

Is RFID the Answer to Resurgent Border Traffic?

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Wait-time mitigation measures already in place at and near Blaine, Washington:

- *Newly built POEs at both Peace Arch and Douglas, with added booths*
- *Additional booths at Sumas and Pacific Highway*
- *High-low booths (that can be used at times for autos) at Lynden and Pacific Highway*
- *Wait-time measurement technology that feeds a system of highway signs and other media (web, radio) in efforts to balance demand between four POEs*
- *Significant expenditure upon highways leading to POEs*
- *Extensive promotion and usage of NEXUS and Enhanced Driver Licenses*
- *A “Ready Lane” at Peace Arch for RFID-enabled documents*

Introduction. With respect to cross-border passenger travel at Blaine, Washington (the I-5 corridor), two things were evident in the aftermath of 9/11—the volume of travel dropped dramatically, and the at-booth inspection process became more time-consuming. The combined effect was that wait-times remained roughly comparable to what existed pre-9/11, despite traffic volumes that were 25 percent lower. The constant worry, though, was “How will we cope when traffic volumes climb?” For eight years regional stakeholders pursued initiatives intended to reduce wait-times (*see left sidebar*), even as traffic volumes languished at an average volume of about 215,000 cars per month. The tail end of that eight-year period is seen in the left half of Figure 1, and the long-anticipated resurgence of traffic is evident in the right half, dating roughly from autumn 2009. In the first ten months of 2011 (highlighted in the figure), traffic reached an average level of 358,000 cars per month, a level not observed since 1997. The vast majority of those travelers were Canadian residents.

Despite the benefits accruing from past efforts to reduce wait-times, the surge in traffic has at times resulted in long lineups. With many significant mitigation strategies already deployed at Blaine, what more can be done to reduce delay? The *Beyond the Border Action Plan* emphasizes RFID-enabled documents as a means to expedite clearance of travelers at land ports-of-entry (POEs). Such a strategy presents both a promise and a challenge.

Figure 1: Volume of Southbound Car Traffic per Month at Blaine, WA (Peace Arch + Pacific Highway)¹

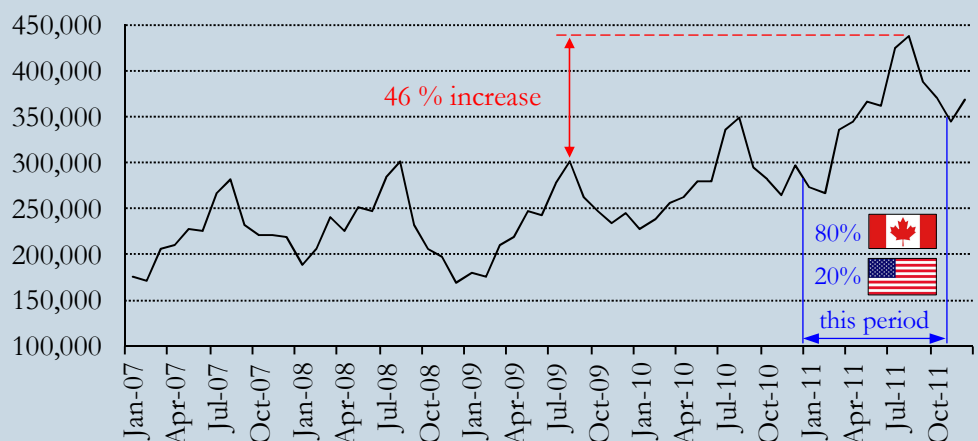
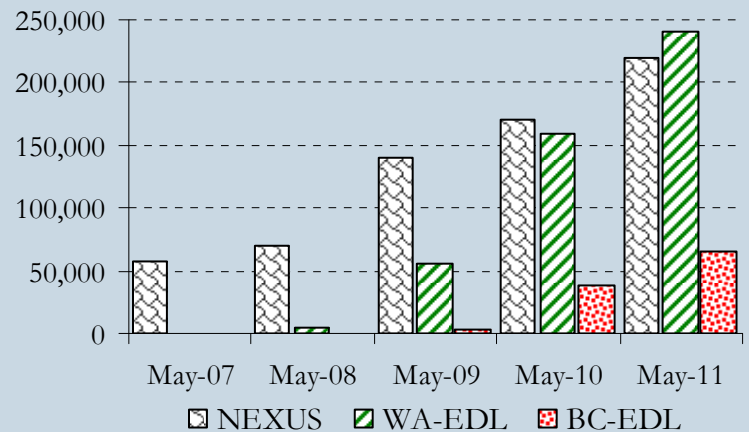


Figure 2: Per-Vehicle Clearance Rate at Peace Arch / Douglas (sec.)

		2007	2011
NEXUS	SB	26	20
	NB	24	25
Standard	SB	65	61
	NB	60	60

BPRI calculations based upon loop detector records collected at peak traffic hours on peak summer days. Values averaged over several hours and multiple lanes.

