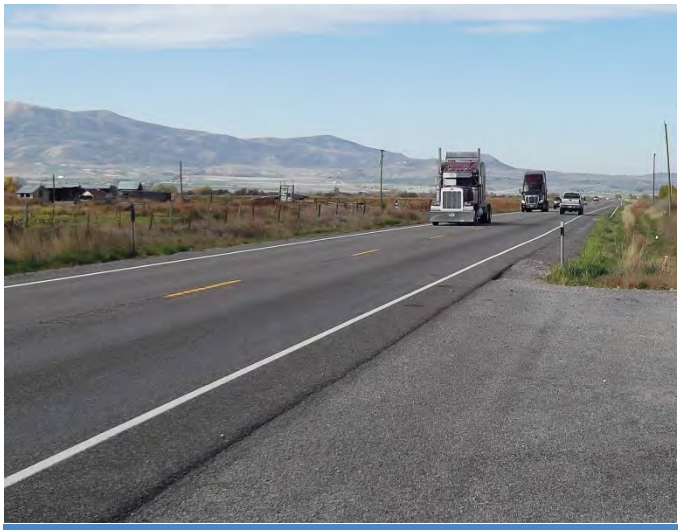
State Route 30
CORRIDOR STUDY
I-15 to 1000 West



S.R. 30 Corridor Study

State Route 30 Corridor Study,
I-15 to 1000 West

Utah Department of Transportation

May 18, 2016

Contents

Tables

Figures

Appendixes

1.0 Introduction

The State Route 30 Corridor Study, I-15 to 1000 West, provided information and recommendations about potential improvements to about 17.5 miles of State Route (S.R.) 30 from Interstate-15 (I-15) in Box Elder County to 1000 West (10th West or S.R. 252) in Logan, Utah (see Figure 1). This corridor study builds on the information provided by the Utah Department of Transportation's (UDOT) previous S.R. 30 Corridor Study, I-15 to S.R. 252, which was completed in July 2015 (UDOT 2015c).

UDOT recognizes the importance of S.R. 30 to Box Elder and Cache Counties and is committed to meeting the long-term needs of the public and to ensuring the continued efficiency of this route. UDOT commissioned this planning report to document the results of the State Route 30 Corridor Study, I-15 to 1000 West, which addressed safety on, congestion on, and the operation of S.R. 30.

The process used for the S.R. 30 Corridor Study, I-15 to 1000 West, was collaborative. UDOT was aided by input from affected local governments, related agencies, and user groups that had an interest in safety issues on and the future operation of S.R. 30. Throughout the planning and review process, UDOT communicated with local communities and corridor residents in an open, transparent public and agency involvement process regarding any planned or needed repairs, renovations, or major roadway maintenance activities that would substantially affect the operation of S.R. 30. Through this public involvement process, stakeholders identified specific issues along the corridor, and UDOT incorporated the issues into the study as specific needs (see Section 4.0, Needs Assessment for the S.R. 30 Corridor). UDOT then confirmed the needs with quantitative data such as traffic conditions and accident locations.

UDOT's intent with the S.R. 30 Corridor Study, I-15 to 1000 West, was to develop a list of recommendations for improving S.R. 30 that UDOT could implement over the next 25 years. These recommendations are general and don't include detailed engineering. Once a recommended project is funded, UDOT will conduct the appropriate environmental reviews and engineering. UDOT might also modify the recommendations in this planning report based on information developed from additional project planning and analysis.

Throughout the corridor study process, UDOT relayed to stakeholders that each potential corridor improvement might require analysis in a National Environmental Policy Act (NEPA) document and that this S.R. 30 Corridor Study Planning Report might be adopted in such NEPA documents.

2.0 Description of the Study Area

The study area (study corridor) for the State Route 30 Corridor Study, I-15 to 1000 West, was defined as the S.R. 30 highway from I-15 in Box Elder County to 1000 West in Logan, which is in Cache County (see Figure 1). Although the study focused primarily on the S.R. 30 corridor, UDOT also considered influencing factors (such as access, travel demand, and type of use on S.R. 30) from surrounding communities, businesses, and future developments.

Figure 1. S.R. 30 from I-15 to 1000 West

3.0 Public Engagement

UDOT conducted a targeted public engagement program as part of the S.R. 30 Corridor Study, I-15 to 1000 West. The purpose of the outreach effort was to seek input from the public, local government representatives, state and federal agencies, and other interested stakeholders regarding the locations on S.R. 30 that need to be improved and any environmental concerns associated with those improvements. The public engagement process had four phases:

1. Stakeholder interviews
2. Presentations to governments to provide an overview of the corridor study and gather input
3. Agency and tribal input
4. Presentations to governments to present the recommendations from the corridor study

To provide stakeholders with information about the corridor study, UDOT hosted a website that included a brief summary of the study, the purpose of the study, and a study schedule. The following materials were included on the study website during the study process (see Appendix A, Stakeholder Interview Materials):

- Initial stakeholder overview handout
- Stakeholder interview form
- Summary of stakeholder interview input
- Study potential recommendation handout

During the study, UDOT solicited stakeholder input through an email address that was included on the website and all handout materials. In addition, UDOT established a project hotline to allow stakeholders to call in and get information about the study.

3.1 Stakeholder Interviews

The purpose of the stakeholder interviews was to seek input about corridor operations and environmental issues on S.R. 30 from people who use the highway on a daily basis or engage in recreation near the highway. The study team conducted stakeholder interviews from February 29 to March 9, 2016, with representatives from the following organizations and communities:

- Cache County and Logan City
- Cache County Metropolitan Planning Organization
- Cache County Chamber of Commerce
- Cache County Sheriff's Office
- County and state road maintenance departments
- Emergency service providers
- Agricultural community
- Cycling community
- Environmental groups
- PacifiCorp
- Trucking industry
- Utah State University

During the interview, each representative was given an overview of the study process and an opportunity to review the corridor maps, the basic corridor conditions, and the initial stakeholder overview handout. The interviewer invited the representative to comment on any of the issues on the stakeholder interview form (see Figure 2).

Figure 2. Stakeholder Interview Form

State Route 30
CORRIDOR STUDY
I-15 to 1000 West

UDOT project number S-R199(185)

Stakeholder Interview Form

Date: _____

Name/Organization_____

Address _____

Name/Representing	Phone	Email address
Project Team		

1. **Corridor Use:** Please describe how you use the SR 30 Corridor, such as commuting (work or school), trucking/goods transport and delivery, personal, recreational, regular destinations, other.

2. **SR 30 Roadway/Corridor Operational Conditions Issues/Concerns:** Such as congestion, traffic speed, safety, emergency stopping, passing, turns, signage, maintenance, environmental, accident data, etc.

3. **SR 30 Roadway/Corridor Physical Conditions Issues/Concerns:** Such as lane capacity, turn lanes, passing lanes, surface condition, sight distance, shoulder width, drainage, signage, right of way, environmental, etc.

4. **Adjacent Property Issues:** Issues on or affecting adjacent properties that might be addressed with project improvements, such as access, utilities, drainage, parking, pedestrian access and signage, etc.

5. **Future development:** If applicable, are you aware of any future plans for changes to adjacent property/facilities or planned operational changes that may affect roadway operation or access? Such as new or removed development, access changes, changes in traffic volume, etc. If so, what and when?

6. **Other Issues and Comments:**

During the stakeholder interview process, UDOT sent a press release to local media that led to articles in Logan's *The Herald Journal* (March 3, 2016) and in *The Deseret News* (March 3, 2016) (see Appendix B, News Articles). The purpose of the press release, and UDOT's intention in encouraging the subsequent articles, was to inform the public about the corridor study, the ways in which the public could learn more about the study, and upcoming public presentations (see Section 3.2, Presentations to Governments to Provide an Overview and Gather Input) and to provide input into the study process.

Table 1 summarizes the input received by UDOT during the stakeholder interviews. Appendix C, Stakeholder Interview Notes, provides the detailed notes from each interview that was conducted. UDOT used the input it received during the stakeholder interview process to identify needed improvements on S.R. 30.

Table 1. Summary of Stakeholder Interview Comments

Physical/Operational Issues	Adjacent Property Issues	Future Development Issues	Other Issues/General Comments
I-15 to S.R. 13 • Lack of turn lanes to turn onto 6000 West from S.R. 30. S.R. 13 to S.R. 38 • Limited sight distance at Bear Hollow Drive. Widen shoulders. S.R. 38 to Beaver Dam Road • S.R. 38 / S.R. 30 northbound S.R.38 to eastbound S.R.30 is a dangerous merge. Beaver Dam Road to S.R. 23 • Limited sight distance and skewed intersection at Beaver Dam Road. • Study realigning intersection at Beaver Dam Road. • Congestion at Beaver Dam Road and S.R. 30. • Limited sight distance and skewed intersection at 1400 North. S.R. 23 to 1000 West • Safety concerns because of narrow or no shoulders. • Heavy fog is prevalent in the Cutler Marsh area, creating very limited sight distance and unsafe conditions. • No pullouts for vehicles (buses and vehicles carrying hazardous materials) that must stop at the railroad crossing. • Unsafe for highway patrol/local law enforcement/maintenance because of lack of shoulders. • Unsafe recreation parking along roadway because of lack of shoulders and lack of safe access. • Conflicts between through traffic and agricultural or slow vehicles because of lack of shoulder. • Congestion and car/truck conflicts along Cutler Marsh. • Lack of or inadequately sized left- and right-turn lanes at high-use intersections and access points. • Lack of left- and right-turn lanes to recreation access sites. • Unsafe for bicyclists because of lack of shoulders or a designated or separated bicycle pathway. • Lack of road edge markings for night travel and during heavy fog. • Cross-drainage under roadway is insufficient in some areas. • Box culverts are not protected by railings and should be replaced. • Recreational parking along the road damages the edge of the pavement. • Difficult curves at milepost 105 and near the Humane Society building. • No road sub-base. Highway should be reconstructed. • Add roadway traffic positive separation.	• Mixed-use development from 1000 West to 1900 West causes car/truck conflicts and congestion. • Agricultural use and accesses east of S.R.23 cause intermittent conflicts (delays and unsafe turning movements) between cars and agricultural vehicles. • Unofficial PacifiCorp access at 4000 West. Slow-moving maintenance vehicles and cattle trucks enter and exit the highway at this location, and the access is used by hunters. • Anglers access the lower Logan River along S.R. 30. Need to add more designated pullouts. • Utah Division of Wildlife Resources (UDWR) walk-in access at 2700 West could use improvement and parking space.	• Logan City is the final design stage of improving its wastewater treatment facility near 2300 West and plans to begin operating the new plant in 2020. Access will be 1,000 feet west of UDWR gun safety center. • Future development between Cutler Marsh and S.R. 23 is limited by poor water quality. • Future commercial development is likely to be closer to 1000 West (east of 1900 West) rather than farther west. • New subdivision is planned south of S.R. 30 at the Box Elder County–Cache County border. • Lack of sewer plant and water connections limits large subdivisions west of Cutler Marsh in Cache County.	• When Sardine Canyon is closed, S.R. 30 is the only northwest route. • S.R. 23 to I-15 generally functions well with the exception of minor sight distance issues. • The most significant needs are between 1000 West and S.R. 23. • The primary needs are to enhance safety, not capacity. • The bicycle community wants a safe east-west route via a separated bicycle facility, at from 1000 West to S.R. 23. • Environmental impacts from needed safety improvements might be acceptable but should be minimized. • Need to limit or restrict unofficial parking along S.R. 30 through Cutler Marsh because it's a safety concern. Provide more official parking areas to improve safety and overall recreational access. • Add intersection lighting at all major intersections. • Improve access control through limited access purchasing and moving access locations to improve sight distance and spacing.

3.2 Presentations to Governments to Provide an Overview and Gather Input

After the stakeholder interviews, the study team presented at the following government meetings:

- Logan City Council – March 15, 2016
- Box Elder County Council – March 16, 2016
- Cache County Council – March 29, 2016
- Cache Metropolitan Planning Organization (MPO) – April 11, 2016

The purposes of the presentations were (1) to summarize the comments received during the stakeholder interviews so that the councils and the public could hear the opinions of stakeholders in their communities and (2) to seek additional input from community representatives. To ensure that the public had the opportunity to learn about the corridor study and provide input, UDOT sent a press release to local media outlets (see Section 3.1, Stakeholder Interviews). In addition, UDOT sent emails to stakeholders on the S.R. 30 Corridor Study mailing list and to state legislators informing them about the study and the presentation dates and times.

UDOT received the following key input during the government presentations:

- The lack of shoulders and turn lanes on S.R. 30 across Cutler Marsh is a public safety issue.
- Bicycling on S.R. 30 is dangerous, and improvements to the road should include bicycle accommodations.
- Additional passing lanes should be added.
- S.R. 30 should be a four- or five-lane road.
- Safety is a critical concern.
- Improvements should start as soon as possible.

3.3 Agency and Tribal Input

3.3.1 Resource Agency Meeting

The study team met with representatives from the U.S. Fish and Wildlife Service (USFWS), the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers (USACE), and the Utah Division of Wildlife Resources (UDWR) on April 12, 2016. The purposes of the meeting were to summarize the S.R. 30 Corridor Study process and seek input from the agencies regarding impacts to the environment that might occur from improvements potentially identified in the study. The meeting included an overview of concerns identified during the stakeholder interviews. The agencies were also informed that an environmental study would likely be prepared for any improvement projects identified in the corridor study. The agencies identified the following key concerns:

- UDOT should ensure that the most recent lists of raptors and state sensitive species are being used when evaluating impacts to threatened, endangered, and state sensitive species.
- UDOT should address issues concerning migratory birds, including seasonal timing, habitat, cumulative impacts, and induced growth.
- Section 404 permit coordination with USACE.
- USFWS will consult with UDOT regarding impacts to Ute ladies'-tresses and yellow-billed cuckoos, and UDOT should ensure that any new USFWS guidance regarding these species is followed.
- Improvements to S.R. 30 should be implemented with minimal disturbance.
- UDOT should coordinate with UDWR regarding the fisheries experiment station at the north end of 1400 West and the Cache Valley Hunter Education shooting range.

3.3.2 Tribal Consultation

UDOT sent a letter requesting input into the S.R. 30 Corridor Study to the Eastern Shoshone Tribe of the Wind River Reservation and the Shoshone-Bannock Tribes of Fort Hall. The letter requested any information that the tribes felt was important regarding the operation of S.R. 30 and any environmental issues that UDOT should consider when making recommendations for improvements. The letter included the handout provided during the stakeholder interviews (see Section 3.1, Stakeholder Interviews). UDOT did not receive a response from either tribe.

3.4 Presentations to Governments to Present Recommendations

After the draft corridor study recommendations were developed, the study team presented the recommendations at the following government meetings:

- Cache County Council – May 24, 2016
- Box Elder County Council – June 1, 2016
- Cache Metropolitan Planning Organization (MPO) – June 6, 2016
- Logan City Council – June 7, 2016

The purposes of the presentations were (1) to summarize the draft study recommendations and (2) to seek additional input from community representatives on the recommendations. To ensure that the public had the opportunity to learn about the corridor study and provide input, prior to the presentations UDOT sent a press release to local media that led to a segment on Utah Public Radio (May 18, 2016) and news articles in Logan's *The Herald Journal* (May 28, 2016) and in *The Deseret News* (May 19, 2016) (see Appendix B, News Articles).

The purposes of the press release, and UDOT's intention in encouraging the subsequent news coverage, were to inform the public about the corridor study, the ways in which the public could learn more about the study, and upcoming public presentations and to inform the public about way to provide input into the study process.

In addition, UDOT sent emails to stakeholders on the S.R. 30 corridor study mailing list and to state legislators informing them about the study and the presentation dates and times. The email also included the recommendation handout (see Appendix A, Stakeholder Interview Materials). The project website was updated to include the meeting times and the recommendation handout.

UDOT received the following key input during the government presentations:

- The environmental document should consider bicycle/pedestrian facilities between S.R. 23 and 1000 West. Need to document the number of bicyclists that might use the facility.
- The area between S.R. 23 and 1000 West has heavy fog during winter. As part of alternatives development, UDOT should consider ways to improve travel in these conditions.
- Right- and left-turn lanes should be added at 3200 West in Box Elder County; 3200 West provides access to the Old Barn Community Theatre. There have been several accidents at this location.
- Extend passing lanes on S.R. 30 farther eastbound on Peterboro Hill toward Beaver Dam Road.
- Add additional warning of the upcoming stop sign on Garland Road.
- Add a natural snowdrift fence a couple miles east of S.R. 38.
- Add warning signs on S.R. 30 of the upcoming stop sign at the intersection with S.R. 13 and reduce speed limits because trucks are traveling at high speeds when approaching the intersection.
- There are inadequate shoulders west of 4400 West in Box Elder County.

- Schoolchildren use S.R. 30 near 4400 West in Box Elder County, and the road should have wider shoulders.
- Consider a traffic signal at 1400 West in Logan. There is heavy truck and local traffic use from the city transfer station from 1400 West to S.R. 30. Left turns onto S.R. 30 are difficult, and, on weekends, traffic that is turning left onto 1400 West backs onto S.R. 30.

4.0 Needs Assessment for the S.R. 30 Corridor

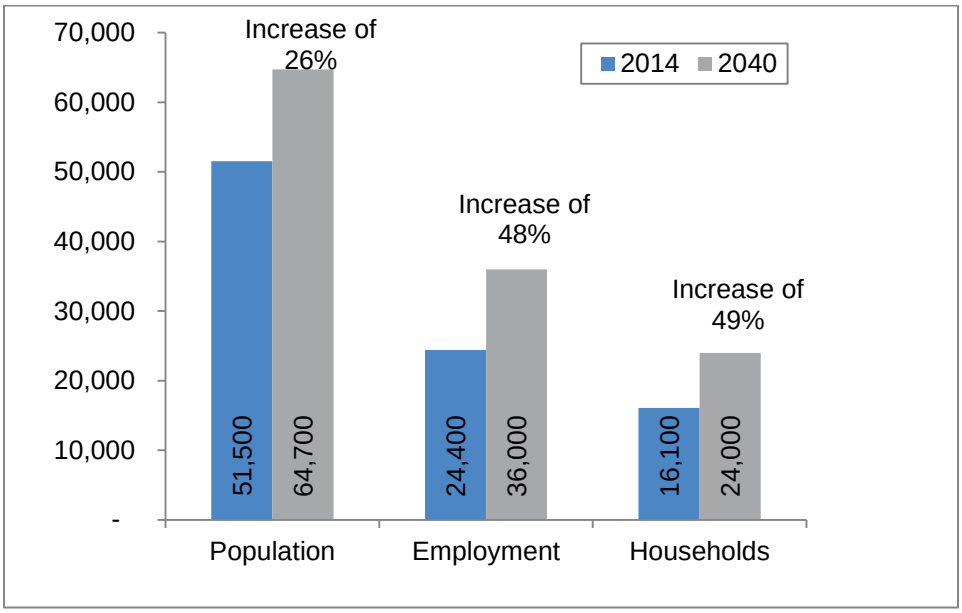
4.1 Growth Trends

Growth in population, employment, and households are all important factors in determining travel demand (the expected number of transportation trips in an area). Large increases in any of these factors over a long time can substantially increase travel demand. This section summarizes the expected growth in population, employment, and households in the needs assessment study area, which is Cache and Box Elder Counties.

4.1.1 Box Elder County

Box Elder County was estimated to have a population of about 51,500 in about 16,100 households in 2014. The county's population is expected to increase to about 64,700 in about 24,000 households in 2040. Box Elder County's total employment was estimated to be about 24,400 in 2014. This is expected to increase to about 36,600 in 2040 (GOMB 2012) (see Figure 3).

Figure 3. Estimated Population, Employment, and Households in Box Elder County in 2014 and 2040

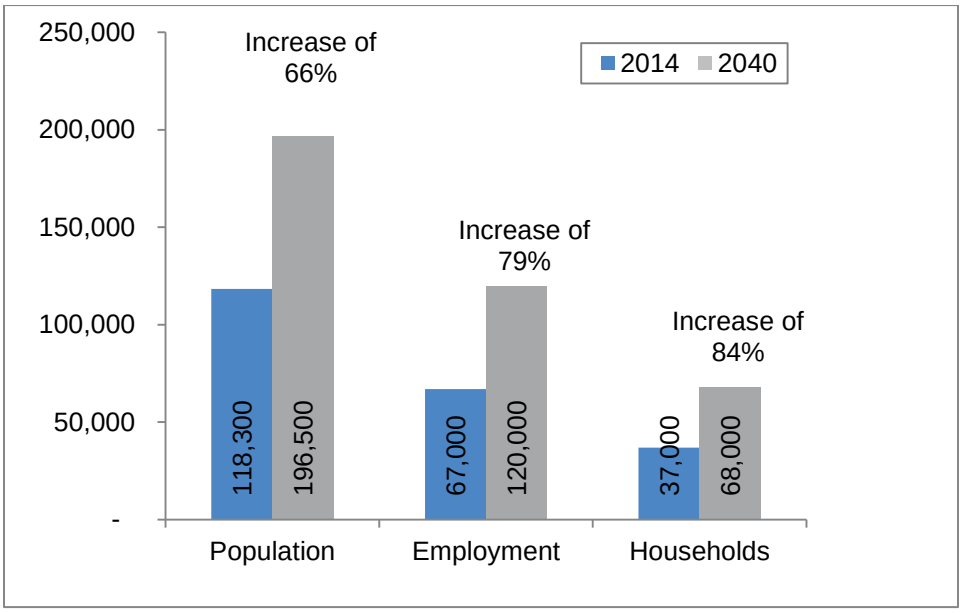


Source: GOMB 2012

4.1.2 Cache County

Cache County was estimated to have a population of about 118,300 in about 37,000 households in 2014. The county's population is expected to increase to about 196,500 in about 68,000 households in 2040. Cache County's total employment was estimated to be about 67,000 in 2014. This is expected to increase to about 120,000 in 2040 (GOMB 2012) (see Figure 4).

Figure 4. Estimated Population, Employment, and Households in Cache County in 2014 and 2040



Source: GOMB 2012

4.2 Regional and Local Transportation Planning

The anticipated growth in population, employment, and households in the needs assessment study area by 2040 (see Section 4.1, Growth Trends) has led the Cache MPO, UDOT, Box Elder and Cache Counties, and Logan City to develop transportation and land-use plans that take this growth into account. These plans identify specific transportation projects as well as general concepts about how the transportation network in their respective jurisdictions is expected to operate. Table 2 summarizes how planning officials view the need for improvements to S.R. 30 in the needs assessment study area.

Table 2. Improvements to S.R. 30 in Transportation Plans

Plan Administrator	Plan Name	Summary of Improvements
UDOT	2015–2040 Long-Range Transportation Plan: Transportation in Utah's Rural Areas (UDOT 2015b)	UDOT develops a long-range transportation plan (LRP) every 4 years to summarize anticipated transportation system needs for the next 25 to 30 years. The UDOT LRP is the transportation plan for the rural areas of Utah. In addition to addressing future capacity needs for automobiles, the LRP also identifies needs and projects that will improve Utah's overall transportation system, facilitate efficient freight movement, enhance roadway safety, and provide transit service and active transportation systems. The current LRP includes the following projects on S.R. 30: • Phase 1 (2015–2024): widen S.R. 30 from two to four lanes from 1000 West to S.R. 23. • Phase 2 (2025–2034): widen S.R. 30 from two to four lanes from S.R. 38 to S.R. 23.
UDOT	Utah Freight Plan (UDOT 2015a)	The Utah Freight Plan was developed to ensure that the Utah's transportation system supports and enhances trade and sustainable economic growth. As the "Freight Crossroads of the West," Utah relies on an efficient and complex freight transportation network. Utah has the highest percentage of truck traffic in the United States (23% compared to a nationwide average of 12%). The current plan includes the following projects on S.R. 30: • Phase 1 (2015–2024): widen S.R. 30 from two to four lanes from 1000 West to S.R. 23. • Phase 1 (2015–2024): add eastbound and westbound passing lanes from milepost 97 to milepost 101. • Phase 2 (2025–2034): widen S.R. 30 from two to four lanes from I-15 to S.R. 23.
UDOT	Utah's Unified Plan 2011 to 2040 (UDOT 2011)	The Cache MPO coordinated with UDOT and the four other MPOs in Utah, as well as the Utah Transit Authority, the Cache Valley Transit District, and the Federal Highway Administration, to develop Utah's Unified Plan. The current plan includes the following projects on S.R. 30: • Phase 1 (2011–2020): widen S.R. 30 from I-15 to S.R. 38. • Phase 1 (2011–2020): conduct a planning study from S.R. 38 to the Cache MPO boundary at 1900 West in Logan. • Phase 2 (2021–2030): widen S.R. 30 from S.R. 38 to 1000 West in Logan.
Cache MPO	Cache County, Utah, Regional Transportation Plan 2040 (Cache MPO 2015)	The Cache MPO works with Cache County and 10 of the 19 incorporated Cities in Cache County to oversee transportation planning activities for the Logan Urbanized Area and the Utah portion of the greater Cache Valley area. The Cache County, Utah, Regional Transportation Plan 2040 identifies specific projects that will be needed to meet the transportation demands of the region. The current plan includes the following project on S.R. 30: • Phase 1 (2015–2014): widen S.R. 30 from two to four lanes from 1000 West to S.R. 23.

(*continued on next page*)

Table 2. Improvements to S.R. 30 in Transportation Plans

Plan Administrator	Plan Name	Summary of Improvements
Cache Valley Regional Council	Envision Cache Valley Final Report and Toolkit (Envision Utah 2010)	The Envision Cache Valley project was initiated by the Cache Valley Regional Council, a group created by an interlocal agreement among Cache Valley jurisdictions to address valley-wide issues and work toward mutually beneficial solutions. Envision Cache Valley consisted of a public process in which citizens explored the challenges associated with growth and worked toward creating a long-term vision for the valley. The result is a report that could influence future land-use plans. The effort engaged citizens from all 25 cities and towns in the greater Cache Valley area (including southern Idaho) through interactive workshops where participants developed comprehensive scenarios for future growth. These scenarios included detailed possible land uses and transportation infrastructure. The public input led to a preferred land-use and transportation scenario called the Cache Valley Vision as well as a series of guiding Cache Valley quality growth principles. Ultimately, this vision was endorsed by the Envision Cache Valley Steering Committee and the Cache Valley Regional Council. The Cache Valley Vision includes an expanded S.R. 30 from 1000 West to S.R. 23 with a bicycle route.
UDOT	Box Elder Emerging Area Plan (UDOT 2008)	The Box Elder Emerging Area Plan states that S.R. 30 provides an important economic tie between Cache Valley and Box Elder County. The plan also states that local governments should work with UDOT to ensure that S.R. 30 functions as a safe, high-speed, and high-capacity road because the road provides an important connection to Cache Valley from I-15.

4.3 Transportation Network and Modal Relationships

4.3.1 Current Transportation Network

S.R. 30 in the needs assessment study area was added to the state highway system in 1930s, and some of the original box culverts constructed across the Little Bear River are still in place. The route provides an important transportation link to numerous communities and residents between I-15 in Box Elder County and Cache Valley. S.R. 30 provides support for economic development in Box Elder and Cache Counties, a commuting route between Logan and industrial centers in Box Elder County, and access to Utah State University and a number of recreation areas. UDOT manages the day-to-day operation and maintenance of S.R. 30.

Cache and Box Elder Counties are served by a network of arterial roads and highways owned and maintained primarily by UDOT. In Cache County, three of these roads (S.R. 30, U.S. Highway 89 [U.S. 89], and U.S. Highway 91 [U.S. 91]), serve as the main entrances into and exits out of Cache Valley (see Figure 5). The Cache MPO states that managing these roads to maximize throughput capacity is of critical importance (Cache MPO 2015).

S.R. 30 is the only east-west route that functions as a primary arterial in Cache Valley and as such provides an important connection to other major transportation routes throughout the region (I-15, U.S. 89, and U.S. 91). S.R. 30 is a major truck route (see Section 4.3.2, Truck Freight Route) and a backup route to U.S. 89/91 for access to I-15 when U.S. 89/91 is closed because of accidents or snow.1000 West provides north-south bypass access to U.S. 89/91 to the south and north of Logan's Main Street. S.R. 23 intersects S.R. 30 west of Cutler Marsh and provides north-south access to the communities of Wellsville, Mendon, and Newton. S.R. 23 also provides access to U.S. 89/91 for these communities to the south of S.R. 30.

In Box Elder County, S.R. 30 connects to I-15, the main north-south interstate in Utah (see Figure 6). S.R. 30 provides access to the communities of Riverside and Fielding via S.R. 13 and connects to S.R. 38, which provides access to Brigham City to the south. S.R. 30 provides an important economic connection between residents in Cache County and the industrial center near the intersection of I-15 and Interstate 84 (I-84).

Figure 5. Cache County Road Network

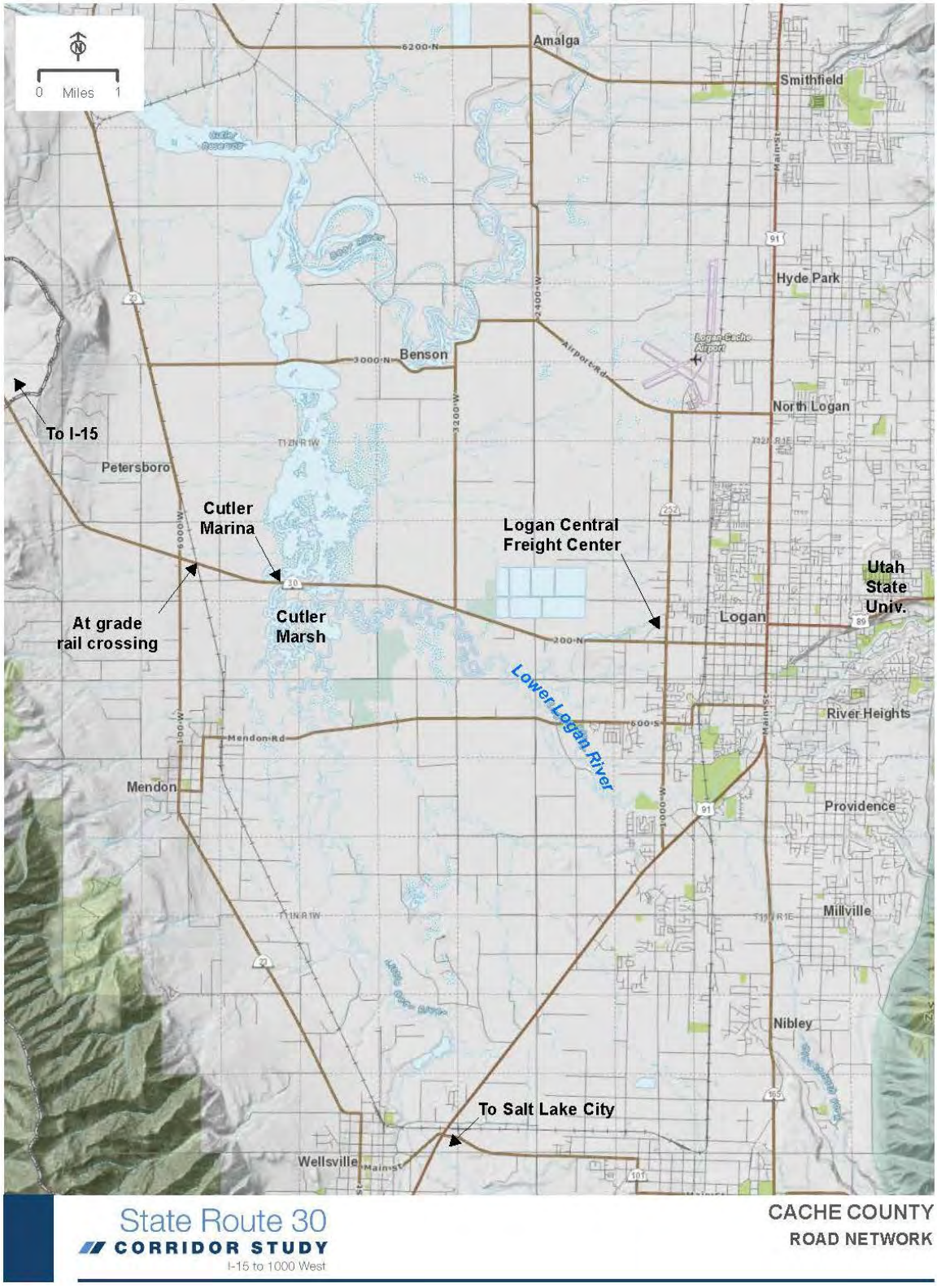
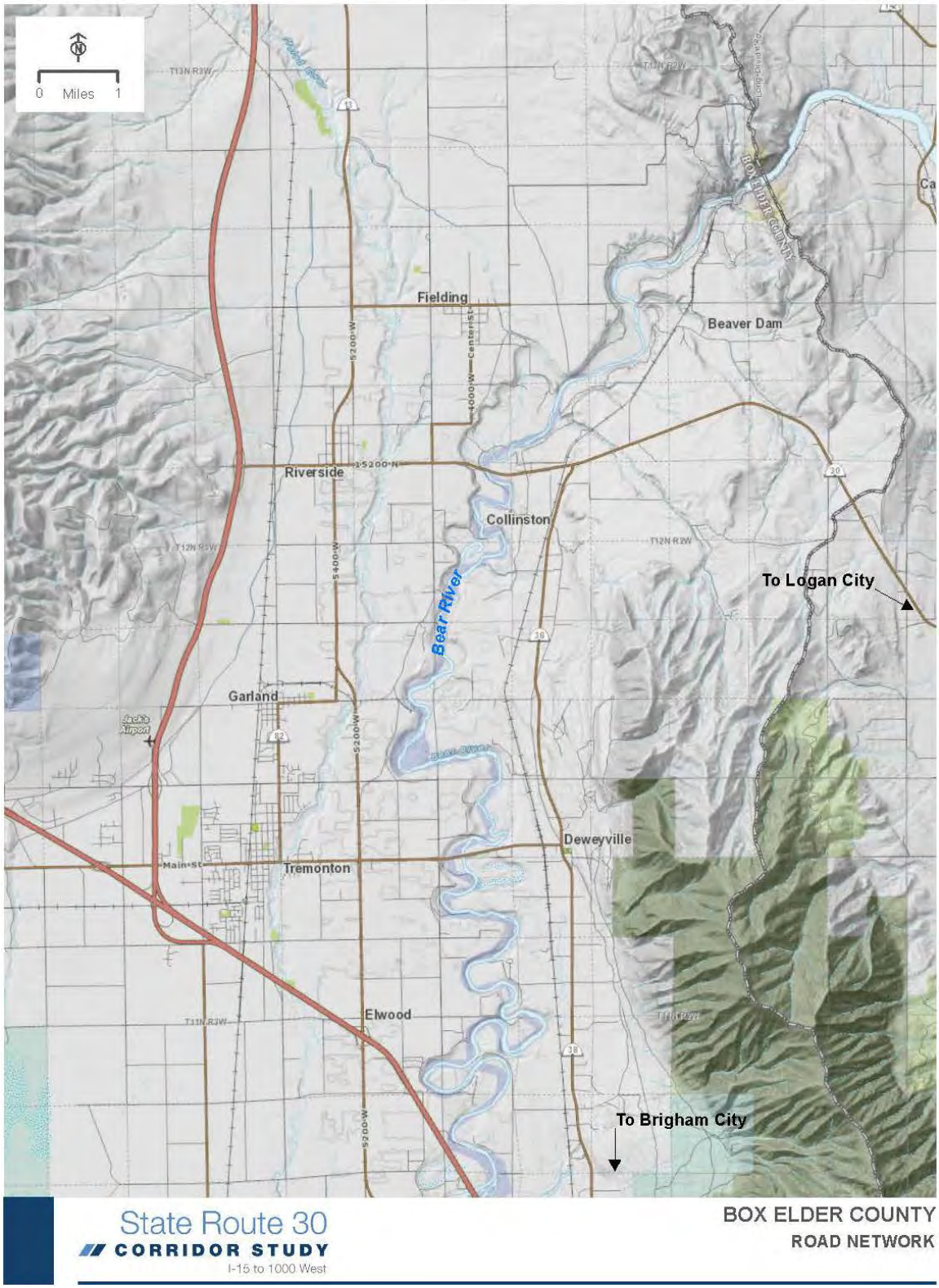


Figure 6. Box Elder County Road Network



4.3.2 Truck Freight Route

Truck transportation is the most-used for freight to and from Cache County as a whole. In 2007, Cache County imported over 2.4 million tons of freight with a total value of $2.2 billion. In the same year, Cache County exported just under 1 million tons of freight with a total value of $1.6 billion. A large portion of the employment in Cache County depends on industries that need freight mobility into, out of, and through Cache County. Also, the availability and prices of consumer goods and services in Cache County are directly linked to the level of freight mobility (Cache MPO 2015).

Because of its direct link to I-15, S.R. 30 is used extensively by freight trucks (about 29% of all traffic on S.R. 30 is freight trucks). The large percentage of trucks on S.R. 30, the importance of the trucking industry to Cache Valley's economy, and S.R. 30's direct link to I-15 led UDOT to designate S.R. 30 as a critical rural and urban freight route.

The Utah Freight Plan lists four freight centers in the Cache Valley (UDOT 2015a). The Logan central freight center is located on S.R. 30 immediately west of 1000 West. For this reason, S.R. 30 needs to accommodate use by large freight trucks in terms of both capacity and safety. The Utah Freight Plan states that freight routes need to have full-width shoulders, acceleration/deceleration lanes for trucks, and intersections designed to accommodate freight truck movements. Several trucking companies also have business locations on S.R. 30 near 1000 West.

What is a freight center?

A freight center is a location that produces a large amount of freight movement and has a connection to interstates.

