Results of the TAC Project on the Framework for the Collection of High-Quality Data on Urban Goods Movement (Phase 1)

David Kriger, P.Eng., MCIP
Vice President
iTRANS Consulting Inc., Ottawa, Ontario

Errol Tan, P.Eng.
Project Manager
iTRANS Consulting Inc., Richmond Hill, Ontario

and

Allison Clavelle, E.I.T.
Transportation Planner
iTRANS Consulting Inc., Vancouver, British Columbia

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ABSTRACT

Transportation planning authorities at all levels of government recognize that efficient goods movement is central to an urban area's economic vitality. However, until recently, urban goods movement has rarely been included in the urban transportation planning process in a comprehensive manner. One important reason for this is that the role of goods movement in transportation planning is not well understood. This situation is complicated further by the fact that a typical city's goods movement activities comprise a mix of urban and inter-urban (and often international) functions, which are driven by complex business-oriented economic, trade and logistical considerations. Modes can include trucks, rail, air, marine and pipeline, as well as courier, the private automobile, walking and cycling: Equally important, commercial activities – such as appliance repair – are now considered as being part of the urban goods movement profile.

However, data and information on urban goods movement are relatively sparse. Accordingly, the Transportation Association of Canada (TAC) identified the need to improve goods movement (freight) data collection in Canada. As a first step, TAC established two needs: first, to develop a framework to guide potential future goods movement data collection; and, second, to develop an understanding of urban goods movement issues as they relate to land use planning, infrastructure planning, traffic safety and operations, demand management and sustainable transportation.

This initiative provided the basis for the research project, *Framework for High Quality Data Collection of Urban Goods Movement in Canada*. The specific purpose of this research project is to provide an improved understanding of the characteristics, operations, issues and opportunities of urban and inter-modal goods movement. This was to be achieved in two phases: Phase 1 conducts an international literature review (including follow-up interviews with 'best practitioners'), develops a survey questionnaire to better grasp the stakeholders current needs and practices, develops a sampling and stratification plan for that survey and pilot-tests the survey. Phase 2 then would administer the survey, synthesize the results and develop an overall data-gathering framework for urban goods movement in Canada. Because Phase 2 is planned for autumn 2007, subject to funding approvals, this paper describes the key findings of Phase 1.

Through a review of the literature and through consultation with selected stakeholders, Phase 1 identified several needs and applications for urban goods movement data. The research has provided a comprehensive overview of urban goods movement issues as they relate to infrastructure planning, land use planning, traffic safety and operations, demand management, and sustainable transportation. The research also identified the challenges facing practitioners, as well as the best practices around the world.

Phase 1 also found that there are many deficiencies with the existing data sets as well as gaps in data; and there is no single, comprehensive source of quality goods movement data for use in urban (or inter-urban) goods movement planning. The sources of freight data for Canadian planners have been explored, and their strengths and weaknesses have been discussed. There are some public and commercial data sources, and many organizations conduct their own surveys and counts, but a more comprehensive program would be of use to many organizations that were consulted.

Based upon this assessment, Phase 1 developed and tested a web-based questionnaire to identify stakeholder needs for urban goods movement data. A contact list of stakeholders also was developed.

As noted, Phase 2 of this study would administer the survey to stakeholders across Canada. This would develop further information about the data collection needs and practices of Canadian practitioners, which is needed to determine the state of the practice across Canada and to aid in future data collection projects.

The survey would be the basis of the development of a framework for high quality data collection on urban goods movement in Canada.

1. INTRODUCTION

The Transportation Association of Canada (TAC) identified the need to improve goods movement (freight) data collection in Canada. As a first step, TAC established two needs: first, to develop a framework to guide potential future goods movement data collection; and, second, to develop an understanding of urban goods movement issues as they relate to land use planning, infrastructure planning, traffic safety and operations, demand management and sustainable transportation.

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TAC engaged iTRANS Consulting Inc. to conduct Phase 1. TAC administered the research, and a Project Steering Committee (PSC) directed and guided the consultant. This paper describes the key findings of Phase 1. Subject to funding approvals, Phase 2 is planned for autumn 2007. Accordingly, this paper considers Phase 1 only.

