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North American Freight Transportation Data Workshop

May 15, 2007
Washington, D.C.

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North American Freight Transportation Data Workshop

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Transportation Research Board
Freight Transportation Data Committee and
International Trade and Transportation Committee

Kathleen Hancock, *Editor*
Virginia Polytechnic Institute and State University

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Preface

North American freight transportation data are important for understanding cross-border issues between Canada, Mexico, and the United States. Two Transportation Research Board (TRB) standing committees, the Freight Data Committee and the International Trade and Transportation Committee, initiated a conference to allow data users and providers to discuss freight transportation data from a North American perspective, highlighting recent changes in government-supplied data sources, and assessing users' needs for today and the future. The workshop showcased recent and innovative applications of cross-border and freight flow data to address important transportation, policy, and development issues and offered an interactive format for a diverse set of participants to engage in productive dialogue.

An ad hoc committee, chaired by Paul Bingham of Global Insight, Inc., and selected by the sponsoring committees, carried out the detailed planning for the workshop. This circular consists of individually attributed summaries. No language should be construed as consensus findings or recommendations on the part of workshop participants, the planning committee, or the sponsoring committees.

The planning committee represented cross-border freight data producers, analysts, and modelers. The 46 persons attending reflected organizational diversity as follows:

U.S. Department of Transportation	20%
International stakeholders	13%
Regional and state governments	13%
Consultant and private sector	24%
University	13%
Other	17%

The Research and Innovative Technology Administration and the Bureau of Transportation Statistics provided funding to support travel and on-site expenses.

—Kathleen Hancock, *Editor*
Virginia Polytechnic Institute and State University

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The Increasing Importance of North American Freight Data
Introduction to the Workshop

PAUL BINGHAM
Global Insight, Inc.

This introduction is intended to provide some context for the discussion of North American freight transportation data that was the subject of the workshop. The intent is to provide the rationale for why the topic of North American freight data matters to the researchers and the policy makers involved with Transportation Research Board (TRB).

Freight transportation is ultimately a consequence of the desire for goods, and cross-border freight transportation reflects the desire for the movement of goods between countries. If one considers just the North American goods trade between Canada, the United States, and Mexico, the first impression is that it is big and growing larger every year. By any of several measures of trade, the merchandise trades across the U.S. northern and southern borders are the largest in the world. And despite the recent attention in the popular press about Asian, especially Chinese, trade with the United States, total North American Free Trade Agreement (NAFTA) trade is still far larger, including the number one and number three U.S. trade partner countries Canada and Mexico, respectively. And unlike the rest of U.S. trade, NAFTA trade is predominantly cross border, instead of only seaborne and airborne, meaning that truck and rail transportation are significant for this trade. Consequently, the infrastructure, security, environmental, and efficiency aspects of border trade continue to be important across modes of transport.

The importance of data quantifying North American cross-border freight transportation derives from the benefits from trade. Starting in 1994 (and earlier with the U.S.–Canadian Free Trade Agreement), the Canadian–U.S.–Mexican NAFTA liberalized trade across the continent, significantly expanding cross-border economic activity and shipments. The subsequent increase in trade has been the result of businesses and consumers taking advantage of newly opened markets. The newly opened markets have reflected reduced prices for traded goods and services and increased quality and variety of products available to each country's consumers. Under NAFTA, all three countries' economies developed faster than they would have without the agreement. The affects of NAFTA on each country's economy have been complex with consumers and businesses affected through the new opportunities and new competition. Canadian, U.S., and Mexican importers have benefited from new access to neighboring country resources and labor. Exporters in each of the three countries benefited from an expanded, more open market (as long as the exporters' production was still competitive in the face of expanded competition). Increased trade resulted in job growth in the transportation and distribution sectors tied to trade, which was most visible in the border states and provinces with the highest volume gateway crossings. Finally, there have been shifts in economic–industrial geography across North America as a consequence of businesses and workers pursuing new opportunities and responding to new threats under NAFTA.

After the events of September 11, 2001 (9/11), there has been a concern with border infrastructure capacity and a new level of concern with environmental, safety, and security issues

that are threatening to impede further growth in trade and potentially limit the benefits of trade between the NAFTA countries.

The reasons for trade remain, however, as the underlying demand for goods by business and consumers continue to increase as the economies of the countries expand. Under NAFTA, competition-driven outsourcing of production and supply has lengthened and complicated North American supply chains, while substantially increasing trade volumes.

Trade policy liberalization and improved logistics management have been as important as improvements in transportation equipment and infrastructure in enabling North American freight flows to increase. However, trade growth under NAFTA has been uneven due to differences in economic performance, resource endowments, political conditions, infrastructure, and economic policy. This uneven growth in trade is likely to continue and remains a challenge to those planning for the future.

There are a variety of groups concerned with present and future North American goods trade activity and the statistics that quantify it. These groups include

- Trade community: importers, exporters, and intermediaries;
- Transportation industry: carriers, facility operators, railroads, and truckers;
- Government: federal, state, local—regulators and planners; and
- Others: consultants, media, lawyers, academic researchers, bankers, and equity investors.

The interests of these groups overlap but mirror their roles in trade as users, providers, regulators, and facilitators. What they have in common is a need for information on cross-border trade activity that is comprehensive in its coverage (i.e., not limited to one geographic area or transportation mode) and available consistently over time.

Federal freight transportation data programs have been developed to provide needed information. These programs provide national-level data to help address questions such as:

- What are existing and potential markets?
- What infrastructure is needed?
- What are implications from and for policy decisions?
- What are the emerging trends? What's changing?
- What resources are needed? Where to deploy them?
- Are we collecting all revenues due?
- What is the competition doing?

Federal freight data programs are also used to satisfy congressional mandates, and to reduce the need for patchwork data collection by states and metropolitan areas.

The uses of the data from the federal programs therefore are many. The cross-border policy, planning, and development issues for which the statistics are applied have become increasingly complex as the volume of trade and border crossings increase.

The workshop for which the material in this report was prepared covered a variety of applications of the North American cross-border data. The example applications addressed in the workshop included economic impacts of wait times, potential modal diversion analysis, border region environmental impact studies, forecasting border facility throughput demand, and analysis of geographic shifts in market share.

The desired outcome from the workshop is to assure that North American freight data continues to help decision makers address growing problems. The challenges that North American policy makers, investors, and managers face are growing and the data can help them alleviate challenges such as:

- Worsening congestion;
- Deteriorating travel times–delivery time reliability;
- Increasing freight transportation–logistics costs;
- Increased complexity of supply and services chains; and
- Increased impacts of existing border gateway activity on border communities and related trade corridors.

Ultimately, the data should help all those involved reduce the growing constraints on benefits from North American trade.

There were several objectives set out by the organizers of the workshop and these are as follows:

- Foster exchange among users and providers of North American border crossing and trade flow data;
- Learn about improvements that the U.S. Department of Transportation (DOT) Research and Innovative Technology Administration (RITA) has made in its primary North American transportation data programs, transborder freight data, and border crossing data;
- Demonstrate applications and capabilities of transborder, border crossing, and other trade flow data to address a wide range of policy, planning, and development issues, including trade corridor development; and
- Identify potential changes that would improve the usefulness of current North American border data programs.

These objectives were addressed in detail as covered in the remainder of the report.

Update on the Border Data Programs of the Bureau of Transportation Statistics

MICHAEL SPRUNG
STEVE BENINGO
Bureau of Transportation Statistics

On May 15, 2007, Michael Sprung and Steven Beningo of the Bureau of Transportation Statistics (BTS), demonstrated and discussed extensive improvements to the BTS international data programs. BTS, a component of RITA within the U.S. DOT, maintains two unique North American datasets, the Transborder Freight Data and Border Crossing/Entry Data.

The Border Crossing/Entry Data provides counts of vehicles, containers, and people crossing into the United States at U.S.–Canadian and U.S.–Mexican border ports. Data on incoming trucks, trains, personal vehicles, buses, passengers, pedestrians, and containers are available to the public monthly, from January 1995 to the present, though an online searchable database accessible at www.bts.gov/itt.

The TransBorder Freight Data, a special extract of official U.S. foreign trade statistics, provides monthly freight flow data by state, port, commodity, and mode of transportation. This unique data series covers shipments between the United States and Canada and the United States and Mexico by all modes of transportation. In response to customer feedback and thanks to advances in technology, a number of improvements have been made to the TransBorder data program since its inception in 1993. Expanded coverage, a powerful online data access tool, and new table structures are among the many improvements made in recent years.

Initially, the transborder data only included statistics on trade by land modes of transportation. Beginning in January 2004, air and vessel mode statistics were added to the dataset to provide a more complete picture of freight transportation between the U.S. and its NAFTA partners, Canada and Mexico.

To further improve the coverage and utility of BTS transBorder data, several additional changes have been made to the program since the addition of air and vessel modes in 2004. Beginning with January 2007 statistics, a new combination of port and commodity data was added, providing users with details on North American freight transportation not previously available.

While adding this new data, a simplified table structure for the raw data files was sought. Twenty tables from the old structure have been combined and replaced with three new, more usable tables. Each of these tables include all the same data elements available in the past, but combines the previously separate tables for imports, exports, Canada, Mexico, and air–vessel modes. The structure of these new tables allows users to conduct analyses that would have been time consuming or impossible with the previous table layouts. The need to have three tables instead of one is due to disclosure restrictions that prevent the combination of state, port, and commodity details in a single public table.

The new tables are structured as follows:

- Table 1 provides state and port detail;

- Table 2 provides state and commodity detail; and
- Table 3 provides port and commodity detail.

To increase the utility of both new and historical transborder data, BTS commissioned the development of a modernized web interface. In the past, user access to transborder data was limited by a restrictive searchable database, requiring the download and combination of many queries to conduct any extensive analysis.

The redesigned transBorder web interface, unveiled at the TRB Border Data Workshop in May 2007, enables users to analyze data by port, geography, and commodity for all modes in multivariable cross tabulations. The new interface integrates a dynamic search capability with a user-friendly and robust query function, enabling power users to develop advanced queries to suit their needs. The new interface also includes a "Fast Facts" component, which allows users to quickly and efficiently obtain ranked results on top freight flows between the United States and Canada–Mexico. Additional features of the new website include comprehensive metadata, and the ability to quickly and easily download monthly and annual data.

A demonstration on how to use and access information within the new transBorder website was provided to workshop attendees. Participants learned how to generate rankings of the top ports, commodities, and U.S. states using the "Fast Facts" feature. A detailed explanation and demonstration was also given on the "Query Detailed Statistics" feature of the website. A number of examples were provided, including queries that show the impact of unique events (such as major hurricanes) on international trade, the extraction of data on specific commodities, and freight flows between U.S. states and Canadian provinces or Mexican states. Attendee's were also introduced to the new data that allows users to make queries of commodity flows through individual customs ports. Finally, workshop attendees learned how to download and work with results to detailed queries, fast facts, and raw data tables.

Additional details and documentation regarding the TransBorder Freight Data are available on the BTS website, accessible at www.bts.gov/transborder.

Transforming North American Freight Data into Information

OVERVIEW OF FREIGHT IN THE U.S. DEPARTMENT OF TRANSPORTATION

Michael Onder, *Federal Highway Administration*

Figure 1 provides an overview of how freight fits into FHWA within the U.S. Department of Transportation (DOT).

Policy Team

Freight Analysis conducts research on commodity flows and related freight transportation activities, develops analytical tools, measures system performance, and examines the relationship between freight transportation improvements and the economy. An example of the type of work performed by this team is shown in Figure 2.