In interviews, stakeholders in the trucking community that uses S.R. 30 mentioned the following concerns:

- The lack of roadway shoulders on S.R. 30 from S.R. 23 to 1000 West in Logan is hazardous for truck travel because there's no area for emergency stops or room to maneuver in emergencies. We recommend adding shoulders wide enough to accommodate freight trucks.
- The curve at milepost 107.2 (near the Humane Society building) is difficult to navigate at the posted speed limit.
- Eastbound S.R. 30 needs a longer right-turn lane at S.R. 23 to allow right-turning vehicles to move out of the travel lane. Trucks gain speed coming down the eastbound hill and have difficulty slowing for vehicles that are making a right turn onto S.R. 23.
- We suggest variable message signs to indicate when there's heavy fog.
- Street lights should be added to intersections to improve visibility.
- From 1000 West to 3200 West, S.R. 30 should include right-turn lanes and a center median to allow trucks to access businesses.
- Extend the left-turn lane into the Logan City Landfill. On weekends, vehicles turning left to go to the landfill back up into the S.R. 30 travel lane.
- There's no passing lane at the S.R. 30 railroad crossing at east of S.R. 23, so both buses and trucks carrying hazardous materials must stop in the travel lane before proceeding across the tracks. In heavy fog, this is very dangerous.

- The grade on S.R. 30 heading west from Beaver Dam Road is steep, and trucks pick up speed. We recommend adding signs to warn drivers of the steep grade.
- There should be no latent demand from truck use if road improvements are made, because S.R. 30 is the fastest route to I-15 and on to Tremonton or north to Idaho. There are no alternatives to using S.R. 30, and truck drivers use S.R. 30 despite the safety concerns.

4.3.3 Recreational Route Use

S.R. 30 across Cutler Marsh has become a recreational corridor. The highway between 3500 West and S.R. 23 is used to access the marsh for boating, fishing, hunting, birding, and other recreational pursuits.

Official Access Points to Cutler Marsh. PacifiCorp, under a licensing agreement from the Federal Energy Regulatory Commission, provides two official access points from S.R. 30 (see Figure 7).

- The first access point is the Cutler Marsh Marina, located at milepost 103. This site provides a boat ramp to the marsh and is a designated entry for a canoe trail. There is no left-turn lane into this site from S.R. 30, and there are no acceleration lanes on S.R. 30 when leaving the site.
- The second access point, located at milepost 105.4, provides access to the lower Logan River for fishing, canoeing, birding, and sightseeing. There are no right- or left-turn lanes into this site from S.R. 30 or acceleration lanes on S.R. 30 when leaving the site.

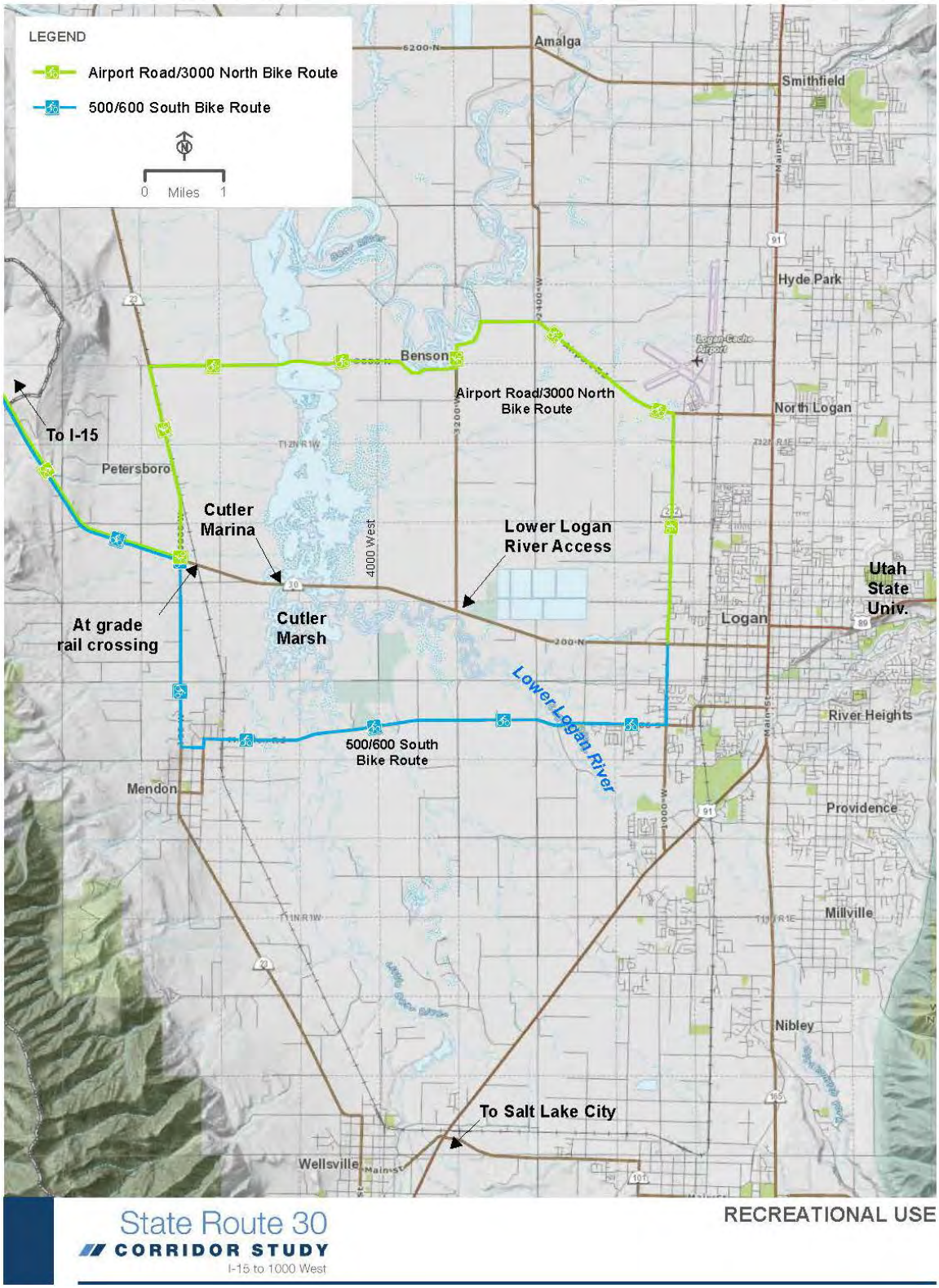
Boaters have said that it's unsafe to slow down in the S.R. 30 travel lanes to access either site and unsafe to accelerate into the S.R. 30 travel lanes when leaving either site.

Unofficial Access Points to Cutler Marsh. Birders, anglers, hunters, and other recreational users stop along the highway to access the marsh and the lower Logan River. Because there are no shoulders along S.R. 30 through the Cutler Marsh, it's unsafe for vehicles to pull onto the dirt embankment. Vehicles can't stop a safe distance from the highway or slow down or accelerate from or to the highway safely. Unofficial pullouts have been created along the highway in areas that aren't safe to access because of the lack of appropriate turn lanes. The unofficial accesses have also damaged the edge of the pavement and caused ruts along the pavement edge.

Another unofficial access point is the PacifiCorp site-management entrance at 4000 West. The entrance is used by PacifiCorp to maintain Cutler Marsh and move livestock to and from its property. Recreationalists park just off S.R. 30 at the locked gate to access Cutler Marsh. PacifiCorp has said that access to and from this entrance is very dangerous because there are no right- or left-turn lanes or shoulders to allow vehicles to slow down out of highway traffic.

Recreationalists (birders, anglers, and hunters) have said that additional safe recreational access points should be created on S.R. 30 through Cutler Marsh.

Figure 7. Recreational Uses in the Study Corridor



Cycling. Bicycling is a popular activity throughout Cache Valley. The scenic area is popular with recreational cyclists, tour groups, riding events, and racing events. About 10 major cycling events and numerous smaller events are held each year.

The Cache County Sheriff's Office said that a permit is required to hold a cycling event. Because of the lack of shoulders and unsafe conditions for cyclists, the Sherriff's Office does not permit cycling events on S.R. 30 even though the highway is the most convenient east-west travel corridor through Cache Valley.

In stakeholder interviews, members of Cache Valley's bicycling community said that they wanted to ride on S.R. 30, but few cyclists use the highway because of the lack of shoulders, unsafe conditions, and high-speed highway traffic, including trucks.

Because of the location of scenic Cutler Marsh along S.R. 30 and cyclists' desire to use the highway, the Cache MPO has included in the Cache County Regional Transportation Plan a proposed trail along S.R. 30 from 1000 West to S.R. 23 (Cache MPO 2015). S.R. 30 is considered an important connection for active transportation such as recreational and commuter bicycle traffic because it's the primary east-west route that provides direct access to Logan's downtown area and main population center. Additionally, S.R. 30 west of S.R. 23 is the only route for cyclists into or out of Cache Valley, so a continuous connection on S.R. 30 east of S.R. 23 into Logan is needed. This route is about 5.5 miles long.

An alternate route, 500 South/600 South, provides indirect access to S.R. 30 east of S.R. 23 in Cache Valley, but this route also lacks shoulders for cyclists and is about 8.3 miles (50% longer) than S.R. 30. To the north, Airport Road/3000 North provides indirect access east-west but also lacks shoulders and is about 13 miles (230% longer) than S.R. 30. Although both routes currently have low amounts of vehicle traffic, continued population growth in the county (see Section 4.1, Growth Trends) will result in more vehicle/bicycle conflicts.

UDOT received numerous comments during the stakeholder interviews in support of providing bicycle access on S.R. 30 and active transportation access (for example, walking and family bicycling opportunities) to Cutler Marsh from Logan. Given the high traffic speeds and heavy truck traffic on S.R. 30, the cycling community, Cache County, and Logan City commented on the need to provide a safe, separate shared-use path adjacent to S.R. 30 from 1000 West in Logan to S.R. 23.

Interview Comments. In interviews, stakeholders in the recreational community that uses S.R. 30 mentioned the following concerns:

- The lack of shoulders on S.R. 30, combined with high traffic speeds and heavy truck and vehicle use, make cycling unsafe.
- S.R.30 would be the most convenient east-west cycling route if the highway were to accommodate cycling use.
- If the highway were to accommodate bicycle travel, S.R. 30 could be used by bicycle commuters because S.R. 30 provides the most direct access to Logan and Utah State University.
- The cycling community preferred a separate shared-use bicycle path versus a wider shoulder because of the high-speed highway traffic.
- Anglers, hunters, and birders said that additional recreational pullouts along the lower Logan River and Cutler Marsh are needed to provide recreational opportunities, but the pullouts shouldn't be

placed in sensitive wetlands. Currently, recreational users pull out at locations that don't have designated access and no shoulder along S.R. 30, an action that's unsafe for the recreationalists and the vehicles traveling on the highway.

- Shoulders could invite unsafe and unlimited recreational access along S.R. 30. We prefer designated access points to key areas.
- Entering or exiting the Cutler Marsh Marina from S.R. 30 is difficult when hauling a boat.
- The speed limit on S.R. 30 through Cutler Marsh should be reduced to accommodate safe recreational access.
- Parking zones should not be added along S.R. 30, and recreational traffic should be focused into designated areas.
- Recreational access should be improved at 4000 West.

4.3.4 Transit

There are no transit routes on S.R. 30 from I-15 to 1000 West in Logan, and transit is not included in any of the long-range plans for the study corridor. Given the low-density development and dispersed population along S.R. 30, it would be difficult to operate an efficient transit system.

4.4 Safety

4.4.1 Roadway Elements

Several roadway elements of S.R. 30 between I-15 and 1000 West don't meet current design standards. These elements contribute to reduced traffic speeds and also lead drivers to expect typical road conditions, an expectation that can result in driver error. In addition, inadequate shoulder widths and clear zones create hazards for drivers whose vehicles stray from the travel lane or drivers who need to pull off the roadway during an emergency. Listed below are some of the design elements of S.R. 30 that don't meet current design standards.

I-15 to S.R. 13

- Lack of center turn lane from I-15 to S.R. 13.
- Lack of center turn lanes at some private drive locations and other access points throughout this segment.

S.R. 13 to S.R. 81 (4400 West)

- Lack of center turn lanes at access points throughout this segment.
- Inadequate shoulder widths at some locations.

S.R. 81 (4400 West) to S.R. 38

- Potential sight distance concern for traffic leaving the access to the Bear Hollow community and turning onto S.R. 30. UDOT might need to consider realigning the access if the sight distance is inadequate, because the bridge over the railroad tracks to the west is a constraint.
- Inadequate shoulder widths at some locations.
- Lack of right and left-turn lanes at 3200 West.

S.R. 38 to S.R. 23

- Sight distance issue for traffic turning from northbound S.R. 38 to westbound S.R. 30.
- Lack of center turn lanes at access points.
- Sight distance issue and substandard left-turn lane at S.R 30 and Beaver Dam Road (both the eastbound S.R. 30 left turn onto Beaver Dam Road and the westbound S.R. 30 left turn onto Early Park Road).
- Lack of center turn lanes at access points.
- Substandard shoulders and existing cut slope along the north side of S.R. 30 and west of 2100 North.
- Inadequate shoulder widths at some locations.

S.R. 23 to 3200 West

- No stop lane for buses and trucks at the railroad tracks.
- Lack of center turn lanes at access points.
- No left-turn lane provided for westbound S.R. 30 into the Cutler Marsh Marina access area.
- No left- or right-turn lanes for recreation access at 4000 West.
- No left-turn or right-turn lanes provided for the recreation access site for the lower Logan River.
- Inadequate clear zones and shoulder widths.
- Two bridges on S.R. 30 have deficiencies: structure E-558A, located about 4.8 miles west of Logan at milepost 104.2, and structure E-588D. Both bridges' parapets don't meet current design standards and have heavy fragmenting, chipping, and cracking with exposed reinforcing throughout.

3200 West to 1000 West

- Lack of center turn lanes from 3200 West to S.R. 252 at some locations.
- Inadequate clear zones and shoulder widths at some locations.
- Minimum curve radius at mileposts 105 and 107.2.

4.4.2 Crash Evaluation

This section summarizes a safety analysis (see Appendix D, Safety Technical Analysis) that was conducted for S.R. 30 from I-15 to 1000 West (Parametrix 2016a). Crash data were collected from 2011 through 2015 from UDOT's Traffic and Safety Division. The purpose of the safety analysis was to help UDOT better understand the safety concerns along S.R. 30 by evaluating crash data.

This section provides information related to determining improvements that are needed on S.R. 30. Crashes that don't indicate areas that need improvement are not discussed. For example, if a boat falls off a towing hitch and causes a crash, this doesn't indicate a roadway safety issue.

Crash Rates

Crash rates normalize crash frequencies by roadway volume in order to account for the fact that roadway segments with higher traffic volumes can be expected to have more crashes than lower-volume segments as a result of the increased vehicle conflicts. Table 3 summarizes the crash rates for segments of S.R. 30 and compares them to the statewide averages for roads with similar traffic volume and functional class.

Table 3. Crash Rates in the Study Corridor (2011–2015)

Segment	Average Annual Daily Traffic	Functional Class	Total Crashes	Actual Crash Rate [a]	Statewide Average Crash Rate [b]
I-15 to S.R. 13	3,082	Rural minor arterial	20	2.78	1.71
S.R. 13 to S.R. 81	5,643		11	0.86	
S.R. 81 to S.R. 38	6,211		30	1.48	
S.R. 38 to S.R. 23	7,167		80	0.83	
S.R. 23 to 3200 West	7,241		51	1.08	
3200 West to 1900 West	6,744	Rural principal arterial	30	1.44	1.35
1900 West to 1000 West	6,742	Urban principal arterial	53	4.18	2.74

Red indicates a crash rate higher than the statewide average.

[a] Crash rate per year per million vehicle-miles

[b] UDOT statewide average for roads with similar traffic volume and functional class (2009–2013)

As shown above in Table 3, three segments of S.R. 30 have higher crash rates than the statewide average for roads with similar traffic volume and functional class. Of note are the segments on the eastern and western ends of the study corridor where the crash rate is higher than the statewide average. Of the crashes recorded, about 49% occurred between S.R. 23 and 1000 West, though this area is only 37% of the corridor. Also, note that the majority of the crashes on the segment from I-15 to S.R. 13 occurred at the intersection of S.R. 30 and S.R. 13, which has a four-way stop sign. Other than the traffic signal at the eastern end of the

study corridor at 1000 West (about 15 miles away), this is the only location on the S.R. 30 mainline with a form of traffic control, so the stop sign can be an unexpected condition for drivers heading westbound on the highway.

In 2015, UDOT installed an overhead flashing light, advance-warning signs, and perimeter-flashing stop signs at this intersection. Since these features were installed, there have been zero crashes at the intersection. The high accident rate at the east end of the corridor is likely related to the numerous access points into businesses and government facilities.

Crash Attributes

The corridor study team compiled crash attribute summaries for the study corridor to provide an overall look at crash patterns and characteristics. Table 4 summarizes the crash attributes. As shown, wild-animal-related crashes account for about 1 in every 5 crashes on in the study corridor. Thirty-eight of the 67 wild-animal-related crashes occurred in a 4 mile stretch between S.R. 81 and Beaver Dam Road in Box Elder County. During a field review of the corridor, the study team did not see any wildlife warning signs or wildlife safety mitigation measures.

Table 4. Key Attributes of Crashes in the Study Corridor (2011–2015)

	Total Crashes	Wild Animal Related	Teen Driver Involved	Speed Related	Older Driver Involved	Overturn/ Rollover	Commercial Motor Vehicle	Distracted Driver	Drunk Driver
Crashes	314	67	54	39	31	30	28	26	9
Percent of total	100%	21%	17%	12%	10%	10%	9%	8%	3%

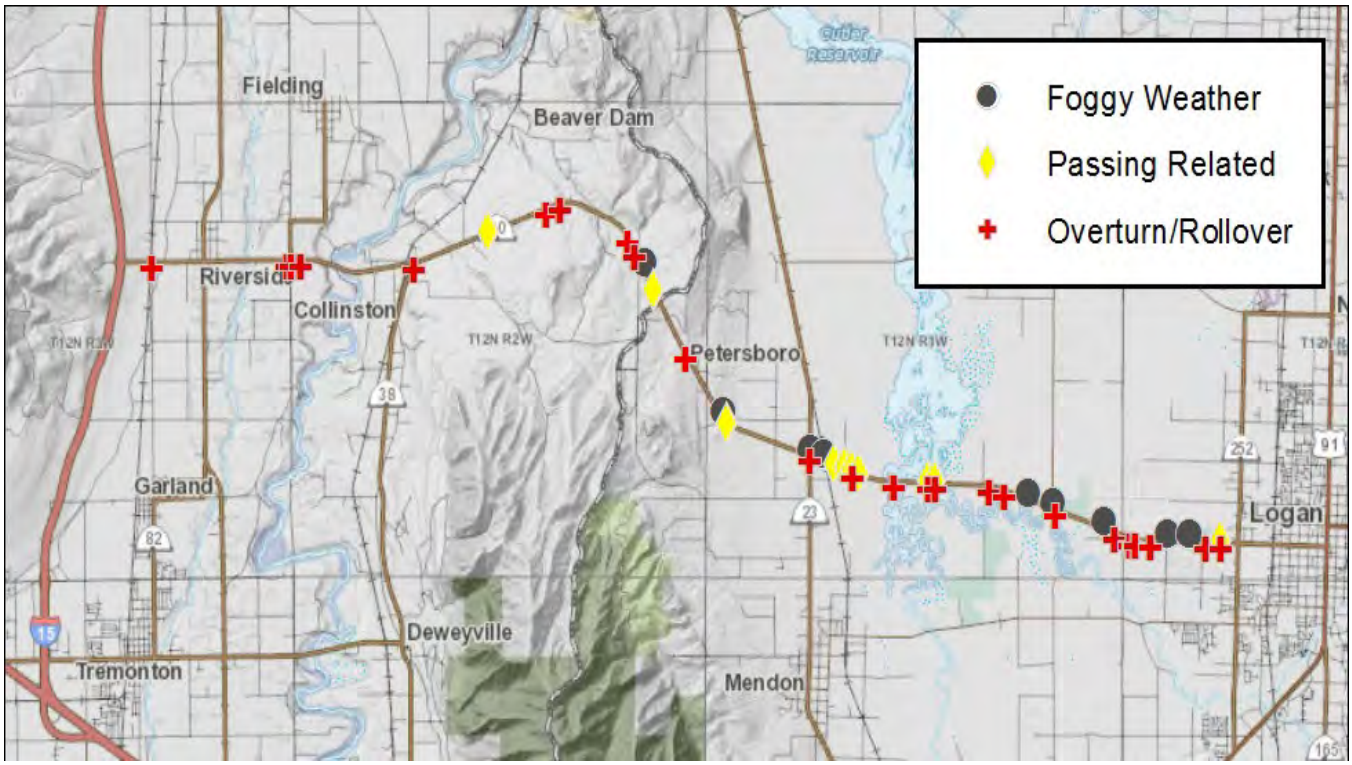
Foggy-weather crashes account for 11 of the crashes study corridor over 5 years. As expected, most of these crashes occurred in Cache Valley (see Figure 8). Most foggy-weather crashes on S.R. 30 involved a vehicle turning into or out of a side street or driveway.

The 5.8mile section of S.R. 30 between S.R. 23 and 1400 West has some challenging safety conditions. The lack of shoulders leaves drivers with little room to recover if they drift out of their lane or slide off the road in snowy or icy conditions. Of the 100 crashes in this segment, nearly half (43) involved a vehicle running off the road, and 15 of those 43 crashes resulted in the vehicle overturning or rolling over. Because of the steep side slopes and adjacent ditches, if vehicles do leave the roadway, they're very likely to overturn or roll over and cause greater injury to drivers and passengers.

The surrounding wetlands also contribute to frequent foggy weather. When cold air interacts with warmer water, fog is enhanced, which reduces visibility. There are no passing lanes, which further increases the potential for accidents. As shown in Figure 8, most rollover, passing, and fog-related accidents occur in this segment of the study corridor.

Lastly, S.R. 30 has a substantial amount of freight traffic, and 9% of crashes involved a commercial motor vehicle. These crash types are spread evenly throughout the study corridor.

Figure 8. Selected Types of Crashes in the Study Corridor (2011–2015)



Crash Hot Spots

The corridor study team analyzed the S.R. 30 corridor to identify crash "hot spots." Crash hot spots are helpful in identifying areas with a potential safety problem and determining where crash mitigation might be most effective. However, UDOT was careful to make sure that crash hot spots didn't simply reflect areas with greater traffic volumes. With this caveat in mind, five crash hot spots nevertheless stand out. Four of these hot spots are at intersections, and one is on a small curve just west of 1900 West.

- 6000 West/S.R. 30 intersection (Box Elder County)
- S.R. 13/S.R. 30 intersection (note that UDOT's improvements in 2015 have addressed the safety issues at this intersection)
- S.R. 81/S.R. 30 intersection
- S.R. 38/S.R. 30 intersection
- S.R. 23/S.R. 30 intersection
- Curve at milepost 107.2

Crash Summary

The study team evaluated the safety needs in the study corridor using several crash-analysis methods including an evaluation of fatal and serious-injury crashes, crash rates, and key crash attributes; a crash hot spot analysis, a field review of the corridor, and *Highway Safety Manual* methodologies (see Table 5). The safety needs between I-15 and S.R. 23 can be mitigated with small intersection improvements or the addition of safety-related signs or lighting, but the safety needs on the segment between S.R. 23 and 1000 West require substantial road modifications and the addition of shoulders for most of the segment and continuous turn lanes at the far eastern part of the segment.

The study team presents the safety recommendations in Table 5 for the S.R. 30 study corridor. Some improvements, such as adding lighting at intersections, should be considered at all intersections throughout the corridor.

Table 5. Safety Issues and Potential Recommendations

Location	Crash Rate above Statewide Average?	Crash Hot Spot?	Safety Issues	Potential Recommendations
I-15 to S.R. 23				
At-grade Railroad Crossing (milepost 94.14)			• No safety pullout, high-speed highway	• Consider shoulders or additional lanes for busses and hazardous material carrying vehicles to make mandatory stops at crossing outside of the main travel lane.
6000 West/ S.R. 30 intersection	✓	✓	• Numerous stop-sign-running crashes, mostly during dark conditions • Crash frequency higher than predicted in *Highway Safety Manual*	• Add intersection lighting • Consider upgrade to LED light flashing stop signs like at the S.R. 13 intersection
S.R. 13/S.R. 30 intersection	✓	✓	• Numerous stop-sign-running crashes • Numerous serious-injury crashes	• Recent improvements have corresponded with zero stop-sign-running crashes • Continue to monitor conditions
S.R. 81/S.R. 30 intersection		✓	• Stop-sign-running crashes, mostly during dark conditions	• Add intersection lighting • Consider upgrade to LED light flashing stop signs like at the S.R. 13 intersection
Bear Hollow Drive/S.R. 30 intersection			• Limited sight distance • Expected increase in traffic as development expands	• Add intersection warning signs on S.R. 30 to warn drivers of potential turning vehicles • Add intersection lighting

(*continued on next page*)

Table 5. Safety Issues and Potential Recommendations

Location	Crash Rate above Statewide Average?	Crash Hot Spot?	Safety Issues	Potential Recommendations
S.R. 38/S.R. 30 intersection		✓	• Short length of left-turn deceleration lane • Limited sight distance	• Lengthen left-turn deceleration lane • Add intersection lighting
Beaver Dam Road/S.R. 30 intersection			• Primary access point for community • Limited sight distance	• Add left-turn acceleration lane and connect to downstream eastbound passing lane • Add intersection lighting
S.R. 81 to Beaver Dam Road			• High concentration of wild-animal-related crashes	• Investigate comprehensive wildlife-mitigation strategies such as fences and designated crossing points
S.R. 23 to 1000 West				
S.R. 23/S.R. 30 intersection		✓	• Skew angle and presence of turn lanes increases crossing distance	• Realign S.R. 23 approaches to eliminate skew angle
At-grade Railroad Crossing (milepost 102.60)			• No safety pullout, high-speed highway	• Consider shoulders or additional lanes for busses and hazardous material carrying vehicles to make mandatory stops at crossing outside of the main travel lane.
Cutler Marsh Marina/S.R. 30 intersection			• No left-turn lane • Pattern of rear-end crashes from vehicles stopped to turn left from S.R. 30	• Add a left-turn lane on S.R. 30
3200 West/ S.R. 30 intersection			• No right-turn lane • Right-turn volumes meet UDOT threshold for right-turn lane	• Add a right-turn lane on S.R. 30 • Add intersection lighting
Milepost 107.2 curve		✓	• 2-foot shoulders, steep side slope, adjacent ditch • Frequent eastbound run-off-road crashes • Crash frequency higher than predicted in *Highway Safety Manual*	• Widen shoulders on south side of curve • Add chevrons to eastbound direction

(*continued on next page*)

Table 5. Safety Issues and Potential Recommendations

Location	Crash Rate above Statewide Average?	Crash Hot Spot?	Safety Issues	Potential Recommendations
S.R. 23 to 1900 West	✓		• Very narrow or nonexistent shoulders • Deep ditches and non-recoverable slopes • Frequent foggy conditions • No passing lanes • Frequent roadway departure and rollover crashes • Passing-related and foggy-weather crashes • Multiple serious-injury crashes • Crash frequency higher than predicted in *Highway Safety Manual from* 3200 West to 1900 West	• Widen shoulders • Add passing lanes • Add weather-advisory system
1900 West to 1000 West	✓		• Numerous access points and no left-turn lanes • Frequent rear-end and angle crashes • Crash frequency substantially higher than predicted in *Highway Safety Manual*	• Add continuous center turn lane • Consider access-management treatments to reduce or consolidate vehicle conflicts

4.4.3 Weather

Cache Valley has unique topographical and meteorological conditions that contribute to dense fog during the winter. The bottom of Cache Valley is about 4,500 feet above sea level, and the valley is almost entirely surrounded by steep mountains reaching over 9,000 feet above sea level that form a bowl around the valley. During the winter, sub-freezing temperatures, snow-covered ground, and stagnant high-pressure systems are common, resulting in dense fog formation and a strong temperature inversion over the valley. Although the Salt Lake Valley also has temperature inversions, Cache Valley is much smaller and narrower. These conditions can substantially reduce visibility and create ice on local roads, particularly over bridges.

Additionally, S.R. 30 crosses Cutler Marsh, which creates fog when cold air interacts with warmer water. This condition enhances fog and increases ice formation on bridges from late October through April when nighttime temperatures are below freezing. Because bridges are exposed to air on all of their surfaces (top, bottom, and sides), they cool faster than roads, which are exposed to air on the top surface only. This means that, when temperatures drop, bridges ice quicker than roads. Because of the frequent dense fog and potential for ice in the study corridor, these conditions need to be considered when planning potential roadway improvements.

Crash data show that fog-related crashes are most prevalent during the winter and during the morning when fog is most likely. Fog-related crashes are most common on rural undivided highways because the narrower right-of-way (narrow shoulders and no center median) doesn't provide an area for a driver to recover if their vehicle leaves the travel lane. Several roadway design features (for example, rumble strips and box dots) can improve drivers' perception during foggy conditions. Rumble strips give a driver a physical and audible

warning—even when the driver can't see the roadway centerline or edge-of-pavement line—that their vehicle is about to leave the travel lane. However, the lack of shoulders and center median on S.R. 30 makes it difficult to provide rumble strips. In addition, the lack of shoulders from S.R. 23 to 1000 West means that drivers can't pull over if they feel they can no longer drive safely (Hamilton and others 2014).

During the stakeholder interviews (see Section 3.1, Stakeholder Interviews), most stakeholders mentioned the dense fog across Cutler Marsh from October through about April. The heavy fog results in the following issues:

- Representatives from the Cache County Sheriff's Office and Highway Patrol said that they don't stop vehicles during foggy conditions because there are no shoulders for pulling vehicles over and, because of the reduced visibility, it isn't safe to work along the road.
- If an incident occurs, the Highway Patrol moves the vehicle off the roadway into the embankment or, if the vehicle can be moved, to a safe place it is moved to avoid stopping in the roadway.
- Several stakeholders said that, in heavy fog, it's difficult to see the roadway edge and, without a shoulder with a rumble strip, it's difficult to determine the edge of the pavement.
- Without left- or right-turn lanes at some access points, it's difficult for drivers to see vehicles slowing down or stopped in the travel lane to make a turn.
- Buses and certain trucks (for example, trucks carrying hazardous materials) are required to stop at the railroad tracks just east of S.R. 23. There is no pullout location at the railroad tracks, so the buses and trucks stop in the travel lane. Several stakeholders said that in the fog it's difficult to see stopped vehicles in the travel lane.
- UDOT Maintenance mentioned frequent road icing during fog.

Because of the fog and icy conditions on S.R. 30, these weather elements need to be considered when planning potential roadway improvements.

4.5 Lack of Roadway Capacity

This section provides an overview of level of service (LOS), the S.R. 30 level of service planning goals, and the existing capacity and level of service in the study corridor. Traffic volumes on S.R. 30 are compared with capacities to determine the current quality of service on the highway.

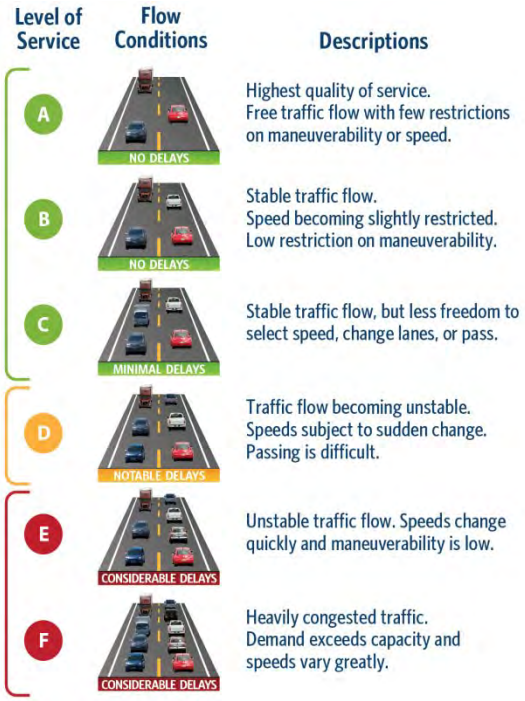
4.5.1 Level of Service

Level of Service Definition

Two-way rural roads such as S.R. 30 operate differently than multi-lane highways. Passing opportunities allow drivers to maintain their travel speed and therefore reduce their travel time. On two-lane roads, passing is possible only in the face of opposing traffic or where passing lanes are available. As traffic volumes increase in areas without passing lanes, so do the volumes in the opposing direction, reducing the opportunities to pass. When drivers experience delays from reduced travel speeds and a lack of passing opportunities, the level of service of the road deteriorates.

Level of service is graded on a letter scale from A to F, with A being the best level of service and F being the worst (see Figure 9). At LOS A, traffic flows freely, and drivers can select their desired travel speeds with ample passing opportunities. At LOS F, traffic flow is forced, the traffic volume has exceeded the capacity of the roadway to handle it, and there are no passing opportunities.

Figure 9. Levels of Service for Two-Lane Highways



Level of Service Planning Goals

To achieve UDOT's goal of optimizing mobility, proposed roadway projects are evaluated in terms of the road's modeled level of service. UDOT has set a goal of maintaining roads in rural parts of the state at LOS C or better. Therefore, LOS C was chosen as the threshold for determining whether capacity improvements are needed in rural areas (UDOT 2015b).

4.5.2 Existing (2016) and Future (2040) No-Build Levels of Service

This section summarizes a level of service analysis (see Appendix E, Capacity Analysis) that was conducted for S.R. 30 from I-15 to 1000 West (Parametrix 2016b and 2016c). The analysis looked at both highway segments and key intersections during the PM peak hour for the existing conditions in 2016 and for the no-build conditions (that is, define no-build conditions) in 2040.

What are the no-build conditions?

The no-build conditions are the conditions on S.R. 30 in 2040 assuming that all projects in the Cache MPO's Regional Transportation Plan and in UDOT's Long-Range Plan are built, except for projects on S.R. 30.

Existing (2015) Level of Service

For existing (2016) conditions, the analysis assumed the completion of a new passing lane project planned for summer of 2016 from west of Beaver Dam Road from about milepost (MP) 97.6 to MP 95.3 (see Figure 10). Additionally, the gap between the two existing westbound passing lanes on S.R. 30 between S.R. 23 and Beaver Dam Road will be completed in the summer of 2016, and the passing lane will be extended to begin at the S.R. 23 intersection.

Figure 10. Passing Lane Projects on S.R. 30 in 2016

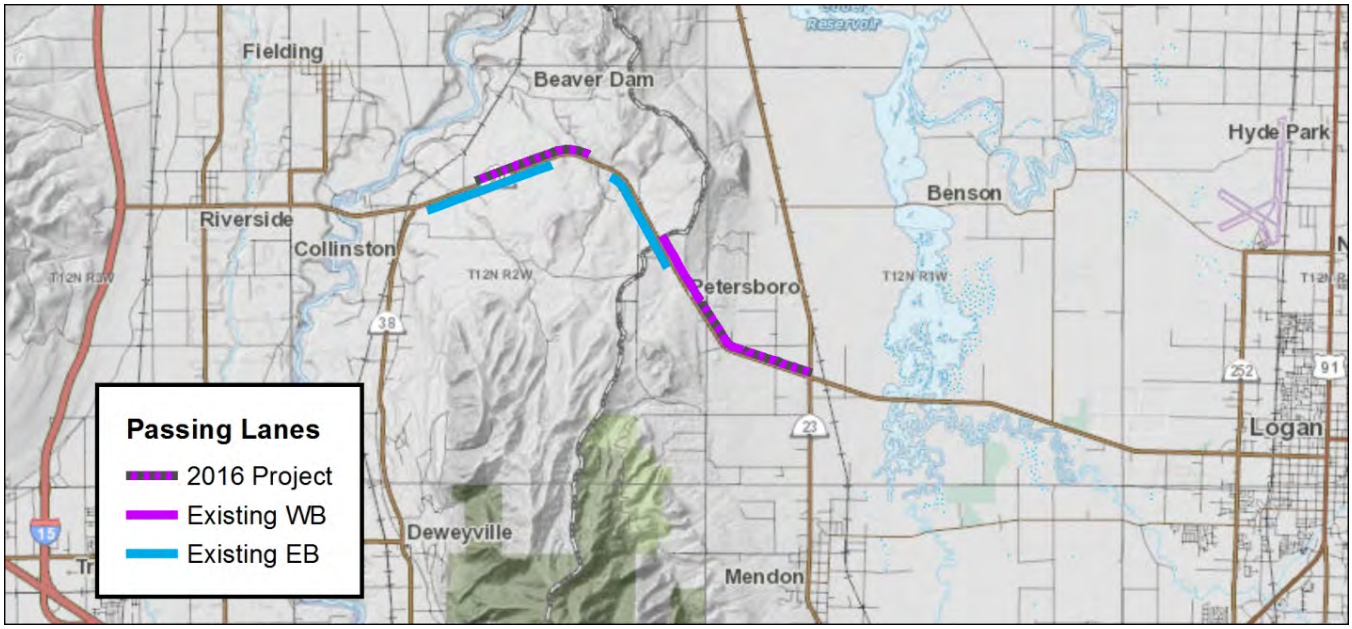


Table 6 summarizes the level of service on highway segments for the existing conditions, and Table 7 summarizes the level of service at intersections (also see Figure 11 on page 37). As shown by the tables, most segments of S.R.30 currently function at LOS C or better. All analyzed intersections also operate at acceptable levels.

What is the PM peak hour?

The PM peak hour is the 1-hour period of the afternoon during which there is the greatest number of vehicles on the roadway system.

The only area operating at LOS D is westbound S.R. 30 between S.R. 23 and 1900 West (MP 107.62). This segment of S.R. 30 has the heaviest single-direction volumes in the entire corridor. During the PM peak hour, there is a strong westbound directional flow of traffic out of Logan as many drivers return home from commercial and employment centers in Cache Valley. In addition, there are no passing lanes in this entire segment.

