



## Board Report

File #: 2015-0445, File Type: Contract

Agenda Number: 4.

### SAFE BOARD MEETING JUNE 25, 2015

#### SUBJECT: CALL BOX SYSTEM RESTRUCTURING

#### ACTION: APPROVE THE RESTRUCTURING OF THE CALL BOX SYSTEM

#### RECOMMENDATION

AUTHORIZE the **restructuring of the Los Angeles County Kenneth Hahn Call Box System** as outlined, based upon the findings and recommendations of the recently concluded Call Box Assessment Study (Attachment A).

#### ISSUE

As part of the overall management of the Call Box System, an assessment Study was completed in 2014. The Study recommends that LA SAFE proceed with a four phase restructuring of the call box system resulting in the removal of approximately 412 call boxes in phase 1 from service or a 23% reduction. This recommendation is being brought to the Board for approval prior to implementation.

#### DISCUSSION

The Call Box system was established to provide a motorist aid service to the public. In 2007, the Board authorized an initial restructuring that transitioned the call box system from a primary motorist aid resource to a secondary safety net. This resulted in a decrease of approximately 2,500 call box sites from the initial base of 4,500 call boxes. At the time the usage of the call box system had decreased from an average of 20,000 calls per month in the year 2000 to approximately 5,000 calls per month in 2007. Current call box system usage averages approximately 1,700 calls per month spread over an installed base of approximately 1,800 call boxes.

Due to the decrease in usage and the continued proliferation of cell phones, as well as the implementation of new motorist aid services, the call box system was further evaluated to identify call boxes that are no longer useful in meeting program goals, as well as those that present a safety risk due to their location. A field site assessment of all existing locations (1,786 sites at the time of the assessment) was conducted. The field assessments were conducted during the months of May 2013, June 2013, and March 2014 and consisted of the following tasks:

1. Verification of the location and sign number data;

2. Verification of the call box site type;
3. Assessment of the availability of cell phone coverage to determine if sufficient service is available to support personal cell phone usage;
4. Confirmation of the width of the shoulder;
5. Identification of any unusual conditions such as poor sight distance, steep grade, vegetation covering the site, etc. that can pose a safety hazard to call box users and/or the motoring public;

In addition to the field assessment, a review of the maintenance history and usage data for each call box was also conducted. Utilizing the results of the field assessment, maintenance history and usage data, three main criteria were used to evaluate each call box location and determine if the box should be removed:

1. **Site Type** - Due to safety concerns, Caltrans has recommended the phased removal of Type B and C call boxes where they are no longer effectively used. These call box types were cut into an existing hillside (Type B) or built over an existing down slope (Type C). As such, an assessment of Type B and C call boxes with low utilization was conducted and locations identified.
2. **Knockdowns** - Call boxes with a history of multiple knockdowns in a year indicate a potential problematic location or site and as such were identified for removal.
3. **Program Goals** - The Call Box program goals are to provide motorist aid service to the public. For various reasons, primarily the proliferation of the usage of cellular telephones and other alternative emergency services available to the motorists, there are call boxes with a pattern of little or no usage.

As a result of the evaluation, a total of 412 type B and C call box sites have been recommended for removal within Phase I.

In addition to the recommendation to remove the 412 identified type B and C call box sites, the assessment also provides a working roadmap to continue identifying call box sites that are candidates for removal and/or relocation under the above criteria.

## **DETERMINATION OF SAFETY IMPACT**

Removal of the identified call boxes is not anticipated to present any negative safety impacts. The recommendations have been reviewed by our partner agencies, Caltrans and CHP, for safety implications and both agencies concur with the findings.

## **FINANCIAL IMPACT**

Funding of \$500,000 for implementation of the restructuring has been included in the FY16 budget

request under Cost Center 3351, Project 300209 for LA SAFE.

Since this is a multi-year project, the cost center manager and Executive Officer will be accountable for budgeting the cost in future years, including any options exercised.

### **ALTERNATIVES CONSIDERED**

The Board could elect not to approve the restructuring. Staff is not recommending this alternative, since the restructuring will ensure a more efficient, effective and safe system for the motoring public.

### **NEXT STEPS**

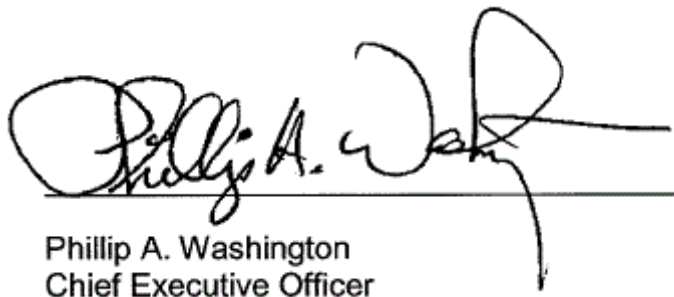
Upon approval, staff will begin steps to restructure the call box system. Additionally staff will continue monitoring the system and move forward with additional call box removals as warranted and report to the Board annually of any implemented changes.

### **ATTACHMENTS**

A. Call-Box Assessment Study

Prepared by: Iain Fairweather, Sr. Program Manager LASAFE, (213) 922-5650  
Ken Coleman, Deputy Executive Officer LASAFE, (213) 922-2951

Reviewed by: Shahrzad Amiri, Executive Officer LA SAFE, (213) 922-3061



---

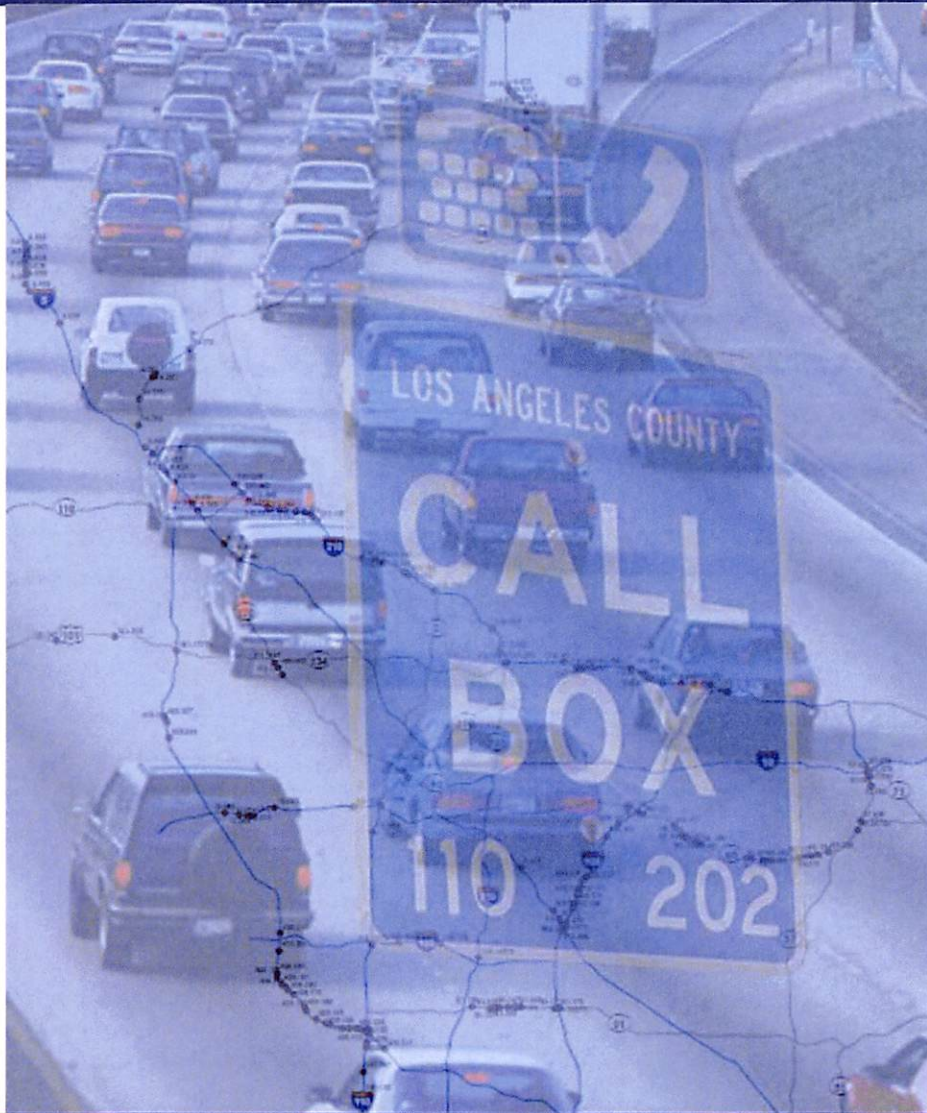
Phillip A. Washington  
Chief Executive Officer



# **Call Box Assessment Study**

**May 27, 2014**

J12-1798



## TABLE OF CONTENTS

Table of Contents .....	i
Appendices.....	i
List of Tables.....	ii
List of Figures .....	ii
<b>1.0 Introduction .....</b>	<b>1</b>
1.1 BACKGROUND.....	1
1.2 PROGRAM GOALS.....	6
<b>2.0 Current Call Box System Environment .....</b>	<b>6</b>
2.1 MOTORIST AID ALTERNATIVE TO CALL BOXES .....	8
2.2 STATEWIDE CALL BOX GUIDELINES.....	9
<b>3.0 Field Site Assessment.....</b>	<b>11</b>
<b>4.0 System Evaluation Methodology.....</b>	<b>12</b>
4.1 SITE TYPE.....	14
4.2 KNOCKDOWNS .....	17
4.3 PROGRAM GOALS.....	17
4.4 APPROACHES TO SYSTEM EVALUATION OF OTHER SAFES.....	18
<b>5.0 Recommendations .....</b>	<b>19</b>
5.1 FUTURE ADDITIONAL PHASED REDUCTION.....	22
5.2 NEXT STEPS.....	24

## APPENDICES

Appendix A: Recommendations for Removal  
Appendix B: Remaining Type B/C Sites  
Appendix C: Remaining Non Type B/C Sites

## LIST OF TABLES

Table 1: 2012 Call Types.....	5
Table 2: Summary of Call Box Removal Program by Selected California SAFE Agencies .....	19
Table 3: Summary of Recommendations for Removal .....	21

## LIST OF FIGURES

Figure 1: Pew Research Center Surveys on Cell Phone Ownership.....	2
Figure 2: CTIA-The Wireless Association Data on Cellphone Subscribers in US.....	3
Figure 3: CTIA-The Wireless Association Data on Reported Cell Sites in US .....	4
Figure 4: Call Box Call Usage From 2004 to 2012 .....	5
Figure 5: Current Call Box System.....	7
Figure 6: Type B and Type C Examples .....	15
Figure 7: Location of Type B & Type C Call Boxes.....	16
Figure 8: Los Angeles County Past and Projected Call Box Usage (2004 to 2023) .....	23



## 1.0 INTRODUCTION

The Los Angeles County Service Authority for Freeway Emergencies (LA SAFE) is responsible for call boxes that are located within Los Angeles County's freeway and highway system. The goal of this project is to evaluate the status and provide recommendations on the current deployment of the Los Angeles County Kenneth Hahn Call Box System, with an emphasis on ensuring that the call box system will continue to provide a safe, efficient, and effective service to the motoring public. One of the main objectives is to develop and establish a methodology/guideline to determine the optimal placement of call box sites given present conditions and needs, and the reduction of those call box sites that do not meet the established guidelines.

Based on the data presented in this report, it will become clear that the Call Box program, including its associated guidelines, has become inconsistent with its original intentions and that the physical boxes on the side of the road may be nearing obsolescence. This assessment study will lay out a plan for the immediate removal of call boxes that, for various reasons, no longer serve the purpose of the program. The plan will also address the future removal of boxes, potential alternative uses for sites where call boxes have been removed, and the next steps towards developing guidelines for how the program could more efficiently utilize the funding available to best serve the public with motorist aid.

