Tempe Bike Count Report

2014

Tempe Bicycle Action Group

Rev 2: 3/5/2017

1. Abstract

In April the fourth annual city-wide bike count in Tempe was conducted as a way of understanding cycling habits and to identify routes and intersections that are problematic or dangerous. In total, 12,577 bicyclists were counted by 78 volunteers from a total of 48 different locations, with 15 locations counted for all 4 years from 2011 to 2014. Overall helmet use was 21%, wrong way riding was 19% and sidewalk riding was 42%. Helmet use and wrong way riding were fairly consistent between the four years of bike count data. Sidewalk riding percentage had more variability year-to-year. Helmet use was much lower and wrong way and sidewalk riding were much higher than the values obtained for similar count data in Pima County, AZ (Tucson area) [1] - [3].

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. Now, almost 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 25th, 26th and 27th, 2014, 78 volunteers observed cyclists at 48 intersections during morning (7-9 am) and evening (4-6 pm) rush hours, counting 12,577 cyclists. The count of cyclists travelling through an imaginary cordon around the ASU-Tempe campus was 541 per hour in-bound in the morning and 700 per hour out-bound in the afternoon. Besides a count, additional data was collected covering rider gender, helmet use, riding on the sidewalk, and riding on the wrong side of the street (against traffic). In addition to these data, our analysis considers 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]. Other recent reports on bicycle transportation include those from Maricopa Association of Governments [9], [10] and a Bike Network Connectivity Study for SRP [11].

3. Results

a. Attribute Analysis

Attributes collected were wrong-way riding, riding on the sidewalk, wearing a helmet, and gender. The high incidences of cyclists riding against traffic, riding on the sidewalk and riding without a helmet are all matters of significant concern.

The 20 intersections with the highest fraction of wrong-way riding are shown in Figure 1. In all, there were 16 intersections at which 25% or more of the cyclists observed were riding the wrong direction. ARS §28-812 concerns applicability of traffic laws to bicycle riders. Riding on the wrong side is dangerous, as motorists often do not anticipate or look for wrong-way traffic. While some of the intersections with high wrong-way riding lack a dedicated bike lane in the problem direction, many, such as several along University Drive in the ASU area, do have bike lanes.

Sidewalk riding had even higher percentages. Six intersections had greater than 90% sidewalk riding. The 20 intersections with the highest fraction of sidewalk riding are shown in Figure 2. In all, 34 intersections out of 48 had 25% or more of the cyclists riding on the sidewalk. Tempe City Code sec. 7-52 concerns riding on sidewalks or bicycle lanes. Sidewalk riding 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.

Overall helmet use was 21%. This is substantially lower than that observed in the count by Pima Association of Government (PAG) of slightly over 50% (see Table 1). Wrong way riding was 19% and sidewalk riding was 42%, both substantially higher than PAG. Wrong-way riding was counted for both

on-street and on-sidewalk riding. The calculation of overall attribute percentages was weighted according to the total count for each intersection/direction.

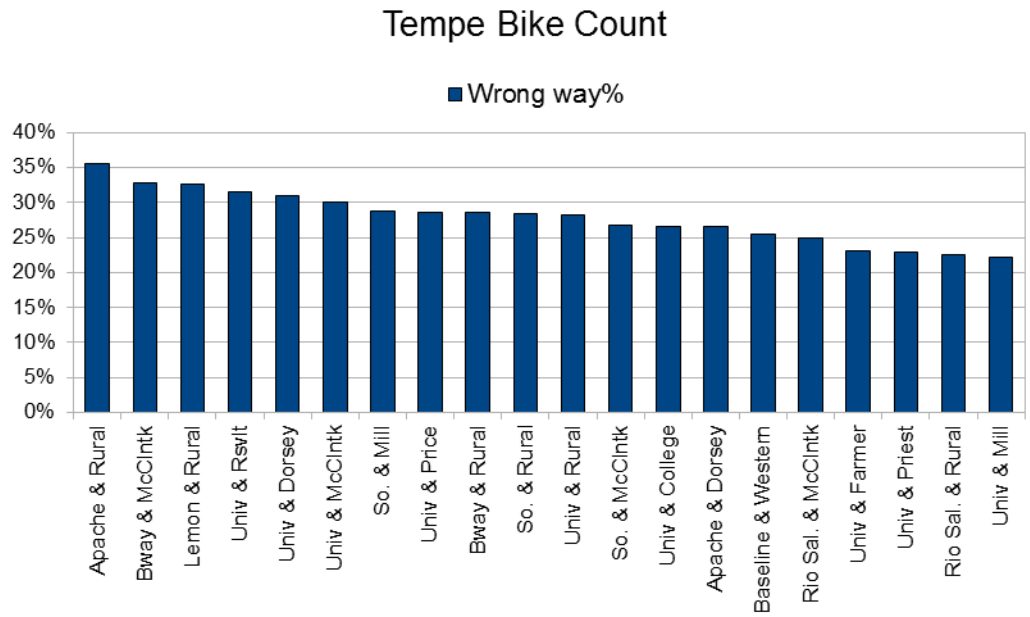


Figure 1 Top 20 locations by percentage of wrong-way riders, by intersection (directions combined)

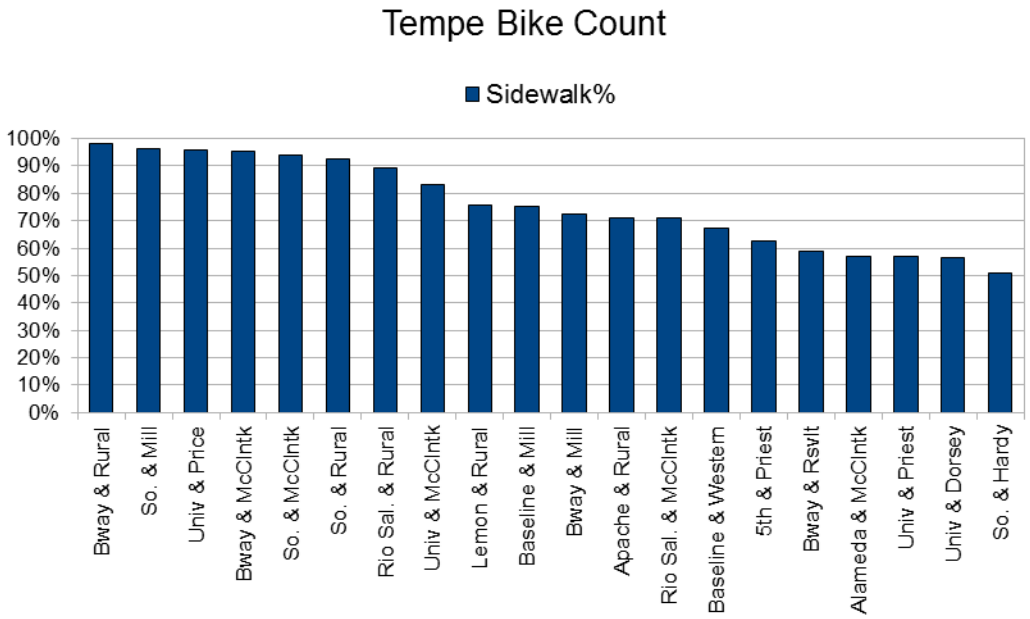


Figure 2 Top 20 locations by percentage of cyclists on sidewalk, by intersection (directions combined).

A summary of count data and attribute data is shown in Table 1. Count and attribute data are depicted geographically in Appendix A.