2. URBAN GOODS MOVEMENT: SOME KEY DEFINITIONS

The research considered several types of data. However, it is useful to define and clarify three key terms. This is important, because these terms are often confused: They may be related, but they are not interchangeable. Moreover, some terms have more than one definition, depending upon the source and the application. Accordingly, the definitions discussed below focus on the specific needs of this research. This matters, because it impacts the types of data that are collected as well as the associated characteristics, such as source, method, frequency and so on. Accordingly, the definitions discussed below focus on the specific perspective and needs of this research; that is, on urban goods movement data collection.

Additional definitions are provided in a glossary to the research report.

- **Freight v. Goods Movement**. To some degree, the terms "*freight*" and "*goods movement*" are interchangeable. Both terms refer to the carriage of "*commodities*" for a price, by any mode. Importantly, however, the broader term "goods movement" also includes the movement of people and goods in order to provide "*commercial*" services, for example, appliance repair.

  Both types may operate on fixed routes (e.g., waste pick-up) or may be generated randomly (on demand). The importance of trips related to the provision of services is illustrated in a recent study in Calgary in which surveys revealed that 50% of all business stops are made to provide a service (Stefan et al., 2005). Clearly, a complete profile of urban commercial movements requires consideration beyond just freight movements and must include service deliveries within the urban area.

- **Commodities**. For the purposes of this research, the term "commodity" refers to any tangible item that is transported by goods movement modes. Commodities are defined for all sectors of the economy, including both raw materials and finished products: standard classification systems are used to define these commodities. A commodity might be discrete – such as, a courier package or a piece of furniture – or bulk, for example, aggregate stone or oil. For the purposes of this research, the electronic transmission of documents is not included in this definition.

- **Movement v. Flow of Goods**. The *"movement"* of goods refers to a trip, while *"flow"* describes the good that is being moved.

  Specifically, ***goods movement*** describes the characteristics of the trip made by a vehicle(s) or person(s) to transport a particular good between a single origin and a single destination. The characteristics are depicted in terms of their origin-destination, the mode or modes used, trip start or end time, frequency, trip route or itinerary, cost, vehicle ownership, points of intermodal transfer, loading factors, etc.; that is, in terms that are typical of an origin-destination survey.

  The ***flow of goods*** (i.e., commodity flow survey) describes the characteristics of the goods that are generated at a location for distribution to another location(s). The flow is expressed commonly in terms of economic activity or output, such as the type of good generated (i.e., the commodity; and typically according to a standard industrial classification), the total volume that is generated in a given period, its value and so on. In addition to the economic reference, the description might also be based in land use. Critically, however, there may be no reference to the actual movement of the good, nor is the description necessarily developed for purposes of transportation, nor might there be a reference to the actual movement of the good. However, flows are often translated into vehicle trips through the use of factors.

  Goods movement characteristics, such as origin-destination surveys and traffic counts, are most commonly associated with urban and inter-urban road vehicle transportation. Commodity flow data typically are reported for all types of inter-urban goods movement, for example, Statistics Canada's annual *Shipping in Canada* report of marine flows.

3. OVERVIEW OF FINDINGS

Through a review of the literature and through consultation with selected stakeholders, Phase 1 identified several needs and applications for urban goods movement data. The research provided a comprehensive overview of urban goods movement issues as they relate to infrastructure planning, land use planning, traffic safety and operations, demand management, and sustainable transportation. The research also identified the challenges facing practitioners, as well as the best practices around the world.

First, to set the stage, a recent study of urban goods data in the United States found that urban freight models can shed light on infrastructure, safety, and environmental issues pertaining to the transportation system. Having such models will enable planners to identify and evaluate alternative actions based on performance measures obtained through the modelling process (Victoria and Walton 2004).

Accordingly, the U.S. study grouped the data needed for urban goods movement planning into five categories: cargo, road transportation, major freight generators and corridors, non-road transportation modes, and economic, land-use, and socio-economic data.

