

Traffic Impact Analysis

Terakee Farm
300 North and 3600 West
West Weber, Utah

Submitted to:
Terakee Farm PUD Development
Weber County

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Riley Traffic Consultants, LLC

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INTRODUCTION AND SUMMARY

1.1 Purpose of Report and Study Objectives

The purpose of this report is to document the results of a study undertaken to identify traffic impacts that would result from access to the proposed Terakee Farm Residential Development in West Weber, Utah. The site layout has been designed by Great Basin Engineering. This study was prepared for Weber County and meets the requirements of a Level II Traffic Impact Study, as defined by the Utah Department of Transportation.

1.2 Executive Summary

The existing site is undeveloped agricultural use property. There is currently one point of access to the development at approximately 200 South and 3600 West, connecting to the existing 3600 West. An additional point of access is desired in the future but currently is not feasible.

The affected roadway network is from 400 South to SR-39 and from SR-134 to 3500 West. The roadway and intersection capacities were analyzed using the algorithm from the Highway Capacity Manual 2000 and the *Synchro 8* Traffic Model. The result of the capacity analysis, with and without the development, shows that all the intersections in the network function with an Intersection Capacity Utilization (ICU) calculated at a level-of-service (LOS) "A".

Traffic counts were taken using the MIOVISION digitized traffic camera. This video was reviewed to verify results of the existing traffic analysis. The numerical traffic counts are shown in this report.

The intersection of 400 South and 3600 West will be the most affected. Improvement of the intersection is proposed and recommended to mitigate the increased traffic.

PROPOSED PROJECT

1.3 Proposed Project

The project proposes development of a 240-unit residential PUD and equestrian center. The primary point of access is at approximately 400 South and 3600 West.

An image of the site and surrounding area that was studied is shown in Figure 1. The proposed access and layout is shown in Figure 2.

