

In memory of Noorani Khaderoo, who was the project manager for this submission project:
Freight Transportation Demand Management Study, who passed away on June 21, 2013

Transportation Association of Canada (TAC) Sustainable Urban Transportation Award

Project: Region of Peel's Freight Transportation Demand Management Study

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INTRODUCTION

Moving goods and services efficiently, effectively, and sustainably within an urbanized environment is challenging. The competing road spaces and the abundant traffic and parking regulations for cars, on-surface transit vehicles, pedestrian and cyclists have made truck movement intricate to maneuver on the busy urban streets and highways. The same challenge applies to the rail and air traffic, since goods movement usually share the same rail line infrastructure and air capacity with the commuters. All of these challenges have been further complicated by the goods movement companies who practise the necessary "Just-In-Time" delivery in order to service the demanding consumer and manufacturing markets and to compensate for the shortage of distribution centres and other infrastructures within the supply chains of commodities and consumer products. Unfortunately, not too many urban communities in Canada have set priorities to tackle the goods movement challenges. As stated in one of thirteen decision making principles in the TAC's *A New Vision for Urban Transportation*: "#7 Improve the efficiency of the urban goods distribution systems... will be difficult because even basic data are lacking and because of the fragmented and highly competitive nature of the trucking industry..."¹. The lack of attention to a sustainable goods movement solution has resulted in inefficient usage of road capacity due to empty container trips (up to 40% of total truck trips), extra greenhouse gas emission by the truck's diesel engine (15 times more than car gas emissions²), and impacting the economy from the perspective of congestion costs (up to \$2.7 billion/year to the Greater Toronto and Hamilton Area (GTHA)³).

Peel Region, one of six regional municipalities in GTHA in Ontario, recognized the challenges and have faced them head on. In collaboration with all levels of government and businesses, Peel Region established the *Goods Movement Strategic Plan* with 23 Action

¹ Sustainable Urban Transportation Initiatives in Canada, Transportation Association of Canada, 1996
<http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-sustainableinitiatives.pdf>

² Proceedings of the National Academy of Sciences, UC Berkeley, 2012
<http://newscenter.berkeley.edu/2012/10/22/diesel-vs-gas-contributing-to-smog/>

³ Costs of Congestion, Metrolinx, 2008
http://www.metrolinx.com/en/regionalplanning/costsofcongestion/costs_congestion.aspx

Items⁴. Among them, Peel Regional Council approved the *Freight Transportation Demand Management Study (FTDMS)* in 2013 which recommends 11 explicit improvements using Transportation Demand Management (TDM) principles. These improvements are categorized in the following three areas:

- A. Partnership framework to coordinate/communicate/advocate for enhancement (e.g. Smart Freight Association)
- B. Technologies to reduce truck vehicle-kilometres (e.g. Virtual Container Yards), and
- C. System enhancement to support sustainable mode shifts (e.g. truck to rail) and time shifts (e.g. off-peak delivery)

The FTDMS is a demonstration of commitment towards the overall sustainable transportation strategy as set out by all levels of government such as Canada's *Federal Sustainable Development Strategy*, Ontario's *Sustainability Strategy*, Metrolinx's *The Big Move*, Peel Region's *Long Range Transportation Plan*, and the other regional and local municipalities' community visions. It is also a demonstration of partnership with the private sector to promote and advocate for efficient and sustainable goods movement planning and operations. The FTDMS implementations are underway with pilot initiatives and programs, and performance measures have been and will be established to gauge success before the pilots are fully implemented in Peel Region, and ultimately in a bigger geographical context such as GTHA and beyond where the true impact of goods movement takes place.

DEVELOPMENT & ENHANCEMENT OF SUSTAINABLE URBAN TRANSPORTATION

The FTDMS follows the basic TDM principles to reduce the demand, and redistribute the demand by mode and/or by time, in the context of goods movement. The three R's strategy of Reduce, Re-mode, and Re-time contributes to each of the sustainability pillar, as follows:

Economic component

Efficient goods movement is vital to the economic health and competitiveness of an urban area. According to the Commercial Vehicle Surveys 2008 by the Ministry of Transportation of Ontario, there were at least \$1.5 billion worth of goods travelled on the highways in Peel Region. Goods movement industry accounts for 221,000 jobs and contributes \$21 billion to the economy. However, there are still rooms to improve the efficiency in the industry. Through the stakeholder consultation with the goods movement companies, it was found that although companies have already optimize the supply chain operations as much as possible, the inefficiency lies within the majority of the smaller companies due to lack of

⁴ Peel Region Goods Movement Strategic Plan 2012-2016, Region of Peel, 2012

<https://www.peelregion.ca/pw/transportation/goodsmovement/pdf/PeelRegionGoodsMovementStrategicPlan-2012-2016.pdf>

coordination and communication tools. The result is a significant number of truck trips carrying empty containers returning to the origin, or a tractor without a trailer. These empty truck trips occupy the precious road space in urban communities which aggravate congestion and slash productivity. The FTDMS recommends that Virtual Container Yards, a system of container matching using the Internet, can be used to reduce empty truck trips by providing load matching service for both inbound and outbound goods movement among companies with non-confidential shipping information. This program would increase efficiency and coordination, and in turn, enhance the economic competitiveness.