Four key points may be drawn from this categorization:
1. Urban goods movement data needs are significantly greater than those that traditionally would be associated with model development and forecasting.
2. These needs must address operational, safety, logistical and regulatory issues, which – although related to planning – again go beyond those that are traditionally associated with planning.
3. The data cover several perspectives, which include land use and economic development, in addition to transportation. However, the needs may differ. They also may overlap or coincide.
4. Private and public sector interests are stakeholders in urban goods movement data, both as users and as providers of data. Their needs also may differ, but – as before – they also may overlap or coincide. One critical difference is that private sector data may be held as confidential or proprietary.

Part of the freight transportation demand modelling process involves partitioning the freight market based on demand and trip characteristics. Following that, the zone system to be used to analyze the data is defined. However, these zone systems are often developed for passenger transportation models, and then are adapted to freight modelling (D'Este 2000). In addition, they are adapted specifically to inter-regional freight transportation modelling. In urban freight demand modelling and the activities needed to collect related data, there is a need to define zoning systems in accordance with urban goods movement rather than using hereditary zoning systems that were defined for passenger transport modelling.

In the case of intra-urban modelling, it must be remembered that just focusing data collection efforts on major freight focal points such as ports will ignore a large amount of intra urban freight activity which does not pass through major modal interchanges (D'Este 2000). It should be further noted that not all links in the road network will be accessed equally, given that the type of freight determines the transport vehicle used. In

turn, this affects the kinds of roads that are used to transport the goods commonly moved in that vehicle.

Commodity flows are derived from data sources in either tonnes or dollars. Finding the effects of freight on the transportation system requires that commodity flows be converted to trucks, rail cars, shiploads, aircraft, barges, or containers. The correct conversion requires knowledge of how much of a commodity is carried by a particular vehicle. These payload factors (tons per vehicle) can be obtained from several sources, such as, the VIUS database, commercial freight data vendors, such as, the TRANSEARCH database, railroad carload waybill sample.

Many sources of freight data give commodity flows as yearly totals. For modelling purposes which require single-day forecasts (or peak periods within a single day), it is necessary to determine the fraction of yearly commodities transported in a day. This fraction can be obtained implicitly through OD table estimation techniques or explicitly by calculating the number of truck days in a year.

Freight components that are commodity-based usually require that commodity production totals be estimated for each commodity category by zone. A recent study found that almost all states with this requirement derived commodity productions from employment estimates and commodity output per employee. One state in particular, Kentucky, obtained its production totals directly from the TRANSEARCH database (Horowitz 2006).

Commodity flow databases are often reported for fairly large spatial units such as provinces or states. Many states in the U.S. with freight components have created procedures for disaggregating their commodity flows. The method most often cited by states was to factor county-to-county flows into zone-to-zone flows using employment categories and population totals (Horowitz 2006).

Major urban distribution centres should be surveyed, for two reasons (Finnegan et al. 2005): First, established transport and distribution operators are striving to obtain competitive advantage through new and improved freight consolidation and urban delivery operations. Second, the increased popularity of cooperation and partnerships along the supply chain - for example, between retailers and major contract distribution companies – means that much of the goods movement profile otherwise would be lost.

The presence of large urban distribution centres in an urban area typically facilitates more flexible delivery times. As such, night deliveries are more likely to occur and this should be accounted for when conducting data collection.

To survey business involved in the urban goods movement, some cities have opted to use diaries. Businesses were asked to complete a diary for a typical delivery day. As a starting point, members of a city's City Centre Business Association or its equivalent should be surveyed. This list of stakeholders can then be supplemented with representatives from major industries operating within the urban area. For example, a survey was conducted in Dublin, Ireland, and with more than 700 members of the Licensed Vintner's Association (LVA) located within the city centre, the survey was expanded to include LVA members as it was opportunity to survey delivery patterns of bars in the downtown Dublin (Finnegan et al. 2005).

Postal or mail-out surveys can often generate low response rates. These types of efforts can be supplemented by having surveyors personally distribute survey forms to business on predetermined streets such as primary shopping corridors. This survey approach is useful in that helpful feedback and comments made by shop personnel can be noted along with collected data (Finnegan et al. 2005).

