

2011 Tempe Bike Count Report



Tempe Bicycle Action Group

1. Abstract

In March 2011 the first city-wide bike count in Tempe was conducted as a way of understanding cycling habits, such as which routes have the most ridership, and to identify routes and intersections that are problematic or dangerous. In total, 9,407 bicyclists and 11,013 pedestrians were counted. The cyclist count through an imaginary cordon around the ASU-Tempe campus was 395 per hour in-bound in the morning and 379 per hour out-bound in the afternoon. Overall helmet use was 17%, wrong way riding was 17% and sidewalk riding was 32%. Helmet use was much lower and wrong way and sidewalk riding were much higher than the values obtained for a similar count done in Tucson in 2010. Correlation is detected between riding behavior (wrong way and sidewalk) and vehicular traffic flow.

2. Introduction

In 1974, the Planning Department of the City of Tempe released the comprehensive Tempe Bikeway Plan, the first plan of its kind in Arizona. The Bikeway Plan aimed to “encourage use of the bicycle for everyday transportation,” among other goals, as a way to decrease automobile traffic, reduce the environmental impacts of transportation, and raise the quality of living in Tempe. Not quite forty years later, Tempe has more than 165 miles of dedicated bikeways, has been a League of American Bicyclists ‘Bicycle Friendly Community’ for fourteen years, and has one of the highest percentages of commuter cyclists in the country. Further increasing ridership is a current goal of the city, a goal shared by the Tempe Bicycle Action Group (T.B.A.G.). T.B.A.G. is a non-profit 501(c)(3) organization dedicated to advancing the bicycle as a safe, efficient, and sustainable form of transportation.

On March 29th, 30th and 31st, 2011, 58 volunteers observed cyclists and pedestrians at fifty-one intersections during morning (7-9 am) and evening (4-6 pm) rush hours, counting 9,407 cyclists. Besides a count, additional data was collected covering rider demographics, helmet use, riding on the sidewalk, and riding on the wrong side of the street (against traffic). In addition to these data, our analysis included vehicle traffic volume data by intersection made available by the City of Tempe. The Tempe bike count was modeled in part after a similar program by the Pima Association of Governments (PAG) [1].

3. Results

a. Intersection Analysis

Analysis of cyclist behavior at several intersections gives reason for concern. For instance, at Broadway Rd and Priest Dr, 100% of the 11 East/West (E/W) cyclists recorded were on the sidewalk, while at Rio Salado Parkway and McClintock, 87% of the 47 North/South (N/S) cyclists were on the sidewalk. In all, there were seventeen intersections at which half or more of the cyclists observed were on the sidewalk. Sidewalk riding in the direction of traffic is generally not illegal, but it can create a hazard for pedestrians and it can create conflicts between motorists and cyclists, as motorists often do not anticipate relatively fast-moving traffic on sidewalks. This is especially true when the sidewalk traffic is moving opposite of street traffic.

Among the intersections surveyed, wrong-way riding was most frequent at the intersection of Lemon and Rural, where 64% of the 280 N/S cyclists were moving in the wrong direction. Unlike sidewalk riding, wrong-way riding is illegal. It is also dangerous, as motorists often do not anticipate or look for wrong-way traffic. Other intersections with high frequencies of wrong-way riders are University Dr. and Roosevelt St. (N/S) and Broadway and Priest (E/W). What all of these have in common is that one or both streets at each intersection lacks a dedicated bike lane. Nine intersection/directions surveyed have incidences of wrong-way riding in excess of 30% of cyclists observed.

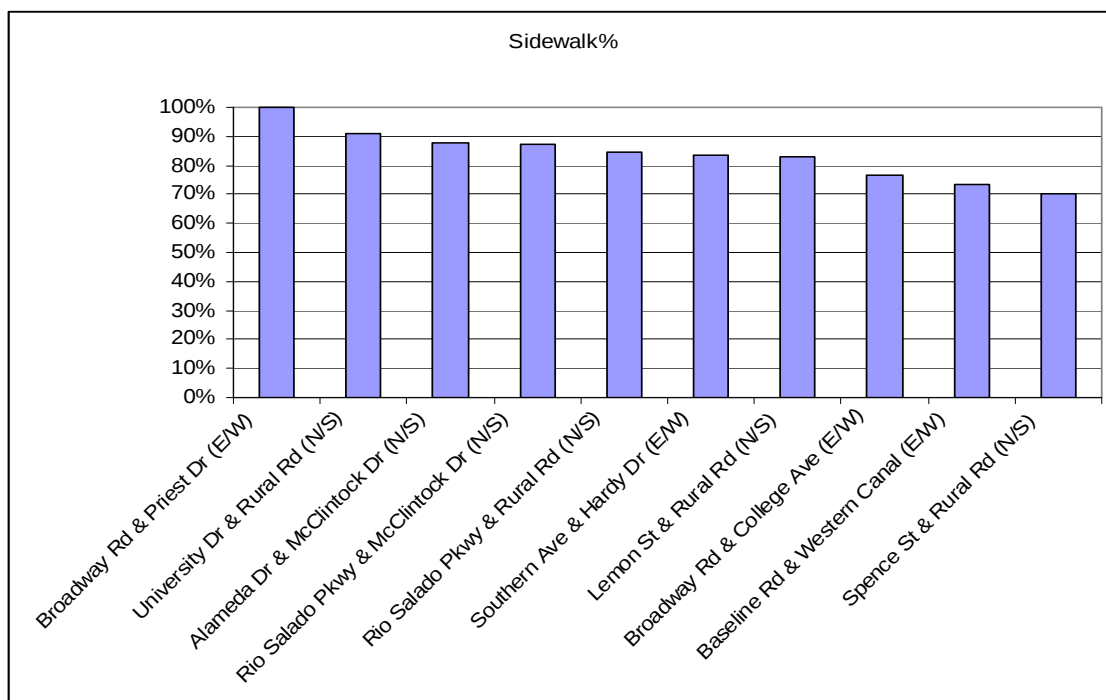


Figure 1 Top 10 locations by percentage of cyclists on sidewalk, by intersection and direction.

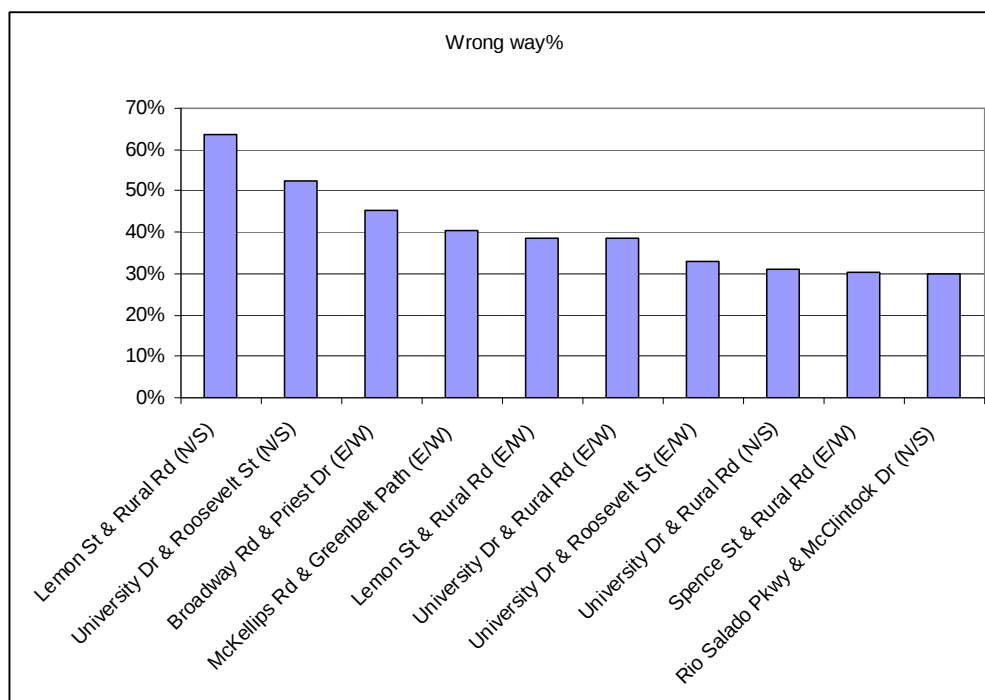


Figure 2 Top 10 locations by percentage of wrong-way riders, by intersection and direction

