




Containerized cargo security at the U.S. – Mexico border: how supply chain vulnerabilities impact processing times at land ports of entry

Maria Burns¹ 

Received: 11 September 2017 / Accepted: 10 January 2019 / Published online: 15 February 2019
© Springer Science+Business Media, LLC, part of Springer Nature 2019

Abstract

Nucleus of this research is to identify how the strategies of trucking and land transportation and logistics companies utilizing the U.S. Mexican border land routes affect border processing times, while providing policy recommendations for specific problems. Namely, this work identifies a link between delays and security at the border, as opposed to security risk-mitigation strategies by truckers on the Mexican side of the border. As higher volumes of containerized cargoes are processed at the U.S. Borders each year, security risks also increase. In fact, illegitimate entities such as money laundering, drug trafficking, contraband and human trafficking cartels strategically select busy ports of entry and high traffic times, in order for illegitimate trade and travelers to penetrate the U.S. borders (Burns J Transp Secur. 11(3–4): 85–100 2018; Basu J Transp Secur 7:99–113 2014; Böhle et al in J Transp Secur 7:255–276 2014). Optimum border management and border security results do not depend exclusively on border patrol and border protection agencies: industry stakeholders can contribute towards optimum results once they eliminate waste and operate in greater efficiency (Burns J Transp Secur. 11(3–4): 85–100 2018). For this to be achieved, supply chain stakeholders and partners should make strategic decisions with increased visibility, harmonization of processes, and standard operating procedures in place. This paper is a part of a broader border security research conducted by the author, focusing on the U.S. Department of Homeland Security's (DHS) missions “to safeguard lawful trade and travel”, “to secure and manage our borders”, and the goal “to secure the U.S. borders, by preventing the illegal flow of people and goods across the borders, while expediting the safe flow of lawful travel and commerce” (DHS 2015–2019; DHS 2014–2018; DHS 2012–2016). This paper entails three goals: First, to identify and classify the high risk areas at the border. Second, to propose recommendations for improvement whereas pinpointing time saved. Third, to offer an array of options where government professionals (such as U.S. DHS, CBP (2017c, d),

✉ Maria Burns
marcy.maria.burns@gmail.com

¹ University of Houston, Houston, TX, USA

ICE) and industry stakeholders can pick and choose solutions and avoid, eliminate, share or allocate to contractors their security risks throughout different stages of the supply chain.

Keywords Homeland security · Border security · DHS · CBP · ICE · Cargo processing times · Drug cartels · Illegitimate activities · Border crossing Times · Public/private partnerships · Risk assessment · Risk management · Port of entry (PoE) · Globalization · Supply chain security · Public and private stakeholders · Root cause analysis · Problem solving

Introduction

The present study deals with the critical issue of border security. For every nation around the world, Borders and Ports of Entry (PoE) represent the strategic nodes that ensure national security, economic growth and social wellbeing. Alas, each border and each PoE may also represent a convergent point where illegitimate supply chains meet, and impact any attempt for security, growth and prosperity. Borders can therefore become the confluent points where legitimate trade meets contraband, cargo theft, drug trafficking, money laundering, etc., but also the intersections where legitimate travelling meets human trafficking, terrorism, illegal entries etc. (Burns 2013).

This paper demonstrates a connection between delays and security at the border, as opposed to security risk-mitigation strategies: by increasing supply chain efficiency beyond the border, the U.S. Department of Homeland Security would utilize their time and resources in addressing more significant security risks. While there is extensive literature on improving turnaround time at sea, land and air ports of entry, these studies mainly reflect on the commercial risks and challenges. This paper focuses on the border security risk factors, and provides best practices for federal, state and industry stakeholders to improve situational awareness, supply chain visibility and consequently risk management.

The scarcity with respect to the security effects of bottlenecks and supply chain delays bears affirmation to the fact that this is a relatively under-researched research subject, and yet requires time, efforts and resources both by Government and Industry entities. To be precise, Border Crossing delays can be categorized according to their cause, which most of the times is found at earlier stages of the supply chain, i.e. beyond the border.

As part of a risk assessment protocol, border risks are well known and national security strategies are dedicated on their reduction. America's Southern Border with Mexico is broadly examined, whereas the study mainly focuses on land Ports of Entry due to the unique security, infrastructure, and supply chain particularities. After all, America is the leading global superpower with the unmistakable ability to influence and inspire the globe.

Although this paper focuses on the U.S. – Mexico Border, the findings can be applied to most global land ports facing similar challenges.

The US Department of Homeland security considers homeland security risks as a function of Threats, Vulnerabilities, and Consequences (TVC) (DHS 2011). Various security risk methodologies were developed, typically sorted into qualitative and

quantitative categories. Both types of assessments have the potential to deliver useful analytic results when they are designed properly, or be needlessly complex (DHS Risk Lexicon 2010; NRC 2010).

