DRAFT REPORT

LEIDESDORFF STREET PARKING AND CIRCULATION STUDY

Submitted to:
City of Folsom

Submitted by:
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Transportation Consultants

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Table of Contents

APPENDICES

List of Tables

List of Figures

EXECUTIVE SUMMARY

This study analyzed the transportation impacts and access needs of the proposed Lake Natoma Inn and Traders Lane parking garages in the City of Folsom Historic District. Potential impacts of the two garages on the roadway, transit, pedestrian, and bicycle systems in the area were evaluated under existing and cumulative conditions. The purpose of the parking garages is to:

- relieve the localized shortfall of parking in the heart of the Historic District (i.e., the Sutter Street subarea) during typical weekday conditions;
- relieve the overall shortfall of parking throughout the area during special events; and
- provide reserve parking capacity for future development in the area.

Existing Conditions

- Field observations were conducted in October 1999 to identify the existing parking situation during typical weekday mid-day (11:30 a.m. – 1:30 p.m.) and evening (5:00 p.m. – 7:00 p.m.) conditions and during special events (e.g., Farmers Market on Friday evenings, street fairs on Saturdays). The existing parking situation is assessed as follows:

  - During typical weekday mid-day and evening peak periods, the Traders Lane parking lot and adjacent parking on Wool Street is nearly full. However, ample parking is available in lots located farther away from the heart of the Historic District. Parking does not typically overflow to the adjacent neighborhood to the south of Sutter Street during these periods.

  - During special events, nearly all on-street and off-street parking facilities in the Sutter Street subarea are full. In addition, parking typically overflows into the adjacent neighborhood located south of Sutter Street.

- The following intersections located in the vicinity of the two proposed parking garages currently operate acceptably (LOS C or better) during the mid-day and p.m. peak hours according to the City's minimum level of service policy:

  - Leidesdorff Street/Wool Street;
  - Leidesdorff Street/Riley Street; and
  - Leidesdorff Street/Folsom Boulevard Off-ramp.

- Motorists traveling northbound on Riley Street have limited visibility of Leidesdorff Street due to the substantial downhill grade north of Sutter Street. However, a review of the 1998 accident data at the Riley Street/Leidesdorff Street intersection did not show any accidents to have occurred as a result of this limited sight distance.

Project Description

- The proposed project consists of the construction of the Lake Natoma Inn and the Traders Lane parking garages (see Figure 1 for location of proposed garages), totaling 744 spaces.

- Access to the proposed parking garages is to be provided by driveways on Wool Street, Leidesdorff Street, and Riley Street. As a result of meetings with City staff, two potential access options for the garages were identified for analysis. The two options are illustrated on Figures 8 and 9 and described below:

  - Option 1 – provides access to the Traders Lane garage via a right-turn ingress only driveway on Riley Street, a right-turn ingress/egress and left-turn ingress driveway on Leidesdorff Street, and a full access driveway on Wool Street. Access to the Lake Natoma Inn garage would be provided by the existing right-turn only driveway serving the hotel on Leidesdorff Street and a new full access driveway on Leidesdorff Street directly opposite Wool Street.

  - Option 2 – is similar to Option 1, but prohibits left-turn ingress movements at the Traders Lane driveway on Leidesdorff Street and permits left-turn ingress movements at the existing Lake Natoma Inn driveway on Leidesdorff Street.

- As part of the construction of the two parking garages, several off-site improvements to the surrounding roadway, bicycle, and pedestrian systems are recommended (see Figures 8 and 9).

- The Lake Natoma Inn and Traders Lane parking garages are estimated to generate a combined 630 trips during the mid-day and p.m. peak hours assuming nearly full occupancy of each garage.

Project Impacts Under Existing Conditions

- All three study intersections are expected to continue operating acceptably during both the mid-day and p.m. peak hours with full occupancy of both parking garages with either access option. Assuming that the off-site improvements shown on Figures 8 and 9 are in place, the project is not expected to result in any off-site impacts to the roadway, transit, pedestrian, or bicycle systems.

Project Impacts Under Cumulative Conditions

- The traffic impacts of the two parking garages were evaluated under cumulative (2015) conditions assuming: 110,000 square feet of infill retail development in the Historic District, a conference center facility located on Leidesdorff Street at the present location of the City's Corporation Yard, a light rail station in the vicinity of Leidesdorff Lid, the expansion of the Lake Natoma Inn, and buildout of the Railroad Block consistent with the illustrative plan in the *Folsom Historic Railroad Block Urban Design Master Plan.*

- The Leidesdorff Street/Riley Street intersection is projected to operate unacceptably under "cumulative no project" conditions. Unacceptable operations at this intersection would be exacerbated by the addition of project trips and the provision of the northbound left-turn lane, which would reduce the green time available for southbound through movements. This finding is consistent with results from the *Circulation Element for the Historic District Specific Plan* (Fehr & Peers Associates, 1994) and the *American River Bridge Crossing Project Draft EIR* (Jones & Stokes Associates, 1992).

Analysis of Project Access

- Three driveways would be located on Leidesdorff Street to serve the two garages. Although these driveway spacings are generally adequate, the close proximity of the driveways on opposing sides of Leidesdorff Street would result in conflicting left-turn movements if all turning movements were permitted at each driveway via a two-way center left-turn lane. Therefore, access Options 1 and 2 were developed to provide channelized left-turn movements to reduce vehicle conflicts.

- A right-turn deceleration lane is recommended at the Traders Lane garage driveway on Riley Street. The amount of deceleration to be provided should be determined when the driveway location is finalized as part of the design of the parking garage.

- The Traders Lane garage driveway on Wool Street should be located as far south of Leidesdorff Street as possible to minimize the potential for northbound traffic at the Leidesdorff Street/Wool Street intersection queuing back beyond the driveway entrance.

- The 95th percentile queue length for the unsignalized left- and right-turn lanes on Leidesdorff Street and Wool Street within the study area ranges from 50 to 100 feet under Options 1 and 2. Each turn lane is recommended to include between 100 and 150 feet of vehicle storage to minimize the potential for queuing problems.

- Table 8 summarizes the traffic- and circulation-related advantages and disadvantages of Options 1 and 2. Although both options will provide adequate access, Option 1 offers more advantages and less disadvantages than Option 2.

Recommended Off-Site Improvements

- The provision of a 150-foot northbound left-turn lane from Riley Street to Leidesdorff Street is recommended to improve access to the two parking garages. The left-turn lane would be used by the majority of traffic traveling northbound on Riley Street toward the parking garages and would avoid a substantial increase in traffic on Sutter Street west of Riley Street. The northbound left-turn lane would provide storage for six vehicles, which is adequate to accommodate the projected maximum queue of five to six vehicles under near-term conditions. Since additional development in the Historic District will result in increased traffic in the northbound left-turn lane, the City should monitor operations at the intersection.

- The construction of a 50-foot northbound left-turn lane on Riley Street at Sutter Street is recommended to properly align the northbound through lanes on Riley Street approaching and departing Sutter Street. This would substantially improve operations at the Riley Street/Sutter Street intersection and would likely require the elimination of on-street parking and some shoulder improvements on both sides of Riley Street south of Sutter Street.

- The widening of Leidesdorff Street between the Folsom Boulevard Off-ramp and Wool Street to include two eastbound travel lanes, one westbound travel lane, and Class II bicycle lanes is recommended to improve access to the two parking garages. The installation of stop signs and crosswalks on all approaches to the Leidesdorff Street/Wool Street intersection is also recommended. Field observations indicate that the widening can be accomplished using a portion of the gravel area south of Leidesdorff Street and with some minor widening along the frontage of the Railroad Block.

- The provision of angled parking on the south side of Leidesdorff Street west of Wool Street is not recommended because it would preclude the ability to widen Leidesdorff Street to include two eastbound travel lanes, which is necessary to provide adequate access to the two proposed parking garages.

I. INTRODUCTION

Purpose

This study analyzes the transportation impacts and access needs of the proposed Lake Natoma Inn and Traders Lane parking garages in the City of Folsom Historic District. Potential impacts of the two garages on the roadway, transit, pedestrian, and bicycle systems in the area were evaluated under existing and cumulative conditions. The primary purposes of the parking garages are to:

- relieve the localized shortfall of parking in the heart of the Historic District (i.e., the Sutter Street subarea) during typical weekday conditions;
- relieve the overall shortfall of parking throughout the area during special events; and
- provide reserve parking capacity for future development in the area.

Study Area

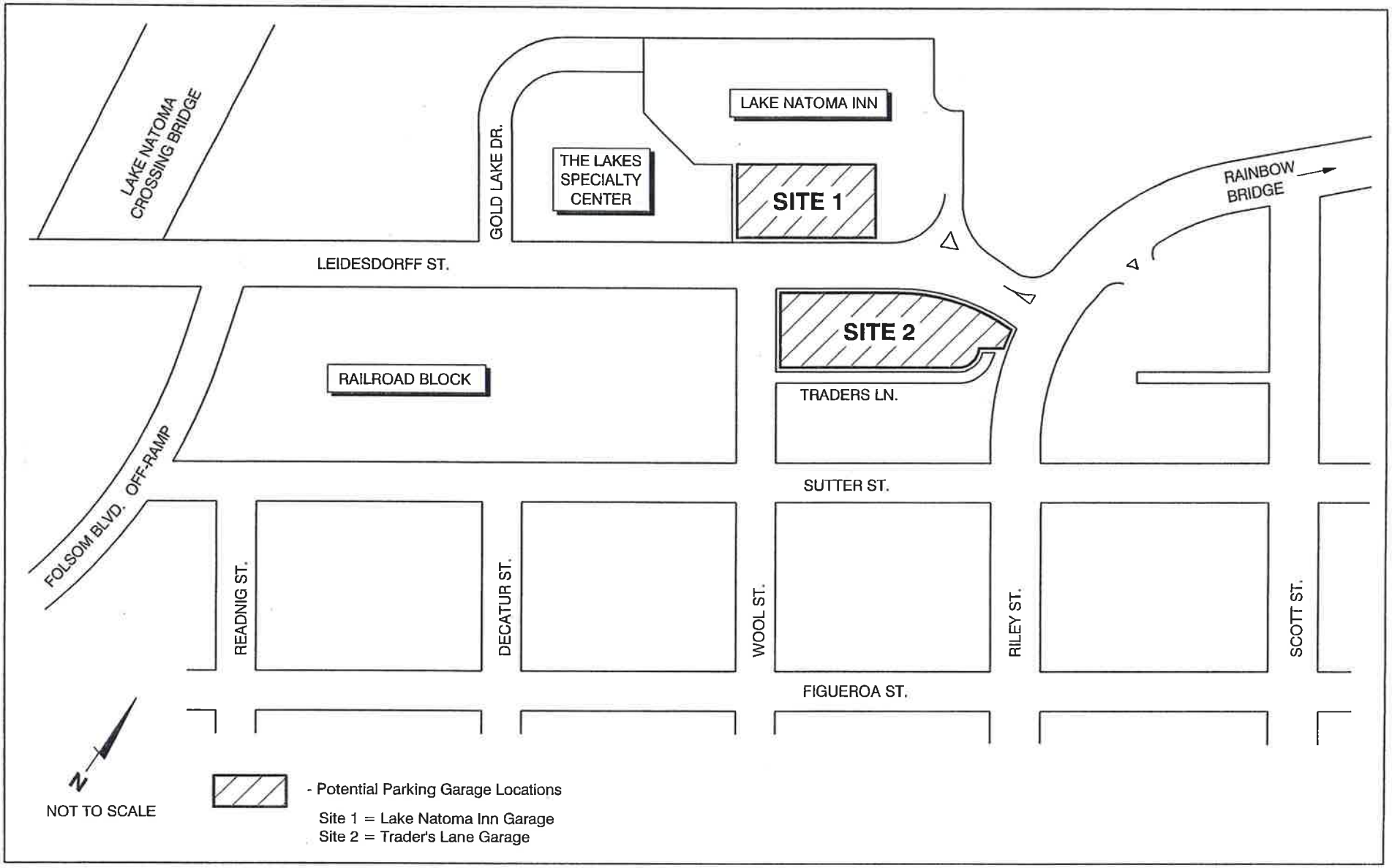
Figure 1 illustrates the study area and the proposed locations of the two parking garages (i.e., the "project"). The potential transportation impacts and access needs of the two garages were evaluated on the segments of Leidesdorff Street, Riley Street, and Wool Street within the study area.

Synopsis of Previous Studies in the Area

Several studies of parking and circulation within the Historic District have been completed over the past several years. Most recently, a parking feasibility study was completed by Seifel & Associates in December 1997 to evaluate the cost and financial feasibility of several potential sites for parking in the Historic District. Prior to that, the Folsom Historic District Specific Plan (1996) and Railroad Block Master Plan (1996) were completed. The Historic District Specific Plan set forth recommended parking ratios and phased improvements to the vehicular, bicycle, and pedestrian systems within the Historic District.

Analysis Methodology

Level of service (LOS) is a term that describes the operating performance of an intersection or roadway. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst. Table 1 relates the LOS letter designation to a general description of traffic operations.



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STUDY AREA

FIGURE 1

Table 1
Level of Service Description

Level of Service	Description	Average Delay (seconds/vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Represents free flow. Individual users are virtually unaffected by others in the traffic stream.	≤ 5.0	≤ 5.0
B	Stable flow, but the presence of other users in the traffic stream begins to be noticeable.	5.1 – 15.0	5.1 – 10.0
C	Stable flow, but the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.	15.1 – 25.0	10.1 – 20.0
D	Represents high-density, but stable flow.	25.1 – 40.0	20.1 – 30.0
E	Represents operating conditions at or near the capacity level.	40.1 – 60.0	30.1 – 45.0
F	Represents forced or breakdown flow.	> 60.0	> 45.0

Source: *Highway Capacity Manual - Special Report 209* (Transportation Research Board, 1994).

Intersections were analyzed using the methodology contained in the *Highway Capacity Manual - Special Report 209* (Transportation Research Board, 1994). Table 1 displays the average delay thresholds for each service level for signalized and unsignalized intersections.

Policy 17.17 of the *City of Folsom General Plan Update* (January, 1993) specifies that LOS C is the minimum acceptable level of service for intersections in the City. Thus, LOS C is considered the minimum acceptable level of service for intersections and roadways in this study.

II. EXISTING CONDITIONS

This chapter describes the existing transportation system in the vicinity of the two proposed parking garages including the existing parking situation and traffic conditions.

Parking Situation

Fehr & Peers Associates performed parking surveys within the Folsom Historic District area in October 1999 during typical weekday mid-day (11:30 a.m. – 1:30 p.m.) and evening (5:00 p.m. – 7:00 p.m.) conditions and during special events (e.g., Farmers Market on Friday evenings, street fairs on Saturdays). Figure 2 shows the existing parking supply in the study area. The existing parking situation is assessed as follows:

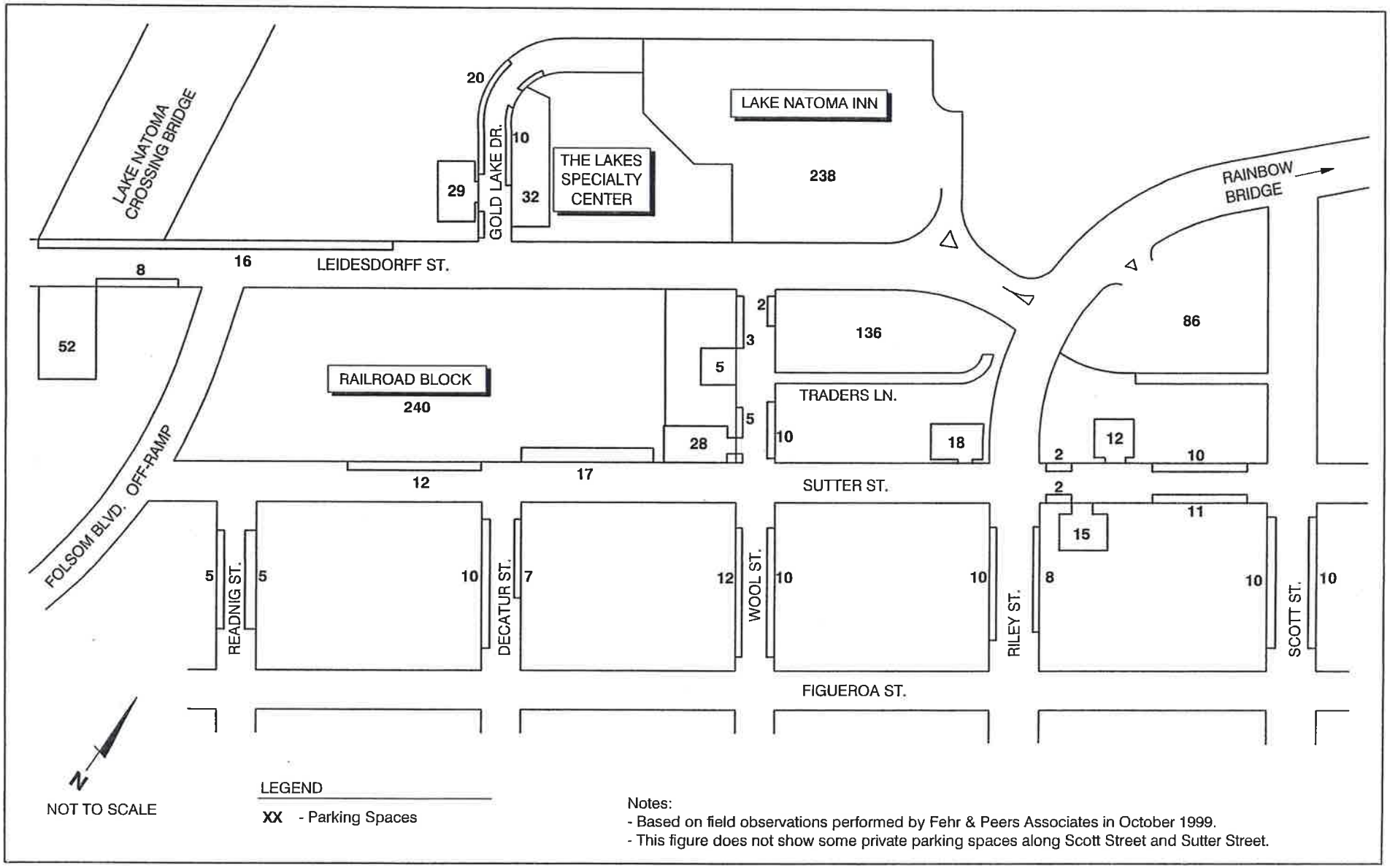
- During typical weekday mid-day and evening peak periods, the Traders Lane parking lot and adjacent parking on Wool Street is nearly full. However, ample parking is available in lots (e.g., Railroad Block, Scott Street lot) located farther away from the heart of the Historic District (defined as Sutter Street between Wool Street and Riley Street). Parking does not typically overflow to the adjacent neighborhood to the south of Sutter Street during these periods. Figures 3 and 4 show the existing parking demand during typical weekday mid-day and evening peak periods, respectively.

