

## Timing Analyses of BCC Bus Hub & LCC Gondola Systems

### BCC Bus Hub Stats

Garage capacity: 1,750 stalls

Average 2 people per vehicle

Hub capacity: ~3,600 people

Bus capacity: 50 people

Bus frequency: Initially 10-15 minute intervals -- projecting 5-7 minute intervals by 2050

First bus: 7:00 AM

Maximum number of buses: 25-30 in 2050

### Time-Related Issues

Two time-related factors will be critical in determining whether the BCC bus hub will be successful in reaching its goal of drastically reducing wintertime canyon traffic by offering a centralized, convenient, and reliable park-and-ride option in the valley.

The first factor is the total time it takes to move a large number of people up and down the canyon. The second is how long it takes an individual to do the same thing -- essentially a queuing issue.

UDOT's description of the hub very prominently features the timing of the buses -- starting with 10-15 minute intervals and then increasing to 5-7 minute intervals by 2050. Unfortunately, UDOT does not include an analysis of the implications of these time frames in its EA.

### AM Total Transit Time -- 3,600 passengers

Vehicles enter the hub sequentially over the course of the day. This chart shows the fastest that skiers can be boarded onto buses -- it assumes everything is working perfectly.

Bus Frequency	Buses / Hour	# of passengers/hour @ 50 riders/bus	# of hours to load 3,600 Passengers	1 <sup>st</sup> Bus 7:00 AM -- 3,600th passenger boards a bus at:
5 minutes	12	600 pass/ hour	6 H	1:00 PM
7 minutes	9	450	8 H	3:00 PM
10 minutes	6	300	12 H	7:00 PM
15 minutes	4	200	18 H	1:00 AM the next day

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### PM Total Transit Time

All skiers are now at the top of the canyon with the buses as their only means of exit. Skiers will be jockeying for a good position in a queue because on high volume days the total evacuation time will stretch well into the cold winter nights.

Bus Frequency	Buses / Hour	Passengers/hour @ 50 riders/bus	Hours to load	3:00 PM start of high volume = last on a bus at:
			<b>1,800 skiers</b>	
5 min	12	600	<b>3 H</b>	<b>6:00 PM</b>
			<b>3,600 skiers</b>	
			<b>6H</b>	<b>9:00 PM</b>

### Queuing Time AM & PM

Queuing will be inevitable in both the morning and afternoon. The length of time you will stand in the queue is independent of the time of day that you enter the queue -- and is totally dependent on how many people are in front of you when you get in line.

Bus Frequency	Passengers per Hour	# of passengers in front of you			
		600 p	1200 p	1800 p	3600 p
5 min	600	1 H waiting in a queue	2 H	3 H	6 H
7 min	450	1.3 H	2.7 H	4 H	8 H

A 2-minute difference in bus frequency can make a significant difference in queue time

### PM Staging Areas

The BCC EA describes two enclosed waiting areas: an 8,600 square foot one at Solitude and a 7,000 sf one at Brighton. Even though the EA document says they were sized for only 200-300 people, they are both fortunately the size of basketball courts and will therefore well serve the queues that will inevitably form at end of day.

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### Gondola System Timing Issues

The LCC Gondola system has the same timing issues as the BCC bus hub. The LCC EIS states that it will only take **12 minutes** from the time a vehicle enters the base station garage for its occupants to be on the Gondola. This is inaccurate, misleading, and technically impossible.

The base station garage will have 2,500 stalls. Using UDOT's average of about 2 passengers per vehicle, the garage capacity is about 5,000 individuals. Each Gondola car holds 35 people and the cars will be 2 minutes apart. The system can evacuate 1,050 passengers per hour.

### AM -- Fastest Time to Board Riders

Vehicles enter the garage sequentially over the course of the morning. This is the fastest that skiers can be boarded onto buses -- it assumes everything is working perfectly.

# of Vehicles entering the Garage	# of Skiers	Board 1,050 / hr	Start 7:00 AM -- Time of last person on board will be
500	1,000	1 hour	8:00
1,000	2,000	2 hours	9:00
2,500	5,000	5 hours	12:00 noon
			+ 30-40 minutes to top

### PM -- Fastest Time to Board all Riders

All skiers are now at the top of the canyon with the Gondola as their only means of exit. All will be jockeying for a good position in the queues that will inevitably form.

# of Skiers at Top of Canyon	Evacuate 1,050/hr	If 3:00 PM is start of high volume = last on board at:
1,000	1 hour	4:00 PM
3,000	3 hours	6:00 PM
5,000	5 hours	8:00 PM
		+ 30-40 min to base

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### Queuing -- Both AM & PM

Queuing will be inevitable in both the morning and afternoon. The length of time you will stand in the queue is independent of the time of day that you enter the queue -- and is totally dependent on how many people are in front of you when you get in line.

# People ahead of you in line	35 Riders / car	Your Gondola Car	Your Wait Time 2 min / car
350	350 / 35	10 <sup>th</sup> in line	20 min
1,050	1,050 / 35	30th	60 min
2,800	2,800 / 35	80th	~ 3 hours
5,000	5,000 / 35	142nd	~5 hours
The AMs could easily see 2-3 hour queues & the PMs 3-4 hour queues			

### Conditions in the Garage

While waiting in the queue, you will be standing on a cement floor, in a 6-7 story garage with escalators, with potentially thousands of other skiers with all their gear and children in tow, for variable lengths of time ranging from a few minutes to a few hours. This will not be a pleasant experience for most people. Your time in the queue combined with the garage environment will definitely set the tone for that day's skiing experience.

### End of Day Conditions

Unlike the situation in the morning when skiers are protected from the elements in the garage, the people in the PM queue will be standing unprotected on the slopes since UDOT does not seem to envision any protected areas that would shelter thousands of people. Everyone will be jockeying to secure a good position in the Gondola queue because their position in line will determine whether they get home at a reasonable hour, or long after dark. Winter sunset in LCC is about 5:00.

### The Reality of the Ride

Snowbird's tram ride is about 7 minutes long -- but the Gondola ride up to Alta will be about 40 minutes long -- about 6 times longer than the tram. Imagine getting on Snowbird's tram and riding it up-down-up-down-up-down without getting off -- and you'll need to do that twice a day.

### Are These Good Solutions

Both the Gondola and the bus hub are meant to handle future increases in the numbers of skiers. Both systems produce long queues and travel times for individual skiers and still mainly leave the red snakes on the roads as they are today.

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