



SOUTH JEFFERSON COUNTY TRAFFIC STUDY REPORT

Project No: 23005

Prepared For:

Idaho Transportation Department District 6
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ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADTV	Average Daily Traffic Volumes
BL	Business Loop
CMF	Crash Modification Factor
CRF	Crash Reduction Factor
DDI	Diverging Diamond Interchange
FHWA	Federal Highway Administration
I-15	Interstate 15
ITD	Idaho Transportation Department
ITE	Institute of Transportation Engineers
LOS	Level of Service
MEV	Million Entering Vehicles
MVMT	Million Vehicle Miles Traveled
PDM	Property Damage
ROW	Right of Way
SH-48	State Highway 48
SPUI	Single Point Urban Interchange
TAZ	Traffic Analysis Zone
TDM	Travel Demand Model
TWLTL	Two-way Left-turn Lane
US-19	U.S. Highway 19
US-20	U.S. Highway 20
US-26	U.S. Highway 26
US-191	U.S. Highway 191
V/C	Volume-to-Capacity

EXECUTIVE SUMMARY

The Idaho Transportation Department's (ITD) South Jefferson County Traffic Study Report analyzes and evaluates a list of potential projects to mitigate congestion and improve safety in the south Jefferson County area.

KEY FINDINGS

High-impact locations that are experiencing high congestion or an above-normal range of crashes were identified within south Jefferson County. These locations are identified as the following:

- County Line Road from 3700 E to Yellowstone Highway
- 3800 E from County Line Road to 200 N
- State Highway 48 (SH-48) from 3rd Street to 4000 E
- US-20 from exit County Line Road (318) to Exit North Rigby (322)

The locations impacted were then closely evaluated and potential projects were proposed to either mitigate congestion or improve safety, with most projects successfully addressing both issues. Potential projects were modeled with high-end modeling programs to determine right of way (ROW) impacts as well as estimated costs.

A Travel Demand Model (TDM) of the study area was created using the Annual Average Daily Traffic (AADT) volumes. The base year was established as 2025, and the model was then projected to the year 2050. This included historical regional growth and additional traffic volumes added by known large-scale developments.

Potential projects were then analyzed to determine the impact of the project on the high impact locations. The largest improvement to congestion occurred when there was the implementation of an interchange in middle of the US-20 corridor (200 N), and was paired with widening county line to a 5 lane section with double-lane roundabouts with a signal at the eastbound on/off ramp intersection.

1 INTRODUCTION

1.1 BACKGROUND

Irrigation infrastructure, regional transportation corridors, and proximity to larger urban centers shape the southern portion of Jefferson County. Located in the Upper Snake River Plain of eastern Idaho, this region historically supports a strong agricultural economy.

Stagecoach routes, the main form of transportation, initially supported regional settlement in the mid-1880s. Market Lake (Roberts), Menan, Lewisville, and Rigby were some of the earliest communities to develop by the late 1880s.

A defining characteristic of development in south Jefferson County was the construction of the extensive canal systems that drew water from the Snake River. These canal systems enabled large-scale agricultural production and established the region's long-term use of farmland. To this day, agriculture remains a foundational economic driver of Jefferson County.

Rigby, located in the southern section of the county, holds the primary population of Jefferson County. Two historic highway routes crossed paths in Rigby: State Highway 48 (SH-48), carrying east-west traffic, and U.S. Highway 191 (US-191), known as Yellowstone Highway and carrying north-south traffic. This configuration supported local economies, since through traffic contributed to commercial visibility and access within town centers. However, as traffic volumes increased between Idaho Falls and Rexburg, the limitation of routing high-speed traffic through local street networks became a congestion and safety concern.

U.S. Highway 20 (US-20), a divided highway, replaced the U.S. Highway 191 (US-191) route to address the growing regional mobility demands. This replacement improved safety and increased traffic capacity but created an access barrier of local traffic from east to west through Jefferson County. This limited the crossing opportunities to SH-48 and the two interchanges: County Line Road and north Rigby. South Jefferson County's location between Idaho Falls and Rexburg, two major cities, has shifted local traffic patterns from local roads to commuter traffic. Idaho Falls developed into a major employment and commercial hub for the area, and Rexburg houses BYU-I, a large educational institution that has seen a large increase in attendance in recent years. Neighboring cities' residential development growth has contributed to increased pressure within south Jefferson County. Traffic patterns transition from agriculturally based to rural residential/commuter-based is a direct result of this growth.

South Jefferson County has evolved from a transportation- and irrigation-driven agricultural region into a growing rural-residential area influenced by neighboring regional urban centers. Foundational infrastructure systems, such as canals, railroads, and highways, remain fundamental to the region's identity and function. They also present ongoing challenges that

must be addressed through thoughtful planning and design to support future development while maintaining safe and efficient transportation networks.

The Idaho Transportation Department (ITD) initiated this traffic study to address this area's growing congestion and increased crashes, anticipating a drastic influx of traffic over the next coming years with new residential and commercial development.

1.2 STUDY OBJECTIVES

This traffic study evaluates the existing roadway infrastructures' traffic congestion and safety, identifying high-impact locations that are below acceptable congestion and safety levels. Potential projects were created with community stakeholders to address either traffic safety or congestion concerns. Once each alternative was analyzed, the potential projects were then assessed in order of highest positive impact in reducing congestion. This report presents the findings of that evaluation.

1.3 STUDY AREA

The study area is as follows: The North border is 500 N and goes as far south as County Line Road. The west border is 3400 E and goes as far east as 4700 E (see Figure 1). Each yellow circle on the map indicates where field data was collected for this study.



Figure 1: Traffic Study Area

2 EXISTING CONDITIONS

2.1 ROADWAY NETWORK

Existing roadway geometrics were reviewed using ITD roadway inventory data, aerial imagery, and field observations. The roadway geometric in the study area is predominantly two-lane, undivided rural highways, with turn lanes at various intersections. The US-20 highway runs through the study area as a four-lane divided highway. There are four crossings on the highway:

- SH-48, which has no access to US-20.
- One half interchange (South Rigby), with one on-ramp for westbound and one off-ramp for eastbound but no local access crossing the highway.
- Two full interchanges (Bonneville County Line and North Rigby).

2.2 TRAFFIC VOLUMES

Traffic volumes were obtained from existing data procured from traffic cameras at 26 different intersections, tracking peak hour volumes and turning movement counts. Intersection locations are shown in Figure 2. Horrocks also utilized ITD's Annual Average Daily Traffic (AADT) website to characterize daily demands on local/regional roads. AM Peak traffic volumes were from 7:00 a.m. to 9:00 a.m., and PM Peak traffic volumes were from 4:00 p.m. to 6:00 p.m. Existing traffic data is included in Appendix A.

The data of the existing roadway network and the AADT volumes create an average daily traffic Travel Demand Model (TDM) as a base year for 2025. The results of the 2025 TDM are detailed in Figure 2.



2.3 CRASH DATA

Crash data for the study area was collected from Webcars (a Web Crash Analysis Reporting System from ITD) between the dates of January 1, 2020, through December 31, 2024. The crash data was used to identify segment crash rates, severity trends, and predominant crash types.

The crash rate of each AADT segment was calculated using this crash data and AADT data available from the ITD website. This information was then analyzed against the average crash rate for Idaho roads. The average rates were found in the Idaho Traffic Crash 2024 Report produced by the Office of Highway Safety. **Error! Reference source not found.** shows the different segments' crash rates and whether they are experiencing above or below the average for the roadway type. Roadways that did not have a known AADT from ITD's website did not have a crash rate calculated.

Crash rates are a measure of the number of crashes in relationship to the amount of traffic volume served. Segment crash rates are calculated as the number of crashes per million vehicle miles traveled. The calculation for segment crash rate is below:

$$R = \frac{100,000,000 \times C}{365 \times N \times V \times L}$$

R = Crash rate for the road segment expressed as crashes per million entering vehicles (MEV)

C = Total number of intersection crashes in the study period

N = Number of years of data

V = Number of vehicles per day (both directions)

L = Length of roadway segment in miles

SH-48 roadway sections were compared to the total crash rate for state highways in Idaho (139.5 100 million vehicle miles traveled [MVMT]), and all other local roads in the study area were compared to the total crash rate for local roads (179.2 100MVMT). In Figure 3, the segments that are green are below the respective roadway's average, and if it is red, it is above the respective roadway's average.