- During special events, nearly all on-street and off-street parking facilities in the Sutter Street subarea are full. In addition, parking typically overflows into the adjacent neighborhood located south of Sutter Street. Figure 5 shows the existing parking demand during special events.

Roadway System

Figure 6 displays the configuration (travel lanes, traffic control devices, etc.) of the roadway system in the study area. A brief description of the key roadways in the area is provided below.

Leidesdorff Street – begins at Riley Street and extends west across the Lake Natoma Crossing Bridge (via the "Leidesdorff Lid") to the entrance to the City's Corporation Yard. Leidesdorff Street has two eastbound travel lanes and one westbound travel lane from Riley Street to Wool Street, and one travel lane in each direction west of Wool Street. Leidesdorff Street provides access to the Lakes Shopping Center, the Lake Natoma Inn, and parking (via the Traders Lane and Railroad Block lots) that serves the retail uses and historic attractions in the area.



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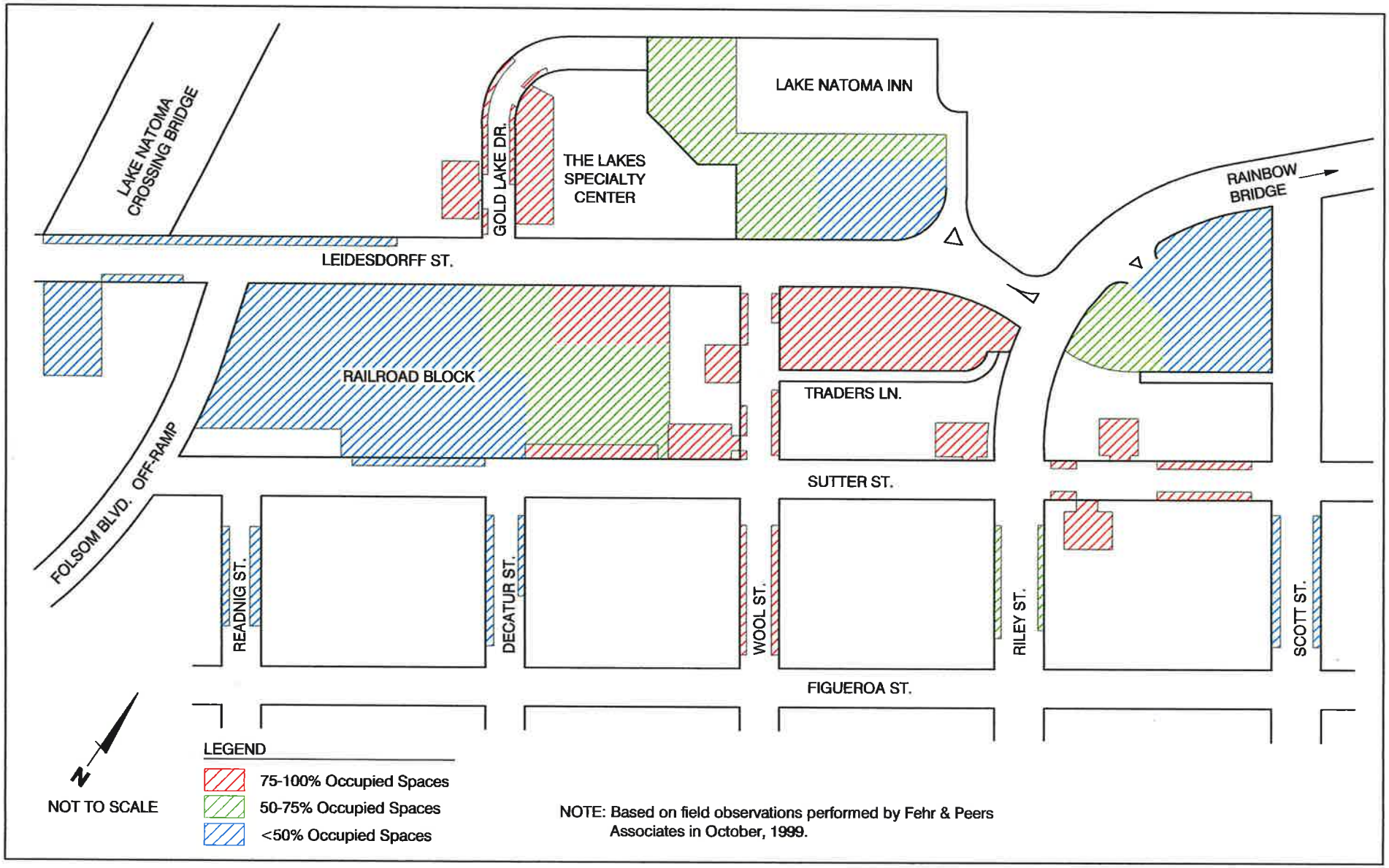
EXISTING PARKING SUPPLY

FIGURE 2



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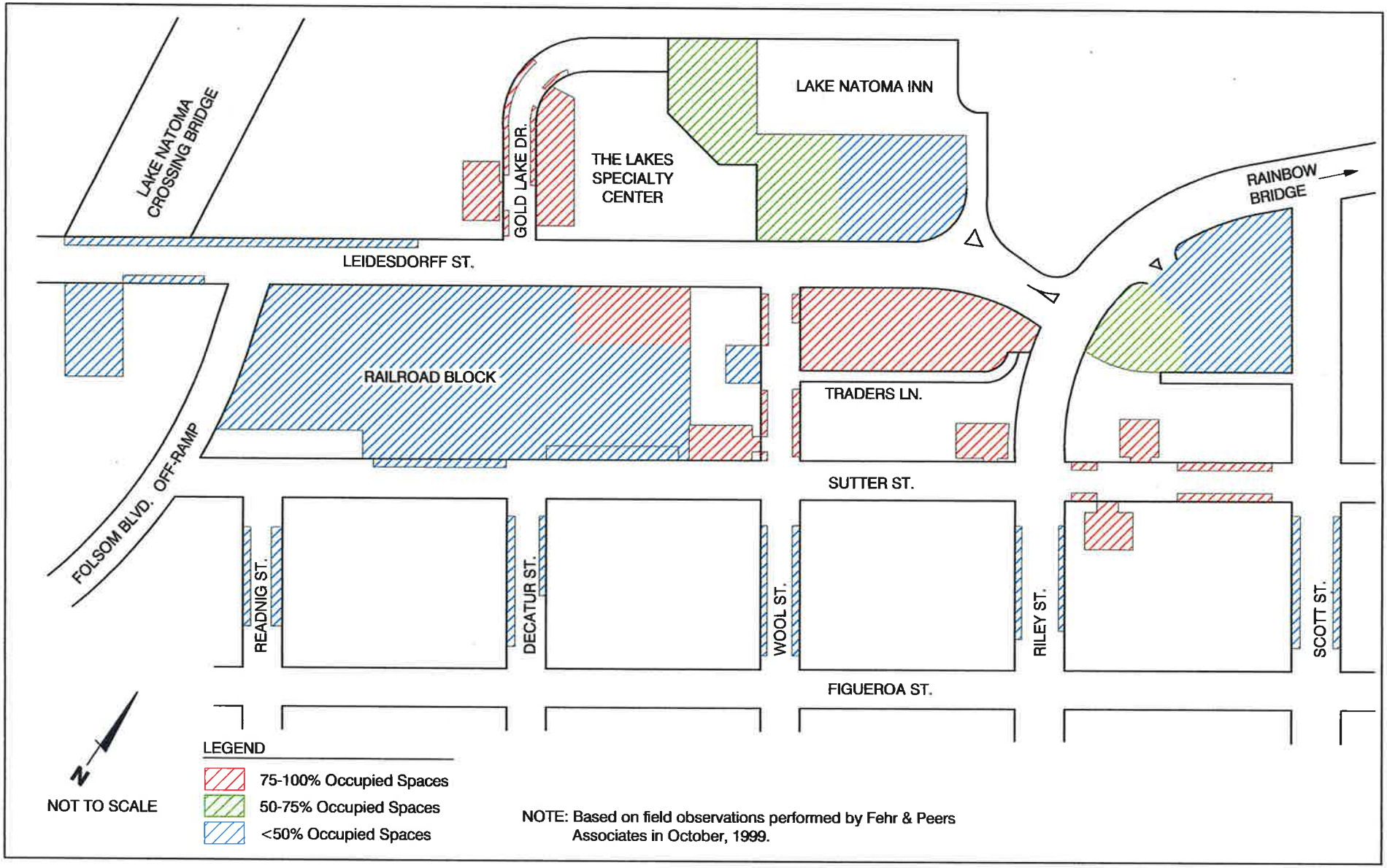
EXISTING PARKING DEMAND-
TYPICAL WEEKDAY MID-DAY PEAK HOUR

FIGURE 3



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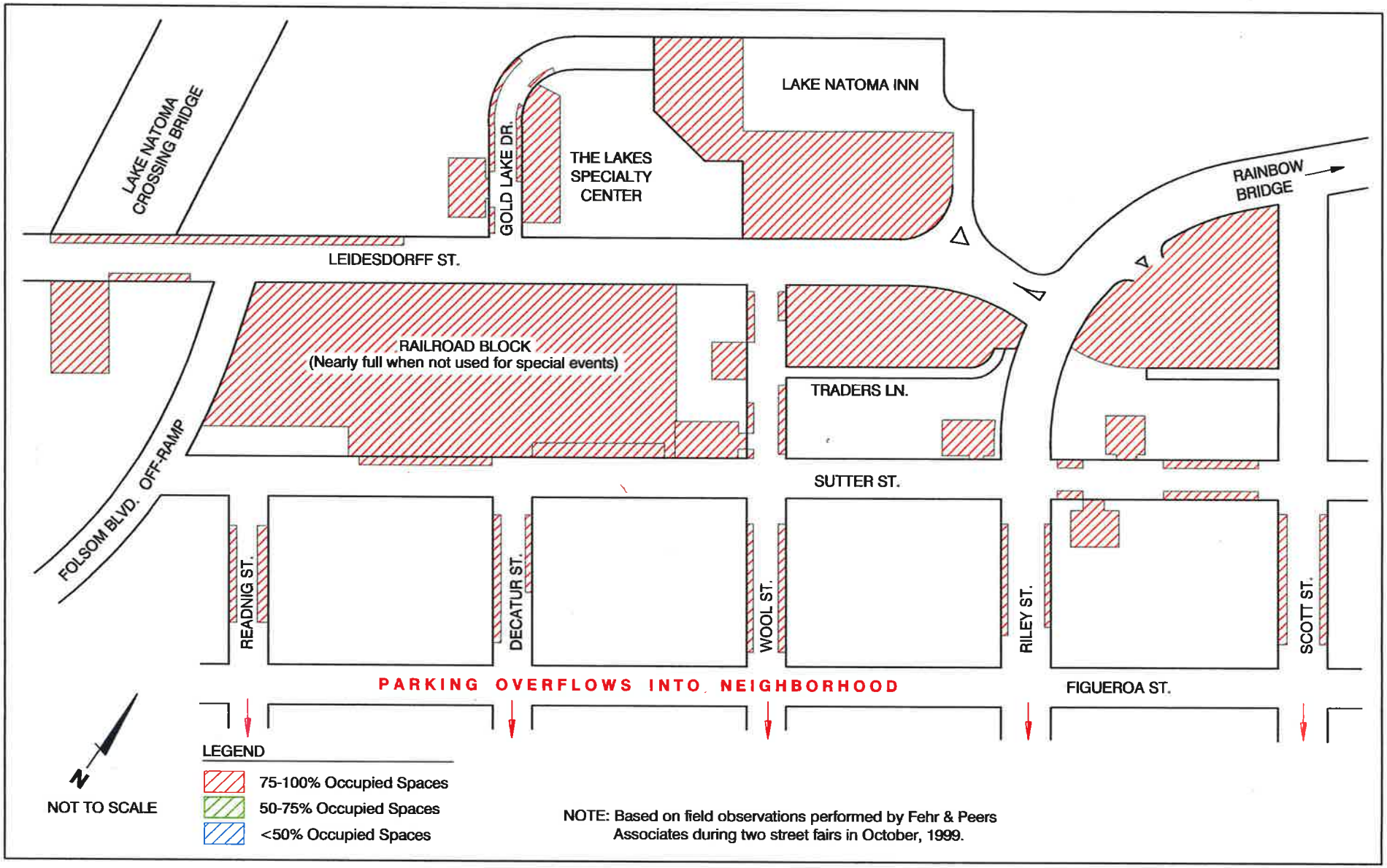
EXISTING PARKING DEMAND-
TYPICAL WEEKDAY EVENING PEAK HOUR

FIGURE 4



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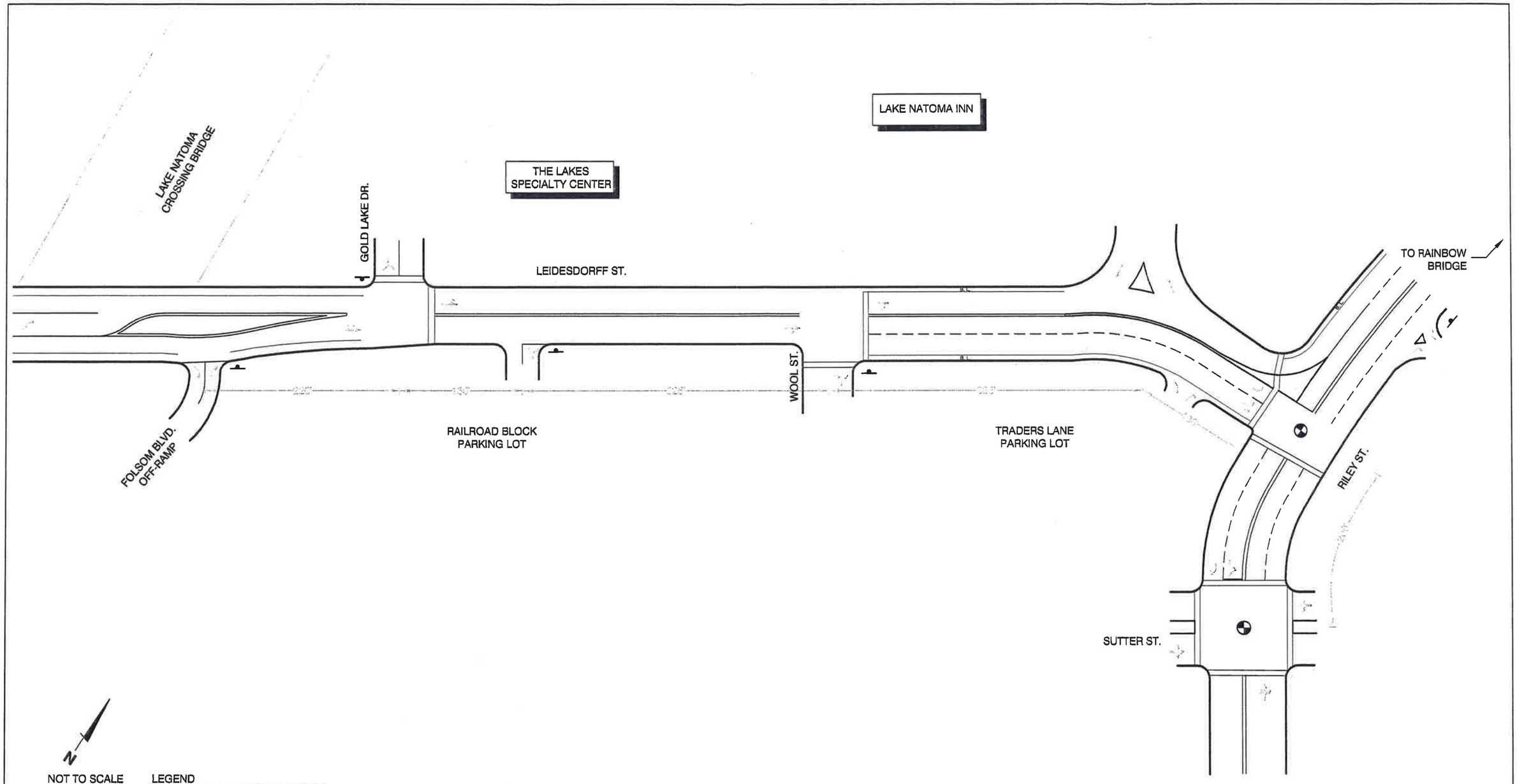
EXISTING PARKING DEMAND-SPECIAL EVENTS

FIGURE 5



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EXISTING LANE CONFIGURATIONS AND PEDESTRIAN AND BICYCLE FACILITIES ON LEIDESDORFF STREET AND RILEY STREET

FIGURE 6

Riley Street – begins at the Rainbow Bridge and extends south through the Historic District to Blue Ravine Road. Riley Street has one lane in each direction from the Rainbow Bridge to Scott Street, two lanes in each direction between Sutter Street and Scott Street, and one lane in each direction south of Sutter Street. In addition to being a primary access route to the Historic District, Riley Street is an important commute route across the American River.

Wool Street – begins at Leidesdorff Street and extends south as a two-lane street through the Historic District to Bidwell Street. Wool Street provides access to the retail uses and historic attractions in the vicinity of Sutter Street and residences south of Sutter Street.

Sutter Street – begins at Coloma Street and extends west as a two-lane street through the Historic District to the Folsom Boulevard off-ramp. The majority of the retail uses in the Historic District and some residences are located on Sutter Street. Segments of Sutter Street are often closed to vehicular traffic during special events.

Transit System

Public transportation within the City of Folsom is provided by the Folsom Stage Line. The Folsom Stage Line provides fixed-route bus service throughout the City with a bus stop located on Sutter Street east of Riley Street within the Historic District. The bus service provides flexibility for riders to either flag a bus down along its route or ask to be dropped off at points in between scheduled stops. The Folsom Stage Line also provides dial-a-ride service for residents with disabilities and senior citizens.

Bicycle and Pedestrian System

The bicycle and pedestrian system within the study area consists of on-street bike lanes, sidewalks, crosswalks, and pedestrian paths. Class II bike lanes (i.e., a dedicated on-street lane with appropriate signing and striping) exist on both sides of Leidesdorff Street between Wool Street and Riley Street and on the west side of Riley Street between Scott Street and Leidesdorff Street. Although not a designated bike lane, the wide shoulders on Leidesdorff Street in the vicinity of the Leidesdorff Lid are also suitable for bicyclists.

Sidewalks exist on the south side of Leidesdorff Street between Riley Street and Wool Street and on the north side of Leidesdorff Street between Wool Street and Gold Lake Drive. Sidewalks are also provided on both sides of Riley Street between Scott Street and Sutter Street and on various segments of other streets in the Historic District. Crosswalks are provided at numerous intersections in the study area including: Riley Street/Sutter Street, Riley Street/Leidesdorff

Street, Riley Street/Scott Street, Leidesdorff Street/Wool Street, and Leidesdorff Street/Gold Lake Drive. The traffic signals on Riley Street at Sutter Street, Leidesdorff Street, and Scott Street feature actuated push-button pedestrian crossings.

