Traffic Impact Study for Lost Coast Brewery

Prepared for the

City of Eureka

Submitted by

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Balancing Functionality and Livability
Traffic Engineering • Transportation Planning

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Introduction and Study Parameters

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of the proposed Lost Coast Brewery project as well as that associated with a project at the maximum density allowed under the proposed zoning for the 11.2-acre project site located on the east side of US 101 (Broadway), north of Sunset Drive, in the City of Eureka. The traffic study was completed in accordance with the criteria established by the City of Eureka, and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data that they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required in order to mitigate these impacts to a level of insignificance as defined by the City's General Plan or other policies. Traffic impacts are typically evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections included in the study.

Project Profile

The 11.2-acre project site is located on the east side of Broadway between Sunset Drive to the south and the access point to the Ocean View Cemetery to the north. The project consists of a 66,000 square foot brewery building and a 20,000 square foot building that will contain office space as well as a small bar to be called the "Tap Room" with a maximum assembly area of 4,500 square feet and a capacity of 300 people. The project site is currently occupied by a single family residential unit; no changes are proposed for this portion of the site. The location of the project site is shown in Figure 1.

The site under the proposed zoning could be developed under considerably higher intensity than is currently proposed; therefore, conditions were also evaluated for the maximum intensity that could be accommodated under the proposed land use designation.

Study Area and Periods

The study area consists of the following intersections:

1. Broadway/Henderson Street
2. Broadway/Bayshore Mall (North)
3. Broadway/Bayshore Mall (South)
4. Broadway/McCullens Avenue
5. Broadway/Ocean View Cemetery
6. Broadway/Pierson's Entrance
7. Broadway/Sunset Drive
8. Broadway/K-Mart Entrance

Operating conditions during the weekday p.m. peak period were evaluated as this time period reflects the highest traffic volumes area wide and for the proposed project. The evening peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion of the day during the homeward bound commute.

Traffic Impact Study for Lost Coast Brewery — Figure 1

City of Eureka — Study Area and Lane Configurations

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Service for the intersections with side street stop controls, or those which are unsignalized and have one or two approaches stop-controlled, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM and the Traffix software package. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections that are currently controlled by a traffic signal were evaluated using the signalized methodology from the HCM and the SYNCHRO software package. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology.

The ranges of delay associated with the various levels of service are indicated in Table 1.

Table 1
Intersection Level of Service Criteria

LOS	Two-Way Stop-Controlled	Signalized
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual,* Transportation Research Board, 2000

Traffic Operation Standards

The City of Eureka's adopted Level of Service (LOS) Standard is contained in their *General Plan*. The minimum acceptable level of service for intersections along Broadway is LOS D. The LOS standard was applied to the overall average intersection delay for signalized intersections and to the worst approach at stop-controlled intersections. Therefore, an approach delay of up to 35 seconds at a stop-controlled intersection and an overall average delay of up to 55 seconds at a signalized intersection was considered acceptable.

Since Broadway is technically US 101 through Eureka, the Caltrans standard was also considered. In the *Guide for the Preparation of Traffic Impact Studies*, Caltrans indicates that they endeavor to maintain operation at the transition from LOS C to LOS D; however, where operation is already below LOS C, the existing measure of effectiveness should be maintained.

Baseline Conditions

Description of Study Area

The study area for this analysis consisted of Broadway along the project frontage as well as the following eight intersections selected by City staff:

1. Broadway/Henderson Street
2. Broadway/Bayshore Mall (North)
3. Broadway/Bayshore Mall (South)
4. Broadway/McCullens Avenue
5. Broadway/Ocean View Cemetery
6. Broadway/Pierson's Entrance
7. Broadway/Sunset Drive
8. Broadway/K-Mart Entrance

Study Intersections

Broadway/Henderson Street is a signalized, four-legged intersection with protected left-turn phasing on the northbound and southbound Broadway approaches and split phasing on the eastbound and westbound approaches of Henderson Street. Henderson Street is one-way westbound, east of Fairfield Street, which is located approximately 450 feet east of Broadway. There are crosswalks across both Henderson Street legs as well as the northern leg of Broadway.

Broadway/Bayshore Mall (North) is a signalized, 'tee' intersection with protected left-turn phasing on the northbound Broadway approach. The southbound Broadway approach is phased with a right-turn overlap. There are crosswalks across the Bayshore Mall leg as well as the southern leg of Broadway.

Broadway/Bayshore Mall (South) is also a signalized, 'tee' intersection with protected left-turn phasing on the northbound Broadway approach and a right-turn overlap on the eastbound Bayshore Mall approach. There are crosswalks across the Bayshore Mall leg as well as the southern leg of Broadway.

Broadway/McCullens Avenue is a signalized, four-legged intersection with protected left-turn phasing on the northbound and southbound Broadway approaches and permitted left-turn phasing on the eastbound and westbound McCullens Avenue approaches. Crosswalks are provided across all four legs of this signalized intersection.

Broadway/Ocean View Cemetery is a three-legged intersection that is stop-controlled on the Ocean View Cemetery approach. A two-way left-turn lane separating the northbound and southbound travel lanes on Broadway serves as a left-turn lane for southbound traffic turning left from Broadway onto from Ocean View Cemetery and a refuge lane for westbound traffic turning left from Ocean View Cemetery onto Broadway.

Broadway/Pierson's Entrance is a signalized, four-legged intersection with protected left-turn phasing on the northbound and southbound approaches of Broadway and permitted left-turn phasing on the eastbound and westbound approaches of Pierson's Entrance. There are crosswalks across the western leg of Pierson's Entrance as well as the northern leg of Broadway.

Broadway/Sunset Drive is a three-legged intersection that is stop-controlled on the Sunset Drive approach. The two-way left-turn lane on Broadway serves as a left-turn lane for southbound traffic turning left from Broadway onto Sunset Drive and a refuge lane for westbound traffic turning left from Sunset Drive onto Broadway.

Broadway/K-Mart Entrance is a signalized, 'tee' intersection with protected left-turn phasing on the southbound Broadway approach and the westbound K-Mart Entrance approach has a right-turn overlap. There are crosswalks across the K-Mart Entrance leg as well as the northern leg of Broadway.

Since level of service standards do not apply to private driveway intersections, neither of the project driveway intersections with Ocean View Cemetery and Sunset Drive were included as study intersections. The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Study Roadway

Broadway operates as the primary north-south arterial in the City of Eureka with two travel lanes in each direction and a center two-way left-turn lane which transitions into left-turn lanes at major intersections. South of Sunset Drive Broadway has curb, gutter and sidewalks on the east side of the street; however, north of Sunset Drive the sidewalk facilities terminate along the project frontage. The speed limit on Broadway near the project site is posted at 40 miles per hour (mph) in the northbound direction and 45 mph for southbound travel.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the p.m. peak periods. This condition does not include project-generated traffic volumes. Volume data was collected between October and November, 2010, while local schools were in session. Based on direction from City staff the expected inbound and outbound trips associated with the Pacific Motorsports site, as indicated in the *Traffic Impact Study for Pacific Motorsports,* Whitlock & Weinberger Transportation, 2007, were used in addition to the existing volume data collected for the intersection of Broadway and Ocean View Cemetery.

Intersection Levels of Service

Under existing conditions, all of the study intersections are operating acceptably at LOS C or better. The existing traffic volumes are shown in Figure 2. A summary of the intersection level of service calculations is contained in Table 2. Level of Service calculations for all scenarios evaluated are provided in Appendix A.

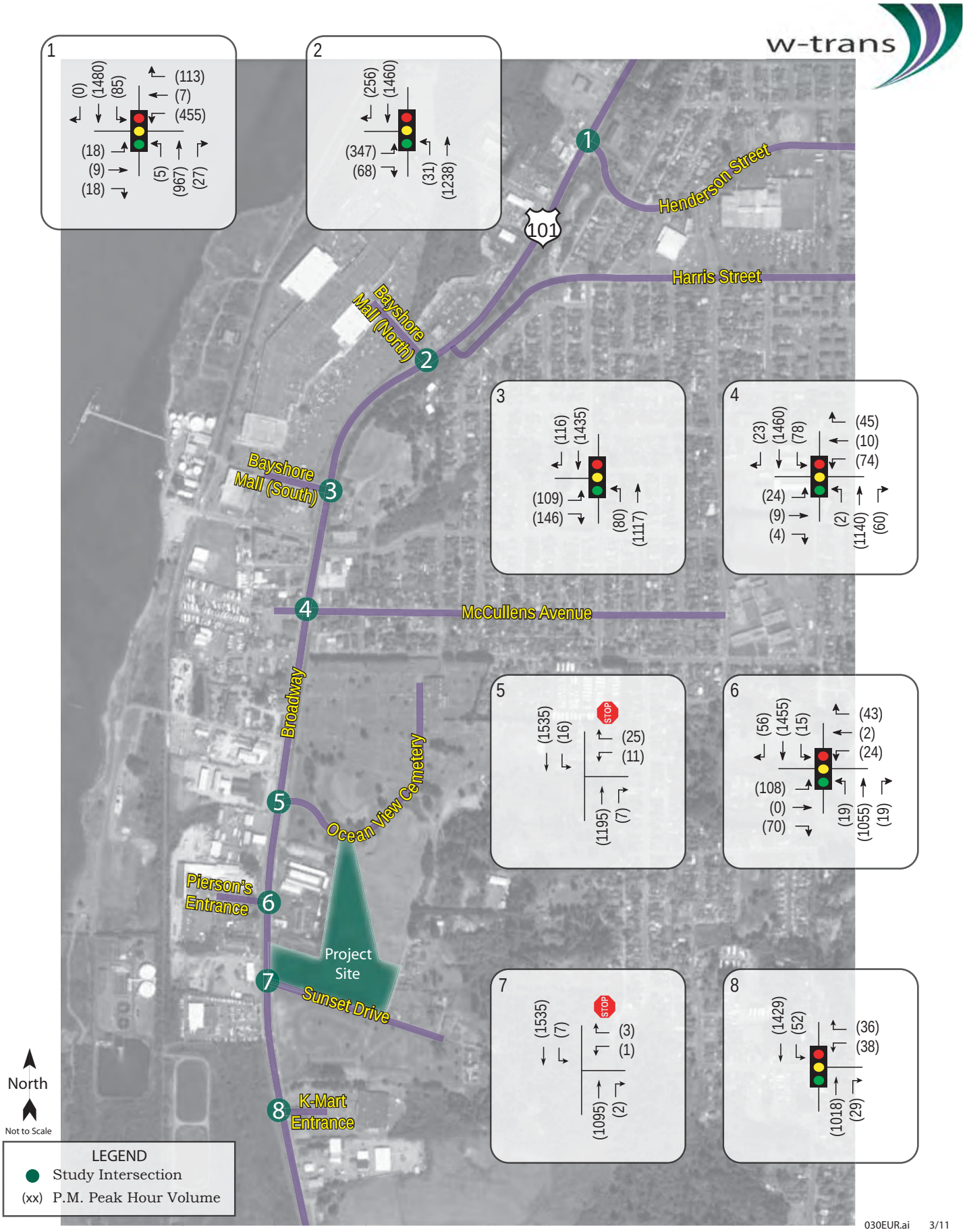

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Figure 2

Existing Traffic Volumes

Table 2
Summary of Existing PM Peak Hour Intersection Level of Service Calculations

Study Intersection *Approach*	Existing Conditions		Existing plus Project (Average)		Existing plus Project (Maximum)		Existing plus Highest Use	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Broadway/Henderson St	34.2	C	35.0	C	38.6	D	47.8	D
2. Broadway/Bayshore Mall (North)	14.9	B	14.9	B	15.1	B	16.1	B
3. Broadway/Bayshore Mall (South)	8.3	A	8.3	A	8.4	A	8.6	A
4. Broadway/McCullens Ave	12.8	B	13.1	B	13.6	B	14.5	B
5. Broadway/Ocean View Cemetery	0.3	A	0.4	A	0.8	A	0.3	A
Westbound (Ocean View) Approach	*19.0*	*C*	*20.1*	*C*	*24.8*	*C*	*23.0*	*C*
6. Broadway/Pierson's Entrance	9.6	A	9.5	A	9.5	A	9.9	A
7. Broadway/Sunset Dr	0.1	A	0.5	A	1.4	A	26.0	D
Westbound (Sunset) Approach	*15.6*	*C*	*19.1*	*C*	*26.4*	*D*	**	***F***
8. Broadway/K-Mart Entrance	5.6	A	5.6	A	5.6	A	5.6	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service;
Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*
** = delay greater than 120 seconds; **Bold** text = deficient operation

Collision History

The collision history for the one-mile segment of Broadway from McCullens Avenue to the K-Mart Entrance was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their State Wide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2005, through December 31, 2009. The calculated rate was compared to average collision rates for similar facilities statewide, as indicated in *2007 Accident Data on California State Highways*, California Department of Transportation.

The study segment was found to have 43 collisions reported over the five-year study period, which translates to a calculated collision rate of 0.88 collisions/million vehicle miles (c/mvm). The statewide average collision rate for a suburban five-lane undivided highway with a speed limit of less than 55 mph is 0.95 c/mvm. Since the collision rate on this portion of Broadway is lower than the statewide average, it would appear that it is operating within acceptable safety standards. A copy of the collision rate worksheet is included in Appendix B.

Alternative Transportation Modes

Transit

Public transit service in the study area is provided by Redwood Transit System (RTS) and Eureka Transit Service (ETS). RTS Mainline Route and ETS Gold Route operate in both directions along the study corridor of Broadway. From the proposed project site the closest bus stops for both transit services are located at McCullens Avenue, which is approximately one-half of a mile north of the project site.

Bicycles

The Pacific Coast Bike Route, which is a Class III facility, provides paved bicycle access along both sides of the study segment of Broadway.

Pedestrians

Intermittent sidewalks are provided along both sides of Broadway. The project frontages on Broadway and Sunset Drive currently do not have sidewalks.

Crosswalks are provided on at least two approaches of all signalized study intersections. Neither of the two stop-controlled intersections within the study area has crosswalks across Broadway or the minor streets of Ocean View Cemetery or Sunset Drive.

Future Conditions

Traffic volumes on Broadway as well as on other area streets will increase as the populations of the City of Eureka and County of Humboldt grow. Because model-generated volumes are not available, with direction from City staff a growth rate of 1.4 percent per year was applied to determine traffic volumes in the study area at 2030. This is a 32 percent increase over 20 years, or 1.32 times current volumes.

Under the anticipated Future volumes all of the study intersections are expected to continue to operate acceptably at LOS D or better, except for the intersection of Broadway/Henderson Street, which is expected to operate at LOS F during the p.m. peak hour. Future volumes are shown in Figure 3 and operating conditions are summarized in Table 3.

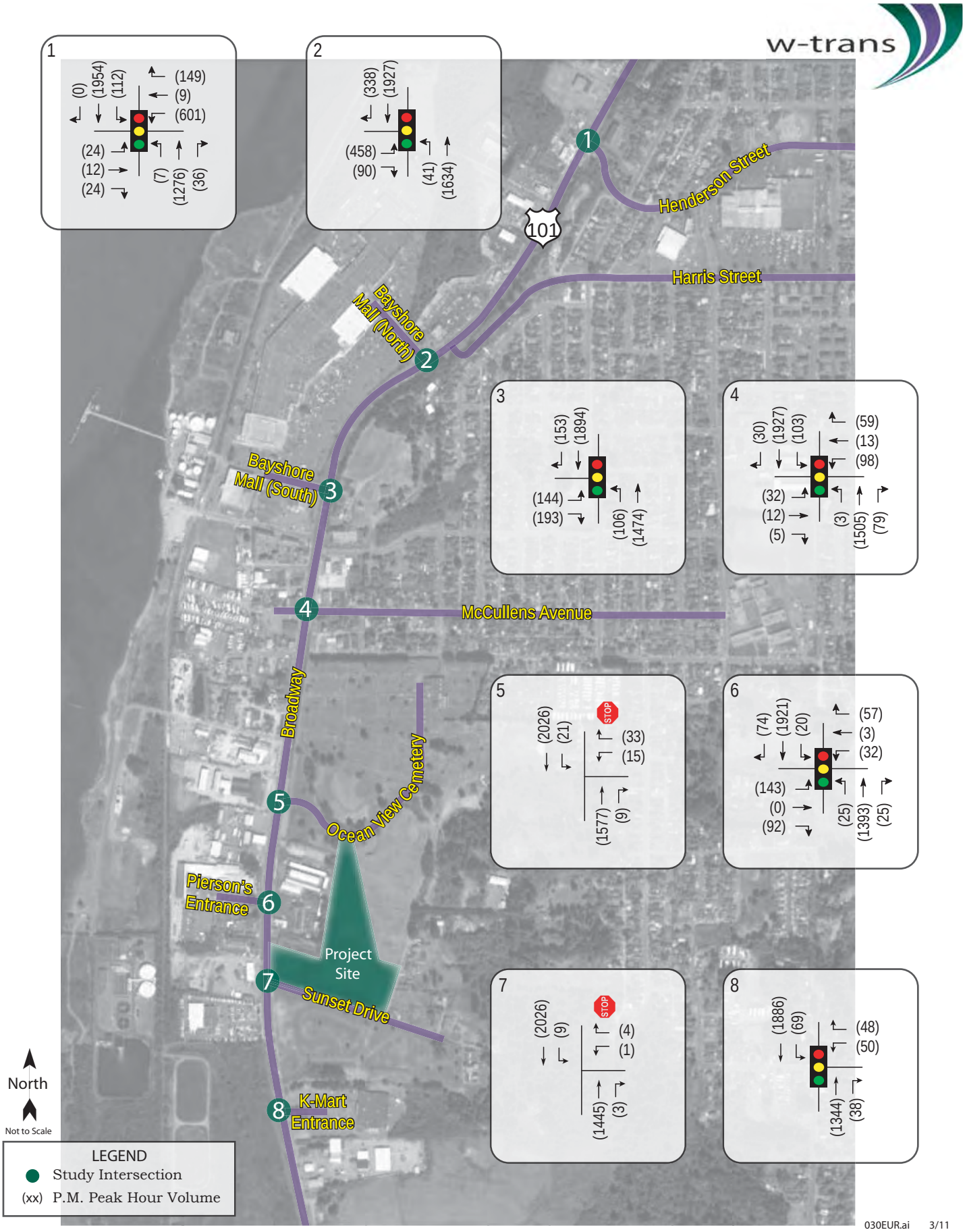

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Figure 3
Future Traffic Volumes

Table 3
Summary of Future PM Peak Hour Intersection Level of Service Calculations

Study Intersection ***Approach***	**Future Conditions**		**Future plus Project (Average)**		**Future plus Project (Maximum)**		**Future plus Highest Use**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Broadway/Henderson St	**105.4**	**F**	**109.4**	**F**	**	**F**	**	**F**
Additional NB, SB and WB Lanes	30.9	C	33.0	C	33.8	C	35.5	D
2. Broadway/Bayshore Mall (North)	30.2	C	32.7	C	40.3	D	54.0	D
3. Broadway/Bayshore Mall (South)	12.9	B	12.9	B	20.0	C	33.9	C
4. Broadway/McCullens Ave	24.0	C	25.0	C	26.6	C	38.8	D
5. Broadway/Ocean View Cemetery	0.5	A	0.6	A	1.3	A	0.5	A
Westbound Approach	*29.2*	*D*	*31.8*	*D*	***46.5***	***E***	***37.4***	***E***
6. Broadway/Pierson's Entrance	16.0	B	16.3	B	17.6	B	27.0	C
7. Broadway/Sunset Dr	0.1	A	0.6	A	2.0	A	31.7	D
Westbound Approach	*20.3*	*C*	*27.8*	*D*	*34.2*	*D*	**	***F***
8. Broadway/K-Mart Entrance	7.7	A	7.8	A	7.9	A	8.0	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service;
Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*
** = delay greater than 120 seconds; **Bold** text = deficient operation; Shaded cells = conditions with recommended improvements

To achieve acceptable LOS C operation at the intersection of Broadway/Henderson Street under future 2030 conditions (without project) additional through lanes will be needed on both approaches of Broadway together with a second left-turn lane on the westbound Henderson Street approach. It should be noted that while there are no improvements planned for this intersection, Caltrans is currently conducting a feasibility study in which the study area includes this section of Broadway. The expected improvements needed at the intersection of Broadway/Henderson Street are consistent with recommendation described above.

Plus Project Conditions

Project Description

The project consists of a 66,000 square foot brewery building that would allow for a brewing capacity of up to 300,000 barrels annually. This building would consist of fermentation, bottling and warehouse space. Exterior brewery facilities would include tanks, boilers and loading docks. A second building, which would be constructed just west of the proposed brewery building, would provide 20,000 square feet of space for office space, the "Tap Room", a limited kitchen to prepare snacks for the "Tap Room" and a gift shop. Exterior facilities include an outdoor patio, a landscaped area to be called the "Beer Garden" and bocce ball courts, which would be open to the public. Tours would be scheduled between 10:00 a.m. to 3:00 p.m., to allow guests to learn about the beer-making process and obtain complimentary tastings. The "Tap Room" would have a maximum assembly area of 4,500 square feet and a capacity of 300 people. It should be noted that the maximum occupancy of the proposed "Tap Room" was calculated using an occupancy rate of one person per 15 square feet of assembly area based on standards established in the California Building Code, Section 1004: Occupant Load; Table 1004.1.1.

The project site is located within the City of Eureka on the east side of Broadway between Sunset Drive to the south and the access point to the Ocean View Cemetery to the north. The proposed 11.2-acre project site consists of two separate parcels, a 1.9-acre parcel (APN 019-211-001) and 9.3 acres on a larger parcel (APN 019-341-002). The smaller 1.9-acre parcel is currently occupied by a single family residential unit; no changes are proposed for this portion of the site, while the remaining 9.3 acres is currently vacant. As part of the project the larger 9.3-acre parcel, which is currently zoned as Public (P), would be amended to Service Commercial (CS). The smaller 1.9-acre parcel is currently zoned CS and is proposed to remain as such.

