

CAMPUS WEST REDEVELOPMENT  
TRANSPORTATION IMPACT STUDY  
FORT COLLINS, COLORADO

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APPENDIX

A	Recent Peak Hour Traffic
B	Current Peak Hour Operation/Description of Level of Service
C	Year 2000 Background Traffic Analyses
D	Year 2000 Total Traffic Analyses
E	Year 2018 Background Traffic Analyses
F	Year 2018 Total Traffic Analyses
G	Pedestrian, Bicycle, and Transit Level of Service

## I. INTRODUCTION

This transportation impact study addresses the capacity, geometric, and control requirements at and near the proposed Campus West Redevelopment, located south of West Elizabeth Street and east of City Park Avenue. This transportation analysis addresses potential vehicular impacts upon the street system, the pedestrian network surrounding the study area, the bicycle system, and the availability of transit facilities. Traffic projections will be prepared for future Years 2000 and 2018.

During the course of the analysis, numerous contacts were made with the project architect/planner (Kenney & Associates), the owner (Rex Miller), and City staff. This study generally conforms to the format set forth in the Fort Collins Transportation Impact Study Guidelines. The study involved the following steps:

- Collect physical, traffic, and development data;
- Perform trip generation, trip distribution, and trip assignment;
- Determine peak hour traffic volumes and daily traffic volumes;
- Conduct capacity and operational level of service analyses for all pertinent modes of transportation.

This report is prepared for the following purposes:

- Evaluate the existing conditions;
- Estimate the trip generation by the proposed/assumed developments;
- Determine the trip distribution of site generated traffic;
- Evaluate level of service;
- Determine the geometrics at key intersections;
- Determine the impacts of site generated traffic at key intersections;
- Determine pedestrian, bicycle, and transit levels of service.

Information used in this report was obtained from the City of Fort Collins, the planning and engineering consultants, the developer, research sources (ITE, TRB, etc.), and field reconnaissance.

## II. EXISTING CONDITIONS

The location of the proposed Campus West Redevelopment is shown on Figure 1. It is important that a thorough understanding of the existing conditions be presented.

### Land Use

Land uses in the area are commercial and residential. The topography surrounding the site is essentially flat. The center of Fort Collins is located east of this site.

### Roads

The primary streets, which will serve the proposed project in the study area, are West Elizabeth Street and City Park Avenue. The intersection of West Elizabeth/City Park is signal controlled. The site accesses to West Elizabeth Street and City Park Avenue are stop sign controlled. There are two driveways to each street.

West Elizabeth Street is an east/west arterial street. Within the study area, West Elizabeth Street accommodates five travel lanes: two through lanes in each direction and a center left-turn lane. The left-turn lane is striped as a two-way continuous left-turn lane adjacent to the site.

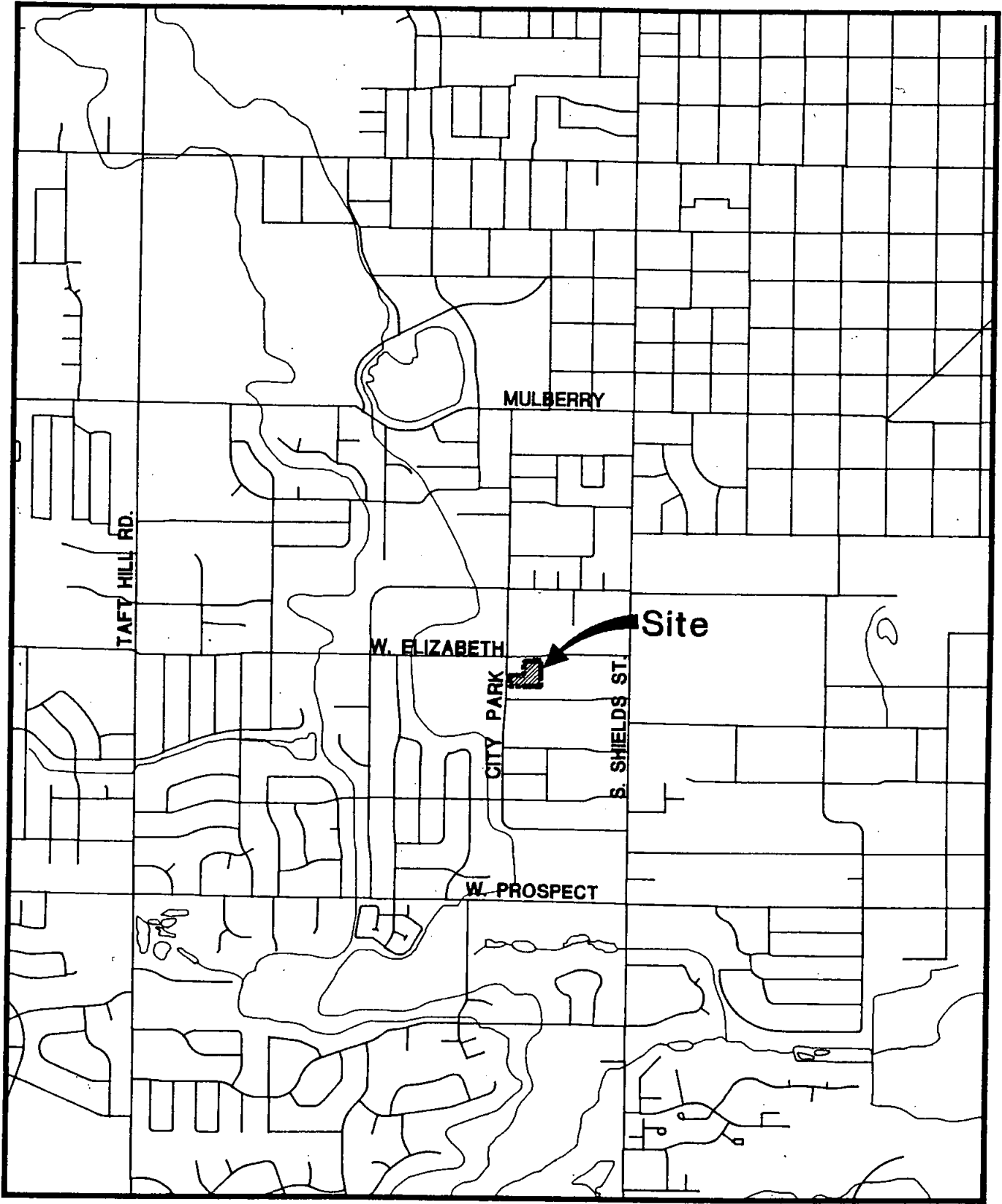
City Park Avenue is a local street that primarily serves the residential uses north and south of West Elizabeth Street. It has exclusive left-turn lanes at the West Elizabeth/City Park intersection. There is no striping adjacent to the site.

