

US Highway 101 Traffic Calming and Gateway Study

Final Report



Prepared for the

Del Norte Local Transportation Commission

Prepared by

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Design Workshop, Inc.

US HIGHWAY 101 TRAFFIC CALMING AND GATEWAY STUDY

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Section I Introduction

Under the direction of the Del Norte Local Transportation Commission, a Consultant Team led by LSC Transportation Consultants, Inc., with the assistance of Design Workshop, Inc., has developed a plan to address traffic calming issues and to enhance the “gateway” aspect of US Highway 101 in the Crescent City, California area. This study has been initiated to address the following goals:

- Improve traffic safety and pedestrian/bicycle safety along the key highway entrances to the Crescent City urban area.
- Calm traffic flow to improve the urban quality of the entrance areas.
- Enhance the local economy by improving the attractiveness of Crescent City to visiting motorists as a place to stay and enjoy.

The study corridor includes US Highway 101 from Sand Mine Road northward to the downtown Crescent City “grid” at Front Street, as well as from the Washington Boulevard interchange on the north, southward to Cooper Avenue.

This document first presents information regarding existing transportation and gateway conditions, including roadway configuration, vehicle and truck volumes, traffic safety, transit, and bicycle and pedestrian activity. This is followed by a review of design issues and driver perceptions along the two gateway corridors, as well as a review of current plans and projects in the corridor that may affect or need to be coordinated with the gateway/traffic calming plan. A review of potential traffic calming/gateway strategies is presented that have been studied or implemented in similar settings, with a focus on projects in Northern California. An analysis of potential alternatives is discussed next. Finally, a plan for the study corridors is presented, including physical modifications, financial strategies, and the next steps in implementing the study recommendations.

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Section II

Existing Transportation Conditions

This section presents a review of the existing roadway characteristics, followed by data regarding existing traffic volumes, trends in volumes, traffic characteristics, traffic speeds, traffic collisions, and bicycle/pedestrian activity.

EXISTING ROADWAY CONFIGURATION

US Highway 101 is the primary arterial highway serving the Northern California and Oregon coasts, and as such is a key element in the national and statewide highway network. Drivers approaching Crescent City from the south on US Highway 101 travel approximately 70 miles from the nearest significant urbanized area (Arcata/McKinleyville), while drivers approaching from the north travel approximately 25 miles from Brookings (via US Highway 101) or 80 miles from Grants Pass (via US 199). As a result, there is a tendency for drivers arriving in Crescent City to be acclimated to traveling at relatively high speed with little need to be aware of conflicting traffic, pedestrian, and bicyclist movements.

Diagrams of the existing roadway configuration are provided in Figures 1 and 2 for the south and north study areas, respectively. Right-of-way maps obtained from the California Department of Transportation (Caltrans) District 1 indicates that total right-of-way varies from 82 feet to 100 feet in the south segment and from 100 feet to 130 feet in the north segment. Pavement widths and number of lanes change throughout the study area. As shown in Figure 1, south of the developed area of Crescent City US Highway 101 has a two-lane cross section. This widens to three lanes with a two-way left-turn lane (TWLTL) at Anchor Way. US Highway 101 further widens to five lanes (two lanes in each direction plus a TWLTL) between Elk Valley Road and the M/L Streets couplet.

As shown in Figure 2, entering from the north, US Highway 101 has two lanes in each direction with freeway design standards and interchanges rather than at-grade intersections. South of Parkway Drive, there is a standard five-lane cross section with two through lanes in each direction and a TWLTL. South of Cooper Avenue, a six-lane cross section is provided with three through lanes for southbound traffic, two through lanes for northbound traffic, and a TWLTL.

There are four traffic signals along the study corridor at the following locations:

- At the intersection of US Highway 101 with Elk Valley Road
- At the intersection of US Highway 101 southbound (L Street) with Front Street
- At the intersection of US Highway 101 with Cooper Avenue
- At the intersection of US Highway 101 with Northcrest Drive

Traffic control at other locations consist of Stop signs on side street (non US Highway 101) approaches. There are no all-way stop controlled intersections along US Highway 101 in the study area. The following are streets that intersect US Highway 101 at major stop-controlled intersections in the study area:

- Anchor Way
- Citizens Dock Road
- Front Street (with US Highway 101 northbound (M Street))
- Wilson Avenue and Burtschell Street

FIGURE 1
Existing Roadway Configuration - South Section

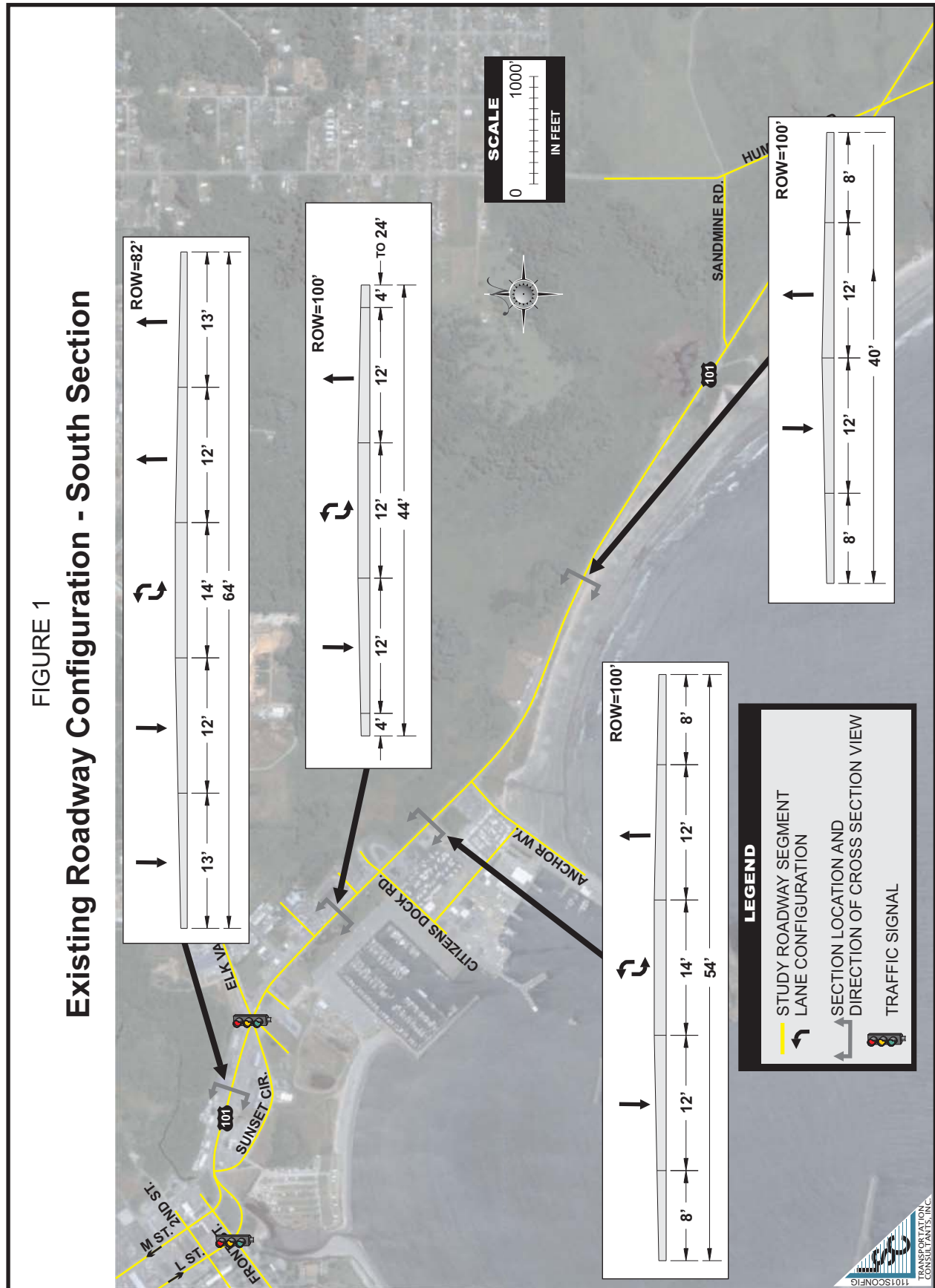
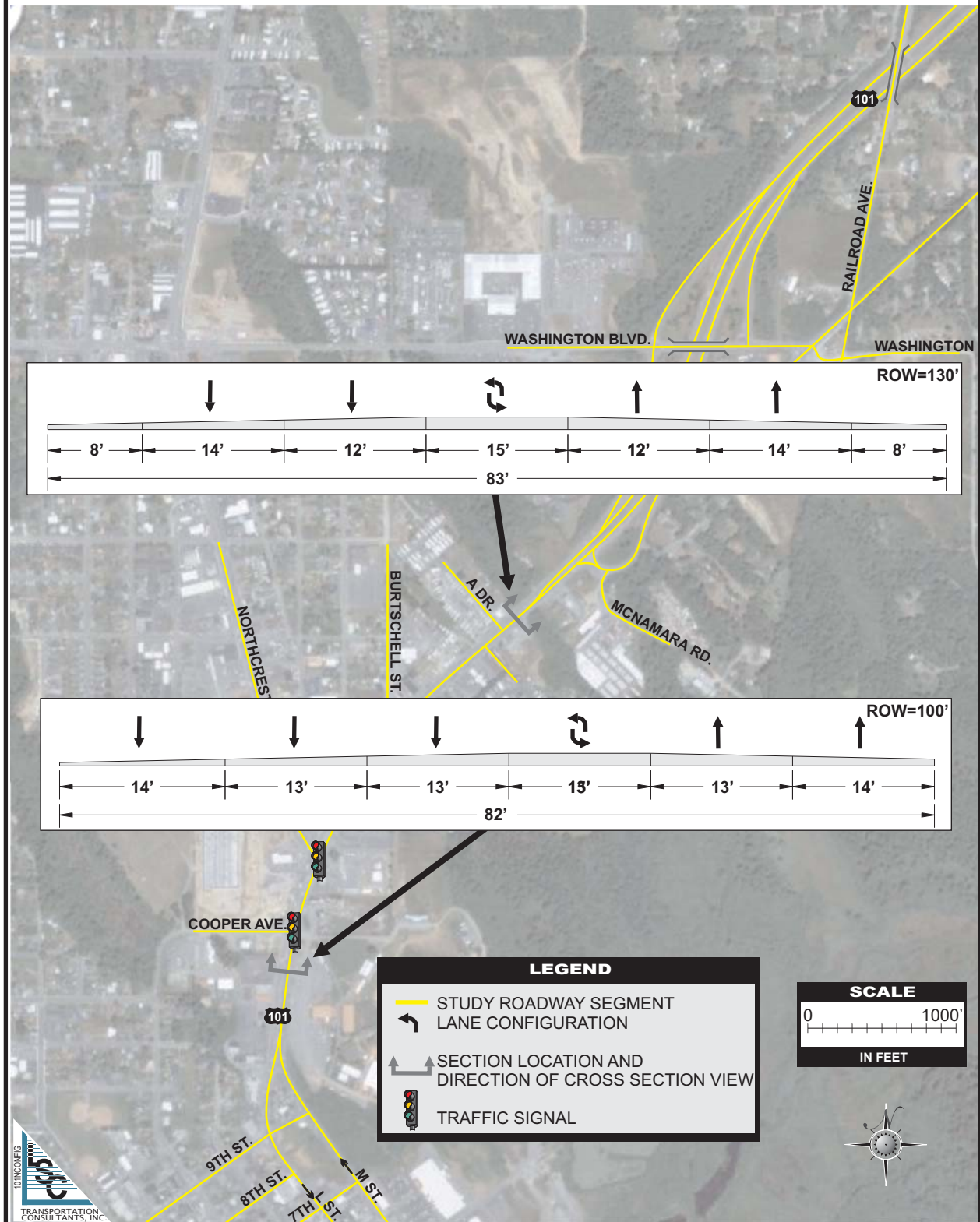


FIGURE 2
Existing Roadway Configuration - North Section



EXISTING TRAFFIC VOLUMES AND TRENDS

Existing and historical traffic volumes were obtained from Caltrans. Data was obtained from the Caltrans website and from staff at the District 1 office.

Annual Traffic Volumes

Average Daily Traffic (ADT) volumes are available annually and for the peak month of the year. As shown in Table 1, data is available for both Average Annual Daily Traffic (AADT) as well as the average daily traffic during the peak month. Figure 3 presents a summary of the most recent (2008) count data across the study area, indicating that both AADT and peak month ADT is greatest around the Cooper Avenue and Northcrest Drive intersections. Figures 4 and 5 also present the locations of peak month ADT and AADT for the south and north study areas in 2008.

TABLE 1: US 101 Traffic Volume Trends in Crescent City Area					
Annual Average Daily Traffic					
Postmile	Description	1993	1998	2003	2008
24.410	South of Sandmine Road	5,300	4,600	4,600	4,600
24.410	North of Sandmine Road	6,300	6,300	6,700	6,500
25.840	South of Elk Valley Road	12,000	10,500	9,200	11,400
25.840	North of Elk Valley Road	16,800	16,000	15,800	16,500
26.183	South of M/L Street Couplet	16,700	16,600	20,000	21,500
26.211	M Street @ Front Street (Northbound)	7,800	8,000	11,000	10,400
26.268	L Street @ Front Street (Southbound)	8,900	8,000	11,000	11,900
26.380	M Street @ 4th Street (Northbound)	7,800	7,000	11,200	9,600
26.437	L Street @ 4th Street (Southbound)	8,000	10,400	11,500	12,600
26.663	M Street @ 9th Street (Northbound)	10,400	12,000	12,000	12,900
26.720	L Street @ 9th Street (Southbound)	10,000	11,300	15,400	13,300
26.813	North of M/L Street Couplet	22,200	26,500	26,000	29,500
27.872	South Washington Boulevard Interchange	10,900	11,000	12,500	15,900
30.810	South of Junction with Route 199 Northeast	9,300	9,600	10,000	10,900
31.810	North of Junction with Route 199 Northeast	6,000	6,400	6,000	6,500
Peak Month Average Daily Traffic					
Postmile	Description	1993	1998	2003	2008
24.410	South of Sandmine Road	7,500	7,700	7,000	7,000
24.410	North of Sandmine Road	8,900	8,900	9,500	9,200
25.840	South of Elk Valley Road	16,300	14,200	11,800	14,600
25.840	North of Elk Valley Road	21,800	20,900	20,200	21,100
26.183	South of M/L Street Couplet	21,600	21,700	25,500	27,500
26.211	M Street @ Front Street (Northbound)	10,100	9,000	14,000	13,200
26.268	L Street @ Front Street (Southbound)	11,500	8,900	14,000	15,100
26.380	M Street @ 4th Street (Northbound)	10,100	9,100	14,500	12,200
26.437	L Street @ 4th Street (Southbound)	10,400	13,500	14,900	16,300
26.663	M Street @ 9th Street (Northbound)	13,500	15,500	15,500	16,700
26.720	L Street @ 9th Street (Southbound)	13,000	14,600	19,900	17,200
26.813	North of M/L Street Couplet	29,500	35,000	34,000	38,500
27.872	South Washington Boulevard Interchange	14,800	15,000	16,300	20,700
30.810	South of Junction with Route 199 Northeast	11,800	10,800	12,800	14,000
31.810	North of Junction with Route 199 Northeast	8,200	8,700	7,700	8,300

Source: Caltrans Crescent City Caltrans Historic Volumes.xls

FIGURE 3: 2008 Daily Traffic along US Highway 101 in Crescent City

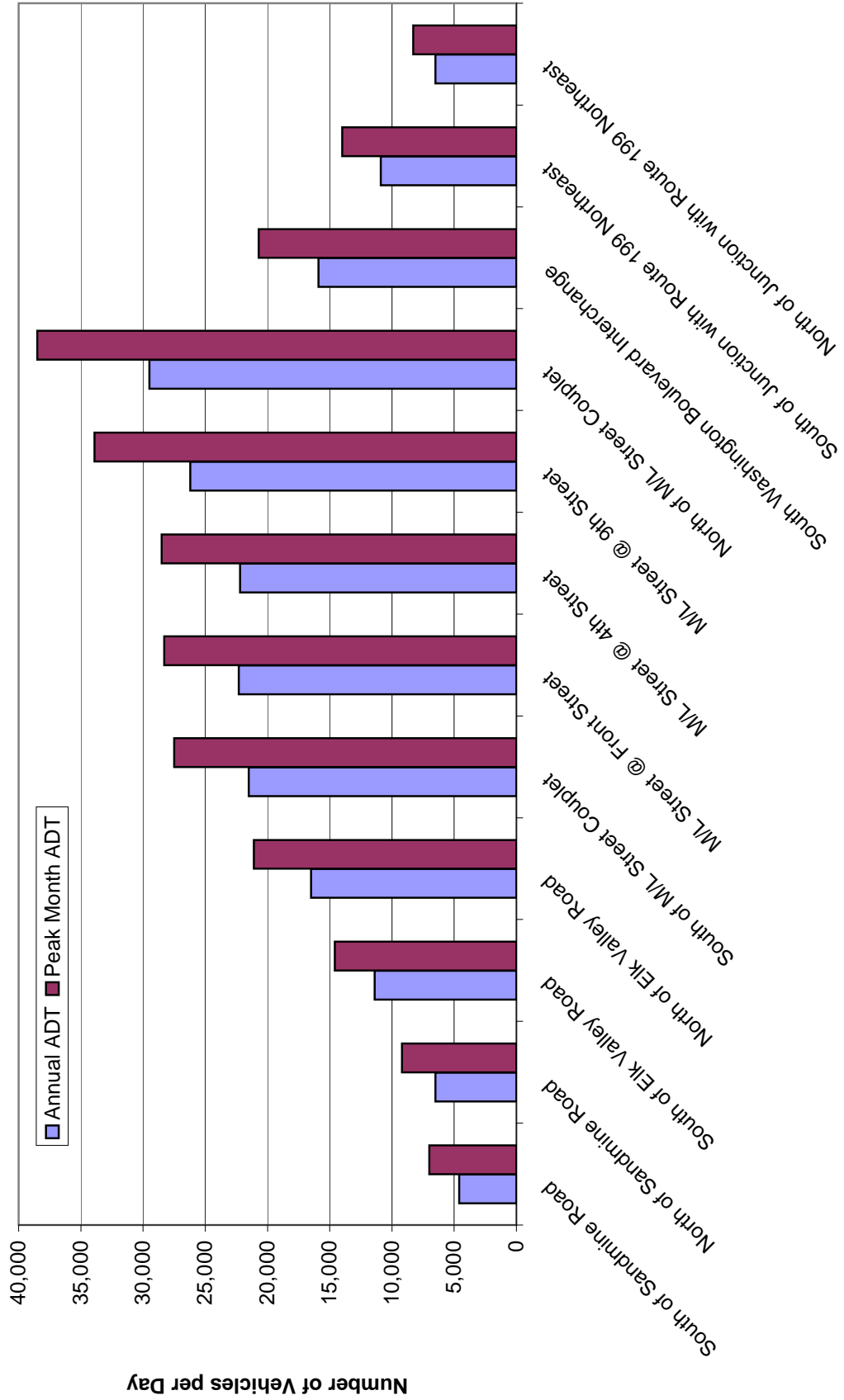


FIGURE 4
2008 Peak Month Average Daily Traffic (ADT)
& Annual Average Daily Traffic (AADT) - South Section

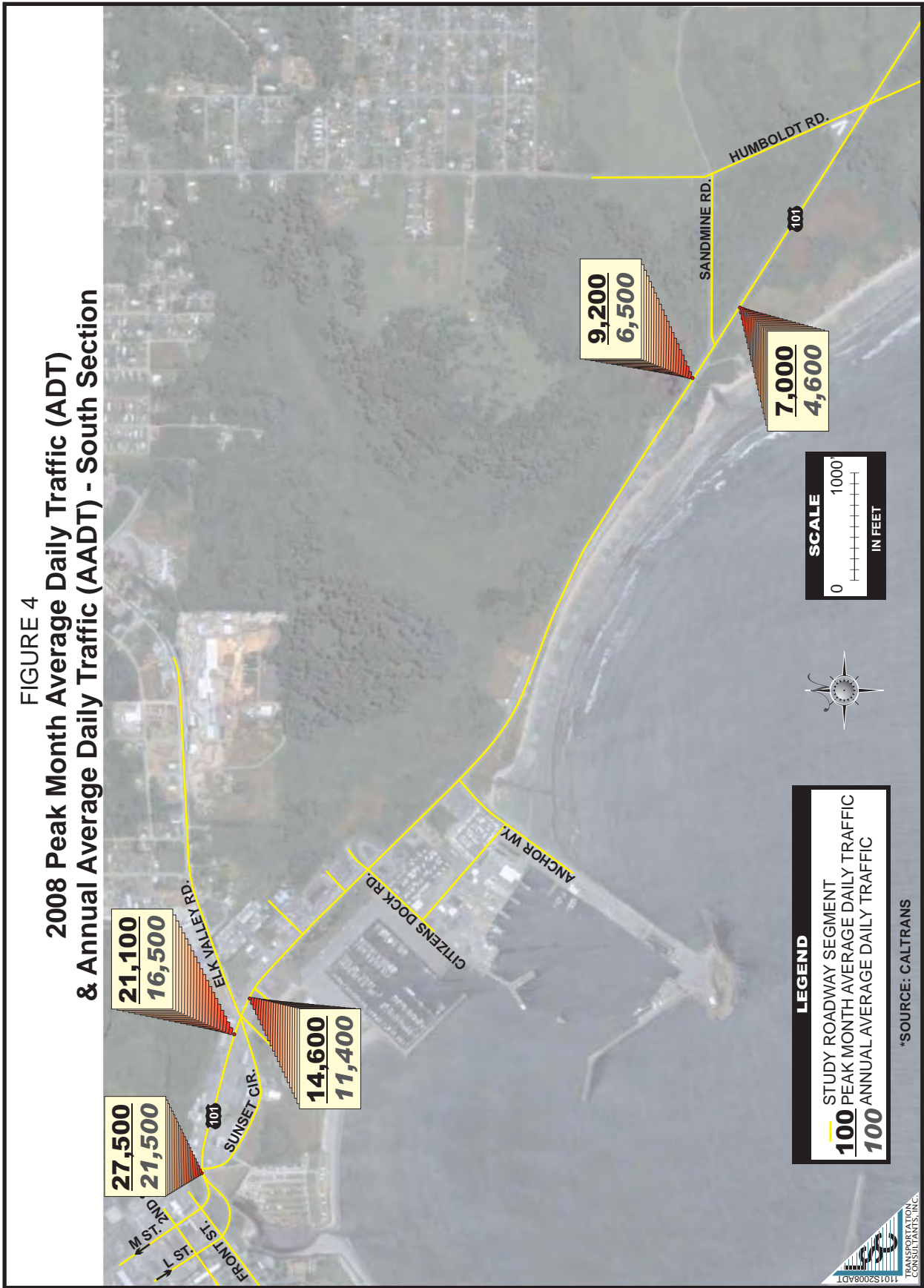


FIGURE 5

2008 Peak Month Average Daily Traffic (ADT) & Annual Average Daily Traffic (AADT) - North Section



The historical data for these two data sets over the past 17 years is shown graphically in Figures 6 and 7. A review of this data indicates the following:

- The highest AADT at a specific location is observed north of the M/L Streets couplet with an AADT in 2008 of 29,500 and a peak month ADT of 38,500. The greatest traffic volumes in Crescent City are in the “grid” section of downtown. Volumes in the grid are approximately 130 percent of those outside of the grid area. The north study area generally has higher traffic volumes than the south study area.
- The highest traffic volumes are in the downtown Crescent City grid area. The ratio of these volumes to those on either side of Crescent City is approximately 5 to 1. The ratio of AADT in the study areas south and north of the downtown grid area to AADT in areas outside of the Crescent City area is approximately 3 to 1. This suggests that the majority of traffic in the developed areas of Crescent City is local traffic and that through traffic on US Highway 101 accounts for approximately 20 to 35 percent of the total traffic in Crescent City.
- Comparing the peak month ADT at the north and south entrances to the urbanized areas, volumes at the north end (20,700 south of Washington Boulevard) are almost three times the volumes at the south end (7,000 south of Sandmine Road).
- Traffic trends along the corridor are mixed. As shown, the change in AADT over the past 10 years (1998-2008) has varied considerably by location. Volumes along US Highway 101 south of Crescent City have been flat, with no overall change over this period. At the other extreme, AADT volumes on US Highway 101 south of the Washington Boulevard interchange grew by a full 44 percent. Traffic volumes in the downtown grid grew by roughly 30 percent.
- Overall, the ratio of peak month ADT to AADT has remained constant at 1.30 over the last ten years. This indicates that volumes in the shoulder seasons have been increasing at the same rate as the peak seasons.

Seasonal Variation in Traffic

The US Highway 101 Corridor provides access to many recreational activities and vacation spots. These two aspects can cause major traffic volume shifts throughout the year. Caltrans maintains a permanent count location on US Highway 101 at Smith River (approximately 12 miles north of Crescent City), which provides a general indication of seasonal variation in traffic volumes. (No closer location to Crescent City is available). In order to assess seasonal variation in traffic to a level adequate for purposes of this study, one year’s worth of data was analyzed from October 1, 2008, through September 30, 2009. Figure 8 provides a graph of the ADT by month during this period. As shown, peak traffic volumes occur on the US Highway 101 Corridor during the summer months, with July having the greatest amount of traffic. Traffic volumes are the lowest in the fall and winter months with little variation between October and February. Traffic volumes gradually increase incrementally during the spring months. Traffic volumes in the peak month of July are approximately 45 percent higher than traffic volumes during the lowest month of November. Throughout the summer, significant peaks in traffic occur around the holidays. The Independence Day holiday period has the greatest traffic volumes of any time during the year. There are lesser, but noticeable peaks in traffic surrounding the Memorial Day and Labor Day holiday periods.