<u>On-Site Circulation Improvements</u>

Main access to the project site is proposed via a dedicated driveway on the north side of Sunset Drive approximately 250 feet east of Broadway. A gated emergency access driveway is proposed to connect to the north side of Sunset Drive approximately 450 feet east of Broadway. A future roadway connection to the south side of the Ocean View Cemetery access road approximately 500 feet east of Broadway will provide access for attendees of events at the "Tap Room" as well as a second emergency access route. The driveway for the existing single family residential unit on the 1.9-acre parcel located approximately 80 feet north of Sunset Drive will continue to provide access to the residential unit. The proposed project site plan is shown in Figure 4.

<u>Off-Site Circulation Improvements and City Standards</u>

Sunset Drive is a City-maintained cul-de-sac that currently provides access to a cemetery and residences outside the City Limits. Due to this limited access, Sunset Drive has very low traffic volumes, and potential development that would be served by this street, other than the proposed project, is extremely limited. For this reason, the applicant is proposing improvements to Sunset Drive only between Broadway and the proposed project's main access driveway. City standards typically require street frontage improvements extending the length of the project site.

According to City staff, Sunset Drive improvements should include a 6-foot sidewalk, one 8-foot parking lane, two 12-foot driving lanes, and one 2-foot unpaved shoulder (east of the main driveway the parking lane may decrease to a 2-foot buffer to maintain existing trees). These are full width improvements, even though the project is on one side of Sunset Drive. The applicant proposes a 5-foot sidewalk, two

North

Not to Scale

Source: Laco Associates 3/11

030EUR.ai 3/11

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Figure 4

Site Plan

12-foot driving lanes, and an 11-foot unpaved shoulder. However, for purposes of this analysis, City infrastructure standards were evaluated.

Trip Generation

For purposes of estimating the number of trips that the existing residential unit currently generates, *Trip Generation*, 8th Edition, Institute of Transportation Engineers, 2007, was used. This publication is a standard reference used by jurisdictions throughout the country, and is based on actual trip generation studies performed at numerous locations in areas of various populations. Trip generation rates for "Single Family Detached Housing" (ITE LU #210) were applied to the existing residential unit.

Project Trip Generation

Since *Trip Generation* does not contain information for breweries, specific information obtained from the project applicant about the anticipated operation was used to determine the potential trip generation for the remaining components of the proposed project. At build out, the project is expected to employ a total of 50 persons for typical operation; these employees were assumed to generate an average of three trip ends daily each, or 150 trip ends total per day. Other traffic associated with the proposed project was assumed to include a maximum of 20 tasting room visitors per day. Based on an average vehicle occupancy of 2.5 visitors per vehicle, 16 daily trips are expected due to tasting room visitors. It is estimated that there will be an average of eight truck deliveries for production and sales each day, resulting in 16 trip ends per weekday. On days when there is an average size event, it was conservatively assumed that 25 percent of the daily tasting room and truck traffic would be generated during the p.m. peak hour, though standard p.m. peak hour rates are typically on the order of 10 to 15 percent of the daily rate. Since truck traffic would be limited during a maximum size event, it was assumed that only 20 percent of the eight daily truck deliveries expected during a typical day would occur during the p.m. peak hour.

The proposed project includes participation in an average of three to four group events per week with a maximum occupancy level of 300 persons in attendance. Since details about these group events, such as the typical number of attendees per event and the day and time the events would take place, are yet to be defined the following assumptions were made. Based on conversations with the applicant it is understood that the majority of events would have between 50 and 100 attendees. Assuming that the rate of three to four group events per week would occur throughout the year, a total of approximately 180 events will take place at the project site annually. Of these 180 events it was assumed that 90 would have 50 attendees, 45 would have 100 attendees, 25 would have 150 attendees, 15 would have 200 attendees, three would have 250 attendees and only one event would reach the maximum occupancy level of 300 attendees. Based on these assumptions the 180 annual events would result in an average of 47 attendees per day, which is approximately equal to the 50-person event which is expected to be the most common. Upon the request of City staff the average sized event as well as a maximum sized event with 300 attendees were evaluated.

Assuming an occupancy of 2.5 persons per vehicle, a 47-person event would be expected to generate 38 trip ends (19 inbound and 19 outbound). Although average-sized events would not occur on a daily basis, due to the frequency of such events the associated trips were included as part of the project's daily trip generation. Using the same vehicle occupancy rate, a 300-person event would generate 240 trip ends (120 inbound and 120 outbound). Since the starting and ending times of the group events are unknown, to provide a worse case scenario, all of the inbound and outbound trips for both average and maximum sized events were assumed to occur during the same p.m. peak hour. Since events would rarely last less than an hour, this is an extremely conservative assumption.

Based on the information presented above, it is estimated that the project, including an average sized event, would generate 220 daily trips, including 96 trips during the p.m. peak hour. During a maximum sized event the project is expected to generate 416 daily trips, including 297 trips during the p.m. peak hour. The anticipated trip generation of the proposed project is shown in Table 4.

Table 4
Project Trip Generation Summary

Land Use	Units	Daily		PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out
Proposed							
Employees	50	3.0	150	1.00	50	10	40
Tasting Room Visitors	20	0.8	16	0.25	4	2	2
Truck Traffic (Average Size Event)	8	2.0	16	0.25	4	2	2
Truck Traffic (Maximum Size Event)	5	2.0	16	0.20	3	1	2
Event Traffic (Average Size)	n/a	n/a	38	n/a	38	19	19
Event Traffic (Maximum Size)	n/a	n/a	240	n/a	240	120	120
Total Proposed Trips (Average-Sized Event)			*220*		*96*	*33*	*63*
Total Proposed Trips (Maximum-Sized Event)			*416*		*297*	*133*	*164*

Highest Use Conditions

The City of Eureka requested the evaluation of a scenario that involves development of the project site at the highest use, assuming that the "highest" use would be the one generating the most traffic based on the proposed zoning designation.

Based on discussions between the applicant and City staff it was determined that for the 1.9-acre parcel the permitted land use that would generate the maximum number of trips would be a Fast Food Restaurant with a drive-thru. Coverage of 35 percent of the lot was assumed for this parcel. Based on these assumptions, this parcel could accommodate about 28,950 square feet of floor space. Of this, 10,000 square feet was assumed to consist of a Fast Food Restaurant with a drive-thru. The remainder of the parcel was assumed to consist of a mixture of retail space and a high turnover restaurant, which can be reasonably considered appropriate land uses to accompany Fast Food Restaurants.

The permitted land use that would generate the maximum number of trips for the 9.3-acre parcel was determined to be retail space. It was assumed that the parcel could accommodate a 95,000 square foot retail development, which equates to approximately 23 percent lot coverage.

Pass-by Trips

Some portion of traffic associated with retail and restaurant uses is drawn from existing traffic on nearby streets. These vehicle trips are not considered "new," but are instead comprised of drivers who are already driving on the adjacent street system and choose to make an interim stop, and are referred to as "pass-by." The percentage of these pass-by trips is typically developed based on information provided in the *Trip Generation Handbook: An ITE Recommended Practice*, ITE, 2004. However, based on direction from Caltrans and concurrence from City staff, a pass-by rate of 15 percent was applied to the high

turnover restaurant, fast food restaurant and retail uses associated with the highest uses at both subject parcels.

As shown in Table 5, the parcels combined would be expected to generate an average of 9,176 new trips per day, including 617 new trips during the p.m. peak hour and 727 trips at the driveway when pass-by trips are included.

Table 5
Highest Use Trip Generation Summary

Land Use	Units	Daily		PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out
APN 019-211-001 (1.9 acres)							
Fast Food w/ Drive-thru	10 ksf	496.12	4,961	33.84	338	176	162
Pass-by Trips		*15%*	*-744*	*15%*	*-51*	*-27*	*-24*
Specialty Retail	9.475 ksf	44.32	420	2.71	26	11	15
Pass-by Trips		*15%*	*-63*	*15%*	*-4*	*-2*	*-2*
High-Turnover Restaurant	9.475 ksf	127.15	1,205	11.15	106	62	44
Pass-by Trips		*15%*	*-181*	*15%*	*-16*	*-9*	*-7*
Total Highest Use Trips for APN 019-211-001			*5,598*		*399*	*211*	*188*
APN 019-341-002 (9.3 acres)							
Specialty Retail	95 ksf	44.32	4,210	2.71	257	113	144
Pass-by Trips		*15%*	*-632*	*15%*	*-39*	*-17*	*-22*
Total Highest Use Trips for APN 019-341-002			*3,578*		*218*	*96*	*122*
Total Highest Use Trips for both Parcels			**9,176**		**617**	**307**	**310**

Notes: ksf = 1,000 square feet

Trip Distribution

The pattern used to allocate new project trips as well as trips associated with the highest land uses to the street network was determined by reviewing existing turning movements at the study intersections. The applied distribution assumptions and resulting daily and peak hour trips are shown in Table 6.

Table 6
Project Trip Distribution Assumptions

Route	Percent
Broadway – North of project site	50%
Broadway – South of project site	30%
Harris St/Henderson St couplet – East of Broadway	20%
TOTAL	**100%**

Intersection Operation

Existing plus Project (Average-Sized Event) Conditions

Upon the addition of project-related traffic with an average-sized event to the Existing volumes, the study intersections are expected to continue to operate acceptably at LOS C or better during the p.m. peak period. These results are summarized in Table 2. Project traffic volumes with an average-sized event are shown in Figure 5.

Impact: The study intersections are expected to continue operating acceptably at the same levels of service upon the addition of project-generated traffic with an averaged sized event.

Recommendation: The project's impact is less-than-significant, so no improvements are needed.

Existing plus Project (Maximum-Sized Event) Conditions

Upon the addition of project-related traffic with a maximum sized event to the Existing volumes, the study intersections are expected to continue to operate acceptably at LOS D or better during the p.m. peak period. These results are summarized in Table 2. Project traffic volumes with a maximum-sized event are shown in Figure 5.

Impact: The study intersections are expected to continue operating acceptably upon the addition of project-generated traffic with a maximum sized event.

Recommendation: The project's impact is less-than-significant, so no improvements are needed.

Existing plus Highest Use Conditions

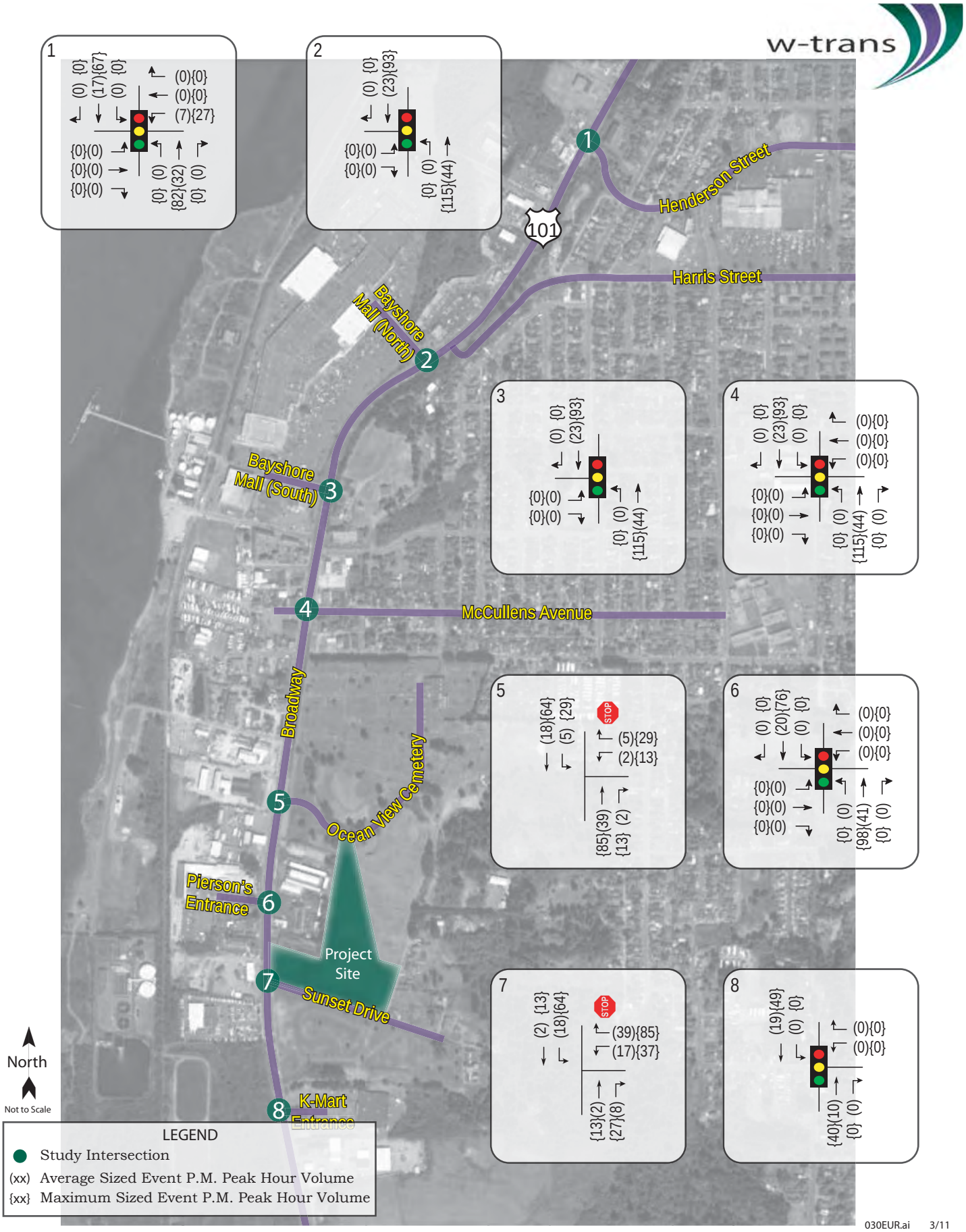
Upon adding trips related to the assumed "highest" land uses to Existing volumes, all of the study intersections would be expected to continue operating at acceptable levels of service, except the intersection of Broadway/Sunset Drive which is expected to operate at LOS F on the westbound Sunset Drive approach. If the project site is developed with anything other then the proposed project, further evaluation of operating conditions at Broadway/Sunset Drive will need to take place. A summary of the level of service calculations is contained in Table 2. Traffic volumes assumed under the highest land uses are shown in Figure 6.

Future plus Project (Average-Sized Event) Conditions

With project-generated traffic, including that associated with an average-sized event, added to the anticipated Future volumes all of the study intersections are expected to operate acceptably, except for the intersection of Broadway/Henderson Street which is expected to continue to operate at LOS F during the peak hour evaluated. Operating conditions under Future plus Project conditions with an average sized event are summarized in Table 3.

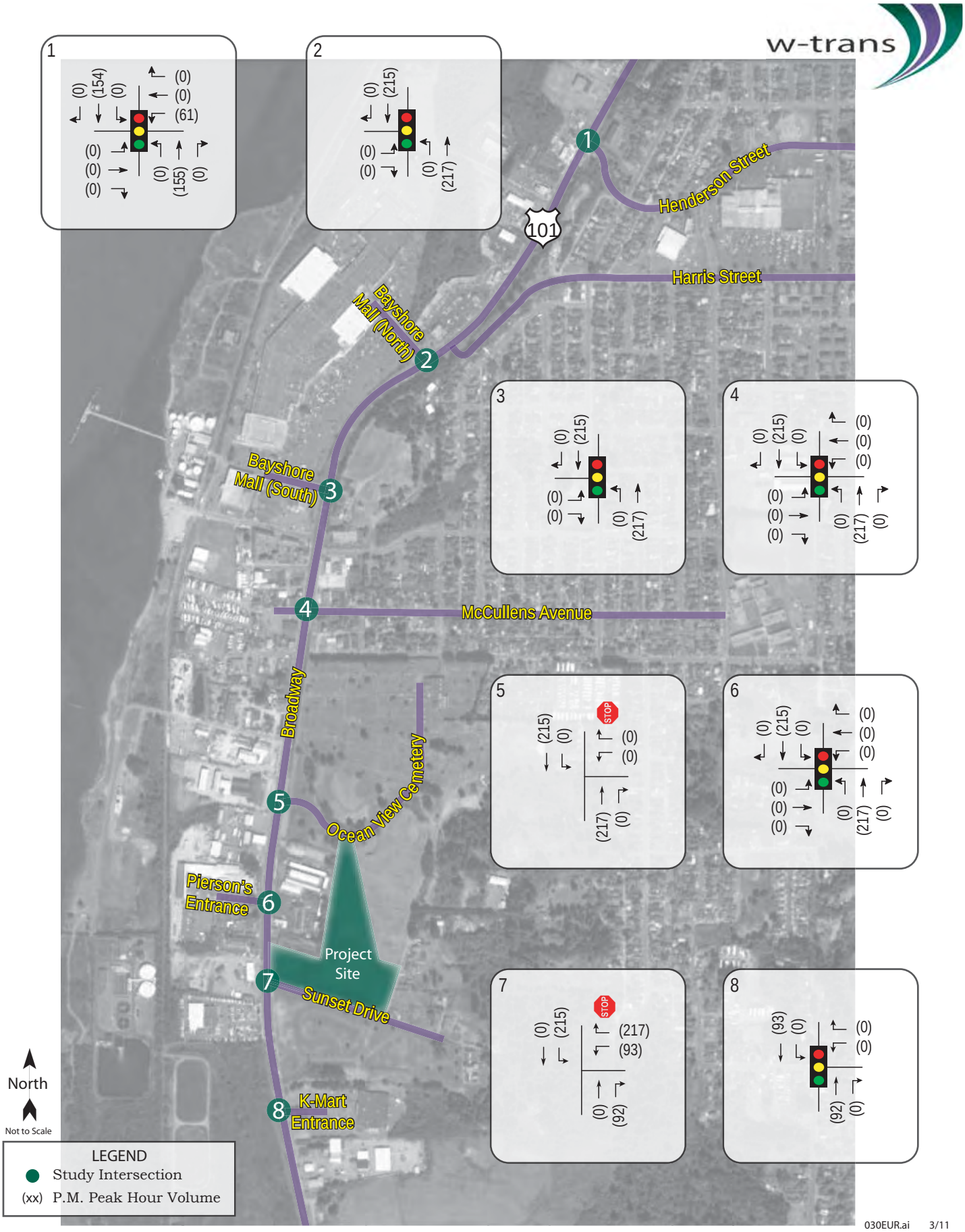
Impact: As was the case for Future conditions without the project, the study intersection of Broadway/ Henderson Street will continue operating at an unacceptable Level of Service during the p.m. peak hour.

Recommendation: Although the City of Eureka does not have a traffic impact fee program established, the project applicant should contribute to a funding mechanism for future improvements at the intersection of Broadway/Henderson Street, potentially including additional through lanes on both Broadway approaches and a second left-turn lane on the westbound Henderson Street approach. This funding mechanism should be adopted prior to issuance of the certificate of occupancy.



Traffic Impact Study for Lost Coast Brewery
City of Eureka

Figure 5
Project Traffic Volumes



Traffic Impact Study for Lost Coast Brewery

City of Eureka

Figure 6

Highest Land Use Traffic Volumes

Future plus Project (Maximum-Sized Event) Conditions

Upon the addition of project-generated traffic associated with a maximum-sized event to the anticipated Future volumes the study intersections are expected to operate acceptably during the p.m. peak hour, except for the intersections of Broadway/Henderson Street and Broadway/Ocean View Cemetery which are expected to operate unacceptably at LOS E or worse. Operating conditions under Future plus Project conditions with a maximum-sized event are summarized in Table 3.

Impact: The study intersection of Broadway/Henderson Street will continue operating unacceptably during the p.m. peak hour.

Impact: The westbound approach at the intersection of Broadway/Ocean View Cemetery is expected to operate unacceptably at LOS E during the p.m. peak hour.

Recommendation: Implementation of the previously mentioned improvements for the intersection of Broadway/Henderson Street will produce acceptable LOS C operation.

Recommendation: To avoid unacceptable operating conditions on the westbound Ocean View Cemetery approach at Broadway, the arrival and departure times of a maximum-sized event should not coincide with the p.m. peak hour.

Future plus Highest Use Conditions

Upon the addition of trips related to the assumed "highest" land uses to projected Future volumes all of the study intersections would be expected to continue operating at acceptable levels of service, except for the intersections of Broadway/Henderson Street, Broadway/Ocean View Cemetery and Broadway/Sunset Drive which are expected to operate unacceptably at LOS E or worse. Implementation of the previously identified improvements for the intersection of Broadway/Henderson Street will produce acceptable operating conditions. As stated under Existing plus Highest Use conditions, if the project site is developed with anything other then the proposed project, further evaluation of operating conditions at Broadway/Ocean View Cemetery and Broadway/Sunset Drive will need to take place. A summary of the level of service calculations is contained in Table 3.

Access and Circulation Evaluation

The proposed project site plan includes one main access driveway on the north side of Sunset Drive approximately 250 feet east of Broadway. A gated emergency access driveway is proposed to connect to the north side of Sunset Drive approximately 450 feet east of Broadway. Under future phases a second emergency access driveway is proposed to connect to the south side of the Ocean View Cemetery access road approximately 500 feet east of Broadway that will also be used by attendees of events at the "Tap Room". The existing access driveway for the single family residence located approximately 80 feet north of Sunset Drive will remain.

Circulation throughout the proposed project site was evaluated to determine if the facility would provide adequate space for circulation and turning movements. The site plan was used together with the AutoTURN software package to evaluate vehicle movements through and around the site. Based on the site plan provided, it is anticipated that the proposed project site would have adequate turning radii and site circulation for a typical passenger vehicle as well as for the larger trucks expected to access the site. Copies of the Site Plan Truck Turning Templates are contained in Appendix C.

Since the existing alignment of Sunset Drive is slightly skewed to the southeast, the curb return radius needed to accommodate trucks making a right turn from northbound Broadway would greatly exceed

what is allowed by Caltrans. If Sunset Drive were realigned to intersect Broadway at a right angle, trucks could make the right turn with acceptable curb return radii and retention of the proposed 40-foot right-of-way. Realignment of Sunset Drive would need to occur on the property located south of the project site to avoid the removal of the existing structures on the 1.9-acre parcel on the north side of Sunset Drive.

With realignment of Sunset Drive, trucks exiting Sunset Drive via westbound right-turns are also expected to be able to do so within the egress travel lane. Under this assumption both the northeast and southeast corners of the realigned intersection of Broadway/Sunset Drive would have 40-foot curb return radii.