To attain the goals of Homeland Security and Border Protection, it is important to develop a robust Risk Management system. After all, the vision of homeland security is to safeguard “*a homeland that is safe, secure, and resilient against terrorism and other hazards*” (DHS 2017).

Risk Assessment represents the basic tool used by authorities, industry stakeholders and communities, to identify and mitigate such risks. Traditionally, supply chain activities and operations passing through the borders are categorized according to their risk factor, and the generic classification of legitimate versus illegitimate activities. On the other hand, illegitimate groups (be it terrorist groups, drug cartels, human trafficking cartels etc.) use their resources to challenge government systems, and pass their illegitimate activities in our homeland. The identity of these groups is known, and so are their activities and geographical areas of influence (which changes over time, as cartels fight each other for control).

In our modern world, high risk is related to innovation, productivity and sustainable growth. If this assumption is correct, security threats increase exponentially in high-growth areas: A major PoE with high volume of cargoes, thousands of business partners and workers, and a large number of vehicles involved in cargo loading and discharging operations, is exposed to a multitude of risks. As a PoE expands its threats and vulnerabilities grow exponentially (Burns 2014, 2015). This is the case for the vibrant American Ports of Entry that facilitate the legitimate flows of travelers and trade.

Cargo flows in the U.S. border with Mexico and Canada

The first hypothetical foundation of this work is based on the principle that the flow of legitimate trade and travelling is occasionally impacted by delays or disruptions at the border PoE. In order to better measure the correlation between delays at the PoE, and root causes found beyond the border, the region examined herewith entails the Southern U.S. Border with Mexico. Both countries have been NAFTA members and this partnership has contributed to a rise in the volume of trade and traffic across the border.

The statistics demonstrated in this section demonstrate the continuous efforts, determination and dedication required by the DHS authorities, and the CBP/ICE Officers in particular, in their dual role of preventing illegitimate activities (Table 1, Figs. 1 and 2), while facilitating legitimate flows (Table 2).

Namely, Table 1 and Figs. 1 and 2 compare security related facts and figures of the U.S. Borders with Canada and Mexico, including illegitimate activities occurring in the heart of Mexico by drug cartels, cargo theft entities and human trafficking cartels. It appears that America’s border with Mexico is almost three times more narrow in mileage, with half the number of border crossing points. However, the number of apprehensions due to illegitimate passing or other activities, and the value of seized commodities is beyond comparison. The number of DHS/CBP Agents at the Southern

Border is higher compared to the Northern Border, due to the disparity in crime incidents. Furthermore, action has been taken at a Federal and State level, and the number of DHS/CBP Agents at the Southern Border is expected to increase substantially over the next years.

On the other hand, as seen in Table 2, there is a robust, ever growing flow of legitimate trade among the NAFTA countries, with Mexico increasingly gaining ground in terms of high cargo volumes moved from Mexico to the U.S. This continuous growth of cargo represents all commodities imported to the U.S. (ratio of value to weight). The value-to-weight measure is relevant to this study, as it is a measure of the monetary value a product has per kilogram or pound. This is a significant measure used in supply chain design and strategy.

Transportation modes in the U.S. border with Mexico and Canada

Transportation is the means for supply chains to forward their commodities to their final destination, i.e. the buyers. Hence, Fig. 3 shows that Land Border Crossing is the prevailing transportation route, and Trucking prevails over rail and pipeline transport.

It is therefore determined, that the Mexico-U.S. trade route prevails in terms of valuable commodities, and cargo volume. At the same time, it is verified that land border crossings and trucks in particular represent the prevailing transportation mode. Consequently, one can conclude that as cargo volumes and values increase, the increased activity broadens the risk assessment methodology in scope and capacity.

Previous sections of this paper discuss how high volumes of cargoes and traffic pass through America's Ports of Entry. Security and Freight professionals representing Government and Private Sector, are asked to utilize their time and

Table 1 U.S. Borders with Canada and Mexico

Factor	Canada	Mexico
Land Border Length Miles	5525	1989
No. of border crossing points	121	48
Apprehensions (2015)	2626	331,333
Apprehensions (2017)	3027	303,916
Seizure Value Total (2015) - \$	\$337,507	\$4,401,155
Nbr of Conveyances Seized (2017)	79	7388
Nbr of Firearms Seized (2017)	45	369
Nbr of Ammunition Seized (2017)	384	13,938
Seizure Value Total (2017) - \$	\$374,282	\$5,169,593
Personal Vehicle crossings	28,544,860	74,158,801
Border Patrol Agents	2051	17,522

Source: compiled by the Author, based on data from: CBP, (2017a); CBP, (2017b). Last accessed: December 31, 2018

