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Traffic Calming Signs

Request to Experiment – Final Report

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April 6, 2012

City of Stockton
Traffic Calming Sign Experiment
Final Report

PROBLEM:

In 2010, four years after adopting vertical measures into the City of Stockton Traffic Calming Toolbox, nearly 270 speed humps and cushions had been installed in 24 different neighborhoods. Although marked in accordance with the California Manual on Traffic Control Devices (CA-MUTCD), the City received numerous complaints from drivers claiming difficulty noticing speed hump warning signs and/or the chevron marked speed humps/cushions in the street. Local residents complained of too many traffic calming signs polluting their neighborhoods.

As a possible solution to these two concerns, City staff proposed changes including two signs, “SPEED HUMPS AHEAD” to be used on street segments and “SPEED HUMP AREA” for neighborhood areas with limited access. Rather than placing “SPEED HUMP” signs at each measure, the proposal included replacing those signs with “BUMP” pavement markings installed 50 feet in advance of each speed hump or cushion. This solution was proposed since some municipalities have already adopted these variations of the W17-1 sign including City of Sacramento (see Speed Hump Program Guidelines Amended by Council 01/27/04), and Los Angeles as shown on the LADOT Community Services website http://ladot.lacity.org/tf_Speed_Humps.htm (website photo at right). None of these signs have been approved by the California Traffic Control Devices Committee (CTCDC).



The City of Stockton was advised to and did submit a Request to Experiment proposing to change the signage and markings for speed humps and cushions to address the resident concerns.

On February 2, 2011 the California Traffic Control Devices Committee (CTCDC) approved the City of Stockton request to experiment with traffic calming signage within six neighborhood areas and six street segments.

BACKGROUND:

Prior to conducting the experiment the City of Stockton installed a W17-1 Speed Hump Warning and W13-1 Advisory Speed Warning sign in advance of each vertical measure (speed hump/speed cushion/speed table). In a series of measures between intersections, the W13-1 Advisory Speed Warning signs could be eliminated on all but the first or outer most measures as per the CA-MUTCD. However, a Speed Hump Warning sign (W17-1) would still be posted in each direction at subsequent measures. In some neighborhoods this did contribute to sign pollution.



**Mariposa Avenue, Stockton - 6 Speed Hump Warning Signs in each direction.
(Measures are 350' to 500' apart between intersections.)**

In addition to signs each vertical measure was, and continues to be, marked with a number of retro-reflective chevrons. Stockton maintains a dense urban forest which contributes to the visibility issues of traffic calming measures even with the retro-reflective chevrons.

The 2012 California Manual on Uniform Traffic Control Devices (CA-MUTCD) provides the following guidance for use of the Speed Hump (W17-1) Warning sign including a series of humps:

Section 2C.29 SPEED HUMP Sign (W17-1)

Guidance:

01 The SPEED HUMP (W17-1) sign (see Figure 2C-6) should be used to give warning of a vertical deflection in the roadway that is designed to limit the speed of traffic.

02 If used, the SPEED HUMP sign should be supplemented by an Advisory Speed plaque (see Section 2C.08).

Option:

03 If a series of speed humps exists in close proximity, an Advisory Speed plaque may be eliminated on all but the first SPEED HUMP sign in the series.

04 The legend SPEED BUMP may be used instead of the legend SPEED HUMP on the W17-1 sign.

Support:

05 Speed humps generally provide more gradual vertical deflection than speed bumps. Speed bumps limit the speed of traffic more severely than speed humps. Other forms of speed humps include speed tables and raised intersections. However, these differences in engineering terminology are not well known by the public, so for signing purposes these terms are interchangeable.

The 2012 CA-MUTCD provides further guidance regarding Speed Hump Markings and Advance Speed Hump Markings:

Section 3B.25 Speed Hump Markings

Standard:

01 If speed hump markings are used, they shall be a series of white markings placed on a speed hump to identify its location. If markings are used for a speed hump that does not also function as a crosswalk or speed Table, the markings shall comply with Option A, B, or C shown in Figure 3B-29. If markings are used for a speed hump that also functions as a crosswalk or speed Table, the markings shall comply with Option A or B shown in Figure 3B-30.

Support:

02 Per CVC 440, speed humps or bumps are not official traffic control devices.

Section 3B.26 Advance Speed Hump Markings

Option:

01 Advance speed hump markings (see Figure 3B-31) may be used in advance of speed humps or other engineered vertical roadway deflections such as dips where added visibility is desired or where such deflection is not expected.

02 Advance pavement wording such as BUMP or HUMP (see Section 3B.20) may be used on the approach to a speed hump either alone or in conjunction with advance speed hump markings.

Appropriate advance warning signs may be used in compliance with Section 2C.29.

Standard:

03 If advance speed hump markings are used, they shall be a series of eight white 12-inch transverse lines that become longer and are spaced closer together as the vehicle approaches the speed hump or other deflection. If advance markings are used, they shall comply with the detailed design shown in Figure 3B-31.

Guidance:

04 If used, advance speed hump markings should be installed in each approach lane.

GOALS AND OBJECTIVES:

The experiment had two main goals;

Approval of New Signs – slightly change the message on W17-1 and how it is presented, and

Approval of Posting/Marking Changes – reduce the number of signs while increasing the visibility of vertical measures.

One objective of the experiment was to determine if visibility and awareness would be increased from a retro-reflective pavement marking at 50 feet in advance as opposed to a retro-reflective warning sign posted at 100-200 feet in advance of the measure. Also, would an increased visibility with fewer signs significantly impact speed and collision statistics?



IMPLEMENTATION

City Staff identified six street segments and six full neighborhoods that met the criteria outlined in the experiment request;

- Previously traffic calmed with vertical measures,
- Three or more measures on a single street,
- Limited access points to a network of neighborhood streets.

These areas are identified on the Vicinity Map (Exhibit A). Pre-Experiment speed surveys were conducted on March 31, 2011 in 18 locations (one on each street segment and two in each neighborhood area). These results as well as the Post-Experiment speed surveys of January 11, 2012 are shown on Exhibit F.



Prior to the experiment, photos were taken of vertical measures and signage in each selected area from 100', 150', 200' and 250' from the measure. Once the experiment began after July 1, 2011, these same photos were repeated for comparison in gauging visibility. These comparisons are shown in Exhibit H.

The six street segments selected for the experiment were as follows:

Street Segment	Approx Length in Feet	Number of Vertical Measures	Number of W17-1 Signs Removed	Number of W13-1 Signs Removed	New Ahead Sign Added	Net Difference
Lafayette St	1940	3	8	4	5	-7
Mariposa Av	2975	6	12	6	7	-11
Mayfair Av	1900	4	8	4	3	-9
Robinhood Dr	1500	3	6	4	3	-7
Rosemarie Ln	1325	3	6	4	3	-7
Waudman Av	3000	6	8	0	2	-6

The total number of signs on these six street segments was reduced by 47. Fifty retro-reflective “BUMP” pavement legends were installed in place of the removed signs. If the sign experiment is approved by CTCDC, 24 unistrut sign posts can be removed from these six streets.