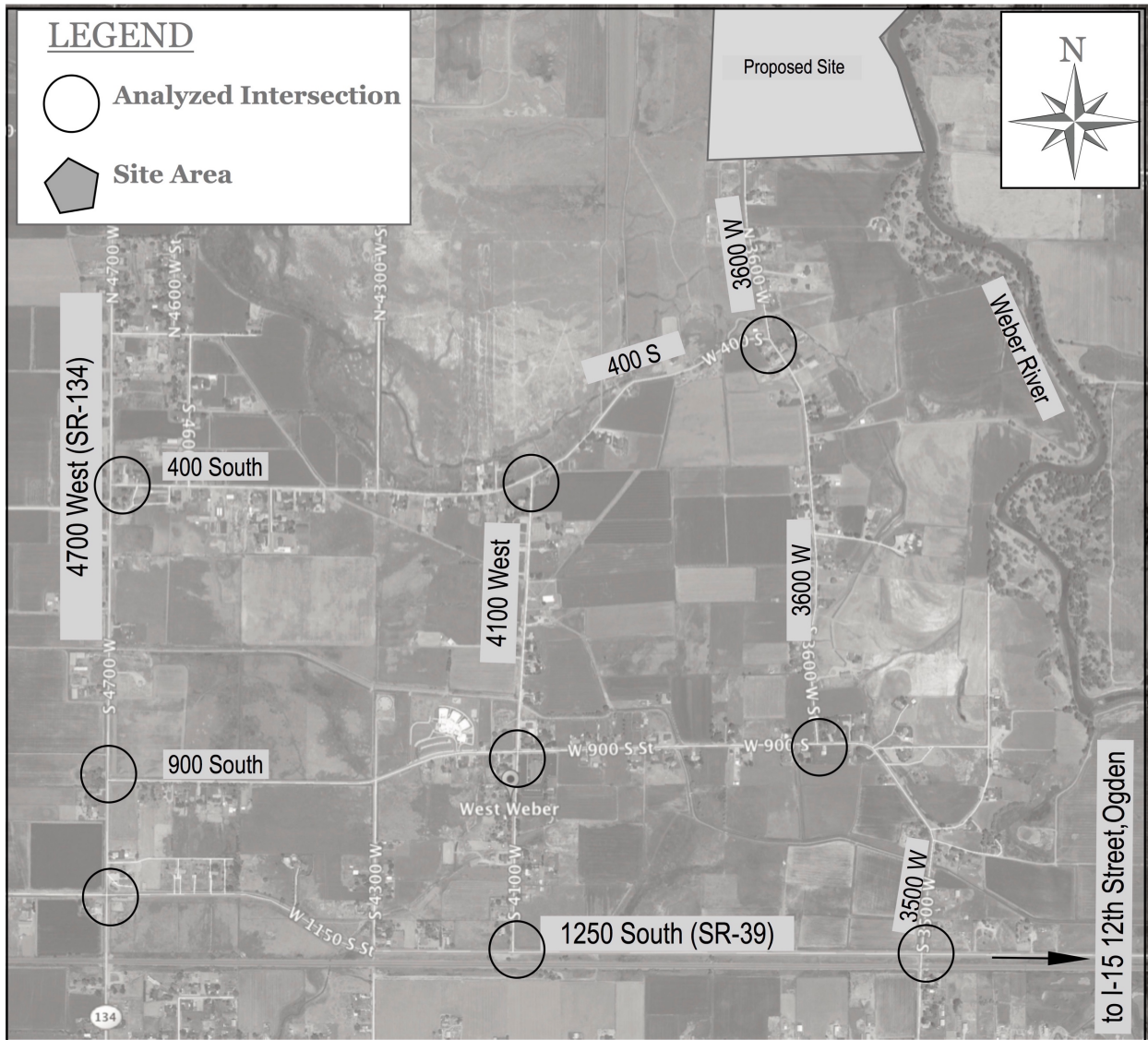


Figure 1. Site Location and Surrounding Area

1.5 Adjacent Roadway Condition

3600 West, north of 400 South, is a paved, unimproved roadway, with no pavement markings, ranging from 14 to 20 feet in width. The speed limit is not posted but is presumed to be 25 MPH because it is residential along this segment. The grade is approximately level. SR-39 and SR-134 are both two-lane roadways, west and east, and north and south, respectively.

Traffic counts, including turning movements, were taken for the study intersections during the week of January 31 through February 3, 2017. Conditions were snowy, but all roads were clear. The weekday a.m. peak-hour traffic occurs from 7:00 a.m. to 8:00 a.m. The peak traffic on SR-134 appears to be influenced by commuters northbound to the nearby high school. On SR-134, the p.m. peak-hour traffic occurs approximately between 2:30 p.m. and 3:30 p.m., again influenced by the local high school. The peak periods on SR-39 were 7:30 a.m. to 8:30 a.m. and 4:30 p.m. to 5:30 p.m. In both cases, the highest traffic volumes were used, and therefore, traffic may not balance exactly between intersections. The existing traffic volumes for the study intersections in the area are shown in Figures 3 and 4, respectively.

Traffic counts were taken with MIOVISION cameras and were digitally processed and manually reviewed, as recorded, to determine any irregularities or safety issues. The data were processed using the Turning Movement Count (TMC) and Gap module to tabulate the number of left turns, right turns, U-turns, and through movements for each leg. Accuracy is estimated at 95%+. A count of pedestrians and bicycles was also taken. Existing gaps for traffic on SR-39 were evaluated. Count summaries are shown in the Appendix.

The site effect on Saturday traffic is expected to be minimal and is not required for a Level II traffic study.

1.6 Zoning

The area is zoned for A-2. A conditional use permit to allow for this residential development was granted by the Planning Commission.



Figure 3. Existing AM Peak-Hour Traffic Volumes



Figure 4. Existing PM Peak-Hour Traffic Volumes

1.7 Analysis of Existing Conditions

The intersections were analyzed preliminarily in accordance with the *Highway Capacity Manual 2000* guidelines, using *Synchro Version 8* software. A summary of the ICU (Intersection Capacity Utilization) and the level-of-service (LOS) is shown in Table 2. Printouts from the *Synchro* model are contained in the Appendix.

Table 1. Existing Capacity Analysis Result

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	ICU*	Level of Service	ICU*	Level of Service
SR-39 & 4100 West	36.6%	A	36.9%	A
4100 West & 400 S	14.4%	A	13.3%	A
4100 West & 900 S	19.0%	A	22.2%	A
900 South & 3600 W	13.3%	A	13.3%	A
3600 South & 400 S (to Site Entrance)	13.3%	A	14.7%	A
SR-134 & SR-39	44.0%	A	50.2%	A
SR-134 & 900 South	32.9%	A	39.0%	A
3500 West & SR-39	32.2%	A	40.7%	A
SR-134 & 400 South	33.5%	A	34.0%	A

PROJECTED TRAFFIC

1.8 Trip Generation

Trips into and out of the facility were projected using the Institute of Transportation Engineers (ITE) *9th Edition Trip Generation Manual*. Average Daily Traffic (ADT) and peak-hour traffic were evaluated. Traffic was generated by considering the Single Family Home, ITE Code 210. Two hundred and forty (240) dwelling units are assumed.

