CITY OF GLENDALE

Bicycle and Pedestrian Count 2010

Count and Collision Data Review

FINAL REPORT

Prepared for:

Safe & Healthy Streets Initiative: A Collaboration of the L.A. County Bicycle Coalition and the City of Glendale

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Table of Contents

Page

Table of Figures

Page

Executive Summary

Over the past decade, bicycling and walking have grown significantly throughout the nation. People increasingly view these modes as not just recreation but also as viable options for commuting and other trips. While cities like Glendale are working to meet these demands and provide the facilities needed to further encourage bicycling and walking, they often face critical information gaps about the actual use and demand for non-motorized modes, as well as bicycling and walking safety. In 2008, City of Glendale partnered with the Los Angeles County Bicycle Coalition to create the City's first *Safe and Healthy Streets Plan.* One of the ongoing priorities of this project is to develop an accurate picture of bicycling and walking in the City of Glendale through formal and standardized bicycle and pedestrian counts, which were conducted for the first time in 2009 and 2010.

The primary objective of this report is to analyze bicycle and pedestrian count data gathered in 2009 and 2010, including identifying key trends, such as high volume locations, across the two years of collected data. Another objective of this report is to provide a basic assessment and profile of bicyclist and pedestrian safety in the City of Glendale. Finally, this report seeks to analyze Glendale's bicycle and pedestrian data in comparison to selected peer cities. The ultimate goal of this report is to provide City staff with information that can then be used to inform decisions about how to plan for future projects and where to invest resources to further enhance bicycling and pedestrian infrastructure and programs in Glendale.

Key Findings

1. **Both bicycle and pedestrian volumes declined from 2009 to 2010, but it is unlikely that this finding represents a valid trend.** Bicycle and pedestrian volumes declined by 7% and 5%, respectively, from 2009 to 2010. Despite the overall decline, results varied across the count locations. In fact, a number of intersections did experience an increase in volumes. For example, in 2010 there were 135 bicyclists at Verdugo and Mountain, a 63% increase over the 2009 volumes. In addition, in 2010 there were 339 pedestrians at Flower and Sonora, a 70% increase over the 2009 volumes.

   This decline in volumes is likely not a valid trend for a number of reasons. First, and foremost, the number of bicyclists or pedestrians counted at a given location will vary to a certain degree from one day to the next. Any number of factors can influence the degree of variation, and what may seem like an important increase or decrease in bicycle volumes could really just be the natural ebb and flow of bicycle and pedestrian activity. Performing counts on consecutive days in consecutive weeks is one of the best solutions to overcoming this limitation because data from consecutive counts periods can be averaged to account for natural variation. However, that level of data collection is very time consuming, and given limited resources, was not feasible for Glendale in 2009 and 2010. As more count data is collected in subsequent years, the City will be able to account for variation by indexing the data and averaging count data across multiple years.

   Second, it appears that weather was likely a contributing factor in the decline from 2009 to 2010. Obviously, weather plays a significant role in an individual's decision to bicycle or walk - if it is raining or cold, the number of people choosing to bicycle or walk declines substantially. In 2009, weather during the observation periods was described as "ideal" for bicycling and walking. In 2010, however, during the Wednesday, September 22nd count the weather was overcast and quite cool (high 50s and low 60s), and some count locations experienced mild

precipitation. Furthermore, during the Saturday, September 25th count the weather shifted dramatically and was described as "uncomfortably hot." In short, it is difficult to assess exactly to what degree the weather impacted the 2010 counts, but, once again, additional count data in future years can be used to account variations due to weather and other factors.

Finally, it is unlikely that the decline in bicycle and pedestrian volumes reflect an overall downward trend because other data sources indicate that bicycling and walking are increasing in both Glendale and on a national scale. For example, data from the U.S. Census and American Community Survey show that bicycling and walking as commute modes increased 75% and 27% in Glendale from 2000 to 2009, respectively. Likewise, the National Household Travel Survey (NHTS) shows that bicycling and walking comprise 11.9% of *all* trips made in the country in 2009, an increase of 25% from 2001.

2. **There are a consistent number of high volume intersections.** Figures ES-1 and ES-2 show that there are a number of count locations which consistently have high volumes of pedestrians, bicyclists, or both. The intersection of Flower and Sonora, for example, was the highest volume intersection for bicyclists in both 2009 and 2010, as this is the primary route to the popular Griffith Park. Similarly, the top five intersections for pedestrian volumes were very consistent in both years, including: Brand and Broadway, Glendale and Wilson, San Fernando and Los Feliz, and Honolulu and Oceanview. Central and Americana, a new count location in 2010 in Glendale's downtown core, had the highest pedestrian volumes for any location.

Figure ES-1 Top 5 Intersections, by Bicycle Volumes

Rank ('10)	Rank ('09)	ID	Location	2009	2010
1	1	11	Flower & Sonora	341	299
2	14	27	Verdugo & Mountain	83	135
3	2	16	Glenoaks & Grandview	175	129
4	7	4	Canada/Verdugo/Menlo	101	122
5	15	25	San Fernando & Los Feliz	76	118

Figure ES-2 Top 5 Intersections, by Pedestrian Volumes

Rank ('10)	Rank ('09)	ID	Location	2009	2010
1	n/a	5	Central & Americana Way	**n/a**	3310
2	1	1	Brand & Broadway	2520	2239
3	3	14	Glendale & Wilson	1274	1318
4	4	25	San Fernando & Los Feliz	1261	1099
5	2	19	Honolulu & Oceanview	1686	1095

3. **More bicycling occurs on the weekends.** Total bicyclist volumes for the two weekend morning count periods totaled over 1,000 in both 2009 and 2010, which are more than twice the bicycle volumes observed during the weekday evening counts. This data strongly

indicates that bicycling in Glendale is done much more often on the weekends for recreation than on the weekdays for commuting.

4. **A large percentage of observed bicyclists were not wearing helmets.** At every intersection in both 2009 and 2010, bicyclists were observed without helmets. Roughly 33% of bicyclists were not wearing helmets in 2010, a slight increase from 30% in 2009. The percentage of bicyclists not wearing helmets was especially high at the two count locations near schools.

5. **Riding on the sidewalk is common.** At each location in both 2009 and 2010 at least one bicyclist was observed riding on the sidewalk. In total, 21% (or 1 in 5) of observed bicyclists in 2009 and 2010 were riding on the sidewalk. While sidewalk riding was prevalent at each count location, sidewalk riding did decline slightly from 2009 (22%) to 2010 (21%).

6. **Most bicyclists are male and very few bicyclists are children.** The vast majority of observed bicyclists were male. In fact, only 7% of observed bicyclists were female. Children comprised an even smaller percentage of bicyclists and pedestrians at approximately 5% for each mode. No more than 11 child bicyclists were observed at any one location.

7. **A number of key trends related to bicycle and pedestrian injury collisions emerged.** These include:

   - From 2004-2009, pedestrian injury collisions increased by approximately 19% (102 to 121). Pedestrian injury collisions peaked in 2007 with 134 collisions, including six fatal collisions. In 2009, however, there were no fatal pedestrian collisions, the first year since 2004 without a pedestrian fatality.

   - Bicycle injury collisions have remained constant from 2004 to 2009, with an average of approximately 41 bicycle injury collisions per year. There has been one fatal bicycle injury collisions in Glendale since 2004, which occurred in 2008.

   - Since 2004, no one intersection or street segment had a disproportionate number of bicycle or pedestrian collisions. In fact, the highest total for any intersection or street segment during that six year period was five injury collisions.

   - Statewide Integrated Traffic Records Systems (SWITRS) collision data reveals that there are a select few Primary Collision Factors (PCFs) and California Vehicle Code (CVC) violations that are consistently a factor in bicycle and pedestrian injury collisions. For bicyclists, riding on the wrong side of the road was the number one PCF and CVC violation. Furthermore, drivers violating the right-of-way and improper lane changes by drivers were also consistent factors in bicycle collisions.

     For pedestrians, violation of the pedestrian right-of-way by vehicles was the number one PCF by a large margin, with pedestrians violating the right-of-way second. Similarly, failure to yield to pedestrians by drivers was by far the most common CVC violation for pedestrian injury collisions.

   - Certain segments of the population were more likely to be involved in a bicycle or pedestrian injury collision. For injured pedestrians, there is a roughly even split between males and females. By contrast, more than 80% of injured bicyclists were male. While youth (less than 14 years of age) comprise 15.9% percent of Glendale's population and

do not ride bicycles in great numbers, more than 20% of bicycle injury collisions in Glendale involved someone less than 14 years of age.

Pedestrians over 65 years of age are involved in injury collisions at a much higher rate than all other age groups (almost 30% of all pedestrian collisions involve someone over 65 years of age), and well above their share of the total population.

- When analyzed on a per capita and per work trip basis, Glendale's number of collisions puts it in the middle of its geographic peers for 2008. Glendale has the lowest bicycle collisions per capita of any of the selected peer cities at 23 per 100,000 residents. Glendale also had approximately 52 pedestrian collisions per 100,000 residents in 2008, which put in the middle of its geographic peers. In addition, in 2008, Glendale had almost 44 bicycle injury collisions and 12 pedestrian injury collisions per 100,000 annual work trips.

Key Recommendations

In addition to analyzing the data in this report, Nelson\Nygaard has also presented the L.A. County Bicycle Coalition and City of Glendale with recommendations about how the data from this report can be utilized to inform future planning efforts, as well as about how the City can ensure that bicycle and pedestrian count efforts are as efficient and productive as possible. All of these recommendations must be evaluated and prioritized in the context of limited resources. Nevertheless, this section is intended to give City staff additional ideas about ways in which the City can continue to plan for additional bicyclists and pedestrians on city streets and ensure safety for these modes.

1. **Utilize count and collision data to begin to prioritize and develop planning efforts, policies, and programs related to bicycle and pedestrian travel.**

    - *Identify and monitor high volume count locations, and begin to investigate potential design or engineering changes at these locations to better accommodate bicyclists and pedestrians, as well as ensure their safety.* The data shows that there are a number of count locations which consistently have high volumes of pedestrians, bicyclists, or both. The City can use volume data from the count efforts as an initial "filter" to identify and prioritize which intersections and streets should be a focus for future bicycle and pedestrian infrastructure improvements. However, volume data should not be the only metric by which infrastructure improvements should be prioritized. A thorough review of existing facilities from a design, engineering, safety, and functional perspective should also be conducted before any improvements are made.

    - *Develop engineering solutions, safety programs, or education campaigns based on key trends.* Both the count data and collision information highlight some areas where various initiatives can be developed to further improve bicycle and pedestrian safety. These include:

        - Address common motorist, bicyclist, and pedestrian behaviors. There are consistent behaviors by motorists, pedestrians, and bicyclists which are a primary cause of injury collisions. Identifying and monitoring these trends is a key first step to improving safety for all users. Moving forward, the City should

begin to develop targeted safety programs and education campaigns that specifically address and prevent these behaviors.

- Work with the Glendale Police Department to improve enforcement for all users. Enforcement of laws and regulations is a key component to ensuring safety for all users of the roadway. Additional collaboration with police is needed, and enforcement efforts should be targeted at consistent behaviors by motorists, bicyclists, and pedestrians that jeopardize safety.

- Encourage helmet use. The count data demonstrates that a high volume of bicyclists are riding without helmets, especially at school locations. The City should consider campaigns to encourage helmet use and a potential helmet distribution program, especially for youth.

- Address safety needs for vulnerable populations. The collision data shows that seniors and youth are involved in a disproportionate share of injury collisions, relative to population share. As a result, special pedestrian and bicycle education efforts should be aimed at the elderly and youth populations, such as bicycle safety courses. In addition, motorist education efforts should be focused on special considerations for elderly and youth pedestrians and bicyclists. Additional efforts should also be made by the City enhance and expand its Safe Routes to School program to target schools with critical safety and infrastructure needs.

- Increase education efforts at certain times of the year and at key periods of the day. Collision data shows that more pedestrians are injured during the winter months, while more bicyclists are injured in the summer and fall months. In addition, collisions involving both pedestrians and bicyclists are more common during commute times. Education and safety campaigns, as well as enforcement, should be targeted to help mitigate collisions during these hours.

- *Continue to monitor location of collisions to identify future "hot spots."* Since 2004 no one location in Glendale distinguished itself in terms of bicycle or pedestrian collisions. Nevertheless, this data is important to monitor. While a number of factors contribute to each collision, a spike in collisions at one intersection may be indicative of potential safety concerns and would likely merit additional investigation, and, potentially, safety improvements.

2. **Continue with bicycle and pedestrian counts not only in 2011, but also in future years.** While the 2009 and 2010 counts have enabled the City to get a better understanding of bicycle and pedestrian activity on Glendale streets, definitive trends in volumes and behavior are difficult to establish with limited data. Therefore, additional counts in subsequent years are highly recommended. By continuing to build a database of bicycle and pedestrian activity at key locations, the City will be able to account for variation and conclusively identify trends. Outlined below are some specific recommendations that can improve the efficacy of the City's data collection efforts.

   - *Above all else, maintain consistency with the counts and its methodology, especially in terms of the number of count locations and their location.*

- *To ensure consistency, make every effort to have surveyors participate in a minimum level of training.*

- *At high volume locations, ensure enough surveyors are present and have appropriate counting materials.*

3. **Utilize the count and collision data as a tool in pursuing additional funding opportunities.** The data gathered in 2009 and 2010, and presented in this report, offers the City a wealth of new information regarding bicycle and pedestrian behavior in the Glendale. As the City pursues additional grants or sources to fund new infrastructure and safety and educational campaigns, this data should be used to target priority funding needs and enhance applications.

4. **Continue to utilize additional data sources to supplement the bicycle and pedestrian counts.** While the bicycle and pedestrian count data is the primary focus of this study, additional data should continue to be analyzed and integrated. ACS data provides a statistically representative overview of bicycle and walking as commute modes. SWITRS data provides a comprehensive look at bicycle and pedestrian collision data. Other potential data sources include: National Household Travel Survey (NHTS), Bike to Work surveys, surveys of bicyclists and pedestrians, and Air Quality Management District (AQMD) employer commute data.

Chapter 1. Introduction

Over the past decade, bicycling and walking have grown significantly throughout the nation. People increasingly view these modes as not just recreation, but also as viable options for commuting and other trips. People who choose to bicycle and walk often seek to capitalize on the health, economic, and social benefits associated with non-motorized travel. As bicycling and walking increase, so does the demand for supportive infrastructure and programs that ensure that these modes are safe, accessible, and responsive to a variety of users. While cities like Glendale are working to meet these demands and provide the facilities needed to further encourage bicycling and walking, they often face critical information gaps about the actual use and demand for non-motorized modes, as well as information about bicycling and walking safety.

The City of Glendale and the L.A. County Bicycle Coalition understand the importance of bicycling and walking as crucial modes in the city's overall transportation network, while also recognizing that they need to better understand bicycling and walking behaviors. In 2008, the L.A. County Bicycle Coalition received a PLACE Program (Policies for Livable, Active Communities and Environments) grant from the Los Angeles County Department of Public Health. Funding from the PLACE Program has allowed the L.A. County Bicycle Coalition to partner with the City of Glendale to create the City's first *Safe and Healthy Streets Plan*, a policy document designed to facilitate implementation of existing policies from current planning documents, as well as recommend new policies to make Glendale a safer and friendlier city for bicyclists and pedestrians.

One of the key priorities of the *Safe and Healthy Streets Plan* is to develop an accurate picture of bicycling and walking in the City of Glendale through formal and standardized bicycle and pedestrian counts. In September of 2009, Glendale's first bicycle and pedestrian counts took place at key locations throughout the city. This data served as a baseline for the 2010 counts, which were completed in September 2010. This report presents the 2010 data, as well as trendline analysis comparing the 2009 and 2010 counts. This report further presents an analysis of bicycle and pedestrian collision data to provide a basic profile of bicycling and pedestrian safety.

Chapter 2. Project Objectives

The primary objective of this report is to analyze bicycle and pedestrian count data gathered in 2009 and 2010, including identifying key trends across the two years of collected data. Data was analyzed at the macro level (citywide) and the micro level (at specific locations), as well as in relation to certain bicyclist and pedestrian behaviors. The ultimate goal of this report is to provide City staff with information that can then be used to inform decisions about how to plan for future projects and where to invest resources to further enhance bicycling and pedestrian infrastructure and programs in Glendale.

Another objective of this report was to provide a basic assessment and profile of bicyclist and pedestrian safety in the City of Glendale. Nelson\Nygaard analyzed six years of bicycle and pedestrian collision data and summarized key trends related to number of collisions, collision severity, most frequent collision locations, primary collision factors, vehicle code violations, and basic demographics of injured parties. This information can also serve as a baseline for future safety assessments.

Finally, another objective of this report was to look at Glendale's bicycle and pedestrian data in comparison to selected peer cities. More specifically, how does Glendale's number of bicyclists and pedestrians compare with other cities? Also, does Glendale have a higher number of bicycle and pedestrian collisions in comparison to other cities? This report seeks to provide preliminary answers those questions.

Chapter 3. Count Methodology

The methodology for the bicycle and pedestrian counts was established in 2009 prior to the first count effort and builds off of standards set forth by the National Bicycle and Pedestrian Documentation Project (NBPD), a nationwide effort to promote data collection and ensure a consistent count methodology across count efforts.[1] The NBPD methodology was informed by the Institute of Transportation Engineers (ITE), other transportation professionals, and best practices nationwide. The core of the NBPD methodology is

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

Number of Count Locations

In 2009, the number of count locations was based on criteria of one count location per 15,000 residents. For the City of Glendale, with a 2000 census population of 194,973 people, this equated to a minimum of 13 count locations. Preferring to go beyond the minimum, additional locations were chosen and assigned priority to ensure citywide coverage. The final number of count locations was determined based on the total number of volunteer surveyors that could be recruited to conduct the counts. Twenty-four primary count locations were selected, plus an additional two count locations at two Glendale high schools.

Selection of Count Locations

Selection of count and survey locations followed from the criteria developed by the NBPD data collection and analysis program. These criteria included:

- Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc),
- Locations near proposed major bicycle/pedestrian improvements, particularly the PLACE Grant Physical Project corridor proposed on Riverdale Drive and Maple Street,
- Representative locations in the urbanized area,
- Key corridors that can be used to gauge the impacts of future improvements, and
- Locations where bicyclist and pedestrian collision numbers are high.

Figures 3-1 and 3-2 provide an overview of the count locations that were selected. It is important to note that between 2009 and 2010, one count location was changed. In 2009, Broadview Drive and Oceanview Boulevard was a count location, but for 2010 count effort this location was eliminated. In its place Central Avenue and Americana Way was added as a count location for 2010. When comparing 2009 and 2010 volumes, these two locations were omitted to allow for accurate comparisons. In addition, data from one count period (Weekend 10 AM-12 PM) at the Concord Street and Doran Street location was not available for analysis. As a result, this location was also omitted from certain comparisons.

[1] See www.bikepeddocumentation.org

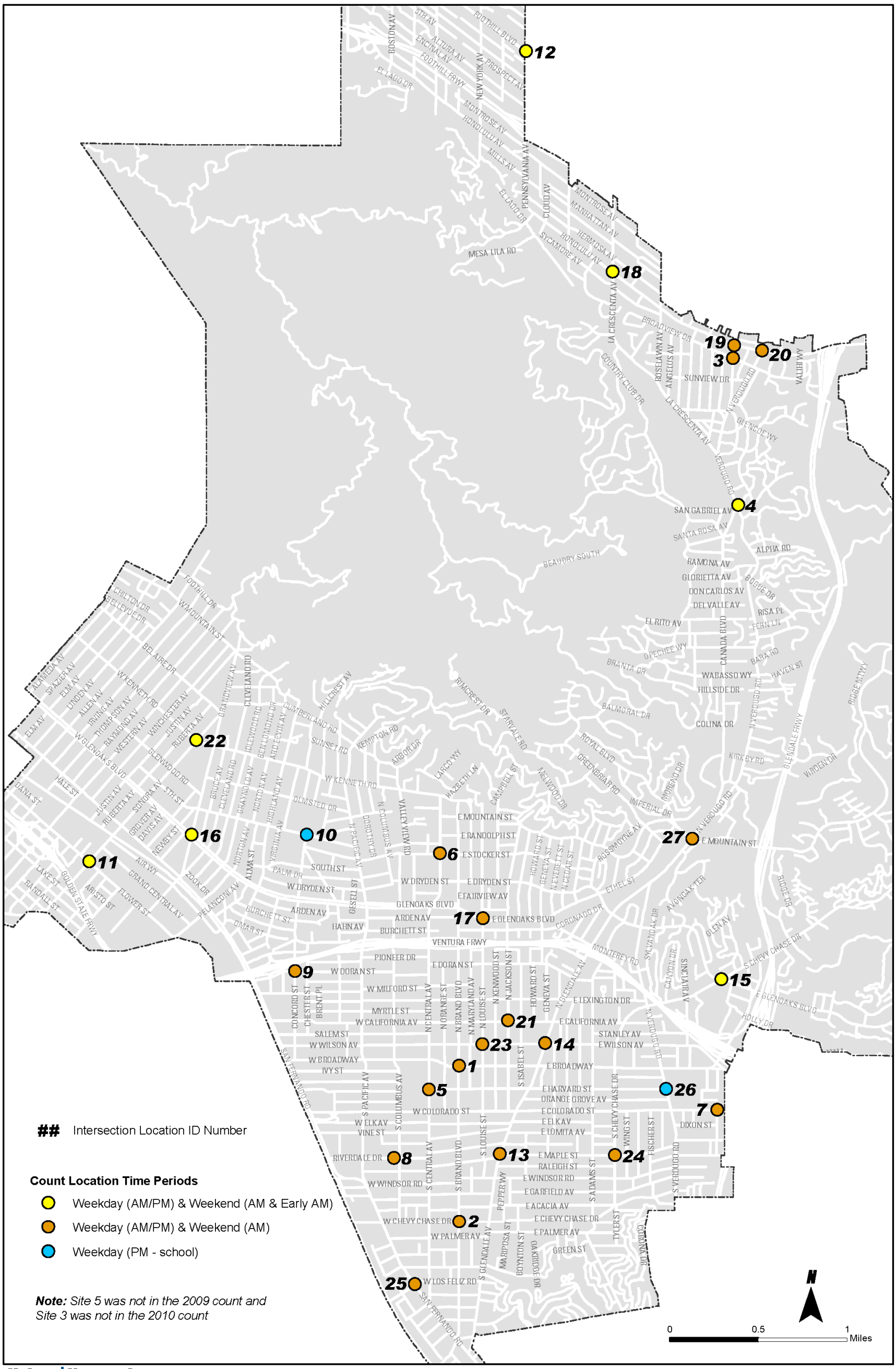
Finally, locations 10 and 26 are the two count locations that took place at Hoover High School and Glendale High School, respectively.

Figure 3-1 Bicycle and Pedestrian Count Locations

ID	Location	ID	Location
1	Brand Blvd. & Broadway	15	Glenoaks Blvd. & Chevy Chase Dr.
2	Brand Blvd. & Chevy Chase Dr.	16	Glenoaks Blvd. & Grandview Ave.
3	Broadview Dr. & Oceanview Blvd. (2009)	17	Glenoaks Blvd. & Louise St.
4	Canada Blvd. & Verdugo Rd.	18	Honolulu Ave. & La Crescenta Ave.
5	Central Ave. & Americana Way (2010)	19	Honolulu Ave. & Oceanview Blvd.
6	Central Ave. & Stocker St.	20	Honolulu Ave. & Verdugo Rd.
7	Colorado St. & Lincoln Ave.	21	Jackson St. & California Ave.
8	Columbus Ave. & Riverdale Dr.	22	Kenneth Rd. & Sonora Ave.
9	Concord St. & Doran St.[2]	23	Louise St. & Wilson Ave.
10	Concord St. & Glenwood Rd. (Hoover H.S.)	24	Maple St. & Chevy Chase Dr.
11	Flower St. & Sonora Ave.	25	San Fernando Rd. & Los Feliz Rd.
12	Foothill Blvd. & Pennsylvania Ave.	26	Verdugo Rd. & Harvard St. (Glendale H.S.)
13	Glendale Ave. & Maple St.	27	Verdugo Rd. & Mountain St.
14	Glendale Ave. & Wilson Ave.		

[2] Data not available for Weekend 10 AM-12 PM count period.

Figure 3-2 Map of Count Locations



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GIS Source: City of Glendale

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Count Dates and Times

September is the preferred month for bicycle and pedestrian counts. Counting in September helps to reduce variation in travel patterns due to summer vacations and while the weather is still typically amenable to bicycle and pedestrian travel. In 2009, data was collected primarily on Wednesday, September 16th and Saturday, September 19th. In 2010, the majority of counts took place on Wednesday, September 22nd and Saturday, September 25th. In both years, some count locations were surveyed in the following week.

Counting in the middle of the week helps to eliminate variation of commute patterns due to extended weekends or holidays. For Glendale, primary counts were performed during three time periods: weekday morning, weekday evening, and weekend late morning. For the 24 primary count locations, weekday counts were conducted at both 7-9 AM and 5-7 PM, while weekend counts were conducted at 10 AM-12 PM.

At seven locations, weekend counts were supplemented with an early morning 8-10 AM count. These early morning counts were the result of extra volunteers in 2009, and, in order to ensure consistency, were repeated in 2010. Finally, volunteers also collected data at two high school locations during the afternoon egress period from 2:30-4:30 PM (2009) and 3-5 PM (2010). Figure 3-3 provides an overview of the count locations and times.

Figure 3-3 Count Locations and Count Periods

ID	Location	Weekday (AM/PM) + Weekend (AM)	Weekend (Early AM)	Weekday (PM - School)
1	Brand Blvd. & Broadway	X		
2	Brand Blvd. & Chevy Chase Dr.	X		
3	Broadview Dr. & Oceanview Blvd. (2009)	X		
4	Canada Blvd. & Verdugo Rd.	X	X	
5	Central Ave. & Americana Way (2010)	X		
6	Central Ave. & Stocker St.	X		
7	Colorado St. & Lincoln Ave.	X		
8	Columbus Ave. & Riverdale Dr.	X		
9	Concord St. & Doran St.[3]	X		
10	Concord St. & Glenwood Rd. (Hoover H.S.)			X
11	Flower St. & Sonora Ave.	X	X	
12	Foothill Blvd. & Pennsylvania Ave.	X	X	
13	Glendale Ave. & Maple St.	X		
14	Glendale Ave. & Wilson Ave.	X		
15	Glenoaks Blvd. & Chevy Chase Dr.	X	X	
16	Glenoaks Blvd. & Grandview Ave.	X	X	
17	Glenoaks Blvd. & Louise St.	X		
18	Honolulu Ave. & La Crescenta Ave.	X	X	

[3] Data not available for Weekend 10 AM-12 PM count period.

ID	Location	Weekday (AM/PM) + Weekend (AM)	Weekend (Early AM)	Weekday (PM - School)
19	Honolulu Ave. & Oceanview Blvd.	X		
20	Honolulu Ave. & Verdugo Rd.	X		
21	Jackson St. & California Ave.	X		
22	Kenneth Rd. & Sonora Ave.	X	X	
23	Louise St. & Wilson Ave.	X		
24	Maple St. & Chevy Chase Dr.	X		
25	San Fernando Rd. & Los Feliz Rd.	X		
26	Verdugo Rd. & Harvard St. (Glendale H.S.)			X
27	Verdugo Rd. & Mountain St.	X		

Count Methodology/Materials

Approximately 85 volunteers helped to survey the count locations. Surveyors were provided with a detailed instruction sheet prior to their survey period (see Appendix E) to ensure consistency. Surveyors used standardized count forms, which considered pedestrian and bicyclist activity for the entire intersection (see Appendix F). Maps guided surveyors to the exact intersections to monitor. In addition, surveyors were also asked to count pedestrians and bicyclists as they left the intersection so that counts recorded the direction of travel for each bicyclist and pedestrian. In addition, surveyors also observed targeted bicycling behaviors, including wrong-way riding, helmet use, and riding on the sidewalk. In 2010, surveyors were also instructed to note each bicyclist's gender, identify children who were walking or bicycling, and count wheelchair users to provide added demographic information about the walking and bicycling populations in Glendale.

