



SUMMARY OF EVENTS: NEW INNOVATIONS IN SUPPLY CHAIN PERFORMANCE AND SUSTAINABILITY MEASUREMENT

CTR and SCL Canada

Tuesday, March 19, 2013: Mississauga Convention Centre

By the time a product reaches a customer it will have changed hands many times and may have crossed international and regional boundaries, consuming fuel all the while. As such, the efficient movement of that product requires continuous monitoring and information sharing.

This conference focussed on recent innovations in supply chain performance and sustainability research and measurement. These innovations have allowed companies to better manage their own fuel efficiency and turn that into a competitive advantage. They have also enhanced the flow of communication among supply chain participants and policymakers in order to improve the performance and fluidity of Canada's supply chains in general.

Perspectives from carriers, shippers, policymakers and academics featured interactive panel discussions aimed at assisting practitioners, researchers and policymakers in their daily work.

MORNING PANEL – SMARTWAY: MAXIMIZE YOUR COMPETITIVE ADVANTAGE THROUGH SUSTAINABILITY BENCHMARKING

Whether conducting business on a global or local basis, individuals and companies need to seek new and innovative ways to stay ahead. Fuel pricing and efficiency are a major concern in the effort to drive down cost. The volatility of fuel pricing and associated fuel surcharges are a significant cost component for carriers and shippers. While carriers are working hard to increase their fuel efficiency, shippers are now expected to choose carriers that have a sustainability program.

To date, a standardized central source for sustainability tools to benchmark fleets has not been available. SmartWay provides these tools enabling year-over-year evaluation of your company's progress and providing a mechanism for you to measure your company against other companies in this sector.

Through case study and presentations this session demonstrated how businesses can leverage the benefits of the SmartWay® program to improve fuel consumption and best practices, enabling you to create a distinct competitive advantage.

AL NORRIE, CHAIR

SUPPLY CHAIN & LOGISTICS ASSOCIATION OF CANADA

“THE SMARTWAY TRANSPORT PARTNERSHIP”

Mr. Norrie explained that although energy efficiency in the freight trucking sector has increased by 25%, growth in the amount of freight moved by truck has resulted in an increase of 70% in GHG emissions. In other words, the sector has been successful in reducing its *intensity* of energy use but not enough to reduce the actual *levels* of energy use.

SmartWay is a program of the US Environmental Protection Agency designed to encourage efficiency throughout the supply chain. Although the US program began in 2004 and has been available to Canadian carriers, it is now being administered in Canada by Natural Resources Canada (NRCan). The Canadian program is identical to the US program, so there is no duplication in effort required for those companies that had already enrolled in the US program.

The program contributes a real return to carriers and shippers – it is not only good for the environment. For example, it was suggested that for every \$1 of investment in the program almost \$400 in savings have been realized.

SmartWay allows carriers to benchmark emissions performance with similar operators and offers shippers and logistics companies an opportunity to select more fuel efficient carriers. It provides a framework for partnership to happen across the supply chain, rather than just at the individual company level. In addition to tracking GHG emissions, the program also benchmarks carriers according to the local emissions (some of which have decreased both in terms of intensity and actual levels).

DAVID PATTERSON, DIRECTOR, TRANSPORTATION MANAGEMENT

RYDER CANADA

“PARTNERS MOVING FORWARD WITH SMARTWAY & NATURAL RESOURCES
CANADA”

Ryder, a transportation and supply chain solutions provider, has been a SmartWay Partners since 2004. 91% of all freight miles managed by Ryder are contracted with SmartWay Carriers. SmartWay metrics allow Ryder clients to evaluate trends in GHG emissions and monitor cost savings.

Tractor strategies such as more aerodynamic cabs have helped to reduce fuel consumption by 12%, while trailer strategies such as the addition of side skirts have contributed 11%

fuel consumption savings. On the supply chain side, Ryder partners with carriers in order to supply related equipment.

The sustainability goals go beyond just the rolling-stock side. Facilities & buildings and network design have also helped to reduce energy consumption.

A range of metrics are available through the Smartway program. Ryder feels that the best measurement of GHG emissions is freight moved per ton-mile (or tonne-kilometre).

TAMMY WHITE, BUSINESS DEVELOPMENT EXECUTIVE

XTL TRANSPORT LOGISTICS DISTRIBUTION

XTL is an asset-based carrier that has been operating for 28 years. The company participates in several sustainability programs including Fleetsmart, US SmartWay and now SmartWay Canada.

As fuel is the company's largest expense, it is important to reduce fuel not only through the use of new technologies but also through operational changes and driver training. Hourly costs per fuel are now in fact more than the hourly rate that the company pays drivers.

SmartWay has allowed them to identify cost saving solutions and to build networks with green shippers and manufacturers. For example, driving training has helped to reduce truck idle rates. Whereas the company had a 27.2% idle rate in 2003, since the implementation of monitoring and equipment upgrades this has been reduced to just 2.5%. This translates into savings of \$3,500 per truck, per year.

