VIMY RIDGE ROAD
ROAD SAFETY AUDIT FINDINGS REPORT

July 2025

FINAL REPORT

METROPLAN
SMART PLANNING MAKES SMART PLACES.

SAFETY ACTION PLAN
CENTRAL ARKANSAS

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Introduction

Central Arkansas Safety Action Plan

Metroplan, the Metropolitan Planning Organization (MPO) for Central Arkansas, developed the Central Arkansas Safety Action Plan under the United States Department of Transportation (USDOT) Safe Streets and Roads for All (SS4A) Program. Adopted in November 2024, the Central Arkansas Safety Action Plan serves as the region's roadmap to ensure safe streets and roads for all travelers. The Safety Action Plan identifies key steps needed for Central Arkansas to achieve zero fatal and serious injuries on its roadways. The plan includes regional safety analysis and public engagement to identify safety issues, project and policy recommendations, and an implementation plan that prioritizes locations for deploying safety countermeasures.

The safety analysis, which reviewed historic crash data from 2018 through 2022, led to the development of a Regional High Injury Network (HIN). This HIN was created by selecting roadway segments and intersections with the highest density of fatal and serious injury crashes over the five-year analysis period. The HIN served as the basis for developing project recommendations and identifying locations for more detailed analysis and suggested improvements.

Following the completion of the Central Arkansas Safety Action Plan, Metroplan utilized` the remaining funds from their SS4A grant to conduct road safety audits (RSAs) on roads in the four Metroplan counties. Metroplan staff coordinated with Saline County Judge Matt Brumley to select a corridor within Saline County for more detailed analysis and suggested improvements. Judge Brumley originally selected the high-injury network (HIN) road segment of Vimy Ridge Road between County Line Road and the southern Loganberry Drive intersection because two serious injury crashes occurred there from 2018 through 2022.

However, during initial RSA discussions with Metroplan staff and Shannon Hills Mayor Mike Kemp, it was decided to include the adjacent HIN road segment along Vimy Ridge Road between Loganberry Drive and Germania Drive in the RSA to capture additional crash data from 2018 through 2022, including another serious injury crash.

As a result, the 1.8-mile road segment of Vimy Ridge Road, between County Line Road and Germania Road, was selected for an RSA. Throughout this document "Vimy Ridge Road" or "the study corridor" will be referring to the segment of Vimy Ridge Road between County Line Road and Germania Road, unless otherwise noted.

Road Safety Audit Process

An RSA is a formal safety examination of a transportation facility conducted by an independent, experienced, multidisciplinary RSA team. These teams are independent of the facility's owner and operator, adopting a proactive approach that identifies not only locations where crashes have occurred but also areas with potential crash risks. While RSAs involve formal safety examinations, it is important to note that they do not review compliance with standards.

The Vimy Ridge Road RSA followed the 8-step RSA process as recommended by the FHWA and described in the *FHWA Road Safety Audit Guidelines* document (Publication FHWA-SA-06-06) and the *Road Safety Audit Toolkit for Federal Land Management Agencies and Tribal Governments* document (Publication FHWA-FLH-10-0011). A summary of the 8-step RSA process is provided in **Figure 1**.

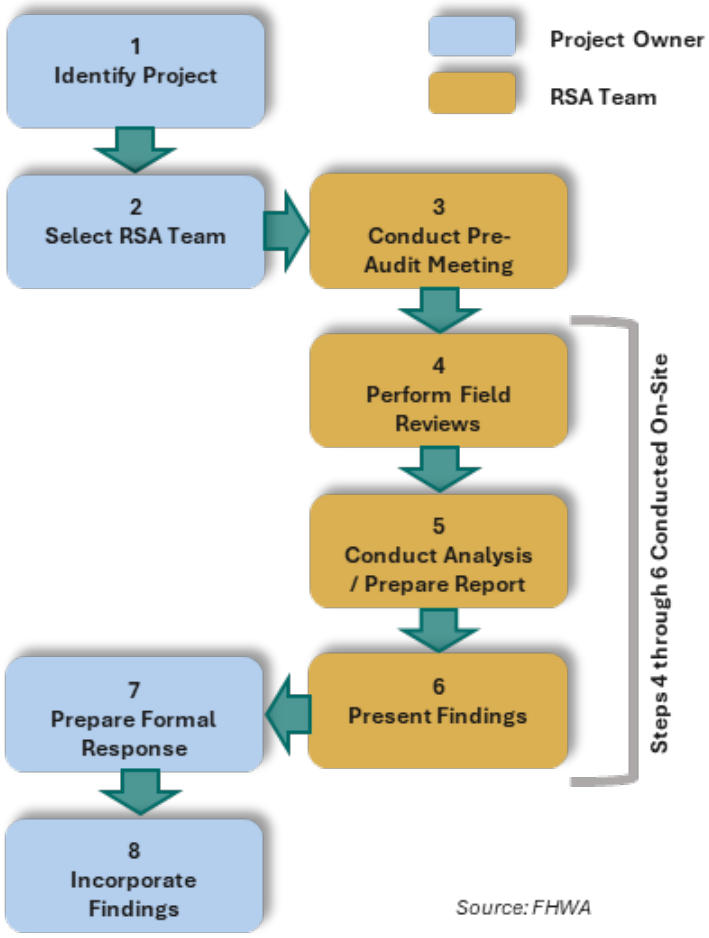


Figure 1: Road Safety Audit Process

The process assigns responsibility of the eight (8) steps to two (2) different groups: Project Owner and RSA team. The Project Owners for the Vimy Ridge Road RSA are the City Shannon Hills and Saline County. A description of the eight (8) steps are as follows.

Step 1 – Identify Project: Vimy Ridge Road, between County Line Road and Germania Road, is on the High Injury Network in the Central Arkansas Safety Action Plan developed by Metroplan. Therefore, Metroplan, the Saline County Judge, and the Mayor of Shannon Hills identified a need for an RSA on Vimy Ridge Road in order to proactively improve safety.

Step 2 – Select RSA Team: The RSA team was selected by Shannon Hills Mayor Kemp during the Pre-Audit meeting. The team included representatives from Metroplan, the City of Shannon Hills, and the project consultants.

Step 3 – Conduct Pre-Audit Meeting: A general project Pre-Audit meeting was conducted virtually on February 27, 2025. The purpose of this meeting was to discuss the general RSA process, exchange data, and identify participants to include in subsequent activities.

Step 4 – Perform Field Reviews: The field review included an examination of Vimy Ridge Road, between County Line Road and Germania Road. The RSA team conducted their field review on April 18, 2025. The project consultants also drove and created a video log of the corridor during both daytime and nighttime conditions.

Step 5 – Conduct Analysis/Prepare Report: Following the field review, the RSA team developed a set of observations to present to representatives of Metroplan, the City of Shannon Hills, and Saline County. The RSA team identified suggested corridor-wide safety improvements for Vimy Ridge Road, in addition to improvements that applied to specific point locations along the corridor.

Step 6 – Present Findings: The City of Shannon Hills and Saline County staff decided to review the observations and safety concerns that were identified during the RSA field review and the additional suggested improvements developed by the consultant team after the field review as part of their review of the full draft written report once the draft was complete.

Step 7 – Prepare Formal Response: A formal response to the RSA was not prepared by the City of Shannon Hills or Saline County, however the written report was sent to the City and the County and they were provided with an opportunity to review and comment on the report before it was finalized.

Step 8 – Incorporate Findings: The final step in the RSA process is for the City of Shannon Hills and Saline County, as the owners of the project, to work towards implementing the agreed-upon suggested improvements from the RSA report in coordination with state and local partners.

Stakeholder Coordination

Pre-Audit Meeting

The Vimy Ridge Road RSA began with a virtual Pre-Audit meeting on February 27, 2025. This meeting included members of the RSA Team, including representatives from Metroplan and the City of Shannon Hills. All meeting attendees are listed in **Table 1**.

Table 1: Pre-Audit Meeting Attendees

Agency	Representative(s)
City of Shannon Hills	Mike Kemp
Metroplan	Hans Haustein
Kimley-Horn **(RSA Team Consultant)**	Tom Fowler Kate Reichard
TEC **(RSA Team Subconsultant)**	Finley Vinson

The purpose of the Pre-Audit meeting was to brief Mayor Kemp on the RSA process, review the pre-audit crash data analyses, and obtain information from the Mayor to assist the RSA team in conducting the RSA. This included identifying other City of Shannon Hills staff and Saline County staff who should be involved in the RSA field review. During this meeting, the project team decided to expand the study extents of Vimy Ridge Road from between County Line Road and the southern Loganberry Drive intersection to between County Line Road and Germania Drive. Mayor Kemp briefed the RSA team on a variety of topics that were useful for conducting the RSA, such as roadway geometry challenges like vertical curves, crash history, vehicular volume growth, recent and planned roadway widening, school traffic operations characteristics, and pedestrian and bicycle tendencies.

Field Review

The Vimy Ridge Road RSA field review was conducted on April 18, 2025. The RSA team began by meeting at the City of Shannon Hills City Hall to brief the City of Shannon Hills staff on the RSA purpose, process, and benefits. The team also discussed pre-audit data analyses and obtained additional information from attendees from all agencies to assist the RSA team in conducting the RSA. All field review participants are listed in **Table 2**.

Table 2: Field Review Participants

Agency	Representative(s)
City of Shannon Hills	Kim Connor-Hamby Mike Kemp
Metroplan	Hans Haustein
Kimley-Horn **(RSA Team Consultant)**	Tom Fowler Kate Reichard
Crafton Tull **(RSA Team Subconsultant)**	Dave Roberts
TEC **(RSA Team Subconsultant)**	Finley Vinson

After the briefing, the RSA team went to the intersection of Vimy Ridge Road and County Line Road to begin observations of Vimy Ridge Road. The RSA team then conducted observations from the north end of the study corridor to the south end, stopping at several key points along the way, such as the Packer Drive intersection and the Barth Road intersection. The RSA team members identified safety concerns, strengths, weaknesses, and possible improvements along Vimy Ridge Road. Anecdotal experiences and pedestrian tendencies were discussed as well.

Existing Conditions

General Roadway Characteristics

Vimy Ridge Road, between County Line Road and Germania Road, is a 1.8-mile corridor in northeastern Saline County that cuts through the center of the City of Shannon Hills boundary. Throughout this document “Vimy Ridge Road” or “the study corridor” will be referring to the segment of Vimy Ridge Road between County Line Road and Germania Road, unless otherwise noted. Vimy Ridge Road is owned and maintained by the City of Shannon Hills from County Line Road to the southern Loganberry Drive intersection, where Saline County maintenance begins.