Limitations of Counts

Bicycle and pedestrian counts are a very useful tool in obtaining data regarding the usage of these modes and certain behaviors. It is important to note, however, that these bicycle and pedestrian counts are not meant to measure the *exact* number of people who bicycle or walk in Glendale, nor are they intended to determine the proportion of all trips made on bicycle or foot. Given that these counts occur once a year and over a one day period, they are more useful in providing a "snapshot" that enables the identification of basic trends in bicycle and pedestrian behavior over time. NBPD has developed a methodology to estimate daily, monthly, or annual users based on an extrapolation of data obtained from counts. However, this methodology is best used when data from three consecutive count days can be averaged. For example, counts from 5-7 PM on consecutive weekdays (Tuesday-Thursday) during the same week, or, in consecutive weeks. Unfortunately, this level of data collection requires significant resources and coordination, which is particularly difficult with a staff of volunteer counters.

For these reasons, identifying the exact level of bicycle ridership or number of pedestrians in Glendale can be better accomplished through a combination of U.S. Census data, National Household Travel Survey (NHTS) data,[4] or a statistically representative survey of residents and visitors. In fact, as discussed in Chapter 4, while the counts show a slight decline in the number of

[4] NHTS was not analyzed for this report. It can be found at http://nhts.ornl.gov

bicyclists and pedestrians in Glendale from 2009 to 2010, other data sources suggest increases in bicycling and walking in Glendale. For example, the American Community Survey[5] reveals that the commute mode share for bicycling increased from .33% in 2000 to .57% in 2009, an increase of 75%. Similarly, the commute mode share for walking increased from 3.24% in 2000 to 4.11% in 2009, an increase of 27%.

[5] Complete U.S. Census and American Community Survey data can be found at www.census.gov

Chapter 4. Key Findings – Bicycle and Pedestrian Counts

This section uses the data gathered from 2009 and 2010 counts to identify key trends in bicycling and pedestrian usage, as well as bicyclist behavior. It is important to note that all comparisons between 2009 and 2010 count data omit the two count locations (Broadview/Oceanview and Central/Americana) that were changed from 2009 to 2010, as well as the Concord and Doran location, which had incomplete data in 2010. Omitting these locations is necessary to ensure accurate comparisons between years. In order to ensure accurate comparisons across time and to avoid the omission of data, it is crucial that future count efforts maintain consistent count locations. This recommendation is discussed in additional detail in Chapter 7.

Additional data gathered in 2010 in regards to gender, the number of children bicycling and walking, and wheelchair use is documented and can be used in future counts efforts to identify trends in those areas. Finally, traffic cameras were also used to perform "screenline" counts at six locations in both 2009 and 2010.

The data and analysis presented in this chapter are organized in the following manner:

- Bicycle volumes
- Pedestrian volumes
- A note on volumes
- Peak-hour volumes
- Weekday vs. weekend volumes
- Bicyclist behavior
- Gender, children, and wheelchair users (2010)
- Direction of travel
- Screenline counts

Bicycle Volumes

As shown in Figure 4-3, there was an overall 7% decline in bicycle volumes from 2009 to 2010. Despite the overall decline, results varied across the count locations. In fact, a number of intersections experienced an increase in bicycle volumes. For example, in 2010 there were 135 bicyclists at Verdugo and Mountain, a 63% increase over the 2009 volumes. Other notable increases in bicyclist volumes were observed at San Fernando and Los Feliz (55%), Brand and Broadway (22%), and at Canada and Verdugo (21%). The largest decline in bicycle volumes was at Jackson and California, which experienced a 48% decline (46 bicyclists to 24 bicyclists).

The top five locations by bicycle volume are presented in Figure 4-1 below. In both 2009 and 2010 Flower and Sonora had the highest bicycle volumes of all the count locations by a large margin, although the volume at this location declined 12% percent from 2009 to 2010. Verdugo and Mountain had the second highest volume in 2010 with 135 bicyclists. By contrast, in 2009 this intersection was ranked 14th for bicycle volumes. A complete ranking of intersection by bicyclist volumes is available in Appendix B.

Figure 4-1 Top 5 Intersections, by Bicyclist Volumes

Rank ('10)	Rank ('09)	ID	Location	2009	2010
1	1	11	Flower & Sonora	341	299
2	14	27	Verdugo & Mountain	83	135
3	2	16	Glenoaks & Grandview	175	129
4	7	4	Canada/Verdugo/Menlo	101	122
5	15	25	San Fernando & Los Feliz	76	118

Pedestrian Volumes

As shown in Figure 4-3, there was an overall 5% decline in pedestrian volumes from 2009 to 2010. Despite the overall decline, results varied across the count locations. In fact, a number of intersections experienced an increase in pedestrian volumes. For example, in 2010 there were 339 pedestrians at Flower and Sonora, a 70% increase over the 2009 volumes. Other notable increases in pedestrian volumes were observed at Kenneth and Sonora (68%), Canada and Verdugo (61%), and Verdugo and Mountain (40%). The largest decline in pedestrian volumes was at Honolulu and Oceanview, which experienced a 35% decline (1,686 pedestrians to 1,095 pedestrians).

The top five locations by pedestrian volume are presented in Figure 4-2 below. In 2010, Central and Americana Way had the highest pedestrian volumes of all the count locations by a large margin with 3,310 pedestrians. This was a new count location in 2010. Brand and Broadway had the second highest volume in 2010 with 2,239 pedestrians. Brand and Broadway was the highest ranked intersection for pedestrians in 2009. In all, there was a high level of consistency between 2009 and 2010 for intersections with the highest pedestrian volumes. A complete ranking of intersection by pedestrian volumes is available in Appendix B.

Figure 4-2 Top 5 Intersections, by Pedestrian Volumes

Rank ('10)	Rank ('09)	ID	Location	2009	2010
1	n/a	5	Central & Americana Way	**n/a**	3310
2	1	1	Brand & Broadway	2520	2239
3	3	14	Glendale & Wilson	1274	1318
4	4	25	San Fernando & Los Feliz	1261	1099
5	2	19	Honolulu & Oceanview	1686	1095

A Note on Volumes

The 2010 count data shows that both bicycle and pedestrian volumes declined from 2009 to 2010. However, for a number of reasons, it is unlikely that this change represents a valid trend. First, and foremost, the number of bicyclists or pedestrians counted at a given location will vary to a certain degree from one day to the next. Any number of factors can influence the degree of variation, and what may seem like an important increase or decrease in bicycle volumes could really just be the natural ebb and flow of bicycle and pedestrian activity. Performing counts on consecutive days in consecutive weeks is one of the best solutions to overcoming this limitation because data from consecutive counts periods can be averaged to account for natural variation. However, that amount of data collection is very time consuming, and given limited resources, was not feasible for Glendale in 2009 and 2010. As more count data is collected in subsequent years, the City will be able to account for variation by indexing the data and averaging count data across multiple years.

Second, it appears that weather was likely a contributing factor in the "decline" from 2009 to 2010. Obviously, weather plays a significant role in an individual's decision to bicycle or walk - if it is raining or cold, the number of people choosing to bicycle or walk declines substantially. In 2009, weather during the observation periods was described as "ideal" for bicycling and walking. In 2010, however, during the Wednesday, September 22nd count the weather was overcast and quite cool (high 50s and low 60s), and some count locations experienced mild precipitation. Furthermore, during the Saturday, September 25th count the weather shifted dramatically and was described as "uncomfortably hot." In fact, September 25th was the first day of a record breaking heat wave in Southern California. Ideally, counts can be adjusted and shifted to days and times to avoid such weather conditions. However, such last minute logistical adjustments are especially difficult when dealing with volunteer surveyors, as was the case in Glendale. In short, it is difficult to assess exactly to what degree the weather impacted the 2010 counts, but, once again, additional count data in future years can be used to account variations due to weather and other factors. As discussed in Chapter 7, the City of Glendale should formalize an annual count program as a means to account for variation in a given year and continue to build a data set that will enable conclusive trends to be determined.

Therefore, it is unlikely that the declines in bicycle and pedestrian volumes represent a real downward trend in bicycle and pedestrian volumes in Glendale. It is more probable that the declines in volume were part of variation largely due to less than ideal weather conditions. This conclusion is also supported by the fact that other data sources indicate that bicycling and walking are increasing in both Glendale and nationally. As discussed in detail in Chapter 6, data from the U.S. Census and American Community Survey show that bicycling and walking as commute modes increased 75% and 27% from 2000 to 2009, respectively. Likewise, the National Household Travel Survey (NHTS) shows that bicycling and walking comprise 11.9% of *all* trips made in the country in 2009, an increase of 25% from 2001.

Figure 4-3 Overall Bicycle and Pedestrian Volumes, 2009-10

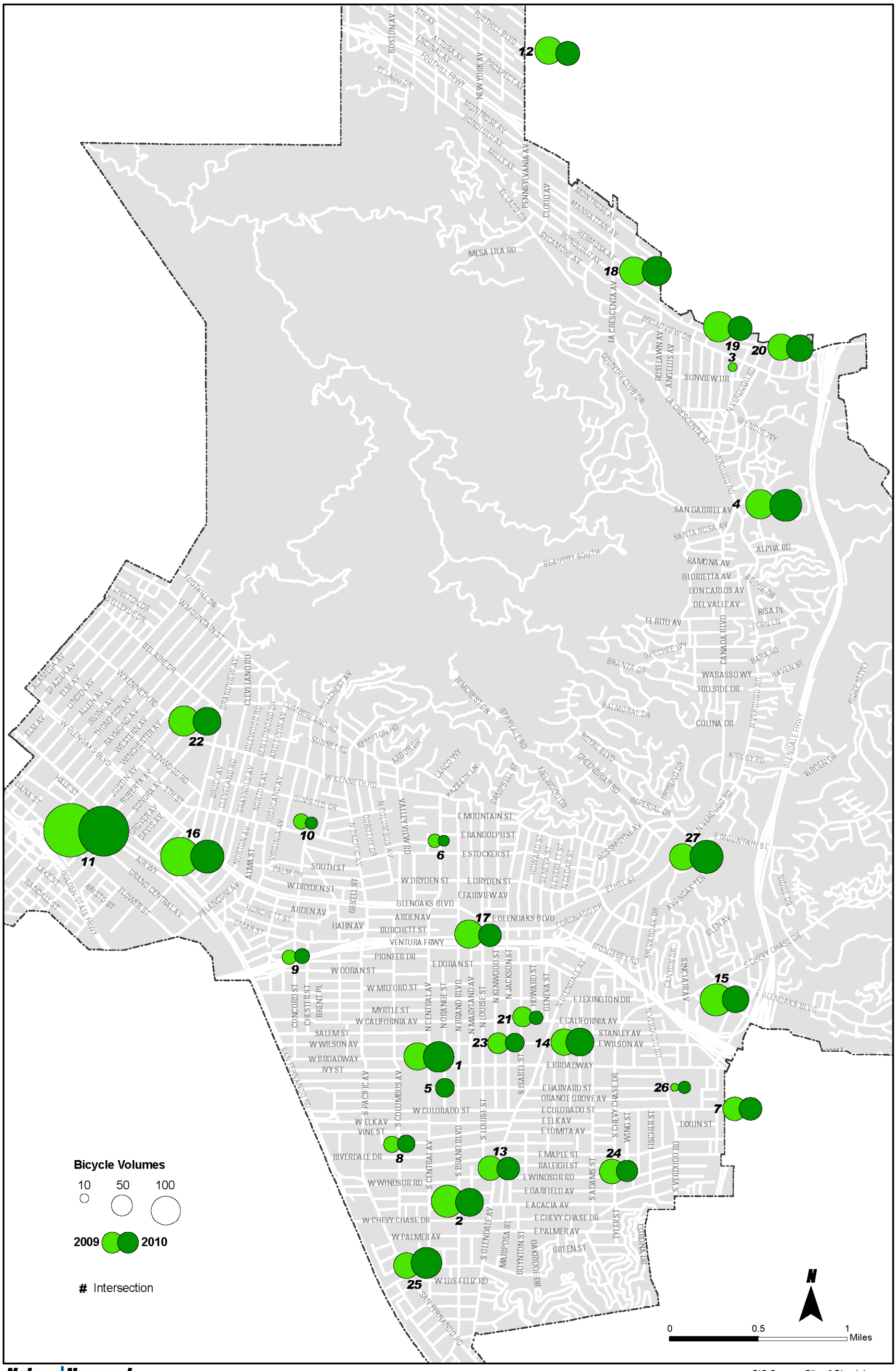
Location		Bicyclists			Pedestrians			Combined		
		2009	2010	% change	2009	2010	% change	2009	2010	% change
1	Brand & Broadway	92	112	22%	2520	2239	-11%	2612	2351	-10%
2	Brand & Chevy Chase	120	92	-23%	779	576	-26%	899	668	-26%
3	Broadview & Oceanview	9	n/a	n/a	211	n/a	n/a	220	n/a	n/a
4	Canada & Verdugo	101	122	21%	72	116	61%	173	238	38%
5	Central & Americana Way	n/a	46	n/a	n/a	3310	n/a	n/a	3356	n/a
6	Central & Stocker	21	14	-33%	879	826	-6%	900	840	-7%
7	Colorado & Lincoln	68	60	-12%	434	480	11%	502	540	8%
8	Columbus & Riverdale	33	37	12%	703	516	-27%	736	553	-25%
9	Concord & Doran[6]	25	26	4%	167	137	-18%	192	163	-15%
10	Concord & Glenwood (HS)	7	18	157%	1055	966	-8%	1062	984	-7%
11	Flower & Sonora	341	299	-12%	199	339	70%	540	638	18%
12	Foothill & Pennsylvania	87	71	-18%	285	259	-9%	372	330	-11%
13	Glendale & Maple	74	67	-9%	728	660	-9%	802	727	-9%
14	Glendale & Wilson	86	92	7%	1274	1318	3%	1360	1410	4%
15	Glenoaks & Chevy Chase	119	90	-24%	334	333	0%	453	423	-7%
16	Glenoaks & Grandview	175	129	-26%	230	296	29%	405	425	5%
17	Glenoaks & Louise	98	65	-34%	392	350	-11%	490	415	-15%
18	Honolulu & La Crescenta	97	108	11%	265	268	1%	362	376	4%
19	Honolulu & Oceanview	110	68	-38%	1686	1095	-35%	1796	1163	-35%
20	Honolulu & Verdugo	84	88	5%	396	407	3%	480	495	3%
21	Jackson & California	46	24	-48%	422	420	0%	468	444	-5%
22	Kenneth & Sonora	111	93	-16%	407	685	68%	518	778	50%
23	Louise & Wilson	50	43	-14%	567	575	1%	617	618	0%
24	Maple & Chevy Chase	70	56	-20%	578	466	-19%	648	522	-19%
25	San Fernando & Los Feliz	76	118	55%	1261	1099	-13%	1337	1217	-9%
26	Verdugo & Harvard (HS)	28	21	-25%	900	991	10%	928	1012	9%
27	Verdugo & Mountain	83	135	63%	693	969	40%	776	1104	42%
	TOTAL (all locations)[7]	**2211**	**2094**	**-5%**	**17437**	**19696**	**13%**	**19648**	**21790**	**11%**
	TOTAL (omit 3,5,9)[8]	**2177**	**2022**	**-7%**	**17059**	**16249**	**-5%**	**19236**	**18271**	**-5%**

[6] Data not available for Weekend 10 AM-12 PM count period.

[7] Includes all locations from 2009 and 2010. These figures are shown for informational purposes and should not be used to describe changes from 2009 and 2010.

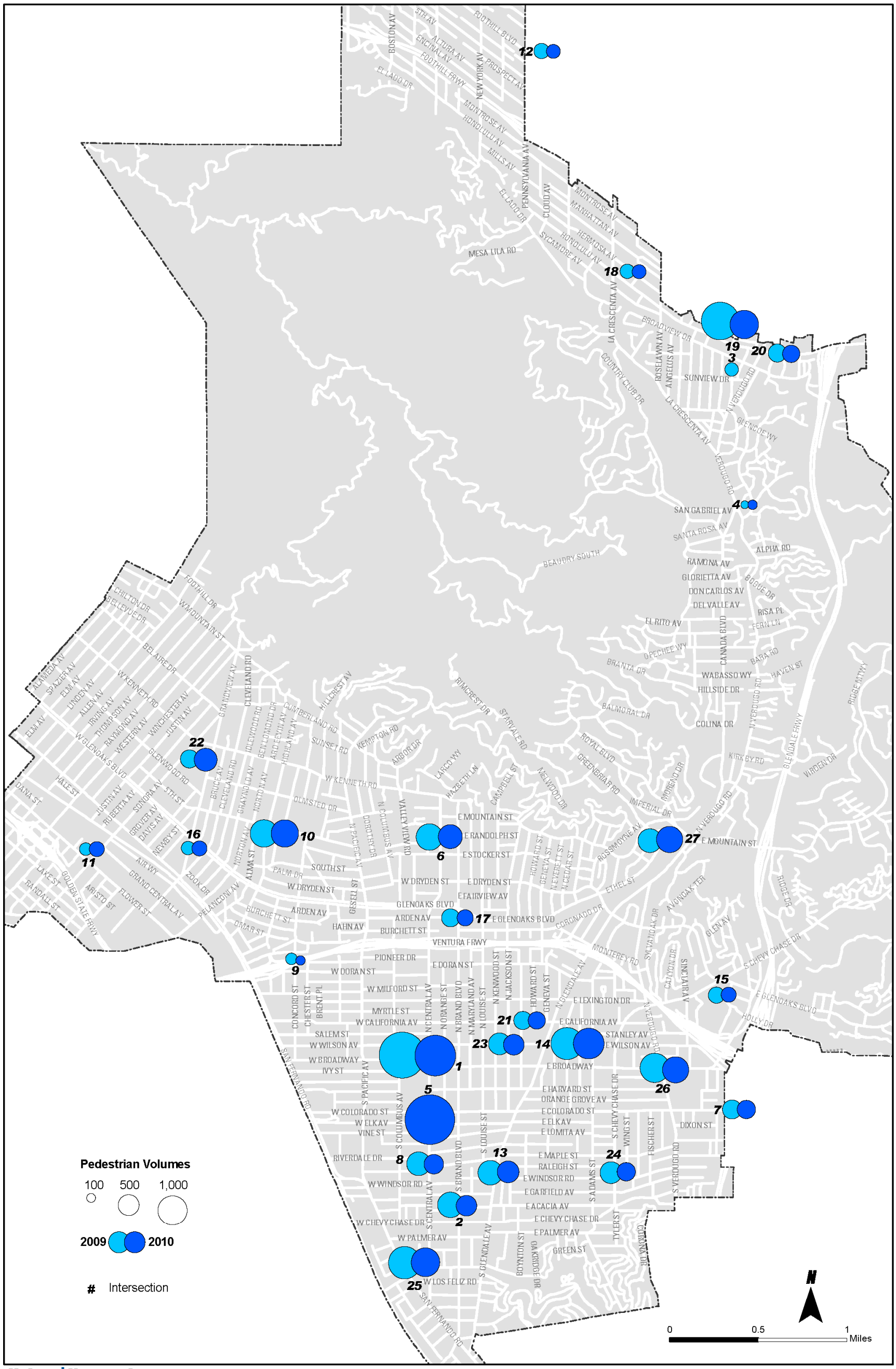
[8] Omits locations 3, 5, and 9 for comparison purposes.

Figure 4-4 Map of Count Locations with Overall Bicycle Volumes



GIS Source: City of Glendale

Figure 4-5 Map of Count Locations with Overall Pedestrian Volumes



GIS Source: City of Glendale

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Peak-hour Volumes

Peak-hour values represent the sum of the four consecutive 15-minute intervals, within the two-hour count period, recording the highest volumes of bicyclists or pedestrians. Peak-hour volumes are useful to analyze because even within a two-hour count period there can be a great deal of fluctuation in the number of bicyclists or pedestrians at a given intersection. For example, if a school gets out at 3 PM, there will invariably be a great deal of activity in the first 30 minutes on the streets in the immediate vicinity of that school. However, by 5 PM most students will have left and bicycle and pedestrian activity will have declined significantly. Peak-hour data isolates when streets are busiest and can be a helpful tool in planning for future improvements or projects.

Figures 4-6 and 4-7 provide a summary of the bicycle and pedestrian peak-hour volumes by both location and count period. Following Figures 4-6 and 4-7 are a series of maps (Figures 4-8 to 4-13) which compare 2009 and 2010 peak-hour volumes for each mode by each count period. Highlights of the data include:

- Bicyclists
  - For the Weekday 7-9 AM counts, peak-hour bicycle volumes increased by 5% from 2009 to 2010 (219 bicyclists to 229 bicyclists). However, during all other count periods, peak-hour bicycle volumes declined.
  - The highest peak-hour bicycle volumes in both 2009 (104 bicyclists) and 2010 (74 bicyclists) was at Flower and Sonora during the Weekend 8-10 AM count.
  - For both 2009 and 2010, the weekday evening peak period for bicyclists was higher than the weekday morning peak period. In fact, in 2010 peak-hour bicycle volumes in the weekday evening were approximately 48% higher than weekday morning peak-hour volumes (338 vs. 229).
  - However, the weekend peak-hour experienced the highest volumes of all the count periods for bicyclists. In 2010, peak-hour bicycle volumes during the weekend mid-morning count were 465. Compared with 2009, however, there was a 21% decrease in weekend mid-morning peak-hour volumes.
- Pedestrians
  - For the Weekend 8-10 AM count, peak-hour pedestrian volumes increased by 50% from 2009 to 2010 (299 pedestrians to 448 pedestrians). During all other count periods, however, pedestrian peak-hour activity declined from 2009 to 2010.
  - For both 2009 and 2010, the weekday evening peak period for pedestrians was the highest peak period. In fact, in 2010 peak-hour pedestrian volumes in the weekday evening were approximately 19% higher than weekday morning peak-hour volumes (3,053 vs. 2,560) and 38% higher than weekend mid-morning peak-hour volumes (3,053 vs. 2,211).
  - The highest peak-hour pedestrian volume in 2009 was at Brand and Broadway (620) during the Weekday 5-7 PM count period. In 2010, the highest peak-hour pedestrian volume was at Central and Americana (953) during the Weekend 10 AM-12 PM count period.

Figure 4-6 Peak-hour Bicycle Volumes by Count Period

		Bicycle Peak-hour Volumes														
		Weekday 7-9 AM			Weekday 5-7 PM			Weekend 10 AM-12 PM			Weekend 8-10 AM			Weekday 3-5 PM		
Location		2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change
1	Brand & Broadway	11	11	0%	25	29	16%	22	22	0%						
2	Brand & Chevy Chase	19	20	5%	20	22	10%	40	20	-50%						
3	Broadview & Oceanview	2	n/a	n/a	3	n/a	n/a	3	n/a	n/a						
4	Canada & Verdugo	6	6	0%	5	7	40%	30	21	-30%	28	43	54%			
5	Central & Americana Way	n/a	3	n/a	n/a	16	n/a	n/a	8	n/a						
6	Central & Stocker	3	5	67%	2	3	50%	10	3	-70%						
7	Colorado & Lincoln	7	5	-29%	19	14	-26%	21	21	0%						
8	Columbus & Riverdale	4	8	100%	15	11	-27%	6	6	0%						
9	Concord & Doran	5	4	-20%	5	10	100%	5	n/a	n/a						
10	Concord & Glenwood													5	10	100%
11	Flower & Sonora	25	30	20%	43	46	7%	68	34	-50%	104	74	-29%			
12	Foothill & Pennsylvania	10	2	-80%	7	9	29%	16	10	-38%	29	28	-3%			
13	Glendale & Maple	13	12	-8%	19	19	0%	19	15	-21%						
14	Glendale & Wilson	12	13	8%	17	19	12%	37	25	-32%						
15	Glenoaks & Chevy Chase	15	5	-67%	12	10	-17%	20	20	0%	34	21	-38%			
16	Glenoaks & Grandview	11	11	0%	13	21	62%	53	17	-68%	53	35	-34%			
17	Glenoaks & Louise	9	5	-44%	11	8	-27%	50	25	-50%						
18	Honolulu & La Crescenta	4	7	75%	7	9	29%	26	19	-27%	22	36	64%			
19	Honolulu & Oceanview	8	9	13%	18	6	-67%	39	45	15%						
20	Honolulu & Verdugo	4	9	125%	19	8	-58%	31	48	55%						

	Location	Bicycle Peak-hour Volumes														
		Weekday 7-9 AM			Weekday 5-7 PM			Weekend 10 AM-12 PM			Weekend 8-10 AM			Weekday 3-5 PM		
		2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change
21	Jackson & California	3	3	0%	11	9	-18%	n/a	5	n/a						
22	Kenneth & Sonora	6	10	67%	10	17	70%	24	12	-50%	42	28	-33%			
23	Louise & Wilson	6	6	0%	21	14	-33%	7	5	-29%						
24	Maple & Chevy Chase	15	7	-53%	12	14	17%	13	16	23%						
25	San Fernando & Los Feliz	13	24	85%	26	26	0%	16	26	63%						
26	Verdugo & Harvard													24	14	-42%
27	Verdugo & Mountain	15	21	40%	14	17	21%	25	42	68%						
	TOTAL (all locations)	226	236	4%	354	364	3%	581	465	-20%	312	265	-15%	29	24	-17%
	TOTAL (omits 3,5,9)	219	229	5%	346	338	-2%	573	452	-21%						

Figure 4-7 Peak-hour Pedestrian Volumes by Count Period

	Location	Pedestrian Peak-hour Volumes														
		Weekday 7-9 AM			Weekday 5-7 PM			Weekend 10 AM-12 PM			Weekend 8-10 AM			Weekday 3-5 PM		
		2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change
1	Brand & Broadway	323	304	-6%	620	506	-18%	478	437	-9%						
2	Brand & Chevy Chase	163	134	-18%	141	113	-20%	137	79	-42%						
3	Broadview & Oceanview	37	n/a	n/a	50	n/a	n/a	43	n/a	n/a						
4	Canada & Verdugo	8	32	300%	13	19	46%	10	4	-60%	17	25	47%			
5	Central & Americana Way	n/a	129	n/a	n/a	905	n/a	n/a	953	n/a						
6	Central & Stocker	139	107	-23%	184	204	11%	173	141	-18%						
7	Colorado & Lincoln	67	90	34%	104	99	-5%	84	88	5%						
8	Columbus & Riverdale	217	141	-35%	135	127	-6%	73	50	-32%						
9	Concord & Doran	47	57	21%	41	34	-17%	19	n/a	n/a						
10	Concord & Glenwood													955	799	-16%
11	Flower & Sonora	50	78	56%	43	62	44%	18	11	-39%	23	68	196%			
12	Foothill & Pennsylvania	35	40	14%	50	51	2%	30	21	-30%	53	28	-47%			
13	Glendale & Maple	201	176	-12%	126	151	20%	103	91	-12%						
14	Glendale & Wilson	271	278	3%	247	244	-1%	174	208	20%						
15	Glenoaks & Chevy Chase	67	69	3%	51	63	24%	32	18	-44%	47	46	-2%			
16	Glenoaks & Grandview	42	33	-21%	42	39	-7%	32	22	-31%	23	85	270%			
17	Glenoaks & Louise	108	85	-21%	99	80	-19%	33	35	6%						
18	Honolulu & La Crescenta	45	48	7%	43	47	9%	29	24	-17%	41	38	-7%			
19	Honolulu & Oceanview	127	50	-61%	418	120	-71%	369	470	27%						
20	Honolulu & Verdugo	40	58	45%	99	119	20%	84	50	-40%						

