



# Morgantown Pedestrian Safety Study

## *Pedestrian Audit*

*Presentation to Morgantown  
Monogalia MPO*

June 2022





# Agenda

- Welcome & Introductions
- Purpose of Study
- Morgantown Pedestrian Audit Review
- Next Steps
- Open Discussion



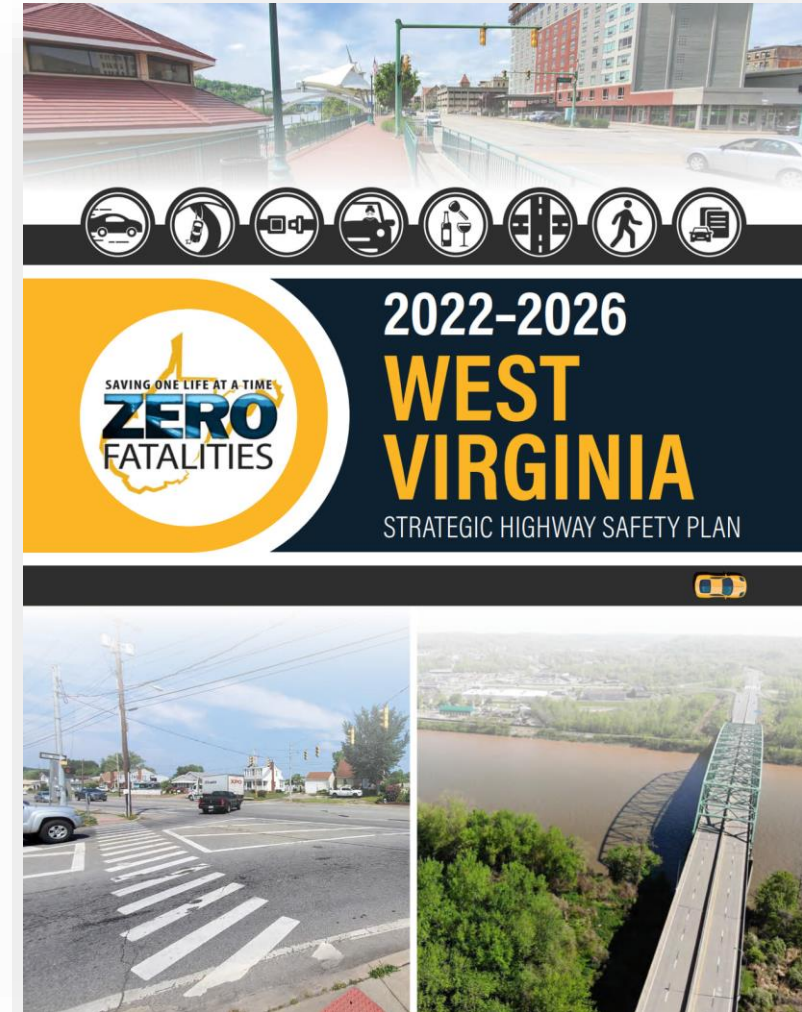
# Purpose of Study

- Evaluate pedestrian safety within the City of Morgantown and around West Virginia University
    - Includes major routes such as:
      - University Avenue
      - Monongalia Boulevard
      - Patteson Drive
    - Study includes:
      - Review of crash data
      - Assess intersection turning movement counts
      - Assess pedestrian movements
      - *Make recommendations for pedestrian safety improvements*
- Subject of today's discussion* →



# WV Strategic Highway Safety Plan

- 9% of all WV fatal injury crashes involve pedestrians
- 6% of all WV serious injury crashes involve pedestrians
- 12% of all WV fatal injury crashes resulting from impaired driving involved pedestrians
- 2% of all WV fatal injury crashes involving speeding and aggressive driving also involved pedestrians
- The 2022-2026 WV SHSP includes a regionally focused pedestrian emphasis area





# Morgantown Pedestrian Crashes

January 1, 2014 – December 31, 2019

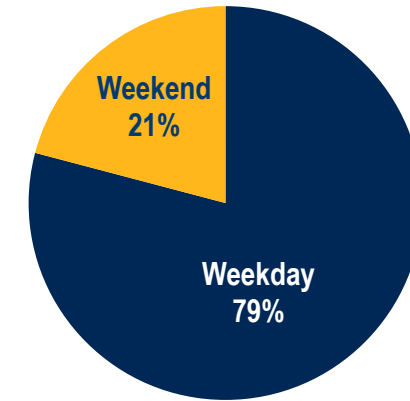
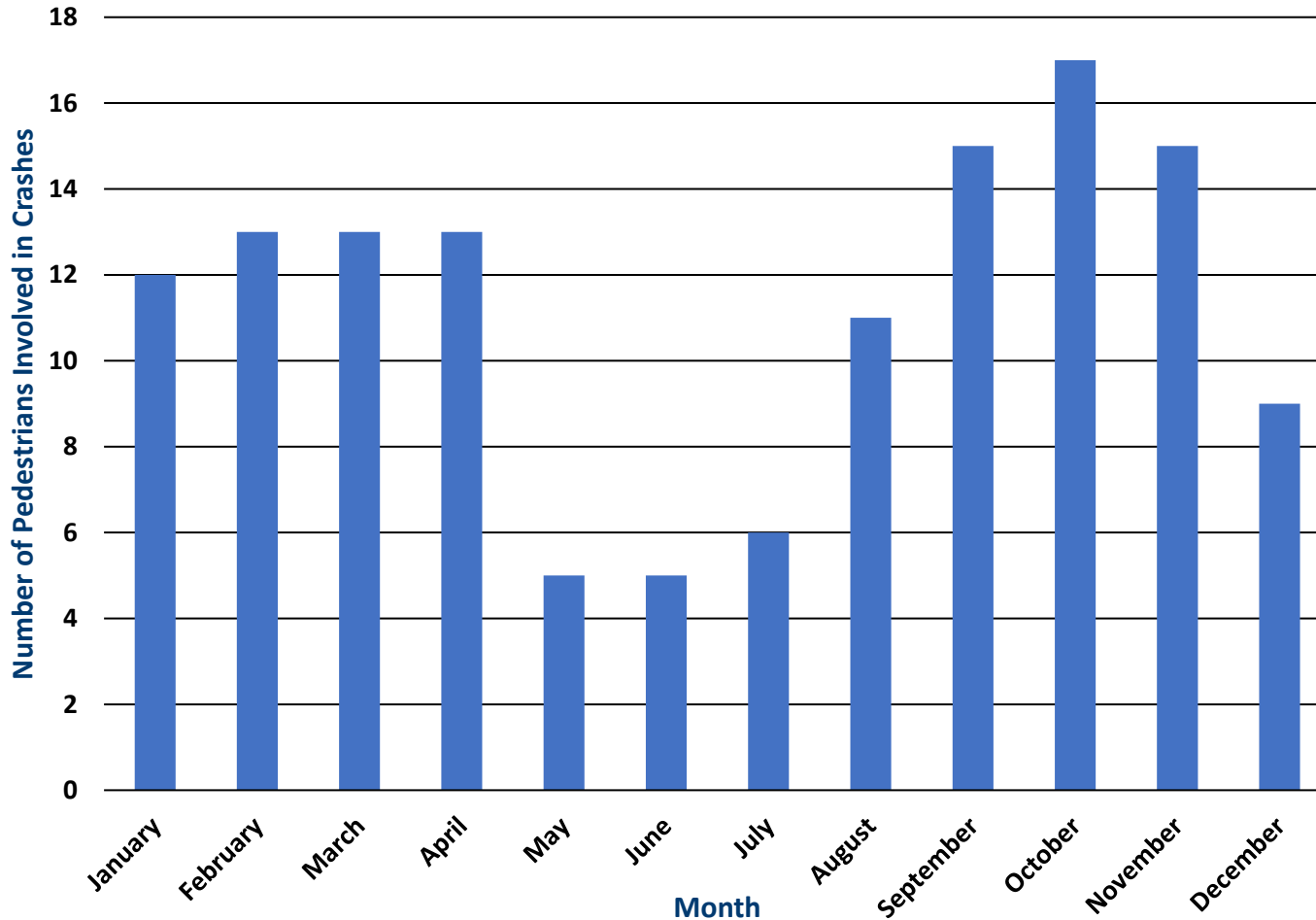
- 134 pedestrian crashes, involving 134 pedestrians (i.e., there were no crashes involving multiple pedestrians)
- 106 (79%) pedestrian crashes occurred between Monday and Friday
- 118 (88%) pedestrian crashes occurred during the primary school months of August through April
- 54 (40%) crashes involved pedestrians between the ages of 18-23
- 23 (17%) pedestrians involved in crashes were under the influence of alcohol or drugs
- 57 (43%) pedestrians suffered incapacitating injuries or non-incapacitating injuries (Type A injuries / Type B injuries)
- 6 (4%) pedestrians died of injuries related to crashes



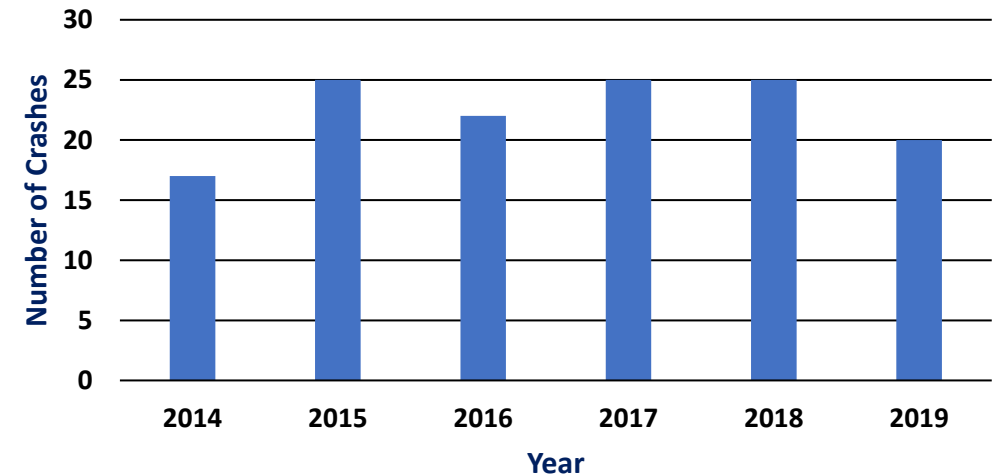
# Morgantown Pedestrian Crashes

January 1, 2014 – December 31, 2019

*88% of crashes occurring during the primary months of WVU classes/activities (August – April)*



*134 Pedestrians were involved in crashes over a 6-year period*





# Morgantown Pedestrian Crashes

January 1, 2014 – December 31, 2019

## All Crashes

	12A	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12P	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P	Totals
Sunday		2	2	1		1									3	2			1						12
Monday									1		1	2	2	1	1	1	2	2	1	3	1	1			19
Tuesday							1	2	1	1	1	1	3	1		2	2	2	1	2	3	1	1		25
Wednesday	1				1			3			1	2	1	2	1	2			3	2	1	1		1	22
Thursday	1							1	2		2	2	1	1	1	2	1	2	4	1					21
Friday	1	1					1		1	1	2	2	3		1			1	1	1		1	1	1	19
Saturday	1	1				1				2				2		2		2	1	1	1	1		1	16
<b>Totals</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>7</b>	<b>9</b>	<b>10</b>	<b>7</b>	<b>7</b>	<b>11</b>	<b>5</b>	<b>9</b>	<b>12</b>	<b>10</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>134</b>

## November - February

	12A	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12P	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P	Totals
Sunday		1	1			1										1									4
Monday																1	2	1		1		1			6
Tuesday											1		2	1		1	1	1	1	1	2				11
Wednesday					1			2			1	1				1			1				1		7
Thursday									2									1	3	1					7
Friday							1				1	1	1					1	1			1			7
Saturday		1				1								1				1		1		1		1	7
<b>Totals</b>		<b>2</b>	<b>1</b>		<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>		<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>		<b>3</b>	<b>3</b>	<b>5</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>49</b>

Lower Frequency

Higher Frequency

XX Number of Pedestrians Involved in Crashes

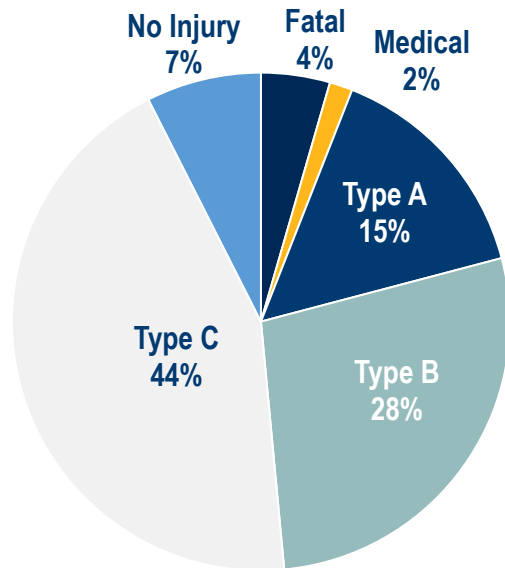
53% of all pedestrian crashes occurred  
between 12:00 PM and 8:00 PM