Vimy Ridge Road generally runs in the north-south direction, as shown in **Figure 2**, and is primarily surrounded by single family housing, as well as convenience stores at both ends of the study corridor. Robert L. Davis Elementary School is located at the southeast corner of Vimy Ridge Road and County Line Road. Vimy Ridge Road provides a connection to County Line Road and Germania Road and connects to Interstate 30 within the City of Little Rock.

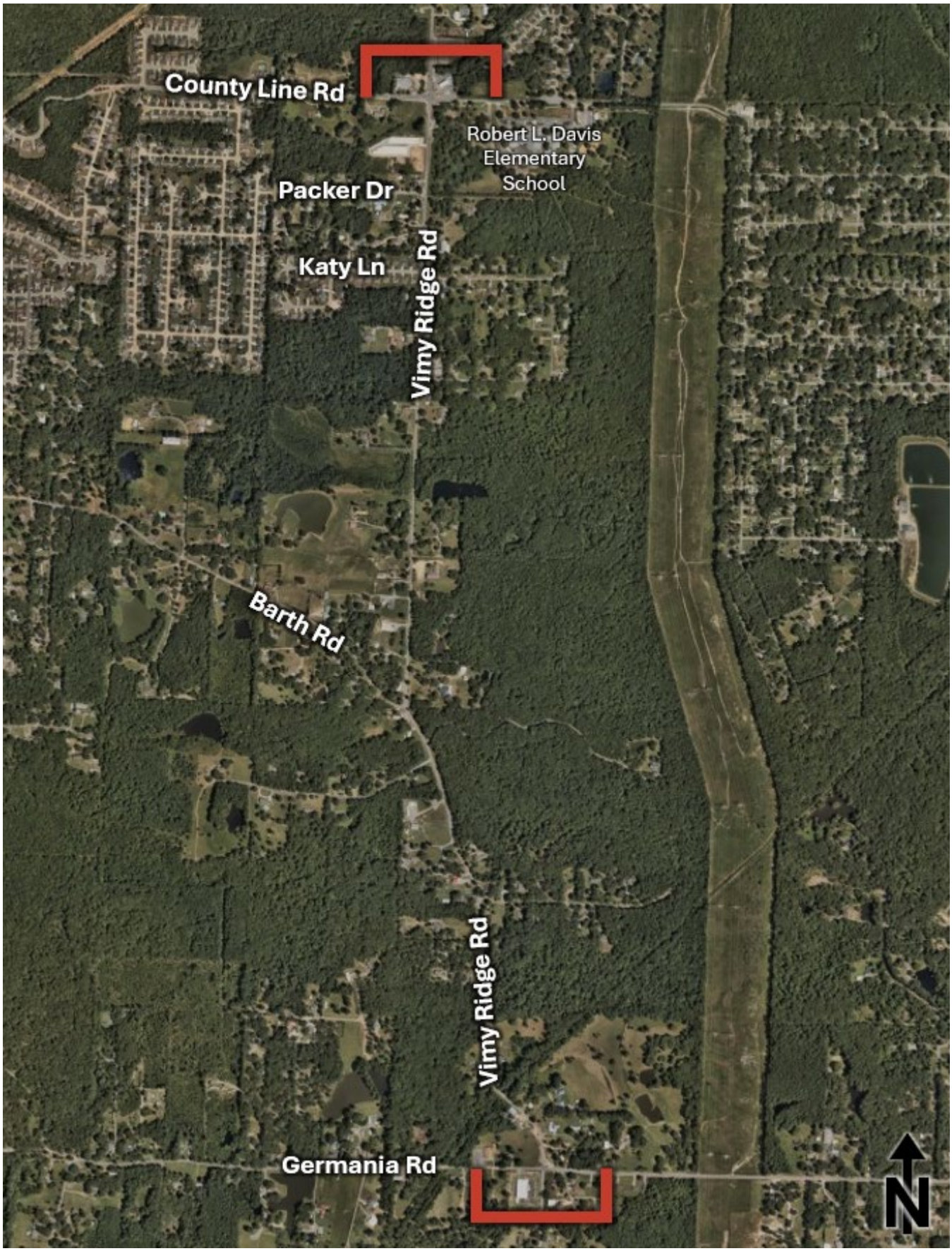


Figure 2: Vimy Ridge Road Study Corridor Extents

Vimy Ridge Road consists of two lanes, with one in each direction. The study corridor does not have a sidewalk or a bike lane along either side of the roadway, except for existing sidewalk at all corners of the intersection of Vimy Ridge Road and County Line Road. There are no transit facilities along Vimy Ridge Road.

The study corridor has a posted speed limit of 25 miles per hour (mph) between County Line Road and Katy Lane, and a 35 mph posted speed limit between Katy Lane and Germania Road. The only speed limit sign for northbound vehicles is a standard speed limit sign for 25 mph posted between Katy Lane and Packer Drive. For southbound vehicles, the last speed limit signage along the study corridor is for 35 mph just south of the southern Loganberry Drive intersection at the Saline County boundary. The sign states that the speed limit within the County is 35 mph unless otherwise posted.

Average daily traffic (ADT) data provided by ARDOT's Interactive ADT Web App was analyzed along Vimy Ridge Road and Germania Road. ADT counts were taken most recently in 2023, when approximately 10,000 vehicles were counted on Vimy Ridge Road north of the County Line Road intersection and 2,500 vehicles were counted on Vimy Ridge Road just north of Germania Road. Approximately 2,100 vehicles were counted on Germania Road, just east of Vimy Ridge Road.

Historic Crash Data

The Central Arkansas Safety Action Plan used 2018 through 2022 crash data to develop the HIN, as it was the most recent full five years of data at the time the development of the HIN began. For the RSA, more recent crash data from 2019 through 2023 was analyzed. During this crash data analysis period, there were a total of 31 crashes along the 1.8-mile study corridor of Vimy Ridge Road. Detailed crash diagram maps are included in **Appendix A**.

Among the 2019 through 2023 crashes along Vimy Ridge Road, three resulted in suspected serious injuries, six resulted in suspected or potential minor injuries, and none resulted in a fatality. Over 61 percent of all injury crashes involved a single vehicle, including all three serious injury crashes. Half of all crashes were run off the road, including two serious injury crashes and five minor injury crashes. About a third of all crashes occurred during nighttime between dusk and dawn, approximately 64 percent of which involved a single vehicle. Four of the 11 nighttime crashes occurred at the intersection of Vimy Ridge Road and Barth Road, half of which resulted in minor injuries. Almost a third of all crashes occurred with the road surface reported as not dry.

Existing Plans

City of Little Rock Widening of Vimy Ridge Road

In May 2025, the Little Rock Board of Directors allocated over $1.26 million for widening Vimy Ridge Road between County Line Road/Pleasant Hill Road and Sherri Marie Drive from two lanes, with one lane in each direction, to three lanes, with one lane in each direction and a center two-way left-turn lane. The project will also add paved shoulders and a dedicated right-turn lane at key intersections. This project will include construction of combination curb and gutter, asphalt street widening, curb inlets, underground drainage, sidewalks along both sides of Vimy Ridge Road, and associated driveway aprons and related work. Shannon Hills Mayor Kemp noted his concern that this widening could lead to an increase in traffic volumes on Vimy Ridge Road in the City of Shannon Hills, particularly at the intersection of Vimy Ridge Road and County Line Road.

Southwest Trail

The Southwest Trail is a 65-mile paved recreational trail that is planned to connect the City of Little Rock to the City of Hot Springs. The planned Southwest Trail route follows the disused Rock Island Railroad corridor, passing through Saline County and the City of Shannon Hills. As of June 2025, the Saline County section of the Southwest Trial will intersect Vimy Ridge Road just north of Germania Road. **Figure 3** shows a screenshot from the Southwest Trail Interactive WebMap Public Comment Tool taken in June 2025 of the Southwest Trail – Revised Selected Alternative, shown in yellow, where it intersects Vimy Ridge Road.

Figure 3: Planned Southwest Trail Intersection with Vimy Ridge Road

RSA Observations & Recommendations

Strengths

During the Vimy Ridge Road RSA field review, several positive aspects of the study corridor were recognized by the RSA team and are worth noting. It is recommended that efforts be made to ensure these features continue to be strengths during future maintenance and operation of Vimy Ridge Road and that these features are incorporated elsewhere along the study corridor and into the design and construction of new City of Shannon Hills and Saline County roads.

Sidewalk

Sidewalks enhance transportation safety for all road users by providing a dedicated space for pedestrians to travel, separated from vehicular traffic. This separation reduces the risk of pedestrian-vehicle conflicts and ensures a safer walking environment. The City of Shannon Hills recently constructed sidewalks along County Line Road, through the intersection with Vimy Ridge Road, connecting the residential neighborhoods to Robert L. Davis Elementary School. No crashes involving pedestrians occurred from 2019 through 2023 along County Line

Road between Carrington Place Drive and Donnie Drive. While additional sidewalks are recommended to connect neighborhoods located south of Robert L. Davis Elementary School to the school, the sidewalks that have already been built near the school are a very positive safety improvement for pedestrians.

Retroreflective Object Markers on Guardrail

The existing guardrail along Vimy Ridge Road was observed at night to be lined with retroreflective object markers. Retroreflective object markers on guardrails significantly improve visibility of the guardrail, particularly during nighttime or adverse weather conditions. These markers reflect headlights' light back towards its source, helping drivers identify the road boundaries and potential hazards early, allowing them to navigate more safely and reduce the risk of road departure crashes.

Figure 4: Reflectors on Guardrail at Night

Suggested Improvements

The RSA team identified suggested improvements based on the daytime and nighttime field reviews of Vimy Ridge Road as well as discussions with the staff representing Metroplan and the City of Shannon Hills. Suggested improvements are provided for corridor-wide issues as well as specific locations along the study segment of Vimy Ridge Road. The following information is provided for each of the 22 corridor-wide and location-specific suggested improvements in **Table 3**.

- **Location:** Location is defined as either a corridor-wide improvement which is applied to large parts or the entirety of the Vimy Ridge Road RSA study segment, between County Line Road and Germania Road, or a specific location along the study segment. For location-specific suggested improvements, road segment or intersection details are provided.
- **Observations:** A summary of the observations made by the RSA team and relevant crash data is provided for each suggested improvement.
- **Suggested Improvements:** Suggested improvements are provided for a range of implementation timeframes identified below. Generally, immediate suggested improvements are considered to be lower-cost countermeasures that address immediate safety issues, such as signing a sharp turn that requires a reduction in speed. Long-term suggested improvements are generally higher-cost improvements that may require additional capital programming or development of engineering plans, such as the reconfiguration of an intersection.
    - Immediate: Less than 1 year

    - Short-Term: 1 – 2 years
    - Mid-Term: 2 – 5 years
    - Long-Term: 5+ years
- **Cost Estimates for Suggested Improvements:** An opinion of probable cost for each suggested improvement is provided. The cost estimation methodology is described in the following section and a list of the unit costs for individual pay items used to develop the cost estimates is provided in **Appendix B**.
- **Photos:** Photos, when available, have been provided to assist the reader in visualizing the described observations and suggested improvements.
- **Conceptual Layouts:** A note is included in the recommendation table if a conceptual layout was developed for the recommendation. Conceptual layouts are included in **Appendix C**.

