Lake Tahoe Region Bicycle and Pedestrian Monitoring Program
Summer & Fall 2015 Data Collection Report

Prepared For:

TAHOE REGIONAL PLANNING AGENCY

Tahoe Metropolitan Planning Organization

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Executive Summary

This report summarizes the Summer and Fall 2015 bicycle and pedestrian data collection cycles which were conducted in August and September, respectively. These data collection efforts adhered to the data collection procedures established by the *Lake Tahoe Region Bicycle and Pedestrian Monitoring Protocol* (Protocol), June 2015. The 2015 Summer and Fall bicycle and pedestrian data collection cycles will provide data to the TRPA for evaluation and prioritization of bicycle and pedestrian projects (before and after studies), analysis of bicycle and pedestrian safety, prioritization of bicycle and pedestrian safety improvements, tracking of overall utilization trends of bicycle and pedestrian facilities, and integration of bicycle and pedestrian monitoring data into the evaluation and analysis methods that quantify the benefits of active transportation[1]. The data from this report has been compiled and added to the TRPA bicycle and pedestrian count database which will continue to be updated with future data collection efforts.

Data for the Summer and Fall 2015 data collection cycles was gathered through manual counts using recorded video observations and through automatic counts which utilized passive infrared detectors. Using these methods, a total of 144 hours of manual counts were conducted across 12 locations, over two months of data was collected at three of the four automatic counter locations, and nearly a full month of data was collected at the final automatic counter location.

Top five busiest locations for **bicyclists**:
1. 15th St. & Eloise Ave
2. US 50 at Al Tahoe
3. US 50 at Lakeview Drive
4. Fanny Bridge Intersection
5. Pioneer Trail South of Stateline

Top five busiest locations for **pedestrians**:
1. Pioneer Trail South of Stateline
2. SR 28 between Bear and Coon Streets
3. Fanny Bridge Intersection
4. US 50 at Lakeview Drive
5. SR 28 at Village

Top five busiest locations on **weekdays**:
1. Rabe Meadows
2. US 50 at Lakeview Drive
3. Fanny Bridge Intersection
4. US 50 at Al Tahoe Blvd
5. Lake Tahoe at Sawmill Rd

Top five busiest locations on **weekends**:
1. Fanny Bridge Intersection
2. SR 28 between Bear and Coon Streets
3. 15th Street at Eloise Ave
4. Incline Beach
5. US 50 at Lakeview Drive

The presence of high quality bicycle and pedestrian infrastructure influenced bicycle and pedestrian usage. Locations such as 15th Street at Eloise Ave and US 50 at Al Tahoe, which are located near Class 1 Bikeways/Shared Use Paths experienced very high volumes of bicyclists comparatively. Furthermore, locations with high quality pedestrian facilities such as SR 28 between Bear and Coon Streets and Pioneer Trail (both have wide sidewalks) experienced the highest pedestrian volumes. Conversely, the lowest pedestrian volumes were found in areas with either poor pedestrian facilities (e.g. US 50 at Warrior Way) or a lack of pedestrian generators (e.g. Lake Tahoe Blvd at Sawmill Road).

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[1] *Lake Tahoe Region Bicycle and Pedestrian Monitoring Protocol, Page. 4, June 2015*

Site Selection

During both the Summer and Fall 2015 data collection cycles, counts were conducted at a total of sixteen locations. The sixteen locations were selected from the comprehensive list of historic count locations and proposed count locations included in the Protocol. These sixteen locations were deemed to be best suited to help TRPA further the purpose of the monitoring program. Automatic counters were utilized at four of the sixteen locations with the remaining twelve locations being counted using recorded video and manual breakdown.

Manual Locations
- 15th Street & Eloise Ave (Class 1/Shared Use)
- Fanny Bridge Intersection (Sidewalk)
- Lake Tahoe & Sawmill Road (Class 1/Shared Use)
- Pioneer Trail South of Stateline (Class 2/Sidewalk)
- SR 28 and Village Boulevard (Class 2/Sidewalk)
- SR 28 at Carnelian Bay (Class 2/Sidewalk)
- SR 28 between Bear & Coon Street (Class 2/Sidewalk)
- US 50 & Al Tahoe Boulevard (Class 1/Shared Use)
- US 50 & Lakeview Ave (Class 1/Shared Use)
- US 50 & Warrior Way (Sidewalk)
- US 50 & Santa Fe Drive (Class 1 & 2)
- US 50 & Sierra Boulevard (Sidewalk)

Automatic Locations
- Incline Beach (Class 1/Shared Use)
- Rabe Meadows (Class 1/Shared Use)
- SR 28 and Fallen Leaf Trail (Class 1/Shared Use)
- West Shore Bike Path (Class 1/Shared Use)

All sixteen locations are shown in **Figure 1** on the following page by their respective counter technology and facility type which they monitored. (Additional counts were conducted by Douglas County and the Tahoe City Public Utility District. A map of all locations counted during 2015 is included in **Appendix A**. A diagram of each manual and automatic count location showing the approximate placement of the counter and the detection area is included in **Appendix B** & **C** respectively.)

Figure 1. 2015 Summer and Fall Manual and Automatic Count Locations

Count Technology

Two kinds of count technology were utilized during the Summer and Fall count cycles: Passive Infrared (Pyroelectric) and Recorded Video Observations.

Passive Infrared (Pyroelectric)

Passive Infrared counters were used at long-term count locations in order to assess daily, weekly, and monthly trends. These counters identify heat differentials of bicyclists and pedestrians when they pass through the detection area and can be placed on either side of a count corridor. During this count cycle, four passive infrared counters were placed along trails in inconspicuous locations (as shown to the right) so as to avoid vandalism.   These counters do not differentiate between bicyclists and pedestrians and only record the total number of bicyclists and pedestrians to cross in front of the counter.

Left: Passive Infrared Automatic Counter prior to installation.   Right: Passive Infrared Automatic Counter installed in the field at the West Shore Bike Path location.

Recorded Video Observations

Recorded Video Observations utilize video recording technology which is placed at the desired location during the appropriate observation period. After the observation period, video recorded by the device is downloaded and viewed in the office at a higher rate of speed. This allows for a higher rate of accuracy, as the video may be reviewed to assure proper detection, and allows for further analysis at a later date if desired. During the Summer and Fall count cycles, recorded video observations were used for bicycle and pedestrian intersection turning movement counts. Additionally, information about gender was collected through recorded video observations. Data on gender of bicyclists and pedestrians is approximate and is not intended to be an exact representation of gender breakdown of bicycle and pedestrian facility usage for each location. Recorded video observations were utilized at twelve locations around Lake Tahoe.

Count Methodology

The data collection effort was divided into two portions, an automatic count effort and a manual count effort.

Automatic Counts

The passive infrared automatic counters allow for large amounts of data to be collected over a long period of time. The passive infrared automatic counters mimic a screenline count but do not collect data on directionality or mode and simply log the volume of users who pass through the infrared beam.

For the automatic count effort, passive infrared counters were placed at four locations around Lake Tahoe. These locations are:

- Incline Beach
- Rabe Meadows & Elks Point Road
- SR 89 & Fallen Leaf Path
- West Shore Bike Path

These locations are shown in **Figure 1** (page 3), exact locations for each automatic counter can be found in **Appendix C**. Three of the four counters were installed on the 17th of July, 2015 with the fourth (West Shore Bike Path) being installed on the 23rd of August, 2015. All four counters were retrieved on the 21st of September, 2015.

In order to ensure accuracy, the infrared counters were calibrated in the field at their respective locations using manual counts. Data collected during manual counts was compared to corresponding data collected by the infrared counters during the same time period. Calibration factors developed this methodology were used to adjust the raw data (Raw Data x Calibration Factors = Final Data). These calibration factors are unique to the locations and equipment set-ups for which they were developed. In order to ensure accuracy, new calibration factors should be developed each time a counter is placed in the field. The calibration factors for the automatic count locations are shown in **Table 1**.

The infrared counters were monitored frequently throughout the data collection cycle in order to ensure continued proper functioning. During the count cycle, the infrared counters were found to have operated properly and were not vandalized or tampered with in any way.

Location	Calibration Factor
Rabe Meadows & Elks Point Road	1.473684211
Incline Beach	1.485714286
SR89 & Fallen Leaf Path	0.973684211
West Shore Bike Path	1.25

Table 1. Calibration Factors for Automatic Counters

Manual Counts

The manual count effort utilized recorded video observations in order to ensure a high level of accuracy. Prior to the counts being conducted, formal definitions of bicyclists and pedestrians were developed in order to maintain consistency throughout this count effort and future count efforts. The definitions used for bicyclists and pedestrians are shown on the next page.

Pedestrians
The following is a list of who will be counted as a pedestrian during manual counts:
- Baby in stroller
- Baby being carried
- Person using an assistive walking device (walker, cane, knee walker)
- Person walking or jogging
- Wheelchair or assistive power scooter user
- Non-motorized kick scooter rider
- Person on toy (pull cat, big wheel, etc.)
- Rollerblader
- Segway Rider
- Skateboarder

Bicyclists
The following is a list of who will be counted as a bicyclist during manual counts:
- Bicyclist (including electric motor assisted)
- Bicyclist walking his/her bicycle on the sidewalk
- Cyclist on three of four-wheeled cycle
- Hand Cyclist
- Unicyclist
- Human passenger in bicycle trailer (each person counted separately)
- Human passenger on a cycle (each person counted separately)
- Pedicab operator and passengers (each person counted separately)
- Recumbent Bicyclist
- Tandem Bicyclists (each person counted separately)
- Quadcyclists (each person counted separately)

Manual counts were conducted at a total of 12 locations, shown in **Figure 1** (page 3). Diagrams of the approximate location of each counter and detection zone are provided in **Appendix B**. Manual counts were conducted on mid-week days during the AM and PM peak periods (7AM – 9AM; 4PM – 6PM) and during the weekend mid-day peak (12PM – 2PM). Manual counts in the Summer cycle were conducted during the week of August 24th and in the Fall cycle during the week of September 21st. Manual counts included intersection turning movement data for bicyclists and pedestrians at all twelve manual count locations. Intersection turning movement data collected for this study includes through movements as well as turning movements, which is consistent with the TRPA Bike & Ped Count database. The SR 28 between Bear St. and Coon St. location was conducted at a mid-block location which is a common area for pedestrian crossings; for this reason this location was also treated as an intersection and counted accordingly. Manual counts also included information on gender.

Drawbacks
A significant barrier to both the automatic and manual count efforts was the process of obtaining permits from Caltrans in order to place video recording technology in the field within the Right of Way. In attempting to obtain permits, data collection was delayed significantly and caused the Summer count cycle to be delayed until the end of August.

Monitoring Results

Results of the Summer and Fall cycles are divided into two sections: Manual Counts and Automatic Counts. The best comparisons between manual counts and automatic counts are average hourly volumes for the same peak periods used for the manual counts; 7am-9am (weekdays), 4pm-6pm (weekdays), 12pm-2pm (weekends). For comparison purposes, automatic counter data for the periods in which manual counts were conducted was averaged in order to develop average hourly volumes. Data gathered by automatic counters during the hours of 7am – 9am on a weekday was averaged and divided by 2 (the number of hours) in order to develop AM average hourly volumes. The same process was carried out for data gathered between 4pm – 6pm on a weekday, and between 12pm – 2pm on a weekend. These metrics allow for a more direct comparison across all locations regardless of their counter type. Average hourly volume will be used as a comparison between manual and automatic count data. Additionally, a table and graph showing equivalent average hourly volumes for both automatic and manual counters is included on the following page for comparison. For a more detailed analysis of Manual Counts, refer to **Appendix B**. For a more detailed analysis of Automatic Counts please refer to **Appendix C**. **Appendix D** includes a map showing the combined totals for August and September at each manual and automatic location and how they rank proportionally to each other.

Summary

As shown in **Table 2**, of the five busiest locations on the weekend, according to the total average hourly volumes, three are on the North Shore (Fanny Bridge Intersection, SR 28 between Bear and Coon Streets, Incline Beach) and two are on the South Shore (15th Street at Eloise Ave, US 50 at Lakeview Drive). Four of the top five busiest locations in the PM peak period, according to total average peak hours, are in dense residential/tourist/Recreation areas. The Pioneer Trail location had the highest AM and PM total average hourly volume compared to both manual and automatic counts. The Fanny Bridge location had the highest weekend total average hourly volume compared to both manual and automatic counts.

Location	AM Average Hourly	PM Average Hourly	Weekend Average Hourly
15th Street at Baldwin Path	9.75	45.50	142.50
Al Tahoe at US 50	34.75	86.00	106.00
Fanny Bridge	26.50	44.25	169.75
Incline Beach	39.68	35.59	125.58
Lake Tahoe Blvd at Sawmill Road	5.50	14.25	30.00
Pioneer Trail	77.25	131.75	78.25
Rabe Meadows	6.53	7.30	18.37
SR 28 and Fallen Leaf Trail	3.99	9.58	37.66
SR 28 at Carnelian Bay	18.25	21.75	46.00
SR 28 at Village	27.50	28.00	51.75
SR 28 between Bear and Coon	25.75	66.25	146.75
US 50 at Lakeview Drive	29.25	97.50	121.75
US 50 at Santa Fe Drive	6.00	12.25	27.25
US 50 at Sierra Blvd	20.25	31.00	51.25
US 50 at Warrior Way	1.50	14.50	22.25
West Shore Bike Path	5.40	10.88	25.56

Table 2. Total Average Hourly Volumes for Automatic & Manual Count Locations

The locations with the highest bicycle volumes were:

- 15th Street at Eloise Ave
- US 50 at Al Tahoe Blvd
- US 50 at Lakeview Drive
- Fanny Bridge Intersection
- Pioneer Trail

The locations with the highest pedestrian volumes were:

- SR 28 between Bear & Coon Streets
- Pioneer Trail
- Fanny Bridge Intersection
- US 50 at Lakeview Drive
- SR 28 at Village

Figure 2 shows that the weekend and weekday total average hourly volumes by facility type. The highest volumes of bicycle traffic were observed near dedicated bike path facilities (15th St & Baldwin Path Trail, US 50 & Al Tahoe, and US 50 at Lakeview Drive) which indicates that these facilities attract a large number of bicyclists from all skill levels. Conversely, the lowest bicycle volumes were found in areas without separated bike facilities (SR 28 Between Bear & Coon Streets, SR 28 at Carnelian Bay, US 50 & Warrior Way). As shown in **Figure 2** Class 1/Shared-Use Path facilities generally had the highest total average hourly volumes for both weekday and weekend time periods. This indicates that this kind of facility attracts more users on average than other kinds of facilities such as sidewalks or Class 2 & 3 bike facilities.
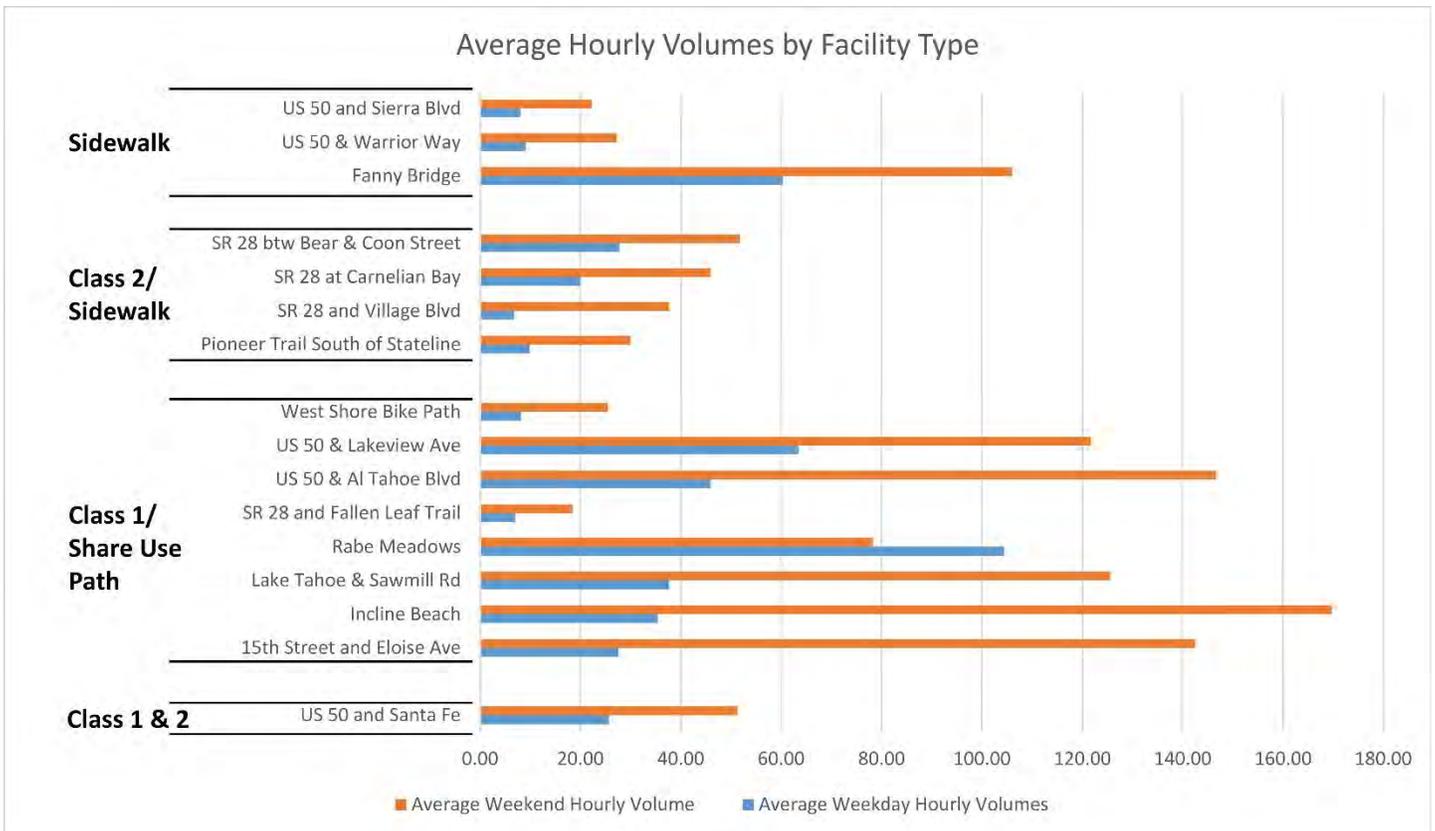

Figure 2. Total Average Hourly Volumes By Facility Type

The special event Tour De Tahoe is not believed to have affected data collected by the automatic counters. As the bicyclists who took part in that race generally ride in the road and not on the Class 1 Bike Paths which the automatic counters were monitoring, the riders were not counted by the automatic counters.

The total average hourly volumes for AM, PM, and weekend periods are shown below in **Figure 3**. This graph shows the different usage trends for each location which are most heavily used on the weekend (Fanny Bridge and Incline Beach) and those used more heavily during the week (Pioneer Trail and US 50 at Al Tahoe). This graph also shows that only one location out of all sixteen has a higher AM average hourly volume than PM average hourly volume (Incline Beach). From this graph it is clear that weekend usage is much higher than usage during the week for the majority of locations; due in large part to the high volume of tourists who visit the Lake Tahoe area on the weekends. Maps detailing the average hourly volumes for each time period are also included in the following pages (**Figures 4-6**).
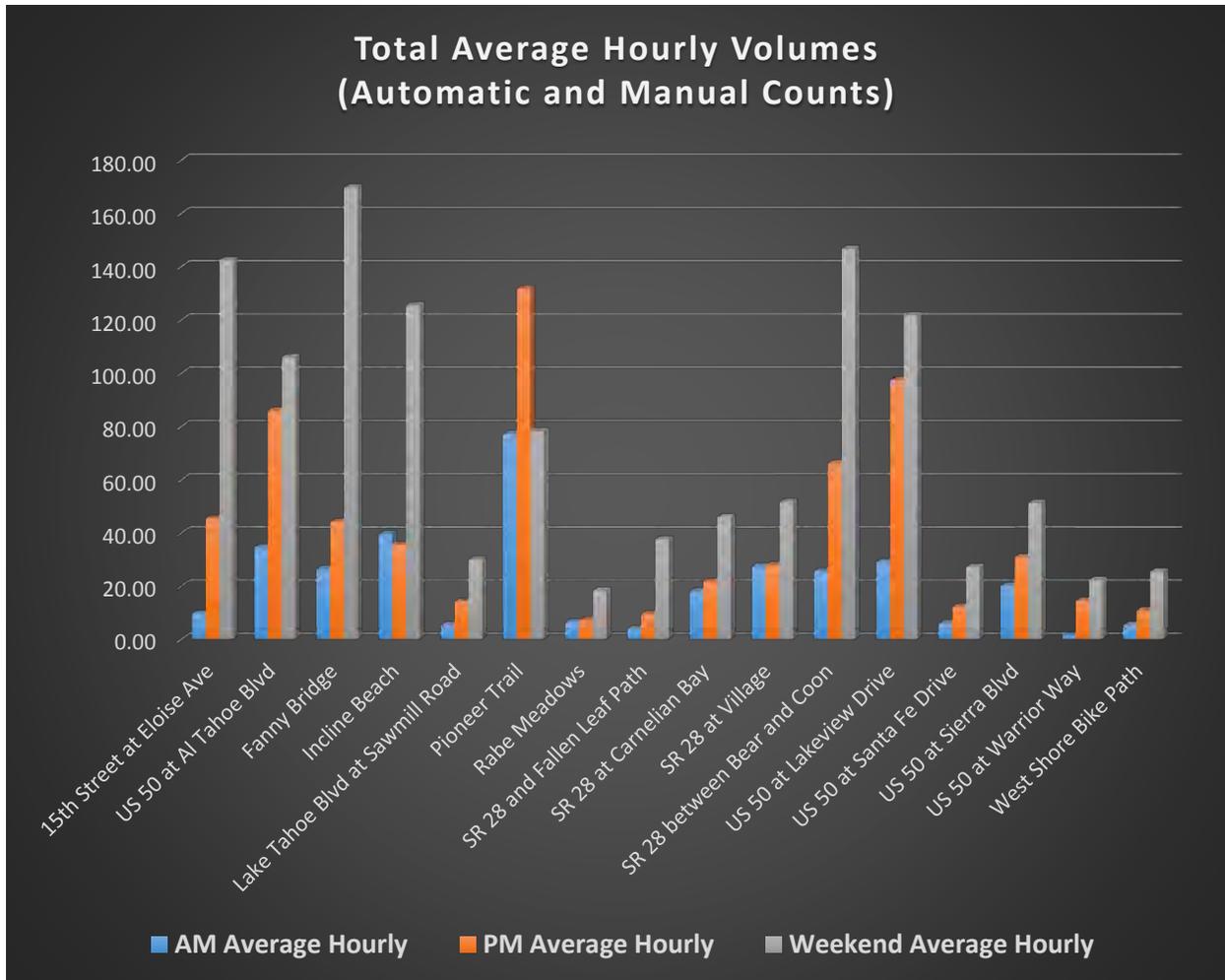
Figure 3. Total Average Hourly Volumes by Time Period

Additionally, the count data for manual and automatic counts has been extrapolated to show the average daily combined traffic (bicycles & pedestrians) using the NBPDP Extrapolation tables. These extrapolations are included in **Appendix E** for reference. These extrapolations may be revised upon the development of extrapolation factors based on annual data gathered around Lake Tahoe. As these extrapolation factors will be unique to the Lake Tahoe area they will create more accurate extrapolations.
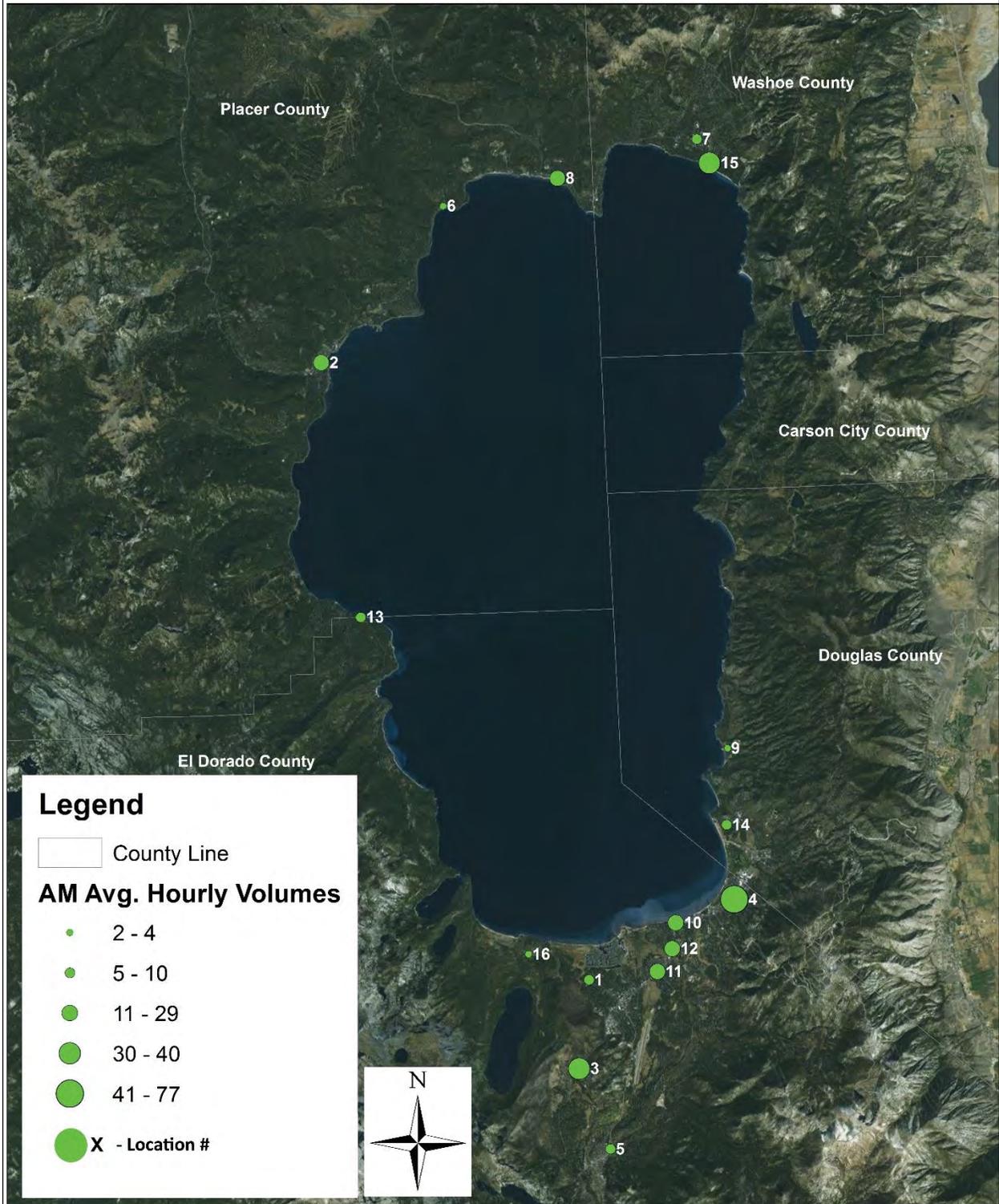
Figure 4. AM Average Hourly Volumes (Automatic & Manual Counters)
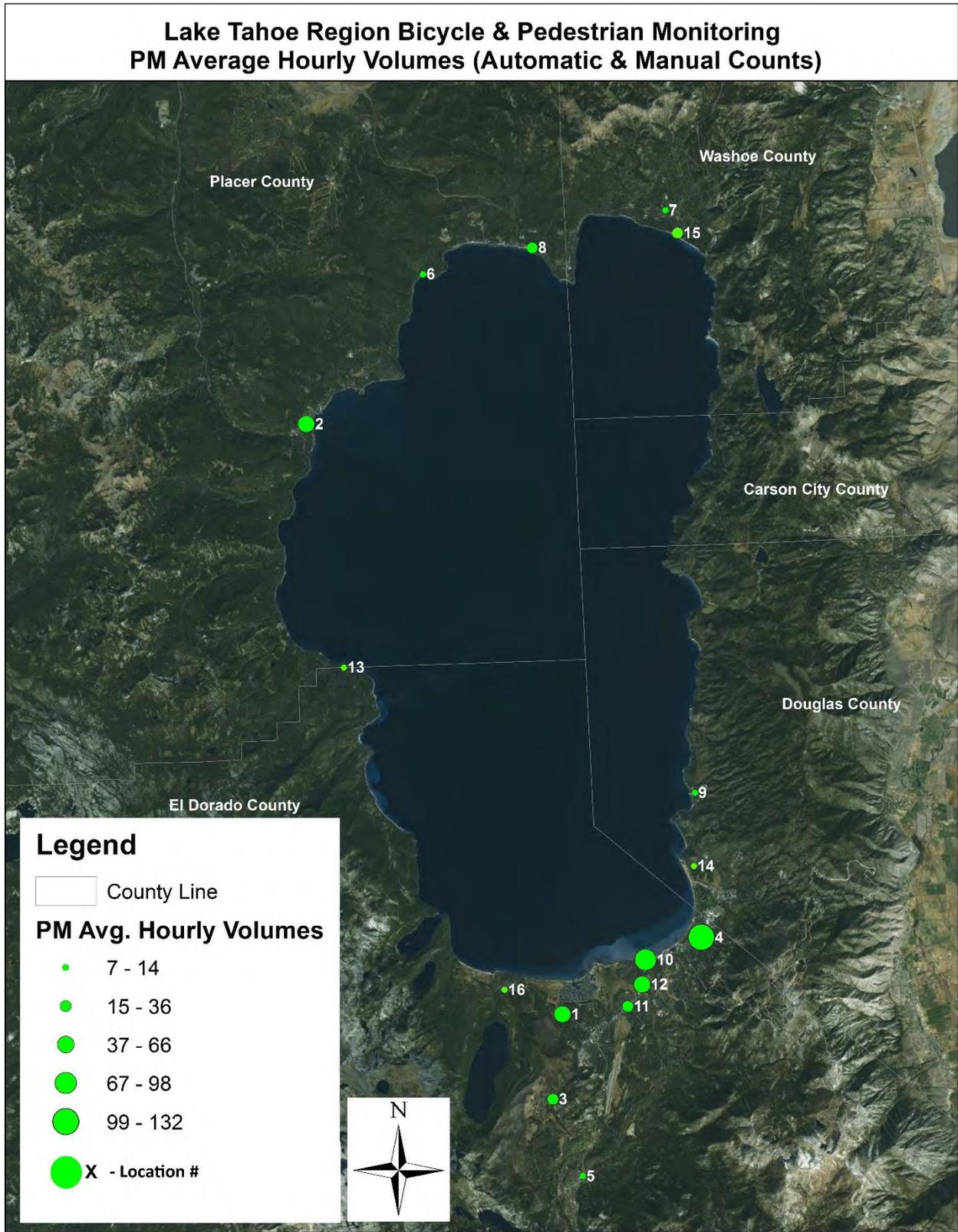
Figure 5. PM Average Hourly Volumes (Automatic & Manual Counters)
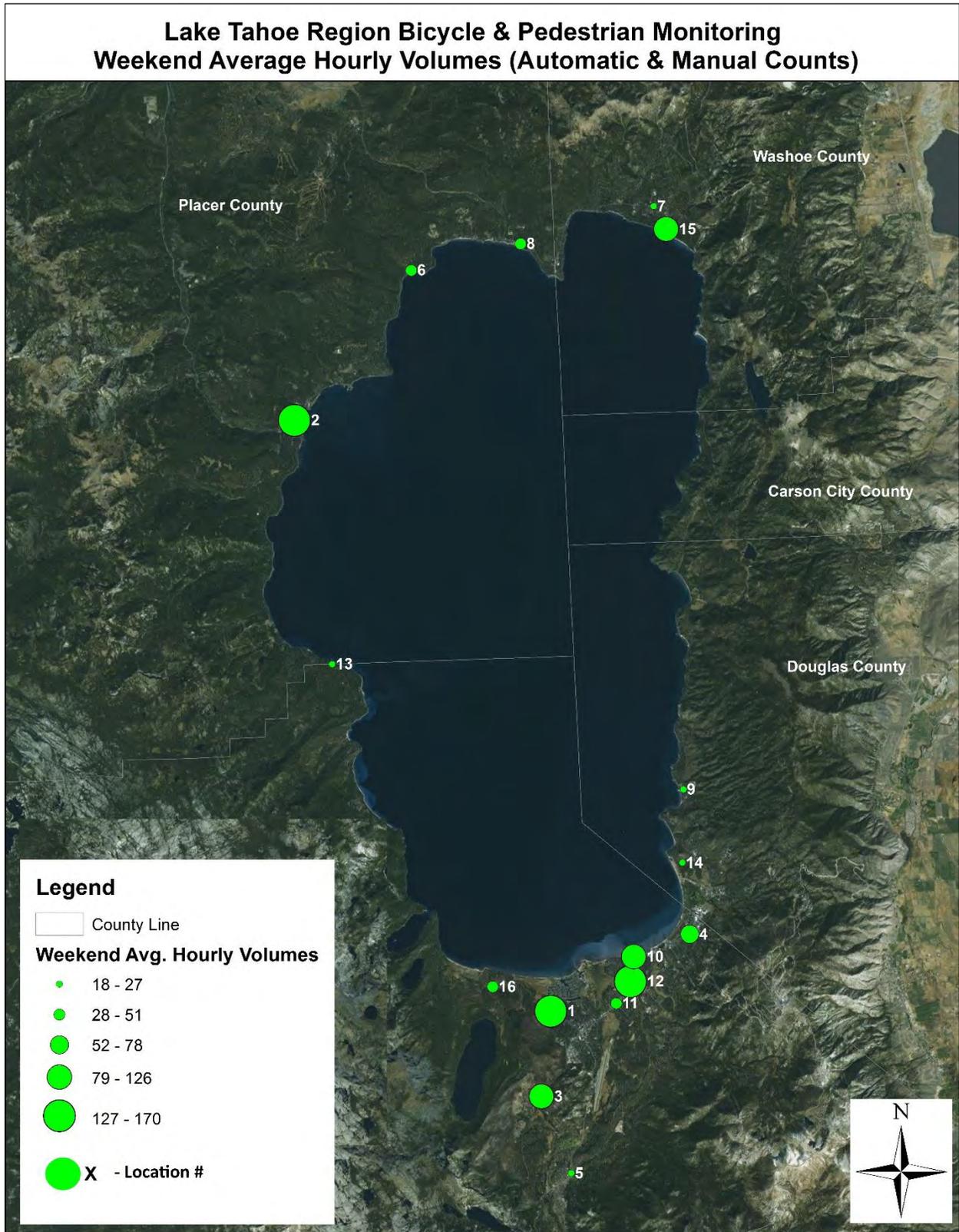
Figure 6. Weekend Average Hourly Volumes (Automatic & Manual Counters)

Manual Counts

The total average hourly volumes for each collection period (AM, PM, Weekend) have been calculated and are shown in **Table 3**. The three locations with the highest average volume in each category have been highlighted. As this table shows, the locations with the top three highest average hourly weekend volumes would fall into the category of recreational/utilitarian trips, where the locations with the highest AM and PM average hourly volumes would likely fall into the commute/school trip type.

| Locations	Average Hourly AM	Average Hourly PM	Average Hourly Weekend
15th Street at Eloise Ave	9.75	45.50	142.50
US 50 at Al Tahoe	34.75	86.00	106.00
Fanny Bridge	26.50	44.25	169.75
Lake Tahoe Blvd at Sawmill Road	5.50	14.25	30.00
Pioneer Trail	77.25	131.75	78.25
US 50 at Santa Fe Drive	6.00	12.25	27.25
SR 28 at Carnelian Bay	18.25	21.75	46.00
SR 28 at Village	27.50	28.00	51.75
SR 28 between Bear and Coon	25.75	66.25	146.75
US 50 at Lakeview Drive	29.25	97.50	121.75
US 50 at Sierra Blvd	20.25	31.00	51.25
US 50 at Warrior Way	1.50	14.50	22.25

Table 3. Total Average Hourly Volume by Time Period

Mode Comparison

Each location had a unique mix of pedestrians and bicyclists due to the surrounding facilities, land uses, and demographics. **Figure 7** (page 15) offers a visual comparison of pedestrian and bicyclist totals between August and September at the manual count locations. **Figures 8 & 9** show the modal mix between bicyclists and pedestrians at each location for both Summer and Fall manual count efforts. A more detailed accounting for each location is shown in **Appendix B**.