### Existing Motor Vehicle Traffic

Peak hour traffic counts at the key intersections are shown on Figure 2. The key intersections included in this study are: West Elizabeth/City Park and the site accesses. Raw count data is provided in Appendix A. Since some of these counts were obtained during the summer, they were adjusted and balanced to reflect a school time condition. The resulting traffic volumes are shown in Figure 3.

### Existing Motor Vehicle Operation

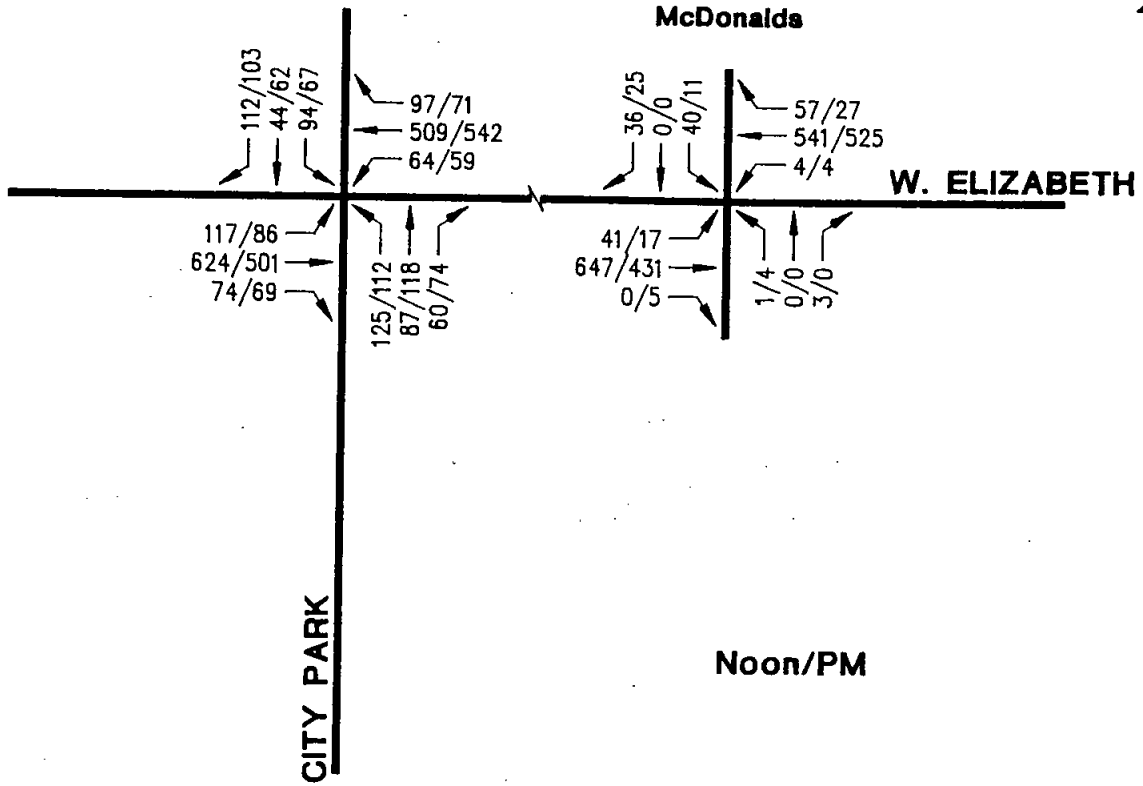
Using the traffic volumes shown in Figure 3 and the existing control, the key intersections operate as indicated in Table 1. Calculation forms for these analyses are provided in Appendix B. Appendix B also describes level of service for unsignalized intersections as provided in the 1994 Highway Capacity Manual. Operation at the key intersections is acceptable. Acceptable level of service is defined as level of service D or better.



