



2139 S. 1260 W.
Salt Lake City, UT 84119

801-456-3847
wcg.us

Date: June 10, 2021
To: UDOT; Sam Grimshaw & Jeff Sanders
From: Jeremy Searle, PE, PTOE, Austin Feula, PE, PTOE
Subject: 18897; US-89 & SR-9 Traffic Volume Estimates

Traffic volume projections were developed for both the current year (2021) and a future condition (2050) for the 5 segments of the US-89 & SR-9 corridor study area. The methodology for developing these volumes is described in the memo below.

Data Sources

The following data sources were utilized in estimating *traffic volumes*:

- **CCS 411, 412, & 504:** January 2018 – March 2021 hourly and directional volume data
- **Short-term tube counts:** WCG deployed tubes at 5 locations within the study area from Wednesday, March 17 to Saturday, March 20, 2021 to collect hourly and directional volume data

The following data sources were utilized in estimating future *traffic growth rates*:

- **Kanab City,** 2018 Transportation Impact Fee Facilities Plan & Impact Fee Analysis
- **UDOT CCS data:** Station 411, 412, and 504, 1981 – 2019 AADT
- **Utah Statewide Travel Model (USTM):** 2015 and 2040 daily volume outputs

March 2021 Data Collection

Short-term tube counts were deployed in the 5 segments of the study area from Wednesday, March 17 to Saturday, March 20, 2021. Weather was good for the duration of the counts.

- US-89: Kanab (200 N) to SR-9
- SR-9: East Zion National Park Entrance to US-89
- US-89: SR-9 to SR-14
- US-89: SR-14 to SR-12
- US-89: SR-12 to Panguitch (Roller Mill Hill Dr)

Figure 1 presents the daily traffic volumes for the peak day of data collection (Friday, March 19, 2021). Volumes range from 5,920 on US-89 between Kanab and SR-9 to 2,256 on SR-9.

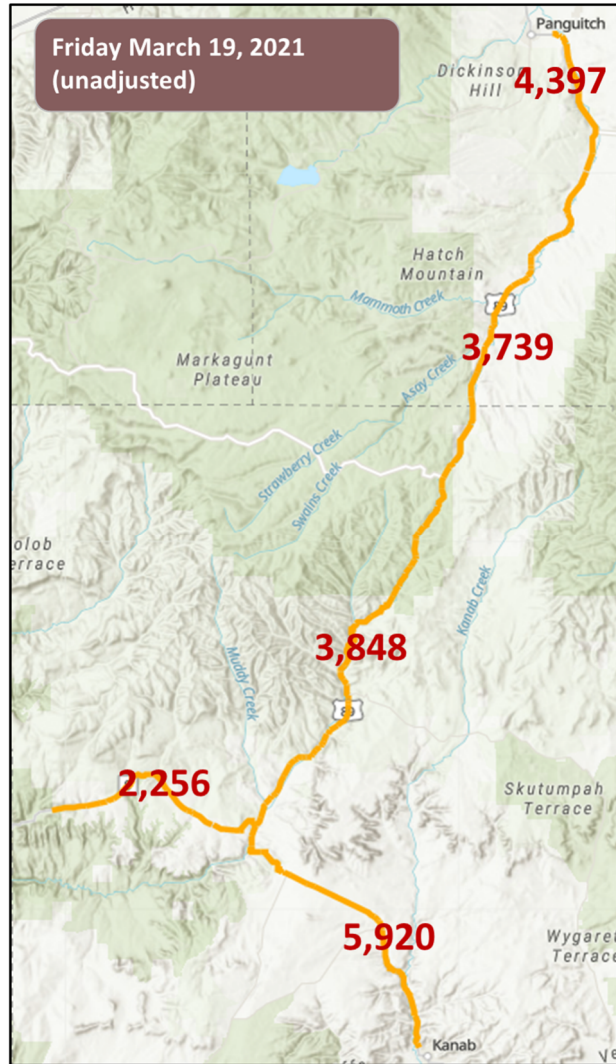


Figure 1: Unadjusted daily traffic counts

Design Condition

Due to large tourism demands along US-89 and SR-9, traffic patterns do not follow typical month of year or day of week traffic distributions. With this in mind, an analysis condition needed to be determined. It was decided that a typical peak day (Friday) during the summer (June – August) would be utilized. This average of approximately 13 Friday’s ensures the corridor is planned for busy summer conditions, but also that the roadway is not overbuilt to accommodate a condition that only occurs a few days out of the year.