Environmental component

Canada's busiest airport for cargo (Pearson International Airport) and two of Canada's largest rail intermodal terminals (CN Brampton and CP Vaughan) are located in close proximity in Peel Region. These facilities and the surrounding lands with logistic and manufacturing companies create opportunities for the industry to minimize truck travelled distance (or referred as "last miles" at origins/destinations). The FTDMS leverages on these opportunities by recommending further encouragement of truck-rail intermodality through the planning of land use (e.g. establishment of clusters of freight hub around major terminals), communication and coordination (e.g. launching of Smart Freight Association), and improved decision making through better data collection and sharing programs. The outcome of last miles planning is shrinking truck kilometres travelled and shifting modes from truck to rail. These initiatives would reduce shipment footprint, and in turn, lowering greenhouse gas emissions and noise pollution.

Social component

Peel Region has over 1.3 million population and 0.6 million employment. By 2041, Peel is expected to have almost 2 million population and 1 million employment⁵. The rate of growth is one of the fastest in Canada. This growth, especially in supporting intensification within the urban boundary, will exponentially increase the goods movement challenges in urban settings. To provide a balanced solution between the people and goods movement, for this generation and the next, the need for peak hour spreading will be critical. The FTDMS recommends that the encouragement of off-peak delivery can be applied to any link within the supply chain. For example the arrival schedule for trucks to enter the gates at the Intermodal Terminals can be spread throughout 24 hours using technology, incentives and fees. Another example is to leverage on the Province effort in encouraging off-peak delivery during the Pan Am and ParaPan Am Games. The outcome of peak hour spreading implies less conflicts among trucks, cars, buses, pedestrian and cyclists during rush hours, which in turn reduces congestions and possibilities of accidents.

⁵ Places To Grow Amendment 2, Ontario Municipal Affairs and Housing, 2013
https://www.placestogrow.ca/index.php?option=com_content&task=view&id=398&Itemid=14

DEGREE OF INNOVATION

TDM applications are widely recognized and exercised for managing people movement. Applying TDM principles on goods movement is an unprecedented innovation in the GTHA and in Canada. Through the FTDMS research on best practises, it was found that there are no domestic Canadian examples of comprehensive regional or provincial freight TDM plans. The best practices found in United States and Europe were unique to each other due to difference in government structure, economic and political environment, and the overall context. The FTDMS therefore explores the following innovations:

Technical Innovation

The FTDMS recommends:

- A. Partnership framework to coordinate/communicate/advocate for enhancement
 - Establishing a Smart Freight Association to operate as a central coordinator to provide services including facilitate discussion, issue newsletters, training, investigate and lobby for desired infrastructure and non-infrastructure improvements, guiding the development of new software and exchanging ideas between businesses.
 - Developing a recognition program that rewards business behaviour which improves freight movement to motivate businesses to meet a common standard for operations and assist the Smart Freight Association in bringing together interested businesses.
- B. Technologies through the use of Intelligent Transportation Systems (ITS)
 - Employing new ITS options include: developing and promoting the development of virtual load management software, and establishing incident impact measures and recovery time to restore normal service level to Improve the level of information available to truck drivers on real-time network performance
 - Conducting new and enhanced inventory of existing and desired goods movement technology to improve information flow to and from the goods movement industry
 - Improving traffic operations along the goods movement corridors such as a Trucking-focused Signal Priority Plan to improve travel time reliability for trucks in key goods corridors
- C. System enhancement to support sustainable mode shifts and time shifts
 - Exploring the need and benefits of extending strategies to include dedicated freight hubs to shorten the truck trip length and to promote intermodalism
 - Investigating the feasibility of practicing off-peak delivery with intermodal terminals, shippers and carriers, and distribution centres to shorten queues for unloading and loading cargo, decrease idling of cargo vehicles (thus decreasing emission)
 - Formalizing monitoring and evaluation system with goals based on the findings from further work on Peel's goods movement baseline

Financial Innovation

There is a strong financial support from the Regional budget program. The FTDMS is one of the overall 23 Action Items from the Peel's Goods Movement Strategic Plan, which is nested within the overall Regional objectives and legislations: The Regional Official Plan, which as a strong theme of sustainability, gives strategic directions in policy 5.9.2.16 to develop demand management program to facilitate goods movement⁶. This policy articulates the rationale of securing funding through the Development Charge and Tax program of \$816,000 annually. Furthermore, the Smart Freight Association, the body which overseeing the FTDMS implementations, will be created as a stand-alone entity initially funded through provincial grants and Regional budget program, with a gradual shift over to funding from participating businesses, which follows the model of Smart Commute Associations for people movement in GTHA. Lastly, another example of financial innovation can be used in the off-peak delivery program, where extra charges could be applied to peak hour users and its revenues from the traffic mitigation fee are used to support the operating cost of maintaining extended port gate hours.

