APPENDIX H

Draft Evaluation of Mobility Hub Locations

Little Cottonwood Canyon ENVIRONMENTAL IMPACT STATEMENT
S.R. 210 | Wasatch Blvd. to Alta

Draft Evaluation of Transit Hub Locations

Little Cottonwood Canyon Environmental Impact Statement S.R. 210 – Wasatch Boulevard to Alta

Utah Department of Transportation

April 3, 2020

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1.0 Introduction

This report evaluates potential transit hub locations to support parking for transit alternatives for Little Cottonwood Canyon. The purpose of the transit hub concept is to improve overall mobility in Little Cottonwood Canyon by providing a more efficient transit system.

The transit hub concept would support the transit alternatives (bus, train, and gondola) being considered for the Little Cottonwood Canyon Environmental Impact Statement (EIS). These transit alternatives would require additional parking to be provided in order for the alternatives to operate efficiently. A transit hub could support winter access to the four ski resorts and weekday commuter-related transit if possible.

2.0 Transit Criteria

2.1 Transit Hub Screening Criteria

To determine the location(s) of the transit hub(s), the Utah Department of Transportation (UDOT) used the following criteria to screen alternatives:

- The alternative must be available on weekdays, weekends, holidays, heavy snow days, and extended vacation periods (for example, the Christmas, Presidents' Day, and Easter holiday).
- The alternative must provide convenient access to Little Cottonwood Canyon to improve bus travel times, reduce out-of-direction travel, minimize traffic conflicts in residential areas, and reduce potential traffic conflicts for transit.
- For new or existing transit hub locations, the area must be about 4 acres or must accommodate about 672 to 3,475 parking stalls [see Section 2.2, Transit Hub(s) Sizing Requirements]. One or more sites could meet this need.

2.2 Transit Hub(s) Sizing Requirements

UDOT determined the number of parking spaces and amount of land required for the transit hub(s) based on the transit alternatives being considered for Little Cottonwood Canyon. Table 1 shows the parking spaces and land requirements for the transit hub(s) in 2050. For the Little Cottonwood Canyon EIS transit alternatives, UDOT assumed that two transit hubs would be required: one for transit users coming from the south part of the Salt Lake Valley and one for transit users coming from the north part of the valley.

According to traffic counts taken by UDOT in March 2018 (L2 Data Collection 2018), about 40% of the traffic going to Little Cottonwood Canyon comes from the south Salt Lake Valley and uses 9400 South and State Route (S.R.) 209, and about 60% comes from the north and uses S.R. 210. Based on the traffic count data, UDOT assumed that about 40% of transit users would park at the south transit hub and about 60% would park at the north transit hub.

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Table 1. Transit Hub Sizing Requirements Based on the Little Cottonwood Canyon EIS Transit Alternatives (in 2050)

Transit Ridership[a]	Daily Ridership[b]	Estimated Number of Parking Stalls[c]		Parking Garage Size (square feet)[d]		Cost (millions)[e]	
	Little Cottonwood Canyon	North Hub	South Hub	North Hub	South Hub	North Hub	South Hub
20% ridership	3,650	1,020	680	333,041	222,028	$22	$14
30% ridership	5,200	1,440	960	474,470	316,313	$31	$20

[a] Transit ridership is either 20% or 30% of the total number of people going to the canyons on the 30th-busiest day.
[b] Estimated one-way ridership from a transit hub to a ski resort.
[c] Based on 2.17 average occupants for entire day per vehicle in Little Cottonwood Canyon.
[d] Includes the following assumptions: for transit users going to Little Cottonwood Canyon, 40% of parking stalls are at the south transit hub and 60% of parking stalls are at the north transit hub. Lot size is based on 330 square feet per parking stall (Kimley Horn 2016).
[e] Cost is based on $64.77 per square foot (WGI 2019).

As shown in Table 1 above, a total of between 1,700 and 2,400 parking stalls would be required at the transit hubs, depending on the percentage of transit riders. This number of parking stalls would require between 13 and 18 acres for a surface parking lot. A parking lot of this size would require an internal transit system, which would increase the operating cost of such an alternative and would increase the travel time for skiers, and thus was eliminated from consideration.