		Pedestrian Peak-hour Volumes														
		Weekday 7-9 AM			Weekday 5-7 PM			Weekend 10 AM-12 PM			Weekend 8-10 AM			Weekday 3-5 PM		
	Location	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change
21	Jackson & California	66	70	6%	123	84	-32%	n/a	68	n/a						
22	Kenneth & Sonora	53	51	-4%	61	89	46%	35	125	257%	95	158	66%			
23	Louise & Wilson	83	57	-31%	117	158	35%	112	130	16%						
24	Maple & Chevy Chase	153	146	-5%	102	96	-6%	69	47	-32%						
25	San Fernando & Los Feliz	289	230	-20%	223	242	9%	179	124	-31%						
26	Verdugo & Harvard													791	849	7%
27	Verdugo & Mountain	251	283	13%	200	340	70%	29	36	24%						
	TOTAL (all locations)	2882	2746	-5%	3332	3992	20%	2345	3232	38%	299	448	50%	1746	1648	-6%
	TOTAL (omits 3,5,9)	2798	2560	-9%	3241	3053	-6%	2283	2211	-3%						

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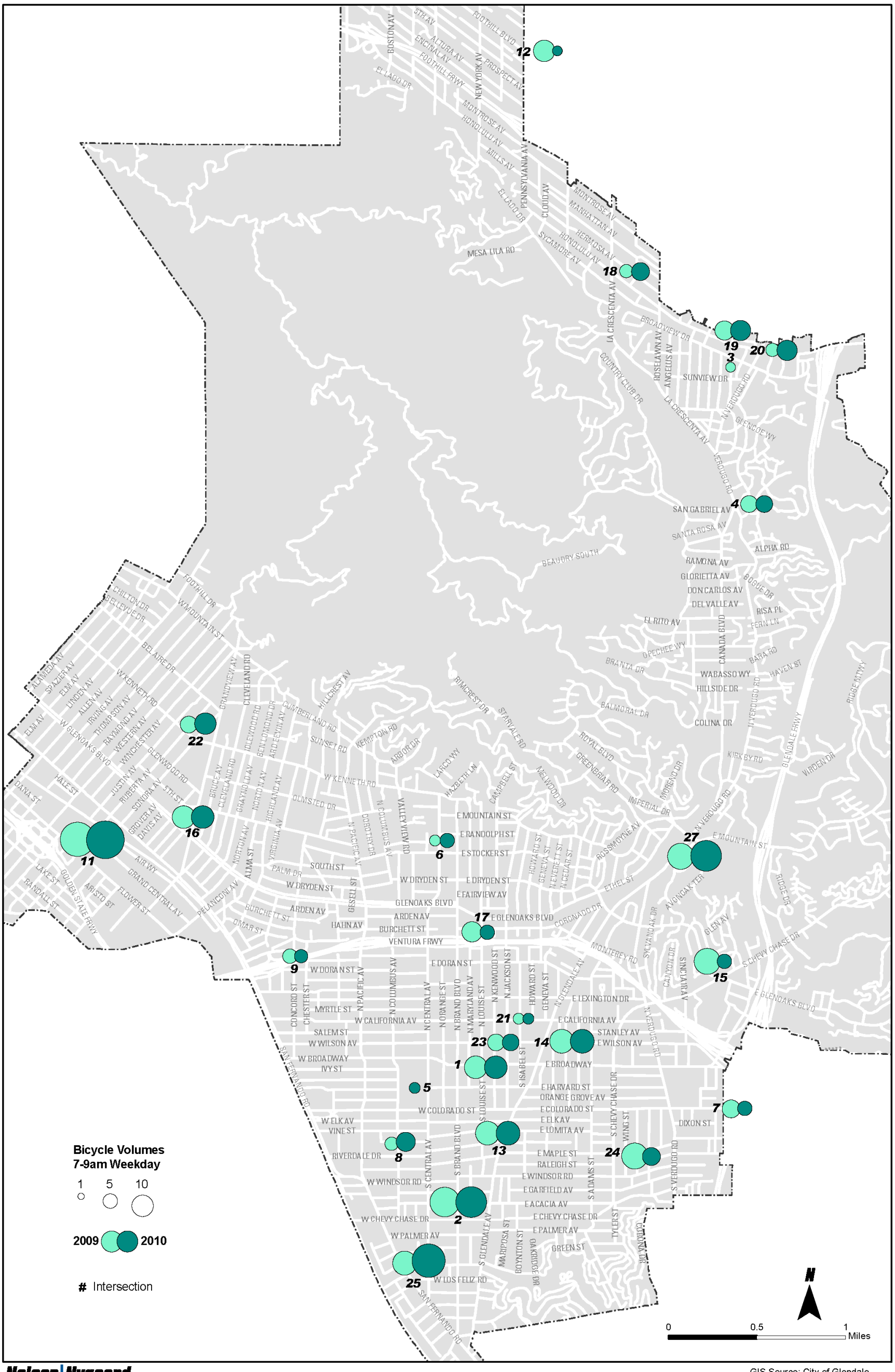
Figure 4-8 Peak-hour Bicycle Volumes, Weekday 7-9 AM



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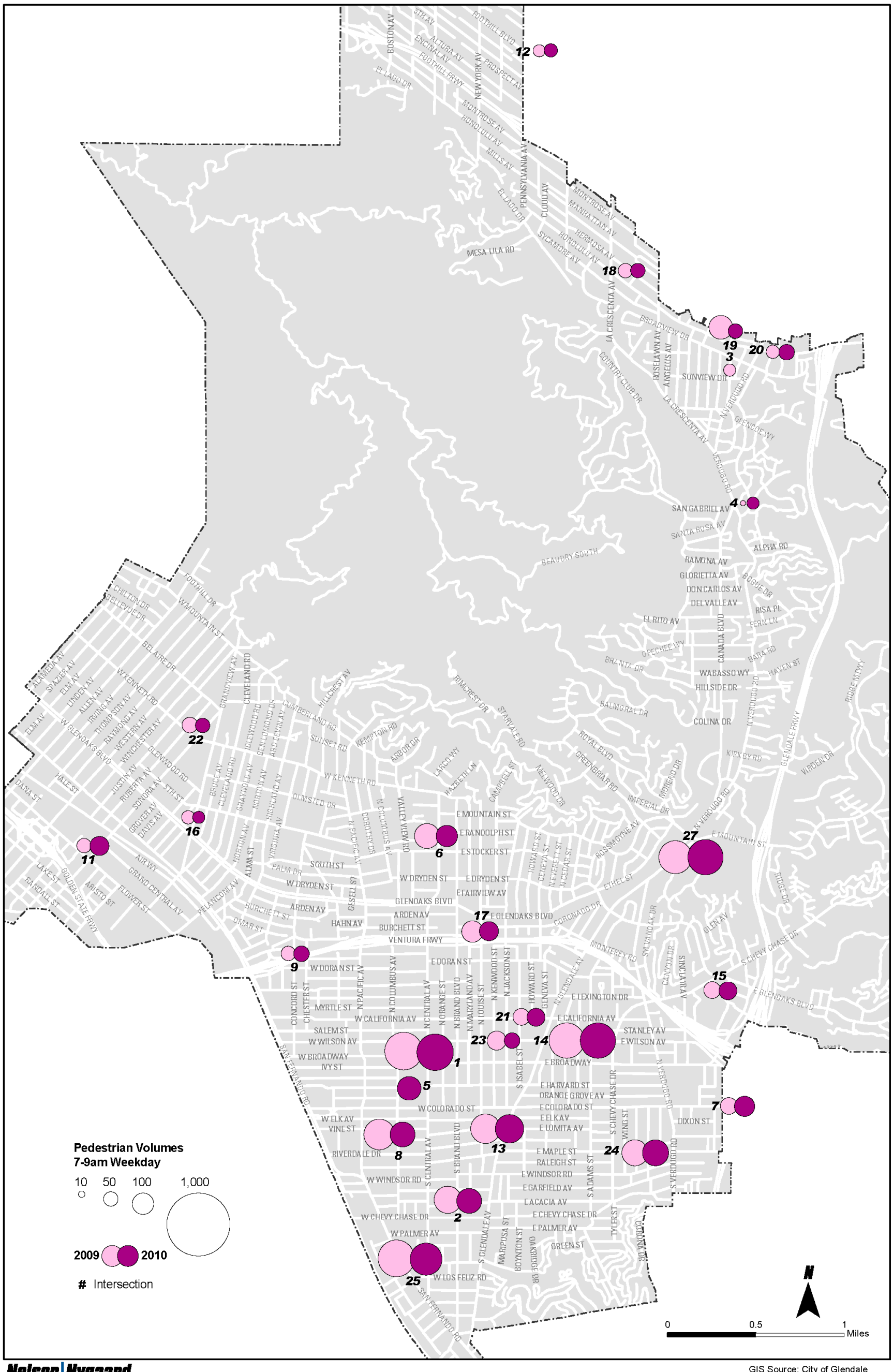
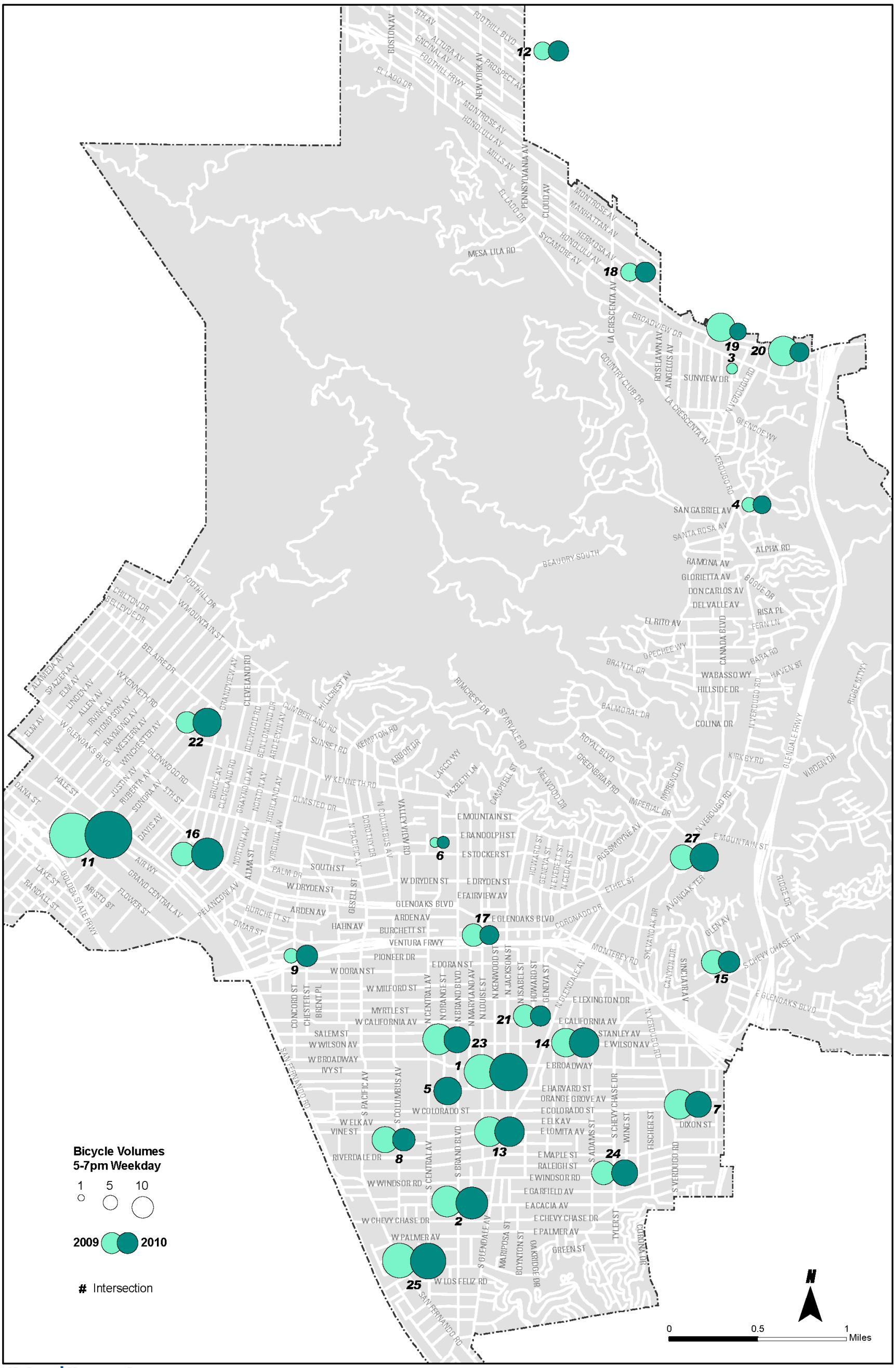
GIS Source: City of Glendale

Figure 4-9 Peak-hour Pedestrian Volumes, Weekday 7-9 AM



GIS Source: City of Glendale

Figure 4-10 Peak-hour Bicycle Volumes, Weekday 5-7 PM



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GIS Source: City of Glendale

Figure 4-11 Peak-hour Pedestrian Volumes, Weekday 5-7 PM

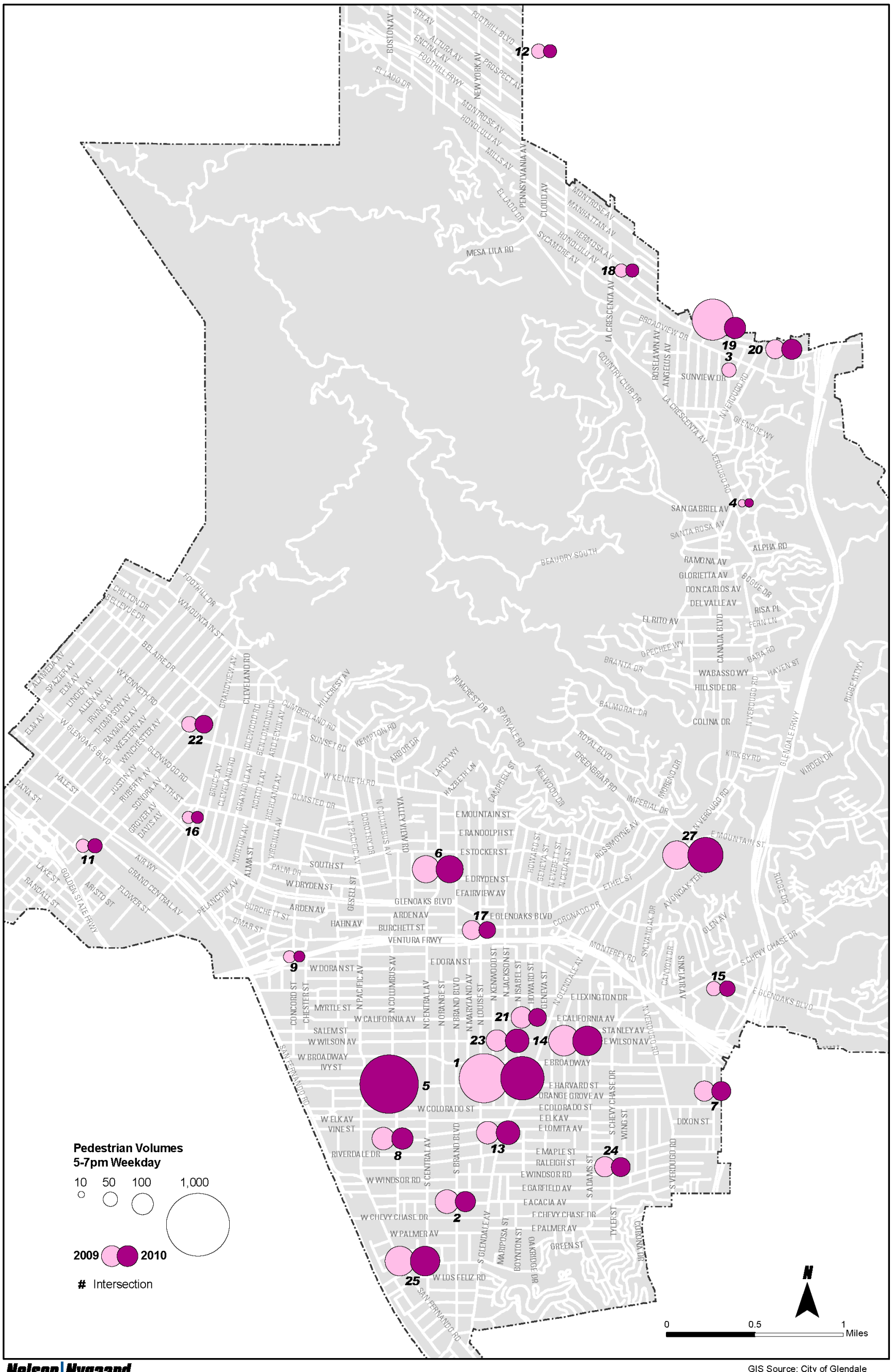
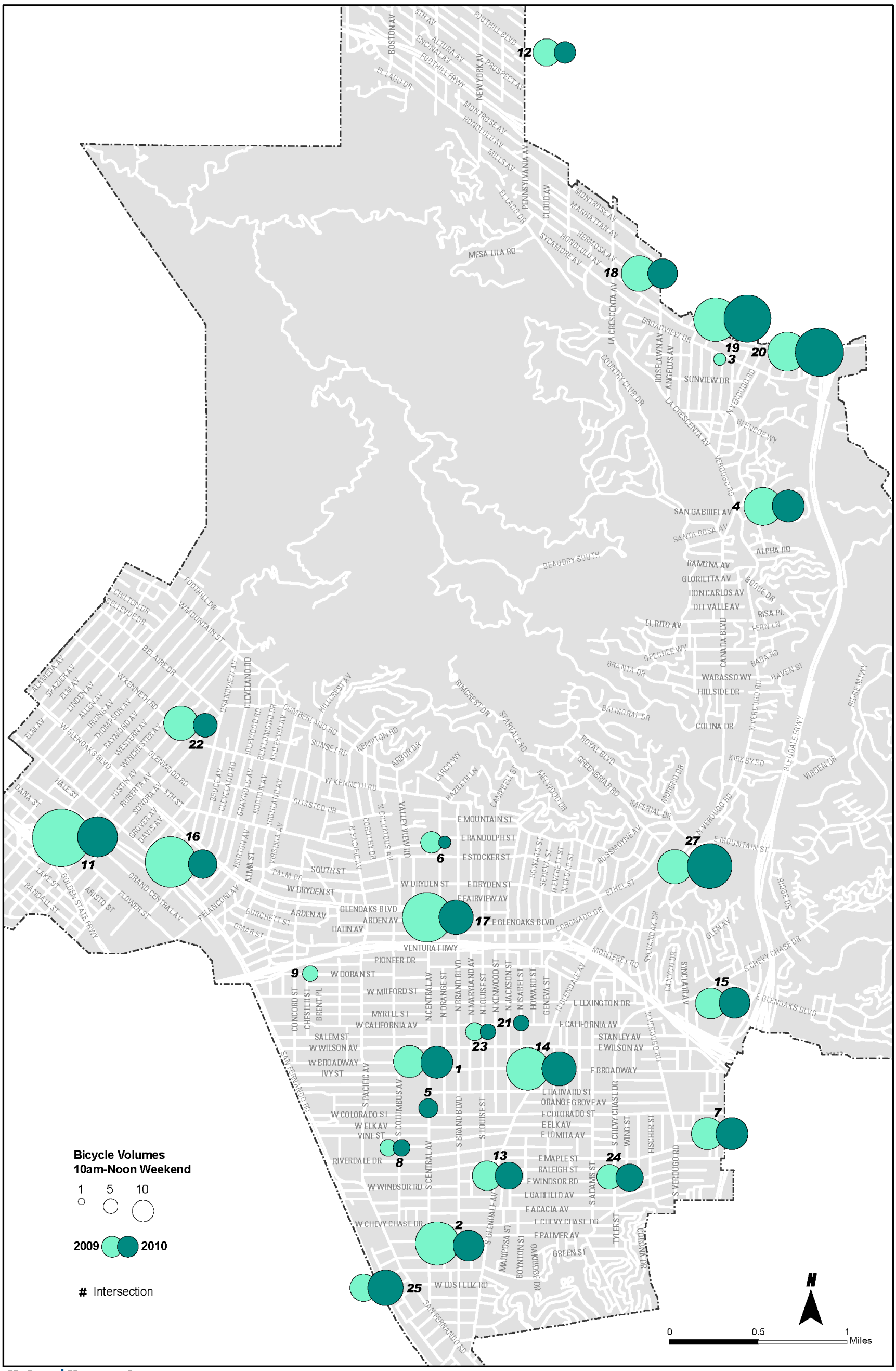


Figure 4-12 Peak-hour Bicycle Volumes, Weekend 10 AM-12 PM



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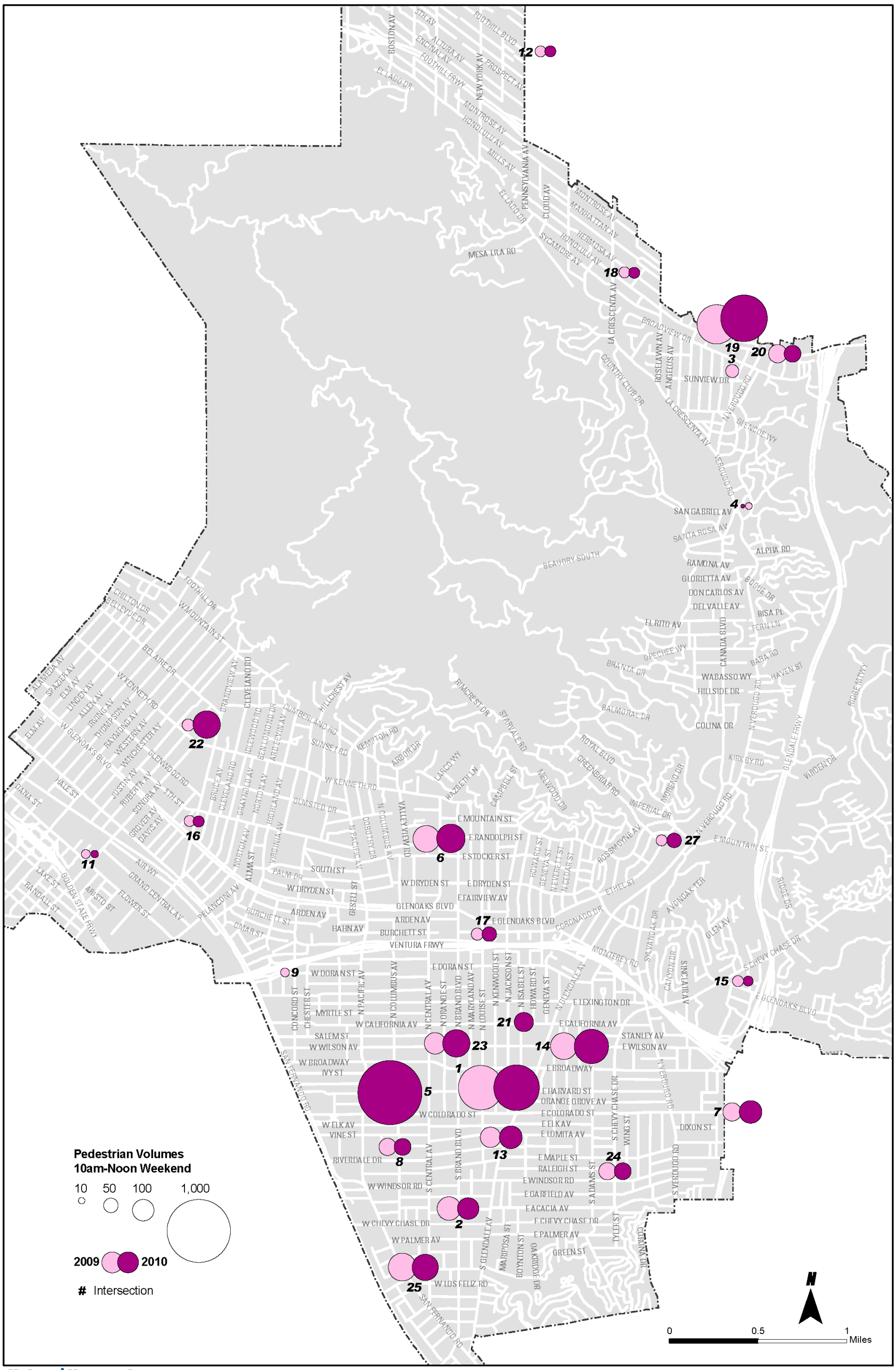
GIS Source: City of Glendale

Figure 4-13 Peak-hour Pedestrian Volumes, Weekend 10 AM-12 PM



GIS Source: City of Glendale

Weekday vs. Weekend Volumes

Appendix A provides a summary of the raw bicycle and pedestrian volumes for each count location by count period. In brief, some notable observations can be made regarding bicycle and pedestrian activity during the weekday and weekend count periods. First, the highest combined volumes of bicyclists and pedestrians were observed during the weekday evening count period. Second, pedestrian volumes were lower on the weekend than both the weekday morning and evening count periods. In fact, the highest overall pedestrian volumes were observed during the Weekday 5-7 PM count period. This trend is likely due to a much smaller population of weekend commuters.

Finally, the highest overall count of bicyclists was observed during the two weekend morning count periods. As shown in Appendix A, total bicyclist volumes for the two weekend morning count periods totaled over 1,000 in both 2009 and 2010. These volumes are more than twice the bicycle volumes observed during the weekday evening counts. This data strongly indicates that bicycling in Glendale is done much more often on the weekends for recreation than on the weekdays for commuting.

Volumes by Geographic Region

Figures 4-14 and 4-15 show the count locations organized by approximate geographic regions – North Glendale (six count locations), Central Glendale (four), Downtown/South Glendale (12), Northwest Glendale (three), as well as the two school count locations. Not surprisingly, with 12 count locations, the Downtown/South Glendale region had the highest raw pedestrian and bicycle volumes. However, if one looks at the data according to volume per count location, then the two school locations come out on top (998 bicyclists and pedestrian per school location in 2010). This high average is to be expected given the high student activity on streets adjacent to those schools. By contrast, the North region had the lowest volumes per count location in 2010 (434 bicyclists and pedestrians per location).

A number of other observations can be made about bicycling and walking by region:

- The Central (6%), Northwest (26%), and school (.3%) regions all experienced increases in total bicycle and pedestrian volumes from 2009 to 2010. These volume increases, however, were offset by declines in the North (18%) and Downtown/South (9%) regions.
- Every region experienced declines in bicycle volumes from 2009 to 2010. The two schools, however, had an 11% increase, albeit within the context of lower raw volumes.
- The Northwest region experienced a 68% increase in pedestrian volumes from 2009 to 2010, by far the highest growth of any region. By contrast, the North region experienced the largest pedestrian decline at 21%, while the Downtown/South region also experienced a 10% decline in pedestrian volumes.

