Chapter 2. Data Collection

This chapter describes in detail the data collection efforts. The goal was to ensure participation by all 58 counties and 478[1] cities. SR 8 had set the bar high in 1999 by obtaining responses from 57 counties and nearly 400 cities, so this study could aim for no less.

2.1 Outreach Efforts

Tremendous efforts were made to reach all 536 agencies between April to August 2008. This included letters, emails, phone calls, and presentations at meetings and conferences by members of the Oversight Committee as well as by Nichols Consulting Engineers, Chtd. (NCE).

An initial database of over 900 contacts was compiled for all cities and counties. The data came from a variety of sources, i.e. the memberships of both CSAC and the League as well as NCE's contacts. Signup sheets from the Joint League Public Works Officers Institute/CEAC Spring conference in La Jolla (March 2008) were also included. The initial contacts focused on Public Works staff (Directors or engineers responsible for pavement/asset management) but later included City Managers, County Administrative Officers as well as RTPAs and MPOs (Metropolitan Planning Agencies).

Over 900 contact letters were mailed out the first week of April, 2008 (see Appendix A) with copies of the survey questionnaire and a fact sheet explaining the project. The letter was mailed out on Los Angeles County letterhead. Within 2 weeks, NCE made at least two follow-up phone calls to the recipients to ensure that they had received the letter and realized the importance of the study and survey. The original deadline for submittal of the survey questionnaire was April 30th, 2008.

However, by early May, it was clear from our follow up phone calls that most agencies needed more time to compile the information, particularly as the construction season commenced. Based on this input, the Oversight Committee decided to extend the deadline to August 31st, 2008 and assisted in making renewed efforts to get their members to respond.

In addition, presentations were made at a variety of meetings and conferences to "spread the word". This included the spring conference in La Jolla as well as chapter meetings of the American Public Works Association (APWA) and at RTPA meetings.

2.2 Project Website

A website was designed and developed for this study at www.SaveCaliforniaStreets.org (see Figure 2.1). The intent of this website was to act as both an information resource on this study as well as a repository of related reports that may be of interest to cities and counties. More importantly, it was a portal to the online survey that is described in Section 2.3.

Figure 2.1 Home Page of www.SaveCaliforniaStreets.org Website

The domain name was registered for five years (expires February 27, 2013) and can be used for future updates after this study is completed. The website currently contains the following information:

- Home page
- Project status
- Reports for downloading
- Related Links
- FAQ
- Contact Us
- Participate in study – includes link to www.surveygizmo.com, which contains the online questionnaire as well as the ability to upload reports and other files to our ftp site.

2.3 Survey Questionnaire

A survey questionnaire was prepared and finalized in early April 2008 (see Appendix A). Briefly, it included a request for the following information:

1. Contact name and information
2. Pavements
    a. Pavement management software used, if any
    b. Network inventory data
    c. Distress survey procedures

   d. Pavement condition ratings and needs
3. Safety, Traffic and Regulatory Components
   a. Asset inventory
   b. Replacement costs
4. Funding sources and expenditures

The survey was also available online at www.surveygizmo.com so that agencies had the option to enter this information online. The advantage of this was that it automatically tracked the responses, and produced a database containing all the data.

Since the questionnaire was similar to others that had been sent out by the Metropolitan Transportation Commission in the San Francisco Bay Area and the Metropolitan Transportation Authority in Los Angeles County, agencies in these areas had the option of not filling out the questionnaire (in MTC's case), or only filling out portions (if you were in MTA's jurisdiction). Our analyses for these two regions depended to some extent on the data provided by MTC and MTA.

While the request for pavement information was relatively straightforward, there was more discussion on what elements of the safety, traffic and regulatory components should be collected. The original Request for Proposal identified the following elements to be of interest:

- **Storm drains**
- **Curb & gutters**
- **Sidewalks**
- **Traffic signals**
- **Street lights**
- Bicycle paths
- Bridges
- Corporate yards
- Curb medians
- Curb ramps
- Guardrails
- Heavy equipment
- Parking lots
- Pathways
- Public parks
- Sewer - pipelines
- Sound/retaining walls
- Speed bumps
- Storm damage costs
- Traffic circles
- Traffic signs
- Trees

