Example Application from HSIP-Cycle 5 and HR3-Cycle 3

11-El Cajon-4

Countermeasures Used:

NS5: Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs

Primary reasons this application was selected to show as an Example:

- Application shows how safety funds can be used to meet the program's primary goal of reducing fatalities and serious injuries while assisting agencies in meeting part of their federal mandate on sign retro reflectivity.
- For agencies with strong GIS analysis tools and roadway signage cataloging, this application shows how an application can be developed for a sign upgrade project.
    - The methodology for selecting and attributing historic SWITRS crash data to warning and regulatory signs was discussed in Narrative Question #3

Changes needed for similar applications in future HSIP calls for projects:

- The collision summary report should include the total numbers of collisions by severities.

APPLICATION FOR HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROGRAM CYCLE 5 AND HIGH RISK RURAL ROADS (HR3) PROGRAM CYCLE 3

APPLICATION SUMMARY

After the application is finalized, please save this PDF form using the exact "Application ID" (shown below) as the file name.

This summary page is filled out automatically once the application is completed.

Application ID: 11-El Cajon-4

Submitted By (Agency):
El Cajon

Caltrans District	Application Number	Out of
11	4	4

Project Location

Various streets in the City of El Cajon.

Project Description

The replacement of 160 regulatory and 175 warning signs along various City streets within the City of El Cajon.

Countermeasure 1: NS5: Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs

Countermeasure 2:

Countermeasure 3:

Total Expected Benefit $1,928,940.00 **Total Project Cost** $135,500.00

B/C Ratio: 14.24

I. Basic Project Information

Date: Jul 18, 2012 Caltrans District: 11 MPO: SANDAG

Agency: El Cajon County: San Diego County

Total number of applications being submitted by your agency: 4

Application Number (each application must have a unique number): 4

Contact Person Information

Name (*Last, First*): Sanchez, Mario

Position/Title of Contact Person: City Traffic Engineer

Email: msanchez@cityofelcajon.us Telephone: (619) 441-1651 Extension:

Address: 200 Civic Center Way

City: El Cajon Zip Code: CA 92020 (Enter only a 5-digit number.)

Project Information

Project Location
-Be Brief (limited to 250 characters)
-See Instructions

Various streets in the City of El Cajon.

Project Description
-Be Brief (limited to 250 characters)
-See Instructions

The replacement of existing regulatory and warning signs along various City streets within the City of El Cajon.

Functional Classification: Other Principal Arterial (For Functional Classification and CRS Maps, Visit http://www.dot.ca.gov/hq/tsip/hseb/crs_maps/)

CRS Map ID (e.g. 08E14): 16Y21

Urban/Rural Area: Urban (Visit http://earth.dot.ca.gov/)

Eligible for HR3 Funding *(See Instructions)*: No

Work on the State Highway System *(See Instructions)*

Does the project include improvements on the State Highway System? No

If no, move on to the next page; If yes, go to the below question.

Is this a joint-funded project with Caltrans? No

☐ If yes, check this box to confirm a formal Letter of Support from Caltrans - District Traffic is attached to the application. The letter should include estimates of cost sharing.

☐ If no, check this box to confirm a written correspondence from Caltrans District Traffic is attached to the application. The correspondence should indicate that Caltrans does not see issues that would prevent the proposed project from receiving an encroachment permit

Additional Information

1. Is the project focused primarily on "spot location" or "systemic" improvements? Systemic

   The primary type of the "systemic" improvements: Install/Improve Signing

2. Which of the California's Strategic Highway Safety Plan (SHSP) Challenge Areas does the project address primarily? (For more information on the SHSP and its Challenge Areas, see: http://www.dot.ca.gov/SHSP/)

   5: Improve Driver Decisions About Rights of Way and Turning

3. How were the safety needs and potential countermeasures for this project **first** identified?

   Jurisdiction-wide safety analysis

4. What is the primarily mode of travel intended to be benefited by this project?

   Motorized users

5. Approximate percentage of project cost going to improvements related to **motorized** travel 90 %

6. Approximate percentage of project cost going to improvements related to **non-motorized** travel 10 %

7. Is the project focused primarily on "Intersection" or "Roadway" improvement?

   Roadway

   Miles of Roadway 196

8. Posted Speed Limit (mph) 40

9. Average Daily Traffic *(See Instructions)*

ADT (Major Road)	ADT (Minor Road)	Year Collected
20,100	9,100	2011

II. Narrative Questions (See Instructions)

These narrative questions are intended to provide additional project details for the application reviewers and project files. Application reviewers will use the information in their "fatal flaw" assessment of the applications, including:

1) The project scope is eligible for HSIP and/or HR3 funding;
2) The countermeasures used in the B/C ratio calculation are appropriately applied based on the scope of the project;
3) The crash data used in the B/C ratio calculation is appropriately applied based on the scope of the project and countermeasures used;
4) The costs included in the application represent the likely total project cost necessary to fully construct the proposed scope. If the proposed project is a piece of a larger construction project, the entire scope of the larger project must be identified.
5) The application data and attachments are reasonable and meet generally accepted traffic engineering and transportation safety principles.

If significant inconsistencies or errors are found in the application information, the Caltrans reviewers may conclude that the application includes one or more "fatal flaws" and the application will be dropped from further funding considerations. The applicant will be notified of Caltrans findings until after the selection process is complete.

1. Overall Identification of Need

Describe how the agency identified the project as one of its top safety priorities. Was a data-driven, safety evaluation of their entire roadway network completed? (limited to 5,000 characters)

Traffic signs provide important information to drivers at all times, during both day and night. As a result, the FHWA increased the minimum retro-reflectivity requirements of traffic signs to increase sign visibility. This new federal mandate requires local agencies to establish and implement a sign assessment or management method to maintain traffic signs in compliance with the retro-reflectivity requirements of Section 2A.09 of the CAMUTCD. Here's a breakdown of some of the changes;
• Four years to implement (and continue using) an assessment or management method to maintain traffic sign retro-reflectivity at or above the established minimum levels by January 2012.
• Seven years for replacement of regulatory, warning, and ground-mounted signs (except street name signs) that fail to meet the established minimum levels by January 2015.
• Ten years for replacement of street name signs and overhead guide signs that fail to meet the established minimum levels by January 2018.

As a result of this new mandate, the City submitted an application for Highway Safety Improvement Program (HSIP) and received funding to replace STOP, YIELD and Speed limit Signs through the City of El Cajon. It should be noted that on May 14, 2012, a final rule was published in the Federal Register, revising Table I-2 in the Introduction of the 2009 MUTCD to modify the compliance dates for the minimum maintained sign retro-reflectivity standard. This rule change extended the compliance date for implementation and continued use of an assessment or management method that is designed to maintain traffic sign retro-reflectivity at or above the established minimum levels to June 13, 2014 and refined the compliance date to only apply to regulatory and warning signs. However, this new change will be on the California Traffic Control Devices Committee (CTCDC) agenda for the August 2012 meeting. Once the CTCDC makes a final recommendation to Caltrans on this FHWA revision, the Office of Signs, Markings and External Support will work towards incorporating them into the CA MUTCD 2012 by issuing a revised addendum.

A review of the collision history from January 1, 2007 through December 31, 2009, showed a total of 1,988 collisions within the City of El Cajon with 1,249 collisions resulting in injuries and 10 collisions resulted in fatalities. Over 35 percent of those injury and fatality related collisions occurred during nighttime hours from 6:00 p.m. to 6:00 a.m. Within the last three years, the number of nighttime collisions resulting in injuries or fatalities increased from 48 to 99 collisions.