The six neighborhoods identified to participate in the experiment were as follows:

Neighborhood Area	Approx. Size in Sq Ft	Number of Access Points	Number of Vertical Measures	Number of W17-1 Signs Removed	Number of W13-1 Signs Removed	New “Area” Sign Added	Net Difference
Country Greens	4.5 mil	2	8	16	13	2	-27
LVW-Embarcadero	4.1 mil	4	13	26	24	4	-46
Little John Creek	5.7 mil	3	13	26	24	3	-47
River Oaks/River Bluff	4.5 mil	3	8	16	14	3	-27
Stonewood/Sunnyoak	5.9 mil	5	13	16	14	5	-25
Weston Ranch-Crestmore	3.9 mil	3	15	13	12	3	-22

The total number of signs removed from these six neighborhoods is 194. 113 retro-reflective "BUMP" pavement markers were installed in place of removed signs. If the sign experiment is approved by CTCDC, an additional 72 unistrut sign posts can be removed from these six neighborhoods.

Letters explaining the purpose of the experiment with pre-experiment survey postcards enclosed (see attached Exhibit B) were mailed on May 2, 2011 to 3,491 addresses in the identified experiment areas. Although response was requested by May 31, 2011, cards were accepted through June 15. A total of 678 responses were received or approximately 21% after adjusting for undeliverable/returned mail.

Results of the pre-experiment survey are shown on Exhibit C. These responses from the residents of those streets and neighborhoods are typically what was to be expected. Current residents do not have problems seeing the vertical measures since they have become familiar with the locations.

Removal and replacement of signs in the experiment was completed between June 15 and June 30, 2011. The experiment was conducted from July 1, 2011 through December 31, 2011.

During this time period, six months of pre-experiment collision data, December 1, 2010 through May 31, 2011, was collected for the experiment areas. Since these residential areas were already subject to traffic calming, collision data was expected to be minimal. If the premise of eliminating and replacing the signs was valid, we expected there to be little difference between the pre and post-experiment collision data.

After the experiment concluded, collision data was collected from July 1 through December 31, 2011 and compared to the pre-experiment data, see Exhibit G. As expected there is very little difference, with three pre-experiment collisions and two post-experiment collisions. One collision due to unsafe speed, two driving under the influence, one right-of-way violation and the remaining of unknown cause hitting a stopped vehicle.

On January 6, 2012 post-experiment information letters and survey postcards were mailed to the original 3,491 addresses (Exhibit D). Surveys were requested to be returned by February 10, but were accepted through the end of February. 759 responses were received, 23% after adjusting for undeliverable/returned mail. Results are shown on Exhibit E.

EVALUATION/SUMMARY

A total of 241 warning signs, W-17-1 Speed Hump and W13-1 Advisory Speed, were removed from the 12 experiment areas. The experiment included 25 vertical measures on 6 street segments and 70 measures in the 6 neighborhood areas. "Speed Humps Ahead" signs were posted at the beginning of each street segment with an Advisory

Speed Warning sign. The “Speed Hump Area” sign was posted with the Advisory Speed sign at the access points of each neighborhood. If the proposed signs are approved by CTCDC, a total of 96 sign posts can also be removed from these areas. 163 “BUMP” pavement legends were installed fifty feet in advance of each vertical measure to replace the signs.

As expected there was very little difference between the pre-experiment and post-experiment collision data. Of the 3 pre-experiment collisions and 2 post-experiment collisions, none were the result of or involved with the traffic calming measures.

The results of 18 speed surveys conducted on January 11, 2012 indicate that the 85th percentile speeds increased in 15 areas after signs were removed. Although this speed varied from approximately 1 mph up to nearly 8 mph in one location, the overall average increase was less than 3 mph. Data collected for the other 3 areas was determined to be unreliable and was not included in this assessment (see Exhibit F).

Empirical data based upon the resident surveys and unsolicited comments provide mixed results. Generally the physical measures appear to be more visible with “BUMP” pavement markings (question 4). Where residents originally felt there were not too many warning signs in their neighborhoods (question 5), once the signs were removed they felt there are enough warning signs. Finally where nearly 50% of residents originally felt other drivers did not have trouble seeing the speed humps (question 8), that number has dropped by half after signs were removed.

Photographic comparisons show the “BUMP” pavement markings are visible from 250’ in most locations although shade and glare do affect visibility at all distances. The photos submitted were taken during daytime hours, however all pavement markings used are retro-reflective which are easily seen during nighttime hours. Posted warning signs also are subject to similar visibility constraints of shade and glare, but are also subject to being obscured by tree and vegetation cover and parked vehicles.

CONCLUSIONS/RECOMMENDATIONS

Since the experiment areas were already subject to traffic calming, few conclusions can be drawn from collision data. Speed surveys offer slightly more information although it cannot be determined if 85th percentile speeds increased as a result of fewer warning signs or if there were other extenuating circumstances such as weather conditions (a wet/grey March 2011 as opposed to a dry/clear January 2012). Photographic comparisons offer some evidence of an advance and repetitive warning of the approaching vertical measure since the pavement markings can be seen easily and consistently from 250 feet.

The City of Stockton would recommend continued use of the “BUMP” pavement legend to draw attention to vertical traffic calming measures.

Section 2C-29.01 of the CA-MUTCD 2012 uses “should” rather than “shall” in regard to usage of the W17-1 sign, which renders it as “Guidance” rather than a “Standard”. Section 3B-26.02 allows advance word legends such as “BUMP” on the approach to a speed hump either alone or in conjunction with advance speed hump markings.

The only question to be resolved is whether or not the two sign modifications are acceptable to the CTCDC. There is no evidence provided from the experiment that the signs were ineffective, misunderstood, or created more problems than were resolved. Based on before and after collision data, there was no indication that changing the signs made a difference – in terms of safety. Based on the findings of this experiment, there is no indication that the proposed signs should be precluded from use.

It is recommended that Section 2C.29 of the CA-MUTCD 2012 edition be revised as follows:

Option:

If a series of speed humps exists in close proximity, the optional “SPEED HUMPS AHEAD” sign may replace the first SPEED HUMP sign in the series provided additional warning of speed humps is provided through signs or pavement markings at the speed humps.

If speed humps exist on a network of streets within an area accessible by a limited number of access points to the area, the optional SPEED HUMP AREA sign may be placed at each access point to the area provided additional warning of speed humps is provided through signs or markings at the speed humps.

