CALIFORNIA'S FREEWAY SERVICE PATROL PROGRAM

Management Information System Annual Report

Fiscal Year 2013-14

Prepared for the California Department of Transportation

Traffic Operations Division

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Section 1: Executive Summary

1.1 *Introduction*

The Freeway Service Patrol (FSP) is a program run jointly by Caltrans, the California Highway Patrol (CHP) and local transportation agencies. Whether fixing a flat tire, towing a disabled vehicle to a safe location, clearing debris from a lane of traffic, or providing a gallon of gasoline to a motorist that has run out of fuel, California's fleet of FSP roving tow trucks have two primary benefits. First, the patrolling trucks of the FSP find congestion-causing incidents and clear them quickly. Second, tow truck drivers provide direct assistance to stranded motorists, increasing safety and security for them in a moment of need. This service reduces delay for other motorists by maintaining the capacity of our highway system and increases safety for motorists by clearing hazards that may cause secondary incidents. The operational performance measures contained in this report were developed for program managers at Caltrans and partner agencies as tools for improving the efficiency and effectiveness of the FSP program.

This report seeks to increase the information available to state and local agencies running the FSP programs so that resources are distributed within the various statewide FSP operations in the most cost-effective manner possible.

1.2 *FSP Database Summary*

The bulk of the data used to develop the measures contained in this report were obtained directly from each FSP program. Each dataset was standardized to the greatest extent possible to allow data comparability between FSP programs. Unfortunately, the majority of the FSP programs collects and records their operational data in somewhat different formats.

The following points summarize the primary outputs of the FSP programs into the statewide Management Information System (MIS) databases for fiscal year 2013-14**:**

(1) In fiscal year 2013-14, the roving tow trucks of the FSP program provided over 660,000 assists on California's highway system. This is approximately 1.5 percent (%) increase over the previous year. About 42% of total statewide assists were provided by the Los Angeles FSP program in that county, while the next largest program, covering the nine counties of the San Francisco Bay Area, provided about 17% of total statewide assists.

(2) The estimated benefit/cost ratios for FSP programs ranged from 2.5-to-1 (for the El Dorado, Santa Cruz, Santa Barbara and San Joaquin County FSP programs) to 11.5-to-1 for Riverside County. The statewide average B/C ratio (weighted on FSP beat costs) was 8.0-to-1.

(3) Once a driver spots an incident, they are instructed to work for up to 10 to 15 minutes to get the stranded vehicle moving or provide a tow to a safe location. The average assist duration for the state FSP in 2013-14 was about 14 minutes.

(4) The speed at which FSP locates and clears incidents is determined in part by the number of FSP trucks patrolling a stretch of road and the amount and type of traffic on that road.

In FY 2013-14 the state's fourteen FSP programs operated 194 beats with 366 trucks (during the PM peak period) covering over 1,800 centerline freeway miles. Together they provided over 836,000 total truck hours of service. On average, California's FSP trucks in FY 2013-14 supplied almost one assist for every hour of service (0.78 assists per tow truck-hour). These assists were primarily given to automobiles and vans, which constituted 73 percent of all assists. The two most common types of assists given were for mechanical problems (21.3%), flat tires (14.7%) and vehicle collisions (14.6%).

(5) The number of FSP trucks and truck hours the state and its partner agencies can deploy is determined by funding availability. In FY 2013-14, the state allocated about $25.5 million to the locally run FSP programs and another $4.7 million to CHP for field supervisors, monitoring and training activities. The local transportation agency partners that run each program are required to provide 25 percent matching funds. In FY 2013-14, the local partner transportation agencies provided over $21.6 million in matching funds – about an 85 percent match. Many of the smaller FSP programs did not surpass the 25 percent local match requirement. Los Angeles County had the highest proportion of local match funding. All matching funds are used by the contributing local transportation agencies for their own FSP operations.

Table 1 provides a more detailed summary of the data and performance measures contained within this report. Table 2 lists additional environmental benefits attributable to the California FSP program such as motorist delay savings, fuel savings and mobile source emission reductions.

Table 1: Statewide FSP Program Annual Summary (Combined Weekday and Weekend Service)

Program	Area	# of Wkdy Beats	# of Peak Period Trucks	Wkdy Center - line Miles	Truck Hours	Total Assists	Average Assist Duration (min.) [1]	Assist Rate [2]	Total B/C Ratio	State FSP Funds ($)	% of State FSP Funds	Local Match Funds ($)	% of Local Match Funds	CHP Allocation ($)	% of CHP Allocation
3-SY	Sac / Yolo	17	17	96	27,828	26,807	7.9	0.96	5.0	1,179,459	4.6%	747,000	3.5%	269,007	5.6%
3-P	Placer	2	2	25	4,242	4,439	4.9	1.05	4.5	218,412	0.9%	54,604	0.3%	0	0.0%
3-ED	El Dorado	1	1	11	1,364	913	12.0	0.67	2.5	102,463	0.4%	25,626	0.1%	0	0.0%
4	Bay Area	35	79	558	151,621	106,064	12.1	0.70	7.0	6,196,611	24.4%	3,369,114	15.6%	1,181,033	24.8%
5-M	Monterey	2	2	22	3,352	4,464	10.1	1.33	4.5	235,079	0.9%	58,770	0.3%	0	0.0%
5-SC	Santa Cruz	2	2	16	3,690	1,513	13.9	0.41	2.5	199,612	0.8%	167,000	0.8%	0	0.0%
5-SB	Santa Barbara	3	2	22	2,928	567	15.6	0.19	2.5	155,000	0.6%	38,750	0.2%	0	0.0%
6	Fresno	4	4	21	4,375	4,869	10.1	1.11	4.0	315,424	1.2%	79,550	0.4%	97,953	2.1%
7	Los Angeles	40	146	474	381,472	276,344	17.3	0.72	9.5	8,361,261	32.9%	11,920,453	55.1%	1,461,835	30.7.%
8-R	Riverside	9	21	81	38,808	44,076	10.3	1.14	11.5	1,547,104	6.1%	665,074	3.1%	317,156	6.7%
8-SB	San Bernardino	8	16	70	29,568	34,141	10.4	1.15	10.0	1,442,231	5.7%	455,648	2.1%	317,156	6.7%
10	San Joaquin	3	6	37	13,785	11,864	6.1	0.86	2.5	506,198	2.0%	605,962	2.8%	0	0.0%
11	San Diego	34	34	244	94,540	83,184	9.9	0.88	5.0	2,391,502	9.4%	908,805	4.2%	602,846	12.6%
12	Orange	34	34	132	78,628	52,196	15.2	0.66	9.0	2,578,664	10.1%	2,518,893	11.7%	520,816	10.9%
Total or Average		**194**	**370**	**1,808**	**893,564**	**660,935**	**13.7**	**0.78**	**8.0**	**25,479,000**	**100.0%**	**21,615,248**	**100.0%**	**4,767,872**	**100.0%**

Notes: 1 – FY 2012-13 assist duration statistics were used for Fresno, Santa Cruz and Monterey Counties. Fresno did not record assist details; Santa Cruz and Monterey County had irreconcilable assist duration errors.
2 – Assist Rate = Total Assists divided by Total Truck Hours.

Table 2: Statewide FSP Program Annual Summary (Combined Weekday and Weekend Service)

Program	Total Vehicle Delay Savings (veh-hr)	Total Fuel Savings (gallons)	Total ROG Reductions (kg)	Total CO Reductions (kg)	Total NOx Reductions (kg)	Total PM10 Reductions (kg)	Total CO2 Reductions (kg)	Total N2O Reductions (kg)	Total CH4 Reductions (kg)
3-SY	428,637	736,828	34.68	415.09	18.69	6.69	6,484,083	99.23	268.75
3-P	51,238	88,077	4.15	49.62	2.23	0.80	775,082	11.86	32.12
3-ED	11,891	20,440	0.96	11.51	0.52	0.19	179,874	2.75	7.46
4	3,048,537	5,240,435	246.63	2,952.20	132.92	47.56	46,115,827	705.71	1,911.37
5-M	41,688	71,662	3.37	40.37	1.82	0.65	630,622	9.65	26.14
5-SC	39,803	68,421	3.22	38.55	1.74	0.62	602,106	9.21	24.96
5-SB	21,998	37,814	1.78	21.30	0.96	0.34	332,763	5.09	13.79
6	74,565	128,177	6.03	72.21	3.25	1.16	1,127,954	17.26	46.75
7	9,454,840	16,252,870	764.90	9,156.07	412.23	147.50	143,025,256	2,188.70	5,928.00
8-R	1,187,096	2,040,618	96.04	1,149.58	51.76	18.52	17,957,436	274.80	744.29
8-SB	770,358	1,324,246	62.32	746.01	33.59	12.02	11,653,364	178.33	483.00
10	83,369	143,312	6.74	80.73	3.63	1.30	1,261,146	19.30	52.27
11	1,098,067	1,887,578	88.83	1,063.37	47.88	17.13	16,610,685	254.19	688.47
12	1,971,226	3,388,537	159.47	1,908.94	85.95	30.75	29,819,128	456.32	1,235.92
Statewide	**18,283,312**	**31,429,014**	**1,479.12**	**17,705.56**	**797.15**	**285.22**	**276,575,325**	**4,232.40**	**11,463.27**

1.3 *Summary of Recommendations*

FSP Assist Data Collection Procedures

Caltrans Headquarters, the FSP agency partners and CHP should continue working to keep current with best practices for data management technologies and for monitoring the activities of the FSP tow providers. With WiFi/Bluetooth /cell phone technical advancements, new and very affordable GPS enabled data collection systems are readily available which to enable FSP management teams (local agencies and CHP) monitor the activity of the FSP tow providers – in real time, and to ease the tasks of preparing FSP performance reporting.

The majority of the FSP programs have migrated to using customized applications with laptop, iPAD or some other portable device for collecting FSP assist data. Sacramento's FSP program was one of the first programs to automate this process. Sacramento County developed and has been using *FSPTrack* for several now. *FSPTrack* is a Google Android application with server support that enables FSP managers to monitor FSP tow truck activity. *FSPTrack* also allows FSP tow truck drivers to log incidents via the Android app which is uploaded to a database on a server, thus making the FSP assist data available to FSP management in near real time.

A few of the FSP programs (Los Angeles MTA, Santa Barbara SBCAG, El Dorado EDCTC and Fresno COG) are still using manual (paper form based) FSP assist data collection technologies. The Los Angeles MTA's FSP program managers are in the process of upgrading their data collection and management system. The Los Angeles MTA FSP data project should be completed within the next 12 to 18 months. San Diego's FSP program managers are looking into electronic data collection options. The Bay Area MTC program has recently upgraded their FSP data management technologies to an enterprise system very similar to OCTA's data management system. The Sacramento FSP managers are reviewing the set of "Problem Type" categories. They are looking into add adding "Partner Assist" to the set of driver choices, maybe other Problem Types too. STA will be updating their FSP assist data collection app to reflect the findings from their review of data collection needs. Appendix B contains additional information on the FSP data management systems currently being used to collect and manage the California FSP assist data.

