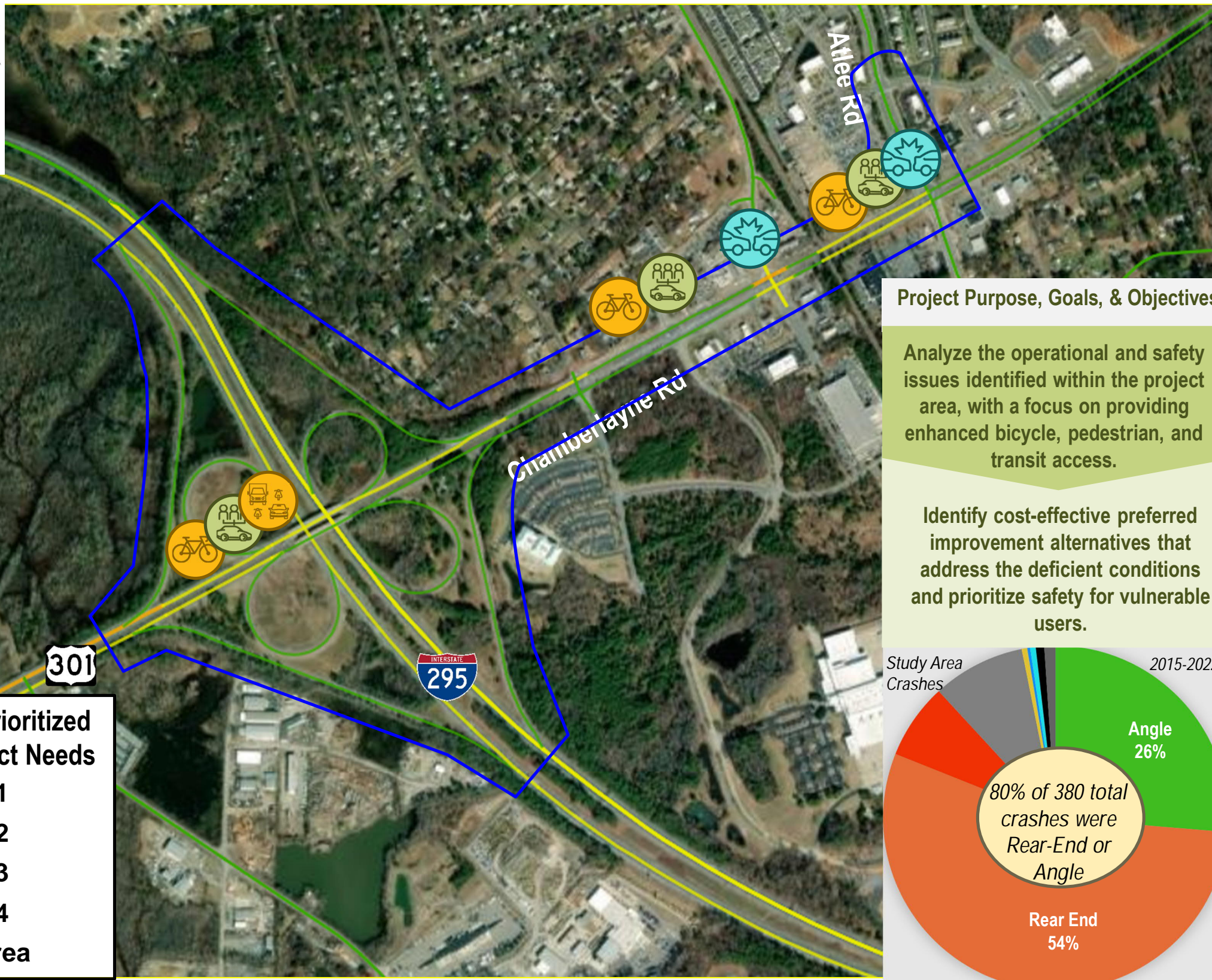


# Project Overview | RI-23-11

## US-301 (Chamberlayne Road) Corridor, 1.2 Miles

### Study Corridor Includes:

- US-301 (Chamberlayne Rd) from I-295 interchange to VA-638 (Atlee Road), 1.2 miles



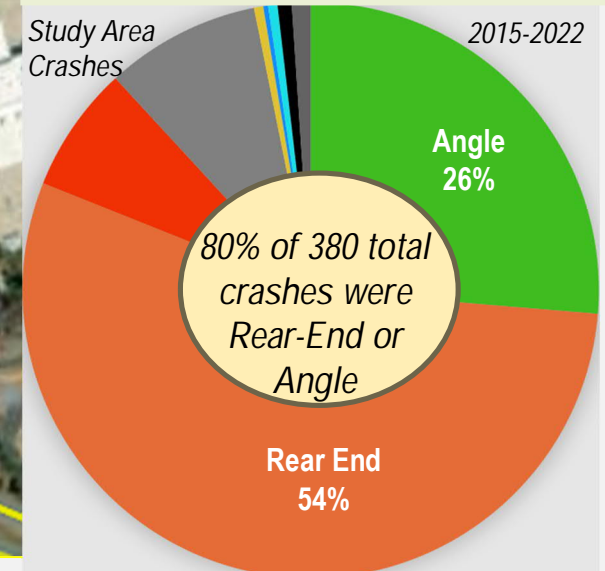
### Identified Issues in the Study Area

- Significant rear-end and angle crash trend at intersections.
- No existing bike lanes, shared-use paths, sidewalks, or crosswalks along US-301 (Chamberlayne Road). Sidewalks along Atlee Road, Bike lanes along Atlee Station Road.
- Commuters traveling to/from I-295 leads to congestion during AM/PM peak hours. Capacity preservation is a need along US-301 at the interchange.
- There are no existing park and ride facilities present along the corridor. There are no existing transit routes or bus stops along the corridor.

### Project Purpose, Goals, & Objectives

Analyze the operational and safety issues identified within the project area, with a focus on providing enhanced bicycle, pedestrian, and transit access.

Identify cost-effective preferred improvement alternatives that address the deficient conditions and prioritize safety for vulnerable users.



