APPENDIX G

Park City to Little Cottonwood Canyon Traffic Analysis

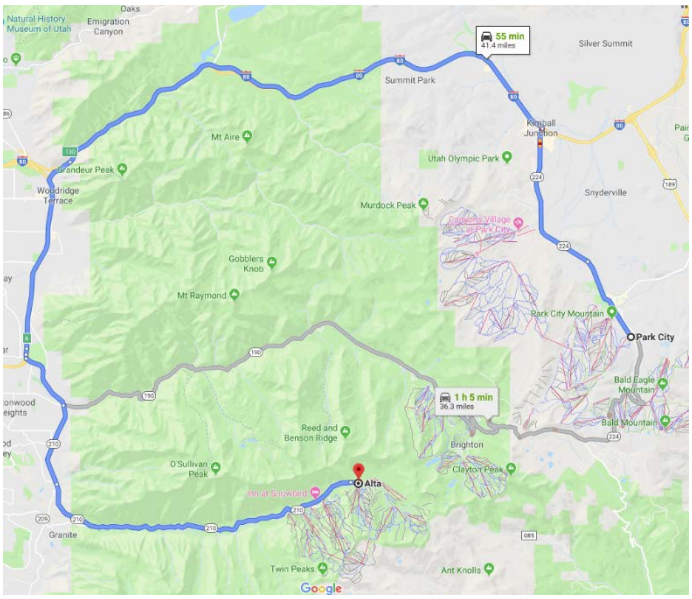
Memo

Date:	Friday, April 03, 2020
Project:	Little Cottonwood Canyon EIS, S.R. 210 – Wasatch Boulevard to Alta
To:	Utah Department of Transportation
From:	HDR
Subject:	**Park City to Little Cottonwood Canyon Traffic Analysis**

Introduction

This memo describes the analysis that HDR performed to identify the percentage of traffic on Little Cottonwood Canyon Road (State Route [S.R.] 210) in Little Cottonwood Canyon (LCC) that originates from Park City during different time periods throughout the year or during peak periods on a typical day. The fastest vehicular travel route from Park City to LCC during the winter is about 55 miles and follows a route heading southbound on S.R. 224 to westbound Interstate 80, down Parley's Canyon to southbound Interstate 215 to exit 6, to southbound Wasatch Boulevard to S.R. 210. Figure 1 shows this travel route in blue. The primary trip type for this travel route is residents of and visitors to Park City traveling to LCC to enjoy its recreation offerings.

Figure 1. Title



Methodology

HDR conducted an origin-destination (OD) analysis between Park City and LCC. OD analyses are conducted to help transportation planners understand travel patterns associated with trips from an origin location to a destination location. HDR used the StreetLight InSight web software platform to assist in this analysis. StreetLight Data (https://www.streetlightdata.com) is a big-data vendor that processes location-based data from smart phones and other navigation devices in connected cars and trucks for

transportation planning purposes. There are three components to an OD analysis that must be defined: travel zones, time period, and output day types and day parts.

The StreetLights InSight software allows the software user to place travel zones or "gates" at specific locations, and the software filters the results based on the traffic that passes through those zones. For the OD analysis, the zones were placed across the primary travel route shown in Figure 1. The methodology included directionality at each zone to specify traffic for the trips ***from*** Park City ***to*** LCC. This method filtered trips based on this direction only and did not include trips heading in the opposing direction (***from*** LCC ***to*** Park City). Little Cottonwood Canyon Road is a dead-end road with no exit, so HDR set middle filter zones at all possible entrance points into the canyon to capture all inbound trips. The zones for all analyses were placed at the following locations (see Figure 2):

Zone 1. Origin zone: Parley's Summit
Zone 2. Middle filter zones:
- **a)** S.R. 210 (North Little Cottonwood Road)
- **b)** S.R. 209 (Little Cottonwood Canyon Road)

Zone 3. Destination zone: S.R. 210 (mouth of LCC)