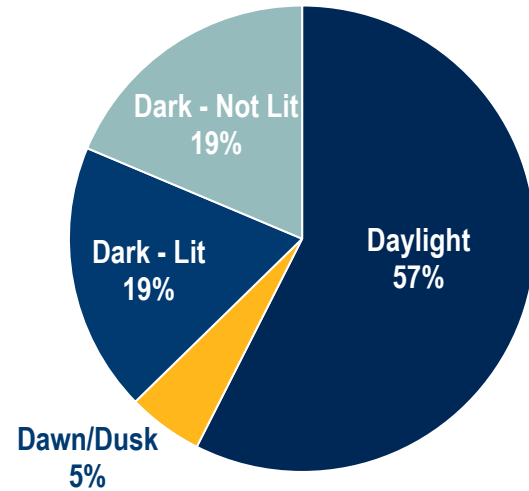
# Morgantown Pedestrian Crashes

January 1, 2014 – December 31, 2019

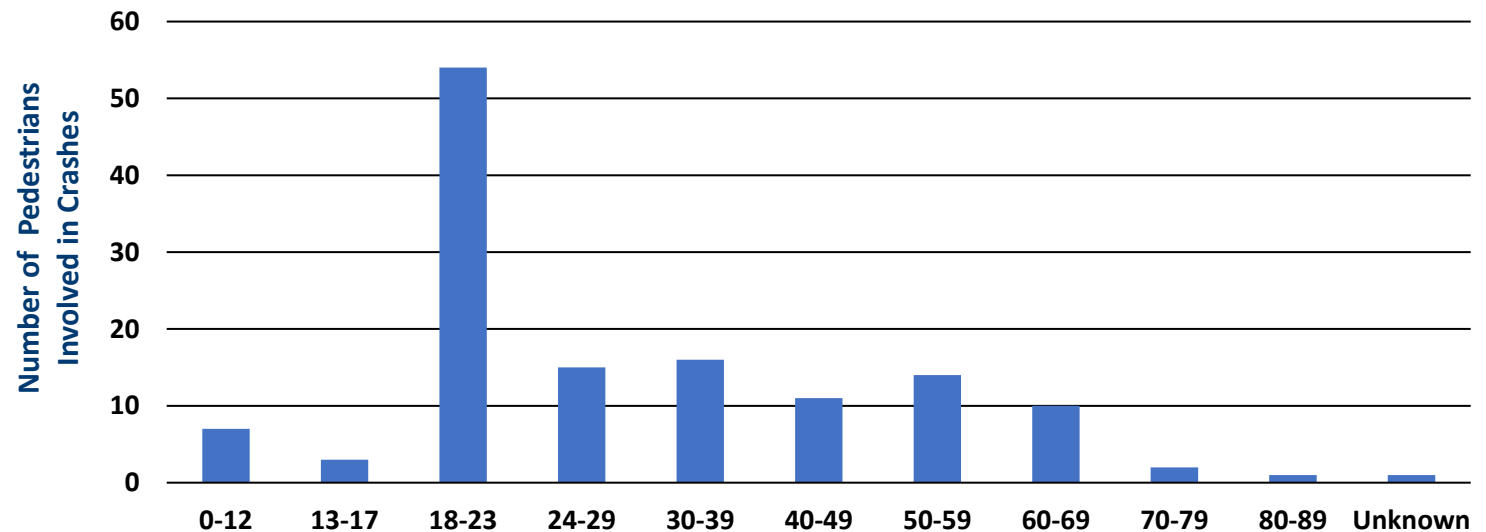
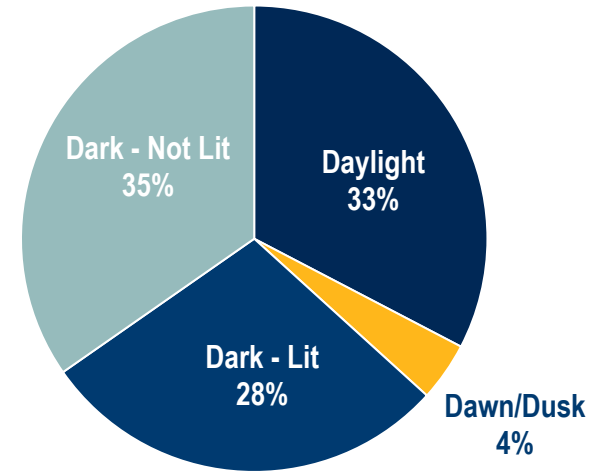


**19% of all pedestrian crashes resulted in Fatal or Suspected Serious (Type A) Injuries**

**All Crashes**



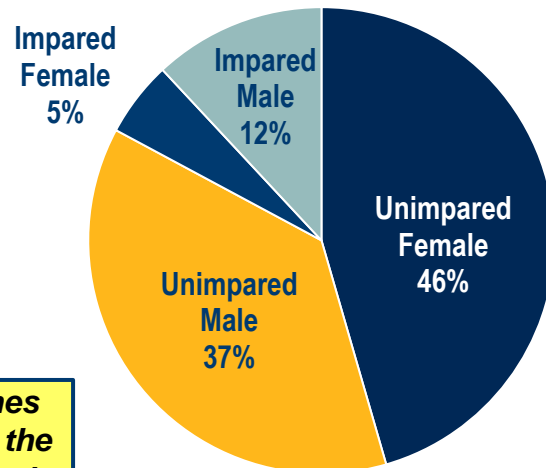
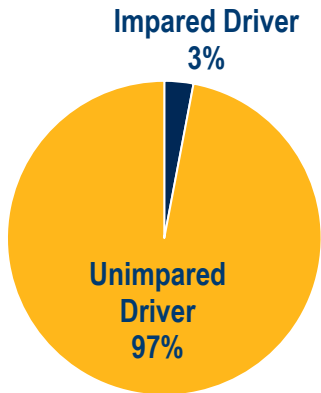
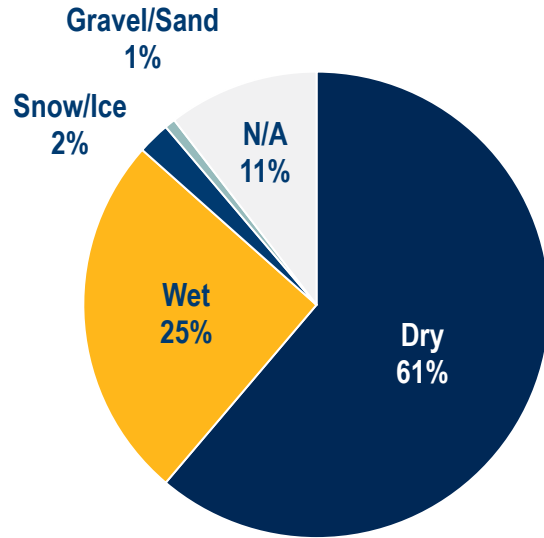
**Nov - Feb**



