Appendix A. Parent Survey Report

A survey for parents of students enrolled in Wasco's public schools was administered in December, 2012. The survey was given both online and on paper in both English and Spanish and received 1,209 responses. This section describes some of the key findings from the survey.

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City of Wasco Safe Routes to School Parent/Caregiver Survey Report

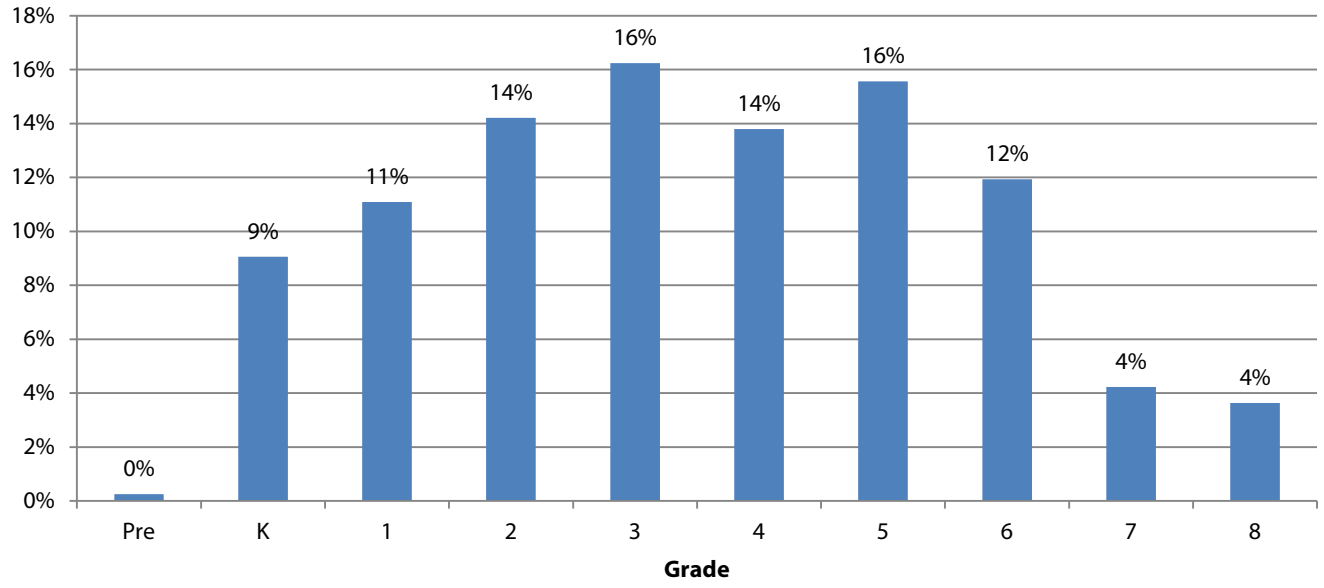
Date Collected: Fall 2012

School:	Clemens	Jefferson	Prueitt	Burke	Palm Ave	Total
Surveys Returned:	273	94	247	268	327	**1,209**

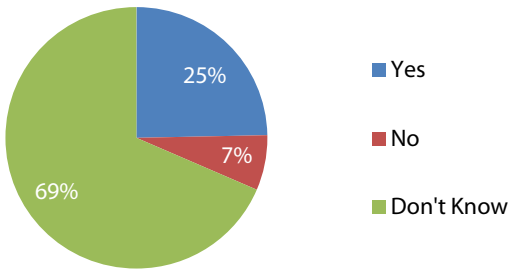
Gender *n= 1141*

Gender	Count	Percent
Male	524	46%
Female	617	54%

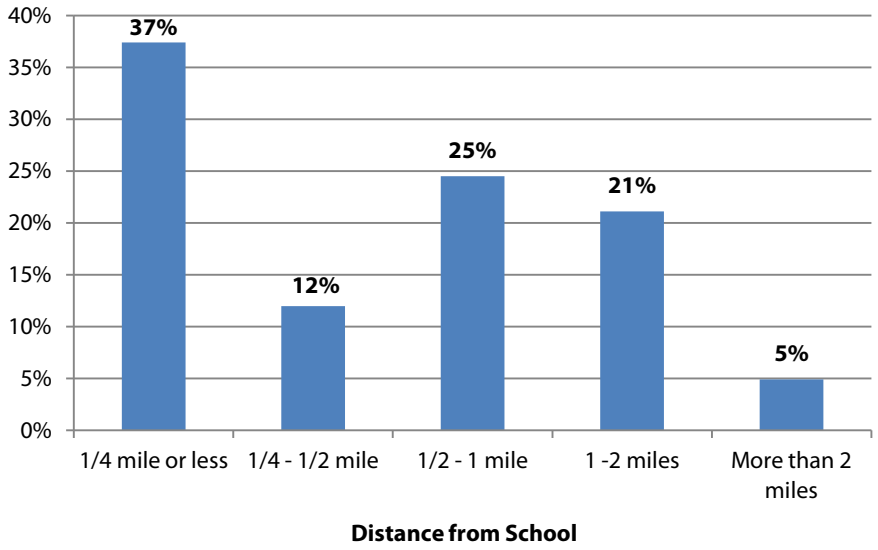
Grades *n= 1182*



Does this school have a Safe Routes to Schools Program? *n= 1147*



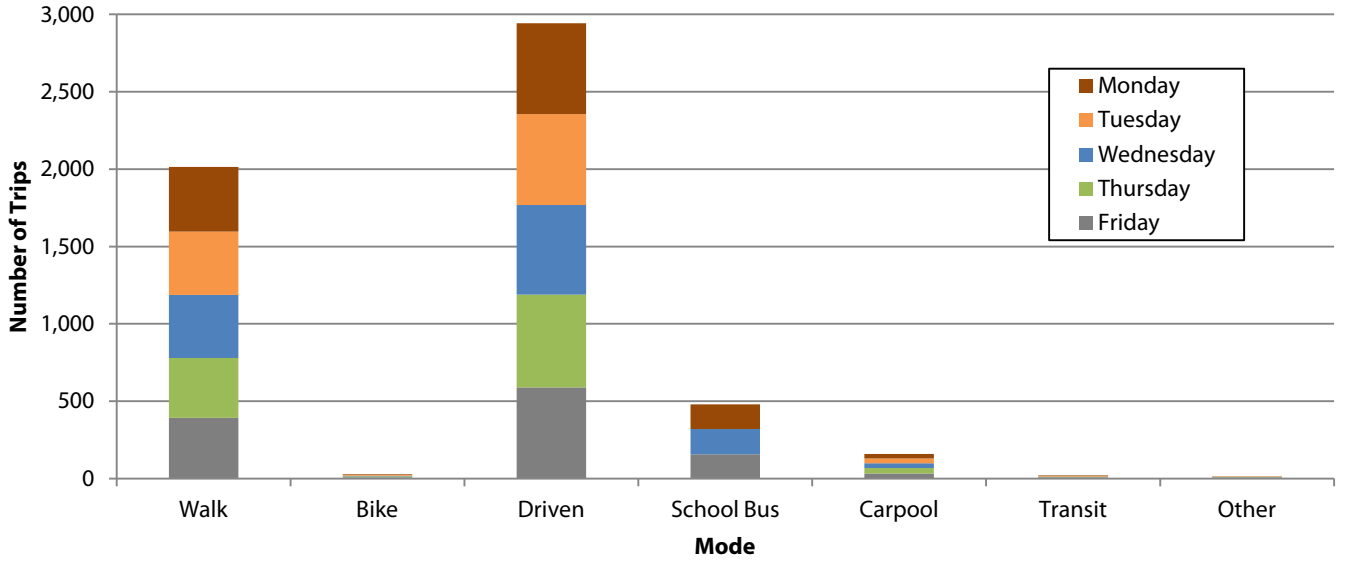
What is the approximate distance from your home to the school? *n=1117*



	Number	Percent
1/4 mile or less	418	37%
1/4 - 1/2 mile	134	12%
1/2 - 1 mile	274	25%
1 -2 miles	236	21%
More than 2 miles	55	5%
Total	**1,117**	**100%**

Last week, how did your child get TO school? *n=1203*

Mode by day of the week

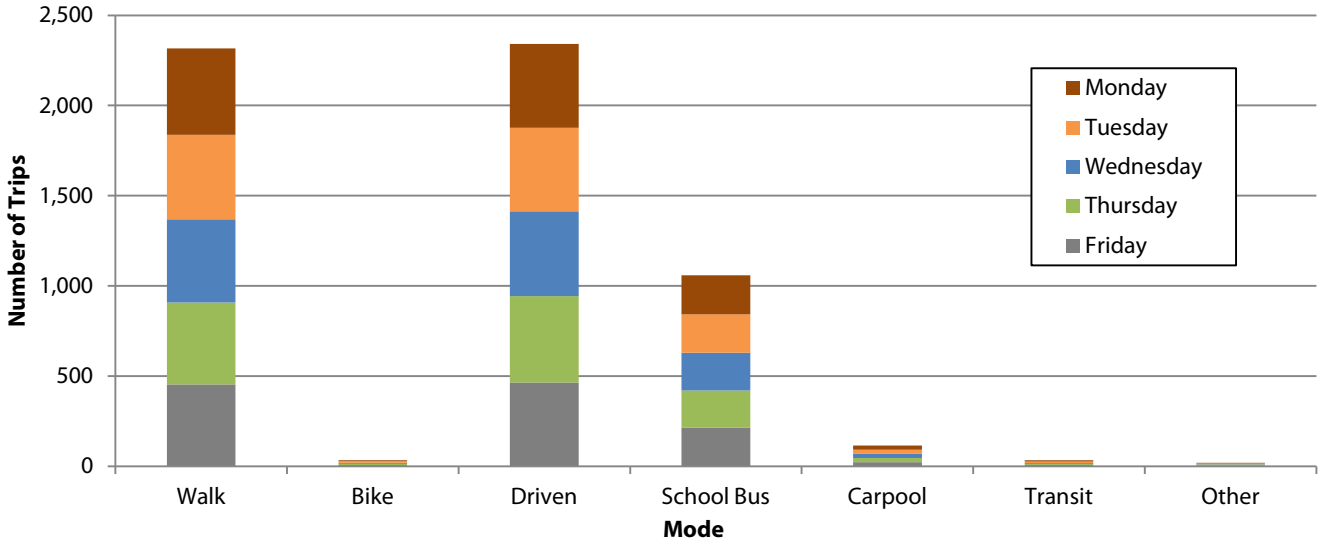


Travel to School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	419	3	588	158	29	4	2
Tuesday	410	6	587	0	30	4	2
Wednesday	407	5	579	164	31	4	2
Thursday	386	7	601	0	35	4	4
Friday	393	7	588	157	33	4	4
Total trips	**2,015**	**28**	**2,943**	**479**	**158**	**20**	**14**
Percent of trips	36%	0%	52%	8%	3%	0%	0%

Last week, how did your child get FROM school?

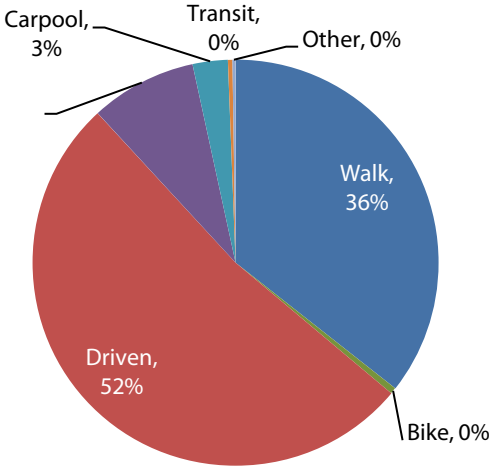
Mode by day of the week

n=1193

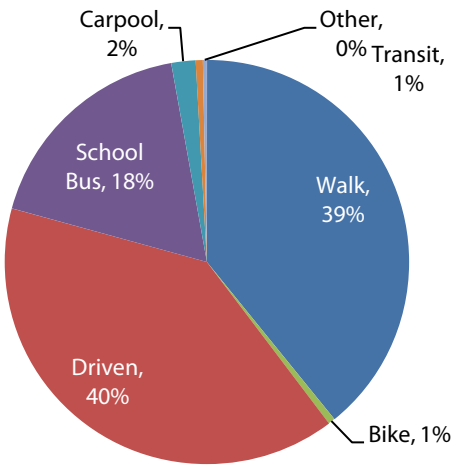


Travel from School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	480	5	464	217	22	8	3
Tuesday	467	8	464	212	22	8	3
Wednesday	462	5	469	210	25	6	3
Thursday	454	8	479	206	23	5	5
Friday	454	7	465	214	23	7	5
Total trips	**2,317**	**33**	**2,341**	**1,059**	**115**	**34**	**19**
Percent of trips	39%	1%	40%	18%	2%	1%	0%

Mode Split TO school

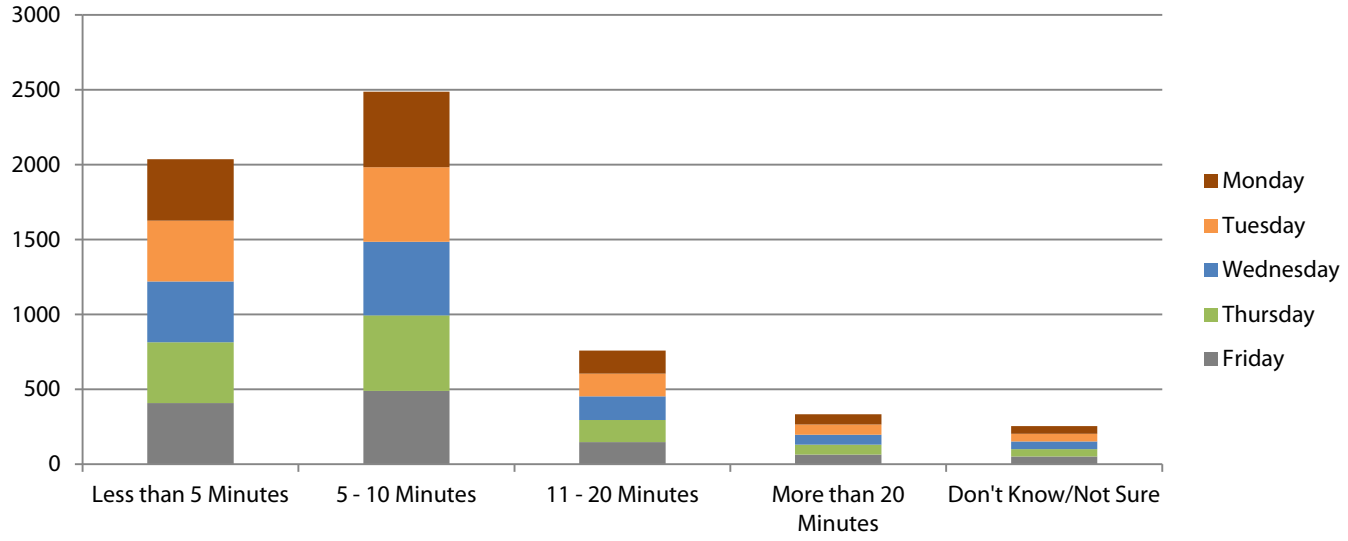


Mode Split FROM school



Last week, how long did it take to travel TO school? *n=1188*

Travel time by day of the week

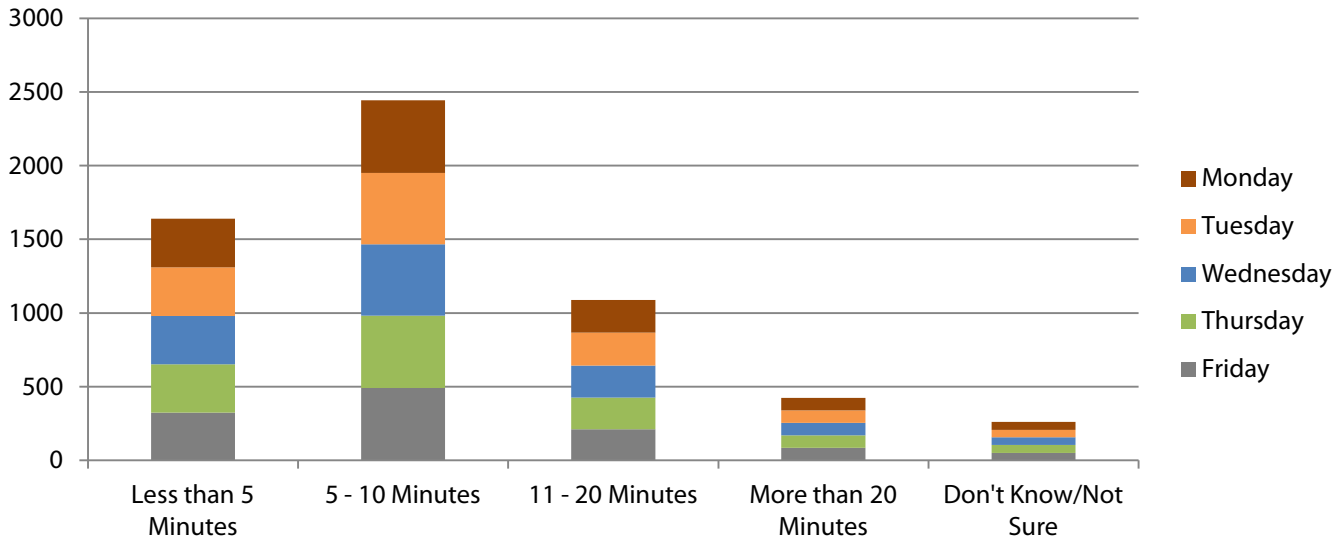


Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	410	504	154	69	51
Tuesday	405	499	152	67	50
Wednesday	407	491	157	67	51
Thursday	406	503	147	66	50
Friday	408	491	149	65	52
Total Trips	**2036**	**2488**	**759**	**334**	**254**
Percent of trips	34.7%	42.4%	12.9%	5.7%	4.3%

Last week, how long did it take to travel FROM school?

n=1187

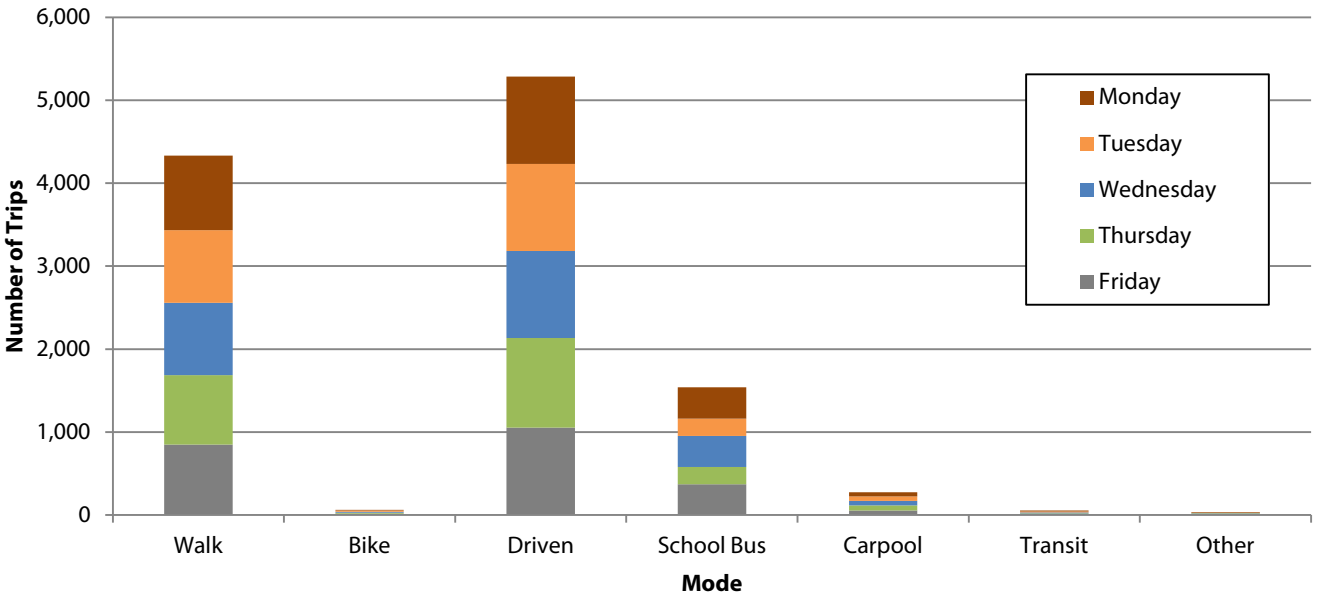
Travel time by day of the week



Travel from school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	331	494	222	85	55
Tuesday	329	483	224	84	50
Wednesday	329	486	218	84	52
Thursday	327	489	214	86	53
Friday	324	492	211	84	51
Total Trips	**1640**	**2444**	**1089**	**423**	**261**
Percent of trips	28.0%	41.7%	18.6%	7.2%	4.5%

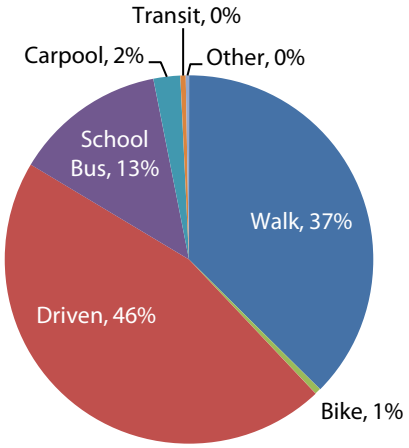
Overall Mode Split TO and FROM School

Mode by day of the week



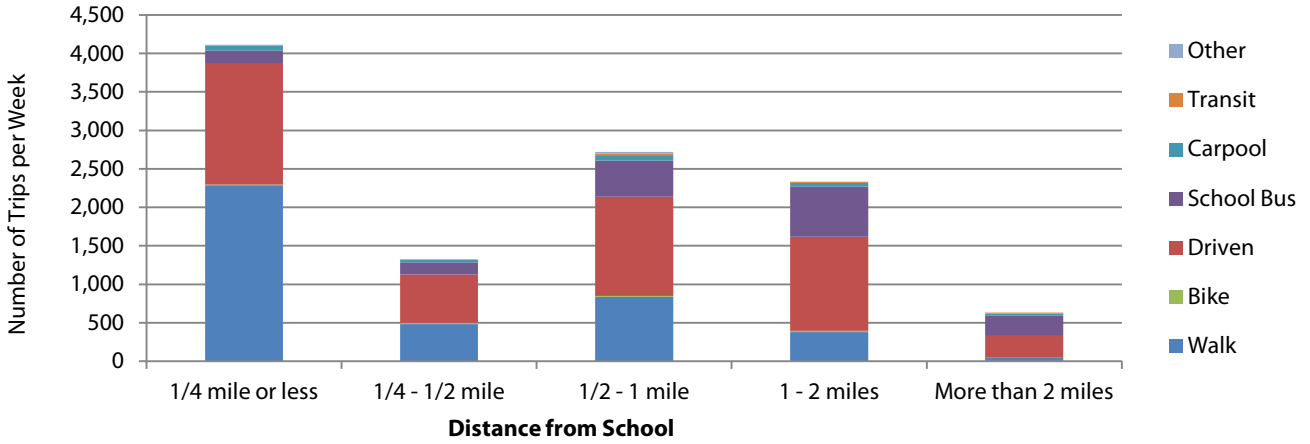
Travel for all trips	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	899	8	1052	375	51	12	5
Tuesday	877	14	1051	212	52	12	5
Wednesday	869	10	1048	374	56	10	5
Thursday	840	15	1080	206	58	9	9
Friday	847	14	1053	371	56	11	9
Total trips	4332	61	5284	1538	273	54	33

Mode split for all trips



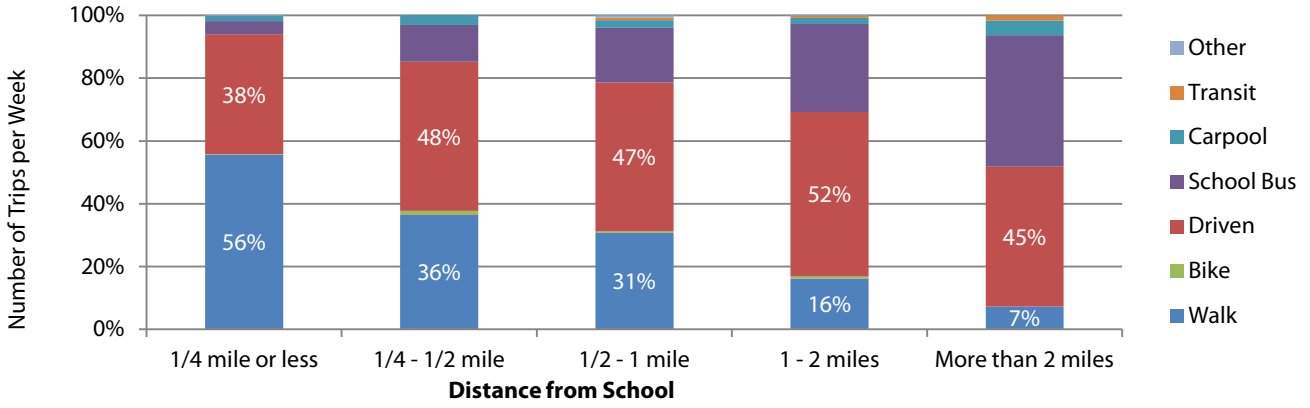
Weekly Trips by Mode and Distance from School

Mode by distance from school



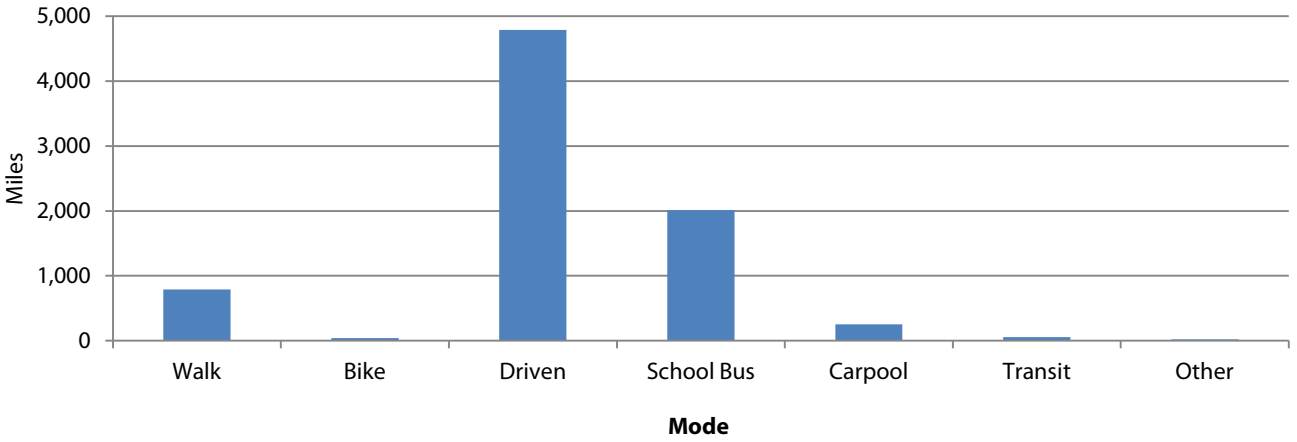
Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	2,286	9	1,570	175	63	0	10
1/4 - 1/2 mile	482	17	630	155	40	0	0
1/2 - 1 mile	835	13	1,289	472	69	22	18
1 - 2 miles	377	17	1,223	653	46	14	5
More than 2 miles	46	0	281	264	30	10	0
Total	**4,026**	**56**	**4,993**	**1,719**	**248**	**46**	**33**

Mode Split by Distance from School



Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	56%	0%	38%	4%	2%	0%	0%
1/4 - 1/2 mile	36%	1%	48%	12%	3%	0%	0%
1/2 - 1 mile	31%	0%	47%	17%	3%	1%	1%
1 - 2 miles	16%	1%	52%	28%	2%	1%	0%
More than 2 miles	7%	0%	45%	42%	5%	2%	0%
Total	**36%**	**1%**	**45%**	**15%**	**2%**	**0%**	**0%**

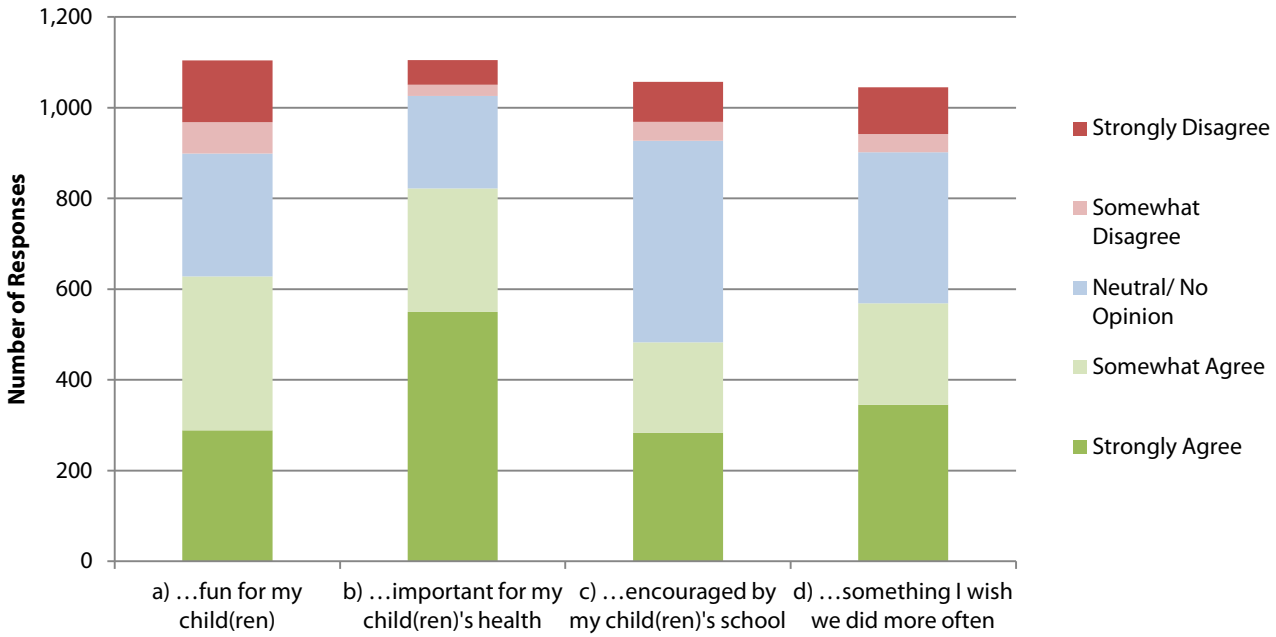
Weekly Miles Traveled by Mode



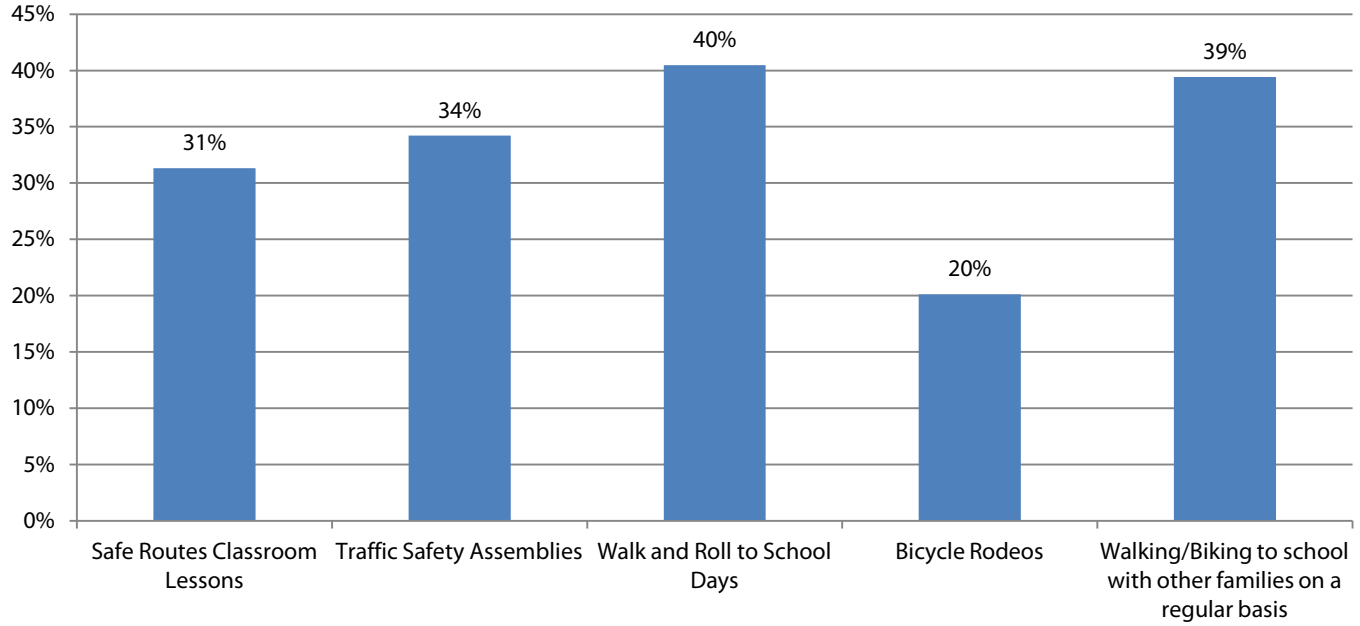
	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
All Trips	790	42	4,788	2,015	253	57	22
Percent of Total Mileage	10%	1%	60%	25%	3%	1%	0%

Note:This analysis uses the mode frequency by respondent and assumes the median of the distance from school categories or the respondent-provided distance if greater than two miles.

How strongly do you agree or disagree with the following statement? a. n=1104 b. n=1105 c. n=1057 d. n=1045

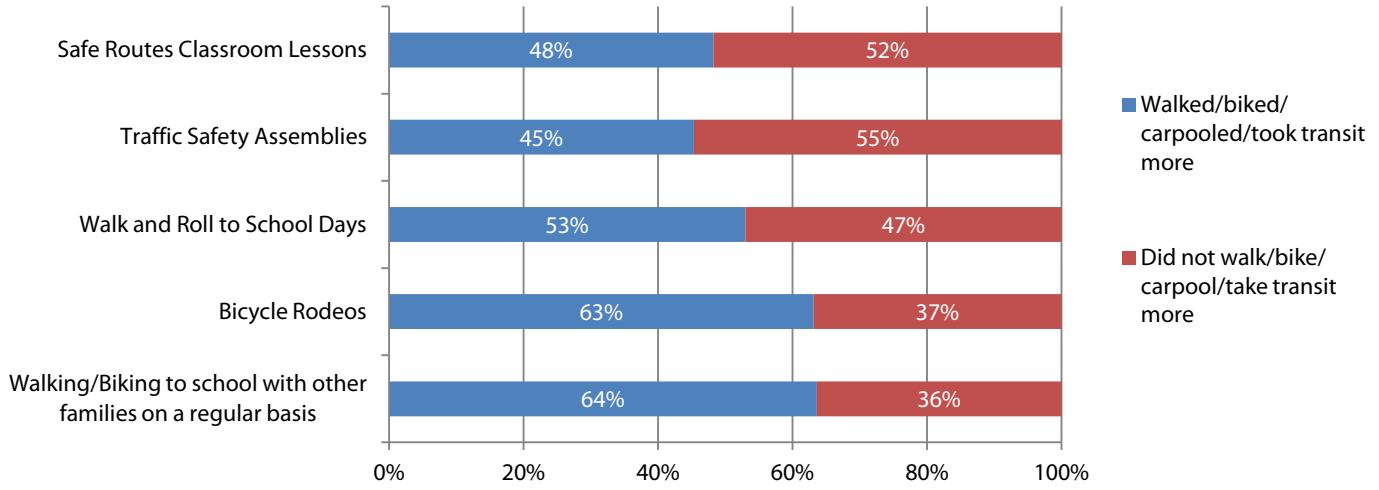


Have you or your child(ren) participated in the following Safe Routes events/programs?



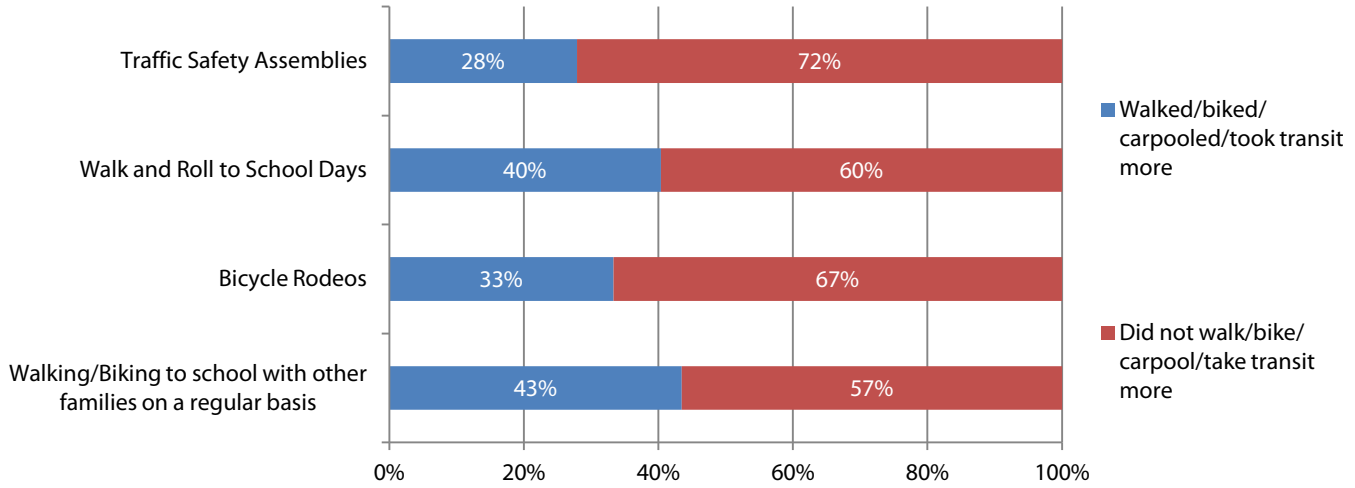
For any events/programs you answered "yes" for in the previous question, did your child(ren) walk, bike, or carpool more often after participating?

Note: Includes responses from respondents who previously indicated that they had participated in the specific program.



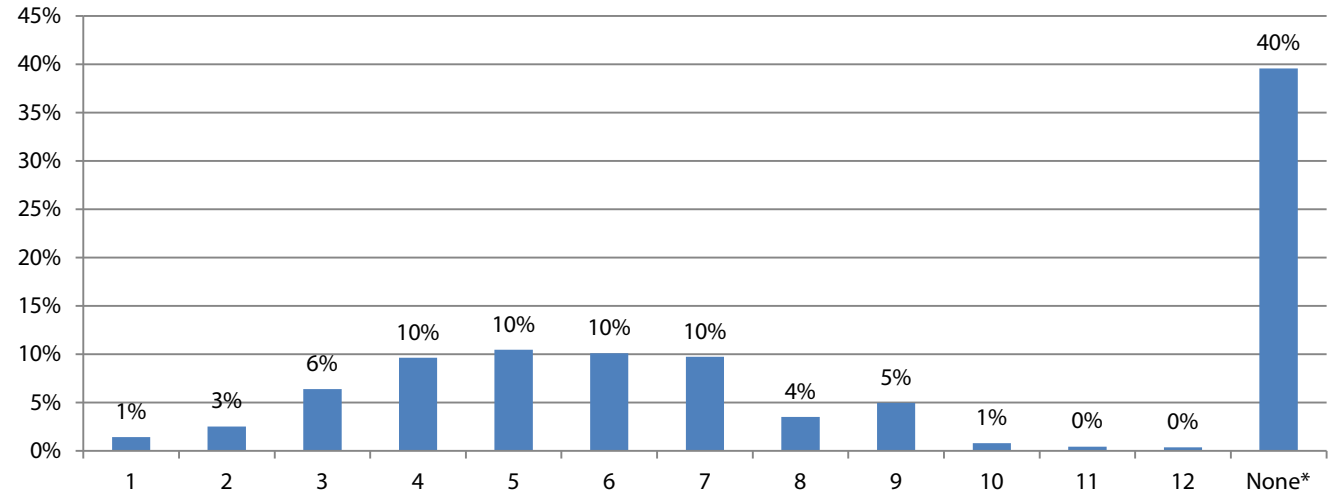
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	41	44
Traffic Safety Assemblies	34	41
Walk and Roll to School Days	44	39
Bicycle Rodeos	24	14
Walking/Biking to school with other families on a regular basis	56	32

If you have participated in the Safe Routes program, do you drive yourself or your child(ren) less often for non-school



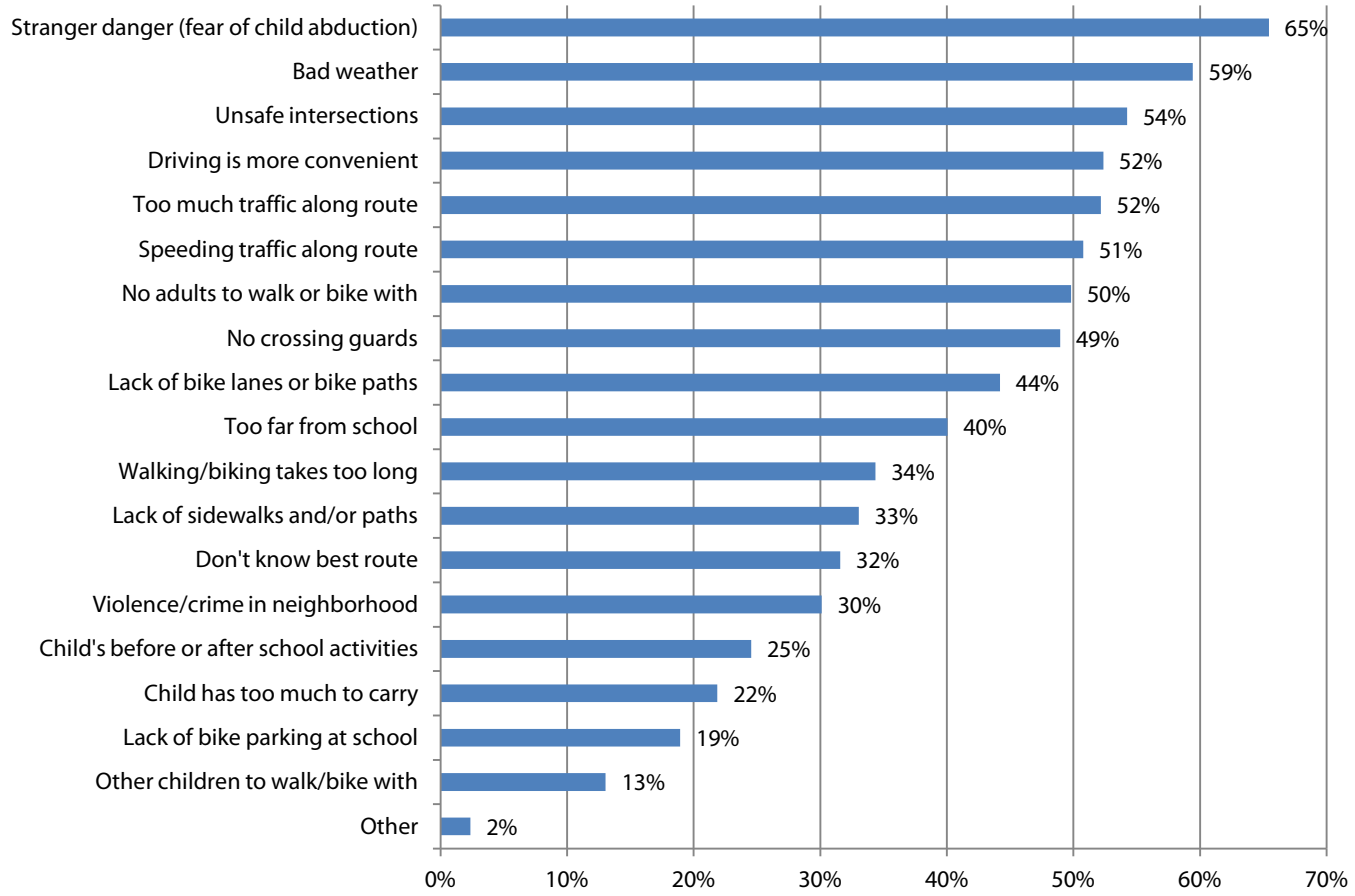
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	20	36
Traffic Safety Assemblies	12	31
Walk and Roll to School Days	21	31
Bicycle Rodeos	9	18
Walking/Biking to school with other families on a regular basis	20	26

At what grade level would you allow your child(ren) to walk or bike to/from school without an adult?



* *"I would not feel comfortable at any grade"*

What concerns limit your child(ren)'s ability to walk or bike to/from school? *n=695*

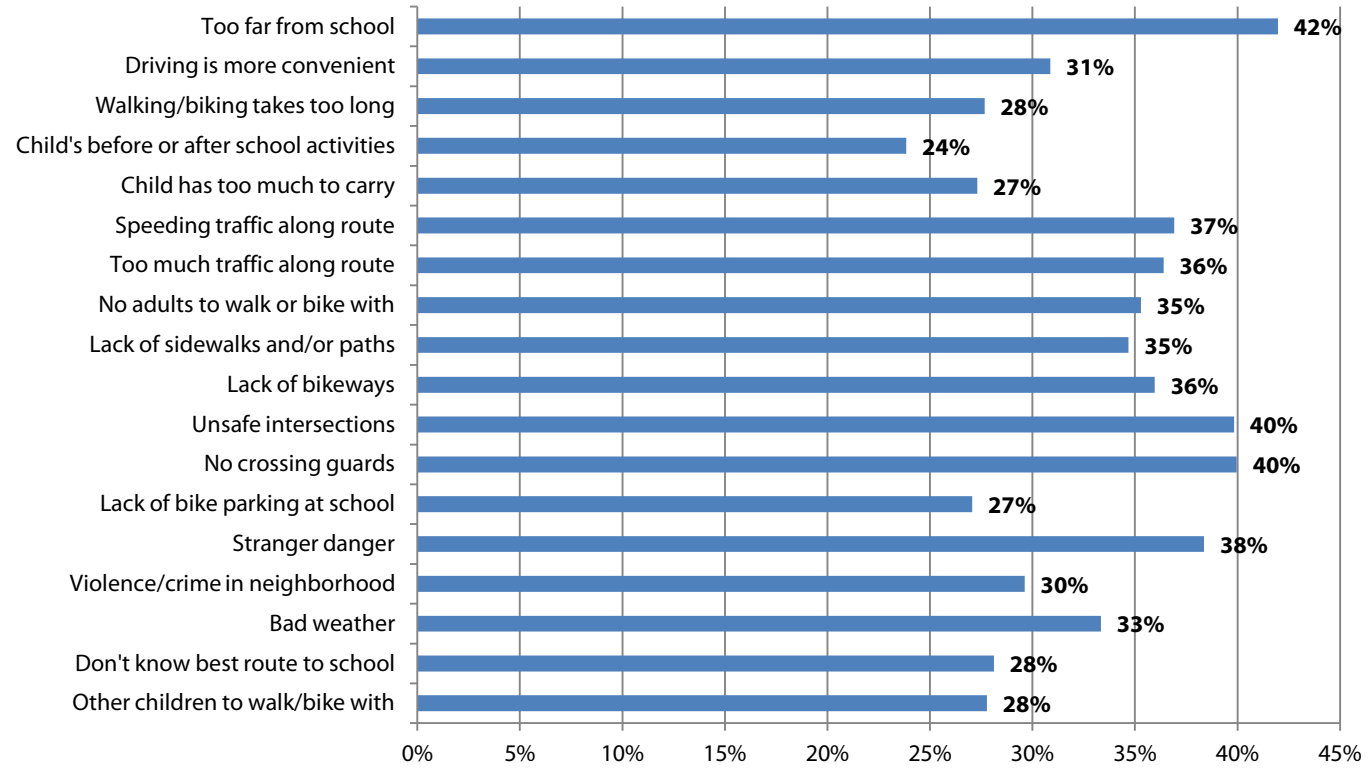


Concern	Yes	Percent
Too far from school	436	40%
Driving is more convenient	227	22%
Walking/biking takes too long	456	44%
Child(ren)'s before or after school activities	542	52%
Child has too much to carry	544	52%
Speeding traffic along route	311	30%
Too much traffic along route	236	25%
No adults to walk or bike with	310	32%
Lack of sidewalks and/or paths	509	49%
Lack of bikeways	360	34%

Concern	Yes	Percent
Unsafe intersections	191	19%
No crossing guards	336	33%
Lack of bike parking at school	569	54%
Stranger danger (fear of child abduction)	29	2%
Violence/crime in neighborhood	531	51%
Bad weather	3	13%
Don't know best route	524	50%
Other	695	65%

Would you allow your child(ren) to walk/bike more often if this concern was addressed?

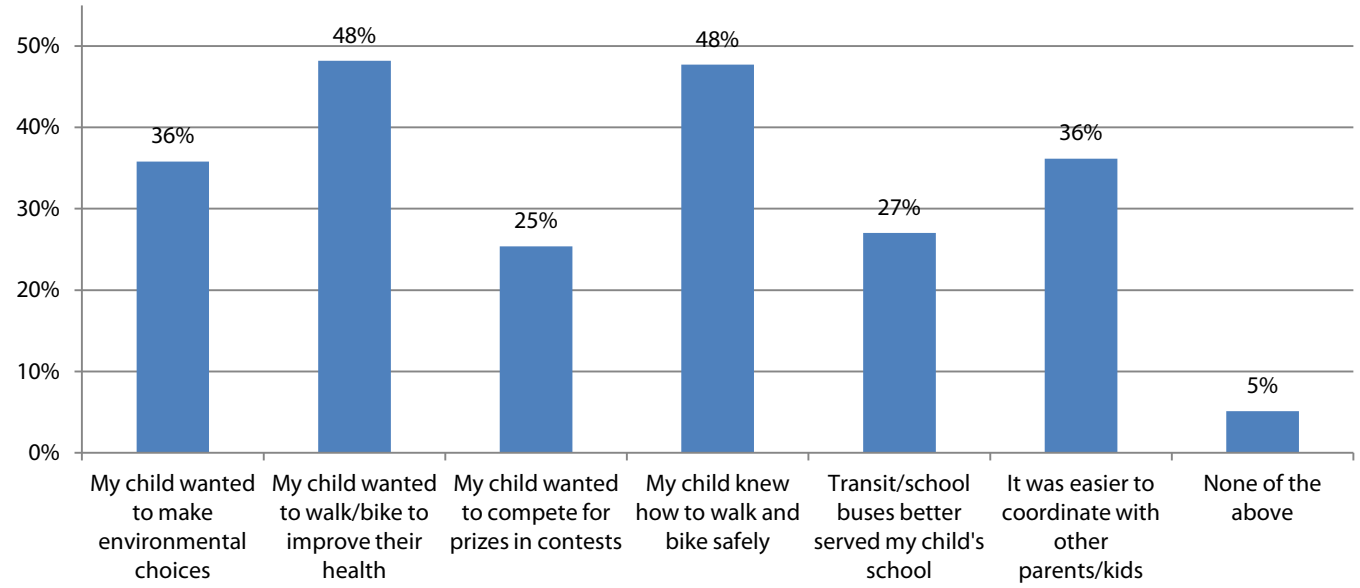
Chart shows "yes" responses.



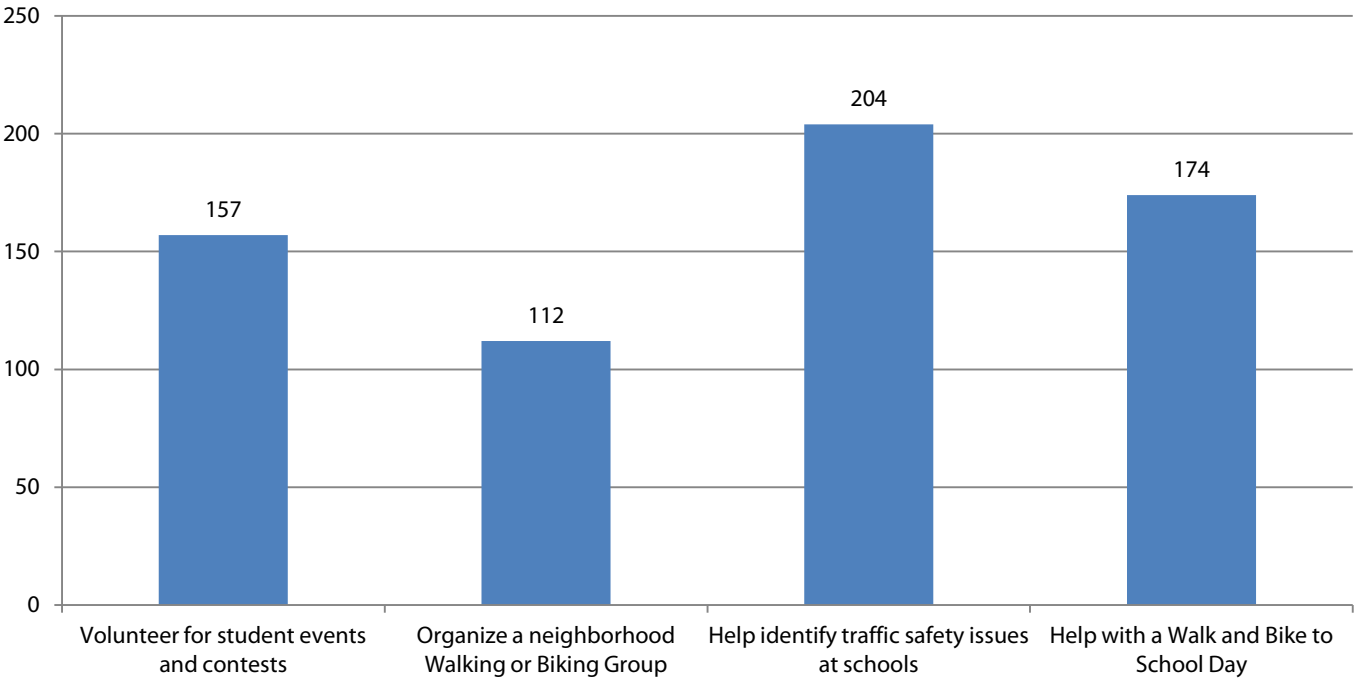
	Yes	No	Not Sure	Total
Too far from school	311	292	138	741
Driving is more convenient	188	249	172	609
Walking/biking takes too long	161	275	146	582
Child's before or after school activities	134	283	145	562
Child has too much to carry	154	284	126	564
Speeding traffic along route	213	232	132	577
Too much traffic along route	214	232	142	588
No adults to walk or bike with	205	243	133	581
Lack of sidewalks and/or paths	197	243	128	568
Lack of bikeways	205	238	127	570
Unsafe intersections	233	218	134	585
No crossing guards	231	221	126	578
Lack of bike parking at school	151	275	132	558
Stranger danger	226	227	136	589
Violence/crime in neighborhood	170	263	141	574
Bad weather	196	253	139	588
Don't know best route to school	158	265	139	562

I would reduce the number of times I drive my child(ren) to school if...

n=1470



Are you interested in participating in any of the following activities?



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City of Wasco Safe Routes to School Parent/Caregiver Survey Report

School: Teresa Burke Elementary School
Date Collected: Fall 2012
Total Surveys Returned: 268

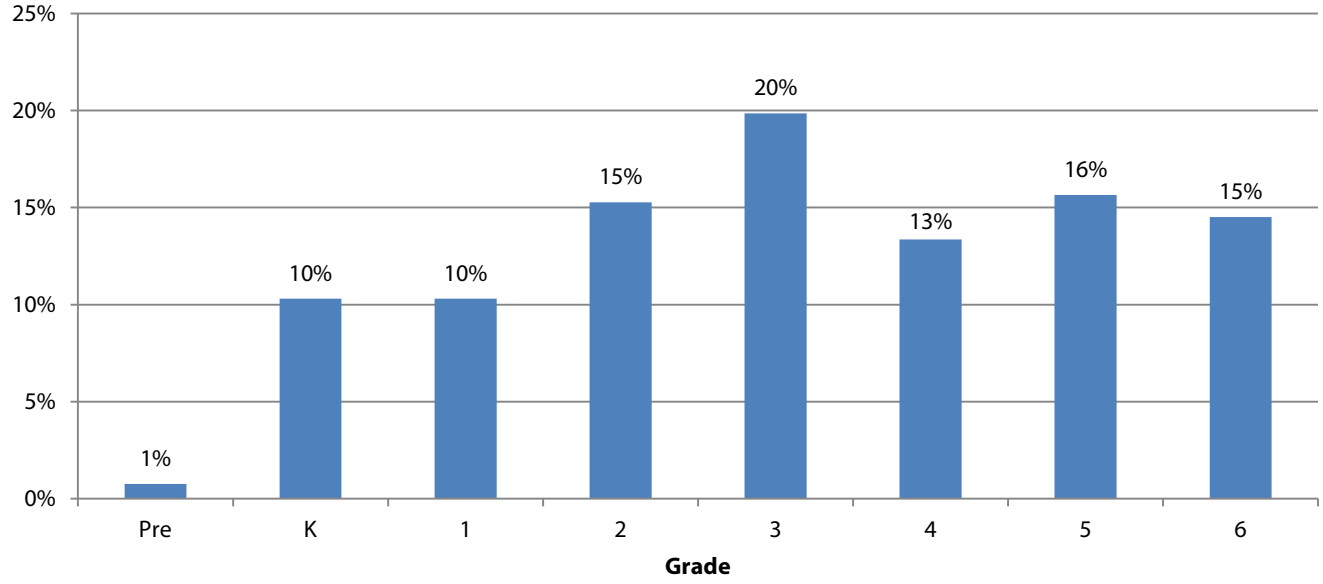
Gender

n= 249

Gender	Count	Percent
Male	113	45%
Female	136	55%

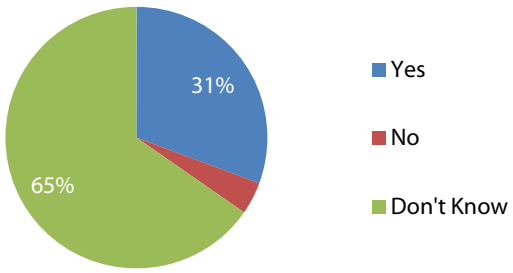
Grades

n= 262

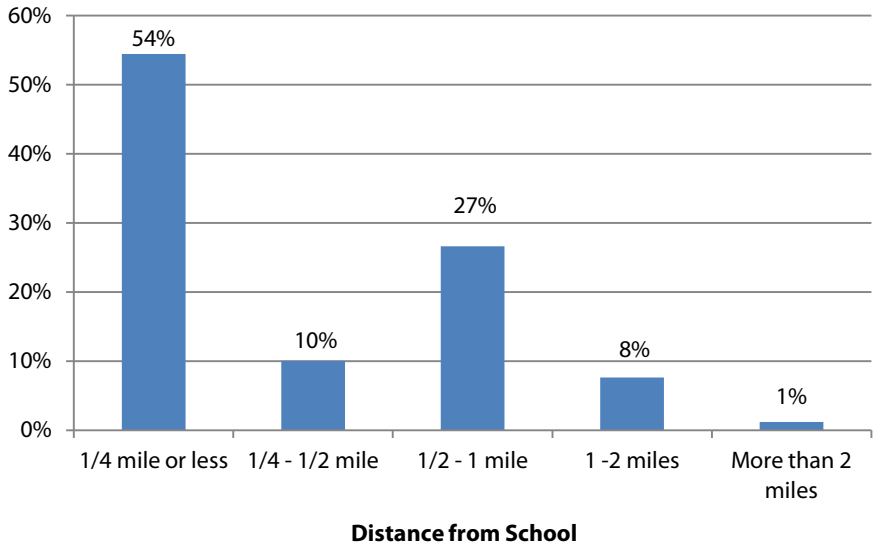


Does this school have a Safe Routes to Schools Program?

n= 251



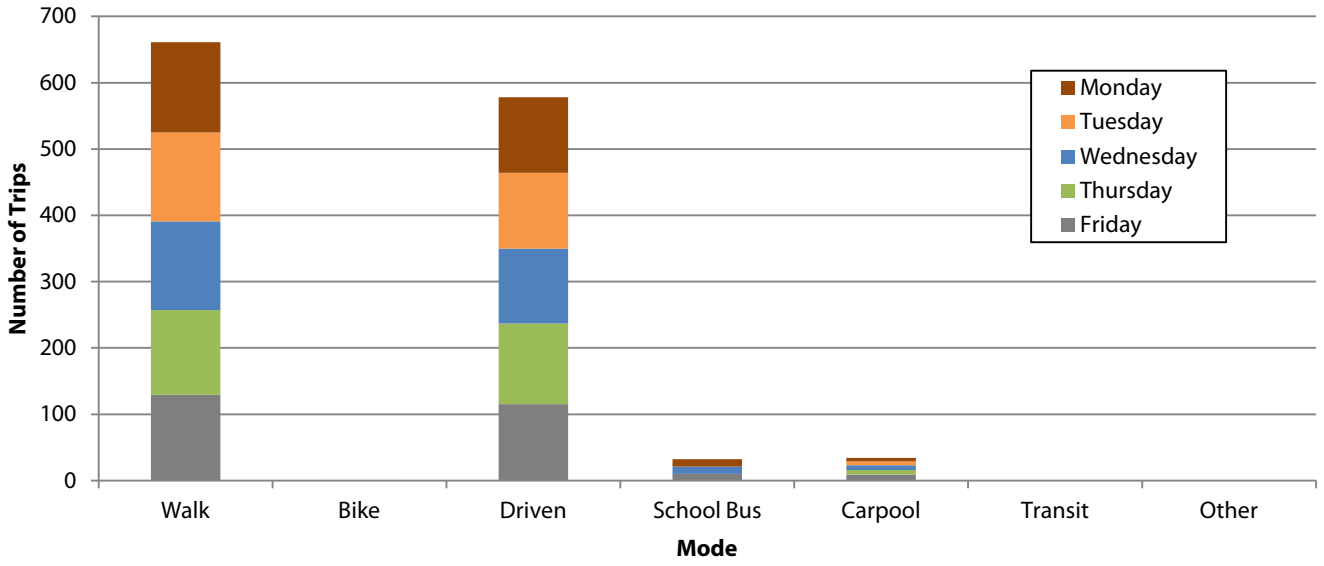
What is the approximate distance from your home to the school? *n=248*



	Number	Percent
1/4 mile or less	135	54%
1/4 - 1/2 mile	25	10%
1/2 - 1 mile	66	27%
1 -2 miles	19	8%
More than 2 miles	3	1%
Total	**248**	**100%**

Last week, how did your child get TO school? *n=266*

Mode by day of the week

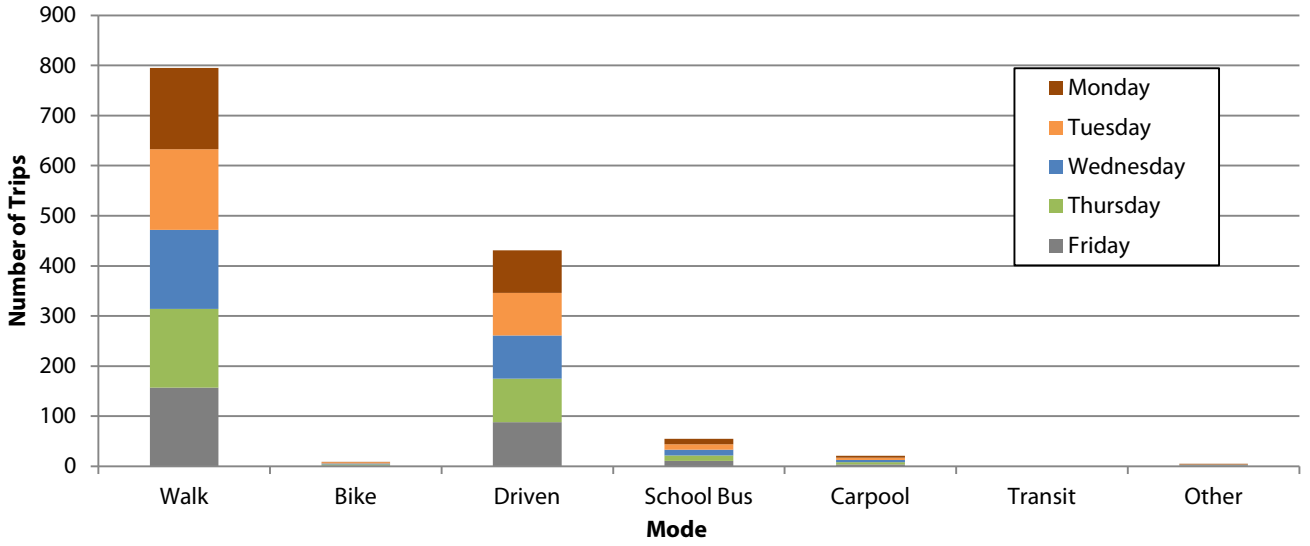


Travel to School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	136	0	114	11	5	0	0
Tuesday	134	1	114	0	6	0	0
Wednesday	134	0	113	11	7	0	0
Thursday	128	0	122	0	7	0	0
Friday	129	0	115	10	9	0	0
Total trips	**661**	**1**	**578**	**32**	**34**	**0**	**0**
Percent of trips	51%	0%	44%	2%	3%	0%	0%

Last week, how did your child get FROM school?

