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Speeding up fast: Shortening waiting times for commercial freight at the Canada–U.S. border

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ABSTRACT

The Free and Secure Trade (FAST) program provides participating commercial vehicles with shorter waiting times at the Canada–U.S. border. Prior to 2011, FAST vehicles had access to a dedicated approach lane and inspection booth at the southbound Pacific Highway Crossing (PHC) in Blaine, WA. Non-participating vehicles were restricted to a general purpose approach lane and two general purpose inspection booths. While this configuration had the advantage of rewarding FAST participants with shorter border waiting times, it could result in undesirably high waiting times for non-participants during periods of high demand. A simulation study was conducted to determine if an alternative border configuration could reduce the waiting times of non-participants without notably increasing the waiting times of FAST vehicles. A new border configuration was found to dramatically reduce waiting times for non-participants with only a small increase in waiting times for FAST vehicles. In spring 2012 the southbound PHC was reconfigured to implement the recommendations of the study, thereby enhancing the efficiency of the existing border infrastructure. This paper reviews the concerns with the pre-2011 state of the southbound PHC; the recommendations of the simulation analysis; and the documented results of the subsequent implementation of the new configuration.

1. Introduction

Canada and the United States have long enjoyed a strong trading relationship; in 2013, goods moving from Canada to the United States represented 74.8% of Canada's exports and 14.6% of U.S. imports, while the reverse flow constituted 64.4% of Canada's imports and 19.0% of U.S. exports (Statistics Canada, 2014; US Census Bureau, 2014). Toward the end of the previous century, this relationship was strengthened with the passage of the Canada–US Free Trade Agreement in 1989 and the North American Free Trade Agreement in 1994. As stated in the North American Free Trade Agreement, a key objective of these agreements was to "facilitate the cross-border movement of goods and services" between the signatory countries (NAFTA, 1994).

This trend toward greater cross-border integration was abruptly challenged by the events of 9/11. There was a renewed emphasis on border security in the U.S., and increased security at the Canada–U.S. border resulted in an increase in border-crossing delays and shipping costs; this in turn led to a measurable decline in Canada–U.S. trade (Globerman & Storer, 2008). In the heavily-traveled trade corridor between Western New York and Southern Ontario, survey results reported in MacPherson, McConnell, Vance, and Vanchan (2006) estimated that security budgets for U.S. and Canadian exporters increased by 39% between 2001 and 2004, with 90% of the increases due to post-9/11 regulations. More generally, Taylor, Robideaux, and Jackson (2004) utilized a range of primary and secondary sources to determine that border processes and policies that impeded Canada–U.S. trade were costing the two economies a combined total of 2.7% of the annual value of merchandise trade. In a review of several studies, Moens and Cust (2008) found that most researchers estimated the overall cost of post-9/11 security along the Canada–U.S. border to be between 2 and 3% of the value of total trade. Globerman and Storer (2009) found evidence that these increased costs of trade were having a dampening effect on Canadian exports; their econometric model indicated that the long-run impact of the 9/11 border changes had been as much as a 37% drop in Canadian exports to the U.S. by the fourth quarter of 2007.

To mitigate the negative economic impact of increased security, new border and supply chain security initiatives were introduced by the U.S. and its land-based trading partners (Hintsa & Hameri, 2009). Rather than relying solely on increased inspection scrutiny at the border, the new "trusted traveler" programs emphasized securing the supply chain upstream of the border. The Customs–Trade Partnership Against Terrorism (C-TPAT) program, launched less than three months after 9/11, established a framework for ensuring the security of international supply chains (USCBP, 2004). With respect to the Canada–U.S. border, freight carriers and importers bringing goods into the U.S.

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were encouraged to become C-TPAT participants and implement C-TPAT security recommendations.

C-TPAT compliant carriers and shippers could then choose to participate in the FAST, or Free and Secure Trade program (USCBP, 2005). The FAST program offered tangible benefits to carriers and importers to help offset the cost of enrollment and to encourage voluntary participation: shorter inspection times, less frequent referrals to secondary inspection, one or more inspection booths at each border crossing dedicated to FAST participants, and, at some crossings, a dedicated highway approach lane. These benefits gave FAST trucks the potential of a significantly lower and more predictable cross-border waiting time. For a truck to be considered FAST-qualified, however, the driver, as well as the carrier and the shipper, must be FAST-approved. If any one of the three elements associated with the arriving truck—shipper, carrier, or driver—is not FAST-approved, the truck is not eligible to use the dedicated FAST lane(s) and booth(s).

Haughton (2007) modeled the cost of non-enrollment in FAST for export shippers and found that they could range as high as 7.54% of export revenues for a large truckload (TL) shipper, and up to 10.67% for a small less-than-truckload (LTL) shipper; that is, participating in FAST could lower the shippers' waiting and other costs by that amount. However, Haughton noted that the business case for FAST was weakened when the waiting and other costs directly experienced by the carrier were not passed back to the shipper.

