



BEYOND PRECLEARANCE

The Next Generation Canada–U.S. Border

October 5, 2018



Beyond Preclearance Coalition

The Beyond Preclearance Coalition is comprised of bi-national organizations with a vested interest in advancing the efficiency and security of the Canada - U.S. border.



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Airlines for America



Airports Council International
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Foreword

The *Beyond Preclearance: The Next Generation Canada-U.S. Border* white paper provides a blueprint for policy and process change that could herald a new era in border management that promises both more effective, faster security and free flow cross-border movement of known low risk travelers and goods.

In early 2018, over 40 industry partners came together to form the bi-national Beyond Preclearance Coalition to fund and guide the development of this White Paper. This has been a considerable undertaking involving an extensive series of stakeholder engagements throughout 2018 including: the Woodrow Wilson Forum in Washington, D.C. in March, two Public Policy Forum Roundtables in Ottawa and Toronto in June, a Government Advisory Group Workshop in Ottawa in July, a Beyond Preclearance Roundtable at the PNWER Conference in Spokane also in July, culminating with an Intermodal Cargo Workshop in Ottawa in August.

Our work reflects a unique contribution from industry organizations whose business success is linked to an efficient U.S./Canada border both from a travel and goods movement perspective. Our Coalition members include companies and industry associations involved in tourism, trade and transportation. All modes of transport, which directly interface with the border daily, are represented — ports, airports, airlines, rail, cruise lines and trucking. While these businesses share many common concerns, the challenges do vary by mode. Through extensive engagement with this diverse group, as well as ongoing consultations with government border agencies, we have arrived

at a common vision of the future border—a vision that encompasses a wide array of possibilities, takes into consideration recent advances in biometrics, information and inspection technologies, and provides a platform that will both enhance security and move people and goods at speed, with the potential of greatly reducing transaction costs.

Our vision is very much disruptive and will require significant financial investment from both governments and the private sector. However, Borders and Security have a tremendous impact on the economic prosperity of both Canada and the U.S. as well as the international competitiveness of both countries. Governments cannot afford the cost of adding resources and continuing with the same border and security processes that have been in place for half a century. And, increasing cost recovery is not a sustainable model in the long term. We need to find more public-private partnership opportunities that will effectively deal with the continuing growth in traffic and provide a return on investment for all parties. It is also imperative that our two nations work together to avoid duplication and share technology solutions that will enhance throughput and reduce costs. Industry will invest in technology solutions in partnership with government where the payoff is operational cost savings, reduced capital investment in facility expansion, expedited movement of goods and a queue-less passenger experience.

While the development of the white paper was the Coalition's main objective for 2018, the real work is yet to start. Over the course of the next two years, we are committed to advancing the recommendations of the Beyond Preclearance Vision and Strategy, working closely with our government partners in advancing pilot initiatives across all modes, and advocating for policy changes and investments that will turn our Vision into reality over the next 5-10 years.

As Coalition Co-Chairs, we would like to thank all the U.S. and Canadian government officials who provided valuable insights and feedback during the consultation process; InterVISTAS Consulting for producing an exceptional White Paper as well as managing the stakeholder engagement; and, of course all of our Coalition partners for their commitment to this initiative, their creative ideas and innovative solutions, and their financial contributions without which this White Paper could not have been produced.

Matt Morrison

CEO, Pacific Northwest Economic Region
Co-Chair Beyond Preclearance Coalition

Gerry Bruno

Vice President, Federal Government Affairs, Vancouver Airport Authority
Co-Chair Beyond Preclearance Coalition

We are experiencing a substantial shift towards an increasingly mobile world, a world that blurs the boundaries between countries and constantly seeks the efficient movement of people and products to new markets and destinations. The stress this global growth puts on our resources is substantial and, for many of us, has progressed to the point where we must ask ourselves if there is a better way to optimize our border.

The *Beyond Preclearance: The Next Generation Canada-U.S. Border* white paper addresses the demands of growth and provides a foundation for our future success. It has been long in the making—built on our countries’ history of collaboration and innovation and inspired by our accomplishments to date. Together with our partners, we have crafted the beginning of a long-term vision that we believe will lead to a safer, more efficient and productive border system, which removes old processes and moves towards solutions that are now at our fingertips. This vision will bring substantial changes to the way we do business and will require a major leap from our collective efforts.

Instead of refinement, we must seek new approaches. And with the advancements in technology we now have an opportunity to explore a wide range of options that were, until recently, not possible.

As the President & CEO of Vancouver International Airport, I see the interconnected nature of our land, air and sea borders every day. We are dependent on the same border processes—to verify our travelers, move our goods and ensure our safety and security. And we share the same challenges, balancing the need to protect and enforce while ensuring the well-being of cross-border activity, which plays a large role in our economic success. Our shared experience needs to evolve toward a more unified and frictionless system, one that supports the multi-modal nature of our borders.

We must focus on our collaborative effort to work towards the visions set out in this White Paper if we are to meet the demands of the future together. Thankfully, we are on the right path. I would like to thank the coalition, whose efforts have made the Beyond Preclearance initiative possible and whose work on this paper has brought these urgent matters into the spotlight. By working together, we will continue to evolve the productive relationship our countries have shared for many years, while improving cross-border operations for everyone.

Craig Richmond

President & CEO, Vancouver Airport Authority

Rocky Mountaineer is proud to offer over 65 unique Pacific Northwest vacation packages and four distinctive rail routes through British Columbia, Alberta and Washington State. Our world-renowned, luxury train travels by daylight through the wild beauty of Canada's West and is the best way to experience the majestic Canadian Rockies.

Rocky Mountaineer has had the pleasure of hosting more than 2 million guests onboard our trains, the majority of whom crossed at least one international border to enter Canada or the US to begin their iconic rail journeys. We feel blessed to have received numerous accolades and recognition for the exceptional experiences we provide our guests – and we work hard at that. As a company dedicated to our guests' entire travel experience, we rely on our many, many strategic partners – hoteliers, airlines, tour operators, attraction companies, cruise ship operators, and yes, officials responsible for ensuring our borders operate as efficiently and safely as possible.

That is why we felt it important that Rocky Mountaineer take an active role in the Beyond Preclearance Coalition and the development of this white paper. The action plans we outline today will meaningfully improve the travel experience of our international guests for decades to come. Canada welcomes over 20 million international visitors each year, and our American friends represent over 14 million of the total. Similarly, Canadians take over 26 million outbound trips annually, with 16 million of those visits being to the US. We are each other's #1 travel destination and largest trade partner, and with the successful resolution of the United States-Mexico-Canada trade agreement, cross-border movement of goods and people will continue to increase.

A fact less recognized is that the great guest experience that Rocky Mountaineer provides depends on the efficiency of trade as the rail

lines we operate on are owned and maintained by three tremendous Class I Railways: CN, CP and BNSF. Passenger rail services today cannot justify the expenditures required to build and maintain proprietary rail lines. We are therefore tied to the success of these freight railroads that transport exports and imports across the country and across our shared border. Further enhancements to systems that security screen freight and passenger trains crossing borders in the most efficient manner possible is important to Rocky Mountaineer and our Class I railway partners.

Finally, we wish to recognize the leadership provided in initiating this project by Craig Richmond, President and CEO of the Vancouver Airport Authority as well as the Beyond Preclearance Coalition Co-Chairs, Gerry Bruno, YVR Vice President and Matt Morrison, CEO of the Pacific Northwest Economic Region (PNWER). Their leadership resulted in hundreds of experts on the topic providing input into what we anticipate will be the next generation of border security efficiency. Everyone will benefit from the resulting improvements.

Now the job turns to utilizing this White Paper as an exceptional tool in advocating for enhancements that will reap benefits for generations to come.

Steve Sammut

President, Rocky Mountaineer

Executive Summary

Canada and the United States share a long history of border innovation and excellence. Four major bi-national efforts since the 1995 Shared Border Accord created our current framework for co-operation, culminating in the 2011 Beyond the Border Action Plan. The 2015 Land, Rail, Marine and Air Transport Preclearance Agreement (LRMA) also promises to generate incremental benefits in the coming years.

Much work remains, however, to address a range of processing and policy issues to fully co-ordinate efforts between governments and between the private and public sectors. The Beyond Preclearance Coalition was formed to develop a long-term vision for trade and travel, especially with the recent United States-Mexico-Canada Agreement (USMCA), which is the successor to the North American Free Trade Agreement (NAFTA).

The group commissioned a white paper and a series of six consultations, including events hosted by the Woodrow Wilson Center and Public Policy Forum. Views from governments and border stakeholders were gathered from March to August 2018. The feedback resulted in the creation of the Beyond Preclearance vision, which articulates the direction for border innovation to improve efficiency, effectiveness and security.

The consultations revealed a strong desire to create predictability in border and security processing. More importantly, the border was seen as a place that goods and people flow, not as a single line or step. A shared vision was developed encapsulating a future for the United States and Canada.

The shared vision for U.S. & Canada:

**Predictable, secure and integrated
borders that can scale to future
opportunities, threats and volumes**

Context

The new vision is based on eight major challenges within travel and trade sectors and the services that enable border and security clearances:

1. Inability to keep up with traffic growth

Traffic volumes will continue to grow, nearly doubling across all modes in the next 20 years, with the aviation sector reaching almost 2.5 times more traffic by 2038. The concern is whether our systems will be able to keep up with growth or be limited by insufficient resources, leading to long queues.

2. Wasted resources from duplication

Significant progress has been made in the last 25 years to remove a large portion of paper-based processes, from multiple data-entry to duplicated application forms. More work remains to simplify programs, many of which are separate, requiring almost the same information and are aimed at similar objectives.

3. Privacy issues must be addressed up front

With the proliferation of information sources tied to personal identity or commercial confidentiality, there is the need to improve the performance of the entire system to better manage privacy. Privacy by Design and its seven principles identify best practices that augment existing public agency requirements to conduct privacy impact assessments and do so early in the process.

4. Ensuring ideas are future-proof

Scalability and systems that cannot be linked together are examples of problems still faced as border process requirements evolve. Standalone systems may be desirable for speed of implementation but there is the need to ensure connectivity with future changes to systems.

5. Resilience to evolving threats

Dynamic and asymmetric threats are problems faced by public and private sector stakeholders. The resilience of the system to accommodate future shocks through risk-based approaches also further reinforces the need to develop as much efficiency in the system today as possible.

6. Lack of sustainable private-public partnerships

From user fees to investments in facilities and requirements, there is a perception of an unsustainable model for funding future changes. The private sector presents strengths in investment, acquisition, technology deployment and research. These may also represent the opportunities to sustain future co-operation.

7. Underuse or overuse of technology

In the past two years, there has been focused efforts towards product-based pilot projects. “The blockchain pilot” or the “biometric pilot” are important because they are emerging technologies with benefits. The use case however needs to

balance the process, staffing envelope and risk model to ensure the success for new technology adoption.

8. Global competition

Finally, the challenge collectively is not the debate over whether Canada or the U.S. stands to gain from future improvements. The economies are intricately linked, as are the cycles of innovation in border and security excellence. The competition is how Canada and the United States, as a U.S. \$100-trillion economy by 2038, will remain competitive in the world market.

Technology

To achieve the vision for a predictable, secure and integrated border, we have identified eight game-changers in technology that will form the building blocks for the evolution of border management:

- **Next-generation biometrics:** enable upwards of 50% faster throughput through airports, land borders, rail and seaports and will likely replace many of the existing border kiosks.
- **Remote and multi-use screening:** provide the ability for one scan to be reused by multiple border agencies in each country from thousands of miles away.
- **Drone networks:** offer last mile delivery or pickup, as well as niche applications for border communities, provided that secure protocols are in place for flight operations.
- **Blockchain:** provides the potential to revolutionize the communications between systems that previously were not easy to link together and dramatically reduce the costs of solutions such as single-window interfaces.