Based on the high number of collisions and in the continued effort to make the City of El Cajon roadway system safer, the City is moving forward (independent of the future changes to the compliance dates) and will attempt to meet the January 2015 deadline of replacing the regulatory and warning signs that fail to meet the established minimum levels.

2. Potential for Proposed Improvements to Correct the Problem

Describe the primary causes of the collisions that have occurred within the project limits. Are there patterns in the crash types? Clearly demonstrate the connection between the problem and the proposed countermeasures utilized in the Benefit/Cost Ratio calculations. (limited to 5,000 characters)

Note: Safety improvements that do not have countermeasures and crash reduction factors identified in the TIMS B/C Calculator can be included in the project scope; they just won't be added to the project's B/C ratio shown in the application.

Regulatory and warning traffic signs are used to promote roadway safety and efficiency and need to command attention to give adequate time for appropriate driver response. At nighttime, the visibility of signs depends on the retro-reflectivity of the sheeting material on the signs. Retro-reflectivity is a measure of the amount of light emanating from vehicle headlamps that is reflected directly back, by the sign, to the driver of the vehicle. When a sign is properly illuminated, motorists can focus their attention on safely controlling their vehicle. Motorists are more aware of the regulatory and warning signs from a farther distance are more comfortable, less stressed and less likely to make mistakes or poor judgments that could potentially cause vehicle crashes.

With the Highway Safety Improvement Program (HSIP) received in 2010, the City of El Cajon has reviewed the different types of assessment or management methods for signs and has selected a Combination of Methods (Expected Sign Life and Measured Retro-reflectivity). The intent of the combination methods is to provide a systematic means for the City of El Cajon to maintain traffic sign retro-reflectivity at or above the minimum levels. In doing so, the City of El Cajon's objective is to minimize the removing of signs before their useful life; therefore, reducing administrative and field expenses incurred each time a sign needs replacement.

To follow the selected method and as part of the preliminary engineering the City will inventory and assess all of the warning signs and remaining regulatory signs not yet completed. It shall be noted that all warning signs are made with engineering grade, and therefore, do not meet the new retro-reflectivity requirements. Although the engineering grade can be used for regulatory signs, it is expected that all of the signs are below the required minimum retro-reflectivity level of 50 candelas per lux per meters squared. Through these efforts, identified warning and regulatory signs that do not meet the minimum levels and/or sheeting requirements will need to be upgraded with the high intensity prismatic (or better) sheeting and in some locations the size of the sign will be increased for better and increased visibility.

The high intensity prismatic sheeting increases night visibility for all drivers as well as provides longer retro-reflectivity lifespan than Engineering Grade signs. During the day if the sun is hitting the sign with high intensity prismatic sheeting you can see the sign brightness. Furthermore, during the night, there is a distinguished difference in visibility of the sign.

A recent study at the University of Iowa found a direct correlation between a sign's brightness and a driver's ability to comprehend the sign's message. Study participants were able to read and understand brighter signs substantially faster. This study suggests that brighter signs require less "eyes-off-the-road" time, leaving drivers more time to attend to the task of driving, an especially important advantage when driving at night. This countermeasure provides motorists, especially older drivers, with a longer response time to react accordingly and reduces the occurrence of injury and fatal collisions.

3. Crash Data Evaluation

Describe how the limits of the crash data were established to ensure only appropriate crashes were included in the Collision Summary Report(s), Collision Diagram(s) and B/C calculations. Explain how the influence areas for each separate countermeasure were established. (limited to 5,000 characters)

A collision history list was downloaded from the SWITRS Geographic Information Systems (GIS) mapping from January 1, 2006 to December 31, 2010. The collision history list was filtered to only include incidents with primary collision factors with "Traffic Signals and Signs" category. Those incidents that were tallied within 250 feet of signalized intersection were removed from the list to conform to the countermeasure criteria. The remaining collisions were imported onto the City's Geographic Information System (GIS) system to a physical location (based on X and Y coordinates) and were plotted on a map. Regulatory (excluding STOP, YIELD, Speed limit, Parking, bicyclists, pedestrian) and warning signs were overlaid on this collision location map.

Regulatory and warning signs that overlapped with Collisions within a (300 foot radius buffer) were selected to be upgraded for this project. The remaining collisions not overlapping with any sign were than deleted form the map and subsequently from the collision list. A total of 161 remaining collisions were extracted and converted to a *.CSV file to be used to estimate the benefit/cost

ratio. However, when the *.CSV file was imported to the "benefit/cost estimate", only 128 collisions were reported and 33 collisions were not imported "due to an invalid date". Therefore, the collision summary list shows 33 more collisions than reported in the Transportation Injury Mapping System (TIMS).

Although, there is a discrepancy between the list and the (TIMS) incident summary, the City is confident that the list shows the appropriate crashes that would benefit from the countermeasure. In addition the benefit/cost ratio rate shows a lower and conservative analysis due to the 33 incidents not accounted in the estimate.

4. Prior attempts to address the Safety Issue

If appropriate, list all other projects/countermeasures that have been (or are being) deployed at this location. Applicants must identify all prior federal HSIP, HR3 or Safe Routes To School (SRTS) funds approved within or directly adjacent to the propose projects limits within the last 5 years. (limited to 5,000 characters)

In 2011, the City obtained a Highway Safety Improvement Program (HSIP) grant to upgrade regulatory signs. This project included the replacement of STOP, YIELD and Speed Limit Signs that do not meet the minimum retroreflectivity requirements. Those signs will be upgraded with high intensity grade prismatic sheeting. The project will be being advertised for bids in September 2012 and is project expected to be completed by March 2013.

Due to the new regulations and compliance dates, the City has a standard practice to upgrade all ground-mounted regulatory and warning signs with high intensity grade prismatic sheeting, and to upgrade all traffic signal mast arm signs with Diamond grade reflective sheeting.

5. Total project costs

Describe the process used to establish the total cost for the project. Confirm contingencies for reasonably expected costs, including drainage, environmental, traffic, etc, are included. (limited to 5,000 characters)

Note: For applications with more than one countermeasure used in the B/C calculations, applicants need to describe the logic used to distribute the total project cost to each countermeasure.

Preliminary Engineering $15,500
The City has estimated $500 for project advertisement and Notice of Exemption (CEQA environmental) fees. In an effort to continue with assessing of the regulatory and warning signs, the City has allocated 200 hours for a Public Works Maintenance Worker time at $42 per hour ($8,400) and a rental cost of $2,940 for a handheld retroreflectometer. The cost estimate to develop the Plans, Specifications and Estimate is 40 hours for Design Engineer at $46 per hour ($1,840), and 40 hours for a Junior Engineer at $33 per hour ($1,320) is anticipated to be approximately $15,000.

Construction Engineering $7,500
The City has allocated 36 hours for a Public Works Maintenance Worker time at $42 per hour ($1,530) and a rental cost of $1,500 for a handheld retroreflectometer. The City has estimated 30 hours for a Supervising Engineering Technician time at $57 per hour ($1,710) and 60 hours of Public Works Inspector time at $46 per hour ($2,760) for a total cost estimate of $7,500 for the construction engineering phase of the project.

Construction $112,500
The unit prices included in the detail Engineer's estimate has been compiled from various sources, including private consultants, other public agencies, and recent City projects. The total construction cost estimate for furnishing installing and disposing of materials is approximately $95,778. A 10% contingency in the amount of $16,722 is included for small variances in unit costs and construction change orders. The total cost to install the proposed countermeasure is approximately $135,500.

