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June 15, 2018

Mr. Eric Nordeen, Principal  
Ascendant Holdings, LLC  
2001 West Beltline Highway  
Suite 200  
Madison, WI 53713

Re: 122 State Street Site Traffic Analysis

Dear Mr. Nordeen:

This brief report summarizes the data collection, review, calculations, and traffic modeling results for the proposed restaurant and hotel development located at 122 State Street in Madison, Wisconsin (Site). Please let us know if you have any comments or questions. If not, this represents the full and completed traffic analysis for the Site. Thank you for asking Strand Associates, Inc.® to complete this study. We look forward to continuing to assist with this exciting project.

Sincerely,

STRAND ASSOCIATES, INC.®

A handwritten signature in blue ink, appearing to read 'Jeffrey S. Held', is written over the printed name.

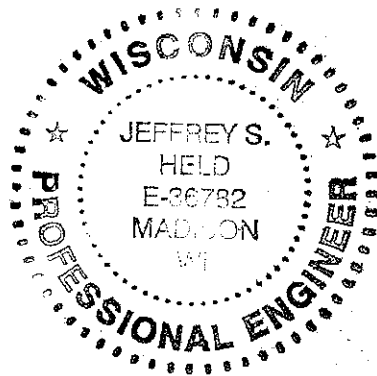
Jeffrey S. Held, P.E., PTOE

Enclosure: Report

Report for  
122 State Street Group, LLC,  
Madison, WI

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122 State Street Site Traffic Analysis



*J. Held*  
2018-06-14

Prepared by:

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June 2018



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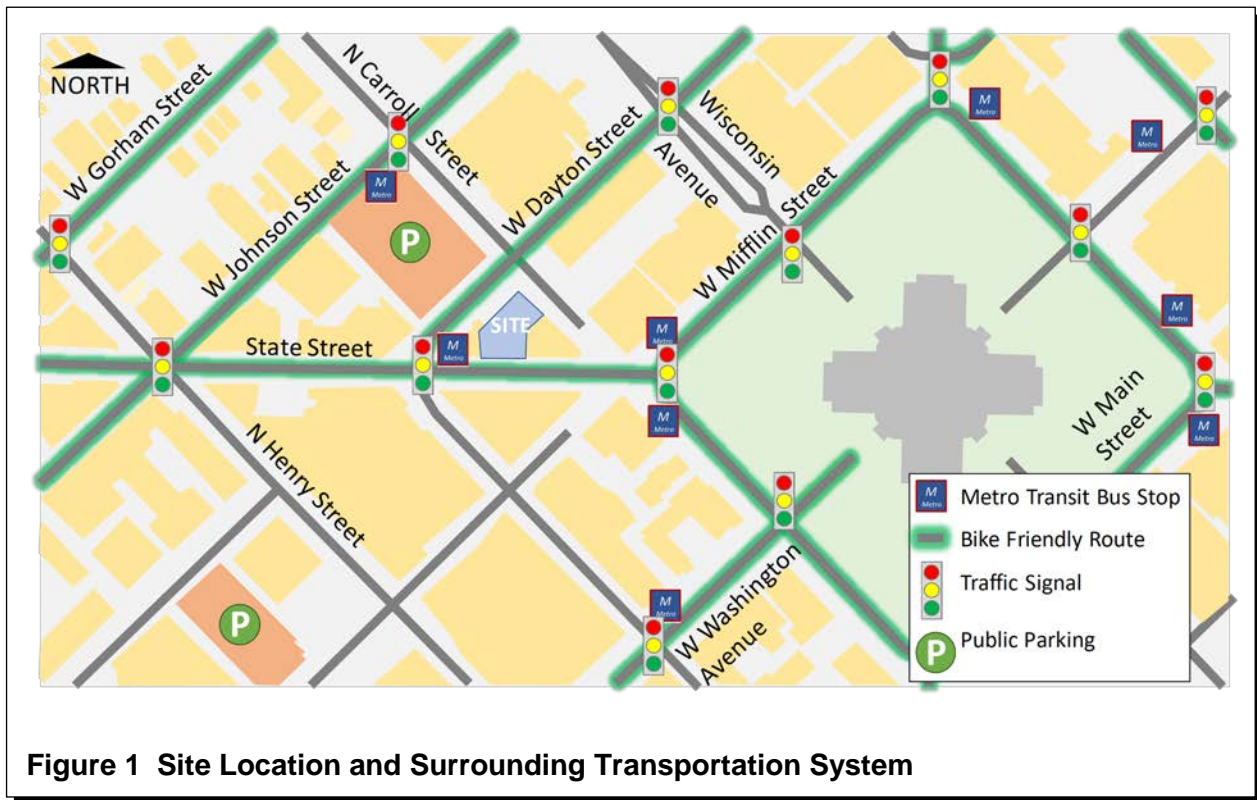
### **APPENDIX**

#### APPENDIX–TRAFFIC DATA AND MODELING RESULTS

Strand Associates, Inc.® (Strand) was hired by 122 State Street Group, LLC (122 State) to complete the 122 State Street Site Traffic Analysis (Study) for the proposed redevelopment of properties generally located at 122 State Street in Madison, Wisconsin (Site). This report summarizes the project approach, results, and recommendations.