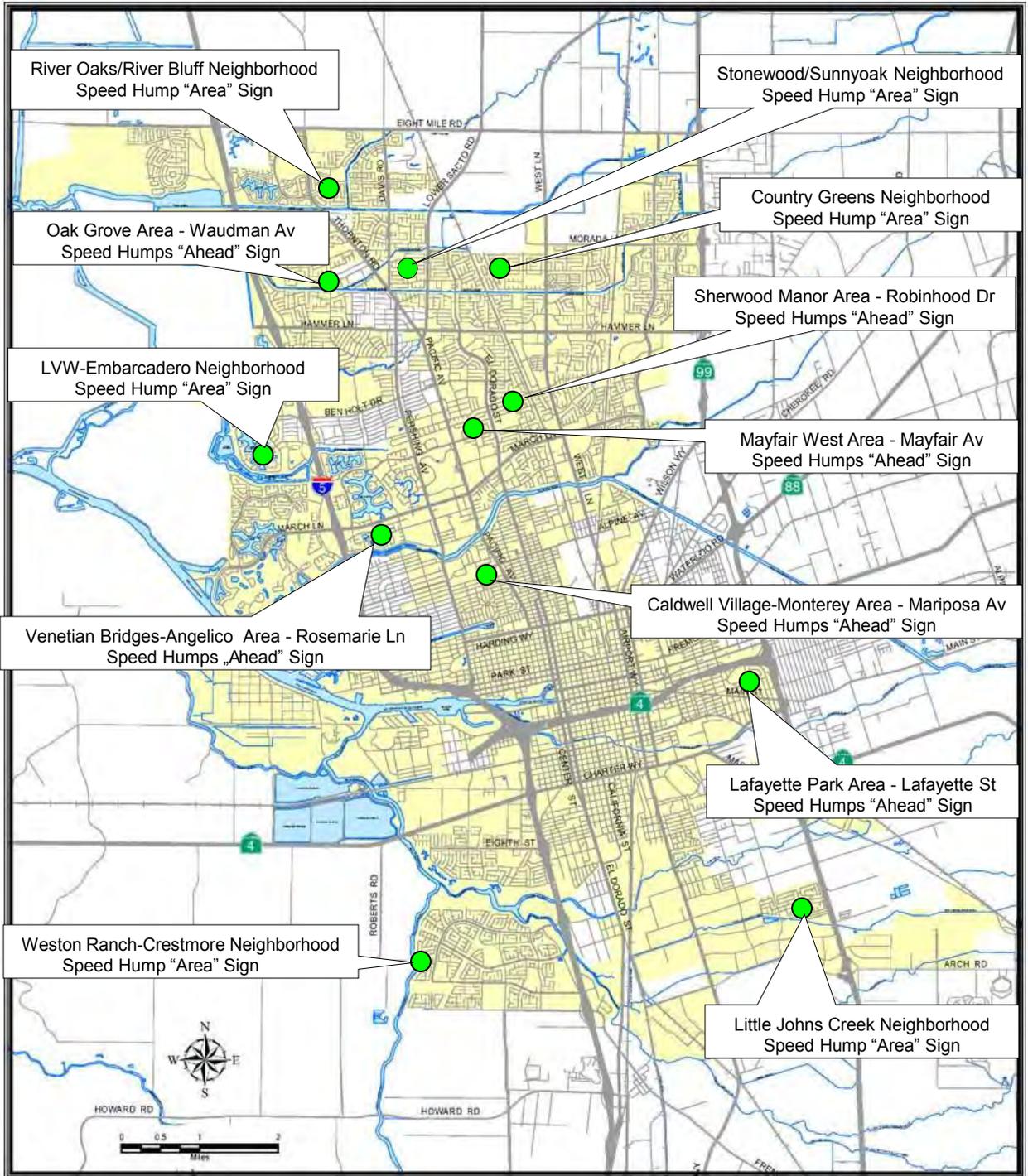
The CTCDC approval and ultimately Caltrans adoption of these signs could provide local municipalities with options and legitimize signs currently in use throughout the State.

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Exhibits

Exhibit A	Vicinity Map
Exhibit B	Pre-Experiment Resident Survey Letter and Business Reply Mail Postcard
Exhibit C	Pre-Experiment Survey Results
Exhibit D	Post-Experiment Resident Survey Letter and Business Reply Mail Postcard
Exhibit E	Post Experiment Survey Results
Exhibit F	Pre and Post-Experiment Speed Survey Comparisons
Exhibit G	Pre and Post-Experiment Collision Comparisons
Exhibit H	Pre and Post-Experiment Photographic Comparisons

Traffic Calming Experiment Locations



Legend:
City Limit

CITY OF STOCKTON





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PUBLIC WORKS DEPARTMENT

22 East Weber Avenue, Room 301 • Stockton, CA 95202-2317 • 209/937-8411 • Fax 209/937-8277

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May 2, 2011

Resident
Lafayette Park NTMP Area

TRAFFIC CALMING WARNING SIGNS EXPERIMENT - RESIDENT SURVEY

The City of Stockton currently installs Traffic Calming warning signs as required under State guidelines. In some neighborhoods where multiple speed humps or cushions have been installed, residents have complained about too many signs negatively affecting the overall appearance of their neighborhood and the visibility of the speed humps and cushions.

To address these concerns, the City of Stockton petitioned the California Traffic Control Devices Committee (CTCDC) to conduct an experiment to test other signs and at the same time make the traffic calming measures more visible to drivers. The CTCDC authorized the City of Stockton to conduct the experiment.

Your neighborhood has been identified as having multiple traffic calming measures on a single street or limited entrances to the network of neighborhood streets. We are asking for your assistance in determining the effectiveness of the new signs compared to the signs we currently use. **Please complete the enclosed survey postcard and return to the City of Stockton Public Works Department before May 31, 2011.**

After May 31st, many of the existing signs in your neighborhood or on selected streets will be removed and replaced with "BUMP" pavement markings in both directions before each measure. Sign posts will remain (without signs) until after the experiment is completed. The test period will be six months. After this time, you will be asked to complete another resident survey. Results of this survey will help the City and the State determine if the new signs and markings should be included in future traffic calming programs.

Thank you for your assistance in this experiment. If you have any questions or would like additional information, please contact the Neighborhood Traffic Management Program Coordinators at either (209) 937-5136 or (209) 937-8613.

ROBERT MURDOCH, DIRECTOR
PUBLIC WORKS DEPARTMENT

TODD W. GREENWOOD
CITY TRAFFIC ENGINEER

RKM:TWG:sa

Enclosure: Pre-Experiment Resident Survey

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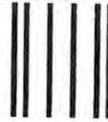
I live on _____ (Street name).

Please circle your response to each of the following items using a scale of 1 to 5, where 1 you least agree and 5 you most agree.