### 1.1 BACKGROUND

The Call Box program in the State of California was created in 1986 and is governed by individual regions and/or counties through local SAFE agencies. The program is currently funded through a \$1.00 per vehicle annual registration fee and maintenance for the program is privately contracted. The annual \$1.00 fee also supports other motorist aid programs within the individual counties/regions.



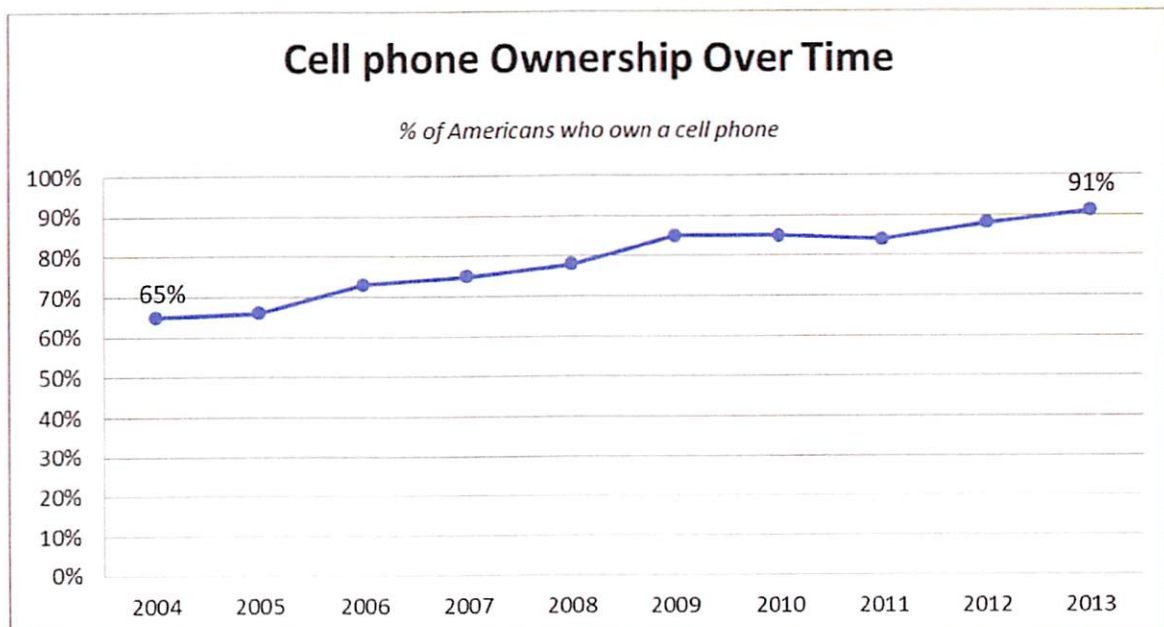
At its inception, the Call Box program was established for the purposes of providing motorist aid, improving safety, and incident detection. Call boxes were placed as close as one-quarter mile apart on highways in many urban areas. The call box site was intended to give the stranded motorist a feeling of security, suggesting that help would soon be on the way. Like phone booths, the call boxes were intended to provide communications access in order for stranded motorist to request for help when assistance is needed, thereby reducing exposure time and impact of the vehicle on the roadway and potentially reducing related traffic congestion. This was at a time when many other options to get assistance were not available to the general motoring public. The mobile cellular telephones or in-vehicle communications systems were just coming on the market and were not available to most people. In addition, the Metro Freeway Service Patrol (FSP), as well as the Caltrans and California Highway Patrol (CHP) Transportation Management Center (TMC) 24-hour 7-day incident management programs, did not get implemented until the 1990s.



## Los Angeles County Call-Box Assessment Study

Conditions have changed in recent years such that the need for an extensive call box system and program has been called to question. Today, there are many more options available to a stranded motorist to get expedited assistance. The Los Angeles urban freeway corridors are now extensively instrumented and equipped with sensors and cameras for active incident management systems and are monitored by Caltrans and the CHP from Transportation Management Centers (TMC) 24 hours a day, seven days a week. The corridors are also monitored by the Metro FSP during busy traffic hours, on weekdays as well as weekends. The development of the Metro 511 program allows for other motorists to call in and notify the 511 call center of a stranded vehicle or a motorist in need of assistance. At the same time, the conventional highways are now more developed with commercial businesses, such as gas stations, mini-marts, shopping centers, and restaurants, which allow a stranded motorist to seek help. The most compelling change, however, is the advancement of technology and the widespread (almost universal) use of mobile cellular telephones by the motoring public. Where portable or mobile cellular telephones were just being invented in the 1980s and introduced for the few in the 1990s, they are now widely used by the masses, basically as a necessity of life. According to a 2013 Pew Research Center survey, approximately 91% of adults in the United States currently own cell phones, up from 88% in 2012 and 83% in 2011. Figures 1 through 3 below present survey data showing the growth of cell phone ownership and usage over the years. In addition, the survey showed that 56% of all cell phone owners currently own a smartphone, up from 46% in 2012 and 35% in 2011. These percentages are likely to be much higher in Southern California; where the median income is relatively higher and where cellular network coverage is superior to most other regions in the nation, and owning a cell phone is often regarded as a necessary personal accessory such as watches, hand bags, or wallets.

FIGURE 1: PEW RESEARCH CENTER SURVEYS ON CELL PHONE OWNERSHIP



Source: [www.pewresearch.org](http://www.pewresearch.org)

## Los Angeles County Call-Box Assessment Study

FIGURE 2: CTIA-THE WIRELESS ASSOCIATION DATA ON CELLPHONE SUBSCRIBERS IN US

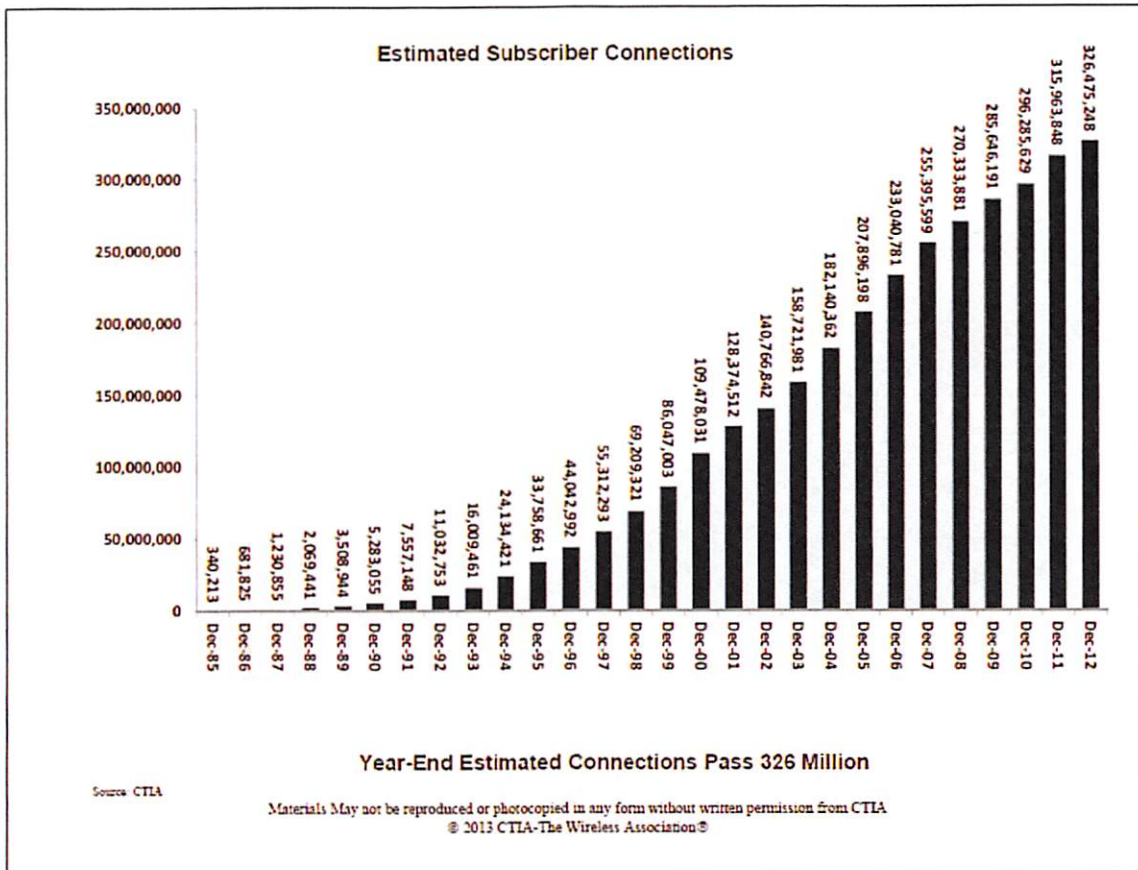
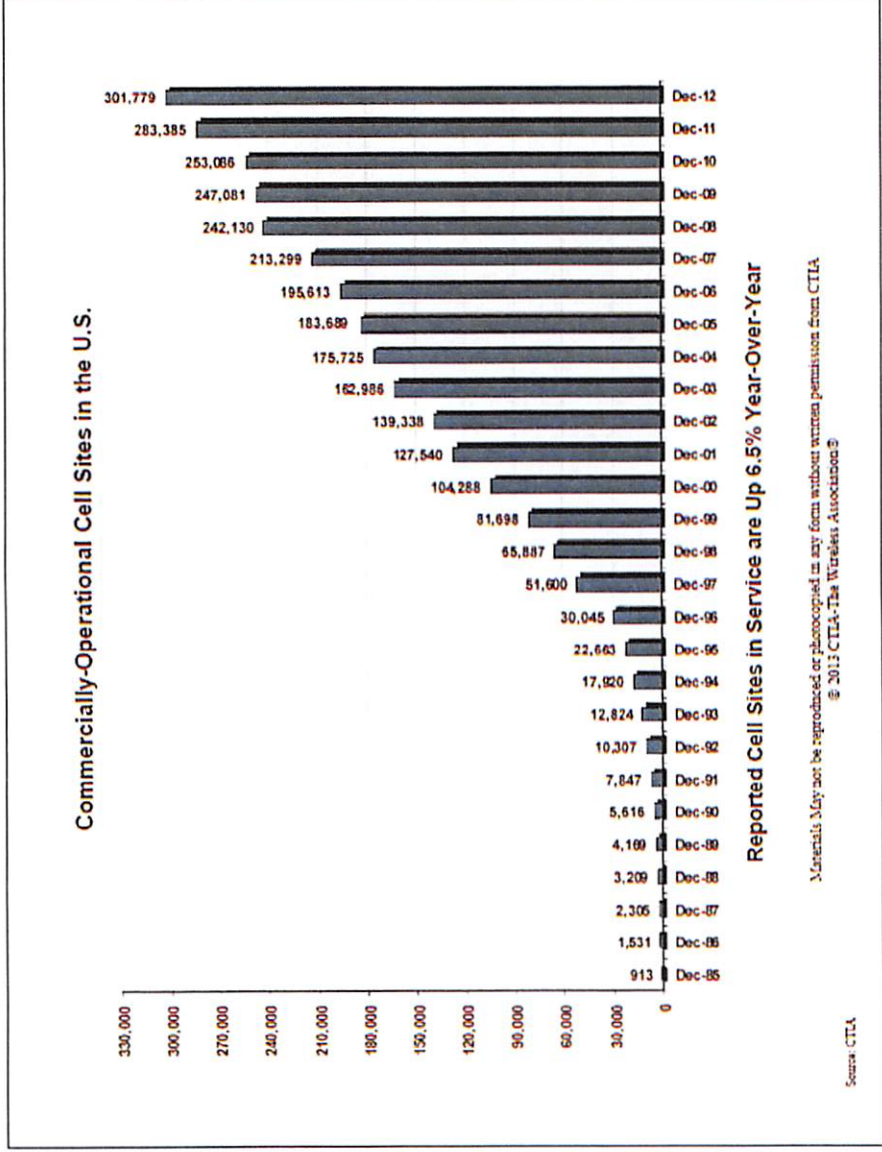


