

Planning Process for Urban Goods Movement

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

Paper prepared for presentation
at the *Urban Goods Movement – New Approaches* Session
of the 2004 Annual Conference of the
Transportation Association of Canada
Québec City, Québec

ABSTRACT

Urban transportation plans are often prepared in accordance with a city or region's planning mandate (e.g., in Ontario, as part of the regular update to a city's Official Plan), or are predicated by a specific issue that requires a comprehensive, holistic treatment before planning and investment decisions can be made. Although these transportation plans usually identify actions that individual residents and employers could take to manage projected growth in travel, at the core they largely focus on identifying the requirements for new public investment in the urban area's transportation infrastructure. The need for such plans generally is accepted by the authorities that are responsible for delivering urban passenger transportation services.

In contrast, with some exceptions the need for urban goods movement plans is not as well established among these authorities. Although the movement of people clearly is the dominant usage of an urban transportation system (hence it is the appropriate focus of urban plans), many plans either ignore goods movement or mention the subject seemingly only in passing. This lack of attention is due to at least two reasons: the multitude of governmental mandates that oversee and regulate goods movement services and infrastructure (meaning that a clear urban mandate does not exist for any particular level of government) and the competitive nature of the (mainly) private sector operators (meaning that the impetus for any cooperative, multi-modal planning tends to be market-driven). These reasons are related to other problems, such as the lack of contextual analysis, hard data and forecasting tools. They are further compounded by the complexity inherent to the logistics associated with the movement of goods in all economic sectors, which in turn are linked to complex systems of local, national and international decisions regarding facility location, modal use, tariffs and so on.

Still, many authorities have begun to recognize the importance of addressing a growing number of urban goods movement problems and – perhaps more important – the relationship between efficient goods movement and a region's economic prosperity. The challenge is that there is very little guidance and experience on how to develop a plan. Accordingly, the purpose of this paper is to identify the components that should constitute an urban goods movement plan, drawing from a recent study in Central Ontario (the Toronto-centred region) and from other sources.

1. CONTEXT AND PURPOSE

Goods movement is central to an urban area's economic vitality, yet it is rarely included in the urban transportation planning process in a comprehensive manner. One reason for this is that responsibility for the different goods movement modes is divided among different levels of government and between the public and private sector; i.e., there is little to bring the various – often competing – players together in common cause. A second reason is that the role of goods movement in transportation planning is not well understood. This situation is complicated further by a general lack of data and analytical capabilities. A third reason is 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.

A recent study in Central Ontario (the region centred about Toronto but also including much of southern Ontario) sought to identify trends and issues for goods movement

planning, in the recognition that changes in the global and local economy are placing demands on transportation systems that are not matched by appropriate changes in planning, funding and implementation of infrastructure and services. The study was sponsored by the Ministry of Transportation of Ontario.¹

Central Ontario's study was driven by the need to support economic development, ensure the region's competitiveness, and balance transportation needs with other public quality of life goals. Similar studies elsewhere in North America have often acted as catalysts for innovative public-private partnerships to implement multi-modal improvements to the transportation infrastructure, with benefits to the movement of goods and people alike.

The study combined an extensive stakeholder consultation with an analysis of the characteristics of each mode (truck, rail, air, marine and pipeline), a profile of trade and a review of available data and modelling tools. Through an extensive stakeholder consultation process and supporting research, the study found that a healthy goods movement system requires mode choice for shippers and receivers, system reliability, continuity of infrastructure and services and services focused on the needs of shippers and receivers. The study looked at the strengths, weaknesses and emerging trends of the Central Ontario economy, in terms of how the logistics of goods movement are changing and the role of the local economy in the national, North American and global context. Finally, the study also assessed the available data and analytical tools as the basis for decision-making.

The study provides a strong methodological prototype that could be applied to urban goods movement analyses in other Canadian cities. Accordingly, using the Central Ontario study (and others) as a model, this paper provides a paradigm of how an urban goods movement study could be structured. It does so by identifying several key planning tenets that are critical to urban goods movement, and how the process used for the Central Ontario study (and others) addresses these.