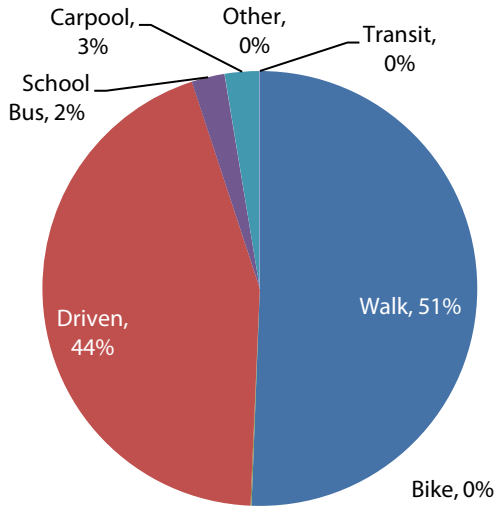
n=264

Mode by day of the week

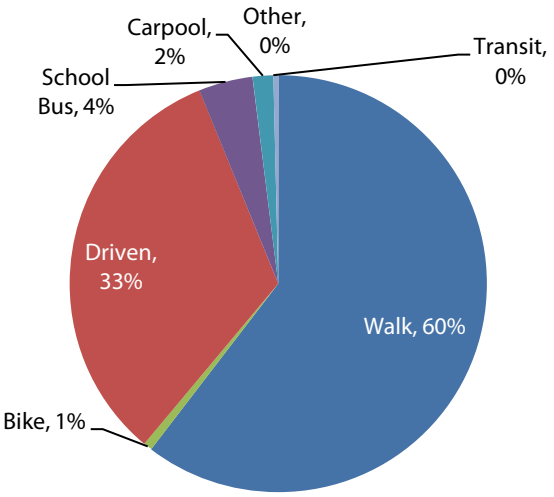


Travel from School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	162	1	85	11	4	0	1
Tuesday	161	2	85	11	4	0	1
Wednesday	158	2	86	11	5	0	1
Thursday	157	3	87	11	4	0	1
Friday	157	1	88	11	4	0	1
Total trips	**795**	**9**	**431**	**55**	**21**	**0**	**5**
Percent of trips	60%	1%	33%	4%	2%	0%	0%

Mode Split TO school

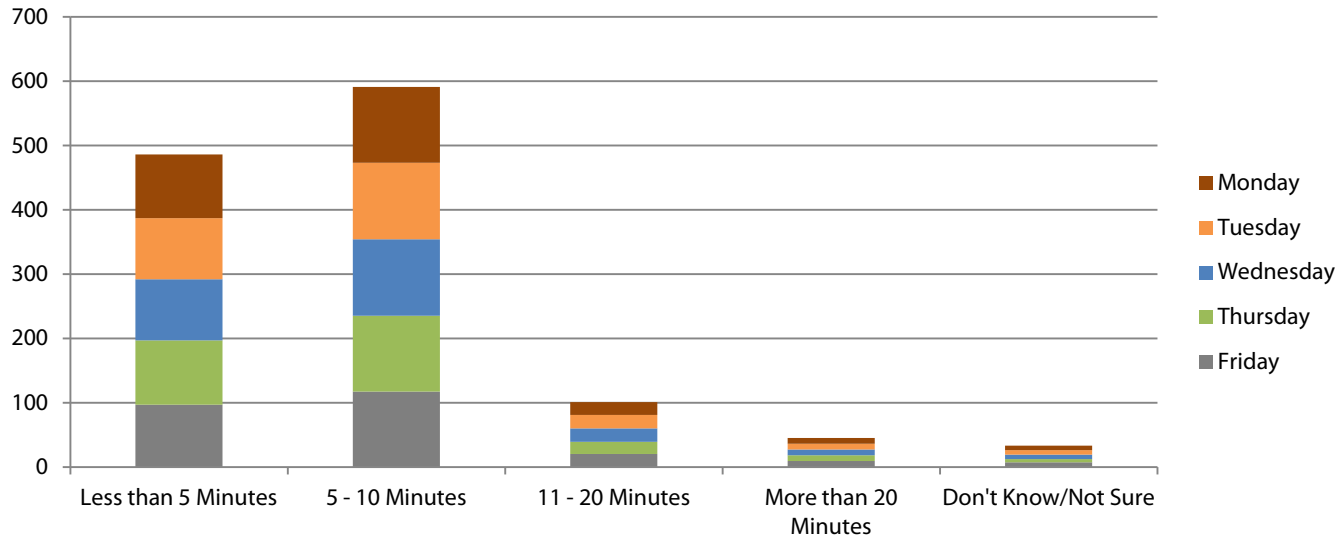


Mode Split FROM school



Last week, how long did it take to travel TO school? *n=253*

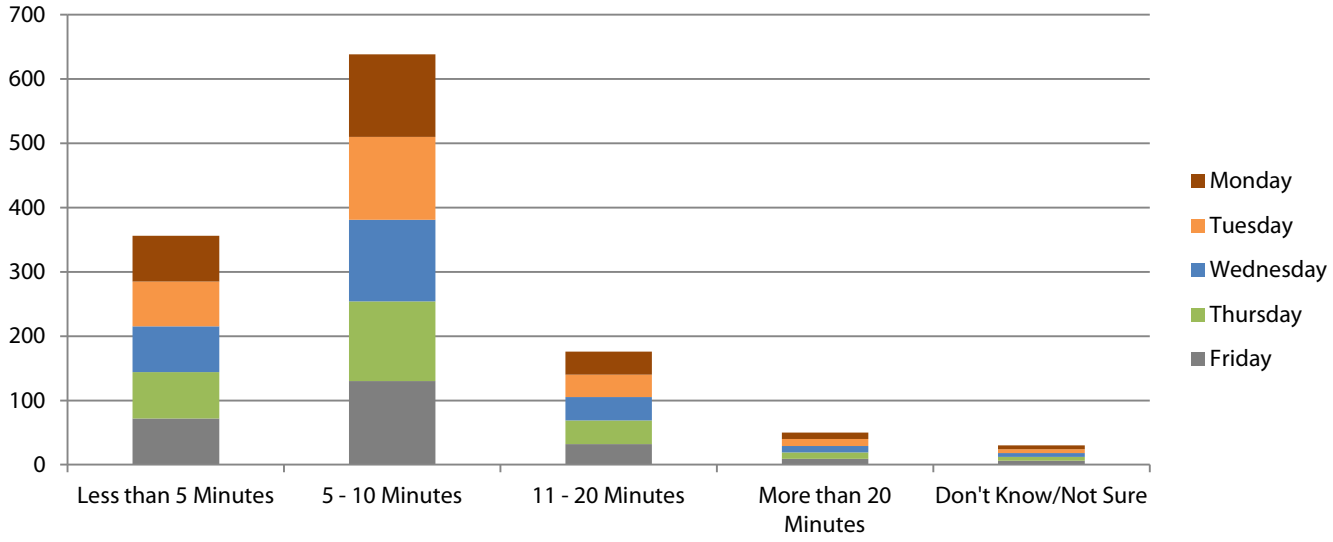
Travel time by day of the week



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	99	118	20	9	7
Tuesday	95	119	21	9	7
Wednesday	95	119	21	9	7
Thursday	100	118	19	9	5
Friday	97	117	20	9	7
Total Trips	**486**	**591**	**101**	**45**	**33**
Percent of trips	38.7%	47.1%	8.0%	3.6%	2.6%

Last week, how long did it take to travel FROM school? *n=251*

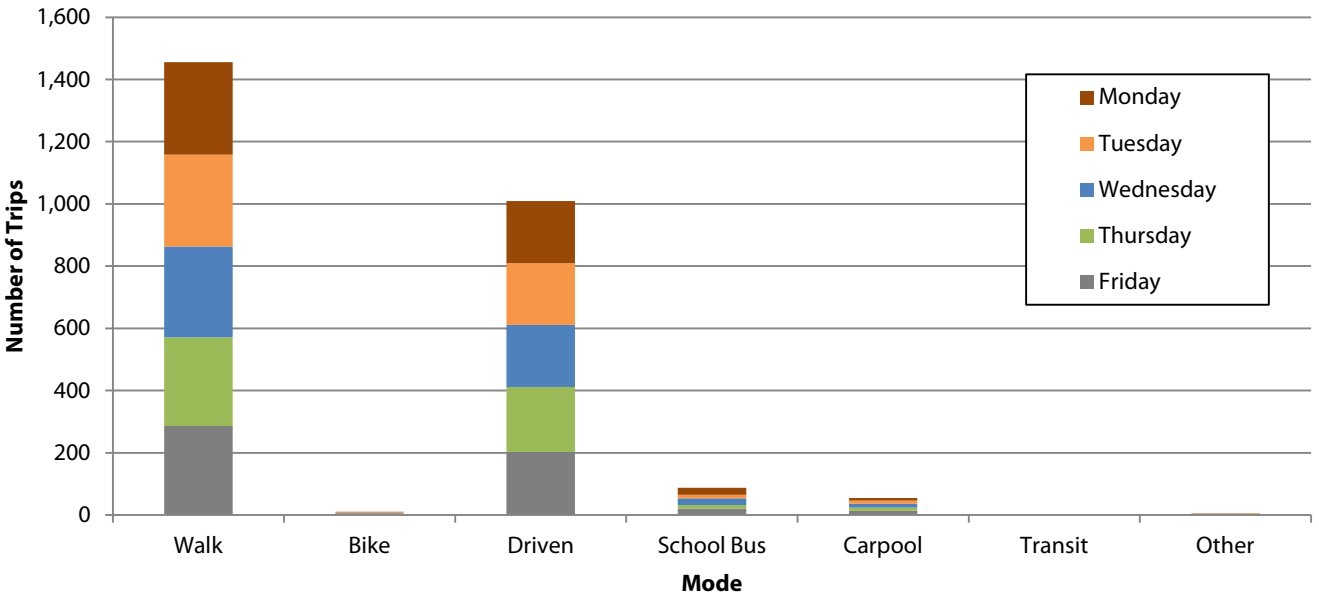
Travel time by day of the week



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	71	128	36	10	6
Tuesday	70	129	35	11	6
Wednesday	71	127	36	10	6
Thursday	72	124	37	10	6
Friday	72	130	32	9	6
Total Trips	**356**	**638**	**176**	**50**	**30**
Percent of trips	28.5%	51.0%	14.1%	4.0%	2.4%

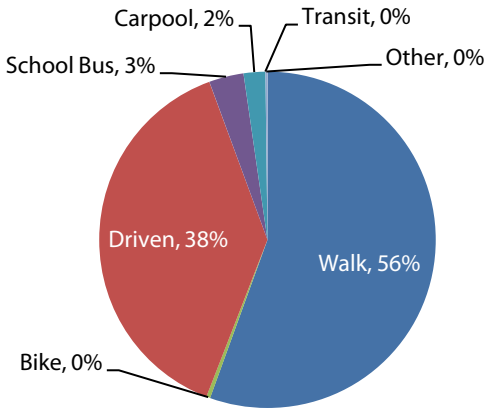
Overall Mode Split TO and FROM School

Mode by day of the week



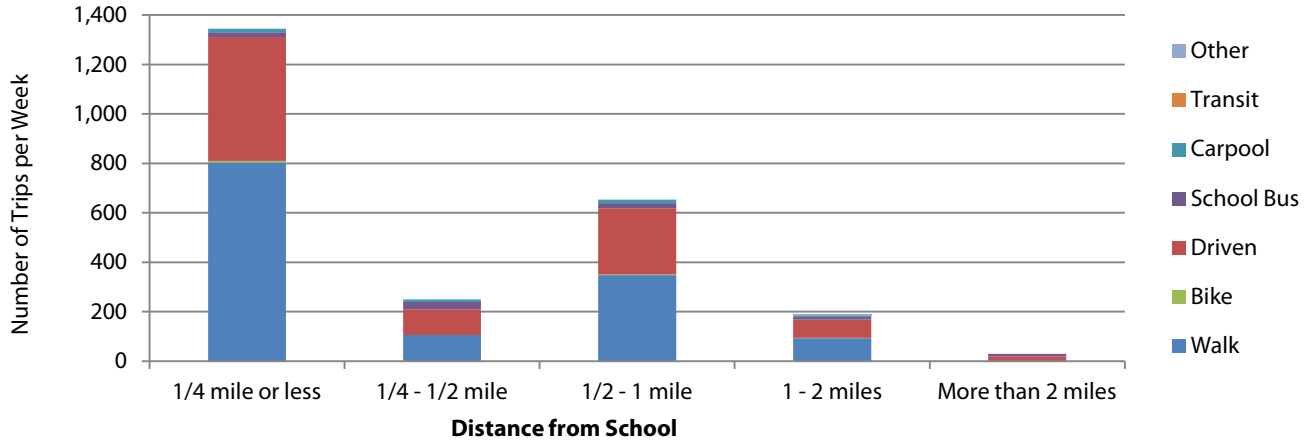
Travel for all trips	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	298	1	199	22	9	0	1
Tuesday	295	3	199	11	10	0	1
Wednesday	292	2	199	22	12	0	1
Thursday	285	3	209	11	11	0	1
Friday	286	1	203	21	13	0	1
Total trips	1456	10	1009	87	55	0	5

Mode split for all trips



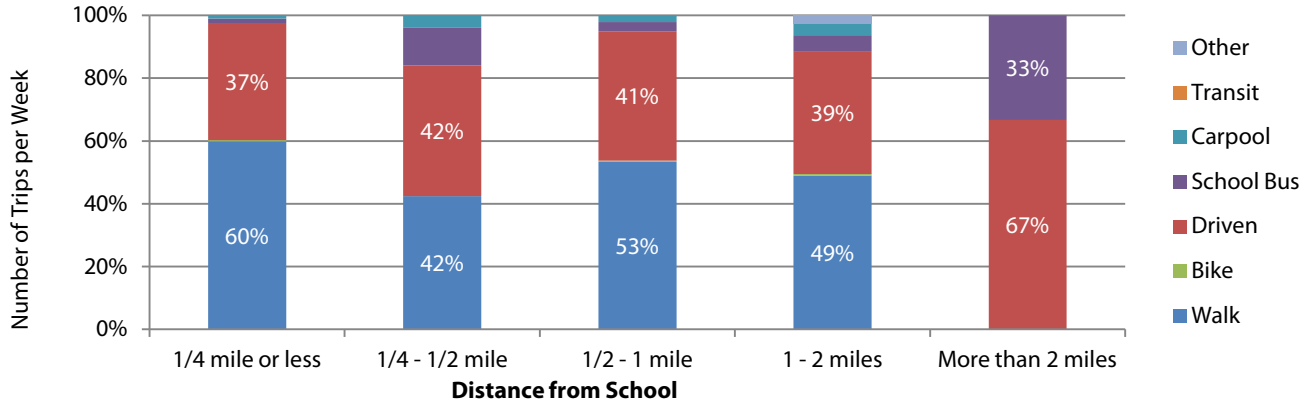
Weekly Trips by Mode and Distance from School

Mode by distance from school



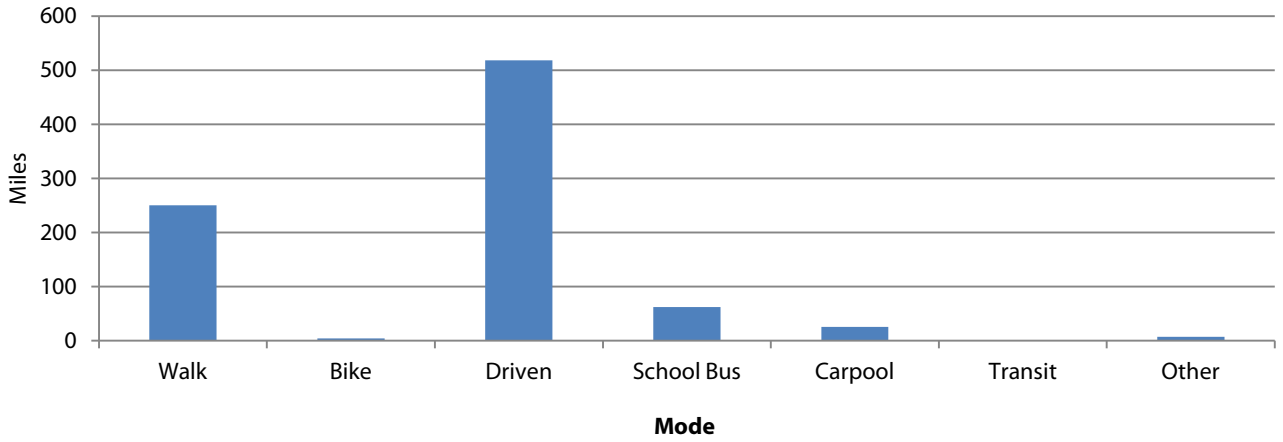
Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	804	6	501	19	14	0	0
1/4 - 1/2 mile	106	0	104	30	10	0	0
1/2 - 1 mile	348	3	268	20	14	0	0
1 - 2 miles	93	1	74	10	7	0	5
More than 2 miles	0	0	20	10	0	0	0
Total	**1,351**	**10**	**967**	**89**	**45**	**0**	**5**

Mode Split by Distance from School



Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	60%	0%	37%	1%	1%	0%	0%
1/4 - 1/2 mile	42%	0%	42%	12%	4%	0%	0%
1/2 - 1 mile	53%	0%	41%	3%	2%	0%	0%
1 - 2 miles	49%	1%	39%	5%	4%	0%	3%
More than 2 miles	0%	0%	67%	33%	0%	0%	0%
Total	**55%**	**0%**	**39%**	**4%**	**2%**	**0%**	**0%**

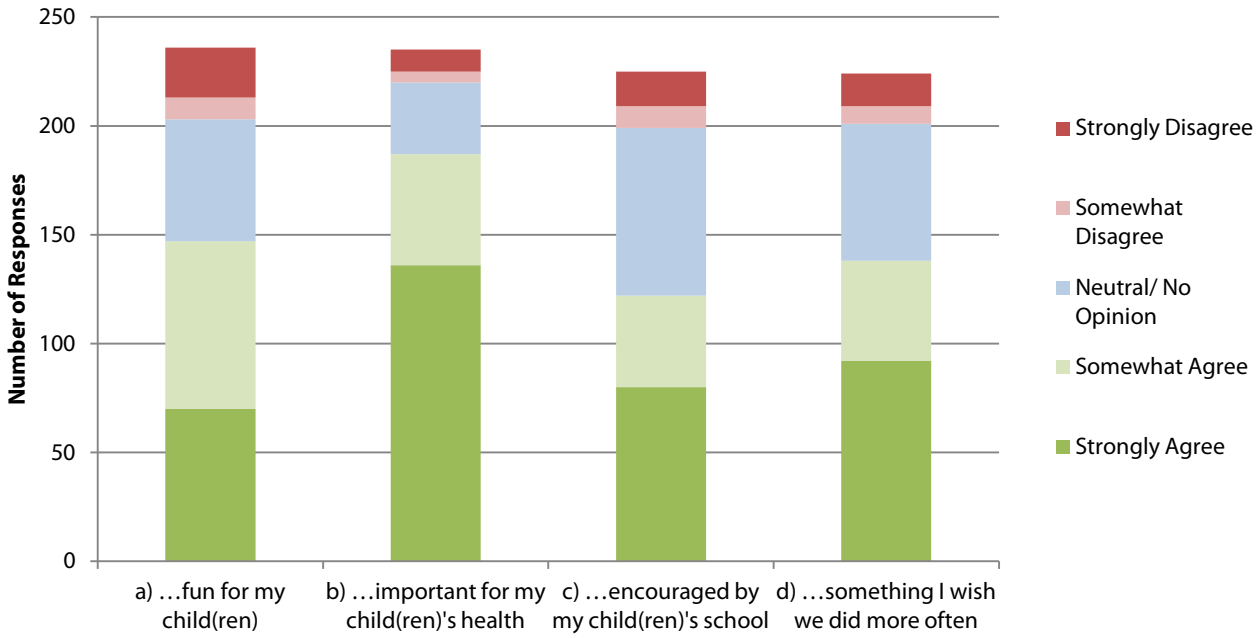
Weekly Miles Traveled by Mode



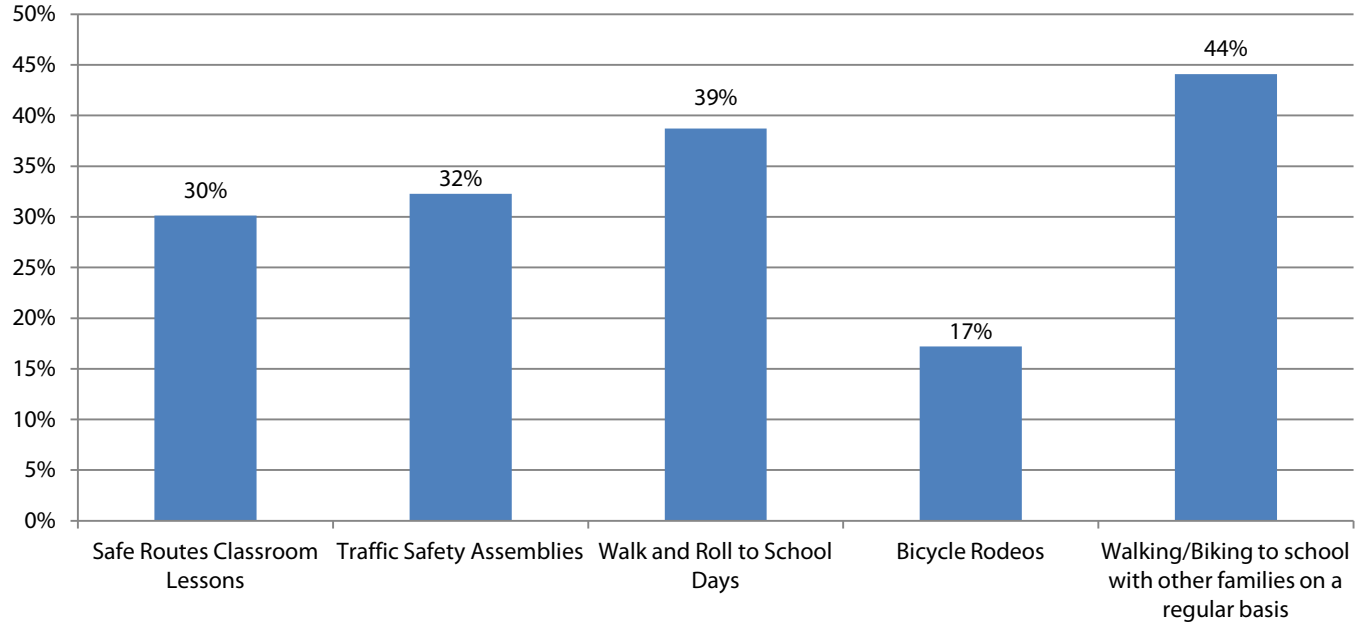
	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
All Trips	250	4	519	62	26	0	8
Percent of Total Mileage	29%	1%	60%	7%	3%	0%	1%

Note:This analysis uses the mode frequency by respondent and assumes the median of the distance from school categories or the respondent-provided distance if greater than two miles.

How strongly do you agree or disagree with the following statement? a. n=236 b. n=235 c. n=225 d. n=224

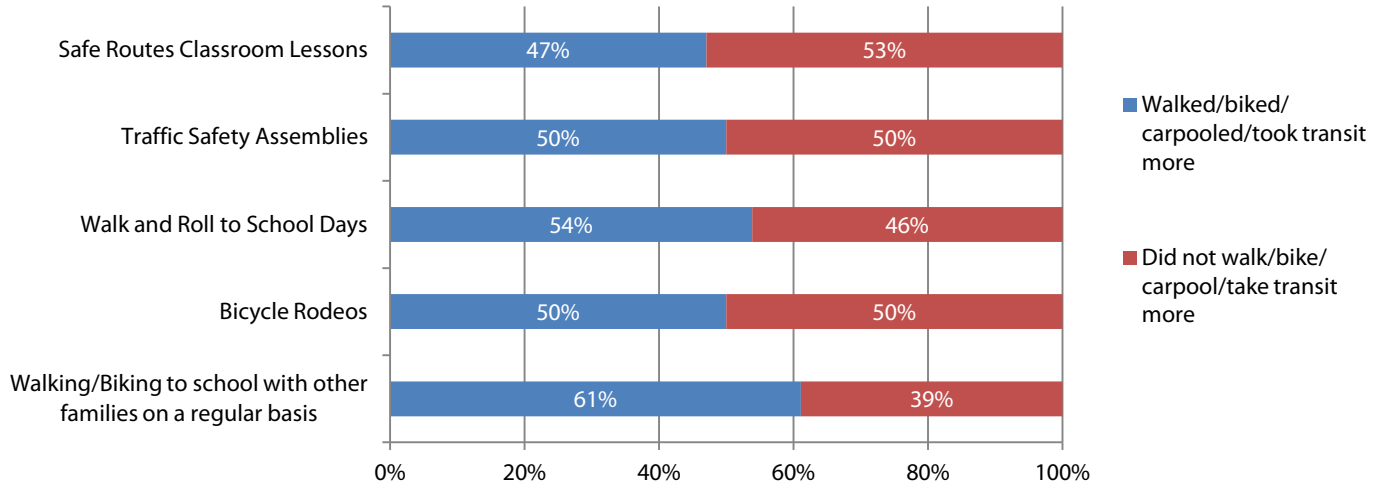


Have you or your child(ren) participated in the following Safe Routes events/programs?



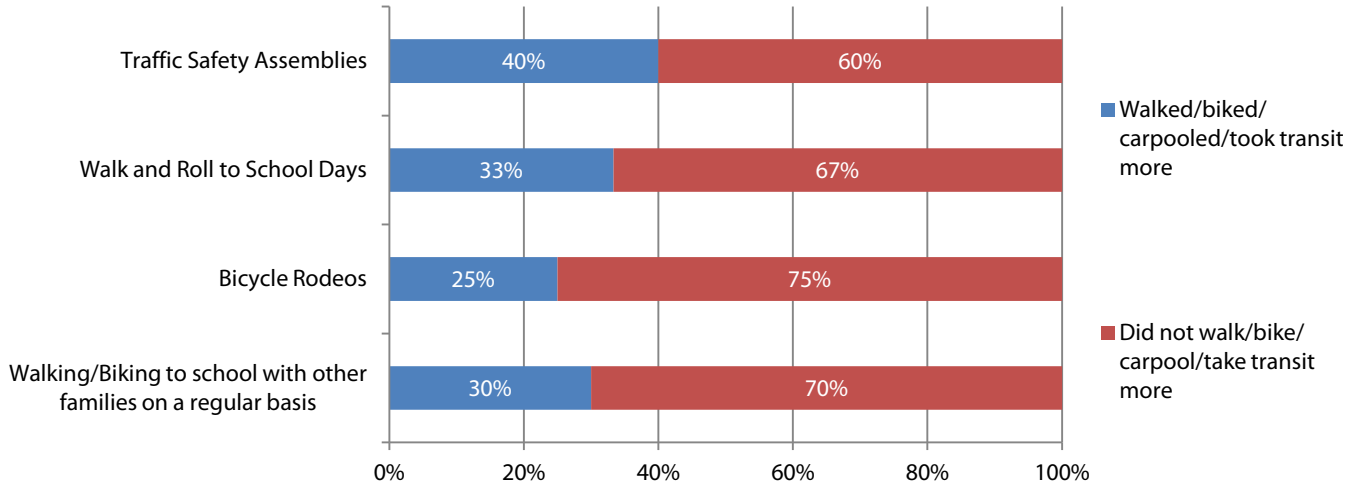
For any events/programs you answered "yes" for in the previous question, did your child(ren) walk, bike, or carpool more often after participating?

Note: Includes responses from respondents who previously indicated that they had participated in the specific program.



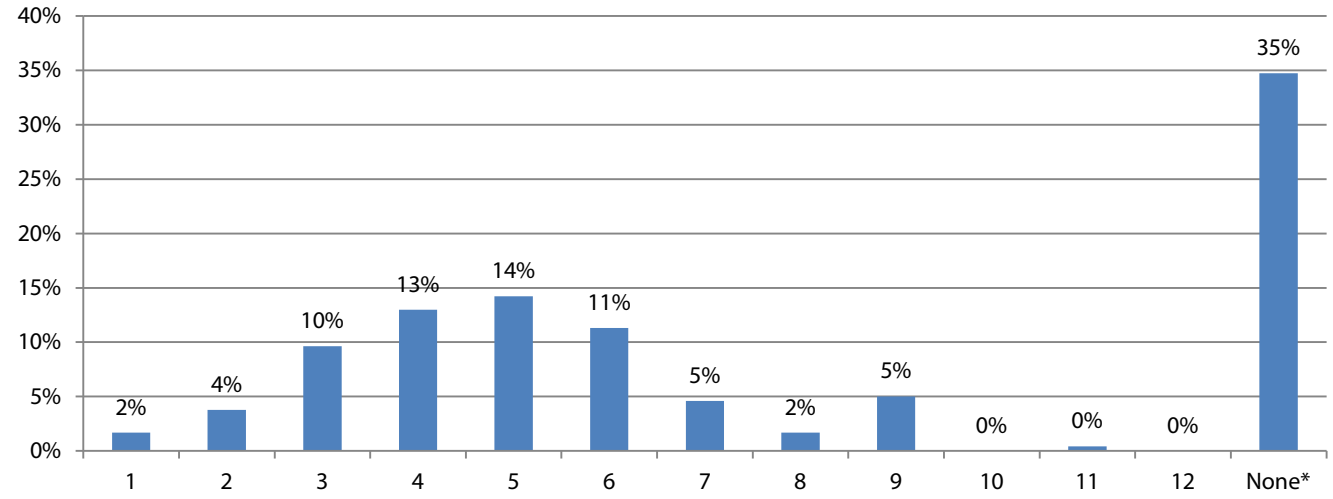
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	8	9
Traffic Safety Assemblies	6	6
Walk and Roll to School Days	7	6
Bicycle Rodeos	2	2
Walking/Biking to school with other families on a regular basis	11	7

If you have participated in the Safe Routes program, do you drive yourself or your child(ren) less often for non-school



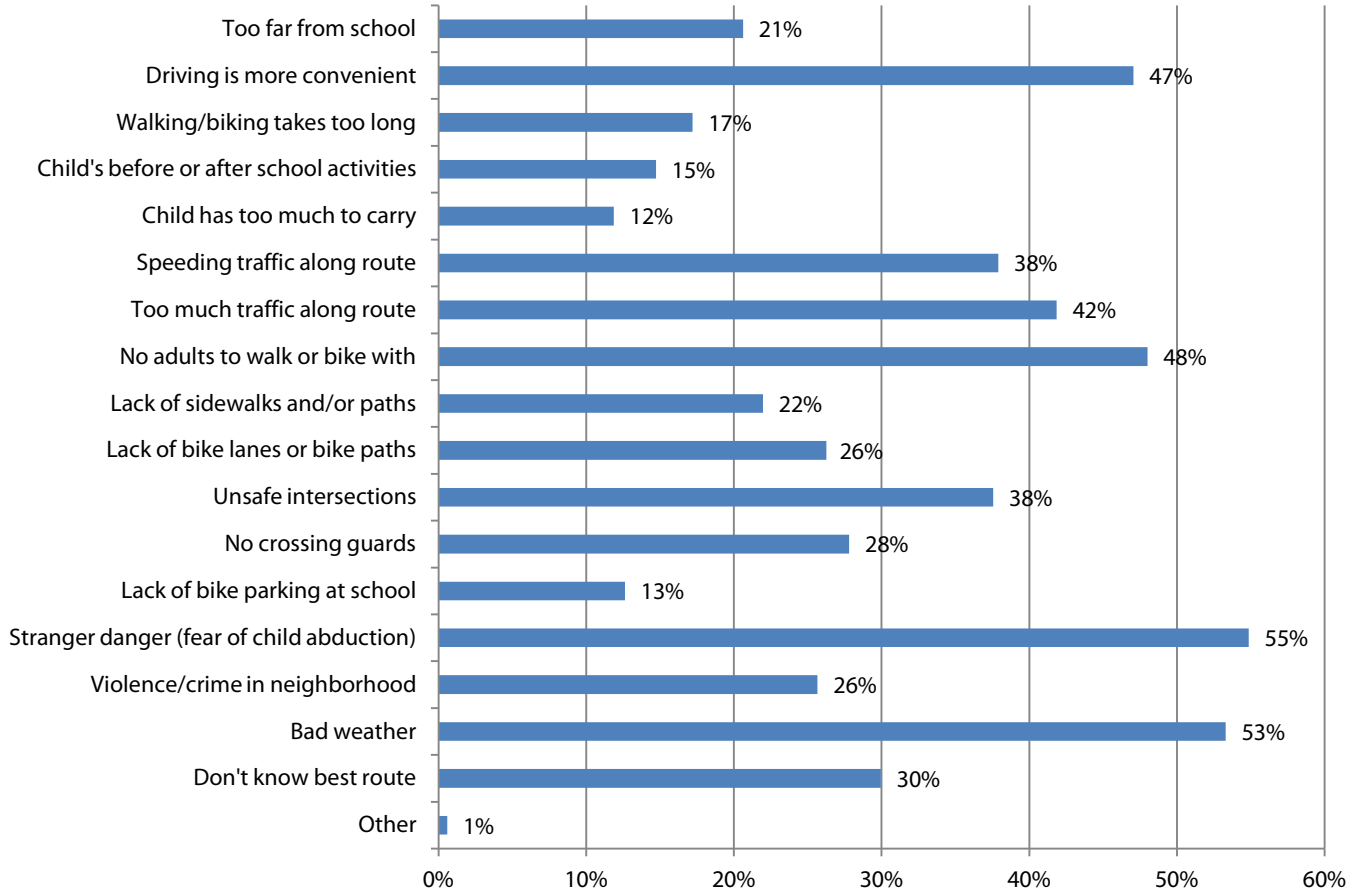
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	4	9
Traffic Safety Assemblies	4	6
Walk and Roll to School Days	3	6
Bicycle Rodeos	1	3
Walking/Biking to school with other families on a regular basis	3	7

At what grade level would you allow your child(ren) to walk or bike to/from school without an adult?



* *"I would not feel comfortable at any grade"*

What concerns limit your child(ren)'s ability to walk or bike to/from school? *n=1173*

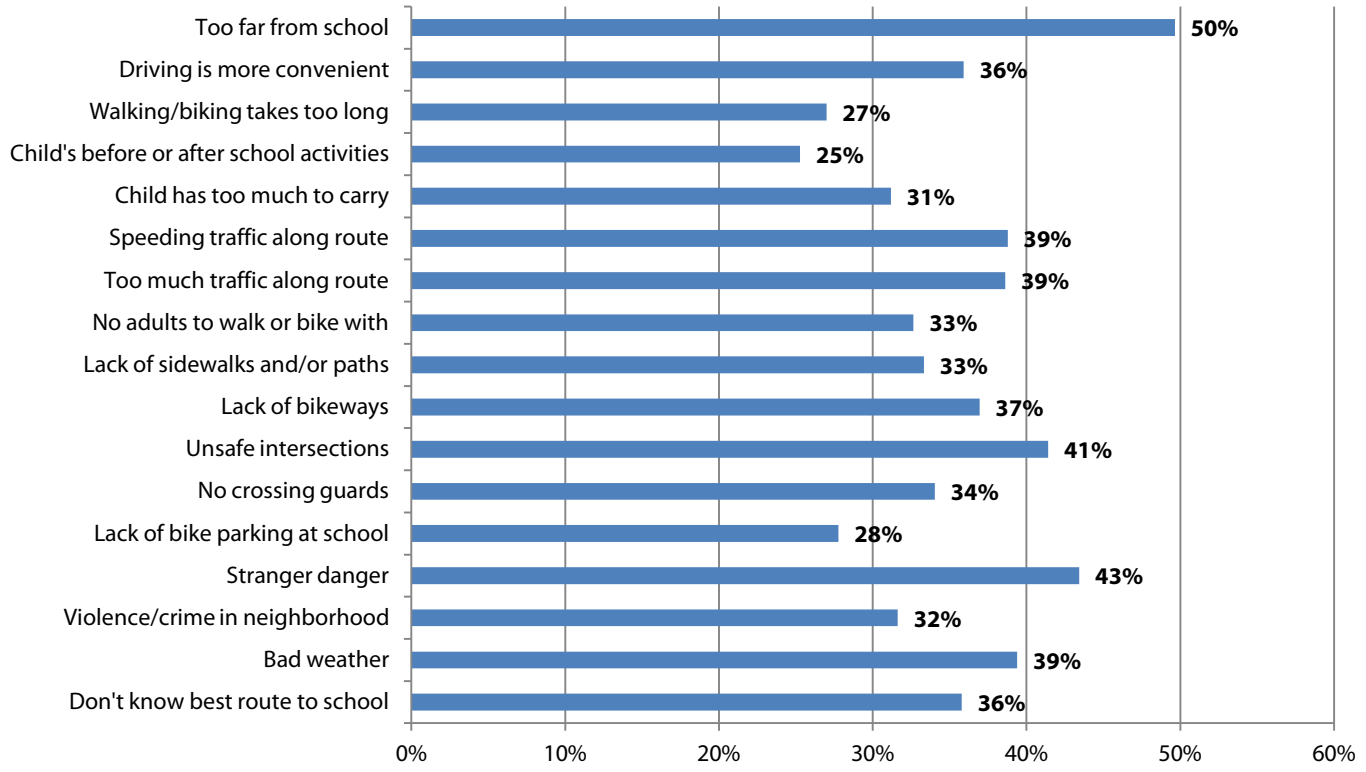


Concern	Yes	Percent
Too far from school	47	21%
Driving is more convenient	104	47%
Walking/biking takes too long	38	17%
Child(ren)'s before or after school activities	29	15%
Child has too much to carry	26	12%
Speeding traffic along route	83	38%
Too much traffic along route	90	42%
No adults to walk or bike with	108	48%
Lack of sidewalks and/or paths	47	22%
Lack of bikeways	57	26%

Concern	Yes	Percent
Unsafe intersections	83	38%
No crossing guards	62	28%
Lack of bike parking at school	27	13%
Stranger danger (fear of child abduction)	124	55%
Violence/crime in neighborhood	58	26%
Bad weather	121	53%
Don't know best route	62	30%
Other	7	1%

Would you allow your child(ren) to walk/bike more often if this concern was addressed?

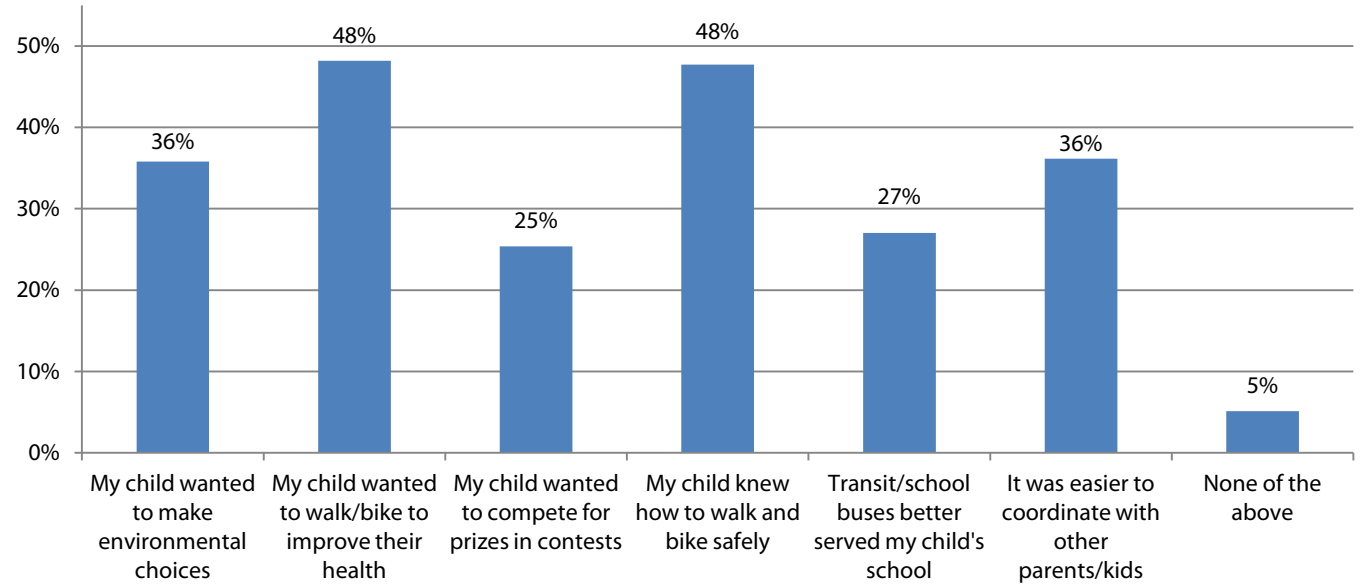
Chart shows "yes" responses.



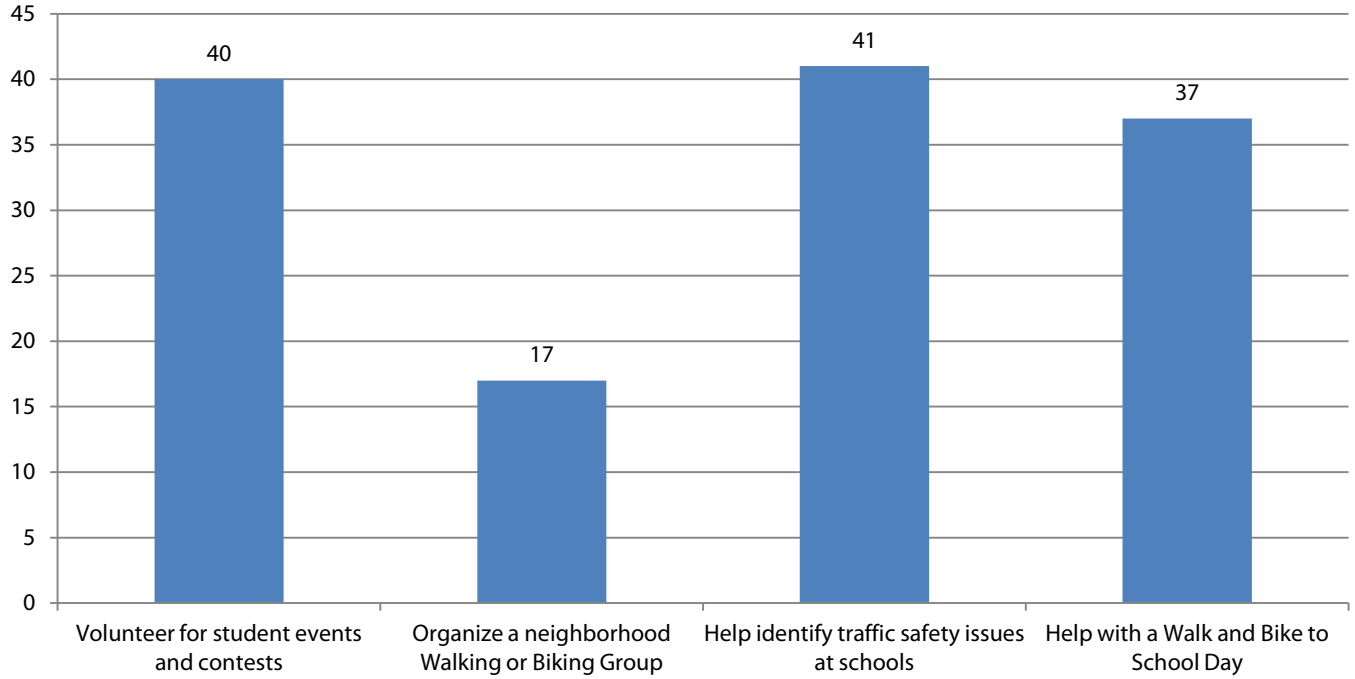
	Yes	No	Not Sure	Total
Too far from school	70	52	19	141
Driving is more convenient	37	43	23	103
Walking/biking takes too long	27	51	22	100
Child's before or after school activities	23	46	22	91
Child has too much to carry	29	46	18	93
Speeding traffic along route	38	41	19	98
Too much traffic along route	39	43	19	101
No adults to walk or bike with	32	48	18	98
Lack of sidewalks and/or paths	31	44	18	93
Lack of bikeways	34	41	17	92
Unsafe intersections	41	38	20	99
No crossing guards	32	43	19	94
Lack of bike parking at school	25	47	18	90
Stranger danger	43	39	17	99
Violence/crime in neighborhood	31	46	21	98
Bad weather	39	39	21	99
Don't know best route to school	34	39	22	95

I would reduce the number of times I drive my child(ren) to school if...

n=326



Are you interested in participating in any of the following activities?



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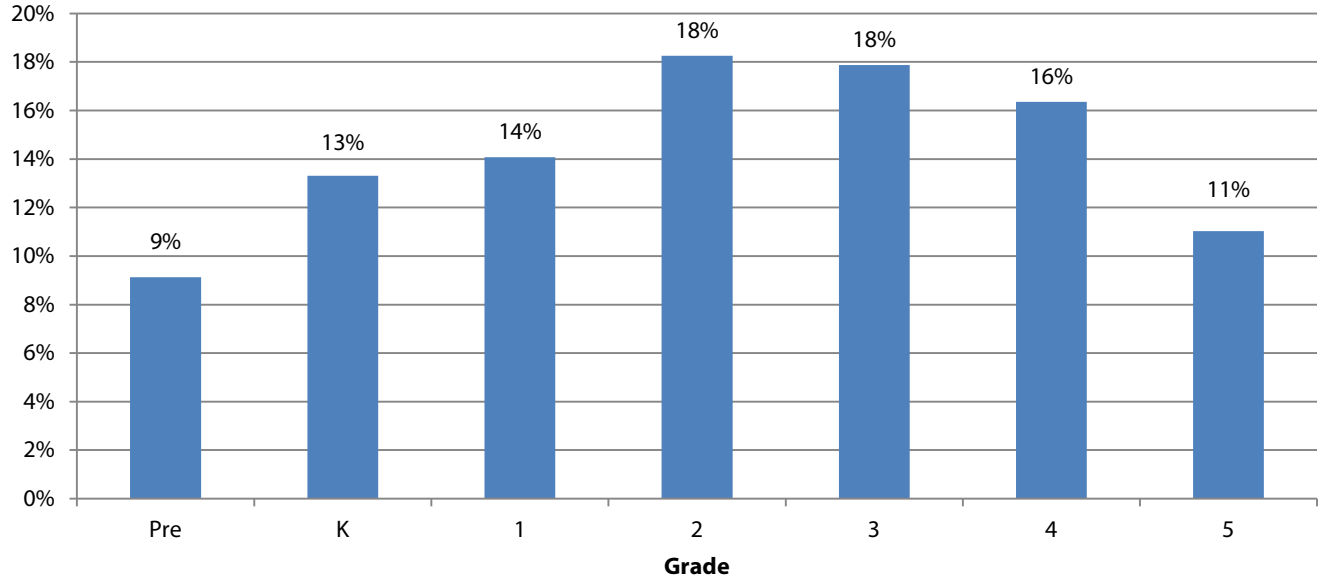
City of Wasco Safe Routes to School Parent/Caregiver Survey Report

School: Karl F. Clemens Elementary School
Date Collected: Fall 2012
Total Surveys Returned: 273

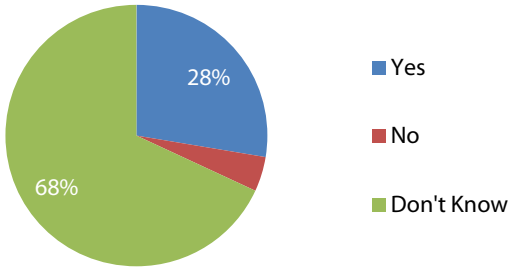
Gender *n= 258*

Gender	Count	Percent
Male	128	50%
Female	130	50%

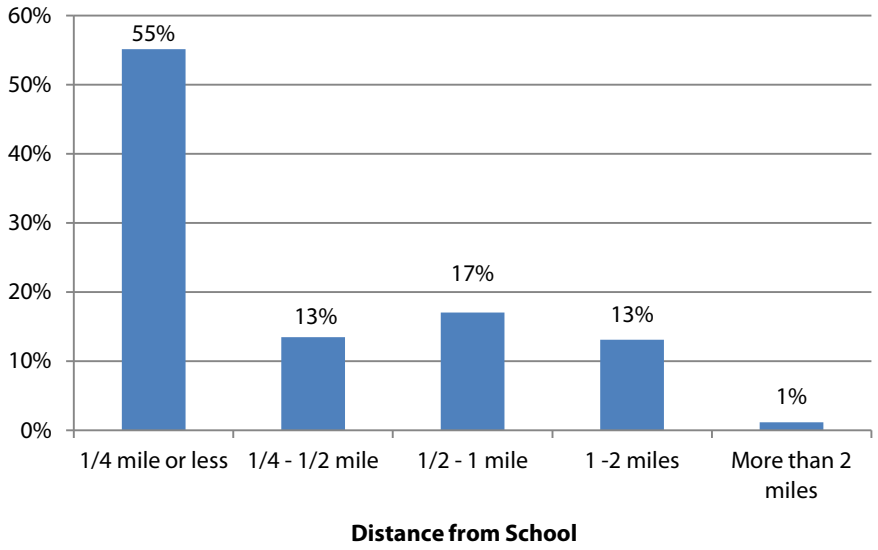
Grades *n= 263*



Does this school have a Safe Routes to Schools Program? *n= 257*



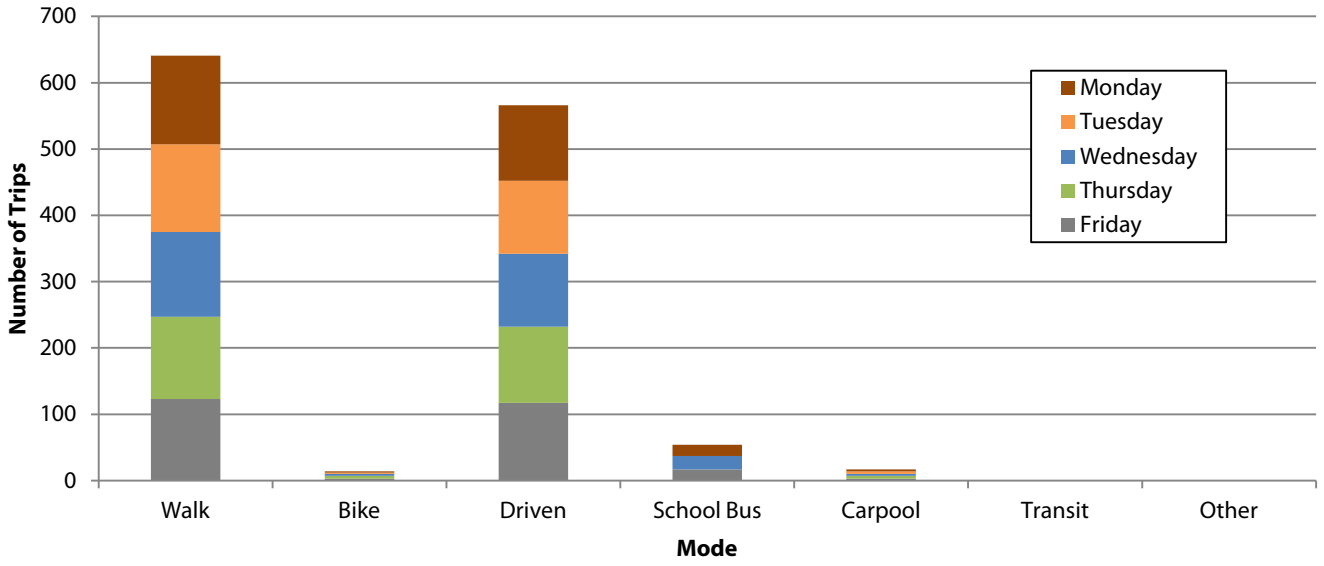
What is the approximate distance from your home to the school? *n=252*



	Number	Percent
1/4 mile or less	139	55%
1/4 - 1/2 mile	34	13%
1/2 - 1 mile	43	17%
1 -2 miles	33	13%
More than 2 miles	3	1%
Total	**252**	**100%**

Last week, how did your child get TO school? *n=270*

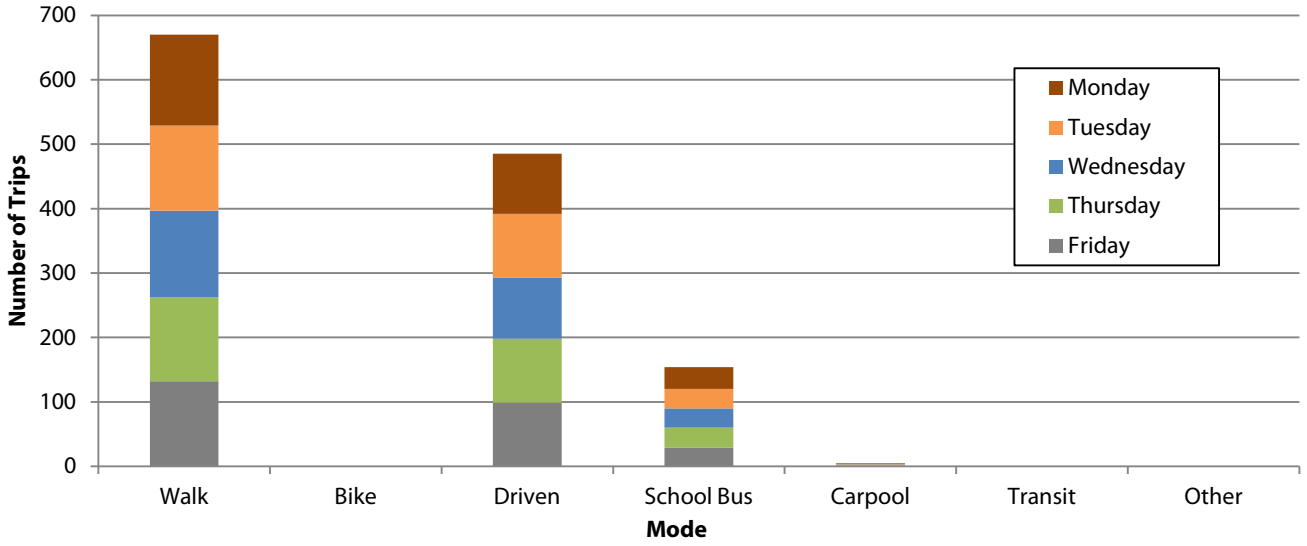
Mode by day of the week



Travel to School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	134	2	114	17	3	0	0
Tuesday	132	2	110	0	4	0	0
Wednesday	128	3	110	20	3	0	0
Thursday	124	4	115	0	4	0	0
Friday	123	3	117	17	3	0	0
Total trips	**641**	**14**	**566**	**54**	**17**	**0**	**0**
Percent of trips	50%	1%	44%	4%	1%	0%	0%

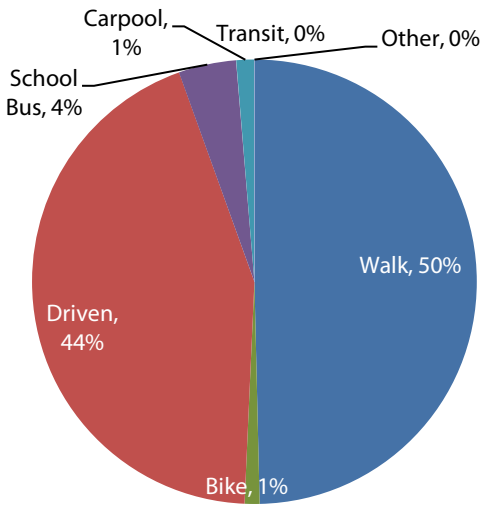
Last week, how did your child get FROM school? *n=269*