Surveys might require coordination according to the type of commodity being delivered in urban areas. This is because there is evidence that the timing of deliveries is sometimes correlated to the type of good being delivered. For example, a study in Dublin, Ireland found that food deliveries peaked at between 7 and 8 am, whereas the greatest amount of household goods, hardware, general mail and parcels arrived at between 11 am and noon (Finnegan et al. 2005). For some types of goods, off-peak trips by trucks may be more limited due to the move to just-in-time delivery and the demands of integrated supply chain management (Woudsma 2001). Consequently, when surveying business or private sector stakeholders to capture information on delivery times, a distinction must be made among the following four types of businesses (Holguin-Veras et al. 2005):

1. Businesses that are required to make off-peak deliveries (e.g. newspaper distribution, transportation of vegetables to consumer markets).
2. Companies that make off-peak deliveries because it is beneficial to them (e.g. deliveries to 24/7 establishments such as convenience stores).
3. Companies that could make off-peak deliveries given the right incentives.
4. Business for which off-peak deliveries are not feasible because additional costs are too high or the marginal benefits are too small.

The literature suggests that the most 'successful' urban freight studies use a number of different survey methods or combination of data sources. Depending on the objectives of the study, research suggests that the best outputs are achieved using a combination of the following survey methods (Taylor 1997):

- Employer surveys of (origin)generation rates
- Mail-out / mail-back questionnaires
- Surveys and interviews with truck drivers and terminal operators
- Truck counts
- Truck origin-destination surveys
- "*Expert groups*" comprising of trucking operators, police forces and industry representatives

A detailed examination of commercial vehicle surveys carried out in Sydney, Australia listed a number of lessons (Taylor 1997):

- There is a need to publish errors or, more specifically, relative standard errors to enable data users to ascertain the level of confidence they can place on the dataset. Comparisons between data might be drawn erroneously because apparent differences could be due to variability in the data (high error) rather than real differences.
- There may be a need to conduct a series of surveys rather than one single survey to capture the needed data. The characteristics of the freight industry vary according to the types of goods being moved, the size and type of vehicles used, the payment methods, use of logistics, unloading / loading requirements, the type of industry sector, for example, manufacturing, retail, express, wholesale, and the culture or

ethos of the people involved. This means that the method of data collection including the sampling frame, survey instrument, degree of aggregation, stratification, response rate, and nature of non-responses all must be investigated or chosen carefully, bearing in mind the final needs of the data, for example, disaggregate or aggregate analysis of goods or vehicles.

- There may be a need to over-sample small or individual truck operators because large fleet operators tend to have a better response rate due to greater resources. Drivers are generally loath to fill out surveys as they are already required to fill out log books, paperwork for firm records, handle invoices, etc., so unless they can see a real benefit or they are instructed to fill out the survey forms, they are unlikely to respond to the survey.
- Response rates for light vehicles are generally poor and extremely variable. It is noted that while these vehicles are classified as commercial, they have very different objectives and functions to the generic freight vehicle. Given that these types of vehicles typically comprise a large proportion of the total population (over 70% in the case of Sydney), there may be a need to collect this data separately, or alternatively, obtain a larger sample.
- Results from the Sydney CVS appear to indicate that, in general, articulated vehicles operating within urban areas show more homogeneity than either rigid or light vehicles, therefore requiring a smaller sample size relative to the latter types of vehicles. However, there may be a need to further investigate this homogeneity in larger vehicles as it may be the result of response bias towards larger firms, as noted previously.

To facilitate movement of intra urban goods, time of day vehicle classification counts are needed. In order to find a balance between off-hours deliveries and resistance from neighbourhoods to night-time truck movements, classification counts on major / minor arterial and collector roads is required for local land use planning. Trip generation by land use also is important to movement of goods within an urban area. Detailed categories of land use will give more accurate results to impact studies. Truck operations data and "*last mile*" studies for freight movements are not common today, but needed in Ontario. The dwell time, linked trip behaviour, number of trips per day, and loading and unloading characteristics of urban goods delivery would greatly assist in planning for intra urban freight movements.