Table 6. Level of Service on Segments of S.R. 30 in the PM Peak Hour for Existing (2015) Conditions

Direction	Segment	LOS
Eastbound	MP 90.62 (I-15) to 91.85 (S.R. 13)	C
	MP 91.85 (S.R. 13) to 95.13 (S.R. 38)	C
	MP 95.13 (S.R. 38) to 98.02	A
	MP 98.02 to 102.37 (S.R. 23)	B
	MP 102.37 (S.R. 23) to 105.92	C
	MP 105.92 to 107.62	C
	MP 107.92 to 108.15	C
	MP 108.15 to 108.65 (1000 West)	C
Westbound	MP 108.65 (1000 West) to 108.15	C
	MP 108.15 to MP 107.62	C
	MP 107.62 to 105.92	D
	MP 105.92 to 102.37 (S.R. 23)	D
	MP 102.37 (S.R. 23) to MP 97.60	A
	MP 97.60 to 94.95 (S.R. 38)	A
	MP 94.95 (S.R. 38) to 91.85 (S.R. 13)	C
	MP 91.85 (S.R. 13) to 90.62 (I-15)	B

LOS D through F do not meet UDOT's goal of LOS C for rural highways.

Table 7. Level of Service at Intersections on S.R. 30 in the PM Peak Hour for Existing (2015) Conditions

Intersection	Intersection Type	Worst Approach	Average Control Delay (seconds/vehicle)	LOS
S.R. 13 / S.R. 30	All-way stop-controlled	Not applicable	10	A/B
S.R. 38 / S.R. 30	Minor-leg stop-controlled	Northbound	11	B
S.R. 23 / S.R. 30	Minor-leg stop-controlled	Southbound	15	B/C
3200 West / S.R. 30	Minor-leg stop-controlled	Southbound	15	B/C
1400 West / S.R. 30	Minor-leg stop-controlled	Northbound	12	B
1000 West / S.R. 30	Signalized	Not applicable	15	B

Future (2040) No-Build Level of Service

For future conditions, the analysis used 2040 as the planning horizon because 2040 is the planning horizon for both the Cache MPO's Regional Transportation Plan (Cache MPO 2015) and UDOT's Long-Range Plan (UDOT 2015b). The analysis of level of service under the no-build conditions in 2040 assumed that all projects in the Cache MPO's Regional Transportation Plan and in UDOT's Long-Range Plan would be built, except for projects on S.R. 30.

Table 8 and Table 9 summarize the levels of service on highway segments and at intersections, respectively, for the future (2040) no-build conditions. In the tables, **red** indicates a segment or intersection that wouldn't operate at least LOS C, which is UDOT's goal for rural highways.

Table 8. Projected Level of Service at Segments on S.R. 30 in the PM Peak Hour for Future (2040) No-Build Conditions

Direction	Segment	LOS
Eastbound	MP 90.62 (I-15) to 91.85 (S.R.13)	D
	MP 91.85 (S.R.13) to 95.13 (S.R. 38)	D
	MP 95.13 (S.R. 38) to 98.02	B
	MP 98.02 to MP 102.37 (S.R. 23)	C
	MP 102.37 (S.R. 23) to 105.92	D
	MP 105.92 to 107.62	D
	MP 107.92 to 108.15	E
	MP 108.15 to 108.65 (1000 West)	F
Westbound	MP 108.65 (1000 West) to 108.15	F
	MP 108.15 to MP 107.62	E
	MP 107.62 to 105.92	E
	MP 105.92 to 102.37 (S.R. 23)	D
	MP 102.37 (S.R. 23) to 94.95 (S.R. 38)	B
	MP 94.95 (S.R. 38) to 91.85 (S.R. 13)	D
	MP 91.85 (S.R. 13) to 90.62 (I-15)	C

LOS D through LOS F do not meet UDOT's goal of LOS C for rural highways.

For the future (2040) no-build conditions, a few intersections are projected to operate at LOS F, including the S.R. 23/S.R. 30 intersection, the future western arterial/S.R. 30 intersection, and the 1000 West/S.R. 30 intersection. The failure (LOS F) at the S.R. 23/S.R. 30 intersection reflects increased cross traffic on S.R. 30 as well as increased use of S.R. 23 as a north-south corridor in Cache Valley. The failure (LOS F) at the urban signalized intersections at the western arterial and 1000 West is a surrogate for failure for the entire urban S.R. 30 segment from 1900 West to 1000 West, since intersections are the constraint.

Table 9. Projected Level of Service at Intersections on S.R. 30 in the PM Peak Hour for Future (2040) No-Build Conditions

Intersection	Intersection Type	Worst Approach	Average Control Delay (seconds/vehicle)	LOS
S.R. 13 / S.R. 30	All-way stop-controlled	Not applicable	12	B
S.R. 38 / S.R. 30	Minor-leg stop-controlled	Northbound	12	B
S.R. 23 / S.R. 30	Minor-leg stop-controlled	Northbound	> 50	F
3200 West / S.R. 30	Minor-leg stop-controlled	Southbound	20	C
Western arterial (1400 West) / S.R. 30	Signalized	Not applicable	60	E
1000 West / S.R. 30	Signalized	Not applicable	> 80	F

Figure 12 on page 38 illustrates the level of service analysis for the no-build conditions. By 2040, almost all rural segments of S.R. 30 that do not have passing lanes are projected to operate at LOS D or worse. In contrast, the segment between S.R. 38 and S.R. 23, which currently has passing lanes in both directions, is projected to operate at LOS C or better.

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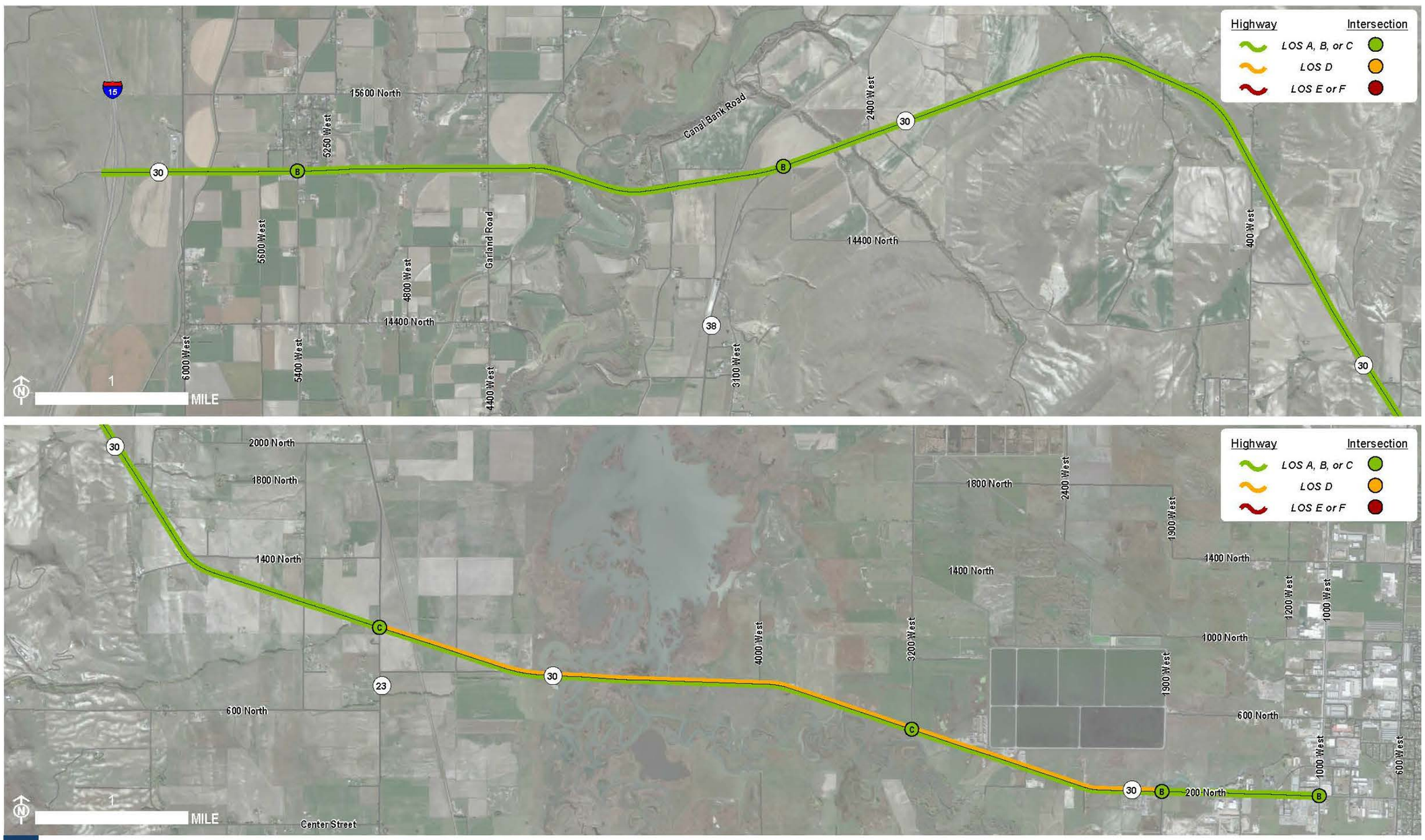
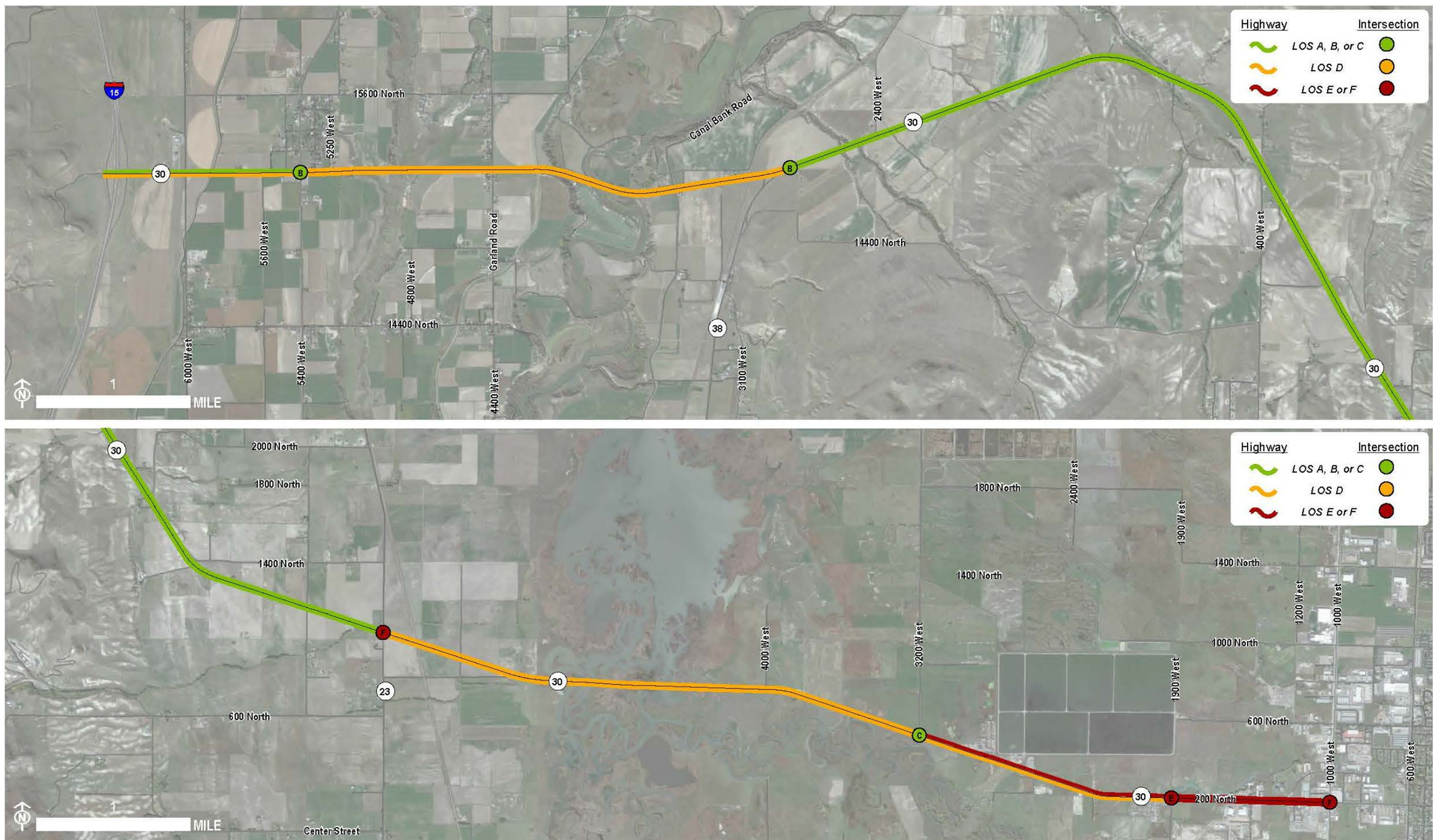
Figure 11. Levels of Service on S.R. 30 in 2015



S.R. 30 2015 LEVELS OF SERVICE (LOS)
I-15 TO S.R. 252

Figure 12. Projected Levels of Service on S.R. 30 2040



State Route 30
CORRIDOR STUDY
I-15 to 1000 West

S.R. 30 2040 LEVELS OF SERVICE (LOS)
I-15 TO S.R. 252

5.0 Identified Potential Improvements Needed for the S.R. 30 Corridor

UDOT conducted a detailed stakeholder interview and technical analysis process to determine the improvements that are needed in the S.R. 30 corridor from I-15 to 1000 West in Logan. The purpose of the corridor study was to help UDOT determine the roadway improvement projects that are needed, prioritize the projects, and determine the type of environmental documents that will be required for the projects.

5.1 Potential Recommended Projects

Table 10 lists potential recommended roadway improvements (projects) in the S.R. 30 study corridor along with the type of improvement. Figure 13 on page 43 shows the locations of these improvements along with the segments and intersections on S.R. 30 that are not projected to meet UDOT's level of service goal of LOS C for rural highways in 2040. The segments and intersections that are not projected to meet this goal need highway capacity improvements, such as adding additional passing lanes or widening the highway from two to four lanes. The type of capacity improvement will be evaluated by UDOT in subsequent analysis to this corridor study.

In addition to the specific projects listed in Table 10 below, other general items to consider include:

- Add intersection lighting at all major intersections and right- and left-turn lanes as necessary.
- Improve overall access control by limiting access to S.R. 30.
- Reduce speed limits on S.R. 30 when approaching the four-way stop sign at the intersection with S.R. 13.
- Add a natural snowdrift fence on S.R. 30 2 miles east of S.R. 38.

Table 10. Potential Recommended Projects in the S.R. 30 Study Corridor

Location	Type of Improvement		Potential Recommended Project
I-15 to S.R. 23			
I 15 to S.R. 13 eastbound	Capacity		Add additional roadway capacity.
S.R. 13 to S.R. 38 eastbound and westbound	Capacity		Add additional roadway capacity.
Milepost 91.3	Railroad crossing		Add pullout for school buses.
6000 West / S.R. 30 intersection	Intersection		Add intersection lighting.
S.R 81 / S.R. 30 intersection	Intersection		Add additional intersection lighting and stop ahead warnings on S.R. 81.
	Shoulder		Inadequate shoulders west of intersection through bridge used by schoolchildren. Widen shoulders.
Bear Hollow Drive / S.R. 30 intersection	Intersection		Add intersection lighting and warning signs.
3200 West / S.R. 30 intersection	Intersection		Add right and left-turn lanes and intersection lighting.
S.R. 38 / S.R. 30 intersection	Intersection		Add intersection lighting and lengthen left-turn lane.
Beaver Dam Road / S.R. 30 intersection	Intersection		Add intersection lighting and improve intersection geometry.
S.R. 81 to Beaver Dam Road	Wildlife/Snow		Reduce wildlife strikes with fences and wildlife crossing locations. Add a snowdrift fence 2 miles east of S.R. 38.

(*continued on next page*)

Table 10. Potential Recommended Projects in the S.R. 30 Study Corridor

Location	Type of Improvement		Potential Recommended Project
S.R. 23 to 1000 West			
S.R. 23 to 1000 West eastbound and westbound	Capacity		Add additional roadway capacity.
S.R. 23 / S.R. 30 intersection	Capacity		Improve intersection capacity.
S.R. 23 / S.R. 30 intersection	Intersection		Improve intersection geometry.
Milepost 102.6	Railroad crossing		Add pullout for school buses.
Cutler Marsh Marina / S.R. 30 intersection	Intersection		Add left-turn lane.
3200 West / S.R. 30 intersection	Intersection		Add intersection lighting and right-turn lane.
Milepost 107.2 curve	Curve		Widen shoulders and add sign to warn of alignment change.
S.R. 23 to 1900 West	Shoulders		Widen shoulders, add weather alert system for fog, add turn lanes to access points, and consider bicycle safety.
	Recreation access and bike safety		
	Turn lanes		
	Weather		
1900 West to 1000 West	Access		Add continuous left-turn lane, improve right-turn lane access to businesses, and add shoulders.
1400 West (western arterial) / S.R. 30 intersection	Capacity and access		Improve intersection capacity. Improve access to city transfer station.
1000 West / S.R. 30 intersection	Capacity		Improve intersection capacity.

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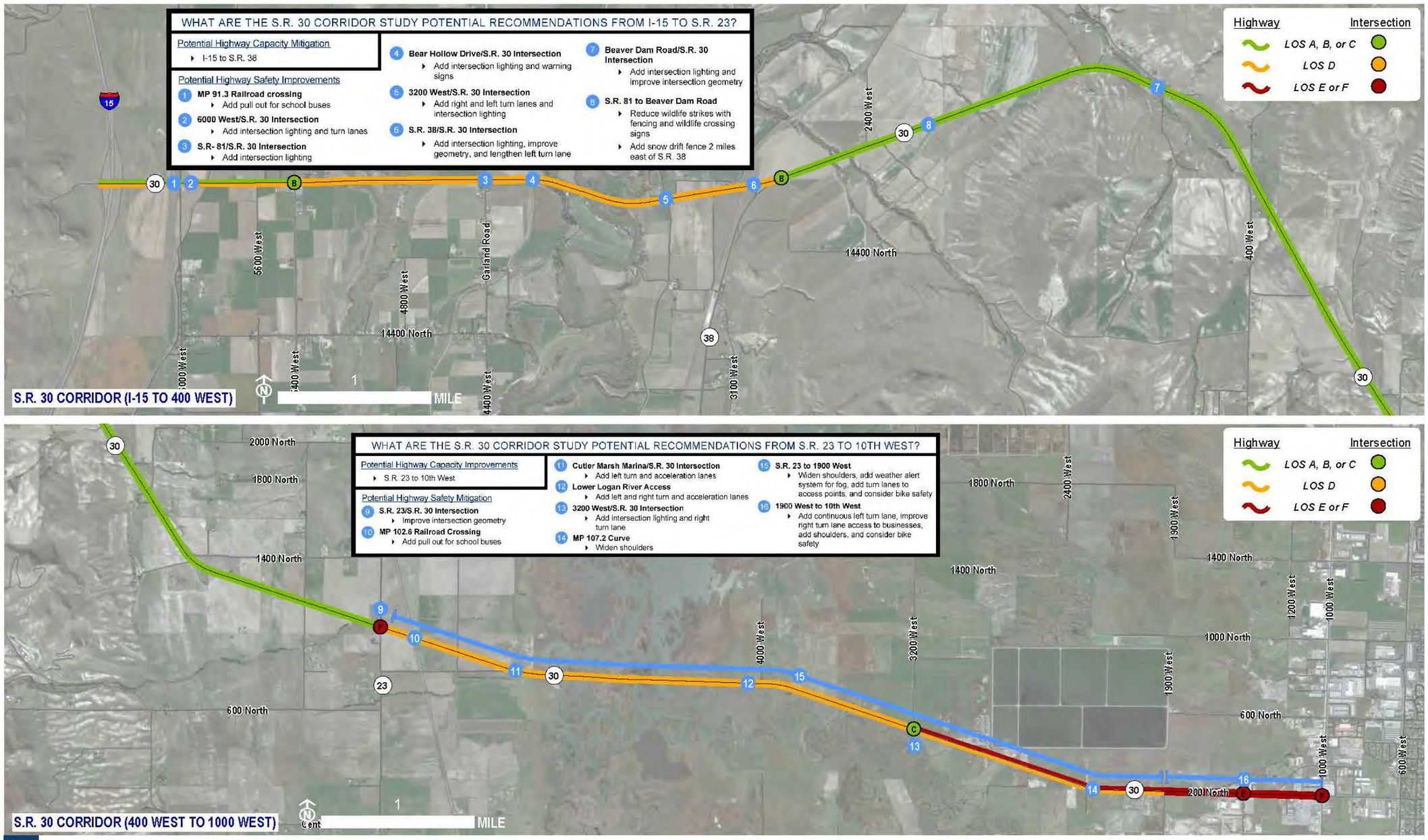
Figure 13. S.R. 30 Corridor Study Recommendations



State Route 30
CORRIDOR STUDY
I-15 to 1000 West

S.R. 30 CORRIDOR STUDY RECOMMENDATIONS
I-15 TO S.R. 252

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5.2 Future Environmental Documents

UDOT reviewed the list of recommended projects in Table 10 above and considered the type of project, the surrounding environment, and logical termini for each recommended improvement. The evaluation of logical termini is intended to ensure meaningful evaluation of alternatives and avoid commitments to transportation improvements before they're fully evaluated. The project evaluated in each environmental document shall:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Have independent utility or independent significance, that is, be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

5.2.1 I-15 to S.R. 23

Minor potential spot improvements and capacity improvements were identified for the segment of S.R. 30 from I-15 to S.R. 23. Based on the criteria in Section 5.2, Future Environmental Documents, UDOT determined that the potential recommendations for minor spot improvements (for example, intersection restriping, additional signs, or minor intersection realignments) would have independent utility to address local safety concerns that would not require additional transportation improvements and would not force immediate transportation improvements on the remainder of S.R. 30.

For the capacity improvements, the segments from I-15 to S.R. 13 (eastbound) and from S.R. 13 to S.R. 38 (both directions) would have independent utility, would not require additional transportation improvements, and would not force immediate transportation improvements on the remainder of S.R. 30. The spot improvements for each of the above segments should be made at the time of capacity improvements. No other reasonably foreseeable transportation improvements were identified.

The potential spot improvement projects include:

- MP 91.3 rail crossing
- 6000 West intersection
- Bear Hollow Drive
- S.R. 81 intersection
- S.R. 38 intersection
- Beaver Dam Road intersection
- S.R. 81 to Beaver Dam Road – wildlife crossing signs and fencing

5.2.2 S.R. 23 to 1000 West

The segment of S.R. 30 from S.R. 23 to 1000 West requires substantial improvements along the entire segment. In this segment, much of the highway doesn't meet the design requirements for roadway shoulders and doesn't have appropriate turn lanes into high-traffic businesses. These deficiencies have resulted in above-average crash rates and serious accidents. Several emergency services providers said that this segment of highway is unsafe and can't be properly patrolled by law enforcement because of the lack of shoulders. The level of service analysis shows that in 2040 this entire segment would operate at LOS D through F, would not meet UDOT's goal of LOS C, and would require some type of capacity improvement.

Improvements on this segment to address these issues would be reasonable and would allow the highway to operate efficiently even if no additional improvements were made, and the improvement would not force immediate transportation improvements on the remainder of S.R. 30 west of S.R. 23 (the segment west of S.R. 23 currently has two westbound lanes to the Cache County–Box Elder County border). Additionally, improving this segment of S.R. 30 wouldn't restrict alternatives for other reasonably foreseeable transportation projects west of S.R. 23 or east of 1000 West.

The only reasonable foreseeable project was identified in a corridor study that was conducted to evaluate the potential realignment of S.R. 30 near 1000 West. Any of the needed improvements to address the safety and capacity improvements would not restrict any alternatives identified in that study.

The main issue with this segment is the potential effects on wetlands and threatened and endangered species. The project would be long enough to address any potential impacts to these resources without restricting future transportation improvements outside this segment.

For the segment of S.R. 30 from S.R. 23 to 1000 West, UDOT proposes to move forward with a NEPA document to evaluate potential alternatives to improve the safety and capacity of the highway. UDOT will determine the type of environmental document following this corridor study. Based on the evaluation in this corridor study, the draft purpose of the project would be as follows:

The purpose of the project is to meet projected traffic demands, improve public safety, and meet other identified project needs for a 6-mile stretch of S.R. 30 between S.R. 23 and 1000 West in Cache County, Utah. Specifically, the purpose is to:

- Meet UDOT's goal of LOS C for rural highways on as much of the highway as possible.
- Meet UDOT's safety requirements (such as lane and shoulder widths, access, and sight distance) for all roadway users including passenger and freight vehicles, bicyclists, pedestrians, and recreational users during all weather conditions.
- Provide improved opportunities for bicyclists, pedestrians, and roadside recreational users.

6.0 References

[Cache MPO] Cache Metropolitan Planning Organization

2015 Cache County, Utah, Regional Transportation Plan 2040.

Envision Utah

2010 Envision Cache Valley Final Report and Toolkit.

[GOMB] Utah Governor's Office of Management and Budget

2012 Baseline population projections.

Hamilton, B., B. Tefft, L. Arnold, and J. Grabowski

2014 Hidden Highways: Fog and Traffic Crashes on America's Roads. Published by the AAA Foundation for Highway Safety. November.

Parametrix

2016a S.R. 30 Safety Analysis Memorandum. May 2016.

2016b S.R. 30 travel modeling. May 2016.

2016c S.R.30 Capacity Analysis Memorandum. May 2016.

[UDOT] Utah Department of Transportation

2008 Box Elder Emerging Area Plan. December.

2011 Utah's Unified Plan 2011 to 2040.

2015a Utah Freight Plan. November.

2015b 2015–2040 Long-Range Transportation Plan: Transportation in Utah's Rural Areas.

2015c S.R. 30 Corridor Study, I-15 to S.R. 252, project S-R 199(185). July.

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A

Stakeholder Interview Materials

Identifying Improvements on State Route 30

State Route 30
CORRIDOR STUDY
I-15 to 1000 West

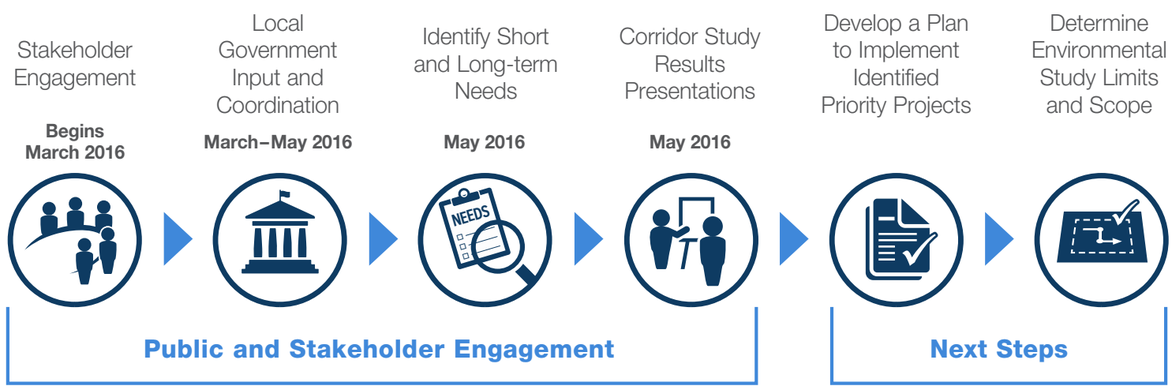
WHAT IS THE S.R. 30 CORRIDOR STUDY?

The Utah Department of Transportation is conducting a corridor study on 17.54 miles of State Route 30 (S.R. 30 or Valley View Highway) from Interstate15 (I-15) to Logan 1000 west (10th West or SR-252). UDOT recognizes the importance of the S.R. 30 corridor to the communities within Box Elder and Cache counties and is committed to meeting the short and long-term needs of the traveling public while ensuring the continued efficiency of this important route. The purpose of the corridor study is to identify and document areas that may need operational and safety improvement. Once the needs of the corridor are identified UDOT will make recommendations for the next steps to implement improvements.

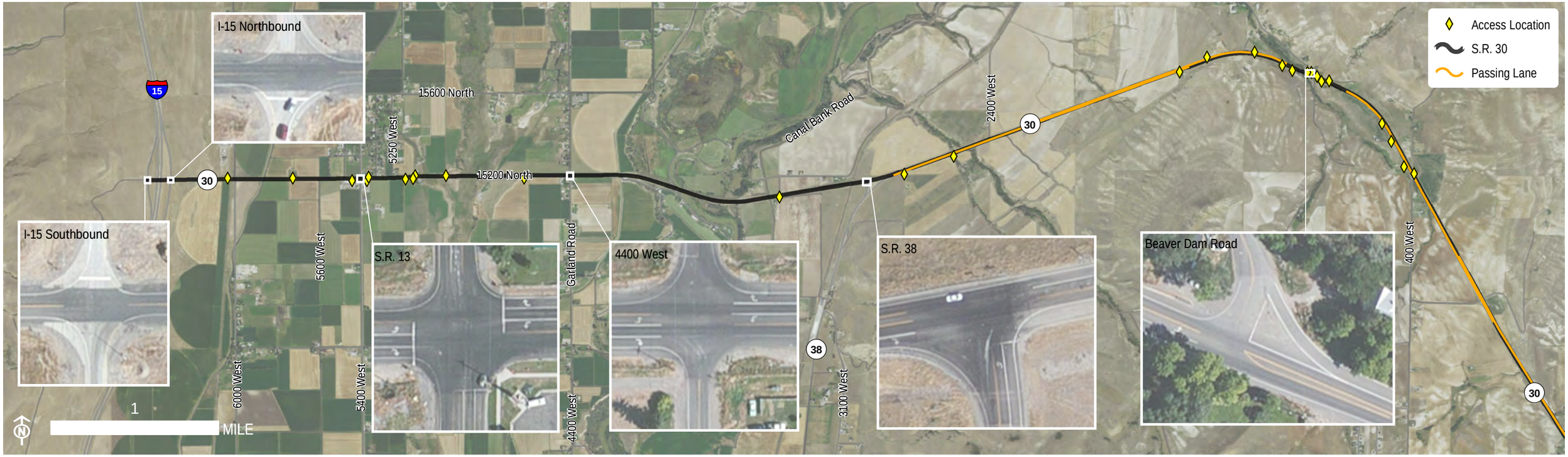
HOW TO PROVIDE INPUT INTO THE STUDY PROCESS:

Input from stakeholders that use the corridor for personal travel and those that rely on the route for business activities and economic development is critical to the corridor study. As part of the study, UDOT will reach out to key stakeholders to identify what they feel are important issues in corridor operation. If you have specific concerns, please provide your comments to SR30study@utah.gov or use the attached map and provide the completed form to the project team.

WHAT IS THE CORRIDOR STUDY SCHEDULE AND NEXT STEPS?



S.R. 30 CORRIDOR (I-15 TO 400 WEST)



PHONE (435) 554-1136 **EMAIL** SR30study@utah.gov **WEB** udot.utah.gov/SR30study

State Route 30
CORRIDOR STUDY
I-15 to 1000 West

S.R. 30 FACTS

- Classified as a **two-lane rural arterial**
- 7 miles of eastbound and 4 miles of westbound **passing lanes**
- Identified by UDOT as a **critical trucking route** and freight route —14% of the traffic is trucks
- Eight main **intersections**
- About 50 personal, public, and commercial **access points**
- 11 bridge or **crossing structures**
- 2014 Average **daily traffic** ranges from 3,000 to 7,500.

WHAT ISSUES WILL BE CONSIDERED IN THE CORRIDOR STUDY?

ENVIRONMENTAL CONSIDERATIONS

- Culter Marsh
- Wetlands
- Wildlife
- Sensitive plant and animal species
- Air and water quality
- Farmland
- Canal operations
- Noise
- Cultural resources
- Recreational access and opportunities
- Economic development

PHYSICAL CONSIDERATIONS

- Roadway shoulders
- Weather
- Sight distance
- Access points
- Intersections
- Adjacent property impacts

OPERATIONAL CONSIDERATIONS

- Safety
- Crashes
- Travel delay and congestion
- Roadway capacity
- Passing lanes
- Turning lanes
- Freight corridor considerations
- Maintenance

GET ON THE MAILING LIST

To be added to the study mailing list, please provide your contact information

Name: _____

Email: _____

Mailing Address: _____

_____

_____

S.R. 30 CORRIDOR (400 WEST TO 1000 WEST)

PHONE (435) 554-1136 **EMAIL** SR30study@utah.gov **WEB** udot.utah.gov/SR30study

State Route 30
CORRIDOR STUDY
I-15 to 1000 West

UDOT project number S-R199(185)

Stakeholder Interview Form

Date: _____

Name/Organization_____

Address _____

Name/Representing	**Phone**	**Email address**
Project Team		

1. **Corridor Use:** Please describe how you use the SR 30 Corridor, such as commuting (work or school), trucking/goods transport and delivery, personal, recreational, regular destinations, other.

2. **SR 30 Roadway/Corridor Operational Conditions Issues/Concerns:** Such as congestion, traffic speed, safety, emergency stopping, passing, turns, signage, maintenance, environmental, accident data, etc.

3. **SR 30 Roadway/Corridor Physical Conditions Issues/Concerns:** Such as lane capacity, turn lanes, passing lanes, surface condition, sight distance, shoulder width, drainage, signage, right of way, environmental, etc.

4. **Adjacent Property Issues:** Issues on or affecting adjacent properties that might be addressed with project improvements, such as access, utilities, drainage, parking, pedestrian access and signage, etc.

5. **Future development:** If applicable, are you aware of any future plans for changes to adjacent property/facilities or planned operational changes that may affect roadway operation or access? Such as new or removed development, access changes, changes in traffic volume, etc. If so, what and when?

6. **Other Issues and Comments:**

S.R. 30 Stakeholder Interview Highlights

March 9, 2016

Stakeholder interviews were conducted from February 29 to March 9, 2016 by the study team with representatives from the entities and organizations listed below. Each representative was given an overview of the study process and an opportunity to review the corridor maps and basic corridor conditions. Comments were invited regarding issues for any or all of the categories shown below.

- Agriculture Community
- Cycling Community
- Cache County Chamber of Commerce
- Cache County Sheriff
- Emergency Service Providers
- Environmental Groups
- Logan City and Cache County
- Cache County Metropolitan Planning Organization
- PacifiCorp
- The Trucking Industry
- Utah State University
- County and state Road Maintenance

1) Corridor Uses

- Commuters, trucks and local traffic between 10th West and S.R. 23

2) Physical/Operational Conditions

I-15 to S.R. 13

- 6000 West access lacks turn lanes on S.R. 30
- North/south traffic on 6000 West misjudges speed on S.R. 30 coming downhill from I-15 or fail to stop at intersection

S.R. 13 to S.R. 38

- Limited sight distance at Bear Hollow Drive

S.R. 38 to Beaver Dam Road

- S.R. 38 / S.R. 30 northbound to eastbound is a dangerous merge

Beaver Dam Road to S.R. 23

- Limited sight distance and skewed intersection at Beaver Dam Rd
- Congestion at Beaver Dam Road caused by S.R. 30 west bound narrowing from passing lane to two lane highway.
- Limited sight distance and skewed intersection at 1400 North

S.R. 23 to 3500 West

- Safety concerns due to narrow roadway and lack of shoulders
- Heavy fog is prevalent in the Cutler Marsh area creating very limited sight distance and unsafe conditions when vehicles slow or stop due to lack of shoulders, passing lanes, pullouts and at RR crossing (for buses and hazmat vehicles)

- Lack of pull out or passing lane at railroad crossing requires buses and hazmat trucks to stop in the high speed travel lane which is dangerous especially in heavy fog
- Unsafe for patrol / enforcement/ respond to emergencies/maintenance due to lack of shoulders and pullouts
- Unsafe recreation parking along roadway because lack of shoulders and safe access
- Conflicts between agricultural/slow vehicles and through traffic due to lack of additional lane or shoulder
- Lack of designated pullouts for emergency or recreation use
- Congestion / Car/truck conflicts along Cutler Marsh
- Lack of / inadequate sized left & right turn lanes at high-use intersections and access points
- Lack of left and right turn lanes to recreation access sites
- Unsafe for bicyclists due to lack of shoulders, designated facility and debris on roadway
- Lack of designated / separated bike pathway
- Lack of road edge markings for night travel and during frequent heavy fog
- Cross drainage under roadway is insufficient in some areas
- The entire highway across the marsh should be reconstructed. The road has many potholes and no road base. For many of the locations it is just mud under the pavement
- Box culverts are not protected by railing and should be replaced
- Snow Plow maintenance is difficult/unsafe because of narrow lanes
- Recreational parking along the road damages the edge of pavement and causes deep ruts adjacent to S.R. 30 which become difficult to repair
- With lack of shoulders any road maintenance requires closure of one lane of traffic

<u>3500 West to 10th West</u>

- Lack of designated pullouts for emergency vehicles
- Congestion / Car/truck conflicts
- Lack of / inadequate sized left and right turn lanes at high-use intersections and access points
- Lack of passing / slow vehicle lanes
- Lack of designated / separated bike pathway
- Safety concerns due to narrow roadway and lack of shoulders
- Unsafe for bicyclists due to lack of shoulders, designated facility and debris on roadway
- Unsafe for patrol / enforcement/emergency response/maintenance due to lack of shoulders and pullouts
- Unsafe recreation parking along roadway. The most used unofficial recreational access is along the S.R. 30 bridge over the marsh
- Difficult curves at milepost 105 and near Humane Society. Vehicles leave the roadway at these locations. Need to improve signage

3) Adjacent Property Uses

- Mixed use development from 10th West to 1900 W causes car / truck conflicts and congestion
- Agricultural use and accesses causes intermittent conflicts (delays and unsafe turning movements) between cars and agricultural vehicles
- Unofficial PacifiCorps access at 4000 West. Slow moving maintenance/cattle trucks enter/exit road at this location and the access is used by hunters

- Lower Logan River fishing access occurs along S.R. 30. Need to add more designated pull outs. DWR walk-in access at 2700 West could use improving and parking space

4) Future Development

- Logan City is in final design on improvements to it's wastewater treatment facility near 2300 W and plans to begin operation of the new plant in 2020. Access will be 1,000 feet west of DWR gun safety center
- Future development between Cutler Marsh and S.R. 23 is limited due to poor water quality
- Future commercial development is likely to be closer to 10th West (east of 1900 West), rather than further west
- New subdivision is planned south of S.R. 30 at Box Elder/Cache County line
- Lack of sewer plant and water connections limits large subdivisions west of Cutler Marsh in Cache County.