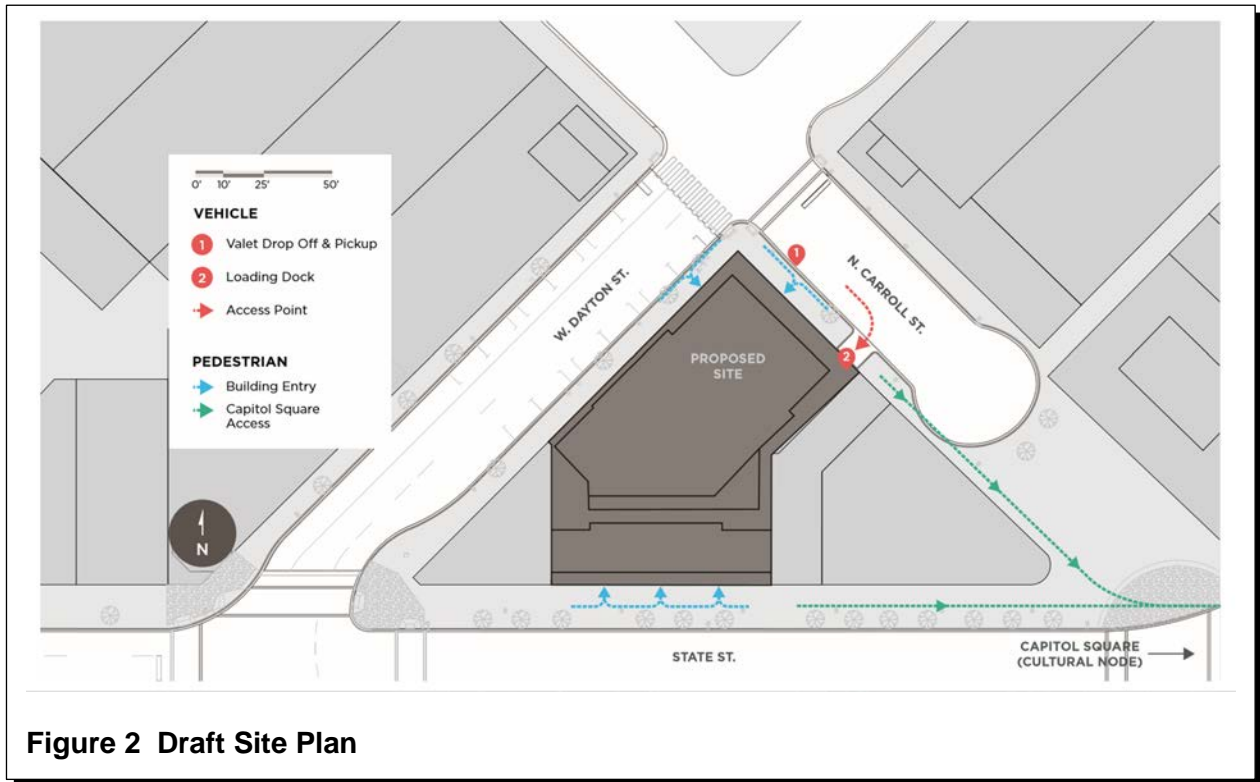
**SUMMARY OF PROPOSED REDEVELOPMENT**

The proposed Site redevelops three parcels located at or near 122 State Street. The Site is in the 100 block of State Street, located between the Capitol Loop and Capitol Square. It is bounded by the triangle formed by State Street to the south, North Carroll Street to the north/east, and West Dayton Street to the north/west. Figure 1 shows the site location.



**Figure 1 Site Location and Surrounding Transportation System**

The Site includes a 136-room boutique hotel, with a first floor restaurant and a rooftop restaurant totaling about 12,400 square feet (SF), of which approximately 4,800 SF is terrace area. It is replacing 12,500 SF of restaurant space and 34,200 SF of office space. The Site is located in the urban core of downtown City of Madison (City) and is, therefore, served by the most robust transportation options in the City. Walking, bicycling, and using transit, cab, or rideshare services will be highly convenient for Site employees and guests. Those that do arrive and depart by passenger car are proposed to be accommodated by 24-hour valet service with all parking/vehicle storage occurring off-site. Figure 2 is the draft site plan.



**Figure 2 Draft Site Plan**

## TRAFFIC STUDY PROCESS AND RESULTS

The development team completed an initial data review that included time lapse photography of the Carroll Street cul-de-sac, trip generation for the existing and proposed land uses, and field observation of a nearby, similar hotel. We completed draft traffic modeling and met with City staff to review the initial findings. Based on this meeting and follow-up with staff, the agreed upon approach and results are summarized in the following subsections.

### A. Summary of Existing Conditions

The proposed Site redevelopment will replace existing office, restaurant, and residential apartment uses with a hotel and two restaurants. The site is unique in that it will have access to all three public streets that surround the site. State Street provides access for pedestrians, bicyclists, and transit/cab users. Dayton Street has on-street metered parking adjacent to the site and a public parking garage opposite the Site. Carroll Street currently has eight 90-degree metered parking stalls.

Dayton Street is part of the Capitol Loop and operates one-way south/westbound. The intersection of Dayton Street and Carroll Street is unsignalized, with stop sign control on the Carroll Street approaches. Traffic signals exist on Dayton Street one block upstream (Wisconsin Avenue) and one block downstream (State Street).

Pedestrian accommodations are abundant and continuous in the project area. Bicycles are accommodated at a high level on several routes nearby including State Street, Dayton Street near the Site, the West Johnson Street/Gorham Street one-way pair, and the Capitol Square. There is a Metro

Transit bus stop at the corner of Dayton Street and State Street that serves routes 2, 3, 4, 6, 11, 12, 14, 15, 29, 37, 47, 56, 57, 58, 70, 71, and 72 providing connections to all parts of the City.

The site is located within about a 10-minute walk of a number of parking garages and lots, some public and some private. These are summarized in Table 1.

<b>Garage/Ramp</b>	<b>Number of Spaces</b>
State Street Capitol Garage	738
Overture Center Garage	621
Buckeye Lot	55
Dayton Street/Pinckney Street Ramp	471
Madison Opera Parking Lot	92
Capitol Square South	1,000
Capitol Square North Garage	612
American Exchange Lot	42
Brayton Lot	222
Tenney Plaza Garage	140
Block 89 Garage	743
Lot 88 Garage	15
Government East Garage (expanding in 2019)	516
Monona Terrace	600
State Street Campus Garage	1,602
122 West Doty Street Parking Garage	528
<i>Total</i>	<i>7,997</i>

**Table 1 Parking Structures Within Walking Distance of the Site**

## B. Data and Observations

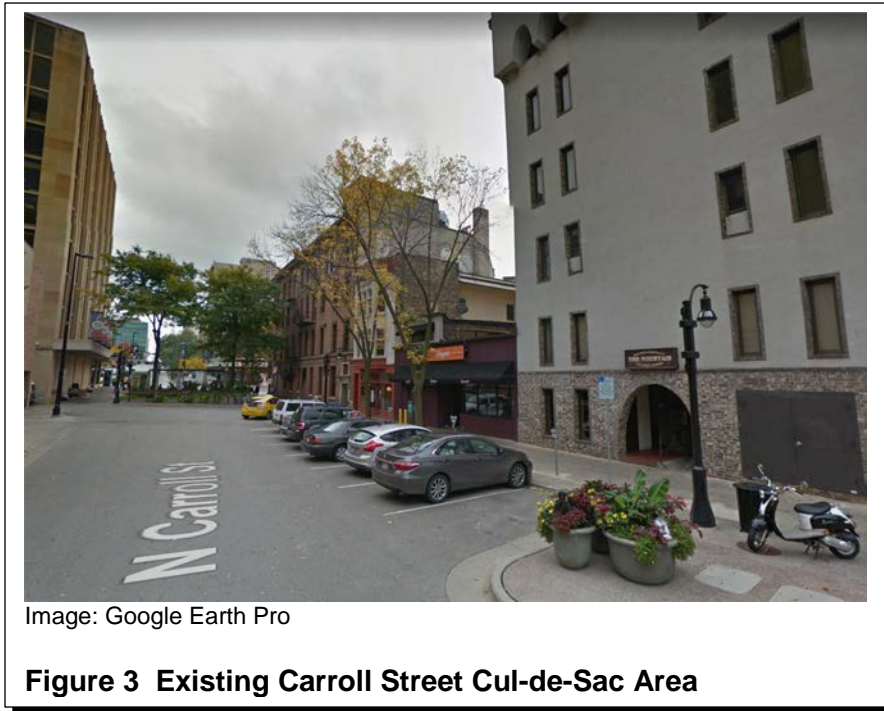
### 1. Time Lapse Photography (Existing Conditions)

The Site owners set up a time lapse camera in the window of one of the buildings that will be replaced. The camera captured activity in the Carroll Street cul-de-sac which is being proposed for use as the valet staging area for the Site. Following are some of the findings based on the data from eight weekdays in November 2017.