In the U.S., some Metropolitan Planning Organizations have found that the information and databases needed to undertake comprehensive freight planning are sometimes priced beyond their reach. Access to such information has been gained through members and associates involved in freight movement task forces. Facility site visits, electronic data, and hard-copy information have all been secured through this networking effort. However, a link between the data provided and the output in the planning process must be evident in the near term to maintain an ongoing willingness on the part of participants to provide such access (Plumeau and Jones 1998).

To obtain a comprehensive view of the issues related to urban goods movement, there is the need to collect both quantitative and qualitative data. Data collection in the *Goods Movement in the New York Metropolitan Area Study* was done in two stages (Morris et al. 1998). The first part of the study was designed to gather qualitative data through industry-sector focus groups that addressed broad urban freight movement issues. The focus groups also assisted in gaining the input needed to develop and refine the

interview form to be used in the second part of the data collection process. The interview, administered as the second part of the data collection effort, collected data through structured interviews with logistics, transportation and distribution managers. The following practices were found to work well:

- Participants can be drawn from membership lists of major trade associations and programs serving logistics companies. Recruitment procedure includes sending a cover letter stating the study's goals and the interview's purpose, along with the survey instrument to prospective interviewees. Non-attendees and participants also received a summary of their industry sector Focus Group findings and overall results as an incentive for participation.
- Follow-up telephone calls were placed one week after cover letters were mailed out, followed by a reminder telephone call the day before the scheduled interview. The reminder phone calls also allowed the interviewers to ensure that the participants had a copy of the survey instrument.
- Focus groups should be organized by industry sector. Participants are recruited on the basis of their having extensive operational experience in managing their firms' domestic transportation needs. Having senior-level executives is also essential since it allows planning staff to locate appropriate contacts from the private sector for follow-up interviews to collect quantitative data. These senior executives will also have the authority to permit proprietary company data to be shared. This establishment of trust is also important when attempting to gather data from companies using third party logistics companies.
- Safeguards must be in place to meet confidentiality requirements of the study's industry representatives, particularly if information on costs and performance are requested. For example, participants are informed that data would be pooled and that no individual organization would be identified. Further, the word "CONFIDENTIAL" is printed in bold face across all written survey instruments (Morris et al. 1999).
- Meeting time must be flexible enough to accommodate busy schedules of those executives willing to participate. In the case of the New York study, interviews could be scheduled from 7:30 am to 7:30 pm. In addition, participants were given the flexibility of choosing the form of the interview, for example, face-to-face versus telephone. Follow-up telephone calls were used liberally to collect missing data.
- Focus groups limited to two to four members to allow sufficient time to discuss and explore issues in depth and to ensure sessions could be completed within the scheduled time of two hours.
- A Moderator's Guide (consisting of six questions and related probes dealing with barriers to urban freight mobility, a review of the interview instrument, and how to improve industry access to the local planning organization) along with informational material was provided to participating executives well in advance of their session.
- Visual displays, a flip chart that listed seminal points for questions and probes, and a large map highlighting the Central Business District's (CBD's) geographic boundaries were all used to reinforce the attendees' attention to topics under discussion. Some representatives also participated via speaker phone as a last resort.

The most common survey method for conducting truck travel surveys in urban areas is the combined telephone – mail out / mail back method. It is a cost effective approach and yields a reasonably high response rate. The Commodity Flow Survey for goods shipped from the City of Edmonton and the Edmonton Region utilized a hybrid of the telephone – mail out / mail back methods coupled with personal contact and with

assisting company officials in filling out the survey forms using records of the shipment information.

Also of interest, the Edmonton survey accounted for all business establishments, and thus covered the generation of both goods and services trips. A large survey sampled was used. The survey also sought information on individual shipments and movements, and incorporated special surveys to address different needs (e.g., establishments with large numbers of small shipments, such as couriers, newspaper deliveries and waste collection).

The second most used survey method is the roadside interview method. Roadside interviews produce very high response rates with complete information. They are ideal for cordon surveys or for surveying trucks travelling in from outside the survey area. The External Cordon Commodity Flow Survey used this method for the collection of data at the entry and exit points into the study area (City of Edmonton and Alberta Transportation 2003).