To get to this design condition counts performed on Friday, March 19, 2021 were adjusted to peak month (June – August) conditions.

Adjustment Methodology

As shown below in Figure 3, the three UDOT continuous count stations (CCS) with historic data are just beyond the extents of the study area. CCS 726 and 730 were recently constructed and

started collecting data in December 2020, and thus has not yet recorded summer conditions. However, by analyzing trends at CCS 411, 412, and 504 peak conditions, we are able to estimate seasonal trends along the study corridor. Figure 2 presents the adjustment factors for each month of the year. The factor to adjust March counts to the peak month condition (June – August) was determined to be 1.44 (a 44% increase).

	Monthly Adjustment Factor
January	2.06
February	1.95
March	1.44
April	1.23
May	1.08
June	1.00
July	0.98
August	1.02
September	1.07
October	1.21
November	1.58
December	1.80

Figure 2: Adjustment Factors

A day-of-week adjustment factor was not necessary as the tube counts were performed on the peak day (Friday). Additionally, the UDOT Covid-19 Traffic Dashboards¹ were reviewed and it was determined that traffic volumes in Region 4 are generally back to pre-Covid levels. Thus, no Covid-19 adjustment factors were applied.

¹ <https://sites.google.com/utah.gov/udotcovid-19>



Figure 3: CCS Locations

2050 Growth Rate Estimates

Growth estimates were developed based on the three data sources described below:

- Kanab City, 2018 Transportation Impact Fee Facilities Plan & Impact Fee Analysis:
 - Estimated 3% annual growth rate between 2018 and 2028
 - Estimated 2% annual growth rate between 2028 and 2038
- Utah Statewide Travel Model (USTM)
 - Estimated an average of 1.9% annual growth rate between 2015 and 2040 along the study corridor
- UDOT CCS locations: 1981 – 2019 AADT
 - Station 411: Average annual historic growth rate of 1.4%
 - Station 412: Average annual historic growth rate of 0.9%
 - Station 504²: Average annual historic growth rate of 0.3%
- University of Utah – An Economic Analysis of Zion National Park Scenarios
 - Approximate average annual growth rate of 0.5% between 2020 and 2030

² Utilized 1990 – 2019 data as the CCS station was not established until 1990.

Station 504 does not seem to be impacted by the recreational growth expected along the study area because it is further away from the National Parks and most drivers will use SR-20 (south of Station 504) when traveling to these areas. Given the range of estimates, we consider a 2% annual growth rate as reasonable. This results in an 78% increase in traffic volumes between 2021 and 2050.³

Volume Estimates

By applying the seasonal factor and the annual growth rate to the counts performed on Friday, March 19, 2021 typical peak day (Friday) during the summer (June – August) were projected for both 2021 and 2050. These projections were made for the 5 study segments outlined below and are shown in Figure 4.

- US-89: Kanab (200 N) to SR-9
- SR-9: East Zion National Park Entrance to US-89
- US-89: SR-9 to SR-14
- US-89: SR-14 to SR-12
- US-89: SR-12 to Panguitch (Roller Mill Hill Dr)

Given the uncertainty of future volumes projections and the limited historic traffic data along the study corridor volumes were rounded to the nearest thousand. These volume projections represent a planning level estimate and are sufficient developing corridor cross sections. With the recent installation of two new CCS locations (#726 and #730) more precise estimates will likely be possible after a few years of data collection.

³ Compounding growth.