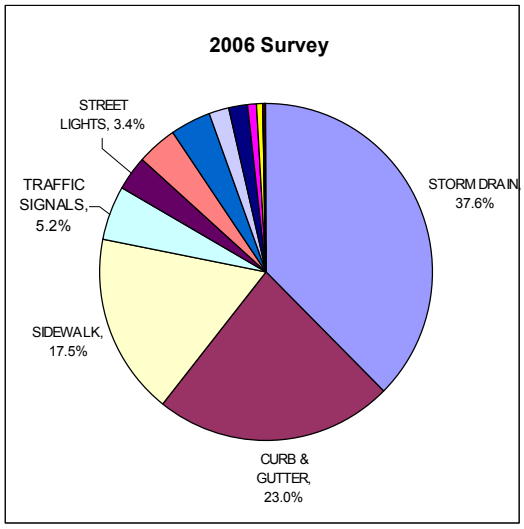

Figure 2.2 Replacement Costs of Safety, Traffic & Regulatory Components from MTC study[7]

However, a survey conducted by MTC in 2006[7] on over 100 agencies indicated that the top five categories (highlighted in bold/blue above) comprised almost 90% of the total value (see Figure 2.2). Therefore, it was agreed that the survey questionnaire would only include these five categories as well as the following six other categories:

- Curb ramps

[7] *Non-Pavement Needs Assessment*, Metropolitan Transportation Commission, Oakland, CA, October 2007.

- Sound/retaining walls
- Traffic signs
- NPDES (National Pollutant Discharge Elimination System) requirements
- Other ADA (American with Disabilities Act) compliance needs
- Other physical assets/expenditures that comprised >5% of total costs, e.g. heavy equipment, corporation yards, etc.

The intent of reducing the number of elements was to reduce the burden of data collection/reporting for the agencies by focusing only on those that represented the highest costs. However, the primary reason to include the costs of curb ramps, ADA and NPDES was to capture the impacts of the ever-changing regulatory climate.

2.4 Results of Data Collection

By September 2008, the data collection phase was essentially completed, although a late entry was received in early November. A total of 415 agencies responded to the survey – 56 counties and 359 cities. This represented more than 76% of the agencies surveyed, but more importantly, it represented more than 93% of the total centerline miles of local streets and roads in the state (see Figure 2.3). This was an incredible launch to this study; by comparison, many national surveys performed by the National Cooperative Highway Research Program (NCHRP) have survey responses of less than 30%.

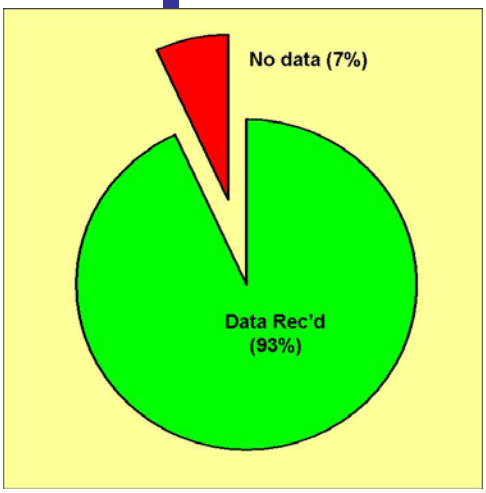

Figure 2.3 Responses to Survey (% centerline miles)

Both large and small (in terms of size of pavement network) agencies responded – the largest was the City of Los Angeles with over 6,500 miles, and the smallest was the City of Hidden Hills, with only 0.3 miles.

Many of the missing 130 agencies were contacted multiple times, either by NCE or by members of the Oversight Committee. In some instances, they reported no data available, or that they were currently performing an update of their system. More frequently, they reported a lack of resources to collect the information requested – this was particularly true of many of the smaller cities.

93% of the state's local streets and roads are included in this study.

Only two counties did not submit any data – San Benito County and Mono County. In the case of Mono County, NCE's archives contained a PMS database that was approximately five years old – this was used to project the current conditions. In the case of San Benito County, neighboring agencies were used to arrive at the current condition. This is further discussed in Chapters 3 and 4.

Of the data received, 97% of the responding agencies reported inventory data, and 93% reported information on their pavement needs. Encouragingly, 72% also reported some data on the safety, traffic and regulatory components – this was positive given that it was probably the first time a statewide survey had requested this information.