III. Project Cost Estimate *(See Instructions)*

All project costs must be accounted for on this form, even if substantial elements of the overall project are to be funded by other sources.

Round all costs up to the nearest hundred dollars. Once all costs are entered, click "Check Cost Estimate" to perform validation. If errors are detected, they will appear below the button. Click it to check again each time when the costs have been revised.

Phase		Federal Funds	Local/Other Funds(7)	Total Cost	Federal/Total(5)
Preliminary Engineering	Environmental	$400	$100	$500	
	PS&E	$13,500	$1,500	$15,000	
	PE Subtotal(2)	**$13,900**	**$1,600**	**$15,500**	**90%**
	☐ Agency does NOT request **federal** funds for PE Phase (automatically checked if PE - federal funds is $0).				
Right of Way	Right of Way Engineering				
	Appraisals, Acquisitions & Utilities				
	ROW Subtotal(3)				**0%**
Construction Engineering & Construction	Construction Engineering(4)	$6,700	$800	$7,500	**89%**
	Construction(1)	$101,200	$11,300	$112,500	**90%**
	CON Subtotal	**$107,900**	**$12,100**	**$120,000**	
	Total Cost(5)(6)(7)	**$121,800**	**$13,700**	**$135,500**	

(1) The "Total Construction Cost" (including contingencies) must match the detailed Engineer's Estimate (attached to the application).
(2) "Federal Funds" for Preliminary Engineering may not exceed 25% of the Federal Construction Cost.
(3) "Federal Funds" for Right of Way may not exceed 25% of the Federal Construction Cost.
(4) "Federal Funds" for Construction Engineering may not exceed 15% of the Federal Construction Cost.
(5) "Federal Funds" may not exceed 90% of "Total Cost." This applies to each phase.
(6) "Federal Funds" may not exceed $900,000.
(7) To maintain efficiencies in the overall Program and Project Management, the total "Federal Funds" must be no less than $100,000 (see Application Form Instructions for exceptions). If needed, agencies should consider extending the project limits and/or adding other safety improvements in order to increase both the Benefits and Costs.

Check Cost Estimate [Per (2) through (7) above]

Congratulations! No errors have been found in the cost estimate.

IV. Implementation Schedule *(See Instructions)*

The local agency is expected to deliver the project per Caltrans Local Assistance safety program delivery requirements.
In order for the milestones to be calculated correctly, all fields needs to be filled in. For steps that are not applicable, enter "0".

Target Date for the Project's Amendment into the FTIP: **01/01/2013**

Time for agency to internally staff project and request PE authorization	2	Month(s)
Typical Time for Caltrans and FHWA to process and approve PE authorization	2	Month(s)
Proposed PE Authorization Date:	**05/02/2013**	**(PE Authorization Delivery Milestone)**
Will external consultants be required to complete the PE phase of this project?	*No*	
Additional time needed to the Delivery Process for hiring PE consultant(s)	0	Month(s) (0 - 6)
Time to prepare environmental studies request	1	Month(s)
Time to complete CEQA/NEPA studies/approvals	1	Month(s)
See PES Form in the LAPM for Typical studies and permits		
Time to complete the Right of Way Acquisition (federal process)	0	Month(s)
Plan on 18 months minimum for federal process including a condemnation		
Time to complete final PS&E documentation	3	Month(s)
Other	0	Month(s)
Expected Completion Date for the PE Phase:	**10/01/2013**	
Time for agency to request CON authorization	2	Month(s)
Typical Time for Caltrans and FHWA to process and approve CON Auth	3	Month(s)
Proposed CON Authorization Date:	**03/02/2014**	**(CON Authorization Delivery Milestone)**
Time included for the agency's workload-leveling or construction-window needs	1	Month(s)
Time to award contract with CON contractor (following the federal process, including Board/Council approval, advertise, award, execute and mobilize)	2	Month(s)
Time to complete construction	3	Month(s)
Time included for closing the CON contract	2	Month(s)
Other	0	Month(s)
Expected Completion Date for the CON Phase:	**10/31/2014**	
Time to complete the project close-out process	2	Month(s)
Typical Time for Caltrans and FHWA to process and approve project close-out	3	Month(s)
Expected Completion Date for the project Close-Out:	**04/01/2015**	**(Close-Out Delivery Milestone)**

V. Countermeasures, Crash Data and Benefit/Cost Ratio *(See Instructions)*

In the process of completing this application, the Local Agency is required to utilize the Benefit/Cost Ratio Calculation Tool that is included in the Safe Transportation research and Education Center (SafeTREC) Transportation Injury Mapping System (TIMS) web site. This **web site** can be assessed at http://tims.berkeley.edu/

The final output summary page from TIMS must be included as part of the official application (both electronically and hard copy). The hard copy page must be included in the application following this page.

In order to facilitate the electronic collection and tracking of this data, Caltrans is requiring agencies to manually enter some of the key "input data" and "output data" used in their final TIMS B/C Ratio. *NOTE: If any of the values inputted on this sheet do not match the values from the TIMS B/C Ratio Output Summary sheet, THE APPLICATION WILL BE REJECTED.* ***Be Careful and confirm the numbers!***

TIMS Application ID: **11-El Cajon-4** (This ID is generated by this form. TIMS Application ID must match this ID.)

Version (from TIMS) : **1**

Total Project Cost: $135,500 (This must match the total project cost in Section III.)

Countermeasure Information

Number of countermeasures utilized: 1

	Countermeasure	% of Total Project Cost
#1:	NS5: Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs	100 (%)
#2:		0 (%)
#3:		0 (%)

B/C Ratio Calculation

	Expected Benefit (Life)	Expected Cost	Resulting B/C
Countermeasure #1	$1,928,940	$135,500	14.24
Countermeasure #2		$0	0.00
Countermeasure #3		$0	0.00
Project's Total (Overall)	**$1,928,940**	**$135,500**	**14.24**

VI. Application Data Verification and Signature *(See Instructions)*

All HSIP/HR3 applications (hard-copies only) must be signed by a registered engineer or the Agency's Transportation Manager in responsible charge of their Traffic Engineering section. By signing and submitting this application, the engineer/manager is attesting to:

1. All data in the application is accurate and represents the total scope of the planned project.
2. All likely project costs are included in the Total Project Cost (additional federal funds for cost increases will not be approved.)
3. Each countermeasure included represents a minimum of 20% of the Total Project Cost.
4. All crash data is: 1) accurately shown in collision diagram(s) attached to this application; and 2) applied to countermeasures using generally accepted traffic engineering principles.
5. The agency understands the Project Delivery Requirements for the HSIP and HR3 programs and is prepared to deliver the project with these requirements;
6. The agency understands if Caltrans staff determine that any of the above requirements are not met, inaccurate, or fail to meet the program guidelines and application instructions, the application will be rejected and will not be eligible to receive federal safety funding. Due to time constraints in the evaluation process, applicants will not be notified until after the selection process is complete. Refer to Application Form Instructions for more information on "fatal flaws."

Name *(Last, First)*: Sanchez, Mario

Title: City Traffic Engineer

Engineer License Number: CA52765

Signature*: Mario Sanchez

Date: Jul 18, 2012

* Note: This signature is only expected on the two hard copies of the application. The electronic copy of this PDF form must be saved in the original format (NOT a scanned copy) so the application data can be extracted.

Application Attachments *(See Instructions)*

Check all attachments included in this application.