The locations selected for the manual counts vary in their mode split between bicycles and pedestrians significantly. Locations such as 15th Street at Eloise Ave and Lake Tahoe Boulevard at Sawmill Road had far more bicyclists than pedestrians and locations such as SR 28 at Village Blvd and SR 28 between Bear and Coon Streets had many more pedestrians than bicyclists. With this in mind, the twelve manual locations have been analyzed based on Average Pedestrian Hourly Volume[2] and Average Bicyclist Hourly Volume[3] (**Table 4**). The three locations with the highest average volume in each category have been

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[2] Average Pedestrian Hourly Volume = (Total Pedestrian Volume Collected/Total Number of Hours Collected)
[3] Average Bicycle Hourly Volume = (Total Bicyclist Volume Collected/Total Number of Hours Collected)

highlighted. Additionally, the total average hourly volumes at each manual and automatic location are shown proportionally in **Figure 6** (page 8).

Locations	Average Pedestrian Hourly Volume	Average Bicyclist Hourly Volume
15th Street at Baldwin Path	6.50	59.42
Al Tahoe at US 50	23.42	52.17
Fanny Bridge	49.42	30.75
Lake Tahoe Blvd at Sawmill Road	3.58	13.00
Pioneer Trail	66.33	29.42
US 50 at Santa Fe Drive	5.83	13.00
SR 28 at Carnelian Bay	17.17	11.50
SR 28 at Village	28.08	7.67
SR 28 between Bear and Coon	67.33	12.25
US 50 at Lakeview Drive	35.08	47.75
US 50 at Sierra Blvd	13.67	20.50
US 50 at Warrior Way	4.92	7.83

Table 4. Average Hourly Volume by Mode

Gender

Data on gender of users was collected during the manual counts. This data, shown in **Table 5**, is approximate and is intended as a reference only. The locations with more pedestrians than bicyclists generally had a more even gender split. Conversely, locations with more bicyclists than pedestrians were found to generally have a higher percentage of male users.

Location	Male	Female
15th Street at Eloise Ave	62.2	37.8
US 50 at Al Tahoe	62.0	38.0
Fanny Bridge	57.8	42.2
Lake Tahoe Blvd at Sawmill Road	62.8	39.2
Pioneer Trail	59.8	40.2
US 50 at Santa Fe Drive	70.6	29.4
SR 28 at Carnelian Bay	62.2	37.8
SR 28 at Village	57.2	42.8
SR 28 between Bear and Coon	51.2	48.8
US 50 at Lakeview Drive	58.0	42.0
US 50 at Sierra Blvd	65.5	34.5
US 50 at Warrior Way	71.8	28.2

*Table 5. Approximate Gender Mix at Manual Count Locations*
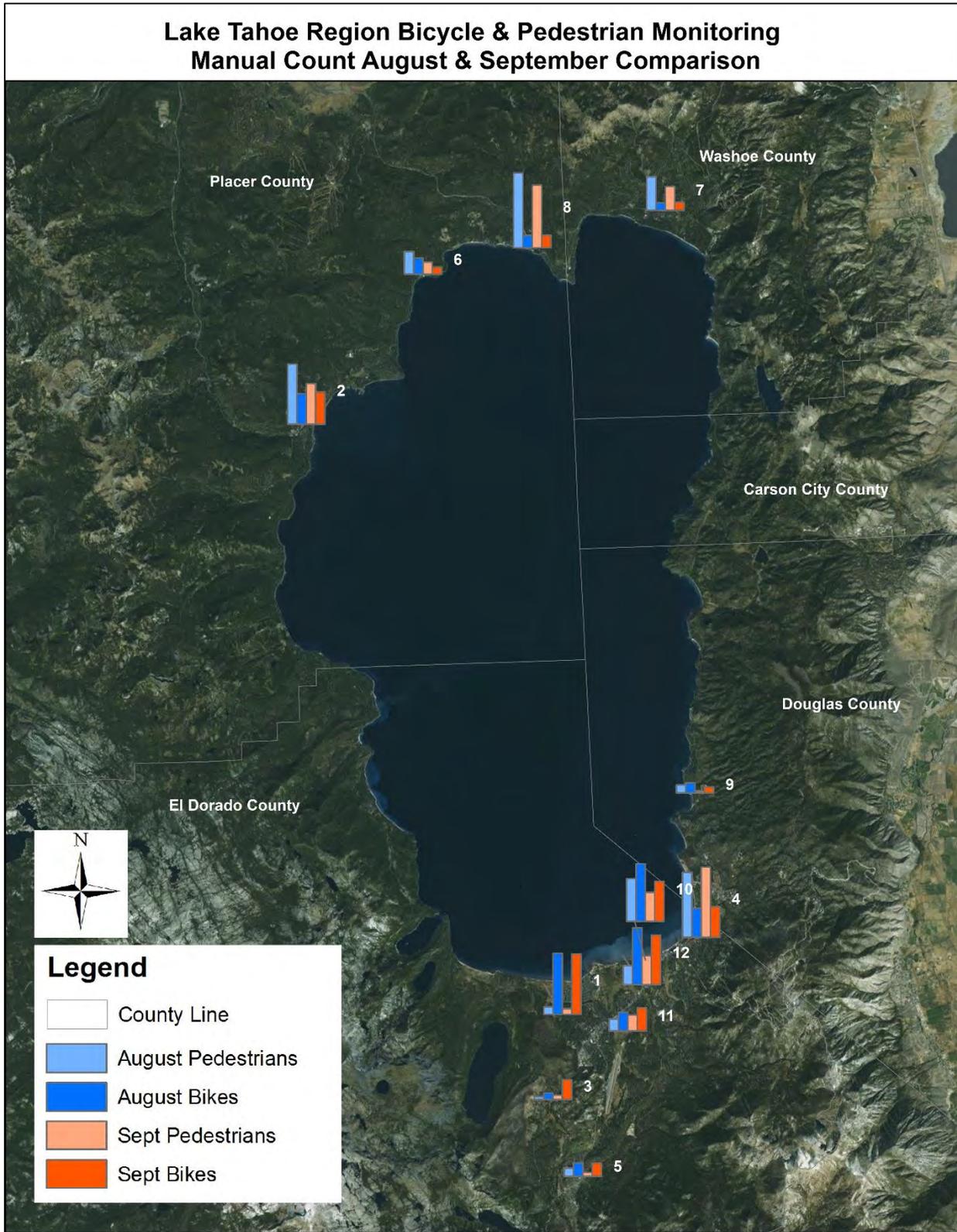
Figure 7. Manual Count August & September Modal Comparison
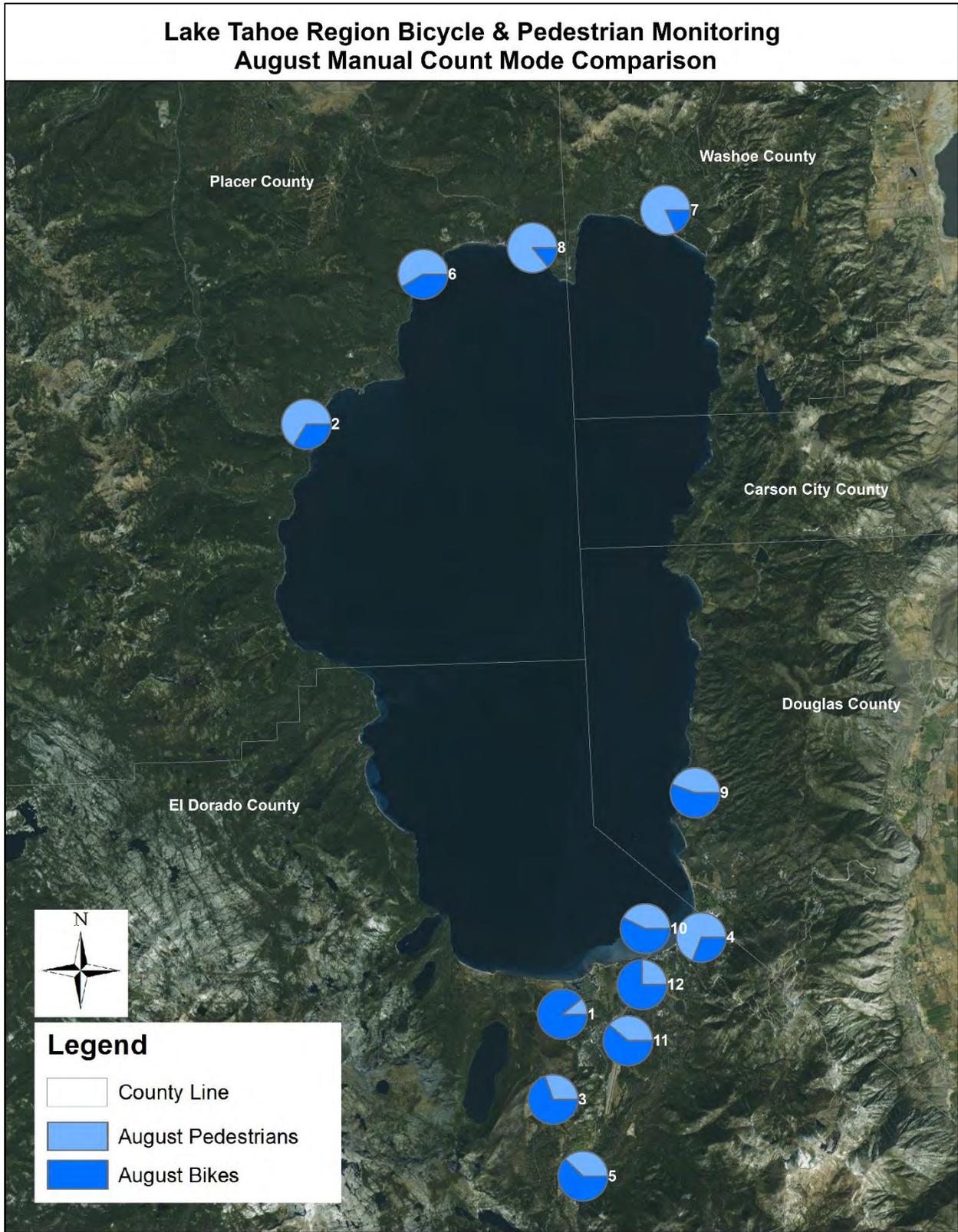
*Figure 8. August Manual Count Mode Comparison*
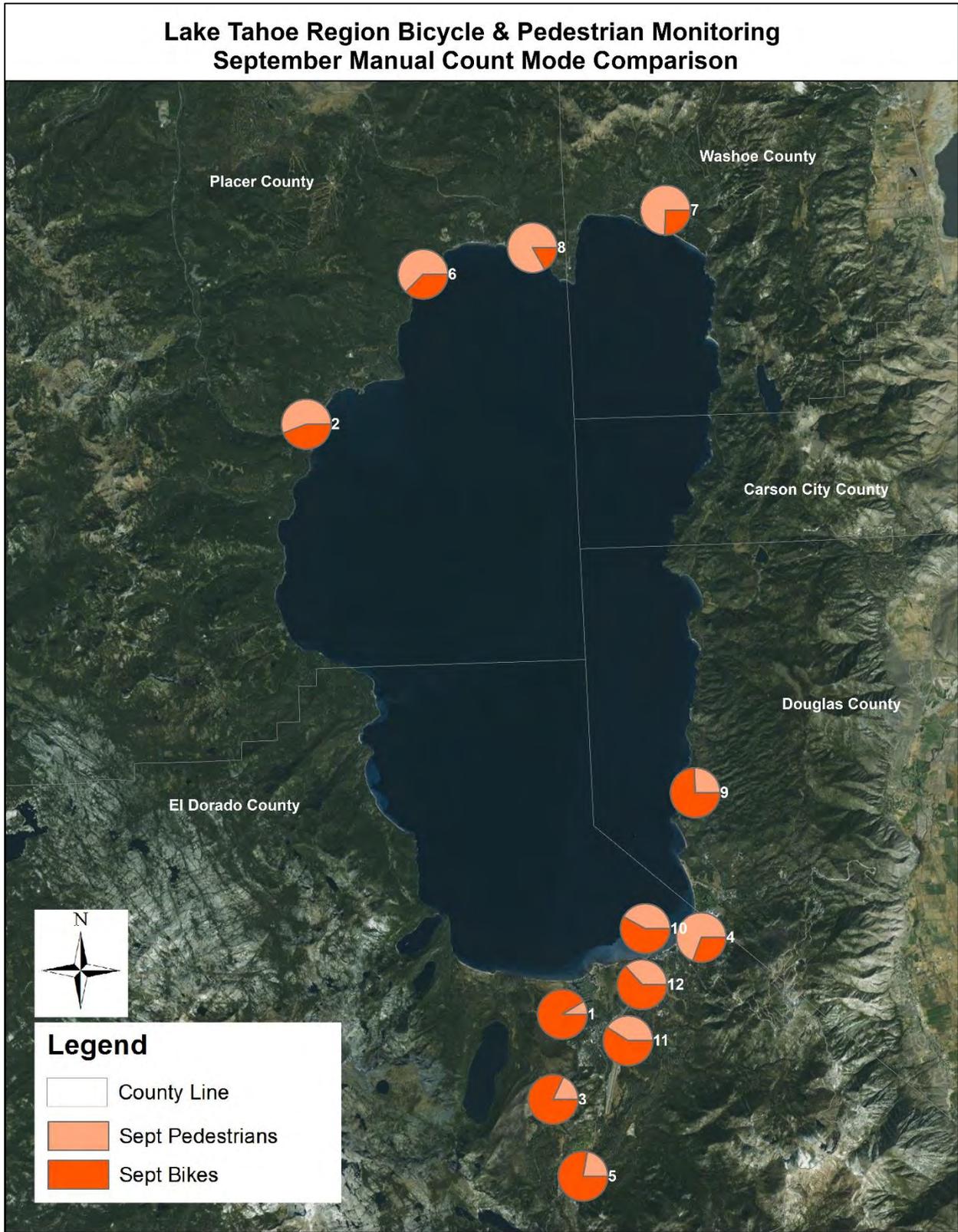
Figure 9. September Manual Count Mode Comparison

Automatic Counts

The automatic count effort during the Summer and Fall count cycles was delayed by the need for permits from Caltrans. This resulted in data not being collected at the West Shore Bike Path location until the end of August 2015. However, despite this significant delay, nearly a full month of data was gathered at this location which allows for the identification of daily and weekly trends.

For comparison purposes, the average hourly weekday and weekend volumes for the automatic counters have been calculated using the same peak hours which were used during the manual counts; weekday 7am-9am & 4pm – 6pm, weekend 12pm – 2pm. The volumes collected by the auto counters during these time periods were averaged and divided by the number of hours they represent (2). In this way, direct comparisons to the manual counters can be made.

The location with the highest volume was Incline Beach. **Table 6** shows that this location experienced a total average hourly weekday volume of 35.38 and a total average hourly weekend volume of 169.75. The majority of this volume is attributed to beach-goers as they travel along the path to reach Incline Beach from their parked cars. The second busiest location based on average hourly volumes was the Rabe Meadows location. This was the only location to have a higher average weekday hourly volume than average weekend average hourly volume. This may indicate that this facility is utilized more heavily by locals during the week that the other facilities monitored by the automatic counter locations.

Location	Facility Type	Average Weekday Hourly Volumes	Average Weekend Hourly Volume
Incline Beach	Class 1/Shared Use	35.38	169.75
Rabe Meadows	Class 1/Shared Use	104.50	78.25
West Shore Bike Path	Class 1/Shared Use	8.14	25.56
SR 28 and Fallen Leaf Trail	Class 1/Shared Use	6.92	18.37

Table 6. Average Weekday and Weekend Hourly Volumes by Facility Type

Figure 10 (next page), shows the total average volume per hour for both weekend and weekday periods combined. The Incline Beach location was by far the busiest throughout each hour of the day, which is evident in the figure. Incline Beach also had the highest average hour (combined weekday and weekend counts) of 143.6. The peak period for each location was in the middle of the day, which indicates these locations are most commonly used for recreational purposes. The SR 89 at Fallen Leaf Path location also had a significant peak in the middle of the day which shows that a vast majority of the use at this facility occurs between 10 am and 3 pm.

Hourly Averages
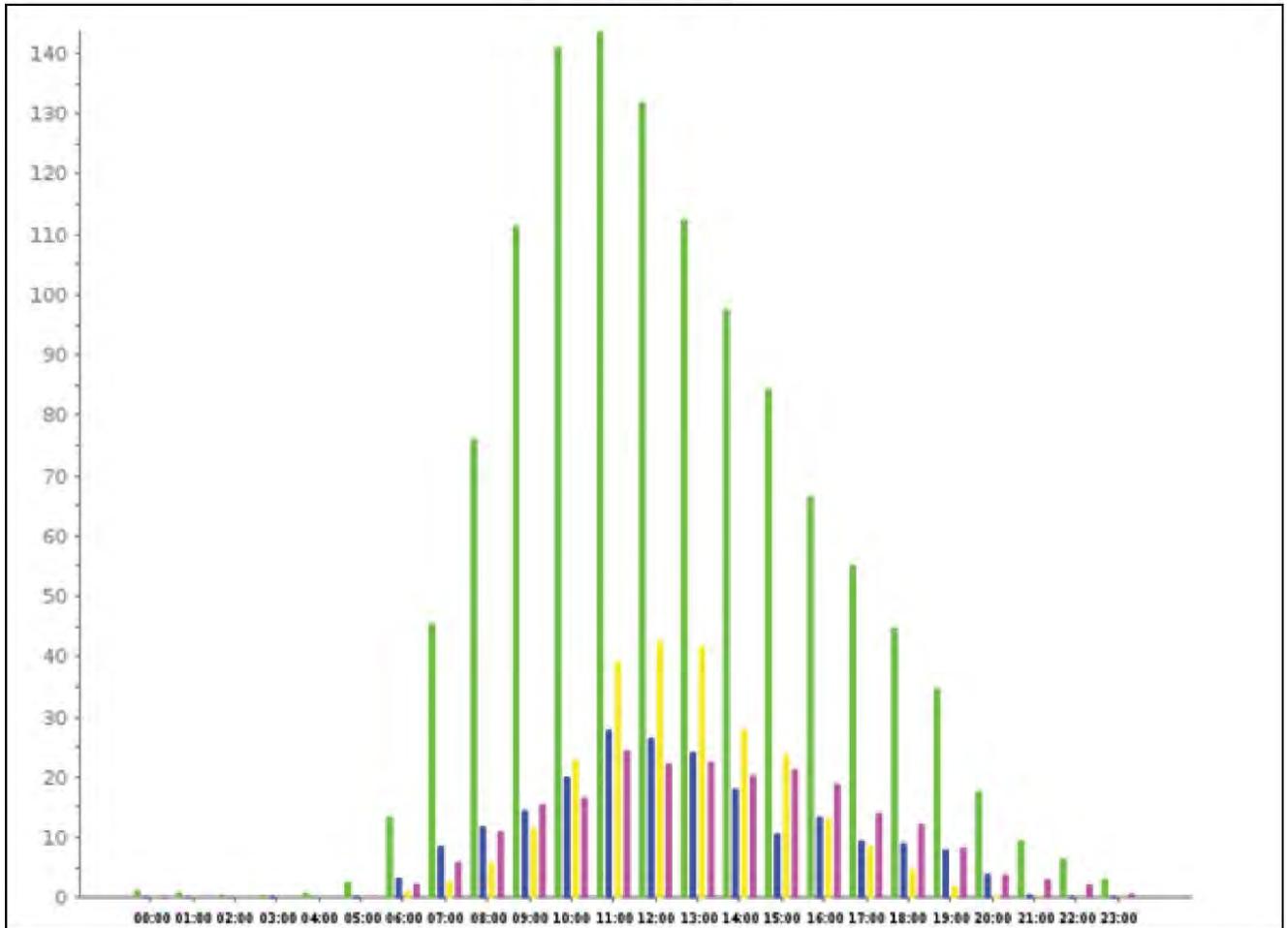
Site Name		Average	Median	Min	Max
Incline Beach[A]		50.0	39.7	0.4	143.6
Rabe Meadows & Elks Point Rd[A]		8.8	8.3	0.0	27.8
SR 89 & Fallen Leaf Path[A]		10.4	2.4	0.0	42.6
West Shore Bike Path[A]		9.4	7.1	0.1	24.5

A - Adjustment Applied

Figure 10. Automatic Counter Hourly Averages

Comparing the daily total at each location shows that the Incline Beach location experienced the highest average daily volume of 1,208.6. This location also had the largest volume recorded in a single day of 2,229.00. This large volume was recorded on a Saturday, which was the busiest day of the week for all automatic count locations. The other three locations all experienced an average daily total volume between 211.8 and 251.9 as shown in **Figure 11** below. It is important to point out that the large spike in activity at all locations in the beginning of September was Labor Day weekend. Furthermore, the noticeable spikes in activity at the Incline Beach location represent the weekend, which was busiest time of the week for all locations. The SR 89 at Fallen Leaf Path location experienced two full days with almost zero activity in mid-September due to construction which closed the portion of the path where the counter was located.

Site Name		Average	Min	Max
Incline Beach[A]		1,208.6	398.0	2,229.0
Rabe Meadows & Elks Point Rd[A]		211.8	78.0	426.0
SR 89 & Fallen Leaf Path[A]		251.9	1.0	568.0
West Shore Bike Path[A]		228.0	41.0	709.0
	A - Adjustment Applied			
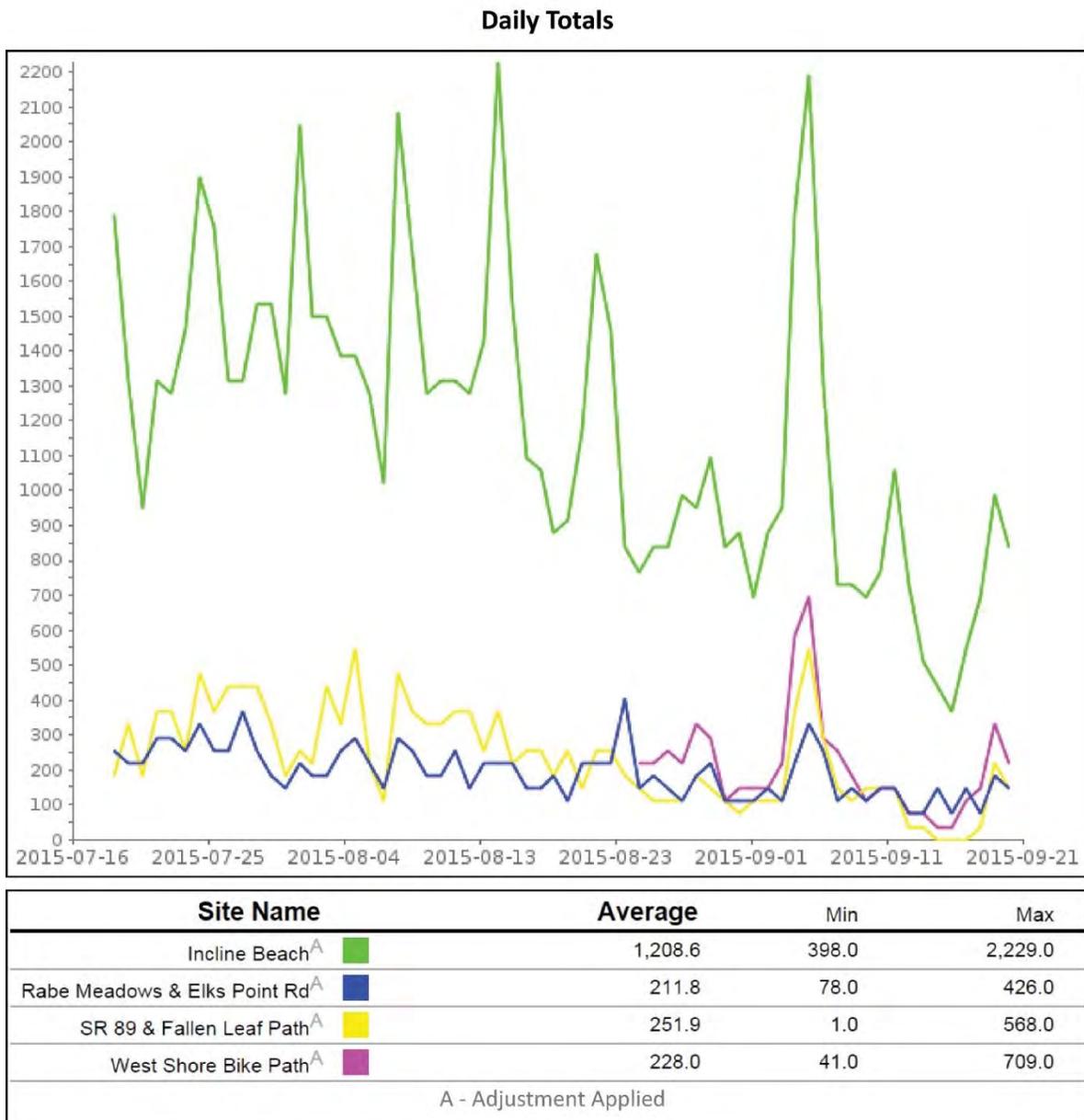
Figure 11. Automatic Counter Daily Totals

The day with the highest level of activity across all locations was Saturday, with Sunday being the second busiest day of the week. **Figure 12** indicates that the midweek volumes were significantly lower compared to the weekend volumes at most locations. This again illustrates that these locations are generally used for recreational purposes and experience much higher usage during the weekend. Rabe Meadows had more constant usage throughout the week compared to the other sites.

Daily Averages
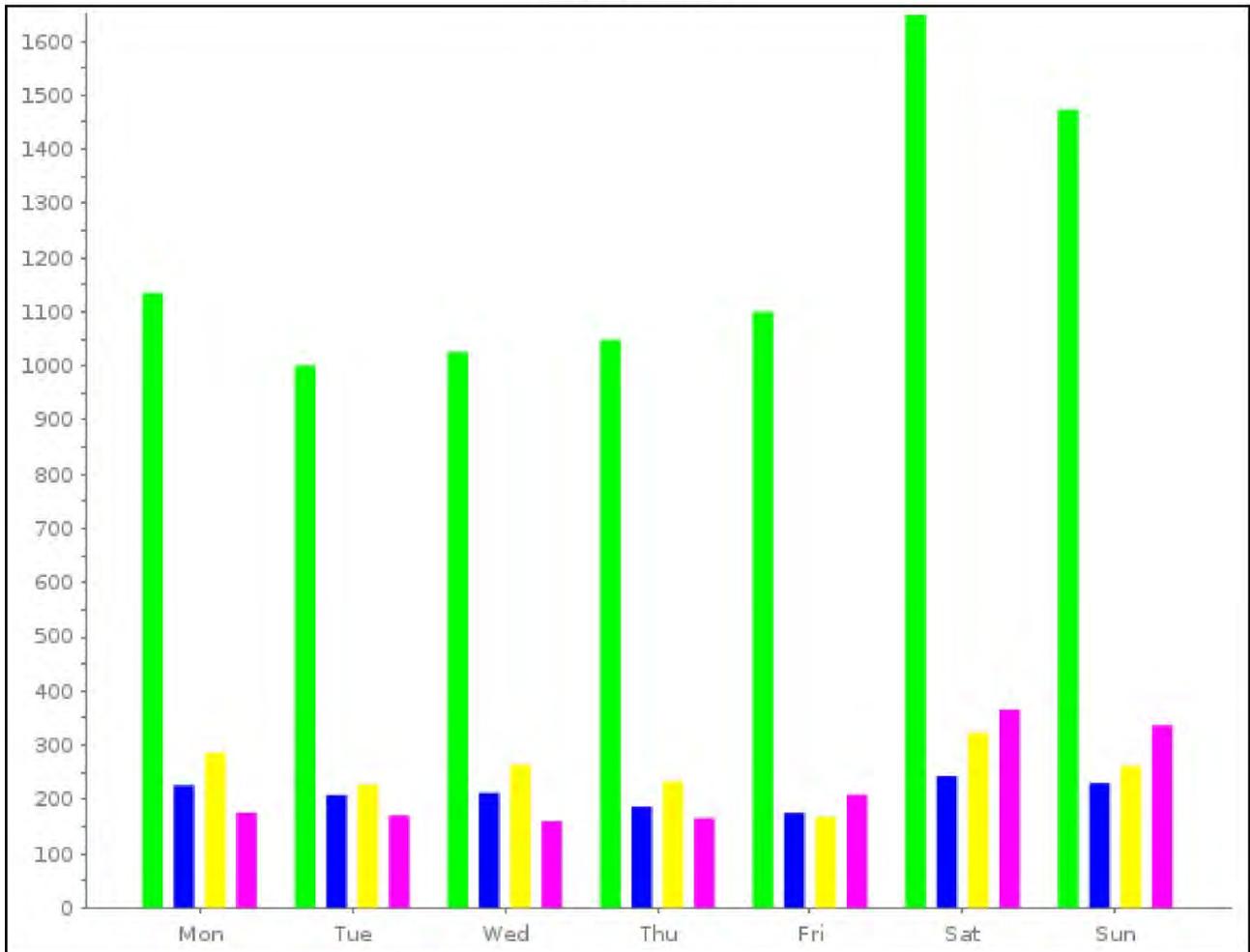
site name		Mon	Tue	Wed	Thu	Fri	Sat	Sun
Incline Beach[A]	(green)	1,134.9	1,001.1	1,025.7	1,048.1	1,099.8	1,648.0	1,473.2
Rabe Meadows & Elks Point Rd[A]	(blue)	225.8	208.0	212.2	186.7	175.0	242.8	230.2
SR 89 & Fallen Leaf Path[A]	(yellow)	286.1	226.6	263.9	233.3	167.6	323.0	261.6
West Shore Bike Path[A]	(magenta)	175.3	170.5	159.8	165.5	208.8	366.0	337.0
Daily averages		455.5	401.5	415.4	408.4	412.8	644.9	575.5
A - Adjustment Applied								

Figure 12. Automatic Counter Daily Averages

Historical Comparisons

Many of the locations included in the Summer and Fall data collection cycles did not have available historical intersection turning movement count comparisons within the TRPA Bicycle and Pedestrian Count Database. However, a total of six locations counted during 2015 have data which can be used for historical comparisons.