- | | | | | | |
|---|---|---|---|---|---|
| 1) Traffic calming has been effective at slowing traffic in my neighborhood. | 1 | 2 | 3 | 4 | 5 |
| 2) Traffic calming has reduced or eliminated vehicles cutting through my neighborhood. | 1 | 2 | 3 | 4 | 5 |
| 3) Children and pedestrians are safer in my neighborhood since traffic calming. | 1 | 2 | 3 | 4 | 5 |
| 4) I easily notice the speed hump warning signs in my neighborhood. | 1 | 2 | 3 | 4 | 5 |
| 5) There are too many speed hump warning signs in my neighborhood or on my street. | 1 | 2 | 3 | 4 | 5 |
| 6) The number of signs on my street detracts from the overall appearance of my neighborhood. | 1 | 2 | 3 | 4 | 5 |
| 7) I have trouble seeing the speed humps/cushions in my neighborhood. | 1 | 2 | 3 | 4 | 5 |
| 8) I notice other drivers seem to have trouble seeing the speed humps/cushions in my neighborhood. (They are caught off guard.) | 1 | 2 | 3 | 4 | 5 |

Thank you very much for responding to this survey.

 CITY OF STOCKTON, PUBLIC WORKS DEPARTMENT
NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM
(209) 937-5136 or (209) 937-8613

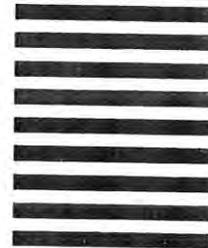


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Surveys by Area or Street Segment

Area/Segment	# Mailed	# Undeliverable	# Valid	# Responses	% Response
Lafayette St	64	6	58	10	18
Mariposa Av	87	3	84	55	66
Mayfair Av	54	5	49	15	31
Robinhood Dr	50	3	47	14	30
Rose Marie Ln	46	7	39	5	13
Waudman Av	48	4	44	9	21
Country Greens	420	20	401	51	13
LVW-Embarcadero	336	11	325	107	33
Little Johns Creek	791	48	743	85	12
River Oaks/River Bluff	525	8	516	98	19
Stonewood-Sunnyoak	642	30	611	131	22
Weston Ranch	428	8	420	40	10
Area not Identified				61	2
Totals	3491	148	3344	678	21

1. Traffic calming has been effective at slowing traffic in my neighborhood.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	5	1	1	0	3
Mariposa Av	8	11	10	5	21
Mayfair Av	4	1	4	2	4
Robinhood Dr	6	2	2	1	3
Rose Marie Ln	2	1	0	2	0
Waudman Av	2	2	4	0	1
Country Greens	13	10	11	7	10
LVW-Embarcadero	12	10	22	20	41
Little Johns Creek	13	11	14	13	33
River Oaks/River Bluff	18	9	22	19	29
Stonewood-Sunnyoak	17	12	31	27	41
Weston Ranch	7	4	3	9	17
Area not Identified	9	2	10	15	23
Totals	116	76	134	120	226
Response	17.26%	11.31%	19.94%	17.86%	33.63%

2. Traffic Calming has reduced or eliminated vehicles cutting through my neighborhood.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	5	0	2	0	2
Mariposa Av	17	7	8	9	13
Mayfair Av	7	1	1	2	3
Robinhood Dr	7	1	2	1	3
Rose Marie Ln	1	2	1	1	0
Waudman Av	2	2	4	1	0
Country Greens	20	7	12	5	5
LVW-Embarcadero	31	14	16	12	29
Little Johns Creek	16	14	16	12	24
River Oaks/River Bluff	25	8	17	20	22
Stonewood-Sunnyoak	42	19	23	19	19
Weston Ranch	11	4	4	9	11
Area not Identified	16	8	12	9	15
Totals	200	87	118	100	146
Response	30.72%	13.36%	18.13%	18.13%	22.43%

3. Children and pedestrians are safer in my neighborhood since traffic calming.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	5	1	1	2	1
Mariposa Av	12	10	8	8	17
Mayfair Av	4	0	6	4	0
Robinhood Dr	5	3	3	1	2
Rose Marie Ln	3	0	1	1	0
Waudman Av	1	2	6	0	0
Country Greens	17	10	6	7	11
LVW-Embarcadero	14	14	24	14	39
Little Johns Creek	10	5	24	9	36
River Oaks/River Bluff	17	13	19	24	24
Stonewood-Sunnyoak	20	16	31	25	36
Weston Ranch	7	4	6	10	12
Area not Identified	8	4	13	14	20
Totals	123	82	148	119	198
Response	18.36%	12.24%	22.09%	17.76%	29.55%

4. I easily notice the speed hump warning signs in my neighborhood.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	1	2	1	1	4
Mariposa Av	9	11	7	10	18
Mayfair Av	2	1	2	7	3
Robinhood Dr	4	1	3	2	4
Rose Marie Ln	1	1	0	1	2
Waudman Av	0	2	2	1	4
Country Greens	11	5	12	7	16
LVW-Embarcadero	9	7	20	25	44
Little Johns Creek	5	6	15	20	39
River Oaks/River Bluff	10	8	13	18	47
Stonewood-Sunnyoak	13	7	13	37	58
Weston Ranch	1	2	6	6	24
Area not Identified	7	5	10	13	25
Totals	73	60	104	148	288
Response	10.88%	8.64%	15.50%	22.06%	42.92%

5. There are too many speed hump warning signs in my neighborhood or on my street.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	6	0	0	1	3
Mariposa Av	17	5	9	3	20
Mayfair Av	5	6	2	1	1
Robinhood Dr	5	1	2	3	3
Rose Marie Ln	1	2	1	0	1
Waudman Av	2	4	2	0	1
Country Greens	19	3	9	6	14
LVW-Embarcadero	40	17	12	12	23
Little Johns Creek	40	17	11	6	9
River Oaks/River Bluff	46	15	13	7	15
Stonewood-Sunnyoak	74	16	23	8	7
Weston Ranch	22	8	1	2	3
Area not Identified	20	10	9	6	12
Totals	297	104	94	55	112
Response	44.86%	15.71%	14.20%	8.31%	16.92%

6. The number of signs on my street detracts from the overall appearance of my neighborhood. Page 3 of 3

Area/Segment	1 Least Agree	2 -	3 -	4 -	5 Most Agree
Lafayette St	6	1	1	0	1
Mariposa Av	22	3	7	7	16
Mayfair Av	8	4	2	0	1
Robinhood Dr	5	1	2	3	3
Rose Marie Ln	2	1	1	0	1
Waudman Av	3	2	3	0	1
Country Greens	22	3	5	8	13
LVW-Embarcadero	38	14	22	11	20
Little Johns Creek	43	11	14	7	8
River Oaks/River Bluff	43	17	13	3	19
Stonewood-Sunnyoak	67	19	23	6	11
Weston Ranch	20	7	7	0	4
Area not Identified	19	8	15	4	13
Totals	296	91	115	49	111
Response	44.88%	13.70%	17.32%	7.38%	16.72%

7. I have trouble seeing the speed humps/cushions in my neighborhood.

Area/Segment	1 Least Agree	2 -	3 -	4 -	5 Most Agree
Lafayette St	4	2	1	1	2
Mariposa Av	18	4	7	9	15
Mayfair Av	7	3	4	0	1
Robinhood Dr	5	1	2	2	4
Rose Marie Ln	3	1	0	1	0
Waudman Av	3	2	2	1	0
Country Greens	21	6	9	3	12
LVW-Embarcadero	51	23	14	8	8
Little Johns Creek	43	11	12	5	12
River Oaks/River Bluff	57	15	16	3	6
Stonewood-Sunnyoak	77	25	11	9	8
Weston Ranch	24	7	3	1	5
Area not Identified	24	9	12	6	7
Totals	337	109	93	49	80
Response	50.45%	16.32%	13.92%	7.34%	11.98%

8. I notice other drivers seem to have trouble seeing the speed humps/cushions in my neighborhood. (They are caught off guard.)