1"=1500'

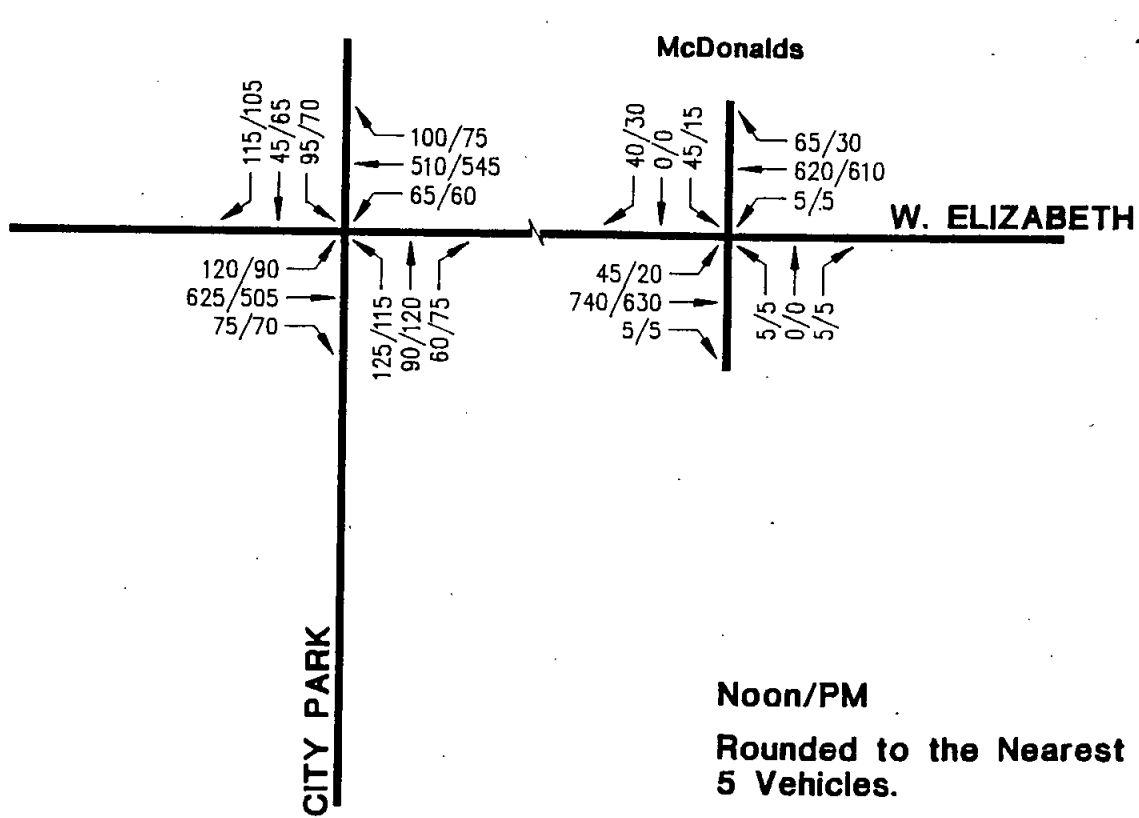
# SITE LOCATION

Figure 1



1998 PEAK HOUR TRAFFIC

Figure 2



ADJUSTED 1998 PEAK HOUR TRAFFIC

Figure 3

Table 1

Current Peak Hour Operation

<u>Intersection</u>	<u>Level of Service</u>	
	<u>Noon</u>	<u>PM</u>
Elizabeth/City Park (signal)	B	B
Elizabeth/Access (stop sign)		
NB LT/T/RT	B	B
SB LT/T/RT	C	B
EB LT	A	A
WB LT	A	A
OVERALL	A	A



### Pedestrian Facilities

Currently, there are pedestrian facilities adjacent to the project site and adjacent to both key streets near the project site. Some of these sidewalks were built under former City Street Standards and, therefore, do not have the parkway between the street and the sidewalk. Some sidewalks do not meet current or former City Street Standards. These should be improved when adjacent properties redevelop or the City should make improvements under an overall improvement program. There are handicap ramps at 3 of the 4 corners of the West Elizabeth/City Park intersection.

### Bicycle Facilities

There are bike lanes striped along West Elizabeth Street. This is a major bike route for CSU students.

### Transit Facilities

Transfort currently serves this area with Routes 2, 3, and 11. There are transit stops within close proximity of the site.

### III. PROPOSED DEVELOPMENT

The project site is proposed to have retail and restaurant uses. The project site, depicted on Figure 4, is located east of City Park Avenue on the south side of West Elizabeth Street. The multiple driveways to each street will be reduced to one to each street.

#### Trip Generation

Trip generation is important in considering the impact of a development such as this upon the existing and proposed street system. A compilation of trip generation information, prepared by the Institute of Transportation Engineers (Trip Generation, 6th Edition) was used to estimate trip generation. Table 2 shows the trip generation of the proposed project. Land use code 814 (Specialty Retail) and 832 (High Turnover Restaurant) were used. Peak hour of the generator rates were used as a conservative analyses procedure.

#### Trip Distribution

The directional distribution of the generated trips was determined for the Campus West Redevelopment. The distribution was determined based upon a gravity model process, in addition to analysis of the existing traffic patterns in the area and the type of use proposed at the site. The trip distribution is provided on Figure 5. It is expected that most traffic will access the site via the West Elizabeth Street access.