When data on potentially dangerous behaviors are combined, the intersections of most concern are:

1. Broadway Rd & Priest Dr (E/W)
2. Lemon St & Rural Rd (N/S)
3. University Dr & Rural Rd (N/S)
4. Rio Salado Pkwy & McClintock Dr (N/S)
5. University Dr & Roosevelt St (N/S)

Overall helmet use was 17%. This is substantially lower than that observed in the Tucson count [1]. Wrong way riding was 17% and sidewalk riding was 32%, both substantially higher than Tucson. Wrong way riding was counted for both on-street and on-sidewalk.

	Helmet%	Wrong way%	Sidewalk%
Total	17.2%	17.5%	31.8%
Max ¹	87.5%	63.8%	100%
Tucson 2010	50.7%	3.1%	6.2%

¹ Directional, by intersection, AM & PM combined

Table 1. Use statistics: helmet, wrong way, sidewalk

b. Correlation Analysis

In a simple linear regression model, the regressor is assumed to have a linear relationship with the response. Data was collected at a total of 45 locations. Of these, 19 locations were counted for only morning or afternoon. We tested several regression models, but only two yielded significant results. There is a positive correlation between traffic volume and sidewalk riding, with some intersections seeing all or virtually all cyclists riding on the sidewalk. See Figure 3. P-value for the slope of the regression line is extremely small (1.2E-6), indicating that there is good confidence that the null hypothesis, that the slope is zero, is false. There is also a weak but positive correlation between traffic volume and wrong-way riding. See Figure 2. There are some outliers indicating a departure from the assumption that the residuals are normally distributed.

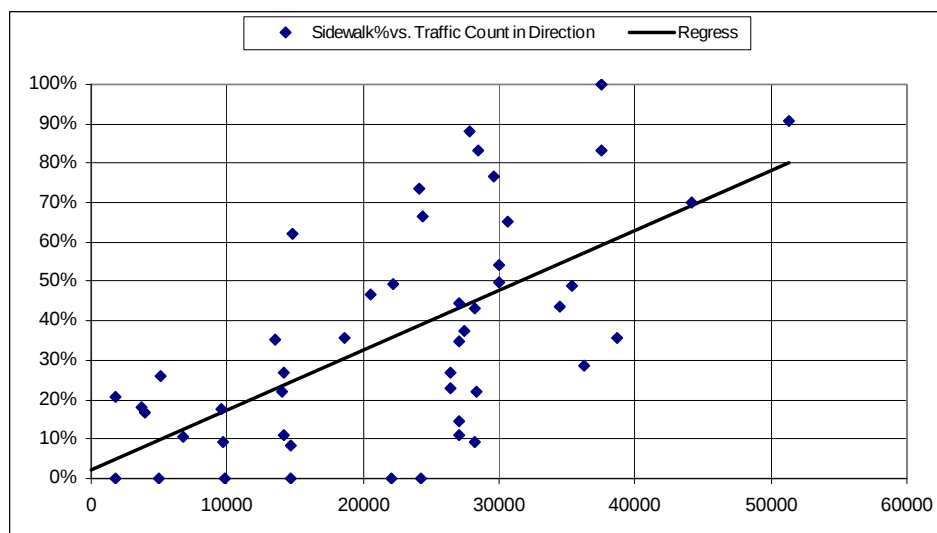


Figure 3 Correlation between sidewalk riding and vehicular traffic count, by direction.
 $R^2 = .40$; $P = 1.2E-6$.

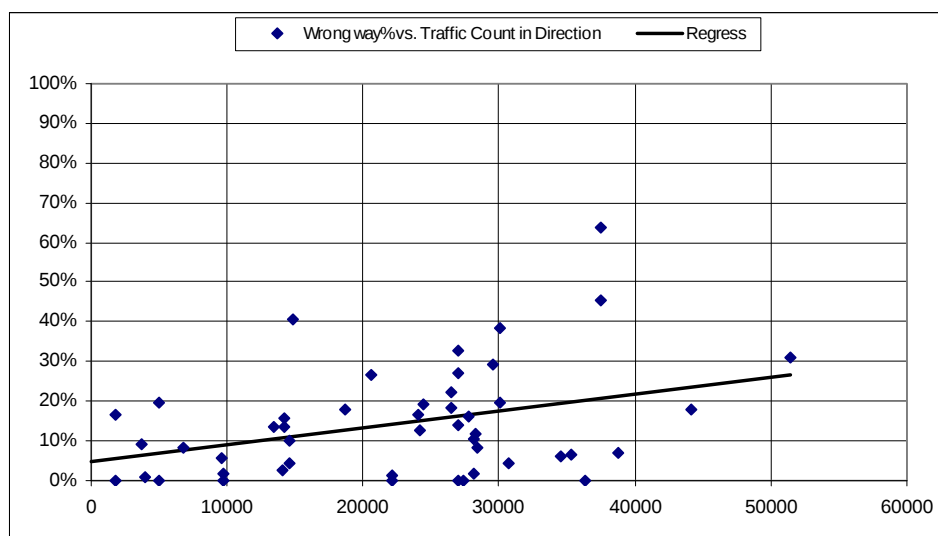


Figure 4 Correlation between wrong way riding and vehicular traffic count, by direction.
 $R^2 = .13$; $P = .013$.

c. Mapping Analysis

Maps of some of the data for each intersection can be found in Appendix A. Some clear patterns can be observed, especially concerning total bike activities and certain dangerous behaviors (low helmet use and sidewalk and wrong-way riding) on University and East of ASU campus. Many of the worst intersections for wrong-way riding are also the worst intersections for sidewalk riding as shown in the maps of Figure A3 and Figure A4.

d. Error Detection

Error detection methods were applied to the collected data. The detailed procedure is provided in Appendix B. A number of count locations were removed from the attribute data set due to detected errors that indicated a possible procedural error in data collection for the attributes.

4. Recommendations

The City of Tempe has made great strides in developing the city as a bicycle-friendly community. This first bike count indicates that there is still work to do to improve bicycle safety both in terms of infrastructure improvement (bicycle lanes and paths) and education. In particular, we recommend that the city look at bike lanes on routes that are popular with cyclists. Sidewalk riding is one of the leading causes of car-bike accidents, especially when the bike is going the wrong way on the sidewalk. T.B.A.G. [3] would like to work with the city on plans to improve these roads, to add bike lanes, and to work on educational and enforcement campaigns in these areas.