Typically, in parking lots, the level of service is based on the following:

- **Level of service A (best):** walking distance of 300 feet or less
- **Level of service B (good):** walking distance of 600 feet or less
- **Level of service C (average):** walking distance of 900 feet or less
- **Level of service D (below average):** walking distance of 1,200 feet or less

One factor to consider with the transit hub(s) is that users could be in ski boots and carrying skis and ski equipment, so a short walking distance of 300 to 400 feet should be maintained. Based on a 400-foot-by-400-foot-area, the amount of land required would be about 3.6 acres, or about 4 acres, or about 528 parking stalls (4 acres = 174,240 square feet, divided by 330 square feet per stall = 528 stalls). Thus, a multistory garage with elevators would be required to meet the parking demand. Although smaller area dimensions, such as a 300-foot-by-300-foot or 2-acre area (about 264 parking stalls) could have been used in the analysis, it would increase the number of stories required to meet the demand, which would create greater visual impacts. To meet the transit demand, the 400-foot-by-400-foot-area garage would need to be about three stories for the north lot. However, the dimensions of the structure can be changed to reduce or increase the number of stories.

To accommodate users of Little Cottonwood Canyon who use 9400 South and S.R. 209 to access the canyon, about 675 to 960 parking stalls (or 222,028 to 316,313 square feet) would be required in a separate location. The reason for a separate transit hub for these users is to reduce the amount of vehicle-miles traveled if users were to bypass Little Cottonwood Canyon to park at another parking location farther north. To meet the demand using the same assumptions as for the north Little Cottonwood Canyon lot, the structure would need to be about two to three stories.

