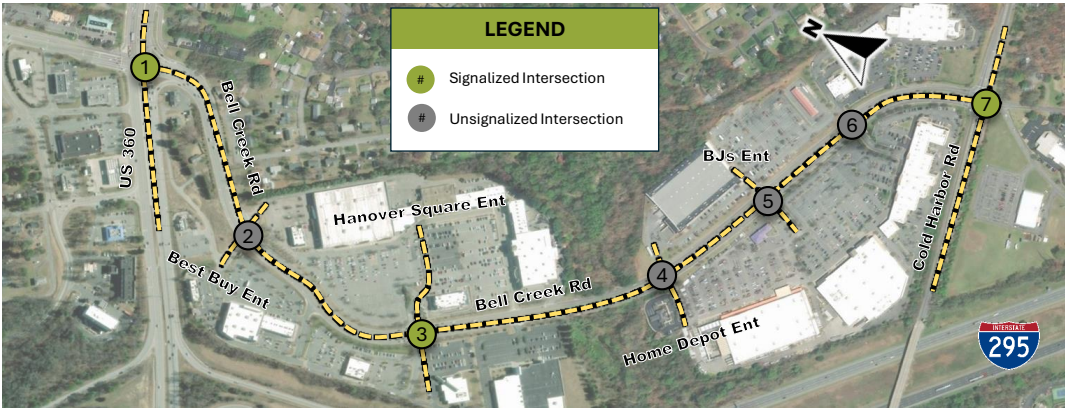




PROJECT PIPELINE NEEDS AND EXISTING CONDITIONS SUMMARY

Route 642 (Bell Creek Road) Corridor US 360 to Cold Harbor Road
VDOT District: Richmond District / Locality: Hanover



Study Purpose, Goals, and Objectives

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

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

VTrans Needs

- Significant angle and rear-end crash trend at intersections.
- There are no shared use or dedicated bike and ped paths along the corridor
- Commuters traveling to/from the restaurants, retail, and commercial businesses in the corridor leads to congestion during peak hours.
- There are no existing park and ride facilities or bus routes present along the corridor.

Study Facts

Major Study Intersections	7
Length of Study Area	1.1 miles
Classification	Major Collector
Transit Routes	None
Speed Limit	35 mph

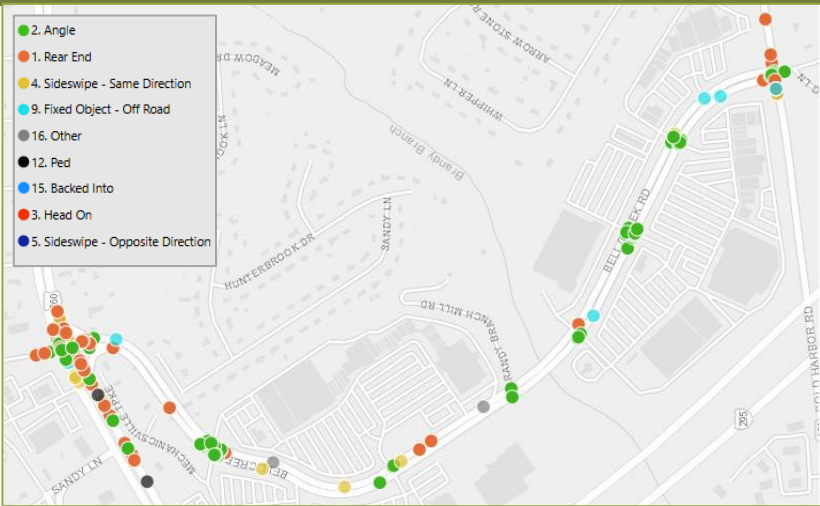
Safety Needs

Roadway Safety Improvement Summary:

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

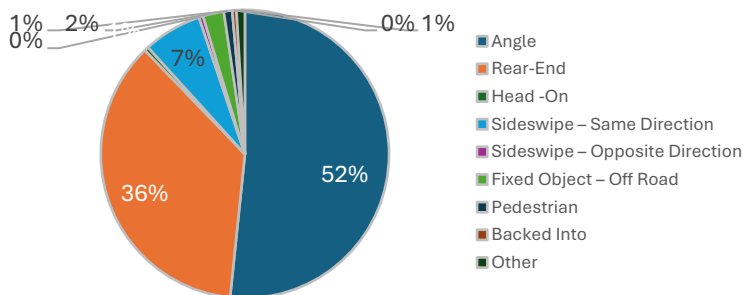
Pedestrian Safety Improvement Summary:

- The **Pedestrian Safety Improvement** VTrans Need along the corridor is based on "Utilization of roadway segments included in VDOT's Pedestrian Safety Action Plan (PSAP) Priority Corridors."