Existing Traffic Volumes

Fehr & Peers Associates performed traffic counts at the following three study intersections during the mid-day (11:30 a.m. – 1:30 p.m.) and p.m. (5:00 – 7:00 p.m.) peak periods on Thursday, October 7, 1999:

- Leidesdorff Street/Riley Street;
- Leidesdorff Street/Wool Street; and
- Leidesdorff Street/Folsom Boulevard Off-ramp.

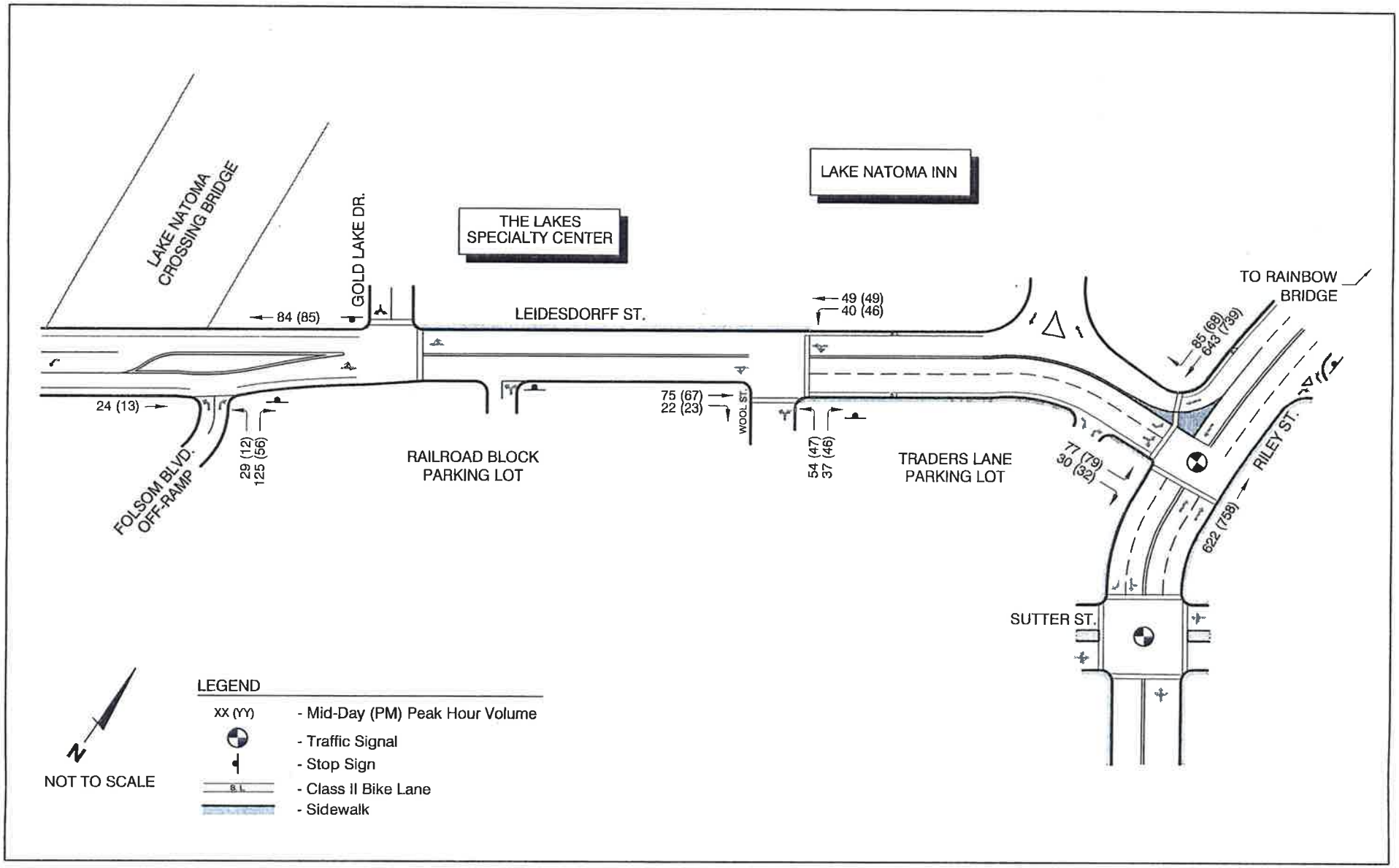
These periods were selected for analysis as they generally represent the peak parking demands in the Historic District during a typical weekday.

As shown on Figure 7, the Leidesdorff Street/Riley Street intersection is signalized and the Leidesdorff Street/Wool Street and Leidesdorff Street/Folsom Boulevard Off-ramp intersections are stop-controlled. This figure also displays the existing mid-day and p.m. peak hour traffic volumes at each intersection.

Levels of Service

Table 2 displays the existing mid-day and p.m. peak hour level of service at each study intersection (see Appendix A for technical calculations). All three study intersections currently operate at LOS A during the mid-day and p.m. peak hours. Thus, according to the City's minimum level of service standard, these intersections operate acceptably.

The modest delays at the signalized Riley Street/Leidesdorff Street intersection are attributable to this intersection being coordinated with the adjacent signalized Riley Street/Scott Street and Riley Street/Sutter Street intersections. The favorable signal timing for through traffic on Riley Street results in most vehicles on the Riley Street approaches passing through the intersection without stopping, and consequently, modest overall delays at the intersection.



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MID-DAY AND P.M. PEAK HOUR TRAFFIC VOLUMES - EXISTING CONDITIONS

FIGURE 7

Table 2
Mid-Day and P.M. Peak Hour Intersection Levels of Service – Existing Conditions

Intersection	Control	Mid-Day Peak Hour		P.M. Peak Hour	
		Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service
Leidesdorff Street/ Riley Street	Traffic Signal	4.0	A	4.2	A
Leidesdorff Street/ Wool Street	Stop-Control	1.9	A	1.9	A
Leidesdorff Street/Folsom Boulevard Off-Ramp	Stop-Control	2.0	A	1.3	A

Source: Fehr & Peers Associates, 1999.

Accident Data

The City of Folsom Public Works Department provided accident data for 1998 at the Leidesdorff Street/Riley Street intersection. The data indicated that five accidents occurred at this intersection in 1998, none of which resulted in any injuries or fatalities. Four of these accidents involved vehicles improperly turning left (e.g., running a red light, unsafe speed, unsafe lane change, etc.) from Leidesdorff Street onto Riley Street. One rear-end accident occurred on the northbound approach to the intersection as a result of wet pavement conditions and unsafe travel speeds.

Sight Distance on Riley Street

Motorists traveling northbound on Riley Street have limited visibility of Leidesdorff Street due to the substantial downhill grade north of Sutter Street. Minimum sight distance requirements, as prescribed in the *Highway Design Manual* (Caltrans, 1995), are not met at the Riley Street/Leidesdorff Street intersection. However, the 1998 accident data did not show any accidents to have occurred as a result of this limited sight distance.

III. EXISTING PLUS PROJECT CONDITIONS

This chapter evaluates the transportation impacts of the two parking garages under existing conditions.

Project Description

The proposed project consists of the construction of the Lake Natoma Inn and the Traders Lane parking garages. The Lake Natoma Inn garage would be a four-level garage with 332 parking spaces. The first level would be at-grade with the existing Lake Natoma Inn parking lot and the fourth level would be at-grade with Leidesdorff Street. The Traders Lane garage would be a three-level garage with 412 parking spaces. The first level would be below ground.

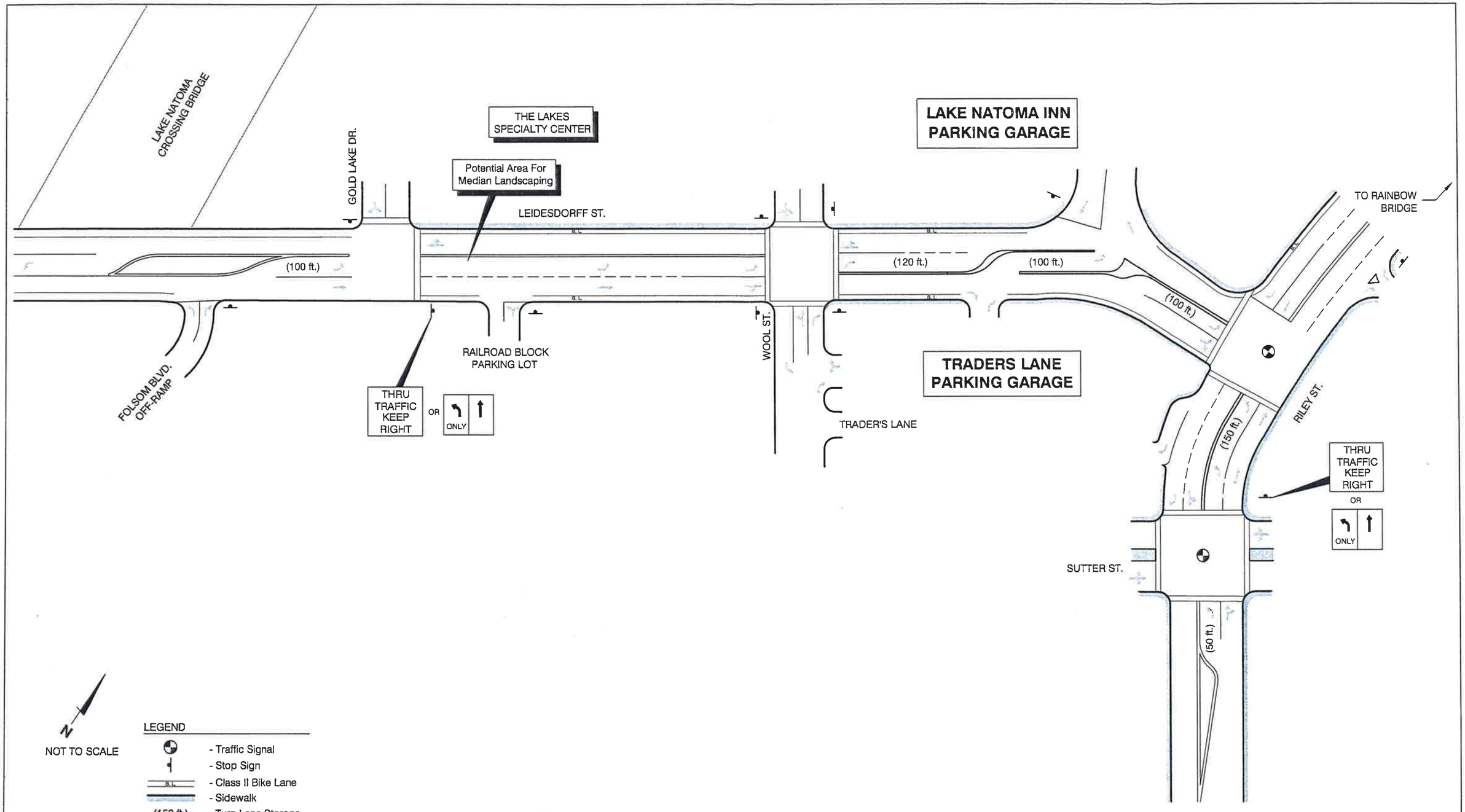
Access to the proposed parking garages is to be provided by driveways on Wool Street, Leidesdorff Street, and Riley Street. As a result of meetings with City of Folsom Redevelopment Agency and Department of Public Works staff, the following two potential access options for the garages were identified for analysis:

- Option 1 – would provide access to the Traders Lane garage via a right-turn ingress only driveway on Riley Street, a right-turn ingress/egress and left-turn ingress driveway on Leidesdorff Street, and a full access driveway on Wool Street. Access to the Lake Natoma Inn garage would be provided by the existing right-turn only driveway serving the hotel on Leidesdorff Street and a new full access driveway on Leidesdorff Street directly opposite Wool Street.

- Option 2 – is similar to Option 1, but prohibits left-turn ingress movements at the Traders Lane driveway on Leidesdorff Street and permits left-turn ingress movements at the existing Lake Natoma Inn driveway on Leidesdorff Street.

Figures 8 and 9 display the proposed access to each garage under Options 1 and 2, respectively.

As part of the construction of the two parking garages, some off-site improvements to the surrounding roadway, bicycle, and pedestrian systems are recommended to allow for adequate access to each garage. These recommendations are described below and apply to both access options:



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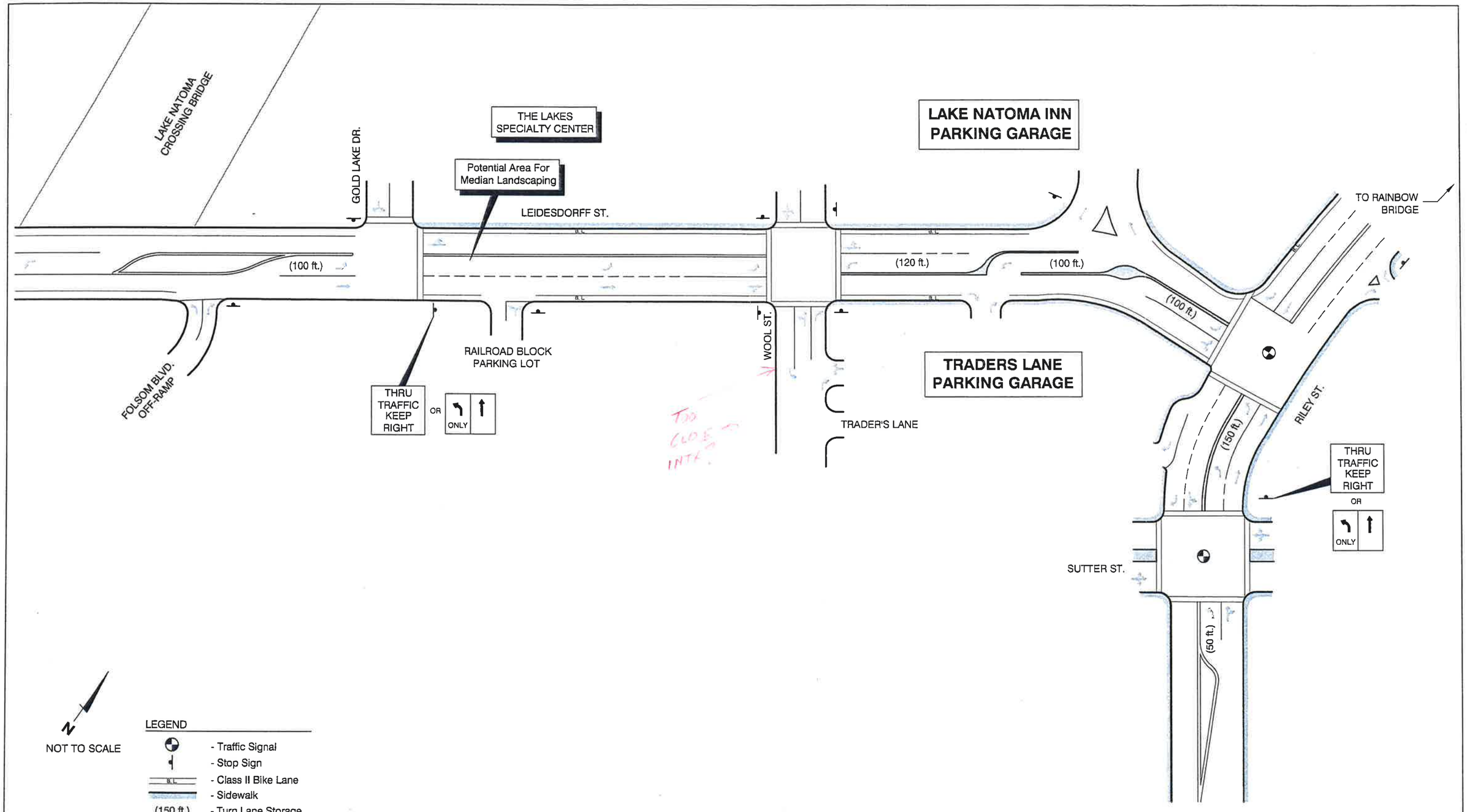
RECOMMENDED ACCESS UNDER OPTION 2

FIGURE 9



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RECOMMENDED ACCESS UNDER OPTION 1

FIGURE 8

- Permit northbound left-turn movements from Riley Street to Leidesdorff Street.
  The provision of a 150-foot northbound left-turn lane from Riley Street to Leidesdorff Street is important to provide adequate access to the two parking garages. The left-turn lane would be used by the majority of traffic traveling northbound on Riley Street toward the parking garages. If the two parking garages were constructed and left-turns were not permitted at this intersection, significant increases in traffic would likely occur on certain streets in the Historic District including Sutter Street, Figueroa Street, Wool Street, and Scott Street as motorists use other travel routes to access the parking garages.

- Modify the Riley Street/Leidesdorff Street intersection.
  To accommodate left-turns from northbound Riley Street, the existing island in the northwest corner of the intersection would need to be removed. In addition, the southbound right-turn lane would be placed under the control of the traffic signal.

- Construct a 50-foot northbound left-turn lane on Riley Street at Sutter Street.
  This improvement is necessary to align the northbound through lane on Riley Street approaching Sutter Street with the outside through lane approaching Leidesdorff Street. It would substantially improve operations at the Riley Street/Sutter Street intersection by reducing disruptions to the flow of northbound through traffic caused by left-turning vehicles.

- Install a narrow raised median separating the northbound and southbound travel lanes on Riley Street between Sutter Street and Leidesdorff Street.
  This improvement is necessary to eliminate the potential of northbound motorists on Riley Street turning left into the driveway serving the Traders Lane garage.

- Restripe the middle travel lane on Leidesdorff Street between Wool Street and Riley Street to provide channelized left-turns.
  This improvement is necessary to allow westbound left-turn ingress movements into the Traders Lane garage (under Option 1) or eastbound left-turn ingress movements into the Lake Natoma Inn garage (under Option 2).

- Widen Leidesdorff Street between the Folsom Boulevard Off-ramp and Wool Street to include two eastbound travel lanes and Class II bicycle lanes.
  This improvement is necessary to align the eastbound and westbound travel lanes on Leidesdorff Street on either side of Wool Street and to provide an exclusive

eastbound left-turn ingress lane into the Lake Natoma Inn garage driveway (directly opposite Wool Street). The provision of Class II bike lanes along this segment will provide improved connectivity of bike lanes in the Historic District.

- Install stop signs and crosswalks on all approaches to the Leidesdorff Street/Wool Street intersection.
  This improvement is recommended to accommodate projected vehicular and pedestrian traffic.

Chapter VI provides a more detailed discussion of these recommended off-site improvements.

Trip Generation

To evaluate the potential off-site traffic impacts and access needs of the two parking garages, the number of mid-day and p.m. peak hour trips generated by each garage was estimated from recent driveway counts at the Traders Lane parking lot and historical data of parking lot entry/exit vehicle ratios for various land uses. Trips generated by the two parking garages were classified into one of the following three categories:

- Existing – vehicles that currently park in the two lots that the proposed parking garages would occupy;
- Shifted – vehicles that relocate to the parking garages from more remote parking areas; and
- New – vehicles that make a new trip to the Historic District and park in either parking garage as a result of the added convenience provided by the garages or as a result of new retail development in the Historic District.