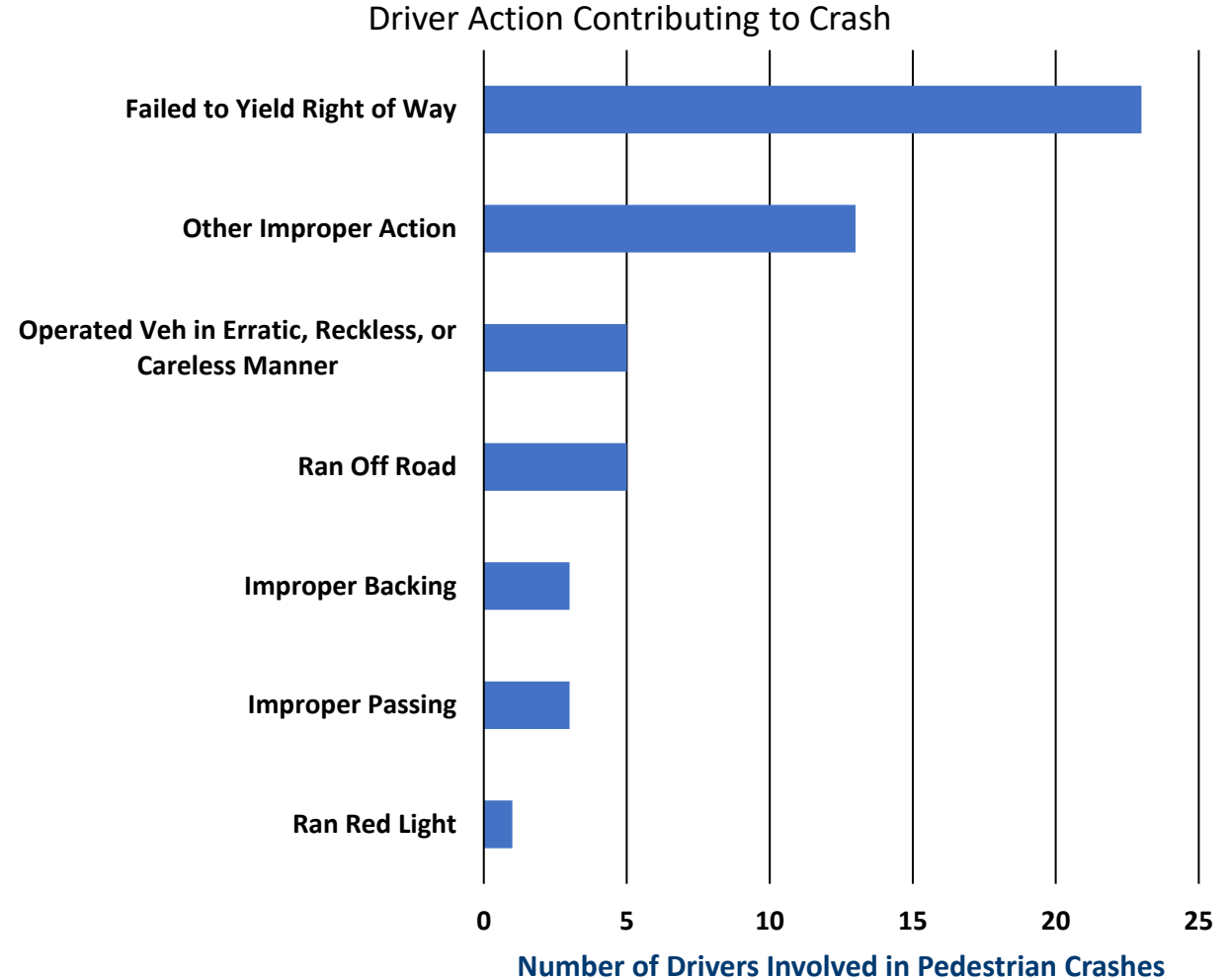


# Morgantown Pedestrian Crashes

January 1, 2014 – December 31, 2019



**17% of all pedestrian crashes involved pedestrians under the influence of drugs or alcohol**

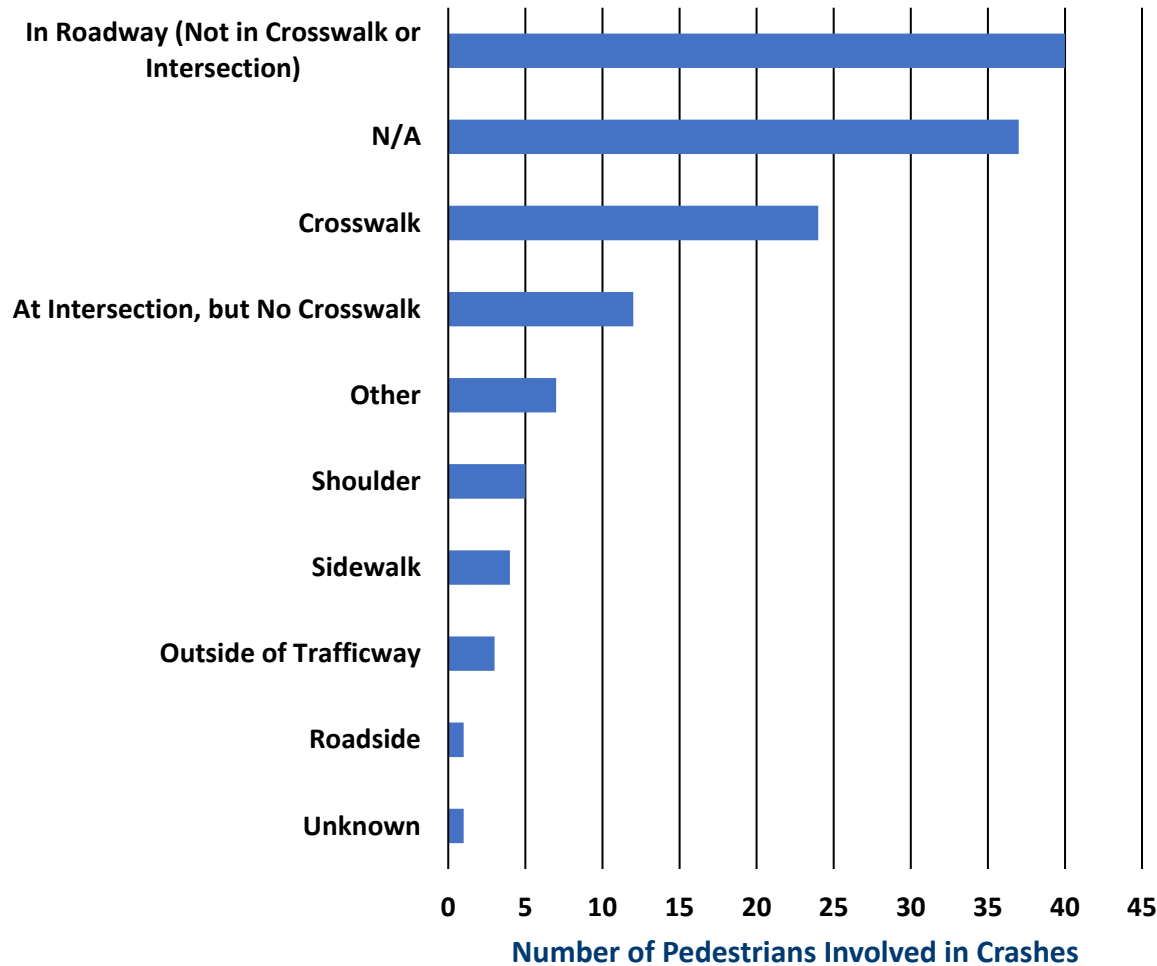




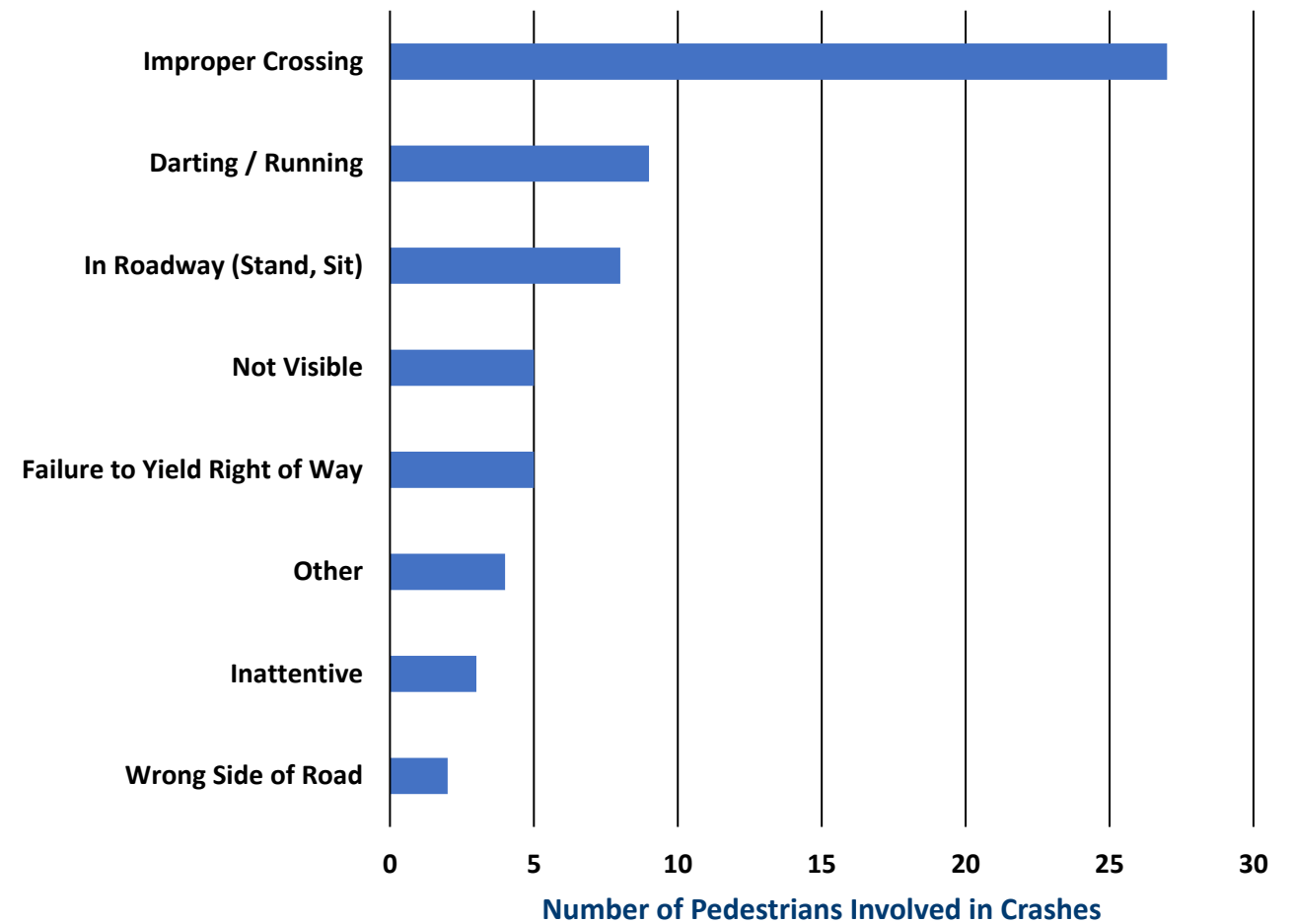
# Morgantown Pedestrian Crashes

January 1, 2014 – December 31, 2019

Pedestrian Locations



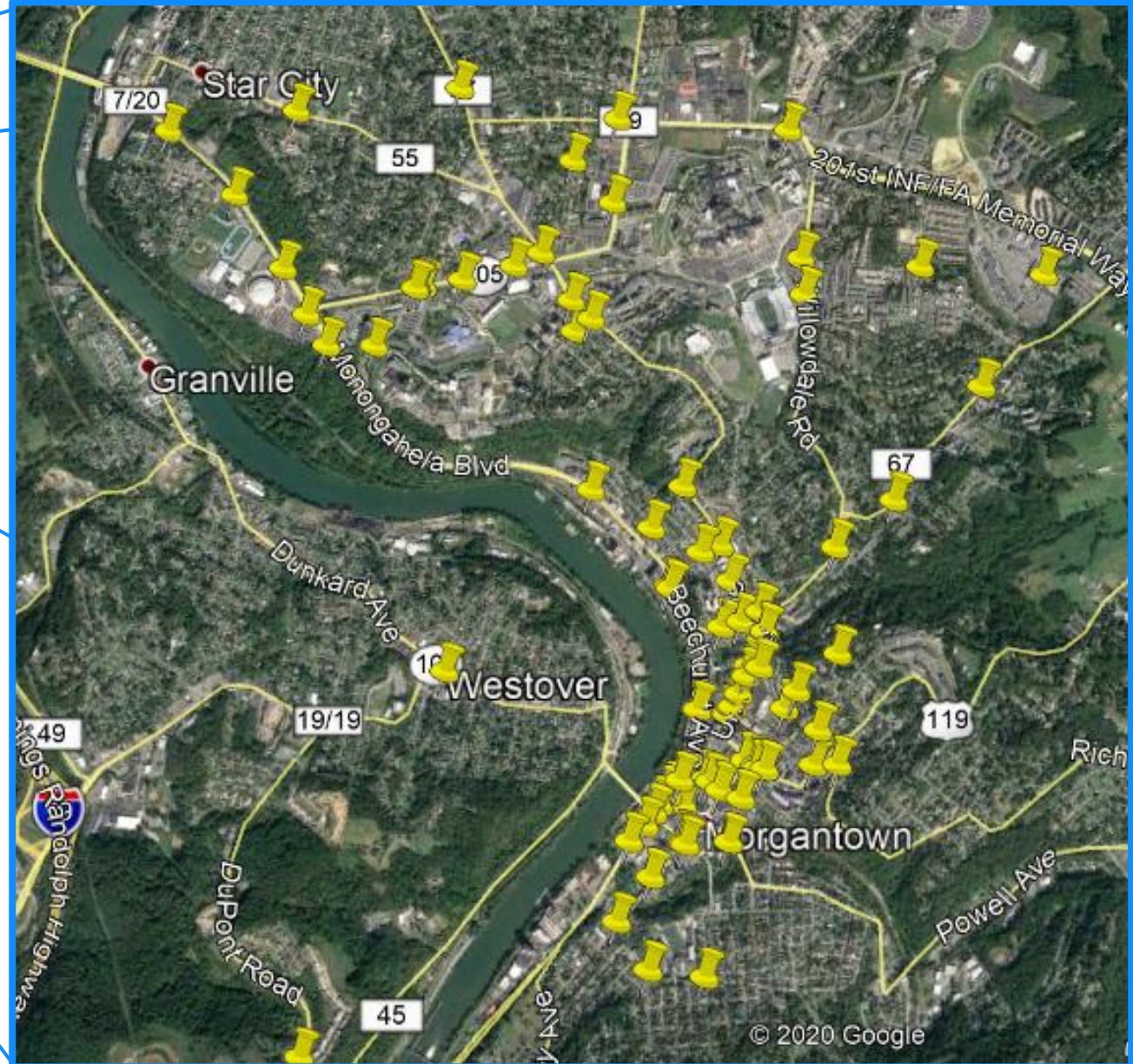
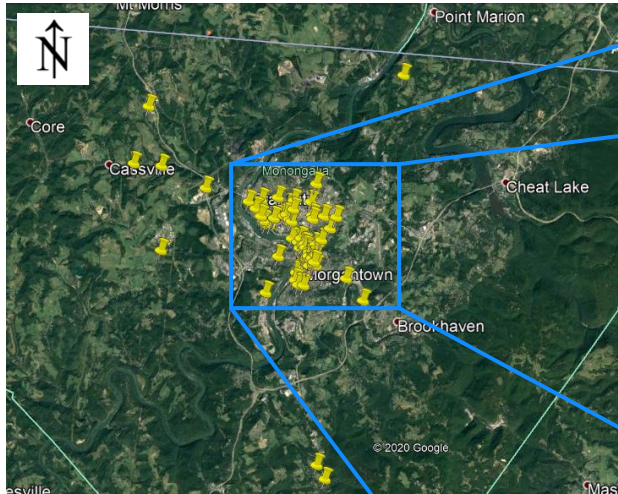
Pedestrian Contributing Actions



Many of the pedestrian crashes resulted from pedestrians crossing local streets away from a designated crosswalk



# Pedestrian Crash Locations



## Roadways of concern

- University Ave.
- Monongahela Blvd.
- Patteson Dr.
- Don Knotts Blvd.
- Willey St.
- Fayette St.
- Pleasant St.



