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Responses by Chris McGranahan
LSC Transportation Consultants, Inc.
July 30, 2021

December 9, 2020

Mr. Chris Phipps
Mountain Classic Real Estate
461 E 200 S., Suite 102
Salt Lake City, UT 84111

Re: Knights Inn Conversion - Parking Inventory and Utilization Study
Aurora, CO
LSC #200770

Dear Mr. Phipps:

In response to your request, LSC Transportation Consultants, Inc. has prepared this parking inventory and utilization study for the Knights Inn Conversion in Aurora, Colorado, as shown in Figure 1.

INTRODUCTION

The site currently includes a 153-room hotel and is proposed to be converted to 150 studio apartment dwelling units. The target market for the hotel is expected to be similar to that for the proposed studio apartments. The site includes a total of 154 parking spaces. Figure 2 shows the conceptual site plan.

check consistency with Site Plan

Comment noted

EXISTING PARKING CONDITIONS

A parking inventory and utilization survey was conducted at the hotel parking lot on Tuesday, November 17, 2020; Friday, November 20, 2020; and on Saturday, November 21, 2020 on a half-hourly basis from 6:00 AM to 9:00 AM and from 7:00 PM to 11:00 PM. There is a total of 154 parking spaces available on the site.

Table 1 shows the maximum observed parking demand was 44 vehicles during any given half-hour with an average observed demand of 30 to 38 vehicles. There were always at least 110 available parking spaces on the site and an average of between 116 and 124 available parking spaces on the site during the three-day study period.

PARKING UTILIZATION ADJUSTED FOR FULL OCCUPANCY

Table 2 shows the observed parking utilization adjusted for full occupancy of the hotel. As shown in Table 2, the parking utilization for full occupancy of the hotel is expected to range from 95 to 118 parking spaces.

Is reduction allowed?

The updated analysis makes this reduction irrelevant.

PARKING REDUCTION REQUEST

Table 3 shows the Code required parking spaces and the maximum utilization of the existing parking spaces.

Per Section 4.6.4(A) of the *City Unified Development Ordinance*, Subsection 4.6.4(A)(1) states a 15 percent parking reduction is allowed if the development is located within one-quarter mile of an RTD transit stop with headways between 16 and 30 minutes. Subsection 4.6.4(A)(3) states this reduction is not available for multifamily dwelling units; however, these will be all studio units so will likely have a lower parking demand than a typical multifamily development with a mix of studios, one-bedroom, two-bedroom, or even three-bedroom units. In addition, the target market is expected to remain similar to the previous hotel use which has been documented to be under-utilizing the existing parking lot.

SUMMARY

The required parking with a 15 percent parking reduction is 153 parking spaces. The site has 154 parking spaces available. No further analysis should be needed.

* * * * *

We trust this information will assist you in planning for the pr

Respectfully submitted,

LSC Transportation Consultants, Inc.

By: _____
Christopher S. McGranahan, P.E., PTOE
Principal

CSM/wc

Enclosures: Tables 1 - 3
Figures 1 and 2
RTD Route 6 Map and Headways

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The parking study has been replaced with a parking generation letter based on the number of bedrooms for multifamily housing (low-rise).

GENERAL NOTE: The utilization comparison of a Hotel vs. a Studio Apt facility is like comparing apples & oranges. Taxi and ride hailing services can dramatically alter the usage of hotel parking lot(s) utilization.
As such, a detailed parking supply & demand analysis with identified variances of all potential users for the new Studio Apt facility should be performed rather then a study of current conditions that will no longer be in place after the conversion. I recommend the following study be performed:
1.)Provide a detailed parking supply and demand analysis summary with identified variances of all potential users (i.e., employees, visitors, residents, etc.) by the following categories:
- Daytime Use - 8 am - 5 pm, Mon - Fri
- Evening Use - After 5 pm, daily
- Weekend Use - 8 am - 5 pm

○Provide an explanation and proposed solution/plan on all unfavorable variances (i.e., when demand exceeds supply)

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Update report for the following, comments 7.8.21:
1. Provide site plan Figure 2
Included in updated study.
2. Report HCM results for all signalized intersections and include worksheet. Update report and tables accordingly
Included in updated study.
3. Please separate the Parking Study to a separate document.
Separate documents will be provided.
4. Remove DRAFT and stamp next submission. Noted.
5. See comments throughout report
Noted.