Technology Team

Freight Operations and Technology conducts operational tests of intelligent transportation system (ITS) technologies, supports the development of tools to evaluate infrastructure and operational needs at border crossings, and promotes the development of standards for information exchange. Figure 3 provides an example of a project performed by this team.

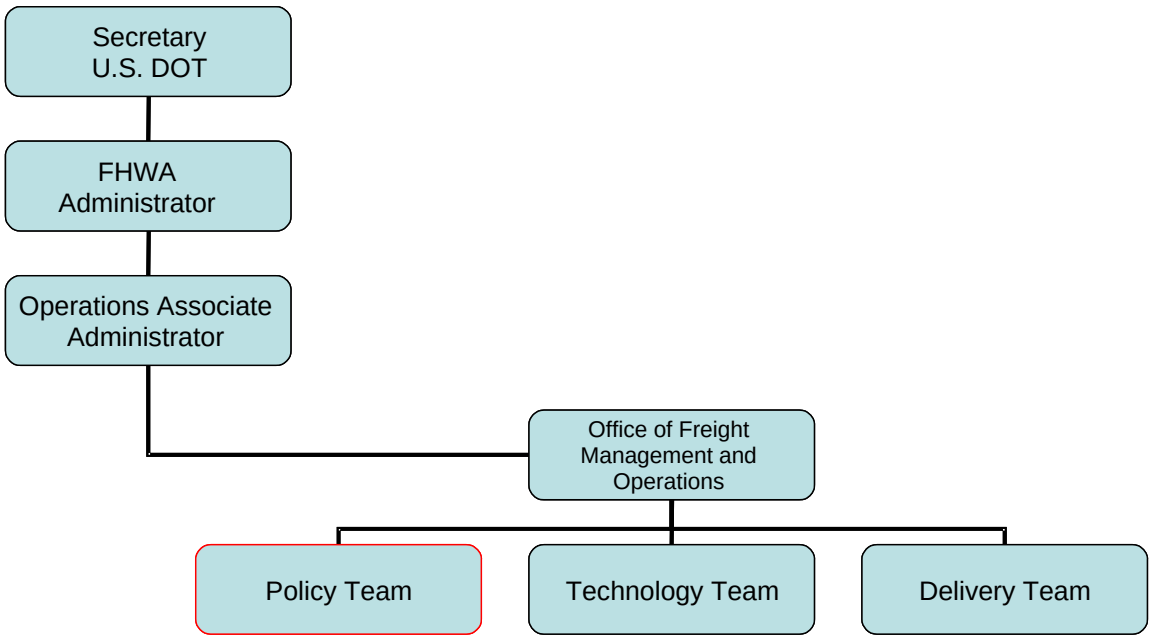

FIGURE 1 Freight in U.S. DOT.

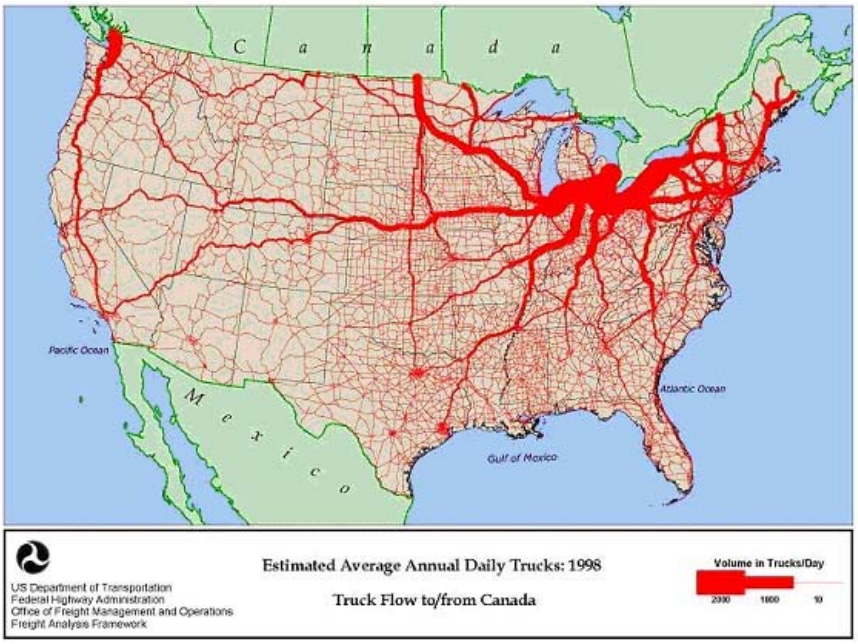

FIGURE 2 Example of work performed by the Policy Team.

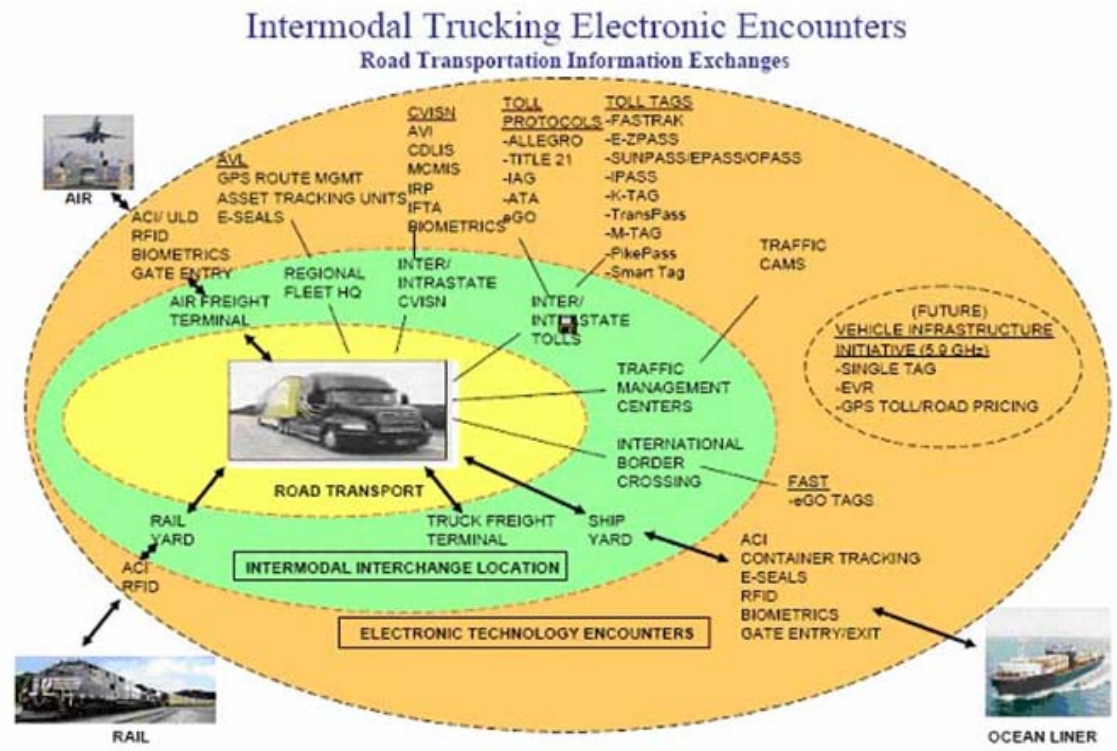

FIGURE 3 Example of a Technology Team project.

Additional Data

FHWA has access to some of the Customs and Border Protection data:

- ACE electronic manifest for collecting advance truck and cargo data;
- Status of system, deployment, and mandatory use of above;
- Transportation data elements for truck;
- Customs and Border Protection's (CBP's) relationship to U.S. DOT through the International Trade Data System (ITDS), specifically data sharing and enforcement for arriving trucks; and
- Other automated commercial environment (ACE) initiatives involving transportation and ITDS.

WORKING WITH CUSTOMS AND BORDER PROTECTION TO BETTER UNDERSTAND CROSS-BORDER FLOWS: URLS TO WEBLINKS

James Swanson, *Customs and Border Protection*

Swanson provided the following links to data programs:

- ACE eManifest pages—There are several presentations and frequently asked questions documents as well as sections on deployment, Federal Register Notices, and implementation guides with data element breakouts: www.cbp.gov/xp/cgov/toolbox/about/modernization/.
- A description of the ITDS: www.cbp.gov/linkhandler/cgov/toolbox/about/modernization/ace/what_is_itds.ctt/what_is_itds.pdf.

USE OF THE BUREAU OF TRANSPORTATION STATISTICS U.S.–MEXICO DATASET AND OTHER MEXICAN SOURCES TO ANALYZE INTERNATIONAL TRADE CORRIDORS AND POTENTIAL MODE DIVERSION

Juan Carlos Villa, *Texas Transportation Institute*

Increased global trade and major shifts in trade-flow patterns require tools and information to analyze impacts on the transportation system. U.S.–Mexico crossborder trade has more than tripled since the inception of NAFTA. This increased trade volume has resulted in congestion at border crossings and transportation corridors that required adequate planning. A comprehensive data set that contains sufficient detail to present a complete picture of international origin–destination (O-D) commodity flows is a fundamental element to perform adequate planning.

No single data source currently provides all the data needed to analyze binational commodity trade flow. BTS Transborder Freight Dataset provides state-to-state commodity flow information for U.S.-to-Mexico movements. The BTS file containing Mexico to U.S. data provides shipment weight, value, mode of transport, port of entry, and U.S. state of destination. However, this data set does not provide the Mexican state of origin. A methodology to obtain a proxy of Mexican trade flows to the United States by originating Mexican state was developed.

The results of this methodology provide a good approximation of the Mexico to U.S. trade flows with sufficient geographic distribution to complement the BTS U.S.–Mexico data set.

Several sources of information in Mexico were analyzed to identify statistical information to disaggregate BTS' Mexican origin information to the state level for each commodity. The Mexican Economic Census information, produced by the National Statistics and Geography Institute (Instituto Nacional de Estadística Geografía e Informática, INEGI) was found to be a good source of information as it reports Mexican Gross State Product for nine manufacturing categories.

Methodology

The methodology that was developed included the following steps:

1. The Harmonized Tariff Schedule of the United States Annotated (TSUSA) classifies Mexico to U.S. trade flows in 98 categories. These 98 categories were grouped into 22 aggregated categories or "sections." This aggregation into 22 sections facilitates the analysis procedure.
2. The nine manufacturing categories from the 1999 Mexican Economic Census information produced by INEGI were assigned to the 22 sections of the TSUSA as shown in Figure 1.
3. The total Mexican originated flows were distributed proportionally by commodity category to each Mexican state based on the value-of-production by state information from INEGI.