	Total Count	# locations	Recorders	Wrong way%	Sidewalk%	Helmet%	Female%
Tempe 2014	12,577	48	78	19.2%	41.8%	20.6%	24.7%
Tempe 2013	14,750	54	91	17.2%	40.6%	19.0%	26.1%
Tempe 2012	6,563	28	20	18.7%	45.8%	17.6%	29.8%
Tempe 2011	9,407	45	58	17.5%	31.8%	17.2%	24.8%
PAG 2013	13,265	82		2.9%	6.0%	50.9%	28.0%
PAG 2012	12,211	86		3.2%	7.0%	54.6%	24.5%
PAG 2011	15,898	117		2.5%	5.9%	50.3%	26.8%

Table 1 Summary of count data and attribute data [1] - [3], [6] - [8].

b. Correlation Analysis

Both sidewalk riding and wrong way riding are positively correlated with vehicular traffic volume as shown in Figure 3 and Figure 4. That is, the higher the volume of vehicular traffic in a particular direction, the higher the incidence of both riding on the sidewalk and riding against traffic. These correlations indicate the need to recognize the effect of traffic volume on cyclist riding behavior.

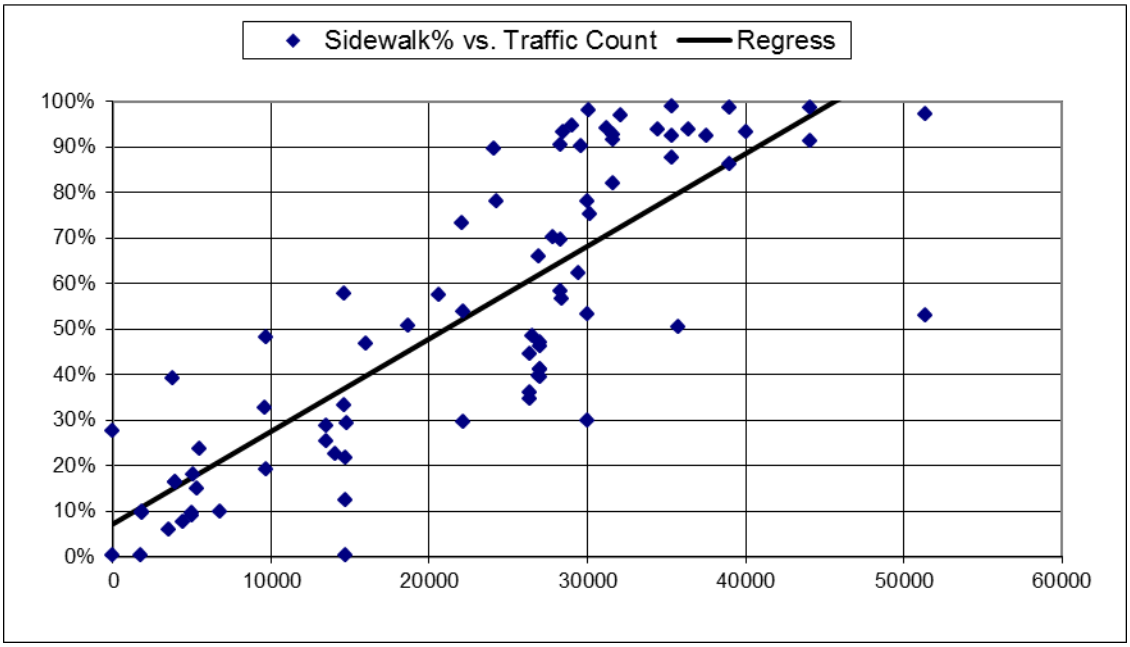


Figure 3 Correlation between sidewalk riding % and vehicular traffic count (24 hour period), E/W and N/S directions separated. $R^2 = 0.66$.

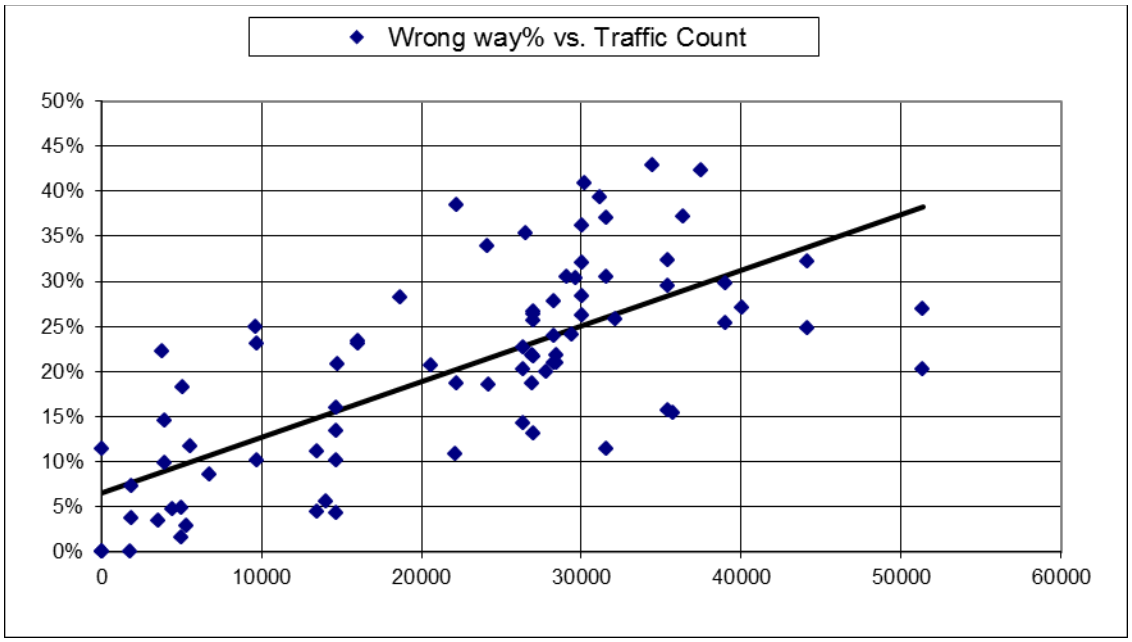


Figure 4 Correlation between wrong way riding % and vehicular traffic count (24 hour period), E/W and N/S directions separated. $R^2 = 0.50$.

The plot in Figure 5 shows that the highest bicycle usage areas are adjacent to the ASU campus.

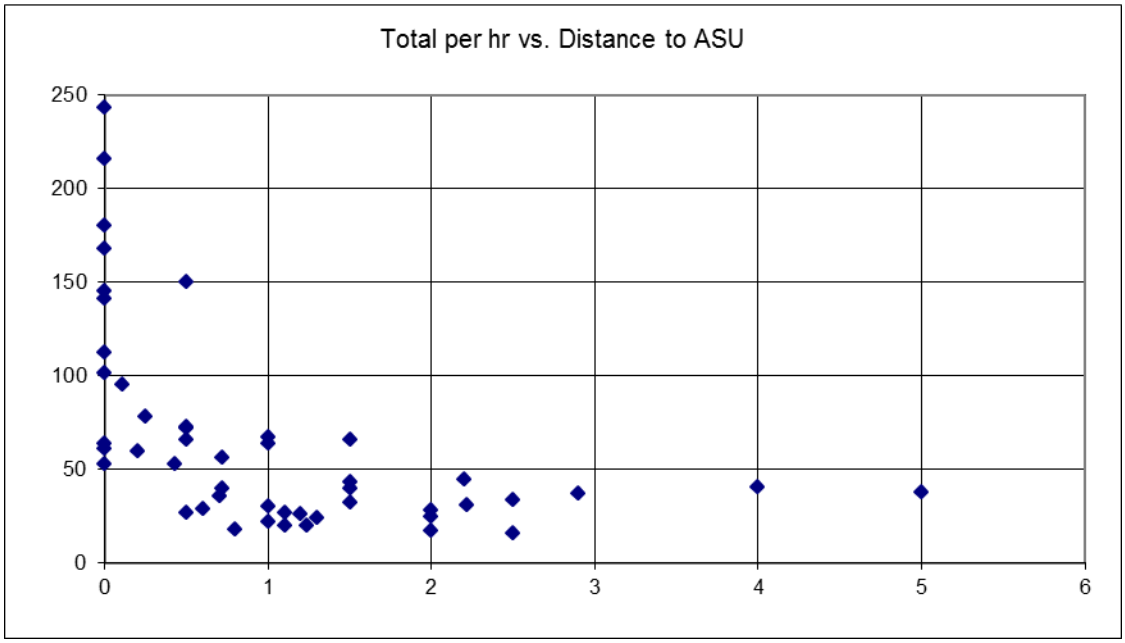


Figure 5 Relationship between cyclist count per hour and distance to ASU (miles).