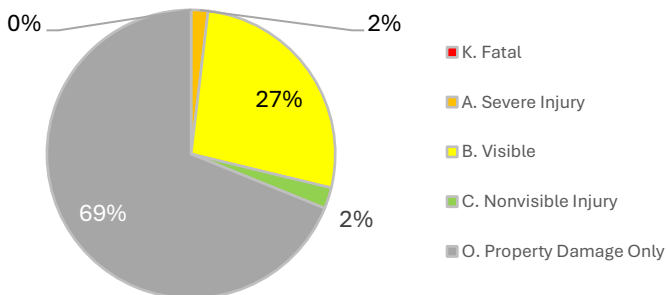
Crash Type

212 Total Crashes (2020 – 2024)



Crash Severity

212 Total Crashes (2020 – 2024)



PROJECT PIPELINE NEEDS AND EXISTING CONDITIONS SUMMARY

Route 642 (Bell Creek Road) Corridor US 360 to Cold Harbor Road
VDOT District: Richmond District / Locality: Hanover

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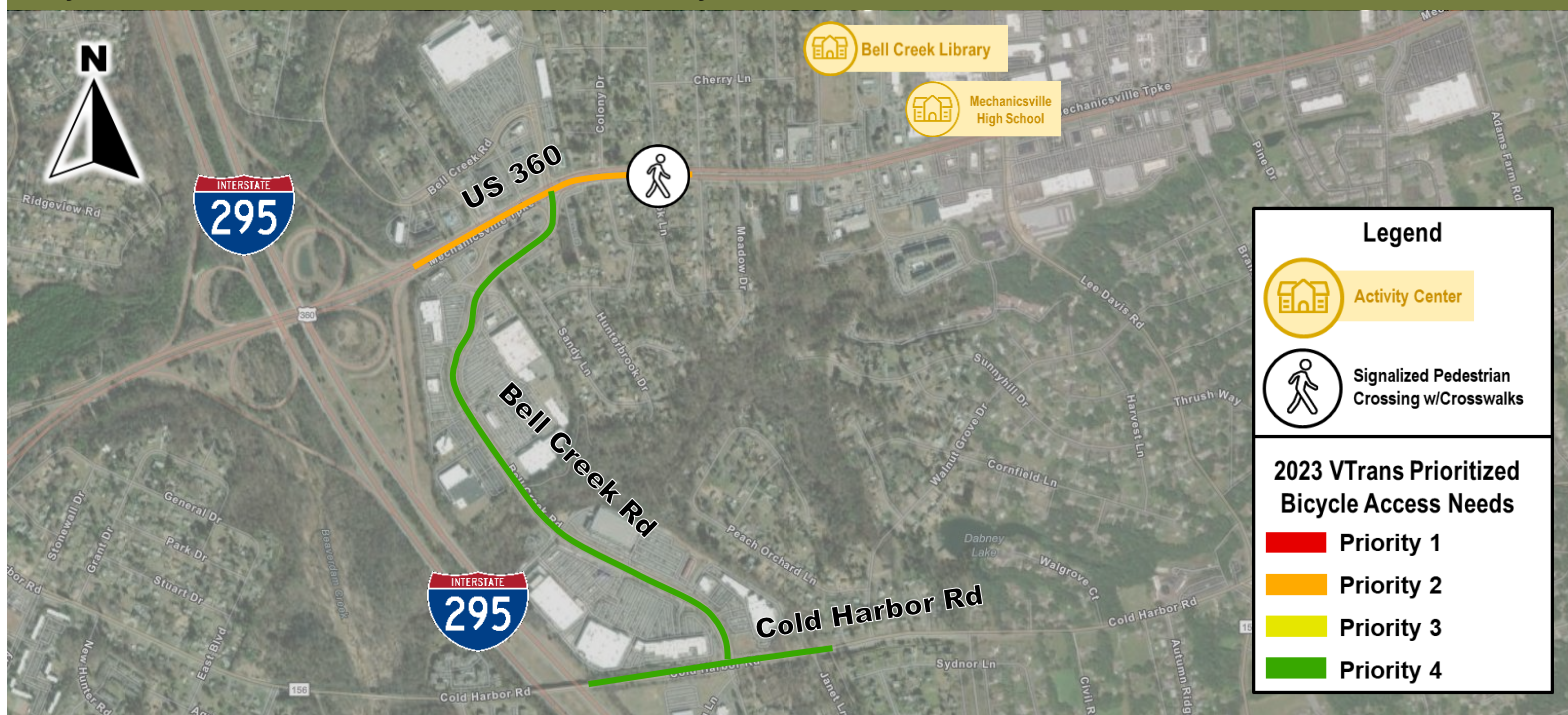
Pedestrian Accessibility Summary