- ☒ Vicinity map /Location map (Required)
- ☒ Project map showing existing and proposed conditions (Required)
- ☒ Collision diagram(s) (Required)
- ☒ Collision summary report / list (Required)
- ☒ TIMS output summary sheet (Required)
- ☒ Detailed Engineer's Estimate (Required)
- ☐ Warrant studies (Required when applicable to proposed improvements)
- ☐ Letter of Support from Caltrans (Required when applicable)
- ☒ Additional narration, documentation, photographs, letters of support, etc.

Application Submittal Process

For applications to be included in the final Caltrans review, ranking and selection process, they must follow the exact submittal process identified in the application instructions. Some of the key requirements are as follows:

1). Submit two (2) original copies of the SIGNED application form and attachments;

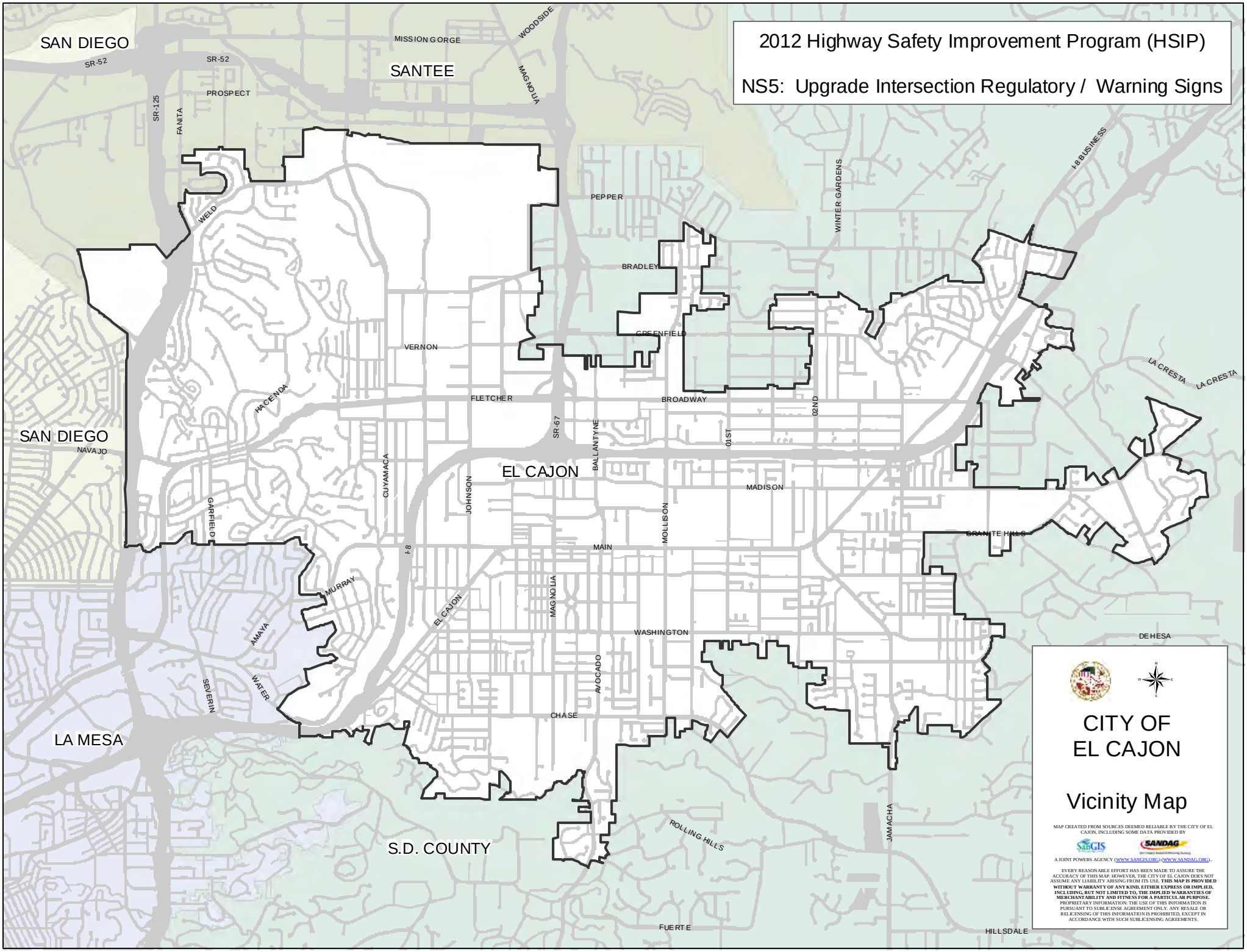
2). On a CD or flash drive, submit electronic copies of

- The original PDF form with application data. The file name must match the "Application ID" shown on the cover page. This file will be used to extract the application data. It can not be a scanned or printed copy.
- Separate electronic PDF files for a scanned copy of signed application form and application attachments.

3) The above must be submitted to Caltrans Local Assistance District Local Assistance Engineer (DLAE), by Friday, July 20, 2012.

City of El Cajon
Highway Safety Improvement Program

- Vicinity Map/Location Map
- Project Map Showing Existing and Proposed Conditions
- Collision Diagram (s)
- Collision Summary Report/List
- TIMS Output Summary Sheet
- Detailed Engineer's Estimate
- Additional Narration, Documentation, Photographs, Letters of Support, etc


2012 Highway Safety Improvement Program (HSIP)
NS5: Upgrade Intersection Regulatory / Warning Signs
SAN DIEGO
SR-52
SR-52
SR-125
FANITA
PROSPECT
MISSION GORGE
SANTEE
WOODSIDE
MAGNOLIA
WELD
PEPPER
WINTER GARDENS
I-8 BUSINESS
BRADLEY
GREENFIELD
VERNON
HACIENDA
FLETCHER
BROADWAY
02ND
LA CRESTA
LA CRESTA
SAN DIEGO
NAVAJO
SR-67
BALLANTYNE
01ST
EL CAJON
CUYAMACA
JOHNSON
MADISON
GARFIELD
MOLLISON
GRANITE HILLS
I-8
MAIN
MURRAY
MAGNOLIA
EL CAJON
AMAYA
WASHINGTON
DEHESA
SEVERIN
WATER
AVOCADO
CHASE
LA MESA
JAMACHA
ROLLING HILLS
S.D. COUNTY
FUERTE
HILLSDALE
CITY OF
EL CAJON
Vicinity Map
MAP CREATED FROM SOURCES DEEMED RELIABLE BY THE CITY OF EL CAJON, INCLUDING SOME DATA PROVIDED BY
SanGIS
SANDAG
A JOINT POWERS AGENCY (WWW.SANGIS.ORG) (WWW.SANDAG.ORG).
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Highway Safety Improvement Program (HSIP)
NS5: Upgrade Warning and Regulatory Signs

EXISTING

PROPOSED

EXISTING

PROPOSED

Replace Warning and Regulatory signs that do not meet the minimum levels of retro-reflectivity.

