A1B09: Committee on Freight Transportation Data
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Freight Transportation Data

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The Transportation Research Board (TRB) Committee on Freight Transportation Data pursues several goals:

- To identify and publicize sources of data—as well as the needs for data—on commodity movement, international trade, freight transportation, and the economics and organization of entities engaged in freight transportation;
- To advise data-collection agencies on cost-effective ways to fulfill essential data needs; and
- To assist analysts and decision makers in the effective use of freight transportation data.

As the new millennium approaches, several challenges face freight transportation:

- Logistics in a changing regulatory and technological environment,
- Impact of freight transportation service on global competitiveness,
- Energy and environmental concerns,
- Safety considerations,
- National security requirements, and
- Continued pressure to do more with fewer resources (*1*).

Appropriate data are fundamental to addressing these challenges. These data support two functions:

1. The identification and measurement of the impact of freight transportation on the transportation infrastructure, and
2. Integrated transportation planning, which considers the needs of freight transportation as part of an overall intermodal passenger and freight transportation system.

SOURCES OF FREIGHT DATA

A variety of freight transportation data are currently available, from microscopic, local survey data to macroscopic, national commodity flow data and from hard-copy improvement plans to digital data sets stored on electronic media. Sources of data include individual shippers, forwarders, and carriers; private vendors and consultants; and public

agencies (*2–9*). However, use and availability of this information are limited by several considerations:

- How can private companies provide information without compromising their competitive advantage?
- How do users identify the data needed to address their problems?
- How do users locate appropriate data?
- How do users decide whether the available data can be used to solve those problems?
- How can users link data sets?
- How do users acquire data that are not currently available or have not yet been collected?

Understanding these issues and the limitations of currently available data sets is the starting point. Several areas already have been identified as requiring new data or the new packaging of existing data; these are outlined below.

Small Area Commodity Flow Data

The degree of detail required to record small area commodity flow is necessary if data are to be modeled and assigned to regional highway and railroad networks. Currently, federal agencies are unable to release information for public use unless it is aggregated into multicounty zones; state and local agencies often do not have the resources necessary for gathering such detailed information.

Transborder Data

Under contract with the U.S. Bureau of the Census the U.S. government receives unpublished data on U.S. exports and imports, via rail, truck, water, and pipeline, with Canada and Mexico. Certain information, such as the Mexican state of destination for U.S. exports is coded and keyed by the U.S. Bureau of the Census. The U.S. Bureau of Transportation Statistics of the U.S. Department of Transportation (DOT) and the U.S. Army Corps of Engineers (water transportation) post public information files on their websites.

The major data element missing from information for U.S. exports and imports is weight. Obtaining weight data for surface modes of transportation will make it easier to compare the data against the water transportation data. This information is important to carriers, shippers, and others because freight weight is more useful and meaningful for transportation analyses than is freight value; it can more accurately and readily be translated into numbers of vehicles.

Currently, the Railroad Carload Waybill Sample required by the U.S. Surface Transportation Board does not retrieve data from most shipments that terminate in Canada (that is, on Canadian railroads). Few shipments from Mexico to the United States are recorded, and U.S. exports to Mexico are indicated as terminating at U.S. border points. With the growth of intercountry freight traffic under the North American Free Trade Agreement (NAFTA), a NAFTA waybill sample should be developed to record complete movements among the United States, Canada, and Mexico.

Small Railroad Data
Precise information about how many freight railroads operate in the United States is difficult to obtain. The American Association of Railroads conducted a survey of operating railroads in 1997 and received responses from 507 local and 34 regional railroads in addition to the Class I railroads. Is this the extent of this segment of the industry? Information about parameters such as trackmiles, the percentage of ties replaced, and major commodities hauled also would be useful.

Intercity Trucking Data
In addition to existing shipper-based surveys such as the Commodity Flow Survey (CFS), a carrier-based survey similar to that used for domestic water transportation might provide better routing information about origin, destination, value, hazardous materials designation, and weight. In contrast, shipper-based surveys are better linked to industrial activity. However, a carrier-based survey, or a national truck waybill sample, should be less burdensome and less costly as information technology improves. However, comprehensive trucking data are difficult to acquire either way, because a large proportion of fleets has fewer than 10 vehicles, is private, or is not the primary business of the owner.

Regional and Local Truck Trips
Data on truck trips from warehouses to retailers are needed to measure the demand on local infrastructure. The total number of trips to convenience stores, grocery stores, gas stations, and similar facilities might not vary greatly among cities with comparable populations. This pattern should reduce survey requirements.

National Freight Databases of Metropolitan Planning Organizations
Uses for these data include cordon-line checks, corridor travel, and inflow/outflow imputations.

Truck Trips
Two possibilities for quantifying truck trips include

- Vehicle inventory and use survey (VIUS) data-accessing procedures to make truck-trips-per-day data available to MPOs, and
- Conversion tables to determine the number of trucks from the number of tons by examining relationships between value and weight or between ton-miles and vehicle miles traveled.

A possibility for larger MPOs is the metropolitan statistical area-level data that will be provided by the 1997 CFS.

Time Dimension of Freight Data
Time recognition and tracking information could provide measures of our transportation system’s productivity. Issues such as just-in-time and next-day delivery as well as time-

sensitive commodities (fresh food) also must include temporal considerations in logistics and planning activities.