The detection of inconsistencies in attribute data (which were removed from the statistical analysis) indicates that improvement may be possible in one or more of the following areas:

- 1) Training
- 2) Count sheet (simplification, *e.g.*, removal of lower-priority metrics)
- 3) Consideration of error detection methods in the count methodology

While the detection of errors may indicate problems in the data collection methodology, it does not imply the results are less accurate than comparable count data analysis results in other cities. The fact

that error detection methods were applied to remove questionable data likely improves the final data analysis accuracy.

5. References

- [1] 2010 Regional Bicycle/Pedestrian Count Summary, www.pagnet.org.
- [2] Traffic count data from the City of Tempe, www.tempe.gov/traffic.
- [3] Tempe Bicycle Action Group (T.B.A.G.), www.biketempe.org.

6. Acknowledgements

Tempe Bike Count 2011 was a concerted effort by a diverse team representing a wide cross-section of the bicycle-interest community. Many thanks go out to the 45 volunteers who contributed their time to recording data and to the other members of the community who assisted in this effort.

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Appendix A Geographical Presentation of Statistics

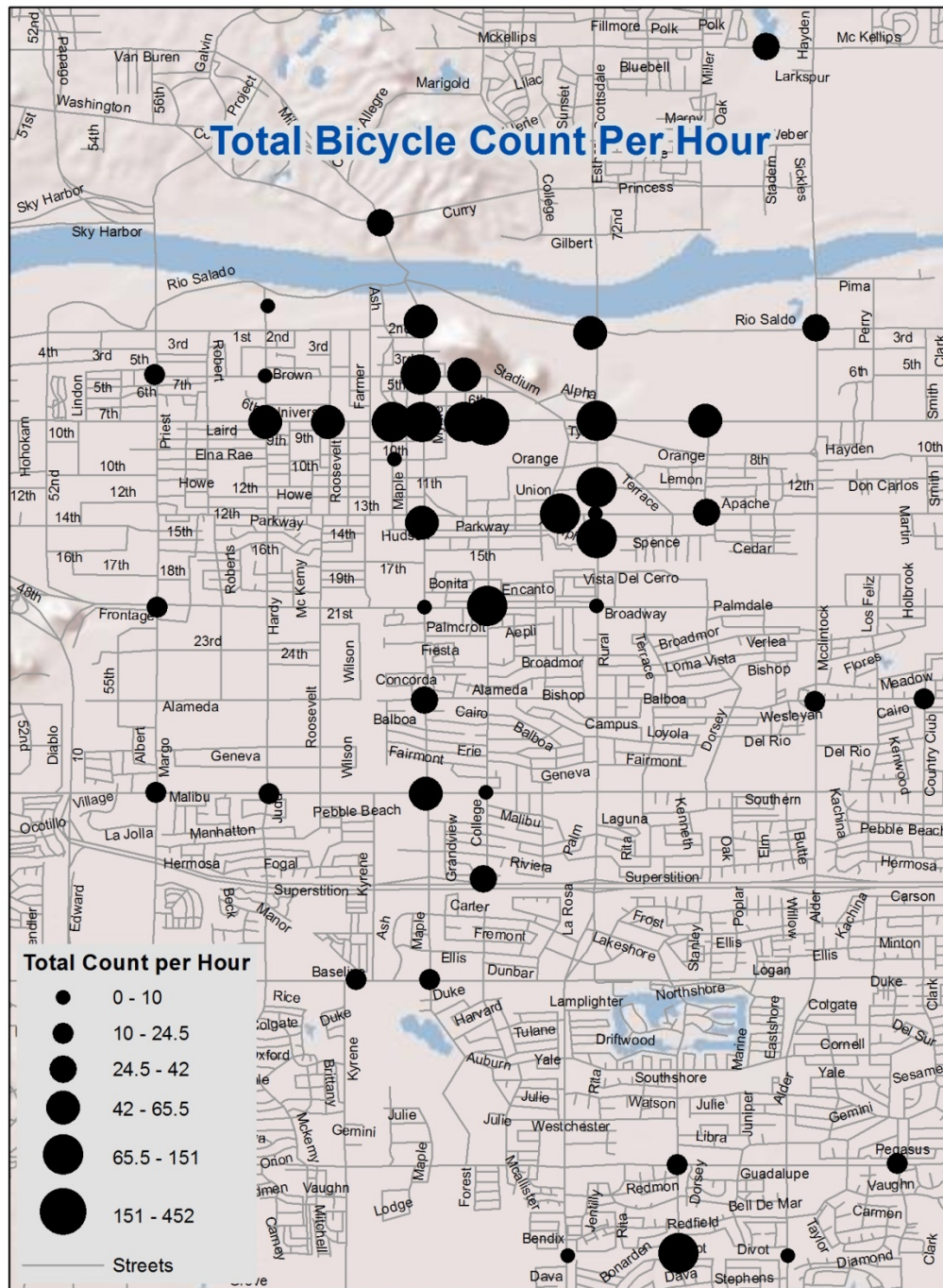


Figure A1 Total Bicycle Count per Hour

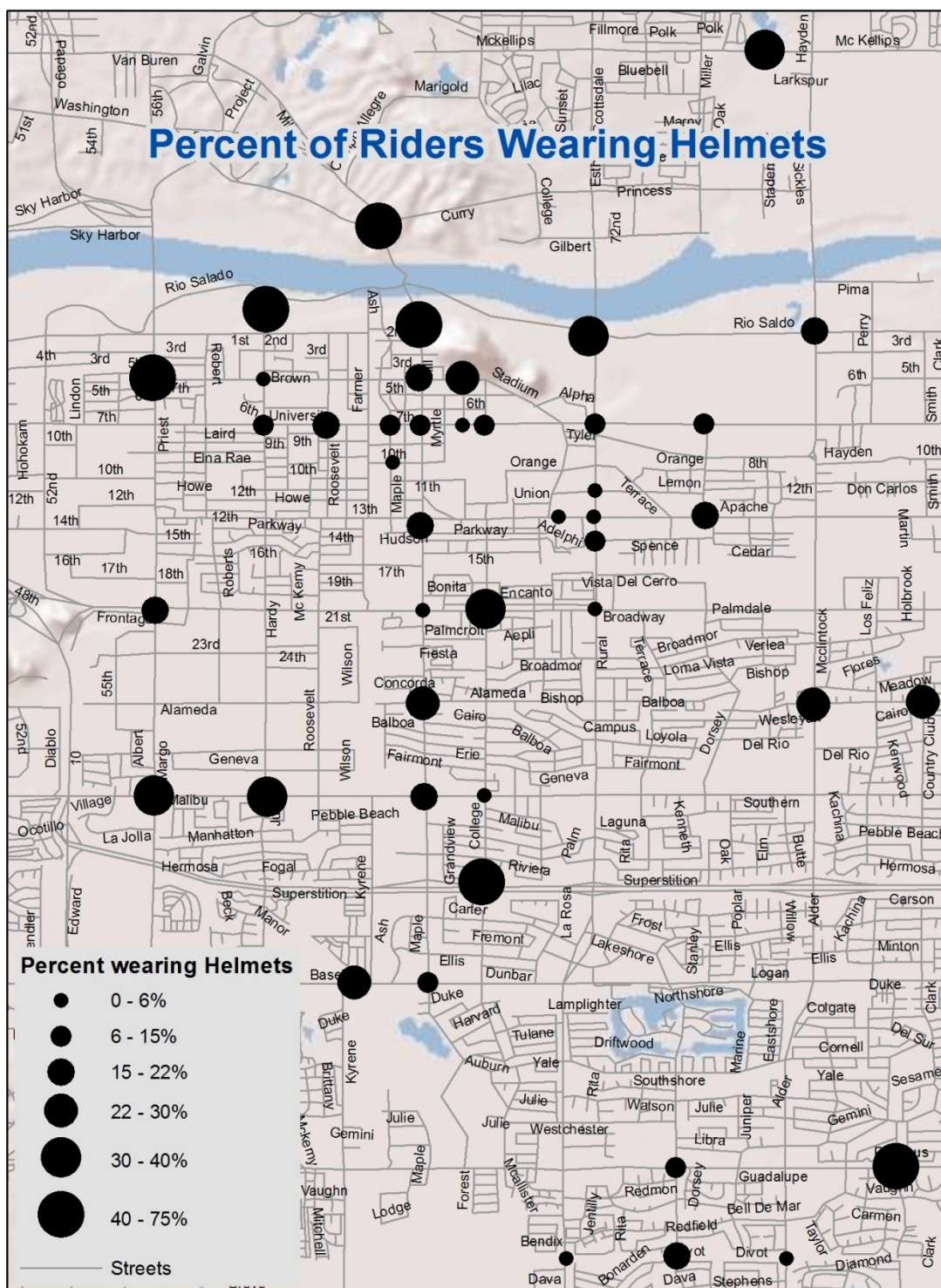


Figure A2 Percent Riders Wearing Helmets

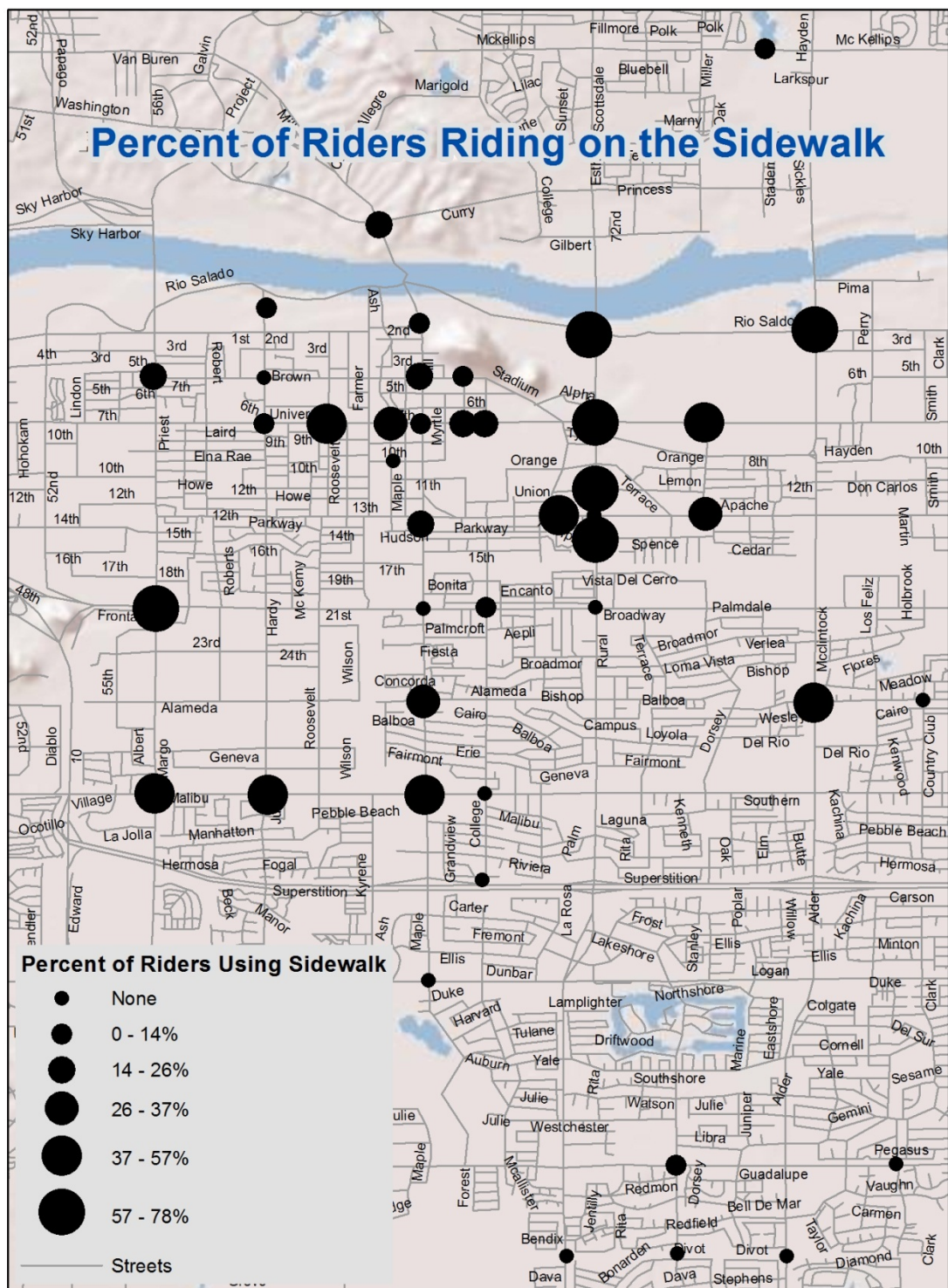


Figure A3 Percent Riders Riding on the Sidewalk

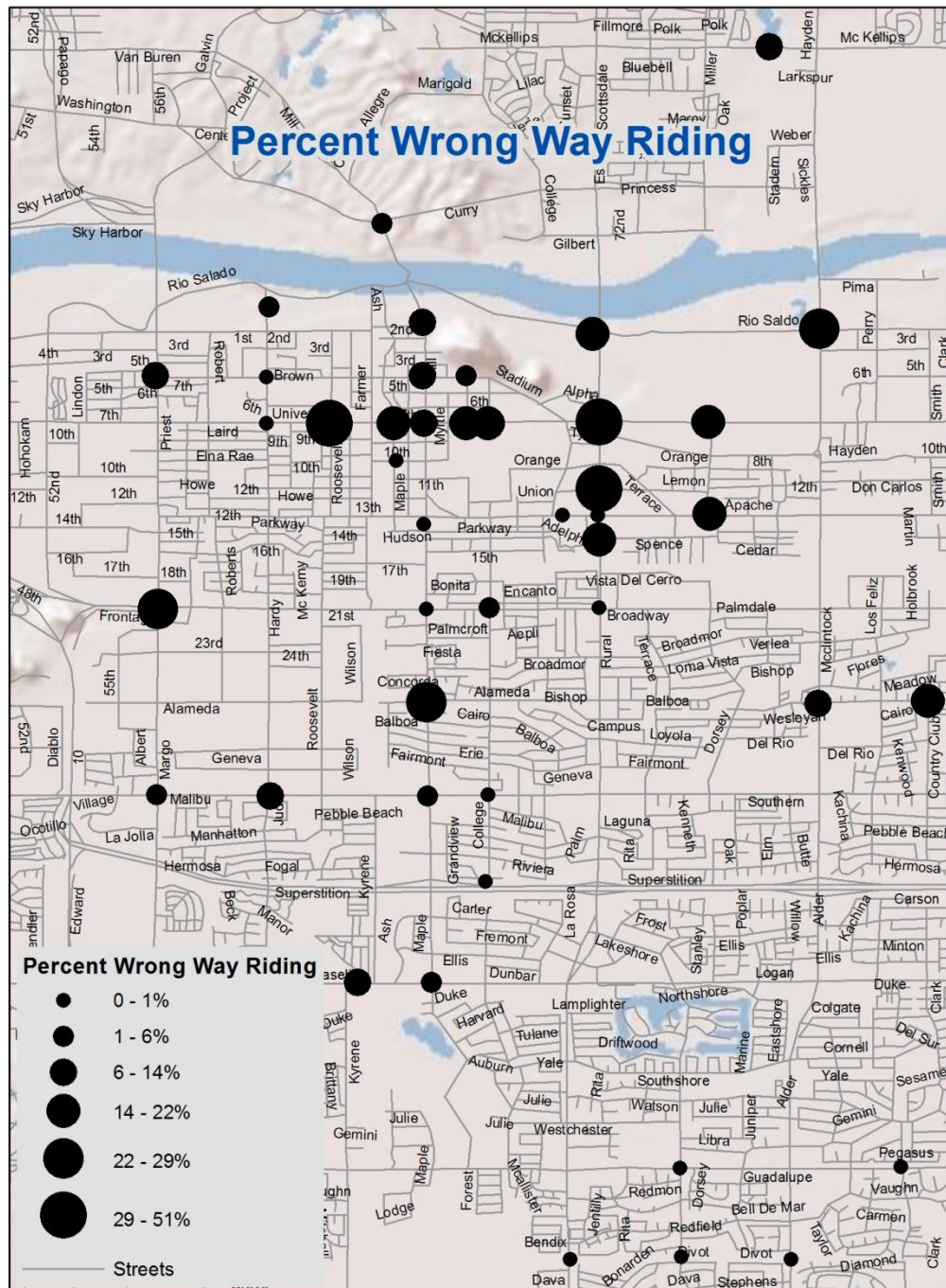


Figure A4 Percent Wrong Way Riding

Appendix B Methodology

Locations and times for collecting data were selected based on the following characteristics:

- a. Highest estimated volume of bicycle traffic
- b. Intersections
- c. Establishment of cordon around (traffic in and out of) ASU
- d. Coverage of a representative sample of the City of Tempe
- e. Practicality of volunteer participation

The total number of intersections was capped in the plan at 50.