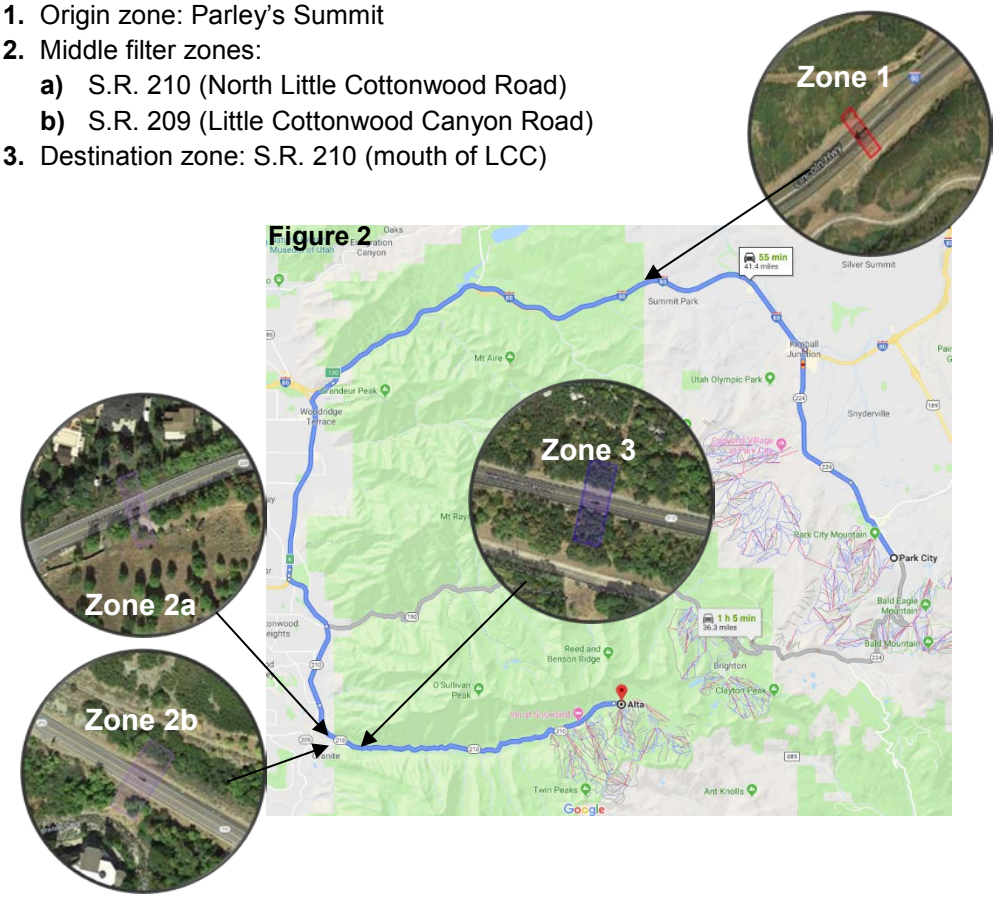


Figure 2

Three time periods were defined to help HDR gain a broad insight into travel patterns for the Park City to LCC trip. The time periods are important because the results are filtered just to the specific date ranges specified. The three time periods are:

1. **Peak Winter**
   - This time period for analysis is constrained to the winter months of January, February, and March for 2016–2019.
   - This time period captures the busiest months of ski traffic and prime operating season of the resorts in both LCC and Park City.

2. **Holiday Specific**
    - This time period for analysis is constrained to the dates of the Martin Luther King, Jr. Day (MLK) and Presidents' Day holiday weekends. These weekends are historically busy days in LCC, with traffic counts from this time period consistently ranking in the top 30 days of the year.
        - 2016: MLK 1/15–1/18, Presidents' Day 2/12–2/15
        - 2017: MLK 1/13–1/16, Presidents' Day 2/17–2/20
        - 2018: MLK 1/12–1/15, Presidents' Day 2/16–2/19
        - 2019: MLK 1/18–1/21, Presidents' Day 2/15–2/18
3. **Year Round**
    - This time period includes all days from January 1, 2016, to April 30, 2019.This time period captures all seasons of use and visitation.

The following day types and day parts were also defined for our analysis. The analysis output across all three time periods above was further categorized by the following day types and day parts. The results for these categories are mutually exclusive, meaning that one cannot use the sum of results from 1b and 1c below to produce an average day result. The results for each category are specific to that day type and period.

1. **Day Type**
    a. Average Day: Monday–Sunday
    b. Average Weekday: Monday–Thursday
    c. Average Weekend Day: Friday–Sunday
2. **Day Part**
    a. All Day: 12 AM–12 AM
    b. Early AM: 12 AM–7 AM
    c. Peak AM: 7 AM–11 AM
    d. Mid-day: 11 AM–3 PM
    e. PM: 3 PM–12 AM

Results

The results of the OD analysis are summarized in Table 1. Table 1 identifies the average percentage of total inbound trips passing through Zone 3 in LCC that originated from Park City Zone 1 for the specific day type and day part identified. These results show, for example, that 5.7% of daily traffic entering LCC during the winter months of January–March (Peak Winter time period) is originating from the Park City area. The average percentage of traffic is developed from the StreetLight InSight methodology of sampling all trips for that time period passing through Zones 1–3 and then identifying an average number of trips that followed the specified travel route identified. The resulting number varies because the number of trips sampled varies for each time period.