#### a. Trucks

- (1) The Carroll Street cul-de-sac serves as the loading zone and delivery area for the Concourse Hotel and Ian's Pizza, among other businesses.
- (2) The peak hour for trucks was observed to be from Noon to 1 P.M.

- (3) On an average day three trucks entered and three trucks exited during the peak hour.



b. Cars

- (1) The eight 90-degree metered parking stalls on Carroll Street are used sporadically during the morning and afternoon hours. They tend to be mostly occupied during the early evening hours.
- (2) The peak hour for cars was observed to be 6 to 7 P.M.
- (3) On an average day, 20 cars entered and 21 cars exited during the peak hour.

c. Daily Traffic (5 A.M. to 8 P.M.)

- (1) Trucks: an average of 23 entered and 23 exited.
- (2) Cars: an average of 175 entered and 170 exited.<sup>1</sup>
- (3) Total: an average of 391 vehicles used Carroll Street.
- (4) Average Daily Traffic: Approximately 430 to 490 vehicles per day.<sup>2</sup>

<sup>1</sup>More cars enter than exit between 5 A.M. and 8 P.M. because the cul-de-sac area and metered parking stalls tend to be nearly empty at 5 A.M. and nearly or fully occupied at 8 P.M.

<sup>2</sup>Assuming 80 to 90 percent of the daily traffic occurs from 5 A.M. to 8 P.M.

2. Trip Generation/Travel Demand and Parking Demand

We completed trip generation for the existing land uses that will be replaced by the Site. The rates are from the Institute of Transportation Engineers, *Trip Generation Handbook, 9th Edition*. Table 2 shows the results. The detailed calculations can be found in the Appendix.

	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed	2,791	127	100	227	121	98	219
Existing	2,582	166	86	252	106	133	239
Difference	209	(-39)	14	(-25)	15	(-35)	(-20)

Note: Proposed: 12,400 SF restaurant, 136 hotel rooms (occupied)  
 Existing: 15,100 SF restaurant, 34,200 SF office, 4 apartments

**Table 2 Institute of Transportation Engineers (ITE) Trip Generation for the Proposed Site Versus the Existing Land Uses**

This exercise serves as a means to generally understand how the activity level of the Site and its proposed hotel and restaurants would compare to the existing land uses if they were fully occupied. It shows that the proposed site has modestly higher trips in and out throughout the day, and modestly lower traffic during the typical peak hours of the adjacent streets.

These trip generation results are not an accurate indication of the number of cars and trucks that would seek to access the location under either land use scenario because the data behind the ITE rates is primarily from suburban locations with little or no transit service and often without inviting pedestrian and bicycle networks. The actual cars and trucks in and out of Carroll Street due to the Site land uses will be much fewer because of the outstanding pedestrian, bicycle, and transit/cab/ride sharing networks available in downtown City that contribute to a substantial mode split.<sup>3</sup>

The recently opened AC Hotels Marriott at the corner of East Washington Avenue and Webster Street shares many similarities with the Site. It is a hotel with on-site restaurants and 100 percent valet service for arriving guests and customers. The AC Marriott has 165 rooms, and there are two on-site restaurants plus a lounge area, so the activity is likely a bit higher than the Site (with 136 rooms and two restaurants). Staff from the AC Hotels Marriott indicate that they typically park 75 to 100 vehicles overnight. Based on this figure as well as discussion with the anticipated Site hotel operator, the Site is expected to park 50 to 75 vehicles overnight. This parking demand versus the demand based on the existing land uses is shown below in Table 3 using the City zoning code requirements.

<sup>3</sup>The traffic modeling for the Site valet service is based on field counts from the nearby AC Hotels Marriot. The field data confirms that there is substantially less motor vehicle traffic in and out of the site than the unadjusted ITE trip generation rates would predict.



Existing Site	Units	Zoning Code <sup>4</sup>
122 Office	34,000 SF	85 to 136
124/126 Restaurant	2,600 SF	14 to 37
126 Apartments	4 Dwelling Units	0 to 4
122 Restaurant	275 persons	41 to 110
118 Restaurant	168 persons	25 to 67
Existing Total		165 to 354
<b>Proposed Site</b>		
Hotel	136 Rooms (valet)	50 to 75
Restaurant	379 persons	65 to 176
Proposed Total		115 to 251
<i>Difference</i>		<i>50 to 103 fewer stalls</i>

**Table 3 Parking Demand for the Existing Land Uses Versus the Proposed Site**

Similar to the ITE trip generation rates, these parking demand rates reflect a suburban condition with nearly all trips being completed by car rather than an alternate mode. The actual parking demand due to the Site land uses will be much lower because of the infrastructure and transportation options available in downtown Madison that contribute to a substantial mode split. The table suggests the level of parking demand may be about 30 percent lower than what it would be with the existing uses fully occupied.

3. Valet service at AC Hotels Marriot

We observed a Tuesday, Wednesday, and Friday in February during the evening peak period of downtown Madison Streets (4 to 6 P.M.). The data summary can be found in the Appendix.

- Total car and shuttle bus volume in and out was very consistent on all three days.
- The maximum hourly volume observed was 26 in and 30 out.
- We also recorded the average dwell time (time vehicles were standing):
  - Minimum of 10 seconds.
  - Maximum of 10 minutes.
  - Average of 2 minutes 18 seconds.

<sup>4</sup>Section 28.141(4)(g) of the City of Madison Zoning Code.



Image: Google Earth Pro

**Figure 4 AC Hotel Marriott Valet Area**

There are some additional observations worth noting. The AC Hotel Marriott has a single, one-way drive isle that is not wide enough for one vehicle to pass another. This means any vehicles standing in a queue must wait until the first vehicle leaves. 122 State proposes using two drive isles on Carroll Street which will provide significantly more flexibility and reduce the amount of time cars are standing. The AC Hotel Marriott generally performs well, but cars will queue across the sidewalk typically two to three times per peak hour. Rarely, the valet queue will spill on to the street and block the curb loading zone area for a short time (30 seconds or less).

