IRRITABLE BORDER SYNDROME: THE IMPACT OF SECURITY ON TRAVEL ACROSS THE CANADA-U.S. BORDER

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INTRODUCTION

The events of September 11, 2001 directly affected commerce and travel across the United States, Canada and many other countries throughout the world. All trade and traffic between the United States and Canada came to a standstill as the border closed for approximately 24 hours and all civilian air traffic was grounded for two days (Goodrich, 2002). Recognizing the economic importance and need to keep the Canada-U.S. border open, as well as secure, the two countries worked cooperatively to produce the Smart Border Accord, signed on December 12, 2001. This accord includes a 32-point action plan that focuses on security while facilitating the movement of people and goods across the border (Government of Canada, 2001). Since then, other security measures have been implemented, such as the Western Hemisphere Travel Initiative (WHTI), which has raised even more concerns about the impact of security on the movement of

people across the Canada-U.S. border (Abelson and Wood, 2007; Alden, 2008; Canadian Chamber of Commerce, 2009; Conference Board of Canada, 2005; Sands, 2009; Muller, 2010). While much of the research to date has focused on the impact of increased border security on trade (Goldfarb and Robson, 2003; MacPherson et al., 2006; Canadian Chamber of Commerce, 2009; Globerman and Storer, 2009; Bradbury, 2010), little attention has been paid on the impact of security measures on movement of people across the Canada-U.S. border (Abelson and Wood, 2007; Alden, 2008; Conference Board of Canada, 2005).

Although several researchers have examined the impact of 9/11 on the tourism industry, most have either limited their focus to the U.S. (Goodrich, 2002; Bonham, Edmonds and Mak, 2006; Gut and Jarrell, 2007) or the airline industry (Ready and Dobie, 2003; Lee, Oh and O'Leary, 2005; Rupp, Holmes and DeSimone, 2005; Blunk, Clark and McGibany, 2006). Not surprisingly, demand for travel is highly susceptible to shocks such as incidents of terrorism, economic fluctuations, currency instability, natural disasters, or incidents of contagious disease (Bonham, Edmonds and Mak, 2006; Ritchie, Molinar and Frechtling, 2010). However, even less significant effects can also impact travel, such as the perceived "hassle" of crossing the border, longer wait times at the border, the need to obtain a visa, weather issues, or even traffic congestion (Timothy, 1995; Timothy and Tosun, 2003; Nyaupane and Andereck, 2008).

The purpose of this study is to examine how various changes implemented at the Canada-U.S. border have impacted the movement of people across the border. Several researchers have commented on the "thickening" of the border – a term that refers to

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both the physical modifications and policy measures that have occurred since 9/11. Specifically, this study will evaluate the impact of security measures, including the effect of the WHTI, on travel and tourism across the Canada-U.S. border. In doing so this study will examine the influence of other factors, such as exchange rates and gasoline prices, as well as assess the impact of other policies such as the NEXUS program, on cross border travel. In addition, the study will examine how all these factors affect what is occurring at the local level by examining the situation at the six busiest border ports along the Canada-U.S. border. Prior to this analysis, the article will review how borders influence tourism, briefly discuss the history of the Canada-U.S. border, and detail the relatively recent policy initiatives, such as the WHTI and NEXUS before outlining the study's methodology.

BORDERS INFLUENCE ON TOURISM

International borders and boundaries have been found to influence tourism in two distinct ways – positively and negatively (Knowles and Matthiessen, 2009; Smith, 1984; Timothy, 1995; Timothy and Tosun, 2003). Borders can serve as barriers that negatively influence the flow of tourists (Knowles and Matthiessen, 2009; Timothy and Tosun, 2003). International borders delineate the sovereign boundaries between nation-states and are physically designated in some manner. In certain cases, actual fences, barriers, towers, floodlights and surveillance equipment mark the border. In other situations, the border is more inconspicuous, identified with markers, flags, and simple checkpoints. The condition of the border often, although not always, indicates the nature of the relationship between the two countries and the relative permeability of the border. More fortified borders typically indicate that the relationship between the two countries is either hostile, or that one country desires to control the movement of people into or out of the country. The amount of fortification also influences the degree to which people perceive the border as a barrier (Timothy and Tosun, 2003).

The extent to which a border acts as a barrier or an attraction is determined by a number of factors. These include the degree of economic, socio-cultural, and political difference present on opposite sides of the border, and the perceptions and experiences of travelers and potential travelers about what lies on either side of the border (Knowles and Matthiessen, 2009; Timothy and Tosun, 2003). Eco-

nomic factors include differentials in cross-border prices for goods and services, currency values, and the level of taxation, such as sales tax. Cultural factors include differences in language, customs, art, music or sports, while political factors include border formalities. Severe border policies and restrictions, along with extensive border formalities can discourage people from crossing. Examples of these policies include departure taxes, passport and visa requirements, currency exchange, and customs controls (Ascher, 1984; Knowles and Matthiessen, 2009).

Related to these factors is how people perceive these differences and the border procedures and formalities that they encounter. While not all borders represent real deterrents to travel, they may act as barriers based upon people's perception of them (Knowles and Matthiessen, 2009; Timothy and Tosun, 2003). In fact, research has shown that even relatively inconspicuous borders such as the Canada-U.S. border can produce profound psychological effects for some travelers (Slowe, 1994; Timothy and Tosum, 2003). This is because borders clearly identify when someone is crossing from familiar into unfamiliar (or less familiar) locations (Hopkins and Dixon, 2006). For many people, traveling to unfamiliar or exotic places is appealing, part of the desire and excitement associated with traveling (Timothy, 1995). For others, crossing an international boundary results in feelings of uneasiness, fear, and loss of control (Timothy, 2001). Where border formalities are minimal, the border is less likely to be seen as a barrier. However, in cases where entry procedures are more arduous, the border is more likely seen as a barrier, thus something to be avoided. The range of perceptions can be considerable among various groups of people (Knowles and Matthiessen, 2009). Some travelers take border procedures in stride, considering them as something necessary in order to cross the border. Some see them more as a nuisance, while others may view them as intimidating and frightening (Timothy and Tosun, 2003).

THE CANADA- UNITED STATES BORDER

What we know today as the Canada-U.S. border was established through a series of treaties beginning with the Treaty of Paris in 1783 and concluding with the Oregon Boundary Dispute between Great Britain and the United States in 1846. The border between the two countries has long been heralded as the "longest undefended border" in the world (Thompson and Randall, 1994). Throughout

the past 150 years the border was regarded as open and for the most part served as little more than a symbolic line that distinguished one country from the other. Over time, however, the border became more entrenched as an economic barrier with the establishment of tariffs between the two countries in the late nineteenth century (Granatstein and Hillmer, 1991). Despite these policies, the border between Canada and the U.S. has remained very permeable, enabling the easy flow of goods and people between the two countries and establishing the largest bilateral trading relationship in the world (Government of Canada, 2011a). In 1989 the passage of the Canada-U.S. Free Trade Agreement (FTA) and the subsequent 1994 North American Free Trade Agreement (NAFTA) enhanced this relationship creating a more economically open border. The establishment of free trade not only led to the removal of tariffs for goods and services, expanding trade between the two countries, but it also resulted in a perceptual change as well (Bradbury and Turbeville, 1998). For travelers the border was viewed as less restrictive than it had been in the past. Agreements such as the Shared Border Accord of 1995 further supported this perception as the two countries worked to create the "the most efficient border in the world" (Department of Foreign Affairs and International Trade, 1996, p. 1).

However, the events of September 11, 2001 resulted in a number of significant policy changes concerning the border and its operations. No longer was the focus on creating an efficient border; rather *security* became the foremost priority. The Smart Border Accord of 2001 contains a number of security measures and programs that were designed to ensure security while facilitating the movement of goods and people across the border. However, many agencies and researchers have begun to question whether these new security measures are too severe and are actually hampering cross border travel (Conference Board of Canada, 2005; Canadian Chamber of Commerce, 2009; Sands, 2009). Recently, other security measures have been added, such as the Western Hemisphere Travel Initiative (WHTI), which has raised even more concerns about the impact of security measures on the movement of people across the Canada-U.S. border (Industry Canada, 2008).

WESTERN HEMISPHERE TRAVEL INITIATIVE - WHTI

The Western Hemisphere Travel Initiative (WHTI) requires all travelers to show either a valid passport or other approved secure

document when traveling to the United States from areas within the Western Hemisphere including travelers from Canada. It is regarded as the most significant change in terms of security and border procedures impacting travelers since 2001.The WHTI was one of the recommendations from the 9/11 Commission. It was implemented as part of the Intelligence Reform and Terrorism Prevention Act signed into law by President Bush on December 17, 2004 (U.S. Department of Homeland Security, 2007). The purpose of this initiative is to strengthen border security and facilitate entry into the United States for legitimate U.S. citizens, residents and foreign visitors. The initiative mandates the use of standardized, secure and reliable documentation, thus allowing quick and accurate identification of all travelers entering the U.S. (U.S. Department of Homeland Security, 2007). Prior to the passage of the WHTI, a vast array of documents could be used to prove identity and citizenship and, as a result, there were growing concerns about the authenticity of these documents.

In April 2005, the U.S. State Department and the Department of Homeland Security announced the phased implementation of WHTI. Air travelers were the first to experience the WHTI with passports being required for air travel as of January 23, 2007. Land and marine requirements were originally scheduled to go into effect on January 1, 2008 but were postponed until June 1, 2009, providing more time for American and Canadian citizens and permanent residents to obtain the required travel documents, and for provinces and states to implement Enhanced Driver's Licenses. However, as an incremental step in preparation for the full implementation of WHTI, the U.S. government announced on January 31, 2008 that oral declarations were no longer acceptable to prove identity and citizenship when entering the U.S. Accepting oral declarations had been a long established routine practice (U.S. Department of Homeland Security, 2007). As of January 31, 2008, Canadian citizens were now required to present a government issued photo ID, such as a driver's license, plus proof of citizenship such as a birth certificate or citizenship card to enter the U.S. by land or water. Other documents were also acceptable such as a passport, NEXUS card or an enhanced driver's license (Public Safety Canada, 2008).

From the first mention of the WHTI, the Government of Canada expressed concern about the impact of the initiative on travel and tourism. The Canadian Tourism Commission (CTC) requested

that the Conference Board of Canada conduct a study on the potential impact of the WHTI on Canada's tourism industry. This study reported that many citizens and travelers of both nations do not possess a passport[1] and thus this new requirement imposes an additional cost of approximately $100 per person to obtain a passport. There is also an added inconvenience associated with cross border travel with this requirement. Each traveler needs to make sure to carry an up-to-date passport.[2] A survey conducted in 2006 revealed that 34.5 percent of American non-passport holders and 29.2 percent of Canadian non-passport holders stated that they would be less likely to cross the border if they needed a passport or other secure document in order to do so (Zogby International, 2006). Thus these new documentation requirements could deter at least some people from crossing the border (Conference Board of Canada, 2005; Olmedo, 2005).

Tourism is big business in Canada contributing billions of dollars into the economy, and supporting hundreds of thousands of jobs throughout the country (Canadian Tourism Commission, 2009). U.S. visitors make up the largest segment of the Canadian market accounting for approximately 76 percent of all international travelers to Canada (Canadian Tourism Commission, 2009). Research predicted that the WHTI would result in a significant decline in the number of travelers to Canada from the U.S. and a substantial loss in expected tourism receipts of approximately $1.8 billion between 2005 and 2008 (Conference Board of Canada, 2005; Industry Canada, 2008). Not surprisingly, Canadian travel to the United States was also expected to decline due to the WHTI reducing U.S. travel payments by $785 million over the period 2005 to 2008 (Conference Board of Canada, 2005; Industry Canada, 2008).