US 50 at Al Tahoe

Two previous counts were conducted at this location in October and November of 2014. Due to the fact that the previous counts were conducted during the winter months, it is difficult to infer whether usage has increased or decreased. The length of the counts conducted in 2014 also varies from 2 to 5 hours, which makes a direct comparison on the basis of average hourly volume difficult. The average hourly volumes were calculated by dividing the total volume (bicycles & pedestrians) recorded by the number of hours recorded. Data in the database for some previous counts does not include the breakdown for each hour collected; therefore it is difficult to develop a more accurate historical comparison for this location.

US 50 at Al Tahoe Weekday AM (Total Average Hourly Volume)
10.2.2014: 38.8; 11.6.2014: 16.7; 8.25.2015: 35; 9.24.2015: 34.5

US 50 at Al Tahoe Weekday PM (Total Average Hourly Volume)
10.2.2014: 59.5; 11.6.2014: 36.3; 8.25.2015: 85; 9.24.2015: 87
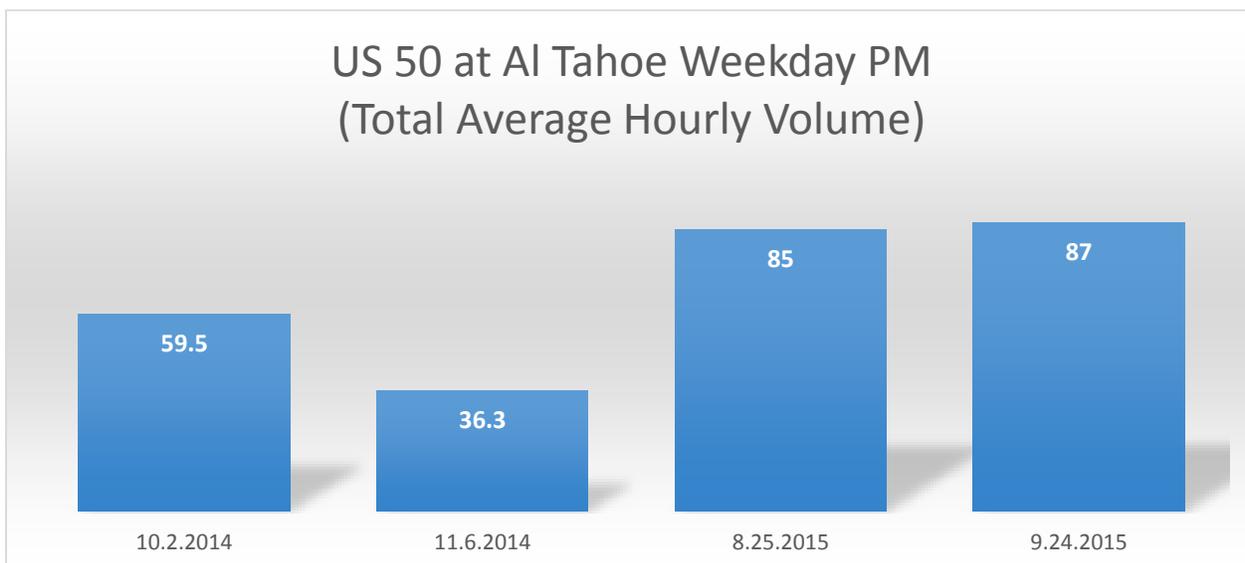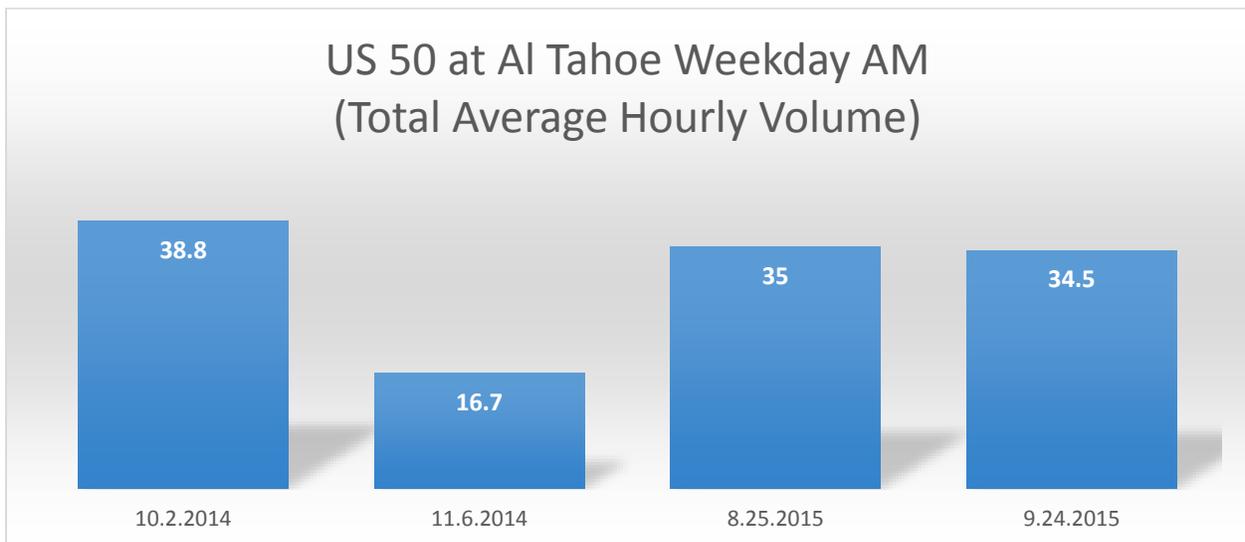
US 50 at Lakeview Drive

Manual counts were conducted at this location during both a weekday and a weekend in August of 2001. The weekday count was only conducted during the PM peak period at this location and due to this, a historical comparison is not possible for AM total average hourly volume data at this time. With the previous counts being conducted during the month of August, a strong comparison can be made between the historical data and the data collected during the 2015 August collection cycle. Total average hourly volumes were calculated by dividing the total volume (bicycles & pedestrians) recorded by the number of hours collected. Volumes for this comparison are all from the same time periods and use the same number of hours (2) so as to ensure a direct comparison. The total average hourly volumes were higher in 2015 than in 2001 during the month of August. Both the August 2001 and 2015 total average hourly volumes are higher than the September 2015 volumes in both the PM and weekend periods. This is likely due to the change in season and the general decline in tourism activity in September compared to August.

US 50 & Lakeview Drive Weekday PM
(Total Average Hourly Volume)

8.2001	8.25.2015	9.29.2015
92.5	104.5	90.5

US 50 & Lakeview Drive Weekend
(Total Average Hourly)

8.2001	8.29.2015	9.26.2015
135	154.5	89
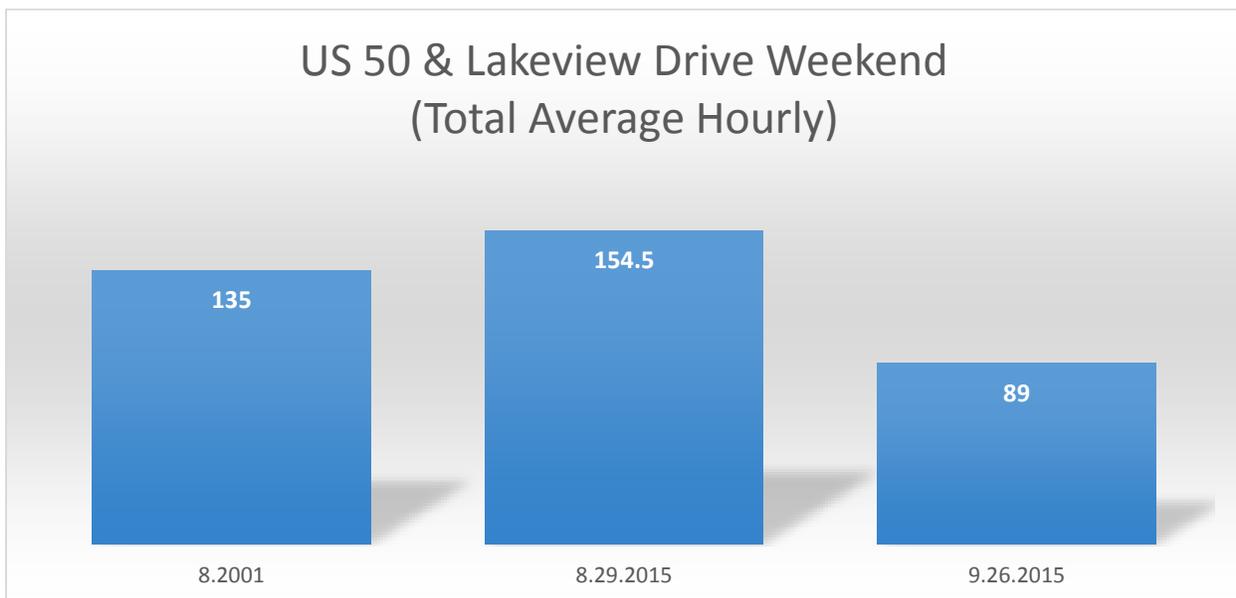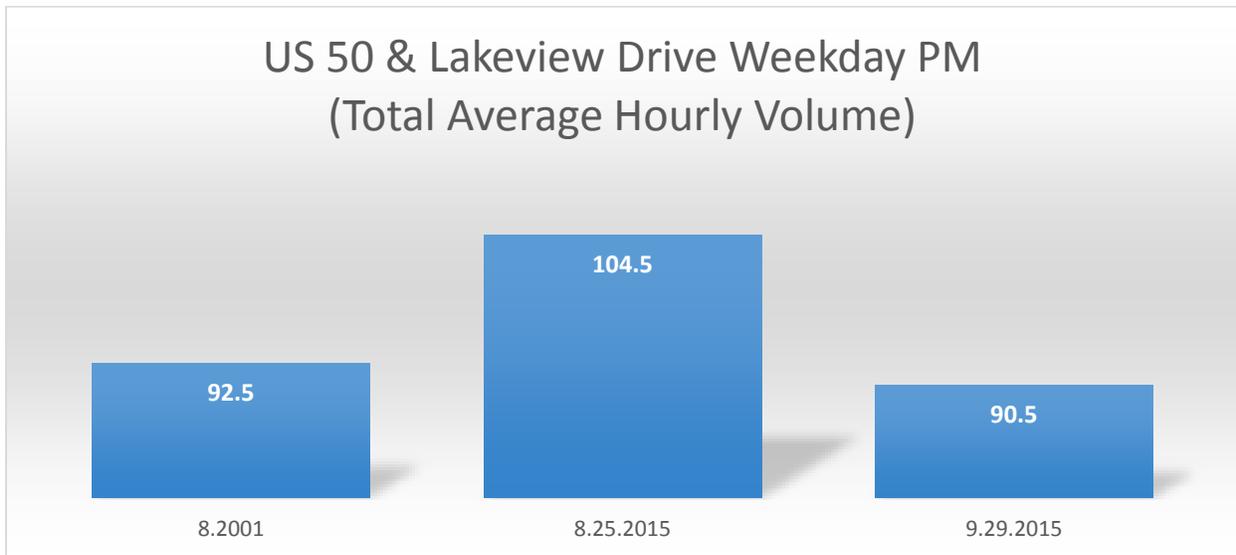
Kaspian

This location is monitored by TCPUD and is located on the West Shore Trail at the USFS's Kaspian Picnic Facility. This location has been monitored in 1994, 2006, 2008, 2014, and 2015. As shown in the time of day graph below, this location generally has a peak hour between 11 am – 12 pm. The data from the August, 2006 count is significantly higher than the other counts. This dataset may be a statistical outlier and should be compared to future counts at this location. It was not deemed appropriate at this time to exclude the August 2006 dataset from the comparison. Based on the graph below, usage has stayed relatively consistent since 1994 at this location, excluding the high volume recorded in August, 2006.
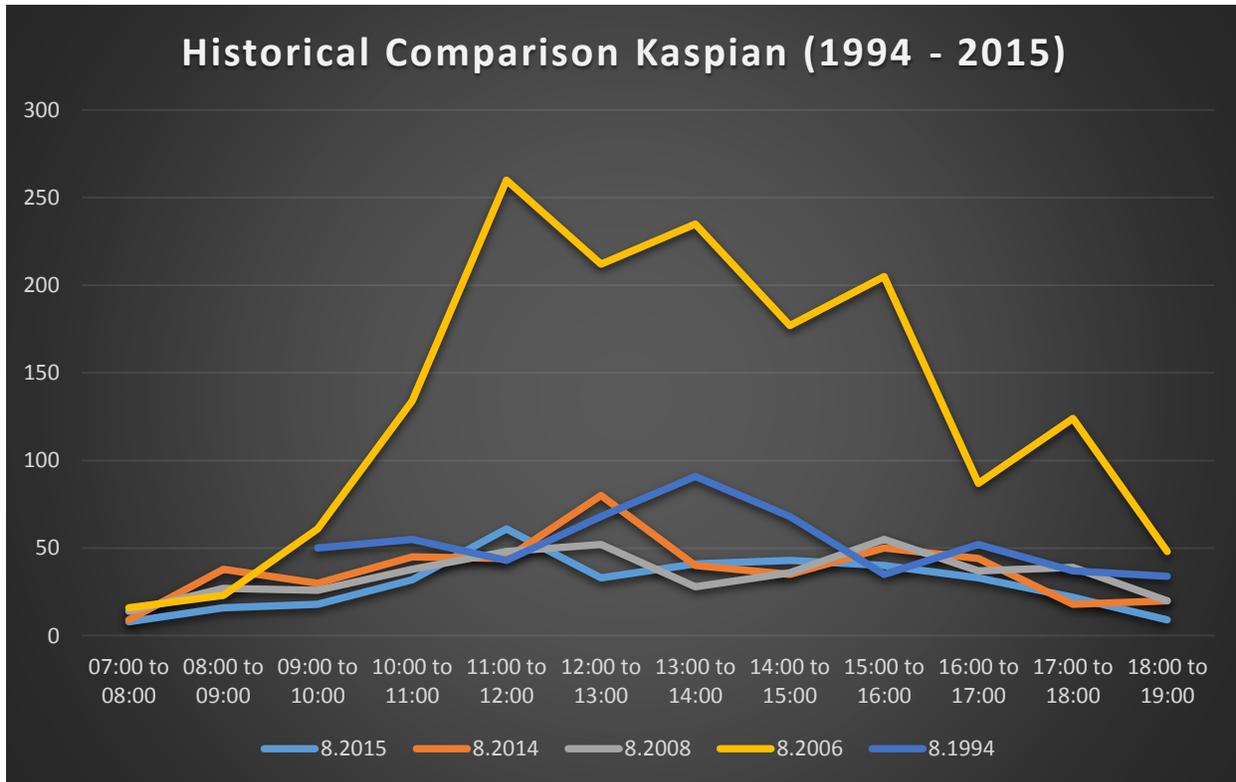
64 Acre

This location has been monitored by TCPUD intermittently since 1994 and is located on TCPUD's Truckee River Trail at the 64-Acre Tract, approximately 200 yards north of the vehicle entrance at the intersection of the West Shore Trail and Truckee River Trail. Similar to the Kaspian location, the 64 Acre location has a relatively normal distribution of usage with the average peak hour being between 11 am – 12 pm. As the graph below shows, there are two peak hours with one between 11 am – 12 pm and the other between 2 pm – 3 pm. The data collected in 2015 does not indicate an increase or decrease in overall usage at this time. The August 2005, 2006, and 1994 counts are far below the other datasets in terms of volume. It is unclear at this time whether these counts were affected by construction, adverse weather, or other factors.

Historical Comparison 64-Acres (1994 - 2015)
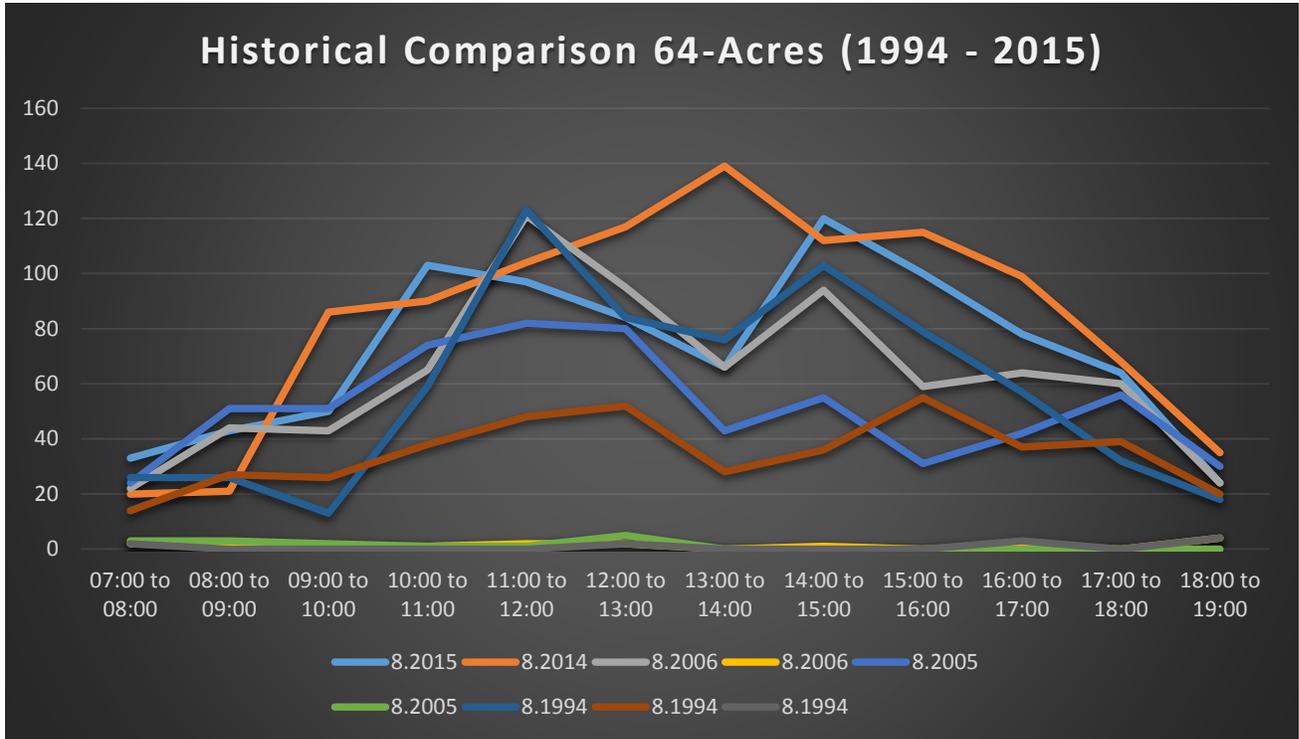
Lakeside Trail

The Lakeside Trail location has been monitored by TCPUD since 2014 and is located at the Lakeside Trail just west of Bliss Court. The graph below indicates that the AM hours have similar volumes, but divergent volumes in the PM hours. This location should continue to be monitored in the future as more data will help to bring long-term trends to the forefront. At this time, usage in PM hours appears to have decreased at this location. More data is required to determine whether this trend will continue or if the mild decrease in activity identified from the August 2015 count is an outlier.

Historical Comparison Lakeside Trail
(2014 - 2015)
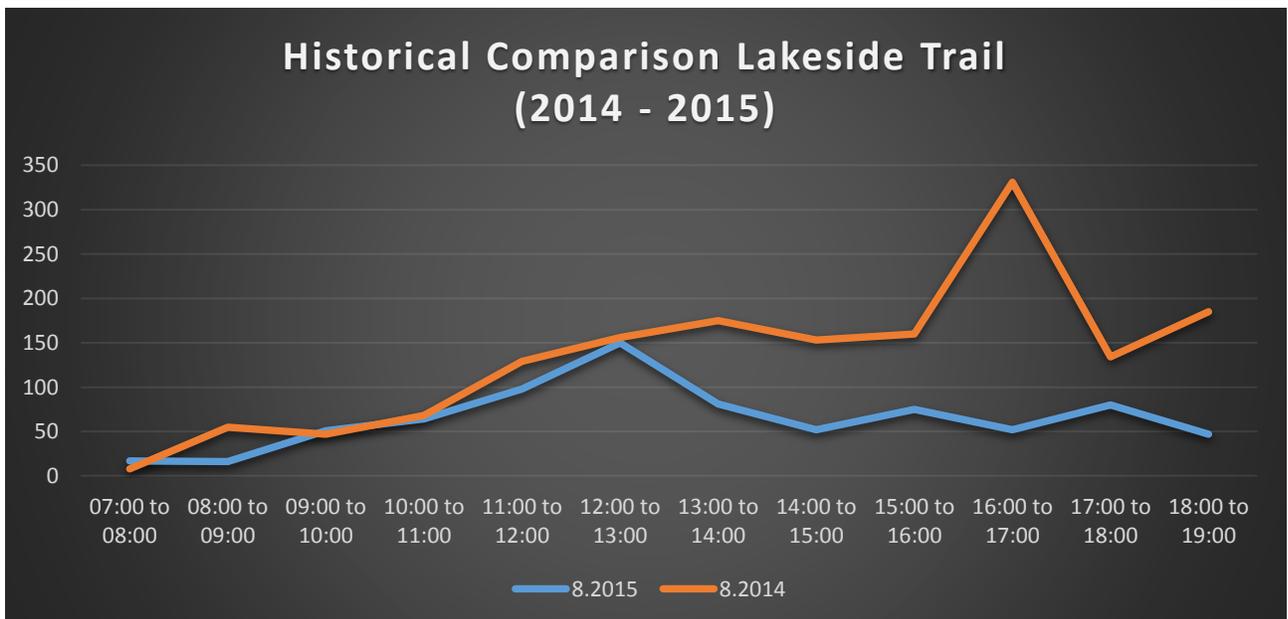
Rabe Meadows

The Rabe Meadows area is monitored by Douglas County and TRPA/TMPO. This location has been monitored consistently since 2013 and is prime for historical comparisons. The recently constructed Round Hill Pines shared use path connects to Rabe Meadows at the Elks Point Intersection. TRPA/TMPO placed an automatic counter here to understand current use of the new section of path, measuring general knowledge of path existence. This location, in comparison to Rabe Meadows Counts, also illustrates the destination of users to either Round Hill Pines Beach, or Nevada Beach. As shown in the graph below, volumes collected by TRPA/TMPO for the Roundhill Pines section of path are much lower than volumes collected by Douglas County. This indicates many users' destination is Nevada Beach, and/or visitors may not be aware of the new path connection to Round Hill Pines. The data shown in this historical comparison is between July 1st and September 30th and spans from 2013 to 2015. July and August counts are not available from Douglas County because the counter was vandalized and inoperable. The large spikes in activity correspond to the July 4th weekend and the Labor Day weekend (September 6th).

Historical Comparison Rabe Meadows (2013 - 2015)
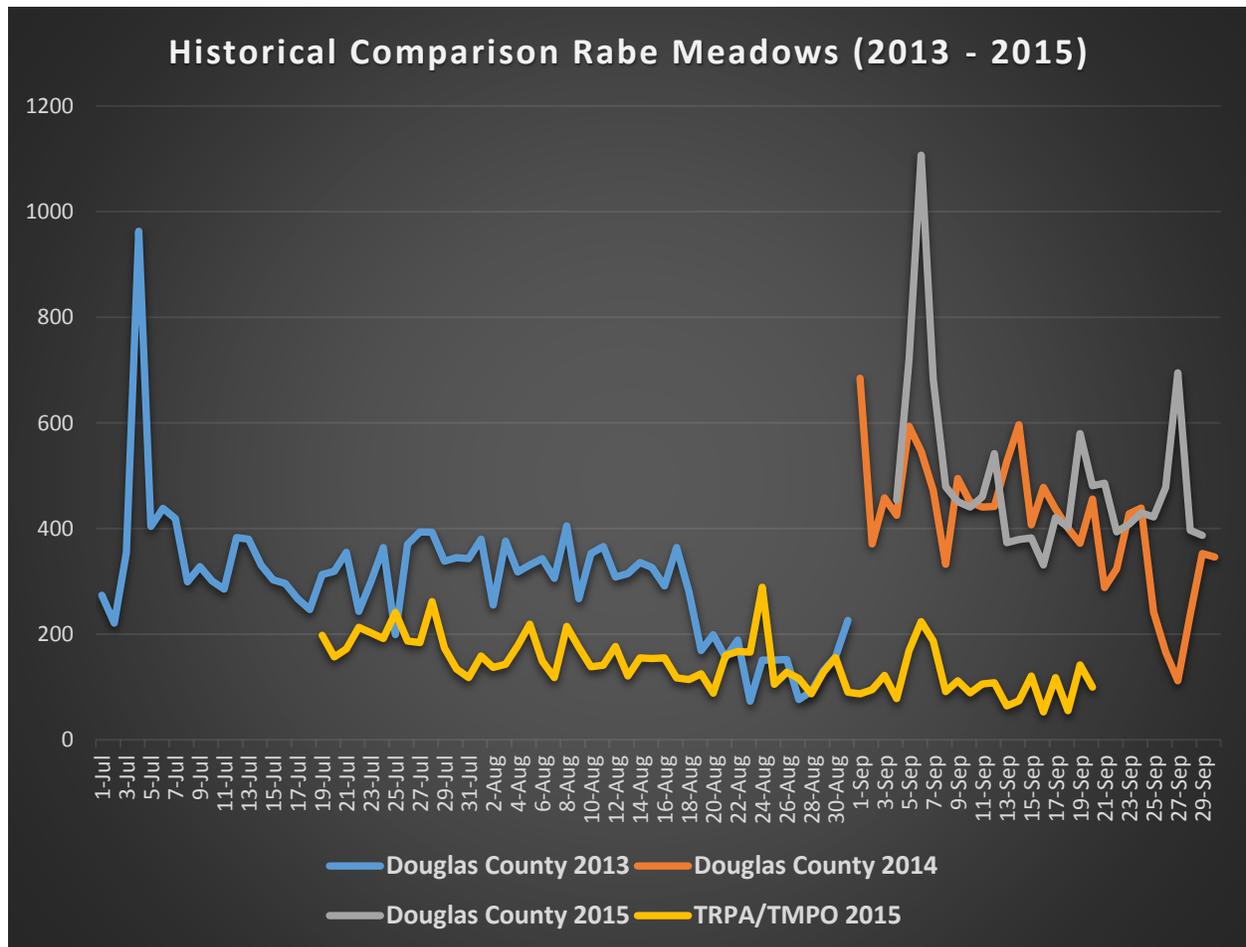
Recommendations

In order to continue to improve on the collection and analysis of bicycle and pedestrian data, the following strategies should be incorporated into future cycles of the data collection program.

The largest hurdle to the timely collection of data was the process of obtaining permits from Caltrans. In future efforts, a "Double Permit" (Section 501.14 of the Caltrans Encroachment Permit Manual) should be obtained from Caltrans well in advance of the data collection dates; under Section 201.2A, the permit may be exempted from fees. Obtaining a "Double Permit" will allow future phases to begin on schedule and without unnecessarily encroaching within the Caltrans Right of Way.

The locations selected for the automatic counters during this cycle were largely recreational in nature. Since one of the goals of the data collection program is to develop unique extrapolation factors for the Lake Tahoe area, it will be beneficial to collect data at more commuter oriented facilities. Because the recreational and commuter oriented facilities have such different usage trends it may also be advantageous to collect data from automatic counters at both kinds of facilities (recreational & commuter oriented) in order to develop a unique extrapolation factor for each kind of facility.

Automatic counters used for this effort could be placed in the field for extended periods of time. It would be beneficial to place automatic counters in the field for as close to a full year as possible in order to gather as much data as possible. As more data is gathered throughout the year, a more accurate extrapolation factor can be developed for the Lake Tahoe area.

Additional Data

The Tahoe City Public Utility District conducted an annual Bike Trail Survey in 2015. This effort conducted in-person surveys on the Truckee River Bike trail, North Shore Bike trail, West Shore Bike Trail, and the Bike Trail at 64 acres. Additionally, usage counts were also conducted along these bike paths during this effort. The full report can be found in **Appendix F**.

Summary

The 2015 Summer and Fall data collection cycles for the Lake Tahoe Region Bicycle and Pedestrian Monitoring Protocol successfully added data for 12 manual sites and 4 automatic sites to the TRPA Bicycle and Pedestrian Count Database. This information will continue to help inform TRPA about facility usage, seasonal trends, weekly trends, and provide insight regarding the benefit of current and future bicycle and pedestrian infrastructure projects. As the TRPA Bicycle and Pedestrian Count Database continues to increase and data is collected at additional locations through various portions of the year, TRPA will be better suited to identify trends and analyze the value of pedestrian and bicycle infrastructure projects.

This is the first round of data collection to utilize the guidelines set out in the Protocol in June 2015. Gathering data over several years using a consistent format will help track the increases and/or reductions in users by season, and long term usage trends will also become apparent.

Going forward, the data collected during these cycles will provide comparisons for Summer and Fall usage across the Lake Tahoe Region. Seasonal data provides a unique perspective on shifts in usage due to seasonal variations, as shown in the data throughout this report.

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APPENDIX A
2015 Count Locations Map
(TRPA, TCPUD, Douglas Count)

MAP KEY:

2015 AT Count Locations
Lead Agency:
- ★ TRPA/TMPO
- ★ TCPUD
- ★ Douglas County

Existing Facilities
- Bike Path
- Bike Lane
- Bike Route
- Sidewalk
- Trails

Proposed Facilities
- Bike Path
- Bike Lane
- Bike Route
- Sidewalk

TAHOE REGIONAL PLANNING AGENCY

LAKE TAHOE REGION

2015 ACTIVE TRANSPORTATION MONITORING LOCATIONS

Tahoe Metropolitan Planning Organization

TRPA MAP DISCLAIMER: This map was developed and produced by the TRPA GIS department. It is provided for reference only and is not intended to show map scale accuracy or all inclusive map features.

APPENDIX B
Manual Count Summaries

For more information about volume by directionality, please refer to the TRPA Bike & Pedestrian Count Database.

