

December 21, 2017



RE: Cottonwood Mall Site Traffic Study Review – Holladay, UT

The following is a review of the October 2017 Cottonwood Mall Redevelopment Traffic Impact Study Update from Hales Engineering. The purpose of the review is to identify if the methodology is appropriate for the standard practice and that there is concurrence with the findings of impact and associated mitigation. The review items include the elements of the traffic study.

- Trip Generation

The study assumes 1334 apartments, 120,000 sf of office, 70,000 sf of commercial, 107 single family homes, and 79 residential condominiums. Applying the ITE rates for these land uses and sizes provides the projected traffic generated for the site.

- O-D

The original destination is assumed to be:

- 35% North
- 20% South
- 25% East
- 20% West

The origin destination is likely based on the traffic counts at Murray Holladay / Highland Drive intersection. Typically, this would be an appropriate method as this is the critical intersection in the area. However, since this is such a high residential oriented development, the nearby residential intersections may provide more insight into the residential directional distributions. The existing counts show at both Meadowmoor and Arbor intersections, a high rate to the south, more than 50%. It may be more appropriate to assume different origin – destinations for the residential and commercial portions of the development.

- Access Assignment

No Comment

- Intersection Analysis

Geometry and signal timing assumptions are requested

- Access Analysis

No Comment



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Traffic Study Review Comments

- The proposed site plan separates the site into two distinct parcel from a traffic aspect.
- No unsignalized access onto the Murray-Holladay is included in the analysis and therefore the assumption is this access will be closed. This is confirmed on page 11 under E. Access that states the only access on Murray Holladay Road will be located at the signalized intersection.



Conflict from the west and east center turn lane at Mall Access on Murray Holladay Road

- If it were requested to remain open, it should only be considered as a right-in / right-out due to current operational issues for westbound queueing at Murray Holladay and eastbound left turn movements into the commercial area.
- A development this size should include an AM peak analysis. The trip generations shows that the larger egress from the site is in the AM peak and egress from the site is the likely critical issue.
- Memory Lane connection, other than as an emergency, should be analyzed if considered and a discussion as to why the residential homes could not be connected to the signal on Murray Holladay will need to be made.
- The connection at Arbor is too close to Highland and will likely lead to similar issues as on the west side of Highland at Meadowmoor.
- Is Meadowmoor going to continue to operate as a split phase. Meadowmoor signal needs to be completely rebuilt.

Recommended Actions

- IF requested, restrict Murray-Holladay unsignalized access to a right-in / right-out
- Construct the westbound right turn lane at Murray Holladay Road and Highland Drive. Ideally, the 4830 South traffic signal would have been located to a mid-block location to serve the property to the west as well as the Holladay Mall site.
- Reconstruct Meadowmoor / Highland Signal
- I would not recommend the relocation of Meadowmoor traffic signal to Arbor/Moormont under the current site plan and current signal location at 4830 South.
- The City has recommended that the original area of analysis be considered in this traffic study. The following is the existing conditions for the intersections analyzed.

**Table 6
Existing Conditions - Intersections
Cottonwood Mall**

Intersection	Stop Control	Intersection Conditions	EXISTING (YEAR 2007)				
			APPROACH				
			OVERALL	EB	WB	NB	SB
S 13th E @ Spring Lane	Two-Way Stop Control	LOS	D		D		B
		Delay (sec/veh)	25.1		25.1		10.2
		95% Queue (feet)			40		6
E 45th S @ Highland Drive	Signal	LOS	D	E	D	C	E
		Delay (sec/veh)	50	70.2	36.1	30.8	55.5
		95% Queue (feet)		1090	690	425	785
Highland Drive @ Mall North Access	Two-Way Stop Control	LOS	C		C		A
		Delay (sec/veh)	16.2		16.2		9.3
		95% Queue (feet)			14		5
Highland Drive @ Meadow Moor Road	Signal	LOS	C	C	C	C	C
		Delay (sec/veh)	26.3	32.3	32.8	22.8	27.8
		95% Queue (feet)		60	90	400	605
Highland Drive @ Moormont Drive	Two-Way Stop Control	LOS	D	D	D	B	A
		Delay (sec/veh)	32.5	32.5	26	10.6	9.6
		95% Queue (feet)		5	25	0	1
Moormont/Arbor @ Mall Access	Two-Way Stop Control	LOS	A	A			A
		Delay (sec/veh)	8.6	7.4			8.6
		95% Queue (feet)		3			1
Highland Drive @ Spring Lane	Signal	LOS	B	B		B	B
		Delay (sec/veh)	11	13.8		10.5	11.2
		95% Queue (feet)		35		260	345
Murray-Holladay Road @ Highland Drive	Signal	LOS	C	C	C	C	C
		Delay (sec/veh)	27	21.1	22	25.7	34.2
		95% Queue (feet)		245	300	300	610
Murray-Holladay Road @ Mall West Access	Two-Way Stop Control	LOS	B		A	B	
		Delay (sec/veh)	13.3		9.7	13.3	
		95% Queue (feet)			2	2	
Murray-Holladay Road @ Mall East Access	Signal	LOS	B	B	B	C	C
		Delay (sec/veh)	16.3	15.8	15.5	21.8	22.5
		95% Queue (feet)		310	275	45	75
Murray-Holladay Road @ Holladay Blvd.	Signal	LOS	C	C	C	C	D
		Delay (sec/veh)	31.5	24.9	21.7	25.7	41
		95% Queue (feet)		300	100	420	775