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Figure 4-14 Map of Count Locations, by Geographic Region

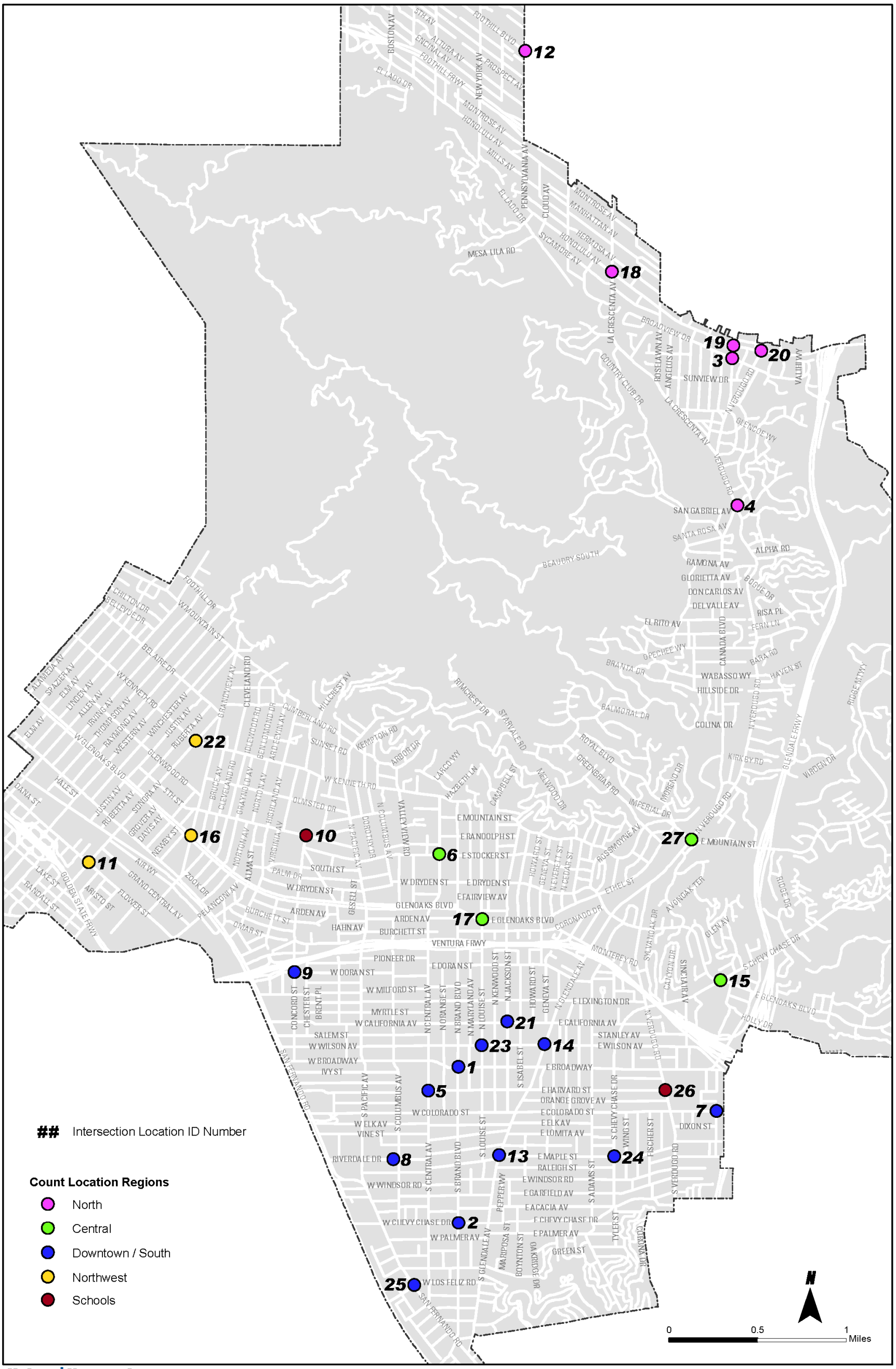

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Figure 4-15 Total Bicycle and Pedestrian Volumes, by Region

		Bicyclists			Pedestrians			Combined			Volume / Location	
	Location	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010
	North											
3	Broadview & Oceanview	9	n/a	n/a	211	n/a	n/a	220	n/a	n/a		
4	Canada & Verdugo	101	122	21%	72	116	61%	173	238	38%		
12	Foothill & Pennsylvania	87	71	-18%	285	259	-9%	372	330	-11%		
18	Honolulu & La Crescenta	97	108	11%	265	268	1%	362	376	4%		
19	Honolulu & Oceanview	110	68	-38%	1686	1095	-35%	1796	1163	-35%		
20	Honolulu & Verdugo	84	88	5%	396	407	3%	480	495	3%		
	Total	**488**	**457**	**-6%**	**2915**	**2145**	**-26%**	**3403**	**2602**	**-24%**		
	Total (w/o 3)	**479**	**457**	**-5%**	**2704**	**2145**	**-21%**	**3183**	**2602**	**-18%**	**531**	**434**
	Central											
6	Central & Stocker	21	14	-33%	879	826	-6%	900	840	-7%		
15	Glenoaks & Chevy Chase	119	90	-24%	334	333	0%	453	423	-7%		
17	Glenoaks & Louise	98	65	-34%	392	350	-11%	490	415	-15%		
27	Verdugo & Mountain	83	135	63%	693	969	40%	776	1104	42%		
	Total	**321**	**304**	**-5%**	**2298**	**2478**	**8%**	**2619**	**2782**	**6%**	**655**	**696**
	Downtown & South											
1	Brand & Broadway	92	112	22%	2520	2239	-11%	2612	2351	-10%		
2	Brand & Chevy Chase	120	92	-23%	779	576	-26%	899	668	-26%		
5	Central & Americana Way	n/a	46	n/a	n/a	3310	n/a	n/a	3356	n/a		
7	Colorado & Lincoln	68	60	-12%	434	480	11%	502	540	8%		
8	Columbus & Riverdale	33	37	12%	703	516	-27%	736	553	-25%		
9	Concord & Doran	25	26	4%	167	137	-18%	192	163	-15%		
13	Glendale & Maple	74	67	-9%	728	660	-9%	802	727	-9%		
14	Glendale & Wilson	86	92	7%	1274	1318	3%	1360	1410	4%		
21	Jackson & California	46	24	-48%	422	420	0%	468	444	-5%		
23	Louise & Wilson	50	43	-14%	567	575	1%	617	618	0%		
24	Maple & Chevy Chase	70	56	-20%	578	466	-19%	648	522	-19%		
25	San Fernando & Los Feliz	76	118	55%	1261	1099	-13%	1337	1217	-9%		
	Total	**740**	**773**	**4%**	**9433**	**11796**	**25%**	**10173**	**12569**	**24%**		
	Total (w/o 5)	**740**	**727**	**-2%**	**9433**	**8486**	**-10%**	**10173**	**9213**	**-9%**	**925**	**838**
	Northwest											
11	Flower & Sonora	341	299	-12%	199	339	70%	540	638	18%		
16	Glenoaks & Grandview	175	129	-26%	230	296	29%	405	425	5%		
22	Kenneth & Sonora	111	93	-16%	407	685	68%	518	778	50%		
	Total	**627**	**521**	**-17%**	**836**	**1320**	**58%**	**1463**	**1841**	**26%**	**488**	**614**
	Schools											
10	Concord & Glenwood	7	18	157%	1055	966	-8%	1062	984	-7%		
26	Verdugo & Harvard	28	21	-25%	900	991	10%	928	1012	9%		
	Total	**35**	**39**	**11%**	**1955**	**1957**	**0.1%**	**1990**	**1996**	**0.3%**	**995**	**998**

Bicyclist Behavior[9]

As Glendale moves forward with improving safety for bicyclists, the counts reinforce the need to pay close attention to certain bicyclist behaviors. In both 2009 and 2010, surveyors noted key bicyclist riding behaviors – wrong way riding (i.e. riding against the flow of traffic), riding without a helmet, and riding on the sidewalk. The City of Glendale does not condone these behaviors because they can be illegal in certain areas,[10,11] and often endanger bicyclists, pedestrians, and motorists. At the same time, the observation of such behavior can highlight segments of the street network where bicyclists perceive unsafe conditions or where certain safe bicycle facilities may be lacking.

Figures 4-16 and 4-17 provide a summary of these bicyclist behaviors at each count location. A number of key findings emerge from the data:

- A very small percentage of bicyclists are riding the wrong way, roughly 3% of observed bicyclists. The percentage of wrong-way riders is consistent from 2009 to 2010.
- In 2010, Verdugo and Mountain had the highest number of wrong-way riders with 10.
- At every intersection in both 2009 and 2010, bicyclists were observed without helmets. Approximately 33% of bicyclists were not wearing helmets in 2010, a slight increase from 30% in 2009.
- Verdugo and Harvard had the highest share of bicyclists not wearing a helmet in both 2009 (79%) and 2010 (90%). While the bicyclist volumes at this location were small in 2009 and 2010 (28 and 21, respectively), this finding is still noteworthy, especially given that this is one of the two school count locations and the majority of bicyclists are youth.
- At each location in both 2009 and 2010 at least one bicyclist was observed riding on the sidewalk. In fact, more than 20% of bicyclists observed in Glendale in 2009 and 2010 were riding on the sidewalk. While sidewalk riding was prevalent at each count location, sidewalk riding did decline slightly from 2009 (22%) to 2010 (21%).
- The highest percentage of sidewalk riding in both 2009 and 2010 occurred at Glendale and Maple. More than 75% of bicyclists at this location in 2009 rode on the sidewalk (74 total observed bicyclists in 2009). This percentage declined to 63% in 2010 (67 total observed bicyclists in 2009), yet this still constitutes a substantial percentage of bicyclists at this location.

[9] Given the high volumes of pedestrians at certain locations and the complexities of monitoring each pedestrian's walking behavior, similar behavioral observations were not made for pedestrians.

[10] City of Glendale Municipal Code – 10.64.025: "Bicycle riding on sidewalks. No person shall ride or operate a bicycle upon any public sidewalk in any business district within the city except where such sidewalk is officially designated as part of an established bicycle route. Pedestrians shall have the right-of-way on sidewalks. The prohibition in this section shall not apply to peace officers on bicycle patrol. (Ord. 5116 § 1, 1996)"

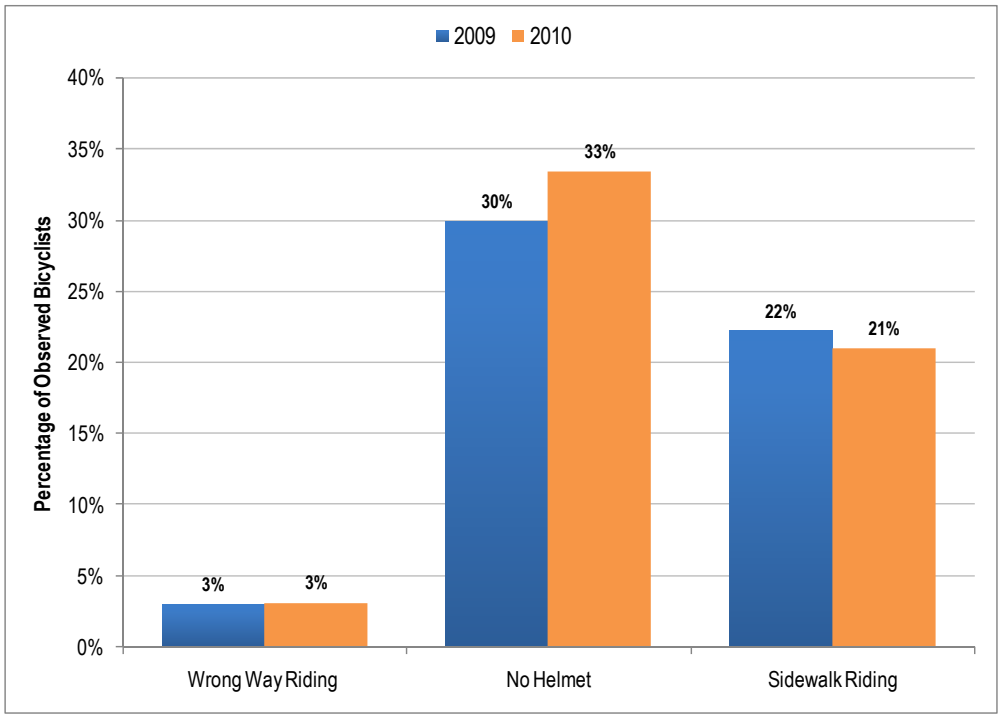
[11] California Vehicle Code – 21212(a): "A person under 18 years of age shall not operate a bicycle, a nonmotorized scooter, or a skateboard, nor shall they wear in-line or roller skates, nor ride upon a bicycle, a nonmotorized scooter, or a skateboard as a passenger, upon a street, bikeway, as defined in Section 890.4 of the Streets and Highways Code, or any other public bicycle path or trail unless that person is wearing a properly fitted and fastened bicycle helmet…"

Figure 4-16 Bicyclist Behavior by Count Location

		Total Bicyclist Behavior													
		Total Bicyclists		Wrong-Way				No Helmet				Sidewalk Riding			
	Location	2009	2010	2009	%	2010	%	2009	%	2010	%	2009	%	2010	%
1	Brand & Broadway	92	112	0	0%	6	5%	63	68%	46	41%	52	57%	26	23%
2	Brand & Chevy Chase	120	92	1	1%	6	7%	71	59%	52	57%	51	43%	18	20%
3	Broadview & Oceanview	9	n/a	1	11%	n/a	n/a	2	22%	n/a	n/a	1	11%	n/a	n/a
4	Canada & Verdugo	101	122	0	0%	1	1%	8	8%	6	5%	2	2%	4	3%
5	Central & Americana Way	n/a	46	n/a	n/a	4	9%	n/a	n/a	17	37%	n/a	n/a	17	37%
6	Central & Stocker	21	14	1	5%	0	0%	12	57%	7	50%	13	62%	9	64%
7	Colorado & Lincoln	68	60	4	6%	0	0%	33	49%	38	63%	25	37%	31	52%
8	Columbus & Riverdale	33	37	0	0%	3	8%	20	61%	24	65%	17	52%	10	27%
9	Concord & Doran[12]	25	26	0	0%	5	19%	13	52%	19	73%	12	48%	12	46%
10	Concord & Glenwood	7	18	0	0%	0	0%	3	43%	10	56%	6	86%	10	56%
11	Flower & Sonora	341	299	0	0%	4	1%	60	18%	65	22%	35	10%	44	15%
12	Foothill & Pennsylvania	87	71	1	1%	2	3%	12	14%	8	11%	7	8%	8	11%
13	Glendale & Maple	74	67	0	0%	1	1%	58	78%	53	79%	57	77%	42	63%
14	Glendale & Wilson	86	92	3	3%	1	1%	24	28%	49	53%	20	23%	32	35%
15	Glenoaks & Chevy Chase	119	90	2	2%	5	6%	28	24%	18	20%	23	19%	14	16%
16	Glenoaks & Grandview	175	129	8	5%	3	2%	48	27%	30	23%	21	12%	19	15%
17	Glenoaks & Louise	98	65	0	0%	0	0%	15	15%	13	20%	9	9%	8	12%
18	Honolulu & La Crescenta	97	108	0	0%	1	1%	4	4%	8	7%	5	5%	6	6%
19	Honolulu & Oceanview	110	68	7	6%	1	1%	12	11%	6	9%	13	12%	8	12%
20	Honolulu & Verdugo	84	88	1	1%	6	7%	5	6%	11	13%	0	0%	7	8%
21	Jackson & California	46	24	4	9%	1	4%	18	39%	14	58%	14	30%	10	42%
22	Kenneth & Sonora	111	93	1	1%	2	2%	10	9%	14	15%	5	5%	10	11%
23	Louise & Wilson	50	43	4	8%	4	9%	23	46%	23	53%	23	46%	16	37%
24	Maple & Chevy Chase	70	56	13	19%	0	0%	40	57%	33	59%	35	50%	20	36%
25	San Fernando & Los Feliz	76	118	6	8%	6	5%	45	59%	75	64%	25	33%	40	34%
26	Verdugo & Harvard	28	21	1	4%	0	0%	22	79%	19	90%	12	43%	11	52%
27	Verdugo & Mountain	83	135	8	10%	10	7%	18	22%	54	40%	13	16%	22	16%
	TOTAL (all locations)	**2211**	**2094**	**66**	**3%**	**72**	**3%**	**667**	**30%**	**712**	**34%**	**496**	**22%**	**454**	**22%**
	TOTAL (w/o 3, 5, 9)	**2177**	**2022**	**65**	**3%**	**63**	**3%**	**652**	**30%**	**676**	**33%**	**483**	**22%**	**425**	**21%**

[12] Data not available for Weekend 10 AM-12 PM count period.

Figure 4-17 Bicyclist Behavior by Year, All Locations



Gender, Children, and Wheelchair Users (2010)

For the 2010 count, surveyors were also instructed to note the number of female bicyclists, the number of child[13] bicyclists and pedestrians, and the number of wheelchair users. This data was not gathered in 2009, and, therefore, no comparisons can be made. However, this data can serve as a baseline for future comparisons and does provide additional information about the characteristics of bicyclists and pedestrians in Glendale. Furthermore, research has demonstrated that the presence of female and child bicyclists can generally serve as an "indicator species" for bicycle-friendly cities,[14] and, therefore, constitutes an additional benchmark for Glendale as it evaluates its non-motorized planning efforts. Figure 4-18 provides a summary of this data and some of the key findings are highlighted below:

- In 2010, the vast majority of observed bicyclists were male. In fact, only 7% of observed bicyclists were female, which is in stark contrast to the fact that females comprise 53%[15] of Glendale's overall population. Jackson and California had the highest share of female bicyclists at 21%.
- Children comprised an even smaller percentage of bicyclists and pedestrians, at approximately 5% for each mode. No more than 11 child bicyclists were observed at any one location. Honolulu and Oceanview had the highest share of child pedestrians, at 15% of observed pedestrians.
- Wheelchair users comprised only one-half of 1% of pedestrians. The highest number of wheelchair users was observed at Brand and Broadway (20) and at Honolulu and Oceanview (15). Both of these locations are proximate to a number of bus lines, which is a likely explanation for the higher number of observed wheelchair users.

[13] Defined as a person 12 years of age or under. Surveyors utilized best judgment to identify child bicyclists and pedestrians.

[14] Baker, L. (2009, October 16). How to Get More Bicyclists on the Road: To boost urban bicycling, figure out what women want. *Scientific American*.

[15] American Community Survey, 2006-08.

Figure 4-28 Gender, Child Bicyclists and Pedestrians, and Wheelchair Users (2010)

	Location	Total Bikes	Total Peds	Female Bicyclist		Child Bicyclist		Child Pedestrian		Wheelchair	
		2010	2010	2010	%	2010	%	2010	%	2010	%
1	Brand & Broadway	112	2239	3	3%	2	2%	113	5%	20	1%
2	Brand & Chevy Chase	92	576	9	10%	7	8%	28	5%	1	0%
3	Broadview & Oceanview	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4	Canada & Verdugo	122	116	10	8%	2	2%	2	2%	0	0%
5	Central & Americana Way	46	3310	7	15%	7	15%	214	6%	10	0%
6	Central & Stocker	14	826	2	14%	7	50%	43	5%	3	0%
7	Colorado & Lincoln	60	480	2	3%	7	12%	36	8%	3	1%
8	Columbus & Riverdale	37	516	1	3%	2	5%	70	14%	2	0%
9	Concord & Doran[16]	26	137	3	12%	5	19%	9	7%	0	0%
10	Concord & Glenwood	18	966	0	n/a	3	n/a	8	n/a	0	n/a
11	Flower & Sonora	299	339	22	7%	3	1%	2	1%	1	0%
12	Foothill & Pennsylvania	71	259	1	1%	4	6%	20	8%	0	0%
13	Glendale & Maple	67	660	1	1%	4	6%	77	12%	4	1%
14	Glendale & Wilson	92	1318	7	8%	5	5%	40	3%	5	0%
15	Glenoaks & Chevy Chase	90	333	6	7%	6	7%	5	2%	1	0%
16	Glenoaks & Grandview	129	296	8	6%	2	2%	1	0%	3	1%
17	Glenoaks & Louise	65	350	5	8%	0	0%	1	0%	3	1%
18	Honolulu & La Crescenta	108	268	8	7%	6	6%	6	2%	1	0%
19	Honolulu & Oceanview	68	1095	6	9%	0	0%	167	15%	15	1%
20	Honolulu & Verdugo	88	407	11	13%	11	13%	44	11%	2	0%
21	Jackson & California	24	420	5	21%	2	8%	17	4%	2	0%
22	Kenneth & Sonora	93	685	12	13%	11	12%	50	7%	0	0%
23	Louise & Wilson	43	575	6	14%	2	5%	45	8%	4	1%
24	Maple & Chevy Chase	56	466	8	14%	1	2%	59	13%	8	2%
25	San Fernando & Los Feliz	118	1099	1	1%	4	3%	18	2%	8	1%
26	Verdugo & Harvard	21	991	0	**n/a**	0	**n/a**	3	**n/a**	0	**n/a**
27	Verdugo & Mountain	135	969	11	8%	0	0%	2	0%	2	0%
	TOTAL	**2094**	**19696**	**155**	**7%**	**103**	**5%**	**1080**	**5%**	**98**	**0.5%**

[16] Data not available for Weekend 10 AM-12 PM count period.

Direction of Travel

As part of the counts in both 2009 and 2010, surveyors recorded the direction of travel for each bicyclist and pedestrian. More specifically, surveyors noted the direction of travel as each individual left a given intersection. Detailed review of direction of travel was not an option at this time, but can be reviewed on a case by case basis when considering potential improvements at intersections where the count was performed. Directional data will enable the City to identify, for example, key turning movements by bicyclists or where a large number of pedestrian are crossing a street. Ultimately, this data can enable the City to prioritize infrastructure improvements based on those movements. In short, this directional data is another tool available to the City and should be utilized in future bicycle and pedestrian planning efforts.

Screenline Camera Counts

Existing traffic camera data was used to supplement the counts by providing video data from six cameras around downtown, northwest Glendale, and south Glendale. Footage was taken from several days over a two-week period. Screenline counts are methodologically different from intersection counts. Observers of the video footage count all bicyclists and pedestrians traveling in either direction on a single road. For example, the camera at the Central and Broadway location recorded data for all bicyclists and pedestrians moving north and south on Central, just north of the intersection at Broadway. Intersection counts conducted manually by volunteers, on the other hand, record the number of people leaving in each direction of a given intersection. Comparing data collected according to different methods can be problematic. However, screenline counts in consecutive years at the same locations can be used to measure change in bicycling and walking behavior, and data collection via traffic cameras provides ample options for count repetition.

Figures 4-19 and 4-20 summarize the bicycle and pedestrian data gathered from the screenline counts. A number of observations can be made:

- Total bicyclist volumes increased by 12%. The count period with the highest increase was the Weekday 5-7 PM, which experienced a 52% increase in volume. By contrast, the Weekday 7-9 AM count experienced a 19% decline. Bicycle volumes on the weekend stayed relatively constant. This suggests that bicycling overall has not declined as would be suggested by the trendline counts at consistent intersections.
- On the other hand, the screenline counts also show that while pedestrian volumes increased during the weekday morning count, they also declined in both weekday evening and weekend counts, resulting in an overall 7% decline in pedestrian volumes.
- San Fernando and Colorado was the location that experienced the highest increase in bicycle volumes from 2009 to 2010 at 58%. Bicycle volumes at San Fernando and Flower, by contrast, declined 25%.
- Central and Colorado was the only location that experienced an increase in pedestrian volumes from 2009 to 2010 at 23%. At all other locations pedestrian volumes declined, especially at the train station entrance on Cerritos, which had a 40% decline in pedestrian volumes.

Figure 4-19 Bicycle Screenline Counts

Location		Weekday 7-9 AM			Weekday 5-7 PM			Weekend 10 AM-12 PM			TOTAL		
		2009	2010	% Change	2009	2010	% Change	2009	2010	% Change	2009	2010	% Change
1	Central & Broadway	8	3	-63%	5	9	80%	7	14	100%	20	26	30%
2	Central & Colorado	6	8	33%	6	16	167%	12	10	-17%	24	34	42%
3	Colorado & Brand	7	6	-14%	7	18	157%	6	3	-50%	20	27	35%
4	San Fernando & Flower	16	11	-31%	17	14	-18%	18	13	-28%	51	38	-25%
5	San Fernando & Colorado	4	4	0%	5	8	60%	3	7	133%	12	19	58%
6	Train Station at Cerritos	2	3	50%	4	2	-50%	0	0	n/a	6	5	n/a
	TOTAL	**43**	**35**	**-19%**	**44**	**67**	**52%**	**46**	**47**	**2%**	**133**	**149**	**12%**

Figure 4-20 Pedestrian Screenline Counts

Location		Weekday 7-9 AM			Weekday 5-7 PM			Weekend 10 AM-12 PM			TOTAL		
		2009	2010	% Change	2009	2010	% Change	2009	2010	% Change	2009	2010	% Change
1	Central & Broadway	74	92	24%	221	163	-26%	162	158	-2%	457	413	-10%
2	Central & Colorado	94	130	38%	149	198	33%	129	128	-1%	372	456	23%
3	Colorado & Brand	85	93	9%	139	109	-22%	124	93	-25%	348	295	-15%
4	San Fernando & Flower	39	35	-10%	11	16	45%	10	7	-30%	60	58	-3%
5	San Fernando & Colorado	65	34	-48%	18	24	33%	29	18	-38%	112	76	-32%
6	Train Station at Cerritos	65	52	-20%	46	17	-63%	19	9	-53%	130	78	-40%
	TOTAL	**422**	**436**	**3%**	**584**	**527**	**-10%**	**473**	**413**	**-13%**	**1479**	**1376**	**-7%**

Chapter 5. Bicycle and Pedestrian Collisions

Six years of bicycle and pedestrian collision data was obtained from the California Highway Patrol and analyzed to identify some basic trends related to bicycle and pedestrian safety. Analysis of collision data can help identify locations that should be prioritized for increased education and enforcement, identify key behaviors that contribute to injury collisions, assist with the planning of new bicycle facilities, and provide safety education opportunities. The information provided in this chapter will ultimately enable Glendale to better address bicycle and pedestrian collisions and continue to improve safety on city streets.

It is important to note that the data in this chapter exclusively represents collisions that involve an *injury* to a bicyclist or pedestrian. While all collisions are of significant concern, property damage-only, or non-injury collisions involving bicyclists or pedestrians, are not consistently reported to the police. Furthermore, the data produced by such "non-injury" reports is not reliable since it is typically self-reported by one or more of the parties involved without investigation by a neutral third party. Injury and fatal collisions are reported more consistently over time. However, even bicycle and pedestrian injury collisions can be underreported or reported inconsistently. For example, a bicyclist that crashes without the involvement of a second party may not report that self-involved collision to the police, thereby under representing the actual number of bicycle injuries.

The source of all collision data presented in this chapter is from the Statewide Integrated Traffic Records Systems (SWITRS), which is maintained by the California Highway Patrol (CHP). California Vehicle Code (CVC) Section 20008 requires that local governments send their police collision reports to the State.[17]

[17] SWITRS data is typically not made available until a year after the end of a given calendar year.