15th Street and Eloise Ave

Total Pedestrians Observed: 78
Total Bicyclists Observed: 713
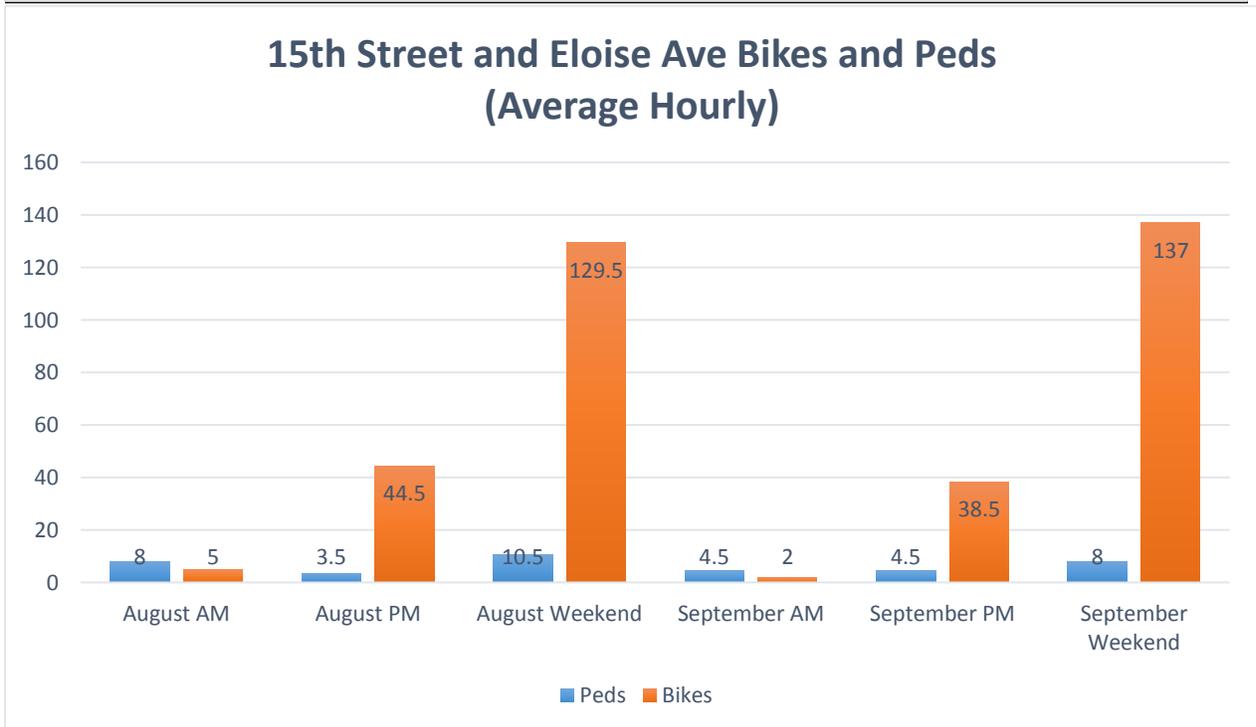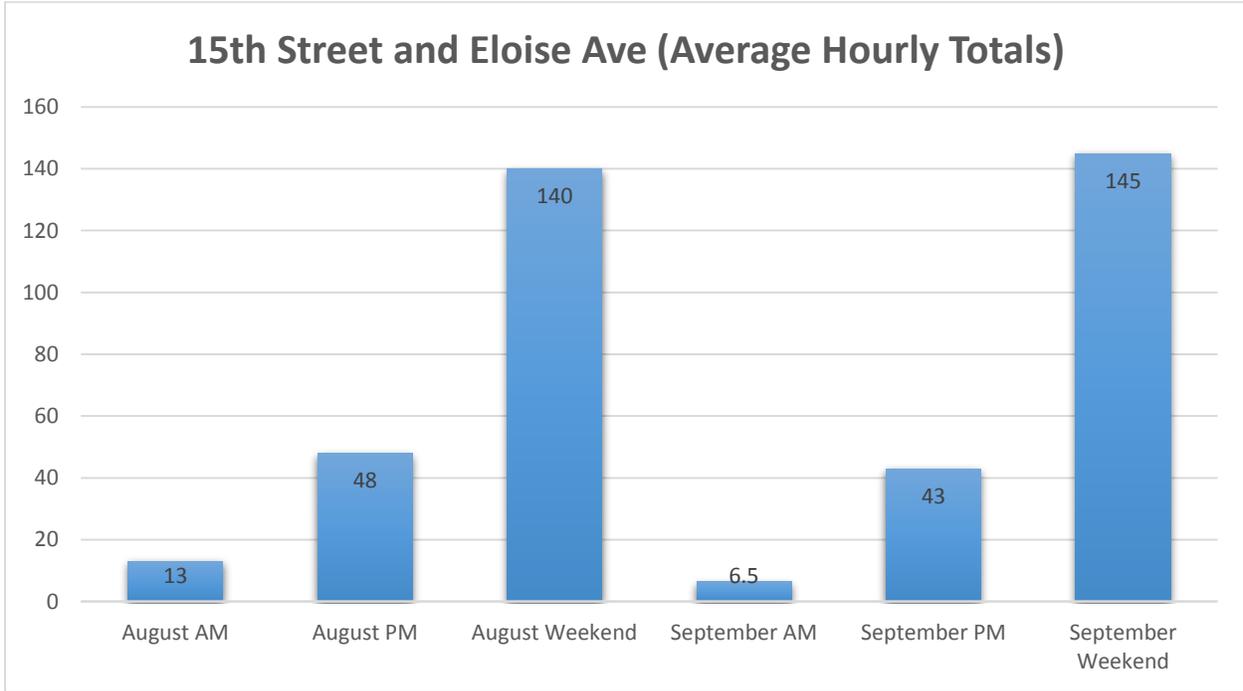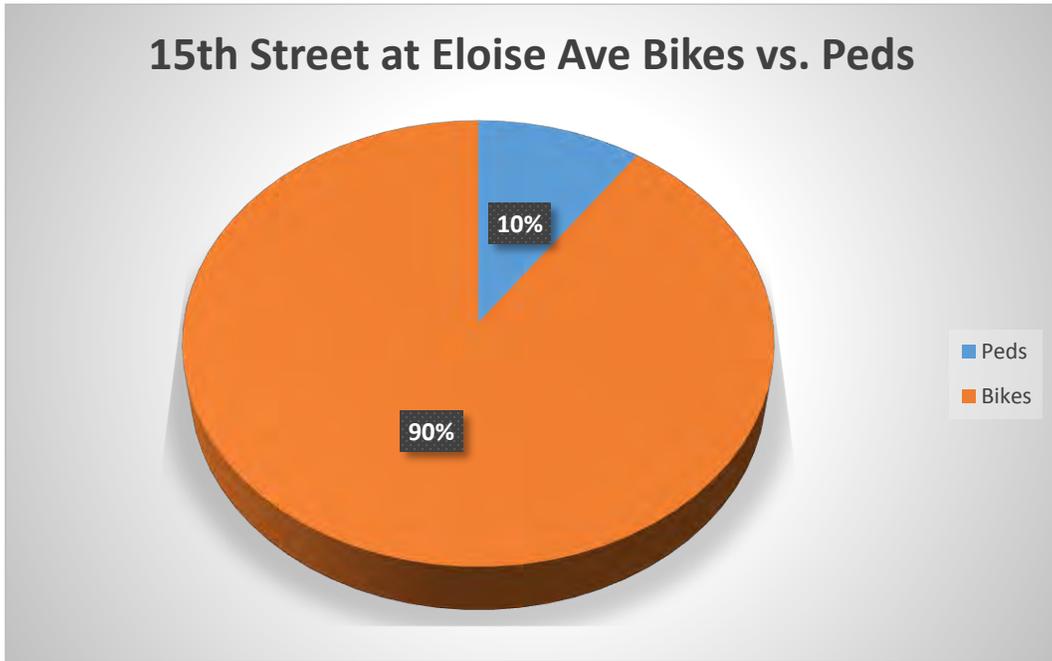
Count Location

US 50 at Al Tahoe Boulevard

Total Pedestrians Observed: 281

Total Bicyclists Observed: 626

US 50 & Al Tahoe Blvd (Average Hourly Totals)

Category	Value
August AM	35
August PM	85
August Weekend	103
September AM	34.5
September PM	87
September Weekend	109

US 50 & Al Tahoe Blvd Bikes and Peds (Average Hourly)

Category	Peds	Bikes
August AM	9.5	25.5
August PM	20.5	64.5
August Weekend	26	77
September AM	17.5	17
September PM	33	54
September Weekend	34	75
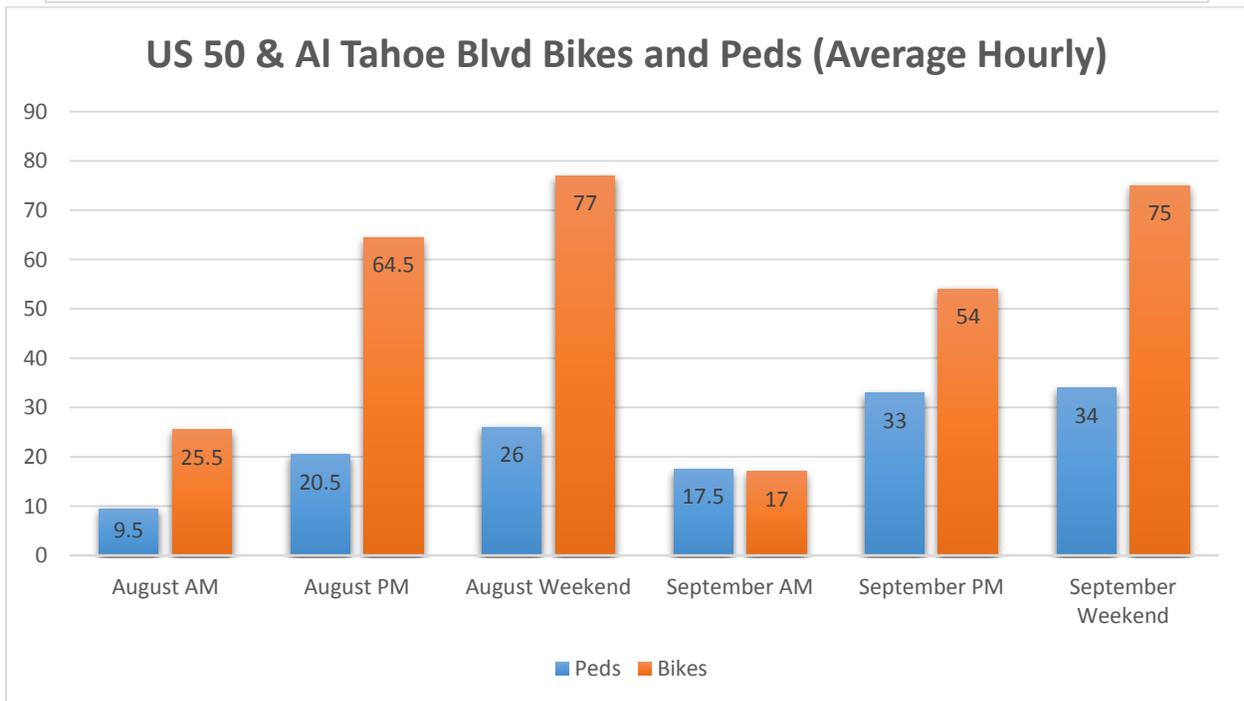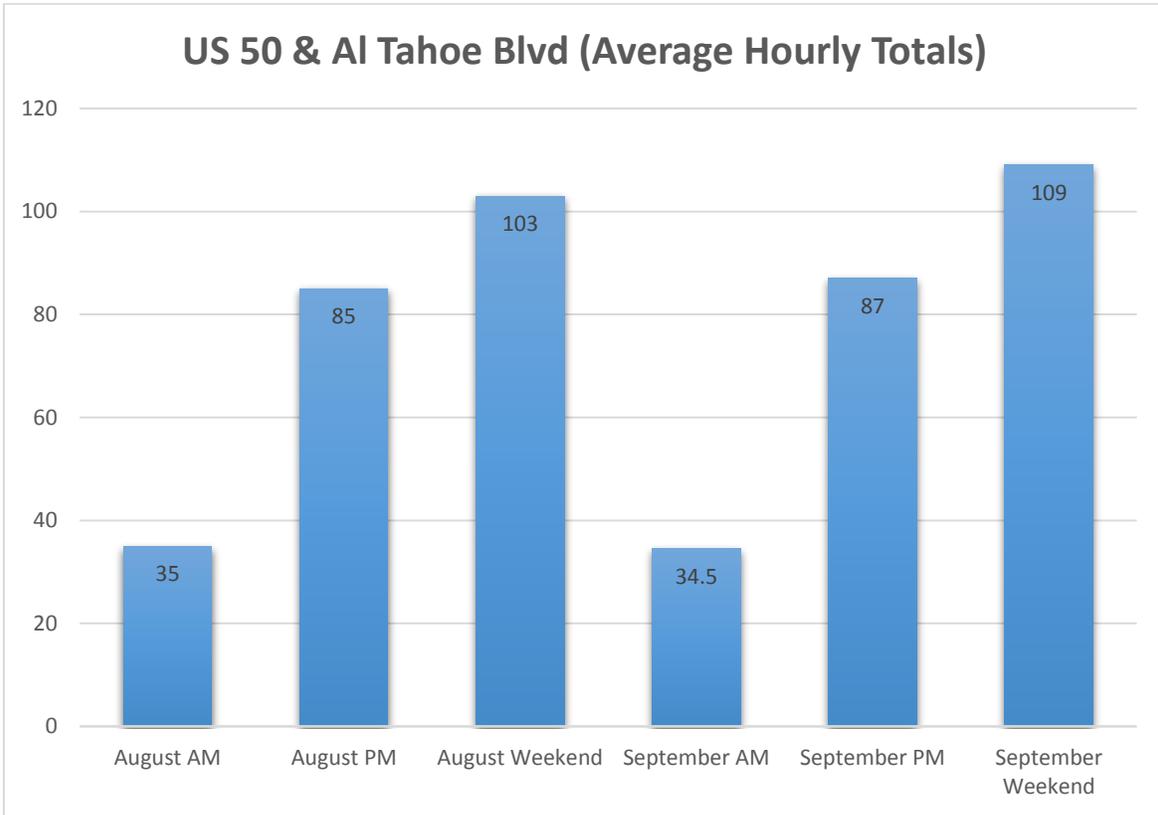
■ Peds ■ Bikes
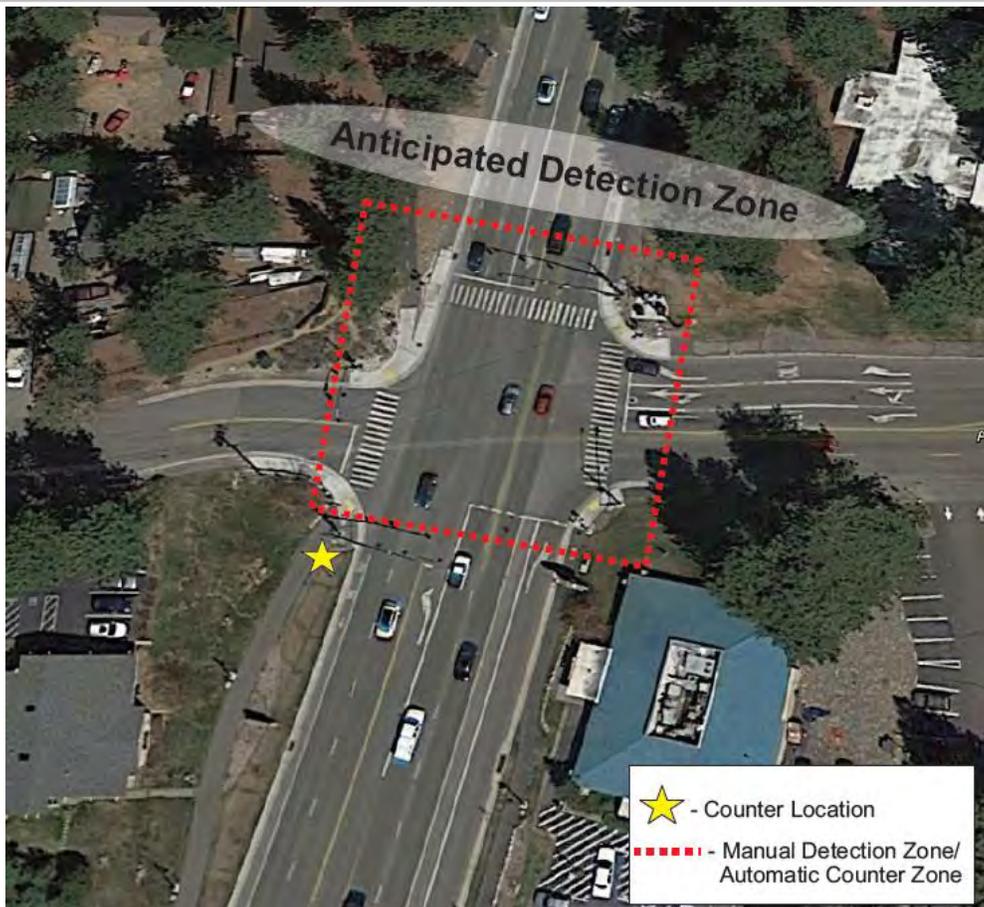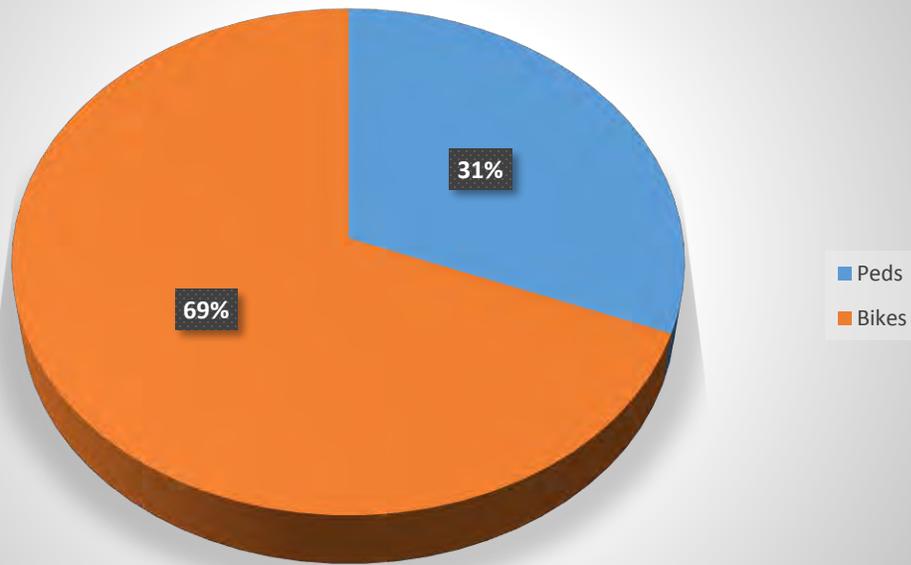
Count Location

Fanny Bridge

Total Pedestrians Observed: 593

Total Bicyclists Observed: 369

Fanny Bridge (Average Hourly Totals)

Fanny Bridge Bikes and Peds (Average Hourly)

Fanny Bridge (Bikes vs. Peds)

38%

62%

Peds

Bikes

Anticipated Detection Zone

⭐ - Counter Location

▪▪▪▪ - Manual Detection Zone/
Automatic Counter Zone
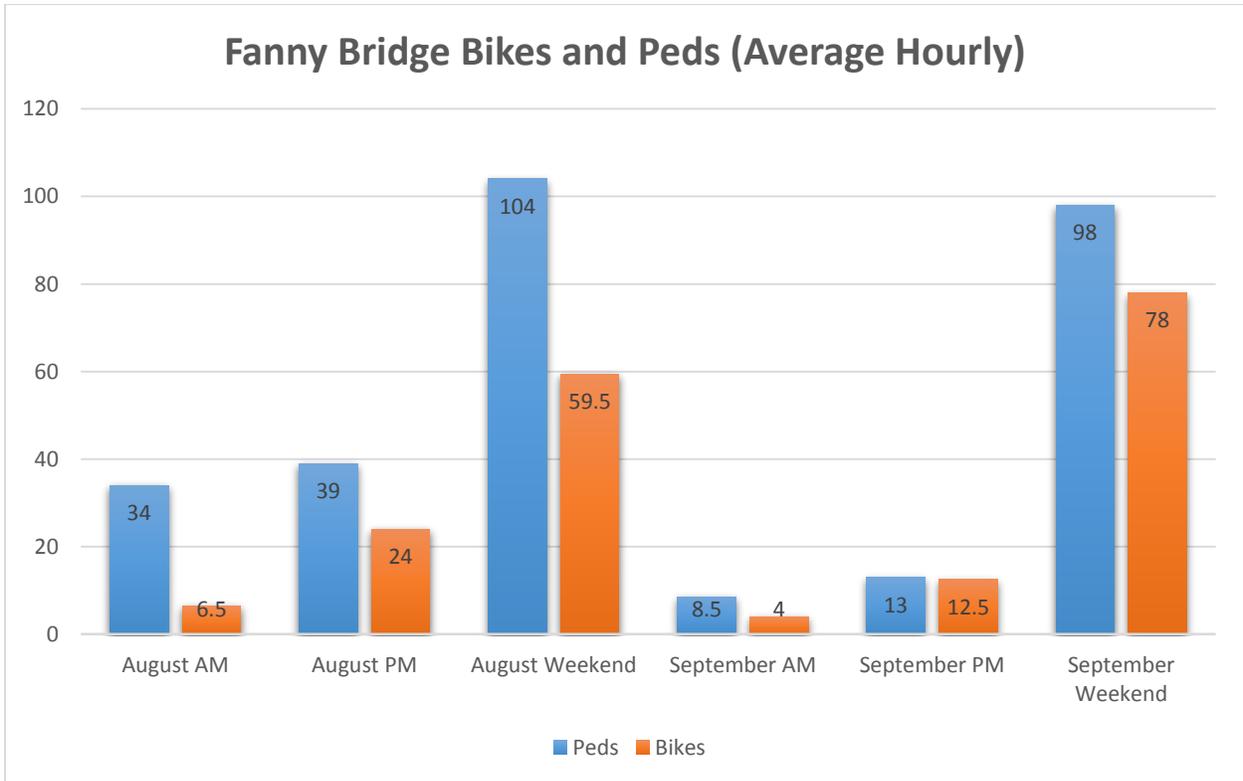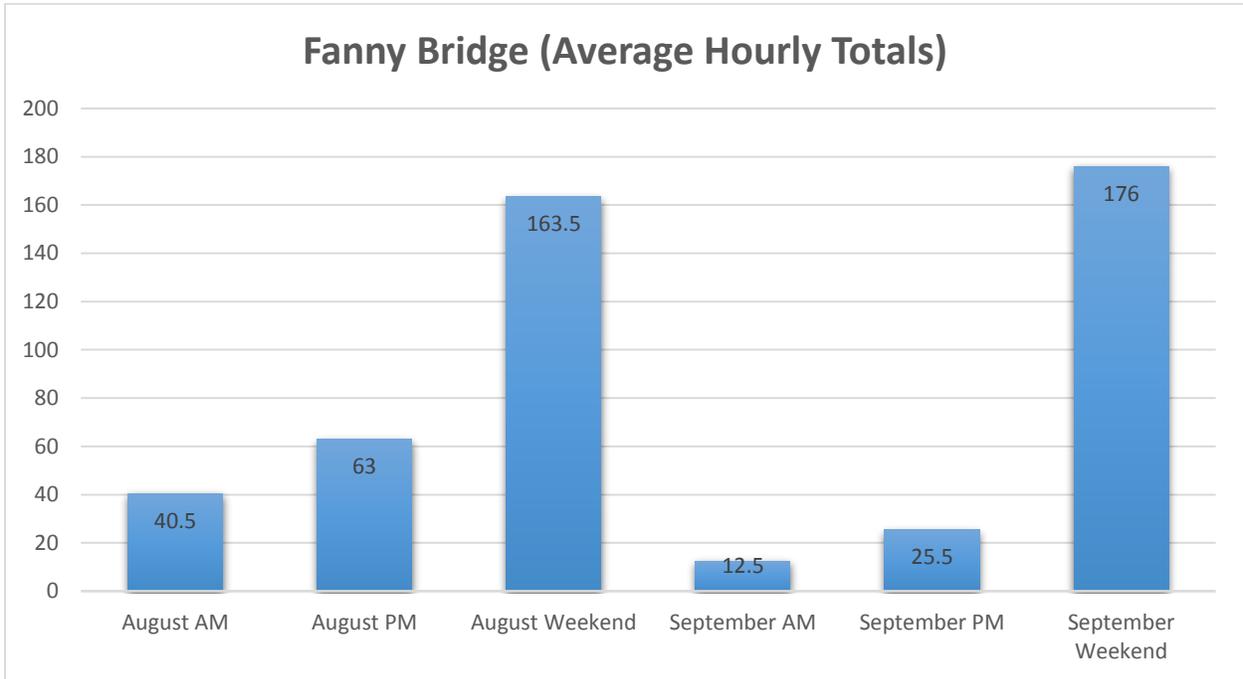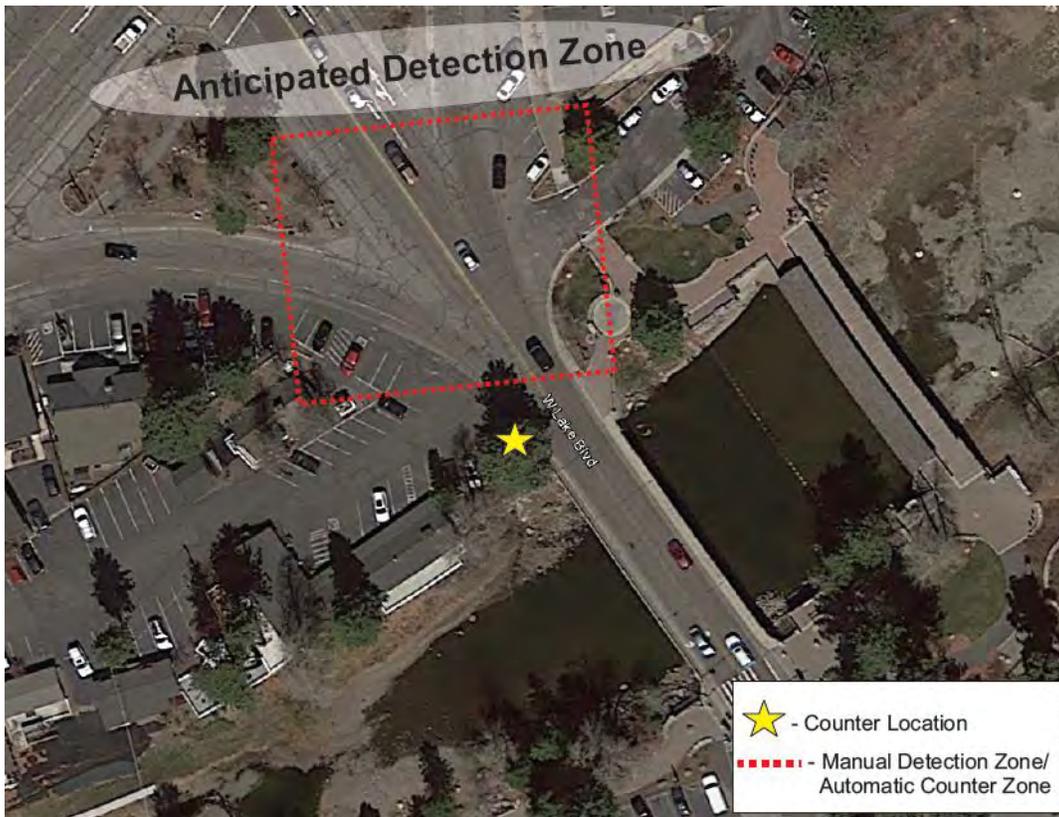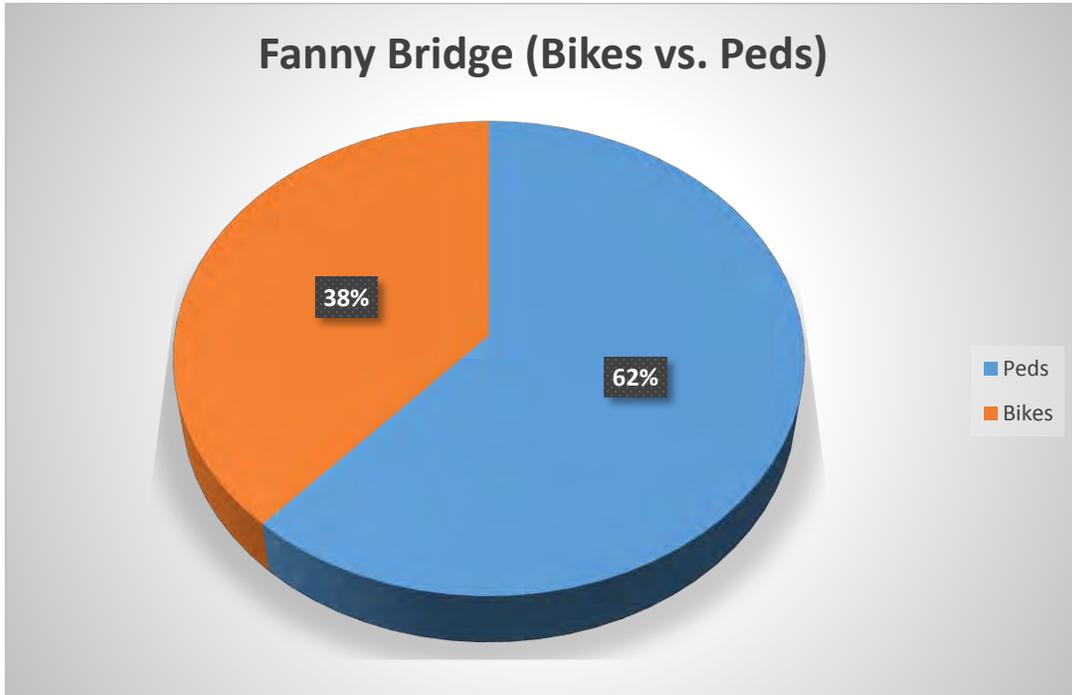
Count Location

Lake Tahoe Boulevard at Sawmill Road

Total Pedestrians Observed: 43

Total Bicyclists Observed: 156

Lake Tahoe Blvd at Sawmill (Average Hourly Totals)
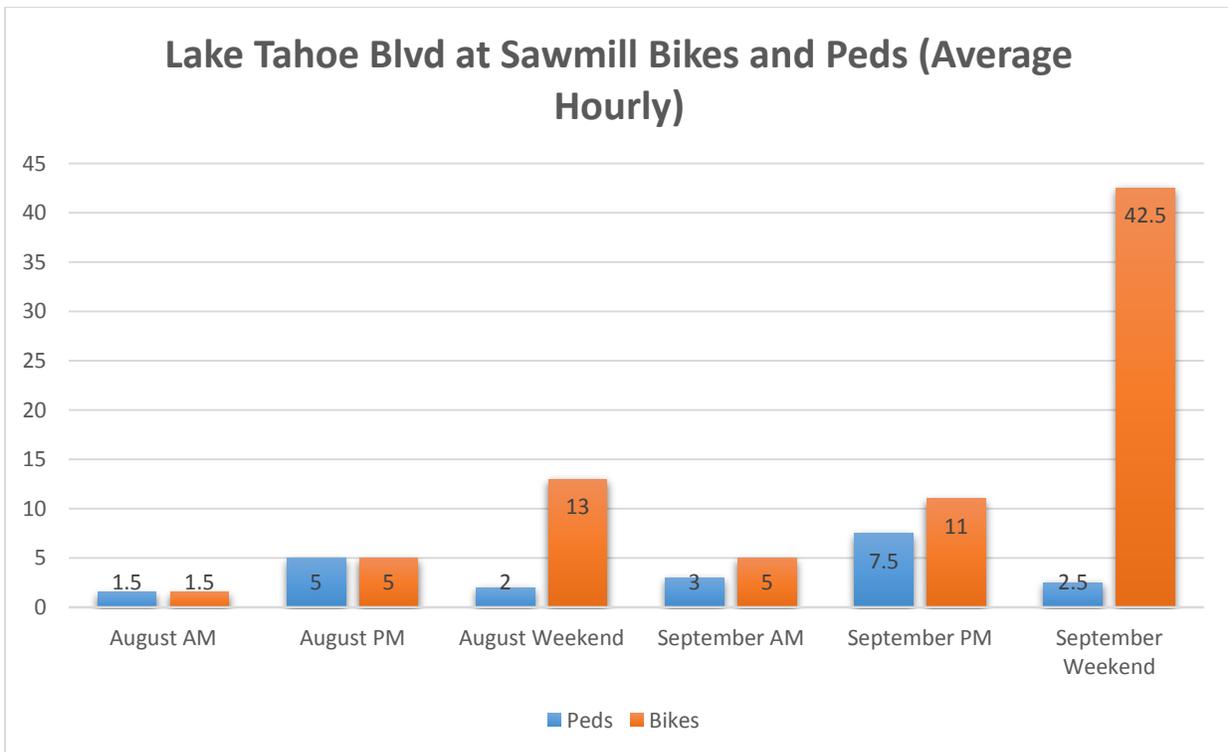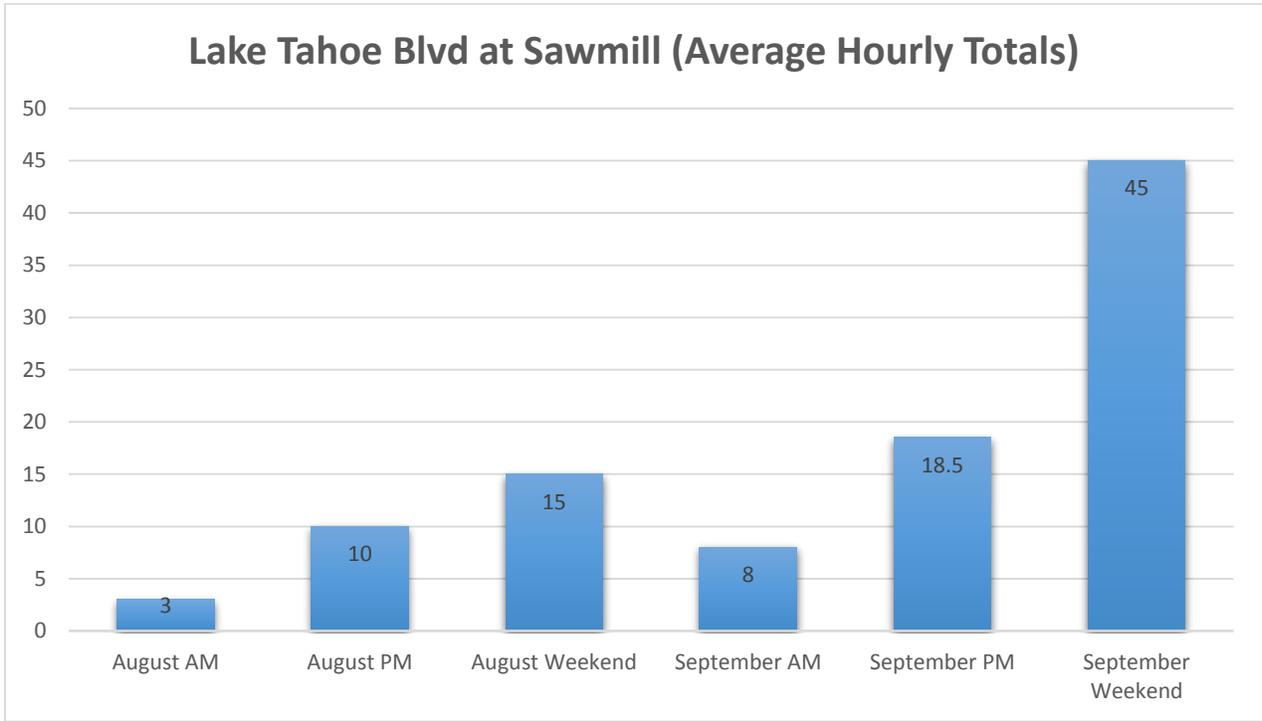
Lake Tahoe Blvd at Sawmill Bikes and Peds (Average Hourly)
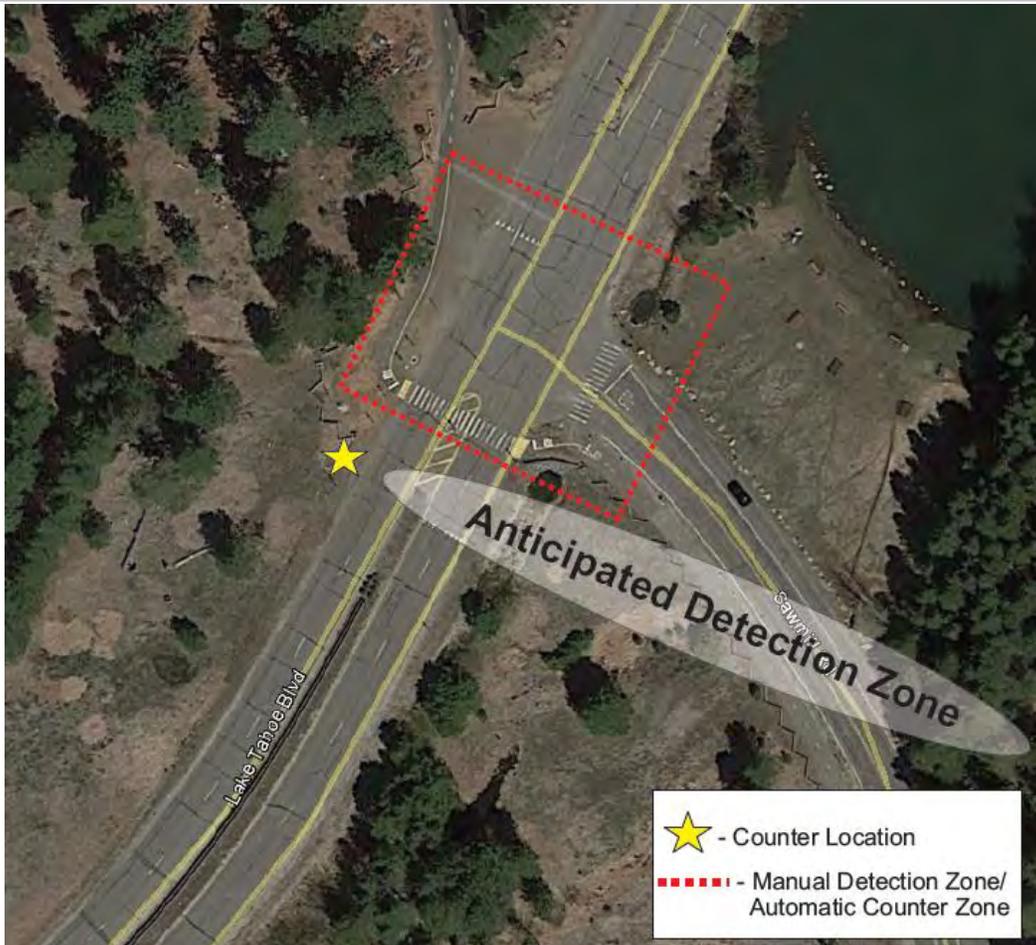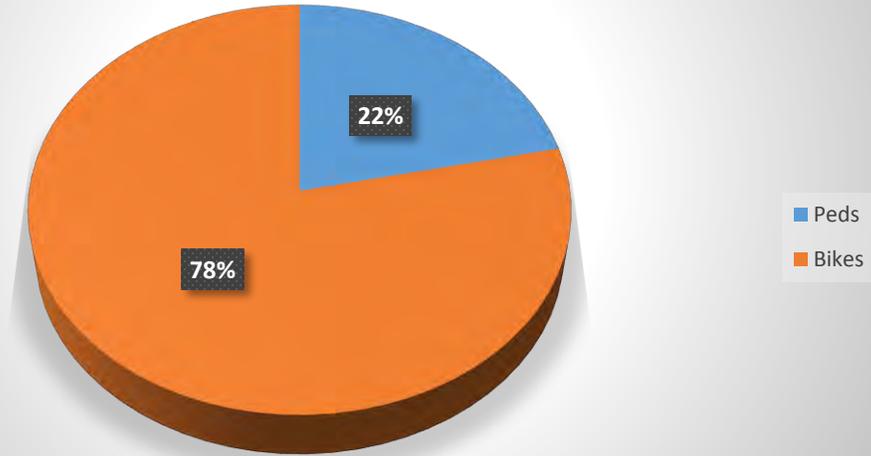
Count Location