Table 3: Field Review Observations and Suggested Improvements

1. Retroreflective Signage

Location: Corridor-Wide

Observations

- Several signs are very faded, with some completely blank. Some specific signs that were noted include:
  - School crossing warning signs at both approaches to Packer Drive.
  - Sign under school crossing warning sign for southbound approach to Packer Drive.
  - Blind drive ahead warning sign southbound south of Loganberry Drive.

Immediate Improvements

- Replace all faded and worn signs on Vimy Ridge Road.
- Replace existing signs that are not retroreflective with signs that meet the MUTCD retroreflectivity requirements.

Cost Estimate
Immediate: $6,600

The cost estimate assumes replacement of ten standard signs.

Figure 5: Faded warning sign for southbound vehicles on Vimy Ridge Road south of Loganberry Drive.

2. Retroreflective Object Markers

Location: Corridor-Wide

Observations

- Reflective object markers exist at several, but not all fixed objects, along Vimy Ridge Road.
- Object markers exist on both sides of both approaches of many, but not all, culverts and guardrails along Vimy Ridge Road.

Immediate Improvements

- Install object markers on both sides of all guardrail at both approaches to the object along Vimy Ridge Road.
- Add reflective object markers to all fixed objects, including mailboxes, along Vimy Ridge Road.

Cost Estimate
Immediate: $6,500

The cost estimate assumes four object markers at approximately five locations.

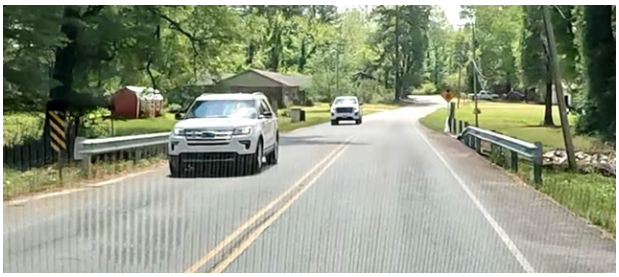


Figure 6: Object marker is missing on the right side of the guardrail on southbound Vimy Ridge Road south of Floresta Lane.

3. Wider Striping

Location: Corridor-Wide

Observations

- Existing pavement markings are faded along most of the corridor and difficult to see at night.
- Existing centerline and edge line pavement markings along the corridor are 4” wide. While this meets standards for pavement markings, 6” wide pavement marking are more visible especially on corridors with no lighting.
- Some reflective raised pavement markers were present, but a majority of the markers appeared to be missing or not installed.

Mid-Term Improvements

- Restripe the centerline and edge line on Vimy Ridge Road with 6” wide pavement markings.
- Install raised reflective pavement markers along the centerline of Vimy Ridge Road.

Cost Estimate

Mid-Term: $47,300

Figure 7: Faded pavement markings along Vimy Ridge Road south of Loganberry with no lighting.

4. Corridor Lighting

Location: Corridor-Wide

Observations

- Lighting is not present along Vimy Ridge Road and the corridor appears very dark at night.
- A single intersection light exists at the southwest corner of the intersection of Vimy Ridge Road and County Line Road and does not light up the entire wide intersection.
- The City of Shannon Hills noted that intersection lighting was unintentionally removed from the County Line Road intersection when the approaches were widened.

Mid-Term Improvements

- Install corridor and intersection lighting along the entire corridor.

Cost Estimate

Mid-Term (Shannon Hill): $312,600
Mid-Term (Saline County): $764,000

Note: The cost estimate assumes lighting along the entire corridor and at the intersection of Vimy Ridge Road and County Line Road and the intersection of Vimy Ridge Road and Germania Road. Lighting for the intersection of Vimy Ridge Road and Barth Road is included in suggested improvement number 15.

Figure 8: A single light exists at the southwest corner of the intersection of Vimy Ridge Road and County Line Road and does not provide sufficient lighting to illuminate the entire intersection.

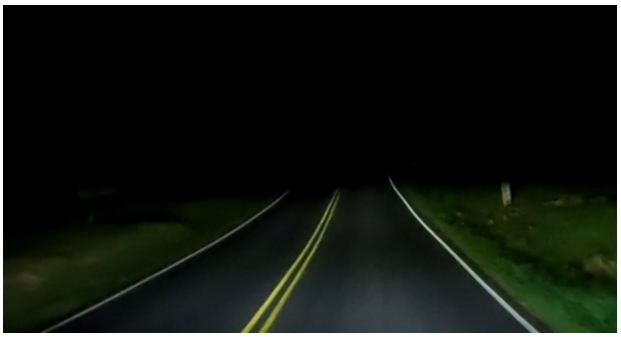


Figure 9: Southbound on Vimy Ridge Road between the two intersections with Loganberry Drive.

5. Recoverable Area

Location: Corridor-Wide

Observations

- Steep drop offs or ditches exist along both sides of Vimy Ridge Road for majority of the corridor.
- The RSA team observed that the lanes feel narrow for majority of the corridor. The southbound lane of Vimy Ridge Road approaching Barth Road was measured at 9.5-feet wide and the northbound lane of Vimy Ridge Road north of Barth Road was measured at 10-feet.
- The edge of the northbound lane of Vimy Ridge Road just north of Barth Road slopes off the road and vehicles were observed avoiding driving on the slope by veering across the centerline. Similarly, the edge of the southbound lane just south of Barth Road slopes off the road and vehicles were observed avoiding driving on that slope by veering across the centerline. Centerline markings appeared more worn and faded within most curves.
- No shoulders or grassy recoverable areas exist along a majority of the Vimy Ridge Road corridor.

Mid-Term Improvements

- Where possible, construct shoulders or provide grassy recoverable areas to add buffers between travel lanes and ditches on the side of Vimy Ridge Road.

Cost Estimate

Mid-Term: $266,000

The cost estimate assumes 1-mile of shoulders constructed for recoverable areas.

Figure 10: Steep drop off from the surface of pavement to the ditch along the east side of Vimy Ridge Road south of County Line Road.

6. Pedestrian Intersection Crossings

Location: County Line Road/Pleasant Hill Road Intersection

Observations

- Crosswalk pavement markings are faded for crossing the eastbound and northbound approaches to the intersection of Vimy Ridge Road and County Line Road.
- No crosswalk exist across the southbound approach.
- The pedestrian ramp at the northwest corner is diagonal.
- No crosswalk or ramps exist for crossing the westbound approach.
- Drainage inlet exists at the northeast corner of the intersection.
- Yield to pedestrian signage is posted on the stop sign posts under the stop signs for the southbound and eastbound approaches but were faded. Stop signs require a complete stop and that drivers yield to pedestrians. The yield to pedestrian sign may confuse drivers and imply a stop is not required.

Immediate Improvements

- Stripe high visibility crosswalks across all legs of the intersection of Vimy Ridge Road and County Line Road.
- Remove signage from the stop sign posts related to yielding to pedestrians.

Short-Term Improvements

- Replace the existing diagonal ramp with directional ramps at the northwest corner.
- Construct directional ramps at the northeast and southeast corners for crossing the westbound approach.

Cost Estimate

Immediate: $16,800
Short-Term: $126,000

*Note: A conceptual drawing of improvements for Vimy Ridge Road and County Line Road is included in **Appendix C**.*

Figure 11: Faded crosswalk markings for crossing the west leg of the intersection and diagonal ramp at the northwest corner.

7. Intersection Approach Signage and Striping

Location: County Line Road/Pleasant Hill Road Intersection

Observations

- Stop sign on County Line Road at the eastbound approach to the intersection is tilted away from the intersection.
- Stop signs for the northbound, southbound, and eastbound approaches had 4-WAY plaques underneath (ARDOT standard is ALL WAY plaques).
- Very wide eastbound and westbound approaches of County Line Road quickly widen from one lane approaching to three lanes with no striping for transition.
- The centerline at the westbound approach extends into the intersection and has extra space that is not hatched.
- The wide three lane approaches make it difficult to see the standard sized stop signs.
- The existing in-lane arrow pavement markings for all approaches are faded.
- The existing lane assignment sign for the northbound approach of Vimy Ridge Road is bent and facing southbound vehicles. City of Shannon Hills staff noted this was due to heavy winds from a recent storm.
- The northbound through lane of Vimy Ridge Road aligns with the right-turn deceleration lane for the Dollar General just north of County Line Road, making the lane assignment at the intersection approach confusing.

Immediate Improvements

- Add double post stop signs for all approaches to the intersection. Consider using oversized stop signs for all approaches similar to the stop sign on Germania Road.
- Add ALL WAY plaques under all stop signs.
- Add reflective red tape to stop sign posts to improve visibility of the signs.
- Replace the damaged lane assignment sign for northbound approach.
- Stripe all pavement markings at all approaches to the intersection as noted.
    - Include centerline, edgeline, lane lines, turn lane lines, in-lane arrows, and stop bars at all approaches. Centerline and lane lines between the transition from one lane to three lanes at the eastbound and westbound approaches along County Line Road should also be striped.
    - Include edgeline taper for the westbound approach to help guide drivers through the transition from one lane to the abrupt widening to three lanes.

Figure 12: A stop sign for the eastbound approach was tilted away from the intersection.

Figure 13: Faded pavement markings along Vimy Ridge Road and no lighting present south of Loganberry Drive.

Figure 14: The existing lane assignment sign for northbound Vimy Ridge Road was facing the wrong direction due to damage from a recent storm.

Figure 15: Vehicles observed turning right onto Pleasant Hill Road from the shared left-thru lane of southbound Vimy Ridge Road (where there are no in-lane arrows or stop bar pavement markings).

- Include hatching at extra space along the centerline within the transition section of the westbound approach.

Cost Estimate

Short-Term: $19,600

*Note: A conceptual drawing of improvements for Vimy Ridge Road and County Line Road is included in **Appendix C**.*

Figure 16: Aerial of the intersection showing lack of pavement markings as approaches widen to provide dedicated turn lanes.

