Nonmotorized Transportation Pilot Program

Summary of 2007, 2008, 2009, 2010, and 2011 Bicycle and Pedestrian Counts and Surveys

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Executive Summary

Pedestrians and bicyclists were counted and surveyed in Marin County between 2007 and 2011 as part of the Non-motorized Transportation Pilot Program (NTPP). Bicycling and walking in Marin County has increased significantly between 2007 and 2011 at the 22 locations. Bicycling increased 90% on weekends and 59% on weekdays, while walking increased 39% on weekends and 35% on weekdays between 2007 and 2011. At 12 locations counted originally in 1999, bicycling levels in 2011 are 1.59 times 1999 weekend counts and 1.72 times 1999 weekday counts. These changes are likely due to a combination new improvements and programs funded through the NTPP and local agencies, an overall increase in active lifestyles, and changes in local economic or demographic conditions. Between the NTPP and other local, regional, and State funding sources, a substantial investment has been made across Marin County toward building out the countywide bikeway network and improving facilities and access for pedestrians and transit users. Regardless of the reason and given the static nature of Marin County's population, there is a significant trend of increased walking and bicycling in Marin County over both a four and 12-year period.

The NTPP is a federally funded project that initially allocated $25 million each to four communities nationwide, including Marin County, to determine whether increased investments in programs and projects would result in more people walking and bicycling. A baseline intercept survey was conducted in 2007, and a bookend survey was conducted again in 2010. The National Bicycle & Pedestrian Documentation Project methodology[1] was used to measure these changes, since it can be compared to counts and surveys conducted around the country.

In 2011, locations in Marin County with the highest volumes of combined bicycle and pedestrian activity were:

- Bridgeway/Princess Street, Sausalito - 4,652 pedestrians and bicyclists over a two-hour period on a weekday and a two-hour period on a weekend day.
- Broadway at Bolinas Road, Fairfax – 2,498 pedestrians and bicyclists over a two-hour period on a weekday and a two-hour period on a weekend day.
- Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction – 1,973 pedestrians and bicyclists over a two-hour period on a weekday and a two-hour period on a weekend day.

Map 1 and Map 2 on the following pages present the results of this count program over time. Weekend peak hour volumes are shown above the x-axis, while weekday peak hour volumes are shown below the axis, illustrating which locations experience more activity on weekends compared to weekdays. The maps also show the relative distribution of pedestrian and bicycle activity throughout Marin County.

The 2010 survey results showed that about 54% of pedestrians and 53% of bicyclists surveyed were making transportation-related trips (school, work, utilitarian trips), compared to 44% and 38% in 2007. This increase in walking and bicycling trips for transportation purposes bodes well for reducing congestion and improving air quality, as transportation trips are more likely to replace automobile trips than recreational trips. Another significant survey result showed an increase in the number of people linking walking trips with transit: 38% of all trips linked to transit in 2010 compared to 14% in 2007.

[1] http://bikepeddocumentation.org/

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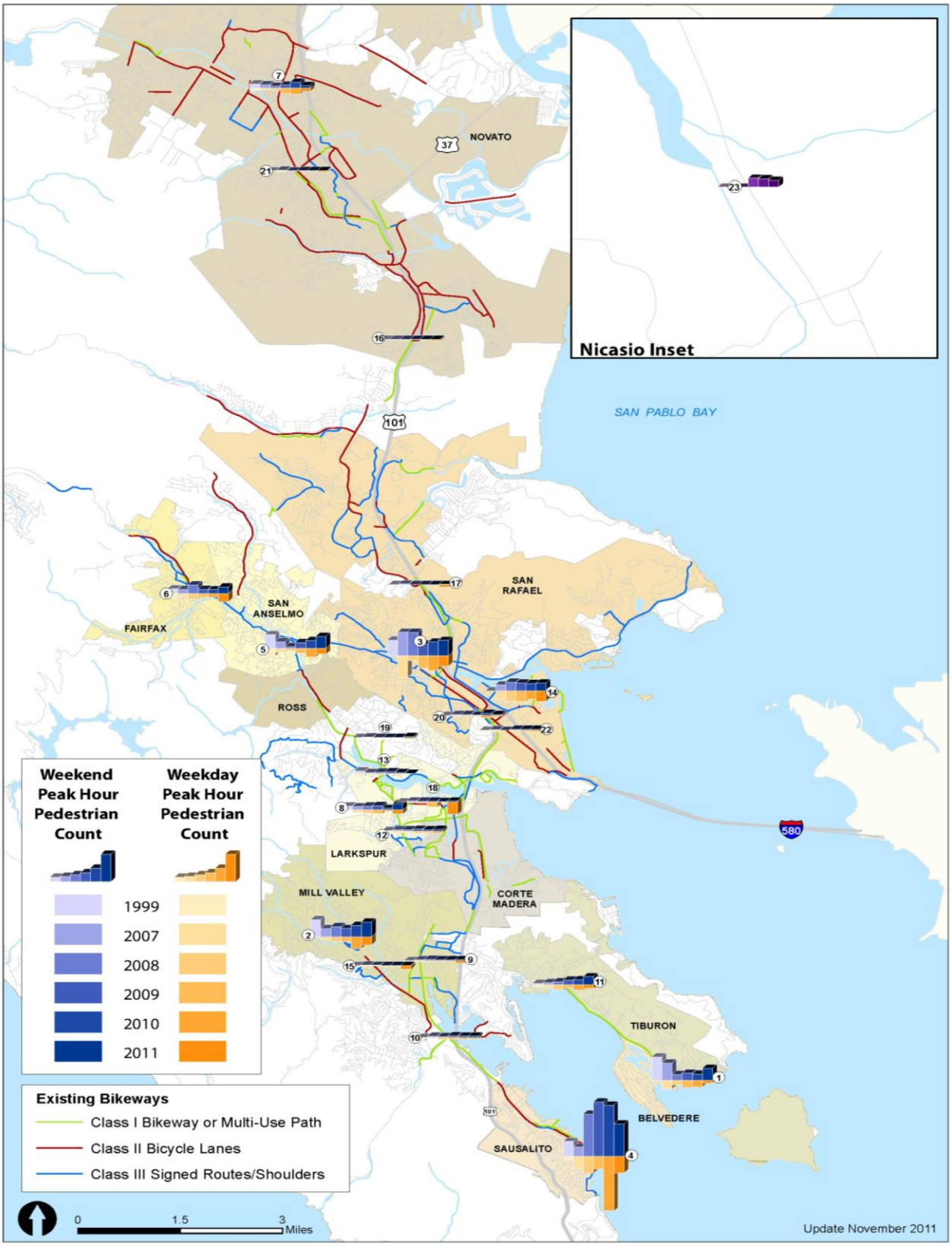
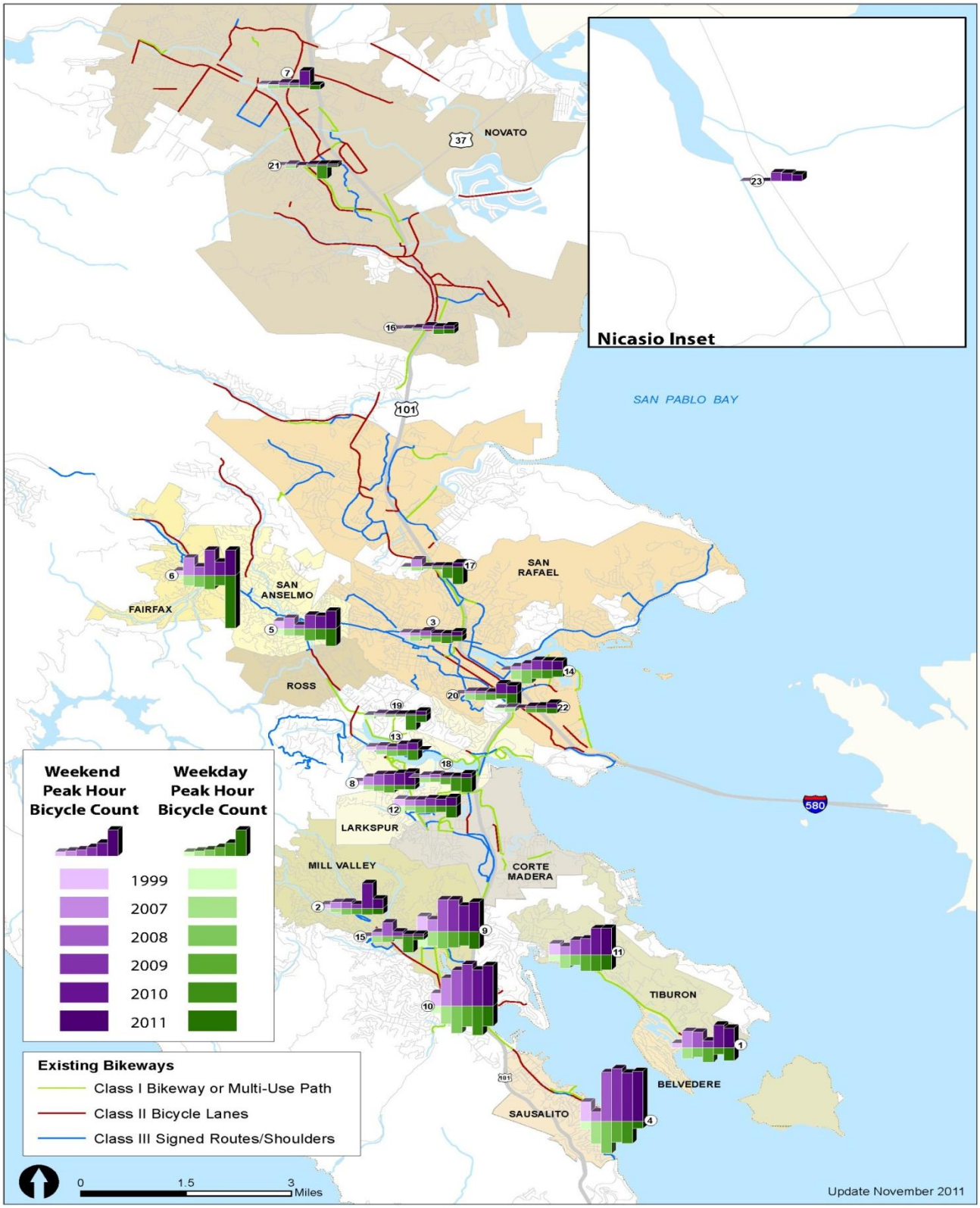


National Bicycle and Pedestrian Documentation Project & Nonmotorized Transportation Pilot Program Count Locations

Marin County, California

Map 1. Pedestrian Peak Hour Volumes



National Bicycle and Pedestrian Documentation Project & Nonmotorized Transportation Pilot Program Count Locations

Marin County, California

Map 2. Bicycle Count Volumes

1 Summary of Non-Motorized Transportation Pilot Program Count/Survey Program & Objectives

Marin County conducts regular counts and surveys of pedestrians and bicyclists to measure the effectiveness of investments in pedestrian and bicycle infrastructure and programs in increasing walking and bicycling. This report summarizes Marin County's approach, which consists of counts and surveys at 23 locations throughout the County, and presents count results from 1999 through 2011.

Marin County's approach is based on the National Bicycle & Pedestrian Documentation Project (NBPD) methodology. The NBPD is a joint national effort by the Institute of Transportation Engineers (ITE) Pedestrian & Bicycle Council, and Alta Planning + Design. The NBPD identifies a consistent count and survey methodology and count dates, collects count and survey data nationwide, and analyzes the data to identify walking and bicycling trends and patterns.

The objective of the count and survey program in Marin County is two-fold. First, the program establishes a baseline and subsequent annual counts of walking/bicycling activity at key locations, so that changes in activity levels can be measured subsequent to the implementation of County programs and projects. Second, the annual count and 2007/2010 survey data provides a better understanding of travel patterns. Information from the surveys, as well as updated Census data and regional transportation data, were used to develop an aggregate demand model for Marin County, presented in Appendix D. This demand model estimates the number of walking and biking trips taken in the County on a typical weekday. In addition, the surveys provide data regarding where bicyclists and pedestrians live, trip purpose, trip length, travel frequency, alternate modes, factors for route choice, seasonal behavior, desires for improvements and demographic data. See the 2010 report for detailed information on the NTPP surveys.

2 Summary of Methodology

The Marin County count and survey methodology uses the NBPD methodology. The core of this methodology is:

- Consistent count days and times
- Consistent count and survey methods and materials
- Centralized data collection and analysis
- Open access to all research professionals and public agencies

The NTPP methodology and materials were customized for the unique needs of the NTPP, as described in the sections below.

2.1 Number of Count and Survey Locations

The Volpe National Transportation Systems Center, which is part of the U.S. Department of Transportation's Research and Innovative Technology Administration, was tasked by the four NTPP communities and the Federal Highway Administration (FHWA) to advise on the evaluation of the NTPP program, assist with data collection, and coordinate evaluation methods across the communities. Working with the Volpe Center, the communities enlisted Alta Planning + Design to develop an evaluation methodology for the four NTPP communities. One of the first steps was to provide guidance on the number of count locations for each of the communities. Alta estimated that, at a minimum, one count should be conducted per 15,000 people in a community. This was considered a reasonable balance between obtaining representative counts throughout a community and budget limitations. For Marin County, this equaled 16 count locations. In addition to these 16 count locations, Marin County also decided to count an additional six (6) locations that reflected previous counts conducted in 1999 and on-going count locations throughout the county, for a total of 22 count locations. In 2008, these 22 count locations were reduced to 20 count locations due to funding restrictions. In 2009 and 2010, one additional location was counted on the weekend for a total of 23 locations. In 2011, counts were conducted at 22 locations; one location (#13) was not counted due to construction.

In addition to collecting annual counts between 2007 and 2011, intercept survey data was collected at six locations in Marin County during 2007 and 2010. Intercept survey data was used to measure the impact of selected NTPP infrastructure projects.

Table A-1 provides a list of count and survey locations.

2.2 Count and Survey Location Criteria

Count and survey locations for Marin County were selected based on criteria developed through the NTPP data collection and analysis program. The criteria for selecting the NTPP project-related count locations includes:

- Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc)
- Locations near proposed major bicycle/pedestrian improvements
- Representative locations in the urbanized area
- Key corridors that can be used to gauge the impacts of future improvements
- Locations where counts have been conducted historically
- Locations where bicycle and pedestrian collision numbers are high
- Locations where there are ongoing counts being conducted by other agencies through a variety of means, including videotaping gaps and pinch points for bicycling and pedestrians

Survey locations were chosen based on where the NTPP infrastructure projects were to be constructed and where potential users were likely to be traveling before the project was constructed. Some locations were strategically chosen to survey for multiple projects, such as the Ranchitos Road location for both the Puerto Suello path and the Ranchitos Road bike lanes.

Table A-1 provides a list of count and survey locations.

2.3 Count Dates and Times

The NTPP count days and times were selected to be consistent with the NBPD methodology, as described below.

2.3.1 Dates

The 2007 counts were conducted during the NBPD national count period of September 11-16, 2007. To aid with multi-year comparisons, subsequent counts have been conducted within one to three weeks of this period. Counts are not collected in inclement weather, on Mondays or Fridays, or on holidays. The dates during each count year are as follows:

- September, 1999
- September 11-16, 2007
- September 27-October 5, 2008
- September 8-21, 2009
- September 14 and October 9, 2010
- September 13-15, 2011

2.3.2 Times

Weekday afternoon peak period counts were conducted at all locations for all count years. In addition, in 2009, 2010, and 2011, bicyclists were also counted during the weekday morning peak period. Standard peak times are as follows:

- Weekday (Tuesday-Thursday, non-holidays) morning peak: 7-9 am
- Weekday (Tuesday-Thursday, non-holidays) afternoon peak: 4-6 pm
- Weekend Days (Saturday, Sunday, non-holiday): 12-2 pm

When comparing volumes between years or between locations, the peak hour from each count was selected (for example, in one location the afternoon peak may have been 4:15 to 5:15 pm, whereas at another location the peak was from 4:45 to 5:45 pm. In 2011, three locations had extended weekday count periods of 2 to 6 pm. . In these cases, the single peak hour or two peak hours were selected to compare to other locations and years, as appropriate for the analysis.

2.4 Count Methodology

All counts were conducted using manual counters and standardized count forms (see **Appendix C: Count Materials**). Counters were trained and given maps showing the exact screen line to be used in the counts. (see **Appendix E: Count Location Orthoimagery**).

2.4.1 Attribute Information

Counters collected attribute information about bicyclists and pedestrians to supplement the count data. Attribute data included gender, children (estimated at under 18), bicyclists riding the wrong-way on the street, and bicyclists not wearing helmets. The attribute information collected varies from year-to year, and is summarized in **Table 2-1**.

Table 2-1 Attribute Information Collected

Year	Gender	Child	Wrong-way	No helmets
1999	✓			
2007	✓	✓	✓	✓
2008	✓	✓		
2009	✓			
2010	✓			
2011	✓	✓	✓	✓

2.4.2 Accuracy and Calibration of the Data

Two of the weekend count days in 2009 were rainy. In order to use this data and to make it comparable to the rest of the data collected in 2009 and previous years, the project consultant developed a growth factor to apply to these counts. The factor was calculated using the 2008 counts and the 2009 counts from locations where data was collected when it was not raining. The average growth from these locations between 2008 and 2009 was applied to the 2009 locations where data was collected in rainy conditions.

3 Summary of Count Data Results

Comparisons of bicycle and pedestrian counts conducted in September 2011 with counts from fall 1999, 2007, 2008, 2009, and 2010 are shown in **Appendix B.** The rates of change reflect a direct comparison of count sites between count years. Only locations that were counted in both 2011 and the comparison year are included in the analysis.

3.1 Pedestrian Count Results

Looking at the 19 count locations where data was collected between 2007 and 2011, the total number of pedestrians counted during peak hours on both weekends and weekdays has increased over the years. These changes show a strong correlation (R^2=0.73 for weekday peak and R^2=0.76 for weekend peak).**Table B-1** and **B-2: Weekday and Weekend Peak-Hour Pedestrian Counts and Percent Change** in Appendix B summarize count information by location for 1999 and 2007 through 2011.

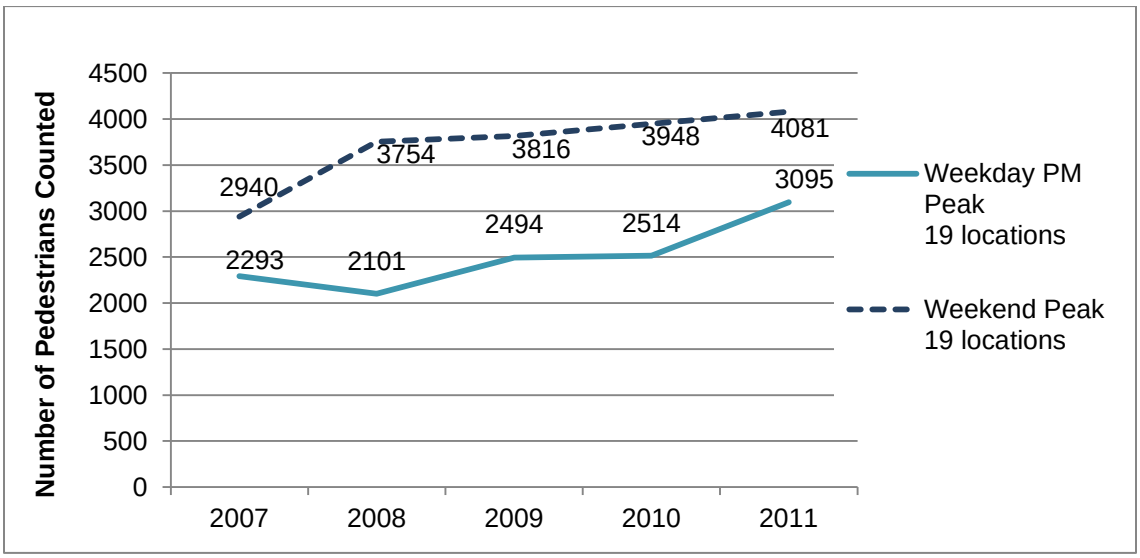


Figure 3-1: Total Peak Hour Pedestrian Volumes 2007-2011

3.1.1 Average Weekday Afternoon Peak Hour Pedestrian Volumes

The count results show that there are high numbers of pedestrians in Marin County on weekdays, with pedestrian counts more than double bicyclist counts. Activity levels range from no pedestrians counted at Nicasio Valley Road near Nicasio School to 786 pedestrians counted at Bridgeway at Princess St., Sausalito during the afternoon peak hour. **Figure 3-2** shows the percent change between 2011 and previous years' count data, which indicates increases over all years.

