



ROAD SAFETY AUDIT: AUTO MALL DRIVE IN SANDY

5/25/2026

PREPARED FOR:



SUBMITTED BY:



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1. INTRODUCTION

The city of Sandy, Utah, submitted a request to the Wasatch Front Regional Council (WFRC) to conduct a Road Safety Audit along Auto Mall Drive. WFRC approved this request and retained METHODS Consulting as a third-party consultant to perform a Road Safety Audit with WFRC and staff from Sandy, including landowners, engineers, and planners in November 2025. This report summarizes the existing conditions of the project area, observations made in the field, and short-, medium-, and long-term recommendations.

Road Safety Audit Definition

According to the Federal Highway Administration (FHWA), a **Road Safety Audit (RSA)** is a formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users.

Figure 1: Summary of What RSAs Are and Are Not

RSAs <u>are</u> :	RSAs <u>are not</u> :
♦ Focused on road safety ♦ A formal examination ♦ Proactive in nature ♦ Conducted by a multidisciplinary team ♦ Conducted by a team that is independent of the operations, design, or ownership of the facility ♦ Conducted by a qualified team ♦ Broad enough to consider the safety of all road users of the facility ♦ Qualitative in nature	♦ A means to evaluate the design of a facility ♦ A check of compliance with standards ♦ A means of ranking or justifying one project over another ♦ A means of rating one design option over another ♦ A redesign of a project ♦ A crash investigation (although the crash history of an existing facility is reviewed by an RSA team)

Road Safety Audit Meetings and Process

As noted above, the RSA process is conducted in accordance with FHWA guidelines. **Figure 2** outlines the steps involved in an RSA.

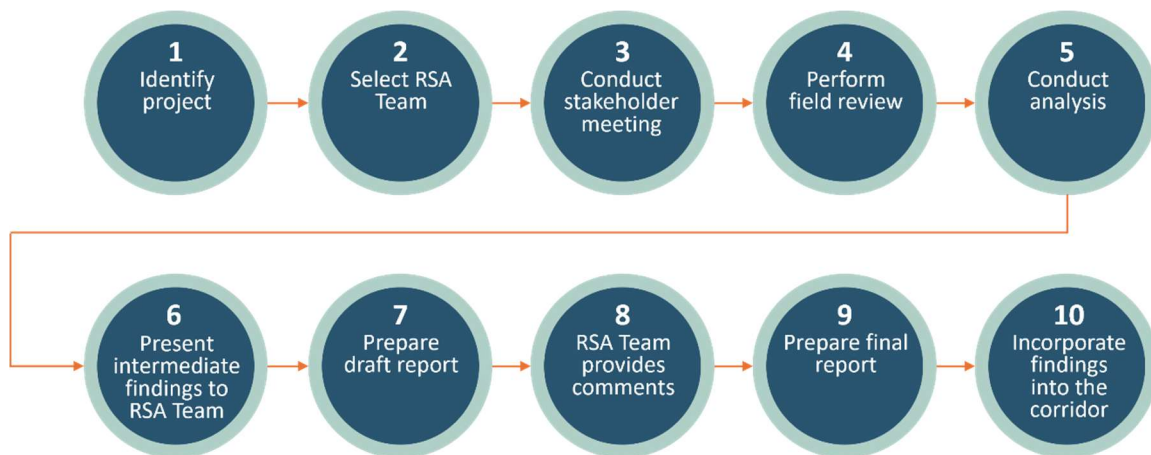


Figure 2: Key Steps in a Road Safety Audit

Stakeholders and points of contact participate throughout the process, particularly during key meetings. The kick-off meeting introduced concept of an RSA, its process, and the responsibilities of the point of contact. At the organization meeting, WFRC staff, METHODS staff, and the Sandy City point of contact identified the following locations for the field review:

- 11000 S
- Southern Costco access
- across from the new development
- culvert crossing
- Scheels
- Motor Park Avenue

At the stakeholder meeting the RSA process was introduced, key features of the corridor were presented, and the plan for the field review was outlined. At the field review, observations were made at the locations outlined above. Key takeaways from the field review are included in the Appendix. The consultant team presented the identified key concerns and potential solutions at the intermediate meeting.

Project Team and Field Review

RSAs require an independent, qualified, and multidisciplinary team of experts. Team members should act independently of the project owner/design team and have the freedom, ability, and comfort to comment frankly on potentially controversial safety issues. Having a combination of skills and experience in different areas is also helpful to ensure the most critical aspects of the project are addressed¹.

¹ FHWA Road Safety Audit Guidelines, Publication No. FHWA-SA-06-06, page 27

The Auto Mall Drive RSA's team included 16 members, identified in Table 1 with the elements of the audit for which they were present. Erica Wygonik of METHODS Consulting was the RSA team leader.

Table 1: RSA Team Members and Attendance

Name	Agency	AM Peak Hour Review	Stakeholder Meeting	Field Review	PM Peak Hour Review	Intermediate Results Meeting
Chad Liljenquist	One Fourteen LLC		X	X		X
Dave Liljenquist	Micam LLC		X	X		X
John Liljenquist	Micam LLC		X	X		X
Matthew Cook	Arrowhead Dental Lab		X	X		X
Chris Bryan	Costco Wholesale		X	X		
John Shaw	Costco Wholesale		X	X		
Brandon Preece	Gilson Engineering		X	X		X
Britney Ward	Sandy City		X	X		X
Ivan Hooper	Sandy City		X	X		
Travis Ackerman	Sandy City		X	X		
Wayne Bennion	WFRC					X
Kip Billings	WFRC		X	X		
Fariba Soltani	WFRC		X	X		
Erica Wygonik (team leader)	METHODS (Consultant)	X	X	X		X
Ian MacGregor	METHODS (Consultant)	X	X	X	X	X
Scott Johnson	METHODS (Consultant)		X	X		

The team gathered for a stakeholder meeting at Sandy City Public Works Department at 9:00 am on November 19, 2025, then held a field review, driving the corridor and making stops at key locations to observe and discuss together. METHODS also observed the corridor including specific observations at the Costco access intersections during the morning and evening peak hours. A site visit was also completed on a Saturday and a Sunday to observe traffic during peak Costco times. Sight distance observations were made at the south Costco access and developments south of Costco. After the formal field review was over, METHODS made additional observations throughout the corridor. Findings and analysis from these observations are included in this report.

Following the field review and additional observations, METHODS met with members of the RSA team to discuss a list of short-, medium-, and long-term recommendations to include in the final report.

2. PROJECT CONTEXT

The total length of the study corridor is the 0.8-mile segment between 10600 South and State Street (US-89). The project corridor is located to the east of I-15 and west of State Street (US-89). Auto Mall Drive is a north-south route and is a federal aid eligible road

(2073)². Most of the land use surrounding Auto Mall Drive is commercial. South of 11000 South is Costco Wholesale, Scheels, Arrowhead Dental Laboratory, and several sit-down and fast-food restaurants. North of 11000 South to Holiday Park Drive are several auto dealerships. Between Holiday Park Drive and 10600 South are hotels, Zions Bank, a Wendy's, and a gas station.



