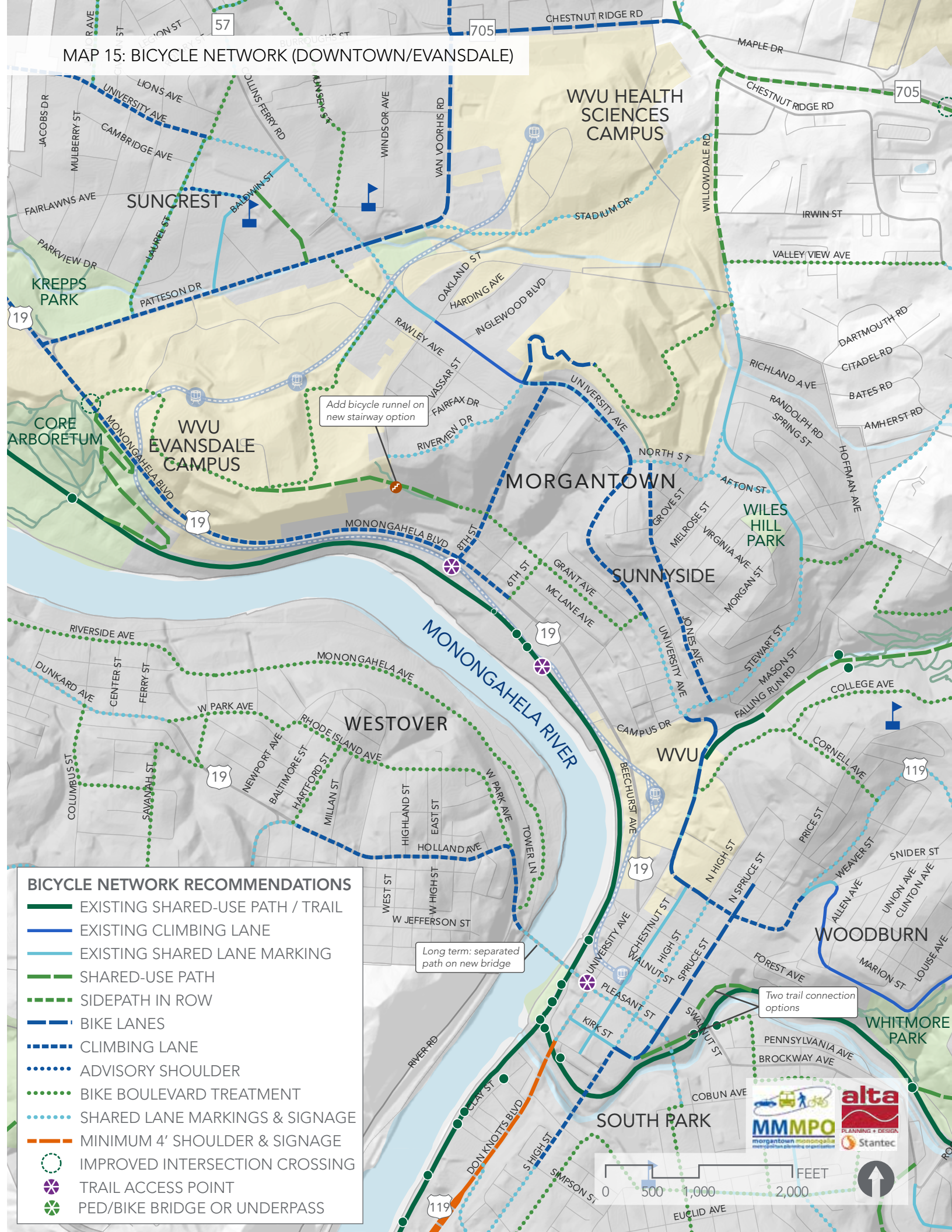
BICYCLE NETWORK RECOMMENDATIONS

- EXISTING SHARED-USE PATH / TRAIL
- EXISTING CLIMBING LANE
- EXISTING SHARED LANE MARKING
- SHARED-USE PATH
- SIDEPATH IN R.O.W.
- BIKE LANES
- CLIMBING LANE (WITH DOWNHILL SHARROWS)
- ADVISORY SHOULDER
- BIKE BOULEVARD TREATMENT
- SHARED LANE MARKINGS & SIGNAGE
- MINIMUM 4' SHOULDER & SIGNAGE
- IMPROVED INTERSECTION CROSSING
- TRAIL ACCESS POINT
- PED/BIKE BRIDGE OR UNDERPASS

• Extend shoulder on Grafton Rd to Walmart/Hornbeck Rd



MAP 15: BICYCLE NETWORK (DOWNTOWN/EVANSDALE)



Add bicycle runnel on new stairway option

Long term: separated path on new bridge

Two trail connection options

BICYCLE NETWORK RECOMMENDATIONS

- EXISTING SHARED-USE PATH / TRAIL
- EXISTING CLIMBING LANE
- EXISTING SHARED LANE MARKING
- SHARED-USE PATH
- SIDEPATH IN ROW
- BIKE LANES
- CLIMBING LANE
- ADVISORY SHOULDER
- BIKE BOULEVARD TREATMENT
- SHARED LANE MARKINGS & SIGNAGE
- MINIMUM 4' SHOULDER & SIGNAGE
- IMPROVED INTERSECTION CROSSING
- TRAIL ACCESS POINT
- PED/BIKE BRIDGE OR UNDERPASS



7.3 PEDESTRIAN/BICYCLE FACILITY SAFETY BENEFITS*

- Marked crosswalks are **best used in combination with other treatments** such as curb extensions, raised crossing islands, traffic signals, roadway narrowing, enhanced overhead lighting, and traffic calming measures.
- Traffic and roadway factors found to be related to a greater frequency of pedestrian crashes included **higher pedestrian volumes, higher traffic volumes, and a greater number of lanes.**
- The presence of a **raised median or raised crossing island was associated with a significantly lower pedestrian crash rate** at multi-lane sites with both marked and unmarked crosswalks.
- On **two-lane roads**, there were **no significant differences in the pedestrian crash rate at intersections** with marked or unmarked crosswalks.
- On multi-lane roads (>2 traffic lanes and >12,000 vehicles per day), a marked crosswalk **by itself** at an uncontrolled intersection, **without other substantial improvements****, was associated with a higher pedestrian crash rate compared to an unmarked crosswalk.
- **Motorists failing to yield represented a large percentage of pedestrian crashes** in both marked and unmarked crosswalks. More pedestrian-friendly roadway designs may be helpful in reducing pedestrian crashes.
- Although installing marked crosswalks alone may not be the final solution to safe pedestrian crossings, **the safety needs of pedestrians must not be ignored.** Updates to engineering designs, enforcement programs, education programs, and legislation may help provide safer pedestrian crossings.
- One study found no evidence of more aggressive crossing behavior or less vigilance by pedestrians when crossing at a marked crosswalk vs. unmarked, i.e. **no evidence that crosswalks created a “false sense of security.”**
- **Vehicle speeds are reduced when motorists approached marked crossings** vs. unmarked crossings and in some cases motorists had higher yielding behavior.

*Pedestrian crossing safety information was obtained from the following sources:

- Federal Highway Administration. 2002. Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines, by Zeeger, C.; Stewart, R.; Huang, H.; and Lagerway, P.

- Pedestrian and Bicycle Information Center. 2014. Evaluation of Pedestrian-Related Roadway Measures: A Summary of Available Research

**Includes new traffic signals (if warranted), Pedestrian Hybrid Beacons, Median Refuge Islands and Rectangular Rapid Flash Beacons (RRFBs)

Table 13: Pedestrian safety countermeasures

FACILITY DESIGN TREATMENT	SAFETY IMPACT	SOURCE
Raised medians	46% reduction in crashes at marked crosswalks and 39% reduction in crashes at unmarked crosswalks	L. Zegeer, C., Lyons, S., Sokolow, G., Ecklund, J., Pedestrian Bicycle Information Center. Federal Highway Administration (Webinar.) May 30, 2012.
Pedestrian crossing island	56% reduction in pedestrian crashes. "Transportation agencies should consider medians or pedestrian crossing islands in curbed sections of urban and suburban multi-lane roadways with a significant mix of pedestrians and vehicle traffic and intermediate or high travel speeds. Example locations...include: mid-block areas, approaches to multi-lane intersections, and areas near transit stops or other pedestrian focused sites."	https://safety.fhwa.dot.gov/provencountermeasures/
Lead pedestrian interval (LPI)	60% Reduction in pedestrian-vehicle crashes at intersections with LPI	https://safety.fhwa.dot.gov/provencountermeasures/lead_ped_int/
Sidewalk along roadway	65% - 89% pedestrian crash reduction	https://safety.fhwa.dot.gov/provencountermeasures/
Convert unsignalized intersection to roundabout	27% pedestrian crash reduction	https://safety.fhwa.dot.gov/provencountermeasures/
Paved shoulders	71% reduction in crashes involving pedestrians walking along roadways	https://safety.fhwa.dot.gov/provencountermeasures
Pedestrian hybrid beacon	69% reduction in pedestrian crashes, 29% reduction in total crashes, and 15% reduction in serious injury or fatal crashes	https://safety.fhwa.dot.gov/provencountermeasures
Countdown signals	Up to 52% crash reduction in pedestrian injuries in a large-scale study in San Francisco	F. Markovitz, S. Sciortino, J. Fleck, and B. Yee, "Pedestrian Countdown Signals: Experience with an Extensive Pilot Installation," ITE Journal, 2006.

For additional information, data and links related to bicycle and pedestrian safety countermeasures that could be implemented in the Morgantown region, see:
http://www.pedbikeinfo.org/cms/downloads/PedestrianLitReview_April2014.pdf#page=27&zoom=100,69,330

Table 14: Bicycle safety countermeasures

FACILITY DESIGN TREATMENT	SAFETY IMPACT	SOURCE
Bicycle lanes	36% bicycle crash reduction	https://safety.fhwa.dot.gov/provencountermeasures/
Protected bicycle lanes	40% reduction in crashes for all users	https://safety.fhwa.dot.gov/provencountermeasures/
Bicycle box (advance stop bar and dedicated space for bicyclists)	36% bicycle crash reduction	https://safety.fhwa.dot.gov/provencountermeasures/
Colored bicycle lanes in conflict areas	15% motorist yield rate increase and 36% motorist turn signal rate increase	Federal Highway Administration. Desktop Reference for Crash Reduction Factors. http://safety.fhwa.dot.gov/
Road diet (4-lane to 3-lane with center two-way left-turn lane)	19% - 47% reduction in total crashes	https://safety.fhwa.dot.gov/provencountermeasures/

For additional information, data and links related to bicycle and pedestrian safety countermeasures that could be implemented in the Morgantown region, see:
http://www.pedbikeinfo.org/cms/downloads/PedestrianLitReview_April2014.pdf#page=27&zoom=100,69,330

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7.4 SAFETY-RELATED PROJECTS

This section identifies 20 (10 bike and 10 pedestrian) high-priority projects which emphasize safety for bicyclists and pedestrians. These projects are highlighted here due to their impact on safety for vulnerable road users.

The selection was based on a number of factors, including high frequency of crashes adjacent to the proposed project, proximity to high-need areas (e.g., schools), and input from the public and the Steering Committee.