It is recommended that Caltrans Headquarters continue to work with the FSP managers in their efforts as they update their data management practices and as they make changes to the FSP assist data that is being collected by the FSP tow truck drivers/providers. One recent concern that has been raised is "How is it tracked when multiple FSP tow trucks respond to a single incident?" Do these multiple FSP responses to a single incident result in an over reporting of incidents (i.e., duplicate incident records) in the FSP tracking databases? The over reporting of freeway incidents could result in an over reporting of FSP delay savings.

Performance Based Management Practices

Additionally, there are concerns about efficiencies in the allocation of FSP tow trucks to FSP beats, the currently assigned FSP hours of operation, and levels of FSP service being provided. Basically, the questions boils down to: 1) How many FSP tow trucks should we have? 2) Where should the tow truck be? And, 3) When should they be operating?

To address these concerns and to improve the FSP program's performance (i.e., the cost effectiveness), a method should be developed that compares the allocation of FSP tow trucks (and truck-hours) to the need for FSP service. The need for FSP service could be measured using other freeway utilization & performance indicators such as freeway corridor vehicle miles of travel (VMT), vehicle hours of travel (VHT), vehicle hours of delay, and accident/incident rates. These indicators provide the means for comparisons between the demand for FSP services and the supply of FSP resources, which would facilitate FSP managers to allocate the FSP resources in proportion to the demand for FSP service. The method of matching FSP service to the need for tow assistance should be temporal as well as geographical – that is it should provide information on FSP operating hours (and number of tow trucks required by time of day) as well as showing how the required number of tow trucks varies by freeway segments. This tool could also be utilized to identify freeway segments where new FSP service would most probably be cost effective.

When implementing changes to the FSP service, the effects of these changes on the performance of the FSP program should be closely monitored to assure that the changes (improvements) to the FSP program actually deliver the expected increases in performance. This need for follow through and performance monitoring holds true whether the changes to FSP service is extending FSP hours of operation, new weekend or midday FSP service, increases or reductions to the number of FSP tow trucks on a beat or FSP service on a new beat. Tracking FSP performance metrics using "Before and After" techniques and/or by the use of control groups needs to accompany implementing changes in FSP service otherwise it cannot be shown that the expected gains in FSP performance are actually realized (in the real world) as forecasted in planning exercises.

Section 2: Introduction

2.1 *Background*

The FSP program is a free motorist assistance service using contracted tow trucks that patrol designated routes on congested urban California freeways. Typically the FSP operates Monday through Friday during peak commute hours. In heavily congested freeway corridors it is becoming more commonplace for FSP to operate during the midday and on weekends/holidays in addition to the weekday peak period service.

The goal of the FSP is to maximize the efficiency of the freeway transportation system. The FSP is a traffic congestion management tool that strategically addresses non-recurring traffic problems by quickly finding and removing disabled/stranded vehicles or roadway obstructions from the freeway system. Deployment of FSP trucks is driven by congestion windows and traffic patterns in major metropolitan areas.

The rapid removal of freeway obstructions has a positive effect on traffic conditions by reducing incident durations and removal of other obstructions that directly contribute to non-recurrent congestion. In fiscal year 2013-14, the FSP program provided over 652,000 assists from the fourteen FSP programs across nine of the twelve Caltrans districts.

Because the traffic conditions of the state's freeway system and the demand for its services are constantly changing, it is necessary for the FSP program to respond to these changing and increasing needs for traffic mitigation. This report seeks to centralize and summarize the information available to state and local agencies managing the FSP programs so that resources are distributed within the various statewide FSP operations in the most efficient and cost-effective manner possible. The database constructed for this project was used to generate a series of indicators that measured and compared the performance of each FSP program. The following provides an overview of the scope of work for this project:

2.2 *Project Scope*

The project scope included FSP assist data collection, database design and programming, calculate summary statistics for reporting purposes using the FSP assist database and report generation. The project objectives were accomplished in four phases:

1) Develop FSP 2013-14 Management Information System (MIS) databases
2) Produce FSP 2013-14 California Local Program Report
3) Produce FSP 2013-14 California Statewide MIS Program Report
4) Make Recommendations for future data collection policies, procedures and report content.

Each phase is described in more detail in the following sections.

2.2.1 Develop FSP 2013-14 MIS Databases

The development of the FSP MIS databases consisted of the following sub-tasks:

1) Solicit and collect the 2013-14 FSP program data from each of the FSP Programs.

2) Analyze the data for consistency and accuracy. Clean the data as necessary to correct any inconsistencies and/or inaccuracies.
3) Compile the cleaned data into a set of sub-databases, with each database containing the data for individual FSP programs.

2.2.2 Produce FSP 2013-14 California Local Program Report

The development of the FSP 2013-14 California Local Program Report consisted of the following sub-tasks:

1) Generate database queries to compile each local program data into summary tables that will identify how each program is performing in the customer defined set of performance areas.
2) Format the resulting set of tables and graphs so they are consistent in format and easily understandable.
3) Load the formatted tables and graphs into the report with the content of each table or graph identified by the section heading. This report will not contain any text or state summary data. It will only contain summarized FSP program data.

2.2.3 Produce FSP 2013-14 California Statewide MIS Program Report

The development of the FSP 2013-14 California Statewide MIS Program Report consisted of the following sub-tasks:

1) Generate database queries for the statewide database to compile FSP program data into summary tables that will identify how the FSP statewide program is performing in the customer defined set of performance areas.
2) Format the resulting set of tables and graphs so they are consistent in format and easily understandable.
3) Use the format of the previous FSP MIS annual report as a template for the FSP 2013-14 report. Create the shell of the FSP 2013-14 report.
4) Add all relevant text and tables from the previous FSP annual report. There is no need to recreate information that has already been created and will stay the same from yearly report to yearly report.
5) Load the formatted state summary tables and graphs into the report with the content of each table or graph identified by the caption heading.
6) Fill in all the report information that is unique to the FSP 2013-14 Fiscal Year.

2.2.4 Make Recommendations for Improving FSP Program Reporting

The development of recommendations to improve the California FSP Program's data collection, storage and reporting consisted of the following sub-tasks:

1) Take notes when collecting and compiling the received FSP data. The notes should contain references to problems and inconsistencies with the received FSP data.
2) Compile those notes into a complete set of meaningful recommendations that will help the state and local FSP Program representatives collect, process and report FSP data that is both accurate and consistent across all programs.

Section 3: FSP Data Compilation Methodology

3.1 *FSP MIS Development Methodology*

The integrated statewide MIS database was created to combine the FSP assist data from each of the California FSP programs into one single database. The data was provided by the local partner agencies managing the FSP programs. Since each program independently collects and stores their FSP assist data, the format of each of the program's datasets varies (somewhat) in data completeness, data coding consistency, data recording accuracy and in format. The Recommendations section in this report provides a description of some of the more serious problems with the collected data and recommendations on how to improve the quality of the data.

Each local program's raw data was cleaned, standardized and combined into a single, unified database. In the final databases there are over 652,000 records for the fiscal year 2013-14. They are stored in and manipulated using Microsoft Excel. Each FSP program's dataset is stored in its own database file. The local program queries and reports can be run from the associated program's database file. The following sections provide the statewide summary tables and graphs based on this final database. The Trucks and Centerline Miles Excel file includes information such as the Total Number of Trucks, Total Truck Hours, Centerline Miles of each beat, and the number of beats in each FSP program.

3.2 *FSP Evaluation Methodology*

The effectiveness of the FSP Program is assessed by calculating the annual benefit/cost (B/C) ratio of each FSP beat. First the annual savings in incident delay, fuel consumption and air pollutant emissions due to FSP service are calculated based on the number of assists, beat geometries and traffic volumes. The savings are then translated into benefits using monetary values for delay ($17.35/vehicle-hour) and fuel consumption ($3.93/gallon).

The value of time for motorists was obtained from the Caltrans 2011 Performance Mobility Report (MPR) which states that for 2011travel time is priced at $17.35 for each vehicle hour of delay for year 2011. (The Caltrans 2011 MPR was the most up-to-date MPR at the time of the FSP cost effectiveness evaluation and the production of this report.)

The California statewide annual average fuel costs of $3.93/gallon of gasoline for FY 2013-14 was estimated from weekly California statewide average prices are compiled by the U.S. Department of Energy's Energy Information Administration (EIA) from a telephone survey that includes a sample of 38 California gasoline stations. These stations were sampled with a likelihood equal to the company's proportional size to the total annual volume of gasoline, by grade, sold in California. The Caltrans MPR website confirmed an average statewide gasoline price of $3.93 per gallon.

The annual FSP program costs include the annual capital, operating and administrative costs for providing FSP service. The FSP evaluation methodology has been incorporated into an Excel spreadsheet. Input data requirements consist of beat geometries (number of lanes, presence of shoulders), traffic volumes, and the number and characteristics of FSP assists.

Section 4: FSP Performance Summary

4.1 *Statewide Total Assists by Fiscal Year*

Table 3 shows that the annual statewide total assists increased only nominally, by about 0.1% (651,315 to 652,209) from FY 2012-13 to 2013-14. This is shown graphically in Figure 1.

Table 3: Total Assists and Annual Change by Fiscal Year

Fiscal Year	Total Assists	Annual Change (percent)
1991-92	152,526	0.0%
1992-93	295,613	93.8%
1993-94	452,018	52.9%
1994-95	448,170	-0.9%
1995-96	540,874	20.7%
1996-97	587,941	8.7%
1997-98	583,699	-0.7%
1998-99	568,276	-2.6%
1999-00	625,090	10.0%
2000-01	631,161	1.0%
2001-02	643,607	2.0%
2002-03	651,710	1.3%
2003-04	646,749	-0.8%
2004-05	618,440	-4.4%
2005-06	669,895	8.3%
2006-07	666,612	-0.5%
2007-08	668,142	0.2%
2008-09	638,880	-4.4%
2009-10	649,155	1.6%
2010-11	655,686	1.0%
2011-12	672,472	2.6%
2012-13	651,315	-3.1%
2013-14	651,441	0.0%