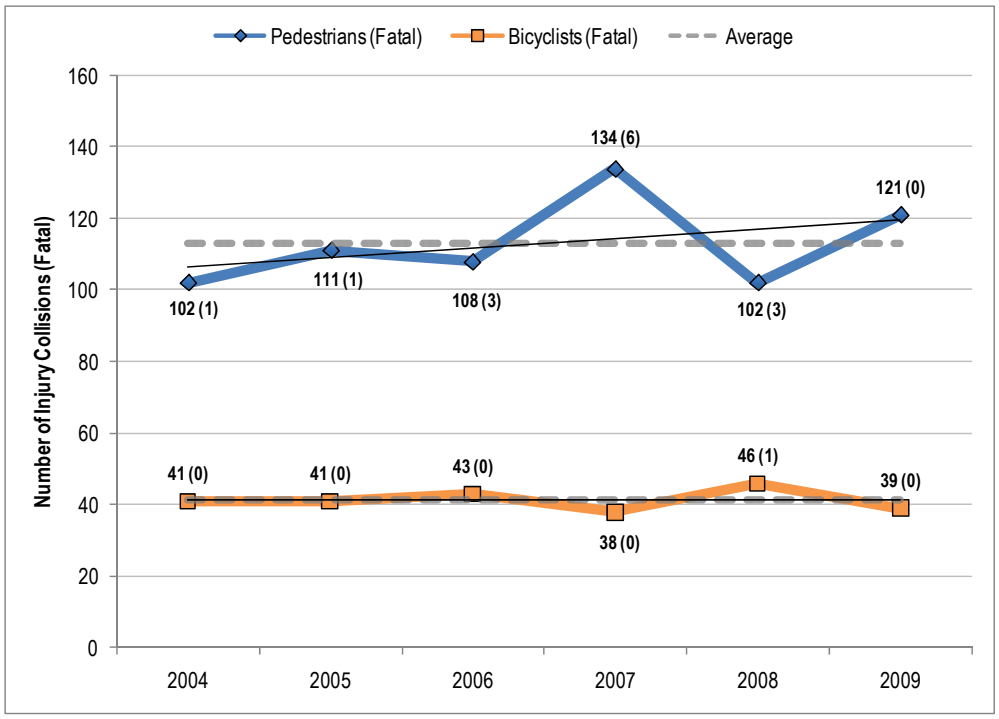
Number of Collisions

Figure 5-1 shows the number of bicycle and pedestrian injury collisions[18] in Glendale from 2004 to 2009. Over the past six years, Glendale has averaged 113 pedestrian injury collisions. From 2004 to 2009, pedestrian injury collisions increased by approximately 19% (102 to 121). Pedestrian injury collisions peaked in 2007 with 134 collisions, including six fatal collisions. In 2009, however, there were no fatal pedestrian collisions, the first year since 2004 without a pedestrian fatality.

Bicycle injury collisions have remained constant from 2004 to 2009, with an average of approximately 41 bicycle injury collisions per year. The peak number of bicycle injury collisions over the past six years was 46 in 2008. There has been one fatal bicycle injury collision in Glendale since 2004, which occurred in 2008.

It is important to note that SWITRS data is not always reliable or accurate in regards to fatal collisions. For example, the one bicycle fatality in Glendale since 2004 occurred in 2008, but the individual did not die until a year later. As a result, this fatality was not captured by SWITRS data. To ensure accuracy SWITRS data should ultimately be cross-referenced with hospital data.

Figure 5-1 Bicycle and Pedestrian Injury Collisions, 2004-09

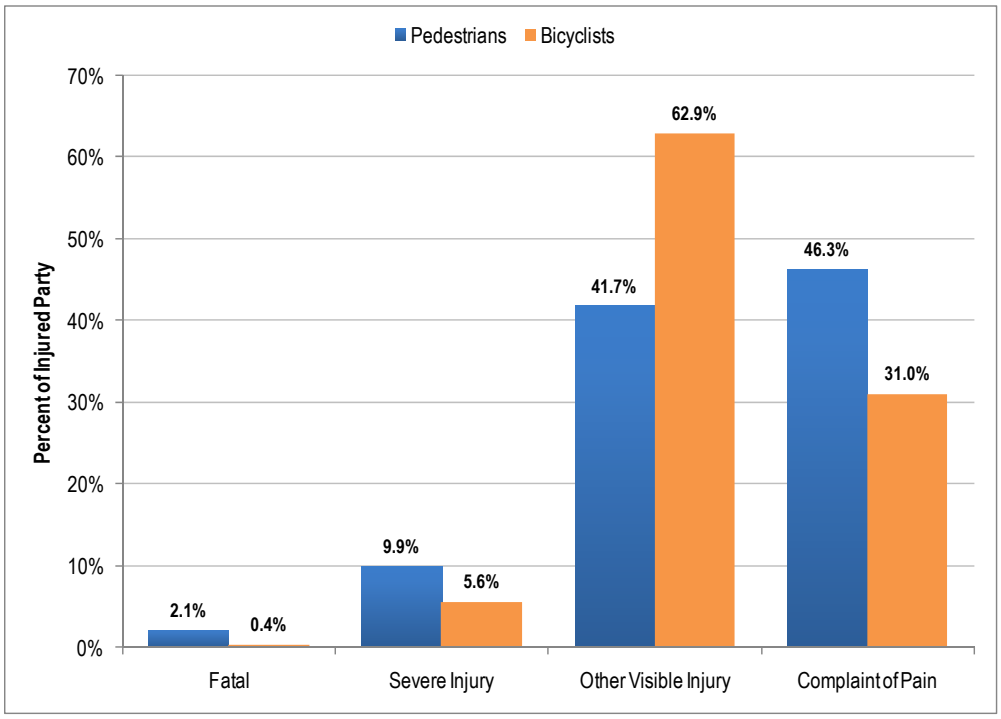


[18] Includes fatal collisions.

Severity of Collisions

Severity of collisions in SWITRS data is divided into a range of four categories, with "fatal" being the most severe and "complaint of pain" being the least severe. The severity of injury is an important characteristic of bicycle and pedestrian collisions, as bicyclists and pedestrians are the most vulnerable users of the street. Since 2004 there have been 14 fatal pedestrian collisions, or roughly 2% of all pedestrian injury collisions. There was one fatal bicycle collision in Glendale since 2004, or .4% of all bicycle collisions. The vast majority of injury collisions in Glendale are categorized as "Other Visible Injury" or "Complaint of Pain."

Figure 5-2 Severity of Bicycle and Pedestrian Collisions, 2004-09



Top Locations for Injury Collisions

This section describes both intersections and street segments with the highest number of pedestrian and bicycle collisions. It is important to note that the locations identified in this report should not necessarily be considered Glendale's "most dangerous" places for pedestrians or bicyclists. Overall traffic volumes including the number of bicycles and pedestrians at a given location all play a significant role in determining injury collision totals – the more people that use an intersection, the higher the likelihood of a collision occurring.

It is beyond the scope of this report to develop collision rates for any given intersection or evaluate specific geometries of any intersection to determine its safety from an engineering and design perspective. In short, the data in this section provides a reference point for future data analysis and can be used as one tool to identify potential intersections for safety improvements. Significant additional data collection and analysis must be performed before any definitive conclusions can be drawn about the relative safety or level of "danger" at any given intersection or street segment.

Figure 5-3 shows the top locations for pedestrian injury collisions in Glendale from 2004 to 2009. These include both intersections and street segments where a collision occurred. Over six years of data, however, no one intersection had a highly disproportionate number of pedestrian injury collisions. With five pedestrian injury collisions, Central Avenue, south of Stocker Street, was the top location for pedestrian injury collisions. Figure 5-4 shows the top locations for bicycle injury collisions from 2004 to 2009. Similarly, no one intersection distinguished itself in terms of bicycle injury collisions over the past six years.

It is important to continue to monitor the location of collisions because such an analysis can highlight any future collision "hot spots" as they emerge and ensure that the City can quickly address potential unsafe conditions. As discussed in the following section, motorist, pedestrian, and bicyclist behaviors can also supplement a locational analysis to provide a more complete picture of why collisions are occurring and how safety improvements can be made.

Figure 5-3 Locations with the Highest Number of Pedestrian Injury Collisions, 2004-09

Location	Collisions
On Central Ave. – S of Stocker St.	5
At Intersection: Chevy Chase Dr. & San Fernando Rd.	4
On Glendale Ave. – N of Cypress St.	4
On Brand Blvd. – S of Lexington Dr.	4
On Glenoaks Blvd. – E of Western Ave.	3
On Route 134 – E of Pacific Ave.	3
At Intersection: Glenoaks Blvd. and Western Ave.	3
On Colorado St. – E of Lincoln Ave.	3
At Intersection: Glendale Ave. and Maple St.	3

Figure 5-4 Locations with the Highest Number of Pedestrian Injury Collisions, 2004-09

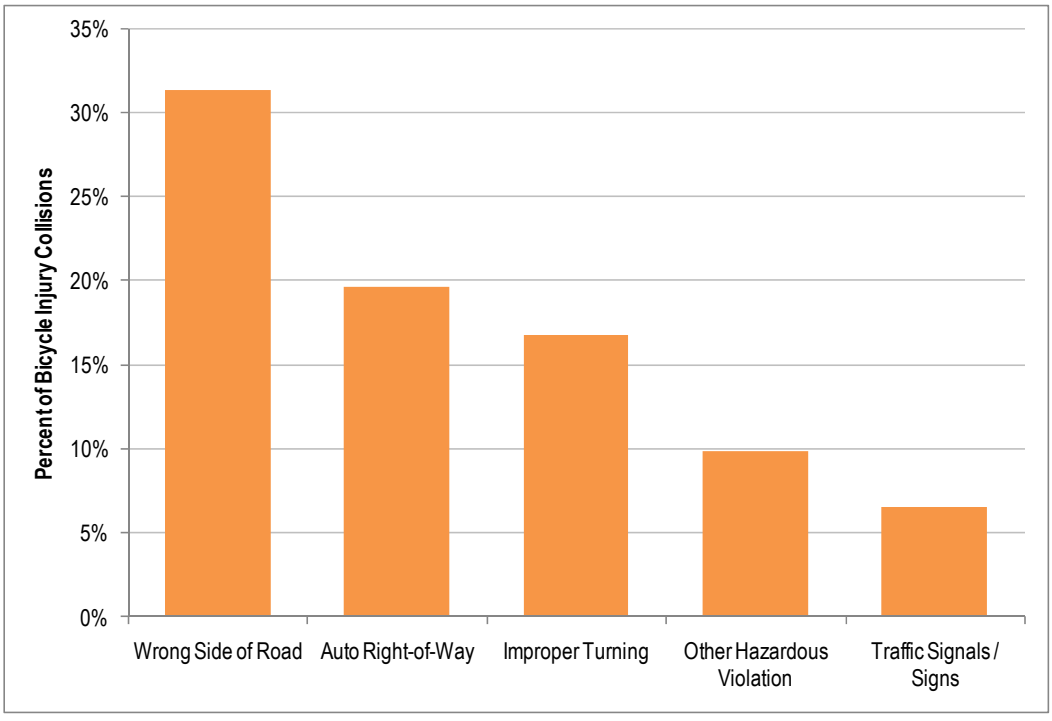
Location	Collisions
At Intersection: Acacia Ave. & Brand Blvd.	2
At Intersection: Central Ave. & Doran St.	2
At Intersection: Glendale Ave. & Palmer Ave.	2
At Intersection: Louise St. & Monterey Rd.	2
On Allen Ave. – N of San Fernando Rd.	2
On Colorado St. – E of Chevy Chase Dr.	2
On Glendale Ave. – N of Cypress St.	2
On Oceanview Blvd. – S of Honolulu Ave.	2
On Windsor Rd. – E of Verdugo Rd.	2
At Intersection: Verdugo Rd. & Windsor Rd.	2
On Brand Blvd. – S of Laurel St.	2

Primary Collision Factors

SWITRS data also list 20 different primary collisions factors (PCFs) in its database. PCFs are general categories and can be defined as "the one element or driving action which, in the officer's opinion, best describes the primary or main cause of the collision."[19] As discussed in the following section, California Vehicle Code (CVC) violations are also noted for each injury collision and can provide even more detailed information about the cause of a collision.[20] Figure 5-5 highlights the top five PCFs for bicycle injury collisions in Glendale from 2004 to 2009.

The number one PCF for bicycle injury collisions was "Wrong Side of Road" at more than 31%. "Wrong Side of Road" can generally be defined as driving or riding on the wrong side of the road. The majority of the bicycle injury collisions associated with this PCF was attributed to bicyclist violations (CVC 21202.a and 21650.1). The second highest PCF was "Auto Right-of-Way" at approximately 20%. "Auto Right-of-Way" can generally be defined as a violation of the right-of-way by a motorist. A complete breakdown of all PCFs is available in Appendix G.

Figure 5-5 Top 5 PCFs for Bicycle Injury Collisions, 2004-09

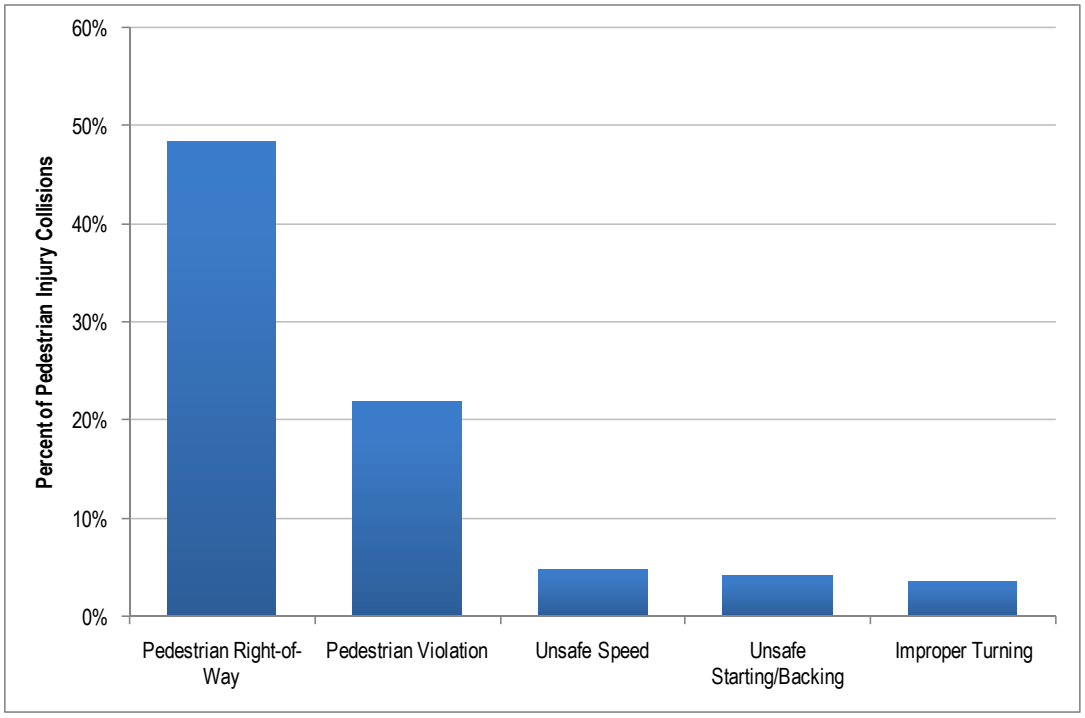


[19] http://www.chp.ca.gov/switrs/pdf/2007-glossary.pdf

[20] It is recommended that the actual police report be reviewed when evaluating any specific collision, as the complete report can provide additional information and useful context.

The number one PCF for pedestrian injury collisions was "Pedestrian Right-of-Way," at close to 50%. "Pedestrian Right-of-Way" can generally be defined as motorist's failure to yield to a pedestrian's right-of-way. The second highest PCF for pedestrian injury collisions was "Pedestrian Violation" at approximately 22%. "Pedestrian Violation" can generally be defined as a violation of the right-of-way by a pedestrian. A complete breakdown of all PCFs is available in Appendix G.

Figure 5-6 Top 5 PCFs for Pedestrian Injury Collisions, 2004-09



California Vehicle Code (CVC) Violations

SWITRS data also includes the CVC violation for each injury collision.[21] The noting of the specific CVC violations can be useful in determining the exact cause of a collision.[22] Figure 5-7 highlights the top five CVC violations for bicycle injury collisions in Glendale from 2004 to 2009. The top CVC violation was "21202.a" at slightly more than 20% of bicycle injury collisions. The descriptions for the top five CVC violations are listed below and a complete breakdown of bicycle injury collisions by CVC is available in Appendix G.

- 21202.a[23]: Bicyclists traveling at lower speeds than other traffic must ride as close to the right as practicable, except under certain situations.
- 22107: No driver shall turn or switch lanes until they can do so with reasonable safety, and only after giving the appropriate signal.
- 21804.a: The driver of any vehicle about to enter or cross a road from any public or private property shall yield to all traffic.
- 22350: No person shall drive a vehicle upon a road at a speed greater than is reasonable or prudent under given conditions.
- 21801.a: When turning left or attempting a U-turn, the driver shall yield to all vehicles approaching from the opposite direction.

[21] The *2011 California Vehicle Code* can be found at http://dmv.ca.gov/pubs/vctop/vc/vc.htm.

[22] It is recommended that the actual police report be reviewed when evaluating any specific collision, as the complete report can provide additional information and context.

[23] 21202. (a) Any person operating a bicycle upon a roadway at a speed less than the normal speed of traffic moving in the same direction at that time shall ride as close as practicable to the right-hand curb or edge of the roadway except under any of the following situations:

(1) When overtaking and passing another bicycle or vehicle proceeding in the same direction.

(2) When preparing for a left turn at an intersection or into a private road or driveway.

(3) When reasonably necessary to avoid conditions (including, but not limited to, fixed or moving objects, vehicles, bicycles, pedestrians, animals, surface hazards, or substandard width lanes) that make it unsafe to continue along the right-hand curb or edge, subject to the provisions of Section 21656. For purposes of this section, a "substandard width lane" is a lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the lane.

(4) When approaching a place where a right turn is authorized.

Figure 5-7 Top 5 CVC Violations for Bicycle Injury Collisions, 2004-09

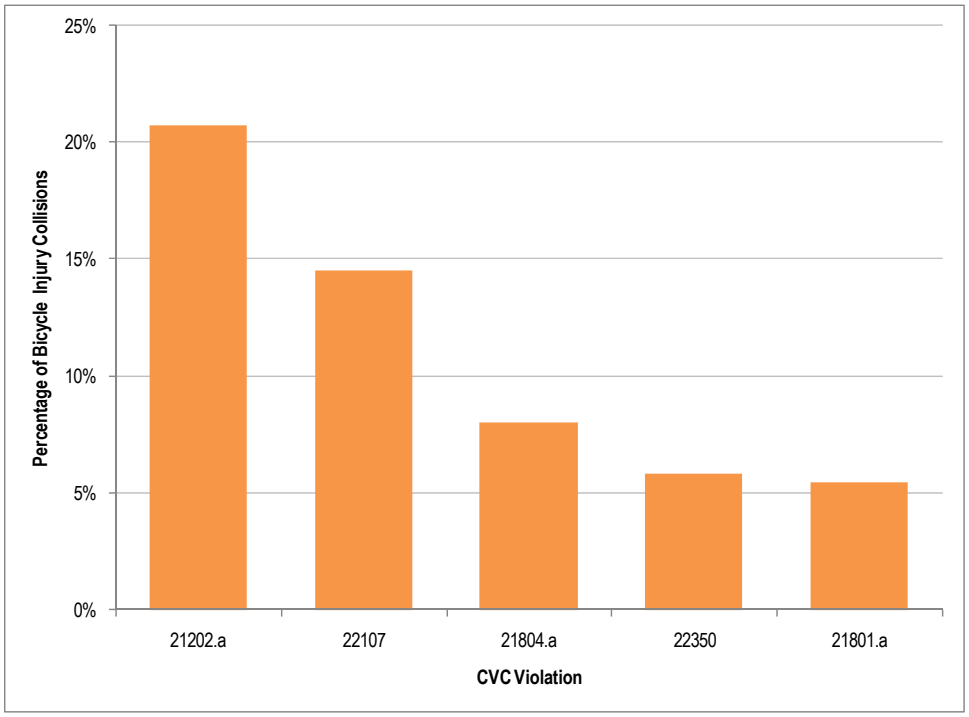
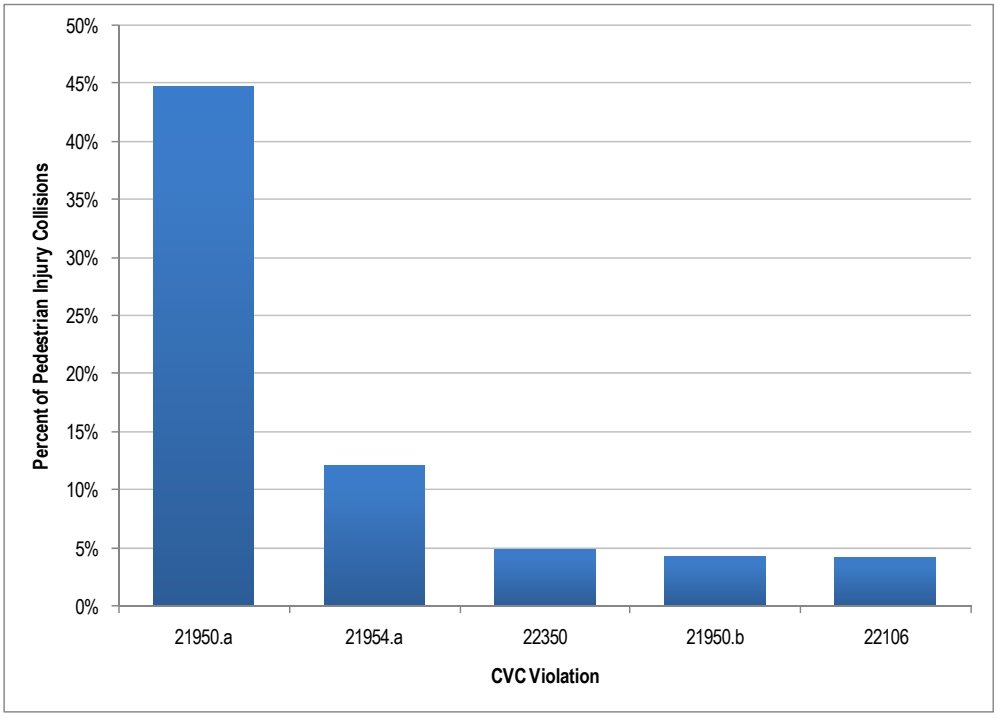


Figure 5-8 highlights the top five CVC violations for pedestrian injury collisions in Glendale from 2004 to 2009. The top CVC violation was "21950.a" at just less than 45% of pedestrian injury collisions. The descriptions for the top five CVC violations are listed below and a complete breakdown of pedestrian injury collisions by CVC is available in Appendix G.

- 21950.a: The driver shall yield to a pedestrian crossing the road within any marked crosswalk or unmarked crosswalk at an intersection.
- 21954.a: Every pedestrian upon a road except at a legal crosswalk at an intersection shall yield to vehicles to avoid creating a hazard.
- 22350: No person shall drive a vehicle upon a road at a speed greater than is reasonable or prudent under given conditions.
- 21950.b: Even with the right of way, pedestrians are to exercise caution when at crosswalks, and may not purposely delay traffic.
- 22106: Unless it can be done safely, no person shall start a vehicle stopped, standing, or parked on a road, nor back a vehicle on a road.

Figure 5-8 Top 5 CVC Violations for Pedestrian Injury Collisions, 2004-09

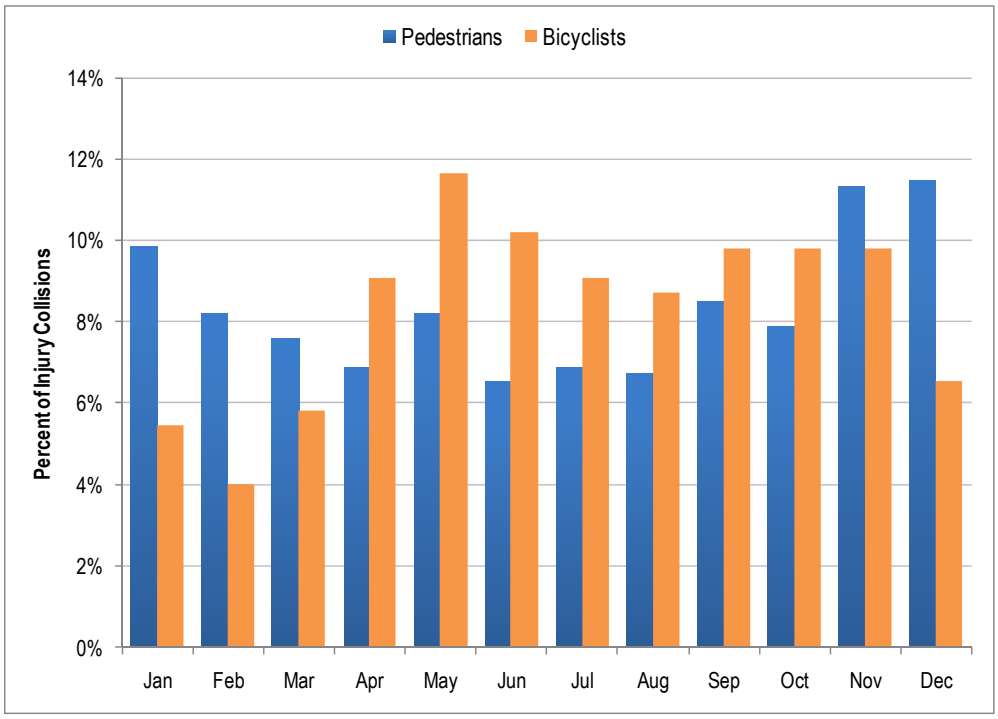


Analyzing PCFs and CVC violations is an useful tool when evaluating injury collisions as this data provides an initial snapshot of motorist, bicyclist, and pedestrian behaviors that are the typical cause for injury collisions. Identifying these behavioral trends is one of the first steps to improving safety for all modes. Furthermore, such data can provide the foundation for public outreach and educational campaigns aimed at addressing common safety violations, as discussed in greater detail in Chapter 7.

Month of the Year

Figure 5-9 shows a breakdown of bicycle and pedestrian collisions by the month of the year. Most bicycle injury collisions occur during May and June, with September, October, and November also having a higher share of bicycle collisions. These trends are likely reflective of the fact that more bicyclists are on the road during warm weather (which can certainly extend into the fall in Southern California). Most pedestrian injury collisions occur from November to January. This trend can likely be partially attributed to the short daylight hours and limited visibility in those months.

Figure 5-9 Bicycle and Pedestrian Injury Collisions by Month, 2004-09

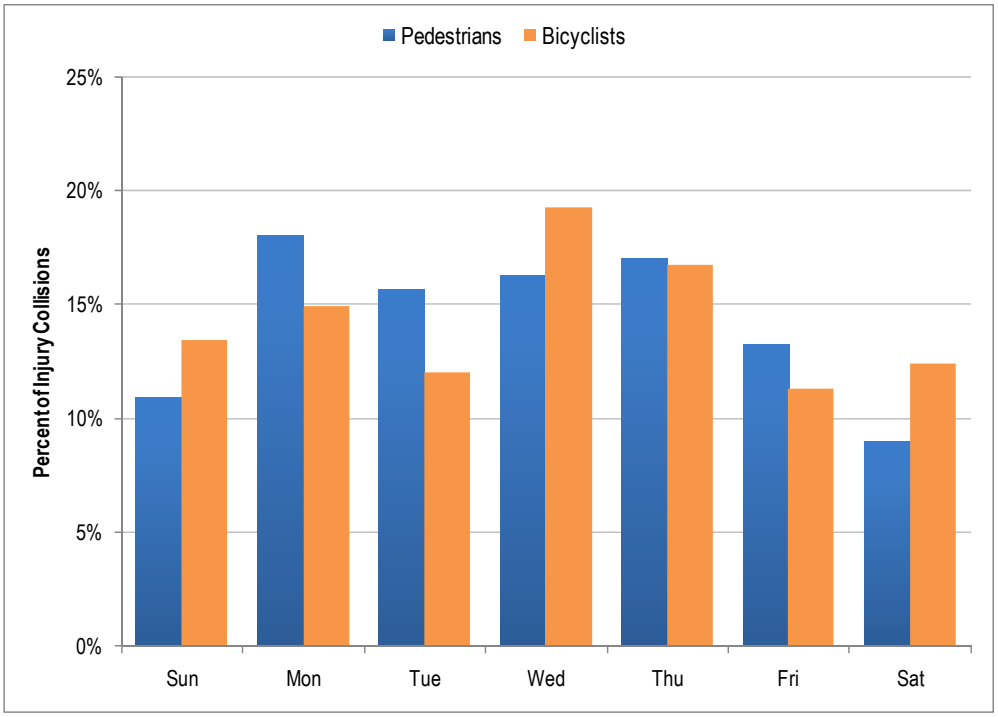


Day of the Week

Figure 5-10 provides a breakdown of bicycle and pedestrian injury collisions by day of the week. Most pedestrian and bicycle injury collisions occur during the week when activity is higher. For pedestrians, Monday had the highest share of injury collisions at 18%. For bicyclists, the highest share of injury collisions occurred on Wednesday at 19.3%.