Mode by day of the week

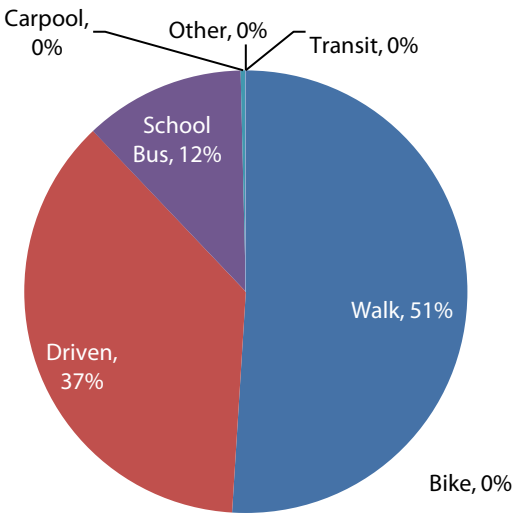


Travel from School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	141	0	93	34	1	0	0
Tuesday	132	0	99	30	1	0	0
Wednesday	135	0	95	30	1	0	0
Thursday	130	0	99	31	1	0	0
Friday	132	0	99	29	1	0	0
Total trips	**670**	**0**	**485**	**154**	**5**	**0**	**0**
Percent of trips	51%	0%	37%	12%	0%	0%	0%

Mode Split TO school

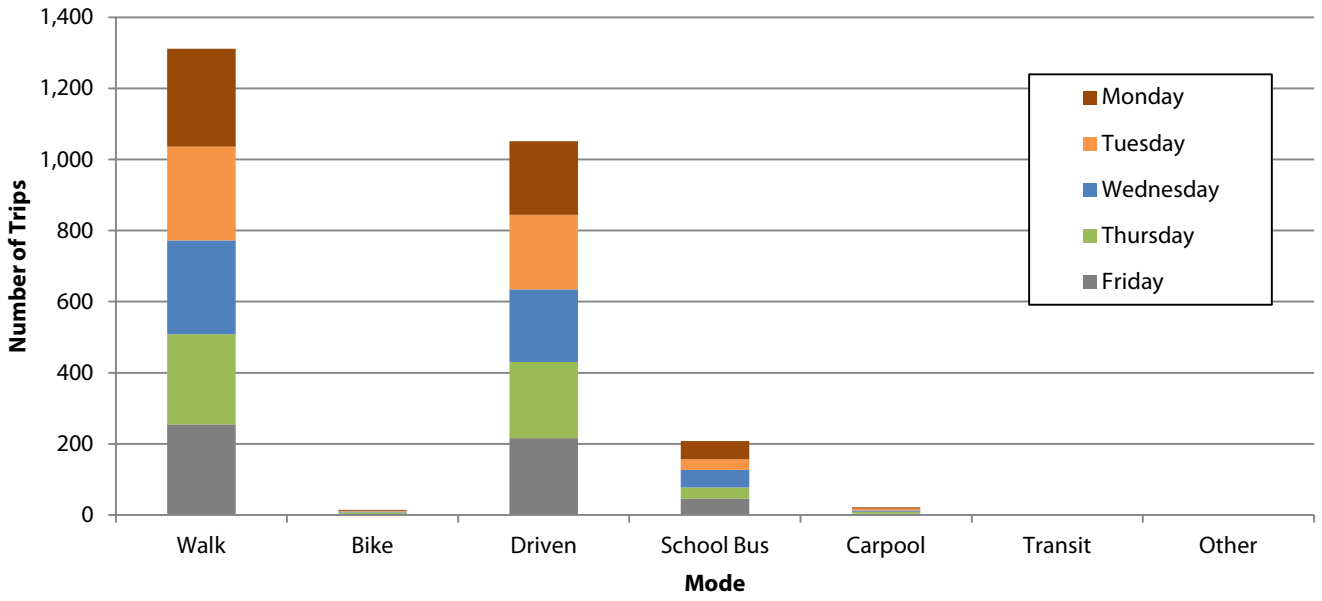


Mode Split FROM school



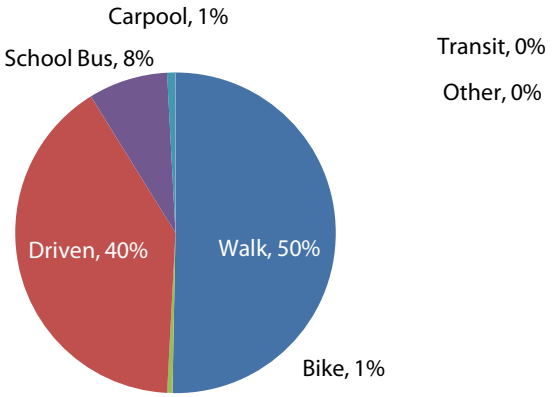
Overall Mode Split TO and FROM School

Mode by day of the week



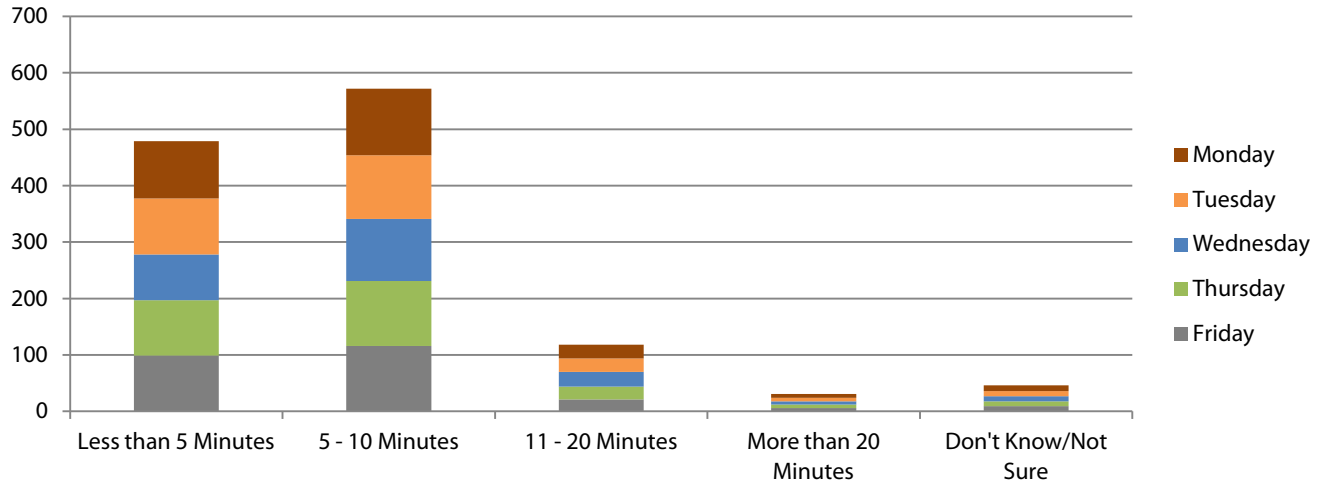
Travel for all trips	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	275	2	207	51	4	0	0
Tuesday	264	2	209	30	5	0	0
Wednesday	263	3	205	50	4	0	0
Thursday	254	4	214	31	5	0	0
Friday	255	3	216	46	4	0	0
Total trips	1311	14	1051	208	22	0	0

Mode split for all trips



Last week, how long did it take to travel TO school? *n=261*

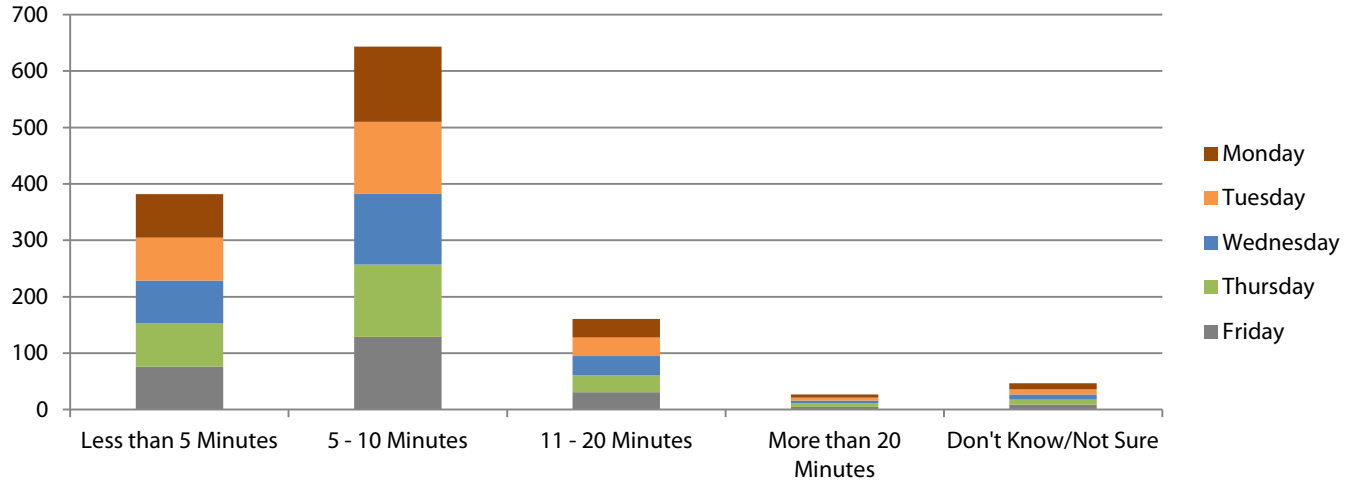
Travel time by day of the week



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	102	118	24	7	10
Tuesday	99	113	24	6	9
Wednesday	81	110	26	6	9
Thursday	98	115	23	6	9
Friday	99	116	21	6	9
Total Trips	**479**	**572**	**118**	**31**	**46**
Percent of trips	38.4%	45.9%	9.5%	2.5%	3.7%

Last week, how long did it take to travel FROM school? *n=260*

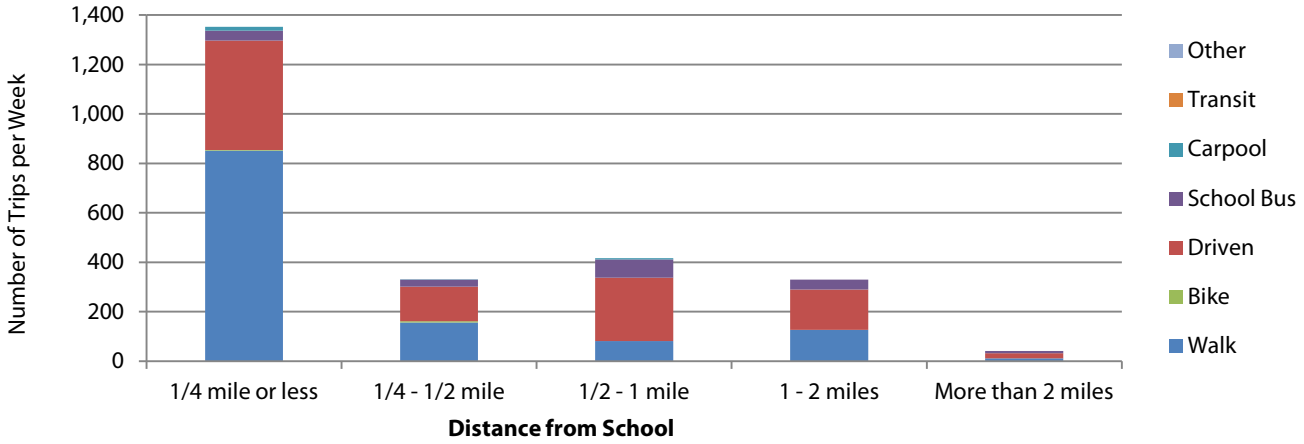
Travel time by day of the week



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	77	133	33	6	11
Tuesday	76	127	33	5	9
Wednesday	76	126	34	5	9
Thursday	77	128	30	6	9
Friday	76	129	31	5	9
Total Trips	**382**	**643**	**161**	**27**	**47**
Percent of trips	30.3%	51.0%	12.8%	2.1%	3.7%

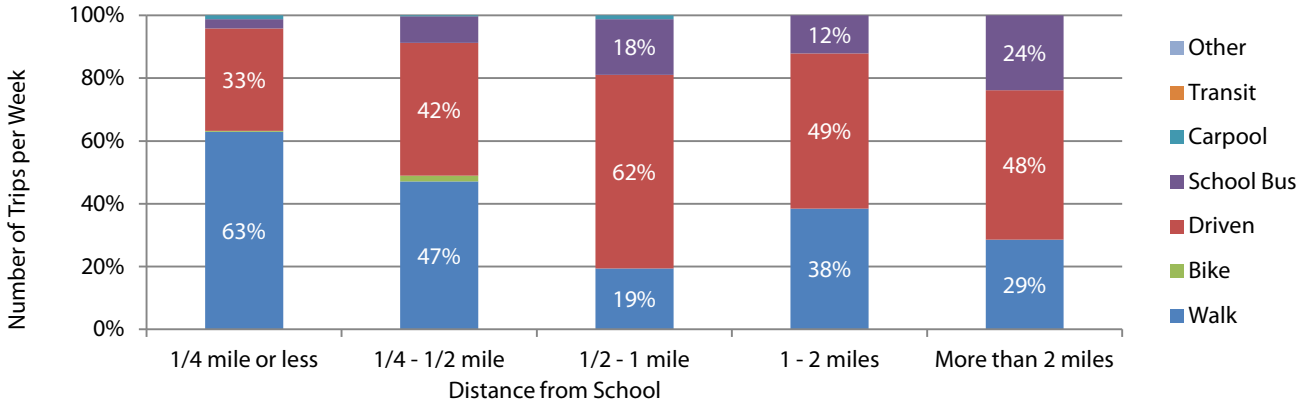
Weekly Trips by Mode and Distance from School

Mode by distance from school



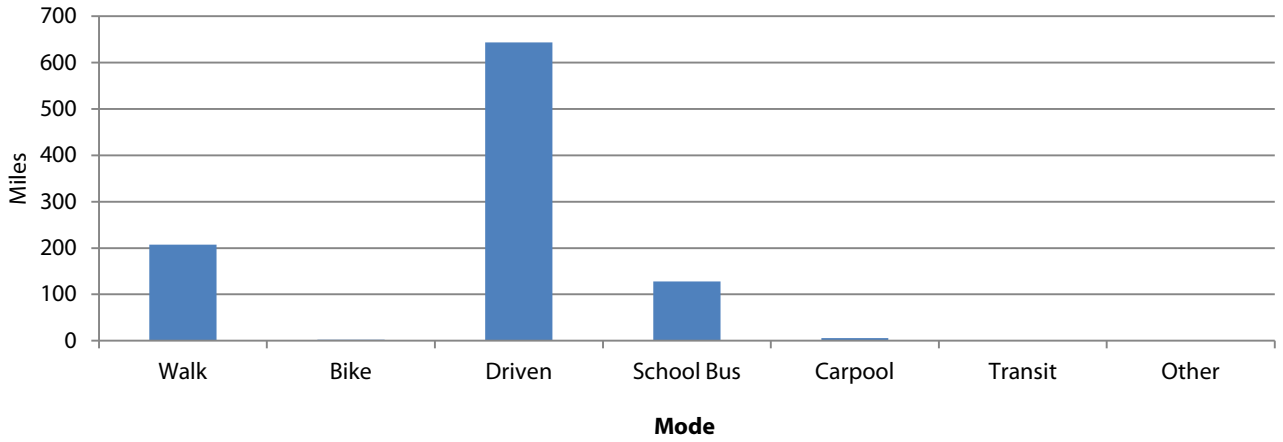
Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	851	3	442	40	16	0	0
1/4 - 1/2 mile	156	6	140	28	1	0	0
1/2 - 1 mile	81	0	257	74	5	0	0
1 - 2 miles	127	0	163	40	0	0	0
More than 2 miles	12	0	20	10	0	0	0
Total	**1,227**	**9**	**1,022**	**192**	**22**	**0**	**0**

Mode Split by Distance from School



Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	63%	0%	33%	3%	1%	0%	0%
1/4 - 1/2 mile	47%	2%	42%	8%	0%	0%	0%
1/2 - 1 mile	19%	0%	62%	18%	1%	0%	0%
1 - 2 miles	38%	0%	49%	12%	0%	0%	0%
More than 2 miles	29%	0%	48%	24%	0%	0%	0%
Total	**50%**	**0%**	**41%**	**8%**	**1%**	**0%**	**0%**

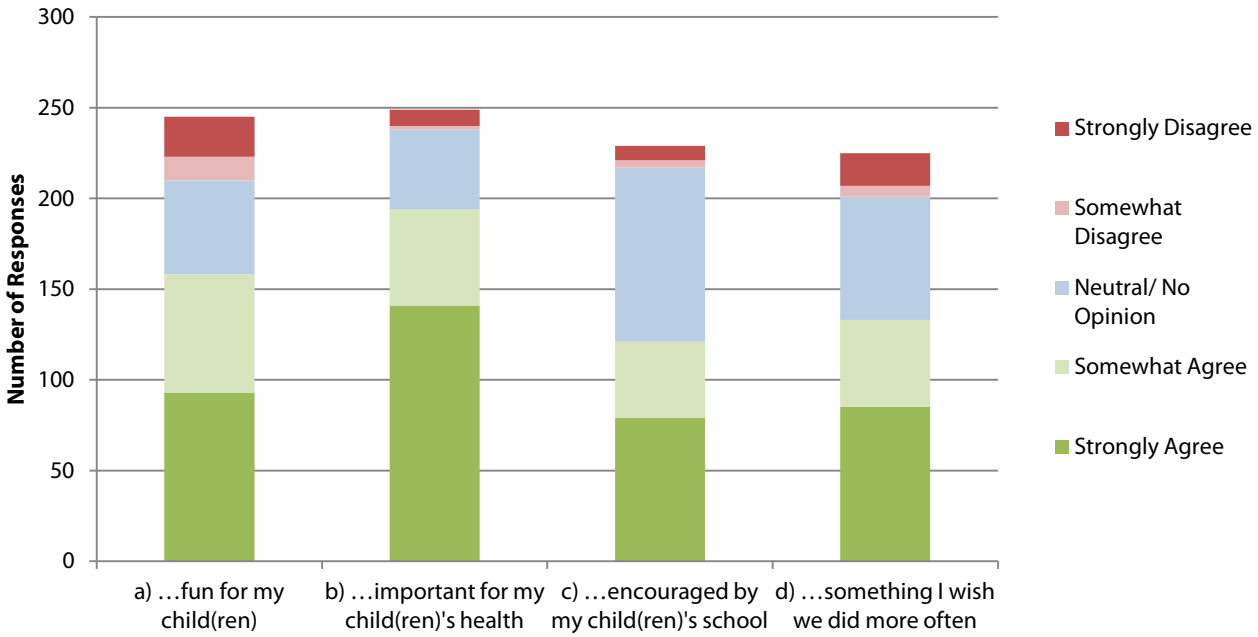
Weekly Miles Traveled by Mode



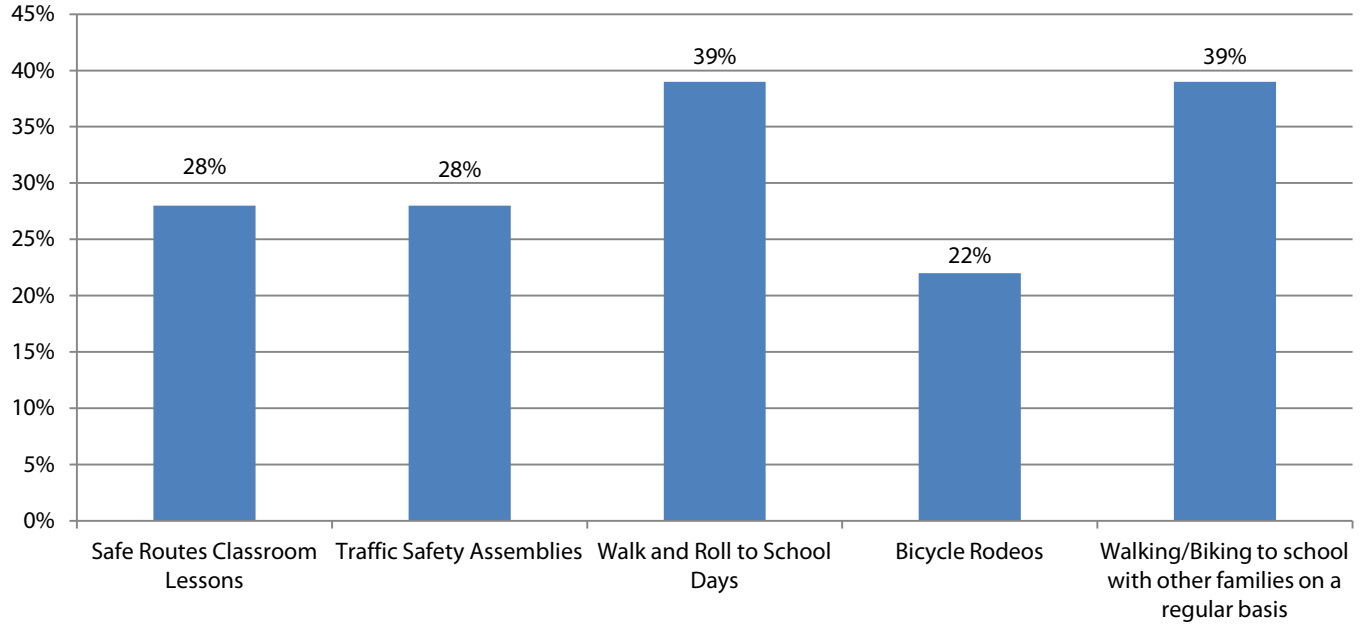
	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
All Trips	207	3	644	128	6	0	0
Percent of Total Mileage	21%	0%	65%	13%	1%	0%	0%

Note:This analysis uses the mode frequency by respondent and assumes the median of the distance from school categories or the respondent-provided distance if greater than two miles.

How strongly do you agree or disagree with the following statement? a. n=245 b. n=249 c. n=229 d. n=225

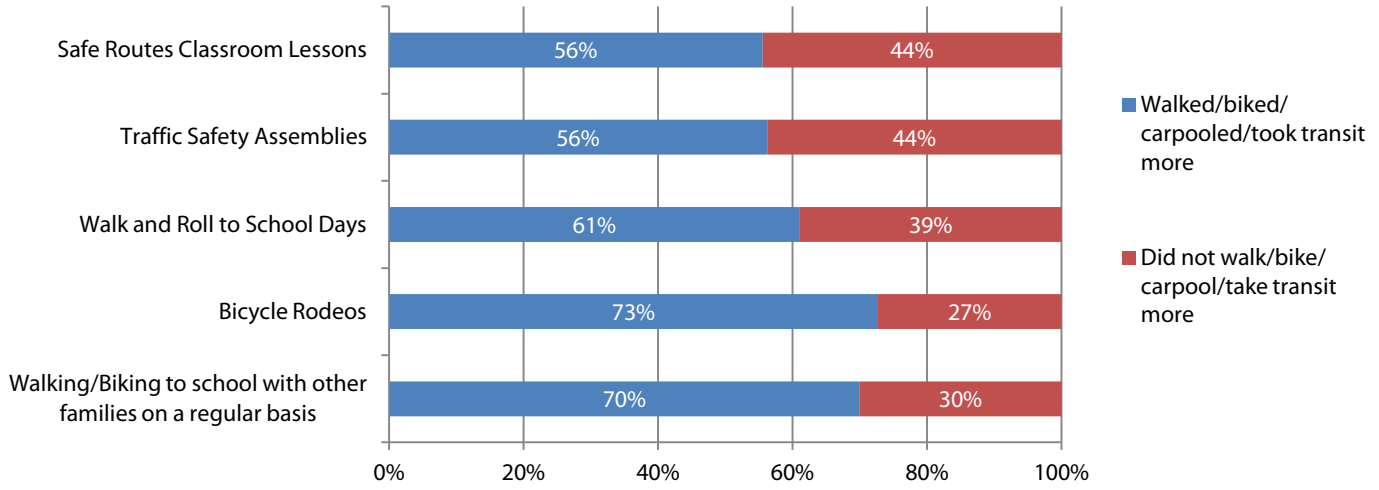


Have you or your child(ren) participated in the following Safe Routes events/programs?



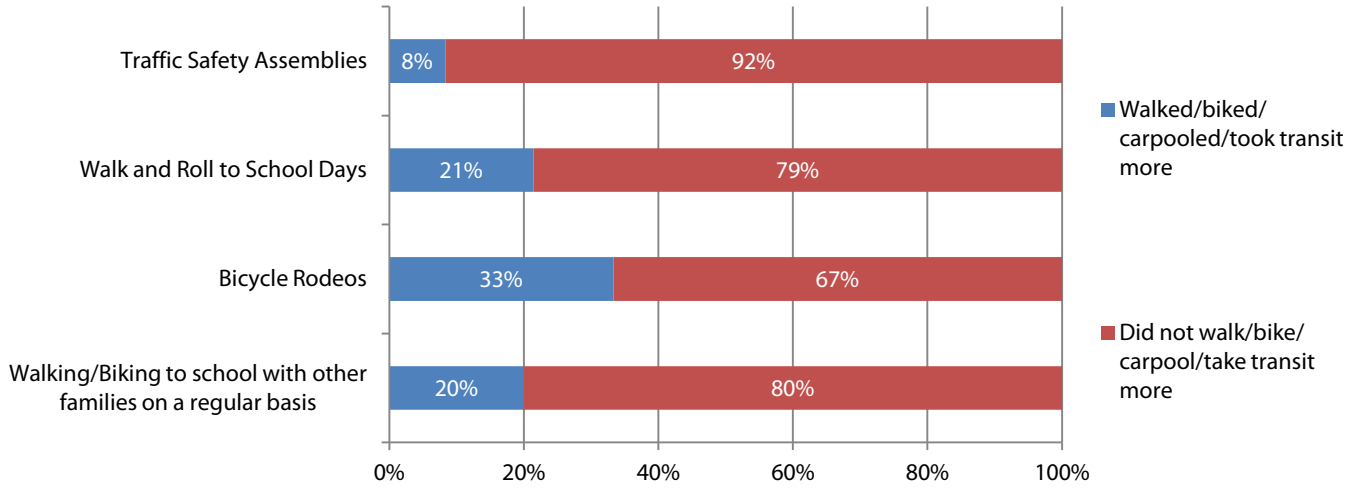
For any events/programs you answered "yes" for in the previous question, did your child(ren) walk, bike, or carpool more often after participating?

Note: Includes responses from respondents who previously indicated that they had participated in the specific program.



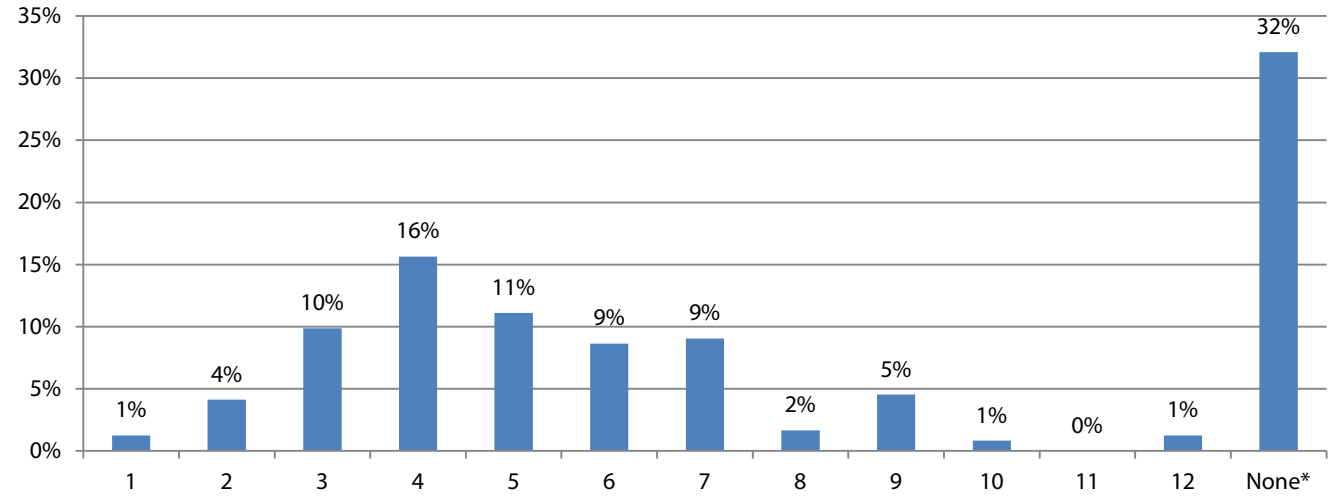
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	10	8
Traffic Safety Assemblies	9	7
Walk and Roll to School Days	11	7
Bicycle Rodeos	8	3
Walking/Biking to school with other families on a regular basis	14	6

If you have participated in the Safe Routes program, do you drive yourself or your child(ren) less often for non-school



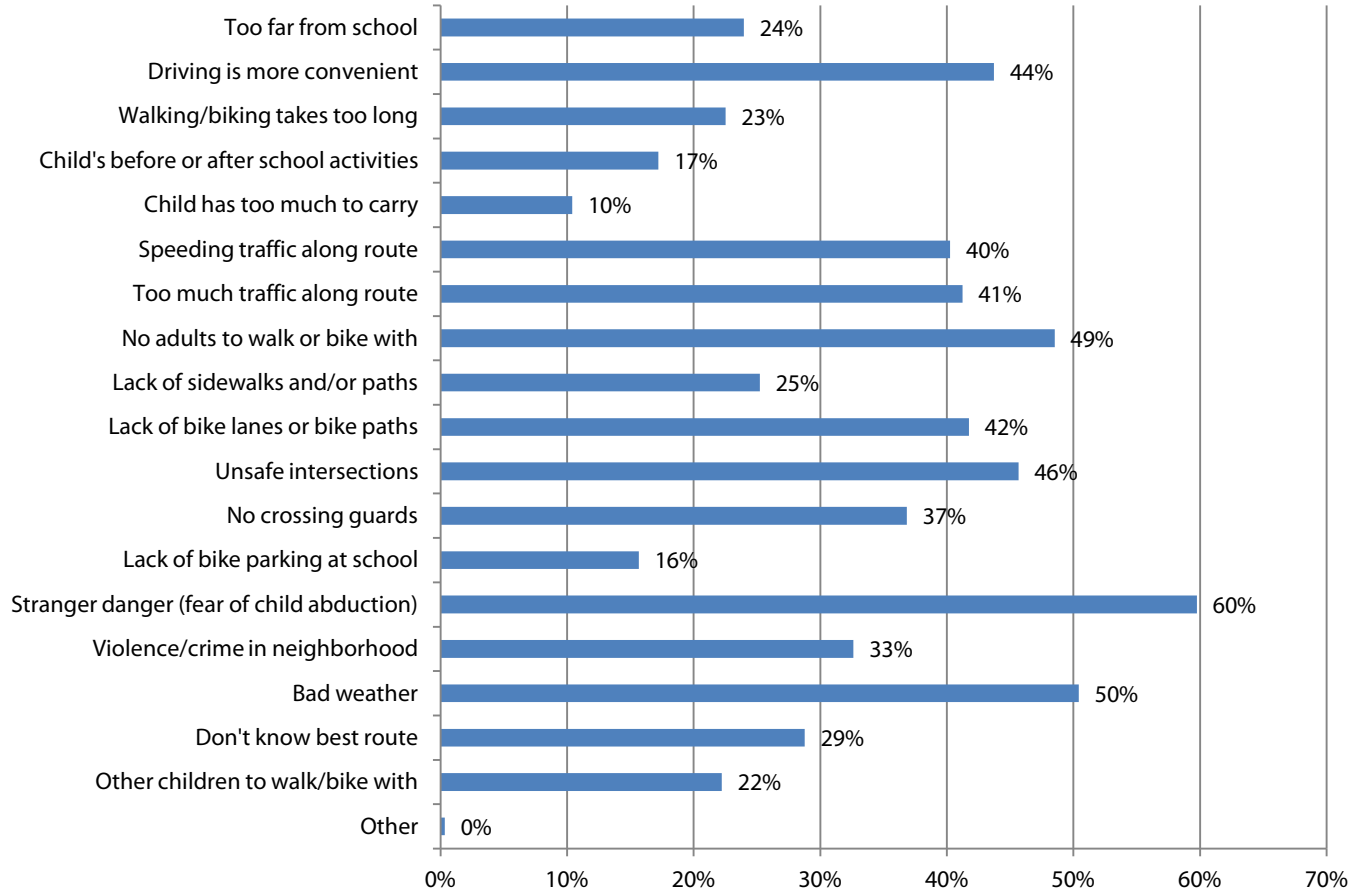
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	4	12
Traffic Safety Assemblies	1	11
Walk and Roll to School Days	3	11
Bicycle Rodeos	3	6
Walking/Biking to school with other families on a regular basis	2	8

At what grade level would you allow your child(ren) to walk or bike to/from school without an adult?



* *"I would not feel comfortable at any grade"*

What concerns limit your child(ren)'s ability to walk or bike to/from school? *n=1355*

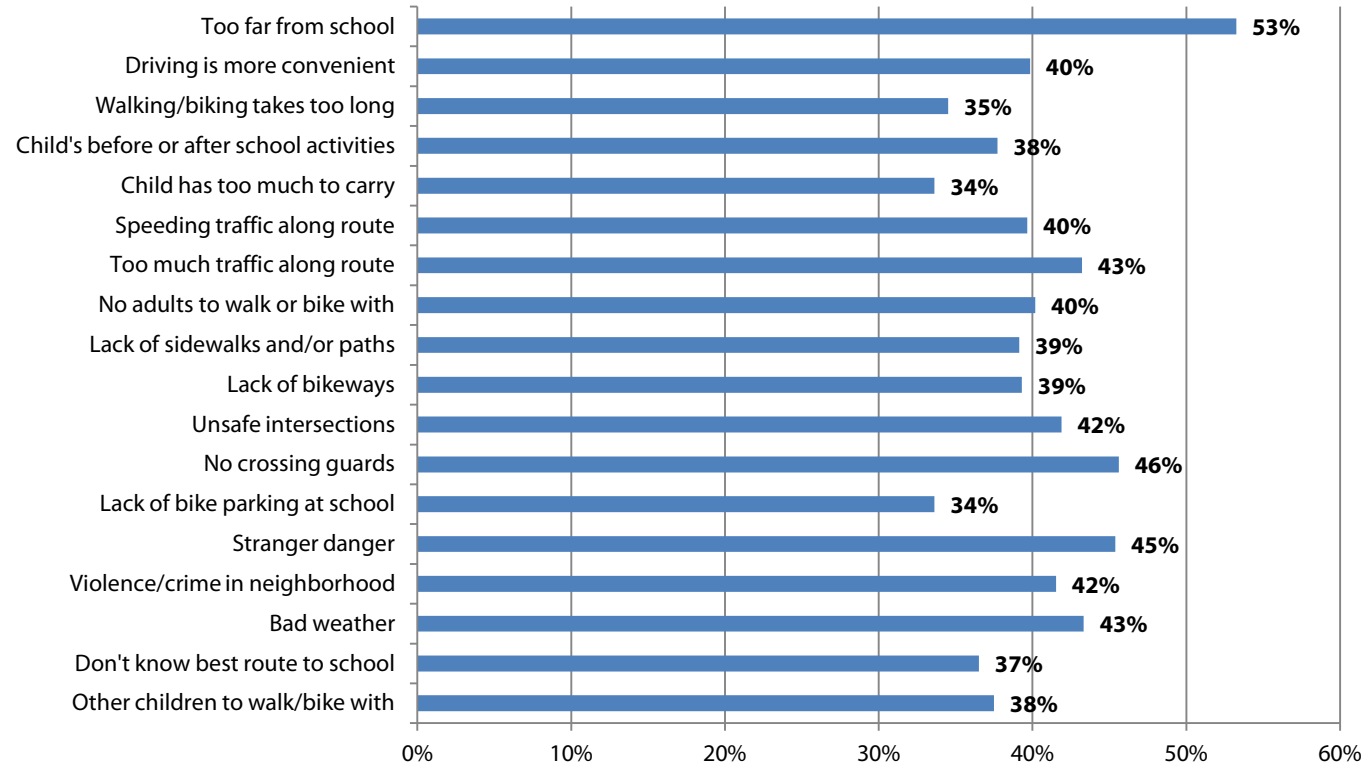


Concern	Yes	Percent
Too far from school	58	24%
Driving is more convenient	101	44%
Walking/biking takes too long	52	23%
Child(ren)'s before or after school activities	37	17%
Child has too much to carry	24	10%
Speeding traffic along route	93	40%
Too much traffic along route	94	41%
No adults to walk or bike with	114	49%
Lack of sidewalks and/or paths	57	25%
Lack of bikeways	96	42%

Concern	Yes	Percent
Unsafe intersections	105	46%
No crossing guards	84	37%
Lack of bike parking at school	36	16%
Stranger danger (fear of child abduction)	141	60%
Violence/crime in neighborhood	76	33%
Bad weather	118	50%
Don't know best route	63	29%
Other	4	0%

Would you allow your child(ren) to walk/bike more often if this concern was addressed?

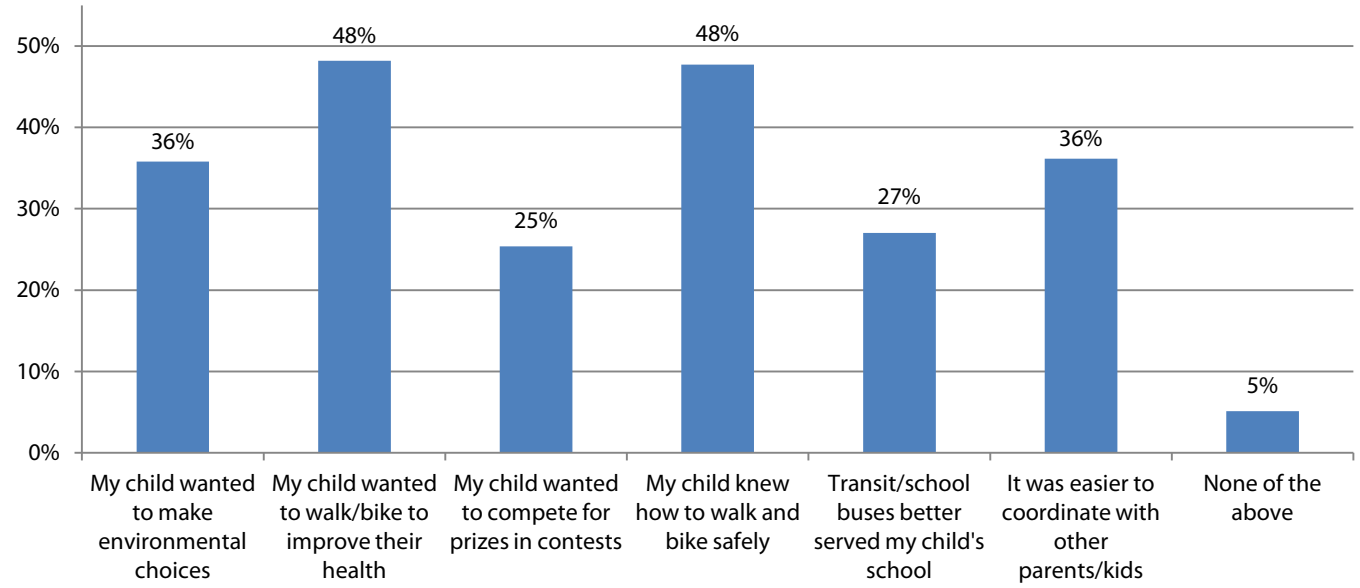
Chart shows "yes" responses.



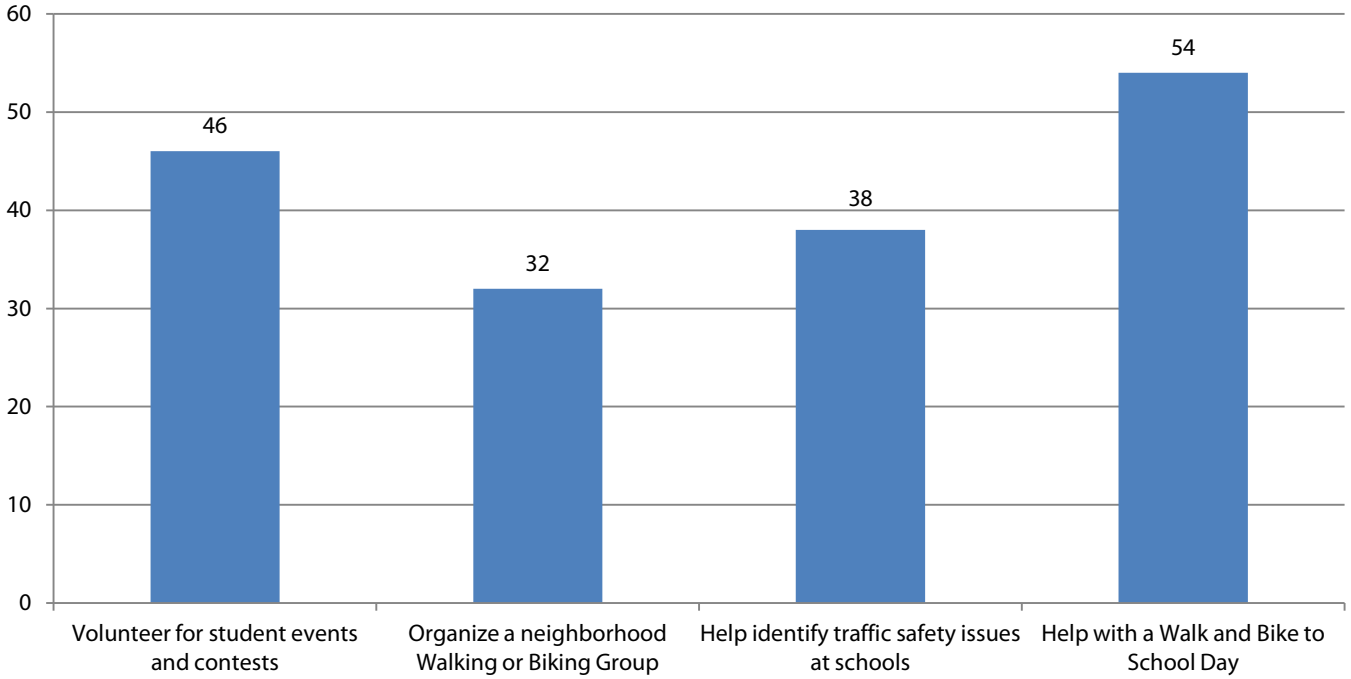
	Yes	No	Not Sure	Total
Too far from school	82	43	29	154
Driving is more convenient	49	38	36	123
Walking/biking takes too long	39	45	29	113
Child's before or after school activities	43	45	26	114
Child has too much to carry	38	50	25	113
Speeding traffic along route	46	43	27	116
Too much traffic along route	51	38	29	118
No adults to walk or bike with	47	43	27	117
Lack of sidewalks and/or paths	45	44	26	115
Lack of bikeways	46	41	30	117
Unsafe intersections	49	39	29	117
No crossing guards	52	40	22	114
Lack of bike parking at school	38	44	31	113
Stranger danger	54	33	32	119
Violence/crime in neighborhood	49	40	29	118
Bad weather	52	39	29	120
Don't know best route to school	42	40	33	115

I would reduce the number of times I drive my child(ren) to school if...

n=328



Are you interested in participating in any of the following activities?



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City of Wasco Safe Routes to School Parent/Caregiver Survey Report

School: Thomas Jefferson Middle School
Date Collected: Fall 2012
Total Surveys Returned: 94

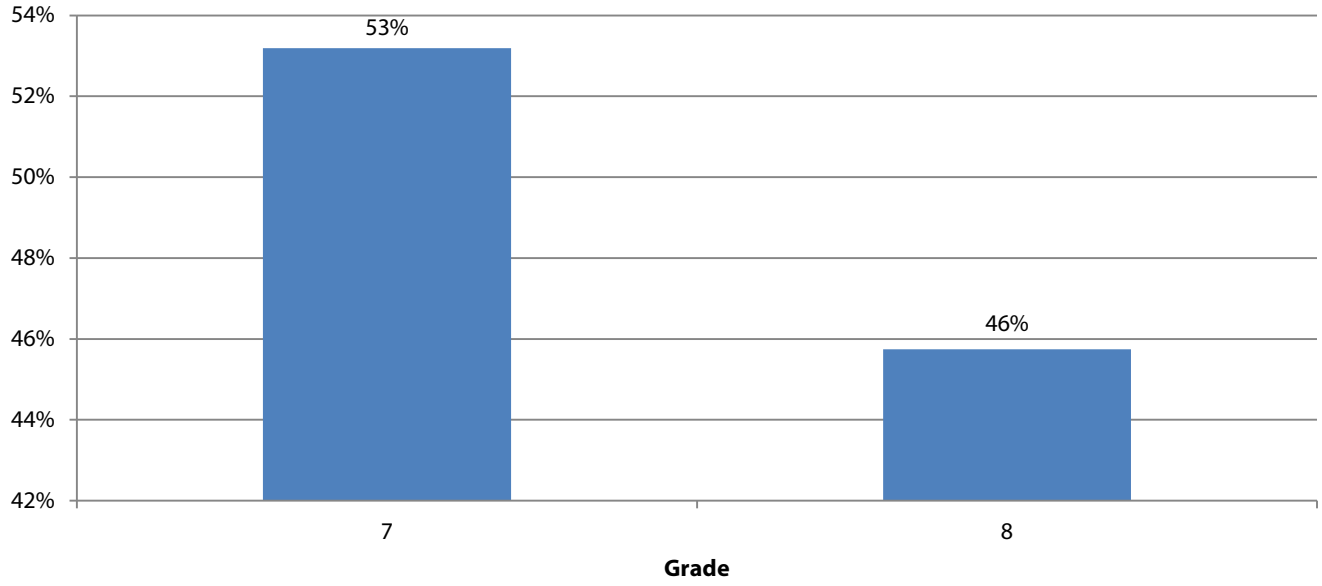
Gender

n= 92

Gender	Count	Percent
Male	35	38%
Female	57	62%

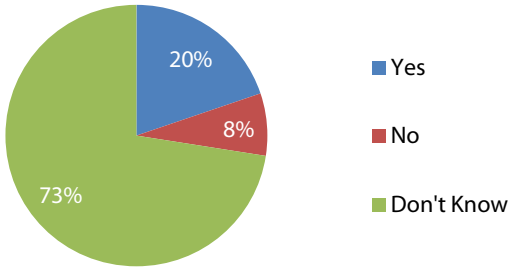
Grades

n= 94

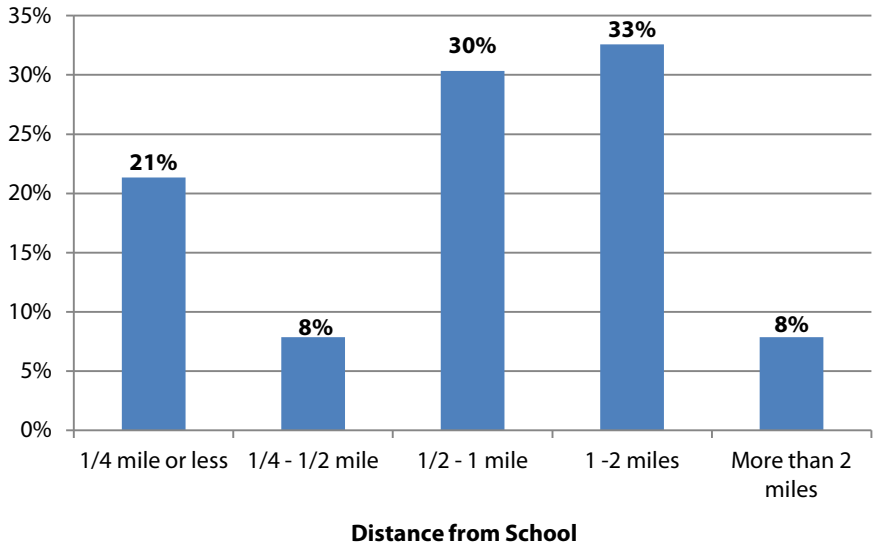


Does this school have a Safe Routes to Schools Program?

n= 91



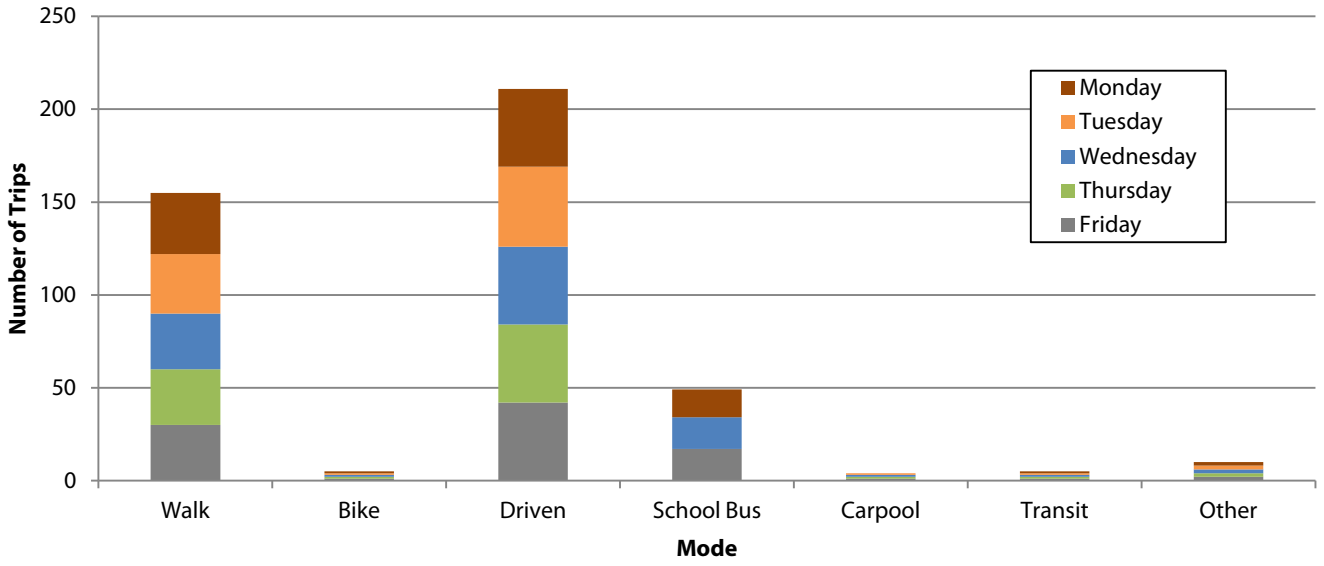
What is the approximate distance from your home to the school? *n=89*



	Number	Percent
1/4 mile or less	19	21%
1/4 - 1/2 mile	7	8%
1/2 - 1 mile	27	30%
1 -2 miles	29	33%
More than 2 miles	7	8%
Total	**89**	**100%**

Last week, how did your child get TO school? *n=94*

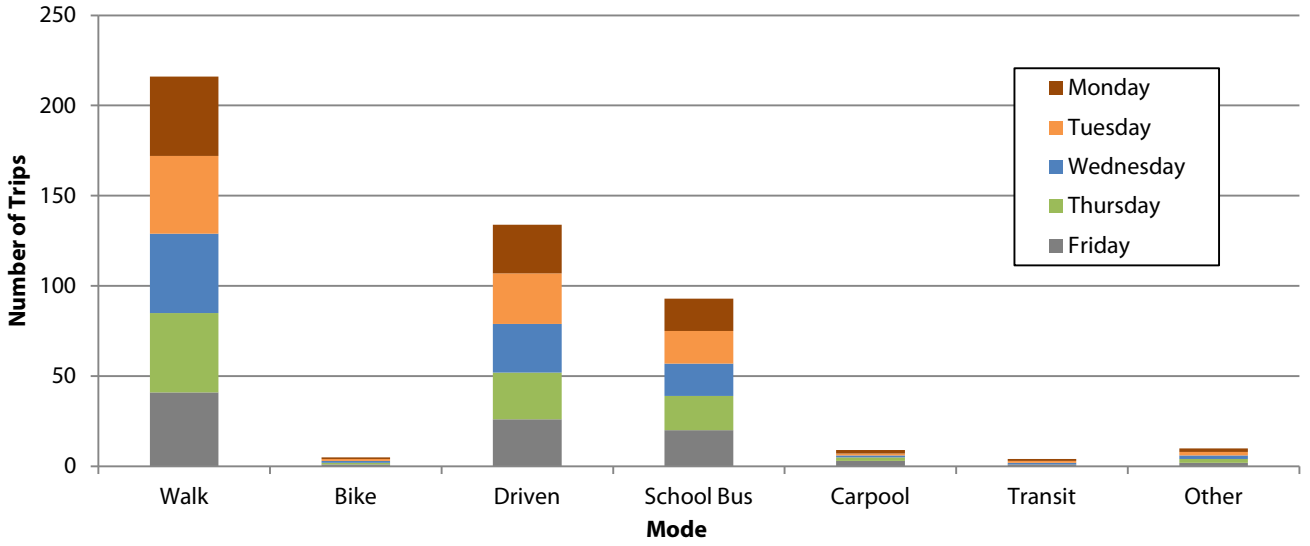
Mode by day of the week



Travel to School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	33	1	42	15	0	1	2
Tuesday	32	1	43	0	1	1	2
Wednesday	30	1	42	17	1	1	2
Thursday	30	1	42	0	1	1	2
Friday	30	1	42	17	1	1	2
Total trips	**155**	**5**	**211**	**49**	**4**	**5**	**10**
Percent of trips	35%	1%	48%	11%	1%	1%	2%

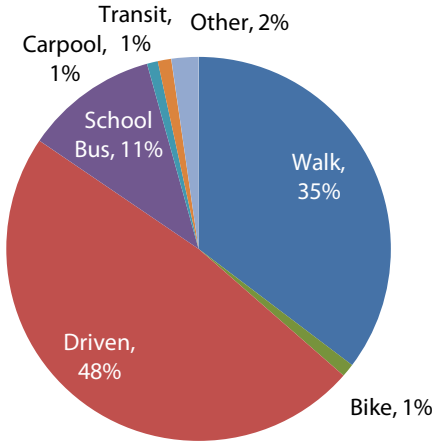
Last week, how did your child get FROM school? *n=94*

Mode by day of the week

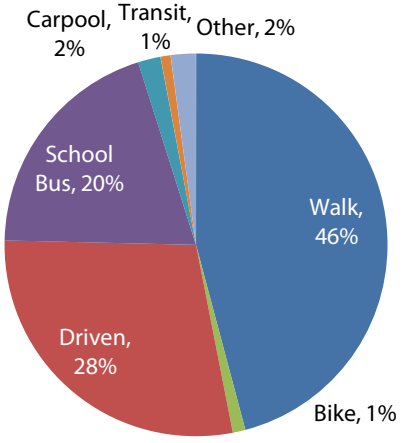


Travel from School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	44	1	27	18	2	1	2
Tuesday	43	1	28	18	1	1	2
Wednesday	44	1	27	18	1	1	2
Thursday	44	1	26	19	2	0	2
Friday	41	1	26	20	3	1	2
Total trips	**216**	**5**	**134**	**93**	**9**	**4**	**10**
Percent of trips	46%	1%	28%	20%	2%	1%	2%

Mode Split TO school

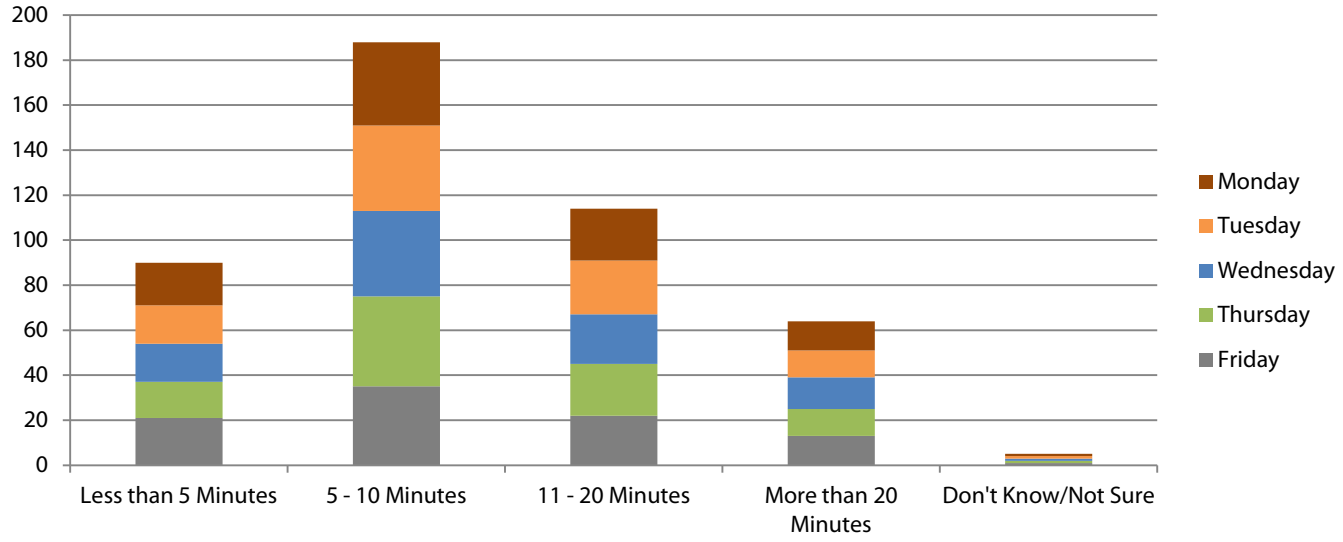


Mode Split FROM school



Last week, how long did it take to travel FROM school? *n=93*

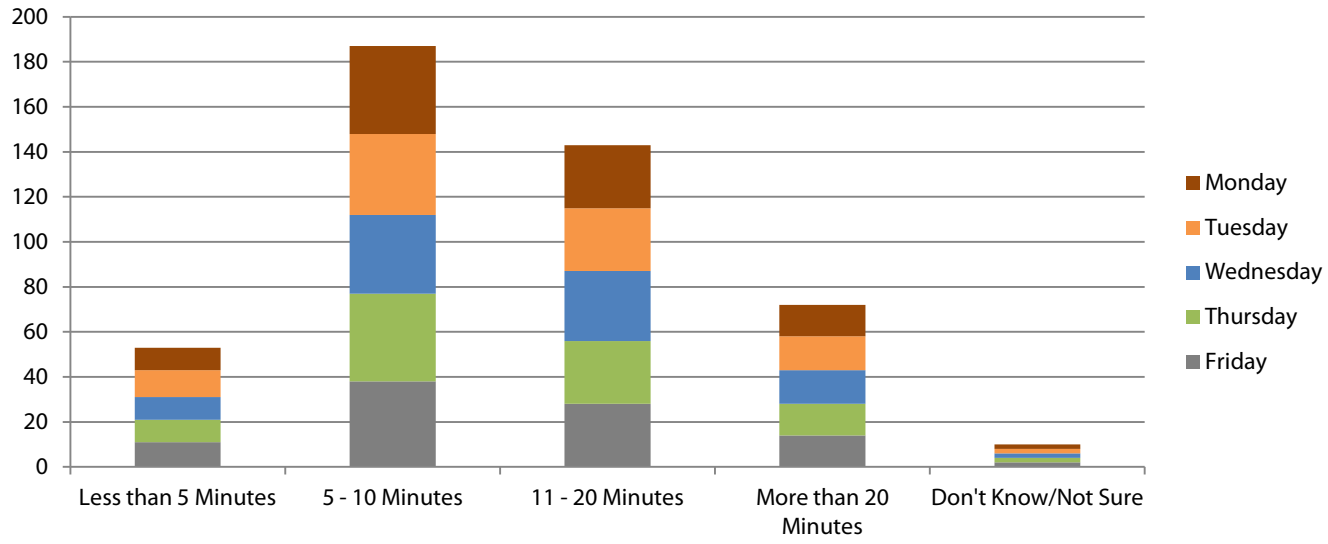
Travel time by day of the week.