3.0 Transit Hub Evaluation

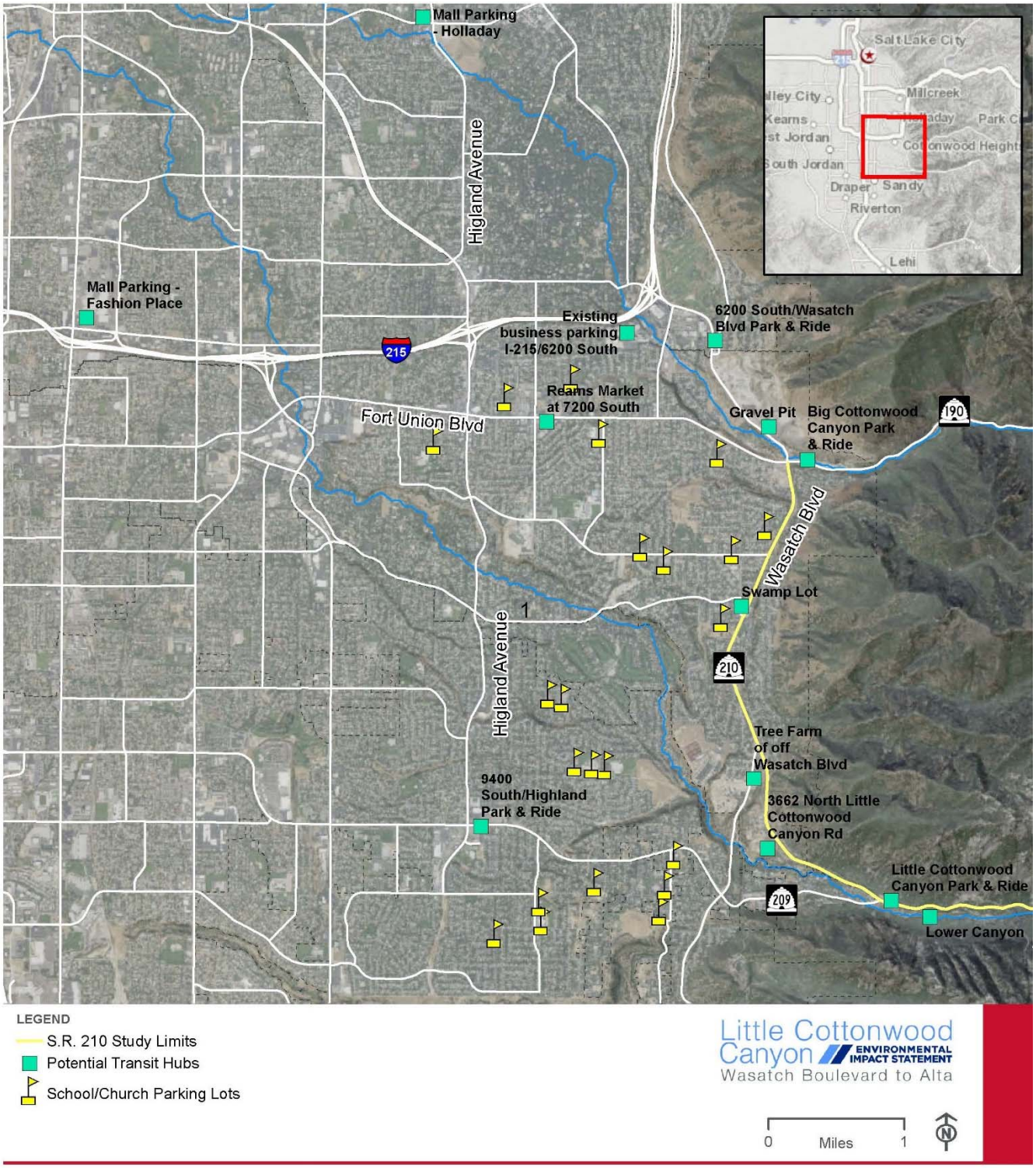
3.1 Transit Hub Alternatives Considered

During the scoping process for the Little Cottonwood Canyon EIS, UDOT received numerous comments regarding potential transit hub locations. Table 2 lists the transit hub alternatives that UDOT brought forward for consideration in this report. Figure 1 shows the locations of the transit hub alternatives listed in Table 2.

Table 2. Transit Hub Alternatives Being Considered

Alternative	Location	Lot Size	Primary Current Use
Little Cottonwood Canyon Park-and-Ride	Intersection of S.R. 210 and S.R. 209	1.3 acres	Winter transit park-and-ride lot for skiers. Summer lot for recreational users and trailhead.
Big Cottonwood Canyon Park-and-Ride	Intersection of S.R. 210 and Fort Union Blvd.	1.6 acres	Winter transit park-and-ride lot for skiers. Summer lot for recreational users and trailhead.
9400 South/Highland Drive Park-and-Ride	Intersection of 9400 South and Highland Drive	4 acres	Utah Transit Authority (UTA) park-and-ride lot. Currently about 275 parking stalls.
6200 South/Wasatch Blvd. Park-and-Ride	Intersection of 6200 South and Wasatch Blvd.	1.6 acres	UTA park-and-ride lot.
Reams Market at 7200 South	Fort Union Blvd. and 2300 East	500 parking stalls	Strip mall parking.
Tree Farm off of Wasatch Blvd.	3802 North Little Cottonwood Road	28.9 acres	Tree farm and vacant land between Wasatch Blvd. and North Little Cottonwood Road. Some of the land is steep and narrow and might not be suitable for construction of a parking garage.
3662 North Little Cottonwood Canyon Rd	3662 North Little Cottonwood Canyon Rd	6.65 acres	Vacant land between two residential developments about 0.8 mile west of S.R. 210/S.R 209 intersection.
Swamp Lot	8101 South 3500 East	2.1 acres	UTA park-and-ride lot.
Lower Canyon	1,000 feet east of S.R. 209/S.R. 210 intersection	6.5 acres	Trail. USDA FS land with trail south of S.R. 210 and north of Little Cottonwood Creek.
School and Church Parking Lots	Various	Not applicable	Various parking lots used by schools during the week and special events and churches on weekends and other times during the week.
Existing Business Parking at I-215/6200 South	6200 South and 3000 East	3,000 parking stalls	Parking used generally during the week in support of various office buildings.
Gravel Pit	6900 South and Wasatch Blvd.	65 acres	Gravel Pit.
Mall Parking – Holladay	Murray Holladay Road and Highland Drive	48 acres	Vacant land that once contained shopping mall.
Mall Parking – Fashion Place	6191 S. State Street in Murray	4,900 parking stalls	Shopping mall.

Figure 1. Locations Considered for the Transit Hub Alternatives



3.2 Screening of Transit Hub Alternatives

UDOT reviewed the alternatives for transit hub locations listed in Table 2 above against the screening criteria (see Section 2.1, Transit Hub Screening Criteria) to determine which could be potential reasonable alternatives. Table 3 summarizes the screening analysis.