Area/Segment	1 Least Agree	2 -	3 -	4 -	5 Most Agree
Lafayette St	5	1	2	0	2
Mariposa Av	13	11	10	4	16
Mayfair Av	7	2	3	2	1
Robinhood Dr	6	2	2	1	2
Rose Marie Ln	3	0	0	1	1
Waudman Av	2	3	1	2	1
Country Greens	20	6	11	6	8
LVW-Embarcadero	43	26	15	11	9
Little Johns Creek	39	11	11	8	15
River Oaks/River Bluff	54	13	13	10	5
Stonewood-Sunnyoak	70	25	19	8	5
Weston Ranch	24	5	1	5	4
Area not Identified	24	10	11	7	8
Totals	310	115	99	65	77
Response	46.55%	17.27%	14.86%	9.76%	11.56%



CITY OF STOCKTON

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22 East Weber Avenue, Room 301 • Stockton, CA 95202-2317 • 209/937-8411 • Fax 209/937-8277
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January 6, 2012

Resident – Lafayette Street
Lafayette Park NTMP Area

TRAFFIC CALMING REQUEST TO EXPERIMENT - RESIDENT SURVEY

Your neighborhood has been participating in an experiment with the City of Stockton to test new Traffic Calming warning signs and markings. Several months ago you were asked to complete a Pre-Experiment Survey to let us know how well you thought the previous signs and markings were working and how they affected the appearance of your neighborhood.

The new signs and markings have been in place for six months. We would now like your responses on the enclosed Post-Experiment Survey card. Circle your response to each question using a scale of 1 to 5, where 1 you least agree and 5 you most agree. Please drop the postage-paid card into the mail before February 10, 2012.

Responses from both the Pre-Experiment Surveys and Post-Experiment Surveys will be compared to determine if there have been any significant changes or improvements. These results will be compared with other data the City has collected for your neighborhood including speed surveys and collision reports. The California Traffic Control Devices Control Committee will use this data to determine if the new signage can be included in future traffic calming programs.

We appreciate you taking the time to help with our study. Please let us know if you have any questions or would like any additional information by calling our Neighborhood Traffic Management Program Coordinators at (209) 937-5136 or (209) 937-8613.

ROBERT MURDOCH, DIRECTOR
PUBLIC WORKS DEPARTMENT

TODD W. GREENWOOD
CITY TRAFFIC ENGINEER

RKM:TWG:sa

::ODMA\GRPWISE\COS.PW.PW_LIBRARY:190308.1



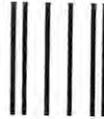
I live on _____ (Street name).

Please circle your response to each of the following items using a scale of 1 to 5, where 1 you least agree and 5 you most agree. **"Since changes were made to the traffic calming warning signs and markings in my neighborhood..."**

- 1) Speed humps and/or speed cushions seem to be doing a better job of slowing traffic.
1 2 3 4 5
- 2) There is less cut-through traffic (drivers cutting through my neighborhood).
1 2 3 4 5
- 3) Children and pedestrians are safer, and/or I feel safer.
1 2 3 4 5
- 4) "BUMP" pavement markings make speed humps and/or speed cushions more visible.
1 2 3 4 5
- 5) There are enough speed hump and/or speed cushion warning signs.
1 2 3 4 5
- 6) The overall appearance of my neighborhood has improved because of fewer signs.
1 2 3 4 5
- 7) I have trouble seeing the speed humps/cushions in my neighborhood.
1 2 3 4 5
- 8) I think other drivers still have trouble seeing the speed humps and/or cushions (They are caught off guard.)
1 2 3 4 5

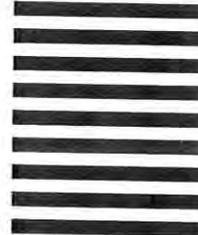
Thank you very much for responding to this survey.

PUBLIC WORKS DEPARTMENT
NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM
(209) 937-5136 or (209) 937-8613

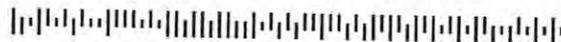


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POSTAGE WILL BE PAID BY ADDRESSEE



CITY OF STOCKTON
PUBLIC WORKS DEPARTMENT
22 E WEBER AVE STE 301
STOCKTON CA 95297-0250



Post-Experiment Survey Results – March 15, 2012

Surveys by Area or Street Segment

Area/Segment	# Mailed	# Undeliverable	# Valid	# Responses	% Response
Lafayette St	64	2	62	12	20
Mariposa Av	87	2	85	32	38
Mayfair Av	54	3	51	13	26
Robinhood Dr	50	4	46	19	42
Rose Marie Ln	46	7	39	13	34
Waudman Av	48	2	46	8	18
Country Greens	420	22	398	62	16
LWV-Embarcadero	336	10	326	106	33
Little Johns Creek	791	40	751	103	14
River Oaks/River Bluff	525	10	515	111	22
Stonewood-Sunnyoak	642	28	614	149	26
Weston Ranch	428	13	415	47	12
Area not Identified				84	3
Totals	3491	143	3348	759	23

“Since changes were made to the traffic calming warning signs and markings in my neighborhood...”

1. Speed humps and/or cushions seem to be doing a better job of slowing traffic.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	2	1	5	2	2
Mariposa Av	3	6	4	9	10
Mayfair Av	4	0	4	2	3
Robinhood Dr	7	3	2	4	3
Rose Marie Ln	2	2	1	3	5
Waudman Av	0	0	3	2	3
Country Greens	9	8	7	15	22
LWV-Embarcadero	18	8	17	23	39
Little Johns Creek	18	10	19	19	36
River Oaks/River Bluff	15	5	22	30	37
Stonewood-Sunnyoak	17	17	27	37	50
Weston Ranch	5	6	6	8	21
Area not Identified	15	7	9	22	30
Totals	115	73	126	176	261
Response	15.31%	9.72%	16.78%	23.44%	34.75%

“Since changes were made to the traffic calming warning signs and markings in my neighborhood...”