Traffic counts were performed during the mid-day and evening peak hours of a typical weekday at the Traders Lane parking lot driveways. During these periods, an average of 115 vehicles entered or exited the parking lot[1]. Approximately 60 percent of vehicles were inbound during the mid-day peak hour and 50 percent of vehicles were inbound during the evening peak hour. Based on these counts, the "entry/exit ratio[2]" was calculated to be 0.85 (115 vehicles ÷ 136 total parking spaces).

1 This count does not include motorists who circulated through the lot looking for a space and then exited after not finding one.

2 The "Entry/Exit Ratio" is defined as the number of vehicles entering and exiting the parking lot during the peak hour divided by the parking lot capacity.

Historical parking lot traffic generation data was reviewed to determine the expected ranges of entry/exit ratios for the land uses to be served by the parking garages. Retail uses typically have entry/exit ratios ranging from 0.45 to 0.65. Restaurants typically have entry/exit ratios ranging from 0.80 to 0.95.

For analysis purposes, an entry/exit ratio of 0.85 was used for the two parking garages. This ratio is consistent with field observations at the Traders Lane parking lot and is within the commonly-accepted ranges for parking lots serving the land use types (i.e., primarily restaurants and retail) within the Historic District.

Table 3 summarizes the estimated mid-day and p.m. peak hour trip generation of each garage. The Lake Natoma Inn and Traders Lane parking garages are estimated to generate 280 and 350 trips, respectively, during the mid-day and p.m. peak hours. These trip generation estimates assume nearly full occupancy of each garage, which is required to properly analyze the environmental impacts and determine the appropriate access needs of the project.

Table 3
Estimated Peak Hour Trip Generation of Parking Garages

Parking Garage	Total Parking Spaces	Mid-day Peak Hour			P.M. Peak Hour		
		In	Out	Total[1,2]	In	Out	Total[1,3]
Lake Natoma Inn	332	170	110	280	140	140	280
Traders Lane	412	210	140	350	175	175	350

Notes: [1] Based on a ratio of 0.85 peak hour trips (entering and exiting) per parking space.
[2] 60 percent of mid-day peak hour trips are assumed to be inbound.
[3] 50 percent of p.m. peak hour trips are assumed to be inbound.
Source: Fehr & Peers Associates, 1999.

Table 4 displays the estimated number of existing, shifted, and new peak hour vehicle trips generated by each parking garage. The number of shifted and new trips generated by each garage was determined based on the proportion of available spaces (i.e., spaces not occupied by existing vehicles) in each garage. The two garages are expected to generate a combined 330 new mid-day peak hour trips and 370 new p.m. peak hour trips to/from the Historic District. Based on existing travel and parking patterns, 50 percent of the shifted trips were assumed to be new trips onto Leidesdorff Street. The other 50 percent of the shifted trips represent motorists who currently search unsuccessfully for a parking space in the area (i.e., these trips are included in the existing traffic volumes). Therefore, the two parking garages are expected to add approximately 410 new mid-day peak hour trips and 430 new p.m. peak hour trips onto Leidesdorff Street, Riley Street, or Wool Street.

Table 4
Estimated Number of Existing, Shifted, and New Trips of Parking Garages

Parking Garage	Total Parking Spaces	Mid-day Peak Hour				P.M. Peak Hour			
		Existing Trips	Shifted Trips	New Trips	Total Trips	Existing Trips	Shifted Trips	New Trips	Total Trips
Lake Natoma Inn	332	20	80	180	280	20	50	210	280
Traders Lane	412	120	80	150	350	120	70	160	350

Notes: The trip generation of the Lake Natoma Inn expansion is included as a portion of the new trips for the Lake Natoma Inn garage.
Source: Fehr & Peers Associates, 1999.

Trip Distribution and Assignment

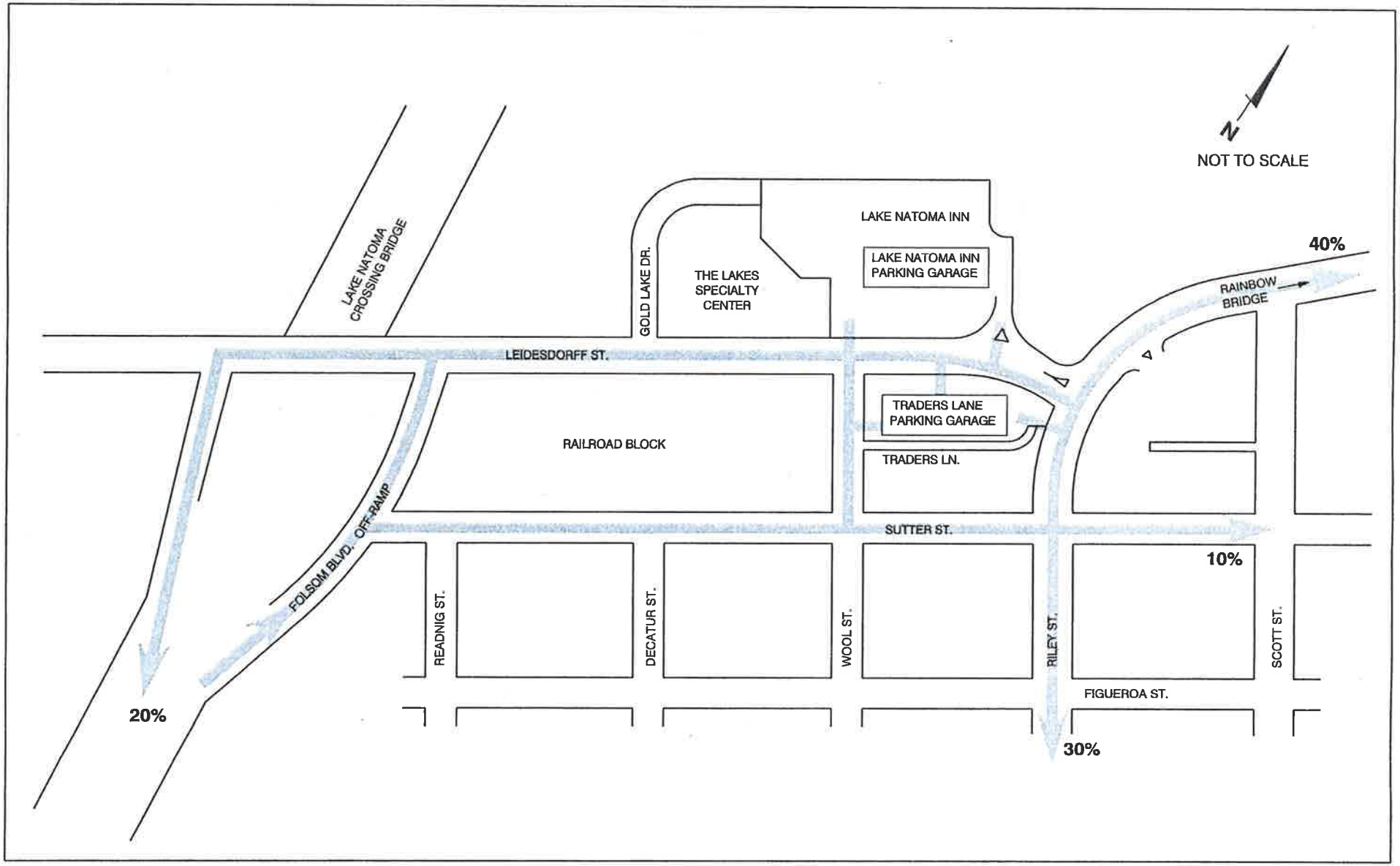
The distribution of new trips to the parking garages was determined based on existing travel patterns of traffic entering and exiting the Historic District. Figure 10 displays the expected project trip distribution.

Under Option 1, nearly all new project trips to/from the south on Riley Street are expected to use Leidesdorff Street to access the two parking garages. Under Option 2, most project trips will still use Leidesdorff Street, but some trips are also expected to use Sutter Street (because westbound left-turn movements from Leidesdorff Street into the Traders Lane garage are not allowed).

Traffic Volumes

Project trips were assigned to the study intersections based on the trip distribution percentages shown on Figure 10 and then added to existing traffic volumes to yield the "existing plus project" volumes shown on Figures 11 and 12 for access Options 1 and 2, respectively. These figures also display the peak hour traffic volumes at the driveways serving the two parking garages.

The projected left-turn volume from northbound Riley Street to Leidesdorff Street includes existing traffic that currently turns onto Sutter Street and project-related trips. These volumes were then increased by 25 percent to account for the potential for vehicles that currently use other routes (e.g., Folsom Boulevard or Sibley Street) to access the Historic District to use this route. This approach ensures that the volume of traffic turning left (and the resulting storage requirements in the left-turn lane) is not underestimated.



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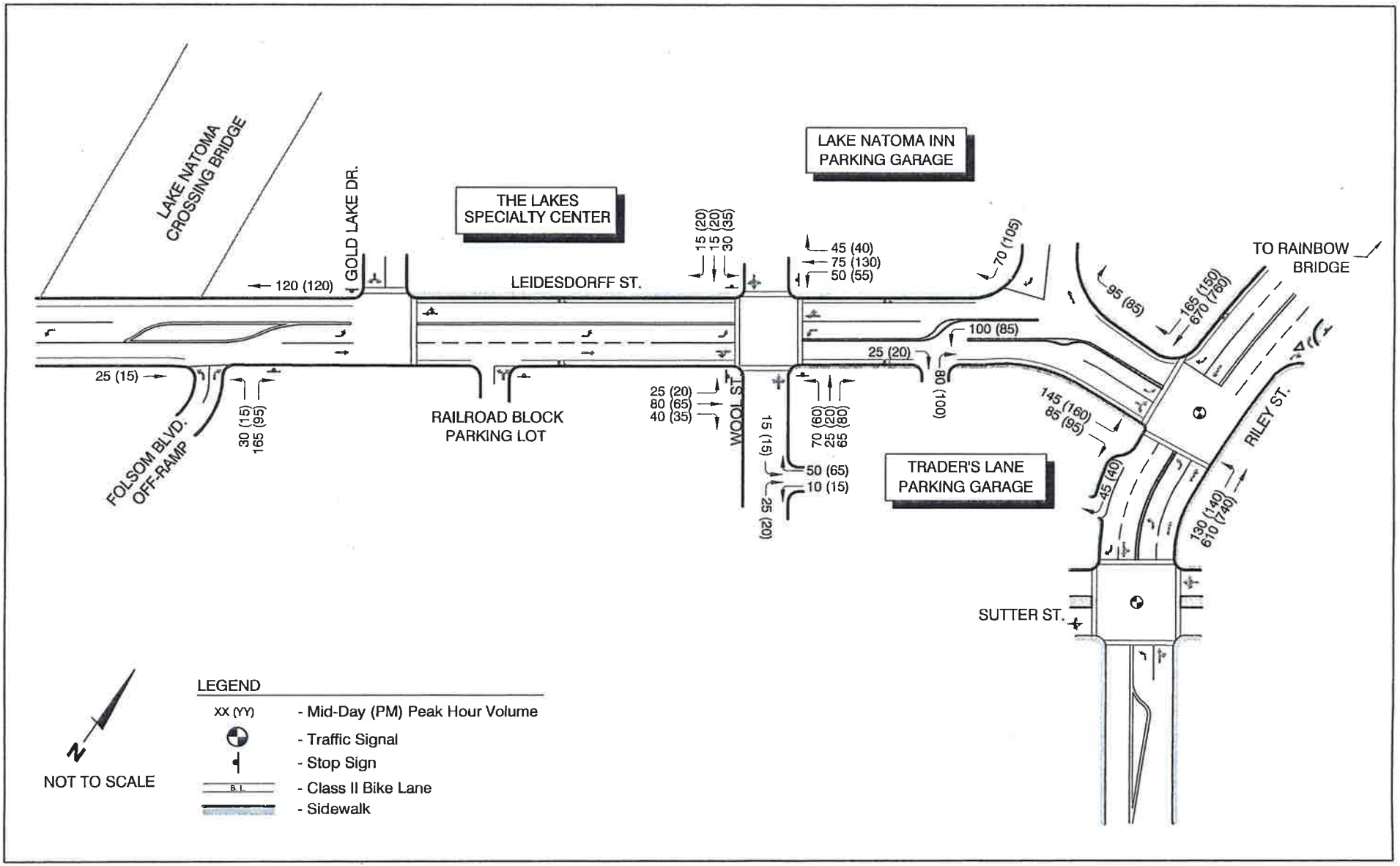
EXPECTED DISTRIBUTION OF NEW PROJECT TRIPS

FIGURE 10



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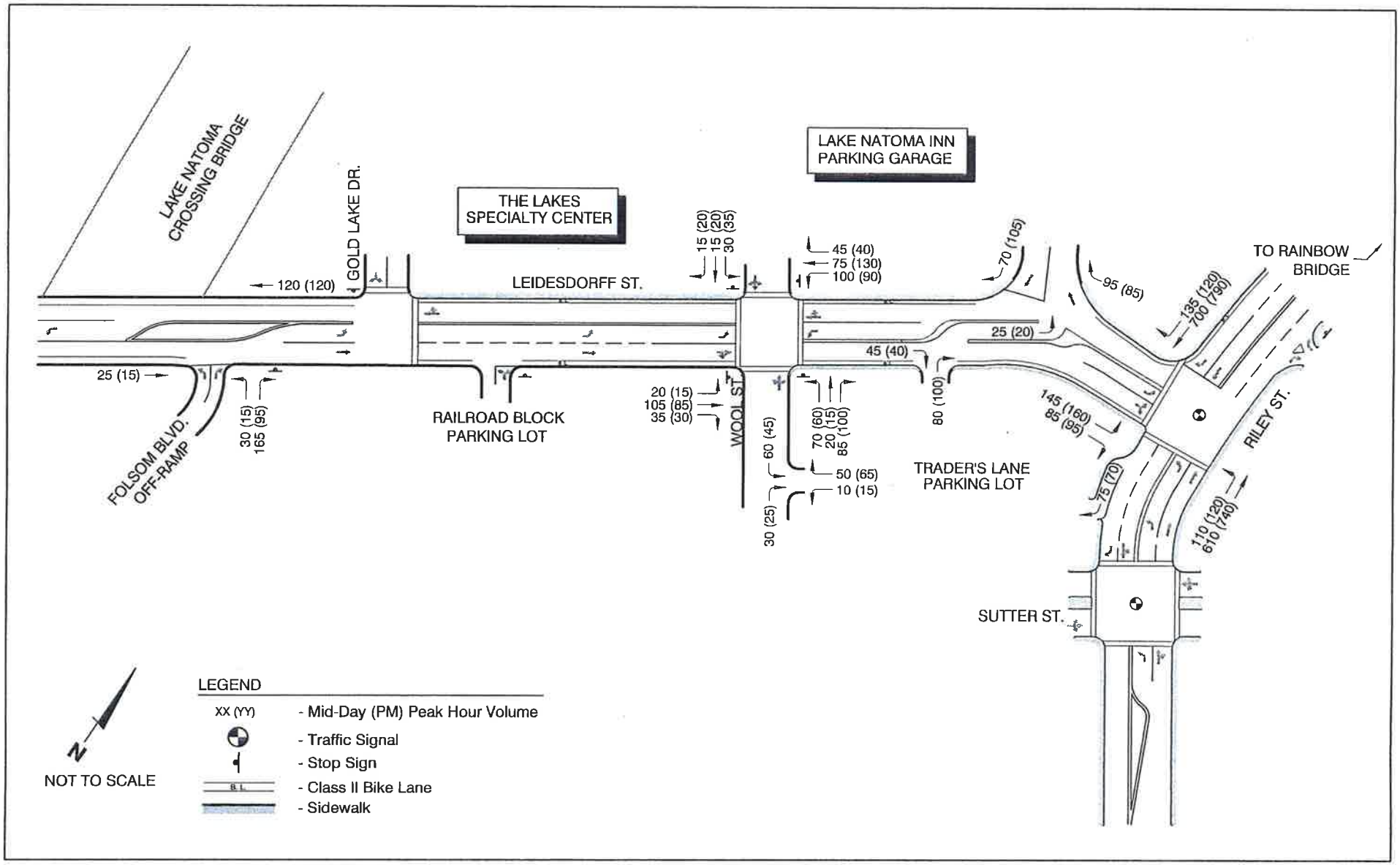
MID-DAY AND P.M. PEAK HOUR TRAFFIC VOLUMES - EXISTING PLUS PROJECT (OPTION 1) CONDITIONS

FIGURE 11



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MID-DAY AND P.M. PEAK HOUR TRAFFIC VOLUMES-EXISTING PLUS PROJECT (OPTION 2) CONDITIONS

FIGURE 12

Levels of Service

Table 5 displays the average delays and levels of service at the study intersections under existing plus project conditions for each option (see Appendix B for technical calculations). The recommended off-site improvements for each access option were assumed in place for the analysis.

Table 5
Mid-Day and P.M. Peak Hour Intersection Levels of Service – Existing Plus Project Conditions

	Mid-Day Peak Hour				P.M. Peak Hour			
	Option 1		Option 2		Option 1		Option 2	
Intersection	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service
Leidesdorff St./ Riley Street	15.7	C	12.7	B	16.3	C	14.0	B
Leidesdorff St./ Wool Street	3.8	A	5.6	B	4.1	A	5.3	B
Leidesdorff St./ Folsom Blvd. Off-Ramp	2.0	A	2.0	A	1.4	A	1.4	A

Source: Fehr & Peers Associates, 1999.

According to Table 5, all three study intersections are expected to operate acceptably (i.e., LOS C or better) during both the mid-day and p.m. peak hours under Options 1 and 2. Option 2 results in slightly greater delays at the Leidesdorff Street/Wool Street intersection due to the elimination of the westbound left-turn lane into the Traders Lane garage (many of these would-be left-turns would travel through this intersection to access the garage driveway on Wool Street).

Since all study intersections are projected to continue operating acceptably with the addition of project traffic (with the recommended off-site improvements in place), no significant impacts to the roadway system were identified.

Impacts to the Transit System

Potential impacts to the transit system were determined by comparing the project description for compatibility with existing or planned transit facilities and goals, objectives, and policies in the City of Folsom General Plan and the Historic District Specific Plan. The following policies contained in these documents relate to transit services:

> "The City should plan for the expansion of future public transit routes (bus and fixed rail service)." (Source: Policy 17.9 of the City of Folsom General Plan)
>
> "Circulation and project designs shall allow for future development of transit routes and facilities, including a potential multi-use terminal." (Source: Policy 4.3 of the Folsom Historic District Specific Plan)

A multi-modal transportation facility is planned in the vicinity of the Leidesdorff Lid. The multi-modal station will include a Regional Transit light rail station, bus stops, and parking. Construction of the proposed parking garages would not increase the demand for transit services in the area, nor adversely affect existing or planned transit services or facilities. Therefore, no impacts to the transit system were identified.