Application

The information resulting from this methodology in combination with the U.S.–Mexico state-to-state information produced by BTS was used to develop a complete set of O-D tables at the state

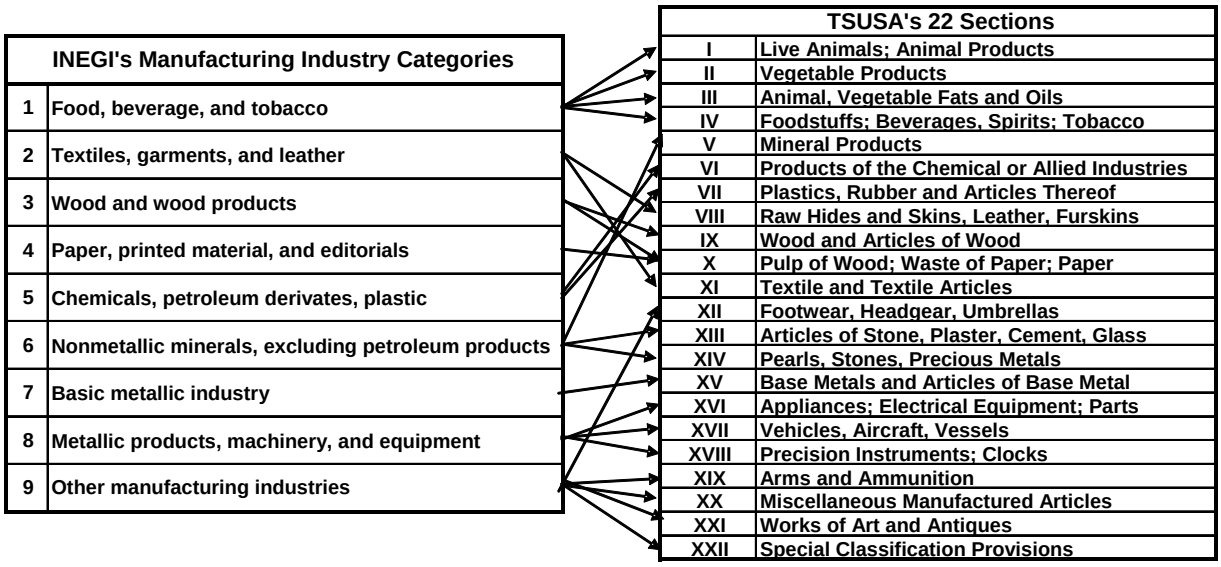

FIGURE 1 Mexican state manufacturing industry categories—TSUSA section category.

levels in both countries that was used to determine potential diversion from land modes of transport to short sea shipping in the Gulf of Mexico. This methodology was implemented during the Analysis of U.S.–Mexico Border Trade Targets for Short Sea Shipping study conducted by the Texas Transportation Institute (TTI) for the Gulf Ports Association of America.

States in southeast Mexico and the United States were grouped to form trade analysis zones (TAZs) to facilitate the analysis. Trade flows between the U.S. and Mexican TAZs were analyzed, eliminating those commodities that are not amenable to waterborne transportation and those flows with volume levels that would make a water move unfeasible. A sample of the results is shown on Figure 2.

It is important to note that the BTS data set, which is the baseline data for this analysis, provides the best approximation of U.S.–Mexico trade flows. However, the state of origin and destination that is reported does not necessarily reflect the true origin or destination of the commodities. The database captures geographic information from customs brokers or other supply chain participants that are not necessarily located where the shipment initiates or terminates.

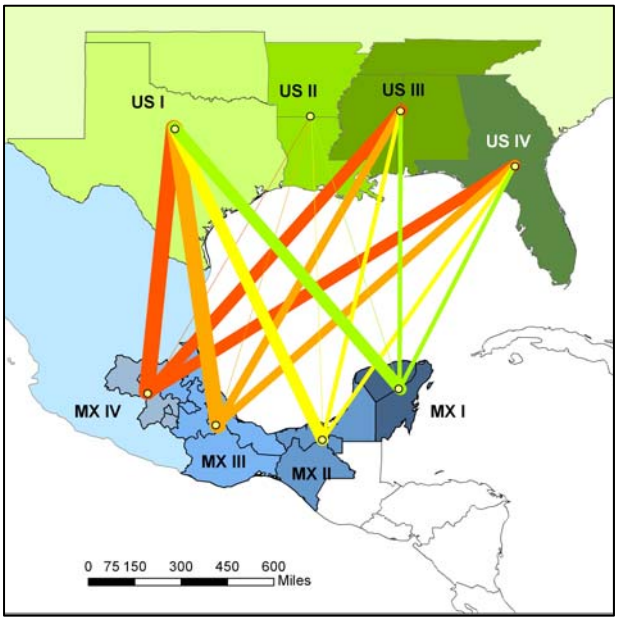

FIGURE 2 Mexico-to-U.S. sample zonal flows.

Improving North American Freight Data

USING OPERATIONAL TRUCK LOCATION DATA TO IMPROVE UNDERSTANDING OF FREIGHT FLOWS

Rob Tardiff, *Ontario Ministry of Transportation*

Each day in Ontario, Canada, approximately 200,000 trucks travel 1.4 million miles on our highways and carry goods worth $3 billion. Approximately 80% of Ontario's population is within a 2-h drive to the United States, resulting in highly integrated economies. Our economic relationship is visible with over 1 in 10 of Ontario's trucks (23,000) moving between our two countries carrying $700 million worth of goods daily. While traditional trade data provides a census of these financial transactions, supplementary data collection is required to promote informed investment decisions in support of freight from a traffic demand and operational characteristics perspective. Accordingly, the Ontario Ministry of Transportation (MTO) has invested in a patchwork of high-quality carrier freight data collection efforts with a trade focus and we are incrementally shifting from manual roadside surveys towards Electronic On-Board RecordS (EOBR) Global Positioning System (GPS) operational data.

Ontario's Freight Data Collection Framework: Roadside Surveys

In partnership with Transport Canada, as part of a national data collection effort, the MTO is presently conducting roadside truck surveys with a budget of US$4.3 million for Ontario alone and investing another $3 million in the continuous collection of traffic classification using a combination of weigh-in-motion and automatic traffic recorders (ATRs). These surveys are conducted with the full support of our enforcement officers and carriers provide their waybill information, allow us to weigh each axle, take measurements, and participate in a 7- to 10-min questionnaire where we gain detailed characteristics related to the vehicle, driver, carrier, trip, precise routing with stops, border crossings and commodity logistics details, and weight–volume. While this is a predominantly intercity survey, at several locations in Toronto, Ontario, where daily truck volumes reach 42,000, trucks are escorted off-highway to a secure site where the survey is administered.

Nationally, it is estimated that 110,000 surveys will be collected and expanded to the population of trucks passing through each of the approximately 350 directional survey sites. As a result, we are able to confidently simulate 70% of the known truck vehicle miles traveled (VMT) on our highways and gain 50% of VMT on local roads. Thus, even after completion of this intensive effort, notable data gaps exist.

Taking Stock of Where We Are: Assessing Client Needs and Future Issues

Until the late 1990s, the contribution of freight to our economies was highly undervalued and minimal knowledge of their movements was available. While trucks shared our roads with cars, in percent terms, trucks remained within a tolerable threshold. Retailers and manufacturers relied on large warehousing facilities to store stockpiles of commodities and these facilities were well connected to rail spurs. As just-in-time (JIT) logistics took hold, trucks began to dominate freight

movements and rail spurs vanished. Truck volumes have been increasing faster than autos and the auto driver perception of declining truck safety with wheel separations and increased collisions took hold. In general, highway system expansion, maintenance, and bridge rehabilitation has not kept pace with auto ownership, trip making, and truck demands. While rail and marine freight modal diversion are viewed as the answer, in reality these solutions may only contribute to further road congestion in urban areas, given the prime location of our ports and present saturation of freight activity in the vicinity of intermodal terminals where the relief is needed the most.

In Ontario, MTO has been very successful in heightening the awareness of freight with our coarse carrier roadside inventory type data. However, with the awareness goal realized, the same senior management is now looking to planners to develop performance measures and prioritize investments based on: reducing congestion costs, improving safety, building system redundancy, balancing investments across all modes and promote economic growth. We recognized that the data collection methods based on inventories used to increase the visibility of freight flows, volumes, and infrastructure loading–condition do not necessarily address the more complex operational awareness required to inform and prioritize this nature of investment decisions.

Following the guiding principals outlined in *Special Report 276: A Concept for a National Freight Data Program* (TRB, 2003) we have come to realize that a cost-effective freight data framework must build its strengths from a variety of corporate and third-party data sources that are less intrusive and that results and recommended outcomes be communicated clearly.

MTO and Ontario government have moved to a results-based planning approach to allocations. As part of this process, we took a critical look at our traditional freight data collection methods and concluded that an increased investment to improve the survey instrument, sampling, and geographic and seasonal coverage would not provide a dramatic benefit nor overcome operational data gaps. While existing Freeway Traffic Management Systems (FTMS) have the potential to identify travel speeds and congestion, their deployment is neither evenly distributed nor comprehensive across all highways and cities. In addition, while toll roads initially financed and constructed by governments and then leased to private consortiums are equipped with advanced FTMS, this information is not shared with government agencies in a timely manner. While our current commercial vehicle operations (CVO) data is rich with intercity volume, routing, and value of goods, the required data to address freight travel speeds and the cost of congestion remained distant.

Electronic On-Board Recorders and Carrier Fleet Management Global Positioning System

In year 2001, in the interest of monitoring border transit times and bring clarity to the perception that our borders were clogged, Transport Canada–Ontario Region reviewed a variety of existing industry-based technological solutions adopted by carriers. These routing, operations, and travel time technologies included tachographs, GPS, and even more advanced satellite systems with two-way communications. They concluded that a recently incorporated company (2001), Turnpike Global Technologies (TGT), an Ontario-based company, provided the motor carrier industry with an attractive GPS reporting services including fuel and mileage tax (IFTA), hours-of-service compliance, electronic trip sheets, and fleet management reporting.

In April 2007, TGT provided services to 18,000 trucks each day traveling 1.2 million miles. Approximately, 4,000 of the trucks were domiciled in the United States, and Canadian carriers travel extensively in the United States, adding to our probe routing and travel operations knowledge. The client base for TGT has been doubling every 8 months, providing greater opportunity for long-term market coverage. Part of the reason for their success, beyond their services is their attractive cost structure for carriers to equip their fleets without a significant investment in capital. The startup fee is based on the reporting requirements and fleet size, followed by a modest monthly rental cost of Can$25 per unit per month. In an effort to provide a low-cost technological solution with high resolution (polling every 700 ft or 20 to 30 s depending on speed and variance) without costly communication fees, compared to some satellite services, data collected by each truck is stored on the GPS unit and downloaded daily to a receiver at the truck base of operations, at another client company of TGT or if the truck crosses an Ontario border crossing.

Today, with a minimal investment in adding receivers at our border crossings and access corridors, TGT's carriers, Transport Canada, customs, bridge and tunnel operators, MTO and other partners gain near real-time border wait times for trucks via the web, with a 15-min delay in processing these data.

The MTO quickly realized the potential of the truck GPS data to more effectively respond to road users concerns and deliver outcomes to road safety issues through planning solutions, and geometric and signage improvements. Only TGT maintains access to the raw GPS data on behalf of their clients and acts as a third party responsible for scrubbing truck and carrier identifiers and limits the data to strategic links of interest. Effectively, in this manner, address level detail is not shared. Instead, responding to our specific data needs from this source, these probes provide samples of their travel experiences with time stamp, location, instant travel speed and average over the link distance, unique but nondescriptive truck identifier enabling linking of the vehicle for detailed routing but limited to the links of interest, reporting of sudden deceleration referred to as "hardbrakes" where deceleration incidents of 7 mph/s occur, and fuel consumption but limited to trucks equipped with the latest generation of the TGT GPS device. The sample is robust, with a mix of: all truck classes, carrier types, trucks loaded with commodities and empty trucks, a mix operating in urban and intercity corridors on multijurisdictional infrastructure. As a natural extension of our existing MTO Truck Model in the TransCAD/Oracle environment containing a North America wide road network, these two geographic systems were calibrated and each link geofenced to capture the GPS data in a consistent sampling manner.