8. Intersection Control Evaluation

Location: County Line Road/Pleasant Hill Road Intersection

Observations

- The City of Little Rock has plans to widen Vimy Ridge Road north of County Line Road to be three lanes (one lane in each direction with a two way left-turn lane in the center).
- The City of Shannon Hills has conducted a traffic signal warrant analysis at the intersection of Vimy Ridge Road and County Line Road in the past, but traffic volumes did not meet warrants.
- The City of Shannon Hills expressed interest in converting the all-way stop controlled intersection to a roundabout (preferred) or a traffic signal if the intersection can meet warrants for a traffic signal.
- The intersection is very wide, with dedicated turn and through lanes at each approach, making it difficult for drivers to know who has the right-of-way when several vehicles stop at the same time.
- Driveways for businesses at the northwest and northeast corners are very close to the intersection, intersecting the approaches within the dedicated turn lanes or transition area.

Mid-Term Improvements

- Collect traffic counts (after the convenience store on the northwest corner is complete) and conduct an intersection control evaluation study to determine if a roundabout or traffic signal is most feasible.
- Future steps after the completion of the study include:
    - Design and implement the most feasible improvement to the intersection.
    - Add intersection lighting, signage, and striping to support the improved intersection control.
    - Consider relocating driveways further away from the intersection if a roundabout is constructed or as the area gets more developed to reduce conflicts between the intersection traffic and vehicles accessing the businesses on the northwest and northeast corners.

Cost Estimate

Mid-Term: $45,000

Figure 17: Eastbound approach to the wide stop-controlled intersection.

9. Shared-Use Path

Location: Between County Line Road and Katy Lane

Observations

- Footpath was observed worn into the grass along both sides of Vimy Ridge Road between County Line Road and Katy Lane.
- The RSA team observed a person walking their bike along the east side of Vimy Ridge Road south of Packer Drive.
- There is not a safe way for pedestrians to walk between the neighborhood at Packer Drive and Katy Lane and Robert L. Davis Elementary.

Mid-Term Improvements

- Construct a sidewalk or shared-use path along Vimy Ridge Road from Katy Lane to County Line Road.

Cost Estimate

Mid-Term: $271,000

The cost estimate assumes approximately 1,460-feet of sidewalk on one side of Vimy Ridge Road.

Figure 18: Footpath exists along the east side of Vimy Ridge Road between Katy Lane and County Line Road.

10. Retroreflective Warning Signage

Location: Packer Drive Intersection

Observations

- Existing school crossing warning sign is angled towards the roadway. This damage may have been the result of recent storms in the area.
- Existing white sign posted on the same pole as the school crossing sign is completely faded.
- City of Shannon Hills staff noted students cross Vimy Ridge Road from Packer Drive to an existing trail that connects to the Robert L. Davis Elementary.
- Dangerous intersection warning sign at the northbound approach to Packer Drive is very worn and difficult to read (especially at night).
- No T-intersection warning signs exist at the northbound or southbound Vimy Ridge Road approaches to Packer Drive. The intersection of Packer Drive is hidden by a vertical crest curve for northbound vehicles.

Immediate Improvements

- Replace the existing school crossing warning sign (and possibly the sign underneath, depending on what it used to say) at the Vimy Ridge Road southbound approach to Packer Drive.
- Replace the dangerous intersection warning sign with a similar sign or a T-intersection warning sign and post the signa at an appropriate height.
- Install a T-intersection warning sign at the northbound approach to Packer Drive.

Cost Estimate

Immediate: $2,000

Figure 19: Existing school crossing warning sign and faded sign underneath at the southbound approach to Packer Drive.

Figure 20: Dangerous intersection warning sign at the northbound approach to Packer Drive.

11. Pedestrian Mid-Block Crossing

Location: Packer Drive Intersection

Observations

- A trail exists on the east side of Vimy Ridge Road, across from Packer Drive, which connects Vimy Ridge Road to Robert L. Davis Elementary school. Students use this trail to avoid walking along Vimy Ridge Road.
- Steep drop offs and ditches exist on both sides of Vimy Ridge Road, particularly the east side.
- A vertical curve along Vimy Ridge Road crests approximately 300-feet south of the trail, limiting the sight distance for northbound drivers of the trail and potential students crossing Vimy Ridge Road from the trail. The location of the trail is within AASHTO stopping sight distance minimum of 165-feet for a 6% downgrade slope at 25 mph, however vehicles that are speeding would require more than 165-feet of distance to see safely see them.
- Vehicles were observed speeding down the hill when the RSA team was at Packer Drive.

Mid-Term Improvements

- Pave the existing trail on the east side of Vimy Ridge Road that connects to Robert L. Davis Elementary. This project could be completed as part of the recommended sidewalk or greenway or sidewalk along Vimy Ridge Road.
- Install a rapid rectangular flashing beacon (RRFB) with advance warning signs and flashing beacons near the crest of the vertical curve.

Cost Estimate

Mid-Term: $242,800

The cost estimate assumes approximately 1,000-feet of sidewalk.

Figure 21: Trail access to Robert L. Davis Elementary across from Packer Drive.

12. Curb

Location: Packer Drive Intersection

Observations

- The curb along the Packer Drive approach to Vimy Ridge Road curves out approximately 15-feet before reaching the Vimy Ridge Road travel way.
- Tire treads were seen in the mud at the northeast corner of the intersection where westbound right-turn vehicles have cut the corner and veered off the pavement.

Short-Term Improvements

- Extend curb or add pavement so turning vehicles do not depart the road and get sucked into the ditch.

Cost Estimate

Short-Term: $26,300

Note: The cost estimate assumes an extension of the curbs to Vimy Ridge Road.

Figure 22: Packer Drive curb curves (Image from Google Street View).

Figure 23: Tire path in mud at the southwest corner of Vimy Ridge Road and Packer Drive.

13. Separate Signage

Location: Katy Lane Intersection

Observations

- The school crossing warning sign on northbound Vimy Ridge Road near Katy Lane is very faded.
- A school crossing warning sign, welcome to Shannon Hills sign, and speed limit sign are all posted on the same poles, creating sign clutter at the approach to Packer Drive.
- Based on tracks worn in the grass, it appears that students often cross Vimy Ridge Road near Packer Drive when traveling to Robert L. Davis Elementary.

Immediate Improvements

- Repost the welcome to Shannon Hills, speed limit, and school zone signs on separate posts. Consider relocating the welcome to Shannon Hills sign to reduce sign clutter in the area just before the crest of the vertical curve.
- Update the school zone and crossing warning signage to standard school zone and crossing warning signs and add a flashing beacon. ARDOT standards could be used if the City or Saline County do not have their own.

Cost Estimate

Short-Term: $29,400

Figure 24: Existing signage for northbound vehicles on Vimy Ridge Road across from Katy Lane.

14. Intersection Within Curve Warning Signage

Location: Barth Road Intersection

Observations

- Advance warning signage for the curve and intersection within the curve do not exist at any approach to the intersection of Vimy Ridge Road and Barth Road.
- Chevrons do not exist along the outside of the horizontal curve along Vimy Ridge Road at Barth Road.
- The curve and intersection are difficult to see coming up from all approaches, particularly at night.
- Centerline pavement marking is worn and leads straight to the southbound and northbound approaches of Vimy Ridge Road to Barth Road, contributing to the lack of advance visibility of the curve.
- Multiple hit fixed object crashes occurred at this location during the five-year study period. Two crashes involved a utility pole being struck. A utility pole observed on the southbound approach that may have been the pole that was struck as it looked new and had several reflective object markers on it.
- No advance stop ahead warning sign exists at the eastbound approach of Barth Road to Vimy Ridge Road.
- A horizontal curve limits the visibility of the intersection and stop sign for drivers approaching Barth Road.

Immediate Improvements

- Install advance warning signs for the intersection of Vimy Ridge Road with Barth Road within the curve.
- Install chevrons along the outside of the horizontal curve for both directions of Vimy Ridge Road.
- Install a stop ahead warning sign at the Barth Road approach.

Cost Estimate

Immediate: $3,500

Figure 25: Southbound approach to Barth Road has no curve or intersection warning signage or chevrons.

Figure 26: Northbound approach to Barth Road has no curve or intersection warning signage or chevrons.

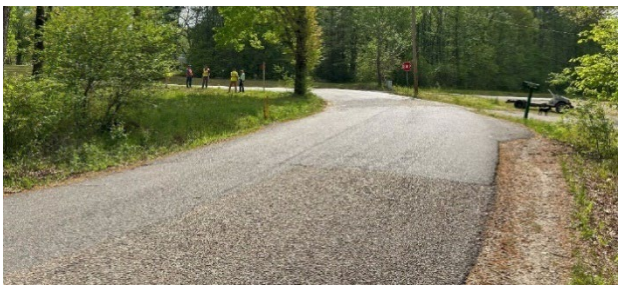


Figure 27: Horizontal curve without warning signage at the eastbound approach of Barth Road to Vimy Ridge Road.

Figure 28: Stop sign appears to have been hit (Imagery from Google Street View – June 2023).

Figure 29: Utility pole that appears new with reflective object markers at the southbound approach of Vimy Ridge Road to Barth Road.

Figure 30: MUTCD intersection within curve warning sign W1-10L that should be considered for this location.

15. Intersection Nighttime Visibility

Location: Barth Road Intersection

Observations

- The curve and intersection of Vimy Ridge Road and Barth Road are difficult to see at night.
- Reflective object markers do not exist on or in front of all fixed objects in the vicinity of the intersection and horizontal curve.
- No streetlights exist at the intersection.
- Two fixed object crashes occurred at this location within the five-year study period. One of the crashes occurred at night.

Immediate Improvements

- Install reflective object markers on or in front of all fixed objects and hazards in the vicinity of the intersection and horizontal curve.

Mid-Term Improvements

- Install intersection lighting at the intersection of Vimy Ridge Road and Barth Road.

Cost Estimate
Immediate: $600
Mid-Term: $65,800

Figure 31: Southbound approach of Vimy Ridge Road to Barth Road at night.

Figure 32: Drop off exists along the outside of the curve that is difficult to see at night.

16. Dashed Pavement Markings

Location: Between Mary Lane and Floresta Lane

Observations

- Dashed white pavement markings exist along the centerline of Vimy Ridge Road for approximately 640-feet between Mary Lane and Floresta Lane.

Immediate Improvements

- Remove dashed white pavement markings along the centerline.

Cost Estimate
Immediate: $2,600

Figure 33: Dashed white pavement markings along the centerline of Vimy Ridge Road.

17. Vegetation

Location: Between Mary Lane and Floresta Lane

Observations

- The existing reverse turn warning sign and road unsafe when under water warning sign for northbound vehicles are hidden by vegetation.
- The reverse curves the sign is posted for are less severe than the curves where warning signage is not posted further south, which may lead drivers to think the road is straight.

Immediate Improvements

- Clear vegetation in front of warning signs.