# Pedestrian Safety Study Process

- Develop corridor base mapping with existing conditions information and pedestrian crash locations
  - Will need to observe pedestrian movements within each corridor
- Field reviews
- Evaluate the following:
  - Pedestrian phasing at signalized intersections
  - Right Turn on Red restrictions
  - Sign and pavement marking improvements at established pedestrian crossings
  - Speed limits and speed studies
  - Lighting inventories
  - Need for pedestrian barriers to prevent undesirable mid-block crossings
  - Obtain traffic counts as needed
  - Incorporate recommendations from other studies where appropriate



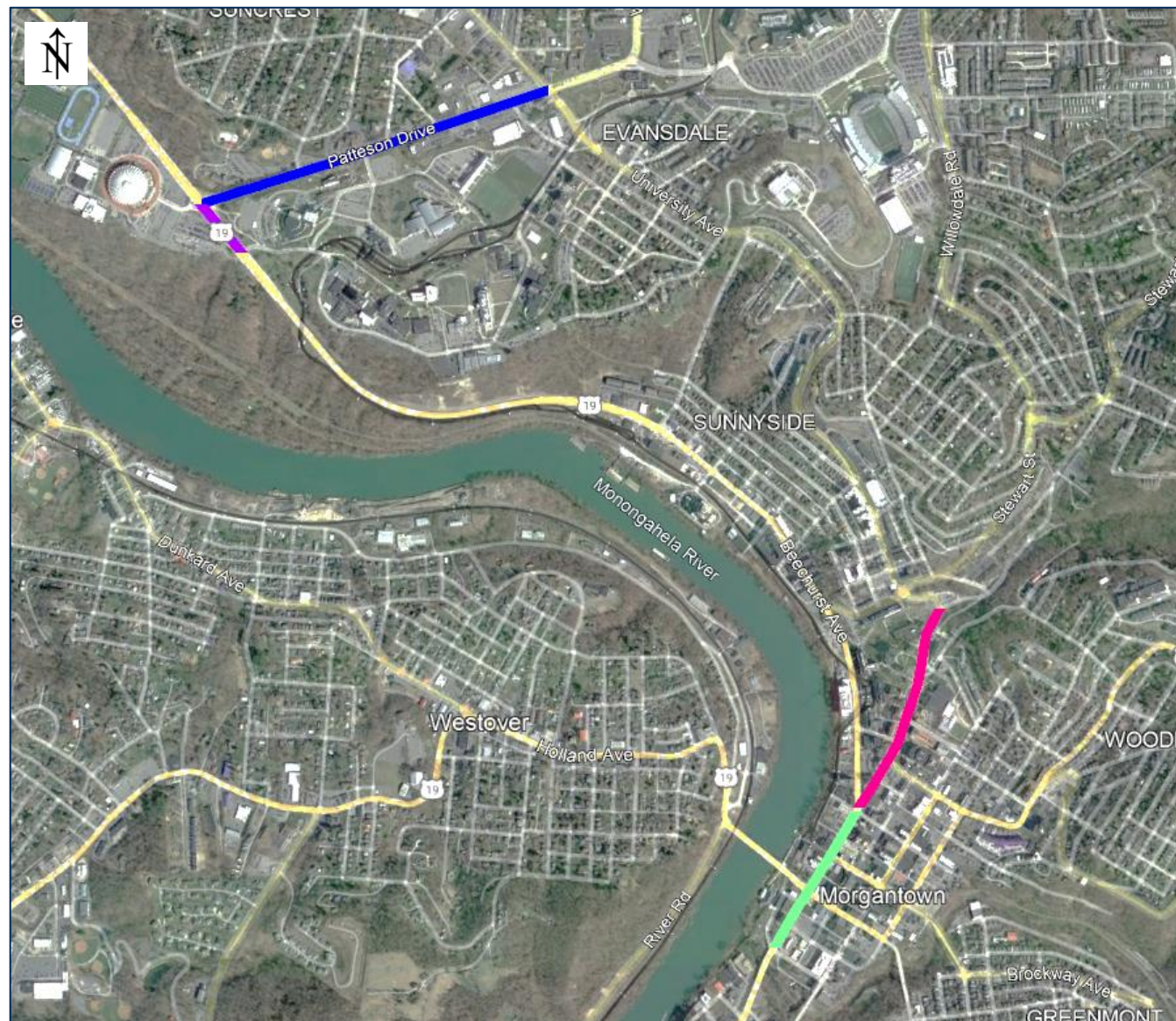
# Pedestrian Safety Study Process

- Review location-specific pedestrian crash history at selected sites
- Perform pedestrian observations & counts
- Compile existing data
  - Pedestrian facilities: sidewalk, pedestrian signals, etc.
  - Bus stop locations and ridership data
  - Roadway facilities: channelization, lighting, etc.
  - Vehicular and pedestrian volumes
- Perform additional analysis to evaluate potential improvements (short and long-term)
- Present improvements to stakeholders for concurrence



# High Priority Corridors

- **Don Knotts Boulevard**
  - Garrett Street / Sturgiss Street to Fayette Street
- **University Avenue**
  - Beechurst Avenue / Fayette Street to Falling Run Road
- **Monongahela Boulevard**
  - Patteson Drive to Evansdale Drive
- **Patteson Drive**
  - Monongahela Boulevard to University Avenue

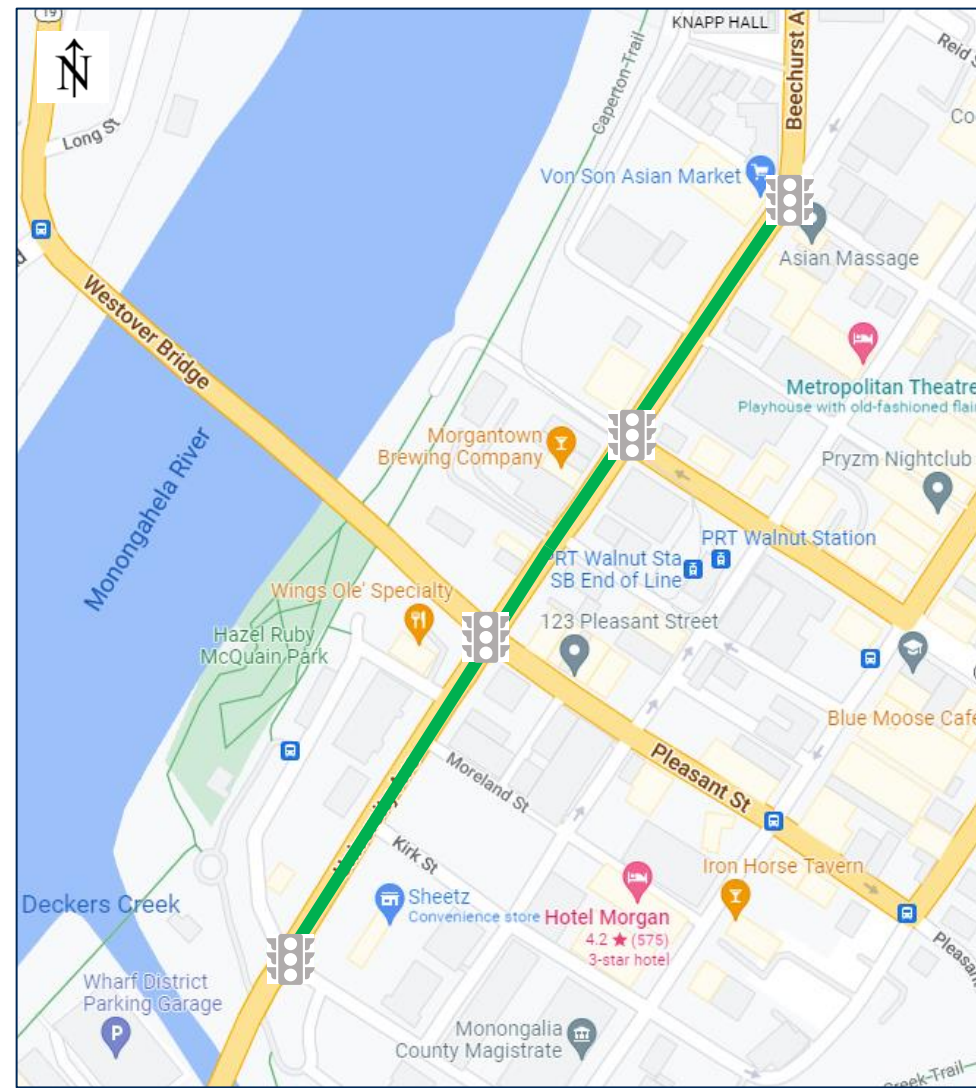




# Don Knotts Boulevard

Garrett Street / Sturgiss Street to Fayette Street

- 0.30-mile corridor
- 4 signalized intersections and 5 unsignalized intersections
- Numerous unsignalized mid-block parking lots and driveway entrances
- Varies one – three through lanes
- Turn lanes at major intersections
- Sidewalks and lighting present
- 25-MPH speed limit





# Don Knotts Boulevard

Garrett Street / Sturgiss Street to Fayette Street

## 7 Crashes (Jan 2014 – Dec 2019)

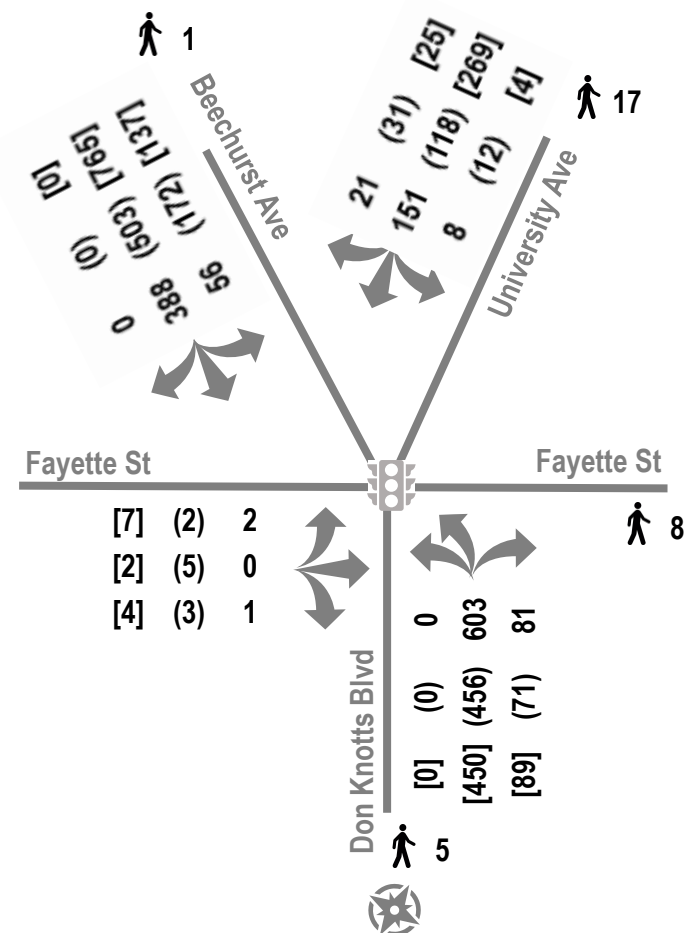
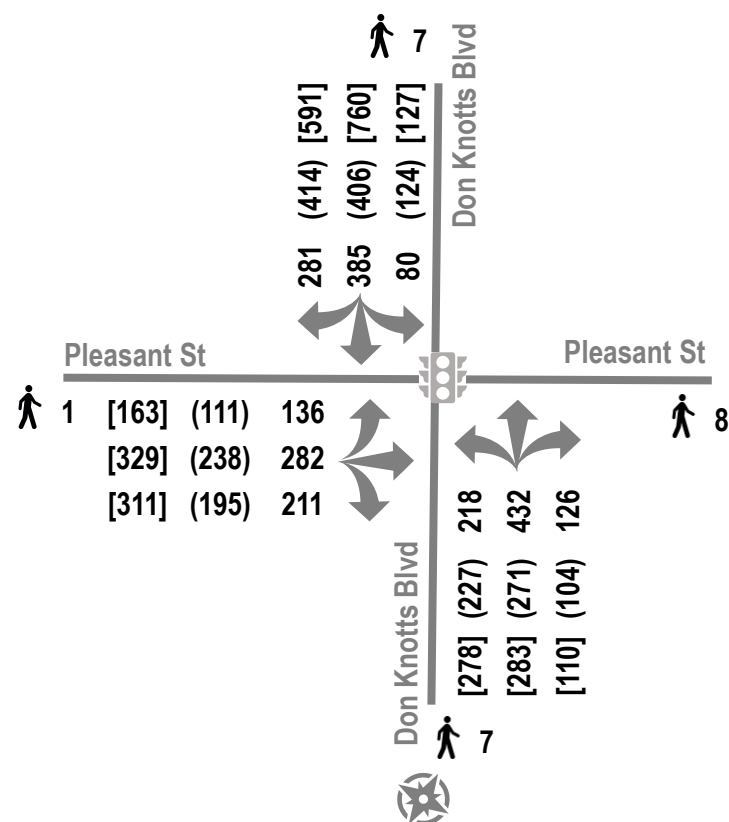
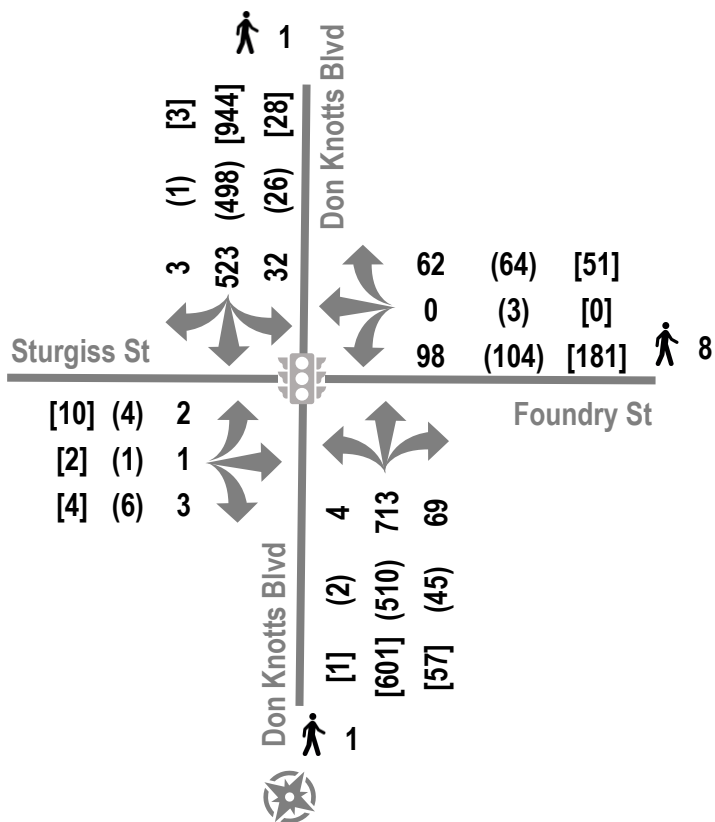
- 4 crashes involving pedestrians jaywalking and getting struck by NB / SB vehicles (near Wall Street, Pleasant Street, Kirk Street, and Court Street)
- 1 crash involving an EBL vehicle striking a pedestrian in the crosswalk at Pleasant Street
- 1 crash involving a pedestrian crossing at Walnut Street against the signal and getting struck by a vehicle (H&R)
- 1 crash involving a pedestrian getting out of a stopped car and stepping into the path of a SB vehicle at Walnut Street