EXISTING AND PROPOSED CONDITIONS

2012 Highway Safety Improvement Program (HSIP)

NS5: Upgrade Intersection Regulatory / Warning Signs

SANTEE
S.D. COUNTY
EL CAJON
LA MESA
GRANITE HILLS
HORIZON HILLS

WELD
FANITA
WINDMILL VIEW
BRADLEY
JOHNSON
VERNON
GREENFIELD
PEPPER
I-8 BUSINESS
CUYAMACA
HACIENDA
FLETCHER
SR-67
BALLANTINE
BROADWAY
LA CRESTA
SR-125
NAVAJO
WEST WIND
I-8
MAIN
MADISON
2ND
GARFIELD
EL CAJON
MURRAY
3RD ST
AMAYA
WASHINGTON
MOLLISON
MAGNOLIA
AVOCADO
DEHESA
VISTA GRANDE
SEVERIN
WATER
CHASE
FUERTE

MAP CREATED FROM SOURCES DEEMED RELIABLE BY THE CITY OF EL CAJON, INCLUDING SOME DATA PROVIDED BY

SDGIS SANDAG

A JOINT POWERS AGENCY (WWW.SANGIS.ORG) (WWW.SANDAG.ORG)

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City of El Cajon

Collisions

2006 - 2010

0 500 1,000 2,000 Feet

Legend

- Collisions

Regulatory / Warning Sign Type

- Assembly A
- Assembly B
- Assembly C
- BOTH LANES TURN RIGHT
- NO RIGHT TURN ON RED ARROW
- R2-5
- R3-1
- R3-1p
- R3-18
- R3-2(L)
- R3-2a
- R3-3L
- R3-3R
- R3-4
- R3-5(L)
- R3-5(R)
- R3-6
- R3-7(L)
- R3-7(R)
- R3-8K
- R4-7
- R5-1
- R5-1A
- R5-10c
- R6-1(L)
- R6-1(R)
- R6-2(L)
- R6-2(R)
- R10-1
- R10-10L
- R10-11a
- R10-12
- R15-1
- R15-2(2)
- R16B
- R17B
- R28B
- R41
- R48
- R73-3(CA)
- R82A
- S1-1
- S4-3
- W1-2(L)
- W1-2(R)
- W1-3(R)
- W1-6
- W1-7
- W1-8
- W1-8(L)
- W2-1
- W3-1
- W3-1a
- W3-1B
- W3-3
- W4-1a
- W4-1R
- W4-2
- W4-2R
- W4-4p
- W4-7
- W5-1
- W8-1
- W8-1a
- W8-2
- W8-5
- W9-1L
- W9-2
- W9-2L
- W10-1
- W10-2
- W10-12a
- W11-2
- W13-1(15)
- W13-1(25)
- W13-1(30)
- W16-7p
- W16-9p
- W16-10
- W32-(CA)
- W34A(1/4)
- W53
- W82

Project Information

Application ID:
11-El CAJON-4

Crash Data:
5 years

From 01/01/2006
To 12/31/2010

Countermeasure 1 Information

CM Number: NS5

Mod: Operation / Warning

Name: Install / upgrade larger or additional stop signs or other intersection warning / regulatory signs

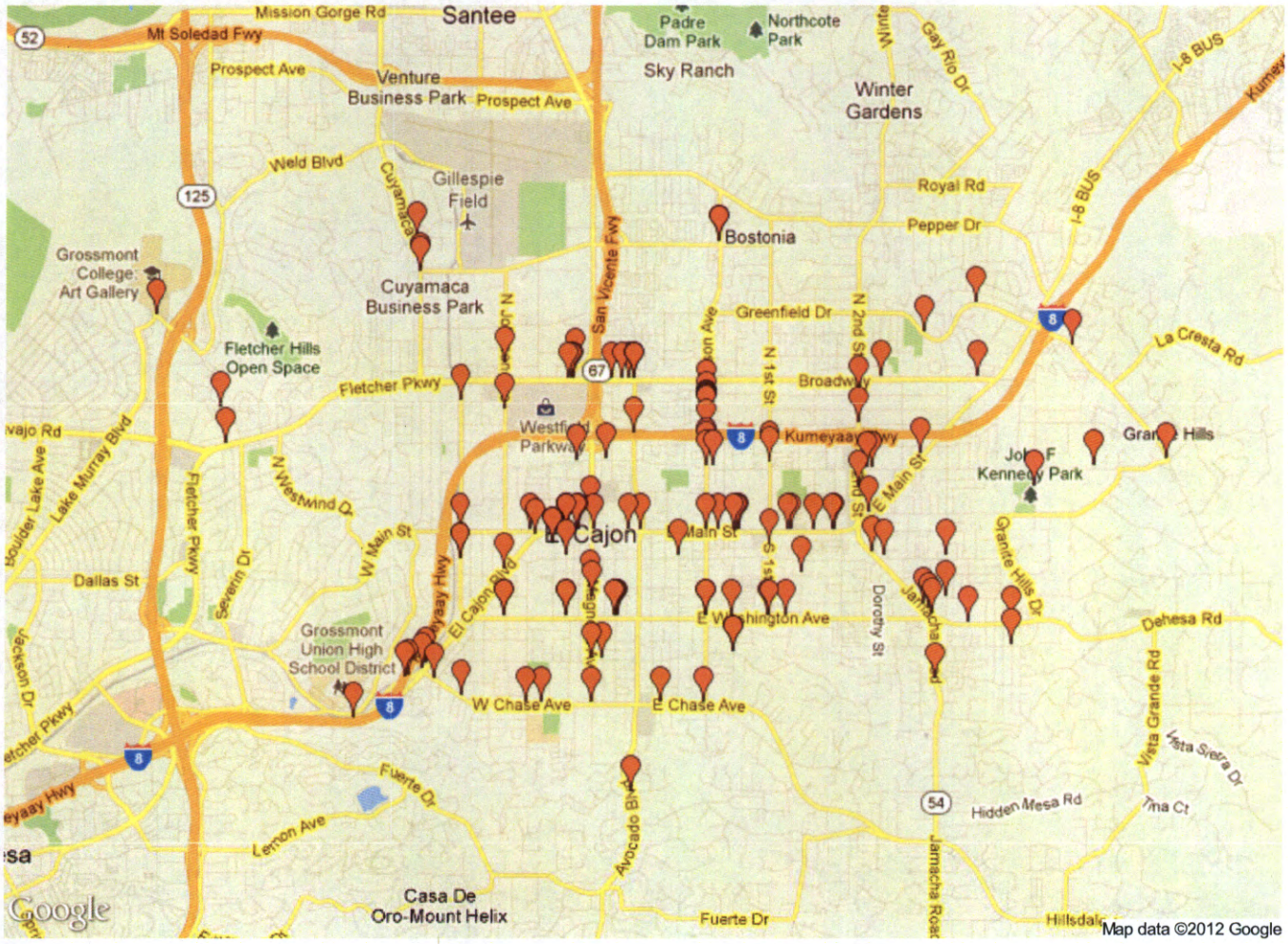
Crash Type: **All**

CRF: 15

Life: 10

Legend

- Fatality - from File
- Other - from File
- Fatality - User Input
- Other - User Input



Crash Summary in the map

Crash Type	Fatality (Death)	Severe Injury	Injury - Other Visible	Injury - Complaint of Pain	Property Damage Only	Total
All	0	1	15	112	0	128

Safety Practitioner / Engineer: Mario Sanchez

Signature: Mario Sanchez 7/19/12

By signing this B/C Calculator Map Result, you are attesting to your authority / responsibility at your local agency for this work and you are attesting to the accuracy of the values on this page and that they have been entered into the HSIP Application Form correctly, DO NOT SIGN if any of this is not the case.