Appendix D includes existing cross-sections of Ocean View Cemetery and Sunset Drive as well as the cross-sections for the 40-foot right-of-way on Sunset Drive based on City standards and as proposed. Also shown in Appendix D are truck turning templates that illustrate the curb return radii needed at the intersection of Broadway/Sunset Drive.

Impact: The existing alignment of Sunset Drive cannot accommodate right-turns without encroaching upon the opposing lane.

Recommendation: Sunset Drive should be realigned to intersect with Broadway at a right angle. If a portion of the property located on the southeast corner of the intersection can be acquired, removal of the existing structure located on the 1.9 acre north of Sunset Drive will not be necessary.

Queuing Analysis

The projected maximum queue lengths at the two stop-controlled study intersections on Broadway at Ocean View Cemetery and Sunset Drive were evaluated to determine if access to any existing driveways along Broadway would be blocked. Under p.m. peak hour conditions with project-generated traffic associated with a maximum-sized event added to future volumes it is projected that the maximum queue on southbound Broadway waiting to make a left-turn will be three vehicles (approximately 75 feet) at both Ocean View Cemetery and Sunset Drive. Since the nearest driveway on Broadway north of either of these two intersections is greater than the expected maximum queue lengths, operation along Broadway is not expected to be impacted.

Under these same conditions, the maximum queue lengths on Ocean View Cemetery and Sunset Drive are expected to extend approximately 75 and 100 feet east of Broadway respectively. Since the project driveways on Ocean View Cemetery and Sunset Drive are proposed to be located approximately 500 and 250 feet east of Broadway respectively, the expected maximum queue lengths on these westbound approaches can be accommodated without obstructing access to the project site. Copies of the Maximum Queue Length spreadsheets are contained in Appendix E.

Sight Distance

Sight distance from the proposed new driveways as well as at the intersections of Broadway/Sunset Drive and Broadway/Ocean View Cemetery was evaluated based on sight distance criteria contained in Caltrans' *Highway Design Manual* (HDM) and a field check of actual conditions.

The HDM indicates that stopping sight distance standards are applicable for private driveways, so stopping sight distance requirements were applied to sight lines from the proposed driveways on Sunset Drive and Ocean View Cemetery. Since the speed limit is not posted on either of these streets an approach speed of 35 mph was assumed. For this approach speed, a private road intersection should

have stopping sight distance of at least 250 feet. From the location of both proposed driveways the sight distance to the east and west exceeds this minimum requirement so is adequate.

The existing speed limit on Broadway is 40 mph in the northbound direction and 45 mph in the southbound direction at both intersections with Sunset Drive and Ocean View Drive. Both of these locations were treated as public road intersections, with the minimum sight distance requirement based on corner sight distance. For the approach speeds of 40 and 45 mph a public road intersection should have corner sight distance of at least 440 and 495 feet respectively. From these intersections the sight distance is in excess of 500 feet in both directions, which is adequate for approach speeds of up to 55 mph. Therefore, adequate sight distance exists at both intersections. It should be noted that corner sight distance on Broadway was measured from the proposed stop bar location on the westbound approach of Sunset Drive, as shown in the project site plan and as requested by Caltrans.

Though sight distance requirements are met, it is possible that existing or proposed vegetation situated on either side of Sunset Drive, Ocean View Cemetery or the proposed driveways could impede clear sight lines if not maintained.

Impact: Though sight distance requirements are met, existing or proposed vegetation could potentially impede clear sight lines.

Recommendation: The existing or proposed vegetation located on either side of Sunset Drive, Ocean View Cemetery or the proposed driveways should be periodically trimmed to maintain clear sight lines.

Alternative Transportation Modes

Transit

The project is located approximately one-half of a mile from RTS or ETS bus stops, which is greater than what is considered to be a reasonable walking distance (one-quarter of a mile). Therefore, the project site is considered inaccessible via transit service and anticipated transit demand generated by the project will not be adequately accommodated by the existing transit routes.

Impact: Existing transit services are expected to inadequately serve the project site.

Recommendation: The applicant and the City of Eureka should coordinate with RTS and ETS to include additional bus stops within one-quarter mile of the project site. These stops will improve transit accessibility not only to the proposed project site but also to the surrounding land uses on both sides of Broadway. Implementation of this recommendation would result in a less-than-significant project transit impact.

Bicycle

The proposed project is located adjacent to the Pacific Coast Bicycle Route on Broadway. Bicyclists using this bike route will be able to access the project site. Visitors and event attendees of the proposed Lost Coast Brewery are not expected to access the site via bicycles; however, employees of the brewery may use bikes as an alternative transportation mode for commuting to and from work. Bicycle racks are not shown on the provided project site plan.

Impact: Bicycle racks are not provided within the project site restricting accessibility for employees who may commute to and from work via a bike.

Recommendation: Bicycle racks should be installed within the proposed project site to improve accessibility for employees.

Pedestrian

There are currently no sidewalks along the project frontages on Broadway and Sunset Drive, nor are sidewalks proposed connecting the project to these public streets.

Impact: Pedestrian access from Broadway to the project site is inadequate.

Recommendation: Sidewalks should be provided along the project frontage on Broadway and along the north side of Sunset Drive between Broadway and the project's main access driveway, as well as along at least one side of the project access driveway connecting to Sunset Drive.

Parking Analysis

The proposed project would provide a total of 177 parking spaces, including 55 designated for staff and 122 for visitors. The City of Eureka's Zoning Ordinance Section §155.117 does not have specific requirements for the proposed brewery land use; therefore, the expected parking demand was based on site specific information.

Assuming that each employee drives to work in their own vehicle and all are on-site simultaneously, a total of 50 new spaces would be needed to accommodate the proposed Lost Coast Brewery staff. It is unlikely that tasting room visitors and attendees for a maximum-sized event would be on-site at the same time, so the maximum parking supply was based on the higher of these two, or the maximum-sized event. Based on a vehicle occupancy rate of 2.5 people per vehicle a maximum-sized event of 300 people would produce 120 parked vehicles. The resulting peak parking demand is estimated at 170 parking spaces, which is met by the proposed parking supply of 177 spaces with a surplus of seven spaces.

Finding: The proposed parking supply is expected to be adequate for both staff and visitors during large events at the project site.

Recommendation: The project as proposed provides 177 on-site parking spaces, including 55 designated for staff and 122 for visitors, which is adequate to meet the expected peak parking demand. A minimum of six parking spaces should be designated as handicapped accessible spaces.

Conclusions and Recommendations

Conclusions

- The proposed project, including an average-sized event, is expected to generate 220 new daily trips, with 96 trips expected during the p.m. peak hour. With a maximum-sized event the project is expected to generate 416 new daily trips, including 297 p.m. peak hour trips.

- All of the study intersections are expected to operate acceptably based on applicable standards under Existing conditions without and with either average or maximum project scenarios. Unacceptable operating conditions associated with the development of a "highest use" project under the proposed zoning will need to be analyzed in further detail if the proposed project is not implemented.

- Under all future scenarios evaluated, the intersection of Broadway/Henderson Street is expected to operate at LOS F during the p.m. peak period.

- The study intersections of Broadway/Ocean View Cemetery and Broadway/Sunset Drive are expected to operate unacceptably under Future plus Project Maximum-Sized Event and Future plus Highest Use scenarios evaluated.

- The assumed 20-foot ingress and 15-foot egress lane configurations for the 40-foot right-of-way on Sunset Drive provide adequate width for truck ingress and egress.

- Due to the skewed alignment of Sunset Drive at Broadway, trucks turning right into Sunset Drive cannot do so without either encroaching upon the opposing lane.

- The proposed project access driveways and both stop-controlled study intersections along Broadway meet applicable sight distance requirements.

- Existing transit stops are located outside what is considered an acceptable walking distance from the project site.

- Adequate bicycle facilities are available near the project site; however, bicycle racks are not shown on the project site plan.

- Pedestrian facilities along the project frontages with Broadway and Sunset Drive as well as within the project site are inadequate.

- The proposed parking supply is expected to sufficiently meet the peak parking demand during large events at the project site; however, there is not a sufficient supply of handicap accessible spaces.

Recommendations

- To improve operation at Broadway/Henderson Street under future (2030) conditions additional through lanes on both Broadway approaches as well as a second left-turn lane on the westbound approach of Henderson Street will be needed.

- To avoid unacceptable operating conditions on the westbound Ocean View Cemetery approach at Broadway, the arrival and departure times of a maximum-sized event should not coincide with the p.m. peak hour.

- If the project site is developed with anything other then the proposed project, further evaluation of operating conditions at Broadway/Ocean View Cemetery and Broadway/Sunset Drive will need to take place.

- The project should contribute appropriate traffic impact fees or pay its proportional share of a funding mechanism towards future improvements at Broadway/Henderson Street.

- The proposed 40-foot right-of-way on Sunset Drive should include a 20-foot ingress travel lane, a 15-foot egress travel lane and five-foot sidewalk along the project frontage.

- Sunset Drive should be realigned to intersect with Broadway at a right angle. If a portion of the property located on the southeast corner of the intersection can be acquired, removal of the existing structure located on the 1.9-acre parcel with the single family dwelling will not be necessary.

- Any existing or proposed vegetation located on either side of Sunset Drive, Ocean View Cemetery or the proposed driveways should be periodically trimmed to maintain clear sight lines.

- The applicant and the City of Eureka should coordinate with RTS and ETS to include bus stops within one-quarter mile of the project site.

- Bicycle racks should be installed within the project site.

- Sidewalks should be provided along the project frontages with Broadway and Sunset Drive, as well as along the project access driveway connecting to Sunset Drive.

Study Participants and References

Study Participants

Principal in Charge:	Dalene Whitlock, PE, PTOE
Transportation Planner:	Chris Helmer
Technician/Graphics:	Deborah J. Mizell
Editing/Formatting:	Angela McCoy

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Communications

Rob Wall, City of Eureka Community Development Department, November 11, 2010; email providing comments on the Memorandum of Assumption.

Dan Moody, City of Eureka Public Works Department, November 24, 2010; decision to evaluate both average and maximum-sized events.

EUR030

Appendix A

Intersection Level of Service Calculations

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	9	18	455	7	113	5	967	27	85	1480	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1451		1414	1348		1583	3151		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1451		1414	1348		1583	3151		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	9	19	479	7	119	5	1018	28	89	1558	0
RTOR Reduction (vph)	0	18	0	0	19	0	0	2	0	0	0	0
Lane Group Flow (vph)	19	10	0	311	275	0	5	1044	0	89	1558	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	4.9	4.9		28.8	28.8		1.6	57.1		11.0	66.5	
Effective Green, g (s)	5.4	5.4		30.4	30.4		1.6	59.8		11.0	69.2	
Actuated g/C Ratio	0.04	0.04		0.25	0.25		0.01	0.48		0.09	0.56	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	69	63		347	330		20	1520		140	1767	
v/s Ratio Prot	c0.01	0.01		c0.22	0.20		0.00	0.33		c0.06	c0.49	
v/s Ratio Perm												
v/c Ratio	0.28	0.16		0.90	0.83		0.25	0.69		0.64	0.88	
Uniform Delay, d1	57.4	57.1		45.3	44.4		60.6	24.9		54.6	23.8	
Progression Factor	1.00	1.00		1.00	1.00		1.05	0.65		1.00	1.00	
Incremental Delay, d2	0.8	0.4		23.8	15.7		2.0	2.1		6.8	6.7	
Delay (s)	58.2	57.5		69.1	60.1		65.8	18.4		61.3	30.6	
Level of Service	E	E		E	E		E	B		E	C	
Approach Delay (s)		57.8			64.7			18.6			32.2	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall (North) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	347	68	31	1238	1460	256
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	74	34	1346	1587	278
RTOR Reduction (vph)	0	62	0	0	0	50
Lane Group Flow (vph)	377	12	34	1346	1587	228
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	19.2	19.2	5.1	93.7	82.7	101.9
Effective Green, g (s)	20.2	20.2	6.1	93.7	82.7	101.9
Actuated g/C Ratio	0.16	0.16	0.05	0.76	0.67	0.82
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	500	231	78	2393	2112	1164
v/s Ratio Prot	c0.12		0.02	c0.43	c0.50	0.03
v/s Ratio Perm		0.01				0.13
v/c Ratio	0.75	0.05	0.44	0.56	0.75	0.20
Uniform Delay, d1	49.5	43.8	57.3	6.4	13.8	2.3
Progression Factor	1.00	1.00	0.84	1.46	0.57	1.11
Incremental Delay, d2	5.7	0.0	1.3	0.9	1.5	0.0
Delay (s)	55.2	43.9	49.4	10.3	9.3	2.6
Level of Service	E	D	D	B	A	A
Approach Delay (s)	53.3			11.2	8.3	
Approach LOS	D			B	A	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall (South) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	109	146	80	1117	1435	116
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1401	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1401	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	159	87	1214	1560	126
RTOR Reduction (vph)	0	20	0	0	0	23
Lane Group Flow (vph)	118	139	87	1214	1560	103
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	15.4	25.8	10.4	97.5	81.9	81.9
Effective Green, g (s)	15.9	26.8	10.9	100.2	84.6	84.6
Actuated g/C Ratio	0.13	0.22	0.09	0.81	0.68	0.68
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	394	356	139	2559	2161	932
v/s Ratio Prot	0.04	c0.03	c0.05	0.38	c0.49	
v/s Ratio Perm		0.06				0.08
v/c Ratio	0.30	0.39	0.63	0.47	0.72	0.11
Uniform Delay, d1	49.0	41.6	54.6	3.7	12.3	6.8
Progression Factor	1.00	1.00	0.95	0.79	0.15	0.01
Incremental Delay, d2	1.2	0.3	5.1	0.5	1.5	0.2
Delay (s)	50.2	41.9	57.1	3.4	3.4	0.3
Level of Service	D	D	E	A	A	A
Approach Delay (s)	45.4			7.0	3.1	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	9	4	74	10	45	2	1140	60	78	1460	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583			1533		1583	3137		1583	3157	
Flt Permitted		0.72			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1182			1263		1583	3137		1583	3157	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	10	4	80	11	49	2	1239	65	85	1587	25
RTOR Reduction (vph)	0	3	0	0	16	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	37	0	0	124	0	2	1302	0	85	1611	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.2			16.0		1.6	81.8		9.2	89.4	
Effective Green, g (s)		15.7			17.6		1.6	84.5		9.2	92.1	
Actuated g/C Ratio		0.13			0.14		0.01	0.68		0.07	0.74	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		150			179		20	2138		117	2345	
v/s Ratio Prot							0.00	0.41		c0.05	c0.51	
v/s Ratio Perm		0.03			c0.10							
v/c Ratio		0.24			0.69		0.10	0.61		0.73	0.69	
Uniform Delay, d1		48.8			50.6		60.5	10.8		56.2	8.4	
Progression Factor		1.00			1.00		1.05	1.12		1.18	0.33	
Incremental Delay, d2		0.8			8.9		0.8	1.2		12.5	1.2	
Delay (s)		49.6			59.5		64.2	13.3		78.5	4.0	
Level of Service		D			E		E	B		E	A	
Approach Delay (s)		49.6			59.5			13.4			7.7	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

```
PM Existing                 Fri Mar 11, 2011 11:28:31                 Page 6-1
--------------------------------------------------------------------------------
                        PM Peak Hour - Existing Conditions
                  Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
********************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: C[ 19.0]
********************************************************************************
Street Name:             Broadway                    Ocean View Cemetery
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     7    16 1535     0     0     0     0    11     0    25
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1195     7    16 1535     0     0     0     0    11     0    25
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1195     7    16 1535     0     0     0     0    11     0    25
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1195     7    16 1535     0     0     0     0    11     0    25
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1202 xxxx xxxxx  xxxx xxxx xxxxx  1998 2766   601
Potent Cap.: xxxx xxxx xxxxx   588 xxxx xxxxx  xxxx xxxx xxxxx    54   20   448
Move Cap.:   xxxx xxxx xxxxx   588 xxxx xxxxx  xxxx xxxx xxxxx    52   19   448
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    90   99 xxxxx   163  102 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.07 0.00  0.06
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B     *     *     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  293 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.4 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 19.0 xxxxx
Shared LOS:      *    *     *     *     *     *     *     *     *     *     C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            19.0
ApproachLOS:         *                *                *               C
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************


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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	0	70	24	2	43	19	1055	19	15	1455	56
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1476		1583	3157		1583	3167	1366
Flt Permitted		0.67	1.00		0.88		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1113	1390		1323		1583	3157		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	0	76	26	2	47	21	1147	21	16	1582	61
RTOR Reduction (vph)	0	0	63	0	39	0	0	1	0	0	0	13
Lane Group Flow (vph)	0	117	13	0	36	0	21	1167	0	16	1582	48
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		20.5	20.5		20.0		4.0	87.5		2.8	86.8	86.8
Effective Green, g (s)		21.0	21.0		20.5		4.0	90.9		2.8	90.2	90.2
Actuated g/C Ratio		0.17	0.17		0.17		0.03	0.73		0.02	0.73	0.73
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		188	235		219		51	2314		36	2304	994
v/s Ratio Prot							c0.01	0.37		0.01	c0.50	
v/s Ratio Perm		c0.11	0.01		0.03							0.03
v/c Ratio		0.62	0.05		0.16		0.41	0.50		0.44	0.69	0.05
Uniform Delay, d1		47.8	43.2		44.4		58.8	7.0		59.8	9.2	4.8
Progression Factor		1.00	1.00		1.00		0.85	0.89		1.15	0.25	0.08
Incremental Delay, d2		10.5	0.3		0.4		1.8	0.7		7.0	1.4	0.1
Delay (s)		58.3	43.5		44.7		51.9	7.0		75.9	3.7	0.4
Level of Service		E	D		D		D	A		E	A	A
Approach Delay (s)		52.4			44.7			7.8			4.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

```
------------------------------------------------------------------------------
                        PM Peak Hour - Existing Conditions
                   Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Broadway/Sunset Dr
******************************************************************************
Average Delay (sec/veh):      0.1       Worst Case Level Of Service: C[ 15.6]
******************************************************************************
Street Name:             Broadway                          Sunset Dr
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0     0     0     1     0     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1095     2     7 1535     0     0     0     0     1     0     3
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1095     2     7 1535     0     0     0     0     1     0     3
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1095     2     7 1535     0     0     0     0     1     0     3
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1097 xxxx xxxxx  xxxx xxxx xxxxx  1878 2645   549
Potent Cap.: xxxx xxxx xxxxx   644 xxxx xxxxx  xxxx xxxx xxxxx    65   24   485
Move Cap.:   xxxx xxxx xxxxx   644 xxxx xxxxx  xxxx xxxx xxxxx    64   23   485
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    96  109 xxxxx   182  110 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B     *     *     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  343 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 15.6 xxxxx
Shared LOS:      *    *     *     *     *     *     *     *     *     *     C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            15.6
ApproachLOS:         *                *                *               C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway

12/1/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	38	36	1018	29	52	1429
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3150		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3150		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	39	1107	32	57	1553
RTOR Reduction (vph)	0	33	1	0	0	0
Lane Group Flow (vph)	41	6	1138	0	57	1553
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.1	16.6	93.0		7.5	104.0
Effective Green, g (s)	9.6	17.6	97.4		8.0	108.4
Actuated g/C Ratio	0.08	0.14	0.79		0.06	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	123	233	2474		102	2769
v/s Ratio Prot	c0.03	0.00	0.36		0.04	c0.49
v/s Ratio Perm		0.00				
v/c Ratio	0.33	0.02	0.46		0.56	0.56
Uniform Delay, d1	54.2	45.8	4.5		56.3	1.9
Progression Factor	1.00	1.00	1.00		1.09	0.47
Incremental Delay, d2	0.6	0.0	0.6		2.8	0.6
Delay (s)	54.8	45.8	5.1		64.1	1.5
Level of Service	D	D	A		E	A
Approach Delay (s)	50.4		5.1			3.7
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

3/15/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	9	18	462	7	113	5	999	27	85	1497	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1451		1414	1350		1583	3151		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1451		1414	1350		1583	3151		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	9	19	486	7	119	5	1052	28	89	1576	0
RTOR Reduction (vph)	0	18	0	0	18	0	0	2	0	0	0	0
Lane Group Flow (vph)	19	10	0	311	283	0	5	1078	0	89	1576	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	4.9	4.9		28.8	28.8		1.6	57.1		11.0	66.5	
Effective Green, g (s)	5.4	5.4		30.4	30.4		1.6	59.8		11.0	69.2	
Actuated g/C Ratio	0.04	0.04		0.25	0.25		0.01	0.48		0.09	0.56	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	69	63		347	331		20	1520		140	1767	
v/s Ratio Prot	c0.01	0.01		c0.22	0.21		0.00	0.34		c0.06	c0.50	
v/s Ratio Perm												
v/c Ratio	0.28	0.16		0.90	0.85		0.25	0.71		0.64	0.89	
Uniform Delay, d1	57.4	57.1		45.3	44.7		60.6	25.3		54.6	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.05	0.67		1.00	1.00	
Incremental Delay, d2	0.8	0.4		23.8	18.2		2.0	2.3		6.8	7.3	
Delay (s)	58.2	57.5		69.1	62.9		65.5	19.4		61.3	31.4	
Level of Service	E	E		E	E		E	B		E	C	
Approach Delay (s)		57.8			66.1			19.6			33.0	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM Average Control Delay	35.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall (North) & Broadway

3/15/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	347	68	31	1282	1483	256
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	74	34	1393	1612	278
RTOR Reduction (vph)	0	62	0	0	0	50
Lane Group Flow (vph)	377	12	34	1393	1612	228
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	19.2	19.2	5.1	93.7	82.7	101.9
Effective Green, g (s)	20.2	20.2	6.1	93.7	82.7	101.9
Actuated g/C Ratio	0.16	0.16	0.05	0.76	0.67	0.82
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	500	231	78	2393	2112	1164
v/s Ratio Prot	c0.12		0.02	c0.44	c0.51	0.03
v/s Ratio Perm		0.01				0.13
v/c Ratio	0.75	0.05	0.44	0.58	0.76	0.20
Uniform Delay, d1	49.5	43.8	57.3	6.6	14.0	2.3
Progression Factor	1.00	1.00	0.84	1.44	0.56	1.12
Incremental Delay, d2	5.7	0.0	1.3	0.9	1.5	0.0
Delay (s)	55.2	43.9	49.6	10.5	9.3	2.6
Level of Service	E	D	D	B	A	A
Approach Delay (s)	53.3			11.4	8.4	
Approach LOS	D			B	A	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall (South) & Broadway