5) Other Issues / General Comments

- S.R. 30 is the only NW route when Sardine Canyon is closed
- S.R. 23 to I-15 generally functions well, with the exception of minor sight distance issues
- The most significant needs are between 10th West and S.R. 23
- The primary needs are to enhance safety, not capacity
- A safe east/west connection via a separated facility is desired by the bike community; at least from 10th West to S.R. 23
- Environmental impacts to implement needed safety improvements may be acceptable, but should be minimized
- Safe access to adjacent recreation sites should be expanded to limit unofficial access points
- Passing lanes and pullouts are needed through the Marsh area
- Adequate left and right turn lanes are needed at all high use intersections and access points
- Need to limit or restrict unofficial parking along S.R. 30 through marsh area as it is a safety concern. Provide more official parking areas to improve safety and overall recreational access.

Identifying Improvements on State Route 30

State Route 30
CORRIDOR STUDY
I-15 to 1000 West

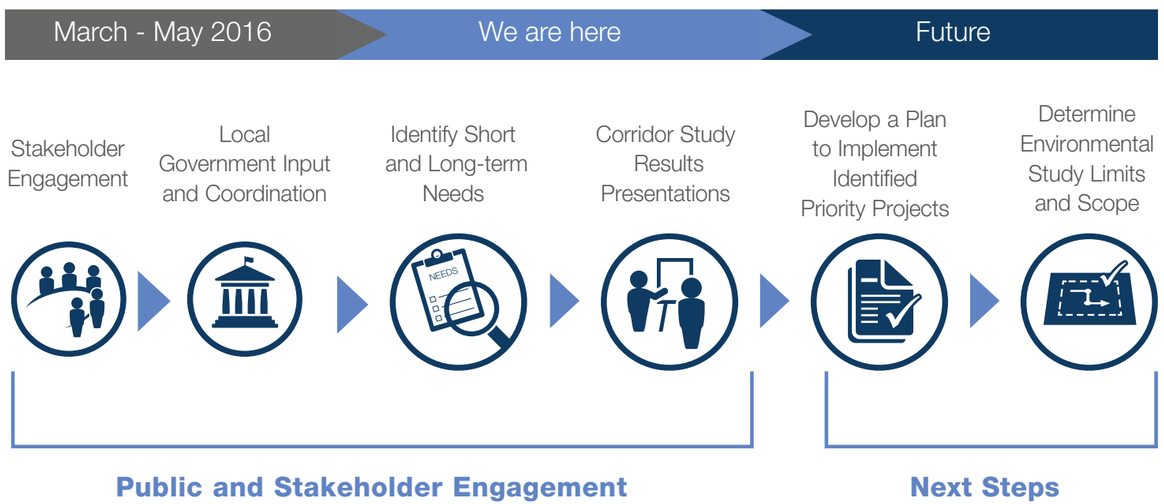
WHAT IS THE S.R. 30 CORRIDOR STUDY?

The Utah Department of Transportation conducted a corridor study on 17.54 miles of State Route 30 (S.R. 30) from Interstate 15 (I-15) to Logan 1000 West (10th West or S.R. 252). UDOT recognizes the importance of the S.R. 30 Corridor to the communities within Box Elder and Cache counties and is committed to meeting the short and long-term needs of the traveling public while ensuring the continued efficiency of this important route. A targeted public engagement program was conducted as part of the S.R. 30 Corridor Study. The purpose of the outreach effort was to seek input from key stakeholders, local governments, state and federal agencies with associated opportunities for input from the general public. Specific input was invited on the locations that need improvement along the corridor and environmental concerns from those improvements. The study also included analysis of safety data and current and projected future traffic volumes. This fact sheet documents the results of the study and preliminary draft recommendations to improve the S.R. 30 Corridor.

HOW TO PROVIDE INPUT INTO THE STUDY PROCESS:

Input from stakeholders that use the corridor for personal travel and those that rely on the route for business activities and economic development is critical to the corridor study. If you have specific concerns or would like to provide comments to these draft recommendations, please send them to SR30study@utah.gov or use the attached map and provide the completed form to the project team.

WHAT IS THE CORRIDOR STUDY SCHEDULE AND NEXT STEPS?



WHAT ARE THE S.R. 30 CORRIDOR STUDY POTENITAL RECOMMENDATIONS FROM I-15 TO S.R. 23?

Potential Highway Capacity Mitigation

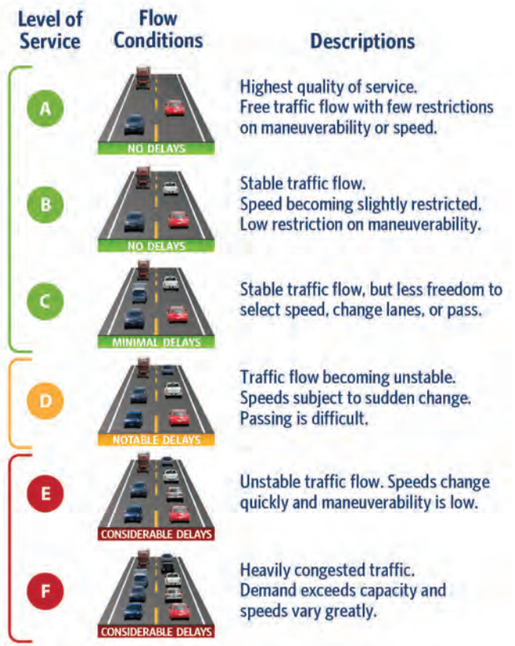
- I-15 to S.R. 38

Potential Highway Safety Improvements

1. **MP 91.3 Railroad crossing**
   - Add pull out for school buses
2. **6000 West/S.R. 30 Intersection**
   - Add intersection lighting and turn lanes
3. **S.R- 81/S.R. 30 Intersection**
   - Add intersection lighting
4. **Bear Hollow Drive/S.R. 30 Intersection**
   - Add intersection lighting and warning signs
5. **S.R. 38/S.R. 30 Intersection**
   - Add intersection lighting, improve geometry, and lengthen left turn lane
6. **Beaver Dam Road/S.R. 30 Intersection**
   - Add intersection lighting and improve intersection geometry
7. **S.R. 81 to Beaver Dam Road**
   - Reduce wildlife strikes with fencing and wildlife crossing signs

PHONE (435) 554-1136 **EMAIL** SR30study@utah.gov **WEB** udot.utah.gov/SR30study

LEVELS OF SERVICE
for Two-Lane Highways



WHAT SEGMENTS OF S.R. 30 NEED TO HAVE ADDITIONAL HIGHWAY LANES?

To determine where highways need additional lanes, UDOT uses a guideline called level of service (LOS). Level of service is graded on a letter scale from A to F, with A being the best level of service and F being the worst (see graphic to the left). UDOT has set a goal of maintaining two-lane highways in rural parts of the state (like S.R. 30) at LOS C or better. Therefore, LOS A through C are acceptable operating conditions for rural highways, and LOS D through F are unacceptable. If a rural highway operates at LOS D through F, UDOT considers adding additional travel lanes to improve traffic operations.

The orange (LOS D) and red (LOS E and F) segments of S.R. 30 on the map show where UDOT needs to consider highway capacity improvements to S.R. 30, such as adding passing lanes or widening the highway from two to four lanes. The type of capacity improvement will be evaluated in future studies.

Based on projected 2040 traffic volumes, and in order to achieve the desired LOS (as shown on the map), the following segments of S.R. 30 need highway capacity improvements:

- I-15 to S.R. 38
- S.R. 23 to 10th West

WHAT ARE THE NEXT STEPS FOR THE S.R. 30 CORRIDOR?

Based on the type of safety and highway capacity improvements identified in the corridor study, UDOT has determined that S.R. 30 can be evaluated in segments.

I-15 to S.R. 23. UDOT will look at making spot improvements in this segment of S.R. 30 to address identified safety and capacity needs. Improvements in this segment can be evaluated independently, which will allow individual projects to move forward more quickly. UDOT will prioritize projects based on future funding and the identified need.

S.R. 23 to 10th West. This segment of S.R. 30 has numerous safety issues, and the entire segment needs to be evaluated for additional capacity (adding passing lanes or widening the highway from two to four lanes). Addressing both safety and capacity will require reconstructing the highway from S.R. 23 to 10th West, plus consideration for facilities to safely accommodate bicycles. These types of improvements could affect wetlands and sensitive wildlife species. Therefore, starting in summer of 2016, UDOT will begin an environmental study to evaluate potential alternatives for the improvements, analyze potential environmental impacts, and identify appropriate recommended improvements.

State Route 30
CORRIDOR STUDY
I-15 to 1000 West

GET ON THE MAILING LIST

To be added to the study mailing list, please provide your contact information

Name: _____

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_____

_____

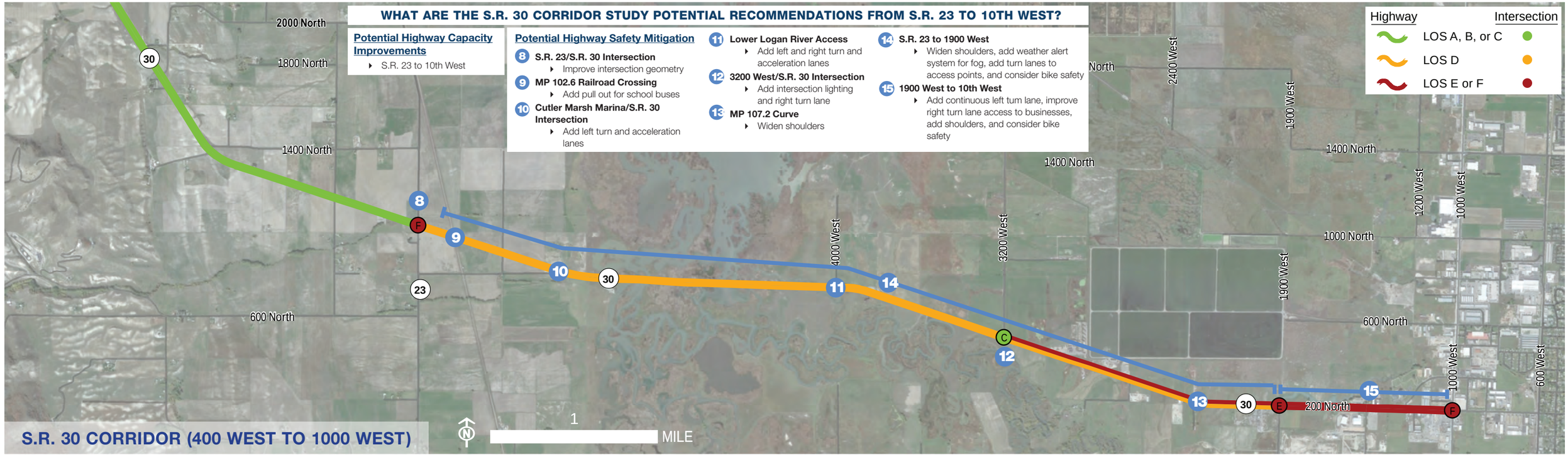
WHAT ARE THE S.R. 30 CORRIDOR STUDY POTENTIAL RECOMMENDATIONS FROM S.R. 23 TO 10TH WEST?

Potential Highway Capacity Improvements

- S.R. 23 to 10th West

Potential Highway Safety Mitigation

8. **S.R. 23/S.R. 30 Intersection**
   - Improve intersection geometry
9. **MP 102.6 Railroad Crossing**
   - Add pull out for school buses
10. **Cutler Marsh Marina/S.R. 30 Intersection**
   - Add left turn and acceleration lanes
11. **Lower Logan River Access**
   - Add left and right turn and acceleration lanes
12. **3200 West/S.R. 30 Intersection**
   - Add intersection lighting and right turn lane
13. **MP 107.2 Curve**
   - Widen shoulders
14. **S.R. 23 to 1900 West**
   - Widen shoulders, add weather alert system for fog, add turn lanes to access points, and consider bike safety
15. **1900 West to 10th West**
   - Add continuous left tum lane, improve right turn lane access to businesses, add shoulders, and consider bike safety



S.R. 30 CORRIDOR (400 WEST TO 1000 WEST)

PHONE (435) 554-1136 **EMAIL** SR30study@utah.gov **WEB** udot.utah.gov/SR30study

S.R. 30 Corridor Study

UDOT project number is S-R199(185)

Comment Form 2: Study Recommendations

Date: _____

Name/Organization_____

Address _____

Email _____ Phone _____

After reviewing the S.R. 30 Corridor Study Recommendations from the handout or presentation, please provide comments below and return the completed form to the email address listed at the bottom of the form.

1. **I-15 to S.R. 23:** Please provide comments on the S.R. 30 Corridor Study recommendations for the area between I-15 and SR 23. Please be as specific as possible noting the specific location for your comment, such as the intersection or corridor area.

_____

_____

_____

_____

_____

2. **S.R. 23 to 1000 West:** Please provide comments on the S.R. 30 Corridor Study recommendations for the area between SR 23 and 1000 West. Please be as specific as possible noting the specific location for your comment, such as the intersection or corridor area.

_____

_____

_____

_____

_____

3. **Other Issues and Comments:**

_____

_____

_____

_____

B

News Articles

Study underway on S.R. 30 in Cache, Box Elder counties

Published: Monday, Feb. 29 2016 11:55 a.m. MST
Updated: Monday, Feb. 29 2016 11:58 a.m. MST

Summary

The Utah Department of Transportation is conducting a corridor study to evaluate short- and long-term transportation needs for state Route 30 in Cache and Box Elder counties.

OGDEN — The Utah Department of Transportation is conducting a corridor study to evaluate short- and long-term transportation needs for state Route 30 in Cache and Box Elder counties.

UDOT is conducting the study on just over 17 miles of state Route 30 from I-15 to Logan's 1000 West. The corridor is an important travel and trucking route for the communities of Box Elder and Cache counties, as well as regionally.

"The purpose of the corridor study is to identify and document areas that may need operational and safety improvement as traffic continues to grow," UDOT project manager Rodney Terry said in a statement.

Terry said there is the potential that the study could be adopted into future National Environmental Policy Act documents that may be prepared to address potential corridor improvements. He said that as part of the process, the study team will be making presentations to local government councils and commissions, as well as to many nongovernmental organizations.

Members of the community with specific concerns can provide comments to the study at SR30study@utah.gov.

Comments

UDOT studying SR-30 for possible future improvements

Staff Report Mar 3, 2016

The Utah Department of Transportation is conducting a corridor study on State Route 30 in order to “identify and document areas that may need operational safety improvement as traffic continues to grow,” UDOT Project Manager Rodney Terry said.

The study is spread over 17 miles of the major road, aka Valley View Highway. The study stretches from SR-30’s intersection with Interstate 15 in Box Elder County to 1000 West in Logan.

“UDOT is committed to meeting the short- and long-term needs of the traveling public while ensuring the continued efficiency of this important route,” Terry said in a UDOT news release.

The future of SR-30 has been discussed by lawmakers, state officials and the public over the past decade, some of whom desire to see the road widened to better accommodate the traffic in and out of the west side of Cache Valley. UDOT listed projects for SR-30 on its four-year Long-Range Transportation Plan funding priority list in 2015.

However, UDOT officials have said concerns about environmental impacts, particularly around Cutler Reservoir, which SR-30 cuts through, are a significant element to be considered.

There is a potential the SR-30 Corridor Study could be used in future environmental documents that may be prepared to address corridor improvements, Terry said. The process will include making presentations to local government councils and commissions and many non-governmental organizations.

“We hope that when these meetings appear on the agenda, that the public will take the opportunity to attend them and learn more about the study, too,” Terry said the news release.

UDOT is asking for input from stakeholders that travel on the corridor, and also from those that rely on the route for business and industrial activities and economic development. Key stakeholders will be contacted for their views on important issues.

Members of the public can communicate their specific concerns and comments for the study by email: SR30study@utah.gov.

UDOT to release preliminary results of S.R. 30 study

Published: Thursday, May 19 2016 5:45 p.m. MDT
Updated: 16 hours ago

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Summary

The Utah Department of Transportation will release the preliminary results of a corridor study of state Route 30 from Logan to Riverside during a series of meetings in late May and early June.

LOGAN — The Utah Department of Transportation will release the preliminary results of a corridor study of state Route 30 from Logan to Riverside during a series of meetings in late May and early June.

The meetings will be held at 5 p.m. Tuesday, May 24, at the Cache County Courthouse, 199 N. Main; 5 p.m. Wednesday, June 1, at the Box Elder County Courthouse, 1 S. Main, Brigham City; 5 p.m. Monday, June 6, and 5:30 p.m. Tuesday, June 7, at Logan City Hall, 290 N. 100 West. The public is invited to attend.

“UDOT recognizes that the S.R. 30 corridor is an important travel and trucking route for the communities within Box Elder and Cache counties, and the purpose of the study is to identify the short- and long-term operational and safety improvement needs of the corridor,” Rodney Terry, UDOT project manager, said in a statement.

Terry said the study team has conducted targeted outreach to a wide variety of key stakeholders, user groups, local governments and interested organizations to identify outstanding issues and needs of the corridor. He said the process also included a technical assessment of safety data, and current and projected future traffic volumes to help determine any areas that may be in need of capacity improvements through 2040.

For more information about the study, go to udot.utah.gov/SR30study. Comments on the study and the preliminary recommendations can be submitted via email to SR30study@utah.gov.

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Legislature to study impact of... 90
LDS Church condemns sexual assault as... 34
Pleasant Grove woman dies in crash... 28
Housing pressure puts the squeeze on... 24
Gov. Gary Herbert says 'tone' of... 19
Utah lawmakers pass resolution against... 19
Former U. football player sues NCAA,... 15
Utah Justice Tom Lee on Trump's list of... 15

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SR-30 Roadway Under Consideration

By LOGAN DZATKO • 16 HOURS AGO

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UDOT.UTAH.GOV

Listen
1:30

Click here to listen to the audio story

Northern Utah government and transportation officials are gathering public comment to determine what changes are needed to improve the Valley View Highway. The state road provides a direct connection for travelers from Cache Valley to I-15.

The Utah Department of Transportation has completed the first phase of its corridor study of SR-30, which goes from Logan to Riverside. UDOT will meet with local governments in Cache and Box Elder counties to explain the preliminary findings in late May and early June.

UDOT says that SR-30 is a well-traveled road and would like to make changes to it without harming the environment, said Vic Saunders, regional communications manager for UDOT.

“It goes across the Cutler Marsh, that’s an area that’s very sensitive and so we also want to be sensitive to that."

Saunders also said that in order to preserve the environment, UDOT took samples of the soil, water and shrubbery. It’s also looking to widen the road and make it safer for trucks and civilian vehicles, especially during the winter.

“It’s only two lanes.Iit’s very narrow, [and] there are only two shoulders on it and a lot of places there aren’t any shoulders at all. And so we’ve taken into account what could be done. We've looked at several areas along the road in Cache Valley and another in Box Elder County where spot improvements could be made that would be immediate,” said Saunders

UDOT is currently releasing only preliminary results. Saunders hopes to see a positive outcome from the meetings so UDOT can continue researching ways to improve the road.

“We are looking for the best possible solution, with the least amount of impact that will move the most people.”, said Saunders

TAGS: UDOT (/TERM/UDOT) SR-30 (/TERM/SR-30) VIC SAUNDERS (/TERM/VIC-SAUNDERS)

CUTLER MARSH (/TERM/CUTLER-MARSH) ROAD CONSTRUCTION (/TERM/ROAD-CONSTRUCTION)

CACHE VALLEY (/TERM/CACHE-VALLEY) BOX ELDER COUNTY (/TERM/BOX-ELDER-COUNTY)

I-15 (/TERM/I-15)

UDOT announces SR-30 corridor study results

By From The Tremonton Leader May 28, 2016

The Utah Department of Transportation has completed the first phase of its corridor study of SR-30 from Logan to Riverside and will be meeting with local government entities in Cache and Box Elder counties to explain the preliminary findings in late May and early June.

In January, UDOT began conducting a corridor study on just over 17 miles of SR-30 from Interstate 15 to Logan's 1000 West (SR-252).

Rodney Terry, UDOT project manager, provided comment on the study results in a statement.

"UDOT recognizes that the SR-30 corridor is an important travel and trucking route for the communities within Box Elder and Cache counties, and the purpose of the study is to identify the short- and long-term operational and safety improvement needs of the corridor," Terry states.

The study team has conducted targeted outreach to a wide variety of key stakeholders, user groups, local governments and interested organizations to identify outstanding issues and needs of the corridor, according to Terry. He states the process also included a technical assessment of safety data and current and projected future traffic volumes to help determine any areas that may be in need of capacity improvements through the planning horizon of 2040.

"The team has combined the input from stakeholders with the technical data gathered to identify a number of priority improvements for specific locations on the corridor, as well as looked into the needs of broader corridor, itself," he states.

Before UDOT finalizes its recommendations for corridor improvements and an implementation plan, presentations will be made to local governments. Upcoming meetings include: Cache Municipal Planning Organization, 5 p.m. June 6, Logan Municipal Council Chambers; Logan City Council, 5:30 p.m. June 7, Logan Municipal Council Chambers; with

Box Elder County commissioners 5 p.m. June 1, the Box Elder County Courthouse. The public is invited to attend these meetings to learn about the recommendations and provide comment.

UDOT presented the study findings already with the Cache County Council on May 24.

C

Stakeholder Interview Notes

Meeting Notes

State Route 30 CORRIDOR STUDY I-15 to 1000 West

Stakeholder Interview – Agricultural Community

3/1/2016 –11:00 a.m.

1. **Attendance and Location**
   a. List of attendees:

Name	Representing	Email
Larry J. Olsen	The Ranch	HatJRanch@cu-w.com
Clark E. Israelsen	USU Extension	clark.israelsen@usu.edu
Vince Izzo - HDR	HDR	vincent.izzo@hdrinc.com
Rob Smith	Cache County Farm Bureau Federation	rob@dtsattorneys.com

   b. Location – Logan City Offices

2. **Corridor Use**
   a. Move farm equipment on S.R. 30 from just east of S.R. 23 to west of S,R. 23.
   b. Need shoulder wide enough to accommodate farm equipment. Need 16 feet wide to accommodate farm equipment
   c. Bring equipment to 1400 West. Occurs twice a year a couple of times of day.
   d. Now travel on Sunday morning to avoid heavy truck.

3. **Operational Conditions Issues/Concerns:**
   a. Canal at Benson turn off needs to be accommodated.
   b. Very foggy at Cutler March. Need acceleration lanes on Benson turnoff. Fog makes it difficult to get across road. Fog is a very common occurrence. The road does ice from fog.
   c. 3200 West is very well traveled. Need deceleration lane to turn right from S.R. 30 onto Benson Road. Very dangerous.
   d. Major route for livestock going to JBS. About 20 to 30 trucks a day. Need to accommodate the truck traffic. Some of the cattle trucks come from Canada.

4. **Corridor Physical Conditions Issues/Concerns:**
   a. There are bicyclists that use the route and it is very unsafe as they ride in the travel lane.
   b. Need rumble strips because of dense fog.
   c. Very common for slow moving farm equipment to move along the road. About 20 farmers use the road.

d. Culvert on 1900 West does not allow water to flow to farm fields. Culvert was constructed to high

5. Adjacent Property Issues:

a. Benson Cow pasture canal is on the north side of the road. Culvert on 1900 West does not allow water to flow to farm fields. Culvert was constructed to high.

6. Future Development:

a. N/A

7. Other Issues

a. N/A.

The meeting was adjourned at 11:45 am.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – Bike Community

3/3/2016 – 8:30 a.m.

1. Attendance and Location

a. List of attendees:

Name	Representing	Email
Dayton Crites	Cache County Trail Planner	
Paul Rogers	Citizen/Biking Community	
Mike Pepper	KMP	
Sean Keenan	Citizen/Biking Community	
Bob Bayn	Citizen/Biking Community	
Ben Jarris	Citizen/Biking Community	
Vince Izzo	HDR	

b. Location – Logan City Offices

2. Corridor Use

a. Biking in the Cache Valley.

3. Operational Conditions Issues/Concerns:

a. From the Cache County perspective S.R. 30 is in the trail plan as having a future separated bike path. The County would like to ensure that UDOT consider the separate path in any future environmental document. The County trail planner (Dayton Crites) will assist in coordinating with the biking community.

b. Does the state really want to include a bike facility? Or is this meeting just to placate the bike community?

c. S.R.30 is one of the few continuous east-west routes to provide regional connectivity for long bike rides. There are only 3 or 4 east-west roads that provide an east-west connection across the valley and none of the roads provide adequate places to ride. .

d. Currently bikes don't take S.R. 30 because it is too dangerous.

e. The group noted the best solution would be a separate bike path along S.R. 30 that could accommodate multiple uses such as families and the serious bicyclist.

f. S.R. 30 could be a bike commuting route for travel to work.

g. Will a separate bike path be needed to accommodate recreational bicyclists as well as high speed bicyclist that commute or are out for exercise? Can a path be built to accommodate both?

h. Need commuting connectivity to downtown Logan and the University. S.R. 30 would provide connection from the west side of the valley to the east side of the valley.

i. The group agreed that a bike facility similar to Legacy Parkway should be considered.

j. Bikes don't use S.R. 30 because lack of shoulder, heavy truck use, and high speeds.

k. It is important to connect to 3200 West to ride north. Ultimately the separated bike path should go to S.R. 23 or the entire way to I-15.

l. There is no place in the valley where a family can ride securely and S.R. 30 would provide that route. S.R. 30 has scenic and recreational value and connectivity to town.

4. Corridor Physical Conditions Issues/Concerns:

a. . People in Logan may not support impacts to wetland for a separate bike path.

b. The group did not like the option of using a shoulder on S.R. 30 to bike because it accumulates debris and the high speeds and truck traffic will still make the route dangerous to use.

c. The shoulder on S.R. 30 west of S.R. 23 has shoulders but the shoulders have debris and are narrow.

d. The group noted that the current shoulders in the county need better maintenance.

5. Adjacent Property Issues:

a. Could improvements to the abandoned rail line north of S.R. 30 that connects to Benson be made? The old rail bridge crosses Cutler Marsh.

6. Future Development:

a. N/A

7. Other Issues

a. Other routes have less traffic and vehicle speeds but still have narrow travel lanes and lack shoulders.

b. The bike community has general interest in the health and welfare of the valley.

c. Need to think differently about land use and how people drive to reduce vehicle use.

d. As the modeling is done think differently on what alternatives should be considered. Such as more transit or bike paths.

e. Could a trail be put on Mendon Road instead of S.R. 30?

f. The number of competitive or charitable rides has increased dramatically in the Cache Valley.

g. The group noted that there is a large biking community in Cache Valley,

h. There is a high level of interest to use a bike route along S.R. 30 for the biking events

i. Families would like to ride to the two PacifiCorps recreational sites on S.R. 30.

The meeting was adjourned at 9:30 am.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – Cache County Sheriff

3/2/2016 –4:00 p.m.

1. Attendance and Location

a. List of attendees:

Name	Representing	Email
Chad Jensen	Cache Co. Sheriff	
Mike Pepper	KMP	
Matt Bilodeau	Deputy Sheriff	
Vince Izzo	HDR	

b. Location – Cache County Offices

2. Corridor Use

a. Emergency service providers along S.R. 30.

3. Operational Conditions Issues/Concerns:

a. On S.R. 30 the Sheriff responds to accidents and also does traffic control. Much depends on location of UHP in Valley. The Sheriff noted they respond more to S.R. 30 incidents than UHP.

b. The route get's heavy truck traffic (mostly cattle trucks).

c. If there is an accident traffic lanes have to be closed.

d. For minor accidents when vehicles are still drivable the Sheriff will ask the vehicles to drive into Logan so they can do the report in safe conditions.

e. During fog events the road will ice quickly. If the wind is blowing which is common the road will also ice quickly because of the moisture from Cutler Marsh.

f. The intersection of S.R. 23 and S.R. 30 has a higher level of accidents. At this intersection vehicles use the shoulders as a park and ride which obstructs sight distance. Should be signed no parking to force cars to use the UDOT park-and-ride.

g. Need turn lanes from 10th West to S.R. 23.

h. Speed should be reduced further west of the Sheriff Office.

i. Street lights at intersections would improve safety.

j. Once you get passed S.R. 23 heading west not really any issues on S.R. 30. That part of the road is out of the fog, has shoulders and passing lanes.

k. For the most part, people travel the speed limit. 60 mph is a safe speed. The sheriff does not do focused enforcement from 10th West to S.R. 23 because it is not safe for troopers.

4. Corridor Physical Conditions Issues/Concerns:

a. Patrol cars can't turn around on S.R. 30. So it is one-way traffic control. Most wait to pull over vehicles until they get to an area with shoulders.

b. No area for vehicles that break-down to pull out of traffic. The road is very dangerous without shoulders.

c. In heavy fog patrol cars don't like to work on S.R. 30 or handle incidents because there is no place to pull off the road.

d. On S.R. 30 east of Benson Road livestock have gotten onto the road which is a big safety hazard.

e. It is dark on S.R. 30 at night which makes it difficult for drivers to determine the side and center lane markers. If possible UDOT should add some type of road delineators on the side of the highway.

f. Duck hunters also park along side of S.R. 30 in along Cutler Marsh which is unsafe.

g. A bike lane to accommodate bicyclist could also allow fisherman access along the road as well. Although the Sheriff noted they should be kept clear of park vehicles. UDOT should consider a pull out on the north side of S.R. 30 to address this issue.

h. Fisherman park behind the guardrail on the approach to the bridge over the Little Bear River. Most of the parking occurs on the north side of the road. Need to provide a safe access to fishing on the north side of the road.

5. Adjacent Property Issues:

a. The railroad is a branch line. Rail cars cross S.R.30 about 4 times a week. Once on Monday (morning), twice on Wednesday (morning and afternoon), and once on Friday (afternoon).

6. Future Development:

a. Development in Cache County is an issue because of poor ground water quality. The Sheriff feels this will restrict development outside of city services.

b. There is a robotic company south of S.R. 30 on S.R. 23 which is expanding to about 150 employees. No other developments are being planned in Cache County.

7. Other Issues

a. Sheriff noted that about 100 biking events a year in the Logan Valley and each event requires a permit. Many of the events want to use S.R. 30 but the Sheriff will not allow use of the highway because of safety concerns.

b. The Sheriff would like to be added to the mailing list.

The meeting was adjourned at 5;30 pm.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY I-15 to 1000 West

Stakeholder Interview – Emergency Responders

2/29/2016 –1:00 p.m.

1. **Attendance and Location**
   a. List of attendees:

Kendal Allen – Cache School District	Jeff Peterson – Logan Fire	Jason Kendrick – UHP
Steve Hales – Garland Fire	Craig Humphreys – Logan Fire	Mark Millett – Box Elder County Emergency Management
Jay Downs – Cache County EMS	Jerry Richards – Fielding Fire/ EMS	Vince Izzo - HDR
Tammy Champo - HDR		

   b. Location – Logan City Offices

2. **Corridor Use**
   a. Emergency service providers along S.R. 30.
   b. School bus service for Logan City

3. **Operational Conditions Issues/Concerns:**
   a. Poor sight distance between the Little Bear River bridge and the Cutler Marsh recreational access.
   b. No issues with school bus service as the drivers pull into driveways to pick up students
   c. Serious accidents at the intersection of S.R. 30 and 6000 West in Box Elder County. Vehicles coming off of I-15 down the hill are traveling at a high rate of speed entering the intersection. There are no turn lanes at this intersection.
   d. Eastbound traffic will back up around shift change at 1400 West due to traffic in the left turn lane
   e. The Utah Highway Patrol stated the corridor from I-15 to S.R. 23 has few issues and the speed limit is acceptable. From S.R. 23 to 10th West is very unsafe because of the lack of shoulders. The following issues were identified:
      i. Can't pull vehicles over because of the lack of shoulders.
      ii. If there is an accident, the entire road may need to be shut down as there is little room to direct traffic around accidents.
      iii. In heavy fog (low visibility) if there is an accident or a car has broken down it is very unsafe for the UHP to stop. The humidity also causes icy roads which decreases

safety during the fog. In some cases they push the cars off the road and don't return to retrieve the car until the fog has lifted and visibility has improved.

iv. If there is an emergency in the opposite direction of travel there is no place for the highway patrol to turn around which increases response time.

v. Noted that the lack of shoulders has resulted in vehicles crashing into the marsh.

vi. Area has higher incident of head-on collisions or vehicles overcorrecting and going into the marsh.

vii. Noted that fog in this area can be extremely dense, reducing safety. Safety risk under these conditions is amplified because of the lack of shoulders. Noted that the UHP is concerned about any incidents in this area because of safety concerns for their personnel having to stop in a traffic lane.

viii. Noted speed limit was acceptable.

ix. Noted higher level of accidents at the curve at milepost 100

f. Noted that traffic conditions seem acceptable as UDOT has implemented numerous passing lanes.

g. From 10th West to 19th West traffic backs up because there are no left turn lanes into the businesses. Cars will try to pass on the right side to get around.

4. Corridor Physical Conditions Issues/Concerns:

a. All service providers noted safety is a big concern from S.R. 23 to 10th West because of the lack of shoulders.

i. Difficult to work on stranded vehicles – must stop in a traffic lane which increases safety risk to responders.

ii. No place for vehicles to pull-out of traffic in an emergency.

b. The two recreational accesses to Cutler Marsh from S.R. 30 need better turn-lanes/access.

5. Adjacent Property Issues:

a. People fish from the road in the area without shoulders and park their cars on the road, increasing safety risk

6. Future Development:

a. N/A

7. Other Issues

a. N/A.

The meeting was adjourned at 2:00 pm.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview - TNC

2/24/2016 – 11:00 a.m

1. **Attendance and Location**
   a. List of attendees:

Chris Brown - TNC		
Elizabeth Kitchen - TNC		
Vince Izzo - HDR		

   b. Location – TNC Salt Lake City

2. **Corridor Use**
   a. N/A

3. **Operational Conditions Issues/Concerns:**
   a. TNC understood the road across Cutler Marsh has safety concerns and lacks shoulder. They noted TNC typically does not have concern regarding roadway safety improvements

4. **Corridor Physical Conditions Issues/Concerns:**
   a. TNC noted the marsh provides important bird habitat and that the team should work with Bear River Land Conservancy and Bridger Island Audubon.
   b. TNC noted that they would be interested in talking about wetland mitigation opportunities but the area may be too isolated for them to take control of a property. TNC would have difficulty providing property maintenance.

5. **Adjacent Property Issues:**
   a. N/A

6. **Future Development:**
   a. N/A

7. **Other Issues**
   a. The primary TNC POC for the project should be Joan Degiorgio. She can be reached at jdegiorgio@tnc.org.

The meeting was adjourned at 11:30 am.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – Trucking Industry

3/1/2016 –2:00 p.m.

1. **Attendance and Location**
   a. List of attendees:

Name	Representing	Email
Chuck Webb	LW Miller	chuckw@LWMiller.com
Mark Adams	Sharp Transportation	mark@sharptrucking.com
Vince Izzo - HDR	HDR	vincent.izzo@hdrinc.com
Tyler Howell	Stokes Trucking	tyler@stokestrucking.com
Mark Lwver	Stokes Trucking	mark@stokestrucking.com

   b. Location – Logan City Offices

2. **Corridor Use**
   a. Heavy truck traffic

3. **Operational Conditions Issues/Concerns:**
   a. “Scary stretch of road”
   b. Lack of shoulders is hazardous for truck travel leaving little room for error.
   c. S.R. 38 merge is dangerous if coming from the south on to S.R. 30.
   d. Need passing lane across marsh to reduce congestion
   e. No passing lane on tracks and trucks carrying hazardous materials and busses must stop in travel lane before proceeding across tracks. In fog this is very dangerous.
   f. Corner by humane society is a dangerous spot. At posted speed limit the curve is difficult to navigate for trucks
   g. If sardine is closed S.R. 30 is used and then it backs up. Closes two to three times a year
   h. Recommend shoulder wide enough to accommodate trucks or at least pull outs.
   i. Most intersections from S.R. 38 to I-15 are okay.
   j. On S.R. 23 right heading east from S.R. 30 need longer turn lane to pull out of traffic. Lane is not long enough and trucks have to slow down heading down the hill.
   k. Suggest sign in winter to notify that there is fog.
   l. Could lights be added to intersections to improve visibility?

m. 10th West to Logan City dump needs to be widened to 5 lanes with right turn lanes. With all of the businesses congestion can be overwhelming. Difficult for trucks to make lefts into business or pull into traffic. Need center turn lane and right turn lane

4. Corridor Physical Conditions Issues/Concerns:

a. Fog is heavy in winter and it is difficult to see vehicles that are turning off of the road it

b. Slope heading down from Beaver Dam Road towards the river heading west is steep and trucks pick up speed. Could add more signage about the steep grade.

c. Road needs to be wider near Logan to accommodate trucks and have turn lanes.

5. Adjacent Property Issues:

a. N/A

6. Future Development:

a. No latent demand for truck traffic if improved. Trucks use the road even with safety concerns

7. Other Issues

a. N/A

The meeting was adjourned at 2:00 pm.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – USU Department of Natural Resources

3/3/2016 –3:00 p.m.