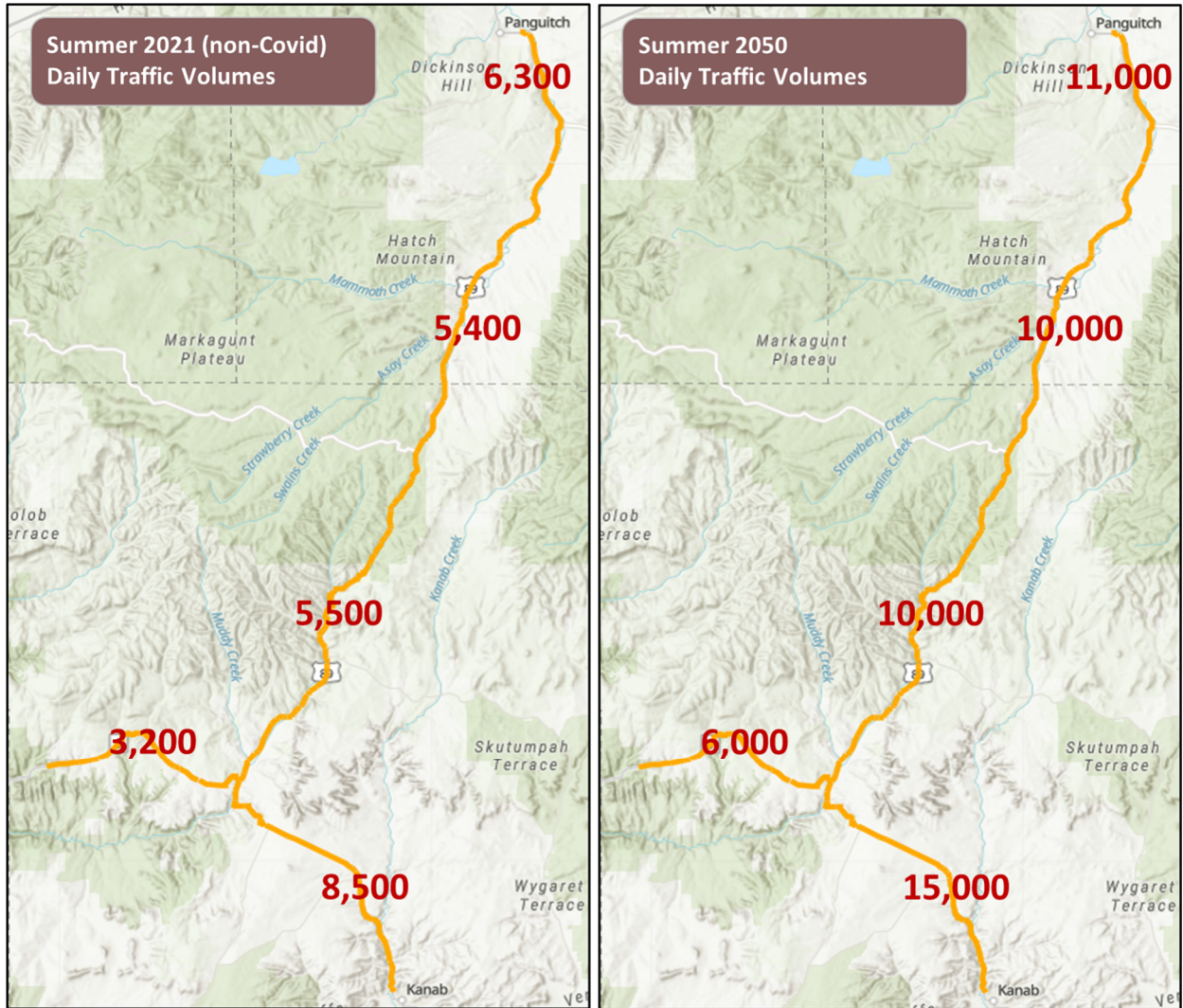


Figure 4: 2021 and 2050 Daily Traffic Volume Estimates

Hourly Traffic Volume Trends

Daily volume profiles for the segment along US-89 between Kanab (200 N) to SR-9 are shown below in Figure 5. It was assumed that future traffic volumes will follow a similar pattern to existing volumes. As travel demand increases it is likely that the peak hours will spread out throughout the day. Currently, hourly volumes are estimated to peak at just under 800 vehicles per hour in 2021. By 2050 this is projected to grow to almost 1,400 vehicles per hour.