Figure 3: Project Location

Planned Improvements

Five projects are planned that may impact the corridor.

- ♦ Auto Mall Drive Area Master Plan: The Sandy City Planning Department is working on a master plan for the Auto Mall Drive area.
- ♦ UDOT I-15 Widening: This project will widen I-15 to the east, potentially removing approximately 100 parking stalls from the Costco parking lot. As a result, Costco is

² Federal-aid eligible roads are roads the Federal-Aid Highway Program supports with financial assistance for the nation's highway network, which includes locally owned roads. <https://www.fhwa.dot.gov/federal-aidessentials/federalaid.cfm>

currently considering redeveloping their site to relocate these stalls to another location on the property. Costco's project is considering shifting the existing Costco accesses on Auto Mall Drive.

- ♦ South Costco Access Roundabout: A roundabout is currently planned at the South Costco Access & Auto Mall Drive intersection, and Sandy is actively seeing funding for the project. The concept plans are included in the Appendix.
- ♦ One Ten Mixed Use Apartments development south of 11000 South: The parcel south of 11000 South and east of Auto Mall Drive is under construction as a multi-use housing development. A traffic impact study for this development has been completed. A full access onto Auto Mall Drive, and a right-in-right-out (RIRO) access on 11000 South will be installed.
- ♦ Dual restaurant development north of the Quick Quack car wash: The parcel north of the Quick Quack car wash is planned to become a dual restaurant development. It is anticipated that this development will share the Quick Quack access onto Auto Mall Drive, and there will also be cross-access on both sides of the development on State Street.

WFRC Comprehensive Safety Action Plan

The WFRC Comprehensive Safety Action Plan (CSAP) was completed in 2024. This plan presents strategies to reduce roadway fatalities and serious injuries in the WFRC region. Auto Mall Drive was one corridor identified in the plan. Safety measures identified in the plan are shown in **Figure 4**.

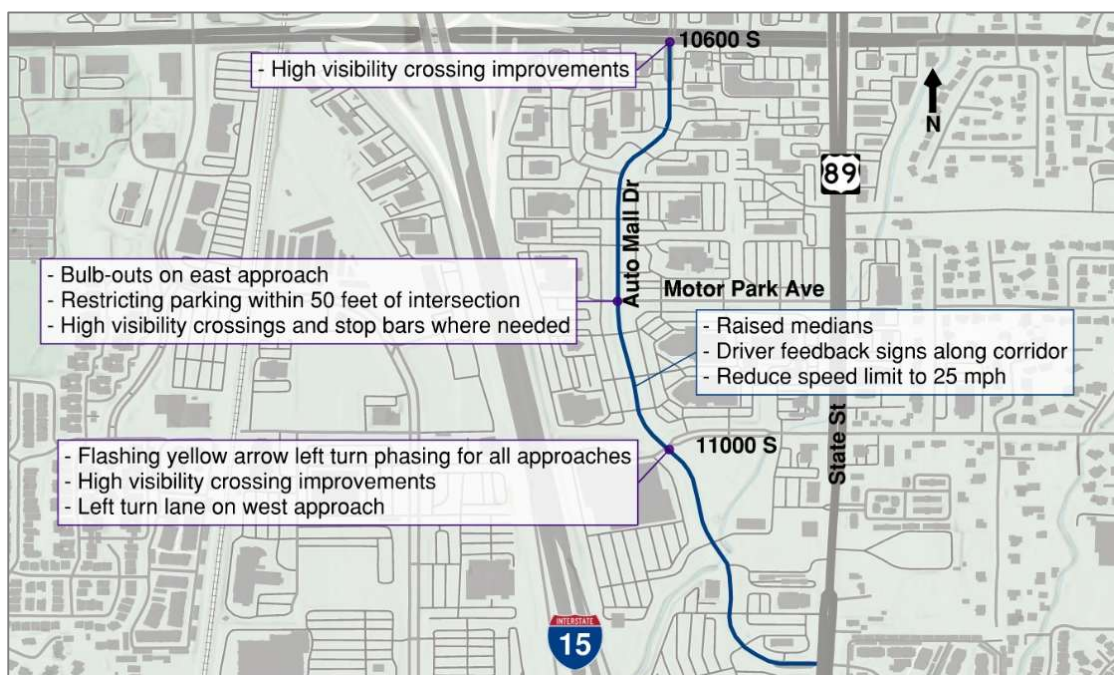


Figure 4: Safety Measures Identified in WFRC CSAP

3. EXISTING CONDITIONS

Roadway Cross Section

The cross section of different segments of the corridor vary, as shown in [Figure 5](#).