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	19	37	23	13	1
Tuesday	17	38	24	12	1
Wednesday	17	38	22	14	1
Thursday	16	40	23	12	1
Friday	21	35	22	13	1
Total Trips	**90**	**188**	**114**	**64**	**5**
Percent of trips	19.5%	42.4%	12.9%	5.7%	4.3%

Last week, how long did it take to travel FROM school? *n=93*

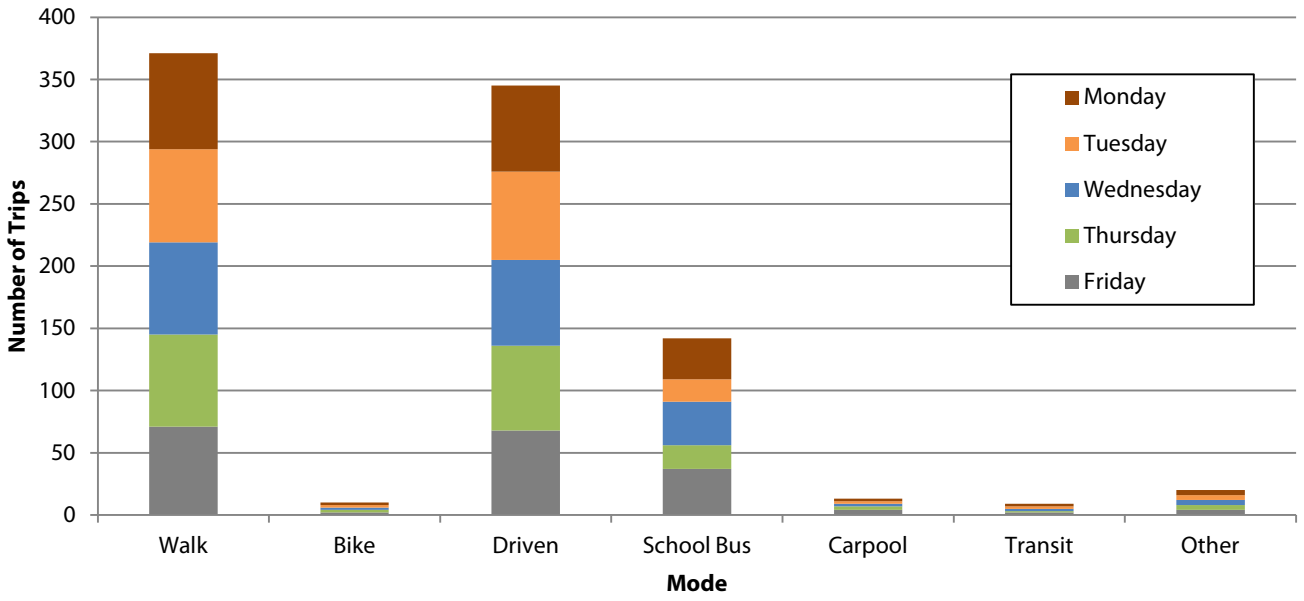
Travel time by day of the week



Travel from school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	10	39	28	14	2
Tuesday	12	36	28	15	2
Wednesday	10	35	31	15	2
Thursday	10	39	28	14	2
Friday	11	38	28	14	2
Total Trips	**53**	**187**	**143**	**72**	**10**
Percent of trips	11.4%	42.4%	12.9%	5.7%	4.3%

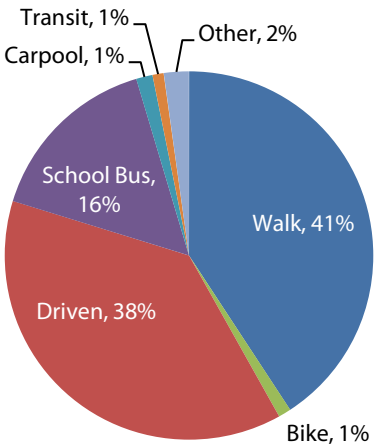
Overall Mode Split TO and FROM School

Mode by day of the week



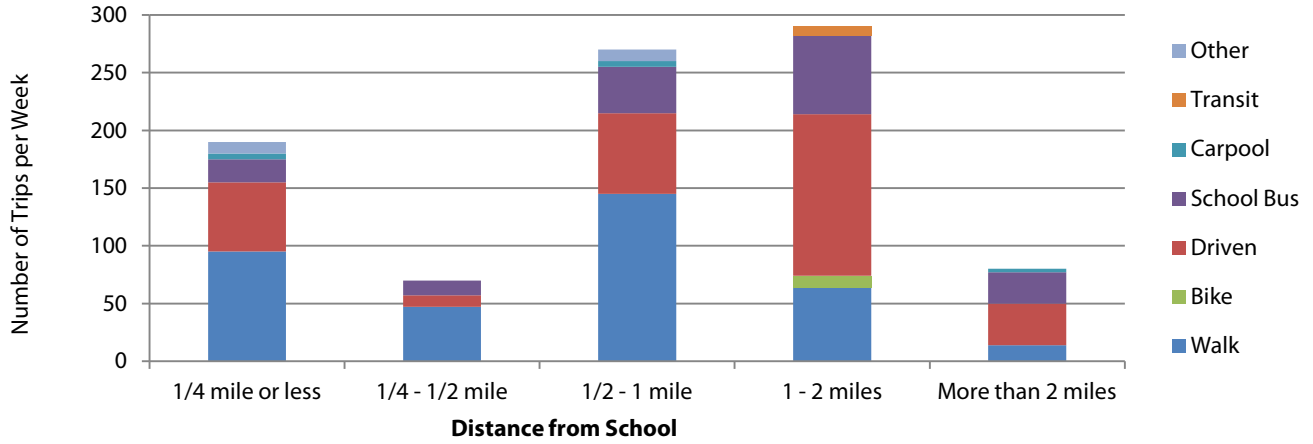
Travel for all trips	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	77	2	69	33	2	2	4
Tuesday	75	2	71	18	2	2	4
Wednesday	74	2	69	35	2	2	4
Thursday	74	2	68	19	3	1	4
Friday	71	2	68	37	4	2	4
Total trips	371	10	345	142	13	9	20

Mode split for all trips



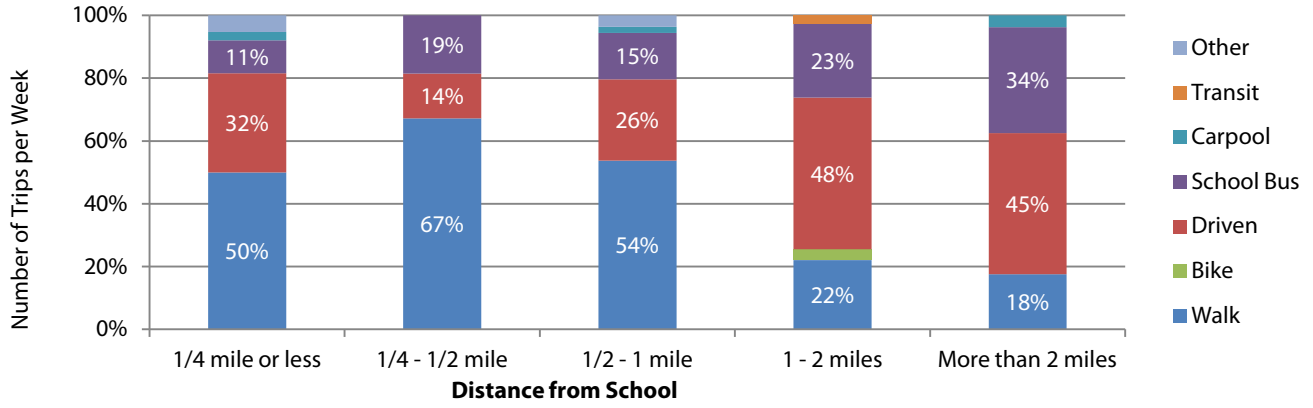
Weekly Trips by Mode and Distance from School

Mode by distance from school



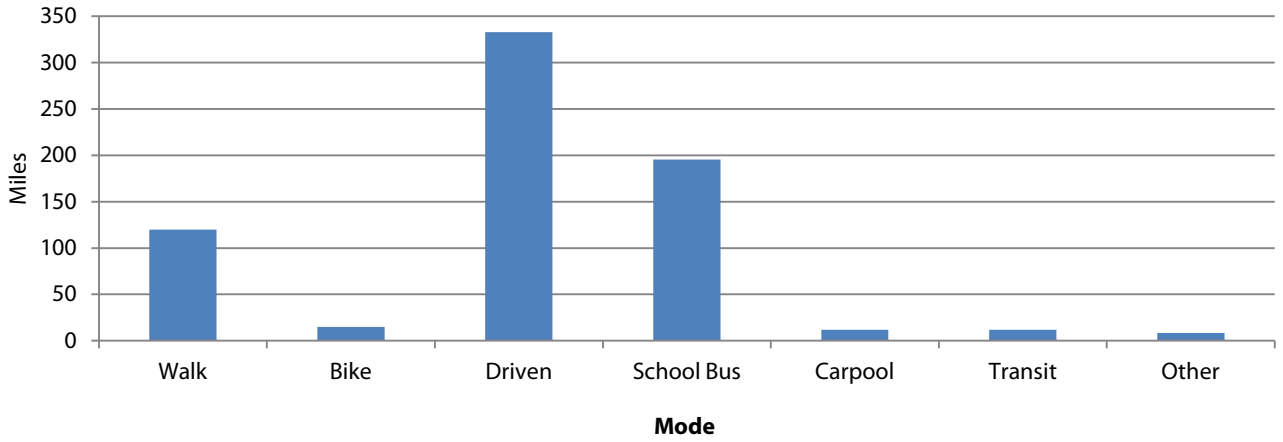
Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	95	0	60	20	5	0	10
1/4 - 1/2 mile	47	0	10	13	0	0	0
1/2 - 1 mile	145	0	70	40	5	0	10
1 - 2 miles	64	10	140	68	0	8	0
More than 2 miles	14	0	36	27	3	0	0
Total	**365**	**10**	**316**	**168**	**13**	**8**	**20**

Mode Split by Distance from School



Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	50%	0%	32%	11%	3%	0%	5%
1/4 - 1/2 mile	67%	0%	14%	19%	0%	0%	0%
1/2 - 1 mile	54%	0%	26%	15%	2%	0%	4%
1 - 2 miles	22%	3%	48%	23%	0%	3%	0%
More than 2 miles	18%	0%	45%	34%	4%	0%	0%
Total	**41%**	**1%**	**35%**	**19%**	**1%**	**1%**	**2%**

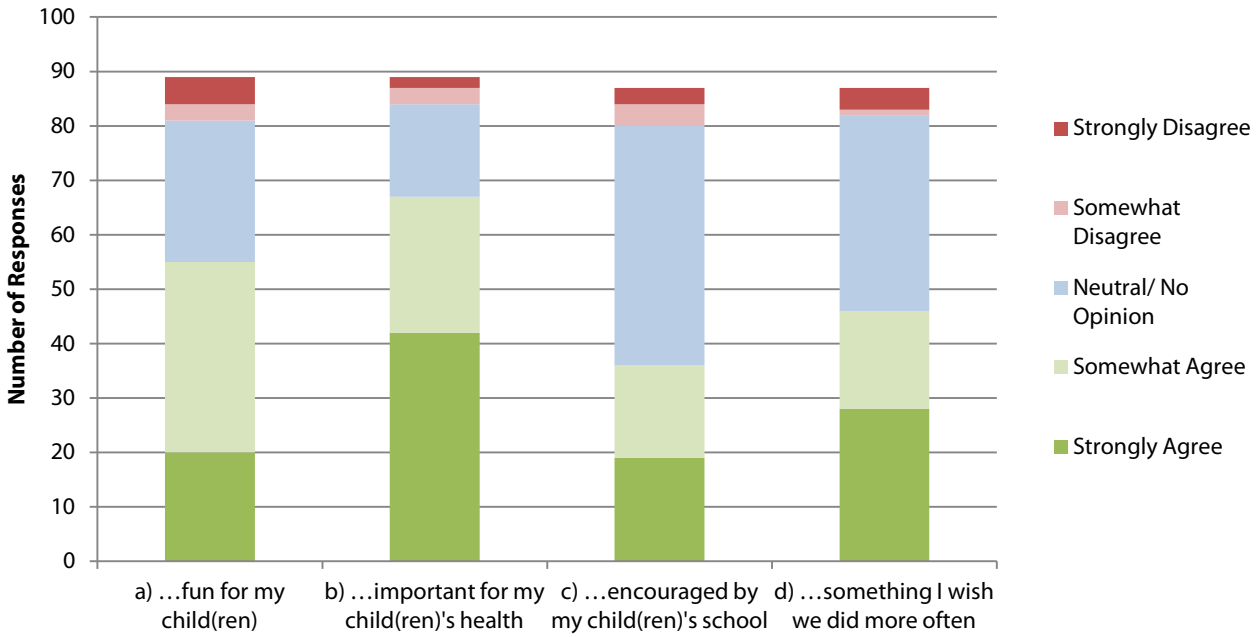
Weekly Miles Traveled by Mode



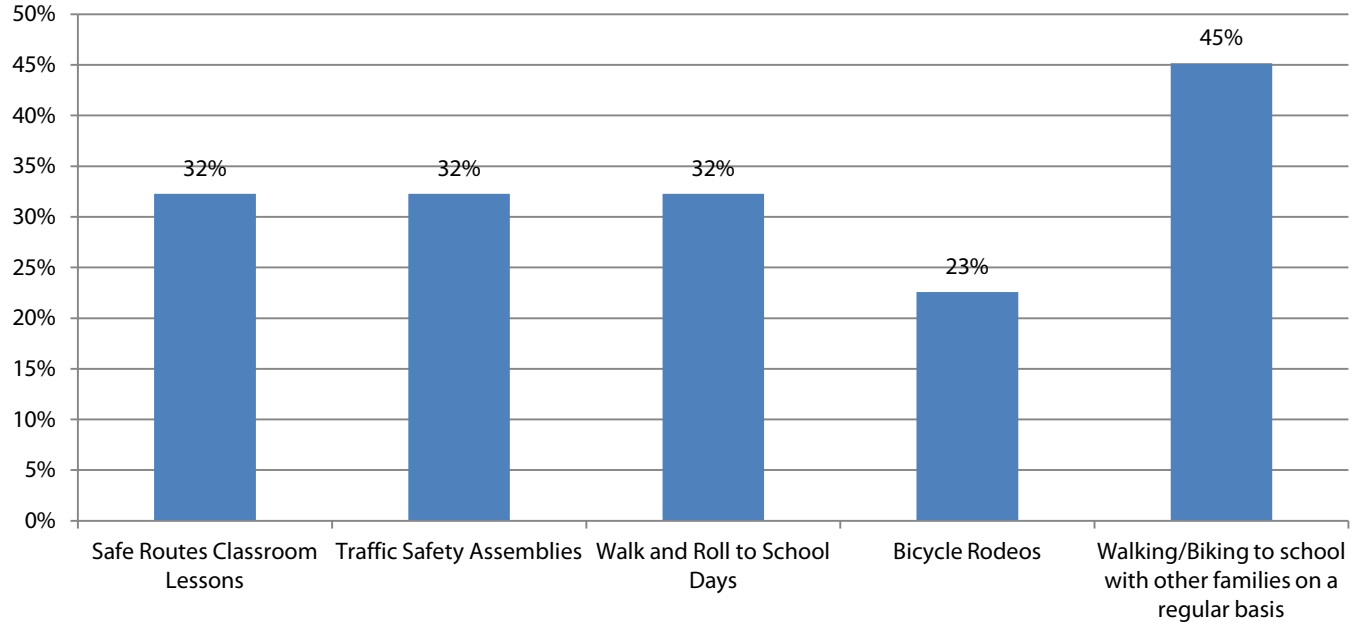
	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
All Trips	120	15	333	195	12	12	8
Percent of Total Mileage	17%	2%	48%	28%	2%	2%	1%

Note:This analysis uses the mode frequency by respondent and assumes the median of the distance from school categories or the respondent-provided distance if greater than two miles.

How strongly do you agree or disagree with the following statement? a. n=89 b. n=89 c. n=87 d. n=87

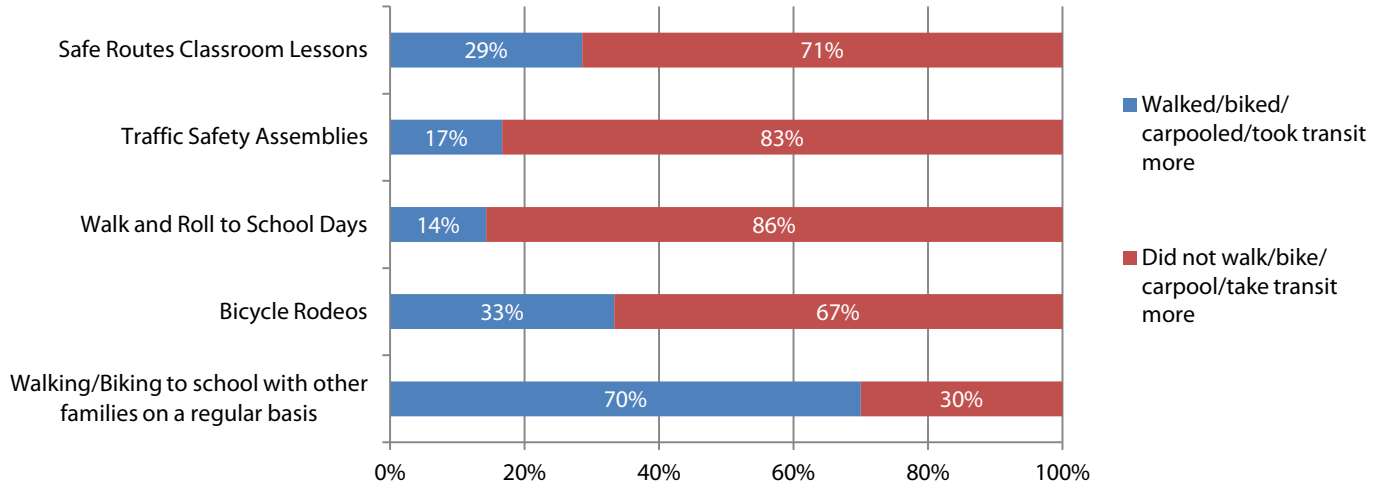


Have you or your child(ren) participated in the following Safe Routes events/programs?



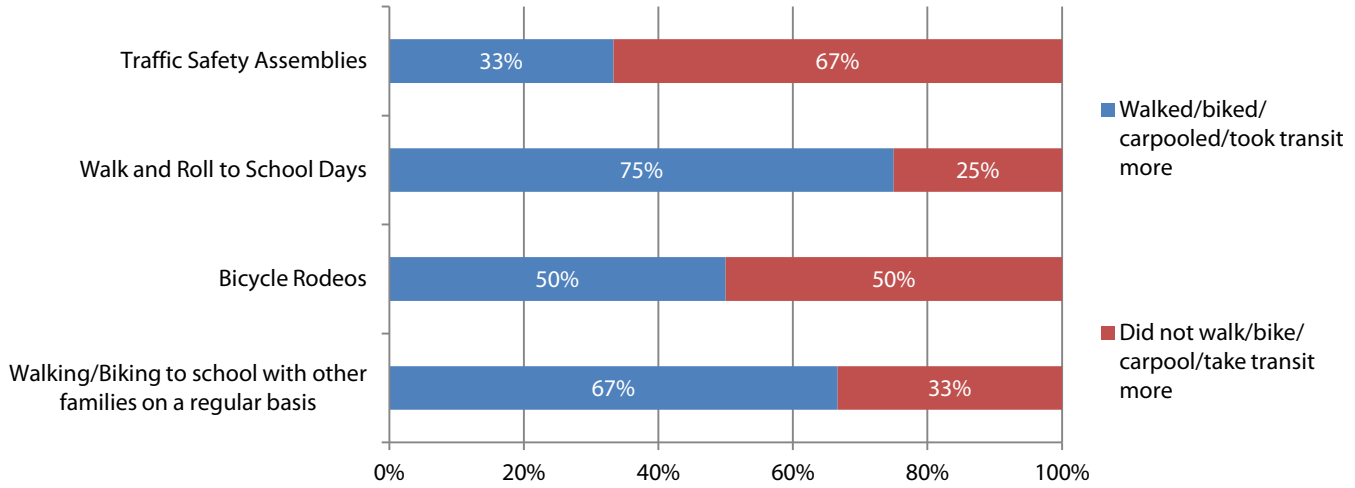
For any events/programs you answered "yes" for in the previous question, did your child(ren) walk, bike, or carpool more often after participating?

Note: Includes responses from respondents who previously indicated that they had participated in the specific program.



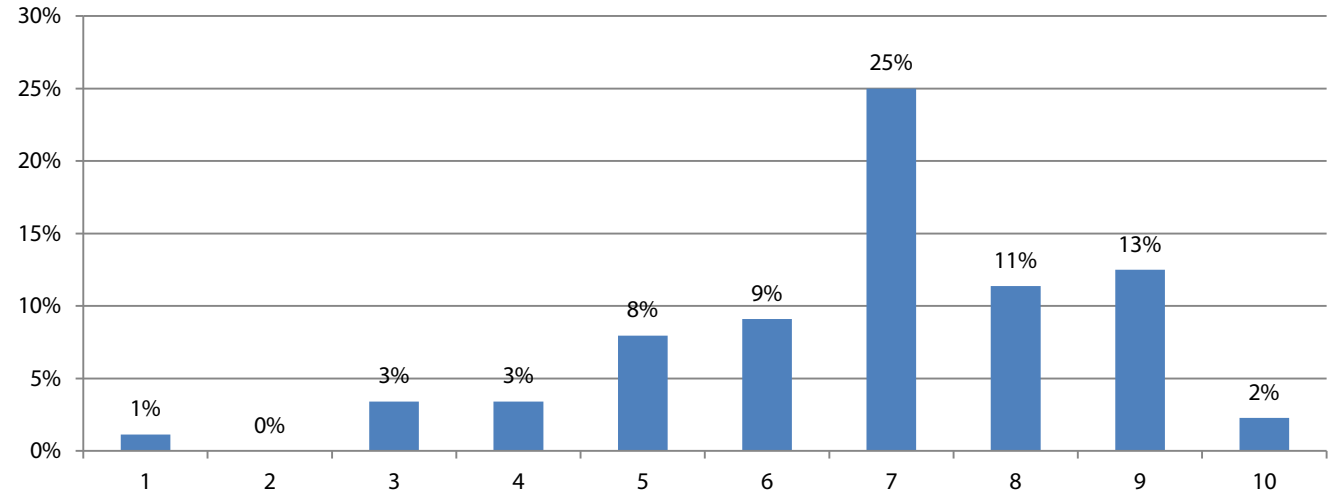
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	2	5
Traffic Safety Assemblies	1	5
Walk and Roll to School Days	1	6
Bicycle Rodeos	1	2
Walking/Biking to school with other families on a regular basis	7	3

If you have participated in the Safe Routes program, do you drive yourself or your child(ren) less often for non-school



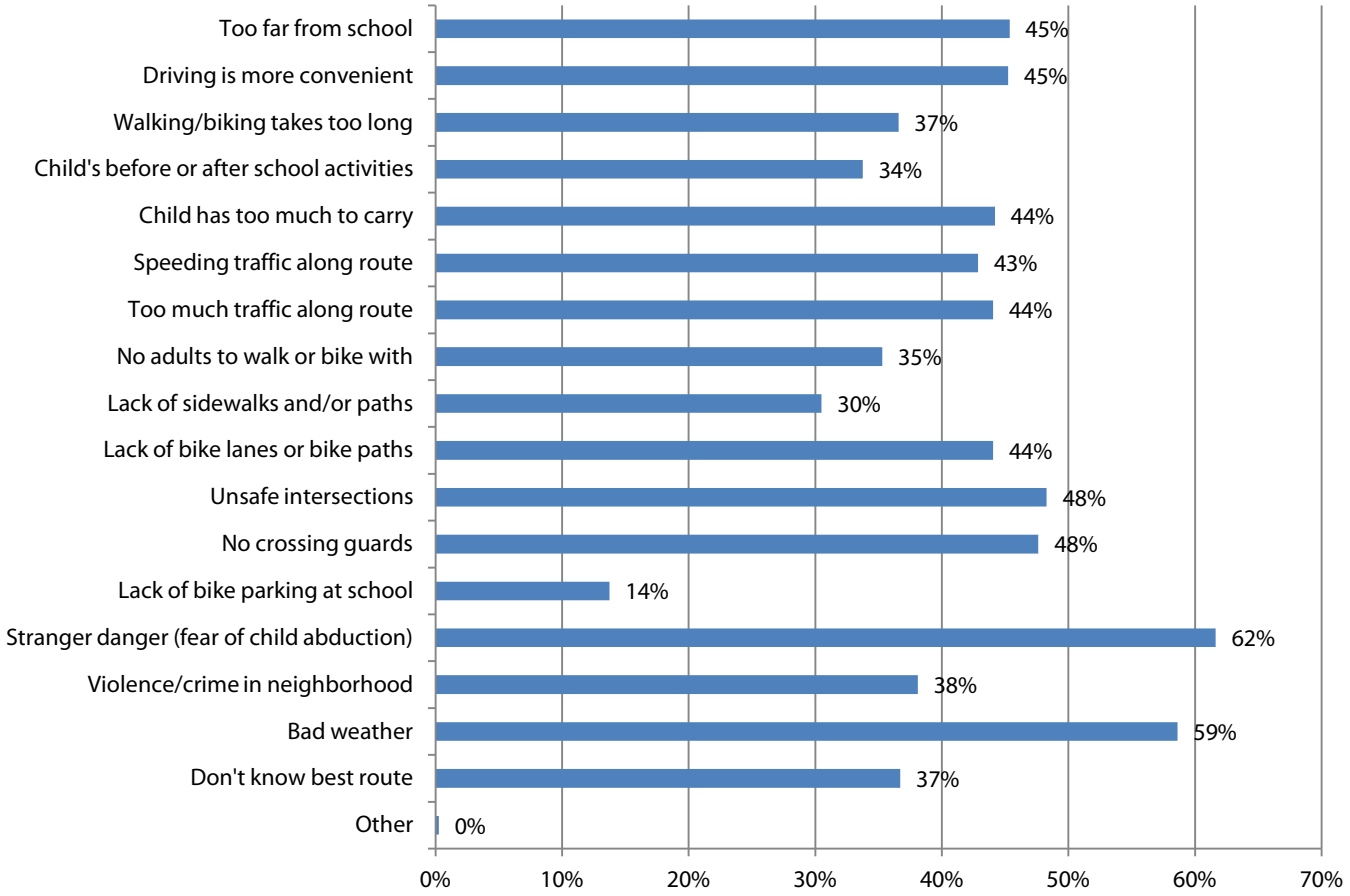
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	4	1
Traffic Safety Assemblies	1	2
Walk and Roll to School Days	3	1
Bicycle Rodeos	2	2
Walking/Biking to school with other families on a regular basis	4	2

At what grade level would you allow your child(ren) to walk or bike to/from school without an adult?



* *"I would not feel comfortable at any grade"*

What concerns limit your child(ren)'s ability to walk or bike to/from school? *n=598*

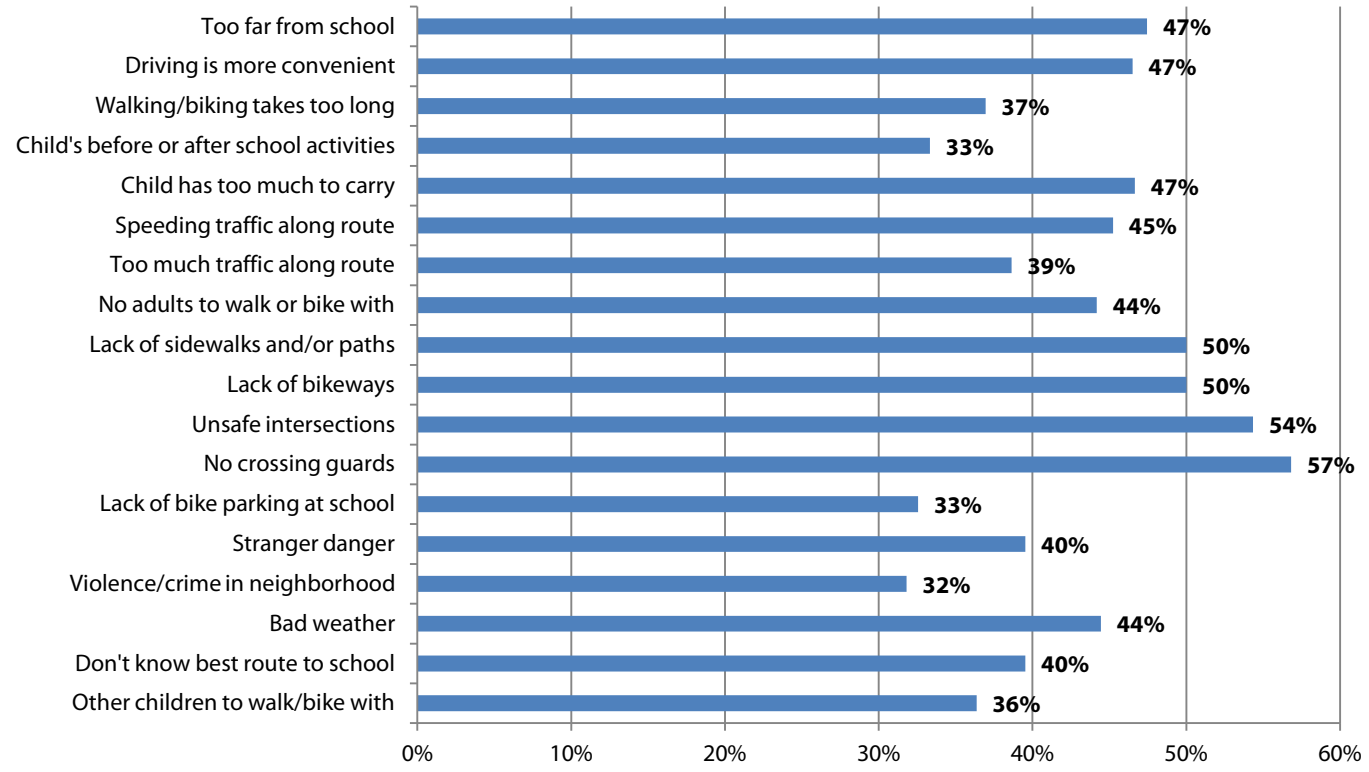


Concern	Yes	Percent
Too far from school	39	45%
Driving is more convenient	38	45%
Walking/biking takes too long	30	37%
Child(ren)'s before or after school activities	27	34%
Child has too much to carry	38	44%
Speeding traffic along route	36	43%
Too much traffic along route	37	44%
No adults to walk or bike with	30	35%
Lack of sidewalks and/or paths	25	30%
Lack of bikeways	37	44%

Concern	Yes	Percent
Unsafe intersections	42	48%
No crossing guards	40	48%
Lack of bike parking at school	11	14%
Stranger danger (fear of child abduction)	53	62%
Violence/crime in neighborhood	32	38%
Bad weather	51	59%
Don't know best route	29	37%
Other	3	0%

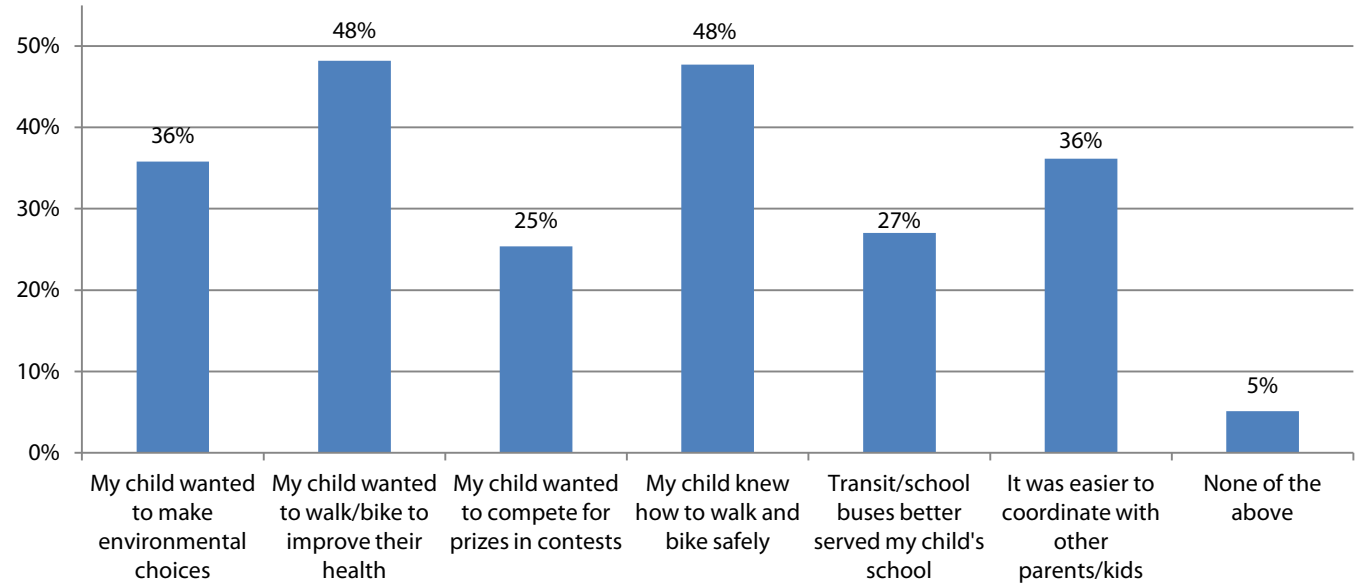
Would you allow your child(ren) to walk/bike more often if this concern was addressed?

Chart shows "yes" responses.

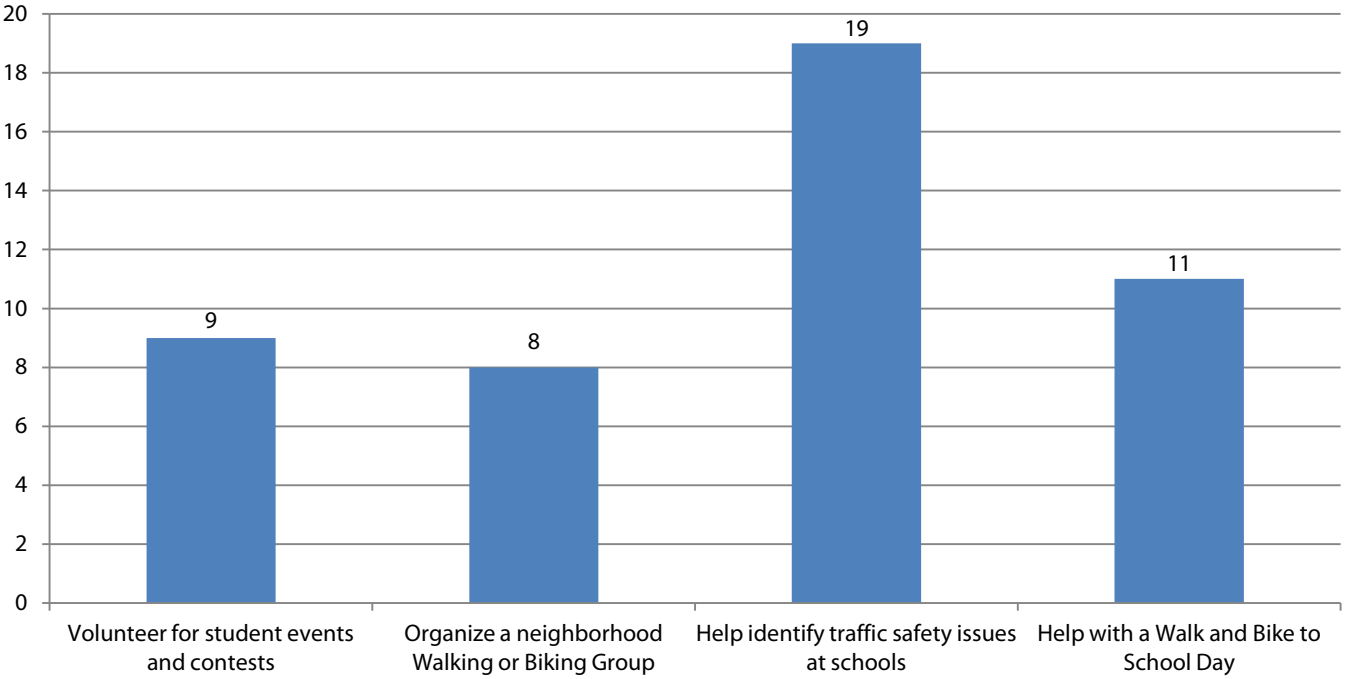


	Yes	No	Not Sure	Total
Too far from school	28	20	11	59
Driving is more convenient	20	12	11	43
Walking/biking takes too long	17	16	13	46
Child's before or after school activities	14	18	10	42
Child has too much to carry	21	14	10	45
Speeding traffic along route	19	13	10	42
Too much traffic along route	17	16	11	44
No adults to walk or bike with	19	14	10	43
Lack of sidewalks and/or paths	21	12	9	42
Lack of bikeways	22	14	8	44
Unsafe intersections	25	11	10	46
No crossing guards	25	10	9	44
Lack of bike parking at school	14	20	9	43
Stranger danger	17	15	11	43
Violence/crime in neighborhood	14	17	13	44
Bad weather	20	14	11	45
Don't know best route to school	17	16	10	43

I would reduce the number of times I drive my child(ren) to school if... *n=129*



Are you interested in participating in any of the following activities?



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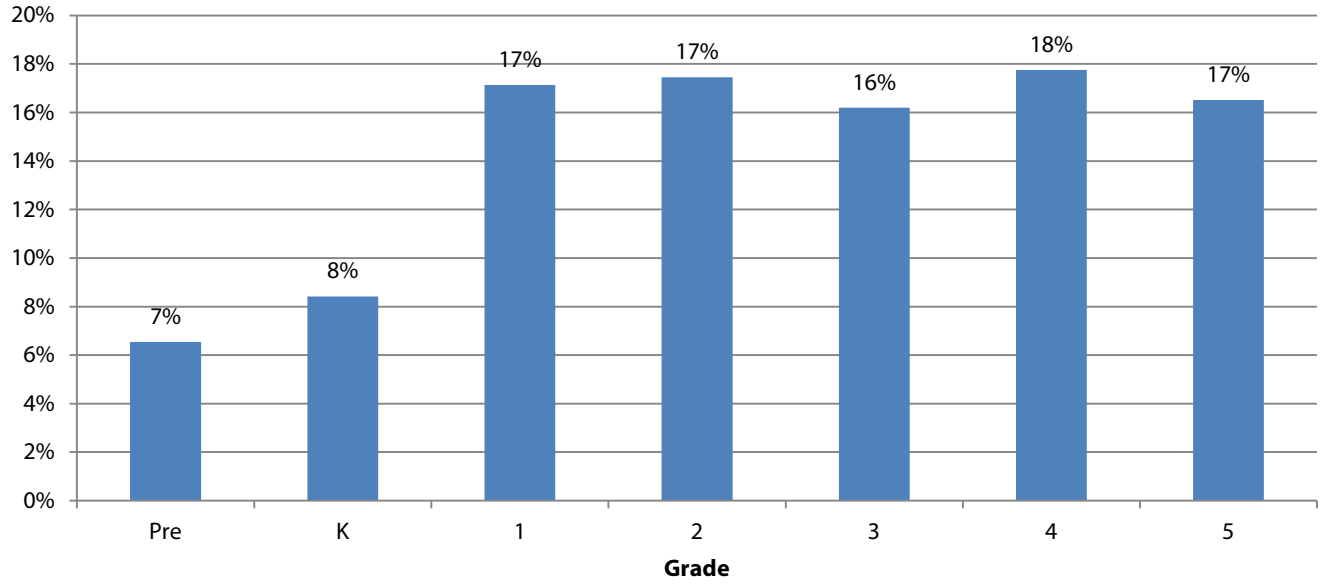
City of Wasco Safe Routes to School Parent/Caregiver Survey Report

School: Palm Avenue Elementary School
Date Collected: Fall 2012
Total Surveys Returned: 327

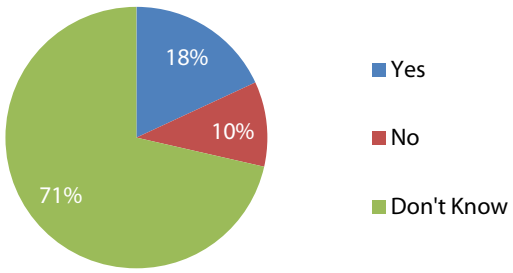
Gender *n= 311*

Gender	Count	Percent
Male	145	47%
Female	166	53%

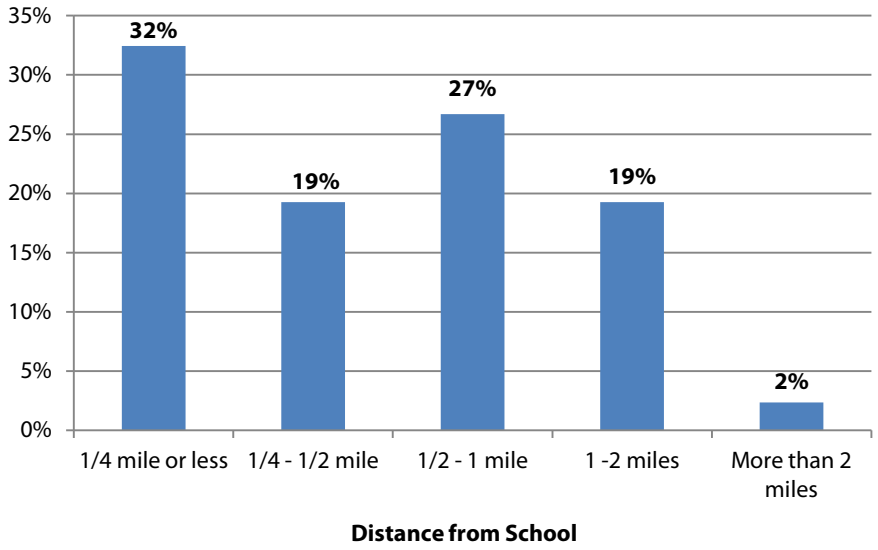
Grades *n= 321*



Does this school have a Safe Routes to Schools Program? *n= 315*



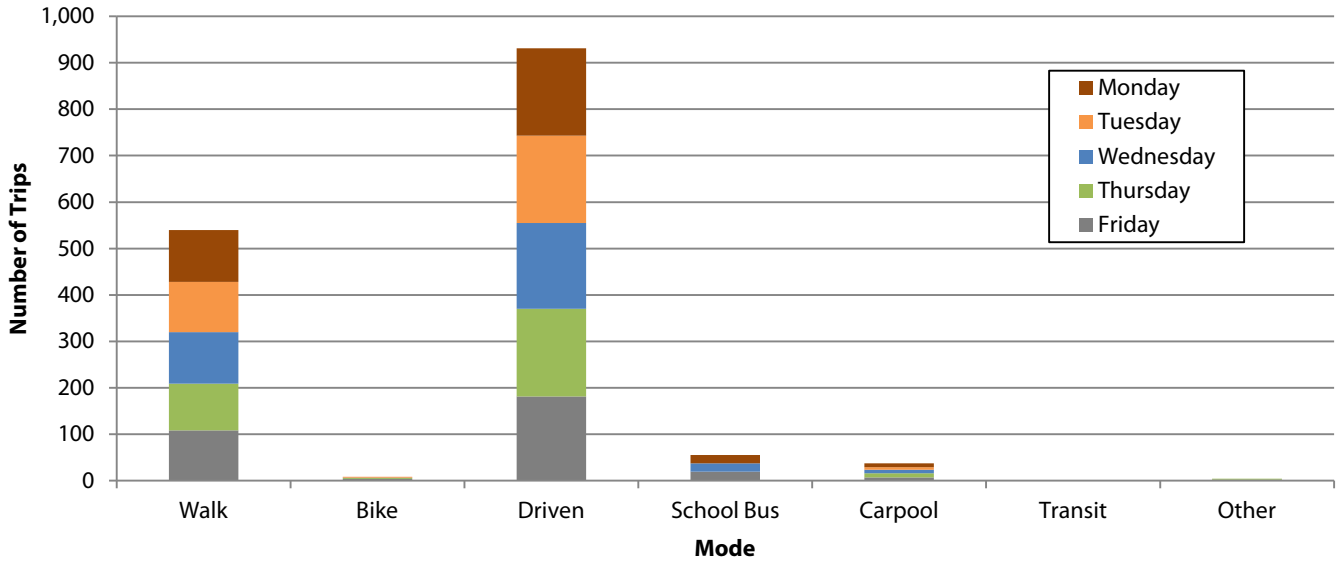
What is the approximate distance from your home to the school? *n=296*



	Number	Percent
1/4 mile or less	96	32%
1/4 - 1/2 mile	57	19%
1/2 - 1 mile	79	27%
1 -2 miles	57	19%
More than 2 miles	7	2%
Total	**296**	**100%**

Last week, how did your child get TO school? *n=326*

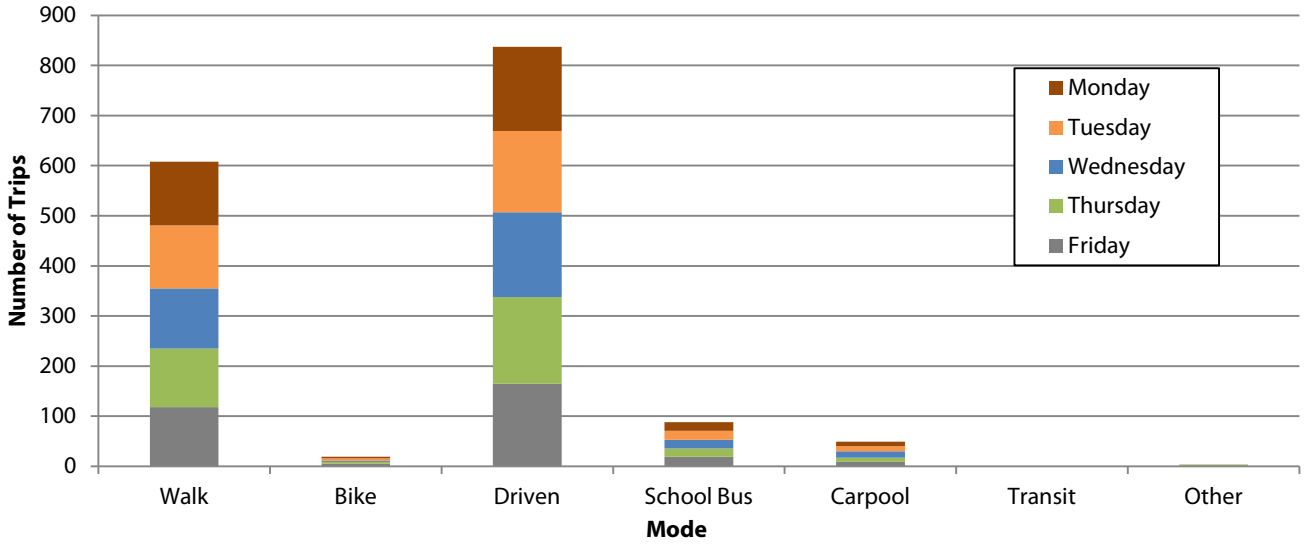
Mode by day of the week



Travel to School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	112	0	188	18	8	0	0
Tuesday	108	2	188	0	6	0	0
Wednesday	111	1	185	18	7	0	0
Thursday	101	2	189	0	9	0	2
Friday	108	3	181	19	7	0	2
Total trips	**540**	**8**	**931**	**55**	**37**	**0**	**4**
Percent of trips	34%	1%	59%	3%	2%	0%	0%

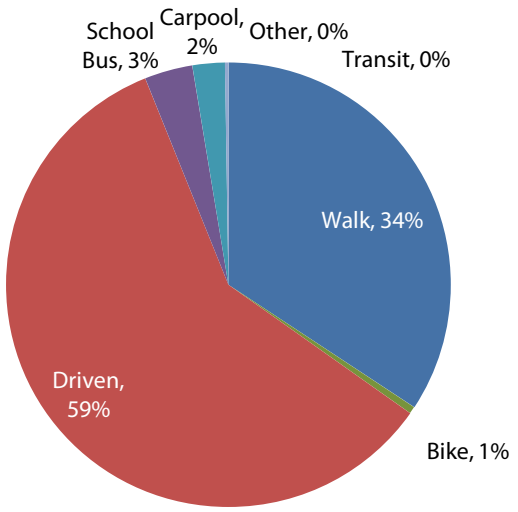
Last week, how did your child get FROM school? *n=324*

Mode by day of the week

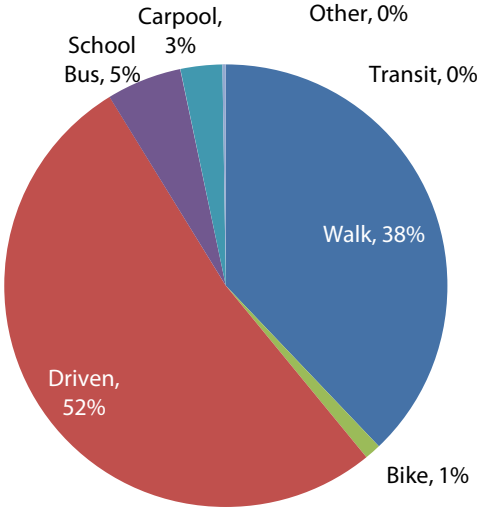


Travel from School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	127	3	168	17	9	0	0
Tuesday	126	5	162	18	10	0	0
Wednesday	120	2	169	17	13	0	0
Thursday	117	4	173	17	8	0	2
Friday	118	5	165	19	9	0	2
Total trips	**608**	**19**	**837**	**88**	**49**	**0**	**4**
Percent of trips	38%	1%	52%	5%	3%	0%	0%

Mode Split TO school

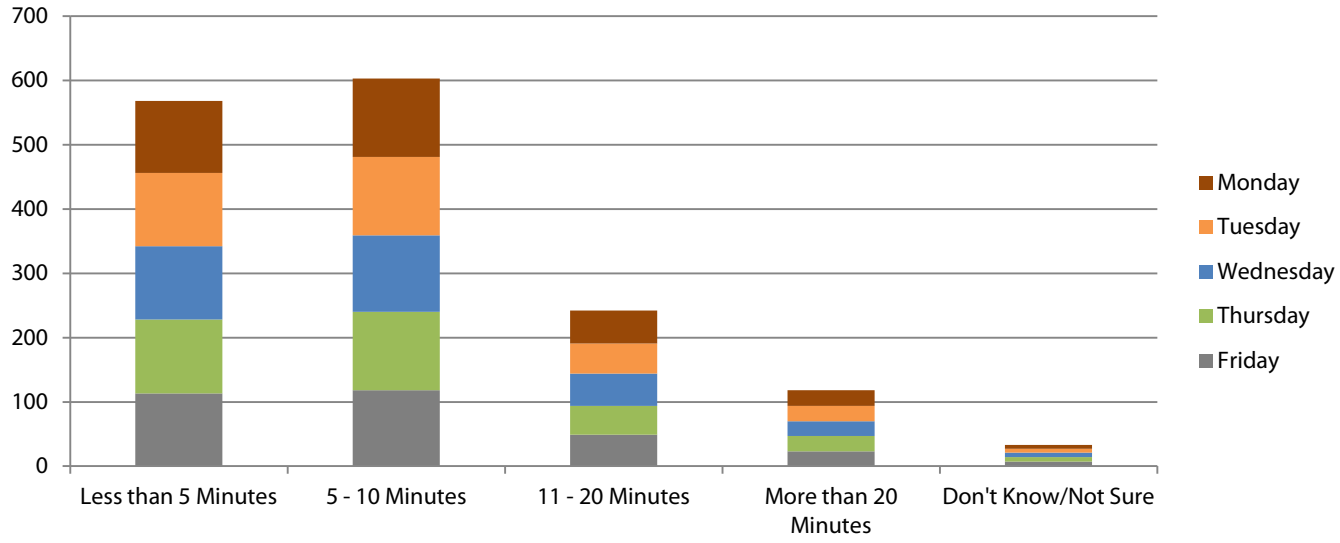


Mode Split FROM school



Last week, how long did it take to travel TO school? *n=315*

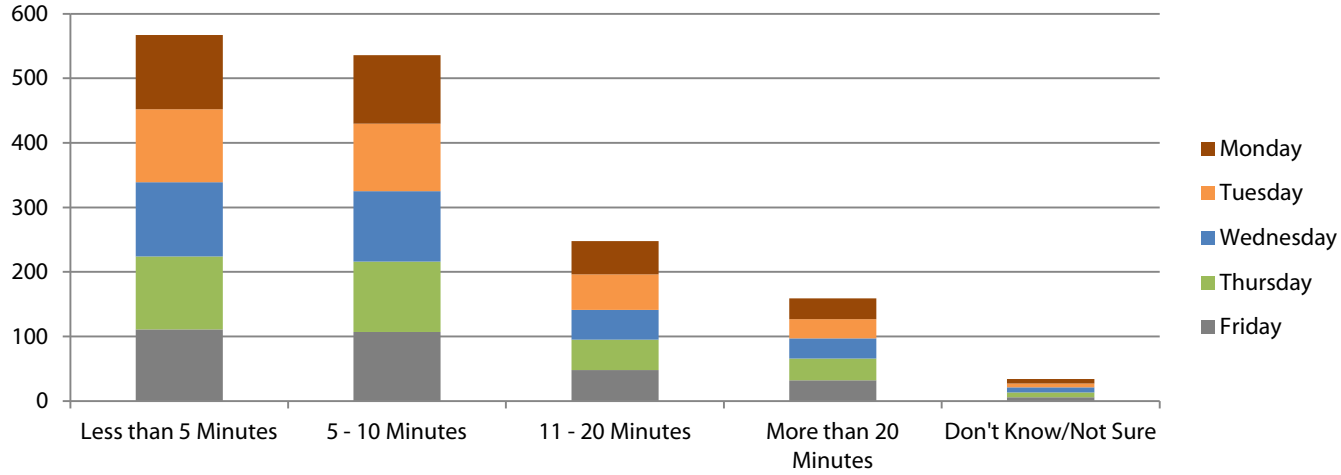
Travel time by day of the week



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	112	122	51	24	6
Tuesday	114	122	47	24	6
Wednesday	114	119	50	23	7
Thursday	115	122	45	24	7
Friday	113	118	49	23	7
Total Trips	**568**	**603**	**242**	**118**	**33**
Percent of trips	36.3%	38.6%	15.5%	7.5%	2.1%

Last week, how long did it take to travel FROM school? *n=312*

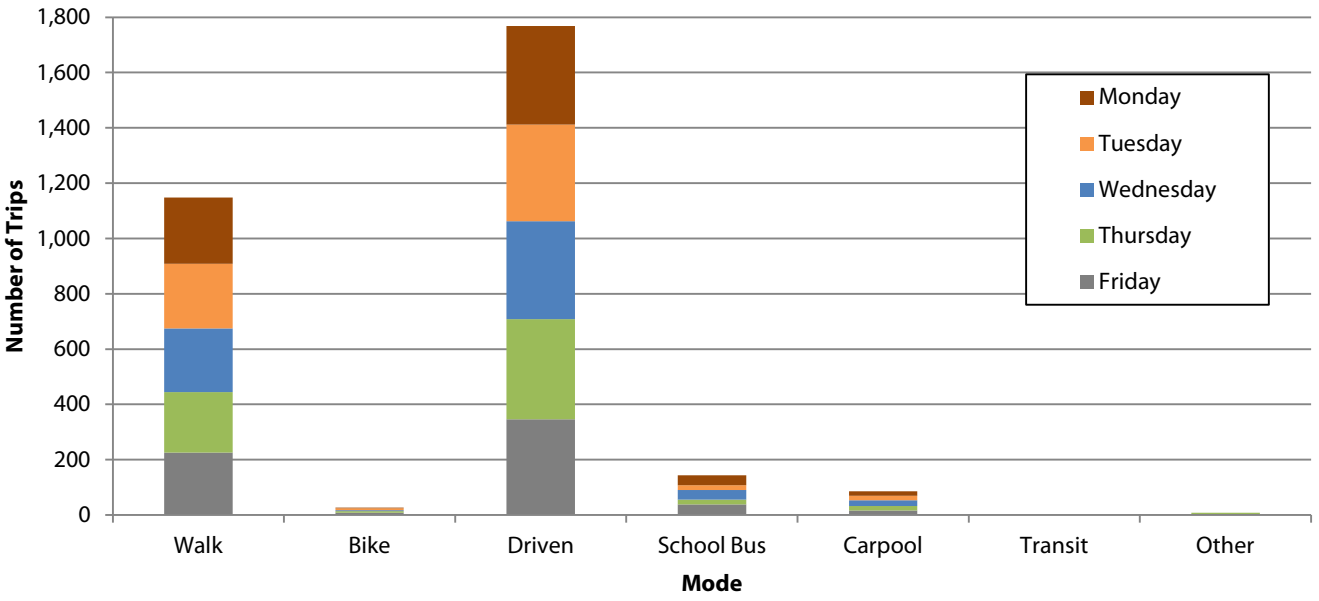
Travel time by day of the week



Travel from school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	115	106	52	32	7
Tuesday	113	105	55	30	6
Wednesday	115	109	46	31	8
Thursday	113	109	47	34	7
Friday	111	107	48	32	6
Total Trips	**567**	**536**	**248**	**159**	**34**
Percent of trips	36.7%	34.7%	16.1%	10.3%	2.2%

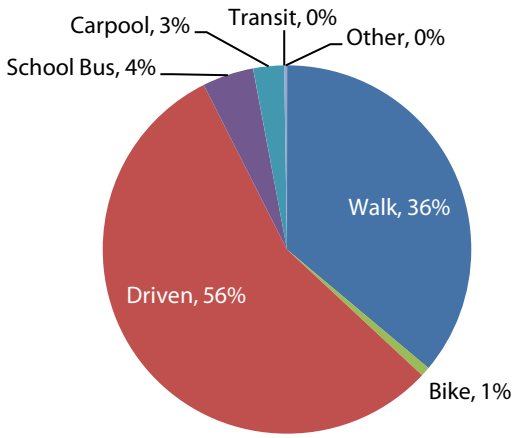
Overall Mode Split TO and FROM School

Mode by day of the week



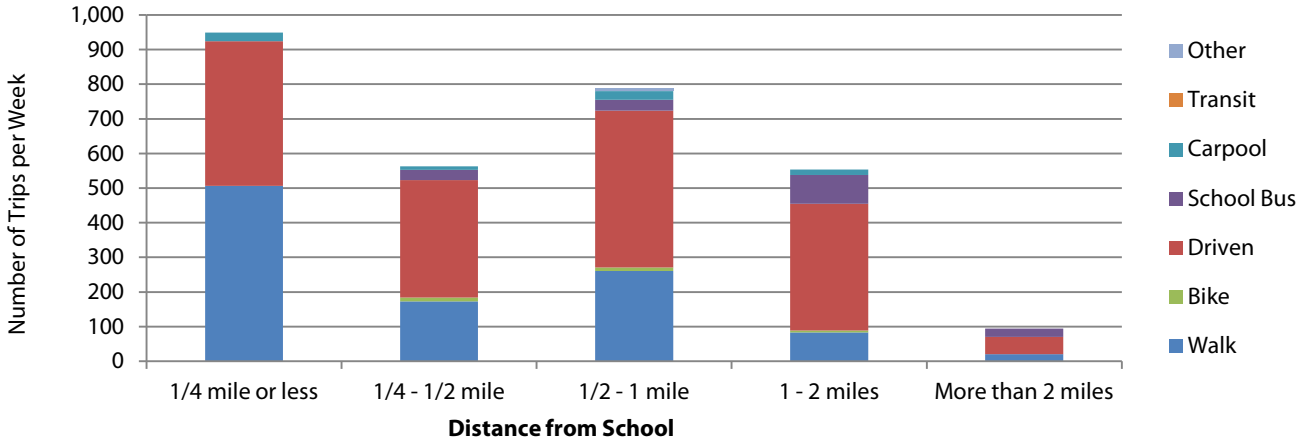
Travel for all trips	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	239	3	356	35	17	0	0
Tuesday	234	7	350	18	16	0	0
Wednesday	231	3	354	35	20	0	0
Thursday	218	6	362	17	17	0	4
Friday	226	8	346	38	16	0	4
Total trips	1148	27	1768	143	86	0	8

Mode split for all trips



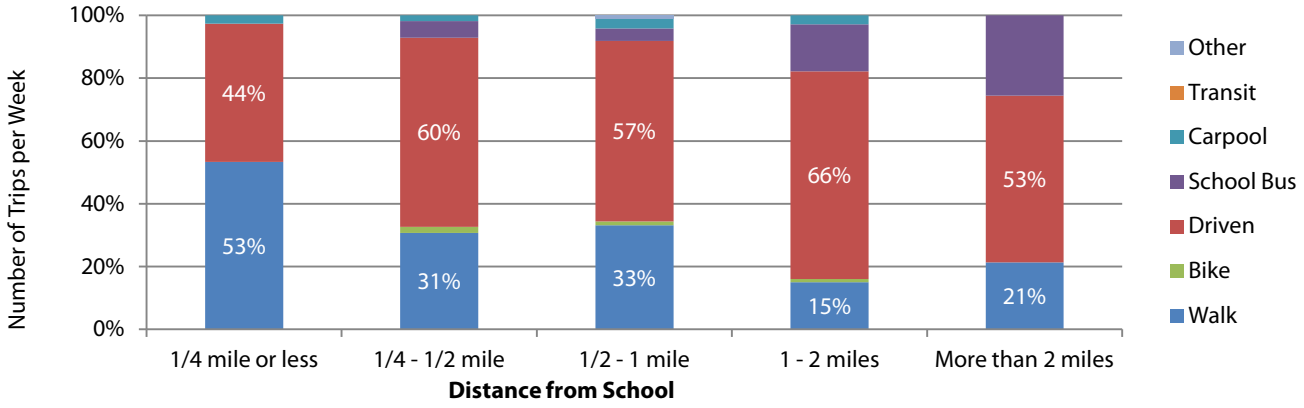
Weekly Trips by Mode and Distance from School

Mode by distance from school



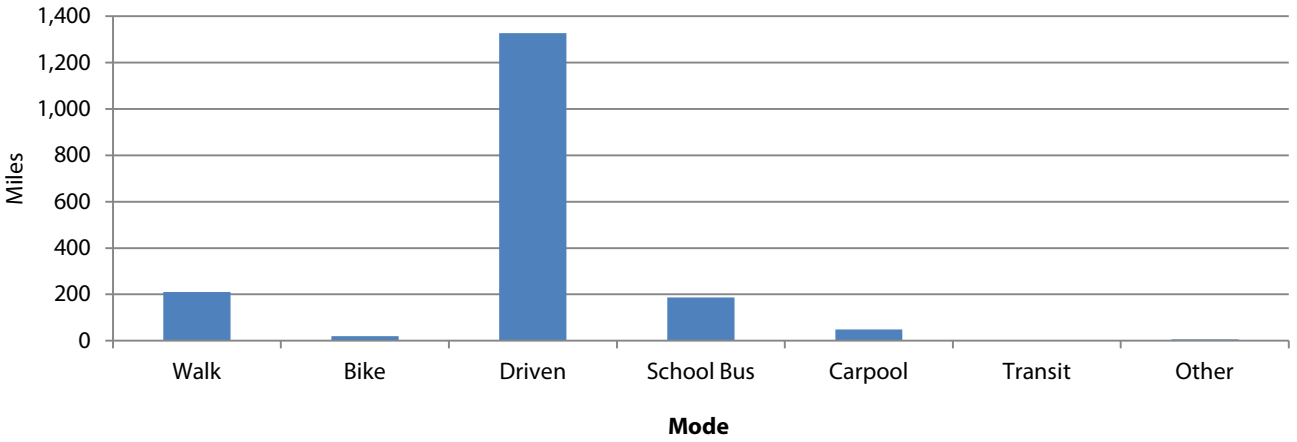
Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	506	0	418	0	25	0	0
1/4 - 1/2 mile	173	11	339	30	10	0	0
1/2 - 1 mile	261	10	453	31	25	0	8
1 - 2 miles	83	6	366	83	16	0	0
More than 2 miles	20	0	50	24	0	0	0
Total	**1,043**	**27**	**1,626**	**168**	**76**	**0**	**8**

Mode Split by Distance from School



Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	53%	0%	44%	0%	3%	0%	0%
1/4 - 1/2 mile	31%	2%	60%	5%	2%	0%	0%
1/2 - 1 mile	33%	1%	57%	4%	3%	0%	1%
1 - 2 miles	15%	1%	66%	15%	3%	0%	0%
More than 2 miles	21%	0%	53%	26%	0%	0%	0%
Total	**35%**	**1%**	**55%**	**6%**	**3%**	**0%**	**0%**

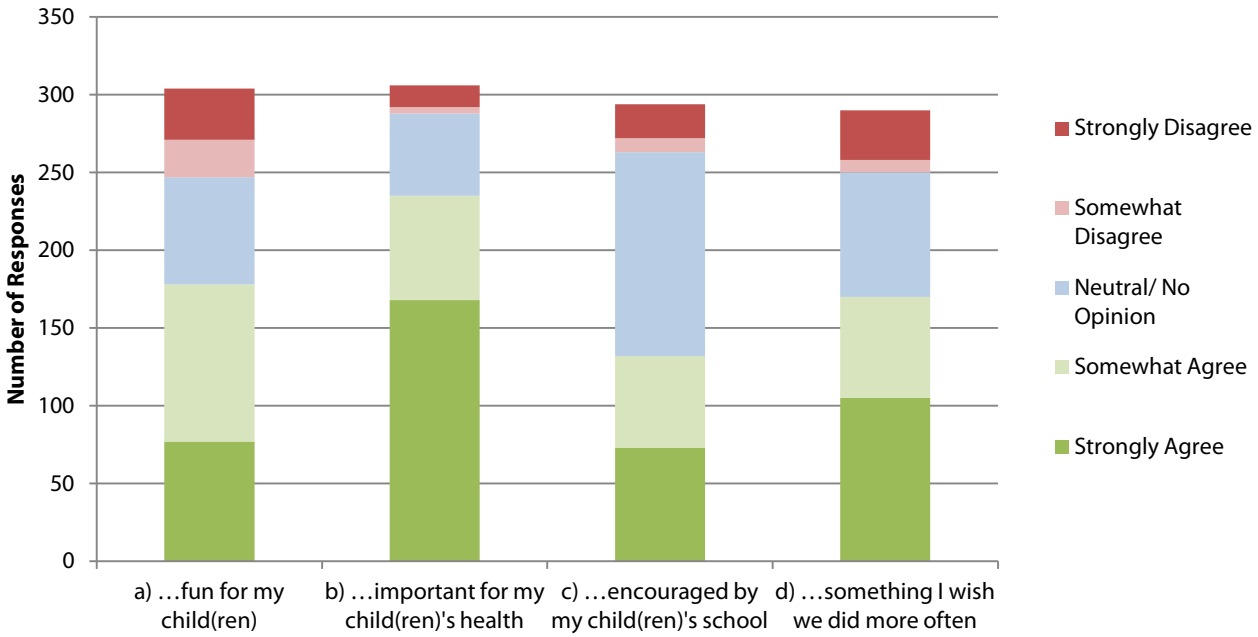
Weekly Miles Traveled by Mode



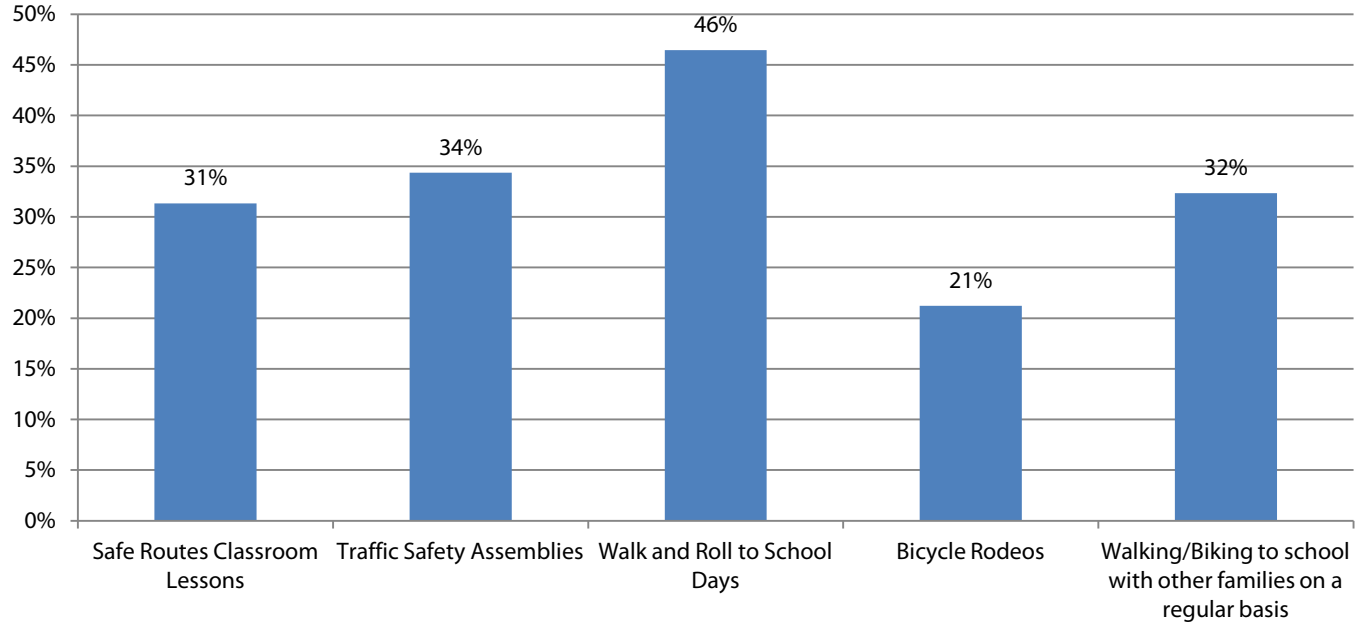
	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
All Trips	210	20	1,327	187	49	0	6
Percent of Total Mileage	12%	1%	74%	10%	3%	0%	0%

Note:This analysis uses the mode frequency by respondent and assumes the median of the distance from school categories or the respondent-provided distance if greater than two miles.