#### 2019 VTrans Prioritized Mid-Term District Needs

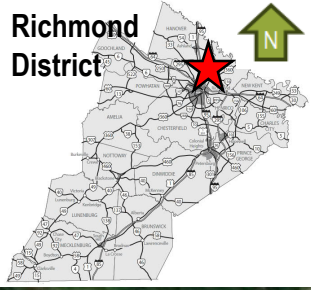
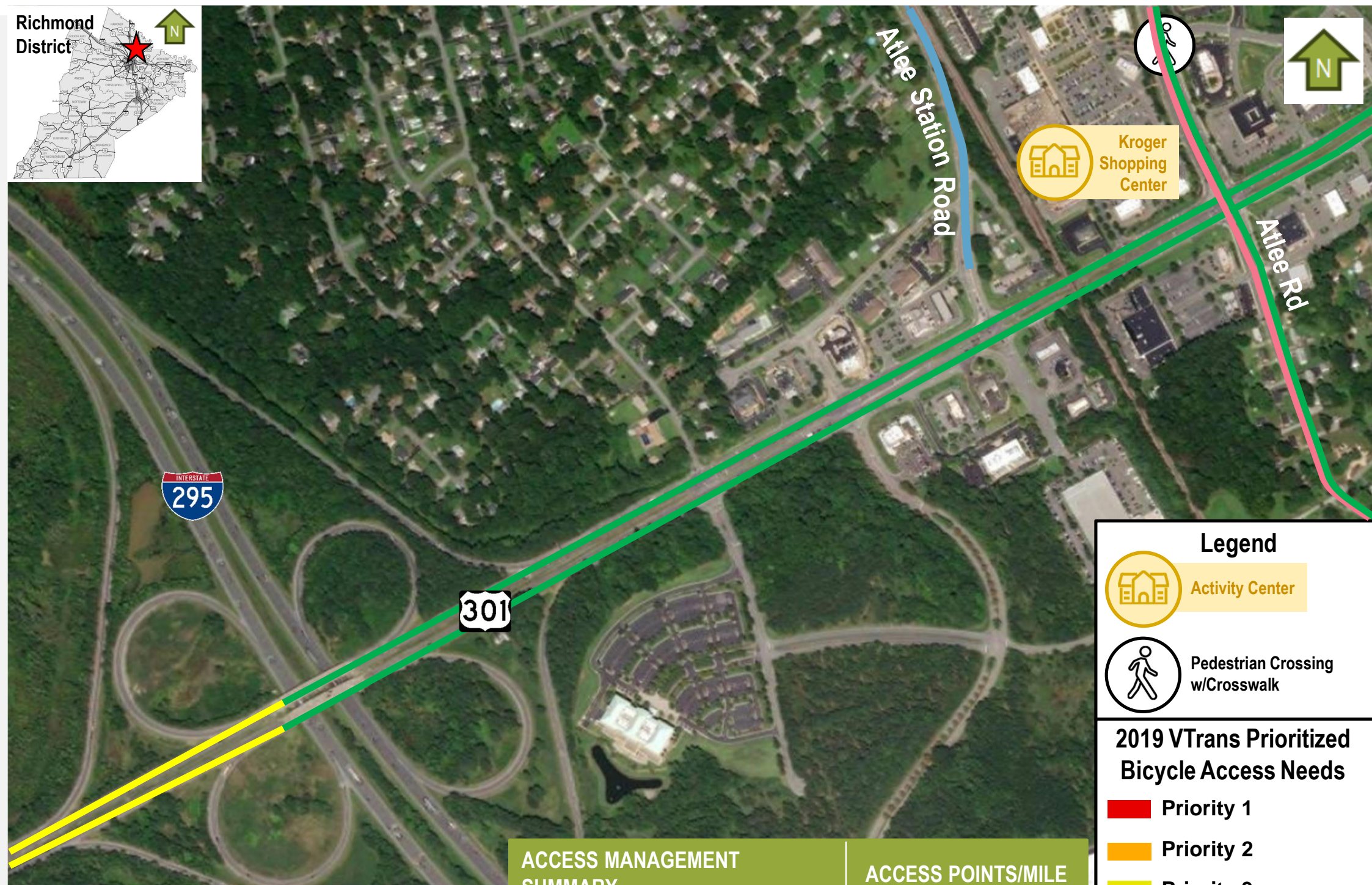
- Priority 1
- Priority 2
- Priority 3
- Priority 4
- Study Area

### Project Fact Sheet

VDOT District	Richmond
Locality	Hanover County
# of Study Intersections	5
Transit Routes	None
Intermodal Connections	None
Nearby Bikeways	US Bike Route 76
Functional Classification	Minor Arterial
Speed Limit	45 mph

# Operations / Access Needs

## Bicycle/Pedestrian Access Needs Identification Summary



### Bicycle Accessibility Summary

- No existing bike lanes along US-301,
- Existing Bike Lanes along both sides of VA-637 (Atlee Station Road) as part of US Bike Route 76.
- No existing shared-use paths,
- No crashes involving a bicyclist between 2015-2022.
- The **Bicycle Access** VTrans Need is Medium based on "Applicable roadway segments within biking distance (seven miles) of VTrans Activity Centers, fixed-guideway transit stations, or BRT lines."<sup>1</sup>

### Pedestrian Accessibility Summary

- No existing sidewalks along US-301.
- Existing sidewalks along both sides of VA-638 (Atlee Road).
- No Pedestrian Crosswalks along US-301.
- Unsignalized Pedestrian Crosswalk across VA-638 (Atlee Road) at Barnfield Lane (south leg).
- No crashes involving pedestrians between 2015-2022.
- According to VTrans, there is no **Pedestrian Access** VTrans Need based on "Applicable roadway segments within walking distance (one mile) of VTrans Activity Centers, fixed-guideway transit stations, or BRT lines."<sup>1</sup>

**Legend**

- Activity Center
- Pedestrian Crossing w/Crosswalk

**2019 VTrans Prioritized Bicycle Access Needs**

- Priority 1
- Priority 2
- Priority 3
- Priority 4
- Existing Bike Lanes
- US Bike Route 76

ACCESS MANAGEMENT SUMMARY	ACCESS POINTS/MILE
<b>Corridor-Wide</b>	<b>10.0</b>
Chamberlayne Road Eastbound	9.2
Chamberlayne Road Westbound	10.8

Access Needs	
VTRANS NEED	PRIORITY
<b>Bicycle Access (RN)</b>	<b>MEDIUM</b>
<b>Pedestrian Access (RN) IEDA (UDA)</b>	<b>No Need</b>
<b>Access (State)</b>	<b>No Need</b>

1. Technical Guide for the Identification and Prioritization of the VTRANS Mid-Term Needs, Office of Intermodal Planning and Investment (OIP&I), November 2021.