Also of note is that while most bicycle injury collisions occur during the week, more than 25% do still occur on the weekend. In fact, more bicycle collisions occur on Saturday and Sunday than either Tuesday or Friday. This trend likely reinforces the fact that many bicyclists in Glendale are recreational riders on the weekends, as was indicated by the count data.

Figure 5-10 Bicycle and Pedestrian Injury Collisions by Day, 2004-09

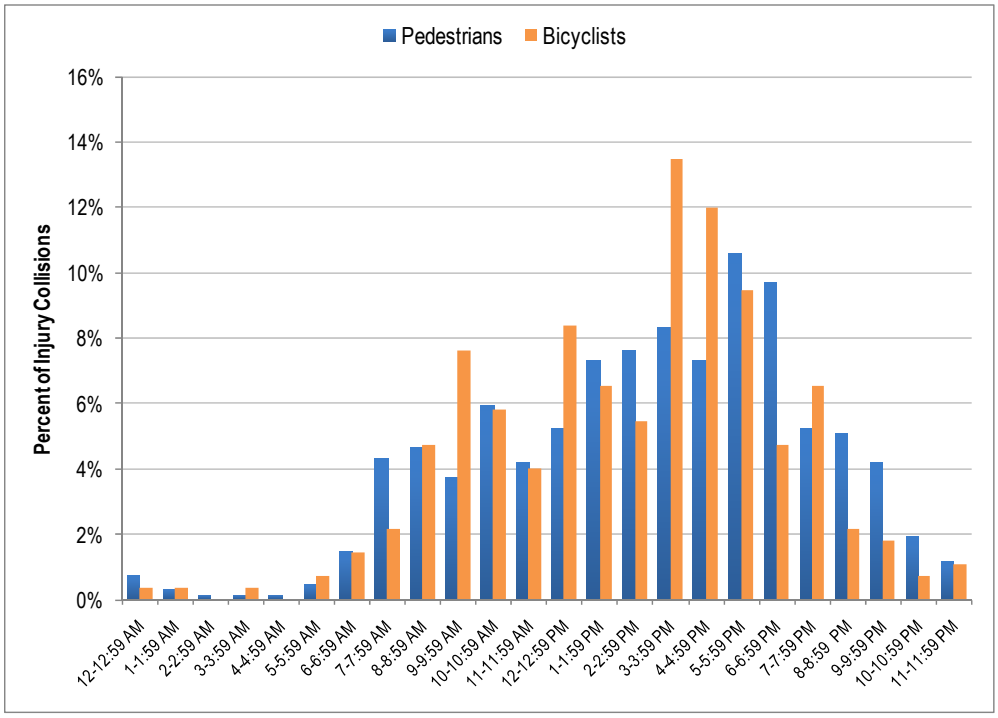


Time of Day

Figure 5-11 provides a breakdown of bicycle and pedestrian injury collisions by time of day. The highest number of bicycle collisions occurs during the afternoon and evening. Almost 35% of bicycle collisions occur from 3-6 PM. Bicycle collisions are also more common in the morning (9-10 AM) and during the midday (12-1 PM).

Pedestrian injury collisions are more evenly dispersed, yet the evening hours (5-7 PM) have the highest share of pedestrian injury collisions. These trends are consistent with activity levels for these modes throughout the day.

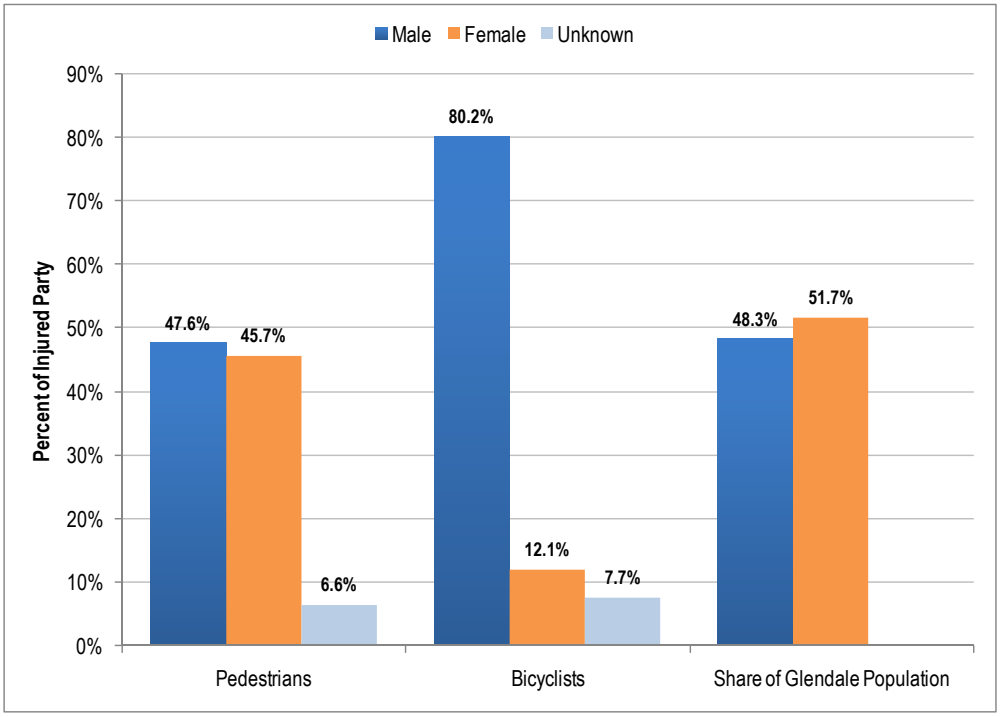
Figure 5-11 Bicycle and Pedestrian Injury Collisions by Time of Day, 2004-09



Gender of Injured Bicyclists and Pedestrians

Figure 5-12 shows the gender split for injured bicyclists and pedestrians from 2004 to 2009. For injured pedestrians, there is a roughly even split between males and females, with males involved in slightly more pedestrian collisions, a slight contrast to the overall gender split in Glendale. By contrast, the vast majority of the injured bicyclists were male, consistent with the count data showing that more than 90% of the observed bicyclists on the survey days were male.

Figure 5-12 Gender of Injured Bicyclists and Pedestrians, 2004-09

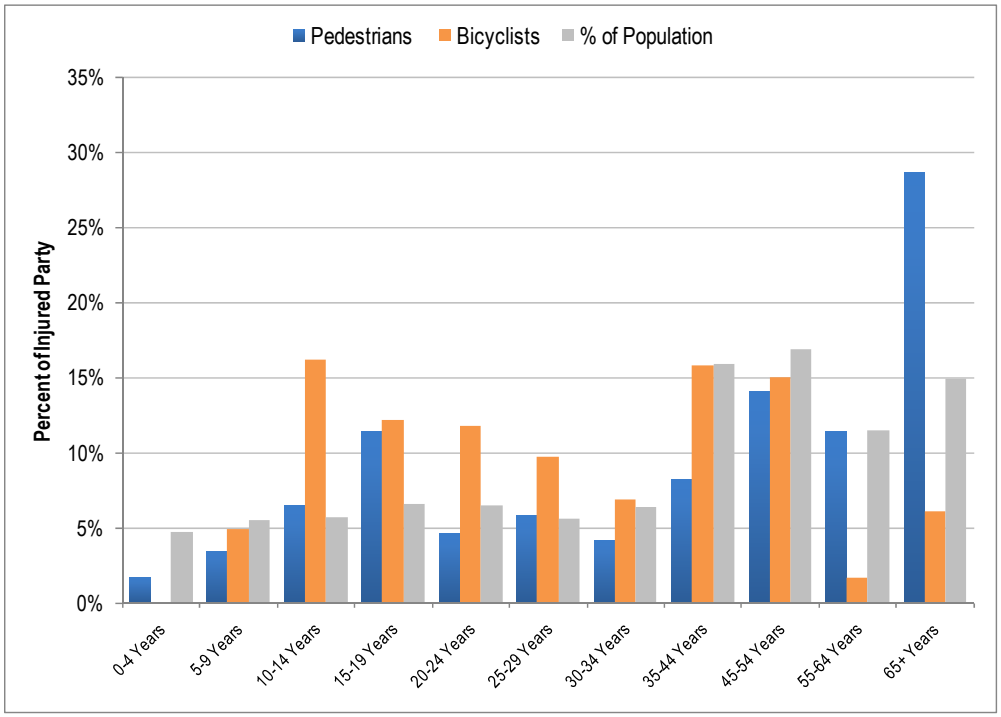


Age of Injured Bicyclists and Pedestrians

Figure 5-13 provides a breakdown of injured bicyclists and pedestrian according to age group. For bicyclists, injury collisions were evenly dispersed, with the 10-14 age group comprising the largest share of bicycle injury collisions, and well above that age group's share of the total population in Glendale.[24] Similarly, age groups 15-19, 20-24, and 25-29 all have a disproportionate share of bicycle injury collisions when compared to their share of the overall population. The finding is especially relevant given that the count data shows that very few of the counted bicyclists were children (approximately 5%). Clearly, while youth (less than 14 years of age) comprise only 15.9% of the population and they do not ride bicycles in great numbers in Glendale, bicyclist safety for youth should be of concern as more than 20% of bicycle injury collisions in Glendale involved someone less than 14 years of age.

For pedestrians, the data clearly shows that pedestrians over 65 years of age are involved in injury collisions at a much higher rate than all other age groups, and well above their share of the total population. This may be due to slower walking speeds and lack of safe refuges in the middle of streets for older pedestrians who cannot cross the street in a single light cycle.

Figure 5-13 Age of Injured Bicyclists and Pedestrians, 2004-09



[24] American Community Survey, 2006-08

Chapter 6. Glendale and Its Peers

When analyzing bicycle and pedestrian data it is useful to look at the experience of Glendale in context with its neighbors. Such an analysis can provide useful insights into the travel behaviors of different municipalities, while serving as a metric for an ongoing evaluation of efforts to make bicycling and walking more desirable modes of travel. In addition, peer comparisons can also serve as useful metric to evaluate the number of injury collisions in relation to a city's overall population and mode shares.

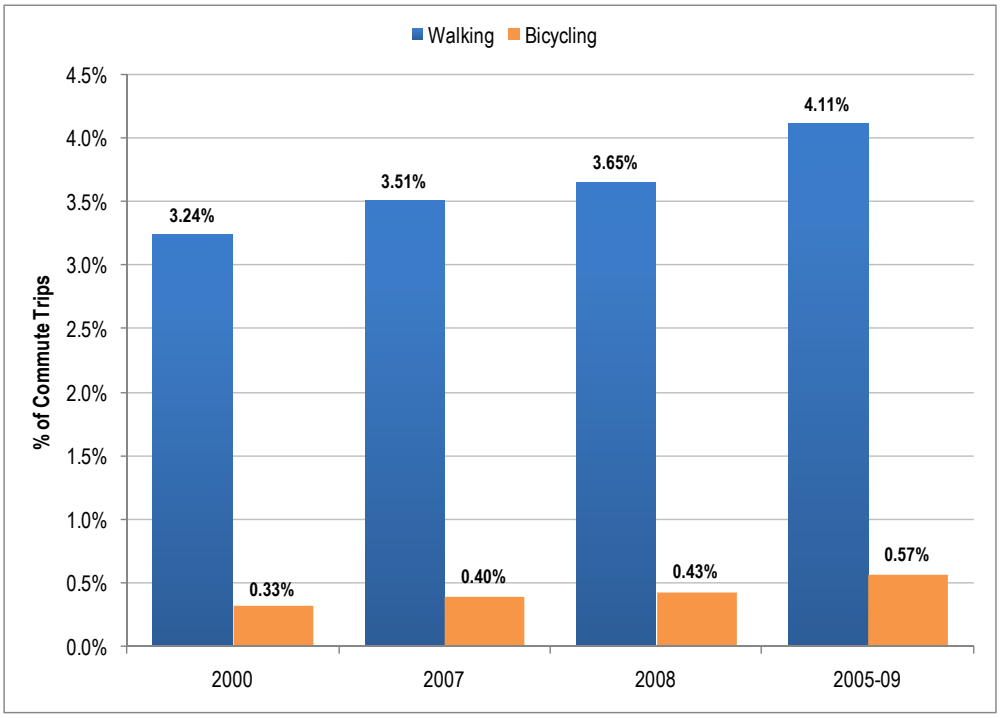
The most useful data set for such comparisons is the U.S. Census and American Community Survey (ACS),[25] which provides "journey to work" data. Journey to work data, while not truly representative of how many people are walking or bicycling in a given city because it does not take into account youth or non-commuting travelers, offers the most consistent and universal information. In addition, collision data from both SWITRS and the California Office of Traffic and Safety (OTS) was utilized to generate comparisons between peer cities.

[25] All Journey to Work data for this section was compiled from the U.S. Census at www.census.gov. Specific data sources include: U.S. Census, SF3, Table P30; ACS Table B0831.

Journey to Work

Figure 6-1 shows Glendale's bicycling and walking commute mode share in 2000, 2007, and 2008, and for 2005-09.[26] While bicycling and walking still comprise a very small percentage of commuting in Glendale, both modes have increased from 2000 to 2009. More specifically, walking as a commute mode increased from 3.24% in 2000 to 4.11% in 2005-09, an increase of 27%. Bicycling as a commute mode increased from .33% in 2000 to .57% in 2005-09, an increase of 75%.

Figure 6-1 Percent of Glendale Commute Trips by Bicycling and Walking



The local trends in Glendale reflect increases in bicycling and walking across the country. Over the last decade, for example, bicycling commute mode share in the United States has increased from .38% in 2000 to .55% in 2009, an increase of 45%. Furthermore, the National Household Travel Survey (NHTS) shows that bicycling and walking comprise 11.9% of *all* trips made in the country in 2009, an increase of 25% from 2001.[27] This includes a 25% increase in walking for *all* trips from 8.7% in 2001 to 10.9% in 2009.

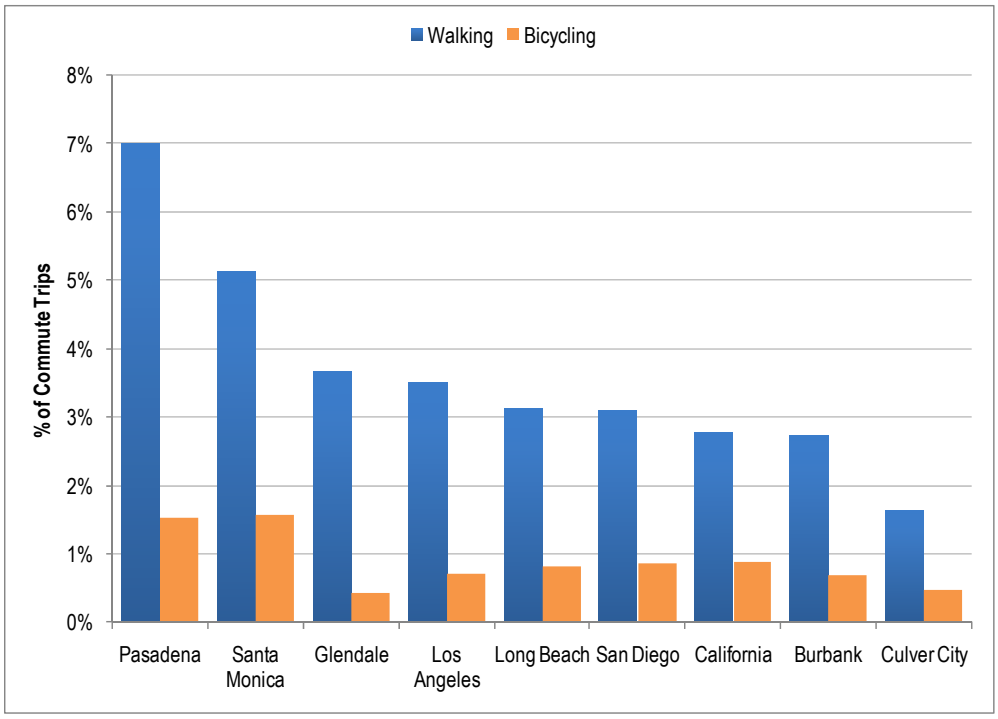
Figure 6-2 shows Glendale's 2008 bicycling and walking commute mode splits in relation to its peer cities. Glendale's 3.7% walking mode share was third highest among selected cities (and in California) in 2008,[28] yet its bicycle mode share of .43% was the lowest among selected peers.

[26] Based on the sampling methodology employed by the ACS in its surveys, these are the years in which enough journey to work data was available for cities of Glendale's population size.

[27] http://www.bikeleague.org/resources/reports/pdfs/nhts09.pdf

[28] Data from 2008 was utilized for comparison purposes between cities. At the time of this report's writing, 2008 was the latest year for which data was available for all of the peer cities.

Figure 6-2 Bicycling and Walking Commute Mode Share for Selected Cities, 2008



Collisions per Capita and Trips to Work

One of the primary challenges when analyzing collision data is developing an accurate and definitive *collision rate*, as raw data can be misleading. For example, while pedestrian injury collisions in Glendale have increased since 2004, there has also been an increase in the number of people walking to work in recent years. What might appear as a dramatic increase in pedestrian collisions, therefore, might not be an actual increase in the overall *rate* of pedestrian collisions. Bicycle or pedestrian count data has only been recently gathered at specific intersections in Glendale, and, therefore, cannot yet be linked or compared to injury collision trends in a statistical manner. Additional collision data in future years would facilitate such an analysis.

However, two admittedly imperfect ways of trying to establish a "collision rate" for bicycles and pedestrians are based on the size of the population, as well as the number of people bicycling or walking to work. This simplified measurement omits the vast numbers and varieties of non-commuting bicyclists or pedestrians, as well as the important differences between street geometries and travel characteristics at specific intersections and road segments. Nevertheless, the number of injury collisions per resident and work trip can serve as an approximate substitute.

Collisions per Capita

Figures 6-3 and 6-4 highlight Glendale's 2008 per capita bicycle and pedestrian collision rates in relation to its peer cities (and California).[29] Glendale has the lowest bicycle collisions per capita of any of the selected peer cities (and in California), at 23 per 100,000 residents. Glendale also had approximately 52 pedestrian collisions per 100,000 residents in 2008, which put it near the middle of selected cities (and California).[30]

[29] Data from 2008 was utilized for comparison purposes between cities. At the time of this report's writing, 2008 was the latest year for which data was available for all of the peer cities.

[30] Complete data for per capita collision comparisons are available in Appendix B.

Figure 6-3 Bicycling Injury Collisions per Capita for Selected Cities, 2008

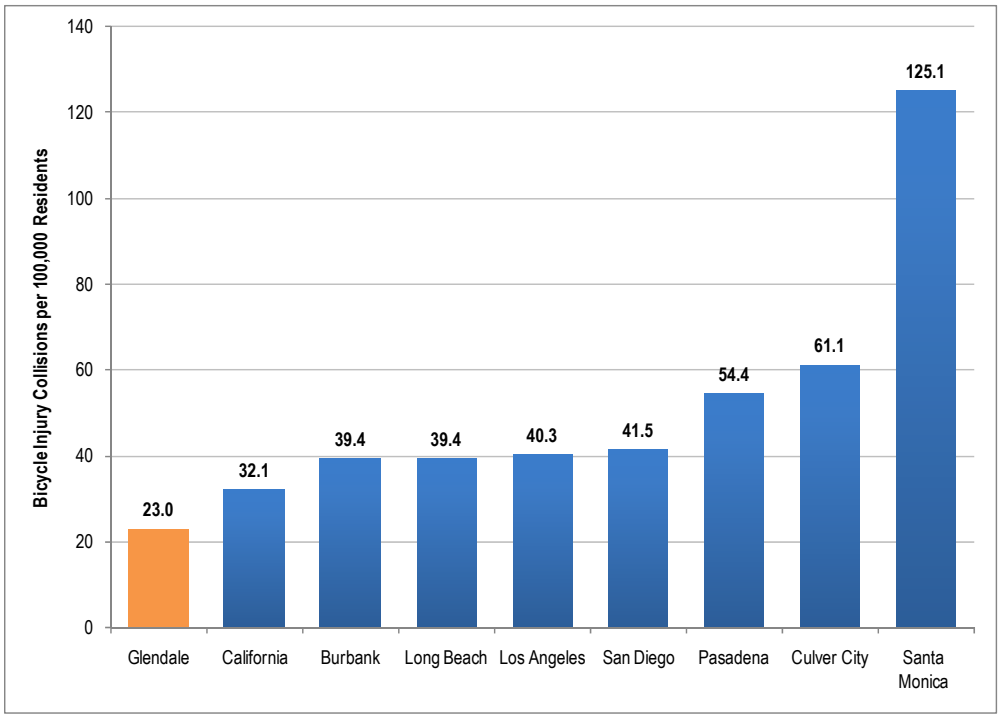
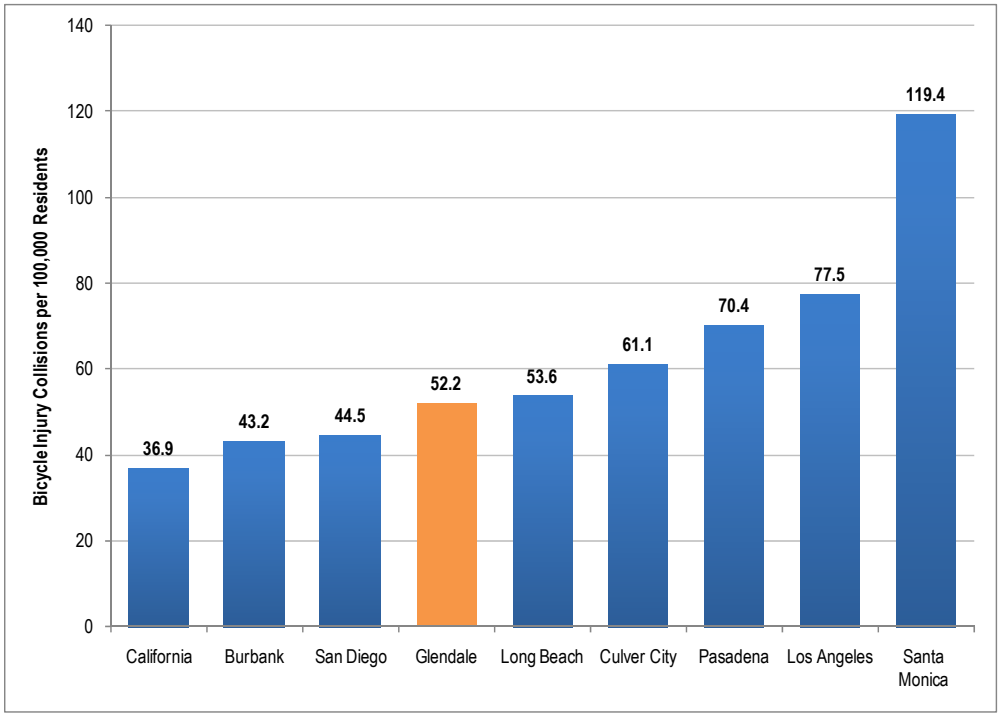


Figure 6-4 Pedestrian Injury Collisions per Capita for Selected Cities, 2008

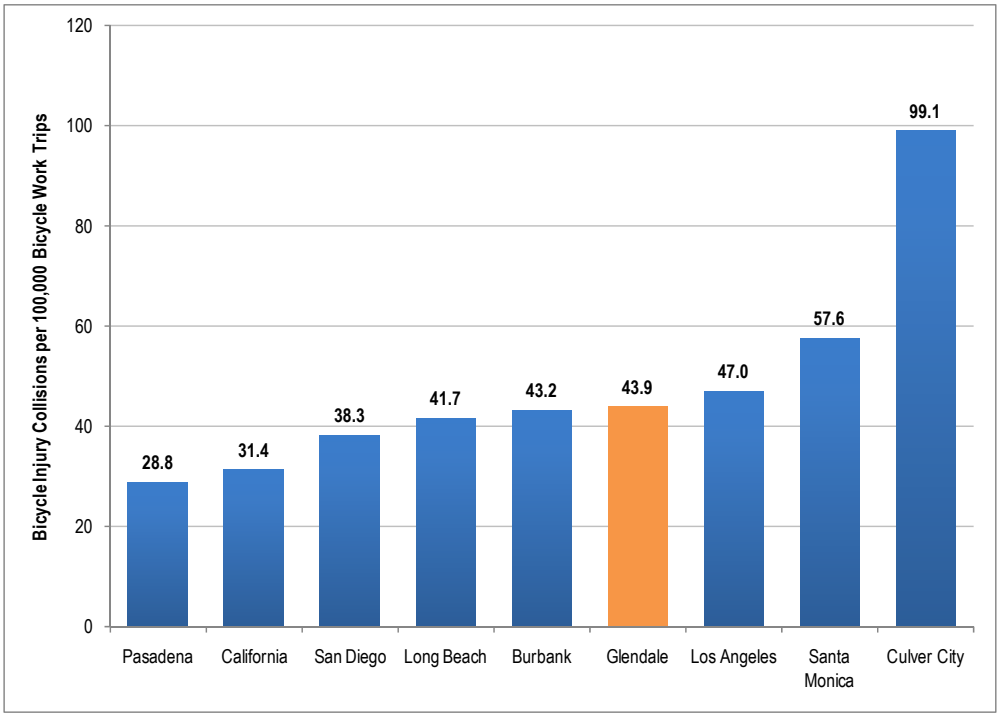


Collisions per Trips to Work

Figures 6-5 and 6-6 provide a summary of Glendale's estimated bicycle and pedestrian collisions per 100,000 annual trips to work.[31,32] This metric seeks to link injury collisions to actual bicyclist and pedestrian volumes in a given city. Once again, journey to work data, although it underestimates actual bicycling and walking volumes, is the best available data to utilize, especially when seeking to compare data across multiple cities. If the City of Glendale continues with its annual bicycle and pedestrian counts it would be able to supplement ACS data and develop a more accurate collision rate.

In 2008, Glendale had almost 44 bicycle injury collisions and 12 pedestrian injury collisions per 100,000 annual work trips. Among eight peer cities (and California), Glendale would be ranked fourth for bicycle collisions per 100,000 annual bicycle trips to work and sixth for pedestrian collisions per 100,000 annual walking trips to work.