3/15/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	109	146	80	1161	1458	116
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1401	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1401	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	159	87	1262	1585	126
RTOR Reduction (vph)	0	20	0	0	0	23
Lane Group Flow (vph)	118	139	87	1262	1585	103
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	15.4	25.8	10.4	97.5	81.9	81.9
Effective Green, g (s)	15.9	26.8	10.9	100.2	84.6	84.6
Actuated g/C Ratio	0.13	0.22	0.09	0.81	0.68	0.68
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	394	356	139	2559	2161	932
v/s Ratio Prot	0.04	c0.03	c0.05	0.40	c0.50	
v/s Ratio Perm		0.07				0.08
v/c Ratio	0.30	0.39	0.63	0.49	0.73	0.11
Uniform Delay, d1	49.0	41.6	54.6	3.8	12.5	6.8
Progression Factor	1.00	1.00	0.95	0.85	0.15	0.01
Incremental Delay, d2	1.2	0.3	4.9	0.5	1.6	0.2
Delay (s)	50.2	41.9	56.6	3.8	3.4	0.3
Level of Service	D	D	E	A	A	A
Approach Delay (s)	45.4			7.2	3.2	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway

3/15/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	9	4	74	10	45	2	1184	60	78	1483	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583			1533		1583	3138		1583	3158	
Flt Permitted		0.72			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1182			1263		1583	3138		1583	3158	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	10	4	80	11	49	2	1287	65	85	1612	25
RTOR Reduction (vph)	0	3	0	0	16	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	37	0	0	124	0	2	1350	0	85	1636	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.2			16.0		1.6	81.8		9.2	89.4	
Effective Green, g (s)		15.7			17.6		1.6	84.5		9.2	92.1	
Actuated g/C Ratio		0.13			0.14		0.01	0.68		0.07	0.74	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		150			179		20	2138		117	2346	
v/s Ratio Prot							0.00	0.43		c0.05	c0.52	
v/s Ratio Perm		0.03			c0.10							
v/c Ratio		0.24			0.69		0.10	0.63		0.73	0.70	
Uniform Delay, d1		48.8			50.6		60.5	11.0		56.2	8.5	
Progression Factor		1.00			1.00		1.01	1.15		1.17	0.33	
Incremental Delay, d2		0.8			8.9		0.8	1.4		12.3	1.2	
Delay (s)		49.6			59.5		61.7	14.0		78.3	4.0	
Level of Service		D			E		E	B		E	A	
Approach Delay (s)		49.6			59.5			14.1			7.7	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

```
     PM Peak Hour - Existing plus Project Conditions (Average Sized Event)
                 Traffic Impact Study for Lost Coast Brewery
                              City of Eureka
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
********************************************************************************
Average Delay (sec/veh):      0.4       Worst Case Level Of Service: C[ 20.1]
********************************************************************************
Street Name:             Broadway                    Ocean View Cemetery
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     7    16 1535     0     0     0     0    11     0    25
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1195     7    16 1535     0     0     0     0    11     0    25
Added Vol:      0   39     2     5   18     0     0     0     0     2     0     5
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1234     9    21 1553     0     0     0     0    13     0    30
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1234     9    21 1553     0     0     0     0    13     0    30
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1234     9    21 1553     0     0     0     0    13     0    30
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1243 xxxx xxxxx  xxxx xxxx xxxxx  2057 2834   622
Potent Cap.: xxxx xxxx xxxxx   567 xxxx xxxxx  xxxx xxxx xxxxx    49   18   435
Move Cap.:   xxxx xxxx xxxxx   567 xxxx xxxxx  xxxx xxxx xxxxx    47   17   435
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    85   94 xxxxx   155   97 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.04 xxxx  xxxx  xxxx xxxx  xxxx  0.08 0.00  0.07
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  282 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.5 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 20.1 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             20.1
ApproachLOS:         *                *                *                 C
********************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway

3/15/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	0	70	24	2	43	19	1096	19	15	1475	56
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1476		1583	3157		1583	3167	1366
Flt Permitted		0.67	1.00		0.88		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1113	1390		1323		1583	3157		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	0	76	26	2	47	21	1191	21	16	1603	61
RTOR Reduction (vph)	0	0	63	0	39	0	0	1	0	0	0	13
Lane Group Flow (vph)	0	117	13	0	36	0	21	1211	0	16	1603	48
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		20.5	20.5		20.0		4.0	87.5		2.8	86.8	86.8
Effective Green, g (s)		21.0	21.0		20.5		4.0	90.9		2.8	90.2	90.2
Actuated g/C Ratio		0.17	0.17		0.17		0.03	0.73		0.02	0.73	0.73
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		188	235		219		51	2314		36	2304	994
v/s Ratio Prot							c0.01	0.38		0.01	c0.51	
v/s Ratio Perm		c0.11	0.01		0.03							0.04
v/c Ratio		0.62	0.05		0.16		0.41	0.52		0.44	0.70	0.05
Uniform Delay, d1		47.8	43.2		44.4		58.8	7.2		59.8	9.3	4.8
Progression Factor		1.00	1.00		1.00		0.85	0.89		1.16	0.24	0.07
Incremental Delay, d2		10.5	0.3		0.4		1.8	0.8		6.9	1.4	0.1
Delay (s)		58.3	43.5		44.7		52.0	7.2		76.1	3.7	0.4
Level of Service		E	D		D		D	A		E	A	A
Approach Delay (s)		52.4			44.7			7.9			4.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

```
PM Peak Hour - Existing plus Project Conditions (Average Sized Event)
                Traffic Impact Study for Lost Coast Brewery
                              City of Eureka
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Broadway/Sunset Dr
********************************************************************************
Average Delay (sec/veh):      0.5       Worst Case Level Of Service: C[ 19.1]
********************************************************************************
Street Name:             Broadway                          Sunset Dr
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0     0     0     1     0     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1095     2     7 1535     0     0     0     0     1     0     3
Added Vol:      0    2     8    18    2     0     0     0     0    17     0    39
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1097    10    25 1537     0     0     0     0    18     0    42
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1097    10    25 1537     0     0     0     0    18     0    42
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1097    10    25 1537     0     0     0     0    18     0    42
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1107 xxxx xxxxx  xxxx xxxx xxxxx  1921 2689   554
Potent Cap.: xxxx xxxx xxxxx   638 xxxx xxxxx  xxxx xxxx xxxxx    60   22   481
Move Cap.:   xxxx xxxx xxxxx   638 xxxx xxxxx  xxxx xxxx xxxxx    59   21   481
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    87  101 xxxxx   175  104 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.04 xxxx  xxxx  xxxx xxxx  xxxx  0.10 0.00  0.09
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  316 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.7 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 19.1 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             19.1
ApproachLOS:         *                *                *                 C
********************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway

3/15/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	38	36	1028	29	52	1448
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3150		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3150		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	39	1117	32	57	1574
RTOR Reduction (vph)	0	33	1	0	0	0
Lane Group Flow (vph)	41	6	1148	0	57	1574
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.1	16.6	93.0		7.5	104.0
Effective Green, g (s)	9.6	17.6	97.4		8.0	108.4
Actuated g/C Ratio	0.08	0.14	0.79		0.06	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	123	233	2474		102	2769
v/s Ratio Prot	c0.03	0.00	0.36		0.04	c0.50
v/s Ratio Perm		0.00				
v/c Ratio	0.33	0.02	0.46		0.56	0.57
Uniform Delay, d1	54.2	45.8	4.5		56.3	2.0
Progression Factor	1.00	1.00	1.00		1.09	0.46
Incremental Delay, d2	0.6	0.0	0.6		2.8	0.6
Delay (s)	54.8	45.8	5.1		63.9	1.5
Level of Service	D	D	A		E	A
Approach Delay (s)	50.4		5.1			3.7
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	9	18	482	7	113	5	1049	27	85	1547	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1451		1414	1351		1583	3152		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1451		1414	1351		1583	3152		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	9	19	507	7	119	5	1104	28	89	1628	0
RTOR Reduction (vph)	0	18	0	0	17	0	0	2	0	0	0	0
Lane Group Flow (vph)	19	10	0	324	292	0	5	1130	0	89	1628	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	4.9	4.9		30.5	30.5		1.6	55.4		11.0	64.8	
Effective Green, g (s)	5.4	5.4		32.1	32.1		1.6	58.1		11.0	67.5	
Actuated g/C Ratio	0.04	0.04		0.26	0.26		0.01	0.47		0.09	0.54	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	69	63		366	350		20	1477		140	1724	
v/s Ratio Prot	c0.01	0.01		c0.23	0.22		0.00	0.36		c0.06	c0.51	
v/s Ratio Perm												
v/c Ratio	0.28	0.16		0.89	0.83		0.25	0.77		0.64	0.94	
Uniform Delay, d1	57.4	57.1		44.2	43.4		60.6	27.3		54.6	26.5	
Progression Factor	1.00	1.00		1.00	1.00		1.04	0.73		1.00	1.00	
Incremental Delay, d2	0.8	0.4		21.1	15.0		1.9	3.1		6.8	12.0	
Delay (s)	58.2	57.5		65.3	58.4		64.8	22.9		61.3	38.5	
Level of Service	E	E		E	E		E	C		E	D	
Approach Delay (s)		57.8			61.9			23.1			39.7	
Approach LOS		E			E			C			D	

Intersection Summary			
HCM Average Control Delay	38.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall (North) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	347	68	31	1353	1553	256
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	74	34	1471	1688	278
RTOR Reduction (vph)	0	62	0	0	0	50
Lane Group Flow (vph)	377	12	34	1471	1688	228
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	19.2	19.2	5.1	93.7	82.7	101.9
Effective Green, g (s)	20.2	20.2	6.1	93.7	82.7	101.9
Actuated g/C Ratio	0.16	0.16	0.05	0.76	0.67	0.82
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	500	231	78	2393	2112	1164
v/s Ratio Prot	c0.12		0.02	c0.46	c0.53	0.03
v/s Ratio Perm		0.01				0.13
v/c Ratio	0.75	0.05	0.44	0.61	0.80	0.20
Uniform Delay, d1	49.5	43.8	57.3	6.9	14.7	2.3
Progression Factor	1.00	1.00	0.84	1.44	0.56	1.12
Incremental Delay, d2	5.7	0.0	1.3	1.1	1.6	0.0
Delay (s)	55.2	43.9	49.6	11.0	9.8	2.6
Level of Service	E	D	D	B	A	A
Approach Delay (s)	53.3			11.9	8.8	
Approach LOS	D			B	A	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall (South) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	109	146	80	1232	1528	116
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1401	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1401	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	159	87	1339	1661	126
RTOR Reduction (vph)	0	16	0	0	0	22
Lane Group Flow (vph)	118	143	87	1339	1661	104
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	15.4	25.8	10.4	97.5	81.9	81.9
Effective Green, g (s)	15.9	26.8	10.9	100.2	84.6	84.6
Actuated g/C Ratio	0.13	0.22	0.09	0.81	0.68	0.68
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	394	356	139	2559	2161	932
v/s Ratio Prot	0.04	c0.04	0.05	c0.42	c0.52	
v/s Ratio Perm		0.07				0.08
v/c Ratio	0.30	0.40	0.63	0.52	0.77	0.11
Uniform Delay, d1	49.0	41.7	54.6	4.0	13.2	6.8
Progression Factor	1.00	1.00	0.94	0.92	0.14	0.01
Incremental Delay, d2	1.2	0.3	4.7	0.6	1.8	0.2
Delay (s)	50.2	42.0	55.8	4.2	3.6	0.3
Level of Service	D	D	E	A	A	A
Approach Delay (s)	45.5			7.4	3.4	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	9	4	74	10	45	2	1255	60	78	1553	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583			1533		1583	3140		1583	3158	
Flt Permitted		0.72			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1182			1263		1583	3140		1583	3158	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	10	4	80	11	49	2	1364	65	85	1688	25
RTOR Reduction (vph)	0	3	0	0	16	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	37	0	0	124	0	2	1427	0	85	1712	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.2			16.0		1.6	81.8		9.2	89.4	
Effective Green, g (s)		15.7			17.6		1.6	84.5		9.2	92.1	
Actuated g/C Ratio		0.13			0.14		0.01	0.68		0.07	0.74	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		150			179		20	2140		117	2346	
v/s Ratio Prot							0.00	0.45		c0.05	c0.54	
v/s Ratio Perm		0.03			c0.10							
v/c Ratio		0.24			0.69		0.10	0.67		0.73	0.73	
Uniform Delay, d1		48.8			50.6		60.5	11.5		56.2	9.0	
Progression Factor		1.00			1.00		1.02	1.18		1.16	0.35	
Incremental Delay, d2		0.8			8.9		0.7	1.5		11.6	1.3	
Delay (s)		49.6			59.5		62.2	15.2		76.9	4.5	
Level of Service		D			E		E	B		E	A	
Approach Delay (s)		49.6			59.5			15.2			7.9	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

```
PM Peak Hour - Existing plus Project (Maximum Sized Event)
Traffic Impact Study for Lost Coast Brewery
City of Eureka
--------------------------------------------------------------------------------
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
********************************************************************************
Average Delay (sec/veh):      0.8       Worst Case Level Of Service: C[ 24.8]
********************************************************************************
Street Name:             Broadway                    Ocean View Cemetery
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     7    16 1535     0     0     0     0    11     0    25
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1195     7    16 1535     0     0     0     0    11     0    25
Added Vol:      0   85    13    29   64     0     0     0     0    13     0    29
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1280    20    45 1599     0     0     0     0    24     0    54
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1280    20    45 1599     0     0     0     0    24     0    54
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1280    20    45 1599     0     0     0     0    24     0    54
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1300 xxxx xxxxx  xxxx xxxx xxxxx  2180 2979   650
Potent Cap.: xxxx xxxx xxxxx   540 xxxx xxxxx  xxxx xxxx xxxxx    40   14   417
Move Cap.:   xxxx xxxx xxxxx   540 xxxx xxxxx  xxxx xxxx xxxxx    38   13   417
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    70   79 xxxxx   140   85 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.08 xxxx  xxxx  xxxx xxxx  xxxx  0.17 0.00  0.13
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  12.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  259 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.2 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 24.8 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             24.8
ApproachLOS:         *                *                *                 C
********************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	0	70	24	2	43	19	1153	19	15	1531	56
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1476		1583	3158		1583	3167	1366
Flt Permitted		0.67	1.00		0.88		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1113	1390		1323		1583	3158		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	0	76	26	2	47	21	1253	21	16	1664	61
RTOR Reduction (vph)	0	0	63	0	39	0	0	1	0	0	0	13
Lane Group Flow (vph)	0	117	13	0	36	0	21	1273	0	16	1664	48
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		20.5	20.5		20.0		4.0	87.5		2.8	86.8	86.8
Effective Green, g (s)		21.0	21.0		20.5		4.0	90.9		2.8	90.2	90.2
Actuated g/C Ratio		0.17	0.17		0.17		0.03	0.73		0.02	0.73	0.73
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		188	235		219		51	2315		36	2304	994
v/s Ratio Prot							c0.01	0.40		0.01	c0.53	
v/s Ratio Perm		c0.11	0.01		0.03							0.04
v/c Ratio		0.62	0.05		0.16		0.41	0.55		0.44	0.72	0.05
Uniform Delay, d1		47.8	43.2		44.4		58.8	7.4		59.8	9.7	4.8
Progression Factor		1.00	1.00		1.00		0.86	0.91		1.14	0.22	0.08
Incremental Delay, d2		10.5	0.3		0.4		1.8	0.9		6.5	1.5	0.1
Delay (s)		58.3	43.5		44.7		52.3	7.6		74.8	3.6	0.4
Level of Service		E	D		D		D	A		E	A	A
Approach Delay (s)		52.4			44.7			8.3			4.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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PM Peak Hour - Existing plus Project (Maximum Sized Event)
Traffic Impact Study for Lost Coast Brewery
City of Eureka
```

```
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #7 Broadway/Sunset Dr
*******************************************************************************
Average Delay (sec/veh):      1.4       Worst Case Level Of Service: D[ 26.4]
*******************************************************************************
Street Name:             Broadway                          Sunset Dr
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0     0     0     1     0     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1095     2     7 1535     0     0     0     0     1     0     3
Added Vol:      0   13    27    64   13     0     0     0     0    37     0    85
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1108    29    71 1548     0     0     0     0    38     0    88
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1108    29    71 1548     0     0     0     0    38     0    88
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1108    29    71 1548     0     0     0     0    38     0    88
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1137 xxxx xxxxx  xxxx xxxx xxxxx  2039 2813   569
Potent Cap.: xxxx xxxx xxxxx   622 xxxx xxxxx  xxxx xxxx xxxxx    50   18   471
Move Cap.:   xxxx xxxx xxxxx   622 xxxx xxxxx  xxxx xxxx xxxxx    46   16   471
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    68   81 xxxxx   155   89 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.11 xxxx  xxxx  xxxx xxxx  xxxx  0.24 0.00  0.19
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.4 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  292 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  2.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 26.4 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             26.4
ApproachLOS:         *                *                *                 D
*******************************************************************************
Note: Queue reported is the number of cars per lane.
```

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HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway

12/1/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	38	36	1058	29	52	1478
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3151		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3151		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	39	1150	32	57	1607
RTOR Reduction (vph)	0	33	1	0	0	0
Lane Group Flow (vph)	41	6	1181	0	57	1607
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.1	16.6	93.0		7.5	104.0
Effective Green, g (s)	9.6	17.6	97.4		8.0	108.4
Actuated g/C Ratio	0.08	0.14	0.79		0.06	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	123	233	2475		102	2769
v/s Ratio Prot	c0.03	0.00	0.37		0.04	c0.51
v/s Ratio Perm		0.00				
v/c Ratio	0.33	0.02	0.48		0.56	0.58
Uniform Delay, d1	54.2	45.8	4.6		56.3	2.0
Progression Factor	1.00	1.00	1.00		1.07	0.45
Incremental Delay, d2	0.6	0.0	0.7		2.7	0.6
Delay (s)	54.8	45.8	5.2		63.2	1.5
Level of Service	D	D	A		E	A
Approach Delay (s)	50.4		5.2			3.7
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway Street

3/14/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	9	18	516	7	113	5	1122	27	85	1634	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.95		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1451		1414	1355		1583	3153		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1451		1414	1355		1583	3153		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	9	19	543	7	119	5	1181	28	89	1720	0
RTOR Reduction (vph)	0	18	0	0	15	0	0	1	0	0	0	0
Lane Group Flow (vph)	19	10	0	342	312	0	5	1208	0	89	1720	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	4.9	4.9		31.7	31.7		1.6	54.2		11.0	63.6	
Effective Green, g (s)	5.4	5.4		33.3	33.3		1.6	56.9		11.0	66.3	
Actuated g/C Ratio	0.04	0.04		0.27	0.27		0.01	0.46		0.09	0.53	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	69	63		380	364		20	1447		140	1693	
v/s Ratio Prot	c0.01	0.01		c0.24	0.23		0.00	0.38		c0.06	c0.54	
v/s Ratio Perm												
v/c Ratio	0.28	0.16		0.90	0.86		0.25	0.83		0.64	1.02	
Uniform Delay, d1	57.4	57.1		43.7	43.1		60.6	29.4		54.6	28.9	
Progression Factor	1.00	1.00		1.00	1.00		1.01	0.79		1.00	1.00	
Incremental Delay, d2	0.8	0.4		23.1	17.0		1.8	4.5		6.8	25.9	
Delay (s)	58.2	57.5		66.8	60.1		63.1	27.8		61.3	54.8	
Level of Service	E	E		E	E		E	C		E	D	
Approach Delay (s)		57.8			63.5			27.9			55.1	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM Average Control Delay	47.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall Access (North) & Broadway Street

3/14/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	347	68	31	1455	1675	256
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	74	34	1582	1821	278
RTOR Reduction (vph)	0	62	0	0	0	50
Lane Group Flow (vph)	377	12	34	1582	1821	228
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	19.2	19.2	5.1	93.7	82.7	101.9
Effective Green, g (s)	20.2	20.2	6.1	93.7	82.7	101.9
Actuated g/C Ratio	0.16	0.16	0.05	0.76	0.67	0.82
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	500	231	78	2393	2112	1164
v/s Ratio Prot	c0.12		0.02	c0.50	c0.58	0.03
v/s Ratio Perm		0.01				0.13
v/c Ratio	0.75	0.05	0.44	0.66	0.86	0.20
Uniform Delay, d1	49.5	43.8	57.3	7.4	16.2	2.3
Progression Factor	1.00	1.00	0.84	1.44	0.59	1.17
Incremental Delay, d2	5.7	0.0	1.2	1.3	2.5	0.0
Delay (s)	55.2	43.9	49.1	11.9	12.0	2.8
Level of Service	E	D	D	B	B	A
Approach Delay (s)	53.3			12.7	10.8	
Approach LOS	D			B	B	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall Access (South) & Broadway Street

3/14/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	109	146	80	1334	1650	116
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1401	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1401	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	159	87	1450	1793	126
RTOR Reduction (vph)	0	12	0	0	0	20
Lane Group Flow (vph)	118	147	87	1450	1793	106
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	15.4	25.8	10.4	97.5	81.9	81.9
Effective Green, g (s)	15.9	26.8	10.9	100.2	84.6	84.6
Actuated g/C Ratio	0.13	0.22	0.09	0.81	0.68	0.68
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	394	356	139	2559	2161	932
v/s Ratio Prot	0.04	c0.04	0.05	c0.46	c0.57	
v/s Ratio Perm		0.07				0.08
v/c Ratio	0.30	0.41	0.63	0.57	0.83	0.11
Uniform Delay, d1	49.0	41.8	54.6	4.2	14.4	6.8
Progression Factor	1.00	1.00	0.91	1.00	0.14	0.01
Incremental Delay, d2	1.2	0.3	4.4	0.6	2.2	0.1
Delay (s)	50.2	42.1	54.3	4.9	4.2	0.2
Level of Service	D	D	D	A	A	A
Approach Delay (s)	45.6			7.7	3.9	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway Street