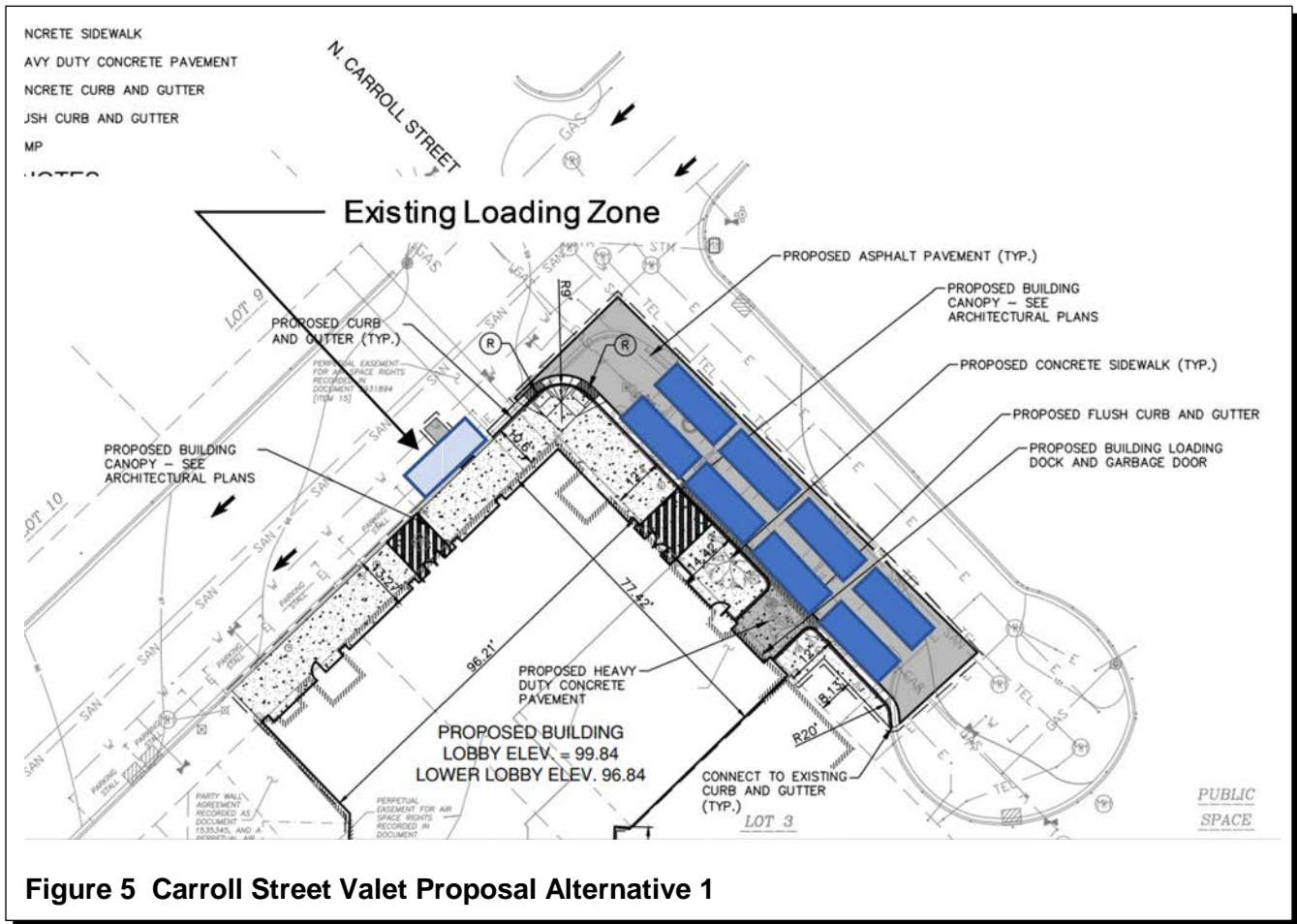
#### 4. Estimated Site Motor Vehicle Traffic Volumes

AC Hotel Marriott staff provided hotel occupancy data for the dates that the valet operations were observed (ranging from between 65 and 90 percent occupancy). Based on this, our team calculated average peak hour motor vehicle entry and exit rates per occupied room. We then applied these rates to the proposed Site assuming all 136 rooms were occupied. The result is a conservative (high) estimate of Site motor vehicle traffic.

The estimated motor vehicle traffic using the Site valet area at full occupancy is 28 entering and 28 exiting.

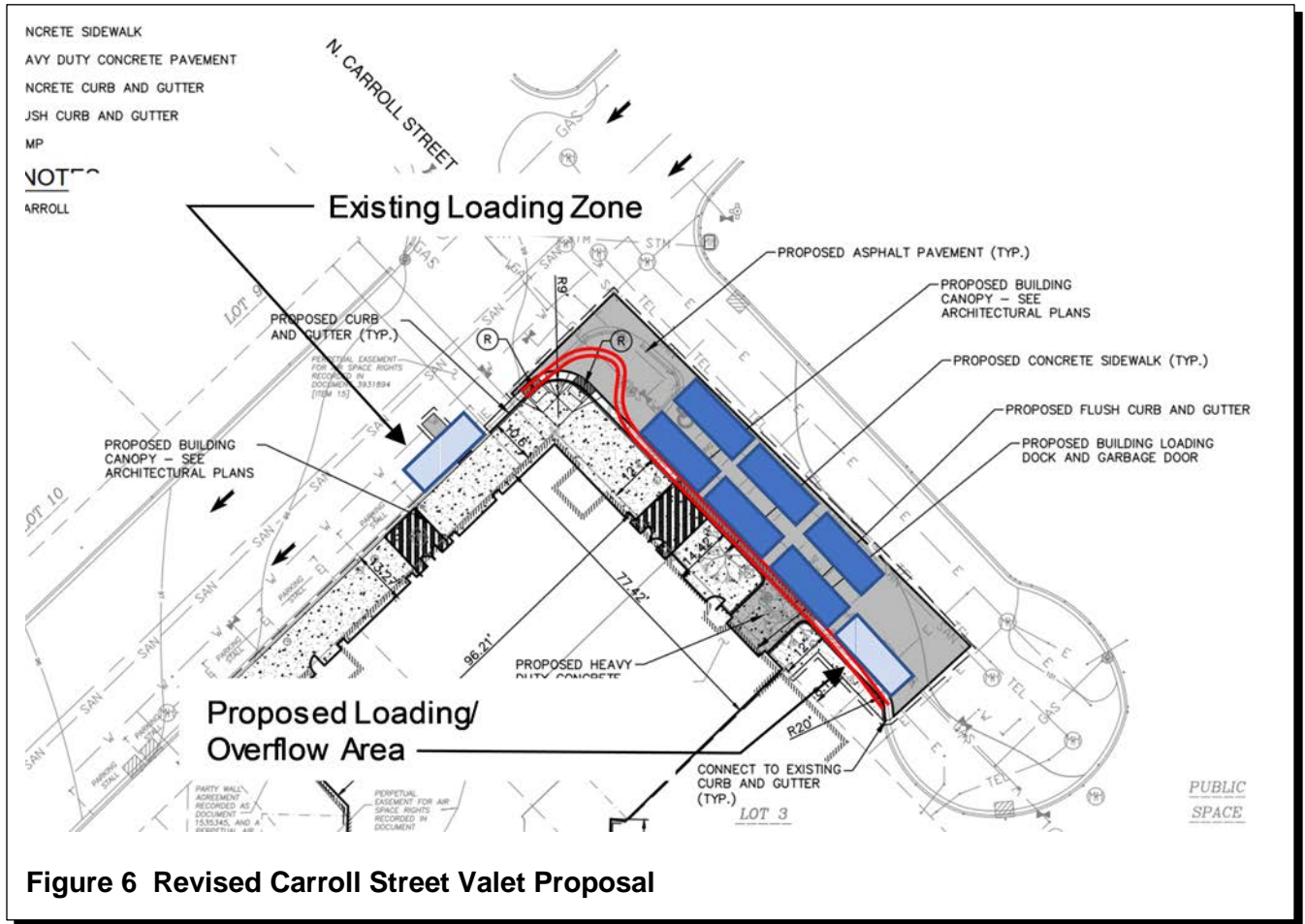
C. 122 State Street Valet Service Operation

The initial submittal package included proposed valet service on Carroll Street in the space currently occupied by the eight, 90-degree, metered parking stalls. The initial layout (Alternative 1) included removal of the curb bumpout on the south/east quadrant of the Dayton Street and Carroll Street intersection to provide a wider throat and allow a higher level of flexibility for motor vehicles entering and exiting the cul-de-sac. Figure 5 shows Alternative 1. There is storage available for eight to nine vehicles.



