DO WE NEED TO ASSESS SERVICE DELIVERY AT CANADIAN PORTS?

Mary R. Brooks, Dalhousie University

Introduction

Recent research on port service delivery for the American Association of Port Authorities aimed at developing a standard instrument (SEAPORT–Seaport Effectiveness Assessment for PORT managers) that can accurately and reliably measure how well ports deliver services to their users. The study population was customers and users of container ports in the U.S. and Canada—cargo owners, freight forwarders, shipping lines and supply chain partners at the port. Designed as a standalone measurement tool, results from the SEAPORT instrument can be used to assess the effectiveness of service delivery. When placed in context with fluidity measurements by Transport Canada and the berth productivity measurement by the Journal of Commerce (JoC), this instrument would provide a holistic view of Canadian port performance for container movements. This short paper draws heavily on several research papers already published as well as forthcoming research for the Canada Transportation Act Review (CTAR) Panel, to focus on understanding what service delivery assessment research is needed in order to balance the many ways of spending funds in the port sector, both by the port and by government.

The Foundational Model

Griffis et al. (2007) developed a three-dimensional space for thinking about measuring performance (in organizations) and these three dimensions were discussed in the background article about developing the SEAPORT approach to measuring port performance (Schellinck and Brooks, 2016a). Griffis et al.'s dimensions are: Competition (efficiency versus 'responsiveness', which we call effectiveness), Purpose (diagnostic or monitoring) and Focus (operational improvement or strategic management). While the dimensions of purpose (why you measure what you are measuring) and Focus (how you will use the results) seem self explanatory, the Competition dimension needs a little more explanation.

Port efficiency has been studied extensively since the seminal publication (UNCTAD, 1976) providing advice to developing countries on what they need to measure at ports in order to improve port efficiency. Efficiency is easily understood as it implores ports to 'do things right'. Operational enhancements are low-hanging fruit in continuous improvement activities and investments. On the other hand, effectiveness, or 'doing the right things' requires an effort to understand the world through the eyes of those you serve, and to know what they value and why. This is not low-hanging fruit as the transportation industry tends to assume that transportation services are a commodity and all that matters is price; operators in the shipping world in particular continue to act as if users have 'no choice' other than to look at price. However, there is significant research in the marketing field that evaluates the path of value creation for customers (focusing on differentiating or niche strategies) and delivering value as the means to leapfrog competitors and dominate sales thereby generating new top line revenue.

Meta-analyses by both Woo and Pettit (2010) and Cullinane (2010) demonstrated that most port performance research has focused on efficiency, diagnostic and operational improvement dimensions of port performance measurement. Schellinck and Brooks (2016a) argues that port managers need programs to collect data on their service delivery as well (e.g., effectiveness), over time (for initial diagnosis and then monitoring progress on continuous improvement) and for the Purposes of both short-term operational improvements and long-term strategic planning. Use of effectiveness measurement and monitoring, e.g. the measurement of port service delivery over time as initially proposed by Brooks et al

(2011a, 2011b), would complement existing efforts at evaluating Canadian port efficiency (by ports, by third party evaluation services like the Journal of Commerce [2014] and by national or local governments). In this way, all combinations of the Griffis et al. (2007) model would be available for decision-making by ports and for monitoring and oversight by government. The research for the CTAR Panel (MRBTC, 2015) explored the port performance topic from a government and regulatory perspective in keeping with the Panel's mandate and so used the same framework to discuss government options. At the time of writing, the Panel's report has been delivered but not released and so that aspect can only be addressed here in a limited way, and this paper is a short paper rather than a full one.

Development of the SEAPORT Instrument

A 2007 meta-analysis by Dalhousie University researchers of more than 80 journal articles and port studies written between 1993 and 2007 found very little consensus on what port performance benchmarks and indicators were being or should be used by port managers in assessing their own efficiency. There was also no agreement on what the metrics being used meant to those responding or common agreement on wording of the items in scales used. In 2009 and 2010, field research and focus group discussions with industry experts, reduced a long list of evaluative criteria to a shorter list for three North American pilot studies. The first two were published (Brooks et al., 2011a, 2011b); the third was not published but pre-tested the survey instrument used in the 2012 American Association of Port Authorities (AAPA) Port Customer Service Initiative (Port Performance Research Network [PPRN], 2012) and identified a framework for reporting results that could be understood by port management and by Boards of Directors. The visual report framework was published as Schellinck and Brooks (2014).

Throughout this research, the elements of port service delivery were found to differ by user group. Because ports do not always see container lines as their only target user, the 2012 AAPA Port Customer Service data was analyzed from the perspectives of three user groups as follows: **(1) Cargo interests** were defined as those responsible for either the purchase of some of the transportation services for either (a) goods they sell/buy or (b) on behalf of some importer and/or exporters; **(2) Shipping lines**, defined as companies supplying **container** ship services that call ports with container-handling facilities; and **(3) Supply chain partners**, defined as (a) warehouse operators that service port(s) with container handling facilities; (b) asset-based logistics service suppliers that use port(s) as part of the services provided; and/or (c) trucking or rail companies that service port(s) with container handling facilities.