The cordon for ASU was defined as follows:

- West border: Mill Ave
- South border: Apache Blvd
- East border: Rural Rd
- North border: Rio Salado Pkwy

The time periods 7-9am and 4-6pm were believed to include the peak time periods while also allowing volunteers to participate without interfering with their normal work schedules. Tuesday, Wednesday and Thursday were estimated to be the highest volume days of the week and roughly equivalent to each other (volunteers were allowed to select, at will, any one of the three days for data collection). The data collection worksheet was set up with 15 minute bins.

The detailed set of instructions distributed to all recorders is shown in Appendix D. In addition, three training sessions were held. A quality assurance (QA) procedure was implemented during data collection:

- a. to verify that established procedures were being followed
- b. to answer any questions that the recorder may have
- c. to ensure that special circumstances get recorded (*e.g.*, construction, count rate exceeding recorder's capabilities)

Bicycle and pedestrian count was collected for each of the directions (typically 4) of each intersection. For analysis, the two opposite direction (E/W or N/S) counts were added.

Error detection methods were applied to the collected data. For each cyclist observed, instructions required that one notation be recorded in the count column, with attribute data recorded in addition in each respective column as applicable. Therefore, for a given 15 minute bin, if the sum of notations for any one attribute exceeds the count column total, an error has occurred. Possible causes include

- a. accidental double-counting in the attribute column
- b. accidental uncounted data in the count column
- c. improper procedure followed
- d. data translation error from hand-written sheets to database