Temperature-controlled solutions have also been targeted for fuel efficiency improvements. For example, 120 new Temperature Solution Trailers are being purchased. At a cost of \$52,000 each these trailers are not inexpensive. However, they come equipped with R6 insulations as opposed to the industry standard of R1 or R2. Moreover, they come with multiple temperature-controlled zones and are built from lighter weight materials. All of this contributes to less fuel consumption. XTL also invested in programmable reefers which has reduced the average hours of use of the reefers by 12%, with a corresponding reduction in fuel cost savings.

XTL is also investing in long-combination vehicles (LCV). LCVs use 1/3 less fuel than two tractor-trailers carrying the same amount of freight. Some obstacles such as already-congested intersections outside of XTL's facilities have limited their use to some extent though (as well as the general heavy restrictions on their use in Ontario).

XTL has placed a high priority on driver education through in-house training. This has helped to reduce idle time, improve vehicle inspections and vehicle maintenance. As the cost of onboarding a new hire is approximately \$13,000, the carrier is looking to reduce turnover as much as possible.

VOLVO TRUCKS CANADA

As a major manufacturer, Volvo is committed to achieving energy efficiency and air quality through fuel economy. Volvo is a leader in integrated powertrain in North America and has implemented real time driver aids and performance bonus in cabs. The sustainability benchmarking offered by SmartWay has allowed them to maximize the company's competitive advantage. Volvo has been a Smartway participant since the program's inception in the US.

An example of Smartway specifications is that tractors must be 2007 or later model years, include an aerodynamic package, bumper, mirrors, etc. This is currently only applied to sleeper cabs, although they are working on daycab specifications as well.

A fact that is not always obvious – you can put a lot of modifications on a tractor to improve fuel efficiency but then a simple thing like a bug deflector can increase fuel consumption by two per cent and eliminate those gains. Any of these extras can hurt fuel efficiency, which Volvo tests and measures through computational fluid dynamics. This doesn't just apply to the front of the truck. It also applies to the sides, top, under the hood, the trailer gap, etc.

The integration of driver aides in the dash, such as those that show idle time, sweet spot (time spent running in the optimal curve of the engine) and fuel economy have helped to positively influence driver behaviour.

While driver training has and continues to be stressed, Volvo feels that there is still a huge opportunity to improve fuel efficiency through driving training. Volvo now provide e-driver training as well with this in mind.

PANEL DISCUSSION

SmartWay is a tool that not only allows participants to benchmark against similar firms, but also offers access to new technologies and encourages information sharing along the supply chain. While costs savings are the goal, being green is the benefit.

SmartWay in the US has become a requirement for carriers in some cases. For example, some larger RFPs have required Smartway participation just to bid. It will require more carriers in Canada to make the program worthwhile for shippers.

The collection and entering of data on spreadsheets requires an investment in time. However, if it is done on a regular basis it becomes less onerous and some data can be produced directly.

The SmartWay program does calculations automatically when data is entered, based on unit emissions factors. Although there are no audits done of the data entry, a “sanity” check is routinely performed against the results. The methodology has been academically-reviewed.

SmartWay offers carriers evidence-based results to attract customers and encourage continual improvement.

The US EPA website lists verified technologies promoted through SmartWay and provides descriptions of the benefits, including return on investment. This is particularly benefit for small carriers who are not able to perform their own tests.

Carriers have experimented with driver bonuses for good driving. For the most part this has been in non-monetary forms. However, the next step would be to introduce financial incentives.

It is interesting to note that when dealing with shippers, there is now an expectation that the carrier that is a Smartway participant is expected to be slightly higher costs than the non-Smartway carrier; this despite the apparent cost-reduction benefits of the program.

AFTERNOON PANEL - SUPPLY CHAIN PERFORMANCE MEASUREMENT

Canada’s trade is becoming much more diversified, with a greater focus on trade with Asian economies. In order to compete in international markets, Canada will require competitive supply chains to facilitate anticipated future trade growth. This will entail continued improvement by all supply chain participants.

The panel provided an overview of the evolution of intermodal supply chain performance measurement, monitoring and data collection in Canada. These initiatives have led to improved information sharing among supply chain participants. They are also providing policymakers with more information and tools to understand the competitive pressures that are driving goods movement patterns. Evidence to date suggests that improved information sharing is resulting in measurable improvements in supply chain performance.

ALIREZA TAJBAKSH, MCMASTER UNIVERSITY

MEASURING SUSTAINABILITY IN THE SUPPLY CHAIN

A literature review has been undertaken on sustainability measures in supply chains that sought to integrate sustainability with supply chain management (SSCM). Measures are classified into six different categories: economic, environmental, social, reputable, valuable and equitable. A framework for performance measurements is proposed that spans these different categories and involves all partners in a supply chain, including suppliers, manufacturers, distributors, retailers and customers.