FIGURE 3: CTIA-THE WIRELESS ASSOCIATION DATA ON REPORTED CELL SITES IN US

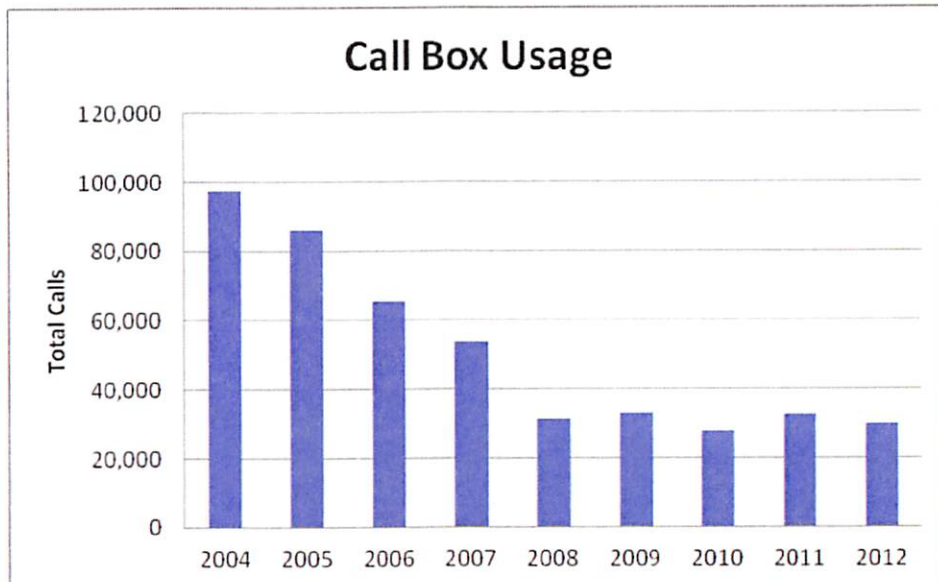


As expected, with the increase in cell phone ownership call box usage has significantly declined during the recent years. Figure 4 shows the general trend of total calls received on the Los Angeles County Call Box System during the past nine years. As shown in the figure, from 2004 to 2012, calls made on the system dropped from approximately 97,000 to 30,000, at an average of 13% per year.



## Los Angeles County Call-Box Assessment Study

FIGURE 4: CALL BOX CALL USAGE FROM 2004 TO 2012



Source: LA SAFE

The Call Box system receives calls of different types. Table 1 summarizes the total number of calls per call type in 2012.

TABLE 1: 2012 CALL TYPES

Emergency Calls	890
Non-Emergency Request for Aid Calls	<u>6,104</u>
Subtotal	6,994
Non-Aid Related Incidental Calls	
Call Box Check	10,544
Duplicate Calls	1,513
Inappropriate Calls	111
No Help Calls	1,402
Incidental Calls	<u>7,347</u>
Subtotal	20,917
TOTAL	27,911

As indicated in Table 1 above, out of the 27,911 composite call data for 2012, only 6,994 calls (approximately 25%) were for emergency related calls or calls requesting motorist aid. Emergency calls include calls related to accidents, ambulance requests, crime, fire, first responder, medical, road blocked, roadway hazard, or other special circumstances. Non-emergency request for motorist aid calls

include Auto Club, company dispatch, friends and family, Freeway Service Patrol, tow request, roadway hazard, and other special circumstances. Incidental calls include ghost calls, maintenance test, system runaway, training test, special circumstances, and unknown. As indicated above only about 25 percent of all call box usage data is related to actual motorist aid calls. Given the total number of 1,786 operating call boxes in Los Angeles County, on average for the entire 2012, this translates to less than 4 calls per call box.

The call box system was initiated and developed before the proliferation of the cellular telephones as a means to motorist aid. With the recent trend of ownership of cellular telephone, the widespread coverage of the cellular service with the growth of cell sites, and the provisions of other motorist aid services such as FSP, Metro go511 program, and Caltrans/CHP incident management, the call boxes are now nearing obsolescence much like the pay phones and phone booths. As such, the call box system should continuously be reevaluated and usage data analyzed to consider slowly phasing out the sites that are no longer being used or effective, and save the cost and valuable resources to operate and maintain them.

### 1.2 PROGRAM GOALS

As described in the CHP/Caltrans Call Box and Motorist Aid Guidelines, the California Legislature passed Senate Bill 1190 in 1985 to enable counties to generate revenue for the purpose of purchasing, installing, operating and maintaining an emergency motorist aid system. As stipulated in the Streets and Highway Code Chapter 14, Section 2550, "the Legislature declares that its intent in enacting this chapter is to encourage the placement of call boxes along the California Freeway and Expressway System to enable motorists in need of aid to obtain assistance. However, it is not intended that a motorist aid system of call boxes be considered an emergency telephone system." As such, it is acknowledged that the purpose and goal of the call box system is to provide motorist aid.

## 2.0 CURRENT CALL BOX SYSTEM ENVIRONMENT

In order to meet the project goals and develop a methodology for evaluating the current system, it is first necessary to discuss the current system. The Los Angeles County SAFE is the largest and most active motorist aid call box system in California. The program currently consists of 1,786 operating call boxes. The general locations of these call boxes are shown on Figure 5. Since the inception of the call box program, transportation system conditions and technology environment have changed over time, most significantly in recent years, and thus an evaluation of the overall call box system is necessary to ensure the program continues to stay relevant and meets its goals while operating in the most efficient manner possible.

In the years since the previous assessment study was conducted, various motorist aid options other than call boxes have emerged that have had a profound effect on the usage of the call box system and will affect how the overall call box program would operate in the coming years.







### 2.1 MOTORIST AID ALTERNATIVE TO CALL BOXES

- **Cellular Phone Usage** – Cell phone usage has likely had the largest impact on the usage of the overall call box system. Within the past five years, the advent of “smart phone” ownership has allowed motorists to not only use their phones as a means to call or text for aid, but also as a GPS (Global Positioning System) device to identify and/or transmit their location. Accompanying cellular telephone service features include the ability to make 911 emergency calls to the CHP or other law enforcement and the 511 calls to the Metro call center. Many motorists also have roadside emergency service call centers offered by the Auto Club, insurance carriers, vehicle manufacturers, and credit card companies.

- **Freeway Service Patrol (FSP)** – Metro, in partnership with the California Department of Transportation (Caltrans) and the California Highway Patrol (CHP) manages the largest fleet of tow and service trucks in the country, known as the Los Angeles County Metro Freeway Service Patrol (FSP). This elite team of tow truck drivers spots incidents, disabled vehicles and motorists who are in need of assistance during their “patrols” and provides help to stranded motorists and removes vehicles involved in and debris from traffic accidents to keep traffic moving. This free service also greatly reduces the chances of further incidents caused by onlookers and impatient drivers. FSP trucks operate on over 400 miles of LA County freeways based on specially designed “beats”. Service levels (number of trucks) vary by day of week/time of day.



- **Advanced Freeway Service Technologies** – Advanced communication systems such as the General Motor’s “On Star” service, generally regarded as the nation’s leading in-vehicle safety, security, and communication service, have also played a role in the reduced usage of call boxes. Other advanced technology is continuously evolving including smart phone and tablet applications. For many luxury vehicles, the vehicle computer system diagnoses problems and sends trouble notices to a call center even before the vehicle driver is aware, often including GPS coordinates.
- **Incident Management** – Caltrans and the CHP monitor the Los Angeles County freeway system 24 hours a day, 7 days a week from their joint Transportation Management Center (TMC). Most of the urban freeway corridors are instrumented with vehicle detection sensors, closed-circuit television cameras, and electronic message signs, to detect, locate and verify incidents and disabled vehicles. In many cases, CHP dispatch sends a patrol officer to a disabled vehicle even before a call for help is completed.

- **Commercial Development along Highways** – Since the late 1980s when the call boxes were introduced, commercial businesses have developed significantly along State highways. There are many more shops and businesses available now to get help rather than taking the longer walk to find the next call box along the highway.

### 2.2 STATEWIDE CALL BOX GUIDELINES

A set of motorist aid guidelines were originally developed by the California Highway Patrol (CHP) and Caltrans to guide statewide consistency of the call box systems, which are developed and operated on a county-by-county basis. The latest guidelines developed by CHP, Caltrans, and various SAFE agencies in California can be found in *CHP/Caltrans Call Box and Motorist Aid Guidelines* (November 2007).

The guidelines outline the roles and responsibilities of the various agencies involved in providing motorist aid services in California. The guidelines also provide guidance on the physical aspects of the call box system, such as spacing of boxes and design of the call box sites. The following paragraphs summarize some key information contained in the “Design and Construction” section of the guidelines, as they pertain to this study:

#### Call Box Site Requirements

- Within spacing requirements, call box locations will be selected to have minimal impact on highway operation. A call box will not be located where there is less than an eight foot shoulder. Any exceptions shall be reviewed and approved by the local district at Caltrans.

Where the highway shoulders are narrow, it is recognized that the liability is greater for a motorist to walk along the freeway to find the closest call box to use. This factor is more relevant today where there are many more options to call boxes for motorist aid. Motorists in need of assistance are more likely to use their cellular telephone, in vehicle communication system, wait for a passerby to call in to the 511 or 911 Call Centers, or wait for the FSP/CHP in the safety and comfort of their vehicle rather than get out to walk to a roadside call box. Even if the motorist does not have a cell phone, most motorists passing by will have a cell phone to call in for help, particularly if the vehicle is blocking a lane or is in a hazardous/emergency condition.

#### Call Box Spacing

- Within the guidelines, call box spacing should ensure motorist safety by providing the closest feasible spacing to reduce pedestrian and vehicle exposure time. Closer spacing also contributes to congestion relief by providing faster notification and clearing of disabled vehicles from the roadway.
- Variation in terrain, available revenue, urban/rural characteristics, and proximity for roadside services are factors in the decision of spacing between call boxes. For existing systems in place for two or more years, call box usage may also be considered when determining spacing. In order to allow flexibility and still maintain consistency in these installations, the county SAFEs should adhere to the following suggested spacing guidelines:

- A reasonable spacing on rural highways with low ADTs may be based on geometric and economic needs. Other factors may include the cellular coverage area and isolation. Spacing does not constitute a system of call boxes but rather a service. These call boxes should only be placed in an area where adequate safe clearance from the roadway is available.
- On Caltrans toll bridges, call boxes should be spaced between 600 to 1,200 feet, depending on whether or not adequate shoulders are provided. Special situations and deviations from this should be discussed with the district traffic liaison.

Considering the alternative motorist aid options available, call box spacing may no longer be appropriate or relevant. Where the guidelines suggest closer spacing in urban areas with higher traffic volumes, it is likely that the cellular coverage is also highest and alternatives are most abundant, including FSP service and incident management and monitoring. Where there is higher traffic volume, there are also more motorists passing by that can call for help on their cell phone, if the stranded motorist does not have one. There is less need or urgency for a motorist to walk along the freeway of a quarter mile to get to a call box today.

### **Call Box Removal, Relocation, and Repairs**

- There may be factors, including, but not limited to, significant decreases in annual call volume, administrative issues, and operational issues, that warrant the need to remove call boxes on a systemwide basis. The SAFE will develop a systemwide call box removal plan that shall include a list of recommended call box sites to be removed, the resulting spacing between remaining adjacent sites, and justification for removal. If call boxes are being removed as a result of low call box usage, call box usage data for each call box shall also be provided. However, it should be noted that a call box may be removed due to systemwide decreases in call volume. The SAFE shall submit the call box removal plan to the CHP and Caltrans for a 60-day review and approval. With the exception of removal for construction, a removal that is planned or in existence for more than six months is considered a permanent removal and requires an approved removal plan.
- A SAFE does not need to submit a removal plan to the CHP and Caltrans for the removal of individual call boxes. However, removal of greater than 10 percent of the number of installed call boxes on any one corridor does require a removal plan.
- Where a call box has been removed, the site shall be restored to its original pre-installation conditions. All call box materials (e.g., pedestrian pads, asphalt paths, retaining walls, handrails, etc.) shall be removed from the site. The surface area where the call box was installed shall be graded flush with the surrounding soil.
- Along freeways, expressways, and divided conventional highways, call boxes shall be removed from both sides of the roadway to maintain call box pairing.