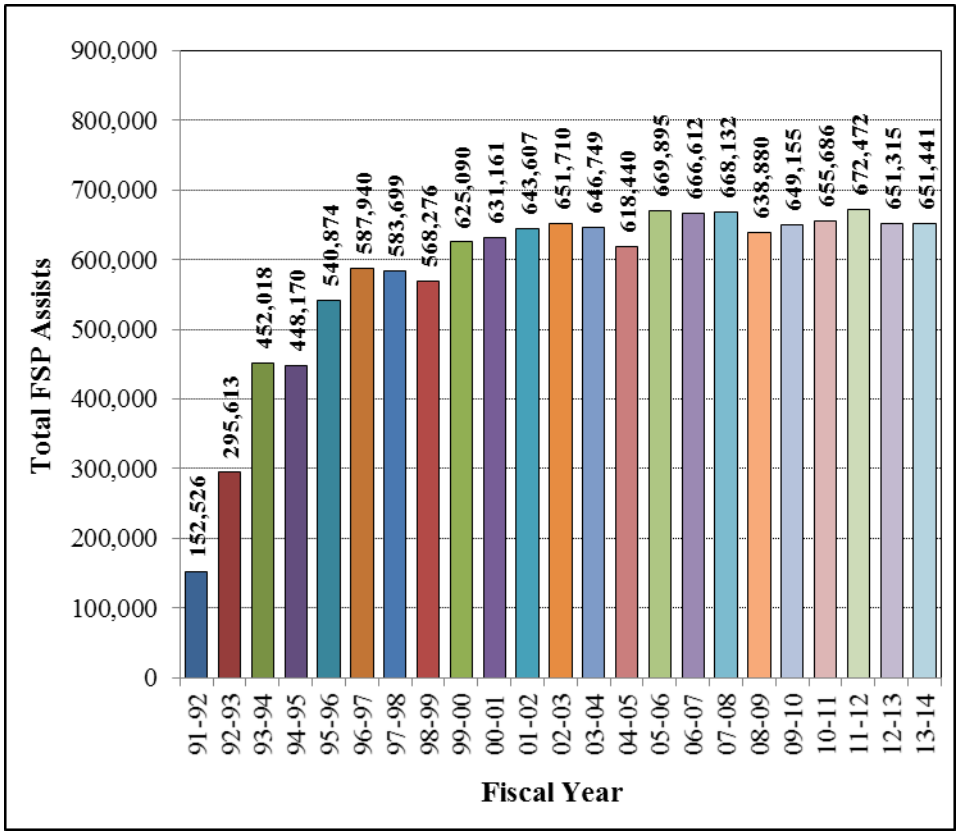

Figure 1: Bar Chart – Total FSP Assists by Fiscal Year

4.2 *Benefit/Cost Ratios for FSP Programs*

Table 4: B/C Ratio for Each FSP Program

Program	Name	Peak Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday (Pk+Md) B/C Ratio	Weekend B/C Ratio	Annual (Total) B/C Ratio
3-SY	Sacramento/Yolo	5.0		5.0	1.0	5.0
3-P	Placer	5.0		5.0	0.0	4.5
3-ED	El Dorado	2.5		2.5		2.5
4	Bay Area	7.0	4.5	7.0	0.5	7.0
5-M	Monterey	4.5		4.5	3.5	4.5
5-SC	Santa Cruz	3.0		3.0	2.5	2.5
5-SB	Santa Barbara	2.5		2.5		2.5
6	Fresno	4.0		4.0		4.0
7	Los Angeles	9.5	14.0	10.5	4.0	9.5
8-R	Riverside	11.5		11.5		11.5
8-SB	San Bernardino	10.0		10.0		10.0
10	San Joaquin	2.5		2.5	0.5	2.5
11	San Diego	6.5	1.0	5.5	1.0	5.0
12	Orange	9.5	3.5	9.0	3.5	9.0
Statewide		**8.5**	10.5	10.5	3.0	8.0

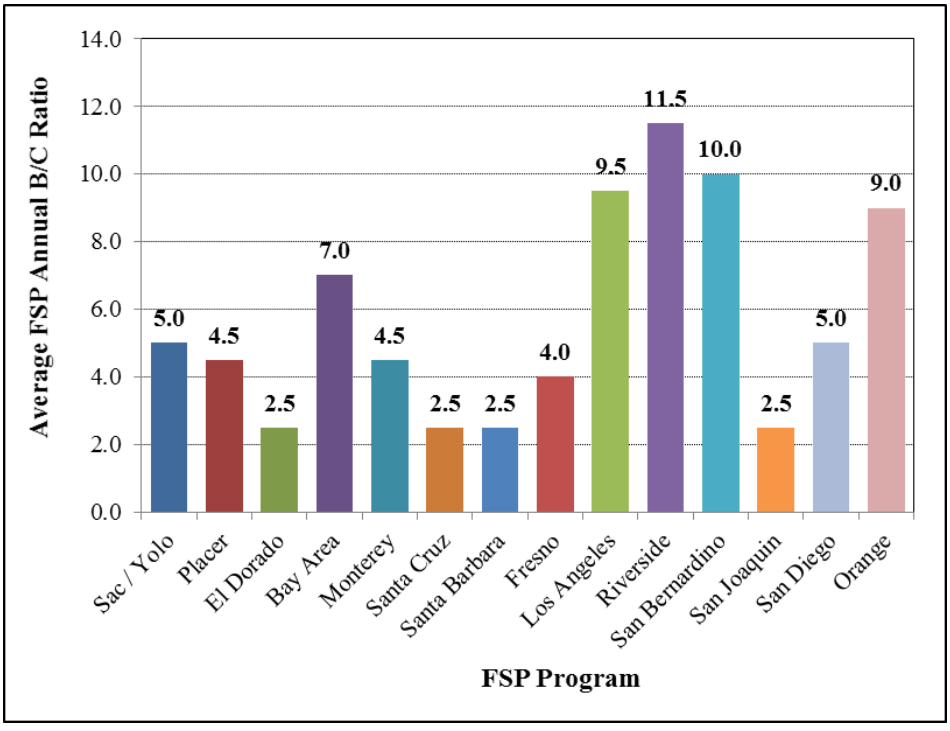

Figure 2: Bar Chart of FSP Benefit/Cost Ratios by Program

4.3 *Statewide FSP Total Assists by Quarter & Program*

Table 5: Total Assists by Quarter & Program

		Jul 13 - Sep 13	Oct 13 - Dec 13	Jan 14 - Mar 14	Apr 14 - Jun 14		
Program	**Name**	**Quarter 3**	**Quarter 4**	**Quarter 1**	**Quarter 2**	**Total Assists**	**Percent**
3-SY	Sac / Yolo	7,715	6,514	5,658	6,920	26,807	4.1%
3-P	Placer	1,534	1,132	962	811	4,439	0.7%
3-ED	El Dorado	290	216	187	220	913	0.1%
4	Bay Area	25,902	24,973	25,877	29,312	109,641	16.3%
5-M	Monterey	1,141	995	1,177	1,151	4,464	0.7%
5-SC	Santa Cruz	397	340	339	438	1,513	0.2%
5-SB	Santa Barbara	166	138	107	156	567	0.1%
6	Fresno	976	948	1,361	1,584	4,869	0.7%
7	Los Angeles	74,599	62,768	65,901	73,076	276,282	42.4%
8-R	Riverside	12,213	9,802	9,947	12,114	44,076	6.8%
8-SB	San Bernardino	8,929	8,045	7,954	9,213	34,141	5.2%
10	San Joaquin	3,071	2,730	2,761	3,302	11,454	1.8%
11	San Diego	21,893	18,597	19,922	22,772	82,970	12.8%
12	Orange	14,305	11,549	12,019	14,323	58,031	8.0%
Total Assists		173,131	148,747	154,172	175,392	651,441	**100.0%**
% of Total Assists		**26.6%**	**22.8%**	**23.7%**	**26.9%**	**100.0%**	

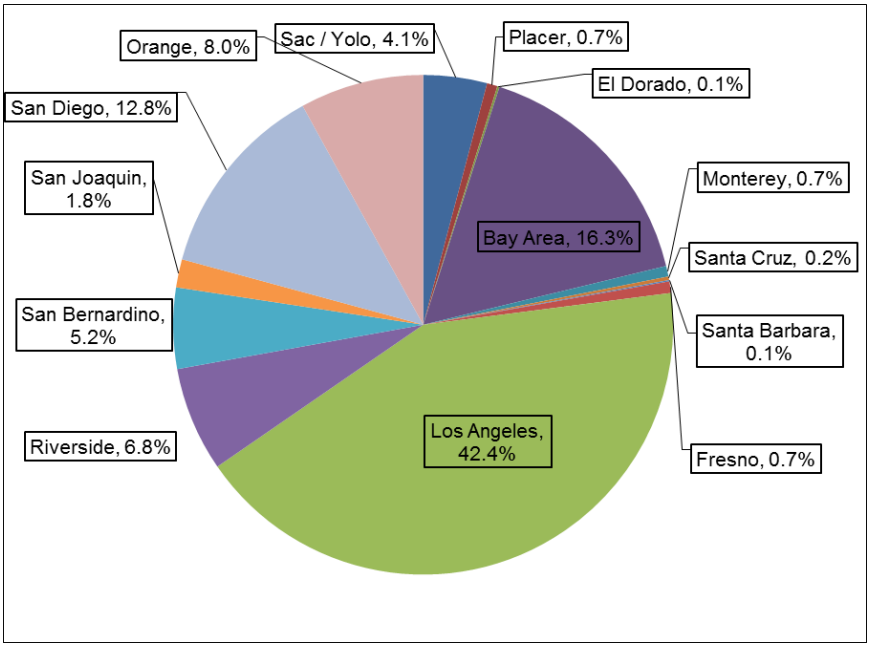

Figure 3: Pie Chart of Total Assists by Program

4.4 *Statewide FSP Total Assists by Problem Type*

Table 6: Total Assists by Problem Type

Problem Type	Total Assists	Percent
Abandoned	25,818	4.0%
Accident	95,539	14.7%
Debris Removed	30,876	4.7%
Flat Tire	96,083	14.7%
Mechanical Problems	138,692	21.3%
Other*	164,843	25.3%
Out of Gas	63,913	9.8%
Over Heated	35,673	5.5%
Total Assists	**651,441**	**100.0%**

* "Other" includes the assist records for refused service, informational assistance, unable to locate, drive off, service en route, and/or incidents with too little information.