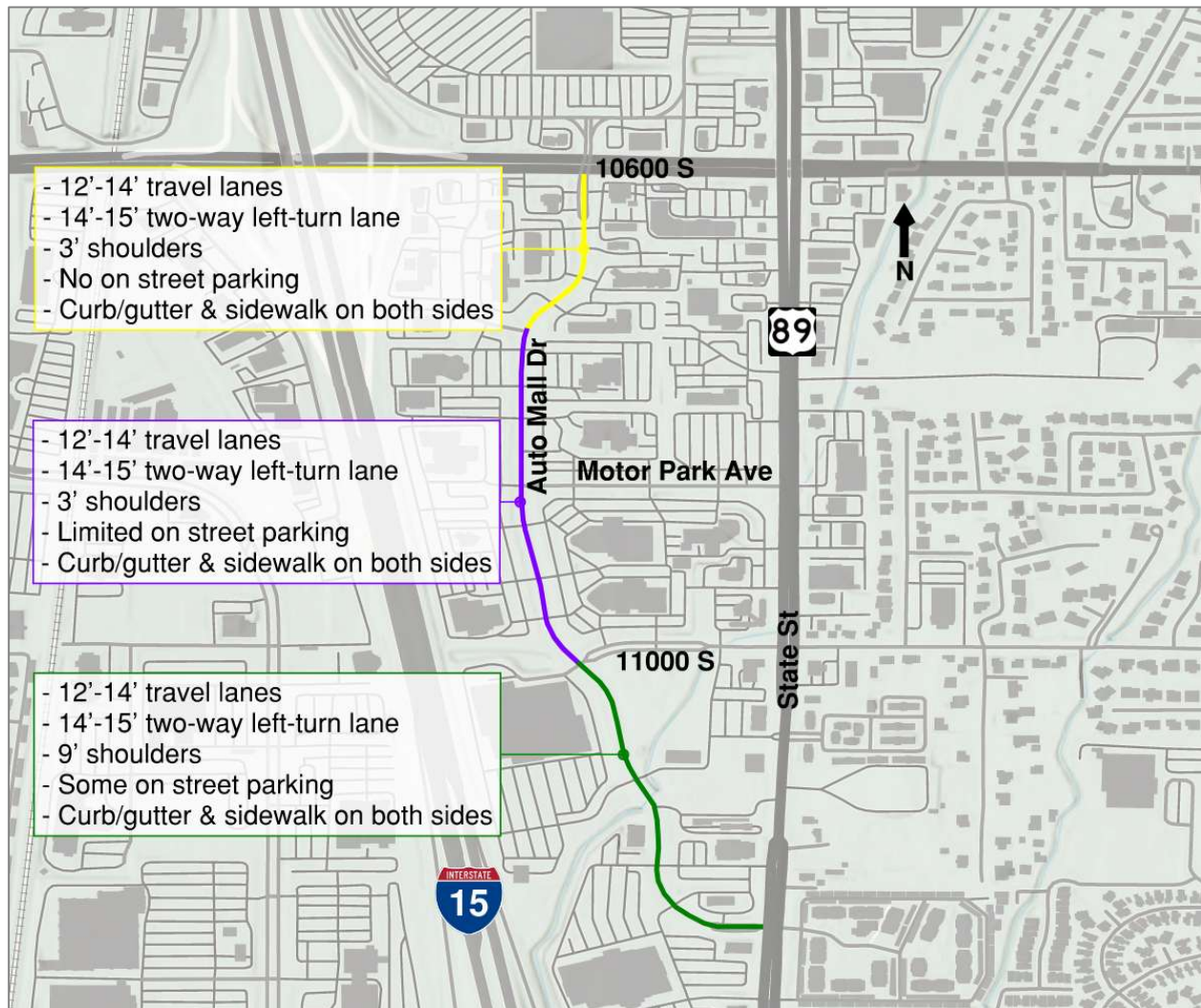


Figure 5: Existing Roadway Cross Sections

Volumes

Traffic data was collected as part of the traffic impact study for the One Ten Mixed Use Apartments development. Traffic data was collected in March 2023. Turning movement volumes are shown in [Figure 6](#).

Key
 XX (XX) – AM Peak Hour (PM Peak Hour)

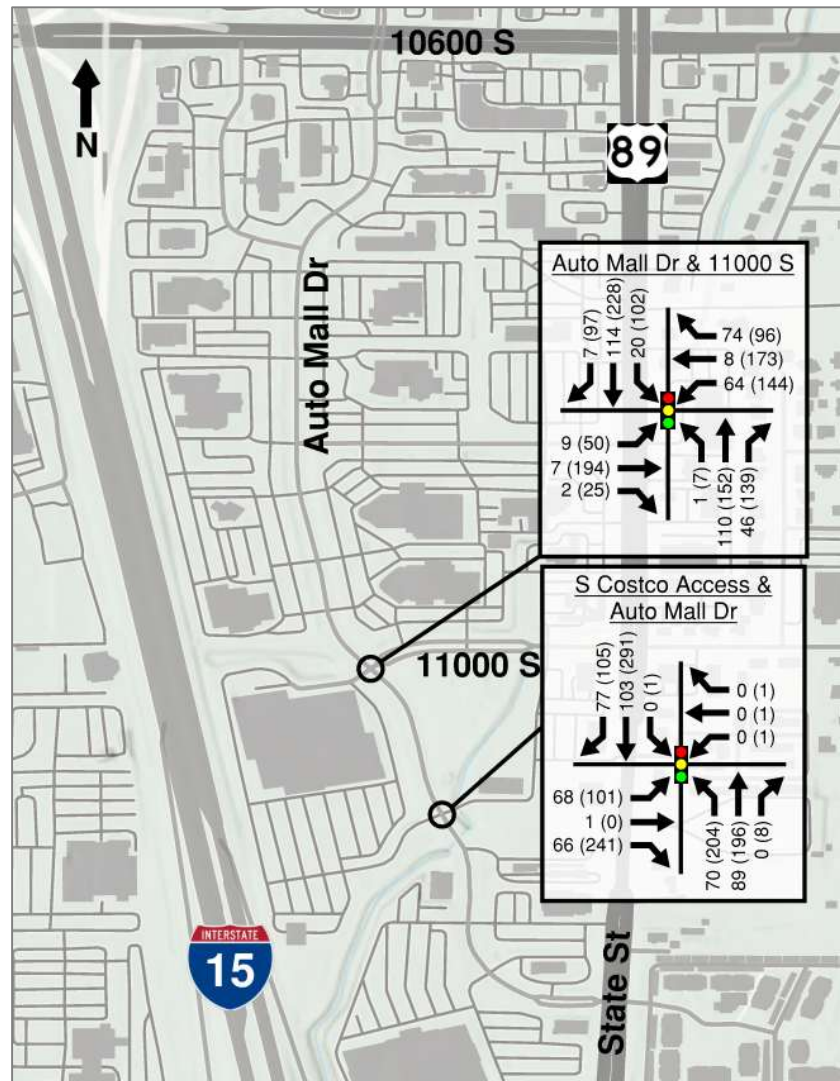


Figure 6: Traffic Volumes at South Costco Access and 11000 South (March 2023)

Speeds

The posted speed limit along the study corridor is 30 mph.

Crash Summary

Crash data was obtained from the UDOT Traffic and Safety Division³. Crash data may be protected under 23 USC 407. A summary of crashes is shown in [Table 2](#) and [Figure 7](#). Data from the most recent validated five full years (January 2020 to December 2024) was

³ <https://udot.aashtowareshsafety.com/>

used. Crashes reported in 2025 were also reviewed. Crashes reported in 2025 may not be fully validated.

Table 2: Crash Data Summary

Year	All Crashes	
	Total	Severe (Fatal or Serious Injury)
2020	20	0
2021	14	0
2022	14	0
2023	15	2
2024	12	0
2025*	10	0
Total:	85	2

*2025 crash data may not be fully validated



Figure 7: Crash Summary

Notable Crash History Findings Along the Study Corridor

- ♦ 75 crashes have been reported along the study corridor between 2020 and 2024.
- ♦ There have been two reported serious injury crashes. One was a head-on crash resulting from a southbound vehicle drifting into the northbound lane. The other serious injury crash resulted from a pedestrian getting hit by an SUV turning out of the south Costco access.
- ♦ There have been three reported pedestrian or bicyclist crashes. One involved a northbound right turning vehicle hitting a cyclist on 10600 South. Another involved an eastbound right turning vehicle hitting a pedestrian on State Street (US-89). The third is the SUV coming out of the south Costco access and hitting a pedestrian, mentioned above.
- ♦ As illustrated in the Figure 7, of the 75 reported crashes on the study corridor during the study period,
 - 21 crashes were at the north end of Auto Mall Drive approaching 106th South
 - 4 crashes were at the Auto Mall Drive & Motor Park Avenue intersection
 - 5 crashes were at the Auto Mall Drive & 11000 S intersection
 - 11 crashes were at the Auto Mall Drive & South Costco Access intersection
 - 5 crashes were at the Scheels south access intersection with Auto Mall Drive
 - 13 crashes were at the south end of Auto Mall Drive approaching State Street.