Pioneer Trail

Total Pedestrians Observed: 796

Total Bicyclists Observed: 353

Pioneer Trail (Average Hourly Totals)

Category	Value
August AM	80
August PM	116.5
August Weekend	80.5
September AM	74.5
September PM	147
September Weekend	76

Pioneer Trail Bikes and Peds (Average Hourly)

Category	Peds	Bikes
August AM	54	26
August PM	84	32.5
August Weekend	53.5	27
September AM	59.5	15
September PM	97.5	49.5
September Weekend	49.5	26.5

Pioneer Trail (Bikes vs. Peds)

31%

69%

Peds

Bikes

Anticipated Detection Zone

⭐ - Counter Location

▪▪▪▪ - Manual Detection Zone/
Automatic Counter Zone

Count Location

US 50 at Santa Fe Drive

Total Pedestrians Observed: 70

Total Bicyclists Observed: 156

US 50 at Santa Fe Dr (Average Hourly Totals)

Category	Value
August AM	7.5
August PM	14.5
August Weekend	26
September AM	4.5
September PM	10
September Weekend	28.5

US 50 at Santa Fe Dr. Bikes and Peds (Average Hourly)

Category	Peds	Bikes
August AM	3.5	6
August PM	7.5	11.5
August Weekend	13	22
September AM	2	3.5
September PM	2	9.5
September Weekend	7	25.5
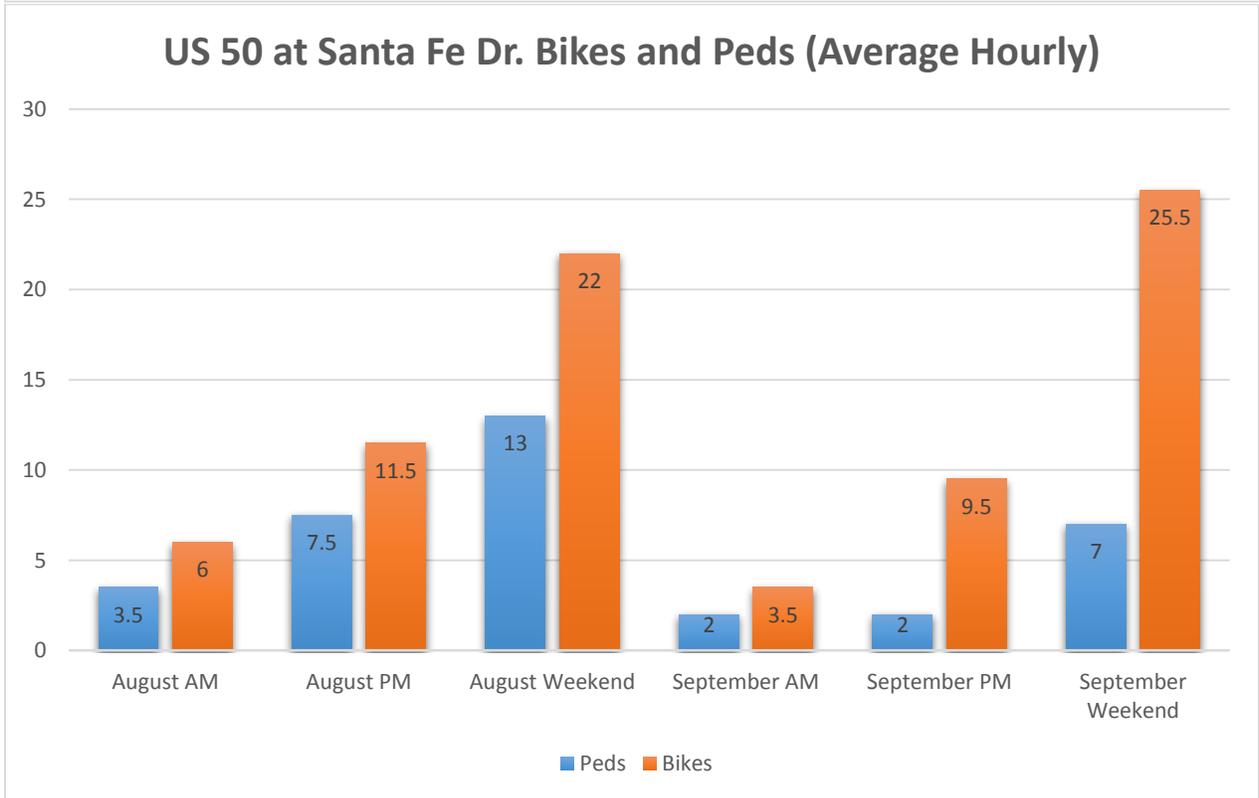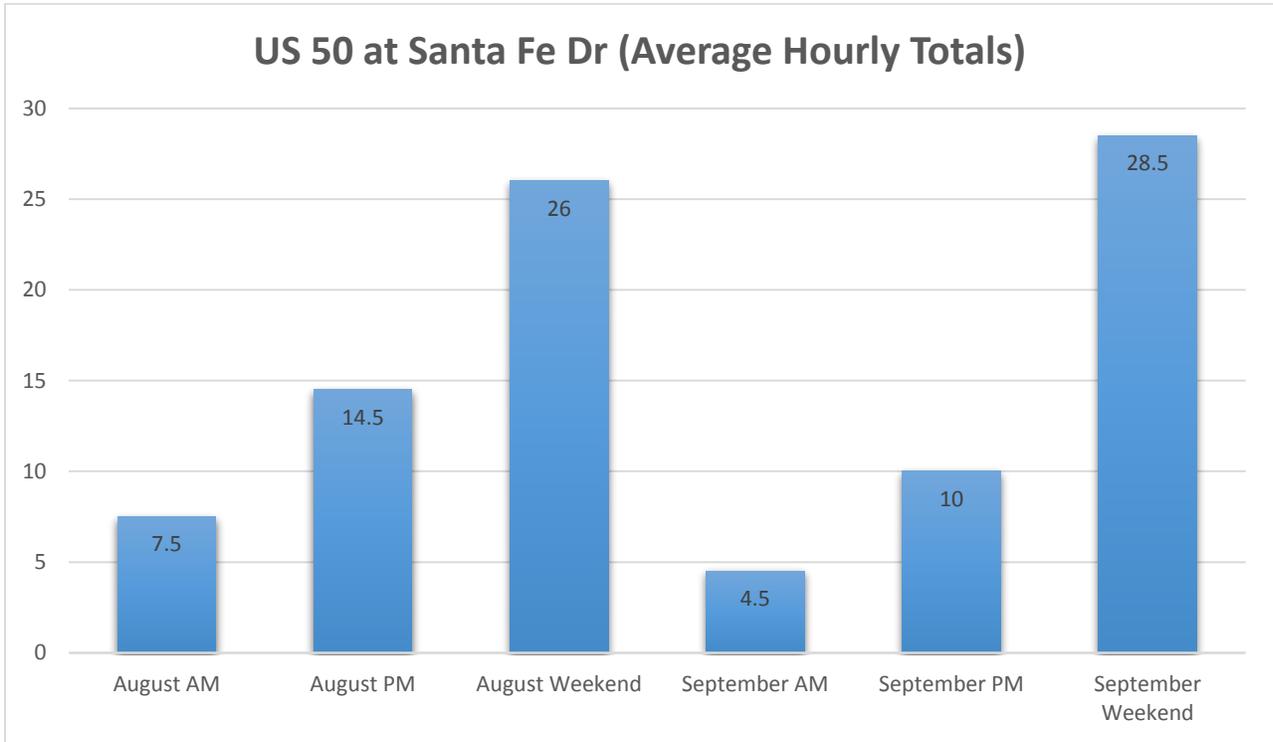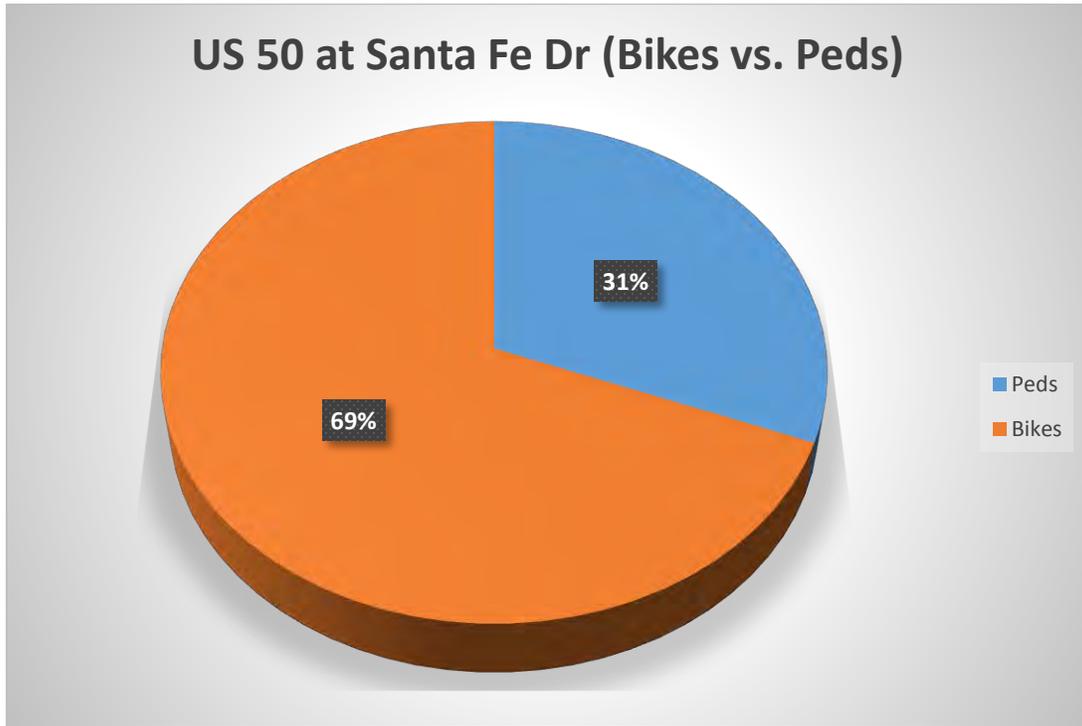
Count Location

Carnelian Bay

Total Pedestrians Observed: 206

Total Bicyclists Observed: 138

SR 28 at Carnelian Bay (Average Hourly Totals)

August AM	28.5
August PM	27
August Weekend	59
September AM	8
September PM	16.5
September Weekend	33

SR 28 at Carnelian Bay Bikes and Peds (Average Hourly)

	Peds	Bikes
August AM	20	8.5
August PM	15	12
August Weekend	32	27
September AM	6	2
September PM	7.5	9
September Weekend	22.5	10.5
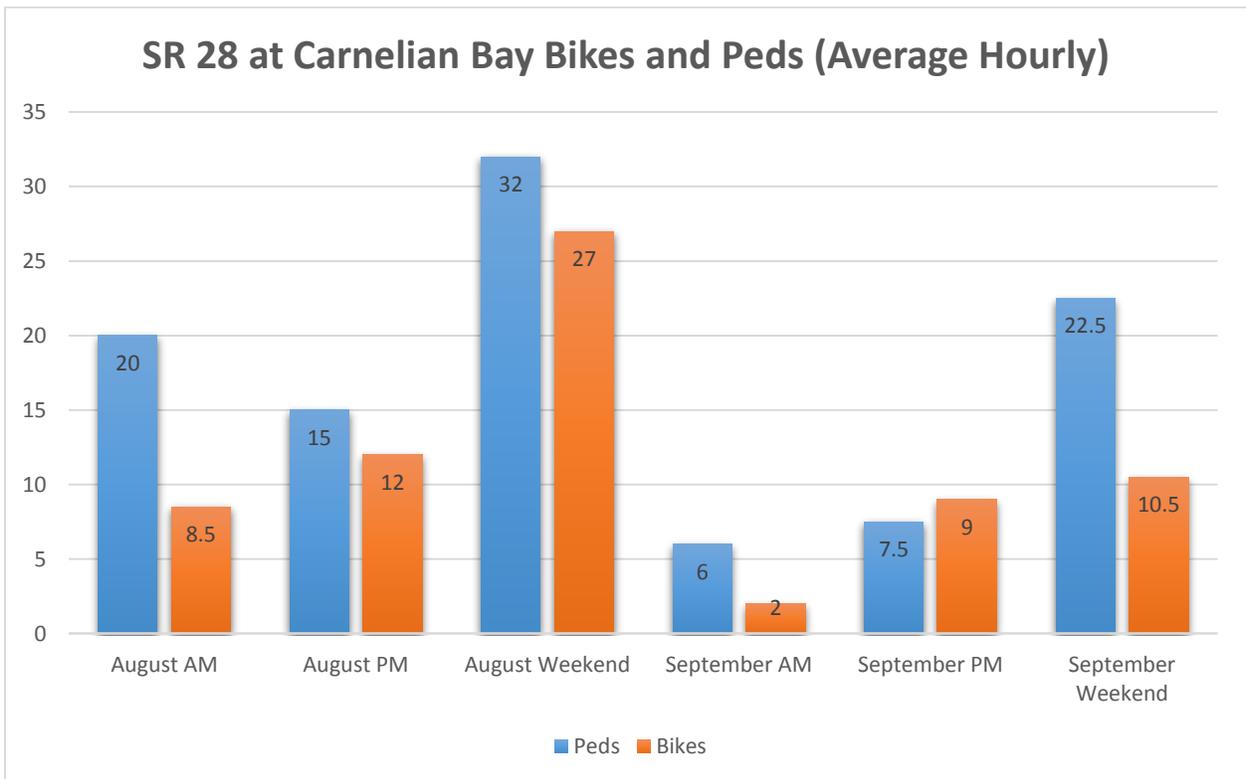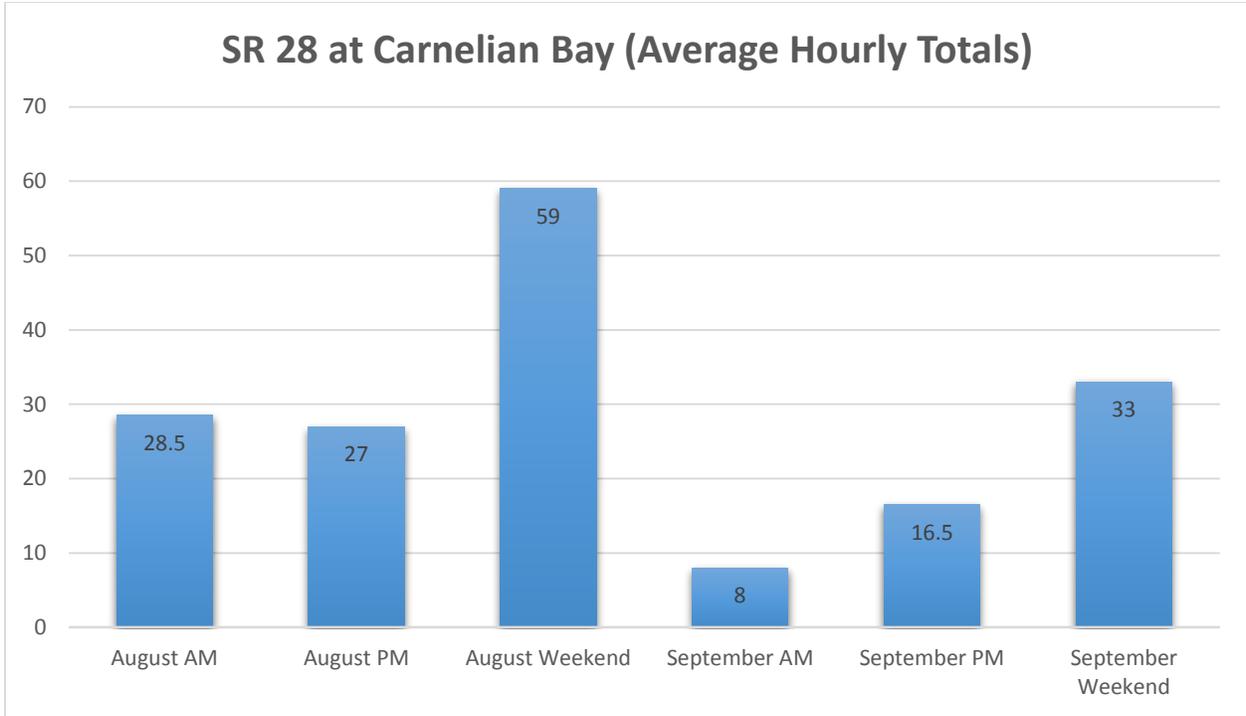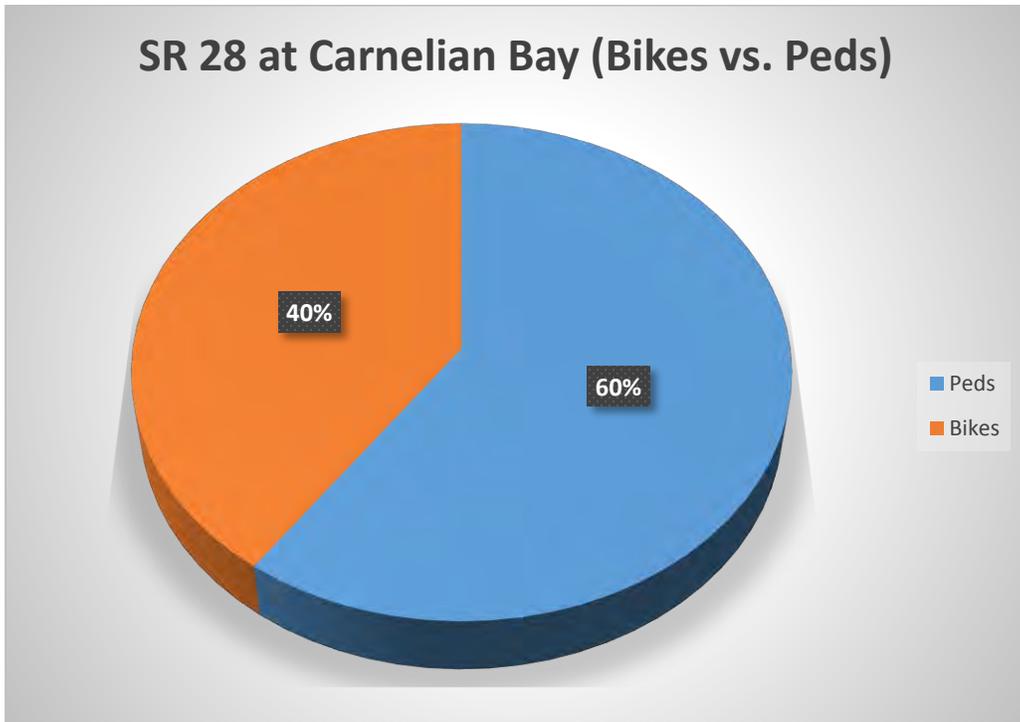
Count Location

SR 28 at Village

Total Pedestrians Observed: 337

Total Bicyclists Observed: 92

SR 28 at Village Blvd (Average Hourly Totals)

SR 28 at Village Blvd Bikes and Peds (Average Hourly)
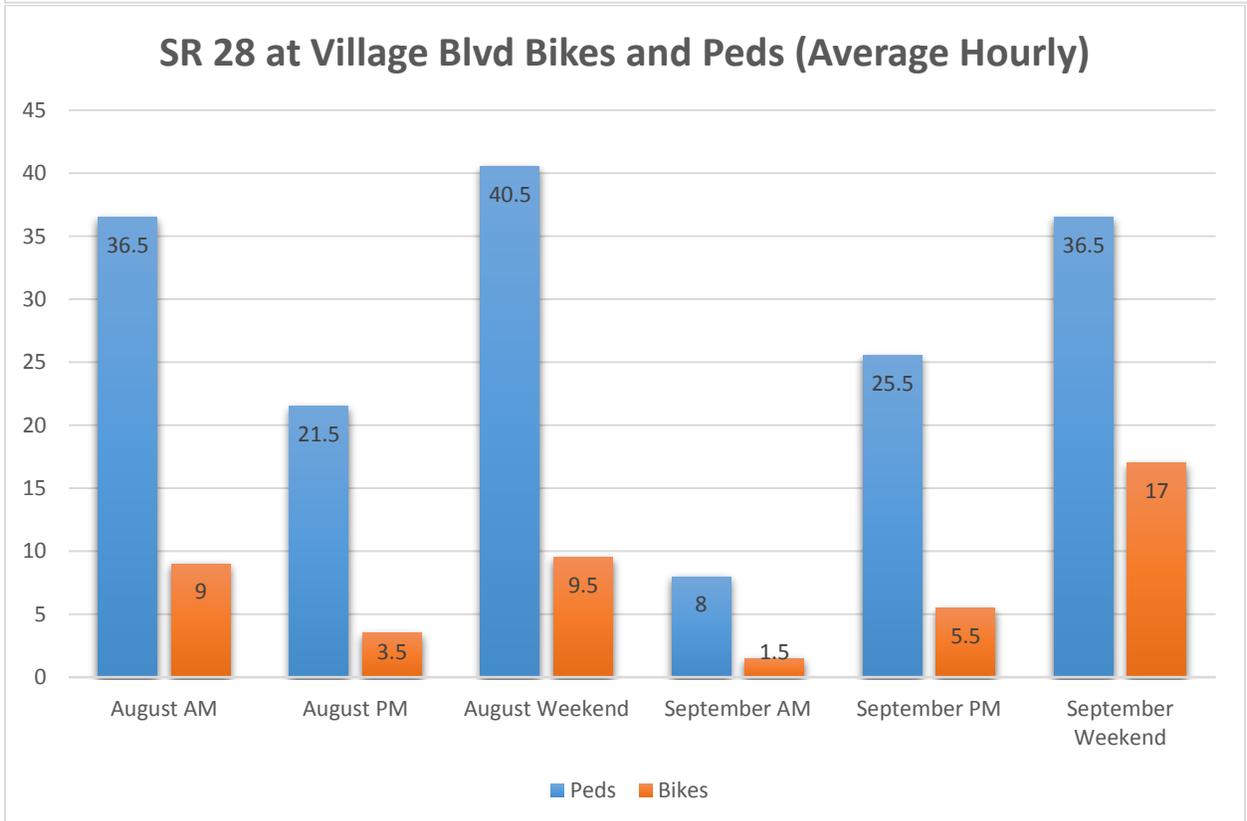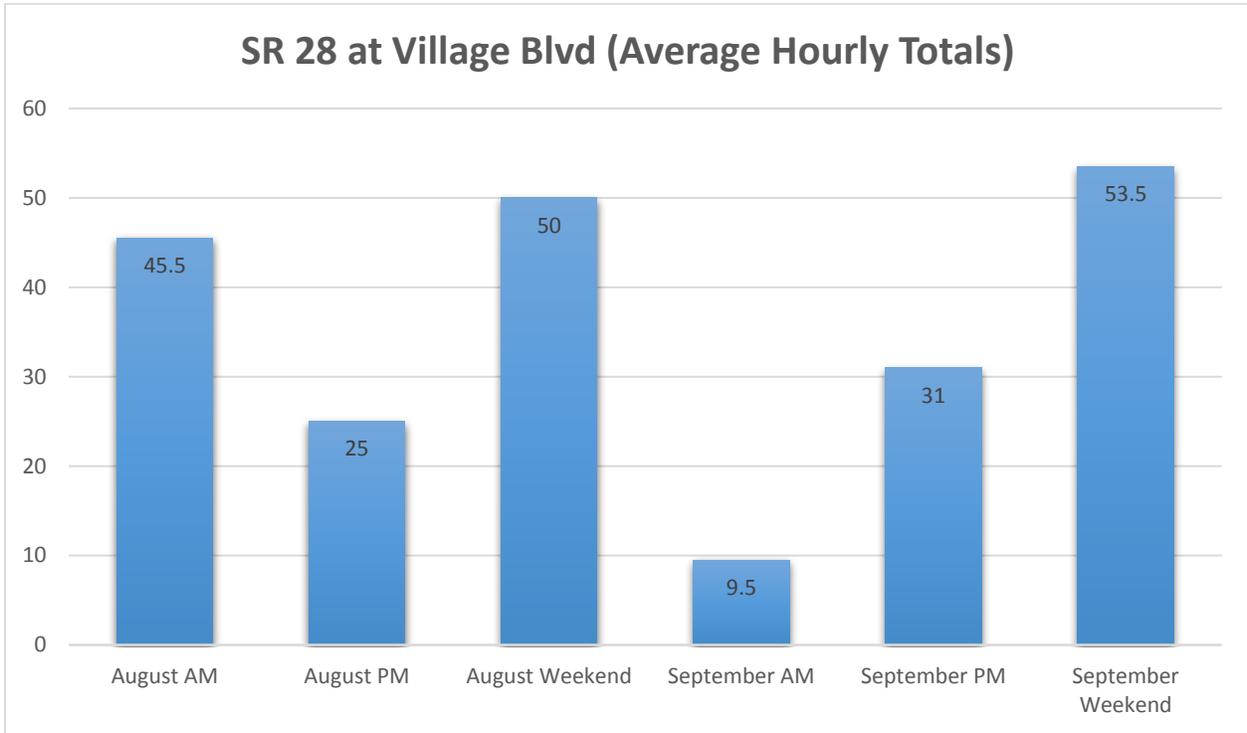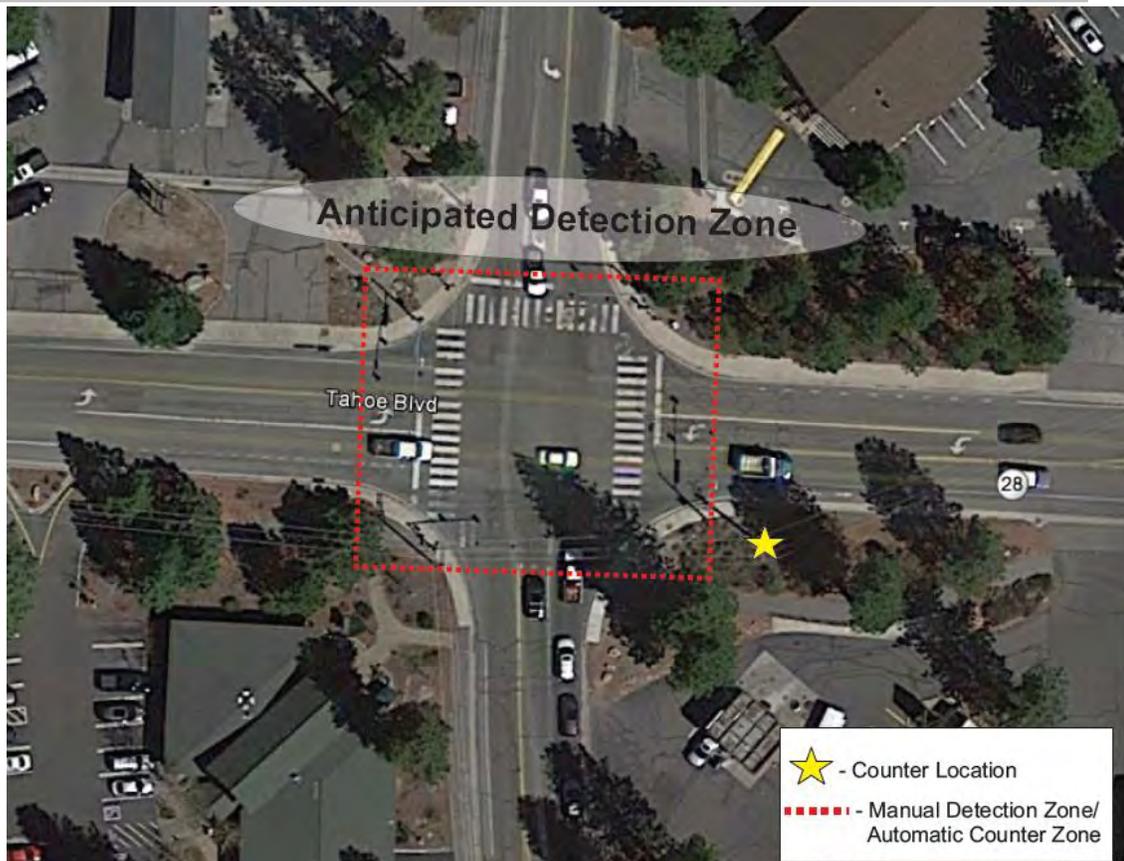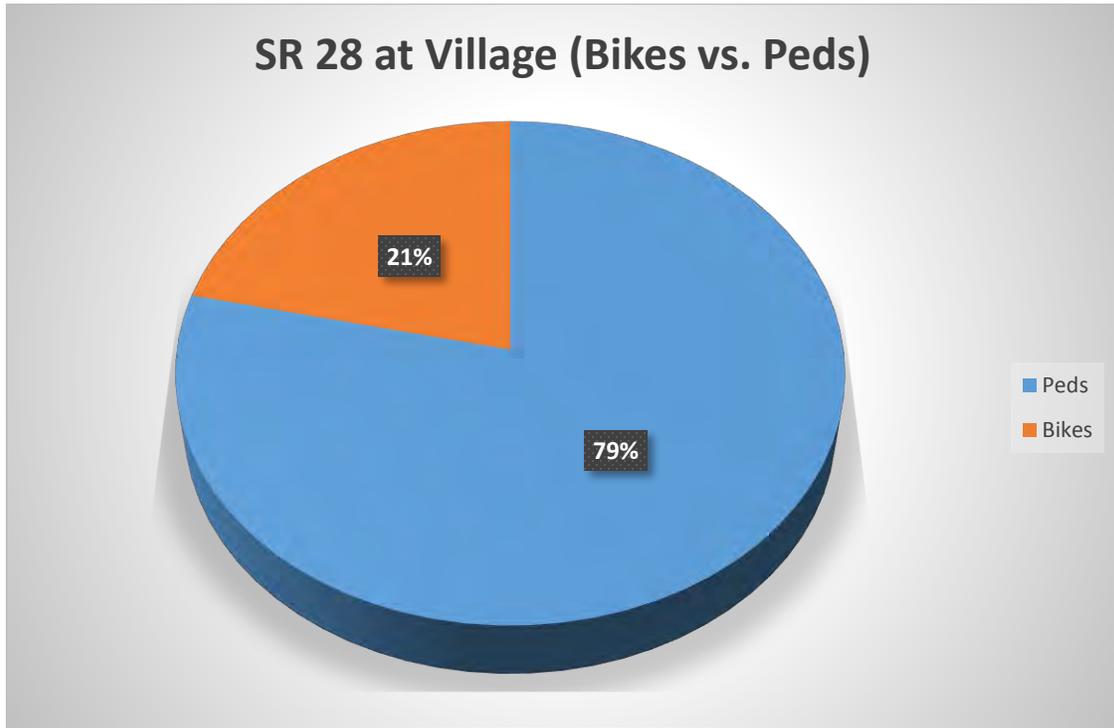
Count Location