Figure 3: Regional Possession of RFID Cards²



The Promise of RFID. For several years, U.S. Customs and Border Protection (USCBP) has used a process in which watchlist and criminal-database queries are run upon 100 percent of the people seeking to enter the U.S.—i.e., a process of “100-percent name query.” There are differing methods by which the name of a traveler can be input into a computer. The most time-consuming and error-prone method is to manually enter the traveler’s name at a keyboard, and this was the norm in the years prior to WHTI. Next most expedient is to feed a WHTI-compliant document to a scanner that is able to extract printed biographic information (name, date-of-birth, card number, etc.) from a machine-readable zone found along the edge of the document. While this eliminates the need for manual typing, it still requires that documents be passed from the vehicle to the inspector and then fed to the scanner one at a time. The most rapid method is to read a document while it remains in the car, prior to the arrival of the car at the inspection booth. This is what is achieved with an RFID-enabled document. A radio transmitter installed upstream of the booth interrogates the card, and the card responds with a unique identifier number. That number is then used to query an agency-maintained[†] database that contains the same biographic data as is printed upon the card, together with a photo of the cardholder taken upon issuance of the card. By the time a car reaches the booth, watchlist queries have been done and a photo of the cardholder is displayed on the inspector’s terminal. The inspector compares the traveler to the photo to verify that the document is in possession of its rightful owner.

RFID technology is incorporated in cards used for the various trusted-traveler programs (NEXUS, FAST, SENTRI, Global Entry) as well as the PASS Card (U.S. passport card) and the Enhanced Driver’s Licenses (EDLs) issued by states and provinces. At Blaine, NEXUS cards receive the most widespread use and have been deployed for the longest period of time. The efficiency gains attributable to NEXUS are well documented. Figure 2 shows the average number of seconds between clearance of successive vehicles in the north- and southbound lanes at Peace Arch. In the northbound direction, NEXUS has consistently been 60 percent faster than a standard lane (i.e., 24 sec. in the NEXUS lane versus 60 sec. in the standard). Southbound rates (both standard and NEXUS) were a bit slower than northbound a few years ago, but are now equivalent. Southbound NEXUS vehicles are today cleared 67 percent faster than standard vehicles.

RFID is responsible for only part of the speedier NEXUS process, because NEXUS enrollees are “trusted travelers” that are also subject to abbreviated interviews at the booth. Still, USCBP states that RFID can provide a 33 percent speedup for regular travelers, such as those possessing a PASS Card or an EDL. Computer modeling has shown that lineups at Blaine would be virtually nonexistent if RFID-enabled documents were in widespread use.

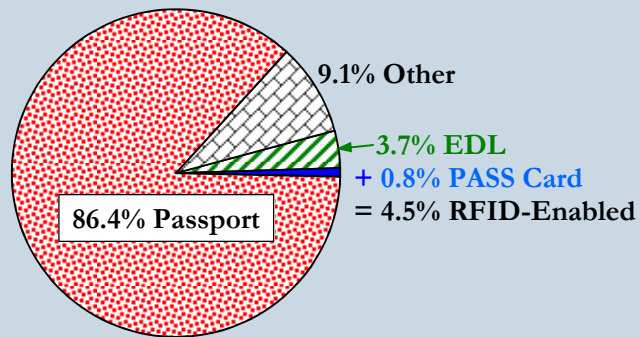
[†] Some EDL databases are maintained by state/provincial agencies, but all other databases are under federal control.

Figure 4: Uptake of RFID-Enabled Licenses in Region (as of Jan. 2011)

	WA	BC
Total licenses issued (million)	5.15	3.14
RFID-enabled fraction of total	4.0%	1.7%
RFID-enabled share of annual issuances	8.5%	3.0%

BPRI calculations based on “snapshot” data available on web sites of Insurance Corp. of BC and WA Dept. of Licensing

Figure 5: Documents Processed in Standard Lanes, Blaine, FFY2011



Source: USCBP, documents processed at booth, Blaine (Peace Arch and Pacific Highway combined), 10/2010 - 9/2011

Support for RFID cards has been more prevalent near Blaine than in other northern border regions. NEXUS was first pilot-tested in Blaine, building upon the popular PACE program that existed in the region prior to 9/11. As of May 2011 there were 537,000 NEXUS members in total, and 41 percent of them (220,000) were estimated to reside in the border region straddling Blaine.² On some days, as many as 45 percent of the travelers entering the U.S. at Peace Arch pass through the NEXUS booth, and in federal fiscal year 2011, 25 percent of the documents presented at Blaine (Peace Arch and Pacific Highway combined) were NEXUS cards. Additionally, B.C. and Washington were the jurisdictions that successfully persuaded federal authorities to accept EDLs as WHTI-compliant documents, and the pilot-test of EDLs took place in Washington. Figure 3 shows the growth in the regional holdership of RFID-enabled cards over a five-year span, and there is clearly an upward trend, particularly so with the Washington EDL. But despite such statistics, there are challenges associated with bolstering the further use of RFID.