December 4, 2020

Mr. Chris Phipps
Mountain Classic Real Estate
461 E 200 S., Suite 102
Salt Lake City, UT 84111

Knights Inn Conversion
Aurora, CO
LSC #200770

Dear Mr. Phipps:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the proposed Knights Inn Conversion. As shown on Figure 1, the site is located west of Billings Street and south of E. 6th Avenue in Aurora, Colorado.

REPORT CONTENTS

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site including the lane geometries, traffic controls, posted speed limits, etc.; the existing weekday peak-hour traffic volumes; the existing daily traffic volumes in the area; the typical weekday site-generated traffic volume projections for the site; the assignment of the projected traffic volumes to the area roadways; the projected long-term background and resulting total traffic volumes on the area roadways; and the site's projected traffic impacts.

LAND USE AND ACCESS

The site currently includes a 153-room hotel and is proposed to be converted to 150 apartment dwelling units. Access exists to Billings Street from two locations as shown in the conceptual site plan in Figure 2. The northern access is right-in/right-out and the southern access is full movement.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

The major roadways in the site's vicinity are shown on Figure 1 and are described below.

- **E. 6th Avenue (SH 30)** is an east-west, six-lane major arterial roadway north of the site. It is classified as R-A (Regional Highway) by CDOT. The CDOT Straight Line Diagram (SLD) is attached for reference. The intersection with Billings Street is signalized with auxiliary turn lanes. The posted speed limit in the vicinity of the site is 40 mph.

- **Billings Street** is a north-south, two-lane local roadway east of the site. The intersection with E. 6th Avenue is signalized with auxiliary turn lanes. No speed limit is posted.

Existing Traffic Conditions

Figure 3a shows the 2018 existing traffic volumes and posted speed limits in the site's vicinity on a typical weekday based on traffic counts provided by the City. Figure 3b shows the estimated existing 2020 traffic volumes, lane geometry, and traffic control. The volumes in Figure 3b were estimated by LSC based on the 2018 volumes in Figure 3a, the CDOT 20-year growth factor of 1.13, and the trip generation potential for the existing hotel.

2022 and 2040 Background Traffic

Figure 4 shows the estimated 2022 background traffic and Figure 5 shows the estimated 2040 background traffic. The 2022 and 2040 background traffic volumes are based on an annual growth rate of just over 0.6 percent based on the CDOT 20-year growth factor of 1.13.

Existing, 2022, and 2040 Background Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay and LOS F is indicative of a high level of congestion or delay. Attached are specific level of service definitions for signalized and unsignalized intersections.

The intersections in the study area were analyzed to determine the existing, 2022 and 2040 background levels of service using Synchro. Table 1 shows the level of service analysis results. The level of service reports are attached.

- **E. 6th Avenue (SH 30)/Billings Street:** This signalized intersection currently operates at an overall LOS "B" during both morning and afternoon peak-hours and is expected to do so through 2040.

- **Billings Street/Knights Inn Access/Retail Access:** All movements at this unsignalized intersection currently operate at LOS "B" or better during both morning and afternoon peak-hours and are expected to do so through 2040.

- **Billings Street/RIRO Access:** All movements at this unsignalized intersection currently operate at LOS "A" during both morning and afternoon peak-hours and are expected to do so through 2040.

- **Billing Street/Denny's Access:** All movements at this unsignalized intersection currently operate at LOS "B" or better during both morning and afternoon peak-hours and are expected to do so through 2040.