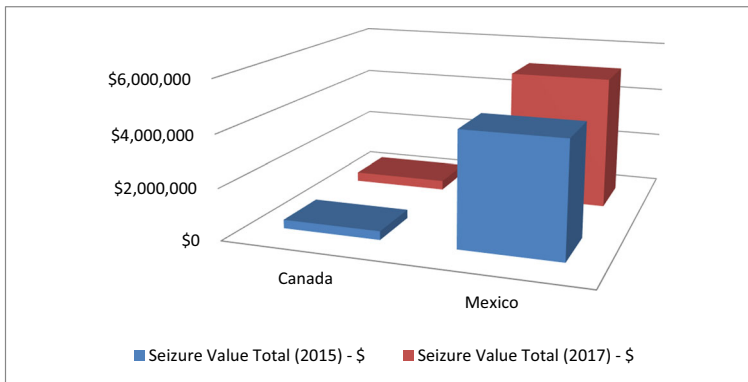


Fig. 1 Apprehension/Seizure Value in U.S.-Canada and U.S. Mexico borders (FY 2017)

resources wisely, with two key goals: 1) Mitigate Security Risks, and 2) Reduce Delays at the Border.

Methodology: Data collection and analysis

The primary data gathering and analysis process of time measurement at the border includes the following stages:

1. The researchers visited the southern border in the state of Texas (namely Laredo and Eagle Pass areas).
2. Qualitative Surveys were taken to evaluate time delays in each stage of the transiting process, i.e. from arrival on the Mexico side of the border, to clearance on the U.S. side of the border.
3. Qualitative Surveys were taken by rail and trucking professionals as part of the POA methodology. Namely, processing times and delay points were verified by industry members of the Advisory Board for the Participatory Operational Assessment research (Burns 2018).

Goal of the baseline measurements is to estimate the point-to-point time processing of cargoes, from the moment a truck or train arrives at the POE, until the cargo is released to its owners.

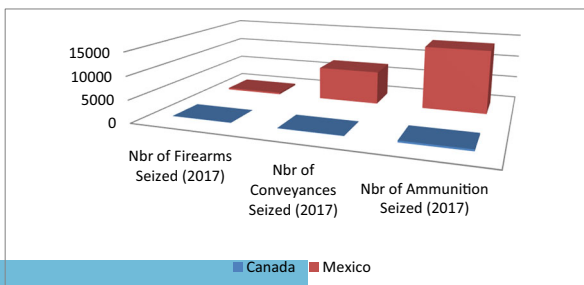


Fig. 2 Seizure types in U.S.-Canada and U.S. Mexico borders

Table 2 U. S. imports: Southern vs. Northern border (Imports per Value in USD, 2004–2016)

US Imports: Southern VS. Northern border		
Year	Northern border: trade imports per value	Southern border: trade imports per value
2016	278,066,769,006	294,151,039,667
2015	295,190,308,915	294,741,107,390
2014	346,062,580,560	294,157,476,596
2013	332,552,762,992	280,528,799,845
2012	324,262,633,591	277,593,589,235
2011	315,324,753,291	262,873,595,958
2010	277,636,732,987	229,985,623,006
2009	224,910,749,701	176,537,048,132
2008	335,555,269,423	215,914,854,328
2007	313,110,879,133	210,799,020,880
2006	303,416,249,743	198,258,639,178
2005	287,870,207,365	170,197,883,805
2004	255,927,945,545	155,843,010,915

Source: The author, based on data collected from U.S. DOT, Bureau of Transportation Statistics (2017)

Inbound border crossing procedure

The border crossing process from Mexico into the U.S. can be broken down into the following stages, also reflected in Fig. 4:

- i. The customs broker on the Mexico side informs the authorities in both nations (U.S. and Mexico) about the exporting cargo origin, destination, transport details, importer and exporter information etc.
- ii. The cargo is being transported through the Mexican customs.
- iii. When cleared from Mexico, the cargo moves to the U.S. POE whereas CBP examines the border-crossing transaction from an import and transportation perspective. Upon cross-checking the CBP system data with the ACE documentation, cargo, vehicle and driver's credentials, the CBP officer will decide if the import is cleared, or if secondary inspection is needed.
- iv. In the case a secondary or further inspection has been determined it will include the Vehicle and Cargo Inspection System (VACIS), x-ray, canine, gamma ray or other type of inspection. The DHS/CBP and possibly other departments and/or agencies will be involved, including but not limited to the U.S. Food and Drug Administration (FDA); the Federal Motor Carrier Safety Administration (FMCSA) of the U.S. Department of Transportation, (DOT), the Environmental Protection Agency (EPA) etc.
- v. Once the CBP and other agencies clear the cargo, the truck needs to be inspected by the Border Safety Inspection Facility (BSIF). The process varies according to State regulations. E.g. for the Texas POEs, the State's Department of Public Safety (DPS) conducts these inspections to ensure the state requirements on transport safety are met, e.g. cargo weight; cargo and vehicle safety regulations (State of Texas 2014); (Burns 2014, 2015).

