

Transportation Impact Study

**MOTEL 6**

Fort Collins, Colorado

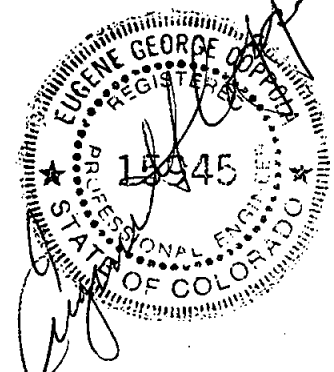
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## I. INTRODUCTION

A Motel 6 is planned just north of Boardwalk Drive along Mason Street in Fort Collins, Colorado. It will be situated north of the Ramada Suites Hotel across from the Olive Garden restaurant. A vicinity map is presented on Figure 1.

This transportation impact study follows the established guidelines for such studies as are applicable and appropriate to the proposed project. The following key steps were undertaken as part of this study.

- ▶ Obtain current traffic and roadway data in the immediate area of the site.
- ▶ Evaluate current operations to establish base conditions.
- ▶ Determine site generated traffic volumes and distribute this traffic to the nearby street system.
- ▶ Estimate roadway traffic volumes for short-term conditions.
- ▶ Evaluate operations with the Motel 6 fully operational under existing and short-term conditions.
- ▶ Inventory, evaluate, and assess the pedestrian, bicycle, and transit networks serving the site.
- ▶ Identify deficiencies and recommend measures to mitigate the impact of site generated traffic and enhance the alternate travel mode systems as appropriate.

The City of Fort Collins defined the parameters of this study in a scoping meeting held on November 12, 1997. At that meeting, the Mason Street - Boardwalk Drive, Mason Street - Creger Drive, and Mason Street - Horsetooth Road intersections were identified as requiring investigation in addition to the site access point. Other study

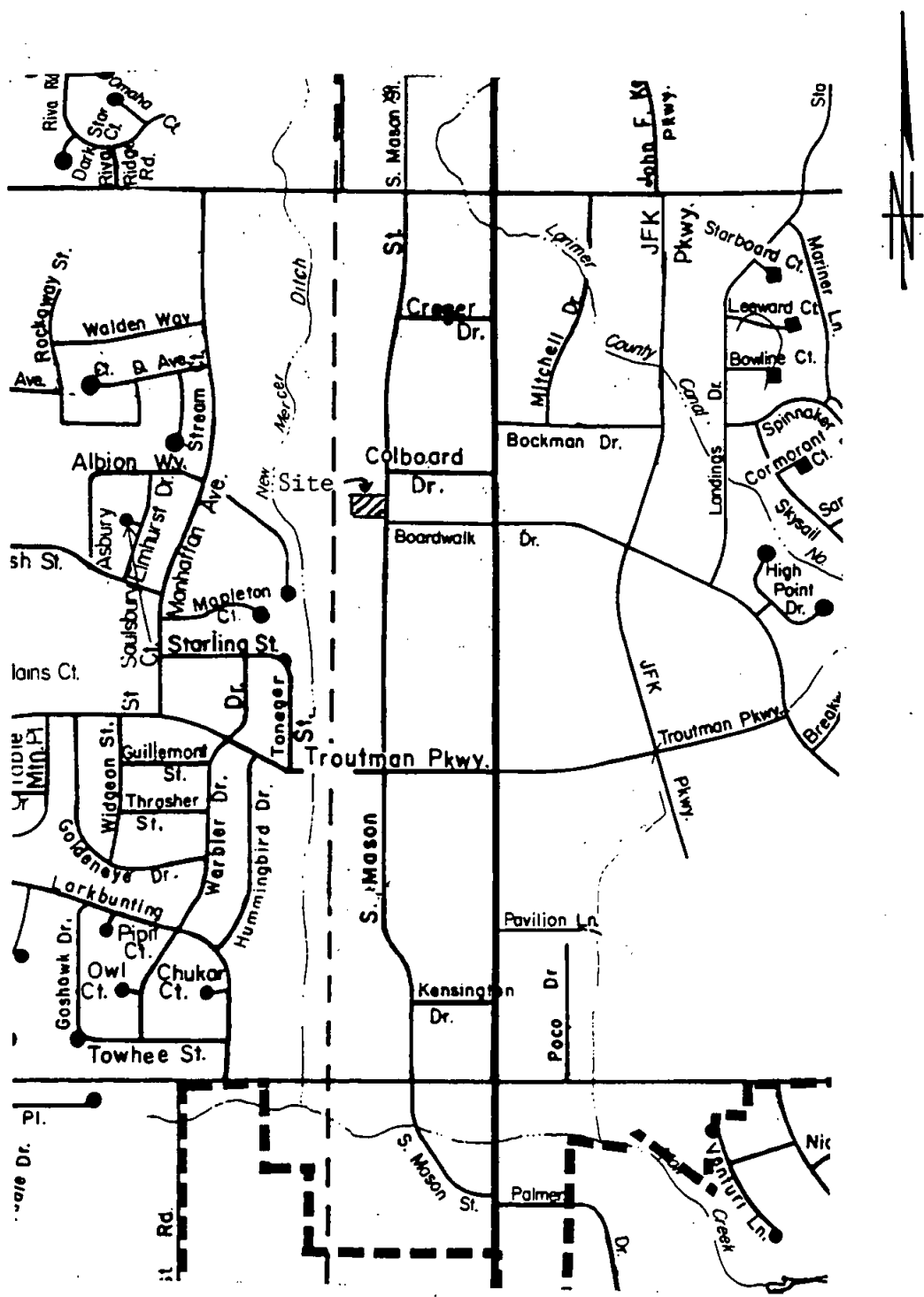


Figure 1  
VICINITY MAP

parameters were defined at that time. Transportation impact study base assumptions and pedestrian analyses work sheets from that meeting are available in Appendix A.

## II. EXISTING CONDITIONS

### A. Existing Road Network

The Motel 6 site is located north of Boardwalk Drive along the west side of Mason Street. The site is bordered on the north by Harms Sound Labs, on the west by the Burlington Northern railroad, on the east by Mason Street and on the south by the Ramada Suites Hotel. It lies directly west of the Olive Garden restaurant.

Mason Street is a north-south minor arterial roadway having two lanes (one in each direction) and bicycle lanes along both sides. It extends from north of Horsetooth Road to south of Harmony Road and connects to other arterial streets. Recent daily traffic on Mason Street is in the range 8,000 - 9,000 vehicles per day. The posted speed limit is 30 miles per hour.

Boardwalk Drive is a three lane east-west roadway extending from Mason Street to the east of College Avenue. It has bicycle lanes along both sides of the street and is under stop sign control at Mason Street.

Creger Drive is a two lane roadway extending between Mason Street and College Avenue. At College Avenue, eastbound traffic is required to turn right. Creger Drive is under stop sign control at Mason Street and, while not striped, the westbound approach functions as two-lanes.

Horsetooth Road is an east-west arterial roadway with two through lanes in each direction and a center left turn lane. Daily traffic on Horsetooth Road is in the range

of 25,000 vehicles per day. The Horsetooth Road - Mason Street intersection is under traffic signal control.

The area streets carry traffic volumes consistent with their current roadway classifications. Functional roadway geometry and traffic controls are shown on Figure 2.