FIGURE 6: Peak Month Average Daily Traffic on Highway 101 in Crescent City

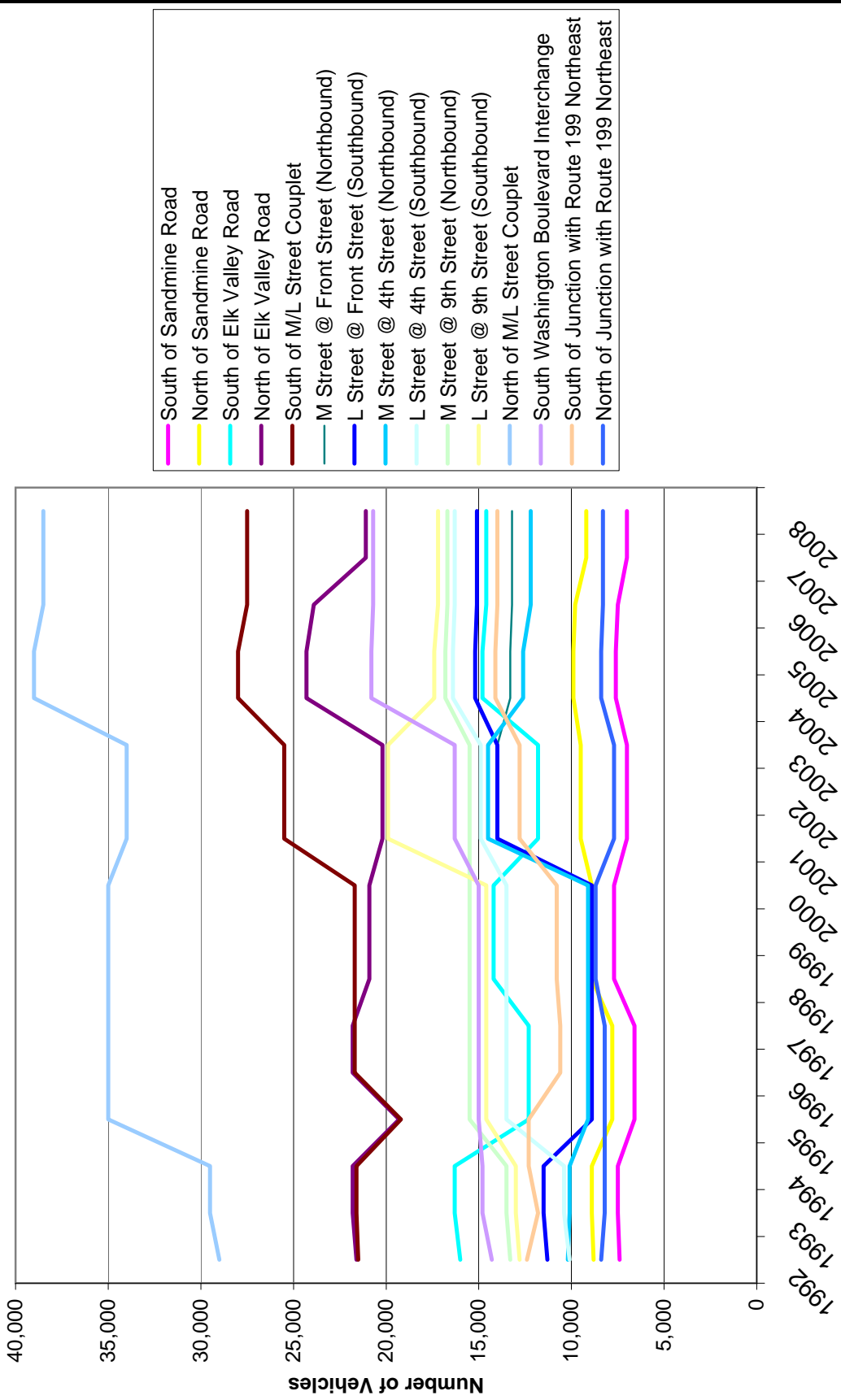


FIGURE 7: Annual Average Daily Traffic on Highway 101 in Crescent City

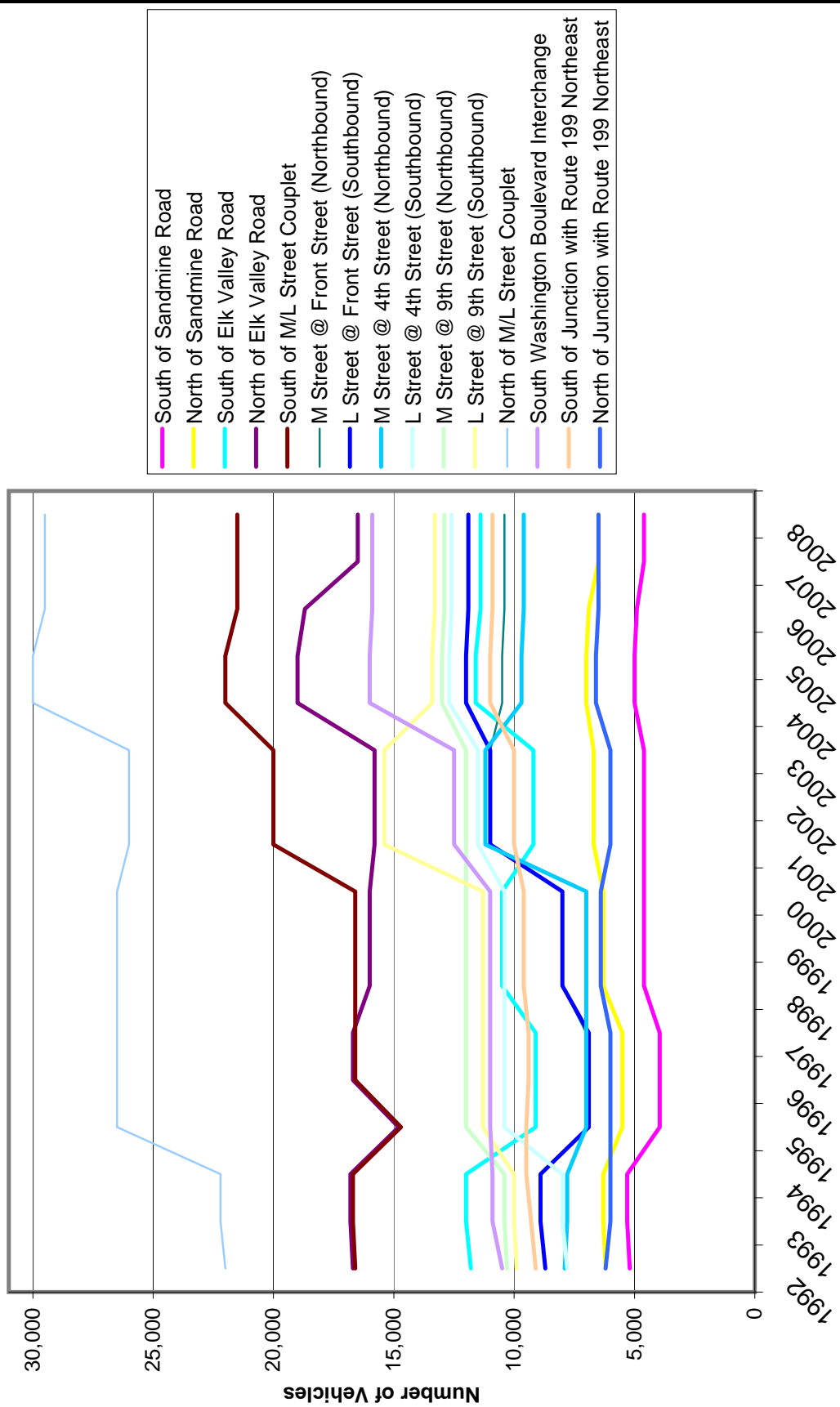
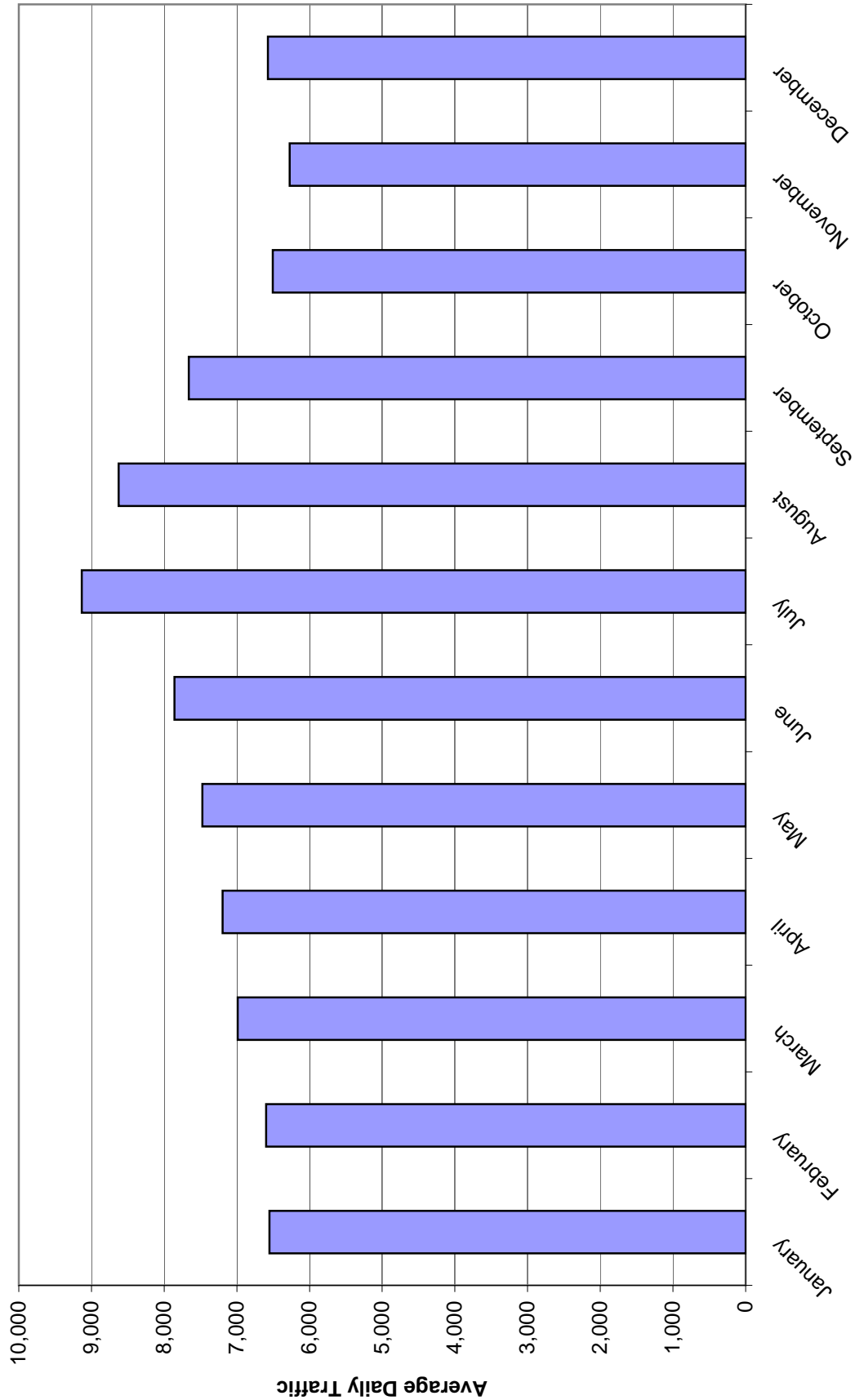


FIGURE 8: Seasonal Variation in Traffic on US 101 at Smith River (North of Crescent City)



Day of Week Variation in Traffic

A review of the count data at the Smith River count station for an average of three busy summer weeks in July is provided in Figure 9. As shown, Friday is the busiest day of the week for traffic activity, with volumes 9 percent higher than the average. Saturday is clearly the second busiest day and the least amount of traffic generally occurs on Sundays. An average of the last three weeks in July (so as not to be skewed by the Independence Day holiday period) indicated that that Fridays have approximately 13 percent greater traffic volumes than Sundays. This weekend spike in traffic volumes is consistent with traffic patterns in other recreational and vacation areas.

TRAFFIC FORECASTS

Caltrans District 1 completed a *Transportation Concept Report* for US Highway 101 in October 2002. This Report provides an estimate for the percentage of traffic growth per year averaged over the next 20 years at many locations along the study corridor. In summary, the annual forecast growth in traffic volumes on US Highway 101 in Crescent City is about 2.7 percent, compared to a 2.6 percent growth rate north of Crescent City and 1.7 percent growth rate south of Crescent City.

EXISTING TRUCK ACTIVITY

Existing Truck Traffic

As trucks have a greater impact on the community, it is worthwhile to review traffic activity for trucks. AADT volumes for trucks were obtained from Caltrans for the most recent year available, 2007, at multiple locations throughout the corridor. Year 2007 truck volumes for the US Highway 101 corridor in Crescent City are provided in Table 2. Trucks represent a higher than average proportion of the total traffic in the study area, accounting for between 5 and 12 percent of total traffic. The proportion of truck traffic is highest in the south study area with 12 percent truck traffic at the Sandmine Road intersection. Averaged over the corridor as a whole, truck traffic accounts for 7 percent of total traffic. The proportion of total truck traffic by number of axles is as follows:

- Two axle trucks – 47 percent
- Three axle trucks – 17 percent
- Four axle trucks – 4 percent
- Five plus axle trucks – 32 percent

Trends in Truck Traffic

Caltrans AADT truck volume data were also obtained for the years 2002, 1997, and 1992 in order to evaluate trends in truck traffic. A summary of historical truck volumes is provided in Table 3. A review of this data indicates the following:

- Over the longer term (the last 15 years), truck traffic grew 34 to 50 percent in the central portion of Crescent City (around Northcrest Drive) but dropped by 13 - 16 percent at the south entrance area and 23 - 34 percent at the north entrance area.

FIGURE 9: Weekly Variation in Traffic Volumes at Smith River (North of Crescent City)

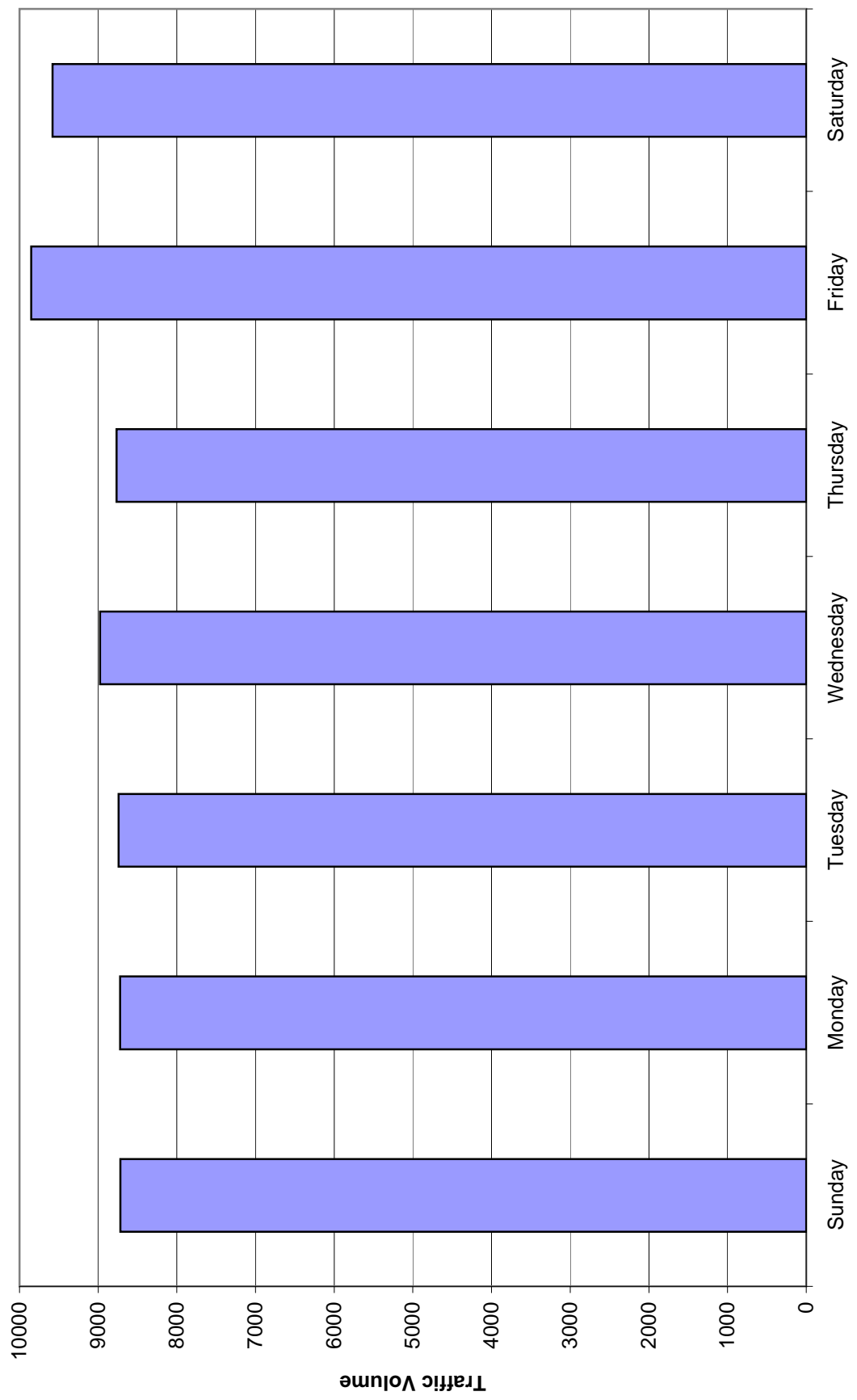


TABLE 2: US 101 Corridor 2007 Daily Truck Traffic in Crescent City Area

Cross Street	Location	Post Mile	Total AADT	2007 Average Annual Daily Truck Traffic					% Trucks in Total Traffic	% Trucks 5+ Axle
				Total	2 Axle	3 Axle	4 Axle	5+ Axle		
SANDMINE ROAD	South of	24.41	4,600	570	230	92	18	230	12%	40%
SANDMINE ROAD	North of	24.41	6,500	576	232	93	19	232	9%	40%
CRESCENT CITY, NORTHCREST DRIVE	South of	27.01	29,500	1,475	779	232	15	450	5%	31%
CRESCENT CITY, NORTHCREST DRIVE	North of	27.01	15,900	1,526	835	253	15	423	10%	28%
JCT. RTE. 199 NORTHEAST	South of	30.81	10,900	739	275	141	77	246	7%	33%
JCT. RTE. 199 NORTHEAST	North of	30.81	6,500	397	142	95	49	111	6%	28%

Source: Caltrans online data.

US 101 truck vols.xls

TABLE 3: Trends in US 101 Corridor Daily Truck Traffic in Crescent City Area

Cross Street	Location	Average Annual Daily Truck Traffic		Percent Change			
		1992	2002	1992 - 2007	2002 - 2007		
		1997	2007	1997 - 2007	2007		
Total Trucks							
SANDMINE ROAD	South of	655	588	570	-13%	28%	-3%
SANDMINE ROAD	North of	688	537	576	-16%	14%	7%
CRESCENT CITY, NORTHCREST DRIVE	South of	1,100	1,300	1,475	34%	11%	13%
CRESCENT CITY, NORTHCREST DRIVE	North of	1,018	1,200	1,526	50%	45%	27%
JCT. RTE. 199 NORTHEAST	South of	964	678	739	-23%	-26%	9%
JCT. RTE. 199 NORTHEAST	North of	601	367	397	-34%	-32%	8%
<i>Corridor as a Whole</i>		5,026	4,670	5,283	5%	8%	13%
5+ Axle Trucks							
SANDMINE ROAD	South of	249	227	230	-8%	45%	1%
SANDMINE ROAD	North of	240	213	232	-3%	40%	9%
CRESCENT CITY, NORTHCREST DRIVE	South of	341	397	450	32%	11%	13%
CRESCENT CITY, NORTHCREST DRIVE	North of	290	332	423	46%	44%	27%
JCT. RTE. 199 NORTHEAST	South of	251	226	246	-2%	-5%	9%
JCT. RTE. 199 NORTHEAST	North of	127	102	111	-13%	-10%	9%
<i>Corridor as a Whole</i>		1,498	1,497	1,692	13%	21%	13%
<i>Source: Caltrans online data.</i>							
<i>US 101 truck vols.xls</i>							

- Over the most recent five years, however, truck traffic has grown in all portions of the corridor, except for south of Sandmine Road. The greatest growth has been just north of Northcrest Drive, with a 27 percent growth over only five years.
- The percentage of total trucks that have 5 or more axels has remained fairly consistent throughout the 16-year period, varying slightly between 29 and 32 percent.

EXISTING TRAFFIC SPEEDS

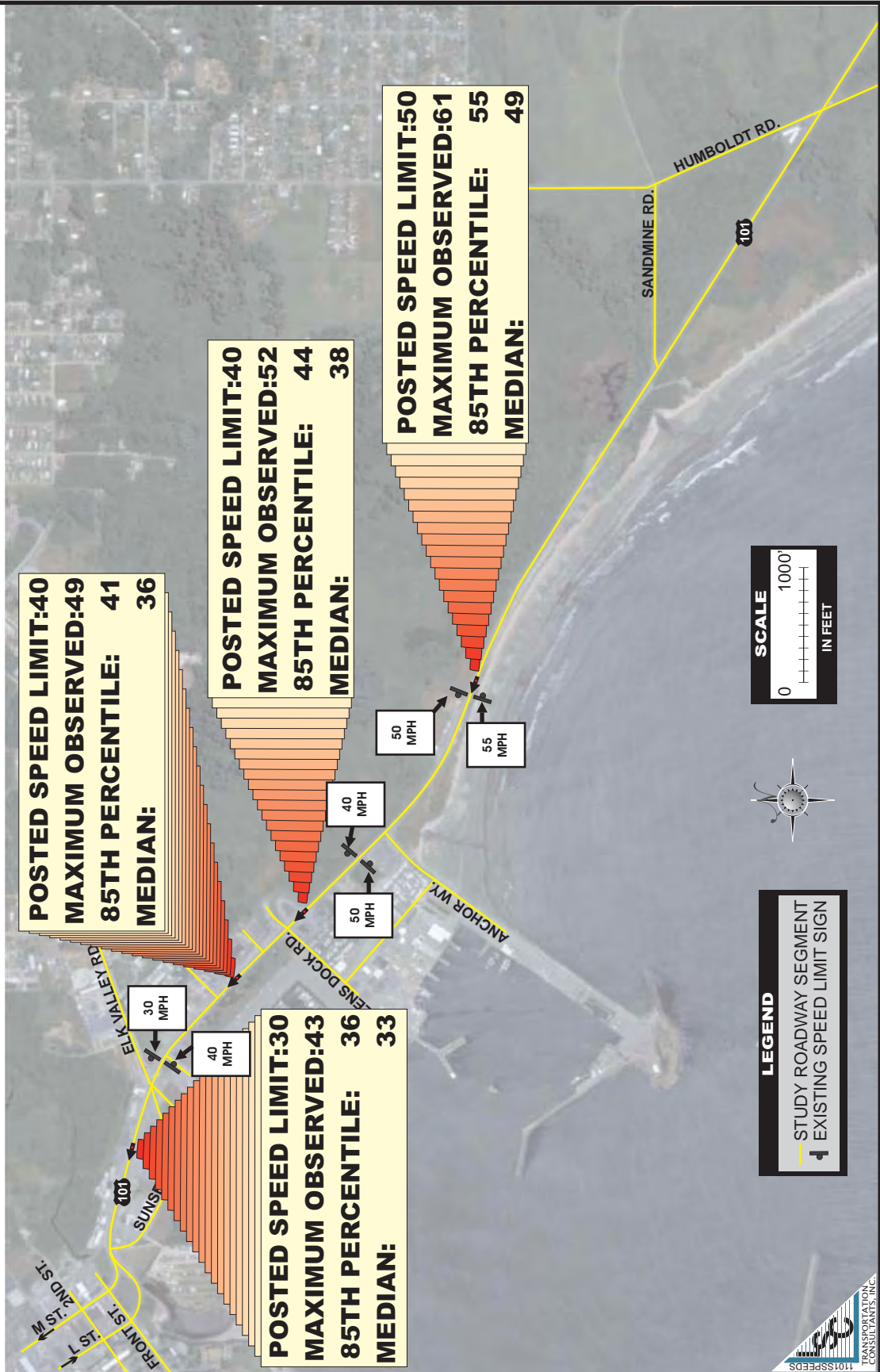
Speed surveys were conducted at seven locations along US Highway 101. Three locations were surveyed in the inbound direction for both the south and north study areas on Monday, October 12, 2009. The weather this day was cloudy with no rain and dry road conditions. The locations of the surveys and a summary of the data collected at each location are displayed on in Figures 10 and 11 for the south and north study areas, respectively. Three locations in each study segment were chosen to observe differing traffic speeds as vehicles enter and progress through the developed areas of Crescent City from both the north and the south. The first location in each study area was selected to observe traffic speeds as vehicles encounter the first speed reduction and development along the highway. The second location in each study area was selected to observe traffic speeds as vehicles have now had time to adjust their speeds to those appropriate for urban areas. The third location in each study section was selected to observe traffic speeds as vehicles approach the downtown area of Crescent City. A limited fourth survey location was observed in the south study area only on Tuesday, October 13, 2009. The weather conditions on this day was cloudy with intermittent heavy rain and wind with wet pavement. This survey was conducted at a location just south of Anchor Way (and the start of the developed area) and immediately downstream of a reduction in the posted speed limit from 55 mph to 50 mph for northbound traffic on US Highway 101. While the time frame available for this study did not allow speed surveys to be completed in the peak summer travel period, the survey data is valid for typical conditions.

The speed surveys were conducted using a radar gun and conform to the procedures specified in the Caltrans *Traffic Manual*. The *Traffic Manual* specifies that “it is desirable to have a minimum sample of 100 vehicles in each survey. [And,] In no case should the sample for any survey contain less than 50 vehicles.” Over one hundred observations were recorded at all of the survey locations with the exception of the additional fourth speed survey location in the south study area, where 67 vehicle speeds were recorded due to low traffic volumes. The speed survey data is provided in Appendix A.

In reviewing speed data, traffic engineers typically focus on the 85th percentile speed – that speed at which 85 percent of all drivers travel at or below. This generally represents the speed at which the majority of reasonable drivers choose to drive.

As indicated in Figure 10 for the south study area, the 85th percentile northbound speed was found to be 5 mph over the 50 mph posted speed limit between Sandmine Road and Anchor Way, and the maximum speed was observed to be 11 miles over the limit. The 85th percentile speed remains above the posted speed limit as traffic approaches Citizens Dock Road (44 mph 85th percentile versus a 40 mph speed limit), with a maximum observed speed 12 mph over the limit. However, for the locations north of Citizens Dock Road and north of Elk Valley Road, 85th percentile speed is within 1 mph of the posted speed limits, reflecting driver’s adjustment to the more urban conditions in these segments. In general, this speed survey for the southern study segment does not indicate a particularly severe speeding problem, but does indicate a need to

FIGURE 10
Existing Vehicle Speeds - South Section



slow inbound traffic speeds at a location further south than is currently occurring. The observed difference between the posted and 85th percentile speed also indicates that simply posting a lower speed limit would have little or no affect.

The results of the speed surveys for southbound traffic approaching Crescent City from the north are provided in Figure 11. At the northernmost location just south of Parkway Drive, the 85th percentile speed was equal to the posted 45 mph speed limit, with a maximum speed of 54 mph. This suggests that signage and the transitioning of the highway from a four-lane freeway segment to a five-lane roadway with urban characteristics effectively slows traffic as it enters into the developed area of Crescent City.

Traffic continues to slow as it progresses southward, however the 85th percentile speed exceeds the speed limit by 6 mph at the second speed survey location (85th percentile speed of 41 mph and posted speed limit of 35 mph). By the time traffic has reached the speed survey location near the overhead warning flasher for the traffic signal at the Northcrest Drive intersection, the 85th percentile speed is equal to the posted speed limit of 35 mph. Overall, this speed survey for the north segment indicates that additional traffic calming measures are needed to slow traffic south of Parkway Drive to achieve an 85th percentile speed closer to the posted 35 mph speed limit.

EXISTING TRAFFIC SAFETY

Information on traffic collisions is kept by the California Highway Patrol in the Statewide Integrated Traffic Records System (SWITRS). This is the same dataset used in Caltrans' Traffic Accident Surveillance and Analysis System. Data on all traffic collisions for the most recent ten years (1999-2008) was collected for the study corridor. Information on all collisions is presented in Appendix B.

SWITRS categorizes the severity of collisions into three categories: property damage only, injury, and fatal. Table 4 presents a summary of collisions in the corridor by severity, involvement with pedestrians and bicycles, and other factors (speed related, dry vs. wet pavement, etc.). As shown in the table, there were a total of 100 collisions in the south study area and a total of 96 collisions in the north study area during the ten-year period:

- On the south segment, there were a total of 100 reported collisions over the ten-year period. These collisions resulted in a total of three fatalities and 78 persons injured. Of the total, 20 percent involved vehicles traveling northbound on US Highway 101, 36 percent involved southbound vehicles, and the remaining 44 percent either involved vehicles in both directions or vehicles moving in the east-west directions.
- Two collisions on the south segment involved pedestrians and another two involved bicyclists. These resulted in a total of two injured bicyclists and one injured pedestrian, but no fatalities.
- On the north segment, there were a total of 96 reported collisions over the ten-year period, which resulted in a total of one fatality and 47 persons injured. Of the total, 40 percent involved vehicles traveling northbound on US Highway 101, 26 percent involved southbound vehicles, and the remaining 34 percent either involved vehicles in both directions or vehicles moving in the east-west directions.

FIGURE 11
Existing Vehicle Speeds - North Section

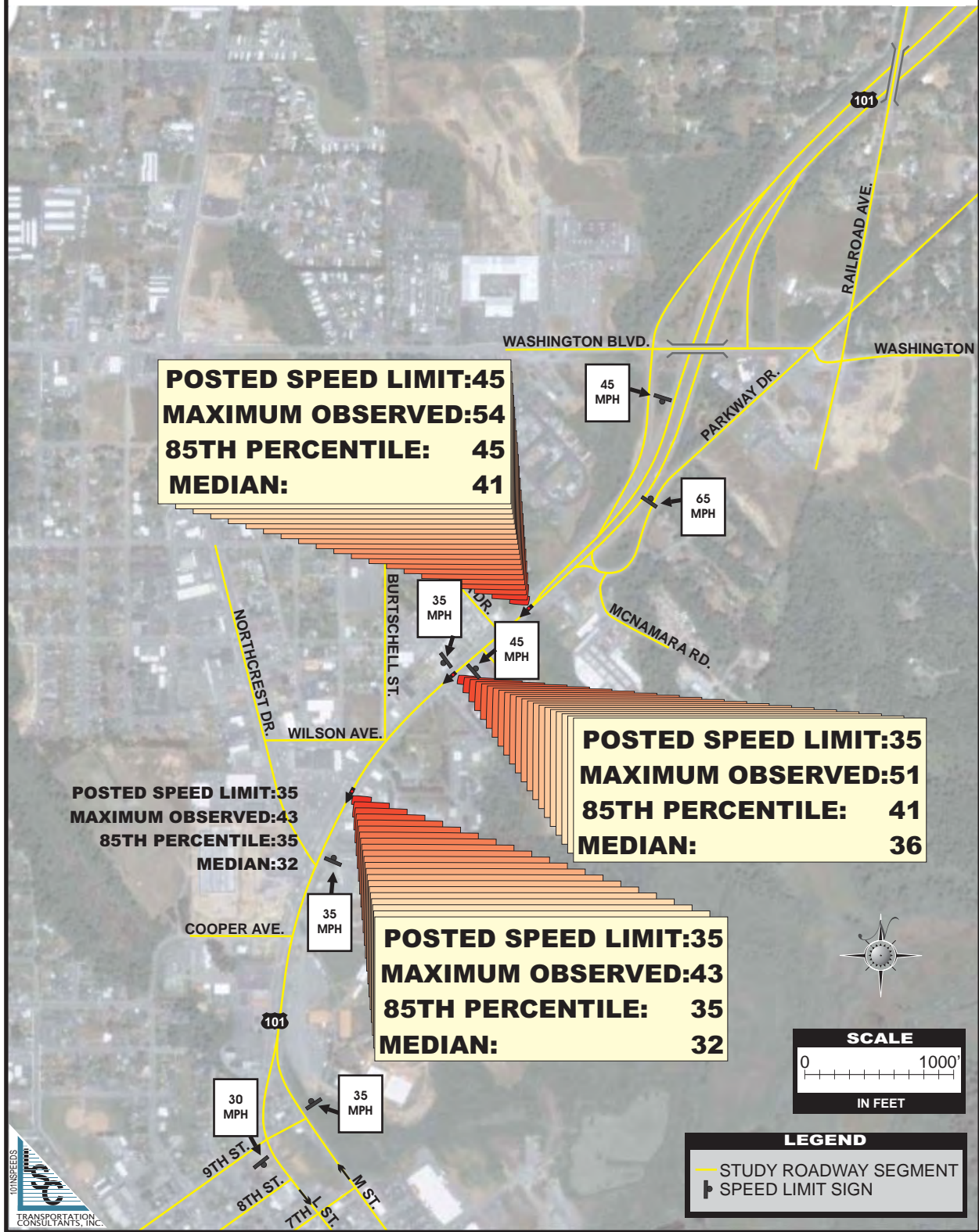


TABLE 4: US 101 Collision Summary by Segment 1999-2008

Segment	Total Collisions	# of Fatal Collisions	# of Injury Collisions	# Killed	# Injured	# Speed Related	# Pedestrian Crashes	# Bicycle Crashes	Darkness	Wet Pavement
At Sandmine Rd	5	0	4	0	12	1	0	1	3	1
- between	21	3	7	6	26	8	0	0	2	4
At Anchor Way	4	0	3	0	4	0	0	0	0	2
- between	2	0	1	0	1	1	0	0	0	0
At Citizens Dock Rd	6	0	1	0	1	1	0	0	1	3
- between	6	0	2	0	5	2	0	0	4	2
At Elk Valley Rd	21	0	9	0	14	4	2	0	4	6
- between	7	0	3	0	3	1	0	1	3	2
At Front St (M St)	9	0	4	0	4	2	0	0	0	2
At Front St (L St)	19	0	5	0	8	3	0	0	6	4
Total South Study Area	100	3	39	6	78	23	2	2	23	26
At Cooper Ave	28	0	11	0	13	7	0	2	4	9
At Northcrest Dr	25	0	10	0	12	7	1	2	5	5
- between	27	1	10	1	13	3	1	3	4	4
At Parkway Dr	12	0	5	0	7	0	0	0	3	1
At Washington Blvd	4	0	2	0	2	2	0	0	1	0
Total North Study Area	96	1	38	1	47	19	2	7	17	19
TOTAL	196	4	77	7	125	42	4	9	40	45

Note: Collisions within 200 feet of an intersection are included in the total for the intersection.