SR 28 Between Bear and Coon Streets

Total Pedestrians Observed: 808

Total Bicyclists Observed: 147

SR 28 between Bear & Coon (Average Hourly Totals)
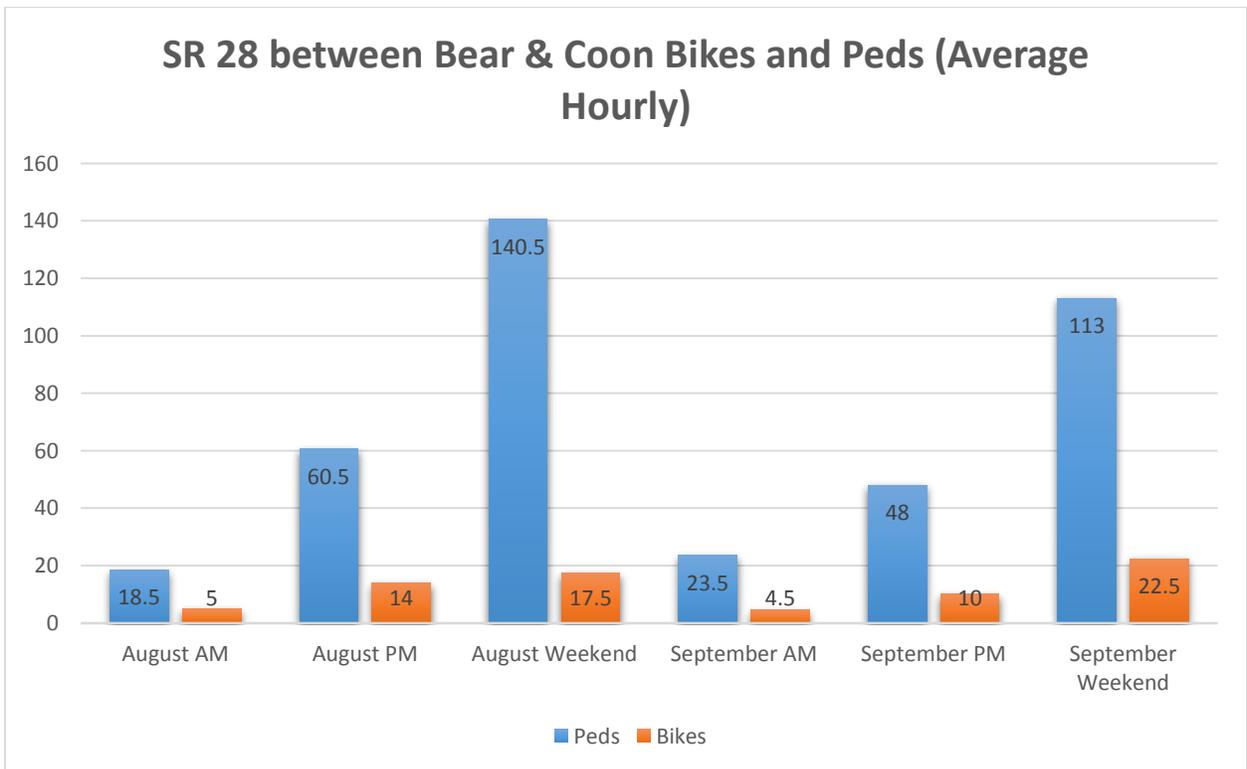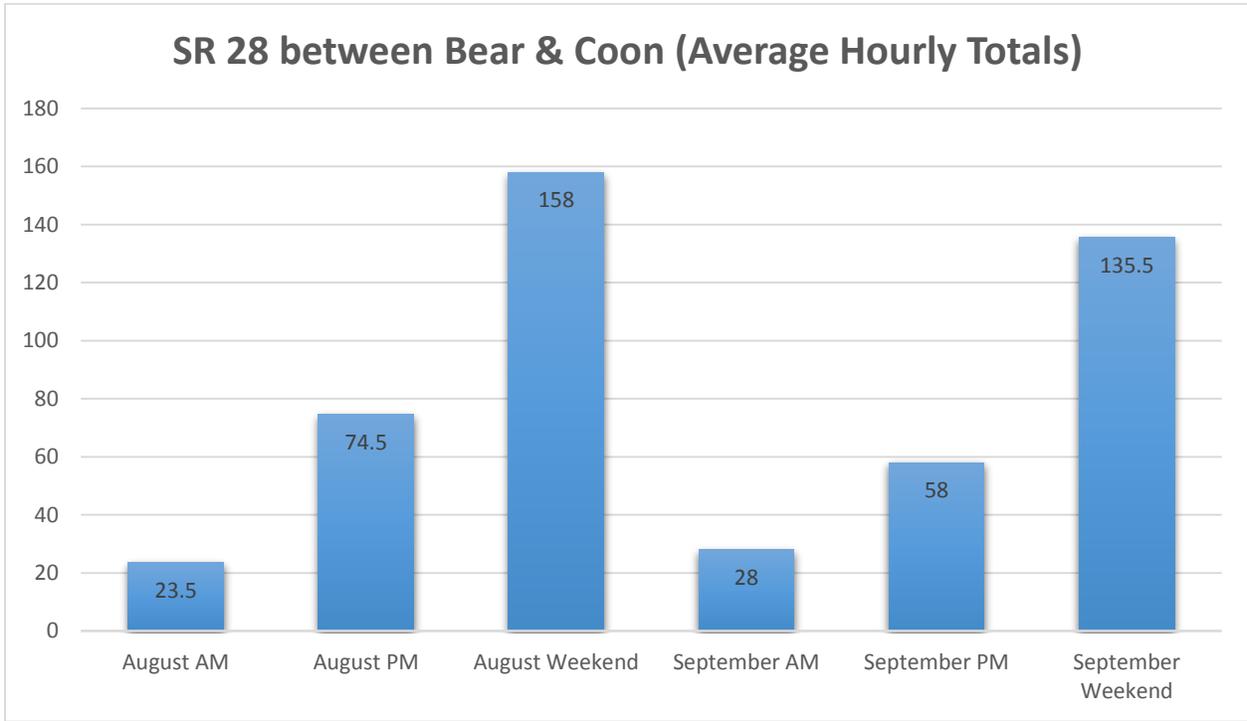
SR 28 between Bear & Coon Bikes and Peds (Average Hourly)
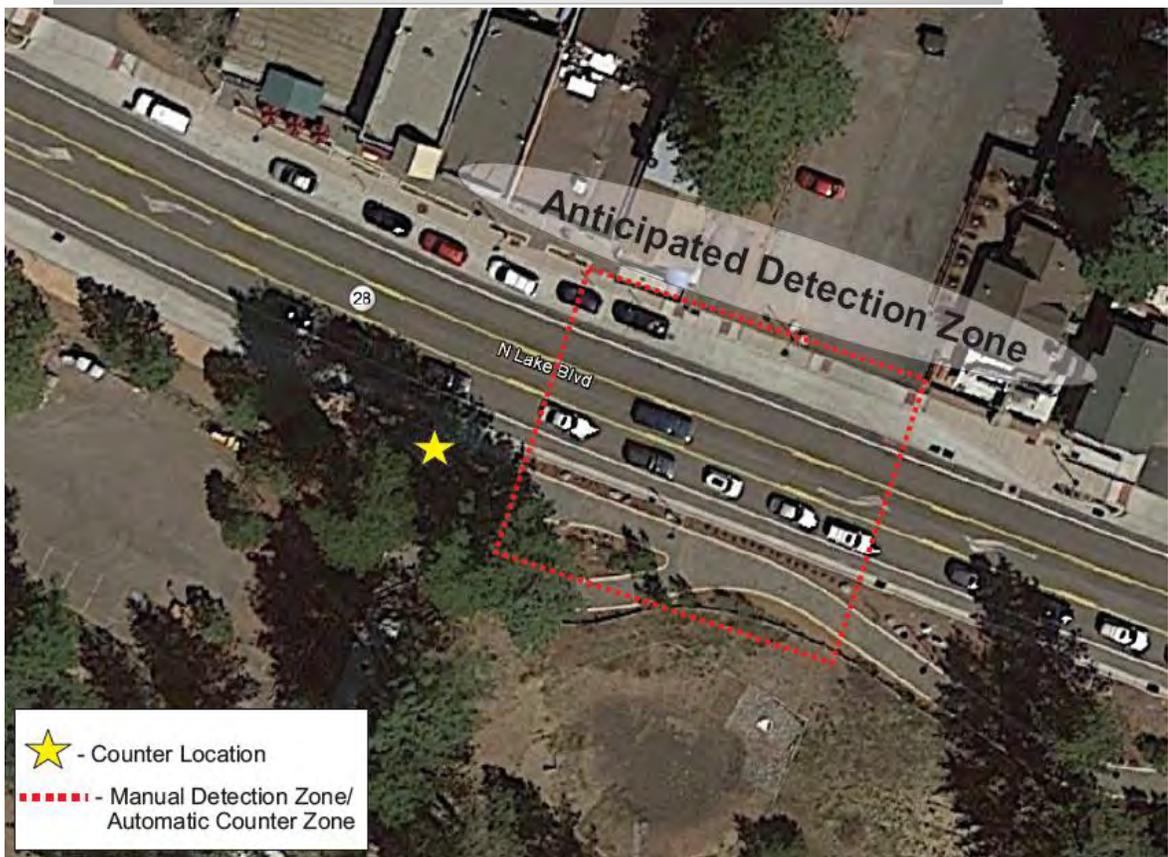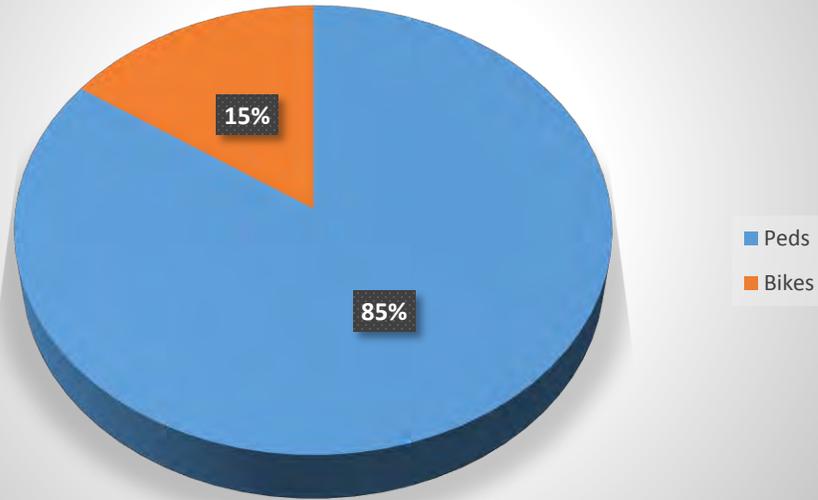
Count Location

US 50 at Lakeview Drive

Total Pedestrians Observed: 421

Total Bicyclists Observed: 573

US 50 at Lakeview Drive (Average Hourly Totals)

Category	Value
August AM	35.5
August PM	104.5
August Weekend	154.5
September AM	23
September PM	90.5
September Weekend	89

US 50 at Lakeview Drive Bikes and Peds (Average Hourly)

Category	Peds	Bikes
August AM	13	22.5
August PM	36.5	68
August Weekend	76	78.5
September AM	11.5	11.5
September PM	37.5	53
September Weekend	36	53
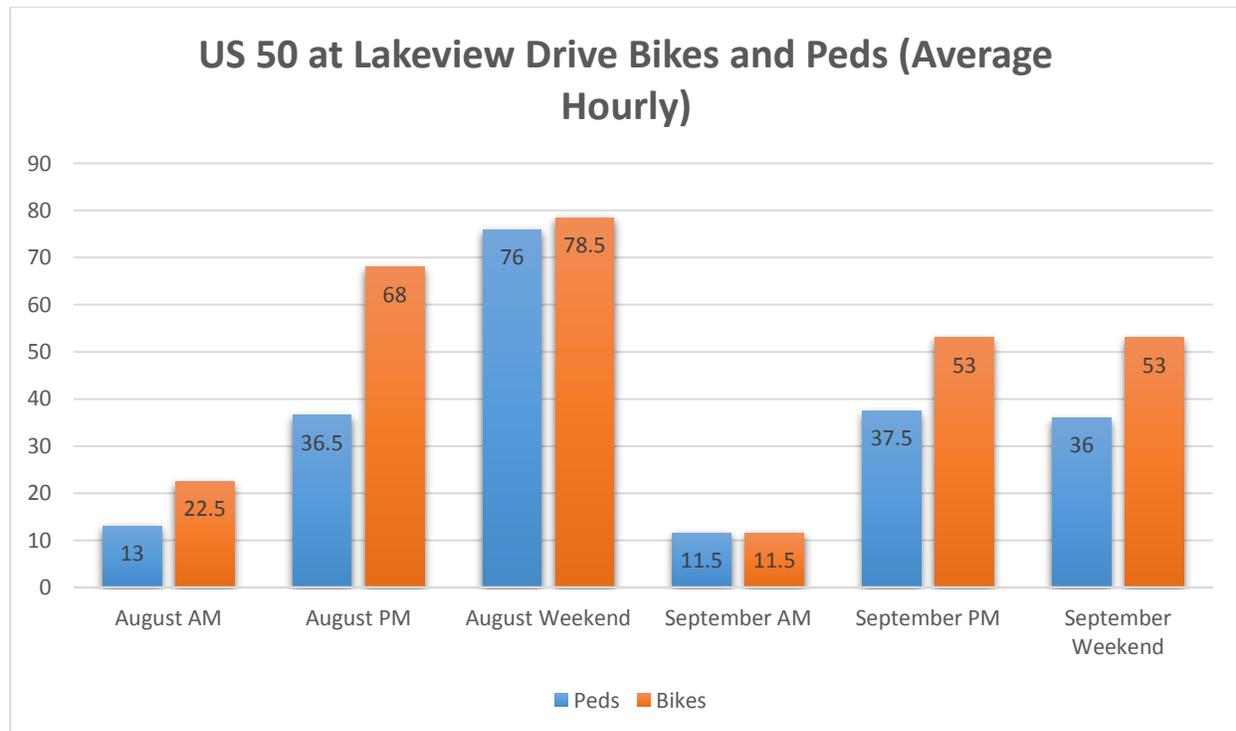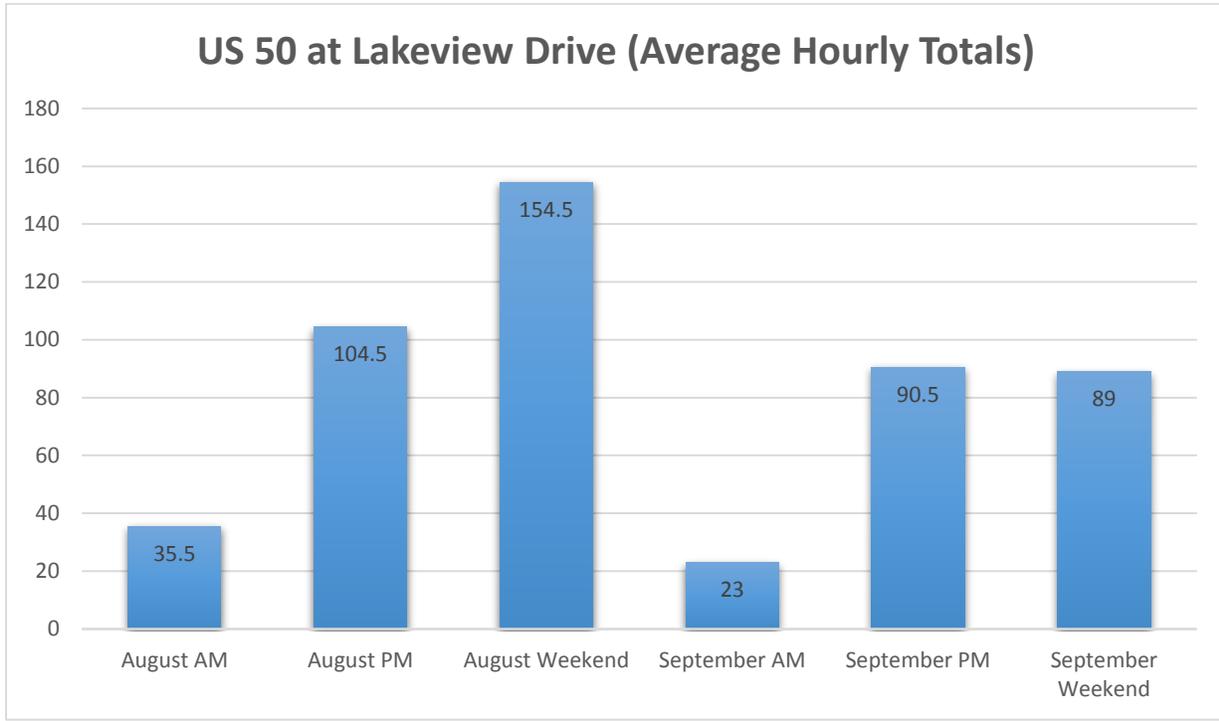
■ Peds ■ Bikes
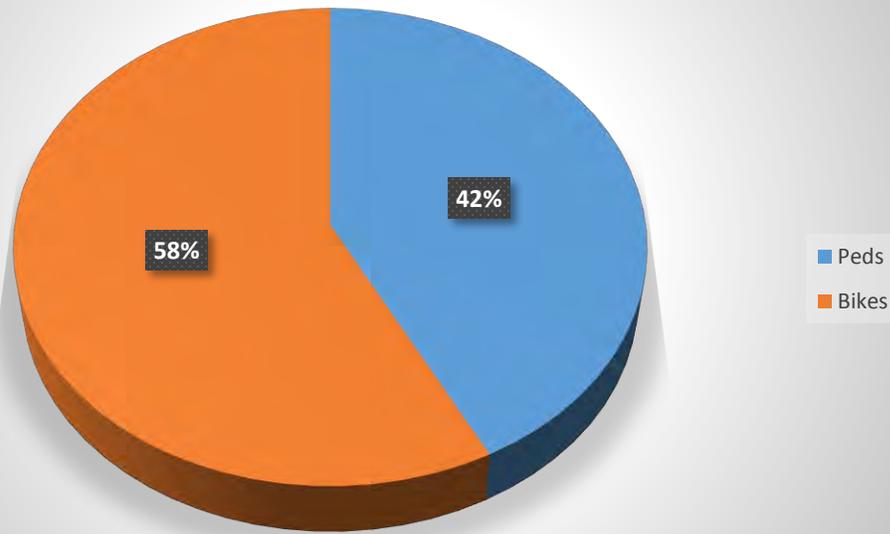
Count Location

US 50 at Sierra Boulevard

Total Pedestrians Observed: 164

Total Bicyclists Observed: 246

US 50 at Sierra (Average Hourly Totals)

Category	Value
August AM	27.5
August PM	32
August Weekend	30.5
September AM	13
September PM	30
September Weekend	72

US 50 at Sierra Bikes and Peds (Average Hourly)

Category	Peds	Bikes
August AM	10	17.5
August PM	12	20
August Weekend	13	17.5
September AM	7	6
September PM	12.5	17.5
September Weekend	27.5	44.5

US 50 at Sierra Blvd (Bikes vs. Peds)

40%

60%

- Peds
- Bikes

Anticipated Detection Zone

⭐ - Counter Location

▪▪▪▪▪ - Manual Detection Zone/
Automatic Counter Zone

Count Location

US 50 at Warrior Way

Total Pedestrians Observed: 59

Total Bicyclists Observed: 94

US 50 at Warrior Way (Average Hourly Totals)

Category	Value
August AM	2
August PM	15.5
August Weekend	35.5
September AM	1
September PM	13.5
September Weekend	9

US 50 at Warrior Way Bikes and Peds (Average Hourly)

Category	Peds	Bikes
August AM	0	2
August PM	12	3.5
August Weekend	11.5	24
September AM	0	1
September PM	3.5	10
September Weekend	2.5	6.5
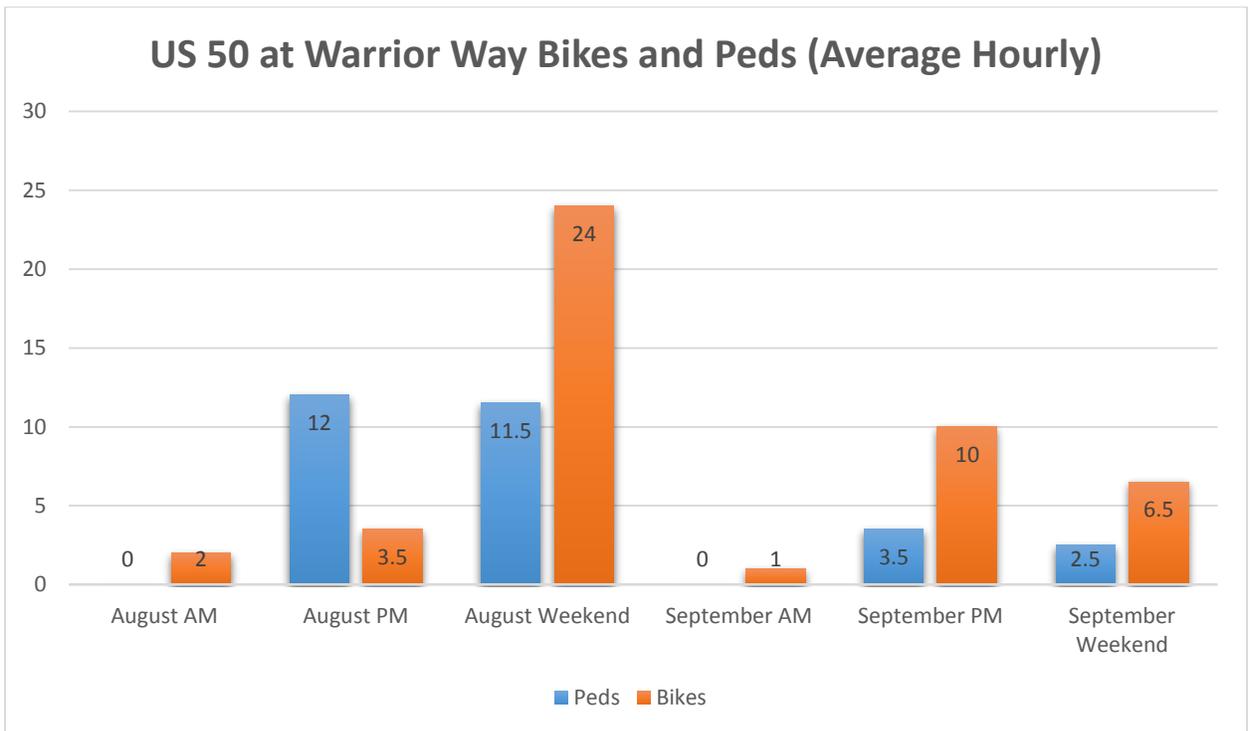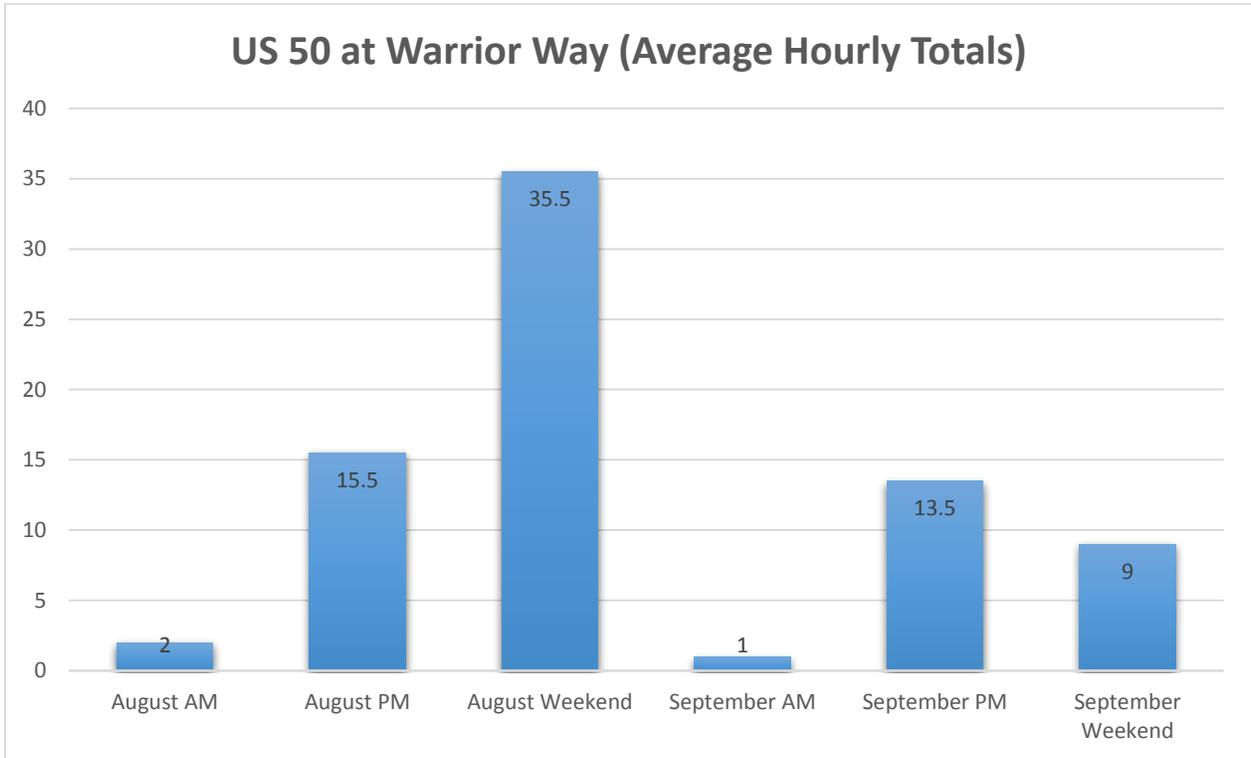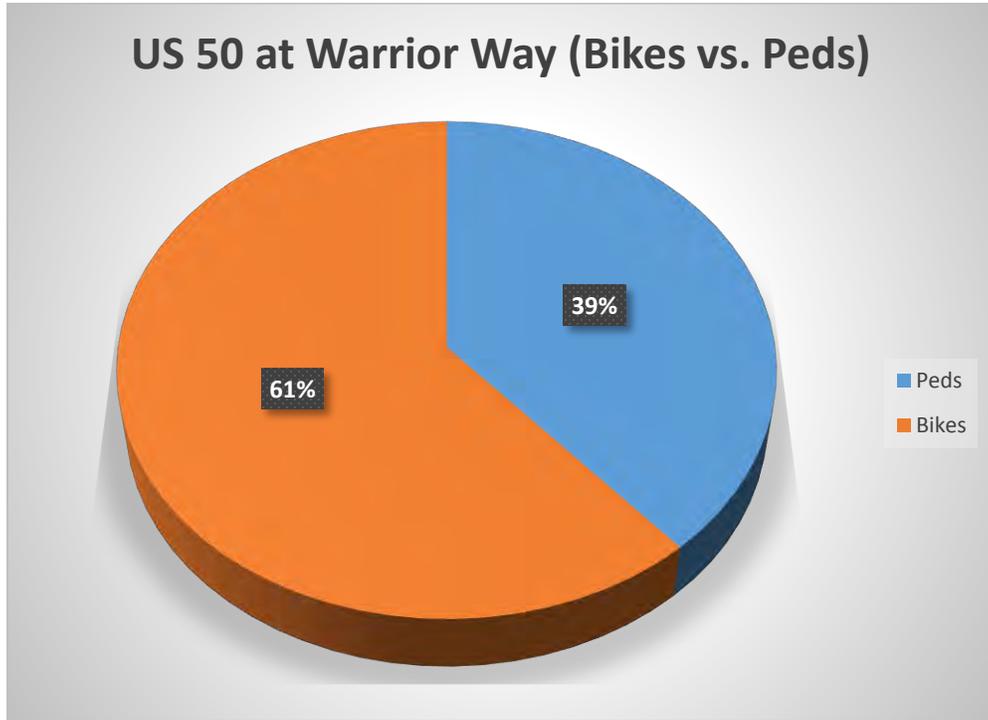
Count Location

APPENDIX C
Automatic Count Summaries

Incline Beach

Dates in field:	July 18th, 2015 – September 21st 2015
July Total Counted:	19,019
August Total Counted:	40,184
September Total Counted:	18,147
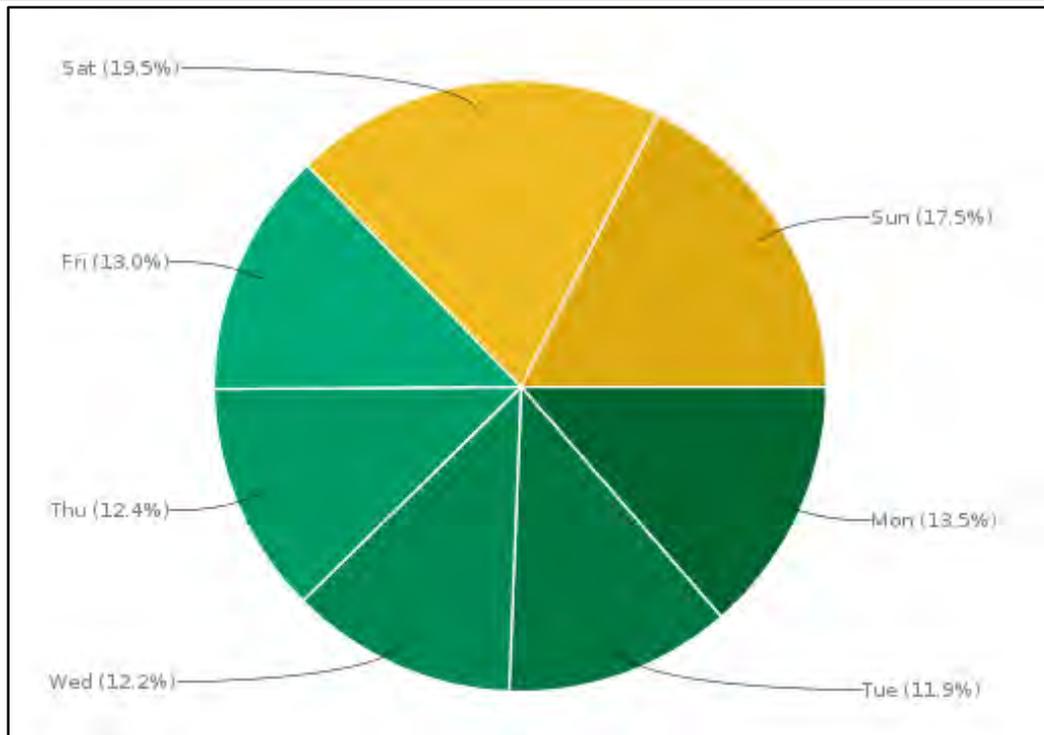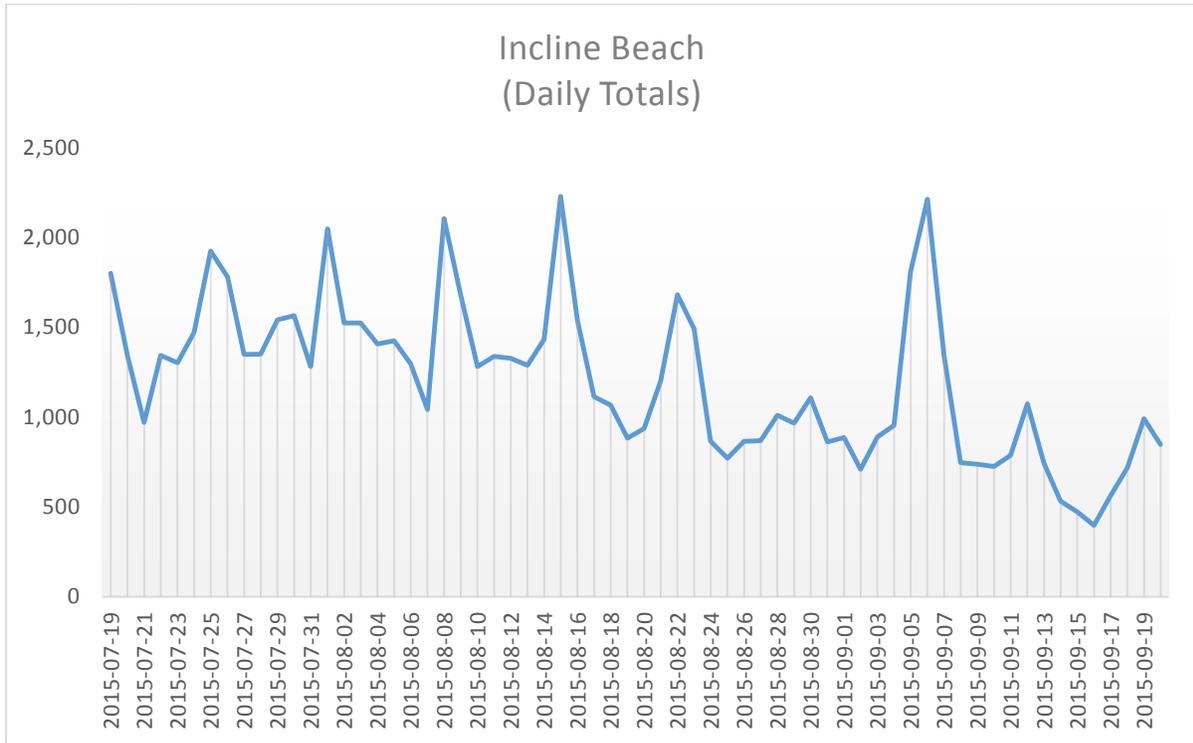
Count Location