Cost Estimate

Immediate: $300

Figure 34: Reverse turn warning sign for northbound vehicles is hidden by vegetation.

18. Guardrail

Location: Between Floresta Lane and Germania Road

Observations

- Guardrail was damaged along both sides of Vimy Ridge Road south of Floresta Lane. The RSA team assumed the damage may have been the result of a fallen tree from recent heavy winds and storms that occurred in the area.

Immediate Improvements

- Repair the guardrail on both sides of Vimy Ridge Road.

Cost Estimate

Immediate: $12,600

Figure 35: Guardrail is damaged along the east side of Vimy Ridge Road.

19. Curve Warning Signage

Location: 'S' Curve Between Floresta Lane and Germania Road

Observations

- Reverse curve warning signage does not exist at the northbound or southbound approaches.
- Two chevrons exist for southbound vehicles approaching the first curve of the 'S' curve, but one sign is not angled towards approaching southbound vehicles. The chevrons are also very close together and do not lead vehicles through the curve.
- Reflective posts, object markers, and raised reflective pavement markers have been placed along the outside of the 'S' curve. These markers may have been placed by the resident(s) whose driveway meets Vimy Ridge Road at the apex of one of the curves. Chevrons also may have been installed by the resident(s). The makers are only visible by southbound vehicles at night and not by northbound vehicles.
- A chain link fence along the outside of the first curve appears to have been hit.
- Chevron signs do not exist along the outside of the second curve for southbound vehicles.
- Centerline striping is faded within both curves.

Immediate Improvements

- Install advance warning signs for the reverse curve at both Vimy Ridge Road approaches.
- Install chevrons along the outside of both horizontal curves for both directions of travel along Vimy Ridge Road .

Cost Estimate

Immediate: $1,400

Figure 36: Southbound approach of the first 'S' curve.

Figure 37: Reflective items visible at night for vehicles at the southbound approach to the curve.

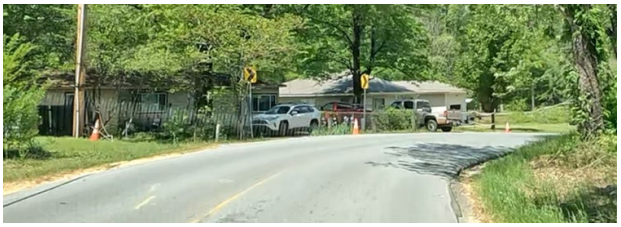


Figure 38: Northbound approach to the second curve of the 'S' curve.

20. Trail Crossing

Location: 'S' Curve Between Floresta Lane and Germania Road

Observations

- Southwest Trail crossing within 'S' curve has very limited sight distance, particularly for southbound vehicles.
- Southbound vehicles stopping for trail users in the crossing would be stopped within a sharp curve and would be at risk for getting rear ended by another vehicle.
- Northbound sight distance prior to the trail crossing seems adequate.
- Residents that the RSA team met during the field review mentioned that the middle of the 'S' curve used to be a dip where the train track intersected it. Vehicles usually slowed down due to the dip. However, the dip was flattened out after the train tracks were removed and now that it is flatter vehicles are able to speed through the curves.

Short-Term Improvements

- Consider relocating the Southwest Trail crossing to a location with better site distance for the crossing prior to constructing the trail.

Cost Estimate

Short-Term: To Be Determined Based on Possible New Locations for the Trail Crossing

Figure 39: Proposed future Southwest Trail crossing is within the 'S' curve where barricades are currently placed (see areas circled in red).

21. Stop-Controlled Intersection Signage

Location: Germania Road Intersection

Observations

- No stop ahead warning signs exist along the Germania Road approaches to Vimy Ridge Road. The nearest traffic calming along Germania Road to the west of Vimy Ridge is a 90-degree curve approximately 0.8-miles west. Approximately 1-mile to the east of Vimy Ridge Road is a stop-controlled intersection at North Sardis Road. Germania Road is a relatively straight road and City of Shannon Hills representatives noted that speeding is common.
- The stop ahead warning sign for the southbound approach of Vimy Ridge Road to Germania Road is approximately 1,584-feet in advance of the intersection prior to the 'S' curves. (MUTCD does not establish a distance for a stop ahead warning sign for a 35 mph speed limit, which is what Vimy Ridge is signed for in this location. However, a City of Shannon Hills representative noted there is often speeding on Vimy Ridge Road. MUTCD distance for stop ahead warning sign on a 40 mph road is 125-feet.)
- Stop signs are double posted and oversized for the eastbound approach of Germania Road to Vimy Ridge Road, but other signs were standard size and only posted on the right side of the approach.
- Residents noted that stop sign running is very prevalent.

Immediate Improvements

- Install stop ahead warning signs 125-feet in advance of the intersection at all approaches.
- Stripe in-lane STOP pavement markings.
- Double post stop signs at all approaches. Consider using oversized stop signs for all approaches.
- Add reflective red tape to all stop sign posts.

Cost Estimate

Short-Term: $10,200

Figure 40: Stop ahead warning sign for the southbound approach of Vimy Ridge Road to Germania Road is well before the approach to curves.

22. Pavement Repair

Location: Germania Road Intersection

Observations

- Pavement at the northwest corner of the intersection of Vimy Ridge Road and Germania Road is degraded.

Immediate Improvements

- Repair the pavement at the northwest corner of Vimy Ridge Road and Germania Road.

Cost Estimate

Short-Term: $8,200

Figure 41: Degraded pavement at the northwest corner of the intersection of Vimy Ridge Road and Germania Road.

Cost Estimates

An opinion of probable cost was developed for each of the suggested improvements. Estimated quantities for developing costs were derived through a combination of observations from the RSA field review, reference to aerial imagery, and engineering judgement. The quantities that were used in the cost estimates are preliminary and are not based on engineering design. The RSA team relied on several guidance documents to develop quantities including the *FHWA Manual on Uniform Traffic Control* (MUTCD) as well as ARDOT standards.

The cost estimates provide the City of Shannon Hills and Saline County with a planning level cost for high-level budgeting and should only be considered approximate. Cost estimates utilize unit pricing based on average unit costs seen on similar road and safety projects. These costs will vary based on local construction costs, size of the project, mobilization costs, and other factors. The unit costs for the pay items used for developing the cost estimates for each suggested improvement are presented in **Appendix B**.

An example of a cost estimate calculation worksheet that was prepared for one of the suggested improvements is provided in **Table 4**. To account for engineering, mobilization, traffic control, and other costs associated with construction, cost estimates were increased by 40 percent. The 40 percent factor used is inclusive of all costs beyond the unit cost used for the suggested improvement costed items.

Table 4: Example Cost Estimate for Suggested Improvement

Interseciton Approach for Signage and Striping (Vimy Ridge Road and County Line Road/Pleasant Hill Road)										
Itemized Recommendation Costs										
			Immediate		Short-Term		Mid-Term		Long-Term	
Improvement	**Unit**	**Unit Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**
Install Standard Sign	Per Sign	$ 470		$ -	8	$ 3,760		$ -		$ -
Replace/Relocate Standard Sign	Per Sign	$ 900		$ -	1	$ 900		$ -		$ -
Add Reflective Tape on Sign Post	Per Sign	$ 60		$ -	8	$ 480		$ -		$ -
Add Plaque Under Sign	Per Plaque	$ 40		$ -	8	$ 320		$ -		$ -
Add/Improve Pavement Markings	Per Approach Lane			$ -	4	$ 3,720		$ -		$ -
Add/Restripe Stop Bars	Per Approach lane	$ 230		$ -	4	$ 920		$ -		$ -
Add In-Lane Pavement Marking	Per Marking	$ 390		$ -	10	$ 3,900		$ -		$ -
Engineering, Mobilization, Traffic Control, Etc.	40%			$ -		$ 5,600		$ -		$ -
Recommendation Cost Summary										
Total Cost by Timeframe			**Immediate**		**Short-Term**		**Mid-Term**		**Long-Term**	
				$ -		**$ 19,600**		**$ -**		**$ -**
Total Recommendation Cost			**$**							**19,600**

A summary of all suggested improvement cost estimates is provided in **Table 5**. A view of the cost aggregated by type of cost (Signing, Pavement Markings and Striping, and Other) is provided in **Table 6**. This view is provided should the City or County want to address all signing or pavement marking and striping improvements through a corridor-wide type project.

Table 5: Summary of Suggested Improvement Cost Estimates by Timeframe

No.	Suggested Improvement	Cost Estimate by Implementation Timeframe			
		Immediate	Short-Term	Mid-Term	Long-Term
1	Retroreflective Signage	$6,600	-	-	-
2	Retroreflective Object Markers	$6,500	-	-	-
3	Wider Striping	-	-	$47,300	-
4	Corridor Lighting	-	-	-	$1,076,600
5	Recoverable Area	-	-	$266,000	-
6	Pedestrian Intersection Crossings (County Line Road/Pleasant Hill Road)	$16,800	$126,000	-	-
7	Intersection Approach Signage and Striping (County Line Road/Pleasant Hill Road)	-	$19,600	-	-
8	Intersection Control Evaluation (County Line Road/Pleasant Hill Road)	-	-	$45,000	-
9	Shared-Use Path (Between County Line Road and Katy Lane)	-	-	$271,000	-
10	Retroreflective Warning Signage (Packer Drive)	$2,000	-	-	-
11	Pedestrian Mid-Block Crossing (Packer Drive)	-	-	$242,800	-
12	Curb (Packer Drive)	-	$26,300	-	-
13	Separate Signage (Katy Lane)	-	$29,400	-	-
14	Intersection Within Curve Warning (Barth Road)	$3,500	-	-	-
15	Intersection Nighttime Visibility (Barth Road)	$600	-	$65,800	-
16	Dashed Pavement Markings (Between Mary Lane and Floresta Lane)	$2,600	-	-	-
17	Vegetation (Between Mary Lane and Floresta Lane)	$300	-	-	-
18	Guardrail (Between Floresta Lane and Germania Road)	$12,600	-	-	-
19	Curve Warning Signage ('S' Curve Between Floresta Lane and Germania Road)	$1,400	-	-	-
20	Trail Crossing ('S' Curve Between Floresta Lane and Germania Road)	NA	NA	NA	NA
21	Stop-Controlled Intersection Signage (Germania Road)	-	$10,200	-	-
22	Pavement Repair (Germania Road)	-	$8,200	-	-