The trips generated are summarized in the following table.

Table 2. Projected Trip Generation

Description/ ITE Code	Expected Units	Total Generated Trips			Total Distribution of Generated Trips					
		Daily	AM Hour	PM Hour	AM In	AM Out	Pass -By	PM In	PM Out	Pass -By
Single Family Homes 210	240.0	2,285	180	240	45	135	0	151	89	0

1.9 Trip Distribution

Site-generated traffic and distribution to the roadway network for the a.m. and p.m. peaks are shown in Figures 6 and 7. Traffic to and from the site was distributed by using the same percentages as the existing overall traffic flow. These percentages and the trip paths are shown in Figure 5.

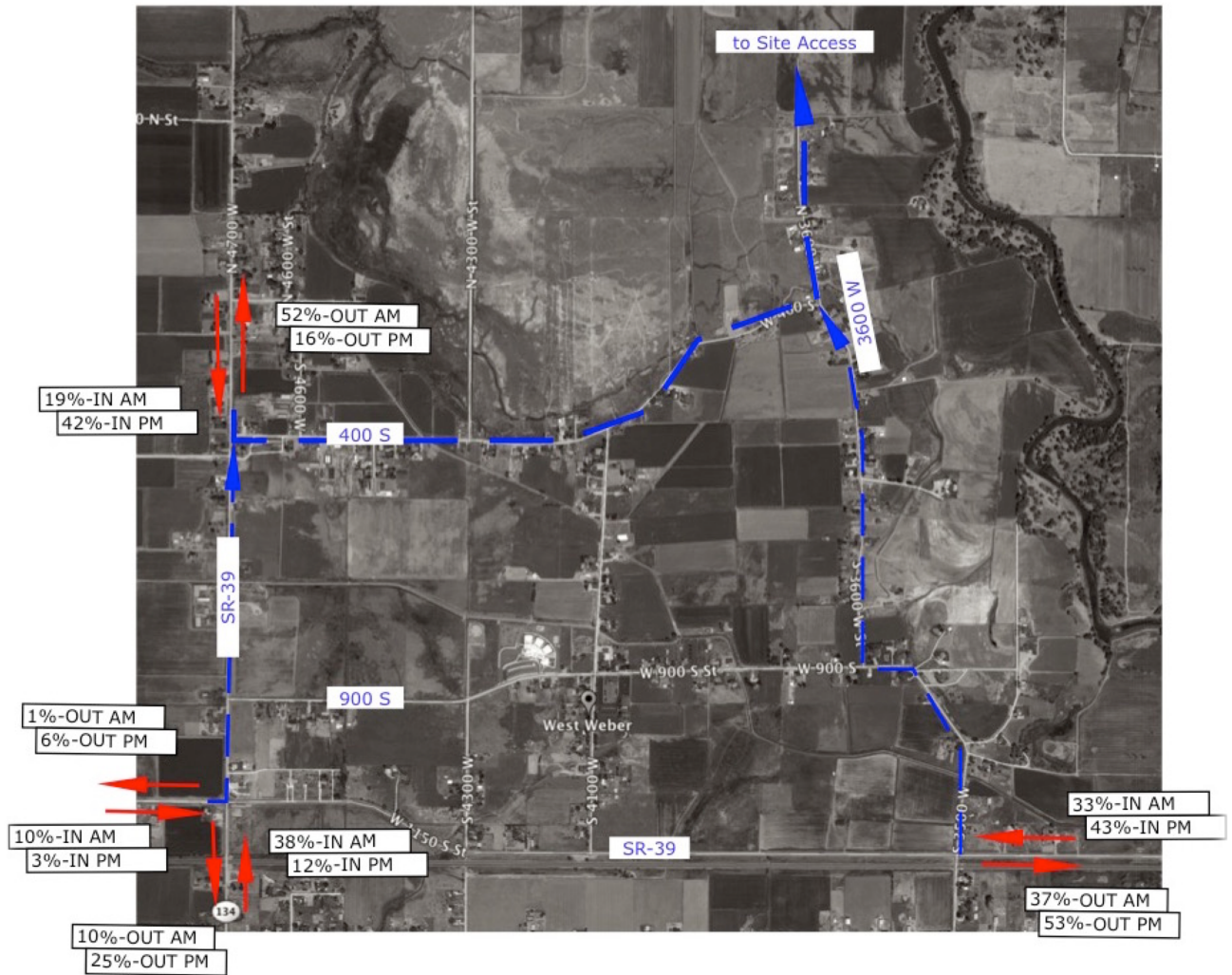


Figure 5. Trip Distribution – Origin and Destination

1.10 Background Traffic and Total Volumes

Existing traffic volumes were used as the background traffic for the opening year (2017). Total traffic volumes for 2017 were obtained by adding the site-generated traffic volumes to the existing background traffic. The estimated traffic volumes for the opening year are shown in Figures 8 and 9.



Figure 6. Site-Generated AM Peak-Hour Traffic Volume



Figure 7. Site-Generated PM Peak-Hour Traffic Volumes



Figure 8. Total Projected AM Peak-Hour Traffic Volumes



Figure 9. Total Projected PM Peak-Hour Traffic Volumes

TRAFFIC ANALYSIS

1.11 Capacity Analysis

Analysis was then performed using *Synchro* Version 8. Printouts from the *Synchro* model are contained in the Appendix.

The following table shows the existing Level of Service (LOS) and estimated ICU (Intersection Capacity Utilization) for the intersections within the influence area of proposed development.

Level of Service for signalized and unsignalized intersections are based on Table 1 from the Highway Capacity Manual.

Table 3. Level of Service for Intersections

LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	>80 sec	>50 sec

Table 4. Projected Capacity Analysis Results

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	ICU*	Level of Service	ICU*	Level of Service
SR-39 & 4100 West	36.6%	A	39.6%	A
4100 West & 400 S	18.6%	A	15.4%	A
4100 West & 900 S	19.0%	A	22.2%	A
900 South & 3600 W	13.5%	A	15.6%	A
3600 South & 400 S (to Site Entrance)	18.4%	A	19.5%	A