#### Trip Assignment

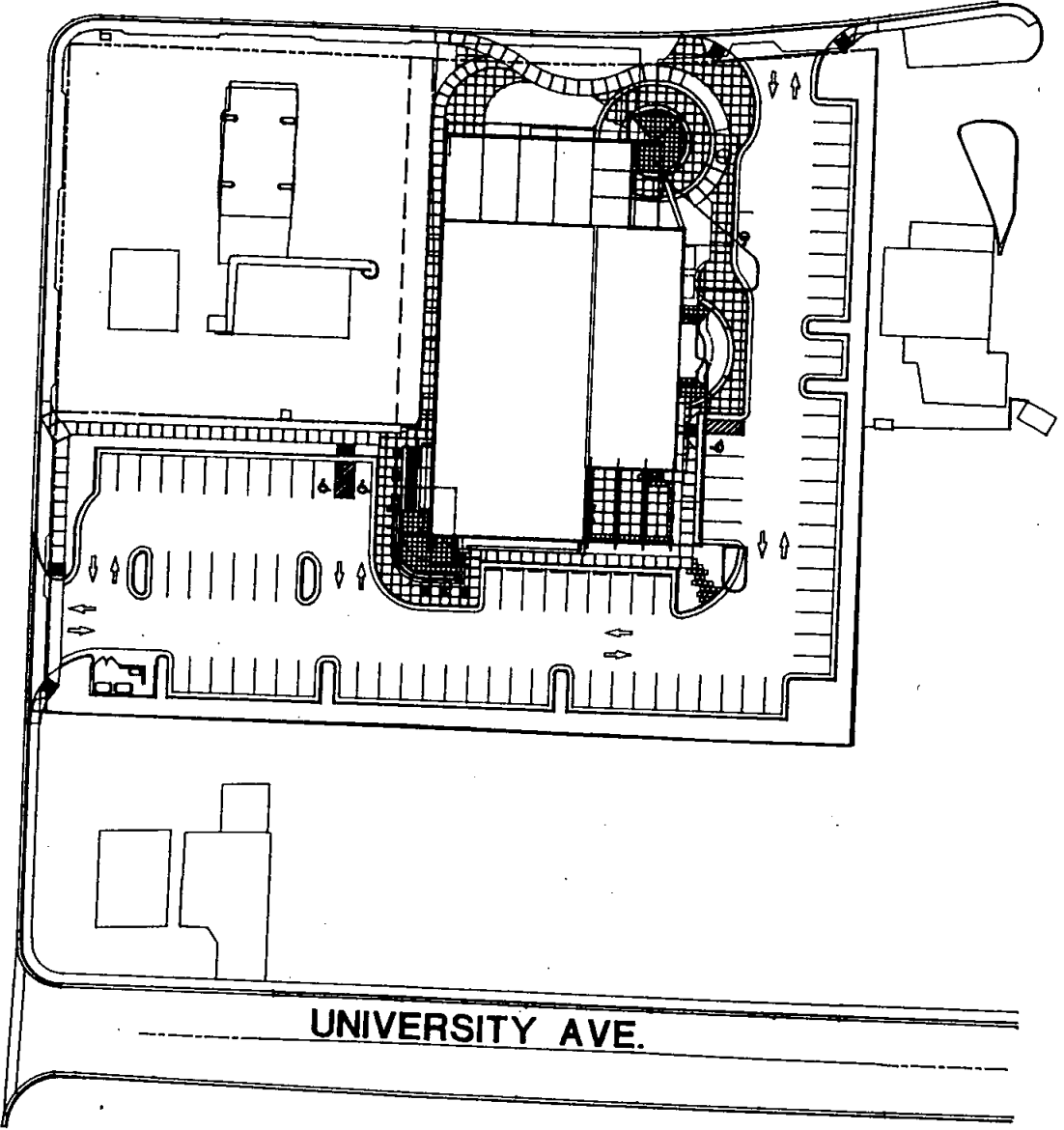
Trip assignment is how the generated and distributed trips are expected to be loaded on the street system. The assigned trips are the resultant of the trip distribution process. Figure 6 shows the peak hour site generated traffic for the proposed project.



W. ELIZABETH ST.

CITY PARK AVE.

UNIVERSITY AVE.