How strongly do you agree or disagree with the following statement? a. n=304 b. n=306 c. n=294 d. n=290

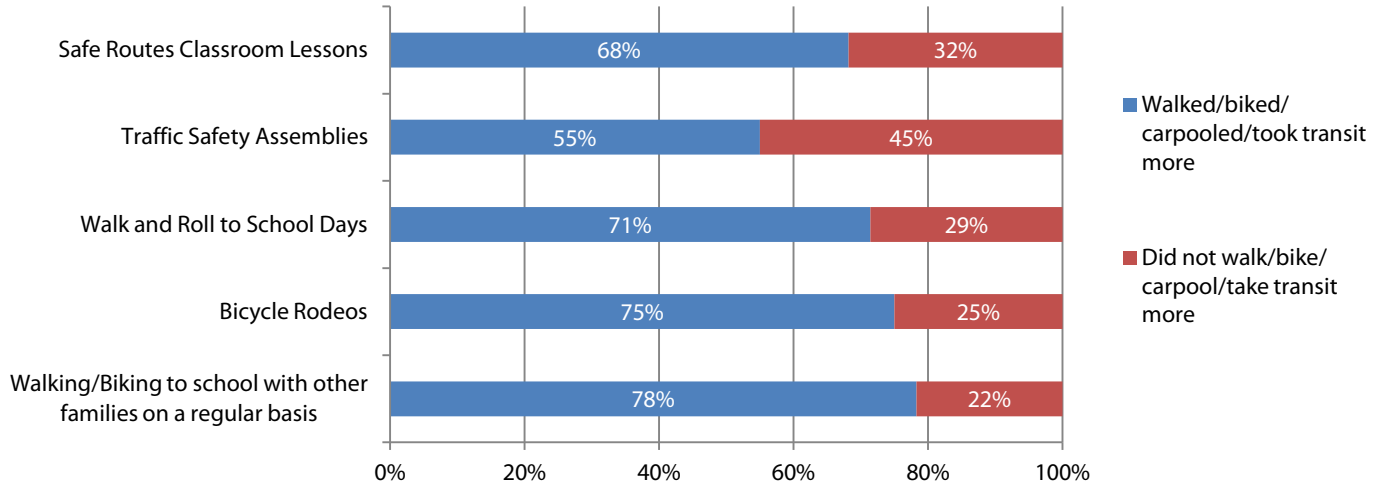


Have you or your child(ren) participated in the following Safe Routes events/programs?



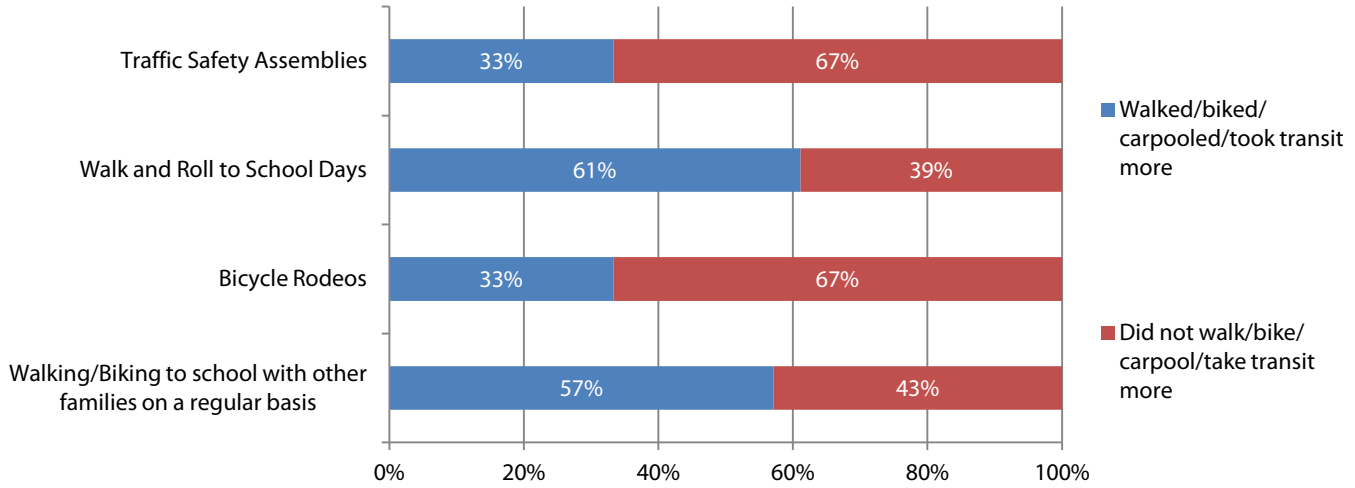
For any events/programs you answered "yes" for in the previous question, did your child(ren) walk, bike, or carpool more often after participating?

Note: Includes responses from respondents who previously indicated that they had participated in the specific program.



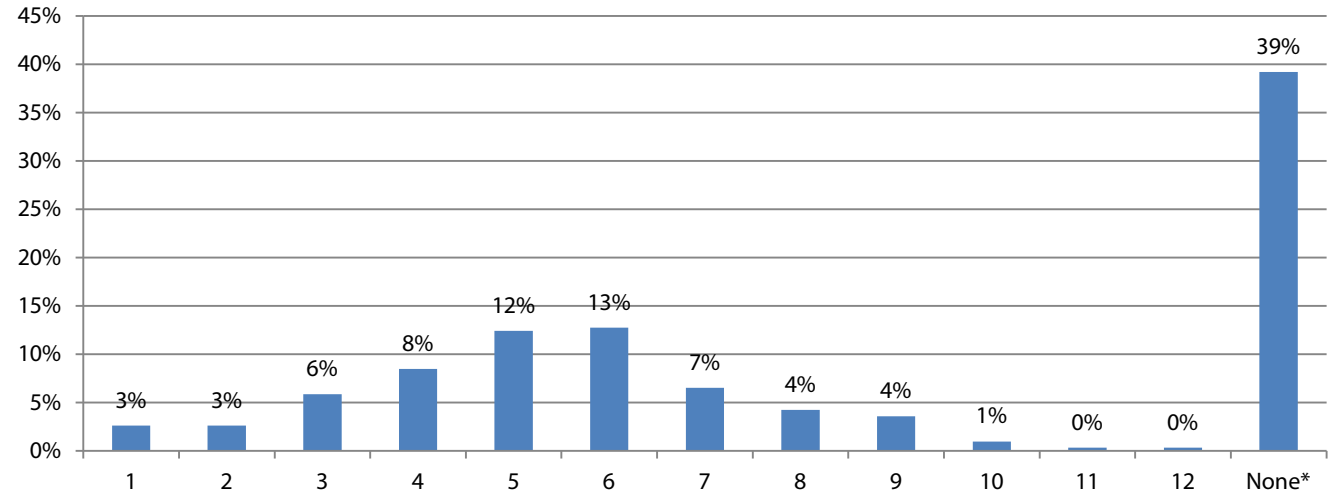
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	15	7
Traffic Safety Assemblies	11	9
Walk and Roll to School Days	20	8
Bicycle Rodeos	9	3
Walking/Biking to school with other families on a regular basis	18	5

If you have participated in the Safe Routes program, do you drive yourself or your child(ren) less often for non-school



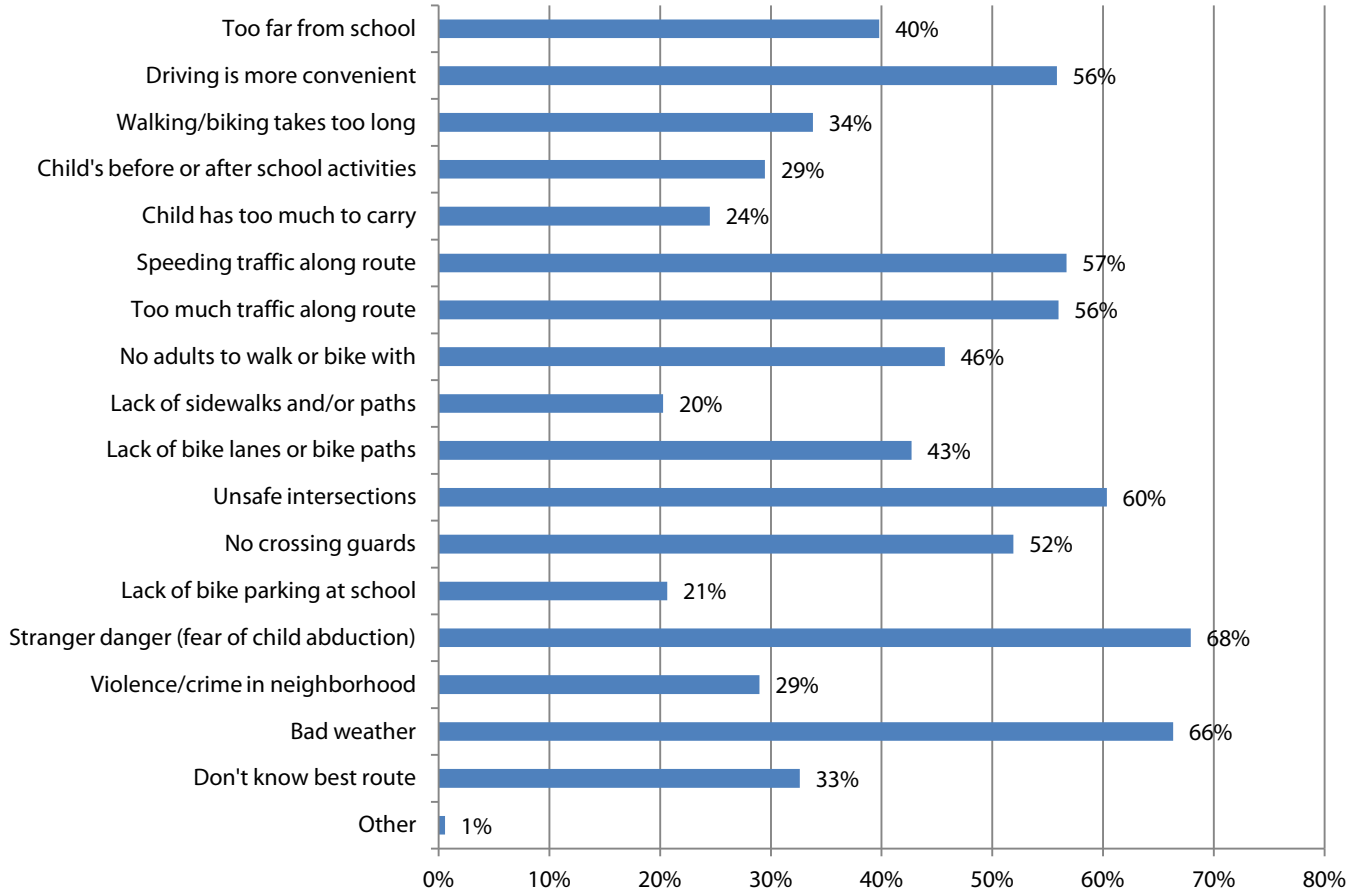
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	5	9
Traffic Safety Assemblies	3	6
Walk and Roll to School Days	11	7
Bicycle Rodeos	2	4
Walking/Biking to school with other families on a regular basis	8	6

At what grade level would you allow your child(ren) to walk or bike to/from school without an adult?



* *"I would not feel comfortable at any grade"*

What concerns limit your child(ren)'s ability to walk or bike to/from school? *n=2131*

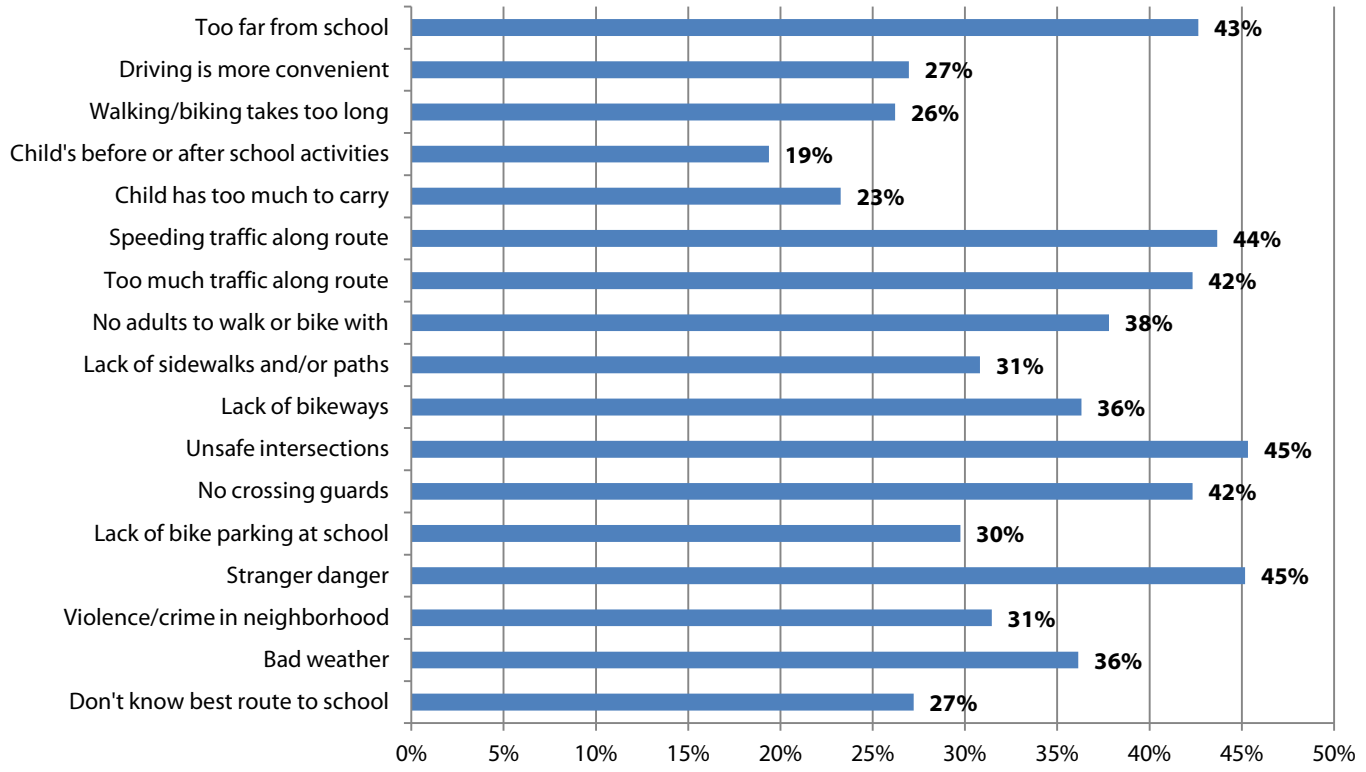


Concern	Yes	Percent
Too far from school	119	40%
Driving is more convenient	163	56%
Walking/biking takes too long	99	34%
Child(ren)'s before or after school activities	79	29%
Child has too much to carry	71	24%
Speeding traffic along route	165	57%
Too much traffic along route	164	56%
No adults to walk or bike with	133	46%
Lack of sidewalks and/or paths	57	20%
Lack of bikeways	123	43%

Concern	Yes	Percent
Unsafe intersections	175	60%
No crossing guards	150	52%
Lack of bike parking at school	58	21%
Stranger danger (fear of child abduction)	199	68%
Violence/crime in neighborhood	82	29%
Bad weather	197	66%
Don't know best route	90	33%
Other	7	1%

Would you allow your child(ren) to walk/bike more often if this concern was addressed?

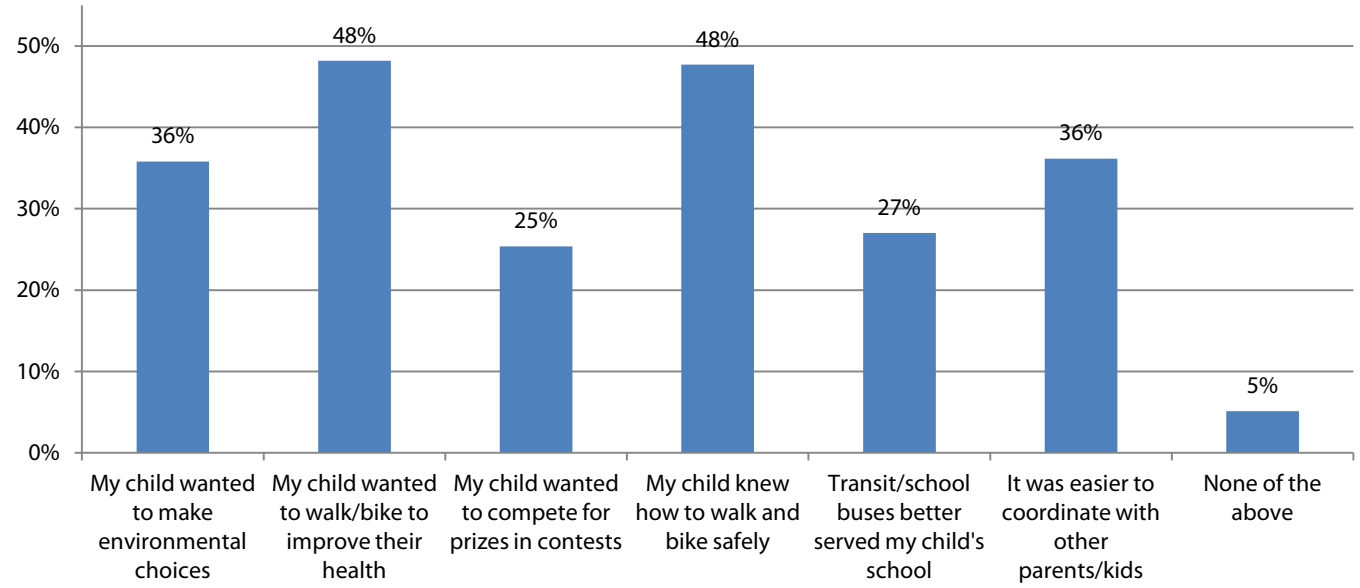
Chart shows "yes" responses.



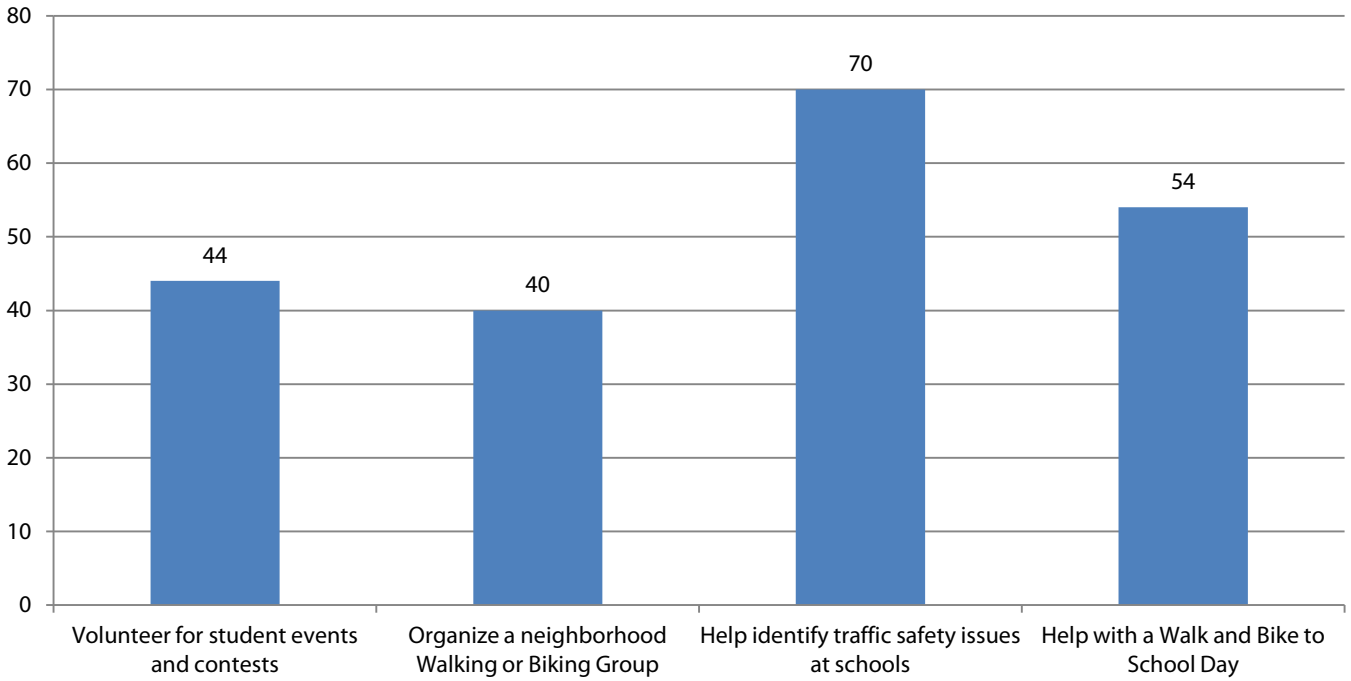
	Yes	No	Not Sure	Total
Too far from school	84	71	42	197
Driving is more convenient	48	69	61	178
Walking/biking takes too long	43	74	47	164
Child's before or after school activities	31	82	47	160
Child has too much to carry	37	85	37	159
Speeding traffic along route	69	55	34	158
Too much traffic along route	69	52	42	163
No adults to walk or bike with	62	64	38	164
Lack of sidewalks and/or paths	49	70	40	159
Lack of bikeways	57	65	35	157
Unsafe intersections	73	50	38	161
No crossing guards	69	52	42	163
Lack of bike parking at school	47	74	37	158
Stranger danger	75	52	39	166
Violence/crime in neighborhood	50	68	41	159
Bad weather	60	65	41	166
Don't know best route to school	43	76	39	158

I would reduce the number of times I drive my child(ren) to school if...

n=438



Are you interested in participating in any of the following activities?



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City of Wasco Safe Routes to School Parent/Caregiver Survey Report

School: John L. Prueitt Elementary School
Date Collected: Fall 2012
Total Surveys Returned: 247

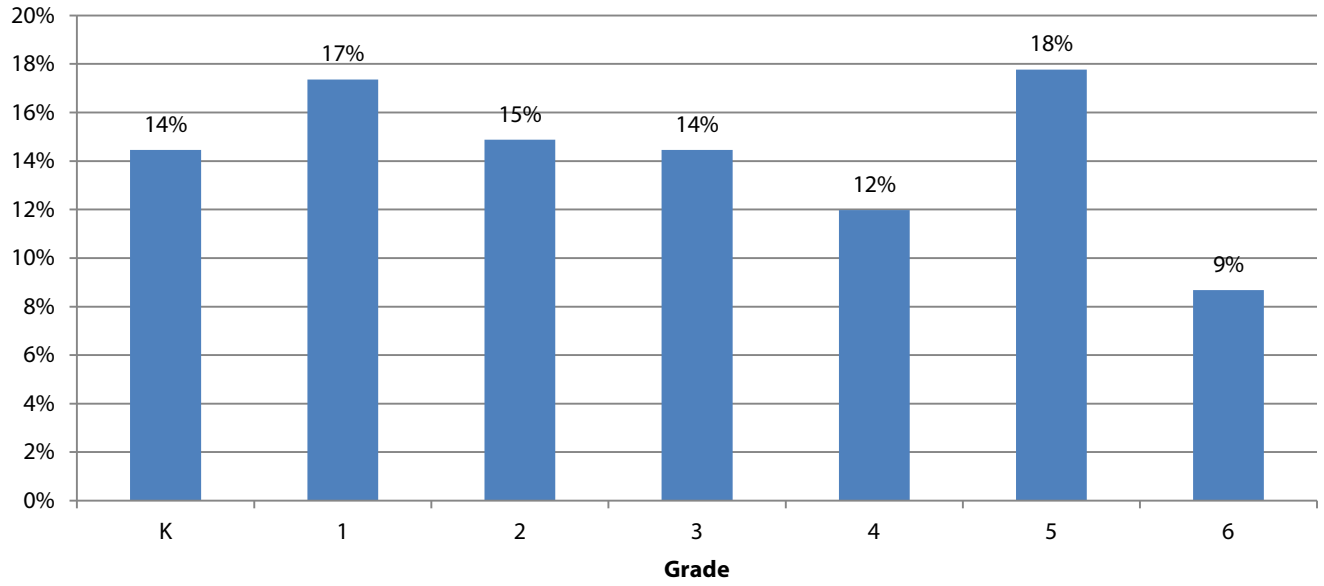
Gender

n= 231

Gender	Count	Percent
Male	103	45%
Female	128	55%

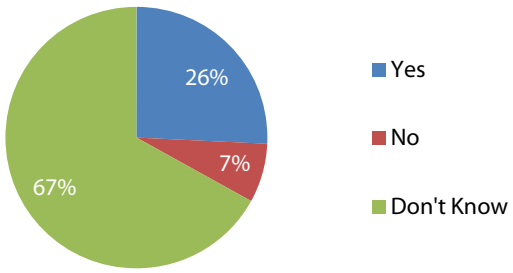
Grades

n= 242

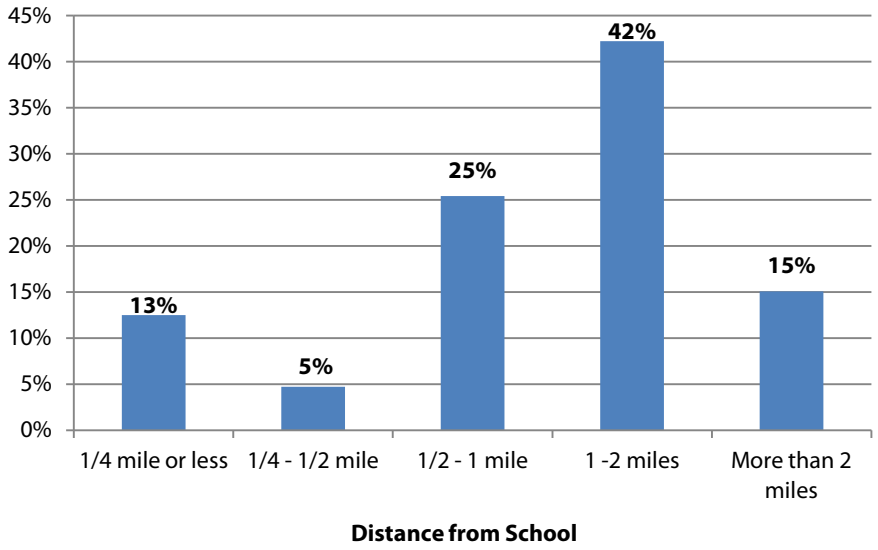


Does this school have a Safe Routes to Schools Program?

n= 233



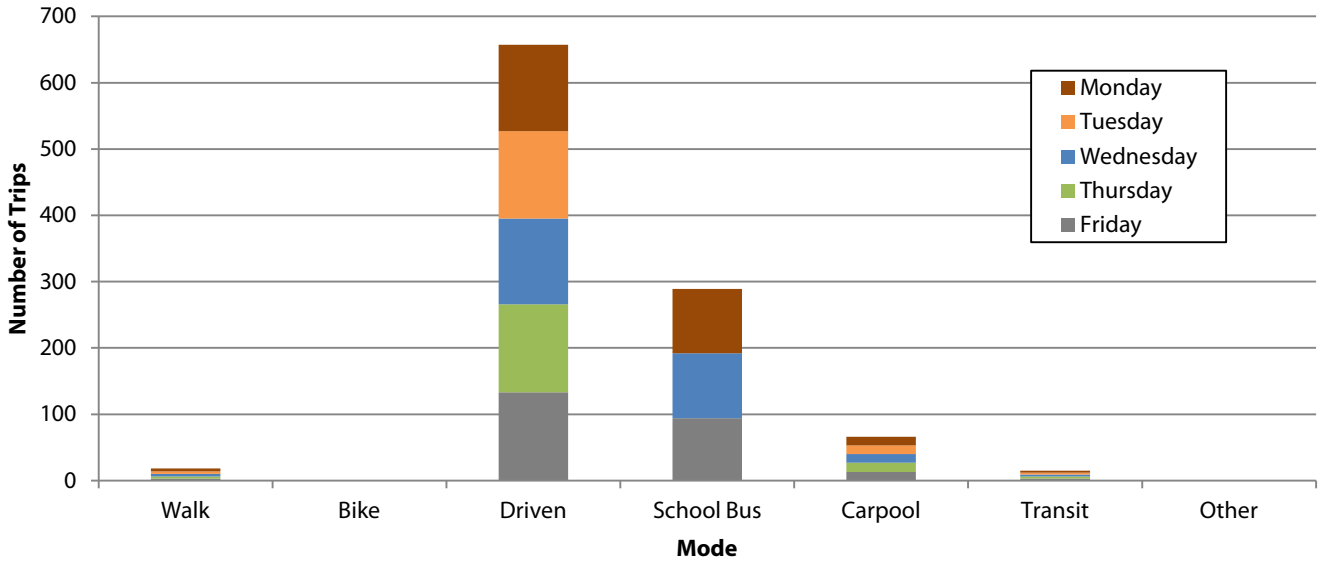
What is the approximate distance from your home to the school? *n=232*



	Number	Percent
1/4 mile or less	29	13%
1/4 - 1/2 mile	11	5%
1/2 - 1 mile	59	25%
1 -2 miles	98	42%
More than 2 miles	35	15%
Total	**232**	**100%**

Last week, how did your child get TO school? *n=247*

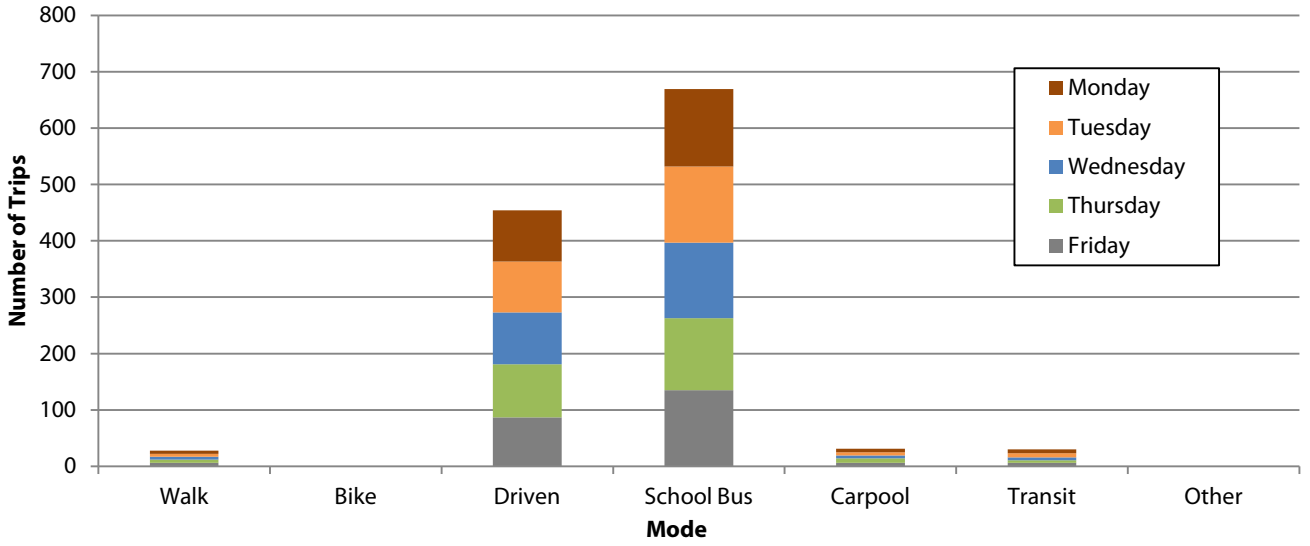
Mode by day of the week



Travel to School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	4	0	130	97	13	3	0
Tuesday	4	0	132	0	13	3	0
Wednesday	4	0	129	98	13	3	0
Thursday	3	0	133	0	14	3	0
Friday	3	0	133	94	13	3	0
Total trips	**18**	**0**	**657**	**289**	**66**	**15**	**0**
Percent of trips	2%	0%	63%	28%	6%	1%	0%

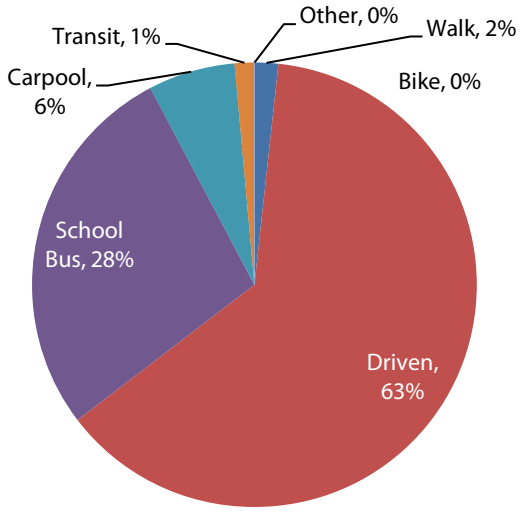
Last week, how did your child get FROM school? *n=242*

Mode by day of the week

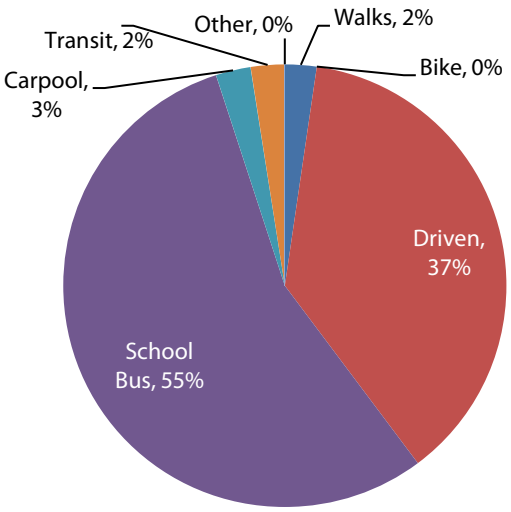


Travel from School	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	6	0	91	137	6	7	0
Tuesday	5	0	90	135	6	7	0
Wednesday	5	0	92	134	5	5	0
Thursday	6	0	94	128	8	5	0
Friday	6	0	87	135	6	6	0
Total trips	**28**	**0**	**454**	**669**	**31**	**30**	**0**
Percent of trips	2%	0%	37%	55%	3%	2%	0%

Mode Split TO school

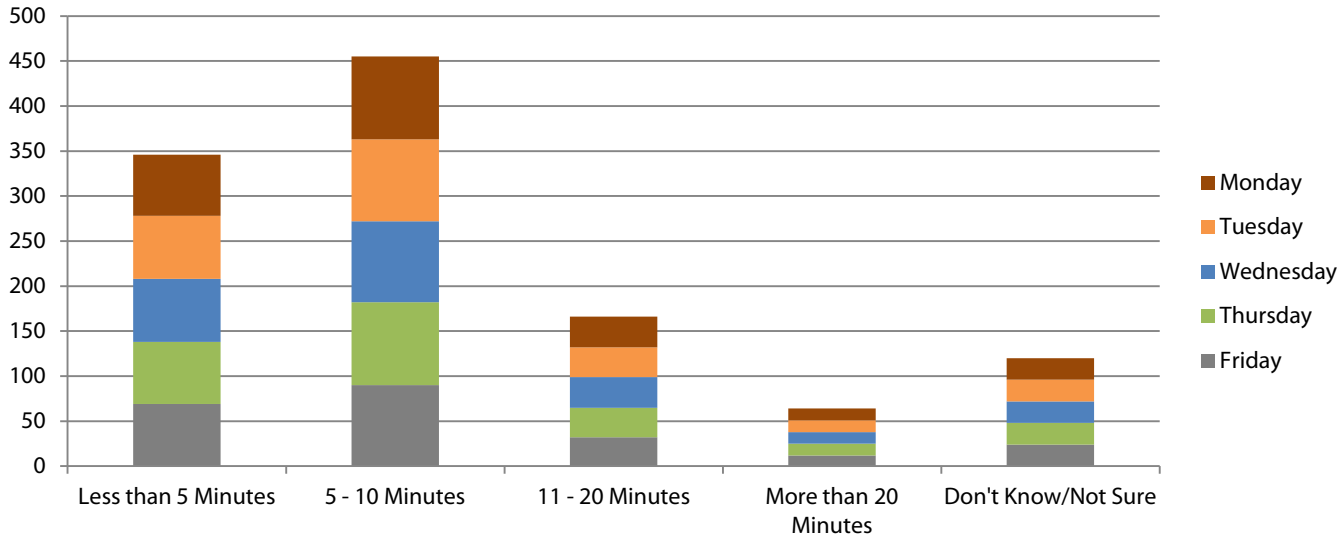


Mode Split FROM school



Last week, how long did it take to travel TO school? *n=231*

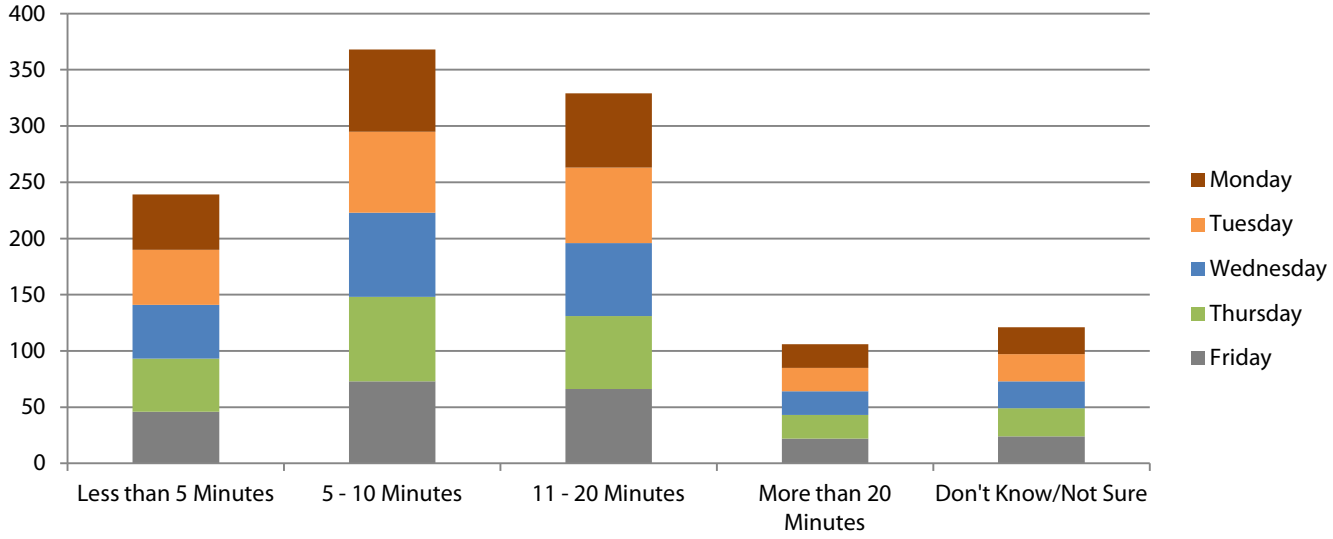
Travel time by day of the week



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	68	92	34	13	24
Tuesday	70	91	33	13	24
Wednesday	70	90	34	13	24
Thursday	69	92	33	13	24
Friday	69	90	32	12	24
Total Trips	**346**	**455**	**166**	**64**	**120**
Percent of trips	30.1%	39.5%	14.4%	5.6%	10.4%

Last week, how long did it take to travel FROM school? *n=233*

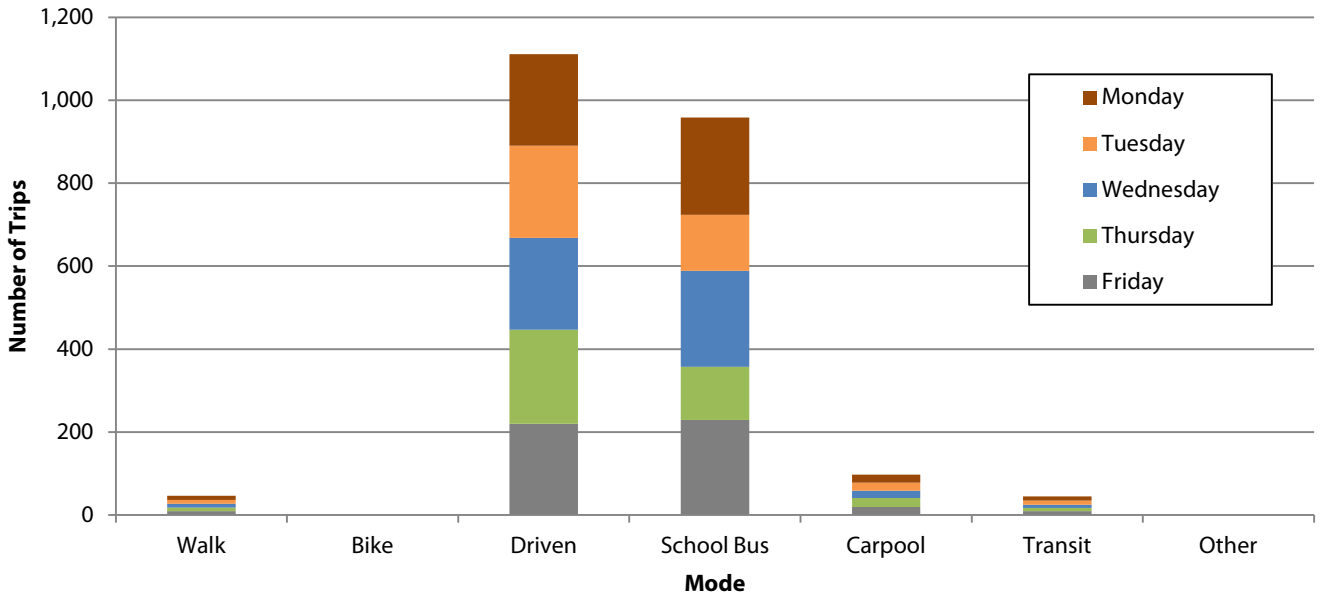
Travel time by day of the week



Travel to school	Less than 5 Minutes	5 - 10 Minutes	11 - 20 Minutes	More than 20 Minutes	Don't Know/Not Sure
Monday	49	73	66	21	24
Tuesday	49	72	67	21	24
Wednesday	48	75	65	21	24
Thursday	47	75	65	21	25
Friday	46	73	66	22	24
Total Trips	**239**	**368**	**329**	**106**	**121**
Percent of trips	20.6%	31.6%	28.3%	9.1%	10.4%

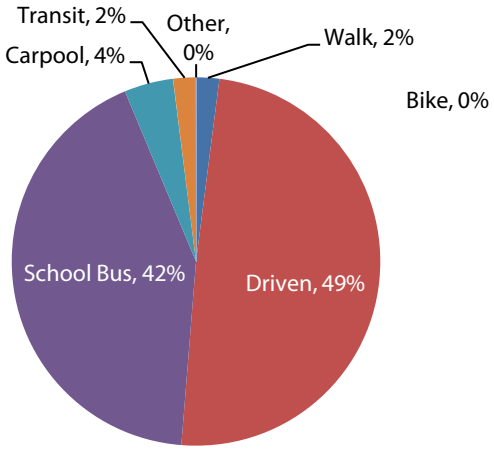
Overall Mode Split TO and FROM School

Mode by day of the week



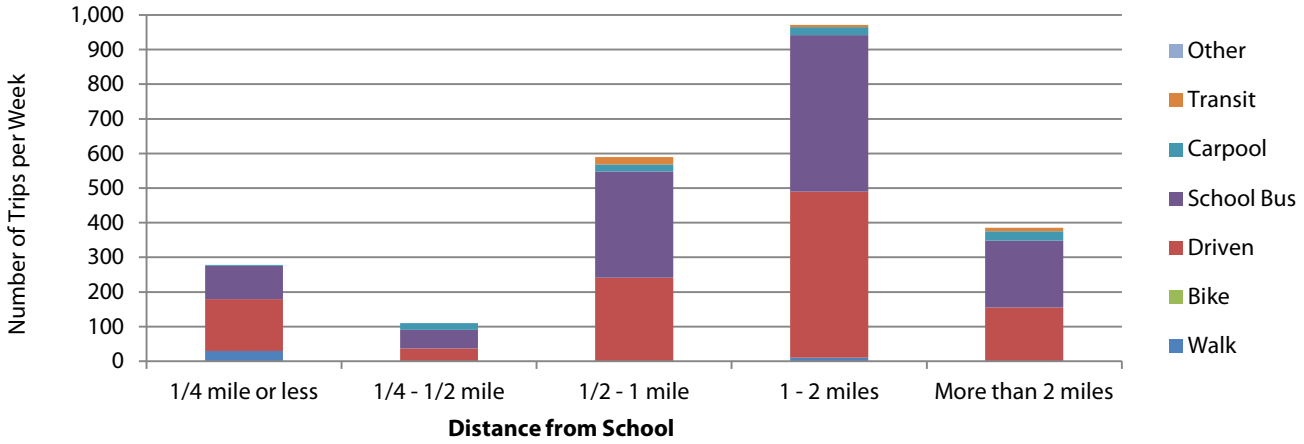
Travel for all trips	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
Monday	10	0	221	234	19	10	0
Tuesday	9	0	222	135	19	10	0
Wednesday	9	0	221	232	18	8	0
Thursday	9	0	227	128	22	8	0
Friday	9	0	220	229	19	9	0
Total trips	46	0	1111	958	97	45	0

Mode split for all trips



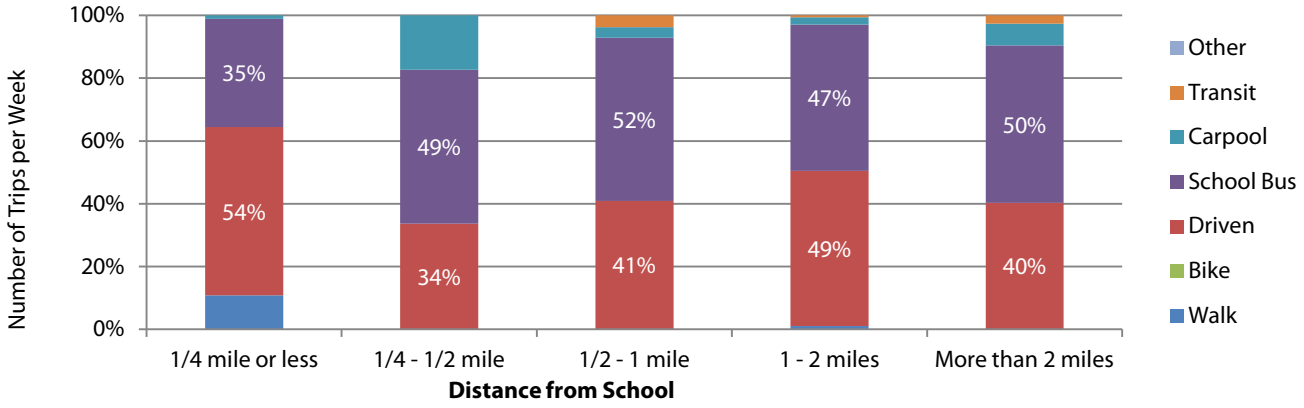
Weekly Trips by Mode and Distance from School

Mode by distance from school



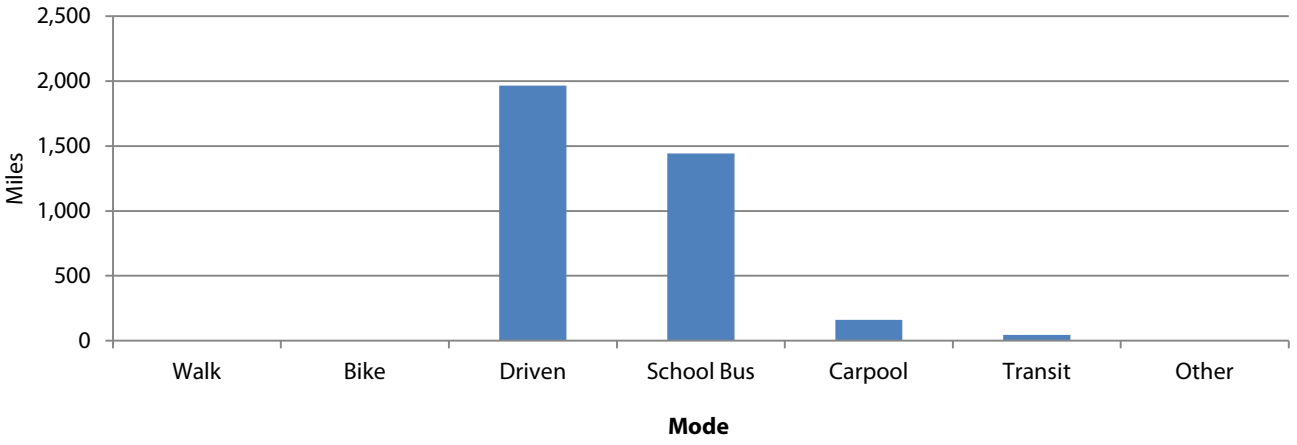
Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	30	0	149	96	3	0	0
1/4 - 1/2 mile	0	0	37	54	19	0	0
1/2 - 1 mile	0	0	241	307	20	22	0
1 - 2 miles	10	0	480	452	23	6	0
More than 2 miles	0	0	155	193	27	10	0
Total	**40**	**0**	**1,062**	**1,102**	**92**	**38**	**0**

Mode Split by Distance from School



Distance	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
1/4 mile or less	11%	0%	54%	35%	1%	0%	0%
1/4 - 1/2 mile	0%	0%	34%	49%	17%	0%	0%
1/2 - 1 mile	0%	0%	41%	52%	3%	4%	0%
1 - 2 miles	1%	0%	49%	47%	2%	1%	0%
More than 2 miles	0%	0%	40%	50%	7%	3%	0%
Total	**2%**	**0%**	**46%**	**47%**	**4%**	**2%**	**0%**

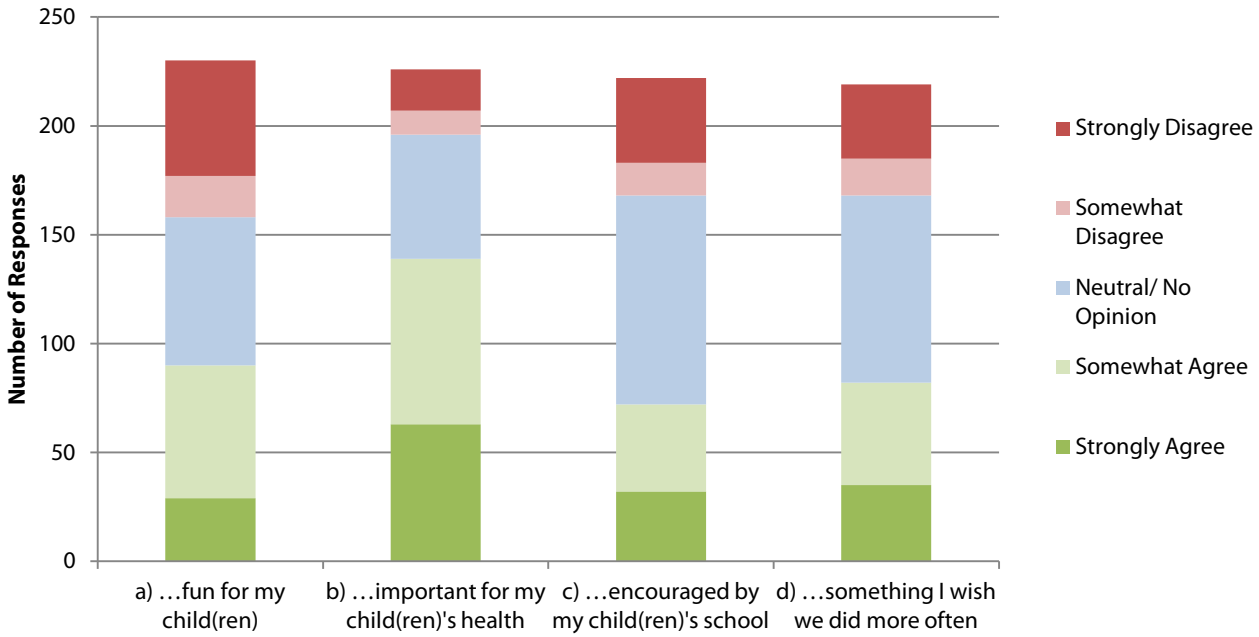
Weekly Miles Traveled by Mode



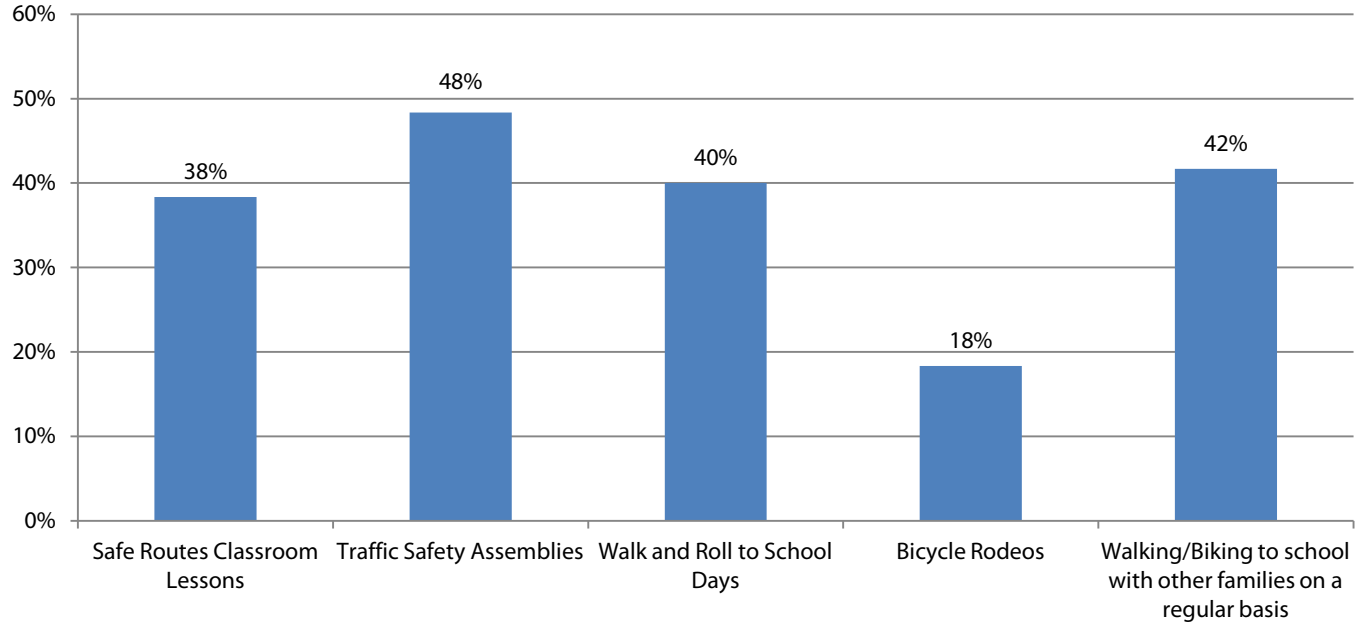
	Walk	Bike	Driven	School Bus	Carpool	Transit	Other
All Trips	2	0	1,966	1,442	161	45	0
Percent of Total Mileage	0%	0%	54%	40%	4%	1%	0%

Note:This analysis uses the mode frequency by respondent and assumes the median of the distance from school categories or the respondent-provided distance if greater than two miles.