PEDESTRIAN SAFETY PROJECTS

- Crosswalk, median island, and HAWK signal on Patteson Drive at Laurel Street
- Crosswalk, median island, and RRFB on Powell Avenue / Route 7 at Mineral Avenue and Deckers Creek Boulevard
- RRFBs on University Avenue in Star City
- Sidewalk, crosswalk, and median island on Collins Ferry Road near Suncrest Elementary School
- Crosswalk at Jones Avenue and Stewart Street
- Crosswalk at Holland Avenue and Hartford Street
- Crosswalk with RRFB and bump outs at High Street and Prairie Avenue
- Crosswalks with HAWK signal at Beechurst Avenue and Hough Street
- Sidewalk on 8th Street from Monongahela Boulevard to University Avenue
- Sidewalk on Fairmont Road from Savannah Street to Holland Avenue



Intersection of Powell Ave and Mineral Ave



Collins Ferry Road adjacent to Suncrest Elementary

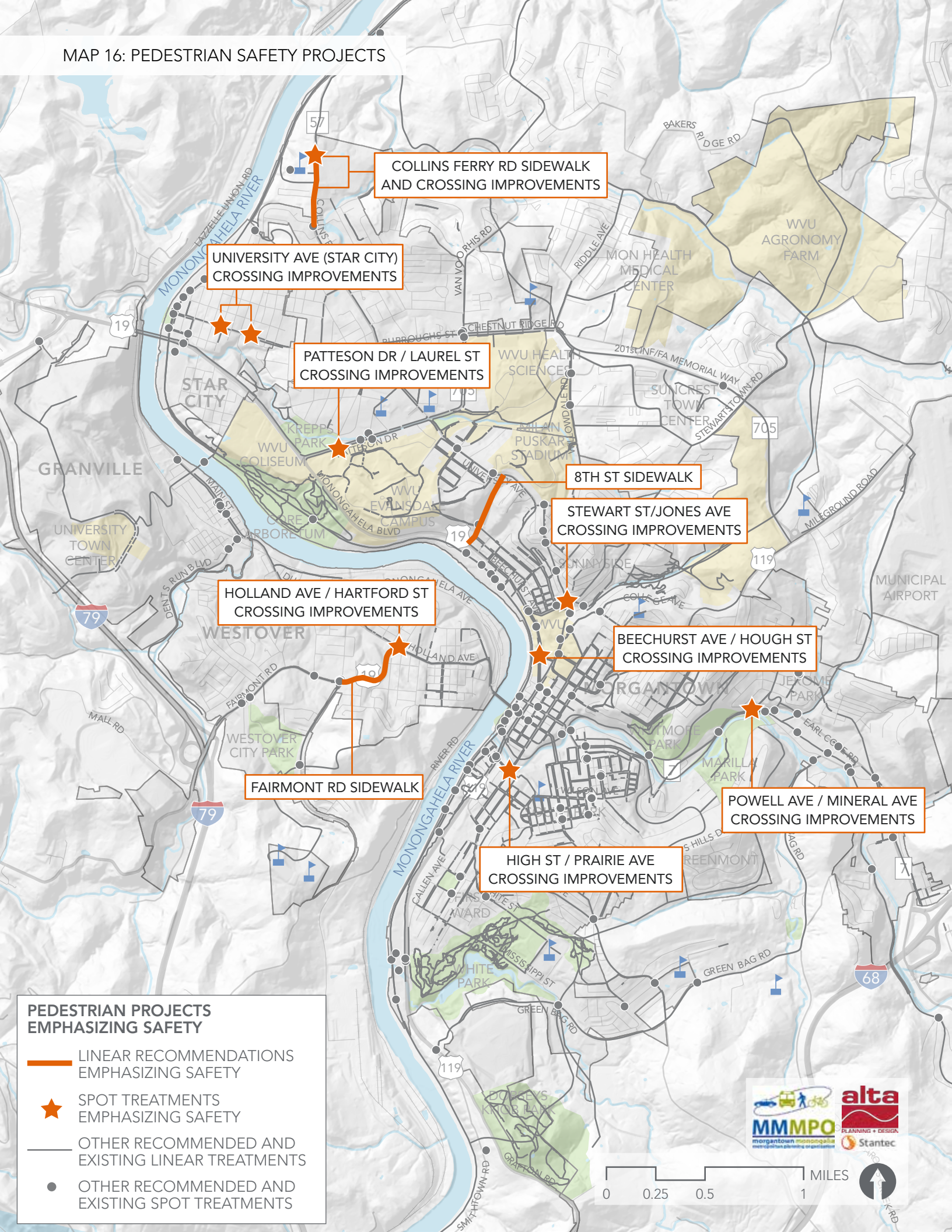


Intersection of Beechurst Ave and Hough St



*Intersection of Patteson Dr and Laurel St
(Source: Google)*

MAP 16: PEDESTRIAN SAFETY PROJECTS



COLLINS FERRY RD SIDEWALK AND CROSSING IMPROVEMENTS

UNIVERSITY AVE (STAR CITY) CROSSING IMPROVEMENTS

PATTESON DR / LAUREL ST CROSSING IMPROVEMENTS

8TH ST SIDEWALK

STEWART ST/JONES AVE CROSSING IMPROVEMENTS

HOLLAND AVE / HARTFORD ST CROSSING IMPROVEMENTS





BEECHURST AVE / HOUGH ST CROSSING IMPROVEMENTS

FAIRMONT RD SIDEWALK

POWELL AVE / MINERAL AVE CROSSING IMPROVEMENTS

HIGH ST / PRAIRIE AVE CROSSING IMPROVEMENTS

PEDESTRIAN PROJECTS EMPHASIZING SAFETY

-  LINEAR RECOMMENDATIONS EMPHASIZING SAFETY
-  SPOT TREATMENTS EMPHASIZING SAFETY
-  OTHER RECOMMENDED AND EXISTING LINEAR TREATMENTS
-  OTHER RECOMMENDED AND EXISTING SPOT TREATMENTS



BICYCLE SAFETY PROJECTS

- Pleasant Street / Westover Bridge shared lane markings and signage and University Avenue shared lane markings and signage at the intersection (short-term project)
- Willey Street climbing lane from High Street to Richwood Avenue
- Mileground Road bike lanes from Herman Avenue to Airport Boulevard
- High Street shared lane markings and signage from Willey Street to Pleasant Street
- Monongahela Boulevard climbing lane from 6th Street to Patteson Drive
- Chestnut Ridge Road and Van Voorhis Road bike lanes from University Avenue to Riddle Avenue
- University Avenue climbing lane from Boyers Avenue in Star City to Laurel Street in Morgantown
- Green Bag Road sidepath
- Monongahela Avenue bike boulevard in Westover
- Spruce Avenue bike lane downtown from Pleasant Street to Prospect Street

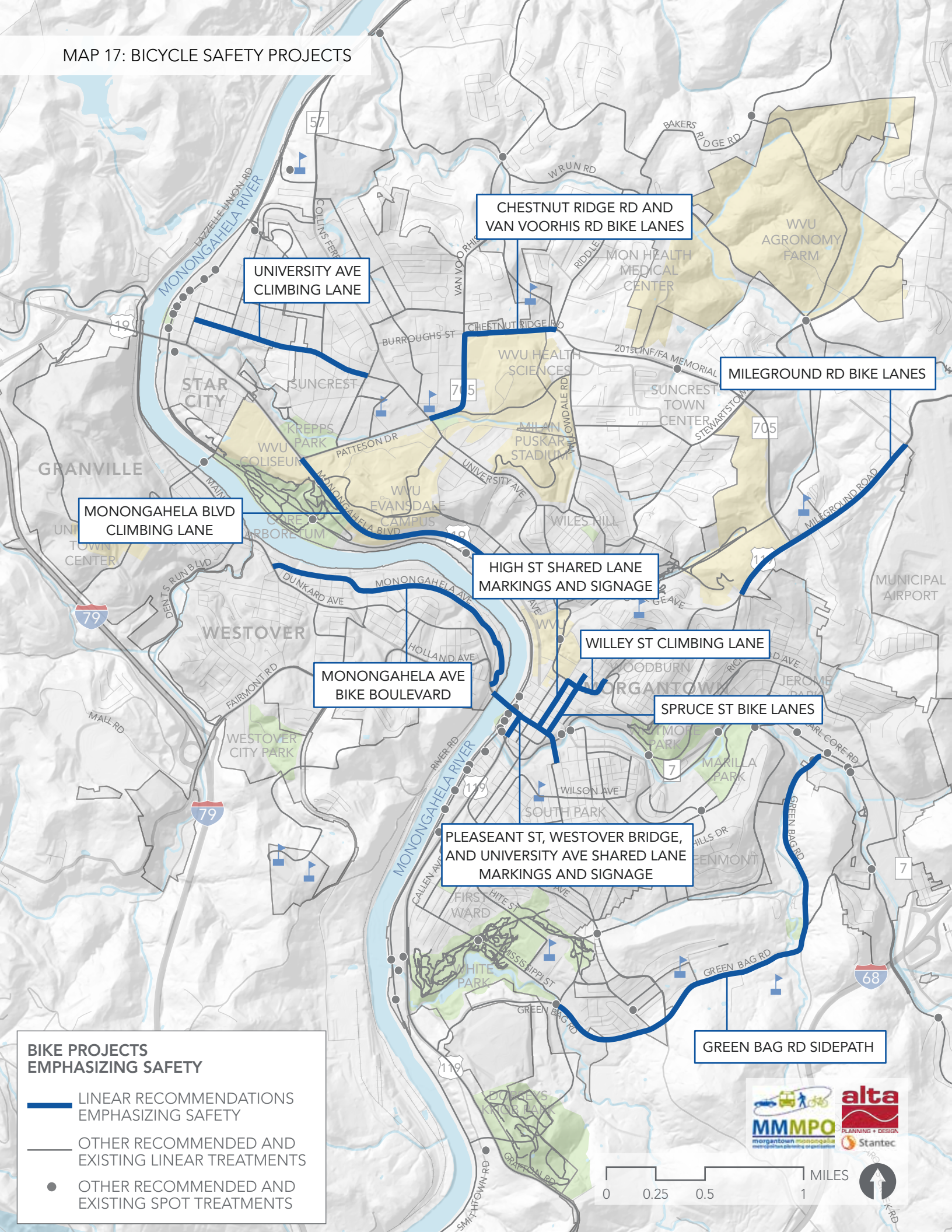


Green Bag Road



University Ave in Star City

MAP 17: BICYCLE SAFETY PROJECTS



UNIVERSITY AVE
CLIMBING LANE

CHESTNUT RIDGE RD AND
VAN VOORHIS RD BIKE LANES

MILEGROUND RD BIKE LANES

MONONGAHELA BLVD
CLIMBING LANE

HIGH ST SHARED LANE
MARKINGS AND SIGNAGE

WILLEY ST CLIMBING LANE




MONONGAHELA AVE
BIKE BOULEVARD

SPRUCE ST BIKE LANES

PLEASANT ST, WESTOVER BRIDGE,
AND UNIVERSITY AVE SHARED LANE
MARKINGS AND SIGNAGE

GREEN BAG RD SIDEPATH

**BIKE PROJECTS
EMPHASIZING SAFETY**

-  LINEAR RECOMMENDATIONS EMPHASIZING SAFETY
-  OTHER RECOMMENDED AND EXISTING LINEAR TREATMENTS
-  OTHER RECOMMENDED AND EXISTING SPOT TREATMENTS



7.5 BICYCLE & PEDESTRIAN AMENITIES

Bike and pedestrian amenities as well as streetscape enhancements help make roadways and trails more welcoming to all users. They also result in a traffic calming effect along busy corridors. Enhancements such as lighting, seating, bike parking, and other active transportation amenities make biking and walking networks more functional for bicyclists and pedestrians and help promote alternative modes of transportation.

LIGHTING

Lighting for trails should be analyzed per segment context with full consideration for safety needs, sensitive habitats, trail function, and maintenance commitments. Street lighting can improve visibility of the crossing and trail users for motorists. Lighting may also be necessary for day-time use in trail tunnels and underpasses.

Recommended locations for lighting include parking areas, restroom facilities, major trail intersections, bridges, underpasses, tunnels, and street crossings.

Design features for lighting include:

- Design lighting levels appropriate to each situation.
- Lighting should be at pedestrian scale and depends on the type and intensity of lights. 30-50 ft spacing is common for pedestrian scale lighting.
- Lighting should avoid trees and be placed outside of canopy edge where possible.

- Solar powered lighting is available where utility connection is difficult or when alternative energy sources are desired. Daylight hours should be analyzed per season prior to specifying solar lighting.
- Avoid light fixtures at eye level that could impair visibility.
- Dependent upon trail hours, consider uses in urban and/or commercial land use areas.
- Local jurisdiction ordinances should be consulted to determine lighting requirements and limitations.
- Lighting placement and fixtures should minimize light pollution for adjacent neighborhoods and environments.



Site with Multiple Amenities: Seating, Trash Receptacle, and Lighting

SEATING

Seating along trails provides a place for trail users to rest, congregate, contemplate, or people-watch along trails and throughout the trail system. Benches can be designed to create identity in a place or along the trail or be strictly utilitarian. Picnic tables provide places for trail users to congregate for meals or to relax.