The Challenges Facing RFID. The concept of “market share” is a useful lens through which to view the challenge of bolstering the use of RFID. Figure 4 is intended to help clarify the eventual steady-state market share of EDLs within the universe of all driver’s licenses. The top row shows the size of the entire driver’s license market within B.C. and Washington, a combined 8.3 million. As seen in the second row, the Washington EDL program had resulted in a market share of 4 percent as of January 2011, the end of its third year. Given that driver’s licenses are issued on a renewal cycle of five years, only two additional years of fresh “customers” exist with which to bolster market share. Viewing things from a different angle, the bottom row of the table shows what fraction of the annual *issuances* of licenses (new licenses and renewals combined) is comprised of EDLs. In Washington the value is 8.5%, and it is that value that best represents the eventual EDL market share, should trends remain steady. Said differently, the upward trend in Figure 3 is likely to top out at about 450,000 upon conclusion of the fifth year of the Washington EDL program. B.C. is on track to achieve even less market penetration, which is unfortunate given the predominance of Canadian residents within the universe of cross-border travelers.

Figure 5 reveals the extent of usage of RFID-enabled documents at the Blaine crossings. The figure excludes NEXUS, which amounts to 25 percent of all travel, as noted earlier. Looking only at the 75 percent of travelers that use the standard lanes, the figure reveals how little of the “market” has been captured by RFID.

There are several factors that might account for the relatively low uptake of EDLs in Washington and B.C. Each jurisdiction charges an added fee to issue an EDL, with the B.C. fee a bit higher than that in Washington. Furthermore, regional residents were recently faced with the WHTI mandate, and many of the target “customers” invested not long ago in their passports. Another factor might be a

Possible Strategies for Increasing the Holdership of RFID-Enabled Documents

- **Advertising/Education.** Prior advertising campaigns designed to promote NEXUS have met with success. Conduct periodic repeats of such efforts, promoting both NEXUS and EDLs and targeting primarily Canadians. Ensure that materials dispel misperceptions regarding privacy.
- **Decrease the Cost.** Reduce or eliminate the extra fee charged for EDLs. A cost-benefit study of the tradeoffs between adding infrastructure vs. augmenting the RFID-enabled population might show that subsidized EDLs are most cost effective.
- **Increase the Benefit.** Revise approach roads to POEs in order to provide a reduction in wait-time to EDL holders. Allow use of an EDL in the air mode between Canada and the U.S. Install RFID readers at all major northbound POEs (matching what exists southbound) to provide bidirectional benefit.
- **Enhance Passports.** Install RFID chips in passport books. The front and back covers of a passport, fitted with a metallic foil inner layer, would serve to prevent queries of the RFID chip except when the book is opened. The 10-year renewal cycle for passports hinders the near-term benefit of this strategy.
- **Retrofit Existing Passports.** Develop a self-adhesive anti-tamper RFID insert that spans two facing pages in a passport book. When the book is closed, the RFID chip is sandwiched within metallic foil to protect privacy. Opened to the correct page, the chip is read as normal. Provide voluntary free enrollment at the POE. This strategy acknowledges the large “installed base” of passports evidenced by the 86-percent pie wedge in Figure 5.

perceived lack of benefit. Whereas a NEXUS holder speeds to the booth in a dedicated highway lane, an EDL holder waits in the lineup with everyone else. The true benefit of RFID will only be realized once a large fraction of travelers hold the cards, resulting in a significant reduction of the waits experienced by all; at this point the EDL is an individual cost that does not yet generate a system-wide benefit. Finally, there has been some resistance to EDLs, particularly in Canada, on the grounds of privacy. Some people are uneasy with the idea that their photo and biographic information will be lodged within a government database.

Bolstering Usage of RFID. The traveling public, like any other group of target customers, is likely to respond to traditional marketing strategies—i.e., campaigns to create greater awareness of the availability and the merits of a product, perhaps coupled with product modifications that change the cost/benefit calculation undertaken by the customer. Some specific ideas are listed in the shaded box above. Also present are two strategies that take a different approach, aiming to expand the number of available platforms for RFID rather than promote the use of existing platforms.

Conclusion. Within the paradigm of “100-percent name query” at the border, the rise of traffic at Blaine to levels last seen in the 90s is likely to produce long lineups at peak travel times. Years of efforts to install wait-time mitigation infrastructure will provide great benefit, but travelers stuck in a lineup will not understand how bad it might have been absent those efforts. RFID cards (both EDL and NEXUS) are a means of providing additional wait-time mitigation, but the rate of uptake of such cards is frustratingly slow. New measures are needed if RFID is to offer a major near-term benefit.

Endnotes

1. Traffic data retrieved from the U.S. Bureau of Transportation Statistics website: <http://www.transtats.bts.gov/> Data regarding citizenship is from Statistics Canada, based upon license-plates of cars traveling into Canada at Blaine in the non-NEXUS lanes in the first ten months of 2011.
2. NEXUS data based upon verbal remarks of CBSA, USCBP, and WCOG at meetings of the International Mobility & Trade Corridor (IMTC) group, as memorialized in meeting minutes. BC-EDL based upon presentation by Ian Forbes of ICBC at IMTC on 19 January 2012. WA-EDL based upon data provided by the WA Dept. of Licensing.