### **B. Surrounding Land Uses**

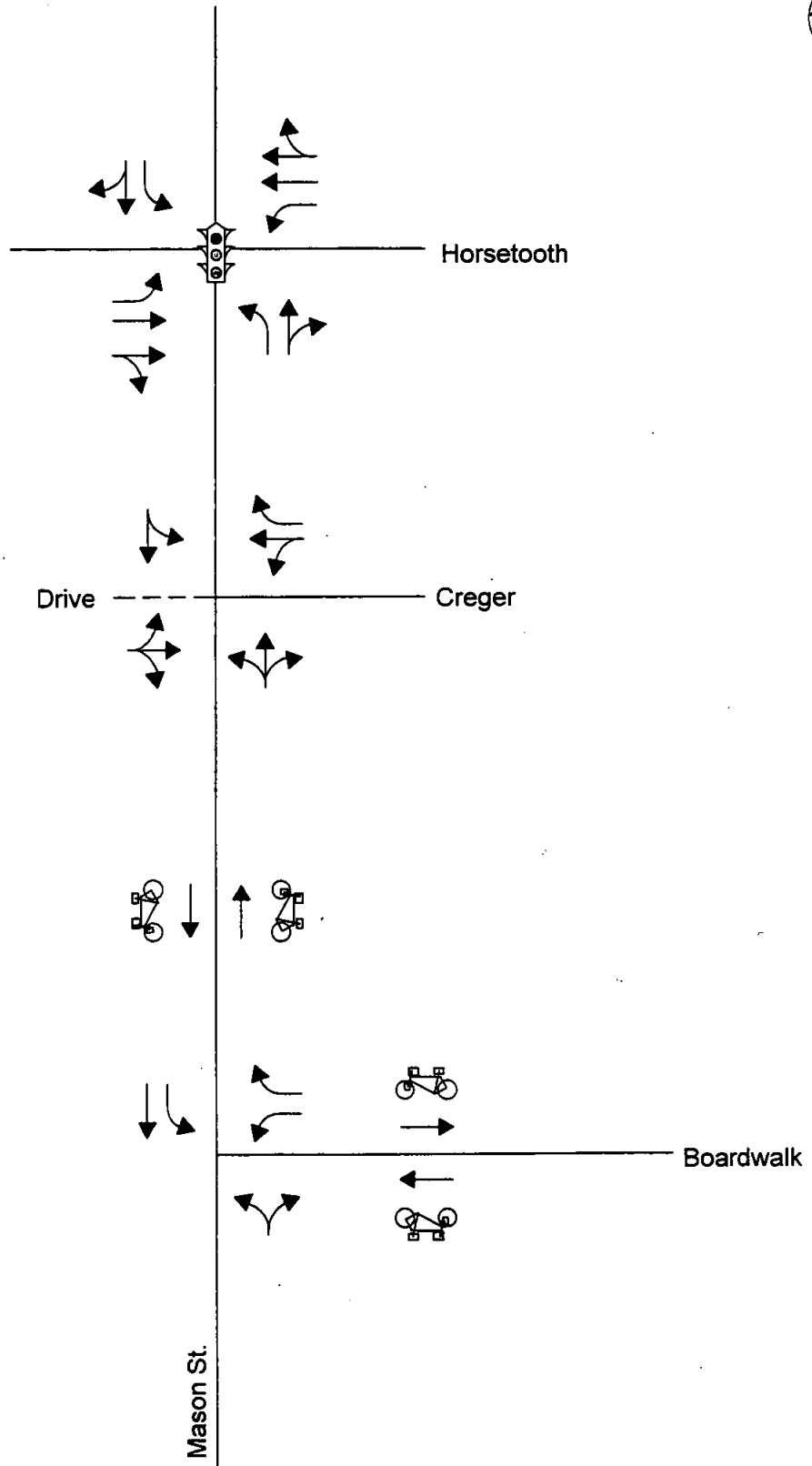
The site is currently vacant. The Ramada Suites Hotel abuts the site to the south while Harms Sound Labs is adjacent to the site to the north. The Olive Garden restaurant is directly across Mason Street to the east. The site is considered an in-fill development.

### **C. Existing Traffic Conditions**

Morning and afternoon weekday and Saturday noon peak hour traffic counts were conducted at the Horsetooth Road, Creger Drive, and Boardwalk Drive intersections with Mason Street. The Mason Street access to the Olive Garden restaurant was also counted during these time frames. Turning movement counts are presented on Figure 3. Directional imbalances were noted during these peak hour periods. A significant amount of cut-through traffic was observed at the Mason Street - Horsetooth Road intersection. This involved eastbound right turning traffic cutting through the bowling alley parking lot to access Mason Street.

### **D. Existing Traffic Operations**

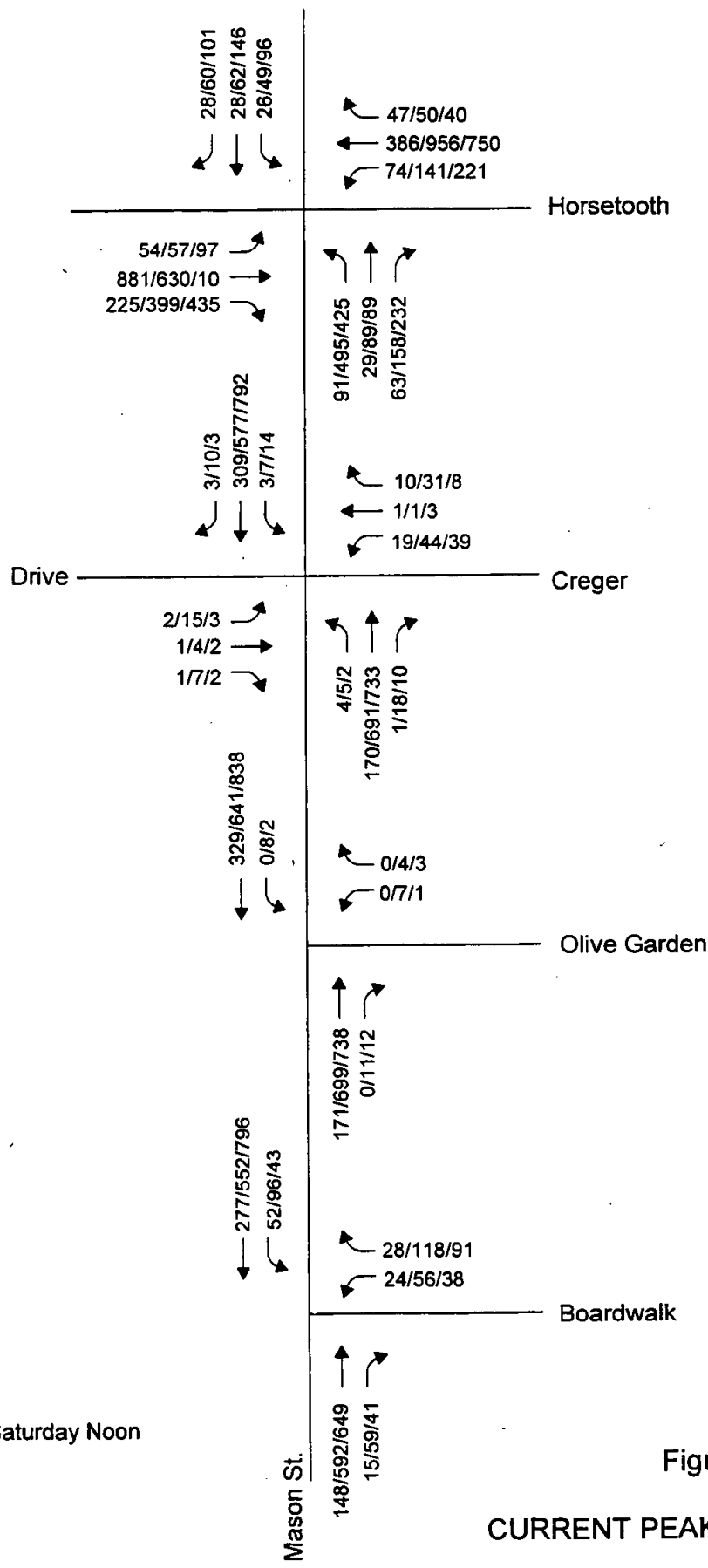
Highway Capacity Manual procedures were used to quantify current intersection operations. Resultant peak hour levels of service (LOS) are indicated below for the



NOTE: Functional lanes are shown.

Figure 2

EXISTING FUNCTIONAL ROADWAY GEOMETRY



Legend: AM/PM/Saturday Noon

Figure 3  
CURRENT PEAK HOUR TRAFFIC



investigated intersections. Traffic volumes presented on Figure 3 were loaded onto current roadway geometry which is shown on Figure 2.

EXISTING OPERATING CONDITIONS					
INTERSECTION	CONTROL	MOVEMENT	LEVEL OF SERVICE		
			Wkdy AM	Wkdy PM	Sat. Noon
Mason - Boardwalk	Stop	WB LT	B	E	D
		WB RT	A	B	B
		SB LT	A	B	A
		Overall	A	A	A
Mason - Olive Garden	Stop	WB LT/RT	A	C	C
		SB LT	A	A	A
		Overall	A	A	A
Mason - Creger	Stop	EB LT/TH/RT	B	D	D
		WB LT/TH	B	E	F
		WB RT	A	B	B
		NB LT	A	A	B
		SB LT	A	A	B
		Overall	A	A	A
Mason - Horsetooth	Signal	EB	B	C	E
		WB	B	C	C
		NB	B	C	D
		SB	C	D	E
		Overall	B	C	D

Per City standards, all locations operate acceptably while specific movements and approaches are at capacity. Capacity work sheets are in Appendix B.

