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David L. (David Lindsay) Davidson
Western Washington University

Hugh Conroy

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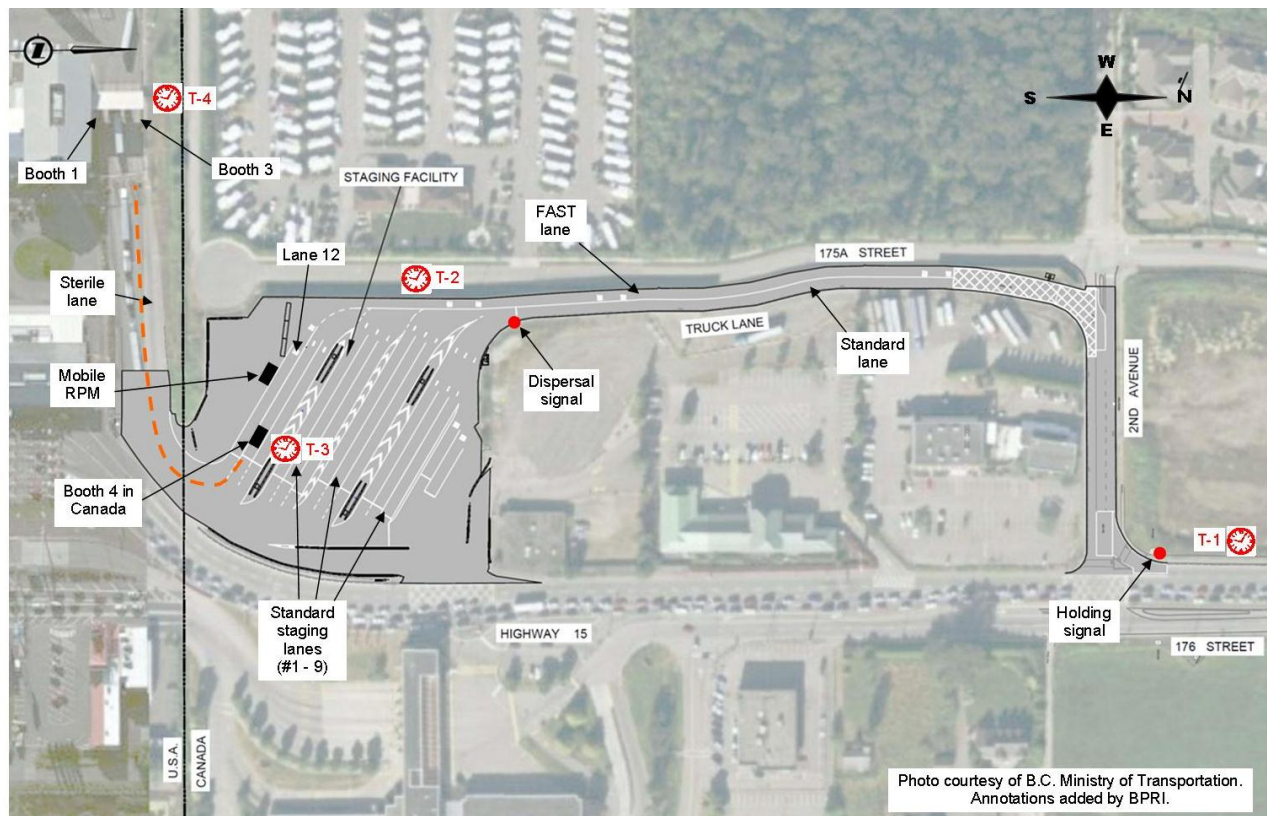
Evaluation of Commercial Pre-Inspection Pilot Test—Blaine, WA
David Davidson, Border Policy Research Institute, Western Washington University
Hugh Conroy, Whatcom Council of Governments
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Background. U.S. Customs and Border Protection (USCBP) is pilot-testing the operation of a commercial primary inspection booth on Canadian soil. The pilot test is occurring at the Pacific Highway port-of-entry in Blaine, WA. In past years, the Border Policy Research Institute (BPRI) has partnered with the Whatcom Council of Governments (WCOG) to collect extensive datasets at Pacific Highway, including metrics such as the average dwell-time of a truck at a primary booth and the average wait-time in the queue. A recent study can be found at: http://www.wwu.edu/bpri/files/2012_Sep_SB_Pac_Hwy_Report_No_16.pdf. Prior studies are accessible via the bibliography within the above-cited report.