c. Error Detection

Error detection methods were applied to the collected data. The detailed procedure is provided in Appendix A. Errors were detected as attribute count exceeding the bike count for a specific time and direction. There were 24 errors detected out of 3168 data points. These errors can generally be attributed to either recording (at the time of the count) or transcription (converting handwritten marks to numbers in a database). Corrections to transcriptions are straight forward and simply involves checking the count

sheets. Corrections to recording data errors can be estimated by inferring that either a bike count mark was missed or a false mark was applied to the attribute column. Most of the recording corrections applied here resulted in an increase of 1 count for the given time segment. As a result of these estimated corrections, the total bicycle count increased by 15. Based on the low percentage of errors, the counting procedure appears to be sound. In addition, some data fields indicated wrong way and/or sidewalk riding for intersection approaches where motor vehicles are not allowed and wrong way riding is not applicable. These were corrected by nulling the sidewalk and wrong way riding in the appropriate direction since these data contradict the intent of the statistic to represent bad behavior.

4. Recommendations

The City of Tempe has made great strides in developing the city as a bicycle-friendly community. This 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 a concern relating to car-bike collisions, especially when the bike is going the wrong way on the sidewalk. T.B.A.G. [5] 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.

Detected errors were reduced substantially relative to last year's count. This improvement is likely due to the following corrections made in the overall count process:

1) Training
2) Count sheet (simplification, *e.g.*, removal of lower-priority metrics)

The use of cross-checking reduced the effect of errors even further.

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 detect questionable data improves the final data analysis accuracy.

5. References

[1] 2011 Regional Bicycle/Pedestrian Count Summary, http://www.pagnet.org/documents/bicycle/2011RegionalBicycleCountReport.pdf.

[2] 2012 Regional Bicycle and Pedestrian Count Summary Report, http://www.pagnet.org/documents/bicycle/2012RegionalBicycleCountReport.pdf.

[3] 2013 Regional Bicycle and Pedestrian Count Summary Report, http://www.pagnet.org/documents/bicycle/2013RegionalBicycleCountReport.pdf.

[4] Traffic count data from the City of Tempe, www.tempe.gov/traffic.

[5] Tempe Bicycle Action Group (T.B.A.G.), www.biketempe.org.

[6] 2011 Tempe Bike Count Report, http://www.biketempe.org/wp-content/uploads/2011/12/Tempe-Bike-Count-2011-Final-Report1.pdf.

[7] Tempe Bike Count Report 2012, http://www.biketempe.org/wp-content/uploads/2013/01/Tempe_Bike_Count_Report_2012.pdf.

[8] Tempe Bike Count Report 2013, http://www.biketempe.org/wp-content/uploads/2014/04/Tempe_Bike_Count_Report_20131.pdf.

[9] MAG Bicycles Count: Final Report and Implementation Plan, https://www.azmag.gov/Documents/BaP_2014-08-21_FINAL-MAG-Bicycle-Count-Data-Summary-Report.pdf

[10] MAG Bicycle Count Data Summary Presentation, https://www.azmag.gov/Documents/BaP_2014-05-21_MAG-Bicycle-Count-Data-Summary-Presentation.pdf
[11] Bike Network Connectivity Study for SRP Service Area, http://www.public.asu.edu/~mikekuby/BikeNetworkConnectivity/
[12] ADOT traffic collision database, http://azbikelaw.org/blog/adot-traffic-collision-database/ http://azbikelaw.org/blog/arizona-crash-facts-2013/
[13] D. Kahle and H. Wickham. ggmap: Spatial Visualization with ggplot2. The R Journal, 5(1), 144-161. URL http://journal.r-project.org/archive/2013-1/kahle-wickham.pdf

Acknowledgements

Tempe Bike Count 2014 was a concerted effort by a diverse team representing a wide cross-section of the bicycle-interest community. Many thanks go out to the volunteers who contributed their time to recording data and other areas of this effort.

Bike count coordinator:

- Scott Walters, T.B.A.G.

Report contributors:

- Clifford Anderson, Six Sigma Black Belt (data processing, statistical analysis, writing)
- Yue Zhang, School of Geographical Sciences and Urban Planning, Arizona State University (graphical presentation)
- Scott Walters, T.B.A.G.

Other bike count contributors:

- Jenn Guzy, T.B.A.G.

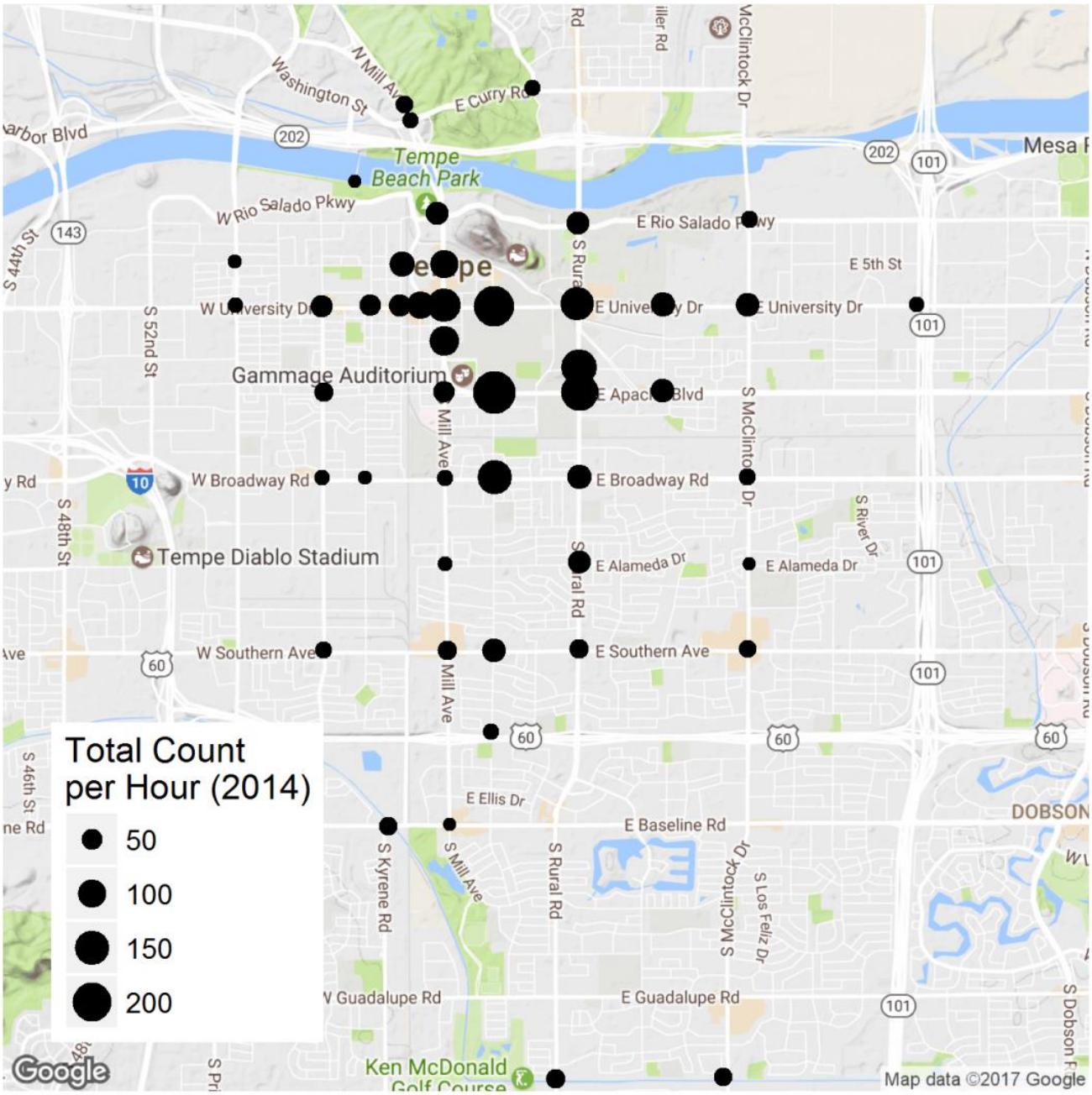
Count recorders:

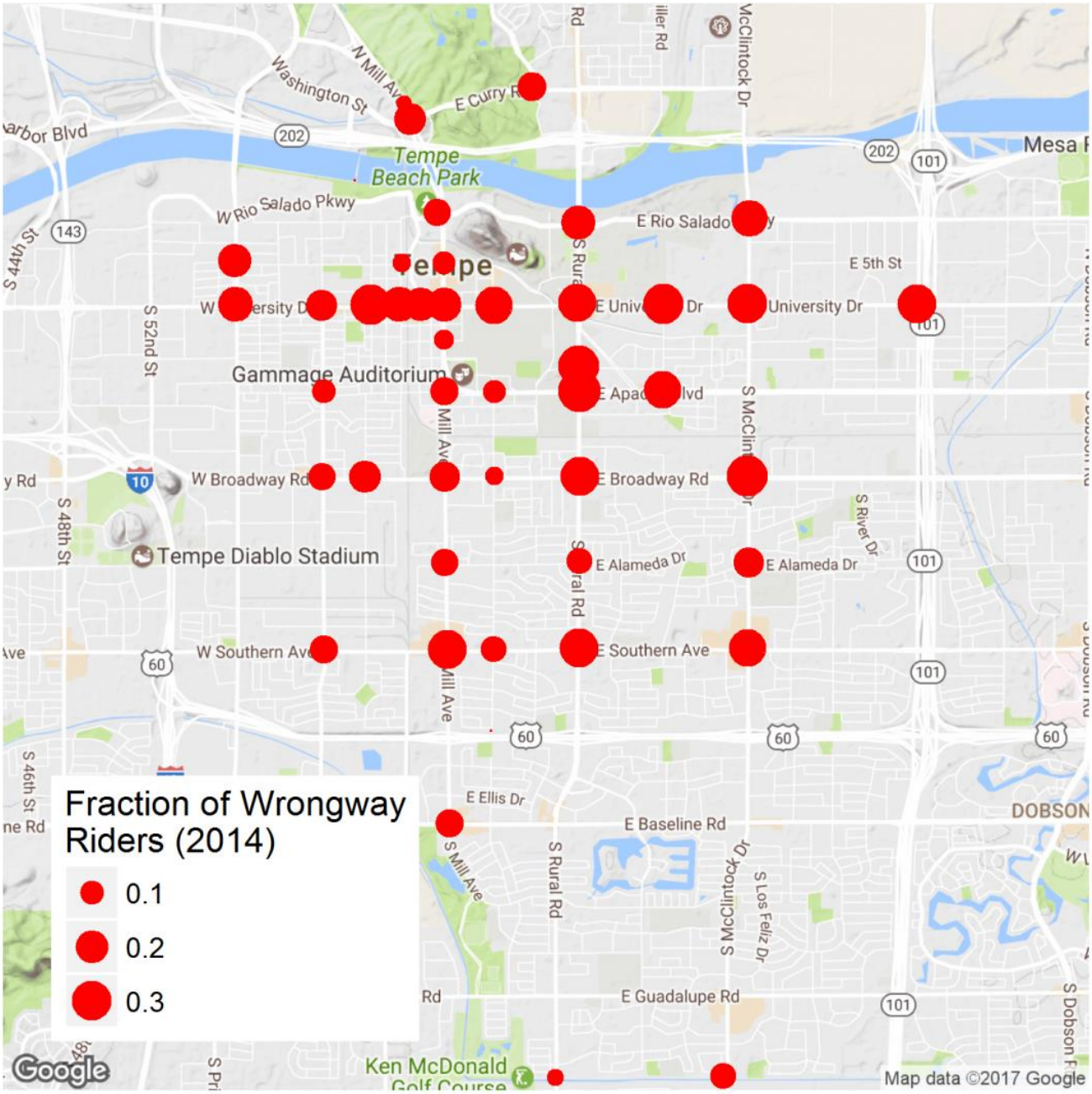
- 78 volunteers

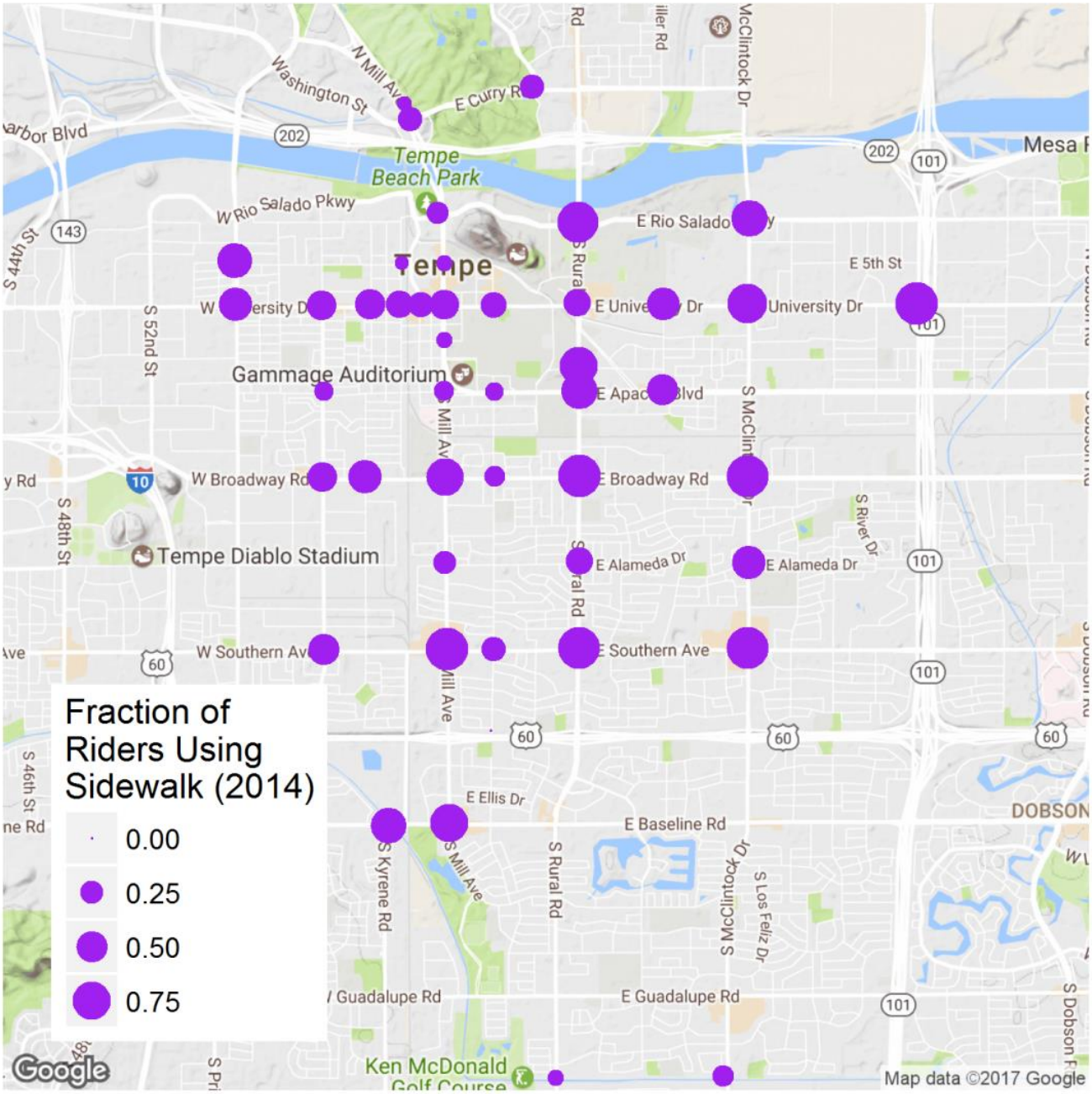
REVISION HISTORY

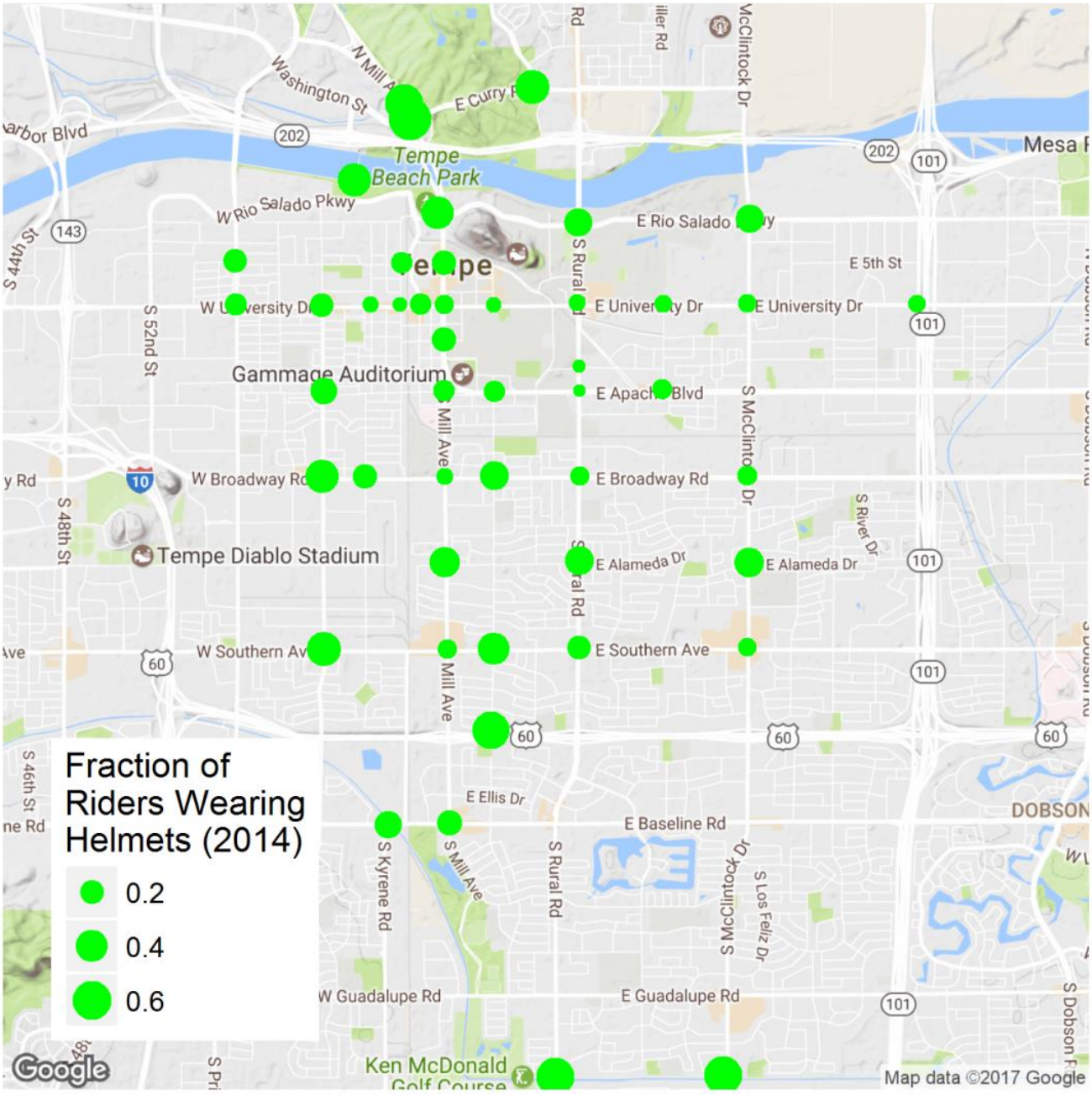
Revision	Description	Date
1	Initial	3/24/2015
2	Correction to data for LocID 102,113,115,116,129,133,146 & Fig 1,2,6,7, Tab 1, App A,B, F relating to algorithm for handling duplicate counts . “15 locations counted for all 4 years” was 21. Cordon out 700 was 458. Ignore wrong way and sidewalk riding for intersection approaches where motor vehicles are not allowed and wrong way riding is not applicable. Remove collision plots.	3/5/2017

Appendix A Geographical Presentation of Statistics [13]




Fraction of Wrongway Riders (2014)
0.1
0.2
0.3
Tempe Beach Park
Tempe Diablo Stadium
Gammage Auditorium
Ken McDonald Golf Course
Washington St
W Rio Salado Pkwy
E Rio Salado
E 5th St
University Dr
W Broadway Rd
E Broadway Rd
E Alameda Dr
W Southern Ave
E Southern Ave
E Ellis Dr
E Baseline Rd
E Guadalupe Rd
Mill Ave
S Rural Rd
S McClintock Dr
S 48th St
S 52nd St
S 44th St
S River Dr
S Los Feliz Dr
Mesa
DOBSON
Google
Map data ©2017 Google


Fraction of Riders Using Sidewalk (2014)
0.00
0.25
0.50
0.75
Tempe
Tempe Beach Park
Gammage Auditorium
Tempe Diablo Stadium
Ken McDonald Golf Course
W Rio Salado Pkwy
E Rio Salado
E 5th St
University Dr
W Broadway Rd
E Broadway Rd
E Alameda Dr
W Southern Ave
E Southern Ave
E Ellis Dr
E Baseline Rd
E Guadalupe Rd
Washington St
N Mill Ave
E Curry Rd
S Mill Ave
S Rural Rd
S McClintock Dr
S Kyrene Rd
S 52nd St
S 48th St
S 44th St
S River Dr
S Los Feliz Dr
Harbor Blvd
Mesa
DOBSON
Google
Map data ©2017 Google


Fraction of Riders Wearing Helmets (2014)
0.2
0.4
0.6
Tempe Beach Park