1.1. Regional differences

For trucks moving freight between the U.S. and Canada, FAST initially prescribed a single set of rules and procedures. However, freight patterns between the U.S. and Canada vary by region, and this has had implications for the relative success of FAST along the Canada–U.S. border. Bradbury (2010) examined the five busiest crossings for commercial freight on the Canada–U.S. border and found that four of the five ports experienced a "statistically significant drop in average border wait time after the implementation of the FAST program," while the fifth crossing also experienced a wait time decline, but it was not statistically significant. Although her findings indicated the positive impact of the FAST program, they also demonstrated that the level of benefit varied from port to port. In addition, the FAST participation rate varied considerably between ports; less-than-truckload shippers, as well as shippers of certain types of products, may believe it is less beneficial to join the FAST program, and the relative prevalence of these different types of shippers varies between border crossings.

The busiest border crossing on the Canada–U.S. border is Detroit/Windsor (Ambassador Bridge), where the automobile manufacturing supply chain straddles the border. Most of the freight (by dollar value) shipped in both directions across this part of the border consists of manufactured goods, and carriers making multiple cross-border trips per day operate on tight schedules to keep "lean" manufacturing plants running smoothly (Davidson & Rose, 2011). The bi-directional nature of much of this traffic, along with the high value-added nature of the freight, the need for predictable delivery times, and the relative ease of securing the well-defined supply chain, have provided an ideal fit for the FAST program: in 2008, 44% of all shipments entering the U.S. through the Detroit–Windsor crossing used the FAST booths (Conroy, 2008).

By comparison, while manufactured products dominate northward flow through the Pacific Highway Crossing (PHC) between Washington State and British Columbia, forestry and paper products dominate the southward flow (Bradbury, 2010; Davidson & Rose, 2011). In-depth interviews of twenty U.S. and Canadian carriers using the PHC in 2007 revealed that only seven of the twenty characterized most of their deliveries as "time-sensitive" (Goodchild, Globerman, & Albrecht, 2007). Jet fuel, produce, and aircraft parts dominated the list of time-sensitive shipments; lumber and, to a lesser extent, steel, headed the list of shipments that were not time-sensitive. Perhaps partly due to such differences, the fraction of southbound shipments cleared through the FAST booth at the PHC in 2008 was 8%, less than one-fifth the proportion observed at Detroit/Windsor (Conroy, 2008).

Bradbury (2010) found that successful FAST implementations included infrastructure enhancements in the form of additional dedicated inspection booths and approach lanes; indeed, it was the addition of these infrastructure improvements, and not only the priority processing of FAST participants, which enabled the average wait time for all trucks—FAST and non-FAST—to decline after FAST implementation at the five crossings she analyzed. Additional infrastructure was indeed added to the PHC as part of the initial FAST implementation: the southbound approach featured a dedicated highway lane that provided access to a dedicated FAST booth, while general purpose (GP) trucks traversed a separate lane that fed the other two booths. In essence, however, this resulted in one-third of the inspection capacity at southbound PHC being reserved to serve 8% of the arriving goods. Since empty southbound trucks with FAST-qualified drivers and carriers were also eligible for the FAST booth, the fraction of all southbound trucks using the PHC FAST booth, namely 23%, was higher than the shipment proportion of 8% (WCOG, 2010). Even with the empty trucks being routed through the FAST booth, however, the FAST booth and lane were underutilized.

1.2. The End of FAST at PHC?

Relatively low use of the FAST lane at the southbound PHC became an increasing concern as traffic volumes recovered from the recession and waiting times for trucks in the GP lanes increased. In spring 2011, a study of the southbound PHC over nine weekdays revealed that while the ratio of FAST lane trucks remained at 23%, the wait time differential between trucks in the FAST and GP lanes was significant: FAST lane trucks waited, on average, 3.7 min, while trucks using the GP lanes waited an average of 50.9 min over the nine-day study period (BPRI & WCOG, 2011). Even if West Coast carriers were less sensitive to delays than their Midwestern counterparts, the cost imposed on trucks in the GP lanes was considered unreasonable in light of the frequently empty FAST lane.

Serious consideration was given to the elimination of the dedicated FAST lane and booth at the southbound PHC. A pilot project was undertaken in 2011 in which the southbound FAST lane and booth were opened to all trucks for thirteen weekdays; this temporary border configuration was referred to as the "pilot configuration," while the original configuration was referred to as the "baseline." All trucks in the pilot configuration, whether or not they were FAST-qualified, had access to the same lanes and booths during the study period. As expected, the average waiting time for all trucks, 14.6 min, resulted in FAST trucks waiting longer, and GP trucks waiting less (Springer, 2011c). Since only a fraction of the trucks were FAST-qualified, the overall average waiting time decreased, but at the expense of the FAST trucks.

1.3. A different FAST?

While these results indicated dramatic time savings for GP trucks in switching from the baseline to the pilot configuration at the southbound PHC, there was concern about the increase in average waiting time for FAST-qualified vehicles. Stakeholders expressed a desire for configurations that would yield a more satisfactory combination of waiting time costs and benefits for both FAST and GP trucks. In particular, border managers were interested in a configuration that, relative to the baseline configuration, obtained sharp reductions in GP waiting times with a smaller increase in FAST waiting times.

1.4. Stakeholder considerations

It should be emphasized that recognition of the problem, as well as approval of the pilot project and the necessary studies, was a multi-