The WHTI has been estimated to have the greatest negative impact on tourism, specifically on spontaneous tourism (Abelson and Wood, 2007). Sands (2009) distinguishes the various impacts associated with the WHTI amongst different types of travelers. According to Sands (2009) there are two types of cross border travelers, regular commuters who cross the border frequently and amateur border crossers who rarely cross the border. The majority of the travel between Canada and the U.S. involves casual, discretionary travel -- people making short trips for recreation, shopping, vacation or to visit family or friends, those whom Sands refers to as amateur border crossers. While regular commuters will likely not be as

affected by the new identification regulations, these new identification requirements may act as a constraint to cross border travel for amateur border crossers (Timothy, 1995; Nyaupane and Andereck, 2008; Sands, 2009). The new identification requirements not only increase the actual costs associated with these "fun" trips (due to the cost associated with acquiring a passport) and the transaction costs (requiring people to apply for a passport), they also add the illusion that the level of examination at the border has increased. This creates the perception that the border is a less friendly place. These factors have all combined to create a "psychological border" – one that may significantly constrain cross border tourism.

NEXUS

Before examining the impact of security measures such as the WHTI, another program, NEXUS, needs to be discussed. Established in 2002 as part of the Smart Border Accord, NEXUS is a joint program between U.S. Customs and Border Protection (CBP) and the Canada Border Services Agency (CBSA). The NEXUS program allows pre-screened, low-risk, approved travelers expedited passage when crossing the border at selected air, land and marine ports of entry (Canada Border Services Agency, 2009a). The program is targeted at U.S. and Canadian citizens or permanent residents who frequently cross the border. Those interested in joining NEXUS must submit an application and go through a registration process, satisfy the eligibility criteria, pass the risk assessments conducted by both countries, and pay a $50 non-refundable fee. Given that it is a joint program, both the United States and Canada must approve an individual's application to participate. Once approved, applicants are issued a photo-identification card (valid for five years) containing a proximity Radio Frequency Identification (RFID) chip (U.S. Customs and Border Protection, 2009a). The NEXUS card provides members with access to dedicated commuter lanes and primary inspection booths designed to provide expedited passage across the border. Thus NEXUS is intended to reduce traffic congestion and delays at the border.

The program has expanded since its inception and is now available at 19 land border crossings and all major Canadian airports (U.S. Customs and Border Protection, 2012). As of April 2010 there were 400,000 members enrolled in the NEXUS program (Canada Border Services Agency, 2010a) of which approximately 70

percent were Canadians and 30 percent Americans (Sands, 2009). Membership in NEXUS also varies considerably across the continent, with the majority of those enrolled in the program located in the West (Canada Border Services Agency, 2008a). While the limited literature available on the NEXUS program is generally positive, some criticisms of the program have been identified (Canada Border Services Agency, 2008a).[3] Specifically, the program was developed for frequent business travelers or regular commuters and is not aimed or suitable for the typical tourist or leisure traveler. As a result, NEXUS enrollment rates are expected to remain relatively low (Sands, 2009). In 2011 U.S. Customs and Border Protection introduced Ready Lanes, replacing southbound NEXUS lanes at several crossings. Ready Lanes can accommodate travelers with a variety of approved documents including a U.S. Passport Card, Enhanced Driver's License, Trusted Traveler Card (NEXUS, SENTRI Global Entry and FAST cards) and New Enhanced Permanent Resident Card (U.S. Customs and Border Protection, 2012), all of which are RFID enabled cards that can be scanned automatically while the vehicle proceeds to the inspection booth, thus expediting border crossing for more travelers.

METHODOLOGY

The methodology utilized in this study was greatly influenced by the security environment in which this research occurred. Aspects of this research were severely constrained by government secrecy surrounding border operations and by significant data constraints (Bradbury, 2002). Although the two countries collect statistics on border traffic, number of visitors, and border wait times, much of what is collected is either not available on a consistent basis, fails to be collected usefully for researchers at a detailed geographical/port level, or in the case of border wait times for entry into the U.S., the data is collected and currently reported (in real time) by U.S. Customs and Border Protection on their website. But historical trend data is not available to researchers. These significant data limitations make it very difficult for researchers to accurately discern the current situation regarding the movement of people and the impacts of security measures along the border. As a result, much of the analysis conducted as part of this study utilizes a mixture of different data, combines data from a number of different sources, or utilizes what data is available for a limited time period in an attempt

to try to provide a glimpse into what is occurring along the border both at the national level and at six of the major crossing ports.

To overcome some of these data limitations a mixed method, case study approach was utilized as part of this project. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context (Yin, 2003). Case study methodology has many strengths, such as the ability to trace changes over time and deal with a full range of evidence including documentation, interviews, observations, and artifacts as well as quantitative data analysis (Creswell, 2003; Yin, 2003), all of which were utilized in this study. Six cases are examined involving the six busiest auto ports along the Canada-U.S. border (see Figure 1 and Table 1). As Table 1 shows, these six crossings account for approximately 46 percent of total Canada-U.S. cross border auto traffic (U.S. Department of Transportation, Bureau of Transportation Statistics, 2009). The number of cases and their selection were determined to accommodate a variety of differences among the six ports. Thus, similarities and differences could be evaluated. The ports vary considerably in terms of configuration (land crossing verses bridges), ownership (private verses public), amount of traffic, and NEXUS participation rates.

Figure 1 The Location of the six busiest auto ports along the Canada-U.S. Border.

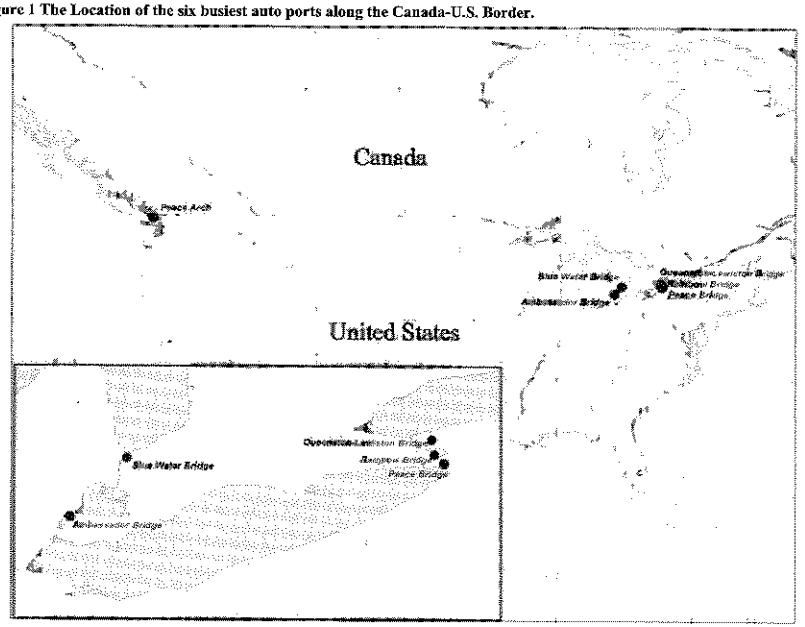


Table 1 The Six Busiest Ports Along the Canada-U.S. Border.

Border Crossing	Location	Percentage of total Canada-U.S. auto traffic
Ambassador Bridge	Detroit, MI/Windsor, ON	15.2
Peace Bridge	Buffalo, NY/Fort Erie, ON	8.9
Blue Water Bridge	Port Huron, MI/Sarnia, ON	5.9
Peace Arch	Blaine, WA/Surrey, B.C.	5.6
Rainbow Bridge	Niagara Falls, NY/Niagara Falls, ON	5.2
Queenston-Lewiston Bridge	Buffalo, NY/Niagara Falls, ON	5.1
Total		45.90%

Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Border Crossing/Entry Data, 2009.

A two-step research approach was used within the case study methodology. First, data from a variety of accepted and reliable governmental sources (including Statistics Canada, Canada Border Services Agency and the U.S. Department of Transportation, Bureau of Transportation Statistics) were utilized to understand the situation concerning cross border traffic along the Canada-U.S. border and at the six busiest crossings. These data sets allowed the study of traffic patterns over time (both prior to 9/11 and the implementation of the WHTI as well as afterward) and permitted some statistical analysis, including regression analysis and testing the hypothesis that border wait times have increased over time. Second, once the data sets had been collected and analyzed, some limited field work was carried out so that on-site observations and interviews could be conducted with border personnel, port authority representatives and local business organizations in order to obtain their view on what was occurring along the border and the impact of the various security programs on cross-border traffic.

The ability to interview U.S. border personnel was greatly restricted. Despite a formal request to Washington D.C. and a subsequent security review, permission was granted to interview only three Department of Homeland Security representatives. In contrast, access to members of the Canada Border Services Agency was less problematic, although this tended to vary considerably from port to port and from individual to individual. Interviews and on-site observations were conducted during three time periods: July 2007, June/July 2008 and June 2009. Semi-focused interviews, consisting of a set of open-ended questions were conducted with nine border officials, three bridge authority personnel and three representatives from local Chambers of Commerce. These interviews typically lasted one hour and focused on five general areas: respondents were

asked (1) to comment on the trends or changes to passenger vehicle traffic through that particular port over the last several years; (2) what improvements had been made to the port since 2001 in terms of facilities, technology, approaches, staffing or programs and how these improvements facilitated passenger traffic; (3) specifics about the implementation of the NEXUS program (when implemented, participation rates, overall impact, and any problems); (4) about the implementation of the WHTI; and (5) to comment on trends regarding average border wait time for passenger vehicles at that port over the last few years. A total of 15 individuals representing a variety of agencies and organizations were eventually interviewed, but most insisted on talking "off the record." However, a variety of concurrent evidence--including various reports, published data, research literature and field observation, as well as the interviews--strengthens this methodology and allows for comparison across the range of data, and with other research findings, thus ensuring the study's validity.

NATIONAL TRENDS: THE PATTERN OF CROSS BORDER TRIPS

The following figures and data seem to support the concern that since September 2001, increased security measures at the border have negatively impacted cross border travel. Figure 2 shows the number of American and Canadian cross border travelers by automobile between 1989 (the year the Canada-U.S. Free Trade Agreement went into effect) and 2011 (Statistics Canada, 2012). As the figure shows, more Canadians have typically travelled to the U.S. than Americans to Canada. This pattern is particularly significant given the fact that the population of Canada is approximately a tenth of the size of the United States. As the variability in the graph indicates, the number of cross border travelers is influenced by several factors. One of the most important is the exchange rate between the Canadian and U.S. dollars (Roy, 2005).

Correlation coefficients identify a strong relationship between the number of visitors crossing the border and the exchange rate (see Table 2). Strong positive coefficients (close to 1) indicate that both Canadian and American travelers are sensitive to variations in the exchange rate. Between 1989 and 2000, as the Canadian dollar strengthened, Canadians were more willing to cross the border (with correlation coefficients of .93). Similarly, as the U.S. dollar strength-

ened relative to the Canadian dollar between 1989 and 2000, the number of Americans crossing the border increased, demonstrating a strong positive correlation of .87. Thus between 1989, when the free trade policy was implemented and 2000, simple economics seemed to govern the cross border activities, which is not surprising since cross border shopping has long been a feature of Canada-U.S. tourism (Timothy and Butler, 1995; Turbeville and Bradbury, 1999). However, since then other factors seem to be at work. The correlation coefficients for Canadians weakened slightly between 2002 and 2011 to .86 and strengthened slightly for Americans (see Table 2). What is particularly interesting to note is that the number of Canadian visitors to the U.S. peaked in 1991 at approximately 73.4 million when the exchange rate was $1 U.S. = $1.146 (CND). However, in 2009 when the exchange rate was similar to that experienced in 1991 (at $1 U.S. = $1.142 CND) only 36.4 million Canadians traveled across the border - a decline of approximately 50 percent from 1991 figures (see Figure 2). Similarly, the number of American visitors to Canada declined during the same period. In 1991 the number of U.S. visitors to Canada was 28.2 million, compared to only 14.9 million in 2009, a decline of 47.2 percent. These findings would appear to indicate something other than the exchange rate is reducing cross-border travel.

Figure 2 Number of Travelers by Automobile.
Source: Statistics Canada, 2012.