2.4.1 Are Data Representative?

Throughout the data collection phase, it was important to ensure that the data received were representative in nature. This was critical for the analyses – the criterion used was network size.

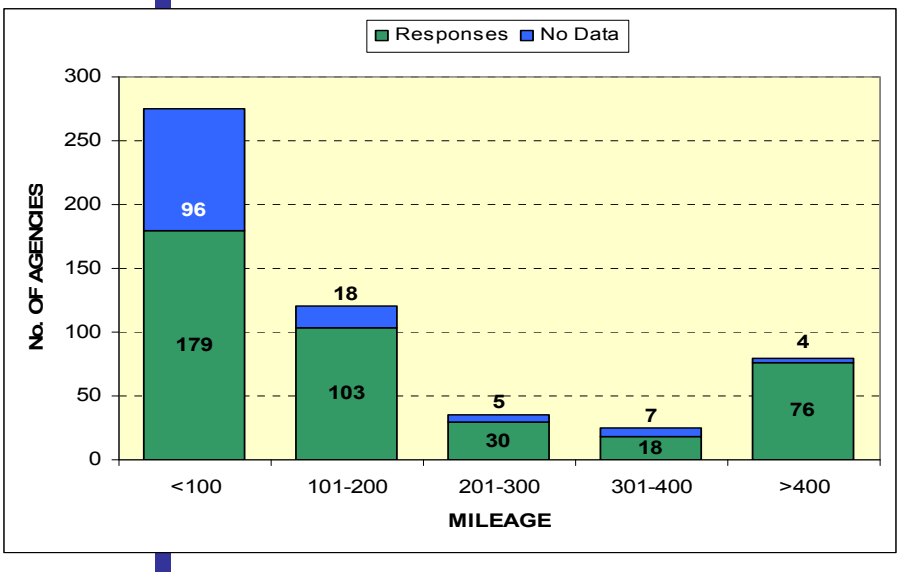

Figure 2.4 Distribution of Agency Responses by Network Size (Centerline miles)

The distribution of responses with respect to network size is shown in Figure 2.4. Small agencies are those that have less than 100 centerline miles; medium between 101 to 300 miles, and large agencies have more than 300 miles.

Figure 2.4 shows all the agencies who responded in green, and the ones who did not in blue. Clearly, the bulk of the agencies who did not respond had less than 100 miles of pavement network i.e. small cities, but we still had 179 responses (65%) in this size category, so our confidence in the responses were validated.

An important point to note is that small agencies account for a very small percentage of the state's pavement network. There are 275 Cities with less than 100 centerline miles of streets, and 167 Cities with less than 50 centerline miles of streets. However, they comprise only 8.7% and 3.2% of the total miles in the state, respectively. Their impact on the statewide needs is consequently minimal.

2.4.2 PMS Software

The survey responses showed that 85% of the responding agencies had some pavement management system (PMS) software in place (see Figure 2.5). The StreetSaver® (40%) and MicroPAVER (20%) software programs are the two main ones in the state, not surprising given their roots in the public domain and reasonable costs. StreetSaver® was developed and supported by the Metropolitan Transportation Commission (MTC) and MicroPAVER supported by the American Public Works Association (APWA).

The remaining agencies used a variety of PMS software, including:

- Cartegraph
- Stantec
- Infra Manager
- Windows PMS Pro
- Custom Excel/Access programs