### III. DEVELOPMENT ISSUES

#### A. Project Description

Motel 6 will be a single building with about 54 rooms. Site access is proposed via a single driveway which will align with the Olive Garden driveway on the east side of Mason Street. A concept plan for Motel 6 is presented on Figure 4.

Construction is expected to begin in 1998 with completion in the same year.

#### B. Site Traffic

Site traffic was estimated using Institute of Transportation Engineers (ITE) publication, "Trip Generation, 5th Edition", a nationally recognized reference. The motel classification was selected for use. The following trips are expected with the Motel 6 development. They indicate conditions with the motel fully occupied and, therefore, present worse case conditions.

Land Use	Size	Daily		AM Peak Hour			PM Peak Hour			Sat. Peak Hour		
		Rate	Trips	Rate	In	Out	Rate	In	Out	Rate	In	Out
Motel	64 rooms	10.19	440	0.66	11	18	0.60	15	11	0.74	12	20
<sup>1</sup> Weekday												

As shown above, the motel is expected to generate 29 morning peak hour trips, 26 afternoon peak hour trips, and 440 trips per day under weekday conditions. During Saturday peak hour conditions, 32 site trips can be expected. It should be noted that, in the interest of a conservative analysis, site traffic was assumed constant. No reductions were taken to reflect an increase in pedestrian and transit trips to and from the site.

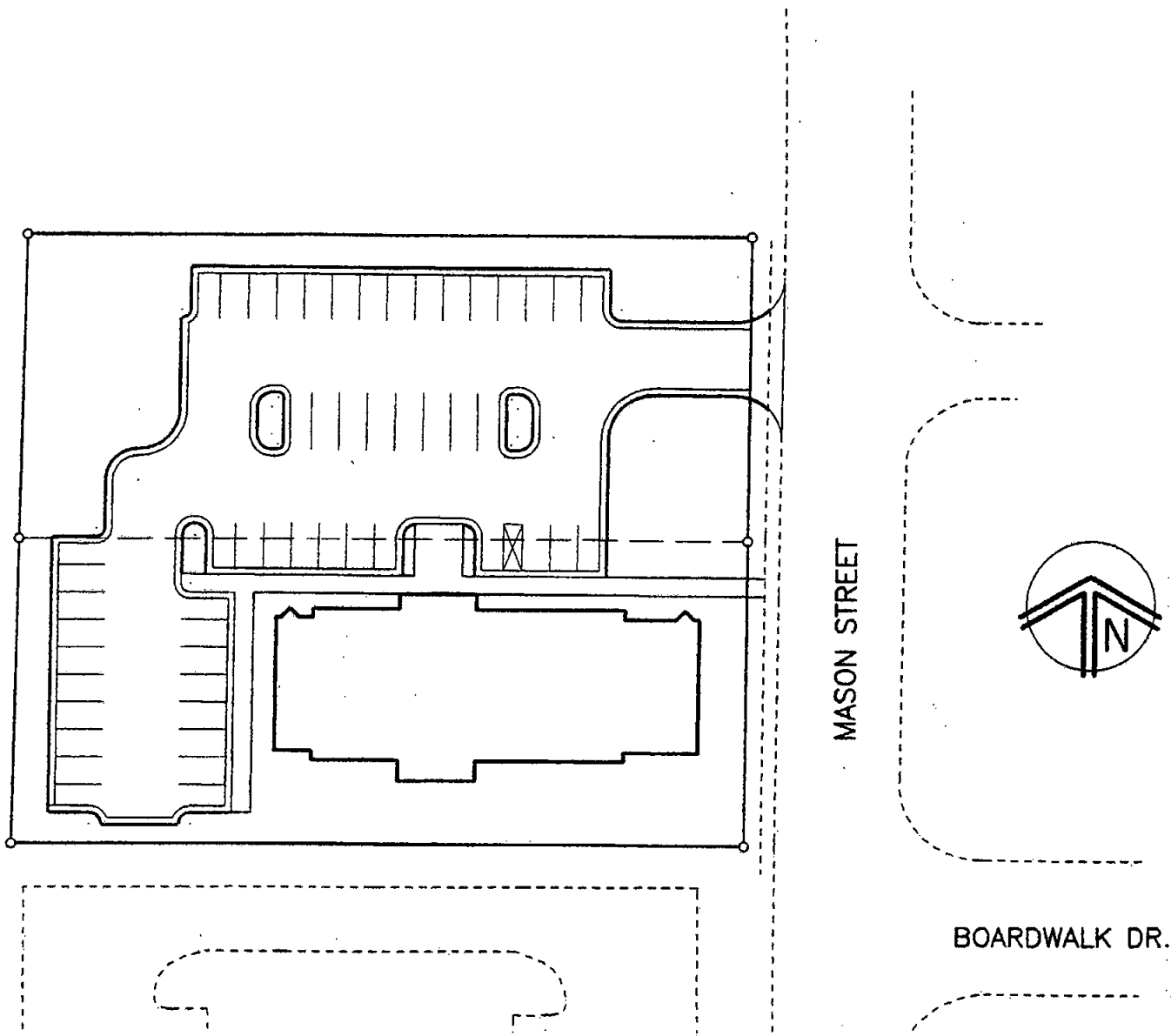


Figure 4

CONCEPT PLAN

### **C. Trip Distribution**

Trip distribution is a function of the origin and destination of site users, their work and shopping trips, and the available roadway system. In this case, all site traffic must use Mason Street to access the site. Site traffic distributions are shown on Figure 5. These distributions reflect current roadway patterns adjusted for business, shopping, and food service attractions located within a reasonable distance of the site.