Design features for seating include:

- Locate all seating (and other site furniture) a minimum of 3' from the edge of the trail.
- Locate benches a minimum of 4' from restrooms, phone booths and drinking fountains and a minimum of 2' from trash receptacles, light poles and sign posts.
- Seating should be placed in shaded area, especially where there is minimal shade available.
- Drainage should slope away from the bench and the trail.
- Placement of benches should provide interesting views, be close to an educational or historical trail element, and offer shade or shelter from seasonal winds.
- All seating placement should consider accessibility, including grade leading to seating areas. Wheelchair access should be possible at some seating areas, especially along ADA accessible trail sections. ADA Standards for Accessible Design seating and turn radius should be considered for access to seating.

Examples of potential seating options





Shade Structure Example

TRASH AND RECYCLING RECEPTACLES

Trash and recycle receptacles provide for proper maintenance and appearance of the trail system.

Design features for receptacles include:

- Locate receptacles at each trailhead and each seating area (1 per every 1 picnic table, 1 per every 2 benches).
- Placement of other receptacles will depend upon the location of concessions, facilities and areas of group activities.
- Receptacles should be selected using the following criteria:
 - Expected trash amount
 - Maintenance program requirements
 - Types of trail users
 - Durability



Trash Receptacle Example

SHADE STRUCTURE

Whether it be protection from the rain or a place to rest during a sunny day, shade structures and shelters create comfort and protection for all trail users.

Design features for shade structures include:

- The orientation of structures should be considered to provide maximum protection from elements.
- Can be placed in any setting (grass, concrete, asphalt, etc) with considerations for ADA access to and into the structure.
- Plants may be incorporated into the design of the structures especially where they can provide additional user benefits (vines or greenwall for cooling effect). Additional plantings should be context sensitive and mindful of the maintaining agency's capacity.
- Structures should not impede bicycle and/or pedestrian movement and shall be located adjacent to the trail (not within the travelway).
- Structures should not block viewsheds of historic, natural, or cultural elements.
- Structures should incorporate other amenities, especially benches and picnic tables.



Bike Parking Example

BIKE PARKING

Short-term bicycle parking is meant to accommodate users departing in two hours or less. Racks should be placed adjacent to comfort stations, visitor centers, seating areas, and be weather protected where possible. The Association for Pedestrian and Bicycle Professionals (APBP) provides standards for bike rack design, spacing, and placement. Local, state, and federal codes should be consulted for additional count requirements and installation regulations.

Design features for bike parking include:

- In urban settings: 2' minimum from the curb face to avoid 'dooring.'
- Close to destinations; 50' maximum distance from main building entrance.
- Minimum clear distance of 6' should be provided between the bicycle rack and a property line.
- Should be highly visible from adjacent bicycle routes and pedestrian traffic.
- Locate racks in areas that cyclists are most likely to travel.
- All bicycle parking spaces shall permit the locking of the bicycle frame and one (1) wheel with a U-type lock, support the bicycle in a stable horizontal position without damage to the bicycle, and provide two (2) points of contact with the bicycle's frame.
- Bicycle parking facilities shall be securely anchored so they cannot be easily removed



Bike Repair Station Example

BIKE REPAIR STATIONS

Bicycle repair stations are self-serve kiosks designed to offer a complete set of tools necessary for routine bicycle maintenance. Popular locations include trailheads, access points, plazas, farmer's markets, and any public center of activity that is well monitored and easily accessible by foot or bicycle.

Design features for bike repair stations include:

- Bicycle repair stations should be at least 6' from trail edge to allow room to repair bicycles.
- Stations should be secured to a durable pad, such as concrete.
- Bicycle repair station tools are secured by high security cables, but will still be an attractive target for theft. Proper placement of kiosks in areas of high activity is one key strategy to reduce potential vandalism.



8. PRIORITIZATION

In order to help the Morgantown region prioritize its hundreds of recommended bicycle and pedestrian treatments, the Plan used five criteria to evaluate and score each project based on GIS-based data sources. These criteria were derived from the planning goals established early on the process and are shown at right.

Beyond this **quantitative** scoring methodology, it is also important to consider **qualitative** principles for future implementation of project recommendations as well. The MPO Policy Board's desire is for individual municipalities and Monongalia County to strongly consider safety initiatives related to improved crosswalks (potentially with refuge islands), new pedestrian lighting, safer connections to downtown Morgantown, and protected bicycle lanes where possible.



Safety: number of crashes within 1000' of the recommended project.



Connectivity: pedestrian or bicycle project that connects to existing sidewalk, trail access point, bike lane, bus stop, school, PRT station or university campus within 1000' of the recommended project.



Design: ability of project to reduce level of "traffic stress" for pedestrians and bicyclists (qualitative score).



Equity: use of the equity score of the area where the recommended project lies.



Economy: weighted average of employment and population densities.

DEFAULT PEDESTRIAN FACILITY IMPROVEMENTS

Although not scored and ranked as an individual project, one of the most important recommendations in this plan is for DOH and individual municipalities in the region to provide a collection of pedestrian safety improvements at ALL signalized intersections with crosswalks, unsignalized crosswalk locations, and at trail crossings of busy roadways.

Signalized Intersections: Existing traffic signals should be retrofitted with pedestrian signal heads that include countdown timers. While these exist at many traffic signals in the Morgantown area, they should ultimately be included at all signalized crossing locations. Unless an intersection includes an exclusive pedestrian crossing phase, the signal cycle should be adjusted to provide for a Lead Pedestrian Interval (LPI) during a concurrent crossing phase. The LPI gives pedestrians a 3-5 second head start from motor vehicle traffic to enhance their visibility in the crosswalk, and to reduce the chance of a collision involving a motor vehicle and pedestrian. At intersections with exclusive pedestrian crossing phases (aka "Barnes Dance"), diagonal crosswalks should be considered to encourage pedestrians to avoid a more-lengthy, orthogonal two-stage crossing. Along with drainage issues, the orientation of the existing pedestrian ramp will need to conform with the diagonal crossing to ensure accessibility. The intersection of Spruce and Walnut downtown could be a good candidate for this retrofit.

Unsignalized Crossings: Unsignalized crossings: At existing and recommended crossings either mid-block or at unsignalized intersections, a crosswalk sign assembly should be included at all locations. The package includes a bright yellow retroreflective crosswalk sign (MUTCD W11-2 with W16-7P) at each approach to the crosswalk with an in-street pedestrian crossing sign (MUTCD R1-6) set in the center of the crosswalk for additional visibility.

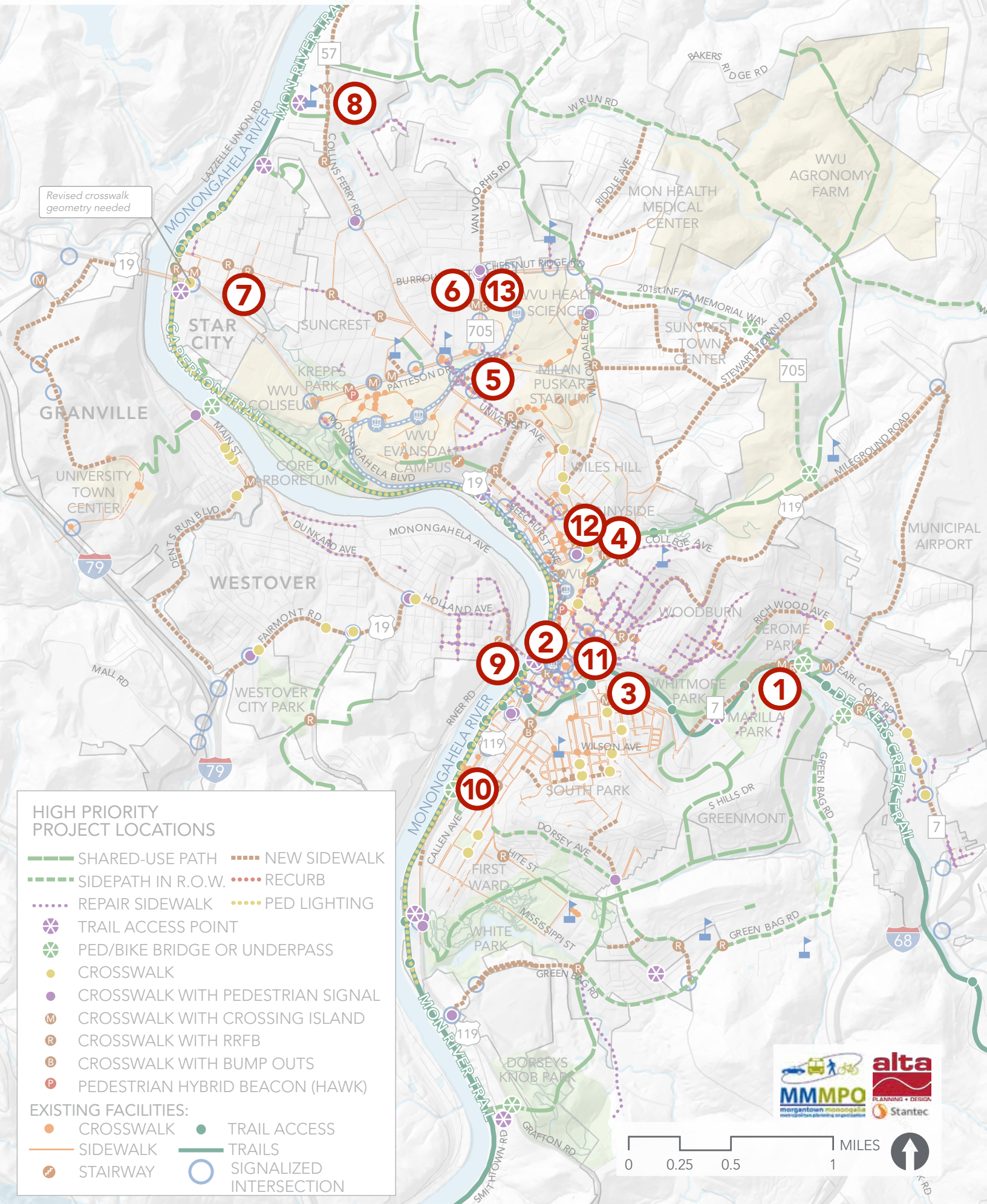


Lead pedestrian intervals give walkers a few seconds head start to cross at a signalized intersection



Sidewalk sign assemblies and in-street crossing signs are especially effective at night, alerting motorists to the presence of a crosswalk from a substantial distance, even at relatively high speeds

MAP 18: BAKER'S DOZEN HIGH RANKING PROJECTS



Revised crosswalk geometry needed

HIGH PRIORITY PROJECT LOCATIONS

- SHARED-USE PATH
- - - SIDEPATH IN R.O.W.
- ⋯ REPAIR SIDEWALK
- ✳ TRAIL ACCESS POINT
- ✳ PED/BIKE BRIDGE OR UNDERPASS
- CROSSWALK
- CROSSWALK WITH PEDESTRIAN SIGNAL
- M CROSSWALK WITH CROSSING ISLAND
- R CROSSWALK WITH RRFB
- B CROSSWALK WITH BUMP OUTS
- P PEDESTRIAN HYBRID BEACON (HAWK)
- - - NEW SIDEWALK
- ⋯ RECURB
- ⋯ PED LIGHTING

- EXISTING FACILITIES:
- CROSSWALK
 - TRAIL ACCESS
 - SIDEWALK
 - TRAILS
 - STAIRWAY
 - SIGNALIZED INTERSECTION



Trail Crossings: Where either the Caperton Trail/Mon River Trail or the Deckers Creek Trail crosses a non-local street, an RRFB should be installed at the existing crosswalk location (or, a new crosswalk added, if not striped currently). Locations for the RRFB installations include, at a minimum:

- Mon River Trail at Frontier Street in Star City
- Deckers Creek Trail at Deckers Creek Blvd
- Deckers Creek Trail at Green Bag Road
- Deckers Creek Trail at Carnegie Street
- Deckers Creek Trail at Sommer School Road



RRFB's at all trail crossings of busy roadways will improve safety and access for trail users

BAKER'S DOZEN HIGH RANKING PROJECTS

The full tables of ranked project recommendations are presented in the Capital Improvement Plan portion of Chapter 9. Of the hundreds of project recommendations developed during the planning process, thirteen high-ranking projects are described and illustrated on the following pages in more detail. This “baker’s dozen” include high-visibility projects that:

- provide a variety of facility types, ranging from new crosswalk and median islands, to striped bike lanes to pedestrian overpasses
- include improvements designed to enhance pedestrian and/or bicycle safety
- reside in various neighborhoods and jurisdictions within the region
- have had support expressed at either the public workshops or at Project Advisory Committee meetings, or both
- provide important pedestrian and/or bike connections to/from neighborhoods, the WVU campuses, commercial areas, parks, greenways and schools

The goal of highlighting these projects is to elevate their profile and increase the level of interest and enthusiasm from stakeholders. As high-ranking projects in highly visible areas of the region, the hope is that overall support, fundraising, and implementation for these particular projects could be expedited. Many of the 13 projects lie on state roadways, so each will require strong partnership between local/regional planners and West Virginia DOH. This will ensure a level of comfort about roadway and intersection operations (for all road users) and that all state engineering standards are met.