Impacts to the Bicycle and Pedestrian System

Potential impacts to the bicycle and pedestrian system were determined by comparing the project description for compatibility with existing or planned bicycle and pedestrian facilities and goals, objectives, and policies in the City of Folsom General Plan and Folsom Historic District Specific Plan. Policy 4.4 of the Folsom Historic District Specific Plan states that:

> "Pedestrian and bicycle circulation shall be encouraged through construction and improvement of pathways and safety features. Such paths shall connect to existing and future routes to serve both tourist and commute needs."

The recommended off-site improvements under both access options include: the provision of Class II bike lanes on Leidesdorff Street west of Wool Street, a sidewalk on the north side of Leidesdorff Street between Wool Street and Riley Street, and crosswalks at the Leidesdorff Street/Wool Street intersection. Traders Lane is to become a pedestrian promenade with a pedestrian overcrossing connecting the third floor of the Traders Lane parking garage with the retail uses on Sutter Street. Since the off-site improvements associated with the two parking garages will enhance the bicycle and circulation system in the area, no impacts were identified.

IV. CUMULATIVE CONDITIONS

This chapter evaluates the traffic impacts of the two parking garages under cumulative (2015) conditions.

Cumulative Land Use Assumptions

Cumulative land use assumptions within the Folsom Historic District were based on information provided by the Planning, Inspections, and Permitting Department and Historic District Specific Plan. The following land uses, in addition to existing development, were assumed in place within the Historic District under cumulative conditions:

- 110,000 square feet of infill retail development in the Historic District;
- A conference center facility located on Leidesdorff Street at the present location of the City's Corporation Yard;
- A light rail station in the vicinity of the Leidesdorff Lid;
- The expansion of the Lake Natoma Inn; and
- Approximately 75,000 square feet of retail development within the Railroad Block.

Buildout of the Railroad Block consistent with the illustrative plan contained in the *Folsom Historic Railroad Block Urban Design Master Plan* (Nacht & Lewis Architects, 1996) would require off-site parking facilities to accommodate the projected parking demand. Since the two parking garages would not be in place to satisfy this parking demand under cumulative "no project" conditions, a reduced amount of retail development with adequate on-site parking was assumed on the Railroad Block. Assuming a 25 percent floor-to-area ratio for the 6.7-acre site results in approximately 75,000 square feet of retail space.

Under cumulative "with project" conditions, the Railroad Block was assumed to be developed consistent with the illustrative plan contained in the *Folsom Historic Railroad Block Urban Design Master Plan.* The majority of the off-site parking demand would be served by the proposed Traders Lane and Lake Natoma Inn parking garages.

Cumulative Roadway Assumptions

The following roadway network assumptions were assumed for the cumulative conditions analysis:

- The Oak Avenue Parkway Bridge across the American River is *not* in place;
- Northbound left-turns from Riley Street to Leidesdorff Street are prohibited under the "no project" condition, but permitted under the two "with project" conditions;
- The Scott Street-Sutter Street-Coloma Street travel route is open to local and commute traffic; and
- A two-lane roadway connects Sutter Street and Leidesdorff Street (similar to the existing Folsom Boulevard Off-ramp) near the Leidesdorff Lid.

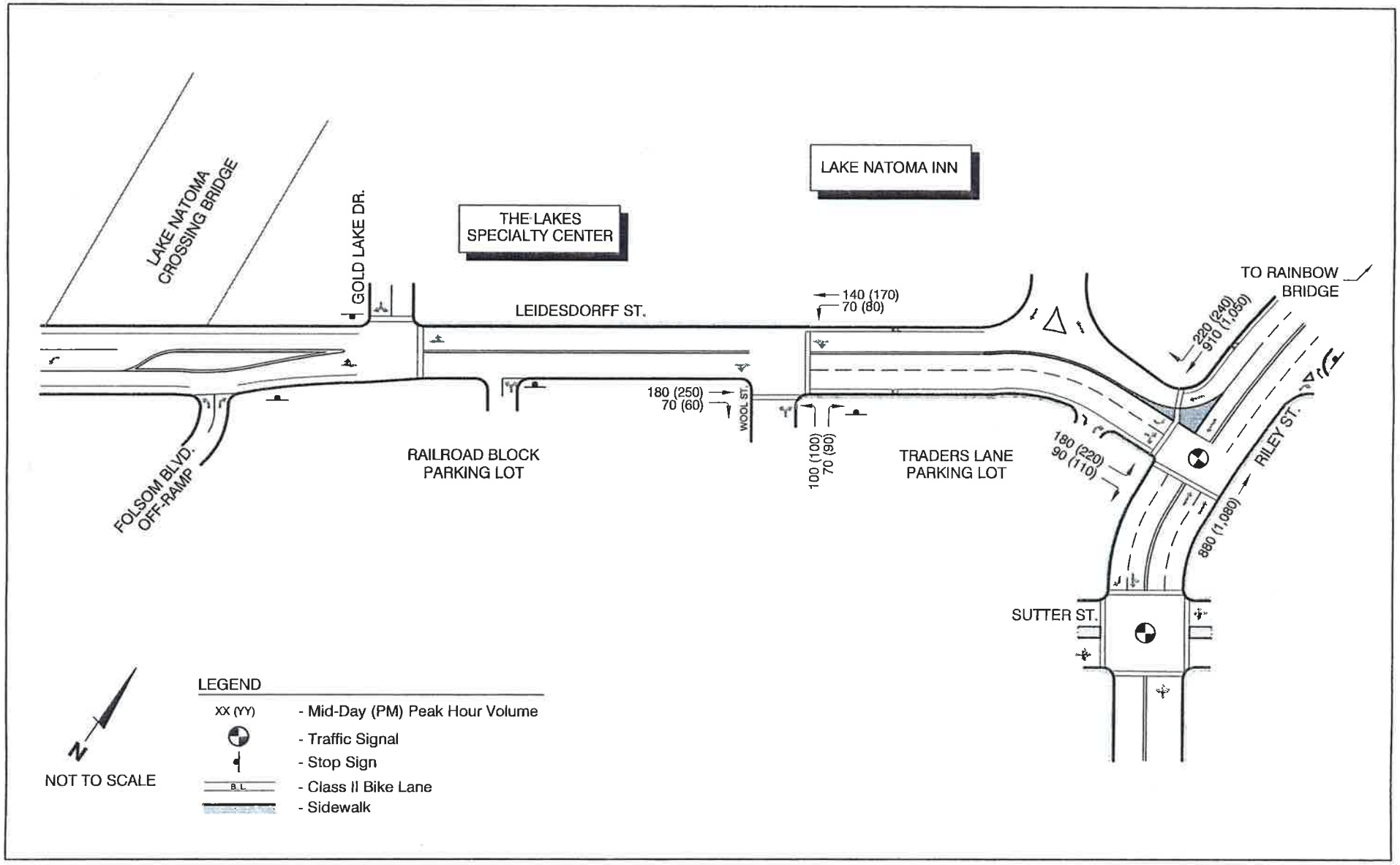
Traffic Forecasts

Figure 13 displays the cumulative "no project" mid-day and p.m. peak hour traffic volumes at the Leidesdorff Street/Riley Street and Leidesdorff Street/Wool Street intersections. The Leidesdorff Street/Folsom Boulevard Off-ramp intersection was not evaluated under cumulative conditions because the configuration of the roadway that will serve the light rail station is still under design and is subject to change. Cumulative traffic levels on Riley Street through the Historic District are expected to increase by about 40 percent over existing conditions and are expected to be similar to conditions prior to the recent opening of the Lake Natoma Crossing Bridge.

Figure 14 displays the cumulative plus project peak hour traffic volumes at the Leidesdorff Street/Riley Street and Leidesdorff Street/Wool Street intersections under Options 1 and 2. As this figure shows, northbound left-turns from Riley Street to Leidesdorff Street are assumed to be permitted.

Levels of Service

Table 6 displays the average delays and levels of service at the study intersections under each cumulative condition. The Leidesdorff Street/Riley Street intersection is projected to operate unacceptably under cumulative no project conditions. Unacceptable operations at this intersection would be exacerbated by the addition of project trips and the provision of the northbound left-turn lane, which would reduce the green time available for southbound through movements. This finding is consistent with results from the *Circulation Element for the Historic District Specific Plan* (Fehr & Peers Associates, 1994) and the *American River Bridge Crossing Project Draft EIR* (Jones & Stokes Associates, 1992).



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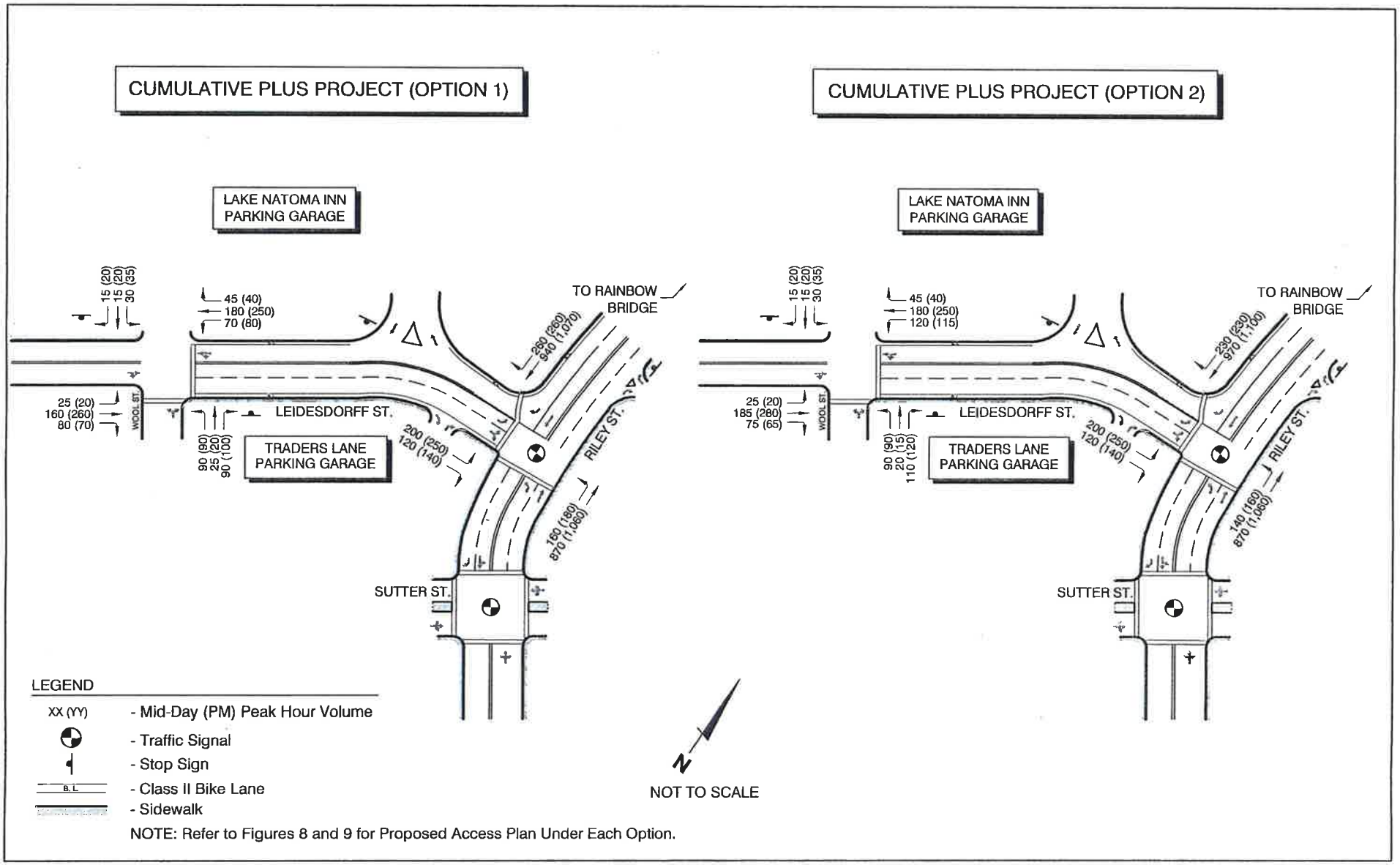
MID-DAY AND P.M. PEAK HOUR TRAFFIC VOLUMES - CUMULATIVE NO PROJECT CONDITIONS

FIGURE 13



NOTE: Refer to Figures 8 and 9 for Proposed Access Plan Under Each Option.

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MID-DAY AND P.M. PEAK HOUR TRAFFIC VOLUMES - CUMULATIVE PLUS PROJECT CONDITIONS

FIGURE 14

Table 6
Mid-Day and P.M. Peak Hour Intersection Levels of Service – Cumulative Conditions

Intersection	Average Delay (sec/veh) – Level of Service					
	Mid-Day Peak Hour			P.M. Peak Hour		
	Cumulative No Project	Cumulative + Option 1	Cumulative + Option 2	Cumulative No Project	Cumulative + Option 1	Cumulative + Option 2
Leidesdorff St./ Riley Street	43.8 – E	54.7 – E	54.7 – E	> 60 – F	> 60 – F	> 60 – F
Leidesdorff St./ Wool Street	2.5 – A	7.2 – B	10.8 – C	2.9 – A	10.0 – B	10.6 – C

Source: Fehr & Peers Associates, 1999.

The Leidesdorff Street/Wool Street intersection is projected to operate at LOS C or better under cumulative conditions, without and with the proposed project. Option 2 worsens operations at the intersection from LOS B (under Option 1) to LOS C during the mid-day and p.m. peak hours. This finding is attributable to the elimination of the westbound left-turn lane into the Traders Lane garage, which results in additional vehicles passing through the Leidesdorff Street/Wool Street intersection.

Impacts to the Transit, Bicycle, and Pedestrian Systems

Construction of the two parking garages would not adversely affect existing or planned transit services and facilities and would enhance the bicycle and pedestrian systems in the study area. Therefore, no significant impacts to the transit, bicycle, and pedestrian systems were identified under cumulative conditions.

V. ALTERNATIVES ANALYSIS

This chapter qualitatively evaluates an alternative parking facility to the two proposed parking garages and discusses the potential impacts of two measures for modifying vehicular circulation within the Historic District.

Analysis of Project Alternative

City of Folsom Redevelopment Agency staff requested that a two-story parking garage on the Brann Property be evaluated as a project alternative. The Brann Property is located on the west side of Scott Street between Riley Street and Sutter Street. According to City staff, the two-story parking garage would provide approximately 80 parking spaces.

At full occupancy, the Brann parking garage is estimated to generate approximately 70 trips during the mid-day and p.m. peak hours. By comparison, the Traders Lane and Lake Natoma Inn parking garages are estimated to generate 350 and 280 trips, respectively, during each peak hour. Thus, the Brann parking garage would generate about one-quarter of the traffic of either of the two proposed parking garages.

Access to the Brann parking garage would likely be provided by one or two driveways on Scott Street. Access to the garage is complicated by several factors including:

- the difficulty of widening Scott Street along the garage frontage to provide a left-turn ingress lane;
- the steep grade on Scott Street, which constrains the possible locations for garage driveways, but provides an opportunity for driveways onto both levels on the parking garage; and
- queued vehicles that often extend back from the signalized Riley Street/Scott Street intersection to Sutter Street, thereby blocking access to the garage driveway(s) for left-turn movements.

Due to its lesser size, the Brann parking garage would result in fewer off-site traffic impacts than either of the two proposed parking garages. However, the Brann parking garage is more remote from the Sutter Street subarea than the other two parking garages and has several significant access constraints.

Analysis of Potential Modifications to Vehicular Circulation in the Historic District

City of Folsom Department of Public Works staff requested that the following potential modifications to vehicular circulation within the Historic District be evaluated under cumulative conditions in consideration of the access needs of the two proposed parking garages:

- Close the Scott Street-to-Sutter Street-to-Coloma Way travel route.
- Permit left-turns from Scott Street onto Riley Street.

The Scott Street-to-Sutter Street-to-Coloma Way route is used by motorists to travel between the north side of the American River (via Rainbow Bridge) and East Natoma Street. This route currently carries approximately 7,000 vehicles per day. By 2015, this route is expected to carry about 9,000 vehicles per day. If the route were to be closed (via street barriers at the Sutter Street/Scott Street intersection, for instance), the majority of these trips would shift to Riley Street. The diverted trips would substantially worsen operations at the signalized intersections on Riley Street at Sutter Street and Leidesdorff Street, which are projected to operate unacceptably under cumulative conditions. The additional trips would also result in more delays for motorists traveling to/from the two proposed parking garages.

Thus, the closure of the Scott Street-to-Sutter Street-to-Coloma Way travel route under cumulative conditions would adversely affect the parallel segment of Riley Street and would not improve access to the two proposed parking garages.

Movements from Scott Street to Riley Street are currently restricted to right turns only. The Riley Street/Scott Street intersection is projected to operate unacceptably under cumulative conditions with this configuration. If left-turns from Scott Street to Riley Street were permitted, overall delay at the intersection would increase significantly. Since the westbound left-turn movement and the northbound right-turn movement could no longer be simultaneously phased (because the northbound Scott Street approach would include left- and right-turning vehicles in a single lane), less green time would be available for the heavy volume of through traffic on Riley Street. In addition, a slight increase in traffic on Scott Street and Sutter Street would be expected if left-turns were permitted from Scott Street to Riley Street.

As described in Chapter VI, it may not be possible to allow left-turn movements from northbound Riley Street to Leidesdorff Street under cumulative conditions due to insufficient stacking in the left-turn lane. If these left-turn movements are ultimately restricted, then the provision of left-turn movements from Scott Street to Riley Street should be considered as a means to improve access to the two parking garages.

How would this affect LOS of the intersection?

VI. ANALYSIS OF PROJECT ACCESS AND RECOMMENDED OFF-SITE IMPROVEMENTS

This chapter analyzes access to the two proposed parking garages and discusses the recommended off-site improvements in more detail. A comparison of the traffic- and circulation-related advantages and disadvantages of the two access options is also provided.

Analysis of Project Access

Figures 8 and 9 display the recommended access to each garage under Options 1 and 2, respectively. Under each option, three driveways would be located on Leidesdorff Street to serve the two garages. Although these driveway spacings are generally adequate, the close proximity of driveways on opposing sides of Leidesdorff Street would result in conflicting left-turn movements if all turning movements were permitted at each driveway via a two-way center left-turn lane. Therefore, the access options provide channelized left-turn movements to reduce conflicting left-turn movements.

A right-turn deceleration lane is recommended at the Traders Lane garage driveway on Riley Street. The amount of deceleration to be provided should be determined when the driveway location is finalized as part of the design of the parking garage. The design of the parking garage should allow for adequate internal stacking of inbound and outbound vehicles at each driveway if pay parking (via a ticket booth) is to be implemented.

The Traders Lane garage driveway on Wool Street should be located as far south of Leidesdorff Street as possible to minimize the potential for northbound traffic at the Leidesdorff Street/Wool Street intersection to queue back beyond the driveway entrance. The need to locate this driveway as far from Leidesdorff Street as possible is particularly important under Option 2, given that this driveway is a primary access point and will serve a heavy volume of southbound left-turn ingress movements under this option.