Table 6: Summary of Suggested Improvement Cost Estimates by Type

No.	Suggested Improvement	Cost Estimate by Type		
		Signing	Pavement Markings	Other
1	Retroreflective Signage	$6,600	-	-
2	Retroreflective Object Markers	$6,500	-	-
3	Wider Striping	-	$47,300	-
4	Corridor Lighting	-	-	$1,076,600
5	Recoverable Area	-	-	$266,000
6	Pedestrian Intersection Crossings (County Line Road/Pleasant Hill Road)	-	$16,800	$126,000
7	Intersection Approach Signage and Striping (County Line Road/Pleasant Hill Road)	$7,700	$12,000	-
8	Intersection Control Evaluation (County Line Road/Pleasant Hill Road)	-	-	$45,000
9	Shared-Use Path (Between County Line Road and Katy Lane)	-	-	$271,000
10	Retroreflective Warning Signage (Packer Drive)	$2,000	-	-
11	Pedestrian Mid-Block Crossing (Packer Drive)	-	-	$242,800
12	Curb (Packer Drive)	-	-	$26,300
13	Separate Signage (Katy Lane)	$29,400	-	-
14	Intersection Within Curve Warning (Barth Road)	$3,500	-	-
15	Intersection Nighttime Visibility (Barth Road)	$600	-	$65,800
16	Dashed Pavement Markings (Between Mary Lane and Floresta Lane)	-	$2,700	-
17	Vegetation (Between Mary Lane and Floresta Lane)	-	-	$300
18	Guardrail (Between Floresta Lane and Germania Road)	-	-	$12,600
19	Curve Warning Signage (S' Curve Between Floresta Lane and Germania Road)	$1,400	-	-
20	Trail Crossing (S' Curve Between Floresta Lane and Germania Road)	NA	NA	NA
21	Stop-Controlled Intersection Signage (Germania Road)	$9,000	$1,300	-
22	Pavement Repair (Germania Road)	-	-	$8,200

Prioritization

Suggested improvements are categorized as high, medium, or low priorities. Prioritization is based on the RSA team's assessment of each safety issue and the impact that the suggested improvements is expected to have on improving safety. Engineering judgement regarding the potential for future crash rate reduction and crash severity reduction were considered when prioritizing the suggested improvements.

While all the suggested improvements are considered important and expected to have a positive impact on safety, it is recommended that the City of Shannon Hills and Saline County consider focusing on high priority

recommendations first as they may yield the greatest impact on safety along Vimy Ridge Road. **Table 7** organizes each suggested improvement by implementation priority (high, medium, or low). The City or County may use this prioritization if fiscal constraints and personnel availability prohibit the City or County from implementing all the suggested improvements in a timely manner.

Table 7: Summary of Suggested Improvement Priorities

No.	Suggested Improvement	Improvement Timeframe
High Priority Suggested Improvements		
1	Retroreflective Signage	Immediate
2	Retroreflective Object Markers	Immediate
6	Pedestrian Intersection Crossings (County Line Road/Pleasant Hill Road)	Immediate/Short-Term
7	Intersection Approach Signage and Striping (County Line Road/Pleasant Hill Road)	Short-Term
9	Shared-Use Path (Between County Line Road and Katy Lane)	Mid-Term
10	Retroreflective Warning Signage (Packer Drive)	Immediate
11	Pedestrian Mid-Block Crossing (Packer Drive)	Mid-Term
14	Intersection Within Curve Warning (Barth Road)	Short-Term
17	Vegetation (Between Mary Lane and Floresta Lane)	Short-Term
18	Guardrail (Between Floresta Lane and Germania Road)	Immediate
19	Curve Warning Signage ('S' Curve Between Floresta Lane and Germania Road)	Short-Term
21	Stop-Controlled Intersection Signage (Germania Road)	Short-Term
Medium Priority Suggested Improvements		
3	Wider Striping	Mid-Term
4	Corridor Lighting	Long-Term
5	Recoverable Area	Mid-Term
8	Intersection Control Evaluation (County Line Road/Pleasant Hill Road)	Mid-Term
13	Separate Signage (Katy Lane)	Short-Term
16	Dashed Pavement Markings (Between Mary Lane and Floresta Lane)	Immediate
20	Trail Crossing ('S' Curve Between Floresta Lane and Germania Road)	Short-Term
Low Priority Suggested Improvements		
12	Curb (Packer Drive)	Short-Term
15	Intersection Nighttime Visibility (Barth Road)	Immediate/Mid-Term
22	Pavement Repair (Germania Road)	Short-Term

Appendix A: Crash Diagram Maps

SITE: VIMY RIDGE RD

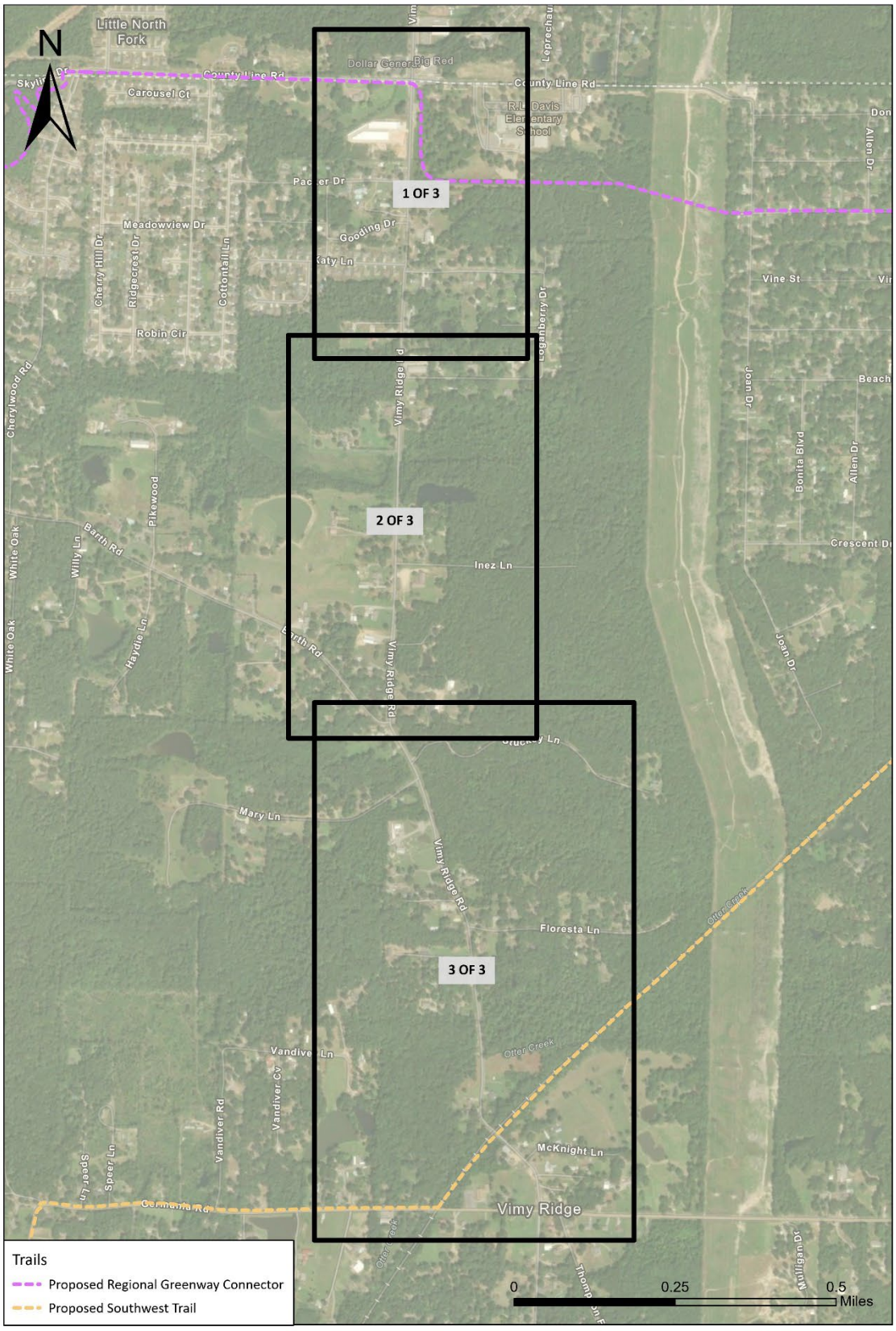
Pleasant Hill Rd/County Line Rd to Germania Rd (1.8 Miles)

2019 - 2023 Crash Data: 3 KA Crash Count (31 Total Crash Count)

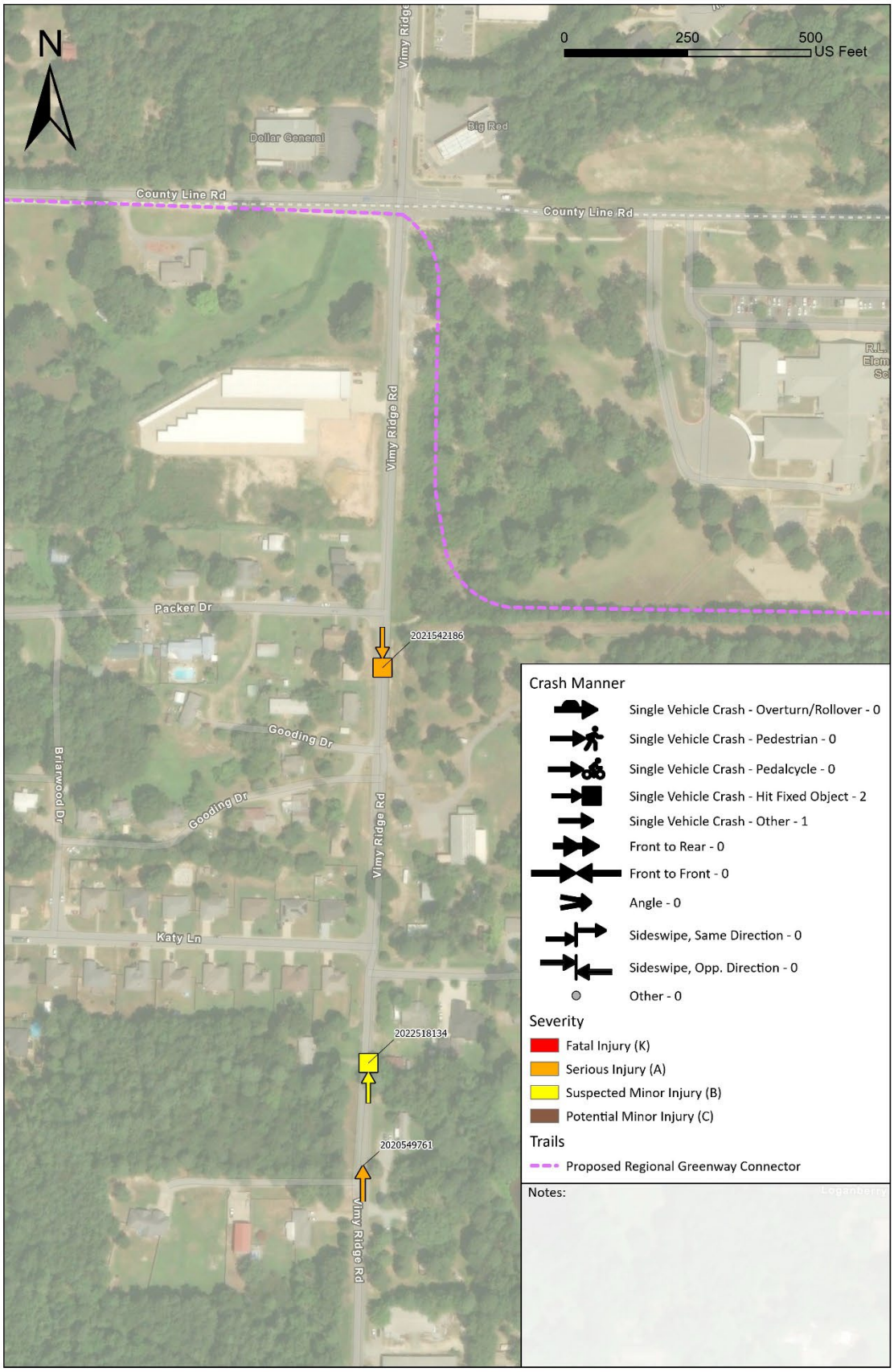
SITE: VIMY RIDGE RD

Pleasant Hill Rd/County Line Rd to Germania Rd (1.8 Miles)