Rabe Meadows at Elks Point Road

Dates in Field:	July 18th, 2015 – September 21st, 2015
July Total Counted:	3,587
August Total Counted:	6,736
September Total Counted:	3,233

Rabe Meadows at Elks Point Road
(Daily Totals)
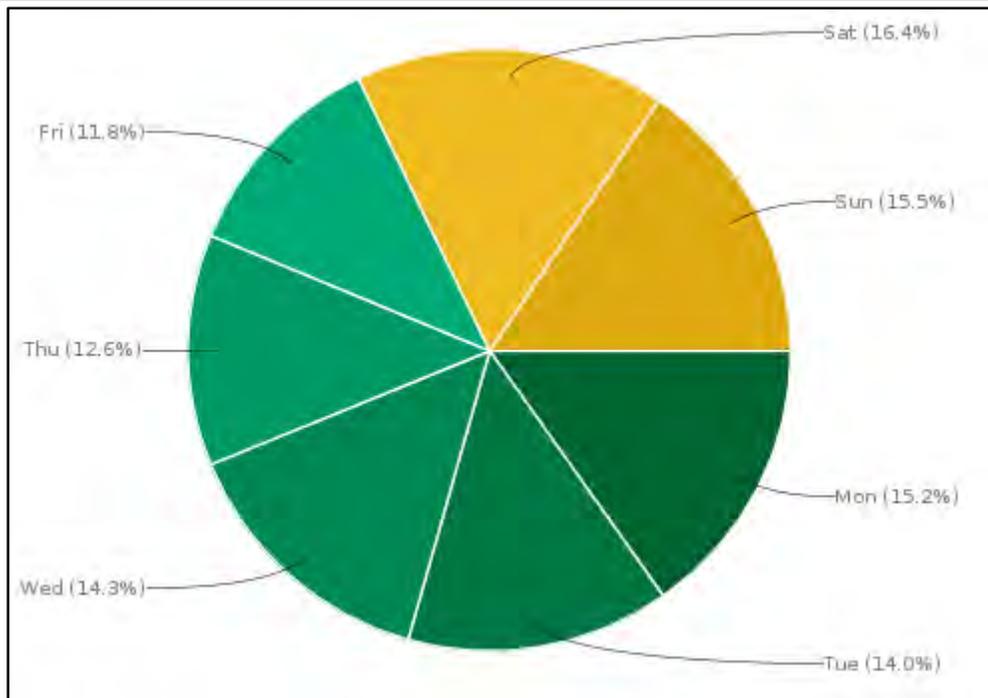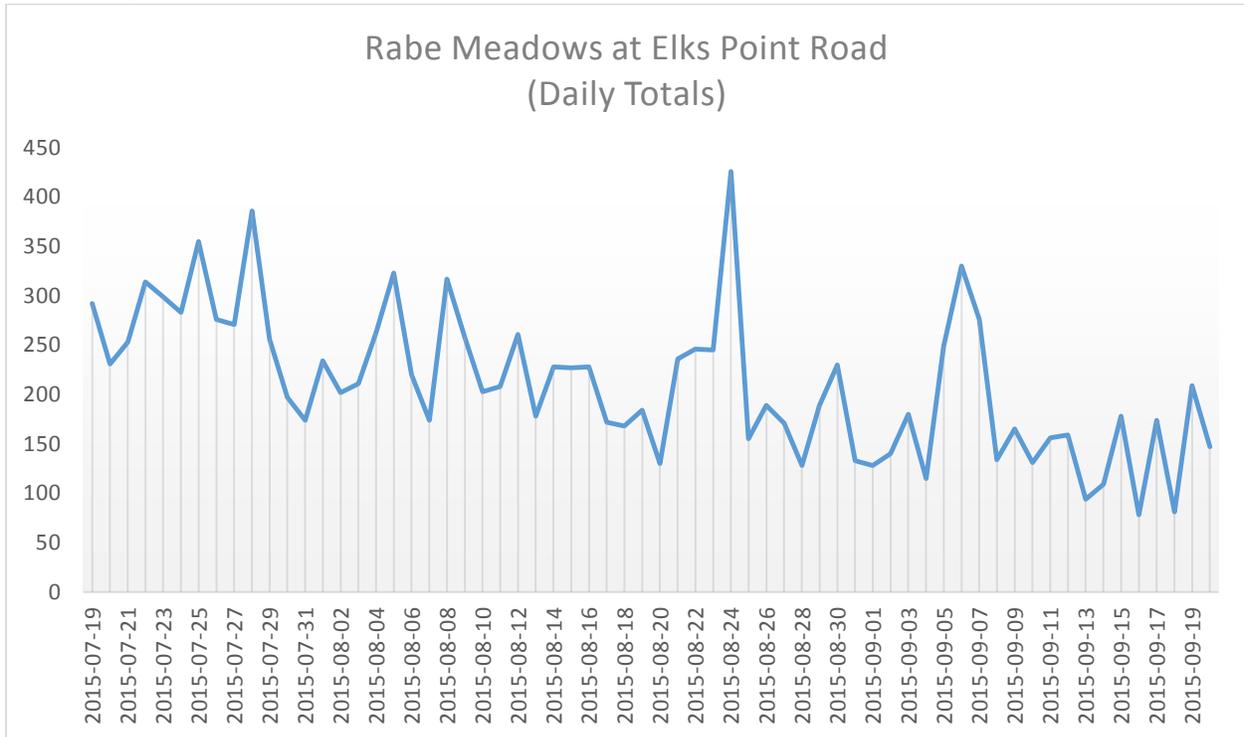
Count Location

SR 89 and Baldwin Beach Path

Dates in Field:	July 18th, 2015 – September 21st, 2015
July Total Counted:	4,567
August Total Counted:	8,385
September Total Counted:	3,168

SR 89 and Baldwin Beach Path
(Daily Totals)

Sat (18.3%)
Fri (9.5%)
Sun (14.8%)
Thu (13.2%)
Mon (16.2%)
Wed (15.0%)
Tue (12.9%)
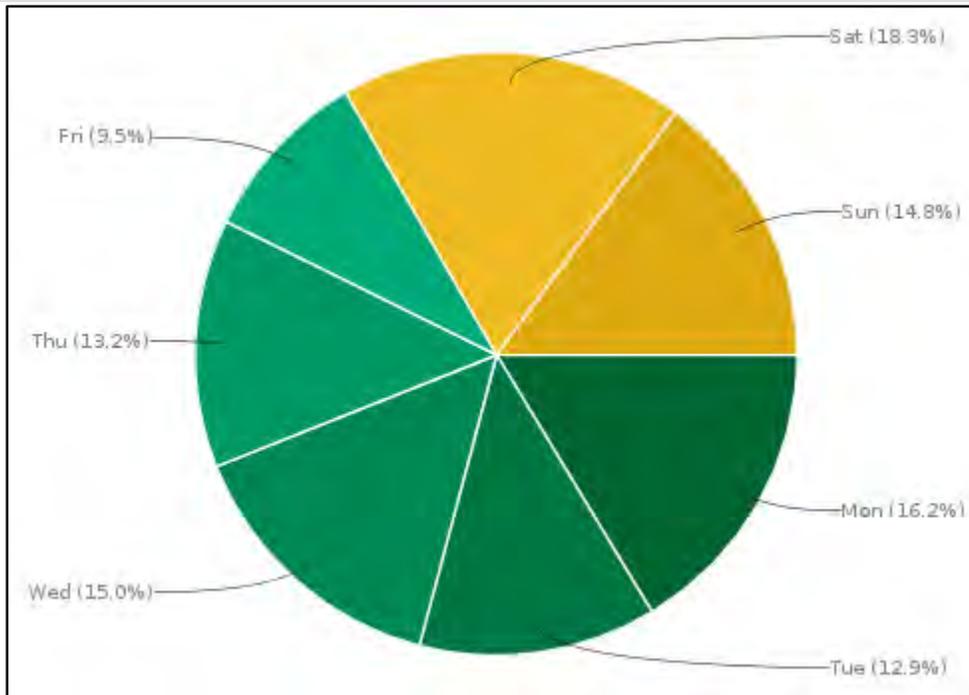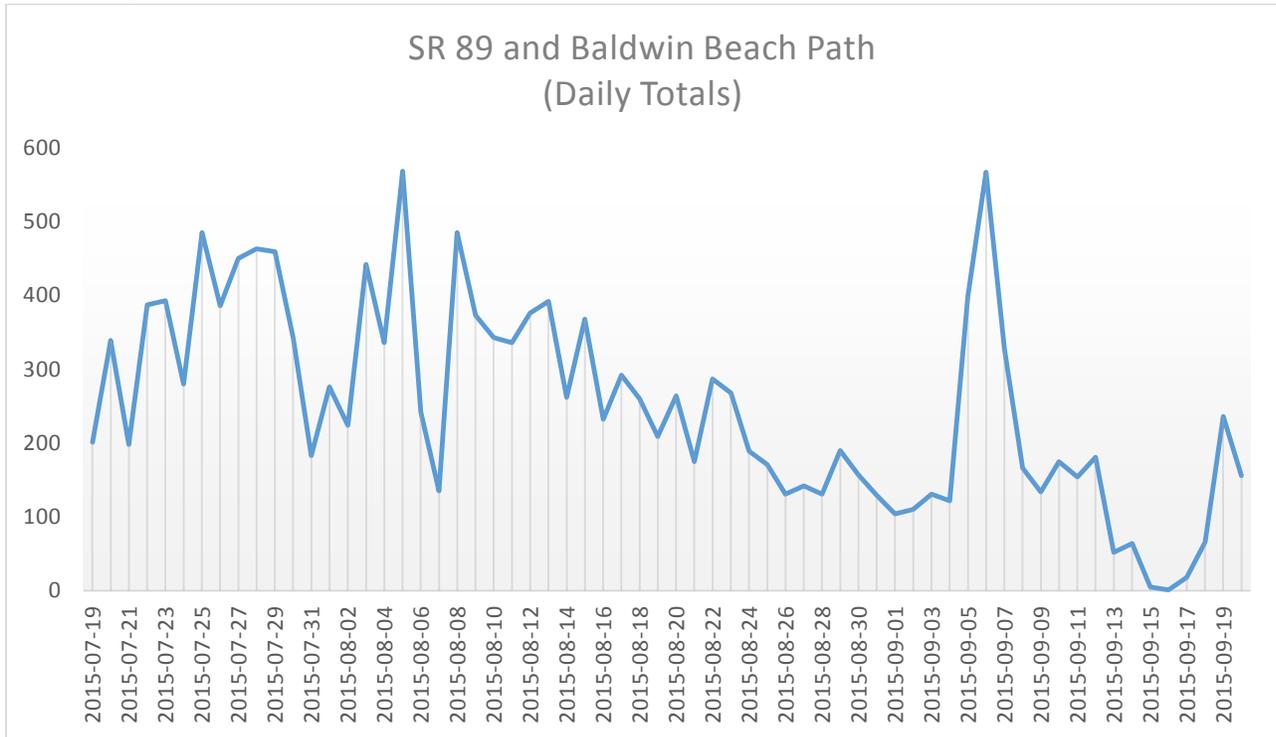
West Shore Bike Path

Dates in Field:	August 24th, 2015 – September 21st, 2015
July Total Counted:	-
August Total Counted:	1,724
September Total Counted:	4,432

West Shore Bike Path
(Daily Totals)

Sat (23.1%)
Sun (21.3%)
Fri (13.2%)
Mon (11.1%)
Thu (10.5%)
Tue (10.8%)
Wed (10.1%)

Legend:
★ - Counter Location
▪▪▪▪▪ - Manual Detection Zone/
Automatic Counter Zone
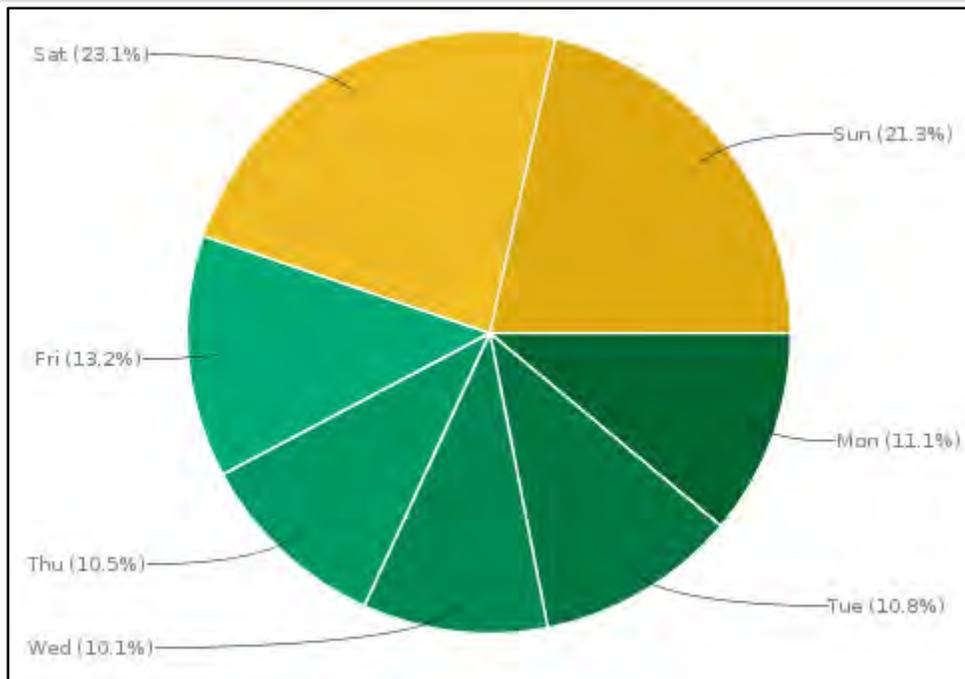
APPENDIX D
Proportional Total Map

Lake Tahoe Region Bicycle & Pedestrian Monitoring
August & September Combined Totals
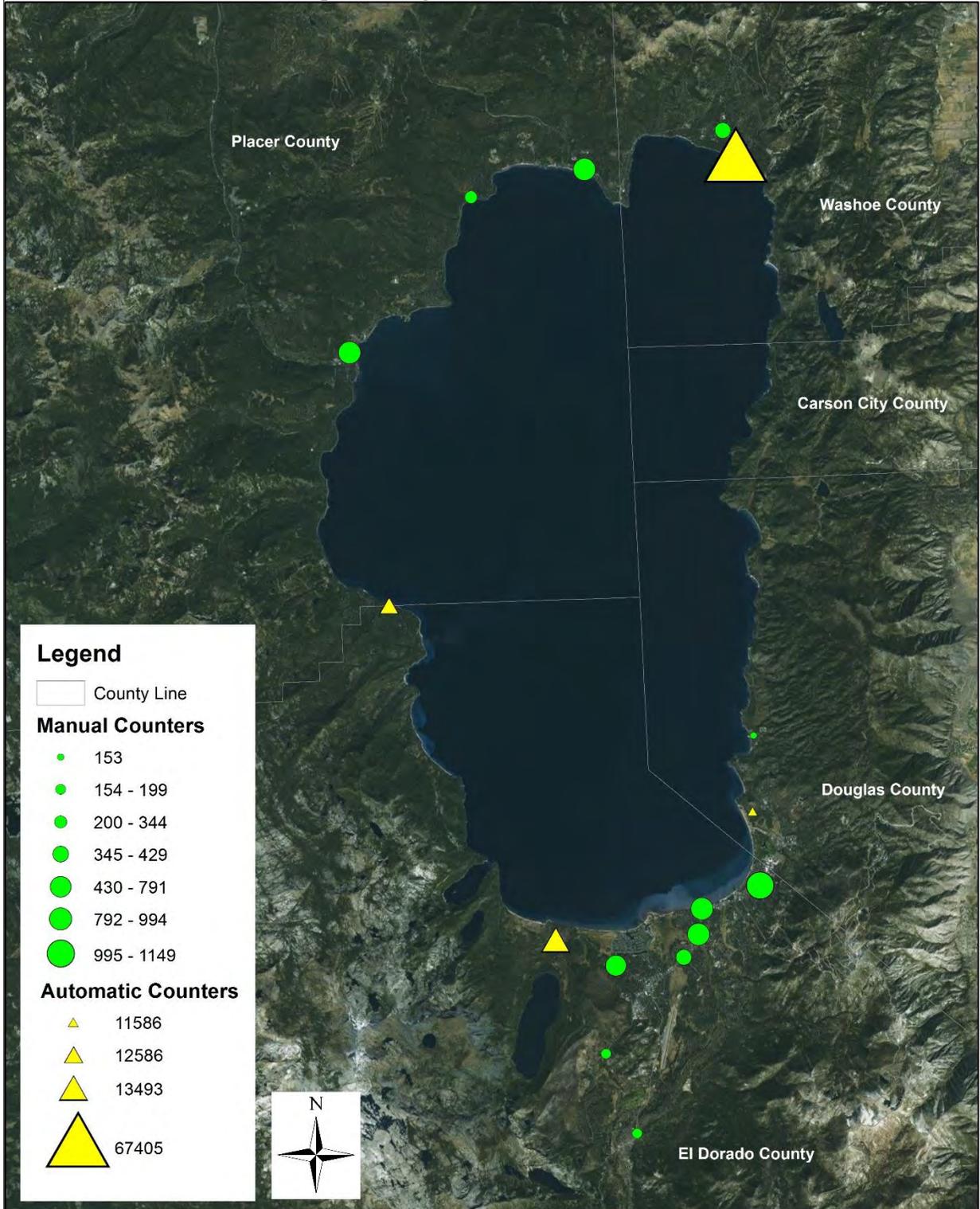
APPENDIX E
NBPDP Extrapolation Table

LOCATION	NBPD DESIGNATION	WEEKDAY PM COUNTS	WEEKEND COUNTS	WEEKDAY EXTRAPOLATION	WEEKEND EXTRAPOLATION
US 50 & Al Tahoe	Path	170	206	1275	1138
US 50 & Lakeview Ave	Path	209	309	1568	1708
15th Street & Eloise Ave	Path	96	280	720	1547
SR 28 @ Carnelian Bay	Path	54	118	405	652
Fanny Bridge	Pedestrian District	126	327	945	2453
Lake Tahoe & Sawmill Road	Path	20	30	150	166
Pioneer Trail South of Stateline	Pedestrian District	233	161	1748	1208
US 50 & Santa Fe	Path	29	52	218	287
SR 28 btw Bear & Coon Street	Pedestrian District	149	316	1118	2370
SR 28 & Village Blvd	Pedestrian District	50	100	375	750
US 50 & Sierra Blvd	Path	64	61	480	337
US 50 & Warrior Way	Pedestrian District	31	71	233	533
Incline Blvd	Path	43	120	323	663
Rabe Meadows	Path	14	41	105	227
SR 89 & Fallen Leaf Trail	Path	11	85	83	470
West Shore Bike Path	Path	23	81	173	448

The National Bicycle and Pedestrian Documentation Project (NBPDP) developed extrapolation factors for bicycle and pedestrian activity across the United States. This tool is used to give a general idea of the daily, monthly, and annual activity at a certain location based upon peak hour counts. The table above shows the daily activity for each location that has been extrapolated using the NBPDP factors. The weekday activity was extrapolated using the PM (4pm-6pm) peak hours for each site and entering them into the NBPDP extrapolation tool. Weekend daily activity volumes were developed using the peak hour from the weekend data collected (12PM – 2PM) and entering the total volume (bicycles and pedestrians) into the NBPDP extrapolation tool.

While these factors are used nationally, they are not calibrated specifically for the Lake Tahoe area. It may be beneficial to develop unique extrapolation factors for bicycle and pedestrian activity in the Lake Tahoe area on both recreational and commuter-oriented facilities. By doing this, a more accurate picture of usage trends unique to the Lake Tahoe area can be developed through extrapolation factors.

APPENDIX F
Tahoe City Public Utility District

Bike Trail Annual Survey – Summary Report

Tahoe City Public Utility District
Bike Trail Annual Survey – Summary Report
2015

PREPARED BY:
Kurt Althof
Tahoe City Public Utility District
Phone: 530-580-6057
kalthof@tcpud.org

September 2, 2015

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Introduction

Overview and Purpose of Bike Trail Surveys

OVERVIEW
The Tahoe City Public Utility District has been conducting intercept surveys and user counts on its bike trail network since 2005. The surveys are conducted the same time in August each year in order to provide consistent and comparable data year over year.

This report represents a summary of the results and information gathered from the surveys conducted August 5 and August 6, 2015. Included in this report is an analysis of the purpose of trail usage, the volume of trail usage, user characteristics, and user perception of the trails.

User counts and surveys were conducted on each of the four different trail segments within the Tahoe City Public Utility District trail system. The survey intercept locations were:

1. North Lake Blvd, Immediately east of the Lighthouse Center
2. Truckee River Trail, just North of River Ranch
3. 64 Acres Park, just south of the Tahoe City Wye
4. West Shore Trail, just south of Park Avenue in Tahoe Pines

PURPOSE
The Tahoe City Public Utility District has several objectives for conducting annual bike trail surveys. These objectives include:
- document the number of users the trail system serves;
- collection of trail users opinions with regards to trail conditions, maintenance and signage;
- identify any improvements desired by trail users, as well as concerns and general feedback;
- gauge the importance of the trail system for the community and visitors;
- support for funding applications aimed at financing or partially financing new trails, new trail connections, and trail improvements; and
- measure the impact of a grant funded project and provide the documentation required for grant reporting

Highlighted Findings for the Bike Trail Network

❖ Nearly all respondents claim the trails play a significant positive role in their enjoyment of North Lake Tahoe

❖ 81% of the trail users are visitors and seasonal residents which is 1% higher than 2014

❖ 58% of the respondents who drove to the trail did so because of safety concerns or because riding or walking on the road is not enjoyable, this number is up 5% from 2014

❖ 52% of the respondents would have used a car for their trip had they not been using the trail, representing a 4% decrease from 2014

❖ The ratio of pedestrians to cyclists was 1:4, in 2014 that ratio was 2:3

❖ 74% of the use was for recreation, sightseeing and exercise

❖ 26% of the use was transportation to access shopping, dining, work, etc.

❖ In the open comment section and nearly identical with 2014 results, the overwhelming majority of comments were positive in nature and thankful for the bike trail network. There were some common themes in the comments focused on the desire to expand the trail system, improve or increase signage, and continue to improve the surface and invest in the asset. See Exhibit C for all individual comments.

Note: The above findings and graphical results found in this report were derived from 493 total intercept surveys.

Truckee River Bike Trail Survey Results

Person counts were conducted on the Truckee River Bike Trail, approximately 100 yards south of River Ranch and adjacent to highway 89 from 7:00 am and 12:00 pm on Wednesday, August 5th, 2015 and again between 12:00 pm and 7:00 pm Thursday, August 6th, 2015. Over the course of the 12 hour counting period, The Truckee River Trail Bike Trail had 1,310 users of which 6% were pedestrian and 94% were bikers. Compared to 2014 total trail use was down 12% and the ratio of bikers to pedestrians went up. Peak usage occurred between 12:30 pm and13:00 pm. Exact user counts in 15 minute intervals can be found in Exhibit B.

There were 141 surveys completed on the Truckee River Bike Trail, up from 113 surveys in 2014. The following illustrates some of the user characteristics of those on the Truckee River Bike Trail.

Who is using the Truckee River Bike Trail?

Where the Truckee River Bike Trail users are staying
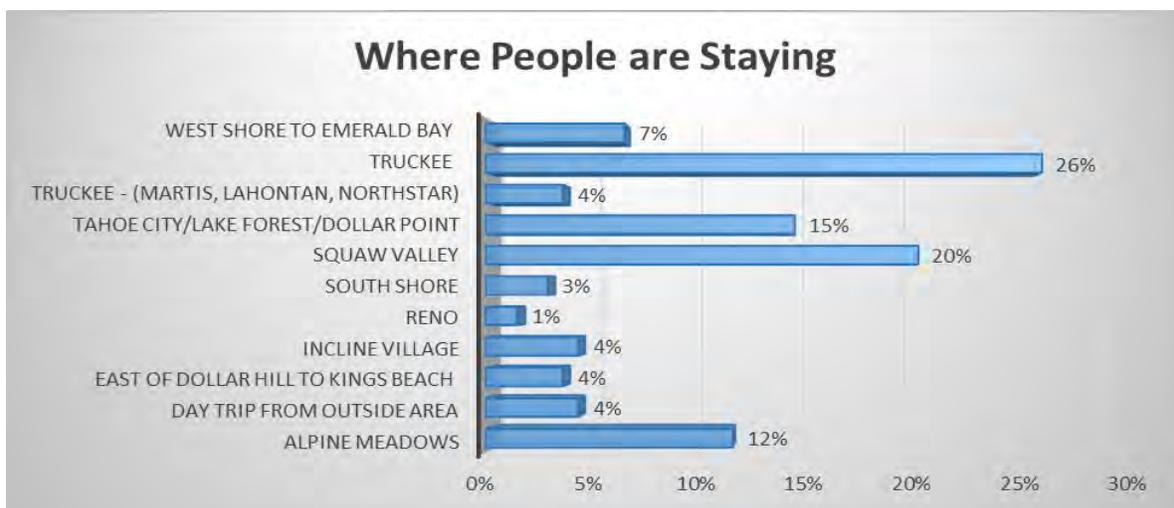
Would Truckee River Bike Trail users drive a car if not on the Trail?

Why are people using the Truckee River Bike Trail?

North Shore Bike Trail Results

Person counts were conducted on the North Shore Bike Trail, at the north entrance to town just behind the bus stop between 7:00 am and 12:00 pm on Wednesday, August 5th, 2015 and again between 12:00 pm and 7:00 pm Thursday, August 6th, 2015. Over the course of the 12 hour counting period, The North Shore Bike Trail had 783 users, of which 42% were pedestrian and 58% were bikers. Compared to 2014 total users were up 8% and the mix of cyclists to pedestrians was the same. Peak usage occurred between 12:15 pm and 12:45 pm. Exact user counts in 15 minute intervals can be found in Exhibit B.

There were 125 surveys completed on the North Shore Bike Trail, up from 57 surveys in 2014. The following illustrates some of the user characteristics of those on the North Shore Bike Trail.

Who is using the North Shore Bike Trail?

Where the North Shore Bike Trail users are staying
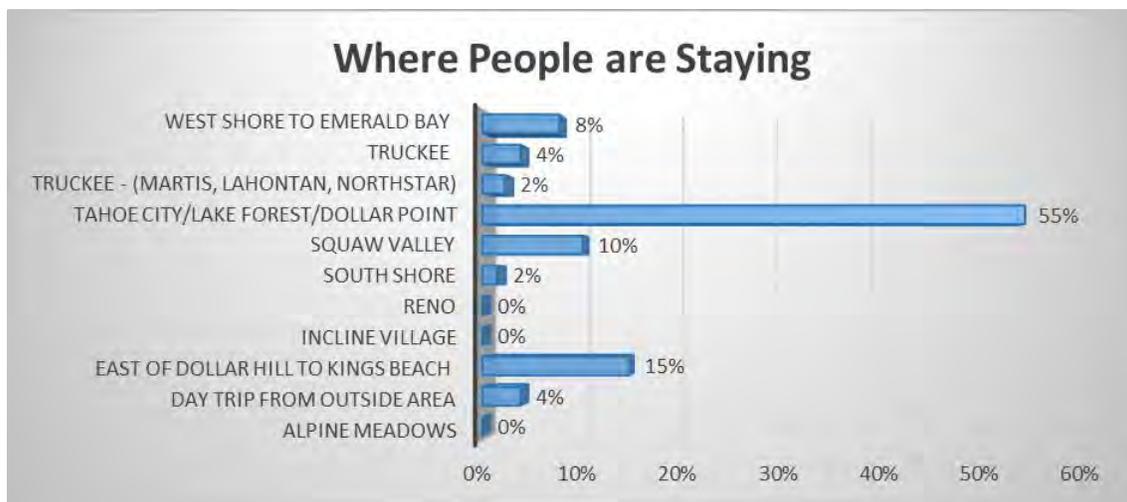
Would North Shore Bike Trail users drive a car if not on the Trail?

Why are people using the North Shore Bike Trail?

West Shore Bike Trail Results

Person counts were conducted on the West Shore Bike Trail, at the north entrance to town just behind the bus stop between 7:00 am and 12:00 pm on Wednesday, August 5th, 2015 and again between 12:00 pm and 7:00 pm Thursday, August 6th, 2015. Over the course of the 12 hour counting period, The West Shore Bike Trail had 356 users, of which 17% were pedestrian and 83% were bikers. Compared to 2014, total users were down 21% and the cyclist to pedestrian ratio increased slightly. Peak usage occurred between 11:15 am and 11:45 am. Exact user counts in 15 minute intervals can be found in Exhibit B.

There were 56 surveys completed on the West Shore Bike Trail, down from 67 surveys in 2014. The following illustrates some of the user characteristics of those on the West Shore Bike Trail.

Who is using the West Shore Bike Trail?

Where the West Shore Bike Trail users are staying
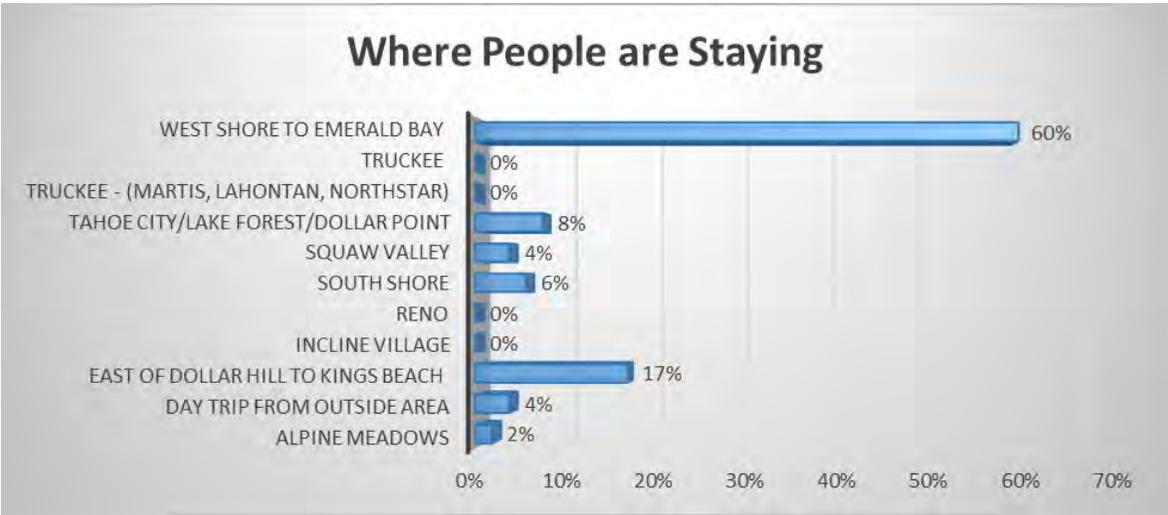
Would West Shore Bike Trail users drive a car if not on the Trail?