Source: California Highway Patrol - Statewide Integrated Traffic Records System (SWITRS)

US 101 Accident Data.xls

- Two collisions on the north segment involved pedestrians and another seven involved bicyclists. One pedestrian was killed, one pedestrian was injured, and seven bicyclists were injured.

Overall, 59 percent of reported collisions resulted in property damage only, 39 percent resulted in injuries, and 2 percent resulted in fatalities.

Table 5 provides collision rates by roadway segment and intersection and compares the collision rates with those for the applicable statewide average. The first group of columns represents the observed collision rate for each segment for the three rates tracked by the state. Next the applicable statewide average was determined based on roadway or intersection type (2 lanes vs. 4 lanes, divided vs. undivided, 4 legged vs. T-intersection, etc.). Finally, the observed rate and the statewide rate are compared, as shown in the last group of columns. Any value in these columns over 100 percent, and therefore highlighted, means the observed rate is greater than the statewide average for the specific facility type. The number of collisions by location is also displayed geographically on the maps provided in Figure 12 for the south study area and Figure 13 for the north study area. This analysis indicates the following:

- Locations with collision rates exceeding the statewide average are concentrated in the south study area and specifically near the US Highway 101/Sandmine Road intersection and the roadway segment to the north. As shown, the collision rates at these locations are slightly greater than the statewide average. However the rate of serious collisions (those resulting in fatalities or injuries) at the Sandmine Road intersection is nearly double the statewide average. Further analysis indicates no clear pattern of collisions that would indicate the geometry of the intersection (such as the skewed approach of Sandmine Road to US Highway 101) is a significant contributing factor to the collision history. In addition, 4 out of the 5 collisions at this intersection were alcohol related. This location could benefit from concentrated DUI enforcement, particularly between 6:00 PM and 1:00 AM when all of the DUI collisions occurred.
- The injury collision rate at the Anchor Way intersection is 113 percent of the statewide average. However, there were only 4 collisions at this location during the ten-year period and the total collision rate is 68 percent of the statewide average.
- The fatal collision rate on the highway segment between Sandmine Road and Anchor Way is 414 percent of the statewide average for comparable highway segments. This is a high speed, two-lane section of highway adjacent to beach access. Although only 1 of the 3 fatal crashes on this highway segment was caused by unsafe speed, the severity of the other fatal crashes could have been reduced if vehicle speeds were reduced.
- The fatality collision rate on the highway segment Northcrest Drive and Parkway Drive was 112 percent of the statewide average for this highway type. However, there was only a single fatal collision in the ten-year analysis period and the total collision rate is only 28 percent of the statewide average. Therefore this highway segment does not have any notable safety deficiencies.

TABLE 5: Analysis of Collision Rate by Highway Segment

Highway Segment	MVM ¹	Observed Accident Rates			Applicable Statewide Average			Percent of Statewide Average		
		Total Collisions per MVM	Injury + Fatal Collisions per MVM	Fatal Collisions per MVM	Total Collisions per MVM	Injury + Fatal Collisions per MVM	Fatal Collisions per MVM	Total Collisions per MVM	Injury + Fatal Collisions per MVM	Fatal Collisions per MVM
<i>South Study Area</i>										
Sandmine Rd	21	0.23	0.19	0.00	0.22	0.10	0.004	105%	195%	0%
- between	20	1.03	0.49	0.15	0.95	0.46	0.036	108%	106%	414%
Anchor Way	27	0.15	0.11	0.00	0.22	0.10	0.004	68%	113%	0%
- between	4	0.45	0.23	0.00	1.00	0.48	0.031	45%	48%	0%
Citizens Dock Rd	39	0.15	0.03	0.00	0.22	0.10	0.004	68%	31%	0%
- between	10	0.60	0.2	0.00	1.00	0.48	0.031	60%	42%	0%
Elk Valley Rd	65	0.33	0.14	0.00	0.43	0.19	0.002	77%	73%	0%
- between	20	0.35	0.15	0.00	4.45	1.21	0.045	8%	12%	0%
Front St (Northbound M Street intersection)	44	0.21	0.09	0.00	0.22	0.09	0.002	95%	95%	0%
Front St (Southbound L Street intersection)	46	0.41	0.11	0.00	0.43	0.19	0.002	95%	58%	0%
<i>North Study Area</i>										
Cooper Ave	127	0.22	0.09	0.00	0.28	0.12	0.001	79%	74%	0%
Northcrest Dr	106	0.24	0.09	0.00	0.28	0.12	0.001	86%	74%	0%
- between	22	1.23	0.5	0.05	4.45	1.21	0.045	28%	41%	112%
Parkway Dr	59	0.20	0.08	0.00	0.22	0.10	0.004	91%	82%	0%
Washington Blvd	27	0.15	0.07	0.00	0.45	0.20	0.014	33%	36%	0%

Note: Highlighted text means the observed collision rate is greater than the applicable statewide average collision rate.

NOTE 1: MVM = Million Vehicle Movements for intersections, and Million Vehicle-Miles for roadway segments.

US 101 Accident Data.xls

FIGURE 12
Collisions - South Section

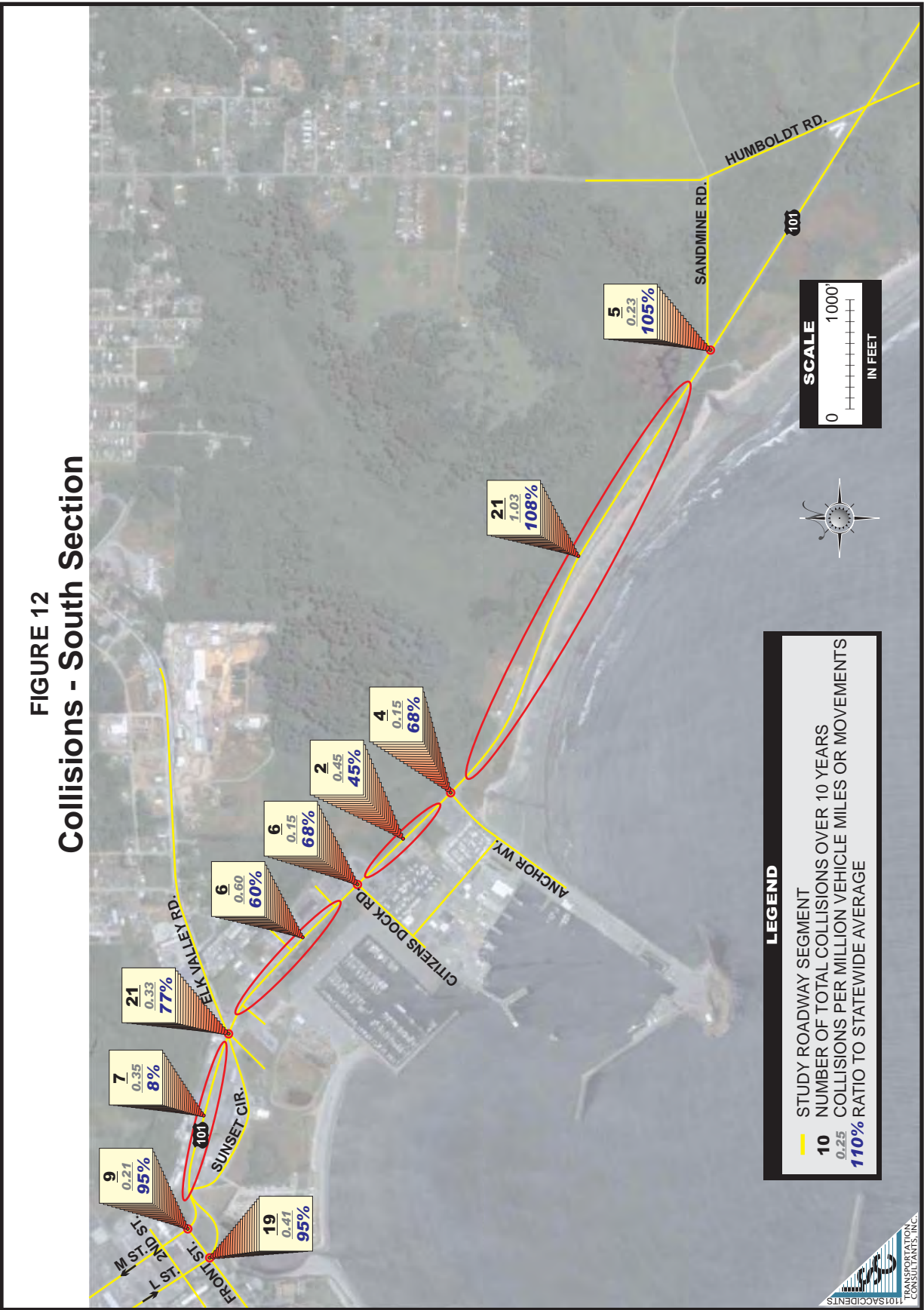
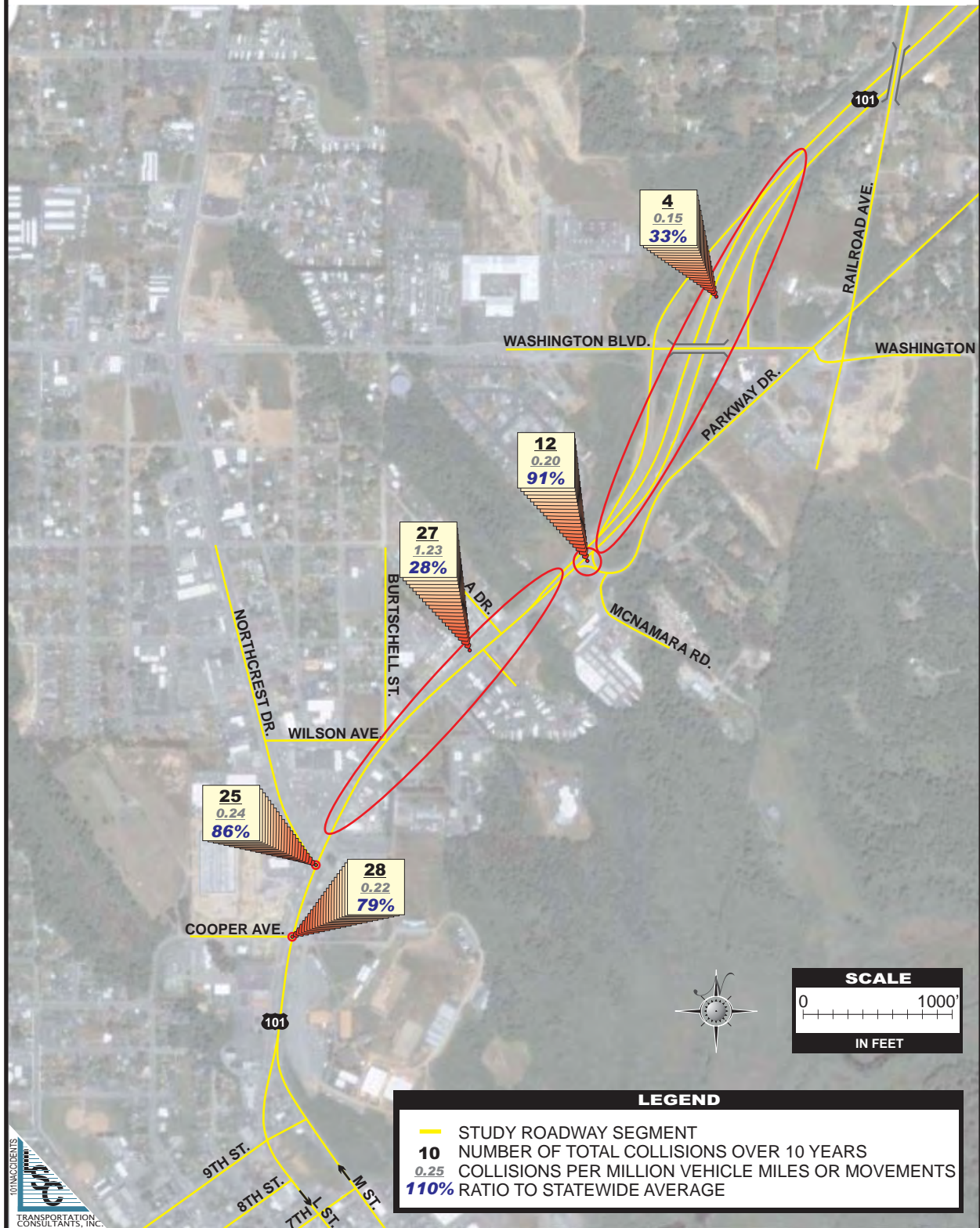


FIGURE 13
Collisions - North Section



EXISTING TRANSIT SERVICES AND ACTIVITY

Bus service along both corridors is provided by the Redwood Coast Transit system. Local route service consists of four routes operated hourly, between 6:30 AM and 7:30 PM. Along the northern study segment, northbound service is provided by Route 1, which serves a stop along US Highway 101 just south of Williams Drive and a stop on northbound Parkway Drive just off of US Highway 101, while southbound service is provided by Route 1 serving stops just north of Burtshell Street and just north of Northcrest Drive. The south study segment is served by Route 4, which forms a large counterclockwise loop, heading south along US Highway 101 and serving stops just north of Walton Street, just north of Anchor Way, and along South Beach approximately half way between Anchor Way and Sandmine Road. No stops are served along the corridor in the northbound direction.

In addition, Redwood Coast Transit's Routes 10 and 20 provide service four times a day in each direction along the south study corridor (as part of trips to Klamath and Arcata), while Route 20 provides five roundtrips per day along the north corridor (as part of trips to Smith River) and Route 199 provides three roundtrips on Tuesdays and Fridays (as part of trips to Gasquet).

Of these, three local routes (Routes 1, 2, and 4) include stops within the study corridor segments. The activity for these stops is shown in Table 6, based on data was collected in 2008 as part of the *Del Norte County Transit Development Plan Update* (LSC Transportation Consultants, Inc. 2009). As shown, the stop at US Highway 101 and Williams Drive had the greatest daily passenger activity, with 4 boardings and 1 alighting. Lastly, the stop located at US Highway 101 and Anchor Way generated 2 boarding and 2 alightings. As shown in the table, there were many stops with little to no activity within the study area. When looking at the stops cumulatively, the data reveals that the majority of the transit stop activity occurs in the region of the study area to the north of the downtown grid.

TABLE 6: Average Daily Transit Activity by Stop			
	Boardings	Alightings	Served by Routes:
US 101 and Williams	4	1	Rt 1
Parkway and McNamara	0	2	Rt 1
US 101 and Burtshell	0	2	Rt 2
US 101 and Wilson	0	3	Rt 2
Elk Valley Road and US 101	0	0	Rt 4
US 101 and Anchor Way	2	2	Rt 4
US 101 @ Crescent Beach Motel	0	1	Rt 4

Source: LSC Transportation Consultants, Inc., Del Norte County Transit Development Plan Update, 2009

EXISTING BICYCLIST AND PEDESTRIAN CONDITIONS

Sidewalks are available along the highway through most of Crescent City, although sidewalk presence is sporadic in some locations. In the south study area, a paved sidewalk is provided along the east side of US Highway 101 only from north of Citizens Dock Road to Elk Valley Road. A paved sidewalk is provided along the west side of US Highway 101 north of Walton Street. Paved sidewalks are provided along both sides of the highway between Elk Valley Road and just south of the M/L Streets couplet. In the north study area, paved sidewalks are provided on both sides of the highway from the north end of the M/L Streets couplet to just south of Williams Drive on the east side of the highway and just south of Wilson Avenue on the west side of the highway. North of the Wilson Avenue/Burtschell Street intersection, paved sidewalks are provided intermittently on both sides through the northern boundary of the developed area. Where paved sidewalks are not provided, there are unpaved areas adjacent to and off of the roadway, which may be generally suitable for pedestrian movement for users without mobility limitations.

There are significant levels of bicycle activity in the corridor. Pedestrian and bicycle counts were performed in the north study area on Monday, October 12, 2009, and in the south study area on Tuesday, October 13, 2009. Counts were conducted both days from 7:00 AM until 9:00 AM and from 3:30 PM until 5:30 PM. Pedestrians and bicycles crossing at intersections, between intersections, and along both sides of the highway were recorded in fifteen-minute intervals. Daily pedestrian and bicycle volumes were estimated by multiplying the sum of the AM and PM peak hour counts at each location by a factor of five.

Figures 14 and 15 present existing bicycle and pedestrian activity levels along the southern and northern study segments, respectively. Pedestrians and bicycles crossing the highway were counted at several locations. As expected, crossing volumes are highest at the signalized intersections. However, there is significant midblock crossing activity in both the south and north study areas.

As shown in Figure 14, the busiest midblock crossing location in the south study area is south of Elk Valley Road near King Street. There are approximately 45 daily pedestrian crossings at this location. There are an additional 20 daily pedestrian crossings on the block between Anchor Way and Citizens Dock Road. There are only an estimated 10 pedestrian crossings between Elk Valley Road and the south end of the M/L Streets couplet. This low number of crossings may not represent actual crossing demand, as this is a busy five-lane section of roadway that may be intimidating for pedestrians to cross. In addition, there are no marked crosswalks for over a quarter-mile between Elk Valley Road and Front Street. There is also significant pedestrian activity along the roadway with an estimated 60 pedestrians per day along the west side of US Highway 101 south of Elk Valley Road.

There is also significant bicycle activity in the south study area, as shown in Figure 15. The busiest area for bicycles is between Elk Valley Road and Front Street with approximately 30 daily bicyclists riding along the roadway. There are not a significant number of bicycles crossing US Highway 101. Most crossing locations have less than 5 daily crossings.

There is also significant pedestrian and bicycle activity on the north study section. The busiest location for pedestrians along the US Highway 101 is in front of the Shangri La Trailer Court where there are 170 daily pedestrians walking along the west side and 50 daily pedestrians waling along the east side. There are also approximately 75 daily pedestrian crossings of US

FIGURE 14
Daily Pedestrian and Bicycle Activity - South Section

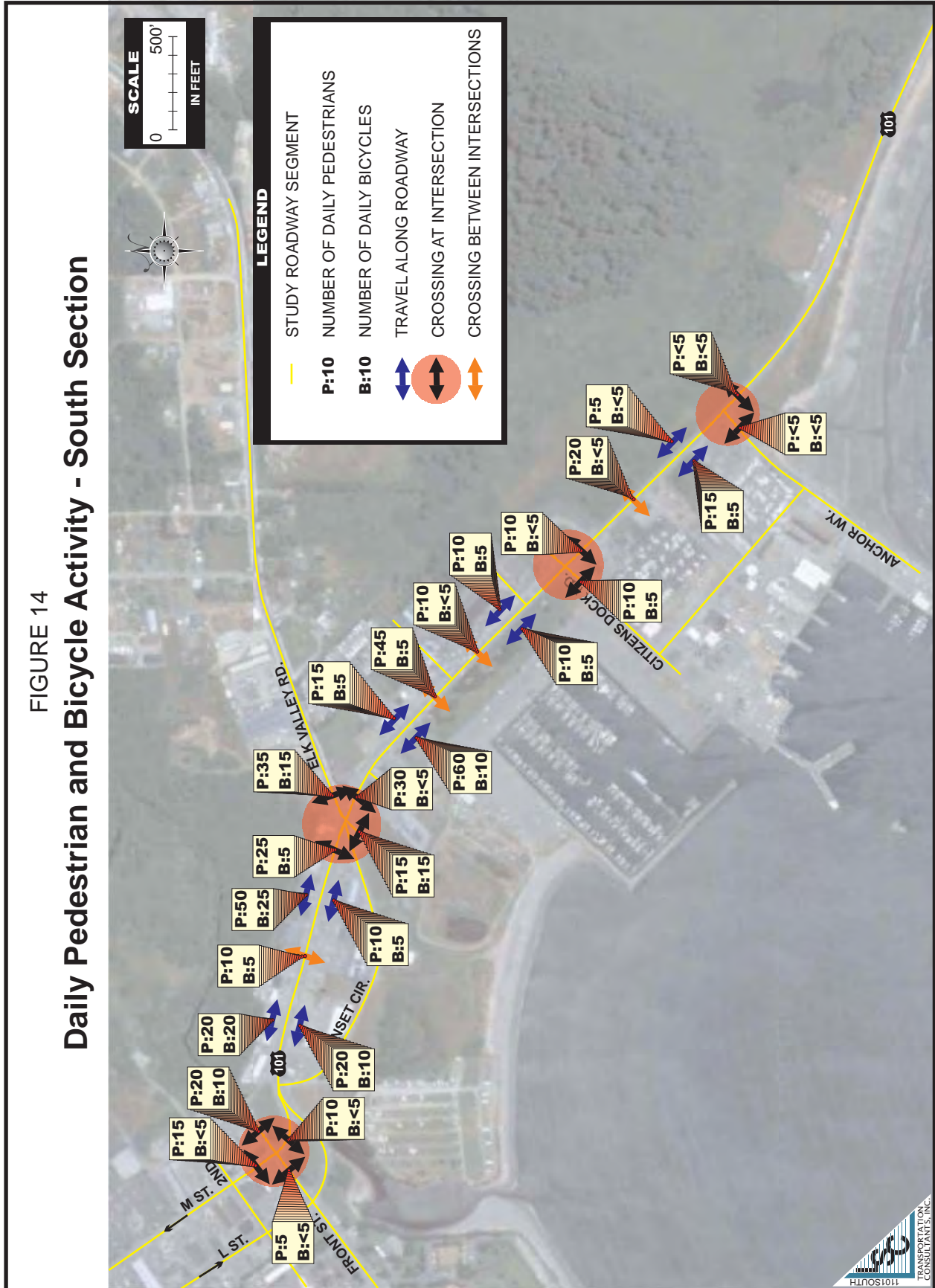
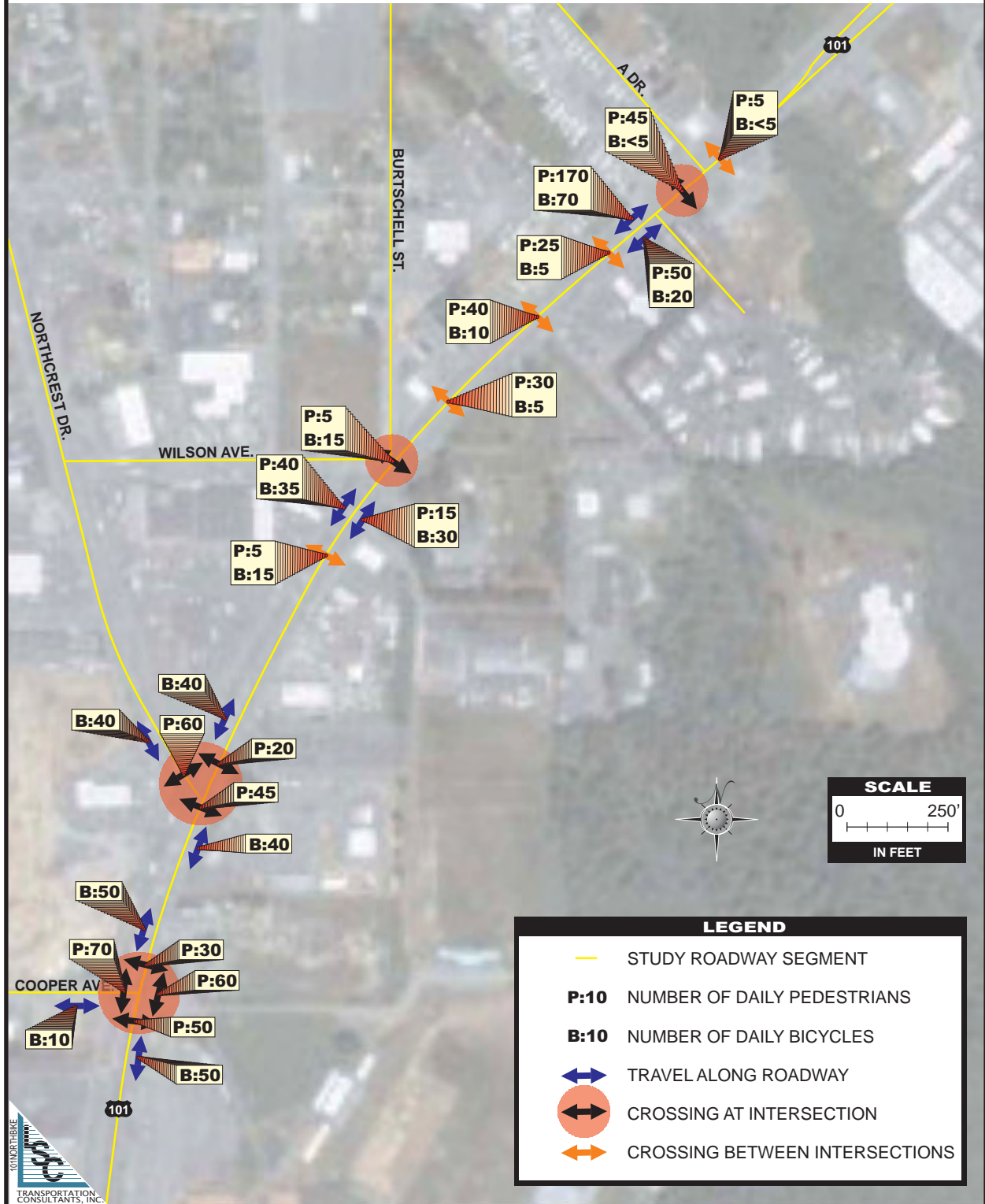


FIGURE 15
Daily Pedestrian and Bicycle Activity - North Section



Highway 101 at or near this location. There are an additional 70 daily pedestrian crossings north of the Burtschell Street intersection and south of the trailer court. Further south, there is less pedestrian activity with approximately 65 daily pedestrians on both sides of the roadway and 10 daily crossings at or near the Wilson Avenue/Burtschell Street intersection with US Highway 101. Both signalized intersections (at Cooper Avenue and at Northcrest Drive) have significant daily crossing activity. There are very few midblock crossings south of the Wilson Avenue/Burtschell Street intersection due to few gaps in traffic.

Bicycle activity on the north study section is greater than that in the south study section. There are approximately 100 daily bicycles in both directions along US Highway 101 at Cooper Avenue. The number of bicycles decreases slightly to the north, however there are still approximately 90 daily bicycles along the highway at A Drive. The greatest number of bicycles crossing the highway in the north study area occurs at and near the Wilson Avenue/Burtschell Street intersection with approximately 30 daily crossings.

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Section III

Existing Design and Gateway Conditions

EXISTING GATEWAY SIGNAGE

Within the area there are two locations that could potentially provide a certain level of “gateway” experience and where signage welcoming visitors to Crescent City is placed. However due to their locations, they are not easily visible and recognizable. They are also within the urbanized areas and do not serve a role in changing the expectations of arriving drivers to reduce their speed. As part of this process, the study team will assess the future role of these signs and how they may influence future gateway expressions.

EXISTING COMMERCIAL SIGNAGE

Historically, advertising signage (billboards) have provided information to travelers of the types of services that are “down the road” and also provide drivers with an indication that they are approaching a community. Crescent City has a relatively low quantity of these types of signs, partly due to the public land ownership that is in close proximity to the City, restrictions to this type of signage within the Caltrans right-of-way, as well as County regulations of signage. It should also be noted that several of the billboards in the area are on lands presently owned by the California Department of Fish and Game, and were on the property when it was acquired by the department.

There has long been pressure at a national level to reduce and prohibit the use of billboards, particularly in areas of high scenic value. Changes in how people make travel plans have also resulted in a decline of new billboards. Typically advertising for towns occurs within a 10 to 20 mile distance from town unless there is a specific major destination or tourist attraction, in which advertising begins at a greater distance from town. Based on a site reconnaissance, the following are the types and locations of billboards we observed.

Entering from the North

Interestingly, when traveling from Oregon, there are very few billboards located to the north of the city. Most of the advertising is more than 6 to 8 miles out of the city. One thing worth noting is that the closest signage to the city from the north identifies the Washington Blvd. exit and the services that can be found there with no recognition of Crescent City ahead until a driver arrives at the north end of town. The following are the types and locations of billboard signs we observed.

<u>Information on Sign</u>	<u>Miles from North City Limit Sign</u>
• Super 8 Motel	16.9
• Hampton Inn	16.2
• Ocean World	14.8
• Elk Valley Casino	11.8
• McDonald's	11.1
• Crescent City mileage with icon symbols signs (Caltrans Sign)	3.0
• Washington Blvd with icon symbols signs (Caltrans Sign)	0.5

Entering from the South

Due to the Redwood National and State Parks to the south of town, the majority of advertising occurs in close proximity to the City. The following are the signs we observed.

Information on Sign

Miles from South City Limit Sign

• Two blank billboards	2.6
• Casino	1.9
• Curly Lodge	1.6
• Hampton Inn	0.9
• Ocean World	0.8
• Chartroom Restaurant	0.6
• Casino	0.5
• Two Blank Billboards	0.4

EVALUATION OF EXISTING SENSE OF ARRIVAL

When assessing the existing sense of arrival into a community, a number of things play into how drivers are informed and arrive into town. This includes advertising (described previously), the surrounding natural and built landscapes, the topography, the width of the viewshed and scenic aspects that contribute to one's perception of the community. These aspects affect the travel speed as well as influence the desire to stop in the town. Our preliminary assessment of the approach into Crescent City, and how that may inform the location and type of gateway features, are as follows.