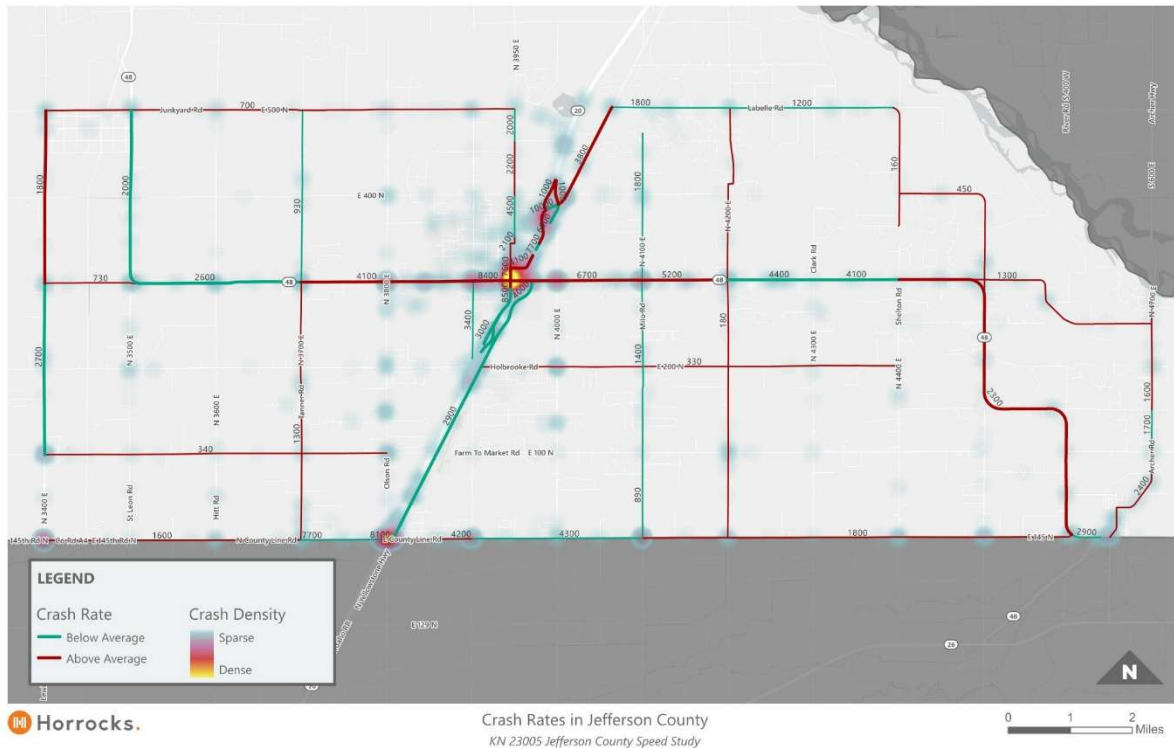


Figure 3: Crash Rates

The crash data was also used to analyze severity trends. The number of fatal, injury, and property damage (PDM) crashes is consistent with the average amount of crashes occurring in the state. The average was derived from the Idaho Traffic Crash 2024 Report produced by the Office of Highway Safety. Crashes are categorized into five different levels of severity: Fatal, Injury A, Injury B, Injury C, and PDM.

Fatal crashes occur when the most severe harm to at least one person from the crash is death. Injury A crashes occur when the most severe harm to any one person is a serious injury. Injury B crashes occur when the most severe harm to any one person is a minor injury. Injury C crashes occur when the most severe harm to any one person is suspected of having an injury. A crash classified as PDM is documented when damage over \$1,500 is the result of the crash but no individuals were injured in the event. Figure 4 shows the study area's percentage of crash severity type, and Figure 5 shows the state of Idaho's percentage of crash severity occurrence. The study area and the state experience a similar trend of collisions, as the percentages of the types of crash severity are distributed similarly.

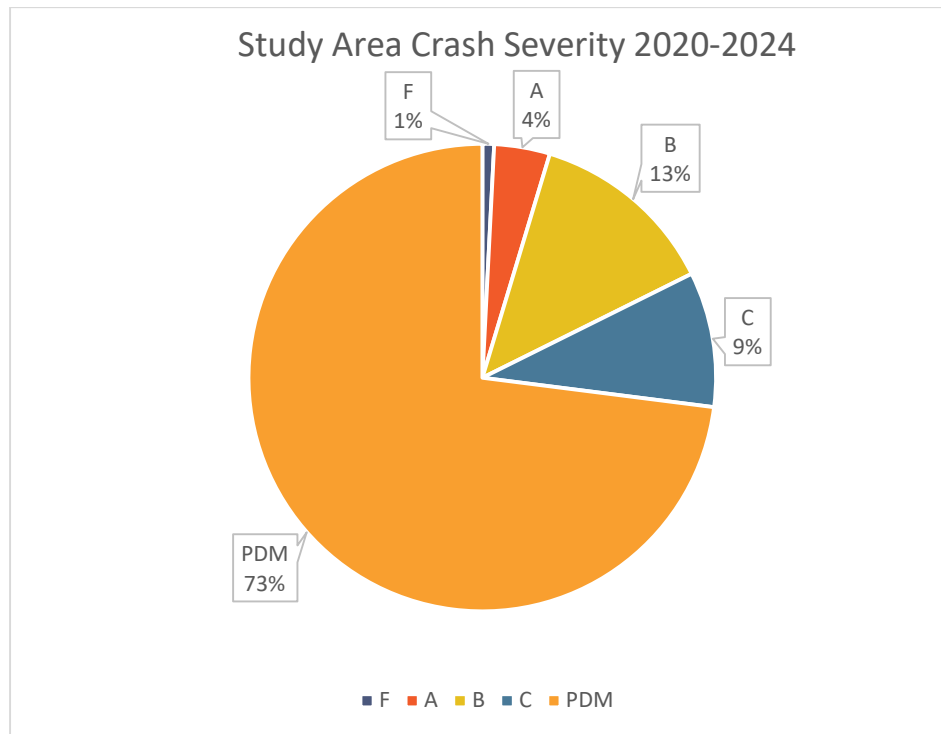


Figure 4: Study Area Crash Severity 2020–2024

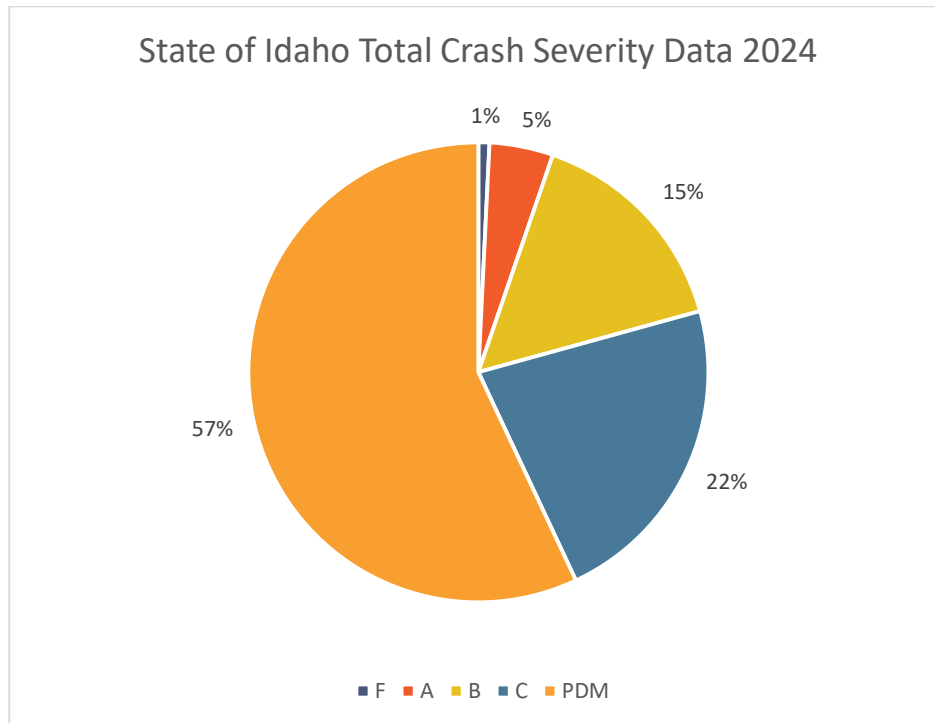


Figure 5: State of Idaho Total Crash Severity Data 2024

All crashes should be evaluated to determine if there is a way to improve safety for the roadway system, but fatal and injury crashes have the largest impact to communities. Each crash severity category was looked at individually to determine if there is a pattern that can be determined and addressed in the study area. Table 1 shows the number of crash types in each severity category for the study area.

Table 1: Number of Crash Types Occurring in Each Severity Category

Crash Type	Severity Category				
	Fatal	Injury A	Injury B	Injury C	PDM
Angle	2	14	47	40	270
Hit Object	-	11	23	24	219
Overtake	1	9	21	15	56
Rear-End	-	2	25	15	125
Head-On	2	2	14	4	37
Pedestal/Pedestrian	2	2	4	-	-
Immersion	2	-	-	1	4
Animal	-	2	3	2	77
Equipment Failure	-	-	1	1	9

It is important to note that between the different types of crashes, angle crashes are the highest number in each severity category. This shows that most crashes, and, most importantly, most severe crashes, are caused by angle crashes. These types of collisions occur at access points or intersections due to the driver improperly navigating a safe gap and not having a clear line of sight to properly navigate the roadway. Angle crashes reported from Webcars cover a large plethora of subcategories: Angle, Angle Turning, Same Direction Turning, Side Swipe Same, and Side Swipe Opposite.

The data above indicates that the study area is experiencing a nontypical pattern of crash types, as the most common type of crashes in all severities are angle crashes. You typically see a variety of crash types depending on the severity of the crash. The high number of angle crashes in the study area is due to unmanaged access control without the implementation of turn lanes. Future evaluation of access control needs to be applied, then monitored, to see if any positive improvements are made.

2.4 MULTIMODAL CONDITIONS

Multimodal evaluation was not performed as a part of this study. As the area develops with more residential and commercial buildout, an analysis for a potential multimodal connective path would be beneficial to the community.

The TDM for the overall study area was created using software called CUBE. Traffic volumes for 2025 were gathered from the ITD website as well as the AADT. Land use in the study area was gathered from Jefferson County's zoning map. Existing roadway geometry was gathered from Google Earth, and specific areas were verified in person. The results of the existing 2025 base year are shown in Figure 6.