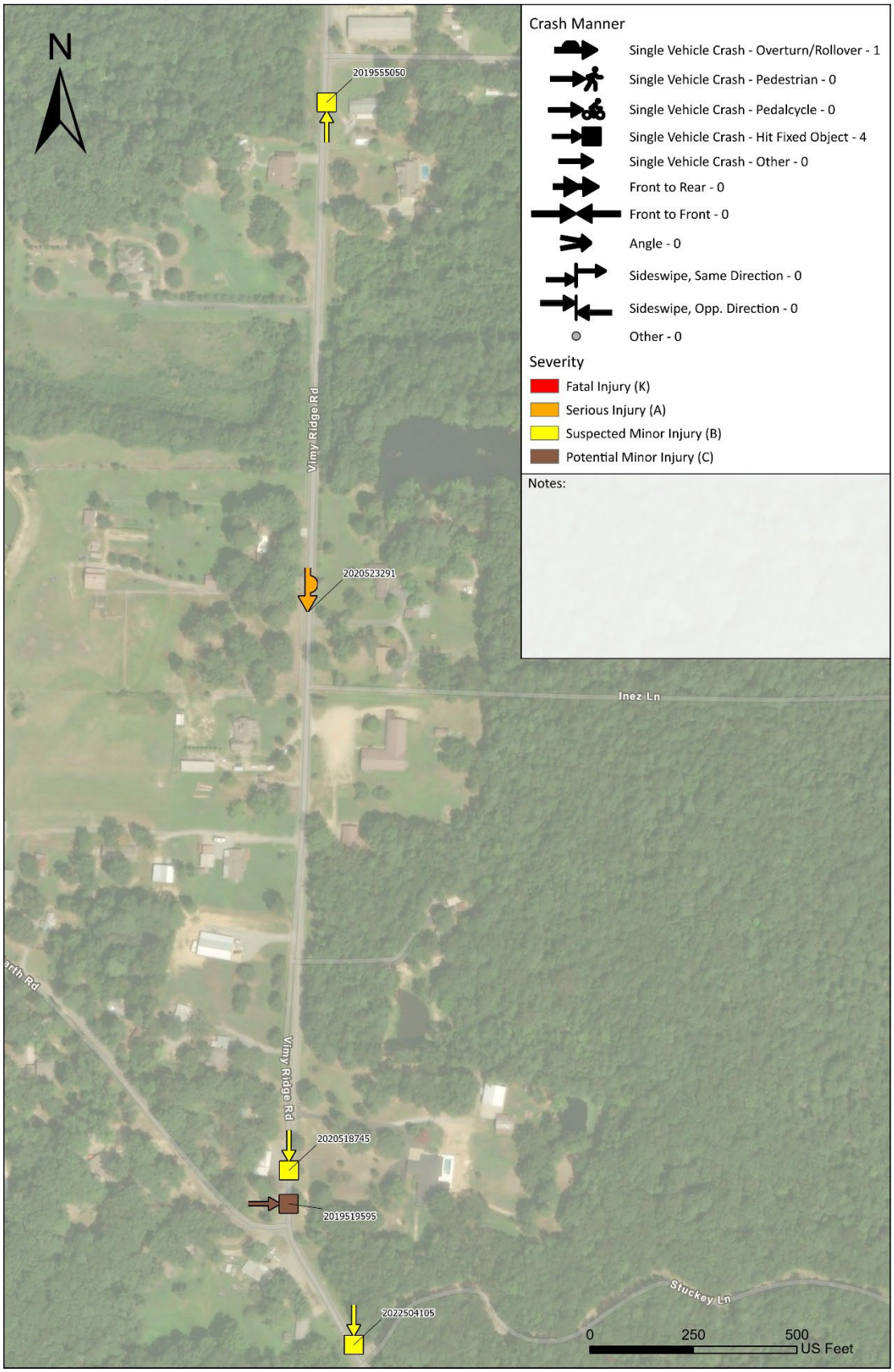
2019 - 2023 Crash Data: 3 KA Crash Count (13 Total Crash Count)



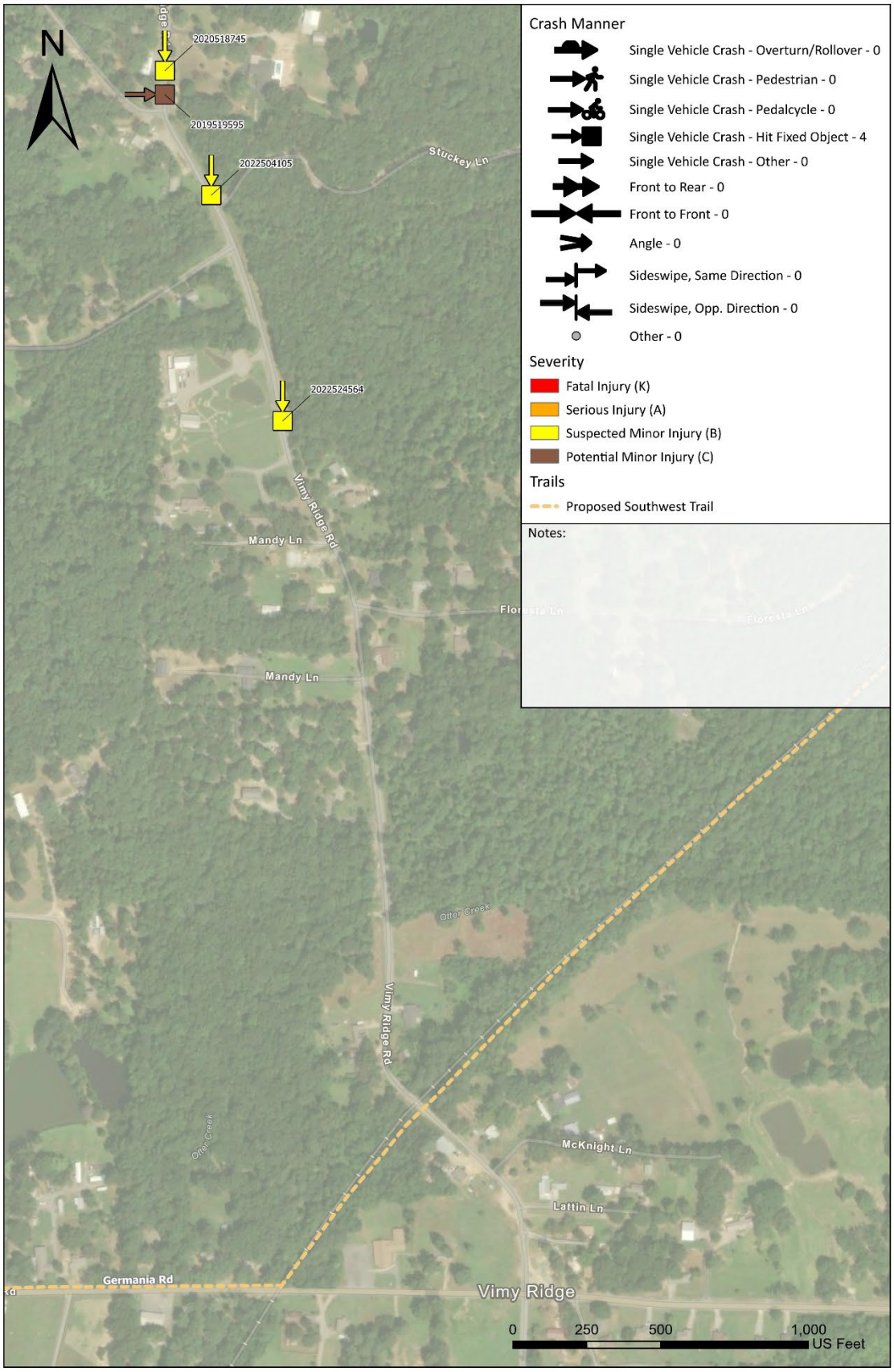
SITE: VIMY RIDGE RD (1 OF 3)



SITE: VIMY RIDGE RD (2 OF 3)



SITE: VIMY RIDGE RD (3 OF 3)



VIMY RIDGE ROAD

SUMMARY TABLE

2019-2023 Crash Data: 3 KA Crash Count (31 Total Crash Count)

Crash Severity	Crash Manner	Lighting Condition	Surface Condition
(K) FATAL INJURY - 0	SINGLE VEHICLE CRASH - 3 (19)	DAYLIGHT - 2 (20)	DRY - 3 (22)
(A) SUSPECTED SERIOUS INJURY - 3	FRONT-TO-REAR - 0 (5)	DAWN - 0 (1)	WET/WATER - 0 (8)
(B) SUSPECTED MINOR INJURY - (5)	FRONT-TO-FRONT - 0 (1)	DUSK - 0 (0)	SNOW - 0 (1)
(C) POTENTIAL MINOR INJURY - (1)	ANGLE - 0 (4)	DARK - LIGHTED - 0 (2)	SLUSH - 0 (0)
(O) NO APPARENT INJURY - (22)	SIDESWIPE, SAME DIRECTION - 0 (2)	DARK - NOT LIGHTED - 1 (7)	ICE/FROST - 0 (0)
	SIDESWIPE, OPP. DIRECTION - 0 (0)	DARK - OTHER/UNKNOWN - 0 (1)	UNKNOWN - 0 (0)
	OTHER - 0 (0)		