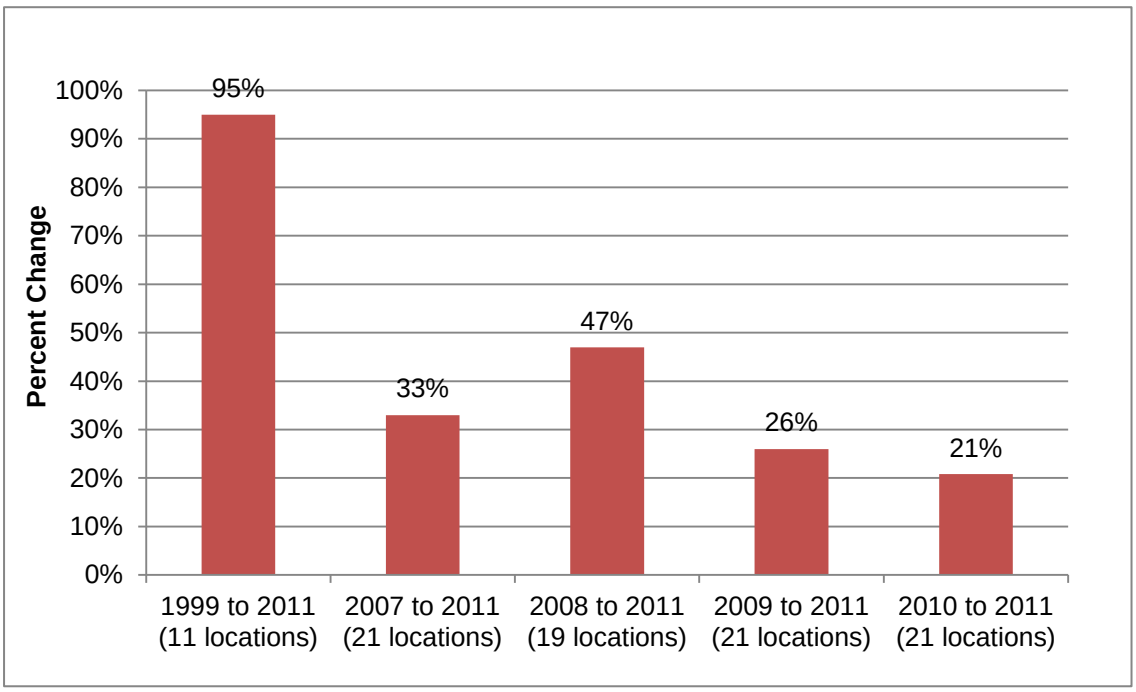


Figure 3-2. Percentage Change in Average Weekday Afternoon Peak Hour Pedestrian Volumes Volumes

3.1.2 Average Weekend Peak Hour Pedestrian Volumes

Average weekend peak hour pedestrian volumes have shown increases each year. There is a moderate 13% increase in average peak hour volumes at the original 12 locations between 1999 and 2011. Even more impressive is the 39% increase in the average volume at the expanded list of 21 locations between 2007 and 2011, which indicates that walking is on the rise throughout Marin on weekends. Figure 3-3 shows the percent change between 2011 and previous years' count data.

The most popular 2011 weekend walking locations were:

- Bridgeway at Princess Street, Sausalito (1,928 pedestrians)
- Miller Ave. at Throckmorton, Mill Valley (914 pedestrians)
- 4th and B Streets, San Rafael (896 pedestrians)

The location included in both 1999 and 2011 counts, where the increase was the greatest in absolute terms, was at Bridgeway/Princess Street in Sausalito (on the weekend, the count increased from 490 pedestrians/hour in 1999 to 1,055 pedestrians/hour in 2011). This large change may be due to special events and transit/ferry arrivals or it may indicate changes in the tourist, economic and commercial dynamics of this area.

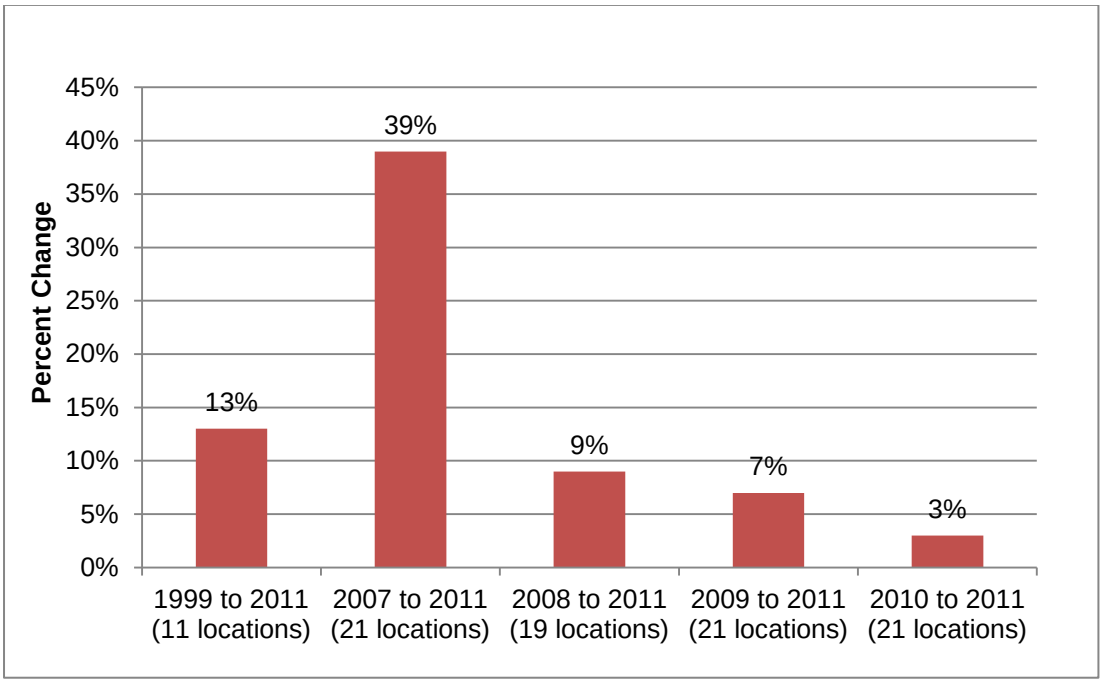


Figure 3-3. Percentage Change in Average Weekend Peak Hour Pedestrian Volumes

3.2 Bicycle Count Results

Looking at the 19 count locations where data was collected between 2007 and 2011, the total number of bicyclists counted during peak hours on both weekends and weekdays has increased over the years. These changes show a strong correlation (R^2=0.91 for weekday peak and R^2=0.90 for weekend peak). **Table B-3 and B-4: Weekday and Weekend Peak-Hour Bicycle Counts and Percent Change** show a comparison of bicycling volumes between 1999 and 2007 through 2011.

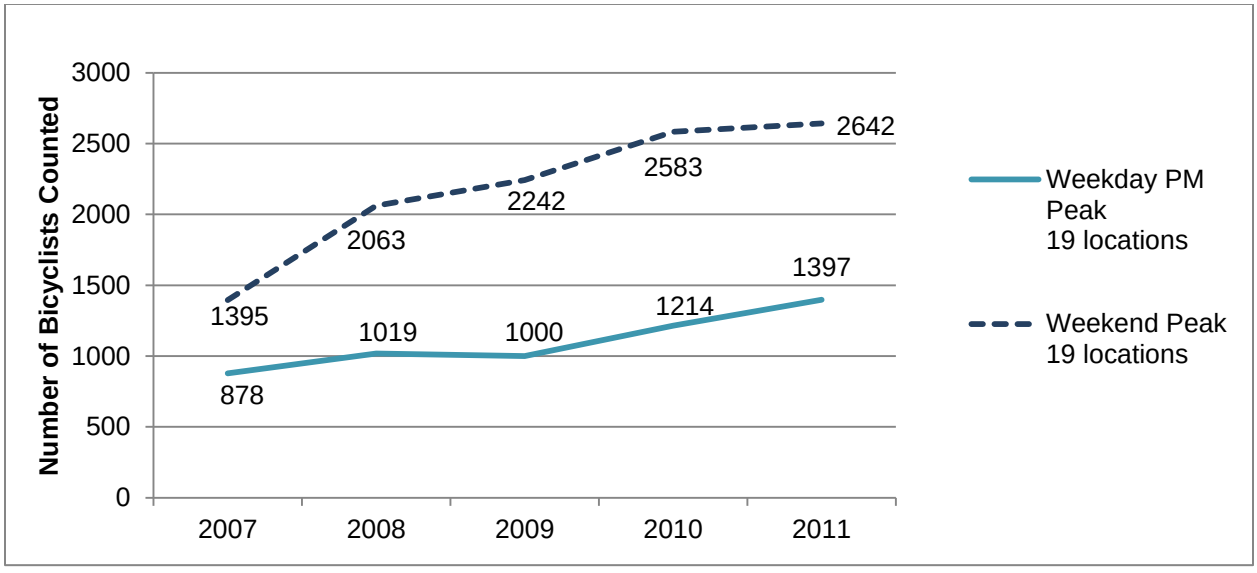


Figure 3-4: Total Peak Hour Bicyclist Volumes 2007-2011

The largest absolute increase in bicycling from 1999 to 2011 occurred at Bridgeway and Princess Street in Sausalito, where 188 peak hour weekend bicyclists were counted in 1999 and 476 in 2011, an increase of 288 bicyclists. At the same location, there was a decrease of five bicyclists during the weekday period.

3.2.1 Average Weekday Afternoon Peak Hour Bicyclist Volumes

In 2011, bicycling activity on weekdays generally increased throughout the county, with afternoon peak activity levels ranging from a low of 15 bicyclists over two hours (Nicasio Valley Road near Nicasio School) to a high of 429 bicyclists (Broadway at Bolinas Rd., in Fairfax). The average for weekday bicycle counts was 76 bicyclists in the morning two-hour peak and 106 bicyclists over the afternoon two-hour peak at the 21 count locations, suggesting large increases in work and school-based bicycling.

The average weekday afternoon peak hour bicyclist volumes have shown steady increases between 1999 and 2011. The average peak hour volumes increased by 1.72 times at the original 12 locations between 1999 and 2011, shown in Figure 3-5. Average peak hour volumes increased 57% at the expanded list of 21 locations between 2007 and 2011.

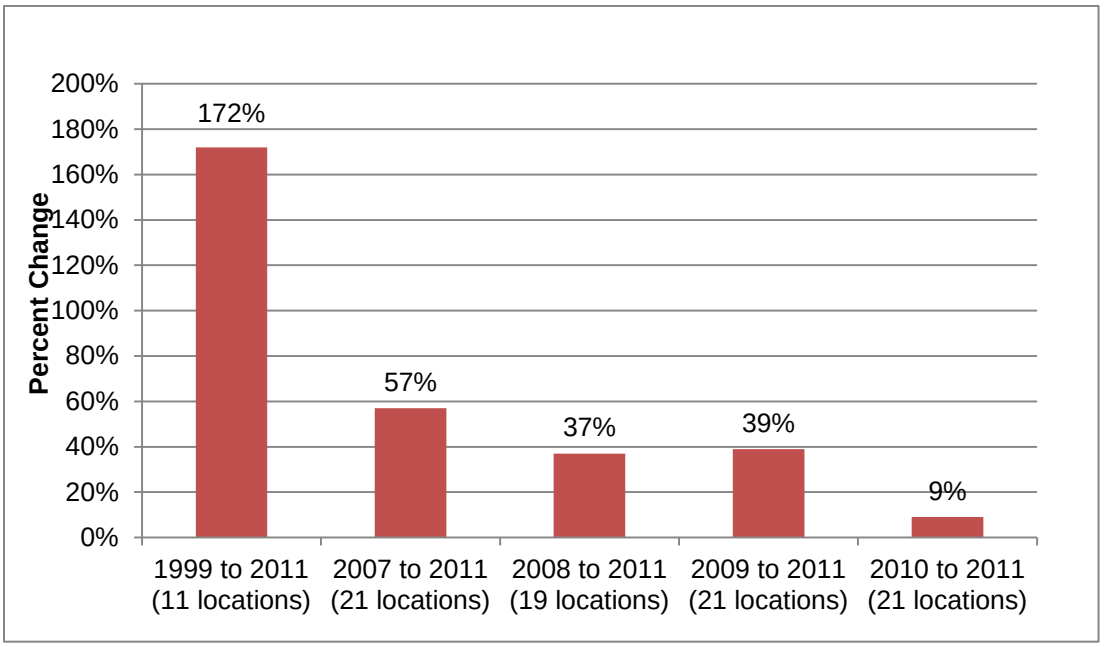


Figure 3-5. Percentage Change in Average Weekday Afternoon Peak Hour Bicyclist Volumes Volumes

3.2.2 Average Weekend Peak Hour Bicyclist Volumes

The average weekend peak hour bicyclist volumes show a large increase in bicycle trips on weekends. Peak hour volumes increased by 1.59 times at the original 12 locations between 1999 and 2011. Peak hour volumes increased 91% at the expanded list of 21 locations between 2007 and 2011, suggesting large increases in recreational bicycle riding.

The 2011 weekend bicycling locations indicate the popularity of Marin's multi-use paths.:

- Bridgeway at Princess Street, Sausalito (795 bicyclists)
- Mill Valley-Sausalito Path at Tennessee Valley (727 bicyclists)
- Mill Valley-Sausalito Path at E. Blithedale, Mill Valley (512 bicyclists)

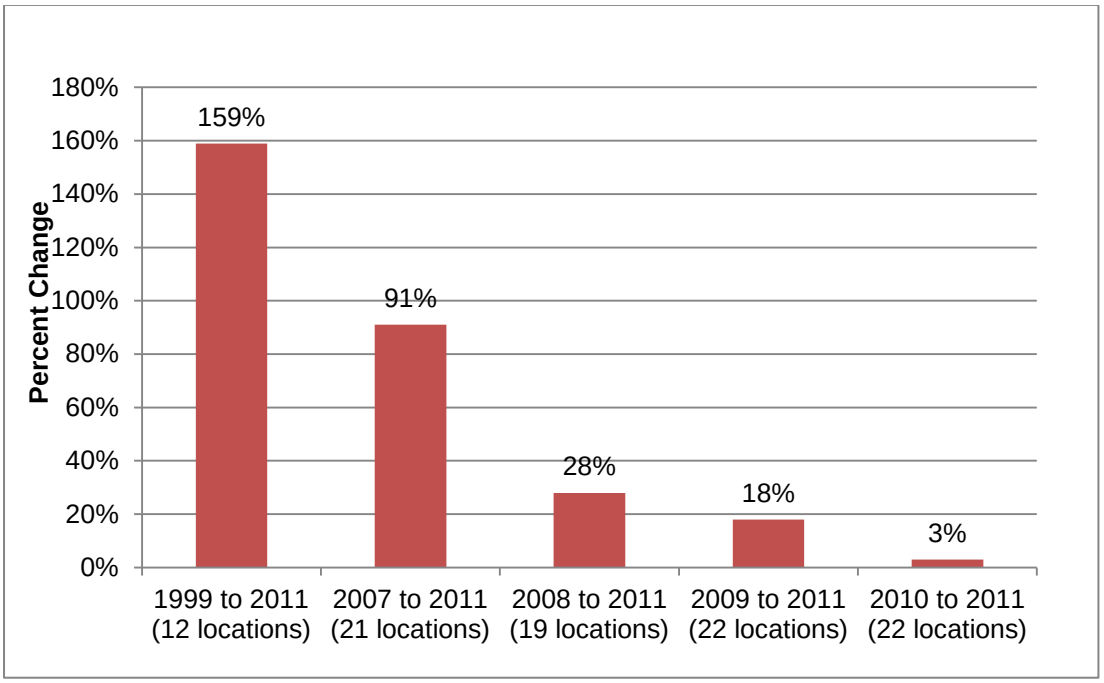


Figure 3-6. Percentage Change in Average Weekend Peak Hour Bicyclist Volumes

3.3 Combined Count Results

A total of the 2007, 2008, 2009, 2010, and 2011 bicycle and pedestrian counts by two-hour increments is shown in **Tables B-5 through B-9.** Key information from the count results includes the following:

- In 2011, the busiest weekday morning peak locations for combined bicycle/pedestrian counts are:
  - Medway/Belvedere Street, San Rafael (286 pedestrians and bicyclists)
  - Broadway at Bolinas Rd., Fairfax (222 pedestrians and bicyclists)
  - Mill Valley-Sausalito Path at E. Blithedale, Mill Valley (217 pedestrians and bicyclists)
- In the weekday afternoon peak, the busiest locations for combined walking/bicycling activity are:
  - Broadway at Bolinas Road, Fairfax (881 pedestrians and bicyclists)
  - Bridgeway at Princess St., Sausalito (855 pedestrians and bicyclists)
  - 4th and B Street (676 pedestrians and bicyclists)
- Walking and bicycling on weekend days is common throughout the eastern urbanized areas of Marin County. In 2011, average bicycling activity on the weekday was only 46% of average weekend volumes, suggesting the importance of bicycling for recreational purposes, as compared to commute purposes. In 2011, the average weekday walking was 67% of average weekend walking, suggesting the importance of walking for commute trips, as compared to recreational trips.
- Data for 2007 through 2011 indicate that activity levels are related to land use, facility types, visitor destinations, and transit ridership. Downtown areas, high transit ridership areas, visitor destinations, routes leading to the Golden Gate Bridge and San Francisco, and multi-use pathways account for the high activity areas.

3.3.1 Attribute Data Results

Table B-12 provides a breakdown of bicyclist and pedestrian trip attributes, including gender, and whether the person counted was a child (under 18). Counters used their best judgment to determine the age of a bicyclist. Helmet use and wrong-way riding for bicyclists are only available for the 2007 and 2011 data. Key findings include:

- Almost half (45%) of the pedestrians counted were women, while 38% were men, and the remaining 17% were children (under age 18) and did not have gender recorded. This indicates that women over age 18 are significantly more likely to be walking than men over age 18.
- Males made up 60% of the adult bicyclists counted in 2011.
- Children 18 years or under make up about 15% of the bicyclists counted in 2011.
- A relatively small proportion of the 2011 bicyclists (16%) were reported not to be wearing helmets.

3.4 Comparison of Counts at Completed NTPP Project Locations

NTPP projects have been completed at four of the count locations. This section summarizes the changes in bicycle and pedestrian counts at these locations. The before and after data for specific project locations indicate that pedestrian and bicycle peak travel has generally increased subsequent to NTPP improvements. The improvements have affected weekday peaks more than weekend peaks, suggesting that the projects are primarily impacting commuters. The projects that have been constructed have closed a gap in the network by improving access through a pinch point, and thus are likely to affect a larger number of pedestrians and bicyclists than other projects might.

3.4.1 Medway Road at Belvedere Street, San Rafael (Location 14)

Medway Road is part of a key connector between the Canal community of San Rafael and downtown and has a high level of pedestrian and transit usage and, to a lesser degree, bicycling. Completed in October 2008, this project removed several obstacles in the original sidewalk layout by undergrounding utility lines, widening sidewalks, installing curb ramps, improving transit stops, and adding street furniture.

This location was first counted in 2007. Since that time, the weekday pedestrian activity has generally trended upwards, from 244 pedestrians counted during the weekday peak hour in 2007 to 322 pedestrians in 2011. Weekend pedestrian counts increased between 2007 and 2008 after the project was completed, but have remained steady since then.