# Don Knotts Boulevard

Garrett Street / Sturgiss Street to Fayette Street



Oct. 20, 2021

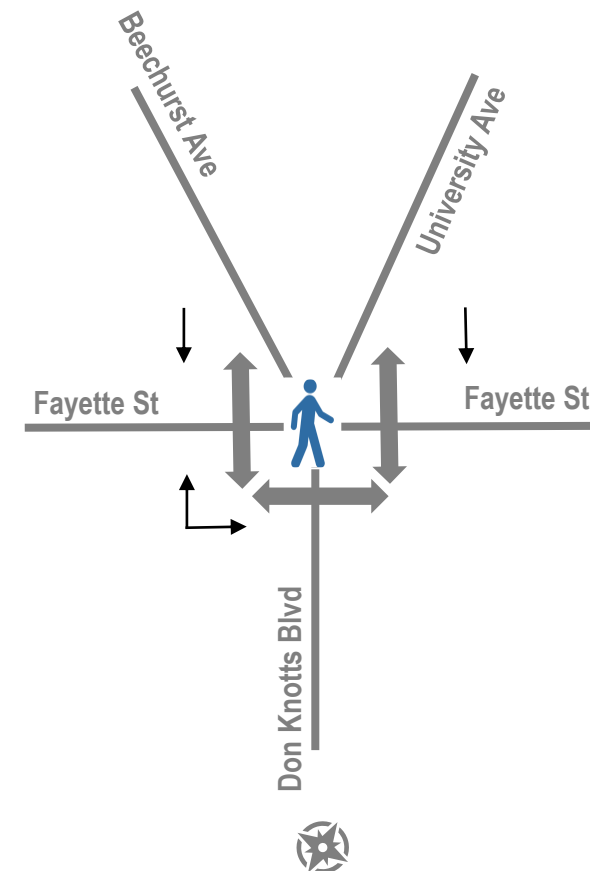
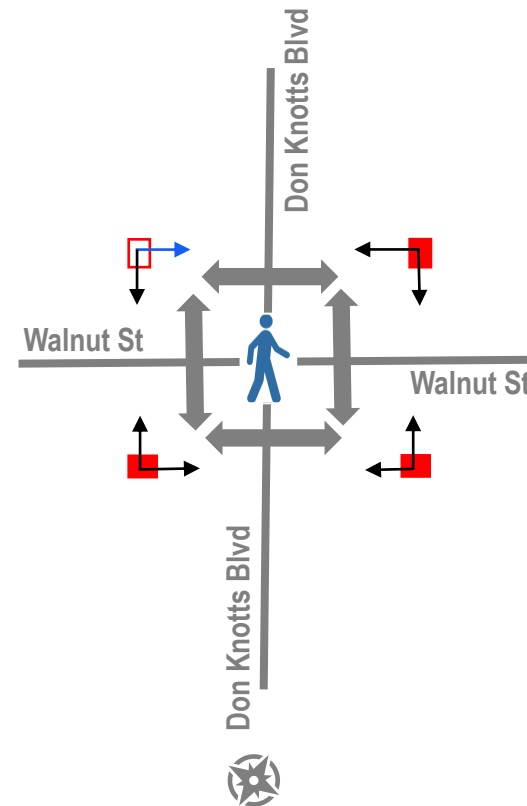
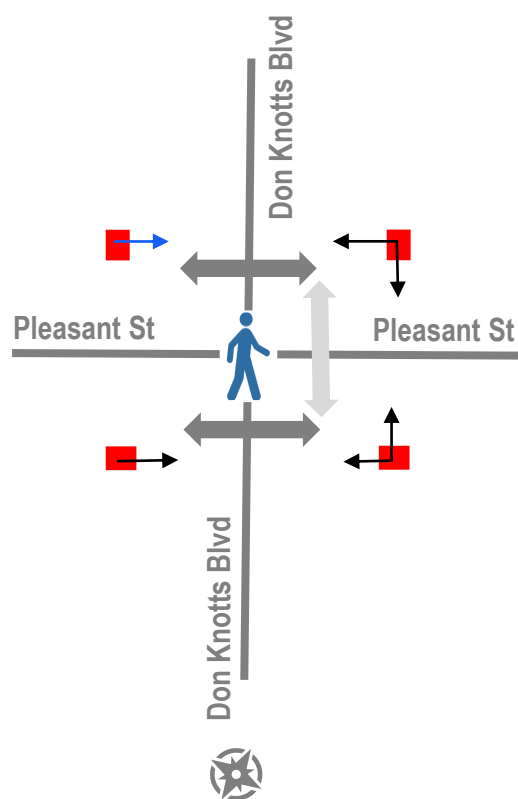
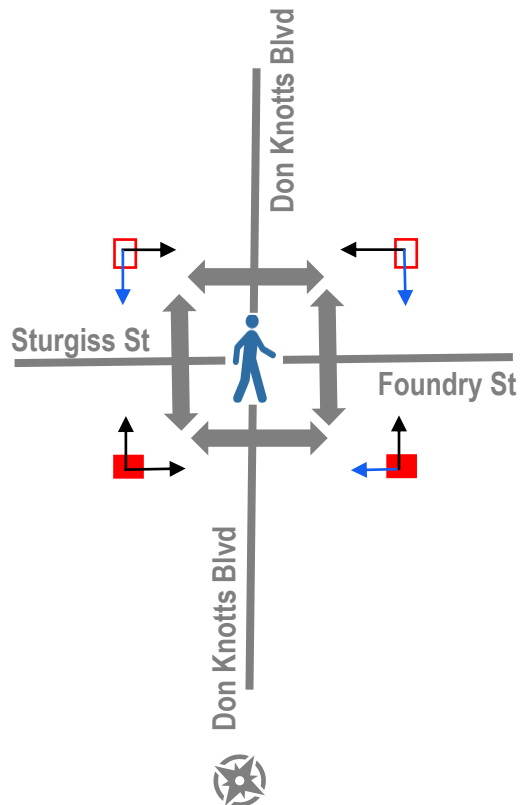
AM (MID) [PM]

\*Weekday Hourly Ped Volume (highest recorded hour of 3 peaks)



# Don Knotts Boulevard

Garrett Street / Sturgiss Street to Fayette Street



## Pedestrian Signal Legend:

- ← Countdown Ped Heads
- ← Flashing Hand Only Ped Heads
- Ped Button Working
- Ped Button Malfunction
- No Ped Button Present

## Crosswalk Legend:

- ↔ Proper Crosswalk
- ↔ Faded Crosswalk
- No Crosswalk Present



# Potential Improvements

## Don Knotts Boulevard

- Install TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) signs for the following locations:
  - Don Knotts Boulevard at Sturgiss Street / Foundry Street for all turning movements
  - Don Knotts Boulevard at Pleasant Street for the NBR, SBL, EBL, EBR, WBL, and WBR
  - Don Knotts Boulevard at Walnut Street for the NBL, SBR, EBL, EBR, and WBL
  - Don Knotts Boulevard at Fayette Street for the NBL, NBR, SBL, and SEBL
- Refresh faded crosswalk on the east leg of Don Knotts Boulevard at Pleasant Street
- Install missing pedestrian push buttons and ped heads at the intersection of Don Knotts Boulevard at Fayette Street
- Install countdown ped heads where missing
- Reprogram ped buttons where malfunctioning
- Improve signal timing and vehicle coordination to reduce queuing

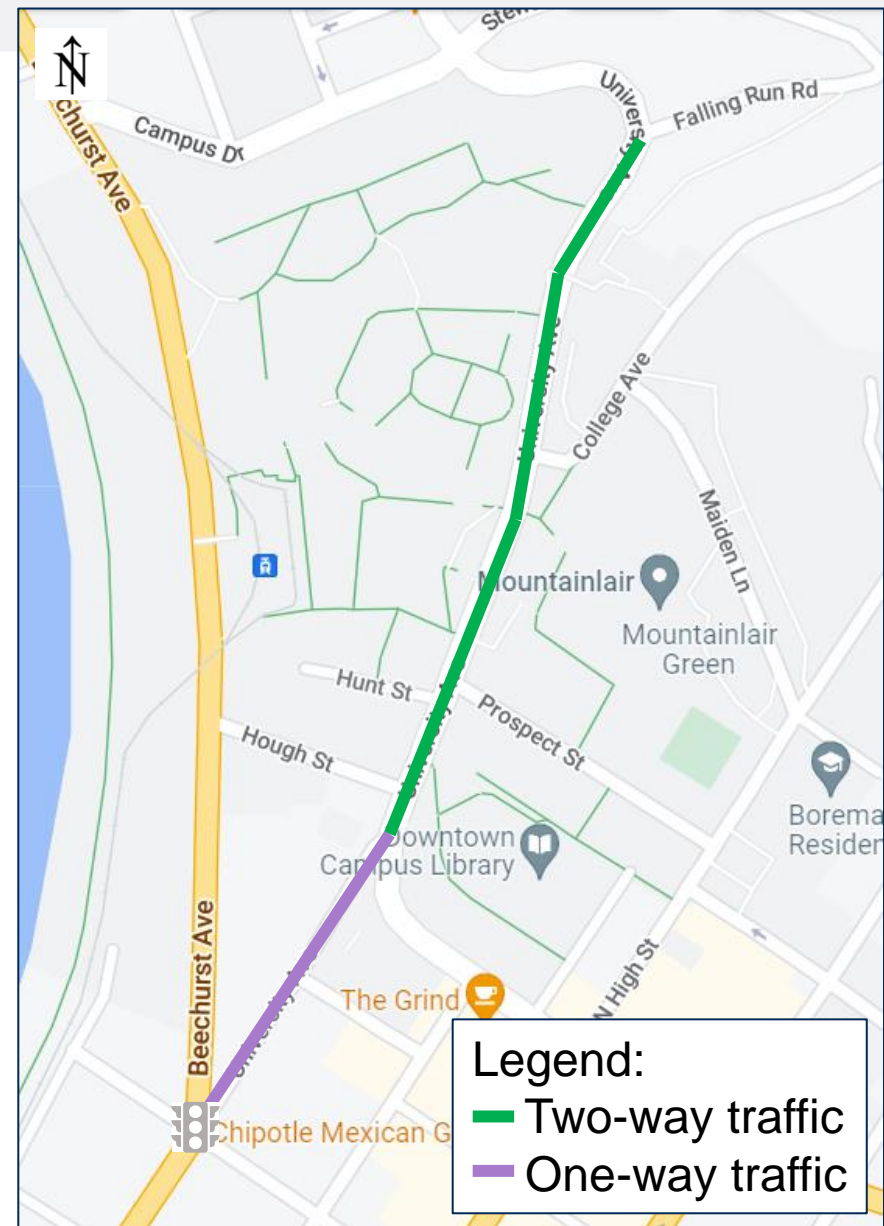




# University Avenue

Beechurst Avenue / Fayette Street to Falling Run Road

- 0.42-mile corridor
- 1 signalized intersection and 6 unsignalized intersections
- Numerous unsignalized mid-block parking lots and driveway entrances
- Runs through WVU campus, passing numerous classroom buildings and the Mountainlair Student Union
- One through lane NB / SB
- Turn lanes at major intersections
- One-way southbound with on-street parking between Fayette Street and Willey Street
- Sidewalks and lighting present
- 25-MPH speed limit