TRIP GENERATION

Table 2 shows the estimated average weekday, morning peak-hour, and afternoon peak-hour trip generation for the existing and proposed land uses on the site based on the rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE).

- **Billing Street/Denny's Access:** All movements at this unsignalized intersection are expected to operate at LOS "B" or better during both morning and afternoon peak-hours through 2040.

Additional detail has been provided.

PEDESTRIAN CONNECTIVITY AND LEVEL OF SERVICE

Residents will be able to cross both E. 6th Avenue (SH 30) and Billings Street at the existing pedestrian crossings located at the signalized E. 6th Avenue (SH 30)/Billings Street intersection. There are existing sidewalks connecting the site south to the 2nd Avenue/Abilene RTD passenger rail station.

Add additional discussion i.e. update ped ramps at access locations on Billings St, ped LOS, ped improvements/ enhancements, ped circulation, etc

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. The site is projected to generate about 1,098 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, about 17 vehicles would enter and about 53 vehicles would exit the site. During the afternoon peak-hour, about 53 vehicles would enter and about 31 vehicles would exit. These estimates are expected to be reduced by about 15 percent because bus transit with more than 15-minute headings is walkable from the site. In addition, the 2nd Avenue/ Abilene RTD passenger rail station is about a half-mile walk to the south.

   It is important to note the proposed land use has a similar trip generation potential as the previous hotel land use.

Projected Levels of Service

2. The signalized E. 6th Avenue (SH 30)/Billings Street intersection is expected to operate at an overall LOS "C" or better during both morning and afternoon peak-hours through 2040.

3. All movements at the unsignalized intersections analyzed are expected to operate at LOS "C" or better during both morning and afternoon peak-hours through 2040.

Conclusions

4. The impact of the Knights Inn Conversion can be accommodated by the existing roadway network with implementation of the recommendations below.

Recommendations

5. The northern site access should be right-in/right-out-only enforced by a raised pork-chop style median.

add ped improvement/ enhancements, show raised pork-chop style median on Site Plan

This detail has been added.

Table 1
Intersection Levels of Service Analysis
Knights Inn Conversion
Aurora, CO
LSC #200770; December, 2020

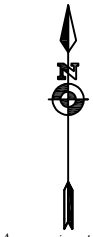
Intersection Location	Traffic Control	Existing Traffic Level of Service AM	Existing Traffic Level of Service PM	2022 Background Level of Service AM	2022 Background Level of Service PM	2022 Total Level of Service AM	2022 Total Level of Service PM	2040 Background Level of Service AM	2040 Background Level of Service PM	2040 Total Level of Service AM	2040 Total Level of Service PM
E. 6th Avenue (SH 30)/Billings Street	Signalized										
EB Left		B	B	B	B	B	B	C	B	C	B
EB Through or Through/Right		B	B	B	B	B	B	B	B	B	B
WB Left		A	A	A	A	A	A	A	A	B	A
WB Through or Through/Right		B	B	B	B	B	B	B	B	C	B
NB Left/Through		E	E	E	E	E	E	E	E	E	E
NB Right		A	A	A	B	A	A	A	A	A	B
SB Left/Through		D	D	D	D	D	D	D	D	D	D
SB Right		A	B	A	B	A	B	A	B	A	B
Entire Intersection Delay (sec /veh)		15.6	16.7	15.1	16.2	17.4	17.4	18.3	18.8	20.9	19.8
Entire Intersection LOS		B	B	B	B	B	B	B	B	C	B
Billings Street/Knights Inn Access/Retail Access	TWSC										
NB Approach		A	A	--	--	A	A	--	--	A	A
EB Approach		B	B	--	--	B	B	--	--	B	C
WB Approach		A	B	A	B	A	B	A	B	B	B
SB Approach		A	A	A	A	A	A	A	A	A	A
Critical Movement Delay		10.9	13.0	9.6	10.5	11.3	13.5	9.9	11.1	12.2	15.0
Billings Street/RIRO Access	TWSC										
EB Right		A	A	--	--	A	A	--	--	A	A
Critical Movement Delay		8.8	8.9	--	--	8.7	8.9	--	--	8.8	9.0
Billings Street/Denny's Access	TWSC										
WB Approach		A	B	A	B	B	B	B	B	B	B
SB Left/Through		A	A	A	A	A	A	A	A	A	A
Critical Movement Delay		9.8	10.1	9.7	10.0	10.1	10.3	10.2	10.6	10.5	10.9