It must be stressed that the data is analyzed to prioritize infrastructure investment decisions in support of the trucking industry and all road users. While one can identify which lane a truck is using on a multilane highway with minimal geoshifting and monitor their speed, our foremost interest is to gain access to this type of data for the long term. Accordingly, these data will be examined in aggregate and will not be used for regulatory purposes.

This new decision-making tool empowers MTO to explore actual truck operations data spanning the latest hot topics in freight transportation by integrating location, duration, severity, and cost of congestion, potential safety issues, plus linking this knowledge to the more traditional freight volumes, trucking industries contribution to the economy and employment sector growth. While this GPS data collection activity relates to truck operations, in Ontario, probe car data has been collected in parallel. Preliminary analysis of the auto and truck GPS suggests that trucks may provide a proxy for all road users including analysis of high-occupancy vehicle (HOV)–

general purpose lanes, provided that minor adjustments be applied to reflect differences in performance characteristics and car trip diversion flexibility to avoid or mitigate the effects of nonrecurrent congestion. Thus, we may realize further benefits by reducing our need for constant car probe surveys and their costly analysis.

It is critical to demonstrate the benefits back to the trucking industry and their associations. This precise data, in the hands of planners, has only recently become available and internal program delivery areas responsible for sifting through their own project evaluation criteria based on many interests, layered within their benefit-cost models will have to be convinced of the measurable results.

IMPORTANT APPLICATIONS OF BORDER DATA AND WAYS TO INCREASE THE USEFULNESS OF DATA PRODUCTS

Don Ludlow, *Cambridge Systematics, Inc.*

National, state, and local governments in the United States, Canada, and Mexico collect considerable freight data tracking the cross-border movements of goods. These data relate the mode, direction, weight, value, and type of shipment (i.e., containers, trucks, rail carloads). In some cases, the data include a high level of detail pertaining to the O-D of cargoes, some of which is gathered electronically by customs agencies. These border data enable public agencies—including transportation and economic development agencies—to effectively observe trends and provide meaningful input to improve current and future operations. Private companies, including railroads, third-party logistics providers (3PLs), trucking companies, and manufacturers (among others) use these data in a wide variety of applications ranging from market reconnaissance to supply-chain efficiency analysis. Collectively, the current array of publicly available trade data effectively supports these and other important applications. However, there are several areas in which the data could be improved to further expedite transportation planning and economic development, generating both public and private benefits. The improvement areas proposed include greater standardization, complete coverage of freight movements, and enhanced geographic granularity.

Applications of Border Data

Public agencies and private companies apply border data to answer policy and business questions and plan for the future. There are three broad categories of border data applications, including (*a*) operations, (*b*) infrastructure planning, and (*c*) economic development.

Operations

Government agencies responsible for transportation operations, customs, immigration, trade, and even municipal bridge, monitor border data to inform their strategies to improve operations at the border. Public agencies are also interested in border data for safety and security purposes, especially in the post-9/11 environment. Private companies, ranging from long-haul trucking to customs brokers, track gateway performance to minimize travel time. Delays affect the bottom line of companies and are often passed to consumers and manufacturers. Long dwell times at crossings or inspection stations decrease efficiency and add cost to the supply chain. Both public and private

entities collect operations-related border data, including wait and inspection times at international crossings. Applications of operations-related border data fall into two classes: applications to enhance efficiency and applications to enhance safety and security.

Efficiency applications have traditionally included delay measurement on bridges and key international corridors. More recently, and into the future, public agencies will use border data to estimate reliability for key facilities. Operations-related border data also allow agencies to determine the effects of congestion on routing and even mode diversion. Companies use these data to supplement on-the-ground observations to inform their routing decisions.

Safety and security applications of border data have become increasingly important since the terrorist attacks of 9/11. Safety- and security-related applications include hazardous materials analysis, threat assessment of key gateways and corridors by cargo type, and system redundancy analysis. Hazardous materials analyses, such as one recently completed by the City of Laredo, Texas, have focused on routing of hazardous cargoes and identifying means to mitigate potential accidental or intentional spills. Cargo-specific border data also permit agencies to conduct threat assessments weighted for the potential to disruption international trade or sabotage supply chains of materials, food, or goods. Finally, public agencies and private carriers use border freight data to help mitigate interruptions of certain gateways or corridors by identifying alternative routes to provide system redundancy in case of incident.

Infrastructure Planning

Another category of border data applications support infrastructure planning. Federal and state agencies—especially transportation departments—from the United States, Mexico, and Canada engage in diverse border transportation planning applications relying heavily on cross-border goods movement data, especially publicly available data. Public agencies use these data to plan for new capacity for existing or emerging gateways and corridors. Similarly, carriers (highway and rail) and logistics providers use these data for planning facilities to support growing international trade lanes. Specific applications include trend analysis, forecasting, commodity-level analysis, bottleneck identification and ranking, mode shift–diversion analysis, truck size and weight harmonization, and toll and revenue assessment to finance new infrastructure.

Economic Development

The third category of border freight data applications moves forward economic development efforts by the public sector and builds markets and profits for trade-related businesses. Economic development agencies, chambers of commerce, corridor coalitions, and other public or non-profit trade promotion groups depend on border data to provide critical information to advance their missions, track progress, and identify trends and opportunities. Carriers (railroads, trucking, steamship lines), shippers (manufacturers, suppliers, agriculture), and the logistics community that supports them rely on border data to make strategic investment and marketing decisions. Economic development related applications include marketing plans, logistics plans, supply chain analysis, gateway–corridor development plans. These applications allow analysts to recognize subtle shifts in trends that may lead to market opportunities with public or private benefits.

Improving Border Data

The current border data sets available from public agencies and private vendors support many important applications in operations, planning, and economic development. While great advances have been made to both the quantity and quality of available data over the past decade, there are several ways in which border data could be improved to facilitate and enhance these application activities. Recent improvements to the transborder data by BTS exemplify the types of improvements that might be realized to make border data more accessible and applicable. Based on recent experience and conversations with several users of border data, applications could be improved in at least three important ways: better standardization, more complete coverage of full freight movements through the supply chain, and more detailed geographic granularity.

Standardization

The current array of cross-border freight transportation data is a bifurcated set of disparate measures for volume, value, units, distance, and commodity classes. While these differences can be overcome using correspondence tables, the act of standardizing the data into "apples-to-apples" format for applications and comparisons is a time-consuming task for even cable analysts. To improve this situation, border data stakeholders should collaborate to establish uniform standards—or meta-standards—that will foster the use of standard methodologies to correspond and convert measures for analysis and comparison. Ultimately, collection efforts should be coordinated and focused on acquiring data using standard measures.

Another area that could be standardized—or at least coordinated better—is the design, execution, and sharing of freight-related border surveys. Several groups, including border working groups and binational planning groups, have made good progress toward realizing the benefits of survey standardization or sharing. However, gaps remain in the coordination of survey efforts and the sharing of survey results. For example, multiple agencies often administer similar truck intercept surveys or shipper surveys in border states and synergies between survey efforts are not always realized because information is not shared—between states, the federal government, and states, or between agencies within a single state (in all three NAFTA countries).

Full Coverage of Freight Movements

Most cross-border freight data do not account for the complete movement of freight from origin to final destination. Instead, the data tend to focus on the movement of the transport vehicle. For example, existing data may not track a container originating in Puebla, Mexico, with a final destination of Milwaukee, Wisconsin, for the full length of transit, especially with one or more intermodal exchanges (truck-to-rail or vice versa). Instead, the data may show a container originating at Puebla and crossing at Laredo, Texas, with a destination of Chicago, Illinois, but would not show the truck drayage move to Milwaukee. Some of this uncertainly is overcome with select commercial data, but the ability to show fully linked trips is largely missing from most commercial and publicly available data sets, especially for bulk commodities and trips with a waterborne segment. The ability to track linked cargo trips from true O-D would greatly improve the understanding and ability of transportation planning and policy agencies to track and anticipate trends and supply the infrastructure and operational changes necessary to ensure

efficient goods movement. Several emerging technologies, including electronic manifest (e-manifest) data, hold promise to overcome these coverage gaps.

Geographic Granularity

Another way public agencies and private vendors could improve border data is by providing greater geographic detail of origins, destinations, and routing. The most important area for improvement is in the granularity of the data—currently available for all three countries at the state or province level—but not yet at a more detailed geographic equivalent, such as the county (United States) versus municipio (Mexico), for example. Some data are available from vendors and others at the metropolitan area, county, or zip code level, but these data are not available for all three countries. Provision of greater detail is useful for substate analysis of international freight movements, including analysis of drayage patterns in gateway regions. Again, the availability of more complete, more geographically specific data from electronic collection systems such as e-manifest or radio frequency identification would greatly assist border data planning applications.

Conclusions

Both public and private users apply border data to enhance operations, plan for future infrastructure, and improve the economic prospects of regions and firms. Improvements in border freight data would provide public officials and private industries with a more reliable, standard, consistent, and detailed source of information for making investment decisions. From the author's perspective, the most essential actions for moving forward with the suggested improvements are

- Enhance coordination and communication. Forums already exist to coordinate binational and North American transportation planning efforts. These forums might focus efforts to enhance communication between international stakeholders and between agencies within each country. Better domestic and international cooperation will result in better data coverage. Private participants should also be involved in these discussions and activities as they provide another perspective and layer of value to the process. The goals of enhanced coordination and communication are to bridge the gaps and share existing data and to plan for additional improvements.
- Make the case for better data. Many important public and private decisions rest on the accuracy and robustness of border data. Policy makers who fund data collection and dissemination efforts may not realize the full importance of the data program and the spectrum of border data applications. Efforts to enhance the data—especially the inclusion of electronically collected data—will be more successful if the border data community clearly articulates the use and importance of the data.
- Develop a North American Border Data Clearinghouse. The ultimate vision for the future of border data might include the establishment of a North American Border Data Clearinghouse where participating agencies from the United States, Canada, and Mexico might maintain a uniform and coordinated set of border data. Such a clearinghouse could be accumulated over time with incremental improvements to the data.

If implemented, these improvements would add value to border data for public and private users and ultimately generate greater benefits and would enable agencies and companies to better respond to current operational challenges and to foresee opportunities for future development. Advocacy in behalf of border data programs is essential for continued momentum to realize these and other improvements.

Key Points for the Workshop

JOSEPH SCHOFER
Northwestern University

NORTH AMERICAN FREIGHT DATA APPLICATIONS

Poster and oral presentations described a wide range of applications of North American freight border crossing data. There was a strong focus on measuring the short-term performance of border crossings (gateways)—throughput times and rates, queue lengths, delays, and traffic spillovers to the local road network. These performance measures focused on highways and trucks, and the presentations showcased a variety of uses for these data: providing users with real-time information on delays, managing border crossing operations, identifying crossing problems and their causes, designing solutions in the form of improved infrastructure and procedures, and assessing the effects of such solutions.

Crossing performance data are necessarily locally collected and owned data, in contrast to national databases. They are collected on the ground with manual and automated methods. Of course such data can have national implications, for they reflect efficiency and costs of transborder trade operations (which makes them directly salient to carriers and shippers), and they are important for assessing security risks and supporting designs and operating policies for secure border checkpoints.

Presentations included examples of uses of international trade flows important for both short-term studies and assessment of longer-term trade trends. These are used for national and local economic development studies, particularly those concerned with infrastructure evaluation and planning; in contrast with the performance measurement applications presented in the posters, international trade studies are naturally multimodal and use data integrated from multiple sources. This reflects the fact that no single source contains all data of interest. Most (if not all) of these studies rely on national databases, either directly, or in the form of enhanced and enriched proprietary databases marketed by vendors.