The V/C ratio from the AADT TDM for 2025 on SH-48 between Yellowstone Highway and State Street sits between 0.8-0.9. County Line Road from Yellowstone Highway to 3800 E experiences a V/C ratio of over 1.0. This indicates a greater demand for space in this roadway section than available space for cars to navigate.

traffic flow makes the operational flow of the intersections unideal which causes major congestion issues and regular crashes in this 0.14-mile section of County Line Road.

Other intersections brought up by stakeholders as either deficient in safety or having unideal geometric issues are the following intersections: Yellowstone Highway and SH-48, SH-48 and 4100 E, SH-48 and US-26 Business Loop (BL), and US-26 BL and Main Street. These intersections did not experience crash rates that were above normal in the timeframe studied. Intersections experiencing geometric concerns should be looked at for improvements as funding becomes available.

4 FUTURE CONDITIONS

4.1 GROWTH ASSUMPTIONS

After the existing base year TDM was established for 2025, the model file was copied and then projected to the year 2050. The following compound annual growth rate of 2.041% was applied to the Traffic Analysis Zone (TAZ) population category. This growth rate was calculated based on historic census data for the study area. The compound growth rate of 1.5% was applied to the TAZ employment category. Once the growth rates were applied to all TAZs, the team reviewed the existing infrastructure in each TAZ to determine if the growth rate was appropriately applied due to areas being fully built out or adjusted based on land zoning. The full build out of all anticipated developments in the study area was also implemented into their appropriate TAZs.

Once the forecasted TAZs were established, the TDM was rerun for the year 2050. A model was created where all future anticipated traffic was operating as if they were on roadway infrastructure as they existed in the 2025 model. This is referred to as the No Build model. The output is referred to as the 2050 No Build.

4.2 FUTURE OPERATIONS

The results of the 2050 TDM are shown in Figure 7. Areas that were beginning to experience minor congestion in the year 2025 were projected to experience a V/C well over 1.0. The section of County Line Road from Yellowstone Highway to just east of 3800 E holds more demand than capacity allows, as does SH-48 from State Street to Yellowstone Highway. This indicated a high probability of standstill traffic, and surrounding areas (indicated in red) have a V/C of 0.9-1.0, which is near capacity.



Areas of heavy congestion also have a high correlation to a high frequency in vehicle collisions. The data shows that as Annual Average Daily Traffic (AADT) increases, crash frequencies will also rise, particularly in locations where congestion and conflicting vehicle movements occur. Intersections and segments with high-density traffic and more turning movements have a higher collision rate. If no infrastructure improvements are implemented, this area will continue to see a steady rise of crashes as congestion increases.

An initial stakeholder meeting was held on November 19, 2025, as soon as the base year TDM was created and the collision data analyzed. Agencies such as Jefferson County, Bonneville County, ITD, City of Ririe, City of Rigby, and known land developers were participants in this meeting. The background information of the TDM and crash data was presented and then the stakeholders collaborated to identify high-impact areas and propose potential projects that may address either congestion or safety concerns. The information from this meeting was evaluated and condensed by the study team, consisting of ITD and Horrocks, to evaluate the potential impact to congestion, right of way (ROW) impact, estimated cost, and crash reduction factor (CRF).

Each potential project was implemented into the 2050 TDM model and then rerun to gather the results and impact that the project had. The results of each project were then compared to the No Build model results.

The potential projects were modeled in ConceptStation, a high-end modeling program. This model was then used to establish ROW impacts that the potential project may cause as well as estimated quantities to determine an estimated cost.

Each potential project was researched based on the Crash Modification Factor Clearinghouse database that is provided by Federal Highway Administration (FHWA). If a similar project was in the database, the CRF was evaluated to see if similar historical project has had an increase or decrease to the occurrence of crashes. There are some projects in this study that will not have a CRF due to no previous recorded studies being documented in this database.

5.1.1 County Line Road – Widen to Five Lanes from Yellowstone Highway to 3700 E

County Line Road was identified as a high-impact area early in the study. The roadway section has many constraints and challenges. County Line Road is currently experiencing heavy congestion and above-average collision rates in the area, particularly near the US-20 interchange. The 0.14-mile section that is experiencing a V/C ratio above 1.0 has four intersections, one railroad crossing, and three different canals that parallel the roadways.

As shown in Figure 8, County Line Road also has jurisdiction challenges; the road gets its name because it runs along the county line between Jefferson County and Bonneville County. It also crosses into ITD jurisdiction at the County Line Road interchange. County Line Road is currently a two-lane rural roadway, with most of it measuring approximately 28 feet to 30 feet wide, and the only left turn lanes on the 15-mile roadway are the ones located at the US-20 on-ramps. The roadway also parallels the Harrison Canal for 11.5 miles. Two fatal crashes on the County Line Road section in the study area occurred because of immersion in this canal.

This route is heavily used by local and regional traffic. County Line Road connects U.S. Highway 26 (US-26), US-20, and Interstate 15 (I-15), as shown in Figure 9. Despite the road's configuration deficiencies, County Line Road provides the most direct route between all these major freeways, attracting lots of familiar and new travelers along the road.

As part of this study, Horrocks evaluated the impacts a project would have if County Line Road was widened from two lanes to five lanes. These five lanes would consist of two lanes in each direction to address the congestion and a center turn lane to improve safety. This five-lane configuration was evaluated from Yellowstone Highway to 3700 E, where heavy congestion occurs as shown in both the 2025 TDM and 2050 TDM. The alternative included the reroute of 3800 E moving farther west away from the US-20 westbound on- and off-ramps. 3800 E would

be moved a minimum of 600 feet away from the US-20 ramps. Figure 10 shows what a possible layout of this configuration would look like.