For the screening analysis, UDOT assumed that, to reduce cost and improve transit use, both Little Cottonwood Canyon transit users using the 6200 South exit from I-215 and Big Cottonwood Canyon transit users would share the same transit hub. This would allow UTA to operate a more efficient system with shared buses, drivers, and ticketing at one location that serves both canyons. In addition, the transit hub could be used as a regional transit hub for commuters on weekdays. UDOT also assumed that, for Little Cottonwood Canyon, about 40% of the transit users would come from south of 9400 South and would want to reduce their travel time and avoid out-of-direction travel by parking at a lot that is closer to the canyon.

Table 3. Summary of Screening Results of Transit Hub Alternatives

Alternative	Screening Criteria (Green = Pass, Red = Eliminated)				
	Available[a] (Yes/No)	Convenient Access[b] (Yes/No)	Lot Size[c]	Pass Screening (Yes/No)	Notes
Little Cottonwood Canyon Park-and-Ride	Yes	Yes	1.3 acres	No	Lot size is too small to accommodate parking requirements and would result in potential traffic congestion at the S.R. 209/S.R. 210 intersection similar to existing conditions.
Big Cottonwood Canyon Park-and-Ride	Yes	Yes	1.6 acres	No	Lot size is too small to accommodate parking requirements.
9400 South/ Highland Drive Park-and-Ride	Yes	Yes	4 acres	**Yes**	—
6200 South/ Wasatch Blvd. Park-and-Ride	Yes	Yes	1.6 acres	No	Lot size is too small to accommodate parking requirements Little Cottonwood Canyon.
Reams Market at 7200 South	No	Yes	500 parking stalls	No	Currently in use for commercial business. Lot would not be available.
Tree Farm off of Wasatch Blvd.	Yes	No	28.9 acres	No	The lot includes steep train that may make construction difficult. In addition, the lot would but a high level of traffic in residential area and would be located in a residential area not compatible with a parking structure.
3662 North Little Cottonwood Canyon Rd	Yes	No	6.85 acres	No	Location would cause congestion on Wasatch Blvd during peak use times in a residential area similar to current conditions. Land is between two residential subdivisions which would not be compatible with parking structure.
Swamp Lot	Yes	No	2.1 acres	No	Lot size is too small to accommodate parking requirements for Little Cottonwood Canyon.
Lower Canyon	Yes	No	6.5 acres	No	The lot would impact a heavily used Little Cottonwood Canyon hiking trail and would be immediately adjacent to Little Cottonwood Canyon Creek. Lot would result in potential traffic congestion at the S.R. 209/S.R. 210 intersection similar to existing conditions

Table 3. Summary of Screening Results of Transit Hub Alternatives

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	Available[a] (Yes/No)	Convenient Access[b] (Yes/No)	Lot Size[c]	Pass Screening (Yes/No)	Notes
School and Church Parking Lots	No	No	Not applicable	No	Church lots would not be available on Sundays and some weekends during special events. School lots might may not be available during weekdays, weekends during special events, and some holidays.
Existing Business Parking at I-215/ 6200 South	No	Yes	3,000 parking stalls	No	An agreement with the owner would need to be reached to allow use and address liability concerns. Lot would may not be available on weekdays and holidays.
Gravel Pit	Yes	Yes	65 acres	**Yes**	—
Mall Parking – Holladay	Yes	No	48 acres	No	Area does not have convenient freeway access. Would increase transit travel times and out-of-direction travel for users.
Mall Parking – Fashion Place	No	Yes	4,900 parking stalls	No	Currently in use for commercial business and would not be available on weekdays, weekends, and holidays.

[a] The alternative must be available on weekdays, weekends, holidays, heavy snow days, and extended vacation periods (for example, the Christmas, Presidents' Day, and Easter holidays).

[b] The alternative must provide convenient access to traffic from the south end and north ends of the Salt Lake Valley, reduce out-of-direction travel, reduce potential traffic conflicts with residential traffic, and provide convenient bus access to Little Cottonwood Canyon.

[c] For new or existing transit hub locations, the area must be about 4 acres or must accommodate about 680 to 1,440 parking stalls [see Section 2.2, Transit Hub(s) Sizing Requirements]. One or more sites could meet this need.