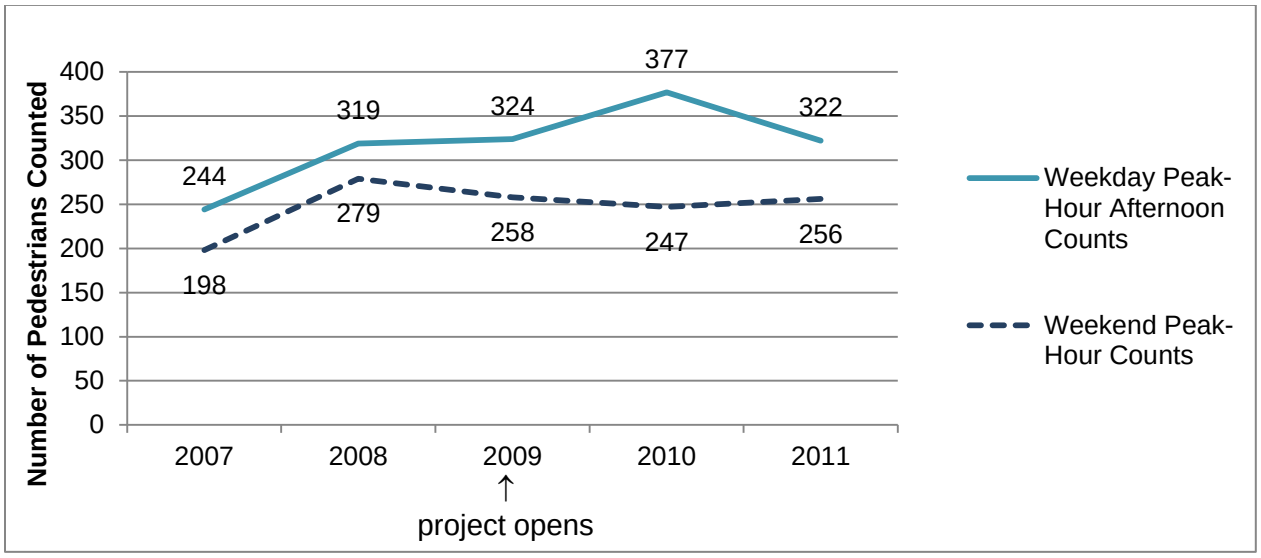


Figure 3-7. Peak Hour Pedestrian Counts at Medway Road at Belvedere Street, San Rafael

Peak hour bicycle counts at this location have trended downward during the weekday peak, from 55 bicyclists counted in 2007 to 41 bicyclists counted in 2011. Weekend peak hour bicycle counts increased dramatically after the project opened between 2007 and 2009, from 32 bicyclists in 2007 to 92 bicyclists in 2009. Since 2009, weekend bicycle counts have decreased slightly, indicating that bicycle commuters. are the primary users at this location.

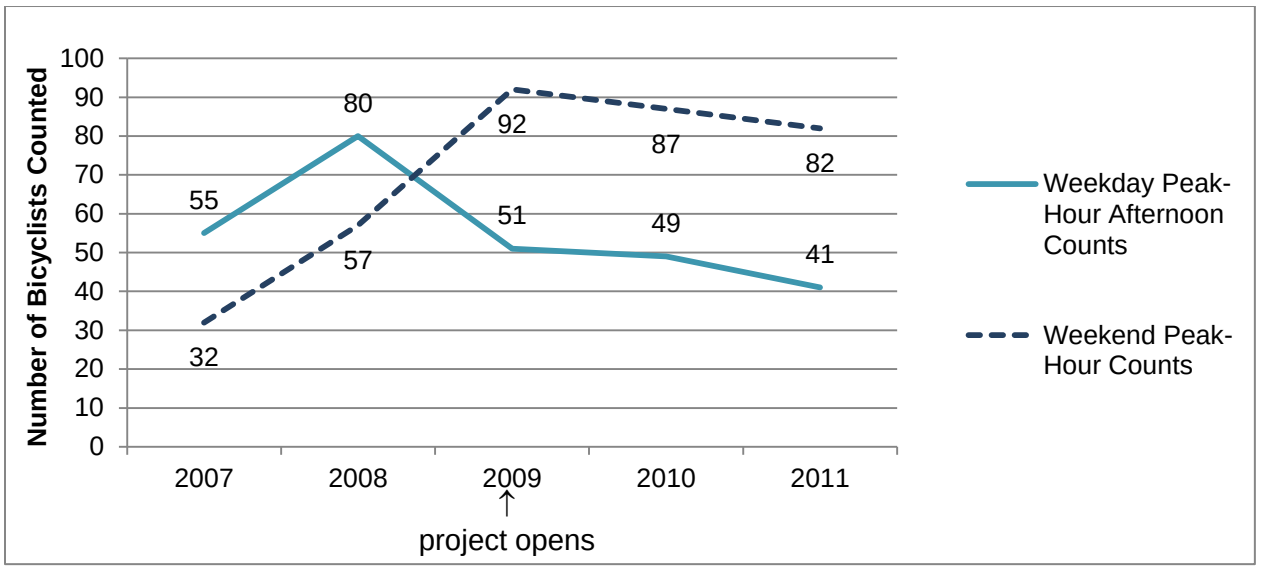


Figure 3-8. Peak Hour Bicyclist Counts at Medway Road at Belvedere Street, San Rafael

3.4.2 Alameda Del Prado at Nave Drive, Ignacio (Location 16)

This count location is to the south of the Alameda del Prado bike lane improvements. Completed in July 2010, the project narrowed an overly-wide median to provide enough room to add Class II bike lanes while preserving on street parking. It is on the North-South Bikeway and is the main route between Marinwood and Novato.

At this location, weekday afternoon peak walking rates increased dramatically between 2009 and 2011, after the project opened. In 2009, 7 pedestrians were counted during the weekday afternoon peak hour, in 2010, 20 pedestrians were counted, and in 2012, 29 pedestrians were counted. Weekend peak hour pedestrian counts have remained relatively stable since 2007.

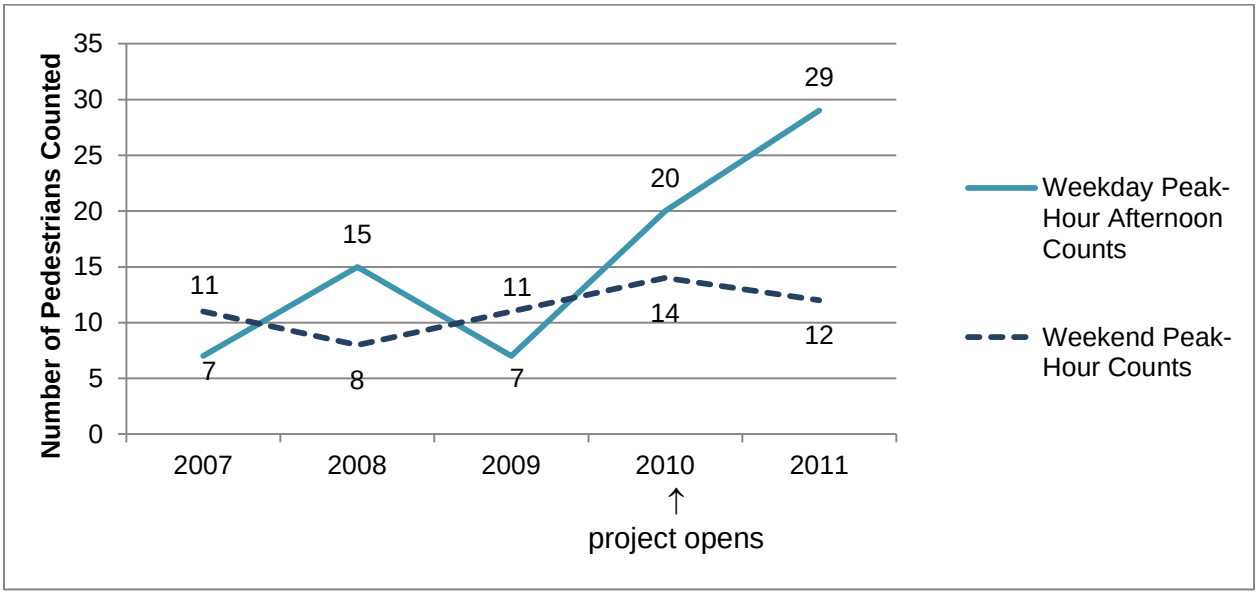


Figure 3-9. Peak Hour Pedestrian Counts at Alameda Del Prado at Nave Drive, Ignacio

Bicycling activity also shows a substantial upward trend between 2007 and in 2011 after the project opened. During the weekday afternoon peak hour, bicycle counts increased dramatically between 2009 and 2011, with 4 bicyclists counted during 2009, 28 bicyclists counted during 2010, and 27 bicyclists counted during 2011. Weekend peak hour counts have shown a relatively steady increase since 2007.

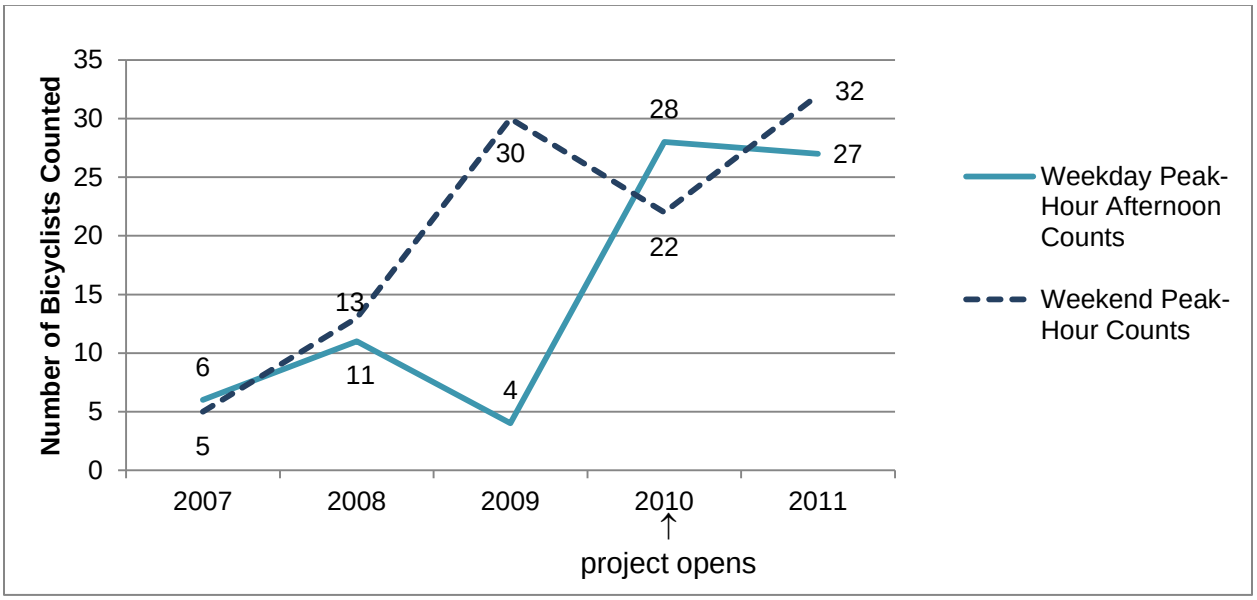


Figure 3-10. Peak Hour Bicyclist Counts at Alameda Del Prado at Nave Drive, Ignacio

3.4.3 Ranchitos Rd at Puerto Suello Summit, San Rafael (Location 17)

This count location is at the summit of Puerto Suello Hill where two major projects were completed to improve bicycling and walking in the North-South Bikeway corridor. To the south is the Puerto Suello Hill path, which provides a continuous Class I multiuse pathway with no cross traffic between Mission Avenue in downtown San Rafael and Merrydale Road, including an overpass and connector at Linden Lane and an underpass at the Lincoln Avenue freeway ramps. The path was completed in December 2010. To the north, Ranchitos Road was widened in November 2009 to add Class II bike lanes between the Puerto Suello path and North San Pedro Road. A sidewalk was also installed, connecting with apartment complexes along the roadway where previously pedestrians had to navigate a dirt path.

This location was first counted in 1999, for the weekday peak hour only. Low initial numbers of pedestrians in both 1999 and 2007 have led to substantial percent changes and large absolute changes. During the weekday peak, counts at this location increased by 39 times over 1999 levels and 7 times over 2010 levels. Weekend peak-hour pedestrian counts show a slight increase, with an average of 5 pedestrians per hour counted between 1999 and 2010, and 11 pedestrians counted during the weekend peak in 2011. A substantial increase in pedestrian traffic was recorded after the opening of the path, while the bike lane project had minimal impact on pedestrian traffic.

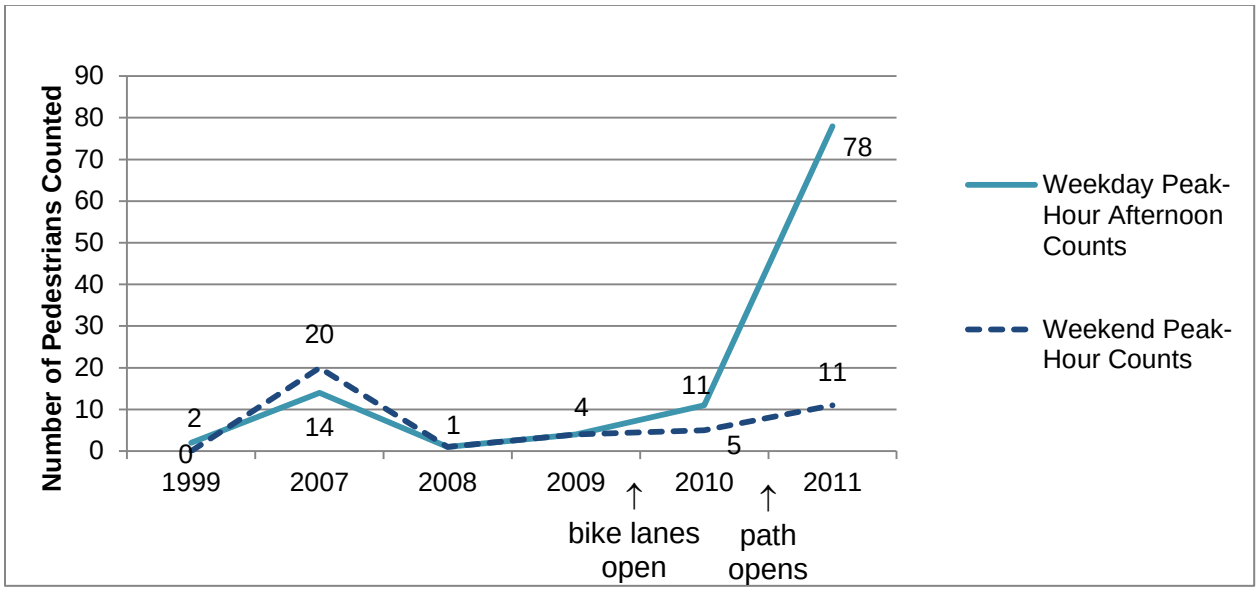


Figure 3-11. Peak Hour Pedestrian Counts at Ranchitos Rd at Puerto Suello Summit, San Rafael

Weekday bicycling levels have shown a more dramatic increase than pedestrian counts. Between 1999 and 2009, weekday peak hour bicycle counts remained relatively stable at about 16 per hour. Between 2009 and 2011, weekday peak hour bicycle counts increased to 65 counted in 2010 and 101 counted in 2011. Weekend peak hour bicycle counts were unusually high in 2007, but between 2008 and 2010 remained relatively stable at about 9 bicyclists per hour. Between 2010 and 2011, weekend peak hour bicyclist counts more than tripled from 11 counted in 2010 to 38 counted in 2011. The data reflects notable increases in bicycling after both the bike lane and pathway projects.

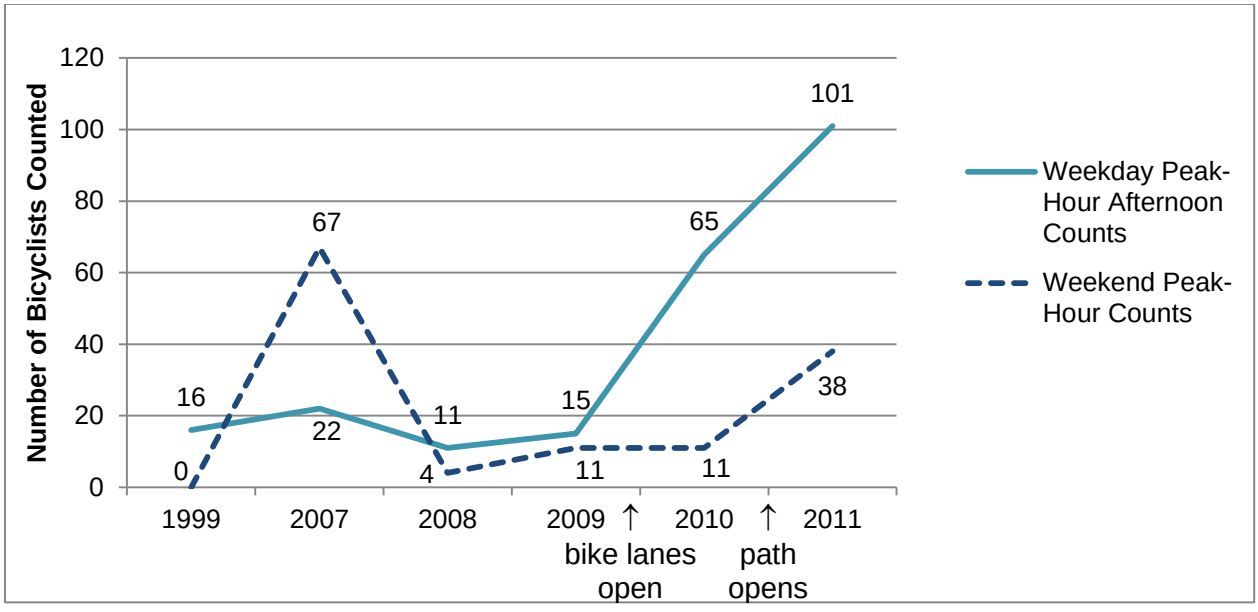


Figure 3-12. Peak Hour Bicyclist Counts at Ranchitos Rd at Puerto Suello Summit, San Rafael

3.4.4 Andersen Drive at Cal Park Tunnel Path, San Rafael (Location 20)

In December 2010, the Cal Park Tunnel Path opened. The 2010 counts were collected prior to opening. This count location records bicyclists and pedestrians that travel along the Cal Park Tunnel corridor. In 2007, the screenline included only those bicyclists and pedestrians traveling along Andersen Drive and the adjacent sidewalks. In 2011, the screenline included bicyclists and pedestrians traveling along Andersen Drive, the adjacent sidewalk, and the newly constructed adjacent pathway.

Counts were recorded separately at the tunnel pathway and the roadway and sidewalk, then combined for comparison with the other data. No pedestrians were counted using the tunnel pathway during the weekday counts, while significantly fewer pedestrians used the undercrossing compared with the roadway during the weekend counts (11 pedestrians crossing at the pathway compared to 21 using the sidewalk). The pathway counts had a peak hour of 39 bicyclists in both weekday and weekend counts, while a peak hour of 43 bicyclists were counted on the roadway and sidewalk during both count periods. Both men and women bicyclists more frequently used the roadway and sidewalk, although 59% of men crossed at the roadway during the weekend, while 53% of women counted crossed at the roadway.

During 2010, weekend peak hour counts for both bicyclists and pedestrians were unusually high, and should be considered outliers and not used to indicate trends. The 2010 were significantly higher than counts in other years, likely due to a special event or other anomaly that drew more pedestrians and bicyclists to the project area during the count period. Disregarding the 2010 outlier, peak hour pedestrian counts have varied slightly from year-to-year, but show a very slight increase overall. Eleven pedestrians were counted during the weekday peak hour in 2007, compared to 32 pedestrians counted during the weekend peak hour in 2011. During the weekend peak hour 21 pedestrians were counted in 2007, compared to 32 pedestrians counted in 2011. There are no noticeable trends in pedestrian volumes associated with the opening of the Cal Park Tunnel Path.