First, however, it is important to define what is meant by the term "goods movement" (often interchanged with "freight"): The term refers to the transportation of goods, for a price, by road, rail, air, water and even pipeline. While each of these modes has a role in urban goods movement, road vehicles predominate. These generally are trucks of all sizes, but also can be vans, pick-ups and autos. The circulation of couriers on foot and on bicycle also constitutes urban goods movement.

2. GENERAL STEPS

In general, based upon the Central Ontario experience, and drawing upon approaches elsewhere, six general steps are proposed for an urban goods movement study:

- i. **Establish economic context and trends.** This step establishes the critical connection between transportation and an urban area's economic prosperity and competitiveness. It recognizes that local goods movement issues are linked to

¹ iTRANS Consulting et al., *Research on goods movement trends and issues in Central Ontario*, technical report (draft), prepared for the Ministry of Transportation of Ontario, Toronto, 2004. Unpublished. Approval pending.

inter-regional, national, cross-border and international trade. An example from the Central Ontario goods movement study demonstrates why this is important: The region has a growing high-technology sector in a variety of areas (e.g., the health sciences), which builds upon world-class research capabilities in Central Ontario's universities. These produce high-value, low-weight goods, both of which attributes make it economically attractive to ship these products by air (rather than truck). Accordingly, during a consultation process (see below), some interests identified efficient, uncongested road and highway access to the region's major airports as fundamental to their ability to maintain and expand nascent high-technology nodes.

The Central Ontario study described the composition of the regional economy and its relationship to those of the province, the nation and international trading partners (notably, the United States). The importance of this is to establish quantitatively why goods movement is important to the region's economic prosperity, and how. In the case of Central Ontario, the automobile industry (manufacturing and assembly) is a key generator of the regions' prosperity, anecdotally accounting for 1 in 6 jobs and accounting for a significant proportion of Canada-US trade. The profile identified which industries were growing and which were stagnating, as a means of indicating possible future demands for goods movement (e.g., the expected increased demands for the high-technology sector's access to air transportation). It also reviewed the role of the goods movement industry (transportation, warehousing and distribution) in the region's economic profile, which illustrated the importance of the industry as a source of jobs in its own right – common to many urban areas. The changing nature of goods movement trips was described, as a function of both the changing economy but also on the adaptation of just-in-time logistics practices by different sectors (other than manufacturing; e.g., the retail sector). Finally, a separate discussion was provided on the 'best practice' goods movement plans of other regions in North America and elsewhere for increasing or maintaining their competitive position.

- ii. **Establish local conditions and trends.** This step describes the supply and demand of goods movement transportation, in the context of a demographic and socio-economic profile. In Central Ontario, this focused on the more traditional aspects of urban transportation planning studies, but with some significant differences. These comprised three topics:
- A review of the region's population and employment forecasts and their geographic distribution. An attempt was made to break down jobs by type (i.e., employment at the work end, as opposed to the occupation), in order to further identify where growth in goods-producing industries was expected to take place. However, the available data either were incomplete or inconsistent.
 - An inventory of the goods movement transportation infrastructure for all modes. This included a review of the major highway and arterial road networks, with respect to their importance as trade corridors, as well as of intermodal transportation terminals (primarily truck-rail), marine ports and airports.

- A synopsis of the demand for these modes, including an analysis of inter-modal demand. However, except for road (truck) demand, the data tended to be sparse or could not be broken down beyond provincial or national levels. The road data, which were available from local public sources, were used to identify congestion points on the major highway network. Noteworthy were data from the Ministry's *Commercial Vehicle Survey (CVS)*, last conducted in 1999-2000.² These inter-urban roadside survey data provide information on truck origin-destination volumes, the commodities carried, commodity values, vehicle types, registration and other information. The CVS is a valuable source of truck data, fairly unique (at its scale and frequency) in North America. However, it only partially covers intra-urban truck trips.

The analysis also reviewed the treatment of goods movement in urban transportation plans and policies, including an examination of inconsistencies in the definition of truck route maps and regulations among municipalities in the region.

- iii. **Identify issues**. This critical step identifies issues of concern to goods movement stakeholders. In Central Ontario, it was based in part on a review of the literature (experiences in Central Ontario and elsewhere) and upon a synthesis of the two preceding steps. However, the most important source of information was an extensive stakeholder consultation.