8.1 PEDESTRIAN FACILITY IMPROVEMENTS

PROJECT 1 - POWELL AVE PEDESTRIAN CROSSING NEAR DECKERS CREEK BLVD

Currently, pedestrian connections from the Jerome Park neighborhood to the Deckers Creek Trail are tenuous. Traffic volume and speed, especially from trucks, on Powell Ave/ Earl Core Road (State Route 7) form a substantial barrier. To enhance the connection across Route 7, a short segment of new sidewalk along the north side is needed to provide access to a new crosswalk midway between Mineral Avenue and Deckers Creek Blvd. A sidewalk along the south side of Route 7 would provide both a stairway and ADA-accessible sloped connection to the trail. To maximize safety for crossing Route 7, a median island is strongly recommended along with the standard crosswalk signage described earlier. Revised geometry of the trail crossing of Deckers Creek Blvd is also proposed to decrease the length of the crosswalk, improve visibility and provide more space for vehicles turning off Route 7 to Deckers Creek Blvd. to see a trail user and come to a stop. Further highlighting this need is the provision of an RRFB at the crossing.



Image of the recommended location for the Powell Avenue crossing—near the front end of the truck—from Mineral Ave (at left) to the Deckers Creek Trail (at right, obscured)

In the long term, this Plan also recommends consideration of a pedestrian bridge over Route 7. The bridge would tie into Paul Preserve Park and Playground in Jerome Park and a switchback ramp would provide a connection to the Deckers Creek Trail near Deckers Creek Blvd. or near Hartman Run Road.

A conceptual design graphic for this project is included in Appendix C of this report.



Design graphic showing the approximate location of the recommended crosswalk between Mineral Ave and Deckers Creek Blvd and the improved crossing of the trail



Proposed recommendations include a revised crossing geometry for the trail, along with a RRFB for enhanced safety



PROJECT 2 - CHESTNUT ST CROSSWALKS

In some respects, Chestnut Street provides a good northbound bicycle connection through downtown and is well-used by those on foot as well. The principle challenge is crossing the two state roadways downtown: Pleasant Street and Walnut Street, another one-way traffic couplet. Despite high demand for pedestrian crossing at both locations along Chestnut Street only a block apart, no crosswalks exist at either location. The Plan recommends new crosswalks at both locations with an RRFB recommended at the Chestnut/Pleasant intersection, and curb extensions (aka “bump outs”) at the Chestnut/Walnut intersection. Both will improve pedestrian safety and enhance access to the only PRT station in downtown Morgantown.

Curb extensions at a recommended crosswalk on Walnut Street will improve access to the PRT station



Current conditions



PROJECT 3 - BROCKWAY AVE CROSSING AT KINGWOOD

Brockway Avenue represents another state highway in Morgantown that creates a challenging crossing environment for pedestrians. The limited sightlines at the curve at the Brockway/S Walnut intersection likely precludes it from having a crosswalk across Route 7. Brockway Ave at Kingwood, however features better sightlines, and a wider road, which provides the necessary space for a median island to assist with safe crossing of the busy roadway. When implemented, it would be the only striped crosswalk on Route 7, but would provide access to the S. Walnut Street bridge sidewalk, to the Phoenix Bakery (a neighborhood landmark), and further down Kingwood to the accessway to the foot bridge over Deckers Creek to the trail.

A new crosswalk and median island along Brockway Avenue/Route 7 will help South Park residents access the Deckers Creek Trail, the popular Phoenix Bakery, and the Walnut Street bridge sidewalk to downtown



Current conditions



PROJECT 4 - FALLING RUN RD CROSSING AT YOKE

In mid-2019 the City of Morgantown installed a RRFB at the University Avenue crosswalk at Falling Run Road. Further up Falling Run Road, a clear pedestrian desire line exists at Yoke Road as well. To the south lies a path that leads directly to the WVU Downtown campus. The recommended crosswalk with RRFB would provide a more comfortable pedestrian crossing opportunity for students and other residents who live in the apartment buildings along Yoke, Mason and Stewart Streets.

The proposed crosswalk and RRFB on Falling Run Road will improve opportunities for students and other residents living along Yoke Street connect to the WVU campus



Current conditions



PROJECT 5 - OAKLAND ST AND HARDING AVE SIDEWALKS

The highest ranked pedestrian project in Morgantown, a new sidewalk along Oakland Street is recommended between University Avenue and the University Park Oakland Hall building. Currently, many students walk to campus and the PRT station along Oakland Street or Harding Avenue. Both roadways would benefit from the elimination of the sidewalk gap, helping to complete the walking network in the Evansdale neighborhood.

Elimination of the sidewalk gap along Oakland Street will improve the walking environment for WVU students between University Avenue and the University Park Oakland Hall facility



PROJECT 6 - VAN VOORHIS RD CROSSING AT CHESTNUT RIDGE AND CHRISTY

Crossing five-lane Van Voorhis near the WVU Evansdale Campus can be difficult for pedestrians. The Chestnut Ridge intersection is especially challenging as pedestrians must cross a 100'-wide intersection where motor vehicles can approach at a relatively high rate of speed and are not required to stop when turning right from Van Voorhis to Chestnut Ridge. A pedestrian signal is recommended here in combination with a double red arrow that requires vehicles to stop after the pedestrian signal has been actuated. Further south along Van Voorhis, a new crossing is recommended at the intersection with Christy Street. A new crosswalk accommodates the pedestrian desire line from the PRT station and WVU Medical Campus to the Starbucks and the Suncrest

Currently, drivers approach the Chestnut Ridge Road intersection with Van Voorhis are permitted to take a right turn without stopping, which creates hazardous conflicts with crossing pedestrians

neighborhood beyond. The presence of the two-way left turn lane along Van Voorhis provides the opportunity to include a median refuge island in the center of the roadway and a rapid flashing beacon to maximize pedestrian safety at the recommended mid-block crossing. Finally, narrowing traffic lanes to 11' will slow motor vehicle traffic a bit and provides space for striped bike lanes on each side of Van Voorhis from University Avenue to Chestnut Ridge Road.



Narrower travel lanes on Route 705 provides space for striped bike lanes and the turn median accommodates a raised median island to improve the level of safety—along with the RRFB—for the recommended crosswalk



Current conditions



PROJECT 7 - UNIVERSITY AVE CROSSINGS IN STAR CITY

No striped crosswalks exist along the entire length of University Avenue in Star City. While sight lines and the topography make the inclusion of crosswalks a challenge in some segments of the avenue, new crosswalks and RRFB's are recommended in two locations. At Broadway Avenue, the new crossing provides access from the existing sidewalk on the north side of University with the neighborhood on the south side and the Star City Town Hall building. At Herman Street, a new crosswalk and RRFB would facilitate pedestrian crossings in the small cluster of commercial buildings, and provide access for walkers, runners and bicyclists coming to/from the north end of Krepps Park (at the other end of Chips Hollow Road).

Two recommended crosswalks with RRFB's along University Avenue, such as the one at Herman Street above, will improve pedestrian safety and accessibility in Star City



Current conditions



PROJECT 8 - COLLINS FERRY RD CROSSING AT SUNCREST ELEMENTARY SCHOOL

Recently built at the north end of Collins Ferry Road, Suncrest Elementary School offers limited opportunities for children from the nearby neighborhood to walk to school. There are no crosswalks from the existing sidewalk on the east side of the road to the school, and the school has short stretches of sidewalk in the parking and drop-off area but they don't reach Collins Ferry Road. As such, the Plan recommends that West Virginia DOH, the City of Morgantown School District and Monongalia County coordinate their efforts to improve walking conditions in the vicinity of the school. A good place to start is with the recommended crosswalk and median island—with associated sidewalk extensions—that allow children and

The recommended crossing of Collins Ferry Road links the existing east-side sidewalk with the pathway in front of Suncrest Elementary School, providing a median island for improved safety for students and their parents



Current conditions

their guardians to access the school from the existing east sidewalk (see graphic). The Plan also recommends a new sidewalk on the west side of Collins Ferry Road, a new crosswalk and RRFB at the Lawnview Drive intersection, and shared use path connections to neighborhood streets and to the Mon River Trail immediately to the east (will require switchback ramps to accommodate the topographic change).

8.2 COMBINED PEDESTRIAN & BICYCLE FACILITY IMPROVEMENTS

PROJECT 9 - WESTOVER BRIDGE IMPROVEMENTS

The Westover Bridge connects the cities of Morgantown and Westover. Also designated as State Route 19, it carries roughly 20,000 vehicle trips per day. As the only link between the two cities, it also provides the only pedestrian and bicycle connection to and from the Caperton Trail on the Morgantown bank of the Mon River, to Mon Avenue along the Westover side. Because there are so few connections across the Mon River and because the river itself is such a destination, improvements for pedestrian and bicycle access over the Westover Bridge is a critical need. Currently, most walkers and cyclists share the narrow sidewalk along the north edge of the bridge (though some intrepid bicycle commuters use the bridge roadway, which is legal).

On the Morgantown side, access to the rail trail requires a circuitous route along University Avenue to Walnut Street or along Don Knotts Blvd to Sturgiss Street. Neither feature bicycle facilities of any kind, and in consequence bicyclists frequently ride on the sidewalk for access. The bridge intersection at University/Don Knotts is a challenge for both pedestrians and bicyclists due to its width, high volumes, frequent turning movements and missing crosswalk on one leg. On the Westover side, pedestrian access from the bridge to the sidewalk along Holland Avenue requires a journey across an extremely wide gap in the sidewalk network, interrupted by Mon Avenue and Tower Lane. While bike connections to/from the bridge sidewalk to Mon Avenue are relatively seamless, continuing on Holland Avenue can be a daunting experience for bicyclists.

The project team studied several options to improve connectivity for pedestrians and bicyclists and arrived at a short term and two longer-term design options for the Westover Bridge. These include:

- **Short-term Recommendation:** bicycle shared lane markings and signage across the bridge
- **Long-term Recommendation Option A:** narrowing of bridge travel lanes to 11'—12' for outermost lanes—and widening the existing 5' wide sidewalk to 8' clear (flexible delineator posts or concrete barrier separates the wider sidewalk from general traffic)