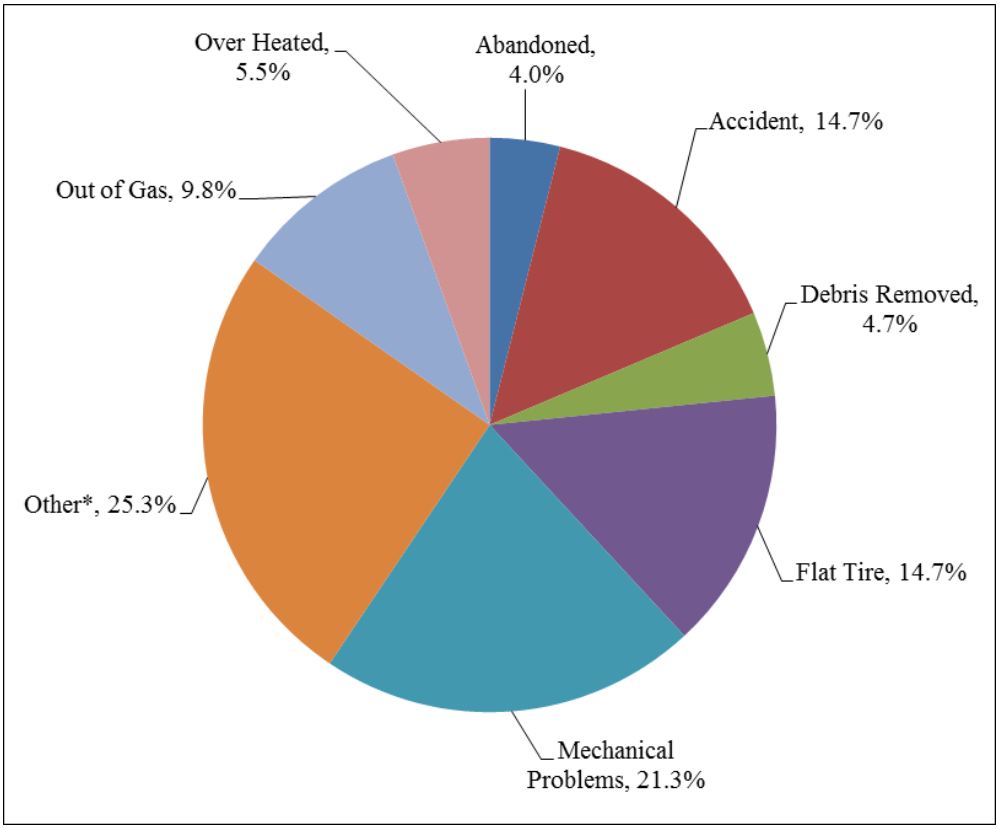

Figure 4: Pie Chart of Total Assists by Problem Type

4.5 *Statewide FSP Total Assists by Problem Type & Program*

Table 7: Total Assists by Problem Type & Program

Program	Name	Abandoned	Accident	Debris Removed	Flat Tire	Mechanical Problems	Other*	Out of Gas	Over Heated	Total Assists
3-SY	Sac / Yolo	1,231	8,350	665	4,730	5,745	2,288	3,013	785	26,807
3-P	Placer	260	1,203	138	627	816	819	443	132	4,439
3-ED	El Dorado	88	36	115	7	325	200	107	35	913
4	Bay Area	6,885	9,904	15,253	14,571	15,179	30,715	8,956	4,601	106,064
5-M	Monterey	247	394	781	408	558	1,507	431	138	4,464
5-SC	Santa Cruz	108	243	90	145	349	328	155	97	1,513
5-SB	Santa Barbara	20	153	5	77	146	24	133	9	567
6	Fresno	484	1,506	57	534	1,244	108	926	9	4,869
7	Los Angeles	5,112	51,631	3,876	48,082	47,689	69,891	29,743	20,320	276,344
8-R	Riverside	1,824	3,488	2,105	6,042	7,845	16,279	3,799	2,694	44,076
8-SB	San Bernardino	1,670	2,466	2,652	5,137	5,654	12,302	2,794	1,466	34,141
10	San Joaquin	484	1,474	980	2,217	1,819	2,264	1,998	628	11,864
11	San Diego	5,503	6,919	2,158	12,815	14,783	25,672	10,674	4,660	83,184
12	Orange	1,902	7,772	2,003	691	36,541	2,446	742	99	52,196
Total Assists		**25,818**	**95,539**	**30,876**	**96,083**	**138,611**	**165,695**	**63,913**	**35,673**	**651,441**
Average %		**4.0%**	**14.7%**	**4.7%**	**14.7%**	**21.3%**	**25.3%**	**9.8%**	**5.5%**	**100.0%**

* "Other" includes assist records for refused service, informational assistance, unable to locate, drive off, service en route, and/or incidents with too little information.

Table 8: Total Assists by Problem Type & Program (in Percent)

Program	Name	Abandoned	Accident	Debris Removed	Flat Tire	Mechanical Problems	Other*	Out of Gas	Over Heated	Total Assists (percent)
3	Sac / Yolo	4.6%	31.1%	2.5%	17.6%	21.4%	8.5%	11.2%	2.9%	4.1%
3-P	Placer	5.9%	27.1%	3.1%	14.1%	18.4%	18.5%	10.0%	3.0%	0.7%
3-ED	El Dorado	9.6%	3.9%	12.6%	0.8%	35.6%	21.9%	11.7%	3.8%	0.1%
4	Bay Area	6.5%	9.3%	14.4%	13.7%	14.3%	29.0%	8.4%	4.3%	16.3%
5-M	Monterey	5.5%	8.8%	17.5%	9.1%	12.5%	33.8%	9.7%	3.1%	0.7%
5-SB	Santa Barbara	3.5%	27.0%	0.9%	13.6%	25.7%	4.2%	23.5%	1.6%	0.2%
5-SC	Santa Cruz	7.1%	16.0%	5.9%	9.6%	23.0%	21.7%	10.2%	6.4%	0.1%
6	Fresno	9.9%	30.9%	1.2%	11.0%	25.5%	2.2%	19.0%	0.2%	0.7%
7	Los Angeles	1.8%	18.7%	1.4%	17.4%	17.3%	25.3%	10.8%	7.4%	42.4%
8-R	Riverside	4.1%	7.9%	4.8%	13.7%	17.8%	36.9%	8.6%	6.1%	6.8%
8-SB	San Bernardino	4.9%	7.2%	7.8%	15.0%	16.6%	36.0%	8.2%	4.3%	5.2%
10	San Joaquin	4.1%	12.4%	8.3%	18.7%	15.3%	19.1%	16.8%	5.3%	1.8%
11	San Diego	6.6%	8.3%	2.6%	15.4%	17.8%	30.9%	12.8%	5.6%	12.8%
12	Orange	3.6%	14.9%	3.8%	1.3%	70.0%	4.7%	1.4%	0.2%	8.0%
Average %		**4.0%**	**14.7%**	**4.7%**	**14.7%**	**21.3%**	**25.3%**	**9.8%**	**5.5%**	**100.0%**

4.6 *Statewide FSP Total Assists by Vehicle Type*

Table 9: Total Assists by Vehicle Type

Vehicle Type	Total Assists	Percent
Auto / Van	478,394	73.4%
Big Rig	21,362	3.3%
Other / Unknown	35,172	5.4%
SUV / Pickup	107,252	16.5%
Trucks	9,259	1.4%
Total Assists	**651,441**	**100.0%**

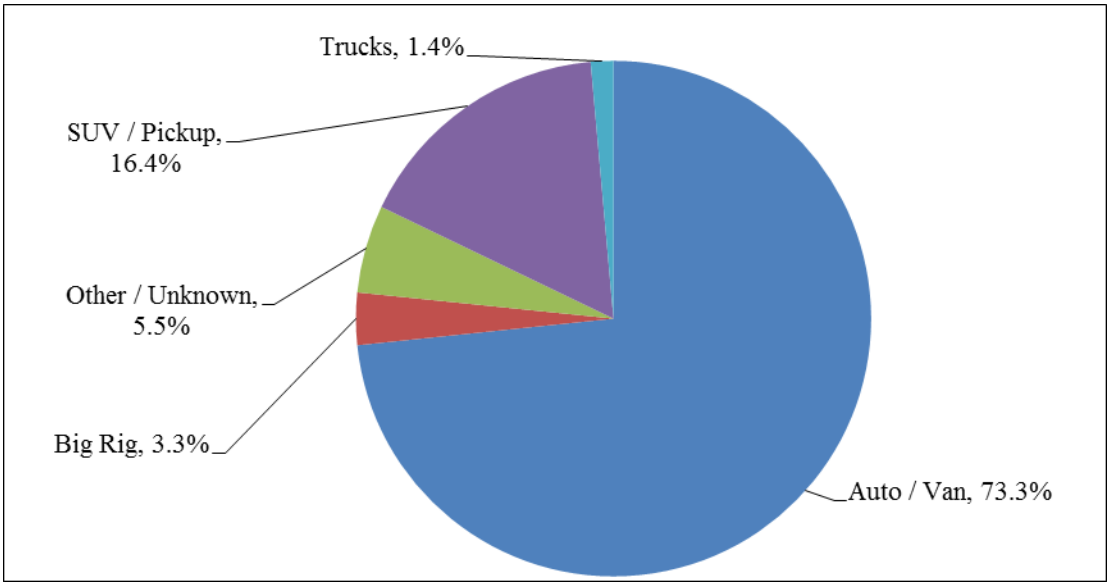

Figure 5: Pie Chart of Total Assists by Vehicle Type

4.7 *Statewide FSP Total Assists by Vehicle Type & Program*

Table 10: Total Assists by Vehicle Type & Program

Program	Name	Auto / Van	Big Rig	Other / Unknown	SUV / Pickup	Trucks	Total Assists
3-SY	Sac / Yolo	15,240	232	3,353	7,503	479	26,807
3-P	Placer	2,269	45	607	1,455	62	4,439
3-ED	El Dorado	414	0	146	339	14	913
4	Bay Area	78,804	2,613	5,160	15,869	3,619	106,064
5-M	Monterey	2,526	163	960	815	0	4,464
5-SC	Santa Cruz	1,086	25	191	212	0	1,513
5-SB	Santa Barbara	395	8	28	130	6	567
6	Fresno	3,676	54	127	978	34	4,869
7	Los Angeles	241,906	2,997	8,259	23,182	0	276,344
8-R	Riverside	24,254	6,713	3,304	7,757	2,048	44,076
8-SB	San Bernardino	18,496	5,900	3,514	4,949	1,282	34,141
10	San Joaquin	7,873	75	1,283	2,478	155	11,864
11	San Diego	47,965	627	6,003	27,888	701	83,184
12	Orange	33,490	1,910	2,238	13,698	860	52,196
Total Assists		**478,394**	**21,362**	**35,940**	**107,252**	**9,259**	**651,441**
Average %		**73.4%**	**3.3%**	**5.4%**	**16.5%**	**1.4%**	**100.0%**

Table 11: The Percent of Total Assists by Vehicle Type & Program

Program	Name	Auto / Van	Big Rig	Other / Unknown	SUV / Pickup	Trucks	Total Assists
3-SY	Sac / Yolo	56.9%	0.9%	12.5%	28.0%	1.8%	4.1%
3-P	Placer	51.1%	1.0%	13.7%	32.8%	1.4%	0.7%
3-ED	El Dorado	45.3%	0.0%	16.0%	37.1%	1.5%	0.1%
4	Bay Area	74.3%	2.5%	4.9%	15.0%	3.4%	16.3%
5-M	Monterey	56.6%	3.7%	21.5%	18.3%	0.0%	0.7%
5-SB	Santa Barbara	71.8%	1.7%	12.6%	14.0%	0.0%	0.2%
5-SC	Santa Cruz	69.7%	1.4%	4.9%	22.9%	1.1%	0.1%
6	Fresno	75.5%	1.1%	2.6%	20.1%	0.7%	0.7%
7	Los Angeles	87.5%	1.1%	3.0%	8.4%	0.0%	42.4%
8-R	Riverside	55.0%	15.2%	7.5%	17.6%	4.6%	6.8%
8-SB	San Bernardino	54.2%	17.3%	10.3%	14.5%	3.8%	5.2%
10	San Joaquin	66.4%	0.6%	10.8%	20.9%	1.3%	1.8%
11	San Diego	57.7%	0.8%	7.2%	33.5%	0.8%	12.8%
12	Orange	64.2%	3.7%	4.3%	26.2%	1.6%	8.0%
Average %		**73.4%**	**3.3%**	**5.4%**	**16.5%**	**1.4%**	**100.0%**