2. There is less cut-through traffic (drivers cutting through my neighborhood).

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	2	3	2	1	4
Mariposa Av	6	3	8	12	3
Mayfair Av	5	0	2	2	3
Robinhood Dr	7	6	2	2	2
Rose Marie Ln	3	3	2	2	3
Waudman Av	0	1	4	1	2
Country Greens	9	8	15	8	20
LWV-Embarcadero	23	7	26	20	24
Little Johns Creek	20	13	21	21	24
River Oaks/River Bluff	21	15	19	23	23
Stonewood-Sunnyoak	42	22	29	29	21
Weston Ranch	6	4	10	10	16
Area not Identified	22	4	25	11	17
Totals	166	89	165	142	162
Response	22.93%	12.29%	22.79%	19.61%	22.38%

"Since changes were made to the traffic calming warning signs and markings in my neighborhood..."

3. Children and pedestrians are safer, and/or I feel safer.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	2	1	3	4	2
Mariposa Av	7	4	3	10	7
Mayfair Av	5	0	4	0	4
Robinhood Dr	6	2	5	3	2
Rose Marie Ln	3	2	2	2	3
Waudman Av	0	1	2	2	3
Country Greens	8	6	15	14	17
LWW-Embarcadero	22	7	21	23	30
Little Johns Creek	16	14	21	15	36
River Oaks/River Bluff	14	14	19	25	33
Stonewood-Sunnyoak	26	24	25	25	42
Weston Ranch	6	5	10	11	14
Area not Identified	15	6	9	23	24
Totals	130	86	139	157	217
Response	17.83%	11.80%	19.07%	21.54%	29.77%

"Since changes were made to the traffic calming warning signs and markings in my neighborhood..."

4. "BUMP" pavement markings make speed humps and/or speed cushions more visible.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	1	1	3	3	3
Mariposa Av	4	2	4	4	17
Mayfair Av	0	0	5	5	3
Robinhood Dr	5	3	1	6	4
Rose Marie Ln	1	1	4	4	3
Waudman Av	0	0	2	2	4
Country Greens	4	1	8	24	22
LWW-Embarcadero	10	4	14	23	51
Little Johns Creek	10	4	14	24	49
River Oaks/River Bluff	9	7	11	29	53
Stonewood-Sunnyoak	8	11	16	33	78
Weston Ranch	2	4	7	13	19
Area not Identified	8	1	16	21	36
Totals	62	39	105	191	342
Response	8.39%	5.28%	14.21%	25.85%	46.28%

"Since changes were made to the traffic calming warning signs and markings in my neighborhood..."

5. There are enough speed hump and/or speed cushion warning signs.

Area/Segment	1 Least Agree	2	3	4	5 Most Agree
Lafayette St	3	1	1	5	2
Mariposa Av	2	0	0	6	23
Mayfair Av	1	1	4	2	5
Robinhood Dr	4	0	1	4	10
Rose Marie Ln	0	0	0	2	8
Waudman Av	1	1	2	1	2
Country Greens	7	5	7	10	31
LWW-Embarcadero	9	4	9	12	68
Little Johns Creek	15	10	17	20	38
River Oaks/River Bluff	11	5	9	20	61
Stonewood-Sunnyoak	8	12	28	30	79
Weston Ranch	6	2	9	9	19
Area not Identified	6	5	10	21	38
Totals	73	46	97	142	384
Response	9.84%	6.20%	13.07%	19.14%	51.75%

"Since changes were made to the traffic calming warning signs and markings in my neighborhood..."

6. The overall appearance of my neighborhood has improved because of fewer signs.

Area/Segment	1 Least Agree	2 -	3 -	4 -	5 Most Agree
Lafayette St	3	0	3	2	3
Mariposa Av	7	3	8	6	5
Mayfair Av	3	0	2	2	4
Robinhood Dr	7	3	2	4	3
Rose Marie Ln	1	0	7	2	3
Waudman Av	0	1	4	2	1
Country Greens	8	7	14	14	18
LVW-Embarcadero	19	6	22	22	27
Little Johns Creek	16	9	25	26	24
River Oaks/River Bluff	16	17	25	18	31
Stonewood-Sunnyoak	17	16	45	18	37
Weston Ranch	7	5	16	7	9
Area not Identified	12	10	17	14	25
Totals	116	77	190	137	190
Response	16.34%	10.85%	26.76%	19.30%	26.76%

"Since changes were made to the traffic calming warning signs and markings in my neighborhood..."

7. I have trouble seeing the speed humps/cushions in my neighborhood.

Area/Segment	1 Least Agree	2 -	3 -	4 -	5 Most Agree
Lafayette St	2	2	2	2	3
Mariposa Av	15	6	2	2	7
Mayfair Av	7	1	1	3	1
Robinhood Dr	9	2	3	2	3
Rose Marie Ln	6	2	2	1	1
Waudman Av	2	1	1	1	2
Country Greens	21	11	10	5	12
LVW-Embarcadero	50	19	14	12	9
Little Johns Creek	40	12	20	11	17
River Oaks/River Bluff	53	20	15	13	6
Stonewood-Sunnyoak	73	18	25	16	9
Weston Ranch	22	6	8	6	4
Area not Identified	29	10	12	11	7
Totals	329	110	115	85	81
Response	46.44%	15.07%	15.75%	11.64%	11.10%

"Since changes were made to the traffic calming warning signs and markings in my neighborhood..."

8. I notice other drivers seem to have trouble seeing the speed humps and/or cushions (They are caught off guard).

Area/Segment	1 Least Agree	2 -	3 -	4 -	5 Most Agree
Lafayette St	1	2	3	2	4
Mariposa Av	10	5	6	2	9
Mayfair Av	5	1	4	0	3
Robinhood Dr	8	1	3	3	4
Rose Marie Ln	5	1	6	1	0
Waudman Av	2	1	4	1	0
Country Greens	18	14	12	7	9
LVW-Embarcadero	38	16	21	20	9
Little Johns Creek	33	11	31	11	14
River Oaks/River Bluff	44	18	23	17	6
Stonewood-Sunnyoak	55	25	27	23	12
Weston Ranch	14	12	7	8	5
Area not Identified	29	13	15	14	8
Totals	262	120	162	109	83
Response	25.60%	16.30%	22.01%	14.81%	11.28%