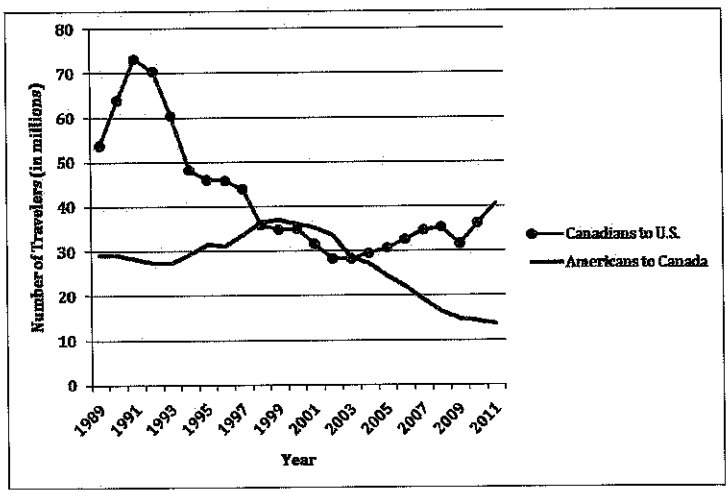


Table 2

Correlation Coefficients Between the Canada-U.S. Exchange Rate and		
Time Period	Number of American Travelers to Canada	Number of Canadian Travelers to the U.S.
1989-2000	0.868	0.933
1989-2011	0.89	0.246
2002-2011	0.942	0.863

Source: Bank of Canada, 2012a and Statistics Canada, 2012.

One of the unique characteristics of Canada-U.S. cross border travel by automobile is that it is dominated by same day trips (Bradbury and Turbeville, 2009; Timothy and Butler, 1995). In 2000 same day visits consisted of 77.3 percent of the total trips by automobile made by Canadians to the United States and 73.8 percent of the total trips by automobile made by Americans to Canada. Figure 3 shows the trend regarding same day travel across the Canada-U.S. border between 1989 and 2011 (Statistics Canada, 2012). The decline in the number of same day trips is much more significant than was seen in the previous figure. The correlation coefficients bear this out (see Table 3). The number of same day Canadian travelers to the United States by automobile peaked in 1991 at 59.1 million visitors. By 2009, when the exchange rate was similar to that experienced in 1991 (1.146 versus 1.142) only 20.9 million Canadians visited the U.S. – a decline of almost 65 percent from 1991 levels. Likewise, the number of same day American travelers to Canada by automobile went from 19.8 million in 1991 to 7.8 million in 2009, a decline of 60.6 percent. The correlation coefficients indicate that particularly for Canadian same day travelers a new factor weakened the influence of the exchange rate after 2001. Reports suggest that increased security measures such as the WHTI have resulted in greater scrutiny as well as longer crossing times. They therefore are negatively impacting the number of Canadians crossing the border (Alden, 2008; Conference Board of Canada, 2005; Industry Canada, 2008; Konrad, 2010; Roy, 2005).

Figure 3 Number of Same Day Travelers by Automobile.
Source: Statistics Canada, 2012.

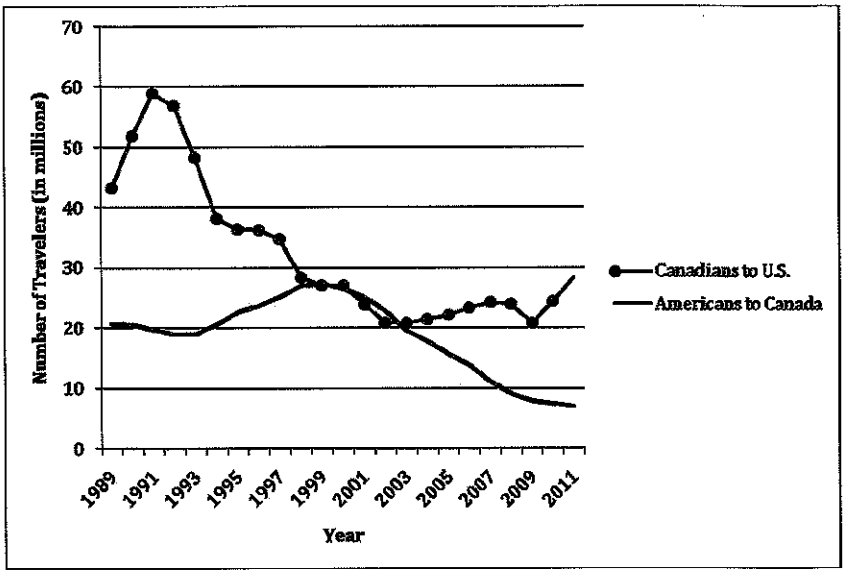


Table 3

	Correlation Coefficients Between the Canada-U.S. Exchange Rate and	
Time Period	Number of Same Day American Travelers to Canada	Number of Same Day Canadian Travelers to U.S.
1989-2000	0.866	0.937
1989-2011	0.868	0.152
2002-2011	0.942	0.757

Source: Bank of Canada, 2012a and Statistics Canada, 2012.

IMPACTS OF SECURITY ON TRAVELERS ACROSS THE CANADA-U.S. BORDER

As mentioned previously, while there is the belief that security measures have impacted the number of travelers crossing the Canada-U.S. border, there are also several other factors that could also explain the decline in travelers. This study will empirically examine the impact of security measures put in place since September 11, 2001 on the number of people crossing the border by automobile. Specifically this study focuses on whether security

procedures put in place since 9/11 at the various land-ports has reduced the number of people crossing the border, and on whether the WHTI has further reduced the number of people crossing the border.

First, to examine whether the security procedures put in place after 9/11 (but prior to the implementation of the WHTI) have reduced the number of people crossing the border, a multiple regression analysis with several influencing factors was conducted. In this study, the data are coded on a monthly basis from January 1991 to December 2007, and as a result 204 cases are observed. The dependent variable, *Number of Travelers*, is operationalized as the number of Canadian or American same day travelers entering or leaving Canada by automobile (Statistics Canada, 2012). Same day travel statistics were selected since they are typically used to measure discretionary or casual tourist travel (Deloitte, 2011). The main independent variable, *Security*, is a dummy variable that allows the researcher to distinguish months before and after the addition of security procedures. While security procedures were already in place prior to 9/11, heightened security procedures were implemented immediately after 9/11. Thus, in the first model (see Table 4) the dummy variable, *Security*, was coded zero in the months prior to September 2001, and one for the months between September 2001 and December 2007. Expectations for this model were as follows: if security procedures reduce the number of travelers crossing the border, a negative association between *Security* and *Number of Travelers* would be expected, while a positive coefficient would be expected if *Security* does not affect the number of travelers.

Two control variables were also included in the model: (1) *Exchange Rate* and (2) *Gas Price*. Monthly exchange rate data (expressed as the value of $1 Canadian in U.S. funds) were collected from the Bank of Canada (2012) and monthly U.S. regular gasoline prices (expressed as dollars per gallon) were collected from the U.S. Energy Information Administration (2012). Table 4 shows the results of the multiple regression analysis for both Canadian and American same day travelers.

Table 4 Model 1 Multiple Regression results.

	Canadians to U.S.		Americans to Canada
Dependent variable:	Number of Travelers		
Security	-768869.9**	(114369.1)	-589994.8**
(94104.4)			
Exchange Rate	9676437.6**	(537748.8)	-3806493**
(442467)			
Gas Price	-1315672**	(121296.9)	282127.2*
(99804.7)			
Constant	-2386659	(332565.2)	4430218.9
(273639.1)			
R-squared	0.77		0.45
N	204		204

Note: Standard errors are shown in parentheses.
*p < .01
**p < .0001

As Table 4 indicates, controlling for the effect of variables such as exchange rate and gas prices, *Security* is negatively associated with *Number of Travelers* and the coefficient is statistically significant at the p = < .0001 level. As security procedures have increased since 9/11, the number of monthly travelers by automobile has tended to decline, on average by 768,870 among Canadian travelers to the U.S. and 589,995 for American travelers to Canada. The results confirm that security measures implemented since 9/11 have resulted in a decline in both American and Canadian travelers crossing the border.

Model 2 also utilized *Number of Travelers* as the dependent variable and exchange rates, gasoline prices and security as independent variables. However, Model 2 differs from Model 1 in that it examines the time period January 2005 to December 2011, with 84 cases observed. Model 2 is attempting to isolate out the impact of the WHTI from other security measures introduced after 9/11. In this case, *Security* was coded as zero for the months January 2005 to January 2008, corresponding to the time period prior to the phased implementation of the WHTI and one for the months February 2008 to December 2011, which corresponds to the time period after the first phase of the WHTI went into effect. Expectations for this model are similar to Model 1: if security procedures reduce the number of travelers crossing the border, we would expect a negative association between *Security* and *Number*

of Travelers, while a positive coefficient would be expected if *Security* (in this case the WHTI) does not affect the number of travelers. Table 5 shows the results of the multiple regression analysis for Canadian and American same day travelers.

Table 5 Model 2 Multiple Regression results.

	Canadians to U.S.		Americans to Canada
Dependent variable:	Number of Travelers		
Security	-91238.8*	(53231.3)	-400226.7**
(47539.4)			
Exchange Rate	-782779.8	(576277.3)	-2874795**
(514657.1)			
Gas Price	352603.2**	(72531.1)	320239.5**
(64775.5)			
Constant	356635.8	(386613.2)	2846743.1
(345273.4)			
R-squared	0.53		0.64
N	84		84

Note: Standard errors are shown in parentheses.
* $p < .1$
**$p < .0001$

As Table 5 indicates, controlling for the effect of the exchange rate and gas prices, *Security* is negatively associated with *Number of Travelers*, and the coefficient is statistically significant at the $p = < .0001$ level for Americans traveling to Canada, but the coefficient was only statistically significant at the $p = < .1$ level for Canadians traveling to the U.S. These findings show that the WHTI has negatively impacted the number of Americans crossing the border into Canada to a much greater degree than Canadian travelers to the U.S. Although the *Exchange Rate* coefficient was not statistically significant for Canadian travelers to the U.S., the overall regression model was found to be statistically significant at the .0001 level with an F ratio of 31.53. The introduction of the WHTI beginning in February 2008 tended to decrease the number of monthly American travelers to Canada, on average, by 400,227 and Canadian travelers to the U.S. by 91,239. The results confirm that the WHTI has resulted in a decline in both American and Canadian same day travelers crossing the border by automobile.

The regression models located in Table 5 were used to predict the number of travelers who would have crossed the border if the

WHTI had not been implemented. To accomplish this, all explanatory variables were held at their mean values. Table 6 shows the results of these predictions and compares them to the total number of travelers who did cross the border between February 2008 and December 2011. Based upon these predictions the number of Canadians traveling to the U.S. would have increased slightly to 100.3 million travelers if the WHTI had not been implemented. This compares to the 96 million Canadians who did cross the border. Thus only 4.2 percent of Canadians chose not to cross the border because of the WHTI. In contrast, the number of Americans traveling to Canada would have increased to nearly 50 million without the enactment of the WHTI. This compares to the 30.7 million American travelers who did cross the border between February 2008 and December 2011, after the WHTI was implemented. Thus 38 percent of Americans chose not to cross the border due to the implementation of the WHTI.

Table 6 Predicted Number of Travelers (holding other variables at their mean values).

	Number of Canadian Travelers to U.S.	Number of American Travelers to Canada
Without WHTI	100,337,940	49,538,259
With WHTI	96,049,716	30,727,605
Difference	4,288,224	18,810,654

The results of this analysis are consistent with other research and confirm that the security procedures put in place since 9/11 have negatively impacted the movement of travelers across the border. Ferris (2010) estimated a monthly decline between 300,000 and 600,000 among same-day crossings into the U.S. based upon similar analysis. A recent report by the Border Policy Research Institute (2010) estimates that the WHTI caused a 7 percent decrease in Canada-U.S. border traffic. Industry Canada (2008) predicted that the WHTI would result in a cumulative loss of 14.1 million travelers to Canada from the United States between 2005 and 2010, while Canadian travel to the U.S. was expected to decline by 7.4 million trips. A similar study by the Conference Board of Canada (2005) estimated that the WHTI would result in a cumulative loss of approximately 5 million same-day person-trips to Canada by Americans and a loss of 2.6 million same-day person-trips by Canadians to the U.S. between 2005 and 2008.