3/14/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	9	4	74	10	45	2	1357	60	78	1675	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583			1533		1583	3142		1583	3159	
Flt Permitted		0.72			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1182			1263		1583	3142		1583	3159	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	10	4	80	11	49	2	1475	65	85	1821	25
RTOR Reduction (vph)	0	3	0	0	16	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	37	0	0	124	0	2	1538	0	85	1845	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.2			16.0		1.6	81.8		9.2	89.4	
Effective Green, g (s)		15.7			17.6		1.6	84.5		9.2	92.1	
Actuated g/C Ratio		0.13			0.14		0.01	0.68		0.07	0.74	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		150			179		20	2141		117	2346	
v/s Ratio Prot							0.00	0.49		c0.05	c0.58	
v/s Ratio Perm		0.03			c0.10							
v/c Ratio		0.24			0.69		0.10	0.72		0.73	0.79	
Uniform Delay, d1		48.8			50.6		60.5	12.3		56.2	9.9	
Progression Factor		1.00			1.00		1.01	1.25		1.15	0.36	
Incremental Delay, d2		0.8			8.9		0.7	1.9		10.3	1.6	
Delay (s)		49.6			59.5		62.0	17.2		75.0	5.2	
Level of Service		D			E		E	B		E	A	
Approach Delay (s)		49.6			59.5			17.3			8.2	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

```
PM Existing plus Highest LaFri Mar 11, 2011 11:39:53                Page 7-1
-------------------------------------------------------------------------------
                 PM Peak Hour - Existing plus Highest Land Uses
                   Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
*******************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: C[ 23.0]
*******************************************************************************
Street Name:             Broadway                    Ocean View Cemetery
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     7    16 1535     0     0     0     0    11     0    25
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1195     7    16 1535     0     0     0     0    11     0    25
Added Vol:      0  217     0     0  215     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1412     7    16 1750     0     0     0     0    11     0    25
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1412     7    16 1750     0     0     0     0    11     0    25
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1412     7    16 1750     0     0     0     0    11     0    25
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1419 xxxx xxxxx  xxxx xxxx xxxxx  2323 3198   710
Potent Cap.: xxxx xxxx xxxxx   486 xxxx xxxxx  xxxx xxxx xxxxx    32   10   381
Move Cap.:   xxxx xxxx xxxxx   486 xxxx xxxxx  xxxx xxxx xxxxx    31   10   381
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    66   75 xxxxx   126   77 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.09 0.00  0.07
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  12.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  236 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.5 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 23.0 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             23.0
ApproachLOS:         *                *                *                 C
*******************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway Street

3/14/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	0	70	24	2	43	19	1272	19	15	1670	56
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1476		1583	3158		1583	3167	1366
Flt Permitted		0.67	1.00		0.88		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1113	1390		1323		1583	3158		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	0	76	26	2	47	21	1383	21	16	1815	61
RTOR Reduction (vph)	0	0	63	0	39	0	0	1	0	0	0	12
Lane Group Flow (vph)	0	117	13	0	36	0	21	1403	0	16	1815	49
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		20.5	20.5		20.0		4.0	87.5		2.8	86.8	86.8
Effective Green, g (s)		21.0	21.0		20.5		4.0	90.9		2.8	90.2	90.2
Actuated g/C Ratio		0.17	0.17		0.17		0.03	0.73		0.02	0.73	0.73
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		188	235		219		51	2315		36	2304	994
v/s Ratio Prot							c0.01	0.44		0.01	c0.57	
v/s Ratio Perm		c0.11	0.01		0.03							0.04
v/c Ratio		0.62	0.05		0.16		0.41	0.61		0.44	0.79	0.05
Uniform Delay, d1		47.8	43.2		44.4		58.8	8.0		59.8	10.8	4.8
Progression Factor		1.00	1.00		1.00		0.85	0.95		1.15	0.20	0.07
Incremental Delay, d2		10.5	0.3		0.4		1.8	1.1		5.9	1.9	0.1
Delay (s)		58.3	43.5		44.7		51.9	8.6		74.9	4.1	0.4
Level of Service		E	D		D		D	A		E	A	A
Approach Delay (s)		52.4			44.7			9.3			4.6	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

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                 PM Peak Hour - Existing plus Highest Land Uses
                   Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Broadway/Sunset Dr
********************************************************************************
Average Delay (sec/veh):     26.0       Worst Case Level Of Service: F[260.1]
********************************************************************************
Street Name:             Broadway                          Sunset Dr
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0     0     0     1     0     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1095     2     7 1535     0     0     0     0     1     0     3
Added Vol:      0    0    92   215    0     0     0     0     0    93     0   217
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1095    94   222 1535     0     0     0     0    94     0   220
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1095    94   222 1535     0     0     0     0    94     0   220
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1095    94   222 1535     0     0     0     0    94     0   220
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1189 xxxx xxxxx  xxxx xxxx xxxxx  2354 3121   595
Potent Cap.: xxxx xxxx xxxxx   594 xxxx xxxxx  xxxx xxxx xxxxx    31   12   453
Move Cap.:   xxxx xxxx xxxxx   594 xxxx xxxxx  xxxx xxxx xxxxx    22    7   453
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    19   26 xxxxx    99   52 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.37 xxxx  xxxx  xxxx xxxx  xxxx  0.95 0.00  0.49
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   1.7 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  14.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  219 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 18.3 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  260 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            260.1
ApproachLOS:         *                *                *                F
********************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway Street

3/14/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	38	36	1110	29	52	1522
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3152		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3152		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	39	1207	32	57	1654
RTOR Reduction (vph)	0	33	1	0	0	0
Lane Group Flow (vph)	41	6	1238	0	57	1654
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.1	16.6	93.0		7.5	104.0
Effective Green, g (s)	9.6	17.6	97.4		8.0	108.4
Actuated g/C Ratio	0.08	0.14	0.79		0.06	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	123	233	2476		102	2769
v/s Ratio Prot	c0.03	0.00	0.39		0.04	c0.52
v/s Ratio Perm		0.00				
v/c Ratio	0.33	0.02	0.50		0.56	0.60
Uniform Delay, d1	54.2	45.8	4.7		56.3	2.1
Progression Factor	1.00	1.00	1.00		1.06	0.49
Incremental Delay, d2	0.6	0.0	0.7		2.4	0.6
Delay (s)	54.8	45.8	5.4		62.0	1.6
Level of Service	D	D	A		E	A
Approach Delay (s)	50.4		5.4			3.6
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	601	9	149	7	1276	36	112	1954	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		1414	1348		1583	3150		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		1414	1348		1583	3150		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	633	9	157	7	1343	38	118	2057	0
RTOR Reduction (vph)	0	24	0	0	19	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	411	369	0	7	1379	0	118	2057	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		32.0	32.0		1.6	53.0		10.3	61.7	
Effective Green, g (s)	7.0	7.0		33.6	33.6		1.6	55.7		10.3	64.4	
Actuated g/C Ratio	0.06	0.06		0.27	0.27		0.01	0.45		0.08	0.52	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		383	365		20	1415		131	1645	
v/s Ratio Prot	c0.02	0.01		c0.29	0.27		0.00	0.44		c0.07	c0.65	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		1.07	1.01		0.35	0.97		0.90	1.25	
Uniform Delay, d1	56.1	55.7		45.2	45.2		60.7	33.5		56.3	29.8	
Progression Factor	1.00	1.00		1.00	1.00		0.96	0.95		1.00	1.00	
Incremental Delay, d2	0.6	0.4		66.8	49.9		2.5	14.1		48.8	117.9	
Delay (s)	56.7	56.1		112.0	95.1		60.5	45.8		105.2	147.7	
Level of Service	E	E		F	F		E	D		F	F	
Approach Delay (s)		56.4			103.8			45.9			145.4	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM Average Control Delay	105.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	106.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

12/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	601	9	149	7	1276	36	112	1954	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.91	0.91		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.91		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		2709	1256		1583	4526		1583	4550	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		2709	1256		1583	4526		1583	4550	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	633	9	157	7	1343	38	118	2057	0
RTOR Reduction (vph)	0	24	0	0	46	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	544	209	0	7	1379	0	118	2057	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		26.5	26.5		1.6	55.8		13.0	67.2	
Effective Green, g (s)	7.0	7.0		28.1	28.1		1.6	58.5		13.0	69.9	
Actuated g/C Ratio	0.06	0.06		0.23	0.23		0.01	0.47		0.10	0.56	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		614	285		20	2135		166	2565	
v/s Ratio Prot	c0.02	0.01		c0.20	0.17		0.00	0.30		c0.07	c0.45	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		0.89	0.73		0.35	0.65		0.71	0.80	
Uniform Delay, d1	56.1	55.7		46.4	44.5		60.7	24.9		53.7	21.5	
Progression Factor	1.00	1.00		1.00	1.00		1.03	0.80		1.00	1.00	
Incremental Delay, d2	0.6	0.4		14.0	8.1		2.5	1.0		11.3	2.8	
Delay (s)	56.7	56.1		60.4	52.5		65.1	21.0		65.0	24.3	
Level of Service	E	E		E	D		E	C		E	C	
Approach Delay (s)		56.4			57.9			21.2			26.5	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall (North) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	458	90	41	1634	1927	338
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	498	98	45	1776	2095	367
RTOR Reduction (vph)	0	61	0	0	0	71
Lane Group Flow (vph)	498	37	45	1776	2095	296
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	22.9	22.9	7.0	90.0	77.1	100.0
Effective Green, g (s)	23.9	23.9	8.0	90.0	77.1	100.0
Actuated g/C Ratio	0.19	0.19	0.06	0.73	0.62	0.81
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	592	273	102	2299	1969	1143
v/s Ratio Prot	c0.16		0.03	c0.56	c0.66	0.05
v/s Ratio Perm		0.03				0.16
v/c Ratio	0.84	0.13	0.44	0.77	1.06	0.26
Uniform Delay, d1	48.2	41.5	55.8	10.6	23.5	2.9
Progression Factor	1.00	1.00	0.80	1.11	0.49	0.47
Incremental Delay, d2	10.1	0.1	0.9	2.1	30.1	0.0
Delay (s)	58.3	41.6	45.6	13.9	41.5	1.4
Level of Service	E	D	D	B	D	A
Approach Delay (s)	55.5			14.7	35.5	
Approach LOS	E			B	D	

Intersection Summary			
HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall (South) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	144	193	106	1474	1894	153
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1402	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1402	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	210	115	1602	2059	166
RTOR Reduction (vph)	0	7	0	0	0	27
Lane Group Flow (vph)	157	203	115	1602	2059	139
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	16.6	30.2	13.6	96.3	77.5	77.5
Effective Green, g (s)	17.1	31.2	14.1	99.0	80.2	80.2
Actuated g/C Ratio	0.14	0.25	0.11	0.80	0.65	0.65
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	424	406	180	2528	2048	883
v/s Ratio Prot	0.05	c0.06	0.07	c0.51	c0.65	
v/s Ratio Perm		0.09				0.10
v/c Ratio	0.37	0.50	0.64	0.63	1.01	0.16
Uniform Delay, d1	48.6	39.7	52.5	5.1	21.9	8.6
Progression Factor	1.00	1.00	1.31	0.15	0.15	0.01
Incremental Delay, d2	1.5	0.4	2.8	0.6	10.8	0.1
Delay (s)	50.1	40.1	71.9	1.4	13.9	0.1
Level of Service	D	D	E	A	B	A
Approach Delay (s)	44.4			6.1	12.9	
Approach LOS	D			A	B	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	12	5	98	13	59	3	1505	79	103	1927	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1585			1533		1583	3137		1583	3157	
Flt Permitted		0.71			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1156			1286		1583	3137		1583	3157	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	13	5	107	14	64	3	1636	86	112	2095	33
RTOR Reduction (vph)	0	3	0	0	16	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	50	0	0	169	0	3	1719	0	112	2127	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.1			18.9		1.6	76.5		11.6	86.5	
Effective Green, g (s)		18.6			20.5		1.6	79.2		11.6	89.2	
Actuated g/C Ratio		0.15			0.17		0.01	0.64		0.09	0.72	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		173			213		20	2004		148	2271	
v/s Ratio Prot							0.00	0.55		c0.07	c0.67	
v/s Ratio Perm		0.04			c0.13							
v/c Ratio		0.29			0.79		0.15	0.86		0.76	0.94	
Uniform Delay, d1		46.8			49.7		60.5	17.9		54.8	15.0	
Progression Factor		1.00			1.00		0.83	1.07		0.82	1.06	
Incremental Delay, d2		0.9			17.1		1.0	3.9		5.7	3.1	
Delay (s)		47.7			66.8		51.3	23.1		50.4	19.0	
Level of Service		D			E		D	C		D	B	
Approach Delay (s)		47.7			66.8			23.1			20.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group


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PM Future                    Fri Mar 11, 2011 12:40:00                  Page 6-1
-------------------------------------------------------------------------------
                          PM Peak Hour - Future Conditions
                     Traffic Impact Study for Lost Coast Brewery
                                  City of Eureka
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
*******************************************************************************
Average Delay (sec/veh):      0.5       Worst Case Level Of Service: D[ 29.2]
*******************************************************************************
Street Name:             Broadway                     Ocean View Cemetery
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     7    16 1535     0     0    0     0    11    0    25
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1577     9    21 2026     0     0    0     0    15    0    33
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1577     9    21 2026     0     0    0     0    15    0    33
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1577     9    21 2026     0     0    0     0    15    0    33
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1587 xxxx xxxxx  xxxx xxxx xxxxx  2637 3650   793
Potent Cap.: xxxx xxxx xxxxx   420 xxxx xxxxx  xxxx xxxx xxxxx    20    5   336
Move Cap.:   xxxx xxxx xxxxx   420 xxxx xxxxx  xxxx xxxx xxxxx    19    5   336
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    43   54 xxxxx   100   57 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.05 xxxx  xxxx  xxxx xxxx  xxxx  0.14 0.00  0.10
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  14.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  196 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.9 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 29.2 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             29.2
ApproachLOS:         *                *                *                 D
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************


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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	0	92	32	3	57	25	1393	25	20	1921	74
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1478		1583	3157		1583	3167	1366
Flt Permitted		0.63	1.00		0.83		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1052	1390		1253		1583	3157		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	155	0	100	35	3	62	27	1514	27	22	2088	80
RTOR Reduction (vph)	0	0	54	0	50	0	0	1	0	0	0	15
Lane Group Flow (vph)	0	155	46	0	50	0	27	1540	0	22	2088	65
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		24.2	24.2		23.7		2.9	82.8		3.8	84.2	84.2
Effective Green, g (s)		24.7	24.7		24.2		2.9	86.2		3.8	87.6	87.6
Actuated g/C Ratio		0.20	0.20		0.20		0.02	0.70		0.03	0.71	0.71
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		210	277		245		37	2195		49	2237	965
v/s Ratio Prot							c0.02	0.49		0.01	c0.66	
v/s Ratio Perm		c0.15	0.03		0.04							0.05
v/c Ratio		0.74	0.16		0.20		0.73	0.70		0.45	0.93	0.07
Uniform Delay, d1		46.6	41.1		41.8		60.2	11.2		59.1	15.7	5.6
Progression Factor		1.00	1.00		1.00		0.92	0.69		1.09	0.58	0.67
Incremental Delay, d2		17.0	0.8		0.4		39.5	1.6		3.2	4.8	0.1
Delay (s)		63.6	41.9		42.2		95.1	9.4		67.8	13.9	3.8
Level of Service		E	D		D		F	A		E	B	A
Approach Delay (s)		55.1			42.2			10.8			14.0	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group


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------------------------------------------------------------------------------
                        PM Peak Hour - Future Conditions
                   Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Broadway/Sunset Dr
******************************************************************************
Average Delay (sec/veh):      0.1       Worst Case Level Of Service: C[ 20.3]
******************************************************************************
Street Name:             Broadway                          Sunset Dr
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0    0     0     1    0     3
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1445     3     9 2026     0     0    0     0     1    0     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1445     3     9 2026     0     0    0     0     1    0     4
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1445     3     9 2026     0     0    0     0     1    0     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1448 xxxx xxxxx  xxxx xxxx xxxxx  2478 3491   724
Potent Cap.: xxxx xxxx xxxxx   474 xxxx xxxxx  xxxx xxxx xxxxx    25    7   373
Move Cap.:   xxxx xxxx xxxxx   474 xxxx xxxxx  xxxx xxxx xxxxx    25    6   373
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    48   62 xxxxx   116   63 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  12.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     B     *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  240 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 20.3 xxxxx
Shared LOS:     *    *     *     *     *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             20.3
ApproachLOS:         *                *                *                C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************


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HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway

12/1/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	48	1344	38	69	1886
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3151		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3151		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	52	1461	41	75	2050
RTOR Reduction (vph)	0	38	1	0	0	0
Lane Group Flow (vph)	54	14	1501	0	75	2050
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.7	18.2	91.4		8.5	103.4
Effective Green, g (s)	10.2	19.2	95.8		9.0	107.8
Actuated g/C Ratio	0.08	0.15	0.77		0.07	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	130	251	2434		115	2753
v/s Ratio Prot	c0.03	0.00	0.48		0.05	c0.65
v/s Ratio Perm		0.01				
v/c Ratio	0.42	0.06	0.62		0.65	0.74
Uniform Delay, d1	54.1	44.7	6.1		56.0	3.0
Progression Factor	1.00	1.00	1.00		0.84	1.10
Incremental Delay, d2	0.8	0.0	1.2		4.5	0.9
Delay (s)	54.9	44.7	7.3		51.5	4.2
Level of Service	D	D	A		D	A
Approach Delay (s)	49.9		7.3			5.8
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

3/15/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	608	9	149	7	1308	36	112	1971	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		1414	1349		1583	3151		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		1414	1349		1583	3151		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	640	9	157	7	1377	38	118	2075	0
RTOR Reduction (vph)	0	24	0	0	18	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	410	378	0	7	1413	0	118	2075	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		32.0	32.0		1.6	53.0		10.3	61.7	
Effective Green, g (s)	7.0	7.0		33.6	33.6		1.6	55.7		10.3	64.4	
Actuated g/C Ratio	0.06	0.06		0.27	0.27		0.01	0.45		0.08	0.52	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		383	366		20	1415		131	1645	
v/s Ratio Prot	c0.02	0.01		c0.29	0.28		0.00	0.45		c0.07	c0.66	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		1.07	1.03		0.35	1.00		0.90	1.26	
Uniform Delay, d1	56.1	55.7		45.2	45.2		60.7	34.1		56.3	29.8	
Progression Factor	1.00	1.00		1.00	1.00		0.94	0.96		1.00	1.00	
Incremental Delay, d2	0.6	0.4		66.0	55.6		2.3	18.3		48.8	122.7	
Delay (s)	56.7	56.1		111.2	100.8		59.6	51.1		105.2	152.5	
Level of Service	E	E		F	F		E	D		F	F	
Approach Delay (s)		56.4			106.1			51.2			149.9	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM Average Control Delay	109.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

3/15/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	608	9	149	7	1308	36	112	1971	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.91	0.91		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.91		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		2709	1256		1583	4527		1583	4550	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		2709	1256		1583	4527		1583	4550	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	640	9	157	7	1377	38	118	2075	0
RTOR Reduction (vph)	0	24	0	0	47	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	550	209	0	7	1413	0	118	2075	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		27.6	27.6		1.6	57.0		10.7	66.1	
Effective Green, g (s)	7.0	7.0		29.2	29.2		1.6	59.7		10.7	68.8	
Actuated g/C Ratio	0.06	0.06		0.24	0.24		0.01	0.48		0.09	0.55	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		638	296		20	2180		137	2525	
v/s Ratio Prot	c0.02	0.01		c0.20	0.17		0.00	0.31		c0.07	c0.46	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		0.86	0.71		0.35	0.65		0.86	0.82	
Uniform Delay, d1	56.1	55.7		45.5	43.5		60.7	24.2		55.9	22.6	
Progression Factor	1.00	1.00		1.00	1.00		0.94	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.4		11.2	6.2		2.3	0.9		38.0	3.2	
Delay (s)	56.7	56.1		56.6	49.7		59.6	25.1		93.9	25.7	
Level of Service	E	E		E	D		E	C		F	C	
Approach Delay (s)		56.4			54.4			25.2			29.4	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall (North) & Broadway

3/15/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	458	90	41	1678	1950	338
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	498	98	45	1824	2120	367
RTOR Reduction (vph)	0	61	0	0	0	71
Lane Group Flow (vph)	498	37	45	1824	2120	296
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	22.9	22.9	7.0	90.0	77.1	100.0
Effective Green, g (s)	23.9	23.9	8.0	90.0	77.1	100.0
Actuated g/C Ratio	0.19	0.19	0.06	0.73	0.62	0.81
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	592	273	102	2299	1969	1143
v/s Ratio Prot	c0.16		0.03	c0.58	c0.67	0.05
v/s Ratio Perm		0.03				0.16
v/c Ratio	0.84	0.13	0.44	0.79	1.08	0.26
Uniform Delay, d1	48.2	41.5	55.8	11.0	23.5	2.9
Progression Factor	1.00	1.00	0.80	1.12	0.49	0.47
Incremental Delay, d2	10.1	0.1	0.9	2.4	35.6	0.0
Delay (s)	58.3	41.6	45.3	14.7	47.0	1.4
Level of Service	E	D	D	B	D	A
Approach Delay (s)	55.5			15.4	40.3	
Approach LOS	E			B	D	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall (South) & Broadway

3/15/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	144	193	106	1518	1917	153
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1402	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1402	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	210	115	1650	2084	166
RTOR Reduction (vph)	0	6	0	0	0	26
Lane Group Flow (vph)	157	204	115	1650	2084	140
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	16.6	30.2	13.6	96.3	77.5	77.5
Effective Green, g (s)	17.1	31.2	14.1	99.0	80.2	80.2
Actuated g/C Ratio	0.14	0.25	0.11	0.80	0.65	0.65
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	424	406	180	2528	2048	883
v/s Ratio Prot	0.05	c0.06	0.07	c0.52	c0.66	
v/s Ratio Perm		0.09				0.10
v/c Ratio	0.37	0.50	0.64	0.65	1.02	0.16
Uniform Delay, d1	48.6	39.8	52.5	5.3	21.9	8.6
Progression Factor	1.00	1.00	1.31	0.14	0.14	0.01
Incremental Delay, d2	1.5	0.4	2.6	0.6	11.2	0.0
Delay (s)	50.1	40.1	71.3	1.4	14.3	0.1
Level of Service	D	D	E	A	B	A
Approach Delay (s)	44.4			5.9	13.3	
Approach LOS	D			A	B	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway

3/15/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	12	5	98	13	59	3	1549	79	103	1950	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1585			1533		1583	3138		1583	3158	
Flt Permitted		0.71			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1156			1286		1583	3138		1583	3158	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	13	5	107	14	64	3	1684	86	112	2120	33
RTOR Reduction (vph)	0	3	0	0	16	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	50	0	0	169	0	3	1767	0	112	2152	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.1			18.9		1.6	76.5		11.6	86.5	
Effective Green, g (s)		18.6			20.5		1.6	79.2		11.6	89.2	
Actuated g/C Ratio		0.15			0.17		0.01	0.64		0.09	0.72	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		173			213		20	2004		148	2272	
v/s Ratio Prot							0.00	0.56		c0.07	c0.68	
v/s Ratio Perm		0.04			c0.13							
v/c Ratio		0.29			0.79		0.15	0.88		0.76	0.95	
Uniform Delay, d1		46.8			49.7		60.5	18.5		54.8	15.3	
Progression Factor		1.00			1.00		0.83	1.09		0.81	1.07	
Incremental Delay, d2		0.9			17.1		0.9	4.5		5.2	3.4	
Delay (s)		47.7			66.8		51.1	24.7		49.9	19.7	
Level of Service		D			E		D	C		D	B	
Approach Delay (s)		47.7			66.8			24.8			21.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	25.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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PM Peak Hour - Future plus Project Conditions (Average Sized Event)
                Traffic Impact Study for Lost Coast Brewery
                              City of Eureka
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
********************************************************************************
Average Delay (sec/veh):      0.6       Worst Case Level Of Service: D[ 31.8]
********************************************************************************
Street Name:             Broadway                    Ocean View Cemetery
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     7    16 1535     0     0     0     0    11     0    25
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1577     9    21 2026     0     0     0     0    15     0    33
Added Vol:      0   39     2     5   18     0     0     0     0     2     0     5
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1616    11    26 2044     0     0     0     0    17     0    38
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1616    11    26 2044     0     0     0     0    17     0    38
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1616    11    26 2044     0     0     0     0    17     0    38
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1628 xxxx xxxxx  xxxx xxxx xxxxx  2696 3718   814
Potent Cap.: xxxx xxxx xxxxx   405 xxxx xxxxx  xxxx xxxx xxxxx    18    5   325
Move Cap.:   xxxx xxxx xxxxx   405 xxxx xxxxx  xxxx xxxx xxxxx    17    4   325
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    41   51 xxxxx    96   54 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.06 xxxx  xxxx  xxxx xxxx  xxxx  0.17 0.00  0.12
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  14.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  188 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 31.8 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             31.8
ApproachLOS:         *                *                *                 D
********************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway

3/15/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	0	92	32	3	57	25	1434	25	20	1941	74
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1478		1583	3157		1583	3167	1366
Flt Permitted		0.63	1.00		0.83		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1052	1390		1253		1583	3157		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	155	0	100	35	3	62	27	1559	27	22	2110	80
RTOR Reduction (vph)	0	0	54	0	50	0	0	1	0	0	0	15
Lane Group Flow (vph)	0	155	46	0	50	0	27	1585	0	22	2110	65
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		24.2	24.2		23.7		2.9	82.8		3.8	84.2	84.2
Effective Green, g (s)		24.7	24.7		24.2		2.9	86.2		3.8	87.6	87.6
Actuated g/C Ratio		0.20	0.20		0.20		0.02	0.70		0.03	0.71	0.71
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		210	277		245		37	2195		49	2237	965
v/s Ratio Prot							c0.02	0.50		0.01	c0.67	
v/s Ratio Perm		c0.15	0.03		0.04							0.05
v/c Ratio		0.74	0.17		0.20		0.73	0.72		0.45	0.94	0.07
Uniform Delay, d1		46.6	41.1		41.8		60.2	11.6		59.1	16.0	5.6
Progression Factor		1.00	1.00		1.00		0.92	0.70		1.11	0.57	0.67
Incremental Delay, d2		17.0	0.8		0.4		39.7	1.8		3.0	5.1	0.1
Delay (s)		63.6	41.9		42.2		95.3	9.8		68.4	14.3	3.8
Level of Service		E	D		D		F	A		E	B	A
Approach Delay (s)		55.1			42.2			11.2			14.4	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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      PM Peak Hour - Future plus Project Conditions (Average Sized Event)
                  Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Broadway/Sunset Dr
********************************************************************************
Average Delay (sec/veh):      0.6       Worst Case Level Of Service: D[ 27.8]
********************************************************************************
Street Name:             Broadway                          Sunset Dr
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled      Stop Sign        Stop Sign
Rights:           Include           Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0     0     0     1     0     3
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1445     3     9 2026     0     0     0     0     1     0     4
Added Vol:      0    2     8    18    2     0     0     0     0    17     0    39
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1447    11    27 2028     0     0     0     0    18     0    43
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1447    11    27 2028     0     0     0     0    18     0    43
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1447    11    27 2028     0     0     0     0    18     0    43
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1458 xxxx xxxxx  xxxx xxxx xxxxx  2521 3535   729
Potent Cap.: xxxx xxxx xxxxx   470 xxxx xxxxx  xxxx xxxx xxxxx    24    6   370
Move Cap.:   xxxx xxxx xxxxx   470 xxxx xxxxx  xxxx xxxx xxxxx    23    6   370
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    43   56 xxxxx   111   59 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.06 xxxx  xxxx  xxxx xxxx  xxxx  0.16 0.00  0.12
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  13.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  218 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 27.8 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             27.8
ApproachLOS:         *                *                *                 D
********************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway

3/15/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	48	1354	38	69	1905
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3151		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3151		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	52	1472	41	75	2071
RTOR Reduction (vph)	0	37	1	0	0	0
Lane Group Flow (vph)	54	15	1512	0	75	2071
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.7	18.2	91.4		8.5	103.4
Effective Green, g (s)	10.2	19.2	95.8		9.0	107.8
Actuated g/C Ratio	0.08	0.15	0.77		0.07	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	130	251	2434		115	2753
v/s Ratio Prot	c0.03	0.00	0.48		0.05	c0.65
v/s Ratio Perm		0.01				
v/c Ratio	0.42	0.06	0.62		0.65	0.75
Uniform Delay, d1	54.1	44.7	6.2		56.0	3.1
Progression Factor	1.00	1.00	1.00		0.84	1.13
Incremental Delay, d2	0.8	0.0	1.2		4.3	0.9
Delay (s)	54.9	44.7	7.4		51.4	4.3
Level of Service	D	D	A		D	A
Approach Delay (s)	49.9		7.4			6.0
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	628	9	149	7	1358	36	112	2021	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		1414	1351		1583	3151		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		1414	1351		1583	3151		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	661	9	157	7	1429	38	118	2127	0
RTOR Reduction (vph)	0	24	0	0	17	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	423	387	0	7	1465	0	118	2127	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		32.0	32.0		1.6	53.0		10.3	61.7	
Effective Green, g (s)	7.0	7.0		33.6	33.6		1.6	55.7		10.3	64.4	
Actuated g/C Ratio	0.06	0.06		0.27	0.27		0.01	0.45		0.08	0.52	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		383	366		20	1415		131	1645	
v/s Ratio Prot	c0.02	0.01		c0.30	0.29		0.00	0.47		c0.07	c0.67	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		1.10	1.06		0.35	1.04		0.90	1.29	
Uniform Delay, d1	56.1	55.7		45.2	45.2		60.7	34.1		56.3	29.8	
Progression Factor	1.00	1.00		1.00	1.00		0.93	0.98		1.00	1.00	
Incremental Delay, d2	0.6	0.4		77.2	62.6		2.1	27.8		48.8	136.5	
Delay (s)	56.7	56.1		122.4	107.8		58.7	61.4		105.2	166.3	
Level of Service	E	E		F	F		E	E		F	F	
Approach Delay (s)		56.4			115.3			61.4			163.1	
Approach LOS		E			F			E			F	

Intersection Summary			
HCM Average Control Delay	120.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

12/2/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	628	9	149	7	1358	36	112	2021	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.86		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		2887	1319		1583	4528		1583	4550	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		2887	1319		1583	4528		1583	4550	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	661	9	157	7	1429	38	118	2127	0
RTOR Reduction (vph)	0	24	0	0	119	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	661	47	0	7	1465	0	118	2127	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		28.4	28.4		1.6	55.1		11.8	65.3	
Effective Green, g (s)	7.0	7.0		30.0	30.0		1.6	57.8		11.8	68.0	
Actuated g/C Ratio	0.06	0.06		0.24	0.24		0.01	0.47		0.10	0.55	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		698	319		20	2111		151	2495	
v/s Ratio Prot	c0.02	0.01		c0.23	0.04		0.00	0.32		c0.07	c0.47	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		0.95	0.15		0.35	0.69		0.78	0.85	
Uniform Delay, d1	56.1	55.7		46.2	36.9		60.7	26.1		54.8	23.7	
Progression Factor	1.00	1.00		1.00	1.00		1.01	0.82		1.00	1.00	
Incremental Delay, d2	0.6	0.4		21.6	0.1		2.1	1.1		21.1	3.9	
Delay (s)	56.7	56.1		67.8	37.0		63.6	22.5		75.9	27.7	
Level of Service	E	E		E	D		E	C		E	C	
Approach Delay (s)		56.4			61.6			22.7			30.2	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall (North) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	458	90	41	1749	2020	338
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	498	98	45	1901	2196	367
RTOR Reduction (vph)	0	61	0	0	0	71
Lane Group Flow (vph)	498	37	45	1901	2196	296
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	22.9	22.9	7.0	90.0	77.1	100.0
Effective Green, g (s)	23.9	23.9	8.0	90.0	77.1	100.0
Actuated g/C Ratio	0.19	0.19	0.06	0.73	0.62	0.81
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	592	273	102	2299	1969	1143
v/s Ratio Prot	c0.16		0.03	c0.60	c0.69	0.05
v/s Ratio Perm		0.03				0.16
v/c Ratio	0.84	0.13	0.44	0.83	1.12	0.26
Uniform Delay, d1	48.2	41.5	55.8	11.7	23.5	2.9
Progression Factor	1.00	1.00	0.79	1.11	0.47	0.48
Incremental Delay, d2	10.1	0.1	0.9	2.8	52.7	0.0
Delay (s)	58.3	41.6	44.9	15.8	63.8	1.4
Level of Service	E	D	D	B	E	A
Approach Delay (s)	55.5			16.5	54.8	
Approach LOS	E			B	D	

Intersection Summary			
HCM Average Control Delay	40.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall (South) & Broadway

12/1/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	144	193	106	1589	1989	153
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1402	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1402	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	210	115	1727	2162	166
RTOR Reduction (vph)	0	5	0	0	0	25
Lane Group Flow (vph)	157	205	115	1727	2162	141
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	16.6	30.2	13.6	96.3	77.5	77.5
Effective Green, g (s)	17.1	31.2	14.1	99.0	80.2	80.2
Actuated g/C Ratio	0.14	0.25	0.11	0.80	0.65	0.65
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	424	406	180	2528	2048	883
v/s Ratio Prot	0.05	c0.06	0.07	c0.55	c0.68	
v/s Ratio Perm		0.09				0.10
v/c Ratio	0.37	0.50	0.64	0.68	1.06	0.16
Uniform Delay, d1	48.6	39.8	52.5	5.5	21.9	8.6
Progression Factor	1.00	1.00	1.31	0.13	0.15	0.01
Incremental Delay, d2	1.5	0.4	2.3	0.6	26.5	0.0
Delay (s)	50.1	40.1	71.3	1.4	29.6	0.1
Level of Service	D	D	E	A	C	A
Approach Delay (s)	44.4			5.7	27.5	
Approach LOS	D			A	C	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	12	5	98	13	59	3	1620	79	103	2020	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1585			1533		1583	3139		1583	3158	
Flt Permitted		0.71			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1156			1286		1583	3139		1583	3158	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	13	5	107	14	64	3	1761	86	112	2196	33
RTOR Reduction (vph)	0	3	0	0	16	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	50	0	0	169	0	3	1844	0	112	2228	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.1			18.9		1.6	76.5		11.6	86.5	
Effective Green, g (s)		18.6			20.5		1.6	79.2		11.6	89.2	
Actuated g/C Ratio		0.15			0.17		0.01	0.64		0.09	0.72	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		173			213		20	2005		148	2272	
v/s Ratio Prot							0.00	0.59		c0.07	c0.71	
v/s Ratio Perm		0.04			c0.13							
v/c Ratio		0.29			0.79		0.15	0.92		0.76	0.98	
Uniform Delay, d1		46.8			49.7		60.5	19.6		54.8	16.6	
Progression Factor		1.00			1.00		0.83	1.11		0.81	1.07	
Incremental Delay, d2		0.9			17.1		0.9	6.3		1.8	2.8	
Delay (s)		47.7			66.8		51.1	28.2		46.4	20.5	
Level of Service		D			E		D	C		D	C	
Approach Delay (s)		47.7			66.8			28.2			21.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group


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PM Future plus Project (MaxWed Dec 1, 2010 14:55:14                    Page 8-1
-------------------------------------------------------------------------------
      PM Peak Hour - Future plus Project Conditions (Maximum Sized Event)
                  Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
*******************************************************************************
Average Delay (sec/veh):      0.5       Worst Case Level Of Service: D[ 32.8]
*******************************************************************************
Street Name:             Broadway                     Ocean View Cemetery
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     0     0 1535     0     0    0     0     1    0     0
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1577     0     0 2026     0     0    0     0     1    0     0
Added Vol:      0   85    13    29   64     0     0    0     0    13    0    29
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1662    13    29 2090     0     0    0     0    14    0    29
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1662    13    29 2090     0     0    0     0    14    0    29
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1662    13    29 2090     0     0    0     0    14    0    29
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1675 xxxx xxxxx  xxxx xxxx xxxxx  2772 3817   838
Potent Cap.: xxxx xxxx xxxxx   388 xxxx xxxxx  xxxx xxxx xxxxx    16    4   314
Move Cap.:   xxxx xxxx xxxxx   388 xxxx xxxxx  xxxx xxxx xxxxx    15    4   314
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    38   47 xxxxx    90   50 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.07 xxxx  xxxx  xxxx xxxx  xxxx  0.16 0.00  0.09
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  15.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     C    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  172 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 32.8 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             32.8
ApproachLOS:         *                *                *                 D
*******************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway

12/1/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	0	92	32	3	57	25	1491	25	20	1997	74
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1478		1583	3158		1583	3167	1366
Flt Permitted		0.63	1.00		0.83		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1052	1390		1253		1583	3158		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	155	0	100	35	3	62	27	1621	27	22	2171	80
RTOR Reduction (vph)	0	0	53	0	50	0	0	1	0	0	0	15
Lane Group Flow (vph)	0	155	47	0	50	0	27	1647	0	22	2171	65
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		24.2	24.2		23.7		2.9	82.8		3.8	84.2	84.2
Effective Green, g (s)		24.7	24.7		24.2		2.9	86.2		3.8	87.6	87.6
Actuated g/C Ratio		0.20	0.20		0.20		0.02	0.70		0.03	0.71	0.71
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		210	277		245		37	2195		49	2237	965
v/s Ratio Prot							c0.02	0.52		0.01	c0.69	
v/s Ratio Perm		c0.15	0.03		0.04							0.05
v/c Ratio		0.74	0.17		0.20		0.73	0.75		0.45	0.97	0.07
Uniform Delay, d1		46.6	41.2		41.8		60.2	12.0		59.1	17.0	5.6
Progression Factor		1.00	1.00		1.00		0.92	0.71		1.11	0.56	0.66
Incremental Delay, d2		17.0	0.8		0.4		39.6	2.0		2.7	7.1	0.1
Delay (s)		63.6	42.0		42.2		95.0	10.5		68.3	16.6	3.8
Level of Service		E	D		D		F	B		E	B	A
Approach Delay (s)		55.1			42.2			11.9			16.6	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group


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PM Future plus Project (MaxWed Dec 1, 2010 14:55:14                 Page 10-1
-------------------------------------------------------------------------------
      PM Peak Hour - Future plus Project Conditions (Maximum Sized Event)
                  Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #7 Broadway/Sunset Dr
*******************************************************************************
Average Delay (sec/veh):      2.0       Worst Case Level Of Service: D[ 34.2]
*******************************************************************************
Street Name:              Broadway                          Sunset Dr
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0    0     0     1    0     3
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1445     3     9 2026     0     0    0     0     1    0     4
Added Vol:      0   13    27    64   13     0     0    0     0    37    0    85
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1458    30    73 2039     0     0    0     0    38    0    89
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1458    30    73 2039     0     0    0     0    38    0    89
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1458    30    73 2039     0     0    0     0    38    0    89
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1488 xxxx xxxxx  xxxx xxxx xxxxx  2639 3659   744
Potent Cap.: xxxx xxxx xxxxx   458 xxxx xxxxx  xxxx xxxx xxxxx    20    5   362
Move Cap.:   xxxx xxxx xxxxx   458 xxxx xxxxx  xxxx xxxx xxxxx    17    4   362
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    32   42 xxxxx    98   49 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.16 xxxx  xxxx  xxxx xxxx  xxxx  0.39 0.00  0.25
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.6 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  14.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *      *     B    *      *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  200 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  3.7 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 34.2 xxxxx
Shared LOS:      *    *      *     *    *      *    *     *     *    *     D     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             34.2
ApproachLOS:         *                *                *                 D
*******************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway

12/1/2010

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	48	1384	38	69	1935
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3151		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3151		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	52	1504	41	75	2103
RTOR Reduction (vph)	0	35	1	0	0	0
Lane Group Flow (vph)	54	17	1544	0	75	2103
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.7	18.2	91.4		8.5	103.4
Effective Green, g (s)	10.2	19.2	95.8		9.0	107.8
Actuated g/C Ratio	0.08	0.15	0.77		0.07	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	130	251	2434		115	2753
v/s Ratio Prot	c0.03	0.01	0.49		0.05	c0.66
v/s Ratio Perm		0.01				
v/c Ratio	0.42	0.07	0.63		0.65	0.76
Uniform Delay, d1	54.1	44.8	6.3		56.0	3.2
Progression Factor	1.00	1.00	1.00		0.84	1.17
Incremental Delay, d2	0.8	0.0	1.3		3.9	0.8
Delay (s)	54.9	44.8	7.6		51.0	4.5
Level of Service	D	D	A		D	A
Approach Delay (s)	49.9		7.6			6.1
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

3/14/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	662	9	149	7	1431	36	112	2108	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		1414	1354		1583	3152		1583	3167	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		1414	1354		1583	3152		1583	3167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	697	9	157	7	1506	38	118	2219	0
RTOR Reduction (vph)	0	24	0	0	17	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	439	407	0	7	1542	0	118	2219	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		32.0	32.0		1.6	53.0		10.3	61.7	
Effective Green, g (s)	7.0	7.0		33.6	33.6		1.6	55.7		10.3	64.4	
Actuated g/C Ratio	0.06	0.06		0.27	0.27		0.01	0.45		0.08	0.52	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		383	367		20	1416		131	1645	
v/s Ratio Prot	c0.02	0.01		c0.31	0.30		0.00	0.49		c0.07	c0.70	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		1.15	1.11		0.35	1.09		0.90	1.35	
Uniform Delay, d1	56.1	55.7		45.2	45.2		60.7	34.1		56.3	29.8	
Progression Factor	1.00	1.00		1.00	1.00		0.92	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.4		92.1	80.0		1.9	46.8		48.8	161.1	
Delay (s)	56.7	56.1		137.3	125.2		57.6	81.0		105.2	190.9	
Level of Service	E	E		F	F		E	F		F	F	
Approach Delay (s)		56.4			131.3			80.9			186.6	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	140.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Henderson Street & Broadway

3/14/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	12	24	662	9	149	7	1431	36	112	2108	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			12%			0%			0%	
Total Lost time (s)	4.7	4.7		3.6	3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor	1.00	1.00		0.91	0.91		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1465		2709	1264		1583	4529		1583	4550	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1465		2709	1264		1583	4529		1583	4550	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	13	25	697	9	157	7	1506	38	118	2219	0
RTOR Reduction (vph)	0	24	0	0	38	0	0	2	0	0	0	0
Lane Group Flow (vph)	25	14	0	585	240	0	7	1542	0	118	2219	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Split			Split			Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases		7										
Actuated Green, G (s)	6.5	6.5		26.8	26.8		1.6	56.7		11.8	66.9	
Effective Green, g (s)	7.0	7.0		28.4	28.4		1.6	59.4		11.8	69.6	
Actuated g/C Ratio	0.06	0.06		0.23	0.23		0.01	0.48		0.10	0.56	
Clearance Time (s)	5.2	5.2		5.2	5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)	89	83		620	289		20	2170		151	2554	
v/s Ratio Prot	c0.02	0.01		c0.22	0.19		0.00	0.34		c0.07	c0.49	
v/s Ratio Perm												
v/c Ratio	0.28	0.17		0.94	0.83		0.35	0.71		0.78	0.87	
Uniform Delay, d1	56.1	55.7		47.0	45.5		60.7	25.5		54.8	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	0.94		1.00	1.00	
Incremental Delay, d2	0.6	0.4		22.8	17.3		1.9	1.0		21.1	4.3	
Delay (s)	56.7	56.1		69.8	62.9		62.7	24.9		75.9	27.6	
Level of Service	E	E		E	E		E	C		E	C	
Approach Delay (s)		56.4			67.6			25.1			30.1	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	35.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Bayshore Mall (North) & Broadway

3/14/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	458	90	41	1851	2142	338
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.2	4.2	4.9	5.9	5.9	5.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1417	1583	3167	3167	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1417	1583	3167	3167	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	498	98	45	2012	2328	367
RTOR Reduction (vph)	0	61	0	0	0	71
Lane Group Flow (vph)	498	37	45	2012	2328	296
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases	4	4				6
Actuated Green, G (s)	22.9	22.9	7.0	90.0	77.1	100.0
Effective Green, g (s)	23.9	23.9	8.0	90.0	77.1	100.0
Actuated g/C Ratio	0.19	0.19	0.06	0.73	0.62	0.81
Clearance Time (s)	5.2	5.2	5.9	5.9	5.9	5.2
Vehicle Extension (s)	1.5	1.5	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	592	273	102	2299	1969	1143
v/s Ratio Prot	c0.16		0.03	c0.64	c0.74	0.05
v/s Ratio Perm		0.03				0.16
v/c Ratio	0.84	0.13	0.44	0.88	1.18	0.26
Uniform Delay, d1	48.2	41.5	55.8	12.8	23.5	2.9
Progression Factor	1.00	1.00	0.80	1.09	0.46	0.50
Incremental Delay, d2	10.1	0.1	0.8	3.8	82.6	0.0
Delay (s)	58.3	41.6	45.4	17.7	93.5	1.5
Level of Service	E	D	D	B	F	A
Approach Delay (s)	55.5			18.3	80.9	
Approach LOS	E			B	F	

Intersection Summary			
HCM Average Control Delay	54.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bayshore Mall (South) & Broadway

3/14/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	144	193	106	1691	2109	153
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	4.7	4.7	3.2	3.2	3.2
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3072	1402	1583	3167	3167	1366
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3072	1402	1583	3167	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	210	115	1838	2292	166
RTOR Reduction (vph)	0	4	0	0	0	24
Lane Group Flow (vph)	157	206	115	1838	2292	142
Confl. Peds. (#/hr)		5				5
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	16.6	30.2	13.6	96.3	77.5	77.5
Effective Green, g (s)	17.1	31.2	14.1	99.0	80.2	80.2
Actuated g/C Ratio	0.14	0.25	0.11	0.80	0.65	0.65
Clearance Time (s)	5.2	5.2	5.2	5.9	5.9	5.9
Vehicle Extension (s)	6.0	1.5	1.5	2.0	2.0	2.0
Lane Grp Cap (vph)	424	406	180	2528	2048	883
v/s Ratio Prot	0.05	c0.06	0.07	c0.58	c0.72	
v/s Ratio Perm		0.09				0.10
v/c Ratio	0.37	0.51	0.64	0.73	1.12	0.16
Uniform Delay, d1	48.6	39.8	52.5	6.0	21.9	8.6
Progression Factor	1.00	1.00	1.31	0.25	0.18	0.01
Incremental Delay, d2	1.5	0.4	1.7	0.6	54.3	0.0
Delay (s)	50.1	40.2	70.5	2.1	58.3	0.1
Level of Service	D	D	E	A	E	A
Approach Delay (s)	44.4			6.1	54.3	
Approach LOS	D			A	D	

Intersection Summary			
HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: McCullens Avenue & Broadway

3/14/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	12	5	98	13	59	3	1722	79	103	2142	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.5			3.6		5.9	3.2		5.9	3.2	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1585			1533		1583	3141		1583	3158	
Flt Permitted		0.71			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1156			1286		1583	3141		1583	3158	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	13	5	107	14	64	3	1872	86	112	2328	33
RTOR Reduction (vph)	0	3	0	0	16	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	50	0	0	169	0	3	1955	0	112	2360	0
Confl. Peds. (#/hr)	5		5			5			5			5
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.1			18.9		1.6	76.5		11.6	86.5	
Effective Green, g (s)		18.6			20.5		1.6	79.2		11.6	89.2	
Actuated g/C Ratio		0.15			0.17		0.01	0.64		0.09	0.72	
Clearance Time (s)		6.0			5.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0			2.0		1.5	7.0		1.5	7.0	
Lane Grp Cap (vph)		173			213		20	2006		148	2272	
v/s Ratio Prot							0.00	0.62		c0.07	c0.75	
v/s Ratio Perm		0.04			c0.13							
v/c Ratio		0.29			0.79		0.15	0.97		0.76	1.04	
Uniform Delay, d1		46.8			49.7		60.5	21.4		54.8	17.4	
Progression Factor		1.00			1.00		0.85	1.14		0.82	1.07	
Incremental Delay, d2		0.9			17.1		0.9	12.0		1.8	19.2	
Delay (s)		47.7			66.8		52.6	36.5		46.5	37.9	
Level of Service		D			E		D	D		D	D	
Approach Delay (s)		47.7			66.8			36.5			38.3	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