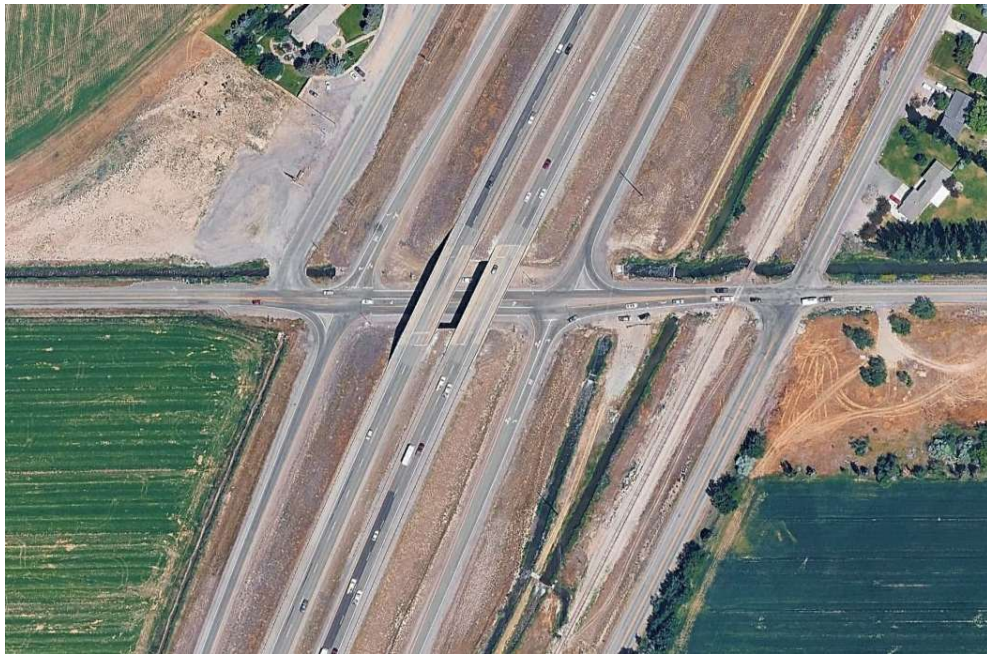


Figure 8: Existing County Line Road High-Impact Location

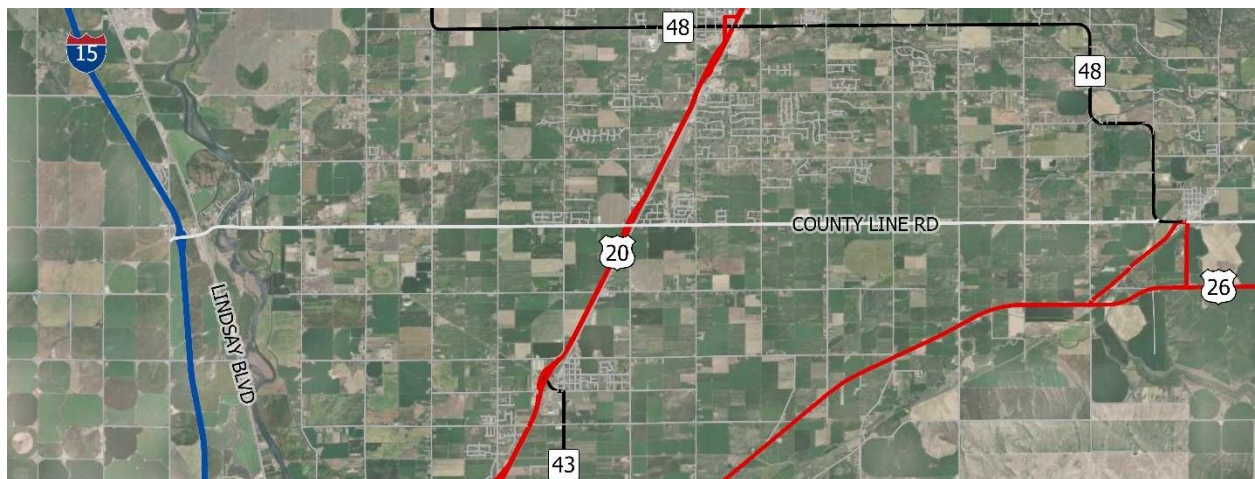


Figure 9: County Line Road Regional Layout

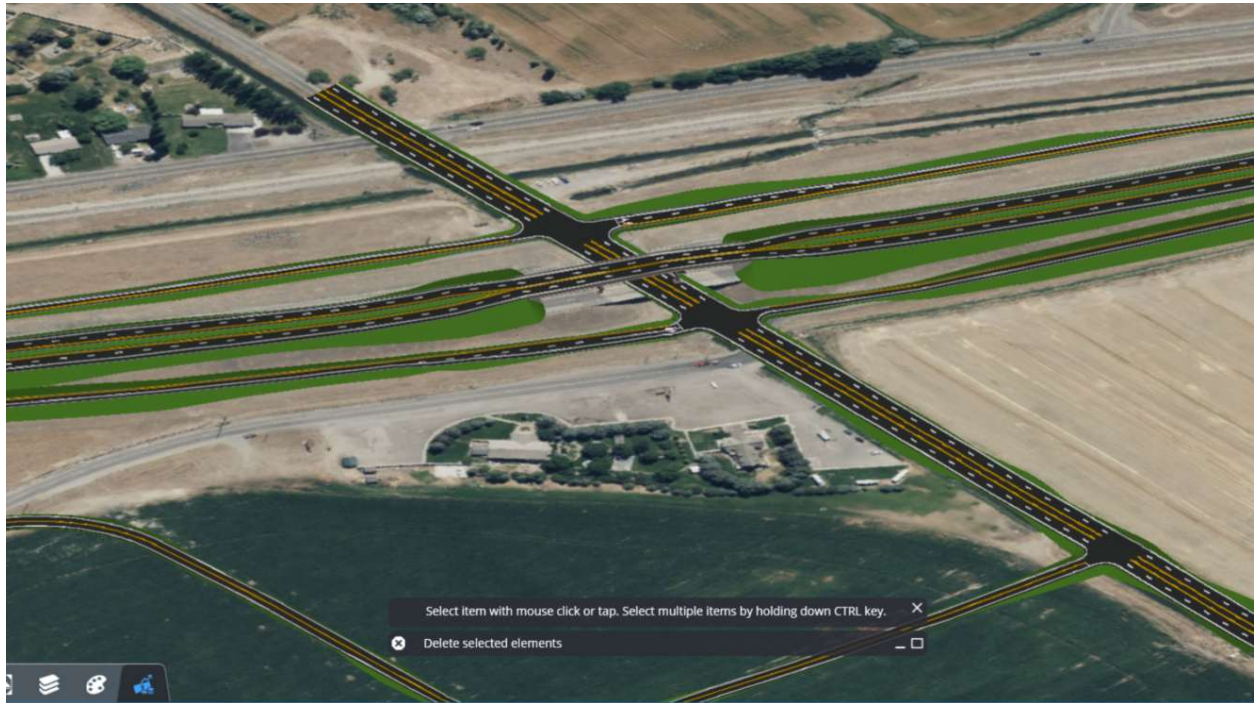


Figure 10: County Line Road – Widen to Five Lanes From Yellowstone Highway to 3700 E With 3800 E Rerouted

When this potential project was implemented into the 2050 TDM, parts of County Line Road's V/C ratio decreased, but the section directly under the interchange still experienced a V/C over 1.0. This potential project also increased congestion on the US-20 westbound off-ramp but decreased congestion on SH-48. Figure 11 shows the No Build TDM results vs. this potential project TDM results.

The ROW required for the project would impact an anticipated 4.4 acres and seven parcels. A project cost estimate of 11.3 million dollars includes the cost of purchasing the ROW for the project.

This project would have an estimated CRF of 54%. This comes from two different countermeasures that were then multiplied together to create a combined treatment CRF. The first Crash Modification Factor (CMF) is Countermeasure ID:7569 Convert a two-lane roadway to a four-lane divided roadway. The CMF from this study is 0.712. The second CMF is Countermeasure ID: 583 Introduce two-way left-turn lane (TWLTL) on two rural lanes roads. The CMF from this study is 0.64. The two countermeasures multiplied together are 0.455. The CMF is the factor in the number of crashes left after the countermeasure is implemented. The CRF is 1-CMF. The CRF of these two countermeasures is 0.544 (54%). With this potential project, Horrocks anticipates seeing a 50% decrease in crashes.



Figure 11. 2050 No Build TDM vs. County Line Road Widening TDM

Table 2: County Line Road Widening Summary

Potential Project	TDM V/C Results		ROW Impact	Project Cost Estimate	Crash Reduction
Widen County Line Road to Five Lanes from Yellowstone Hwy to 3700 E	SH-48 US-20 County Line Rd	1.0+ → 0.8-0.9 0.9-1.0 → 1.0+ 1.0+ → 1.0+	4.4 Acres 7 Parcels	\$11.3M	54%

5.1.2 SH-48 – Widen to Five Lanes from 3600 E to 4200 E

Another high-impact area identified in the preliminary stages of this study is SH-48. This route is in the jurisdiction of ITD. It diagonally crosses through Jefferson County and runs east-west through the City of Rigby. There is no direct access to US-20 from this route, but it intersects the US-20 BL that runs north-south through the city. A majority of this road is a two-lane rural roadway with turn bays at major intersections throughout the corridor. This roadway also hosts six different schools, five of which are within the study area, that directly access this route. Most of these schools are located on the west side of US-20, while most of the residential development has occurred to the east side of US-20. SH-48 is the only midpoint crossing of US-20 in the study area.

The highest point of congestion occurs from 3900 E to 4000 E. This potential project was evaluated with the five-lane widening occurring from 3600 E to 4200 E. This means that the

five-lane widening would extend from the farthest school west to the farthest school east on SH-48, allowing optimal freeflow movement for traffic and a continuous TWLTL providing safety for cars making left turns on or off the highway. Figure 12 shows the SH-48 high-impact area. Figure 13 shows a visual model of what the potential five-lane section would look like. The whole roadway section this would be applied to is not shown in Figure 13, only a portion of the roadway section is included to show the potential improvements.



Figure 12: SH-48 High-Impact Area



Figure 13: SH-48 – Widen to Five Lanes from 3600 E to 4200 E

When this potential project was implemented into the 2050 TDM, all SH-48 V/C ratio decreased to a value of less than 0.7. This potential project also increased congestion on the US-20 westbound off-ramp and had no impact on congestion on County Line Road. See Figure 14 for the No Build vs. the potential project.

This project would have an anticipated ROW impact of 110.1 acres, impacting 296 different parcels. The project cost estimate of 105.1 million dollars includes the cost of purchasing the ROW for the project. The need to widen the roadway footprint along urban sections of SH-48 greatly impacts the ROW.

This project would have an estimated CRF of 54%. This comes from two different countermeasures that were then multiplied together to create a combined treatment CRF. The first CMF is Countermeasure ID:7569 Convert two-lane roadway to four-lane divided roadway. The CMF from this study is 0.712. The second CMF is Countermeasure ID: 1285 Add two-way left-turn lane. The CMF from this study is 0.92. These two countermeasures multiplied together is 0.655. The CMF is the number of crashes left after the countermeasure is implemented. The CRF is 1-CMF. The CRF of these two countermeasures is 0.345 (35%). With this potential project, Horrocks anticipates seeing about a 35% decrease in crashes.



Figure 14: 2050 No Build TDM vs. SH-48 Widening TDM

Table 3: SH-48 Widening Summary

Potential Project	TDM V/C Results		ROW Impact	Project Cost Estimate	Crash Reduction
Widen SH-48 to Five Lanes from 3600 E to 4200 E	SH-48 US-20 County Line Rd	1.0+ → 0-0.7 0.9-1.0 → 1.0+ 1.0+ → 1.0+	110.1 Acres 296 Parcels	\$105.1M	54%

5.1.3 Overpass of 200 N Over US-20

Another idea proposed in the stakeholder meeting was a potential project that would connect 200 N on the east and west sides of US-20. The potential project's intent redirects traffic from County Line Road and SH-48 to another crossing point across US-20. The 200 N crossing could also connect the existing school infrastructures on the west side of US-20 to a future school facility on the east side of US-20.



Figure 15: 200 N Overpass Over US-20, Railroad Tracks, and Yellowstone Highway

When implemented into the 2050 TDM, the potential project decreased congestion on SH-48 to an ideal V/C, increased congestion on the US-20 westbound off-ramp, and decreased part of County Line Road's V/C ratio. However, the section under the interchange still experienced a V/C over 1.0. See Figure 16 shows the No Build TDM results vs. this potential project TDM results.

The project would have an anticipated ROW impact of 6.4 acres, impacting 23 different parcels. The project cost estimate of 26.5 million dollars includes the cost of purchasing the ROW for the project.

This project does not have an estimated CRF in the Clear House Database.



Table 4: 200 N Overpass Summary

Potential Project	TDM V/C Results		ROW Impact	Project Cost Estimate	Crash Reduction
200 N Overpass Over US-20	SH-48 US-20 County Line Rd	1.0+ → 0.7-0.8 0.9-1.0 → 1.0+ 1.0+ → 1.0+	6.4 Acres 23 Parcels	\$26.5M	None

5.1.4 Modify Half Interchange (Exit 320) to Full Interchange

The next proposed project was to modify the existing half interchange at Exit 320 to become a full interchange. The intent is to decrease congestion at the County Line Road interchange (Exit 318) and the North Rigby interchange (Exit 322) while providing an additional crossing point over US-20.