What is interesting is that there does appear to be a sizeable difference in the effect of security on American, in comparison to Canadian travelers, with American travelers being impacted to a much greater extent. This finding is consistent with the Conference Board of Canada's (2005) report. A recent survey conducted by the Binational Economic and Tourism Alliance in 2010 found that American residents were far more likely to note border identification requirements as the primary reason not the cross the border (Deloitte, 2011). In addition, border crossing wait times was a more significant issue to U.S. respondents than to Canadian respondents (Deloitte, 2011). This difference in terms of impact may be explained by a number of factors. First, by 2010 more Canadians than Americans held a valid passport (60 percent of Canadians compared to 33 percent of Americans). This has been the case historically (Conference Board of Canada, 2005; Passport Canada, 2010; U.S. Department of State, 2012). Second, just over 75 percent of Canadians live within 100 miles of the Canada-U.S. border. This close proximity to the border, along with the historical trend of more Canadians visiting the U.S., may contribute to Canadians being much more knowledgeable and familiar with border procedures. So Canadians may view the border as less of a barrier in comparison to American travelers (Knowles and Matthiessen, 2009). In addition, CBSA ran two advertising campaigns about the new document requirements, one between November 2007 and January 2008 and the other from May 2009 to June 2009 (Canada Border Services Agency, 2011a). These advertising campaigns informed Canadians of the new regulations, gave them time to prepare and overall made them more comfortable with the new regulations and what to expect when crossing the border. Third, Canadians are attracted across the border for economic reasons. Sales tax rates are typically lower in the U.S., and prices are lower for many consumer products including gasoline (Berkow, 2011; Bradbury and Turbeville, 2009). In addition, there is typically a better selection of goods available in the U.S. (Humphreys, 2012). The allure of economic advantages and a relatively favorable exchange rate has continued to attract Canadians across the border despite the implementation of the WHTI. Now that we have some insights as to what is happening nationally, the next section will detail and examine how these changes are distributed regionally along the border. Research suggests that certain regions/border ports will be affected more

than others. The next section will describe what has occurred at the six busiest crossing ports along the border.

VEHICLE CASE STUDIES: CASE 1 – AMBASSADOR BRIDGE

The busiest personal vehicle crossing along the Canada-U.S. border is the Ambassador Bridge, which connects Detroit, Michigan to Windsor, Ontario. This crossing accounts for 15.2 percent of all auto traffic across the northern border (U.S. Department of Transportation, Bureau of Transportation Statistics, 2009). Unlike most of the border crossing points, the Ambassador Bridge is privately owned and operated by the Detroit International Bridge Company and the Canadian Transit Company. Built in 1929, the bridge consists of four lanes – two lanes for northbound traffic and two lanes for southbound traffic. The bridge connects Highway 3/Huron Church Road to Highway 401, Ontario's major east-west throughway, and provides direct access to Interstate Highways I-75 and I-96 in Michigan. Ten auto lanes/primary inspection booths are located at the Canadian plaza while twelve auto primary inspection booths are located on the U.S. side (Transport Canada, 2005a). In addition there are dedicated NEXUS lanes available – one in each direction. NEXUS was implemented at the Ambassador Bridge in January 2003. The program was reported to have a 7.3 percent participation rate in 2004 (Transport Canada, 2005a). As Figure 4 indicates, the number of personal vehicles crossing from Canada into the U.S. at Detroit peaked in 1999 at almost 9 million[4] (U.S. Department of Transportation, Bureau of Transportation Statistics, 2009). By 2009 the number of personal vehicles crossing the border at Detroit declined by over 54 percent from 1999 levels to just over 4 million vehicles.

Figure 4 Number of Personal Vehicles Crossing at Detroit.
Source: U.S. Department of Transportation, Bureau of Transportation Statistics, 2009.

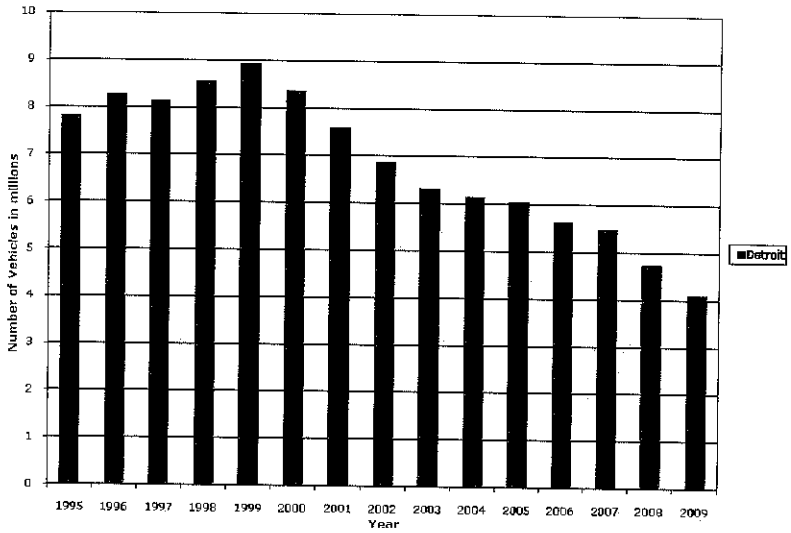
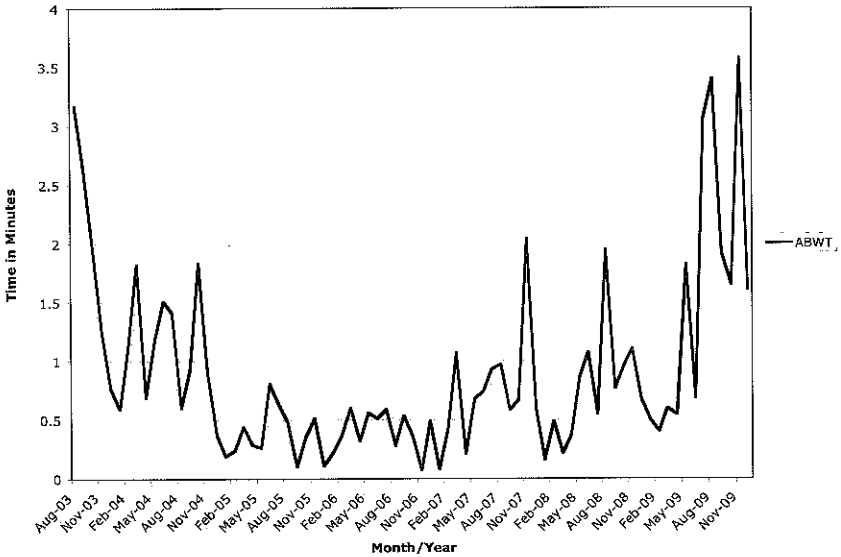


Figure 5 shows the average monthly border wait time for personal vehicles crossing into Canada at the Ambassador Bridge between August 2003 and December 2009 (Canada Border Services Agency, 2009b). Border wait time refers to the estimated wait time for vehicles to reach the primary inspection booth when crossing the Canada-U.S. border (Canada Border Services Agency, 2009b). While border wait times are collected and reported by both the Canada Border Services Agency and U.S. Customs and Border Protection[5], the border wait time data utilized in this study was obtained by the author from CBSA (Canada Border Services Agency, 2009b). Data is collected every hour on the hour every day the port is operational and distinguishes between commercial and personal vehicles. The author utilized this data to calculate the average monthly border wait time for personal vehicles entering Canada from the United States at each of the six ports.

Figure 5 Average Border Wait Time for Personal Vehicles Crossing at the Ambassador Bridge.
Source: Canada Border Services Agency, 2009b.



From Figure 5 it is interesting to note that the average border wait time for personal vehicles crossing into Canada varied considerably over time but does appear to increase slowly especially after January 31, 2008 when oral declarations were no longer accepted (U.S. Department of Homeland Security, 2007). The average border wait time for personal vehicles traveling from the U.S. into Canada across the Ambassador Bridge between February 2006 and December 2007 (before the first increment of the WHTI was implemented) was .59 minutes while the average border wait time between February 2008 and December 2009 was 1.25 minutes (Canada Border Services Agency, 2009b). Results of a paired t-test on the data found that the average border wait time to be significantly different (at the .01 level) between the two time periods (see Table 6).[6] Thus, based on this data it would appear that operational changes at the border contributed to increasing the wait time at the Ambassador Bridge, even as the volume of traffic declined.

Table 6 Paired t-test analysis and results.

Ambassador Bridge	Before	After
Average wait time	0.594	1.25
Maximum wait time	2.04	3.58
Minimum wait time	0.07	0.55
Standard deviation	0.41	0.98
t value	4.04	
p value 22, .05	1.717	Significant
p value 22, .01	2.508	Significant

What makes this finding interesting is the fact that the WHTI is a U.S. government requirement, not a Canadian policy. In fact according to CBSA, the identification requirements for entry into Canada did not change despite the implementation of the WHTI by the U.S. If indeed the identification requirements for entry into Canada did not change, it is puzzling that the border wait time would have increased. However, the Government of Canada does recommend that Canadian citizens travel with a valid passport or one of several other acceptable documents such as an Enhanced Driver's License, NEXUS card, Canadian Citizenship card, Certificate of Indian Status or birth certificate in combination with either a driver's license or a government issued photo identification (Canada Border Services Agency, 2009c). These recommended identification requirements are very similar to those stated in the WHTI. It appears that the Government of Canada is informally harmonizing its entry document standards with those of the United States (Canada Border Services Agency, 2006; Muller, 2010).

CASE 2 - PEACE BRIDGE

The Peace Bridge is the second busiest personal vehicle crossing along the Canada-U.S. border. It connects Buffalo, New York to Fort Erie, Ontario. Built in 1927, this crossing accounts for nearly 8.9 percent of all auto traffic across the border (U.S. Department of Transportation, Bureau of Transportation Statistics, 2009). The bridge spans the Niagara River and is operated by the Buffalo and Fort Erie Public Bridge Authority. The bridge links the Queen Elizabeth Way (QEW), a major Ontario highway, to I-90 and then

to I-190 in New York State. The bridge itself consists of three lanes of traffic. The center lane of the bridge is reversible and can change direction when traffic in one direction becomes congested. There are nine primary auto lanes/booths at the Canadian plaza and eleven at the U.S. plaza. The NEXUS program was implemented at the Peace Bridge in January 2003 when NEXUS booths were installed at both the Canadian and U.S. plazas. However, given the tight configuration of the bridge there are no dedicated NEXUS lanes on approaches to the NEXUS booths. Thus NEXUS travelers can be caught in traffic during congested periods, limiting the overall benefits of the NEXUS program at this particular port. Nonetheless the NEXUS participation rate was reported to be 10.3 percent (Transport Canada, 2005a). Figure 6 shows the number of automobiles crossing into Canada from the U.S. at the Fort Erie port of entry (Statistics Canada, 2010). As the figure shows, the number of autos entering Canada through this port was increasing and peaked at approximately 3.4 million autos in 2000. Since that time the amount of traffic has declined by 39 percent to 2.07 million vehicles in 2009.

Figure 6 Number of Automobiles Entering Canada at Fort Erie.
Source: Statistics Canada, 2010.