Additionally, 2050 projections were examined by direction which is shown in Figure 6. The peak directional volume is projected to be just over 900 vehicles per hour from 5 PM to 6 PM in the southbound direction.

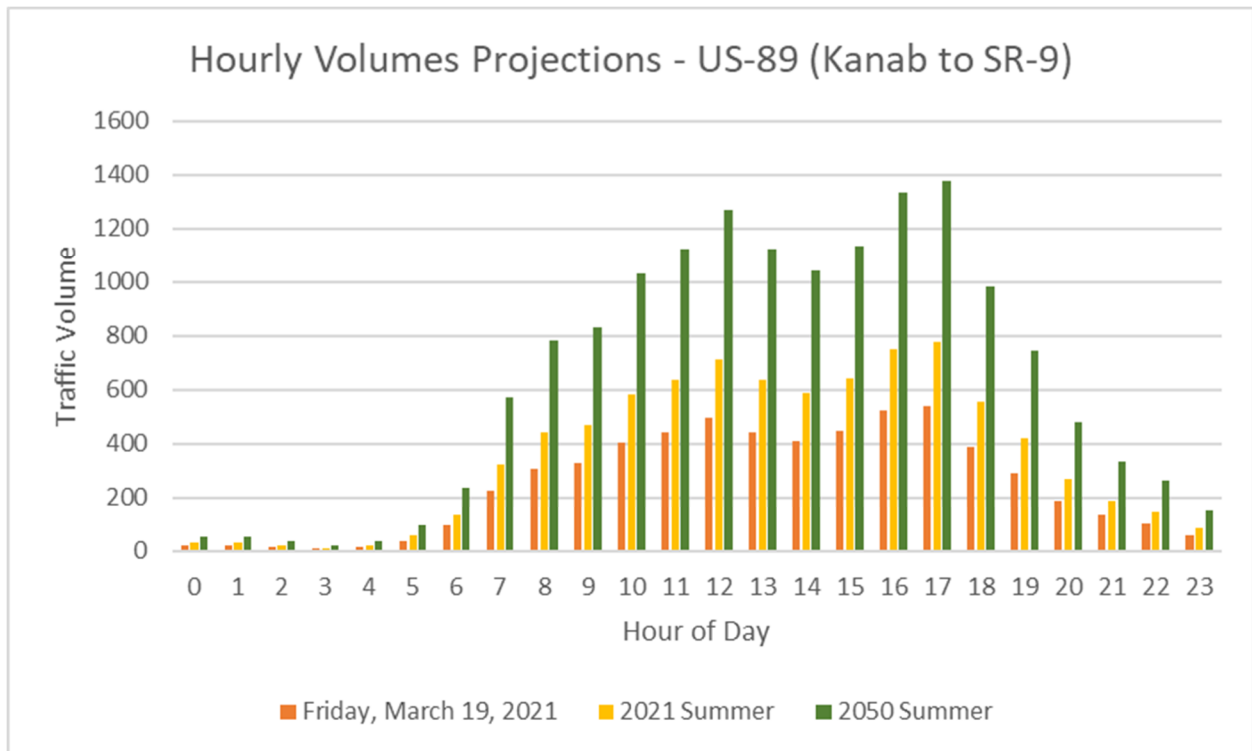


Figure 5: Estimated Hourly Volume Distribution

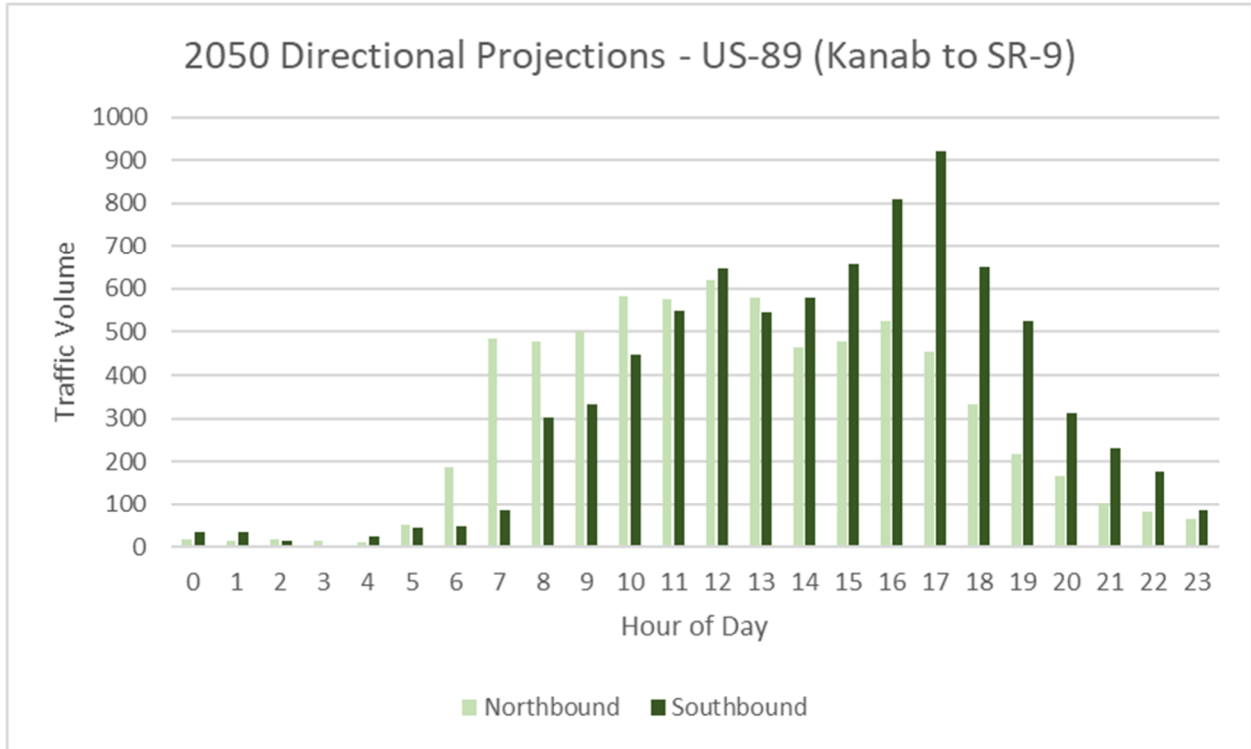


Figure 6: 2050 Directional Hourly Volume Distribution

Truck Traffic

The percentage of cars, single unit trucks, and combination unit trucks were collected on the 5 study segments on Friday, March 19, 2021. Vehicle type distributions are provided below in Figure 7.

Location	Cars	Single Unit Trucks	Combo Unit Trucks
US-89: Kanab (200 N) to SR-9	78%	19%	3%
SR-9: East Zion National Park Entrance to US-89	86%	14%	0%
US-89: SR-9 to SR-14	76%	23%	1%
US-89: SR-14 to SR-12	73%	26%	1%
US-89: SR-12 to Panguitch (Roller Mill Hill Dr)	69%	30%	0%

Figure 7: Vehicle Distribution by segment

Additionally, 2019 data on vehicle type distributions were obtained for UDOT continuous count stations. While these locations are not along the study corridor, they likely provide a reasonable estimate of vehicle type distributions. The percentage of cars were found to be similar to March 2021 data collected along the corridor. While the total percentage of trucks was found to be similar, the distribution between single and combination unit trucks was found to be quite different. Vehicle type distributions from the CCS locations are provided below in Figure 8.

CCS Locations	Cars	Single Unit Trucks	Combo Unit Trucks
411	74%	10%	16%
412	80%	14%	6%
504	82%	7%	11%

Figure 8: Vehicle Distribution by segment at CCS locations

Summary

WCG has evaluated existing, projected, and estimated traffic volumes on the US-89 & SR-9 corridor and have evaluated potential adjustments based on time of year. WCG has also projected future 2050 volumes as shown in Figure 4. These will be used for the ongoing corridor study for this area.