City of El Cajon TIMS Incident 2006-2010
Upgrade Regulatory and Warning Signs

NO.	"CASEID"	POINT_X	POINT_Y	YEAR	CRASHSEV	VIOLCAT	KILLED	INJURED	WEATHER	PEDCOL	BICCOL	TIMECAT	MONTH	PRIMARYRD	SECOND	DISTANCE	DIRECT	INTERSECT	DATE	CITY	COUNTY
1	1901968	-117	32.809	2005	3	3	0	1	C			1500	2	JOHNSON	FESLER	0		Y	2/11/2005	EL CAJON	SAN DIEGO
2	1901972	-116.9	32.793	2005	4	3	0	1	A			1500	2	JAMACHA	LEXINGTON	356	N	N	2/3/2005	EL CAJON	SAN DIEGO
3	1942210	-116.9	32.795	2005	4	3	0	1	A			1500	3	MAIN	ANZA	45	W	N	3/5/2005	EL CAJON	SAN DIEGO
4	1979895	-117	32.795	2005	4	3	0	1	A			1800	4	MAIN ST	SUNSHINE	75	E	N	4/8/2005	EL CAJON	SAN DIEGO
5	2002437	-116.9	32.808	2005	4	3	0	1	A			1800	3	BROADWAY	MAIN ST	270	W	N	3/11/2005	EL CAJON	SAN DIEGO
6	2022467	-117	32.808	2005	4	3	0	1	-			1800	4	GRAVES	BROADWAY	0		Y	4/12/2005	EL CAJON	SAN DIEGO
7	2046495	-117	32.805	2005	4	3	0	1	A			1500	5	MEDFORD	CARLOW	439	S	N	5/12/2005	EL CAJON	SAN DIEGO
8	2046503	-116.9	32.793	2005	4	3	0	2	A			2100	5	E LEXINGTON	S ANZA	275	E	N	5/18/2005	EL CAJON	SAN DIEGO
9	2046515	-117	32.78	2005	3	3	0	2	A			900	4	EL CAJON BL	EL CAJON BL SE	58	W	N	4/20/2005	EL CAJON	SAN DIEGO
10	2046531	-117	32.783	2005	3	3	0	1	A			1800	5	CHASE	PINE	25	W	N	5/19/2005	EL CAJON	SAN DIEGO
11	2046539	-116.9	32.802	2005	4	3	0	1	-			1200	5	2ND	OAKDALE	30	S	N	5/8/2005	EL CAJON	SAN DIEGO
12	2077523	-117	32.78	2005	4	3	0	1	B			1500	6	CHASE	ORANGE	0		Y	6/2/2005	EL CAJON	SAN DIEGO
13	2106015	-117	32.807	2005	4	3	0	1	A			1800	5	BALLANTYNE ST	BROADWAY	255	S	N	5/25/2005	EL CAJON	SAN DIEGO
14	2106058	-117	32.808	2005	4	3	0	1	A			1800	6	FLETCHER	MARSHALL AV	123	E	N	6/2/2005	EL CAJON	SAN DIEGO
15	2129740	-117	32.792	2005	4	3	0	2	A			1500	5	MARSHALL	PALM	375	N	N	5/11/2005	EL CAJON	SAN DIEGO
16	2129756	-117	32.795	2005	4	3	0	3	A			1800	6	MAIN	MARSHALL	73	E	N	6/24/2005	EL CAJON	SAN DIEGO
17	2144015	-116.9	32.8	2005	4	3	0	1	A			1500	7	MADISON	JUNE	25	W	N	7/5/2005	EL CAJON	SAN DIEGO
18	2144031	-117	32.795	2005	4	3	0	1	A			1500	7	MAIN	MAGNOLIA	277	E	N	7/7/2005	EL CAJON	SAN DIEGO
19	2144046	-116.9	32.819	2005	3	3	0	1	A			2400	6	MOLLISON	BRADLEY	117	S	N	6/27/2005	EL CAJON	SAN DIEGO
20	2283856	-117	32.796	2005	3	3	0	2	A			1500	8	JOHNSON	MAIN	264	N	N	8/10/2005	EL CAJON	SAN DIEGO
21	2302057	-117	32.801	2005	3	3	0	1	A			1800	9	MOLLISON AV	MADISON AV	270	N	N	9/23/2005	EL CAJON	SAN DIEGO
22	2306784	-117	32.788	2005	4	3	0	2	A			1500	9	WASHINGTON	MOLLISON	35	E	N	9/6/2005	EL CAJON	SAN DIEGO
23	2306870	-116.9	32.787	2005	4	3	0	1	A			1800	9	WASHINGTON	ALVEDA	93	W	N	9/29/2005	EL CAJON	SAN DIEGO
24	2343543	-116.9	32.791	2005	4	3	0	1	A			1200	11	REDWOOD	ELMIRA ST	65	W	N	11/15/2005	EL CAJON	SAN DIEGO
25	2343544	-116.9	32.811	2005	4	3	0	1	A			1500	11	GREENFIELD CL	BERMUDA	84	E	N	11/5/2005	EL CAJON	SAN DIEGO
26	2373416	-116.9	32.801	2005	3	3	0	2	A			1800	11	1ST ST	MARY	81	S	N	11/16/2005	EL CAJON	SAN DIEGO
27	2373449	-116.9	32.793	2005	3	3	0	7	A			1500	11	JAMACHA	LEXINGTON	349	N	N	11/25/2005	EL CAJON	SAN DIEGO
28	2373478	-117	32.795	2005	4	3	0	1	A			1500	11	MAIN	CLAYDELLE	49	E	N	11/18/2005	EL CAJON	SAN DIEGO
29	2377201	-117	32.795	2005	4	3	0	1	A			1500	10	MAIN ST	PIERCE	45	W	N	10/13/2005	EL CAJON	SAN DIEGO
30	2391753	-117	32.773	2005	4	12	0	4	A			1500	12	AVOCADO	ALZEDA	0		Y	12/3/2005	EL CAJON	SAN DIEGO
31	2393640	-116.9	32.806	2005	4	3	0	1	A			1200	12	2ND	MARLINE	209	N	N	12/14/2005	EL CAJON	SAN DIEGO
32	2477633	-117	32.788	2006	4	3	0	1	A			1800	1	WASHINGTON	SUNSHINE	0		Y	1/27/2006	EL CAJON	SAN DIEGO
33	2477744	-117	32.8	2006	4	3	0	1	B			1200	1	MOLLISON	MADISON	0	S	N	1/29/2006	EL CAJON	SAN DIEGO
34	2477748	-117	32.773	2006	4	12	0	2	A			1500	1	AVOCADO	ALZEDA	0		Y	1/9/2006	EL CAJON	SAN DIEGO
35	2481849	-116.9	32.788	2006	4	3	0	1	A			1200	1	JAMACHA	ALADDIN	135	S	N	1/29/2006	EL CAJON	SAN DIEGO
36	2484636	-116.9	32.808	2006	4	3	0	4	A			1800	2	BROADWAY	MAIN	528	W	N	2/10/2006	EL CAJON	SAN DIEGO
37	2540346	-117	32.794	2005	4	12	0	2	A			2100	11	VAN HOUTEN	DOUGLAS	0		Y	11/22/2005	EL CAJON	SAN DIEGO
38	2540371	-117	32.788	2006	4	3	0	1	C			2100	3	WASHINGTONIA	JOHNSON	323	E	N	3/9/2006	EL CAJON	SAN DIEGO
39	2540386	-116.9	32.801	2006	4	3	0	1	B			1500	2	MADISON AV	GREENFIELD	31	W	N	2/21/2006	EL CAJON	SAN DIEGO
40	2611567	-116.9	32.819	2006	4	12	0	1	C			2100	3	MOLLISON	BRADLEY	0		Y	3/28/2006	EL CAJON	SAN DIEGO
41	2622334	-116.9	32.801	2006	3	3	0	1	B			900	5	N FIRST	535 N FIRST	0		N	5/4/2006	EL CAJON	SAN DIEGO
42	2668565	-116.9	32.811	2006	4	3	0	2	A			1200	5	GREENFIELD	CAMILLO	199	E	N	5/17/2006	EL CAJON	SAN DIEGO
43	2668708	-117	32.784	2006	4	3	0	1	A			1800	5	EL CAJON BL	HILL	136	S	N	5/3/2006	EL CAJON	SAN DIEGO
44	2732996	-116.9	32.788	2006	4	3	0	1	A			1200	6	WASHINGTON	1ST	50	W	N	6/15/2006	EL CAJON	SAN DIEGO
45	2733020	-117	32.802	2006	3	3	0	3	A			1800	6	FLETCHER	EDWARD	177	W	N	6/22/2006	EL CAJON	SAN DIEGO
46	2733040	-116.9	32.795	2006	4	3	0	1	A			1500	6	SHADY	MAIN	0		Y	6/20/2006	EL CAJON	SAN DIEGO
47	2733042	-117	32.782	2006	4	3	0	1	B			1500	6	GROSSMONT	CHASE AV	0		Y	6/27/2006	EL CAJON	SAN DIEGO
48	2733045	-117	32.808	2006	3	3	0	3	A			1800	5	FLETCHER	MAGNOLIA	82	E	N	5/18/2006	EL CAJON	SAN DIEGO
49	2733046	-117	32.784	2006	3	12	0	3	A			2400	6	MAGNOLIA	W RENETTE	9	N	N	6/27/2006	EL CAJON	SAN DIEGO