Gammage Auditorium
Tempe Diablo Stadium
Ken McDonald Golf Course
Washington St
W Rio Salado Pkwy
E Rio Salado
E 5th St
E University Dr
W University Dr
E Apache Blvd
W Broadway Rd
E Broadway Rd
E Alameda Dr
W Southern Ave
E Southern Ave
E Ellis Dr
E Baseline Rd
W Guadalupe Rd
E Guadalupe Rd
S Mill Ave
S Rural Rd
S McClintock Dr
S 48th St
S 52nd St
S Kyrene Rd
S Los Feliz Dr
S River Dr
DOBSON
Mesa
Map data ©2017 Google
Google

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
f. Data collected during previous bike count

The total number of intersections in the initial plan was capped at about 50, but was limited practically by volunteer participation.

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 anticipated 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 designed with 15 minute bins.

The set of instructions conveyed to recorders is shown in Appendix D. Three training sessions were held.

Bicycle count data was collected for each of the directions (typically 4) of each intersection. For analysis, the two opposite direction counts were added, e.g., east was added to west.

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 for errors 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

There were 10 total data entry errors detected out of 3,296 data points. The errors came from 7 data sheets. Based on this low percentage of errors, there does not appear to be any procedural errors by this method of error detection. The errors were reviewed case by case and all appear to be accidental errors rather than procedural. All errors were corrected. Four of the errors were transcription errors while 6 were recording errors.