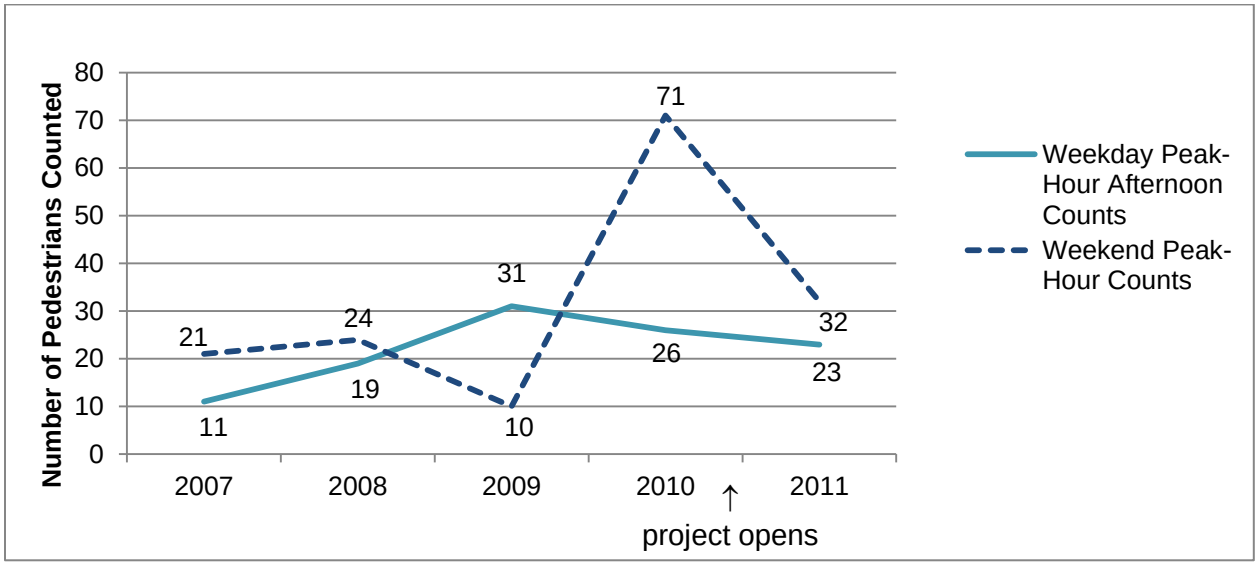


Figure 3-13. Peak Hour Pedestrian Counts at Andersen Drive at Cal Park Tunnel Path, San Rafael

Bicycling increased significantly at this location after the Cal Park Tunnel Path was completed. Prior to 2010, weekday peak hour bicycle counts were steady. Between 2010 and 2011, weekday peak hour bicycle counts more than doubled from 30 in 2010 to 76 in 2011. Disregarding the 2010 weekend data, which shows unusually high bicycle counts, bicycling increased dramatically at this location from 14 bicyclists counted in 2009 to 77 bicyclists counted after the project opened in 2011.

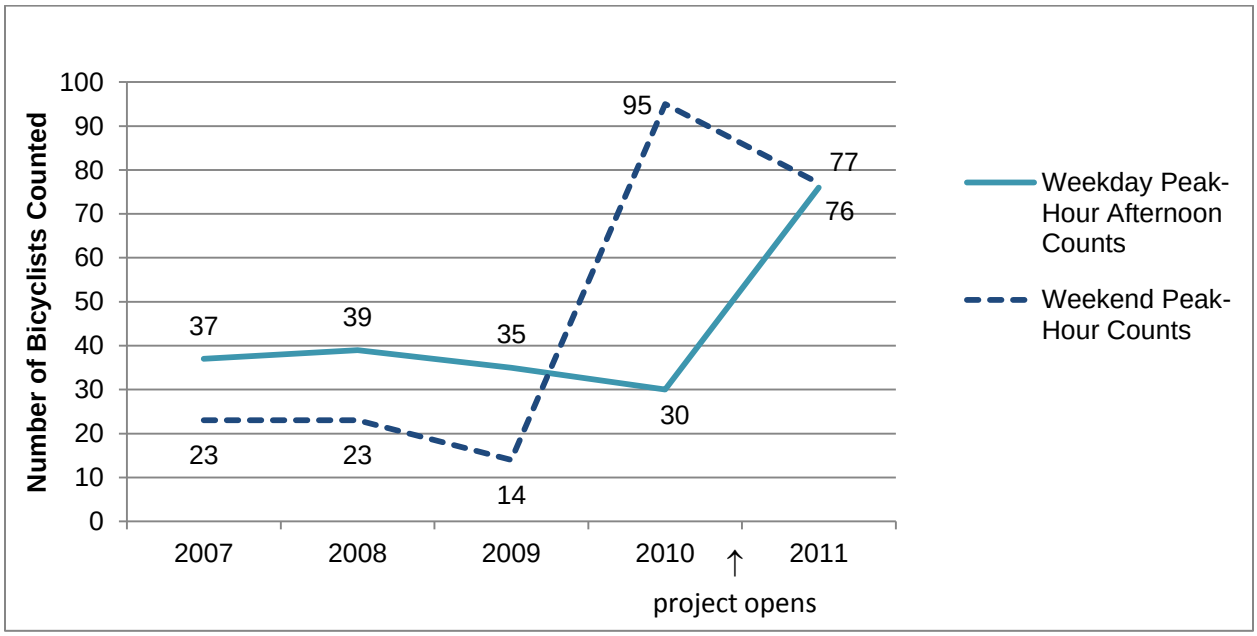


Figure 3-14. Peak Hour Bicyclist Counts at Andersen Drive at Cal Park Tunnel Path, San Rafael

4 Summary of Survey Results

The survey questions developed for the NTPP and Marin County were customized from the NBPD by the four (4) pilot communities and the VTSC. The surveys were designed to be conducted in the field as intercept surveys. The surveys were conducted at selected count locations during or immediately before or after count periods in 2007 and 2010. Surveys were not conducted in 2011.

A copy of the survey form is included in Appendix C. See the 2010 NTPP report for detailed results of the surveys. This section summarizes the key findings from the surveys conducted in 2007 and 2010.

4.1 Pedestrian Survey Results

- Trip Purpose: The number of pedestrian trips that were transportation-related (i.e., work, school, utilitarian) increased 25% between 2007 and 2010, from 44% to 55%. The Transportation Model Appendix quantifies the transportation benefit of these trips.
- Walking Frequency: In 2007, the average walking frequency was 15 days/month, with 31% of the respondents walking daily. In 2010, the average walking frequency increased to 17 days/month, with 44% of the respondents walking daily. The vast majority of pedestrians (82%) walk year-round.
- Distance Walked: In 2007, the average pedestrian trip distance was 2.3 miles. In 2010, this increased to 3.2 miles, an increase of 40%. It is important to note that estimating distances walked is very subjective for many people.
- Alternative Mode for this Trip: In 2007, 43% of respondents indicated they would have driven if they were not able to walk, which is similar to the 44% of the transportation trips identified previously. In 2010, 46% of respondents reported they would have driven if they were unable to walk. In 2007, a large number (28%) would have bicycled, indicating the exercise/recreational nature of their trip. In 2010, 16% indicated they would have bicycled, while 28% indicated they would have taken transit (up from 12% in 2007).
- Improvement Preference: In 2007, respondents identified shade trees, benches, better walking surfaces, and better street crossings as their top four (4) improvements. The top responses were similar in 2010, with wider sidewalks joining the ranks of the top responses.
- Walking Trips that Included Transit: The number of people reporting their walking trip included transit increased from 14% in 2007 to 38% in 2010.
- Reasons for Route Choice: The top three responses were the same in 2007 and 2010, with respondents stating that the directness of the route, accessibility/proximity, and scenic qualities were the top reasons they selected the route to walk. The number of people citing connection to transit increased from 3% in 2007 to 9% in 2010, consistent with the higher number of people in 2010 who reported their walking trip was combined with transit.
- Ethnicity: The ethnic breakdown appeared roughly equivalent to the ethnicity of the county in both survey years.

4.2 Bicyclist Survey Results

- Trip Purpose: The number of bicycle trips that were transportation-related (i.e., work, school, utilitarian) increased 9% between 2007 and 2010, from 34% to 37%. The Transportation Model Appendices quantifies the transportation benefit of these trips.
- Frequency: The average bicycling frequency was 11 days/month, with 16% of the respondents bicycling daily. In 2010, the average bicycling frequency was slightly higher at 12 days/month, with 19% of the respondents bicycling daily.
- Alternative Mode for this Trip: In 2007, if respondents were not able to bicycle, 37% would have driven, which is similar to the 34% of transportation trips identified previously. Nineteen percent would have walked, indicating the exercise/recreational nature of their trip. In 2010, a similar 37% of respondents indicated they would have driven while 12% would have walked. Another 20% would have taken transit.
- Improvement Preference: In 2007, respondents identified better roadway and pathway maintenance, bike lanes, less traffic, and signs/stencils as their top four (4) improvements. Responses were similar in 2010.
- Bicycling Trips that Included Transit - The number of people reporting their bicycling trip included transit increased from 14% in 2007 to 26% in 2010.
- Reasons for Route Choice: While there were some differences in the relative percentages between 2007 and 2010, six factors received the most responses in both years – scenic qualities, bike lanes, direct, accessible/close, separation from traffic and lower traffic volumes. The other four factors – heard about it through friends, level, wider lanes and connection to transit - received notably fewer responses.
- Ethnicity: The ethnic breakdown appeared roughly equivalent to the ethnicity of the county.

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Appendix A. Count Locations

Table A-1. NTPP Count and Survey Locations

ID	Count Year 1999	2007	2008	2009	2010	2011	Count and Survey Locations	Surveys	Count Type
1	×	✓	✓	✓	✓	✓	Tiburon Blvd at Main Street, Tiburon		Annual
2	×	✓	✓	✓	✓	✓	Miller Ave. at Throckmorton, Mill Valley		Annual
3	×	✓	✓	✓	✓	✓	4th and B St., San Rafael		Annual
4	✓	✓	✓	✓	✓	✓	Bridgeway at Princess St., Sausalito		Annual
5	✓	✓	✓	✓	✓	✓	San Anselmo Ave at Tunstead, Ave., San Anselmo		Annual
6	✓	✓	✓	✓	✓	✓	Broadway at Bolinas Rd., Fairfax		Annual
7	✓	✓	✓	✓	✓	✓	Grant Ave., at Redwood Blvd., Novato		Annual
8	×	✓	✓	✓	✓	✓	Magnolia Ave. at Ward St., Larkspur		Annual
9	✦	✓	✓	✓	✓	✓	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	yes	Annual
10	✓	✓	✓	✓	✓	✓	Mill Valley-Sausalito Path at Tennessee Valley Path, Tam Valley		Annual
11	✓	✓	✓	✓	✓	✓	Tiburon Bike Path at Blackie's Pasture, Tiburon		Annual
12	✓	✓	✓	✓	✓	✓	Larkspur-Corte Madera Path at Baltimore Wye		Annual
13	✓	✓	✓	✓	✓		Corte Madera Creek Path at Bon Air Rd., Greenbrae		Annual
14		✓	✓	✓	✓	✓	Medway Rd. at Belvedere St., San Rafael		Annual
15		✓	✓	✓	✓	✓	Camino Alto at E. Blithedale, Mill Valley	yes	Annual
16		✓	✓	✓	✓	✓	Alameda Del Prado at Nave Drive, Novato	yes	NTPP/Annual
17	✦	✓	✓	✓	✓	✓	Ranchitos Rd at Puerto Suello Summit, San Rafael	yes	NTPP/Annual
18		✓	✓	✓	✓	✓	Doherty Dr. at Hall Middle School, Larkspur	yes	NTPP
19	✦	✓	✓	✓	✓	✓	Sir Francis Drake at Wolfe Grade, Kentfield	yes	NTPP
20		✓	✓	✓	✓	✓	Andersen Drive at Cal Park Tunnel Path, San Rafael	yes	NTPP
21		✓		✓	✓	✓	South Novato Blvd. at Rowland; Novato		Annual
22	✦	✓		✓	✓	✓	Bellam at Andersen, San Rafael		NTPP
23				×	×	✓	Nicasio Valley Road near Nicasio School, Nicasio		NTPP

✓ = Weekend and Weekday Count
× = Weekend Count Only
✦ = Weekday Count Only

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Appendix B: Annual Count Data Tables

Table B-1. Weekday Peak-Hour Pedestrian Counts and Percent Change, 1999-2011

		Counts						Percent Change Between Count Year and 2011				
ID	Streets	1999	2007	2008	2009	2010	2011	1999	2007	2008	2009	2010
1	Tiburon Blvd at Main Street, Tiburon	*	269	134	226	161	82	*	(69.5)	(38.8)	(63.7)	(49.1)
2	Miller Ave. at Throckmorton, Mill Valley	*	95	161	162	230	254	*	167.4	57.8	56.8	10.4
3	4th and B St., San Rafael	*	669	147	390	258	317	*	(52.6)	115.6	(18.7)	22.9
4	Bridgeway at Princess St., Sausalito	57	348	514	394	520	506	787.7	45.4	(1.6)	28.4	(2.7)
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	238	122	66	140	129	181	(23.9)	48.4	174.2	29.3	40.3
6	Broadway at Bolinas Rd., Fairfax	107	74	178	121	166	252	135.5	240.5	41.6	108.3	51.8
7	Grant Ave., at Redwood Blvd., Novato	71	52	69	184	95	98	38.0	88.5	42.0	(46.7)	3.2
8	Magnolia Ave. at Ward St., Larkspur	*	84	105	123	119	125	*	48.8	19.0	1.6	5.0
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	36	38	41	26	42	86	138.9	126.3	109.8	230.8	104.8
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	52	20	54	40	15	33	(36.5)	65.0	(38.9)	(17.5)	120.0
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	54	84	164	78	115	117	116.7	39.3	(28.7)	50.0	1.7
12	Larkspur-Corte Madera Path at Baltimore Wye	90	64	42	51	60	51	(43.3)	(20.3)	21.4	0.0	(15.0)
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	90	35	48	35	46	*	*	*	*	*	*
14	Medway Rd. at Belvedere St., San Rafael	*	244	319	324	377	322	*	32.0	0.9	(0.6)	(14.6)
15	Camino Alto at E. Blithedale, Mill Valley	*	35	13	15	67	112	*	220.0	761.5	646.7	67.2
16	Alameda Del Prado at Nave Drive, Novato	*	7	15	7	20	29	*	314.3	93.3	314.3	45.0
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	2	14	1	4	11	78	3,800.0	457.1	7,700.0	1,850.0	609.1
18	Doherty Dr. at Hall Middle School, Larkspur	*	38	46	161	44	387	*	918.4	741.3	140.4	779.5
19	Sir Francis Drake at Wolfe Grade, Kentfield	9	25	13	17	59	42	366.7	68.0	223.1	147.1	(28.8)
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	*	11	19	31	26	23	*	109.1	21.1	(25.8)	(11.5)
21	South Novato Blvd. at Rowland; Novato	*	39	*	9	82	29	*	(25.6)	*	222.2	(64.6)
22	Bellam at Andersen, San Rafael	42	39	*	9	14	30	(28.6)	(23.1)	*	233.3	114.3
23	Nicasio Valley Road near Nicasio School, Nicasio	*	*	*	*	*	0	*	*	*	*	*
Average count per location/Average percent change		**71**	**109**	**108**	**116**	**121**	**143**	**95**	**33**	**47**	**26**	**21**

** = Data unavailable.*

Table B-2. Weekend Peak-Hour Pedestrian Counts and Percent Change, 1999-2011

		Counts						Percent Change Between Count Year and 2011				
ID	Streets	1999	2007	2008	2009	2010	2011	1999	2007	2008	2009	2010
1	Tiburon Blvd at Main Street, Tiburon	770	564	187	238	200	394	(48.8)	(30.1)	110.7	65.5	97.0
2	Miller Ave. at Throckmorton, Mill Valley	552	258	328	270	371	478	(13.4)	85.3	45.7	77.0	28.8
3	4th and B St., San Rafael	510	770	762	385	448	501	(1.8)	(34.9)	(34.3)	30.1	11.8
4	Bridgeway at Princess St., Sausalito	490	303	1388	1782	1676	1055	115.3	248.2	(24.0)	(40.8)	(37.1)
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	450	222	60	194	258	394	(12.4)	77.5	556.7	103.1	52.7
6	Broadway at Bolinas Rd., Fairfax	146	125	276	124	121	205	40.4	64.0	(25.7)	65.3	69.4
7	Grant Ave., at Redwood Blvd., Novato	133	111	61	96	187	79	(40.6)	(28.8)	29.5	(17.7)	(57.8)
8	Magnolia Ave. at Ward St., Larkspur	120	102	114	133	48	195	62.5	91.2	71.1	46.6	306.3
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	*	19	39	28	29	33	*	73.7	(15.4)	17.9	13.8
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	14	48	40	55	52	53	278.6	10.4	32.5	(3.6)	1.9
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	50	75	97	145	166	267	434.0	256.0	175.3	84.1	60.8
12	Larkspur-Corte Madera Path at Baltimore Wye	10	33	44	59	33	52	420.0	57.6	18.2	(11.9)	57.6
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	75	26	37	47	25	*	*	*	*	*	*
14	Medway Rd. at Belvedere St., San Rafael	*	198	279	258	247	256	*	29.3	(8.2)	(0.8)	3.6
15	Camino Alto at E. Blithedale, Mill Valley	*	15	12	6	9	8	*	(46.7)	(33.3)	33.3	(11.1)
16	Alameda Del Prado at Nave Drive, Novato	*	11	8	11	14	12	*	9.1	50.0	9.1	(14.3)
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	*	20	1	4	5	11	*	(45.0)	1000.0	175.0	120.0
18	Doherty Dr. at Hall Middle School, Larkspur	*	30	26	13	8	30	*	0.0	15.4	130.8	275.0
19	Sir Francis Drake at Wolfe Grade, Kentfield	*	15	8	5	5	26	*	73.3	225.0	420.0	420.0
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	*	21	24	10	71	32	*	52.4	33.3	220.0	(54.9)
21	South Novato Blvd. at Rowland; Novato	*	13	*	6	7	8	*	(38.5)	*	33.3	14.3
22	Bellam at Andersen, San Rafael	*	20	*	34	31	31	*	55.0	*	(8.8)	0.0
23	Nicasio Valley Road near Nicasio School, Nicasio	*	*	*	*	2	10	*	*	*	*	400.0
Average count per location/Average percent change		**277**	**136**	**190**	**177**	**182**	**334**	**13.2**	**38.6**	**8.7**	**6.8**	**3.6**

** = Data unavailable.*

Table B-3. Weekday Peak-Hour Bicycle Counts and Percent Change, 1999-2011

		Counts						Percent Change Between Count Year and 2011				
ID	Streets	1999	2007	2008	2009	2010	2011	1999	2007	2008	2009	2010
1	Tiburon Blvd at Main Street, Tiburon	*	64	54	84	40	76	*	18.8	40.7	(9.5)	90.0
2	Miller Ave. at Throckmorton, Mill Valley	*	23	37	36	38	36	*	56.5	(2.7)	0.0	(5.3)
3	4th and B St., San Rafael	*	31	19	35	43	33	*	6.5	73.7	(5.7)	(23.3)
4	Bridgeway at Princess St., Sausalito	45	129	184	121	127	40	(11.1)	(69.0)	(78.3)	(66.9)	(68.5)
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	34	41	40	69	62	100	194.1	143.9	150.0	44.9	61.3
6	Broadway at Bolinas Rd., Fairfax	20	61	67	80	58	303	1,415.0	396.7	352.2	278.8	422.4
7	Grant Ave., at Redwood Blvd., Novato	12	21	17	14	14	25	108.3	19.0	47.1	78.6	78.6
8	Magnolia Ave. at Ward St., Larkspur	*	25	33	45	25	26	*	4.0	(21.2)	(42.2)	4.0
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	88	84	98	93	81	99	12.5	17.9	1.0	6.5	22.2
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	42	101	156	116	166	114	171.4	12.9	(26.9)	(1.7)	(31.3)
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	32	77	58	93	93	86	168.8	11.7	48.3	(7.5)	(7.5)
12	Larkspur-Corte Madera Path at Baltimore Wye	42	28	44	41	36	68	61.9	142.9	54.5	65.9	88.9
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	4	27	38	35	61	*	*	*	*	*	*
14	Medway Rd. at Belvedere St., San Rafael	*	55	80	51	49	41	*	(25.5)	(48.8)	(19.6)	(16.3)
15	Camino Alto at E. Blithedale, Mill Valley	*	36	33	18	93	20	*	(44.4)	(39.4)	11.1	(78.5)
16	Alameda Del Prado at Nave Drive, Novato	*	6	11	4	28	27	*	350.0	145.5	575.0	(3.6)
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	16	22	11	15	65	101	531.3	359.1	818.2	573.3	55.4
18	Doherty Dr. at Hall Middle School, Larkspur	*	28	26	40	78	86	*	207.1	230.8	115.0	10.3
19	Sir Francis Drake at Wolfe Grade, Kentfield	22	9	12	10	88	40	81.8	344.4	233.3	300.0	(54.5)
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	*	37	39	35	30	76	*	105.4	94.9	117.1	153.3
21	South Novato Blvd. at Rowland; Novato	*	18	*	12	76	12	*	(33.3)	*	0.0	(84.2)
22	Bellam at Andersen, San Rafael	16	21	*	25	26	29	81.3	38.1	*	16.0	11.5
23	Nicasio Valley Road near Nicasio School, Nicasio	*	*	*	*	*	1	*	*	*	*	*
Average count per location/Average percent change		**31**	**43**	**53**	**49**	**63**	**65**	**172.4**	**56.8**	**37.1**	**38.7**	**9.3**