## **IV. FUTURE CONDITIONS**

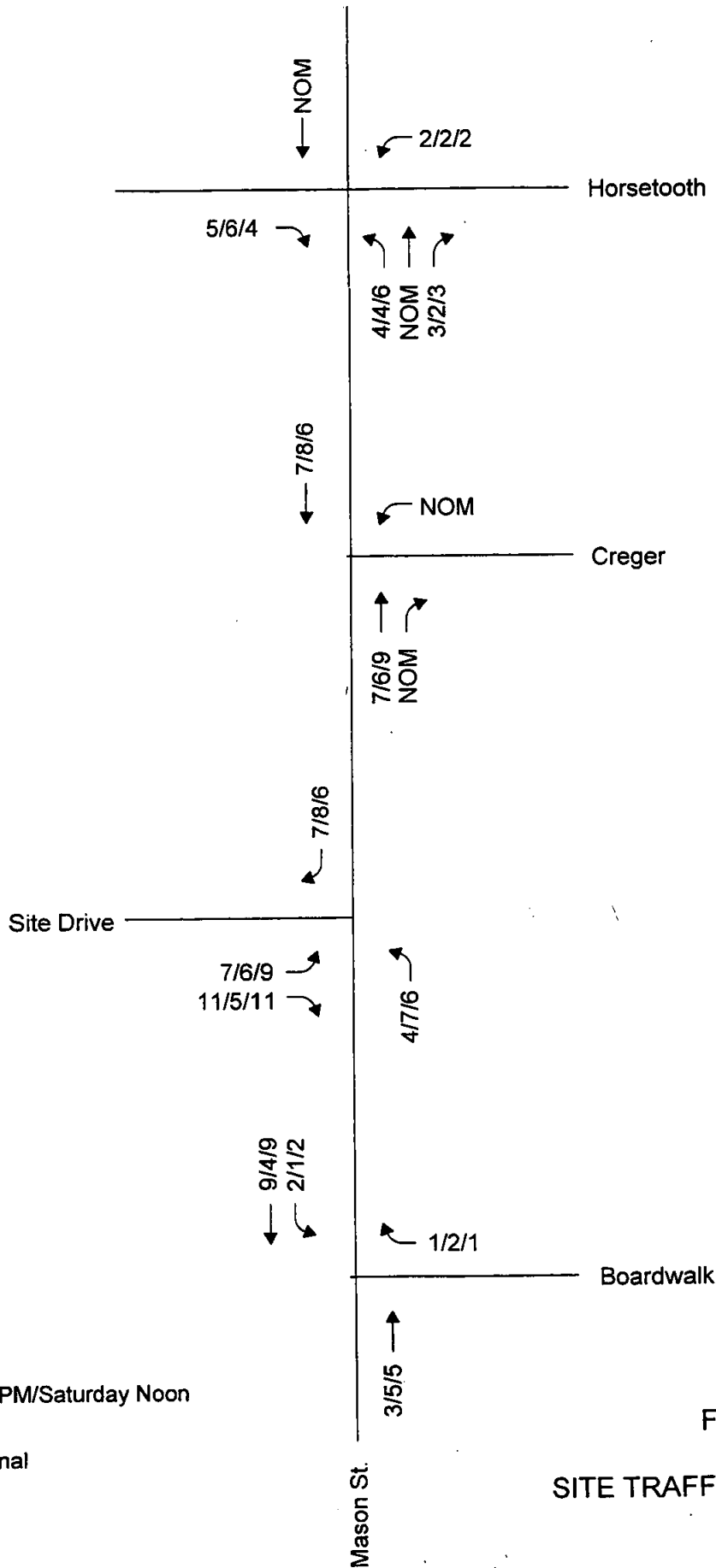
### **A. Roadway Improvements**

No significant roadway improvements are planned in the area of the site in the short-term. If improvements are realized in the next few years, they are expected to be striping changes and traffic signal timing and phasing modifications.

### **B. Background Traffic Volumes**

Background traffic volumes were developed using an annual growth rate of 2.00 percent per year on the City street system. This factor was applied to existing traffic volumes to approximate short-term conditions which reflect the year 1999.

By this time, the Motel 6 development will be fully operational for about one year. Short-term background traffic volumes are shown on Figure 6. Traffic volumes are expected to remain compatible with current roadway classifications.

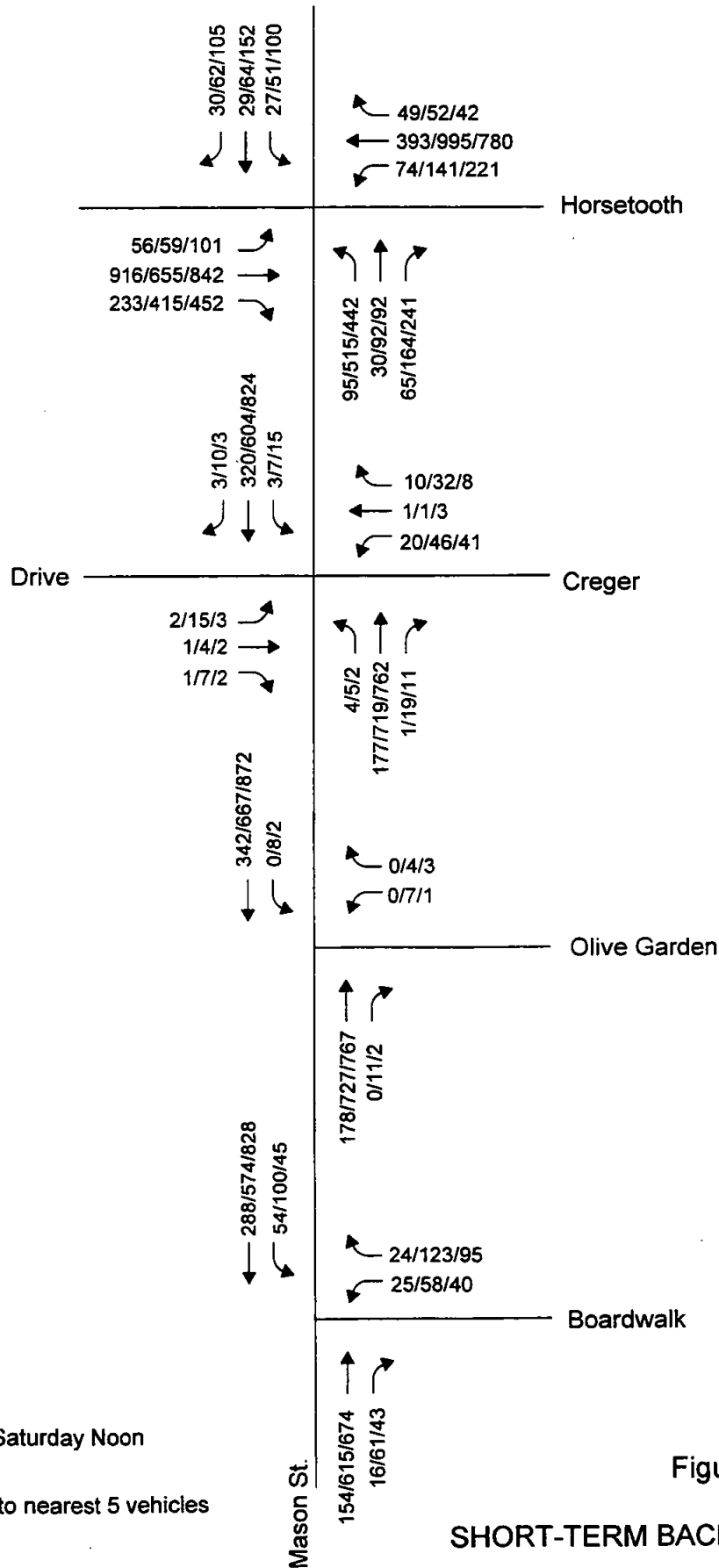


Legend: AM/PM/Saturday Noon

NOM = Nominal

Figure 5

SITE TRAFFIC DISTRIBUTION



Legend: AM/PM/Saturday Noon

NOTE: Rounded to nearest 5 vehicles

Figure 6

SHORT-TERM BACKGROUND TRAFFIC

## V. TRAFFIC IMPACTS

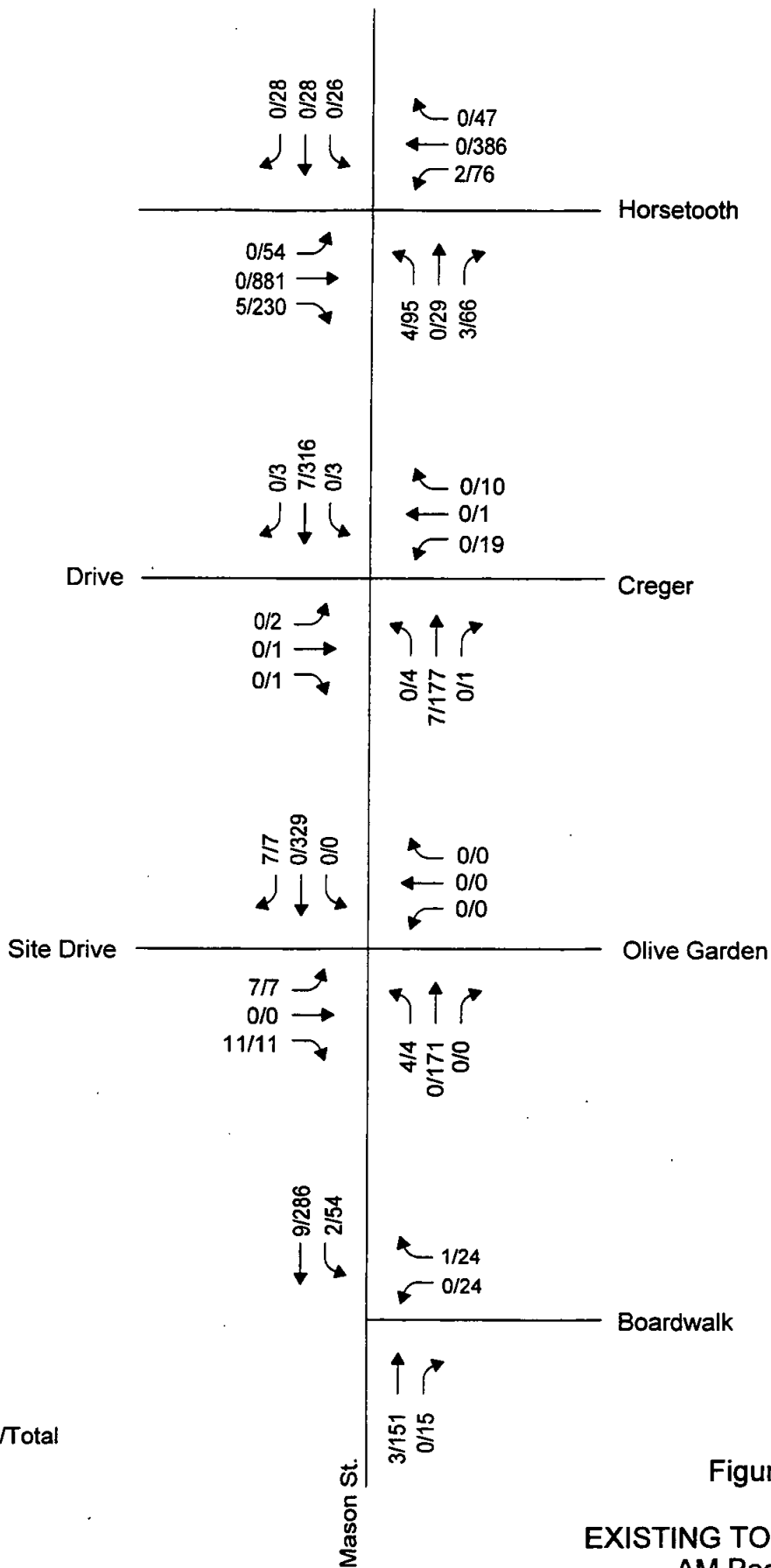
In order to assess operating conditions with the Motel 6 fully operational, capacity analyses were conducted at all intersections and the site access point. Prior to performing the analyses, the site access was reviewed from a traffic volume and turning movement standpoint. Where deemed necessary, warrants were applied to assess the need for additional lanes. The results of this review are discussed in the following section.