The overview findings of the 2012 data collection were first discussed in Brooks and Schellinck (2013), with each user group's findings explored in greater depth in Brooks and Schellinck (2016b) for container shipping lines, Brooks and Schellinck (2015a) for cargo interests, and in Brooks and Schellinck (2015b) for supply chain partners. Analysis of 2012 data led to the derivation of the deployed 2014 SEAPORT instrument using Variance Inflation Factor scores (Schellinck and Brooks (2016a); removing selected criteria from the longer list of 2012 constructs left 32 (non-unique) criteria in the validated 2014 SEAPORT instrument comprised of 13 statements (previously 19) for container shipping lines, and eight (of 11) for the cargo interest and (of 16) supply chain partner user groups.

One finding reported in the development of the SEAPORT instrument was particularly interesting from a North American perspective; the statement 'Overall reliability of the port' was found to have the highest correlation with the overall measure of 'effectiveness of service delivery' for the three user groups. While Schellinck and Brooks (2016a) concluded it was too general a statement and too highly correlated with the overall assessment to be included in the constructs, it does suggest that reliability and effectiveness (or service quality) are viewed to be the same. Fluidity, as measured by Transport Canada, is an alternate measure of supply chain reliability.

How is this data used? In 2012, the AAPA's Port Customer Service Initiative assisted North American container ports in understanding their performance in delivering services to users and customers. The data collected creates four measures: (1) the user's perceived importance of criteria, (2) the user's rating

of the port's performance on each criterion, (3) the importance-performance gap for each criterion (which is one indication for a port on where it could invest to improve services or market services where expectations are exceeded), and (4) the criterion's determinance, that is its influence on the users' overall assessment of port service quality. The last two are inputs into the Determinance–IP Gap Space (Schellinck and Brooks, 2013). Each participating port then received an individual report on their own performance along with the best practice score on that element as well as the range of scores so they could see their relative performance, all put into the Determinance—IP Gap Space framework so that they could immediately visualize the critical elements for action. The AAPA received a 'state of the ports' report (PPRN, 2012) on the overall situation (without naming the ports involved). If continued commitment to benchmarking and participation and cooperation are the desired outcomes, there is little to be gained with a 'naming and shaming' approach.

Each port is then best able to make investment and marketing decisions with the holistic information on berth efficiency (from the published Journal of Commerce data), terminal efficiency with gate monitoring data (if its terminals choose to collect the data), fluidity as measured by Transport Canada for the efficiency and reliability of the supply chain in which it operates (if they participate in the fluidity program), and effectiveness data from its own Determinance–IP Gap Space for each of the users it serves (if the port participates in this program).

What is Not Included in the Instrument and Why

The three groups' criteria for port performance evaluation do not necessarily include the criteria that might be used by excluded port user groups, as the above list does not include all port users and service suppliers. Notable exclusions are those criteria that might be:

- used in smaller ports handling (are they the same criteria as used by users at ports handling more than 250,000 TEUs?);
- used by shippers and carriers of bulk and general cargo exports and imports;
- applicable to port service operators (e.g. those supplying pilotage, towage, line-handling); and
- of relevance to those ports serving cruise lines, auto carriers, or oil and gas rigs.

The primary reason for the first two to be excluded from early research and instrument development validation was because it was believed by the researchers that there would not be enough respondents to provide statistically significant results. A logical extension for the research would be to develop bulk handling indicators for bulk shipping lines, and to see if dry bulk and liquid bulk sectors of operations have different relevant criteria. This is a possible option for the Port Performance Research Network to next explore. In the case of the third group, it would be a logical extension to develop a common instrument that a landlord port can use with its own suppliers for useful feedback in planning port improvements. Finally, criteria for cruise lines are often more like those for hotels and vacation packagers as destination experiences drive port itinerary planning by cruise lines; see (Lekakou, et al., 2009). Similarly, while there might be some overlap in criteria for specialty operators, the reality remains to be proven by research in this area. There are, therefore, many paths that can be followed in further development of metrics for measuring service quality but the existing challenge, as obvious from the previous discussion, is uptake by ports of benchmarking service quality programs.

The Report to the CTAR Panel

To address fluidity in supply chains through Canadian ports, the CTAR Panel wished to explore the measurement of fluidity at ports in order to ensure that Canadian trade interests would continue to be well-served and that Canadian ports would continue to be efficient and effective gateways to/from North America. The research conducted for the Panel by MRBTC (2015) was based on the goal-dimension framework used by SEAPORT but for Canadian ports specifically, and aimed at developing a holistic approach to Canadian port performance measurement. Efficiency metrics are concluded to be mostly

complete but their adoption has not happened at all Canada Port Authorities or the largest non-CPA ports (who might like the opportunity to participate). The challenge of an inconsistent approach to service metrics was discussed and suggestions were made to make the metrics profile holistic. The report also explores questions for further discussion by the Panel about Canada's transport policy, who collects the data, whether it should be voluntary or mandatory, and if it should be in the public domain.

Key Conclusions

Canada is not alone in facing the challenge of handling cargo surges and measuring fluidity and congestion/delay. While Canada has many options for addressing surges, congestion and delay, they all depend on quality data for decision-making and on decision-makers having timely access to the data they need without having to make special requests of government departments. Good investment decisions by both government and industry require both better data and the right data be collected. This does not mean that all reporting should be public; it merely means that if industry must ask and wait, it can be neither nimble nor innovative. At the time of writing, the full report to the CTAR Panel has not be made public, even though the government's mandate letter to the Minister recommends transparency; the 2001 CTAR Panel published all its research in advance of releasing its report. Therefore, next steps will need to wait until the research on the state of Canada's port performance measurement relative to port performance actions in other countries is available for download from MRBTC (2015).

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This paper is a **SHORT** paper.