The cause of error was not easily determined, so the decision was made to exclude data sets with one or more errors. This error detection method resulted in the exclusion of 17 data sets out of 90 total, where a data set is defined as a two-hour period (7-9am or 4-6pm) at a given intersection. The exclusion applies for calculation of attribute data percentages (attribute and associated count). The reported total count of 9407 and time of day results include all data sets.

Bike count vs. time of day, as shown Figure 5, indicates that the highest rate was in the 4:00 – 4:15pm bin. The morning 2-hour recording period started well before the morning peak, but by 9am the rate approached the average afternoon rate observed. Since these are aggregate counts, it is possible that some areas have peak ridership at other times. The data is expected to be influenced by class schedule at ASU.

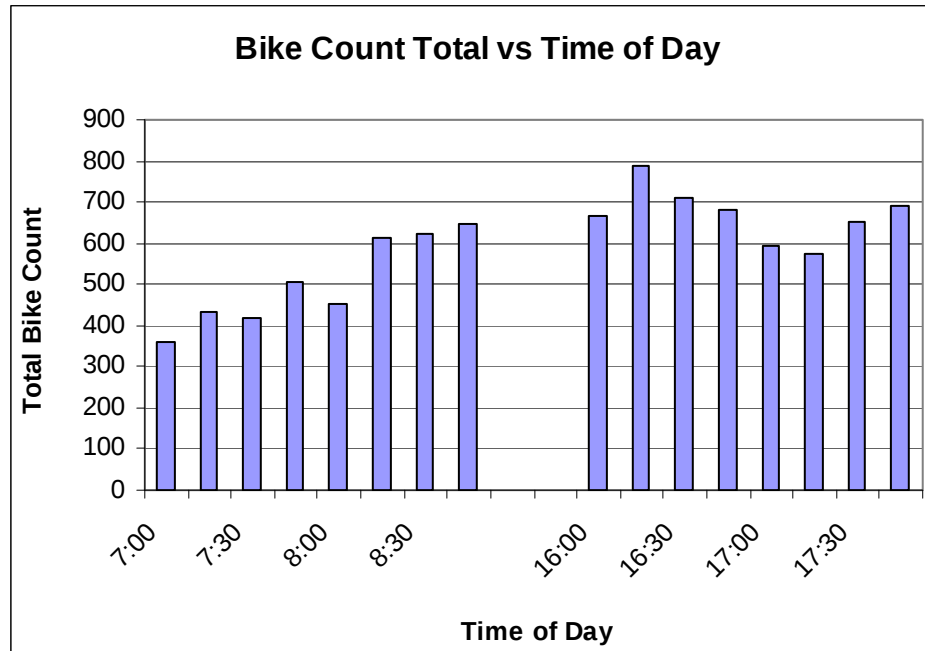


Figure 5 Bike count total vs. Time of Day

Traffic count was obtained from City of Tempe data [2]. This data represents vehicular traffic flow over a 24-hour period in the two opposite directions (e.g., East and West, or North and South). The locations are generally not in intersections. Vehicular data has been collected over a number of years, but the locations change somewhat from year to year. The following method was used to interpret vehicular traffic data for the purpose of this study:

- The most recent data for each sampling location was used.
- For the two sides of a given intersection/direction (East/West or North/South), the larger of the two values was used. If data was available for only one side, that value was used.

Appendix C - Bike Count Form

Name:

Count Sheet

Date:		Location ID#:		Location:				page#: 1 of 3			
Hour		Approach	COUNT	Gender	Age		Wearing	Wrong Way	Sidewalk	Distracted	Pedestrians
X AM	PM	Direction		If FEMALE	<18	65+	HELMET	Riding	Riding	Cyclists	
	:00	NB									
		SB									
		EB									
		WB									
	:15	NB									
		SB									
		EB									
		WB									
	:30	NB									
		SB									
		EB									
		WB									
	:45	NB									
		SB									
		EB									
		WB									
Total Hrs:		Motorized Bikes:		Electric Assist:		Awesome Decorated:			ADA Peds:		
Observations/ Notes:									ADA Chairs:		
Construction etc.											