4. FINDINGS AND MEASURES FOR CONSIDERATION

During the RSA stakeholder meeting, field review, and intermediate results meetings, the project team members discussed their collective knowledge and experience with the corridor, observed the corridor together at various stopping points, and identified possible improvements. The following sections summarize these findings and measures for consideration, based on observations made during the field review and available data. Measures for consideration are identified as **short-**, **medium-**, or **long-term**. Short-, medium- and long-term designations reflect the overall order of magnitude of the cost or logistical requirements to install a particular infrastructure. In some cases, funding or planning may already be available that would enable constructing treatments sooner. However, the classification in this report is independent of those resources and designed to classify according to typical construction timelines.

A summary map of all location-specific insights and issues is shown in **Figure 8. Insights** are not necessarily safety concerns, but observations or background information that inform recommended safety measures. **Issues** are safety concerns which the suggested measures intend to address.

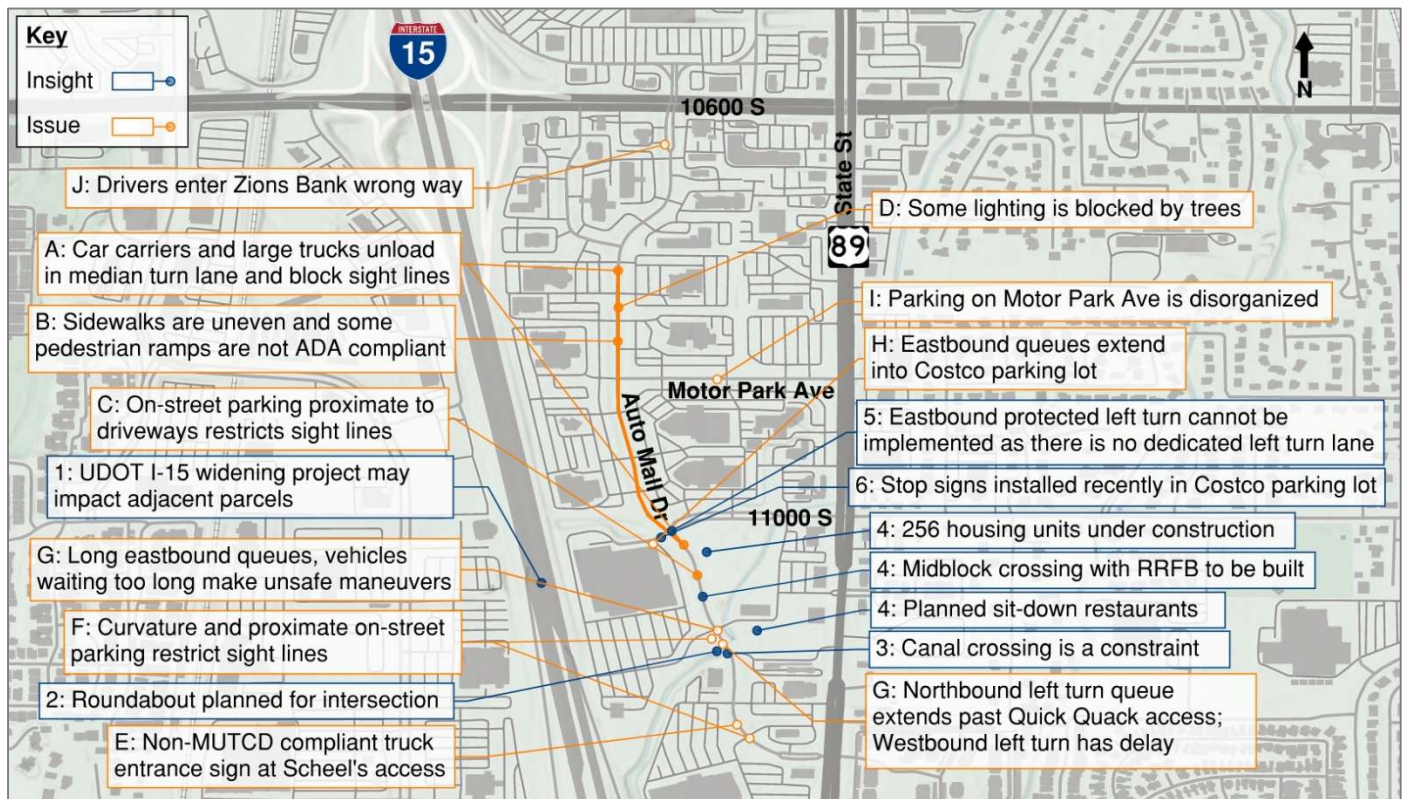


Figure 8: Insights and Issues Summary

Corridor-Wide

Insight 1: The UDOT I-15 widening project may impact adjacent parcels.

Issue A: Trucks unloading cars for the dealerships park in the center median, restricting sight lines.



Figure 9: Trucks parked in the median along Auto Mall Drive

Short-Term Measure: Modify truck delivery schedule so trucks only unload during non-peak hour times.

Medium-Term Measure: Restripe Motor Park Avenue to allow trucks to unload on the side street, as opposed to Auto Mall Drive.

Long-Term Measure: Install a landscaped median; require dealerships to unload on their property

Issue B: There are uneven sidewalks along the portions of the corridor, and some pedestrian ramps are not ADA compliant.



Figure 10: Sidewalks are uneven in places and ramps are not all ADA-compliant

Short-Term Measure: Paint uneven sidewalks to make them more noticeable to pedestrians.

Medium-Term Measure: Replace uneven sections of sidewalk.

Long-Term Measure: Reconstruct sidewalks (ensure all are 5' wide) and ADA ramps. Widen park strip to 8' to allow adequate space for trees.

Issue C: On-street parking proximate to access points restricts sight lines at points along the corridor.



Figure 11: On-street parking restricts sight lines in some locations

Short-Term Measure: Restrict parking near intersections with striping and signage

Long-Term Measure: Install curb bulb-outs at intersections to prevent vehicles from parking too close to the intersection, maintain sight lines and provide identifiable on-street parking.

Issue D: Trees in the park strip cover street lighting in segments of the corridor.



Figure 12: Trees block lighting in some locations

Short-Term Measure: Prune street trees to ensure lighting is visible.

Scheels Access

Issue E: Truck entrance signage is not compliant with the MUTCD. This sign should be green (guidance) instead of white (regulatory).



Figure 13: Truck entrance sign at Scheel's access is not MUTCD-compliant

Short-Term Measure: Remove or replace sign with MUTCD-compliant sign

Issue F: Sight lines are restricted, particularly for vehicles exiting McDonald's, due to the curvature and on-street parking



Figure 14: Sight lines exiting McDonald's are restricted

Short-Term Measure: Restrict on-street parking south of the intersection with striping and signage

Long-Term Measure: Install curb bulb-outs at intersections to prevent vehicles from parking too close to the intersection, maintaining sight lines and providing identifiable on-street parking.