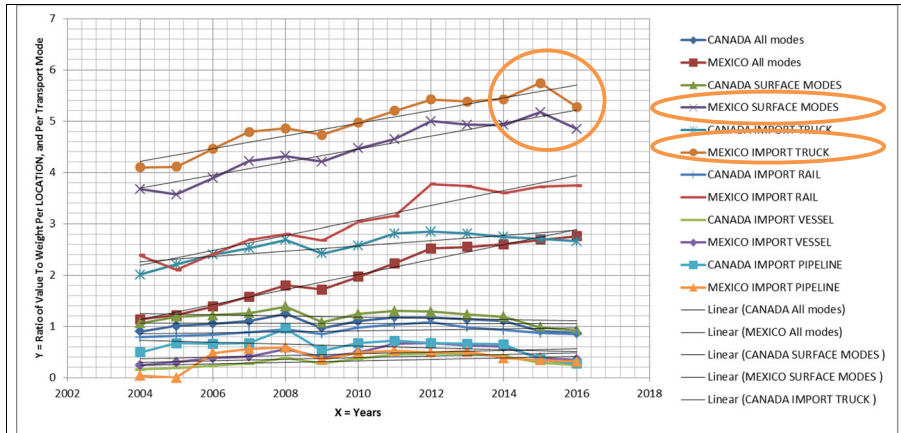
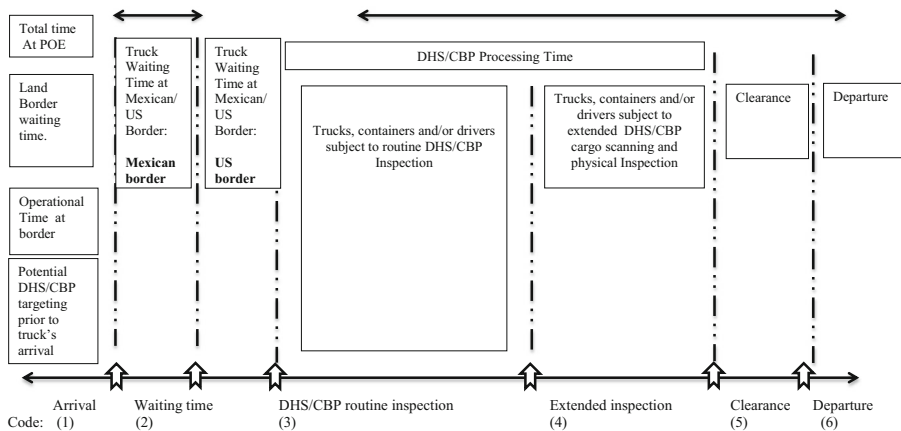


Fig. 3 NAFTA: Trade Growth between the U.S., Mexico and Canada: All Commodities Imported to the U.S. Ratio of Value to Weight (U.S.\$/Kg). * YEARS 2004–2016. Source: The author, based on data collected from U.S. DOT, Bureau of Transportation Statistics (2017)

Cargo delays at Mexico- U.S. (northbound) land border crossings

The deliverables of the U.S. DHS research conducted from 2016 to 2017 presented a list of best practices and recommendations for eliminating border-crossing delays at US-Mexico Land Border Crossings. The research report submitted to DHS contains a detailed list of over 30 delay factors and best

Image 4: Breakdown of inbound truck's time at Land Border POE



Source: M.Burns (2017) project T.1.3. for the Department of Homeland Security. Based on M. Burns. (2014) Port Management and Operations, 1st edition by CRC Press, USA.

Fig. 4 DHS Project T.1.3: “Participatory Operational Assessment (POA): Evaluating and predicting the operational effectiveness of Cargo Security Processes at Ports of Entry”. Image source based on : Burns 2014. Port Management and Operations, CRC Press, USA

practices encompassing the entire supply chain, i.e. commencing beyond the border.

The present section meets the Quantitative performance target of improving at least 3% of processing times at land border crossing for inbound containerized cargoes on trucks and trains at the Southern Border. *Another paper will be produced and submitted to JTRS to include the list of factors and best practices related to supply chain risks and delays beyond the border.*

The following recommendations focus on border management efficiency and are grouped and classified as follows:

A. ENROLLMENT IN HOMELAND SECURITY PROGRAMS

(Overall travelling time and border crossing time saved: 2:15–3 h)

B. TECHNOLOGIES

(Overall travelling time and border crossing time saved: >3 h)

C. OPERATIONAL PROCEDURES

(Overall travelling time and border crossing time saved: >2 h)

The delay factors duly analyzed below address the root cause of the delay, while discuss practical recommendations on how to improving processing times.