- There are no sidewalks along the Bell Creek Corridor.
- Sidewalk along US 360 starting from Wynbrook Lane and extending east towards Mechanicsville High School.
- There were 2 pedestrian crashes on US 360.
- The **Pedestrian Access** VTrans Need is based on *“Applicable roadway segments within walking distance (one mile) of VTrans Activity Centers, fixed-guideway transit stations, or BRT lines.”*

Bicycle Accessibility Summary

- There are currently no bike lanes or other accommodations on the corridor.
- There were no crashes involving a bicyclist between 2020-2024.
- Cold Harbor Road is part of the TransAmerica trail but there are currently no bike facilities on it.
- The **Bicycle Access** VTrans Need is based on *“Applicable roadway segments within biking distance (seven miles) of VTrans Activity Centers, fixed-guideway transit stations, or BRT lines.”*

Bicycle/Pedestrian Access Needs Identification Summary



Transportation Demand Management (TDM) Summary

- No Park and Rides within the study area.
- Mechanicsville Park and Ride 1.0 miles away from study area, off of Atlee Road.
- The TDM VTrans Need is 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.”*

Transit Accessibility Summary

- No Existing Greater Richmond Transit Company (GRTC) Stops or Routes along the Study.
- The Transit Access VTrans Need is 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.”*



PROJECT PIPELINE NEEDS AND EXISTING CONDITIONS SUMMARY

Route 642 (Bell Creek Road) Corridor US 360 to Cold Harbor Road
VDOT District: Richmond District / Locality: Hanover

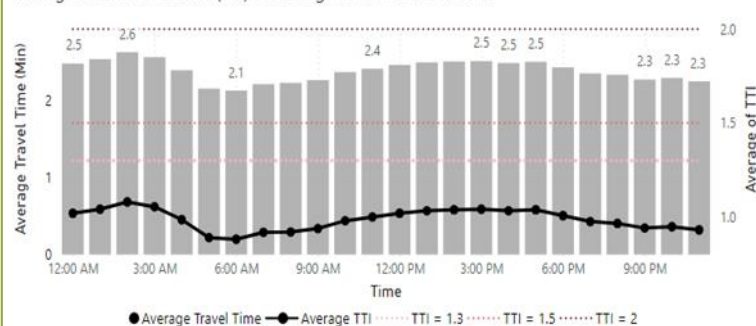
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Transit Access Needs Identification Summary



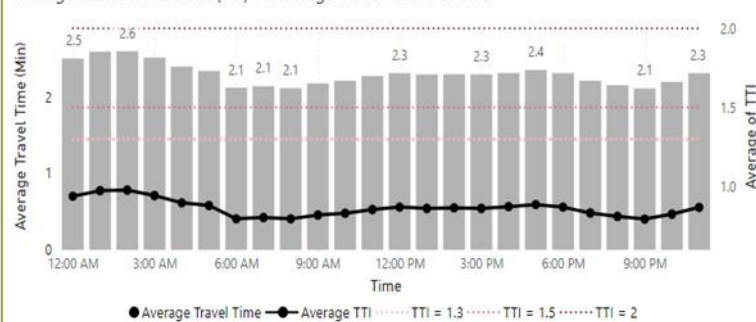
Travel Time Index

Average Travel Time Index (TTI) & Average Travel Time Per Hour



(Bell Creek Road, Northbound, Weekday)

Average Travel Time Index (TTI) & Average Travel Time Per Hour



(Bell Creek Road, Southbound, Weekday)

Operations Summary

- Congestion Mitigation** VTrans Needs are “identified utilizing Travel Time Index (TTI) data.”
 - Between I-205 NB ramps and Lee Davis Rd on US 360.
- Peak hours** of operation on Bell Creek Road*
 - Mid Peak (12:15 p.m. – 1:15 pm)
 - PM Peak (4:45 p.m. – 5:45 pm)
- Capacity Preservation** VTrans Needs are “Identify roadway segments included in VDOT’s Arterial Preservation Network.”