Long-Term Measure: Consider a raised median that prevents left turns. Vehicles can make a U-turn at the planned roundabout at the Costco south access.

Long-Term Measure: Consider textured crosswalks.

South Costco Access

Insight 2: A roundabout is currently planned for this intersection.

Insight 3: The canal crossing is a constraint.

Insight 4: 256 housing units are under construction along the east side of Auto Mall Drive north of this intersection. This project will construct a mid-block crossing with a rectangular rapid flashing beacon (RRFB) between the south Costco Access and 11000 S. New sit-down restaurants are planned on the east side of Auto Mall Drive at this intersection. These developments may increase traffic volumes and delays.

Issue F: Due to the vertical and horizontal curve, sight distance is limited for eastbound left turning vehicles. Near misses are reported.



Figure 15: Sight lines for eastbound left-turning vehicles are constrained

Short-Term Measure: Restrict on-street parking proximate to the intersection.

Long-Term Measure: Continue with plans to implement roundabout at this location and reduce the vertical curve(s).

Issue G: Northbound left turn queue extends past Quick Quack access. Eastbound left turns have long delays, which can result in drivers making unsafe maneuvers. Westbound left turn has delay. Delays may increase with new developments.



Figure 16: Long delays and queues are observed at the south Costco Access

Long-Term Measure: Implement roundabout at this location, to create more acceptable gaps for left-turning vehicles.

Long-Term Measure: Consider making this south access a right-in/right-out (RIRO) only access, or a $\frac{3}{4}$ access, restricting eastbound left turns. This option can work particularly well in conjunction with a roundabout at 11000 South. Northbound vehicles can make a U-turn at 11000 South and then take a right turn to enter at this south access. Eastbound vehicles can exit via 11000 South.

11000 South

Insight 5: Since the eastbound approach does not have a dedicated left turn lane, a protected left turn phase cannot be implemented without reconstructing the intersection.

Insight 6: A LED border embedded stop sign was recently installed within the Costco parking lot near this intersection to mitigate gridlock and driver confusion.

Issue H: Eastbound queue extends into the Costco parking lot.



Figure 17: Eastbound queue at 11000 S gridlocks in the Costco parking lot; new flashing stop sign has helped

Short-Term Measure: Consider retiming signal if queues continue to extend into the parking lot.

Medium-Term Measure: Consider reducing the number of lanes on 11000 South. Removing unnecessary lanes may reduce delays for opposing traffic, shorten crossing distances for pedestrians, and allow for repurposing the ROW for bicycle lanes, park strip space, or wider sidewalks.

Long-Term Measure: Consider redeveloping the Costco site to accommodate longer queues and potentially add a dedicated left turn lane for egressing vehicles, allowing for protected/permitted left turns.

Long-Term Measure: Consider changing the traffic control from a signal to a roundabout, accounting for large delivery trucks. This change could be completed instead of or in addition to other roundabouts on the corridor.

Issue A: Delivery trucks wait in the median to turn into Costco. While most Costco-related trucks park during nighttime or early morning hours, some park during the day.

Short-Term Measure: Modify truck delivery schedule so trucks only unload during non-peak hour times.

Medium-Term Measure: Restripe 11000 South to allow trucks to wait on the side street, instead of Auto Mall Drive.

Long-Term Measure: Consider redeveloping the Costco site to accommodate longer truck queues so trucks wait on site to unload instead of on Auto Mall Drive.

Motor Park Avenue

Issue A: Trucks unloading cars into the dealerships park in the center median, restricting sight lines.



Figure 18: Trucks park in the median along Auto Mall Drive

Short-Term Measure: Consider modifying drop-off schedule so trucks deliver outside of peak hours.

Medium-Term Measure: Consider restriping Motor Park Avenue to allow trucks to deliver there instead of Auto Mall Drive.

Long-Term Measure: Install landscape medians and pedestrian refuge islands in the median, preventing vehicles from parking there.

Issue I: Parking along Motor Park Avenue is disorganized (angled parking in parallel parking spots) and it is unclear which parking is for dealership vehicles, and which parking is for patrons.



Figure 19: Parking along Motor Park Avenue is disorganized

Short-Term Measure: Consider restriping Motor Parking Avenue to clarify what type of parking is permitted on this road and where it is allowed.

Issue J: Vehicles enter Zion's Bank from Auto Mall Drive, when this is an exit-only access.

Medium-Term Measure: Consider converting the access to a right-in/right-out (RIRO) access.

Long-Term Measure: Extend median to the south to prevent northbound left-turning vehicles entering the exit-only.

5. BENEFIT-COST ANALYSIS

The following tables show the cost estimate, expected crash reduction, and benefit-cost ratio of each improvement. These are high-level estimates, based on the best available information. Cost estimates rely on current unit costs, available project estimates, or estimates from similar projects.

METHODS estimated the safety costs in the study area using both predictive modeling and the observed crash data. The estimates relied on the observed crash history unless the crash history was relatively limited. In those instances, the values from the predictive modeling were used. When predictive modeling was used, Average Annual Daily Traffic volumes (AADTs) were developed using UDOT 2024 AADT information, estimated from turning movements, similar roads or surrounding land use. In both cases, crash modification factors (CMFs) from the Utah CMF database, the WFRC CSAP, and CMF Clearinghouse were applied to each measure when there was an applicable equivalent countermeasure. Not all measures have an equivalent countermeasure for various reasons. The lower the CMF, the greater reduction in crashes a countermeasure is expected to produce.

The following table summarizes the improvements with their CMF, cost estimate, and benefit-cost ratio. A benefit-cost ratio (B/C) above one means the benefit of a countermeasure is greater than the cost of that countermeasure. The benefit values used to determine the final B/C ratio are based on a 20-year life analysis. The cost of a countermeasure is factored based on its service life. Complete calculations for each improvement are included in the Appendix.