**Figure 5 Carroll Street Valet Proposal Alternative 1**

The study team is also considering a revised layout for valet service on Carroll Street (Alternative 2). It also uses the space currently occupied by the eight, 90-degree, metered parking stalls. Alternative 2 maintains some of the curb bumpout on the south/east side of the Dayton Street and Carroll Street intersection to reduce the throat width. Figure 6 shows the Alternative 2 layout. There is storage available for six to eight vehicles.



D. Traffic Analysis and Modeling

The study team completed traffic modeling using Synchro/SimTraffic software. Synchro modeling is based on equations found in the Highway Capacity Manual (HCM) authored by the Transportation Research Board, which is part of the National Academies of Sciences, Engineering, and Medicine. Synchro/HCM analysis is best suited for isolated, standard intersections and locations where backups and congestion from upstream or downstream locations do not significantly impact conditions at the subject location.

SimTraffic modeling is microsimulation that models driver/vehicle behavior on a simulated street network. SimTraffic analysis is best suited for congested areas where the overlapping interaction between upstream and downstream locations needs to be accounted for in the results.

The traffic analysis reports can be found in the Appendix.

1. Current Conditions Without the Site

We counted the intersection of Dayton Street and Carroll Street from 4 to 6 P.M. on a Tuesday in February. The existing turning movement counts are shown in Figure 7 and serve as the baseline

for the traffic analysis. One notable feature of this intersection is the high volume of pedestrian traffic using all four crosswalks (and some that cross diagonally when sufficient gaps in traffic exist). The traffic count data can be found in the Appendix.

Synchro analysis indicates outbound traffic on Carroll Street currently experiences Level of Service (LOS) C (an average of 19 seconds of delay) with a 95th percentile queue length<sup>5</sup> of less than one vehicle.

2. Conditions with the Site and valet service in operation

The turning movement counts with the valet traffic added is shown in Figure 7. Note that there was no reduction in traffic applied to account for the removal of the eight existing 90-degree parking stalls.



Valet operation on Carroll Street is proposed to have two drive aisles; however, setup of the traffic model resulted in a single “signal” controlling both lanes. The model uses a one-minute dwell time, followed by a seven-minute dwell time, followed by a two-minute dwell-time that then repeats

<sup>5</sup>The 95th percentile queue length would be expected to be exceeded only 5 percent of the time, or, in other words, the longest queue of the peak hour will be that length or less on 95 percent of the days of the year.

over the course of the full peak hour. The de-facto single lane operation, the dwell times from 1 to 7 minutes, and the lack of a reduction in traffic due to removal of existing parking are additional ways that the traffic analysis is conservative, or portraying a “worst case” condition.

Still, the modeling indicates negligible impacts on the existing intersection and manageable vehicle storage needs for the valet service.

a. Outbound Carroll Street traffic

Synchro analysis indicates outbound traffic on Carroll Street with the addition of the valet service experiences LOS C (an average of 23 seconds of delay up from 19 seconds) with a 95th percentile queue length of about one vehicle up from less than one vehicle.

b. Valet service.

Synchro analysis indicates a 95th percentile queue length of three vehicles (the longest of the two lanes). It predicts a 50th percentile (average) queue length of two vehicles.

SimTraffic analysis indicates a 95th percentile queue length of five vehicles (total of both lanes). It predicts a 50th percentile (average) queue length of two vehicles.

2. Special Events or Construction Contingency Valet Operation

Based on discussion with City staff, the study team evaluated a condition where the Carroll Street cul-de-sac would be closed, whether short-term for an event, or longer term due to construction activities such as utility work or the need for placement of a crane to serve one of the multi-story buildings nearby. The alternate location for valet service would be on Dayton Street between Carroll Street and State Street. If the existing metered parallel parking stalls were “bagged” to keep them clear of vehicles, the valet could operate with enough storage for six vehicles.

Synchro analysis of valet service on Dayton Street indicates a 95th percentile queue length of six vehicles.

SimTraffic analysis indicates a 95th percentile queue length of five vehicles.

E. Pedestrian Conditions

Pedestrian access to the Site is excellent, and pedestrian activity at the intersection of Dayton Street and Carroll Street is notably high. The Carroll Street cul-de-sac is a primary route for pedestrians between the Concourse Hotel, State Street Capital Parking Ramp, and other locations to the west and the State Capitol and Capitol Square.

The proposed Site layout provides pedestrian entrances with canopies from State Street, Dayton Street, and Carroll Street. The sidewalk/terrace widths in front of the new building on all three streets will remain the same width as they are today.

#### F. Bicycle Conditions

Bicycle access to the Site is excellent. Bicycle valet parking is proposed with hotel staff securely storing bicycles for guests and employees inside the building. Staff and guests will also have access to the B-Cycle bike sharing service via bike stations at the following nearby locations:

- West Mifflin Street and Central Library (650 feet away, 2-minute walk)
- Wisconsin Avenue and East Mifflin Street (800 feet away, 3-minute walk)

#### G. Transit Conditions and Access

Transit service to the Site is excellent. There is a Metro Transit bus stop at the corner of Dayton Street and State Street that serves 17 routes providing connections to all parts of the City.

### RECOMMENDATIONS

#### A. Site Layout and Valet Service

The traffic modeling indicates storage for five to six vehicles or less will be sufficient during 95 percent of the weekday peak periods. We recommend operating the valet service on Carroll Street using the Alternative 2 layout. This layout offers storage for six to eight vehicles while maintaining the curb bumpout in the south/east quadrant of the Dayton Street and Carroll Street intersection.

#### B. Travel Demand Management (TDM) Considerations

The Site will not have on-site parking. Opportunities to reduce the demand for off-site parking and to minimize the generation of personal vehicle traffic are recommended. We recommend the following TDM measures be implemented for the Site<sup>6</sup>.