1. **Attendance and Location**
   a. List of attendees:

Name	Representing	Email
Chris Luecke	Dean USU Natural Resources	Chris.luecke@usu.edu
Mike Pepper	KMP	
Vince Izzo	HDR	

   b. Location – USU

2. **Corridor Use**
   a. Students and faculty for commuting and recreation.

3. **Operational Conditions Issues/Concerns:**
   a. Lack of shoulders and narrow lanes makes S.R. 30 dangerous. There is no place to get out of the way if other vehicles are coming into your travel lane.
   b. S.R. 30 west of S.R. 23 is in good shape. The main concern is between S.R. 30 and S.R. 23.
   c. Lack of accesses immediately west of 10th West needs to be improved.
   d. On Saturday the left turn lane into the landfill will back up onto S.R. 30 as vehicles wait for entrance into the landfill.
   e. Need to separate vehicle traffic from recreational traffic.
   f. Guardrail would block the view of the marsh.

4. **Corridor Physical Conditions Issues/Concerns:**
   a. The corner at 4000 West is difficult to navigate at night when visibility is low and in heavy fog.
   b. Wetlands along S.R. 30 are not that important and mitigation may be a benefit for the project because the mitigation could improve areas that provide better habitat away from the highway. Trade-off for safety would be acceptable.

5. **Adjacent Property Issues:**
   a. A canoe trail system on Bear River from 10th west and 600 to connect to Cutler Mash is being planned. The trail system is called the Blue Water Trail. Eve Davies from PacifiCorp may have more information on the trail.

6. **Future Development:**
   a. N/A

7. **Other Issues**
   a. Logan City has not done a good job with planning and leaving green space.
   b. Carin Kettenring is a wetland ecologist with USU that could provide information about plant species.

The meeting was adjourned at 4:00 pm.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY I-15 to 1000 West

Stakeholder Interview – USU Planning

3/3/2016 –1:30 p.m.

1. **Attendance and Location**
   a. List of attendees:

Name	Representing	Email
Jordy Guth	Assistant Director of Planning USU	Jordy.guth@usu.edu
Charles Darnell	Associate VP for facilities	Charles.darnell@usu.edu
Mike Pepper	KMP	
Vince Izzo	HDR	

   b. Location – USU

2. **Corridor Use**
   a. Students and faculty for commuting and recreation. .

3. **Operational Conditions Issues/Concerns:**
   a. Lack of shoulder on S.R. 30 between 10th West and S.R. 23 is a concern.
   b. The S.R. 30 currently does not have much congestion.
   c. The sight distance at Bear River Dam road could be improved. It would help to open up that intersection.
   d. S.R. 30 could use a center turn lane west of 10th West.
   e. West of S.R. 23 the highway functions well.
   f. If a vehicle crosses the center line there is no place to move out of the way with the lack of shoulders.
   g. Don't like center barriers.

4. **Corridor Physical Conditions Issues/Concerns:**
   a. . There are numerous access points along S.R. 30 that need access improved. This is most important the first mile west of 10th West.
   b. Pull offs on S.R. 30 to access recreational areas on Cutler Marsh would be important.
   c. Freezing fog on S.R. 30 can be an issue.
   d. Make more pullouts for recreational opportunities are needed.

5. Adjacent Property Issues:

a. There are many recreational opportunities along S.R. 30 but access from the road is difficult without the appropriate access lanes including acceleration lanes.

b. A path along S.R.30 to recreational locations would provide better access for the fishing and hunting community.

6. Future Development:

a. Logan City is planning a bike path on the old rail line to Benson. Check with the city for additional information.

b. The study needs to consider reasonable growth projections for the valley and most of the growth should occur on the western part of Logan.

c. Check the growth in Mendon as it could increase with an improved S.R. 30 although lack of a good water supply could limit future growth. The current population of Mendon is about1,200.

7. Other Issues

a. . USU just finished a transportation study conducted by Fheer & Peers.

b. USU can provide information on the students that use S.R. 30 for commuting based on zip code data if it would be useful to the project.

c. Numerous cattle trucks use the S.R. 30 but travel at the speed limit.

d. There is some farm equipment that uses S.R. 30.

e. Vehicles are parking behind the guardrail on S.R. 30 near the bridge that crosses the Little Bear River which is not safe.

f. USU is the largest employer in the valley and Thiokol is the second.

g. USU has about 17,000 students.

h. USU would like to be invited to meetings and stay involved in the project and Jordy would be the point of contact.

i. Contact the USU outdoor recreational department on campus for recreational use and the need for potential improved access along S.R. 30.

The meeting was adjourned at 2:30 pm.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – PacifiCorp

2/29/2016 –4:30 p.m.

1. **Attendance and Location**
   a. List of attendees:

Eve Davies - PacifiCorps		
Brent Arnold - HDR		
Vince Izzo - HDR		

   b. Location – HDR Salt Lake City

2. **Corridor Use**
   a. Adjacent landowner – operates Cutler Marsh.
   b. Provides recreational access to Cutler Marsh from S.R. 30

3. **Operational Conditions Issues/Concerns:**
   a. Lack of shoulder along the marsh area is a safety concern.
   b. Access to the dam for maintenance personnel is via Bear River Dam Road. Does not know of any issues.
   c. Access to the two recreational areas from S.R. 30 needs to be improved. Lack of turn lanes and acceleration lanes makes using the sites unsafe.
   d. 4000 West access to Cutler Marsh has no access or acceleration lanes. Very unsafe for maintenance personnel to access site. Cattle are also moved on this access road. Difficult without turn or acceleration lanes. Also access is near a corner which results in poor sight distance.
   e. PacifiCorp allows public access at 4000 West (enough for two vehicles). Poor access from S.R. 30 makes this entrance very dangerous.
   f. People stop along S.R. 30 to fish and access Cutler Marsh which is unsafe. Recommend UDOT post no parking making people use designated recreational access points.

4. **Corridor Physical Conditions Issues/Concerns:**
   a. Water cross flow in the marsh is an issue at the two culverts on S.R. 30. Need to increase height to improve flow. Water backs up which makes leveling the water behind the dam difficult. PacifiCorp would like input into water flow issues.
   b. Area has heavy fog from October through April. Visibility is substantially reduced.

5. **Adjacent Property Issues:**
   a. People fish from the road in the area without shoulders and park their cars on the road, increasing safety risk. Mark as no parking.
   b. Any property take from PacifiCorp will result in reissuing the FERC permit for PacifiCorp to operate the reservoir. This is a time consuming and lengthy process. Will need to work with PacifiCorp and reimburse them for cost.
   c. May need FERC as a cooperating agency or they may need to adopt any future environmental documents.
   d. Increasing culvert height would improve recreational access (boating) under S.R. 30. During high water levels it is not possible for canoes to navigate under the road.

6. **Future Development:**
   a. N/A

7. **Other Issues**
   a. PacifiCorp would like UDOT to work with the Bear River Land Conservancy on any necessary wetland mitigation that may come from the project.
   b. PacifiCorp will need to get a new FERC operating permit in 2019. Would like to tie in the S.R. 30 project into the process.
   c. Would not be surprised to see Ute Ladies Tresses along S.R. 30.
   d. Cutler Marsh is an important waterfowl migration area. Important rookery for white – faced ibis.

The meeting was adjourned at 5:45 pm.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – Environmental

3/1/2016 –12:00 p.m.

1. **Attendance and Location**
   a. List of attendees:

Name	Representing	Email
Trevor Irish	Bear River Land Conservancy	trevorirish@bearrivelandconservnacy.org
Bryan Dixon	Bear River Land Conservancy	brlc@bearriverlandconservnancy.org
Vince Izzo - HDR	HDR	vincent.izzo@hdrinc.com
Richard Mueller	Bridgerland Audubon	Rjmueller15@gmail.com
Rod Terry	UDOT R-1	rodterry@utah.gov

   b. Location – Logan City Offices

2. **Corridor Use**
   a. Cutler marsh is a very important environmental area and a bird area of global significance.
   b. Audubon would like stops along highway to view birds along the mash.
   c. Audubon is interested in potential for bike lanes or just wide shoulders.

3. **Operational Conditions Issues/Concerns:**
   a. Understand there are some safety considerations. Can't argue against larger shoulder if and when something happens.
   b. Keep the project as small as possible and try to minimize impacts.
   c. Keep speed limit at 60 mph or less. Try to keep foot print small. Small enough stretch that a minute or two will not make a difference in travel time.
   d. Could you have limited passing lanes?
   e. Could be latent truck demand? Would more trucks travel on the road?
   f. Look at access points and making improvements.

4. **Corridor Physical Conditions Issues/Concerns:**
   a. Very important depending on Great Salt Lake water level. When the GSL floods the birds use the marsh, which is very important. Reduction in GSL habitat means birds use cutler marsh.
   b. Would like ta rail out to marsh in combination with city trail to land fill. A bike shoulder would be great out to the marsh.
   c. Include additional recreational access points and keep speeds down at least across the marsh.
   d. Could be narrow median with rumble strip in middle similar to US 89. Anything to keep foot print as narrow as possible through the wetlands.

5. **Adjacent Property Issues:**
   a. There are places you could build pull outs where there are no wetlands. Like in the marsh at 4000.
   b. Protect the critical wetland resources.
   c. Stretch between S.R. 23 and sewage lagoons is the most critical section to minimize impacts.
   d. Encourage UDOT to find mitigation site away from highway because of noise and light pollution.
   e. Audubon is more concerned about habitat.

6. **Future Development:**
   a. N/A

7. **Other Issues**
   a. Want to make sure wetland mitigation is done
   b. Problems with invasive species at UDOT wetland mitigation site with Bear River Land Conservancy.
   c. Bryan will not be on the board in the near future but is very interested in the project.
   d. Joan DeGregorio at TNC regarding the project and wetland mitigation.
   e. Talk to Trout Unlimited or Cache anglers association - Paul Holden contact name
   f. Pheasants Forever is a hunting group in the valley, Tony Selley – cell 435.770.9679 home is 435.752.0088.
   g. Bear Lake Watch folks could be concerned about the project.
   h. Logan River Task Force may be interested in the project. Frank Howe is POC – 43.579.78523. frankhowe@utah.gov

i. Cache county trail planner – Dayton is the POC.
j. Land trust would love to help out with the mitigation

The meeting was adjourned at 1:00 pm.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY I-15 to 1000 West

Stakeholder Interview – Trout Unlimited/Cache Anglers

3/9/2016 – 10:00 a.m.

1. **Attendance and Location**
   a. List of attendees:

Jim DeRito – Trout Unlimited	Neal Artz – Cache Anglers	Vince Izzo – HDR

   b. Location – Teleconference

2. **Corridor Use**
   a. Recreational use

3. **Operational Conditions Issues/Concerns:**
   a. Entering or exiting the marina from S.R. 30 is difficult when hauling a boat. Have to enter or exit the site at a slow speed because of the potholes in the dirt parking lot. Need to add better acceleration and de-acceleration lanes. This also applies for the other PacifiCorp recreation site.
   b. Bow hunting for Carp is becoming popular along S.R.30. The unofficial pull-outs along the S.R. 30 Bridge are difficult and unsafe when exiting or entering the highway. Can access be improved without impacting wetlands?
   c. Would like to see improved access along S.R. 30 to the Lower Logan River. Currently, there is a walk-in access point around 2600 West and more parking would provide better access opportunities.
   d. Shoulders may invite unsafe and unlimited recreational access along S.R. 30. Prefer designated access points to key areas.
   e. During heavy fog events can't see the edge of pavement need some type of markers or shoulder rumble strips.

4. **Corridor Physical Conditions Issues/Concerns:**
   a. Future recreational use along marsh will increase as population increase

5. **Adjacent Property Issues:**
   a. Would like to see additional access points to Lower Logan River from S.R. 30. Will provide input on those locations in the next month.

6. **Future Development:**
   a. N/A

7. Other Issues

a. During construction minimize sediment into the Lower Logan River

b. Several mitigation projects have been identified along the Lower Logan River. If possible, would like to work with UDOT on partnering on mitigation opportunities

The meeting was adjourned at 10:30 am.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – UDOT Riverside Maintenance

3/8/2016 – 11:15 a.m.

1. **Attendance and Location**
   a. List of attendees:

Todd Gibbs – UDOT Riverside Maintenance Supervisor	Vince Izzo – HDR	

   b. Location – Teleconference

2. **Corridor Use**
   a. UDOT Maintenance from I-15 to Cache/Box Elder County Line

3. **Operational Conditions Issues/Concerns:**
   a. The only maintenance issue is maintaining pavement that is impacted from heavy truck use.
   b. Sight distance at Bear River Dam Road and S.R. 30 could be improved and the road in that section should be widened. Currently that area is a bottle neck for traffic coming off of the passing lanes.
   c. The intersection of 6000 W and S.R. 30 has severe accidents from vehicles not stopping at as the road intersects S.R. 30. Sight distance is good but vehicles miss the stop signs.
   d. The sight distance at Bear Hollow Drive and S.R. 30 could be improved.

4. **Corridor Physical Conditions Issues/Concerns:**
   a. N/A

5. **Adjacent Property Issues:**
   a. N/A

6. **Future Development:**
   a. N/A

7. **Other Issues**
   a. N/A

The meeting was adjourned at 11:30 am.

These minutes were prepared by Vince Izzo.

Meeting Notes

State Route 30 CORRIDOR STUDY
I-15 to 1000 West

Stakeholder Interview – UDOT Logan Maintenance

3/9/2016 – 11:00 a.m.

1. Attendance and Location

a. List of attendees:

Chris Ransom – UDOT Logan Maintenance Supervisor	Vince Izzo – HDR	

b. Location – Teleconference

2. Corridor Use

a. UDOT Maintenance Cache County

3. Operational Conditions Issues/Concerns:

a. It is very dangerous to provide maintenance along Cutler Marsh. Maintenance crews have to shut down a lane of traffic and this still does not provide enough space to work.

b. It is very dangerous to plow because of the narrow lanes and lack of shoulders. The plow blades take up the entire lane and opposing vehicles get nervous with little room to move around the plow which requires the plow to move off the edge of pavement

c. Vehicles go off the pavement on the curves at milepost105 and by the Humane Society. Provide better signage to give vehicles warning about the curves.

d. Couple of the unofficial recreational access points don't have acceleration or turn lanes. Vehicles damage the edge of pavement when accelerating onto the highway and creates large drop offs from the pavement. Maintenance has a difficult time filling in the holes created by the vehicles. The worst spot is adjacent the east culvert which has become an unofficial pullout. Vehicles accelerating onto S.R. 30 have created a large hole.

e. Maybe add no parking signs in areas like the east culvert and force people to designated parking locations.

f. The Logan City Transfer Station/Landfill to 10th west the road needs to be widened to provide better turning movement. Currently vehicles pull into the dirt to pass left turning vehicles which damages the edge of pavement.

g. It is very dangerous to plow because of the narrow lanes and lack of shoulders. The plow blades take up the entire lane and opposing vehicles get nervous with little room to move around the plow which requires the plow to move off the edge of pavement

4. **Corridor Physical Conditions Issues/Concerns:**
   a. Lack of shoulders is a safety concern for maintenance and vehicle use
   b. The entire highway across the marsh should be reconstructed as it is falling apart. The road has many potholes and there is no road base. For many of the locations it is just mud under the pavement.
   c. A couple of box culverts are not protected by railing and should be replaced

5. **Adjacent Property Issues:**
   a. N/A

6. **Future Development:**
   a. N/A

7. **Other Issues**
   a. N/A

The meeting was adjourned at 11:30 am.

These minutes were prepared by Vince Izzo.

D

Safety Technical Analysis

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

MEMORANDUM

To: Vince Izzo, HDR Engineering, Inc.

From: Charles Allen, P.E., PTOE Parametrix
Vern Keeslar, AICP, Parametrix

Date: May 26, 2016

Subject: **S.R. 30 Safety Analysis Memo**

Introduction

The purpose of this memo is to document the safety conditions on S.R. 30 between I-15 in Box Elder County and S.R. 252 (10th West) in Logan as part of the S.R. 30 corridor analysis (see Figure 1). Crash data were obtained for the most recent available five years (2011-2015) from the Utah Department of Transportation (UDOT) Traffic and Safety Division. Parametrix compiled and analyzed the data to better understand safety trends and investigate potential mitigations.

Fatal and Serious Injury Crashes

For the last several years, UDOT has focused on reducing statewide fatal and serious injury crashes (defined in this memo as "severe" crashes). Figure 2 plots the total crashes and severe crashes within the S.R. 30 study area by year. Total crashes manifest an overall increasing trend with some decrease in the last two years. Severe crashes are too infrequent to establish a trend, but 2013 did exhibit an unusual spike compared to the surrounding years. Overall, there were three fatal crashes resulting in four fatalities within the study area.

Figure 1: S.R. 30 Study Area

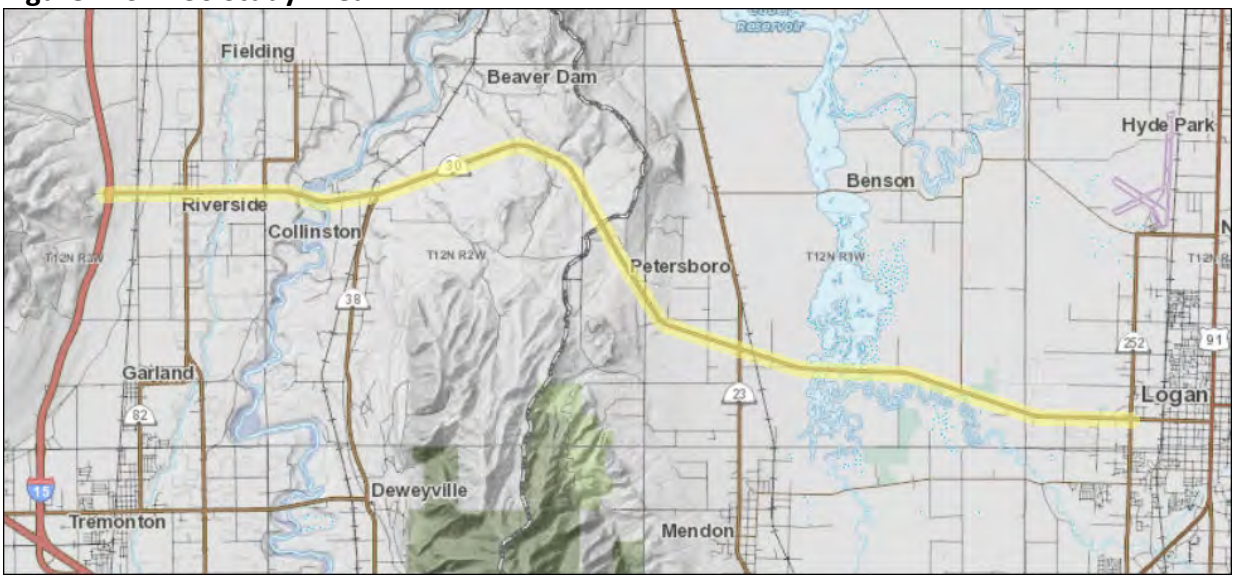


Figure 2: S.R. 30 Total and Severe Crashes (2011-2015)

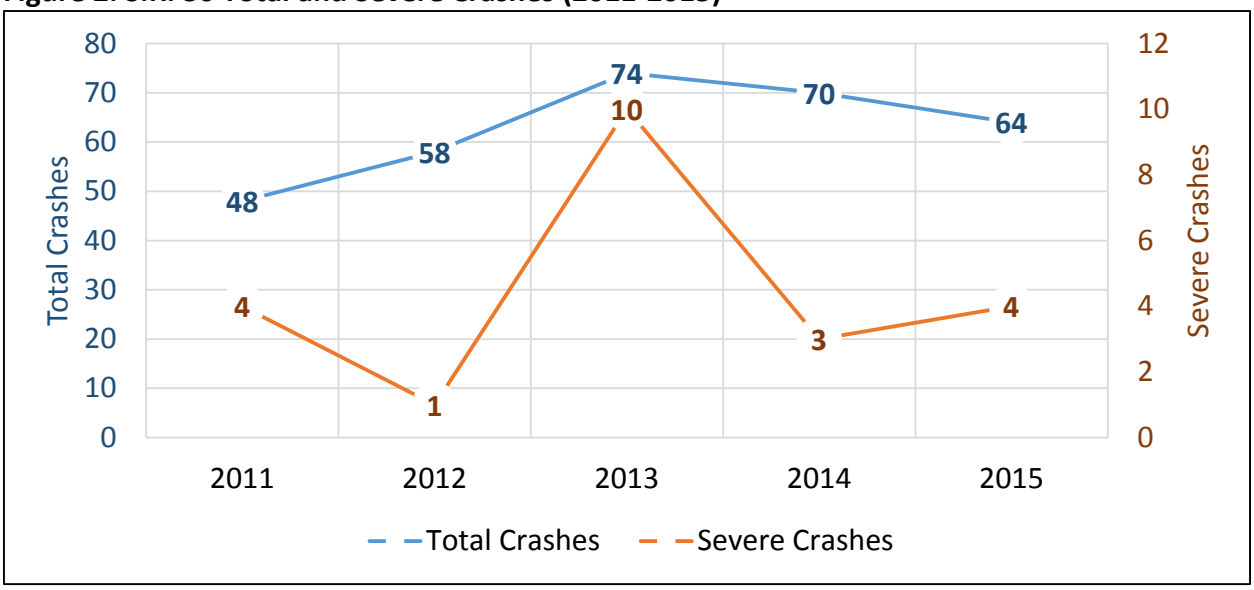


Figure 3 plots the location of every severe crash within the study time frame. Table 1 provides a brief description of all severe crashes with reference numbers corresponding to the labels in Figure 3. There have been a variety of severe crash types over the study period. Some crashes have no apparent link to roadway features and are instead heavily influenced by random events, such as a crash caused by a boat falling off its towing trailer or horses loose on the highway at night. However, some patterns are evident among the data. For example, there have been several crashes with drivers running stop signs, particularly at intersections on the west side of the study area. A few of these crashes occurred when conditions were dark and almost all involved a driver who was impaired, drowsy, distracted, or elderly.

Two crashes involved vehicles attempting to pass slower vehicles on the narrow, two-lane portion of the corridor through the wetlands. Another two crashes involved drivers losing control on snowy road surfaces. Four crashes involved motorcycles, though the motorcyclist was only at fault in one of the crashes. In two crashes, an older driver was at fault and there were three crashes in which a teen driver was at fault.

Multiple phenomenon contribute to the spike in severe crashes experienced in 2013. First, during 2013 there were three stop-sign-running crashes resulting in a serious injury – all at the S.R. 13 intersection. No other year manifests such a high concentration of stop-sign-running crashes. Second, 2013 contains some severe crashes resulting from unusual conditions, such as the horses in the roadway at night and a boat coming loose from its towing trailer. Third, two crashes occurred when roads were snowy. Finally, as shown is a subsequent section, 2013 may have had harsher weather conditions than other years in the analysis period.

Figure 3: S.R. 30 Severe Crashes (2011-2015)

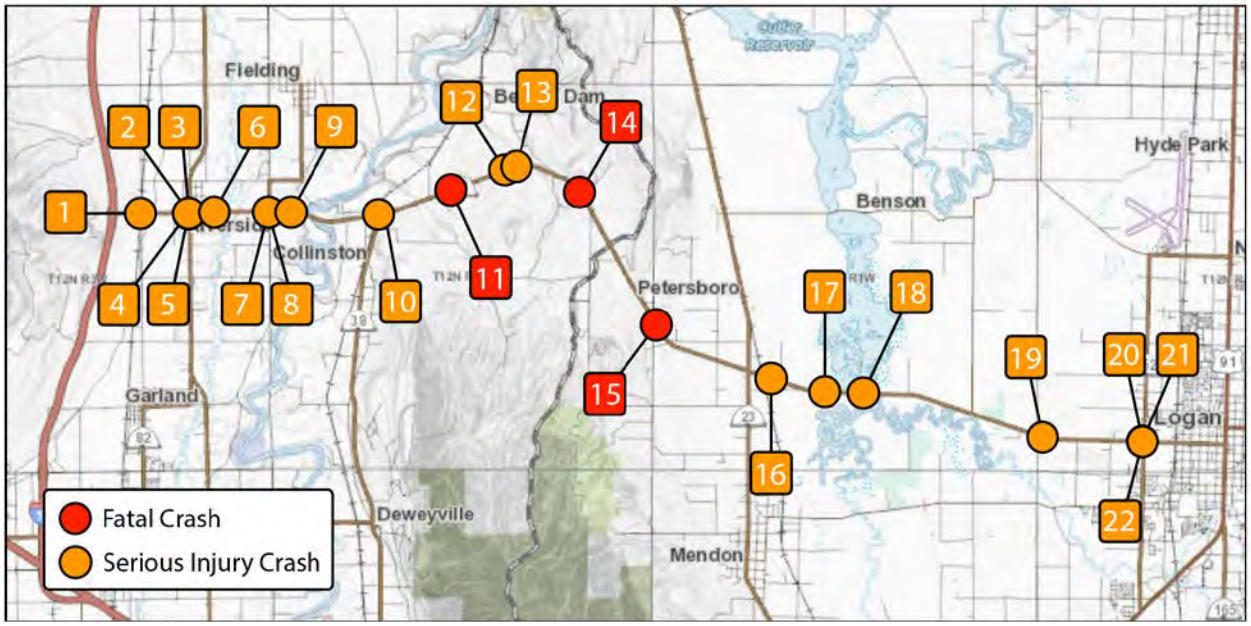


Table 1: S.R. 30 Severe Crash Review (2011-2015)

Map Label	Year	Brief Crash Description
1	2015	Impaired driver ran stop sign (northbound) striking westbound vehicle. Dark conditions.
2	2013	Older driver ran 4-way stop (eastbound) striking northbound vehicle.
3	2013	Drowsy driver ran 4-way stop (northbound) striking westbound vehicle. Dark conditions. Wet roads.
4	2013	Driver ran 4-way stop (eastbound) striking northbound vehicle. Dark conditions.
5	2014	Older driver ran 4-way stop (westbound) striking two southbound vehicles.
6	2013	Driver struck horses in the roadway. Dark conditions.
7	2011	Driver distracted by children ran through stop sign (northbound).
8	2015	Driver distracted by spilled food, ran stop sign (northbound) striking westbound vehicle.
9	2013	Teen driver turned left in front of oncoming vehicle.
10	2013	Driver lost control on snow-packed bridge deck and drifted into oncoming lane.
11	2011	Teen driver drifted over centerline. Possible medical condition. **One fatality.**
12	2013	Drowsy driver ran off road.
13	2014	Impaired motorcyclist took curve too fast and ran off road.
14	2011	Vehicle towing a trailer lost control and ran off road. **One fatality.**
15	2013	Aggressive driver lost control on snowy roads and slid into oncoming vehicle. **Two fatalities.**
16	2014	Aggressive eastbound driver tried to pass three vehicles at once forcing driver in oncoming lane to swerve onto shoulder. Oncoming driver lost control of vehicle on shoulder and spun into one of the eastbound vehicles. Dark conditions.
17	2013	Boat fell off its towing trailer striking the trailing motorcyclist.
18	2013	Two eastbound drivers tried to pass at the same time, lost control and sideswiped each other. Both vehicles slid off roadway with one overturning and sliding off bridge.
19	2011	Driver distracted by cell phone, ran off road. Wet roadway.
20	2012	Driver making U-turn on S.R. 252 south of S.R. 30 clipped a motorcyclist.
21	2015	Teen driver ran red light (westbound) striking two vehicles (one a motorcycle).
22	2015	Northbound driver turned left in front of a southbound through vehicle.

Crash Rates

Parametrix calculated crash rates for segments of the study corridor. Crash rates normalize crash frequencies by roadway volume in order to account for the fact that roadway segments with higher volumes can be expected to have more crashes than lower volume segments due to the increased vehicle conflicts. Table 2 summarizes the crash rates and severe crash rates for segments of S.R. 30 and compares them to the statewide averages for roadway segments of similar functional class and volume.

As can be seen from Table 2 a few segments have higher crash rates than the statewide average for roadways of similar functional class and volume (denoted in red). Of note are the segments on the most eastern and western ends of the study corridor where the crash rate is significantly higher than the statewide average. Severe crash rates for all segments west of S.R. 38 are higher than the statewide average, though it is important to note the relatively low severe crash totals for these segments. Finally, the I-15 to S.R. 13 segment and the 1900 West to S.R. 252 segment both exhibit crash rates and severe crash rates above the respective statewide averages.

Table 2: S.R. 30 Crash Rate Summary (2011-2015)

Segment	Begin MP	End MP	AADT[1]	Functional Class	Crashes[2]		Crash Rate[4]		Severe Crash Rate[5]	
					Total	Severe[3]	Actual	Statewide Average[6]	Actual	Statewide Average[6]
I-15 to S.R. 13	90.62	91.90	3,082	Rural Minor Arterial	20	4	2.78	1.71	55.6	9.5
S.R. 13 to S.R. 81	91.90	93.15	5,643		11	3	0.86		23.5	
S.R. 81 to S.R. 38	93.15	94.95	6,211		30	2	1.48		9.9	
S.R. 38 to S.R. 23	94.95	102.36	7,167		80	5	0.83		5.2	
S.R. 23 to 3200 W	102.36	105.93	7,241		51	3	1.08		6.4	
3200 W to 1900	105.93	107.63	6,744	Rural Principal Arterial	30	1	1.44	1.35	4.8	5.1
1900 W to S.R. 252	107.63	108.67	6,742	Urban Principal Arterial	53	1	4.18	2.74	7.9	6.8

1. Source: Average value from *Traffic on Utah Highways* 2011-2014.
2. Not including crashes at S.R. 30 intersections assigned to the cross-street.
3. Fatal and serious injury crashes.
4. Crashes per year per million vehicle miles.
5. Severe crashes per year per hundred-million vehicle miles.
6. UDOT statewide average for roadways of similar volume and functional class (2009-2013).

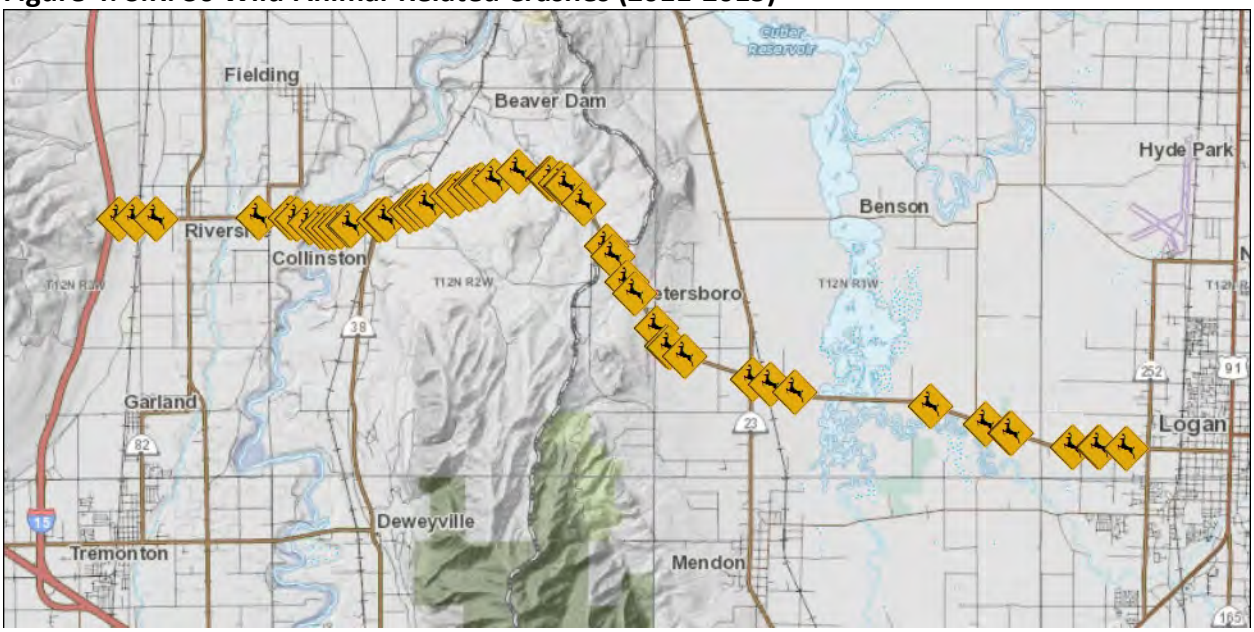
Crash Attributes

Parametrix compiled crash attribute summaries for the study corridor to provide an overall look at crash patterns and characteristics. Table 3 documents several key crash indicators. (Note: study area crashes may fit in multiple, or none, of the categories.) As can be seen from Table 3, wild-animal-related crashes account for approximately one in every five crashes on the corridor. Figure 4 illustrates the locations of these crashes revealing that most wild-animal-related crashes are located in Box Elder County. In particular, 38 of the 67 wild-animal-related crashes occur in a four mile stretch between S.R. 81 and Beaver Dam Road. During a field review of the corridor, Parametrix did not observe any wildlife warning signs or wildlife safety mitigations.

Table 3: S.R. 30 Key Crash Attribute Summary (2011-2015)

	Total Crashes	Wild Animal Related	Teen Driver Involved	Speed Related	Older Driver Involved	Overturn /Rollover	Commercial Motor Vehicle	Distracted Driver	DUI
Crashes	314	67	54	39	31	30	28	26	9
Percent of Total		*21%*	*17%*	*12%*	*10%*	*10%*	*9%*	*8%*	*3%*

Figure 4: S.R. 30 Wild-Animal-Related Crashes (2011-2015)



Also of note are crashes involving teen drivers, which comprise 17 percent of corridor crashes. These crashes are mostly concentrated on the east end of the corridor, closer to the urbanized areas of Cache Valley. Crashes resulting in a vehicle overturning or rolling over account for 10 percent of all crashes. Most of these crashes are located east of S.R. 23 where shoulders are frequently only two feet wide or non-existent, and ditches often line the roadway (see Figures 23 and 24). Finally, S.R. 30 experiences a significant amount of freight traffic, which is manifest in the nine percent of crashes involving a commercial motor vehicle. These crash types are spread evenly through the corridor.

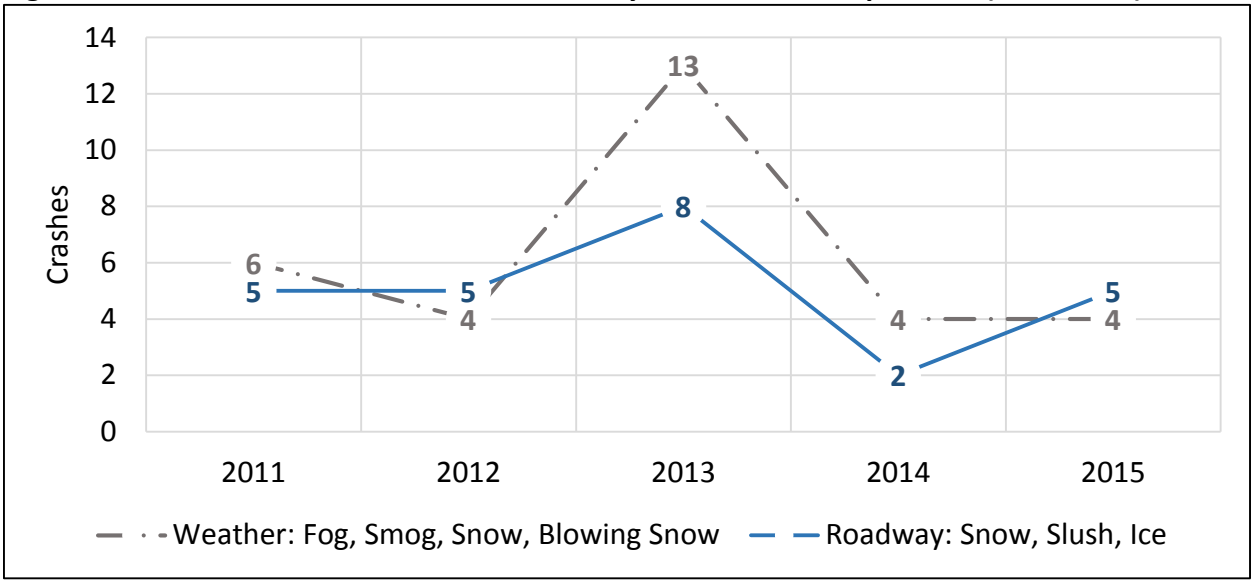
The Cache Valley has a propensity for adverse weather conditions in the winters. The topography leads to frequent temperature inversions, and when combined with the surrounding water features, can lead to foggy conditions and low visibility on S.R. 30. Table 4 documents the weather and roadway surface condition for study area crashes. Figure 5 plots the adverse weather and adverse roadway surface condition crashes during the study period. Crash data for 2013 exhibits more adverse weather and roadway surface crashes than surrounding years which may reflect a harsher winter for that year.

Foggy-weather crashes account for 11 of the study area crashes over five years. As expected, most of these crashes occur in Cache Valley, though none of them occur directly within the central wetland areas along the corridor (see Figure 6). The lack of foggy weather crashes within the central wetland area may be more related to the lack of access and driveways than the presence of fog. Most foggy crashes on the corridor involved a vehicle turning to or from a side street or driveway.

Table 4: S.R. 30 Crash Weather and Roadway Conditions (2011-2015)

Weather Condition			Roadway Surface Condition		
Description	**Crashes**	**Percent**	**Description**	**Crashes**	**Percent**
Clear	213	68%	Dry	52	81%
Cloudy	51	16%	Wet	30	10%
Rain	15	5%	Slush	2	1%
Fog/Smog	11	4%	Snow	17	5%
Snowing	17	5%	Ice	6	2%
Blowing Snow	3	1%	Other	1	0%
Unknown	4	1%	Unknown	3	1%

Figure 5: S.R. 30 Adverse Weather and Roadway Surface Crashes per Year (2011-2015)



Passing-related crashes are frequently an item of concern for two-lane highways. Figure 6 includes the study area crashes involving a passing-related maneuver. Ten such crashes occurred in the study area during the analysis time frame resulting in one fatal crash and two serious injury crashes.