- **Real-time and artificial intelligence:** can leverage historical data to conduct pattern matching and enhance the ability for officers to make decisions on risk management.
- **Mobile smartphone apps:** can provide easy-to-access bi-directional communication to help in way finding, transmission of photographs and documents, and manage people and goods movements in real-time or in advance.
- **Autonomous vehicles:** can assist in providing border controls built on a robust set of sensors, geolocation methods and intelligent routing (i.e. to secondary processing if required).
- **Enterprise cloud services:** can reduce downtime and create redundancy in the management of large data sets, from biometric information to supply-chain data.

Vision & Flows

Process flows have been developed based on reviewing the current issues for trade and travel, along with proposed near-term (2-5 years) and long-term solutions (10+ years) that move Canada and the United States towards a more predictable, secure and integrated vision.

Fifty-four initiatives have also been developed for maritime, aviation, rail and land modes of transportation, with the vast majority applicable across all sectors.

Shift to large data sets to analyze risks

For all modes of transportation there is a fundamental shift away from the plethora of trusted traveler and trade programs. From NEXUS, PreCheck, Global Entry, Customs Trade Partnership

Against Terrorism, Free and Secure Trade, Partners in Protection, among others, there is a view to:

- Simplify the risk management framework with travel and trade history, particularly for the United States and Canada.
- Tie facilitation benefits to information based on a single token (e.g. biometric for individuals or traceable identifier for goods).
- Retain trusted and known traveler models for foreigners to address those with potentially limited travel histories.



The shift represents as profound a change as the differentiation of “primary” and “secondary” processing that both governments introduced for border management in 1971 and creates opportunities for a controlled, free-flow environment.

Maritime

Container, break-bulk and other commodities shipped to the United States and Canada have experienced significant changes since 2001. Pushing the borders out is largely a success, especially for container movements. More work remains to incorporate clearances for U.S. Customs and Border Protection (CBP) and Canada Border Services Agency (CBSA), and across all government agencies. This will enable intermodal transfers to trucking and rail to move more efficiently from one country to the other.

Cruise passengers are largely air transfers and for certain markets (e.g. Alaska or Caribbean cruises) there is the opportunity to further leverage biometrics further to enhance processing. Same-day entry and exit between countries could be greatly facilitated. Six cruise lines have already started to generate pilot projects on biometrics with CBP and this can be further integrated with air transfers and CBSA processes.

Aviation

A robust system exists for in-bond air cargo, but similar to the maritime mode, more is needed than just approvals from a customs agency. A whole of government approach is needed to deal with different commodities – specifically agricultural products. Consequently, a future view towards testing out full in-bond air-air and air-truck is needed, as well as advancing air cargo preclearance.

Air passengers have several important dynamics due to the rapid growth of traffic, and the large number of biometrics implementations. Key initiatives include:

- Further integration of passenger vetting and biometrics to ensure that Canada and the United States are not at a competitive disadvantage versus Europe in attracting foreign tourists.

- Early results demonstrate upwards of 50% throughput benefits compared with the current generation of automated passport control. A unified approach is needed in the preclearance environment.
- Create a streamlined connections environment. Canada has made major improvements at airports in recent years. Biometrics may provide the ability to better manage connections at U.S. facilities.

Further co-operation can be advanced by leveraging excess capacity at new U.S. preclearance sites for Canadian-bound traffic. Joint preclearance could be a stepping stone for full global preclearance starting with allied countries such as the United Kingdom, Australia and New Zealand and potentially be integrated with exit control facilities and systems.

Rail

Rail is the second largest mode after trucking, moving some 15% of US-Canada trade. One of the major sources of demand for rail movements is shipments moved to rail cars from ports. At the same time, there is U.S. and Canadian-origin traffic from North American based factories, lumber yards, etc. The principle is the same; clear before departure and minimize the activity needed at the border itself. Remote screening and en route clearance processes could significantly reduce the burden on rail lines at the border to de-stuff containers or rail cars for inspection.

Similar to air and cruise ship processing, the model for preclearing passenger trains or clearing upon arrival would greatly benefit from the biometric model of processing.

Land Border

Land borders require careful co-ordination of lanes and infrastructure at border plazas. Preclearance offers more flexibility to locate activities away from the physical border. More efforts are needed to ensure traffic can be streamed through the introduction of biometrics to confirm identities, by using mobile technologies to ensure trucks and cars are ready to proceed and by limiting the amount of stops at the physical border in favor of activities before departure, en route or at a controlled destination upon arrival.

Benefits Model

A comprehensive border wait time and supply chain model was developed to assess the benefits of the vision articulated for the Beyond Preclearance Coalition. Whether it is saving five seconds per transaction or gaining 50% more throughput, there are significant gains in the 54 initiatives outlined that can create improved flows into Canada and the United States and between the two countries.

The annual savings based on today's volumes are estimated to be more than \$13 billion. Over 20 years, the benefits could total in excess of \$300 billion.

Mode	Traveler	Goods Movement	Total Annually
Maritime	\$5 M	\$1,245 M	\$1,250 M
Aviation	\$106 M	\$3,228 M	\$3,334 M
Rail	\$1 M	\$4,596 M	\$4,597 M
Land	\$162 M	\$3,878 M	\$4,040 M
Total Annually	\$269 M	\$11,702 M	\$13,221 M

In addition, the ability to create greater throughput across border and security facilities can help delay future expansion projects, which can then be built as demand requires. The value of this space is highly variable to each facility. Deferring capital investments could exceed \$1 billion in aggregate in the first five years depending on the size and scope of projects.

Enabling the Vision

To bring this vision to life, enhancing the border and security environment requires a focus on five key areas:

1. Bilateral mechanisms: a four-tier governance structure is proposed to include senior leadership and engagement of industry stakeholders. The four levels would include a bi-national executive committee, supported by action committees and work groups linked to existing industry-government mechanisms. This structure addresses the periodic four-to-seven-year ramp-up and ramp-down cycle of border action plan teams.

2. Choices for reinvestment: Based on activity forecasts and current processes, 38,000 new officers are required to handle growth at current service levels for border and security processing in the next 20 years.

The additional officers required represents a joint value between Canada and the United States of \$30 billion in labor in today's dollars based on the current processing model. The choices are to:

- **Constrain the system:** resulting in potential economic damage with unacceptable delays and/or compromising risk management,

- **Hire to match growth using today’s model:** adding at least \$30 billion in government expenditures to cover the additional labor costs, or
- **Implement the initiatives outlined in this paper:** rather than finding the case to spend \$30 billion to keep up with growth over the next 20 years, spend a portion of this funding to realize gains in efficiency with increased throughput and reduced duplication.

Building upon the early successes of investments in biometric entry systems that create 50% more throughput per CBP officer or improved cargo screening that increases efficiency by four-fold, there will be many solutions that could be cost-neutral to government. Several billion dollars of new spending will be needed subject to further business case analyses; however, it will be a fraction of the cost of hiring 38,000 new officers.

3. Return on investment (ROI) for solutions: Changes are needed to move away from the current practice of cost recovery and focus on private sector investment to create benefits. Whether it is a set of new flights or reducing queues, decision analysis needs to fundamentally change to ensure public-sector funding streams are clear in the baseline funding, versus areas where the private sector can create solutions that create win-win situations.

There is a potential ROI of two to four times based on existing improvements evaluated and recommended in the Beyond Preclearance vision.



4. Research and development: Applied research and technology acceleration are areas that are currently understated in the United States-Canada border relationship. For the ideas in Beyond Preclearance to succeed, there needs to be concerted efforts to implement a standing research mechanism similar to the Cooperative Research Program (CRP) model housed in the U.S. National Academy of Sciences. Joint academic, industry and government research efforts can pay dividends to ensure that solutions and economic impacts are clear to stakeholders and decision-makers alike.

5. Progressing facilities: Lastly, the provision of free space to governments is a source of friction framed around a set of technical design standards used by both countries. Escalating costs and out-of-date information are some of the issues that are problematic for stakeholders. Technology and risk-based approaches can reduce need for expanded infrastructure.

Next Steps

A set of 16 pilot projects are recommended to begin immediately as a first step towards realizing the vision of a predictable, secure and integrated border. Pilot projects are modal independent – meaning each transportation mode has the potential to implement pilot projects along five themes:

1. Adopt a Remote Clearance Approach
2. Screen Once, Accept Multiple Times
3. Manage to a Trusted Secure Token
4. Move Away from Fixed Checkpoints to Clearing Flows
5. Harness Big Data

These pilot projects will be further developed through upcoming industry-government forums in 2018-19.

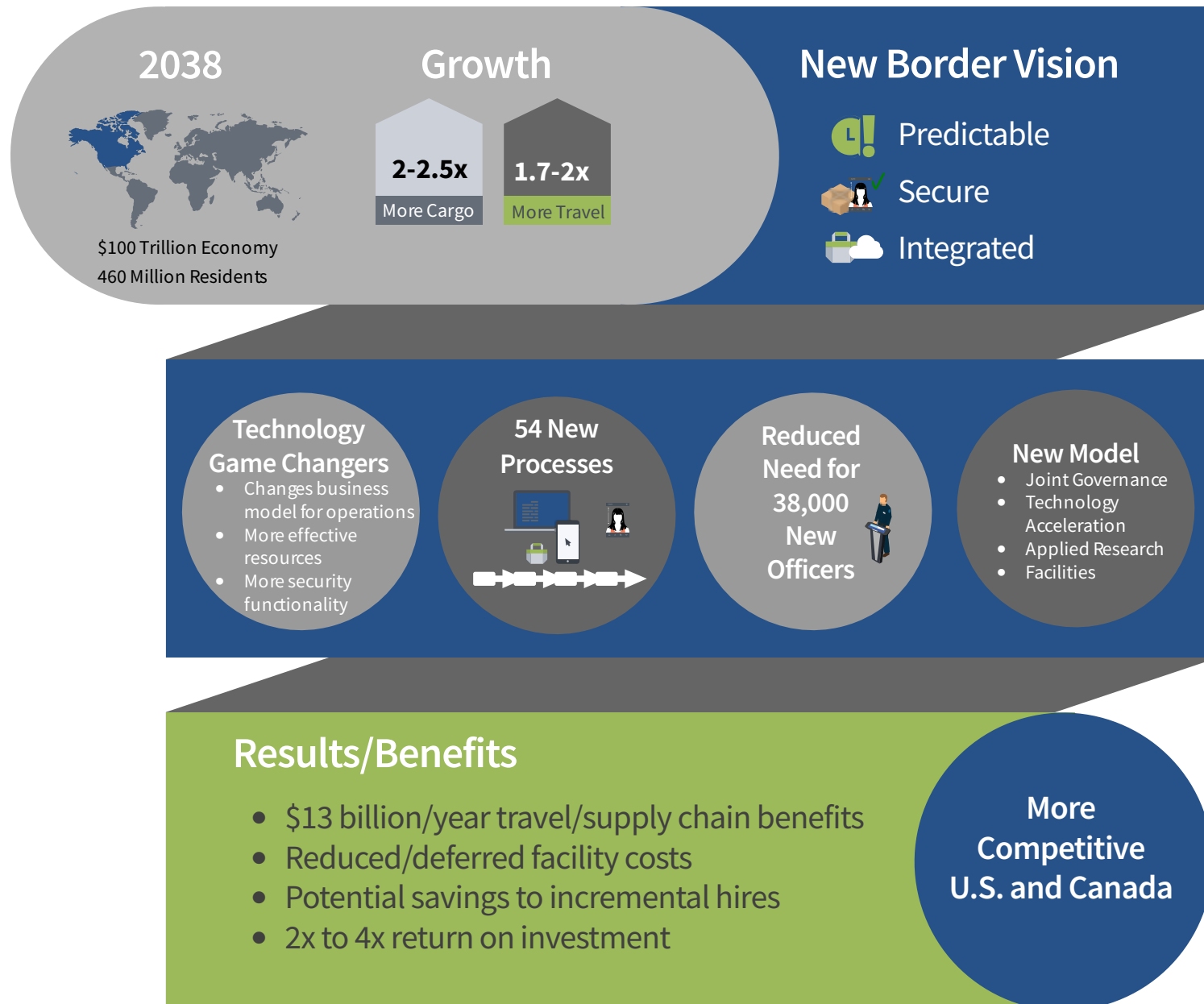


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Chapter 1: Introduction



There are important issues for “the integrity of our mutual border and the need to facilitate legitimate trade and travel along the longest shared border in the world. We are the closest of neighbors -- the United States and Canada -- but we live in troubled times and the need for strong security at our borders has never been more important.”