1. It is important to acknowledge that the Site will benefit from TDM by the nature of the project and location. The mixed hotel and restaurant uses within the same building will reduce total external trips. The location of the project near State Street and the Capitol Square allows easy access to all modes of travel and will afford employees and guests the highest opportunity to travel to and from the Site via alternate modes.
2. The hotel website should include information regarding options for traveling to the site via alternate modes. This includes walking, bicycling, Metro Transit bus service (and potentially future BRT service), taxi, and ridesharing services.
3. The property operator(s) should distribute information to all hotel and restaurant employees and workers regarding options for traveling via alternate modes. In addition to walking, bicycling, Metro Transit bus service (and potentially future BRT service), taxi, and ridesharing services this will also include the following.

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<sup>6</sup>Portions of this section summarize information provided in the Madison Area Transportation Board's Regional Transportation Plan 2050 dated April 2017.

- a. The Madison Area Transportation Planning Board (MATPB) administers Rideshare, Etc. in partnership with the Wisconsin Department of Transportation (WisDOT). The program includes a website ([www.rideshareetc.org](http://www.rideshareetc.org)) where commuters can set up a profile and tailor searches for potential carpool partners, available vanpools, transit routes, and biking partners.
  - b. The Guaranteed Ride Home program offers commuters that do not drive alone a taxi voucher, so they are not stranded at work if an emergency arises. Up to six passes per year worth up to \$75 per ride are available. The program is administered by the MATPB and funded by the Dave County Highway and Transportation Department.
4. The property operator(s) should offer free or discounted B-Cycle passes to employees and guests.
  5. The property owner(s) should offer free or discounted Metro Transit passes to employees and guests.



**APPENDIX  
TRAFFIC DATA AND MODELING RESULTS**

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122 State Street  
Trip Generation

Specified Land Use	ITE Land Use Code	Given Units	Unit	Daily			AM Distribution			PM Distribution			Daily			AM Peak Hour Trips			PM Peak Hour Trips		
				Rate	Hour Rate	% In	% Out	Hour Rate	% In	% Out	Trips	AM In	AM Out	Trips	PM In	PM Out	Trips				
Proposed Hotel	310	136	Occupied Rooms	8.92	0.67	58%	42%	0.7	49%	51%	1214	53	39	92	47	49	96				
Proposed High-Turnover (Sit-Down) Restaurant	932		Seats	42.70	0.96	62%	38%	3.71	48%	52%	0	0	0	0	0	0					
Proposed High-Turnover (Sit-Down) Restaurant	932	12.4	1000 GSF	127.15	10.81	55%	45%	9.85	60%	40%	1577	74	61	135	74	49	123				
Apartment	220	4	Dwelling Units	6.65	0.51	20%	80%	0.62	65%	35%	27	1	2	3	2	1	3				
Existing High-Turnover (Sit-Down) Restaurant	932	15.1	1000 GSF	127.15	10.81	55%	45%	9.85	60%	40%	1920	90	74	164	89	60	149				
Existing General Office Building	710	34.2	1000 GSF	18.56	2.46	88%	12%	2.52	17%	83%	635	75	10	85	15	72	87				


- Linked Trip Reduction 0%
- Passby Reduction 0%

**Table 4: General Office Building Trip Generation Vehicle Trip Ends (Two-Way Volume) Per 1,000 Square Feet Gross Floor Area Derived From Trip Generation Equations**

1,000 Square Feet Gross Floor Area	Average Weekday Vehicle Trip Ends		A.M. Peak Hour (1 Hour Between 7 and 9 A.M.)		P.M. Peak Hour (1 Hour Between 4 and 6 P.M.)	
	Rate	Volume	Rate	Volume	Rate	Volume
10	24.60	246	3.20	32	3.40	34
25	19.72	493	2.60	65	2.68	67
50	16.58	829	2.22	111	2.24	112
100	14.03	1403	1.90	190	1.87	187
200	11.85	2369	1.64	327	1.56	311
300	10.77	3230	1.50	450	1.40	420
400	9.96	3984	1.40	561	1.30	519
500	9.45	4723	1.33	665	1.22	608
600	9.05	5432	1.29	773	1.17	700
700	8.75	6125	1.24	871	1.12	781
800 or more	8.46		1.20		1.08	

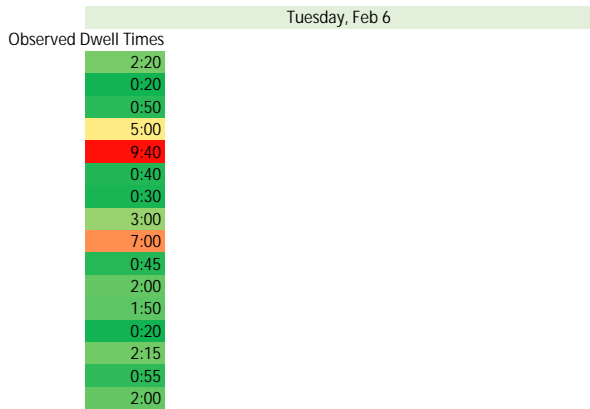
- 34225 SF office
- 9.225 into 25 to 50 range
- 0.369 percent
- 3.14 weekday range
- 1.159 into range
- 18.56 daily
- 0.38 AM range
- 0.14 into range
- 2.46 AM
- 0.44 PM range
- 0.162 into range
- 2.52 PM

General office rate based on table 4 pg. 942 of Trip Gen Manual. Based on linear interpolation of daily and and peak hour rates.

Differences 209 (39) 14 (25) 15 (35) (20)

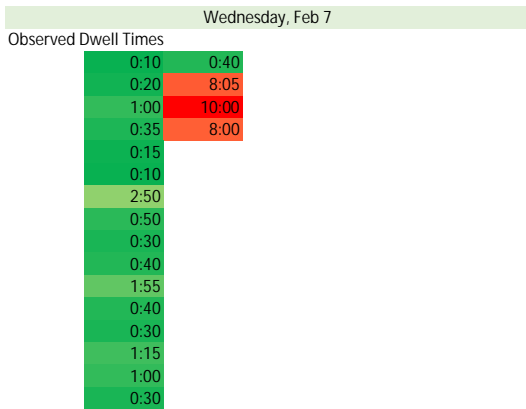
AC Hotel Field Count Data

TOD Start time	Tuesday, Feb 6					Wednesday, Feb 7						
	Cars		Trucks			Cars		Trucks				
	In	Out	In	Out	In	Out	In	Out	In	Out		
16:00							1	3	0	0	4	
16:05							0	0	0	0	0	
16:10							0	0	0	0	0	4
16:15							1	1	0	0	2	
16:20							1	0	0	0	1	
16:25							1	1	1	1	4	7
16:30							4	3	0	0	7	
16:35							2	2	0	0	4	
16:40							1	1	0	0	2	13
16:45							0	0	0	0	0	
16:50							2	1	0	0	3	
16:55							4	2	0	0	6	9
							17	14	1	1		0.63
17:00	1	3	1	0	5		0	3	0	0	3	
17:05	2	2	0	0	4		0	0	2	1	3	
17:10	2	5	0	0	7	16	6	5	0	1	12	18
17:15	1	1	0	0	2		2	3	0	0	5	
17:20	4	2	0	0	6		0	0	0	0	0	
17:25	2	3	0	0	5	13	1	1	0	0	2	7
17:30	1	2	0	1	4		4	2	0	0	6	
17:35	3	2	1	1	7		2	1	0	0	3	
17:40	2	3	0	0	5	16	5	4	0	0	9	18
17:45	1	1	0	0	2		2	0	0	0	2	
17:50	3	3	1	0	7		3	5	0	0	8	
17:55	2	3	0	0	5	14	1	1	0	0	2	12
	24	30	3	2		0.92 PHF	26	25	2	2		0.76 PHF