City of El Cajon TIMS Incident 2006-2010
Upgrade Regulatory and Warning Signs

NO.	"CASEID"	POINT_X	POINT_Y	YEAR	CRASHSEV	VIOLCAT	KILLED	INJURED	WEATHER	PEDCOL	BICCOL	TIMECAT	MONTH	PRIMARYRD	SECOND	DISTANCE	DIRECT	INTERSECT	DATE	CITY	COUNTY
50	2733097	-117	32.794	2006	4	12	0	1	A			2100	6	VAN HOUTEN	DOUGLAS	0		Y	6/19/2006	EL CAJON	SAN DIEGO
51	2856813	-117	32.804	2006	4	3	0	1	-			1800	8	MOLLISON	SANDALWOOD	75	S	N	8/4/2006	EL CAJON	SAN DIEGO
52	2856814	-117	32.801	2006	3	3	0	1	A			900	8	MOLLISON	MADISON	284	N	N	8/24/2006	EL CAJON	SAN DIEGO
53	2856838	-116.9	32.8	2006	3	3	0	2	A			1500	8	1ST	MADISON	111	N	N	8/28/2006	EL CAJON	SAN DIEGO
54	2856853	-117	32.808	2006	4	3	0	1	A			1500	8	BALLANTYNE	BROADWAY	35	S	N	8/11/2006	EL CAJON	SAN DIEGO
55	2856940	-117	32.781	2006	4	3	0	1	A			1800	7	CHASE	BENJAMIN	0		Y	7/5/2006	EL CAJON	SAN DIEGO
56	2859051	-116.9	32.819	2006	4	12	0	1	A			2100	9	MOLLISON	BRADLEY	0		Y	9/2/2006	EL CAJON	SAN DIEGO
57	2859078	-117	32.801	2006	4	3	0	1	A			1800	9	MOLLISON	MADISON	375	N	N	9/14/2006	EL CAJON	SAN DIEGO
58	2859110	-117	32.808	2006	4	3	0	1	A			1800	9	BROADWAY	GRAVES	528	E	N	9/3/2006	EL CAJON	SAN DIEGO
59	2859114	-117	32.803	2006	4	3	0	2	A			1800	9	BALLANTYNE	BEECH	114	N	N	9/8/2006	EL CAJON	SAN DIEGO
60	2861173	-116.9	32.789	2006	4	3	0	1	A			1500	9	JAMACHA	WASHINGTON AV	500	N	N	9/21/2006	EL CAJON	SAN DIEGO
61	2878151	-116.9	32.789	2006	4	12	0	3	-			1500	10	3RD	DUMAR	0		Y	10/1/2006	EL CAJON	SAN DIEGO
62	2889066	-117	32.78	2006	4	3	0	1	A			2400	7	CHASE	ESTES	201	W	N	7/22/2006	EL CAJON	SAN DIEGO
63	2889090	-116.9	32.787	2006	4	3	0	2	A			1800	8	WASHINGTON	ALVEDA	0		Y	8/16/2006	EL CAJON	SAN DIEGO
64	2889093	-117	32.817	2006	4	3	0	2	A			1200	10	CUYAMACA	BRADLEY	119	S	N	10/9/2006	EL CAJON	SAN DIEGO
65	2889110	-117	32.793	2006	4	12	0	1	A			1800	8	LEXINGTON	SUNSHINE	0		Y	8/17/2006	EL CAJON	SAN DIEGO
66	2899125	-117	32.803	2006	4	3	0	1	A			2100	10	MOLLISON	FRIENDLY CIR	526	N	N	10/20/2006	EL CAJON	SAN DIEGO
67	3061713	-116.9	32.795	2006	4	3	0	1	A			1800	11	MAIN	SAFARI	27	W	N	11/20/2006	EL CAJON	SAN DIEGO
68	3061743	-117	32.795	2006	4	3	0	1	C			1800	12	MAIN ST	SUNSHINE	0		Y	12/27/2006	EL CAJON	SAN DIEGO
69	3061752	-116.9	32.795	2006	4	3	0	1	A			1500	12	MAIN	SAFARI	144	W	N	12/7/2006	EL CAJON	SAN DIEGO
70	3066751	-117	32.806	2006	4	3	0	1	A			2100	11	MOLLISON	BROADWAY	528	S	N	11/23/2006	EL CAJON	SAN DIEGO
71	3066773	-116.9	32.798	2006	4	3	0	1	A			1800	12	2ND	MADISON	620	S	N	12/3/2006	EL CAJON	SAN DIEGO
72	3069706	-117	32.783	2006	4	3	0	1	A			1500	12	EL CAJON BL	CHASE	528	S	N	12/15/2006	EL CAJON	SAN DIEGO
73	3069711	-117	32.788	2006	4	3	0	1	A			1800	11	WASHINGTON	SUNSHINE	0		Y	11/6/2006	EL CAJON	SAN DIEGO
74	3098591	-117	32.805	2007	3	3	0	1	-			300	1	KATHERINE	GARFIELD	394	W	N	1/1/2007	EL CAJON	SAN DIEGO
75	3116492	-116.9	32.801	2007	4	3	0	1	A			1500	3	MAIN	OAKDALE	395	S	N	3/12/2007	EL CAJON	SAN DIEGO
76	3116508	-117	32.8	2007	3	3	0	2	A			1800	3	MADISON AV	DOMINGUEZ	40	W	N	3/7/2007	EL CAJON	SAN DIEGO
77	3191430	-116.9	32.793	2007	4	3	0	1	A			1500	5	LEXINGTON AV	IVORY AV	16	W	N	5/23/2007	EL CAJON	SAN DIEGO
78	3191641	-117	32.788	2007	4	3	0	1	-			1800	4	WASHINGTON	PRESCOTT	71	E	N	4/18/2007	EL CAJON	SAN DIEGO
79	3214510	-116.9	32.808	2007	3	3	0	1	A			1800	6	BROADWAY	BOSTONIA	34	E	N	6/1/2007	EL CAJON	SAN DIEGO
80	3214609	-117	32.795	2007	4	3	0	2	A			1500	5	MAIN	ORANGE	0		Y	5/29/2007	EL CAJON	SAN DIEGO
81	3275831	-117	32.784	2007	4	12	0	1	A	Y		1800	7	LESLIE	RENETTE	0		Y	7/8/2007	EL CAJON	SAN DIEGO
82	3292007	-116.9	32.787	2007	4	3	0	1	A			1800	7	WASHINGTON	WICHITA	528	W	N	7/18/2007	EL CAJON	SAN DIEGO
83	3295858	-117	32.804	2007	4	3	0	2	-			900	7	MOLLISON	SANDALWOOD	44	S	N	7/24/2007	EL CAJON	SAN DIEGO
84	3342645	-116.9	32.795	2007	3	3	0	1	A			1800	8	MAIN ST	ORLANDO	0		Y	8/18/2007	EL CAJON	SAN DIEGO
85	3343782	-117	32.805	2007	4	3	0	1	A			1800	7	JOHNSON AV	ARNELE	398	N	N	7/19/2007	EL CAJON	SAN DIEGO
86	3362242	-116.9	32.796	2007	4	3	0	2	A			1200	9	MAIN	MELODY	76	S	N	9/11/2007	EL CAJON	SAN DIEGO
87	3362246	-117	32.808	2007	4	12	0	1	A		Y	1500	9	BROADWAY	GRAVES	23	E	N	9/14/2007	EL CAJON	SAN DIEGO
88	3362313	-117	32.817	2007	4	3	0	2	A			1800	9	CUYAMACA	SWIFT	25	N	N	9/17/2007	EL CAJON	SAN DIEGO
89	3371497	-116.9	32.814	2007	4	3	0	1	A			1500	7	GREENFIELD	SOUVENIR	7	E	N	7/3/2007	EL CAJON	SAN DIEGO
90	3376346	-116.9	32.8	2007	3	3	0	1	A			1500	9	MADISON	WALTER AV	67	E	N	9/10/2007	EL CAJON	SAN DIEGO
91	3427635	-117	32.809	2007	4	3	0	1	A			1200	10	MAGNOLIA	FLETCHER	440	N	N	10/8/2007	EL CAJON	SAN DIEGO
92	3427804	-116.9	32.788	2007	3	3	0	2	A			1800	9	WASHINGTON	WASHINGTON HEIGHTS	122	W	N	9/25/2007	EL CAJON	SAN DIEGO
93	3427827	-117	32.793	2007	4	3	0	1	A			1200	9	S MARSHALL	PALM	428	N	N	9/2/2007	EL CAJON	SAN DIEGO
94	3438066	-117	32.795	2007	4	3	0	1	A			1800	10	MAIN	DOUGLAS	38	W	N	10/25/2007	EL CAJON	SAN DIEGO
95	3468851	-116.9	32.795	2007	4	3	0	1	A			1500	10	E MAIN	ANZA	197	E	N	10/17/2007	EL CAJON	SAN DIEGO
96	3468855	-116.9	32.795	2007	4	3	0	2	A			1800	10	MAIN ST	MOLLISON	371	E	N	10/19/2007	EL CAJON	SAN DIEGO
97	3468897	-116.9	32.788	2007	4	3	0	5	C			900	10	WASHINGTON	ANZA	30	W	N	10/17/2007	EL CAJON	SAN DIEGO
98	3494177	-116.9	32.793	2007	4	12	0	1	A			1800	12	LEXINGTON	3RD	0		Y	12/1/2007	EL CAJON	SAN DIEGO