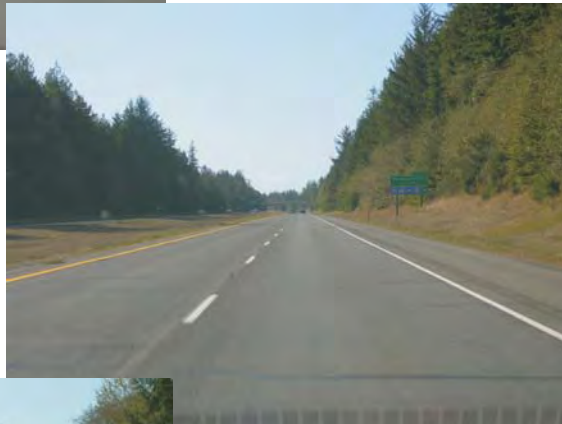
Entering Crescent City from the North

Figure 16 provides examples of the arrival conditions from the north. When traveling from the north, the highway consists of two travel lanes in both directions with a signed travel speed of 65 mph, separated by a wide natural landscaped area. Adjacent to the highway, the existing landscape consists of a relatively level shoulder consisting on natural grasses which transitions into a rising slope and heavily wooded landscape. This provides an attractive natural landscape and frames the driver's viewshed.

Other than a Caltrans information sign located approximately four miles out of town, the first real recognition that a driver approaching from the north has that Crescent City is coming up is the signage at the Washington Boulevard. However, there is nothing to indicate to a driver that there is a connection between the exit and the city itself. It is not until a driver passes under the Washington Boulevard overcrossing that they are rather abruptly transitioned from a rural freeway environment to an urban arterial environment. Because of traffic potentially merging from the Washington Boulevard on ramp and the speed limit reduction from 65 mph to 45 mph, there is no real sense of arrival or transition from the natural environment to the immediate built environment. As the traveler arrives at the jurisdictional city limits of Crescent City, the wide five lane roadway section dominates the viewshed and business signage competes with directional and regulatory signage.

The summary of existing traffic conditions (described above) provides the historical data related to actual travel speeds and pedestrian/vehicular conflict. Yet from a gateway and traffic calming perspective, there are a number of opportunities to inform drivers that they are entering Crescent City, provide an attractive entrance to the north of town, and aid in reducing the

FIGURE 16
Views of North Study Corridor



pedestrian/vehicular conflicts. This will involve working with Caltrans since many of the opportunities will occur within their right-of-way as well as the community during the public outreach process. When leaving to the north, it will be important that the gateway element extends far enough to encourage lower speeds until well out of the pedestrian areas of town.

Entering from the South

When traveling from the south, the highway consists of one travel lane in both directions with a signed travel speed of 50 mph and no separation between lanes. Figure 17 provides views of this corridor. Northbound drivers have just emerged from heavily wooded Redwood National and State Parks, consisting of miles of curved roadway at low speeds, and descend to the coastal plain where the road becomes straight and relatively level and the viewshed opens up. Prior to the descent there is a glimpse of Crescent City and a vista point which provides visitors with information about the redwood forest, Crescent City harbor, and tsunamis. However, since the pullout is on the left side when approaching town, it is easy to miss the turn off or decide not to cross oncoming traffic, resulting in fewer visitors enjoying the perspective overview of Crescent City.

Once at the base of the hill (approximately 3 miles from the city limits) the existing landscape consists of relatively level natural grasslands. This transitions into a heavily natural landscape buffer to the west with views of the Pacific Ocean and a wide open area used for grazing to the east. At this point, drivers encounter the first billboards that are within close proximity to town. Since the road is level and straight and the viewshed is relatively open, the speed of traffic is relatively high. As one approaches Humboldt Road, the views of the ocean to the west are blocked by thick vegetation while the views to the east remain open. This is also the point where recognition of the adjacent recreational opportunities occurs.

Approximately a mile and a half from the city limits, the view to the west opens up and the ocean and South Beach welcome visitors to the community. At this point, the natural beauty with the harbor and jetties that are visible in the distance create a strong sense of arrival into Crescent City. To the east, the natural landscape encroaches onto the highway with thick natural vegetation and a series of billboards exist in a relatively short distance. The dirt area on the west side of the road provides informal parking for beach goers while the shoulder on the east side is wide enough to allow vehicles to pull over and potentially park to view or access the beach. As the traveler arrives at the jurisdictional city limits of Crescent City, the viewshed is cluttered with a series of business, directional, and regulatory signage to the point where the speed sign is somewhat lost in the landscape.

From a gateway and traffic calming perspective, similar to the north entrance, there are a number of opportunities to inform driver's that they are entering Crescent City, provide an attractive entrance to the south of town and aid in reducing speeds and pedestrian/vehicular conflicts. Important to recognize at the south entrance into the city is the role the views of the ocean and city play in capturing the sense of arrival. This will involve working with Caltrans, the California Coastal Commission as well as the community and property owners during the public outreach process.

FIGURE 17
Views of South Study Corridor



WAYFINDING

While this is not part of the US Highway 101 Traffic Calming/Gateway Study, wayfinding provides an important element for communities as a method for informing visitors about the location of important community facilities and points of interest as well as direction to important resources adjacent to the City. There are several methods for accomplishing this and requires a separate planning effort, yet the gateway solution developed as part of this process will aid in establishing the areas where wayfinding is most effective. The Study Team will also provide a list of opportunities that may benefit from a wayfinding program, such as improved wayfinding for the nearby Redwood groves.

Section IV

Review of Current Plans and Projects

This section presents information regarding current plans and projects that guide transportation decisionmaking along the study corridor, or that will impact the corridor in coming years.

CURRENT PLANS

US Highway 101 Route Concept Report (RCR), Caltrans District 1, October 2002

RCRs are long-range planning documents used by Caltrans to guide overall improvements along each roadway. The highway is divided into segments and data and information about the transportation facility is discussed for each segment. Specifically, a RCR presents an overview of local government, air quality, land use, transit service, right-of-way information, traffic forecasts, collision data, environmental concerns, functional classification of the highway, level of service, and concept improvements. The District 1 US Highway 101 RCR discusses the segments of US Highway 101 from the Sonoma/Mendocino County line north to the California/Oregon border.

The RCR lists route concept improvements that Caltrans sees as important over the next twenty years to reduce congestion, improve level of service, and improve safety. Highway conditions are measured by Level of Service (LOS), which ranges from LOS A (very good conditions) to LOS F (volumes exceeding capacity, resulting in stop-and-go operation and long traffic queues). The RCR indicates that LOS C is to be maintained on four-lane highway segments, while an LOS D will be accepted for urban areas and two-lane segments in rural areas, such as US Highway 101 in Crescent City. Improvements outlined in the report include safety strategies to reduce the occurrence of collisions, traffic calming measures to achieve livable community goals, and upgrading shoulders to better accommodate bicycle traffic on portions of the Pacific Coast Bike Route along the highway.

California Transportation Plan 2025

The California Transportation Plan (CTP) is a long-range transportation policy plan that provides a vision of the state's future mobility needs. The intent of the plan is to guide transportation investments and decisions at all levels of government and the private sector. The vision encompasses all types of transportation facilities such as roads, bicycle facilities, and airports as well as goods movement. The document is very broad in nature and was developed in consultation with the state's 44 Regional Transportation Planning Agencies as well as the general public.

There is some discussion on how demographic and economic factors can affect transportation in California. The CTP sets forth transportation goals. The following policies and strategies were developed in order to implement each goal:

- **Improve Mobility and Accessibility** – This includes expanding the capacity of transportation facilities in the state as well as focusing on transportation demand management strategies to improve the efficiency of existing facilities.

- **Preserve the Transportation System** – This goal reaffirms the importance of rehabilitation and maintenance projects such as those funded through the State Highway Operation and Protection Program (SHOPP).
- **Support the Economy** – Goods movement and maintaining adequate funding sources for transportation is addressed in this goal.
- **Enhance Public Safety and Security** – This goal incorporates prevention strategies, employment of intelligent transportation systems, and cooperating planning for emergencies.
- **Reflect Community Values** – This includes public participation as well as smart growth policies.
- **Enhance the Environment** – This goal addresses sensitivity to the environment in all facets of transportation including the impacts of vehicle emissions.

A 2030 Addendum to the CTP was completed. The intent of this document was to address new provisions set forth by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. The report was developed to strengthen the environmental process; expand the public participation process, ensure consistency with local growth and economic plans, add security and safety as new stand-alone planning factors; include operations and management strategies to ensure the preservation and most efficient use of the existing transportation system; and reaffirm consultation with non-metropolitan local officials and federally recognized Native American Tribal Governments (Tribal Government).

Interregional Transportation Strategic Plan 1998

The Interregional Transportation Strategic Plan (ITSP) is the Caltrans version of the Regional Transportation Plans. The ITSP places special emphasis on the statutorily-identified Interregional Road System, with less focus on other elements of the interregional transportation system, including intercity rail and mass transportation which serve the state. The 87 Interregional Road System Routes (IRRS) serve interregional people and goods movement. Six key objectives are identified for the Interregional Improvement Program:

- Complete a trunk system of higher standard (usually expressway/freeway) state highways.
- Connect all urbanized areas, major metropolitan centers, and gateways to the freeway and expressway system to ensure a complete statewide system for the highest volume and most critical trip movements.
- Ensure a dependable LOS for movement into and through major gateways of statewide significance and ensure connectivity to key intermodal transfer facilities, seaports, air cargo terminals, and freight distribution facilities.
- Connect urbanizing centers and high growth areas to the trunk system to ensure future connectivity, mobility, and access for the state's expanding population.
- Link rural and smaller urban centers to the trunk system.

- Implement an intercity passenger rail program (including interregional commuter rail) that complies with federal and state laws, improves service reliability, decreases running times, and reduces the per passenger operating subsidy.

The ITSP identifies several “High Emphasis Interregional Routes” and “Focus Routes,” including US Highway 101. For northern California, the highway is a lower capacity facility that is essential for access to the many rural communities in northern California, such as Crescent City. The purpose of improvements is to cooperatively identify and plan capacity improvement strategies to ensure that the state’s interregional needs, including lifeline and recreational requirements in the north state, are comprehensively considered with regional needs.

Del Norte County Regional Transportation Plan, 2007

Regional Transportation Plans (RTPs) are 20-year programmatic documents containing general transportation related policies, guidelines, and capital improvement project lists for all transportation facilities/modes including roads, bridges, transit, aviation, goods movement, pedestrian and bicycle facilities, and transportation demand management. Both short-term and long-term improvements are included.

Relevant roadway transportation improvement projects on US Highway 101 in the Crescent City downtown area identified in the RTP’s Action Elements include traffic studies and various roadway improvements related to pedestrian and bicycle travel. In particular, bulbouts, landscaping, signs and utilities are proposed; a number of these have been implemented, while total completion is scheduled for 2008 through 2012.

Del Norte County and Crescent City 2007 Bicycle Facilities Plan Update

The *Del Norte County and Crescent City 2003 Bicycle Facilities Plan Update* is the official Bicycle Transportation Plan of Del Norte County and Crescent City. The document was first adopted in 1997 and has been updated many times since with the most recent update in 2007. Within the plan, improvements to the designated bikeway system are recommended, including those within the Crescent City downtown area. Improvements include the construction of Class I and Class II trails on the west side of US Highway 101 and highway crossings, both associated with the Harbor Trail. In addition, the plan notes the need to coordinate with Caltrans for pedestrian and bicyclist improvements on the Pacific Coast Bike Route, which includes portions of US Highway 101 through the City.

Elk Valley Rancheria Plans

The Elk Valley Rancheria is currently in the planning process for a new casino/resort complex, planned to be located east of Humboldt Road with primary access provided by an eastward leg of the Humboldt Road/Sandmine Road intersection. This facility would increase turning movement traffic on US Highway 101 at both Sandmine Road and Humboldt Bay Road. In addition, the Rancheria is developing plans that would increase use of beachfront properties along Enderts Beach Road, which would increase the need for pedestrian/bicycle crossing of US Highway 101 in the vicinity of the Humboldt Road intersection.

Crescent City Harbor District Municipal Service Review and Master Plan

This Municipal Service Review (MSR) was prepared by the Del Norte Local Agency Formation Commission in November 2009. It updates information previously provided in the 2006 Crescent

City Harbor District Harbor Master Plan, including a traffic study. The Harbor District borders the south study corridor roughly between Anchor Way and King Street (excluding several parcels). It lays out a plan for improvements, including new docks and slips, extension of the California Coastal Trail through the harbor district, constructing a promenade along the harbor perimeter, and expanded parking. It also plans for new leaseholds that could include new hotels, restaurants, and shops. Most importantly for this study, the MSR identifies plans for a traffic signal and pedestrian crosswalk at the US Highway 101/Citizens Dock Road intersection, as well as new harbor entry monuments at both the US Highway 101 Citizens Dock Road and the US Highway 101/Anchor Way intersections.

The need for improvements at the US Highway 101/Citizens Dock Road intersection as development in the Harbor District area occurs is corroborated by the results of the traffic report for the Master Plan. While the existing LOS on the worst approach (the eastbound approach) was found to be an adequate LOS C, adding the traffic generated by the Master Plan uses would result in LOS E, while also adding forecast background traffic growth resulted in LOS F with an average delay of over 2.5 minutes.

City of Crescent City General Plan, 2001

The General Plan for the City of Crescent City was last completed in 2001 and serves as a guidance document for future City growth and development. Included in this document are policies related to circulation and transportation improvements.

The document identifies three primary functions of US Highway 101 – servicing traffic passing through the City, servicing traffic accessing the downtown and waterfront areas, and servicing the lands immediately adjacent to the highway. The City has created a new land use planning designation Visitor and Local Commercial (VLC) that provides for regional retail and visitor-serving commercial uses, and allows for intensification of uses and increased level of activity. As such, the City has identified a need for improvements to provide better service to these areas, which are reflected in a number of General Plan goals and policies (City Street Policies 3.A.22 and 3.A.23), and are intended to promote a more pedestrian friendly environment and to improve access to downtown. The General Plan citywide policies pertaining to US Highway 101 are as follows:

- State Highways Policy 3.A.5: The City shall encourage Caltrans to maintain a LOS D or better on US Highway 101.
- City Streets Policy 3.A.12: The City shall endeavor to manage its roadway system so as to maintain LOS C operation, except for when streets intersect with US Highway 101, where LOS D shall be acceptable.
- City Streets Policy 3.A.21: The City and County should cooperate in improving the approaches to the City area by US Highway 101.
- City Streets Policy 3.A.22: The City shall investigate the possibility of using “bulbing” along the couplet, creating a roundabout on US Highway 101 just south of Front Street, and closing off Front Street at US Highway 101.
- City Streets Policy 3.A.23: The City shall investigate the possibility of making improvements to Front Street (between A and L Street) such as providing additional parking and constructing landscaped and concrete median strips.

- Bicycle Transportation Policy 3.C.3: The City shall work with state and local agencies to accommodate and promote the development of recreation/tour travel bicycle routes on US Highway 101.
- Bicycle Transportation Policy 3.C.10: The City shall continue to maintain the Harbor City bicycle route. The route has ocean views at the coastal access points and provides access to recreational opportunities along the route. The City shall only allow relocation of the route in conjunction with new development if relocation would be consistent with all relevant coastal policies.
- Pedestrian Transportation Policy 3.D.2: The City shall ensure that pedestrian walkways are separated, safe, and protected from automobile traffic.
- Pedestrian Transportation Policy 3.D.8: The City should develop a program of constructing pedestrian walkways and sidewalks for its street system. Those streets which carry heavy traffic loads should be considered as priority for sidewalk construction.

Del Norte County Local Coastal Program

The Coastal Element of the Del Norte County General Plan was created to help guide land use policy decisions within the Coastal Zone area, which includes the segments of US Highway 101 within the project's study area. The document is a result of the California Coastal Act of 1976, which set forth the criteria for Local Coastal Programs.

Del Norte County's Local Coastal Program (LCP) consists of ten regulatory sections and two special study sections. In all sections of the document, the South Beach area is considered an important resource. This is primarily due to its popularity as a tourist and recreational attraction, as well as its situation as the southerly gateway to Crescent City and northerly entrance to units of the Redwood National and State Parks. Issues within this area that may impact the gateway study include obtrusive signing, extensive litter, and private land ownership which does not guarantee public access opportunities.

Discussions pertinent to and potentially impacting this study are found in four sections: Land Use, Visual Resources, Public Access, and Recreation. Policy recommendations presented in the LCP are detailed in the sections below.

Land Use Plan

The Land Use section of the LCP outlines a number of recommendations; the most relevant to the gateway study are discussed below:

- The state shall provide a day use facility west of US Highway 101 across from Sandmine Road. The state shall also provide two pathway accesses from Humboldt Road to the beach as agreed in the Bauer Subdivision of land for the state acquisition.
- The parcel lying east of US Highway 101 and Humboldt Road, shall be identified for an agricultural use as an interim use. Should the parcel be developed for public or quasi-public use, such as a community education center, this area may be used for low intensive uses related to the public or quasi-public use in conformance with the local coastal program.

Visual Resources

The following recommendations and guidelines are applicable to the area referred to as “Crescent City to Redwood National Park,” which includes the southern portion of the gateway study area near South Beach, Anchor Way, and Citizen’s Dock. In particular, the US Highway 101 Vista Point, Citizen’s Dock, Anchor Way, and South Beach are considered “viewpoints” and the highway itself is considered a “view corridor.”

Landscape Guidelines

- The maintenance of natural vegetation screens should be encouraged. New landscaping should integrate well with the surrounding environment and at maturity should not obstruct significant coastal views.

Signage Guidelines

- The dimensions of signs should be evaluated in terms of maintaining significant coastal views. The recommended maximum size is 400 square feet.
- Evaluations concerning the placement of signs should include the appropriateness of a given site considering viewing characteristics and setbacks. No commercial signs should be placed in highly scenic areas.

Present Local Policies

The following policy recommendations are designated for the areas of US Highway 101 within the Coastal Zone Boundary that are designated as a scenic highway. The recommendations are part of the County General Plan recommendation for a scenic corridor study.

- Outdoor advertising should be restricted on these routes:
 - The signs should be sufficient in size to describe or indicate the service available.
 - Off-site signs should be restricted to commercial or industrially zoned areas.
 - The signs should meet or exceed the requirements of the County sign ordinance.
- New or relocated utility lines should be placed underground whenever feasible. Utility lines which are in an area where underground placement is not feasible, shall be aligned so that the lines do not interfere with natural scenic resources of the visual environment.

Local Coastal Program Policies

The following policies are designed to maintain the scenic resources in the Coastal Zone, which includes the southern portion of US Highway 101 within the gateway study area.

- The architectural review committee may also be delegated the responsibility of evaluating the design and placement of outdoor advertising signs in the Coastal Zone, consistent with the permitting ordinances.

- ♦ The alteration of natural landforms in highly scenic areas shall be minimized, where feasible, in construction projects by:
 - Designing roadways, driveways and other corridors to blend with the natural contours of the landscape by avoiding excessive cuts and fills.
- ♦ Funds should be sought from the Coastal Conservancy or other sources to establish a Logo Signing System for US Highway 101 north and south of Crescent City. After an appropriate amortization period, existing off-premise signs located within scenic corridors shall be removed and replaced by a well designated logo system similar to that used by the Oregon State Highway Division.
- ♦ The County shall discourage the littering of its beaches, roadways and other public use areas with the following:
 - Seek funds for the placement and maintenance of additional litter receptacles for recreational areas, highway turnouts and other public use areas.
 - Encourage public education and community anti-litter programs.
- ♦ New or relocated utility lines shall be placed underground, whenever feasible and when warranted in highly scenic coastal areas. Utility lines that cannot feasibly be placed underground in highly scenic areas shall be aligned so as to best maintain scenic natural resources.

Public Access

Policy recommendations related to public access of the beach areas between the southern Crescent City limits to Sandmine Road are as follows:

Local Coastal Program Policies

- ♦ The County shall work activity towards the attainment of maximum coastal access for the public, where it is consistent with public safety, property owner rights and the protection of fragile coastal resources.
- ♦ The County shall require funding assistance to improve and maintain existing access and to acquire and develop any new access and facilities.
- ♦ The design and construction by any public entity of shoreline access facilities (e.g., parking, trails, stairways, etc.) shall consider public safety potential for vandalism and the protection of fragile coastal resources.
- ♦ Shoreline access should be clearly signed on adjacent major highways and streets. A uniform shoreline access signing system should be developed.

South Beach Specific Policy Recommendations

- ♦ The County, state and Redwood National Park should cooperate in a comprehensive plan to enhance the recreation and visual qualities of this area.

Recreation

Per the Recreation section of the Coastal Plan, the following policy recommendations have been made:

Present Local Policies

- The development of a regional trail and path system linking residential areas to local recreational areas, Crescent City to the Redwood National Park and recreational areas to each other should be explored giving strong consideration to existing public and quasi-public rights-of-way including railroad rights-of-way.

Area Specific Recreation Proposals – South Beach

The South Beach area, located to the south of the city limits, provides recreational opportunities. Land uses are primarily commercial, recreational, industrial and agricultural, however some motels and other tourist uses are also in the area. An oil storage facility is located along the eastern US Highway 101 right-of-way at the northerly end of South Beach. The following are specific policy recommendations for this area.

- Access easements – Dedication of vertical and lateral access easement should be sought by the state.
- Funding – In the event of easement acquisitions, funds for maintenance and liability shall be provided by the state.
- Cooperative Planning – The County, Harbor District, state and Redwood National Park should cooperate in a comprehensive plan to enhance the visual and recreational qualities of this area.

Del Norte County General Plan, 2003

The County General Plan provides a long-term (20 year) vision for development and includes goals, policies, and standards related to land use, housing, conservation, open space, circulation, recreational and cultural resources, scenic resources, and noise and safety. A review of the relevant policies is discussed below.

Safety and Noise

- For major roadways in the County, the future noise levels estimated on Table 2-1, shall be used to determine the applicability of this policy.

Land Use

- The County shall ensure that all County submittals of transportation improvement projects to be included in regional transportation plans (RTP, RTIP, CMP, etc.) are consistent with the air quality goals and policies of the General Plan.

Recreational and Cultural Resources

- The County shall encourage the interconnection of pedestrian and bicycle trails between Federal Forest, Park and Recreational Area lands, State Park lands, State Highway and County trails.
- The County shall continue to emphasize the importance of maintaining and retaining US Highway 101 as a primary access route which crosses through the Crescent City Marsh/South Beach area to serve the Crescent City area.
- The County shall encourage the state to coordinate and participate with federal and/or local agencies in the provision of public day use, interpretive, and access facilities, both parallel with and to the beach, west of US Highway 101 in the South Beach area.
- The County shall work with other public agencies, such as the City of Crescent City, Local Transportation Commission, Department of Fish and Game, Harbor District, US Forest Service, and State and National Park Services to coordinate the development of equestrian, pedestrian, and bicycle trails.
- The County shall promote the development of a regional trail and path system linking residential areas to local recreational areas, such as Crescent City to Redwood National and State Parks or the Lake Earl area, and recreational areas to each other. The County encourages the use of existing public and quasi-public rights-of-way, including former railroad rights-of-way.
- The County shall continue to coordinate connecting trails with the City of Crescent City, particularly in the Elk Creek, Harbor, and coastline areas through the development of a joint trails plan.
- The County shall continue to support the shoreline access program on adjacent major highways and roads. A uniform shoreline access signing system should be developed.
- Signs indicating shoreline access should be placed on US Highway 101.
- The County encourages the maintenance of existing facilities and the development of commercial and public visitor activities and services. The following commercial areas are recognized for their historic visitor use and their potential visitor use:
 - US Highway 101 – Crescent City Harbor
 - US Highway 101 – South Beach

Scenic Resources

- The County should discourage the littering of its beaches, roadways, and other public use areas through the following:
 - Seek funds for the placement and maintenance of additional litter receptacles for recreational areas, highway turnouts, and other public use areas; and
 - Encourage public education and community anti-litter programs.

- The County shall encourage the provision of public access to significant natural and cultural resources and scenic vistas through scenic routes, scenic highways, and scenic byways.
- The County shall maintain the coastal scenic viewpoints in scenic corridors which the County owns as identified in Table 6-1 and illustrated in Figure 6-1.
 - This table includes Crescent City to Redwood National and State Parks, and specifically the US Highway 101 corridor, South Beach and US Highway 101 Vista Point.
- The County should support the maintenance and enhancement of the scenic qualities of US Highway 101, US 197, and US 199, while ensuring the improvement of these routes and the economic viability of the area they serve.
- The County should continue to limit new on- and off-site outdoor commercial advertising, including billboards, and shall pursue removal of illegally erected signs within designated scenic highway corridors or in designated gateway areas, in order to protect visual quality. The County should support participation in centralized signage programs and develop a sign amortization program if funding is available.
- The County should encourage coordination of scenic route programs among local, regional, and state jurisdictions, recognizing that scenic routes are a resource of more than local importance.

Transportation and Circulation

- The County shall encourage Caltrans to continue to maintain US Highway 101's availability to County communities at all times.
- The County shall continue to actively encourage Caltrans and the Regional Transportation Planning Agency to develop facilities for improved access into the County via US Highway 101 and US 199.
- The County acknowledges that Caltrans has existing adopted overall route concepts for its highways, shown in Table 8-1, notes that full construction of these concepts may not occur or be necessary during the planning period of this General Plan and supports development of such concepts into an overall 50-year highway plan which addresses the need for and location of freeway-expressway improvements.
 - This table includes the Crescent City Flat segment of US Highway 101 to be a four-lane freeway bypass.
- The County supports development of a 20-year highway route concept plan by the Regional Transportation Planning Agency and Caltrans which reflects conventional two-lane highway with passing lanes and/or four lane concepts for all highways in the County, except for the existing US Highway 101 freeway segments at Klamath and Crescent City, and US Highway 101 within the urban Crescent City area.
- The County shall encourage the Regional Transportation Planning Agency and Caltrans to adopt a 20-year route concept for US Highway 101 through the Crescent City area which provides for improvement of the existing roadway in its present alignment.

- The County shall encourage Caltrans and the Regional Transportation Agency to provide for a LOS D or better on all state highways within the County.
- The County shall utilize the Caltrans Highway Design Manual and Traffic Manual to ensure the development of adequate, safe public roadways, including, but not limited to, warrants for traffic control devices such as stop signs or traffic signals.
- The County shall continue its program of maintenance and minor improvement to the existing public roadway system in order to maintain its capacity.
- The County shall encourage the development of multi-use shoulders to accommodate non-motorized traffic along state highways.
- The County shall coordinate with the City of Crescent City and Caltrans to ensure that bicycle planning on the state highways maximizes safety.

Wild Rivers Regional Blueprint Plan

The Wild Rivers Regional Blueprint Plan was prepared by the DNLTC in 2009 in order to communicate a regional consensus throughout the Del Norte area regarding planning issues. Pertaining to the US Highway 101 study, this Plan's Growth Principal Two indicates "Create safe and walkable communities," while Principal Four states "Promote safe and vibrant neighborhoods." The Blueprint Preferred Scenario map indicates that US Highway 101 crosses the Crescent City Urban Area limits at roughly Anchor Way on the south, and the Railroad Avenue overpass on the north.

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Section V

Traffic Calming Gateway Alternatives

Prior to presenting specific options for the two entrance corridors, this section presents a review of potential pedestrian crosswalk options. This is followed by a review of traffic calming options for the South Corridor, followed by a similar discussion for the North Corridor.

PEDESTRIAN CROSSWALK OPTIONS

There have been many studies conducted to assess the safety and efficiency of various treatments for midblock or non-intersection pedestrian crossing locations. *Report 562: Improving Pedestrian Safety at Unsignalized Crossings* published by the National Cooperative Highway Research Program (NCHRP Report) provides a discussion and statistical analysis of many different types of crossing treatments. The study discusses the effectiveness of crossing treatments in terms of the percentage of drivers that yield to pedestrians or comply with the treatment. The following presents a discussion of pedestrian crossing options at midblock locations that may be considered both in the southern and northern gateway areas.

Marked Crosswalks and Pedestrian Refuge Islands

A marked crosswalk provides a defined path for pedestrians to cross a roadway. Marked crosswalks can serve several purposes including channelizing pedestrians to cross the road in a single specific location, and making drivers aware of encountering a pedestrian crossing location. There have been several studies conducted to determine the effects that marked crosswalks have on pedestrian safety. The studies conclude that the addition of marked crosswalks does not increase pedestrian safety versus locations with unmarked crosswalks. For locations with one travel lane in each direction (a two-lane road or a three-lane road with a center two-way left-turn lane), marked crosswalks are generally found to have no significant impact. In many cases, especially on high-speed roadways and those with more than one travel lane in each direction, the addition of a marked crosswalk will actually decrease pedestrian safety. The recommendations of these studies state that a combination of crossing treatments in addition to a marked crosswalk are preferred for increased pedestrian safety and efficiency.



The *California Manual on Uniform Traffic Control Devices* (California Department of Transportation, 2010) (MUTCD) is a key guidance document regarding crossing options. The California MUTCD does not specify minimum pedestrian crossing volume warrants for the installation of marked crosswalks at midblock locations. The California MUTCD states the following guidelines in agreement with studies concluding that marked crosswalks can be less safe than unmarked crosswalks:

- Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from highway traffic signals or STOP signs.

- Because non-intersection pedestrian crossings are generally unexpected by the road user, warning signs should be installed and adequate visibility should be provided by parking prohibitions.

The following factors may be considered in determining whether a marked crosswalk should be used:

- Vehicular approach speeds from both directions
- Vehicular volume and density
- Vehicular turning movements
- Pedestrian volumes
- Roadway width
- Day and night visibility by both pedestrians and motorists
- Channelization is desirable to clarify pedestrian routes for sighted or sight impaired pedestrians
- Discouragement of pedestrian use of undesirable routes
- Consistency with markings at adjacent intersections or within the same intersection

Mid-block pedestrian crossings are generally unexpected by the motorist and should be discouraged unless, in the opinion of the engineer, there is strong justification in favor of such installation. Particular attention should be given to roadways with two or more traffic lanes

Crosswalks may also be enhanced by the addition of a raised median or pedestrian refuge island. The presence of the pedestrian refuge island provides pedestrians with a two-stage crossing, allowing pedestrians to wait for a separate gap in traffic for crossing each direction of traffic. In addition, the use of pedestrian refuge islands shortens the crossing distance and pedestrians' exposure to vehicle traffic. The NCHRP Report states a very wide range of vehicle compliance rates for crosswalks with a pedestrian refuge island. Compliance rates vary from approximately 5 percent to 75 percent, with an average of 35 percent of drivers yielding to pedestrians at crosswalks with refuge islands. The report found a high correlation between driver yielding rates and speed limits for refuge islands. Roadways with a 25 mph speed limit had a driver compliance rate of 75 percent, while roadways with a 35 mph speed limit had an average compliance rate of 15 percent. This data suggests that on moderate to high-speed roadways, a pedestrian refuge island by itself is an insufficient treatment to supplement crosswalks. However, despite the low compliance rate of vehicles yielding to pedestrians in crosswalks supplemented with refuge islands, refuge islands have many positive benefits including those mentioned above, as well as traffic calming and aesthetics.