*Kenneth Merten, Acting Principal Deputy
Assistant Secretary, Bureau of Western
Hemisphere Affairs, U.S. Department of State
March 26, 2018*

Beyond Preclearance is a major Canada-U.S. initiative that combines input from a cross section of border-industry stakeholders across government entities from both countries - along with the views of futurists, strategists, operations and policy leaders – to develop a vision for the competitiveness of both countries.

Global competitiveness is a critical issue. Today, Canada and the United States represent 26% of world’s gross domestic product and a significant portion of global trucking, shipping and air movements. Each day, the two countries facilitate 400,000 travelers and U.S. \$1.9 billion in trade.

Upheavals related to terrorism and trade policies have forced major changes to the rules governing trade and travel but both countries still depend on them for their ongoing economic prosperity.

The future of border management presents daunting challenges. At a global level, there are fundamental shifts in how borders themselves are perceived. These include more awareness of cross-border threats and differences among countries when it comes to immigration policy. These affect relations not only between Canada and the United States but among all countries.

Yet, Canadian and U.S. economic competitiveness depends on governments and other border stakeholders achieving a secure and efficient environment to facilitate legitimate trade.

The current environment also presents opportunities. For example, the United States-Mexico-Canada Agreement (USMCA) may allow for updating decades-old provisions that never anticipated new industries such as e-commerce and information technology (IT) startups.

Moreover, there are also major improvements over the past three decades that require sustained momentum to continue.

The Beyond Preclearance White Paper aims to address challenges and opportunities revealed by these changes and also emphasize the vital role both countries have played in fostering important innovations in security and border facilitation.

About the Coalition

The Beyond Preclearance Coalition consists of over 40 industry organizations representing all major modes of transportation as well as tourism, trade groups and facilities operators. From rail, trucking, aviation and other modes of transportation, the Coalition represents the vast majority of the interests that have an operational, facility or market-development role to serve the movement. Their common interest is to find a way to strategically plan for an improved future of border and security processing in partnership with government.

In 2011, the Beyond the Border Declaration and Action Plan was introduced by the two governments to provide senior-level impetus for joint actions. Reporting to the President of the United States and Prime Minister of Canada, the plan focused attention towards broad goals for cooperation. However, after changes in governments, oversight bodies were disbanded apart from the Regulatory Cooperation Council. As a result, some initiatives were not pursued further and there has not been a vehicle for industry to work with the two governments towards a future strategic vision of the border.

The current Beyond Preclearance Coalition was created in response to a lack of agreement on how to move the Beyond the Border Action Plan to the next phase of border co-operation. The Coalition was formed in late 2017 to relaunch strategic-level discussions, starting in Washington, D.C., in March 2018. Its members have developed a plan through 2020 to advance

implementation of trials, solutions and assist governments to implement a new border vision.

More about the Coalition and its members can be found at www.beyondpreclearance.org. A current list of Coalition partners is provided on pages i and ii.

Initiatives Over the Past 25 Years

The concept of the private sector providing advice on the future of border and security is not new. Over the last 30 years a range of pilot projects and ideas were developed through direct engagement by governments with the private sector.

Time Period	Initiatives	Authority Level
1990s	Shared Border Accord Customs Modernization Customs Blueprint	Attorney General/Minister of National Revenue
2001	Smart Border Action Plan	Homeland Security Secretary / Deputy Prime Minister/
2004	Security and Prosperity Partnership	President/Prime Minister
2011	Beyond the Border Action Plan	President/Prime Minister

White Papers have formed the basis of inputs for these initiatives. From 1999 to 2002, the “Perimeter Clearance Strategy” was produced, contributing to the 2001 Smart Border Action Plan. Similarly, the Coordinated Clearance Strategy built upon the 2004 Security and Prosperity Partnership and helped to inform initiatives in the 2011 action plan.

Achievements to Date

The previous joint initiatives to modernize the border have focused on the development of mechanisms to improve border management both to strengthen security and facilitate trade and travel. There has been a focus on moving work away from physical border crossings and to complete as much of the review and processing for travelers and cargo as possible in advance of their arrival or in a post-verification environment. Risk assessment is increasingly used to identify and address threats at the earliest opportunity. Self-service and automation are used to submit information, complete processing and deal with low-risk commodities and travelers, so resources can focus on cases of unknown and high risk.

Good progress has been made. The introduction of the Trusted Traveler and Trader Programs has allowed governments to ensure applicants are low risk. As a result, border clearance processes have been simplified for these groups while enhancing security and still allowing border agencies to deal with increased volumes. Introduction of new technologies and partnership with industry have automated much of the clearance process.

Improvements in risk assessment techniques and greater information sharing between Canadian and U.S. border agencies and their international counterparts has allowed the United States and Canada to deal with changing security threats. The most recent initiative, the 2011 Beyond the Border Action Plan, achieved real progress in this regard.

In 2018, the predominant Canada-U.S. issue has been the fate of the 1994 North American Free Trade Agreement, which will be replaced by the United States-Mexico-Canada Agreement (USMCA). While the relationship between United States and Canada was dominated by trade issues, there was a recognition in

the Coalition that an eventual successor to the “Beyond the Border” initiative was needed with the new USMCA.

The basic ideas of this future government-to-government initiative would be that:

- It would address the major border challenges and security.
- There would be an agenda for greater cooperation.
- The intrinsic benefits to trade, travel, and governments would be drivers towards improvements.

Objectives of Coalition White Paper

The Coalition embarked on a similar approach as the 2001 Perimeter Clearance and 2006 Coordinated Clearance initiatives: provide a compelling white paper that could help to coalesce a consensus among industry stakeholders to develop government-industry solutions.

The scope included:

- Describing the types of problems to be solved
- Providing opportunities to foster collaboration between public- and private-sector interest to agree and define the next steps toward a new vision
- Defining detailed flow maps and process changes to demonstrate the current and future state of border clearance into, and between, Canada and the United States

At the same time, it was acknowledged that compared with past initiatives in the 1990s through to 2011, there were some

fundamental changes in the role of technology as threats continue to emerge at the border. The coalition also directed the review of key technologies that could help reshape the way borders are managed – including but not limited to automation, biometrics, blockchain and other emerging tools that could help solve strategic border issues.

Why “Beyond” Preclearance?

Preclearance is a vital part of the method for clearing goods and people across borders. In fact, prior to the creation of Ellis Island, New York, the main port for entry from Europe to the United States was in Canada, in Halifax, N.S. The modern-day genesis of the preclearance program originated in Toronto Airport in 1952, representing a fundamental shift of moving clearance of individuals *before* the start of a journey. It is this approach that evolved into the 2018 implementation of the 2015 *Land, Marine, Rail and Air (LMRA) Preclearance Agreement* that is scheduled to be advanced through 2021.

While the LMRA was a crowning achievement of the 2011 action plan, it was only one ingredient in a series of changes. There were other important initiatives under this plan where pilot programs demonstrated some potential but also showed more work was needed to fully achieve the plan’s intended benefits. Significant testing, for example, was undertaken to address issues as cargo arrived at the perimeter so it could be transported with minimal intervention across the land border. However, issues were identified in the pilots that have not been resolved to allow for a fuller implementation.

In other cases, new programs were introduced in a phased approach but need to be further developed to truly capture the benefits for both industry and government. The Single Window

Initiative allows companies to submit information for all government departments, but it still needs additional enhancements to be truly a single window for the risk assessment and processing of all requirements.

The term “Beyond Preclearance” is meant to convey that work needs to continue beyond current efforts where stakeholders are still arguably focused on a border line. It is critical to establish a vision that looks to the future and one that is based on flows – and ensures a focus to bring past efforts to fruition and to deal with emerging and future challenges.

“You have to look at borders not as simply lines on a map but rather as flows....in fact in the context of North America I'll argue that the flows have become as important as the line we insist on because of sovereignty...[and] the extent to which we now have electrons flowing and data flowing that are borderless.”

*Alan Bersin, former Assistant Secretary for Policy and International Affairs, Department of Homeland Security
March 26, 2018*

The Vision: Predictable, Secure and Integrated Borders that can Scale to Future Opportunities, Threats and Volumes

While both countries have developed hundreds of action items, organized in branded programs, Canada and the United States have not had a comprehensive border vision. Previous initiatives have been focused on the causes, but the specific desired effect associated with each investment was never clear.

For the most part, since 9/11, progress has been made at reconciling the two border drivers, security and facilitation. But the approach has focused on investing in new processes, technology, resources and facilities without first agreeing to a *measurable* outcome.

The post-9/11 era ushered in the term border “thickening,” a catch-all phrase to suggest rising wait times and administrative burden due to enhanced security measures. But as demonstrated though several studies over the years, a poor sense of real costs associated with border unpredictability allowed vague references to a thickening border. Governments invested tens of billions of dollars, without clearly defining a projected outcome other than pursuing a “thinning” of the border.

A complicating element is the fact border problems appear in many forms, depending on transportation modes, industry, location, processing costs and infrastructure.

In response, the Beyond Preclearance Initiative is founded on three key principles.

- **Predictable** both in terms of costs and processing time. We need borders that have a set of baselines and benchmarks to help goods and people move from point A to B in a timely way.
- **Secure:** The security component of the border duality is not always transparent to stakeholders. Where there are potential vulnerabilities, stakeholder involvement is a cornerstone of future success when it comes to security and facilitating cross-border movement.
- **Integrated:** Data flow much faster than physical goods or people that can take hours or days to make the journey. The only drawback: duplication/rework between governments, or between governments and stakeholders due to unintegrated systems

For the Beyond Preclearance initiative to be different from its predecessors it must result in a commitment from government, in partnership with industry and key stakeholders, toward defining a set of consistent performance objectives for border activities. The border must be predictable: Performance targets must be set, and costs must be clearly quantified and controlled. The various solutions (biometrics, RFID, blockchain, etc.) can be distracting otherwise without a context rooted in the vision to have a scalable model to successfully deal with future growth and threats.

The core benefits to the Beyond Preclearance approach are:



Enhanced
Security



Increased
Global Competitiveness



Provide an
“On Time” System



Reduced Time & Cost for
Trade & Travel



Reduced Time & Cost
To Governments



Solutions that are
Resilient & Sustainable



Seamless
cross-border movements

Organization of the Paper

In developing the Beyond Preclearance white paper, the scope defined with the Coalition is organized around the following chapters:

- Chapter 2: Provides a synopsis of the **key issues** that the Beyond Preclearance Initiative is addressing and outlines the key **consultation mechanisms** used in 2018 to obtain input.
- Chapter 3: Identifies the **key technology trends** that need to be factored into the Beyond Preclearance vision
- Chapter 4: Details the **flows and future vision** by mode
- Chapter 5: Defines the **implementation mechanisms** to support a new U.S.-Canada border vision
- Chapter 6: Provides **recommendations** and key pilot projects to pursue for implementation over the next few years

Chapter 2: Context

Canada and the United States have the single longest undefended border in the world.