** = Data unavailable.*

Table B-4. Weekend Peak-Hour Bicycle Counts and Percent Change, 1999-2011

		Counts						Percent Change Between Count Year and 2011				
ID	Streets	1999	2007	2008	2009	2010	2011	1999	2007	2008	2009	20110
1	Tiburon Blvd at Main Street, Tiburon	43	154	147	64	213	185	330.2	20.1	25.9	189.1	(13.1)
2	Miller Ave. at Throckmorton, Mill Valley	36	56	58	36	235	89	147.2	58.9	53.4	147.2	(62.1)
3	4th and B St., San Rafael	32	27	46	23	20	41	28.1	51.9	(10.9)	78.3	105.0
4	Bridgeway at Princess St., Sausalito	188	91	467	502	460	476	153.2	423.1	1.9	(5.2)	3.5
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	73	102	34	128	119	166	127.4	62.7	388.2	29.7	39.5
6	Broadway at Bolinas Rd., Fairfax	42	167	82	239	128	238	466.7	42.5	190.2	(0.4)	85.9
7	Grant Ave., at Redwood Blvd., Novato	10	9	24	19	135	0	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
8	Magnolia Ave. at Ward St., Larkspur	36	76	102	104	113	125	247.2	64.5	22.5	20.2	10.6
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	144	111	302	300	243	279	93.8	151.4	(7.6)	(7.0)	14.8
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	122	266	339	397	344	386	216.4	45.1	13.9	(2.8)	12.2
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	106	80	139	153	251	255	140.6	218.8	83.5	66.7	1.6
12	Larkspur-Corte Madera Path at Baltimore Wye	62	57	57	69	66	77	24.2	35.1	35.1	11.6	16.7
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	30	35	26	49	66	*	*	*	*	*	*
14	Medway Rd. at Belvedere St., San Rafael	*	32	57	92	87	82	*	156.3	43.9	(10.9)	(5.7)
15	Camino Alto at E. Blithedale, Mill Valley	*	38	131	42	20	21	*	(44.7)	(84.0)	(50.0)	5.0
16	Alameda Del Prado at Nave Drive, Novato	*	5	13	30	22	32	*	540.0	146.2	6.7	45.5
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	*	67	4	11	11	38	*	(43.3)	850.0	245.5	245.5
18	Doherty Dr. at Hall Middle School, Larkspur	*	19	31	12	9	37	*	94.7	19.4	208.3	311.1
19	Sir Francis Drake at Wolfe Grade, Kentfield	*	15	7	7	12	38	*	153.3	442.9	442.9	216.7
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	*	23	23	14	95	77	*	234.8	234.8	450.0	(18.9)
21	South Novato Blvd. at Rowland; Novato	*	13	*	10	11	15	*	15.4	*	50.0	36.4
22	Bellam at Andersen, San Rafael	*	8	*	16	22	49	*	512.5	*	206.3	122.7
23	Nicasio Valley Road near Nicasio School, Nicasio	*	*	*	83	77	62	*	*	*	(25.3)	(19.5)
Average count per location/Average percent change		**71**	**66**	**105**	**104**	**120**	**126**	**159.2**	**91.1**	**28.1**	**17.7**	**2.8**

** = Data unavailable.*

Table B-5. 2007 Pedestrian and Bicyclist Two-Hour Count Volumes for Weekdays and Weekends

		Weekday (4-6 pm)			Weekend Day (12-2 pm)		
ID	Streets	Pedestrians	Bicyclists	Total	Pedestrians	Bicyclists	Total
1	Tiburon Blvd at Main Street, Tiburon	426	102	528	983	278	1261
2	Miller Ave. at Throckmorton, Mill Valley	167	41	208	503	86	588
3	4th and B St., San Rafael	1141	52	1193	1492	47	1539
4	Bridgeway at Princess St., Sausalito	614	246	860	515	150	665
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	203	67	270	388	176	564
6	Broadway at Bolinas Rd., Fairfax	139	100	239	187	267	454
7	Grant Ave., at Redwood Blvd., Novato	100	26	126	209	14	223
8	Magnolia Ave. at Ward St., Larkspur	160	38	198	123	129	252
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	68	137	205	32	194	226
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	28	157	185	60	516	576
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	133	112	245	132	133	265
12	Larkspur-Corte Madera Path at Baltimore Wye	110	45	155	55	105	160
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	60	45	105	42	56	98
14	Medway Rd. at Belvedere St., San Rafael	420	94	514	395	56	451
15	Camino Alto at E. Blithedale, Mill Valley	61	64	125	21	49	70
16	Alameda Del Prado at Nave Drive, Novato	11	6	17	15	7	22
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	16	30	46	31	84	115
18	Doherty Dr. at Hall Middle School, Larkspur	53	34	87	51	35	86
19	Sir Francis Drake at Wolfe Grade, Kentfield	37	17	54	22	25	47
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	17	52	69	39	30	69
21	South Novato Blvd. at Rowland; Novato	69	35	104	16	23	39
22	Bellam at Andersen, San Rafael	61	33	94	35	14	49
	Total	**4094**	**1533**	**5627**	**5346**	**2474**	**7820**
	Average count per location	**186**	**70**	**256**	**243**	**112**	**355**

** = Data unavailable.*

Table B-6. 2007 Two-Hour Pedestrian and Bicyclist Volumes & Attributes: Gender, Age and Helmet Use

		Pedestrians				Bicyclists					
ID	Streets	Male	Female	Total	Children	Male	Female	Total	Children	No Helmet	Wrong Way
1	Tiburon Blvd at Main Street, Tiburon	714	695	1409	228	251	129	380	30	63	27
2	Miller Ave. at Throckmorton, Mill Valley	276	394	670	101	96	31	127	25	28	28
3	4th and B St., San Rafael	1421	1212	2633	224	86	22	108	10	0	0
4	Bridgeway at Princess St., Sausalito	603	526	1129	67	247	149	396	12	135	0
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	239	352	591	78	186	57	243	15	22	0
6	Broadway at Bolinas Rd., Fairfax	179	147	326	47	*	*	367	*	*	*
7	Grant Ave., at Redwood Blvd., Novato	168	141	309	47	35	5	40	20	25	12
8	Magnolia Ave. at Ward St., Larkspur	154	209	363	60	31	7	38	14	26	4
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	38	62	100	61	*	*	331	*	*	*
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	45	43	88	29	*	*	673	*	*	*
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	114	151	265	52	135	110	245	66	55	*
12	Larkspur-Corte Madera Path at Baltimore Wye	34	101	165	40	*	*	150	*	*	*
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	46	56	102	10	68	33	101	14	15	*
14	Medway Rd. at Belvedere St., San Rafael	559	256	815	188	147	3	150	22	151	46
15	Camino Alto at E. Blithedale, Mill Valley	42	40	82	40	*	*	113	*	*	*
16	Alameda Del Prado at Nave Drive, Novato	22	4	26	0	*	*	13	*	*	*
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	33	9	47	14	*	*	114	*	*	*
18	Doherty Dr. at Hall Middle School, Larkspur	51	56	107	*	63	17	80	22	5	5
19	Sir Francis Drake at Wolfe Grade, Kentfield	33	26	59	11	38	4	42	12	4	0
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	44	12	56	0	75	7	82	0	61	16
21	South Novato Blvd. at Rowland, Novato	43	39	85	16	*	*	58	*	*	*
22	Bellam at Andersen, San Rafael	74	22	96	*	*	*	47	*	*	*
	Total (of locations reporting attributes)	**4553**	**9518**	**4553**	**1313**	**1458**	**574**	**2032**	**262**	**590**	**138**
	Percent	**52%**	**48%**	**100%**	**14%**	**72%**	**28%**	**100%**	**13%**	**29%**	**7%**

** = Data unavailable.*

Table B-7. 2008 Two-Hour Weekday and Weekend Total Pedestrian and Bicyclist Volumes

		Weekday (4-6 pm)			Weekend Day (12-2 pm)		
ID	Streets	Pedestrians	Bicyclists	Total	Pedestrians	Bicyclists	Total
1	Tiburon Blvd at Main Street, Tiburon	254	92	346	373	247	620
2	Miller Ave. at Throckmorton, Mill Valley	303	62	365	629	95	724
3	4th and B St., San Rafael	287	29	316	1301	70	1371
4	Bridgeway at Princess St., Sausalito	911	296	1207	2483	851	3334
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	97	74	171	119	58	177
6	Broadway at Bolinas Rd., Fairfax	346	120	466	468	143	611
7	Grant Ave., at Redwood Blvd., Novato	114	28	142	96	44	140
8	Magnolia Ave. at Ward St., Larkspur	186	53	239	196	181	377
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	57	187	244	68	580	648
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	85	282	367	69	619	688
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	240	94	334	184	265	449
12	Larkspur-Corte Madera Path at Baltimore Wye	69	70	139	71	90	161
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	89	59	148	61	42	103
14	Medway Rd. at Belvedere St., San Rafael	585	131	716	543	86	629
15	Camino Alto at E. Blithedale, Mill Valley	21	60	81	17	201	218
16	Alameda Del Prado at Nave Drive, Novato	25	21	46	9	17	26
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	1	16	17	2	6	8
18	Doherty Dr. at Hall Middle School, Larkspur	78	50	128	47	46	93
19	Sir Francis Drake at Wolfe Grade, Kentfield	18	17	35	12	11	23
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	30	64	94	39	39	78
21	South Novato Blvd. at Rowland; Novato	*	*	*	*	*	*
22	Bellam at Andersen, San Rafael	*	*	*	*	*	*
	Total (of locations reporting attributes)	**3796**	**1805**	**5601**	**6787**	**3691**	**10478**
	Average count per location	**190**	**90**	**280**	**339**	**185**	**524**

** = Data unavailable.*

Table B-8. 2009 Pedestrian and Bicyclist Two-Hour Count Volumes for Weekdays and Weekends

		Weekday (4-6 pm)			Weekend Day (12-2 pm)		
ID	Streets	Pedestrians	Bicyclists	Total	Pedestrians	Bicyclists	Total
1	Tiburon Blvd at Main Street, Tiburon	438	152	590	415	77	492
2	Miller Ave. at Throckmorton, Mill Valley	279	59	338	521	44	565
3	4th and B St., San Rafael	734	66	800	720	43	763
4	Bridgeway at Princess St., Sausalito	656	214	870	2900	996	3896
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	269	122	391	318	214	532
6	Broadway at Bolinas Rd., Fairfax	203	151	354	219	459	678
7	Grant Ave., at Redwood Blvd., Novato	344	25	369	165	33	198
8	Magnolia Ave. at Ward St., Larkspur	207	71	278	248	136	384
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	48	178	226	55	521	576
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	79	216	295	84	697	781
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	151	121	272	271	294	565
12	Larkspur-Corte Madera Path at Baltimore Wye	96	65	161	87	100	187
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	47	54	101	84	81	165
14	Medway Rd. at Belvedere St., San Rafael	506	78	584	462	96	558
15	Camino Alto at E. Blithedale, Mill Valley	25	30	55	10	44	54
16	Alameda Del Prado at Nave Drive, Novato	9	4	13	17	31	48
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	7	21	28	7	14	21
18	Doherty Dr. at Hall Middle School, Larkspur	71	41	112	25	19	44
19	Sir Francis Drake at Wolfe Grade, Kentfield	16	13	29	9	8	17
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	38	61	99	15	27	42
21	South Novato Blvd. at Rowland; Novato	14	20	34	7	12	19
22	Bellam at Andersen, San Rafael	13	40	53	54	20	74
23	Nicasio Valley Road near Nicasio School, Nicasio*	-	-	-	-	126	126
	Total	**4250**	**1802**	**6052**	**6693**	**4092**	**10785**
	Average count per location**	**193**	**82**	**275**	**304**	**180**	**485**

** = Bicycle counts at Location 23 - Nicasio Valley Road near Nicasio School are weekend only. During the same weekend period, 431 vehicles passed at the same location.*

*** = Average excludes Location 23, since it was a weekend count only.*

Table B-9. 2010 Pedestrian and Bicyclist Two Hour Count Volumes for Weekdays and Weekends

		Weekday (4-6 pm)			Weekend Day (12-2 pm)		
ID	Streets	Pedestrians	Bicyclists	Total	Pedestrians	Bicyclists	Total
1	Tiburon Blvd at Main Street, Tiburon	293	68	361	379	308	687
2	Miller Ave. at Throckmorton, Mill Valley	406	63	469	560	341	901
3	4th and B St., San Rafael	483	61	544	825	29	854
4	Bridgeway at Princess St., Sausalito	955	218	1173	2850	789	3639
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	246	100	346	483	227	710
6	Broadway at Bolinas Rd., Fairfax	301	109	410	237	197	434
7	Grant Ave., at Redwood Blvd., Novato	172	19	191	332	244	576
8	Magnolia Ave. at Ward St., Larkspur	205	44	249	82	160	242
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	72	143	215	54	467	521
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	25	259	284	84	621	705
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	190	170	360	331	441	772
12	Larkspur-Corte Madera Path at Baltimore Wye	103	55	158	52	120	172
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	78	111	189	35	105	140
14	Medway Rd. at Belvedere St., San Rafael	664	93	757	464	141	605
15	Camino Alto at E. Blithedale, Mill Valley	94	176	270	9	29	38
16	Alameda Del Prado at Nave Drive, Novato	28	32	60	20	42	62
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	15	113	128	8	16	24
18	Doherty Dr. at Hall Middle School, Larkspur	68	93	161	12	16	28
19	Sir Francis Drake at Wolfe Grade, Kentfield	98	133	231	8	20	28
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	41	37	78	92	146	238
21	South Novato Blvd. at Rowland; Novato	163	133	296	13	15	28
22	Bellam at Andersen, San Rafael	22	36	58	41	38	79
23	Nicasio Valley Road near Nicasio School, Nicasio*	-	-	-	2	128	130
	Total	**4722**	**2266**	**6988**	**6973**	**4640**	**11613**
	Average count per location**	**215**	**103**	**318**	**317**	**205**	**522**

** = Bicycle counts at Location 23 - Nicasio Valley Road near Nicasio School are weekend only.*

*** = Average excludes Location 23, since it was a weekend count only.*

Table B-10. 2011 Pedestrian and Bicyclist Two-Hour Count Volumes for Weekdays and Weekends

		Weekday (4-6 pm)**			Weekend Day (12-2 pm)		
ID	Streets	Pedestrians	Bicyclists	Total	Pedestrians	Bicyclists	Total
1	Tiburon Blvd at Main Street, Tiburon	140	132	272	650	370	1020
2	Miller Ave. at Throckmorton, Mill Valley	460	64	524	914	138	1052
3	4th and B St., San Rafael	620	56	676	896	61	957
4	Bridgeway at Princess St., Sausalito	786	69	855	1,928	795	2,723
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	276	156	432	754	296	1,050
6	Broadway at Bolinas Rd., Fairfax	452	429	881	368	410	778
7	Grant Ave., at Redwood Blvd., Novato***	142	38	180	124	244	368
8	Magnolia Ave. at Ward St., Larkspur	191	44	235	351	234	585
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	136	151	287	52	512	564
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	59	192	251	76	727	803
11	Tiburon Bike Path at Blackie's Pasture, Tiburon**	212	152	364	485	440	925
12	Larkspur-Corte Madera Path at Baltimore Wye	99	126	225	99	137	236
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	*	*	*	*	*	*
14	Medway Rd. at Belvedere St., San Rafael	516	67	583	485	144	629
15	Camino Alto at E. Blithedale, Mill Valley	165	37	202	8	32	40
16	Alameda Del Prado at Nave Drive, Novato	40	41	81	23	50	73
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	125	186	311	14	53	67
18	Doherty Dr. at Hall Middle School, Larkspur**	494	114	608	53	74	127
19	Sir Francis Drake at Wolfe Grade, Kentfield**	75	73	148	46	60	106
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	43	120	163	54	147	201
21	South Novato Blvd. at Rowland; Novato	45	15	60	13	20	33
22	Bellam at Andersen, San Rafael	49	54	103	46	72	118
23	Nicasio Valley Road near Nicasio School, Nicasio	0	15	15	11	93	104
	Total	**5,125**	**2,331**	**7,456**	**7,450**	**5,109**	**12,559**
	Average count per location	**244**	**106**	**339**	**339**	**232**	**571**

* =Data unavailable

** = At locations where counts were longer than two hours, the peak two hours was used.

***= Only gender attribute data collected for Location 7 during the weekend count.

Table B-11. 2011 Two-Hour Pedestrian and Bicyclist Volumes & Attributes: Gender, Age and Helmet Use

		Pedestrians				Bicyclists					
ID	Streets	Male	Female	Children	Total	Male	Female	Children	Total	No Helmet	Wrong Way
1	Tiburon Blvd at Main Street, Tiburon	317	373	100	790	306	144	52	502	58	55
2	Miller Ave. at Throckmorton, Mill Valley	598	661	115	1,374	113	51	38	202	56	27
3	4th and B St., San Rafael	724	667	125	1,516	96	19	2	117	49	5
4	Bridgeway at Princess St., Sausalito	1,125	1,442	147	2,714	707	344	23	864	127	353
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	361	512	157	1,030	238	149	65	452	62	0
6	Broadway at Bolinas Rd., Fairfax	249	303	268	820	287	294	258	839	172	24
7	Grant Ave., at Redwood Blvd., Novato***	175	236	*	411	161	103	*	264	*	*
8	Magnolia Ave. at Ward St., Larkspur	170	282	90	542	173	84	21	278	18	6
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	52	86	50	188	411	195	57	663	49	1
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	58	71	6	135	641	246	32	919	81	0
11	Tiburon Bike Path at Blackie's Pasture, Tiburon**	234	357	117	708	289	193	111	593	70	217
12	Larkspur-Corte Madera Path at Baltimore Wye	51	113	34	198	114	78	71	263	59	0
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	*	*	*	*	*	*	*	*	*	*
14	Medway Rd. at Belvedere St., San Rafael	486	309	206	1,001	132	46	33	211	137	41
15	Camino Alto at E. Blithedale, Mill Valley	34	75	64	173	49	15	5	69	3	3
16	Alameda Del Prado at Nave Drive, Novato	25	28	10	63	61	25	5	91	6	23
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	45	40	54	139	97	67	75	239	27	5
18	Doherty Dr. at Hall Middle School, Larkspur**	37	44	467	548	41	34	120	195	29	17
19	Sir Francis Drake at Wolfe Grade, Kentfield**	43	36	43	122	47	50	36	133	7	0
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	45	33	19	97	181	67	19	267	63	31
21	South Novato Blvd. at Rowland; Novato	19	23	16	58	27	2	6	35	9	4
22	Bellam at Andersen, San Rafael	49	33	13	95	92	19	15	126	72	69
23	Nicasio Valley Road near Nicasio School, Nicasio	3	8	0	11	76	32	0	108	0	0
	Total (of locations reporting attributes)	**4,900**	**5,732**	**2,101**	**12,733**	**4,339**	**2,257**	**1,044**	**7,640**	**1,154**	**881**
	Percent	**38%**	**45%**	**17%**	**100%**	**57%**	**30%**	**14%**	**100%**	**15%**	**12%**

** = Data unavailable.*

*** = At locations where counts were longer than two hours, the peak two hours was used.*

****= Only gender attribute data collected for Location 7 during the weekend count.*

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Appendix C: Count Materials

WILTEC LOC # 4 Phone: (626) 564-1944

NAME: Renee Finn WEATHER CONDITIONS: warm AM 7:00-9:00 PM

LOCATION: Bridgeway Blvd at Princess Street, Sausalito DATE: 9/14/2011

Count all bicyclists and pedestrians crossing your screen line under male or female categories; the no helmet and wrong way categories are in addition to the male and female categories for bicyclist. The child category is in addition to male/female for pedestrians and bicyclist.

	BICYCLES					PEDESTRIANS		
	MALE	FEMALE	CHILD	NO HELMETS	WRONG WAY	MALE	FEMALE	CHILD
700 - 715	32	6	0	1	0	7	13	0
715 - 730	43	10	0	1	1	18	25	1
730 - 745	70	13	0	2	1	30	28	1
745 - 800	86	18	0	2	1	35	37	1
800 - 815	98	20	0	5	2	47	48	1
815 - 830	111	23	0	7	2	58	60	1
830 - 845	126	29	0	11	3	73	72	4
845 - 900	134	31	0	11	4	85	83	4
	male	Female	Child	No Helmet	wrong way	male	Female	Child
400 - 415	33	16	0	15	2	106	130	6
415 - 430	56	22	0	22	2	158	203	10
430 - 445	80	33	0	28	2	220	271	18
445 - 500	106	50	0	40	2	271	326	23
500 - 515	128	60	0	53	2	339	382	27
515 - 530	159	67	0	60	2	379	432	29
530 - 545	180	71	0	65	3	401	449	29
[illegible]	205	74	0	69	3	439	490	29

C- 1 Example Field Count Form

Note that counts are cumulative.