Table 3: Benefit-Cost Analysis⁴

ID	Location	Measure	CMF	20-Year Benefit	20-Year Cost	Benefit-Cost Ratio (B/C)
SHORT TERM						
S-1	Corridor Wide	Paint uneven sidewalks	0.994	\$260,000	\$16,000	16.25
S-2	Corridor Wide	Prune trees to improve lighting	0.996	\$147,000	\$337,000	0.44
S-3	Scheels Access	Replace truck entrance sign	MUTCD compliance issue			
S-4	Scheels & McDonald's	Restrict on-street parking near access w/signs & paint	0.931	\$385,000	\$32,000	12.03
S-5	Scheels Access	Restrict on-street parking near access w/signs & paint	0.931	\$385,000	\$32,000	12.03
S-6	South Costco Access	Restrict on-street parking near access w/signs & paint	0.931	\$2,804,000	\$32,000	87.63
S-7	11000 South	Retime signal	0.948	\$576,000	\$14,000	41.14
S-8	Motor Park Avenue	Modify truck delivery schedule so they do not obstruct sight distance during peak times	0.890	\$628,000	\$53,000	11.85
MEDIUM TERM						
M-1	Corridor Wide	Replace uneven sections of sidewalk	0.994	\$260,000	\$60,000	4.33
M-2	11000 South	Reduce the number of lanes	0.962	\$421,000	\$107,000	3.93
M-3	Motor Park Avenue	Restripe to clarify parking and accommodate delivery trucks	0.962	\$217,000	\$216,000	1.00
M-4	Zion's Bank	Convert to RIRO	0.60	\$102,000	\$7,000	14.57
LONG TERM						
L-1	Corridor Wide	Reconstruct sidewalks	0.994	\$260,000	\$591,000	0.44
L-2	Corridor Wide	Install curb bulb outs	0.680	\$12,787,000	\$30,000	426.23
L-3	Corridor Wide	Landscape median	0.290	\$28,371,000	\$742,000	38.24
L-4	Scheels & McDonalds	Install curb bulb outs	0.680	\$1,780,000	\$30,000	59.33
L-5	Scheels Access	Install curb bulb outs	0.680	\$1,780,000	\$30,000	59.33
L-6	Scheels & McDonalds	Median to prevent left turns at access	0.600	\$2,201,000	\$35,000	62.89
L-7	Scheels Access	Median to prevent left turns at access	0.600	\$2,201,000	\$35,000	62.89
L-8	Scheels Access	Textured crosswalks	0.998	\$14,000	\$93,000	0.15
L-9	South Costco Access	Convert to right-in/right-out (RIRO)	0.600	\$11,353,000	\$7,000	1621.86
L-10	South Costco Access	Roundabout	0.313	\$12,643,000	\$3,716,000	3.40
L-11	11000 South	Implement protected left turn phasing	0.933	\$748,000	\$10,000	74.80
L-12	11000 South	Roundabout	0.737	\$2,916,000	\$5,124,000	0.57
L-13	Motor Park Avenue	Landscape median	0.290	\$4,051,000	\$110,000	36.83
L-14	Zion's Bank	Extend median south near Zion's Bank	0.600	\$102,000	\$30,000	3.40

⁴ Lower CMFs indicate a countermeasure is expected to result in a larger reduction in crashes.

6. RECOMMENDATIONS

The following is a summary of recommendations based on known operations, safety, and geometry along the study corridor and the preliminary evaluation of the measures described above.

Table 4: Recommendations

ID	Location	Measure	Recommended?	Details
SHORT TERM				
S-1	Corridor Wide	Paint uneven sidewalks	Yes	-
S-2	Corridor Wide	Prune trees to make lighting more visible	Yes	-
S-3	Scheels Access	Replace truck entrance sign	Yes	MUTCD compliance issue
S-4	Scheels & McDonald's	Restrict on-street parking	Yes	-
S-5	Scheels Access	Restrict on-street parking	Yes	-
S-6	South Costco Access	Restrict on-street parking	Yes	-
S-7	11000 South	Retime signal	Yes	-
S-8	Motor Park Avenue	Modify truck delivery schedule so that they do not obstruct sight distance during peak times	Yes	-
MEDIUM TERM				
M-1	Corridor Wide	Replace uneven sections of sidewalk	Yes	As feasible, replaced damaged sections
M-2	11000 South	Reduce the number of lanes	Yes	Evaluate traffic demand and signal warrants
M-3	Motor Park Avenue	Restripe to clarify parking and accommodate delivery trucks	Yes	-
M-4	Zion's Bank	Convert to RIRO	Yes	-
LONG TERM				
L-1	Corridor Wide	Reconstruct sidewalks	Yes	-
L-2	Corridor Wide	Install curb bulb outs	Yes	-
L-3	Corridor Wide	Landscape median	Yes	-
L-4	Scheels & McDonalds	Install curb bulb outs	Yes	-
L-5	Scheels Access	Install curb bulb outs	Yes	-
L-6	Scheels & McDonalds	Median to prevent left turns at access	Yes	-
L-7	Scheels Access	Median to prevent left turns at access	Yes	-
L-8	Scheels Access	Textured crosswalks	Not at this time	B/C < 1
L-9	South Costco Access	Convert to RIRO	Yes	-
L-10	South Costco Access	Roundabout	Yes	-
L-11	11000 South	Implement protected/permissive left turn phasing	Yes	-
L-12	11000 South	Roundabout	Not at this time	B/C < 1
L-13	Motor Park Avenue	Landscape median	Yes	-
L-14	Zion's Bank	Extend raised median south near Zion's Bank	Yes	-

7. APPENDIX

A: Summary of Issues

B: Detailed Benefit-Cost Calculation Table

SUMMARY OF ISSUES

The following list of issues is a compilation of the project team's observations during the RSA field review on November 19, 2025, the experience of City officials, and the crash history and volumes discussed in the section on Existing Conditions.

Entire Corridor

- North of 11000 S on Auto Mall Drive and on Motor Park Avenue, trucks unloading cars park in the TWLTL and block sight lines
- On-street parking restricting sight lines
- Uneven sidewalks
- Ped ramps that are not ADA compliant
- Street parking is well used, especially near the Costco

Zions Bank

- Access restrictions confuse people leading to wrong way through the drive through

Motor Park Ave

- Car carriers park in median, deliver during the day
- Dealerships park vehicles on an angle in on-street parallel parking spaces
- Group wondered if a westbound left-turn pocket would be useful
- Need to decide between bulb outs & angled parking
- Some lights blocked by trees

11000 S

- Drainage ditch on east leg of intersection
- New residential development south of 11000 S. One RIRO access on 11000 S and one on Auto Mall Dr
- Eastbound queues extend into Costco parking lot; new stop signs are helping (they've been up for about a month)
- No protected lefts eastbound due to a lack of exclusive left turn lane; signal warrants should be reviewed

Costco Access

- Long EB queues, vehicles waiting too long make unsafe maneuvers
- Sight distance issues

- Canal underneath intersection makes reconstructing this intersection difficult
- 256 residential units to northeast corner, sit down restaurants at southeast corner
 - Restaurants will add evening traffic
- Crosswalk planned across Auto Mall Drive north of the Costco zigzag ramp
 - To be installed with residential development
 - Will be moved when roundabout goes in
 - Will have push-button RRFBs
 - Considering a pedestrian refuge island
- Semis park in median waiting to deliver to Costco.
 - Most 4-9 am but can be as late at 8pm
 - weekdays busier than weekends
 - 15-20 trucks, typically have an appointment
- On-street parking is half employees and half customers
- Eastbound left turn has delay
- Northbound left turn back up and blocks QuickQuack