4.8 *Statewide FSP Total Assists by Vehicle Location*

Table 12: Total Assists by Vehicle Location

Vehicle Location	Total Assists	Percent
In Lane	63,156	9.7%
On Left Shoulder	28,238	4.3%
On Right Shoulder	490,337	73.5%
Other	29,726	4.6%
Ramp / Connector	37,204	5.7%
Unable to Locate	2,781	0.4%
Total Assists	**651,441**	**100.0%**

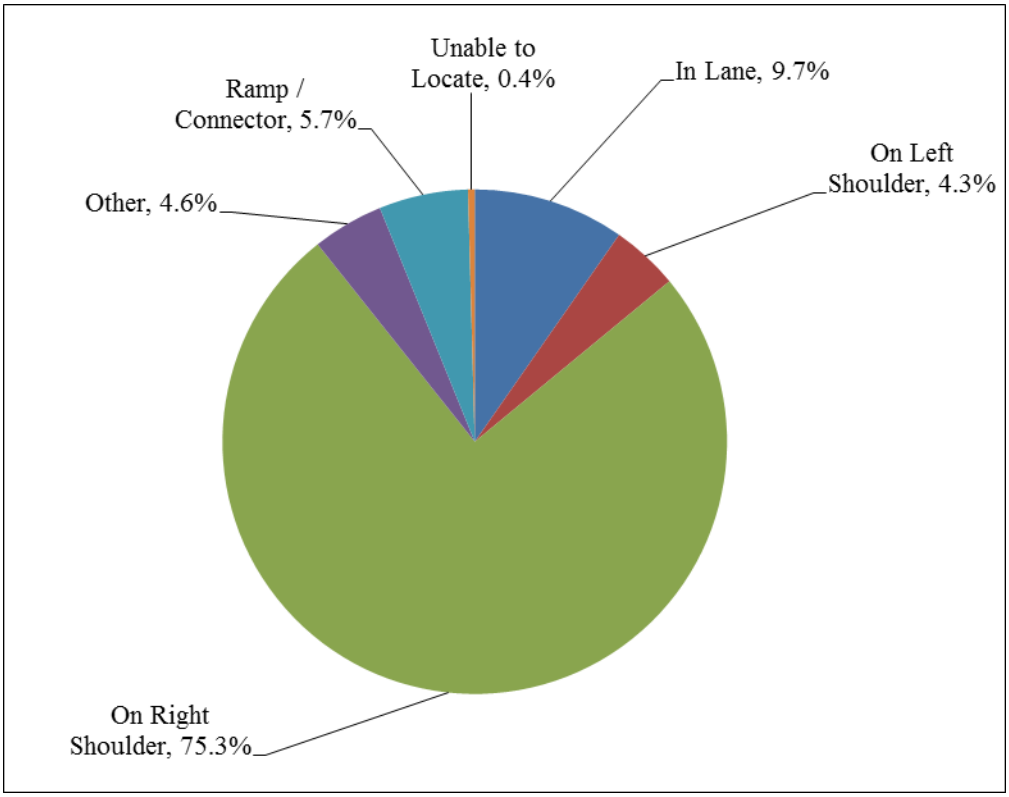

Figure 6: Pie Chart of Total Assists by Vehicle Location

4.9 *Statewide FSP Total Assists by Vehicle Location & Program*

Table 13: Total Assists by Vehicle Location & Program

Program	Name	In Lane	On Left Shoulder	On Right Shoulder	Other	Ramp / Connector	Unable to Locate	Total Assists
3-SY	Sac / Yolo	2,321	1,992	17,497	2,669	2,299	29	26,807
3-P	Placer	281	257	3,156	362	378	4	4,439
3-ED	El Dorado	48	37	715	92	21	0	913
4	Bay Area	10,109	5,773	75,278	0	14,904	0	106,064
5-M	Monterey	1,008	209	2,786	98	316	47	4,464
5-SC	Santa Cruz	217	94	901	90	97	115	1,513
5-SB	Santa Barbara	94	56	303	32	82	0	567
6	Fresno	665	446	3,389	367	2	0	4,869
7	Los Angeles	29,942	7,290	212,841	21,309	3,377	1,585	276,344
8-R	Riverside	4,481	1,657	33,445	470	3,803	220	44,076
8-SB	San Bernardino	4,316	1,229	24,310	560	3,496	230	34,141
10	San Joaquin	1,159	1,413	7,518	163	1,608	3	11,864
11	San Diego	3,902	6,170	64,064	3,214	5,286	548	83,184
12	Orange	4,613	1,615	44,133	299	1,536	0	52,196
Total Assists		**63,156**	**28,238**	**490,337**	**30,494**	**37,204**	**2,781**	**651,441**
Average %		**9.7%**	**4.3%**	**75.3%**	**4.6%**	**5.7%**	**0.4%**	**100.0%**

Table 14: The Percent of Total Assists by Vehicle Location & Program

Program	Name	In Lane	On Left Shoulder	On Right Shoulder	Other	Ramp / Connector	Unable to Locate	Total Assists
3-SY	Sac / Yolo	8.7%	7.4%	65.3%	10.0%	8.6%	0.1%	4.1%
3-P	Placer	6.3%	5.8%	71.1%	8.2%	8.5%	0.1%	0.7%
3-ED	El Dorado	5.3%	4.1%	78.3%	10.1%	2.3%	0.0%	0.1%
4	Bay Area	9.5%	5.4%	71.0%	0.0%	14.1%	0.0%	16.3%
5-M	Monterey	22.6%	4.7%	62.4%	2.2%	7.1%	1.1%	0.7%
5-SB	Santa Barbara	14.3%	6.2%	59.5%	5.9%	6.4%	7.6%	0.2%
5-SC	Santa Cruz	16.6%	9.9%	53.4%	5.6%	14.5%	0.0%	0.1%
6	Fresno	13.7%	9.2%	69.6%	7.5%	0.0%	0.0%	0.7%
7	Los Angeles	10.8%	2.6%	77.0%	7.7%	1.2%	0.6%	42.4%
8-R	Riverside	10.2%	3.8%	75.9%	1.1%	8.6%	0.5%	6.8%
8-SB	San Bernardino	12.6%	3.6%	71.2%	1.6%	10.2%	0.7%	5.2%
10	San Joaquin	9.8%	11.9%	63.4%	1.4%	13.6%	0.0%	1.8%
11	San Diego	4.7%	7.4%	77.0%	3.9%	6.4%	0.7%	12.8%
12	Orange	8.8%	3.1%	84.6%	0.6%	2.9%	0.0%	8.0%
Average %		**9.7%**	**4.3%**	**75.3%**	**4.5%**	**5.7%**	**0.4%**	**100.0%**

4.10 *Statewide FSP Average Assist Duration by Program*

Table 15: The Average Assist Duration by Program

Program	Name	Average Duration (minutes)
3-SY	Sac / Yolo	7.9
3-P	Placer	4.9
3-ED	El Dorado	12.0
4	Bay Area	13.9
5-M	Monterey	10.1
5-SC	Santa Cruz	13.9
5-SB	Santa Barbara	15.6
6	Fresno	10.1
7	Los Angeles	16.1
8-R	Riverside	10.3
8-SB	San Bernardino	10.4
10	San Joaquin	6.1
11	San Diego	9.9
12	Orange	15.2
Average Duration		**13.5**

Note: Only records with assist durations greater than zero minutes were included in average duration calculations.

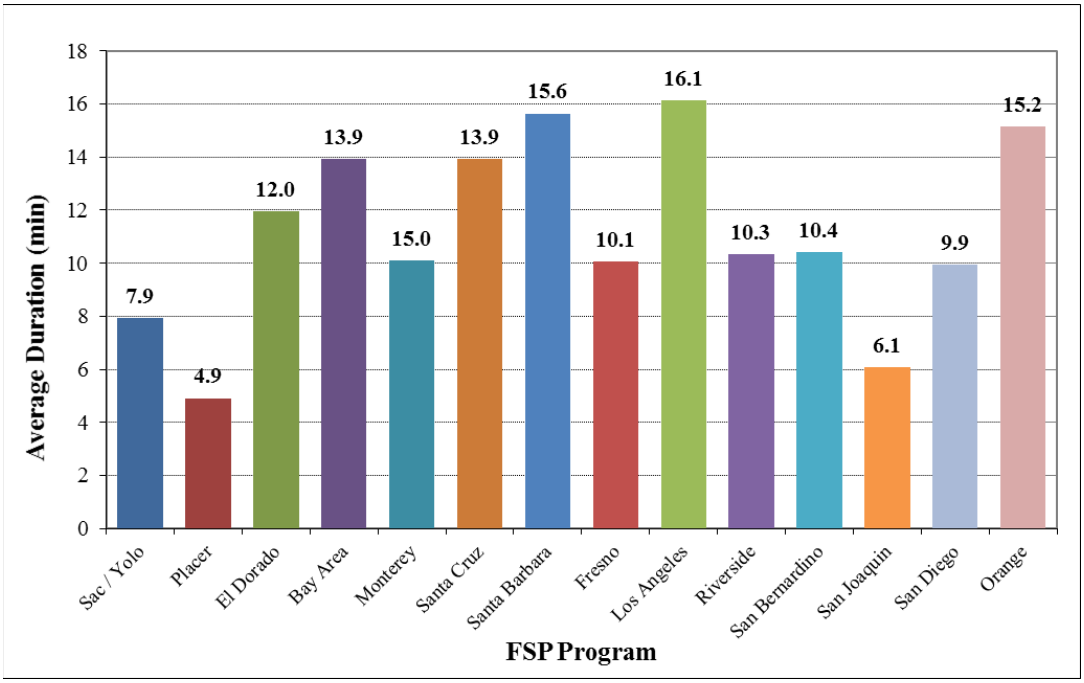

Figure 7: Bar Chart of Average Assist Duration by Program

4.11 *Statewide FSP Average Assist Duration by Problem Type & Program*

Table 16: The Average Assist Duration by Problem Type & Program

Program	Name	Abandoned	Accident	Debris Removed	Flat Tire	Mechanical Problems	Other*	Out of Gas	Over Heated	Average Duration
3-SY	Sac / Yolo	2.6	8.0	1.9	10.6	11.2	2.8	4.8	9.2	7.9
3-P	Placer	1.8	5.0	1.6	8.2	7.0	1.7	4.0	6.6	4.9
3-ED	El Dorado	10.6	11.9	15.4	12.9	17.5	6.1	4.9	6.9	12.0
4	Bay Area	6.3	21.4	16.6	17.2	20.9	8.3	9.0	14.8	13.9
5-M	Monterey	7.0	17.3	3.6	13.8	15.6	6.0	7.6	10.5	10.1
5-SC	Santa Cruz	12.3	17.3	8.9	11.2	17.4	12.7	9.3	14.2	13.9
5-SB	Santa Barbara	10.9	26.0	5.0	12.5	13.7	12.2	9.7	12.3	15.6
6	Fresno	4.6	16.4	8.7	8.9	8.3	7.6	5.9	10.0	10.1
7	Los Angeles	9.3	22.0	11.9	18.0	19.6	9.9	12.8	17.2	16.1
8-R	Riverside	6.2	14.0	5.6	15.5	18.0	4.7	9.5	14.2	10.3
8-SB	San Bernardino	6.6	14.8	7.2	15.0	17.7	5.4	9.3	13.6	10.4
10	San Joaquin	3.4	5.4	2.1	9.2	9.6	2.6	4.9	10.6	6.1
11	San Diego	5.7	15.1	8.3	13.4	14.1	5.8	8.2	11.8	9.9
12	Orange	11.2	14.7	11.6	20.4	15.6	14.8	11.5	14.5	15.2
Average Duration		**6.9**	**18.5**	**12.3**	**16.2**	**17.3**	**7.9**	**10.3**	**15.4**	**13.5**

Note:

- Only records with assist durations greater than zero minutes were included in the average duration calculations.
- The "Other*" category includes the assist records for refused service, informational assistance, unable to locate, drive off, service en route, and/or incidents with too little information.