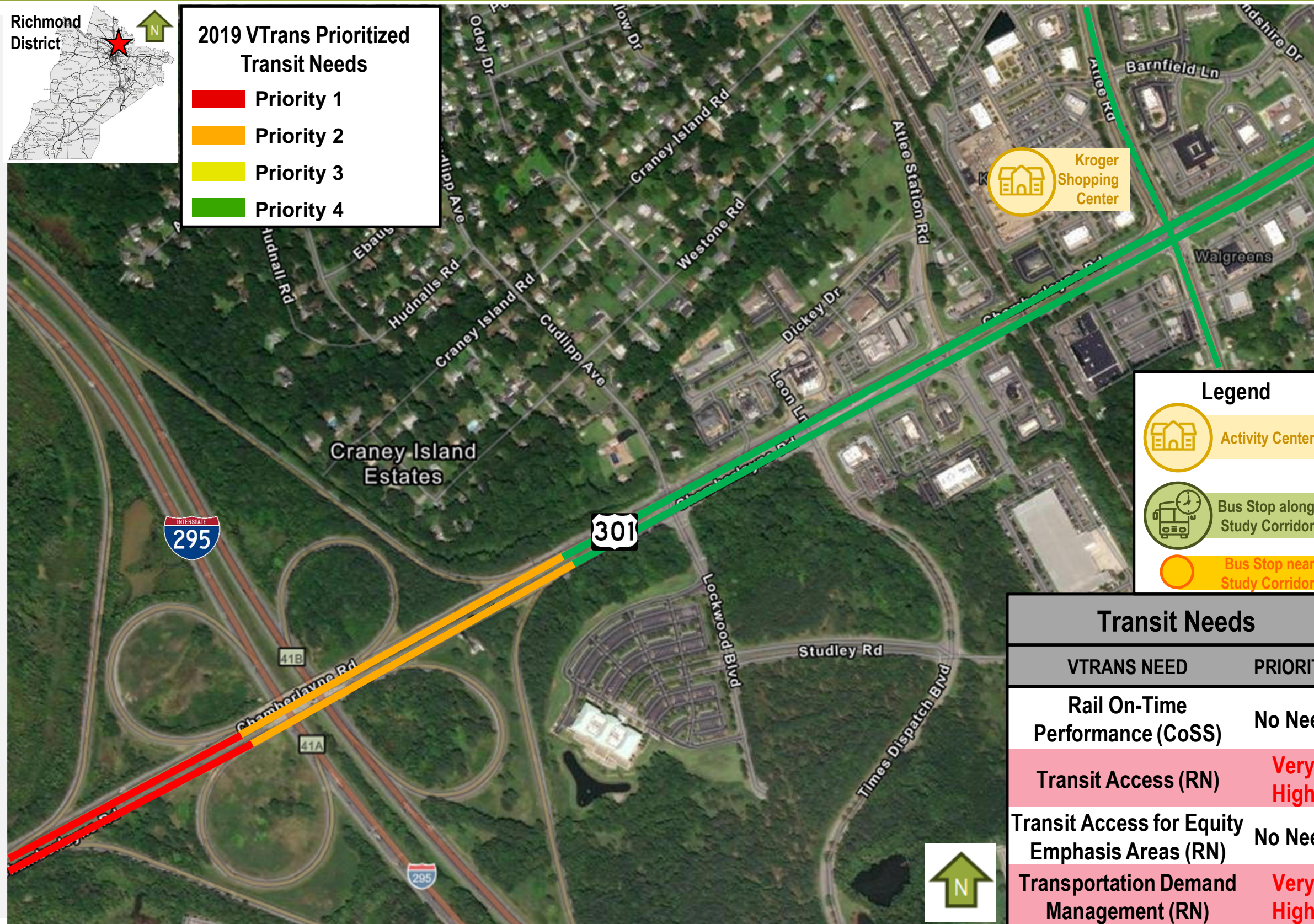
# Operations / Access Needs

## Transit Access Needs Identification Summary



### 2019 VTrans Prioritized Transit Needs

- █ Priority 1
- █ Priority 2
- █ Priority 3
- █ Priority 4



**Legend**

- Activity Center
- Bus Stop along Study Corridor
- Bus Stop near Study Corridor

Transit Needs	
VTRANS NEED	PRIORITY
Rail On-Time Performance (CoSS)	No Need
Transit Access (RN)	Very High
Transit Access for Equity Emphasis Areas (RN)	No Need
Transportation Demand Management (RN)	Very High

### Transportation Demand Management (TDM) Summary

- No existing park and ride or other intermodal facilities exist along or near the study area.
- The **TDM** VTrans Need is Very High based on "Roadway segments where TDM strategies such as new or expanded public transportation services/facilities, new or expanded bicycle and pedestrian facilities, or coordination of commuter assistance programs can be beneficial to reduce vehicle miles traveled."<sup>1</sup>

### Transit Accessibility Summary

- There are no Transit Routes or bus stops along the corridor. Richmond City center is roughly a 20-minute drive, but there are no existing public transportation options in Hanover County outside of ride sharing services such as cabs and Uber.
- The **Transit Access** VTrans Need is Very High based on "The number of workers that can access a given VTrans Activity Center via public transit within 45 minutes versus a private automobile. Any transit deficit greater than zero constitutes a need."<sup>1</sup>

1. Technical Guide for the Identification and Prioritization of the VTRANS Mid-Term Needs, Office of Intermodal Planning and Investment (OIPI), November 2021.



### Operations Along Chamberlayne Road

### Operations Summary

- Congestion occurs on Chamberlayne Road during the AM and PM peak periods as commuters travel to and from the I-295 interchange.
- High congestion also exists outside of peak hours: Southbound US-301 during the 8:00 pm hour, Northbound US-301 during the Noon hour.
- Chamberlayne Road has a High **Capacity Preservation** VTrans Need based on being part of VDOT's Arterial Preservation Network.
- Chamberlayne Road has No **Congestion Mitigation** VTrans Need.