A. ENROLLMENT IN HOMELAND SECURITY PROGRAMS

1. CBP Programs

Time saved:

Factor: Participation in C-TPAT's FAST and other trusted DHS/CBP programs. 12.5%–50% 15–60+ mins

This is one of the most significant factors contributing to time efficiency. Waiting times at POEs would be greatly diminished if companies would enroll in the FAST program would increase.

Benefits:

Many Trucking Companies don't use the C-TPAT programs (FAST for commercial vehicles, program for Foreign Manufacturers, SENTRI programs for travelers etc.) or FAST lanes. Therefore, they don't take advantage of the faster security clearance and checks.

If more industry stakeholders would enroll in the FAST program, or the program for Foreign Manufacturers, and other C-TPAT programs, they could save at least 15–60 min from each border transit.

This estimation is supported in the Data Analysis section of this report, demonstrating the detailed measurement of processing times and delays in several POEs of the southern border. According to the Data Analysis section, FAST lanes and enrollment to C-TPAT initiatives saves trucking companies 15–60 min compared to standard lanes.

The benefits of C-TPAT membership include more than security.

Member companies can also increase their supply chain performance and reduce the risk of loss, damage, and theft.

Being C-TPAT certified also allows companies the opportunity to participate in Free and Secure Trade (FAST) in another trusted traveler program (bilateral initiative within North America) which enables C-TPAT certified companies to use a faster cargo release system for low-risk cargo and conveyances at POEs. Registered partners are presented with an expedited status for the enrolled commercial trucks into the U.S. by simplifying the CBP processes, dedicating FAST lanes at busy POEs, and the use of advanced, non-intrusive technologies.

FAST lowers the incidence of physical inspections by up to four-to-six times, and this translates in time and money saved.

#2.CBP Programs

Factor: Joint Inspections at POEs (U.S. –Mexican Duana)

Joint U.S. – Mexico inspections.

The process of inspections is time consuming and though necessary, it causes delays throughout the entire supply chain. Since the beginning of the supply chain, several inspections take place for agricultural, manufactured, hazmat and other products, adding to the delays and logistics uncertainty. Inspections take place on both sides of the border, and in many occasions the scope, method and findings are similar, leading to duplication of effort, waste of resources, and a waste of time for all involved.

A collaboration between the US CBP and Mexican duana (joint inspections, joint clearance, two officers working side by side) would reduce inspection times in half, having both countries inspectors look at the cargo and the vehicle at the same time. These agencies have established the process, which should be followed by all involved.

- US CBP and Mexican CPB working side by side would be beneficial in getting commercial vehicles cleared faster.

Joint inspections: Unified Cargo Inspection/Processing Pilot Programs.

U.S. Customs and Border Protection has partnered with Mexico's Servicio de Administración Tributaria (SAT) Customs in a time-saving cross-border collaboration. CBP and SAT no longer conduct separate inspections in the selected pilot programs: By conducting joint cargo clearance examinations, wait times at the border are significantly reduced.

July 2016: UCPPP at the Mariposa Port of Entry in Nogales, Arizona (CBP 2017a)

October 2017: UCPPP at the Otay Mesa Cargo Facility (CBP 2017b).

U.S., Mexico to Open Joint Inspection Stations

U.S., Mexico to Open Joint Inspection Stations. (jointly staffed border stations)

- The pre-inspection stations will allow goods to be reviewed only once, instead of two separate times by U.S. and Mexican agents, they said. "I view pre-inspection with trusted partners like Mexico as the wave of the future

Time saved:

~ 50%

~60 mins

Half time saved from the overall inspection process.

- Since 2014 - Laredo airport to 8 airports in Mexico.
- and Otay Mesa crossing in Tijuana on the border with California. (focus, agricultural products).
- San Jeronimo in the Mexican state of Chihuahua, across the US Border from Santa Teresa, New Mexico. Reuters (2015).

#3.Federal and State Programs

Factor: Joint inter-agency inspections E.g. between CBP and DPS

In the state of Texas, CBP and DPS inspections are housed and conducted separately.

Time saved:

~ 50%

~ 60 min

Half time saved from the aggregate multi-agency inspections

There are two separate vehicle inspections that are conducted once the truck crosses the border from Mexico with both CBP and DPS officials as described above.

The reason for having both CBP and DPS at the border is because CBP focuses on the cargo, while DPS focuses on the vehicle and the driver. While it is the case that every state along the U.S.-Mexico border inspects for both Federal and State violations, Texas is the only state that houses them in separate facilities.

Industry representatives, researchers, and DPS officials the consensus is that such an arrangement is inefficient and adds to overall crossing times.

Recommendations:

If they conducted joint inspections, about one hour or 50% of the aggregate inspection time would be saved.

B. TECHNOLOGIES

#4

Factor: TECHNOLOGIES (VTS)

Use of obsolete Paper Log methods may cause delays at the border and beyond the border.