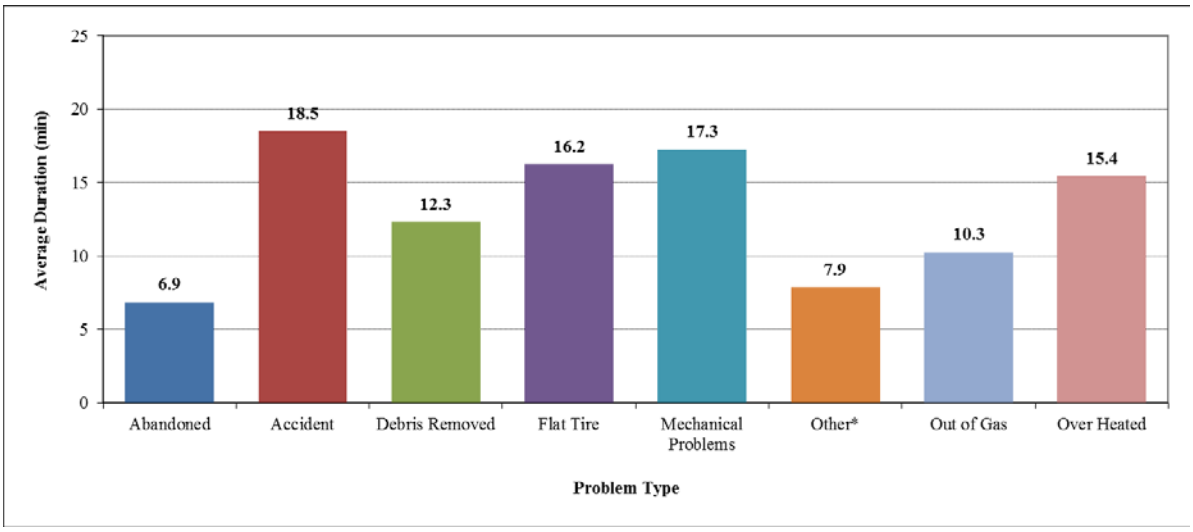

Figure 8: Bar Chart of Average Assist Duration by Problem Type and Program

4.12 *Statewide FSP Average Assist Duration by Vehicle Type & Program*

Table 17: The Average Assist Duration by Vehicle Type & Program

Program	Name	Auto / Van	Big Rig	Other / Unknown	SUV / Pickup	Trucks	Average Duration
3-SY	Sac / Yolo	8.3	9.7	6.2	7.8	8.6	7.9
3-P	Placer	5.3	3.9	2.3	5.1	5.2	4.9
3-ED	El Dorado	13.9	N/A	8.4	11.1	12.9	12.0
4	Bay Area	14.3	11.5	12.2	13.2	13.2	13.9
5-M	Monterey	11.2	14.3	5.1	10.3	N/A	10.1
5-SC	Santa Cruz	13.4	21.5	13.7	15.9	N/A	13.9
5-SB	Santa Barbara	16.0	25.9	13.6	14.4	14.7	15.6
6	Fresno	8.9	8.9	8.8	9.1	10.2	10.1
7	Los Angeles	16.2	15.4	15.6	15.7	N/A	16.1
8-R	Riverside	12.0	6.7	6.3	10.2	8.9	10.3
8-SB	San Bernardino	12.1	7.0	7.8	10.6	7.8	10.4
10	San Joaquin	6.5	5.8	3.6	5.8	8.8	6.1
11	San Diego	10.3	9.5	9.5	8.4	8.2	9.9
12	Orange	15.5	11.2	12.1	15.7	12.3	15.2
Average Duration		**14.3**	**9.2**	**10.3**	**11.7**	**10.6**	**13.5**

Note: Only records with assist durations greater than zero minutes were included in average duration calculations.

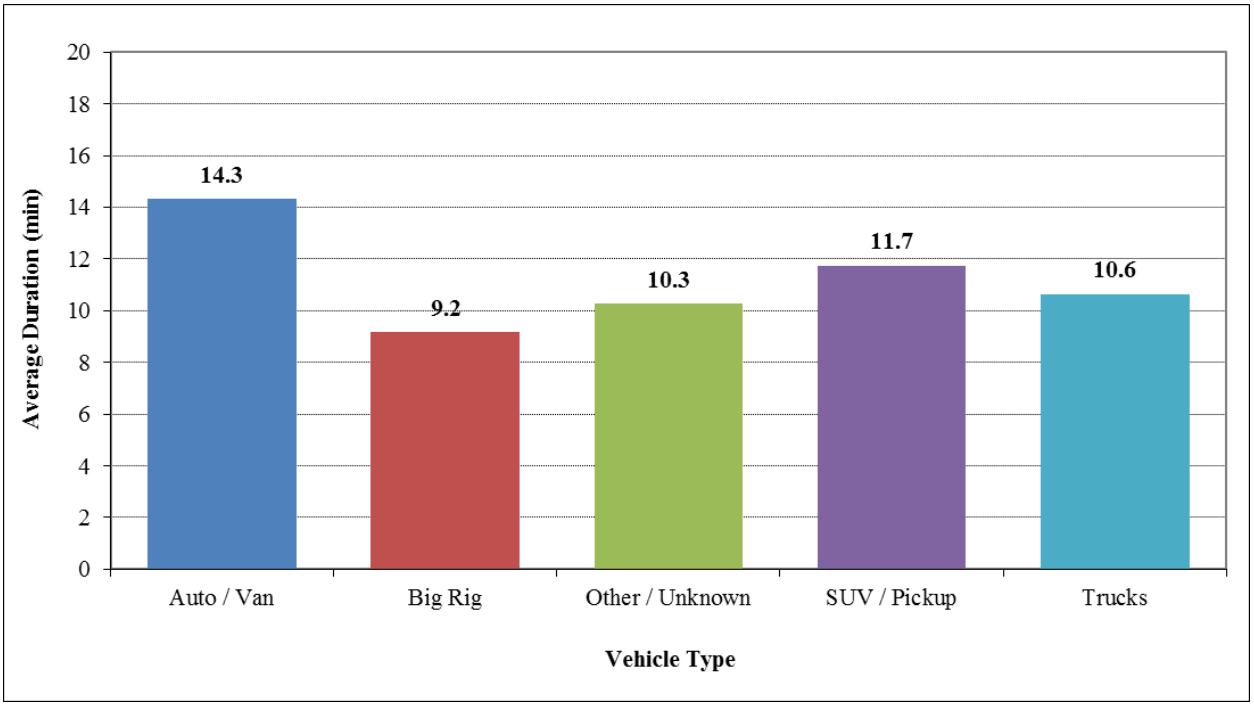

Figure 9: Bar Chart of Average Assist Duration by Vehicle Type

4.13 *Statewide FSP Average Assist Rate by Program*

Table 18: The Average Assist Rate by Program

Program	Name	Annual Assists	Annual Truck-Hours	Assist Rate
3-SY	Sac / Yolo	26,807	27,828	0.96
3-P	Placer	4,439	4,242	1.05
3-ED	El Dorado	913	1,364	0.67
4	Bay Area	106,064	151,621	0.70
5-M	Monterey	4,464	3,352	1.33
5-SC	Santa Cruz	1,513	3,690	0.41
5-SB	Santa Barbara	567	2,928	0.19
6	Fresno	4,869	4,375	1.11
7	Los Angeles	276,344	381,472	0.72
8-R	Riverside	44,076	38,808	1.14
8-SB	San Bernardino	34,141	29,568	1.15
10	San Joaquin	11,864	13,785	0.86
11	San Diego	83,184	94,540	0.88
12	Orange	52,196	78,628	0.66
Statewide		**651,441**	**836,201**	**0.78**

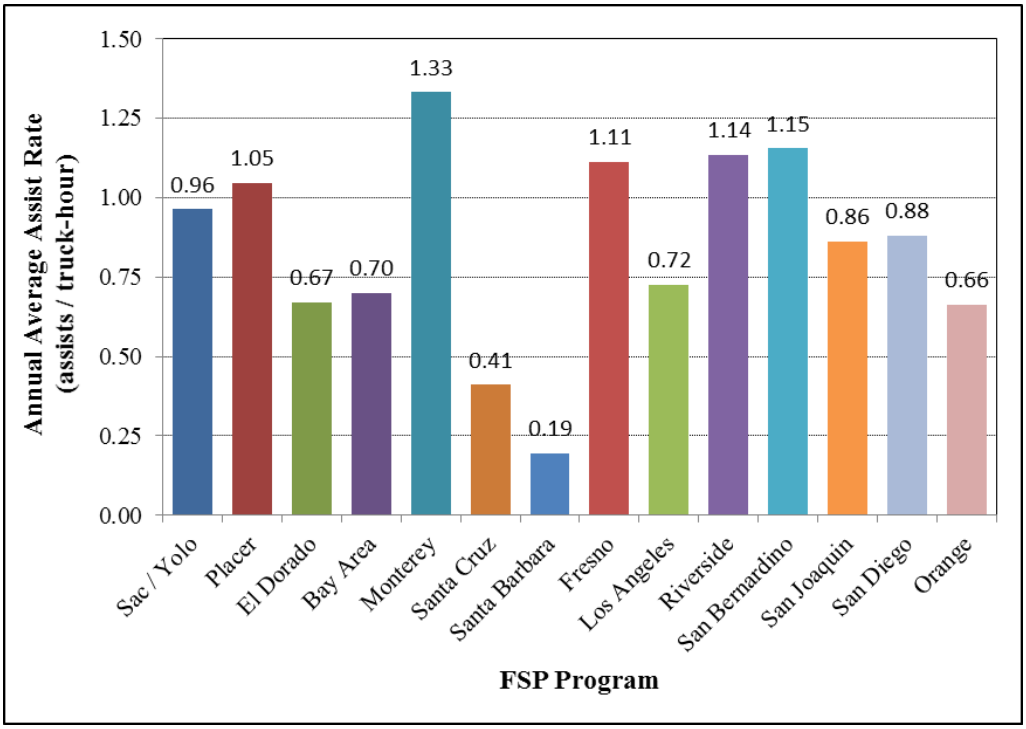

Figure 10: Bar Chart of Average Weekday Assist Rate by Program

Section 5: Statewide Reporting Procedures

This section reports on the FSP assist reporting procedures that were agreed upon by the FSP partner agencies in the 2004/05 FSP review and annual meeting. The statewide motorist aid committee recommended reporting procedures are listed first, and followed by observed data discrepancies.