US Highway 101 in the northern portion of the Crescent City area, with its 5-lane cross section, posted speed limit of 45 mph, and ADT greater than 12,000, fits the description for a location where a marked crosswalk alone is insufficient to provide for a safe and pleasant pedestrian crossing experience. Due to the high posted speed limit of 45 mph, a marked crosswalk supplemented with only a pedestrian refuge island would also be insufficient.

US Highway 101 in the southern portion of Crescent City, with a 3-lane cross section and slightly slower traffic speeds, has more favorable characteristics for the sole use of marked crosswalks, especially with a pedestrian refuge island. With a posted speed limit of 40 mph, however, more than a simple crosswalk is needed. Therefore a combination of crossing treatments including additional signage and lighting at this location would be appropriate.

Pedestrian Warning Beacons

The use of warning beacons at crosswalk locations is common throughout the United States, including California. Crosswalk warning beacons consist of a single or series of flashing yellow signals. They can be implemented in numerous configurations (e.g. overhead, side of roadway, with signs, single flasher, alternating flashers, in advance of crossing location, etc.) to address issues specific to the locations where they are being used. They are recommended for midblock crossing locations, in order to provide a higher level of visibility to drivers. Some pedestrian crossing warning beacons operate continuously, while others are pedestrian actuated. (In California, the California MUTCD indicates that actuated warning beacons can only be considered as a stand-alone strategy at school crossings.) Warning beacons at crosswalk locations are most effective if they operate only when a pedestrian is present, as warning beacons that flash continuously quickly become routine and are subconsciously ignored by drivers. Therefore, an active (push-button activated) or passive (no action required by the pedestrian) pedestrian detection system should be used with the warning beacon.



The NCHRP Report provides studies and summaries of the compliance rate for various pedestrian crossing treatments. Compliance rates are quantified by the percentage of vehicles that yield to crossing pedestrians at locations where the crossing treatment is present. Compliance rates are generally higher for pedestrian crossing warning beacons with active detection than beacons with passive detection. This is due to imperfections in the passive detection technology, which tend on occasion to produce “false calls.” A false call occurs when the detector senses a pedestrian and activates the beacon, when in actuality there is no pedestrian present. This phenomenon has a similar effect to a beacon that continuously flashes. A common cause of false calls is the mistaken detection of a vehicle in the right-lane as a pedestrian waiting to cross on the curb. Rain is also a common source of false calls for passive detection. Animals can also result in false calls.

For pedestrian warning beacons with active (push-button) detection, it is important to provide conspicuous and straightforward signage that provides instructions on the proper procedures for use of the warning beacon. Compliance rates for overhead warning beacons at crosswalks on four-lane roadways were between 30 and 75 percent for push-button activated beacons and between 25 and 45 percent for overhead pedestrian beacons using passive detection.¹ There was limited statistical correlation between driver compliance rates and speed limits for pedestrian warning beacons. Based on the data it would be difficult to estimate the driver yielding rate at a beacon controlled crosswalk location on a roadway with posted speeds of 40 mph and greater present on US Highway 101 in Crescent City.

There are limited guidelines for the installation and use of warning beacons at pedestrian crossings. The California MUTCD specifies that a typical application of a flashing warning beacon is “as emphasis for a midblock crosswalk.” There is no pedestrian crossing volume warrant for the installation of warning beacons. The California MUTCD provides the design standards for warning beacons regarding size and placement within the proper field of view.

¹ The NCHRP Report only conducted studies of pedestrian warning beacons at locations with speed limits of 30 mph and 35 mph.

The use of crosswalks with warning beacons could improve pedestrian efficiency and safety in both the north and south crossing locations in Crescent City. Due to the high 45 mph posted speed limit in the north section, advanced warning signs should be included in the design of the beacon. It would also be advisable to provide multiple beacons at this crossing site. If installed, beacon signals should be installed overhead at the crosswalk location and in conjunction with the advance warning signs, though an overhead beacon could be considered as degrading the visual quality of the corridor. Yield pavement markings should be provided in advance of the crosswalk along with the “Yield here to Pedestrians” signage. In addition, on-street parking and other visual obstructions should be eliminated between the yield bar and the crosswalk.

The south crossing location in Crescent City could make use of a warning beacon with a simpler design. Flashing beacons could be installed on the side of the roadway in addition to warning signs both in advance and at the location of the yield bar.

In-Roadway Warning Lights

In-roadway warning lights have been employed over the last few decades in a wide range of conditions (including in Crescent City). The in-pavement lights are typically triggered by a detection system such as an “electric eye” trip-beam actuation system, so that drivers are warned of the presence of a pedestrian only when appropriate. They have been proven to be quite effective in improving pedestrian safety – a study (Miller and Dore, 2003) indicates that the reported accident rate is about 80 percent less than for a typical marked crosswalk.



The California MUTCD allows for the use of in-roadway warning lights under specific conditions, including volumes that exceed 200 vehicles per hour (in urban areas) and an 85th percentile approach speed of 45 mph or less. A minimum of 40 pedestrians per hour for each of two hours is required for this strategy to be warranted. The California MUTCD allows the option of an overhead or roadside flashing yellow beacon to be installed as part of an in-roadway warning light system.

Table 7 displays the warrant threshold for the number of pedestrians given the vehicle volumes and roadway width for both the north and south sections on US Highway 101 in Crescent City. The counts conducted in October 2009 indicated pedestrian crossing activity that is below the level identified in the California MUTCD to warrant in-pavement flashers. However, actual peak summer season pedestrian activity in the future could be greater than the observed levels, for two reasons. First, pedestrian activity in the South Corridor in particular would be greater than in October due to the presence of motels on one side of US 101 and the Marina on the other. Secondly, the existing crossing conditions tend to discourage crossing activity (particularly in the North Corridor). In addition, provision of a pedestrian path to the Marina as well as signage would help to funnel pedestrians to the South Crossing location. Given the land uses, providing improved crossing conditions could be expected to “induce” a substantial increase in crossing activity. In-pavement flashers are therefore considered to be warranted.

TABLE 7: US 101 Potential Pedestrian Crossing Treatments

Pedestrian Crossing Treatment	South Section ¹	North Section ²
Peak Pedestrian Volume (Ped. / hour) ³	4	25
Crosswalk Warrant Volume	No minimum pedestrian volume warrant specified.	
Pedestrian Crossing Warning Beacon	No minimum pedestrian volume warrant specified.	
In-Roadway Warning Lights	40	40
<u>Signal Warrant Volume</u>		
- 4-hour	75	75
- 1-hour	93	93
<p>NOTE 1: The south section refers to the location along US 101 between the Lighthouse Inn and the Best Western Northwoods Inn.</p> <p>NOTE 2: The north section refers to the location along US 101 between Pacific Terrace Manor and Shagri-La Trailer Court.</p> <p>NOTE 3: Pedestrian volumes are based on pedestrians counts conducted on October 12-13, 2009.</p> <p>NOTE 4: Warrants for the pedestrian hybrid beacon are listed under "guidance" in the MUTCD and are therefore subject to modification based on engineering judgment.</p> <p>NOTE 5: High Intensity Activated Crosswalk (HAWK) not included as it is not included in the current California MUTCD.</p>		
<i>ped volume warrant.xls</i>		

Pedestrian Hybrid Beacons

Pedestrian hybrid beacons (also known as High Intensity Activated CrossWalk or HAWK beacons) are a new addition to the 2009 version of the Federal MUTCD that provide a protected crossing for pedestrians. However, the California Manual on Uniform Traffic Control Devices for Streets and Highways, as applied by Caltrans, has yet to be amended to reflect this recent federal change. The hybrid beacon is so-named as it combines the warning aspects of a flashing beacon with the regulatory aspects of a traffic signal. The hybrid pedestrian beacon includes a regulatory red indication, but is not as restrictive to vehicles as a full traffic signal. The hybrid beacon signal consists of overhead mounted signal heads for vehicles and pedestrian signal indications. The top row of the signal indications contains two adjacent red displays and below there is a single yellow indication.



C. Illustration of Use

Figure 2 below shows the phase sequence for the HAWK pedestrian beacon. Figure 3 is an installation in Tucson, AZ.



Courtesy of Richard Nassi, City of Tucson, AZ

Figure 2: HAWK Beacon and Pedestrian Signal Indications

Hybrid beacons rest in a dark mode with the pedestrian indication displaying “Don’t Walk” until a pedestrian activates the beacon. Once activated, the hybrid beacon sequences through four phases:

1. The first phase is a flashing yellow which is to alert drivers that the signal has been activated.
2. This phase is followed by a solid yellow phase.
3. The third phase is a solid red phase, during which a “Walk” phase is displayed to pedestrians.
4. The last phase is a flashing red phase for vehicle traffic and a flashing “Don’t Walk” phase for pedestrians.

After this final pedestrian clearance interval, the hybrid beacon returns to the dark mode.

The NCHRP Report studied hybrid beacons located at both four-lane and six-lane roadways. At both sites, the study reported over a 95 percent driver yielding rate, consistent with other pedestrian treatments that include a solid red indication. One of the advantages of the hybrid beacon is the flashing red phase. During this phase, vehicles can proceed through the crosswalk after stopping, if the crosswalk is clear. This condition reduces delay to vehicles significantly compared to a full midblock pedestrian signal, for which vehicles are lawfully required to remain stopped for the full pedestrian clearance interval, even if there are no pedestrians remaining in the crosswalk. Casual observations of the operation of the signals in Tucson, Arizona, where pedestrian hybrid beacons have been in use for the last decade, have shown that the signals provide an efficient means for pedestrians to cross wide high volume roadways without creating excessive delays to vehicle traffic.

Full Pedestrian Traffic Signal

The use of a full traffic signal at a midblock pedestrian crossing locations is governed by the Pedestrian Volume Warrant (Warrant 4) in the California MUTCD. A full traffic signal at a pedestrian crossing location is a very restrictive traffic control measure and therefore, requires a high pedestrian crossing volume to justify. The California MUTCD contains both a 4-hour pedestrian volume warrant and a peak hour pedestrian volume warrant. The warrants are based

on a curve such that lower vehicle traffic volume would require higher pedestrian crossing volumes to warrant the traffic signal. Both warrants may be reduced to 70 percent levels for locations where the posted speed limit is greater than 35 mph.

Table 7 displays the minimum pedestrian crossing volumes, based on vehicle traffic, under both the 4-hour and peak hour warrants for both the north and south section in Crescent City. As shown, the crossing demand is far below the minimum pedestrian crossing warrant values for both sections in Crescent City. Therefore, the use of a full traffic signal is not appropriate at midblock crossing locations in Crescent City.

RADAR Vehicle Speed Feedback Sign

Another potential strategy to improve crossing conditions by reducing vehicle speeding is to deploy vehicle speed feedback signs. Also known informally as “Radar Speed” signs, these signs employ RADAR technology to provide a real-time speed to oncoming drivers. They have proven to reduce speeds substantially (1 to 10 mph), depending on the posted speed limit and the original vehicle speeds. While Caltrans does not have specific warrants regarding where Vehicle Speed Feedback signs are appropriate, other jurisdictions consider the history of speed-related accidents, as well as the 85th percentile observed travel speed compared with the posted speed limit. As examples, the State of Vermont requires 85th percentile speeds at least 3 mph higher than the posted speed, while the City of Bellevue, Washington requires a 10 mph speed differential.

In the study area, the greatest speed differential (85th percentile speed minus the posted speed) is observed to be 6 mph in both the North and the South Corridor. As speeds are not unduly high and as accident rates are also not unduly high, the benefits from Vehicle Speed Feedback signs do not appear to warrant the capital or ongoing maintenance costs in the study area.

REVIEW OF POTENTIAL STRATEGIES

Based on the evaluation of existing conditions presented in this document, an initial list of potential options was developed. As shown in Table 8, there are a wide range of options available to address traffic calming issues. However, several are not appropriate for the study corridors:

- Those that result in vertical deflection of vehicles are not appropriate along US Highway 101 due to its function as a high-volume regional travel route.
- A roundabout is not appropriate within the study corridors, as there are no locations where minimum warrant volumes for a traffic control device are met.
- Rumble strips are not appropriate due to the presence of nearby residential and lodging properties that would be impacted by the noise generated by rumble strips.
- Pedestrian activated warning beacons as a stand-alone option (not installed as part of an in-roadway warning light system) are only allowed under the California MUTCD at a school crossing (which neither location is considered).

In addition, a pedestrian hybrid beacon would only be feasible if future changes to the California MUTCD were to allow it.

TABLE 8: POTENTIAL TRAFFIC CALMING STRATEGIES

■ ■ = Strong Benefit
 ■ = Moderate Benefit
 □ = Little/No Benefit

Types of Measures	Type of Traffic Related Concern			Potentially Applicable in Study Area?
	Speeding	Vehicle Collisions	Pedestrian / Bicyclist Safety	
Non-Physical Control Measures				
Speed Feedback Sign	■ ■	□	□	Yes
Optical Speed Bars	■	□	■	Yes
Signage	■	■	■	Yes
Speed Legend	■	□	□	Yes
Centerline Botts Dots	□	■ ■	■	Yes
Colorized Pavement	■	□	■	Possibly
High Visibility Cross Walks	■	□	■ ■	Yes
Pedestrian Activated Warning Lights	■	□	■	No
In-Roadway Warning Lights	■	□	■ ■	Yes
Pedestrian Hybrid (HAWK) Beacon	■	□	■ ■	Not Currently
Speed Control - Narrowing Measures				
Neckdown/Bulbout	■ ■	□	■ ■	Possibly
Center Island Narrowing/Pedestrian Refuge	■ ■	■	■ ■	Possibly
Gateway/Landscaping	■ ■	□	■	Possibly
Speed Control - Horizontal Measures				
Roundabout	■	■ ■	□	No
Speed Control - Vertical Measures				
Raised Crosswalk	■ ■	■	■ ■	No
Raised Intersection	■ ■	■	■ ■	No
Textured Pavement	■	□	■	Possibly
Rumble Strips	■	□	□	No

Section VI

Gateway/Traffic Calming Plan

Based on the goals of the study, evaluation of existing conditions, and assessment of potential alternatives, the following plan is recommended.

OVERALL STRATEGY

Arrival Experience

One of the main goals of the study is to provide an improved arrival experience for drivers as they enter the developed Crescent City area. The existing “Welcome to Crescent City” signs are overshadowed by built form and a clutter of regulatory signage, business signage, and intersection infrastructure, as outlined in the existing conditions report. They are located well within the boundaries of the City and are easily overlooked by arriving drivers. To be effective and present the overall community in the best light, the gateway experience should be on the edges of the City as a way of informing residents and visitors they are entering Crescent City. There are three main goals that guide the gateway design and placement:

1. Provide a sense of transition from natural environment to built environment.
2. Define appropriate locations for gateway treatments that signal to drivers entering the community that they have arrived.
3. Provide traffic calming measures on the approaches to the City that improve pedestrian and bike safety.

Design Principles

With the long undeveloped approaches into Crescent City, the opportunity for a transition from the rural environment to the built environment can provide a sequence of elements that contribute to the overall entry experience resulting in a positive impression. The elements used in the gateway design can establish a palette of materials to bring consistency throughout the area and may influence a way-finding program focused on improving legibility in the urban area and highlight Crescent City’s attractions and public facilities. A number of design principles can be employed in meeting the objectives of this project and providing a solid foundation that can be built upon.

Sequence

- Provide a sequence and hierarchy of entry experiences to help the driver identify they are entering a community and make the transition from a highway environment to a community environment.
- Identify an appropriate location(s) for a gateway treatment where they are separated from the clutter of regulatory and advertising signage on the edges of the urban environment.

- Provide traffic calming in close proximity to a gateway so the driver can recognize the community and respond to the traffic calming measures, improving bicycle and pedestrian safety

Materials and Form

- Gateways need to be designed and legible from the drivers perspective
- Explore the type of gateway most appropriate
- Develop a consistent “family of elements” that can be used in gateway elements compatible with other themes throughout Crescent City
- Use materials for gateway elements and signage that have relevance to the culture, history, and natural resources of Crescent City
- Use regionally appropriate plant species and compositions
- Keep outside of Caltrans clear zones with any structures and trees
- Ensure the location and design meets California Coastal Commission requirements

The Study Team identified two potential gateway locations on the south and north end of town which are described below. These should all be developed to achieve the sequential experience identified as important for the project.

Gateway Sequence

To implement these design principals, the Study Team recommends a sequence of three gateway treatments. As a driver arrives in the Crescent City area, they would be greeted by the following:

- A “Regional Gateway” that provides an initial indication that the community is coming up as well as a positive first impression of Crescent City. This consists of a sculptural element and landscaping, but does not include signage.
- A “Welcome Gateway” that focuses on a relocated “Welcome to Crescent City” sign, along with landscaping elements. Optimally, the existing signs would be removed.
- A “Traffic Calming Gateway” that encourages reduction in travel speeds to levels appropriate for the urbanized area and that improves pedestrian and bicycle conditions, using techniques presented below.

Regional Gateways

The first gateways on approach to the southern and northern edges of Crescent City (as shown in Figures 18 and 19) are located in a rural environment before arriving in the built environment of the City. These locations provide the opportunity to introduce the region and provide a sense of entry as one starts to make the transition from the natural environment to the City limits. The treatment of these gateways should consist of vegetation appropriate to the region, consisting of

FIGURE 18
SOUTH GATEWAY STRATEGY

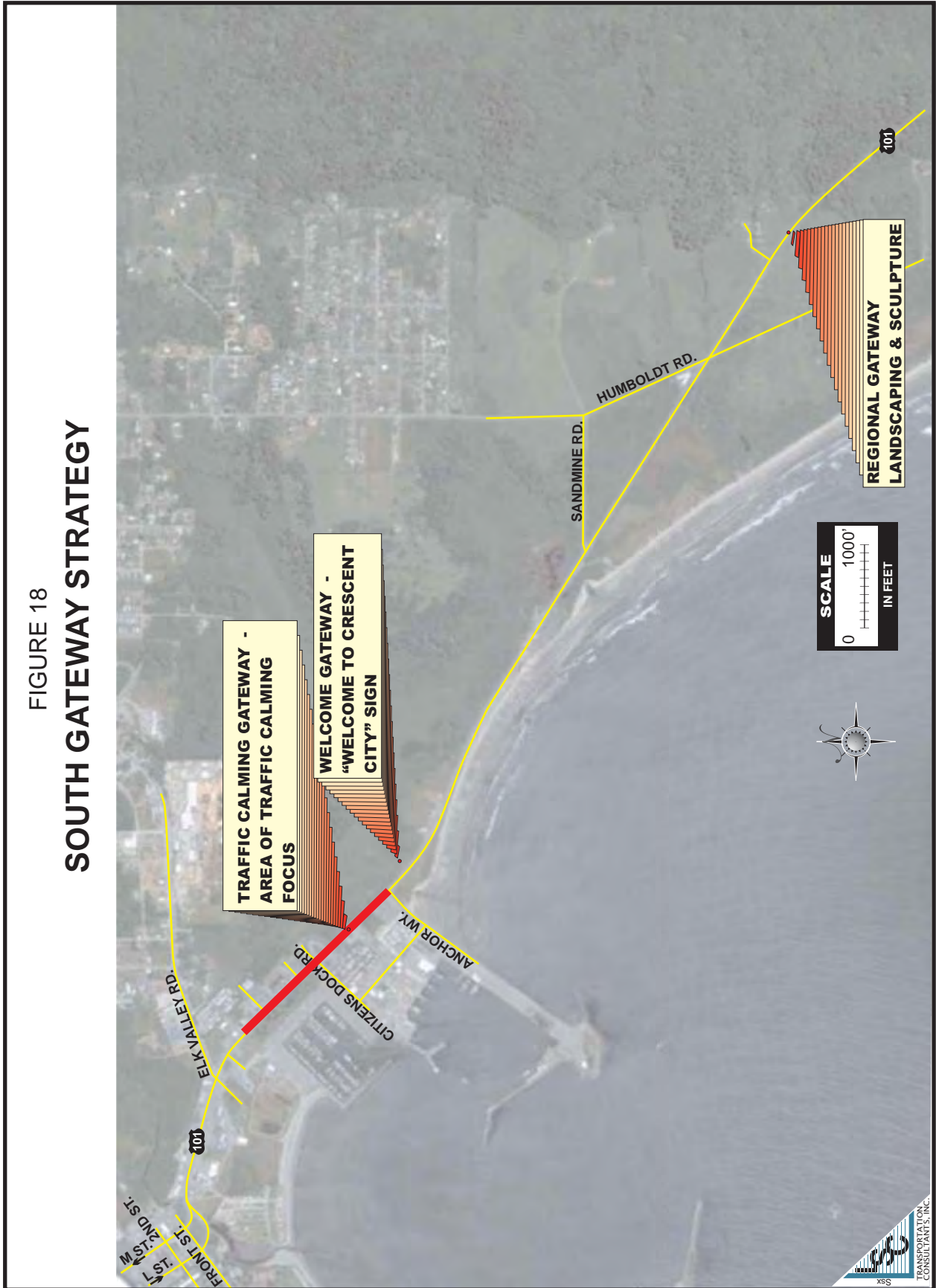
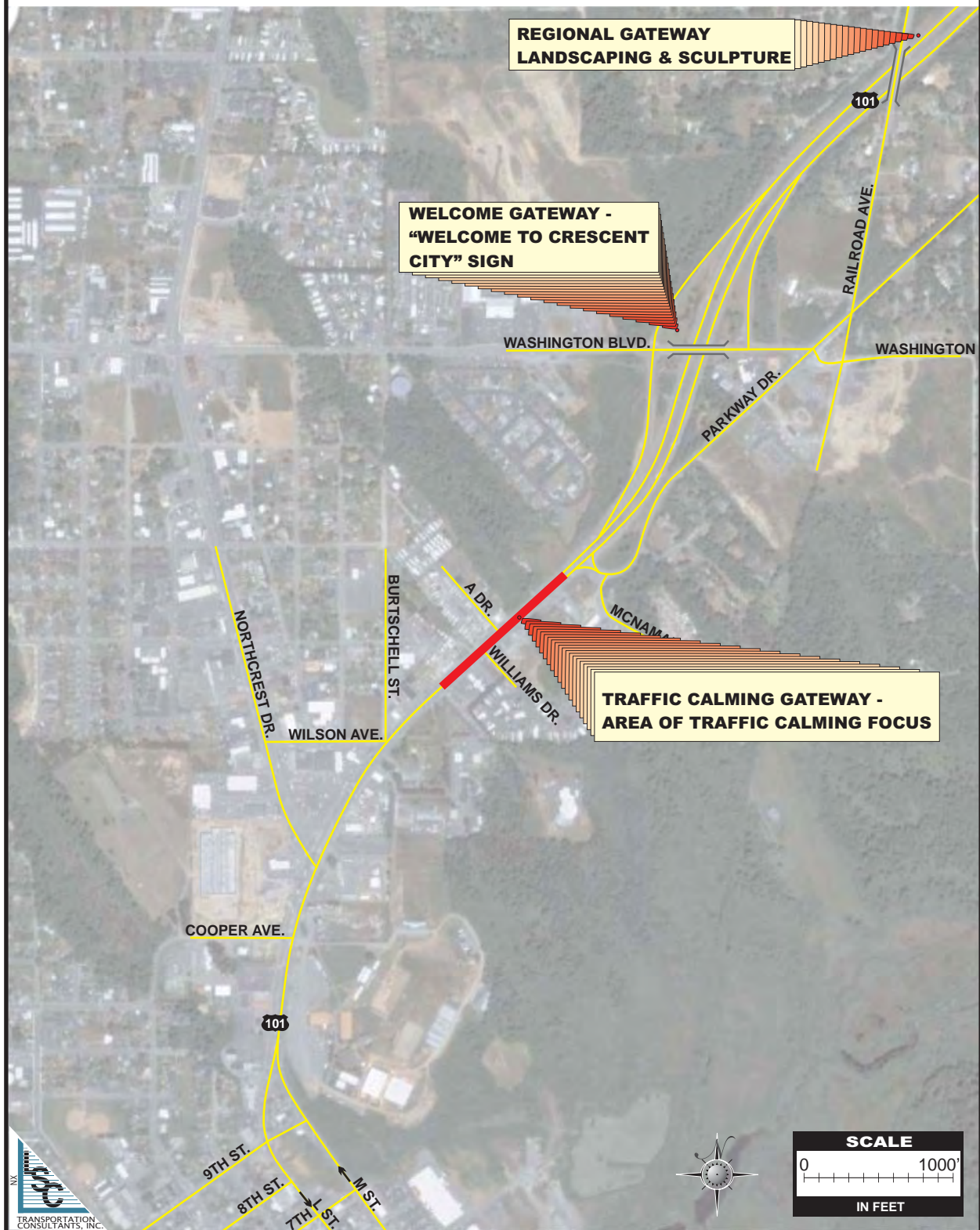


FIGURE 19
NORTH GATEWAY STRATEGY



both trees and shrubs conforming to the Caltrans clear zone requirements as described below for each location. The vegetation can provide a background or a frame for a simple sign and/or a sculptural element that leaves a lasting impression.

The selection of a specific sculptural element for these Regional Gateways should be conducted by local artists and community leaders. Good examples of such elements chosen over recent years in other communities are shown in Figure 20. As indicated, the best Regional Gateway elements are usually not a direct literal reference but rather draw from an idea to make a more abstract reference to a community's character. Crescent City's geographic location, cultural history and/or natural resources are themes that can provide a place-specific reference of which residents feel proud. Examples of these include:

- coastal location with tall cliffs, small buildings, and redwoods
- the coast and the lighthouse
- the harbor and the fishing industry
- logging history
- the redwoods – their size and grandeur
- elks
- the construction of the harbor – the white concrete dolos

Materials used for the Regional Gateways should draw from the theme chosen and be resilient to coastal environmental conditions. For example, the use of redwood as a theme can reflect the natural environment or embrace the importance the timber industry played in the establishment of Crescent City. Metal can be used in a variety of ways providing volume silhouettes with color and graphics and will weather naturally. The scale needs to respond to the setting and the driving speed of the vehicle.

Welcome Gateways

These locations mark the entrance to the City and are located so they are clearly visible and not competing with regulatory signs, advertising signs, and traffic signals. A signage component saying "Welcome to Crescent City" or just "Crescent City" is appropriate and is not intended to identify the jurisdictional "City Limits." Existing "Crescent City" monumental signage would optimally be removed.

The signage component could incorporate elements that link to the Regional Gateways in terms of theme without necessarily being a smaller version of the same idea. The design can also incorporate the style already established for the welcome signs currently located within the City if desired. Whatever approach is taken, it should be consistent on both ends of town. Similar to the Regional Gateways, materials used should reflect the materials that are indigenous to the region. Elements include:

- Low to medium sized planting
- Signage component "Welcome to Crescent City"
- Potential sculptural element that links to Regional Gateways
- Designed along with traffic calming strategies

FIGURE 20
EXAMPLES OF REGIONAL GATEWAY SCULPTURES IN OTHER COMMUNITIES



Traffic Calming Gateways

Finally, each entrance would have a “Traffic Calming Gateway” where various techniques would be used to slow traffic to a speed appropriate for an urban setting, and where pedestrian/bicyclists would be accommodated. As discussed in detail in subsequent sections, these techniques focus on the provision of raised medians, as well as enhanced pedestrian crossings.

SOUTH GATEWAY

Regional Gateway and Welcome Gateway

The South Regional Gateway should be located at the base of the hill after travelers have caught a glimpse of the ocean and Crescent City in the distance. This placement will ensure that their view will not be restricted by vegetation once they have descended further into the valley.

The “Welcome to Crescent City” Gateway should be located south of Anchor Way, catching attention before drivers transition into the urban, built environment. This is the point where drivers first experience urban land uses directly along the roadway and where the first reduction in speed limit occurs. In addition, the bend to the right increases the effectiveness of gateway landscaping – by putting a raised median directly in the driver’s line of sight. There is also an opportunity to provide landscaping on the edges of the highway and improve the aesthetic appeal of the stretch of park adjacent to the harbor.

Figure 21 presents a plan for this area, while Figure 22 presents a perspective of the driver’s view. This plan includes a raised median island along the portions of the existing striped left turn bay island with at least 6 feet of width outside the travel lanes. This provides an island approximately 145 feet in length, with a minimum width of 4 feet on either end and a maximum width of 10 feet. A 1-foot curb-and-gutter is also provided around the island. Note that travel lanes are not realigned.

In both locations on the south end of town, for a discretionary object such as a gateway element, Caltrans desires a minimum of 52 feet from the edge of travel lane pavement (which can be reduced somewhat if natural grade allows the object to be above the roadway). At the Welcome Gateway, Del Norte owns a “paper street” right-of-way that provides a good location for the object at least 52 feet from the edge of pavement (between the existing Denny’s and All Star Liquor signs). At the Regional Gateway location, there is not sufficient right-of-way width to provide a site within Caltrans right-of-way, nor is there other public right-of-way. Land would need to be obtained through purchase or long-term lease.

