
Appendix D

*Overview of Freight Transportation Survey
Procedures and Methods*

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Freight transportation is an integral part of economic activity. Evaluating current freight transportation capabilities and developing plans to meet future freight transportation demand is contingent on having the data and information necessary to make informed decisions. However, there are few, if any, procedures in place at the federal, state, or local level for the collection of the data and information needed. This appendix provides an overview of methods and procedures employed to collect data and information useful in the analysis and forecasting of freight demand.

NCHRP 8-30 Interim Report dated August 1993 discussed the findings of the extensive survey/interview program conducted by the study team with federal and state agencies, metropolitan planning organizations, ports, and airports. Among the questions asked was "What are the principal sources of freight data compiled and/or used by your agency?" The survey results revealed that states, MPOs, ports and airports utilize and, in large part, rely on data and information compiled and published by federal agencies and/or private and commercial sources for data related to freight movement and freight transportation. The principal state-level transportation databases are primarily truck-related and include vehicle registration, operating authority, fuel and other taxes, and safety. Data on commodity movements and origin/destination are limited as to the level of detail required or desired for forecasting and planning purposes. Of those agencies which do collect primary data, most do so sporadically or infrequently.

Gathering primary data on freight and traffic flows at the federal, state or local level is a costly and time-consuming process and data collection programs are rarely a funding priority. In addition, the dramatic regulatory, technological, and operating changes within the transportation industry have rendered many traditional and often modal-oriented data collection programs inappropriate for intermodal/multimodal planning purposes. While the freight movement and origin/destination data available from federal and commercial sources for the rail, water, and air modes are often adequate for planning purposes at the state and local level, comprehensive and detailed information on truck movements is inadequate in most cases.

Because the vast majority of all freight movements at some point move by truck, such information is critical to effectively planning and providing the infrastructure and facilities needed for efficient intermodal movement and transfer of freight. Accordingly, while the methods and procedures discussed herein could apply to all modes, there is particular focus on gathering data on truck movements.

A critical component of any data collection effort is survey sampling, since it would be virtually impossible and prohibitively expensive to collect data from every transportation carrier, facility, shipper, or location. It is much less expensive to gather data from a sample of the population, which, if drawn accurately, can provide reliable results. While there is no definitive way of selecting a sample size, generally the larger the sample, the more reliable the sample estimates.

In determining the optimal sample size, one must consider not only the survey design, but also logistics of implementing the survey. In the case of intercept, telephone surveys or personal interviews, this would include factors such as the number of interviewers, length of survey, traffic flow, time frame, location, etc. In the case of mail surveys, this would include reliability of mailing lists and points of contact, method of transmission and return (mail vs. fax or e-mail), etc.

A recent study prepared for the Metropolitan Transportation Commission (MTC) in Oakland, California¹ provides a comprehensive review of what has and is being done at the state and local level with regard to truck surveys and truck travel demand forecasting. While the methods and procedures discussed in the report related to actual truck travel surveys, most can also be applied to other modes of transport. The primary collection methods include:

- Telephone interviews generally yield a high response rate and facilitate follow-up; however, the survey must be conducted during normal business hours; the respondent may have limited time, data, or information available at the time of the initial contact and may be unwilling to return calls or accept follow-up calls; and may require mail or fax follow-up to verify data and information recorded by the interviewer. Depending on the sample size, time frame, and nature of the survey, the number and skills of the interviewers may make this method too costly.
- Mailout/mailback surveys are less costly, but generally have a lower response rate. The reliability and completeness of the response may

¹ Samuel W. Lau, *Truck Travel Surveys: A Review of the Literature and State of the Art*, prepared for the Metropolitan Transportation Commission, Oakland, California, January 1995. This report includes an extensive bibliography as well as 13 sample forms used in truck surveys throughout the U.S. and Canada.

depend on whether the survey form finds its way to the appropriate individual within an organization or company. This method also requires some type of tracking so that one can easily identify and follow up with non-responses. The follow-up may be done by telephone/fax, postcard reminders, or re-mail of the survey package.