Average bike count per hour vs. time of day, as shown Figure 6, peaked for the AM counts at the end of the morning shift. For the PM counts peaks occurred for the 4:15-4:30 and 5:45-6:00PM segments.

Since these are aggregate counts, it is possible that some areas have peak ridership at other times. The data was likely influenced by class schedule at ASU.

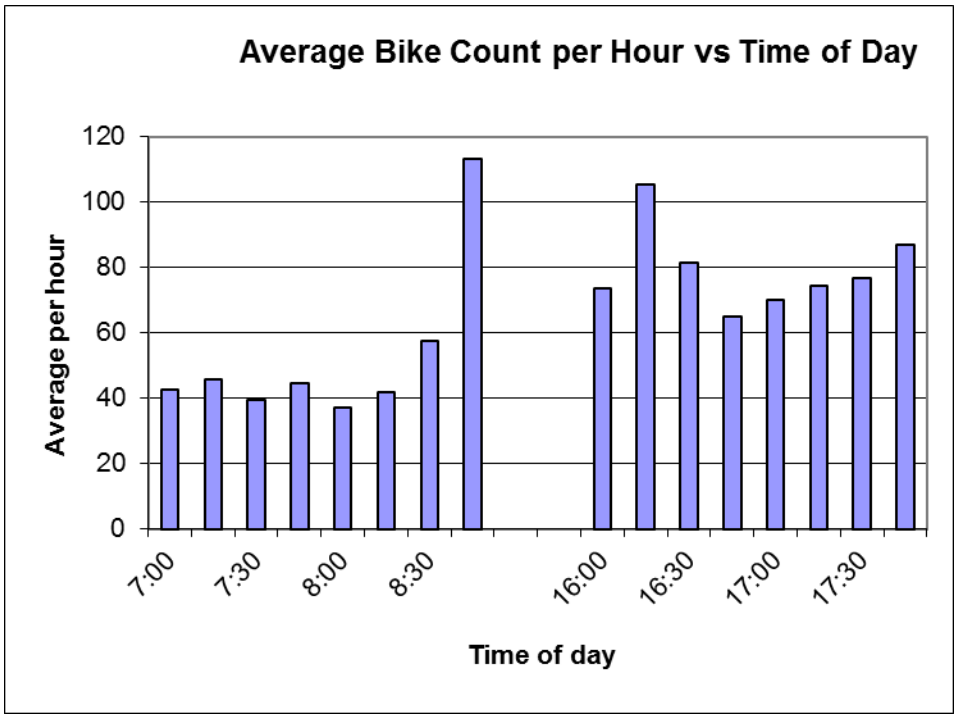


Figure 6 Average bike count per hour vs. time of day

Traffic count was obtained from City of Tempe data [4]. 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 at 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:

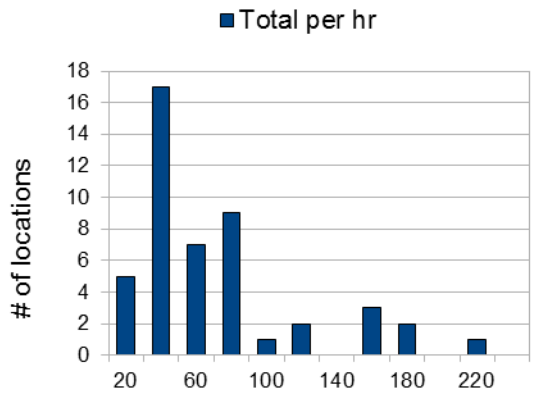
- The most recent data for each sampling location was used.
- For the two sides of a given intersection/direction (east/west or north/south), the larger of the two values was used. If data was available for only one side, that value was used.

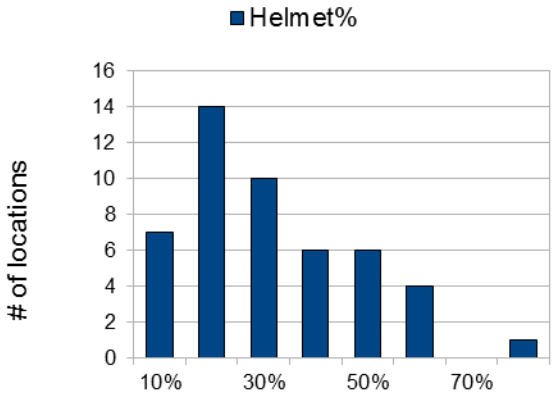
Name:			Count Sheet	page #:			
Date:		Location ID#:	Intersection of streets:				
		Check for every cyclist:	Also check all that apply:				
Hour		Approach			Wearing	Wrong Way	
_AM	_PM	Direction	COUNT	FEMALE	HELMET	Riding	Riding on Sidewalk
		NB					
	:00	SB					
		EB					
		WB					
		NB					
	:15	SB					
		EB					
		WB					
		NB					
	:30	SB					
		EB					
		WB					
		NB					
	:45	SB					
		EB					
		WB					
Observations/ Notes:							
Construction etc.							
		Return all completed sheets to the Bicycle Cellar (200 E 5th St #105, Tempe; ask about the Bike Count discount!), Boulders on Broadway's hostess desk or mail to Tempe Bicycle Action Group, PO Box 1884, Tempe, AZ 85280. Thank you for your participation!					

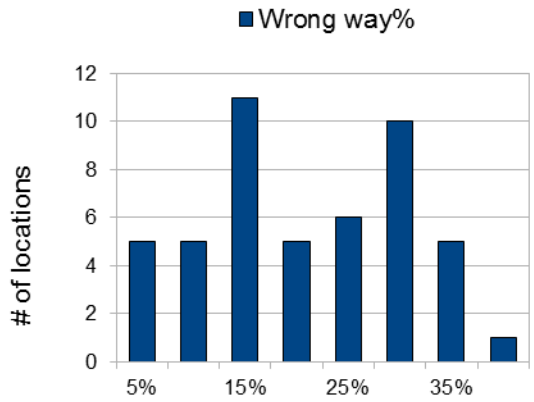
Appendix D - Bike Count Instructions

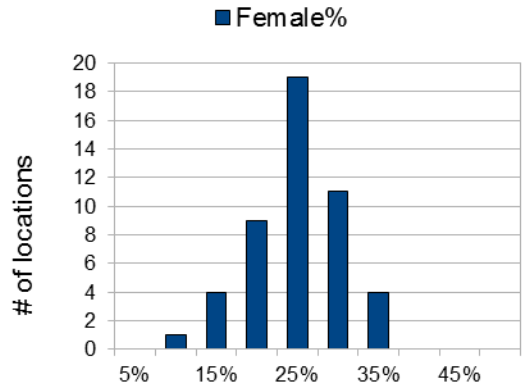
1. **Count Form Structure.**
    a. 1 hr: each form tracks 1 full hr of activity, broken into 15 minute increments.
    b. Total # of Cyclists recorded in "Count" Column. Attributes broken out in following columns.
2. **Fill In:** - Important please include the following info on each tracking sheet.
    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 <u>not</u> 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 a 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. **Helmet** (No Helmet is assumed) - Mark if the cyclist <u>is</u> wearing a Helmet
    d. **Wrong-Way Riding** - cycling against traffic
    e. **Sidewalk Riding** – does not include quick transitions at intersections or parking lots etc.