Scheels Access

- Restricted sight lines from curve and vehicles parked too close to access
- The parking lot has parking stalls for RVs → large vehicles access this area
- TRUCK ENTRANCE sign at Scheels access is not MUTCD-compliant

Appendix B: Detailed Benefit-Cost Calculation Table

			CMF							Predicted												
ID	Location	Measure	Fatal	SI	Minor Injury	Possible Injury	PDO	Overall CMF	Type	Cost per crash	# of Crashes	# w/ Treatment	Crashes avoided	Annual Crash Costs	Safety Benefit per Year	Fatal	SI	Minor Injury	Possible Injury	PDO	# of Crashes	Fatal w/ Treatment
SHORT TERM																						
S-1	Corridor Wide	Paint uneven sidewalks	0.99	0.99	0.99	0.99	0.99	0.99	3T	\$191,471	12.65	12.57	0.08	\$2,421,912	\$15,742	0	0.4	0.4	2.6	11.6	15	0.00
S-2	Corridor Wide	Prune trees (make lighting more visible)	1.00	1.00	1.00	1.00	1.00	1.00	3T	\$191,471	12.65	12.60	0.05	\$2,421,912	\$8,913	0	0.4	0.4	2.6	11.6	15	0.00
S-3	Scheels Access	Replace sign	Compliance issue, not a safety issue																			
S-4	Scheels & McDonald's	Restrict on-street parking near access w/signs & paint	1.00	0.80	0.80	0.80	1.00	0.93	4ST	\$186,804	2.00	1.86	0.14	\$373,982	\$25,909	0	0	0.2	0	0.8	1	0.00
S-5	Scheels Access	Restrict on-street parking near access w/signs & paint	1.00	0.80	0.80	0.80	1.00	0.93	4ST	\$186,804	2.00	1.86	0.14	\$373,982	\$25,909	0	0	0.2	0	0.8	1	0.00
S-6	South Costco Access	Restrict on-street parking near access w/signs & paint	1.00	0.80	0.80	0.80	1.00	0.93	4ST	\$186,804	2.14	1.99	0.15	\$398,827	\$27,631	0	0.2	0	0.4	2.4	3	0.00
S-7	11000 South	Retime signal	0.95	0.95	0.95	0.95	0.95	0.95	4SG	\$165,874	4.49	4.26	0.23	\$745,104	\$38,745	0	0	0	0.2	0.8	1	0.00
S-8	Motor Park Avenue	Modify truck delivery schedule (remove objects to improve sight distance 12106)	0.89	0.89	0.89	0.89	0.89	0.89	4ST	\$186,804	2.05	1.83	0.23	\$383,509	\$42,186	0	0	0	0	1.4	1.4	0.00
MEDIUM TERM																						
M-1	Corridor Wide	Replace uneven sections of sidewalk	0.99	0.99	0.99	0.99	0.99	0.99	3T	\$191,471	12.65	12.57	0.08	\$2,421,912	\$15,742	0	0.4	0.4	2.6	11.6	15	0.00
M-2	11000 South	Restripe to reduce the number of lanes	0.96	0.96	0.96	0.96	0.96	0.96	4SG	\$165,874	4.49	4.32	0.17	\$745,104	\$28,314	0	0	0	0.2	0.8	1	0.00
M-3	Motor Park Avenue	Restripe (clarify parking and accomodate delivery trucks)	0.96	0.96	0.96	0.96	0.96	0.96	4ST	\$186,804	2.05	1.97	0.08	\$383,509	\$14,573	0	0	0	0	1.4	1.4	0.00
M-4	Zion's Bank	Convert to RIRO	0.20	0.20	0.20	0.20	0.82	0.60	3ST	\$112,452	0.00	0.00	0.00	\$0	\$0	0	0	0	0	1.8	1.8	0.00
LONG TERM																						
L-1	Corridor Wide	Reconstruct sidewalks	0.99	0.99	0.99	0.99	0.99	0.99	3T	\$191,471	12.65	12.57	0.08	\$2,421,912	\$15,742	0	0.4	0.4	2.6	11.6	15	0.00
L-2	Corridor Wide	Install curb bulb outs	0.68	0.68	0.68	0.68	0.68	0.68	3T	\$191,471	12.65	8.60	4.05	\$2,421,912	\$775,012	0	0.4	0.4	2.6	11.6	15	0.00
L-3	Corridor Wide	Landscape median	0.29	0.29	0.29	0.29	0.29	0.29	3T	\$191,471	12.65	3.67	8.98	\$2,421,912	\$1,719,558	0	0.4	0.4	2.6	11.6	15	0.00
L-4	Scheels & McDonalds	Install curb bulb outs	0.68	0.68	0.68	0.68	0.68	0.68	4ST	\$186,804	2.00	1.36	0.64	\$373,982	\$119,674	0	0	0.2	0	0.8	1	0.00
L-5	Scheels Access	Install curb bulb outs	0.68	0.68	0.68	0.68	0.68	0.68	4ST	\$186,804	2.00	1.36	0.64	\$373,982	\$119,674	0	0	0.2	0	0.8	1	0.00
L-6	Scheels & McDonalds	Median to prevent left turns	0.20	0.20	0.20	0.20	0.82	0.60	4ST	\$186,804	2.00	1.21	0.79	\$373,982	\$147,961	0	0	0.2	0	0.8	1	0.00
L-7	Scheels Access	Median to prevent left turns	0.20	0.20	0.20	0.20	0.82	0.60	4ST	\$186,804	2.00	1.21	0.79	\$373,982	\$147,961	0	0	0.2	0	0.8	1	0.00
L-8	Scheels Access	Textured crosswalks (crosswalk enhancement)	1.00	1.00	1.00	1.00	1.00	1.00	4ST	\$186,804	2.00	2.00	0.01	\$373,982	\$935	0	0	0.2	0	0.8	1	0.00
L-9	South Costco Access	Convert to RIRO	0.20	0.20	0.20	0.20	0.82	0.60	4ST	\$186,804	2.14	1.29	0.84	\$398,827	\$157,790	0	0.2	0	0.4	2.4	3	0.00
L-10	South Costco Access	Roundabout	0.13	0.13	0.13	0.13	0.41	0.31	4ST	\$186,804	2.14	0.67	1.47	\$398,827	\$274,147	0	0.2	0	0.4	2.4	3	0.00
L-11	11000 South	Redevelop Costco site (permissive to prot/perm LT phasing) adding protected LT	0.93	0.93	0.93	0.93	0.93	0.93	4SG	\$165,874	4.49	4.19	0.30	\$745,104	\$50,295	0	0	0	0.2	0.8	1	0.00
L-12	11000 South	Roundabout	0.45	0.45	0.45	0.45	0.89	0.74	4SG	\$165,874	4.49	3.31	1.18	\$745,104	\$195,986	0	0	0	0.2	0.8	1	0.00
L-13	Motor Park Avenue	Landscape median	0.29	0.29	0.29	0.29	0.29	0.29	4ST	\$186,804	2.05	0.60	1.46	\$383,509	\$272,291	0	0	0	0	1.4	1.4	0.00
L-14	Zion's Bank	Extend median south near Zion's Bank	0.20	0.20	0.20	0.20	0.82	0.60	3ST	\$112,452	0.00	0.00	0.00	\$0	\$0	0	0	0	0	1.8	1.8	0.00