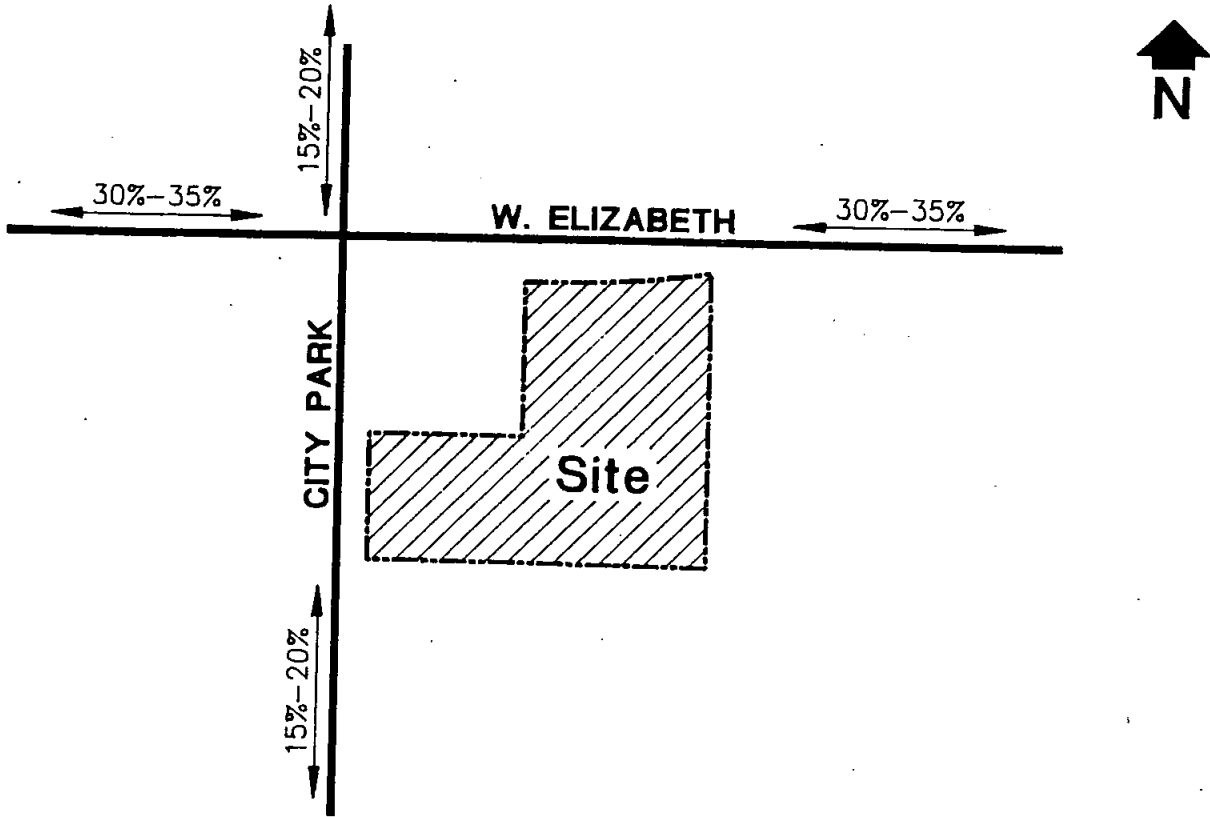
# SITE PLAN

Figure 4

Table 2

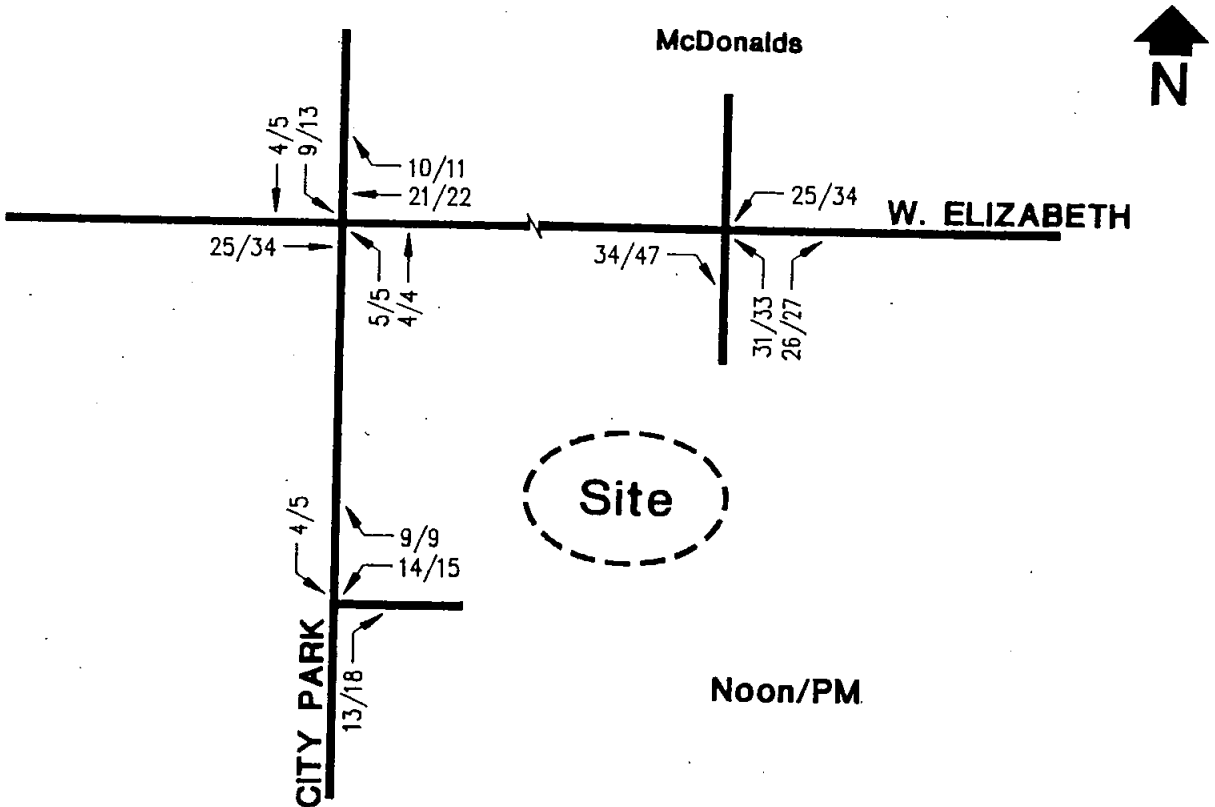
Trip Generation

Land Use	Daily Trips	A.M. Peak Trips in	Peak Trips out	P.M. Peak Trips in	Peak Trips out
Retail - 2.7 KSF (Rate)	110 (40.67)	8 (3.08)	9 (3.33)	8 (2.81)	6 (2.12)
Retail - 3.4 KSF (Rate)	140 (40.67)	10 (3.08)	11 (3.33)	10 (2.81)	7 (2.12)
Restaurant & Bar - 8.1 KSF (Rate)	1055 (130.34)	58 (7.16)	60 (7.46)	86 (10.66)	71 (8.72)
TOTAL	1305	76	80	104	84



### TRIP DISTRIBUTION

Figure 5



### SITE GENERATED TRAFFIC

Figure 6

#### IV. FUTURE BACKGROUND TRAFFIC PROJECTIONS

In order to properly evaluate the potential impact of the proposed Campus West Redevelopment project on the local traffic conditions, future traffic volumes were first estimated for the study area without the project. These future forecasts reflect the growth that is expected from overall development in this area of the City of Fort Collins.