Time Schedule

Process Technologies

Delay Factor:

Time saved:

Use of obsolete Paper Log methods often cause delays at the border and beyond the border due to inconsistencies, omissions and time needed to manually complete the logs. This is an additional stress and fatigue factor to the drivers.

50%–70% cumulative time saved throughout the voyage and the Border (POE).

>60 mins depending on the route distance.

Time pressure is another issue, bearing in mind that truck drivers can only drive for 11 h a day. When in Mexico, daylight driving further restricts the driver time-wise.

Recommendation:

- **Vehicle tracking systems (VTS)** are beneficial technologies to allocate the driver: a) when the truck is in distress, or b) if a breakdown occurs and the driver is in a dead zone for cell phone service the company can take measures to communicate or see what's going on with load or if driver is in distress.
- VTS Time saved: 50–70% compared to paper logs.

Relying on VTS systems with electronic logging saves time and efforts. Paper logs take too much time and if a mistake is made, or it is slightly unreadable, depending on the DPS or other truck enforcement officer, drivers could receive a ticket and have points taken from their license.

- There are a lot of VTS logs/systems used by the industry to track vehicles, and RFIDs to track cargoes. It would be beneficial if more companies used them.
- It is a trend and becoming an expectation.
- VTS Logs optimize routes: they identify/eliminate drivers' habits and idle time that impacts rush hour and border traffic.

#5

Factor: GPS Technologies

Use of obsolete mapping and route selection methods may cause delays at the border and beyond the border.

Time Schedule Process Technologies

GPS Systems for trucks can solve some of the problems related to traffic or real-time tracking.

1. GPS for route planning

The GPS function is useful for route planning, which in turn provides traffic in real time so drivers can select the fastest route to destination.

2. GPS for HazMat Routes

When hauling Hazmat, GPS can be set to only show which roads can be used for hazmat cargoes. Dispatch can also pinpoint the location, speed, whether truck is excessively idling and just driving habits of the driver in general to provide corrective action if necessary or to inform customers of approximate delivery times.

Time saved:

50%–70% cumulative time saved throughout the voyage and the Border (POE).

>60 mins depending on the route distance.

#6

Factor: Cargo scanning technologies

Time Schedule Process Technologies

The use of obsolete cargo scanning technologies reduces the security accuracy during cargo inspections, whereas inspection time is prolonged.

Time saved

~50%

Recommendations:

Innovative, more accurate surveillance technologies along the border and at checkpoints is required in order to attain faster processing times and safer cargo scanning.

Of scanning time

>60 mins

The use of modern post-VACIS technologies at POEs will save at least 50% of inspection time, and increase security / scanning accuracy.

C. OPERATIONAL PROCESSES

#7

Factor: Inconsistent operating hours (Need for Harmonization)

Process Time, Operating Hours

- Delays due to **inconsistent operating hours among the U.S. and Mexico side.**
- Mexico side officers and Freight forwarders working later in the morning, or closing earlier at night and on Saturdays.
- In particular, freight forwarders start working at about 9–10 am, while the peak time for Mexico Borders processing cargo peaks from 10 am onwards.
- US CBP traffic flow peaks from 11 am onwards.

Time saved

~4.1% per hour added daily (**≥60 mins**)



Recommendations:

Need for Harmonization on both sides of the border.

Extending operating time & hiring extra staff will smoothen out peak traffic times & heavy workload.

Additional Comments:

The common problem, suggests that there are overarching common solutions as well, such as the operational hours and staffing schedules at the border crossings. These may be more efficient, and certainly easier to implement unilaterally on the U.S. side, than trying to deal with more fundamental problems of infrastructure and security on the Mexican side.

#8

Factor: Inconsistent processes and paperwork between Mexican and U.S. authorities. (Need for Harmonization)

Process Public and Private sector

Paperwork between Mexican and US authorities is not harmonized / uniform, which means twice the workload / paperwork.

Recommendations:

1.Harmonization of Documentation

Time saved: ~3%- 50% of overall time needed for document preparation and checking between authorities.(>60 min)

2.Joint Inspections

Time saved: ~ 50% Half time saved from the overall inspection process.

~60 mins

1.Harmonization**Time saved**

~3%- 50% of document preparation and checking between authorities.

2.Joint Inspections**Time saved:**

~ 50%

Half time saved from the overall inspection process.

~60 mins

#9 Process Optimization

Factor: Improving Coordination of driver change and drayage on both sides of the border.

Selecting short haul or long haul drivers for both sides of the border.

Both Sides of the Border Process Public and Private sector

The typical procedures require U.S. and Mexican truck drivers to move their trailers to short-haul drayage trucks situated near the Port of Entry. Subsequently they cross the border where trailers are delivered to long-haul truck drivers.

Time saved

25-50%

15-60 min

Long-haul trucking operations on both sides of the border will save at least one hour from transit times, but will always reduce shipping charges and eliminate errors.