Appendix D - Bike Count Instructions

1. Count Form Structure.

- a. 1 hr: each form tracks 1 full hr of activity, broken into 15 minute increments.
- b. Total # of Cyclists recorded in "Count" Column. Attributes broken out in following columns.

2. Fill In: - Important please include the following info on each tracking sheet.

- a. Your Name (cell#)
- b. Location ID# & Location (Intersection) – this info was sent to you in your volunteer confirmation email.
- c. Hour (i.e. 4-5pm) – please record hr in far left column
- d. Total Hrs (bottom left) = total amount of time you were able to stay & count that location (i.e. 1.5 hrs or 2hrs)
- e. Page # (example: 1 of 2 – etc)

3. Count Shifts (2 hr) – you will need at least 2 count sheets per shift. Busier locations may require more sheets. Extra count sheets will be available.

- AM Rush hour: 7-9am
- PM Rush hour: 4-6pm

4. Priority 1: Count (Bikes & Pedestrians)

5. Columns "Count" = Total # Cyclists and "Pedestrians" = Total # of pedestrians

- a. Approach Direction (NB, SB, EB, WB): Record the approach direction (Northbound, Southbound –etc)
- b. note: turn direction is not recorded
- c. Intervals – the data is recorded in 15 minute intervals.

6. Priority 2: Record Attributes

once you've marked the cyclists (or pedestrian) then break out the attributes as well as you can.

7. Cyclist Attributes: **** Default = Male without Helmet ****

- a. **Approach Direction** (NB, EB, WB, SB)
- b. **Gender:** Male is assumed * Mark if cyclist Female
- c. **Age** (under 18 or over 65)
- d. **Helmet** (No Helmet is assumed) - Mark if the cyclist is wearing a Helmet
- e. **Wrong-Way Riding** - cycling against traffic
- f. **Sidewalk Riding** – does not include quick transitions at intersections or parking lots etc.
- g. **Distracted Cyclists** – examples: using cell phones or wearing ear-buds

Rare cyclist attributes tracked at bottom of sheet: - 15 min. intervals do not apply these are lumped together in 1 field in the bottom rows of the tracking sheet.

- h. **Motorized** – moving without pedaling (motorized = loud)
- i. **Electric Assist Bikes** – moving without pedaling (electric = quiet)
- j. **Bike Lights** – record only if light are turned on
because the count is during daylight hours, the # of lights in use expected to be low

8. Pedestrian Attributes Tracked:

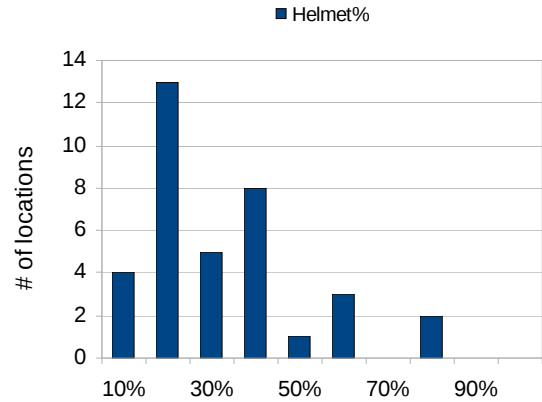
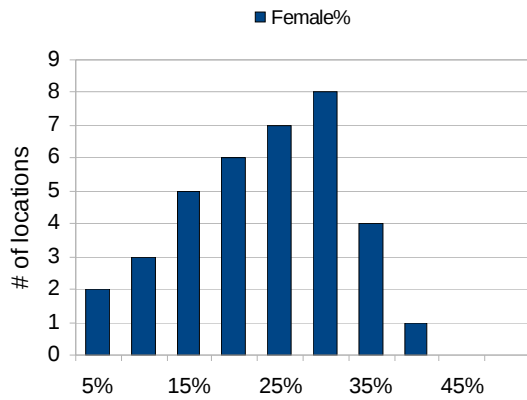
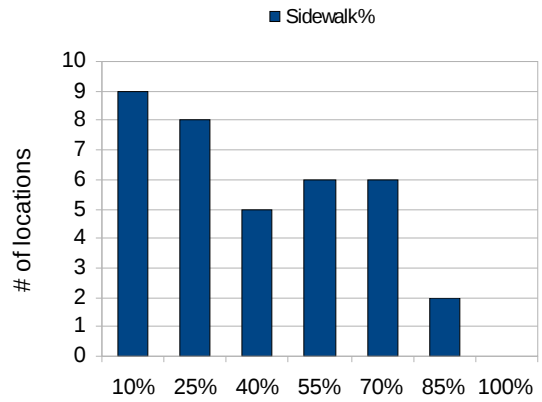
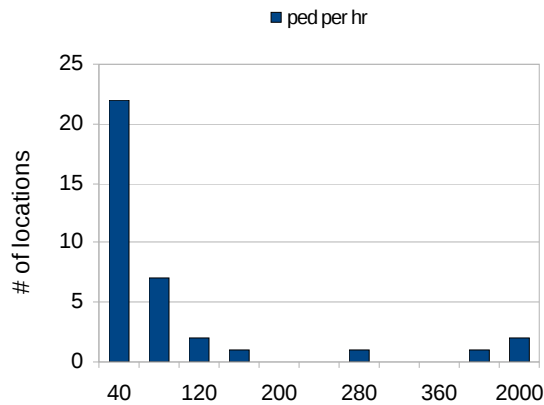
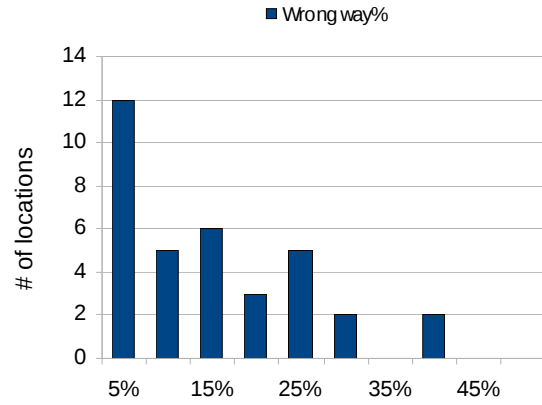
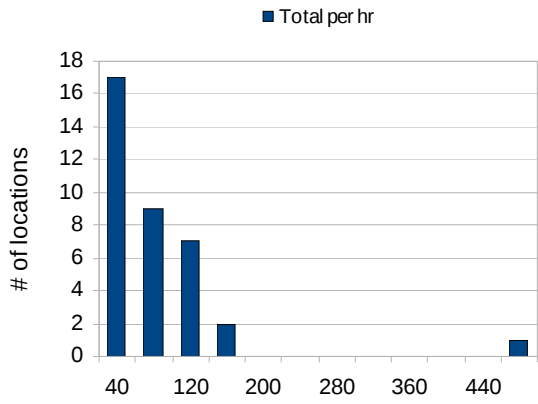
Total # of pedestrians is the most important # - tracked in 15 min intervals (far Rt column)

- a. **Skateboards** (mark: circle the hash mark)
- b. **Rollerblades** (mark: x with circle around)

9. ADA Attributes (fields at bottom rt of tracking sheet)

- a. **ADA = walking** (with canes or assist dogs – etc)
- b. **ADA Chairs** = Wheelchairs or motorized scooter chairs