Presently, phone booths and pay phones are generally considered obsolete. The cost to operate and maintain them can no longer be offset by the benefit of the service provided with their very low usage.



Similarly, removal of call boxes should be considered now for locations where low usage cannot offset the cost to operate and maintain them, not to mention the cost of potential liability.

### 3.0 FIELD SITE ASSESSMENT

The first step was to conduct a field site assessment of all 1,786 locations listed in the database by physically visiting each location and conducting a site survey. The site assessments were conducted by a combination of Iteris and Wiltec staff during the months of May 2013, June 2013, and March 2014.

All field site surveys were conducted by two staff members, a driver and a passenger. At each call box location, the field staff members performed the following tasks:

1. Verified if the box existed with the sign number matching the previous database;
2. Verified the call box site type;
3. Checked the cell phone coverage in the area to determine if an adequate alternative was available;
4. Measured the width of the shoulder;
5. Noted any unusual conditions such as poor sight distance, steep grade, vegetation covering the site, etc.;

In addition, digital pictures were taken at each call box site visited for database update and future verification purposes. For those locations with construction activities along some of the freeway routes, field staff could only conduct the survey passing by the site in their vehicle and were not able to stop and measure at those locations. At some locations, field staff were able to locate and stop at the call box site, but no call box was found at the site or the box was disabled, even though the sign was present (as shown in the pictures to the right). Some



of the surveyed boxes were located on transition roads where the field staff could not stop and measure. The following is a summary of the field surveys:

- 1,786 boxes were surveyed
- Of the 1,786 boxes surveyed, 1,287 boxes were verified, documented and evaluated
- 82 boxes initially listed in the database as a Type B or C were identified in the field as having a non Type B or C site type.
- 25 boxes initially listed in the database as a non Type B or C were identified in the field as being a Type B or C site type
- As a result of the adjusted site types per the field survey, it was confirmed that 229 Type B Call Boxes and 183 Type C Call Boxes currently exist.



The results of the field surveys showed that approximately 28 percent of the boxes identified in the original database did not exist in the field or could not be found by the field survey staff.

### 4.0 SYSTEM EVALUATION METHODOLOGY

In light of Section 1 and 2, and the results obtained from Section 3, the overall Los Angeles County Kenneth Hahn Call Box System was evaluated comprehensively. The purpose of the evaluation was to assess the call box program for effectiveness and develop a plan for efficiency moving forward into the future, considering the changes in today's climate in regards to highway motorist aid. Those locations that are still effective and needed were identified and those that are not as effective and may no longer be needed were also identified. Recommendations are then made for removal of those locations that no longer serve their purpose where the costs and potential liability far outweigh any potential benefits.

Rather than evaluating the system parameters (such as type, number, or spacing requirements), a more appropriate approach would be to re-evaluate the system as a whole in a systematic approach to consider eliminating call boxes that are no longer useful or meeting program goals and/or present an unnecessary potential liability risk, and then evaluate the system parameters as needed. The call box system right-sizing process starts by identifying and moving potentially unnecessary call boxes into a category called "call box candidate for removal" (CFR) using a systematic process. Once all of the CFR boxes have been identified, an additional "filtering"/screening process would take place to make a final determination and recommendation on which call boxes to keep and which ones to consider removing.

Three main criteria were used to place the existing call boxes verified into the CFR category. These criteria, based on the site type, knockdown history, and recent past usage of the call boxes, include the following:

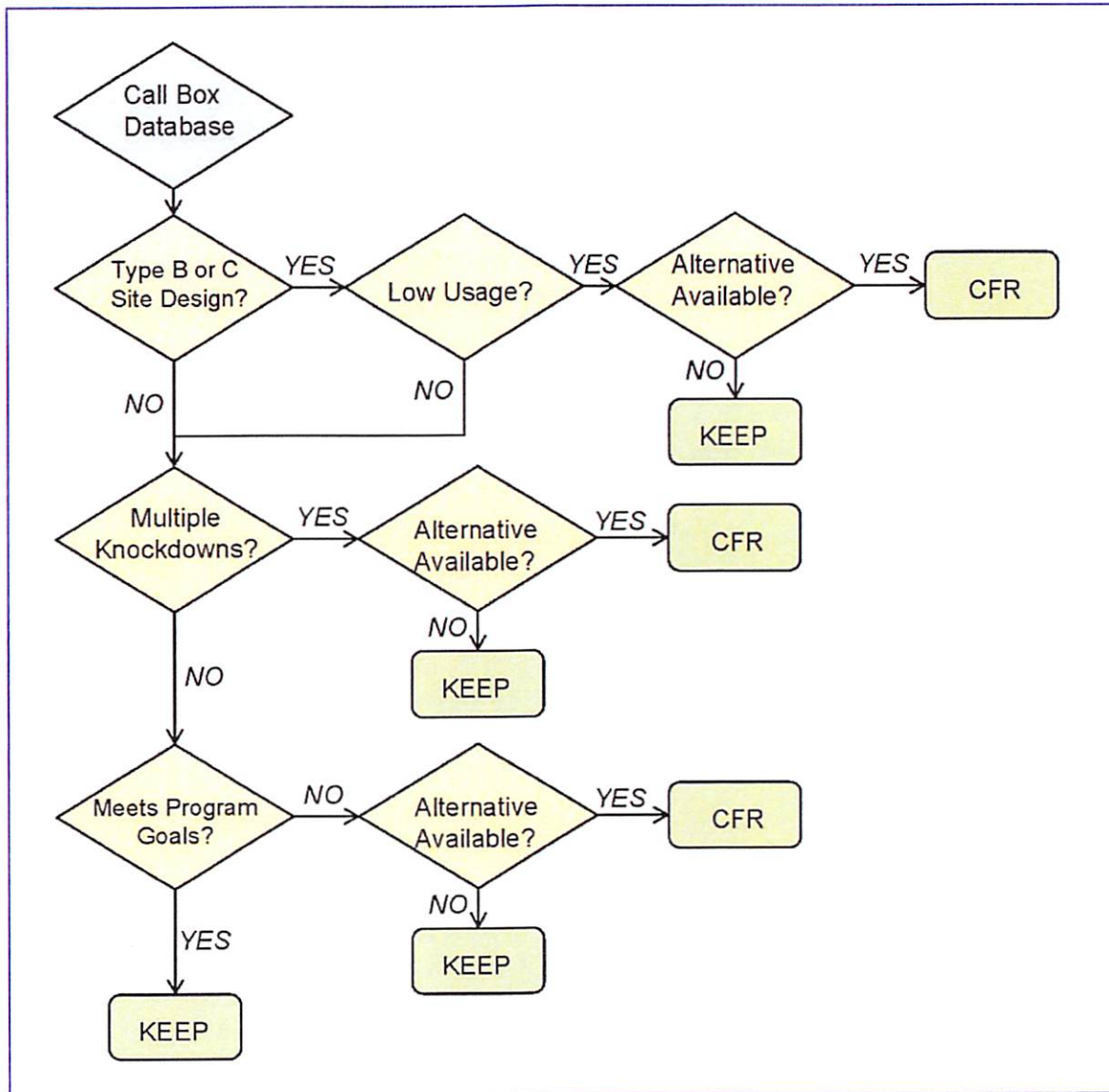
1. **Site Type** – Caltrans has recommended phased removal of all Type B and C call boxes where they are no longer effectively used. As such, an assessment of Type B and C call boxes was made where low utilization sites were identified as CFR.
2. **Knockdowns** – Call boxes with a history of multiple knockdowns in a year indicate a potential problematic location or site, posing a liability risk for traffic safety, and were identified for removal.
3. **Program Goals** – The Call Box program goals are to provide motorist aid service to the public. For various reasons such as the proliferation of cell phone usage and other alternative help avenues, there are call boxes with a pattern of little or no usage. If these boxes are not being used, then they do not meet program goals any longer and were identified for removal.

As part of the CFR determination process, each call box was subject to a final check at each of the three criteria levels. This check consisted of an evaluation of other motorist aid alternatives that would be available to a stranded motorist if the box was removed. These alternatives include FSP coverage, strong cellular phone coverage, incident management instrumentation and monitoring coverage, and/or

## Los Angeles County Call-Box Assessment Study

nearby commercial uses at which to seek help in the absence of the other alternatives. While it is rare that none of these alternatives would be available within Los Angeles County, some boxes located in relatively less urban and/or rural areas such as on State Routes 2, 27, and 38 were identified in the initial stage and were kept off the CFR list.

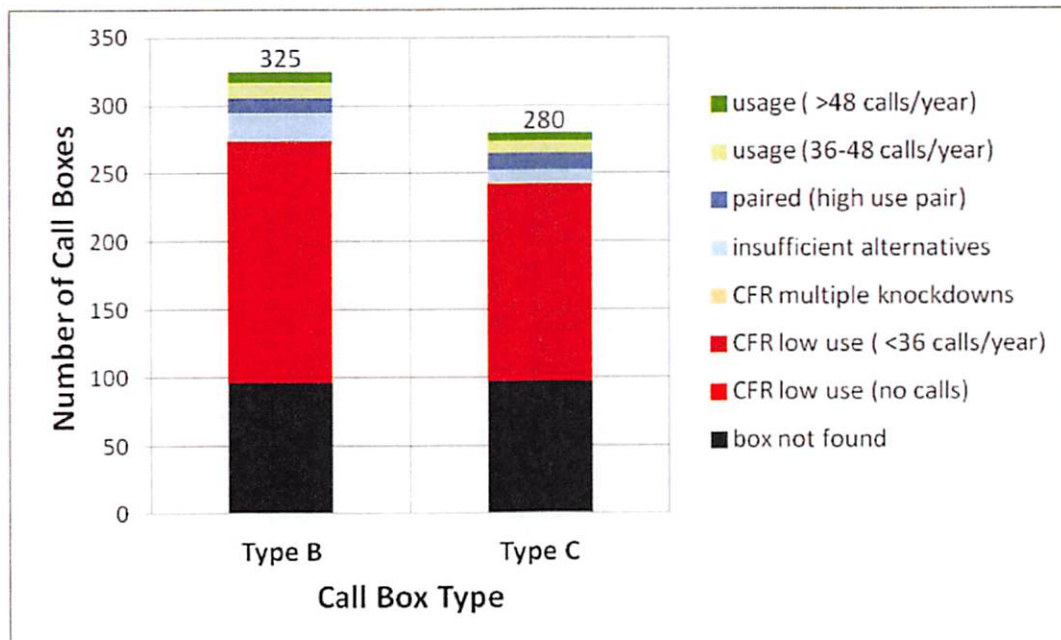
The flow chart presented below illustrates the process used for developing the CFR list, including whether to remove or keep a call box, and is described in further detail in this section.



A total of 669 existing field-verified boxes were identified for initial removal considerations as part of this initial evaluation. The following subsections provide a detailed summary of the methodology used to derive the 669 boxes.