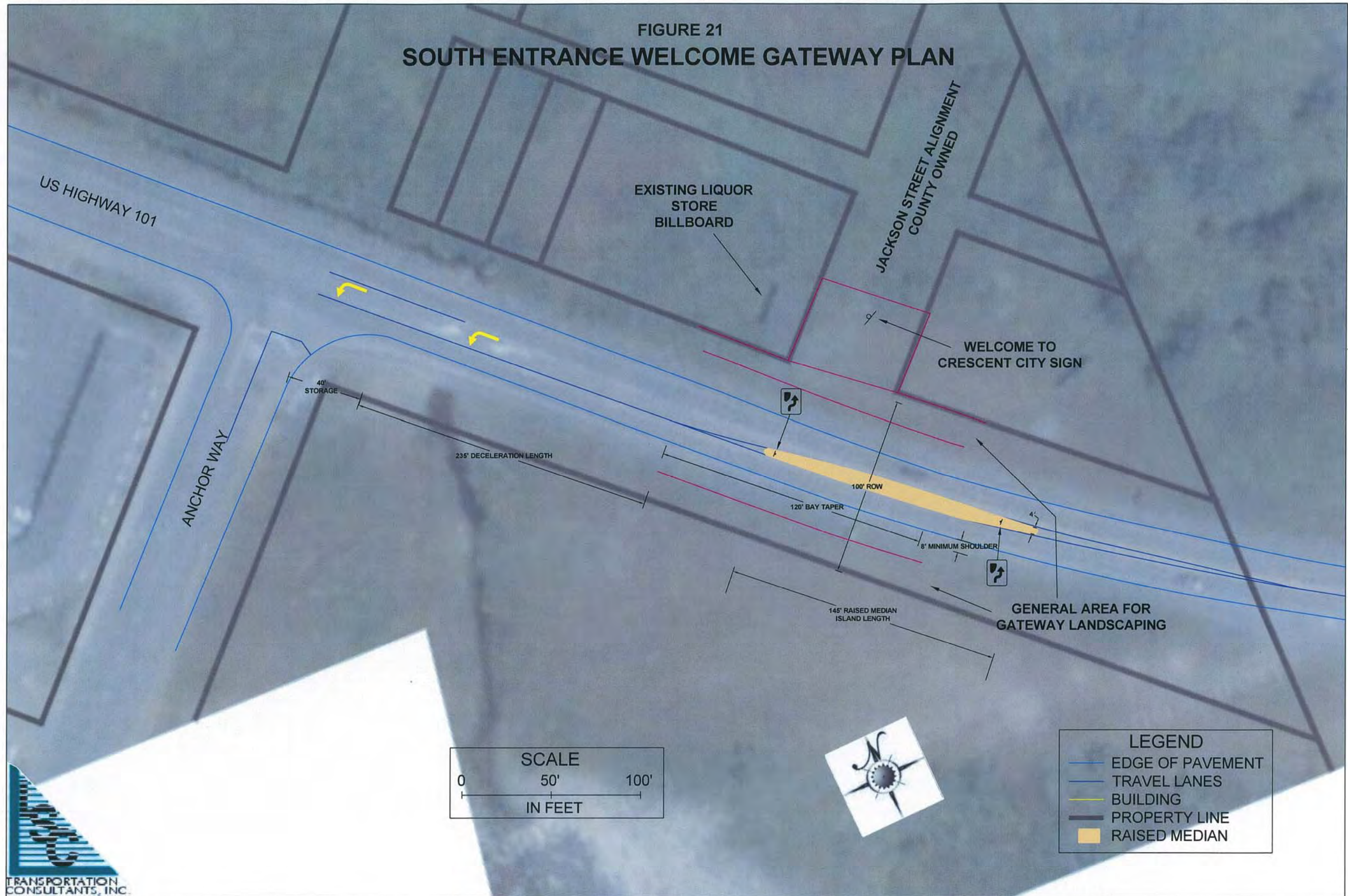
TRAFFIC CALMING GATEWAY

As shown in Figure 23, the planned area of gateway roadway modifications for drivers entering Crescent City from the south focuses on the segment between the beginning of the three-lane cross section just south of Anchor Way on the south and Elk Valley Road on the north. This focus reflects the following factors:

- The observed speeding, as reflected in the differential between the 85th percentile speed (44 mph) and the posted speed limit (40 mph).

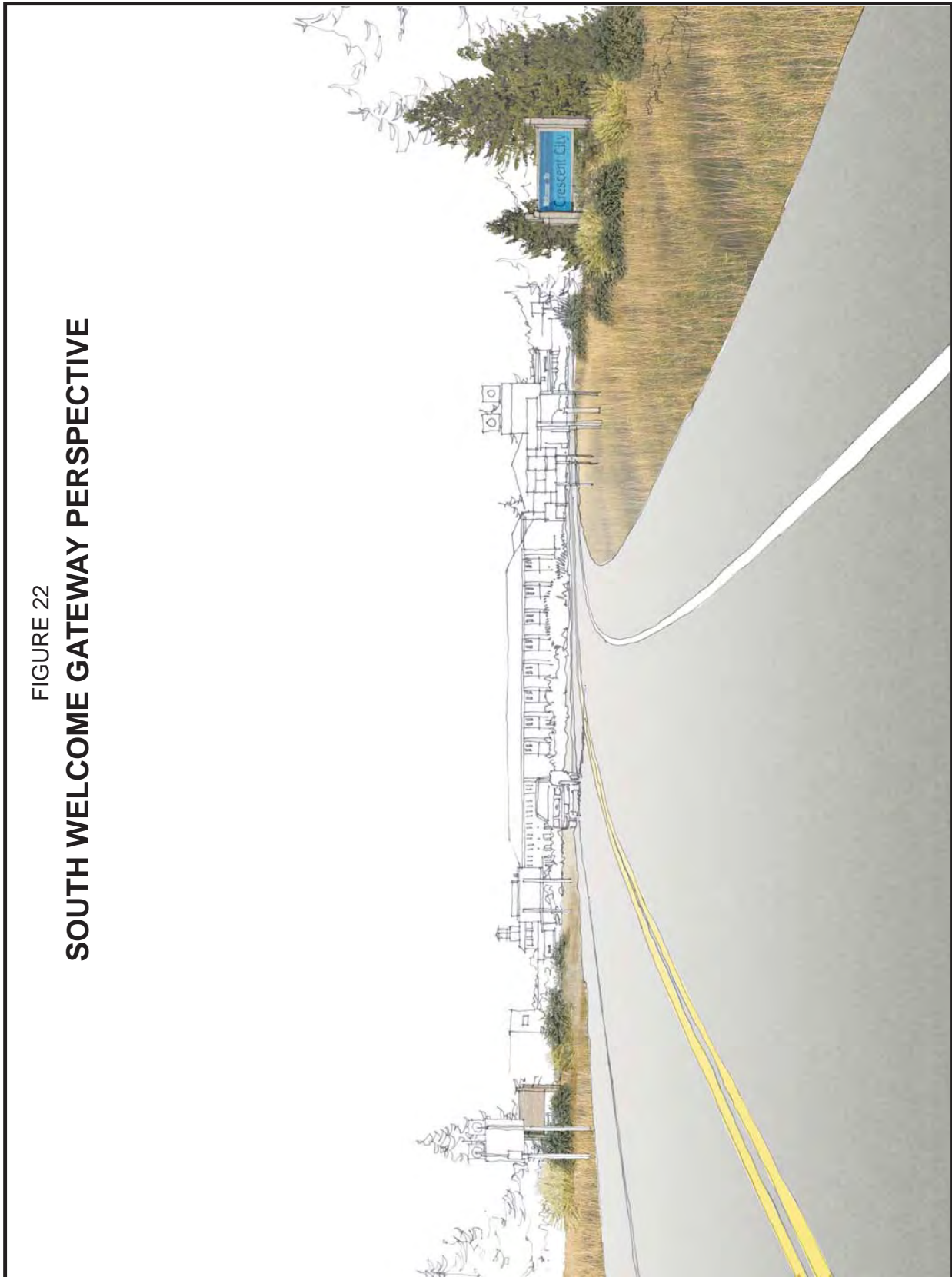
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FIGURE 21
SOUTH ENTRANCE WELCOME GATEWAY PLAN



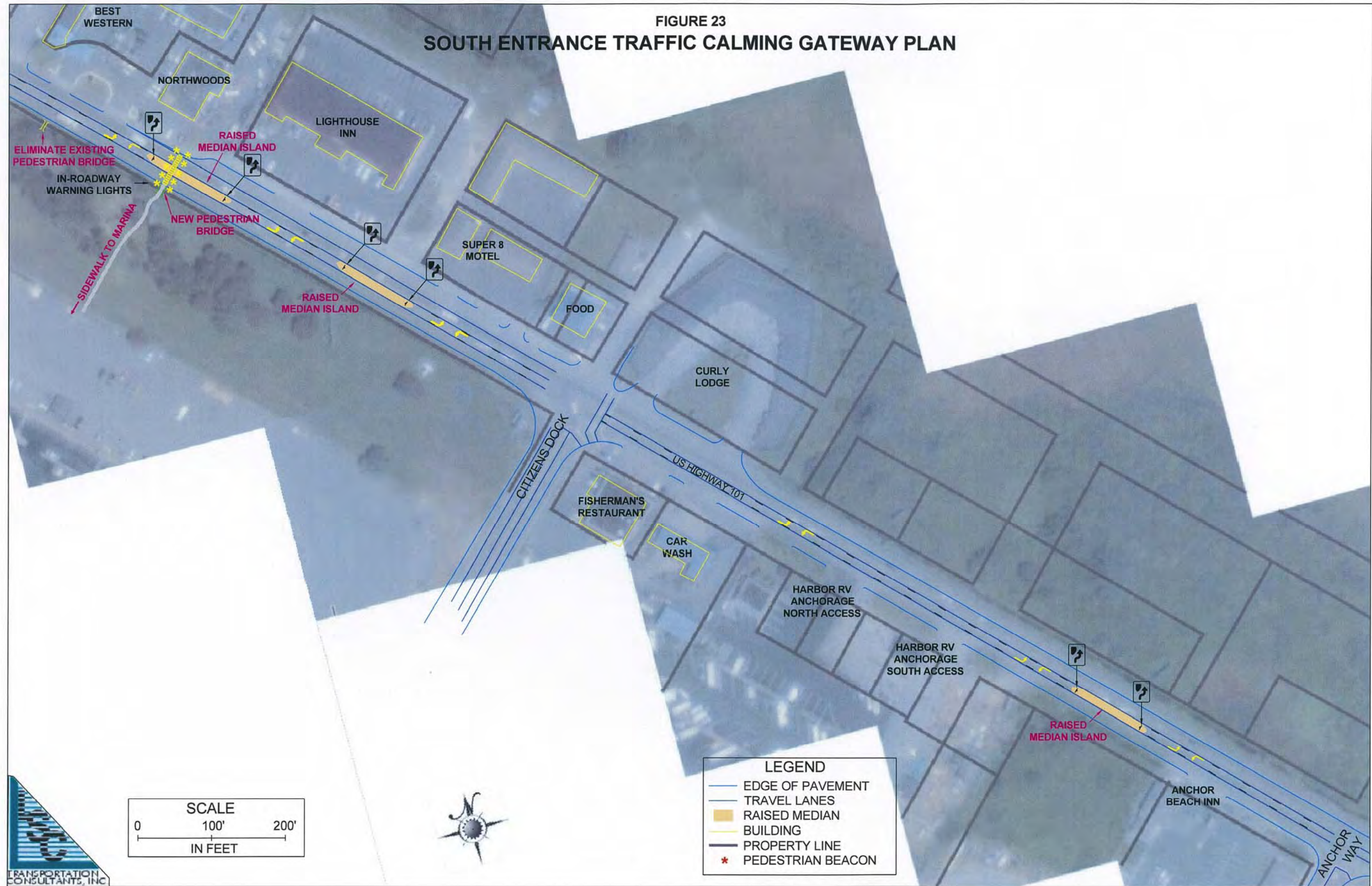
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FIGURE 22
SOUTH WELCOME GATEWAY PERSPECTIVE



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FIGURE 23
SOUTH ENTRANCE TRAFFIC CALMING GATEWAY PLAN



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- The relatively high level of pedestrian activity crossing US Highway 101 (compared to other nearby segments) and lack of crossing protection (south of the Elk Valley Road signal).
- The commercial land uses along the roadway.

As discussed in Section II, above, this roadway segment does not have an unduly high rate of collisions, either among motorists or among pedestrians and bicyclists. Rather than addressing a significant existing traffic safety issue, this traffic calming strategy is intended to encourage reduced travel speeds for motorists traveling through and beyond the gateway area while also improving bicycling and pedestrian conditions.

Pedestrian Crossing/Median

A recommended improvement for the South Entrance is to provide an enhanced pedestrian crossing of US Highway 101. A review of the pedestrian activity indicates that there is a relative concentration in the vicinity of the Best Western, roughly midblock between Citizens Dock Road and Elk Valley Road. At this location, there is a section of pipe which provides a pedestrian bridge across the drainage ditch that parallels US Highway 101 on the west. At least some of the pedestrians at this location appear to be guests of the motels along the east side of the highway that walk to the marina on the west side, as well as boaters that walk to the restaurants along the east side.

While there are no driveways along the west side of US Highway 101 in this area, it is important to provide a crossing location that minimizes impacts on the driveway movements on the east side. This area was originally platted as a series of blocks formed by east-west streets, most of which were never built. As an example, there is a “paper street” right-of-way designated as “Rees Street” between the Northwoods Restaurant and the Lighthouse Inn to the south. This space is currently graveled and is used as an informal access to the rear parking area of the Best Western and could easily be closed or limited to right-in/right-out only. Excluding this, there is a length of 220 feet between the south end of the southernmost Best Western/Northwoods Restaurant access point on the north and the north end of the Lighthouse Inn access point on the south.

As shown in Figure 23, a raised median island is recommended in this area approximately 100 feet in length. This would provide approximately 70 feet to the north that could be used for two-stage left-turn movements out of the Best Western/Northwoods Restaurant driveway. It would also provide approximately 100 feet of center two-way left turn lane that could be used for a short deceleration and storage lane for southbound left turn movements into the Lighthouse Inn (including the usable length along the existing curb cuts). This island would be approximately 10 feet in width, with 1-foot curb-and-gutter outside of the existing through travel lanes.

This island should then be used as part of an enhanced pedestrian crosswalk. It is recommended that a marked crosswalk be installed with pedestrian refuge island constructed in the two-way left-turn lane. At a minimum, the crosswalk should be supplemented with advance warning signs and yield pavement markings. The use of in-roadway warning lights with trip-beam pedestrian activation is also recommended, in order to provide a higher level of visibility of the crossing. The in-roadway warning lights could also be augmented by roadside flashing beacons. This strategy is appropriate given the level of traffic and pedestrian activity at the location, as pedestrian volumes do not warrant more aggressive forms of crossing protection.

In addition, this crosswalk should be provided with “International style” crosswalk pavement markings consisting of stripes parallel with the travel lanes, as well as street lighting to increase visibility at night.

A perspective of this pedestrian crossing is shown in Figure 24. As part of this plan, a short new pedestrian bridge should also be provided across the drainage ditch, as well as a paved path to the marina parking lot. The existing pedestrian bridge over the section of culvert pipe (in poor condition) would be removed.

This plan element provides several advantages:

- It would be a benefit to motel guests staying at the Best Western, Lighthouse Inn, and Super 8 Motel that wish to walk to the marina or use the park area along the west side of US Highway 101.
- It would be a benefit to marina boat owners, crew, and visitors that dine at the restaurants on the east side of US Highway 101, or stay overnight at the motels.
- It would tend to slow traffic speeds by up to approximately 3 miles per hour.
- While there has not been any recent history of collisions involving pedestrians or cyclists crossing US Highway 101 in this vicinity, the raised median would enhance pedestrian safety and encourage additional non-auto travel.

This alternative would not provide a full deceleration lane for the southbound left turn movement into the Lighthouse Inn motel. The disadvantage of this is that drivers following closely behind the left turning vehicle would need to slow to roughly 5-10 miles per hour. This can be an inconvenience and can increase the risk of collisions.

A good guide to whether this condition is acceptable is to consider whether this access point warrants a left turn lane. Caltrans normally establishes the need for left turn lanes based on *Guidelines for Reconstruction of Intersections* published in August 1985 by Caltrans. For the hourly volumes in each direction occurring in the peak hour along US Highway 101 between Anchor Way and Elk Valley Road, Table V-1 of the document indicates that a left turning volume of at least 32 vehicles per hour is necessary to warrant a left turn lane. Below this volume, it can be inferred that the document indicates that acceptable traffic conditions can be maintained with a raised median (barring any site-specific characteristics or history that indicates a relatively high potential for collision).

Counts conducted at the Super 8 Motel driveways as part of this study indicated a maximum of only a few southbound left turn movements per hour. As these counts were not conducted during the peak tourism season, however, a better measure of potential traffic volume can be estimated using standard trip generation rates. The Institute of Transportation Engineer’s *Trip Generation* indicates that the inbound trip-generation rate of a motel is 0.34 vehicle-trips per occupied motel room during the PM peak hour of the busiest day of the week. Multiplied by the total number of rooms at the Super 8 Motel (49), the motel generated a maximum of 17 inbound trips per hour. The existing driveway counts at the lodging properties along this block indicate that roughly 80 percent of traffic is distributed to/from the north. The maximum southbound left turn movement into the Super 8 Motel is therefore approximately 14 vehicles per hour, or 55 percent of the volume needed to warrant a left-turn lane. It can therefore be concluded that the access condition with the raised pedestrian island (requiring much of the deceleration to occur

**FIGURE 24
PEDESTRIAN CROSSING IN SOUTH TRAFFIC CALMING AREA**



in the southbound through travel lane, but providing median space to allow vehicles to wait for an adequate gap in northbound traffic without further impeding southbound traffic flow) is acceptable.

Other Recommended Medians

In addition to the pedestrian crossing/median presented above, the following additional median islands are recommended, as shown in Figure 23:

- **Between Lighthouse Inn and Super 8 Motel** – There is a similar “paper street” between the Lighthouse Inn and Super 8 Motel (originally platted as “Tower Street”) that does not have an existing curb cut. As a result, there is approximately 200 feet between access points. A raised median island approximately 100 feet in length should be provided. This provides approximately 90 feet to the north allowing two-stage left-turn movements onto southbound US Highway 101 from the Lighthouse Inn, as well as approximately 50 feet to the south providing southbound left turn storage for movements into the Super 8 Motel (but not deceleration outside of the southbound through travel lane). Applying the methodology discussed above regarding the pedestrian crossing, the 49 rooms at the Super 8 Motel would generate a maximum of 14 southbound left turning vehicles per hour. Compared with the 32 needed to warrant a left-turn lane, this indicates that the resulting access condition is acceptable.
- **Between Anchor Beach Inn and Harbor RV Anchorage** – This median is between the Anchor Beach Inn on the south and the two access points to the Harbor RV Anchorage on the north. The more southern of these access points also provides access to the Harbor View Grotto Restaurant. Counts conducted as part of this study in October 2009 indicate low northbound left turning volumes at these access points (less than 10 vehicles per hour), though volumes are probably higher in the summer tourist season. This median design allows a full northbound deceleration lane (below 30 mph), a 40-foot median storage length and a short (60-foot) bay taper for the northern Harbor RV Anchorage access point. It also provides approximately 120 feet of center median space for left-turn movements into the southern Harbor RV Anchorage access point, which would require most deceleration to take place in the northbound through travel lane but which would also allow vehicles to wait for a gap in the southbound travel stream outside of the northbound lane.

On the south, this design provides 100 feet of median space north of the Anchor Beach Inn access point, to allow two-stage left-turn movements onto US Highway 101 as well as a short acceleration section. The resulting median is approximately 110 feet in length.

This design would allow deceleration for northbound left-turn movements into the northern Harbor RV Anchorage (below 30 mph) access point. It would allow median storage and deceleration below roughly 5-10 mph for the southern point. Information counts conducted by LSC as part of this study indicated very low left-turn volumes into this access point (only a few vehicles per hour), though these volumes are undoubtedly higher during the summer. However, a review of the left-turn lane guidelines in Caltrans’ *Guidelines for Reconstruction of Intersections* indicates that a full left-turn lane is not warranted until the northbound left-turn volume exceeds approximately 90 vehicles per hour. It is extremely doubtful that volumes reach close to this threshold.

An analysis was conducted regarding whether this island would potentially conflict the provision of a traffic signal at the US Highway 101/Citizens Dock Road intersection, as identified in the *Harbor District Master Plan*. Assuming no change from the existing roadway geometrics, the 95th percentile northbound left turn traffic queue would remain substantially less than the existing 750 feet between the north end of the island and the intersection.

In addition, the pedestrian crossing raised median and the south Welcome Gateway options discussed above could effectively function as additional raised medians, yielding a potential for up to four raised median islands along the South Entrance corridor.

Pedestrian/Bicycle Improvements

A sidewalk is recommended along the east side of US Highway 101 between Elk Valley Road on the north and Citizens Dock Road on the south, reflecting the developed nature of the adjacent parcels. The only missing segment is at approximately 388 US Highway 101 (the vacant parcel just south of the Dive Shop), where a sidewalk approximately 100 feet in length should be constructed. On the west side of US Highway 101 through the traffic calming section, pedestrians can be accommodated within the Harbor area.

South Gateway Traffic Calming Alternatives Considered But Not Included in Plan

Several other potential traffic calming strategies were considered as part of this study, but not included as recommendations in the plan:

- An additional potential median Island was considered for the 404 to 438 US Highway 101 block. This segment includes the Robins Nest Antiques building on the north to the parcel just north of the Best Western (where a building was recently demolished) on the south. It also includes a small two-story structure currently for sale. The north end is formed by King Street, while the south end is the alignment of “Thompson Street” (another paper street). This block currently has a total of five access points onto US Highway 101, within a length of roughly 300 feet, and the land uses are very much underutilized. Within the existing right-of-way, it would be possible to provide a two-way frontage road. This would provide full access to these properties both on the north and the south (at King Street and Thompson Street), but would allow the other four access points to be closed. This in turn would allow a raised median island approximately 150 feet in length to be provided, along with 50 feet of center two-way left-turn lane on the north to allow two-stage left-turn movements from King Street, as well as approximately 80 feet on the south to allow median storage for southbound left turn movements into “Thompson Street.” Providing this short frontage road would require planning and implementation by a public agency (such as Del Norte County). It would reduce the effective available parking in the area (though at present, parking demand appears to be very low). While it could potentially provide opportunities for beautification and redevelopment of this roadway segment (as well as the traffic calming benefits of a median), this would be a particularly challenging improvement to implement.
- Consideration was also given to gateway treatment of the Sandmine Road/US Highway 101 intersection, but not taken further. First, while there is a relatively high collision rate compared with statewide averages for similar facilities, a review of the collisions does not indicate a clear pattern by which the existing geometrics of the intersection are contributing

to these collisions. Secondly, due to the distance between this intersection and the commercial built-up areas (0.9 miles), little if any of the speed reduction that a gateway treatment at Sand Mine Road would generate would persist as far as the commercial uses.

- A sidewalk was considered along the west side of US Highway 101 between Anchor Way and Citizens Dock Road, which could serve the Anchor Beach Inn. However, existing pedestrian activity along this corridor segment is low (on the order of 20 pedestrians per day), and the roadways and parking lots internal to the harbor area provide a viable alternative to walking along the busy highway.
- Finally, possible improvements to the Citizens Dock/US Highway 101 intersection were considered. At present, a traffic signal is not warranted by existing traffic volumes, nor is a crosswalk warranted by existing pedestrian volumes. While both of these conditions could change in the future with implementation of the Harbor District Master Plan, any improvements at this intersection are much more a function of Harbor development than they are a function of gateway/traffic calming goals along US Highway 101. Timing of any improvements should be dictated by progress in achieving the Harbor District Master Plan. However, it is important to note that the plan elements do not conflict with potential future improvements at this intersection.

NORTH GATEWAY

North Corridor Regional Gateway and Welcome Gateway

The Regional Gateway should be located just north of the Railroad Avenue overpass. Approximately 100 feet to the north of the overpass structure there is an existing “cove” in the vegetation that provides a good site approximately 50 feet from the edge of the travelled way and 6 feet above the elevation of US Highway 101. This location well before the exit ramp to Washington Boulevard, to key people in to the fact they are entering the community.

The “Welcome to Crescent City” Gateway should be located just north of the Washington Boulevard overpass, approximately 100 feet north of the structure and 50 feet west of the southbound US Highway 101 edge of travelled way. The specific location should be defined considering the available existing nearby trees. This site allows the bridge to form a doorway into the community and ensuring it is clear that people are entering the urban area before they transition into the urban, built environment. The repetition of the two north entrance gateway elements adjacent to the two overpasses also helps to reinforce the message to the entering driver. Figure 25 presents a perspective view of this Gateway.

TRAFFIC CALMING GATEWAY

The key traffic calming area on the north entrance extends from the south end of the freeway configuration (just south of Washington Boulevard) to Burtshell Street. This is the segment where traffic speeds are substantially higher than the posted speed limit (a posted limit of 35 mph compared with an 85th percentile speed of 41 mph), and relatively high levels of pedestrian and bicycle crossing activity. As discussed in Section II, above, this roadway segment also has been the location for three collisions involving bicyclists and one involving a pedestrian over the past ten years.

FIGURE 25
NORTH WELCOME GATEWAY PERSPECTIVE



Pedestrian Crossing/Median

A review was conducted of all existing driveways along US Highway 101 between Northcrest Drive and Washington Boulevard. Locations were identified where it would be potentially feasible to prohibit left-turn movements (as volumes are very low, or where other access points are available to serve a specific property), or where access points could be moved. At current peak hour traffic levels, a left-turn lane is warranted once the left turning volume from the highway reaches 13 vehicles per hour. Below that, it is assumed that it is acceptable for left turns to be made from the #1 through travel lane. South of the Shangri-la Trailer Park main access, median areas sufficient to allow left turning drivers to decelerate below 30 mph outside of the through travel lanes (a minimum of 235 feet in length) were identified as being necessary for the following access points:

Northbound

- Crescent City Shopping Center Access Points
- Chevron Gas Station
- Wilson Avenue
- Burtschell Street
- Performance Fuels
- Shangri-la Trailer Park South Access
- Shangri-la Trailer Park South Access

Southbound

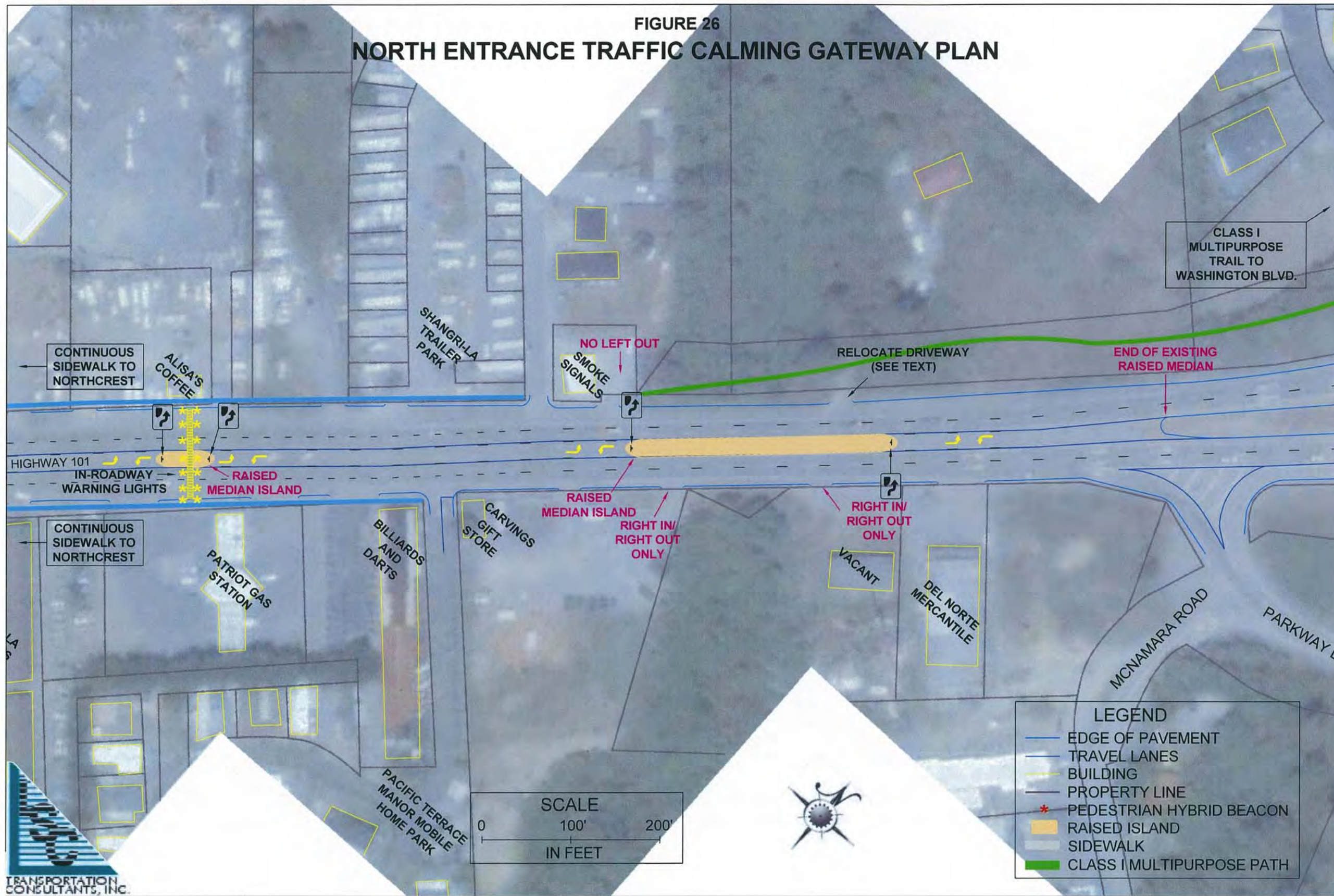
- Patriot Gas Station North Access
- California Department of Forestry
- Williams Drive

Once these areas of needed median left-turn lanes are linked up and added to the median space needed for other lower volume access points, the only opportunity for a short raised median south of Shangri-La was found to be between the two Patriot Gas Station access points (and the two Alisa's Coffee access points on the opposite side of the roadway).

As shown in Figure 26, a raised median with a pedestrian crossing should be provided across US Highway 101 at a point between the two Patriot Gas Station access points. This crossing would have the following characteristics:

- A raised center median island should be provided, approximately 50 feet in length by 13 feet in width, with an "at grade" center section to provide ADA access across the island.
- It is recommended that in-roadway warning lights be installed at this crossing location in accordance with the California MUTCD, Chapter 4L. This location does meet minimum recommended pedestrian crossing volumes corresponding to vehicle volumes and roadway width. Existing pedestrian/bicycle counts for this segment indicate up to 15 crossings per hour, which is below the minimum of 40 needed to warrant a hybrid signal. However, the existing poor crossing conditions of the five-lane roadway can be expected to dissuade some activity. An enhanced crossing would also tend to concentrate crossing activity north of the Northcrest Drive signal at this location. Given the land uses and transit stops on either side of the roadway, it is estimated that up to 40 crossings per hour would occur with a protected crosswalk, attaining the level needed to warrant a hybrid pedestrian signal.
- This crossing should also be lit by streetlights on either side of the highway and provided with advance pedestrian warning signs.