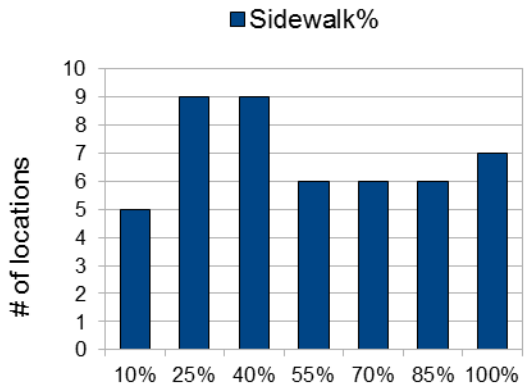
Appendix E – Additional Graphs











Appendix F – Historical Bike Count Data

Loc ID	Location or Intersection: E/W	Location or Intersection: N/S	2011 Total per hr	2012 Total per hr	2013 Total per hr	2014 Total per hr
101	Washington/Curry	Mill Ave	35		28	29
102	Rio Salado Pkwy	Mill Ave	47		57	64
103	Rio Salado Pkwy	Rural Rd	48	44	50	61
104	Rio Salado Pkwy	McClintock Dr	39	19	10	30
105	Rio Salado Pkwy	Hardy Dr	8		14	
106	5th St	Mill Ave	118	91	60	101
107	5th St	Forest Ave	48		24	
108	5th St	Farmer Ave			11	78
109	5th St	Hardy Dr		32	24	
110	5th St	Priest Dr	18		13	20
111	10th St	Mill Ave		138	36	113
112	Superstition Fwy	College Ave	33	28	38	28
113	13th St	Mill Ave	49	32	20	53
114	13th St	Hardy Dr			25	40
115	University Dr	College Ave	452	174	120	216
116	University Dr	Dorsey Ln	66		5	73
117	University Dr	Rural Rd	116	181	45	145
118	University Dr	Mill Ave	93	117	93	141
119	University Dr	Ash Ave	88	61	32	96
120	University Dr	Roosevelt St	46	51	6	53
121	University Dr	Hardy Dr	62	35	21	57
122	McKellips Rd	Greenbelt Path	42	41	35	44
123	Western Canal	Rural Rd		45	13	41
124	Western Canal	McClintock Dr			9	38
125	Western Canal	Lakeshore Dr	86	43	13	
126	Baseline Rd	Western Canal	25		10	37
127	Elliot Rd	McClintock Dr	10		9	
128	Alameda Dr	McClintock Dr	22		12	18
129	Alameda Dr	Rural Rd			34	64
130	Alameda Dr	Country Club Wy	12		8	
131	Apache Blvd	Rural Rd		191	82	180
132	Apache Blvd	S Dorsey Ln	38		9	66
133	Apache Blvd	College Ave		233	191	243
134	Apache Blvd	Paseo Del Saber	121	102	86	
135	Lemon St	Rural Rd	151		75	168
136	Spence St	Rural Rd	92	135	118	
137	Broadway Rd	Priest Dr	16		14	
138	Broadway Rd	Rural Rd		65	70	72
139	Broadway Rd	College Ave	105		114	150
140	Southern Ave	Priest Dr	19		13	
141	Southern Ave	College Ave		70	86	66
142	Southern Ave	Rural Rd			19	43
143	Southern Ave	Hardy Dr	25	23	16	31
144	Southern Ave	Mill Ave	48	48	18	40
145	Alameda Dr	Mill Ave	30	24	13	22
146	Broadway Rd	Mill Ave		37	35	27
147	Baseline Rd	Mill Ave	17		9	16
148	Guadalupe Rd	Kyrene Rd			12	
149	Guadalupe Rd	Country Club Wy	12		10	
150	Guadalupe Rd	Lakeshore Dr	23		12	
151	University Dr	Forest Ave	130	90	57	

Loc ID	Location or Intersection: E/W	Location or Intersection: N/S	2011 Total per hr	2012 Total per hr	2013 Total per hr	2014 Total per hr
152	Tempe Lake S.	TCA Bridge		36	21	18
153	Apache Blvd	McAllister Ave				
154	Terrace Rd	Rural Rd			84	
155	University Dr	McClintock Dr			22	67
156	Crosscut Canal	Mill Ave				36
157	Curry Rd	College Ave				27
158	Washington St	Priest Dr				
159	Broadway Rd	McClintock Dr				32
160	Broadway Rd	Hardy Dr				24
161	University Dr	Price Rd				25
162	Broadway Rd	Roosevelt St				20
163	University Dr	Farmer Ave				60
164	Southern Ave	McClintock Dr				34
165	University Dr	Priest Dr				26

Appendix G Data Summary

North-South Direction

Loc ID	Location or Intersection: E/W	Location or Intersection: N/S	Total per hr	AM per hr	PM per hr	Helmet%	Wrong way%	Sidewalk%	Female%	Traffic Count	Traffic Dir	Loc to ASU	Lane in Dir	Dir
101	Washington/Curry	Mill Ave	20	20		73%	25%	32%	12%	14035	9628	0.6	1	NS
102	Rio Salado Pkwy	Mill Ave	50	39	62	45%	13%	21%	17%	14670	14670	0	1	NS
103	Rio Salado Pkwy	Rural Rd	49	40	59	29%	27%	97%	20%	51380	51380	0	0	NS
104	Rio Salado Pkwy	McClintock Dr	14	8	21	19%	30%	86%	23%	39025	39025	1	0	NS
106	5th St	Mill Ave	52	32	71	28%	10%	12%	25%	14670	14670	0	1	NS
108	5th St	Farmer Ave	12	8	17	18%	18%	16%	16%	3508		0.25	0	NS
110	5th St	Priest Dr	16	13	19	21%	21%	69%	26%	28310	28310	1.24	1	NS
111	10th St	Mill Ave	32	32		23%	20%	34%	17%	26392	26392	0	0	NS
112	Superstition Fwy	College Ave	28	27	30	56%	0%	0%	25%	1774	1774	2	1	NS
113	13th St	Mill Ave	14	14		9%	14%	36%	18%	26392	26392	0	1	NS
114	13th St	Hardy Dr	20	18	22	28%	10%	19%	27%	9690	9690	0.72	1	NS
115	University Dr	College Ave	111	74	149	9%	18%	18%	27%	26482	5044	0	1	NS
116	University Dr	Dorsey Ln	12	5	18	13%	45%	76%	18%	30015		0.5	1	NS
117	University Dr	Rural Rd	48	32	64	14%	20%	53%	24%	51380	51380	0	0	NS
118	University Dr	Mill Ave	63	49	77	21%	23%	44%	28%	27003	26392	0	1	NS
119	University Dr	Ash Ave	32	28	37	21%	11%	19%	32%	27003		0.11	1	NS
120	University Dr	Roosevelt St	9	11	6	12%	59%	59%	21%	27003		0.43	1	NS
121	University Dr	Hardy Dr	26		26	27%	23%	48%	19%	27003	9690	0.72	1	NS
122	McKellips Rd	Greenbelt Path	38	27	50	48%	0%	0%	18%	14788	0	2.2	1	NS
123	Western Canal	Rural Rd	7	4	11	41%	24%	62%	7%	29395	29395	4	0	NS
124	Western Canal	McClintock Dr	11	10	12	43%	41%	75%	30%	30170	30170	5	1	NS
126	Baseline Rd	Western Canal	9	6	13	49%	0%	0%	3%	24094		2.9	1	NS
128	Alameda Dr	McClintock Dr	10	10		20%	20%	70%	5%	27807	27807	2	0	NS
129	Alameda Dr	Rural Rd	44	27	61	24%	15%	50%	25%	35740	35740	1	0	NS
131	Apache Blvd	Rural Rd	84		84	2%	32%	91%	20%	44120	44120	0	0	NS
132	Apache Blvd	S Dorsey Ln	8		8	20%	13%	40%	13%	18699		0.5	0	NS
133	Apache Blvd	College Ave	170	165	175	19%	5%	9%	32%	22165	4997	0	1	NS
135	Lemon St	Rural Rd	92	78	106	3%	42%	92%	29%	37510	37510	0	0	NS

