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Pilot Project: Using RFID to Reduce Border Queues

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RFID Basics:

» A radio-frequency identification (RFID) chip is embedded in an identity document. The chip contains no data other than a unique numeric value.

» When queried by a nearby (~10 feet) radio transmitter, the chip divulges that value.

» The value is a key that identifies a record within a secure data-base maintained by the issuing agency. The record is retrieved and sent to the inspection agent's computer.

» The record contains the same biographic and biometric data (e.g., name, date of birth, facial photo) that is printed upon the document itself.

» The RFID process gets data to an agent's computer before the car reaches the booth, so handling the document becomes unnecessary.

Introduction. Since 9/11, about $500 million has been spent on border infrastructure in the Cascade Gateway region, including new port facilities, improvements to approaching highways, and deployments of technologies such as wait-time systems. Yet there frequently are queues in excess of 60 minutes for the many travelers who are not enrolled in NEXUS (a program that provides trusted travelers with access to a dedicated highway lane). While regional stakeholders know that queues would be far worse in the absence of past investments, efforts are continually underway to improve border mobility. Greater usage of RFID-enabled documents is a proven method of bolstering mobility, because such documents can improve throughput at each inspection booth. (*See the left sidebar for an explanation of the basics of RFID.*)

The NEXUS program is vivid proof of the efficacy of RFID. At the Peace Arch crossing, about 30 percent of the traffic is handled via NEXUS, which is usually deployed at a single inspection booth. Nine booths are then used to handle the remaining 70 percent of traffic, but the port's capacity is still overwhelmed on a regular basis.

USCBP's Adoption of RFID. If RFID-enabled documents were used by enough of the non-NEXUS travelers, queues would diminish—not a statement of opinion, but rather a demonstrable fact. USCBP has championed the usage of RFID, and their enthusiasm is based upon studies conducted about six years ago. USCBP hired a consultant to complete a time-and-motion analysis of the processes that occur within an inspection booth. The analysis showed that about 30 per-cent of an agent's time was used to collect documents from travelers, scan the documents, and hand them back to the driver. RFID makes most of that document-handling unnecessary.

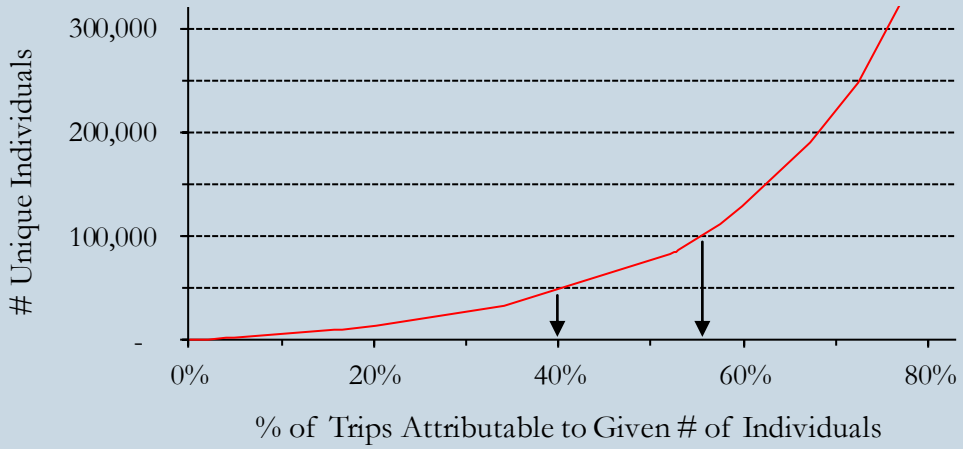
USCBP has since advocated the incorporation of RFID within as many types of border-crossing documents as possible. RFID now exists within Enhanced Driver's Licenses (EDLs), the passport card issued by the U.S. State Department, the NEXUS card, and the "green card" (the card carried by aliens who are legal permanent residents of the U.S.). USCBP has also installed RFID readers upstream of every inspection booth at every major crossing on the northern border. B.C. and Washington State have supported USCBP by making EDLs available to provincial and state residents, and about half a million EDLs have been issued within the region. Despite all efforts, though, RFID-enabled documents are used by only about five percent of the non-NEXUS traffic at the Cascade Gateway.[1]

Figure 1. Dependence of Wait-Time on RFID
(Peace Arch, 2008)

% of Cars Using RFID	Associated Wait-Time
0%	60 min.
10%	10 min.
50%	<5 min.
75%	<3 min.

Source: Unpublished USCBP Analysis

Figure 2. Fraction of Annual Non-NEXUS Trips Attributable to Given Number of Unique Individuals
(Peace Arch & Pacific Highway, 2012)



How Much RFID Is Enough? With a five-percent penetration of RFID within our region's non-NEXUS population, border queues are still problematic. How much more is needed? USCBP also modeled RFID-uptake scenarios at Peace Arch, with the results summarized in Figure 1. In 2008 (i.e., with lower traffic volumes than now exist, and with eight booths rather than the current ten), queues would build through the morning, reaching 60 minutes by noon. An RFID-uptake ratio of 10 percent made a substantial difference, and a ratio of 50 percent yielded dramatic results.

To achieve a 50-percent RFID usage-rate is not as daunting a task as it first appears, in that a large fraction of cross-border travel is attributable to a relatively small number of individuals. Figure 2 shows the relationship between individuals and trips, as derived from a recent driver-interview project undertaken by the BPRI in partnership with the Whatcom Council of Governments.[2] On the order of 50,000 to 100,000 unique individuals are responsible for 40 to 55 percent of cross-border trips. The same project confirmed that over 80 percent of regional cross-border travelers are Canadians. If RFID could be put in the hands of the *right 75,000 Canadians*, border lineups would greatly diminish.

Pilot Project. The goal of the project proposed here is to place RFID-enabled passport cards into the hands of the optimum group of Canadians, all at once, accompanied by a media blitz. The first step is for CBSA to run a database query, extracting the passport numbers used for every northbound trip made by a Canadian through Peach Arch and Pacific Highway over the past three months. That data can be used to validate the shape of the curve shown in Figure 2. At the same time, a transportation planner can run a simulation model using current conditions (i.e., 2013 traffic volumes, ten booths) to generate a new version of Figure 1. With updated analyses, a "go, no-go" decision can be made, and an optimum number of individuals can be established. The list of passport numbers, sorted in order of frequency-of-use, is then handed over to Passport Canada (PC). PC proceeds to make RFID-enabled passport cards for the target group of passport holders. For this pilot, PC could simply adopt the card technology used in the U.S. passport card, adding new artwork. When all cards are ready, PC mass-mails them, free of charge, to the travelers. Regarding the issue of privacy, all data has remained in Canadian federal control, and PC is simply providing a "bonus" passport to people who willingly supplied data to PC in order to procure a passport. PC can explain how the card works and how it's expected to reduce border queues, and point out that users can simply discard it if they want to continue using their book-style passport. At $25 per card, the pilot's cost is on the order of $2 million, a pittance compared to the $500 million invested at the Cascade Gateway over the past 13 years. The project falls within the purview of ministries of transportation, environment (greenhouse gases are reduced), and tourism, so multiple funding sources are possible.

1. See *Border Policy Brief* Vol. 7 No. 1, retrievable at: www.wwu.edu/bpri/files/2012_Winter_Border_Brief.pdf
2. An interim project report is retrievable at: www.wwu.edu/bpri/files/2013_IMTC_PVIS_Interim_Report.pdf