How strongly do you agree or disagree with the following statement? a. n=230 b. n=226 c. n=222 d. n=219

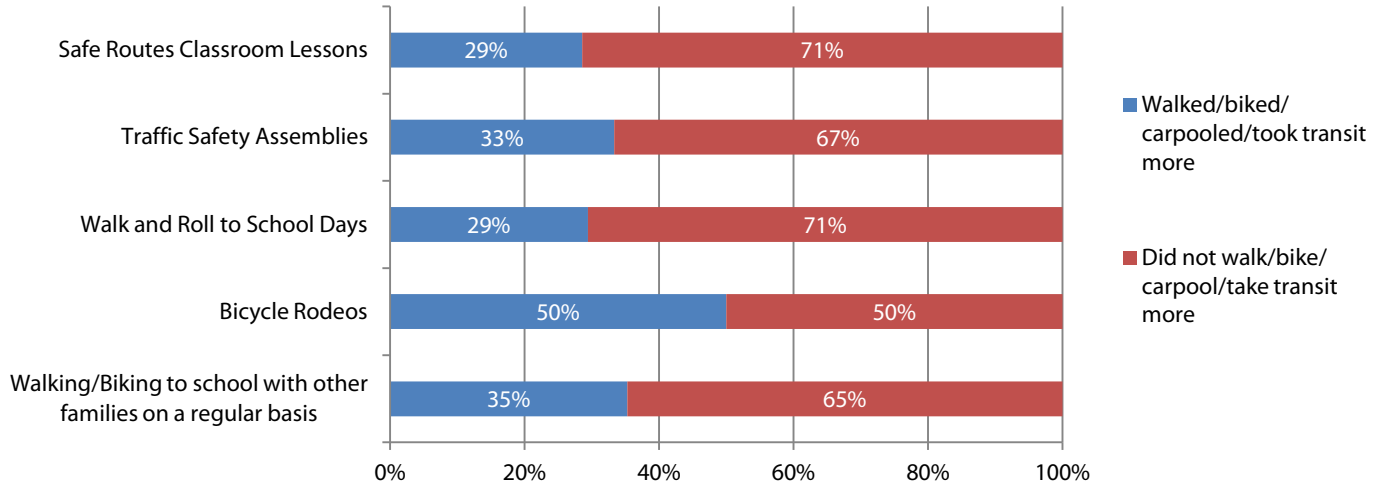


Have you or your child(ren) participated in the following Safe Routes events/programs?



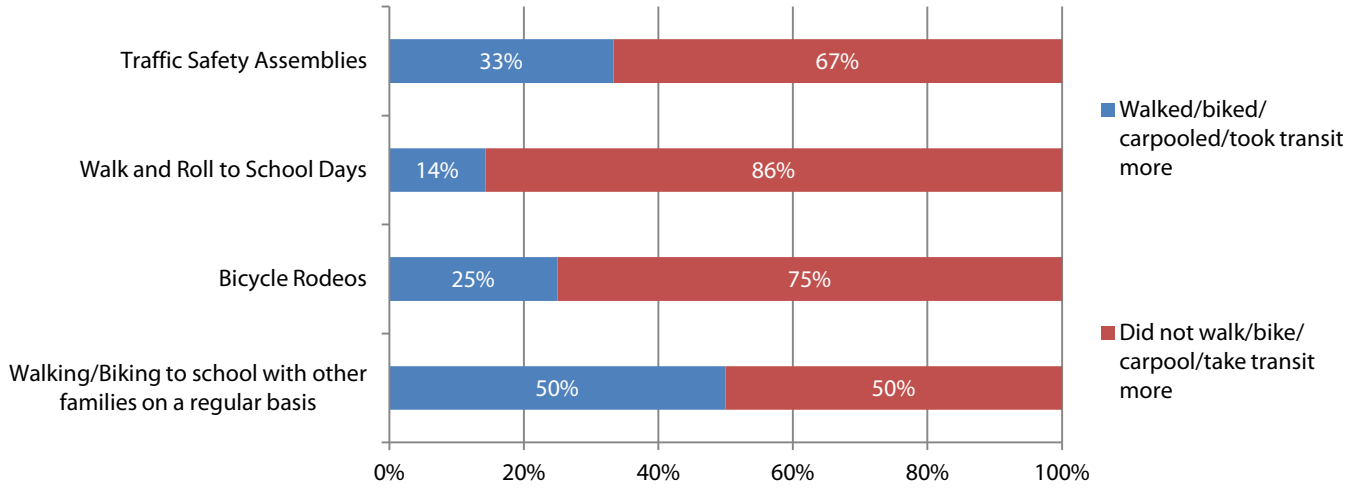
For any events/programs you answered "yes" for in the previous question, did your child(ren) walk, bike, or carpool more often after participating?

Note: Includes responses from respondents who previously indicated that they had participated in the specific program.



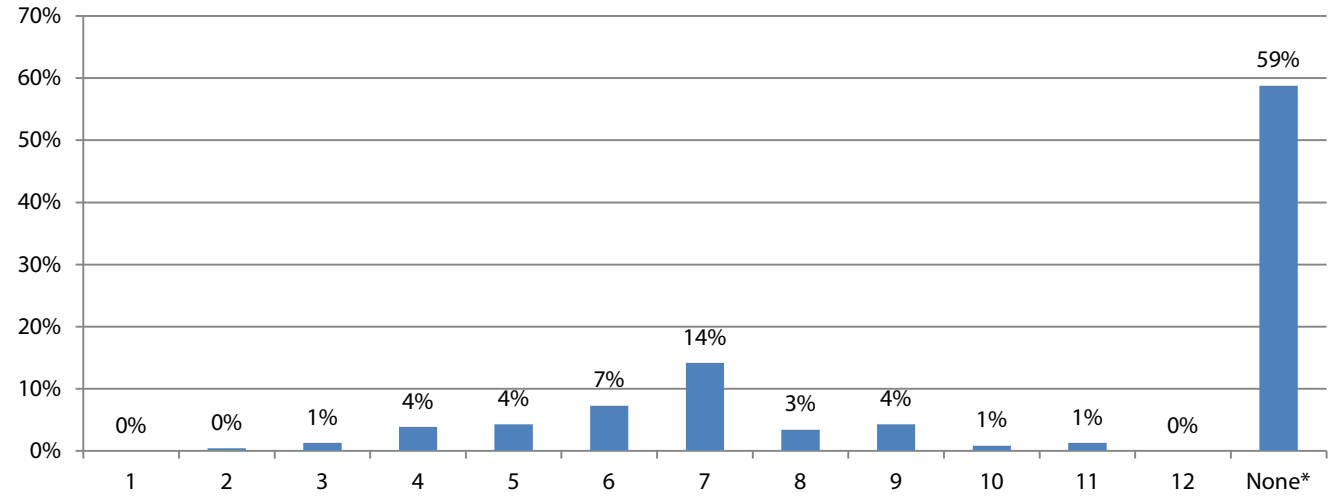
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	6	15
Traffic Safety Assemblies	7	14
Walk and Roll to School Days	5	12
Bicycle Rodeos	4	4
Walking/Biking to school with other families on a regular basis	6	11

If you have participated in the Safe Routes program, do you drive yourself or your child(ren) less often for non-school



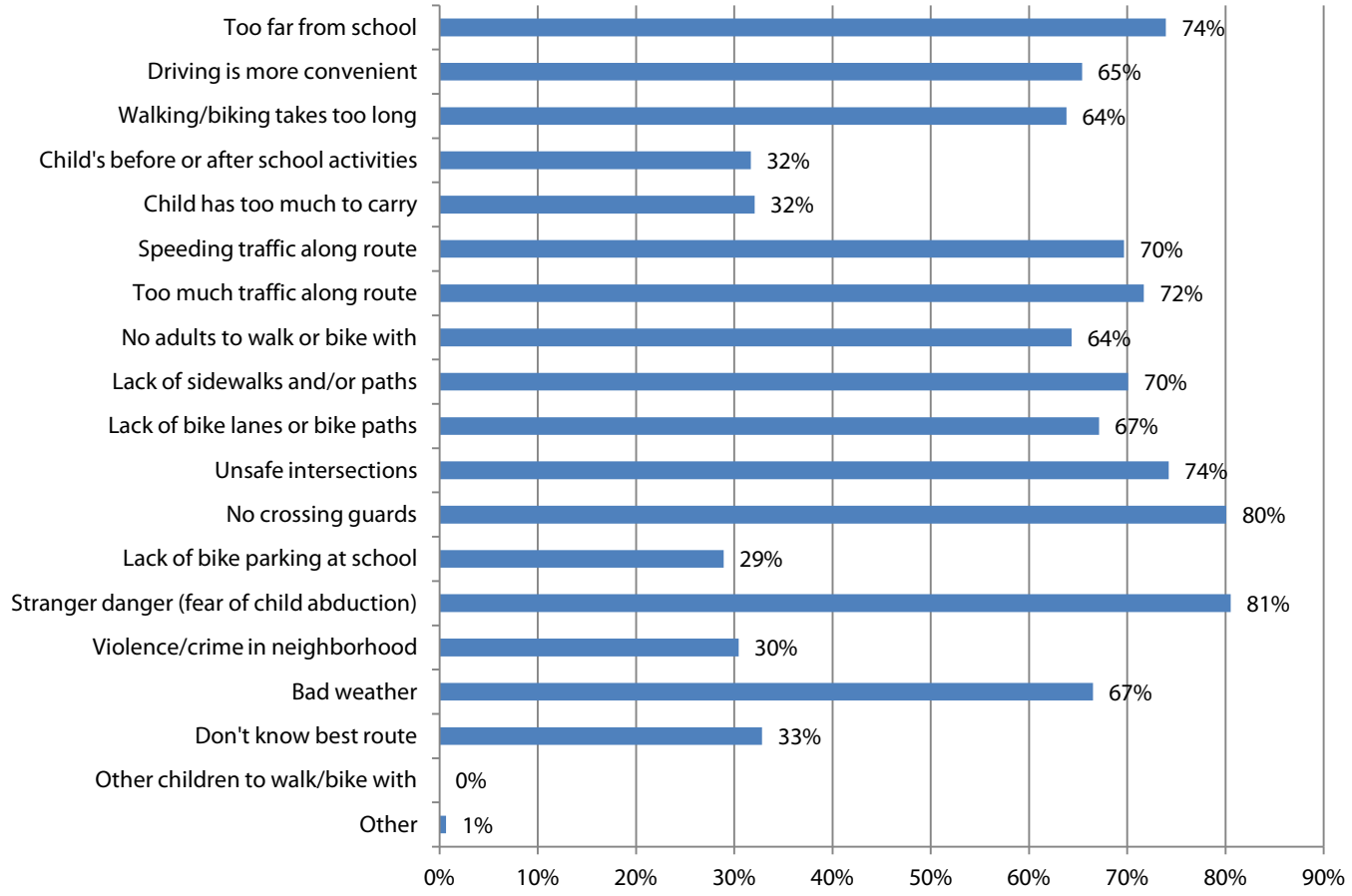
	Walked/biked/carpooled/took transit more	Did not walk/bike/carpool/take transit more
Safe Routes Classroom Lessons	3	5
Traffic Safety Assemblies	3	6
Walk and Roll to School Days	1	6
Bicycle Rodeos	1	3
Walking/Biking to school with other families on a regular basis	3	3

At what grade level would you allow your child(ren) to walk or bike to/from school without an adult?



* *"I would not feel comfortable at any grade"*

What concerns limit your child(ren)'s ability to walk or bike to/from school? *n=2181*

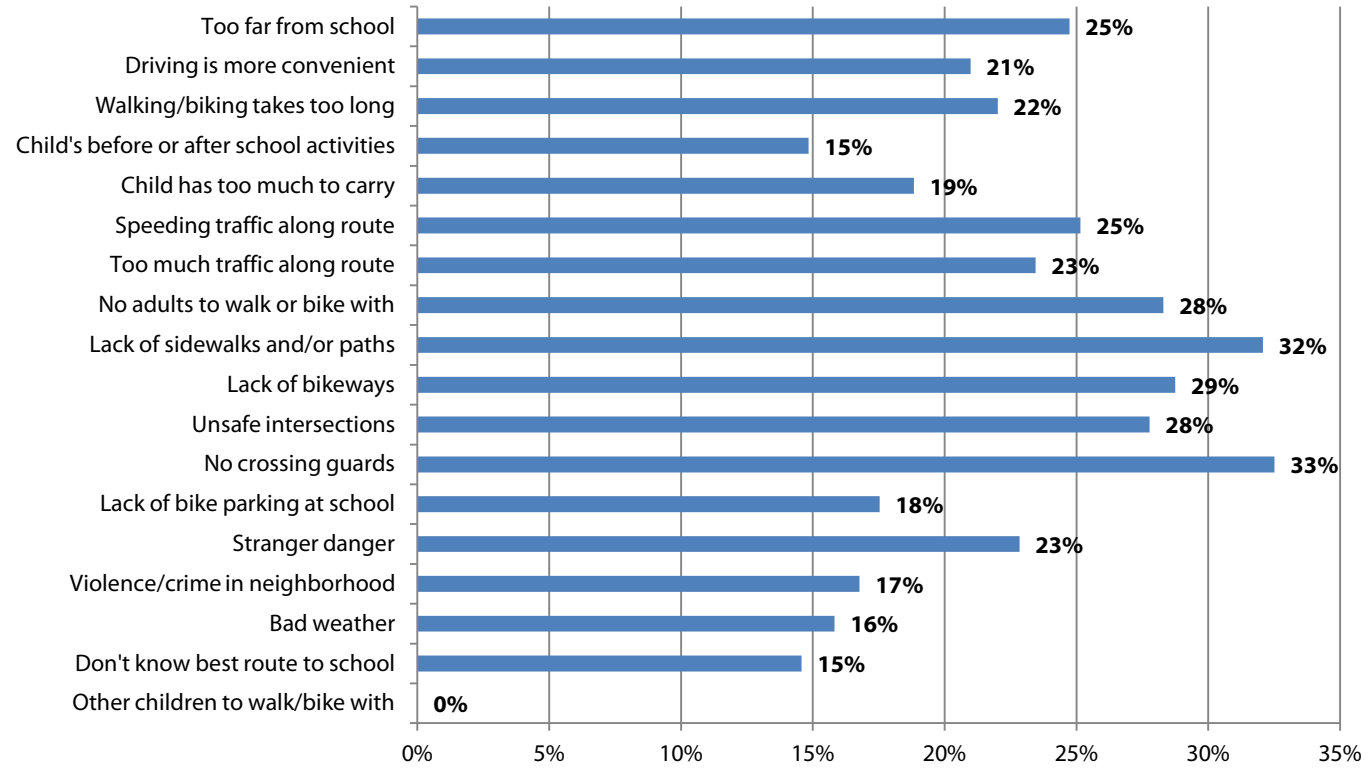


Concern	Yes	Percent
Too far from school	173	74%
Driving is more convenient	138	65%
Walking/biking takes too long	141	64%
Child(ren)'s before or after school activities	64	32%
Child has too much to carry	68	32%
Speeding traffic along route	154	70%
Too much traffic along route	157	72%
No adults to walk or bike with	139	64%
Lack of sidewalks and/or paths	150	70%
Lack of bikeways	143	67%

Concern	Yes	Percent
Unsafe intersections	164	74%
No crossing guards	173	80%
Lack of bike parking at school	59	29%
Stranger danger (fear of child abduction)	178	81%
Violence/crime in neighborhood	63	30%
Bad weather	143	67%
Don't know best route	66	33%
Other	8	1%

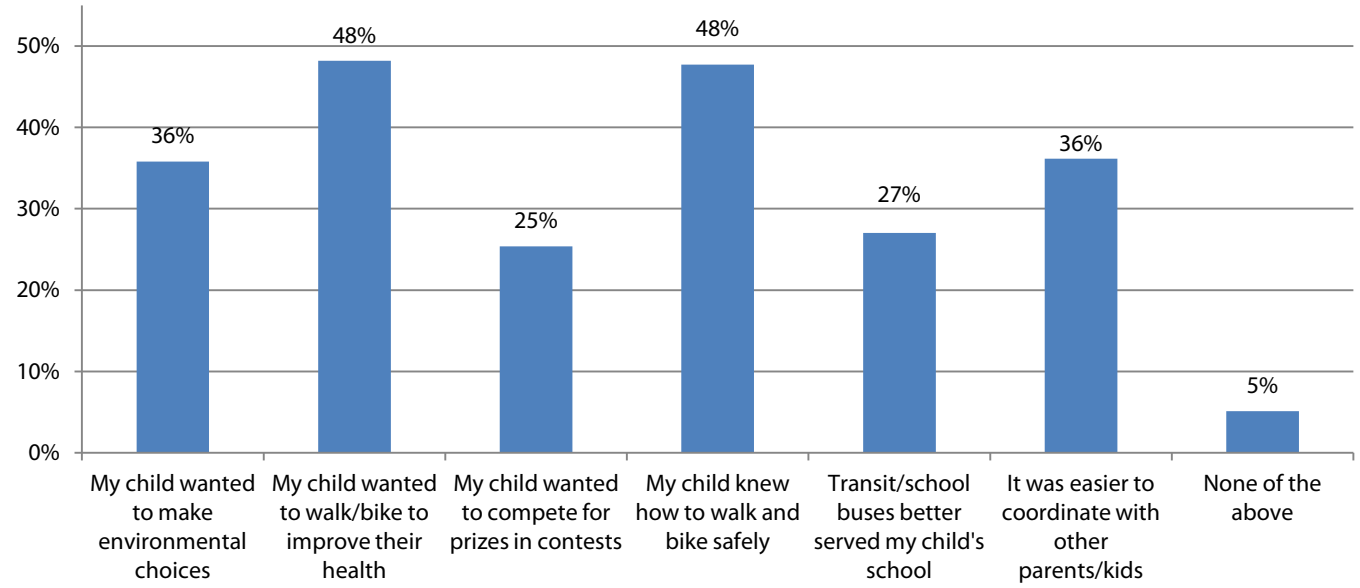
Would you allow your child(ren) to walk/bike more often if this concern was addressed?

Chart shows "yes" responses.

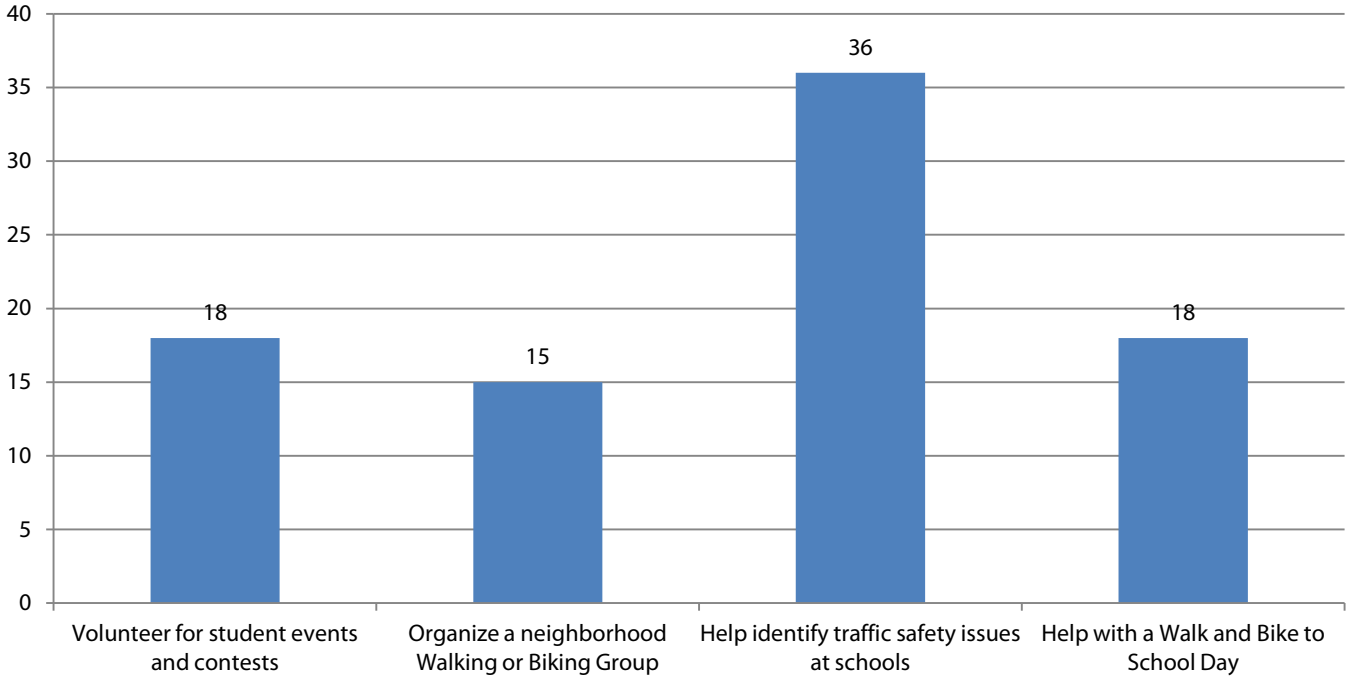


	Yes	No	Not Sure	Total
Too far from school	47	106	37	190
Driving is more convenient	34	87	41	162
Walking/biking takes too long	35	89	35	159
Child's before or after school activities	23	92	40	155
Child has too much to carry	29	89	36	154
Speeding traffic along route	41	80	42	163
Too much traffic along route	38	83	41	162
No adults to walk or bike with	45	74	40	159
Lack of sidewalks and/or paths	51	73	35	159
Lack of bikeways	46	77	37	160
Unsafe intersections	45	80	37	162
No crossing guards	53	76	34	163
Lack of bike parking at school	27	90	37	154
Stranger danger	37	88	37	162
Violence/crime in neighborhood	26	92	37	155
Bad weather	25	96	37	158
Don't know best route to school	22	94	35	151

I would reduce the number of times I drive my child(ren) to school if... *n=249*



Are you interested in participating in any of the following activities?



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Appendix B. School Walk Audit Summaries

Walk audits occurred at five elementary and middle schools in Wasco from January 28th through February 1st, 2013. Notes from these visits are reproduced in this Appendix.

B.1. Thomas Jefferson Middle School, 1/28/2013

B.1.1. Site Information

Thomas Jefferson Middle School is the public middle school for the City of Wasco and the surrounding area. It is located at the intersection of Griffith Avenue and 4th Street, with its main entrance on Griffith Avenue. Students use school accesses at two gates on Birch Avenue, a gate on 4th Street, and the entrance and gate on Griffith Avenue.

B.1.2. Physical Infrastructure Issues

The sidewalks and curb ramps at TJMS were found to be in good to excellent condition. They are generally wide and free of major obstructions. A midblock crossing that provided direct access to the main school entrance was recently removed from Griffith Avenue. It was removed amid concerns about providing a curb ramp or removing on-street parking.

Several signs may need to be updated. Many treatments reserved for uncontrolled crossings are used at controlled crossings. This includes flashing lights, Assembly B and D signage, and SLOW SCHOOL XING stencils. Curb colors are not painted in compliance with California Vehicle Code.

B.1.3. Observed and Reported Behaviors

- It was observed that many students are dropped off across the street and then cross mid-block to access the school. There was previously a mid-block crossing directly across from the main school entrance. However, the crosswalk was recently removed amid concerns about taking a parking space and not being able to construct a curb ramp that would ensure ADA accessibility.
- U-turns were observed on both on Griffith Avenue and 4th Street after dropping off students
- Students were observed jaywalking across 4th Street to access the south side of the school.

B.1.4. Suggested Routes to School

The community suggested the following walking and bicycling routes to Thomas Jefferson Middle School:

- 2nd Street to provide access from the west. The crossing of Poplar Avenue may be challenging.
- Birch Avenue to provide access from the southwest, connecting with 6th Street and Cedar Avenue. Crossing 5th Street may be challenging.
- 5th Street, Broadway, and 6th Street to provide access from the east
- Griffith Avenue to provide access from the north and south

B.1.5. Community and District Staff Identified Priorities

4th Street and Birch Avenue

School administrators suspect that this intersection has the highest pedestrian and bicycle volumes in the school neighborhood. Traffic on 4th Street is uncontrolled; suggestions include four-way stop and traffic calming.

Highway 46 at Griffith Avenue

Audit participants identified this location as a challenging crossing, reporting in particular that the crosswalk across Highway 46 is only located on the east side of the intersection, but that many students are looking for access to destinations on the west side and choose to cross on that side.

4th Street at Griffith Avenue

During the walk audit, cars were observed failing to yield in the crosswalk to pedestrians. Vehicles looking for opportunities to turn onto Griffith Avenue may be focused on crossing motorists and not as attentive to pedestrians. High traffic speeds were observed on Griffith Avenue.

B.2. Palm Avenue Elementary School, 1/29/2013

B.2.1. Site Information

Palm Avenue Elementary School is one of two public schools located in central Wasco, located at the intersection of Palm Avenue and 9th Place. The school grounds stretch south to Jubilee Drive. There are many access gates around the school perimeter, though most remain locked.

B.2.2. Physical Infrastructure Issues

Sidewalks in front of the school were found to be in relatively good condition. The road has deteriorated in many locations, especially at the intersection of 9th Place and Peters Street. Some locations lack curb ramps, including a pedestrian pathway north of Peters Street. Many signage and stenciling treatments intended for uncontrolled crossing are used at controlled crossings. Innovative treatments such as illuminated Assembly C signage and in-pavement flashers, calm traffic and improve crossings, though other treatments may be recognized as best practices.

B.2.3. Observed and Reported Behaviors

- Motorists were observed disobeying the crossing guard stationed at 9th Place and Palm Avenue.
- Double parking was observed in the parking area on Palm Avenue.
- Frequent U turns are reported on 9th Place, as well as motorists using the alley for drop off.

B.2.4. Suggested Routes to School

The community suggested the following walking and bicycling routes to Palm Avenue Elementary:

- Palm Avenue is a good walking and bicycling street in both directions, though the crossing of Poso Drive may need improvement. Traffic speeds can be high.
- 9th Place is a key route stretching from the eastern boundary of the enrollment area to the school site. Students should be encouraged to travel north on the streets east of the school to cross Palm Avenue at 9th Place instead of Jubilee Drive.

B.2.5. Community and District Staff Identified Priorities

Bus Loading Zone

Administrators suggested that the existing Bus Loading Zone be relocated from Jubilee Drive to the fenced-off loading zone on Palm Avenue. This loading zone would be dedicated to the buses only.

9th Place and Griffith Avenue

9th Place is a key corridor for walking and bicycling to school. The community identified the crossing of Griffith Avenue as challenging because it is uncontrolled and visibility can be especially low at the corners.

Palm Avenue at Poso Drive

This intersection, paired with the intersection of Palm Avenue and Jubilee Drive, is on a key route to school for students walking and bicycling from the south. Though Poso Drive is a four-way stop, crossing the street can still be challenging. Suggested options include reassigning the Jubilee Drive crossing guard to Poso Drive or installing crossing treatments at the intersection. Some parents suggested a traffic signal at the intersection.

B.3. Teresa Burke Elementary School, 1/30/2013

B.3.1. Site information

Teresa Burke Elementary School is located in southeastern Wasco, at the intersection of Filburn Avenue and Griffith Avenue. Its enrollment area includes much of the south side of town and rural areas to the east and south of the city. There are two principal loading zones, the south side of Filburn Avenue in front of the school and an off-street loop on Griffith Avenue.

B.3.2. Physical Infrastructure Issues

Sidewalks and curb ramps in the immediate school vicinity are in good condition. There is a bike lane striped only on the north side of Filburn Avenue and isolated segments of multi-use path that could be connected with each other and with other parts of the City. Like many areas in Wasco, Teresa Burke Elementary School has long blocks which increase traffic speed and walking distance and encourage crossings outside of marked crosswalks. Poplar Avenue and Griffith Avenue provide opportunities to cross Filburn Avenue, but these crosswalks are spaced ¼ mile apart.

B.3.3. Observed and Reported Behaviors

- Students and parents were observed crossing Filburn Avenue at the intersection with Catalina Drive instead of at the crossing with the crossing guard at Filburn Avenue.
- Double parking and occasional U-turns on Filburn Avenue were observed

B.3.4. Suggested Routes to School

Due to its location on the edge of town, opportunities for suggested routes to school are limited. The community recognized these routes:

- Filburn Avenue, providing access from both the east and west.

- 16th Street to Griffith Avenue provides ROW priority at every intersection. There are no marked crosswalks at the intersection of 16th Street and Griffith Avenue

B.3.5. Community and District Staff Identified Priorities

Catalina Drive at Filburn Avenue

The community expressed concern with the parents and students using this unmarked crosswalk to cross busy Filburn Avenue.

School Loading Zones

Concerns about school security prompted a discussion of the location of the gate that accesses the Kindergarten building. School administration suggested modifying the northeast parking lot to provide a one-way loading zone.

Education and Encouragement Programs

Attendees expressed particular enthusiasm for Walking School Buses and improved crossing guard training.

16th Street at Griffith Avenue

There are no crosswalks, though many walking routes to school use the intersection.

B.4. John Prueitt Elementary School, 1/31/2013

B.4.1. Site information

John Prueitt Elementary School is located on the northeast edge of town, at the intersection of 7th Street and Magnolia Avenue. There are two loading zones on site. An off-street loop accessed from 7th Street and an on-street area on Strawberry Lane. The loading zone on 7th Street is always managed by at least one staff member, sometimes two, and moved efficiently with three during the audit. School buses unload in a bus bay on Magnolia Avenue that functions well.

B.4.2. Physical Infrastructure Issues

A sidewalk gap on 7th Street presents a major obstacle for pedestrians accessing the school site. The sidewalk is in good condition, but stops at the edge of the housing development. This is especially problematic in wet weather where the side of the street may be muddy.

B.4.3. Observed and Reported Behaviors

- At both loading areas, some parents opted to park across the street off the pavement, either dropping off their children or walking them into the building. 7th Street can get congested, and when vehicles pass the queue on the right side, this behavior creates a multiple-threat hazard. Parents report that this behavior is more common in the afternoon.
- Parents are reported to attempt to access the loading area on 7th Street by turning in the parking lot exit instead of the entrance.

B.4.4. Suggested Routes to School

Prueitt's location at the edge of town presents few options for students walking or bicycling to school:

- Nearly every student's path of travel uses 7th Street
- A route on 5th Street – Woodside – Central Park – Central Avenue provides access from the northeast, and Central Avenue has a bike lane south of 7th Street and is walkable and to the north.
- Beckes Street is a quiet street with several four-way stops and a continuous sidewalk, providing a convenient route for both bicyclists and pedestrians
- Students biking to school from points north of Highway 46 should cross at Griffith Avenue or Palm Avenue and continue to the school along 7th Street

B.4.5. Community and District Staff Identified Priorities

7th Street

Completion of the sidewalk is the top community priority. As more students cross at the intersection of 7th Street and Strawberry Lane, a crossing guard is desired.

Strawberry Lane

Improvements are sought for the parking area opposite Strawberry Lane. This could improve paving, decomposed granite, or the establishment of parallel parking zones.

Programmatic Improvements

The community was especially interested in student valets and walking school buses.

B.5. Karl Clemens Elementary School, 2/1/2013

B.5.1. Site Information

Karl Clemens Elementary School is the oldest public elementary school in Wasco, located in a residential neighborhood near the downtown business district. Its downtown location presents opportunities for walking and bicycling to school as most students live in close proximity to the school. There are two major loading zones, one providing access to the north gate of the school on 5th Street and another loading zone on Broadway. There is an alley south of the school that is not currently used for any function. It leads to a parking lot that is currently unused.

B.5.2. Physical Infrastructure Issues

Infrastructure issues observed and discussed include sidewalk gaps and missing curb ramps at many locations near the school. Priorities include sidewalk gaps on 6th Street and on Broadway. Students choose to walk in the street during wet weather instead of walking on the muddy paths. Curb ramps are missing at most locations along 6th Street, especially challenging for parents with strollers.

Broadway has illuminated Assembly C signs. Its uncontrolled crosswalk at 6th Street does not have the standard suite of treatments used to indicate uncontrolled crossings to motorists.

High volumes of traffic observed at the intersection of 5th and Broadway are challenging for the crossing guard to manage, with students arriving at the intersection from several directions.

B.5.3. Observed and Reported Behaviors

- Many parents were observed using the angled parking lot on the north side of 5th Street for student drop off. Despite easy accessibility to the guard-protected crossing at the intersection of 5th and Broadway, most parents choose to walk directly across the street wherever they are parked.
- Some motorists were observed dropping students off at the north side of 6th Street, from which they ran across the street to meet the crossing guard on the southeast corner of the intersection.

B.5.4. Suggested Routes to School

The community suggested the following walking and bicycling routes to Karl Clemens Elementary School.

- Broadway has low traffic volumes, narrow lanes for some of its length, and provides access from the south and north. Many east-west streets connect with Broadway to provide a safe walking or bicycling route for students
- 6th Street currently has some infrastructure issues, but is a popular walking route
- 7th Street and 5th Street are both good walking and biking routes from the east and west

B.5.5. Community and District Staff Identified Priorities

6th Street and Highway 43

This crossing is challenging for pedestrians. Though pedestrians living east of Highway 43 have the option to ride the bus, many children walk with older siblings at Thomas Jefferson Middle School. There is a marked uncontrolled crosswalk, but visibility is low and traffic speeds and volumes are high.

6th Street and D Street

D street is another challenging crossing for pedestrians approaching the school from 6th Street. Traffic on D Street is not required to stop. Visibility is sometimes low, and the lack of curb ramps complicate entry to and exit from the intersection for people with mobility impairments and those with strollers.

5th Street and Broadway

Many walking and bicycling routes pass through this intersection from the north. Shorter crossing distances and increased visibility and training for the crossing guard may improve the safety and efficiency of the intersection.

Community-wide

Unattended dogs are a problem for students wishing to walk or bike to school. A parent mentioned that her children were frightened to walk.

Appendix C. Bicycle Design Guidelines

This appendix presents an overview of bicycle facility designs, based on appropriate California Manual of Uniform Traffic Control Devices (California MUTCD) and Highway Design Manuals, and supplemented by AASHTO best practices and Wasco-specific design guidelines. The purpose is to provide readers and project designers with an understanding of the facility types that are proposed in the Plan, and with specific treatments that are recommended or required.

Appendix C Table of Contents

C.1. Bicycle Design Standards

The City of Wasco Bicycle Design Guidelines present standards and recommendations that specifically provide for consistency in the City of Wasco, or where details are needed beyond what is provided by state and federal design standards. All projects must also meet state and federal design standards. Therefore, in addition to these City of Wasco Design Guidelines, engineers, planners and designers should also refer to the following documents and their subsequent updates when planning and designing bicycle and pedestrian facilities.

Signage in Wasco is governed by the California MUTCD. In the event that a specific treatment is not in the California MUTCD, it may be necessary to go through experimental testing procedures. Experimental testing is overseen by the California Traffic Control Devices Committee.

The following manuals, guides, policies, directives, and plans informed these design guidelines:

- California Manual on Uniform Traffic Control Devices, 2012 Update. http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/ca_mutcd2012.htm
- Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration. http://mutcd.fhwa.dot.gov/
- Caltrans Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians (2010).
- Caltrans Policies and Directives. http://www.dot.ca.gov/hq/traffops/signtech/signdel/policy.htm including:
    - Traffic Operations Policy Directive 09-06 "Provide Bicycle and Motorcycle Detection on all new and modified approaches to traffic-actuated signals in the state of California."
    - Caltrans Deputy Directive DD-64 " Complete Streets – Integrating the Transportation System."
    - Caltrans Highway Design Manual. http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm
    - Caltrans Design Information Bulletins. http://www.dot.ca.gov/hq/oppd/dib/dibprg.htm

      including:
        - DIB 80-01 Roundabouts
        - DIB 82-03 Design Information Bulletin 82-03 "Pedestrian Accessibility Guidelines for Highway Projects"
    - Caltrans Standard Plans. http://www.dot.ca.gov/hq/esc/oe/project_plans/HTM/06_plans_disclaim_US.htm
- ADA Accessibility Guidelines for Buildings and Facilities (ADAAG). http://www.access-board.gov/adaag/html/adaag.htm
- Revised Draft Guidelines for Accessible Public Rights-of-Way, Access Board. http://www.access-board.gov/prowac/draft.htm

- Guidelines for the Development of Bicycle Facilities, AASHTO. Guidelines for the Planning, Design, and Operations of Pedestrian Facilities, AASHTO. https://bookstore.transportation.org/home.aspx
- A Policy on Geometric Designs of Highways, AASHTO. https://bookstore.transportation.org/Item_details.aspx?id=110
- National Association of City Transportation Officials Urban Bikeway Design Guide http://nacto.org/cities-for-cycling/design-guide/

This appendix is not intended to replace existing state or national mandatory or advisory standards, nor the exercise of engineering judgment by licensed professionals.

Cost estimates cited in the document reflect 2013 dollars and are included for reference only. All costs are for equipment and materials, and do not include labor. Actual costs to construct the facilities may vary depending on market fluctuations, design specifications, engineering requirements and availability of materials.

C.2. Bikeway Classification

C.2.1. Bikeway Classification Overview

Discussion

Caltrans has defined three types of bikeways in Chapter 1000 of the Highway Design Manual: Class I/shared use path, Class II/Bike Lane, and Class III/Bike Route. This document uses the generic terms "shared use path", "bike lane" and "bike route".

Design Summary

Path Width:

8 feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic situations.

10 feet is recommended in most situations and will be adequate for moderate to heavy use.

12 feet is recommended for heavy use situations with high concentrations of multiple users such as joggers, bicyclists, rollerbladers and pedestrians. A separate track (5' minimum) can be provided for pedestrian use.

Bike Lane Width with Adjacent On-Street Parking:

5 feet minimum recommended when parking stalls are marked

Bike Lane Width without Adjacent Parking:

4 feet minimum when no gutter is present (rural road sections)

5 feet minimum when adjacent to curb and gutter (3' more than the gutter pan width if the gutter pan is greater than 2')

Recommended Width: 6 feet where right-of-way allows

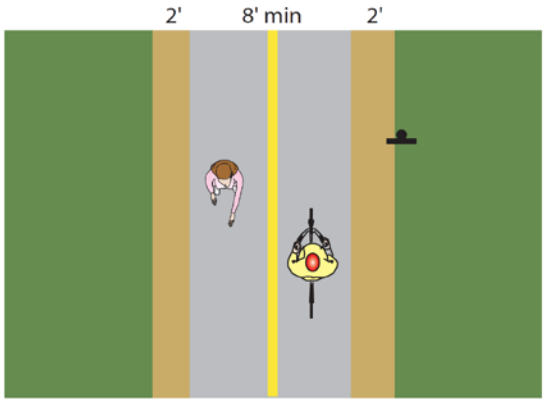
Lane Width for Bicycle Route With Wide Outside Lane:

Fourteen feet (14') minimum is preferred. Fifteen feet (15') should be considered if heavy truck or bus traffic is present. Bike lanes should be considered on roadways with outside lanes wider than 15 feet.

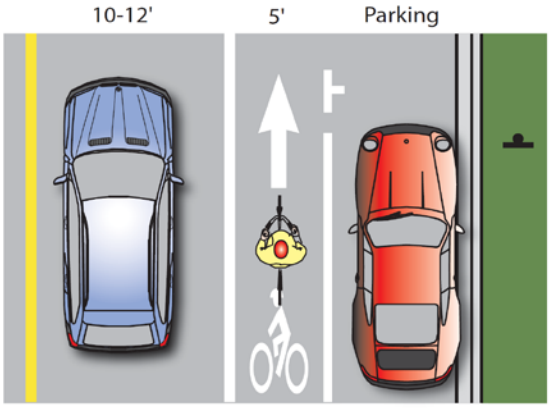
Sign Spacing

Bikeway signs shall be installed at the beginning of bikeways and at every decision point (intersection). Signs should be placed at every decision point and at quarter mile intervals. End signs may be placed at the end of bikeways.

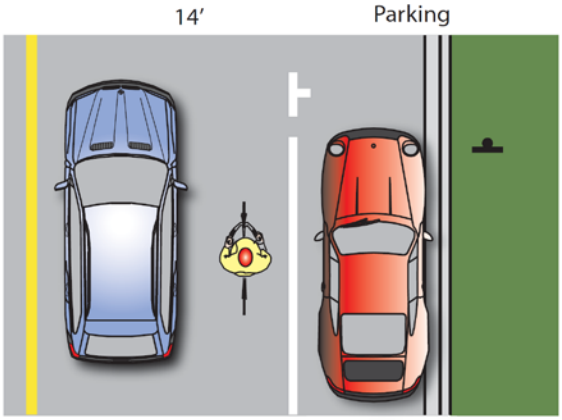
Design Example



Class I Shared Use Bike Path



Class II Bike Lane

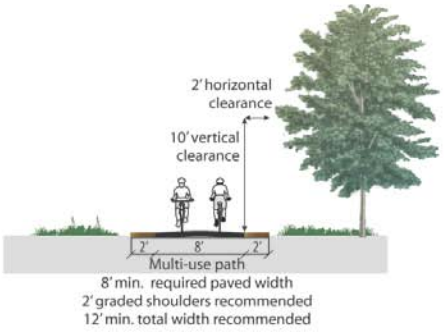


Class III Bike Route

Recommended Design

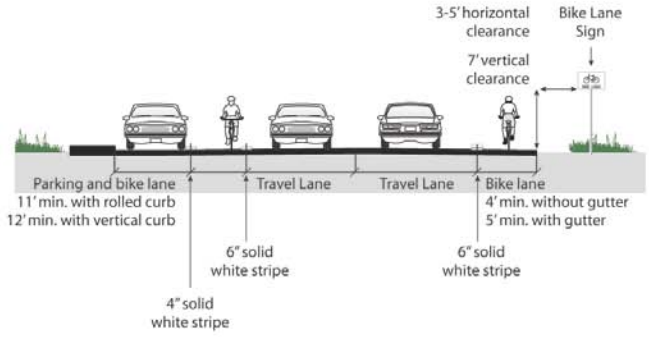
CLASS I
Multi-Use Path

Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflow minimized.



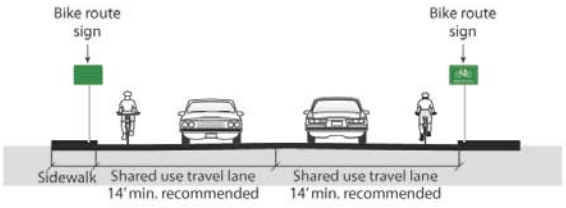
CLASS II
Bike Lane

Provides a striped lane for one-way bike travel on a street or highway.



CLASS III
Bike Route
Signed Shared Roadway

Provides for shared use with motor vehicle traffic, typically on lower volume roadways.



Guidance	Cost
• Caltrans Highway Design Manual (Chapter 1000: Sections 1003.1(1) and (2), 1003.2(1), 1003.3(1), and 1003.5) • California MUTCD Chapter 9 • AASHTO Guide for the Development of Bicycle Facilities, Chapter 2	• Class I Path: $500,000 - $4,000,000 per mile • Class II Bike Lane: $5,000 - $500,000 per mile • Class III Bike Route: $1,000 - $300,000 per mile

C.3. Shared Use Paths

A shared use path (Class I) allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Class I facilities can also include amenities such as lighting, signage, and fencing (where appropriate).

C.3.1. General Design Practices:

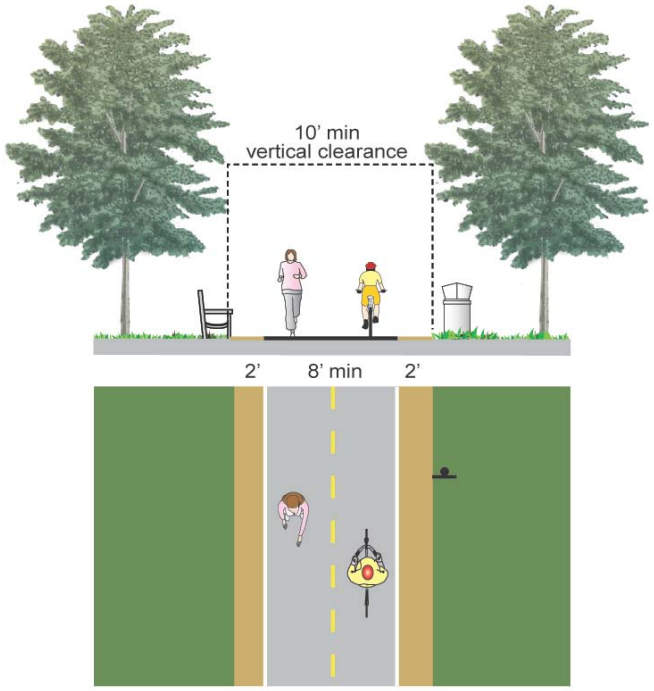
Both the California Highway Design Manual Chapter 1000 and the AASHTO Guide for the Development of Bicycle Facilities generally recommend against the development of shared use paths directly adjacent to roadways. Also known as "sidepaths," these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the path. This can also result in an unsafe situation where motorists entering or crossing the roadway at intersections and driveways do not notice bicyclists coming from their right, as they are not expecting traffic coming from that direction. Stopped cross-street motor vehicle traffic or vehicles exiting side streets or driveways may frequently block path crossings. Even bicyclists coming from the left may also go unnoticed, especially when sight distances are poor.

Shared use paths may be considered along roadways under the following conditions:

- The path will generally be separated from all motor vehicle traffic.
- Bicycle and pedestrian use is anticipated to be high.
- In order to provide continuity with an existing path through a roadway corridor.
- In order to direct bicycle and pedestrian traffic away from freeway ramps
- The path can be terminated at each end onto streets with good bicycle facilities, or onto another well-designed path.
- There is adequate access to local cross-streets and other facilities along the route.

As bicyclists gain experience and realize some of the advantages of riding on the roadway, many stop riding on paths adjacent to roadways. Bicyclists may also tend to prefer the roadway as pedestrian traffic on the bicycle path increases due to its location next to an urban roadway. When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bicycle lane width on the roadway, as the on-street bicycle facility will generally be superior to the "sidepath" for experienced bicyclists and those who are cycling for transportation purposes. Bicycle lanes should be provided as an alternate (more transportation-oriented) facility whenever possible.

C.3.2. Pathway Design

Discussion	Recommended Design
Ten-foot wide paved paths are usually best for accommodating all uses, and better for long-term maintenance and emergency vehicle access. When motor vehicles are driven on shared use paths, their wheels often will be at or very near the edges of the path. Since this can cause edge damage that, in turn, will reduce the effective operating width of the path, adequate edge support should be provided. Edge support can be either in the form of stabilized shoulders, a concrete "ribbon curb" along one or more edges of the path, or constructing additional pavement width or thickness. Constructing a typical pavement width of 10 feet, where right-of-way and other conditions permit, lessens the edge raveling problem. **Surfacing and Path Construction** Thicker surfacing and a well-prepared sub-grade will reduce deformation over time and reduce long-term maintenance costs. At a minimum, off-street paths should be designed with sufficient surfacing structural depth for the sub-grade soil type to support maintenance and emergency vehicles. Asphalt and concrete are the most common surface treatment for multi-use paths, however the material composition and construction methods used can have a significant determination on the longevity of the pathway. Surface selection should take place during the design process. If trees are adjacent to the path, a root barrier should be installed along the path to avoid root uplift.	

Design Summary	Design Example
Width 8 feet minimum paved path width (Caltrans). AASHTO recommends a paved width of 10 feet. A 3 to 4-foot wide native surface path may be considered alongside shared-use paths for runners. (This design differs from the Caltrans required 2-foot shoulders for Class I paths in that wider shoulders are optional if accommodation of joggers is desired.) **Paving** Hard, all-weather pavement surfaces are usually preferred over those of crushed aggregate, sand, clay or stabilized earth (AASHTO). **Separation From Highway** When two-way shared use paths are located adjacent to a roadway, wide separation between a shared use path and the adjacent highway is desirable. Bike paths closer than 5 feet from the edge of the shoulder shall include a physical barrier to prevent bicyclists from encroaching onto the highway (Caltrans). Where used, the barrier should be a minimum of 42 inches high (AASHTO).	 **Guidance** • Caltrans Highway Design Manual (Chapter 1000 Section 1003.1(1) and (2), and 1003.5) • AASHTO Guide for the Development of Bicycle Facilities, Chapter 2 • California MUTCD Chapter 9B. Signs Guidelines for Accessible Public Rights-of-Way **Cost** • Class I Path: $640,000 per mile (Note 1: This assumes an asphalt or concrete path. Note 2: The concrete option is likely to cost 50 percent more than a standard asphalt pathway.)

C.3.3. Bollards

Discussion

Minimize the use of bollards to avoid creating obstacles for bicyclists. Bollards, particularly solid bollards, have caused serious injury to bicyclists. The California MUTCD explains, "Such devices should be used only where extreme problems are encountered" (Section 9C.101). Instead, design the path entry and use signage to alert drivers that motor vehicles are prohibited.

Bollards are ether fixed or removable and may be flexible or rigid. Flexible bollards and posts are designed to give way on impact and can be used instead of steel or solid posts. Bollards are typically installed using one of two methods: 1) The bollard is set into concrete footing in the ground; and 2) the bollard is attached to the surface by mechanical means (mechanical anchoring or chemical anchor).

Design Summary

- Where removable bollards are used, the top of the mount point should be flush with the path's surface so as not to create a hazard. Posts shall be permanently reflectorized for nighttime visibility and painted a bright color for improved daytime visibility.
- Striping an envelope around the post is recommended.
- When more than one post is used, an odd number of posts at 1.5m (5-foot) spacing is desirable. Wider spacing can allow entry by adult tricycles, wheelchair users and bicycles with trailers.

Guidance

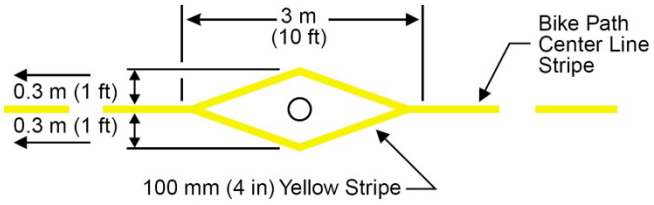
- MUTCD – California Supplement (Section 9C.101-CA)
- AASHTO Guide for the Development of Bicycle Facilities Chapter 2

Cost

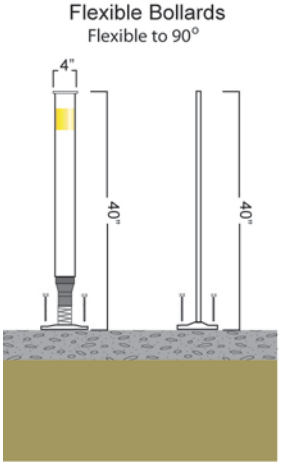
- Bollard, fixed: $220 - $800 each
- Bollard, removable: $680 - $940 each

Recommended Design

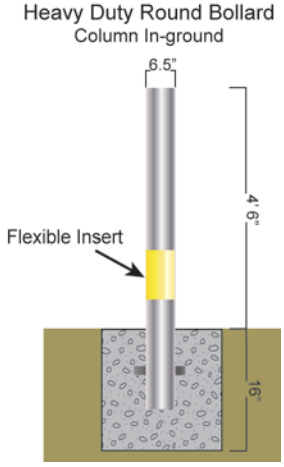
Barrier Post Striping



Flexible Bollards

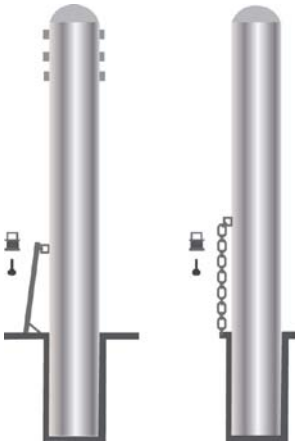


Source: Lighthouse Bollards



Source: Andian Sales

Removable Bollards



Source: Reliance Foundry Co. Ltd

C.3.4. Recommended Path Signage

Discussion

Custom signage may be installed to guide trail users on proper trail etiquette (see graphic), especially in areas where conflicts are likely to occur. Because pedestrians typically travel at slower speeds than bicyclists, it is recommended that any signage direct pedestrians to walk on the right. Where signage is necessary, any of the three types of signage to the right are recommended as ways to encourage path users to yield to each other and to keep the paths clear.

A centerline marking is particularly beneficial in the following circumstances: A) Where there is heavy use; B) On curves with restricted sight distance; and C) Where the path is unlighted and nighttime riding is expected.

Design Summary

Signage
The Shared-Use Path Restriction (R9-7) sign may be installed on facilities shared by pedestrians and bicyclists.

Recommended Design

User Etiquette Signs along Multi-Use Paths

Guidance

- MUTCD, Sections 9B.12 and 9C.03
- MUTCD – California Supplement, Section 9B.11 and 9C.03
- AASHTO Guide for the Development of Bicycle Facilities, Chapter 2

Cost

- Signs, trail regulation: $150 each
- Signs, trail wayfinding / information: $500 - $2,000 each

C.4. Pathway Crossing

Shared use paths can intersect with roadways at midblock locations, or as part of a roadway-roadway intersection. Common issues at intersections of shared use paths and roadways include:

- Bicyclists entering or exiting the path may travel against motor vehicle traffic;
- Motorists crossing the shared use path at driveways and intersections may not notice path users, particularly path users coming from the right;
- Stopped motor vehicle traffic or vehicles exiting side streets or driveways may block the path; and
- Motorists may not expect or be able to yield to fast-moving bicyclists at the intersection.

C.4.1. Treatments

Bicycle and pedestrian pathway designers and traffic engineers generally have four options for designing multi-use pathway crossings. These include:

Option 1- Reroute to the nearest at-grade controlled intersection crossing;

Option 2- Create a new at-grade midblock crossing with traffic controls where the pathway intersects with the roadway;

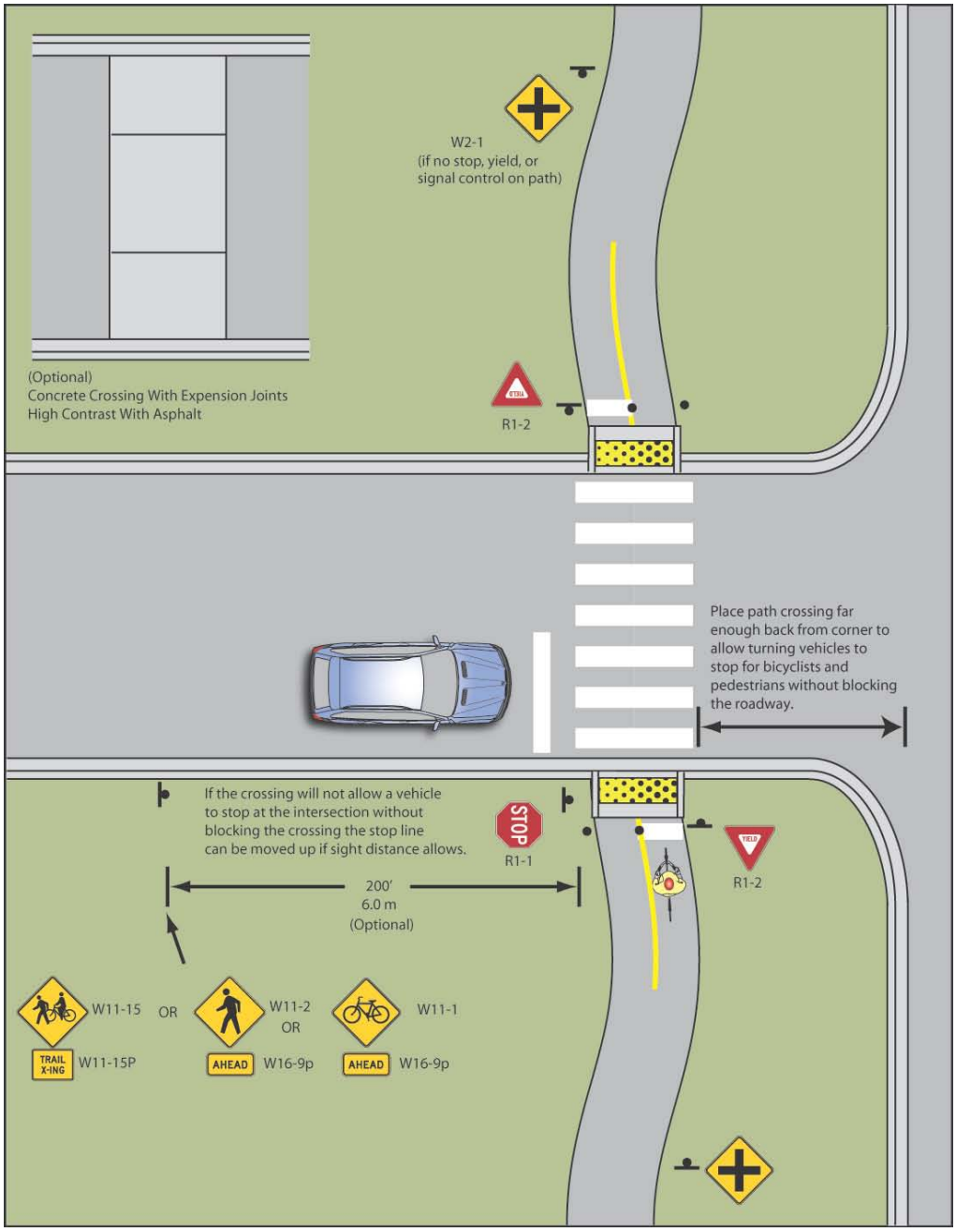
Option 3- Create a new unprotected midblock crossing where the pathway intersects with the roadway; and

Option 4- Create a grade-separated undercrossing or overcrossing of the roadway where the pathway intersects the roadway.