FIGURE 26
NORTH ENTRANCE TRAFFIC CALMING GATEWAY PLAN



TRANSPORTATION CONSULTANTS, INC.

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This plan element would not eliminate any movements into and out of the Patriot Gas Station or Alisa's Coffee. The majority of drivers that enter and exit to/from the north at the northern Gas Station driveway or either Alisa's Coffee driveway would not be impeded by this crossing. Similarly, the majority of drivers that enter and exit to/from the south at the southern driveways would not be impeded. For drivers entering the Gas Station from the north at the southern driveway, 50 feet of median would be available south of the island to wait for a gap in the northbound traffic. In addition, 50 feet of median north of the island would be available for drivers exiting the Gas Station to the south from the northern driveway to make a two-stage left turn by pulling into the median before accelerating into a gap in the southbound traffic.

Other Recommended Median

In addition to the pedestrian crossing/median presented above, an additional median island is recommended, as shown in Figure 26, along the undeveloped segment north of Smoke Signals and south of Del Norte Mercantile. This raised median would be approximately 310 feet in length and 13 feet in width. Like the other median islands it would consist of raised stamped concrete pavers. For drivers exiting Del Norte Mercantile to the south, 50 feet would be provided to the south of the driveway for two-stage left-turn movements out of the property. As part of this improvement, the existing driveway to the single family house on the west side of the highway would be relocated. If current plans to redevelop this parcel as a multifamily residential project are implemented, access would be relocated to Leif Circle (to the north of the parcel). If not, the driveway would be relocated roughly opposite the existing Del Norte Mercantile driveway. Access to the vacant property south of the Del Norte Mercantile property would be limited to right-in/right-out only, or through the Del Norte Mercantile property. Figure 27 presents a perspective of a driver's view entering from the north under this option.

Pedestrian/Bicycle Improvements

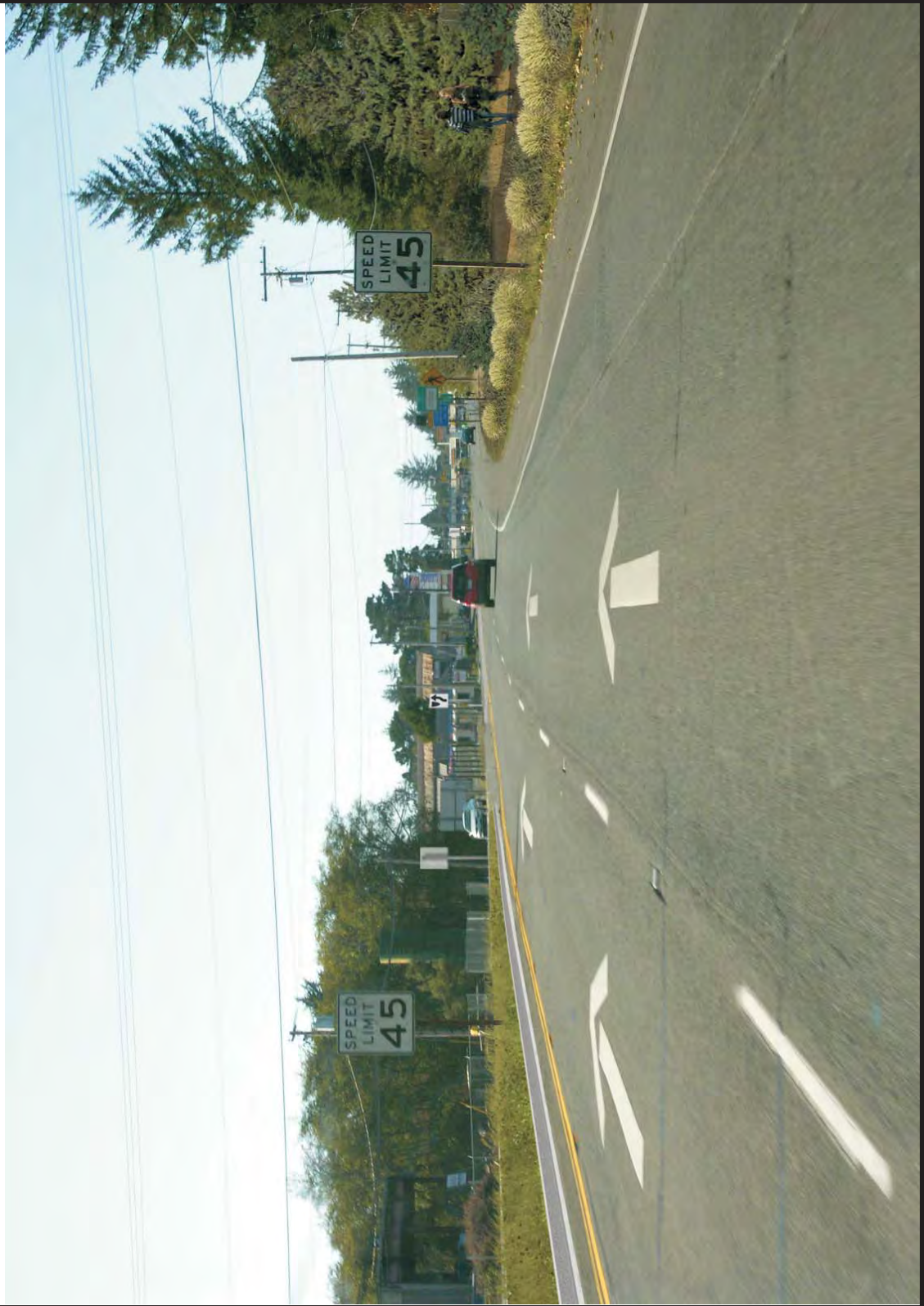
Another option that could be considered for the North Entrance is the provision of a complete sidewalk along both sides of the roadway. If pedestrian travel is to be encouraged along this corridor, a full pedestrian route along the west side of US Highway 101 from Northcrest Drive to Washington Boulevard, as well as along the east side from Northcrest Drive to the Pacific Terrace Manor Mobile Home Park driveway, would be appropriate. As an example, in a relatively short time, the Study Team observed several pedestrians walking along the southbound on-ramp from Washington Boulevard to US Highway 101. In particular, the presence of the Shangri-La Trailer Park and Pacific Terrace Manor Mobile Home Park to the south, and the Wal-Mart and other commercial uses to the north makes this a natural corridor for pedestrian activity.

While sidewalks exist in portions of the area, there are several gaps that require pedestrians to walk along roadway shoulders or through parking lots.

West Side

- Chevron Gas Station to Burtschell Street – 300 feet (sidewalk needed)
- Redwood Welding Service to 944 US Highway 101 – 320 feet (sidewalk needed)
- 1026 US Highway 101 to N. Side of Smoke Signals – 420 feet (sidewalk needed)
- Smoke Signals to Washington Boulevard/Summer Lane – 2,700 feet (multipurpose path needed)

**FIGURE 27
DRIVER'S VIEW OF NORTH TRAFFIC CALMING GATEWAY**



East Side

- Williams Drive to 916 US Highway 101 – 560 feet (sidewalk needed)

North Gateway Traffic Calming Alternatives Considered But Not Included in Plan

Several other potential traffic calming strategies were considered as part of this study, but not included as recommendations in the plan:

- A smaller median design was considered starting 40 feet north of the north edge of the direct Smoke Signals access point, to a point 40 feet south of the south edge of the single family access driveway, with a total length of approximately 150 feet. As this option would not aid in serving pedestrians, it was not considered to adequately meet the goals of the study.
- A more extensive alternative was also considered that would close the median opening in front of Del Norte Mercantile. This has the benefit of extending the existing median by a full 600 feet to the south. All access to Del Norte Mercantile would be limited to right-in/right-out only. This would require drivers departing Del Norte Mercantile heading south to use Parkway Drive and Washington Boulevard. The impact on access to this existing developed property was considered to outweigh the traffic calming benefits of this additional median area.
- Another option considered was providing colored (such as red) asphalt along the west shoulder of US Highway 101 from Washington Boulevard south along the southbound entrance ramp to the Shangri-La Trailer Court. This would visually narrow a driver's perception of the width of the roadway as they enter the developed area from the north, and could result in speed reduction. In addition to the cost of removal and replacement of the shoulder asphalt, without consistent application through the traffic calming areas this strategy would not make sense. As a non-standard practice, this option could also be difficult to gain approval by Caltrans traffic operations and maintenance staff. As maintenance staff is not currently equipped to maintain colorized asphalt, the costs associated with this new-to-the-area option could be substantial.

Financial Plan

Capital Costs

Detailed capital cost estimates are presented for the Traffic Calming Gateways in Tables 9 and 10, for the North Entrance and South Entrance, respectively. Estimating costs for the Regional Gateways and Welcome Gateways is more uncertain, as these costs will depend in large part on the specific sculptural and sign elements chosen as part of detailed design. For planning and funding purposes, the following cost estimates are recommended:

North Entrance

Traffic Calming Gateway	\$590,000
Welcome Gateway	\$50,000
Regional Gateway	\$50,000
<i>Subtotal: North</i>	<i>\$690,000</i>

TABLE 9: North Gateway Traffic Calming Improvement Costs

DESCRIPTION	QTY	UNIT	2008 UNIT	TOTAL	ESTIMATE
			PRICE		
Raised Median (LF)	80	CY	\$366	\$29,300	\$30,000
Crosswalk	500	SQFT	\$5	\$2,685	\$3,000
Signs (ea)	8	EA	\$321	\$2,571	\$3,000
Street Lighting at Crosswalk	2	EA	\$7,500	\$15,000	\$15,000
Sidewalks & Multipurpose Trail	1	LS	--	\$330,000	\$330,000
In-Roadway Flashers	1	LS	\$60,000	\$60,000	\$60,000
SUBTOTAL					\$441,000
2008-2010 FACTOR (2%/year)					\$17,640
SUBTOTAL					\$458,640
CONTINGENCY (5%)					\$22,932
GENERAL CONDITIONS (6%)					\$27,518
SUBTOTAL					\$509,090
O & P (15%)					\$76,364
SUBTOTAL					\$585,454
TOTAL ORDER OF MAGNITUDE ESTIMATE					\$590,000

TABLE 10: South Gateway Traffic Calming Improvements

DESCRIPTION	QTY	UNIT	2008 UNIT	TOTAL	ESTIMATE
			PRICE		
Raised Medians	140	CY	\$366	\$51,275	\$52,000
Crosswalk	225	SQFT	\$5	\$1,208	\$2,000
Signs (ea)	12	EA	\$321	\$3,857	\$4,000
In-Roadway Flashers	1	LS	\$20,000	\$20,000	\$20,000
Ped Bridge	200	SQFT	\$90	\$18,000	\$18,000
Sidewalk (To Marina)	210	LF	\$87	\$18,270	\$19,000
Sidewalk (Parcel S. of Dive Shop)	46	CY	\$1,001	\$46,362	\$47,000
Street Lighting at Crosswalk	2	EA	\$7,500	\$15,000	\$15,000
Remove Lighting	1	EA	\$200	\$200	\$1,000
Relocate Roadside Sign	5	EA	\$220	\$1,100	\$2,000
SUBTOTAL					\$180,000
2008-2010 FACTOR (2%/year)					\$7,200
SUBTOTAL					\$187,200
CONTINGENCY (5%)					\$9,360
GENERAL CONDITIONS (6%)					\$11,232
SUBTOTAL					\$207,792
O & P (15%)					\$31,169
SUBTOTAL					\$238,961
TOTAL ORDER OF MAGNITUDE ESTIMATE					\$240,000

Note 1: Includes all median islands, including south of Anchor Way.

South Entrance

Traffic Calming Gateway	\$240,000
Welcome Gateway	\$50,000
Regional Gateway	\$50,000
<i>Subtotal: South</i>	<i>\$340,000</i>
TOTAL PLAN	\$1,030,000

There are several potential state and federal funding programs that could be used to implement the gateway/traffic calming plan. Some of these are ongoing or recurring funding programs that are largely allocated based upon local decisionmaking, while others are competitive grants generally available for transportation projects though success in obtaining these types of funds is difficult to predict. For reference, recurring funding sources are marked with an (R) and competitive grant sources are marked with a (C).

Federal Sources

- Surface Transportation Program (STP) (R) – This program provides funding for improvements on federally aided highways, bridges, transit capital, bicycle, and pedestrian projects. Authorization of SAFETEA-LU expanded STP eligibility to include advanced truck stop electrification systems, high collision/congestion intersections, and environmental restoration and pollution abatement, control of noxious weeds and establishment of native species. These federal funds pass through the state and may or may not be allocated in any one year to projects in the study corridor.
- Regional Surface Transportation Program (RSTP) (R) – Rural counties can exchange federal STP dollars for State Highway Account (SHA) funds (a process known as “RSTP Exchange”). This is advantageous to Regional Transportation Planning Agencies (RTPAs) as federal funds have more stringent requirements such as a 20 percent local match, while state funds do not require any local match. The state also provides additional state funds to the county, as a match to the exchanged federal dollars. RTPAs may allocate remaining funds for bikeway, pedestrian, transit, safety, ridesharing, parking, traffic management, transportation control, and environmental enhancement projects.
- Safe Routes to Schools (SR2S) (C) – This federal funding program emphasizes community collaboration in the development of projects, and projects that incorporate elements of the 5 E’s – education, encouragement, engineering, enforcement, and evaluation. No local match is required for improvement projects which will make it easier and safer for children K - 8 to walk or bike to school. With the exception of the McCarthy Alternative Education Center along Williams Drive (which does not generate substantial pedestrian/bicycle activity), there are no schools near the two Traffic Calming Gateways and thus no key school travel corridors that could be served. As a result, this is not a source with a high potential to fund this plan.

State Sources

Transportation funding in California is a complex issue, and is far from certain. A brief summary of the various improvement programs that have particular pertinence to the gateway/traffic calming project is as follows:

- Transportation Enhancement (TE) (R) – TE funds are programmed as part of the STIP program. TE projects must be related to surface transportation, but are intended to be enhancements that go beyond the normal transportation project functions. Projects eligible for TE funding include acquisition of scenic easements, scenic or historic highway programs, landscaping, rehabilitation of historic transportation buildings, preservation of existing and abandoned railway corridors, pedestrian/bikeway improvements, and the acquisition of abandoned right-of-way for conversion to pedestrian/bicycle trails. Under TEA-21, safety education activities for pedestrians and bicyclists were also added to the list of eligible projects. The DNLTC is responsible for ranking TE projects countywide, but the California Transportation Commission makes final funding decisions. California receives about \$60 million per year for TE funding through SAFETEA-LU as a set aside from the Surface Transportation Program (STP). As the goals of the Traffic Calming/Gateway Study are closely aligned with the goals of the TE program, this is the primary funding source to implement this plan.
- State Highway Operations and Protection Program (SHOPP) (R) – The purpose of the SHOPP is to maintain the integrity of the State highway system. Funding for this program is provided through gas tax revenues. Projects are nominated within each Caltrans District office. Proposed projects are sent to Caltrans Headquarters for programming on a competitive basis statewide. Final project determinations are subject to the CTC review. Individual Districts are not guaranteed a minimum level of funding. SHOPP projects are based on statewide priorities within each program category (i.e. safety, rehabilitation, operations, etc.) within each Caltrans District. SHOPP funds cannot be used for capacity-enhancing projects.
- Minor Programs (R) – The Minor A Program is a Caltrans discretionary funding program based on annual statewide allocations by District. This program allows some level of discretion to Caltrans District Offices in funding projects up to \$750,000. Minor B Program funds are used for projects up to \$117,000. The advantage of the program is its streamlined funding process and the local District discretion for decision making. Funding is locally competitive within each District and limited to the extent of its allocation.
- Environmental Enhancement and Mitigation (EEM) Program (C) – Similar to TE at the federal level, the EEM offers state-level funding to remedy environmental impacts of new or improved transportation facilities. Mitigation can include highway landscapes and urban forestry or development of roadside recreational facilities such as roadside rest stops, trails, scenic overlooks, trail heads, parks, and snow parks. The State Resources Agency manages this grant program, and the RTPAs make project-funding decisions.
- AB 57 - Safe Routes To School (SR2S) (C) – This state legislated program allocates funds for projects that improve school commuter routes. Fundable projects include the construction of bicycle and pedestrian safety and traffic calming projects such as sidewalk improvements, traffic calming and speed reduction, pedestrian/bicycle crossing improvements, on-street bicycle facilities, traffic control devices, and traffic diversion improvements. This program is currently extended through 2012 and may be extended

further into the future. In 2009 approximately 22.5 million was available for projects in California. This is a competitive funding source and a 10 percent local match is required. As discussed above regarding the federal program, this is not considered to be a likely funding source.

- ♦ Community Based Transportation Planning Grants (CBTP) (C) – As part of the Caltrans Transportation Planning Grant package, the CBTP Grant Program funds coordinated transportation and land use planning projects that encourage community involvement and partnership. Projects should support livable community concepts with transportation or mobility objectives and promote community identity and quality of life. Examples of projects include the following studies/plans:
 - Long-term sustainable community/economic development growth
 - Safe, innovative, and complete pedestrian/bicycle/transit linkage
 - Community to school linkage
 - Jobs and affordable housing proximity
 - Transit oriented/adjacent development or “transit village”
 - Community transit facility/infrastructure
 - Mixed-land use development
 - Form-based or smart code development

Metropolitan Planning Organizations (MPOs), RTPAs, cities, counties, and transit districts may apply for this grant program directly. A 10 percent local match is required and the grant maximum is \$300,000. As the next steps in implementation of the Traffic Calming/Gateway program will be design/implementation rather than planning, CBTP funding is not a likely future funding source for this plan.

Maintenance Costs and Funding

Ongoing maintenance costs for the Regional Gateways and Welcome Gateways will depend in large part on final decisions regarding sign materials, landscaping and lighting. A conservative planning-level estimate based upon costs for similar other installations is \$5,000 per site. The Traffic Calming Gateways are not planned to include median landscaping (beyond pavers), which will limit ongoing maintenance costs will be modest. However, the In-Roadway Flashers will have ongoing maintenance and repair costs. In addition, the typical need to repair/replace curb and gutter as well as pavers will incur costs. Annual maintenance for these Traffic Calming Gateways is estimated at \$3,000 for the South Gateway and \$6,000 for the North Gateway.

As there are no competitive state or federal grant programs to fund ongoing maintenance of traffic calming/gateway features, these maintenance costs will need to be addressed through existing sources, or through a local partnership. Given the modest level of maintenance required for the Traffic Calming Gateways, it is recommended that these costs (on the order of \$9,000 per year) be addressed by Caltrans through the standard ongoing highway and signal maintenance programs. Considering the state’s financial condition, however, ongoing

maintenance of the Regional and Welcome Gateways (on the order of \$20,000 per year) will need to be funded locally. As these gateway elements serve the region as a whole, one option would be for the City, County and Harbor District to jointly fund maintenance. Other non-profit groups such as the Chamber of Commerce or Tri-Agency Economic Development Authority may also wish to participate.

Implementation Plan

The following steps are recommended to accomplish the implementation of this plan:

- Develop a management plan with Caltrans, the City, the County, the Harbor District and others for ongoing maintenance responsibilities.
- Define specific capital funding sources, and submit/obtain grants.
- Retain a design/engineering firm.
- Establish a small local committee of local government and non-profit representatives along with members of the arts community to determine specific designs for the Regional and Welcome Gateway signage and sculptural elements.
- Conduct a traffic study regarding plan elements that affect capacity (raised median islands), and submit to Caltrans for review and approval.
- Develop detailed (30%) plans of specific improvements. This will need to be reviewed by Caltrans for an Encroachment Permit. Roadway geometric changes will need to conform to the Caltrans Highway Design Manual, or obtain a design exception. Median refuge areas will need to comply with drainage and Americans with Disabilities Act (ADA) requirements.
- Coordinate with the Crescent City Harbor District regarding the pedestrian bridge/walkway in the South Traffic Calming Gateway.
- Obtain all necessary City and County approvals, including preparation of CEQA Checklists. Gain County approval for location of South Welcome Gateway on paper street alignment.
- Prepare construction documents, obtain bids, and construct improvements.
- Host a well-attended ribbon cutting celebration.

SUMMARY AND CONCLUSION

Table 11 presents a summary of the various recommended plan elements, including estimates of capital costs and ongoing maintenance costs. It should be noted that the cost estimates are preliminary, but were developed to be conservatively high for planning purposes. In particular, the costs associated with the Regional Gateways and Welcome Gateways could vary substantially depending upon the final selection of signage and sculpture elements. In general, however, the fact that the plan makes good use of existing public rights of way, minimizes design changes to existing roadways, and provides easy-to-maintain improvements all help to minimize capital and ongoing maintenance costs while still meeting the overall goals of the project.

TABLE 11: Gateway/Traffic Calming Plan Impact Matrix

	South Gateway			North Gateway		
	Regional Gateway	Welcome Gateway	Traffic Calming Gateway	Regional Gateway	Welcome Gateway	Traffic Calming Gateway
Impact on Traffic Speeds	None	Up to 3 mph Reduction	Up to 3 mph Reduction	None	None	Up to 4 mph Reduction
Impact on Traffic Safety	Slight Benefit	Slight Benefit	Slight Benefit	Slight Benefit	Slight Benefit	Moderate Benefit
Impact on Bicycle and Pedestrian Safety	None	None	Strong Benefit	None	None	Strong Benefit
Impact on Access to Adjacent Properties	None	None	Minimal	None	None	Minimal
Impact on Visibility of Adjacent Commercial Properties	None	None	None	None	None	None
Impact on Traffic Level of Service	None	None	None	None	None	None
Impact on Bicycle and Pedestrian Travel Along US 101	None	None	None	None	None	None
Impact on Bicycle and Pedestrian Travel Crossing US 101	None	None	Strong Benefit	None	None	Strong Benefit
Impact on Transit Operations	None	None	None	None	None	Moderate Benefit
Right-of-way Requirements	Lease	None	None	None	None	None
Capital Costs	\$50,000	\$50,000	\$240,000	\$50,000	\$50,000	\$590,000
Annual Maintenance Costs	\$5,000	\$5,000	\$3,000	\$5,000	\$5,000	\$6,000
Regulatory Issues (1)	None	None	None	None	None	None

Note 1: Beyond standard Caltrans, County and City approval process.

Specific benefits of the plan as reflected in Table 11 are as follows:

- In general, the potential negative impacts of the various alternatives on factors such as access, visibility of adjacent properties, and traffic level of service are low. This reflects the overall goal of this planning process to identify strategies that have a high potential for implementation.
- In particular, it should be noted that all of the plan elements can be accomplished within existing public rights-of-way, with the sole exception of the southern Regional Gateway.
- No regulatory issues are expected for any of the elements, beyond the standard City, County and Caltrans approval process. In particular, no Coastal Commission issues are expected, as elements are consistent with the Coastal Plan, and are either not within view of the coast or would not impede driver’s view of the coast.

- The provision of improved pedestrian crossings (including raised median islands) is a key element of this plan for both the South Entrance and the North Entrance. These crossings would be a substantial benefit to improving the multimodal nature of the entrances and to encourage additional walking and cycling. Both the public and the Study Steering Committee indicated strong support of these crossing enhancements.
- These plans will make US Highway 101 in the two gateway corridors more consistent (or “context sensitive”) with the surrounding land uses and non-auto activities. Rather than dividing residential, lodging and recreational uses on either side, the plan will help to knit together these uses through improved pedestrian/bicycling amenities and modest reduction in travel speeds.
- “Complete Streets” aspects of these busy traffic corridors, enhance pedestrian/bicycle safety, encourage additional non-auto travel, and help to reduce traffic speeds to levels appropriate for the adjacent land uses.
- While the alternatives highlight specific elements along each corridor, the reviewer is encouraged to consider the overall experience that would be provided to drivers through the combination of the various elements. Providing multiple elements is key in reinforcing the overall message to the driver that they are entering a community and need to change their driving expectations.

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Appendix A

Speed Survey Data

Location: Southbound 1, just south of "End of Freeway"
 Date: 10/12/2009
 Start Time: 11:45 AM
 End Time: 12:05 PM
 Weather: Cloudy, No Rain, No Fog

Posted Speed Limit: 45
 Min: 27
 Max: 54
 Mean: 40
 Median: 41
 85th %tile: 45

Number of Vehicles																										
MPH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total of Each Speed
>=50	X																									1
49	X	X																								2
48	X	X	X																							3
47	X	X	X	X	X	X																				6
46	X	X	X	X																						4
45	X	X	X	X	X	X																				6
44	X	X	X	X	X	X	X																			7
43	X	X	X	X	X	X	X	X	X	X	X															11
42	X	X	X	X	X	X	X	X	X	X	X	X														11
41	X	X	X	X	X	X	X	X	X	X	X	X	X	X												14
40	X	X	X	X	X	X																				6
39	X	X	X	X	X	X	X	X	X	X	X															11
38	X	X	X	X	X	X	X	X	X	X	X	X	X													13
37	X	X	X	X	X	X																				6
36	X	X	X	X	X	X	X	X	X																	9
35	X	X	X																							3
34	X	X	X																							3
33	X	X	X																							3
32	X	X																								2
31																										0
30	X	X																								2
29																										0
28																										0
27	X																									1
26																										0
25																										0
24																										0
23																										0
22																										0
21																										0
<=20																										0
Total Number of Vehicles Observed																									124	

<-- **Critical Speed**
 also speed limit

Location: Southbound 2, just north of "City Limit" sign
 Date: 10/12/2009
 Start Time: 12:15 PM
 End Time: 12:38 PM
 Weather: Cloudy, No Rain, No Fog

Posted Speed Limit: 35
 Min: 25
 Max: 51
 Mean: 36
 Median: 36
 85th %tile: 41

Number of Vehicles																											
MPH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total of Each Speed	
>=50	X	X																								2	
49																										0	
48	X																									1	
47	X																									1	
46	X	X	X	X																						4	
45	X																									1	
44	X	X	X																							3	
43																										0	
42	X	X	X	X																						4	
41	X	X	X	X	X	X																				6	<i><-- Critical Speed</i>
40	X	X	X	X	X	X	X																			7	
39	X	X	X	X	X	X																				6	
38	X	X	X	X	X	X	X	X	X																	9	
37	X	X	X	X	X	X	X	X	X	X	X	X	X	X												13	
36	X	X	X	X	X	X	X	X	X	X	X															11	
35	X	X	X	X	X	X	X	X	X	X	X	X	X													12	<i><-- Speed Limit</i>
34	X	X	X	X	X	X	X	X	X	X	X	X	X	X												13	
33	X	X	X	X	X	X	X																			7	
32	X	X	X	X	X	X	X	X	X	X	X															11	
31	X	X	X																							3	
30	X	X	X																							3	
29	X	X	X	X	X																					5	
28	X																									1	
27																										0	
26																										0	
25	X	X																								2	
24																										0	
23																										0	
22																										0	
21																										0	
<=20																										0	
Total Number of Vehicles Observed																									125		

Location: Southbound 3, just north of Northcrest intersection, at signal warning flasher
 Date: 10/12/2009
 Start Time: 12:45 PM
 End Time: 1:07 PM
 Weather: Cloudy, No Rain, No Fog

Posted Speed Limit: 35
 Min: 21
 Max: 43
 Mean: 32
 Median: 32
 85th %tile: 35

Number of Vehicles																										
MPH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total of Each Speed
>=50																										0
49																										0
48																										0
47																										0
46																										0
45																										0
44																										0
43	X																									1
42																										0
41																										0
40																										0
39	X	X	X	X	X																					5
38	X																									1
37	X	X																								2
36	X	X	X	X	X	X	X																			7
35	X	X	X	X	X	X	X	X	X	X	X	X	X	X												14
34	X	X	X	X	X	X	X	X																		8
33	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	21
32	X	X	X	X	X	X	X	X	X	X	X	X														12
31	X	X	X	X	X	X	X	X	X	X	X	X	X	X												15
30	X	X	X	X	X	X	X	X	X	X																10
29	X	X	X	X	X	X	X	X	X	X																11
28	X	X	X	X	X																					5
27	X	X	X	X																						4
26	X	X																								2
25	X	X	X																							3
24	X																									1
23																										0
22	X																									1
21	X	X																								2
<=20																										0
Total Number of Vehicles Observed																									125	

<-- **Critical Speed**
 also speed limit

Location: Northbound 1, just south of Citizens Dock Rd, in front of Curly Redwood Lodge
 Date: 10/12/2009
 Start Time: 1:25 PM
 End Time: 2:08 PM
 Weather: Cloudy, No Rain, No Fog

Posted Speed Limit: 40
 Min: 27
 Max: 52
 Mean: 39
 Median: 38
 85th %tile: 44

Number of Vehicles																										
MPH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total of Each Speed
>=50	X	X																								2
49																										0
48	X																									1
47	X																									1
46	X	X	X																							3
45	X	X	X																							3
44	X	X	X	X	X	X	X	X	X																	8
43	X	X																								2
42	X	X	X	X	X	X	X	X	X																	8
41	X	X	X	X	X	X	X	X																		7
40	X	X	X	X	X	X	X	X	X	X																9
39	X	X	X	X	X	X	X	X	X																	8
38	X	X	X	X	X	X	X	X	X	X																9
37	X	X	X	X	X	X	X	X	X	X	X	X														11
36	X	X	X	X	X	X	X	X	X																	8
35	X	X	X	X	X																					5
34	X	X	X	X	X	X																				6
33	X	X	X	X	X	X																				6
32	X	X																								2
31	X	X	X	X	X																					5
30	X																									1
29	X																									1
28																										0
27	X																									1
26																										0
25																										0
24																										0
23																										0
22																										0
21																										0
<=20																										0
Total Number of Vehicles Observed																									107	