4.0 Preferred Transit Hub Locations

Based on the alternatives screening summarized in Table 3 above, UDOT determined that the best locations for transit hubs were the Gravel Pit and the UTA park-and-ride lot at 9400 South and Highland Drive. Both locations meet the lot size and availability requirements and would provide convenient access for users and transit to the Cottonwood Canyons.

4.1 Gravel Pit Location and Access

The Gravel Pit, located at 6900 South and Wasatch Boulevard, is an operational gravel and sand material business. The City of Cottonwood Heights is working with the property owner to create a development plan for the southern portion of the site, which could include a transit hub. The site would be accessed from Wasatch Boulevard, with most traffic coming from the 6200 South exit from I-215.

Table 4 shows the traffic analysis for the Gravel Pit site, including the expected number of vehicles entering and exiting the site during the AM and PM peak traffic periods (8 to 9 AM and 4 to 5 PM), the recommended number of access points into the parking structure, and recommendations for access from Wasatch Boulevard. The UDOT access agreement to the site recommends a single access point for the southern Gravel Pit property. With a single access point at 30% transit, a second access from Wasatch Boulevard or a flyover access over northbound Wasatch Boulevard might be required.

Table 4. Traffic Analysis for the Gravel Pit Site

Transit Alternative	Number of Stalls	Number of Vehicles during the Peak Hour		Recommended Parking Structure Access	Wasatch Boulevard Access Recommendation
		AM Peak-hour Vehicles Entering the Site[a]	PM Peak-hour Vehicles Exiting the Site[a]		
20% transit	1,020	459	414	1	Dual lefts
30% transit	1,440	684	584	2	Might need two access points or flyover access

Source: Fehr and Peers 2019

[a] The AM analysis assumes that 45% of users arrive at the site during the AM peak hour, and the PM analysis assumes that 35% of users leave the site during the PM peak hour. Traffic does not include that caused by other traffic generators, such as hotels, residences, retail businesses, or restaurants, in the area.

4.2 9400 South/Highland Drive Location and Access

An existing 4-acre UTA park-and-ride lot at 9400 South and Highland Drive is currently used for ski bus service during the winter. The site is accessed from Highland Drive, 9400 South, and 9510 South and has shared use with a retail business.

Table 5 shows the traffic analysis for this park-and-ride lot, including the expected number of vehicles entering and exiting the site during the AM and PM peak traffic periods (8 to 9 AM and 4 to 5 PM), the recommended number of access points into the parking structure, and access recommendations.

Table 5. Traffic Analysis for the 9400 South/Highland Drive Park-and-Ride Lot

Transit Alternative	Number of Stalls	Number of Vehicles during the Peak Hour		Recommended Parking Structure Access	Access Recommendation
		AM Peak-hour Vehicles Entering the Site[a]	PM Peak-hour Vehicles Exiting the Site[a]		
20% transit	680	306	238	1	Use existing access
30% transit	960	432	336	1	Use existing access

Source: Fehr and Peers 2019

[a] The AM analysis assumes that 45% of users arrive at the site during the AM peak hour, and the PM analysis assumes that 35% of users leave the site during the PM peak hour. Traffic does not include that caused by other traffic generators, such as hotels, residences, retail businesses, or restaurants, in the area.

4.3 Transit Hub Phasing

The analysis in this report assumes full build-out of the transit hubs at 20% and 30% ridership in 2050. Initial construction is likely to occur 20 years prior to 2050 when parking demand and ridership numbers are lower. Other factors could reduce the number of parking stalls needed, factors such as UTA providing regional express bus or light rail service to the transit hubs once they are in operation. Therefore, the transit hubs likely would be constructed in phases, starting as small lots and increasing in size as needed based on demand. This phased construction would also allow UTA or private vendors to look at options to deliver skiers to the transit hub from locations across the Wasatch Front as demand at the transit hubs increases.

5.0 References

Fehr and Peers

2019 Gravel Pit parking model. October.

Kimley Horn

2016 Parking Structure Design Guidelines, Final. Prepared for Capital City Development Corp., Boise, Idaho.

L2 Data Collection

2018 Traffic counts for intersection of S.R. 210 and S.R. 209. March 15.

WGI

2019 Parking Structure Cost Outlook for 2019. https://wginc.com/parking-outlook. Accessed August 8, 2019.