As new models for borders and security evolve (e.g. Brexit) there is a growing recognition that the models U.S. and Canada developed are global best practices to maintain sovereignty while harmonizing efforts to the maximum extent possible.

At the same time, the arrangement isn't trouble free; there are trade irritants, policy differences and variations on operational approaches. Regardless, the reality for business and transportation interests is:

- Supply chain and travel are increasingly integrated.
- International growth is much greater than domestic growth.
- Friction in the system makes planning difficult – whether it is day-of operations or longer-term investments

The outlook over the next 20 years is one in which the two countries as a single region comprise a population of more than 410 million. Canada and the United States will also forge a stronger economic structure to develop new products and services serving internal and global markets. In total, the Organization for Economic Co-operation and Development (OECD) projects a combined gross domestic product of U.S.\$100 trillion by 2038 – up from U.S.\$68 trillion in 2018. This will create corresponding growth in transport movements across the two countries.

“We’re at a really interesting point in our evolution because we have the potential to use technology that has never existed before.”

*Tina Namiesniowski,
Executive Vice President, Canada Border Services Agency
March 26, 2018*



In 2038, we will have greater than 90 million twenty-foot equivalent units (TEUs) of marine cargo, nearly double from today. Similarly, there will be 2.5x more air cargo in 2038 compared to 2018.

(Sources: Journal of Commerce, FAA Aerospace Forecast 2017-37, Airbus Global Market Forecast 2017-2036, Statistics Canada)



In 2038, there will be more than 786 million travelers crossing into and between Canada/U.S. – 70% higher than today's volumes.

(Sources: FAA Aerospace Forecast 2017-37, Airbus Global Market Forecast 2017-2036, Statistics Canada, Destination Canada, U.S. Travel Association)

Key Issues Beyond Preclearance Addresses

What kind of border does a \$100-trillion economy need?

Over the last 25 years, a dichotomy has evolved in discussions on border management between improving security or facilitating smoother goods and people flows. Should the border be thickened or thinned? Are there other areas that are mutually exclusive?

At a very high level, the Beyond Preclearance initiative is rooted in the belief that border flows need to be as efficient and effective as possible. Digging deeper though through consultations with government and industry stakeholders (see Appendix A), there are eight areas that are important to address in the future vision of the U.S.-Canada border, summarized on the following page and detailed below.

1. Traffic Growth

International trade and travel are forecast to grow over the long-term at a rate of 3% to 4% a year. Whether it is the U.S. Federal Aviation Administration or Transport Canada forecasts, or container forecasts by McKinsey & Company covering the next 50 years, there is a consistent view that international traffic will double over the next 20 years.

As a result, border clearance activities must respond to the strong potential for continued long-term growth for international tourism, trade and travel, and high variability between the United States and Canada (e.g. from regional decline to major growth).

It is still early to judge the effects of the USMCA, but the long-range options for resource planning need to be considered.

In 2018, there are some 84,000 officers involved in direct border/security of people and goods in Canada and the United States. This includes frontline staff at Canada Border Services Agency (CBSA), U.S. Customs and Border Protection (CBP), U.S. Transportation Security Administration (TSA) and Canadian Air Transport Security Authority (CATSA). There are also tens of thousands of other staff involved (e.g. U.S. Food and Drug Administration [FDA], U.S. Department of Agriculture [USDA], Agriculture Canada, contract security, rail police, etc.) involved in the cross-border flow of travelers and goods.

For purpose of illustration, staffing growth rates were applied over the next 20 years for international traffic growth. In addition to the 84,000 officers, there are 3,000 kiosks in use at land, ports, and airports in both countries used to speed up processing. Based on projections of activity for all modes, both Canada and United States will need to hire a total of 38,000 new officers over the next 20 years just to keep up with growth.

Growth itself is not homogeneous: While increases will come from traditional trading partners such as Europe, Australia and New Zealand, some fundamental changes about the nature of growth are expected including:

- High-growth markets with unknown or higher-risk source countries
- Accommodating fundamentally different business models of distribution to consumers and businesses
- Changing niche requirements of time-sensitive and perishable products that have a different demand profile for resourcing



2. Duplication

Both governments have made significant advances in the last 25 years to reduce duplication. Removing customs declaration forms, reducing the amount of paperwork as well as eliminating re-screening – these are all efforts that have created the ability to:

- Focus labor resources from manual work
- Reduce the administrative burden for travelers, businesses and other entities alike

One important example involves handling frequent cross-border travelers. In the past there would be separate forms and processes for travelers to enroll into trusted-traveler programs depending on whether the application originated at a land border or airport. The process also had to be repeated for each country a traveler wished to be vetted for. NEXUS simplified this into one fee and one application form. The system has been simplified further in recent years regarding the interview process, as well as providing NEXUS members with the full range of Global Entry and TSA Precheck/CATSA lane benefits, furthering the concept of a “one-stop shop.”

On goods movements, the FAST mechanism allows for a bi-national approach for applications and fees, with separate and coordinated vetting mechanisms.

Overall, there are still many cases where travelers or supply-chain participants need to submit information more than once, even though requirements are similar for each government’s border organizations.

So-called “single-token” for identity, or “single-window” for trade information are important to implement but have daunting

systems-implementation challenges that can address duplication in the following forms:

- Within country - several organizations may do the same review depending on the commodity
- Travelers are submitting requests for several different travel documents, which require the same information
- Inspections are often done by more than one agency

In total, duplication is a major administrative burden with unnecessary costs for industry and governments. More importantly, the amount of effort to duplicate work is also an opportunity cost for resources.

3. Privacy Issues Not Addressed Up Front

Privacy of information increasingly is an important aspect of dealing with border movements – whether it is personal information related to identity or commercially sensitive information.

The issues of privacy in the United States and Canada are both complex and often misunderstood. Many have judged this as a binary question: Do you have “good” privacy or “bad” privacy. If bad, then there are consequences at play.

Both governments also have robust frameworks for managing new processes, namely the requirement to conduct a Privacy Impact Assessment. In general, these are public documents that ensure that the governmental lens for privacy is applied for appropriate use of information, retention, etc.

However, the issues for Beyond Preclearance is the need to adopt a greater universal standard for best practices in privacy

management. Adopted by the International Conference of Data Protection and Privacy Commissioners in October 2010, Privacy by Design applies to a range of ideas that involve participants from the private and public sectors.

In brief, Privacy by Design considers seven foundational principles at the start of any new initiative:

1. Proactive not reactive; preventative not remedial
2. Privacy as the default setting
3. Privacy embedded into design
4. Full functionality – positive-sum, not zero-sum
5. End-to-end security – full lifecycle protection
6. Visibility and transparency – keep it open
7. Respect for user privacy – keep it user-centric

Some jurisdictions such as Europe’s Global Data Protection Regulation have included Privacy by Design in new regulations. There may be the need for Privacy by Design to avoid additional costs by ensuring:

- New programs and policies apply a privacy lens at the start to avoid trying to retrofit a solution
- New solutions, including the digital world of border/security management, addresses privacy with information shared and moved quickly

A special group called Global Privacy and Security by Design was created to promote the idea that there is no need to forsake

personal privacy for public safety, and that there are solutions to help ensure large data analytics can be privacy-protected.¹

4. Ensuring Ideas are Future Proof

One of the challenges for stakeholders in international commerce is the speed of generational shifts. For example, as quickly as border kiosks were implemented over the last 10 years, the model is quickly changing to different ways of achieving the same underlying objectives.

The business risks for developing large-scale solutions is the length of time for implementation. Several previous initiatives in the U.S.-Canada border context have resulted in large technology-driven solutions that are costly and, in many cases, take years or even decades to implement successfully, by which time the technology is out of date.

In developing solutions, there are a couple of basic principles that need to be adhered to in order to minimize the longevity of investments:

- **Ensure scalability:** Anticipate future needs and modules that can be easily implemented as a future phase.
Example: Peace Bridge Pre-Arrival Readiness Evaluation has a first phase, with subsequent phases of expansion
- **Remove “stove-piped” systems:** These approaches prevent stand-alone systems from communicating with each other.
Example: having a single token that can allow information to be transferred easily between information systems

¹ For further information: <https://gpsbydesign.org/>

Scalability and removing standalone systems can help address the speed of change in the economy. With some technologies, large-scale development projects may become quickly outdated even before it is implemented. Addressing these areas can also help to weather an uncertain environment around political priorities and public sensitivities.

Consequently, we can move into a future state where government priorities, funding and development processes are aligned with business needs on both sides of the border.

5. Resilience to Evolving Threats

In the aftermath of 9/11 several border facilitation programs were shut down. Most were reactivated by February 2012 when it was acknowledged that the ability to encourage trusted travelers was measurably better for the security of both countries.

As the threat environment has evolved over the last 17 years, there is every indication the Beyond Preclearance initiative must be able to address two key elements:

- Dynamic – an ever-changing threat profile
- Asymmetric – greater randomness and non-linear approaches to potential disruptions in the system

Furthermore, the types of threats have typically centered on border controls and clearances. Contagions, health pandemics and other events can be disruptive to flows of people and goods. Cyber security threats are also an issue to consider if technology fails or is co-opted.

Overall, the Beyond Preclearance initiative contends that the optimal way of dealing with the vast majority of threats is pre-

departure – well before a physical arriving to either Canada or the United States.

At the same time, any future vision for borders must be resilient to evolving threats. A five-, 10- or 20-year set of solutions must be able to adapt to changing conditions.

6. Lack of Sustainable Private-Public Partnerships

The delivery of policy and operational solutions for borders is increasingly built on the back of private-public partnerships. Both countries have established sizeable efforts to ensure non-governmental entities can team up with governments to work toward modernizing the border. These can include areas such as:

- Payment of cost-recovery fees for officers and equipment from public agencies
- Private investment in new technologies
- Provision of new facilities to house public-sector agencies

Some of these are extremely successful. These include private investment to build a bridge to Tijuana from San Diego to serve an airport with U.S. Customs and Border Protection services. As well, the ability for investment in border processing kiosks defers expenditure in airport expansion.

However, payback period (return on investment) is quite different for public and non-government entities. The lack of sustainability of private-public partnerships is based on the payback period being either too long or non-existent. For example, requirements to construct facilities or parts of facilities that will remain unused represents a carrying cost that is imposed by both governments on transportation operators.

7. Underuse or Overuse of Technology

Technology has an important role to play in the development of border solutions in the U.S.-Canada environment, but it can sometimes be viewed as the cure-all. While there is a need for scalability, more scanning, more inspections or other ways of finding the needle in the haystack may not necessarily create better solutions.

Many of the outputs in the U.S.-Canada environment are severely over-engineered in complexity and are highly problematic due to the additional costs to maintain systems.

As a result, the same attention paid to the kinds of leading-edge technologies that described in this report must be also designed with the use cases that are built from private and public sector experience. This will ensure that technologies are deployed with

- An optimal process
- An appropriate staffing envelope
- A robust risk model

As an example, Canada is resoundingly criticized for not following the U.S. implementation of radio frequency identification (RFID) readers at land border crossings. The United States has seen several benefits to flow traffic through quicker. We are now at a point of integrating next-generation technologies in facial biometrics that can even more dramatically improve processing, reduce staffing requirements and address true unknown/high risk flows.

8. Global competition

Finally, the U.S.-Canada trade dynamic has recently resulted in a revised free trade agreement, the USMCA. There will need to be an evaluation that addresses fully the \$100-trillion economy in 2038 that will rely on the strengths of exterior and interior borders to be able to achieve a future border vision with a joint strategy and action.

Ultimately, it is not a dynamic of U.S. versus Canada and vice versa, as much as it is the competitive environment between a continentally integrated economy versus competitors around the world.

Chapter 3: Technology

Review: Eight Game Changers

In reviewing the key technological changes, there are eight major game changers enabling new models of processing people and goods. Their major benefits for Beyond Preclearance and ease of implementation are explained below.