## 4.1 SITE TYPE

The first criterion was to evaluate Type B and C Call Boxes with low usage which had sufficient alternatives (other motorist aid methods) available. Type B and C call boxes were identified where the average number of calls was less than 36 per year, or on the average less than three calls per month. Based on review of the call statistics for the last two years, the number of calls that pertain to actual motorist aid calls was less than half of the total calls on the system, as shown in **Table 1**. In addition, a filter was applied to those identified for potential removal by conducting a call box alternative analysis. For each of these locations, the availability of Metro Freeway Service Patrol (FSP) service along the corridor covering the call box location was investigated. In addition, the analysis evaluated each location's cellular telephone service coverage and incident management capabilities (with intelligent transportation systems) coverage and monitoring by Caltrans and CHP. If the site was on a highway arterial, then proximity to commercial businesses was considered. Out of the identified 412 Type B and C call box locations verified in the field, 376 were identified to have less than 36 calls per year on average within the last three year's call records. Of these 376 locations, it was concluded that 31 locations did not have sufficient alternative motorist aid options available to the call boxes, if they were removed. Therefore, only the remaining 345 identified locations were recommended for removal. The chart below illustrates the results of the above analysis, indicating the number of Type B and C call boxes and their recent annual call usage records. Examples of Type B and Type C Call Box Sites are shown on **Figure 6**. The general locations of the Type B and Type C Call Box Sites are shown on **Figure 7**.

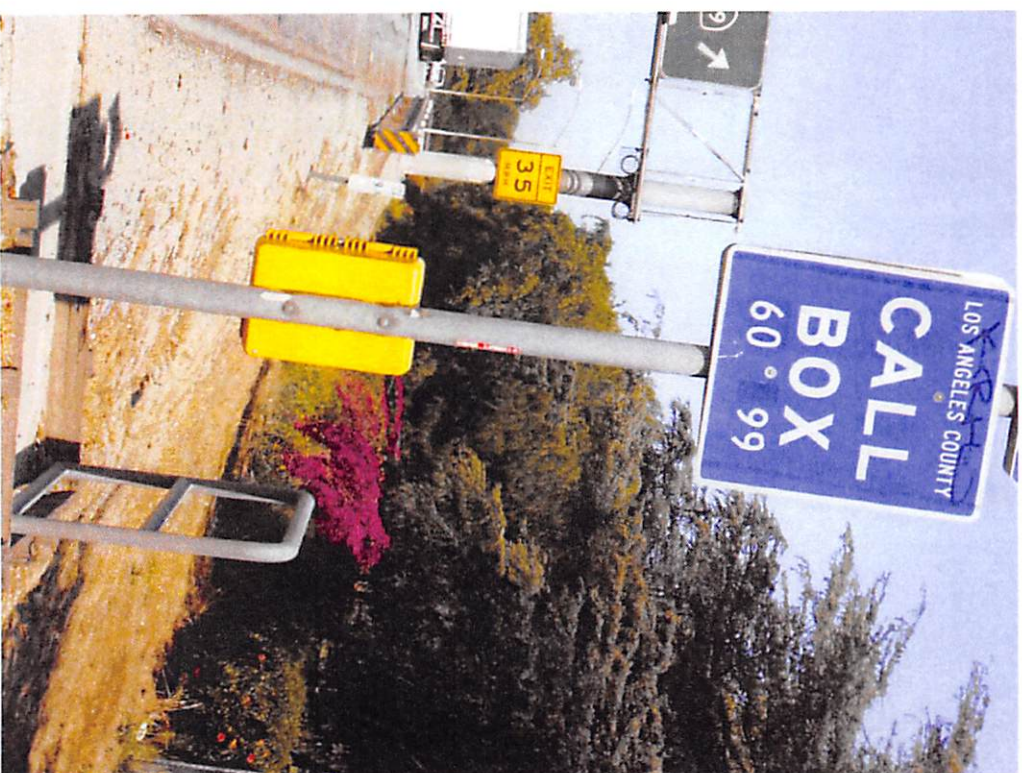


It should be noted from the above chart, call boxes receiving in excess of 24 calls per year on average are less than 20 percent of the total system. Trends indicate that calls are progressively decreasing each year.





Site Type B  
(Cut slope)



Site Type C  
(Fill slope)

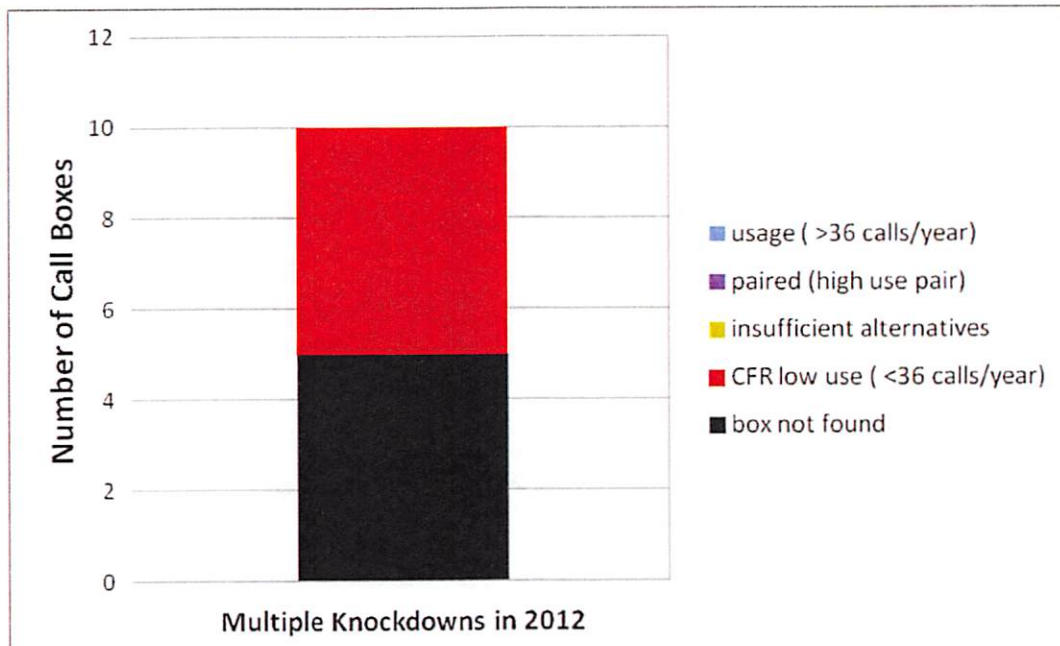






### 4.2 KNOCKDOWNS

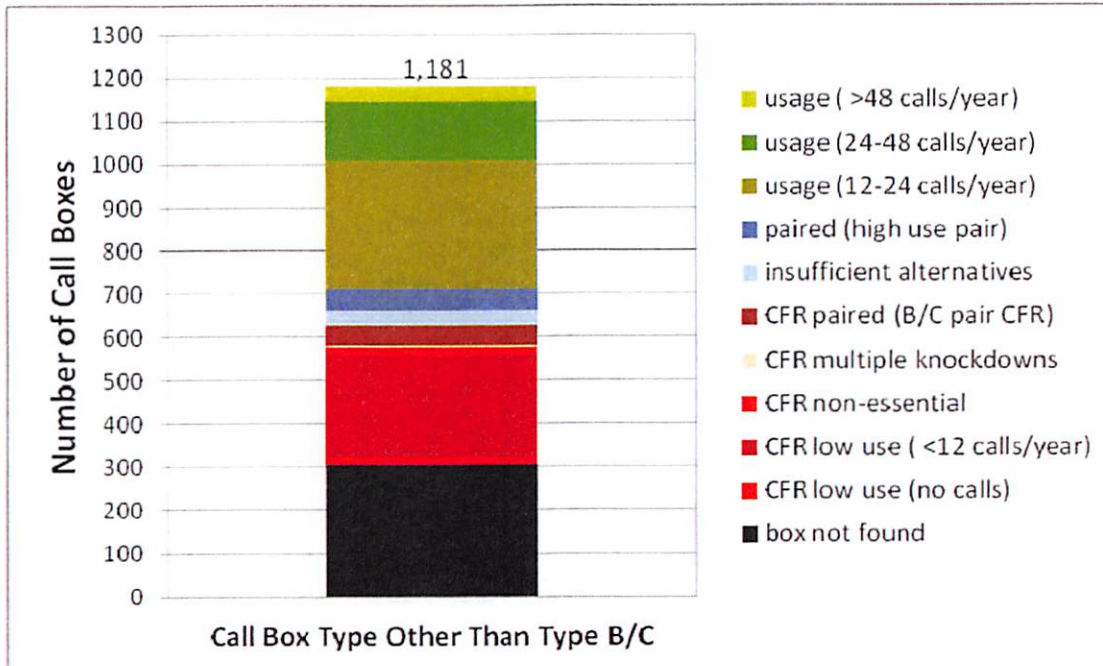
The second criterion was to identify those call boxes that have a history of repeated knockdowns. Analysis of the maintenance records indicated that there were 136 locations with a knockdown record in 2012. Of those, 10 locations had repeated knockdowns. This indicates a potential problem at this location for various reasons such as roadway geometrics, visibility, etc. Of the 10 locations, five were verified in the field and five were not found. Of the five that were verified in the field, one was a Type C location and four were other non-Type B/C. For any location that has a history of multiple knockdowns, their removal is recommended. It was concluded that two locations had sufficient alternatives available and recommended for removal, while three locations need to be considered for relocation. Below is a chart illustrating the results of the above analysis, indicating the number of knockdown locations and their recent annual call usage records.



### 4.3 PROGRAM GOALS

The third criterion was to identify call boxes that do not meet Program Goals. This was defined as call boxes which had no calls recorded during the last 3 years. The initial analysis identified 156 locations with zero calls during the last three years, with 142 of these being boxes that did not exist per the field survey and 14 that did exist. These are the non-Type B and C call boxes, as the Type B and C with low usage have already been assessed in the first step. Once the 14 locations were identified, a filtering process was used to identify whether these locations had sufficient alternatives for motorist aid. Out of the 14 locations, it was concluded that all 14 locations did have sufficient alternatives available. Therefore, it is recommended to consider removing the 14 locations with no calls during the last 3 years. Below is a chart illustrating the analysis results, indicating the 14 call box locations with no calls in the last three years, shown in red, as well as the other usage results.

## Los Angeles County Call-Box Assessment Study



It should be noted from the above chart that, as with the Type B and C call boxes, call boxes receiving in excess of 24 calls per year on average are less than 20 percent of the total. Trends indicate that the number of calls is decreasing each year.

#### 4.4 APPROACHES TO SYSTEM EVALUATION OF OTHER SAFES

Other California SAFE Agencies have developed guidelines and/or undertaken call box system evaluation and/or re-sizing efforts since the last call box system study. To gather information on the approach and methodology of other agencies within the last few years, Iteris staff contacted several major SAFEs and collected and reviewed pertinent reports and documents. **Table 3** summarizes this research. As shown, other California SAFE agencies have also identified call box locations for removal within the last several years.

**TABLE 2: SUMMARY OF CALL BOX REMOVAL PROGRAM  
BY SELECTED CALIFORNIA SAFE AGENCIES**

Agency	Total	Removed/ Identified for Removal	Average Call Box Spacing	
			From	To
Bay Area MTC	2,086	500	1 box/mile	1 box/2 miles
SANBAG	1,700	450	Varies	No change
Riverside County Transportation Commission (RCTC)	594	36	2 boxes/mile (urban) 1 box/2 miles	1 box/mile (urban) No change (rural)
San Diego	1,770	None	1 box/mile	No change
OCTA	633	12	1 box/mile	No change
VCTC	564	None	2 boxes/mile	No change

## 5.0 RECOMMENDATIONS

From the Metro database list of current existing call boxes and their supposed locations, the whereabouts of the 499 physically missing call boxes or boxes that could not be found in the field visits is unknown. Regardless, we recommend including these locations for removal, if not physically then from the Metro's database, since they meet the criteria for removal. Construction activities and other freeway/highway work can, at times, remove call boxes without informing Metro and Metro staff will need to use the call backs to verify active responses and identify those without responses as potential broken or removed call boxes. A plan for periodic reassessment is described later in Section 5.2, and would include new visual inventory surveys.