* Mid-day and PM Peak were determined to be the most congested during the day. Hence, only these two peak hours were studied

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 under uncongested conditions. A higher value indicates more congestion. Along Bell Creek Road on a Typical Weekday:
- Northbound: max TTI of 1.08 occurs between 2 AM and 3 AM with an average speed of 24.6 mph.
- Southbound: max TTI of 0.98 occurs 2 AM and 3 AM with an average speed of 24.6 mph.



PROJECT PIPELINE NEEDS AND EXISTING CONDITIONS SUMMARY

Route 642 (Bell Creek Road) Corridor US 360 to Cold Harbor Road

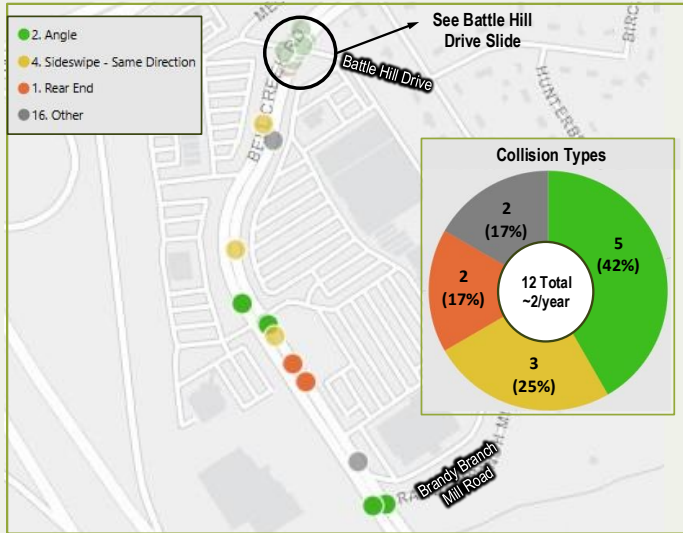
VDOT District: Richmond District / Locality: Hanover

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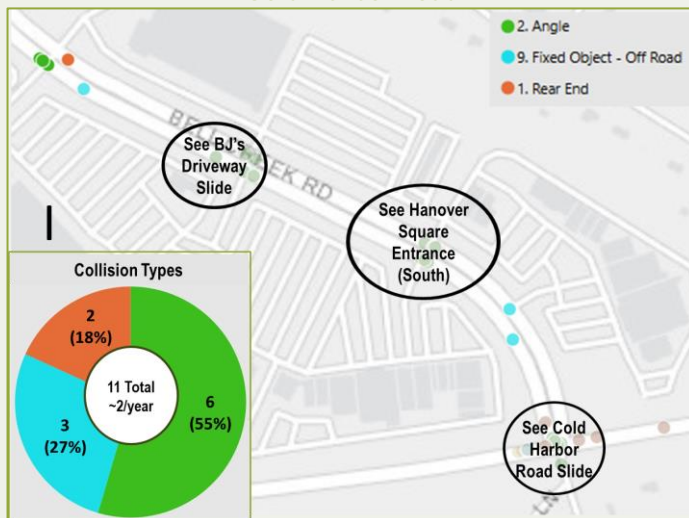
Detailed PSI Segment Crash Analysis (2020 – 2024 Data)

Route 642 from Battle Hill Drive to Brandy Branch Mill Road



- This segment has 52 crashes, 40 of which occurred at the intersection of Battle Hill Drive and are discussed in subsequent slides. Details about the remaining 12 are as follows -
 - 42% of crashes were angle, 25% were sideswipe-same direction, 17% were rear-end collisions, and 17% were due to other reasons.
 - 67% were PDO, 33% were INJ-B, 0 Fatal.
 - Other Trends: 8% Rain Conditions, 25% Night-time, 8% Speeding.