Running continuous surveys or having surveys that use similar survey instruments may be an attractive option since they allow survey participants to become familiarized with the survey process (Browne 2005).

When designing surveys and analyzing their results, details of sample size, sampling frame, sample stratification, response rates and survey accuracy all must be carefully controlled and clearly stated. For example, in the calculation of the overall sample size, it is the required level of accuracy of the smallest variable or segment to be measured that will be the critical factor. This has considerable implications if regional analysis of freight flows by commodity groups or vehicle types is required (The National Institute for Transport and Logistics 2005; McKinnon et al. 2000a). In actuality, few studies typically mention confidence intervals or levels of accuracy. Even when such information is provided, there is little indication of how it is to be used and there is usually no guidance as to which variables it is relevant. As the size of the confidence interval depends on the standard deviation of the variable concerned and on the estimate of the variable, the width of the interval will change. It is important that clear guidance is given on the interpretation and accuracy of the data from sample surveys and that their limitations are fully recognized (The National Institute for Transport and Logistics 2005; McKinnon et al. 2000a).

Two emerging types of data activities provide promise for urban goods movement data:

- Most surveys can be categorized as revealed preference surveys – i.e., they record actual behaviour. However, these cannot capture behaviour regarding situations that do not exist; information about choices that have not been taken (route or mode choices); the necessary information may not be available and the information that is available may be inaccurate or incomplete; and, contractual, legal or confidentiality considerations may be restrict the availability of information. To address these, stated preference surveys have been introduced to freight data collection: these surveys focus on hypothetical but realistic situations that allow respondents to provide meaningful information that analysts can use to develop usable, quantitative behavioural choice relationships.

- A second type of emerging data collection, the satellite-linked Global Positioning System, quantifies the location of a moving vehicle, thus providing accurate information on the vehicle's (or person's) location at any time, as well as the route, travel time and speed, stops made, duration at the stop, and other information such as fuel consumption and emissions.

Finally, a recent study of truck flow trends in the Greater Toronto Area is evidence that – notwithstanding the many gaps in urban goods movement data – the existing available sources may be under-utilized, and that much insight and useful information can be gained by exploiting these databases. The study linked historical screenline and cordon trends with socio-economic and demographic explanatory factors.

4. SURVEY

An online survey was developed with the *Vovici* (formerly *WebSurveyor*) commercial software. The survey was subjected to three rounds of pilot testing.

The resultant survey has six sections. These are outlined below:

- **Section 1: Issues and Applications of Existing Data Collection**. This section beings the survey by identifying applications. It first asks respondents to identify themselves (in confidence), in order to allow for possible follow-up if needed for clarification or to solicit further information, reports, etc.

  Next, Section 1 asks respondents to identify the freight planning issues that they consider in their planning function (or that impact their business decisions). The use of the word "consider" is intended to allow both for actual applications and for planned or desired applications. The choices are: capacity enhancement, system preservation, operations, safety, environmental, policies, human resources, or other. (The "other" choice generally is provided throughout the survey, along with a space for the respondent to explain this response.)

  Section 1 then asks respondents to identify how they use (or would use) freight data to address the aforementioned freight planning issues. The choices are: developing profiles and trends, modelling and forecasting, traffic operations analysis, facility/access design, environmental (and similar) assessments, cost-benefit or financial analysis, investment decision-making, responding to community, political or public concerns, and other.

- **Section 2: Data Collection Programs**. This section asks respondents to describe the types of freight data that their organizations collect, fund / sponsor or purchase from others. Respondents are asked to select all types of surveys that apply: for each selected survey, details then are solicited that describe the survey and discuss the availability of the data to the public. A similar set of questions is posed for traffic counts. Finally, respondents are asked about the use of Intelligent Transportation Systems (ITS) technologies for collecting data: a list of 15 choices is offered.

- **Section 3: Public and Commercial Data Sources**. This section asks respondents to describe the types of freight data that they have procured or purchased externally, from public or commercial sources. Respondents are asked to select all types of data

that apply, from a list of 41 Canadian and U.S. sources. For each selected source, respondents are asked to assess the quality of the data, identify shortcoming or limitations, identify their importance to planning, and describe the purposes for which they use the data and how they are maintained.