---

## Los Angeles County Call-Box Assessment Study

---

For the 1,287 boxes that were found in the field, 669 were initially recommended for removal ("CFR" category) and 618 were initially recommended to be kept ("Keep" category). Consistent with the guidelines, if a call box is to be considered for removal, then its pair box in the opposite direction should also be considered for removal, and the same criteria assessment be made for the paired location. The following additional filter was used to make the final call box removal recommendations using the pair box criteria from the guidelines:

- For a Type B/C box listed in the CFR category, a check into the status and previous usage of its working pair was conducted:
  - If the working pair existed in the field and was listed in the "Keep" category, it was recommended for removal only if it received less than 72 calls over the three year period.
  - If the working pair had received more than 72 calls over the three year period, it remained in the "Keep" category and the Type B/C CFR was moved into the "Keep" category and flagged for potential retrofit.
- For a non Type B/C box listed in the CFR category, a check into the status and previous usage of its working pair was also conducted.
  - If the working pair existed in the field and was listed in the "Keep" category, it was recommended for removal if it received less than 36 calls over the three year period.
  - If the working pair had received more than 36 calls over the three year period, it remained in the "Keep" category and the CFR was moved into the "Keep" category.

This refinement resulted in 70 boxes added to the "Keep" category from the "CFR" category and 45 boxes being moved to the "CFR" category from the "Keep" category. As a result, a total of 646 boxes are recommended for removal. The final database of call boxes recommended for removal that were found and verified in the field is provided in **Appendix A**. A total of 641 boxes are recommended to be kept, 88 of which are Type B/C boxes. It is recommended that a mitigation measure plan be developed to address the retaining wall heights and removal of handrails for the remaining 88 Type B/C site locations. **Appendix B** provides a list of the 88 Type B/C boxes to remain and **Appendix C** provides a list of the non Type B/C boxes to remain.

**Table 3** summarizes the number of boxes recommended for removal by freeway route.

## Los Angeles County Call-Box Assessment Study

**TABLE 3: SUMMARY OF RECOMMENDATIONS FOR REMOVAL**

Route	Total Existing Boxes Before Removal	Recommended for Removal	% To be removed
SR-1	17	1	6%
I-10	66	38	58%
US-101	89	32	36%
SR-103	4	4	100%
I-105	55	34	62%
I-110	87	32	37%
SR-118	35	21	60%
SR-134	6	0	0%
SR-14	30	21	70%
SR-170	11	0	0%
SR-2	94	39	41%
SR-210	12	12	100%
SR-22	4	0	0%
SR-23	36	20	56%
SR-27	162	99	61%
I-405	0	0	0%
SR-47	6	0	0%
I-5	2	0	0%
SR-57	103	51	50%
SR-60	7	7	100%
I-605	150	45	30%
SR-71	28	25	89%
I-710	54	37	69%
SR-90	74	44	59%
SR-91	7	5	71%
Cornell Wy (CN)	40	26	65%
Elizabeth Lake Rd (EL)	9	9	100%
Encinal Cyn Rd (EN)	42	18	43%
La Cienega Blvd (LC)	1	0	0%



---

## Los Angeles County Call-Box Assessment Study

---

Lake Hughes Rd (LH)	1	0	0%
Mulholland Hwy (MU)	0	0	0%
Angeles Forest Hwy (N3)	4	4	100%
Kanan Dume Rd (N9)	5	0	0%
Park n' Ride (PR)	8	0	0%
San Francisquito Canyon Rd (SF)	9	0	0%
Stocker St (STK)	6	0	0%
Total	1,287	646	50%

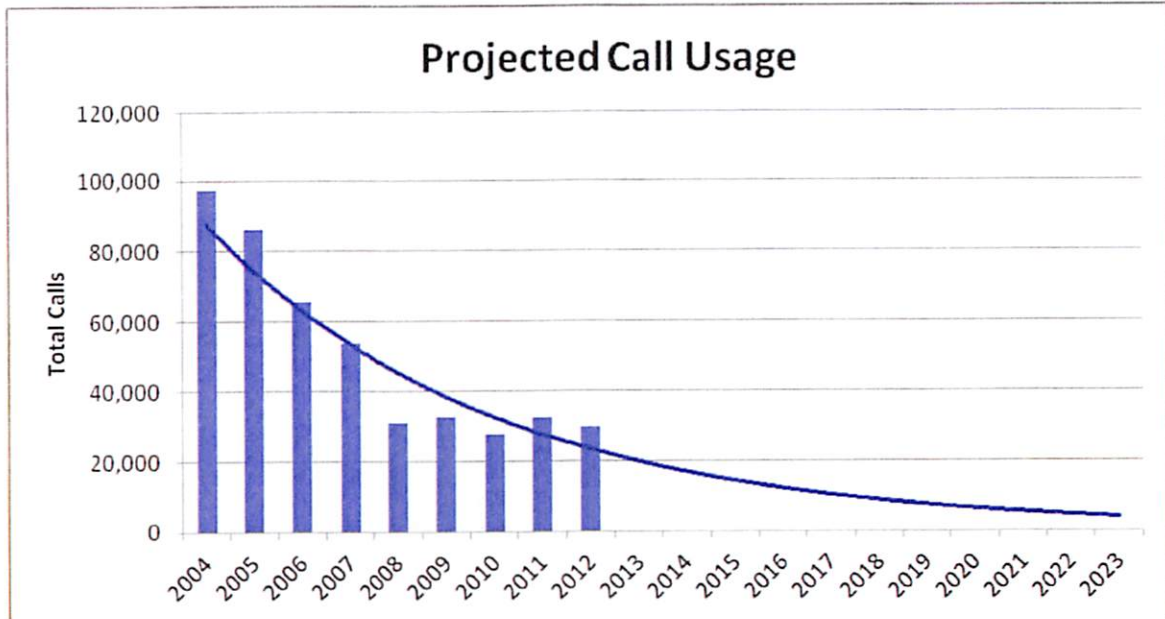
As shown in Table 3, the percentages of call boxes to be removed per individual corridor are all above ten percent, with the exception of SR-14. The final database of call boxes recommended for removal that were found and verified in the field is provided in Appendix A.

### 5.1 FUTURE ADDITIONAL PHASED REDUCTION

Moving forward, a phased approach is recommended to reevaluate the overall call box program and make necessary adjustments as conditions change over the next ten years. A total of 646 call boxes are recommended for removal now as part of Phase I, to be implemented as quickly as possible. As part of subsequent phases, Phase II, III, and IV, it is recommended that a similar evaluation and analysis be conducted every few years or more frequently as needed to determine if any of the 641 remaining sites meet the criteria described in Section 3 and considered no longer effective or useful. It is anticipated that continuous advancement in cellular telephone, in-vehicle communications, and incident management technology would eventually render all call boxes obsolete and no longer needed. The funds saved could be better utilized in support of the new technology alternatives in providing motorist aid rather than to continuously operate and maintain call boxes that are no longer useful.

With the continued increase in cell phone ownership and widespread usage it is expected that call box usage would continue to decline rapidly to insignificant numbers. At the current rate of decline, shown in Figure 8, it is projected that the system usage could dwindle to less than 10,000 yearly by 2016 and less than 2,000 yearly by 2023.

FIGURE 8: LOS ANGELES COUNTY PAST AND PROJECTED CALL BOX USAGE (2004 TO 2023)

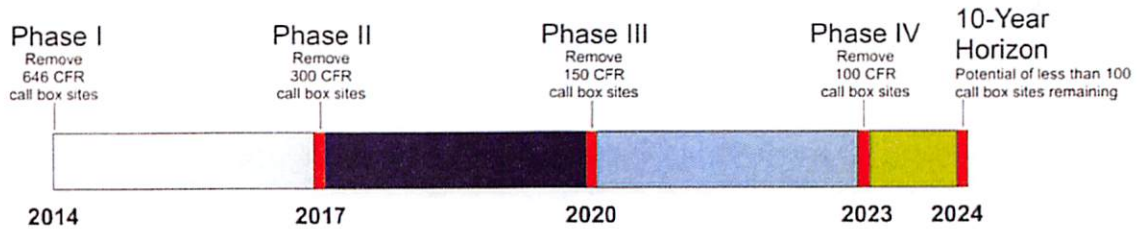


Based on the trend of total calls made per year over the last decade, the number of boxes that could fall in the candidate for removal (CFR) criteria in subsequent phases is projected. The total number of calls could drop 60% by 2017 from 2012, 75% by 2020, and 90% by 2024. Applying the same criteria described in Section 3.0 to the projected usage, the following are estimated:

- At 2016 – Approximately 300 boxes.
- At 2019 – Approximately 150 boxes.
- At 2022 – Approximately 100 boxes.

By the ten-year horizon of 2024, less than 100 call boxes could remain, if all of the additional projected CFR locations are removed. Again, the projections are based on the trend of the total calls made over the last decade. The projected calls over the next ten years, however, could actually be much lower as the cell phone, in-vehicle communications, and motorist aid technology is advancing very quickly. It is not too unreasonable to expect call boxes to be used for motorist-aid very little or none at all in the next few years, essentially rendering them completely obsolete.

## Los Angeles County Call-Box Assessment Study



Currently, the operations and maintenance cost of the call box system is approximately \$400,000 annually, as according to recent LASAFE records. Implementation of Phase I could potentially reduce this cost by nearly 50 percent.

There are other call box programs in the nation that have eliminated all physical call boxes and replaced them with other services including information service, providing emergency phones (as shown on the right), and cellular call services. Where call boxes were initiated in the 1980's before the introduction of cellular phones or mobile phones, technology is advancing very quickly, particularly with the motorist aid services. We now have smart phones with motorist aid applications, the go511 Program, On Star vehicle call service, and other GPS motorist aid services, where these services are getting better and better each year. It is likely that there is a horizon in the near future for the physical call boxes where they will no longer be useful. However, as long as vehicles are driven, motorist aid will still be needed. The call box program could be replaced with other advanced services that are more useful or convenient, in line with the current technology, for motorists in the future. In the meantime, a phased evaluation process over the next several years is recommended to ensure that the call box system stays relevant, effective, and efficient.



### 5.2 NEXT STEPS

Based on the results of this study and the rapidly declining usage in recent years, the statewide guidelines may need to be reviewed to reassess regulations and/or legislature, policy and directives, program goals and objectives, and overall effectiveness of the call box program for motorist-aid. Modifications to the statewide guidelines may be necessary to adjust to the changes in conditions, usage, and technology that have taken place since the inception of the program. The modifications should take into account impact and program changes experienced by other regions in California.

With any removal of call boxes, the dollars saved from future operations and maintenance costs could be applied to other essential motorist aid-related services and should be addressed. In addition, the call box sites with removed call boxes also have the potential for other uses. The sites could still be utilized for signage for 511 call center or for other motorist aid uses. For example, technology application could be implemented at the sites, such as Bluetooth vehicle detection, to improve communication as well as collect and transfer data for motorist aid programs.