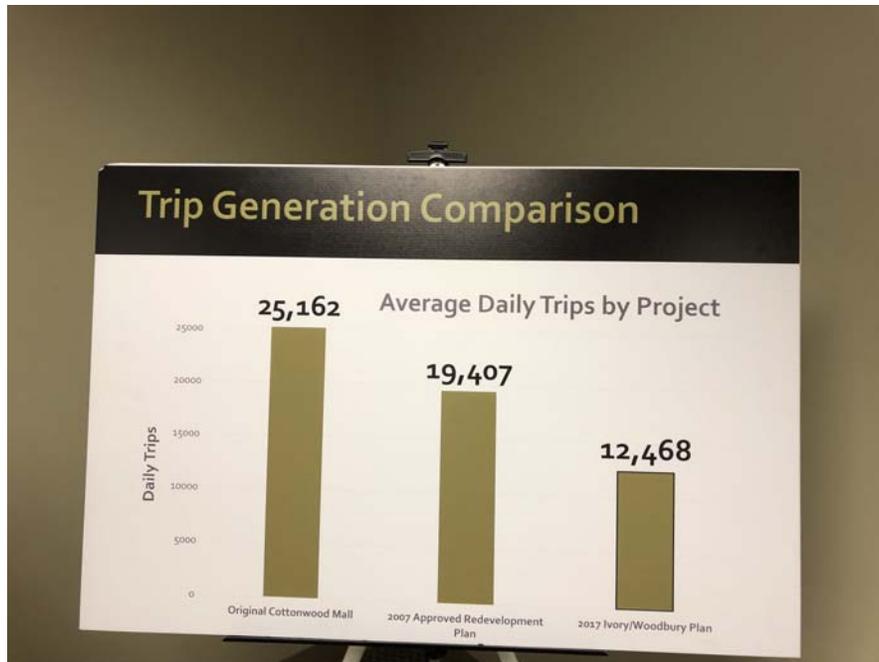
Source: Glattig Jackson Kercher Anglin Lopez Rinehart, Inc.

Additional Information Requested to Hales Engineering

- Include an AM peak analysis
- Need the geometry and signal timing utilized by time period (provide Synchro files is fine)
- Need to see the signal timing update information, how and what changed, it's referred to but not identified what timing changes allowed the intersection to go from a LOS F to LOS D and it's not in the Appendix.
- Confirm NO planned connection to Murray Holladay at unsignalized intersections (existing ¾ access to Mall or to Memory Lane)
- Include Viewmont Street / Murray Holladay Road in the analysis, this is within ¼ mile of the site and is where Murray-Holladay Road reduces from a 5-lane to a 3-lane so is potentially a point of concern.
- How far should the westbound right turn lane be constructed at Murray Holladay Blvd / Highland Drive. There is currently 183 WBR and the site is adding 47 WBR movements in the PM peak period. This is a 26% increase/ The queue analysis indicates a 275 foot queue analysis but Appendix D only shows the shard through-right turn queue analysis and this indicates a 500+ foot queue.
- Comment on the location of 4830 South and the back to back queue for the northbound left at Murray Holladay Road and the southbound left at 4830 South, is there sufficient transition area between the two signals. There is only 500 feet between the traffic signals and the 2024 queue analysis indicates that there is 400 feet of back to back queueing.
- The queue analysis reported appears to be the 2024 based on the Appendix D, was there a 2040 queue analysis since the operational analysis included a 2040 LOS analysis.
- It is assumed that Parcel C and D land uses are factored into the traffic numbers
- The site plan submittal and the traffic study needs to be consistent from a land use and sizing aspect..

One request by the City was to review the open house claims of this site providing far less traffic than the original mall. Based on the information provided by the City, the following land uses are used in the comparison with the resulting daily trips. This does not factor any internal capture or pass-by reductions.

Original Mall – 700,000 sf of Commercial 29,890 Daily Trips
2007 Proposed Project – 725,000 sf of Commercial and 614 Condos/Townhomes - 36,541 Daily Trips
2017 Proposed Development (Traffic Study Assumed Land Uses) - 14,661 Daily Trips



The traffic study has followed the general standard of practice. The above comments are provided as comments for consideration and requested additional information. The submitted plans and land uses is different from the traffic study in terms of units and potential commercial space. The latest submittal to the City includes up to 1073 units and up to 600,000 sf of commercial space. If this were developed, the traffic generated by the site would be close to 33,000 daily trips, close to the original mall, but far less than the approximate 12,500 daily trips assumed in the traffic study. The traffic study should be updated to assume the maximum proposed intensity of the development plan submitted as the worst case situation for the traffic analysis.

Please contact me with any questions.

Sincerely,
A-Trans Engineering

Joseph Perrin, PhD, PE, PTOE
 Principal