In early 2013, USCBP invited BPRI/WCOG to collect measurements during the course of the pilot test. In a memorandum dated April 10, 2013, BPRI/WCOG described a scope of work intended to collect the data of most interest to USCBP:

- Dwell-time of trucks at the booth located in Canada (booth #4), in comparison to historical dwell-times at the standard PIL booths in the U.S.
- Frequency with which trucks inspected in Canada have to halt for additional inspection at the standard PIL booths.

Figure 1. Annotated Diagram of Pilot-Test Configuration, Pacific Highway, Blaine, WA



Site Configuration and Methodology. Figure 1 shows the Pacific Highway southbound approach plaza as configured for the pilot test. In the remainder of this document, a capitalized term is a reference to one of the labeled items in Figure 1. A mingled stream of FAST and standard (i.e., non-FAST) trucks approaches from the north (right side of figure) along BC Highway 15. The trucks wait upstream of the Holding Signal until there is available space in the Truck Lane, at which time a group are released to turn west (right) onto 2nd Avenue. As trucks turn south (left) onto the Truck Lane, they separate into two streams—the FAST trucks use the FAST Lane, and other trucks use the Standard Lane. Standard trucks enter the nine Standard Staging Lanes, where they are eventually released to swing around for primary inspection at Booths 1 or 2. FAST trucks advance along the FAST Lane to Lane 12 and come to a halt just upstream of a Mobile RPM that has been installed as part of the pilot test. At peak periods of FAST arrivals, a queue of as many as three or four trucks can develop in the FAST Lane, waiting for service at Booth 4. When the way is clear, a truck advances slowly through the Mobile RPM and comes to a halt at Booth 4, where the primary inspection is accomplished. After inspection, the truck advances through a cordoned Sterile Lane to Booth 3, which is accessible only to FAST trucks. That booth serves as an “exit booth” during the pilot test. The officer enters the license plate number of an approaching truck into the ACE system and notes whether the inspection process is complete. If so, the truck can roll through Booth 3 without stopping (presuming that the officer confirms the truck’s status quickly enough and is able to signal the driver to proceed). Otherwise, the truck stops a second time at Booth 3 to receive additional attention.

The field crew was deployed at the four locations labeled with red clocks in Figure 1:

- T-1. The person at this location captures the time at which each truck comes to a halt at the rear of the queue on Hwy 15. This is a roving position, as the queue can build to the north as far as 8th Avenue (and beyond). Truck-types are mingled, so only a fraction of the captured timestamps are of use when analyzing wait-times of FAST trucks.
- T-2. This person captures the time at which each truck comes to a halt within the FAST Lane.
- T-3. This person measures the inspection duration (i.e., dwell-time) at Booth 4, defined as the interval between when the truck comes to a halt at the booth to when it begins to again roll forward. This definition is identical to the one used in all prior BPRI/WCOG studies, allowing comparability of dwell measurements that have been gathered over the years.
- T-4. This person measures the dwell-time (if any) at Booth 3. Many trucks roll non-stop through Booth 3, receiving a single timestamp indicating the time at which the tractor rolls past the booth. Trucks that stop receive two timestamps, corresponding to the dwell-time.

A field crew was deployed on June 12, 2013, prior to commencement of the pilot test, in order to gather some baseline data. This data was compared to the data collected in summer 2012 (as found in the report cited earlier) to see whether baseline operation of the port remained roughly stable over the past year. The crew was then deployed during the pilot test on July 2/3 and July 23/24, 2013. As in prior studies, measurements were taken using handheld devices with clocks synchronized to within two seconds. Each timestamp was tagged with a license plate value, allowing all timestamps for a given truck to be gathered into a single record for later analysis. Data was analyzed in an Excel spreadsheet to develop the results presented below.