Speed Survey Comparisons

Location	Limit 1	Limit 2	Speed Limit	Bi-Directional Volume	Average Speed (EB or NB)	85th %	Average Speed (WB or SB)	85th %
Mariposa Av	Manchester Av	Kensington Wy	25	267	21	24.8	21	25.9
Mariposa Av	Manchester Av	Kensington Wy	25	231	21	27	21	27.5
Waudman Av	Brattle Pl	Blue Fox Wy	25	1485	23	27.8	23.2	26.8
Waudman Av	Brattle Pl	Blue Fox Wy	25	1572	24	29.8	25	30.3
Mayfair Av	Claremont Av	El Dorado St	25	765	36	44.5	36	43.2
Mayfair Av	Claremont Av	El Dorado St	25	680	22	27.8	23	28.3
Robinhood Dr	Banbury Dr	Ridgeway Av	35	1681	27	32	27	31.7
Robinhood Dr	Banbury Dr	Ridgeway Av	35	1483	24	29.6	27	33.3
Rose Marie Ln	Venezia Bl	Piccardo Cl	30	3051	26	30.4	26	29.5
Rose Marie Ln	Venezia Bl	Piccardo Cl	30	2920	27	32.4	27	32.6
Lafayette St	Golden Gate Av	Broadway Av	25	698	26	29.2	26	30.4
Lafayette St	Golden Gate Av	Broadway Av	25	685	27	33.8	26	33.4
Togninali Ln	Osceola	Kimball Ln	25	1443	23	28.4	24	30.1
Togninali Ln	Osceola	Kimball Ln	25	1363	27	33.6	28	34.4
Togninali Ln	Kimball Ln	Yutan Ln	25	1491	23	27.8	23	27.3
Togninali Ln	Kimball Ln	Yutan Ln	25	1276	25	30	25	29.6
Sutherland Dr	Springriver Cl (W)	Springriver Cl (E)	25	1100	22	27.8	22	28.6
Sutherland Dr	Springriver Cl (W)	Springriver Cl (E)	25	1046	22	29.7	24	30.3
Bluegrass Dr	Warm Springs Cl	Deer Creek Cl	25	1194	26	32	26	31.4
Bluegrass Dr	Warm Springs Cl	Deer Creek Cl	25	1104	30	37	28	34.5
Forteen Mile Dr	Peterburg Cl	Cumberland Pl	30	717	45	52.3	45	55.2
Forteen Mile Dr	Peterburg Cl	Cumberland Pl	30	620	28	34.6	28	35.7
Sea Gull Ln	Land View Dr	Morgan Pl	25	985	25	29.2	25	28.4
Sea Gull Ln	Land View Dr	Morgan Pl	25	623	28	33.9	26	32.5
River Bluff Ln	Whistler Wy	River Oaks Dr	25	888	23	26.8	23	27.3
River Bluff Ln	Whistler Wy	River Oaks Dr	25	807	24	30.2	25	29.6
River Oaks Dr	Point Reys Cl	River Falls Cl	25	647	22	26.6	23	25.7
River Oaks Dr	Point Reys Cl	River Falls Cl	25	562	27	34.5	21	27.3
Ponce DeLeon Dr	Glenbriar Dr	Oak Knoll Ct	25	3359	26	30.1	26	30.7
Ponce DeLeon Dr	Glenbriar Dr	Oak Knoll Ct	25	2754	20	24.3	21	24.8
Sunnyoak Wy	Spring Oak Wy	Valley Oak Dr	25	865	25	29.8	25	30.7
Sunnyoak Wy	Spring Oak Wy	Valley Oak Dr	25	797	27	33.5	27	32.8
Mist Trail Dr	Paintbrush Dr	Wesley Ln	25	402	20	25	20	24
Mist Trail Dr	Paintbrush Dr	Wesley Ln	25	367	21	27.4	20	25.7
Boo Ln	Paintbrush Dr	Wesley Ln	25	294	21	26.1	21	26.8
Boo Ln	Paintbrush Dr	Wesley Ln	25	233	22	28.9	20	27.1

PRE SURVEYS - Thursday March 31, 2011
 POST SURVEYS - Tuesday Jan. 10, 2012

BOLD = Increase
 * = Overall Decrease

Document #172727

**Request to Experiment Traffic Calming Signs
Pre/Post Collision Stats**

Exhibit G

Location	Limit 1	Limit 2	Segment Length	ADT	Date of ADT	Collision Rate per MVM	# Collisions	Due to Unsafe Speed
Mariposa Av	Pershing Av	Dwight Wy	0.57	267	3/31/11		0	
Mariposa Av	Pershing Av	Dwight Wy	0.57	231	3/31/11		0	
Waudman Av	Bainbridge Pl	Don Av	0.58	1485	3/31/11	6.42	1	
Waudman Av	Bainbridge Pl	Don Av	0.58	1572	3/31/11		0	
Mayfair Av	Claremont Av	El Dorado St	0.26	765	3/31/11		0	
Mayfair Av	Claremont Av	El Dorado St	0.26	680	3/31/11		0	
Robinhood Dr	El Dorado St	Holiday	0.44	1681	3/31/11		0	
Robinhood Dr	El Dorado St	Holiday	0.44	1483	3/31/11		0	
Rose Marie Ln	Venezia Bl	Romano Dr	0.26	3051	3/31/11		0	
Rose Marie Ln	Venezia Bl	Romano Dr	0.26	2920	3/31/11	7.18	1	
Lafayette St	Sequoia Ct	Garden Av	0.51	698	3/31/11		0	
Lafayette St	Sequoia Ct	Garden Av	0.51	685	3/31/11		0	
Togninali Ln	Pock Ln	99 Frntg	0.62	1443	3/31/11		0	
Togninali Ln	Pock Ln	99 Frntg	0.62	1363	3/31/11		0	
Sutherland Dr	Springriver Cl (E)	Blue Grass	0.15	1100	3/31/11		0	
Sutherland Dr	Springriver Cl (E)	Blue Grass	0.15	1046	3/31/11		0	
Bluegrass Dr	Castle Oaks	Sutherland	0.46	1194	3/31/11	9.9	1	
Bluegrass Dr	Castle Oaks	Sutherland	0.46	1104	3/31/11		0	
Fourteen Mile Dr	Petersburg Cl (W)	Cumberland Pl	0.48	717	3/31/11		0	
Fourteen Mile Dr	Petersburg Cl (W)	Cumberland Pl	0.48	620	3/31/11		0	
Sea Gull Ln	Land View Dr	Morgan Pl	0.24	985	3/31/11		0	
Sea Gull Ln	Land View Dr	Morgan Pl	0.24	623	3/31/11		0	
River Bluff Ln	Whistler Wy	River Oaks Dr	0.21	888	3/31/11		0	
River Bluff Ln	Whistler Wy	River Oaks Dr	0.21	807	3/31/11		0	
River Oaks Dr	Whistler Wy	River Bluff Ln	0.46	647	3/31/11		0	
River Oaks Dr	Whistler Wy	River Bluff Ln	0.46	562	3/31/11		0	
Ponce DeLeon Dr	Davis Rd	Lower Sacramento	0.5	3359	3/31/11		0	
Ponce DeLeon Dr	Davis Rd	Lower Sacramento	0.5	2754	3/31/11	3.97	1	
Sunnyoak Wy	Stonewood Dr	Lower Sacramento	0.29	865	3/31/11		0	
Sunnyoak Wy	Stonewood Dr	Lower Sacramento	0.29	797	3/31/11		0	
Mist Trail Dr	Paintbrush Dr	Abruzzi Cl	0.58	402	3/31/11		0	
Mist Trail Dr	Paintbrush Dr	Abruzzi Cl	0.58	367	3/31/11		0	
Boo Ln	William Moss Blvd	Warlow Ln	0.25	294	3/31/11	73.4	1	1
Boo Ln	William Moss Blvd	Warlow Ln	0.25	233	3/31/11		0	