Figure 17: Modify Half Interchange (Exit 320) to Full Interchange

The potential project did not have a significant impact on the congestion on US-20, and the County Line Road V/C did see some decrease. However, the section directly below the interchange still experienced a V/C well over 1.0. Figure 18 shows the No Build TDM results vs. this potential project TDM results.

This project would have an anticipated ROW impact of 11.5 acres, impacting 26 different parcels. The project cost estimate of 32.8 million dollars includes the cost of purchasing the ROW for the project.

This project does not have an estimated CRF in the Clear House Database.

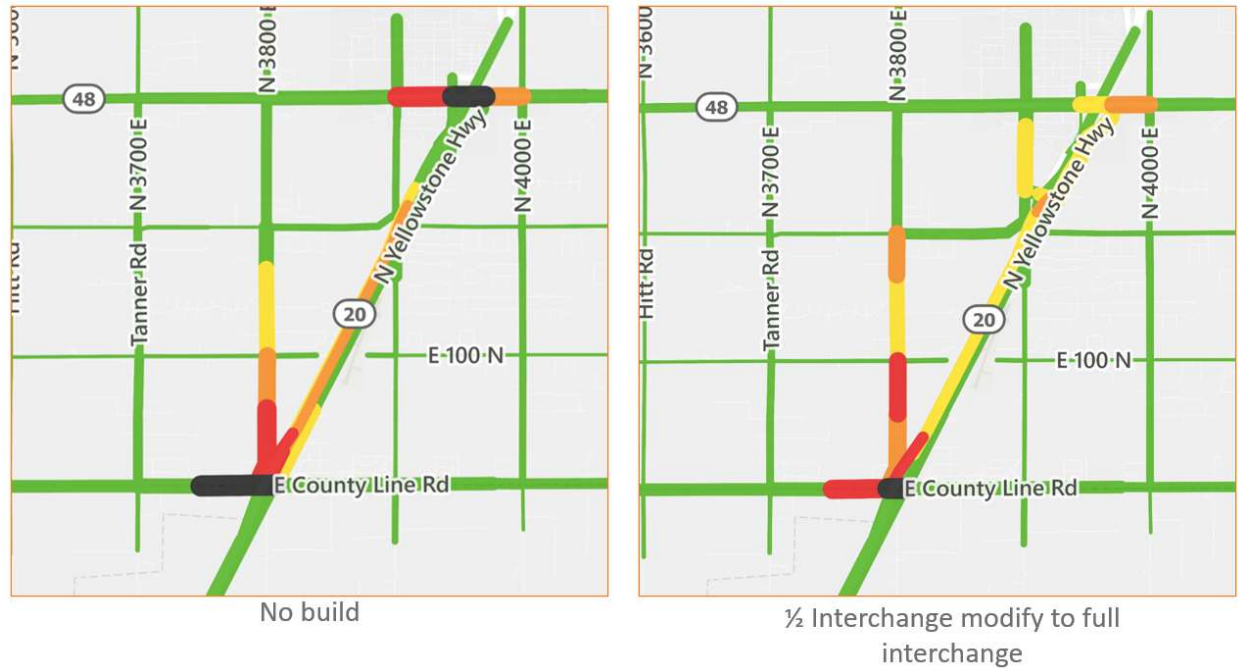


Figure 18: 2050 No Build TDM vs. Half Interchange Modified to Full Interchange TDM

Table 5: Modify Half Interchange (Exit 320) to Full Interchange Summary

Potential Project	TDM V/C Results		ROW Impact	Project Cost Estimate	Crash Reduction
Modify Half Interchange (Exit 320) to Full Interchange	SH-48 US-20 County Line Rd	1.0+ → 0.8-0.9 0.9-1.0 → 0.9-1.0 1.0+ → 1.0+	11.5 Acres 26 Parcels	\$32.8M	None

5.1.5 200 N Interchange

Another proposed project was to construct a full interchange at 200 N. The intent of this project is to provide an additional access to and from US-20 which could alleviate congestion at the County Line Road interchange (Exit 318).



Figure 19: 200 N Interchange

The potential project did help relieve some of the congestion on US-20, and the County Line Road V/C did see some decrease. However, the roadway section between Yellowstone Highway and the proposed development access still will experience a V/C over 0.9. SH-48 also has a significant decrease on congestion, but not to an acceptable level. Figure 20 shows the No Build TDM results vs. this potential project TDM results.

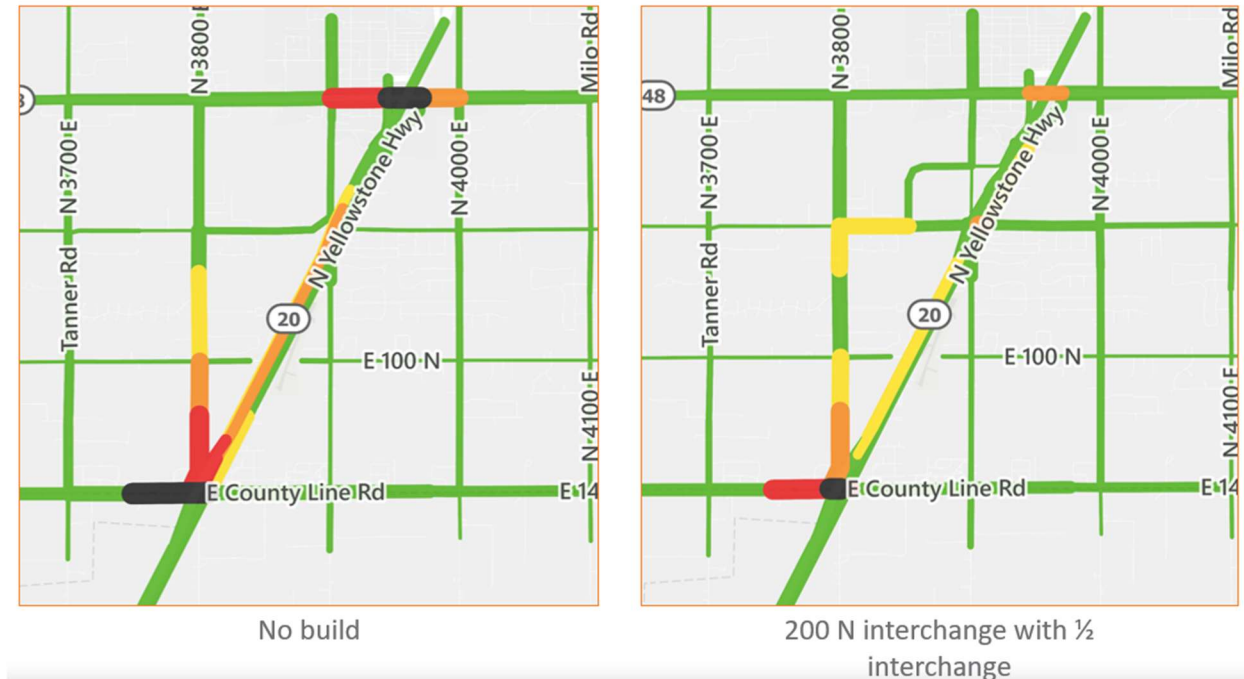


Figure 20: 2050 No Build TDM vs. 200 N Interchange TDM

This project would have an anticipated ROW impact of 37 acres, impacting 45 different parcels. The project cost estimate of 66 million dollars includes the cost of purchasing the ROW for the project.

This project does not have an estimated CRF in the Clear House Database.

Table 6: 200 N Interchange Summary

Potential Project	TDM V/C Results		ROW Impact	Project Cost Estimate	Crash Reduction
200 N Interchange with ½ interchange	SH-48 US-20 County Line Rd	1.0+ → 0.8-0.9 0.9-1.0 → 0.7-0.8 1.0+ → 1.0+	37 Acres 45 Parcels	\$66M	None

5.2 POTENTIAL PROJECTS SELECTING BEST ALTERNATIVES

All the potential projects analyzed provide a positive impact on congestion and safety. However, there is no project that by itself decreases congestion in all high-impact areas. Projects from this list were combined with different options to determine which combination of proposed projects has the most beneficial impact. See

Table 7 for details about each combination's congestion impact. See appendix B for TDM results.

Table 7: Combined Potential Project TDM Results in High-Impact Locations

Potential Project Combination	SH-48		US-20		County Line Road	
	No Build	Potential Project	No Build	Potential Project	No Build	Potential Project
200 N Overpass with County Line Road Widening	1.0 or more	0-0.7	0.9-1.0	1.0 or more	1.0 or more	1.0 or more
County Line Road Widening and SH-48 Widening	1.0 or more	0-0.7	0.9-1.0	1.0 or more	1.0 or more	1.0 or more
Full Interchange at Exit 320 with County Line Road Widening and SH-48 Widening	1.0 or more	0-0.7	0.9-1.0	0.9-1.0	1.0 or more	0.9-1.0
Full Interchange at Exit 320 with County Line Road Widening	1.0 or more	0.7-0.8	0.9-1.0	0.9-1.0	1.0 or more	0.9-1.0
Full Interchange at 200 N with ½ interchange and with County Line Road Widening	1.0 or more	0-0.7	0.9-1.0	0.7-0.8	1.0 or more	0.9-1.0
Full Interchange at 200 N without ½ interchange and with County Line Road Widening	1.0 or more	0.8-0.9	0.9-1.0	0.7-0.8	1.0 or more	0.9-1.0

The results from the Full Interchange at 200 N with County Line Road Widening show the greatest improvement to congestion over all in the study area.