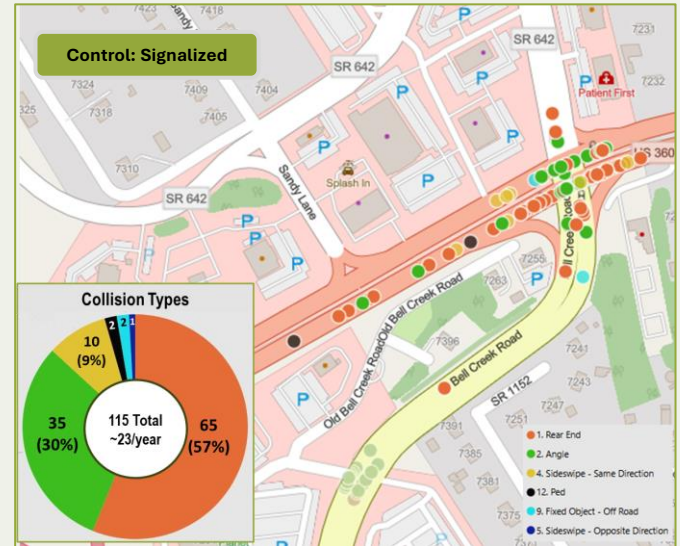
Route 642 (Bell Creek Road) from Brandy Branch Mill Road to Cold Harbor Road



- This segment has 59 crashes, 48 of which occurred at BJ's Driveway, Hanover Square, and Cold Harbor Rd intersection and are discussed in subsequent slides. Details about the remaining 11 are as follows -
 - 55% were angle, 27% fixed object-off road, and 18% were rear-end.
 - 73% were PDO, 27% were INJ-B, 0 Fatal.
 - Other Trends: 18% Rain Conditions, 36% Night-time, 18% Speeding.

Detailed Intersection Crash Analysis (2020 – 2024 Data) (1/3)

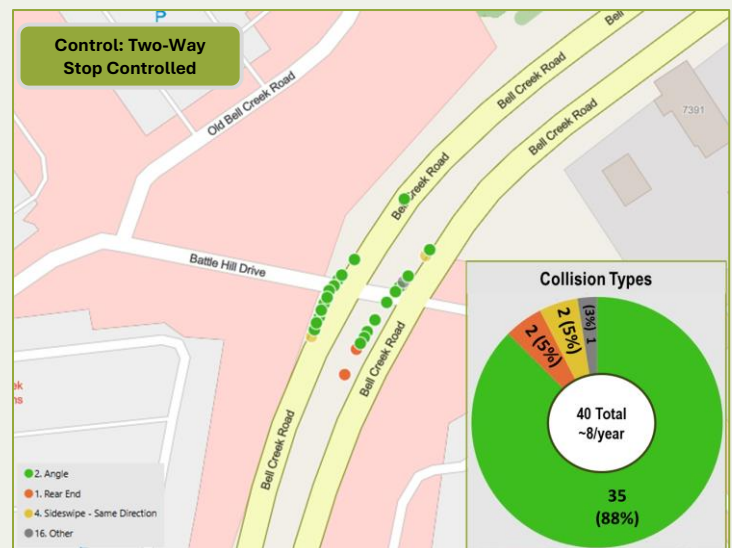
Route 642 (Bell Creek Road) & US 360



(PSI Intersection)

- This intersection has 115 total crashes
- 57% of crashes were rear-end collisions, 30% of crashes were angle collisions, 9% were sideswipe same-direction, and 2% were pedestrian (2 crashes).
- 66% of crashes were PDO, 29% were INJ-B, 2% INJ-A, 3% INJ-C, 0 Fatal.
- Other Trends: 88% No Adverse Conditions, 28% Night-time, 10% Speeding.

Route 642 (Bell Creek Road) & Battle Hill Drive



(PSI Intersection)

- This intersection has 40 total crashes.
- 88% of crashes were angle collisions, 5% of crashes were rear-end collisions, 5% were sideswipe same-direction, and 2% were others..
- 68% of crashes were PDO, 3% were INJ-A, 30% were INJ-B, 0 Fatal.
- Other Trends: 88% No Adverse Conditions, 25% Night-time, 13% Speeding.