The causes of passing-related crashes are diverse. The three western-most crashes all occurred in areas of S.R. 30 with an existing passing lane and are related to vehicles losing control while in a passing lane or traveling in the passing lane and being struck by an oncoming vehicle that drifts out of its lane. Many of the remaining crashes involved vehicles colliding when trying to pass on the two-lane section of S.R. 30. Examples of contributing factors include drivers failing to anticipate closing distances of oncoming vehicles, drivers failing to check their mirrors for a vehicle overtaking them before moving into the oncoming lane, and drivers being aggressive about passing maneuvers and forcing other drivers to take evasive action.

Figure 7 displays the monthly variation among crash totals on the study corridor. Like many corridors in Utah, crashes peak in summer months when traffic volumes tend to be higher, followed by another peak in winter months when adverse weather begins. The relative decrease in crashes in January and February compared to November and December is a departure from the typical seasonal pattern.

Figure 6: S.R. 30 Select Crash Types (2011-2015)

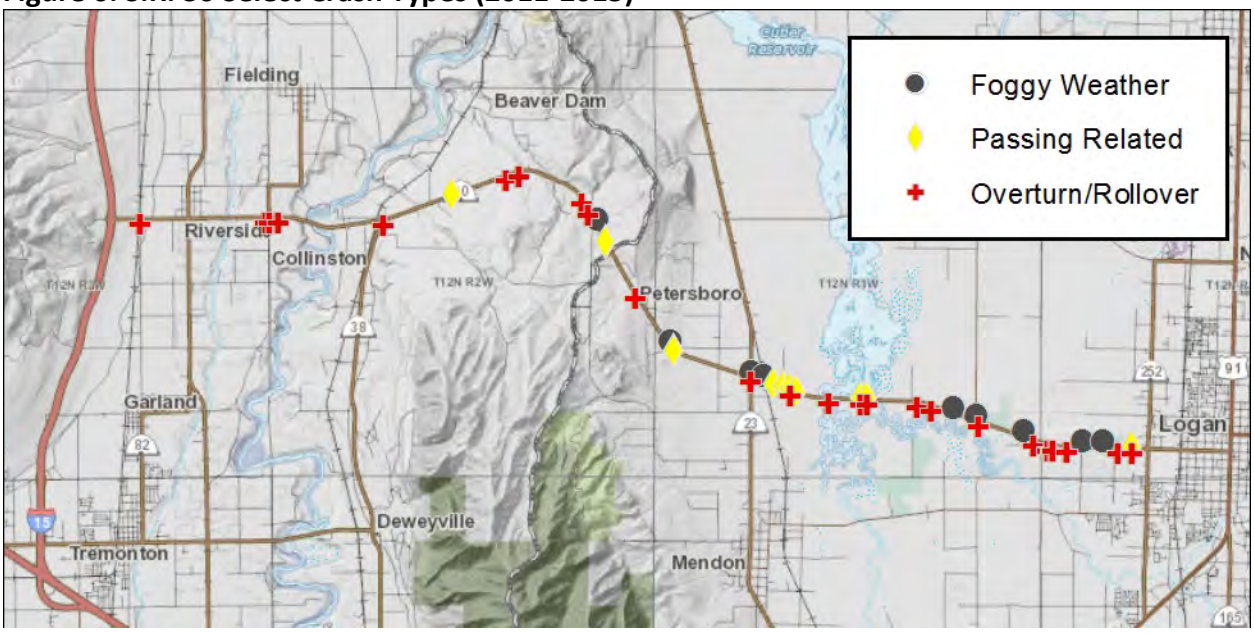
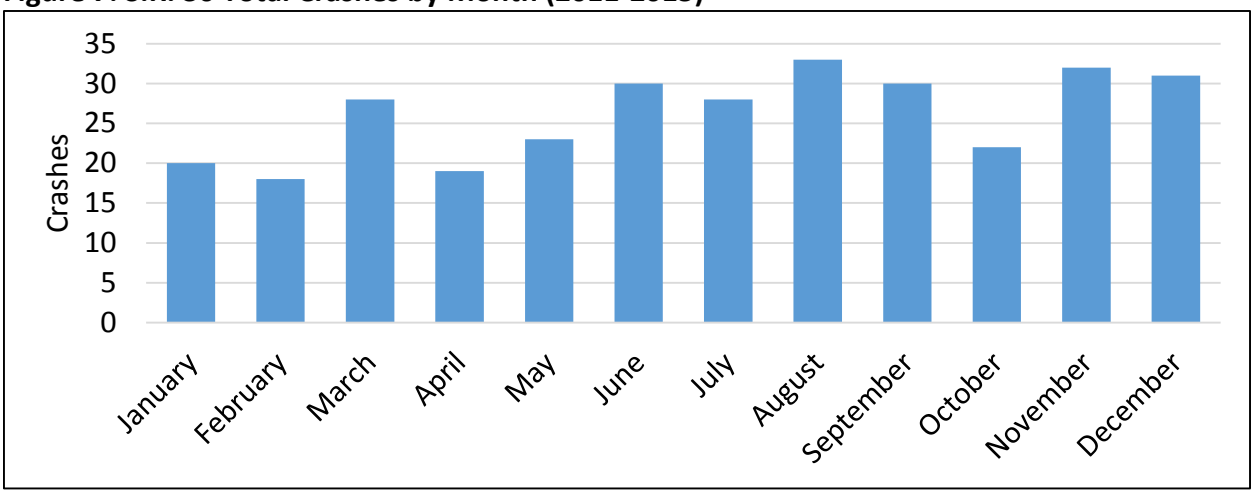


Figure 7: S.R. 30 Total Crashes by Month (2011-2015)



Crash Hot Spots

Parametrix analyzed the S.R. 30 study corridor to identify crash "hot spots." Crash hot spots are helpful in identifying areas with a potential safety problem and determining where crash mitigations may be most effective. However, care should be taken to ensure crash hot spots do not simply reflect areas of higher traffic volumes.

Parametrix generated crash "heat maps" to illustrate relative crash concentrations on S.R. 30. Figure 8 depicts the heat map for crashes on the entire study corridor. As can be seen from Figure 8, crash concentrations are significantly influenced by activity in the urbanized portion of S.R. 30 (defined for this report as east of 1400 West in Logan). Because crash concentrations are so high for the urbanized section, detail for the rural areas of S.R. 30 is washed out. Thus, Parametrix generated a heat map just for rural S.R. 30 (see Figure 9) to provide additional insight for hot spots in the rural areas.

Several rural hot spots manifest themselves when examining the rural heat layer. Five of these hot spots occur at intersections and one occurred on a small curve just west of 1900 West. In order to better understand crash patterns, Parametrix investigated individual crash records at the identified hot spot locations:

1. 6000 West/S.R. 30 intersection (Box Elder County)
2. S.R. 13/S.R. 30 intersection
3. S.R. 81/S.R. 30 intersection
4. S.R. 38/S.R. 30 intersection
5. S.R. 23/S.R. 30 intersection
6. Curve at milepost (MP) 107.2

The following provides discussion and graphical summaries for each location.

Figure 8: S.R. 30 Heat Map of All Crashes (2011-2015)

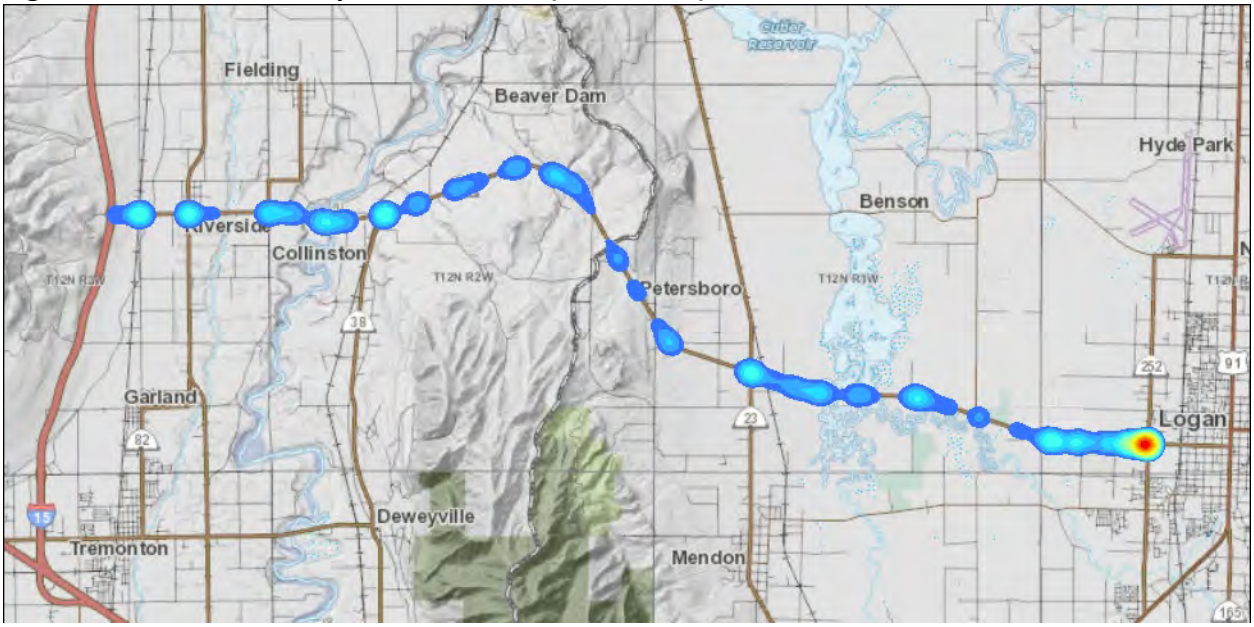
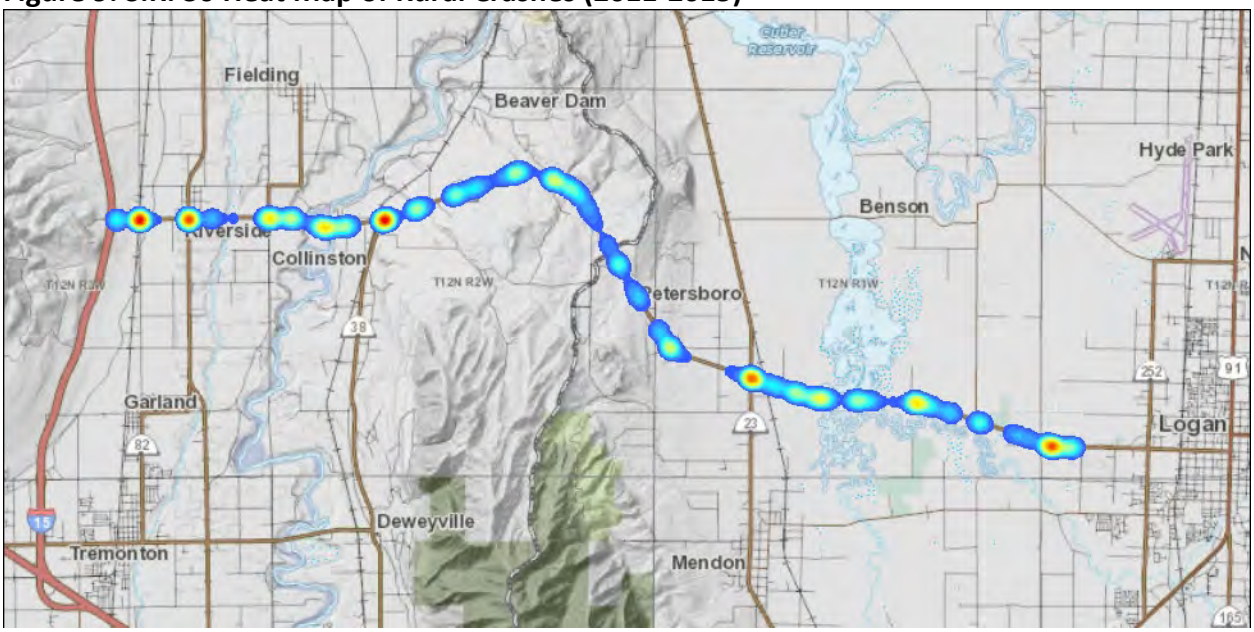


Figure 9: S.R. 30 Heat Map of Rural Crashes (2011-2015)



6000 West/S.R. 30 Intersection

Figure 10 is a crash diagram for the 6000 West/S.R. 30 intersection illustrating the manner of collision and the maneuvers of vehicles involved. The intersection is a four-leg intersection with stop signs on the minor approaches (6000 West). As shown in Figure 10, the intersection features four stop-sign-running crashes, three of which occurred during dark conditions. Two crashes are related to the nearby railroad crossing and two crashes involved hitting wild or domestic animals. The stop signs on the minor approaches appear new, though they do not feature any special warning lighting, nor does the intersection as a whole feature any street lamps.

Sight distance to the east is somewhat obstructed by a brief grade (see Figure 11). To a driver waiting at 6000 West, the grade obstructs the lower portion of westbound vehicles, which would only be significant at night when drivers rely on seeing headlights to detect oncoming traffic.

Figure 10: 6000 West/S.R. 30 Intersection Crash Diagram (2011-2015)

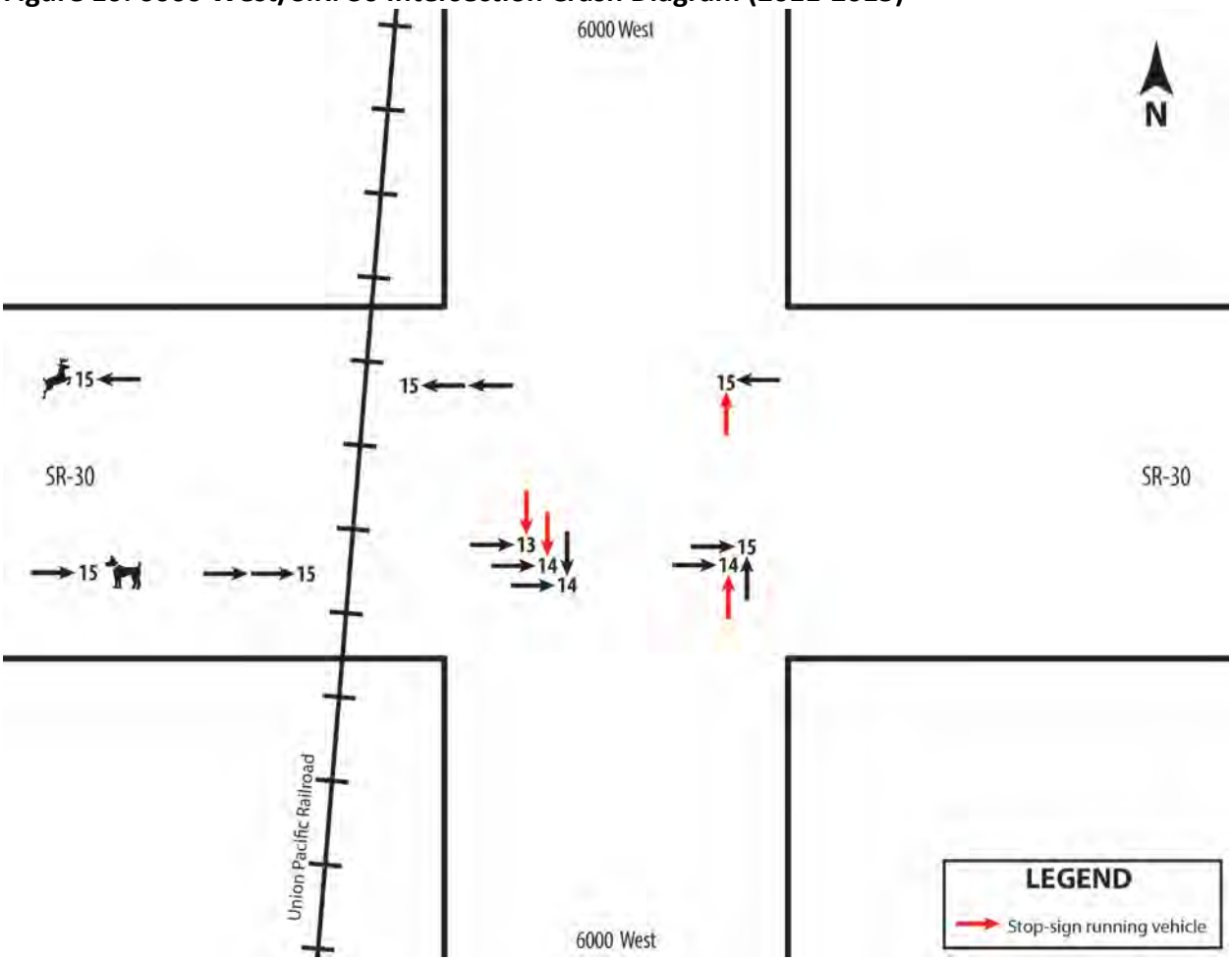


Figure 11: Sight Distance at 6000 West (Looking East)

S.R. 13/S.R. 30 Intersection

Like the 6000 West intersection, the S.R. 13/S.R. 30 intersection features numerous stop-sign running crashes. Seven of the nine crashes in the study time frame involved a driver running a stop sign. The S.R. 13/S.R. 30 intersection is four-way stop-controlled and drivers have run the stop sign most predominantly on the westbound approach. Other than the signal at the study corridor terminus at S.R. 252, this is the only location where mainline S.R. 30 features any traffic control.

Though there have been numerous stop-sign running crashes at this intersection, recent improvements seem to have had a positive effect on safety conditions. Sometime in 2014 or 2015, an all-direction overhead flashing red light was installed above the center of the intersection. In addition, the stop signs and advance warning stop signs on all approaches were upgraded to include perimeter flashing LED lights. (Previous to these improvements, stop signs featured flashing red lights mounted directly above the stop sign.) Finally, street lamps have been installed on both the northwest and southeast corners. Crash data supports the positive effect of these improvements in that since June 2014 there have been zero recorded crashes at the intersection. Conditions should continue to be monitored to confirm the benefits of the safety improvements and the overall appropriateness of the four-way stop configuration.

Figure 12: S.R. 13/S.R. 30 Intersection Crash Diagram (2011-2015)

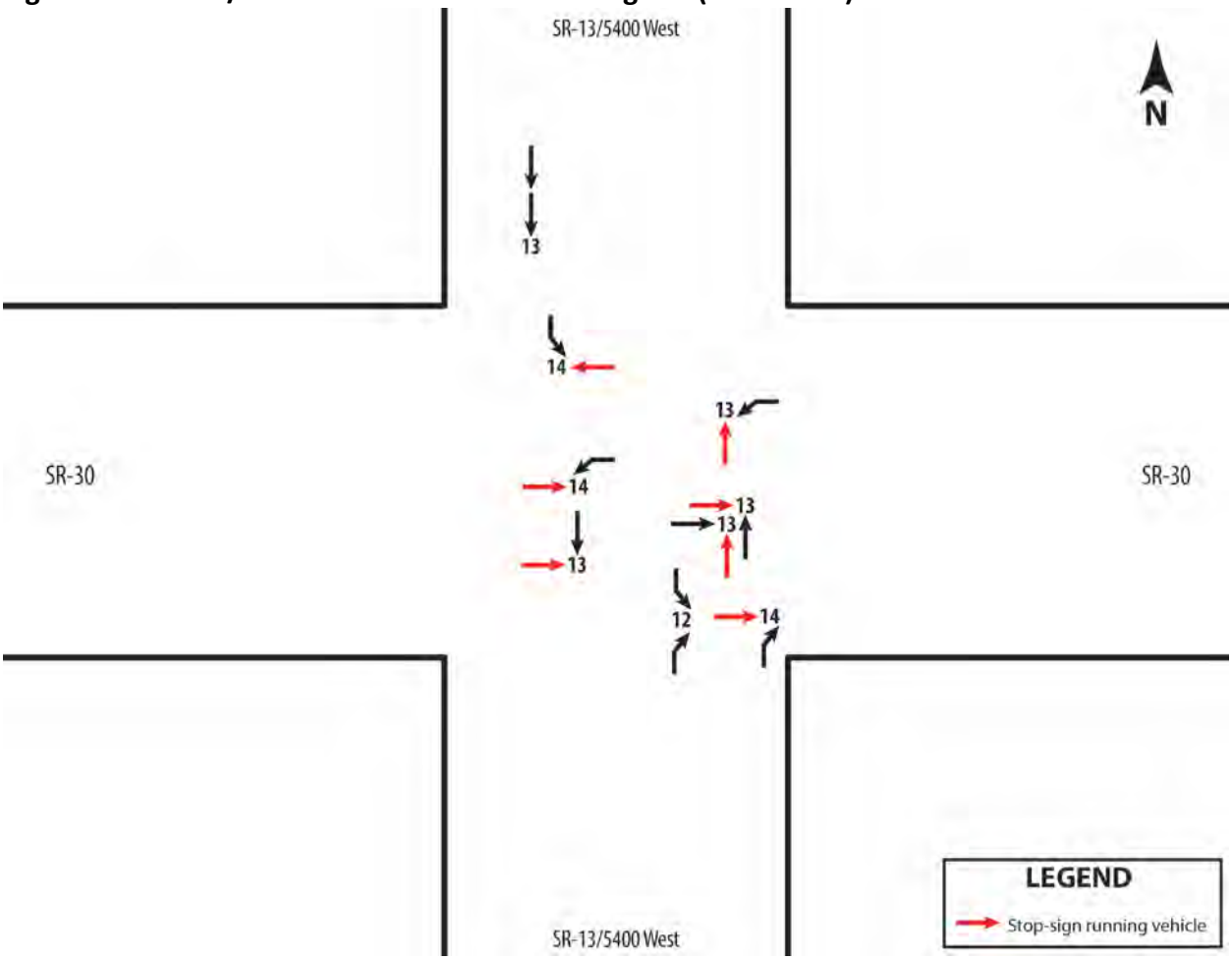


Figure 13: Old Configuration with Flashing Red Lights Mounted Above Stop Signs

Figure 14: New Stop Signs and Overhead Flashing Red Above Center of Intersection

Figure 15: LED Flashing Advance Warning Stop and Stop Sign in Distance

S.R. 81/S.R. 30 Intersection

The S.R. 81/S.R. 30 intersection features fewer crashes than other hot spot intersections, however, the crashes that do occur manifest a consistent problem. Three of the five crashes during the study time frame involved a northbound vehicle running the stop sign. Two of these stop-sign running crashes resulted in serious injuries and all occurred during daylight. Currently, the northbound approach to the intersection features a word message version of the advance warning stop sign whereas the southbound approach features the symbol advance warning stop sign and "Stop Ahead" pavement markings (see Figures 16 and 17). The intersection also has lighting on the northeast corner.

Figure 16: Northbound Approach Advance Warning Features

Figure 17: Southbound Approach Advance Warning Features

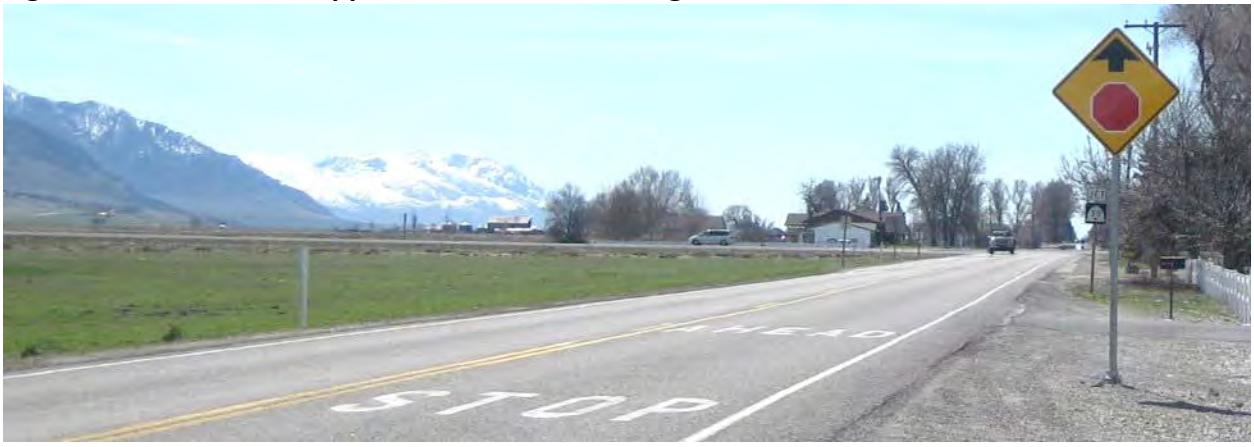
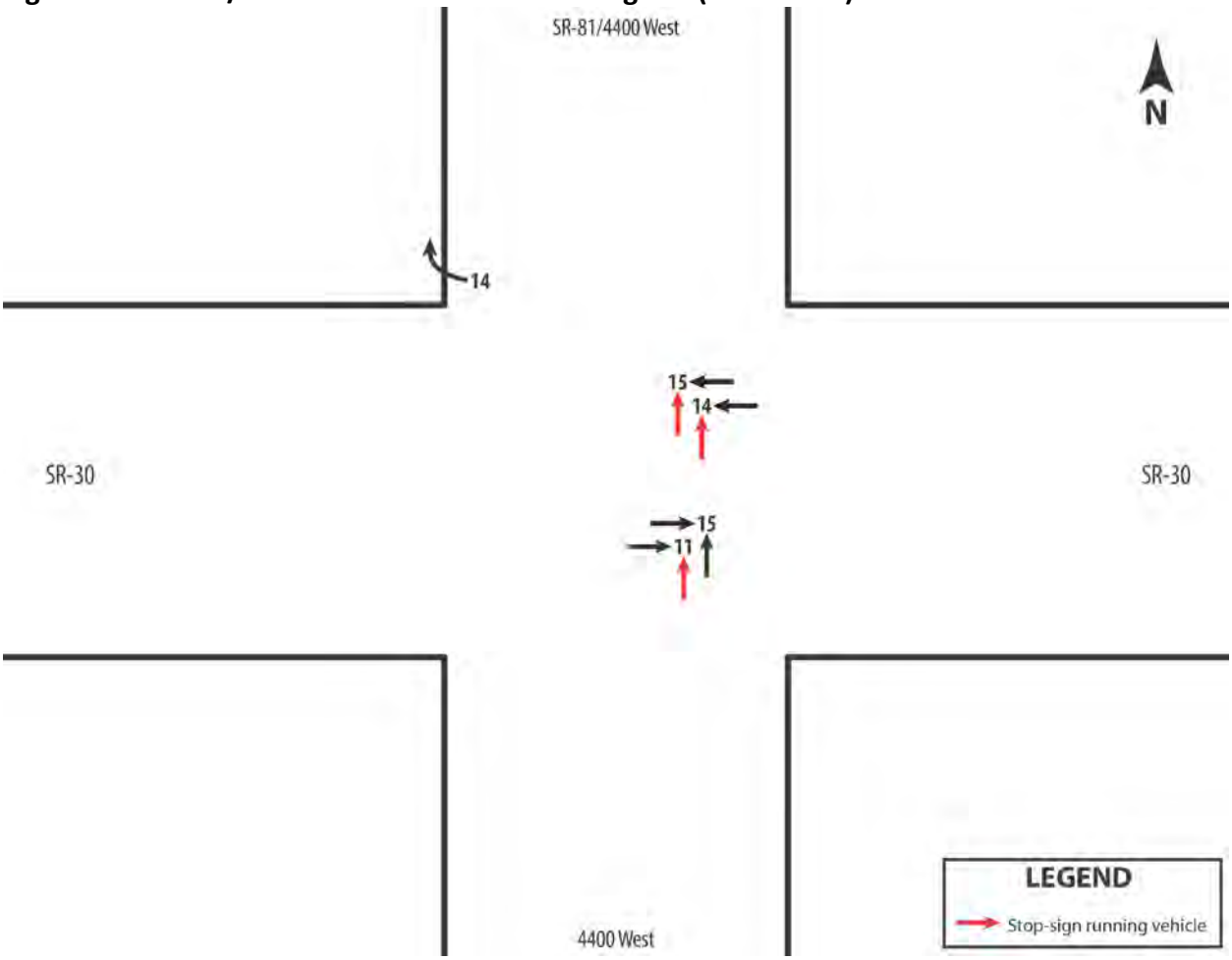


Figure 18: S.R. 81/S.R. 30 Intersection Crash Diagram (2011-2015)



S.R. 38/S.R. 30 Intersection

Investigation of the S.R. 38/S.R. 30 intersection reveals that many of the crashes occurring near the intersection actually involved hitting wildlife. Of the non-wildlife crashes, four crashes involved vehicles turning left, or slowing to turn left, onto S.R. 38. Two factors may contribute to

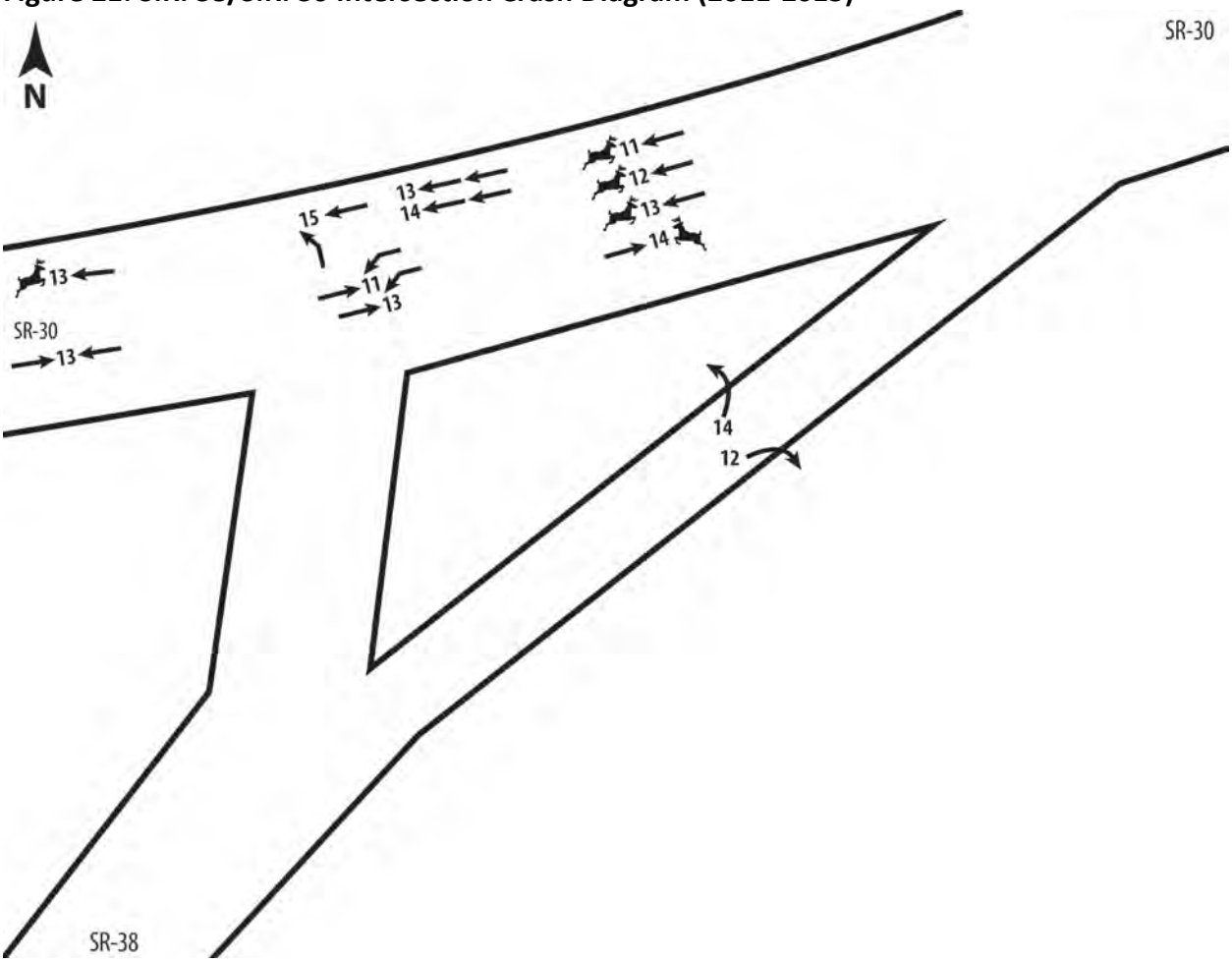
these crashes. First, the deceleration area prior to the westbound left turn lane is only striped for approximately 135 feet. This is much shorter than deceleration locations at other intersections on the corridor (approximately 180 feet at S.R. 23 and approximately 200 feet at 3200 West). Additionally, according to UDOT Standard Drawing DD 14A2, the deceleration lane for a rural roadway with speeds over 50 mph should be at least 180 feet. This short deceleration length may contribute to turning vehicles having to slow suddenly and getting hit from behind.

Second, there is limited sight distance at the intersection for detecting eastbound vehicles on S.R. 30. The grades associated with the natural terrain and the nearby railroad bridge may be related to the two crashes where vehicles turning left onto S.R. 38 were struck by an oncoming through vehicle on S.R. 30. It should be noted that while there is no crash pattern to indicate poor sight distance for the left turn from S.R. 38 to westbound S.R. 30, this is also one of the lowest volume movements of the intersection. The lack of crashes may simply reflect fewer occurrences of turning vehicles rather than ample sight distance.

Figure 19: Sight Distance on S.R. 30 at S.R. 38 (Looking West)

Figure 20: Sight Distance on S.R. 38 (Looking West)

Figure 21: S.R. 38/S.R. 30 Intersection Crash Diagram (2011-2015)

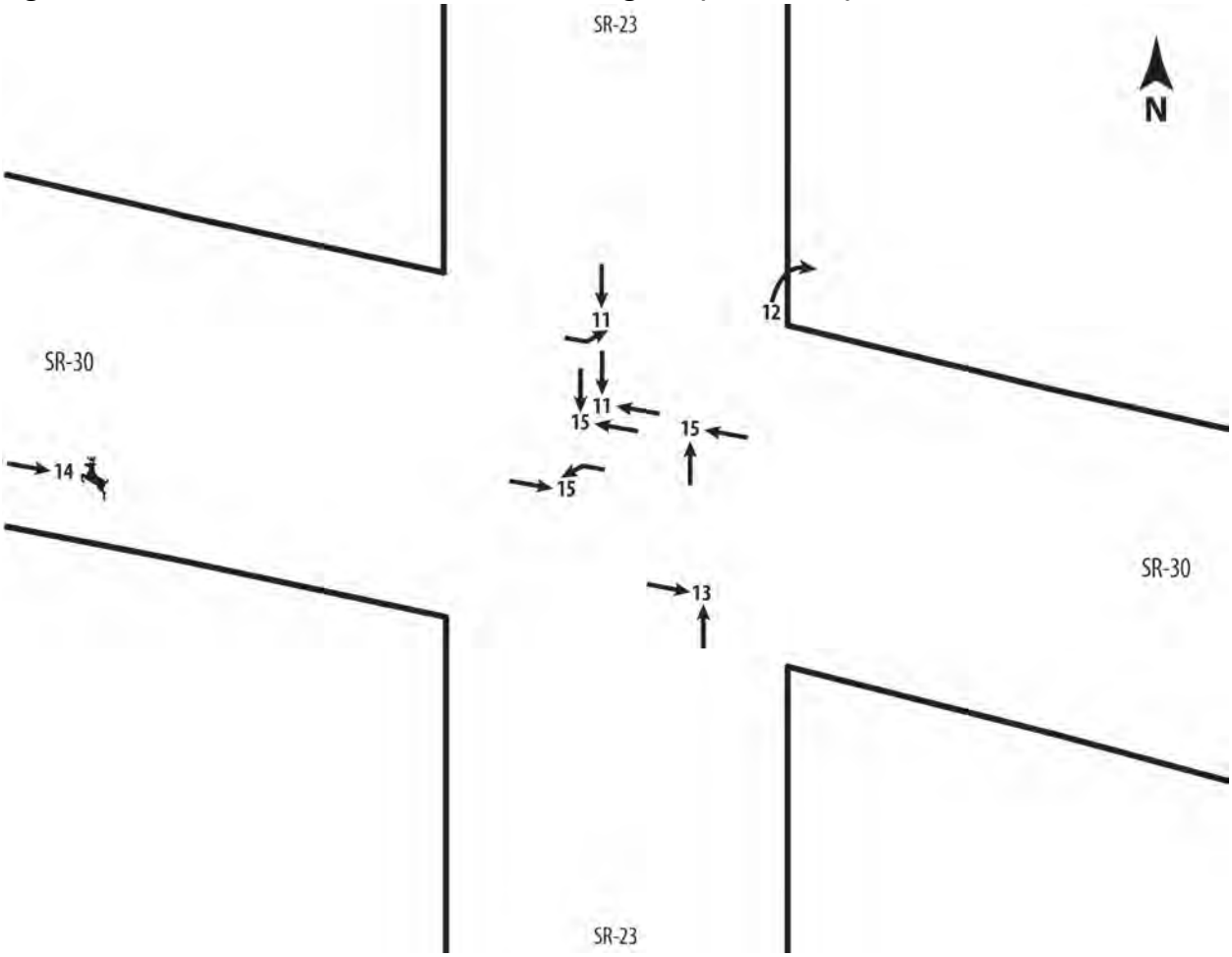


S.R. 23/S.R. 30 Intersection

Crashes at the S.R. 23/S.R. 30 intersection reveal there is no pattern of stop-sign-running crashes unlike some of the other four-leg intersections. Sight distance is clear in both directions for the northbound and southbound stop-controlled approaches. The S.R. 30 approaches each feature right and left turn lanes with long deceleration lengths. There is a street lamp on the southeast corner of the intersection.