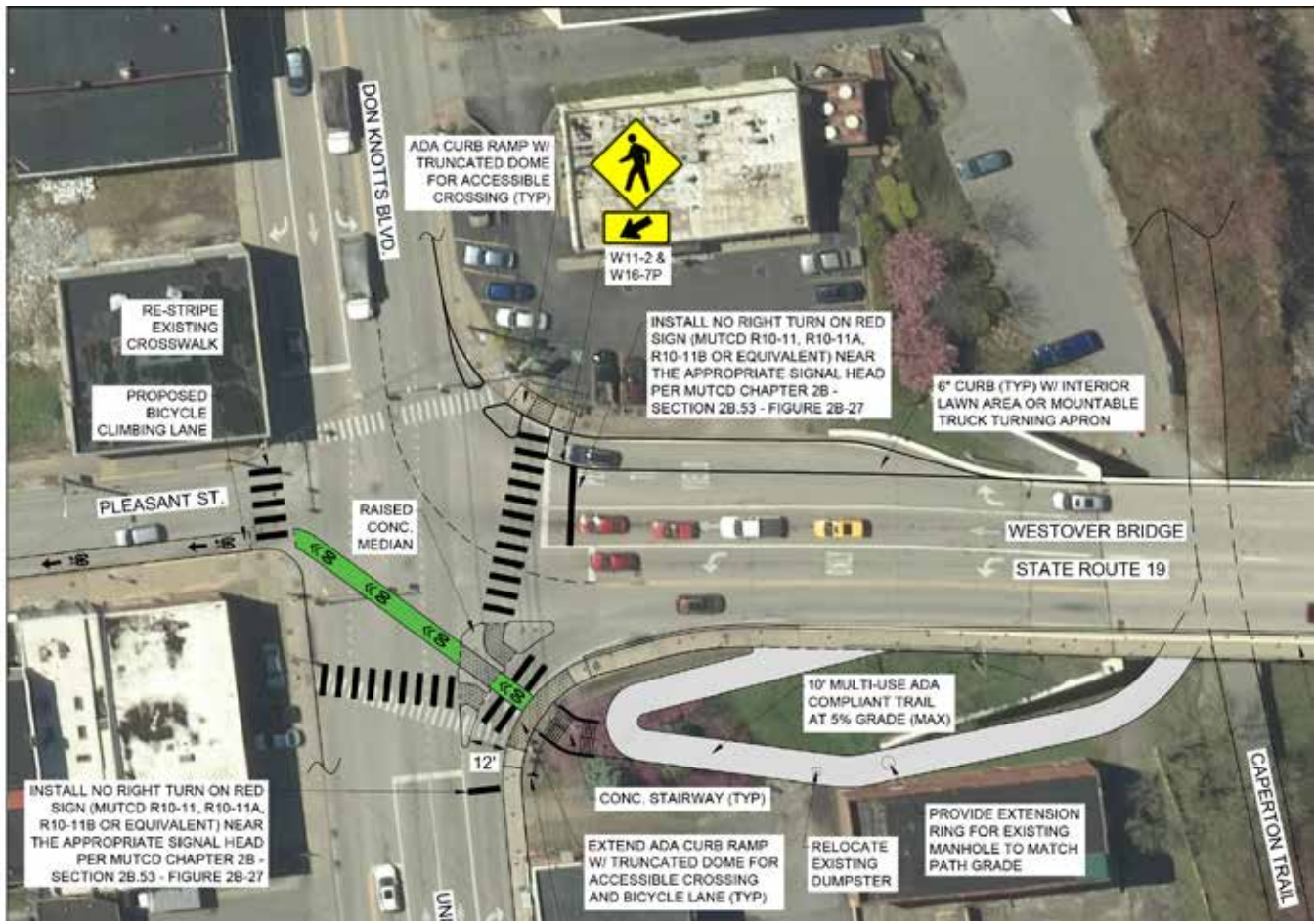
- **Long-term Recommendation Option B:** reallocation of one eastbound travel lane to accommodate a two-way, separated bike lane adjacent to the existing sidewalk (precast concrete curb and flexible delineator posts separate the bicyclists from general traffic)
- Improved connections at both ends of the bridge are common to all, including:
 - path connection from the east end of the bridge sidewalk to the rail trail
 - new crosswalk in the missing leg of the bridge intersection with University/Don Knotts
 - bicycle climbing lane on Pleasant Street with improved bicycle connections from the bridge sidewalk to the foot of Pleasant Street
 - new sidewalk that eliminates the gap from the bridge to the Holland Ave sidewalk
 - mountable median and new crosswalk across the wide intersection of Holland Ave and Mon Ave
 - bicycle climbing lane on Holland Ave from Tower Lane northward

Conceptual design graphics for all three options are included in Appendix B of this report.

In all design options, a 10'-wide path would run from the bridge deck alongside the south edge of the Morgantown-side abutment (at left in photo) and link to the Caperton Trail and Hazel Ruby McQuain Park



Long-term Option A includes 11'-12' travel lanes and an 8'-wide sidewalk (from the current width of 5') for both pedestrians and bicyclists



All design options include pedestrian and bicycle improvements at the bridge intersection with University Ave/Don Knotts Blvd, and a path connection from the bridge to the rail trail

PROJECT 10 - DON KNOTTS BLVD OVERPASS

Currently, access to the riverfront and the rail trail from the South Park or First Ward neighborhoods is challenging for pedestrians and bicyclists. The only somewhat-feasible route is to walk or bike down Prairie Avenue and cross Don Knotts Blvd. at the traffic signal at Hurley Street. To the south, there is no legal and or practical and safe way to access the amenities along the waterfront without a motor vehicle. As such, a critical project recommendation is to provide a pedestrian/bicycle crossing over Don Knotts Blvd., using a former ROW that used to connect to the Boulevard from Callen Avenue in the First Ward.

The recommended project would include a shared use path from the Callen/Meadow Lane intersection to the footbridge over the Don Knotts, adjacent to the south access point to the Morgantown Event Center, near Watertown Jeep. Because of the grade change, a switchback ramp (at an accessible, 5% slope) would provide the link from the north/west end of the bridge down to Caperton Trail Park and access to the rail trail. Although a separate project, the overpass link would complement another recommended pedestrian/bicycle connection across Don Knotts, 0.7 mile to the south. This new crossing would provide access to the rail trail and to the Aldi grocery store, accessible from an improved path connection at the west edge of White Park.



Approximate location of the pedestrian/bike bridge over Don Knotts Blvd at the south driveway to the Morgantown Event Center



Diagram illustrating the alignment of the pedestrian/bicycle bridge over Don Knotts Boulevard with connections to the 1st Ward neighborhood and the riverfront trail system

8.3 BICYCLE FACILITY IMPROVEMENTS

PROJECT 11 - SPRUCE ST BIKE LANE

Running northbound, Spruce Street forms a traffic couplet with High Street, which carries southbound traffic. Combined, they form the primary commercial and cultural spine of downtown Morgantown. Besides a handful of retail spaces, Spruce provides access to the Morgantown Police Department, the Public Library, City Hall and the Farmer’s Market. Despite that, Spruce is a less-than-ideal environment for walking due to the narrow west sidewalk. There are no bicycle facilities along the three-lane street as well.



Image of combined bike and turn lane in New York City



A buffered bike lane along Spruce Street benefits pedestrian traffic by providing a wide spatial buffer for the adjacent sidewalk

PROJECT 12 - JONES AVE BICYCLE CLIMBING LANE

Because of the critical role Spruce plays in the life of downtown, the Plan recommends reallocating one of the traffic lanes as a buffered bike lane to improve both access for bicyclists and the level of comfort and safety for pedestrians. To do so will require a traffic study and analysis to confirm a minimal impact to motor vehicle traffic and intersection performance. Because of the high number of left and right turns where Spruce meets Willey, it is likely a combined bike lane/turn lane will be required to accommodate both modes (see the Intersections chapter of the NACTO Urban Bikeway Design Guide, page 79).

In the same area as the project described above, there is a need to provide improved connections for bicyclists wishing to access Wiles Hill. Currently, Jones Avenue provides a direct connection for cyclists coming down the hill, but it is a one-way street. No comparable one-way street in the uphill direction lies in the immediate vicinity. As such, the Plan recommends a contra-flow bicycle climbing lane, providing access in both directions for bicyclists only. In order to provide the space for the bike lane, a standard traffic lane and parking along one side, some spot improvements to the east shoulder are required to achieve the needed roadway width. Complementing the climbing lane would be shared lane markings for downhill bicycle travel and signage for both directions.



Currently, the City of Morgantown is moving forward with the implementation of a contra-flow bicycle climbing lane on Jones Avenue

PROJECT 13 - CHESTNUT RIDGE RD BIKE LANES

As State Route 705, Chestnut Ridge Road carries a large volume of traffic, including many trucks. Because of the traffic volumes and relatively-high speeds, it is not an inviting environment for either pedestrians or bicyclists. Although the road will always need to be a primary artery for motor vehicle traffic through the Evansdale area of Morgantown, there is an opportunity to narrow the current traffic lanes to 11' in width. The narrower lanes will help to slow traffic, and provide an opportunity to widen the current 2' wide shoulders to create designated bike lanes of at least 5' in width.

The bike lane makes for a more comfortable walking environment as well, since pedestrians will be able to enjoy a wider buffer from moving vehicles. The bike lanes are recommended for

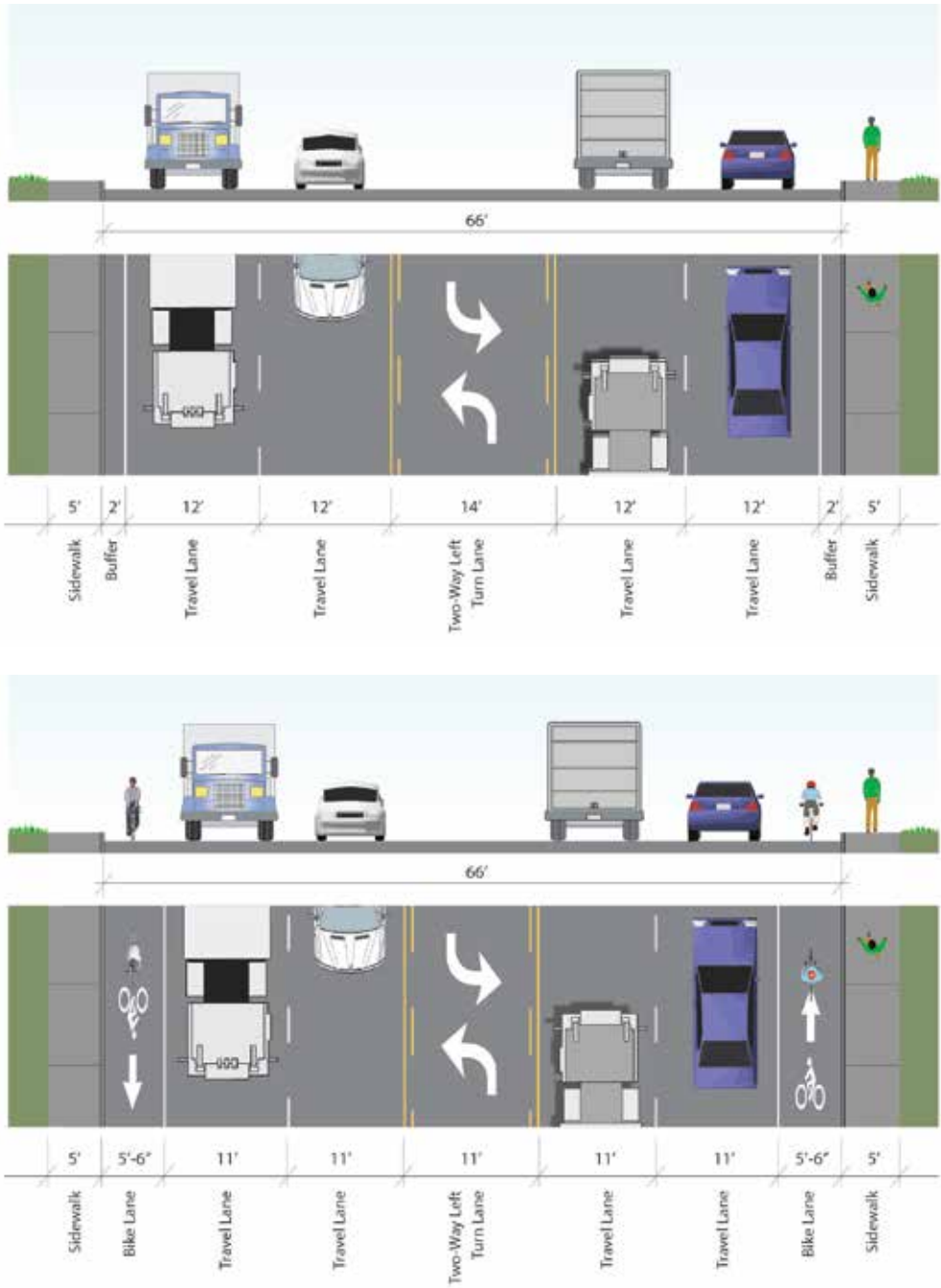
each side of the roadway from Van Voorhis to Willowdale Road. Finally, to further improve conditions for walking and bicycling, the posted 40 mph speed limit should be lowered to 35 mph, the posted speed along the Van Voorhis and Pattenon Drive segments of Route 705.



Current conditions



By narrowing Route 705 travel lanes to 11' in width, space becomes available for striped bike lanes in each direction



Existing cross section of Chestnut Ridge Road and Proposed cross section of Chestnut Ridge Road



9. IMPLEMENTATION PLAN

The recommendations developed for the MMMPO Regional Bicycle and Pedestrian Transportation Plan represent a major investment in active transportation infrastructure in the Morgantown region. The short, medium and long-term results could have a substantial impact on pedestrian and bicycle accessibility and safety, and improve the quality of life for those who live, work or visit the region. None of this can happen without a strong implementation strategy that includes a clear identification of funding strategies, performance measures and identification of those who will take the lead on implementing project recommendations.