PROJECT PIPELINE NEEDS AND EXISTING CONDITIONS SUMMARY

Route 642 (Bell Creek Road) Corridor US 360 to Cold Harbor Road

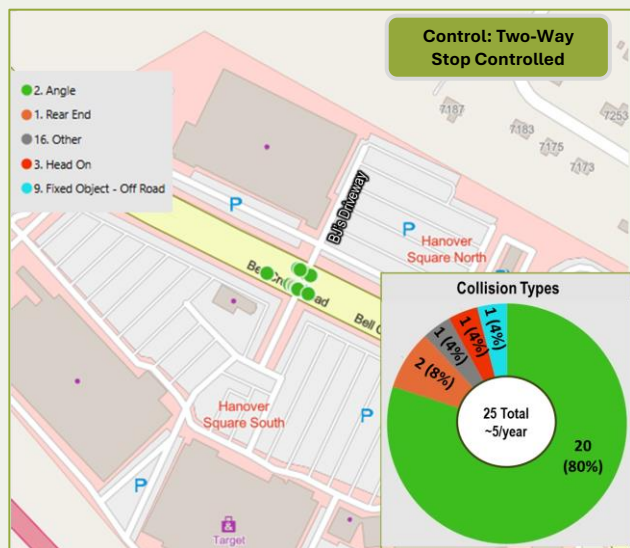
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Detailed Intersection Crash Analysis (2020 – 2024 Data) (2/3)

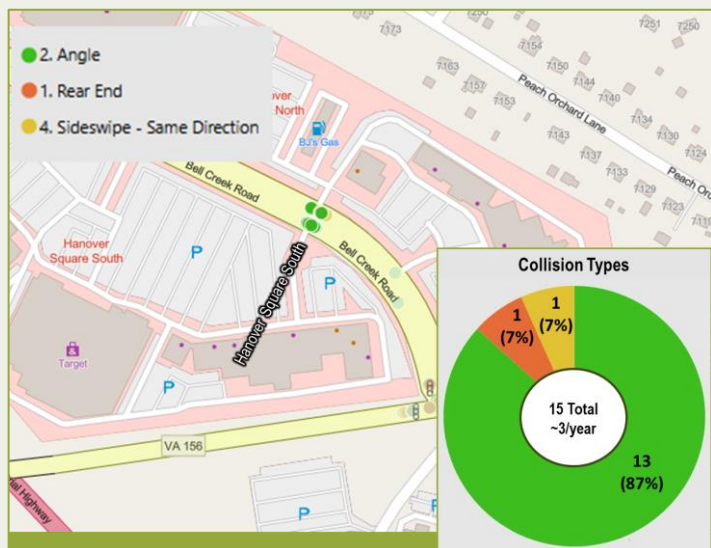
Route 642 (Bell Creek Road) & BJ's Driveway



(Part of PSI Segment)

- This intersection has 25 total crashes.
- 54% of crashes were angle collisions, and 31% were rear-end collisions.
- 64% of crashes were PDO, 32% were INJ-B, 4% INJ-C, 0 Fatal.
- Other Trends: 92% No Adverse Conditions, 16% Night-time, 16% Speeding.

Route 642 (Bell Creek Road) & Hanover Square South

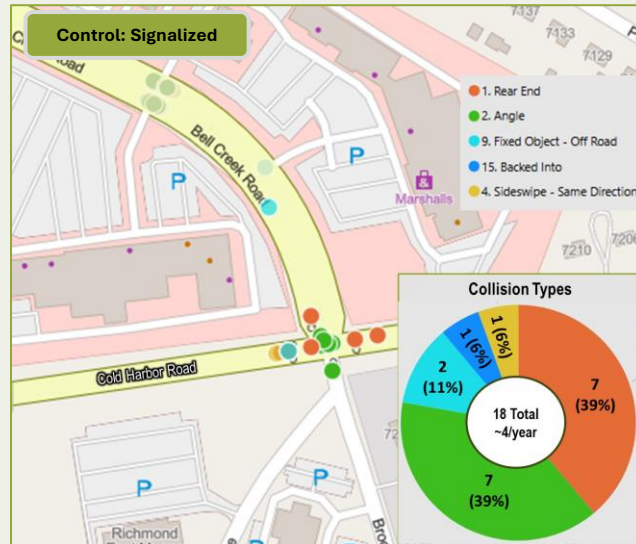


(Part of PSI Segment)

- This intersection has 15 total crashes
- 87% of crashes were angle collisions, 7% were rear-end collisions, and 7% were sideswipe same-direction.
- 93% of crashes were PDO, 7% were INJ-B, 0 Fatal.
- Other Trends: 87% No Adverse Conditions, 20% Night-time, 33% Speeding.