### A. Auxiliary Lane Requirements

The Motel 6 access was reviewed to determine if auxiliary lanes are needed on the basis of morning and afternoon peak hour traffic volumes. The evaluation revealed that auxiliary lanes are not appropriate at this location. This finding is consistent with other treatments along Mason Street.

### B. Existing Total Traffic Conditions

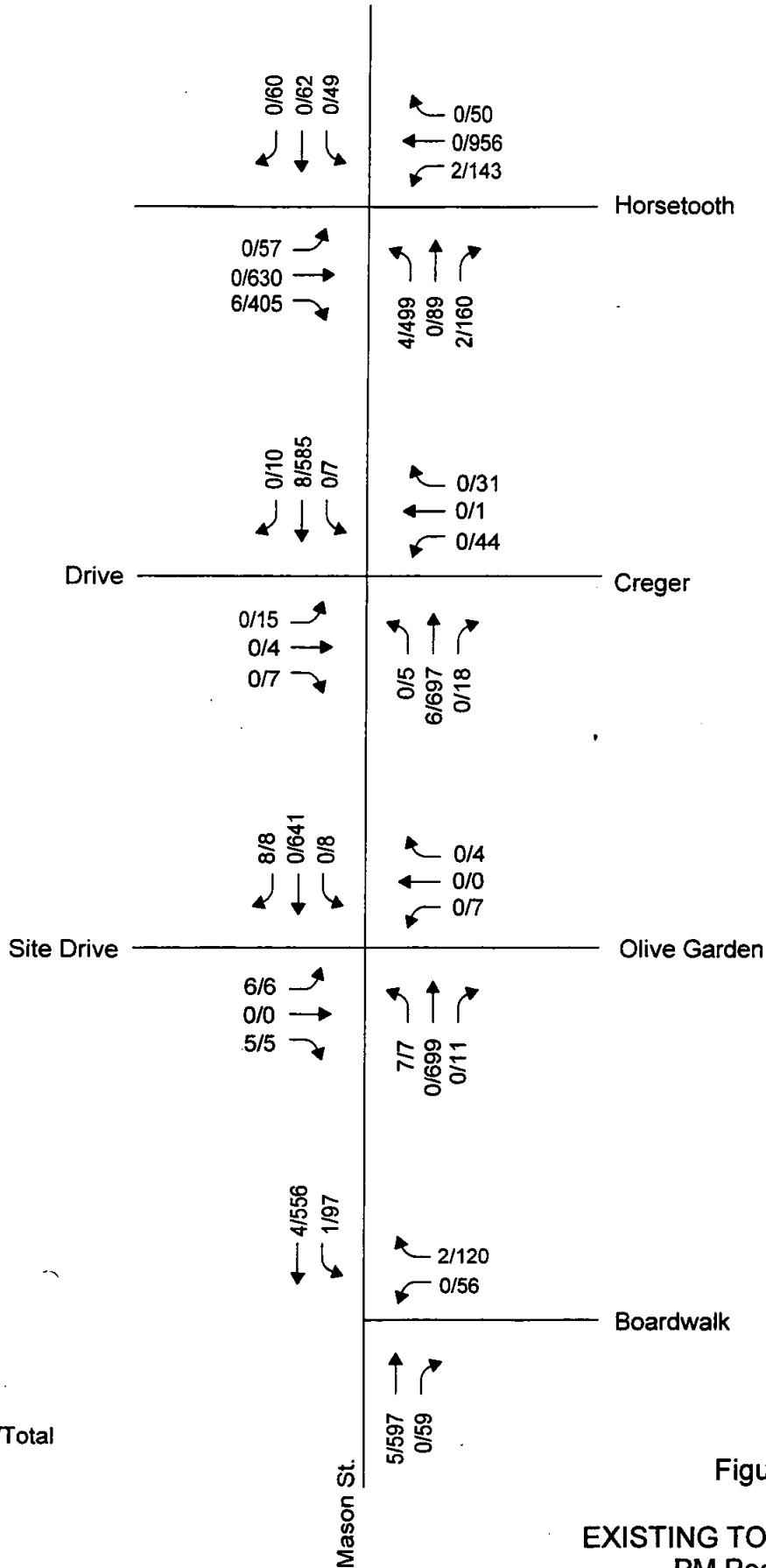
Capacity analyses were conducted to assess existing total traffic conditions at the previously investigated intersections and the site driveway. Operating levels of service were calculated using current roadway geometry, existing traffic controls and the traffic volumes presented in Figures 7, 8, and 9. The following levels of service can be expected in 1997 if the Motel 6 was fully operational. They represent the hypothetical time frame when site traffic would cause its greatest impact and, therefore, the worst case.



Legend: Site/Total

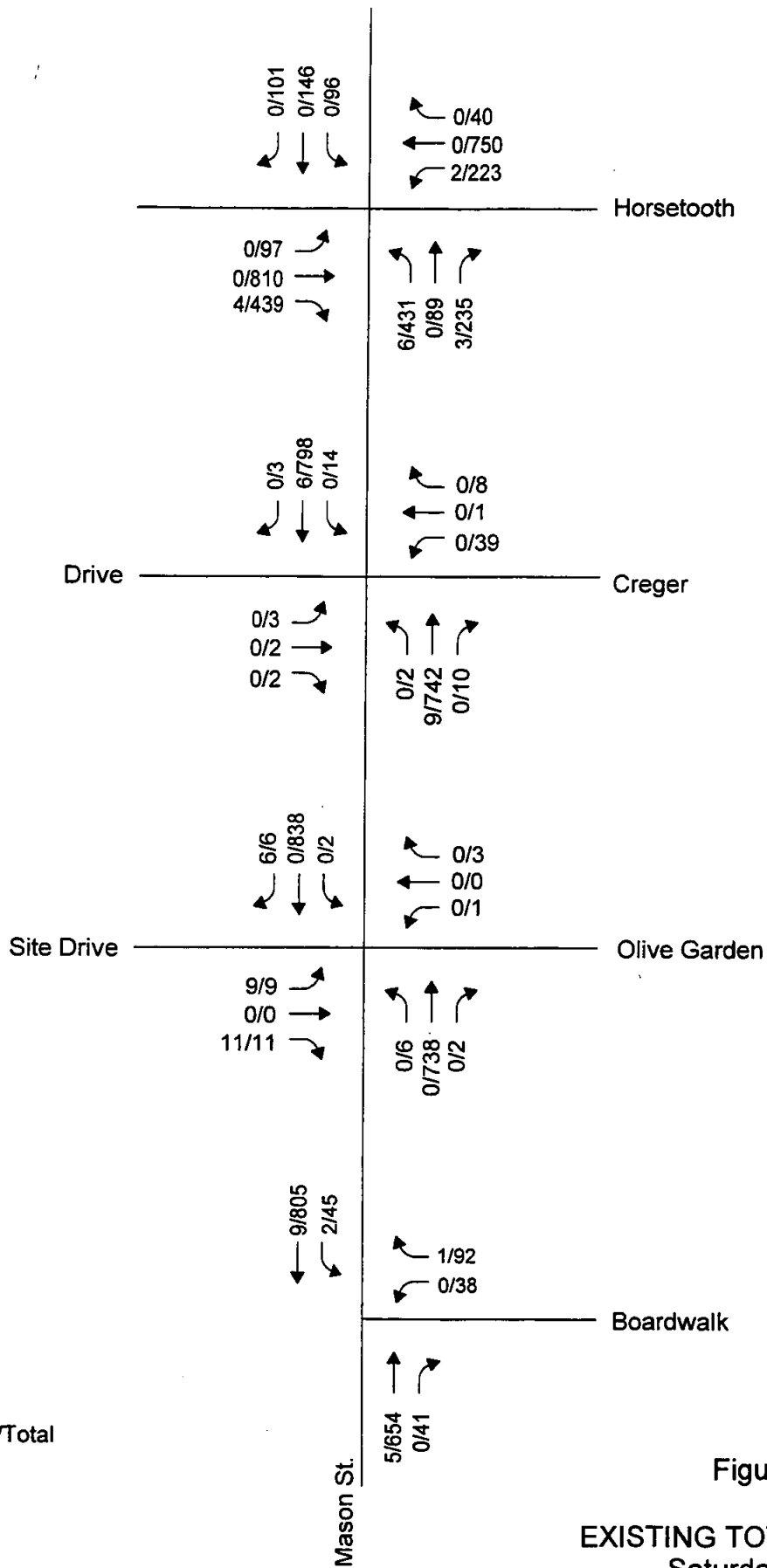
Figure 7  
EXISTING TOTAL TRAFFIC  
AM Peak Hour