- **Section 4: Freight Data Requirements**. This section asks respondents to specify their freight data requirements. The questions distinguish among freight data that respondents currently use, data that they need but which are not available to them and data that do not apply to them. This is achieved with three sets of questions: First, respondents are asked to indicate general information about the details that are needed (e.g., commodity flows, origin-destinations, etc.) followed by the types of modes that they consider in their planning. These modes are highway/trucks, rail, air, water and other. Next, for each selected mode, respondents are asked to indicate the specific data that are currently used, are needed but not available, or are not applicable. Finally, respondents are asked whether they use or need data on intermodal freight transportation – for example, truck/rail – and then are asked to describe the selected data.

- **Section 5: Other Data Sources**. This section asks respondents to describe complementary data sets that they use for freight planning. Three choices are offered: economic data, land-use data and transportation network data. For each selected choice, respondents are asked to describe the pertinent data sets, and assess their quality, shortcomings and limitations.

- **Section 6: Lessons Learned**. This section concludes the survey by asking respondents to assess their existing urban goods movement data, and identify specific needs and priorities. In contrast with the previous sections, these questions are mainly qualitative and largely open-ended: they are intended to draw comment and insight from the respondents; and also to engage respondents for possible future initiatives. Some of the questions focus on possible needs surveys that might have been conducted by respondents among the users of their data. Fourteen questions are asked:
  a) How well existing data meet the respondent's needs that were identified in Section 1.
  b) Improvements or new data that are needed to address any deficiencies or gaps.
  c) Priorities for improvements or new data.
  d) Benefits of having these improvements or new data.
  e) Factors that contribute to the respondent's success in collecting urban goods movement data.
  f) Plans for expanding, enhancing or changing the respondent's data collection and storage methods.
  g) Other needed data items (not otherwise identified).
  h) Primary problems with the respondent's existing data, and the most improvements to address these problems. Respondents also are asked whether or not they have conducted a needs survey among the users of their data and, if so, the findings.
  i) Problems encountered by participants in the respondent's user needs survey, the reasons for these problems and they might be avoided in future surveys. (Note that this question and the next question focus on the conduct of the user needs

survey; in contrast to the previous question which asks about the content of a user needs survey.)

j) Technical or content problems or limitations identified from user needs surveys, and how these might be addressed in future surveys.
k) Legal / confidentiality considerations that impacted the respondent's user needs survey, and how these considerations were addressed.
l) Indication of the respondent's level of interest in participating in a (possible future) TAC programme to coordinate the collection of urban goods movement data.
m) Approximate cost devoted by the respondent's organization to freight collection; distinguished between internal and external costs.
n) Willingness to provide sample data from the surveys carried out by the respondent's organization (i.e., in order to help explain the needs, limitations and opportunities in the documentation of the Phase 2 survey results).

A covering e-mail letter and a briefing document also were prepared. The briefing document provides a brief overview of the survey and its purpose; instructions for completing the survey; and, a glossary of key terms. Much of this material is included in the actual survey as well, for convenience. The survey also provides 'signposts' along the way, in order to guide positively the respondent. The e-mail, briefing document and the survey also alert the respondent to the desirability of assembling and preparing material prior to embarking on the survey, in order to save time. All individual responses are kept as confidential. English and French versions of the Phase 2 survey will be available.

A contact list of stakeholders was developed for the Phase 2 survey. For each contact, the list provides the name, title, organization, type of organization (e.g., government type or industry sector), province or territory (where appropriate), telephone number, e-mail address, website and – where applicable – reference comments.

The list was compiled from information by provided by TAC, members of the PSC and the consultant.

The spreadsheet has several distinct parts. These are summarized below:

- **Federal government departments** that deal with freight transportation or freight statistics, and Federal agencies (e.g., Canada Border Services).

- **Provincial / territorial governments**; primarily ministries of transportation. Where possible, individuals who are responsible for freight activities were identified.