Table 7 shows the 95th percentile queue length for the left-turn lanes on Leidesdorff Street under each access option and the recommended storage for each turn lane. The 95th percentile queue length is the length of the queue that has a probability of five percent or less of being exceeded during the peak hour.

Table 7
Storage Requirements on Leidesdorff Street and Wool Street

Turn Movement	Option 1		Option 2	
	95th Percentile Queue Length[1,2]	Recommended Storage	95th Percentile Queue Length[1,2]	Recommended Storage
Leidesdorff Street/Wool Street Intersection				
Eastbound Left-Turn Lane	50 feet	150 feet	50 feet	150 feet
Westbound Left-Turn Lane	50 feet	120 feet	75 feet	120 feet
Northbound Left/Through Lane	100 feet	100 feet	100 feet	100 feet
Northbound Right-Turn Lane	75 feet	100 feet	100 feet	100 feet
Left-Turn Ingress Lanes on Leidesdorff Street				
Westbound Left-Turn Lane into Traders Lane Garage	75 feet	100 feet	Not Applicable	
Eastbound Left-Turn Lane into Lake Natoma Inn Garage	Not Applicable		50 feet	100 feet

Notes: [1] Assumes cumulative traffic volumes on Leidesdorff Street and Wool Street.
[2] Based on output from intersection level of service/delay calculations and information contained in *Transportation and Land Development* (Institute of Transportation Engineers, 1988).
Source: Fehr & Peers Associates, 1999.

Table 7 shows that the 95th percentile queue length for the unsignalized left- and right-turn lanes on Leidesdorff Street and Wool Street in the study area ranges from 50 to 100 feet. As illustrated on Figures 8 and 9, each turn lane is recommended to include between 100 and 150 feet of vehicle storage to minimize the potential for queuing problems.

Under existing plus project conditions, the eastbound Leidesdorff Street approach to Riley Street is projected to have a 95th percentile queue length of 115 feet per lane. Since a total of nearly 400 feet of vehicle storage is to be provided in the two approach lanes on Leidesdorff Street east of the Traders Lane garage driveway, queued vehicles on the Leidesdorff Street approach to Riley Street are not expected to block access to this driveway under near-term conditions. Blockages could occur under cumulative conditions if gridlock on Riley Street blocks the ability of vehicles to turn left from Leidesdorff Street.

Discussion of Recommended Off-Site Improvements

Chapter III included a brief description of the various off-site improvements recommended to improve access to each garage. These recommendations apply to both access options. A more detailed discussion of these improvements is provided below.

Improvements to the Riley Street/Sutter Street Intersection

A 50-foot left-turn lane is recommended on northbound Riley Street at Sutter Street to align the northbound through lane on Riley Street approaching Sutter Street with the outside through lane departing Sutter Street. The left-turn lane would substantially improve operations at the Riley Street/Sutter Street intersection by reducing disruptions to the flow of northbound through traffic caused by left-turning vehicles. The left-turn lane would provide storage for two vehicles, which is adequate to accommodate the existing and projected demand.

The traffic signal at the Riley Street/Sutter Street intersection should continue to operate under the existing two-phase operation. Protected phasing for the northbound left-turn lane is not recommended due to the difficulty left-turning vehicles would have accessing the turn lane due to queues in the through lane, the adverse effects the protected phasing would have on southbound traffic, and the inability to provide protected phasing for the opposing southbound left-turn lane (due to the lack of an exclusive left-turn lane).

The provision of the left-turn lane would require the elimination of on-street parking on both sides of Riley Street south of Sutter Street. In addition, the approach taper and bay taper would need to be designed in consideration of the existing topographical constraints in the area (i.e., it is unlikely that the tapers could be designed as prescribed in the *Highway Design Manual*, Caltrans, 1995). It would also be necessary to relocate the centerline of Riley Street north of Sutter Street several feet to the west. The width of the southbound travel lanes on Riley Street approaching Sutter Street (the through lane is 14 feet wide and right-turn lane is 13 feet wide including a two-foot gutter) would enable the centerline to be relocated several feet to the west.

The section of Riley Street directly south of Sutter Street consists of approximately 41 feet of usable pavement (assuming on-street parking is eliminated). The amount of usable pavement narrows to 36 feet approximately 150 feet south of the Riley Street/Sutter Street intersection. Shoulder improvements (leveling of the roadway bed, pavement resurfacing, relocation of drainage, etc.) would likely be required on the east side of Riley Street south of Sutter Street to properly locate the northbound through lane. More detailed engineering studies are required to confirm the feasibility of the recommended improvements in this area.

Improvements to the Riley Street/Leidesdorff Street Intersection

Recommended improvements to this intersection include the following:

- Provide a 150-foot northbound left-turn lane from Riley Street to Leidesdorff Street;
- Remove the existing island in the northwest corner of the intersection;
- Place the southbound right-turn lane under the control of the traffic signal; and
- Install a narrow raised median separating the northbound and southbound travel lanes on Riley Street between Sutter Street and Leidesdorff Street.

The northbound left-turn lane would provide storage for six vehicles. The amount of vehicle queuing in this turn lane will depend on several factors including: the actual usage of the two parking garages, the number of vehicles that shift from Sutter Street, the amount of green time provided for the left-turn movement, the signal cycle length, and the coordination with the adjacent traffic signal at the Riley Street/Sutter Street intersection.

According to the intersection analysis results (see Appendix B), the 95th percentile queue in the northbound left-turn lane would be 140 feet during the p.m. peak hour under existing plus project (Option 1) conditions assuming a 90-second cycle length with 20 seconds of green time allocated to the northbound left-turn movement. The 95th percentile queue length would be reduced to about 120 feet by operating the signal with a 75-second cycle length with 15 seconds of green time allocated to the left-turn movement.

The signalized Riley Street/Sutter Street and Riley Street/Leidesdorff Street intersections are recommended to be coordinated such that northbound through traffic at Sutter Street is given the green at about the same time as northbound left and through movements at Leidesdorff Street. This timing plan would enable left-turns onto Leidesdorff Street to be served prior to the arrival of the majority of upstream traffic, thereby providing stacking for upstream vehicles desiring to turn left onto Leidesdorff Street. Signing and striping should be provided on northbound Riley Street approaching Leidesdorff Street as shown on Figures 8 and 9 to indicate the presence of the left-turn lane and to advise through traffic to keep right.

At some point in the future, it may not be possible to allow left-turn movements from Riley Street to Leidesdorff Street. Additional development in the Historic District will result in increased traffic in the left-turn lane. Future traffic levels on Riley Street are expected to eventually approach conditions prior to the opening of the Lake Natoma Crossing Bridge. Therefore, the City should monitor operations on Riley Street through the Historic District to determine the need to restrict left-turn movements from Riley Street to Leidesdorff Street.

Improvements on Leidesdorff Street

Recommended improvements on Leidesdorff Street include the following:

- Widen Leidesdorff Street between the Folsom Boulevard Off-Ramp and Wool Street to include two eastbound lanes and one westbound lane and Class II bicycle lanes;
- Restripe the middle travel lane on Leidesdorff Street between Wool Street and Riley Street to provide channelized left-turns; and
- Install stop signs and crosswalks on all approaches to the Leidesdorff Street/Wool Street intersection.

Figures 8 and 9 illustrate the recommended channelization of the middle travel lane on Leidesdorff Street between Wool Street and Riley Street under Options 1 and 2, respectively. A narrow raised median would be constructed as shown to physically prohibit undesired left-turn movements. No widening of this segment of Leidesdorff Street would be required to provide channelized left-turns in the middle travel lane.

The segment of Leidesdorff Street west of Wool Street currently consists of a 13-foot eastbound travel lane and a 17-foot westbound travel lane (including a two-foot gutter). Widening on the south side of Leidesdorff Street is recommended to provide an 11-foot eastbound through lane, an 11-foot eastbound left-turn lane, a 12-foot westbound through lane and two five-foot bike lanes. Field observations indicate that the widening can be accomplished using a portion of the undeveloped gravel area south of Leidesdorff Street. Approximately 24 feet is provided between the southern edge of the pavement of Leidesdorff Street and the interpretative center located directly west of Wool Street. Some minor widening along the frontage of the Railroad Block may be required to provide the second eastbound travel lane.

Although not a part of this project, the City plans to construct a sidewalk with landscaping on the south side of Leidesdorff Street between the Railroad Block and Wool Street. The recommended widening on the south side of Leidesdorff Street would not preclude this planned improvement.

City of Folsom Redevelopment Agency staff requested that the potential for angled parking on the south side of Leidesdorff Street west of Wool Street be evaluated. The provision of angled parking on this segment would increase the overall amount of parking in the Historic District and, in particular, the amount of parking serving the retail uses in the heart of the Historic District. However, it would preclude the opportunity to widen Leidesdorff Street to include two eastbound travel lanes and one westbound travel lane, which would be required to provide

adequate access to the two parking garages. The provision of angled parking could also result in a traffic hazard as vehicles back out of the parking spaces into the eastbound travel lane on Leidesdorff Street. Therefore, angled parking on Leidesdorff Street west of Wool Street is not recommended.

Advantages and Disadvantages of Two Access Options

Table 8 compares the traffic- and circulation-related advantages and disadvantages of Options 1 and 2. Although both options will provide adequate access to the two proposed parking garages, Option 1 offers more advantages and less disadvantages than Option 2.

Table 8
Comparison of Two Access Options

Option 1	Option 2
- Provides superior access to Traders Lane Parking Garage - Westbound left-turn ingress lane into Traders Lane garage projected to serve more traffic than eastbound left-turn ingress lane into Lake Natoma Inn - Avoids increases in traffic at the Leidesdorff Street/Wool Street intersection - Maximizes usage of project-related off-site improvements (northbound Riley Street left-turn lane) - De-emphasizes use of Sutter Street by providing left-turn ingress into Traders Lane garage from Leidesdorff Street - Minimizes potential queuing problems at the Traders Lane garage driveway on Wool Street	- Provides inferior access to Lake Natoma Inn Parking Garage and Lake Natoma Inn - Increases the likelihood of motorists on eastbound Leidesdorff Street who miss the driveway directly opposite Wool Street having to use Riley Street and/or Rainbow Bridge

Source: Fehr & Peers Associates, 1999.

APPENDIX A -

EXISTING CONDITIONS
LEVEL OF SERVICE CALCULATIONS

Center For Microcomputers In Transportation
University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) Folsom Bl. Off-ramp (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing Midday Peak Hour
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes		24			84		29		125			
PHF		.667			.808		.775		.775			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's							1.10		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	36	
Potential Capacity: (pcph)	1328	
Movement Capacity: (pcph)	1328	
Prob. of Queue-Free State:	0.87	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	140	
Potential Capacity: (pcph)	879	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	879	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	41	879		4.3	0.0	A	3.3
NB	R	177	1328		3.1	0.5	A	

Intersection Delay = 2.0 sec/veh

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University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) Folsom Bl. Off-ramp (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing PM Peak Hour
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes		13			85		12		56			
PHF		.812			.625		.85		.85			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's							1.10		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	16	
Potential Capacity: (pcph)	1359	
Movement Capacity: (pcph)	1359	
Prob. of Queue-Free State:	0.95	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	152	
Potential Capacity: (pcph)	865	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	865	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	15	865		4.2	0.0	A	3.1
NB	R	73	1359		2.8	0.0	A	

Intersection Delay = 1.3 sec/veh

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Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing Midday Peak Hour
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1 < 0		0 > 1		0	0 > 1 < 0			0	0	0
Stop/Yield			N			N						
Volumes		75	22	40	49		54	0	37			
PHF		.808	.808	.856	.856		.843	.843	.843			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's				1.10			1.10	1.10	1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	106	
Potential Capacity: (pcph)	1224	
Movement Capacity: (pcph)	1224	
Prob. of Queue-Free State:	0.96	
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	120	
Potential Capacity: (pcph)	1503	
Movement Capacity: (pcph)	1503	
Prob. of Queue-Free State:	0.97	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.96	
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	210	
Potential Capacity: (pcph)	846	
Capacity Adjustment Factor due to Impeding Movements	0.96	
Movement Capacity: (pcph)	816	
Prob. of Queue-Free State:	1.00	
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	210	
Potential Capacity: (pcph)	800	
Major LT, Minor TH Impedance Factor:	0.96	
Adjusted Impedance Factor:	0.96	
Capacity Adjustment Factor due to Impeding Movements	0.96	
Movement Capacity: (pcph)	771	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	70	771 >					
NB	T	0	816 >	908	4.6	0.4	A	4.6
NB	R	48	1224 >					
WB	L	52	1503		2.5	0.0	A	1.1

Intersection Delay = 1.9 sec/veh

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Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing PM Peak Hour
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1 < 0		0	> 1	0	0	> 1	< 0	0	0	0
Stop/Yield			N			N						
Volumes		67	23	46	49		47	0	46			
PHF		.75	.75	.699	.699		.894	.894	.894			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's				1.10			1.10	1.10	1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	104	
Potential Capacity: (pcph)	1226	
Movement Capacity: (pcph)	1226	
Prob. of Queue-Free State:	0.95	
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	120	
Potential Capacity: (pcph)	1503	
Movement Capacity: (pcph)	1503	
Prob. of Queue-Free State:	0.95	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.95	
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	240	
Potential Capacity: (pcph)	816	
Capacity Adjustment Factor due to Impeding Movements	0.95	
Movement Capacity: (pcph)	775	
Prob. of Queue-Free State:	1.00	
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	240	
Potential Capacity: (pcph)	769	
Major LT, Minor TH Impedance Factor:	0.95	
Adjusted Impedance Factor:	0.95	
Capacity Adjustment Factor due to Impeding Movements	0.95	
Movement Capacity: (pcph)	730	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)		Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	58	730	>					
NB	T	0	775	>	911	4.5	0.4	A	4.5
NB	R	56	1226	>					
WB	L	73	1503			2.5	0.0	A	1.2

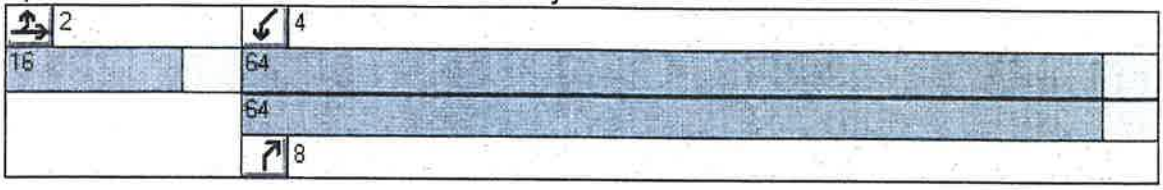
Intersection Delay = 1.9 sec/veh

Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	3263	0	0	3459	1765	1500
Flt Perm.	0.965		0.950			
Satd. Flow (perm)	3263	0	0	3459	1765	1500
Volume (vph)	77	30	0	622	643	85
Lane Group Flow (vph)	129	0	0	726	707	93
Perm or Prot?	Prot		Perm		Perm	Free
Phase Number	2			8	4	
Maximum Split (s)	16			64	64	
Lost Time (s)	3.0			3.0	3.0	
g/c Ratio	0.16			0.76	0.76	1.00
Lane Grp Cap (vph)	530			2637	1346	1500
V/C Ratio	0.24			0.28	0.53	0.06
V/S Ratio Prot	0.04					
V/S Ratio Perm				0.21	0.40	0.06
Critical LG?	Yes				Yes	
Uniform Delay, d1	22.2			2.2	2.9	0.0
Platoon Factor	1.00			1.00	1.00	1.00
Incr. Delay, d2	0.0			0.0	0.3	0.0
Webster's St Delay	22.2			2.2	3.2	0.0
LOS	C			A	A	A
Queue Length 50th (ft)	28			41	107	0
Queue Length 95th (ft)	50			57	167	0
Link Length (ft)	547			125	281	
50th Up Block Time %						
95th Up Block Time %						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Area Type: Other
Cycle Length: 80
Control Type: Pretimed
Lost Time: 6
Sum of Critical V/S Ratios: 0.44
Intersection V/C Ratio: 0.48
Intersection Webster Stopped Delay: 4.0
Intersection LOS: A

Splits and Phases: Leidesdorff St. & Riley St.

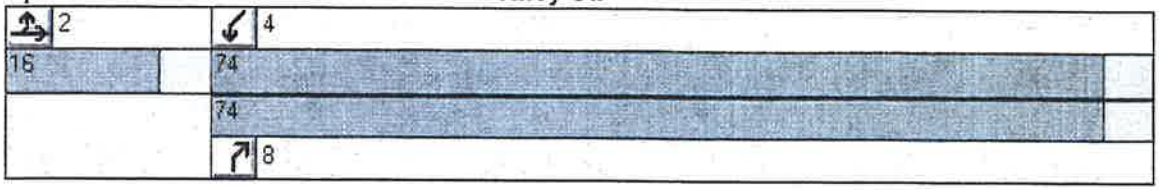


Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	3263	0	0	3459	1765	1500
Flt Perm.	0.966		0.950			
Satd. Flow (perm)	3263	0	0	3459	1765	1500
Volume (vph)	79	32	0	758	739	68
Lane Group Flow (vph)	135	0	0	884	812	75
Perm or Prot?	Prot		Perm		Perm	Free
Phase Number	2			8	4	
Maximum Split (s)	16			74	74	
Lost Time (s)	3.0			3.0	3.0	
g/c Ratio	0.14			0.79	0.79	1.00
Lane Grp Cap (vph)	471			2729	1392	1500
V/C Ratio	0.29			0.32	0.58	0.05
V/S Ratio Prot	0.04					
V/S Ratio Perm				0.26	0.46	0.05
Critical LG?	Yes				Yes	
Uniform Delay, d1	26.1			2.0	2.8	0.0
Platoon Factor	1.00			1.00	1.00	1.00
Incr. Delay, d2	0.1			0.0	0.5	0.0
Webster's St Delay	26.2			2.1	3.3	0.0
LOS	D			A	A	A
Queue Length 50th (ft)	34			54	136	0
Queue Length 95th (ft)	59			70	207	0
Link Length (ft)	547			125	281	
50th Up Block Time %						
95th Up Block Time %					1%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Area Type: Other
Cycle Length: 90
Control Type: Pretimed
Lost Time: 6
Sum of Critical V/S Ratios: 0.50
Intersection V/C Ratio: 0.54
Intersection Webster Stopped Delay: 4.2
Intersection LOS: A

Splits and Phases: Leidesdorff St. & Riley St.