Supporting the strategy are the Capital Improvement Plans (CIP) that are included in this plan for the cities of Morgantown and Westover, the towns of Granville and Star City, and for

the unincorporated portions of Monongalia County. Many of the projects included in all five of the CIPs sit along state roadways, owned and maintained by West Virginia DOT's Division of Highways. As such, one critical strategy is to develop a short-term pedestrian-safety pilot project along a state road to show DOH officials, city/MPO representatives, the WVU Administration and the community at-large that the implementation is being taken seriously, and that accessibility and safety improvements are on the horizon.

9.1 IMMEDIATE NEXT STEPS

The MMMPO Regional Bike and Pedestrian Transportation Plan report is a preliminary step in the overarching goal to make the Morgantown region more walkable and bike friendly.

Implementation of all recommendations will be a long-term, multi-phase effort involving a number of local, regional and state agencies working in partnership. The following are critical next steps towards implementation:

- The Regional Bike and Pedestrian Transportation Plan has been adopted by the MMMPO Policy Board and should be adopted by the City of Morgantown, the City of Westover, the Town of Granville, the Town of Star City, Monongalia County and the WVU Board of Governors. (The adoption by all parties will be key to ensuring system equity, and that safety and mobility improvements are being brought in all parts of the region.)
- The City of Morgantown and other municipalities should consider the long-term sidewalk maintenance and funding policies included in this report; implementation of many of the Plan's sidewalk recommendations are needed to eliminate gaps in the walking network and improve pedestrian safety.
- The MMMPO should establish regular coordination meetings between West Virginia DOH, City of Morgantown, Monongalia County and WVU in order to discuss ongoing implementation of the high priority project recommendations on state roads; these projects are critical to improving pedestrian safety, especially for those trying to cross state highways at both signalized intersections and at mid-block locations where demand is high.
- As the most significant players in the region, MMMPO, DOH, Monongalia County, WVU and City of Morgantown will need to provide a high level of commitment to implementing

the pedestrian and bicycle network projects recommended in the Plan. Senior officials in all of these agencies and institutions should take an active role to ensure political support, funding and local staff capacity to improving walking and bicycling conditions in the Morgantown region. Business and community leaders must also play a role to ensure a solid foundation of support for introducing infrastructure improvements that in some instances, require motorists to drive more slowly and/or be accommodating to vulnerable users of the road.

- The first project that should be considered in the immediate term is the proposed pedestrian-safety pilot project along Patteson Drive/State Route 705. The intersection of Patteson Drive and Morrill Way was the site of a motor vehicle/pedestrian collision that resulted in a fatality in 2018 and other crashes involving pedestrians have occurred, including one in the later summer of 2019 involving a driver who collided with a WVU student pedestrian which resulted in an injury (**see details on the next page**).



The long stretch of Patteson Drive between Mon Blvd and Morrill Way lacks a pedestrian crossing between the Suncrest neighborhood (at left) and the WVU Evansdale campus (at right)

9.2 PATTESON DRIVE PEDESTRIAN-SAFETY PILOT

In the immediate term, this Plan recommends that a pedestrian-safety pilot project be implemented along Patteson Drive, between Morrill Way and Laurel Street. The intent of the pilot is to improve safety and accessibility for pedestrians crossing Patteson either at the existing signalized crosswalk at Morrill Way, or at a proposed crossing location at Laurel Street. At or near Morrill Way, recommendations include:

- installing retroreflective backplates at the existing signal heads in order to make them more visible to approaching motorists
- relocating the eastbound-approach stop bar to lie 15' from the crosswalk for enhanced visibility of pedestrians in the crosswalk
- installing new signs at the stairway to the church parking lot instructing pedestrians to use the crosswalks at Morrill Way or Laurel Street

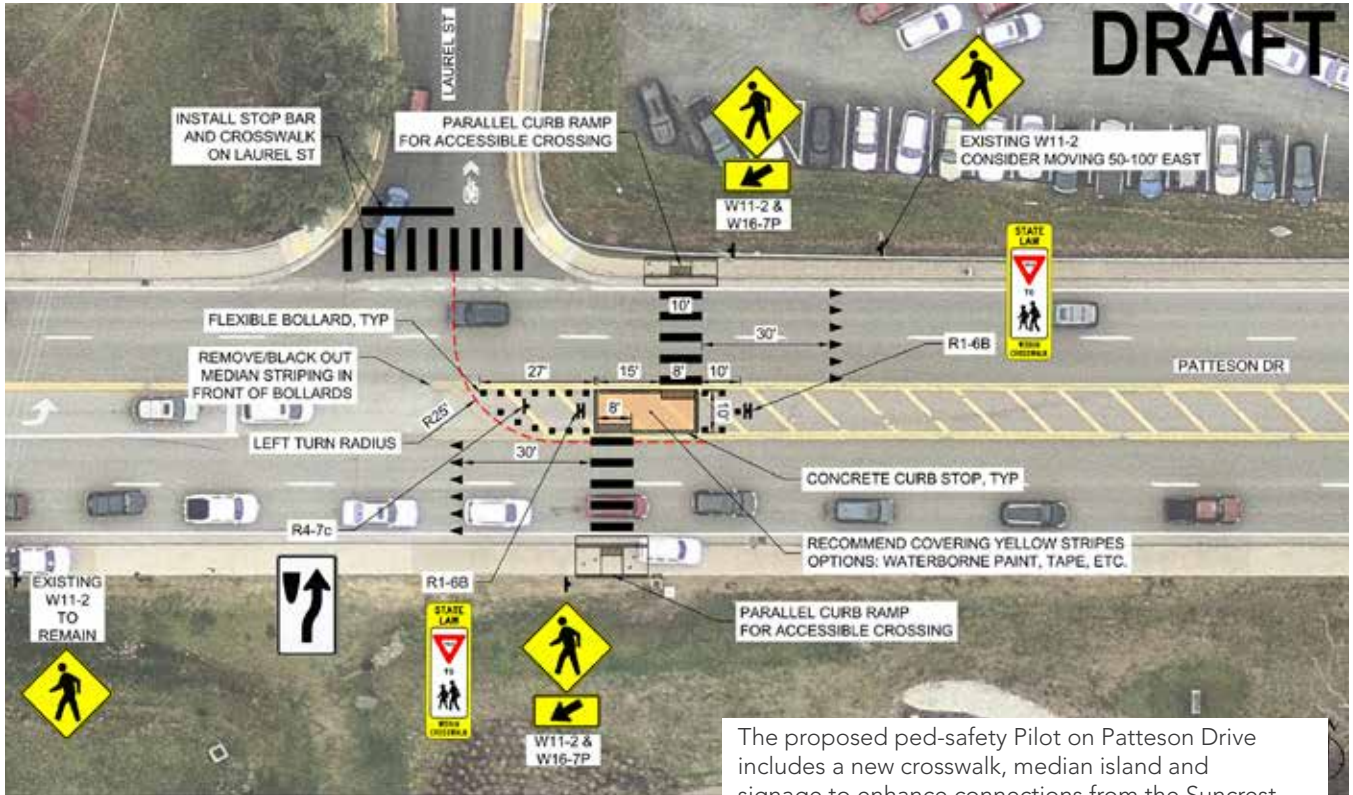


In the long term, a Pedestrian Hybrid Beacon—aka a “HAWK signal”—should be considered as an option at the Patteson/Laurel intersection in order to legally require motorists to stop for crossing pedestrians

(Source: www.newsleader.com)

At the intersection of Laurel Street, a pedestrian desire line connects the Suncrest neighborhood with the WVU School of Art and Design and the rest of the Evansdale Campus. People on foot—especially WVU students—are frequently seen crossing at this undesignated location when there are gaps in traffic. This section of road is posted at 35 mph but motorists frequently exceed that limit, especially during off peak periods. To provide a designated crossing location and create visual friction in the streetscape that can help lower traffic speeds, the following is recommended:

- High-visibility crosswalk across Patteson with pedestrian ramps at each end so that the pilot—and potentially subsequent permanent project—will be fully accessible
- Designated median island defined by pre-cast concrete curb stops to provide a pedestrian refuge between directions of traffic
- Standard signage at the crossing location itself and at each approach to provide a visual warning for motorists
- In-street pedestrian crossing signs, yield bars, and flexible bollards to increase the visibility of the new crossing location
- Accessible path connection (at 5% slope) running southward from Patteson Drive to the existing WVU access-drive sidewalk that leads to the Art Museum and points south



9.3 SIDEWALK MAINTENANCE/ FUNDING POLICY

One of the of the ongoing challenges to improving pedestrian safety and accessibility is funding sidewalk repair and construction. In consequence, a number of gaps in the sidewalk network persist in Morgantown, Westover, Star City, Granville and unincorporated portions of Monongalia County. Additionally, many sidewalks are in need of repair but either municipalities are not informing property owners of their responsibility to have the sidewalk fixed, or property owners lack the resources to pay for the repairs. During the course of the planning work, the team researched sidewalk maintenance policy and funding best practices from other U.S. cities to determine possible ideas for funding the expansion of the local sidewalk network. (See Appendix G for the Draft Sidewalk Maintenance Policy and Funding Best Practices memorandum.)

The findings from the research indicated that many cities have taken over responsibility for sidewalk maintenance from property owners. Though many of these are larger cities, they have used voter-approved bond measures or Transportation User Fees to pay for the program. Currently, the City of Morgantown has a \$3/week Municipal Service Fee for those who work in the City. However, the money generated is not enough to fund a robust program of new and repaired sidewalks, and sidewalk maintenance is still the responsibility of adjacent property owners. **While shifting 100% of sidewalk-maintenance responsibility to the public sector could be a major challenge in the Morgantown region, an approach that takes much of the pressure off of property owners is recommended.**

Potential policy changes that should be considered in the region include:

- Municipalities should have a small number of contractors on retainer to expedite residents' ability to find a qualified contractor. To lower costs and improve efficiency, a 30-to-90 day delay should be incorporated to provide time for additional property owners within the same Ward to hire the same contractor for sidewalk repair or construction.
- Establishment of prioritization criteria to score new and repaired sidewalks. Criteria should include development density, proximity to schools, and proximity to bus stops within 1000' of the property. Equity issues could also be considered so that income levels of a particular neighborhood are taken into account.



Sidewalks in need of repair on Willey St in Morgantown

- To lower the cost to repair or build sidewalks for individual property owner, the following options should be considered:
 - » A city or regionwide referendum for a dedicated tax levy or bond measure to help pay for sidewalks (could potential be expanded to include trails and bike facilities too)
 - » Increase the \$3/week Municipal Service Fee to \$5 and dedicate the additional funds for active transportation projects including sidewalks, bike lanes and trails
 - » Municipal reimbursement for sidewalk repairs based on the sidewalk project "score" as described above, with compensation of 1%-100% of the sidewalk project cost.
 - » Municipal reimbursement could also be based entirely on property's distance from a public school, library, commercial area, bus/PRT stop or park, with compensation of 1%-100% of the project cost

The ideas above could also be combined with a variety of best practices from other U.S. cities in order to enhance the walking environment in the Morgantown region and to improve safety. It is also notable to recognize that leveraging new sidewalks and other pedestrian improvements through a revised policy helps to improve economic development opportunities and enhance access to business downtown and in neighborhood business districts.



A new municipal sidewalk funding policy will lead to improved conditions where pedestrian demand is well established, such as on Elmer Prince Drive near the WVU Medical Campus

9.4 PERFORMANCE MEASURES

Performance Measures are data-driven benchmarks intended to help the MPO, the City of Morgantown and other jurisdictions gauge progress towards the Regional Bicycle and Pedestrian Transportation Plan’s goals and objectives. They also help these agencies communicate successes and challenges and

motivate community and political leaders to take further action to help implement the Plan through fundraising and/or public support. Progress on implementation could be discussed at MPO Policy Board or municipal meetings using the Performance Measures as a target, helping officials understand where the region stands on its commitments to improving pedestrian and bicycle mobility and safety.