Table 1. Average Percent of Trips Originating from Park City

Day Type	Day Part	Time Period		
		Peak Winter	Holiday	Year Round
Average Day (M–Su)	All Day (12 AM–12 AM)	5.7%	6.0%	4.1%
	Peak AM (7 AM–11 AM)	7.8%	7.7%	6.8%
Average Weekday (M–Th)	All Day (12 AM–12 AM)	6.3%	5.5%	4.4%
	Peak AM (7 AM–11 AM)	8.5%	7.5%	7.0%
Average Weekend Day (F–Su)	All Day (12 AM–12 AM)	5.2%	6.2%	3.8%
	Peak AM (7 AM–11 AM)	7.0%	7.8%	6.6%

Across all three time periods, the results range from a low of 3.8% of LCC traffic originating from Park City during the Year Round time period to a high of 8.5% during the Peak Winter time period. The Year Round results are lower in all day parts than the results from the other two time periods. This meets observations, given that the Park City to LCC trip type is known to be more prevalent during the winter rather than during other seasons because of the ski resort attractions in both locations. Given this consistency in the results, we can be confident that the results are representative of traffic for each time period.

Is it important to remember that the results shown are *average* percentages of traffic relative to the time periods selected for analysis and therefore indicate a different traffic volume or number of cars. Historically, there is more traffic observed during the Peak AM day part in the winter than compared to Peak AM volumes averaged across the Year Round time period. For example, the Year Round result of 7.0% during the Average Weekday Peak AM day part does not indicate the same number of vehicles as the result of 7.0% in the Peak Winter results column. The Peak Winter percentage represents a higher number of vehicles. This is validated by UDOT Traffic Statistics reports showing that traffic volumes on S.R. 210 during the winter are, on average, higher than the yearly average.

To develop an estimated volume from the results in Table 1, we need to identify a representative volume of traffic for the specific day parts presented. Although all three time periods provide good insight into this travel pattern, we recommend using the Peak Winter or Year Round time period results. The Peak Winter results ensure that the trip sample used in the analysis is reflecting the true winter-based recreation trips that are most pertinent to the travel pattern we are studying in this analysis. The Year Round results provide us with a good control and estimation of total trips across all time periods. Table 2 was developed using the Peak Winter results to estimate a number of vehicles. Given that the Peak Winter results were higher than the Year Round results and represent the highest traffic volumes, our estimates for the number of vehicles will yield conservative findings.

Table 2. Winter Daily Traffic from Park City

Day Type	Day Part	% Peak Winter	2017 AADT	Estimated Volume
Average Day (M–Su)	All Day (12 AM–12 AM)	5.7%	7,927	450
Average Weekday (M–Th)	All Day (12 AM–12 AM)	6.3%	7,141	446
Average Weekend Day (F–Su)	All Day (12 AM–12 AM)	5.2%	8,712	454

Using UDOT-published traffic counts for 2017 that most closely match the day types and time periods from this OD analysis, we calculated an estimated number of vehicles for each day type. Table 2 shows the results for the All Day day type. For comparable annual average daily traffic (AADT), we used the 2017 traffic volumes published in Table 3 to develop an equivalent AADT for winter months.

Table 3. Average Traffic Volumes in LCC (2017)

Month	Sat – Sun	Mon – Fri
January	8,556	6,645
February	9,011	7,805
March	8,569	6,973
Average	8,712	7,141

Table 4 shows the results for the Peak AM day part. The 30th-highest hour of peak hour of eastbound (EB) or inbound traffic was used for this reference. The inbound traffic count was used because it identifies users entering LCC and matches the directionality associated with the OD analysis.

Table 4. Park City Traffic Entering LCC during the Peak Hour

Day Type	Day Part	% Peak Winter	30th EB Hour	Estimated Volume
Average Day (M–Su)	Peak AM (7 AM–11 AM)	7.8%	1,061	83
Average Weekday (M–Th)	Peak AM (7 AM–11 AM)	8.5%	1,061	91
Average Weekend Day (F–Su)	Peak AM (7 AM–11 AM)	7.0%	1,061	75