Next-Generation Biometrics

INSPASS was a U.S. pioneer in hand-geometry biometrics used at JFK and YVR airports in the early 1990s. Canadian models of biometrics have also evolved.

While many e-Gate models in Asia and Europe flourished from around 2000 through to the early 2010s, the potential for CBP's traveler verification service is significant to address the mechanisms to achieve higher quality matches for biometrics from a limited data set. In other words, rather than trying to match one-to-a-million in a population set, the method achieves a higher read rate through a narrower population. By aiming at thousands or hundreds of people rather than millions, there is the ability to achieve faster recognition and, consequently, faster throughput.

CBP's results are impressive and have relevance across all modes of transportation. In addition to catching several imposters to

date, there are major throughput benefits with airports that have replaced Automated Passport Control kiosks with reports that biometrics have led to a 20% to 50% improvement in throughput.

More significantly, airlines such as British Airways and Lufthansa are reporting rapid boarding of aircraft – 500 to 600 passengers boarding in 22 minutes – a marked improvement versus manual checking of documents.

For Canada and U.S. there are some considerations. While data sharing agreements have been in place since 2012 between Canada and United States, Canadians have been exempted from the US-VISIT program when it started recording facial images for all foreigners visiting the United States, beginning in 2003. These are resolvable issues over time, with opt-in or other approaches to encourage registration (e.g. use Canadian passport photo with opt-in), provided that Privacy by Design is integrated.

NEXT-GENERATION BIOMETRICS					
Potential Benefits	■	■	■	■	■
Ease of implementation	■	■	■	■	□

Remote and Multi-Use Screening

Australia and New Zealand are pioneers of remote-screening to address a range of operational benefits. A model has emerged over the last 10 years from a program allowing baggage X-rays to be sent before departure from New Zealand airports to aid customs and quarantine inspections in Australia.

Meanwhile, TSA and CATSA have a significant opportunity for their operations to allow for multiplexing technology. For example, an operator for a CATSA Plus checkpoint in Calgary can have X-ray images reviewed in a remote viewing room.



CBSA and CBP also have applications to review images remotely – albeit manually until they receive authorization so that a CBSA officer does not have to be physically in the United States to review images for northbound cargo.

By the same logic large-scale cargo imaging need not occur right at the physical border, but at:

- Origin points overseas
- First port or airport in the United States or Canada
- Factory, warehouse or production plant origin in the United States or Canada

Just as heart surgery can be done remotely by trained doctors thousands of miles away, there is also the ability to allow a CBSA or CBP officer to conduct remote screening of checked bags at an overseas airport. The ability is improving dramatically for an X-ray used for one purpose such as explosives detection to be relevant for other purposes such as discovering contraband, particularly when coupled with pattern recognition of threat items from a library of images.

Remote screening, when added together with contracted third-party staff, could also ensure that remote locations can be adequately served without the expense of on-site officers.

REMOTE AND MULTI-USE SCREENING	
Potential Benefits	
Ease of implementation	



Drone Network

Military and civilian use of unmanned aerial vehicles (UAVs) have the potential to enter niche areas in the U.S.-Canada border environment. Currently, the functional range of battery-powered, rotary-wing drones is limited to the distance and time that can be covered on a single battery charge, typically 7.5 miles or 16 minutes. A start-up company, High Lander, developed a flight-plan solution that uses a network of small drone control towers with landing and recharge capabilities to enable autonomous long-distance and endless flight times for commercial drones. The solution enables drones to potentially travel across borders autonomously and could be used for delivery of packages from distribution centers located in a different country.

The use cases are broad, but could assist in:

- Last-mile high-value package delivery
- Surveillance/mission support for border clearances

The security features of ideas outlined in High Lander also indicate that the future automated clearance before flight departure can be defined and integrated in the drone's unique identifier schema. This will ensure that both the conveyance (drone) and items that are carried are fully pre-cleared before any border crossing.

DRONE NETWORKS	
Potential Benefits	
Ease of implementation	

Blockchain

Blockchain technologies are in their infancy. The potential is significant for any transaction-based system. According to a Santander FinTech study, blockchain technologies could reduce financial services infrastructure cost upwards of \$20 billion per annum by 2022. If applied to the supply chain environment, there could also be the parallel benefit of decommissioning legacy systems and reducing information technology costs

There are to date a handful of pilot projects for goods and people movement. Some of these pilot projects include:

- **Known Traveler Digital ID** project under the World Economic Forum. Canada and the Netherlands are currently creating a trusted traveler program called the Known Traveler Digital Identity, which utilizes blockchain technology. Travelers can use an app to provide border officers with personal information that is stored securely on the block chain.
- **IBM/Maersk pilot project TradeLens** to provide customs authorities in the Netherlands, Saudi Arabia, Singapore, Australia and Peru visibility for international cargo as well as participants in port/terminal operators, shippers, freight forwarders and others in transportation logistics.


Both pilot projects are still in their infancy and maturing to the use of blockchain technology. In brief, the benefits of a private blockchain include an immutable ledger that enables vetted participants to have greater visibility and trust through an entire journey. The ledger itself could act as a container for a range of information, including but not limited to biometrics, scanning images, manifest details, etc. When combined with track-and-trace methodologies such as the capabilities from GS-1 pilot

projects, there can also be the ability to deal with a broad range of commodities, including agricultural products.

While there are inevitable pitfalls to manage, blockchain technology could fundamentally deliver a lower cost, more effective mechanism of reaching a single-window interface for multiple government agencies and the trade community.

It could also act as a mechanism to help a group of countries (e.g. U.S./Canada/Australia/New Zealand/U.K./EU) share visa information to enable a virtual visa/travel authorization system.

Accenture and PwC have conducted studies that estimate the IT cost savings to be between 50% and 70% from implementing blockchain technology. For companies that spend a large amount of their IT budget on maintaining and updating their IT infrastructure, such as banks, blockchain has the potential to drastically change their IT budget.

BLOCKCHAIN	
Potential Benefits	
Ease of implementation	

Real-time Artificial Intelligence Decision-Enabling Solutions

Artificial Intelligence (AI) allows for large amounts of data to be processed and analyzed faster than a human can, which can provide valuable information to real time decision makers. For instance, border security officers can use the information generated from AI to make more informed decisions in a shorter amount of time.

A technology company called LineSight that specializes in advanced targeting analytics for border security, has developed an AI solution. The technology works in real time, processes traveler data, and assess the risk of a traveler. This has the potential to drastically reduce border processing time by assigning travelers a risk rating and categorizing travelers into four groups: no risk, low risk, medium risk, or high risk. Based on these risk scores, the AI informs the officer on how to handle each traveler. This allows for officers to focus their resources on medium and high-risk travelers.

Other related technological trends include augmented reality as well as body-worn cameras.

ARTIFICIAL INTELLIGENCE DECISION-ENABLING SOLUTIONS				
Potential Benefits	■	■	■	■
Ease of implementation	■	■	■	■

Mobile Smartphone Apps

Although kiosk technologies are being phased out in favor of facial biometrics, the proliferation of consumer smartphones means there is a mobile data source for inputs, pictures and other interface with the travel/trade community. For example, CBP has advanced the use of mobile apps for a range of remote clearance activities and also included video interviews. Other applications include enabling land borders to work more effectively with advanced reporting for private vehicles.

While many Android and iPhone models now have on-board biometrics features (FaceID, etc.) and U.S. Mobile Passport Control uses smartphone cameras to scan passport machine-readable pages, more work is needed to expand capabilities. For mobile consumer biometrics to work with border authorities some trust issues and testing will be needed to make sure the system cannot be circumvented. Nonetheless, mobile apps can be rapidly deployed to supplement larger changes to processing.

CBP has also found major gains through remote processing through mobile technologies. ROAM is a model for remote processing using a standard mobile phone app. Additionally, contactless payments are promising to reduce the need for time-consuming handling of cash.

MOBILE SMARTPHONE APPS				
Potential Benefits	■	■	■	■
Ease of implementation	■	■	■	■

Autonomous Vehicles

Autonomous vehicles (AVs) are capable of sensing and navigating their environment using advanced algorithms, cameras, sensors and GPS, removing the need for human input.

It has been forecasted that Level 4 and Level 5 automation will mean trucking and private AVs will be a sizeable market share by 2038.

Vehicles can operate 24 hours a day, stopping only for maintenance and arriving at their destination much faster. A fleet of these trucks can be monitored and controlled by a single person who can track them remotely. Whether it is Tesla, Google, Uber, Lyft or a variety of other developers of automated vehicles, they will offer the ability to:

- Take advantage of tracking capabilities to enable a dedicated lane for self-driving vehicles
- Options to enable clearance before departures
- Other ways of using on-board sensors to meet border crossing/integrity requirements

AUTONOMOUS VEHICLES	
Potential Benefits	<div><div></div><div></div><div></div><div></div><div></div></div>
Ease of implementation	<div><div></div><div></div><div></div><div></div><div></div></div>

Enterprise Cloud Services

In the development of Automated Customs Environment and Automated Customs Information, Canada and the United States have relied on in-house development of systems. Similarly, newer developments such as the systems that support ESTA and eTA are also in-house servers to store and process information.

The reliability and lifecycle replacement challenges of these systems are significant. In general, there are no sustainable or reliable methods to keep legacy systems working.

CBP and CBSA are exposed to deficiencies in system performance. Outages can lead to delays in processing clearances, which can create traffic backlog or long lineups at airports on arrival.

The movement by both governments to have systems hosted on Amazon Web Services (AWS) and/or Microsoft Azure are future enterprise system methods that are increasingly relevant to the U.S.-Canada border environment. Most significantly, AWS is the backbone for the facial biometrics system used by CBP.

ENTERPRISE CLOUD SERVICES	
Potential Benefits	<div><div></div><div></div><div></div><div></div><div></div></div>
Ease of implementation	<div><div></div><div></div><div></div><div></div><div></div></div>

Summary

The Beyond Preclearance Initiative must contemplate not only today's technology but future directions of innovation and ideas that can:

- Change the business model for operations (e.g. remote screening)
- Enable more effective resources
- Provide more security functionality

The use case for each of the eight technologies described in this section cut across all modes, whether used for goods and/or people movement. Some already exist, such as apps for airport/land clearance, and need only be adapted to other modes. Others will take more investment of time, attention and money.

The definition of technology types leads into the core questions for Beyond Clearance: What *processes* are needed to support a \$100-trillion economy, and what are the benefits of these improvements? These will be explored by mode in the next chapter.

Chapter 4: Vision and Flows



*“We will have an airport that would be fully
biometric on the entry and exit side.”*

*Colleen Manaher
Executive Director, Office of Field Operations, U.S. Customs and
Border Protection
March 26, 2018*

The following chapter illustrates the current situation, solutions, and vision for Beyond Preclearance. Process flows were developed to show current processes, key problems, costs, near-term solutions, long-term vision, and high-level benefits from implementing the vision. The flows are categorized as follows:

- 1. Maritime**
- 2. Aviation**
- 3. Rail**
- 4. Land (Vehicles)**
- 5. All Modes and Trusted Programs**
- 6. Transportation Automation**

For each of the modes, the process flows depict the following timeframes:

Current – The typical process that takes place in 2018.

Near-Term – Solutions that may be implemented in the next 2 to 5 years that may include some pilot projects that are already being tested.

Long-Range – A vision for the long-term in 10 or more years that may depend on technology, significant industry shifts or disruptors.

In addition to this, the cost savings were estimated for each mode for goods movement as well as for travelers. For example, border crossing time savings of just a few seconds per vehicle at the land border could have cascading positive effects on border wait times/congestion and result in millions of dollars in savings for value of travel time and/or supply chain delivery timeliness.