Table 15: Performance Measures & Proposed Targets

GOAL	PERFORMANCE MEASURE	2/7 YEAR TARGETS	LEAD AGENCIES/ GROUPS
Safety	Reduction in the pedestrian and bicycle-related crash rates that include an injury or fatality	<ul style="list-style-type: none"> • 25% by 2022 • 50% by 2027 	WV DOH, MMMPO, Monongalia County and municipalities
	Number of intersections and new pedestrian crossings outfitted with safety improvements such as flashing beacons, median islands or bump outs	<ul style="list-style-type: none"> • 5 by 2022 • 20 by 2027 	WV DOH, MMMPO, Monongalia County and municipalities
Connectivity	Percent increase in miles of the regional bicycle network (trails/paths and on-street bicycle facilities combined)	<ul style="list-style-type: none"> • 50% by 2022 • 100% by 2027 	MMMPO, Municipalities and Mon River Trails Conservancy
	Number of new sidewalk projects that eliminate network gaps	<ul style="list-style-type: none"> • 5 by 2022 • 15 by 2027 	WV DOH, MMMPO, and municipalities
	Percentage increase in trail users at automated count locations	<ul style="list-style-type: none"> • 25% by 2022 • 100% by 2027 	MMMPO, Municipalities and Mon River Trails Conservancy
Policy	Percentage increase in local funding for capital projects and maintenance related to new/ improved sidewalks	<ul style="list-style-type: none"> • 25% by 2022 • 100% by 2027 	MMMPO and Municipalities
	Percentage increase in the number of children walking and bicycling to school on a regular basis (average of 3X/week)	<ul style="list-style-type: none"> • 15% by 2022 • 50% by 2027 	Municipalities and local school departments
Equity	Percentage of implemented projects in areas within the highest need quartile according to the Plan’s equity analysis	<ul style="list-style-type: none"> • 25% by 2022 • 25% by 2027 	MMMPO
Feasibility	Annual number of temporary projects designed to test-out pedestrian and bicycle-related safety improvements	<ul style="list-style-type: none"> • 1/yr by 2022 • 3/yr by 2027 	MMMPO and Municipalities
Health	Percentage of commuters who report walking or bicycling to work as their primary means, per ACS data (currently 13% for walking, 0.5% for bicycling)	<ul style="list-style-type: none"> • 16% walk/1% bike by 2022 • 20% walk/2% bike by 2027 	MMMPO and Municipalities

9.5 FUNDING OPPORTUNITIES

When considering possible funding sources for the hundreds of project recommendations within the Plan, it is important to note that it is not possible for all projects to be accomplished through a single—or even a few—funding sources. It will be necessary to consider several sources of funding. Pedestrian, bicycle and trail projects are typically funded through a combination of local, state, federal and private sources, many of which require a local match (typically 80% federal/state, 20% local). In some instances, communities have successfully leveraged grant money from private foundations or state programs as the designated “local” match. For trail projects, land donations or in-kind labor may be counted as the local match under some funding programs as well.

Federal/State funding – When developing the Ten-year Plan and/or Transportation Improvement Program (TIP), the Morgantown-Monongalia MPO should continue to seek federal and state funding to implement the recommendations in the Plan. It is also worth noting that funding for roadway projects can sometimes come more easily when the project includes a “complete streets” approach that highlights pedestrian and bicycle facilities. Within some grant contexts, the inclusion of sidewalks, new crossing treatment and/or bicycle lanes can make a more competitive project with a higher probability of success, depending on the grant program’s criteria. Coordination with project recommendations in the Long Range Transportation Plan is one effective way to plan for both roadway improvements and for walking and bicycling. Funding sources that

have been, and should continue to be explored, by the MPO, Monongalia County and local municipalities include:

- Federal Transportation Alternatives Program (TAP)
- Surface Transportation Program (STP)
- Community Development Block Grants (CDBG)
- Congestion Mitigation/Air Quality (CMAQ) funding via the Federal FAST Act
- Highway Safety Improvement Program (HSIP)

Coordination on these and other opportunities can be done by coordinating with the WVDOT Grant Administration Unit at: https://transportation.wv.gov/highways/programplanning/planning/grant_administration/Pages/default.aspx

Trail Project Funding – For trail projects, the Recreation Trails Program (RTP) provides funds for states to distribute to local jurisdictions, to develop and maintain recreational trails and trail-related facilities. They are available for both paved and unpaved trails but may not be used for build roadway shoulders for bicycling or for sidewalks. In West Virginia, the RTP is administered by the Department of Transportation, with application reviewed and approved by the Recreational Trails Advisory Board. Additionally, a series of funding options can be found at:

- the Federal Highway Administration’s web page at: https://www.fhwa.dot.gov/Environment/recreational_trails/overview/benefits/

- the Rails to Trails Conservancy's web site includes opportunities for both the acquisition of trails at: <https://www.railstotrails.org/build-trails/trail-building-toolbox/funding/acquisition-funding/> and trail maintenance at: <https://www.railstotrails.org/build-trails/trail-building-toolbox/funding/maintenance-funding/>
- funding opportunities can also be found at the West Virginia Rail to Trails Council at: <http://wvtrailtrails.org/build/funding/>

Local Funding – Finding local funding sources for pedestrian and bicycle facilities can be challenging at times, but opportunities should be explored regardless. Options may include:

- Sidewalk maintenance and funding policy ideas, as described in the section above
- Referendum for local bonds or tax levies, such as the County-wide vote to approve funding for Mountain Line Transit in 2016
- Seek business/corporate sponsorship of trail improvements, allowing for modest and discrete branding along segments of the trail network
- Development Impact Fees, especially for projects along corridors in need of new/ repaired sidewalks, on-street bicycle facilities and/or within ½ mile of a trail access point
- Inclusion of the Plan's project recommendations into the Capital Improvement Plans for the City of Morgantown, the City of Westover, the Town of Granville, the Town of Star City and Monongalia County (see section below)

9.6 CAPITAL IMPROVEMENT PLANS

The Morgantown Regional Bike and Pedestrian Transportation Plan concludes with the development of Capital Improvement Plans (CIPs) for the cities of Morgantown and Westover, the towns of Granville and Star City and for Monongalia County. The CIPs are critical to the success of this Plan, as they spell out a prioritized series of project recommendations design to enhance the accessibility and safety for pedestrians and bicyclists throughout the region. Although the projects do not include improvements within West Virginia University property per se, a number of recommendations lie on roadways that run adjacent to or through the campus Downtown, the Evansdale Campus, or the Health Sciences Campus.

9.6A CIP PROJECT COST ESTIMATES

In order to develop order of magnitude cost estimates for the hundreds of project recommendations within the Plan, typical unit costs were employed by the project team.

Pedestrian-facility Recommendations:

- Curbing: \$35 per linear foot
- Sidewalk Removal: \$40 per square foot
- New Sidewalk: \$55 per linear foot
- New Sidewalk with Curb and Gutter: \$220 per linear foot
- Ladder-style Crosswalk: ~\$1,000 for a two-lane segment of roadway
- Median Island: \$5,000 each
- RRFB Installation: \$12,000 each

- Pedestrian Signal: \$2,000
- Pedestrian Curb Ramps: \$200 each
- Pedestrian Lighting: \$1,600 each every 40' (one side only)
- Intersection Bump-outs: \$6,000 per pair

Bicycle-facility Recommendations

- Bicycle Sign: \$355 each (every 200 ft)
- 4' shoulder: \$30 per linear foot
- 10' Stonedust Path: \$30 per linear foot
- Clearing and Grubbing for Sidepath: \$100 per linear foot
- Shared Lane Marking (SLM) Stencil: \$300 each, every 200 ft.
- 10'-12' Asphalt Sidepath: \$170 per linear foot
- Bike Lane Markings: \$7/LF
- Bike Blvd Speed Humps: \$3,000 each
- Bike Lane (all inclusive): ~\$125k/mile (includes signs, stencils and line work on both sides)
- Bike Climbing Lane (all inclusive): ~\$85k/mile (includes bike lane one side with SLM on other)

Bicycle Spot Treatment Recommendations

- Improved Intersection Crossing: \$10,000 each
- Concrete Footers: \$400 per footer (Two footers every 10 feet)
- Ped/Bicycle Bridge: \$1000 per linear foot
- 10'-wide Ramps: \$700 per linear foot of ramp

- Add-Ons
- 10% Design Fee: 10% of the project subtotal cost
- 30% Contingency: 30% of the subtotal cost to prepare for unforeseen obstacles

9.6B CIP PROJECT TABLES

The adopted Morgantown Regional Bike & Pedestrian Transportation Plan includes 42 pages of project recommendations tables, which can be found in Appendix A of this report. The projects are sorted by municipality starting with the City of Morgantown, followed by Granville, Star City, Westover and Unincorporated Monongalia County. Within each jurisdiction, tables are separated by bicycle-related projects and pedestrian-related projects to simplify the long lists of recommendations. For the City of Morgantown, projects are further sub-divided by Linear Pedestrian Projects, Crosswalks Projects, Spot Pedestrian Projects, e.g. ADA curb ramps, Linear Bicycle Projects, and Spot Bicycle Projects such as Trail Access Points.

Details about each project include the recommendation type, the location, the municipality, the project length, the prioritization score, its ranking relative to other projects in the same municipality and phasing. Each project is described as lying on a road owned and maintained by either a municipality ("local") or the West Virginia DOT Division of Highways ("state"). "Non-Profit" is used to describe ownership/maintenance for trail-related projects, since the Mon River Trails Conservancy plays such a substantial role in operations and maintenance. Finally, each project includes an order-of-magnitude cost estimate.



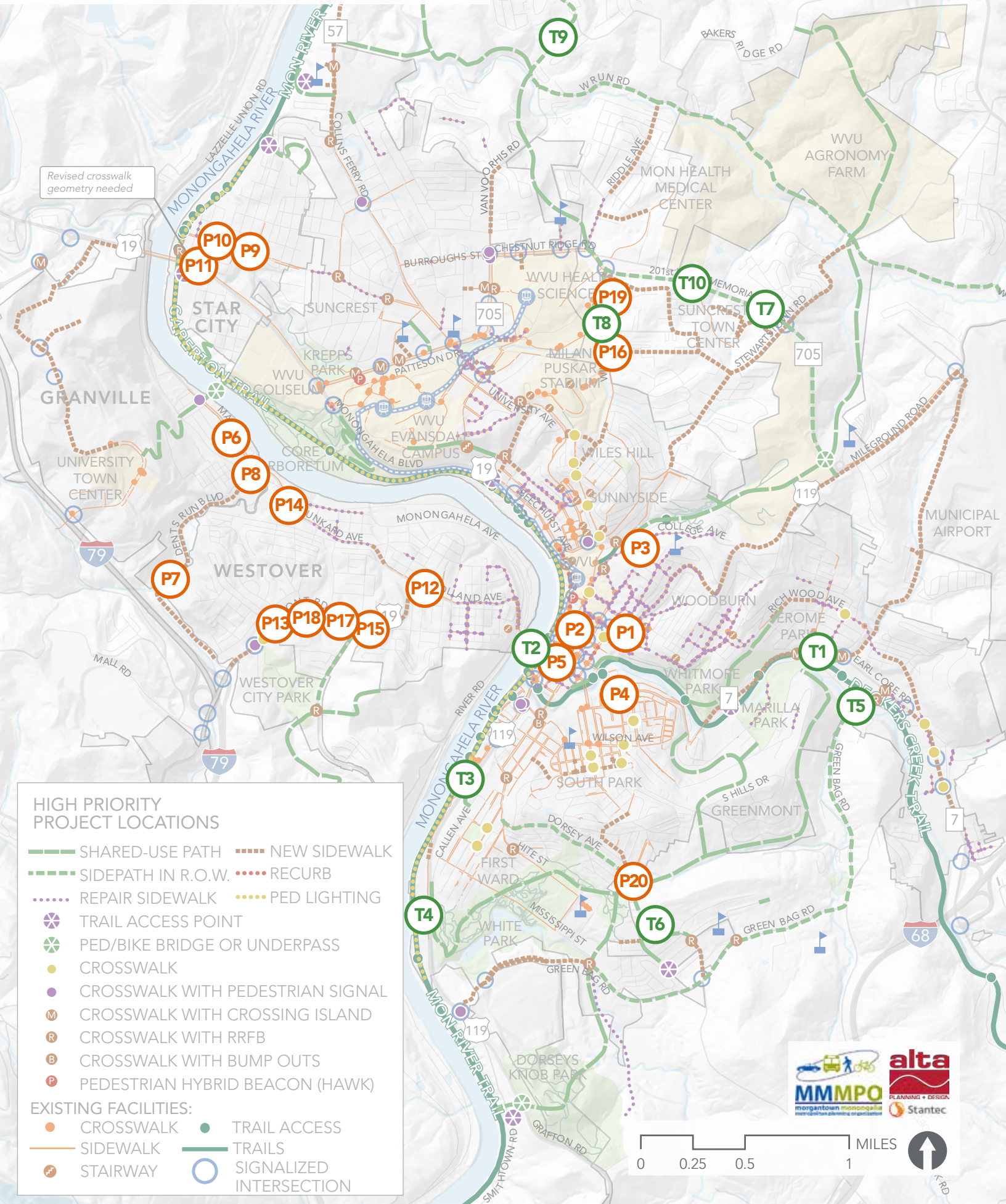
10. MPO POLICY BOARD IMPLEMENTATION STRATEGY AMENDMENT

After completion of the Steering Committee's final draft Morgantown Regional Bike & Pedestrian Transportation Plan, the MPO Policy Board adopted the Plan in late November 2019. Subsequently, the consultant team worked with the Policy Board to develop an implementation strategy for the MPO staff to follow as the MPO seeks to implement the area's transportation plan*. The focus of the implementation strategy was narrowing the hundreds of project recommendations from the Steering Committee's Plan into a much smaller number of projects to be prioritized by MPO staff. To complement the Baker's Dozen High Ranking Projects found in Chapter 8 of this report, a work session was held in January 2020.