<-- Critical Speed

<-- Speed Limit

Location: Northbound 2, Best Western parking lot, between Citizens Dock Rd and Elk Valley Rd
 Date: 10/12/2009
 Start Time: 3:45 PM
 End Time: 4:25 PM
 Weather: Cloudy, No Rain, No Fog

Posted Speed Limit: 40
 Min: 21
 Max: 49
 Mean: 37
 Median: 36
 85th %tile: 41

Number of Vehicles																										
MPH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total of Each Speed
>=50																										0
49	X																									1
48																										0
47	X																									1
46	X																									1
45	X																									1
44	X	X																								2
43	X	X	X	X																						4
42	X	X	X	X	X	X	X	X	X																	8
41	X	X	X	X	X	X																				6
40	X	X	X	X	X																					5
39	X	X	X	X	X	X	X	X	X																	9
38	X	X	X	X	X	X	X	X	X	X	X	X	X													13
37	X	X	X	X	X	X	X	X	X																	9
36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									17
35	X	X	X	X	X	X	X	X	X	X	X															11
34	X	X	X	X	X	X	X	X																		9
33	X	X	X	X	X	X																				6
32	X	X	X	X	X	X	X	X	X	X																11
31	X	X	X	X	X																					5
30	X																									1
29	X	X	X																							3
28																										0
27																										0
26																										0
25	X																									1
24																										0
23																										0
22																										0
21	X																									1
<=20																										0
Total Number of Vehicles Observed																									125	

<-- Critical Speed
 <-- Speed Limit

Location: Northbound 3, Just north of U-Haul parking lot
 Date: 10/12/2009
 Start Time: 2:26 PM
 End Time: 2:50 PM
 Weather: Cloudy, No Rain, No Fog

Posted Speed Limit: 35
 Min: 23
 Max: 43
 Mean: 33
 Median: 33
 85th %tile: 36

Number of Vehicles																												
MPH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total of Each Speed		
>=50																										0		
49																											0	
48																											0	
47																											0	
46																											0	
45																											0	
44																											0	
43	X	X																									2	
42																											0	
41	X	X																									2	
40	X	X	X																								3	
39	X	X																									2	
38	X	X	X	X	X																						5	
37	X	X	X	X																							4	
36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										17	<i><-- Critical Speed</i>
35	X	X	X	X	X	X	X	X	X																		9	<i><-- Speed Limit</i>
34	X	X	X	X	X	X	X	X	X																		9	
33	X	X	X	X	X	X	X	X	X	X																	10	
32	X	X	X	X	X	X	X	X	X	X	X	X	X														13	
31	X	X	X	X	X	X	X	X	X	X	X	X	X														12	
30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												16	
29	X	X	X	X																							4	
28	X	X	X	X	X	X																					6	
27	X	X	X	X																							4	
26	X	X	X																								3	
25	X																										1	
24																											0	
23	X	X	X																								3	
22																											0	
21																											0	
<=20																											0	
Total Number of Vehicles Observed																									125			

Appendix B

Accident Data

Postmile	Primary Road	Distance	Secondary Rd	Side of Hwy	Collison		Collision			Killed	Injured	Roadway Surface	MV	Lighting	Study Area
					Date	Time	Primary Factor	Type	Severity				involved with?		
24.410	Route 101		Sandmine Rd	North	6/8/1999	1840	DUI	Head-On	Injury	0	7	Dry	Other MV	Daylight	South
24.410	Route 101		Sandmine Rd	South	8/31/2000	2050	DUI	Other	Injury	0	1	Dry	Bicycle	dark	South
24.410	Route 101		Sandmine Rd	South	12/10/2004	1810	Unsafe Speed	Rear end	Injury	0	1	Wet	Other MV	dark	South
24.410	sandmine rd	172 ft east	Route 101	North	6/13/2007	10	DUI	Hit Object	Injury	0	3	Dry	Fixed Obj	dark	South
24.420	Route 101	77 ft north	Sandmine Rd	South	5/14/2002	1845	DUI	Rear end	PDO	0	0	Dry	Pkd MV	Daylight	South
24.470	Route 101	275 ft north	Sandmine Rd	North	2/14/2001	1030	Not Driver	Hit Object	PDO	0	0	Dry	Fixed Obj	Daylight	South
24.510	Route 101	528 ft north	Sandmine Rd	South	2/9/1999	1755	Not Driver	Hit Object	Injury	0	2	Wet	Fixed Obj	Dark	South
24.610	Route 101	1056 ft north	Sandmine Rd	North	7/18/2008	1035	Not Driver	Hit Object	PDO	0	0	Dry	Other MV	Daylight	South
24.730	Route 101	1584 ft north	Sandmine Rd	North	7/30/2008	1545	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
24.732	Route 101	4752 ft north	Mill Creek Entrance	North	8/14/2004	1039	Wrong Side	Head-On	Fatal	3	7	Dry	Other MV	Daylight	South
24.740	Route 101	1584 ft north	Sandmine Rd	North	7/21/2008	1755	Unsafe Speed	Rear end	Injury	0	4	Dry	Other MV	Daylight	South
24.770	Route 101	2640 ft south	Anchor Way	North	7/30/2000	1520	Unsafe Speed	Rear end	Injury	0	2	Dry	Other MV	Daylight	South
24.800	Route 101	3168 ft south	Anchor Way	South	6/16/2004	1515	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	South
24.800	Route 101	1056 ft south	Anchor Way	South	12/26/2007	1200	Unsafe Speed	Rear end	PDO	0	0	Wet	Other MV	Daylight	South
24.800	Route 101	1056 ft north	Sandmine Rd	North	10/11/2008	1525	ROW Auto	Broadside	Injury	0	4	Dry	Other MV	Daylight	South
24.900	Route 101	1584 ft south	Anchor Way	South	2/26/2004	145	Unsafe Speed	Hit Object	PDO	0	0	Wet	Other MV	dark	South
24.970	Route 101	1584 ft south	Anchor Way	North	8/27/2003	740	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
24.990	Route 101	1056 ft south	Anchor Way	North	10/4/2003	930	Starting/Backing	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
25.000	Route 101	1584 ft south	Anchor Way	North	9/21/2004	635	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Dusk/Dawr	South
25.020	Route 101	1056 ft south	Anchor Way	South	11/9/2004	1300	Improp Turn	Head-On	Fatal	2	1	Dry	Other MV	Daylight	South
25.040	Route 101	1056 ft south	Anchor Way	South	12/19/2005	1110	Unsafe Speed	Rear end	Injury	0	1	Wet	Other MV	Daylight	South
25.070	Route 101	1056 ft south	Anchor Way	North	7/29/2004	940	Wrong Side	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	South
25.160	Route 101	550 ft south	Anchor Way	South	4/29/2004	1530	Improp Turn	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	South
25.170	Route 101	550 ft south	Anchor Way	North	7/26/2006	1945	Starting/Backing	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
25.170	Route 101	528 ft south	Anchor Way	South	4/26/2008	1252	DUI	Broadside	Injury	0	3	Dry	Pkd MV	Daylight	South
25.200	Route 101	528 ft south	Anchor Way	South	9/27/1999	1625	Unsafe Speed	Rear end	Fatal	1	1	Dry	Other MV	Daylight	South
25.230	Route 101	166 ft south	Anchor Way	South	5/11/2001	1200	Improp Turn	Hit Object	PDO	0	0	Dry	Fixed Obj	Daylight	South
25.270	Route 101	29 ft north	Anchor Way	North	9/17/2002	855	ROW Auto	Hit Object	Injury	0	1	Wet	Fixed Obj	Daylight	South
25.270	Route 101		Anchor Way	South	7/11/2005	1330	ROW Auto	Broadside	Injury	0	2	Dry	Other MV	Daylight	South
25.300	Route 101	173 ft north	Anchor Way	South	1/4/2007	840	DUI	Head-On	Injury	0	1	Wet	Other MV	Daylight	South
25.320	Route 101	240 ft north	Anchor Way	North	7/1/2005	1145	Unsafe Speed	Rear end	Injury	0	1	Dry	Other MV	Daylight	South
25.470	Route 101	225 ft south	Citizen Dock Rd	North	6/13/2005	1105	ROW Auto	Head-On	PDO	0	0	Dry	Other MV	Daylight	South
25.510	Route 101		Citizen Dock Rd	North	8/21/1999	2023	ROW Auto	Sideswipe	PDO	0	0	Dry	Other MV	Dusk/Dawr	South
25.510	Route 101		Citizen Dock Rd	South	12/17/1999	1800	Unknown	Head-On	PDO	0	0	Wet	Other MV	Daylight	South
25.510	Citizens Dock Rd	172 ft west	Route 101	South	5/25/2001	1525	DUI	Other	Injury	0	1	Dry	Non-Clsn	Daylight	South
25.510	Route 101		Citizen Dock Rd	South	1/16/2006	1820	ROW Auto	Broadside	PDO	0	0	Wet	Other MV	dark	South
25.520	Route 101		Citizen Dock Rd	South	3/25/2004	1510	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
25.520	Route 101		Citizen Dock Rd	South	11/26/2006	1015	Unknown	Head-On	PDO	0	0	Wet	Other MV	Daylight	South
25.560	Route 101	288 ft north	Citizen Dock Rd	South	5/9/2003	2100	DUI	Head-On	Injury	0	4	Dry	Other MV	Dark	South
25.610	Route 101	528 ft north	Citizen Dock Rd	North	8/11/2000	1710	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
25.690	Route 101	243 ft south	King	South	2/10/1999	1915	Not Driver	Rear end	Injury	0	1		Other MV	Dark	South
25.750	Route 101		Walton	South	1/15/2006	313	DUI	Hit Object	PDO	0	0	Wet	Fixed Obj	dark	South
25.760	Route 101	89 ft north	King	South	12/13/2002	1818	Unsafe Speed	Other	PDO	0	0	Wet		dark	South
25.770	Route 101	168 ft north	King	South	9/4/2003	1257	not stated	Broadside	PDO	0	0	Dry	Other MV	Daylight	South
25.820	Route 101	120 ft south	Elk Valley	South	9/10/2001	1715	ROW Auto	Head-On	PDO	0	0	Dry	Other MV	Daylight	South
25.820	Route 101		300 Block	South	8/22/2004	911	Unsafe Speed	Head-On	Injury	0	1	Wet	Fixed Obj	Daylight	South
25.820	Route 101	110 ft south	Elk Valley	North	11/5/2004	1615	Improp Turn	Sideswipe	Injury	0	1	Dry	Other MV	Daylight	South
25.830	Route 101		Elk Valley	South	8/19/1999	1210	Unknown	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	South

Postmile	Primary Road	Distance	Secondary Rd	Side of Hwy	Collison		Collision			Killed	Injured	Roadway Surface	MV	Lighting	Study Area
					Date	Time	Primary Factor	Type	Severity				involved with?		
25.830	Route 101		Elk Valley	North	3/28/2008	1250	DUI	Rear end	PDO	0	0	Wet	Other MV	Daylight	South
25.840	Elk Valley Rd	208 ft west	Route 101	South	10/28/2000	2230	DUI	Hit Object	Injury	0	2	Wet	Fixed Obj	Dark	South
25.840	Route 101		Elk Valley	South	11/16/2001	1630	ROW Auto	Hit Object	PDO	0	0	Wet	Fixed Obj	Daylight	South
25.840	Route 101		Elk Valley	North	2/27/2002	1024	Stop sign	Head-On	PDO	0	0	Dry	Other MV	Daylight	South
25.840	Route 101		Elk Valley	South	4/7/2002	1900	Stop sign	Broadside	Injury	0	2	Dry	Other MV	Daylight	South
25.840	Route 101		Elk Valley	South	8/8/2002	1416	not stated	Auto/Ped	PDO	0	0	Dry	Ped	Daylight	South
25.840	Route 101		Elk Valley	North	10/29/2002	1423	Stop sign	Broadside	Injury	0	1	Dry	Other MV	Daylight	South
25.840	Elk Valley Rd		Route 101	North	9/11/2003	1420	Unknown	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
25.840	Elk Valley Rd		Route 101	North	1/22/2005	1447	Too close	Rear end	PDO	0	0	Dry	Other MV	dark	South
25.840	Elk Valley Rd		Route 101	North	3/20/2005	1053	Improp Drv	Rear end	PDO	0	0	Wet	Other MV	Daylight	South
25.840	Elk Valley Rd	120 ft north	Route 101	North	6/23/2008	1432	Improp Turn	Auto/Ped	Injury	0	1	Dry	ped	Daylight	South
25.850	Route 101		Elk Valley	South	8/2/2001	1030	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
25.850	Route 101	25 ft north	Elk Valley	South	8/21/2004	1709	Improp Drv	Rear end	Injury	0	1	Dry	Other MV	Daylight	South
25.850	Route 101		Elk Valley	South	6/24/2006	2329	DUI	Rear end	PDO	0	0	Dry	Other MV	dark	South
25.850	Route 101	30 ft north	Elk Valley	South	8/29/2008	1810	Unsafe Speed	Rear end	Injury	0	2	Dry	Other MV	Daylight	South
25.870	Route 101	12 ft south	Sunset Cir	South	2/15/2003	1017	Unsafe Speed	Rear end	PDO	0	0	Wet	Other MV	Daylight	South
25.871	Route 101		Sunset Cir	South	4/1/2005	2030	DUI	Broadside	Injury	0	3	Dry	Other MV	Dark	South
25.880	Route 101	229 ft north	Elk Valley	South	11/27/2000	1800	Unsafe Speed	Rear end	Injury	0	1	Dry	Other MV	dark	South
25.890	Route 101	289 ft north	Elk Valley	South	5/16/1999	1036	Unknown	Broadside	PDO	0	0	Dry	Other MV	Daylight	South
25.910	Route 101	217 ft north	Sunset Cir	South	10/9/200	826	Unknown	Hit Object	PDO	0	0	Wet	Fixed Obj	Daylight	South
25.940	Route 101	528 ft north	Elk Valley	South	7/17/2000	1650	Improp Turn	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	South
25.940	Route 101	528 ft north	Elk Valley	South	11/22/2002	1700	Improp Turn	Broadside	Injury	0	1	Dry	Bicycle	dark	South
26.040	Route 101	1062 ft north	Elk Valley	South	2/1/2006	530	Improp Turn	Hit Object	PDO	0	0	Wet	Fixed Obj	dark	South
26.050	Route 101	292 ft south	N	North	12/23/1999	1130	Wrong Side	Hit Object	Injury	0	1	Dry	Fixed Obj	Daylight	South
26.209	M		Front	North	9/13/1999	1939	DUI	Rear end	Injury	0	1	Dry	Other MV	Dusk/Dawn	South
26.209	Front		M	North	7/27/2001	1330	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	South
26.200	Route 101	40 ft south	Front	North	11/27/2001	1700	Unsafe Speed	Hit Object	PDO	0	0	Wet	Fixed Obj	Daylight	South
26.209	M		Front	North	7/15/2002	1259	Improp Drv	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	South
26.209	M		Front	North	6/15/2003	1710	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	South
26.200	Route 101		Front	North	7/3/2003	1805	Unknown	Sideswipe	Injury	0	1	Dry	Other MV	Daylight	South
26.209	M		Front	North	9/18/2004	1127	ROW Auto	Broadside	PDO	0	0	Wet	Other MV	Daylight	South
26.209	Front		M	North	3/7/2005	1712	Unsafe Speed	Rear end	Injury	0	1	Dry	Other MV	Daylight	South
26.209	Front		Front	North	12/12/2005	1246	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	South
26.266	Route 101		Front	South	1/25/1999	1847	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Dark	South
26.266	Route 101		Front	South	2/8/1999	1147	Stop sign	Broadside	PDO	0	0	Wet	Other MV	Daylight	South
26.266	Route 101		Front	South	6/15/1999	1045	Stop sign	Broadside	PDO	0	0	Dry	Other MV	Daylight	South
26.280	L		Front	South	8/7/1999	1309	Too close	Rear end	PDO	0	0	Wet	Other MV	Daylight	South
26.266	L		Front	South	8/26/1999	2200	Stop sign	Broadside	Injury	0	4	Dry	Other MV	Dark	South
26.266	Route 101		Front	South	10/7/1999	1809	Unknown	Broadside	Injury	0	1	Dry	Other MV	Daylight	South
26.290	L	89 ft north	Front	South	7/4/2000	2230	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	dark	South
26.266	L		Front	South	8/19/2000	1933	Stop sign	Broadside	Injury	0	1	dry	Other MV	Daylight	South
26.266	L		Front	South	6/22/2001	1845	Stop sign	Broadside	Injury	0	1	Dry	Other MV	Daylight	South
26.266	L		Front	South	8/16/2001	1447	Stop sign	Broadside	PDO	0	0	Dry	Other MV	Daylight	South
26.280	L		Front	South	9/4/2001	1545	Improp Drv	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
26.266	L		Front	South	4/14/2002	1004	Improp Turn	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	South
26.266	L		Front	South	4/24/2003	1740	Stop sign	Broadside	Injury	0	1	Wet	Other MV	Daylight	South
26.266	L		Front	South	6/24/2003	1447	not stated	Broadside	PDO	0	0	Dry	Other MV	Daylight	South
26.266	Front		L	South	2/27/2004	1833	ROW Auto	Head-On	PDO	0	0	Dry	Other MV	dark	South

Postmile	Primary Road	Distance	Secondary Rd	Side of Hwy	Collison Date	Time	Primary Factor	Collision Type	Severity	Killed	Injured	Roadway Surface	MV	Lighting	Study Area
													involved with?		
26.266	L		Front	South	8/1/2005	1807	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	South
26.230	Route 101	186 ft south	Front	South	10/21/2005	9	Unsafe Speed	Hit Object	PDO	0	0	Wet	Fixed Obj	dark	South
26.280	Front		L	South	12/13/2005	1800	Improp Turn	Hit Object	PDO	0	0	Dry	Fixed Obj	dark	South
26.260	L		Front	South	8/7/2007	1330	Improp Turn	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	South
26.820	Route 101	426 ft S	Cooper Ave	North	12/3/1999	1517	Not Driver	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.840	Route 101	300 ft south	Cooper Ave	North	7/28/1999	1324	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.850	Route 101	248 ft south	Cooper Ave	South	10/18/2000	1823	Improp Turn	Other	Injury	0	1	Dry	Bicycle	Daylight	North
26.880	Route 101		Cooper Ave	North	7/17/2003	1013	ROW Auto		PDO	0	0	Dry	Non-Clsn	Daylight	North
26.890	Route 101		Cooper Ave	North	1/31/1999	1535	Too close	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.890	Route 101		Cooper Ave	North	4/23/2000	1442	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.890	Route 101		Cooper Ave	North	7/22/2002	1030	Too close	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.890	Route 101	50 ft ?S	Cooper Ave	North	3/11/2003	1710	Unsafe Speed	Rear end	PDO	0	0	Wet	Other MV	Dusk/Dawr	North
26.890	Route 101		Cooper Ave	North	12/9/2003	1523	Improp Drv	Rear end	PDO	0	0	Wet	Other MV	Daylight	North
26.890	Route 101		Cooper Ave	North	2/25/2005	1610	Unsafe Speed	Rear end	Injury	0	1	Dry	Other MV	Daylight	North
26.900	Cooper Ave	18 ft west	Route 101	South	2/20/2000	2212	Unsafe Speed	Rear end	Injury	0	2	Wet	Other MV	Dark	North
26.900	Route 101		Cooper Ave	North	6/11/2000	1259	Stop sign	Broadside	Injury	0	2	Dry	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	North	11/27/2000	930	Stop sign	Broadside	Injury	0	1	Wet	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	South	10/13/2001	9	Unsafe Speed	Broadside	PDO	0	0	Dry	Other MV	dark	North
26.900	Cooper Ave		Route 101	North	3/15/2002	1206	ROW Auto	Head-On	PDO	0	0	Wet	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	North	3/18/2002	1710	not stated	Head-On	PDO	0	0	Dry	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	South	5/12/2003	839	Stop sign	Broadside	Injury	0	1	Dry	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	North	12/19/2003	1055	Stop sign	Broadside	Injury	0	1	Wet	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	North	1/14/2004	2030	Too close	Rear end	PDO	0	0	Wet	Other MV	dark	North
26.900	Route 101		Cooper Ave	South	9/21/2004	1307	Stop sign	Head-On	Injury	0	1	Dry	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	North	3/21/2005	1300	Stop sign	Other	Injury	0	1	Dry	Bicycle	Daylight	North
26.900	Route 101	81 ft south	Northcrest Dr.	North	2/7/2006	1405	Too close	Rear end	Injury	0	1	Dry	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	North	8/12/2006	1400	not stated	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.900	Route 101		Cooper Ave	North	12/21/2006	1958	Stop sign	Broadside	PDO	0	0	Wet	Other MV	dark	North
26.910	Route 101		Cooper Ave	South	6/14/2001	1327	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.910	Route 101		Cooper Ave	North	9/5/2003	1224	Too close	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
26.910	Route 101		Cooper Ave	South	9/6/2008	1235	Too close	Rear end	Injury	0	1	Dry	Other MV	Daylight	North
26.930	Route 101	149 ft north	Cooper Ave	South	11/15/2000	1010	ROW Auto	Broadside	PDO	0	0	Wet	Other MV	Daylight	North
26.980	Route 101	175 ft south	Northcrest Dr.	North	12/1/1999	1450	Brakes	Rear end	PDO	0	0	Wet	Other MV	Daylight	North
27.000	Route 101		Northcrest Dr.	North	3/2/1999	1800	Too close	Rear end	Injury	0	1	Dry	Other MV	Dusk/Dawr	North
27.000	Route 101		Northcrest Dr.	North	12/29/2000	1057	Unknown	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
27.000	Route 101		Northcrest Dr.	South	3/28/2004	48	Wrong Side	Hit Object	PDO	0	0	Dry	Fixed Obj	dark	North
27.000	Route 101		Northcrest Dr.	North	1/30/2005	1447	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
27.000	Route 101		Northcrest Dr.	North	11/21/2005	1724	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	dark	North
27.010	Route 101		Northcrest Dr.	South	7/24/1999	1608	Other Haz	Other	Injury	0	1	Dry	Bicycle	Daylight	North
27.010	Northcrest Dr.	80 ft north	Route 101	South	8/5/1999	1354	Unsafe Speed	Rear end	Injury	0	1	Dry	Other MV	Daylight	North
27.010	Northcrest Dr.	65 ft north	Route 101	South	8/7/1999	843	Too close	Rear end	PDO	0	0	Wet	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	11/20/1999	1545	Stop sign	Broadside	PDO	0	0	Wet	Other MV	Daylight	North
27.010	Northcrest Dr.	48 ft west	Route 101	South	6/23/2000	1630	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	11/18/2000	1116	Unknown	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	6/25/2002	1307	Improp Drv	Broadside	Injury	0	1	Dry	Bicycle	Daylight	North
27.010	Route 101		Northcrest Dr.	South	6/27/2002	1314	Stop sign	Head-On	Injury	0	1	Dry	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	5/10/2004	1256	Unsafe Speed	Rear end	Injury	0	2	Dry	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	North	10/28/2005	1915	not stated	Sideswipe	PDO	0	0		Other MV	dark	North

Postmile	Primary Road	Distance	Secondary Rd	Side of Hwy	Collison Date	Time	Primary Factor	Collision Type	Severity	Killed	Injured	Roadway Surface	MV involved with?	Lighting	Study Area Section
27.010	Route 101		Northcrest Dr.	South	2/11/2006	1600	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
27.010	Northcrest Dr.	50 ft north	Route 101	South	3/13/2006	1452	Unsafe Speed	Rear end	PDO	0	0	Wet	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	3/23/2006	801	Stop sign	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	9/27/2006	914	Stop sign	Broadside	Injury	0	1	Dry	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	11/19/2006	1322	Stop sign	Head-On	Injury	0	1	Wet	Other MV	Daylight	North
27.010	Route 101		Northcrest Dr.	South	2/10/2008	1929	ROW Auto	Broadside	Injury	0	2	Dry	Other MV	dark	North
27.020	Route 101	65 ft north	Northcrest Dr.	South	9/14/1999	1450	Improp Drv	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
27.020	Route 101		Route 101	South	10/7/2007	1940	DUI	Rear end	PDO	0	0	Dry	Other MV	dark	North
27.100	Northcrest Dr.		Route 101	South	3/9/2004	1000	not stated	Auto/Ped	Injury	0	1	Dry	Ped	Daylight	North
27.050	Route 101	221 ft north	Northcrest Dr.	South	8/12/1999	1129	Unsafe Speed	Rear end	Injury	0	2	Dry	Other MV	Daylight	North
27.140	Route 101	40 ft south	Williams Dr.	North	10/15/2001	1548	Improp Turn	Sideswipe	Injury	0	1	Dry	Other MV	Daylight	North
27.151	Route 101		Williams Dr.	North	8/15/2005	1255	ROW Auto	Broadside	Injury	0	1	Dry	Bicycle	Daylight	North
27.200	Route 101		5 Wilson Dr	South	12/1/2003	1725	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	dark	North
27.210	Route 101		Wilson Dr	South	7/1/1999	1555	DUI	Other	Injury	0	1	Dry	Bicycle	Daylight	North
27.210	Route 101	48 ft south	Wilson Dr	South	12/3/1999	1415	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.222	Burtschell	15 ft west	Route 101	South	3/29/1999	1450	Starting/Backing	Other	PDO	0	0	wet	Other MV	Daylight	North
27.222	Burtschell	65 ft west	Route 101	South	3/24/2000	1255	Starting/Backing	Other	PDO	0	0	Dry	Other MV	Daylight	North
27.222	Route 101		Burtschell	South	9/6/2000	1545	ROW Auto	Broadside	Injury	0	3	Dry	Other MV	Daylight	North
27.222	Burtschell		Route 101	South	7/1/2002	1000	Unsafe Speed	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
27.222	Route 101		Burtschell	North	3/31/2004	855	Improp Turn	Rear end	PDO	0	0	Dry	Other MV	Daylight	North
27.222	Route 101		Burtschell	South	8/3/2007	1750	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	North
27.222	Burtschell	106 ft west	Route 101	South	9/28/2007	1415	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	North
27.222	Route 101		Wilson Dr	South	6/25/2008	1834	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.230	Route 101	50 ft north	Burtschell	North	12/3/2005	645	Lane Change	Rear end	Injury	0	1	Dry	Other MV	Daylight	North
27.230	Route 101		Burtschell	South	11/29/2006	750	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.260	Route 101	214 ft north	Burtschell	North	9/4/2005	1250	DUI	Other	Injury	0	1	Dry	Bicycle	Daylight	North
27.310	Route 101	528 ft north	Burtschell	North	12/1/2004	1350	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.310	Route 101	1320 ft south	Pkwy Dr	North	10/10/2008	1335	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.320	Route 101	528 ft north	Burtschell	North	1/3/2007	1600	Unsafe Speed	Rear end	PDO	0	0	Wet	Other MV	Daylight	North
27.360	Route 101	1056 ft south	Pkwy Dr	North	9/29/1999	1935	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	dark	North
27.380	Route 101	45 ft north	MP DN 27.37	South	11/15/2008	44	DUI	Hit Object	PDO	0	0	Dry	Fixed Obj	dark	North
27.400	Route 101	49 ft south	Pacific Way	South	6/11/2003	1500	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	North
27.400	Route 101	518 ft south	Pkwy Dr	North	4/11/2007	2023	Ped Viol	Auto/Ped	Fatal	1	0	Wet	ped	dark	North
27.430	Route 101	700 ft south	Pkwy Dr	North	7/1/2008	1900	Lane Change	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	North
27.450	Route 101	1056 ft south	Pkwy Dr	North	12/21/2001	1645	ROW Auto	Broadside	PDO	0	0	Wet	Other MV	Dusk/Dawn	North
27.510	Route 101	300 ft south	Pkwy Dr	South	6/9/2001	1330	Fell Asleep	Hit Object	PDO	0	0	Dry	Fixed Obj	Daylight	North
27.564	Route 101		Pkwy Dr	North	11/3/1999	1755	Impede Traffic	Broadside	Injury	0	1	Wet	Other MV	Dark	North
27.564	Route 101		Pkwy Dr	North	11/16/1999	1530	Stop sign	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.564	Route 101		Pkwy Dr	North	3/3/2000	1430	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	North
27.564	Route 101		Pkwy Dr	North	3/23/2000	1300	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.564	Route 101		Pkwy Dr	North	10/31/2000	1725	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.540	Route 101	100 ft south	Pkwy Dr	North	4/28/2001	2105	Not Driver	Other	PDO	0	0	Dry	Animal	Dark	North
27.564	Route 101		Pkwy Dr	North	6/25/2001	1330	ROW Auto	Broadside	Injury	0	3	Dry	Other MV	Daylight	North
27.530	Route 101	150 ft south	Pkwy Dr	North	11/23/2001	2130	Not Driver	Other	PDO	0	0	Dry	Animal	dark	North
28.068	Route 101		Pkwy Dr	North	6/5/2002	1030	Starting/Backing	Hit Object	PDO	0	0	Dry	Fixed Obj	Daylight	North
27.564	Route 101		Pkwy Dr	North	7/2/2002	1655	ROW Auto	Broadside	PDO	0	0	Dry	Other MV	Daylight	North
27.564	Route 101		Pkwy Dr	North	3/4/2003	1010	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	North
27.564	Route 101		Pkwy Dr	North	8/29/2003	1610	ROW Auto	Broadside	Injury	0	1	Dry	Other MV	Daylight	North

Postmile	Primary Road	Distance	Secondary Rd	Side of Hwy	Collison		Primary Factor	Collision		Severity	Killed	Injured	Roadway Surface	MV involved		Study Area Section
					Date	Time		Type	Lighting					with?		
27.950	Route 101	400 ft north	Washington	South	3/2/2003	1600	Unsafe Speed	Rear end	Injury	0	1	Dry	Other MV	Daylight	North	
27.580	Route 101	1320 ft south	Washington	South	11/18/2005	922	Lane Change	Sideswipe	PDO	0	0	Dry	Other MV	Daylight	North	
27.880	Route 101	291 ft n	Washington	North	8/31/2007	1402	Improp Turn	Hit Object	Injury	0	1	Dry	Fixed Obj	Daylight	North	
27.890	Route 101	80 ft north	Washington	North	9/29/2008	510	Unsafe Speed	Hit Object	PDO	0	0	Dry	Other MV	dark	North	