- Combined telephone-mailout/mailback will generally yield a higher response rate than mailout/mailback; however, it is likely to be more expensive. One variation of this procedure involves contacting a company by telephone to advise that a survey form is being mailed and identify the appropriate department/individual to which the form should be addressed. In this manner, one can often determine whether a company is likely to respond and adjust the sample size accordingly. One can also utilize broadcast fax to distribute survey forms, although the quality of the transmission may affect the response.
- Roadside/intercept interviews are often used for truck surveys and generally yield a high response rate, offer better control over the sample, and enable the interviewer to respond to any questions the respondent may have when completing the form. The disadvantages of this method include potential disruption to traffic flow, safety hazards for the interviewers, less ability to follow up with respondents, the effect of factors such as weather, time of day, lighting etc. on implementation, and restricting the sample to a particular location rather than an entire region.
- Personal interviews are the most costly method of conducting surveys and generally involve a smaller, more select or targeted sample. This approach is particularly appropriate when assessing the feasibility of new or expanded facilities. Interviews with shippers to ascertain the demand for such facilities and interviews with carriers to determine whether they would consider providing/expanding service to/from the facility are critical to the decision-making process.

A paper presented at the 1995 Transportation Research Board (TRB) Annual Meeting² provides a comprehensive blueprint for gathering truck movement data and information on a statewide basis. The paper describes the methodology and procedures employed to interview a total of 30,000 truck drivers at 28 weigh stations located throughout the State of Washington. The interviews were conducted in each of four seasons to take into account seasonal differences in truck movements. The researchers established a goal of conducting 300 surveys over a 24-hour period at each survey site, and ultimately interviewed approximately 7500 drivers

² William R. Gillis, Kenneth L. Casavant, and Charles Howard, Jr., *Survey Methodology for Collecting Freight Truck Origin and Destination Data*, presented at the TRB Annual Meeting, Washington, D.C. January 1995.

during each of the survey periods. The following summarize the significant aspects of the methodology and procedures:

- The survey gathered information on vehicle configuration, origin and destination, highway route, cargo type, vehicle and cargo weight, and the use of intermodal facilities. Identification of routes was accomplished with the aid of a map attached to each questionnaire. The primary data collection sites included permanent weigh stations, ports of entry, and border crossings along major interstate and state highway corridors. The questionnaire was designed so that it could be completed within three minutes, with about half the questions answered by the interviewer through direct observation of the vehicle. Terms (such as "payload weight") that were not readily understood by truck drivers were identified during a pretest and replaced by simpler language (e.g., "the weight of the cargo being carried").
- Interview teams, totaling up to 90 people on any given day, were recruited from community service clubs, comprised of individuals with personal knowledge of local roads, industries, and transportation facilities. They were trained, supervised, and periodically evaluated by members of the project management team. Training included instruction in personal interviewing techniques, how to accurately identify different truck and trailer configurations, and safety procedures and requirements. Each team was provided with equipment ranging from clipboards and pens to reflective safety vests, headlamps, and hats. Each site was equipped with a survey crew sign and traffic cones. Cooperation and assistance was provided by uniformed Commercial Vehicle Enforcement Officers and Customs officials, helping to ensure the safety of the interviewers and, by directing selected trucks to the interview site, creating an atmosphere that produced a high response rate. Trucks were selected, on the basis of the sequence in which they were weighed, at a rate that made it possible for the interview to begin without delay.
- At each site, a member of the project management team was available to check completed questionnaires for accuracy and to address any problem areas with interview personnel. Weather and other unforeseen events also had an effect on the quality of data gathered, with some interviews conducted inside the scale house during particularly inclement weather. In addition, during high-volume traffic periods, there were occasions when enforcement and interviewing activities had to be suspended to enable traffic to clear. There were a few instances where interview activities were suspended for a period of time as a result of nearby construction activity or, in one case, a hazardous material spill.

Overall, the effort was highly successful, with a 95% response rate providing data and information for an extensive database of statewide freight and goods movement in Washington.

An additional area being addressed by some state and local transportation agencies is the effort to improve and support data collection programs. Many public agencies have followed the lead of private sector/commercial data providers and are seeking input from the current and potential users ("customers") of the data they collect. For example, the Minnesota DOT recently conducted a "Customer Survey" to determine whether the agency's current data products were adequate to meet the needs of users, whether and to what extent elimination of a particular data product would affect the customer, how current and frequent the data product must be to be useful, and how much historical data is necessary. The goal is to improve existing programs and products to better meet user needs, develop and seek ways for funding new programs and products, and eliminate those which are redundant or no longer useful.