Appendix B: Detailed Benefit-Cost Calculation Table

			Observed													
ID	Location	Measure	SI w/ Treatment	Minor Injury w/ Treatment	Possible Injury w/ Treatment	PDO w/ Treatment	# w/ Treatment	Crashes Avoided	Annual Crash Costs	Annual Crash Cost w/ Treatment	Safety Benefit per Year	20-year analysis period, 3% rate	Cost	Service Life (Years)	20-year Cost	Benefit-Cost Ratio (B/C)
SHORT TERM																
S-1	Corridor Wide	Paint uneven sidewalks	0.40	0.40	2.58	11.52	14.90	0.10	\$2,685,840	\$2,668,382	\$17,458	\$260,000	\$3,000	3	\$16,000	16.25
S-2	Corridor Wide	Prune trees (make lighting more visible)	0.40	0.40	2.59	11.56	14.94	0.06	\$2,685,840	\$2,675,956	\$9,884	\$147,000	\$22,000	1	\$337,000	0.44
S-3	Scheels Access	Replace sign														
S-4	Scheels & McDonald's	Restrict on-street parking near access w/signs & paint	0.00	0.16	0.00	0.80	0.96	0.04	\$101,080	\$84,240	\$16,840	\$385,000	\$6,000	3	\$32,000	12.03
S-5	Scheels Access	Restrict on-street parking near access w/signs & paint	0.00	0.16	0.00	0.80	0.96	0.04	\$101,080	\$84,240	\$16,840	\$385,000	\$6,000	3	\$32,000	12.03
S-6	South Costco Access	Restrict on-street parking near access w/signs & paint	0.16	0.00	0.32	2.40	2.88	0.12	\$993,120	\$804,624	\$188,496	\$2,804,000	\$6,000	3	\$32,000	87.63
S-7	11000 South	Retime signal	0.00	0.00	0.19	0.76	0.95	0.05	\$59,960	\$56,842	\$3,118	\$576,000	\$8,000	10	\$14,000	41.14
S-8	Motor Park Avenue	Modify truck delivery schedule (remove objects to improve sight distance 12106)	0.00	0.00	0.00	1.25	1.25	0.15	\$29,540	\$26,291	\$3,249	\$628,000	\$10,000	3	\$53,000	11.85
MEDIUM TERM																
M-1	Corridor Wide	Replace uneven sections of sidewalk	0.40	0.40	2.58	11.52	14.90	0.10	\$2,685,840	\$2,668,382	\$17,458	\$260,000	\$60,000	20	\$60,000	4.33
M-2	11000 South	Restripe to reduce the number of lanes	0.00	0.00	0.19	0.77	0.96	0.04	\$59,960	\$57,682	\$2,278	\$421,000	\$33,000	5	\$107,000	3.93
M-3	Motor Park Avenue	Restripe (clarify parking and accomodate delivery trucks)	0.00	0.00	0.00	1.35	1.35	0.05	\$29,540	\$28,417	\$1,123	\$217,000	\$41,000	3	\$216,000	1.00
M-4	Zion's Bank	Convert to RIR0	0.00	0.00	0.00	1.48	1.48	0.32	\$37,980	\$31,144	\$6,836	\$102,000	\$7,000	20	\$7,000	14.57
LONG TERM																
L-1	Corridor Wide	Reconstruct sidewalks	0.40	0.40	2.58	11.52	14.90	0.10	\$2,685,840	\$2,668,382	\$17,458	\$260,000	\$591,000	20	\$591,000	0.44
L-2	Corridor Wide	Install curb bulb outs	0.27	0.27	1.77	7.89	10.20	4.80	\$2,685,840	\$1,826,371	\$859,469	\$12,787,000	\$30,000	20	\$30,000	426.23
L-3	Corridor Wide	Landscape median	0.12	0.12	0.75	3.36	4.35	10.65	\$2,685,840	\$778,894	\$1,906,946	\$28,371,000	\$742,000	20	\$742,000	38.24
L-4	Scheels & McDonalds	Install curb bulb outs	0.00	0.14	0.00	0.54	0.68	0.32	\$101,080	\$68,734	\$32,346	\$1,780,000	\$30,000	20	\$30,000	59.33
L-5	Scheels Access	Install curb bulb outs	0.00	0.14	0.00	0.54	0.68	0.32	\$101,080	\$68,734	\$32,346	\$1,780,000	\$30,000	20	\$30,000	59.33
L-6	Scheels & McDonalds	Median to prevent left turns	0.00	0.04	0.00	0.66	0.70	0.30	\$101,080	\$30,682	\$70,398	\$2,201,000	\$35,000	20	\$35,000	62.89
L-7	Scheels Access	Median to prevent left turns	0.00	0.04	0.00	0.66	0.70	0.30	\$101,080	\$30,682	\$70,398	\$2,201,000	\$35,000	20	\$35,000	62.89
L-8	Scheels Access	Textured crosswalks (crosswalk enhancement)	0.00	0.20	0.00	0.80	1.00	0.00	\$101,080	\$100,827	\$253	\$14,000	\$75,000	15	\$93,000	0.15
L-9	South Costco Access	Convert to RIR0	0.04	0.00	0.08	1.97	2.09	0.91	\$993,120	\$230,021	\$763,099	\$11,353,000	\$7,000	20	\$7,000	1621.86
L-10	South Costco Access	Roundabout	0.03	0.00	0.05	0.98	1.06	1.94	\$993,120	\$143,285	\$849,835	\$12,643,000	\$4,351,000	25	\$3,716,000	3.40
L-11	11000 South	Redevelop Costco site (permissive to prot/perm LT phasing) adding protected LT	0.00	0.00	0.19	0.75	0.93	0.07	\$59,960	\$55,913	\$4,047	\$748,000	\$8,000	15	\$10,000	74.80
L-12	11000 South	Roundabout	0.00	0.00	0.09	0.71	0.80	0.20	\$59,960	\$34,409	\$25,551	\$2,916,000	\$6,000,000	25	\$5,124,000	0.57
L-13	Motor Park Avenue	Landscape median	0.00	0.00	0.00	0.41	0.41	0.99	\$29,540	\$8,567	\$20,973	\$4,051,000	\$110,000	20	\$110,000	36.83
L-14	Zion's Bank	Extend median south near Zion's Bank	0.00	0.00	0.00	1.48	1.48	0.32	\$37,980	\$31,144	\$6,836	\$102,000	\$30,000	20	\$30,000	3.40