# University Avenue

Beechurst Avenue / Fayette Street to Falling Run Road



University Avenue at Mountainlair Pedestrian Crossing on a weekday at 12:30 PM



# University Avenue

Beechurst Avenue / Fayette Street to Falling Run Road

## 10 Crashes (Jan 2014 – Dec 2019)

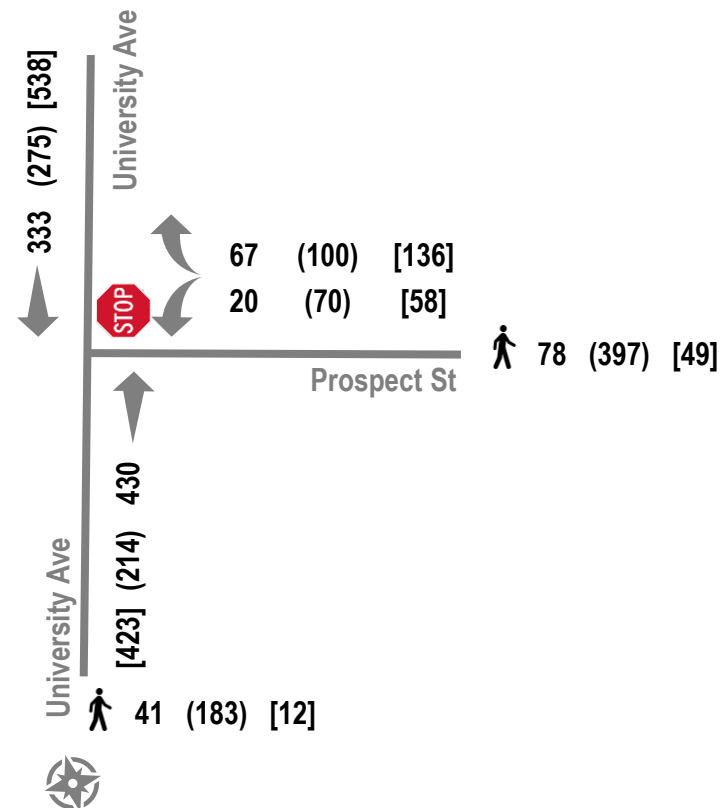
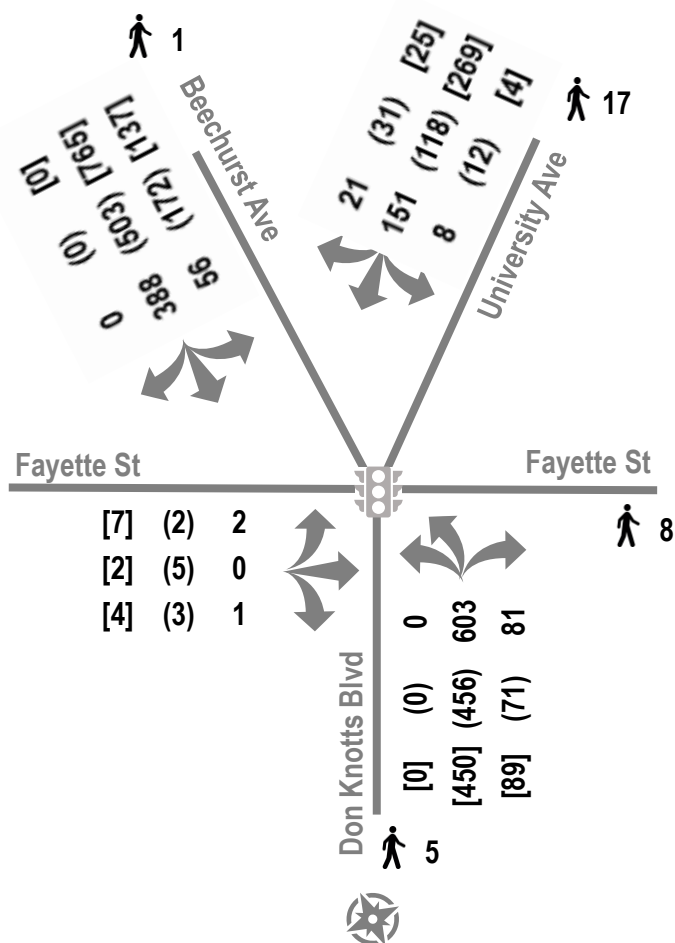
- 3 crashes involving vehicles striking pedestrians in the crosswalk at Falling Run Road (2 NB, 1 WBR)
- 2 crashes involving NB vehicles striking pedestrians N of Prospect Street (1 unknown if at crosswalk)
- 2 crashes involving SB vehicles striking pedestrians in the crosswalk (1 unknown at-fault) (Hough Street and College Avenue)
- 2 crashes involving WBL vehicles striking pedestrians crossing not at a crosswalk at Prospect Street
- 1 crash involving a NB vehicle striking a pedestrian crossing without a crosswalk, N of College Avenue (vehicle DUI)





# University Avenue

Beechurst Avenue / Fayette Street to Falling Run Road



Oct. 20, 2021

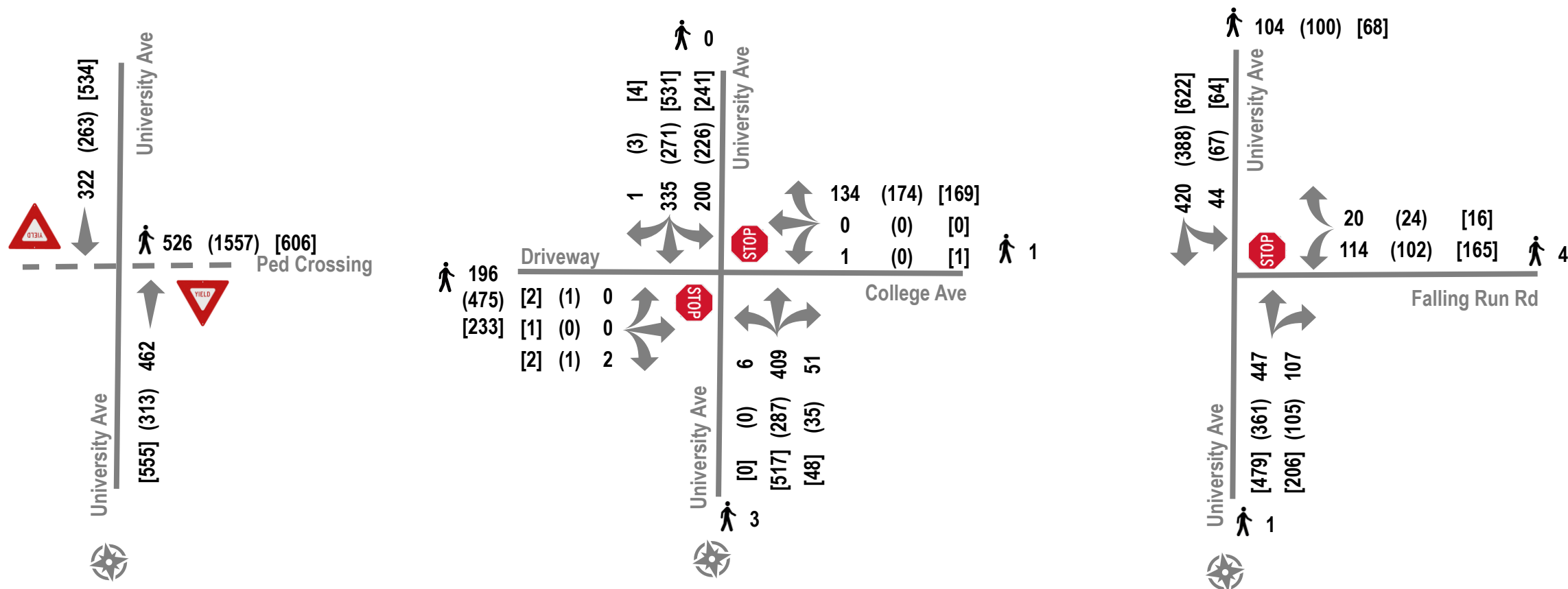
AM (MID) [PM]

\*Weekday Hourly Ped Volume (highest recorded hour of 3 peaks)



# University Avenue

Beechurst Avenue / Fayette Street to Falling Run Road



Oct. 20, 2021

AM (MID) [PM]

\*Weekday Hourly Ped Volume (highest recorded hour of 3 peaks)



# Potential Improvements

## University Avenue

- Refresh the faded crosswalk at the unsignalized intersection of University Avenue at Moore Hall
- Upgrade the existing crosswalk to piano keys at the pedestrian crossing at University Avenue at Mountainlair Student Union
- Upgrade and Install Pedestrian (W11-2) signs with Directional Arrow (W16-7P) signs and advance warning signs with AHEAD plaques (W16-9P) at the following unsignalized crosswalks:
  - University Avenue at Clark Hall
  - University Avenue at Moore Hall
  - University Avenue at Mountainlair Student Union

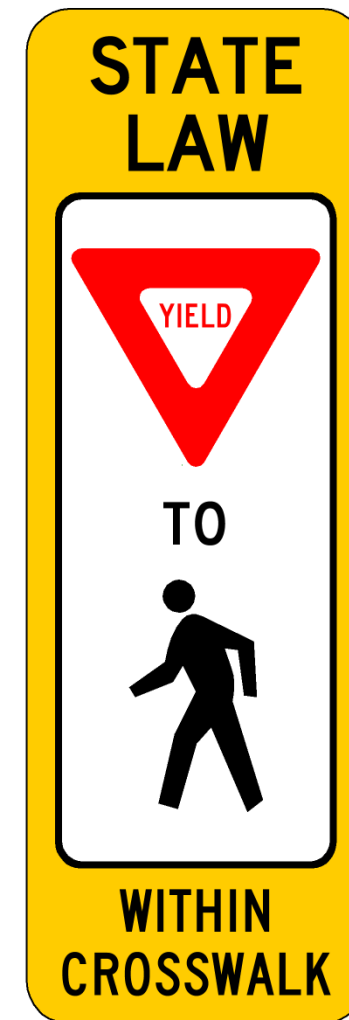




# Potential Improvements

## University Avenue

- Consider converting the unsignalized pedestrian crossing at University Avenue at Mountainlair Student Union to a signalized pedestrian crossing
  - Five out of six hours counted meet Signal Warrant 4 – Pedestrian Volumes
  - Conversion to a signalized pedestrian crossing reduces the level of service (LOS) from a F to a B during the midday peak
- Consider raised medians with R1-6B pedestrian signs on University Avenue where there are existing striped medians and crosswalks
  - University Avenue at Clark Hall
  - University Avenue at Moore Hall