*Note that in the next few years, the Morgantown Monongalia Metropolitan Planning Organization will update its multi-modal transportation plan, which will fully incorporate the recommendations in the Steering Committee's Plan.

Facilitated by the consultant team, discussion focused on the 45 highest-scoring projects that included a mix of pedestrian, bicycle and trail projects within the four cities and towns, and in Monongalia County (see maps on the following pages for project locations). All projects lie within state-owned roadways or rights of way, leaving other well-regarded local projects to be implemented by the respective municipalities. The results of the workshop led to the winnowing of the 45 projects into 13 specific projects that form the Policy Board's Implementation Strategy. The Policy Board also expressed the desire to focus on general initiatives aimed at improving safety and connectivity for pedestrians primarily, with benefits for area bicyclists as well. Both the list of 13 projects favored by the Policy Board and general safety initiatives can be found in Tables 27 and 28 on subsequent pages.

Map 19: HIGH PRIORITY PEDESTRIAN AND TRAIL PROJECTS CONSIDERED BY THE POLICY BOARD



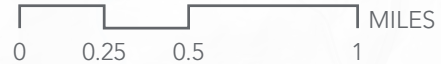
Revised crosswalk geometry needed

HIGH PRIORITY PROJECT LOCATIONS

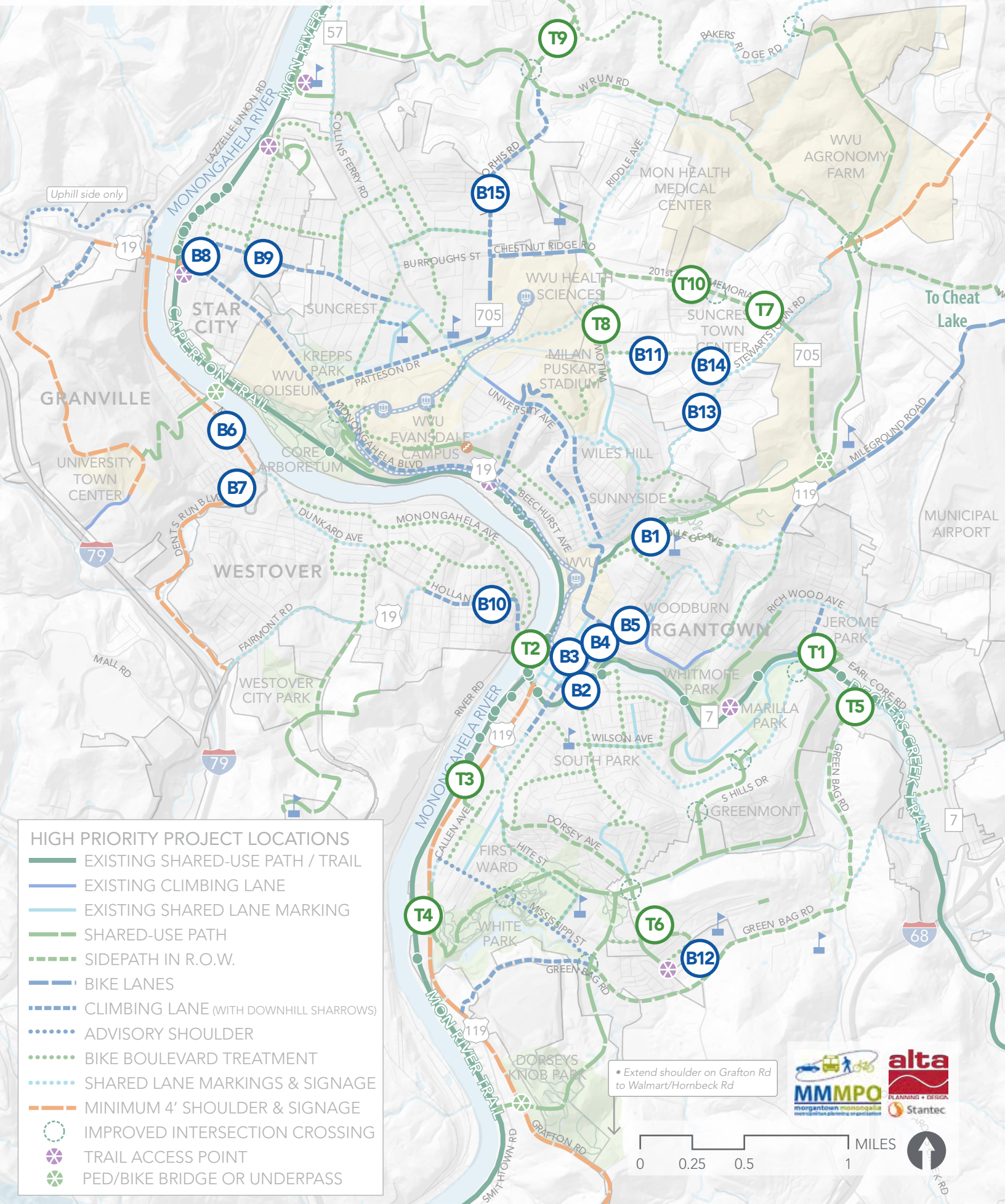
- SHARED-USE PATH
- SIDEWALK
- REPAIR SIDEWALK
- ✳ TRAIL ACCESS POINT
- ✳ PED/BIKE BRIDGE OR UNDERPASS
- CROSSWALK
- CROSSWALK WITH PEDESTRIAN SIGNAL
- CROSSWALK WITH CROSSING ISLAND
- CROSSWALK WITH RRFB
- CROSSWALK WITH BUMP OUTS
- PEDESTRIAN HYBRID BEACON (HAWK)
- NEW SIDEWALK
- RECURB
- PED LIGHTING

EXISTING FACILITIES:

- CROSSWALK
- SIDEWALK
- STAIRWAY
- TRAIL ACCESS
- TRAILS
- SIGNALIZED INTERSECTION



Map 20: HIGH PRIORITY BICYCLE AND TRAIL PROJECTS CONSIDERED BY THE POLICY BOARD



- HIGH PRIORITY PROJECT LOCATIONS**
- EXISTING SHARED-USE PATH / TRAIL
 - EXISTING CLIMBING LANE
 - EXISTING SHARED LANE MARKING
 - - - SHARED-USE PATH
 - · · · · SIDEPATH IN R.O.W.
 - - - BIKE LANES
 - - - CLIMBING LANE (WITH DOWNHILL SHARROWS)
 - · · · · ADVISORY SHOULDER
 - · · · · BIKE BOULEVARD TREATMENT
 - · · · · SHARED LANE MARKINGS & SIGNAGE
 - - - MINIMUM 4' SHOULDER & SIGNAGE
 - IMPROVED INTERSECTION CROSSING
 - ✱ TRAIL ACCESS POINT
 - ✱ PED/BIKE BRIDGE OR UNDERPASS

• Extend shoulder on Grafton Rd to Walmart/Hornbeck Rd



ADOPTED PLAN AMENDMENTS

The MPO Policy Board workshop resulted in the need to amend the Steering Committee's Plan document in two specific places:

- In Unincorporated Monongalia County, the proposed sidewalk on Mileground Road should extend southwest of the WV State Route 705 roundabout, and link with the proposed sidewalk on Willey Street in Morgantown. The corrected sidewalk recommendation is now shown in Map 12 in Chapter 7.
- The two connection options linking the Deckers Creek Trail to downtown Morgantown—via spur trails up to the Walnut Street Bridge and up to the intersection of Spruce/Kirk—are now included in the CIP Project Recommendations tables (see Table 17, City of Morgantown, Linear Bicycle Projects).

10.1 MPO POLICY BOARD PRIORITY PROJECTS

After discussion related to many of the 45 high-scoring pedestrian, bicycle and trail projects, the Policy Board was asked to express their preferences for projects that should be prioritized by MPO staff for implementation. Board members “voted” for the priority projects using colored dots, with each Policy Board member provided with four dots for projects they would like to have prioritized and two optional dots for projects that they prefer to not see implemented. When the votes were cast, 13 projects received more than one vote and are shown in the table on the following page.

Table 16: MPO Policy Board Priority Projects for Implementation

MAP #	PROJ ID	JURISDICTION	PROJECT DESCRIPTION	OWNER	LENGTH	COST ESTIMATE	POLICY BOARD VOTES
T1	PP92	Morgantown	Crosswalk with Crossing Island on Route 7 at Deckers Creek Blvd/ Mineral Ave (see pages 91-92)	State	---	\$9,000	6
	LP25	Morgantown	Sidewalk on Route 7 from Mineral Ave to Deckers Creek Blvd	State	382 Ft	\$118,000	
P8	PP39	Granville	Crosswalk with Crossing Island on Dents Run Rd at Dave Bean Cir	State	---	\$7,000	5
T2	PB5	Morgantown	Trail Access from the Westover Bridge to Caperton Rail Trail (see pages 101-103)	State	---	\$40,000	4
T4	PB13	Morgantown	Trail Access to the Caperton Rail Trail across Don Knotts Blvd from White Park (see page 104)	State	---	\$66,000	4
P9	PP52	Star City	Crosswalk with RRFB at the intersection of University Ave and Herman Ave (see page 99)	State	---	\$18,000	4
P1	LP155	Morgantown	Sidewalk Replacement on Willey St from Price St to Prospect St (north side only)	State	443 Ft	\$44,000	3
P2	PP68	Morgantown	Crosswalk with Bumpouts at the intersection of Walnut St and Chestnut St (see page 93)	State	---	\$9,000	3
P4	PP69	Morgantown	Crosswalk with Crossing Island at the intersection of Brockway Ave and Kingwood St (see page 94)	State	---	\$9,000	3
T5	PB18	Morgantown	Ped/Bike Bridge from Green Bag Rd future path to Deckers Creek Trail	State	---	\$182,000	3
B3	LB159	Morgantown	Shared Lane Markings and Signage on High St from Willey St to Pleasant St	State	1,469 Ft	\$42,000	2
B6	LB102	Granville	Paved Shoulder and Signage on Main St from Every St to Dents Run Rd	State	3,970 Ft	\$258,000	2
P10	PP53	Star City	Crosswalk with RRFB at the intersection of University Ave and Springdale Ave	State	---	\$18,000	2
P16	PP99	Unincorporated Monongalia County	Crosswalk with RRFB at the intersection of Willowdale Rd and Valley View Ave	State	---	\$18,000	2

10.2: MPO POLICY BOARD PREFERRED INITIATIVES

Supplementing the discussion about the 45 high-scoring pedestrian, bicycle and trail projects, the Policy Board expressed their preferences for general safety and connectivity initiatives that should be emphasized over others. The Policy Board’s intent is that these preferences be taken into account when MPO staff and individual jurisdictions in the region implement recommended projects from the Steering Committee’s Plan (other than the 13 listed above).

Table 17: MPO Policy Board Safety Initiatives

SAFETY INITIATIVE	POLICY BOARD VOTES
Implementation of Crosswalks	8
Pedestrian Lighting	6
Pedestrian Refuge Islands	6
Neighborhood Connections to Downtown	4
Protected Bicycle Lanes	4
Connections Between Communities	2
Buffered Bike Lanes	-4*

*A total of 4 negative votes were cast to express concern about 5’-6’ wide striped bicycle lanes recommended on Chestnut Ridge Road, Van Voorhis Road and Spruce Street.



At the Implementation Workshop, the MPO Policy Board expressed strong support for crosswalks and other pedestrian facilities throughout the region