Crashes at this location primarily involve drivers from the minor approaches (S.R. 23) failing to yield to vehicles on S.R. 30, yet there are no consistent contributing factors among these crashes. It is possible that the right and left turn lanes on S.R. 30 and the slight skew angle of the intersection combine to create a longer crossing distance for north-south traffic. This in turn may lead to a higher likelihood that drivers on S.R. 23 misjudge the time needed to cross S.R. 30. Parametrix recommends considering realigning the S.R. 23 approaches to eliminate the skew angle and shorten the distance to cross S.R. 30.

Figure 22: S.R. 23/S.R. 30 Intersection Crash Diagram (2011-2015)



Milepost 107.2 Curve

S.R. 30 features a slight curve at approximately MP 107.2, which Parametrix flagged as one of the rural crash hot spots. Though short, the curve is abrupt and still within the 60 mph speed limit zone. Crash data shows many drivers are failing to navigate this curve in the eastbound direction and run off the road into the adjacent ditch on the right shoulder. Between 2011 and 2015 nine eastbound drivers ran off the road along this curve. Five of these drivers were fatigued or distracted by a cell phone or passengers.

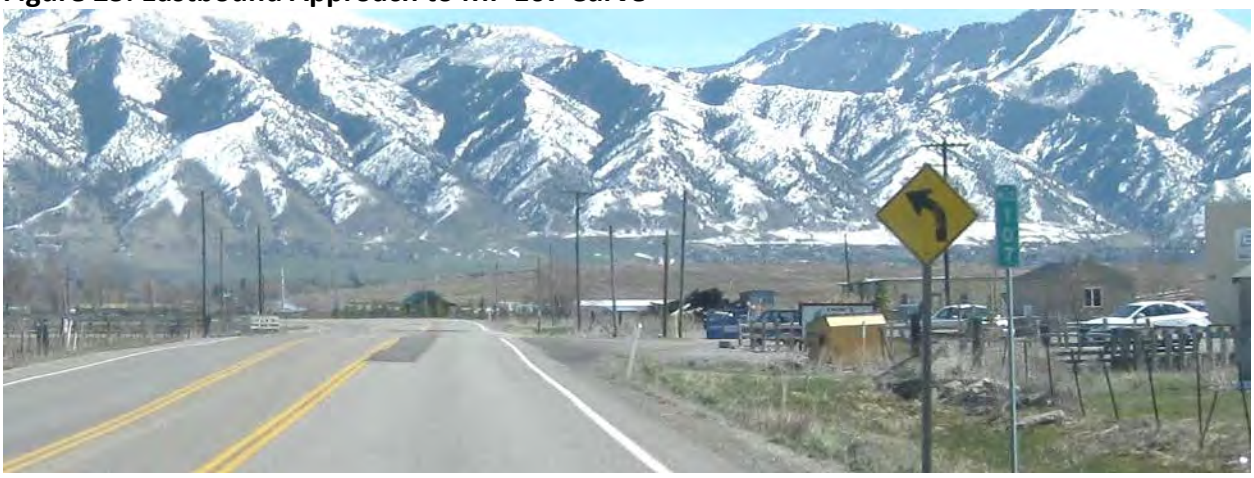
It is interesting to note the differences in crash patterns and roadway features for eastbound and westbound directions on this curve. Almost all run-off-road crashes involved eastbound vehicles, yet the eastbound direction is the only direction that features a curve warning sign (see Figure 23). The only westbound vehicle that ran off the road was a driver swerving to avoid a black bull in the roadway at night.

A review of roadway geometry and speed provides some insights regarding the strong bias towards eastbound crashes. First, the eastbound travel direction is on the outside of the curve meaning that a vehicle drifting out of the curve in the eastbound direction will immediately run off the roadway. With paved shoulders only two feet wide, an eastbound driver has virtually no

room for recovery before falling into the adjacent ditch. In contrast, the westbound direction traverses the inside of the curve. The curve also features a developing left-turn lane at this point so if a westbound driver drifts out their lane, they have the width of the developing paved median plus the opposing travel lane (if unoccupied) to recover their trajectory.

Second, the character of S.R. 30 roadway is different for each direction. Leading up to this curve, eastbound drivers have been traveling a high-speed, rural corridor with few accesses and little impediment to travel for the last 15 miles. In contrast, westbound drivers are only two miles outside heavily developed areas of Logan City and are transitioning from a lower-speed arterial with intersecting streets, driveways, and traffic signals to a high-speed, rural arterial. The speed limit for westbound travel increases from 55 mph to 60 mph just 700 feet in advance of the curve. Thus, eastbound drivers are more likely to be surprised by sudden changes in roadway geometry than westbound drivers.

Figure 23: Eastbound Approach to MP 107 Curve



S.R. 252/S.R. 30 Intersection

While the S.R. 252 intersection features the most crashes of any location in the study area, the intersection was significantly affected by a widening project on S.R. 252 in 2011 and 2012. Given the recent changes, the impact of construction, and the fact that the intersection is at the terminus of the corridor, the S.R. 252 intersection was not evaluated in detail at this time.

Field Visit

Parametrix conducted a field visit of the study area on April 1, 2016 to review site conditions and investigate other potential safety deficiencies. Beyond the locations already discussed in this document, Parametrix provides the following discussion regarding safety issues observed in the field.

Bear Hollow Drive/S.R. 30 Intersection

Bear Hollow Drive is a relatively new roadway leading to the Bearhollow Lakes resort/recreational development. The access point was constructed in 2014 along with an accompanying left-turn lane and a right-turn lane on S.R. 30. The turn lanes provide a clear benefit to vehicles on S.R. 30, yet Parametrix observed that vertical and horizontal curvature on S.R. 30 severely limits sight

distance in both directions for vehicles turning out of Bear Hollow Drive (see Figures 24 and 25). Though there have been no crashes associated with poor sight distance at this location, the access point is relatively new and the development is only partially constructed. As the development expands and generates more traffic, the likelihood of crashes at this location will increase. Because terrain limits the options for sight distance mitigations, Parametrix recommends installing intersection warning signs on S.R. 30. Though this cannot fully mitigate the sight distance concerns, it may alert drivers on S.R. 30 that they may expect vehicles suddenly turning out of Bear Hollow Drive. Additionally, installing intersection lighting can improve visibility for both drivers on S.R. 30 and at the access point.

Figure 24: Sight Distance at Bear Hollow Drive (Looking East)

Figure 25: Sight Distance at Bear Hollow Drive (Looking West)

<u>Beaver Dam Road/S.R. 30 Intersection</u>

The Beaver Dam Road/S.R. 30 intersection is a three-leg intersection that serves as the primary access point for the Beaver Dam community. The intersection features a right-turn lane and a left-turn lane on S.R. 30. Parametrix recommends installing intersection lighting and a left-turn

acceleration lane at this intersection to aid vehicles turning left from Beaver Dam Road onto S.R. 30. Because an eastbound passing lane begins just ¼ mile from the intersection, the acceleration lane could easily tie into the existing passing lane. Again, there is no history of a left-turn crash problem at this location, but these improvements would help facilitate access for a growing community.

Cutler Marsh Marina/S.R. 30 Intersection

The Culter Marsh Marina is a popular recreational destination point in Cache County. The marina provides a boat ramp, a floating dock, parking, and a picnic area. Access to the marina from S.R. 30 features a right-turn lane, but no left-turn lane. Parametrix identified four crashes at this location involving westbound vehicles running into the back of another vehicle stopped or slowing to turn into the marina. Parametrix recommends adding a left-turn lane to allow vehicles turning into the marina to clear the through lane, safely decelerate, and turn into the marina. This is especially important since many vehicles using the access are towing boats or trailers and require longer distances to decelerate to a safe turning speed.

3200 West/S.R. 30 Intersection

The 3200 West/S.R. 30 intersection features a left-turn lane, but no right-turn lane. Data from a previous S.R. 30 corridor study indicate that right-turning volumes exceed the 10 vehicles per hour minimum UDOT uses for adding right-turn lanes on high-speed rural roads. Parametrix recommends installation of a right-turn lane at this intersection along with intersection lighting to improve visibility during nighttime and foggy conditions. Crash history shows one crash involving a right-turning vehicle and one crash where fog was a contributing factor.

MP 102-1400 West

The six mile section of S.R. 30 between MP 102 and 1400 West contains some challenging safety conditions. Shoulders through this section are primarily only two feet wide with non-recoverable slopes. One particular segment has no shoulders at all for over one mile. The roadway is often bounded by deep ditches on one or more sides or else traverses through the marsh. The surrounding wetlands contribute to frequent foggy weather and there are no passing lanes.

Crash data reflect many safety issues facing S.R. 30 in this area. Of the 100 crashes between MP 102 and 1400 West, 43 crashes involved a vehicle running off the road. The lack of shoulders leaves drivers with little room for recovery if they drift out of their lane or slide off the road in snowy or icy conditions. Fifteen of the 100 crashes resulted in a vehicle overturning or rolling over. Because of the steep side slopes and adjacent ditches, when vehicles do leave the roadway, they are very likely to overturn or rollover and cause greater injury to drivers and passengers. Eight of the 100 crashes occurred during foggy weather and six of the 100 crashes involved a passing maneuver.

Given these conditions, Parametrix recommends exploring options to widen shoulders, improve side slopes and add passing lanes for this section of S.R. 30. In addition, methods to warn drivers of poor visibility due to fog or snow could increase driver alertness. Such methods could include variable message signs on either end of corridor that respond to local weather sensors.

Figure 26: Section of S.R. 30 with No Shoulders and Non-recoverable Slopes

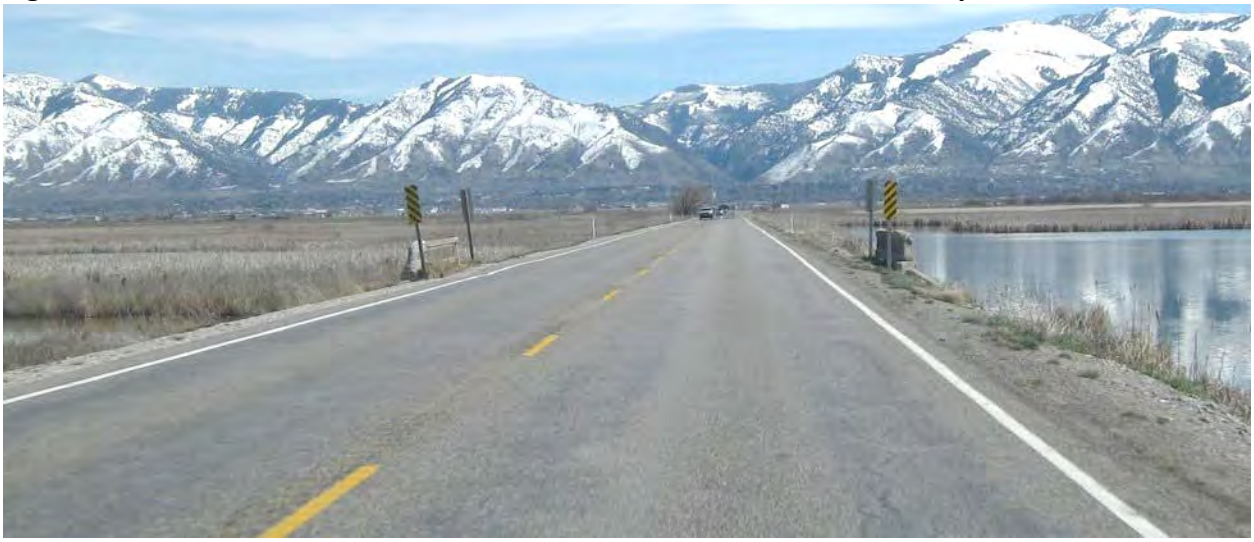
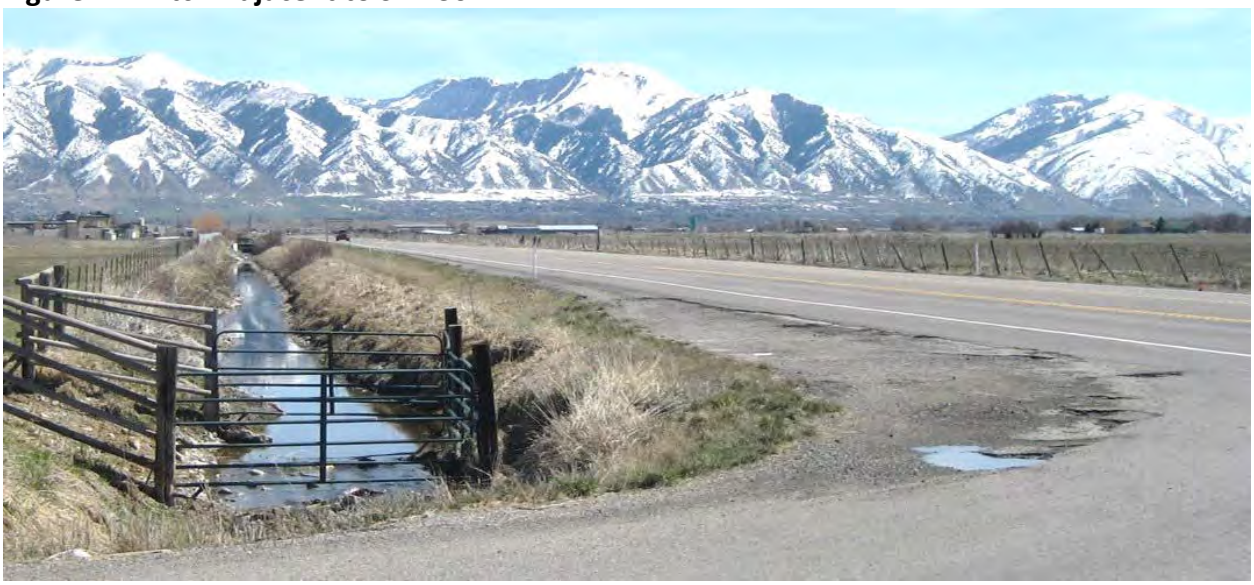


Figure 27: Ditch Adjacent to S.R. 30



1400 West to S.R. 252

The section of S.R. 30 between 1400 West and S.R. 252 is the only urbanized portion of the study corridor. There are numerous driveways including the access to the Cache County Sheriff's Office and commercial and industrial driveways near the S.R. 252 traffic signal. However, there is no center turn lane. This contributes to frequent crashes where vehicles rear-end another vehicle that has stopped in the travel lane to wait for a gap to turn left into a driveway or access. Parametrix recommends widening S.R. 30 from 1400 West to S.R. 252 to include a center turn lane. Consideration should also be given to access management treatments, such as raised medians or access consolidation near the S.R. 252 signal to reduce turning vehicle conflicts at the closely spaced driveways and intersections.

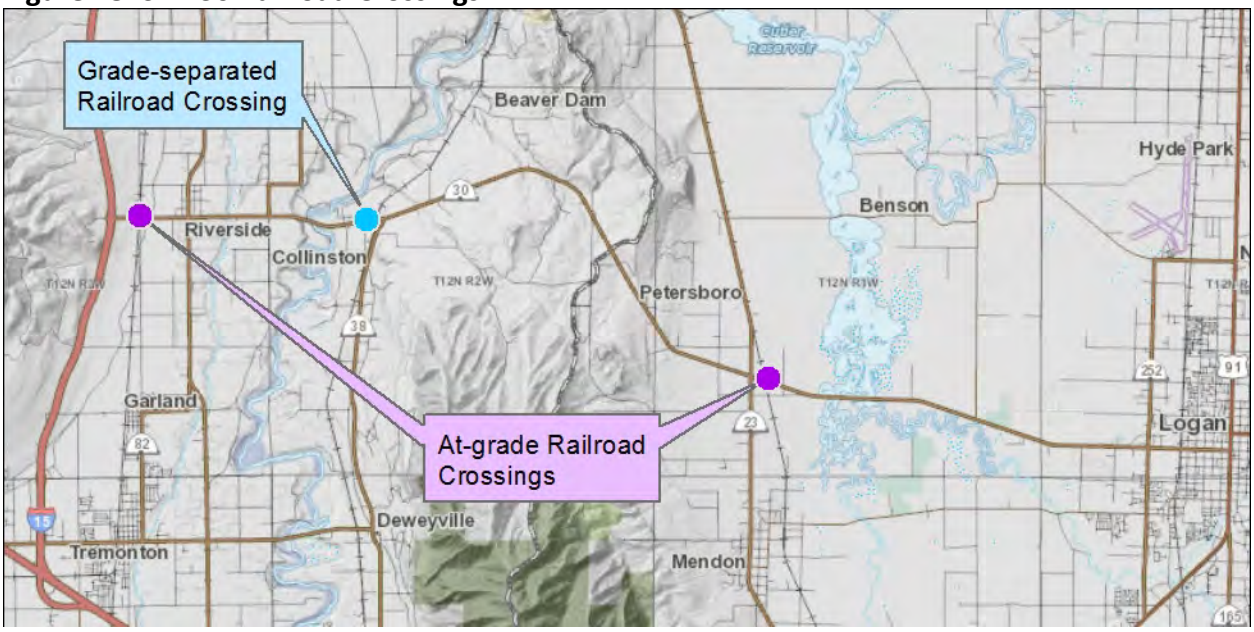
At-grade Railroad Crossings

There are two at-grade railroad crossing in the S.R. 30 study area. The first crossing is located just west of the 6000 West intersection in Box Elder County at approximately MP 91.14. The second crossing is located about ¼ mile east of the S.R. 23 intersection at approximately MP 102.60. As a note, there is a third railroad crossing west of the S.R. 38 intersection, but this is a grade-separated crossing and thus presents no vehicle-train conflicts. Crossing locations are shown in Figure 28.

The crossing near 6000 West is situated directly between the 6000 West intersection on the east and a driveway to a UDOT maintenance shed on the west. The crossing features active control devices including automatic gates and flashing-light signals. The most recent UDOT crossing inspection was performed in August 2015 and found no safety deficiencies. Crash history shows two crashes related to the crossing within the study time frame. Both crashes occurred in 2015 and involved a bus making a required stop at the railroad crossing. One of the crashes involved a vehicle in the eastbound direction running into the back of the bus stopping at the crossing. In the other crash, a westbound vehicle ran into the back of a vehicle behind a school bus stopped at the crossing.

The crossing east of S.R. 23 also features active control devices comprised of automatic gates and flashing-light signals. The latest UDOT crossing inspection from September 2015 determined that the crossing had fading stop lines and "RXR" pavement marking symbols (see Figure 29). Only one crash related to the crossing occurred during the study time frame. This was a single-vehicle crash in which a camping trailer unhooked from a westbound pickup as it crossed the railroad tracks.

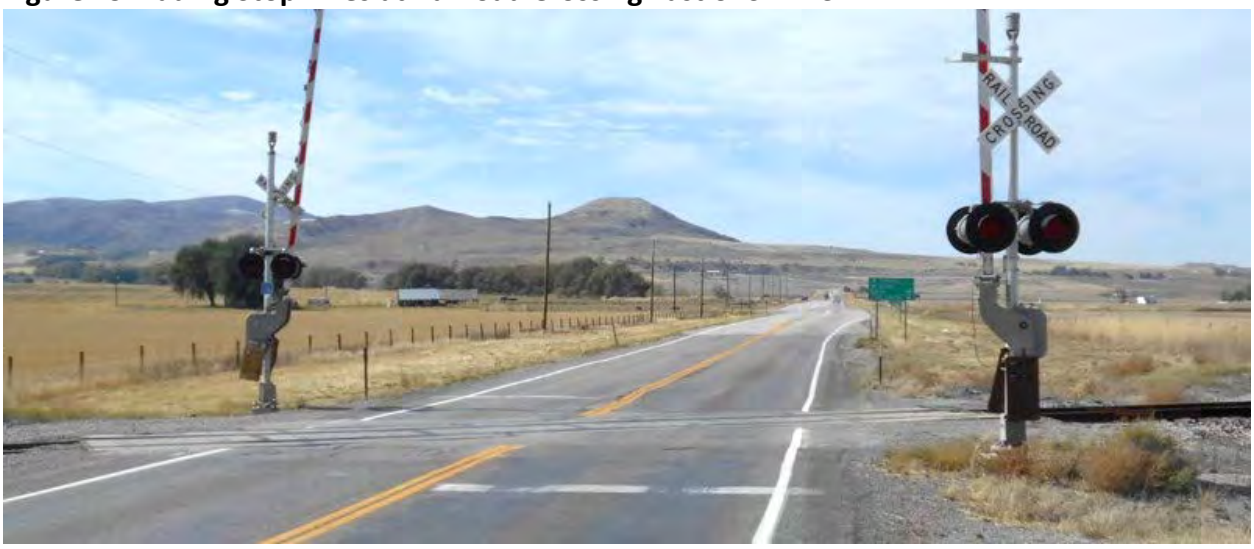
Figure 28: S.R. 30 Railroad Crossings



The higher speed limit (60 mph) and potential foggy conditions create potential safety concerns at the crossing east of S.R. 23. School buses and truck carrying hazardous materials are required to stop at all non-exempt at-grade railroad crossings whether or not the crossing warning signals are activated. A vehicle stopped in the fog could be difficult to detect for a trailing vehicle traveling at high speeds and lead to rear end collisions.

For both locations, adding shoulders or a separate lane for the buses and trucks required to stop would help reduce potential conflicts. At the crossing next to 6000 West, there is an actual crash history of vehicles rear-ending other vehicles stopped for the crossing. Additionally, though speed limits are lower (55 mph), the eastbound approach has a downgrade approaching the crossing which can make it more difficult for a vehicle to stop in time. Any shoulder treatment or lane additions at this location would need to be carefully designed so that it does not create adverse effects with the adjacent intersection and driveway. Though the crossing east of S.R. 23 does not have a crash history reflecting problems with stopped vehicles, the higher speeds and frequent foggy conditions create a greater potential for rear-end crashes.

Figure 29: Fading Stop Lines at Railroad Crossing East of S.R. 23



Source: UDOT Railroad Crossing Inventory, September 2015.

Highway Safety Manual

Predicted Crash Frequencies

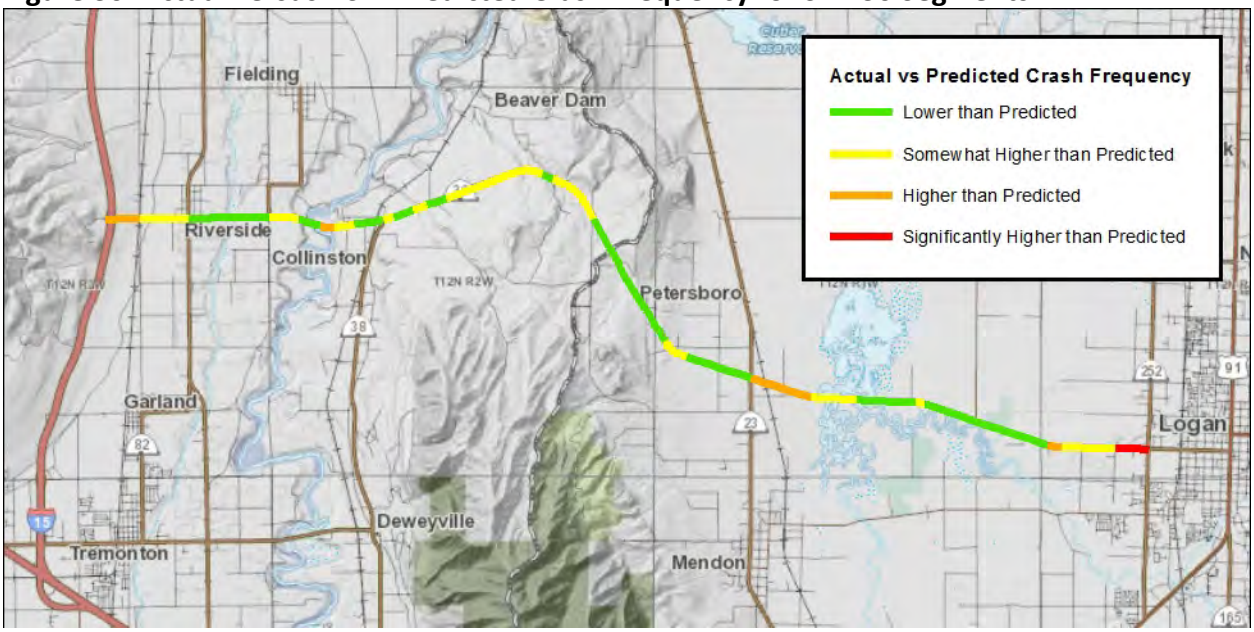
The Highway Safety Manual (HSM) represents some of the latest advancements in crash prediction methodologies. HSM methods allow users to calculate a "predicted" crash frequency for a facility according to its specific roadway features and traffic volumes. The predicted crash frequency can then be compared to historic crash frequencies to determine whether a facility is over-represented by crashes and signifies a potential safety concern.

Parametrix conducted a brief analysis with HSM methods to develop "predicted" crash frequencies for segments of the S.R. 30 study corridor. The intent of this analysis is to provide a high-level assessment of roadway conditions to supplement the other methods of analysis in this document. It should be noted that HSM methods generate precise outputs, yet many of

necessary inputs require some generalization or estimation to be developed comprehensively for the study area. Thus, results should be viewed with the understanding that the level of precision does not reflect the level of accuracy.

Figure 30 illustrates a comparison of actual S.R. 30 segment crash frequencies against HSM predicted crash frequencies. Parametrix generalized results into categories to provide a relative comparison across the corridor. The only segment with actual crash frequencies "significantly higher" than HSM predicted crash frequencies is the urbanized area of S.R. 30 west of 1400 West. It should be noted that as an urbanized roadway, this section is subject to a different HSM methodology than the rest of the corridor.

Figure 30: Actual versus HSM Predicted Crash Frequency for S.R. 30 Segments



Crash Modification Factors

When developing a predicted crash frequency for a roadway segment or intersection, the HSM methodology employs Crash Modification Factors (CMFs) to adjust the predicted crash frequency for site-specific conditions. In other words, the HSM methods first predict crash frequencies for a "baseline" condition which assumes typical roadway characteristics. Then, anytime roadway characteristics depart from the baseline assumptions, CMFs are used to account for the fact that more or fewer crashes could be expected due to the unique conditions on that part of the roadway. For example, the HSM methods assume 12-feet travel lanes for baseline conditions. Anywhere the roadway features travels lanes less than 12-feet, a CMF is applied to account for the fact that narrower travel lanes are correlated with increased crash frequencies.

The CMFs in the HSM predictive method are based on rigorous research and provide a coefficient to multiply against the baseline predicted crash frequency. A CMF greater than 1.00 indicates the roadway feature is correlated with increased crashes over the baseline conditions. A CMF less than 1.00 indicates the roadway feature is correlated with decreased crashes from the baseline conditions. For example, a CMF of 1.25 multiplied against the baseline predicted crash frequency

will result in a 25 percent increase in predicted crashes. CMFs may apply to all crash types or only certain crash types proven to have a correlation with the roadway feature.

Parametrix analyzed the CMFs within the HSM rural, two-lane highway methodology to provide an indication as to how various roadway treatments could affect crash frequencies in the S.R. 30 study corridor. The following discussion and tables (Tables 5 and 6) summarize the CMFs for roadway segments and intersections on rural, two-lane highways that best correlate with safety concerns identified in this document. It should be noted that caution should be used in applying multiple CMFs for the same segment or intersection since separate CMFs may capture impacts to the same crashes, essentially double counting potential crash reductions or increases.

Table 5: Summary of CMFs for Rural, Two-lane Highway Segments

Feature	Feature	CMF	Applicable Crash Type
Shoulder Width[1]	Shoulder width = 0 feet	1.50	• Single-vehicle • Run-off-road • Head-on • Sideswipe
	Shoulder width = 2 feet	1.30	
	Shoulder width = 4 feet	1.15	
	Shoulder width = 6 feet	1.00	
	Shoulder width ≥ 8 feet	0.87	
Passing Lanes[2]	New passing lane in one direction of travel	0.75	All crash types
	Passing lanes in two directions (Short four-lane section)	0.65	
Two-way Left-Turn Lane[3]	Installation of two-way left-turn lane	$1.0 – (0.7 \times P_{dwy} \times P_{LT/D})$	All crash types

Source: HSM.

1. For roads with AADT greater than 2,000 vehicles per day.
2. Assumes passing lane is operationally warranted and has appropriate length.
3. Only applicable when driveway density ≥ 5 driveways per mile.

P_{dwy} = proportion of driveway crashes versus all crashes.

$P_{LT/D}$ = proportion of left-turn crashes susceptible to correction by a two-way left-turn lane versus driveway crashes.

Shoulder Width

The shoulder width CMF is only applicable for single-vehicle crashes, run-off-road crashes, head-on crashes, and sideswipe crashes. The baseline condition for the HSM predictive method is a shoulder width of six feet. Roadways with narrower shoulders have a CMF greater than 1.00 indicating more crashes are expected. Roadways with shoulders eight feet wide or more have a CMF less than 1.00 meaning fewer crashes are expected.

The magnitude of the shoulder width CMF is proportion to shoulder width. Roadways with no shoulder are expected to have 50 percent more of the applicable crash types than roadways meeting the base condition (six foot shoulders). By contrast, roadways with eight foot shoulder or greater are expected to have 13 percent fewer crashes than the baseline condition.

The abundance of locations with narrow shoulders on S.R. 30 suggest that significant crash reductions could be experienced by widening shoulders.

Passing Lanes

The passing lane CMF applies to all crash types, but is only valid for areas where a passing lane is operationally warranted and of appropriate length. The passing lane CMF predicts that the addition of a passing lane reduces crashes by 25 percent within the passing lane area (including tapers). Adding a passing lane in the opposite direction to create a short, four-lane section is predicted to provide an additional 10 percent reduction in crashes.

Long stretches of the S.R. 30 corridor feature no passing lanes and the history of passing-related crashes on the corridor indicate a need to better accommodate passing maneuvers. The HSM CMF signifies the clear safety benefits of appropriately located and designed passing lanes.

Two-Way Left-Turn Lane (Continuous Center Turn Lane)

The two-way left-turn lane CMF applies to all crash types but only pertains when driveway density is greater than five driveways per mile. The CMF predicts fewer crashes when a two-lane left-turn lane is present and is a function of the proportion of driveway-related crashes and left-turn crashes that could be mitigated by a two-way left-turn lane. The formula for the CMF is organized such that the higher the proportion of said crashes, the greater the predicted crash reduction.

Given the frequent driveway crashes in the urbanized portion of the study corridor (1400 West to S.R. 252), the HSM CMF indicates significant crash reductions are predicted with the addition of a two-way left-turn lane.

Table 6: Summary of CMFs for Rural, Two-lane Highway Intersections

Feature	Feature		CMF	Applicable Crash Type
Intersection Skew Angle	Skew angle at 4 leg intersection with stop-control on the minor approaches		$e^{(0.004 \times skew)}$	All crash types
Intersection Left Turn Lanes[1]	3 leg Intersection	Add left-turn lane to 1 approach	0.56	All crash types
	4 leg Intersection	Add left-turn lane to 1 approach	0.72	
		Add left-turn lane to 2 approaches	0.52	
Intersection Right Turn Lanes[1]	3 leg Intersection	Add right-turn lane to 1 approach	0.86	All crash types
	4 leg Intersection	Add right-turn lane to 1 approach	0.76	
		Add right-turn lane to 2 approaches	0.74	
Intersection Lighting	Add intersection lighting		$1 - 0.38 \times p_{ni}$	All crash types

Source: HSM.

1. Minor road stop-controlled intersections.

skew = absolute value of intersection skew angle in degrees.

P_{ni} = proportion of crashes occurring at night.

Intersection Skew Angle

The intersection skew angle CMF assumes a base condition of no skew, meaning the intersecting roadways join at a right angle. The CMF indicates that intersections with skew will have more crashes proportionally to the degree of skew.

The S.R. 23 intersection is the most significant intersection with skew on the study corridor. The HSM CMF coupled with the history of drivers being struck while attempting to crossing S.R. 30 suggest that eliminating the skew would result in fewer crashes.

Intersection Turn Lanes

All intersection turn lane CMFs assume a base condition of no turn lanes on the un-controlled major street approaches. The CMFs are valid for all crash types, but only are applicable for turn lane additions to the major street approaches. There is no documented safety benefit in the HSM for installing turn lanes on the stop-controlled approaches. Turn lane CMFs predict a crash reduction of 14 percent to nearly 50 percent when turn lanes are installed – depending on if they are right-turn or left-turn lanes, the number of total intersection legs, and whether the turn lanes are added to one or both major street approaches.

The S.R. 30 study area features multiple streets and major driveways that lack turn lanes or turn lanes with appropriate deceleration length. The HSM CMF reiterates the safety benefit of adding turn lanes where appropriate.

Intersection Lighting

The intersection lighting CMF assumes a base condition of no lighting. The CMF is valid for all crash types, but is function of the proportion of crashes occurring at night. The greater the proportion of crashes occurring at night, the greater the predicted crash reduction.

The intersection lighting CMF supports the recommendation to add lighting to several S.R. 30 intersections.

Conclusions and Recommendations

Through the use of several crash analysis methods, including an evaluation of fatal and serious injury crashes, crash rates, key crash attributes, crash hot spot analysis, a field review of the corridor, and HSM methodologies, Parametrix presents the following safety recommendations for the S.R. 30 study area:

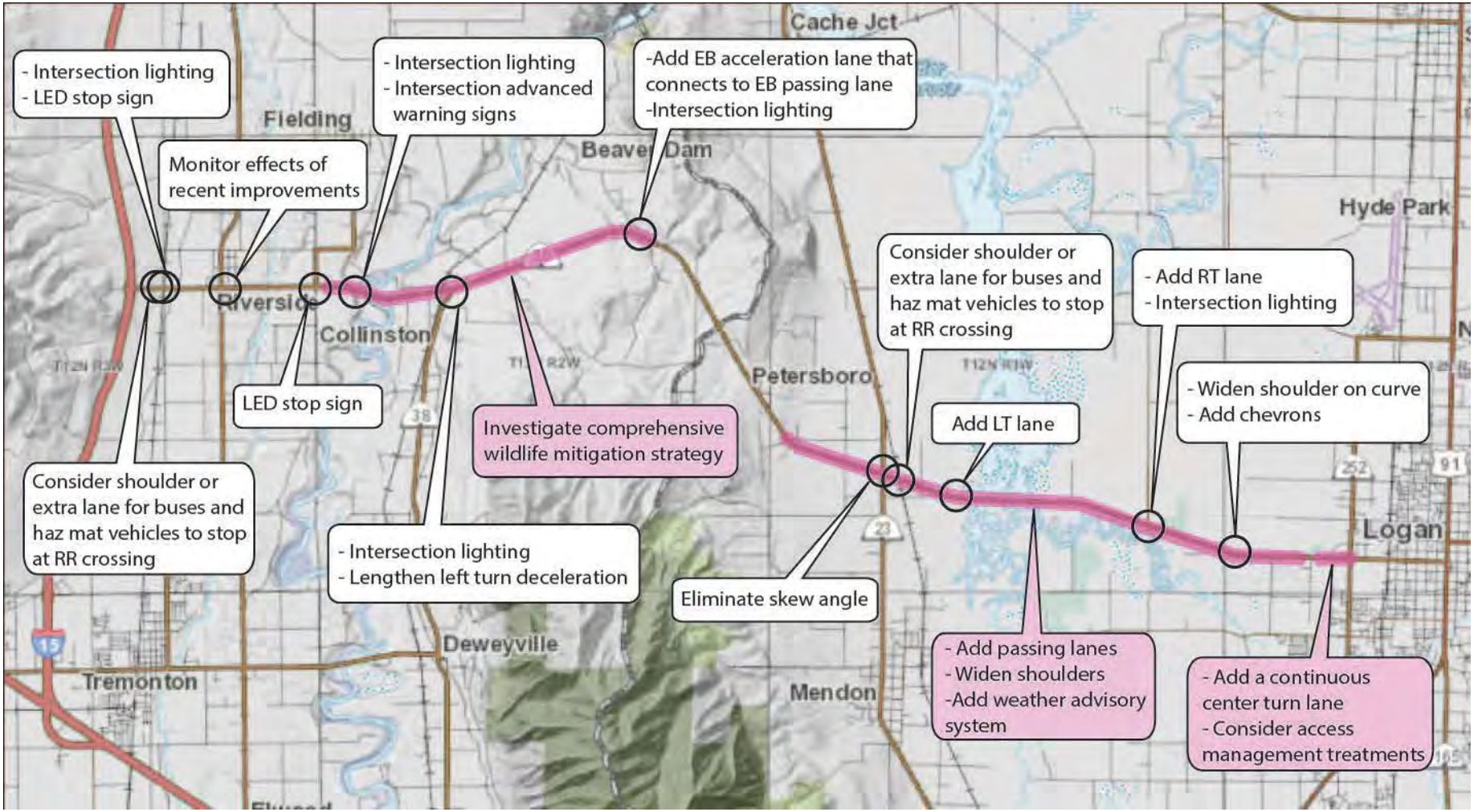
Table 7: Summary of Recommendations

Location	Key Factors	Recommendation
6000 West/ S.R. 30 Intersection	• Crash rate and severe crash rate above statewide average • Crash hot spot • Numerous stop-sign running crashes, mostly during dark conditions • Crash frequency higher than HSM predicted crash frequency	• Upgrade to LED light flashing stop signs similar to the S.R. 13 intersection • Add intersection lighting
S.R. 13/S.R. 30 Intersection	• Crash rate and severe crash rate above statewide average • Crash hot spot • Numerous stop-sign running crashes • Numerous serious injury crashes	• Recent improvements have corresponded with zero stop-sign running crashes • Continue to monitor conditions
S.R. 81/S.R. 30 Intersection	• Severe crash rate above statewide average • Crash hot spot • Numerous stop-sign running crashes	• Upgrade to LED light flashing stop signs similar to the S.R. 13 intersection
Bear Hollow Drive/S.R. 30 Intersection	• Limited sight distance • Expected increase in traffic as development expands	• Add intersection warning signs (W2-2) on S.R. 30 to warn drivers of potential turning vehicles • Add intersection lighting
S.R. 38/S.R. 30 Intersection	• Crash hot spot • Short left-turn lane deceleration length • Limited sight distance	• Lengthen left-turn lane declaration length • Add intersection lighting
Beaver Dam Road/S.R. 30 Intersection	• Primary access point for community	• Add left-turn acceleration lane and connect to downstream eastbound passing lane • Add intersection lighting
S.R. 23/S.R. 30 Intersection	• Crash hot spot • Skew angle and presence of turn lanes increases crossing distance	• Realign S.R. 23 approaches to eliminate skew angle
At-grade Railroad Crossings (MP 94.14, 102.60)	• No shoulders, high-speed roadways	• Consider shoulders or additional lanes for buses and hazardous material-carrying vehicles to make mandatory stops at crossings outside of the main travel lane
Cutler Marsh Marina/S.R. 30 Intersection	• No left-turn lane • Pattern of rear-end crashes from vehicles stopped to turn left from S.R. 30	• Add a left-turn lane on S.R. 30
3400 West/ S.R. 30 Intersection	• No right-turn lane • Right-turn volumes meet UDOT threshold for right-turn lane	• Add a right-turn lane on S.R. 30 • Add intersection lighting
MP 107.2 Curve	• Crash hot spot • 2-feet shoulders, steep side slope, adjacent ditch • Frequent eastbound run off road crashes • Crash frequency higher than HSM predicted crash frequency	• Widen shoulders on south side of curve • Add chevrons to eastbound direction

Table 7: (Continued) Summary of Recommendations

Location	Key Factors	Recommendation
S.R. 81 to Beaver Dam Road	• High concentration of wild-animal-related crashes	• Investigate comprehensive wildlife mitigation strategies such as fencing and designated crossing points
MP 102-1400 West	• Crash rate above statewide average • Very narrow or non-existent shoulders • Deep ditches and non-recoverable slopes • Frequent foggy conditions • No passing lanes • Frequent roadway departure and rollover crashes • Passing-related and foggy weather crashes • Multiple serious injury crashes	• Widen shoulders • Add passing lanes • Add weather advisory system
1400 West to S.R. 252	• Crash rate and severe crash rate above statewide average • Numerous access points and no left-turn lanes • Frequent rear-end and angle crashes • Crash frequency significantly higher than HSM predicted crash frequency	• Add continuous center turn lane • Consider access management treatments to reduce or consolidate vehicle conflicts

Figure 31: Location of Safety Recommendations



E

Capacity Technical Analysis

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

MEMORANDUM

To: Vince Izzo, HDR Engineering, Inc.