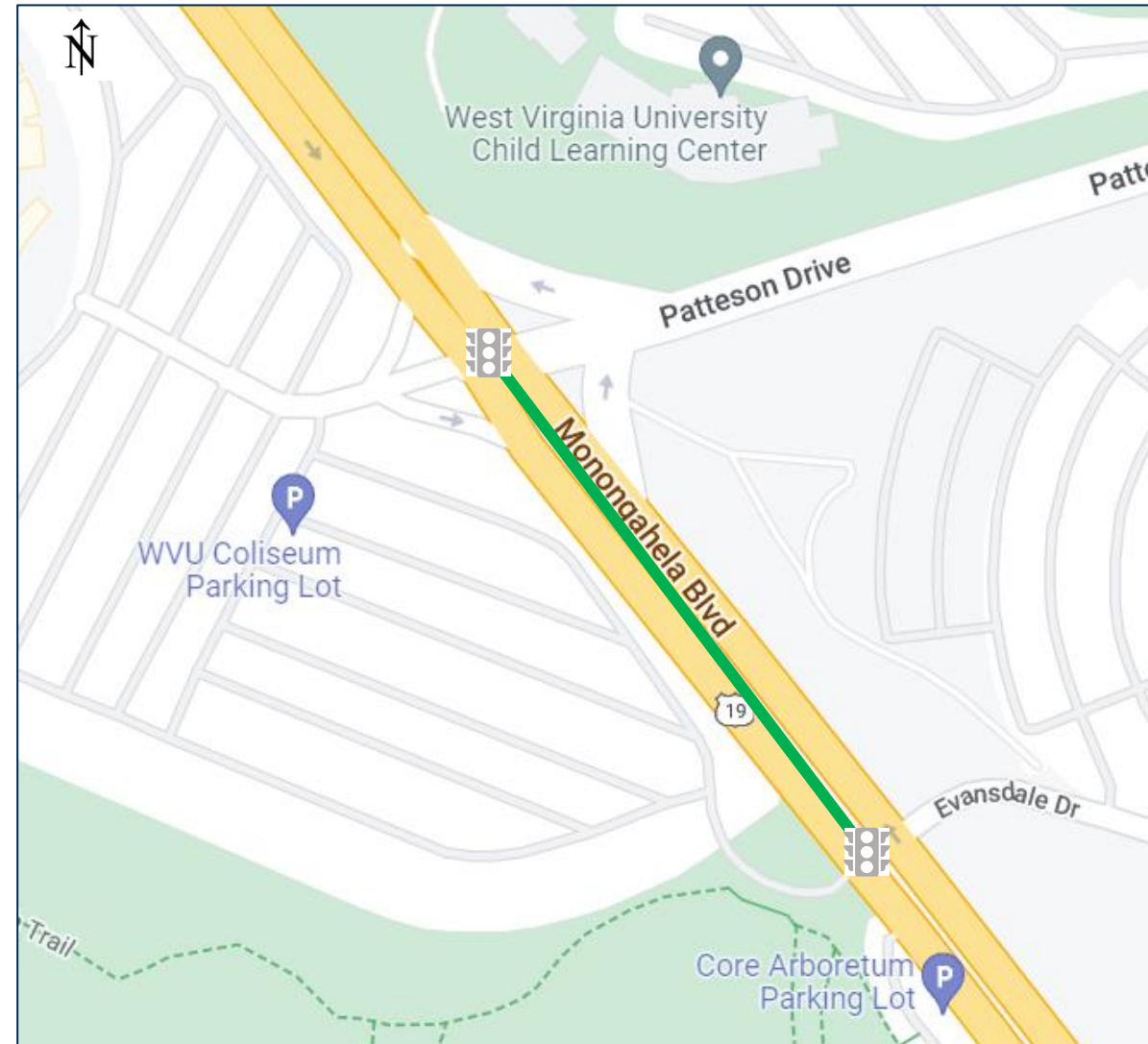




# Monongahela Boulevard

Patteson Drive to Evansdale Drive

- 0.12-mile corridor
- 2 signalized intersections
- No unsignalized mid-block parking lots or driveway entrances
- Entrance to the WVU sports complex
- Two through lanes NB / SB
- Turn lanes at major intersections
- Sidewalks and lighting present
- 45-MPH speed limit





# Monongahela Boulevard

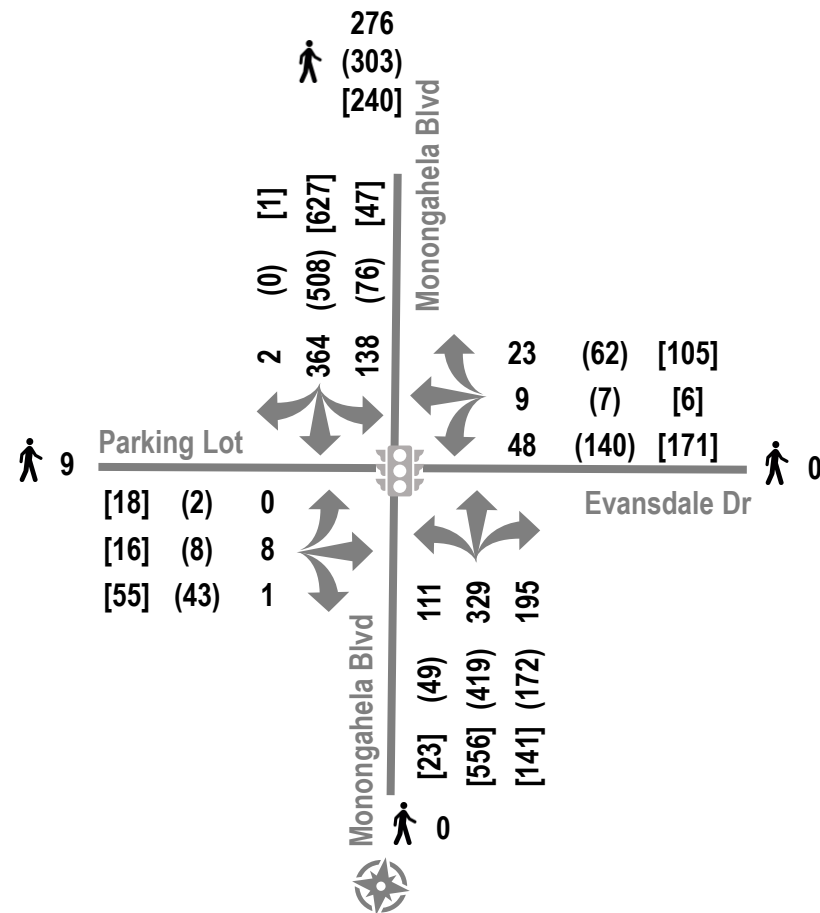
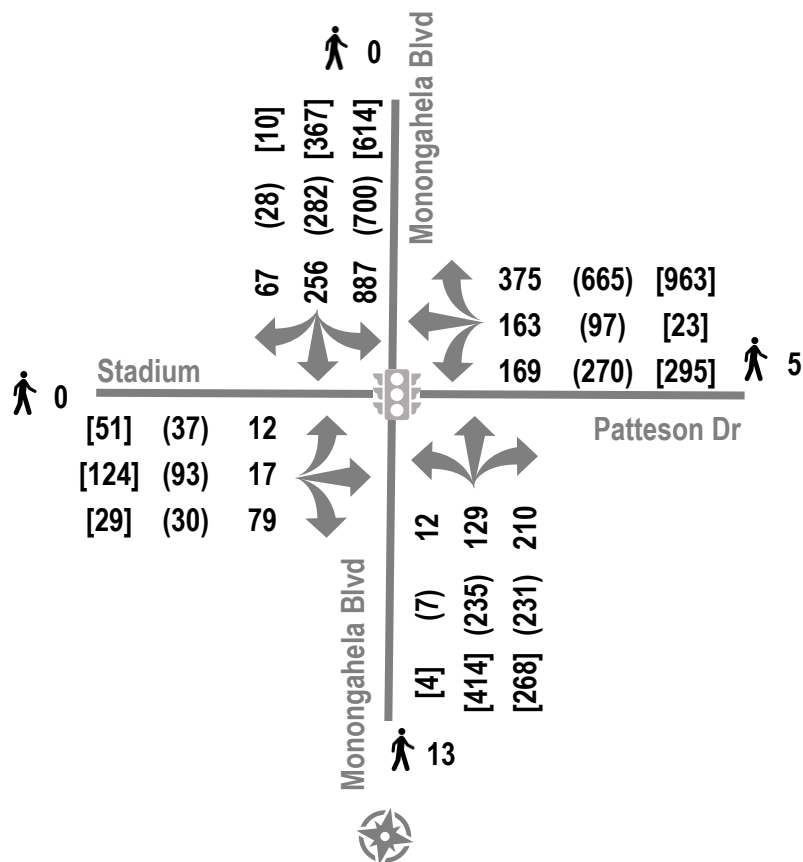
Patteson Drive to Evansdale Drive

## 2 Crashes (Jan 2014 – Dec 2019)

- 1 crash involving a SB vehicle striking a pedestrian crossing against the signal in the crosswalk at Patteson Drive
- 1 crash involving a SB vehicle running a red light and striking a pedestrian in the crosswalk at Evansdale Drive



## Patteson Drive to Evansdale Drive

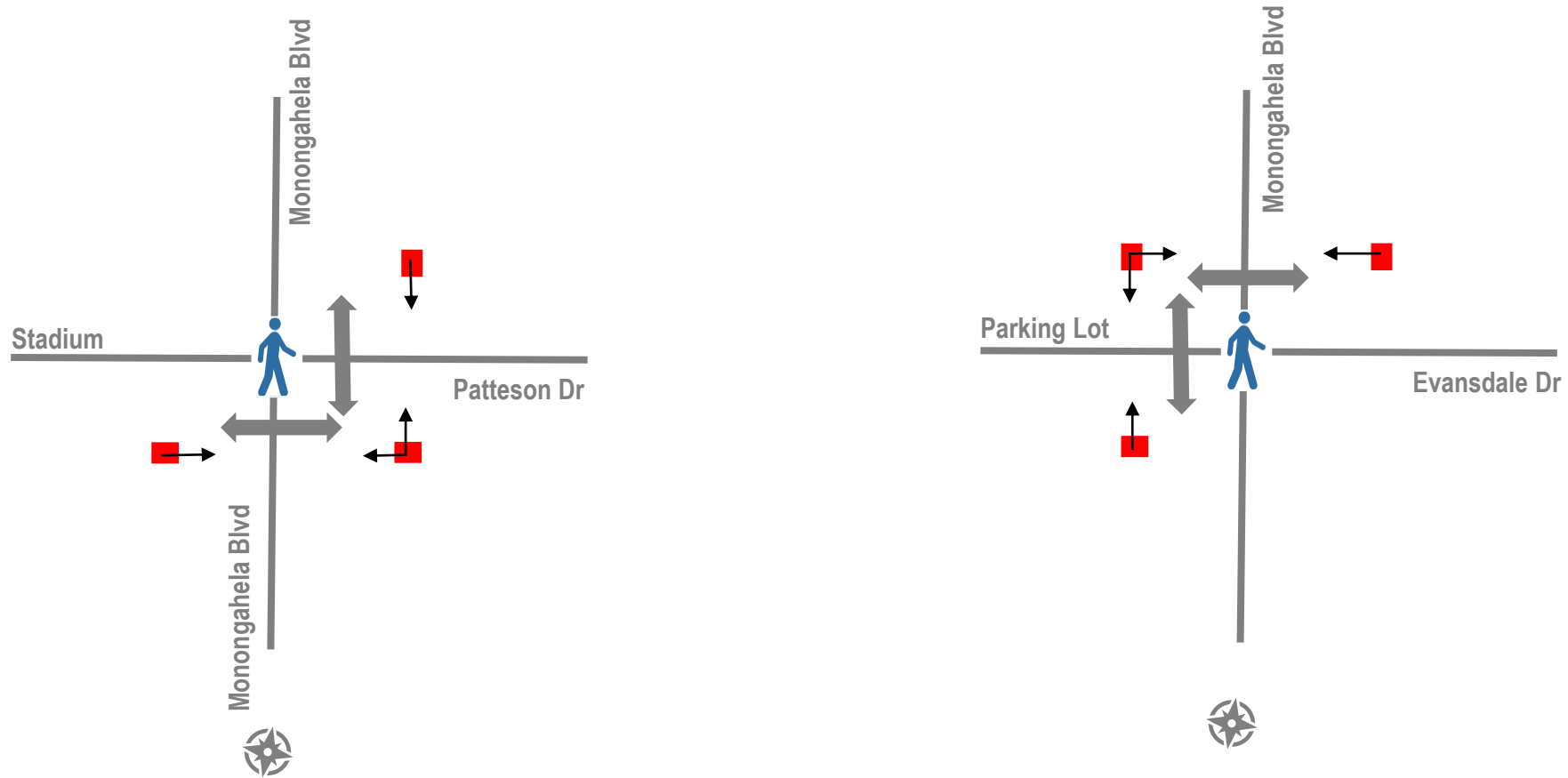


**\*Weekday Hourly Ped Volume (highest recorded hour of 3 peaks)**



# Monongahela Boulevard

Patteson Drive to Evansdale Drive



## Pedestrian Signal Legend:

- ← Countdown Ped Heads
- ← Flashing Hand Only Ped Heads
- Ped Button Working
- Ped Button Malfunction
- No Ped Button Present

## Crosswalk Legend:

- ↔ Proper Crosswalk
- ↔ Faded Crosswalk
- No Crosswalk Present



# Potential Improvements

## Monongahela Boulevard

- Install TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) signs for the NBL, EBL, and SBR at Monongahela Boulevard at Evansdale Drive
- Improve signal timing and vehicle coordination to reduce queuing
- Consider removing the exclusive pedestrian phase at the intersection of Monongahela Boulevard at Patteson Drive
  - PM peak *Synchro* models show a reduction in intersection delay from 144 seconds / vehicle to 90 seconds / vehicle
  - EBR would be required to yield to pedestrians during the EB green phase