138	Broadway Rd	Rural Rd	48	40	57	13%	25%	98%	25%	44120	44120	0.5	0	NS
139	Broadway Rd	College Ave	130	123	138	36%	2%	9%	27%	29614	4997	0.5	1	NS
141	Southern Ave	College Ave	48	39	58	47%	5%	7%	24%	35372	4442	1.5	1	NS
142	Southern Ave	Rural Rd	21	15	28	15%	27%	93%	14%	40059	40059	1.5	0	NS
143	Southern Ave	Hardy Dr	20	21	20	57%	11%	28%	22%	28429	13469	2.22	1	NS
144	Southern Ave	Mill Ave	19	18	21	9%	43%	94%	22%	35372	34482	1.5	1	NS
145	Alameda Dr	Mill Ave	12	11	14	23%	19%	40%	10%	26912	26912	1	1	NS
146	Broadway Rd	Mill Ave	16	13	20	9%	22%	66%	23%	31585	26912	0.5	1	NS
147	Baseline Rd	Mill Ave	7	5	9	19%	19%	78%	22%	24224	24224	2.5	1	NS
152	Tempe Lake S.	TCA Bridge	7	7		69%	0%	0%	8%	0	0	0.8	1	NS
155	University Dr	McClintock Dr	24	12	36	2%	37%	94%	15%	36366	36366	1	1	NS
156	Crosscut Canal	Mill Ave	25	26	24	60%	0%	0%	6%	14670	14670	0.7	1	NS
157	Curry Rd	College Ave	19	18	21	51%	12%	23%	14%	15990	5499	1.1	1	NS
159	Broadway Rd	McClintock Dr	17	17		18%	39%	94%	12%	32138	31175	1.5	0	NS
160	Broadway Rd	Hardy Dr	17	15	20	53%	4%	25%	28%	31585	13469	1.3	1	NS
161	University Dr	Price Rd	7		7	0%	23%	100%	15%	29056	16067	2	0	NS
162	Broadway Rd	Roosevelt St	9	9	9	35%	3%	15%	24%	31585	5329	1.1	1	NS
163	University Dr	Farmer Ave	9	10	9	3%	3%	25%	19%	27003		0.2	1	NS
164	Southern Ave	McClintock Dr	16	15	17	16%	25%	98%	21%	39001	39001	2.5	0	NS
165	University Dr	Priest Dr	13	14	11	24%	24%	58%	24%	28413	28310	1.2	1	NS

East-West Direction

Loc ID	Location or Intersection: E/W	Location or Intersection: N/S	Total per hr	AM per hr	PM per hr	Helmet%	Wrong way%	Sidewalk%	Female%	Traffic Count	Traffic Dir	Loc to ASU	Lane in Dir	Dir
101	Washington/Curry	Mill Ave	9	9		78%	6%	22%	17%	14035	14035	0.6	1	EW
102	Rio Salado Pkwy	Mill Ave	13	10	17	30%	16%	33%	35%	14670	14634	0	1	EW
103	Rio Salado Pkwy	Rural Rd	12	9	15	32%	4%	57%	21%	51380	14634	0	1	EW
104	Rio Salado Pkwy	McClintock Dr	16	12	20	40%	21%	57%	11%	39025	20597	1	1	EW
106	5th St	Mill Ave	50	42	58	15%	9%	10%	22%	14670	6739	0	1	EW
108	5th St	Farmer Ave	66	50	82	15%	3%	6%	35%	3508	3508	0.25	1	EW
110	5th St	Priest Dr	5	3	6	17%	22%	39%	17%	28310	3747	1.24	1	EW
111	10th St	Mill Ave	81	81		20%	1%	2%	39%	26392		0	1	EW
112	Superstition Fwy	College Ave								1774		2	0	EW
113	13th St	Mill Ave	46	47	45	18%	15%	16%	29%	26392	3917	0	1	EW
114	13th St	Hardy Dr	20	16	25	27%	10%	16%	25%	9690	3917	0.72	1	EW
115	University Dr	College Ave	105	80	131	5%	35%	48%	24%	26482	26482	0	1	EW
116	University Dr	Dorsey Ln	61	37	86	10%	28%	53%	24%	30015	30015	0.5	1	EW
117	University Dr	Rural Rd	97	69	126	8%	32%	30%	31%	51380	30015	0	1	EW
118	University Dr	Mill Ave	79	62	95	7%	22%	47%	25%	27003	27003	0	1	EW
119	University Dr	Ash Ave	63	33	94	13%	26%	39%	30%	27003	27003	0.11	1	EW
120	University Dr	Roosevelt St	45	40	49	8%	26%	46%	24%	27003	27003	0.43	1	EW
121	University Dr	Hardy Dr	31		31	15%	13%	41%	20%	27003	27003	0.72	1	EW
122	McKellips Rd	Greenbelt Path	6	5	8	17%	21%	29%	4%	14788	14788	2.2	1	EW
123	Western Canal	Rural Rd	33	28	39	62%	0%	0%	20%	29395		4	1	EW
124	Western Canal	McClintock Dr	27	27	27	64%	0%	0%	25%	30170		5	1	EW
126	Baseline Rd	Western Canal	28	20	36	21%	34%	89%	18%	24094	24094	2.9	0	EW
128	Alameda Dr	McClintock Dr	8	8		53%	13%	40%	20%	27807		2	1	EW
129	Alameda Dr	Rural Rd	20	22	18	48%	4%	9%	20%	35740	1841	1	1	EW
131	Apache Blvd	Rural Rd	96		96	7%	39%	54%	22%	44120	22165	0	1	EW
132	Apache Blvd	S Dorsey Ln	59		59	14%	28%	50%	21%	18699	18699	0.5	1	EW
133	Apache Blvd	College Ave	74	65	83	11%	19%	29%	37%	22165	22165	0	1	EW
135	Lemon St	Rural Rd	76	76	77	7%	21%	56%	25%	37510		0	1	EW
138	Broadway Rd	Rural Rd	24	19	28	10%	36%	98%	13%	44120	30063	0.5	0	EW

139	Broadway Rd	College Ave	20	24	16	6%	30%	90%	28%	29614	29614	0.5	0	EW
141	Southern Ave	College Ave	18	16	20	18%	32%	87%	18%	35372	35372	1.5	0	EW
142	Southern Ave	Rural Rd	22	15	30	26%	30%	92%	27%	40059	35372	1.5	0	EW
143	Southern Ave	Hardy Dr	11	8	14	26%	21%	93%	23%	28429	28429	2.22	0	EW
144	Southern Ave	Mill Ave	21	16	26	16%	16%	99%	25%	35372	35372	1.5	0	EW
145	Alameda Dr	Mill Ave	10	7	14	49%	7%	10%	41%	26912	1841	1	1	EW
146	Broadway Rd	Mill Ave	11	8	14	9%	11%	82%	32%	31585	31585	0.5	0	EW
147	Baseline Rd	Mill Ave	9	9	10	27%	11%	73%	11%	24224	22102	2.5	0	EW
152	Tempe Lake S.	TCA Bridge	12	12		30%	0%	0%	30%	0	0	0.8	1	EW
155	University Dr	McClintock Dr	44	33	55	16%	26%	78%	18%	36366	30015	1	1	EW
156	Crosscut Canal	Mill Ave	11	16	7	55%	11%	27%	18%	14670	0	0.7	0	EW
157	Curry Rd	College Ave	8	7	9	37%	23%	47%	10%	15990	15990	1.1	1	EW
159	Broadway Rd	McClintock Dr	16	16		10%	26%	97%	29%	32138	32138	1.5	0	EW
160	Broadway Rd	Hardy Dr	7	2	12	19%	37%	93%	19%	31585	31585	1.3	0	EW
161	University Dr	Price Rd	18		18	14%	31%	94%	17%	29056	29056	2	1	EW
162	Broadway Rd	Roosevelt St	12	15	9	11%	30%	91%	24%	31585	31585	1.1	0	EW
163	University Dr	Farmer Ave	51	36	66	8%	27%	41%	28%	27003	27003	0.2	1	EW
164	Southern Ave	McClintock Dr	18	11	25	8%	28%	90%	22%	39001	28316	2.5	0	EW
165	University Dr	Priest Dr	14	14	14	13%	22%	56%	9%	28413	28413	1.2	1	EW