In 2015, the U.S. Department of Transportation through its US-Mexico Cross-Border Long-Haul Pilot Program enabled Mexico-based commercial carriers to apply for long-haul trips in the United States (DOT 2015).

Note: As of 2018, there are ongoing diplomatic negotiations between the U.S. and Mexico, and undisclosed sources referring to the discontinuation of the agreement allowing Mexican companies to operate in the U.S.

The U.S. Government revisits the agreement, after estimations of losing thousands of U.S. transportation and logistics jobs amounting to about one trillion dollars (Bloomberg et al. 2017).

Other claims focus on safety and environmental considerations due to the old age, poor maintenance standards and fuel-inefficient engines of Mexican trucks (Forbes 2015). Our next year's research project may revisit these arguments, and update the report accordingly.

Recommendations:

- If one driver could make the trip then that would be faster than drop and hook (line haul). Hence, if this is a single trip, it is better to keep one driver.
- However, if its more than one trip to same location, line haul is best, 2 drivers are doing 4 pickup and deliveries essentially. Again, it just depends on whether its one time or multiple loads.

OPTION #1: At least one hour will be saved if there is no driver change, i.e. if one driver is allowed to drive in long haul trips (for both countries, U.S. and Mexico).

OPTION #2: Industry professionals confirmed that long haul may not always be the faster solution, as it is all a matter of professionalism and experience.

With proper coordination, an hour could still be saved when drivers change.

Recommendations and conclusions

This paper highlighted the connection among delays and security at the U.S. border: as industry stakeholders increase supply chain efficiency, the U.S. Department of Homeland Security would use their time and resources in addressing more significant security risks.

This paper offered a concise list of causes for delays during the border processing times is rather long. A more detailed version of pertinent causes and remedies, is found in the research report submitted to the Government for the present research.

The classification of causes included in this paper have these things in common: Public/Private partnerships, technologies and harmonization of rules, laws and operational protocols are needed as part of the problem solving process. On one hand, legitimate transport has the capacity to strengthen the American continent's influence, through economic growth and social wellbeing. On the other hand, any illegitimate activities can affect trade routes and transport modes.

The role of the Government pertains to ensuring security and limiting illegitimate activities. On the other hand, the industry stakeholders are bound by commercial obligations where time is money, and aim for a fast, uninterrupted flow of legitimate goods (or people).

Both Public and Private entities can benefit if they focus on mutual goals and seek to mitigate these obstacles in a synergistic manner.

Acknowledgment and disclaimer This paper is based upon work supported by the U.S. Department of Homeland Security under Grant Award Number DHS-14-ST-061-COE-00. This grant is awarded to the Borders, Trade, and Immigration (BTI) Institute: A DHS Center of Excellence led by the University of Houston, and includes support for the project “*Participatory Operational Assessment (POA): Evaluating and predicting the operational effectiveness of Cargo Security Processes at Ports of Entry*” awarded to the University of Houston. The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Department of Homeland Security.

The Journal of Transportation Security acknowledges that the Author retains the right to provide a final copy of the final manuscript or software application to DHS upon acceptance for journal *Publication* or thereafter, for public access purposes through DHS’s websites and for public archiving purposes.