Why are people using the West Shore Bike Trail?

Bike Trail at 64 Acres Results

Person counts were conducted on the Bike Trail at 64 Acres, just south of the Tahoe City Wye, at 64 Acres park between 7:00 am and 12:00 pm on Wednesday, August 5th, 2015 and again between 12:00 pm and 7:00 pm Thursday, August 6th, 2015. Over the course of the 12 hour counting period, The 64 Acres Bike Trail had 862 users, of which 22% were pedestrian and 78% were bikers. Compared to 2014, total users were down 21% and the ratio of cyclists to pedestrians was essentially the same. Peak usage occurred between 3:15 pm and 3:30 pm. Exact user counts in 15 minute intervals can be found in Exhibit B.

There were 162 surveys completed on the Bike Trail at 64 Acres, up from 151 surveys in 2014. The following illustrates some of the user characteristics of those on the Bike Trail at 64 Acres.

Who is using the Bike Trail at 64 Acres?

Where the Bike Trail at 64 Acres users are staying
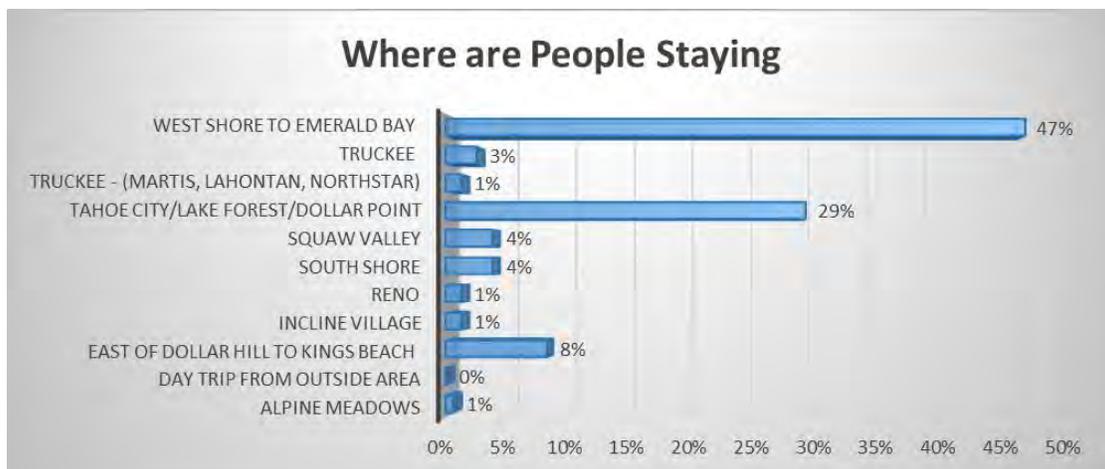
Would Bike Trail at 64 Acres users drive a car if not on the Trail?

Why are people using the Bike Trail at 64 Acres?

EXHIBIT A: TRAIL NETWORK USER SURVEY RESULTS
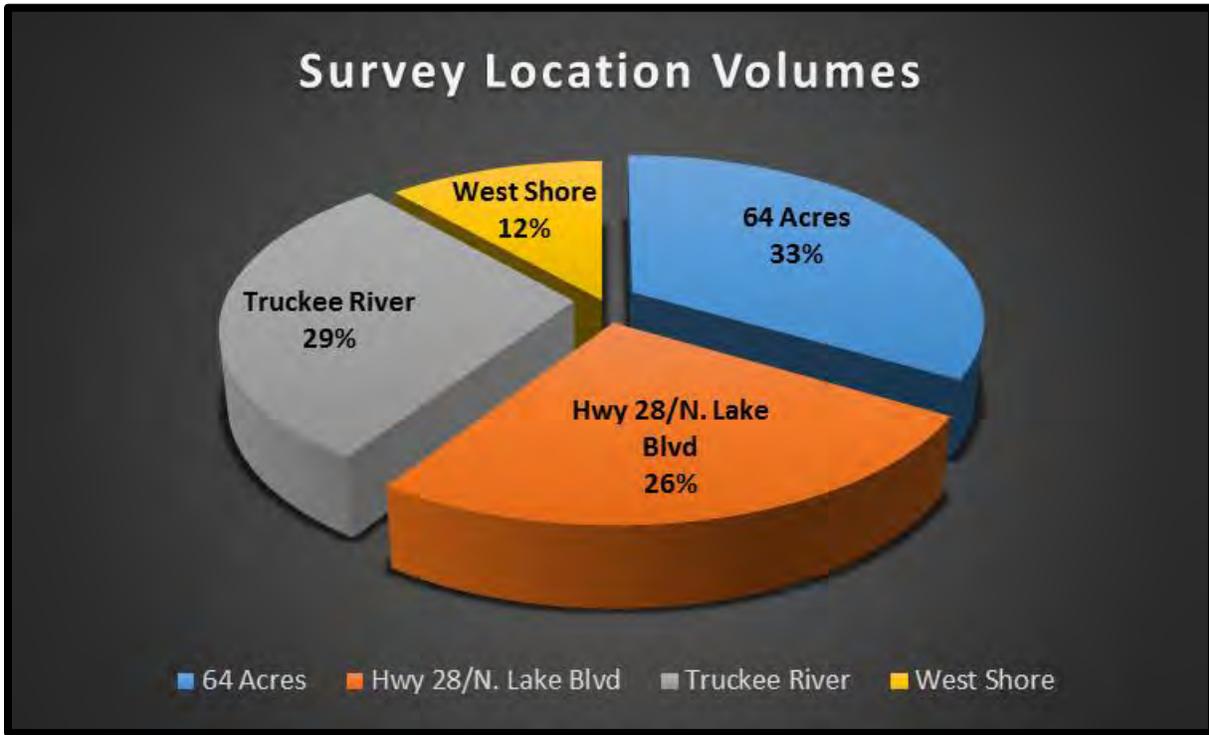
Location of Survey

Are you a full time resident, part time resident or visitor?

Where are People Staying/Living

Location	Percentage
WEST SHORE TO EMERALD BAY	27%
TRUCKEE	9%
TRUCKEE - (MARTIS, LAHONTAN, NORTHSTAR)	2%
TAHOE CITY/LAKE FOREST/DOLLAR POINT	29%
SQUAW VALLEY	10%
SOUTH SHORE	3%
RENO	1%
INCLINE VILLAGE	2%
EAST OF DOLLAR HILL THRU KINGS BEACH	10%
DAY TRIP FROM OUTSIDE AREA	3%
ALPINE MEADOWS	4%
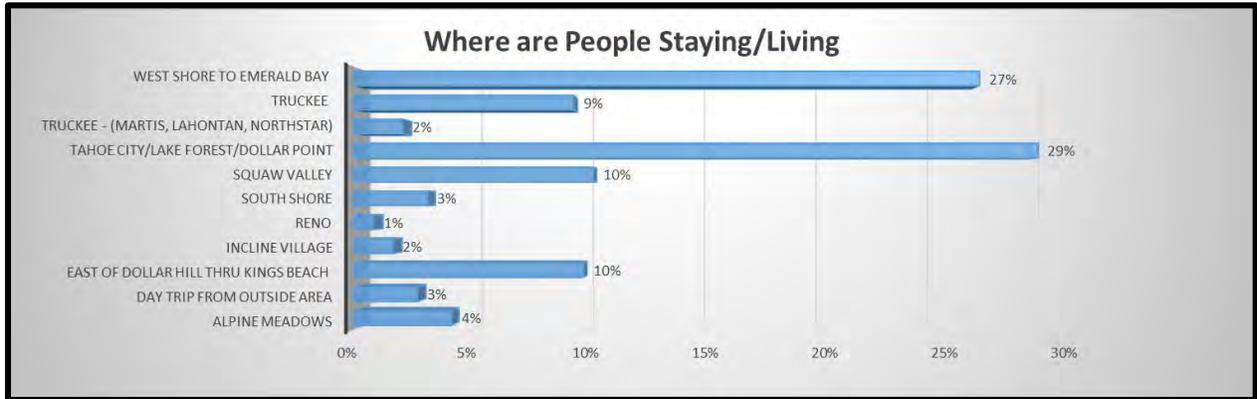
Where do you live or where are you staying in Tahoe?

If you Drove to the Trail Why?

Responses	Number of Responses
SAFETY CONCERNS	61
NOT ENJOYABLE TO RIDE ON THE ROAD	49
TO LIMIT THE DISTANCE OF OUTING	78

If you drove to the trail, why? (check all that apply)

How are you using the trail today? (check all that apply)

If you weren't on the trail today, would you be using a car to complete your trip?
EXHIBIT A: SUMMARY OF TRAIL NETWORK USER SURVEYS
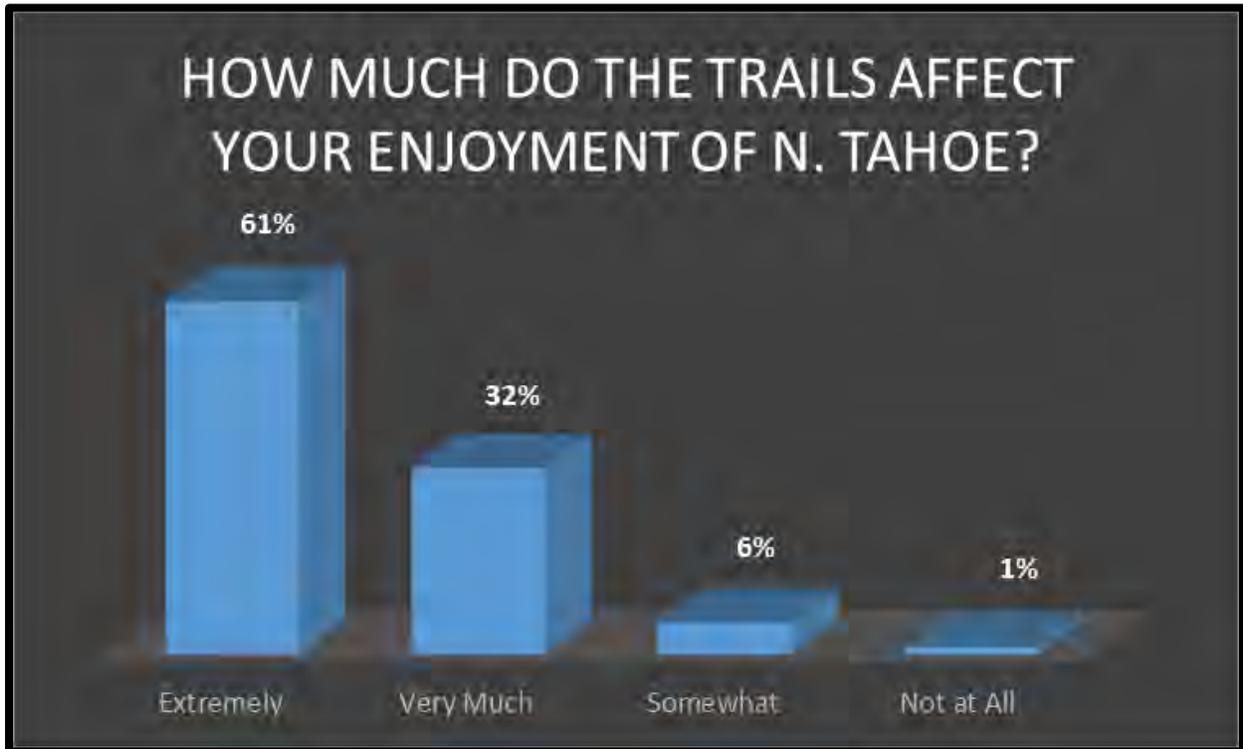
How much do the trails affect your enjoyment of North Lake Tahoe?

EXHIBIT B: TRAIL NETWORK USER COUNTS

Truckee River Trail User Counts

	Walk/Run	Bike	Total
7:00:00 AM	0	2	2
7:15:00 AM	0	3	3
7:30:00 AM	3	2	5
7:45:00 AM	2	1	3
8:00:00 AM	4	0	4
8:15:00 AM	0	3	3
8:30:00 AM	3	3	6
8:45:00 AM	1	0	1
9:00:00 AM	1	8	9
9:15:00 AM	0	3	3
9:30:00 AM	1	3	4
9:45:00 AM	9	21	30
10:00:00 AM	2	9	11
10:15:00 AM	9	16	25
10:30:00 AM	0	55	55
10:45:00 AM	2	32	34
11:00:00 AM	3	25	28
11:15:00 AM	7	38	45
11:30:00 AM	4	30	34
11:45:00 AM	0	51	51
12:00:00 PM	6	50	56
12:15:00 PM	0	52	52
12:30:00 PM	0	90	90
12:45:00 PM	4	56	60
1:00:00 PM	2	62	64
1:15:00 PM	4	47	51
1:30:00 PM	0	47	47
1:45:00 PM	0	48	48
2:00:00 PM	2	60	62
2:15:00 PM	2	13	15
2:30:00 PM	0	52	52
2:45:00 PM	0	36	36
3:00:00 PM	1	57	58
3:15:00 PM	1	29	30
3:30:00 PM	0	19	19
3:45:00 PM	0	20	20
4:00:00 PM	0	21	21
4:15:00 PM	0	22	22
4:30:00 PM	1	31	32
4:45:00 PM	0	51	51
5:00:00 PM	1	5	6
5:15:00 PM	0	14	14
5:30:00 PM	0	17	17
5:45:00 PM	0	10	10
6:00:00 PM	0	4	4
6:15:00 PM	0	13	13
6:30:00 PM	0	1	1
6:45:00 PM	0	3	3
Total	75	1235	1310

EXHIBIT B: TRAIL NETWORK USER COUNTS

North Shore Trail User Counts

	Walk/Run	Bike	Total
7:00:00 AM	3	3	6
7:15:00 AM	2	2	4
7:30:00 AM	0	3	3
7:45:00 AM	1	3	4
8:00:00 AM	5	1	6
8:15:00 AM	3	2	5
8:30:00 AM	4	0	4
8:45:00 AM	1	0	1
9:00:00 AM	10	10	20
9:15:00 AM	9	3	12
9:30:00 AM	5	1	6
9:45:00 AM	6	7	13
10:00:00 AM	9	9	18
10:15:00 AM	9	10	19
10:30:00 AM	9	7	16
10:45:00 AM	7	4	11
11:00:00 AM	16	19	35
11:15:00 AM	11	11	22
11:30:00 AM	10	12	22
11:45:00 AM	4	15	19
12:00:00 PM	13	23	36
12:15:00 PM	18	23	41
12:30:00 PM	14	27	41
12:45:00 PM	12	20	32
1:00:00 PM	4	16	20
1:15:00 PM	3	12	15
1:30:00 PM	13	12	25
1:45:00 PM	9	12	21
2:00:00 PM	10	6	16
2:15:00 PM	1	9	10
2:30:00 PM	2	8	10
2:45:00 PM	8	8	16
3:00:00 PM	13	11	24
3:15:00 PM	6	3	9
3:30:00 PM	7	20	27
3:45:00 PM	5	10	15
4:00:00 PM	3	10	13
4:15:00 PM	2	16	18
4:30:00 PM	1	7	8
4:45:00 PM	3	10	13
5:00:00 PM	8	17	25
5:15:00 PM	14	14	28
5:30:00 PM	2	11	13
5:45:00 PM	5	9	14
6:00:00 PM	6	2	8
6:15:00 PM	10	4	14
6:30:00 PM	5	2	7
6:45:00 PM	11	7	18
Total	332	451	783

EXHIBIT B: TRAIL NETWORK USER COUNTS

West Shore Trail User Counts

	Walk/Run	Bike	Total
7:00:00 AM	0	1	1
7:15:00 AM	0	0	0
7:30:00 AM	2	0	2
7:45:00 AM	4	1	5
8:00:00 AM	0	0	0
8:15:00 AM	0	0	0
8:30:00 AM	2	10	12
8:45:00 AM	3	1	4
9:00:00 AM	2	1	3
9:15:00 AM	0	2	2
9:30:00 AM	2	5	7
9:45:00 AM	2	4	6
10:00:00 AM	1	2	3
10:15:00 AM	0	14	14
10:30:00 AM	3	4	7
10:45:00 AM	6	2	8
11:00:00 AM	0	10	10
11:15:00 AM	0	20	20
11:30:00 AM	1	20	21
11:45:00 AM	1	9	10
12:00:00 PM	1	10	11
12:15:00 PM	0	7	7
12:30:00 PM	0	9	9
12:45:00 PM	1	5	6
1:00:00 PM	12		12
1:15:00 PM	0	2	2
1:30:00 PM	0	17	17
1:45:00 PM	0	10	10
2:00:00 PM	0	15	15
2:15:00 PM	0	5	5
2:30:00 PM	0	4	4
2:45:00 PM	5	14	19
3:00:00 PM	1	11	12
3:15:00 PM	0	9	9
3:30:00 PM	0	12	12
3:45:00 PM	2	5	7
4:00:00 PM	2	5	7
4:15:00 PM	1	5	6
4:30:00 PM	3	10	13
4:45:00 PM	1	6	7
5:00:00 PM	3	3	6
5:15:00 PM	0	3	3
5:30:00 PM	0	7	7
5:45:00 PM	0	6	6
6:00:00 PM	0	5	5
6:15:00 PM	0	2	2
6:30:00 PM	0	2	2
6:45:00 PM		0	0
Total	61	295	356

EXHIBIT B: TRAIL NETWORK USER COUNTS

Bike Trail at 64 Acres User Counts

	Walk/Run	Bike	Total
7:00:00 AM	6		6
7:15:00 AM	4	5	9
7:30:00 AM	5	2	7
7:45:00 AM	8	3	11
8:00:00 AM	8	6	14
8:15:00 AM	6	4	10
8:30:00 AM	2	6	8
8:45:00 AM	8	3	11
9:00:00 AM	7	10	17
9:15:00 AM	4	6	10
9:30:00 AM	5	10	15
9:45:00 AM	2	6	8
10:00:00 AM	2	17	19
10:15:00 AM	4	24	28
10:30:00 AM	8	17	25
10:45:00 AM	18	13	31
11:00:00 AM	4	14	18
11:15:00 AM	2	11	13
11:30:00 AM	1	32	33
11:45:00 AM	8	25	33
12:00:00 PM	4	25	29
12:15:00 PM	2	20	22
12:30:00 PM	2	31	33
12:45:00 PM	2	4	6
1:00:00 PM	5	10	15
1:15:00 PM	8	12	20
1:30:00 PM	3	22	25
1:45:00 PM	4	30	34
2:00:00 PM	0	32	32
2:15:00 PM	1	16	17
2:30:00 PM	2	35	37
2:45:00 PM	0	11	11
3:00:00 PM	5	28	33
3:15:00 PM	4	36	40
3:30:00 PM	6	10	16
3:45:00 PM	3	22	25
4:00:00 PM	4	27	31
4:15:00 PM	1	8	9
4:30:00 PM	4	9	13
4:45:00 PM	4	15	19
5:00:00 PM	1	16	17
5:15:00 PM	5	14	19
5:30:00 PM	0	9	9
5:45:00 PM		0	0
6:00:00 PM	4	10	14
6:15:00 PM	1	9	10
6:30:00 PM			0
6:45:00 PM			0
Total	187	675	862

EXHIBIT B: TRAIL NETWORK USER COUNTS

Total Trail Network User Counts

	Walk/Run	Bike	Total
7:00:00 AM	9	6	15
7:15:00 AM	6	10	16
7:30:00 AM	10	7	17
7:45:00 AM	15	8	23
8:00:00 AM	17	7	24
8:15:00 AM	9	9	18
8:30:00 AM	11	19	30
8:45:00 AM	13	4	17
9:00:00 AM	20	29	49
9:15:00 AM	13	14	27
9:30:00 AM	13	19	32
9:45:00 AM	19	38	57
10:00:00 AM	14	37	51
10:15:00 AM	22	64	86
10:30:00 AM	20	83	103
10:45:00 AM	33	51	84
11:00:00 AM	23	68	91
11:15:00 AM	20	80	100
11:30:00 AM	16	94	110
11:45:00 AM	13	100	113
12:00:00 PM	24	108	132
12:15:00 PM	20	102	122
12:30:00 PM	16	157	173
12:45:00 PM	17	81	98
1:00:00 PM	20	82	102
1:15:00 PM	12	71	83
1:30:00 PM	21	88	109
1:45:00 PM	12	92	104
2:00:00 PM	16	111	127
2:15:00 PM	3	59	62
2:30:00 PM	3	80	83
2:45:00 PM	15	93	108
3:00:00 PM	15	90	105
3:15:00 PM	12	69	81
3:30:00 PM	11	87	98
3:45:00 PM	13	45	58
4:00:00 PM	8	58	66
4:15:00 PM	7	70	77
4:30:00 PM	6	56	62
4:45:00 PM	8	76	84
5:00:00 PM	16	40	56
5:15:00 PM	15	47	62
5:30:00 PM	7	49	56
5:45:00 PM	5	34	39
6:00:00 PM	6	11	17
6:15:00 PM	14	29	43
6:30:00 PM	6	14	20
6:45:00 PM	11	10	21
Total	655	2656	3311

Do you have any comments or suggestions about our trail?
access at tahoe marina lodge
access at tahoe marina lodge w/o going up to street
add missing section
add more walk left sign
add water to river
additional signage starting at the beginning Tahoe city directing visitors on the bike path instead of through town
awesome - thank you
awesome trails
awesome trials a great part of being in Tahoe
awesome way to see the lake
awesome. you guys do a great job.! thank you
beautiful
beautiful no good for road bike
beautiful sight lots of wildlife
beautiful trolls will come back to ride again
beautiful.!
better crossing at hwy
better signage in Tahoe city to know where to go
better signage indicating how trail connects in and through town. confusing heading north from BT roots, cracks, etc make for a bumpy ride north of TC! the crossing at both lake forest rd are sketchy, especially the one near the boat ramp.
better than no trails. they are good for the are
better transition through the "Y' better transition near pine street spend money on existing trails for congestion and flow through busy areas
big bumps/cracks can really throw you off. multiple crossing of highway (especially of west shore) are super dangerous. new road construction will make roads better need a bike trail thru homewood
bike access amp paths add to the overall enjoyment of Tahoe
bike path should go all around the lake
bike pedestrians trail need to be wide to be safe
bike trial through homewood
brochure at rental bike shops signage increase on paths for "visiting" walkers/strollers
build more epsd
can't see bikes coming
can't wait to see the west shore bike trail extended through homewood
caution rafter not paying attention
change to walk right
complete bike trail around homewood
complete trails
confused about construction and crossing highway is difficult
confusing and crowded
confusing- people don't get it
connect from bridgetender to commons beach better signs
connect to kings beach
construction confusing. would be better if trail homewood
construction impact on hwy 89
continue to shore
crossing on the west shore heading towards sunnyside is sketchy! not enough time for car to stop. also possibly more signage explaining the left/right policy and advising ped to not take up entire trial
do you think is working? somewhat
doesn't make sense and few people adhere to it. -extend it around the lake -more signage
doing a great job

educate on hoe to use trail
enjoy it
everything is great
excellent trail one of the best part of our vacations here
expended the network we always bike from squaw valley to Tahoe city lake Tahoe trails don't offer great review add safety fencing at points of stern drop off
extend all around lake
extend it further
extend it to parts without trails
extend past dollar pt.
extend the trial
extend to truckee
extend trail to Truckee via Tahoe city and Alpine Meadows
fantastic bike trail
few signs and rules
finish homewood trail please
finish the trail near hoomewood
go further
go to south shore
good experience
good got all around
good idea! we used it everyday
good safe area to ride with kids
great
great for kids
great job
great job
great job
great signs to mt bike trail access will be great
great to have a trail to direct tourist to activities thanks for the bell
great trail enjoy it every time we came to Tahoe
great trail keep it up
great trails
great trails for me (68 years old)
great trial
great!
i enjoy it. please complete missing section
i like the nice people at the survey booth
I Love Tahoe
i love the bike trail! i have a down my car usage about 50 mile/week. some of the surface need to be paved they're got cracks
i love the extensive trails. lost of tree roots make it bumpy
i love the trails such a great way to see the lake and get some exercise
i love the views of the trail. they are magnificent
i wasn't able to find the trail after i walked down a rode at Tahoe taver no-trail after sign along lake
i wish all bikes would use the trails i hate "red hot" riding on the road.!
in my 52 years around Tahoe this is the best addition to the are we need more !!
in some areas of Tahoe city to lake forest trail bumps can be harsh
is this road old? because it is cracked so can you fix it.
it is really awesome no comments/suggestions
It would be fantastic if we could walk and bike all the to meeks bay on the trail
it would be great to have restroom and water fountains along trails
it would be nice if the portion down 89 to squaw was smother. and of course, a trail around the lake would be ideal.!!
its a great asset for the are- wish we had then in kings beach
it's a little inconsistent, but a good start
its wonderful to have the bike trail i wish i went around the whole lake

jess is awesome
keep funding the trails
keep funding up- great trail
keep it going beautiful
keep it open and get rid of cars
keep it up
keep them up we love them maybe flashing lights at road crossing that turn to red - cars don't stop
keep trails open for all enjoy
keep up the good work
keep up the great work!
light up crosswalk to alert drivers would be great
lights at night
lights for evening groom during the winter
list mileage squaw to tc on maps and trail signs list miles to en of the trail down west shore
looking forward to having trail around the entire lake
Lots of bumps and tree roots but i love the fact that we can make exercise a part of our life here i train triathlon up here and can easily do a 20-50 minutes ride promo squaw. i go up alpine round to other detours thanks for all
lots of lumps because of poor repairs
love bike trail system - please extend further
love it
love it
love it
love it
love it keep people out of their cars!
love the complete trails bummer when you have to off road downtown but such a great ride
love the trail thank you
love this trail this is my favorite spot in the world
make longer/ more miles
make more overall
make more trails
make the bike path from funny bridge hook up to the path at commons now you have to go on hwy 28
make trail longer snack bar along the way
mile markers
missed the river would like to see "do not stop on bike trail" painted every so often on trail
monitors to inform rules would help w/ which side to use pot hole and splits in trails Truckee river trails is dangerous
more and complete trails
more benches to rest along the way
more bike paths better on road, good keeps fast in highways------ works on homewood- soon
more clarity of walk-left, ride right
more education on walk left
more markings to walk on the left. finish homewood
more on path regarding walk/ride crossing at sequoia is bad-pas sunnyside / rideout more flashing lights ant crossing '
more painted instructions and sign to let user know how to conduct themselves
more reminder of "L" and "R" rules some with pictures bikes need to respect walkers speed limit for bikers
more sign and maps. speed and safety
more signs
more signs Tahoe rim trail signage needed
more signs signage as how to walk left right
more trail
more trail maybe better signage around obexter's
more trails
more trails striping good thing
more trash cans (carrying dog poo 2 miles sucks - but o do it) lights for night riding
more trash cans and by hurricane bay
more!!
need more signage

need better root/hole/crack repair homewood area needs better access
need bridge between cherry and ferr and oak and trout
nice walk
no more construction
no walk left, right at commons beach
none
nothing is great
occasional water station extend mult use trial
on road vs on lake
one side or the other rule
other clearly do NOT - tired of been yelled at by bikers -signs need not on pavement
parking at point near trail love this trail (we dove part way to manage the distance
parking is an issue
peds need to be more aware and cautious that this is a bike trail stay on one side and always watch for others
people don't use the general roles especially pedestrians
please mountain bikers to yield to uphill riders its frustrating that bikes have to stop at side in intersections with streets it seems the cars should stop
please add distance makers from place to place on wail helpful when going with kids. very pretty trail wish it were longer around
please keep up on the repairs on the trail it keeps us safe. thank you
put in crosswalk at timberland to many bikes and they go too fast can not always see bikes coming
quicker hike trail thru town to avoid playground marina thru Tahoe commons
really enjoy
repaint when possible for sign (stop and crosswalk)
repair upright signage walk left
replace "walk bike" sign on lakeside trail with "ride slow" congestion ahead "yield to pedestrians"
resurface trail to squaw valley connect homewood please give us a bike path from meeks bay to kings beach
rim trial signage NEEDED!!
river season is dangerous when appropriate
safe trial to kings beach and include would be great
safety concern crossing hwy at the 7eleven if you are exiting forest near nordic center
safety concerns with roads
sidewalks to get place but i love trails
signage and crosswalk at cathedral
signage could be better on west shore
signage improvement enjoy the trail
signage should included stop ahead and mph
signs- more how far it will go 62 acres intercede add mileage and directions
signs with mileage would be helpful 3 mile to Tahoe city
snow
some of the road intersection do not have good visibility for traffic
surface could be upgraded
surface xc west shore for kids
thank you
thank you
thank you
thanks for filling holes no signage on river trail re-stamped stencils are confusing 10-15 runners not following rules
thanks for having the trails
the reason we own a vacation condo on the west shore is because of the bike path - we would probably move to the Nevada side were it not for the wonderful
the trail system is excellent
there are a couple of man hole cover especially near the area of coffee house that are hazardous
this is a great way to get our family out and see n. tahoe
trail is awesome send more money
Trail should continue. I support you! keep uo good work.
trails further away from traffic

user generally following rules walk poor and bike good

very beautiful contains lots of lovely and interesting wildlife

very nice to have a good trail to work out and enjoy

very well main tainted and family friendly!

very well main tainted and family friendly!

walk l and ride r is confusing other trail

walk left, rife right is very confusing for everyone and will not work no matter the effort just follow normal rules of the road

walk/bike lane signage needs to be marked more clearly

walker to walk on one side

we biked across the country on trail and roads and this was one of my smoothies rides! thanks

we enjoy it very much and would love safe trail around tahoe

we enjoyed your trails system every year thank you

we love it

we love it

we love it thank you

we love Tahoe and riding bikes. can't wait for it to get longer. love to ride to Meeks.

we love Tahoe. Crossing of trail along side streets could be better marked. cathedral crossing need to be marked better. mileage makers useful! make exercise more fun.

we the pot-o-potties would love more on the lake

widen the trail

wider trails and have the trails access not near cars and parking lots

wish there were more

wonderful

would be nice to extend to truckee

would love a total

would love areas to be not so close to the road

yelled at by bikers more signs confusing

yes.! we love to come to Tahoe every summer just park car and utilize the bike trails with our children keep up the good work

young children in large group to be mindful of building traffic

2015 TCPUD Trail Surveys

1) Date
( ) 8/5/15   ( ) 8/6/15

2) Time
( ) 7-7:59am   ( ) 8-8:59am   ( ) 9-9:59am   ( ) 10-10:59am ( ) 11-11:59am
( ) 12-12:59pm ( ) 1-1:59pm   ( ) 2-2:59pm   ( ) 3-3:59pm   ( ) 4-4:59pm
( ) 5-5:59pm   ( ) 6-6:59pm

3) Survey Location?
( ) Hwy 28/N. Lake Blvd ( ) Truckee River   ( ) 64 Acres   ( ) West Shore

4) Are you a full time resident, part time resident or visitor?
( ) Full time   ( ) Part time   ( ) Visitor

5) Where do you live or where are you staying in Tahoe?

( ) Squaw Valley

( ) Alpine Meadows

( ) Tahoe City/Lake Forest/Dollar Point

( ) West Shore to Emerald Bay (Sunnyside, Homewood, Tahoma, Meeks Bay)

( ) Incline Village

( ) Truckee - (Martis, Lahontan, Northstar)

( ) Truckee (Donner Lake, Glenshire, Olympic Heights, Prosser, Tahoe Donner)

( ) South Shore

( ) Reno

( ) Day Trip from outside area

( ) East of Dollar Hill thru Kings Beach (Old County, Cedar Flat, Carnelian Bay, Tahoe Vista, Crystal Bay)

If you drove to the trail, why? (check all that apply)
[ ] Safety concerns   [ ] Not enjoyable to ride on the road   [ ] To limit the distance of outing

6) How are you using the trail today? (check all that apply)
[ ] Access to Recreation Site/Activity   [ ] Go to Work/Appointment/School

[ ] Shopping/Errands/Dining   [ ] Recreation/Sightseeing   [ ] Purely Exercise

7) If you weren't on the trail today, would you be using a car to complete your trip?
( ) Yes   ( ) No

8) How much do the trails affect your enjoyment of North Lake Tahoe?
( ) Not at all   ( ) Somewhat   ( ) Very much   ( ) Extremely

9) How many people are in your group (on bike trail) today?
( ) 1   ( ) 2   ( ) 3   ( ) 4   ( ) 5   ( ) More than 5

10) Do you understand the "walk left, ride right--Yield to Wheels" policy on the trails?
( ) Yes   ( ) No   ( ) Not aware of policy

11) Do you think it is working?
( ) Yes   ( ) No

12) Please rate the trail based on the following factors

	poor	average	good	excellent	n/a
Cleanliness & Quality	( )	( )	( )	( )	( )
Surface Conditions	( )	( )	( )	( )	( )
Signage	( )	( )	( )	( )	( )
Access	( )	( )	( )	( )	( )
Congestion on Trail	( )	( )	( )	( )	( )
Users Generally Following Rules	( )	( )	( )	( )	( )
Trail Crossings	( )	( )	( )	( )	( )
Overall Experience	( )	( )	( )	( )	( )

13) Do you have any comments or suggestions about our trail?
_____
_____
Thank You!