Although this alternative travel demand model results show that this potential project has a significantly positive impact on congestion there are some potential conflicts with the ½ interchange remaining with a full interchange at 200 N. A few concerns of this alternative are the proximity of the two interchanges next to each other will not meet the Federal regulation for interchange spacing and will require a variance, the ½ interchange structure is not wide enough to accommodate 3 lanes in each direction on US-20 resulting in the structure either have to be completely reconstructed or significantly remodified and leaving the ½ interchange in place creates the potential safety concern of allowing wrong way drivers access to US-20.

The 200 N interchange with the ½ interchange reduces congestion slightly better on SH-48 than the 200 N interchange without the ½ interchange, all appropriate stakeholders will need to further discuss if this congestion benefit outweighs the safety risks of implementing the ½ interchange.

When comparing the TDM results for a full interchange at 200 N (without the ½ interchange) with County Line Road widened to five lanes, and a full interchange at Exit 320 with the same County Line Road widening, both alternatives effectively reduce congestion throughout the study area. However, each alternative distributes traffic differently.

With a full interchange at 200 N, US-20 operates at a volume-to-capacity (V/C) ratio of approximately 0.7–0.8, while SH-48 operates at a V/C ratio of 0.8–0.9 and County Line Road

operates at a Volume-to-capacity (V/C) ratio of 0.9-1.0. In contrast, a full interchange at Exit 320 results in US-20 operating at a V/C ratio of 0.9–1.0, while SH-48 improves to a V/C ratio of 0.7–0.8 and County Line Road operates at a Volume-to-capacity (V/C) ratio of 0.9-1.0.

Overall, both alternatives improve traffic operations compared to existing conditions. The 200 N interchange alternative provides better operational performance on County Line Road, whereas the Exit 320 interchange alternative shifts more traffic away from SH-48, resulting in improved operations along that corridor. Neither alternative outperforms the other across the entire network; rather, each offers operational benefits in different locations.

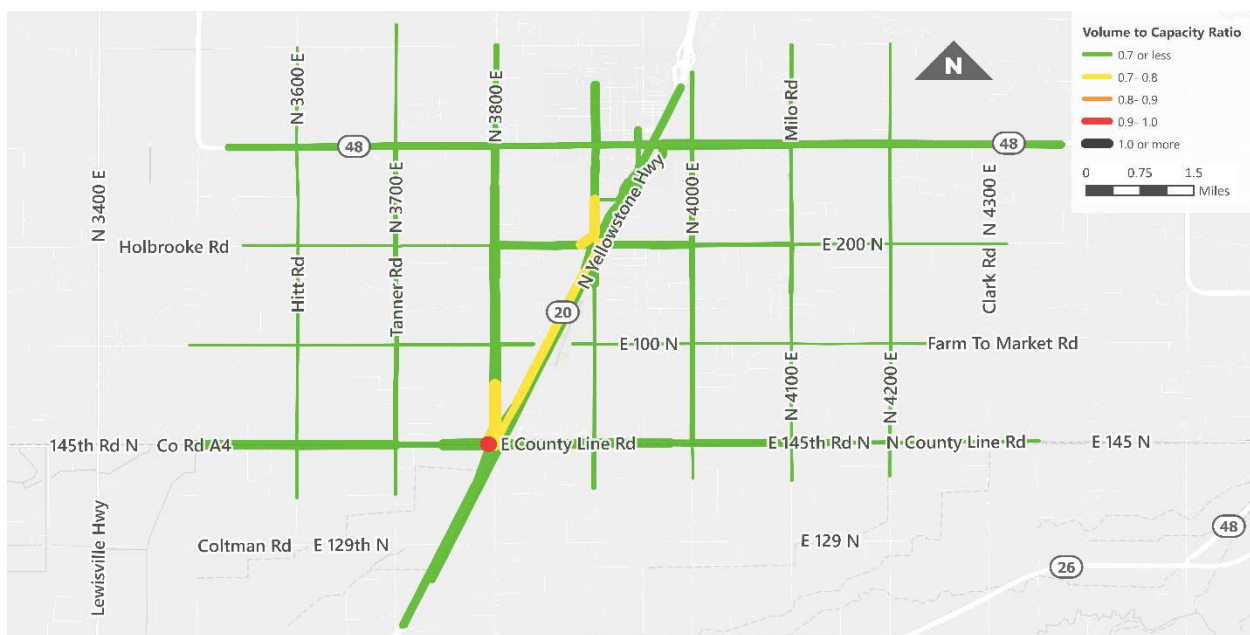


Figure 21. 2050 200 N Interchange with ½ interchange and Widening at County Line Road from Yellowstone Highway to 3700 E TDM

5.3 INTERSECTION IMPROVEMENTS

Although the two projects proposed as the best option decrease traffic congestion significantly, there is still the section on County Line Road that is experiencing an unacceptable level of congestion. The major concern is the area from Yellowstone Highway to 3800 E. This section of roadway was looked at individually to evaluate the congestion, cost, ROW impact, and CRF of each potential intersection improvement project alternative.

The TDM used to analyze the entire study area is called macro-simulation and could not be used for this small study area. To evaluate the impact of these intersection alternatives, Horrocks used a variety of micro-simulations to determine the potential congestion impact.

Traffic volumes for this analysis were determined by using the data from the field traffic counts. It also encompassed the traffic volumes for the developments as if they were fully built out.

The traffic volumes for future developments in the area were determined using PTV Vistro (see the results in Figure 22). The program uses guidance and traffic volumes from the Institute of Transportation Engineers (ITE) Trip Generations Manual.

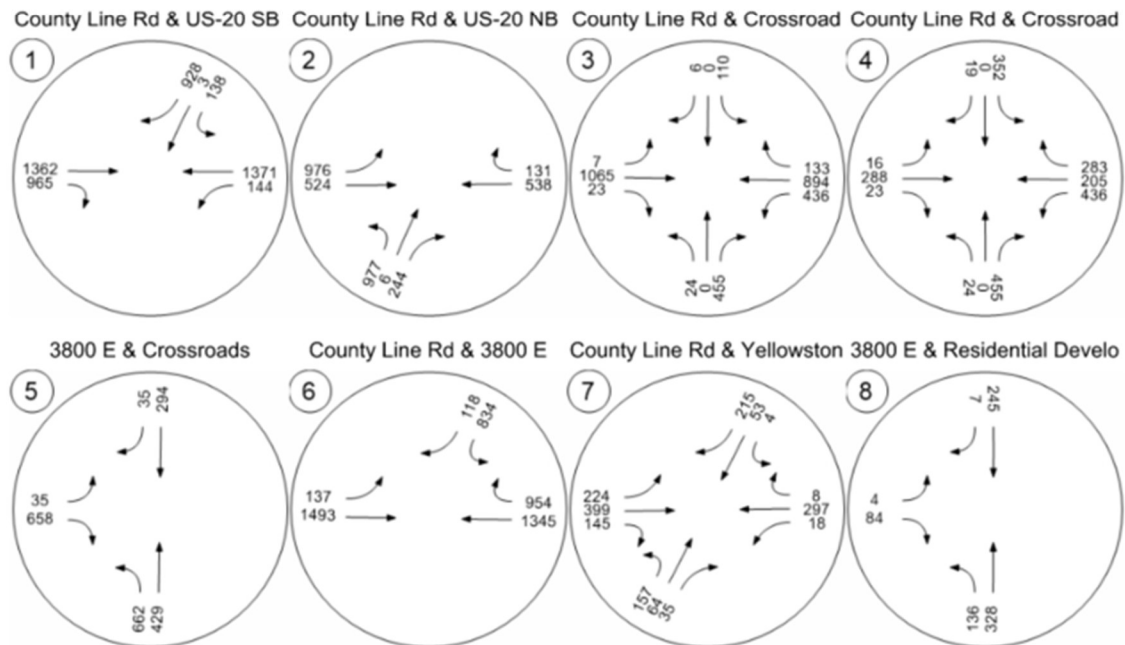


Figure 22: PTV Vistro Potential Traffic Volumes for Future Development

For traffic volumes produced by the potential development, Horrocks used the site plan that Jefferson County provided for the Trellis development and accounted for the housing development north of that based on information provided by Jefferson County. Horrocks also included traffic volumes for the R&S development on the south side of County Line Road. At the time of this analysis, this development did not have a site plan. The team decided to apply the same ratio or development type as the north, to the property on the south side to move forward with the analysis.

Any traffic analysis done for this section regarding future development pieces will need to be reevaluated as more information is finalized.

Potential intersection alternatives which include all known possible configurations were established either at the initial stakeholder meeting or determined to pursue with the traffic study team. The intersection alternatives that were analyzed are the following: Signalized intersections, Diverging Diamond Interchange (DDI), Single Point Urban Interchange (SPUI), Roundabouts, and Two lanes. All alternatives were analyzed as if County Line Road in this section contained the five-lane configuration detailed above. The intersections analyzed include the following;

- County Line Road and Yellowstone Highway
- County Line Road and US-20 eastbound on- and off-ramps
- County Line Road and US-20 westbound on- and off-ramps
- County Line Road and 3800 E
- County Line Road and potential development approach

5.3.1 No Build Conditions

Each intersection's existing level of service (LOS) conditions were evaluated using Synchro (see Figure 23). This included five lanes on County Line Road and the rerouting of 3800 E 700 feet to the west. This did not add any extra equipment or turn lanes to the minor approaches. Traffic volumes were used from the PTV Vistro PM Peak traffic volumes.