##### Background Traffic Year 2000

The growth reflected in Year 2000 Background Traffic is based on area wide growth and development. Based upon historical traffic growth and information from the *North Front Range Regional Transportation Plan*, October 1994, the background traffic was determined. The peak hour background traffic for Year 2000 is depicted on Figure 7.

##### Background Traffic Year 2018

Future projections of background traffic for Year 2018 were obtained using the *North Front Range Regional Transportation Plan*. The peak hour background traffic for Year 2018 is depicted on Figure 8.



## V. FUTURE TOTAL TRAFFIC PROJECTIONS

The future total traffic projections reflect future traffic conditions with the traffic from the proposed Campus West Redevelopment project. The future total traffic projections were developed for Years 2000 and 2018.

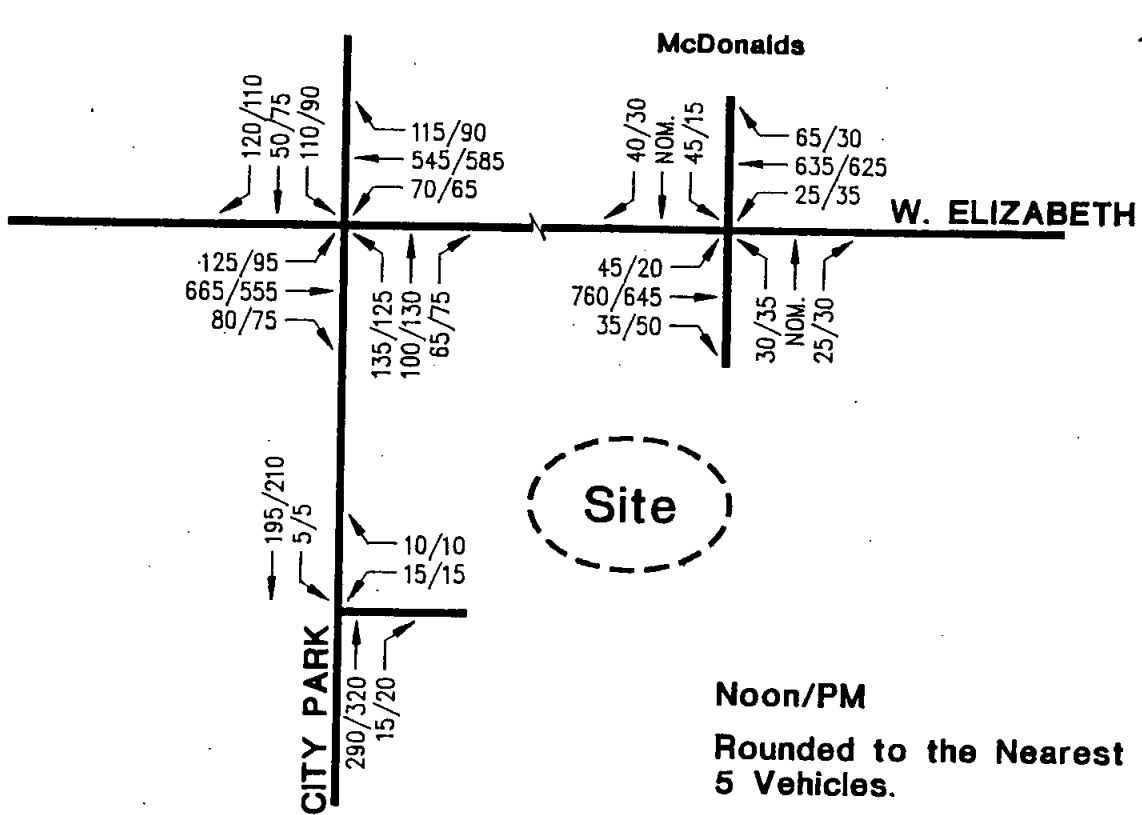
### Total Traffic Year 2000

The total traffic for Year 2000 was developed by adding traffic from the proposed project to the background traffic for Year 2000. The resulting peak hour total traffic projections for Year 2000 are shown on Figure 9.