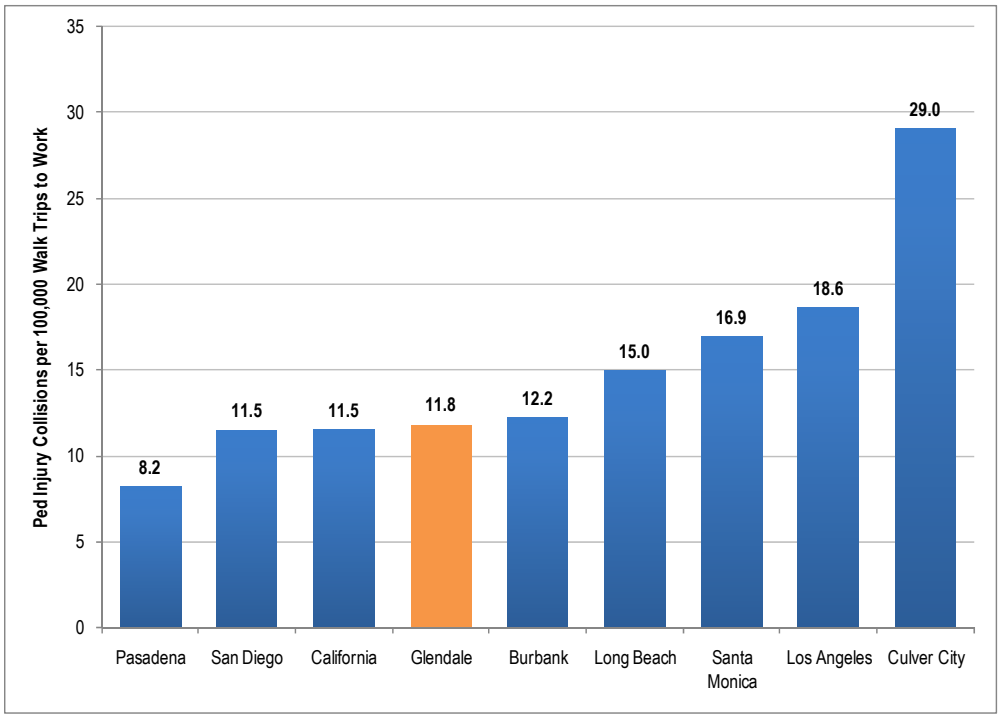
Figure 6-5 Bicycle Injury Collisions per Annual Trips to Work, 2008



[31] "Annual Trips to Work" is an estimation of the number of bicycling or walking trips made annually in Glendale. This figure is extrapolated (based on 255 working days in 2008) from daily bicycling and walking trips to work provided in the ACS.

[32] Complete data for collisions per annual commute trips are available in Appendix C.

Figure 6-6 Pedestrian Injury Collisions per Annual Trips to Work, 2008



Chapter 7. Recommendations

Outlined below are recommendations for the L.A. County Bicycle Coalition and the City of Glendale to consider in regards to how they might utilize the data presented in this report to inform future planning efforts, as well as about how the Bicycle Coalition can ensure that future bicycle and pedestrian count efforts are as efficient and productive as possible. While the L.A. County Bicycle Coalition and the City of Glendale have made tremendous efforts to improve available bicycle and pedestrian data, there are areas in which potential improvements can be made. Of course, all of these recommendations must be evaluated and prioritized in the context of limited resources. Nevertheless, this section is intended to give City and Coalition staff additional ideas about ways in which they can continue to plan for additional bicyclists and pedestrians on city streets and ensure safety for these modes.

1. **Utilize count and collision data to begin to prioritize and develop planning efforts, policies, and programs related to bicycle and pedestrian travel.** This report provides a wealth of information in regards to bicycle and pedestrian activity, behavior, and safety in Glendale. While additional data collection is recommended to confirm and refine these findings, some initial conclusions can be drawn and prioritized for future planning. These are briefly outlined below:

   - *Identify and monitor high volume count locations, and begin to investigate potential design or engineering changes at these locations to better accommodate bicyclists and pedestrians, as well as ensure their safety.* The data shows that there are a number of count locations which consistently have high volumes of pedestrians, bicyclists, or both (see Figures 4-1 and 4-2, as well as Appendix B). The intersection of Flower and Sonora, for example, was the highest volume intersection for bicyclists in both 2009 and 2010, as this is the primary route to the popular Griffith Park. Glenoaks and Grandview was also in the top three intersections for bicyclist volumes in both years. Similarly, the top five intersections for pedestrian volumes were very consistent in both years, including: Brand and Broadway, Glendale and Wilson, San Fernando and Los Feliz, and Honolulu and Oceanview. Central and Americana, a new count location in 2010 in Glendale's downtown core, had the highest pedestrian volumes for any location.

     The City can use volume data from the count efforts as an initial "filter" to identify and prioritize which intersections and streets should be the focus for future bicycle and pedestrian infrastructure improvements. However, volume data should not be the only metric by which infrastructure improvements are prioritized. A thorough review of existing facilities from a design, engineering, safety, and functional perspective should also be conducted before any improvements are made. For example, some high volume locations may already have robust and safe bicycle and pedestrian facilities, and little additional accommodation is required. Nevertheless, volume data, as well as direction of travel data gathered during the counts, can be used to direct City resources to locations where infrastructure improvements will have the greatest impact.

   - *Develop engineering solutions, safety programs, or education campaigns based on key trends.* Both the count data and collision information highlight some areas where

various initiatives can be developed to further improve bicycle and pedestrian safety. These include:

- Address common motorist, bicyclist, and pedestrian behaviors. SWITRS collision data reveals that there are a select few Primary Collision Factors (PCFs) and California Vehicle Code (CVC) violations that are consistently a factor in bicycle and pedestrian injury collisions (See Chapter 5). For bicyclists, riding on the wrong side of the road was the number one PCF and CVC violation.[33] Furthermore, drivers violating the right-of-way and improper lane changes by drivers were also consistent factors in bicycle collisions. For pedestrians, violation of the pedestrian right-of-way by vehicles was the number one PCF by a large margin, with pedestrians violating the right-of-way second. Similarly, failure to yield to pedestrians by drivers was by far the most common CVC violation for pedestrian collisions.

  Clearly, there are consistent behaviors by motorists, pedestrians, and bicyclists which are a primary cause of injury collisions. Identifying and monitoring these trends is a key first step to improving safety for all users. Moving forward, the City should begin to develop targeted safety programs and education campaigns that specifically address and prevent these behaviors. Potential efforts include public awareness campaigns aimed at reminding all users about their respective responsibility to yield, or a campaign aimed at bicyclists reinforcing their rights and responsibilities, such as riding on the right side of the road.

  Another potential education campaign could simply reinforce to drivers, pedestrians, and bicyclists that streets are "shared" spaces and mutual awareness of each user is crucial to safety. The City of San Francisco, in partnership with the San Francisco Bicycle Coalition, implemented a similar program in San Francisco in recent years. The "CoExist" campaign is a "citywide effort to encourage greater respect between bicyclists and motorists, hopefully resulting in safer roads for all users."[34]

- Work with the Glendale Police Department to improve enforcement for all users. Enforcement of laws and regulations is a key component to ensuring safety for all users of the roadway. Additional collaboration with police is needed, and enforcement efforts should be targeted at consistent behaviors by motorists, bicyclists, and pedestrians that jeopardize safety.

- Encourage helmet use. The count data demonstrates that a high volume of bicyclists are riding without helmets, especially at school locations. The City should consider campaigns to encourage helmet use, as well as a potential helmet distribution program, especially for youth.

- Address safety needs for vulnerable populations. The collision data shows that seniors and youth are involved in a disproportionate share of injury collisions

[33] However, the count data shows a low percentage of wrong-way riding among bicyclists. In order to clarify this discrepancy, a more detailed review of collision reports involving bicyclists riding the wrong direction is recommended along with appropriate adjustments to education and safety campaigns as well as enforcement efforts.

[34] http://www.sfmta.com/cms/bsafe/3828.html

relative to population share (see Figure 5-13). As a result, special pedestrian and bicycle education efforts should be aimed at elderly and youth populations, such as bicycle safety courses. In addition, motorist education efforts should be focused on special considerations for elderly and youth pedestrians and bicyclists. Additional efforts should also be made by the City to enhance and expand its Safe Routes to School program to target schools with critical safety and infrastructure needs.

- Increase education efforts at certain times of the year and at key periods of the day. Collision data shows that more pedestrians are injured during the winter months, while more bicyclists are injured in the summer and fall months. The City should consider additional education campaigns at those times, reminding motorists to pay special attention and encouraging bicyclists and pedestrian to wear appropriate safety equipment. A promotional "giveway" of bicycle lights or reflective vests during the winter months could be one element of such a campaign.

  During the morning and evening peak commute periods, there is additional activity on City streets. Collisions involving both pedestrians and bicyclists are more common during those commute times. Education and safety campaigns, as well as enforcement, should be targeted to help mitigate collisions during these hours.

- *Continue to monitor location of collisions to identify future "hot spots."* Since 2004 no one location in Glendale distinguished itself in terms of bicycle or pedestrian collisions. Nevertheless, this data is important to monitor. While a number of factors contribute to each collision, a spike in collisions at one intersection may be indicative of potential safety concerns and would likely merit additional investigation, and, potentially, safety improvements.

2. **Continue with bicycle and pedestrian counts not only in 2011, but also in future years.** While the 2009 and 2010 counts have enabled the City to get a better understanding of bicycle and pedestrian activity on Glendale streets, definitive trends in volumes and behavior are difficult to establish with limited data. As discussed in Chapter 4, bicycle and pedestrian activity varies from day to day and from year to year. Given the nature of Glendale's counts (one day, once a year) it is difficult to account for this natural variation with just two years of data. Therefore, additional counts in subsequent years are highly recommended. By continuing to build a database of bicycle and pedestrian activity at key locations, the City will be able to account for variation and conclusively identify trends. This recommendation also applies to the screenline counts that were conducted at six locations in 2009 and 2010. Outlined below are some specific recommendations that can improve the efficacy of the City's data collection efforts.

   - *Above all else, maintain consistency with the counts and its methodology***.** As with any data collection effort, comparisons between data sets are only valuable if the information gathered is done so in a consistent manner. For example, in future count efforts the City should make every effort to keep the same number of count locations. Adding or eliminating the number of count locations (currently 24 primary counts and two school counts) will impact raw volumes and make it difficult draw longitudinal comparisons. More importantly, however, the City should not change the location of any of the counts in the future. One of the challenges of analyzing the 2009 and 2010

was the change in count location from Broadview and Oceanview to Central and Americana Way. As discussed in Chapter4, data from these two count locations had to be omitted for comparison purposes.

In addition, in future counts every effort should also be made to survey during the same time periods, during the same week(s) of the year, and, if possible, utilize the same volunteers to conduct the counts.

- *Ensure that all surveyors participate in a minimum level of training.* Accuracy of the data is crucial to ensuring that the bicycle and pedestrian counts continue to provide the City with information that can be used to identify trends in volume at intersections, bicyclist behaviors, the characteristics of those counted, as well as utilize this information in future planning efforts. In 2009, in-person training was provided for volunteers, but many of the volunteers were unable to attend. In 2010, in-person training was not provided. Instead, volunteers were provided with a detailed instruction sheet. It is understandably difficult to ensure volunteer attendance, yet some form of training should be required for all volunteers. Simple written instructions can be confusing, especially for those individuals who have never done a bicycle or pedestrian count, and can result in inaccurate data collection.

  One potential solution for future count efforts would be to create a short instructional video that can be posted on a City website for volunteers to watch at their own convenience. An instructional video would likely strike the ideal balance between the need for training and the feasibility of volunteer participation.

- *At high volume locations, ensure enough surveyors are present and have appropriate counting materials.* In both 2009 and 2010, several count locations experienced very high combined bicycle and pedestrian volumes. The high volumes at these locations make it necessary to have several counters during each count period, especially when bicyclist behavior and other data (gender, children, wheerchairs) is also being gathered. Thus far, Glendale has done a good job of ensuring enough surveyors at appropriate locations, and should continue to maintain these staffing levels in the future. “Click-counters” are also a useful tool that can facilitate data collection and potentially reduce the number of surveyors required.

3. **Utilize count and collision data as a tool in pursuing additional funding opportunities.** The data gathered in 2009 and 2010, and presented in this report, offers the City a wealth of new information regarding bicycle and pedestrian behavior in the Glendale. As the City pursues additional grants or sources to fund new infrastructure and safety and educational campaigns, this data should be used to target priority funding needs and enhance applications.

4. **Continue to utilize additional data sources to supplement the bicycle and pedestrian counts.** While the bicycle and pedestrian count data is the primary focus of this study, additional data should continue to be analyzed and integrated. ACS data provides a statistically representative overview of bicycle and walking as commute modes. SWITRS data provides a comprehensive look at bicycle and pedestrian collision data. Other potential data sources include: National Household Travel Survey (NHTS), Bike to Work surveys, surveys of bicyclists and pedestrians, and Air Quality Management District (AQMD) employer commute data.

APPENDIX A

COMBINED BICYCLE AND PEDESTRIANS VOLUMES, BY COUNT PERIOD

Combined Bicycle and Pedestrians Volumes, by Count Period

	Location	Weekday 7-9 AM									Weekday 5-7 PM									Weekend 10 AM - 12 PM									Weekend 8 AM - 10 AM									Weekday 3-5 PM								
		Bike			Ped			Overall			Bike			Ped			Overall			Bike			Ped			Overall			Bike			Ped			Overall			Bike			Ped			Overall		
		2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change	2009	2010	% change
1	Brand & Broadway	20	20	0%	582	513	-12%	602	533	-11%	37	48	30%	1155	930	-19%	1192	978	-18%	35	44	26%	783	796	2%	818	840	3%																	
2	Brand & Chevy Chase	30	29	-3%	279	230	-18%	309	259	-16%	31	33	6%	266	196	-26%	297	229	-23%	59	30	-49%	234	150	-36%	293	180	-39%																	
3	Broadview & Oceanview	2	n/a	n/a	66	n/a	n/a	68	n/a	n/a	3	n/a	n/a	76	n/a	n/a	79	n/a	n/a	4	n/a	n/a	69	n/a	n/a	73	n/a	n/a																	
4	Canada & Verdugo & Menlo	7	9	29%	14	50	257%	21	59	181%	10	11	10%	18	27	50%	28	38	36%	39	63	62%	12	34	183%	51	97	90%	45	39	-13%	28	5	-82%	73	44	-40%									
5	Central & Americana Way	n/a	4	n/a	n/a	183	n/a	n/a	187	n/a	n/a	30	n/a	n/a	1551	n/a	n/a	1581	n/a	n/a	12	n/a	n/a	1576	n/a	n/a	1588	n/a																	
6	Central & Stocker	5	5	0%	212	173	-18%	217	178	-18%	2	4	100%	361	376	4%	363	380	5%	14	5	-64%	306	277	-9%	320	282	-12%																	
7	Colorado & Lincoln	8	6	-25%	87	145	67%	95	151	59%	34	23	-32%	197	182	-8%	231	205	-11%	26	31	19%	150	153	2%	176	184	5%																	
8	Columbus & Riverdale	8	12	50%	312	228	-27%	320	240	-25%	18	15	-17%	257	218	-15%	275	233	-15%	7	10	43%	134	70	-48%	141	80	-43%																	
9	Concord & Doran*	8	6	-25%	81	78	-4%	89	84	-6%	8	20	150%	61	59	-3%	69	79	14%	9	n/a	n/a	25	n/a	n/a	34	n/a	n/a																	
10	Concord & Glenwood																																					7	18	157%	1055	966	-8%	1062	984	-7%
11	Flower & Sonora	43	44	2%	72	122	69%	115	166	44%	63	74	17%	61	110	80%	124	184	48%	141	63	-55%	25	22	-12%	166	85	-49%	94	118	26%	41	85	107%	135	203	50%									
12	Foothill & Pennsylvania	16	4	-75%	67	73	9%	83	77	-7%	11	10	-9%	88	95	8%	99	105	6%	35	16	-54%	44	39	-11%	79	55	-30%	25	41	64%	86	52	-40%	111	93	-16%									
13	Glendale & Maple	20	16	-20%	307	253	-18%	327	269	-18%	25	30	20%	245	255	4%	270	285	6%	29	21	-28%	176	152	-14%	205	173	-16%																	
14	Glendale & Wilson	18	19	6%	471	454	-4%	489	473	-3%	27	35	30%	471	485	3%	498	520	4%	41	38	-7%	332	379	14%	373	417	12%																	
15	Glenoaks & Chevy Chase	20	8	-60%	108	124	15%	128	132	3%	17	19	12%	97	101	4%	114	120	5%	51	33	-35%	51	77	51%	102	110	8%	31	30	-3%	78	31	-60%	109	61	-44%									
16	Glenoaks & Grandview	16	16	0%	76	56	-26%	92	72	-22%	20	32	60%	64	76	19%	84	108	29%	70	26	-63%	48	41	-15%	118	67	-43%	69	55	-20%	42	123	193%	111	178	60%									
17	Glenoaks & Louise	16	7	-56%	169	149	-12%	185	156	-16%	20	14	-30%	164	139	-15%	184	153	-17%	62	44	-29%	59	62	5%	121	106	-12%																	
18	Honolulu & La Crescenta	7	9	29%	82	88	7%	89	97	9%	15	12	-20%	68	87	28%	83	99	19%	32	58	81%	42	61	45%	74	119	61%	43	29	-33%	73	32	-56%	116	61	-47%									
19	Honolulu & Oceanview	11	9	-18%	239	85	-64%	250	94	-62%	27	10	-63%	751	217	-71%	778	227	-71%	72	49	-32%	696	793	14%	768	842	10%																	
20	Honolulu & Verdugo	6	11	83%	58	101	74%	64	112	75%	31	14	-55%	192	216	13%	223	230	3%	47	63	34%	146	90	-38%	193	153	-21%																	
21	Jackson & California	6	3	-50%	117	119	2%	123	122	-1%	14	14	0%	202	166	-18%	216	180	-17%	26	7	-73%	103	135	31%	129	142	10%																	
22	Kenneth & Sonora	9	15	67%	91	93	2%	100	108	8%	13	21	62%	98	118	20%	111	139	25%	55	40	-27%	67	244	264%	122	284	133%	34	17	-50%	151	230	52%	185	247	34%									
23	Louise & Wilson	7	10	43%	139	104	-25%	146	114	-22%	31	23	-26%	227	254	12%	258	277	7%	12	10	-17%	201	217	8%	213	227	7%																	
24	Maple & Chevy Chase	25	12	-52%	266	220	-17%	291	232	-20%	20	19	-5%	179	173	-3%	199	192	-4%	25	25	0%	133	73	-45%	158	98	-38%																	
25	San Fernando & Los Feliz	24	35	46%	538	402	-25%	562	437	-22%	34	45	32%	386	453	17%	420	498	19%	18	38	111%	337	244	-28%	355	282	-21%																	
26	Verdugo & Harvard																																					28	21	-25%	900	991	10%	928	1012	9%
27	Verdugo & Mountain	20	35	75%	342	421	23%	362	456	26%	23	33	43%	302	481	59%	325	514	58%	40	67	68%	49	67	37%	89	134	51%																	
	TOTAL (all locations)	**352**	**344**	**-2%**	**4775**	**4464**	**-7%**	**5127**	**4808**	**-6%**	**534**	**589**	**10%**	**5986**	**6965**	**16%**	**6520**	**7554**	**16%**	**949**	**793**	**-16%**	**4222**	**5752**	**36%**	**5171**	**6545**	**27%**	**341**	**329**	**-4%**	**499**	**558**	**12%**	**840**	**887**	**6%**	**35**	**39**	**11%**	**1955**	**1957**	**0.1%**	**1990**	**1996**	**0.3%**
	TOTAL (w/o 3, 5, 9)	**342**	**334**	**-2%**	**4628**	**4203**	**-9%**	**4970**	**4537**	**-9%**	**523**	**539**	**3%**	**5849**	**5355**	**-8%**	**6372**	**5894**	**-8%**	**936**	**781**	**-17%**	**4128**	**4176**	**1%**	**5064**	**4957**	**-2%**																	

APPENDIX B

PRIMARY COLLISION FACTORS (PCFS) AND CALIFORNIA VEHICLE CODE (CVC) VIOLATIONS FOR BICYCLE AND PEDESTRIAN INJURY COLLISIONS, 2004-09

Primary Collision Factors (PCFs) and California Vehicle Code (CVC) Violations for Pedestrian Injury Collisions, 2004-09

PCF Violation Category	CVC	Number	%	Description of Violation
Drive/Bike Under Influence	23152.a	2	0.3%	It is unlawful for a person under 21 years of age to have over 0.05 Blood Alcohol Content and to operate a vehicle.
	23153.a	1	0.1%	It is unlawful for any person, while under the influence of any alcoholic beverage or drug to drive a vehicle
Unsafe Speed	22350	33	4.9%	No person should drive a vehicle at a speed which exceeds the reasonable and endangers safety of others.
Following Too Closely	21703	1	0.1%	The driver shall not follow another vehicle more closely than is reasonable, taking road conditions into account.
Wrong Side of Road	21202	1	0.1%	Overtaking and passing another bicycle or vehicle is only allowed when proceeding in the same direction.
	21650	1	0.1%	Upon all highways, a vehicle shall be driven upon the right half of the roadway, except during conditions listed in VC 21650.
	21202.a	1	0.1%	Any person operating a bicycle shall ride as close as practicable to the right-hand curb or edge of the roadway except...(4 conditions).
	21752.a	1	0.1%	No vehicle shall be driven to the left side of the roadway when approaching within 100 feet of or crossing an intersection.
Improper Passing	21951	7	1.0%	No driver of any vehicle shall overtake another vehicle when that vehicle has stopped at a marked or unmarked crosswalk.
	21750	1	0.1%	Drivers overtaking another vehicle shall pass to the left at a safe distance without interfering with the safety of others.
	21755	1	0.1%	A driver may overtake another vehicle upon the right only under conditions permitting such movement in safety.
Unsafe Lane Change	21658.a	1	0.1%	On multi-lane roads a vehicle shall be driven within a single lane until movement can be made with reasonable safety.
Improper Turning	22107	23	3.4%	No driver shall turn or switch lanes until they can do so with reasonable safety, and only after giving the appropriate signal.
	22100.b	1	0.1%	Drivers approaching a left turn stay as close as possible to the left-hand edge of the road and stay in that lane as they turn.
Auto Right of Way	21453.b	6	0.9%	After stopping at a red light, a driver may make a legal right turn only after yielding to pedestrians and passing cars.
	21801.a	5	0.7%	When turning left or attempting a U-turn, the driver shall yield to all vehicles approaching from the opposite direction.
	21804.a	3	0.4%	When attempting to enter or to cross a road, the driver of a vehicle must yield to all passing traffic before proceeding.
	21802.a	2	0.3%	When approaching a stop sign the driver of a vehicle must yield to crossing pedestrians and passing traffic.

PCF Violation Category	CVC	Number	%	Description of Violation
	21453.c	1	0.1%	When approaching a circular red light or red arrow, a driver must stop unless there is another signal permitting movement.
Pedestrian Right of Way	21950.a	300	44.7%	The driver shall yield to a pedestrian crossing the road within any marked crosswalk or unmarked crosswalk at an intersection.
	21952	21	3.1%	The driver of any motor vehicle shall yield to crossing pedestrians when driving onto a sidewalk/into a driveway.
	21954.b	2	0.3%	The driver must exercise due care for the safety of any pedestrian, even when the pedestrian makes illegal movements.
	21963	1	0.1%	A blind pedestrian...shall have the right-of-way, and the driver of any vehicle approaching this pedestrian must yield.
	21950.c	1	0.1%	A driver approaching a pedestrian within any crosswalk shall exercise all due care to exercise the safety of the pedestrian.
Pedestrian Violation	21954.a	82	12.2%	Every pedestrian upon a road except at a legal crosswalk at an intersection shall yield to vehicles to avoid creating a hazard.
	21950.b	29	4.3%	Even with the right of way, pedestrians are to exercise caution when at crosswalks, and may not purposely delay traffic.
	21955	11	1.6%	Between adjacent intersections controlled by traffic control signal devices, pedestrians may only cross the road at crosswalks.
	21456.b	13	1.9%	When fashing "Wait" or "Don't Walk" signs are present at crosswalk, no pedestrian shall start crossing the road.
	21453.d	4	0.6%	Unless otherwise directed by a pedestrian control signal, a pedestrian facing any steady red signal shall not enter the road.
	21461.5	2	0.3%	Drivers shall obey signs or signals defined as regulatory in the federal Manual on Uniform Traffic Control Devices.
	21956.a	2	0.3%	No pedestrian may walk on a road outside of business or residence districts otherwise than close to the left edge of the road.
	21953	1	0.1%	Pedestrians must yield to passing traffic if they cross the road without using a pedestrian bridge or tunnel if present.
	21956.b	1	0.1%	A pedestrian may only walk on the right edge of the road only if a safe means of crossing to the other side is not available.
	21451.c	1	0.1%	A pedestrian facing a circular green signal may proceed across the roadway within any marked or unmarked crosswalk, but shall yield the right-of-way to vehicles lawfully within the intersection at the time that signal is first shown.
	21456.a	2	0.3%	Pedestrians may to cross the intersection upon the "Walk" signal, but must yield to vehicles in the middle of the intersection.
Traffic Signals/Signs	21453.a	12	1.8%	A driver must stop at a marked line at a red light or arrow. If there isn't one, he/she must stop before entering the intersection.
	21452.b	2	0.3%	A pedestrian must not enter the intersection if facing a circular yellow light, which indicates insufficient time to cross.

PCF Violation Category	CVC	Number	%	Description of Violation
	22450	4	0.6%	A driver must stop at the limit line at an intersection with a stop sign, or before entering the intersection if a line isn't present.
	21457.a	1	0.1%	A driver must stop at a rapidly flashing red light and treat it as a stop sign, and stop at a limit line if one is present.
Hazardous Parking	22515.a	1	0.1%	No person in charge of a motor vehicle shall leave it on a road unattended without first setting the brakes and stopping the motor.
Brakes	26451.a	1	0.1%	The parking brake shall be adequate to hold the vehicle stationary on any grade on which it is operated under all conditions.
Other Hazardous Violation	21663	1	0.1%	No person shall operate or move a motor vehicle upon a sidewalk except as may be necessary to enter or leave adjacent property.
	21200	1	0.1%	A person riding a bicycle upon a highway has all the rights and is subject to all the provisions applicable to the driver of a vehicle.
	21451.a	1	0.1%	Any driver, including one turning, shall yield to traffic and pedestrians lawfully within the intersection or an adjacent crosswalk.
Other Than Driver/Pedestrian	---	3	0.4%	
Unsafe Starting/Backing	22106	28	4.2%	Unless it can be done safely, no person shall start a vehicle stopped, standing, or parked on a road, nor back a vehicle on a road.
Other Improper Driving	---	6	0.9%	
Unknown	---	24	3.6%	
	20001.a	2	0.3%	The driver of a vehicle involved in an accident shall immediately stop the vehicle at the scene of the accident.
Not Stated	---	19	2.8%	
TOTAL		**671**	**100.0%**	

Note: --- = no reported California Vehicle Code.

Source: Statewide Integrated Traffic Records System, CHP.

Prepared by LAC-DPH-IVPP, July 30, 2010

Primary Collision Factors (PCFs) and California Vehicle Code (CVC) Violations for Bicycle Injury Collisions, 2004-09

PCF Violation Category	CVC	Number	%	Description of Violation
Drive/Bike Under Influence	23140.a	1	0.4%	It is unlawful for a person under 21 years of age to have over 0.05 Blood Alcohol Content and to operate a vehicle.
	23153.a	1	0.4%	It is unlawful for any person, while under the influence of any alcoholic beverage or drug to drive a vehicle
Impeding Traffic	21654.a	1	0.4%	Any vehicle which is traveling at a slower speed than the rest of the traffic should remain the rightmost lane of the road.
Unsafe Speed	22350	16	5.8%	No person shall drive a vehicle upon a road at a speed greater than is reasonable or prudent under given conditions.
Wrong Side of The Road	21202.a	57	20.7%	Bicyclists traveling at lower speeds than other traffic must ride as close to the right as practicable, except under certain situations.
	21650.1	18	6.5%	Vehicle Code 21650 does not prohibit bicyclists to use the shoulder of a highway, sidewalks, or bicycle path within a highway.
	21650	8	2.9%	Upon all roads, a vehicle shall be driven upon the right half of the roadway, except during conditions listed in VC 21650.
	21460.a	1	0.4%	When double parallel solid lines are in place, no person driving a vehicle shall drive to the left thereof, except as permitted in this section.
	21202	2	0.7%	A bicyclist riding upon a one-directional road that has two or more marked traffic lanes, may ride on the left-hand side of the road.
Improper Passing	21750	2	0.7%	Drivers overtaking bicyclists shall pass from the left side at a safe distance without interfering with the safety of the bicylist.
	21755	2	0.7%	Drivers may overtake vehicles and bicycles from the right side only under conditions permitting such movement in safety.
	21951	1	0.4%	No driver of any vehicle shall overtake another vehicle when that vehicle has stopped at a marked or unmarked crosswalk.
Improper Turning	22107	40	14.5%	No driver shall turn or switch lanes until they can do so with reasonable safety, and only after giving the appropriate signal.
	22100.a	3	1.1%	When turning right from one road to another, drivers must stay in the lane during the turn and follow signs on the intersection.
	22100.b	2	0.7%	Drivers approaching a left turn stay as close as possible to the left-hand edge of the road and stay in that lane as they turn.
	22101.d	1	0.4%	When official traffic control devices are placed, it shall be unlawful for any driver of a vehicle to disobey the directions given.
Auto Right-of-Way	21804.a	22	8.0%	The driver of any vehicle about to enter or cross a road from any public or private property shall yield to all traffic.
	21801.a	15	5.5%	When turning left or attempting a U-turn, the driver shall yield to all vehicles approaching from the opposite direction.
	21802.a	9	3.3%	When approaching a stop sign the driver of a vehicle must yield to crossing pedestrians and passing traffic.