Figure 23: No Build Synchro Results

When this No Build layout was evaluated, none of the intersections functioned at an acceptable capacity. Table 8 details the LOS for the base year of 2025. The LOS is a grade given to roadway

sections or intersections to quickly compare the amount of delay the vehicles experience based on traffic volumes and traffic patterns. For rural highways, ITD requires a minimum LOS B for all intersections. For a Rural Arterial roadway (County Line Road), the minimum LOS B is expected for all intersections. These minimums are established in section 335.06 in ITD Roadway Design Manual.

Table 8: No Build Intersection Results

Intersection	LOS
Yellowstone Highway	F
NB On-/Off-ramps	F
SB On-/Off-ramps	F
3800 E	F
Development approach	E

This project would have an anticipated ROW impact of 0 additional acres than detailed previously as well as no additional cost.

This project does not have an estimated CRF due to no improvements being done.

This analysis of the No Build year was done with Synchro.

5.3.2 Signalized

These intersections were then analyzed as if each intersection was signalized (see Figure 24). This model assumed that all intersections that signalized a left-turn bay would operate with protected and permitted movement. The intersection of County Line Road and Yellowstone Highway assumed the signal would operate in a split phase for north-south traffic and east-west traffic.



Figure 24: Signalized Synchro Results

When this signalized layout is evaluated none of the intersections will function at an acceptable capacity. Table 9 details the following LOS for the base year of 2025.

Table 9: Signalized Intersection Results

Intersection	LOS
Yellowstone Highway	F
NB On-/Off-ramps	F
SB On-/Off-ramps	F
3800 E	F
Development approach	E

This project would have an anticipated ROW impact of 0 additional acres than detailed previously. This project's cost estimate is 17.4 million dollars.

This project would have an estimated CRF of 0.56. This comes from Crash Modification Factor (CMF) Countermeasure ID:325 Install a Traffic Signal. The CMF is the factor in the number of crashes left after the countermeasure is implemented. The CRF is 1-CMF. The CRF of the countermeasure is 0.44 (44%). With this potential project, Horrocks anticipates seeing a 44% decrease in crashes.

Table 10: Signalized Summary

Potential Intersection Project	Level of Service (LOS)	ROW Impact	Project Cost Estimate	Crash Reduction
Signalized	3800 F -> F SB F -> F NB F -> F YHWY F -> F	None	\$17.4M	44%

5.3.3 Diverging Diamond Interchange (DDI)

This configuration was analyzed with a classic DDI configuration at the eastbound and westbound ramps for US-20. This configuration was also analyzed as if the remaining intersections, Yellowstone Highway, 3800 E, and the potential development approach, are signalized. This model assumed that the intersections of Yellowstone Highway and the development approach's signalized left-turn bays would operate with protected and permitted movements. The signal at 3800 E would require signaling the left-turn bays as protected left-turn movements to allow for double left-turn lanes. The results of the DDI configuration are included in Table 11 and Figure 25.

Table 11: DDI Results

Intersection	LOS
Yellowstone Highway	B
NB On-/Off-ramps	D
SB On-/Off-ramps	D
3800 E	F
Development approach	E



Figure 25: DDI at County Line Road

The DDI concept improves operations on County Line Road and the highway ramps, with several movements improving to LOS D or B over the No Build alternative. The project would require approximately 3.0 acres of ROW acquisition across 10 parcels and is estimated to cost \$24.6 million, with a projected crash reduction of 14.2%.

Table 12: DDI Summary

Potential Intersection Project	Level of Service (LOS)	ROW Impact	Project Cost Estimate	Crash Reduction
DDI	3800 F -> F SB F -> D NB F -> D YHWY F -> B	3.0 Acres 10 Parcels	\$24.6M	14.2%

5.3.4 Single Point Urban Interchange (SPUI)

This configuration of the SPUI brings eastbound and westbound off-ramps to a single point under the bridge. The two off ramps and the County Line Road traffic alternate traversing through a signal typically directly under the bridge.

The intersections of Yellowstone Highway, 3800 E (which is 700 feet to the west of the ramps), and the proposed development approach's signalized left-turn bay would operate with protected and permitted movement. The results of the SPUI configuration are included in Table 13 and Figure 26.

Table 13: SPUI Results

Intersection	LOS
Yellowstone Highway	B
NB On-/Off-ramps	E
SB On-/Off-ramps	E
3800 E	F
Development approach	E



Figure 26: SPUI at County Line Road

The SPUI alternative provides operational improvements similar to the DDI, improving ramp intersections to LOS E. The project would require 2.9 acres of ROW impacts affecting 10 parcels and is estimated at \$26.0 million.

This project does not have an estimated CRF in the Clear House Database.

Table 14: SPUI Summary

Potential Intersection Project	Level of Service (LOS)	ROW Impact	Project Cost Estimate	Crash Reduction
SPUI	3800 F -> F SB F -> E NB F -> E YHWY F -> B	2.9 Acres 10 Parcels	\$26.0M	Unknown

5.3.5 Single-Lane Roundabouts

The single-lane roundabout includes 3800 E tying into the west roundabout, making it a five-leg roundabout. This configuration also allows the westbound traffic on County Line Road turning left onto the on-ramp to be able to utilize a turn bay to make that maneuver. The left-turn movement from the eastbound US-20 off-ramp would need to turn right and make a U turn through the east. This analysis also assumes there is a signal at the development's approach approximately 1,200 feet to the west of the west roundabout. The results of the single-lane roundabouts configuration are included in Table 15 and Figure 27.

Table 15: Single-Lane Roundabout Results

Intersection	LOS
Yellowstone Highway	F
NB On-/Off-ramps	F
SB On-/Off-ramps	F
3800 E	F
Development approach	F



Figure 27: Single-Lane Roundabout with Left Turn at County Line Road

The single-lane roundabout alternative offers the greatest safety benefit, with an estimated 58.1% crash reduction, but does not significantly improve traffic operations, as all approaches remain at LOS F. The concept requires 3.0 acres of ROW impact across 9 parcels and is estimated to cost \$13.0 million.

Table 16: Single Lane-Roundabouts Summary

Potential Intersection Project	Level of Service (LOS)	ROW Impact	Project Cost Estimate	Crash Reduction
Single-Lane Roundabouts	3800 F -> F SB F -> F NB F -> F YHWY F -> F	3.0 Acres 9 Parcels	\$13.0M	58.1%

5.3.6 Double-Lane Roundabout

The double-lane roundabout includes 3800 E tying into the west roundabout, about making it a five-leg round about. This configuration also allows the westbound traffic on County Line Road turning left onto the on-ramp to be able to utilize a turn bay to make that maneuver. The left-turn movement from the eastbound US-20 off-ramp would need to turn right and make a U turn through the east. This analysis also assumes a signal at the development's approach approximately 1,200 feet to the west of the west roundabout.

Table 17: Double-Lane Roundabout Results

Intersection	LOS
Yellowstone Highway	A
NB On-/Off-ramps	C
SB On-/Off-ramps	F
3800 E	F
Development approach	F

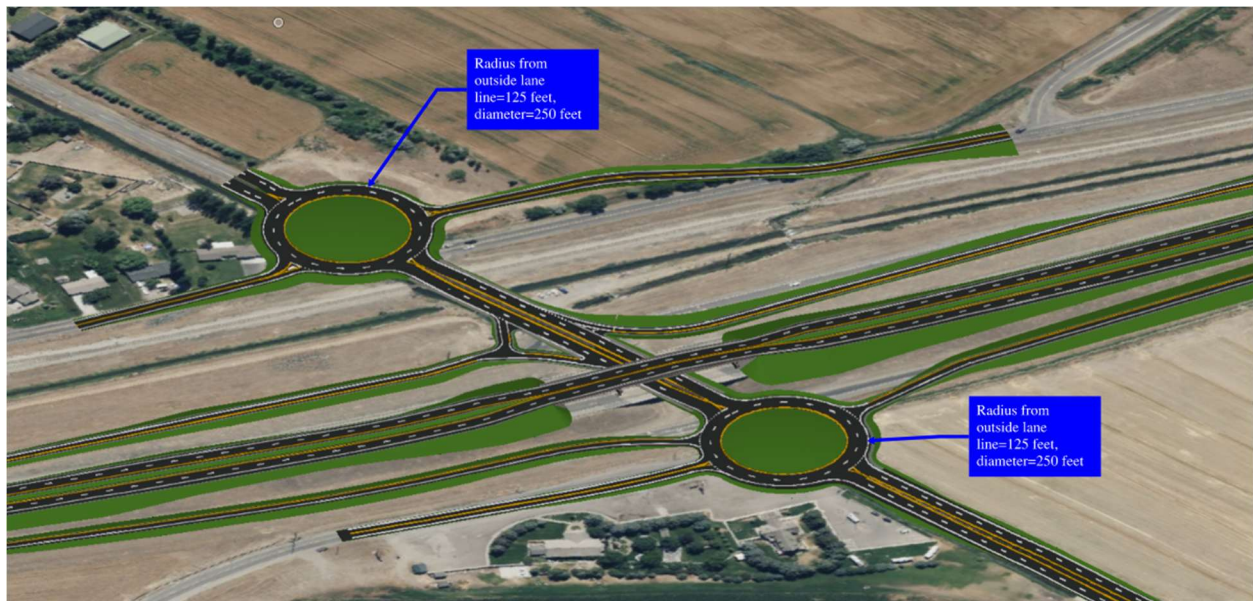


Figure 28: Double-Lane Roundabouts with Left Turn at County Line Road

This alternative also achieves a 58.1% projected crash reduction. The project would require 3.4 acres of ROW acquisition affecting 9 parcels and is estimated to cost \$15.4 million.