### Total Traffic Year 2018

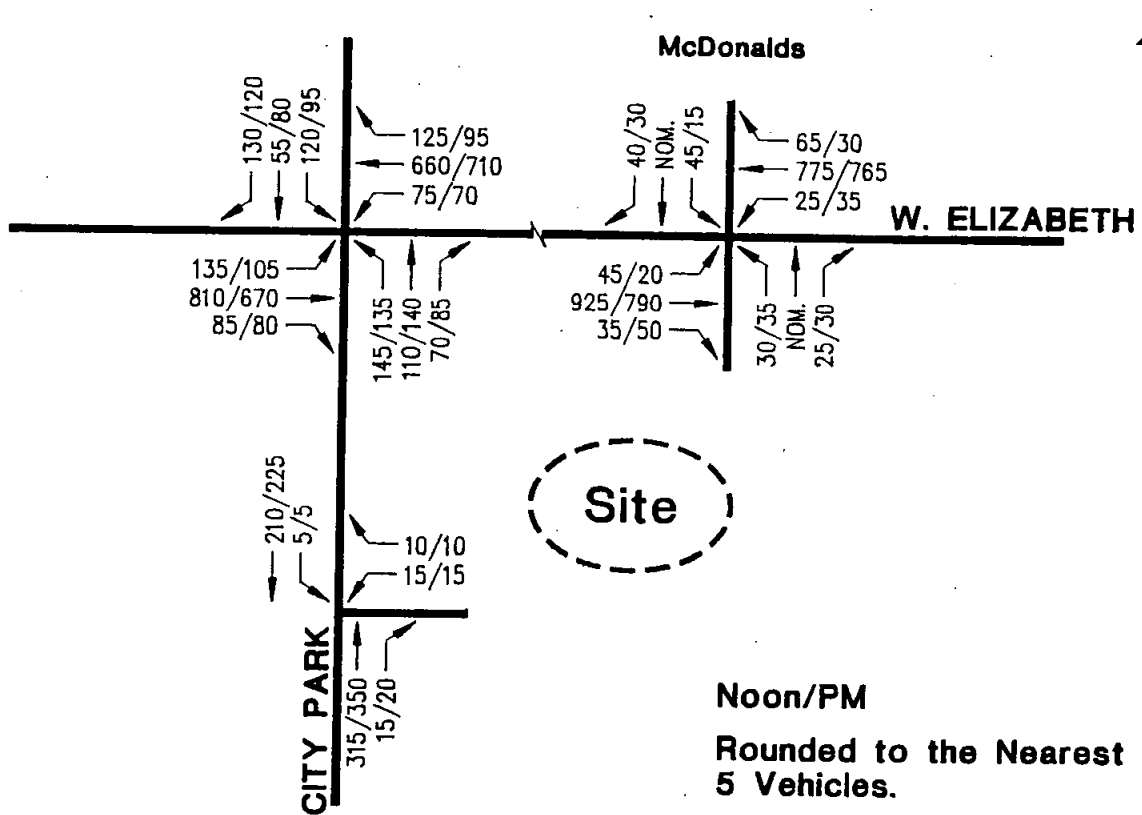
The total traffic for Year 2018 was developed by adding traffic from the proposed project to the background traffic for Year 2018. The resulting peak hour total traffic projections for Year 2018 are shown on Figure 10.





**YEAR 2000 TOTAL PEAK HOUR TRAFFIC**

**Figure 9**



**YEAR 2018 TOTAL PEAK HOUR TRAFFIC**

**Figure 10**

## VI. TRAFFIC IMPACT ANALYSIS

The previous two chapters described the development of future traffic forecasts both with and without the proposed project. Intersection capacity analyses are conducted in this chapter for both scenarios to assess the potential impact of the proposed project-generated traffic on the local street system. Other transportation modes are also addressed in this chapter.

### Traffic Analysis - Year 2000

The peak hour background and total traffic volumes for Year 2000, illustrated on Figures 7 and 9, respectively, were analyzed to determine the intersection delay and corresponding level of service. Tables 3 and 4 summarize the results for the respective Year 2000 background and total traffic conditions. The level of service worksheets for Year 2000 background and total traffic conditions are provided in Appendix C and D, respectively. As indicated in Tables 3 and 4, the traffic movements at each of the study intersections are expected to operate at an acceptable level of service under future traffic conditions for Year 2000. The short range intersection geometry is depicted on Figure 11. Consolidation of the multiple driveways is indicated in Figure 11.

### Traffic Analysis - Year 2018

The Year 2018 peak hour traffic volumes for background and total traffic conditions were analyzed to determine the intersection delay and corresponding level of service. Tables 5 and 6 summarize the results. Appendix E contains worksheets for Year 2018 background conditions and Appendix F for Year 2018 total traffic conditions. The level of service analyses shown in Tables 5 and 6 indicate that the study intersections will operate at acceptable levels of service. The long range intersection geometry is depicted on Figure 11. The geometry will not change between the short range and long range futures.

### Pedestrian Level of Service

The study area for pedestrians is, by definition, destinations which are within 1320 feet of the site. The potential destinations are shown on the graphic in Appendix G. The site itself falls into the "Pedestrian District" category. As mentioned earlier, the site is connected to all of the potential destinations by existing sidewalks, although some of those sidewalks do not meet current City Standards. Improvements should be made to the sidewalk system, especially along West Elizabeth Street. However, this redevelopment could not be expected to make those improvements as a condition of approval.

The Pedestrian LOS Worksheet is provided in Appendix G. The minimum levels of service for activity center are A and B for all measured categories. This level of service will not likely be satisfied for all categories either currently or in the future. There is little that can be