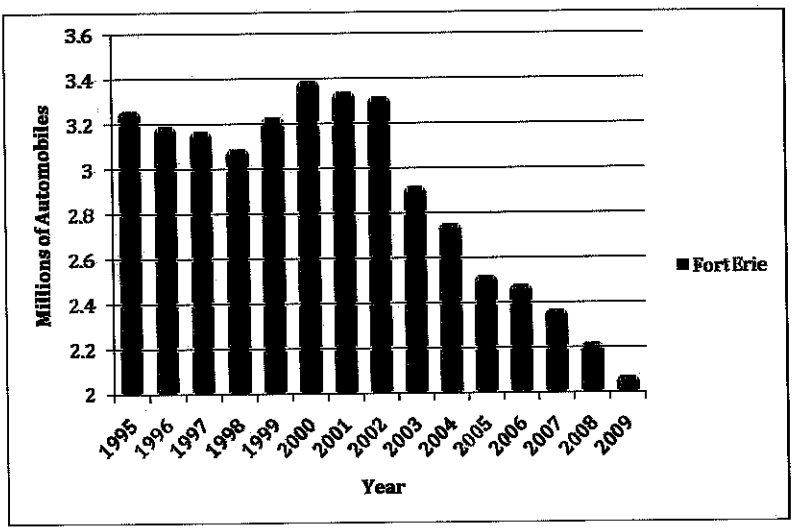


Figure 7 shows the average monthly border wait time for personal vehicles crossing the Peace Bridge between August 2003 and December 2009. Once again the average border wait time for personal vehicles entering Canada increased slightly over time – from .53 minutes to .95 minutes (Canada Border Services Agency, 2009b) but the paired t-test was not significant at the .01 level (see Table 7). One factor that may have contributed to keeping the average border wait time relatively consistent during the study time period is that a new Canadian plaza was constructed, significantly expanding the inspection capacity (Transport Canada, 2005b). The new plaza was completed in March 2007 and as a result, the number of primary inspection lanes/booths increased from 9 to 15 (Transport Canada, 2007). Despite this, Figure 7 shows the average border wait time increased around June 2009 when the WHTI was fully implemented. Consequently, it would appear that the infrastructure project combined with a decreasing amount of traffic helped reduce the impact of the heightened security measures at the Peace Bridge, keeping the average border wait time relatively constant over time.

Figure 7 Average Border Wait Time for Personal Vehicles Crossing at the Peace Bridge. Source: Canada Border Services Agency, 2009b.

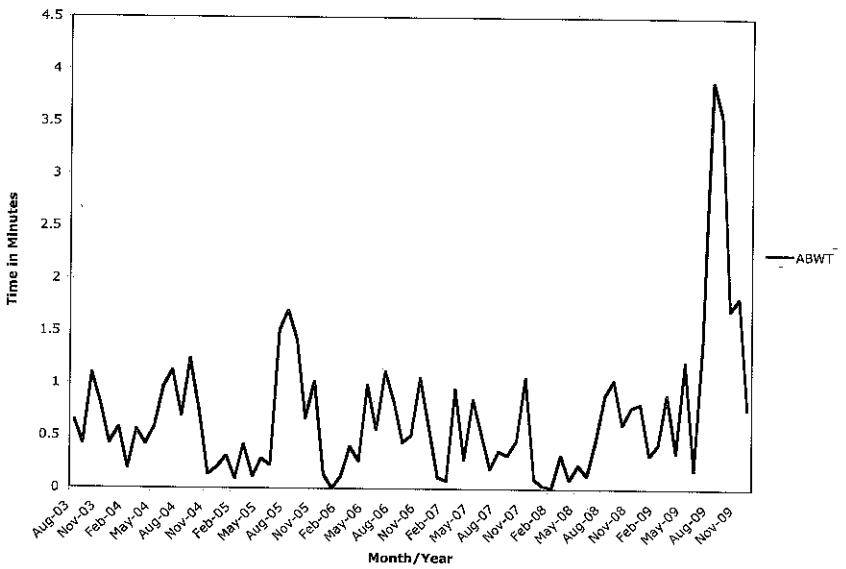


Table 7 Paired t-test analysis and results.

Peace Bridge	Before	After
Average wait time	0.53	0.95
Maximum wait time	1.12	3.89
Minimum wait time	0.09	0.01
Standard deviation	0.34	1.01
t value	1.91	
p value 22, .05	1.717	Significant
p value 22, .01	2.508	Not Significant

CASE 3 - BLUE WATER BRIDGE

The third busiest auto crossing along the Canada-U.S. border is the Blue Water Bridge, which connects Port Huron, Michigan with Sarnia, Ontario. This crossing accounts for 5.9 percent of all auto traffic across the northern border (U.S. Department of Transportation, Bureau of Transportation Statistics, 2009). The bridge is owned and operated in partnership with the Blue Water Bridge Authority and the Michigan Department of Transportation. There are actually two bridges that span the St. Clair River, the original span constructed in 1938 and a more recent span completed in 1997. Both bridges consist of three lanes, with one span conducting eastbound traffic (to Canada) and the other westbound traffic (to the U.S.). Ten auto lanes/primary inspection booths are located on the Canadian side while six auto primary inspection booths are located at the U.S. plaza (Transport Canada, 2005a). The Blue Water Bridge was one of the test sites for the NEXUS program. As a result NEXUS booths were installed at both the Canadian and U.S. plazas in November 2000. However, it was not until January 2004 that dedicated NEXUS lanes were made available on the approaches to the booths, ensuring that NEXUS travelers would no longer be caught in traffic during congested periods (Transport Canada, 2005a). In 2009 work began on improving the NEXUS program by constructing a NEXUS by-pass lane (Blue Water Bridge Authority, 2010). The NEXUS participation rate was reported to be 3.2 percent in 2004, but since then enrollment in the program at the Blue Water Bridge has increased significantly to over 20,000 members by 2009 (Blue Water Bridge Authority, 2007; U.S. Customs and Border Protection, 2009b).

As Figure 8 shows, the number of automobiles crossing into Canada at the Sarnia port of entry was affected by the events of 9/11. The number of autos crossing at Sarnia peaked in 2000 at just over 2.2 million. Since 2000 the number of autos utilizing the Blue Water Bridge has declined by 36.4 percent to 1.39 million vehicles crossing in 2009 (Statistics Canada, 2010).

Figure 8 Number of Automobiles Entering Canada at Sarnia.
Source: Statistics Canada, 2010.

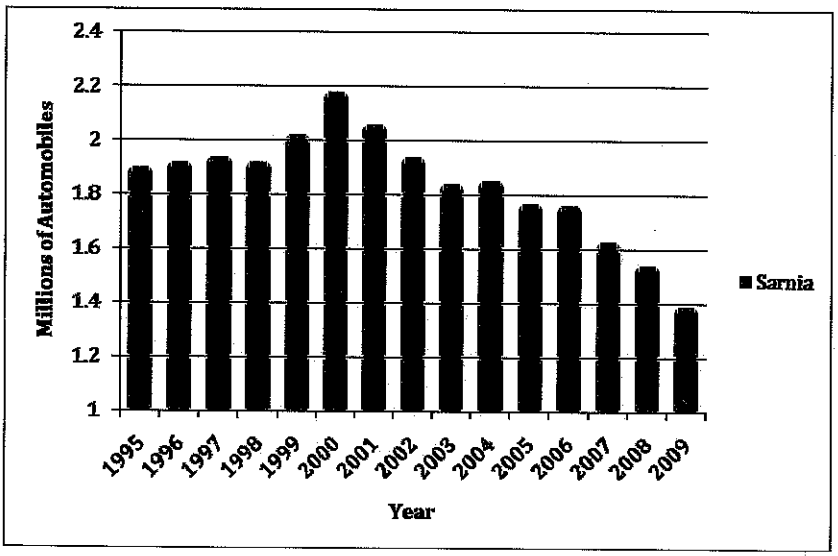


Figure 9 shows the average monthly border wait time for personal vehicles crossing the Blue Water Bridge between August 2003 and December 2009 (Canada Border Services Agency, 2009b). Comparing the average border wait times between the two time periods – before the first phase of the WHTI was in place (between February 2006 and December 2007) and after the first phase of the WHTI was implemented (February 2008 to December 2009) – indicates that the average border wait time has increased. The average border wait time for personal vehicles entering Canada before the WHTI was operational was 2.14 minutes, compared to 3.4 minutes afterward (see Table 8). Once again it is worth noting that

the average wait time increased at the same time that the number of vehicles utilizing the port declined.

Figure 9 Average Border Wait Time for Personal Vehicles Crossing at the Blue Water Bridge.
Source: Canada Border Services Agency, 2009b.

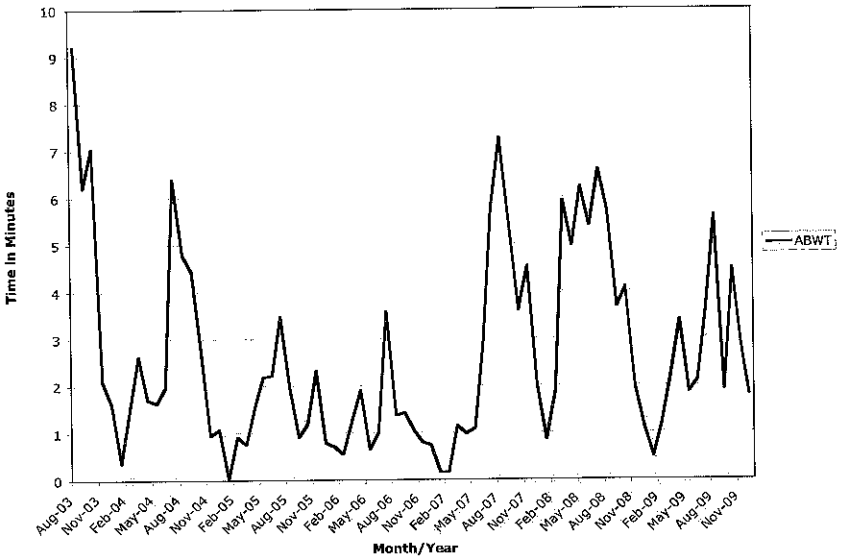


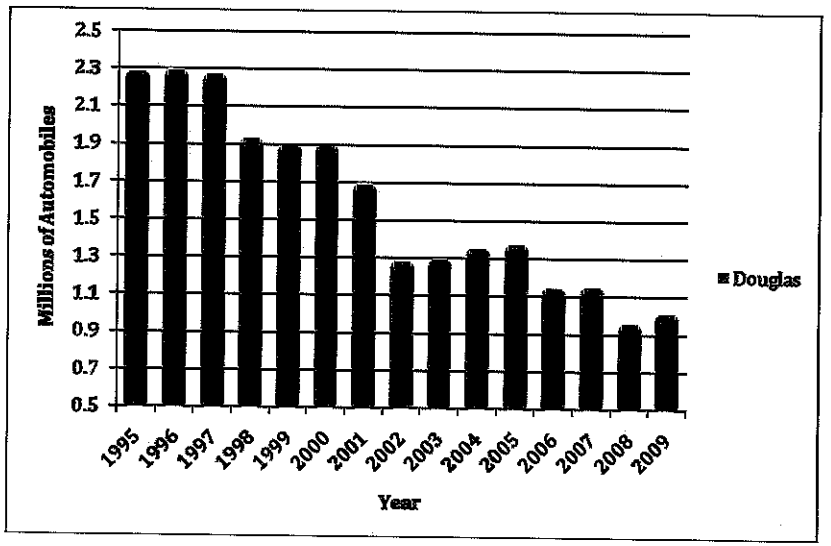
Table 8 Paired t-test analysis and results.

Blue Water Bridge	Before	After
Average wait time	2.14	3.43
Maximum wait time	7.26	6.59
Minimum wait time	0.15	0.48
Standard deviation	1.97	1.87
t value	2.64	
p value 22, .05	1.717	Significant
p value 22, .01	2.508	Significant

CASE 4 – PEACE ARCH

The fourth busiest crossing along the Canada-U.S. border is the Peace Arch, which connects Blaine, Washington to Surrey, British Columbia. This crossing accounts for 5.6 percent of all auto traffic across the northern border. Unlike the previously discussed border ports, which handle commercial and passenger traffic, this port only serves passenger vehicles. This crossing connects U.S. I-5 to Highway 99 in British Columbia. As Figure 10 indicates, the number of autos crossing into Canada from the U.S. at Peace Arch peaked in 1996 at 2.3 million vehicles (Statistics Canada, 2010). However, the number of personal vehicles crossing the border at Peace Arch declined by 58.3 percent reaching a low of just under 1 million vehicles in 2008.

Figure 10 Number of Automobiles Entering Canada at Peace Arch.
Source: Statistics Canada, 2010.