1a. Maritime – Goods Movement

International maritime cargo is a diverse range of container, break bulk and other commodities that are linked to supply chain networks in Canada and the U.S. via trucking, rail and short-sea shipping. The fluid flow of these goods into the Canada/U.S. perimeter and between the two countries is of utmost importance to the cargo supply chains for both countries.

While much has been accomplished with securing maritime trade following the events of 9/11 with the establishment of the Container Security Initiative, for example; there are still significant supply chain efficiency gains to be realized through seamless cross-border maritime trade flows. Pushing the borders out in maritime commerce is a key direction in the past two decades that needs to continue in the coming years. Some (e.g. IBM and Maersk) have started to create new models of working with border authorities via blockchain. The underlying set of changes in the U.S.-Canada environment rests with being able to ensure that any clearances can be done overseas, or at first port of arrival to achieve facilitation benefits for any cargo in other modes. The following page highlights some of the current issues in this mode.

Key Issues to Address

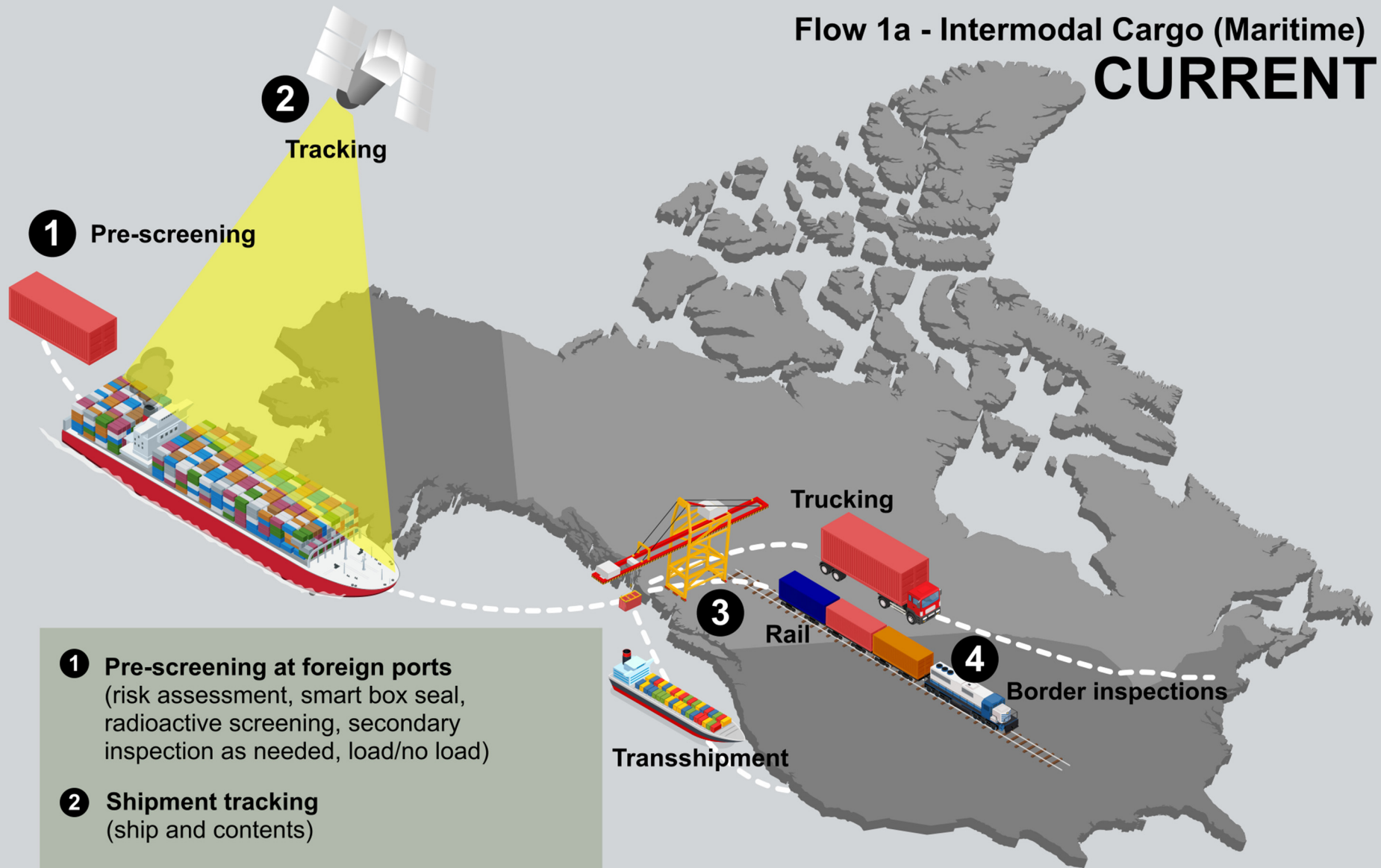
- **Difficulty addressing needs of all agencies** - The primary issue is the ability to address the needs for agencies beyond CBP and CBSA at these foreign ports. Because of the requirements from other agencies such as USDA/AAFC and FDA/CFIA, additional inspections may be required for selected freight containers. Further to the need for inspection, the hours operations may be limited, and their facilities may be located far from the port of entry.

- **International freight stops at the border** - Despite pre-screening that takes place at foreign ports that can include risk assessment, smart box seal, radioactive screening, secondary inspection as needed, load/no load decisions; the conveyances for international intermodal truck and rail cargo must still stop at the border for inspection.
- **Break bulk shipments processed similarly each time** – Break bulk shipments and other homogeneous maritime cargo is often reviewed individually without considering the potentially rich history of transactions for the same product from the same shipper, same freight forwarder, and same consignee. Data collected for shipment transactions should be used to establish whether shipments can undergo considered low-risk and be processed in an expedited fashion without necessarily being part of a trusted trader program.

Costs to Government/Industry

- **Multiple data submission points** - With over 55 different U.S. and Canadian agencies potentially requiring information to be submitted for a given shipment, the U.S. International Trade Data System (ITDS) is intended to establish a single window through which the data required by government agencies for international trade transactions may be submitted by the trade. There are still significant improvements that can be made to provide a truly integrated process that eliminates duplication by government agencies as well as administrative duplication by industry for both sides of the border.

Flow 1a - Intermodal Cargo (Maritime) **CURRENT**



- 1 Pre-screening at foreign ports**
(risk assessment, smart box seal, radioactive screening, secondary inspection as needed, load/no load)
- 2 Shipment tracking**
(ship and contents)
- 3 Intermodal transfers: Transshipments, rail, trucking**
- 4 Additional border inspections**

Near-Term Solutions

The solutions proposed in the near-term for intermodal maritime cargo and their corresponding benefits are as follows:

	Solution	Description	Benefits
1	Single window U.S.-Canada	Improvements to commercial interface systems to obtain a true single window for all U.S.-Canada agencies to reduce duplication.	Reduce administrative transaction costs by industry and border agencies
2	Traceability solutions	Full implementation of traceability solutions such as the GS1 trustmark for goods for accurate and credible product origin.	Standardize and accurate origin information
3	Electronic Chain of Custody and traceability	Use of ECoC smart locks to provide security, tracking, and traceability.	Provides means for trusted in-bond movements
4	Blockchain digital supply chain	Blockchain distributed ledger system used for all supply chain transactions to provide immutable ledger system.	Transparency, traceability, and trust for transactional data.
5	Green lane	Green lane off-load of cargo from ships and no longer a requirement for goods to stop at physical border between U.S.-Canada.	Reduces duplicated inspections for low-risk cargo.

Long-Range Vision

To augment the set of solutions in the near-term, additional functionality is beneficial for both Canada and U.S. through investments in new technologies. A sixth area is as follows:

	Solution	Description	Benefits
6	Large-scale imaging	Large-scale imaging shared between U.S. and Canadian agencies at point of origin or through devices built into materials handling equipment.	Increased security that is seamless and does not impede flow.

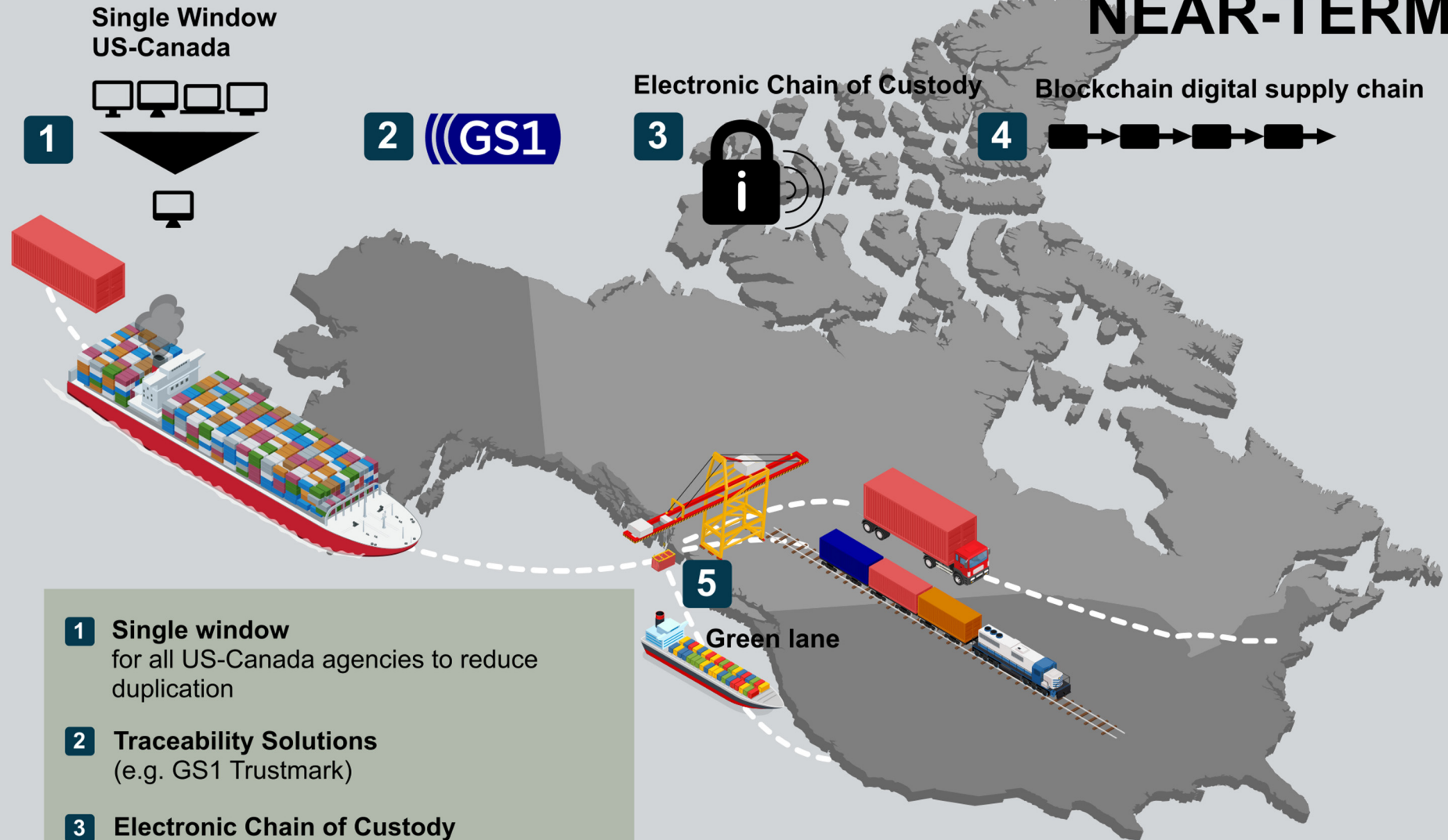
Implementation Considerations

The platform for large scale imaging overseas, or at the first port does require further work to be able to create an appropriate concept of operations to enable interoperability between countries and between agencies.