USES OF FREIGHT DATA

Both the posters and discussions at the workshop showed applications of North American freight data to support decisions in several dimensions and levels:

- Problem identification and priority setting for problem solving;
- Operations management;
- Design of improved crossing facilities and access networks;
- Design and evaluation of investments in border facilities and networks;
- Assessment of economic development and environmental impacts of current and proposed facilities and policies;
- Security and safety analyses; and

- Broader, before-and-after evaluations to support future decisions, e.g., assessment of the consequences of privatization of Mexican railroads, and evaluations of changes in the design or operations of border crossing facilities.

A number of studies described in the posters developed and applied freight flow forecasting procedures to identify future problems and evaluate proposed solutions. These studies relied heavily on extrapolation methods, reflecting the nascent state of the art of freight forecasting, and underscoring the need for investing in more advanced, policy-sensitive freight modeling tools. It is likely that the improvement of freight forecasting tools will be constrained by the availability of accurate and detailed freight flow data, as well as measures of the factors influencing demand and supply for products and commodities. Thus the status of freight data is broadly important for supporting informed decisions about freight shipment facilities and policies.

FREIGHT DATA ISSUES AND OPPORTUNITIES

Freight data applications described in posters and presentations revealed a considerable degree of duplication and overlap. Not surprisingly, agencies across and among countries face similar concerns about cross-border freight flows and the operation of border crossings. This commonality of interests suggests the value of stronger communications across these agencies and entities to exchange ideas, share methods, and pursue more integrated joint efforts to develop better tools, and to advocate for the required freight data.

Sharing practices in the analysis and modeling of freight data is likely to lead to both economies and more rapid advances in the field. Simply sharing practices is likely to bring value, and as border crossing freight policy and planning advances, sharing can focus on good, and eventually, best practices. There is a clear national (federal) interest in sharing decision-support practices across places and countries, for economies and improvements, and because some of the key policy issues have national focus: security, economic development, and social and environmental impacts. And, of course, the federal governments have ownership investments in the core national freight databases. Representatives of some of the key U.S. agencies were active participants at the workshop—the U.S. DOT, Homeland Security (CBP), and the Army Corps of Engineers—but some agencies that collect important datasets were notable in their absence: the U.S. Census Bureau, which plays a central role in the collection of cross-border freight data, as well as the Departments of Agriculture and Energy. Yet the data from these agencies is commonly integrated in decision-support actions, emphasizing the synergistic value of a collaborative approach to maintaining national data programs.

The BTS presentation of the new world wide web interface for the Transborder Freight Data illustrated the high value of easy access to freight data. It is a reminder of the importance of having data in your pocket—users, both analysts and decision makers, often demand quick answers, and quick and easy data access supports these applications and encourages data use. The web offers an effective way to provide access to key national databases.

The presentation on the use of commercial GPS truck tracking data in Ontario illustrated a number of important opportunities and issues in freight data. First, it shows both private- and public-sector interest in freight data for operation management, problem identification, and priority setting. Second, it illustrates that some rich data sources remain to be tapped for a broad

spectrum of applications. Third, shared use of data can produce high value at relatively low cost. Fourth, the public use of this private-sector tracking data requires clear agreements on the permitted applications (i.e., non-regulatory) and the protection of proprietary data (through aggregation). Finally, it shows that when each side understands the data value proposition of the other, it becomes possible to negotiate sharing agreements that bring mutual benefits.

Discussion at the workshop reinforced the continuing drive for increased detail of freight data, by geography (physical and economic), mode, and commodity. This is important to support planning and decision support (including enhanced policy sensitivity and consideration of equity and impacts), and also to provide a strong theoretical basis for improving forecasting tools.

The importance of understanding transborder flows in terms of underlying economic drivers highlighted the need to ensure data continuity, that is, to have the same or similar data on both sides of international borders. This underscores the shared multinational interest in North American freight data that brought participants in this workshop together, and the potential value of sharing best practices to improve data consistency and integration.

DATA USES, USERS, AND PROGRAM SUSTAINABILITY

The relationship between data programs and data users is critically important for the future of those programs; data programs are sustained, in the long run, by their users and the applications of the data. In the market for data, it is important for users and suppliers of data to work together to ensure the future of data programs.

Discussions at the workshop reinforced the fact that both private- and public-sector users rely on North American freight data. Private uses of North American freight data parallel public applications: operations management, and strategic decisions about equipment, locations, and markets. Carriers and shippers also use these data to help influence government decision making. Since much of the useful data can be traced back to carriers and shippers, the fact that these private users also benefit from the data needs to be communicated broadly to ensure future support for such data programs.

Most of the freight data applications described in the workshop were based on data integrated from multiple sources. Multiple source integration was essential to support the needs of data users, particularly in terms of geographic and commodity detail, as well as to test and ensure data consistency. National data programs, including the Commodity Flow Survey and BTS' Transborder Freight Data program, were almost always at the core of these integrated decision support databases, but this foundational connection is not always revealed. This unrevealed or stealth use of essential national data sets is troublesome, because it fails to provide critical market signals in support of national data programs. In the competition for resources for all data programs, it is important for policy makers to understand the sources of the data they are using, and work to ensure that national data programs are maintained.

A number of presenters observed that freight data, like all transportation data, tends to improve in quality, and support for collecting and maintaining it becomes easier to secure, when data are broadly and frequently used (*1*). Frequent use means frequent scrutiny, which contributes to quality control and increases the incentives for data providers to deliver the data. And larger markets for a dataset make it easier to argue, collectively, to continue to invest in it. The connection between data use and data program sustainability is weakened when users are not fully aware of the original source of the data.

An emerging concern is the risk to continued availability of freight border-crossing data based on security issues. While ensuring the safety and security of our borders is essential, and good data will contribute to that objective, it is important to avoid blanket restrictions on the distribution of such data for public and private analysis and decision making. In the long term, the most serious threats to national security may be economic competition for resources and markets. An efficient, integrated, secure logistics system, well-managed with accurate, comprehensive and timely data, may be the best protection for our (shared) national interests. Any data access restrictions should be carefully considered with this broader view in mind.

LESSONS LEARNED

It is clear that much progress has been made in the collection, organization, dissemination, and application of North American transborder freight data. This progress should and does motivate the need for more progress, to collect and apply better data in more advanced and responsive ways. Collaborations offer good ways to focus efforts, learn from others, and accelerate the rate of progress in freight planning. The challenge is shared by business and governments, and each has something to offer the other. And the problems and solutions readily cross borders, making a North American effort logical and worthwhile. Finally, the foundational role of national databases was highlighted, emphasizing the importance of securing and improving those data sources for the future of freight planning and management.

NOTE

1. Schofer, J. L., T. Lomax, T. Palmerlee, and J. Zmud. *Transportation Research Circular E-C109: Transportation Information Assets and Impacts: An Assessment of Needs*, Transportation Research Board of the National Academies, Washington, D.C., 2006. http://onlinepubs.trb.org/onlinepubs/circulars/ec109.pdf.

POSTER SESSION

Overview of North American Freight Data Applications Posters

GORDON RODGERS
Whatcom Council of Governments

Posters presented by named authors or their representative.

- Bruce Lambert, USACE. Using data as a decision tool for U.S. Great Lakes improvement decisions.
- Mark Sarmiento, FHWA. Use of existing BTS data to produce an allocation formula to distribute coordinated border infrastructure funds to border dtates.
- Hamilton Galloway, Washington State University. Research methodology to forecast truck travel demand at specific British Columbia–Washington State ports of entry by converting Strategic Freight Analyses (SFTA) commodity flow data into truck trips.
- Paul Ciannavei, Global Insight, Inc. Research reveals a more detailed picture of North American freight flow.
- Juan Carlos Villa, TTI. Research to produce a methodology for approximating Mexican–U.S. trade flows in a way to allow closer geographic association with BTS data.
- Manuel Solari-Terra, TTI. Research to correlate Freight Analysis Framework Versions 1.0 and 2.2 for the purpose of prioritizing U.S.–Mexican border freight mobility challenges.
- Alisa Arias, San Diego Association of Governments. Results of research on economic impacts of border delay helps identify appropriate improvements.
- Perez Sanchez, Mexican Institute of Transport. Contrasts freight flows before–after transition to private ownership and operation of certain facilities; BTS data played a vital role in study and O-D pairs were identified.
- Alberto Diaz, Mexican Institute of Transport. Research produced a reliable modeling efforts to reflect relative benefits of cross-border infrastructure improvements.
- Don Ludlow, Cambridge Systematics, Inc. Object of project was to provide state of Texas with updated estimates of present and future NAFTA freight flows on the Texas state system; poster reflects the application of multiple data sources in estimating daily NAFTA freight volumes on Texas highways.
- Melissa Miller and Chris Hoff, Whatcom Council of Governments and Transport Canada. Poster shows that numerous changes in programs and infrastructure have not improved commercial vehicle delay in the time period 2002–2006, but acknowledge that due to growth , conditions would have worsened without those improvements.
- Melissa Miller, Whatcom Council of Governments. Poster shows how bi-directional travel data may be gathered from Advance Traveler Information Systems by using the real-time data stream from loop sensors to populate a dedicated database.

POSTER SESSION

Transborder Railway Freight
Its Evolution Since Railways Privatization in Mexico

JOSÉ ARTURO PÉREZ SÁNCHEZ
ROBERTO AGUERREBERE SALIDO
Instituto Mexicano del Transporte

OBJECTIVE

To appraise the evolution of freight flows by railway between Mexico and the United States, before and after the Mexican government owned railway companies and their infrastructure were given in concession to be operated by private companies.

BRIEF DESCRIPTION

Railway freight flows were analyzed based on their importance according to volumes, weight, value, and annual average growth rates, for north and southbound directions of flow. This was done for the main groups of merchandise (tariff chapter) and by land (border) ports of entry. The main states of O-D in the United States were identified. Though for the Mexican side, only destinations were able to be identified. Also, only southbound O-D pairs were able to be identified.

AGENCY INVOLVED

Mexican Institute of Transport (IMT, by its acronym in Spanish).

KEY ELEMENTS OF SUCCESS

Transborder Surface Freight Data disseminated by the BTS and complementary data about railway freight and trade flows available in Mexico were keys in order to achieve the objectives of this study. Also, multiple data sets combination allowed knowing some particular characteristics of railway flows. Due to the little data amount on railway flows available in Mexico, the use of Transborder Surface Data published by BTS have been critical to achieve results in this study.

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POSTER SESSION

San Diego–Baja California Cross-Border Planning

Estimating Economic Impacts of Wait Times at the San Diego–Baja California Border

ELISA ARIAS
San Diego Association of Governments

OBJECTIVE

In 2005, the San Diego Association of Governments (SANDAG) commissioned the development of a model to estimate economic impacts of border wait times in the San Diego–Baja California border for cross-border personal trips and cross-border freight operations. The overarching goal of this study is to develop strategies to enhance security at the border while facilitating the cross-border travel needs of a highly economically interdependent border region.

BRIEF DESCRIPTION

An analytical model was developed to quantify the incremental direct, indirect, and induced impacts of congestion on both sides of the border. The study was conducted within a risk analysis framework.

The model estimated the economic impacts of foregone recreation, shopping, and vacation trips; foregone work trips, as well as productivity losses from impaired cross-border movements for cross-border personal trips. Economic impacts of border delays on freight activity also were quantified.