SR-134 & SR-39	46.0%	A	56.1%	A
SR-134 & 900 South	34.1%	A	41.6%	A
3500 West & SR-39	32.6%	A	47.3%	A
SR-134 & 400 South	36.9%	A	43.8%	A

1.12 Sight Distance

The existing sight distance at 3600 West and 400 South is compromised by the skewed angle of the intersection. Pedestrians were recorded at this intersection, increasing the potential of an accident. Improvements to the intersection are recommended to increase the functionality and safety of this intersection, and to compensate for the increased traffic.

1.13 Critical Gap

In addition to traffic modeling, another method of evaluating turns is to look at the Critical Gap Availability. AASHTO Exhibit 9-54 states that the required gap is 7.5 and 9.5 seconds for passenger vehicles and single-unit trucks, respectively. The critical gap should be sufficient for the increased left-turn movements to and from SR-39, at 3500 West.

Gap data were collected with the MIOVISION cameras at the SR-39 and 3500 West intersection using the Gap Study module. During the critical p.m. peak hour, there were 147 gaps that were 7.1 seconds or greater for the westbound and eastbound directions. There were sufficient gaps for single-unit trucks and passenger cars to make all turning movements.

The results of the gap study are included in the Appendix.

CONCLUSIONS AND RECOMMENDATIONS

All intersections in the study area are under capacity and function at a level-of-service (LOS) "A". The intersections are still at an LOS "A" when evaluating with the additional traffic projected from the development.

As shown in this report, the majority of intersections of the affected network of the project function well in both the a.m. and p.m. peaks, and the proposed development will have a minimal impact on operation.

The intersection of 400 South and 3600 West will be most impacted by the increased traffic. It is recommended to widen the 3600 West connection, where possible, and improve the geometry, pavement markings and signage at 400 South.

It is also recommended to add traffic calming features, such as speed bumps, pavement markings, and median features to the reconstructed portion of 3600 West, to keep traffic speeds down.

APPENDIX

On file at Riley Traffic Consultants.