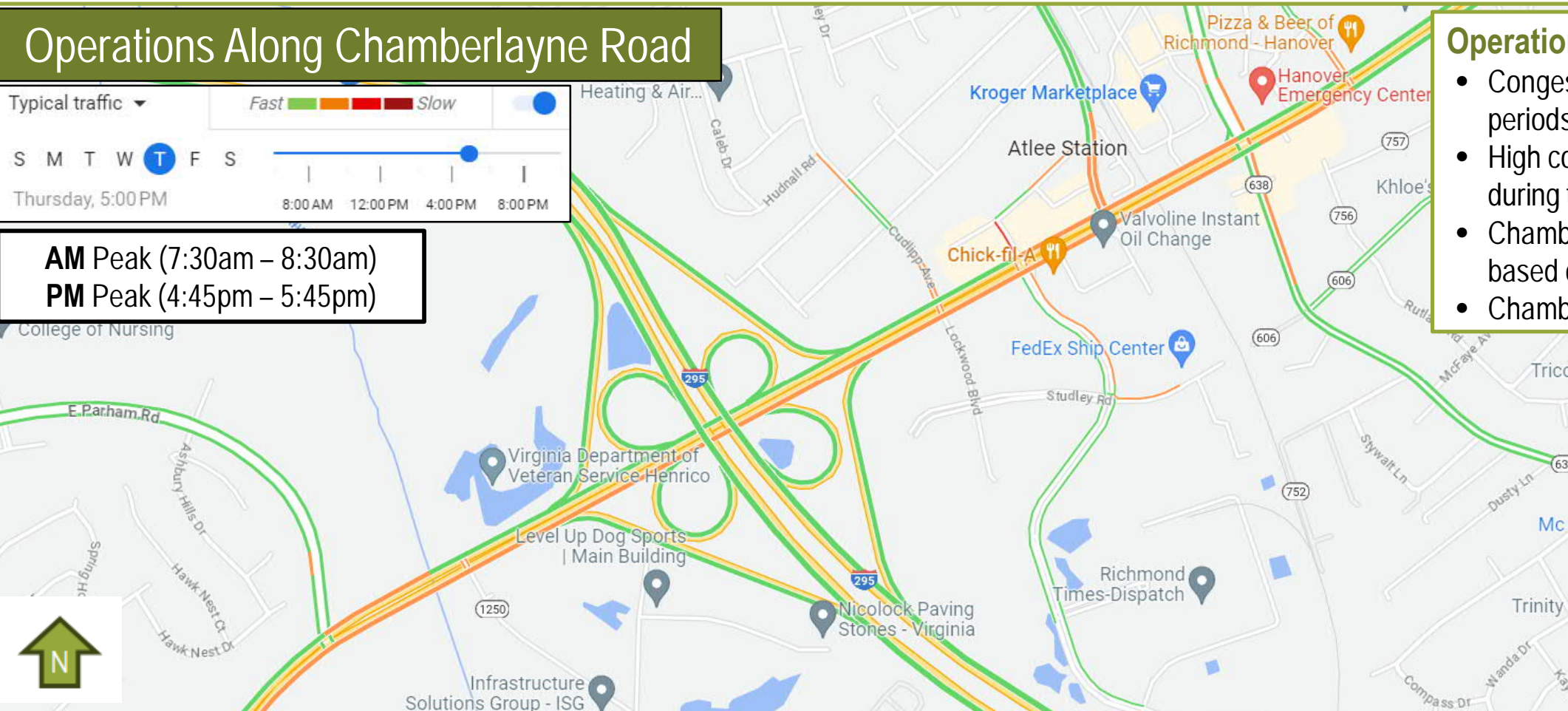
Typical traffic Fast Medium Slow Very Slow

S M T W **T** F S

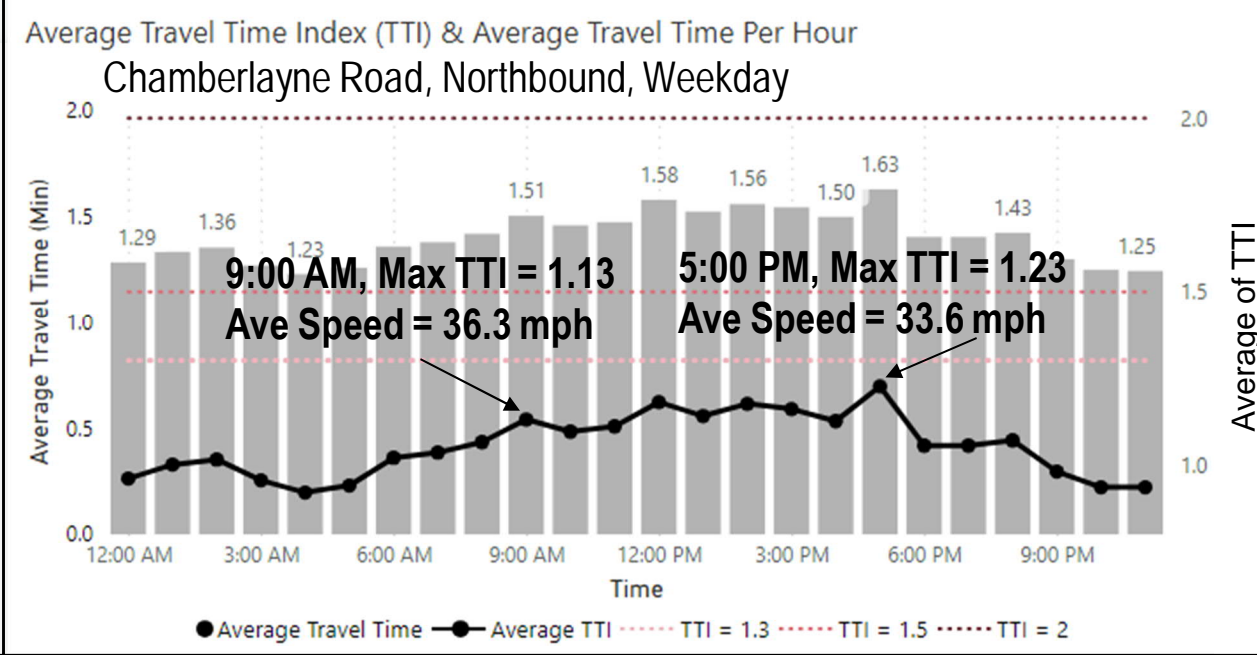
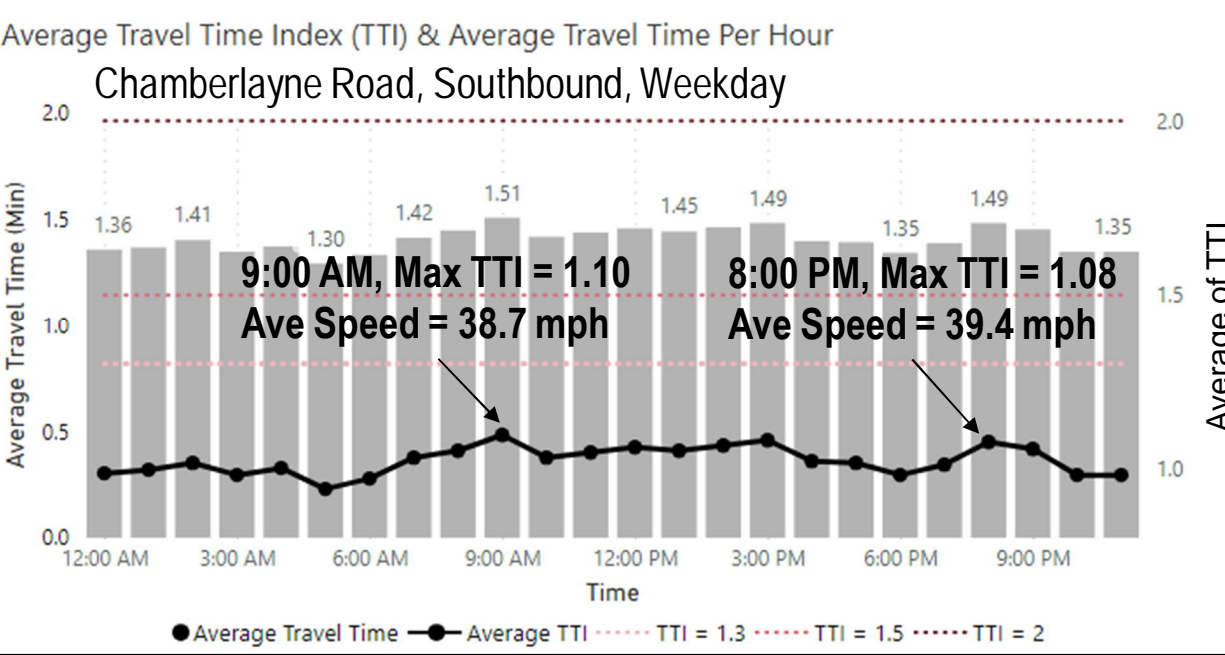
Thursday, 5:00 PM