Stakeholder consultation was a fundamental component of the study given the need for both the private and public sectors to identify goods movement issues, prioritize potential solutions and to integrate both into urban and transportation processes.

Consultation with stakeholders in the Central Ontario goods movement 'community' took the form of one-on-one telephone interviews with identified stakeholders. The general procedure, in most cases, was to send (e-mail) the stakeholder a list of issues prior to the interview, to prepare the stakeholder and guide the interview. Most interviews lasted from 30 to 60 minutes. There were four categories of interviews:

- Municipal, county and regional governments that provide the roads and services, and who zone the lands that are used by and for goods movement. Representation from planning, traffic, transportation and economic developments interests within each government was sought. In most cases, these interviews included representatives from several government departments.
- Carriers and terminals that provide goods movement services, including port and airport authorities.
- Shippers and receivers that demand goods movement services.

² Selected summaries and tabulations from the 1999-2000 "Commercial Vehicle Survey" data base, prepared by the Ministry of Transportation of Ontario, Toronto, 2003.

- Others, such as the federal government, other provincial ministries, industry associations and United States (US) sources, not all of which have a direct impact on goods movement in Central Ontario; hence, their input was sought on specific issues or perspectives.

Most governmental interviews were augmented with reviews of public documents such as Official Plans, bylaws and other policy and regulatory documents. The interviews themselves, for all stakeholders, were allowed to deviate from the pre-arranged questions in order to allow respondents to express their views on whatever issues were important to them. This approach helped minimize the influence of preconceived ideas on the responses received. The questionnaires generally were qualitative (open-ended). It was not possible to obtain a comprehensive database of responses to all issues from all stakeholders, since few respondents were willing or able to provide hard data to back up their views. The supporting documentation proved more reliable for obtaining hard data, although several respondents had some useful quantitative information on their Internet sites or in publications that were made available to the Consultant.

Carriers, shippers and receivers were asked to describe the characteristics of their goods-movement related (and generating) activities, the transportation factors that impact their location and how they are impacted by (or impact) Central Ontario's current transportation infrastructure. Stakeholders were asked to comment on issues in Central Ontario, as well as on cross-border issues (if relevant to them).

Approximately 115 different organizations provided input to the consultation process, with some organizations also providing additional responses from several representatives. The stakeholders comprised representatives from regional, city and county governments, various ministries of the provincial and federal governments, carriers (all modes, including couriers and logistics providers), truck drivers, port and airport authorities, industry/shippers (ranging from a steel manufacturer to a supermarket chain to auto parts retailers), carrier associations; industry associations, economic development agencies, non-governmental organizations, and others such as GO Transit (whose commuter rail service operates on freight lines), the Ontario Provincial Police and a radio traffic reporter. Special attention was given to ensure that private and public stakeholders outside the Greater Toronto Area were well represented in the consultation.

- iv. **Establish analytical base.** The importance of this step is to establish a database of goods movement characteristics and an analytical capability. In Central Ontario, as in most other urban areas in Canada, the data are sparse and the analytical capabilities are limited. Accordingly, the Central Ontario study assessed the state of the existing data and analytical tools that were available to Central Ontario governments, reviewed the data and tools that others use and identified possible means of improving data and analytical capabilities.

In Central Ontario, the *Commercial Vehicle Survey* provides an up-to-date data set; however, as noted, these describe inter-urban truck movements. There remains a significant gap in data on intra-urban goods movement (mainly trucks, but also couriers and other commercial activities [such as trips made by repair

and service people]). The last intra-urban survey was conducted in 1987, and it covered only parts of the region. A 2001 study of goods movement in the Greater Toronto Area reviewed the existing truck modelling capabilities of the City of Toronto and the surrounding suburban regions. It found – where such capabilities existed – generally that simplified approaches were used, using factors of forecast automobile traffic. On the other hand, municipalities in the Greater Toronto Area benefited from an extensive historical series of classification and occupancy counts (although these counts generally did not cover night time traffic, during which truck activity can be high).³