Detailed Intersection Crash Analysis (2020 – 2024 Data) (3/3)

Route 642 (Bell Creek Road) & Cold Harbor Road



- This intersection has 18 total crashes.
- 39% of crashes were angle collisions, 39% were rear-end, 11% were fixed object-off-road, 6% were backed into, and 6% were sideswipe same-direction collisions.
- 78% of crashes were PDO, 6% were INJ-A, 17% were INJ-B, 0 Fatal.
- Other Trends: 94% No Adverse Conditions, 22% Night-time, 6% Speeding.



PROJECT PIPELINE NEEDS AND EXISTING CONDITIONS SUMMARY

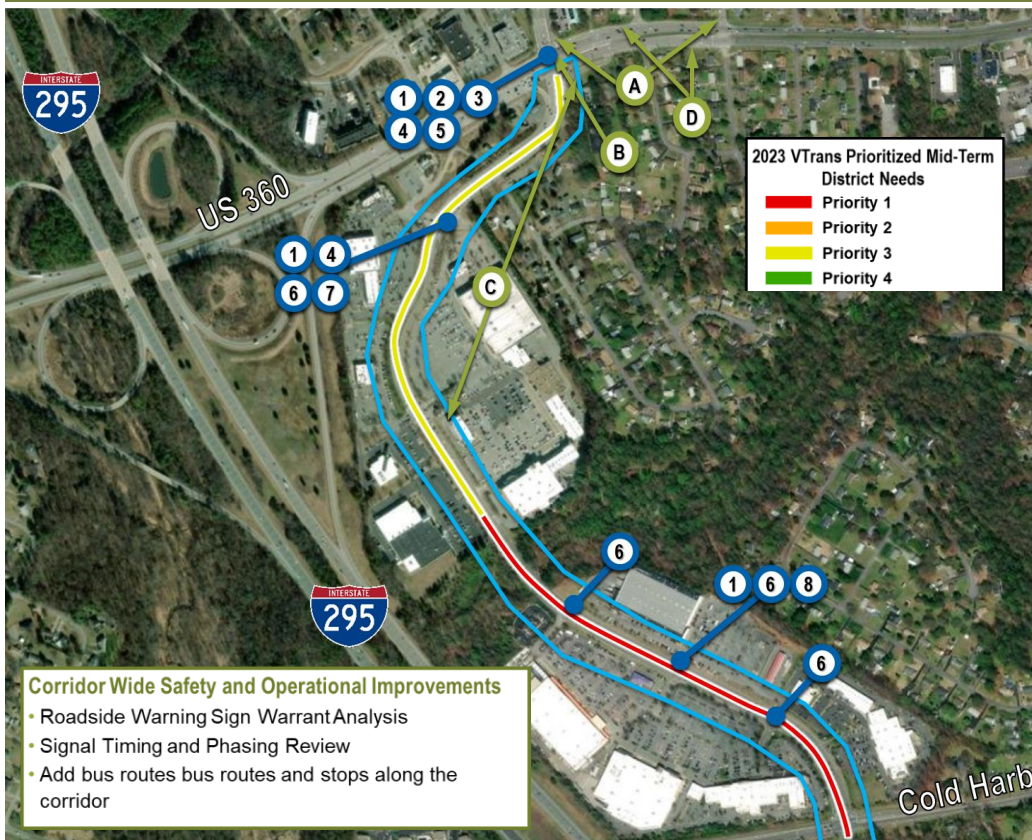
Route 642 (Bell Creek Road) Corridor US 360 to Cold Harbor Road

VDOT District: Richmond District / Locality: Hanover

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Phase 1 Scoping-Level Improvement Concepts



Pedestrian/Bicycle Improvements

- A** Install Crosswalk(s) w/ADA Curb Ramps
- B** Install Crosswalks w/ADA Curb Ramps & Pedestrian Signals
- C** Install Shared-Use Path
- D** Install Sidewalks

Safety and Operations Improvements

- 1** Conventional
- 2** Remove channelization
- 3** *Displaced Left Turn
- 4** *Quadrant Roadway
- 5** *Partial Bowtie
- 6** *Restricted Crossing U-Turn
- 7** *Quadrant Roadway & Roundabout
- 8** *Roundabout

* Denotes an innovative intersection concept. More information on innovative intersections and real-world examples can be found at: <https://www.virginiadot.org/innovativeintersections/>