Appendix E – Additional Graphs



Appendix F Data Summary

Loc ID	Location or Intersection: E/W	Location or Intersection: N/S	Total per hr	AM per hr	PM per hr	ped per hr	Helmet%	Wrong way%	Sidewalk%	Female%	Pedest%	Traffic Count	Traffic Dir	Loc to ASU	Lane in Dir	Dir	Uncorr Tot/hr
101	Washington/Curry	Mill Ave	17	17		4.5	79.4%	5.9%	17.6%	2.9%	52.9%	14035	9628	0.39	1	NS	17
101	Washington/Curry	Mill Ave	18	18		2.25	69.4%	2.8%	22.2%	22.2%	25.0%	14035	14035	0.39	1	EW	18
102	Rio Salado Pkwy	Mill Ave	36.5	36.5		18.8	54.8%	13.7%	11.0%	20.5%	102.7%	14634	14225	0	1	NS	36.5
102	Rio Salado Pkwy	Mill Ave	10	10		9	40.0%	10.0%	0.0%	20.0%	180.0%	14634	14634	0	1	EW	10
103	Rio Salado Pkwy	Rural Rd	36	36		14.5	27.8%	23.6%	84.7%	18.1%	80.6%	14634		0	0	NS	36
103	Rio Salado Pkwy	Rural Rd	12	12		3	75.0%	4.2%	8.3%	16.7%	50.0%	14634	14634	0	1	EW	12
104	Rio Salado Pkwy	McClintock Dr	23.5		23.5	5	17.0%	29.8%	87.2%	10.6%	42.6%	20597		1	0	NS	23.5
104	Rio Salado Pkwy	McClintock Dr	15		15	2.75	30.0%	26.7%	46.7%	26.7%	36.7%	20597	20597	1	1	EW	15
105	Rio Salado Pkwy	Hardy Dr	6.25	5	7.5	14	44.0%	4.0%	8.0%	44.0%	112.0%	9784		0.83	1	NS	6.25
105	Rio Salado Pkwy	Hardy Dr	2	1	3	5.5	87.5%	0.0%	0.0%	12.5%	137.5%	9784	9784	0.83	1	EW	2
106	5th St	Mill Ave	70.5		70.5	249	25.5%	15.6%	27.0%	28.4%	705.7%	14225	14225	0	1	NS	70.5
106	5th St	Mill Ave	47		47	130	10.6%	8.5%	10.6%	22.3%	553.2%	14225	6739	0	1	EW	47
107	5th St	Forest Ave	8	8		42	18.8%	0.0%	6.3%	37.5%	1050.0%			0	0	NS	8
107	5th St	Forest Ave	39.5	39.5		26.5	31.6%	7.6%	13.9%	31.6%	134.2%			0	1	EW	39.5
110	5th St	Priest Dr	12.5	19.5	5.5	10.5	66.0%	12.0%	22.0%	20.0%	42.0%	28310	28310	1.24	1	NS	12.5
110	5th St	Priest Dr	5.5	6	5	13	31.8%	9.1%	18.2%	9.1%	118.2%	28310	3747	1.24	1	EW	5.5
112	60 Fwy	College Ave	32.5	28.5	36.5	23	50.0%	0.0%	0.0%	21.5%	35.4%	1774	1774	2	1	NS	32.5
113	13th St	Mill Ave	12.75	15	10.5	26.5	27.5%	2.0%	43.1%	21.6%	103.9%	28184	28184	0	1	NS	12.75
113	13th St	Mill Ave	36.25	39	33.5	66.5	13.8%	0.7%	16.6%	24.8%	91.7%	28184	3917	0	1	EW	36.25
115	University Dr	College Ave	271.75	293	250.5	1532	10.9%	19.8%	26.1%	26.9%	281.9%	26482	5044	0	1	NS	271.75
115	University Dr	College Ave	180.25	241	120	443	10.3%	22.2%	26.9%	24.1%	122.7%	26482	26482	0	1	EW	180.25
116	University Dr	Dorsey Ln	5		5	1.5	10.0%	20.0%	50.0%	10.0%	60.0%	30015		0.5	1	NS	3
116	University Dr	Dorsey Ln	60.5		60.5	12	10.7%	19.8%	49.6%	25.6%	39.7%	30015	30015	0.5	1	EW	48.5
117	University Dr	Rural Rd	35.25	28	42.5	52.5	6.4%	31.2%	90.8%	23.4%	74.5%	51380	51380	0	0	NS	35.25
117	University Dr	Rural Rd	80.75	53	108.5	82.5	7.1%	38.4%	54.2%	35.9%	51.1%	51380	30015	0	1	EW	80.75
118	University Dr	Mill Ave	37.5	22	53	326	17.3%	10.7%	9.3%	28.7%	434.0%	28184	28184	0	1	NS	37.5
118	University Dr	Mill Ave	55.75	42	69.5	225	3.1%	13.9%	11.2%	29.6%	201.3%	28184	27003	0	1	EW	55.75
119	University Dr	Ash Ave	28.5	20	37	90.5	14.9%	12.3%	24.6%	31.6%	158.8%	27003		0.11	1	NS	28.5
119	University Dr	Ash Ave	59	32	86	173	10.2%	27.1%	34.7%	27.1%	146.6%	27003	27003	0.11	1	EW	59
120	University Dr	Roosevelt St	10.5	10.5		3.5	19.0%	52.4%	57.1%	33.3%	66.7%	27003		0.43	1	NS	10.5
120	University Dr	Roosevelt St	35	35		7	14.3%	32.9%	44.3%	22.9%	40.0%	27003	27003	0.43	1	EW	35
121	University Dr	Hardy Dr	27.5		27.5	13.8	14.5%	1.8%	9.1%	18.2%	100.0%	27003	9690	0.72	1	NS	15.75
121	University Dr	Hardy Dr	34.5		34.5	8.25	7.2%	0.0%	14.5%	24.6%	47.8%	27003	27003	0.72	1	EW	23.25