Benefit / Cost Calculation Result

1. Project Information

Application ID	11-El CAJON-4	Version	1

2. Countermeasures and Crash Data

- **Install / upgrade larger or additional stop signs or other intersection warning / regulatory signs**

CM Number	Project Type	Crash Type	CRF	Life
NS5	Operation / Warning	All	15	10

Crash Type	Fatality (Death)	Severe Injury	Injury - Other Visible	Injury - Complaint of Pain	Property Damage Only	Total
All	0	1	15	112	0	128

Annual Benefit	$192,894
Life Benefit	$1,928,940
Cost	$ 135,500
B/C Ratio	**14.24**

3. Benefit Cost Result

Total Benefit	$1,928,940
Total Cost	$135,500
B/C Ratio	**14.24**

Safety Practitioner / Engineer: Mario Sanchez

Signature: Mario Sanchez

By signing this B/C Calculation Result, you are attesting to your authority / responsibility at your local agency for this work and you are attesting to the accuracy of the values on this page and that they have been entered into the HSIP Application Form correctly, DO NOT SIGN if any of this is not the case.

Detailed Engineer's Estimate

For Construction Items Only

Agency: City of El Cajon | **Application ID:** 11-El Cajon-4 | **Date:** 7/16/2012

Project Description: Upgrade Regulatory and Warning Signs

Project Location: Throughout the City of El Cajon

Prepared by: Raul Armenta

Item No.	Item Description	Quantity	Units	Unit Cost	Total	% to CM #1 %	% to CM #1 $	% to CM #2 %	% to CM #2 $	% to CM #3 %	% to CM #3 $
1	Mobilization and Traffic Control	1	LS	$5,000.00	$5,000	100	$5,000				
4	Furnish and Install Regulatory Signs HIP, with overlay film	160	EA	$150.00	$24,000	100	$24,000				
5	Furnish and Install Warning Signs HIP, with overlay film	120	EA	$150.00	$18,000	100	$18,000				
6	Furnish and Install Warning Signs HIP/DG3	5	EA	$200.00	$1,000	100	$1,000				
7	Furnish and Install School Warning and Regulatory Signs HIP/DG3	50	EA	$200.00	$10,000	100	$10,000				
8	Furnish and Install Break-Away Perforated Sign Post Assembly in Concrete/Soi	50	EA	$200.00	$10,000	100	$10,000				
9	Furnish and Install 36" Perforated Sign Post Extension	228	EA	$50.00	$11,400	100	$11,400				
10	Sign Identification Stickers	335	EA	$1.50	$503	100	$503				
11	Removal and Salvage Existing Signs from Post or Pole	335	EA	$25.00	$8,375	100	$8,375				
12	Removal, Salvage and dispose of Existing Structural Post in Concrete/Soil	50	EA	$150.00	$7,500	100	$7,500				
	Sub Total of Construction Items:				$95,778		$95,778				
	Construction Item Contingencies (% of Con Items) **:**			10	16,722	100%	CM #1		CM #2		CM #3
				Total Construction Items:	**112,500**						

Note: 1. "Preliminary Engineering", "Right of Way", and "Construction Engineering" costs are accounted for in the Application Form.

2. See the Application Instructions for more details on the requirement that all Countermeasures (CM) used in the Benefit / Cost ratio calculations represent a minimum of 20% of the total cost of the Construction Items. The Engineer's Estimate will be used to verify this.

Highway Safety Improvement Program (HSIP)
NS5: Upgrade Warning and Regulatory Signs

White Retro= 380
Red Retro= 98
Contrast Ratio = 3.9
New
Type IX (3M VIP)

White Retro = 21
Red Retro = 6
Contrast Ratio = 3.5
15 Years Old
Type IX

Sign degradation: The sign on the right has a white and red retro-reflectivity of 21 and 6 respectively and the new sign on the left has a white and red retro-reflectivity of 380 and 98 respectively. The sign on the right shows the degradation to the sign sheeting due to 15 years of sun exposure. With the grant, we will upgrade the regulatory and warning sign that have degraded below the minimum retro-reflectivity levels.