Min	0:20	2 min or less	63%
Max	9:40	2 min to 7 min	25%
Avg	2:27	7 min or more	13%

Observations:  
 Max Standing 6 vehs  
 Sidewalk blocked 3 occurrences  
 Lane blocked 1 occurrence



Min	0:10	2 min or less	80%
Max	10:00	2 min to 7 min	5%
Avg	1:59	7 min or more	15%

Observations:  
 Max Standing 4 vehs  
 Sidewalk blocked 2 occurrences  
 Lane blocked 0 occurrences

AC Hotel Field Count Data

Friday, Feb 9					Average Values				
Cars		Trucks			Cars		Trucks		
In	Out	In	Out		In	Out	In	Out	
1	0	0	0	1	1	2	0	0	2.5
0	0	0	0	0	0	0	0	0	0
1	1	0	0	2	3	1	0	0	1 3.5
2	2	0	0	4	4	2	0	0	3
2	2	0	0	4	4	2	1	0	2.5
1	2	0	0	3	11	1	2	1	3.5 9
1	0	0	0	1	1	3	2	0	4
2	3	0	0	5	2	3	0	0	4.5
3	3	0	0	6	12	2	2	0	4 12.5
3	1	0	0	4	2	1	0	0	2
0	1	0	0	1	1	1	1	0	2
2	1	0	0	3	8	3	2	0	4.5 8.5
18	16	0	0	0.71	18	15	1	1	0.67
1	0	0	0	1	1	2	0	0	3
4	4	0	0	8	2	2	1	0	5
5	4	0	0	9	18	4	5	0	9.333333 17.33333
2	3	0	0	5	2	2	0	0	4
1	1	0	0	2	2	1	0	0	2.666667
1	2	1	1	5	12	1	2	0	4 10.66667
4	3	0	1	8	3	2	0	1	6
1	1	0	0	2	2	1	0	0	4
1	1	0	0	2	12	3	3	0	5.333333 15.33333
1	1	0	0	2	1	1	0	0	2
2	2	1	0	5	5	3	3	1	6.666667
2	1	0	1	4	11	2	2	0	3.666667 12.33333
25	23	2	3	0.74 PHF	25	26	2	2	0.80 PHF

Friday, Feb 9			Average Values		
Observed Dwell Times			Observed Dwell Times		
0:10	9:00		Min	0:10	
1:50	2:45		Max	10:00	
1:05	4:40		Avg	2:18	
4:20	1:00		Observations:		
0:30	3:50		Max Standing	5	vehs
1:00	0:30		Sidewalk blocked	3.3	occurrences
2:00	2:20		Lane blocked	0.7	occurrences
1:10			Car backed out	1	occurrences
0:30					
0:45					
0:10					
1:25					
9:00					
3:35					
4:15					
0:55					

Min	0:10	2 min or less	61%
Max	9:00	2 min to 7 min	30%
Avg	2:28	7 min or more	9%

Observations:		
Max Standing	5	vehs
Sidewalk blocked	5	occurrences
Lane blocked	1	occurrences
Car backed out	3	occurrences

122 State Street Development

Hotel/Resturant Valet Trip Generation Rates based on AC Hotels Marriott in Madison

AC Hotel Trip Gen Rates

<u>Date</u>	<u>Trips In</u>	<u>Trips Out</u>	<u>Occupancy</u>	<u>Rooms</u>	<u>In/Room</u>	<u>Out/Room</u>	
Tuesday, February 6	27	32	90%	165	0.182	0.215	
Wednesday, February 7	28	27	95%	165	0.179	0.172	
Friday, February 9	27	26	65%	165	0.252	0.242	
					Min	0.179	0.172
					Avg	0.204	0.210
					Max	0.252	0.242

122 State Trip Generation

Rooms	Occupancy	Occ. Rooms	Rate In	Rate Out	Trips In	Trips Out
135	100%	135	0.204	0.210	28	28

File Name: S:\MIL\1500--1599\1540\010\Designs-Studies-Reports\Traffic\Traffic Counts\Raw Output\Carroll and Dayton.ppd

Start Date: 2/13/2018

Start Time: 4:00:00 PM

Site Code: 00000000

Comment 1: 2/13/2018

Comment 2: 30 degrees

Comment 3: Clear

Comment 4:

Start Time	CARROL From North				DAYTON From East				CARROL From South				DAYTON From West							
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds				
4:00 PM	0	2	30	17	1	91	21	18	1	2	0	9	0	0	0	0	48	148		
4:15 PM	0	2	16	28	2	92	22	14	2	0	0	14	0	0	0	0	37	136		
4:30 PM	0	0	28	17	0	102	20	15	3	3	0	15	0	0	0	0	38	156		
4:45 PM	0	4	22	32	1	123	30	22	0	1	0	15	0	0	0	0	29	181	621	
5:00 PM	0	3	23	16	2	144	28	16	3	4	0	25	0	0	0	0	57	207	680	
5:15 PM	0	3	28	27	4	145	24	15	2	0	0	13	0	0	0	0	32	206	750	
5:30 PM	0	2	19	11	4	126	21	13	3	7	0	8	0	0	0	0	29	182	776	
5:45 PM	0	2	17	17	4	119	32	14	2	3	0	14	0	0	0	0	29	179	774 PHF	0.93

5:00 to 6:00      0      10      87      71      14      534      105      58      10      14      0      60      0      0      0      147

Approach                      97                                      653                                      24                                      0

Truck %                      0%                                      1%                                      4%                                      #DIV/0!

ALL VEHICLES

File Name: S:\MIL\1500--1599\1540\010\Designs-Studies-Reports\Traffic\Traffic Counts\Raw Output\Carroll and Dayton.ppd

Start Date: 2/13/2018

Start Time: 4:00:00 PM

Site Code: 00000000

Comment 1: 2/14/2018

Comment 2: 30 degrees

Comment 3: Clear

Comment 4:

Start Time	CARROL From North				DAYTON From East				CARROL From South				DAYTON From West			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM	0	2	30	17	1	91	20	18	1	2	0	9	0	0	0	48
4:15 PM	0	2	16	28	1	92	22	14	2	0	0	14	0	0	0	37
4:30 PM	0	0	28	17	0	102	19	15	2	3	0	15	0	0	0	38
4:45 PM	0	4	22	32	1	123	30	22	0	1	0	15	0	0	0	29
5:00 PM	0	3	23	16	2	142	27	16	3	4	0	25	0	0	0	57
5:15 PM	0	3	28	27	4	145	24	15	2	0	0	13	0	0	0	32
5:30 PM	0	2	19	11	4	125	20	13	3	7	0	8	0	0	0	29
5:45 PM	0	2	17	17	3	118	30	14	2	2	0	14	0	0	0	29