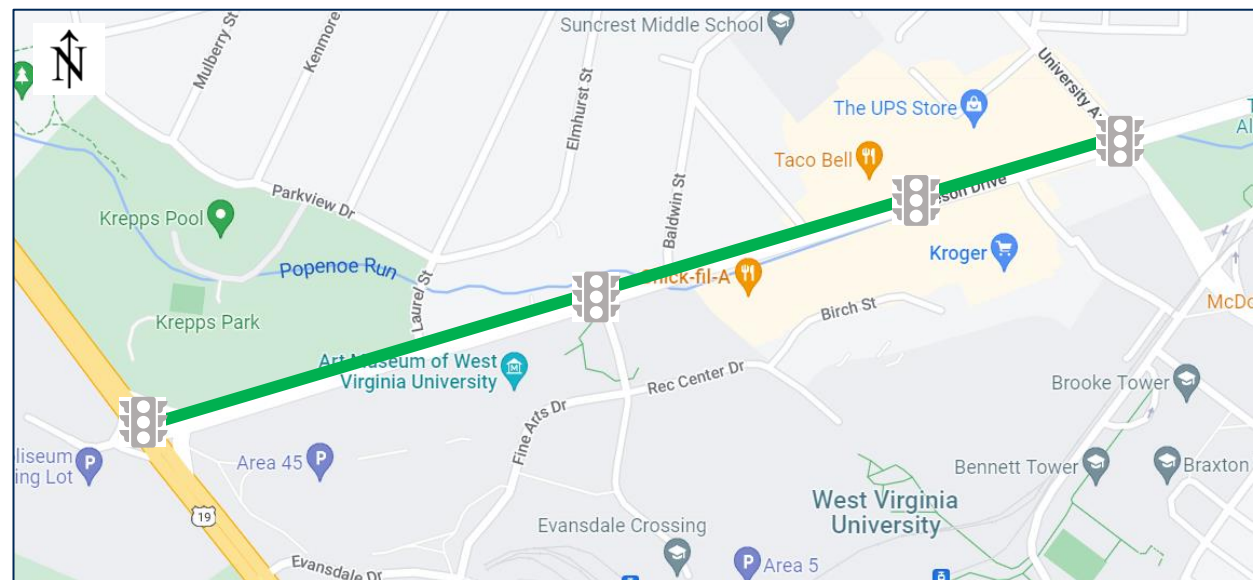




# Patteson Drive

Monongahela Boulevard to University Avenue

- 0.68-mile corridor
- 4 signalized intersections and 3 unsignalized intersections
- Numerous unsignalized mid-block parking lots and driveway entrances
- Two through lanes EB / WB with a two-way left-turn lane between Morrill Way and University Avenue
- Turn lanes at major intersections
- Sidewalks and lighting present
- 35-MPH speed limit
- WVU located on the south side of Patteson Drive, with Morrill Way serving as the north entrance
- RRFB in design for ped crossing at Laurel Street



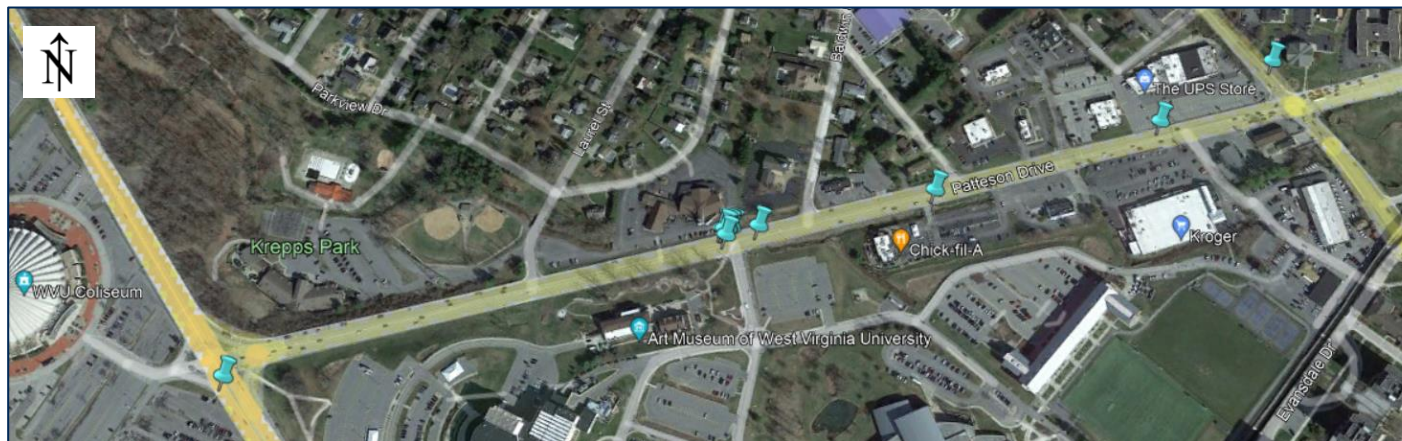


# Patteson Drive

Monongahela Boulevard to University Avenue

## 10 Crashes (Jan 2014 – Dec 2019)

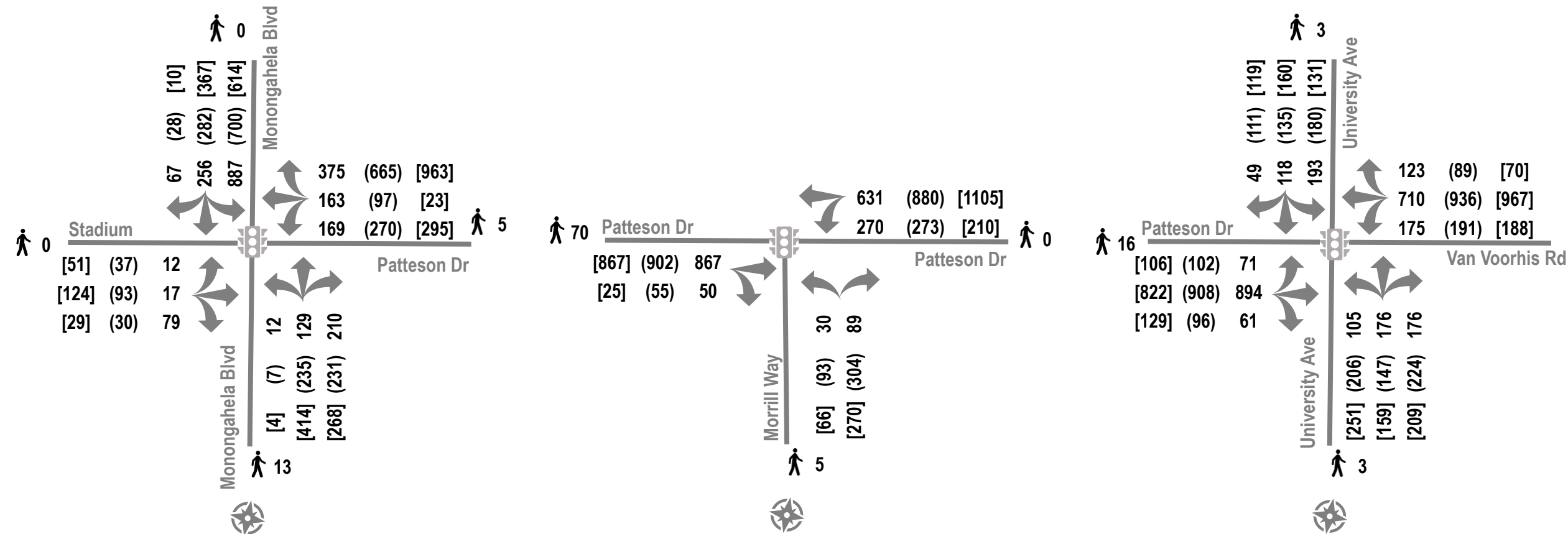
- 5 crashes involving NBL vehicles striking a pedestrian crossing in the crosswalk at Morrill Way (1 unknown at-fault)
- 2 crashes involving pedestrians walking in front of EB / WB vehicles (1 at Morrill Way and 1 at University Avenue)
- 1 crash involving an EB vehicle running a red light and striking a pedestrian in the crosswalk at Morrill Way (FATAL)
- 1 crash involving a NB vehicle striking a pedestrian crossing in the crosswalk at Chick-Fil-A (Tacoma Street)
- 1 crash involving a NB vehicle striking a pedestrian crossing against the signal and not in a marked crosswalk on University Avenue





# Patteson Drive

Monongahela Boulevard to University Avenue



Oct. 19, 2021

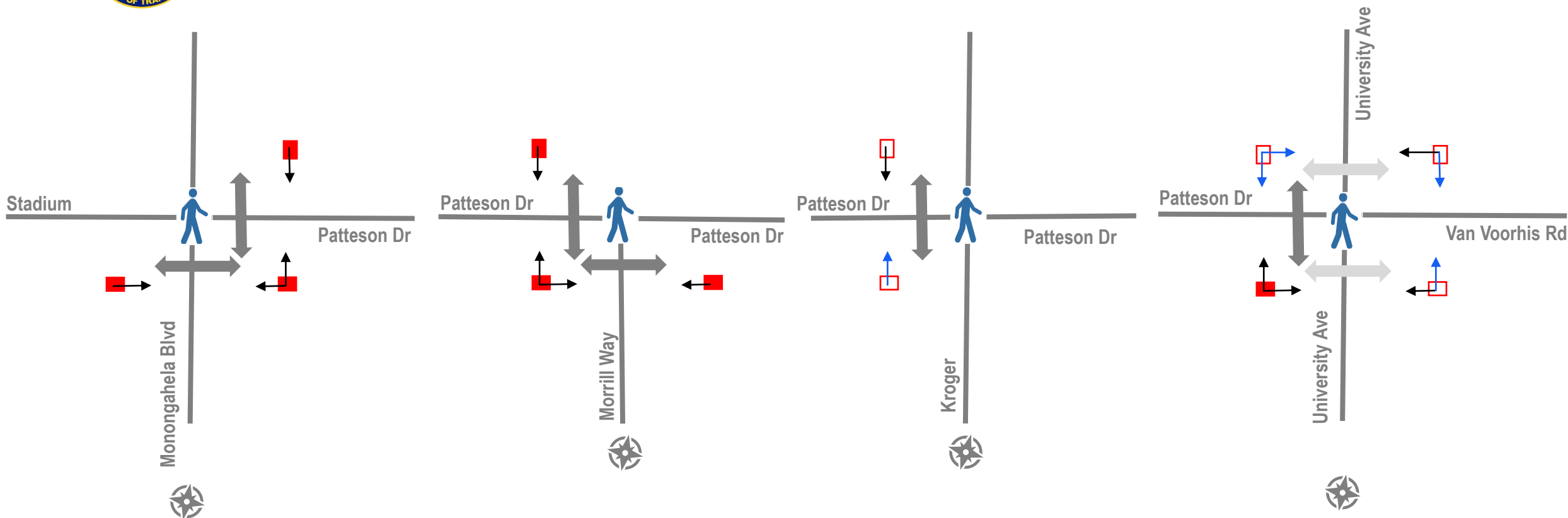
AM (MID) [PM]

\*Weekday Hourly Ped Volume (highest recorded hour of 3 peaks)



# Patteson Drive

Monongahela Boulevard to University Avenue



## Pedestrian Signal Legend:

- ← Countdown Ped Heads
- ← Flashing Hand Only Ped Heads
- Ped Button Working
- Ped Button Malfunction
- No Ped Button Present

## Crosswalk Legend:

- ↔ Proper Crosswalk
- ↔ Faded Crosswalk
- No Crosswalk Present



# Potential Improvements

## Patteson Drive

- Install TURNING VEHICLES YIELD TO PEDESTRIANS (R10-15) signs at the following locations:
  - Patteson Drive at Morrill Way for the NBL, EBR, and WBL
  - Patteson Drive at Kroger for the NBL and SBR
  - Patteson Drive at University Drive for the NBL, EBL, EBR, SBR, WBL, and WBR
- Upgrade the existing crosswalks to piano keys on the north and south legs of the Patteson Drive at University Avenue intersection
- Install crosswalk on the east leg of the Patteson Drive at University Avenue Intersection
- Upgrade existing pedestrian push buttons to include audio at the Patteson Drive at Kroger and University Avenue intersections
- Install countdown ped heads where missing
- Increase pedestrian audio controls at the Patteson Drive at Morrill Way intersection
- Improve signal timing and vehicle coordination throughout the corridors to reduce queuing
- Consider a Leading Pedestrian Interval (LPI) for the west leg pedestrian crossing at Patteson Drive at Morrill Way
- Consider installing barrier between the sidewalk and the roadway to deter pedestrians from crossing midblock





# Thank you!