PCF Violation Category	CVC	Number	%	Description of Violation
	21804	2	0.7%	When attempting to enter or to cross a road, the driver of a vehicle must yield to all passing traffic before proceeding.
	21453.b	2	0.7%	After stopping at a red light, a driver may make a legal right turn only after yielding to pedestrians and passing cars.
	21801	1	0.4%	Once a vehicle turning left (or making a U-turn) has started turning, the traffic from opposite direction must yield to them.
	21800.b	1	0.4%	A vehicle shall yield to the vehicle to its right when the two vehicles have entered the intersection at the same time.
	21804.b	2	0.7%	Drivers must yield to vehicles that are in the process of crossing or entering the road, provided they followed VC 21804 A.
Pedestrian Right of Way	21950.a	3	1.1%	The driver of a vehicle shall yield the right-of-way to a pedestrian crossing the road within any marked or unmarked crosswalk.
Pedestrian Violation	21950.b	2	0.7%	Even with the right of way, pedestrians are to exercise caution when at crosswalks, and may not purposely dealay traffic.
	21453.d	1	0.4%	Unless otherwise directed by a pedestrian control signal, a pedestrian facing any steady red signal shall not enter the road.
Traffic Signals and Signs	21453.a	14	5.1%	A driver must stop at a marked line at a red light or arrow. If there isn't one, he/she must stop before entering the intersection.
	22450.a	4	1.5%	A driver must stop at the limit line at an intersection with a stop sign, or before entering the intersection if a line isn't present.
Other Equipment	24002.a	1	0.4%	It is unlawful to operate any vehicle or combination of vehicles which is in an unsafe condition or may present a safety hazard.
Other Hazardous Violation	22517	12	4.4%	No person shall open the door of a vehicle on the side available to moving traffic unless it is reasonably safe to do so.
	21663	7	2.5%	No person shall operate or move a motor vehicle upon a sidewalk except as may be necessary to enter or leave adjacent property.
	21200.a	5	1.8%	Every bicyclist upon a road has all the rights and is subject to all the provisions applicable to the driver of a motor vehicle.
	21657	1	0.4%	A driver or bicyclist shall follow all designated traffic control devices and signs put up by the authorities of that road or path.
	21204.b	1	0.4%	An operator shall not allow a person riding as a passenger on a bicycle upon a road except on a separate seat attached thereto.
	21451.a	1	0.4%	Any driver, including one turning, shall yield to traffic and pedestrians lawfully within the intersection or an adjacent crosswalk.
Other Than Driver/Pedestrian	---	2	0.7%	
Unsafe Starting/Backing	22106	3	1.1%	Unless it can be done safely, no person shall start a vehicle stopped, standing, or parked on a road, nor back a vehicle on a road.
Unsafe Lane Change	21658.a	1	0.4%	A vehicle shall be driven within a single lane and shall not be moved from the lane until such movement can be made with reasonable safety.
Unknown	---	2	0.7%	

PCF Violation Category	CVC	Number	%	Description of Violation
Not Stated	---	5	1.8%	
TOTAL		**275**	**100.0%**	

Note: --- = no reported California Vehicle Code.

Source: Statewide Integrated Traffic Records System, California Highway Patrol

Prepared by LAC-DPH-IVPP, August 2, 2010

APPENDIX C

BICYCLE AND PEDESTRIAN COLLISIONS PER CAPITA FOR SELECTED CITIES, 2008

Bicycle and Pedestrian Collisions Per Capita for Selected Cities, 2008

	Glendale	Pasadena	Burbank	Culver City	Los Angeles	San Diego	Santa Monica	Long Beach	California
Total 2008 Population*	195,505	137,885	104,191	39,301	3,749,058	1,251,184	87,935	462,556	36,418,499
2008 Bicycle Injury Collisions**	45	75	41	24	1,512	519	110	182	11,683
2008 Bicycle Injury Collisions per Capita	0.0002302	0.0005439	0.0003935	0.0006107	0.0004033	0.0004148	0.0012509	0.0003935	0.0003208
2008 Bicycle Injury Collisions per 100,000 Residents	**23.0**	**54.4**	**39.4**	**61.1**	**40.3**	**41.5**	**125.1**	**39.3**	**32.1**

	Glendale	Pasadena	Burbank	Culver City	Los Angeles	San Diego	Santa Monica	Long Beach	California
Total 2008 Population*	195,505	137,885	104,191	39,301	3,749,058	1,251,184	87,935	462,556	36,418,499
2008 Pedestrian Injury Collisions**	102	97	45	24	2,904	557	105	248	13,420
2008 Pedestrian Injury Collisions per Capita	0.0005217	0.0007035	0.0004319	0.0006107	0.0007746	0.0004452	0.0011941	0.0005362	0.0003685
2008 Pedestrian Injury Collisions per 100,000 Residents	**52.17**	**70.35**	**43.19**	**61.07**	**77.46**	**44.52**	**119.41**	**53.62**	**36.85**

*Source: U.S. Census Bureau, 2006-08 American Community Survey

**Source: California Office of Traffic Safety, 2008 OTS Collision Rankings; 2008 SWITRS

APPENDIX D

BICYCLE AND PEDESTRIAN COLLISIONS PER COMMUTE TRIP FOR SELECTED CITIES, 2008

Bicycle and Pedestrian Collisions Per Commute Trip for Selected Cities, 2008

	Glendale	Pasadena	Burbank	Culver City	Los Angeles	San Diego	Santa Monica	Long Beach	California
Total 2008 Population*	195,505	137,885	104,191	39,301	3,749,058	1,251,184	87,935	462,556	36,418,499
Total Work Trips*	92,513	66,317	52,753	19,858	1,738,058	614,583	47,484	208,326	16,450,620
Daily bicycle trips to work*	402	1,020	372	95	12,608	5,318	749	1,713	147,561
Bicycling mode split	0.4%	1.5%	0.7%	0.5%	0.7%	0.9%	1.6%	0.8%	0.9%
2008 Bicycle Injury + Fatal Collisions**	45	75	41	24	1,512	519	110	182	11,814
Estimated bicycling trips to work per year***	102,510	260,100	94,860	24,225	3,215,040	1,356,090	190,995	436,815	37,628,055
Injury Collisions per Estimated Bicycling Trips to Work	0.0004390	0.0002884	0.0004322	0.0009907	0.0004703	0.0003827	0.0005759	0.0004167	0.0003140
Injury Collisions per 100,000 Annual Bicycling Trips to Work	**43.9**	**28.8**	**43.2**	**99.1**	**47.0**	**38.3**	**57.6**	**41.7**	**31.4**

	Glendale	Pasadena	Burbank	Culver City	Los Angeles	San Diego	Santa Monica	Long Beach	California
Total Work Trips*	92,513	66,317	52,753	19,858	1,738,058	614,583	47,484	208,326	16,450,620
Daily walking trips to work*	3,377	4,640	1,447	324	61,113	18,986	2,432	6,504	456,647
Walking mode split	3.7%	7.0%	2.7%	1.6%	3.5%	3.1%	5.1%	3.1%	2.8%
2008 Pedestrian Injury Collisions**	102	97	45	24	2,904	557	105	248	13,420
Estimated walking trips to work per year***	861,135	1,183,200	368,985	82,620	15,583,815	4,841,430	620,160	1,658,520	116,444,985
Injury Collisions per Estimated Walking Trips to Work	0.0001184	0.0000820	0.0001220	0.0002905	0.0001863	0.0001150	0.0001693	0.0001495	0.0001152
Injury Collisions per 100,000 Annual Walking Trips to Work	**11.8**	**8.2**	**12.2**	**29.0**	**18.6**	**11.5**	**16.9**	**15.0**	**11.5**

*Source: U.S. Census Bureau, 2006-08 American Community Survey
**Source: California Office of Traffic Safety, 2008 OTS Collision Rankings; 2008 SWITRS
*** Based on 255 work days

APPENDIX E

SAMPLE INSTRUCTIONAL SHEET

Sample Instructional Sheet

GLENDALE BICYCLIST & PEDESTRIAN COUNT INSTRUCTIONS 2010

Please review these instructions before going to the count site.
There's also a sample of completed forms that you can review.

Items you should bring to the site include:

1. These instructions.
2. Location map (optional: can be printed from Google map).
3. Count forms (2 intersection forms and 1 tally sheet).
4. Clipboard (or something to use as a writing surface).
5. Pen or pencil and a spare.
6. Watch or cell phone to keep track of 15-minute intervals.
7. Hat, sunscreen, jacket, snacks, water, folding chair (chair highly recommended!).

Once you've reached the site please ensure your safety. Be aware of your surroundings. It is best to arrive at the site 15 minutes before the count period so you can park, lock your bike, get situated, etc..

Once you've arrived:

1. Find a safe location to conduct the count. We suggest a spot on the south side of the intersection to make orientation of your count form easier (north on the form will be actual north), *but use safety as your primary guide*. Also consider the location that provides you with the best view of the intersection.
2. Record the background information at the top of each form. If there are any unusual conditions at your intersection (such as street construction, for example, please notate that).
3. Be sure to notate which street is north/south and which street is east/west on each intersection diagram. In the sample forms, Sonora is the north/south street and Flower is the east/west street. Your intersection may not comply exactly with compass points, but label the streets as close to north-south-east-west as possible, label the streets clearly, and be consistent during the entire count. If your intersection has only three legs, don't use the 4th leg in the diagrams.

Instructions for completing the count forms

1. **Count bicyclists and pedestrians as they leave the intersection.** Use simple hash-marks in groups of five. You should count the cyclists and pedestrians in the box that corresponds to the direction they *leave the intersection*.

2. Multiple passes. If a cyclist or pedestrian goes through your intersection more than once, count them each time. You might see the same cyclist or pedestrian twice (ie 10 minutes go by and there he/she is again), but it's not likely you'll see them three or more times. If a cyclist or pedestrian goes by 3 or more times, count them each time and then notate how many cyclists or pedestrians went by 3 or more times.
3. Neither pedestrians nor cyclists have to cross the street to be counted. If a pedestrian walking northbound turns right at the corner without crossing the street for example, count them in box C1. If a cyclist does the same thing, you would count them in box C2.
4. For cyclists, please also notate if they are riding the wrong way on the street (box E1), if they are riding without a helmet (box E2), and if they are riding on the sidewalk (box E3). There is no official wrong way for cyclists riding on the sidewalk. Example: a cyclist rides north through your intersection, is riding the wrong way and has no helmet. You would put a mark in boxes B2, E1, and E2 (all for one cyclist).
5. Count the number of people on bikes. If there is more than one person on one bike, count two bicyclists.
6. Anyone traveling on foot is counted as a pedestrian. Ignore people on skateboards, push scooters, or skates. Examples of special circumstances. Count joggers as pedestrians. If someone is pushing a stroller with one child, count as two pedestrians.
7. Female cyclists. Please notate how many cyclists are female by marking it in box E5. Don't worry about notating how many cyclists are male. Just put a mark down for every female cyclist. This number is likely to be low and therefore easy to record. We can subtract the number of females from the total number of cyclists to determine how many cyclists were male.
8. This year we've included a box for people in wheel-chairs or on electric scooters. Count them as pedestrians and notate them in box E4 as well.
9. We're also counting children cyclists and pedestrians. If any cyclist or pedestrian looks like he/she might be under 12, count them as a cyclist or pedestrian then notate them in box E6 or E7.
10. Be sure to count in 15-minute intervals. You will use one intersection diagram for each 15-minute interval so at the end you will have completed all 8 diagrams. Please start your count and end your count promptly at the top of the hour.
11. Remember that the goal is to be accurate, not to turn in high numbers. Your numbers may be low at your location. That's okay. We're trying to record the volume on a "typical day" at your location.
12. Once you've finished the 2-hour count, please use the tally sheet to add up your totals.

After completing your count, please turn in your forms as soon as possible.

1. Please try to drop off your forms right after you have finished doing your shift. There will be a volunteer collecting forms in the Chess Park passage on Wednesday from 9 - 10:30 am and 7:00 - 8:30 pm and on Saturday from 10 am - 1:30 pm.
2. The Chess Park passage is at 227 N. Brand Blvd – across the street from the Alex Theatre and about half a block south of California. The Orange Street Parking Structure (on Orange and California) is adjacent to Chess Park and you can park in the Orange Street Structure for 90 minutes for free.
3. North Glendale volunteers can drop off their forms at the Sparr Heights Community Center, 1613 Glencoe Way (but if you come to Chess Park, we can give you your t-shirt and thank you gift right then). If you are delivering to Sparr Heights after hours (after 6 pm on Wednesday and

any time on Saturday), you can put the forms into the mail slot near the main entrance on Glencoe Way.

4. If you can't deliver your forms to the two designated locations after you have completed your count, please contact Colin Bogart at colin@la-bike.org or 818 334-9731 to make alternate arrangements. Thank you.

If you can't do your count shift for some reason, please contact Colin Bogart at least one day in advance (if possible).

Thank you for participating in Glendale's 2nd Annual Bicyclist & Pedestrian Count!

APPENDIX F

SAMPLE COUNT SHEET

Sample Count Sheet

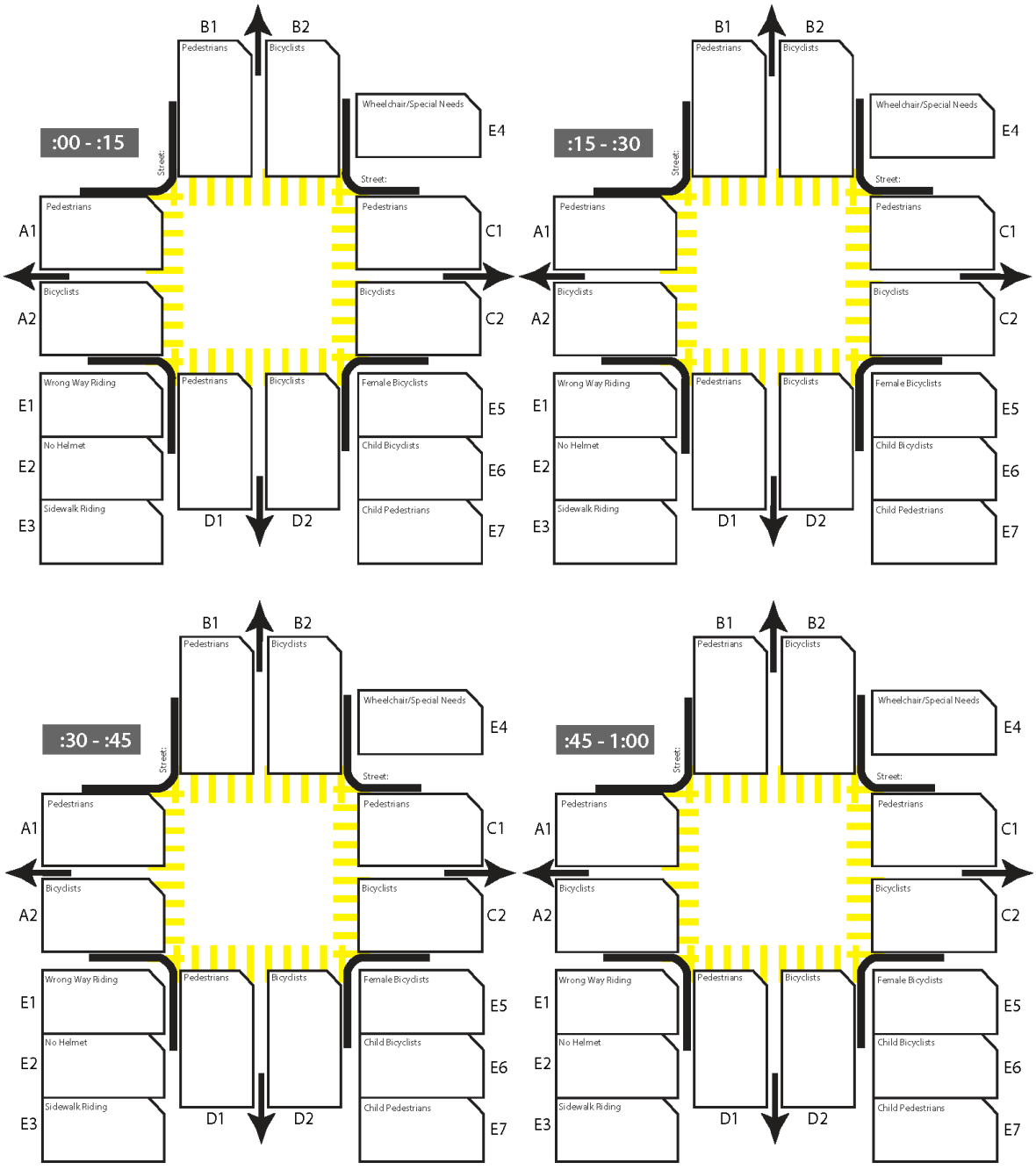
GLENDALE BICYCLE AND PEDESTRIAN COUNT FORM 2010 - Page 1

Name: _____ Location: _____

Date: _____ Start Time: _____ End Time: _____ Weather: _____

North

Count all bicyclists and pedestrians crossing through the intersection in the road and on the sidewalk under the appropriate categories. Use one intersection graphic per 15-minute interval for a two-hour period.



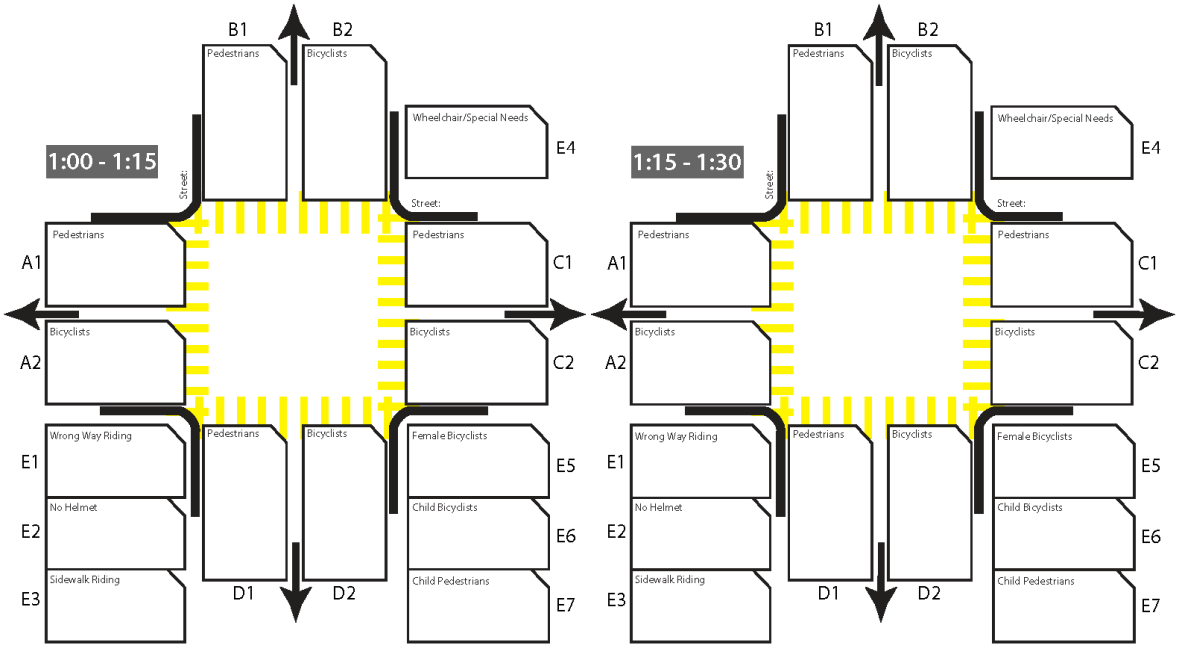
GLENDALE BICYCLE AND PEDESTRIAN COUNT FORM 2010 - Page 2

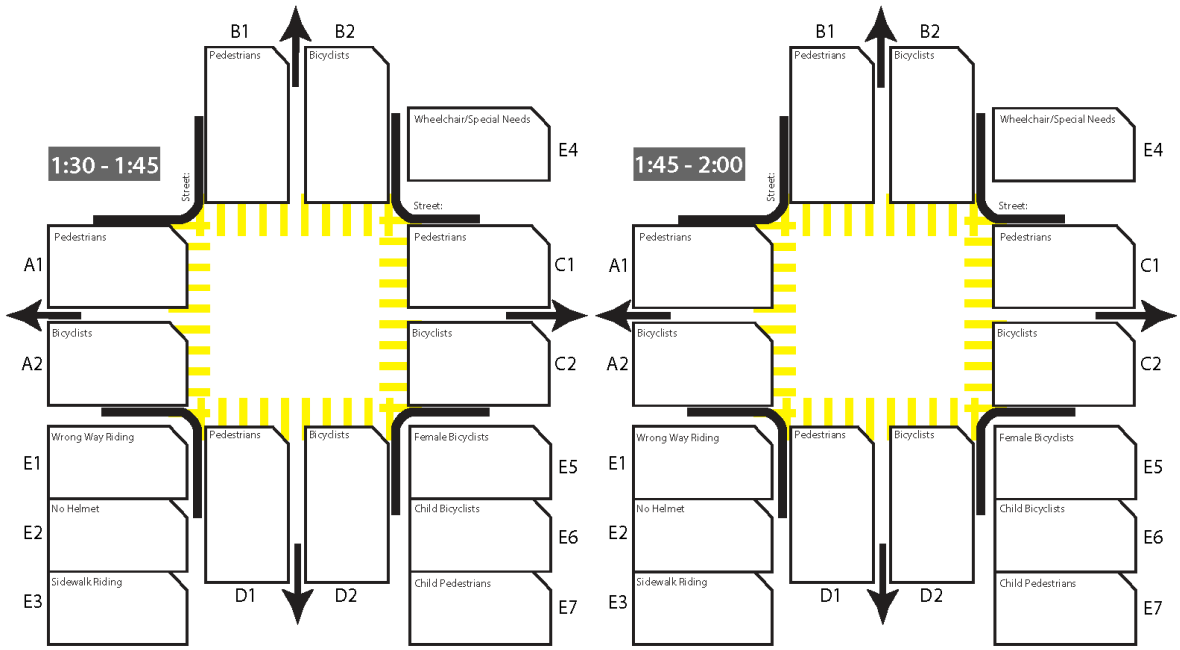
Name: _____ Location: _____

Date: _____ Start Time: _____ End Time: _____ Weather: _____

North

Count all bicyclists and pedestrians crossing through the intersection in the road and on the sidewalk under the appropriate categories. Use one intersection graphic per 15-minute interval for a two-hour period.





Name:_____ Location:_____

Date: _____ Start Time:_____ End Time:_____ Weather:_____

Upon finishing your count shift, please use this sheet to enter your counts for each box (A1, A2 etc) for each of the 15 minute intervals. Please then add up the totals for each column and enter them at the bottom of the sheet. Please turn in all 3 sheets together.

	Glendale Bicycle and Pedestrian Count 2010 - Tally Sheet														
Time Period	Leaving Leg A		Leaving Leg B		Leaving Leg C		Leaving Leg D		Section E						
	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	E3	E4	E5	E6	E7
:00-:15															
:15-:30															
:30-:45															
:45-1:00															
1:00-1:15															
1:15-1:30															
1:30-1:45															
1:45-2:00															
Total	Ped	Bike	Ped	Bike	Ped	Bike	Ped	Bike	Wrong Way Riding	No Helmet	Sidewalk Riding	Wheelchair	Female	Child Bike	Child Ped
Combined Totals															

APPENDIX G

SWITRS DATA FOR SELECTED BICYCLE AND PEDESTRIAN INJURY COLLISION CHARACTERISTICS, 2004-09

Number of Pedestrian and Bicyclist Fatalities and Injuries in Glendale, by Year, 2004-2009

Year	Pedestrian		Bicyclist		Total	Total
	Injuries	Fatalities	Injuries	Fatalities	Ped	Bike
2004	101	1	41	0	102	41
2005	110	1	41	0	111	41
2006	105	3	43	0	108	43
2007	128	6	38	0	134	38
2008	99	3	45	1	102	46
2009	121	0	39	0	121	39

Degree of Injury of Pedestrians and Bicyclists Killed or Injured in MV Collisions in Glendale, 2004-2009

Degree of Injury	Pedestrians	Bicyclists
Fatal	14	1
Severe Injury	67	14
Other Visible Injury	283	156
Complaint of Pain	314	77

Number of MV Collisions Involved With Pedestrians or Bicyclists in Glendale, by Month, 2004-2009

Day of Week	Pedestrian Collisions	Bicyclist Collisions
January	66	15
February	55	11
March	51	16
April	46	25
May	55	32
June	44	28
July	46	25
August	45	24
September	57	27
October	53	27
November	76	27
December	77	18

Number of MV Collisions Involved With Pedestrians or Bicyclists in Glendale by Hour of Day, 2004-2009

Hour of Day	Pedestrian Collisions	Bicyclist Collisions
12-12:59 AM	5	1
1-1:59 AM	2	1
2-2:59 AM	1	0
3-3:59 AM	1	1
4-4:59 AM	1	0
5-5:59 AM	3	2
6-6:59 AM	10	4
7-7:59 AM	29	6
8-8:59 AM	31	13
9-9:59 AM	25	21
10-10:59 AM	40	16
11-11:59 AM	28	11
12-12:59 PM	35	23
1-1:59 PM	49	18
2-2:59 PM	51	15
3-3:59 PM	56	37
4-4:59 PM	49	33
5-5:59 PM	71	26
6-6:59 PM	65	13
7-7:59 PM	35	18
8-8:59 PM	34	6
9-9:59 PM	28	5
10-10:59 PM	13	2
11-11:59 PM	8	3

Number of MV Collisions Involved With Pedestrians or Bicyclists in Glendale, by Day of Week, 2004-2009

Day of Week	Pedestrian Collisions	Bicyclist Collisions
Sunday	73	37
Monday	121	41
Tuesday	105	33
Wednesday	109	53
Thursday	114	46
Friday	89	31
Saturday	60	34

Age of Pedestrians and Bicyclists Killed or Injured in MV Collisions in Glendale, 2004-2009

Age Group	Pedestrians	Bicyclists
0-4 Years	11	0
5-9 Years	23	12
10-14 Years	44	40
15-19 Years	77	30
20-24 Years	31	29
25-29 Years	39	24
30-34 Years	28	17
35-44 Years	56	39
45-54 Years	95	37
55-64 Years	77	4
65+ Years	194	15
Unknown	3	0

Gender of Pedestrians and Bicyclists Killed or Injured in MV Collisions in Glendale, 2004-2009

Gender	Pedestrians	Bicyclists
Male	323	198
Female	310	30
Unknown	45	19