report HCM results for all signalized intersections

Updated

provide site plan

Included

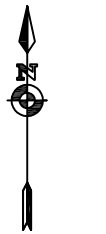


Approximate Scale
Scale: NTS

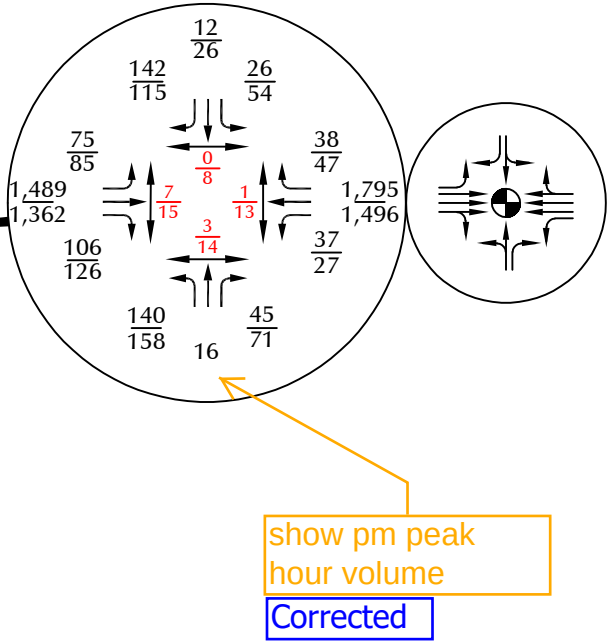
Figure 2

Site Plan

Knights Inn Conversion (LSC #200770)



Approximate Scale
Scale: 1"=200'



show pm peak hour volume

Corrected

Existing Turn Lane Lengths
EB LT = 275 feet + 120-foot transition taper
WB LT = 175 feet + 120-foot transition taper

LEGEND:

- = Stop Sign
- = Traffic Signal
- SPEED LIMIT 40 = Speed Limit
- 26/35 = AM Peak Hour Pedestrian Traffic / PM Peak Hour Pedestrian Traffic
- 26/35 = AM Peak Hour Traffic / PM Peak Hour Traffic
- 1,000 = Average Daily Traffic

show ADT volumes

Updated

Figure 3a

2018 Existing Traffic, Lane Geometry and Traffic Control

Knights Inn Conversion (LSC #200770)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	75	1505	37	1815	142	16	46	26	12	142
Future Volume (vph)	75	1505	37	1815	142	16	46	26	12	142
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6		4			8	
Permitted Phases	2		6		4		4	8		8
Detector Phase	5	2	1	6	4	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	20.0	76.0	13.0	69.0	51.0	51.0	51.0	51.0	51.0	51.0
Total Split (%)	14.3%	54.3%	9.3%	49.3%	36.4%	36.4%	36.4%	36.4%	36.4%	36.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	3.0	5.0	3.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	106.3	97.1	103.3	94.0		24.4	24.4		24.4	24.4
Actuated g/C Ratio	0.76	0.69	0.74	0.67		0.17	0.17		0.17	0.17
v/c Ratio	0.43	0.50	0.18	0.59		0.73	0.14		0.19	0.38
Control Delay	14.4	11.8	7.0	14.5		72.1	2.5		48.4	9.2
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	14.4	11.8	7.0	14.5		72.1	2.5		48.4	9.2
LOS	B	B	A	B		E	A		D	A
Approach Delay		11.9		14.3		56.4			17.5	
Approach LOS		B		B		E			B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Billings Street & E. 6th Avenue