Table 3

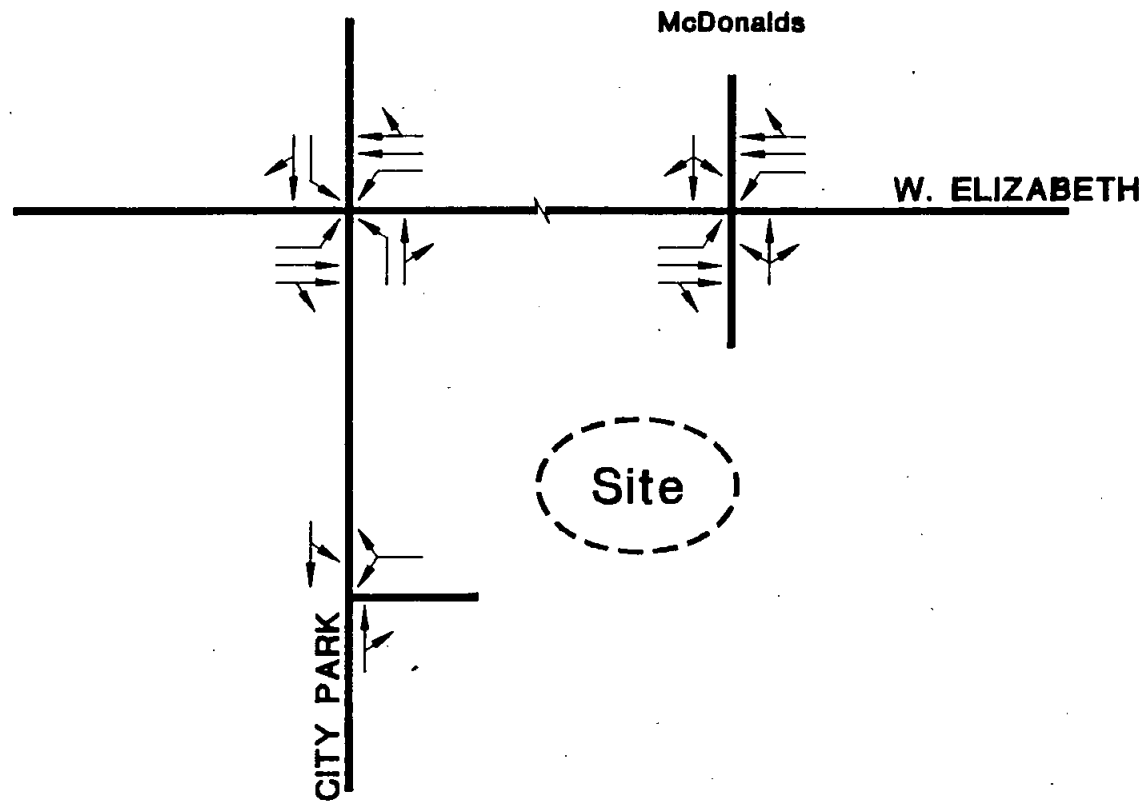
## Short Range Background Peak Hour Traffic Operation

<u>Intersection</u>	Level of Service	
	<u>AM</u>	<u>PM</u>
Elizabeth/City Park (signal)	B	B
Elizabeth/Access (stop sign)		
NB LT/T/RT	C	B
SB LT/T/RT	C	B
EB LT	A	A
WB LT	A	A
OVERALL	A	A
City Park/Access (stop sign)		
WB LT/RT	B	B
SB LT	A	A
OVERALL	A	A

Table 4

## Long Range Background Peak Hour Traffic Operation

<u>Intersection</u>	Level of Service	
	<u>AM</u>	<u>PM</u>
Elizabeth/City Park (signal)	B	B
Elizabeth/Access (stop sign)		
NB LT/T/RT	C	C
SB LT/T/RT	C	B
EB LT	A	A
WB LT	A	A
OVERALL	A	A
City Park/Access (stop sign)		
WB LT/RT	B	B
SB LT	A	A
OVERALL	A	A



Legend:

—▶ - Denotes Lane

Table 5

## Short Range Total Peak Hour Traffic Operation

<u>Intersection</u>	Level of Service	
	<u>AM</u>	<u>PM</u>
Elizabeth/City Park (signal)	B	B
Elizabeth/Access (stop sign)		
NB LT/T/RT	C	C
SB LT/T/RT	C	B
EB LT	A	A
WB LT	A	A
OVERALL	A	A
City Park/Access (stop sign)		
WB LT/RT	B	B
SB LT	A	A
OVERALL	A	A

Table 6

## Long Range Total Peak Hour Traffic Operation

<u>Intersection</u>	Level of Service	
	<u>AM</u>	<u>PM</u>
Elizabeth/City Park (signal)	B	B
Elizabeth/Access (stop sign)		
NB LT/T/RT	C	C
SB LT/T/RT	D	B
EB LT	A	A
WB LT	A	A
OVERALL	A	A
City Park/Access (stop sign)		
WB LT/RT	B	B
SB LT	A	A
OVERALL	A	A

done to completely satisfy all of the criteria, although improvements can be made in the area which will make walking a more pleasant experience.

#### Bicycle Level of Service

This site is directly connected to the on-street bike lanes on West Elizabeth Street. Therefore, the base connectivity is at level of service B as shown on Appendix G. Logic would indicate that neither "public school sites" or "recreation sites" are priority destinations for the proposed uses. The site is in an existing commercial area.

#### Transit Level of Service

There is transit service along West Elizabeth Street and City Park. The current routes (2, 3, and 11) are within 1320 feet of the site. The combination of these routes provides good service for this site. Future transit level of service will be acceptable.

## VII. CONCLUSIONS

This study assessed the potential impacts of the Campus West Redevelopment in Fort Collins, Colorado. As a result of the analysis, the following conclusions were drawn:

- The potential impacts of the proposed project were evaluated at the following intersections: West Elizabeth/City Park and the site access driveways.

- The traffic impact analyses were performed for existing conditions and future Years 2000 and 2018. Future background traffic conditions without the project and the total traffic conditions with completion of the proposed project, were evaluated.

- Under existing conditions, each of the study intersections is currently operating at an acceptable level of service.

- For Year 2000 background and total traffic conditions, the study intersections are projected to operate at acceptable levels of service.

- For Year 2018 future background and total traffic conditions, the study intersections are projected to operate at acceptable levels of service. The required geometry in both the short range future and long range future is shown in Figure 11. The access driveways to the street system will be consolidated.

- Pedestrian access to and from the proposed Campus West Redevelopment is/will be direct and continuous. Pedestrian level of service will be acceptable for some criteria. Improvements should be made to the sidewalk system in the area as other properties redevelop or through a City initiated improvement program. Bicycle level of service will be acceptable. It is anticipated that the transit level of service will be acceptable in the future.