- **Regional and municipal governments**. All regional governments and transportation authorities – for example, the Regional Municipality of Peel in Ontario and TransLink in British Columbia – were included. Cities and municipalities having a population greater than 40,000 were included; the idea being that smaller municipalities likely would neither generate nor require urban goods movement data. Exceptions were included in order to ensure that all provinces and territories were represented. Where possible, individuals who are responsible for freight activities were identified.

- **Economic development departments / commissions**. The municipal economic development organizations of the 34 cities having a population of at least 100,000 (as defined by the 2006 *Census of Canada*; and as included in TAC's upcoming *Urban Transportation Indicators Project*) were identified.

- **Carrier and industrial associations**. Carrier, transportation, industry and manufacturers' associations were identified. Associations for Canadian marine and airports also were identified: the Association of Canadian Port Authorities and the Canadian Airports Council, respectively, have agreed in principle to survey their key members (i.e., minor port and airport authorities would not be surveyed).

- **Goods-producing organizations and companies**. Commercial organizations were categorized in two ways: the first group comprises organizations that generate (ship and/or receive) goods. Within this group, firms were identified by economic sector and, where possible, industry associations were identified for these groups.

- **Service organizations and companies**. The second group comprised organizations that provide services, such as warehousing and distribution, postal services and waste pick-up. Carriers – including air, marine, rail, trucking, courier and third-party logistics providers – were included in this category. Where possible, industry associations were identified for these groups.

- **Others**. This group comprises academics and other organizations, not otherwise categorized, that could be of interest.

5. SUMMARY AND NEXT STEPS

Through a review of the literature and through consultation with selected stakeholders, Phase 1 identified several needs and applications for urban goods movement data. The research has provided a comprehensive overview of urban goods movement issues as they relate to infrastructure planning, land use planning, traffic safety and operations, demand management, and sustainable transportation. The research also identified the challenges facing practitioners, as well as the best practices around the world.

Phase 1 also found that there are many deficiencies with the existing data sets as well as gaps in data; and there is no single, comprehensive source of quality goods movement data for use in urban (or inter-urban) goods movement planning. The sources of freight data for Canadian planners have been explored, and their strengths and weaknesses have been discussed. There are some public and commercial data sources, and many organizations conduct their own surveys and counts, but a more comprehensive program would be of use to many organizations that were consulted.

Based upon this assessment, Phase 1 developed and tested a web-based questionnaire to identify stakeholder needs for urban goods movement data. A contact list of stakeholders also was developed.

As noted, Phase 2 of this study would administer the survey to stakeholders across Canada. This would develop further information about the data collection needs and practices of Canadian practitioners, which is needed to determine the state of the practice across Canada and to aid in future data collection projects.

The survey would be the basis of the development of a framework for high quality data collection on urban goods movement in Canada. The final form of this framework is dependent on the feedback received from Canadian practitioners through the stakeholder survey.

6. WHERE TO FROM HERE? SOME CLOSING THOUGHTS

In closing, the research acknowledges the many challenges that are associated with the current state of urban goods movement data in Canada. However, it also identifies potential opportunities for improving this state:

- Emerging issues – such as security – offer challenges but also opportunities for data collection. The challenges arise because of the complexity and scale of the issue; the need to account for international stakeholders; and the need to access or create sensitive information. The opportunities arise because the complete logistics chain and 'true' origin-destination by all modes must be captured; including notably the inter-modal transfer.

- The growing use of electronic and remote sensing technologies offers opportunities for improved and more precise data collection, in real time; although some problems remain to be addressed with emerging technologies. The availability of inexpensive, unobtrusive technologies, such as wayside and in-vehicle monitors, means that data for transportation planning can be collected as part of other information-gathering activities for business, administrative, accounting or other purposes: i.e., the potential exists for collaboration between the public and private sectors to collect data on goods movement.

- In recent years, budgetary pressure has been exerted in the United States to reduce or eliminate public freight data collection activities. In Canada, these types of pressures are not as apparent; but on the other hand not as many types of data have been available in Canada as in the United States (e.g., a nation-wide commodity flow survey). Still, in combination with emerging issues and growing use of technological innovations to capture data, the opportunity exists to bring in new partners to capture urban goods movement data.

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