Legend: Site/Total

Figure 8  
EXISTING TOTAL TRAFFIC  
PM Peak Hour



Legend: Site/Total

Figure 9

EXISTING TOTAL TRAFFIC  
Saturday Noon

EXISTING TOTAL TRAFFIC OPERATING CONDITIONS					
INTERSECTION	CONTROL	MOVEMENT	LEVEL OF SERVICE		
			Wkdy AM	Wkdy PM	Sat. Noon
Mason - Boardwalk	Stop	WB LT	B	E	D
		WB RT	A	B	B
		SB LT	A	B	B
		Overall	A	A	A
Mason - Olive Garden	Stop	EB LT/TH/RT	B	C	D
		WB LT/TH/RT	A	C	C
		NB LT	A	A	B
		SB LT	A	A	A
		Overall	A	A	A
Mason - Creger	Stop	EB LT/TH/RT	B	D	D
		WB LT/TH	B	E	F
		WB RT	A	B	B
		NB LT	A	A	B
		SB LT	A	A	B
		Overall	A	A	A
Mason - Horsetooth	Signal	EB	B	C	E
		WB	B	C	C
		NB	B	C	D
		SB	C	D	E
		Overall	B	C	D

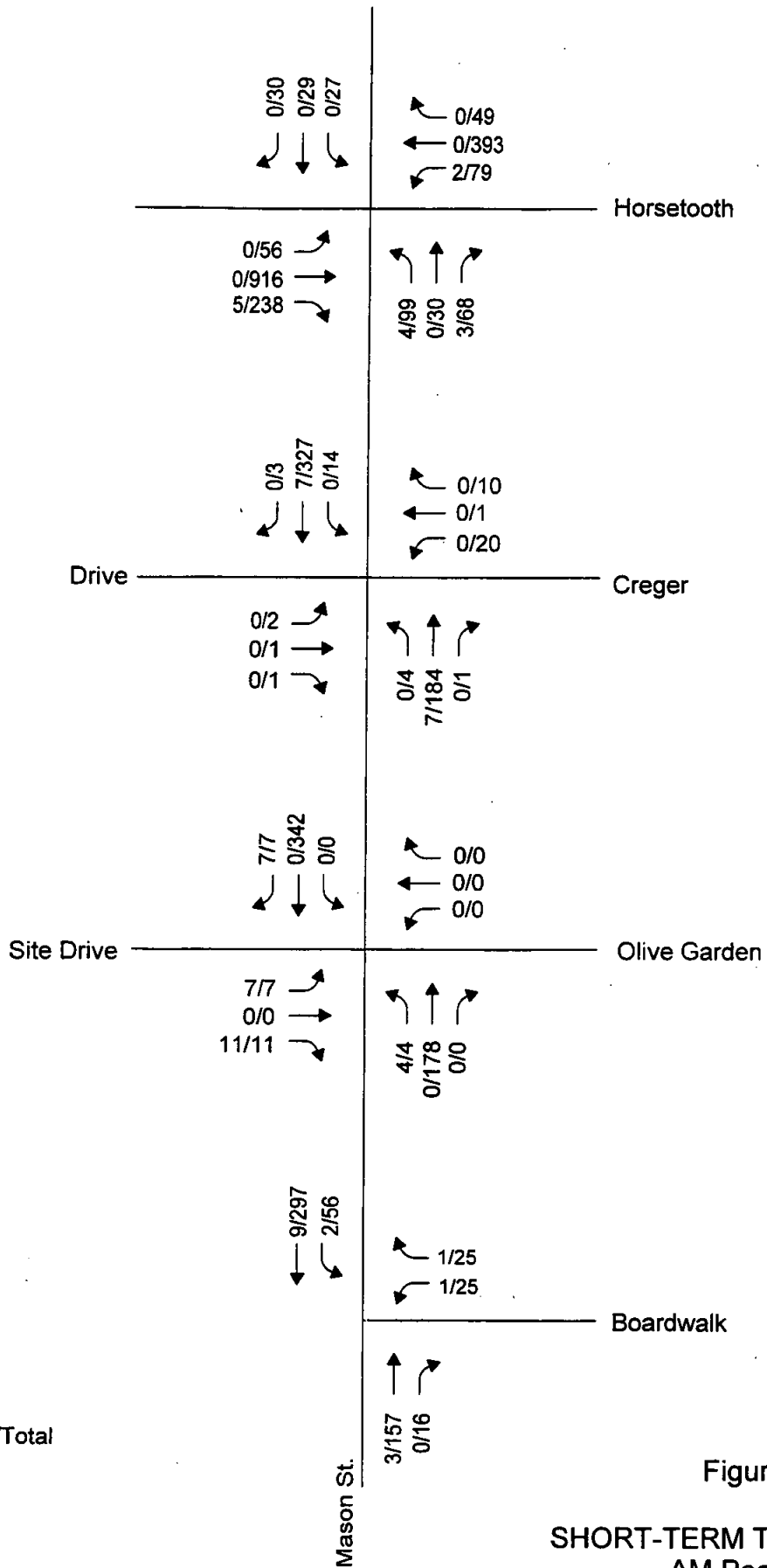
Based upon City criteria operating conditions will be acceptable with the Motel 6 development fully operational and operating conditions will be virtually identical to current conditions. Capacity work sheets are in Appendix C.

### **C. Short-Term Operating Conditions**

Operating conditions were assessed using background and total traffic volume estimates. Total traffic includes full development of the motel. Using the background traffic volumes shown on Figure 6 and current roadway geometry, baseline conditions were established. Background levels of service (without Motel 6) were calculated. This resulted in the operating conditions indicated on the following page.