The project was funded by WCOG using funds from the U.S. Federal Highway Administration’s Coordinated Border Infrastructure Program. Additionally, the BPRI provided in-kind support.

Table 1. Metrics of Mobility of FAST Lane Traffic at Pacific Highway, Southbound

	2012	2013		
	Aug 20/21	Baseline June 12	Pilot July 2/3	Pilot July 23/24
# hrs. observed	14 hrs	6 hrs	9 hrs	13 hrs
Usage Rate of FAST Lane				
# arrivals	272	86	94	149
FAST as % of all traffic	27%	20%	*16%	21%
At Pre-Inspection Booth 4				
Total # trucks observed			94	148
Inspection duration (sec.)			89 sec	62 sec
# "valid" trucks observed			-	135
Inspection duration (sec.)			-	50 sec
# "nonvalid" trucks			-	13
# non-FAST			-	4
# held for queue mitigation			-	9
At Regular PIL Booth				
Total # trucks observed	272	86	94 100%	144 100%
# of "roll through"			40 42%	85 59%
# of "stop-n-go"			27 29%	46 32%
# of inspections	272	86	27 29%	13 9%
Inspection duration (sec.)	62 sec	64 sec	68 sec	104 sec

* 16% value is specific to July 3. On July 2 our crew was too small to allow capture of the overall traffic stream.

Results.

- *Proportion of Traffic in FAST Lane.* In the current pilot configuration, a truck using the FAST Lane arrives directly at a booth where its eligibility to use that lane is verified. That was not the case in the interval from April 2011 through May 2013. During that two year period, non-FAST trucks could use the FAST Lane to bypass the Staging Facility, mingling thereafter with all traffic in the final approach to booths 1 through 3. An agent in the booth would be unable to determine that a truck had made non-compliant use of the FAST Lane unless USCBP took extraordinary measures to note which trucks used that lane and then conveyed that information to the booths. As shown in Table 1, we found that 27 percent of southbound traffic used the FAST Lane in summer 2012, whereas between 16 and 21 percent of traffic are using it this summer. This data indicates that non-compliant use of the FAST Lane was occurring in the two years prior to the pre-inspection pilot. Anecdotally, USCBP staff said that as many as 20 non-FAST trucks per day arrived at Booth 4 in the early days of the pilot. On July 23/24, a month after launch of the pilot, two per day were still arriving.

- *Primary Inspection Duration.* Table 1 shows the average duration of primary inspection for trucks using the FAST Lane. In summer 2012 and June 2013, the observed average duration was 63 seconds, with all such inspections occurring at the regular PIL booths because Booth 4 (the pre-inspection booth) was not yet operational. As discussed above, it's likely that a significant fraction of the trucks using the FAST Lane were not FAST-eligible, so the 63-second value represents a cumulative average of FAST inspections combined with lengthier non-FAST inspections. With the pilot underway, on July 2/3 we observed an average inspection duration of 89 seconds at Booth 4. Because USCBP staff knew that non-FAST trucks were still arriving at Booth 4, we were asked to place crew member T-3 *within* Booth 4 for the final field phase on July 23/24. That crew member was privy to knowledge of which trucks were non-FAST, so we gathered additional data as shown in the rightmost column of Table 1. For "valid" trucks at Booth 4, an average inspection duration of 50 seconds was observed. It's likely that this value is the most accurate FAST-specific value collected within the past 27 months, in that it's based upon a sample of verified FAST trucks. There were 13 "non-valid" trucks excluded from computation of that value—four were non-FAST, and nine were trucks deliberately held at the booth for several minutes while USCBP employed a delay-mitigation strategy for standard trucks (involving use of the Sterile Lane and Booth 3 to clear a number of trucks pulled from the Standard Staging Lanes).
- *Incidence of Additional Inspections at Booth 3.* Ideally, a truck successfully completing primary pre-inspection at Booth 4 will then roll nonstop through Booth 3. However, as shown in the bottom portion of Table 1, on July 2/3 we found that only 42 percent of trucks were rolling through Booth 3. 29 percent made significant stops (averaging 68 seconds). An additional 29 percent were encountering a "stop-n-go" condition, meaning that a truck came to a halt for a period of time too brief to represent any significant interaction with the agent. These stops were 8 seconds or less and involved no exchange of documentation between the driver and the inspector. These stops were also clearly associated with the behavior of individual inspectors. In a given clock hour, virtually all trucks would roll through nonstop, and in the next hour most would "stop-n-go." We surmise that some inspectors are able to ascertain a truck's status more rapidly (either because of better eyesight and/or faster typing) and to then provide an effective visual signal (e.g., a "thumbs up" out the booth window) to the driver. For other inspectors, a truck must come to a brief halt before the inspector is able to tell the driver to proceed.