8:00 AM 12:00 PM 4:00 PM 8:00 PM

**AM Peak (7:30am – 8:30am)**  
**PM Peak (4:45pm – 5:45pm)**



Operations Needs	
VTRANS NEED	PRIORITY
	Chamberlayne Rd
Congestion Mitigation (RN)	No Need
Capacity Preservation (CoSS/RN)	HIGH
Reliability (CoSS/RN)	No Need



### Travel Time Index Summary

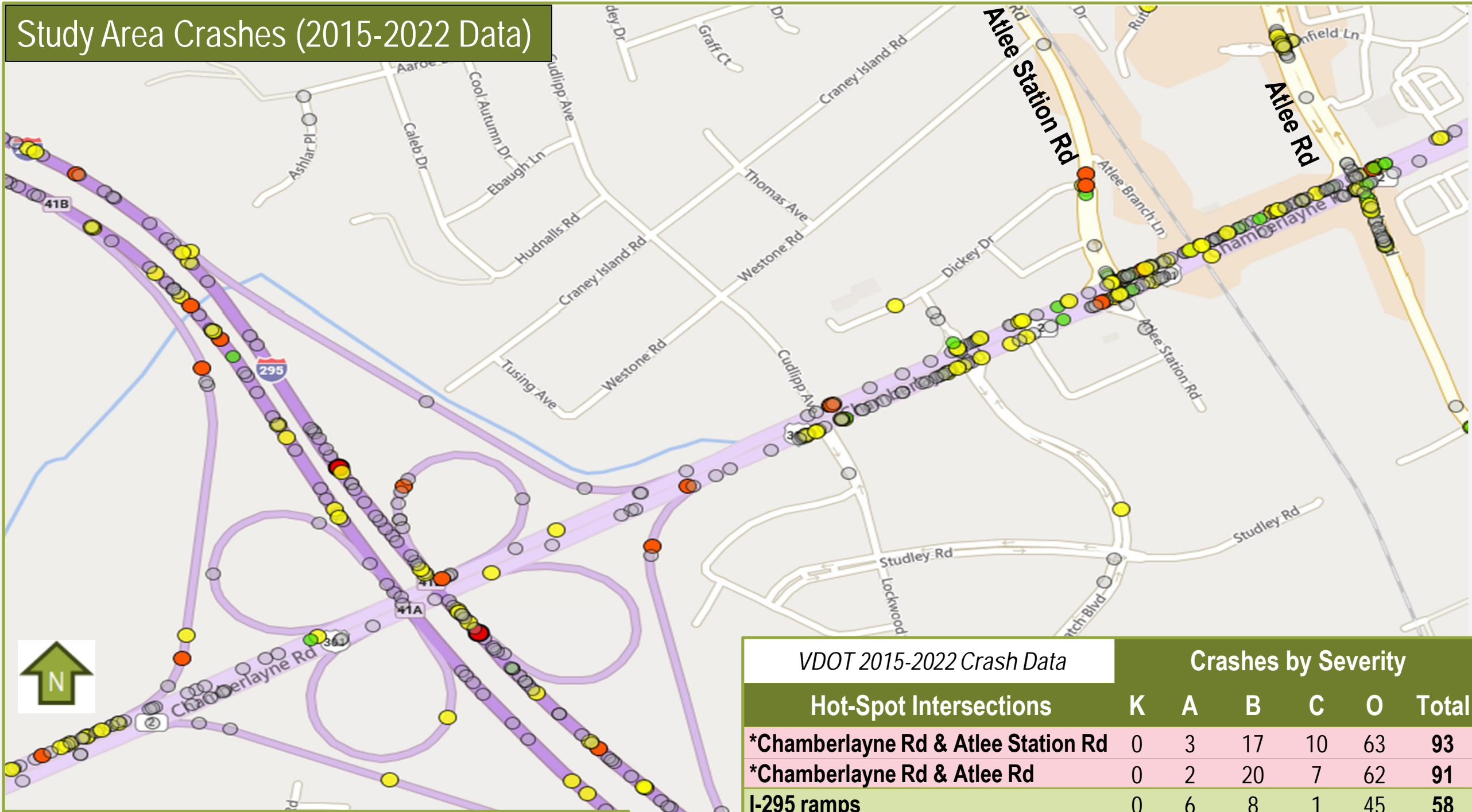
- Travel Time Index (TTI) is the ratio of travel time during a specified time period to the time required to make the same trip at typical speeds. A higher value indicates more congestion.
- Along Chamberlayne Road:
  - NB: A maximum TTI of 1.23 occurs in the 5 PM hour, with a TTI of 1.13 occurring in the 9 AM hour.
  - SB: A maximum TTI of 1.10 occurs in the 9 AM hour, with a TTI of 1.08 occurring in the 8 PM hour.