AGENCIES AND ORGANIZATIONS INVOLVED

This project was conducted in partnership with the California Department of Transportation (Caltrans), District 11. Also, the organizations listed below participated in an expert peer review panel that was set up to review model logic, assumptions, and model probabilities:

- Consulate General of Mexico in San Diego;
- CBP, San Diego Field Office;
- FHWA, International Transportation Program;
- El Colegio de la Frontera Norte (COLEF), Economic Studies Department;
- San Diego Dialogue, University of California San Diego Extension;
- Center for Latin American Studies, San Diego State University;
- Economics Department, Universidad Autónoma de Baja California (UABC);
- Trans-Border Institute. University of San Diego;
- Otay Mesa Chamber of Commerce;

- San Diego Regional Chamber of Commerce; and
- South San Diego County Economic Development Council.

KEY ELEMENTS OF SUCCESS

The border economic impact model provides a new tool for testing public policy solutions. The quantification of the economic significance of border delays has helped advance the implementation of the proposed East Otay Mesa–Otay II port of entry between San Diego and Tijuana.

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POSTER SESSION

NAFTA Freight Market
Freight-Flow Data Development

PAUL CIANNAVEI
Global Insight, Inc.

OBJECTIVE

The objective is to develop a detailed North American freight flow database, incorporating cross-border freight traffic with domestic U.S. goods movements.

BRIEF DESCRIPTION

While the cross-border datasets offer a solid picture of freight movements at relatively aggregate levels of detail, public agency planners and freight carriers need a more detailed picture of this activity to support their efforts. Using the cross-border datasets as a starting point, and supplementing this information with additional demographic and economic data, a more detailed picture of this segment of the North American market has been assembled

AGENCIES AND ORGANIZATIONS INVOLVED

- Global Insight, Inc.
- Numerous state DOTs, metropolitan planning organizations, and federal agencies have made use of the resulting data, plus rail freight and motor carriers

KEY ELEMENTS OF SUCCESS

Using econometric techniques similar to those employed in crating a detailed picture of domestic U.S. freight activity, the broader market definitions identified in the cross-border data sets have been refined to the county level. Through close work with clients that have used the resulting data, for the traffic crossing the U.S.–Canada border this technique seems to produce very acceptable results. For movements across the U.S.–Mexico border, however, findings indicate this technique produces a much greater dispersion of activity than actual.

Additionally, segmentation of the truck mode into component sectors such as less-than-truckload (LTL) and truckload has not been accomplished, but initiatives are underway with selected carriers and shippers to help us in this segmentation. Similarly, the customs clearance points identified in the data are not fully translatable into actual physical locations of border crossing, and ongoing initiatives are also investigating the correlation between these two components.

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POSTER SESSION

Use of Border Data in Coordinated Border Infrastructure Program

MARK SARMIENTO
Federal Highway Administration

OBJECTIVE

FHWA uses border data to distribute funds in its Coordinated Border Infrastructure (CBI) program. The purpose of the program is to improve the safe movement of motor vehicles at and across our nation's borders with Canada and Mexico. Under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, a total of $833 million is authorized in the program to be distributed by formula to border states.

BRIEF DESCRIPTION

The formula for allocating CBI funds to border states is based on the movement of people and goods through the land border ports of entry within each of the states. Specifically, the factors for calculating each border state's share of CBI funds are

- 20% based on number of incoming commercial trucks;
- 30% based on number of incoming personal motor vehicles and buses;
- 25% based on weight of incoming cargo by commercial trucks; and
- 25% based on number of land border ports of entry.

AGENCIES INVOLVED

BTS supplies the data for the factors to FHWA.

KEY ELEMENTS OF SUCCESS

States may use CBI funds in a border region for the following types of activities:

- Improvements to existing transportation and supporting infrastructure;
- Construction of highways and related safety and safety enforcement facilities related to international trade;
- Operational improvements, including those related to electronic data interchange and use of telecommunications;
- Modification to regulatory procedures; and
- International coordination of transportation planning, programming, and border operation with Canada and Mexico.

The poster shows the number of personal motor vehicles and the number of trucks entering the United States through the northern and southern borders for the year 2005. The maps in the poster are also labeled with the percentage of the total number for the northern or the southern border states. Border crossings with relatively low volumes and within a certain distance of each other are grouped together. Crossings within a particular urban area are also grouped together.

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POSTER SESSION

Projecting Washington–British Columbia Border Crossings
An Application Building on North American Freight Data

HAMILTON GALLOWAY
Washington State University

OBJECTIVE

As the United States and Canada move forward in interactive trade, continuing adaptation to the changing transportation needs is critical in maintaining efficiency and reducing costs of raw and manufactured goods. With bilateral trade in excess of $1.4 billion per day between the United States and Canada, and over 200 million annual crossings (passenger vehicles and freight trucks), knowledge of the composition of commodities crossing the border allow for easier adjustment to and support for the changing needs of industries and transportation providers (United States Embassy, Ottawa, March 2006). The objective of this research effort is to forecast the volume of trucks crossing specific Washington–British Columbia border ports by using a method of determining trade growth in the industries represented by the crossing commodities and converting this trade into truck traffic between Washington and British Columbia.

BRIEF DESCRIPTION

Commodity profiles for the border ports were created using a unique truck freight O-D database collected as part of a statewide research effort known as the SFTA. Once each profile was created, projections of northbound and southbound truck crossings to the year 2015 were estimated for each border port, using BTS truck crossing–entry data. This gave the basis for comparison, as well as a starting point for estimation of border crossings based on trade growth (trade–profile method). From there, linear regression analysis was used to determine the potential growth of individual border crossings in the state of Washington, based on the growth of trade between the United States and Canada and each port commodity profile.

AGENCIES AND ORGANIZATIONS INVOLVED

- BTS border crossing–entry data;
- SFTA (O-D survey);
- USA Trade Online (U.S. Census Bureau, Foreign Trade Division); and
- Bureau of Economic Analysis.

KEY ELEMENTS OF SUCCESS

Using the above methodology, border crossings for six major and minor border crossings were forecasted to the year 2015 (more than 95% of the Washington–British Columbia border crossings). There is an expected 10-year growth in the number of annual truck crossings ranging from 3,000 trucks to 159,000 trucks at the Frontier and Blaine border ports, respectively. The trade–profile method for projecting truck crossings was successful in two specific ways. First, the method allowed for increased understanding of the commodities crossing at specific border ports. Second, the method allows for adjustments to truck crossing forecasts as trade projections change, or new information becomes available.

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POSTER SESSION

Challenges in Great Lakes Multimodal Studies

BRUCE LAMBERT
U.S. Army Corps of Engineers

OBJECTIVE

The chief objective is to examine the accessibility of the transborder transportation data available to do multimodal comparisons to evaluate navigation projects in the Great Lakes region.

BRIEF DESCRIPTION

The Great Lakes Navigation System reconnaissance study, a multidistrict study, with Detroit as the lead district, was initiated in 2001 to address potential navigation improvements to the Great Lakes–St. Lawrence Seaway (GL/SLS) navigation system. The evaluation addressed a primary concern among stakeholders, namely the limitations on vessel drafts and restrictive channel and port depths. A transportation cost model is needed to accurately evaluate impacts to proposed channel and port improvement alternatives to determine future investment needs. Proposed improvements to single and multiple ports (e.g., O-D–commodity groupings) will be evaluated considering the impacts of these improvements to the system. Also the model will be risk based, incorporating the uncertainty associated in input variables including water level variations, vessel class cost variability, safety margins, and vessel speeds, etc.

AGENCIES INVOLVED

- USACE, Buffalo District, and
- USACE, Institute for Water Resources.

KEY ELEMENTS OF SUCCESS

The study requires information on costs and O-D, but also the shipment timeframe. The information also requires similar information on costs and O-D of other cargos moving in the Great Lakes region. The lack of a consistent, time series multimodal database that links costs with a transborder multimodal O-D matrix, seasonally adjusted, linked to the USACE models framework would allow the USACE to run various planning scenarios to evaluate investment needs in the Great Lakes region.

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POSTER SESSION

Utilizing Multiple Data Sources to Estimate NAFTA Truck Flows on Texas Highways

DONALD LUDLOW
Cambridge Systematics, Inc.

OBJECTIVE

The objective of the project was to provide the State of Texas with updated estimates of current and future NAFTA freight flows on the state's highway system. The purpose of this poster is to demonstrate the application of multiple international and domestic freight data sources to estimate the daily volume of NAFTA trucks on the Texas highway system.

BRIEF DESCRIPTION

The estimates consist of NAFTA flows of trucks moving freight between Mexico and U.S. destinations, and were developed using, as primary input, Global Insight, Inc.'s TRANSEARCH data as the basis for origins, destinations, and commodities for both domestic and international flows. Several other North American freight data sets were utilized in scaling and calibrating the flows including: FHWA Freight Analysis Framework 2 (FAF2), BTS Transborder, Texas Department of Transportation classification counts, commercial vehicle O-D surveys, and trucking industry interviews.

AGENCIES AND ORGANIZATIONS INVOLVED

- Texas Department of Transportation and
- Private trucking companies, customs brokers, and shippers.

KEY ELEMENTS OF SUCCESS

Multiple data sets provided a rich source of baseline information to arrive at an input truck and commodity flow O-D data set for input to the Statewide Analysis Model as well as for use in comparing to model outputs to develop target truck volume ranges for major corridors. The target ranges guided further adjustments to the corridor assignments to ultimately arrive at final NAFTA truck estimates.

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POSTER SESSION

U.S.–Canada Cross-Border Freight Data Sources

AKSHAY MANI
Cambridge Systematics, Inc.

OBJECTIVE

The objective of the project was to perform an analysis, for the International Mobility and Trade Corridor (IMTC—a coalition comprising of U.S. and Canadian business and government entities for improved cross-border mobility), of cross-border market flows between United States and Canada by truck and rail modes to determine the potential market for and consequently, the feasibility of short sea shipping (SSS) services between United States and Canada along the Pacific west coast. The purpose of this poster is to demonstrate the application of multiple freight data sources to estimate cross-border trade flow volumes for the feasibility analysis of planned multimodal transportation services, and in the process, also identify limitations with existing data sources to address for improved future applications.

BRIEF DESCRIPTION

The project was initiated by the IMTC with the need to identify alternative modes of transport (SSS) to support U.S.–Canada cross-border trade that would potentially reduce the growing congestion along the Cascade Gateway trade corridor highways. The cross-border market analysis involved the use of multiple freight data sources, including Global Insight, Inc.'s TRANSEARCH database, BTS' Transborder Surface Freight Database, the SFTA database from Washington State University, and the IMTC Cross-Border Truck Survey database to arrive at accurate estimates of cross-border market flows. Major market segments for cross-border SSS services were selected based on the locations of major metropolitan areas along the west coast with availability of port facilities to handle potential SSS operations, which included Vancouver–Seattle/Tacoma, Vancouver–Portland, Vancouver–Oakland, and Vancouver–Los Angeles.

ORGANIZATIONS INVOLVED

- IMTC and
- Private trucking companies, cross-border shippers, and intermodal carriers.

KEY ELEMENTS OF SUCCESS

Following are some key elements of success accomplished as part of the project:

- The project illustrated the applicability and usefulness of multiple freight data sources for the analysis of U.S.–Canada trade flow volumes.
- The project resulted in the accurate estimation of U.S.–Canada trade flow volumes, which was based on a robust validation approach using multiple data sources.
- The project resulted in the identification of key limitations with existing freight data sources in the representation of cross-border trade flows, which will provide useful inputs for data improvement efforts in the future for improved applications in similar market analysis studies.