Publisher’s note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

References

- Basu G (2014) The strategic attributes of transnational smuggling: logistics flexibility and operational stealth in the facilitation of illicit trade. *J Transp Secur* 7:99–113. <https://doi.org/10.1007/s12198-013-0132-0>
- Bloomberg, Quinn G., Wingrove J., Martin E. (2017) U.S. Seeks Restrictions on Mexican Trucking Under Nafta. Bloomberg. November 9, 2017. Available at: <https://www.bloomberg.com/news/articles/2017-11-09/u-s-is-said-to-propose-freezing-mexican-trucks-out-of-new-nafta> Last accessed: December 21, 2018
- Böhle C, Hellingrath B, Deuter P (2014) Towards process reference models for secure supply chains. *J Transp Secur* 7:255–276. <https://doi.org/10.1007/s12198-014-0142-6>
- Burns MG (2013) Estimating the impact of maritime security: financial tradeoffs between security and efficiency. *J Transp Secur* 6(4):329–338. <https://doi.org/10.1007/s12198-013-0119-x>
- Burns, Maria G. (2014) Port management and operations. CRC press, a Taylor and Francis Group. 1 edition (July 21, 2014). USA
- Burns, Maria G. (2015) Logistics and transportation security: a strategic, tactical, and operational guide to resilience. CRC press, a Taylor and Francis Group. 1 edition (October 22, 2015). USA
- Burns MG (2018) Participatory Operational & Security Assessment on Homeland Security Risks: An Empirical Research Method for Improving Security Beyond The Borders Through Public/Private Partnerships. *J Transp Secur* 11(3–4):85–100. <https://doi.org/10.1007/s12198-018-0193-1>
- CBP (2017a) U.S. Border Patrol Southwest Border Sectors. Southwest Border Family Unit and Unaccompanied Alien Children (UAC) Apprehensions. Comparisons reflect Fiscal Year 2017 compared to the same time period for Fiscal Year 16. US DHS/CBP. Available at: https://www.cbp.gov/sites/default/files/assets/documents/2017-Jun/BP%20Southwest%20Border%20Family%20Units%20and%20UAC%20Apps%20-%20May%2017_0.pdf Last accessed: June 12, 2017
- CBP (2017b) U.S. Border Patrol Fiscal Year 2016 Sector Profile. United States Border Patrol Sector Profile - Fiscal Year 2016 (Oct. 1st through Sept. 30th, 2016). US DHS/CBP. Available at: <https://www.cbp.gov/sites/default/files/assets/documents/2017-Jan/USBP%20Stats%20FY2016%20sector%20profile.pdf> Last accessed: June 12, 2017
- CBP (2017c) U.S. Customs and Border Protection Announces Unified Cargo Inspection Pilot and Participates in Building Strong Border Communities Event with Government of Mexico. CBP, DHS. August 5, 2016. Available at: <https://www.cbp.gov/newsroom/speeches-and-statements/us-customs-and-border-protection-announces-unified-cargo-inspection>. Last accessed: September 12, 2017
- CBP (2017d) CBP Announces Unified Cargo Inspection Pilot Program at The Otay Mesa. CBP, DHS. September 28, 2017. Available at: <https://www.cbp.gov/newsroom/local-media-release/cbp-announces-unified-cargo-inspection-pilot-program-otay-mesa-cargo> Last accessed: September 28, 2017
- DHS 2011. Risk Management Fundamentals Homeland Security Risk Management Doctrine April 2011. Available at <https://www.dhs.gov/xlibrary/assets/rma-risk-management-fundamentals.pdf>. Last accessed in June 8, 2016
- DHS (2012-2016) Department of Homeland Security Strategic Plan, Fiscal Years 2012–2016 February 2012 Mission 2, Goal 21; Goal 22 Available at: <https://www.dhs.gov/xlibrary/assets/dhs-strategic-plan-fy-2012-2016.pdf> Last accessed: June 12, 2017

- DHS (2014-2018) Department of Homeland Security Strategic Plan, Fiscal Years 2014–2018 February 2012 Mission 2, Goal 21; Goal 22 Available at: <https://www.dhs.gov/sites/default/files/publications/FY14-18%20Strategic%20PlanPDF> Last accessed: June 12, 2017
- DHS (2015-2019) Department of Homeland Security Strategic Plan, Fiscal Years 2015–2019. Sci Technol Directorate. Available at: <https://www.dhs.gov/xlibrary/assets/dhs-strategic-plan-fy-2012-2016.pdf> Last accessed: June 12, 2017
- DHS (2017) DHS, Our Mission. U.S. Department of Homeland Security. Available at: <https://www.dhs.gov/our-mission>, Last accessed in August 12, 2017
- DHS Risk Lexicon (2010) DHS Risk Lexicon, 2010 Edition; Available at: <https://www.dhs.gov/xlibrary/assets/dhs-risk-lexicon-2010.pdf> Edition. Last accessed in June 3, 2016
- DOT (2015) PIA - United States-Mexico Cross Border Long-Haul Trucking Pilot Program. U.S. Department of Transportation. Mar 19, 2015. <https://www.transportation.gov/.../pia-united-states-mexico-cross-border-long-haul-trucking-pilot-program>. Last accessed: November 21, 2017
- DOT (2017) TransBorder Statistics. U.S. DOT, Bureau of Transportation Statistics. Available at: https://transborder.bts.gov/programs/international/transborder/TBDR_VWR.html Last accessed: June 12, 2017
- Forbes, Brinkley J. (2015) Horrors! Mexican Trucks Loose on American Highways! Forbes, J. Brinkley. Available at: <https://www.forbes.com/sites/johnbrinkley/2015/01/13/horrors-mexican-trucks-loose-on-american-highways/#130fd2c52c0b> Last accessed: November 28, 2017
- NRC (2010) Committee to review the Department of Homeland Security's approach to risk analysis, Review of the Department of Homeland Security's Approach to Risk Analysis, Washington DC, National Academies Press, 2010, p.10
- State of Texas (2014) Joint Interim committee to study the effects of border wait times interim report 2014. A Report To The House Of Representatives. 84th Texas Legislature. Rafael Anchia, House Chairman; Robert Nichols, Senate Chairman; Committee Clerk Jeff Madden. The State of Texas. Available at: http://www.house.state.tx.us/_media/pdf/committees/reports/83interim/House-Joint-Committee-on-Border-Wait-Times-Interim-Report-2014.pdf

Reproduced with permission of copyright owner.
Further reproduction prohibited without permission.