After our July 2/3 deployment, USCBP staff described their standard operating procedure with regard to non-FAST trucks using the FAST Lane: at Booth 4 the truck would receive guidance and be handed a letter, and at Booth 3 the actual primary inspection would occur. Over time, USCBP expected that the incidence of inspections at Booth 3 would decline, as the non-FAST trucks learned to avoid the FAST Lane. Our data from July 23/24 confirm that expectation, as only 9 percent of trucks stopped at Booth 3 for a significant time (104 second average). There continued to be a large fraction (32 percent) that performed a "stop-n-go."

- *Resolution of Alerts/Events Occurring in Canada.* USCBP also asked that we keep track of the frequency and duration of alerts and/or events associated with primary inspections at Booth 4 (e.g., a detection from the Mobile RPM). No such events occurred on any of our field days.

- Wait-Time Immediately Upstream of Booth 4.* The stream of trucks approaching Booth 4 along the FAST Lane is intermittent, such that queues rarely form upstream of the Mobile RPM. On the four days July 2/3 and July 23/24, we gathered 242 measurements of wait-time immediately upstream of Booth 4, and the average was 1 min. 53 sec. If this were the *only* wait-time experienced by FAST trucks, then this pilot configuration would be an improvement for FAST movements, as the average wait-time experienced by a FAST truck was 8.7 minutes in summer 2012 (see Table 4 of the report cited earlier). This result is intuitive when considering the path followed by a FAST truck. Before this pilot, a FAST truck moved smoothly to the signal controlling Lane 12 (i.e., up to the current location of Booth 4). Once released from Lane 12, that truck then *mingled with all trucks* for the final approach to the PIL booths, and thus had to wait behind three or four other trucks before reaching a booth. Now, the FAST Lane and the Sterile Lane provide a path that is accessible only to FAST trucks—a FAST truck is never required to wait behind a standard truck (except when behind a non-compliant truck).
- Wait-Time on the Highway.* As was expected, the pilot configuration contributes to the formation of queues on Highway 15, impeding all trucks including FAST. Again, this result is intuitive, in that the pilot configuration dedicates Booth 3 to FAST trucks, leaving all other traffic to clear through just two PIL booths. Booth 3 is idle much of the time, so overall throughput is less than in the post-April 2011 configuration in which all three PIL booths were able to handle a mingled stream of arriving traffic. Of the three days we measured, the worst highway queue occurred on July 3, when the average delay was 15 min. 30 sec. for a 42-truck sample (i.e., the 42 trucks arriving at Booth 4 for which a matching timestamp was gathered at position T-1 on Highway 15). Figure 2 is a scatter plot showing the length of wait-time over the course of the day. A significant queue began to develop at about 9:45, ultimately reaching a peak of almost 70 minutes by 12:00. During the course of the pilot test, USCBP has employed various mitigation techniques in an effort to minimize the wait-times experienced on the highway, including the technique referenced on page 4 in the discussion of “Primary Inspection Duration.”

Figure 2. Wait-Times on Highway 15, July 3