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POSTER SESSION

Mexico–U.S. Origin–Destination Truck Transport Flows

ALBERTO MENDOZA
Mexican Transportation Institute

OBJECTIVE

The objective is to combine O-D information collected from field surveys carried out in the last 15 years in different sites of the federal highways of Mexico as part of the Statistical Field Study of Federal Truck Transport (SFSFTT) study with the BTS Transborder Freight Data. The former was used in order to generate O-D matrixes that are fed into Mexico–U.S. multiproduct truck traffic assignment models. These models have been developed by the IMT for several years.

BRIEF DESCRIPTION

The SFSFTT provides a multiproduct O-D matrix between the Mexican states and the border sites with United States. The flows computed from this matrix can be adjusted based on BTS data: either from the aggregate flows that cross the borders (databases 11 and 5), or from the flows by product type associated with the states of United States (databases 9 and 3). The SFSFTT matrix thus adjusted provides the Mexican part of the Mexican export flows. Also, for the imports as well as for the exports, it provides the percentage composition by product type at each border site. This information is essential in order to disaggregate the aggregate flows that are obtained from databases 11 and 9 of BTS.

AGENCY INVOLVED

Instituto Mexicano del Transporte (Secretaría de Comunicaciones y Transportes)

KEY ELEMENTS OF SUCCESS

The adjusted O-D mutiproduct matrix, which is fed into the assignment models, allows generation of reliable predictions of the flows through arches and nodes of the modeled network. This has permitted estimation of the benefits of different improvement actions on the transborder infrastructure and operative schemes (bridges, road links, operating systems, etc.).

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POSTER SESSION

A Cross-Border Commercial Vehicle Traveler Information System

Developing a Binational Archive of Wait Times and Volumes

MELISSA MILLER
Whatcom Council of Governments

OBJECTIVE

The purpose of this project is to establish a bidirectional data source that can be used for planning and modeling efforts, and develop a base for performance measurements.

BRIEF DESCRIPTION

The Advanced Traveler Information System (ATIS) Data Management System, www.CascadeGatewayData.com, is an archive of data that has been recognized across the United States and Canada. The system stores wait times, volumes, service rates, and queue lengths of passenger vehicles at two land ports of entry between Whatcom County, Washington, and the lower mainland of British Columbia. The system warehouses and packages detector data from the northbound Washington State Department of Transportation's (WSDOT) system, and southbound data from the British Columbia Ministry of Transportation (MOT).

Future phases of the project will expand the archive to include all four Cascade Gateway ports of entry, as well as commercial vehicle traffic measures at all three commercial ports-of-entry.

AGENCIES INVOLVED

- Transport Canada,
- British Columbia MOT,
- WSDOT,
- University of Washington Transportation Center (TRAC), and
- Whatcom Council of Governments.

KEY ELEMENTS OF SUCCESS

A cross-border commercial vehicle traffic data archive will use the same database that is currently archiving wait times, queue lengths, service rates, and volumes for passenger vehicles. While the final methodology for measuring commercial traffic is not yet known, it will undoubtedly rely on a combination of devices and system components.

Results may be used to evaluate trends in border travel; to measure the impacts of new inspection policies on traffic flow; to predict future high-traffic volume periods for better staffing

resource allocation; and to establish performance measurements for future changes in operations or infrastructure. Results may also be used in border operations modeling efforts.

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POSTER SESSION

Pacific Highway Commercial Vehicle Port-of-Entry 2006 Commercial Vehicle Operations Survey

MELISSA MILLER
Whatcom County of Governments and Transport Canada

OBJECTIVE

The purpose of this project was to collect detailed CVO operations data on the approach to the Pacific Highway Port of Entry (POE) that would quantify changes in CVO traffic and operations since a similar 2002 study; reestablish a baseline for monitoring future border ITS and infrastructure improvements projects; identify weak links and opportunities to improve bottlenecks; and provide data for developing a CVO microsimulation model or similar tools.

BRIEF DESCRIPTION

Since the U.S. DOT-sponsored CVO Evaluation Study was completed in 2002, numerous changes have impacted the processing of commercial vehicles at Pacific Highway:

- Radiation portal monitors have been installed (affecting how queues build).
- U.S. (and pending Canadian) requirements for advanced electronic cargo information (ACI).
- U.S. CBP switch to the ACE program to process trucks at primary.
- Electronic manifests are now mandated.
- New southbound B.C. Highway 15 dedicated FAST lane, and dedicated FAST booth.
- Significant B.C. Highway 15 infrastructure changes to improve queuing and access.

To evaluate key determinants of system performance, a subsequent data collection effort was completed in June 2006 to compare wait times and processing rates at the crossing with those in 2002. In addition, these data were linked to carrier manifests to provide corresponding information on commodity flow and O-D patterns. The project also evaluated the time savings benefits of ITS programs such as FAST.

AGENCIES INVOLVED

- Transport Canada,
- Whatcom Council of Governments,
- Border Policy Research Institute at Western Washington University, and
- FHWA.

KEY ELEMENTS OF SUCCESS

The study determined that, despite investments on the Pacific Highway, commercial vehicle delay has not improved in 4 years. An initial review suggests this may be attributed to increases in primary inspection time (averaging between 49 and 66 s per vehicle in 2002, to approximately 2 min in 2006 for general-purpose vehicles, and approximately 90 s for FAST vehicles). However, delay times would be even worse than they are today if the infrastructure was not in place to better handle the large number of commercial vehicles crossing the border.

This type of analysis helps provide a better understanding of the influence of individual factors affecting cross-border commercial movements.

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POSTER SESSION

Complementing FAF1 and FAF2

MANUEL SOLARI-TERRA
Texas Transportation Institute

OBJECTIVE

The objective is to develop a methodology to assign the most up-to-date international trade information to transportation corridors, using two different version of the FAF. TTI gathered and analyzed data from the FAF to determine current international trade trends between Mexico and the United States by commodity, import value, and export value.

BRIEF DESCRIPTION

Version 2.2 of the FAF has up-to-date commodity flow information between more than 100 zones within the United States. However, these flows are not assigned to the transportation network. The first version of the FAF produced truck flows between main international border crossings and the rest of the country.

Information from the truck assignment to–from main border crossings in Texas from the FAF1 was used in combination with the updated traffic volumes from FAF2 to produce an assignment of the most recent publicly available international trade information to transportation corridors in Texas.

This methodology allowed the research team performing the assignment on a commodity-by-commodity basis, producing more realistic trade flows.

AGENCIES AND ORGANIZATIONS INVOLVED

- Freight Management and Operations, FHWA,
- Texas DOT, and
- TTI.

KEY ELEMENTS OF SUCCESS

Results from the application of this methodology allowed the research team to prioritize transportation challenges of Texas and produce recommendations to aid international trade. The recommendations included alternatives to improve border crossings and transportation corridors, as well as financing and investment initiatives.

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POSTER SESSION

Methodology to Identify Mexico–U.S. Trade Flows

JUAN CARLOS VILLA
Texas Transportation Institute

OBJECTIVE

The objective is to develop a methodology to obtain a proxy of Mexican trade flows to the United States by originating Mexican state. The results of this methodology provide a good approximation of the Mexico to U.S. trade flows with sufficient geographic distribution to complement the BTS Transborder Surface Trade Data.

BRIEF DESCRIPTION

The BTS Transborder Surface Trade Data provides state-to-state commodity flow information for U.S.-to-Mexico movements. The Mexico-to-U.S. flows do not provide geographic detail with the Mexican state of origin. Several sources of information in Mexico were analyzed to obtain statistical information to disaggregate the information to the Mexican state level. The Mexican Economic Census information, produced by the INEGI was found to be a good source of information as it reports Mexican Gross State Product for nine manufacturing categories. The value of production for the nine Mexican categories were associated with 22 product categories of the BTS-provided Harmonized Tariff Schedule (TSUSA), and the total Mexican-originated flows were distributed proportionally by commodity category to each Mexican state.

AGENCIES AND ORGANIZATIONS INVOLVED

- BTS Transborder Freight Data,
- INEGI 1999 Economic Census Data, and
- TTI.

KEY ELEMENTS OF SUCCESS

A complete set of binational state-to-state O-D commodity flows is an important element in the analysis of international trade flows and transportation corridors.

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U.S.–Canada Border Needs Compendium

U.S.–Canada Transportation Border Working Group

SARAH CLEMENTS
Federal Highway Administration

FHWA and Transport Canada cochair the U.S.–Canada Transportation Border Working Group (TBWG), which includes U.S. and Canadian federal transportation officials, state DOT and Canadian provincial and territorial governments, and inspection agencies from both countries. The U.S. Department of State and Canadian Department of Foreign Affairs and International Trade also participate, as well as MPOs. The purpose of the TBWG is to addresses infrastructure needs, promotes effective communication between the countries, and enhances border surface transportation planning.

ACTION PLAN

The TBWG has adopted an action plan that includes the following activities and areas of interest:

- Develop a compendium of border infrastructure need assessments and investigate revenue sources to support those needs;
- Information exchange/clearinghouse;
- Coordinate technology application;
- Data information;
- Border transit time;
- Enhance coordination of the planning processes between transportation and inspection agencies;
- Communicate on border management issues;
- Security; and
- Develop a Border Information Flow Architecture (BIFA) for the coordinated implementation of ITS systems.

SUMMARY OF USER APPLICATION

The U.S.–Canada Border Needs Compendium is a list of proposed infrastructure project for the 33 largest commercial land POE with in the 100-mi border zone in the United States and Canada. All TBWG support agencies provide input on all proposed projects over the next 5 to 10 years based on each agencies planning horizon. The goal is to improve the joint planning process between both countries and between the transportation and security organizations and make more efficient use of the limited resources. The focus of the first phase is on commercial or freight ports and freight corridors. The focus issues were

- The need for a detailed set of information for the individual border crossings;
- A need to focus on the most important commercial crossings, the top 33;
- A need to develop a strategy/method for proceeding with the update;
- A need to identify who will house the compendium, and leads for the updating process;
- A need to address the issue of information sharing among jurisdictions;
- A need to more closely involve customs agencies in the project; and
- The need to identify freight corridors and critical areas for improvements.

EXPANDING THE COMPENDIUM

The result is a compendium of the 33 largest commercial ports with an extensive data base that includes freight data. The compendium is available at the TBWG website: www.thetbwg.org. Future plans are to expand the compendium to all land POEs and develop a comprehensive planning system for investments in the border region and work to reduce congestion along North American corridors.

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Border Infrastructure Needs Assessment–GIS

U.S.–Mexico Transportation Planning Joint Working Committee

SARAH CLEMENTS
Federal Highway Administration

The Border Infrastructure Needs (BINS) Assessment project completed five main objectives that followed the overall purpose of assessing the transportation infrastructure needs of the U.S.–Mexico border region. The U.S.–Mexico Border region is defined as 100 km on either side of the border. The BINS study was conducted with the participation of representatives from the 10 border-states as well as the Secretariat of Communications and Transportation (SCT) and FHWA, under the guidance of the Joint Working Committee (JWC). First, multimodal border transportation corridors were identified. Then, an evaluation process and tool, as well as a border-wide database, were developed to analyze and prioritize those corridors within each border state. Next, transportation projects were identified on each of the selected corridors. Finally, traditional and innovative financing methods for transportation projects were investigated

SUMMARY OF USER APPLICATION

The BINS–GIS project provides information to include a complete project listing, including project description, estimated cost, funding needs, and other significant project data prior to further analysis, evaluation, prioritization, or assessment of the existing database, transportation projects, or corridors. This includes development of a framework and process by which corridor projects can be addressed across jurisdictional lines including identifying corridor connectivity between adjacent states and countries. The framework would identify the scope, guidelines and timelines for updating each Bi-State Transportation Plan. The BINS and the JWC Border GIS efforts will become seamless and fully integrated. The BINS modal database framework will be based upon the linear referencing system and point locations in the BGIS. All BINS mapping will be derived from the BGIS. GIS compatibility needs will be identified early in the data collection effort; before database updates are provided. The corridor evaluation criteria will be improved to incorporate such elements as major terminal corridors (corridors directly serving international POEs, i.e., land border crossings, airports, and seaports), as well as feeder corridors (corridors that only connect with the major tecminal Corridors, i.e., regional corridors or intermodal facilities that serve the origins and destinations of trade and transport through international POEs).