SHORT-TERM BACKGROUND TRAFFIC OPERATING CONDITIONS					
INTERSECTION	CONTROL	MOVEMENT	LEVEL OF SERVICE		
			Wkdy AM	Wkdy PM	Sat. Noon
Mason - Boardwalk	Stop	WB LT	B	E	D
		WB RT	A	B	B
		SB LT	A	B	B
		Overall	A	A	A
Mason - Olive Garden	Stop	WB LT/RT	A	C	C
		SB LT	A	A	B
		Overall	A	A	A
Mason - Creger	Stop	EB LT/TH/RT	B	D	D
		WB LT/TH	B	E	F
		WB RT	A	B	B
		NB LT	A	A	B
		SB LT	A	A	B
		Overall	A	A	A
Mason - Horsetooth	Signal	EB	B	C	E
		WB	B	C	C
		NB	B	C	E
		SB	C	D	F
		Overall	B	C	D

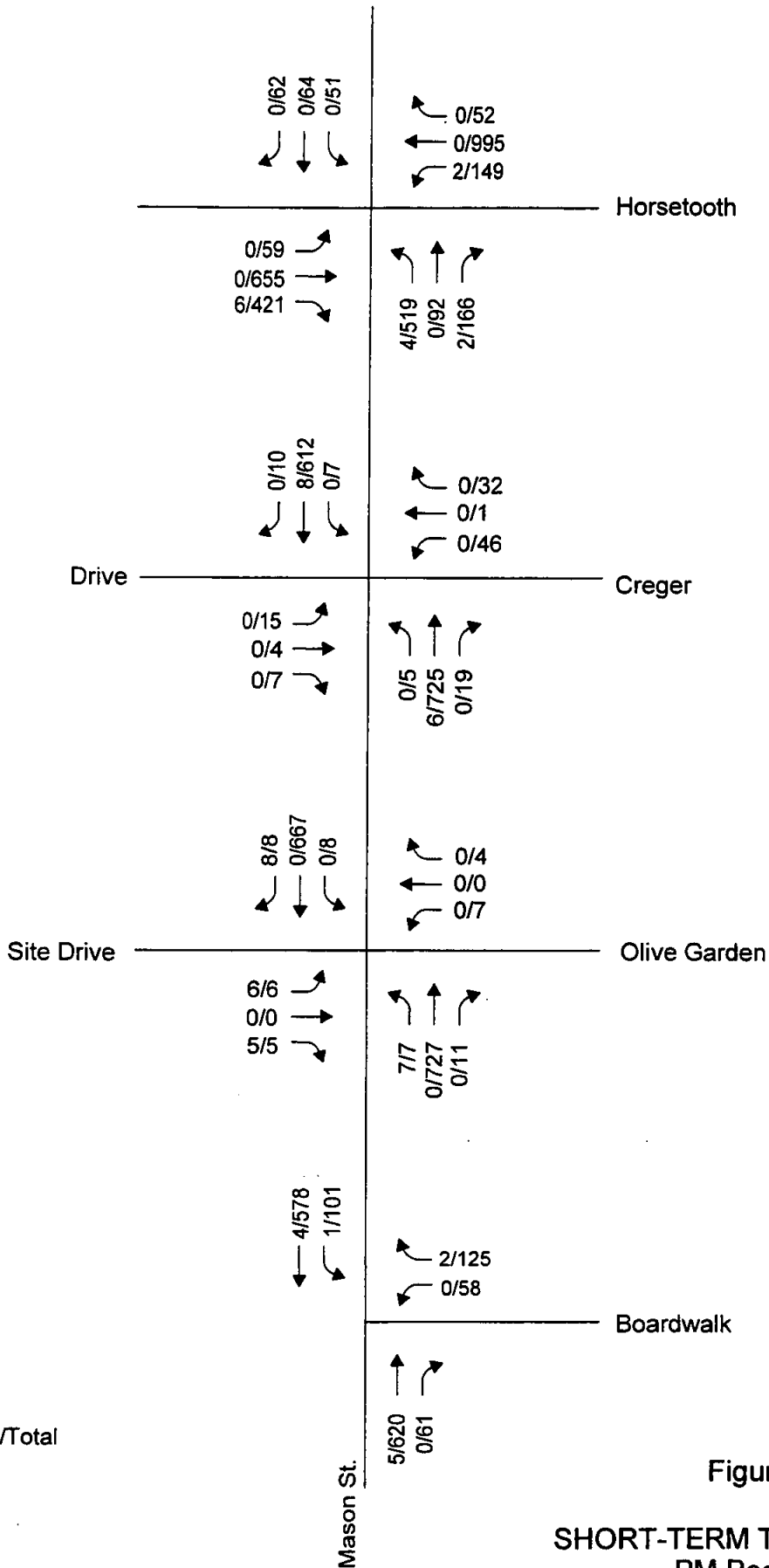
To assess operating conditions with Motel 6 fully operational, current roadway geometry and the traffic volumes shown on Figures 10, 11, and 12 were evaluated. Resultant levels of service are on the page following the above referenced figures.



Legend: Site/Total

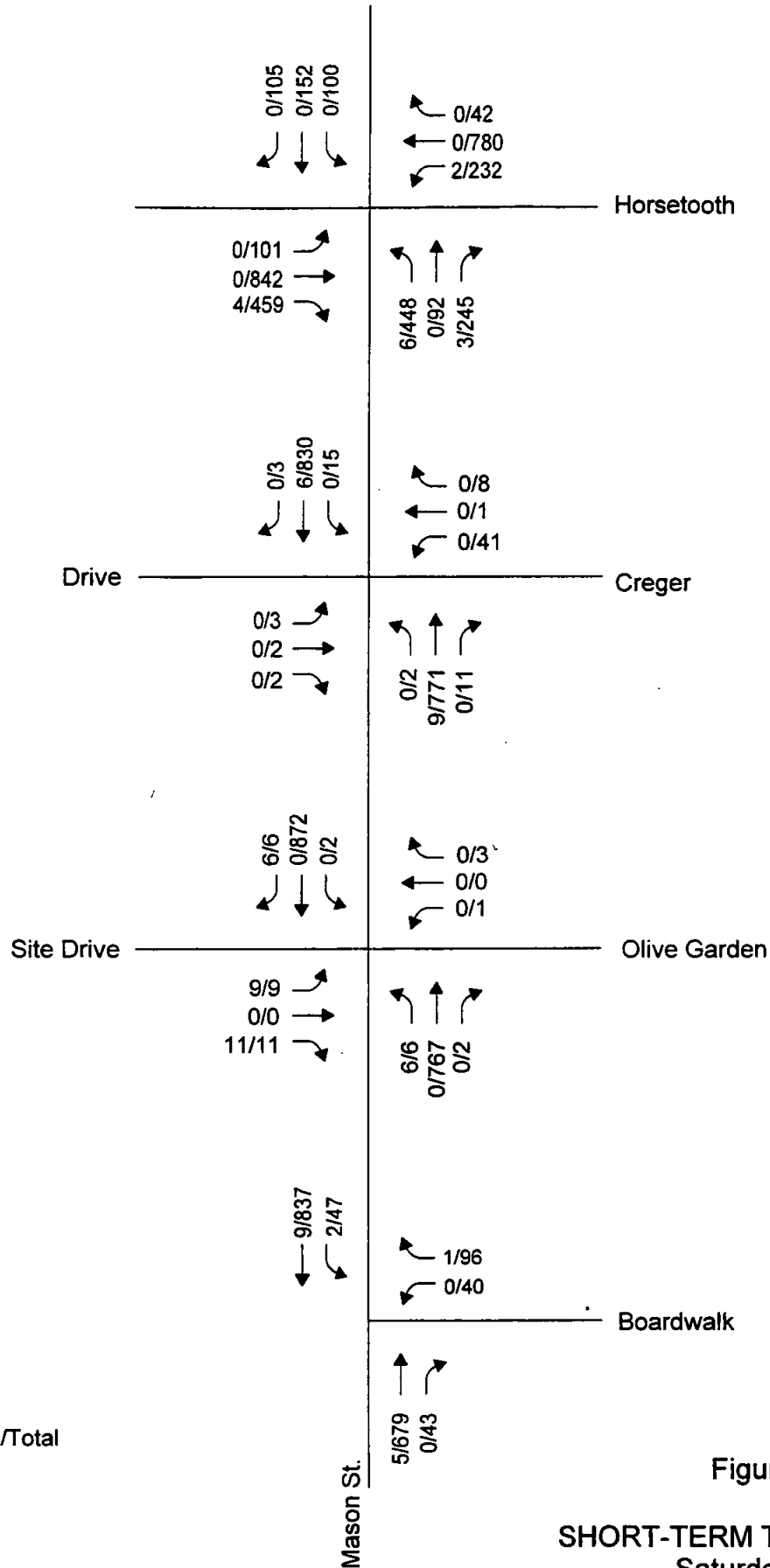
Figure 10

SHORT-TERM TOTAL TRAFFIC  
AM Peak Hour



Legend: Site/Total

Figure 11  
SHORT-TERM TOTAL TRAFFIC  
PM Peak Hour



Legend: Site/Total

Figure 12  
SHORT-TERM TOTAL TRAFFIC  
Saturday Noon



SHORT-TERM TOTAL TRAFFIC OPERATING CONDITIONS					
INTERSECTION	CONTROL	MOVEMENT	LEVEL OF SERVICE		
			Wkdy AM	Wkdy PM	Sat. Noon
Mason - Boardwalk	Stop	WB LT	B	F	D
		WB RT	A	B	B
		SB LT	A	B	B
		Overall	A	A	A
Mason - Olive Garden	Stop	EB LT/TH/RT	B	C	D
		WB LT/TH/RT	A	D	C
		NB LT	A	A	B
		SB LT	A	A	B
		Overall	A	A	A
Mason - Creger	Stop	EB LT/TH/RT	B	D	D
		WB LT/TH	B	E	F
		WB RT	A	B	B
		NB LT	A	A	B
		SB LT	A	B	B
		Overall	A	A	A
Mason - Horsetooth	Signal	EB	B	C	E
		WB	B	C	C
		NB	B	D	E
		SB	C	D	F
		Overall	B	C	D

As shown above, acceptable operations are expected under all traffic volume scenarios with the existing roadway geometry. Of importance is the fact that overall levels of

service are consistent at all intersections whether or not Motel 6 is developed. Capacity sheets are in Appendix E.