KABC Crash Detail Table

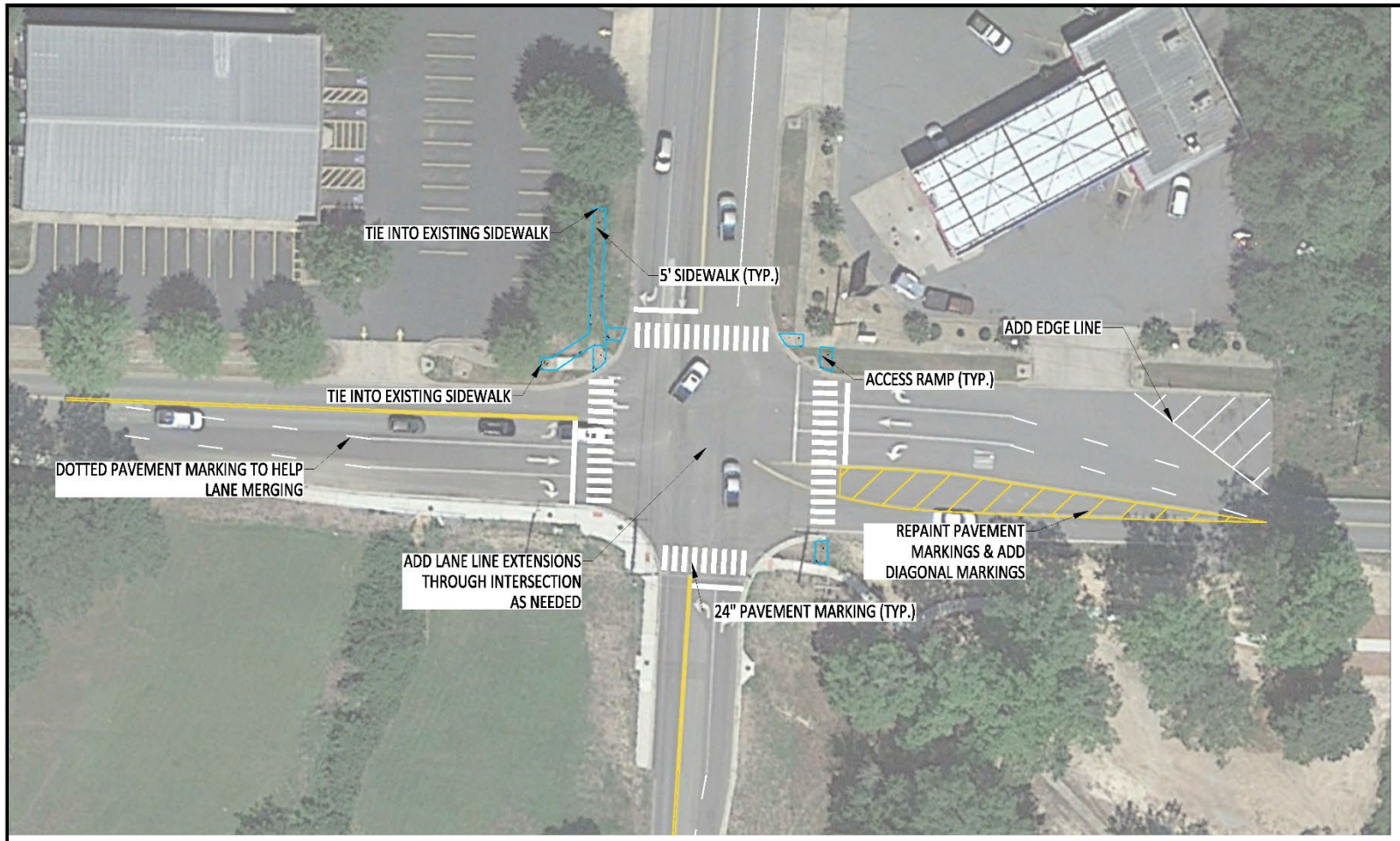
State Case Number	Crash Date	Crash Day	Crash Time*	Crash Severity	Crash Manner	Lighting Condion	Surface Condition
2019519595	2019-04-24	WED	12:33	POTENTIAL MINOR INJURY	SINGLE VEHICLE CRASH - COLLISION WITH UTILITY POLE/LIGHT SUPPORT	DAYLIGHT	DRY
2019555050	2019-10-26	SAT	06:20	SUSPECTED MINOR INJURY	SINGLE VEHICLE CRASH - COLLISION WITH FENCE	DARK - NOT LIGHTED	WET
2020518745	2020-04-23	THU	00:41	SUSPECTED MINOR INJURY	SINGLE VEHICLE CRASH - COLLISION WITH UTILITY POLE/LIGHT SUPPORT	DARK - NOT LIGHTED	WET
2020523291	2020-05-21	THU	14:08	SUSPECTED SERIOUS INJURY	SINGLE VEHICLE CRASH - OVERTURN/ROLLOVER	DAYLIGHT	DRY
2020549761	2020-10-03	SAT	02:10	SUSPECTED SERIOUS INJURY	SINGLE VEHICLE CRASH - FELL/JUMPED FROM VEHICLE	DARK - NOT LIGHTED	DRY
2021542186	2021-07-15	THU	15:31	SUSPECTED SERIOUS INJURY	SINGLE VEHICLE CRASH - COLLISION WITH DITCH	DAYLIGHT	DRY
2022504105	2022-01-22	SAT	03:00	SUSPECTED MINOR INJURY	SINGLE VEHICLE CRASH - COLLISION WITH TREE	DARK - UNK. LIGHTING	DRY
2022518134	2022-03-31	THU	08:06	SUSPECTED MINOR INJURY	SINGLE VEHICLE CRASH - COLLISION WITH DITCH	DAYLIGHT	DRY
2022524564	2022-04-28	THU	16:40	SUSPECTED MINOR INJURY	SINGLE VEHICLE CRASH - COLLISION WITH DITCH	DAYLIGHT	DRY

**Note that some crashes were reported in military time and some crashes were reported using a 12-hour clock system without indicating AM or PM. Therefore, crashes with a time reported as 1300 and later can be assumed to be PM, but crashes with a time reported as earlier than 1300 may have occurred in the AM or PM. Please utilize the date and lighting condition columns to help determine if the crash occurred in the AM or PM.*

Appendix B: Unit Costs

Item	Unit Cost	Unit	Notes
Add High Visibility Crosswalk Pavement Markings	$3,000	Per Crossing	
Add/Improve Pavement Markings	$930	Per Approach Lane	
Convert 4-inch Striping to 6-inch Striping (2 lane)	$18,500	Per Mile (Full Road Width)	This cost estimate assumes two edge lines and centerline.
Add/Restripe Stop Bars	$230	Per Approach lane	
Add In-Lane Pavement Marking	$390	Per Marking	This cost estimate may be used for "STOP AHEAD", share the road symbol, or lane use arrow in-lane pavement markings.
Add Raised Reflective Pavement Markers Along Centerline	$260	Per Mile	This cost estimate assumes the pavement markers are not for a two way left-turn lane but rather for a single yellow centerline stripe.
Enhance Curve Delineation	$750	Per 100-Feet of Curve	
Add Reflective Object Markers (small for mailboxes/poles)	$40	Per Marker	
Add Reflective Object Markers (large for culverts)	$150	Per Marker	
Install Standard Sign	$470	Per Sign	This cost estimate includes signs such as no parking signs, warning signs, or speed limit signs.
Replace/Relocate Standard Sign	$900	Per Sign	This cost estimate includes signs such as no parking signs, warning signs, or speed limit signs.
Add Reflective Tape on Sign Post	$60	Per Sign	
Add Plaque Under Sign	$40	Per Plaque	An example of this is the "ALL-WAY" plaque used in conjunction with stop signs.
Add Advance Warning Signage (with Flashing Beacon)	$20,000	Per Approach	This cost estimate assumes two static signs with a flashing beacon on each sign.
Add Sidewalk	$700,000	Per Mile (one side)	This cost estimate assumes the reconstruction of existing driveways but does not include costs for right-of-way acquisition, utility relocation, or site modifications.
Remove Sidewalk	$170	Per Square Yard	This cost estimate assumes backfilling and planting grass in the affected area, specifically as part of the recommended realignment of the sidewalk along South Donaghey Avenue to align with the RRFBs.
Convert Diagonal Ramps to Directional Ramps	$30,000	Per Corner	This cost estimate assumes converting a single ramp into two directional ramps.
Add Rectangular Rapid Flashing Beacon (RRFB)	$30,000	Per Crossing	This cost estimate assumes the installation of three RRFB assemblies.
Pavement Repair	$290	Per Square Yard	
Add/Replace Guardrail	$90	Per Foot	
Construct Raised Concrete Median	$270	Square Yard	
Construct Curb and Gutter	$2,500,000	Per Mile	This cost estimate assumes adding underground drainage and asphalt overlay.
Add 4' Shoulder	$190,000	Per Mile	
Add Intersection Lighting	$47,000	Per Intersection	This cost estimate assumes the use of two existing utility poles for intersection lighting.
Add Corridor Lighting	$375,000	Per Mile	This cost estimate assumes the installation of new poles spaced every 200 feet.
Intersection Control Evaluation	$32,100	Each	

Appendix C: Conceptual Layouts



REFERENCE NOTES SCHEDULE VIMY RIDGE & COUNTY

SYMBOL	CODE	DESCRIPTION	QTY
03 CONCRETE			
	03-01	SIDEWALK	410 SF
	03-02	ADA RAMP	211 SF

GENERAL NOTES:
-ALL PAVEMENT MARKINGS TO BE REPAINTED
-DOUBLE POST OVERSIZED STOP SIGNS FOR THE EAST AND WESTBOUND APPROACHES OF COUNTY LINE RD
-DOUBLE POST STOP SIGNS AT VIMY RIDGE APPROACHES
-ADD "ALL WAY" PLAQUES UNDER ALL THE STOP SIGNS
-ADD REFLECTIVE RED TAPE TO STOP SIGN POSTS
-REPLACE LANE ASSIGNMENT SIGN FOR NORTHBOUND APPROACH
-RE-STRIPE ALL PAVEMENT MARKING AT ALL APPROACHES TO THE INTERSECTION

NORTH

0 20 40 80 feet
SCALE: 1" = 20'

Crafton Tull

VIMY RIDGE RD & COUNTY LINE RD

L3.01

Conceptual Layout of Suggested Improvements No. 6 and No. 7 at Vimy Ridge Road and County Line Road/Pleasant Hill Road