As well, the ability for technologies to be created that achieve both screening for contraband as well as the ability to help detect issues or anomalies for organic-based substances. A single scan that can contribute to multiple-purposes requires more testing and investment before widespread implementation.

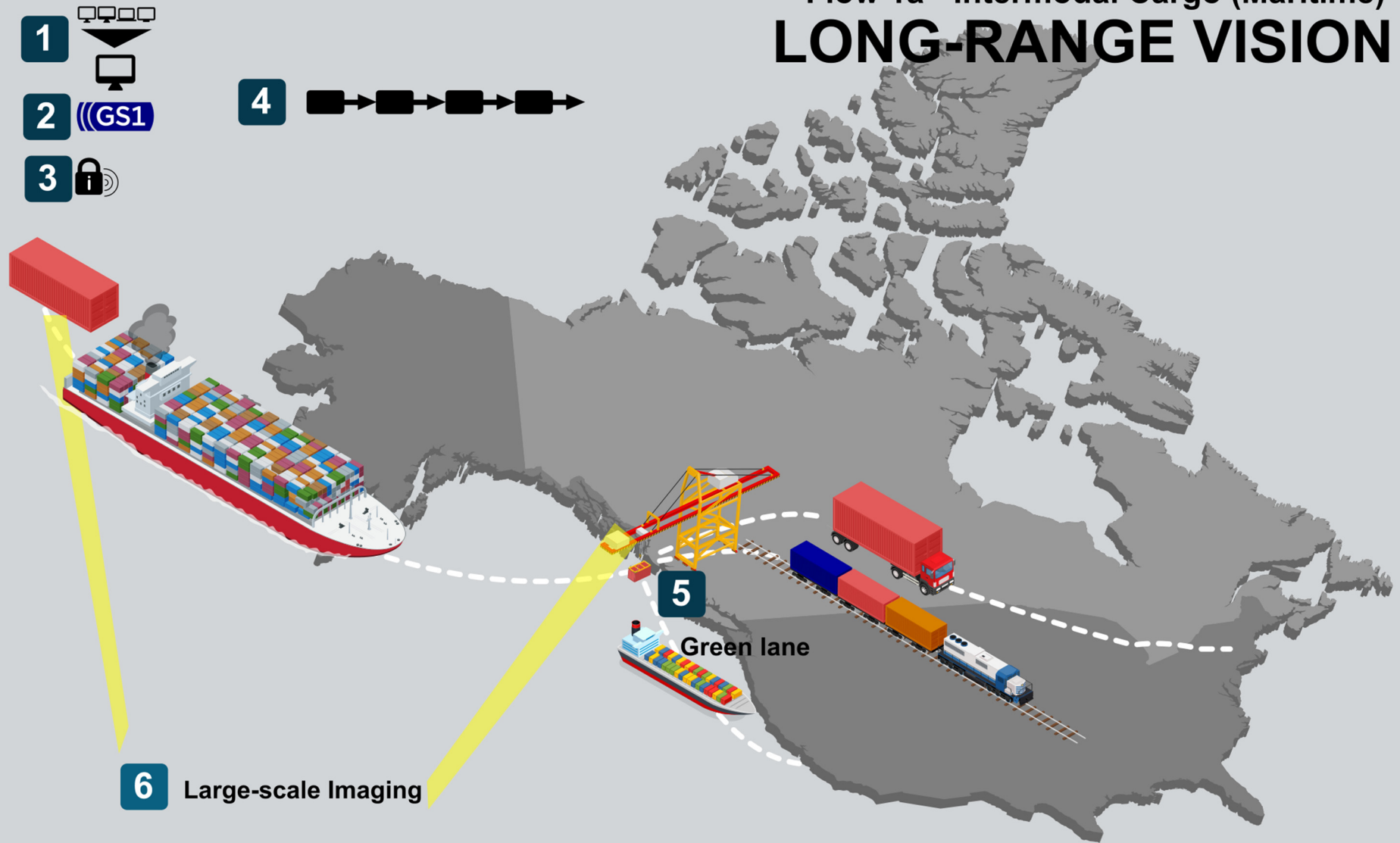
Flow 1a - Intermodal Cargo (Maritime)

NEAR-TERM



- 1 Single window**
for all US-Canada agencies to reduce duplication
- 2 Traceability Solutions**
(e.g. GS1 Trustmark)
- 3 Electronic Chain of Custody**
and traceability (smart locks)
- 4 Blockchain**
used for all supply chain transactions
- 5 Green lane off-load**

Flow 1a - Intermodal Cargo (Maritime) **LONG-RANGE VISION**



1b. Maritime - Traveler

The traffic volume of cruise passengers in the U.S. and Canadian markets continues to grow substantially with 12.9 million cruise passengers last year according to Cruise Lines International Association. There are considerable opportunities to consolidate border processing for cruise routes operating between the U.S. and Canada.

With six cruise lines evaluating biometric solutions to work with U.S. Customs and Border Protection, as well as on-board biometrics introduced as part of the on-cruise experience, there are major directions already advanced for technological adoption. In 2018, the testing of entry biometrics in Bayonne, New Jersey proved successful and there will be more possibilities to facilitate cruise processing.

As well, the *2015 Land, Rail, Marine and Air Transport Preclearance Agreement* (LRMA) between Canada and the U.S. allows for Preclearance to take place at cruise terminals for travel either into the U.S. or into Canada. Cruise ports, such as Port of Vancouver, are preparing for the implementation of the agreement and subsequent upgrade of its U.S. border processing from Pre-inspection to full Preclearance.

Key Issues to Address

- **Available information from flights not used** – The vast majority of cruise passengers fly to and from the embarkation and debarkation ports. The passenger information that is submitted to airlines and received by government agencies can be used for border processing at ports. Currently, this information is not shared/used between these separate modes, despite being part of the cruise passengers same overall travel itinerary.
- **Duplicative border processes** – With most cruise passenger flying between the U.S. and Canada to board cruise ships or upon debarkation at the end of their trip, passengers will often undergo border processing through both countries' border agencies multiple times in one trip. This duplicative processing presents an opportunity to streamline the arrivals and departures experience, with cruise-air and air-cruise transfers.

Anticipated Cost Savings for Maritime

The anticipated cost savings for maritime were estimated from the implementation of all the near-term solutions and long-range vision.

Maritime – Goods Movement

While the removal of U.S./Canada border processing requirements for intermodal transfers will result in significant cost savings, they will generally accrue to these other modes (i.e. rail and land border). The main financial benefits to the maritime industry will be improved process times, reduced data submission requirements, fewer transactional errors, and higher trust in information/data.

The estimated savings were calculated by considering factors that impact annual operating costs such as:

- Number of twenty-foot equivalent units into the U.S. and Canada
- Number of transactions
- Estimated border process time savings
- Supply chain value of delays and uncertainty
- Administrative time/cost

Estimated Annual Cost Savings for Maritime Cargo (USD millions)	\$1,245 M per year
--	---------------------------

There also some potential capital cost savings from reduced space and equipment requirements for border processing.

Maritime – Travelers

It is anticipated that with the implementation of Beyond Preclearance recommendations, the need for border processing for cruise passengers traveling between Canada and the U.S. (i.e. Alaskan and North Eastern U.S./Atlantic Canada cruises) will be eliminated. This results in both annual cost savings to industry and travelers as well as reduced capital expenditures for border processing facilities.

The estimated annual savings were calculated by taking into account the following:

- Number of cruise passengers
- Ratio of crew to cruise passengers
- Estimated border wait and process time savings
- Value of travel time

Estimated Annual Cost Savings for Maritime Cruise (USD millions)	\$5.1 M per year
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The capital costs savings from cruise terminals would stem primarily from potentially no longer needing border processing facilities for some ports in which cruise routes are primarily between Canada and the U.S. only (e.g. Seattle, Bayonne, Bar Harbor, Vancouver, Halifax, Saint John).

2a & b. Aviation – Goods Movement

Air cargo represents approximately 35% of the value of all international trade, but it makes up less than 1% of the global trade volume. The goods transported by air are typically high value and/or perishable items. The fluid flow of these goods into the Canada/U.S. perimeter and between the two countries is of utmost importance to the cargo supply chains for both countries.

Both countries have in-bond programs to allow for transit programs to work for goods. In general, the in-bond process allows imported merchandise to be entered at one port of entry without appraisal or payment of duties and transported by a bonded carrier to another port of entry or other authorized destination. At the destination port, the merchandise is entered or exported.

Current provisions help to facilitate air-air transit for cargo, so long as there is a set of border controls at the next airport, or a bonded/sufferance warehouse. Air-truck movements are more challenging.

Key Issues to Address

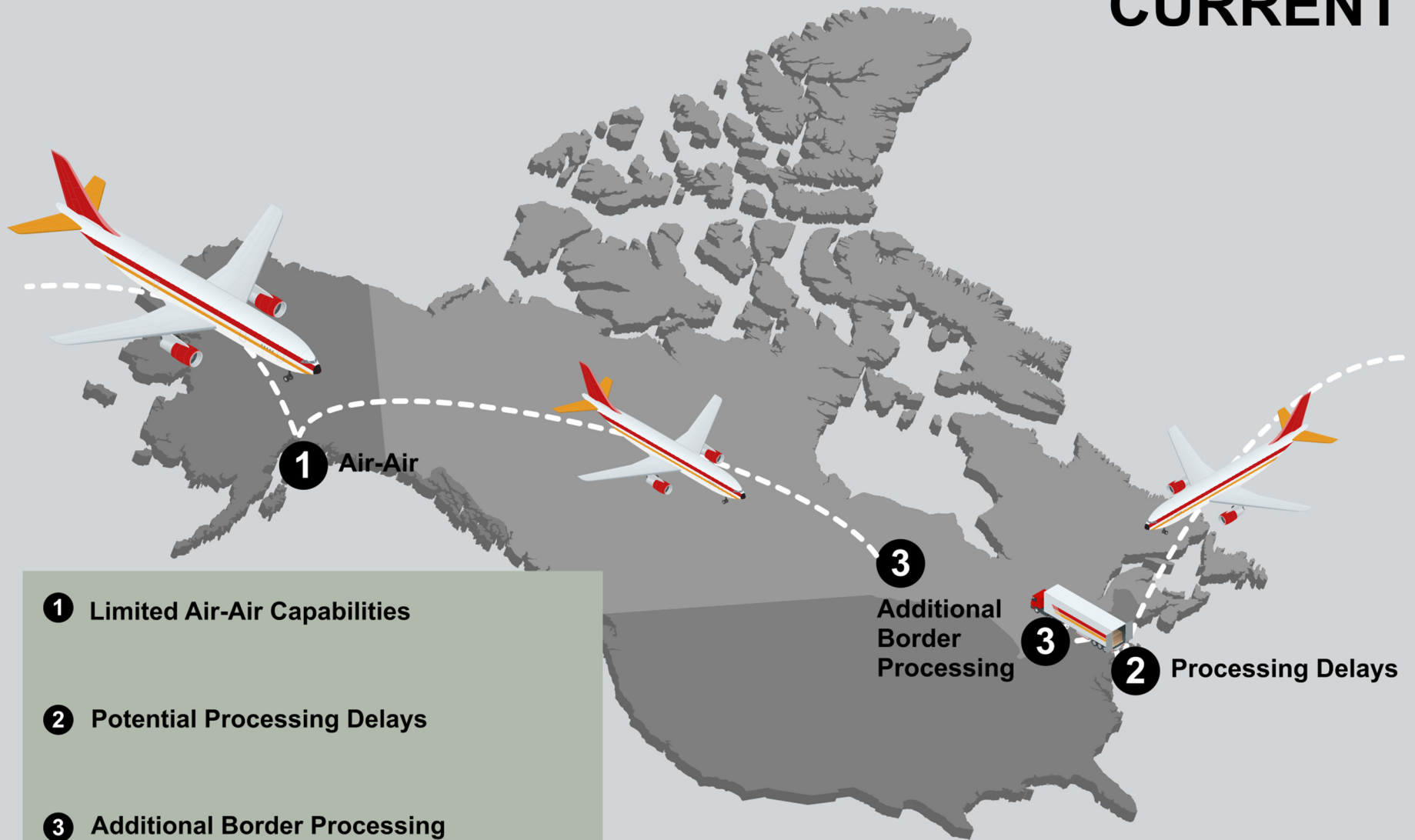
- **International freight stops at the border** - Despite pre-screening that takes place at foreign ports, subsequent intermodal connections for air and truck must still stop at the border/subsequent airport for inspection.
- **Model for Preclearance** – the ratification of the Preclearance Agreement allows for cargo preclearance northbound, but not southbound. Even if authorities were granted, there is a significantly higher complexity in achieving preclearance for certain commodities such as agriculture.