C.4.2. Path Crossing at Intersection

Discussion	Design Summary
The evaluation of a roadway crossing involves analysis of vehicular traffic and path user travel patterns, including speeds, street width, traffic volumes (average daily traffic, peak hour traffic), line of sight, and trail user profile (age distribution and destinations). When engineering judgment determines that the visibility of the intersection is limited on the shared-use path approach, Intersection Warning signs should be used.	A path should be routed to a signalized intersection if the path would cross a major arterial with a high ADT within 350 feet of a signalized intersection. **Signage** Intersection Warning (W2-1 through W2-5) signs may be used on a roadway, street, or shared-use path in advance of an intersection to indicate the presence of an intersection and the possibility of turning or entering traffic. A trail-sized stop sign (R1-1) should be placed about 5 feet before the intersection. **Traffic Calming** Reducing the speed of the conflicting motor vehicle traffic should be considered. Options may include: transverse rumble strips approaching the trail crossing or sinusoidal speed humps. **Crosswalk Markings** Colored and/or high visibility crosswalks should be considered. **Path Speed Control** A chicane, or swerve in multi-use path approaching the crossing is recommended to slow bicyclist speed. Path users traveling in different directions should be separated either with physical separation (bollard or raised median) or a centerline. If a centerline is used, it should be striped for the last 100 feet of the approach.

Recommended Design



Recommended "Typical" At-Grade Crossing at an Intersection Where Trail is Adjacent to a Road

Design Example

Typical "at grade" roadway crossing.

Source: PBIC Image Library

Photographer: Danny McCullough

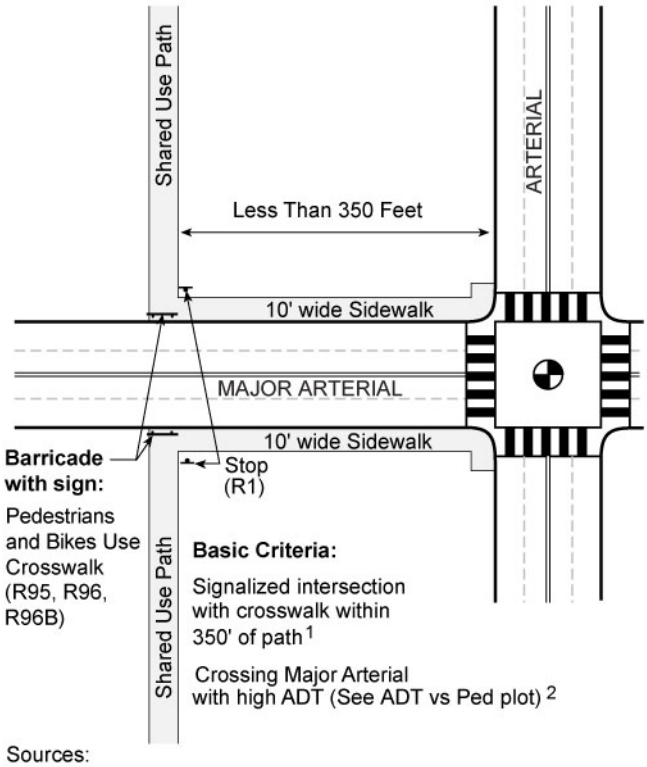
Guidance

- Caltrans Highway Design Manual (Chapter 1000 Section 1003.1(4))
- MUTCD – California Supplement, Part 9
- AASHTO Guide for the Development of Bicycle Facilities and "A Policy on the Geometric Design of Highways and Streets"
- FHWA-RD-87-038 Investigation of Exposure-Based Pedestrian Accident Areas: Crosswalks, Sidewalks, Local Streets, and Major Arterials.

Cost

- Crosswalk, Transverse (parallel) Lines: $320 - $550 each
- Crosswalk, Thermoplastic: $6 per square foot
- Stop bar: $210 each
- Stop Limit Bars / Yield Teeth: $210 - $530 each
- Stop Pavement Markings: $420 each
- Curb Ramps, Retrofit (diagonal, per corner): $800 – 5,340 each
- Curb Ramps, Retrofit (perpendicular, per corner): $5,340 - $10,000 each
- Signs, High-Visibility: $430 each
- Bollard, fixed: $220 - $800 each
- Bollard, removable: $680 - $940 each

Recommended Design (Continued)



Recommended "Typical" At-Grade Crossing of a Major Arterial at an Intersection Where Trail is Within 350 Feet of a Roadway Intersection

C.4.3. Uncontrolled Mid-Block Crossing

Discussion

Uncontrolled midblock crossings can be an important component of a pedestrian network where crosswalks are far apart. On streets with higher traffic volumes and speeds, treatments such as high-visibility crosswalks and crossing signage are appropriate.

Design Summary

Placement

Mid-block crosswalks should be installed where there is a significant demand for crossing and no nearby existing crosswalks.

Yield Lines

If yield lines are used for vehicles, they shall be placed 20 to 50 feet in advance of the nearest crosswalk line to indicate the point at which the yield is intended or required to be made and 'Yield Here to Pedestrians' signs shall be placed adjacent to the yield line. Where traffic is not heavy, stop or yield signs for pedestrians and bicyclists may suffice.

Warning Signs

The Bicycle Warning (W11-1) sign alerts the road user to unexpected entries into the roadway by bicyclists, and other crossing activities that might cause conflicts.

Pavement Markings

A ladder crosswalk should be used. Warning markings on the path and roadway should be installed.

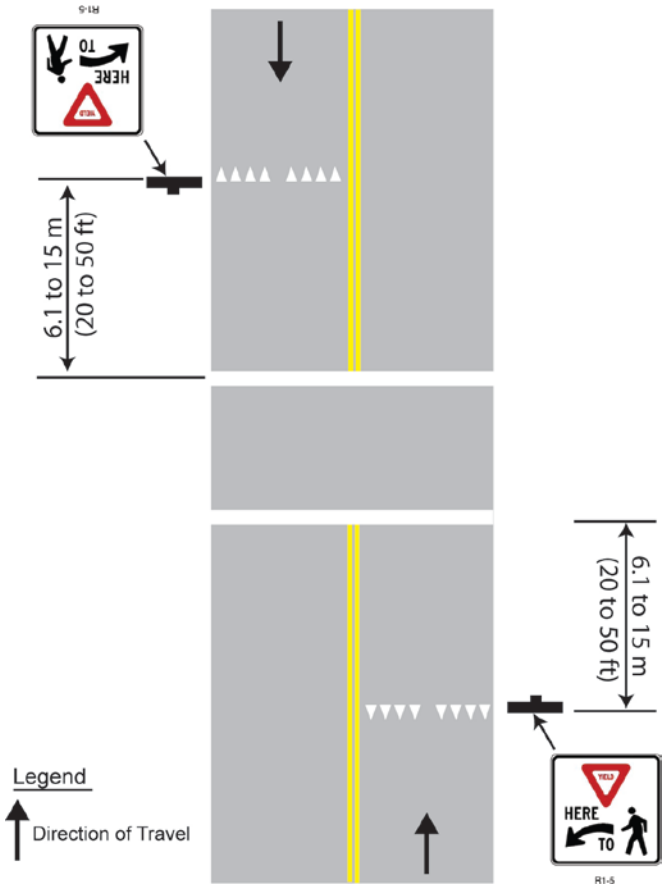
Other Treatments

See table on the following page to determine if treatments such as raised median refuges, flashing beacons should be used.

Beacons

See **Section A.4.4** of this document

Recommended Design



Source: California MUTCD, Figure 3B-15

Guidance	Recommended Design (continued)
• Caltrans Highway Design Manual (Chapter 1000) • MUTCD – California Supplement, Parts 2 and 9 • AASHTO Guide for the Development of Bicycle Facilities	 CA MUTCD

C.4.4. Crossing Beacons

Discussion

Beacons are typically used to supplement advance warning signals or at midblock crosswalks.

Types of Beacons

MUTCD identifies the following types of flashing beacons relevant to shared use trail - roadway intersections:

- Intersection control beacon - a beacon used only at an intersection to control two or more directions of travel
- Warning beacons - a beacon used only to supplement an appropriate warning or regulatory sign or marker
- Stop beacons - a beacon used to supplement a STOP sign, a DO NOT ENTER sign, or a WRONG WAY sign

Experimental Treatments

There are other experimental pedestrian beacons that have been shown to have higher yielding rates than the standard flashing beacon. These include:

- The Rectangular-Shaped Rapid Flash LED Beacons, which have been shown to have an 80 to 90 percent compliance rate in the field; and
- The Pedestrian Hybrid Beacon, or High-Intensity Actuated Crosswalk (HAWK). The HAWK has a driver yielding rate of 97 percent and reduces pedestrian-motor vehicle crashes by 58 percent.

The application of experimental treatments within California should follow the California Traffic Control Devices Committee's (CTCDC) approval process (http://www.dot.ca.gov/hq/traffops/signtech/newtech/).

Jurisdictions within California can apply to the CTCDC for permission to use experimental treatments. Note that the CTCDC has not approved the HAWK treatment to date. (See CTCDC's October 11, 2007 agenda and meeting minutes available on the Committee's website.)

Recommended Design

Rectangular Rapid Flash Beacon

Design Summary

Traffic Control Signal Warrants

MUTCD Section 4C.01 identifies the minimum use and spacing parameters that must be met in order to warrant installation of a beacon.

Overhead flashing pedestrian beacons are governed under Section 4K.03 of the CA MUTCD.

CA MUTCD Section 4K.103 (CA) permits flashing beacons at school crosswalks. Section 4C.06 describes warrants (i.e., minimum requirements) for installation of a signal on a route to school.

Guidance

- MUTCD – California Supplement, Sections 4C and 4K
- ITE – Alternative Treatments for At-Grade Pedestrian Crossings

Cost

- Signs, Overhead Beacon: $15,000-$55,120 each
- Detection, Automated Beacon: $800 each
- Crossing, RRFB: $15,000 each
- Actuated Pedestrian Crossing: $40,000 each

C.4.5. Signalized Mid-Block Crossing

Discussion

Warrants from the MUTCD combined with sound engineering judgment should be considered when determining the type of traffic control device to be installed at path-roadway intersections. Traffic signals for path-roadway intersections are appropriate under certain circumstances. The MUTCD lists 11 warrants for traffic signals, and although path crossings are not addressed, bicycle traffic on the path may be functionally classified as vehicular traffic and the warrants applied accordingly.

Pedestrian volumes can also be used for warrants.

Experimental Treatment

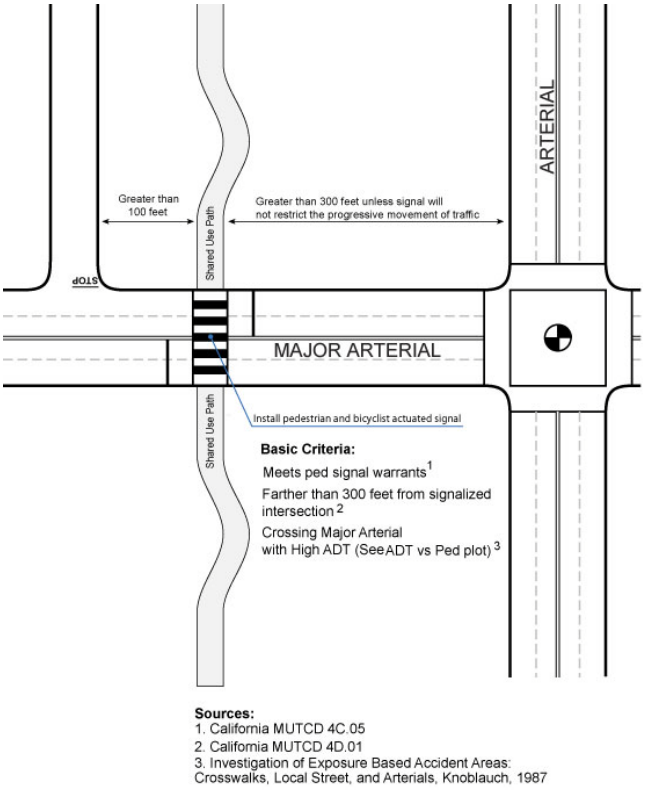
A Toucan crossing (derived from: "two can cross") is used in higher traffic areas where pedestrians and bicyclists are crossing together.

Design Summary

Warrants
Section 4C.05 in the CAMUTCD describes pedestrian volume minimum requirements (referred to as warrants) for a mid-block pedestrian-actuated signal.

Pavement Markings
Stop lines at midblock signalized locations should be placed at least 40 feet in advance of the nearest signal indication.

Recommended Design



Design Example

Toucan Crossing (This experimental treatment has not been approved for use in California)

Guidance

- MUTCD – California Supplement, Chapters 3 and 9 and Section 4C.05 and 4D
- AASHTO Guide for the Development of Bicycle Facilities, Chapter 2

Cost

- Crossing, Toucan: $90,000 each

C.5. On-Street Bicycle Facility Design

C.5.1. Bike Lanes

Bike lanes or Class II bicycle facilities (Caltrans designation) are defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are generally found on major arterial and collector roadways and are 4 to 7 feet wide. Bike lanes can be found in a large variety of configurations, and can even incorporate special characteristics including coloring and placement, if beneficial.

Bike lanes enable bicyclists to ride at their preferred speed without interference from prevailing traffic conditions and facilitate predictable behavior and movements between bicyclists and motorists. Bicyclists may leave the bike lane to pass other bicyclists, make left turns, avoid obstacles or debris, and to avoid other conflicts with other roadway users.

C.5.2. General Design Guidance:

C.5.2.1. Width: Varies depending on roadway configuration, see following pages for design examples.

C.5.2.2. Striping:

Line separating vehicle lane from bike lane (typically left sideline): 6 inches
Line separating bike lane from parking lane (if applicable): 4 inches
Dashed white stripe when:

- Vehicle merging area: Varies
- Delineate conflict area in intersections(optional): Length of conflict area

C.5.2.3. Signing:

Use R-81 Bike Lane Sign at:

R-81 Sign

- Beginning of bike lane;
- Far side of all intersection crossings;
- At approaches and at far side of all arterial crossings;
- At major changes in direction; and
- At intervals not to exceed ½ mile.

C.5.2.4. Pavement Markings:

There are three potential variations of pavement markings for bike lanes allowed by the California MUTCD. Most cities nationwide use the graphic representation of cyclist with directional arrow (pictured right). This stencil should be used at:

Recommended Bike Lane Stencil

- Beginning of bike lane;
- Far side of all bike path (Class I) crossings;
- At approaches and at far side of all arterial crossings;
- At major changes in direction;
- At intervals not to exceed ½ mile; and
- At beginning and end of bike lane pockets at approach to intersection.

C.5.3. Bike Lane with No On-Street Parking

Discussion

Recommended bicycle lane width is 5 feet minimum when adjacent to curb and gutter. Wider bicycle lanes are desirable in certain circumstances such as on higher speed arterials (45 mph+) where a wider bicycle lane can increase separation between passing vehicles and bicyclists, which is especially preferable on uphill grades. Appropriate signing and stenciling is important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane. Bicycle lanes wider than seven feet are not recommended.

Design Summary

Bike Lane Width:

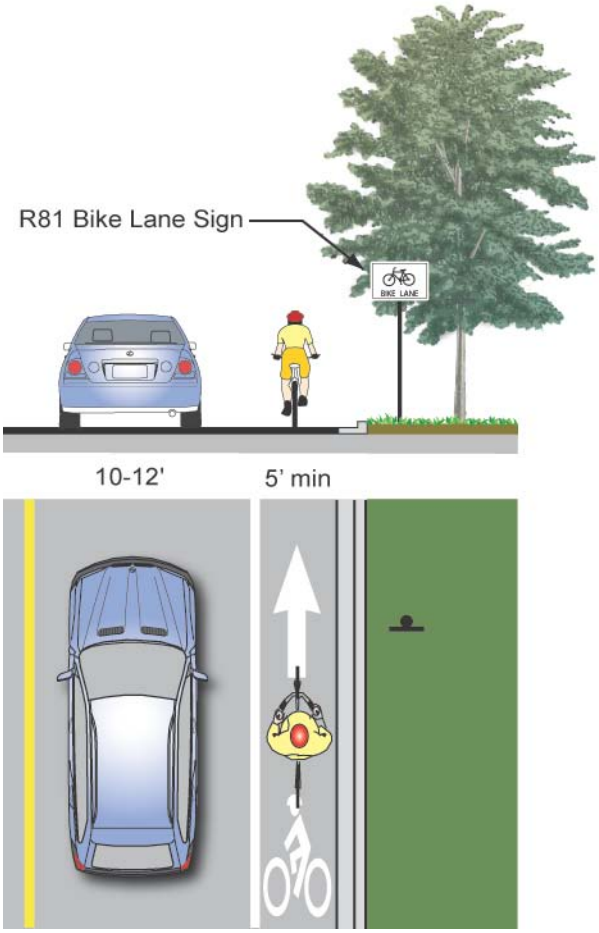
4 feet minimum when no gutter is present (rural road sections)

5 feet minimum when adjacent to curb and gutter (3' more than the gutter pan width if the gutter pan is greater than 2')

Recommended Width:

6 feet where right-of-way allows and up hills

Recommended Design



Guidance

- MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- MUTCD – California Supplement
- AASHTO Guide for the Development of Bicycle Facilities

Cost

- Class II Bike Lane: $5,000-$500,000 per mile

C.5.4. Bike Lane With On-Street Parallel Parking

Discussion

Bike lanes adjacent to parallel parking should be designed to be wide enough to allow bicyclists to ride outside of the "door zone" (i.e., five feet minimum).

Design Summary

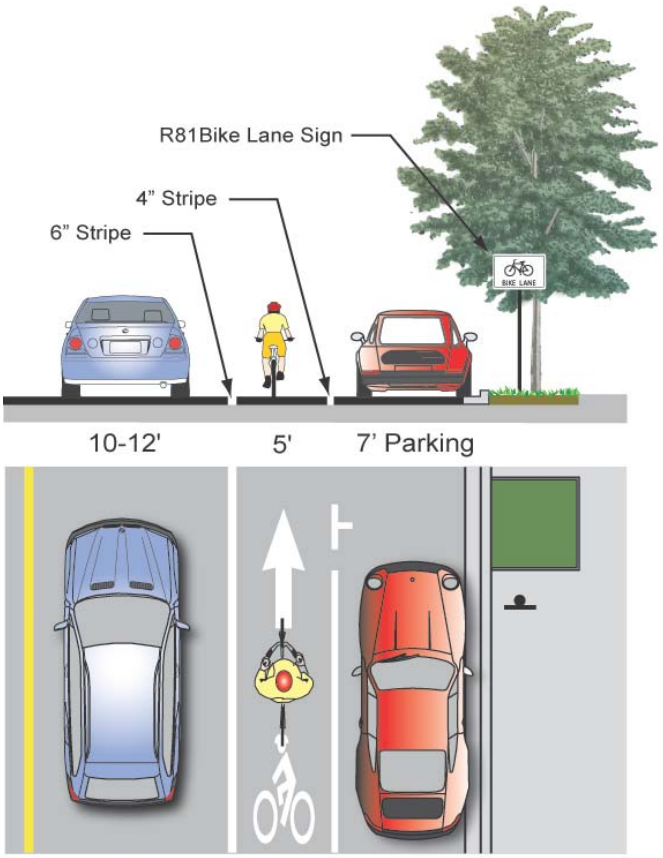
Bike Lane Width:

5 feet minimum recommended when parking stalls are marked

7 feet maximum (wider lanes may encourage vehicle loading in bike lane)

12 feet for a shared lane adjacent to a curb face (13 feet is preferred where parking is substantial or turnover is high), or 11′ minimum for a shared bike/parking lane on streets without curbs where parking is permitted.

Recommended Design



Guidance

- Caltrans Highway Design Manual (Chapter 1000)
- MUTCD – California Supplement
- AASHTO Guide for the Development of Bicycle Facilities

Cost

- Class II Bike Lane: $5,000-$500,000 per mile

C.6. Bike Routes

Bike routes, or Class III bicycle facilities – (Caltrans designation) are defined as facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or with shoulders. Bike routes can be established along through routes not served by shared use paths (Class I) or bike lanes (Class II), or to connect discontinuous segments of bikeway. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Bicycle Routes can employ a large variety of treatments from simple signage to complex treatments including various types of traffic calming and/or pavement stenciling. The level of treatment to be provided for a specific location or corridor depends on several factors.

C.6.1. General Design Guidance:

C.6.1.1. Signing:

Use D11-1 Bicycle Route Sign at:

- Beginning or end of bicycle route (with applicable M4 series sign);
- Entrance to bicycle path (Class I) – optional;
- At major changes in direction or at intersections with other bicycle routes (with applicable M7 series sign); and
- At intervals along bicycle routes not to exceed ½ mile.

D11-1 Sign

C.6.1.2. Pavement Markings:

Shared Lane Markings may be applied to bicycle routes per **Section C.6.3.**

C.6.2. Bike Route

Discussion

Bicycle routes on local streets should have vehicle traffic volumes under 1,000 vehicles per day. Traffic calming may be appropriate on streets that exceed this limit.

Bicycle routes may be placed on streets with outside lane width of less than 15 feet if vehicle speeds and volumes are low.

Design Summary

Bicycle Route signage may include City specific logos. See design example below.

Route signage should be applied at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists.

Design Example

Guidance

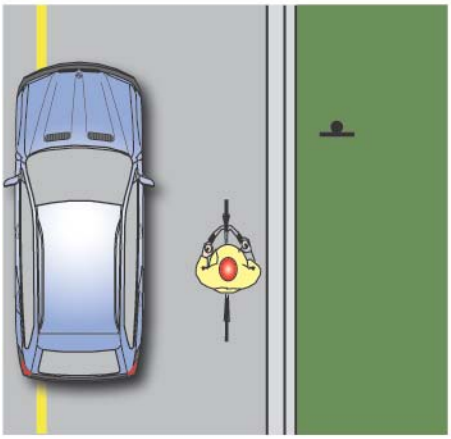
- Caltrans Highway Design Manual (Chapter 1000)
- MUTCD – California Supplement
- AASHTO Guide for the Development of Bicycle Facilities

Cost

- Class III Bike Route: $1,000-$40,000 per mile (assumes no major renovation is required)
- $150,000 - $300,000 (assuming moderate to major roadway renovation)

Recommended Design

Local Street - Width Varies



C.6.3. Class III Bike Route with Shared Lane Markings (SLM)

Discussion

Recently, Shared Lane Marking (SLM) stencils (also called "Sharrows") have been introduced for use in California as an additional treatment for bike route (Class III) facilities and are currently approved in conjunction with on-street parking. The stencil can serve a number of purposes, such as making motorists aware of the need to share the road with bicyclists, showing bicyclists the direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent "dooring" collisions.

SLM should be placed a minimum of 11 feet from the curb. Where there are two or more travel lanes per direction, if the outside lane is less than 14 feet, or where there is high parking turnover or where bicyclists may need positioning guidance, the SLM may be placed in the middle of the outside travel lane. Additionally SLM's may be placed where drivers may need additional notice to expect bicyclists.

Though not always possible, placing the SLM markings outside of vehicle tire tracks will increase the life of the markings and the long-term cost of the treatment.

Design Summary

Door Zone Width:

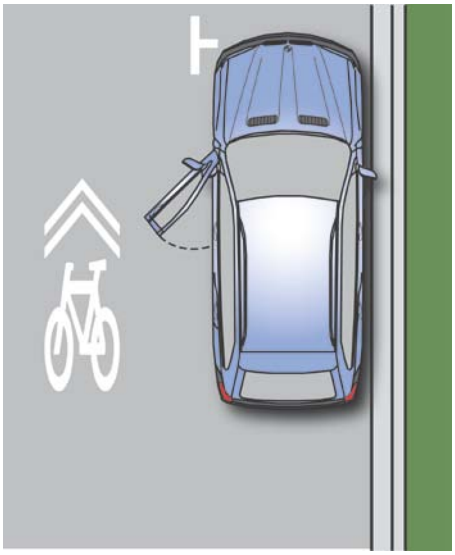
The width of the door zone is generally assumed to be 2.5 feet from the edge of the parking lane.

Recommended SLM placement:

A Minimum of 11.5 feet from edge of curb where on-street parking is present.

Where there are two or more travel lanes per direction, if the outside lane is less than 14 feet, or where there is high parking turnover or where bicyclists may need positioning guidance, the SLM may be placed in the middle of the outside travel lane.

Recommended Design



Guidance

- MUTCD – California Supplement, Section 9C.103

Cost

- Stencils only: $250 each

C.6.4. Additional Bike Route Signage

Discussion

'Share the Road' signs are intended to 'reduce motor vehicle/bicyclist conflict' and are appropriate to be placed on routes that lack paved shoulders or other bicycle facilities. They typically work best in rural situations, or when placed near activity centers such as schools, shopping centers and other destinations that attract bicycle traffic.

In urban areas, many cities around the country have been experimenting with a new type of signage that encourages bicyclists to take the lane when the lane is too narrow. This type of sign is becoming known as BAUFL (Bikes Allowed Use of Full Lane). This can be quantified to lanes being less than 14 feet wide with no parking and less than 22 feet wide with adjacent parallel parking. The 2009 update to the MUTCD recognizes the need for such signage and has designated the white and black sign at right (R4-11). The 2010 CA MUTCD states that Shared Lane Markings (which serve a similar function as Bikes May Use Full Lane signage) should not be placed on roadways that have a speed limit above 40 mph. Dedicated bicycle facilities are recommended for roadways with speed limits above 40 mph where the need for bicycle access exists.

Design Summary

Placement:

Signs should be placed at regular intervals along routes with no designated bicycle facilities.

Guidance

- MUTCD – California Supplement Section 9C.103

Cost

- Sign, regulation: $150 each

Recommended Design

Share The Road Signs

CA MUTCD Sign R4-11

C.6.5. Bicycle Boulevards

Discussion

Bicycle boulevards have been implemented in a variety of locations including Palo Alto, San Luis Obispo, Berkeley and Davis, California and Portland, Oregon. Bicycle boulevards, also known as bicycle priority streets, are non-arterial streets that are designed to allow bicyclists to travel at a consistent, comfortable speed along low-traffic roadways and to cross arterials conveniently and safely. Bicycle boulevards typically include treatments that allow bicyclists to travel along the bicycle boulevard with minimal stopping while discouraging motor vehicle traffic. Traffic calming and traffic management treatments such as traffic circles, chicanes, and diverters are used to discourage motor vehicles from speeding and using the bicycle boulevard as a cut-through. Quick-response traffic signals, median islands, or other crossing treatments are provided to facilitate bicycle crossings of arterial roadways.

Design Summary

- Residential streets with low traffic volumes (typically between 3000 to 5000 average daily vehicles).
- Can include secondary commercial streets.
- Bicycle boulevard pavement markings should be installed in conjunction with wayfinding signs.
- Can be designed to accommodate the particular needs of the residents and businesses along the routes, and may be as simple as pavement markings with wayfinding signs or as complex as a street with traffic diverters and bicycle signals.

Guidance

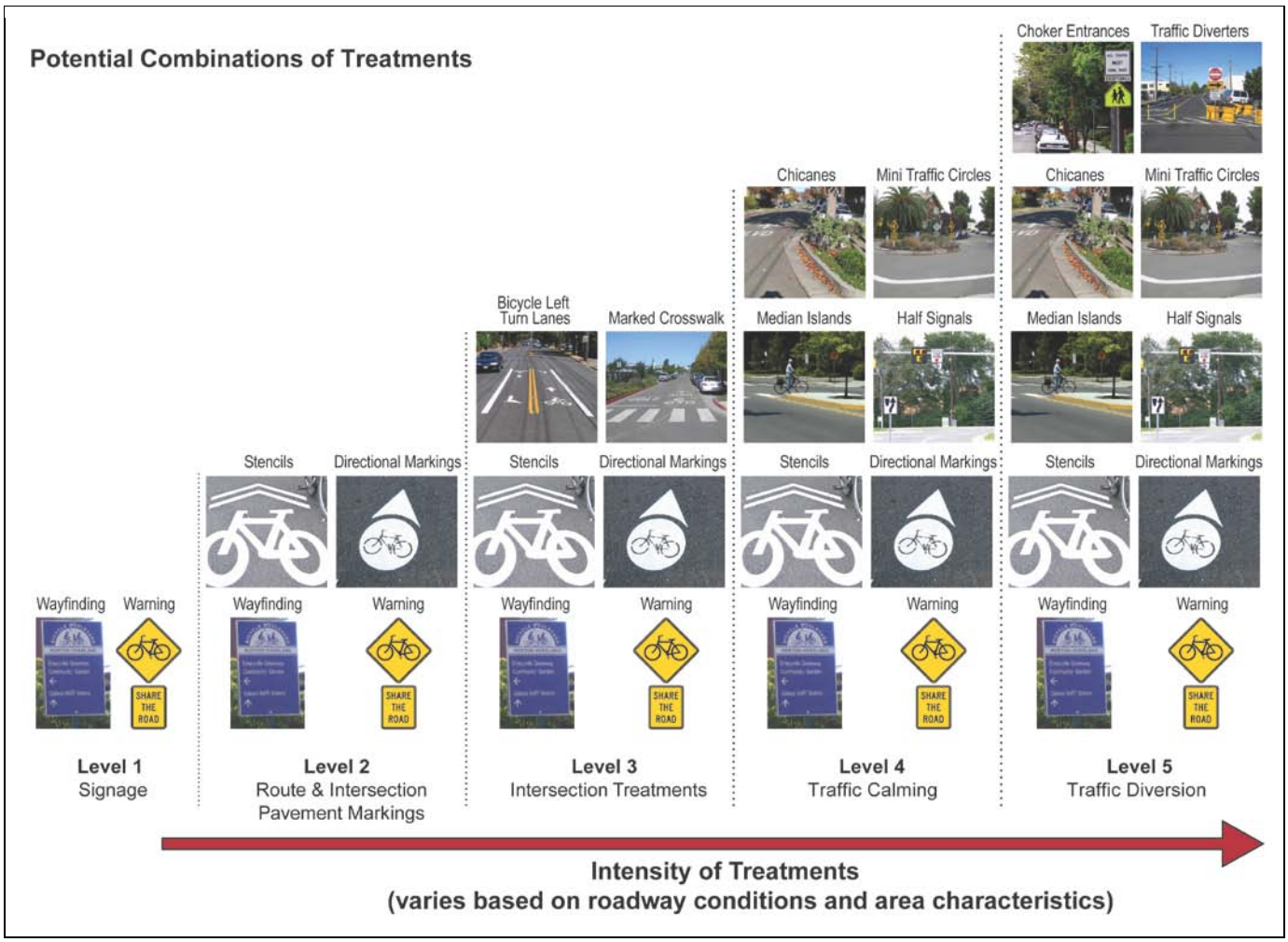
- This treatment is not currently present in any State or Federal design standards
- Berkeley Bicycle Boulevard Design Tools and Guidelines: http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=6652

Cost

- $310,500 per mi (source: San Benito Bike Plan, 2008)

Design Example

See next page.


Potential Combinations of Treatments
Choker Entrances
Traffic Diverters
Chicanes
Mini Traffic Circles
Chicanes
Mini Traffic Circles
Bicycle Left Turn Lanes
Marked Crosswalk
Median Islands
Half Signals
Median Islands
Half Signals
Stencils
Directional Markings
Stencils
Directional Markings
Stencils
Directional Markings
Stencils
Directional Markings
Wayfinding
Warning
Wayfinding
Warning
Wayfinding
Warning
Wayfinding
Warning
Wayfinding
Warning
SHARE THE ROAD
Level 1
Signage
Level 2
Route & Intersection Pavement Markings
Level 3
Intersection Treatments
Level 4
Traffic Calming
Level 5
Traffic Diversion
Intensity of Treatments
(varies based on roadway conditions and area characteristics)

C.6.6. Buffered Bike Lanes

Discussion

A buffered bike lane, also called an enhanced bike lane or protected bike lane, is a five-foot-wide bike lane that is buffered by a striped "shy zone" between the bike lane and the moving vehicle lane. With the shy zone, the buffered lane offers a more comfortable riding environment for bicyclists who prefer not to ride adjacent to traffic. This design makes movement safer for both bicyclists and vehicles. Motorists can drive at a normal speed and only need to watch for cyclists when turning right at cross-streets or driveways and when crossing the buffered lane to park. The advantages of the buffered bicycle lane design are that it provides a more protected and comfortable space for cyclists than a conventional bike lane and does not have the same turning movement constraints as cycletracks that accommodate two-way bicycle travel along one side of the roadway.

The buffer area may only be painted on the road or it may be physically separated by devices such as bots dots or bollards.

Design Summary

- A spatial buffer increases the distance between the bike lane and the automobile travel lane or the parking zone.
- Appropriate for roadways with high automobile traffic speeds and volumes, and/or high volume of truck/oversized vehicle traffic, and roadways with bike lanes adjacent to high turnover on-street parking.

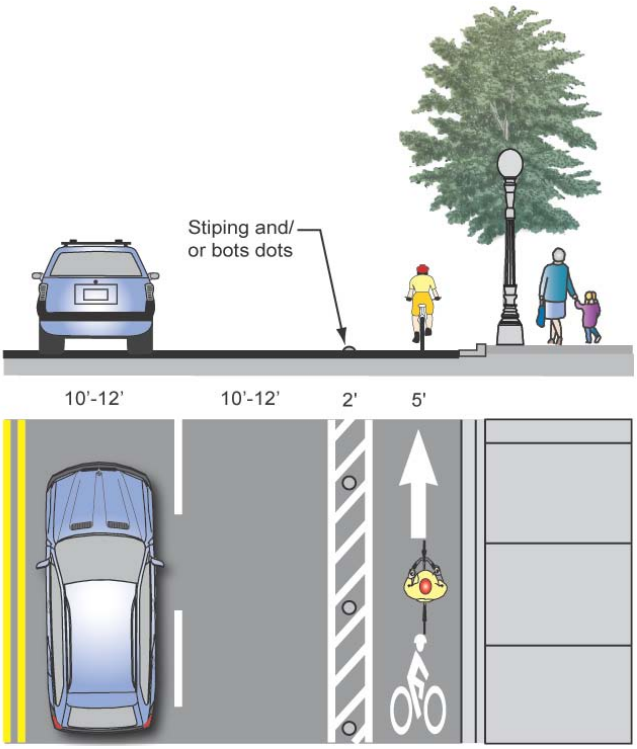
Design Example

Buffered bike lane in Fairfax, CA

Cost

- Bike lanes with 2-foot buffers on each side were installed for 3,000 linear feet in Portland for $45,000 in 2009.

Recommended Design



C.6.7. Colored Bike Lanes

Discussion

Color applied to bike lanes helps alert roadway users to the presence of bicyclists and clearly assigns right-of-way to cyclists. Motorists are expected to yield to cyclists in these areas. Some cities apply color selectively to highlight potential conflict zones, while others use it to mark all non-shared bicycle facilities in high volume traffic situations.

Color Considerations:

There are three colors commonly used in bicycle lanes: blue, green, and red. All help the bike lane stand out in merging areas. The City of Portland began using green lanes in 2008, as blue, the color used previously, is a color associated with ADA related signage on roadways. Green is the color recommended for use in the City of Wasco.

Material Options:

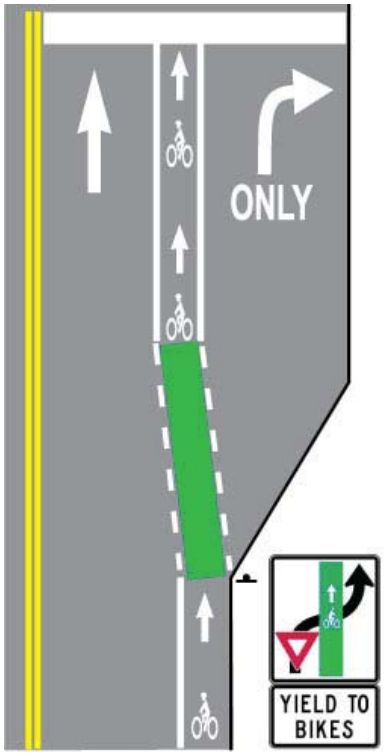
Colored bike lanes require additional cost to install and maintain. Techniques include:

- Paint – less durable and can be slippery when wet
- Colored asphalt – colored medium in asphalt during construction – most durable.
- Colored and textured sheets of acrylic epoxy coating.

Design Summary

- Bike lane width: See Section A.5.
- Appropriate for heavy auto traffic streets with bike lanes; at transition points where cyclists, motorists and/or pedestrians must weave with one another; conflict areas or intersections with a record of crashes; and to emphasize bicycle space in unfamiliar or unique design treatments.

Recommended Design



Colored bike lanes used to designate a conflict zone

Design Example

Guidance

- FHWA provides blanked approval for green colored pavement in marked bike lanes and bike lane extensions.
- Caltrans has approval (IA-14.10 – Green Colored Pavement for Bike Lanes – California Statewide).
- Agencies that use this treatment must provide location to the CTCDC.

C.6.8. Manholes & Drainage Grates

Discussion

Utility infrastructure within the roadway can present significant hazards to bicyclists. Manholes, water valve covers, drain inlets and other obstructions can present an abrupt change in level, or present a situation where the bicyclist's tire could become stuck, potentially creating an accident. As such, every effort should be made to locate such hazards outside of the likely travel path of bicyclists on new roadway construction.

For existing roadways, the roadway surface can be ground down around the manhole or drainage grate to be no more than half an inch of vertical drop. When roadways undergo overlays, this step is often omitted and significant elevation differences can result in hazardous conditions for bicyclists.

Bicycle drainage grates should not have longitudinal slats that can catch a bicycle tire and potentially cause an accident. Acceptable grate designs are presented (top right) as A: patterned, B: transverse grate, or C: modified longitudinal with no more than 6" between transverse supports). Type C is the least desirable as it could still cause problems with some bicycle tires.

The drop in-inlet avoids all issues with grates in the bicyclists' line of travel, however, these drainage inlets are not recommended by Caltrans for use on California Highways.

The CA MUTCD recommends providing a diagonal solid white line for hazards or obstructions in bikeways (see right).

Design Summary

Placement:

Manholes should be placed outside of any bike lanes. Drainage grates should be of one of the types at right.

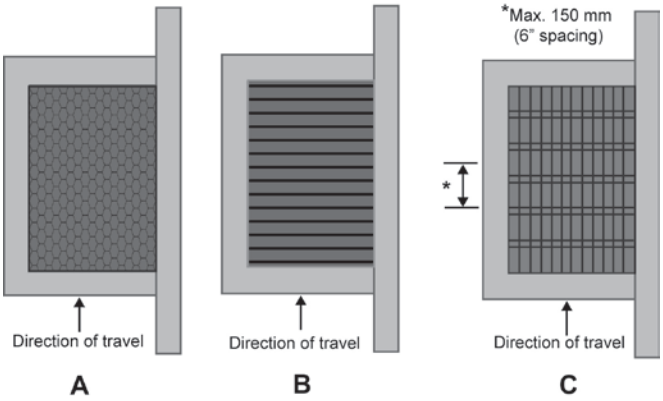
Guidance

- Caltrans Highway Design Manual (Chapter 1000)
- MUTCD – California Supplement
- AASHTO Guide for the Development of Bicycle Facilities

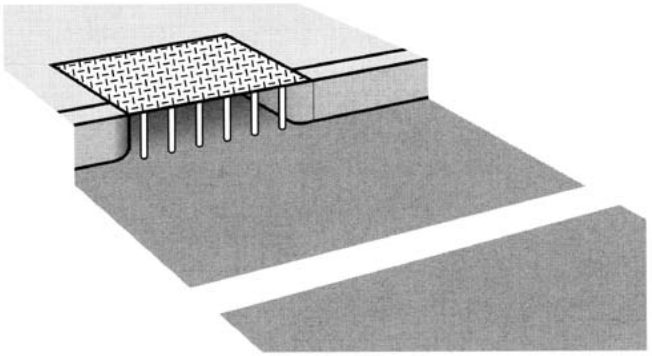
Cost

- Striping: $2 per linear foot
- Drainage grate: $500

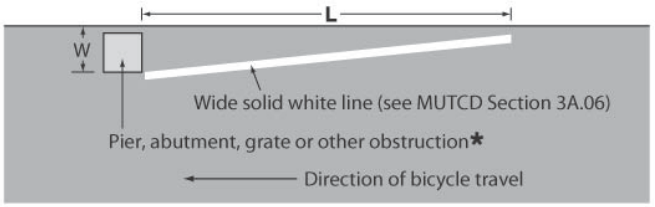
Recommended Design



Bicycle Compatible Drainage Grates



Drop-in inlet flush with in the curb face (Oregon DOT)



L = WS, where W is the offset in feet and S is bicycle approach speed in mph

* Provide an additional foot of offset for a raised obstruction and use the formula L= (W+1) S for the taper length

Figure 9C-8

C.6.9. Bicycle Access During Construction Activities

Discussion

When construction impedes a bicycle facility, the provision for bicycle access should be developed during the construction project planning. Long detour routing should be avoided due to lack of compliance.

Advance warning of the detour should be placed at appropriate locations and clear wayfinding should be implemented to enable bicyclists to continue safe operation along travel corridor. Bicyclists shall not be led into conflicts with mainline traffic, work site vehicles, or equipment.

Caltrans Traffic Operation Policy Directive 11-01 states bicyclists shall not be led into direct conflicts wit h mainline traffic, work site vehicles, or equipment moving through or around the temporary traffic control (TTC) zone.

Design Summary

Construction Detour Signs

Detours should be adequately marked with standard temporary route and destination signs (M409a or M4-9c). The Pedestrian/Bicycle Detour sign should have an arrow pointing in the appropriate direction.

When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project and the roadway width is inadequate for allowing motor vehicles and bicyclists to travel side-by-side, "share the road" signage (W11-1 and W16-1) should be used to advise motorists of the presence of bicyclists in the travel lane.

Signs should be places such that they do not block the bicyclist's path of travel and they do not narrow any existing pedestrian passages to less than 1200 mm (48 in).

Recommended Design

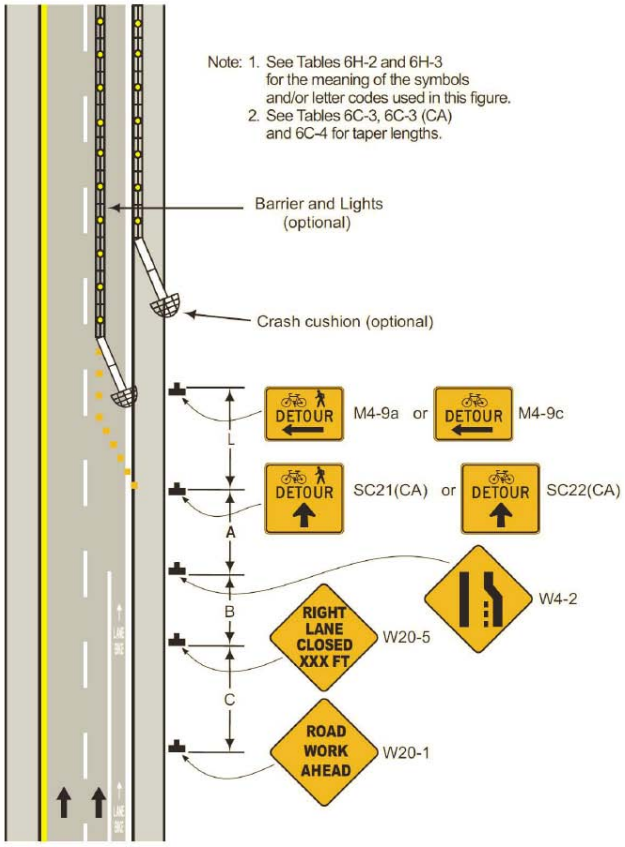
M4-9a M4-9c

National MUTCD

California MUTCD

Design Example

Guidance



Typical Application 102 (CA)

- California MUTCD – Part 6
- California Highway Design Manual
- Caltrans Traffic Operations Policy Directive 11-01

Cost

- Sign, regulation: $150 each

C.7. Intersection and Interchange Design for Bicyclists

Adequately accommodating bicyclists at traffic intersections and interchanges can be challenging for traffic engineers as the needs and characteristics of bicycles and motor vehicles vary greatly. This chapter contains sections on detection of bicycles at signals, bicycle pavement markings at signals, and bicycle signals.

C.7.1. Bicycle Detection at Signalized Intersections

Discussion

Traffic Operations Policy Directive 09-06, issued August 27, 2009 by Caltrans modified CA MUTCD 4D.105 to require bicyclists to be detected at all traffic-actuated signals on public and private roads and driveways. If more than 50 percent of the limit line detectors need to be replaced at a signalized intersection, then the entire intersection should be upgraded so that every line has a limit line detection zone. Bicycle detection must be confirmed when a new detection system has been installed or when the detection system has been modified.

The California Policy Directive does not state which type of bicycle detection technology should be used. Two common types of detection are video and in pavement loop detectors. Push buttons may not be used as a sole method of bicycle detection.

Design Summary

Limit Lines

- The Reference Bicycle Rider must be detected with 95% accuracy within a 6 foot by 6 foot Limit Line Detection Zone.

Loop Detection

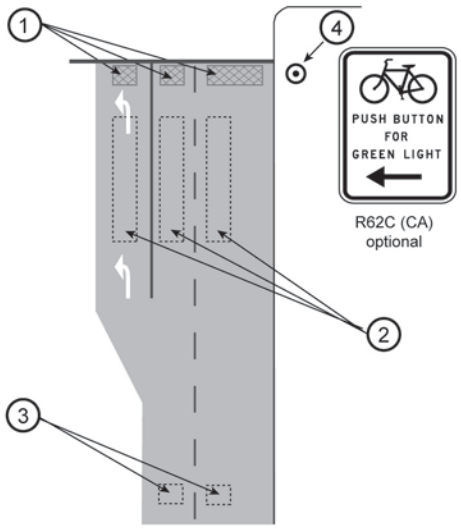
- In order to minimize delay to bicyclists, it is recommended to install one loop about 100 feet from the stop bar within the bike lane, with a second loop located at the stop bar.

Details of saw cuts and winding patterns for inductive detector loop types appear on the following page and Caltrans Standard Detail ES-5B.

NOTE: In California, Caltrans "Type C" and "Type D" quadruple loop detectors have been proven to be the most effective at detecting bicycles at signalized intersections and are presented on the following page.

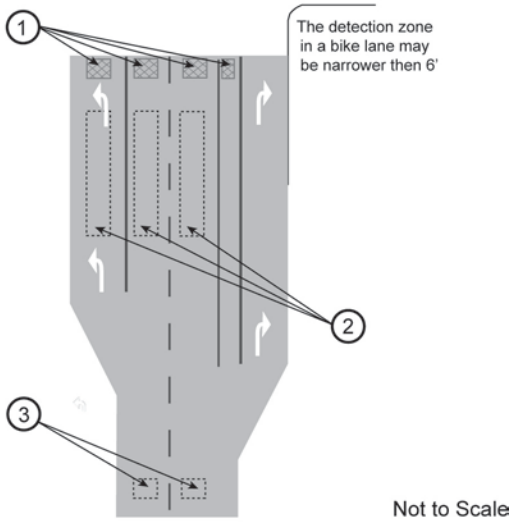
Recommended Design

A. Intersection with a wide right/through lane



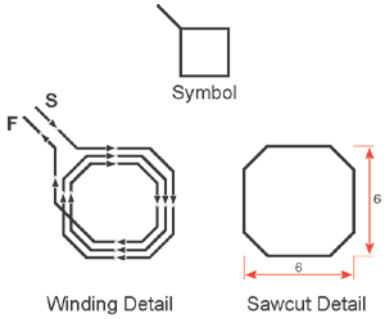
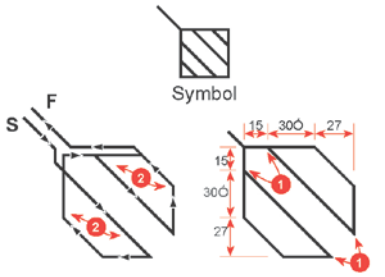
1. Typical technology-neutral limit line detection locations. See Section 4D.105(CA).
2. Typical presence detection locations. See Section 4D.103(CA).
3. Typical advance detection locations.
4. A bicyclist pushbuttion may be used to activate a traffic signal to supplement the required limit line detection. A pushbutton should be located so it is convenient to use by bicyclists. See Section 9B.1 for bicycle regulatory signs.

B. Intersection with a Bike Lane and right-turn lane



Source: Traffic Operations Policy Directive 09-06

Video Detection – Designs not available

Design Examples	Guidance
 **Type A Loop Detector Configuration**  **Type D Loop Detector Configuration**	• Caltrans Highway Design Manual (Chapter 1000) • Caltrans Standard Plans (1999) ES-5B • MUTCD – California Supplement • AASHTO Guide for the Development of Bicycle Facilities • Caltrans Traffic Operation Policy Directive 09-06 **Cost** • Bicycle Loop Detector: $1,000-$2,500 each

C.7.2. Loop Detector Pavement Markings and Signage

Discussion

Bicycle Detector Pavement Markings guide bicyclists to position themselves at an intersection to trigger signal actuation. Frequently these pavement markings are accompanied by signage that can provide additional guidance (see right).

Design Summary

Locate Bicycle Detector Pavement Marking over center of quadrupole loop detector if in bike lane, or where bicycle can be detected in a shared lane by loop detector or other detection technology.

Design Example

Guidance

- Caltrans Highway Design Manual (Chapter 1000)
- Caltrans Standard Plans (1999) ES-5B
- MUTCD – California Supplement
- AASHTO Guide for the Development of Bicycle Facilities

Cost

- Bicycle Loop Detector, Install stencils: $100 per intersection leg

Recommended Design

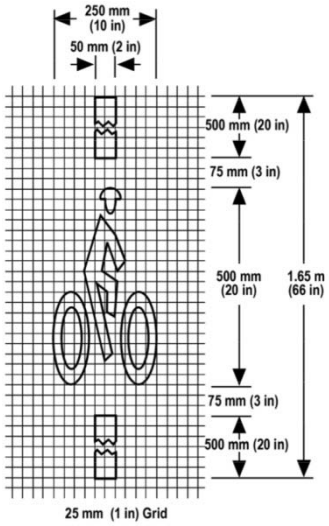


Figure 9C-7 – CAMUTCD

Accompanying Signage (R10-22)

C.7.3. Bike Lane at Intersection with Right Turn Only Lane

Discussion

A bicyclist continuing straight through an intersection from the right of a right turn lane would be inconsistent with normal traffic behavior and would violate the expectations of right-turning motorists. Specific signage, pavement markings and striping are recommended to improve safety for bicyclists and motorists.

The appropriate treatment for right-turn only lanes is to place a bike lane pocket between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to drop the bike lane entirely approaching the right-turn lane. The design (right) illustrates a bike lane pocket, with signage indicating that motorists should yield to bicyclists through the merge area.

- Dropping the bike lane is not recommended, and should only be done when a bike lane pocket cannot be accommodated.
- Travel lane reductions may be required to achieve this design.

Some communities have experimented with colored bicycle lanes through the weaving zone. See Portland's Blue Bike Lanes: http://www.portlandonline.com/shared/cfm/image.cfm?id=58842.

Where the right turn only lane is separated with a raised island, the island should be designed to allow adequate width to stripe the bike lane up to the intersection.

Design Summary

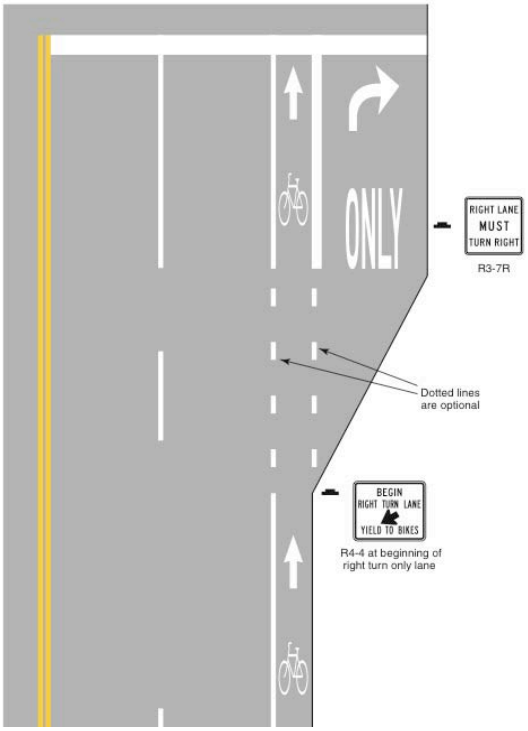
Bike Lane Placement
A through bicycle lane shall not be positioned to the right of a right turn only lane.

Bike Lane Width
Bike Lane through merge area of 5 feet is required.

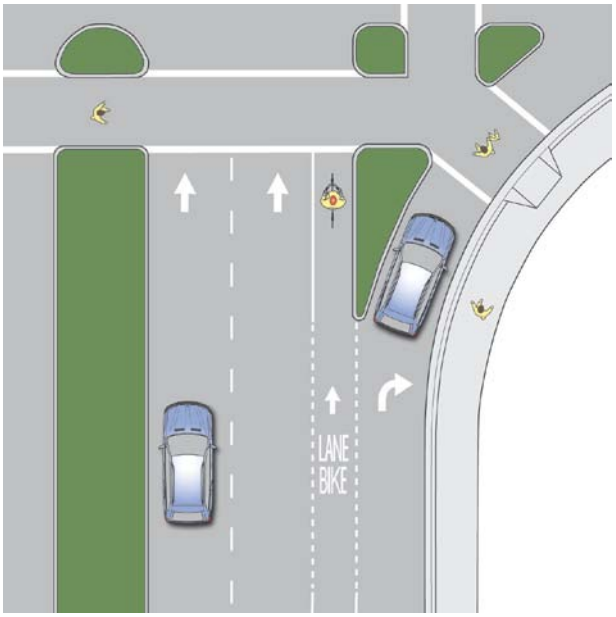
Bike Lane Striping
When the right through lane is dropped to become a right turn only lane, the bicycle lane markings should stop at least 100 feet before the beginning of the right turn lane. Through bicycle lane markings should resume to the left of the right turn only lane (MUTCD).

Where motorist right turns are permitted, the solid bike lane shall either be dropped entirely, or dashed beginning at a point between 100 and 200 feet in advance of the intersection.

Recommended Design



Bike Lane Next to a Right Turn Only Lane



Bike Lane Next to a Right Turn Only Lane Separated by a Raised Island

Design Summary (continued)	
Signage Refer to CA MUTCD.	
Guidance	
• Caltrans Highway Design Manual (Chapter 1000) • MUTCD – California Supplement Section 9C.04 • AASHTO Guide for the Development of Bicycle Facilities	

C.7.4. Bicycle Boxes

Discussion

A bike box is generally a right angle extension to a bike lane at the head of a signalized intersection. The bike box allows bicyclists to get to the front of the traffic queue on a red light and proceed first when that signal turns green. The bike box can also act as a storage area if heavy bicycle traffic exists. On a two-lane roadway the bike box can also facilitate left turning movements for bicyclists. Motor vehicles must stop behind the white stop line at the rear of the bike box.

Bike Boxes should be located at signalized intersections only, and right turns on red should be prohibited unless a separate right turn pocket is provided to the right of the bike box.

Bike boxes can be combined with dashed lines through the intersection for green light situations to remind vehicles to be aware of bicyclists traveling straight, similar to the colored bike lane treatment in **Section A.6.7.** Bike Boxes have been installed with striping only or with colored treatments to increase visibility.

Design Summary

Bike Box Dimensions

The Bike Box should be 10-14 feet deep to allow for bicycle positioning.

Signage

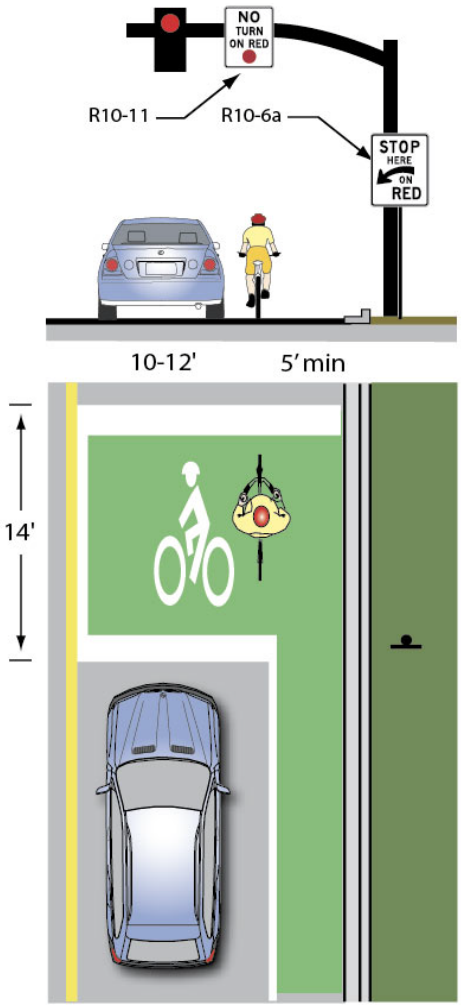
Appropriate signage as recommended by the MUTCD applies. Signage should be present to prevent 'right turn on red' and to indicate where the motorist must stop.

Design Example

Guidance

- This treatment is not currently present in any State or Federal design standards

Recommended Design

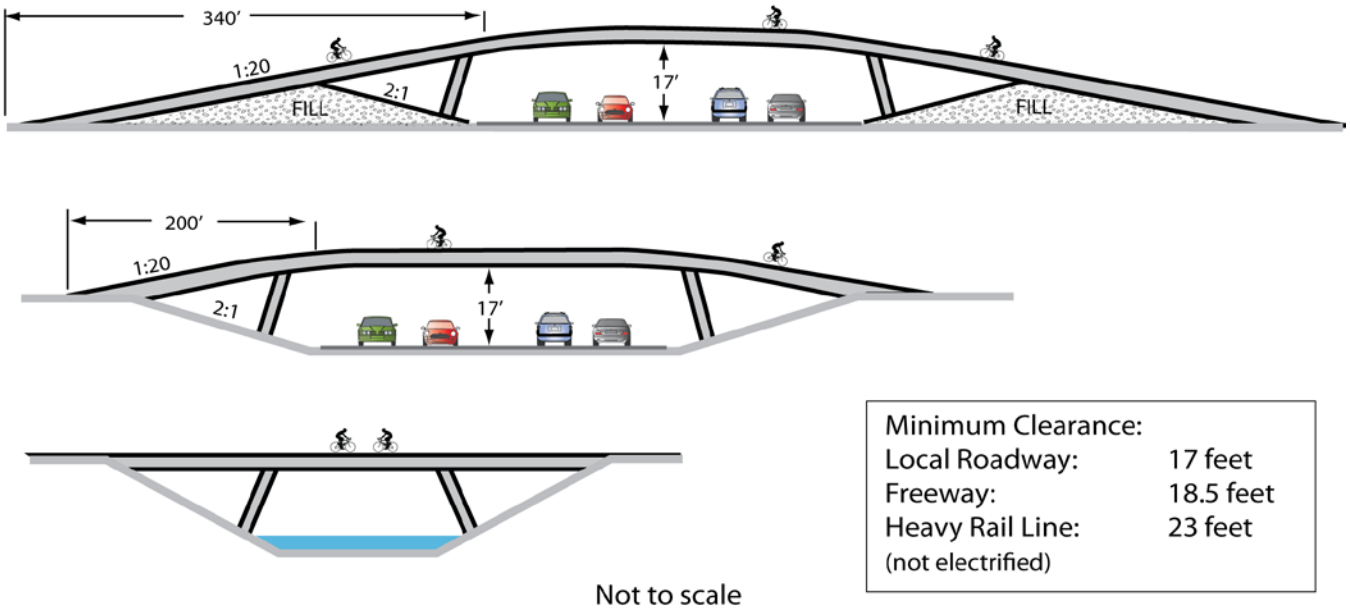


C.7.5. Bicycle and Pedestrian Overcrossing Design

Discussion	Design Example
Overcrossings require a minimum of 17 feet of vertical clearance to the roadway below versus a minimum elevation differential of around 12 feet for an undercrossing. This results in potentially greater elevation differences and much longer ramps for bicycles and pedestrians to negotiate. See following page for additional discussion.	See next page.