The NEXUS program was implemented in June 2002 with dedicated NEXUS booths/lanes provided in each direction. In 2005 an extension was added to the southbound NEXUS lane to provide NEXUS travelers access to the lane and as a means to avoid blockage of the lane by other traffic (Whatcom Council of Governments, 2007). This port has the highest NEXUS participation rate of any of the ports consisting of 30 percent of the traffic for southbound

vehicles and 24 percent of the overall traffic for northbound vehicles (Whatcom Council of Governments, 2010a). This high participation rate may be partially due to the fact that an experimental program, the precursor to NEXUS known as PACE (for Peace Arch Crossing Entry by the U.S. Immigration and Naturalization Service) and the corresponding Canadian program, CANPASS, were implemented at this crossing in 1992 (Sands, 2009). In addition, the Whatcom Council of Governments (WCOG) has long been an advocate for the NEXUS program. It engaged in several intensive regional marketing programs between 2003 and 2011. It has maintained a NEXUS website targeting the program within the region continuously since 2004 (Whatcom Council of Governments, 2004 and 2010a).

Figure 11 shows the average monthly border wait time for personal vehicles crossing at Peace Arch between August 2003 and December 2009 (Canada Border Services Agency, 2009b). This figure differs considerably from the other ports. It shows that the average wait time declined in 2008 and has remained relatively low since then. This trend was supported in the paired t-test analysis shown in Table 9. Comparing the average border wait time before and after the implementation of the WHTI indicates that the average border wait time for personal vehicles decreased from 11.55 minutes to 6.96 minutes (Canada Border Services Agency, 2009b).

Figure 11 Average Border Wait Time for Personal Vehicles Crossing at Peace Arch. Source: Canada Border Services Agency, 2009b.

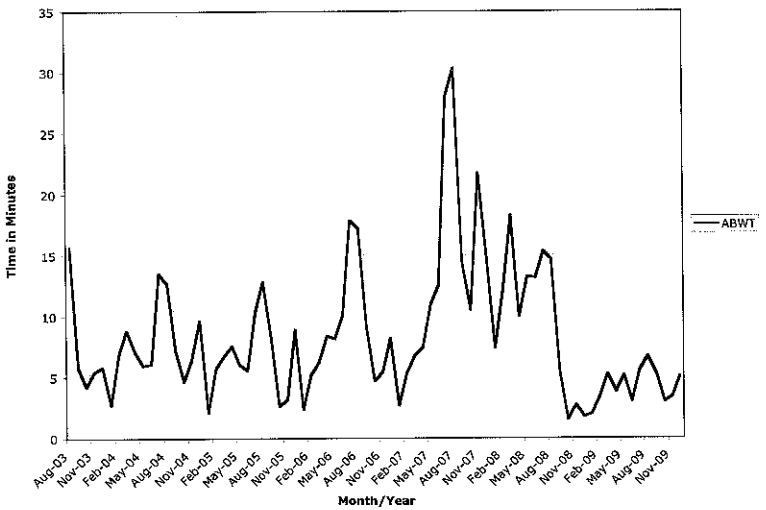


Table 9 Paired t-test analysis and results.

Peace Arch	Before	After
Average wait time	11.55	6.96
Maximum wait time	30.32	15.32
Minimum wait time	2.68	1.51
Standard deviation	7.29	5.02
t value	-2.58	
p value 22, .05	1.717	Not Significant
p value 22, .01	2.508	Not Significant

It should be noted that the average border wait time declined at the same time the amount of traffic through the port was starting to increase. However, a new Canadian port-of-entry facility began construction in August 2007.[7] Although the facility was not officially opened until August 2009, many of the improvements were completed and in operation by September 2008. The new facility expanded the number of primary processing lanes from seven to ten, increasing the overall inspection capacity of the facility (Canada Border Services Agency, 2009d). The impact of the construction of this facility on average border wait time can be clearly seen on Figure 12. During construction the average border wait time increased but once construction was completed the wait time dropped significantly. In addition to the new facility the Advanced Traveler Information System (ATIS) was put in place at Peace Arch and Pacific Highway in 2007. The ATIS consists of signage that provides travelers with wait times at the two ports and thus helps to distribute traffic more efficiently between the two facilities, which are located approximately one mile apart (Whatcom Council of Governments, 2007).

Peace Arch is a rather unique case study due to the fact that more data exists for this crossing than for the others in this study. The Whatcom Council of Governments (WCOG) maintains a comprehensive data set, the Cascade Gateway Border Data, for the four crossings commonly referred to as the Cascade Gateways, consisting of Peace Arch, Pacific Highway, Sumas-Huntingdon and Lynden-Aldergrove. This data set includes border wait time data for cars and trucks traveling in both directions as well as traffic

volumes, number of vehicles in the queue, queue length and service rate at each of the four ports (Whatcom Council of Governments, 2012). As a result, this data set allows for the average border wait time to be examined for traffic going in both directions, northbound to Canada as well as southbound to the U.S. This data can be seen in Figure 12 for the Peace Arch. As Figure 12 shows, the average border wait time for southbound vehicles crossing into the U.S. is significantly greater than for those vehicles traveling northbound to Canada (see Table 10). The average border wait time for vehicles entering the U.S. at Peace Arch is 11.7 minutes compared to 8.4 minutes for vehicles entering Canada (see Table 10) between August 2003 and December 2009.

Figure 12 Average Border Wait Time for Personal Vehicles Crossing at Peace Arch
Source: Canada Border Services Agency, 2009b; Whatcom Councils of Government, 2012.

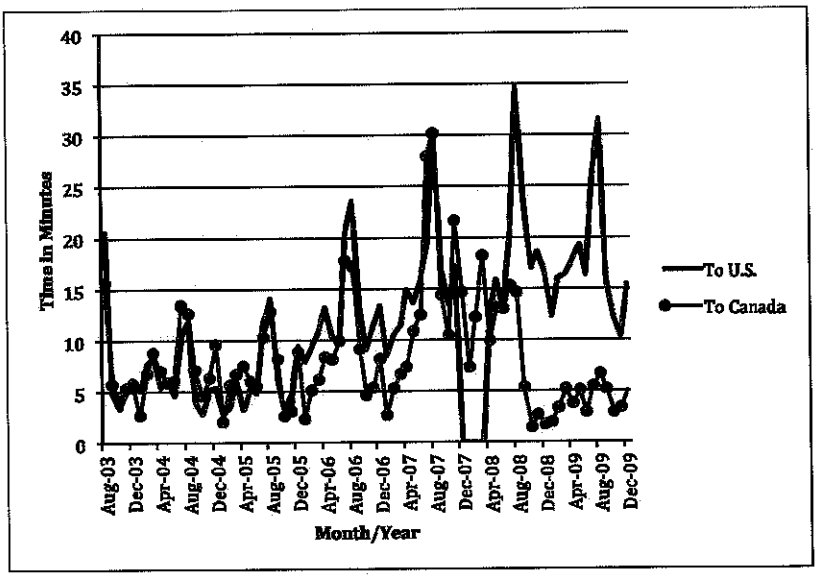


Table 10

Peace Arch	North to Canada	South to U.S.
Average wait time	8.4	11.7
Maximum wait time	30.32	34.74
Minimum wait time	1.51	0
Standard deviation	5.61	7.43
t value	3.11	
p value 77, .05	1.67	Significant
p value 77, .01	2.39	Significant

However, there are some problems with the data. For instance, no data is available for a four-month period for southbound vehicles between December 2007 and March 2008 (Whatcom Council of Governments, 2012). In addition, construction began on a new U.S. port facility in August 2007 and continued for the next several years (Whatcom Council of Governments, 2010b). Construction on the new facility was mostly completed by February 2010, in time for the Vancouver Olympics (U.S. Department of Homeland Security, 2010). All construction was completed by December 2010 and the new facility was officially opened in March 2011 (U.S. General Services Administration, 2011). As a result, we cannot tell if the higher average border wait time observed for southbound vehicles during 2008 and 2009 is due to the implementation of the WHTI, construction delays, or to a combination of both.

Limited data is also available from WCOG that provides some insight as to the benefits associated with the NEXUS program (Whatcom Council of Governments, 2012).[8] Figure 13 shows the average border wait time for southbound vehicles crossing into the U.S. for NEXUS and non-NEXUS vehicles for the time period April 2008 to June 2010. The average border wait time for NEXUS vehicles is significantly lower at 3.8 minutes compared to 17.3 minutes for non-NEXUS vehicles (see Table 11). Figure 14 shows the average border wait time for northbound vehicles crossing into Canada for NEXUS and non-NEXUS vehicles. The average border wait time for NEXUS vehicles is significantly lower at .56 minutes compared to 4.9 minutes for non-NEXUS vehicles (see Table 11).

Figure 13 Average Border Wait Time for Southbound NEXUS and Non-NEXUS Vehicles Crossing at Peace Arch.
Source: Whatcom Council of Governments, 2012.

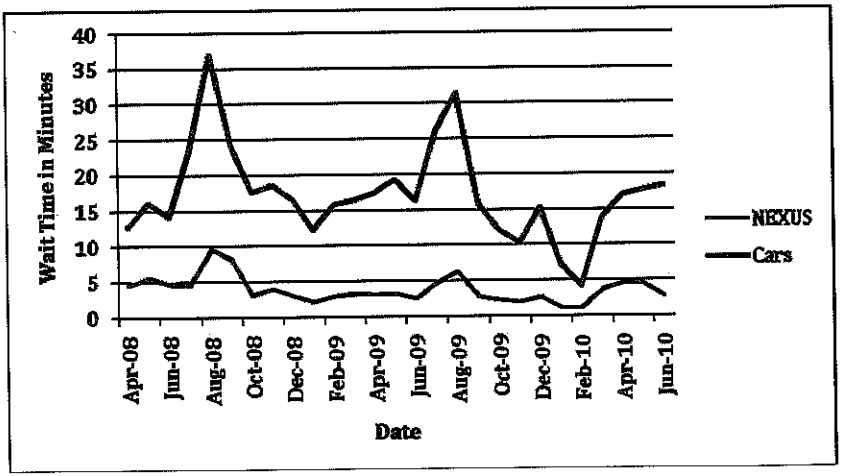


Figure 14 Average Border Wait Time for Northbound NEXUS and Non-NEXUS Vehicles Crossing at Peace Arch.
Source: Whatcom Council of Governments, 2012.

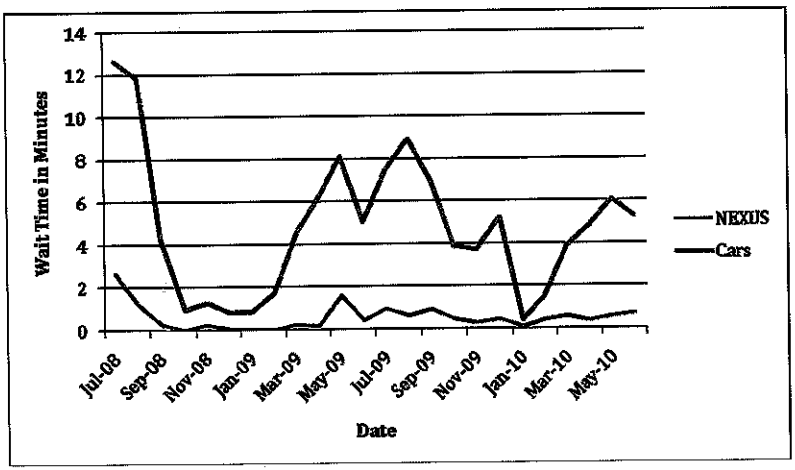


Table 11

Peace Arch	Northbound to Canada		Southbound to U.S.	
	NEXUS	Non-NEXUS	NEXUS	Non-NEXUS
Average wait time	0.56	4.9	3.8	17.3
Maximum wait time	2.64	12.67	9.63	37.13
Minimum wait time	0	0.41	1.04	4.19
Standard deviation	1.2	3.35	1.96	6.78
t value	5.95		9.99	
p value 23, .05	1.714	Significant	1.706	Significant
p value 23, .01	2.5	Significant	2.479	Significant

More southbound travelers seem to utilize the NEXUS lanes than northbound travelers, with approximately 42,000 vehicles per month using the southbound NEXUS lane in comparison to approximately 31,000 vehicles using the northbound NEXUS lane per month at Peace Arch. Thus, NEXUS lanes handle 34.1 percent of the vehicle traffic traveling southbound to the U.S. compared to 26.2 percent of the vehicles traveling northbound to Canada. This result is hardly surprising given that there is a much greater benefit in terms of time saved when utilizing the NEXUS lanes traveling southbound.