CARS AND PEDS

File Name: S:\MIL\1500--1599\1540\010\Designs-Studies-Reports\Traffic\Traffic Counts\Raw Output\Carroll and Dayton.ppd

Start Date: 2/13/2018

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	CARROL From North				DAYTON From East				CARROL From South				DAYTON From West			
	Left	Thru	Right	Bikes	Left	Thru	Right	Bikes	Left	Thru	Right	Bikes	Left	Thru	Right	Bikes
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	1	1	0	0	2	0	0	0	1	0	0	0	2
4:30 PM	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
5:00 PM	0	0	0	1	0	2	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	1	1	2	0	0	1	0	0	0	0	0	0
5:00 to 6:00	0	0	0	5	1	4	4	0	0	1	0	0	0	0	0	0
	0				9				1				0			

TRUCKS AND BIKES



**Intersection**

Int Delay, s/veh 2.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑	↑		↔						↔	
Traffic Vol, veh/h	0	10	87	10	14	0	0	0	0	14	534	105
Future Vol, veh/h	0	10	87	10	14	0	0	0	0	14	534	105
Conflicting Peds, #/hr	58	0	147	147	0	58	40	0	40	60	0	76
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	11	94	11	15	0	0	0	0	15	574	113

Major/Minor	Minor2	Minor1				Major2			
Conflicting Flow All	-	797	567	530	853	-	60	0	0
Stage 1	-	737	-	60	60	-	-	-	-
Stage 2	-	60	-	470	793	-	-	-	-
Critical Hdwy	-	6.54	6.94	7.54	6.54	-	4.14	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	-	4.02	3.32	3.52	4.02	-	2.22	-	-
Pot Cap-1 Maneuver	0	318	467	432	295	0	1542	-	-
Stage 1	0	423	-	-	-	0	-	-	-
Stage 2	0	-	-	543	398	0	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	-	278	437	309	258	-	1542	-	-
Mov Cap-2 Maneuver	-	278	-	309	258	-	-	-	-
Stage 1	-	390	-	-	-	-	-	-	-
Stage 2	-	-	-	408	367	-	-	-	-

Approach	SE	NW	SW
HCM Control Delay, s	15.8	19.3	0.2
HCM LOS	C	C	

Minor Lane/Major Mvmt	NWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	277	278	437	1542	-	-
HCM Lane V/C Ratio	0.093	0.039	0.214	0.01	-	-
HCM Control Delay (s)	19.3	18.5	15.5	7.4	0.1	-
HCM Lane LOS	C	C	C	A	A	-
HCM 95th %tile Q(veh)	0.3	0.1	0.8	0	-	-

Synchro/HCS: Existing Conditions  
 Carroll and Dayton Two-Way Stop Control Intersection  
 Carroll Outbound is NWIn1

**Intersection**

Int Delay, s/veh 3.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑	↑		↑						↑↑	
Traffic Vol, veh/h	0	22	87	22	30	0	0	0	0	30	534	105
Future Vol, veh/h	0	22	87	22	30	0	0	0	0	30	534	105
Conflicting Peds, #/hr	58	0	147	147	0	58	40	0	40	60	0	76
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	24	94	24	32	0	0	0	0	32	574	113

**Major/Minor**

	Minor2	Minor1				Major2		
Conflicting Flow All	- 831	567	570	888	-	60	0	0
Stage 1	- 771	-	60	60	-	-	-	-
Stage 2	- 60	-	510	828	-	-	-	-
Critical Hdwy	- 6.54	6.94	7.54	6.54	-	4.14	-	-
Critical Hdwy Stg 1	- 5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	- 4.02	3.32	3.52	4.02	-	2.22	-	-
Pot Cap-1 Maneuver	0 304	467	404	281	0	1542	-	-
Stage 1	0 408	-	-	-	0	-	-	-
Stage 2	0	-	514	384	0	-	-	-
Platoon blocked, %							-	-
Mov Cap-1 Maneuver	- 261	437	274	242	-	1542	-	-
Mov Cap-2 Maneuver	- 261	-	274	242	-	-	-	-
Stage 1	- 369	-	-	-	-	-	-	-
Stage 2	-	-	365	347	-	-	-	-

**Approach**

	SE	NW	SW
HCM Control Delay, s	16.4	23	0.4
HCM LOS	C	C	

**Minor Lane/Major Mvmt**

	NWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	255	261	437	1542	-	-
HCM Lane V/C Ratio	0.219	0.091	0.214	0.021	-	-
HCM Control Delay (s)	23	20.2	15.5	7.4	0.1	-
HCM Lane LOS	C	C	C	A	A	-
HCM 95th %tile Q(veh)	0.8	0.3	0.8	0.1	-	-

Synchro/HCS: With Valet on Carroll  
 Carroll and Dayton Two-Way Stop Control Intersection  
 Carroll Outbound is NWLn1

Queues

6:

03/22/2018



Lane Group	SET	SER	NWT
Lane Group Flow (vph)	26	30	56
v/c Ratio	0.01	0.38	0.03
Control Delay	0.5	178.1	0.5
Queue Delay	0.0	0.0	0.0
Total Delay	0.5	178.1	0.5
Queue Length 50th (ft)	2	50	3
Queue Length 95th (ft)	2	78	4
Internal Link Dist (ft)	60		6
Turn Bay Length (ft)			
Base Capacity (vph)	1738	79	1738
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.01	0.38	0.03
<b>Intersection Summary</b>			

Synchro/HCS: With Valet on Carroll  
Queuing at Valet (SER)

Intersection: 6:

Movement	SE	SE	SE	NW
Directions Served	T	R	R	T
Maximum Queue (ft)	16	95	77	34
Average Queue (ft)	1	40	12	3
95th Queue (ft)	8	84	46	19
Link Distance (ft)	300	300	300	70
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

SimTraffic: With Valet on Carroll  
 Queuing at Valet (SER)



Lane Group	WBL	SWL	SWT
Lane Group Flow (vph)	30	30	678
v/c Ratio	0.02	0.60	0.21
Control Delay	0.5	231.4	0.7
Queue Delay	0.0	0.0	0.0
Total Delay	0.5	231.4	0.7
Queue Length 50th (ft)	2	89	24
Queue Length 95th (ft)	3	140	25
Internal Link Dist (ft)	79		123
Turn Bay Length (ft)			
Base Capacity (vph)	1652	50	3303
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.02	0.60	0.21
Intersection Summary			

Synchro: With Valet on Dayton  
Queuing at Valet (SWL)

Intersection: 10:

Movement	WB	SW	SW	SW
Directions Served	L	L	T	T
Maximum Queue (ft)	56	146	77	74
Average Queue (ft)	16	54	23	12
95th Queue (ft)	45	122	65	48
Link Distance (ft)	127	284	284	284
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

SimTraffic: With Valet on Dayton  
 Queuing at Valet (SWL)