Design Summary	Guidance
Width 8 feet minimum, 14 feet preferred. If overcrossing has any scenic vistas additional width should be provided to allow for stopped path users. A separate 5 foot pedestrian area may be provided for facilities with high bicycle and pedestrian use. **Height** 10 feet headroom on overcrossing; clearance below will vary depending on feature being crossed. **Signage & Striping** The overcrossing should have a centerline stripe even if the rest of the path does not have one. **ADA Compliance** Either ramp slopes to 5% (1:20) with landings at 400 foot intervals or ramp slopes of 8.33% (1:12) with landings every 30 feet. **Lighting** See Section 3.1.2.	• Caltrans Highway Design Manual (Chapters 200 & 1000) • Caltrans Bridge Design Specifications • MUTCD – California Supplement • AASHTO Guide for the Development of Bicycle Facilities • AASHTO Guide Specifications for Design of Pedestrian Bridges

Recommended Design



Additional Discussion – Grade Separated Overcrossing

Ramp Considerations:

Overcrossings for bicycles and pedestrians typically fall under the Americans with Disabilities Act (ADA), which strictly limits ramp slopes to 5% (1:20) with landings at 400 foot intervals, or 8.33% (1:12) with landings every 30 feet.

Overcrossing Use:

Overcrossings should be considered when high volumes of bicycles and pedestrians are expected along a corridor and:

- Vehicle volumes/speeds are high.
- The roadway is wide.
- An at-grade crossing is not feasible.
- Crossing is needed over a grade-separated facility such as a freeway or rail line.

Advantages of Grade Separated Overcrossing

- Improves bicycle and pedestrian safety while reducing delay for all users.
- Eliminates barriers to bicyclists and pedestrians.

Disadvantages / Potential Hazards

- If crossing is not convenient or does not serve a direct connection it may not be well utilized.
- Overcrossings require at least 17 feet of clearance to the roadway below involving up to 400 feet or greater of approach ramps at each end. Long ramps can sometimes be difficult for the disabled.
- Potential issues with vandalism, maintenance.
- High cost.

C.7.6. Bicycle and Pedestrian Undercrossing Design

Discussion

See following page for discussion.

Design Summary

Width
14 feet minimum to allow for access by maintenance vehicles if necessary

Greater widths may increase security

Height
10 feet minimum

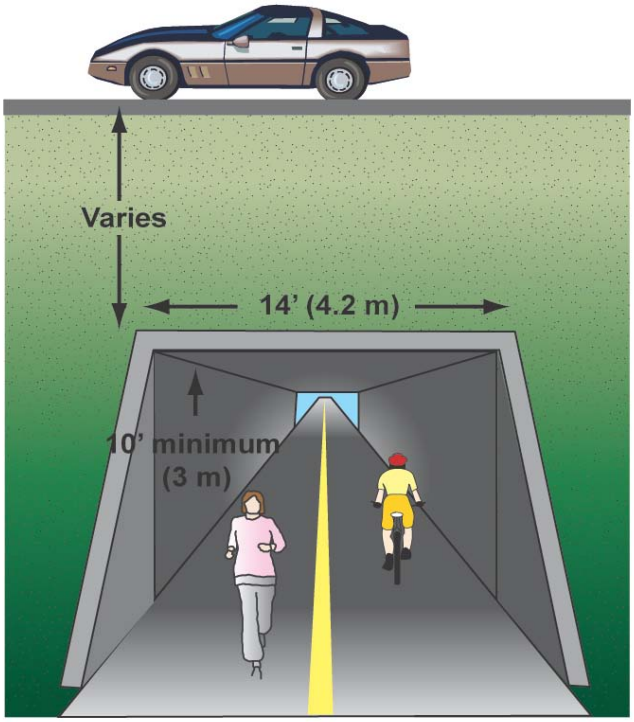
Signage & Striping

The undercrossing should have a centerline stripe even if the rest of the path does not have one.

Lighting

Lighting should be considered during design process for any undercrossing with high anticipated use or in culverts or tunnels.

Recommended Design



Design Example

Guidance

- AASHTO Guide for the Development of Bicycle Facilities
- Caltrans Highway Design Manual (Chapter 1000)

Additional Discussion – Grade Separated Undercrossing

General Notes On Grade-Separated Crossings

Bicycle/pedestrian overcrossings and undercrossings provide critical non-motorized system links by joining areas separated by any number of barriers. Overcrossings and undercrossings address real or perceived safety issues by providing users a formalized means for traversing "problem areas" such as deep canyons, waterways or major transportation corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist. For instance, an overcrossing or undercrossing may be appropriate where moderate to high pedestrian/ bicycle demand exists to cross a freeway in a specific location, or where a flood control channel separates a neighborhood from a nearby bicyclist destination. These facilities also overcome barriers posed by railroads, and are appropriate in areas where frequent or high-speed trains would create at-grade crossing safety issues, and in areas where trains frequently stop and block a desired pedestrian or bicycle crossing point. They may also be an appropriate response to railroad and other agency policies prohibiting new at-grade railroad crossings, as well as efforts to close existing at-grade crossings for efficiency, safety, and liability reasons.

Overcrossings and undercrossings also respond to user needs where existing at-grade crossing opportunities exist but are undesirable for any number of reasons. In some cases, high vehicle speeds and heavy traffic volumes might warrant a grade-separated crossing. Hazardous pedestrian/bicycle crossing conditions (e.g., few or no gaps in the traffic stream, conflicts between motorists and bicyclists/pedestrians at intersections, etc.) could also create the need for an overcrossing or undercrossing.

Undercrossing Use

Undercrossings should be considered when high volumes of bicycles and pedestrians are expected along a corridor and:

- Vehicle volumes/speeds are high.
- The roadway is wide.
- An at-grade crossing is not feasible.
- Crossing is needed under another grade-separated facility such as a freeway or rail line.

Advantages of Grade Separated Undercrossing

- Improves bicycle and pedestrian safety while reducing delay for all users.
- Eliminates barriers to bicyclists and pedestrians.
- Undercrossings require 10' of overhead clearance from the path surface. Undercrossings often require less ramping and elevation change for the user versus an overcrossing, particularly for railroad crossings.

Disadvantages / Potential Hazards

- If crossing is not convenient or does not serve a direct connection it may not be well utilized.
- Potential issues with vandalism, maintenance.
- Security may be an issue if sight lines through undercrossing and approaches are inadequate. Undercrossing width greater than 14 feet, lighting and /or skylights may be desirable for longer crossings to enhance users' sense of security.
- High cost.

C.8. Design of Interpretive and Wayfinding Signage

C.8.1. Wayfinding Signage - General

Discussion

Wayfinding signage acts as a "map on the street" for cyclists, pedestrians, and trail users. Signage and wayfinding is an important component for trail users. Visitors who feel comfortable and empowered will keep coming back to an area, and an effective wayfinding system is key to creating that comfort level. Wayfinding also plays an important role in trail use safety, connecting users with emergency services.

Wayfinding signs are typically placed at key locations leading to and along bicycle facilities, including where multiple routes intersect and at key bicyclist "decision points." Wayfinding signs displaying destinations, distances and "riding time" can dispel common misperceptions about time and distance while increasing users' comfort and accessibility to the priority street network. Wayfinding signs also visually cue motorists that they are driving along a bicycle route and should correspondingly use caution. Note that too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists and pedestrians, rather than per vehicle signage standards.

Design Summary

- If used, Bicycle Route Guide (D11-1) signs should be provided at decision points along designated bicycle routes, including signs to inform bicyclists of bicycle route direction changes. Bicycle Route Guide signs should be repeated at regular intervals so that bicyclists entering from side streets will have an opportunity to know that they are on a bicycle route.
    - Similar guide signing should be used for shared roadways with intermediate signs placed for bicyclist guidance.
    - Signage should be focused along major routes near key destinations.
    - Signage should be oriented toward both commuter and recreational cyclists.
- Destination signage should be easy to read. Signage should be installed on existing Bike Route or Bike Lane signs where possible to avoid sign clutter.

Recommended Design

Design Example	Guidance
 City of Berkeley, CA Wayfinding Sign	• Caltrans Highway Design Manual (Chapter 1000) • MUTCD, Section 9B.20 • MUTCD – California Supplement, Section 9B.19 through 21 • AASHTO Guide for the Development of Bicycle Facilities
	Cost
	• Sign, regulatory: $150 - $250 per sign

C.9. Bicycle Parking

C.9.1. Bicycle Rack Design

Design Summary

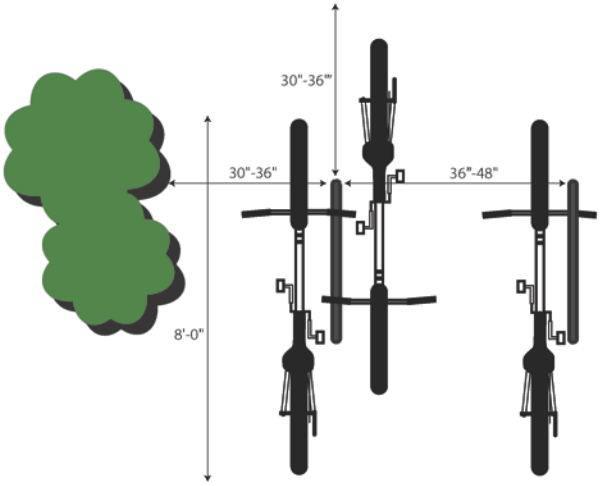
- Bicycle racks should be a design that is intuitive and easy to use.
- A standard inverted-U style rack shall be the standard for the City of Wasco.
- Bicycle racks should be securely anchored to a surface or structure.
- The rack element (part of the rack that supports the bicycle) should keep the bicycle upright by supporting the frame in two places without the bicycle frame touching the rack. The rack should allow one or both wheels to be secured.
- Avoid use of multiple-capacity "wave" style racks. Users commonly misunderstand how to correctly park at wave racks, placing their bikes parallel to the rack and limiting capacity to 1 or 2 bikes.
- Position racks so there is enough room between parked bicycles. Racks should be situated on 36" minimum centers.
- A five-foot aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle racks.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians. Position racks out of the walkway's clear zone.
- For sidewalks with heavy pedestrian traffic, at least seven feet of unobstructed right-of-way is required.
- Racks should be located close to a main building entrance, in a lighted, high-visibility area protected from the elements.

Manufacturers

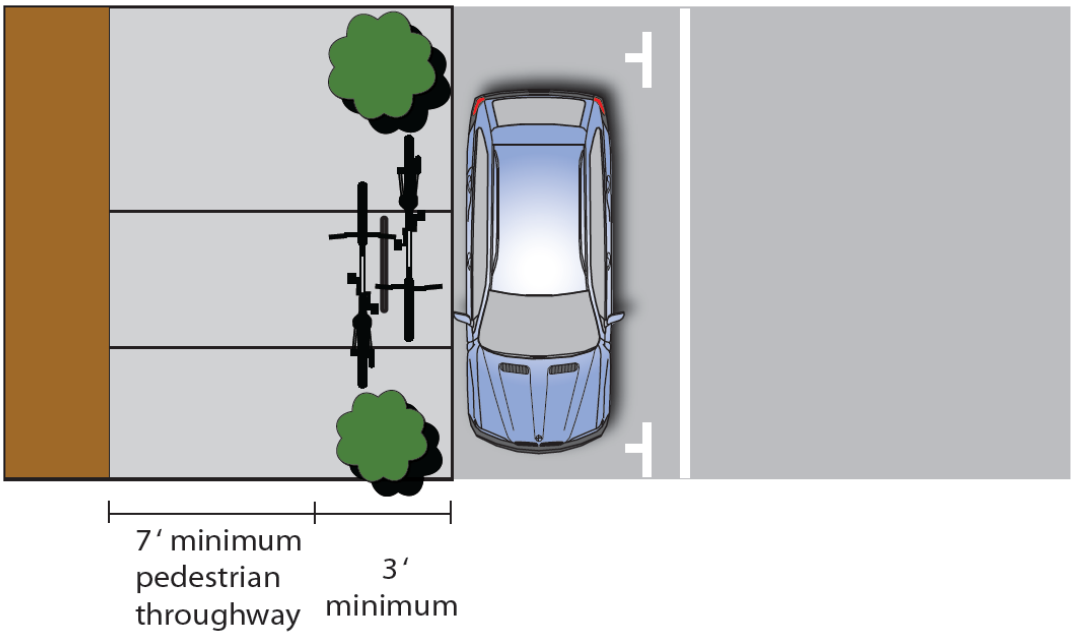
- Palmer: www.bikeparking.com
- Park-a-Bike: www.parkabike.com
- Dero: www.dero.com
- Creative Pipe: www.creativepipe.com
- Cycle Safe: www.cyclesafe.com

City Standard Design

Inverted-U Bicycle Rack



Recommended Design (continued)



Design Example

Short-term bicycle parking showing recommended clearances (non-local)

Guidance

- Association of Bicycle and Pedestrian Professionals Bicycle Parking Guidelines (2nd edition 2010)
- City of Oakland, CA Bicycle Parking Ordinance (2008)

Cost

- Bicycle racks: $150-$200 each

C.9.2. Bicycle Locker Design

Design Summary

- Bicycle lockers should be a design that is intuitive and easy to use.
- Bicycle lockers should be electronically accessed.
- Electronic bicycle locker models from elocker and CycleSafe allow users to access lockers with a SmartCard (linked to a credit card) or mobile phone, respectively.
- Bicycle lockers should be securely anchored to a surface or structure.
- Bicycle lockers should be constructed to provide protection from theft, vandalism and weather.
- A five-foot aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle lockers.
- Lockers should be located close to a main building entrance, in a lighted, high-visibility area protected from the elements. Long-term parking should always be protected from the weather.

Manufacturers

- Palmer: www.bikeparking.com (includes keyed lockers with optional conversion to use a "u-lock" to lock the locker)
- Park-a-Bike: www.parkabike.com
- Dero: www.dero.com
- Creative Pipe: www.creativepipe.com
- Cycle Safe: www.cyclesafe.com
- Elock Technologies / BikeLink: www.bikelink.org

Operators

- BikeLink: www.bikelink.org
- CycleSafe SmartTek: www.cyclesafe.com

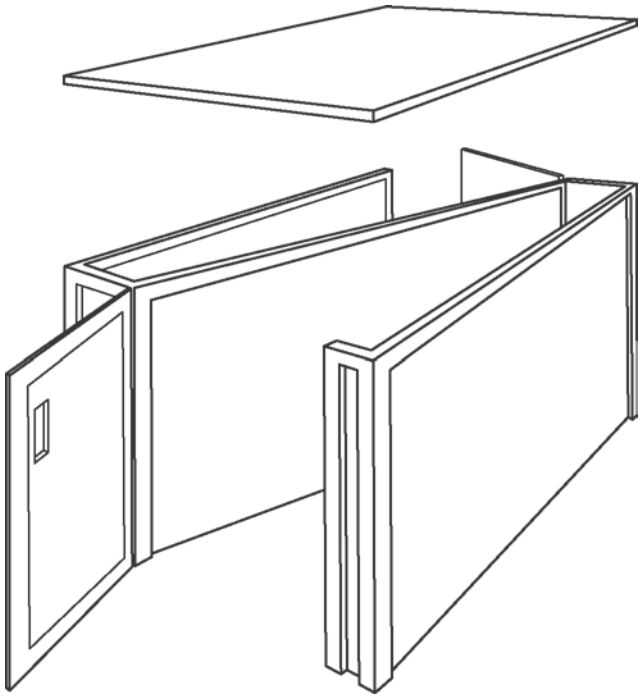
Guidance

- Association of Bicycle and Pedestrian Professionals Bicycle Parking Guidelines (2nd edition, 2010)
- City of Oakland, CA Bicycle Parking Ordinance (2008)

Cost

- Bicycle lockers: $1,350-$2,000 each

Recommended Design



C.10.Maintenance Standards

Like all roadways, bicycle and pedestrian facilities require regular maintenance. This includes sweeping, re-striping, maintaining a smooth roadway, ensuring that the gutter-to-pavement transition remains relatively flat, and installing bicycle-friendly drainage grates. Shared use paths also require regular plant trimming. The following recommendations are provided as a maintenance guideline for the City of Wasco to consider as it augments and enhances its maintenance capabilities.

C.10.1. Shared Use Path Maintenance Standards

Recommended Standards Summary

Maintenance Activity	Frequency
Surface gap repair	As needed (see additional guidance below)
Inspections	Twice a year
Pavement sweeping/ blowing	As needed
Pavement markings replacement	3-5 years
Signage replacement	As needed when vandalized, 5-10 years as maintenance
Shoulder plant trimming (weeds, trees, brambles)	Yearly
Tree and shrub plantings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible

SURFACE GAP REPAIR

Path Surface

- The surface of the pedestrian access route shall be firm, stable and slip resistant (Draft Guidelines for Public Rights of Way, Section R301.5).

Vertical Changes in Level

- Changes in level up to ¼ inch may be vertical and without edge treatment. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2. Changes in level greater than ½ inch shall be accomplished by means of a ramp that complies with ADAAG Section 4.7 or 4.8 (ADAAG Section 4.5.2).
- Surface discontinuities shall not exceed ½ inch maximum. Vertical discontinuities between ¼ inch and ½ inch maximum shall be beveled at 1:2 minimum. The bevel shall be applied across the entire level change (Draft Guidelines for Public Rights of Way, Section R301.5.2).

Gaps and Elongated Openings

- If gratings are located in walking surfaces, then they shall have spaces no greater than ½ inch wide in one direction. If gratings have elongated openings, then they shall be placed so that the long dimension is perpendicular to the dominant direction of travel (ADAAG Section 4.5.4).
- Walkway Joints and Gratings. Openings shall not permit passage of a sphere more than ½ inch in diameter. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel (Draft Guidelines for Public Rights of Way, Section R301.7.1).

Discussion	Maintenance Challenges
Basic Maintenance • Path pavement should be repaired as need to avoid safety issues and to ensure ADA compliance. • Paths should be swept regularly. • Shoulder vegetation should be cleared and trimmed regularly. **Long-Term Maintenance** • Paths should be slurry sealed, at minimum, 10 years after construction. • Paths should receive an overlay, at minimum, 15 years after construction. Agencies or districts with dedicated funding for maintenance generally provide more maintenance activities.	• Most agencies pay for sidewalk and path maintenance out of their maintenance and operations budget. This funding is generally enough to provide seasonal maintenance, but is not enough to fund long-term preventative maintenance, such as overlays. • Grant funding is not generally available for maintenance activities.
Guidance	
• ADAAG • Draft Guidelines for Public Rights of Way (2005)	
Cost	
• $1,000-14,000 per mile per year	

C.10.2. On-Street Facility Maintenance Standards

Recommended Standards Summary

Maintenance Activity	Frequency
Inspections	Seasonal – at beginning and end of Summer
Pavement sweeping/blowing	As needed, weekly in Fall
Pavement sealing, potholes	5 - 15 years
Culvert and drainage grate inspection	Before Winter and after major storms
Pavement markings replacement (including crosswalks)	1 – 3 years
Signage replacement	1 – 3 years
Shoulder plant trimming (weeds, trees, brambles)	Twice a year; middle of growing season and early Fall
Tree and shrub plantings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible

NOTE: Caltrans recommends tolerance of surface discontinuities no more than ½ inch wide when parallel to the direction of travel on bike lanes (Class II) and bike routes (Class III).

Discussion

Basic Maintenance

Bicyclists often avoid shoulders and bike lanes filled with sanding materials, gravel, broken glass and other debris; they will ride in the roadway to avoid these hazards, causing conflicts with motorists. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept. Roadways should also be swept after automobile collisions.

Long-Term Maintenance

Roadway surface is a critical issue for bicyclists' quality. Bicycles are much more sensitive to subtle changes in roadway surface than are motor vehicles. Examine pavement quality and transitions during every roadway project for new construction, maintenance activities, and construction project activities that occur in streets.

Cost

- $1,000-$2,000 per mile per year

Appendix D. Counts Memo

This Appendix presents the vehicle, bicycle and pedestrian count effort findings.

RUETTGERS & SCHULER
CIVIL ENGINEERS

1800 30th Street, Suite 260
Bakersfield, California 93301
Phone (661) 327-1969
Fax (661) 327-1993

MEMORANDUM

To: Jennifer Donlon Wyant

From: Ian Parks

Date: May 3, 2013

Re: Vehicle, Pedestrian and Bike Volume Data and Stop Warrant Analysis

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Pursuant to your request, we have completed the data collection for ADT and peak hour counts at specified locations and intersections. The data was collected at 39 intersections and 8 roadways, and is shown on the attached figures 1 through 4. Figure 1 shows the intersection locations and the ADT volume at each of the 8 locations. Figures 2 through 4 show the volumes for each movement, for vehicles, pedestrians and bicycles respectively.

A review of the data was made with respect to multi-way stop warrants. Table 1 shows a breakdown of the separate warrants met for each intersection. Individual warrant sheets were prepared and are included as part of the memo. Warrants were prepared for intersections that are currently an all way stop for the purpose of confirming that they continue to meet warrants. Following is a brief explanation of each warrant.

Warrant 1: A peak hour signal warrant was prepared with the AM peak hour count data for each unsignalized intersection, and none of the intersections met the signal warrant.

Warrant 2: The adequate trial does not apply to our analysis as we do not have history of other remedies which have been implemented.

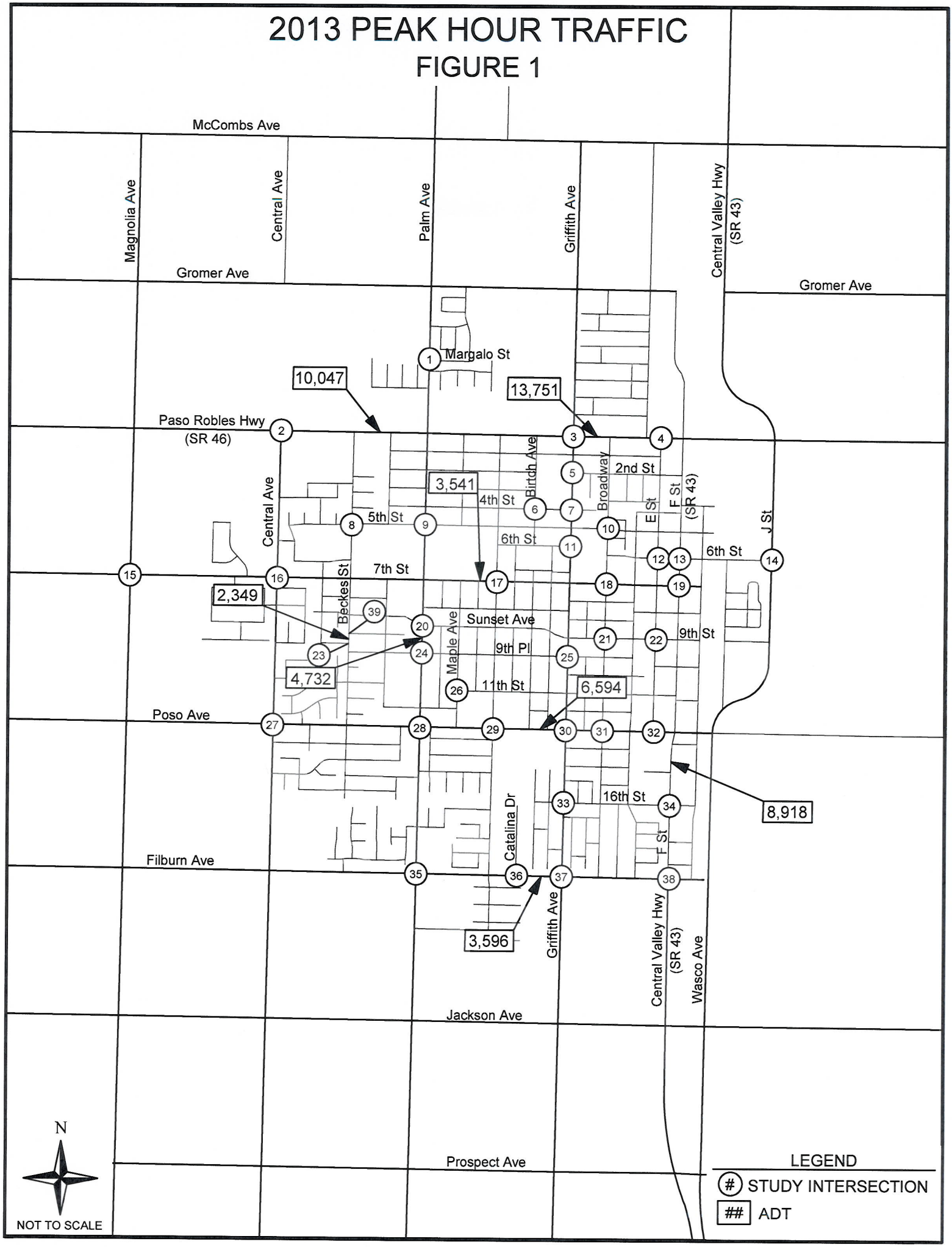
A review of the accidents report for the last three years was reviewed, and in no case did any of the intersections meet the minimum required number of accidents.

Warrant 3: A review of the vehicular and pedestrian volumes in the intersection was made in order to determine if the minimum volume warrant was met. Eight of the 38 unsignalized intersections met the minimum volume

Warrant 4: Should a combination of 80% of the other volumes meet the minimums, this warrant may be met. After review of the accidents and vehicle/pedestrian volumes, in no case did any of the intersections meet this warrant.

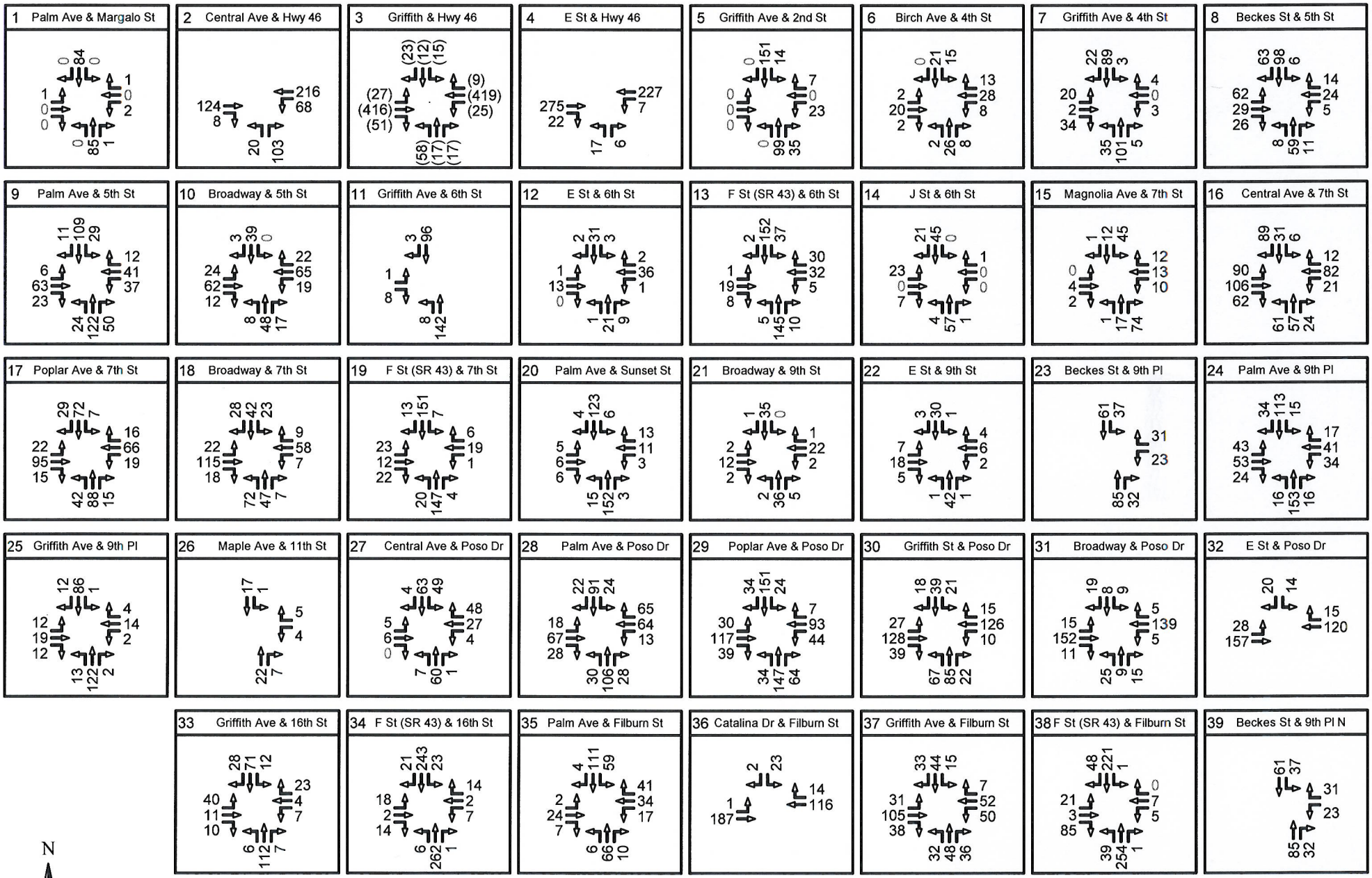
It is important to note that a warrant defines the minimum condition under which the installation of a traffic control device (signal or stop) might be needed. Meeting this threshold condition does not require that an all-way stop control be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the stop control is truly justified.

2013 PEAK HOUR TRAFFIC
FIGURE 1



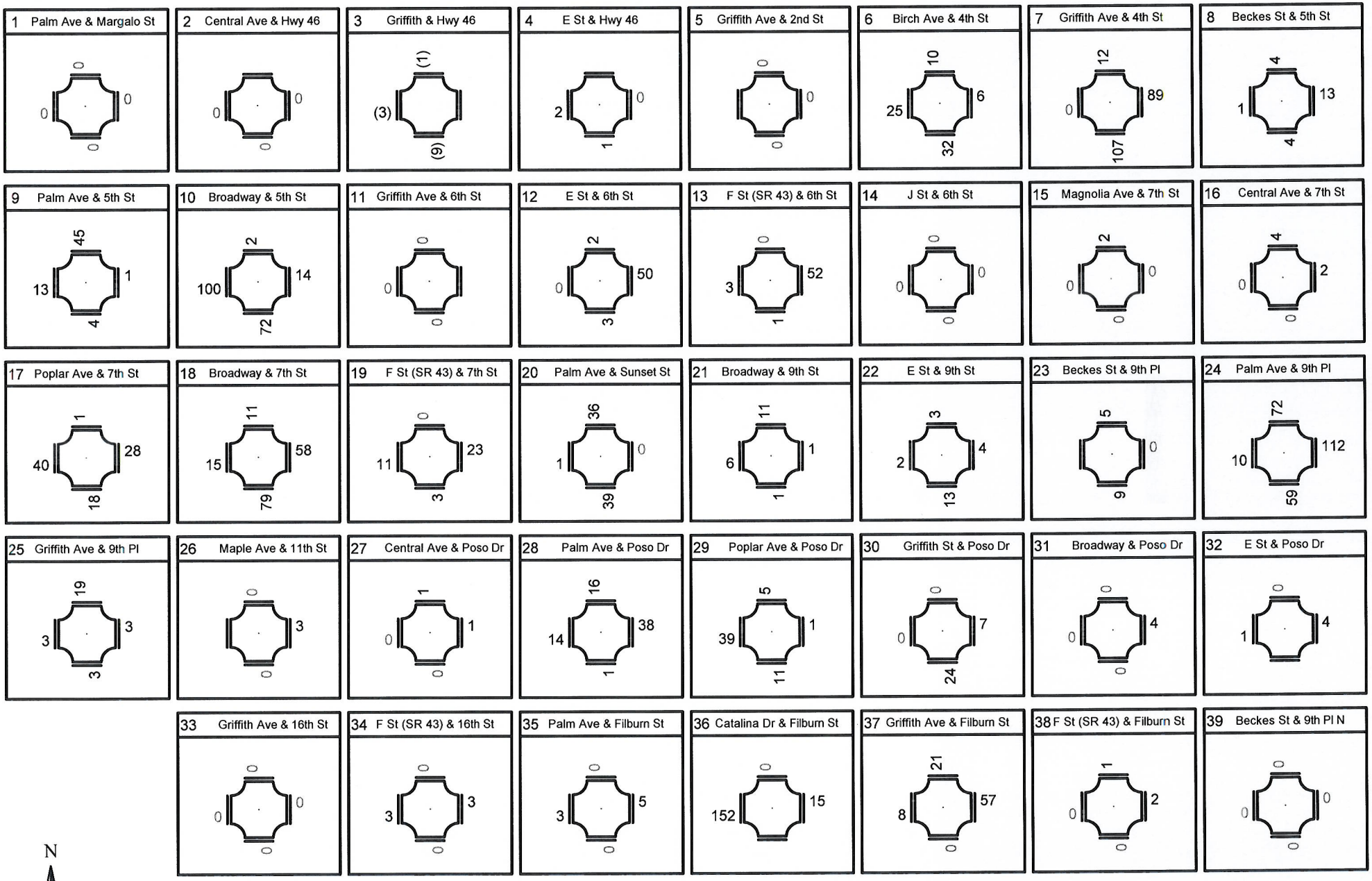
2013 AM PEAK HOUR VEHICLE MOVEMENTS

FIGURE 2



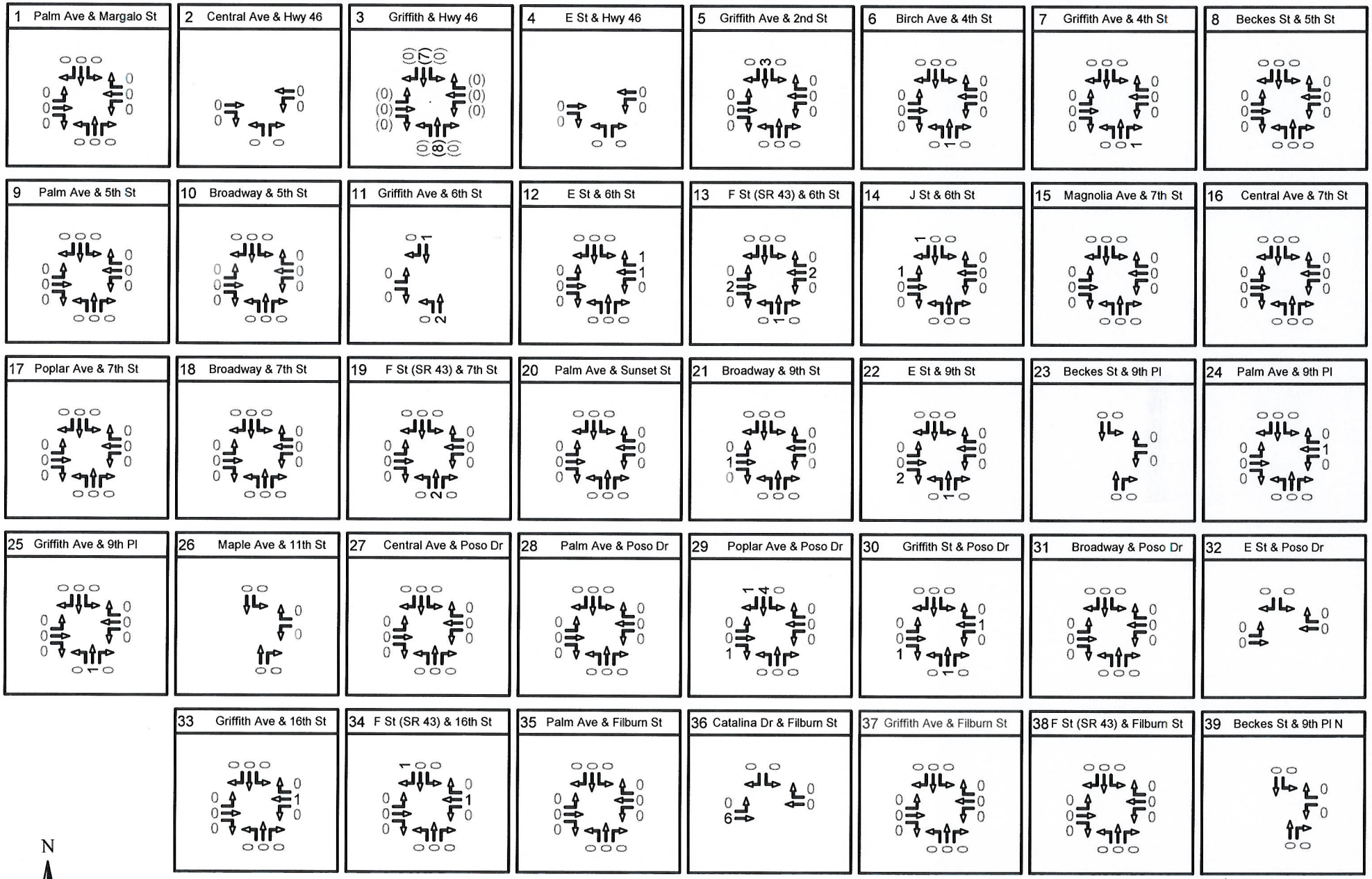
2013 AM PEAK HOUR PEDESTRIAN MOVEMENTS

FIGURE 3



2013 AM PEAK HOUR BICYCLE MOVEMENTS

FIGURE 4



N

NOT TO SCALE

LEGEND

AM VOLUMES

(#) PM VOLUMES

Table 1
MULTI-WAY STOP WARRANTS

		A		B	C	D
INT ID	Intersection Name	Traffic Signals Warranted	Adequate Trial	No. of Accidents	Minimum Volume	80% Accidents and Volumes
1	Margalo St & Palm Ave	-	N/A	-	-	-
2	Hwy 46 & Central Ave	-	N/A	-	-	-
4	Hwy 46 & E St	-	N/A	-	-	-
5	2nd St & Griffith Ave	-	N/A	-	-	-
6	4th St & Birch Ave	-	N/A	-	-	-
7	4th St & Griffith Ave	-	N/A	-	-	-
8	5th St & Beckes St	-	N/A	-	-	-
9	5th St & Palm Ave	-	N/A	-	X	-
10	5th St & Broadway	-	N/A	-	-	-
11	6th St & Griffith Ave	-	N/A	-	-	-
12	6th St & E St	-	N/A	-	-	-
13	6th St & F St (SR 43)	-	N/A	-	-	-
14	6th St & J St	-	N/A	-	-	-
15	7th St & Magnolia Ave	-	N/A	-	-	-
16	7th St & Central Ave	-	N/A	-	X	-
17	7th St & Poplar Ave	-	N/A	-	X	-
18	7th St & Broadway	-	N/A	-	X	-
19	7th St & F St (SR 43)	-	N/A	-	-	-
20	9th St & Palm Ave	-	N/A	-	-	-
21	9th St & Broadway	-	N/A	-	-	-
22	9th St & E St	-	N/A	-	-	-
23	9th Pl (East of Beckes) & Beckes St (South)	-	N/A	-	-	-
24	9th Pl & Palm Ave	-	N/A	-	X	-
25	9th Pl & Griffith Ave	-	N/A	-	-	-
26	11th St & Maple Ave	-	N/A	-	-	-
27	Poso Dr & Central Ave	-	N/A	-	-	-
28	Poso Dr & Palm Ave	-	N/A	-	X	-
29	Poso Dr & Poplar Ave	-	N/A	-	X	-
30	Poso Dr & Griffith St	-	N/A	-	X	-
31	Poso Dr & Broadway	-	N/A	-	-	-
32	Poso Dr & E St	-	N/A	-	-	-
33	16th St & Griffith Ave	-	N/A	-	-	-
34	16th St & F St (SR 43)	-	N/A	-	-	-
35	Filburn St & Palm Ave	-	N/A	-	-	-
36	Filburn St & Catalina Dr	-	N/A	-	-	-
37	Filburn St & Griffith Ave	-	N/A	-	-	-
38	Filburn St & F St (SR 43)	-	N/A	-	-	-
39	Beckes St & 9th (West of Beckes) (North)	-	N/A	-	-	-

x indicated met warrant

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Palm Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - Margalo St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	172	138	201	247	274	283	193	193	213
Vehicles & Pedestrians on minor street	200	140	4	3	5	6	6	7	5	5	5

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Hwy 46 **Critical Approach Speed: 45 m.p.h.**

Minor St. - Central Ave **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	549	609	571	602	610	649	650	535	597
Vehicles & Pedestrians on minor street	200	140	162	180	169	178	180	192	192	158	176

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Hwy 46 **Critical Approach Speed: 40 m.p.h.**

Minor St. - E St **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	850	943	885	932	945	1005	1006	828	924
Vehicles & Pedestrians on minor street	200	140	31	35	33	34	35	38	38	31	34

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Griffith Ave **Critical Approach Speed: 25 m.p.h.**

Minor St. - 2nd St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	2	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	196	186	190	215	311	277	367	452	274
Vehicles & Pedestrians on minor street	200	140	49	47	47	54	77	69	92	112	68

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - 4th St **Critical Approach Speed: 25 m.p.h.**

Minor St. - Birch Ave **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	48	45	46	52	76	68	90	110	67
Vehicles & Pedestrians on minor street	200	140	78	74	76	86	123	110	145	180	109

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Griffith Ave **Critical Approach Speed: 25 m.p.h.**

Minor St. - 4th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	167	159	162	183	265	236	313	386	234
Vehicles & Pedestrians on minor street	200	140	104	99	101	114	165	147	195	241	146

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Beckes St **Critical Approach Speed: 25 m.p.h.**

Minor St. - 5th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	49	65	63	77	107	84	108	117	84
Vehicles & Pedestrians on minor street	200	140	36	45	48	54	70	60	74	76	58

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Palm Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - 5th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	2	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	349	279	408	501	556	574	392	391	431
Vehicles & Pedestrians on minor street	200	140	198	158	232	284	316	326	223	222	245

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - 5th St **Critical Approach Speed: 25 m.p.h.**

Minor St. - Broadway **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	119	117	141	162	205	194	241	311	186
Vehicles & Pedestrians on minor street	200	140	115	113	136	156	198	189	234	301	180

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Griffith Ave **Critical Approach Speed: 25 m.p.h.**

Minor St. - 6th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	145	143	172	198	250	237	295	379	227
Vehicles & Pedestrians on minor street	200	140	5	5	6	7	9	9	11	14	8

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - E St **Critical Approach Speed: 35 m.p.h.**

Minor St. - 6th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	39	38	46	53	67	64	79	102	61
Vehicles & Pedestrians on minor street	200	140	64	63	77	88	111	105	132	169	101

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - F St (SR 43) **Critical Approach Speed: 35 m.p.h.**

Minor St. - 6th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	347	419	358	426	495	515	515	400	434
Vehicles & Pedestrians on minor street	200	140	152	184	157	187	218	226	226	176	191

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - J St **Critical Approach Speed: 25 m.p.h.**

Minor St. - 6th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	4	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	135	141	152	167	178	200	199	154	166
Vehicles & Pedestrians on minor street	200	140	34	35	38	41	44	50	50	38	41

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Magnolia Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - 7th St **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	AVE
Vehicles on major approaches	300	210	229	225	324	212	247	214	225	177	232
Vehicles & Pedestrians on minor street	200	140	63	61	89	58	68	58	61	48	63

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - 7th St **Critical Approach Speed: 35 m.p.h.**

Minor St. - Central Ave **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	3	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	AVE
Vehicles on major approaches	300	210	569	559	807	528	614	532	559	441	576
Vehicles & Pedestrians on minor street	200	140	414	406	587	383	446	387	406	321	419

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Poplar Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - 7th St **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	AVE
Vehicles on major approaches	300	210	386	379	547	358	417	361	379	299	391
Vehicles & Pedestrians on minor street	200	140	298	293	423	276	322	279	293	231	302

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - 7th St **Critical Approach Speed: 35 m.p.h.**

Minor St. - Broadway **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	AVE
Vehicles on major approaches	300	210	349	343	495	324	377	326	343	271	354
Vehicles & Pedestrians on minor street	200	140	443	435	629	411	479	414	435	344	449

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - F St (SR 43) **Critical Approach Speed: 35 m.p.h.**

Minor St. - 7th St **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	338	408	349	415	482	502	502	389	423
Vehicles & Pedestrians on minor street	200	140	116	140	120	142	165	172	172	133	145

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Palm Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - 9th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	279	223	326	400	444	458	313	312	344
Vehicles & Pedestrians on minor street	200	140	46	37	53	65	73	75	51	51	56

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Broadway **Critical Approach Speed: 25 m.p.h.**

Minor St. - 9th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	68	47	47	65	73	70	98	124	74
Vehicles & Pedestrians on minor street	200	140	42	30	29	41	45	43	61	77	46

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - E St **Critical Approach Speed: 35 m.p.h.**

Minor St. - 9th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	2	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	AVE
Vehicles on major approaches	300	210	67	47	46	64	72	69	97	122	73
Vehicles & Pedestrians on minor street	200	140	43	30	30	41	47	44	61	78	47

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Beckes St (South) **Critical Approach Speed: 25 m.p.h.**

Minor St. - 9th Pl (East of Beckes) **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	142	205	198	205	205	181	184	161	185
Vehicles & Pedestrians on minor street	200	140	50	72	70	72	72	64	65	57	65

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Palm Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - 9th Pl **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	351	281	411	504	559	577	394	393	434
Vehicles & Pedestrians on minor street	200	140	340	272	396	486	541	557	381	379	419

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Griffith Ave **Critical Approach Speed: 25 m.p.h.**

Minor St. - 9th Pl **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	239	191	279	343	380	392	268	267	295
Vehicles & Pedestrians on minor street	200	140	70	56	82	100	112	115	79	78	87

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Maple Ave **Critical Approach Speed: 25 m.p.h.**

Minor St. - 11th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	48	38	56	68	76	78	53	53	59
Vehicles & Pedestrians on minor street	200	140	12	9	15	17	20	20	13	13	15

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Central Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - Poso Dr **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	AVE
Vehicles on major approaches	300	210	184	190	258	248	289	236	236	165	226
Vehicles & Pedestrians on minor street	200	140	91	94	127	123	144	116	117	81	112

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Palm Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - Poso Dr **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	305	244	356	437	485	500	342	341	376
Vehicles & Pedestrians on minor street	200	140	311	248	364	445	495	510	349	348	384

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Poplar Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - Poso Dr **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	3	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	387	369	432	583	494	554	530	457	476
Vehicles & Pedestrians on minor street	200	140	340	324	378	511	433	485	464	400	417

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Poso Dr **Critical Approach Speed: 35 m.p.h.**

Minor St. - Griffith St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [X] **No** [ ]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	387	369	432	583	494	554	530	457	476
Vehicles & Pedestrians on minor street	200	140	270	258	302	407	345	388	370	320	333

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Poso Dr **Critical Approach Speed: 35 m.p.h.**

Minor St. - Broadway **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	387	369	432	583	494	554	530	457	476
Vehicles & Pedestrians on minor street	200	140	83	79	93	125	106	119	114	98	102

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Poso Dr **Critical Approach Speed: 35 m.p.h.**

Minor St. - E St **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	2	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	AVE
Vehicles on major approaches	300	210	313	298	349	471	399	448	428	369	384
Vehicles & Pedestrians on minor street	200	140	33	32	37	50	42	48	46	39	41

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Griffith Ave **Critical Approach Speed: 25 m.p.h.**

Minor St. - 16th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	233	282	241	287	333	346	346	269	292
Vehicles & Pedestrians on minor street	200	140	121	145	125	148	172	178	178	139	151

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - F St (SR 43) **Critical Approach Speed: 35 m.p.h.**

Minor St. - 16th St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	2	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	509	614	525	625	726	755	755	586	637
Vehicles & Pedestrians on minor street	200	140	63	76	65	77	89	94	94	73	79

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Palm Ave **Critical Approach Speed: 35 m.p.h.**

Minor St. - Filburn St **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	AVE
Vehicles on major approaches	300	210	244	236	261	353	252	231	183	140	238
Vehicles & Pedestrians on minor street	200	140	127	122	136	183	131	120	95	72	123

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Filburn St **Critical Approach Speed: 35 m.p.h.**

Minor St. - Catalina Dr **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	AVE
Vehicles on major approaches	300	210	256	247	274	370	264	242	192	147	249
Vehicles & Pedestrians on minor street	200	140	24	23	26	34	25	23	18	14	23

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - Filburn St **Critical Approach Speed: 35 m.p.h.**

Minor St. - Griffith Ave **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	AVE
Vehicles on major approaches	300	210	256	247	274	370	264	242	192	147	249
Vehicles & Pedestrians on minor street	200	140	218	210	233	316	226	206	164	125	212

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - F St (SR 43) **Critical Approach Speed: 35 m.p.h.**

Minor St. - Filburn St **Critical Approach Speed: 35 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	1	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	509	614	525	625	726	755	755	586	637
Vehicles & Pedestrians on minor street	200	140	122	146	125	149	174	180	180	140	152

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

MULTI-WAY STOP WARRANTS

By: Jared Meadows **Date: 5/03/13**

Chkd: **Date:**

Major St. - 9th (West of Beckes) (North) **Critical Approach Speed: 25 m.p.h.**

Minor St. - Beckes St **Critical Approach Speed: 25 m.p.h.**

WARRANT 1: Are traffic signals warranted and urgently needed? **Satisfied** **Yes** [ ] **No** [X]

WARRANT 2: Accident record

WARRANT		FULFILLED
Adequate trial of less restrictive remedies has failed to reduce accident frequently		Yes [ ] No [X]
No. of accidents reported within 12 mo. period susceptible to correction		
MIN. REQUIREMENT	NO. OF REPORTED ACCIDENTS	
5	0	Yes [ ] No [X]

WARRANT 3: Minimum volume **Satisfied** **Yes** [ ] **No** [X]

WARRANT	MINIMUM REQUIREMENTS Critical Approach Speed <=40	>40	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	AVE
Vehicles on major approaches	300	210	142	205	198	205	205	181	184	161	185
Vehicles & Pedestrians on minor street	200	140	9	13	13	13	13	12	12	10	12

WARRANT 4: 80% Minimum values **Satisfied** **Yes** [ ] **No** [X]

Accidents >=4

Vehicles on major approach >=300

Vehicles & Pedestrians on minor street >=200

Appendix E. Active Transportation Program Compliance

The California Active Transportation Program is a significant source of funding for bicycle, pedestrian and Safe Routes to School facilities. Table E-1 demonstrates how this Bicycle Master Plan complies with ATP requirements and is provided for the convenience of Caltrans reviewers.

Table E-1: ATP Compliance Table

Item	Compliant Elements in Plan	Page
a) The estimated number of existing bicycle trips and pedestrian trips in the plan area, both in absolute numbers and as a percentage of all trips, and the estimated increase in the number of bicycle trips and pedestrian trips resulting from implementation of the plan.		
Existing Bicycle and Pedestrian Activity	3.2 Travel in Wasco	3-2
Future Bicycle and Pedestrian Demand	Appendix F: Projected Bicycle and Walking Demand	F-1
b) The number and location of collisions, serious injuries, and fatalities suffered by bicyclists and pedestrians in the plan area, both in absolute numbers and as a percentage of all collisions and injuries, and a goal for collision, serious injury, and fatality reduction after implementation of the plan.		
Number of collisions	3.3 Collision Analysis	3-2 through 3-6
Collision locations	Appendix G: Collision Details List	G-1
Goal for collisions	1.4.2 Goals and Policies	1-4
c) A map and description of existing and proposed land use and settlement patterns which must include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, major employment centers, and other destinations.		
Land use map	2.1.3 Land Use Figure 2-1	2-3 2-4
d) A map and description of existing and proposed bicycle transportation facilities.		
Existing bicycle facilities	2.2 Existing Bikeways Figure 2-2	2-5 2-6
Proposed bicycle facilities	4.3 Bikeway Recommendations Figure 4-1	4-3 through 4-18 4-4
e) A map and description of existing and proposed end-of-trip bicycle parking facilities.		
Existing end of trip facilities		
Proposed end of trip facilities	4-10 Bicycle Parking and End of Trip Facilities 4.7 Transit Station Improvements	4-21 through 4-23 4-19
f) A description of existing and proposed policies related to bicycle parking in public locations, private parking garages and parking lots and in new commercial and residential developments.		
Existing policies	2.2.2 End of Trip Facilities	2-7
Proposed policies	4-10 Bicycle Parking and End of Trip Facilities	4-21 through 4-23

Item	Compliant Elements in Plan	Page
g) A map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes. These must include, but not be limited to, parking facilities at transit stops, rail and transit terminals, ferry docks and landings, park and ride lots, and provisions for transporting bicyclists and bicycles on transit or rail vehicles or ferry vessels.		
Existing facilities	2.1.2 Transit	2-3
	2.2.2 End of Trip Facilities	2-7
	Figure 2-2	2-6
Proposed facilities	4.7 Transit Station Improvements	4-19
h) A map and description of existing and proposed pedestrian facilities at major transit hubs. These must include, but are not limited to, rail and transit terminals, and ferry docks and landings.		
Existing and proposed facilities at transit	4.7 Transit Station Improvements	4-19
i) A description of proposed signage providing wayfinding along bicycle and pedestrian networks to designated destinations.		
Bicycle wayfinding signage	4.8 Bicycle Wayfinding Signage	4-20
Pedestrian wayfinding signage	4.9 Pedestrian Wayfinding Signage	4-20
j) A description of the policies and procedures for maintaining existing and proposed bicycle and pedestrian facilities, including, but not limited to, the maintenance of smooth pavement, freedom from encroaching vegetation, maintenance of traffic control devices including striping and other pavement markings, and lighting.		
Maintenance costs, tasks and schedule	6.3 Maintenance	6-6 through 6-8
k) A description of bicycle and pedestrian safety, education, and encouragement programs conducted in the area included within the plan, efforts by the law enforcement agency having primary traffic law enforcement responsibility in the area to enforce provisions of the law impacting bicycle and pedestrian safety, and the resulting effect on accidents involving bicyclists and pedestrians.		
Existing programs	2.3 Existing Bicycle Programs	2-7 through 2-9
l) A description of the extent of community involvement in development of the plan, including disadvantaged and underserved communities.		
Community involvement	1.2.1 Public Outreach	1-2
m) A description of how the active transportation plan has been coordinated with neighboring jurisdictions and is consistent with other local or regional transportation, air quality, or energy conservation plans, including, but not limited to, general plans and a Sustainable Community Strategy in a Regional Transportation Plan.		
Consistency with relevant plans	1.5 Planning and Policy Review	1-5 through 1-8
n) A description of the projects and programs proposed in the plan and a listing of their priorities for implementation, including the methodology for project prioritization and a proposed timeline for implementation.		
Project prioritization	6.1 Prioritized Improvements	6-1 through 6-4
o) A description of past expenditures for bicycle and pedestrian facilities and programs, and future financial needs for projects and programs that improve safety and convenience for bicyclists and pedestrians in the plan area. Include anticipated revenue sources and potential grant funding for bicycle and pedestrian uses.		
Past expenditures	2.5 Past Expenditures	2-11

Item	Compliant Elements in Plan	Page
p) A description of steps necessary to implement the plan and the reporting process that will be used to keep the adopting agency and community informed of the progress being made in implementing the plan.		
Implementation steps	6.4 Implementation Steps	6-9
q) A resolution showing adoption of the plan by the city, county or district. If the active transportation plan was prepared by a county transportation commission, regional transportation planning agency, MPO, school district or transit district, the plan should indicate the support via resolution of the city(s) or county(s) in which the proposed facilities would be located.		
Resolution	Attached	Attached

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Appendix F. Projected Bicycling and Walking Demand

Projected Bicycling Demand

Data	Present	Projected	Source and Assumptions
Commute Statistics			
Study Area Population	25,545	34,700	2010 US Census, Kern COG Regional Housing Data Report
Employed Population	6,902	9,376	2010 US Census, Kern COG Regional Housing Data Report
Bike-to-work mode share	0.00%	0.04%	2009-2011 ACS, Assumes 0.04% increase in bike-to-work mode share
Bike-to-work commuters	0	4	2009-2011 ACS
Work-at-home mode share	1.30%	1.30%	2009-2011 ACS
Work-at-home commuters	9	12	Assumes 10% of population makes at least one bicycle trip
School children, ages 6-14	3429	4658	2009-2011 ACS
School children bicycling mode share	2.00%	2.00%	National Average 2%
School children bike commuters	69	95	School children population multiplied by children bike mode share
Total number of bike commuters	78	111	Total of bike-to-work, school, and utilitarian commuters
Total daily bicycling trips *(taken by residents)*	155	222	Total bicycle commuters, two legs of round trip

Projected Walking Demand

Data	Present	Projected	Source and Assumptions
Commute Statistics			
Study Area Population	25,545	34,700	2010 US Census, Kern COG Regional Housing Data Report
Employed Population	6,902	9,376	2010 US Census, Kern COG Regional Housing Data Report
Walk-to-work mode share	1.60%	1.64%	2009-2011 ACS, Assumes 0.04% increase in walk-to-work mode share
Walk-to-work commuters	110	154	2009-2011 ACS
Work-at-home mode share	1.30%	1.30%	2009-2011 ACS
Work-at-home commuters	9	12	Assumes 10% of population makes at least one walking trip
School children, ages 6-14	3429	4658	2009-2011 ACS
School children walking mode share	16%	16%	National Average 16%
School children walking commuters	549	745	School children population multiplied by children walking mode share
Total number of walking commuters	668	911	Total of walk-to-work, school, and utilitarian commuters
Total daily walking trips *(taken by residents)*	1336	1822	Total walking commuters, two legs of round trip

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Appendix G. Collision Detail Lists

Bicycle-Related Collision Locations and Injuries

Primary Road	Secondary Road	Bicyclist Injuries	Bicyclist Severe Injuries	Bicyclist Fatalities
6th St	G St	1	0	0
Poppy Ct	Poplar Av	1	0	0
3rd St	D St	1	0	0
Poso Dr	Poplar Av	1	0	0
Poso Dr	Palm Av	1	0	0
Adams St	12th St	1	0	0
Rt 43	Poso Dr	1	1	0
2nd St	E St	1	0	0
9th Pl	D St	1	0	0
Sycamore St	Rosewood	1	0	0
9th St	F St	1	0	0
Rt 43	6th St	1	0	0
Poso Dr	Poplar Av	1	0	0
Palm Av	5th St	1	0	0
5th St	Birch Av	1	0	0

Pedestrian-Related Collision Locations and Injuries

Primary Road	Secondary Road	Pedestrian Injuries	Pedestrian Severe injuries	Pedestrian Fatalities
Sunset St	Griffith Av	2	0	0
6th St	G St	1	0	0
F St	10th St	1	1	0
13th St	Broadway Av	1	0	0
Peters St	9th St	1	0	0
Rt 46	Griffith Av	1	0	0
E St	9th Pl	1	0	0
Lewis Ct	D St	1	0	0
F St	16th St	1	1	0
Rosewood Av	11 St	1	0	0
Greenbrier	Adobe Av	1	1	0
2nd St	Poplar Av	1	1	0
Broadway Av	3rd St	1	0	0
5th St	Maple Av	1	1	0
Griffith Av	9th Pl	1	0	0
11th St	Oak St	1	0	0
Woodside Dr	Central Pk	1	0	0
Palm Av	9th Pl	1	1	0
Gaston St	16th St	1	0	0
Camelia St	Beckes Av	1	0	0
9th Pl	Peters St	1	0	0
6th St	D St	1	0	0
Broadway	9th St	1	0	0
E St	Ncl ext of south alley of 7th	1	0	0
Poso Dr	Poplar Av	1	1	0
7th St	Griffith Av	1	0	0
F St	9th St	1	0	0
7th St	Rosewood Av	1	0	0
Sycamore Dr	Poplar Av	1	0	0
Rt 43	Almond Ct	1	1	0
7th St	Griffith Av	1	0	0
6th St	Cedar St	1	1	0

Primary Road	Secondary Road	Pedestrian Injuries	Pedestrian Severe injuries	Pedestrian Fatalities
D St	D St	1	0	0
Griffith Av	16th St	1	0	0
Poso Av	Poplar	1	0	0
2nd St	Griffith Av	1	0	0
Rt 46	Poplar Av	1	1	0
5th St	Broadway Av	1	0	0
Central Av	Filburn	1	1	0
3rd St	Broadway	0	0	0
J St	6th St	0	0	0
Broadway	5th Pl	0	0	0
Rt 46	E St	0	0	1
D St	14th St	0	0	0
D St	7th St	0	0	0
Strawberry Dr	7th St	0	0	0
Poplar Av	El Dorado St	0	0	0
Poso Dr	F St	0	0	1
Rt 43	Filburn St	0	0	1
Poso Dr	Poso Av	0	0	0
Griffith Av	10th Pl	0	0	0

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