# Safety Needs

## Safety Improvement Needs Identification Summary



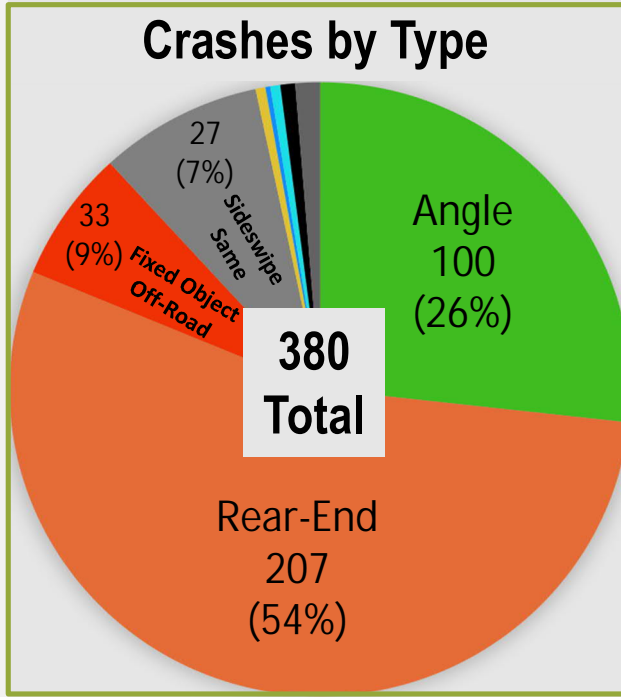
### Study Area Crashes (2015-2022 Data)



Safety Needs	
VTRANS NEED	PRIORITY
Safety Improvement (State/District)	Very High
Pedestrian Safety Improvement (State)	No Need

Crash Data

- K. Fatal Injury
- A. Severe Injury
- B. Visible Injury
- C. Nonvisible Injury
- PDO. Property Damage Only



VDOT 2015-2022 Crash Data		Crashes by Severity					
Hot-Spot Intersections	K	A	B	C	O	Total	
*Chamberlayne Rd & Atlee Station Rd	0	3	17	10	63	93	
*Chamberlayne Rd & Atlee Rd	0	2	20	7	62	91	
I-295 ramps	0	6	8	1	45	58	
Chamberlayne Rd & Leon Ln	0	0	9	3	31	44	
Atlee Rd & Barnfield Ln	0	0	11	0	29	40	
Chamberlayne Rd & Lockwood Blvd	0	1	8	2	26	37	
**"Potential Safety Improvement" (PSI) Intersections							

**Roadway Safety Improvement Summary**

- The **Safety Improvement** VTrans Need is Very High along the corridor based on "Areas with a higher calculated risk of crashes based on roadway characteristics and observed crash data."<sup>1</sup>