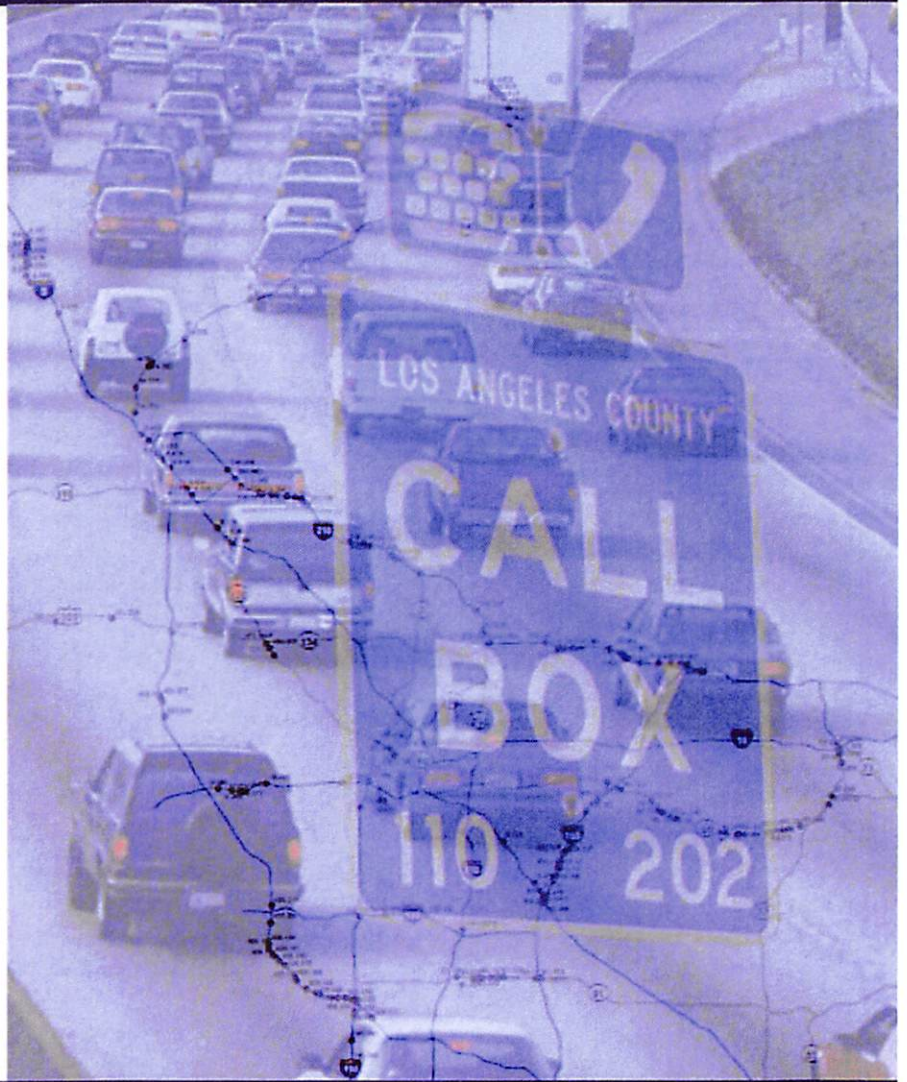




# **Call Box Assessment Study**

## **APPENDIX**

J12-1799



## **APPENDIX A: RECOMMENDATIONS FOR REMOVAL**

## Appendix A - Recommended For Removal

[illegible]















Route	Segment Number	Physical Location	Street Name	Street Length	Numbered Street Type
2	2-186TB	WB SR2 TO WB SR14 CON. **FSP 33** ACC VERBUGO RD			F
2	2-228TB	WB SR2 TO WB SR2 CON. ACC MOUNTAIN ST			F
405	405-095	WB SR2 TO WB SR2 CON. ACC WASHINGTON AV			F
405	405-159	WB SR2 TO WB SR2 CON. ACC ARTHUR BLVD. **FSP 09** ACC ARTHUR BLVD			F
405	405-169	WB SR2 TO WB SR2 CON. ACC ARTHUR BLVD. **FSP 09** ACC ARTHUR BLVD			F
405	405-189	WB SR2 TO WB SR2 CON. ACC ARTHUR BLVD. **FSP 09** ACC ARTHUR BLVD			F
405	405-219T	WB SR2 TO WB SR2 CON. ACC ARTHUR BLVD. **FSP 09** ACC ARTHUR BLVD			F
405	405-263T	WB SR2 TO WB SR2 CON. ACC ARTHUR BLVD. **FSP 09** ACC ARTHUR BLVD			F
47	47-004	WB SR47 AT N PACIFIC AV. ACC SB 1110			F
5	5-045	WB SR15 SAN ANTONIO DR. **FSP 16** ACC NORMAN BLVD			F
5	5-058	WB SR15 AND NB SR5. **FSP15** ACC FLORENCE AV			F
5	5-187T	WB SR15 TO EB SR10 CON. **FSP04** ACC MAIN ST			F
5	5-203	WB SR15 AND N BROADWAY. **FSP04** ACC STADIUM HWY			F
5	5-213	WB SR15 AND SB SR110. **FSP04** ACC STADIUM HWY			F
5	5-221T	WB SR15 AND STADIUM HWY. **FSP 31** CONNECTION RD FROM 2 PMY TO SB 5			F
5	5-226T	WB SR15 TO NB SR2 CON. **FSP 31** ACC STADIUM HWY			F
5	5-229TB	WB SR15 TO NB SR2 CON. **FSP31** ACC STADIUM HWY			F
5	5-509	WB SR15 AND PICO CANYON RD. **FSP 42** APPROX 2/5 MI ACC MCEAN PMWY			F
57	57-074	WB SR57 AND EB SR10. **FSP 38** ACC TEMPLE AV			F
57	57-076	WB SR57 AND EB SR10. **FSP 38** ACC TEMPLE AV			F
57	57-078	WB SR57 AND VIA VERDE. **FSP 38** ACC TEMPLE AV			F
57	57-079	WB SR57 AND VIA VERDE AV. **FSP 38** ACC VIA VERDE			F
57	57-083	WB SR57 AND VIA VERDE AV. **FSP 38** ACC VIA VERDE			F
57	57-108	WB SR57 AND W ARROW HWY. **FSP 38** ACC ARROW HWY			F
57	57-112T	WB SR57 TO WB SR2 CON. **FSP 38** ACC ARROW HWY			F
57	57-112TB	WB SR57 TO WB SR2 CON. **FSP 38** ACC ARROW HWY			F
60	60-0327A	WB SR60 TO WB SR61 CON. **FSP14** ACC ALONDRA BLVD			F
605	605-045T	WB SR605 TO WB SR61 CON. **FSP14** ACC FROM FIRESTONE BLVD			F
605	605-177	WB SR605 AND WB SR60. **FSP37** ACC VALLEY BLVD			F
605	605-254T	WB SR605 TO EB SR10 CON. **FSP37** ACC ARROW HWY			F
71	71-006	WB SR71 AND EB SR10. ACC VALLEY BLVD			F
710	710-1527A	WB ROSECRANS AV ONR TO NB SR170. **FSP 10**			F
710	710-156T	EB E ROSECRANS AV ONR TO NB SR170. **FSP 10**			F
710	710-196T	NB SR170 ON WB FLORENCE AV ONR. **FSP23** ACC FIRESTONE BLVD			F
710	710-235T	WB SR170 TO SB SR10 CON. **FSP23** ACC SR5 ST			F
710	710-249T	WB SR90 TO SB SR5 CON. ACC CENTINELA AV			F
91	91-117T	WB SR170 TO WB SR61 CON. **FSP 30** ACC LONG BEACH BLVD			F
LC	LC-002	WB SR15 CENTINELA BLVD AND W SALUSON AV. ACC SALUSON AV			F
LC	LC-003	WB SR15 CENTINELA BLVD AND W SALUSON ST. NB ACC STOCKER ST			F
PR	PR-026	STUDENTHALL RD AND EB SR10. STUDENTHALL PARK AND RNDZ			F
101	101-138	WB SR105 AT COLDWATER CANYON AV. **FSP 07** ACC LAUREL CANYON BLVD			G
101	101-159	WB SR110 AND W 4TH ST. **FSP02** ACC 4TH ST ON COI			G
118	118-138TB	WB SR110 TO WB SR10 CON. **FSP 33**			G
210	210-364	WB SR110 AND NB SR5. **FSP 28** ACC BUENA VISTA ST			G
405	405-046	NB SR5 AND CHERRY AV. **FSP 19** ACC SPRING ST			G
405	405-227	WB SR60 AND W CENTINELA BLVD. **FSP 06** ACC LA CERRITA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	405-256	NB SR5 AND JEFFERSON BLVD. **FSP 06** ACC LA TIERRA BLVD			G
405	4				



Route	Stop Number	Physical Location	Stop Latitude	Stop Longitude	Revised Stop Type
57	57-109	EB 5857 JNO W CLAUSTONE ST, **FSP 38** ACC AUTO CENTRE DR	34.10888	-117.82302	L
60	60-068	EB 5850 JNO EUCLID AV, **FSP 03** ACC SANTA FE ST	34.1102	-118.25563	L
2	2-144	WB 5812 JNO GLENDALE BLVD, **FSP 35** ACC GLENDALE BLVD	34.1102	-118.25563	R
5	5-825	SB 1105 JNO 5TH ST, APPROX 1/3 MI ACC GORDMAN	34.7699	-118.80272	C
105	105-112	EB 1105 JNO LONG BEACH BLVD, **FSP 40** ACC WILMINGTON AV	33.92527	-118.21148	A
5	5-474	WB 15 JNO CALGROVE BLVD	34.34728	-118.5333	A
57	57-115	WB 5857 JNO AUTO CENTRE DR			L
10	10-369	WB 110 JNO N AZUSA AV, **FSP 12** ACC CITRUS ST			A
110	110-015	SB 1110 JNO CHARREL ST, ACC C ST	33.75678	-118.29095	A
118	118-054	EB 58118 JNO RESEDA BLVD, **FSP 33** ACC TAMPA AV			A
14	14-469	SB 5814 JNO WARD RD, ACC CROWN VALLEY RD **FSP BEAT 41 **			A
14	14-655	SB 5814 JNO AVENUE K, 1/4 MI ACC AVENUE K	34.1833	-118.39757	A
170	170-168	WB 58170 JNO VICTORY BLVD, **FSP 27** ACC OXNARD ST			A
210	210-174	WB 58170 JNO VICTORY BLVD, **FSP 27** ACC VICTORY BLVD			A
210	210-154	EB 1210 JNO LOWELL AV, ACC LA TURIA CANYON RD			A
210	210-488	EB 1210 JNO N TOWNE AV			A
5	5-079	SB 15 JNO LAKEWOOD BLVD, **FSP 16** ACC PARAMOUNT BLVD			A
57	57-015	WB 5857 JNO GLEN CANYON RD, **FSP 21** ACC DIAMOND BAR BLVD			A
57	57-048	WB 5857 JNO EB 5850, **FSP 21** ACC GRAND AV			A
60	60-105	WB 5850 JNO SANTA ANITA AV, **FSP 13** ACC PECK RD			A
605	605-074	WB 1505 JNO IMPERIAL HWY, **FSP 14**			A
605	605-225	SB 1505 ON LOWER AZUSA RD OFF, **FSP 37** ACC LIVE OAK AV	34.0952	-117.98768	A
91	91-089	WB 5891 JNO S WILMINGTON AV, **FSP 26** ACC ACACIA AV			A
91	91-109	WB 5891 JNO N LONG BEACH BLVD, **FSP 23** ACC LONG BEACH BLVD			A
118	118-085	WB 58118 JNO HANFORD BLVD, **FSP 33** ACC WOODLEY AV			D
210	210-089	WB 1210 JNO WHEATLAND AV, ACC WHEATLAND AV			D
210	210-235	WB 1210 AT WASHINGTON BLVD, ACC SECO ST	34.17102	-118.15672	D
210	210-284	EB 1210 JNO N SERRA MAR BLVD, **FSP 11** ACC ALLEN AV			D
60	60-037	WB 5850 JNO NB 1710, **FSP 13** ACC ATLANTIC BL			D
110	110-099	SB 1110 AT EB 5891, **FSP 07** ACC REDONDO BEACH			E
2	2-174	WB 5812 JNO YORK BLVD, **FSP 35** ACC EMILE ROCK BLVD	34.1286	-118.22737	E
101H	101-019H	SB 1501 JNO E 1ST ST, **FSP 02** ACC ALAMEDA ST	34.0493	-118.2216	F
101	101-019	SB 1501 TO SB 58110 COR, **FSP 02** ACC GLENDALE BLVD			F
101	101-194	WB 1501 AT BALBOA BLVD, **FSP 07** ACC BALBOA BLVD			F
10	10-414	EB 110 JNO KILLBOGG DR, **FSP 18** ACC VIA VERDE	34.0682	-117.8254	F
134	134-059	WB 58134 JNO SAN FERNANDO RD, **FSP 22** ACC PACIFIC RD	34.15618	-118.24258	F
134	134-079	WB 58134 JNO N GLENDALE AV, **FSP 35** ACC GLENDALE AV			F
170	170-155	SB 58170 JNO MAGNOLIA BLVD, **FSP 37** ACC BURSAR BLVD			F
210	210-294	EB 1210 JNO N ROSEMEAD BLVD, **FSP 11** ACC MADRE ST			F
210	210-375	WB 1210 JNO N WINDDALE AV, **FSP 28** ACC WINDDALE AV			F
405	405-205	SB 1405 JNO E EL SEGUNDO BLVD, **FSP 09** ACC DIPERIAL HWY			F
5	5-198	WB 15 AT PASADENA AV, **FSP 04** ACC MAIN ST			F
5	5-344	WB 15 JNO PERKINS ST, **FSP 34** ACC SUNLAND BLVD			F
605	605-034	WB 1505 JNO DEL AMO BLVD, **FSP 14** ACC DEL AMO BLVD			F
605	605-054	WB 1505 JNO ALONDRA BLVD, **FSP 14** ACC EB 5891 OR WB 5891			F
405	405-114	WB 1405 JNO AVALON BLVD, **FSP 19** ACC CARSON ST			G
405	405-198	WB 1405 JNO E EL SEGUNDO BLVD, **FSP 09** ACC ROSECRANS AV			G
60	60-044	EB 5850 JNO S ATLANTIC BLVD, **FSP 13** ACC NB 1710			G
118	118-137	WB 58118 JNO EB 1210, **FSP 23** ACC EB 1210			K
14	14-644	WB 5814 JNO AVENUE M, 1/4 MI ACC AVENUE N			L
210	210-009	WB 1210 JNO VANDERBILT ST, ACC ROXFORD ST	34.2322	-118.47727	L
91	91-124	EB 5891 JNO ATLANTIC AV, **FSP 26** ACC ATLANTIC AV	33.87658	-118.18318	L