More recently, intra-urban surveys were conducted in Vancouver (1999), Edmonton (2000) and Calgary (2001). The Vancouver data covered 24-hour light and heavy truck trips. These were used as the basis for a truck forecasting capability, which was added to the AM peak EMM/2 passenger travel demand forecasting model.⁴ This means that the peak travel times for trucks are not modelled (namely, the mid- to late-morning). The Edmonton model simulates several time ‘slices’ of daily travel.⁵ The Calgary goods movement model follows this structure, but was still under development at the time of this writing.⁶

It is important to note that the development of data and analytical capabilities is a comprehensive process, which may require an effort that is separate from – and ideally precedes – a goods movement plan. In addition, intra-urban goods movement surveys are notoriously difficult to conduct, for several reasons including the difficulty of securing a reliable sampling frame and population and challenges in achieving usable responses rates. Advances in survey techniques, notably including the use of GPS technology to reduce the response burden on truck drivers while increasing accuracy, as well as the use of commodity flow surveys (which approach the problem by tracking first the good that is moved, then the vehicle[s] in which it is carried; rather than the other way around as in a traditional goods movement survey), show some promise in addressing these challenges.

- v. **Develop a plan.** Presumably, this is the ultimate product of the exercise. However, many goods movement plans tend to cover a wide range of issues, but they lack a mechanism for implementing or prioritizing them. Similarly, stakeholders often identify (and reasonably so) specific infrastructure improvements that address their individual needs; however, these must be incorporated into the overall infrastructure planning and funding process. Moreover, goods movement plans lack the legal imperative that is associated with many urban passenger transportation plans (i.e., which attain status). Equally important is the need to bring together a number of public and private stakeholders together in order to implement any resulting plan, without which a unified voice likely will not exist for goods movement interests. In short, the plan must “make the case.”

³ IBI Group et al., “GTSB Goods & Services Movement Strategy: Phase I,” Final Report, prepared for the Greater Toronto Services Board, Toronto, 2001.

⁴ Reid Crowther and Partners et al., “1999 Lower Mainland Truck Freight Study, Report No. 4, Model Development,” prepared for TransLink, Burnaby, BC, 2001.

⁵ Personal communication with staff from the City of Edmonton, July 2003.

⁶ Personal communication with staff from the City of Calgary, April 2004.

To this end, the Vancouver Gateway Council (a forum which comprises a number of public and private goods movement stakeholders in the region, including TransLink [the Greater Vancouver Transportation Authority]) has conducted a number of initiatives to further integrate urban goods movement issues into the regional transportation planning process. Among its other activities, in 2003 the Gateway Council conducted a cost-benefit analysis of implementing the regional plan's proposed road and transit improvements. The analysis addressed the perspectives of both urban passengers and urban goods movement.⁷ Earlier, Transport Canada came up with a ranking of previously proposed road and transit improvements from the point of view of improving goods movement operations: although this ranking was not intended to have status, it was meant to illustrate how the goods movement perspective could be taken into account in an urban passenger transportation plan.⁸

Another important analytical aspect relates to the costs of congestion. The significance is that the costs of congestion in urban goods movement generally are passed to the consumer, and can make a particular factory, warehouse, etc., economically unviable in its present location. The aforementioned Vancouver cost-benefit analysis considered the impacts of future congestion in its evaluation. However, there is no methodologically consistent analysis of the costs of congestion across Canada.⁹ A 1987 study estimated the annual costs of congestion to goods movement in Toronto to be \$2 billion.¹⁰ Estimates elsewhere include \$0.5 billion in Ottawa-Gatineau (1991);¹¹ however, it is difficult to reconcile these numbers given the differences in method and inputs (e.g., in the values of time) and in the economic activity, population and other influencing factors in these two regions. Moreover, the studies are now somewhat dated.

vi. Establish implementation and funding framework. The Vancouver Gateway Council provides one example of a growing North American phenomenon; namely, the establishment of permanent freight forums around which serve as a focal point to identify, prioritize and address urban goods movement issues. (A similar forum exists in the Montréal region.) Seattle's FAST Corridor is one example of a freight forum that successfully has addressed critical goods movement problems in that region's key freight corridors, the resolution of which was integrated with transit improvements.¹² According to officials in Seattle and elsewhere in the United States (e.g., Portland, Oregon and Kansas City), critical initial steps include tailoring the forum's activities to the needs of the private

⁷ Delcan Corporation et al., "Economic Impact Analysis of the Major Commercial Transportation System," prepared for the Vancouver Gateway Council, Vancouver, 2003.