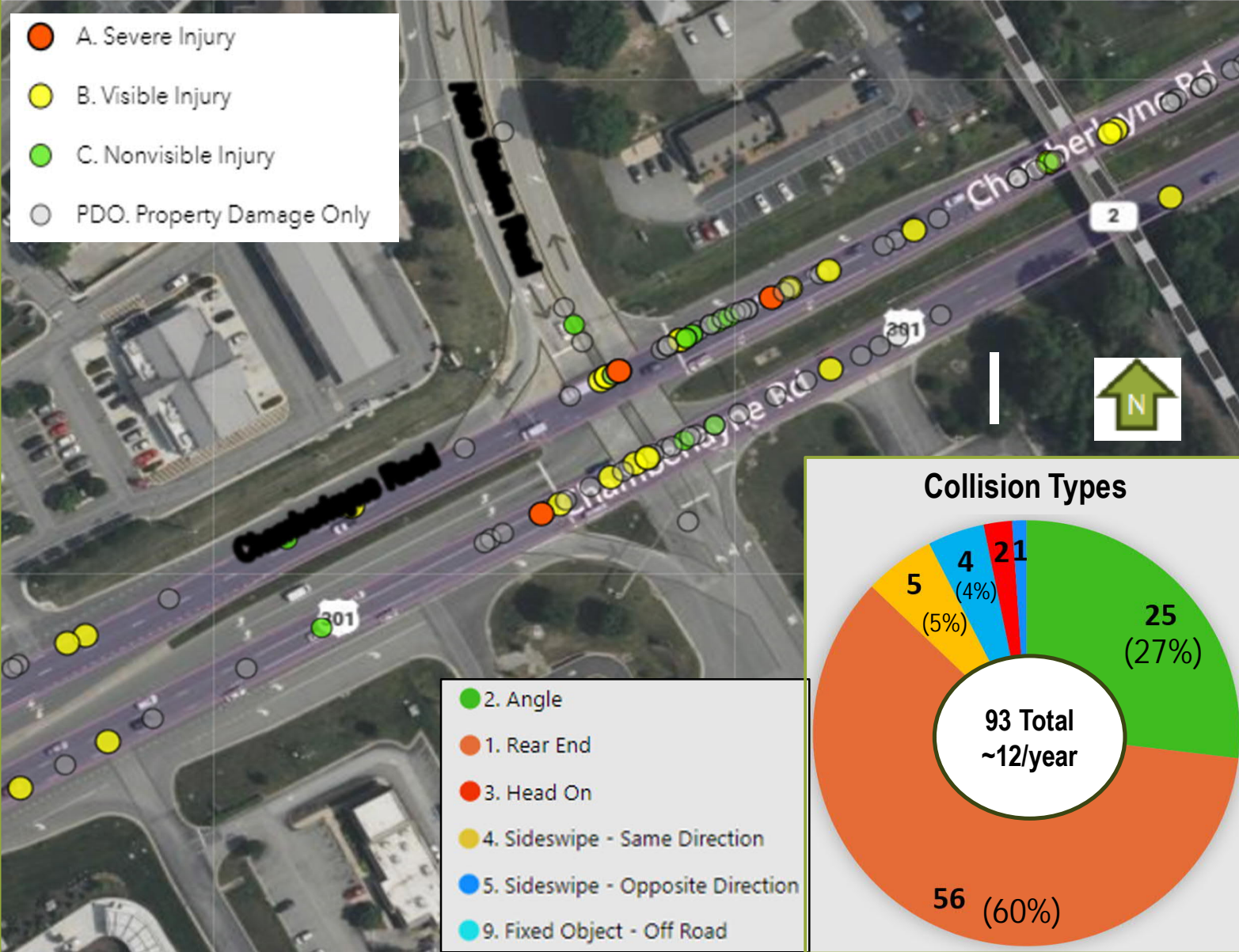
# Safety Needs

## Detailed Intersection Crash Analysis (2015 – 2022 Data)



### Chamberlayne Road & Atlee Station Road (PSI Intersection)

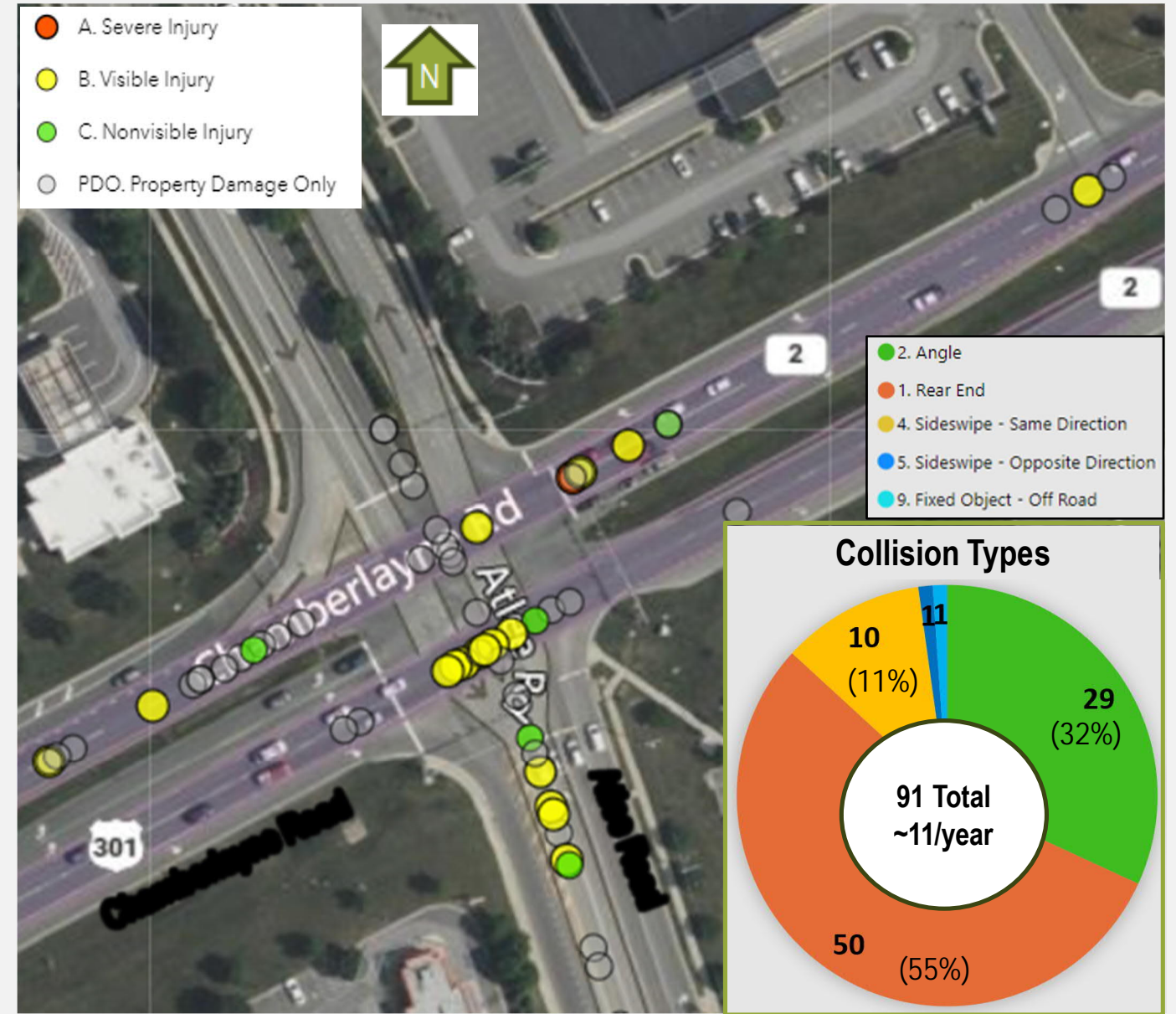
Control: Signal



- 60% of crashes were rear-end collisions, 27% of crashes were angle collisions.
- 71% of rear-end collisions occurred along SB US-301, 25% NB.
- Other Trends: 83% No Adverse Conditions, 22% Night-time, 11% Speeding, 1% Alcohol.

### Chamberlayne Road & Atlee Road (PSI Intersection)

Control: Signal



- 55% of crashes were rear-end collisions, 32% of crashes were angle collisions.
- 64% of rear-end collisions occurred along SB US-301, 8% NB US-301, 22% WB Atlee.
- Other Trends: 80% No Adverse Conditions, 24% Night-time, 29% Distracted, and 5% Speeding.