5.1 *Consistent Assist Record set of Description Fields*

At a minimum, the following fields for each and every FSP Assist Record are required.

- FSP Program
- Beat
- Assist Date
- Arrival Time
- Departure Time
- Problem Type
- Vehicle Type
- Vehicle Location on Road
- Tow To
- How vehicle was found

5.2 *Data Coding and Categories*

Based on an agreement of the FSP technical committee, the standardized motorist assist description codes used to process the FSP program assist data is shown in the tables in the following sections.

5.2.1 Vehicle Type

Table 19: Standardized Vehicle Type Category

Code	Vehicle Type
1	Auto /Van
2	Motorcycle
3	SUV /Pickup
4	Truck
5	Big Rig
6	Other

5.2.2 Problem Type

Table 20: Standardized Problem Type Category

Code	Problem Type
1	Abandoned
2	Accident
3	Debris Removal
4	Drive Off
5	Electrical Problem
6	Flat Tire
7	Help En Route
8	Locked Out
9	Mechanical Problem
10	Other
11	Out of Gas
12	Over Heated
13	Refuse Service
14	Rollover
15	Unable to Locate
16	Vehicle Fire

5.2.3 Vehicle Location Category

Table 21: Standardized Disabled Vehicle Location Category

Code	Disabled Vehicle Location
1	In Freeway Lane
2	Left Shoulder
3	Other
4	Ramp/Connector
5	Right Shoulder
6	Unable to Locate

5.2.4 Towed To Location

Table 22: Standardized Towed to Location Category

Code	Towed to Location
1	Shoulder
2	Off Freeway
3	No Tow

5.2.5 Vehicle Found Category

Table 23: Standardized Found Category

Code	Found Category
1	Dispatched
2	Found by FSP Driver
3	Other

5.3 *Data Entry Errors*

During the processing of the FSP 2013-14 assist data, occasional random data errors were encountered. The errors were in the beat IDs, dates, times and some descriptive code categories. The errors consisted of data entries that were not within the range of valid pre-defined values. For example, assist records had invalid assist dates and start times that were after the end times. Many of the FSP Arrival and FSP Departure time errors resulted in negative durations that could not be used in the calculation of the average assist durations. Upon review of these errors, it appears these problems are most likely the result of data entry errors. These errors have become less frequent over the years as automated data management techniques have become more common.

5.4 *Reporting of "Other/Unknown/Blank" Problem Type*

The Problem Type category "Other/Unknown/Blank" category contains the count of not only the empty and unknown problem types but also the count of the problem types that do not easily fall in the condensed set of reported problem type categories. Combining these two different groupings of problem types takes information away from the data shown on the Problem Type statistical tables and graphs. The Problem Type category could be split into "Other" and "Unknown" for more accurate FSP Assist reporting.

5.5 *FSP Data Collection Reporting Categories by FSP Program*

The FY 2013-14 FSP assist data were visually inspected to determine the FSP assist data categories used by the FSP programs. All FSP programs collect the assist data for the following required FSP assist data categories:

- FSP Program
- Beat
- Assist Date
- Arrival Time
- Departure Time

There are some minor differences between the FSP programs for the FSP Assist data categories that describe the type of problem, FSP service provided, the vehicle's location and vehicle type. FSP assist data reporting categories are summarized in Tables 24 through 28:

- Table 24: Vehicle Type
- Table 25: Problem Type
- Table 26: Vehicle Location on Road
- Table 27: Towed-to Location
- Table 28: How Vehicle Was Found

The Sacramento/Yolo County (STA) and the Placer County (PCTPA) FSP programs use the same reporting technology and procedures (i.e., the same system and app). Similarly, the Riverside County (RCTC) and the San Bernardino County (SANBAG) FSP programs use the same reporting technology and procedures. As such, the STA & PCTPA programs are represented in a single column in Tables 24-28 as are the RCTC & SANBAG FSP programs.

Table 24 "Vehicle Type" Category

Vehicle Type	D-03 STA & PCTPA	D-03 EDCTC	D-04 MTC	D-05 TAMC	D-05 SCCRTC	D-05 SBCAG	D-06 Fresno COG	D-07 MTA	D-08 RCTC & SANBAG	D-10 SJCOG	D-11 SANDAG	D-12 OCTA
Motorcycle	●	●	●	●	●	●	n/a	●	●	●	●	●
Auto	●	●	●	●	●	●	n/a	●	●	●	●	●
Van		●		●	●		n/a	●	●	●	●	●
SUV	●	●					n/a				●	●
Pickup Truck	●	●	●	●	●	●	n/a	●	●	●	●	●
Truck – LTE 1 Ton	●		●			●	n/a	●	●	●	●	●
Truck – Over 1 Ton	●		●			●	n/a	●	●	●		
RV / Motorhome	●						n/a					●
Bus							n/a					●
Big Rig			●	●	●	●	n/a	●	●	●	●	●
No Assist Oversize		●					n/a	●	●	●	●	
Other / Unknown		●	●	●	●	●	n/a	●	●	●	●	●
Debris				●	●		n/a		●	●		●

Notes:
All FSP Programs track "Debris Removal" as a category in the "Vehicle Problem" question.
D-11 SANDAG and D-12 OCTA only have one truck category – "Box Truck".

Table 25: "Problem Type" Category

Problem Type	D-03 STA & PCTPA	D-03 EDCTC	D-04 MTC	D-05 TAMC	D-05 SCCRTC	D-05 SBCAG	D-06 Fresno COG	D-07 MTA	D-08 RCTC & SANBAG	D-10 SJCOG	D-11 SANDAG	D-12 OCTA
Abandoned	●	●	●	●	●	●	n/a	●	●	●	●	●
Accident	●	●	●	●	●	●	n/a	●	●	●	●	●
Debris Removal	●	●	●	●	●	●	n/a	●	●	●	●	●
Dead Battery			●			●	n/a					●
Drove Off			●	●	●		n/a				●	
Electrical	●	●		●	●		n/a	●	●	●	●	
Fire		●		●	●	●	n/a	●	●	●	●	
Flat Tire	●	●	●	●	●	●	n/a	●	●	●	●	●
Help En-route			●	●	●		n/a				●	
Info				●	●		n/a		●	●		●
Locked Out	●	●		●	●		n/a	●	●	●	●	
Mechanical	●	●	●	●	●	●	n/a	●	●	●	●	●
Other	●	●	●	●	●	●	n/a	●				
Out of Gas	●	●	●	●	●	●	n/a	●	●	●	●	●
Over Heat	●	●	●	●	●	●	n/a	●	●	●	●	●
Refused Service	●		●	●	●		n/a				●	●
Unable to Locate			●	●	●		n/a		●	●		●

Notes:
"Refused Service" includes the "None – Service Not Needed" and "No Service Provided" categories.

Table 26: "Vehicle Location" Category

Vehicle Location	D-03 STA & PCTPA	D-03 EDCTC	D-04 MTC	D-05 TAMC	D-05 SCCRTC	D-05 SBCAG	D-06 Fresno COG	D-07 MTA	D-08 RCTC & SANBAG	D-10 SJCOG	D-11 SANDAG	D-12 OCTA
Freeway Lane(s)	●	●	●	●	●	●	n/a	●	●	●	●	●
Left Shoulder	●	●	●	●	●	●	n/a	●	●	●	●	●
Right Shoulder	●	●	●	●	●	●	n/a	●	●	●	●	●
Ramp / Connector	●	●	●	●	●	●	n/a	●	●	●	●	●
Other	●	●		●	●	●	n/a	●	●	●	●	●
Unable to Locate	●			●	●	●	n/a	●	●		●	●

Notes:
D-07 MTA and D-12 OCTA had separate category for "Center Median".

Table 27: "Towed To Location" or "Did You Tow" Category

Did You Tow Categories	D-03 STA & PCTPA	D-03 EDCTC	D-04 MTC	D-05 TAMC	D-05 SCCRTC	D-05 SBCAG	D-06 Fresno COG	D-07 MTA	D-08 RCTC & SANBAG	D-10 SJCOG	D-11 SANDAG	D-12 OCTA
No Tow		●	●	●		●	n/a	●	●	●	●	●
Off Fwy Or Drop Zone	●	●	●	●	●	●	n/a	●	●	●	●	●
Pushed			●		●		n/a		●	●	●	
Shoulder						●	n/a	●	●	●	●	●
Other Location		●		●	●	●	n/a					
Unknown							n/a					●

Notes:
D-05 TAMC and D-05 SCCRTC tracked "Towed To" by individual drop zone locations.

Table 28: "Vehicle Found" or "How Found" Category

How Found Categories	D-03 STA & PCTPA	D-03 EDCTC	D-04 MTC	D-05 TAMC	D-05 SCCRTC	D-05 SBCAG	D-06 Fresno COG	D-07 MTA	D-08 RCTC & SANBAG	D-10 SJCOG	D-11 SANDAG	D-12 OCTA
CHP	•	•		•	•	•	n/a	•	•	•	•	
FSP – Found by You	•	•		•	•	•	n/a	•	•	•	•	
Other	•			•	•		n/a	•				
Partner Assist	•	•					n/a					
Revisit	•						n/a					

Notes:
D-04 MTC and D12 OCTA do not collect "How Found" Information.