APPENDIX B -

EXISTING PLUS PROJECT CONDITIONS
LEVEL OF SERVICE CALCULATIONS

Center For Microcomputers In Transportation
University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) Folsom Bl. Off-ramp (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing Plus Project Midday Peak Hour
Two-way Stop-controlled Intersection Options 1 and 2

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes		25			120		30		165			
PHF		.667			.808		.775		.775			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's							1.10		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	37	
Potential Capacity: (pcph)	1326	
Movement Capacity: (pcph)	1326	
Prob. of Queue-Free State:	0.82	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	186	
Potential Capacity: (pcph)	826	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	826	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	43	826		4.6	0.0	A	3.5
NB	R	234	1326		3.3	0.7	A	

Intersection Delay = 2.0 sec/veh

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Streets: (N-S) Folsom Bl. Off-ramp (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing Plus Project PM Peak Hour
Two-way Stop-controlled Intersection options 1 and 2

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes		15			120		15		95			
PHF		.812			.625		.85		.85			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's							1.10		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	18	
Potential Capacity: (pcph)	1356	
Movement Capacity: (pcph)	1356	
Prob. of Queue-Free State:	0.91	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	210	
Potential Capacity: (pcph)	800	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	800	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	20	800		4.6	0.0	A	3.2
NB	R	123	1356		2.9	0.2	A	

Intersection Delay = 1.4 sec/veh

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Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing Plus Project Midday Peak Hour
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	< 0	1	1	< 0	0	> 1	< 0	0	> 1	< 0
Volumes	25	80	40	50	75	45	70	25	65	30	15	15
PHF	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	29	59	82	35
RT Flow Rate	47	53	76	18
Approach Flow Rate	170	200	187	71
Proportion LT	0.17	0.29	0.44	0.49
Proportion RT	0.28	0.26	0.41	0.25
Opposing Approach Flow Rate	200	170	71	187
Conflicting Approaches Flow Rate	258	258	370	370
Proportion, Subject Approach Flow Rate	0.27	0.32	0.30	0.11
Proportion, Opposing Approach Flow Rate	0.32	0.27	0.11	0.30
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	59	29	35	82
RT, Opposing Approach	53	47	18	76
LT, Conflicting Approaches	117	117	88	88
RT, Conflicting Approaches	94	94	100	100
Proportion LT, Opposing Approach	0.29	0.17	0.49	0.44
Proportion RT, Opposing Approach	0.26	0.28	0.25	0.41
Proportion LT, Conflicting Approaches	0.45	0.45	0.24	0.24
Proportion RT, Conflicting Approaches	0.36	0.36	0.27	0.27
Approach Capacity	631	685	389	381

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	170	631	0.27	2.8	A
WB	200	685	0.29	3.0	A
NB	187	389	0.48	6.2	B
SB	71	381	0.19	2.0	A

Intersection Delay = 3.8
Level of Service (Intersection) = A

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Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Existing Plus Project PM Peak Hour
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1 < 0		1	1 < 0		0	> 1 < 0		0	> 1 < 0	
Volumes	20	65	35	55	130	40	60	20	80	35	20	20
PHF	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	24	65	71	41
RT Flow Rate	41	47	94	24
Approach Flow Rate	141	265	189	89
Proportion LT	0.17	0.25	0.38	0.46
Proportion RT	0.29	0.18	0.50	0.27
Opposing Approach Flow Rate	265	141	89	189
Conflicting Approaches Flow Rate	278	278	406	406
Proportion, Subject Approach Flow Rate	0.21	0.39	0.28	0.13
Proportion, Opposing Approach Flow Rate	0.39	0.21	0.13	0.28
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	65	24	41	71
RT, Opposing Approach	47	41	24	94
LT, Conflicting Approaches	112	112	89	89
RT, Conflicting Approaches	118	118	88	88
Proportion LT, Opposing Approach	0.25	0.17	0.46	0.38
Proportion RT, Opposing Approach	0.18	0.29	0.27	0.50
Proportion LT, Conflicting Approaches	0.40	0.40	0.22	0.22
Proportion RT, Conflicting Approaches	0.42	0.42	0.22	0.22
Approach Capacity	646	745	382	410

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	141	646	0.22	2.3	A
WB	265	745	0.36	3.9	A
NB	189	382	0.49	6.6	B
SB	89	410	0.22	2.3	A

Intersection Delay = 4.1
Level of Service (Intersection) = A

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Ph: (904) 392-0378

Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information..... Existing Plus Project Midday Peak Hour - Option 2
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	< 0	1	1	< 0	0	> 1	< 0	0	> 1	< 0
Volumes	20	105	35	100	75	45	70	20	85	30	15	15
PHF	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	24	118	82	35
RT Flow Rate	41	53	100	18
Approach Flow Rate	189	259	206	71
Proportion LT	0.13	0.46	0.40	0.49
Proportion RT	0.22	0.20	0.49	0.25
Opposing Approach Flow Rate	259	189	71	206
Conflicting Approaches Flow Rate	277	277	448	448
Proportion, Subject Approach Flow Rate	0.26	0.36	0.28	0.10
Proportion, Opposing Approach Flow Rate	0.36	0.26	0.10	0.28
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	118	24	35	82
RT, Opposing Approach	53	41	18	100
LT, Conflicting Approaches	117	117	142	142
RT, Conflicting Approaches	118	118	94	94
Proportion LT, Opposing Approach	0.46	0.13	0.49	0.40
Proportion RT, Opposing Approach	0.20	0.22	0.25	0.49
Proportion LT, Conflicting Approaches	0.42	0.42	0.32	0.32
Proportion RT, Conflicting Approaches	0.43	0.43	0.21	0.21
Approach Capacity	616	746	323	342

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	189	616	0.31	3.2	A
WB	259	746	0.35	3.7	A
NB	206	323	0.64	11.3	C
SB	71	342	0.21	2.2	A

Intersection Delay = 5.6
Level of Service (Intersection) = B

Center For Microcomputers In Transportation
University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information..... Existing Plus Project PM Peak Hour - Option 2
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	< 0	1	1	< 0	0	> 1	< 0	0	> 1	< 0
Volumes	18	85	30	90	130	40	60	15	100	35	20	20
PHF	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	21	106	71	41
RT Flow Rate	35	47	118	24
Approach Flow Rate	156	306	207	89
Proportion LT	0.13	0.35	0.34	0.46
Proportion RT	0.22	0.15	0.57	0.27
Opposing Approach Flow Rate	306	156	89	207
Conflicting Approaches Flow Rate	296	296	462	462
Proportion, Subject Approach Flow Rate	0.21	0.40	0.27	0.12
Proportion, Opposing Approach Flow Rate	0.40	0.21	0.12	0.27
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	106	21	41	71
RT, Opposing Approach	47	35	24	118
LT, Conflicting Approaches	112	112	127	127
RT, Conflicting Approaches	142	142	82	82
Proportion LT, Opposing Approach	0.35	0.13	0.46	0.34
Proportion RT, Opposing Approach	0.15	0.22	0.27	0.57
Proportion LT, Conflicting Approaches	0.38	0.38	0.27	0.27
Proportion RT, Conflicting Approaches	0.48	0.48	0.18	0.18
Approach Capacity	646	783	342	390

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	156	646	0.24	2.5	A
WB	306	783	0.39	4.4	A
NB	207	342	0.61	10.0	B
SB	89	390	0.23	2.4	A

Intersection Delay = 5.3
Level of Service (Intersection) = B

Lanes, Volumes, Timings

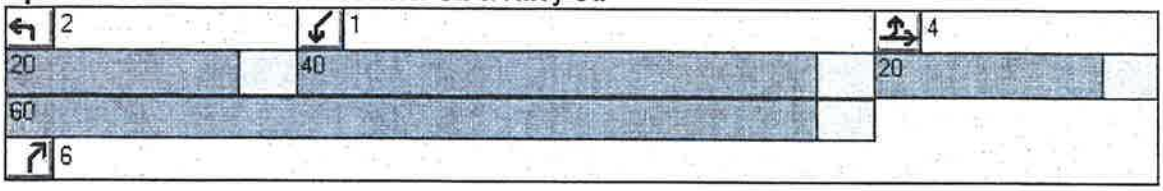
Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	3232	0	1643	1729	1765	1500
Flt Perm.	0.970		0.950			
Satd. Flow (perm)	3232	0	1643	1729	1765	1500
Volume (vph)	145	85	130	610	670	165
Adj. Flow (vph)	167	98	144	678	736	181
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	278	0	144	678	736	181
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	20		20	60	40	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.21		0.21	0.71	0.46	0.46
Lane Grp Cap (vph)	687		349	1232	816	694
V/C Ratio	0.40		0.41	0.55	0.90	0.26
V/S Ratio Prot	0.09		0.09			
V/S Ratio Perm				0.39	0.42	0.12
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	20.6		20.6	4.1	15.1	10.0
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	0.2		0.5	0.4	9.4	0.0
Webster's St Delay	20.8		21.1	4.5	24.5	10.0
LOS	C		C	A	C	B
Queue Length 50th (ft)	60		62	132	325	53
Queue Length 95th (ft)	91		116	207	#553	95
Link Length (ft)	547			125	281	
50th Up Block Time %				9%	14%	
95th Up Block Time %			2%	16%	34%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)				83	175	

Area Type: Other
Cycle Length: 80
Control Type: Pretimed
Lost Time: 9
Sum of Critical V/S Ratios: 0.59
Intersection V/C Ratio: 0.67
Intersection Webster Stopped Delay: 15.7

Intersection LOS: C

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.



Lanes, Volumes, Timings

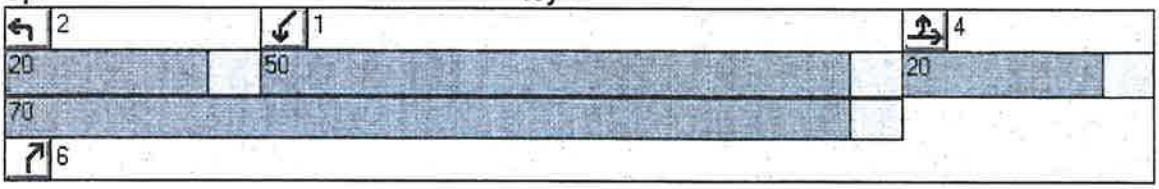
Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	3232	0	1643	1729	1765	1500
Flt Perm.	0.970		0.950			
Satd. Flow (perm)	3232	0	1643	1729	1765	1500
Volume (vph)	160	95	140	740	760	150
Adj. Flow (vph)	184	109	156	822	835	165
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	307	0	156	822	835	165
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	20		20	70	50	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.19		0.19	0.74	0.52	0.52
Lane Grp Cap (vph)	610		310	1287	922	783
V/C Ratio	0.50		0.50	0.64	0.91	0.21
V/S Ratio Prot	0.09		0.09			
V/S Ratio Perm				0.48	0.47	0.11
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	24.8		24.8	4.3	14.8	8.8
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	0.6		1.1	0.8	8.9	0.0
Webster's St Delay	25.4		26.0	5.0	23.7	8.8
LOS	D		D	B	C	B
Queue Length 50th (ft)	79		80	186	408	48
Queue Length 95th (ft)	114		142	286	#671	84
Link Length (ft)	547			125	281	
50th Up Block Time %				13%	19%	
95th Up Block Time %			15%	17%	33%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)			12	123	218	

Area Type: Other
Cycle Length: 90
Control Type: Pretimed
Lost Time: 9
Sum of Critical V/S Ratios: 0.66
Intersection V/C Ratio: 0.74
Intersection Webster Stopped Delay: 16.3

Intersection LOS: C

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.



Lanes, Volumes, Timings

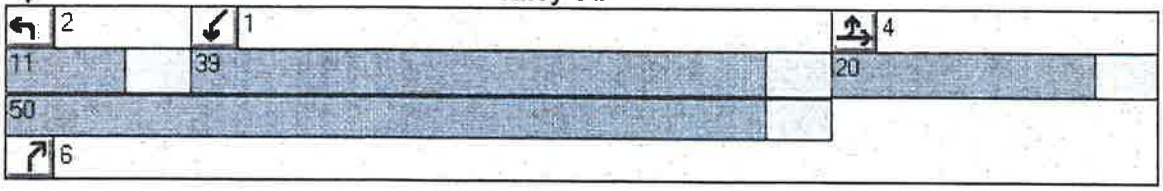
Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	3232	0	1643	1729	1765	1500
Flt Perm.	0.970		0.950			
Satd. Flow (perm)	3232	0	1643	1729	1765	1500
Volume (vph)	145	85	110	610	700	135
Adj. Flow (vph)	167	98	122	678	769	148
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	278	0	122	678	769	148
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	20		11	50	39	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.24		0.11	0.67	0.51	0.51
Lane Grp Cap (vph)	785		188	1161	908	771
V/C Ratio	0.35		0.65	0.58	0.85	0.19
V/S Ratio Prot	0.09		0.07			
V/S Ratio Perm				0.39	0.44	0.10
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	16.7		22.5	4.7	11.1	7.0
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	0.1		5.2	0.6	5.3	0.0
Webster's St Delay	16.8		27.8	5.3	16.4	7.0
LOS	C		D	B	C	B
Queue Length 50th (ft)	49		51	132	265	32
Queue Length 95th (ft)	77		#122	216	#488	62
Link Length (ft)	547			125	281	
50th Up Block Time %				10%	6%	
95th Up Block Time %			6%	19%	27%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)			4	97	127	

Area Type: Other
Cycle Length: 70
Control Type: Pretimed
Lost Time: 9
Sum of Critical V/S Ratios: 0.60
Intersection V/C Ratio: 0.68
Intersection Webster Stopped Delay: 12.7

Intersection LOS: B

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.



Lanes, Volumes, Timings

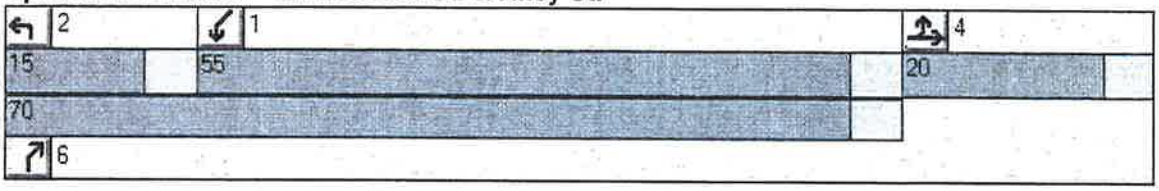
Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	3232	0	1643	1729	1765	1500
Flt Perm.	0.970		0.950			
Satd. Flow (perm)	3232	0	1643	1729	1765	1500
Volume (vph)	160	95	120	740	790	120
Adj. Flow (vph)	184	109	133	822	868	132
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	307	0	133	822	868	132
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	20		15	70	55	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.19		0.13	0.74	0.58	0.58
Lane Grp Cap (vph)	610		219	1287	1020	867
V/C Ratio	0.50		0.61	0.64	0.85	0.15
V/S Ratio Prot	0.09		0.08			
V/S Ratio Perm				0.48	0.49	0.09
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	24.8		27.9	4.3	12.0	6.7
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	0.6		3.4	0.8	5.0	0.0
Webster's St Delay	25.4		31.3	5.0	16.9	6.7
LOS	D		D	B	C	B
Queue Length 50th (ft)	79		72	186	380	32
Queue Length 95th (ft)	114		#142	286	#655	59
Link Length (ft)	547			125	281	
50th Up Block Time %				13%	16%	
95th Up Block Time %			14%	17%	27%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)			9	123	184	

Area Type: Other
Cycle Length: 90
Control Type: Pretimed
Lost Time: 9
Sum of Critical V/S Ratios: 0.67
Intersection V/C Ratio: 0.74
Intersection Webster Stopped Delay: 14.0

Intersection LOS: B

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.



APPENDIX C -

CUMULATIVE CONDITIONS
LEVEL OF SERVICE CALCULATIONS

Center For Microcomputers In Transportation
University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Cumulative No Project Midday Peak Hour
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1 <	0	0 >	1	0	0 >	1 <	0	0	0	0
Stop/Yield			N			N						
Volumes		180	70	70	140		100	0	70			
PHF		.9	.9	.9	.9		.9	.9	.9			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's				1.10			1.10	1.10	1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	239	
Potential Capacity: (pcph)	1048	
Movement Capacity: (pcph)	1048	
Prob. of Queue-Free State:	0.92	
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	278	
Potential Capacity: (pcph)	1264	
Movement Capacity: (pcph)	1264	
Prob. of Queue-Free State:	0.93	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.93	
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	473	
Potential Capacity: (pcph)	616	
Capacity Adjustment Factor due to Impeding Movements	0.93	
Movement Capacity: (pcph)	570	
Prob. of Queue-Free State:	1.00	
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	473	
Potential Capacity: (pcph)	564	
Major LT, Minor TH Impedance Factor:	0.93	
Adjusted Impedance Factor:	0.93	
Capacity Adjustment Factor due to Impeding Movements	0.93	
Movement Capacity: (pcph)	522	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)		Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	122	522	>					
NB	T	0	570	>	659	8.0	1.5	B	8.0
NB	R	86	1048	>					
WB	L	86	1264			3.1	0.1	A	1.0

Intersection Delay = 2.5 sec/veh

Center For Microcomputers In Transportation
University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information.....Cumulative No Project PM Peak Hour
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1 <	0	0 >	1	0	0 >	1 <	0	0	0	0
Stop/Yield			N			N						
Volumes		250	60	80	170		100	0	90			
PHF		.9	.9	.9	.9		.9	.9	.9			
Grade		0			0			0				
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's				1.10			1.10	1.10	1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	312	
Potential Capacity: (pcph)	962	
Movement Capacity: (pcph)	962	
Prob. of Queue-Free State:	0.89	
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	345	
Potential Capacity: (pcph)	1174	
Movement Capacity: (pcph)	1174	
Prob. of Queue-Free State:	0.92	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.91	
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	590	
Potential Capacity: (pcph)	535	
Capacity Adjustment Factor due to Impeding Movements	0.91	
Movement Capacity: (pcph)	485	
Prob. of Queue-Free State:	1.00	
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	590	
Potential Capacity: (pcph)	482	
Major LT, Minor TH Impedance Factor:	0.91	
Adjusted Impedance Factor:	0.91	
Capacity Adjustment Factor due to Impeding Movements	0.91	
Movement Capacity: (pcph)	437	

Intersection Performance Summary

Movement		Flow Rate (pcph)	Move Cap (pcph)		Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB	L	122	437	>					
NB	T	0	485	>	590	10.0	2.0	C	10.0
NB	R	110	962	>					
WB	L	98	1174			3.3	0.2	A	1.1

Intersection Delay = 2.9 sec/veh

Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	2597	0	0	2767	1412	1200
Flt Perm.	0.968		0.950			
Satd. Flow (perm)	2597	0	0	2767	1412	1200
Volume (vph)	180	90	0	880	910	220
Adj. Flow (vph)	200	100	0	978	1011	244
Lane Util. Factor	1.05	1.05	1.05	*1.25	1.00	1.00
Lane Group Flow (vph)	315	0	0	1223	1011	244
Perm or Prot?	Prot		Perm		Perm	Free
Phase Number	2			8	4	
Maximum Split (s)	28			52	52	
Lost Time (s)	3.0			3.0	3.0	
g/c Ratio	0.31			0.61	0.61	1.00
Lane Grp Cap (vph)	812			1695	865	1200
V/C Ratio	0.39			0.72	1.17	0.20
V/S Ratio Prot	0.12					
V/S Ratio Perm				0.44	0.72	0.20
Critical LG?	Yes				Yes	
Uniform Delay, d1	16.3			8.2	11.8	0.0
Platoon Factor	1.00			1.00	1.00	1.00
Incr. Delay, d2	0.2			1.1	92.9	0.0
Webster's St Delay	16.5			9.3	104.7	0.0
LOS	C			B	F	A
Queue Length 50th (ft)	61			190	~611	0
Queue Length 95th (ft)	95			264	#838	0
Link Length (ft)	547			125	281	
50th Up Block Time %				18%	31%	
95th Up Block Time %				24%	43%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)				257	372	

Area Type: CBD
Cycle Length: 80
Control Type: Actuated-Coordinated
Lost Time: 6
Sum of Critical V/S Ratios: 0.84
Intersection V/C Ratio: 0.91
Intersection Webster Stopped Delay: 43.8

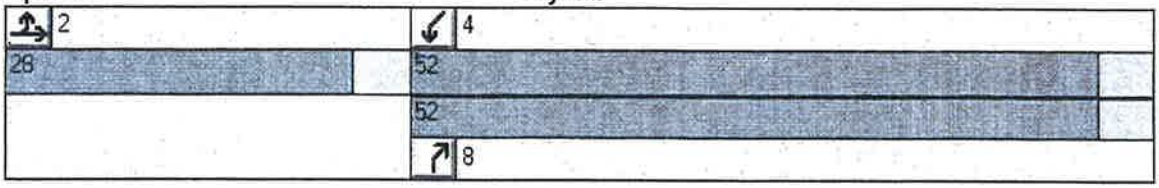
Intersection LOS: E

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.