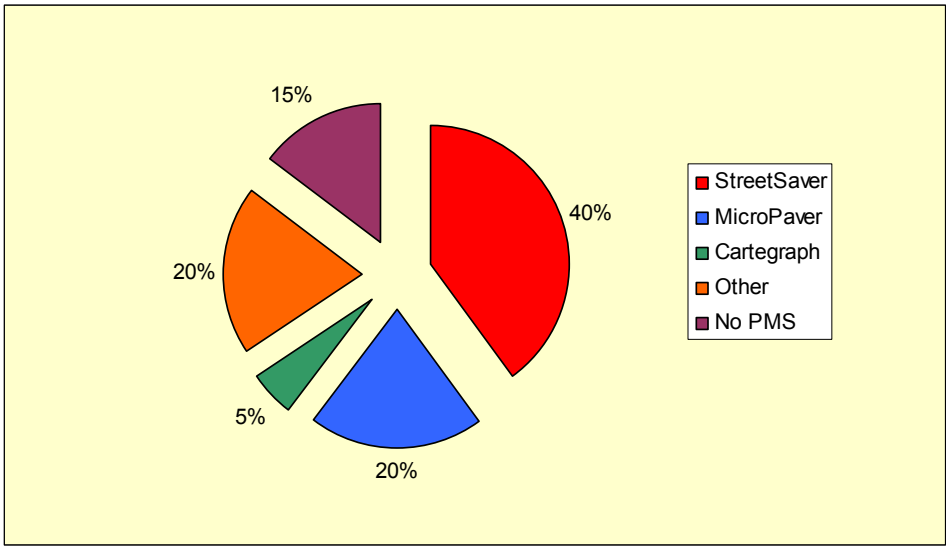

Figure 2.5 PMS Software Used from Survey Responses

2.4.3 Importance of PMS

It cannot be emphasized enough the importance of implementing and maintaining a pavement management system in an agency. Aside from the oft-mentioned benefits of one, it added tremendously to the quality of data received in this survey. The pavement distress survey procedures employed were probably the most important element. They were largely consistent and well-documented procedures (usually the StreetSaver® or MicroPAVER procedures) for collecting this information. Even those agencies which used other PMS software employed pavement distress survey procedures that were similar to those used by StreetSaver® or MicroPAVER.

Due to the widespread use of a PMS, the quality of the pavement data received contributed immensely to the validity of this study's results.

This resulted in a remarkable consistency in the pavement conditions reported, which in turn, allowed us to do an "apples and apples" comparison between agencies and reduced the complexity of this study. The quality of this information contributed immensely to the validity of the results of this study.

Equally important, almost all the medium and large agencies used a pavement management system, which lent more credibility to the results. Overall, 85% of the state's local pavement network was included in a PMS database.

2.4.4 Quality Assurance

The adage "garbage in, garbage out" applies to any data collection effort. Therefore, a quality assurance program was necessary to ensure that the data received was valid for our analyses. While it was not possible to check every single value supplied by the agencies in the surveys, several validation checks were made, particularly on those items that would have an impact on the analysis results. Examples are described below.

1. Inventory – an easy check was to validate the lengths (lane-miles, centerline miles) of the pavement network reported. This was compared with the lengths reported in the

HPMS (Highway Performance Monitoring System) data[2] and any significant differences (more than ±10%) were red-flagged and follow up phone calls made. Minor differences in these numbers were expected due to the many different ways that a pavement network can be sectionalized, e.g. bi-directional streets, double counting of intersections, inclusion or exclusion of unpaved roads, etc.

2. Lane-miles, areas and lane widths - Since we also asked for pavement areas, a quick check was to calculate the average lane-widths. Extreme values, such as widths more than 20 feet or less than 5 feet were flagged for follow up calls.

3. Math errors – surprisingly enough, there were multiple math errors, i.e. the individual components did not add up to the totals submitted.

4. Mismatching units – Particularly for the safety, traffic and regulatory components, the wrong units were used, e.g. feet instead of yards. Any extreme values identified became reasonable once the right units were applied.

5. Tests of reasonableness – in many cases, we had to use simple tests of reasonableness. For example, one medium sized city of 200 miles reported more than 1,300 traffic signals! Another small city with 33 miles reported future pavement expenditures of more than $500,000/mile, which is more than 20 times the state average. For the medium to large agencies, these results triggered a follow-up phone call to obtain explanations. In most instances, they were simple errors in data entry.

Our QA tests resulted in additional follow up calls to between 75 to 100 agencies. Again, we focused primarily on the medium to large agencies (i.e., more than 100 centerline miles) in this instance.

2.5 Summary

Overall, the number and quality of the survey responses received exceeded expectations and more than met the needs of this study. To obtain data on more than 93% of the state's local streets and roads network was a remarkable achievement. That 85% of the agencies that responded also had some pavement management system in place removed many obstacles in the technical analyses. In particular, the consistency in the pavement conditions reported contributed enormously to the validity of the study.

Finally, to obtain some data from 72% of the agencies on their safety, traffic and regulatory components was an encouraging first step.