OBJECTIVES

The overall objectives of the project were to

- To develop a set of minimum criteria to be used by the JWC to identify major multimodal transportation corridors.
- To develop an evaluation process, accepted by the JWC, to analyze major transportation corridors identified in Objective No. 1.
- To create a borderwide database and evaluation tool to prioritize each state's or country's transportation corridors based on the methodology and process identified in Objective No. 2 that can be used for future assessments.
- To compile a list of significant transportation projects on the corridors, including each project's description, estimated cost, anticipated completion date, and to summarize each state funding needs (as well as those for the U.S.–Mexico border) to implement these transportation projects.
- To investigate traditional and innovative methods to fund border transportation infrastructure needs.

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Comments on Opportunities and Issues Raised in the Workshop

ROLF SCHMITT
Federal Highway Administration

The North American Interchange on Transportation Statistics has taken a small step toward the proposed North American freight data clearinghouse with the creation of a website at http://nats.sct.gob.mx/. This website is the product of an extensive collaboration of the transportation departments and national statistics agencies of Canada, Mexico, and the United States.

The BTS Transborder program was also a collaborative effort. Many thanks go to Joel Palley of the FRA for his tireless work on the data community's behalf with Census, the Port Import Export Reporting Service, and others. Arlene Dietz, now retired from USACE, and Bill Ebersold, now retired from the Maritime Administration, also helped BTS launch its international data programs.

This workshop has been dominated by the major issues of geography, comparability, and data elements.

As in all attempts to use trade data for transportation, we must contend with the disconnects among physical geography, economic geography, and paperwork geography. If freight passes through our physical space, the transportation community cares no matter the origin and destination because we must move the goods. If the origin and destination are in other countries or free trade zones, the trade community does not share our interest in the freight because the goods do not enter our economy or affect our balance of payments. Economic geography ignores the physical space between origins and destinations unless tariffs and other trade barriers intervene. Paperwork geography confuses everything when the reported origin, destination, or border crossing is a corporate headquarters of Customs office nowhere near the physical location of the goods movement. We may finally see some progress on these long-standing problems since CBP is now concerned with risk assessment; risks of compromising cargo, and exposure of the population to that cargo affected by the physical geography of the cargo movement both within and beyond our borders. Those who control the data now care about the physical geography as well as the economic geography, and have a need to resolve the paperwork geography.

Other issues of geography include better coverage of in-transits, greater geographic detail, and an ability to compare domestic transportation of international trade with transportation of domestic freight.

Differences among the Transborder data, the FAF, Waterborne Commerce Statistics, and Rail Waybill data highlight the comparability issue. While the FAF is based in large part on Transborder data, differences in scope, modal definitions, commodity classifications, and gateway geography affect data comparability. The differences are even greater with the modal data programs. Some commodity classifications are trade-based, such as the Harmonized System and the Standard Classification of Transported Goods, while others such as the North American Product Classification System and the Standard Transportation Commodity Classification are

based on industry of origin. International gateways are defined by metropolitan areas, Customs districts, or ports, all of which are different.

The last major issue is data elements. We want more. We want weight as well as value for exports, imports, and in-transits. We want the number of vehicles that cross the border as well as the number of vehicle crossings. We want nationality of the carrier. We want border delay and reliability. All of these wants are based in important policy and management questions.

The workshop identified opportunities as well as issues. ITDS and other trade and security initiatives to track goods electronically and integrate the data hold great promise for resolving the geography issue, providing the added data elements we want, and increasing coverage at reduced costs. This promise has been pending for well over a decade, but may finally be nearing fulfillment.

The workshop identified new data sources in administrative record systems and remote sensing, each offering more and better data at less cost. However, these sources require great attention to data integration since they are often narrower views of our world, and even greater attention to data editing issues. When is an unexpected result spurious or real? How do we get rid of the techno-hiccups without destroying serendipity?

Until we develop that silver bullet or panacea, the BTS Transborder Freight Data Program will remain the primary source of information on North American freight flows and a cornerstone of the FAF. The Transborder program must be preserved for the foreseeable future. Great improvements have been made, and we hope that additional improvements such as coverage of in-transits and weights for all flows can be made.

APPENDIX B

List of Abbreviations and Acronyms

3PL	third-party logistics
9/11	September 11, 2001
ACE	automated commercial environment
ACI	advanced cargo information
ATIS	advanced traveler information system
ATR	automatic traffic recorder
BIFA	Border Information Flow Architecture
BINS	Border Infrastructure Needs Assessment
BTS	Bureau of Transportation Statistics
CBI	coordinated border infrastructure
CBP	Customs and Border Protection
COLEF	El Colegio de la Frontera Norte (Mexico)
CVO	commercial vehicle operations
DOT	department of transportation
EOBR	electronic onboard recorder
FAF1	Freight Analysis Framework, version 1
FAF2	Freight Analysis Framework, version 2.2
FAST	free and secure trade
FHWA	Federal Highway Administration
FTMS	freeway traffic management systems
GL/SLS	Great Lakes/St. Lawrence Seaway
GPS	global positioning systems
GSP	gross state product
HOV	high-occupancy vehicle
IMT	Mexican Institute of Transport
IMTC	International Mobility and Trade Corridor
INEGI	Instituto Nacional de Estadística Geografía e Informática (Mexico)
ITDS	International Trade Data System
JIT	just in time
JWC	joint working committee
LTL	less than truckload
MOT	Ministry of Transportation, British Columbia
MPO	metropolitan planning organization
MTO	Ontario Ministry of Transportation (Canada)
NAFTA	North American Free Trade Agreement
O-D	origin–destination
POE	port of entry
RITA	Research and Innovative Technology Administration
SANDAG	San Diego Association of Governments
SCT	Secretariat of Communications and Transportation
SFSFTT	Statistical Field Study of Federal Truck Transport

SFTA	Strategic Freight Transportation Analysis
SSS	short sea shipping
TAZ	transportation analysis zone
TBWG	Transportation Border Working Group
TGT	Turnpike Global Technologies
TRB	Transportation Research Board
TSUSA	Harmonized Tariff Schedule of the United States Annotated
UABC	Universidad Autónoma de Baja California
VMT	vehicle miles traveled

APPENDIX C

Workshop Program

Opening Session
8:30 a.m.–9:15 a.m.
The Increasing Importance of North American Freight Data
Paul Bingham, Global Insight, Inc.

Overview of Application Posters
Gordon Rodgers, Whatcom Council of Governments

Update on BTS Border Data Programs
9:15 a.m.–10:30 a.m.
Michael Sprung and Steve Beningo, BTS

The session highlights major improvements to the RITA–BTS Transborder Freight Data program for 2007. Beginning with the January 2007 statistics the Transborder data feature a revised table structure that provides a combination of port and commodity data not previously available. Access to this new and improved Transborder data is through a modernized online searchable database, which will be demonstrated.

Transforming North American Freight Data into Information
11:00 a.m.–12:30 p.m.
Michael Onder, FHWA, presiding

This session focuses on how various users apply freight data to improve programs and gain better understanding of the dynamics of North American economic interactions and transportation flows. Participant discussions will use two case examples to expand the session scope to other uses.

Working with Customs and Border Protection to Better Understand Cross-Border Flows
James Swanson, Program Manager, Cargo and Conveyance Security, Customs and Border Protection
Gordon Rogers, Deputy Director, Whatcom Council of Governments

Use of the Bureau of Transportation Statistics U.S.–Mexico Dataset and Other Mexican Sources to Analyze International Trade Corridors and Potential Mode Diversion
Juan Carlos Villa, TTI

Discussion

12:30 p.m.–2:00 p.m.
North American Freight Data Applications Poster Session and Lunch

A buffet lunch allows participants to visit with 15 North American freight data users, view posters of their applications, and discuss data fusion techniques, analysis approaches, and how data sources might be improved.

Transborder Railway Freight: Its Evolution Since Railways Privatization in Mexico
Roberto Aguerrebere, Instituto Mexicano del Transporte

San Diego–Baja California Cross-Border Planning Estimating Economic Impacts of Wait Times at the San Diego–Baja California Border
Elisa Arias, San Diego Association of Governments

NAFTA Freight Market: Freight Flow Data Development
Paul Ciannavei, Global Insight, Inc.

Use of Border Data in Coordinated Border Infrastructure Program
Mark Sarmiento, Federal Highway Administration

Projecting Washington–British Columbia Border Crossings: An Application Building on North American Freight Data
Hamilton Galloway, Washington State University

Challenges in Great Lake Multimodal Studies
Bruce Lambert, U.S. Army Corps of Engineers

Utilizing Multiple Data Sources to Estimate NAFTA Truck Flows on Texas Highways
Donald Ludlow, Cambridge Systematics, Inc.

U.S.–Canada Cross-Border Freight Data Sources
Akshay Mani, Cambridge Systematics, Inc.

Mexico–U.S. O-D Truck Transport Flows
Alberto Mendoza, Mexican Transportation Institute

A Cross-Border Commercial Vehicle Traveler Information System: Developing a Binational Archive of Wait Times and Volumes
Melissa Miller, Whatcom Council of Governments

Pacific Highway Commercial Vehicle Port-of-Entry 2006 Commercial Vehicle Operations Survey
Melissa Miller, Whatcom County of Governments and Transport Canada

Complementing FAF1 and FAF2
Manuel Solari-Terra, Texas Transportation Institute

Methodology to Identify Mexico–U.S. Trade Flows
Juan Carlos Villa, Texas Transportation Institute

Improving North American Freight Data
2:00 p.m.–3:30 p.m.
Paul Bingham, Global Insight, Inc., presiding

Two presentations on approaches to expand the sources and usefulness of North American freight data will launch a general discussion of how to improve data sources, their formats, and availability and analytical methods to expand their use.

Using Operational Truck Location Data to Improve Understanding of Freight Flows
Rob Tardif, Ontario Ministry of Transportation

Important Applications of Border Data and Ways to Increase the Usefulness of Data Products
Don Ludlow, Cambridge Systematics, Inc.

Discussion

Key Points for the Workshop
4:00 p.m.–4:30 p.m.
Joseph Schofer, Northwestern University

The lead author of the *Transportation Research Circular E-C109: Transportation Information Assets and Impacts: An Assessment of Needs* provides a perspective on important themes from the day's presentations and discussions and offers ideas on how to ensure the value of North American freight data.

APPENDIX D

Workshop Attendees

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MacroSys Research and Technology

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Thomas Palmerlee
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Brian Wall
Pennsylvania Department of Transportation

THE NATIONAL ACADEMIES

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The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Charles M. Vest is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both the Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. Charles M. Vest are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is a division of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. The Board's mission is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, the Board facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation. The Board's varied activities annually engage more than 5,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.
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