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Appendix D: Pedestrian and Bicycle Demand Models

The following models provide an overview of the demand and benefits of bicycling and walking in Marin County. It is estimated that current levels of walking and bicycling replace approximately 33,000 and 24,000 daily vehicle trips, respectively, which reduces carbon dioxide emissions by a combined 30.4 million pounds per year.

The models used for the Non-Motorized Transportation Pilot Project study incorporate information from existing publications, the 2010 U.S. Census American Community Survey (ACS), the 2000 San Francisco Bay Area Travel Survey (BATS), and NTPP survey results for Marin County. All data assumptions and sources are noted in the tables. Variables used in the NTPP pedestrian and bicycle demand models include commuting patterns of working adults and predicted travel behaviors of area college students and school children. The primary model inputs are described below:

- **Work Commute Trips** - Population data for the existing labor force over 16 years of age (including the number of workers and percentage of pedestrian and bicycle commuters) were obtained from the 2010 ACS estimate for Marin County.
- **School Commute Trips** – 2010 ACS data was combined with data from the 2005 -06 Marin Safe Routes to School Evaluation Report, which found that approximately 17 percent of school children walk to and from school every day while approximately 5 percent of school children bike to and from school each day.
- **College Commute Trips** – The number of people enrolled in undergraduate college, graduate, or professional school was obtained from 2010 ACS data. For the purposes of this report, it was assumed that college students walk and bicycle at the same rate as the working population. Data from the Federal Highway Administration indicates that this is a conservative estimate; nationally, 60% of college students walk to school..
- **Transit Linked Trips** – Transit trips typically begin and end with a walking trip. The estimated number of walking trips linked with transit is derived from multiplying the working age population by the public transportation commute rate, both obtained from 2010 ACS data.
- **Utilitarian (non work or school) Trips** - The 2001 National Household Transportation Survey found that commute trips (including work and school trips) comprise only approximately a third of total trips; trips for shopping, recreation and socializing are a significantly greater proportion of total trips. Data from the 2000 BATS was used to estimate the ratio of home-based shopping trips compared to work trips for walking and bicycling trips, respectively. This ratio was used to develop an estimate of utilitarian trips based on the work commute trip estimate calculated above.
- **Recreational/Discretionary Trips** – Similar to the above, 2000 BATS data was used to estimate the ratio of social/recreational trips to work commute trips for walking and bicycling, respectively. This ratio was used to develop an estimate of recreational/discretionary trips based on the work commute trip estimate calculated above.
- **Total Estimated Daily Bike or Walk Trips** – Calculated as the sum of the types of trips described above.
- **Average Travel Length** – The 2010 Marin NTPP survey asked respondents the length of their trip, and whether they were walking or bicycling. The results are used to estimate trip length by mode.
- **Average Travel Length and Vehicle Trip Replacement** – The 2010 Marin NTPP survey asked respondents what mode they would have used to take the trip if they had not been walking or bicycling. The analysis uses the percent of respondents who noted they would have driven for the trip.

Table D-1. Pedestrian Demand Model Results

	Input	Calculated Totals	Source or Calculation
Work Commute Trips			
a. 2010 Population	252,916		2010 ACS 1-year estimate
b. 2010 Employed persons	117,025		2010 ACS 1-year estimate
c. 2010 Pedestrian commute share	5.10%		2010 ACS 1-year estimate
d. 2010 Pedestrian commuters	5,971	11,942	Commuters doubled for number of trips
School Commute Trips			
e. 2010 Population ages 5-14	29,987		2010 ACS 1-year estimate
f. 2010 Est. Pedestrian commute share	5%		2010 ACS 1-year estimate
g. 2010 Pedestrian school commuters	1,530	3,060	Commuters doubled for number of trips
College Commute Trips			
h. 2010 College population	10,306		2010 ACS 1-year estimate
i. 2010 Pedestrian commute share	5.10%		From (c) above
j.2010 Pedestrian college commuters	526	1,052	Commuters doubled for number of trips
Transit-Linked Trips			
k. Average daily transit trips		8,280	2010 ACS 1-year estimate
Utilitarian Trips			
l. Ratio of work walking trips to home-based shopping or school walking trips	363%		BATS Table 2.2.3.1. 2000 Regional Weekday, Saturday, and Sunday Trips by Purpose and General Travel Mode
m. Estimated utilitarian pedestrians		43,334	Pedestrian commuters (d) multiplied by ratio (l)
Recreational/Discretionary Trips			
n. Ratio of recreation/discretionary walking trips to walking work trips	243%		BATS Table 2.2.3.1. 2000 Regional Weekday, Saturday, and Sunday Trips by Purpose and General Travel Mode
o. Estimated recreation/discretionary pedestrians		29,060	Pedestrian commuters (d) multiplied by ratio (n)
Total Estimated Daily Walking Trips		**96,728**	
Average One-Way Travel Length (miles)			
p. Adults/college students walking trip length	1.00		Marin NTPP 2010 Survey
q. School children walking trip length	0.25		Alice Tibbets, MN assumptions of "walk zone"
Vehicle Trip Replacement			
r. Utilitarian/work/school trip replacement	37%		Marin NTPP 2010 Survey
s. Non-utilitarian trip replacement	41%		Marin NTPP 2010 Survey
Reduced Daily Vehicle Trips		33,888	
Reduced Daily Vehicle Miles		**33,039**	
Reduced Weekly Vehicle Miles		628,425	Work, school, college, transit trips assumed 5x/week, utilitarian, recreational trips distributed over the week
Reduced Annual Vehicle Miles		32,544,399	School, college trips assumed to be 3/4 of the year, other trips distributed as above

Table D-2. Bicycle Demand Model Results

	Input	Calculated Totals	Source or Calculation
Work Commute Trips			
a. 2010 Population	252,916		2010 ACS 1-year estimate
b. 2010 Employed persons	117,025		2010 ACS 1-year estimate
c. 2010 Bicycle commute share	2%		BATS Table 5.1.3. 2000 Weekday Trips by Trip Purpose and County of Attraction
d. 2010 Bicycle commuters	2,662	5,324	Commuters doubled for number of trips
School Commute Trips			
e. 2010 Population ages 6-14	29,987		2010 ACS 1-year estimate
f. 2010 Bicycle commute share	1%		2010 ACS 1-year estimate
g. 2010 Bicycle school commuters	388	777	Commuters doubled for number of trips
College Commute Trips			
h. 2010 College population	10,306		2010 ACS 1-year estimate
i. 2010 Bicycle commute share	2.27%		From (c) above
j. 2010 Bicycle college commuters	234	469	Commuters doubled for number of trips
Utilitarian Trips			
k. Ratio of work bicycling trips to home-based shopping or school bicycling trips	93%		BATS Table 2.2.3.1. 2000 Regional Weekday, Saturday, and Sunday Trips by Purpose and General Travel Mode
l. Estimated bicycle utilitarian trips		4,944	Bicycle commuters (d) multiplied by ratio (l)
Recreational/Discretionary Trips			
m. Ratio of recreation/discretionary bicycling trips to bicycling work trips	69%		BATS Table 2.2.3.1. 2000 Regional Weekday, Saturday, and Sunday Trips by Purpose and General Travel Mode
n. Estimated recreation/discretionary bicyclists		3,661	Bicycle commuters (d) multiplied by ratio (n)
Total Estimated Daily Bicycle Trips		**15,175**	
Average One-Way Travel Length (miles)			
o. Adults/college student bicycle trip length	5.5		Marin NTPP 2010 Survey
p. School children bicycle trip length	0.5		Marin NTPP 2010 Survey
Vehicle Trip Replacement			
q. Utilitarian/work/school trip replacement	28%		Marin NTPP 2010 Survey
r. Non-utilitarian trip replacement	38%		Marin NTPP 2010 Survey
Reduced Daily Vehicle Trips		4,615	
Reduced Daily Vehicle Miles		**24,295**	
Reduced Weekly Vehicle Miles		93,086	Work, school, college, transit trips assumed 5x/week, utilitarian, recreational trips distributed over the week
Reduced Annual Vehicle Miles		4,779,090	School, college trips assumed to be 3/4 of the year, other trips distributed as above

4.3 Air Quality Benefits

The expected number of walking and biking trips in Marin County can be directly translated into reduced vehicle trips, as the current rates of walking and bicycling represent both residents and visitors using alternatives to driving. This number can be used to determine approximate reduction in vehicle miles traveled (VMT), which has the direct effect of reducing vehicular emissions. The number of reduced vehicle trips, VMT and the ensuing vehicle emissions reduction was estimated from the results of the demand models described above. The following tables illustrate the results of the vehicle trips, miles reduction and air quality benefits for pedestrian and bicycle trips, respectively.

Table D-3. Air Quality Benefits

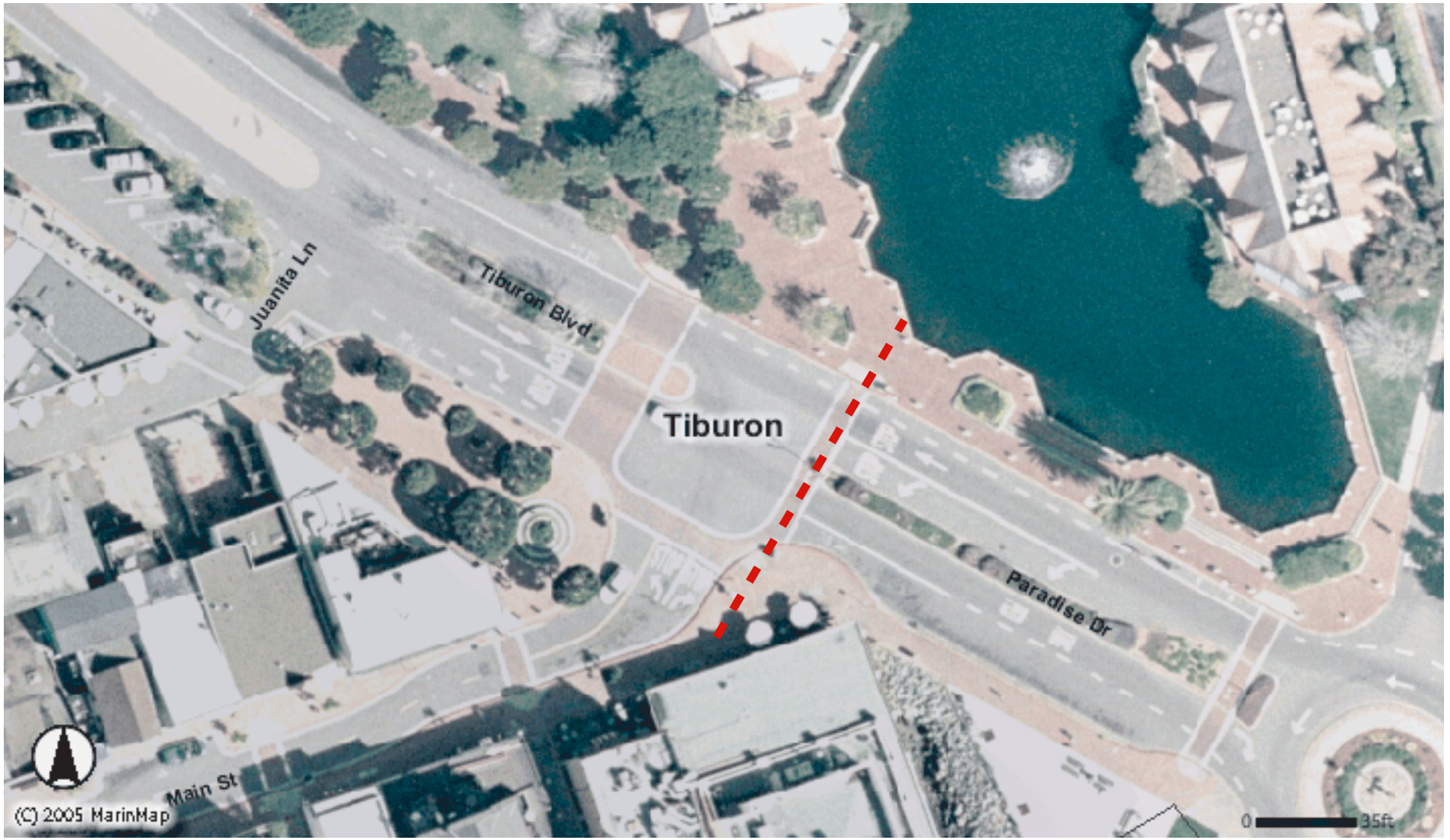
Emission	Reduction (lbs/mile)	Reduction from Pedestrian Trips	Reduction from Bicycle Trips	Total Emissions Reduction
Weekly Benefits				
Reduced Hydrocarbons (pounds/weekday)	0.00300	1,884	279	**2,163**
Reduced Particulate Matter (pounds/weekday)	0.00002	14	2	**16**
Reduced Nitrous Oxide (pounds/weekday)	0.00209	1,316	195	**1,511**
Reduced Carbon Monoxide (pounds/weekday)	0.02734	17,179	2,545	**19,724**
Reduced Carbon Dioxide (pounds/weekday)	0.81351	511,227	75,726	**586,953**
Annual Benefits				
Reduced Hydrocarbons (pounds/year)	0.00300	97,577	14,329	**111,907**
Reduced Particulate Matter (pounds/year)	0.00002	725	106	**831**
Reduced Nitrous Oxide (pounds/year)	0.00209	68,161	10,009	**78,170**
Reduced Carbon Monoxide (pounds/year)	0.02734	889,677	130,648	**1,020,324**
Reduced Carbon Dioxide (pounds/year)	0.81351	26,475,056	3,887,817	**30,362,873**

Source: EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks." 2005.

Appendix E: Count Location Orthoimagery

The following pages consist of detailed aerial photographs of each count/survey location. The dotted line in each map represents the "screen line" where counters watched for pedestrians and bicyclists to cross.

1. Tiburon Blvd at Main Street, Tiburon



Screenline

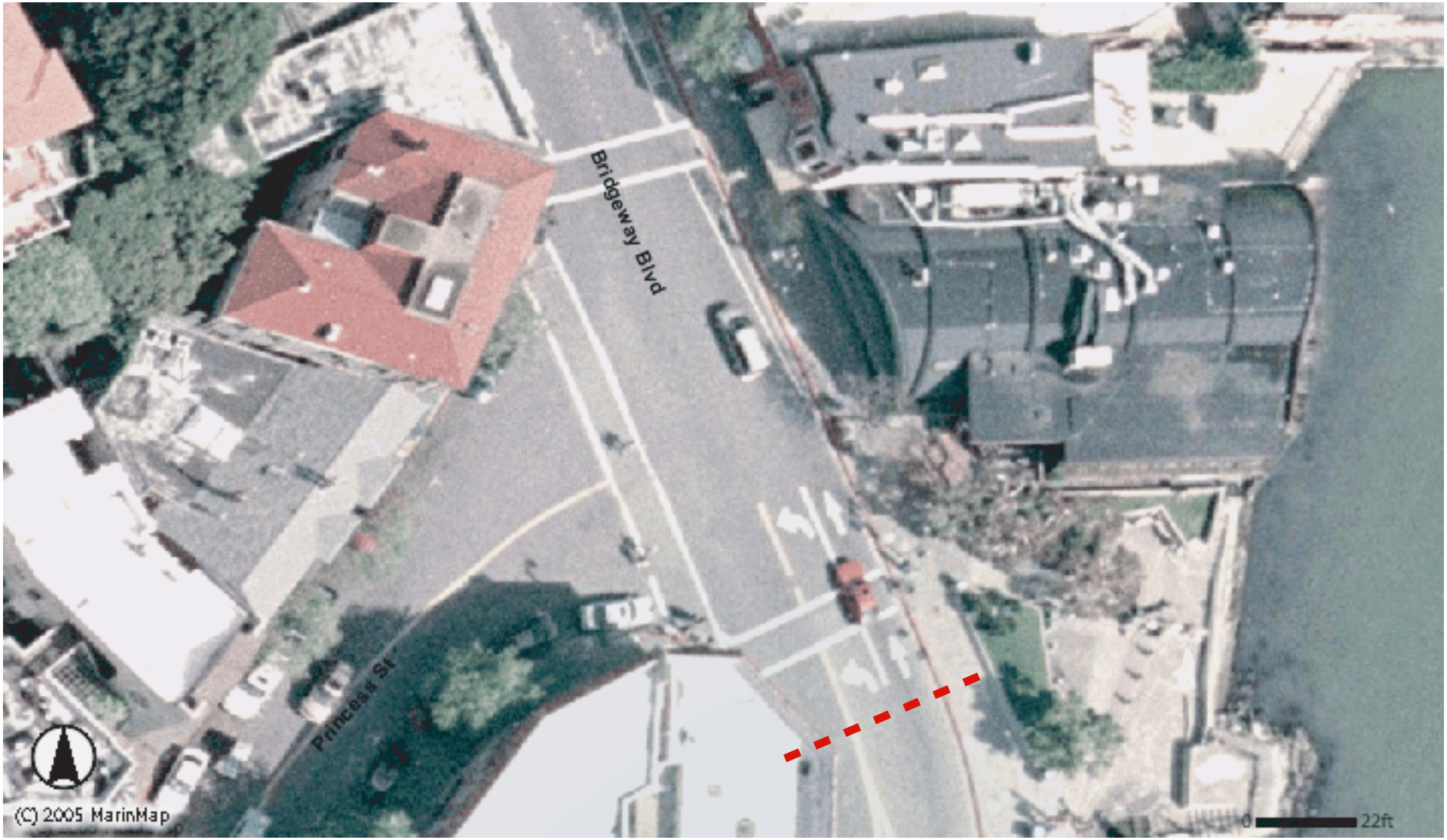
2. Miller Avenue at Throckmorton, Mill Valley