```
PM Peak Hour - Future plus Highest Land Uses
 Traffic Impact Study for Lost Coast Brewery
                City of Eureka
---------------------------------------------------------------------------
                Level Of Service Computation Report
        2000 HCM Unsignalized Method (Future Volume Alternative)
***************************************************************************
Intersection #5 Broadway/Ocean View Cemetery
***************************************************************************
Average Delay (sec/veh):      0.5       Worst Case Level Of Service: E[ 37.4]
***************************************************************************
Street Name:             Broadway                    Ocean View Cemetery
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1195     7    16 1535     0     0     0     0    11     0    25
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1577     9    21 2026     0     0     0     0    15     0    33
Added Vol:      0  217     0     0  215     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1794     9    21 2241     0     0     0     0    15     0    33
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1794     9    21 2241     0     0     0     0    15     0    33
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1794     9    21 2241     0     0     0     0    15     0    33
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1804 xxxx xxxxx  xxxx xxxx xxxxx  2962 4082   902
Potent Cap.: xxxx xxxx xxxxx   346 xxxx xxxxx  xxxx xxxx xxxxx    12    3   285
Move Cap.:   xxxx xxxx xxxxx   346 xxxx xxxxx  xxxx xxxx xxxxx    11    2   285
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx    32   41 xxxxx    78   43 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.06 xxxx  xxxx  xxxx xxxx  xxxx  0.19 0.00  0.12
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  16.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     C    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  158 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.2 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 37.4 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    E     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             37.4
ApproachLOS:         *                *                *                 E
***************************************************************************
Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
6: Pierson's Entrance & Broadway