## VI. PEDESTRIAN FACILITIES

### **A. Existing Conditions**

The existing sidewalk system was field reviewed within 1,320 feet of the Motel 6 site. City identified destinations/activity centers were also investigated. The area to the west of the Burlington Northern rail corridor was not considered given the physical restrictions and safety concerns related to crossing the tracks.

Pedestrian facilities have been installed under previous editions of City design standards. This has resulted in varying sidewalk widths and locations; however, all facilities were determined in generally good condition. Pedestrian ramps are available at all intersections. Sidewalk currently exists along the west side of Mason Street adjacent to the site. There is no sidewalk along the undeveloped areas of Mason Street to the south of the site.

### **B. Planned Improvements**

The pedestrian system internal to the site will serve the motel and provide direct connections to the existing sidewalk along Mason Street. These improvements will maximize porosity with established pedestrian routes serving the local area.

The Burlington Northern transportation corridor is planned to be a future multi-modal transportation corridor. It is expected to include pedestrian, bicycle, bus, rail, and other transportation amenities. While not precisely defined, the corridor will

drastically expand and enhance the area transportation system and result in significant improvements. The ability to access the corridor from sites along Mason Street is being reviewed by the City as development occurs. While access to the corridor may be difficult due to wetlands issues, it should be considered during the preliminary design phase. If deemed acceptable, an area between adjacent developments best serves this purpose.

### **C. Levels of Service**

The City of Fort Collins multi-modal transportation Level-of-Service Manual (the Manual) was used to assess both current and future pedestrian conditions. It was determined that the site fits the "other area" classification. This classification provides the basis for determining minimum level of service criteria. Five factors were assessed under current and future conditions. The pedestrian routes identified by the City are oriented to College Avenue in general rather than individual destinations. Based upon the investigations into current and future pedestrian levels of service, it appears that acceptable levels of service are currently being experienced and will continue in the future. The pedestrian level of service work sheet is presented on Table 1.

## **VII. BICYCLE FACILITIES**

### **A. Existing Conditions**

The Motel 6 is bordered on the east by Mason Street which has on-street bicycle lanes. These lanes connect to established bicycle routes on Horsetooth Road, Boardwalk Drive, and Troutman Parkway. Excellent connectivity is therefore provided in both the north-south and east-west directions.

TABLE 1

PEDESTRIAN LOS WORKSHEET

project location classification: <b>Other</b>		level of service (minimum based on project location classification)					
	description of applicable destination area within 1,320' including address	destination area classification	directness	continuity	street crossings	visual interest & amenities	security
			1	Restaurants along College Avenue	Other	minimum C	minimum C
			actual A	actual C	actual B	actual C	actual B
			proposed A	proposed C	proposed B	proposed C	proposed B
2	Shopping along College Avenue	Other	minimum C	minimum C	minimum C	minimum C	minimum C
			actual A	actual C	actual B	actual C	actual B
			proposed A	proposed C	proposed B	proposed C	proposed B
3			minimum				
			actual				
			proposed				
4			minimum				
			actual				
			proposed				

## **B. Planned Improvements**

In the future, the Burlington Northern multi-modal corridor will greatly enhance the area's transportation system. It will abut the site on the west and result in improved levels of service.

## **C. Levels of Service**

The City of Fort Collins defines level of service based upon connectivity of the site to existing and planned bicycle facilities. In this instance, the site abuts existing bicycle lanes on Mason Street which connect to an existing bicycle route on several east-west streets. This results in level of service 'B' being realized both currently and in the future. The bicycle level of service work sheet is presented on Table 2.

# VIII. TRANSIT

## **A. Existing Conditions**

Transit stops are currently located in the vicinity of the College Avenue - Boardwalk Drive intersection. This location is served by bus route 1 which provides 30 minute service from 6:20 A.M. to 7:17 P.M. The current peak load factor as provided by Transfort is 0.70 for a representative weekday peak hour. Bus route 6 is also available and runs along Horsetooth Road. It provides 60 minute service and operates from 6:15 A.M. to 7:10 P.M. Current bus stops are located at the Horsetooth Road - Mason Street intersection.

TABLE 2

Bicycle LOS Worksheet

		level of service - connectivity		
		minimum	actual	proposed
base connectivity:		C	B	B
specific connections to priority sites:				
	description of destination area within 1,320'	destination area classification (see text)		
1	Restaurants along College Avenue	Other	C	B
2	Shopping along College Avenue	Other	C	B
3				
4				

## **B. Planned Improvements**

Historically, the City has asked that developments adjacent to the Burlington Northern right-of-way set aside an area of the site for a possible future pedestrian/bicycle connection from Mason Street to the Burlington Northern right-of-way. When and if this connection is needed depends on the realization of the Burlington Northern transportation corridor and its interface with nearby areas. Realistically, it appears that the connection may be hampered by the wetlands; however, this and other issues are best resolved during the preliminary design phase.

## **C. Levels of Service**

Using the criteria presented in the Manual, the current and future transit levels of service were determined.

Current travel time factors were calculated for both transit and automobile trips to Fort Collins High School, Foothills Fashion Mall, the CSU Transit Center, and the downtown area as defined in the Manual. Since no bus stop abuts the site, a walk time was assumed to access the transit system. Bus travel times and transfer times were extracted from the current Transfort bus schedule brochure. Auto travel time assumed a 20 mile per hour travel speed on the City street system and a park and walk time of 5 minutes. Current travel times for bus and auto traffic were estimated at 127 minutes and 54 minutes respectively resulting in a travel time factor of 2.35. Given the 13 hour service schedule, the current 30 minute service, and a travel time factor over 2.0, the current transit level of service is 'E'.

It is expected that weekday service hours will be extended to at least 18 hours per day and the frequency of service will be in the 10 minute range in conjunction with the enhanced travel corridor designation for the Burlington Northern transportation corri-

dor. With the planned transit corridor, transit will be easily accessible, have increased frequency of service and extended service hours. This will result in minimal, if any, walk time to access transit, significantly less wait time for transfers, and improved travel time factors. With these improvements, level of service 'A' is expected in the future. Work sheets are presented in Appendix F.

## IX. CONCLUSIONS

Based upon the investigations, analyses, and findings documented in earlier sections of this report, the following can be concluded:

1. Current automobile operations in the area of the Motel 6 site are acceptable.
2. Pedestrian and bicycle operations are currently acceptable.
3. Transit operations are currently unacceptable due to walk times to bus stops, 30 minute service, and relatively lengthy transfer times.
4. Motel 6 will generate 29 morning peak hour trips, 26 afternoon peak hour trips and 440 trips per day under weekday conditions. During the Saturday peak hour, 32 site trips can be expected.
5. Site traffic is considered minor.
6. Design of the Motel 6 site will permit safe and efficient access by automobiles, bicycles, and pedestrians.
7. Auxiliary lanes are not needed at the site access to Mason Street.



8. All investigated roadways currently carry and will continue to carry traffic volumes compatible with their respective classifications.
9. There is virtually no difference between operating levels of service for background and total traffic volume estimates under any of the investigated time frames. This indicates the Motel 6 development will not adversely impact the nearby street system.
10. Bicycle, and pedestrian operations are expected to remain acceptable. Transit operations are expected to operate acceptably as planned improvements are realized.

In summary, the existing transportation system can easily accommodate and absorb the proposed development. This is verified by the fact that acceptable operating conditions can be expected in the area of the Motel 6 for the foreseeable future.