Screenline

3. 4th Street at B Street, San Rafael

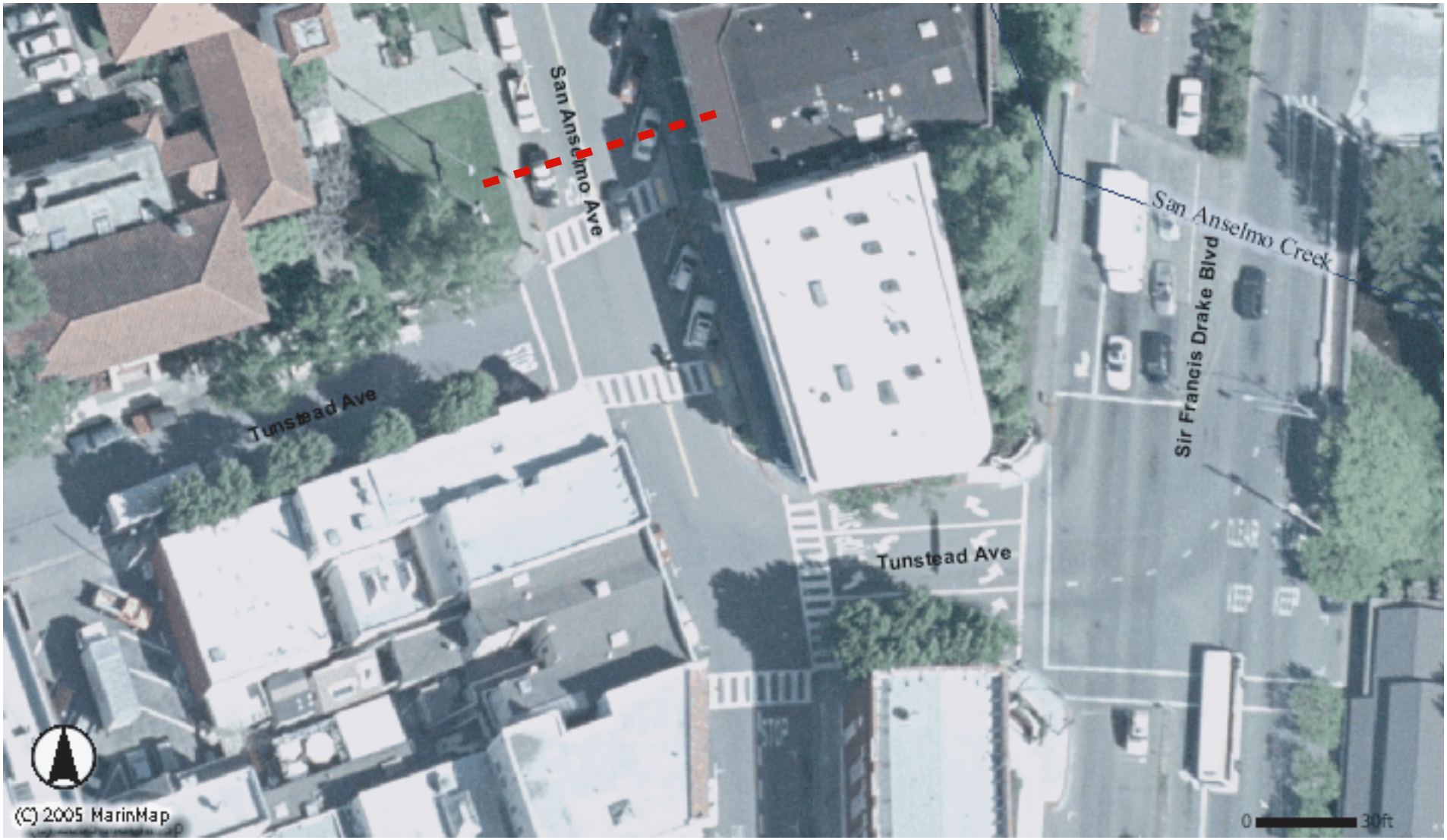
Screenline

4. Bridgeway Blvd at Princess Street, Sausalito



Screenline

5. San Anselmo Ave at Tunstead Ave, San Anselmo



Screenline

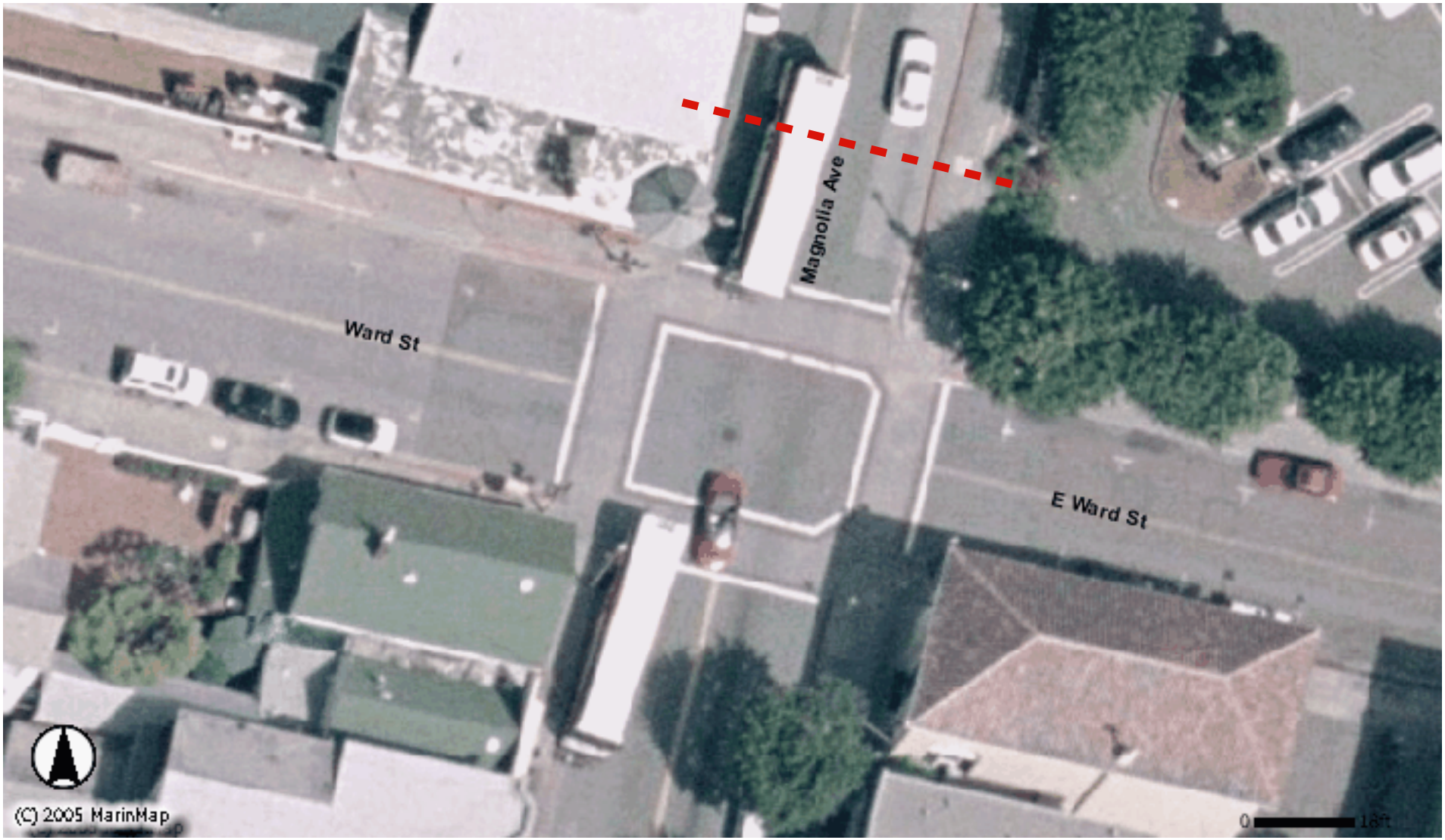
6. Broadway at Bolinas Rd, Fairfax

Screenline

7. Grant Ave at Redwood Blvd, Novato

Screenline

8. Magnolia Ave at Ward Street, Larkspur



Screenline

9. Mill Valley-Sausalito Path at E. Blithedale, Mill Valley

Screenline

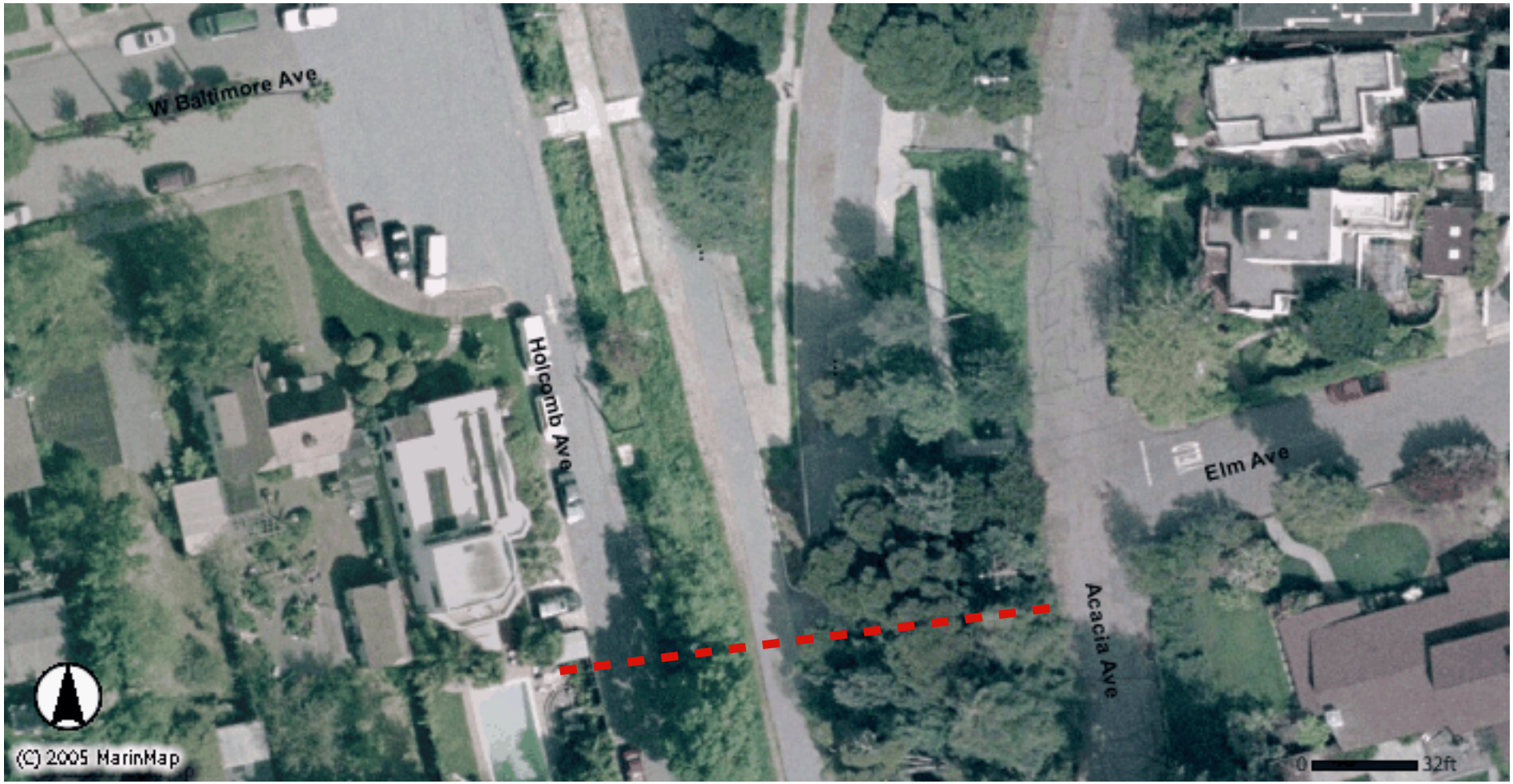
10. Mill Valley-Sausalito Path at Tenn. Valley Path, Tam Valley

Screenline

11. Tiburon Path at Blackies Pasture, Tiburon

Screenline

12. Larkspur-Corte Madera Path at Baltimore Ave., Larkspur



Screenline

13. Corte Madera Creek Path at Bon Air Road, Greenbrae

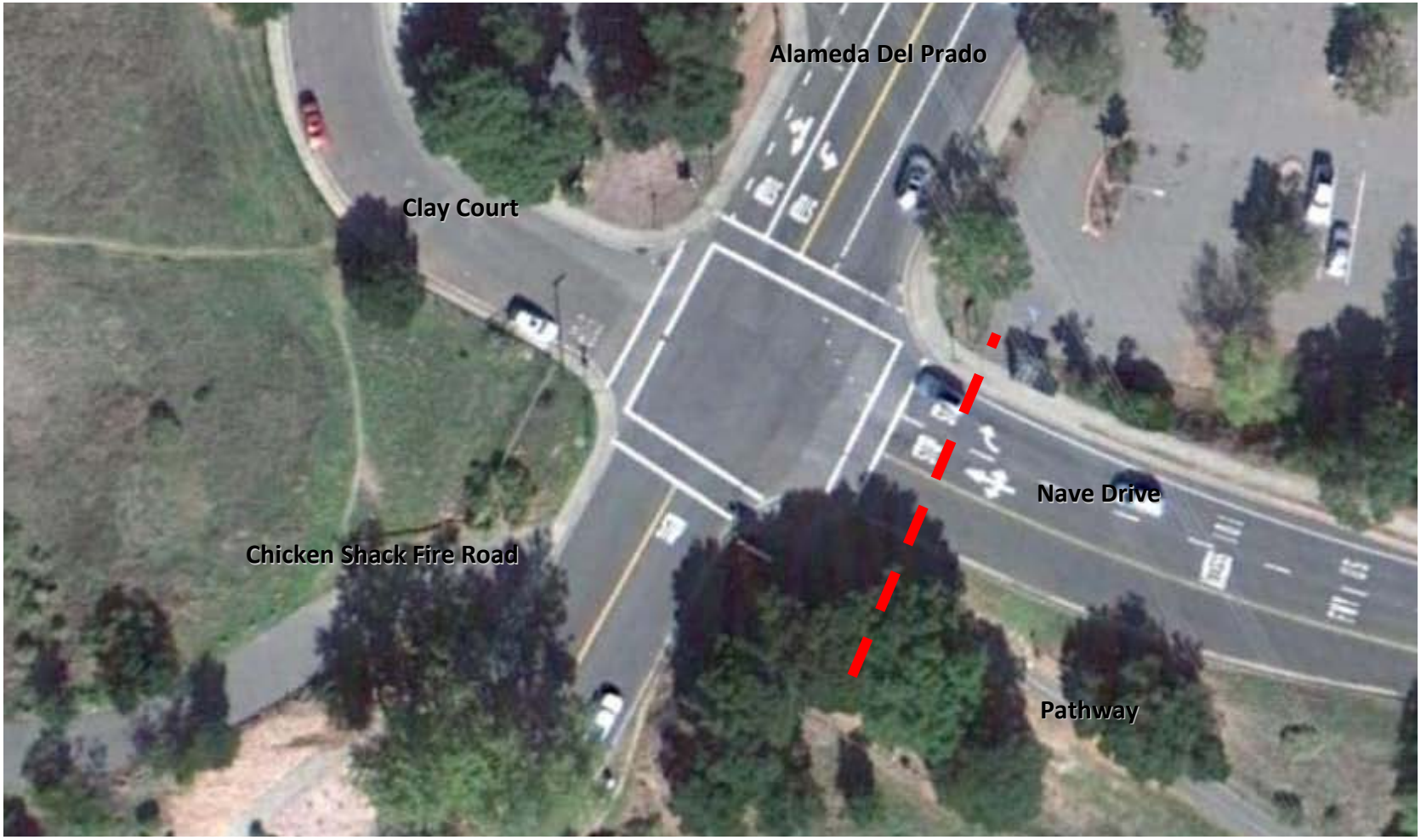
14. Medway Road at Belvedere St., San Rafael