This limited study demonstrates the potential benefit associated with the NEXUS program. Clearly, more expanded research is needed. Data limitations will need to be overcome in order make this research possible. In addition, it is curious to note that 43 percent of all NEXUS card holders live in the Pacific Northwest/British Columbia Mainland region (Whatcom Council of Governments, 2010a). While an extensive marketing campaign along with the considerable time savings associated with the program in this region may help to explain this, nonetheless the NEXUS program is not uniformly embraced across the country.

CASE 5 – RAINBOW BRIDGE

The Rainbow Bridge is the fifth busiest crossing, accounting for 5.2 percent of all auto traffic across the border. It connects Niagara Falls, New York with Niagara Falls, Ontario and in doing so offers a view of Niagara Falls, which makes it popular with tourists. Opened in 1941, the bridge spans the Niagara River and contains four lanes, two flowing in either direction. Like Peace Arch, this port only handles passenger vehicles and connects Highway 420 and the Queen Elizabeth Way (QEW) in Ontario with I-190 and I-90 in New York. The Niagara Falls Bridge Commission

operates the Rainbow Bridge, and also oversees two other bridges, the Queenston-Lewiston and the Whirlpool Bridge. Fourteen auto primary inspection lanes/booths exist at the Canadian plaza and seventeen are located at the U.S. plaza (Transport Canada, 2005a). The NEXUS program was implemented at the Rainbow Bridge in June 2003 with the installation of NEXUS lanes/booths available in either direction. The NEXUS participation rate is relatively low at this port, reported to be just 1.4 percent (Transport Canada, 2005a). Figure 15 shows the number of automobiles entering Canada at the Rainbow Bridge. The number of vehicles peaked in 1998 at 2.1 million automobiles (Statistics Canada, 2010). This number varied considerably between 1999 and 2002 before declining again to 1.34 million automobiles in 2009.

Figure 15 Number of Automobiles Entering Canada at the Rainbow Bridge.
Source: Statistics Canada, 2010.

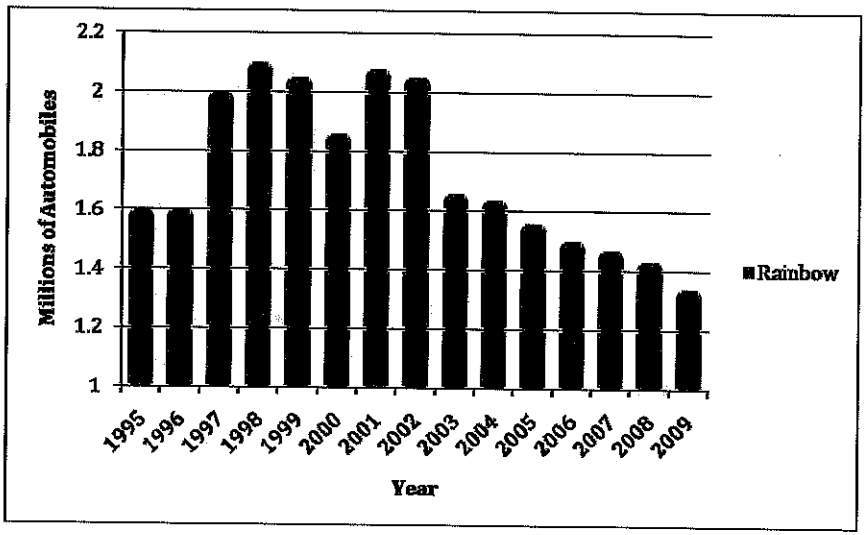


Figure 16 shows the average border wait time for personal vehicles crossing at the Rainbow Bridge. Comparing the average border wait time before and after the implementation of the WHTI indicates that the average border wait time for personal vehicles increased from .85 minutes to 1.49 minutes (Canada Border Services Agency, 2009b), a significant increase (see Table 12).

Figure 16 Average Border Wait Time for Personal Vehicles Crossing at the Rainbow Bridge.
Source: Canada Border Services Agency, 2009b.

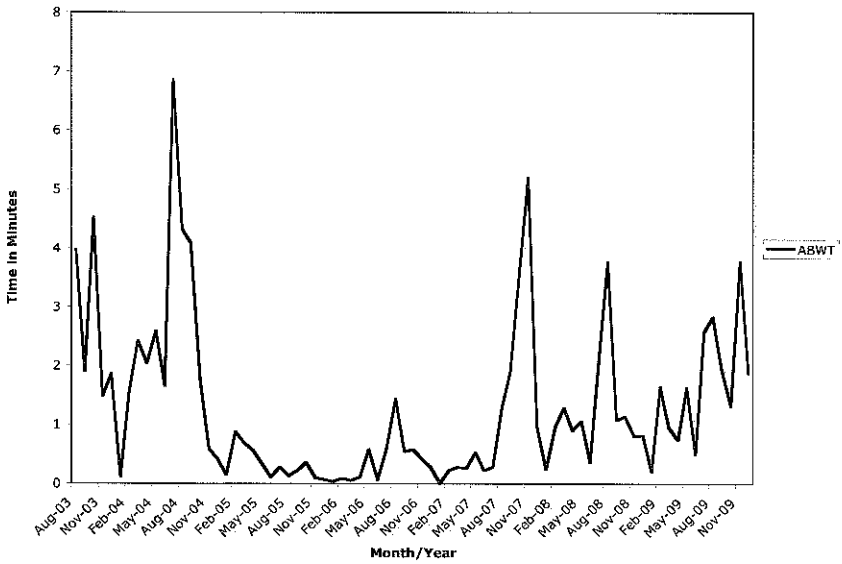


Table 12 Paired t-test analysis and results.

Rainbow Bridge	Before	After
Average wait time	0.85	1.49
Maximum wait time	3.59	3.77
Minimum wait time	0	0.2
Standard deviation	1.24	0.98
t value	3.081	
P value 22, .05	1.717	Significant
P value 22, .01	2.508	Significant

CASE 6 - QUEENSTON-LEWISTON BRIDGE

The Queenston-Lewiston Bridge is the sixth busiest crossing, accounting for 5.1 percent of all auto traffic across the northern border. It connects Lewiston, New York with Queenston, Ontario. Built in 1962, the Queenston-Lewiston Bridge connects I-190 in New York with Highway 405 and the QEW in Canada. The bridge capacity was increased to five instead of four lanes of traffic in 2005. The lanes can be adjusted to accommodate the direction of the heaviest traffic (Deloitte, 2011). Six auto primary inspection lanes/ booths exist at the Canadian plaza and seven are located at the U.S. plaza (Transport Canada, 2005a). Figure 17 shows the number of automobiles entering Canada at the Queenston-Lewiston Bridge. The number of vehicles peaked in 1997 at 1.9 million automobiles and declined by 28.7 percent to 1.34 million by 2009.

Figure 18 shows the average border wait time for personal vehicles crossing at the Queenston-Lewiston Bridge. Comparing the average border wait time before and after the implementation of the WHTI indicates that the average border wait time for personal vehicles increased from 3.19 minutes to 7.33 minutes (Canada Border Services Agency, 2009b). Once again this was at a time when the amount of traffic through the port was declining.

Figure 17 Number of Automobiles Entering Canada at the Queenston-Lewiston Bridge.
Source: Statistics Canada, 2010.

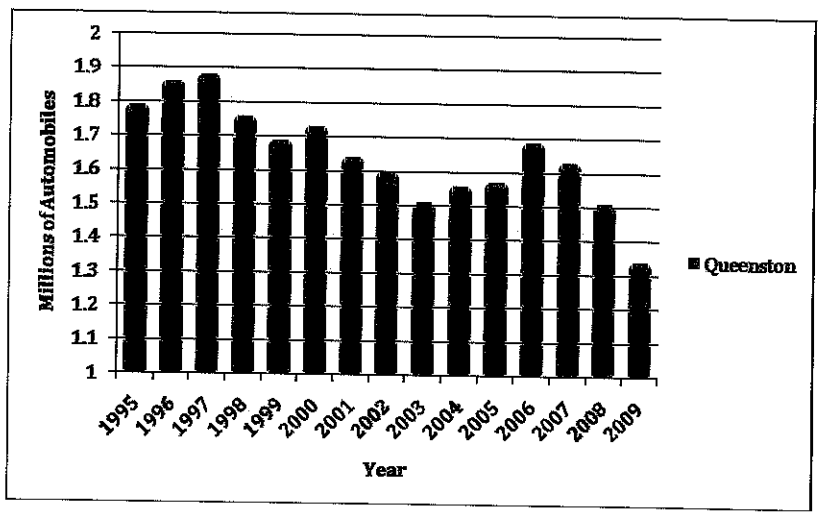


Figure 18 Average Border Wait Time for Personal Vehicles Crossing at Queenston-Lewiston Bridge.
Source: Canada Border Services Agency, 2009b.

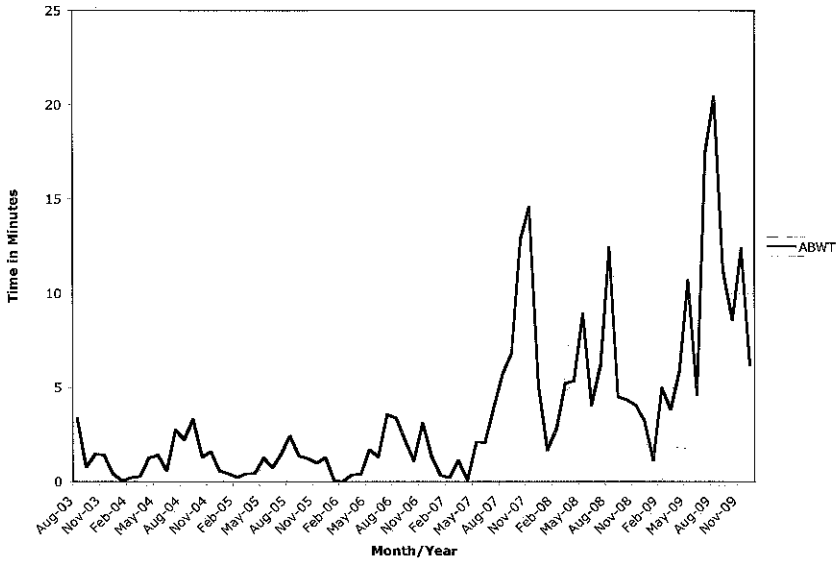


Table 13 Paired t-test analysis and results.

Queenston-Lewiston Bridge	Before	After
Average wait time	3.19	7.33
Maximum wait time	14.59	20.44
Minimum wait time	0.01	1.13
Standard deviation	3.82	4.81
t value	4.55	
p value 22, .05	1.717	Significant
p value 22, .01	2.508	Significant

However, in 2009 construction began on new facilities at the Canadian plaza. A new CBSA building is being built along with the addition of 10 new passenger vehicle primary inspection lanes (Niagara Falls Bridge Commission, 2008). The NEXUS program is currently not available at this port although it is expected to be implemented as part of the overall improvements taking place at this facility (Canada Border Services Agency, 2011b). Thus, construction delays may account for at least some of the increase in the average border wait time. Also, given the fact that vehicle inspection capacity will increase by over 50 percent at the Canadian plaza, one would expect that wait time at the Queenston-Lewiston Bridge will likely decline once the new facilities are operational.

CROSS CASE COMPARISONS

Of the six major border crossings examined, four of them, the Ambassador, Blue Water, Rainbow, and Queenston-Lewiston Bridges experienced a statistically significant increase in average border wait time after the implementation of the WHTI based upon the findings from the paired t-tests. Two exceptions were found: the Peace Bridge and the Peace Arch crossing. At the Peace Bridge border wait times increased but were not found to be statistically significant. Thus border wait time increased at five of the six busiest ports at the time that border traffic decreased by an average of 9.6 percent nationally (U.S. Department of Transportation, Bureau of Transportation Statistics, 2009). The exception to this trend occurred at the Peace Arch crossing where the average border wait time actually decreased, but this reduction in wait time was likely due to infrastructure improvements and the increase in inspection capacity. Another aspect of these findings concerns the variability associated with these average wait times. The standard deviation values in the tables indicate that the variability in wait times increased at three of the six major crossings, the Ambassador, Peace and Queenston-Lewiston Bridges, after the implementation of the WHTI. Overall these findings suggest that greater scrutiny is occurring at the border and is contributing to increased uncertainty and wait times when crossing into Canada.