Appendix A

FSP Beat Benefit/Cost Ratio Summaries (Fiscal Year 2013-14 Analysis)

FSP Beat Benefit/Cost Ratio Summary **District 3: Sacramento & Yolo Counties**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
10	2.5		2.5	1.0	2.5
106	3.0		3.0		3.0
108	8.5		8.5		8.5
108A	4.5		4.5		4.5
150	3.0		3.0		3.0
151	6.5		6.5		6.5
152	2.5		2.5		2.5
153	2.0		2.0		2.0
153A	3.5		3.5		3.5
181	2.5		2.5		2.5
182	1.0		1.0		1.0
182A	5.0		5.0		5.0
184	4.5		4.5		4.5
184A	8.0		8.0		8.0
191A	13.0		13.0		13.0
192	13.5		13.5		13.5
193	6.0		6.0		6.0
Average Benefit/Cost Ratio	**5.0**		**5.0**	**1.0**	**5.0**

FSP Beat Benefit/Cost Ratio Summary **District 3: Placer County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
265	5.5		5.5		5.5
281	4.0		4.0	0.0	4.0
281-A	5.0		5.0		5.0
Average Benefit/Cost Ratio	**5.0**		**5.0**	**0.0**	**4.5**

FSP Beat Benefit/Cost Ratio Summary **District 3: El Dorado County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	2.5		2.5		2.5
Average Benefit/Cost Ratio	**2.5**		**2.5**		**2.5**

FSP Beat Benefit/Cost Ratio Summary **District 4: Bay Area Counties**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	3.5		3.5		3.5
2	4.0	5.5	4.0	0.5	4.0
3	4.5	6.0	5.0	1.0	5.0
4	6.0		6.0		6.0
5	7.5		7.5		7.5
6	6.0	3.0	5.0		5.0
7	14.5		14.5		14.5
8	5.5		5.5		5.5
9	12.5		12.5		12.5
10	10.5		10.5		10.5
11	9.0	3.5	8.0	0.0	7.5
12	7.5		7.5		7.5
13	7.0		7.0	0.5	6.5
14	6.0		6.0		6.0
15	2.5		2.5		2.5
16	2.5		2.5	1.0	2.0
17	0.5		0.5	0.0	0.5
18	5.5		5.5		5.5
19	15.0		15.0		15.0
20	4.5		4.5		4.5
21	4.0		4.0		4.0
22	11.0		11.0	0.5	10.0
23	5.5		5.5		5.5
24	1.5		1.5		1.5
25	16.5		16.5		16.5
26	11.5		11.5		11.5
27	6.5		6.5	0.0	6.0
28	4.5		4.5		4.5
29	1.5		1.5	0.5	1.0
30	6.5		6.5		6.5
32	4.5		4.5		4.5
33	1.0		1.0		1.0
34	4.5		4.5	0.5	4.0
35	4.5		4.5		4.5
37	1.5		1.5	0.5	1.0
Average Benefit/Cost Ratio	**7.0**	**4.5**	**7.0**	**0.5**	**7.0**

FSP Beat Benefit/Cost Ratio Summary **District 5: Monterey County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	3.0		3.0	4.0	3.0
2	6.0		6.0	3.0	6.0
Average Benefit/Cost Ratio	**4.5**		**4.5**	**3.5**	**4.5**

FSP Beat Benefit/Cost Ratio Summary **District 5: Santa Cruz County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	2.5		2.5	3.0	2.5
2	3.0		3.0	2.5	3.0
Average Benefit/Cost Ratio	**3.0**		**3.0**	**2.5**	**2.5**

FSP Beat Benefit/Cost Ratio Summary **District 5: Santa Barbara County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	2.0		2.0		2.0
2	1.0		1.0		1.0
3	5.5		5.5		5.5
Average Benefit/Cost Ratio	**2.5**		**2.5**		**2.5**

FSP Beat Benefit/Cost Ratio Summary **District 6: Fresno County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	5.0		5.0		5.0
2	3.0		3.0		3.0
3	2.5		2.5		2.5
4	6.5		6.5		6.5
Average Benefit/Cost Ratio	**4.0**		**4.0**		**4.0**

FSP Beat Benefit/Cost Ratio Summary **District 7: Los Angeles County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	12.5	15.0	12.5	17.5	13.0
2	11.5	16.5	12.0	6.5	11.5
3	5.5	19.5	7.5	6.0	7.5
4	11.5	25.5	13.0	5.0	12.5
5	14.0	44.5	18.0	7.5	17.0
6	8.5	23.5	11.0	6.0	10.5
7	6.5	18.5	8.0	7.5	8.0
8	3.5	8.5	4.0	2.0	4.0
9	8.0	23.0	10.0	5.5	9.5
10	4.0	9.5	5.0	5.0	5.0
11	6.0	7.0	6.0	2.0	5.5
12	10.5	16.5	11.5	4.0	11.0
13	14.0	22.5	15.0	3.5	14.0
14	14.5	9.5	13.5	3.5	12.5
16	24.5	48.0	28.0	23.0	27.5
17	4.5	14.0	5.5	4.0	5.5
18	10.5	6.5	9.0	2.5	8.0
19	9.0	19.5	10.0	3.5	9.5
20	8.0	11.0	8.5	3.5	8.0
21	10.0	15.5	10.5	0.5	10.0
23	17.5	18.5	18.0	2.0	14.5
24	8.0	1.5	6.5	0.0	6.0
27	13.0	11.0	13.0	4.0	12.0
28	3.5	7.0	4.0	8.5	4.5
29	12.5	11.5	12.0	2.0	11.5
30	9.5	15.0	10.0	0.5	9.5
31	4.0	5.0	4.5	3.0	4.0
33	7.5	1.5	6.5	0.0	6.0
34	14.0	20.5	15.0	2.0	13.5
36	3.0	0.0	2.5	0.0	2.0
37	6.0	8.0	6.0	1.5	6.0
38	5.5	5.5	5.5	0.5	5.0
39	15.5	19.5	16.0	5.0	15.0
40	10.0	23.5	11.5	3.5	11.0
41	2.5	0.5	1.5	1.0	1.5
42	5.0	7.0	5.5	2.0	5.0
43	10.5	19.5	12.0	3.5	11.0
50	13.5	13.5	13.5	3.5	12.5
51	8.0	10.0	8.5	4.5	8.0
Average Benefit/Cost Ratio	**9.5**	**14.0**	**10.5**	**4.0**	**9.5**

FSP Beat Benefit/Cost Ratio Summary **District 8: Riverside County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	6.0		6.0		6.0
2	4.0		4.0		4.0
4	46.5		46.5		46.5
7	6.0		6.0		6.0
8	4.5		4.5		4.5
18	18.0		18.0		18.0
19	3.5		3.5		3.5
25	7.5		7.5		7.5
26	10.0		10.0		10.0
Average Benefit/Cost Ratio	**11.5**		**11.5**		**11.5**

FSP Beat Benefit/Cost Ratio Summary **District 8: San Bernardino County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	17.5		17.5		17.5
2	6.0		6.0		6.0
3	6.5		6.5		6.5
4	10.0		10.0		10.0
5	4.5		4.5		4.5
6	25.5		25.5		25.5
7	3.0		3.0		3.0
8	8.0		8.0		8.0
Average Benefit/Cost Ratio	**10.0**		**10.0**		**10.0**

FSP Beat Benefit/Cost Ratio Summary **District 10: San Joaquin County**

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
1	1.5		1.5	0.5	1.5
2	5.0		5.0	0.5	4.5
3	1.5		1.5	0.0	1.0
Average Benefit/Cost Ratio	**2.5**		**2.5**	**0.5**	**2.5**

FSP Beat Benefit/Cost Ratio Summary — District 11: San Diego County

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
851	6.0		6.0		6.0
852	4.5	0.5	3.5	0.5	2.5
501	13.0		13.0		13.0
503	9.0	0.5	6.0	1.0	5.0
541	8.0		8.0		8.0
125	6.0	1.5	5.5	1.5	5.0
941	5.5		5.5		5.5
505	6.5	0.5	4.5	2.0	4.0
151	4.5		4.5		4.5
152	7.5	2.0	6.0	1.5	5.0
163	11.0		11.0		11.0
522	6.5	1.0	6.0	0.5	5.0
801	6.0		6.0		6.0
802	6.0	4.5	5.5	2.0	4.5
506	3.0		3.0		3.0
521	8.5	0.0	6.0	0.5	4.5
853	3.0	0.0	2.0	0.5	2.0
854	4.0	2.5	3.5	2.5	3.5
508	7.0		7.0		7.0
509	1.5		1.5		1.5
153	5.5		5.5		5.5
154	8.5		8.5		8.5
781	10.5		10.5		10.5
782	7.5		7.5		7.5
951	10.0		10.0		10.0
100	4.5		4.5		4.5
200	4.5		4.5		4.5
300	3.0		3.0		3.0
400	3.5		3.5		3.5
500	6.0		6.0		6.0
600	4.5	0.5	3.5	0.5	2.5
700	13.0		13.0		13.0
800	9.0	0.5	6.0	1.0	5.0
900	8.0		8.0		8.0
Average Benefit/Cost Ratio	**6.5**	**1.0**	**5.5**	**1.0**	**5.0**

FSP Beat Benefit/Cost Ratio Summary — District 12: Orange County

Beat	Peak Period Weekday B/C Ratio	Midday Weekday B/C Ratio	Weekday B/C Ratio	Weekend B/C Ratio	Combined B/C Ratio
910	1.5		1.5		1.5
911	4.5		4.5		4.5
912	7.0		7.0		7.0
913	17.5		17.5		17.5
573		8.0	8.0		8.0
225				5.5	5.5
914	4.5		4.5		4.5
915	4.0		4.0		4.0
916	2.0		2.0		2.0
922				1.0	1.0
220	3.0		3.0		3.0
221	8.0		8.0		8.0
222	8.0		8.0		8.0
223		2.5	2.5		2.5
224		2.0	2.0		2.0
405	16.5		16.5		16.5
406	16.0		16.0		16.0
407	8.5		8.5		8.5
408	12.0		12.0		12.0
409	17.5		17.5		17.5
410	13.5		13.5		13.5
411	6.0		6.0		6.0
501	1.0		1.0		1.0
502	21.0		21.0		21.0
500		1.5	1.5		1.5
503	27.5		27.5		27.5
504	23.5		23.5		23.5
505	12.5		12.5		12.5
506	11.5		11.5		11.5
511				6.0	6.0
512				2.0	2.0
513		5.5	5.5		5.5
507	10.5		10.5		10.5
508	12.0		12.0		12.0
509	7.0		7.0		7.0
510	2.0		2.0		2.0
570	3.5		3.5		3.5
571	9.0		9.0		9.0
572	5.5		5.5		5.5
551	4.0		4.0		4.0
552	12.5		12.5		12.5
555		3.5	3.5		3.5
553	17.5		17.5		17.5
554	3.5		3.5		3.5
550		2.5	2.5		2.5
Average B/C Ratio	**9.5**	**3.5**	**9.0**	**3.5**	**9.0**

Appendix B

Current FSP Assist Data Collection & Management Technologies

FSP Program	Paper or Electronic Reporting	AVL Vehicle Tracking	Data Transfer Technology (Tow provider to Managing Agency)
Sac/Yolo STA	small business solution (mobile workforce management)	yes	electronic, real-time
Placer PCTPA	small business solution (mobile workforce management)	yes	electronic, real-time
El Dorado EDCTC	small business solution (mobile workforce management)	yes	electronic, real-time
Bay Area MTC	enterprise system	yes	electronic, real-time
Monterey TAMC	iPAD mini with app (small business solution)	yes	electronic, twice daily (end of shift)
Santa Cruz SCCRTC	iPAD mini with app (small business solution)	yes	electronic, twice daily (end of shift)
Santa Barbara SBCAG	paper form (with motorist survey)	no	paper, monthly
Fresno Fresno-COG	paper form	no	paper, monthly
Los Angeles LAMTA	paper (scantron)	no	paper, monthly
Riverside RCTC	small business solution (mobile workforce management)	yes	electronic, real-time
San Bernardino SANBAG	small business solution (mobile workforce management)	yes	electronic, real-time
San Joaquin SJCOG	small business solution (mobile workforce management)	no	electronic, daily
San Diego SANDAG	paper (scantron)	no	paper, monthly
Orange OCTA	enterprise system	yes	electronic, real-time