Table 18: Double-Lane Roundabouts Summary

Potential Intersection Project	Level of Service (LOS)	ROW Impact	Project Cost Estimate	Crash Reduction
Double-Lane Roundabouts	3800 F -> F SB F -> F NB F -> C YHWY F -> A	3.4 Acres 9 Parcels	\$15.4M	58.1%

5.3.7 Double-Lane Roundabout with Signal at EB On/Off Ramp

The double-lane roundabout includes 3800 E tying into the west roundabout, about making it a five-leg round about. This configuration also allows the westbound traffic on County Line Road turning left onto the on ramp to be able to utilize a dual turn bay to make that maneuver. This will require the installation of a signal for west bound traffic on County Line Road in order to accommodate this movement safely. The left-turn movement from the eastbound US-20 off-ramp would need to turn right and make a U turn through the east. This analysis also assumes a signal at the development's approach approximately 1,200 feet to the west of the west roundabout.

Table 19: Double-Lane Roundabout Results

Intersection	LOS
Yellowstone Highway	C
NB On-/Off-ramps	B
SB On-/Off-ramps	E
3800 E	E
Development approach	F



Figure 29: Double-Lane Roundabouts with signal at Eastbound on/off ramp Intersection

This alternative also achieves a 58.1% projected crash reduction. The project would require 3.4 acres of ROW acquisition affecting 9 parcels and is estimated to cost \$16.4 million.

Table 20: Double-Lane Roundabouts with Signal at Eastbound on/off ramp intersection Summary

Potential Intersection Project	Level of Service (LOS)	ROW Impact	Project Cost Estimate	Crash Reduction
Double-Lane Roundabouts with a signal at the eastbound on/off ramp intersection	3800 F -> E SB F -> E NB F -> B YHWY F -> C	3.4 Acres 9 Parcels	\$16.4M	58.1%

5.3.8 Intersection Comparison

The highest performing intersection improvement alternatives are the double-lane roundabout, the double-lane roundabout with a signal at the eastbound on/off ramp intersection, and the diverging diamond interchange (DDI). While all three alternatives are projected to operate at an unacceptable level of service at least one intersection in the series, under the 100% development build-out scenario, their performance differs as development progresses.

To better understand how each alternative accommodates future growth, the study evaluated operations at incremental development levels of 10%, 25%, 50%, 75%, and 100% build-out, this was estimated with vistro. Figure 30 summarizes the projected level of service for each alternative at each stage of development. Further details are provided in Appendix C.

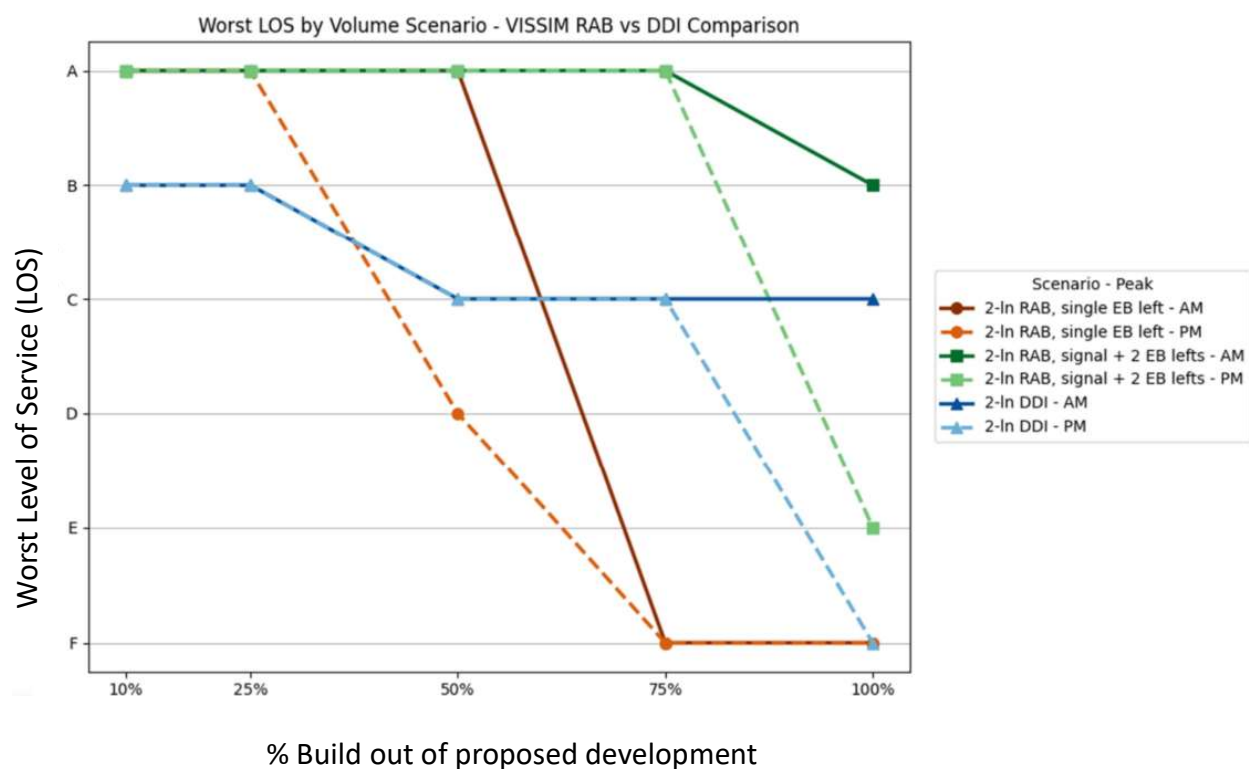


Figure 30: Level of Service of Each Alternative Relative to the Development Status

Ultimately, selecting a preferred alternative will require stakeholder input to balance immediate transportation needs with the long-term operational demands of the corridor as development continues.

5.4 COUNTY LINE ROAD INTERSECTION SELECTING BEST ALTERNATIVE

All traffic volume projections are subject to change as development layouts continue to evolve. As such, traffic conditions should be periodically reevaluated throughout the buildout process to ensure that roadway infrastructure remains adequate.

Based on a 5-lane configuration at County Line Road from Yellowstone Highway to 3800 E, the double-lane roundabouts with a signal at the eastbound on/off ramp intersection are expected to have the highest level of service amongst all the alternatives. However, these designs require a significant amount of ROW. Again, the preferred intersection alternative should be discussed and pursued by all governing agencies.

If municipalities choose to proceed with the double-lane roundabout option, it is recommended that a minor arterial corridor width be preserved within the northern development. This preservation would allow for the future reconfiguration of 3800 E into an access point approximately 700 feet west of the westbound on- and off-ramps. Maintaining this corridor provides flexibility for implementing alternative traffic solutions once the roundabout reaches capacity, while minimizing impacts to future businesses and residential properties.

Table 21: Potential Intersection Project Summary

Potential Intersection Project	Level of Service (LOS)	ROW Impact	Project Cost Estimate	Crash Reduction
Signalized	3800 F -> F SB F -> F NB F -> F YHWY F -> F	None	\$17.4M	44%
Diverging Diamond	3800 F -> F SB F -> D NB F -> D YHWY F -> B	3.0 Acres 10 Parcels	\$24.6M	14.2%
SPUI	3800 F -> F SB F -> E NB F -> E YHWY F -> B	2.9 Acres 10 Parcels	\$26.0M	Unknown
Single lane roundabouts	3800 F -> F SB F -> F NB F -> F YHWY F -> F	3.0 Acres 9 Parcels	\$13.0M	58.1%
Double lane roundabouts	3800 F -> F SB F -> F NB F -> C YHWY F -> A	3.4 Acres 9 Parcels	\$15.4M	58.1%

Double-Lane Roundabouts with a signal at the eastbound on/off ramp intersection	3800 F -> E SB F -> E NB F -> B YHWY F -> C	3.4 Acres 9 Parcels	\$16.4M	58.1%
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6 CONCLUSION

The South Jefferson County Traffic Study demonstrates that congestion and operational issues in the South Jefferson County Area cannot be effectively resolved through isolated improvements. Addressing existing and future transportation needs will require a coordinated, multijurisdictional effort among the municipalities and agencies that influence travel patterns throughout the corridor.

The study identified a broad range of potential improvement projects, each with varying levels of effectiveness. Utilizing a strategy of pairing multiple projects together the largest improvement to congestion occurred when there was the implementation of a interchange in middle of the US-20 corridor (200 N) and is paired with widening county line to a 5 lane section that include double-lane roundabouts with a signal at the eastbound on/off ramp intersection.

To maintain acceptable mobility and system performance, future planning efforts should focus not only on roadway capacity improvements but also on strategies that better distribute traffic volumes across the regional transportation network. This will require coordinated land use and transportation planning; investment in alternative routes and connections; and continued collaboration between local governments, regional agencies, and stakeholders. Through a comprehensive and cooperative approach, Jefferson County and its partner municipalities can more effectively address future growth while improving the overall resiliency and efficiency of the transportation system.

Appendix A. Intersection Traffic Volumes

Appendix B. Travel Demand Model Results

Appendix C. County Line Road Micro Simulation Results