For many uses of freight data, linking data sets together could provide the requisite information to address issues. However, this task is difficult, if not impossible, to achieve because of limitations caused by several kinds of inconsistencies:

- In the terms, phrases, codes, acronyms, and collection tools between and across modes (locations, commodities, vessel and vehicle types, and facilities);
- In geographic codes and references across databases; and
- Between U.S. military, commercial, and public uses and time frames of the transportation infrastructure and the data collected to support evaluation and planning for those uses.

FREIGHT DATA COLLECTION

Current efforts to collect surface freight data consist primarily of surveys, whereas water transportation data are submitted by domestic carriers and by foreign shippers and carriers for each movement. CFS data are submitted by shippers in response to a survey from the U.S. Bureau of the Census. Rail waybills are submitted by rail carriers in response to a survey from the U.S. Surface Transportation Board. Local agencies and private consultants request information via surveys sent to local shippers, carriers, and forwarders. The burden is on the companies to provide freight data.

The potential for unobtrusive freight data-collection methods is very high, especially given the expansion of advanced technologies such as electronic data interchange (EDI), intelligent transportation systems for commercial vehicle operation (ITS-CVO), global positioning systems (GPSs), web site data retrieval and assembly, and automated freight-handling activities. Development and use of these technologies could provide several benefits, such as

- Less paperwork for survey-laded companies (e.g., shippers, carriers, consignees).
- Reduced burden from public and agency data collection requirements, while still maintaining the necessary data.
- Improved completeness, quality, and timeliness of data and statistics for decision making.
- Consistent information about hazardous materials, making it possible to link hazard codes and commodity codes.

FREIGHT DATA DISSEMINATION

Traditionally, freight data have been disseminated as hard copies of reports and tables, on magnetic tape and related media, and, more recently, over the Internet. As the Internet has become widely accessible to the public via the World Wide Web, it has become the preferred mode for providing users with data, either directly (as downloadable files) or indirectly (by informing users of data available for purchase).

For potential users, the biggest limitation of information dissemination via the Internet is knowing which data are available. For data providers, the biggest limitations are letting users know what is available and making hard-copy information accessible. One possible way to minimize these limitations is to establish processes across federal and state agencies

to maximize the distribution of data and products. Such procedures would cover the assessment of distribution media and the creation of supporting interagency and international teams to establish and implement standardized terms, codes, access protocols, and sharing protocols.

FUTURE DIRECTIONS

Freight movement will continue to be an integral part of the evaluation and planning of the transportation infrastructure. Users will become more comfortable with the interrelationship between freight and passengers, the evaluation of a seamless intermodal transportation system, and an effective working relationship between private and public sector partners. Data needs, sources, dissemination, and use will become unambiguous, and users will have access to necessary information to support informed decision making.

With rapidly advancing technological capabilities, private-sector professionals are moving quickly toward the use of real-time information for managing and optimizing freight handling and movement to minimize costs, maximize service, and meet regulatory requirements. The same information could provide the data required for public evaluation and planning purposes. Information from EDI and GPSs includes what kind of freight is being moved and how much, how and why it is being moved, when and where it is moving, and who is moving it. The challenge is to harvest and disseminate this information in a way that does not compromise the confidentiality of individual firms—hence their viability, competitiveness, and existence.

Ideally, as shippers and carriers generate electronic data for their own logistical and operational needs, the data would be filtered automatically and sent to a regulatory clearinghouse. There, the data would be processed to meet federal, state, and local regulations and requirements, then forwarded to the appropriate regulatory agencies. The same data also would be filtered and modified for public availability and use. However, availability is an issue that requires careful exploration. Similarly, publicly gathered information, such as weigh-in-motion, ITS-CVO monitoring, and travel-time and volume data also would be collected and made available to users through a clearinghouse with data-filtering and -linking options.

As we work toward the ideal system, several efforts could lead to more and better access to freight transportation data. These include

- Expanding interagency access to all federally collected transportation and trade data and statistics;
- Increasing public access to nonconfidential public transportation and trade data and statistics;
- Identifying data elements and aggregations of proprietary data that can be disseminated to the public while maintaining the proprietary nature of the data;
- Ensuring federal legislation to improve availability of federal transportation and trade data and statistics, such as within the Trade Secrets Act and Freedom of Information Act and promoting awareness of such legislation;

- Increasing interagency coordination to minimize both the public reporting burden and total federal costs;
- Boosting interagency efforts to create integrated statistical products; and
- Developing and applying a range of sophisticated data-fusion techniques, including simulation and statistical modeling, to fill gaps in freight flow data (*10*).

Challenges that face users and providers of freight data include allowing the private sector to maintain proprietary information while maximizing public information, resolving turf conflicts, and providing adequate funding. One of many challenges to data providers is understanding the broad mix of existing and emerging business and public uses and users of freight transportation data. Reaching this goal will require increased dialogue and reliable feedback mechanisms. Next, users will have to be educated about the existence, purpose, and limitations of the data that are provided.

Improving our understanding of how to incorporate freight transportation data into the evaluation and planning processes will involve the use of data and statistics from all available sources. This in turn will increase the demand for improvements in the completeness, quality, and timeliness of the data; in their collection, processing, and distribution; in ways to minimize the associated costs; and in assigning confidence limits on publicly distributed transportation data and statistics.

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