Process Innovation

The supply chain and logistic operations in any geographic context is unique because of the customer markets, businesses, and government legislation and political context. As such, the development of the FTDMS was primarily relied on effective stakeholder consultation for both private and public sectors to help mold a “tailor-fit” solution for Peel Region. The consultation capitalized from the partnership and trust environment established from the previously-created Peel Goods Movement Task Force, and engaged with stakeholders with open discussions that led to constructive feedback and specific recommendations. The innovation in consultation includes seeking out champions from the Regional Council and from the industry. Political influence, and the charisma and the network from retirees from the industry, helped gain tractions in the dialogue and assisted in finding the common goals and building consensus. Furthermore, the high level of comprehensiveness in Peel's goods movement program has aided in facilitating fruitful dialogues with the private sector. The FTDM recommendations are complemented by the rest of the 23 Action Items for the overall goods movement strategy which includes system optimization, partnership, and planning. The holistic approach gave the stakeholders a sense of trust and confidence. Finally, private sector requires seeing positive gains before they are fully engaged. Performance measures are therefore critical to audit success. The quantitative indicators will be collected through a number of pilot initiatives managed by the Smart Freight Association. This association with public and private membership will collect indicators from both fields such as truck kilometre travelled, process time through gateways, percentage of empty truck trips and off-peak delivery trips.

⁶ Regional Official Plan - Office Consolidation, Region of Peel, 2014

<http://www.peelregion.ca/planning/officialplan/pdfs/rop-consolidation-oct2014.pdf>

TRANSFERABILITY TO OTHER CANADIAN COMMUNITIES AND ORGANIZATIONS

In most Canadian urban communities, sustainable solutions in the realm of goods movement are mostly driven by the private sector which often prioritizes its own profit gained over public wellness. The collaboration approach used by FTDMS is a good demonstration of seeking win-win solutions amongst the businesses in achieving sustainability. The fundamental FTDMS transferability is the approach in teamwork amongst stakeholders with multiple objectives, values and abilities. Stakeholders included all levels of government (Transportation Canada, MTO, Metrolinx, Peel Region and the area municipalities), Boards of Trade and Chambers of Commerce, trucking associations, shippers, carriers, couriers, truckers, and third party logistics companies, The variety of stakeholders posed opportunities in developing a comprehensive custom-made solution TDM solution.

Once the trust and confidence among the team players are established, the Peel's FTDMS technical recommendation, financial model, and sustainability principles can be transferred to other mid- to large- size urban communities. The general supply chain and logistics practise is a global-wide operation with similar protocols. For example the three R's strategy of Reduce, Re-mode, and Re-time can be applied to community planning in conjunction with both people movement and goods movement coordinately. The variations come from individual sector of companies and the "last miles" planning which would require local modifications based on the transportation and land use context and legislations.

ADDED VALUE

Emphasis on the economic importance within the sustainability lens

Economic sustainability is often implied indirectly when implementing sustainable transportation solutions for people movement. Peel Region recognized this negligence and therefore initiated the FTDMS to fill the sustainability gap. Peel Regional Council envision that Peel will continue to be a strong attractor of transportation-related businesses due to a number of factors including Peel's locational characteristics, proximity to 7 provincial highways, Toronto Pearson International Airport and Rail Intermodal facilities. These businesses were an integral part of Peel's economy, which contributes to two third of US-Canada trade value. A strong freight transportation system is critical to the economic and social well-being of Peel residents. As such, the FTDMS and the overall Goods Movement Strategic Plan have positioned Peel Region to continue to be the economic engine of Ontario.

Leadership in goods movement innovation in the GTHA

Peel Region has pioneered the goods movement initiatives in the GTHA since 2000. Leadership and support from the Peel Regional Council has empowered the Transportation Division in the Public Works Department to explore different innovative solutions with adequate funding program. For example Peel is the first among the GTHA municipalities to launch a comprehensive action-oriented Goods Movement Strategic Plan. Peel completed the Strategic Goods Movement Network Study which now Metrolinx and Halton Region is capitalizing this effort and expand to the wider scope. The ongoing Smart Freight Association pilot will also set the stage for a larger implementation with Metrolinx and wider spectrum of private sector involvement across the GTHA. All of these demonstrate the importance of leadership and courage in voyaging on the sea of challenges and exploring the new "land" in transportation.

CONCLUSION

The FTDMS has started a new era for exploring transportation sustainability within goods movement. Traditionally, sustainable transportation initiatives have been solely and primarily focused on reducing passenger travel. The missing piece in the puzzle is goods movement. This missing piece has become gradually critical in an urban environment, as the need for commodity and produces will be growing proportionally with the increasing population and density. The reduced truck trips on the road have a much higher impacts compared to the reduced passenger vehicle trips in terms of the infrastructure repairs, and greenhouse gas emission. The journey of FTDMS has just started and new challenges will be surfaced as the initiative goes deeper and deeper to discover the supply chain and logistics world. Freight demand management, marrying together with system optimization and partnership, is the integral part of the transportation solution and an essential component in building better communities in Canada.