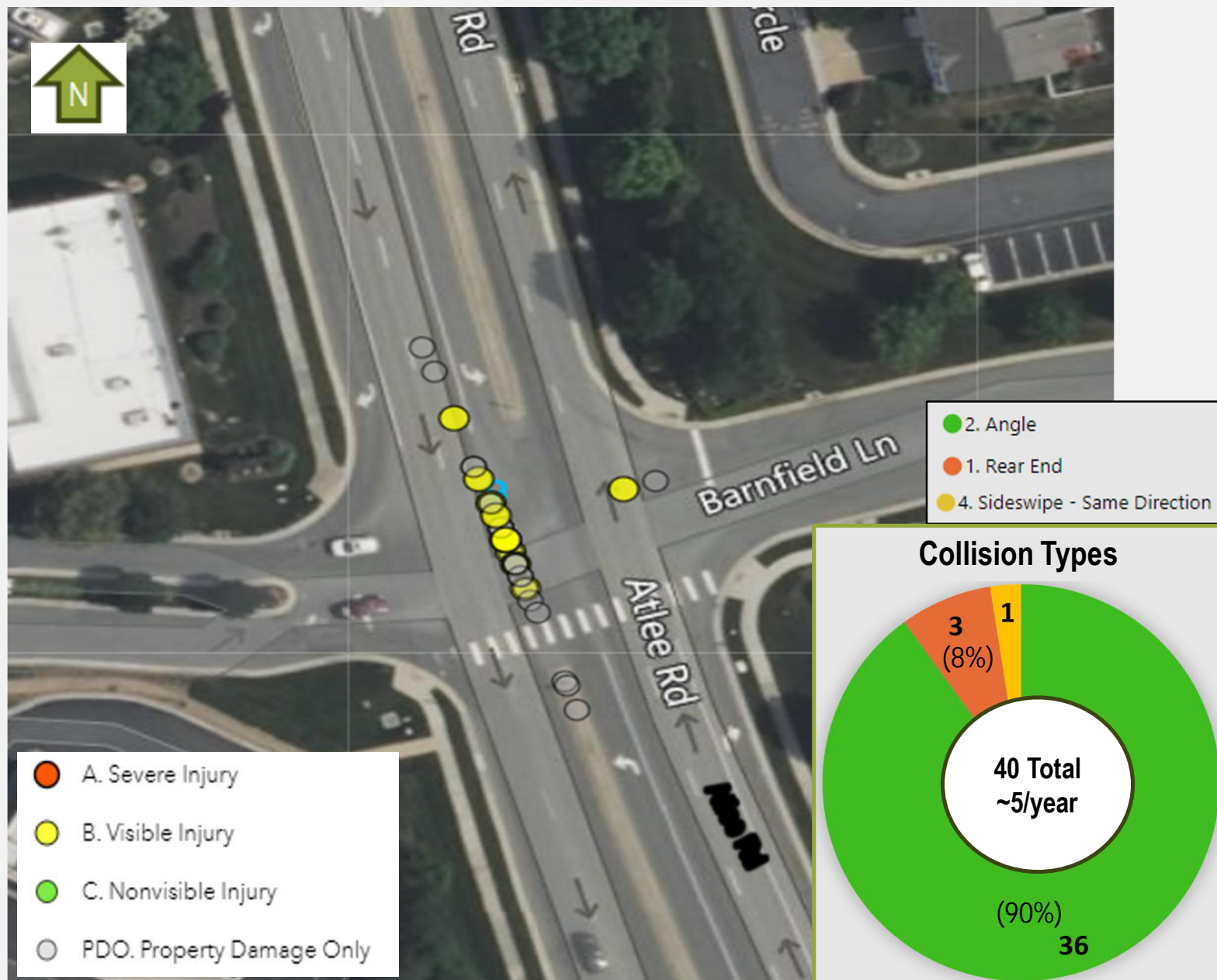
# Safety Needs

## Detailed Intersection Crash Analysis (2015 – 2022 Data)



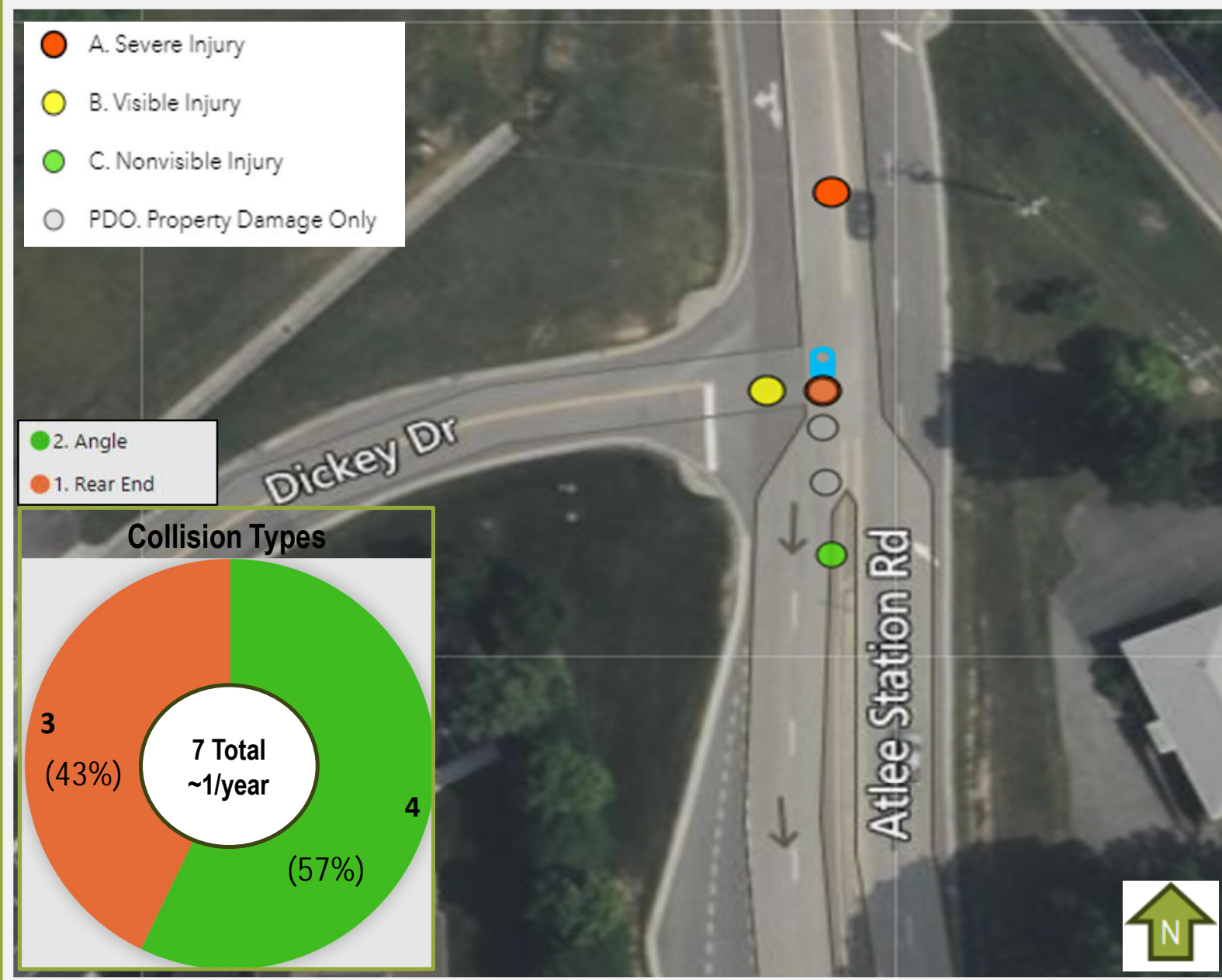
### Atlee Road & Barnfield Lane

Control: Two-way Stop



### Atlee Station Road & Dickey Drive

Control: One-way Stop



- 90% of crashes were angle collisions, 8% of crashes were rear-end collisions.
- 66% of angle collisions involved a vehicle along NB Atlee Rd, 31% SB.
- Other Trends: 78% No Adverse Conditions, 17% Night-time, 7% Distracted.

- 57% of crashes were angle collisions, 43% of crashes were rear-end collisions.
- There were 2 Severe Crashes, 1 Visible Injury, 1 Non-visible Injury.

# Phase 1 Scoping-Level Improvement Concepts

## US 301 (Chamberlayne Road) from I-295 to Atlee Road



### Legend: VTrans Needs Addressed

Bicycle Access	Capacity Preservation
Transit and TDM	Safety Improvement

### Transit Improvements

- Coordinate with GRTC and Hanover County for feasibility of new/extended fixed-route service

### TDM Improvements

- Add new Park-and-Ride near corridor
- Add pedestrian and bicycle facilities

### Safety and Operations Improvements

- 1** Conventional
- 2** \*Thru-Cut
- 3** \*Roundabout
- 4** Signal

### Corridor-Wide Safety and Operations Improvements

- Access Management Review
- Turn Lane Analysis
- Signal Timing and Phasing Review
- Additional Signal Heads
- Signing and Marking Review
- Intersection and Interchange Lighting

### Bicycle Improvements

- A** Add/Update bike lanes
- B** Add shared-use path

\* Denotes an innovative intersection concept. More information on innovative intersections and real-world examples can be found at

<https://www.virginiadot.org/innovativeintersections/>