Screenline

15. Camino Alto at E. Blithedale, Mill Valley

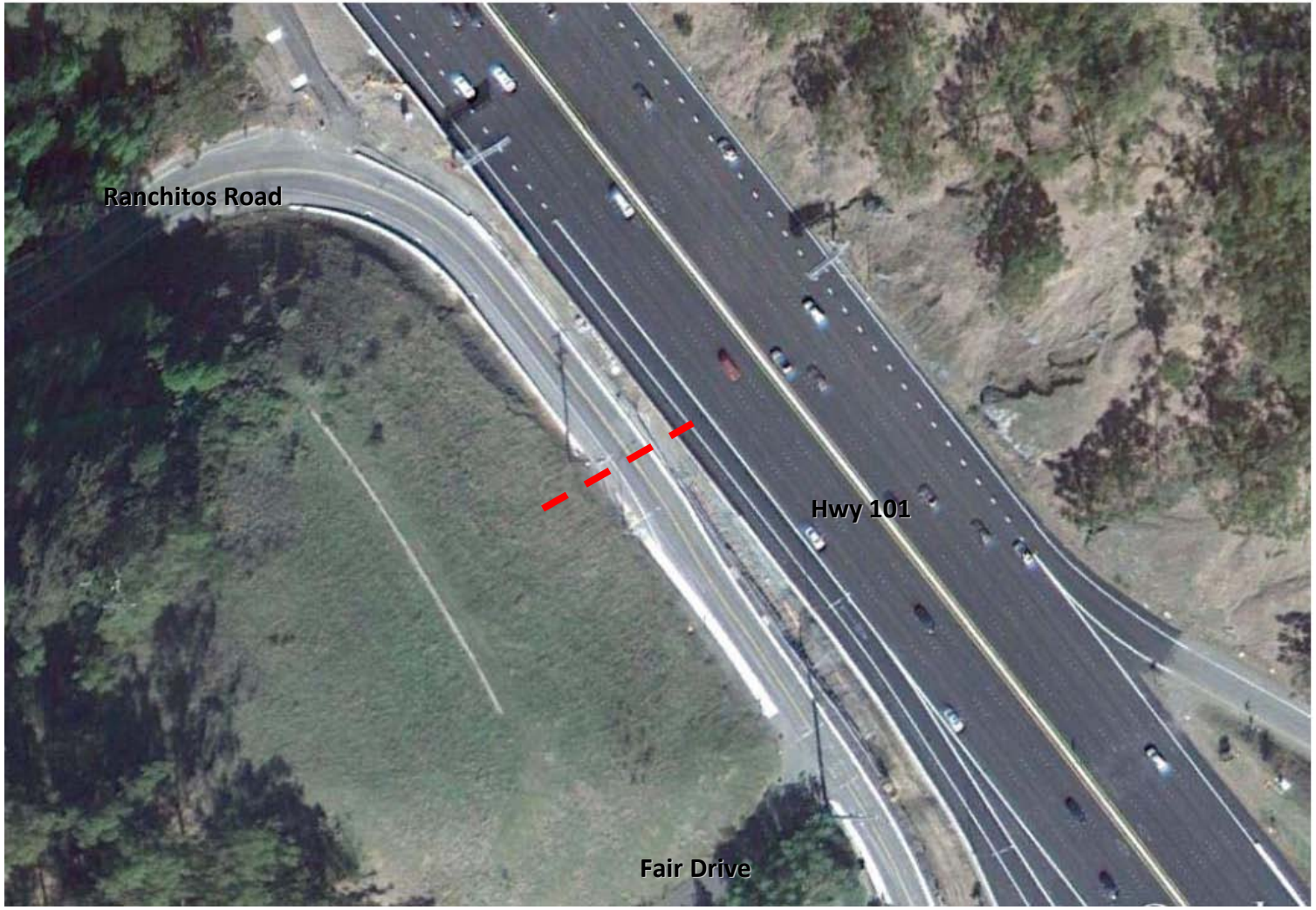
Screenline

16. Alameda Del Prado and Nave Drive

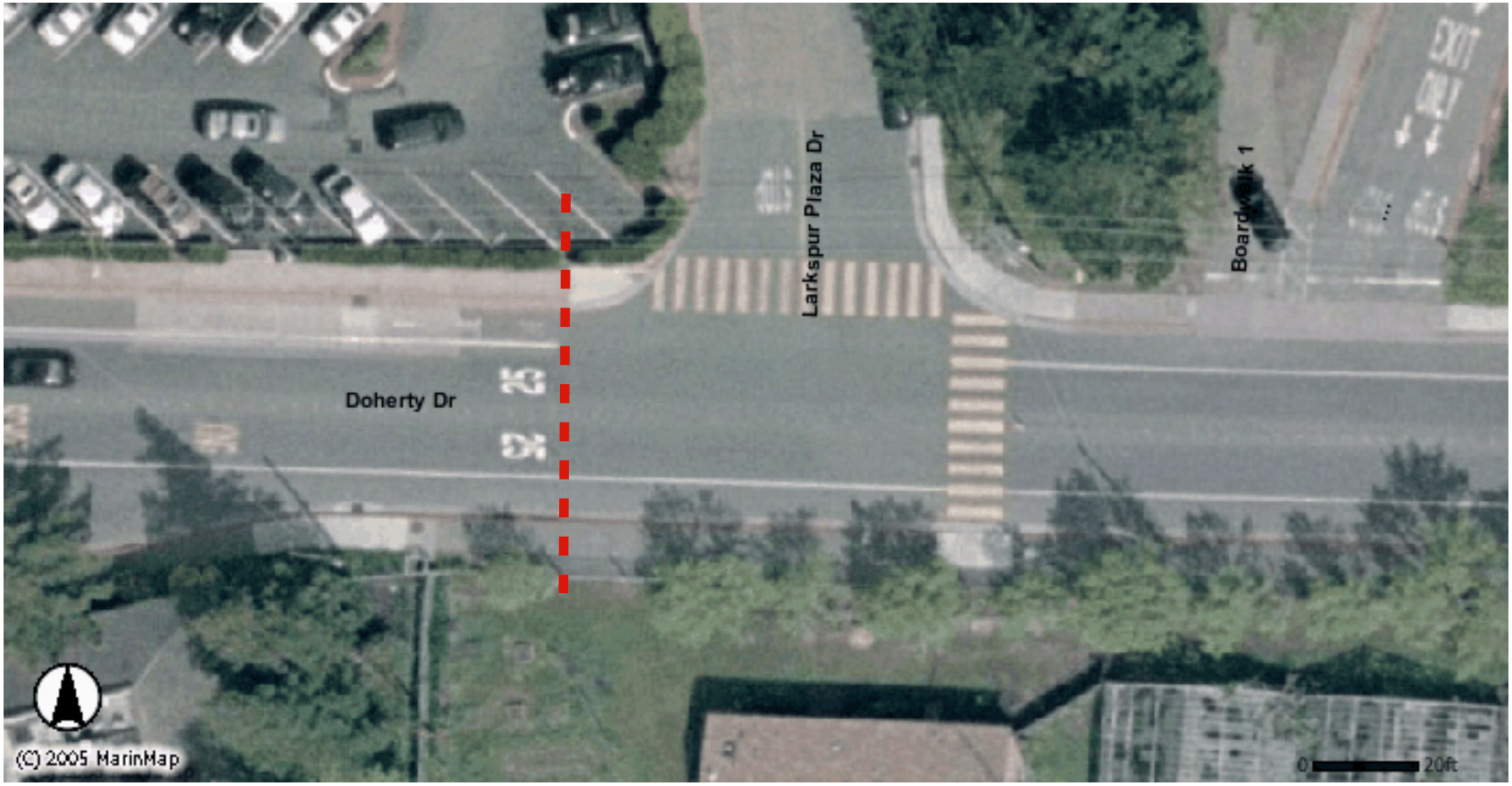


Screenline

17. Ranchitos Road at Puerto Suello Summit, San Rafael

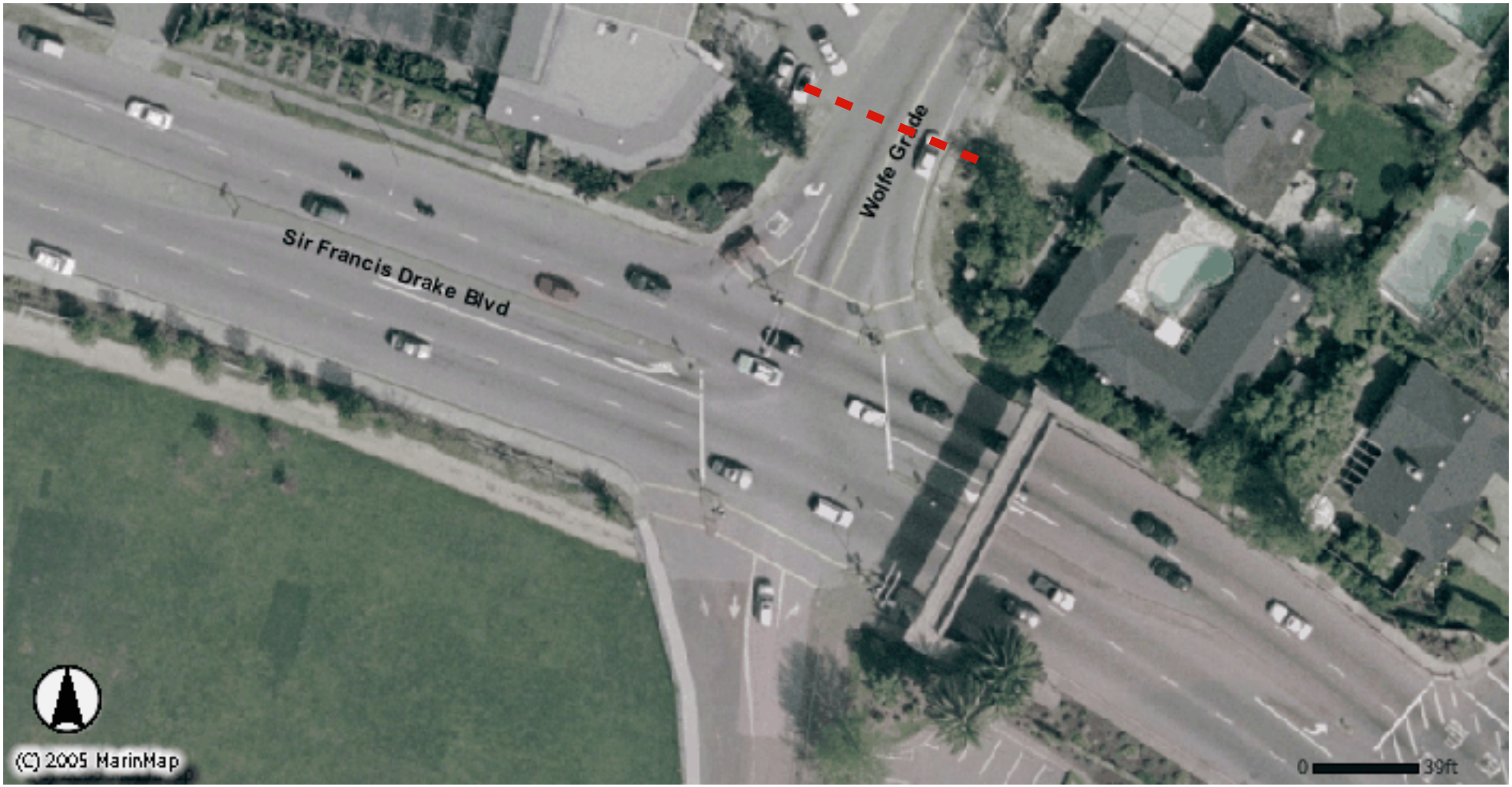


18. Doherty Dr. at Hall Middle School, Larkspur



Screenline

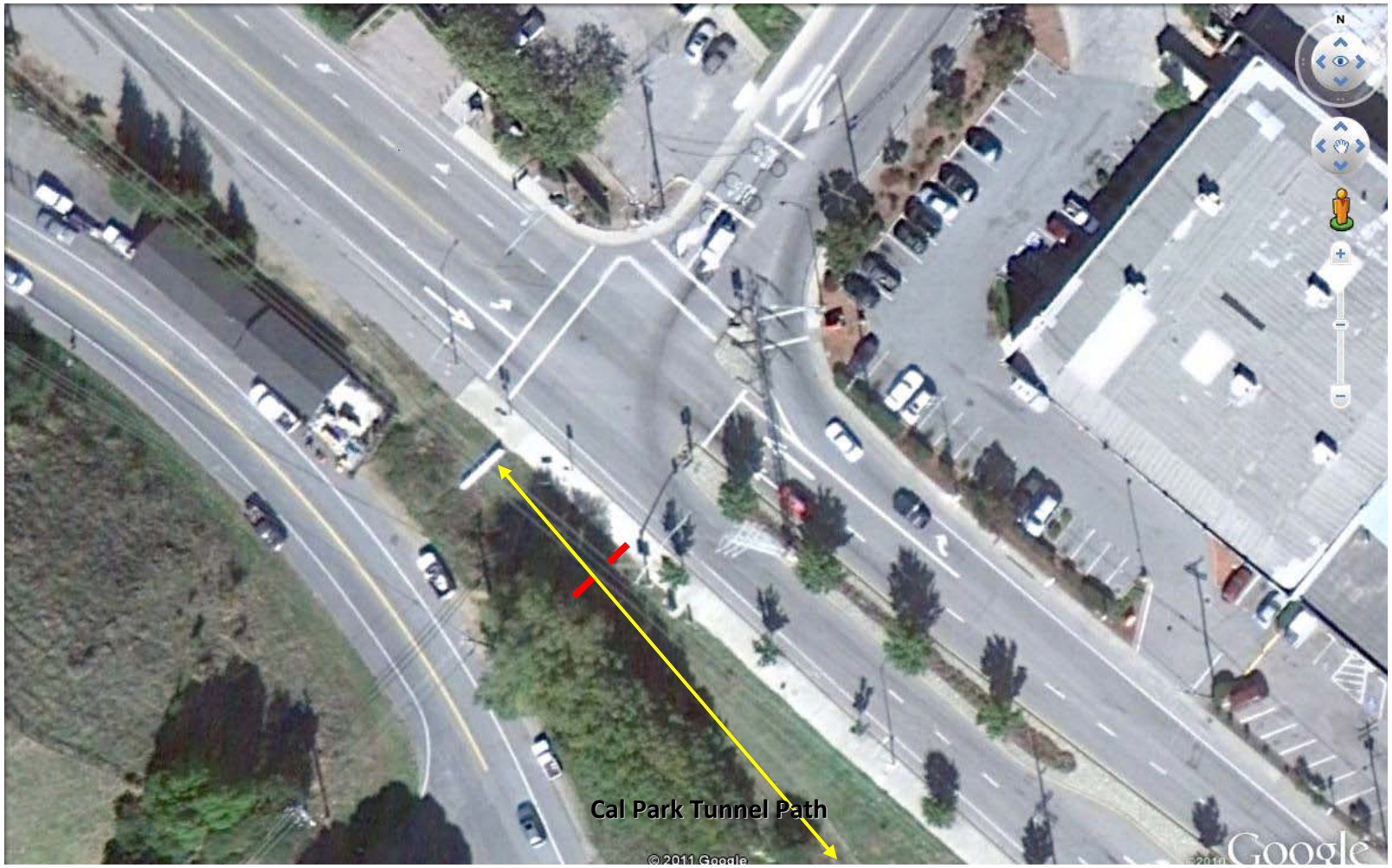
19. Sir Francis Drake at Wolfe Grade, Kentfield



Screenline

20A. Andersen Dr. at Cal Park Tunnel Path, San Rafael

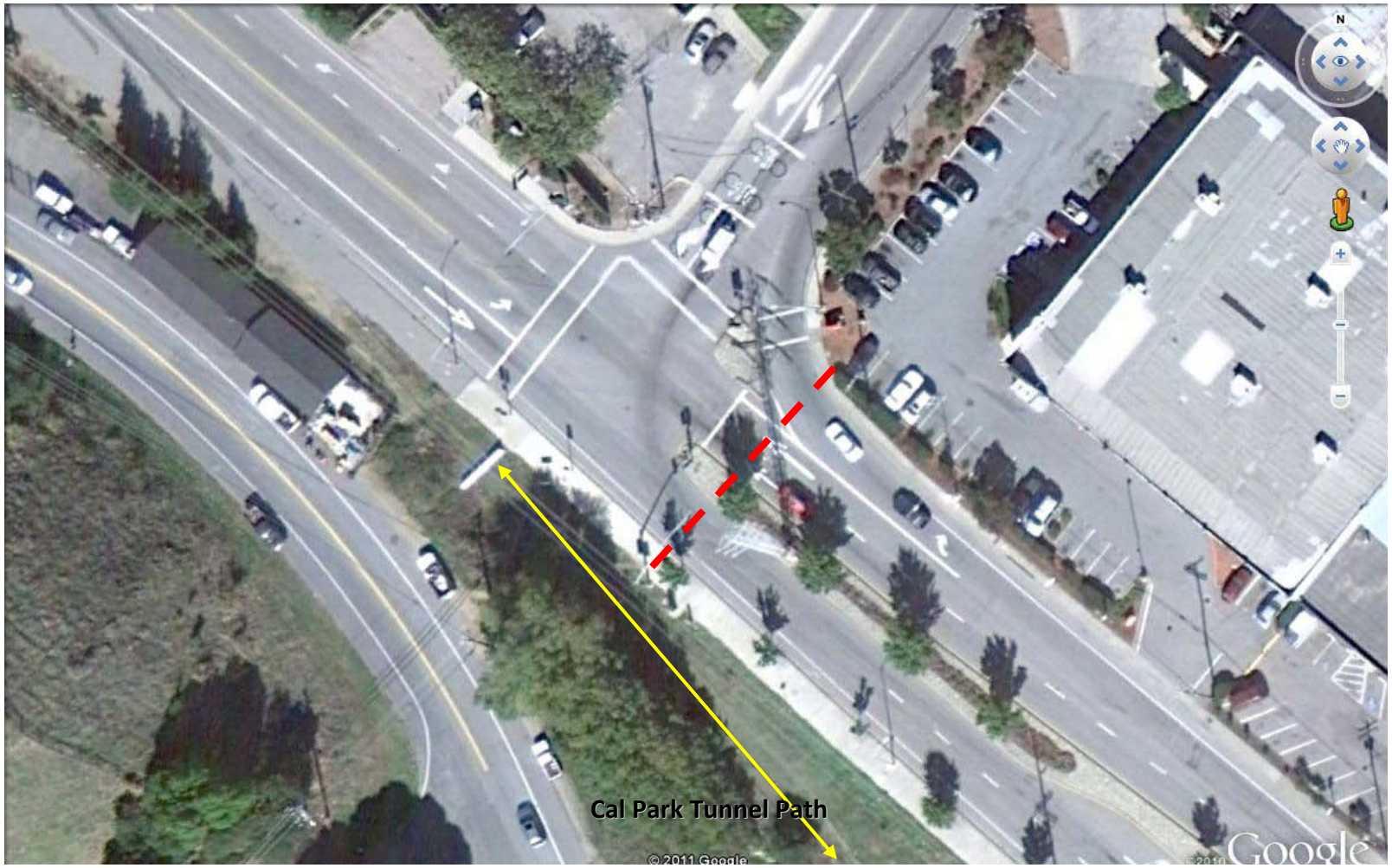
Pathway counts only



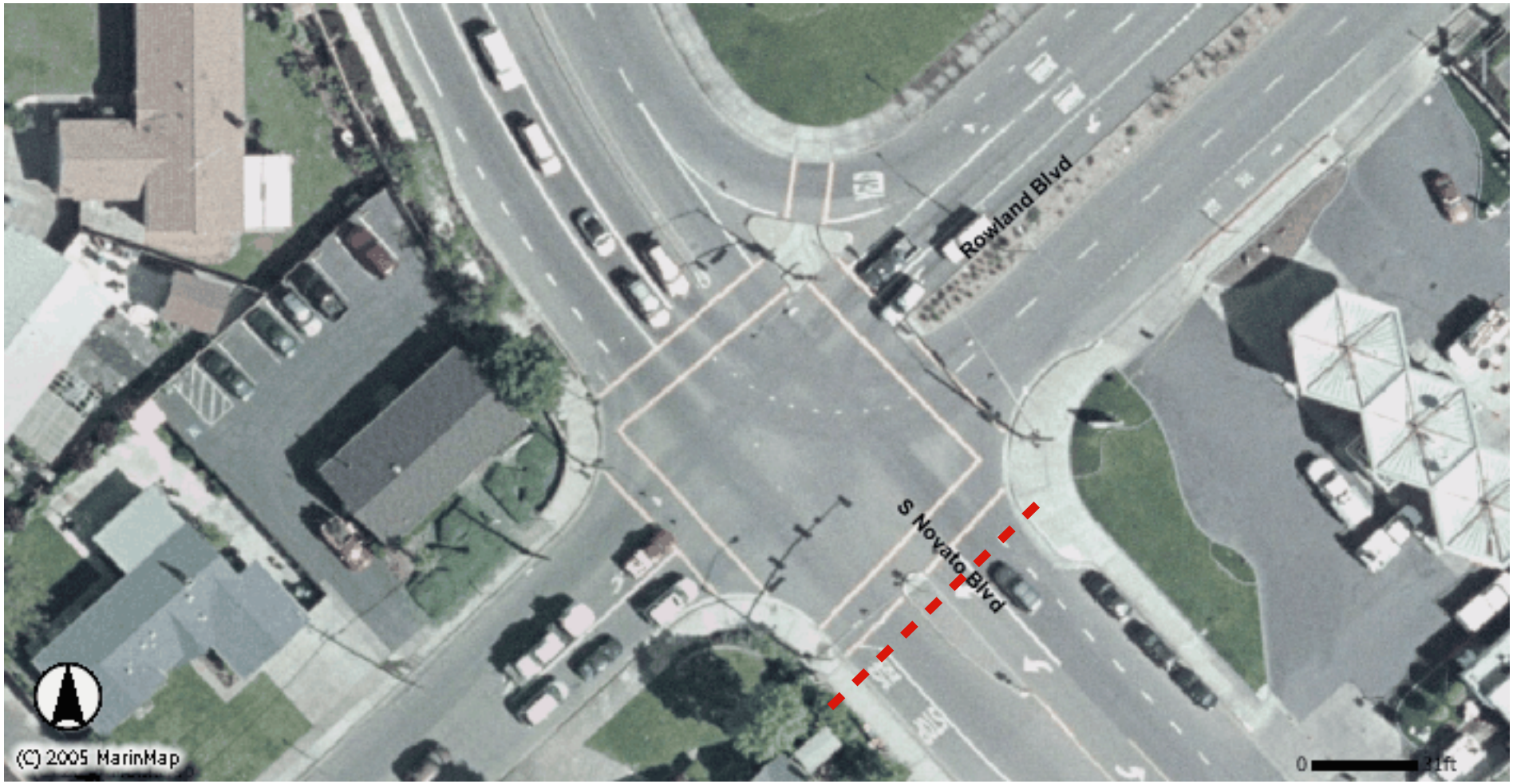
Screenline

20B. Andersen Dr. at Cal Park Tunnel Path, San Rafael

Roadway/sidewalk counts only

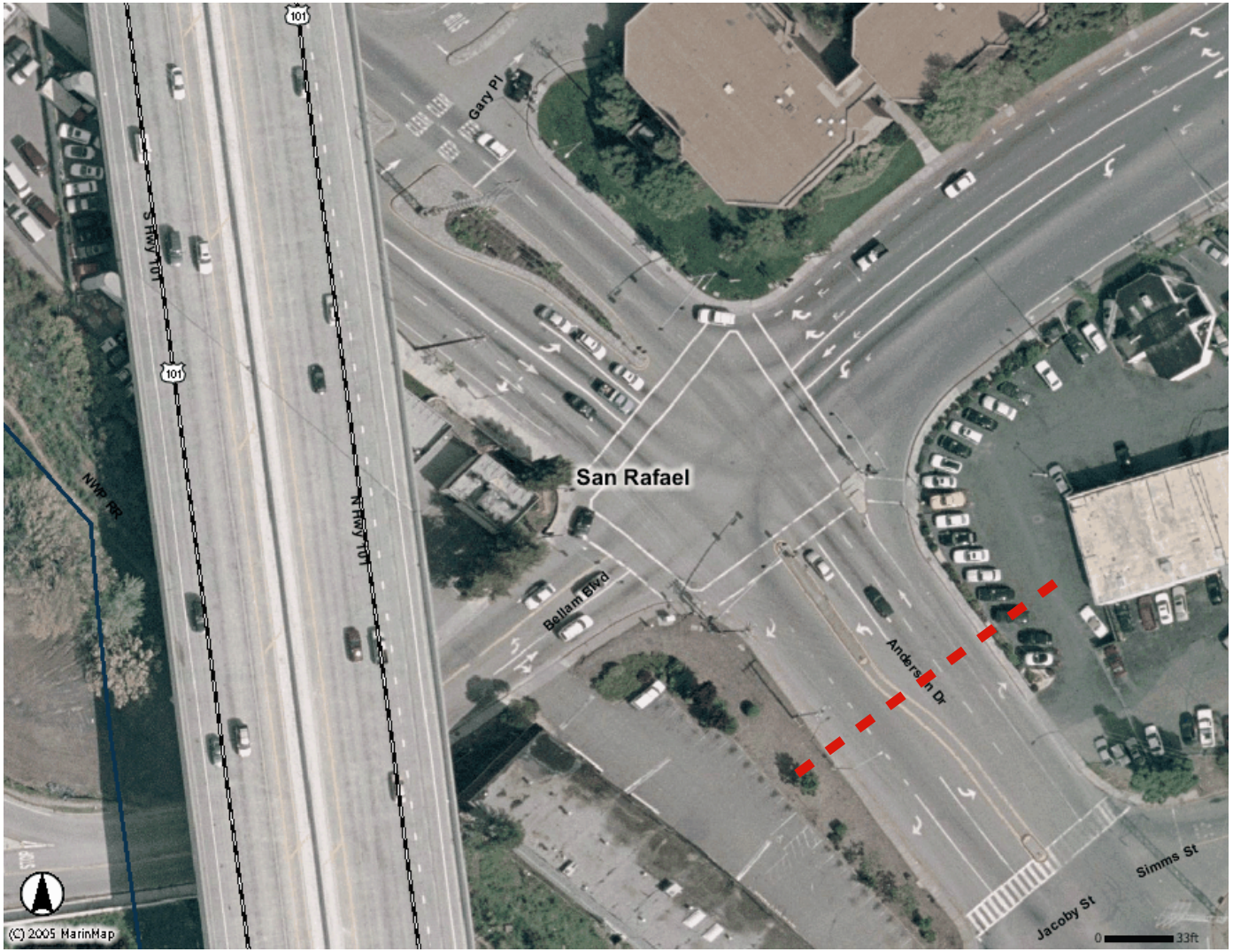


21. South Novato Blvd. at Rowland, Novato



Screenline

22. Bellam at Andersen, San Rafael



Screenline

23. Nicasio Valley Road, north of Nicasio Square

Screenline