3/14/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	0	92	32	3	57	25	1610	25	20	2136	74
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.0	3.0		3.5		3.5	2.3		4.0	2.3	2.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	1390		1478		1583	3158		1583	3167	1366
Flt Permitted		0.63	1.00		0.83		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1052	1390		1253		1583	3158		1583	3167	1366
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	155	0	100	35	3	62	27	1750	27	22	2322	80
RTOR Reduction (vph)	0	0	50	0	50	0	0	1	0	0	0	14
Lane Group Flow (vph)	0	155	50	0	50	0	27	1776	0	22	2322	66
Confl. Peds. (#/hr)			5	5		5			5	5		5
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8	8							6
Actuated Green, G (s)		24.2	24.2		23.7		2.9	82.8		3.8	84.2	84.2
Effective Green, g (s)		24.7	24.7		24.2		2.9	86.2		3.8	87.6	87.6
Actuated g/C Ratio		0.20	0.20		0.20		0.02	0.70		0.03	0.71	0.71
Clearance Time (s)		3.5	3.5		4.0		3.5	5.7		4.0	5.7	5.7
Vehicle Extension (s)		6.0	6.0		3.0		1.5	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		210	277		245		37	2195		49	2237	965
v/s Ratio Prot							c0.02	0.56		0.01	c0.73	
v/s Ratio Perm		c0.15	0.04		0.04							0.05
v/c Ratio		0.74	0.18		0.20		0.73	0.81		0.45	1.04	0.07
Uniform Delay, d1		46.6	41.2		41.8		60.2	13.2		59.1	18.2	5.6
Progression Factor		1.00	1.00		1.00		0.92	0.72		1.10	0.56	0.66
Incremental Delay, d2		17.0	0.9		0.4		39.6	2.8		2.7	23.8	0.1
Delay (s)		63.6	42.1		42.2		94.8	12.3		67.8	34.0	3.8
Level of Service		E	D		D		F	B		E	C	A
Approach Delay (s)		55.2			42.2			13.6			33.3	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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                  PM Peak Hour - Future plus Highest Land Uses
                   Traffic Impact Study for Lost Coast Brewery
                                City of Eureka
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
******************************************************************************
Intersection #7 Broadway/Sunset Dr
******************************************************************************
Average Delay (sec/veh):     31.7       Worst Case Level Of Service: F[657.4]
******************************************************************************
Street Name:             Broadway                          Sunset Dr
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1095     2     7 1535     0     0     0     0     1     0     3
Growth Adj:  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32  1.32 1.32  1.32
Initial Bse:    0 1445     3     9 2026     0     0     0     0     1     0     4
Added Vol:      0    0    92   215    0     0     0     0     0    93     0   217
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1445    95   224 2026     0     0     0     0    94     0   221
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1445    95   224 2026     0     0     0     0    94     0   221
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1445    95   224 2026     0     0     0     0    94     0   221
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1540 xxxx xxxxx  xxxx xxxx xxxxx  2954 3967   770
Potent Cap.: xxxx xxxx xxxxx   437 xxxx xxxxx  xxxx xxxx xxxxx    12    3   348
Move Cap.:   xxxx xxxx xxxxx   437 xxxx xxxxx  xxxx xxxx xxxxx     7    2   348
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx     0    0 xxxxx    57   24 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.51 xxxx  xxxx  xxxx xxxx  xxxx  1.66 0.00  0.64
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   2.9 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  21.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     C    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  137 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 26.7 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  657 xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            657.4
ApproachLOS:         *                *                *                F
******************************************************************************
Note: Queue reported is the number of cars per lane.

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```

HCM Signalized Intersection Capacity Analysis
8: K-Mart Entrance & Broadway

3/14/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	48	1436	38	69	1979
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1402	3152		1583	3167
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1402	3152		1583	3167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	52	1561	41	75	2151
RTOR Reduction (vph)	0	30	1	0	0	0
Lane Group Flow (vph)	54	22	1601	0	75	2151
Confl. Peds. (#/hr)		5		5		
Turn Type		pm+ov			Prot	
Protected Phases	8	1	2		1	6
Permitted Phases		8				
Actuated Green, G (s)	9.7	18.2	91.4		8.5	103.4
Effective Green, g (s)	10.2	19.2	95.8		9.0	107.8
Actuated g/C Ratio	0.08	0.15	0.77		0.07	0.87
Clearance Time (s)	3.5	3.5	7.4		3.5	7.4
Vehicle Extension (s)	1.5	1.5	2.0		1.5	2.0
Lane Grp Cap (vph)	130	251	2435		115	2753
v/s Ratio Prot	c0.03	0.01	0.51		0.05	c0.68
v/s Ratio Perm		0.01				
v/c Ratio	0.42	0.09	0.66		0.65	0.78
Uniform Delay, d1	54.1	44.9	6.5		56.0	3.3
Progression Factor	1.00	1.00	1.00		0.84	1.21
Incremental Delay, d2	0.8	0.1	1.4		2.7	0.6
Delay (s)	54.9	44.9	7.9		49.7	4.6
Level of Service	D	D	A		D	A
Approach Delay (s)	50.0		7.9			6.1
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix B

Collision Rate Spreadsheets

SEGMENT COLLISION RATE CALCULATIONS

Lost Coast Brewery

Location: Broadway from McCullens Ave to K-Mart Entrance

Date of Count: Wednesday, November 3, 2010
ADT: 26,700

Number of Collisions: 43
Number of Injuries: 41
Number of Fatalities: 1
Start Date: January 1, 2005
End Date: December 31, 2009
Number of Years: 5

Highway Type: UNDIVIDED 5-6 LANES
Area: Suburban
Design Speed: <=55

Segment Length: 1.0 miles
Direction: NORTH/SOUTH

$$\frac{\text{NUMBER OF COLLISIONS} \times 1\text{ MILLION}}{\text{ADT} \times 365\text{ DAYS PER YEAR} \times \text{SEGMENT LENGTH} \times \text{NUMBER OF YEARS}}$$

$$\frac{43 \times 1{,}000{,}000}{26{,}700 \times 365 \times 1 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Segment	**0.88 c/mvm**	**2.3%**	**95.3%**
Statewide Average*	**0.95 c/mvm**	**3.1%**	**46.9%**

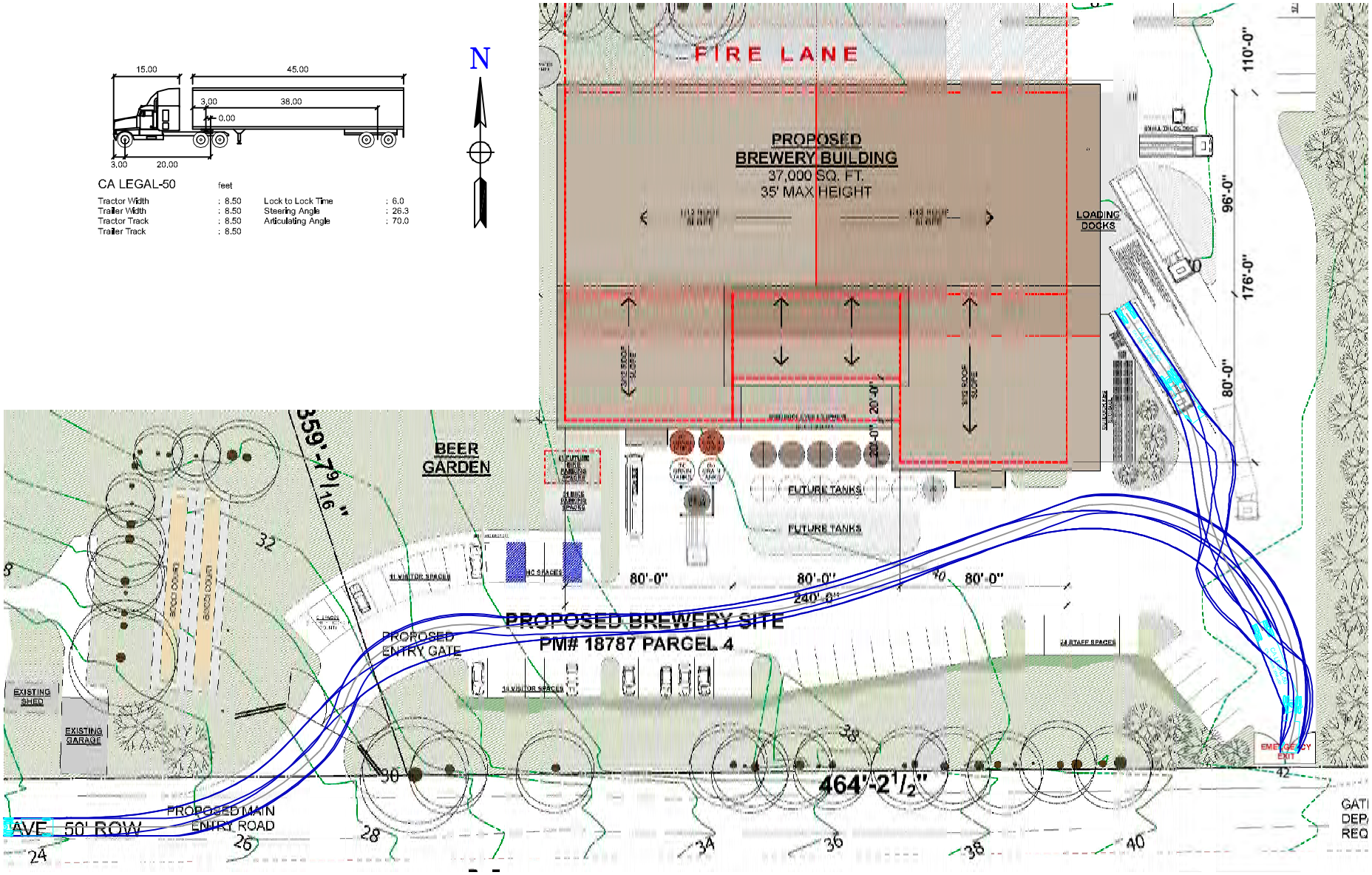
ADT = average daily traffic volume
c/mvm = collisions per million vehicle miles
* *2007 Collision Data on California State Highways* , Caltrans

Appendix C

Site Plan Truck Turning Templates

CA LEGAL-50 feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



Whitlock & Weinberger Transportation, Inc
490 Mendocino Ave, Suite 201
Santa Rosa, CA
(707)542-9500 Fax (707)542-9590

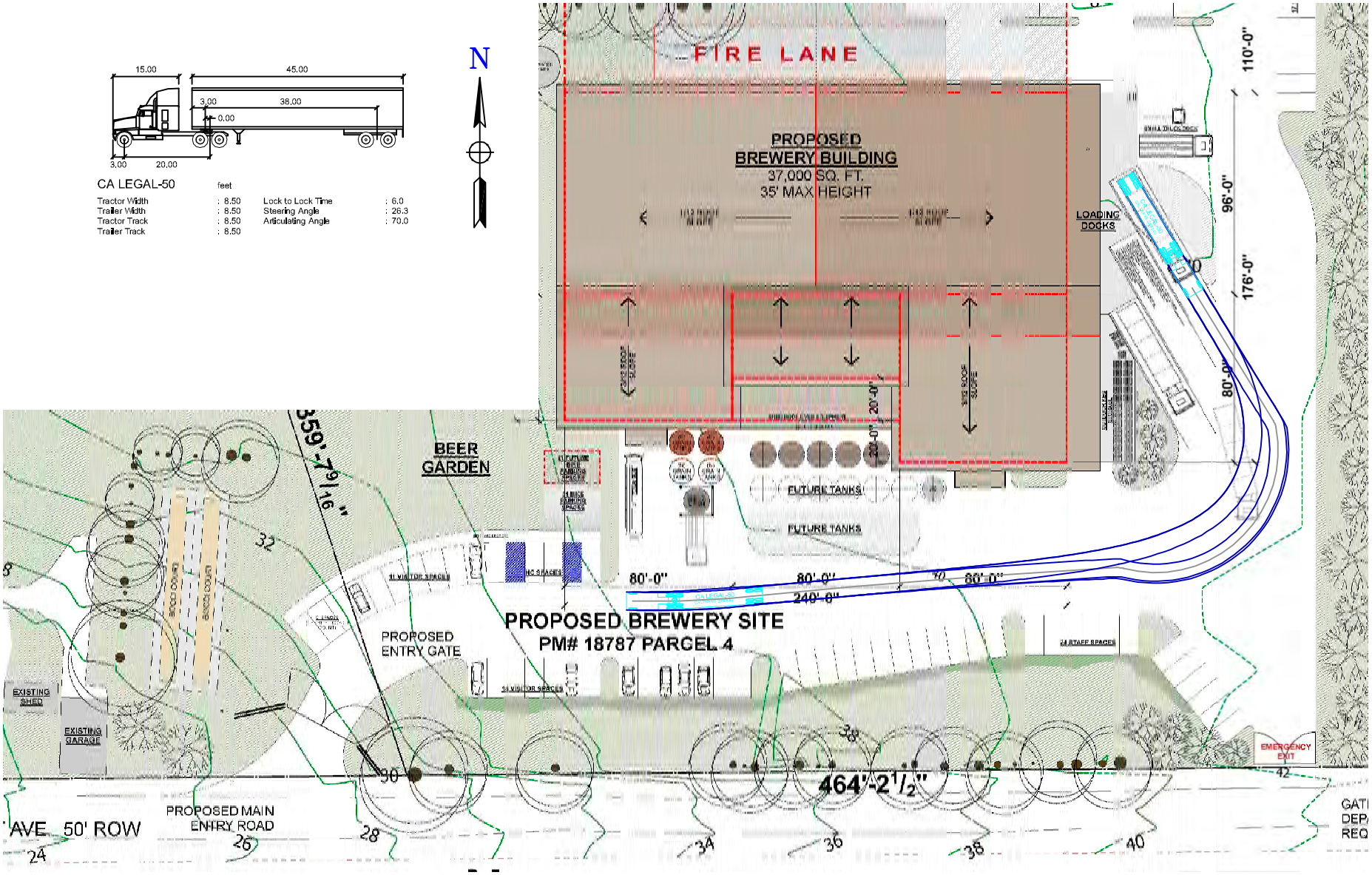
Lost Coast Brewery
Inbound Truck Access

DATE: MAR2011

JOB NO. EUR030

CA LEGAL-50 feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



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(707)542-9500 Fax (707)542-9590

Lost Coast Brewery
Outbound Truck Access

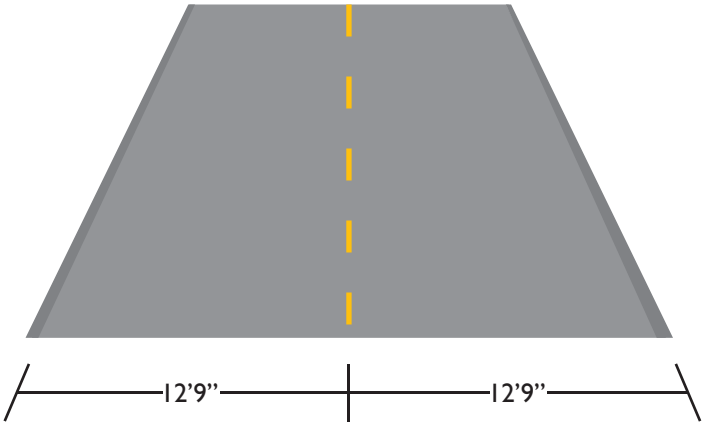
DATE: MAR2011

JOB NO. EUR030

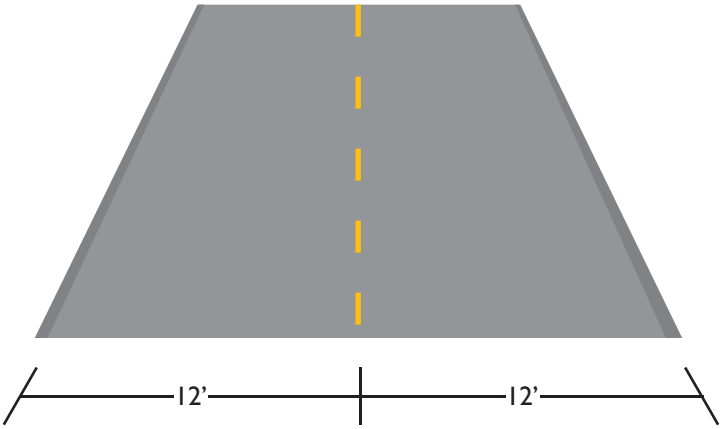
Appendix D

Cross Sections & Broadway/Sunset Drive Truck Turning Templates

Ocean View Cemetery - Existing Cross Section (25'6")



Sunset Drive - Existing Cross Section (24')