From: Charles Allen, P.E., PTOE Parametrix
Vern Keeslar, AICP, Parametrix
Tim Peterson, Parametrix

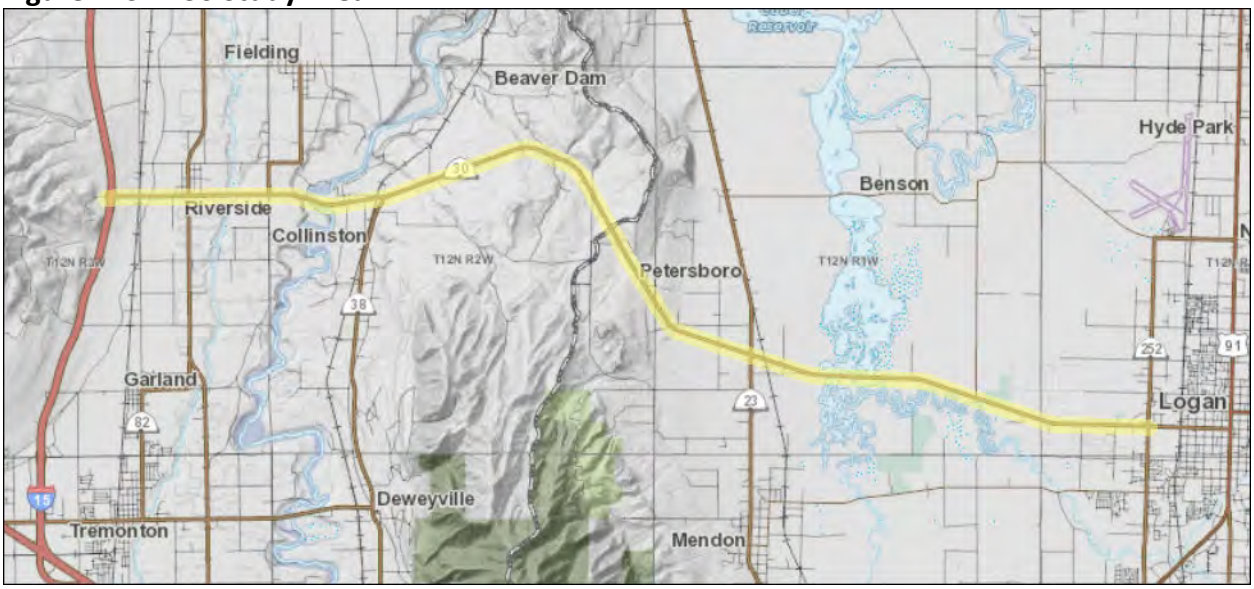
Date: May 12, 2016

Subject: **S.R. 30 Capacity Analysis Memo**

Introduction

The purpose of this memo is to document the capacity analysis on S.R. 30 between I-15 in Box Elder County and S.R. 252 (10th West) in Logan as part of the S.R. 30 corridor analysis (see Figure 1). Parametrix conducted capacity analysis on highway segments and key intersections for existing conditions (2016) and 2040 no build conditions as forecasted in the *S.R. 30 Travel Modeling Memo* (May 2016).

Figure 1: S.R. 30 Study Area



Data Collection

Parametrix obtained roadway traffic counts at six locations along the study corridor. Counts recorded traffic volumes by direction for a continuous 72-hour period from February 9, to February 12, 2016. Figure 2 summarizes the annual daily traffic (ADT) volumes and PM peak period directional volumes at each count location. It should be noted that the data shown in Figure 2 are seasonally adjusted based on information from the Utah Department of

Transportation (UDOT) automated traffic recorder (ATR) 610. Located on S.R. 30 just west of 600 West, ATR 610 records hourly traffic volumes continuously throughout the year. Parametrix examined ATR data from 2014 and determined that traffic volumes in the month of February are approximately five percent below the annual average (see Figure 3). As such, Parametrix increased volumes from the February 2016 traffic counts by five percent to convert to an average annual representation.

Daily traffic volumes on S.R. 30 progressively increase from west to east with the lowest volumes adjacent to I-15 and the highest volumes approaching Logan City. In fact, traffic volumes near Logan City are slightly more than double what is reported by I-15.

Parametrix also obtained PM peak period intersection turning movement counts for key intersections along the study corridor. Counts were conducted during March 2015 as part of a previous S.R. 30 analysis – *S.R. 30; Corridor Study, I-15 to S.R. 252* (July 2015). Since March traffic volumes are near the annual average, the volumes were not seasonally adjusted. Figure 4 summarizes the PM turning movement volumes.

Turning volumes at key intersections influence traffic patterns on S.R. 30. Vehicles turning onto S.R. 30 from the S.R. 13 intersection and the S.R. 38 intersection add to S.R. 30 through traffic volumes by as much as 36 percent. At the S.R. 23 intersection, overall S.R. 30 traffic volumes do not increase to the same magnitude, but turning patterns are such that the PM peak hour directional split on S.R. 30 reverses. For example, west of S.R. 23, the dominant flow in PM peak period is towards Logan (eastbound), but east of S.R. 23 the dominant flow is towards I-15 (westbound).

Figure 2: Summary of Existing Traffic Count Data (Seasonally Adjusted)

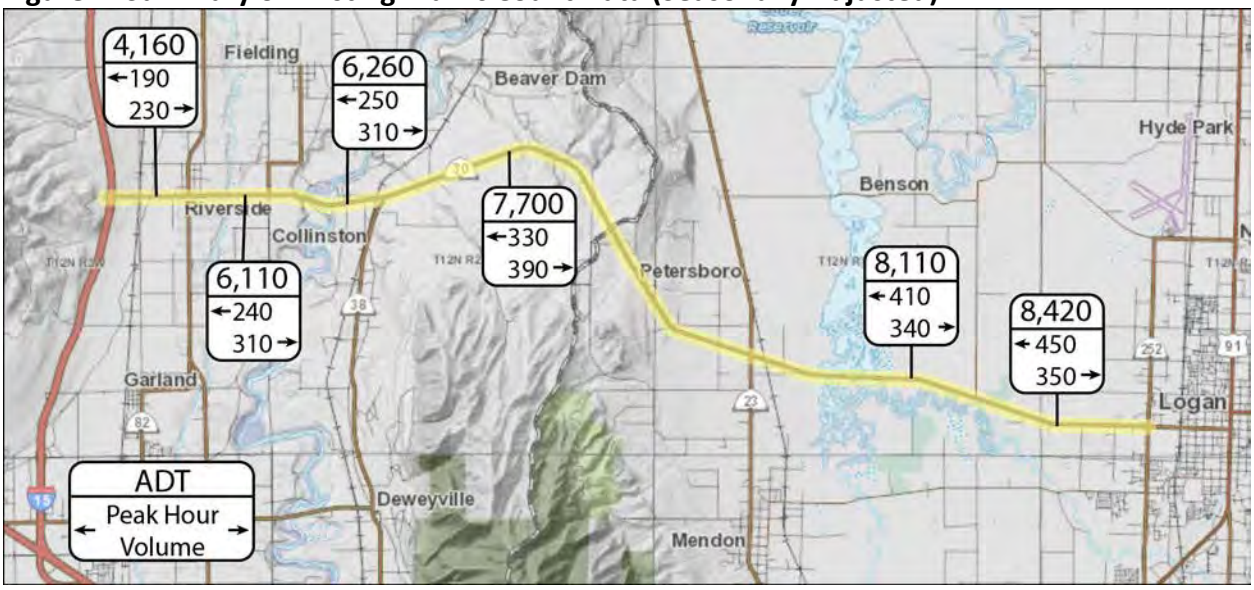
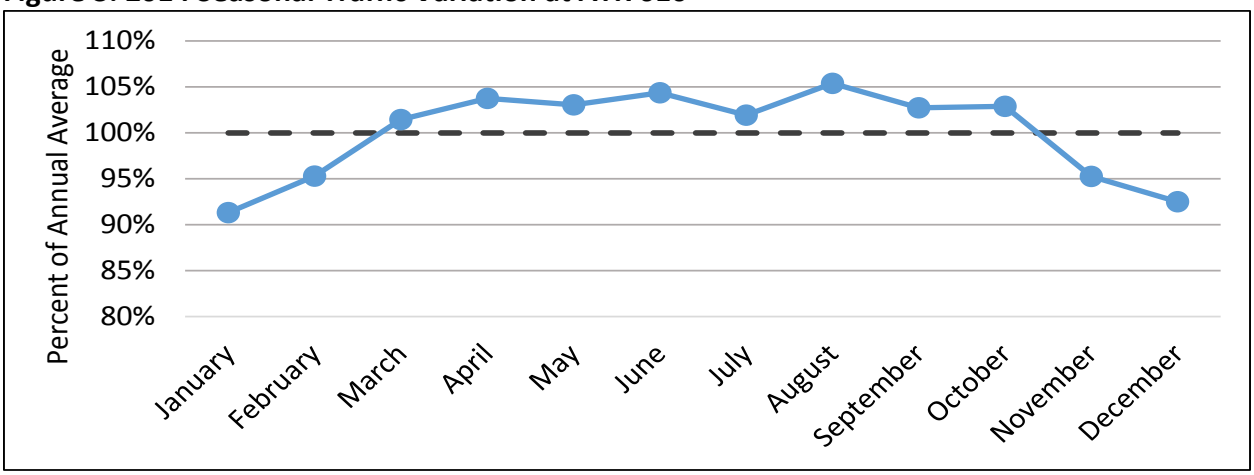
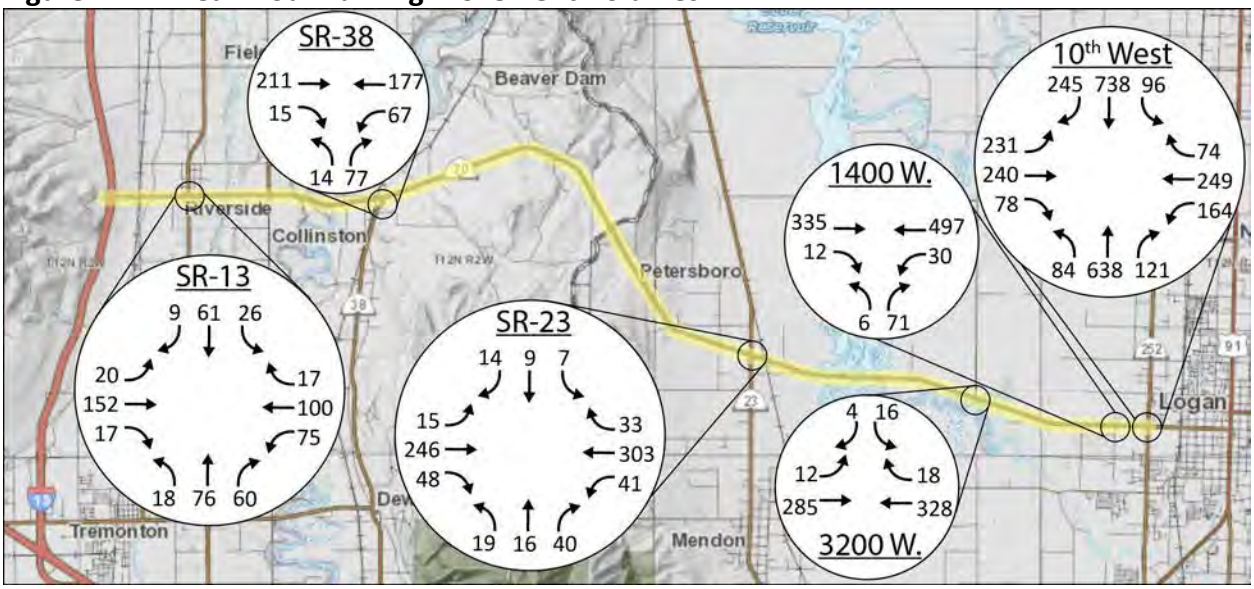


Figure 3: 2014 Seasonal Traffic Variation at ATR 610



Source: UDOT Program Development.

Figure 4: PM Peak Hour Turning Movement Volumes



Methodology

Highway capacity analysis is a function of comparing the expected number and type of vehicles on the road (demand) to physical roadway characteristics (capacity). In Utah, corridors exclusively within metropolitan planning organization (MPO) boundaries have the option to be screened by MPO travel demand model demand/capacity outputs for the defined three-hour "peak period." The S.R. 30 study area, however, is only partially within the Cache MPO boundary. The travel demand model representing the rural portions of the study area is the Utah Statewide Travel Model (USTM) which only reports daily volumes and does not report three-hour peak period volumes.

In order to provide consistent outputs, Parametrix conducted capacity analysis for the entire corridor according to Highway Capacity Manual 2010 (HCM) methodologies. HCM methods are based on analysis of the "peak hour" volumes as obtained from traffic counts or else factored

from daily volumes, which are an output from both the Cache MPO model and the USTM model. Additionally, HCM methods have the ability to more specifically capture the nuances of rural, two-lane highway operation than travel demand model volume/capacity ratios.

HCM capacity methods output a roadway level of service (LOS) measure. LOS is an A to F scale assessment with LOS A representing free-flow conditions and LOS F representing traffic stream breakdowns. In rural areas, LOS C is typically accepted as the design standard in Utah with LOS D being the typical design standard in urban areas. Parametrix used both LOS C and LOS D for the capacity analysis, depending on the rural or urban nature of the segment. Parametrix analyzed the S.R. 30 corridor according to the most applicable HCM methodologies as discussed below.

Rural Two-Lane Highways

HCM capacity analysis methods and outputs are customized by highway type. Rural, two-lane highways operate differently than freeways or multi-lane highways in fundamental ways and must therefore be analyzed differently. The primary constraint for travel on rural, two-lane highways is the ability to pass slower-moving vehicles. Because there is only one travel lane per direction, passing maneuvers must be conducted in the opposing travel lane. Sight distance and the opposing traffic volumes significantly influence drivers' ability to pass safely. When passing maneuvers are inhibited, vehicle platoons form on the highway and delay increases. Consequently, poor operational conditions on rural two-lane highways can be reached at volumes well below the traditional single-lane capacity flow rates for freeways and multi-lane highways.

In order to capture the nuances of rural two-lane highway operation, the HCM defines LOS according to three concepts:

- Percent Time Spent Following (PTSF)
- Average Travel Speed (ATS)
- Percent Free Flow Speed (PFFS)

The applicable LOS definitions depend on the two-lane highway classification (Class I, II, or III). Class I highways are characterized by high speed connections between long trips. Class II highways may represent connections to Class I highways or sections of Class I highways traveling through rugged terrain where high-speed operation is impossible. Class III highways pass through areas of moderate development where access density increases and local traffic mixes with through traffic. Parametrix defined the majority of the S.R. 30 study corridor as a Class I highway with only the portion east of 1900 West (milepost 107.62) being defined as a Class III highway. The following sections discuss each LOS concept and its applicability to the S.R. 30 highway classification. Table 1 summarizes the LOS concepts and thresholds for two-lane highways.

Percent Time Spent Following (PTSF)

LOS on Class I highways is defined by PTSF which represents the percent of drive time that a driver must spend in a platoon of other vehicles that restricts freedom to maneuver and the comfort and convenience of travel. PTSF is measured stochastically using traffic data as opposed to field measurements.

Average Travel Speed (ATS)

LOS on Class I highways can also be defined by the ATS, calculated as the segment length divided by the average travel time for vehicles to traverse the segment. Like PTSF, the ATS is measured stochastically. When both PTSF and ATS are calculated for a Class I highway segment, the worst of the two measures is the prevailing LOS.

Percent Free Flow Speed (PFFS)

High speeds and passing opportunities are not expected on Class III highways. Instead drivers expect to travel at or near the speed limit. Thus, PFFS is used to define operational performance. Like the other two evaluation measures, PFFS is estimated stochastically.

Table 1: LOS Thresholds for Rural Two-lane Highways

LOS	Class I Highways		Class III Highways
	Percent Time Spend Following (PTSF)	Average Travel Speed (ATS)	Percent Free Flow Speed (PFFS)
A	≤ 35	> 55	> 91.7
B	> 35 – 50	> 50 – 55	> 83.3 – 91.7
C	> 50 – 65	> 45 – 50	> 75.0 – 83.3
D	> 65 – 80	> 40 – 45	> 66.7 – 75.0
E	> 80	≤ 40	≤ 66.7

Note: HCM methodologies do not define LOS F for rural, two-lane highways.
Source: HCM 2010.

Intersections

Parametrix also analyzed intersection LOS for major intersections on the S.R. 30 corridor. For signalized and stop-controlled intersections, LOS is defined by average control delay per vehicle during the peak hour. At intersections with stop control on the minor legs, the LOS is reported only for the worst stop-controlled approach. Table 2 summarizes the LOS thresholds for intersections.

Table 2: LOS Thresholds for Intersections

LOS	Minor-Leg Stop Controlled Intersection Approaches (Average Control Delay) (seconds/vehicle)	All-Way Stop Controlled Intersections (Average Control Delay) (seconds/vehicle)	Signalized Intersections (Average Control Delay) (seconds/vehicle)
A	> 0 – 10	> 0 – 10	0 – 10
B	> 10 – 15	> 10 – 15	> 0 – 20
C	> 15 – 25	> 15 – 25	> 20 – 35
D	> 25 – 35	> 25 – 35	> 35 – 55
E	> 35 – 50	> 35 – 50	> 55 – 80
F	> 50	> 50	> 80

Note: For minor-leg stop controlled approaches, LOS is reported for the worst stop-controlled approach.
Source: HCM 2010.

Capacity Analysis

Parametrix conducted capacity analysis on the S.R. 30 study corridor to investigate potential capacity deficiencies. Analysis was performed for the PM peak hour for existing (2016) conditions and 2040 no build conditions. The PM peak hour was selected because it represents the heaviest traffic volumes of the day.

Existing Conditions

For existing conditions analysis, Parametrix assumed the completion of an upcoming passing lane project. The project is planned to be completed by Fall 2016 and will add one new westbound passing lane and lengthen the existing westbound passing lanes between S.R. 23 and S.R. 38. Specifically, a new passing lane will be added west of Beaver Dam Road from approximately milepost (MP) 97.6 to MP 95.3. Additionally, the gap between the two existing westbound passing lanes on S.R. 30 will be completed and the beginning of the first westbound passing lane will be extended east to the S.R. 23 intersection. This will essentially create a three-mile, continuous westbound passing lane from S.R. 23 to MP 99. Figure 5 illustrates the existing passing lanes locations along with the proposed 2016 passing lane project areas.

HCM capacity analysis methodologies require detailed traffic volume and roadway feature inputs. Parametrix gathered existing conditions data from a number of sources, such as traffic counts, UDOT LiDAR-based asset inventories, and aerial imagery. Table 3 summarizes the data input sources.

Figure 5: Existing and 2016 Project Passing Lanes

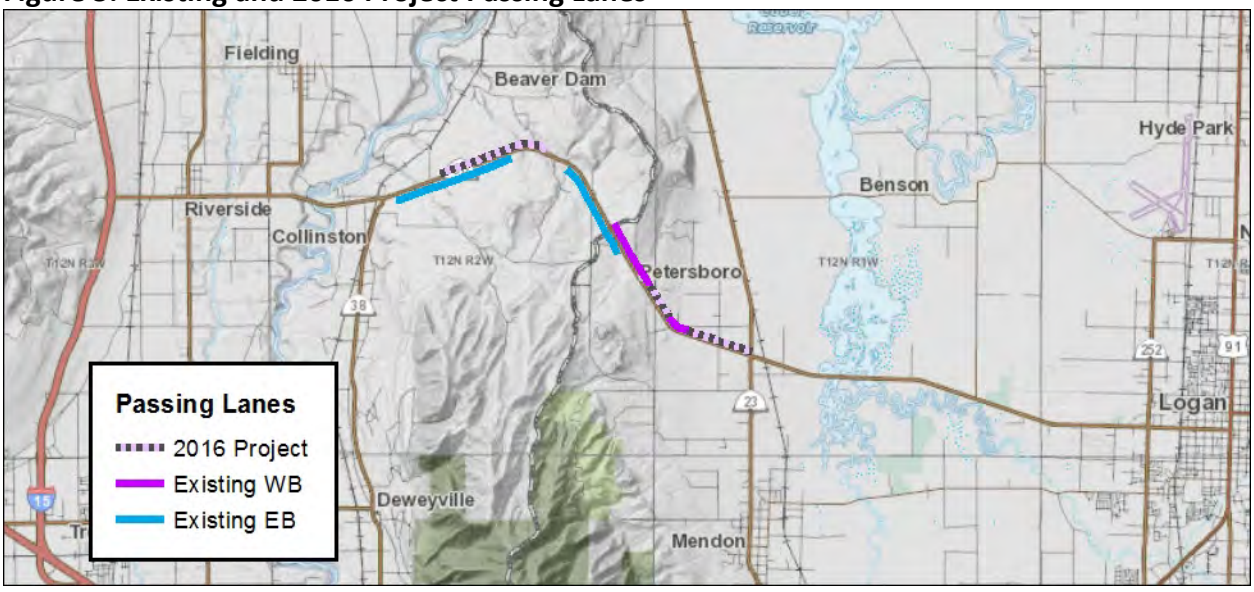


Table 3: Capacity Analysis Data Input Sources

Input	Source
Hourly Volumes	Project traffic counts
Peak Hour Factor	Project traffic counts
Heavy Vehicle Percentages	*Truck Traffic on Utah Highways 2014*
Lane Widths	UDOT LiDAR asset inventory
Shoulder Widths	UDOT LiDAR asset inventory
Access Density	UDOT LiDAR asset inventory, photo-log and aerial imagery
Passing Zone Locations	Photo-log and aerial imagery

Parametrix conducted LOS analysis for the S.R. 30 study corridor customizing the HCM analysis procedures for various segments of the corridor. Because capacity analysis for two-lane highways is dependent on traffic volume directional split, results are given for both eastbound and westbound travel directions. Table 4 summarizes the segment capacity analysis for existing conditions and Table 5 summarizes the intersection capacity analysis. Since LOS C is the typical design threshold for rural areas, segments and intersections that exceed LOS C are denoted in red. Figure 6 illustrates the LOS for S.R. 30 segments and intersections.

As can be seen from Tables 4 and 5 and Figure 6, most segments of S.R. 30 function at LOS C or better. All analyzed intersections also operate at acceptable levels. The only area operating at LOS D is the westbound direction between S.R. 23 and 1900 West (MP 107.92). This segment of S.R. 30 features the heaviest single-direction volumes of the entire corridor. During the PM peak hour, there is a strong westbound directional flow out of Logan City as many drivers return home from commercial and employment centers in the Cache Valley. Additionally, there are no passing lanes for this portion of S.R. 30.

The best performing segments are those between S.R. 23 and S.R. 38 due to the presence of the existing and assumed new passing lanes (see Figure 5). Within these segments, drivers have greater ability to pass slower moving vehicles and travel at desired speeds.

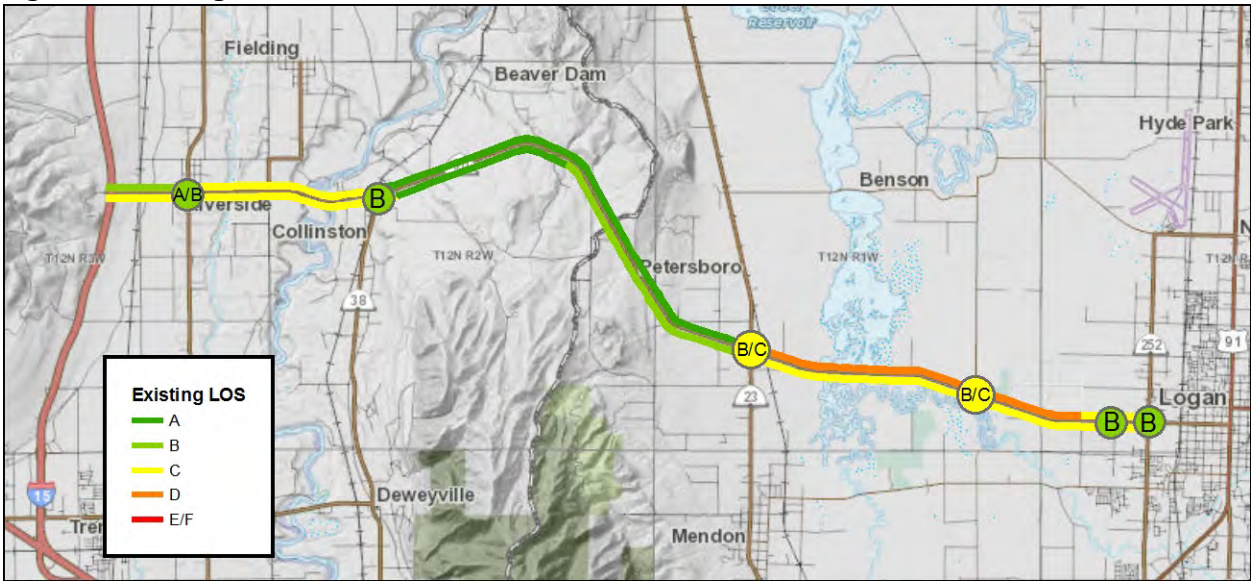
Table 4: Existing PM Peak Hour Segment Capacity Analysis Summary

Direction	Segment	Analysis Type	Measure	Value	LOS
Eastbound	MP 90.62 (I-15) to 91.85 (S.R. 13)	Class 1 Highway	PTSF	58%	C
	MP 91.85 (S.R. 13) to 95.13 (S.R. 38)			64%	C
	MP 95.13 (S.R. 38) to 98.02			34%	A
	MP 98.02 to 102.37 (S.R. 23)			36%	B
	MP 102.37 (S.R. 23) to 105.92			60%	C
	MP 105.92 to 107.62			61%	C
	MP 107.62 to 108.15	Class 3 Highway	PFFS	83%	C
	MP 108.15 to 108.65 (S.R. 252)			79%	C
Westbound	MP 108.65 (S.R. 252) to 108.15	Class 3 Highway	PFFS	77%	C
	MP 108.15 to MP 107.62			82%	C
	MP 107.62 to 105.92	Class 1 Highway	PTSF	70%	D
	MP 105.92 to 102.37 (S.R. 23)			68%	D
	MP 102.37 (S.R. 23) to MP 97.60			31%	A
	MP 97.60 to 94.95 (S.R. 38)			31%	A
	MP 94.95 (S.R. 38) to 91.85 (S.R. 13)			64%	C
	MP 91.85 (S.R. 13) to 90.62 (I-15)			41%	B

Table 5: Existing PM Peak Hour Intersection Capacity Analysis Summary

Intersection	Analysis Type	Worst Approach	Average Control Delay (seconds/vehicle)	LOS
S.R. 13/S.R. 30	All-way Stop Controlled	N/A	10	A/B
S.R. 38/S.R. 30	Minor-leg Stop Controlled	Northbound	11	B
S.R. 23/S.R. 30	Minor-leg Stop Controlled	Southbound	15	B/C
3200 West/S.R. 30	Minor-leg Stop Controlled	Southbound	15	B/C
1400 West/S.R. 30	Minor-leg Stop Controlled	Northbound	12	B
S.R. 252/S.R. 30	Signalized	N/A	15	B

Figure 6: Existing PM Peak Hour LOS



2040 No Build

As documented by the *S.R. 30 Travel Demand Modeling Memo*, Parametrix assumed no improvements to the S.R. 30 corridor beyond the passing lane projects planned for construction in 2016 (see Figure 5). Outside the study corridor, Parametrix included the listed projects from UDOT's 2015-2040 Long Range Transportation Plan and from CMPO 2040 Regional Transportation Plan (RTP). The methods used to generate traffic volume forecasts for the 2040 no build analysis are also documented in the *S.R. 30 Travel Demand Modeling Memo.*

As discussed in the *S.R. 30 Travel Demand Modeling Memo*, the planned Western Arterial project has a significant influence on operations for the east end of the S.R. 30 study corridor. The Western Arterial is a proposed north-south, four-lane roadway connecting U.S. 91 south of Logan to S.R. 218 in Amalga. Planned to be constructed in Phase 2 (20125-2034) of the CMPO 2040 RTP, the roadway would intersect S.R. 30 at approximately 1400 West. Because of the significant traffic volumes expected to be served by the Western Arterial, Parametrix assumed the intersection at S.R. 30 would require a traffic signal. The presence of a future traffic signal, in addition to expected future development, means it is more appropriate to analyze this portion of S.R. 30 as an urban corridor for 2040 no build conditions. Given its short length (0.5 miles) and the urban nature of this segment of S.R. 30 in 2040, the signalized intersections will likely be the capacity constraints. As such, Parametrix used intersection LOS analysis for the Western Arterial intersection and the S.R. 252 intersection to represent the capacity needs for the assumed urban section of S.R. 30 (1900 West to S.R. 252).

Tables 6 and 7 summarize the segment and intersection capacity analysis for 2040 no build conditions, denoting facilities that are worse than LOS C in red. Figure 7 illustrates the LOS analysis. For 2040 no build conditions, almost all rural portions of S.R. 30 that do not feature passing lanes operate at LOS D or worse. In contrast, the sections between S.R. 38 and S.R. 23, which feature several passing lanes, operates at LOS B or C.

For 2040 no build conditions, a few intersections operate at LOS F, including the S.R. 23/S.R. 30 intersection, the Western Arterial/S.R. 30 intersection, and the S.R. 252/S.R. 30 intersection. The failure at the S.R. 23/S.R. 30 intersection reflects increased cross-traffic on S.R. 30 as well as increased use of S.R. 23 as a north-south corridor in Cache Valley. The failure at the urban signalized intersections at the Western Arterial and S.R. 252 is a surrogate for failure for the entire urban S.R. 30 segment (1900 West to S.R. 252) since intersections are the typical capacity constraint for short urban roadway segments.

To provide context, the 2040 no build traffic volumes forecasts for most of S.R. 30 are between 11,000 and 13,000 vehicles per day. This is similar to the 2014 ADT volumes reported for U.S. 91 between Smithfield and Richmond – a section of highway that currently features two travel lanes in each direction, a center turn lane, and shoulders.

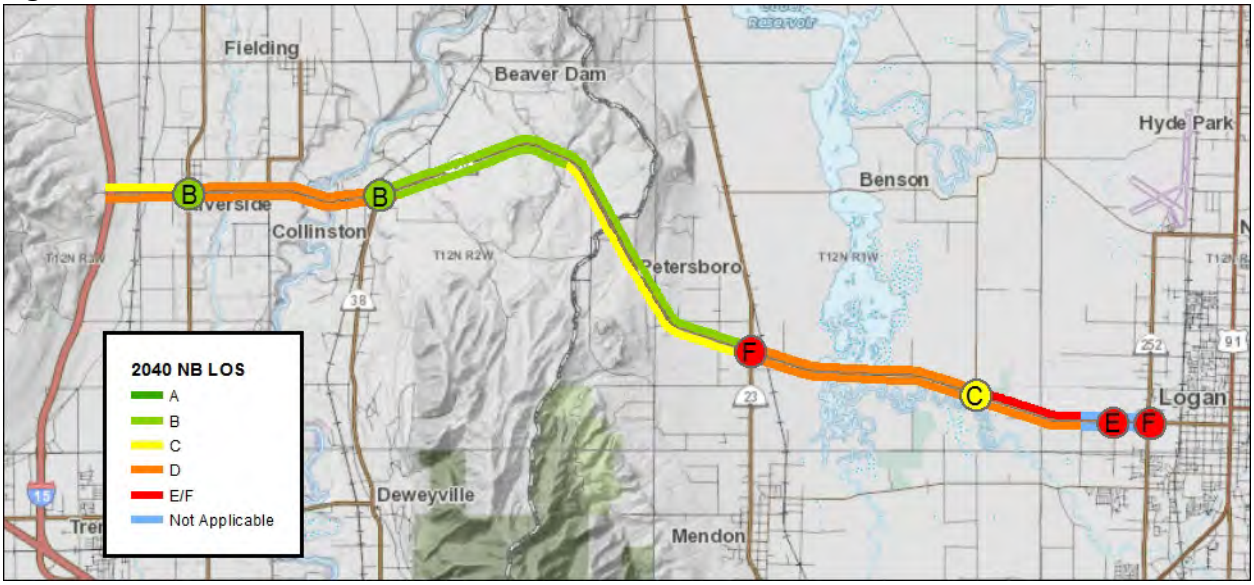
Table 6: 2040 No Build PM Peak Hour Segment Capacity Analysis Summary

Direction	Segment	Analysis Type	Measure	Value	LOS
Eastbound	MP 90.62 (I-15) to 91.85 (S.R. 13)	Class 1 Highway	PTSF	66%	D
	MP 91.85 (S.R. 13) to 95.13 (S.R. 38)			77%	D
	MP 95.13 (S.R. 38) to 98.02			48%	B
	MP 98.02 to 102.37 (S.R. 23)			52%	C
	MP 102.37 (S.R. 23) to 105.92			72%	D
	MP 105.92 to 107.62			76%	D
	MP 107.92 to 108.15	Urban Highway	See Intersection Analysis		
	MP 108.15 to 108.65 (S.R. 252)				
Westbound	MP 108.65 (S.R. 252) to 108.15	Urban Highway	See Intersection Analysis		
	MP 108.15 to MP 107.62				
	MP 107.62 to 105.92	Class 1 Highway	PTSF	84%	E
	MP 105.92 to 102.37 (S.R. 23)			79%	D
	MP 102.37 (S.R. 23) to MP 97.60			46%	B
	MP 97.60 to 94.95 (S.R. 38)			43%	B
	MP 94.95 (S.R. 38) to 91.85 (S.R. 13)			70%	D
	MP 91.85 (S.R. 13) to 90.62 (I-15)			50%	C

Table 7: 2040 No Build PM Peak Hour Intersection Capacity Analysis Summary

Intersection	Analysis Type	Worst Approach	Average Control Delay (seconds/vehicle)	LOS
S.R. 13/S.R. 30	All-way Stop Controlled	N/A	12	B
S.R. 38/S.R. 30	Minor-leg Stop Controlled	Northbound	12	B
S.R. 23/S.R. 30	Minor-leg Stop Controlled	Northbound	> 50	F
3200 West/S.R. 30	Minor-leg Stop Controlled	Southbound	20	C
Western Arterial (1400 W)/S.R. 30	Signalized	N/A	60	E
S.R. 252/S.R. 30	Signalized	N/A	> 80	F

Figure 7: 2040 No Build PM Peak Hour LOS



Conclusions

Parametrix performed capacity analysis on existing (2016) conditions and 2040 no build conditions for the S.R. 30 study corridor. Analysis shows existing capacity deficiencies (LOS D or worse) for the westbound section of S.R. 30 between 1900 West and S.R. 23. This part of S.R. 30 features the heaviest single-direction volumes of the entire corridor and there are no passing lanes.

For 2040 no build conditions, most of the corridor experiences failing LOS including several intersections. The S.R. 23/S.R. 30 intersection experiences LOS F as the increase in though volumes on S.R. 30 and S.R. 23 leave few gaps for drivers turning from S.R. 23.

Additionally, for 2040 no build conditions, the eastern end of the corridor is analyzed as an urban section. This is due to the expected expansion of the Logan urbanized area as well as the influence of the Western Arterial project. Since urban street performance is often governed by signal performance, the failing LOS at the two signals in the urbanized section are a surrogate for general failure of S.R. 30 in this area.

Analysis indicates that passing lanes have a tremendous benefit. Segments of S.R. 30 with passing lanes operate with adequate LOS well into the 2040 analysis time period.