Comments from the interviews help to illuminate these findings. Most of the comments concerning border wait times focused on the variability and unpredictability of the crossing time and not on the actual time it takes to cross the border. Most travel

through these various border ports involves same day trips. Same day trips are characterized as short in duration and distance, and they are typically undertaken for pleasure. These short, leisure trips can quickly become frustrating or even unpleasant if they involve waiting at the border for long periods of time. For many of the people interviewed it is was not the actual time it takes to cross the border that is the critical issue but rather the uncertainty of not knowing how long it will take to cross (and not being able to know until they actually get to the border) that discourages them from making cross border trips. In other words, it is the anxiety, uncertainty, and unpredictability of the crossing time that influences people to not cross the border.

Another interesting point identified through cross case comparison is the considerable variability in average crossing time and in the participation rates of the NEXUS program among the different ports. While this pattern is interesting it raises more questions than it answers and thus indicates the need for more research, especially regarding the NEXUS program.

CONCLUSIONS

The findings from this study are consistent with other research and show that various security procedures put in place since 9/11 have negatively impacted the movement of travelers across the border. Between 1991 and 2011 the number of Canadian travelers crossing the border by automobile declined by 32.5 million travelers or by 44.3 percent, with the greatest decline, 51.8 percent, among same day travelers (those travelers crossing and returning the same day). Likewise, between 1991 and 2011 the number of American travelers crossing the border by automobile declined by 14.5 million travelers or by 51.6 percent, with the greatest decline, 64.7 percent, among same day travelers. Industry Canada (2008) predicted that the WHTI would result in a cumulative loss of 14.1 million travelers to Canada from the United States between 2005 and 2010. Canadian travel to the U.S. was expected to decline by 7.4 million trips with the greatest impact on the number of same day trips. As a result of these declines, spending within the tourism sector was also predicted to be negatively affected, with both countries losing billions of dollars in tourism receipts (Industry Canada, 2008). A more recent report by the Border Policy Research Institute (2010) estimates that the WHTI caused a 7 percent decline in Canada-U.S. border traffic. Konrad (2010) reports that rather than becoming simpler,

the WHTI requirements have actually complicated identification operations at the border. A survey conducted in the Niagara border region confirms these findings that it is the unpredictability of the border that is influencing people not to cross (Deloitte, 2011). As a result, tourism has suffered considerably due to longer and greater unpredictability of crossing time (Konrad, 2010).

A 2005 report produced by Canada's Senate Committee on National Security and Defence recommended that greater emphasis should be placed on security at the border. The report suggested that by 2007 the Government of Canada should require documentation of all people entering Canada to be: (1) tamper-proof, (2) machine readable, (3) biometrically enhanced and (4) known to be reliable (Senate of Canada, 2005). A CBSA Planning and Priority report indicated that the Government of Canada is working to harmonize document standards for entry into Canada with those established by the U.S. through the WHTI (Canada Border Services Agency, 2006; Muller, 2010). It is also interesting to note that the Canada Border Services Agency shifted their strategic outcome from "Efficient and effective border management that contributes to the security and prosperity of Canada" in 2007-2008 to "Border management that contributes to the safety and security of Canada and facilitates the flow of persons and goods" in 2008-2009 (Canada Border Services Agency, 2008b). While the word changes may be subtle, they suggest a greater emphasis on security, in comparison to access, within the agency's mission. Similarly, the following year, CBSA's priority strategic outcome was identified as keeping "Canada's population safe and secure from border-related risks," while its second priority is to allow "legitimate travelers and goods to move freely and lawfully across the border" (Canada Border Services Agency, 2009e). Taken together it would seem that the Government of Canada has placed greater emphasis on security with respect to travelers and that this has resulted in longer wait times when crossing the border. In an attempt to support this trend, the 2011 Canada-U.S. declaration, *A Shared Vision for Perimeter Security and Economic Competitiveness*, is intended to enhance security and accelerate the legitimate flow of people across the border (White House, 2011). Only time will tell if it will have a desired effect.

While this study adds to our understanding of the impact of security measures on travel across the Canada-U.S. border, many questions remain unanswered and provide the basis for future research. For instance, we do not know why people are avoiding the

border, although researchers have begun to speculate on a number of factors. While additional infrastructure capacity and improvements appear to be able to offset some of the impact associated with the implementation of these increased security measures, such as at the Peace Arch crossing, many other infrastructure improvements may have actually contributed to the creation of a psychological effect. Since 2001 many border ports and facilities have been redesigned to resemble military checkpoints complete with barricades, barbed wire, warning signs and a veritable forest of cameras and license plate scanners (Bradbury and Turbeville, 2009; Konrad, 2010). Results from informal interviews suggest that these very visible physical changes to the border area have increased uneasiness about the border and have contributed to the perception that the border is a less friendly place. To complete this image, both Canadian and American personnel at the border are now armed and wear body-armor (Canada Border Services Agency, 2010b).[9] In addition to the physical changes is the fact that border wait times have increased and are less predictable than before. Interviews suggest that it is not so much the actual wait times that seem to discourage people from crossing the border as much as the unpredictability of the time it will take. Although average wait times appear very low, consisting of only a few minutes, actual wait times can extend to several hours during peak season/holiday times (Canada Border Services Agency, 2009b). The combination of all of these changes has created a psychological barrier that clearly discourages the casual cross border traveler. Crossing the border is no longer a mere formality: to many it is a very intimidating experience, often one they are choosing not to undergo. The introduction of these new security measures has created a psychological border that is currently superseding economics.

POLICY IMPLICATIONS

The findings from this study indicate that security measures have had a negative impact on the movement of people across the border. The number of travelers crossing the border has declined, especially the number of same-day travelers. As this study shows, the average border wait time for travelers has increased at many ports while the variability in wait time has also increased, contributing to considerable uncertainty and anxiety for travelers crossing the border. Despite the fact that the average border wait

time has increased at many of the border ports, the wait time remains generally very low consisting in most cases of three minutes or less – hardly an excessive time period to wait. It would appear that other aspects associated with the border are at work, perhaps fueling the perception that the border is unfriendly and inefficient, and should be avoided. Concerns about the uncertainty and unpredictability of the time it takes to cross the border seem to have influenced many casual travelers to avoid the border altogether. Such perceptions may be the result of actual experiences, anecdotes told by friends and family or horror stories reported by the press about long waits, increased inspection and outright intimidation at the border (Sands, 2009; Konrad, 2010). The perception that the United States is like a fortress when it comes to admitting foreign tourists is longstanding (Bonham, Edmonds and Mak, 2006). However, it is unknown whether it is the reality or the perception of these security measures that is responsible for the decline in travelers. Increased scrutiny and wait times at the border, both perceived and real, have contributed to these outcomes.

While investments in border infrastructure, such as increasing inspection capacity and installing passport readers at the primary inspection lanes at the land ports, could help improve aspects of the situation, other steps are also needed. Understanding why people are avoiding the border will help to suggest what can be done to overcome these constraints (Nyaupane and Andereck, 2008). Widespread distribution of accurate information about wait time and inspections by the government and tourism-marketing organizations can help change people's perception of the border. Thus, an extensive public education campaign could help alleviate some fears and encourage people to experience the border for themselves. The 2011 Canada-U.S. Beyond the Border Action Plan includes improving shared border infrastructure and technology, and implementing a border wait-time measurement system as a means to reduce wait times at the border (Government of Canada, 2011b). These wait time service levels will be identified and published for the twenty busiest crossings (Government of Canada, 2012). In addition, real-time information will be available to the public on government websites, roadside signs and other traveler information systems (Deloitte, 2011; White House, 2011). There are also calls to "humanize" the border, ensuring that civility is part of the inspection process (Alper and Hammond, 2009; Konrad, 2010).

These efforts are designed to improve travelers' experiences at the border and thus the perception they have of it. Consequently, while border security is here to stay, both governments appear committed to enhancing border operations and in doing so improving travelers' perceptions of border operations.

Also, yet to be determined is whether these traveler trends are temporary or long-term in nature: whether people will become accustomed to, and accept, these additional security procedures. The data indicates that the number of Canadian travelers to the U.S. has rebounded somewhat between 2009 and 2011, suggesting that in the long term at least some travelers may be adapting to these new border procedures. Both Canadians and Americans seem to be taking steps to adjust to the WHTI requirement of needing a passport. CBSA and U.S. CBP statistics indicate that despite the presence of other options, passports are the preferred form of travel documents (Canada Border Services Agency, 2011a). Since 2004, when the WHTI was passed into law, the portion of both Americans and Canadians acquiring valid passports has increased by approximately 50 percent, suggesting that the impact of the Canada-U.S. border as a barrier may decline over time (Passport Canada, 2010; U.S. Department of State, 2012). By August 2009 almost 90 percent of travelers were presenting the required documents (Canada Border Services Agency, 2011a). To further encourage these developments the Canadian government established new duty-free limits as of June 1, 2012 (Canada Border Services Agency, 2012a) and recently announced that travelers now have the option of obtaining a 5-year or a 10-year passport starting July 2013 (Passport Canada, 2012).[10] In addition, enrollment rates in the NEXUS program have recently boomed as a result of an enrollment blitz (Government of Canada, 2012). Currently there are over 750,000 NEXUS members, with over 100,000 located in the Buffalo-Niagara region (Canada Border Services Agency, 2012b; The Buffalo and Fort Erie Public Bridge Authority, 2012). Other efforts are now underway to further harmonize and expand NEXUS benefits (Government of Canada, 2012). However, until casual travelers become accustomed to, and comfortable with, these new border procedures and uncertainties, the tourism industry in both countries and the many border communities that rely on the movement of people across the border will continue to suffer from the high cost of security.

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ENDNOTES

[1] A household survey conducted by the Conference Board of Canada in 2005 found that approximately 41 percent of Canadians (aged 18 and over) possess a valid passport compared to 34 percent of Americans (aged 18 and over).

[2] Canadian passports are valid for five years, while American passports are valid for ten.

[3] One criticism of the NEXUS program is that there are slightly different criteria for bringing goods across the border whether you are crossing into Canada or the United States. NEXUS members entering the U.S. are allowed to bring goods valued within the limit of their personal exemption. In contrast, NEXUS members bringing goods into Canada must be signed up for the Travel Declaration Card (TDC), which requires them to declare all goods and pay duty on those goods.

[4] For this case border crossing data from the Bureau of Transportation Statistics had to be used as a best estimate for traffic trends because automobile entry data collected by Statistics Canada only has data for the Detroit Tunnel and not for the Ambassador Bridge.

[5] While current wait times are available from U.S. Customs and Border Protection (CBP) on their website, the historical data is not available to researchers. To show just how guarded CBP is about this data, CBSA for a brief period actually recorded the wait time for trucks and travelers entering Canada as well as the U.S. but were later urged to only record wait times for those entering Canada.

[6] A paired t-test is often used to evaluate the results before and after the implementation of some policy or program (Moore, 1995). In this case the difference in wait time from before versus after the initial implementation of the WHTI is what is of interest. Each monthly border wait time prior to the implementation of the WHTI was paired with that same month after the WHTI was implemented. Pairing of data is particularly desirable as a means to reduce the effect of variation, especially given the fact that the average border

wait time varies considerably with the time of year – thus controlling for seasonality.

[7] Port improvements were made to accommodate the anticipated increase in traffic expected during the 2010 Winter Olympic Games in Vancouver, British Columbia.

[8] The border wait time data that is available from the WCOG for the NEXUS lanes is very inconsistent. The longest continuously available data is from the period April 2008 to June 2010 for southbound vehicles traveling to the U.S. and from July 2008 to June 2010 for northbound vehicles traveling to Canada.

[9] American border officers have been armed since 1979, but the arming of Canadian border officers was a major policy change that occurred in 2006. The arming of CBSA officers has been slowly phased in over time.

[10] Up until now Canadian passports were only valid for five years.

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