PRE Collision Stats: 12/01/10 - 5/31/2011

POST Collision Stats: 7/1/2011 - 12/31/2011

Lafayette Park – Lafayette St
100' Before and After



Lafayette Park – Lafayette St 150' Before and After



Lafayette Park – Lafayette St
200' Before and After



Lafayette Park – Lafayette St
250' Before and After



Caldwell Village – Mariposa Av
100 feet – Before and After



Caldwell Village – Mariposa Av
150 feet – Before and After



Caldwell Village – Mariposa Av
200 feet – Before and After



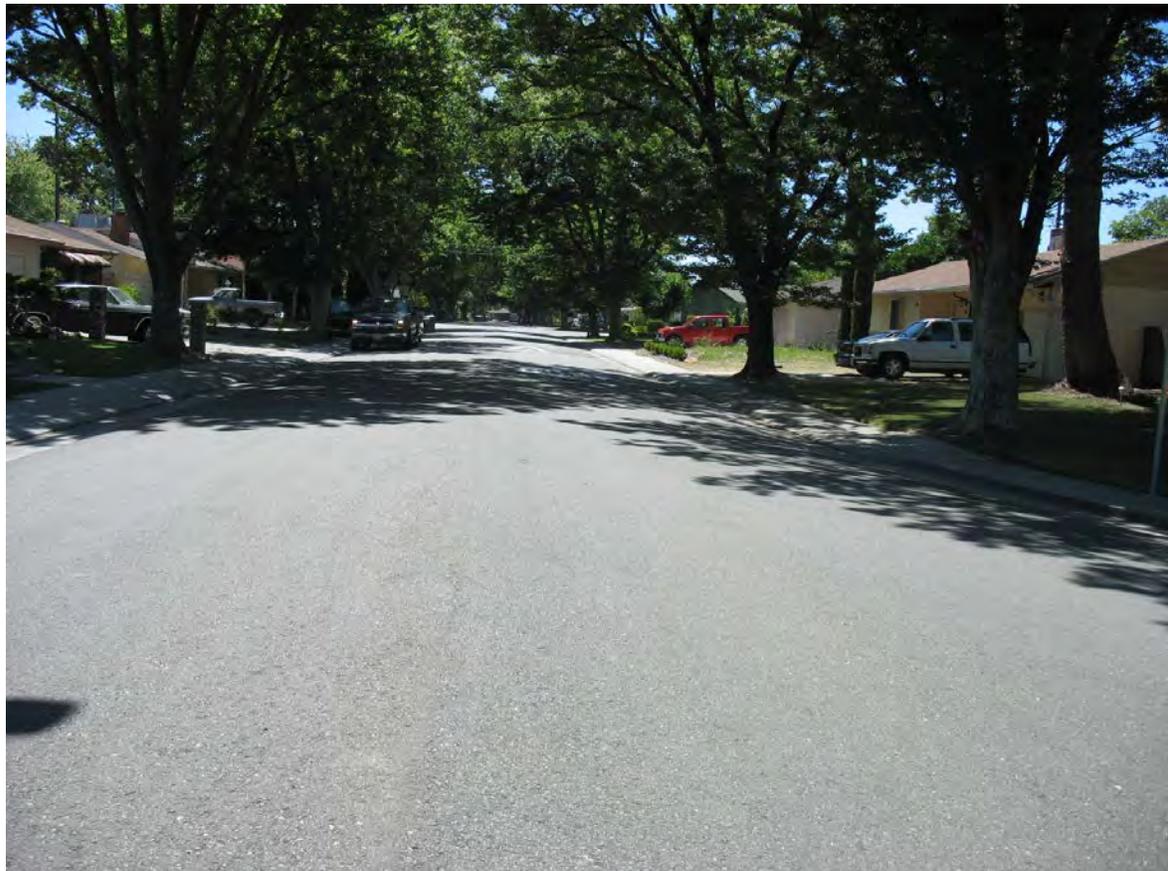
Caldwell Village – Mariposa Av
250 feet – Before and After



Mayfair West – Mayfair Av
100 feet – Before and After



Mayfair West – Mayfair Av
150 feet – Before and After



Mayfair West – Mayfair Av
200 feet – Before and After









Sherwood Manor Area – Robinhood Drive
200 Feet – Before and After



Sherwood Manor Area – Robinhood Drive
250 Feet – Before and After



Venetian Bridges-Angelico – Rosemarie Lane
100 Feet Before and After



Venetian Bridges-Angelico – Rosemarie Lane
150 Feet Before and After



Venetian Bridges-Angelico – Rosemarie Lane
200 Feet Before and After



Venetian Bridges-Angelico – Rosemarie Lane
250 Feet Before and After



Oak Grove – Waudman Av
100 feet – Before and After Photos



Oak Grove – Waudman Av
150 feet – Before and After Photos



Oak Grove – Waudman Av
200 feet – Before and After Photos



Oak Grove – Waudman Av
250 feet – Before and After Photos



Country Greens Area – Blue Grass Dr
100 feet – Before and After



Country Greens Area – Blue Grass Dr
150 feet – Before and After



Country Greens Area – Blue Grass Dr
200 feet – Before and After



Country Greens Area – Blue Grass Dr
250 feet – Before and After



Lincoln Village West – Embarcadero
Fourteen Mile Drive
100 feet Before and After



Lincoln Village West – Embarcadero
Fourteen Mile Drive
150 feet Before and After



Lincoln Village West – Embarcadero
Fourteen Mile Drive
200 feet Before and After



Lincoln Village West – Embarcadero
Fourteen Mile Drive
250 feet Before and After



Little Johns Creek – Togninali Ln
100 feet – Before and After



Little Johns Creek – Togninali Ln
150 feet – Before and After



Little Johns Creek – Togninali Ln
200 feet – Before and After



Little Johns Creek – Togninali Ln
250 feet – Before and After



River Oaks-River Bluff – Creek Trail Ci
100 feet Before and After



River Oaks-River Bluff – Creek Trail Ci
150 feet Before and After



River Oaks-River Bluff – Creek Trail Ci
200 feet Before and After



River Oaks-River Bluff – Creek Trail Ci
250 feet Before and After



Stonewood-Sunnyoak – Golden Oak Wy
100 feet Before and After



Stonewood-Sunnyoak – Golden Oak Wy
150 feet Before and After



Stonewood-Sunnyoak – Golden Oak Wy
200 feet Before and After



Stonewood-Sunnyoak – Golden Oak Wy
250 feet Before and After



Weston Ranch – Crestmore Neighborhood
100 Feet – Before and After



Weston Ranch – Crestmore
150 Feet - Before and After





Weston Ranch – Crestmore
250 Feet – Before and After