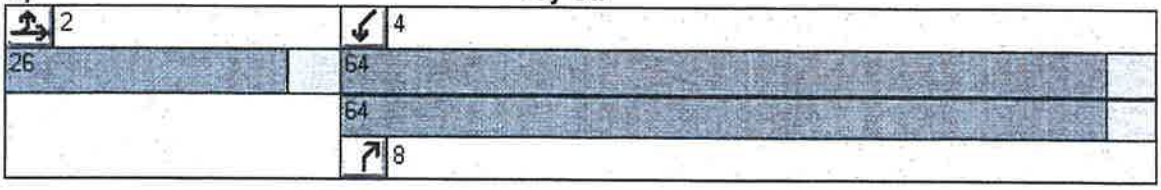
Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	2597	0	0	2767	1412	1200
Flt Perm.	0.968		0.950			
Satd. Flow (perm)	2597	0	0	2767	1412	1200
Volume (vph)	220	110	0	1080	1050	240
Adj. Flow (vph)	244	122	0	1200	1167	267
Lane Util. Factor	1.05	1.05	1.05	*1.25	1.00	1.00
Lane Group Flow (vph)	384	0	0	1500	1167	267
Perm or Prot?	Prot		Perm		Perm	Free
Phase Number	2			8	4	
Maximum Split (s)	26			64	64	
Lost Time (s)	3.0			3.0	3.0	
g/c Ratio	0.26			0.68	0.68	1.00
Lane Grp Cap (vph)	664			1875	957	1200
V/C Ratio	0.58			0.80	1.22	0.22
V/S Ratio Prot	0.15					
V/S Ratio Perm				0.54	0.83	0.22
Critical LG?	Yes				Yes	
Uniform Delay, d1	22.2			7.8	Error	0.0
Platoon Factor	1.00			1.00	1.00	1.00
Incr. Delay, d2	0.9			1.8	Error	0.0
Webster's St Delay	23.2			9.6	Error	0.0
LOS	C			B	F	A
Queue Length 50th (ft)	95			262	~823	0
Queue Length 95th (ft)	141			359	#1065	0
Link Length (ft)	547			125	281	
50th Up Block Time %				20%	31%	
95th Up Block Time %				23%	39%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)				325	410	

Area Type: CBD
Cycle Length: 90
Control Type: Actuated-Coordinated
Lost Time: 6
Sum of Critical V/S Ratios: 0.97
Intersection V/C Ratio: 1.04
Intersection Webster Stopped Delay: Error

Intersection LOS: F
* User Entered Value
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.



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Ph: (904) 392-0378

Streets: (N-S) Wool Street (E-W) Leidesdorff Street
Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information..... Cumulative Plus Project Midday Peak Hour - Option 1
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1 < 0		1	1 < 0		0 > 1	< 0		0 > 1	< 0	
Volumes	25	160	80	70	180	45	90	25	90	30	15	15
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	28	78	100	33
RT Flow Rate	89	50	100	17
Approach Flow Rate	295	328	228	67
Proportion LT	0.09	0.24	0.44	0.49
Proportion RT	0.30	0.15	0.44	0.25
Opposing Approach Flow Rate	328	295	67	228
Conflicting Approaches Flow Rate	295	295	623	623
Proportion, Subject Approach Flow Rate	0.32	0.36	0.25	0.07
Proportion, Opposing Approach Flow Rate	0.36	0.32	0.07	0.25
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	78	28	33	100
RT, Opposing Approach	50	89	17	100
LT, Conflicting Approaches	133	133	106	106
RT, Conflicting Approaches	117	117	139	139
Proportion LT, Opposing Approach	0.24	0.09	0.49	0.44
Proportion RT, Opposing Approach	0.15	0.30	0.25	0.44
Proportion LT, Conflicting Approaches	0.45	0.45	0.17	0.17
Proportion RT, Conflicting Approaches	0.40	0.40	0.22	0.22
Approach Capacity	714	798	318	319

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	295	714	0.41	4.8	A
WB	328	798	0.41	4.8	A
NB	228	318	0.72	15.2	C
SB	67	319	0.21	2.2	A

Intersection Delay = 7.2
Level of Service (Intersection) = B

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Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information..... Cumulative Plus Project PM Peak Hour - Option 1
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1 < 0		1	1 < 0		0	> 1 < 0		0	> 1 < 0	
Volumes	20	260	70	80	250	80	90	20	100	35	20	20
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	22	89	100	39
RT Flow Rate	78	89	111	22
Approach Flow Rate	389	456	233	83
Proportion LT	0.06	0.20	0.43	0.47
Proportion RT	0.20	0.20	0.48	0.27
Opposing Approach Flow Rate	456	389	83	233
Conflicting Approaches Flow Rate	316	316	845	845
Proportion, Subject Approach Flow Rate	0.34	0.39	0.20	0.07
Proportion, Opposing Approach Flow Rate	0.39	0.34	0.07	0.20
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	89	22	39	100
RT, Opposing Approach	89	78	22	111
LT, Conflicting Approaches	139	139	111	111
RT, Conflicting Approaches	133	133	167	167
Proportion LT, Opposing Approach	0.20	0.06	0.47	0.43
Proportion RT, Opposing Approach	0.20	0.20	0.27	0.48
Proportion LT, Conflicting Approaches	0.44	0.44	0.13	0.13
Proportion RT, Conflicting Approaches	0.42	0.42	0.20	0.20
Approach Capacity	785	845	283	298

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	389	785	0.50	6.6	B
WB	456	845	0.54	7.8	B
NB	233	283	0.82	22.8	D
SB	83	298	0.28	2.9	A

Intersection Delay = 10.0
Level of Service (Intersection) = B

Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1600	1600	1800	1600	1600	1600
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	2585	0	1479	1384	1412	1200
Flt Perm.	0.970		0.950			
Satd. Flow (perm)	2585	0	1479	1384	1412	1200
Volume (vph)	200	120	160	870	940	260
Adj. Flow (vph)	222	133	178	967	1044	289
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	373	0	178	967	1044	289
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	20		17	90	73	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.15		0.13	0.79	0.64	0.64
Lane Grp Cap (vph)	400		188	1095	899	764
V/C Ratio	0.93		0.95	0.88	1.16	0.38
V/S Ratio Prot	0.14		0.12			
V/S Ratio Perm				0.70	0.74	0.24
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	34.9		36.2	6.1	15.2	7.3
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	20.8		36.2	6.2	88.4	0.2
Webster's St Delay	55.7		72.4	12.3	103.6	7.4
LOS	E		F	B	F	B
Queue Length 50th (ft)	131		127	380	~876	90
Queue Length 95th (ft)	#221		#265	#864	#1125	144
Link Length (ft)	547			125	281	
50th Up Block Time %			6%	16%	32%	
95th Up Block Time %			53%	19%	38%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)			52	167	365	

Area Type: CBD
Cycle Length: 110
Control Type: Actuated-Coordinated
Lost Time: 9
Sum of Critical V/S Ratios: 1.00
Intersection V/C Ratio: 1.09
Intersection Webster Stopped Delay: 54.7

Intersection LOS: E

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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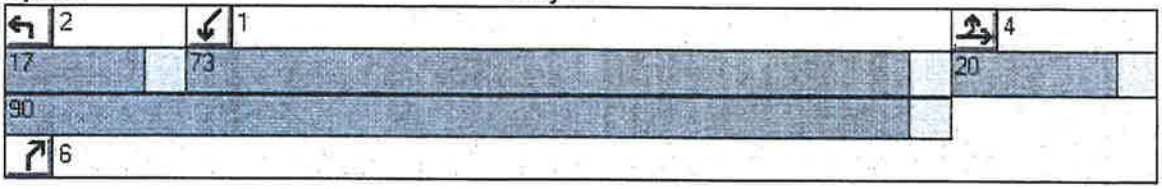
Splits and Phases: Leidesdorff St. & Riley St.



Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1600	1600	1800	1600	1600	1600
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	2588	0	1479	1384	1412	1200
Flt Perm.	0.969		0.950			
Satd. Flow (perm)	2588	0	1479	1384	1412	1200
Volume (vph)	250	140	180	1060	1070	260
Adj. Flow (vph)	278	156	200	1178	1189	289
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	456	0	200	1178	1189	289
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	23		19	97	78	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.17		0.13	0.78	0.63	0.63
Lane Grp Cap (vph)	431		197	1084	882	750
V/C Ratio	1.06		1.01	1.09	1.35	0.39
V/S Ratio Prot	0.18		0.14			
V/S Ratio Perm				0.85	0.84	0.24
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	38.0		39.5	9.9	Error	8.4
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	50.9		53.6	49.0	Error	0.2
Webster's St Delay	88.9		93.1	58.9	Error	8.6
LOS	F		F	E	F	B
Queue Length 50th (ft)	~193		~160	~1025	~1205	103
Queue Length 95th (ft)	#296		#315	#1283	#1465	161
Link Length (ft)	547			125	281	
50th Up Block Time %			23%	21%	39%	
95th Up Block Time %			58%	23%	43%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)			81	257	485	

Area Type: CBD
Cycle Length: 120
Control Type: Actuated-Coordinated
Lost Time: 9
Sum of Critical V/S Ratios: 1.15
Intersection V/C Ratio: 1.25
Intersection Webster Stopped Delay: Error

Intersection LOS: F

~ Volume exceeds capacity, queue is theoretically infinite.
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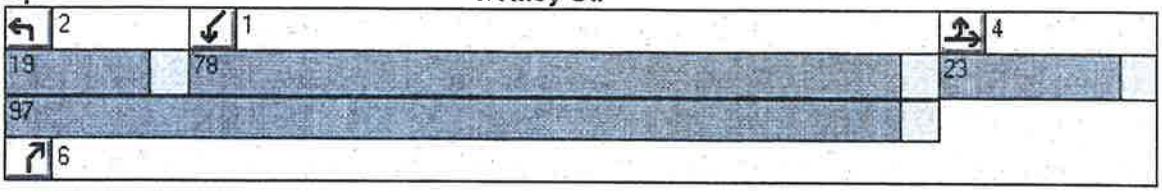
Splits and Phases: Leidesdorff St. & Riley St.



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Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information..... Cumulative Plus Project Midday Peak Hour - Option 2
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	< 0	1	1	< 0	0	> 1	< 0	0	> 1	< 0
Volumes	25	185	75	120	180	45	90	20	110	30	15	15
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	28	133	100	33
RT Flow Rate	83	50	122	17
Approach Flow Rate	317	383	244	67
Proportion LT	0.09	0.35	0.41	0.49
Proportion RT	0.26	0.13	0.50	0.25
Opposing Approach Flow Rate	383	317	67	244
Conflicting Approaches Flow Rate	311	311	700	700
Proportion, Subject Approach Flow Rate	0.31	0.38	0.24	0.07
Proportion, Opposing Approach Flow Rate	0.38	0.31	0.07	0.24
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	133	28	33	100
RT, Opposing Approach	50	83	17	122
LT, Conflicting Approaches	133	133	161	161
RT, Conflicting Approaches	139	139	133	133
Proportion LT, Opposing Approach	0.35	0.09	0.49	0.41
Proportion RT, Opposing Approach	0.13	0.26	0.25	0.50
Proportion LT, Conflicting Approaches	0.43	0.43	0.23	0.23
Proportion RT, Conflicting Approaches	0.45	0.45	0.19	0.19
Approach Capacity	706	830	279	300

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	317	706	0.45	5.5	B
WB	383	830	0.46	5.8	B
NB	244	279	0.87	27.8	D
SB	67	300	0.22	2.3	A

Intersection Delay = 10.8
Level of Service (Intersection) = C

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Analyst..... F&P
Date of Analysis..... 10/18/99
Other Information..... Cumulative Plus Project PM Peak Hour - Option 2
All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1 < 0		1	1 < 0		0	> 1 < 0		0	> 1 < 0	
Volumes	20	280	65	115	250	40	90	15	120	25	30	20
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	22	128	100	28
RT Flow Rate	72	44	133	22
Approach Flow Rate	405	450	250	83
Proportion LT	0.05	0.28	0.40	0.34
Proportion RT	0.18	0.10	0.53	0.27
Opposing Approach Flow Rate	450	405	83	250
Conflicting Approaches Flow Rate	333	333	855	855
Proportion, Subject Approach Flow Rate	0.34	0.38	0.21	0.07
Proportion, Opposing Approach Flow Rate	0.38	0.34	0.07	0.21
Lanes on Subject Approach	2	2	1	1
Lanes on Opposing Approach	2	2	1	1
LT, Opposing Approach	128	22	28	100
RT, Opposing Approach	44	72	22	133
LT, Conflicting Approaches	128	128	150	150
RT, Conflicting Approaches	155	155	116	116
Proportion LT, Opposing Approach	0.28	0.05	0.34	0.40
Proportion RT, Opposing Approach	0.10	0.18	0.27	0.53
Proportion LT, Conflicting Approaches	0.38	0.38	0.18	0.18
Proportion RT, Conflicting Approaches	0.47	0.47	0.14	0.14
Approach Capacity	765	861	299	292

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	405	765	0.53	7.5	B
WB	450	861	0.52	7.3	B
NB	250	299	0.84	24.0	D
SB	83	292	0.28	2.9	A

Intersection Delay = 10.6
Level of Service (Intersection) = C

Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1600	1600	1800	1600	1600	1600
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	2585	0	1479	1384	1412	1200
Flt Perm.	0.970		0.950			
Satd. Flow (perm)	2585	0	1479	1384	1412	1200
Volume (vph)	200	120	140	870	970	230
Adj. Flow (vph)	230	138	156	967	1066	253
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	387	0	156	967	1066	253
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	20		15	90	75	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.15		0.11	0.79	0.65	0.65
Lane Grp Cap (vph)	400		161	1095	924	785
V/C Ratio	0.97		0.97	0.88	1.15	0.32
V/S Ratio Prot	0.15		0.11			
V/S Ratio Perm				0.70	0.75	0.21
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	35.1		37.1	6.1	14.4	6.3
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	27.3		45.0	6.2	83.3	0.1
Webster's St Delay	62.4		82.1	12.3	97.7	6.4
LOS	F		F	B	F	B
Queue Length 50th (ft)	137		111	380	~889	71
Queue Length 95th (ft)	#219		#245	#864	#1140	116
Link Length (ft)	547			125	281	
50th Up Block Time %				16%	30%	
95th Up Block Time %			53%	19%	37%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)			41	167	357	

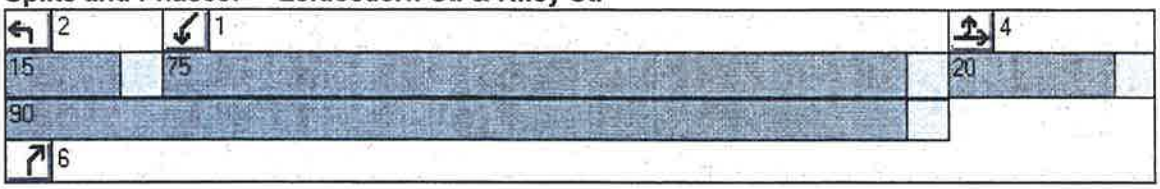
Area Type: CBD
Cycle Length: 110
Control Type: Actuated-Coordinated
Lost Time: 9
Sum of Critical V/S Ratios: 1.01
Intersection V/C Ratio: 1.10
Intersection Webster Stopped Delay: 54.7

Intersection LOS: E

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.



Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1600	1600	1800	1600	1600	1600
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			4%	0%	
Storage Length (ft)		0	0			0
First Detector (ft)	50	50	50	50	50	50
Last Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Right Turn on Reds		Yes				Yes
Satd. Flow (prot)	2876	0	1643	1537	1569	1333
Flt Perm.	0.969		0.950			
Satd. Flow (perm)	2876	0	1643	1537	1569	1333
Volume (vph)	250	140	160	1060	1100	230
Adj. Flow (vph)	287	161	178	1178	1209	253
Lane Util. Factor	1.05	1.05	1.00	1.00	1.00	1.00
Lane Group Flow (vph)	470	0	178	1178	1209	253
Perm or Prot?	Prot		Prot		Perm	Perm
Phase Number	4		2	6	1	
Maximum Split (s)	21		17	99	82	
Lost Time (s)	3.0		3.0	3.0	3.0	
g/c Ratio	0.15		0.12	0.80	0.66	0.66
Lane Grp Cap (vph)	431		192	1230	1033	878
V/C Ratio	1.09		0.93	0.96	1.17	0.29
V/S Ratio Prot	0.16		0.11			
V/S Ratio Perm				0.77	0.77	0.19
Critical LG?	Yes		Yes		Yes	
Uniform Delay, d1	38.7		39.9	7.8	15.5	6.6
Platoon Factor	1.00		1.00	1.00	1.00	1.00
Incr. Delay, d2	63.6		32.2	12.3	91.9	0.1
Webster's St Delay	102.3		72.1	20.1	107.4	6.6
LOS	F		F	C	F	B
Queue Length 50th (ft)	~205		139	632	~1116	76
Queue Length 95th (ft)	#293		#277	#1166	#1376	118
Link Length (ft)	547			125	281	
50th Up Block Time %			13%	17%	31%	
95th Up Block Time %			54%	19%	36%	
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)			59	214	406	

Area Type: Other
Cycle Length: 120
Control Type: Actuated-Coordinated
Lost Time: 9
Sum of Critical V/S Ratios: 1.04
Intersection V/C Ratio: 1.13
Intersection Webster Stopped Delay: 65.7

Intersection LOS: F

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: Leidesdorff St. & Riley St.