⁸ No author given, "Greater Vancouver Transportation Development Strategy," prepared for Transport Canada, Vancouver, 1997.

⁹ Transport Canada's concurrent "Costs of Congestion in Canada's Transportation Sector," for which the author is the consultant project director, seeks to address this issues through the development of congestion measures and indicators in Canada's nine largest urban areas.

¹⁰ Cole-Sherman et al., "Metropolitan Toronto Goods Movement Study," Technical Report, Municipality of Metropolitan Toronto, Toronto, 1987.

¹¹ Delcan Corporation, "National Capital Region Goods Movement Study," Technical Report, prepared for the TRANS Committee, Ottawa, 1991.

¹² Personal communication with staff from the Puget Sound Regional Government, 2000. See also <http://www.wsdot.wa.gov/mobility/fast/default.htm>.

sector (ranging from the timing of meetings to speakers who focused on practical ways that carriers could improve their operations), as a means of gaining trust and establishing a partnership; and, identifying and focusing on prioritizing a small number of specific, tangible issues that can be addressed, in order to attract funding from the private and public partners, and to demonstrate success and momentum as the springboard for further actions. The forums also have been successful in attracting business partners, who see improved freight facilities as allowing them to maintain or increase their market areas.

It is important to recognize that an important key to success in the American freight forums has been the availability of federal funding for urban goods infrastructure. The proposed legislation to reauthorize TEA-21 requires each state to designate a 'freight transportation coordinator, "who will be responsible for fostering public and private collaboration in regional solutions to freight transportation and freight gateway problems."¹³ No such requirement exists in Canada, nor does the sustained funding exist at a national level (let alone in many urban areas).

3. IMPLICATIONS / CONCLUSIONS

This paper has attempted to describe what components an urban goods movement study should contain, and why. It is based upon the experiences of a recent study in Central Ontario, as well as experiences elsewhere. The paper proposes that these components are essential to addressing critical issues; notably, the need to establish the relationship between efficient goods movement and an urban area's economy and competitiveness.

It is also important to note that the resolution of urban goods movement problems also goes far in addressing urban passenger problems; for example, improved curbside management (i.e., providing loading space off-street) would improve bus operations as well. The reverse is also true: in the Central Ontario stakeholder consultations, many truck operators and third-party logistics providers encouraged investment in transit as a means of freeing up road capacity for their trucks; and they also advocated high-density, mixed-use suburban development as one way to promote efficient goods movement servicing.

Finally, the experience of many American cities is that the freight forum can be used to direct efforts to specific, critical urban goods movement issues that otherwise might go unresolved (for lack of a focus). It follows that this focus similarly can be used to address urban passenger movement problems, as well, again by providing a directed critical mass around which partnerships and funding contributions can coalesce.

4. ACKNOWLEDGEMENTS

This paper is based largely upon work conducted by the consultant for the Ministry of Transportation of Ontario, which is now under review by the Ministry, as well as work conducted by the author for or referenced from other agencies. The views expressed in

¹³ See <http://www.fhwa.dot.gov/reauthorization/safetkeyinfo.htm#sfs>.

this paper are those of the author, and do not necessarily reflect those of the Ministry of Transportation of Ontario or its consultants. The paper does not imply any commitment, official position or endorsement by the Ministry of Transportation of Ontario or by any other agency.

Acknowledgement nonetheless must be given to Julius Gorys of the MTO, the study's project manager, who specified that study's process – essentially, steps i, ii and iii described herein. Appreciation also is extended to the MTO staff who participated in the study, to the stakeholders who universally voiced a strong interest in the topic and generously gave their time to be interviewed or participate in a workshop, and to the members of the study's consultant team. In particular, the contributions of Rory Williams, formerly of iTRANS Consulting and now with the City of Oshawa, Ontario, are acknowledged. Again, the views expressed herein are those of the author alone.