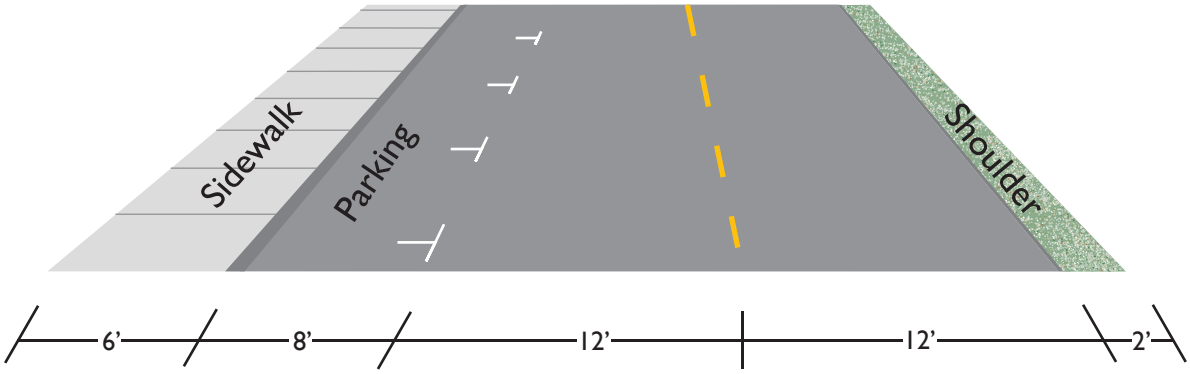


North

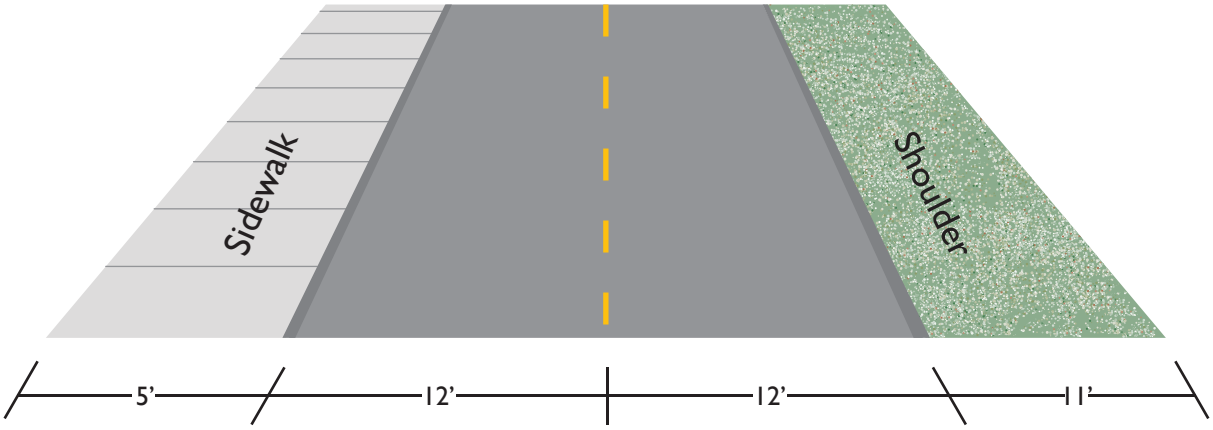
Not to Scale

030EUR.ai 4/11

Sunset Drive - City Standards Cross Section (40' ROW)



Sunset Drive - Proposed Cross Section (40' ROW)



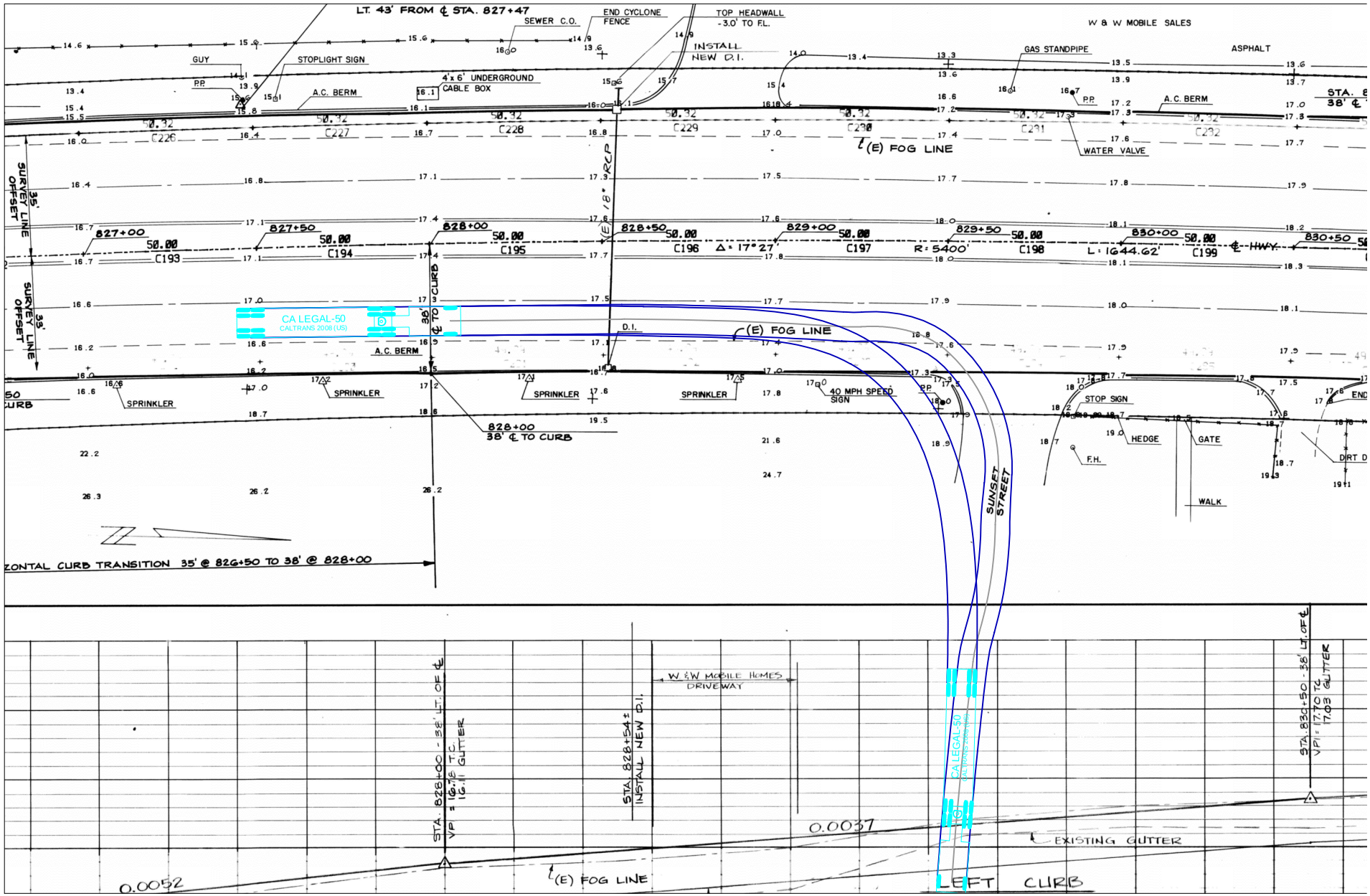
North

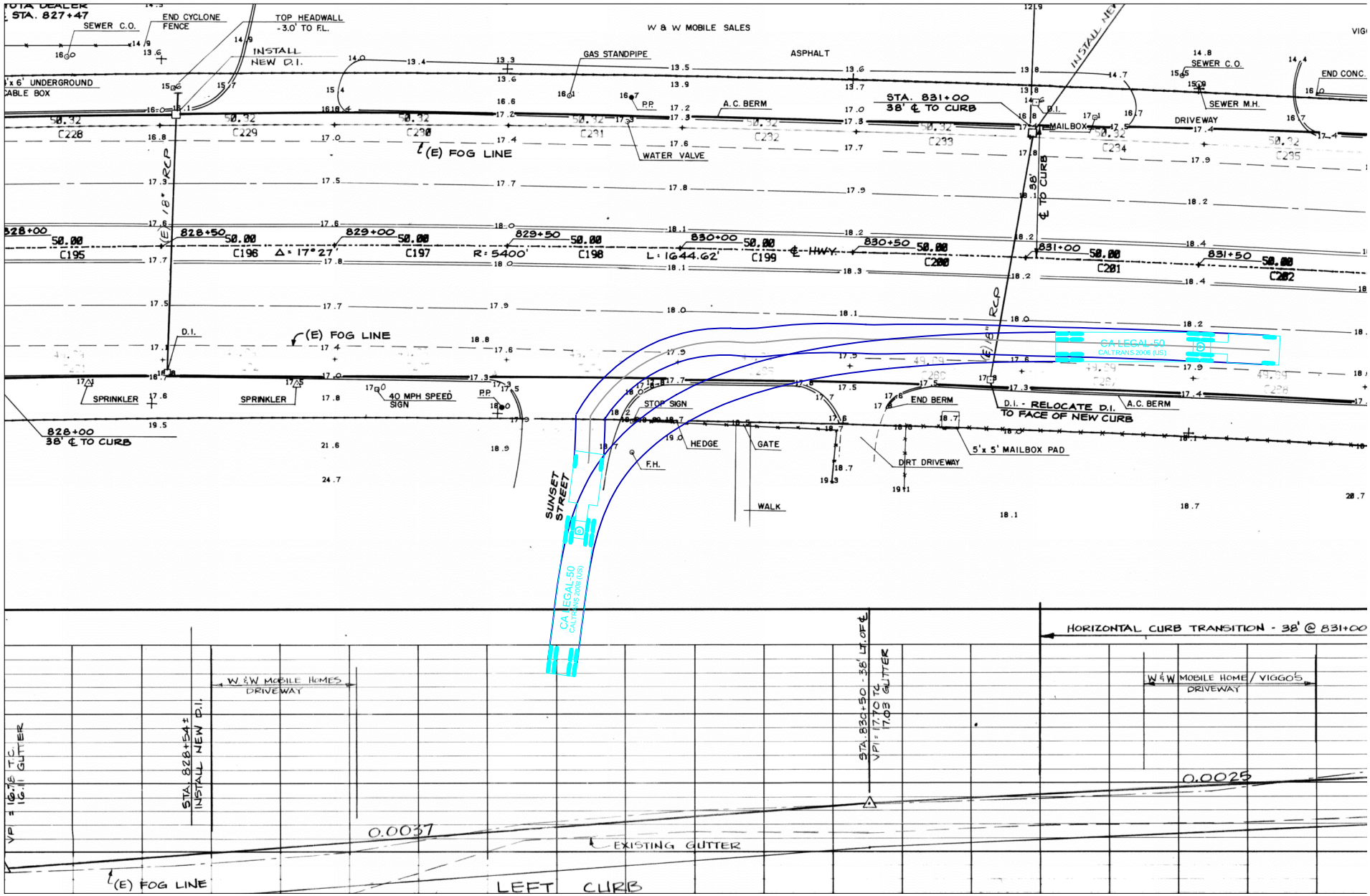
Not to Scale

030EUR.ai 4/11

Traffic Impact Study for Lost Coast Brewery — Appendix D

City of Eureka — Proposed and City Standards Cross Sections


LT. 43' FROM ℄ STA. 827+47
SEWER C.O.
END CYCLONE FENCE
TOP HEADWALL -3.0' TO F.L.
INSTALL NEW D.I.
W & W MOBILE SALES
GAS STANDPIPE
ASPHALT
GUY
STOPLIGHT SIGN
P.P.
A.C. BERM
4'x 6' UNDERGROUND CABLE BOX
WATER VALVE
℄ (E) FOG LINE
SURVEY LINE OFFSET 35'
827+00
827+50
828+00
828+50
829+00
829+50
830+00
830+50
50.00
C193
C194
C195
C196
C197
C198
C199
Δ = 17° 27'
R = 5400'
L = 1644.62'
℄ HWY.
36' ℄ TO CURB
CA LEGAL-50
CALTRANS 2008 (US)
D.I.
SPRINKLER
40 MPH SPEED SIGN
STOP SIGN
HEDGE
GATE
F.H.
WALK
828+00 38' ℄ TO CURB
SUNSET STREET
ZONTAL CURB TRANSITION 35' @ 826+50 TO 38' @ 828+00
STA. 826+00 - 38' LT. OF ℄
VPI = 16.76 T.C.
16.11 GUTTER
STA. 828+54± INSTALL NEW D.I.
W.&W. MOBILE HOMES DRIVEWAY
STA. 830+50 - 38' LT. OF ℄
VPI = 17.70 T.C.
17.03 GUTTER
0.0037
0.0052
EXISTING GUTTER
℄ (E) FOG LINE
LEFT CURB


STA. 827+47
SEWER C.O.
END CYCLONE FENCE
TOP HEADWALL -3.0' TO F.L.
INSTALL NEW D.I.
W & W MOBILE SALES
GAS STANDPIPE
ASPHALT
SEWER C.O.
END CONC.
SEWER M.H.
DRIVEWAY
A.C. BERM
P.P.
STA. 831+00 38' ℄ TO CURB
MAILBOX
D.I.
WATER VALVE
(E) FOG LINE
(E) 18" RCP
828+00
828+50
829+00
829+50
830+00
830+50
831+00
831+50
C195
C196
C197
C198
C199
C200
C201
C202
Δ = 17°27'
R = 5400'
L = 1644.62'
℄ HWY.
38' ℄ TO CURB
SPRINKLER
40 MPH SPEED SIGN
STOP SIGN
END BERM
D.I. - RELOCATE D.I. TO FACE OF NEW CURB
HEDGE
GATE
F.H.
DIRT DRIVEWAY
5'x 5' MAILBOX PAD
WALK
SUNSET STREET
CALEGAL-50
CALTRANS 2008 (US)
HORIZONTAL CURB TRANSITION - 38' @ 831+00
W & W MOBILE HOMES DRIVEWAY
W & W MOBILE HOME / VIGGO'S DRIVEWAY
STA. 828+54 ± INSTALL NEW D.I.
STA. 830+50 - 36' LT. OF ℄
VPI = 17.70 TC 17.03 GUTTER
VPI = 16.78 TC 16.11 GUTTER
0.0037
0.0025
EXISTING GUTTER
(E) FOG LINE
LEFT CURB

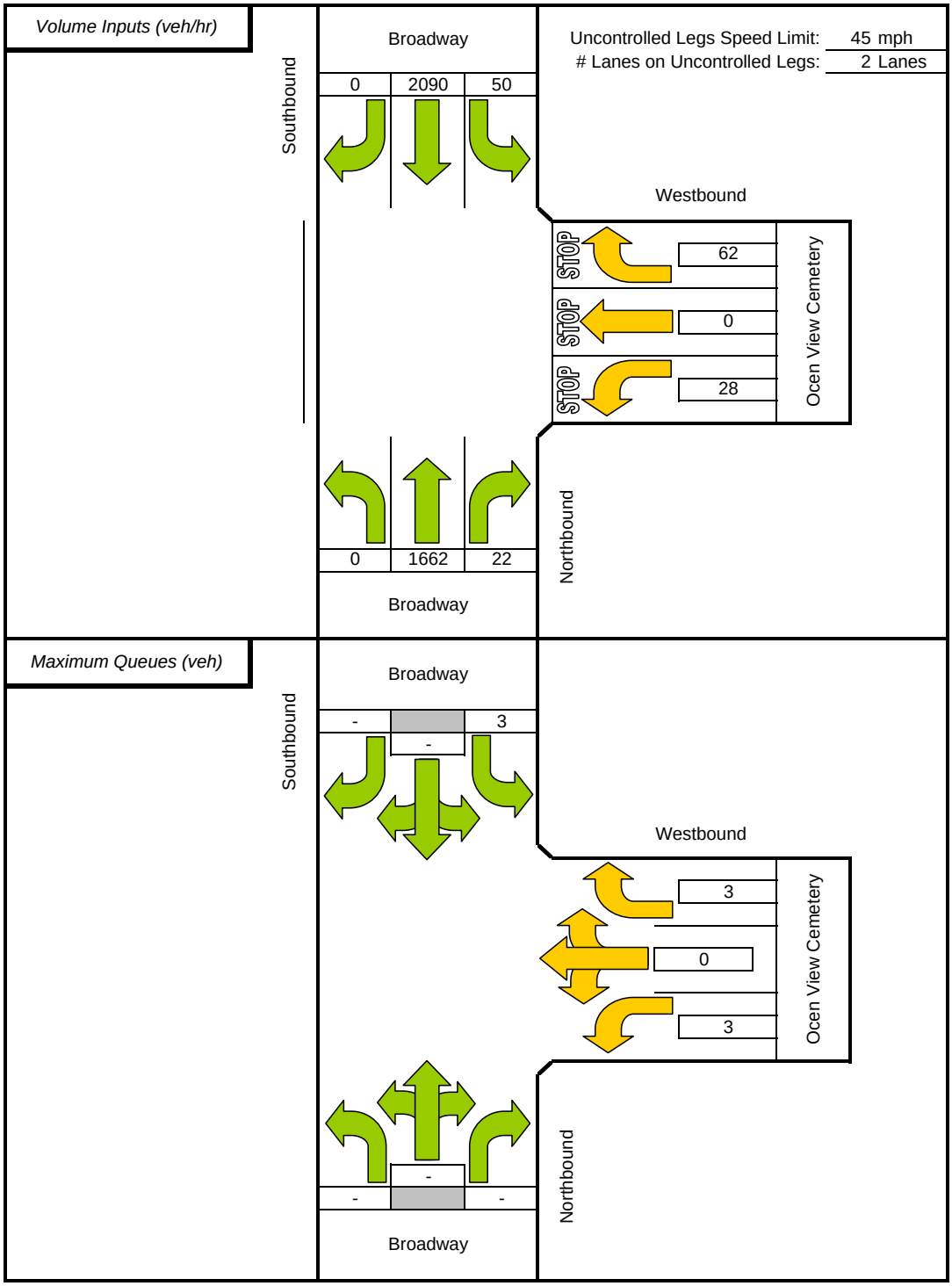
Appendix E

Maximum Queue Length Spreadsheets

Maximum Queue Length
Two-Way Stop-Controlled Intersections

Through Street: Broadway
Side Street: Ocen View Cemetery

Scenario: Future + Project with Maximum Sized Event
Stop Controlled Legs: East/West

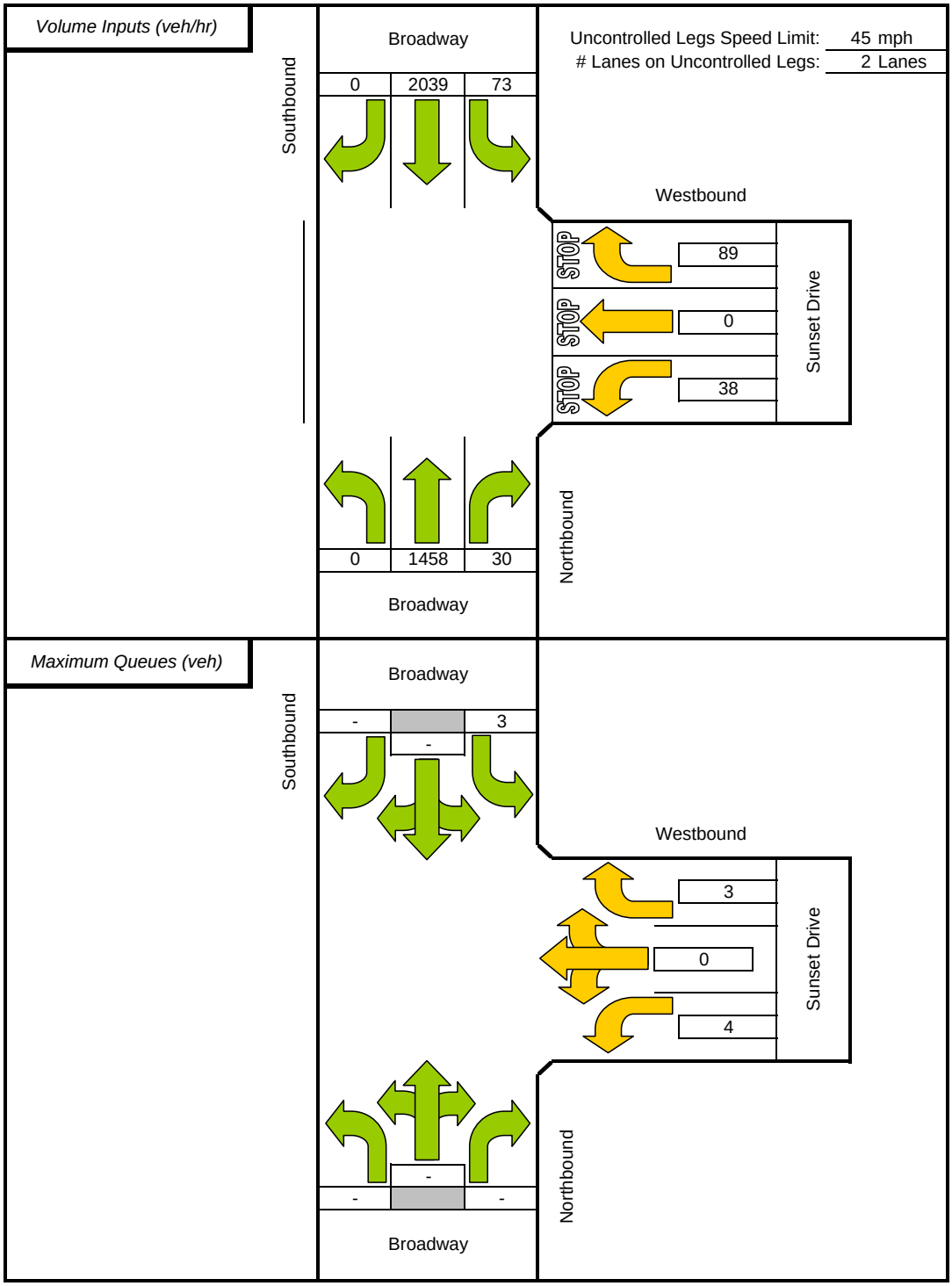


Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"

Maximum Queue Length
Two-Way Stop-Controlled Intersections

Through Street: Broadway
Side Street: Sunset Drive

Scenario: Future + Project with Maximum Sized Event
Stop Controlled Legs: East/West



Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"