Some of the challenges identified in developing measures include the need for collaborative efforts between partners in the supply chain to collect and share data, public policy

incentives to encourage sustainable practices and large data initiatives that involve many players to act as a catalyst.

A review of publications from 1999 to 2010 shows the major attraction to researchers of publications in decision sciences and metrics on sustainability and the supply chain. Most of these studies have focused on the valuable or sustainable aspects of SSCM.

MATTHEW ROORDA, UNIVERSITY OF TORONTO

UNDERSTANDING SUPPLY CHAINS OR LARGE SCALE ESTABLISHMENTS

In collaboration with Metrolinx, the University of Toronto embarked on a data collection project involving large scale (>100 employees) retails and food industries in the Greater Toronto and Hamilton Area (GTHA) to fill in gaps in knowledge of freight and logistics networks and strategies. Information was gathered on business characteristics, shipment information, truck trip generation, truck tour information and supply chain information and similarities and differences were identified.

The next steps will be to develop a system of classification for supply chains of large scale firms and to develop methods for integration supply chain knowledge into the public sector for use in forecasting models.

One of the goals of the project is to gain a better understanding of how the sector is using infrastructure. There is a lot of proprietary data out there that could be much more valuable if there was more information sharing.

Some of the preliminary findings from food and retail supply chains include:

Many of these supply chains are global, in part because labour rates are cheaper abroad. But this is also sometimes due to the fact that shipping overseas can in fact be cheaper than trucking across North America. However, the increased quality control required with global sourcing generally requires more inventory to be held at any given point in time.

Vendors are typically evaluated both on price and quality. Inspections teams are used for incoming product to ensure that quality control.

Most products are flowing through distribution centres (DC). Some product is shipped directly from vendor to customer (about 10%). In those cases the vendor did not want to give up control over distribution or there was an emergency such as a product stockout.

Most ordering methods are still manual (telephone, fax or email).

In terms of forecasting future demand, firms usually relied on historical sales information. They generally look six to 18 month ahead with planning purchases. Certain commodities are highly seasonal so they rely on other forecasts as well (such as weather forecasts).

Firms are emphasizing truckload and full containers from overseas in order to minimize transportation costs. There is less of an emphasis on just-in-time (JIT) delivery relative to the past.

There is quite a bit of variance in terms of supply chain redundancy/resiliency. Some firms had multiple vendors for a given product for this reason, while others had only single vendors. However, in some of those cases firms did have some resiliency in terms of having multiple brands for a given product.

There is also a wide variety of responses with respect to the importance of environmental responsibility and a divergence of views on the use of third-party logistics providers (3PL). Some felt that the use of 3PLs have helped to reduce labour costs while others have felt that 3PLs lead to lower service quality and less timely responses.

ALEXANDER GREGORY, TRANSPORT CANADA

CANADA SUPPLY CHAIN PERFORMANCE MONITORING

The Economic Analysis directorate of Transport Canada has been monitoring the supply chain performance for containers imported through North American gateways for the past three years. The data collected permits an analysis of the various inter-modal components utilized during the import process, which can be leveraged in various ways to aid with policy development.

Discernible trends have been identified in both the segmented and the total transit time performance along the supply chain. The analysis has enabled TC to promote visibility along the supply chains to foster better planning and improved performance. Ultimately, improved data sharing will lead to more resilient and risk-resistant supply chains globally.

It was noted that the overall market share of Canadian Ports (relative to all North American ports) has been flat over the past ten years.

The project's metrics have paid a great deal of attention to port logistics. The metrics have isolated different types of movements such as direct-to-rail, truck, truck-to-rail, transload-to-rail, etc.).

The project now has three years' worth of data. The data show that the overall transit time through Canadian supply chains has increased, but the main contributor to the increase has been the increased ocean transit time. The data have also been able to pinpoint monthly spikes in port dwell times.

In terms of overall transit times through competing gateways, the data currently show that transit times through LA/Long Beach are outperforming BC ports and Seattle mainly because of better rail transit times to Chicago.

DISCUSSION

Any attempt to measure supply chain efficiency requires collaboration with all partners, primarily with the incentive of reducing costs. The importance of measurement has increased substantially over the past decade and has drawn the attention of researchers and industry operators alike.

What is particularly interesting about the sustainability approach is the inclusion of social factors – how to measure them and where to collect data.

Much more attention is now being paid to the entire supply chain, from source to customer, the importance of collaboration and how and where efficiency gains can be shared.

Transport Canada maintains a web portal for stakeholders to view and contribute data towards fluidity measures. Results are published in the department's Annual Report on Transportation. Data are aggregated to protect confidentiality. Most information provided is voluntary rather than regulated.

Tracking containers on rail is done via a GPS database. Rail indicators end at terminals whereas truck trips go door to door. However, it is currently not possible to track containers on trucks. One of the comparative issues is the delay time involved for rail containers to be picked up by customers. Only recently has TC had data to match containers to ships or rail.