## **APPENDIX B: REMAINING TYPE B/C SITES**





Route	Sign Number	Physical Location	Site Latitude	Site Longitude	Revised Site Type
5	5-798	NB IS ISO SR138, APPROX 1 1/3 MI ACC HUNGRY VALLEY RD			C
605	605-289	SB 1605 ISO VALLEY BLVD, ** F3737 ** ACC VALLEY BLVD			C
605	605-249	SB 1605 ISO EB I210, ** F3737 ** ACC EB I210 OR WB I210			C
710	710-084	NB I710 I710 W Willow St			C

## **APPENDIX C: REMAINING NON TYPE B/C SITES**

## Appendix C - Non Type B and C Locations to keep

Route	Segment Number	Physical Location	Site Latitude	Site Longitude	Revised Site Type
101	101-274	WB US101 AT VALLEY CIRCLE BLVD., **FSP 29** ACC WOODAKE AV			A
101	101-325	EB US101 IEO AGOURA RD, ACC LIBERTY CANYON RD			A
10	10-374	EB US101 IN CITRUS ST., **FSP 12** ACC AZUSA AV			A
118	118-098	WB SR134 AT N3 RD., **FSP 33** ACC HANFORD-URST AV			A
134	134-009	WB SR134 IEO E CANYON RD, **FSP 22** ACC PASS AV			A
210	210-109	WB I210 IWO SURLAND BLVD, ACC SURLAND BLVD			A
210	210-115	WB I210 AT SURLAND BLVD, ACC LA TUNA CANYON RD			A
210	210-239	WB I210 IWO MOUNTAIN ST, ACC SECO ST			A
210	210-309	WB I210 AT BALDWIN AV., **FSP 11** ACC SANTA ANITA AV			A
2	2-199	SB SR2 AT MOUNTAIN ST., **FSP 35** ACC VERBURO BLVD			A
5	5-128	NB B AT5 ATLANTIC BLVD., **FSP04** ACC ATLANTIC BLVD			A
60	60-124	EB SR60 IEO N3 RD., **FSP 13** ACC PECK RD ON N3 RD			A
60	60-278	EB SR60 IWO PHILLIPS RANCH RD., **FSP 11** ACC PHILLIPS RANCH RD			A
605	605-122	NB SR55 IWO WASHINGTON BLVD., **FSP27** ACC TELEGRAPH RD			A
91	91-188	EB SR91 IEO NORWALK BLVD., **FSP 15** ACC PIONEER BLVD			A
101	101-265	SB US101 IWO VENTURA BLVD.,			A
110	110-119	SB I110 IWO W ROSECRANS AV., **FSP 43** ACC EL SEGUNDO BLVD			D
210	210-459	WB I210 IWO FOOTHILL BLVD., **FSP 34** ACC FOOTHILL BLVD			D
405	405-009	SB SR5 IWO PALO VERDE AV., **FSP 19** ACC WOODBURY AV			D
405	405-149	SB SR5 IWO WESTERN AV., **FSP 09** ACC CRENSHAW BLVD			D
405	405-165	SB SR5 IWO ARTEZIA BLVD., **FSP 09** ACC HAWTHORNE BLVD			D
5	5-174	NB B SR5 E 4TH ST., **FSP04** ACC CALZADILLA ST			D
605	605-054	NB SR5 IWO ALONDRA BLVD., **FSP14** ACC ALONDRA BLVD			D
91	91-114	EB SR91 TD SB I210 CON., **FSP 26** ACC LONG BEACH BLVD			D
91	91-164	SB SR91 IWO SB I65., **FSP 15** ACC BELTLOWER BLVD			D
110	110-024	NB I110 IWO C ST., ACC C ST			D
10	10-064	EB I10 IEO N3 RD., **FSP 17** ACC RD5			E
101	101-038	NB US101 IWO SILVERLAKE BLVD., **FSP 02** ACC SILVERLAKE BLVD			F
101	101-048	NB US101 IWO MARLBOROUGH AV., **FSP 27** ACC VERMONT AV			F
101	101-075	SB US101 AT VOKE ST., **FSP 27** ACC HIGHLAND AV			F
101	101-205	EB US101 IWO WHITE OAK AV			F
101	101-215	EB US101 IWO RESERVA BLVD., **FSP 29** ACC VAN ALDEN AV			F
110	110-034	NB I110 IWO W AMARKEEN ST, ACC C ST			F
110	110-244	NB SR110 IWO STADIUM WY., **FSP01** ACC SUNSET BLVD			F
14	14-678	NB SR14 IWO AVENUE LAOC AVENUE K			F
5	5-499	SB B SR5 PICO CANYON RD., **FSP 42** ACC LYONS AV			F
60	60-195	WB SR60 IWO N3 FLUTTERBY RD			F
71	71-009	SB SR71 IWO W VALLEY BLVD., ACC SB I210 OR EB I10			F
710	710-234	NB I710 IWO E OLIVEHURST BLVD., **FSP23** ACC WASHINGTON BLVD			F
91	91-067	WB SR91 IWO S MAIN ST., **FSP 26** ACC AVALON BLVD			F
91	91-144	EB SR91 AT LAKEWOOD BLVD., **FSP 15** ACC DOWNER AV			F
110	110-095	SB I110 IWO EB SR91, **FSP 43** ACC REDONDO BEACH BLVD			G
405	405-174	NB SR5 AT HAWTHORNE BLVD., **FSP 09** ACC REDONDO BEACH BLVD			G
405	405-185	SB SR5 IWO EAGLEWOOD AV., **FSP 09** ACC ROSECRANS AV			G
710	710-159	SB I710 IWO ROSECRANS AV., **FSP 30** ACC MK			G
110P	110P-195	SB I110 IWO IWO W 38TH ST., **FSP 11** ACC MK			K
210	210-258	EB I210 IWO N LAKE AV., **FSP 11** ACC MARBENCO ST			K
5	5-529	SB B IWO VALENCIA BLVD., **FSP 42** APPROX 1/3 MI ACC MAGIC MOUNTAIN PKWY			L
126	126-002	HENRY MAYO ON AT LAOC VECO COUNTY LINE			A
138	138-562	SR138 IEO 96TH ST E			A
138	138-642	SR138 IEO 165TH ST E, APPROX 1/3 MI			A
138	138-653	SR138 IEO 175TH ST E, APPROX 1/2 MI			A
138	138-662	SR138 IEO AVENUE WY, APPROX 1/2 MI			A
138	138-689	SR138 IEO 218TH ST E, APPROX 2/10 MI			A
138	138-702	SR138 IEO 581A, APPROX 1/2 MI TO X			A
138	138-713	SR138 IEO 581A, APPROX 1 MI			A
1	1-497	SR1 IEO CRTL, 3/10 MI NORTH END			A
23	23-077	WESTLAKE BLVD IEO CARLSBIE RD, (E MI)			A
2	2-638	SR2 IWO DAWSON SADDLE, APPROX 2/10 MI NMI 69.81			A
2	2-713	ANGELIS CREST HWY NMI 71.40, IWO VINCENT GULCH DIVIDE RD APPROX 2 & 1/10 MI			A
CM	CM-007	CORNELL WY IEO KANAW DUKIE RD, 6 MILES IEO KANAW			A
14	14-159	LAKE HUGHES RD IEO DRY GULCH RD			A









Route	Stop Number	Physical Location	Stop Latitude	Stop Longitude	Revised Stop Type
101	101-308	WB US101 IED LAS VAREZAS RD., ACC PARKWAY CALABASAS			F
101	101-319	EB US101 IED LOST HILLS RD, ACC LIBERTY CANYON RD			F
101	101-324	WB US101 IED LIBERTY CANYON RD, ACC LOST HILLS RD			F
10	10-136A	5 VERMONT IED AV ONR TO EB ILL., ACC FROM VERMONT AV			F
10	10-143T	WB I10 IED W 5 HOOPER ST., ACC LOS ANGELES ST WB I10 IED HOOPER COLLECTOR			F
110	110-094	WB I10 IED EB S91T., ACC 190TH ST			F
110	110-097	WB I10 IED EB S91T., ACC 190TH ST			F
110	110-136	WB I10 IED EB S91T., ACC 190TH ST			F
110	110-137	WB I10 IED EB S91T., ACC 190TH ST			F
110	110-195	WB I10 IED EB S91T., ACC 190TH ST			F
110	110-234	WB I10 IED EB S91T., ACC 190TH ST			F
110	110-265	WB I10 IED EB S91T., ACC 190TH ST			F
118	118-103T	WB S8118 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
118	118-119	WB S8118 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
118	118-138T	WB S8118 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
134	134-056	WB S8134 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
134	134-057	WB S8134 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
134	134-098	WB S8134 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
134	134-104	WB S8134 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
134	134-118	WB S8134 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-269	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-274	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-307T	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-308	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-318	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-334	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-338	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-358	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-375	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-388	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-394	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-404	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-405	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-408	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-409	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-414	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-424	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-434	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-448	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-459	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-465	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-475	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-485	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-495	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-505	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-518	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-524	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-534	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-544	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-554	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-558	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-565	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-575	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-585	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-595	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-609	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-614	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-619	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-629	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-639	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-649	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-659	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
14	14-669	WB S814 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
1	1-605	PACIFIC COAST HWY IED DECKER RD, 670 MI			F
210	210-004	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-005T	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-105	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-128	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-134	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-135	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-138	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-164	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-259	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-304	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-335	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-357B	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
210	210-438	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
2	2-224	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
2	2-225	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
27	27-034	WB I210 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-014	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-038	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-065	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-127	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-198TB	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-213	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-227T	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-237T	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-255	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
405	405-256TA	WB I405 IED TO SB I10 IED, ACC LAUREL CANYON BLVD			F
34.0861	-118.21592				F
34.15203	-118.2505				F
34.446	-118.362				F
33.81847	-118.19113				F
33.96188	-118.36687				F