122	McKellips Rd	Greenbelt Path	32.75	25.5	40	38.5	45.0%	0.0%	0.0%	23.7%	58.8%	14788		2.2	1	NS	32.75
122	McKellips Rd	Greenbelt Path	9.25	6	12.5	10.5	13.5%	40.5%	62.2%	16.2%	56.8%	14788	14788	2.2	1	EW	9.25
125	Western Canal	Lakeshore Dr	33.5		33.5	9.5	11.9%	0.0%	0.0%	37.3%	56.7%			4.5	1	NS	20.5
125	Western Canal	Lakeshore Dr	52.5		52.5	9	21.9%	0.0%	0.0%	31.4%	34.3%			4.5	1	EW	31.75
126	Baseline Rd	Western Canal	6.5	4	9	6.5	30.8%	7.7%	11.5%	7.7%	50.0%	24094		2.9	1	NS	6.5
126	Baseline Rd	Western Canal	18	16.5	19.5	56.5	27.8%	16.7%	73.6%	13.9%	156.9%	24094	24094	2.9	0	EW	18
127	Elliot Rd	McClintock Dr	6	4	8	9	41.7%	0.0%	37.5%	8.3%	75.0%	38743	27418	5.5	1	NS	6
127	Elliot Rd	McClintock Dr	3.5	4.5	2.5	9.5	21.4%	7.1%	35.7%	0.0%	135.7%	38743	38743	5.5	0	EW	3.5
128	Alameda Dr	McClintock Dr	12.5	12.5		8.5	12.0%	16.0%	88.0%	12.0%	136.0%	27807	27807	2	0	NS	15.75
128	Alameda Dr	McClintock Dr	9.5	9.5		4	47.4%	0.0%	5.3%	15.8%	84.2%	27807		2	1	EW	10.5
130	Alameda Dr	Country Club Wy	3.5		3.5	5.5	14.3%	14.3%	0.0%	0.0%	314.3%			2.5	1	NS	3.5
130	Alameda Dr	Country Club Wy	8		8	4	37.5%	25.0%	0.0%	6.3%	100.0%			2.5	1	EW	8
132	Apache Blvd	S Dorsey Ln	7	7		33	14.3%	7.1%	35.7%	14.3%	942.9%	18699		0.5	0	NS	11.75
132	Apache Blvd	S Dorsey Ln	31	31		15.3	16.1%	17.7%	35.5%	12.9%	98.4%	18699	18699	0.5	1	EW	43
134	Apache Blvd	Paseo Del Saber	46	46		35.5	5.4%	0.0%	66.3%	23.9%	154.3%	22165		0	1	NS	85.75
134	Apache Blvd	Paseo Del Saber	75	75		38.5	6.0%	1.3%	49.3%	10.7%	102.7%	22165	22165	0	1	EW	85
135	Lemon St	Rural Rd	74.5		74.5	44	7.4%	63.8%	83.2%	29.5%	59.1%	37510	37510	0	0	NS	70
135	Lemon St	Rural Rd	76.5		76.5	44.5	3.9%	38.6%	47.7%	29.4%	58.2%	37510		0	1	EW	65
136	Spence St	Rural Rd	75.5	75.5		62	16.6%	17.9%	70.2%	25.2%	82.1%	44120	44120	0	0	NS	75.5
136	Spence St	Rural Rd	16.5	16.5		12.5	0.0%	30.3%	24.2%	30.3%	75.8%	44120		0	1	EW	16.5
137	Broadway Rd	Priest Dr	10.5		10.5	17.8	28.6%	19.0%	66.7%	19.0%	338.1%	37476	24403	1.75	1	NS	10.5
137	Broadway Rd	Priest Dr	5.5		5.5	10.3	9.1%	45.5%	100.0%	9.1%	372.7%	37476	37476	1.75	0	EW	5.5
139	Broadway Rd	College Ave	96	96		11.8	36.5%	0.0%	0.0%	29.2%	24.5%	29614	4997	0.5	1	NS	114.5
139	Broadway Rd	College Ave	8.5	8.5		6.25	23.5%	29.4%	76.5%	11.8%	147.1%	29614	29614	0.5	0	EW	12.25
140	Southern Ave	Priest Dr	7	7		14.3	35.7%	0.0%	28.6%	14.3%	407.1%	36313	36313	2.75	1	NS	7
140	Southern Ave	Priest Dr	11.5	11.5		24.8	34.8%	4.3%	65.2%	21.7%	430.4%	36313	30697	2.75	0	EW	11.5
143	Southern Ave	Hardy Dr	18.5	18.5		13	43.2%	13.5%	35.1%	13.5%	140.5%	28429	13469	2.22	1	NS	18.5
143	Southern Ave	Hardy Dr	6	6		11.5	16.7%	8.3%	83.3%	8.3%	383.3%	28429	28429	2.22	0	EW	6
144	Southern Ave	Mill Ave	24		24	29.8	27.1%	6.3%	43.8%	2.1%	247.9%	35372	34482	1.5	1	NS	24
144	Southern Ave	Mill Ave	23.5		23.5	21.8	12.8%	6.4%	48.9%	8.5%	185.1%	35372	35372	1.5	0	EW	23.5
145	Alameda Dr	Mill Ave	17.5		17.5	5.75	17.1%	28.6%	48.6%	17.1%	65.7%	1841		1	1	NS	17.5
145	Alameda Dr	Mill Ave	12		12	1.5	50.0%	16.7%	20.8%	29.2%	25.0%	1841	1841	1	1	EW	12
147	Baseline Rd	Mill Ave	8	8		7.5	25.0%	12.5%	0.0%	37.5%	187.5%	24224	24224	2.5	1	NS	11.5
147	Baseline Rd	Mill Ave	9	9		9.25	5.6%	0.0%	0.0%	27.8%	205.6%	24224	22102	2.5	0	EW	12.75
149	Guadalupe Rd	Country Club Wy	6.5		6.5	0	76.9%	0.0%	0.0%	0.0%	0.0%			5	1	NS	4.5
149	Guadalupe Rd	Country Club Wy	5.5		5.5	0.5	63.6%	0.0%	0.0%	0.0%	18.2%			5	1	EW	7.75
150	Guadalupe Rd	Lakeshore Dr	11		11	27	13.6%	0.0%	4.5%	9.1%	490.9%			4.5	1	NS	10.25
150	Guadalupe Rd	Lakeshore Dr	12		12	7.75	12.5%	0.0%	12.5%	8.3%	129.2%			4.5	1	EW	11.5

151	University Dr	Forest Ave	64.5		64.5	96.3	3.1%	14.0%	17.1%	33.3%	298.4%	26482		0	0	NS	64.5
151	University Dr	Forest Ave	65		65	32.8	5.4%	18.5%	23.1%	25.4%	100.8%	26482	26482	0	1	EW	65
Total			69.052	65.2	72.9	113	17.2%	17.5%	31.8%	24.8%	166.1%						
Max			271.75	293	250.5	1532	87.5%	63.8%	100.0%	44.0%	1050.0%						
Min			2	1	2.5	0	0.0%	0.0%	0.0%	0.0%	0.0%						

All percentages listed in the table above are relative to the error-corrected total bicycle count for that location and direction. The “per hour” values shown are error corrected values with the exception of the last column, “Uncorr Tot/hr” (uncorrected). The “per hour” calculation accounts for missing data, that is, if only a.m. data is available, then the count total is divided by 2 hours, else by 4 hours. The total bicycle count value of 9407 represents data prior to error correction, since errors were mainly associated with attribute data. The following data had detectable errors in attribute data.

Loc ID	Location or Intersection: E/W	Location or Intersection: N/S	Total per hr	AM per hr	PM per hr	ped per hr	Helmet%	Wrong way%	Sidewalk%	Female%	Pedest%	Traffic Count	Traffic Dir	Loc to ASU	Lane in Dir	Dir	Uncorr Tot/hr
109	5th St	Hardy Dr										6409	6409	0.72	1	NS	12
109	5th St	Hardy Dr										6409	3747	0.72	1	EW	15.5
111	10th St	Mill Ave										28184	28184	0	0	NS	66
111	10th St	Mill Ave										28184		0	1	EW	98.5
112	60 Fwy	College Ave										1774		2	0	EW	0
123	Western Canal	Rural Rd										29395	29395	4	0	NS	9.5
123	Western Canal	Rural Rd										29395		4	1	EW	29
124	Western Canal	McClintock Dr										30170	30170	5	1	NS	5
124	Western Canal	McClintock Dr										30170		5	1	EW	17.5
131	Apache Blvd	S Rural Rd												0	0	NS	74.5
131	Apache Blvd	S Rural Rd												0	1	EW	75
138	Broadway Rd	Rural Rd										44120	44120	0.5	0	NS	46.5
138	Broadway Rd	Rural Rd										44120	30063	0.5	0	EW	14.5
141	Southern Ave	College Ave										35372	4442	1.5	1	NS	41.25
141	Southern Ave	College Ave										35372	35372	1.5	0	EW	12.5
146	Broadway Rd	Mill Ave										31585	25849	0.5	1	NS	13.75
146	Broadway Rd	Mill Ave										31585	31585	0.5	0	EW	12.5