Costs to Government/Industry

- **Flexibility in the supply chain** – the current in-bond system for air cargo is appropriate for the kind of movements that enable air-air and air-truck transfers. However, the ability for air logistics centers to evolve requires a much greater view towards enabling options for routing. Air cargo flows like water and cargo diverted to trucks from the air mode (and vice versa) is the kind of flexibility that the supply chain is using to ensure capacities are managed to demand. This is occurring in real-time but the system for transit movements is not structured in this fashion
- **Multiple data submission points** – Similar to maritime cargo, with more than 55 different U.S. and Canadian agencies potentially requiring information to be submitted for a given shipment, the U.S. International Trade Data System (ITDS) is intended to establish a single window through which the data required by government agencies for international trade transactions may be submitted by the trade, for example. There are still significant improvements that can be made to provide a truly integrated process that eliminates duplication by government agencies as well as administrative duplication by industry.

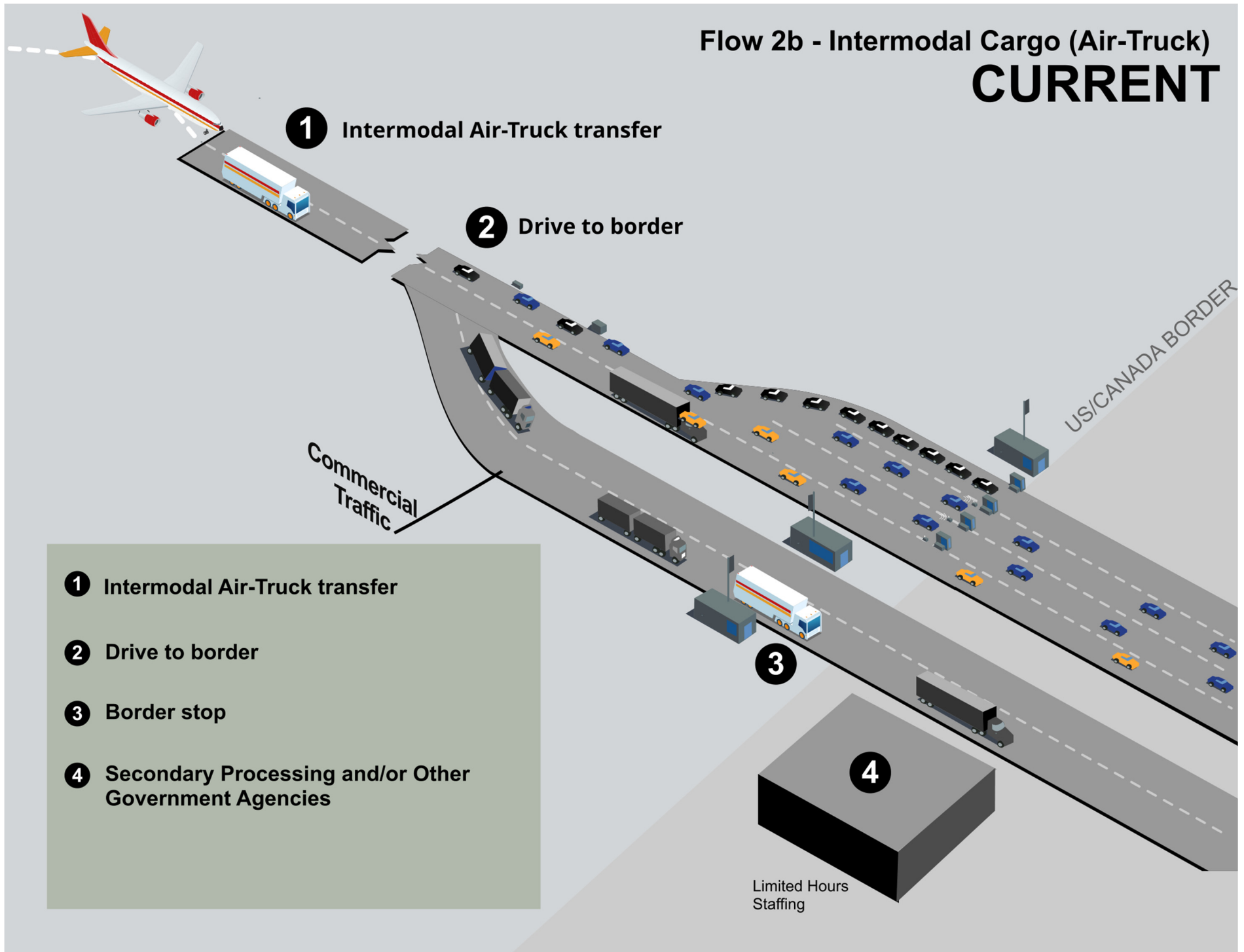
Flow 2a - Intermodal Cargo (Air)

CURRENT



- 1 Limited Air-Air Capabilities**
- 2 Potential Processing Delays**
- 3 Additional Border Processing**

Flow 2b - Intermodal Cargo (Air-Truck) **CURRENT**



Near-Term Solutions

The solutions proposed in the near-term for intermodal air cargo and their corresponding benefits are as follows:

	Solution	Description	Benefits
1	Air-Air/Tail-to-Tail transshipments	Goods can move directly from one aircraft to another aircraft with holds only on an exception basis.	Ensures speed of air cargo and time sensitivity of perishable items.
2	Air-Truck Tail-to-Trailer transshipments	Goods can move directly from an aircraft to a truck trailer with holds only on an exception basis.	Ensures speed of air cargo and time sensitivity of perishable items.
3	Free flow within perimeter	Cargo is screened once at origin, and accepted multiple times (i.e. by all government agencies) to allow goods move between U.S. and Canada seamlessly	Reduces duplication and ensures high value/perishable goods can be delivered quickly
4	Free Trade Zones	Establish Free Trade Zones (FTZs) at airport sites to enable value-added activities to occur before transit to another country.	Provides economic benefits to communities surrounding the airport.

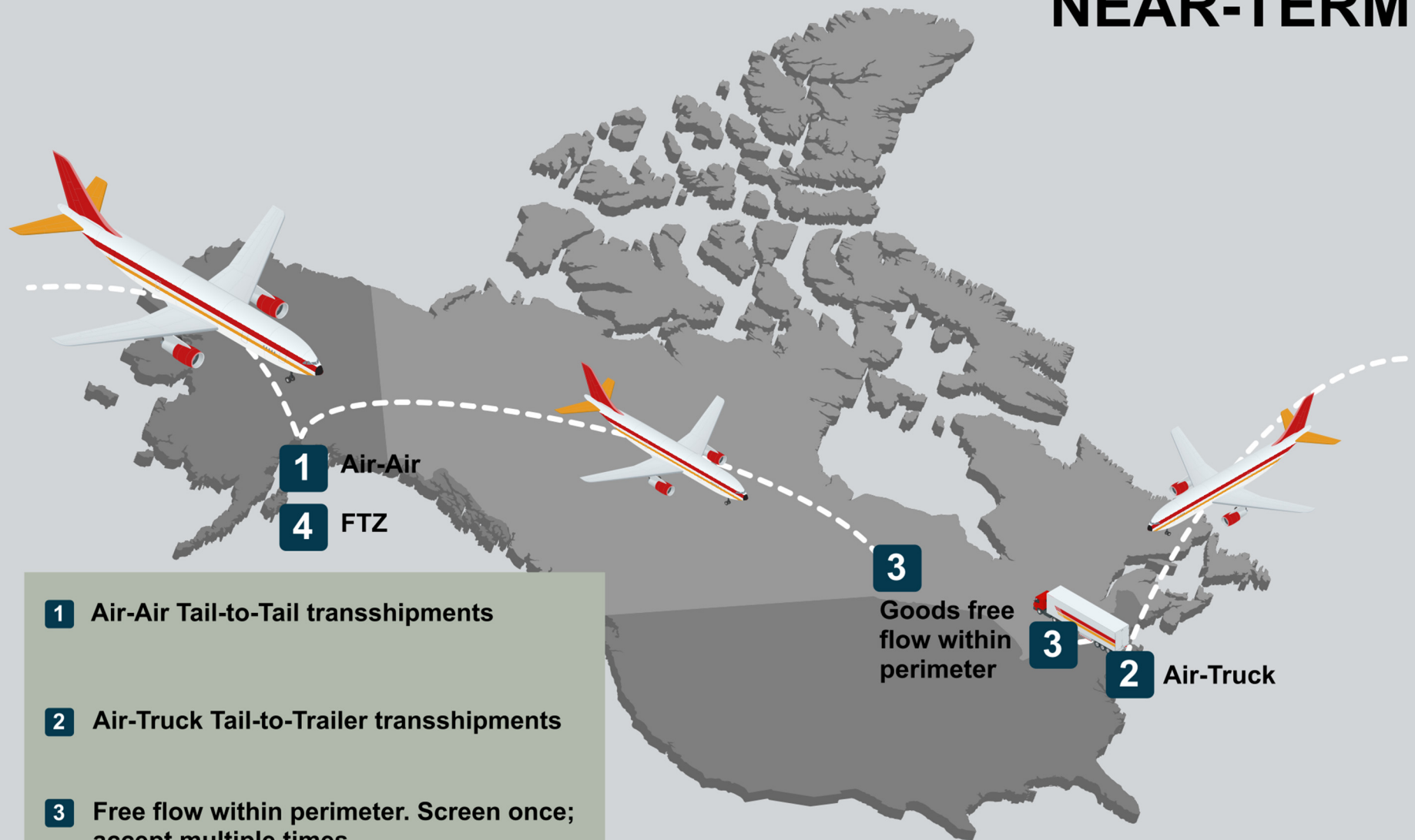
Free Trade Zones (FTZ) are designated areas in a country in which goods can be traded or altered without the imposition of typical trade barriers such as customs quotas and tariffs. FTZs are most often established in locations that provide a geographic advantage for trade such as at major transportation hubs (airports, maritime ports). Typically, FTZs will act as manufacturing hubs in which raw materials or components are imported, goods are assembled within the FTZ, and are finally exported to a different country as a finished good. The establishment of an FTZ will often bring new business to a region and stimulate the local economy.

Free Trade Zones in the United States are reportedly increasing in relevance with the resurgence of trade tariffs. The mechanisms developed for use in Canada needs to be reviewed and updated to be able to ensure that limited value-added for immediate export could be leveraged without administrative, trade or supply-chain complexity.

Further to this, FTZ rules are limited and complex. The rules should be revised to be more flexible and less cumbersome.

Flow 2a - Intermodal Cargo (Air)

NEAR-TERM



- 1** Air-Air Tail-to-Tail transshipments
- 2** Air-Truck Tail-to-Trailer transshipments
- 3** Free flow within perimeter. Screen once; accept multiple times.
- 4** Free Trade Zones

Near-Term Solutions

The near-term solutions for intermodal air to truck cargo and benefits are as follows:

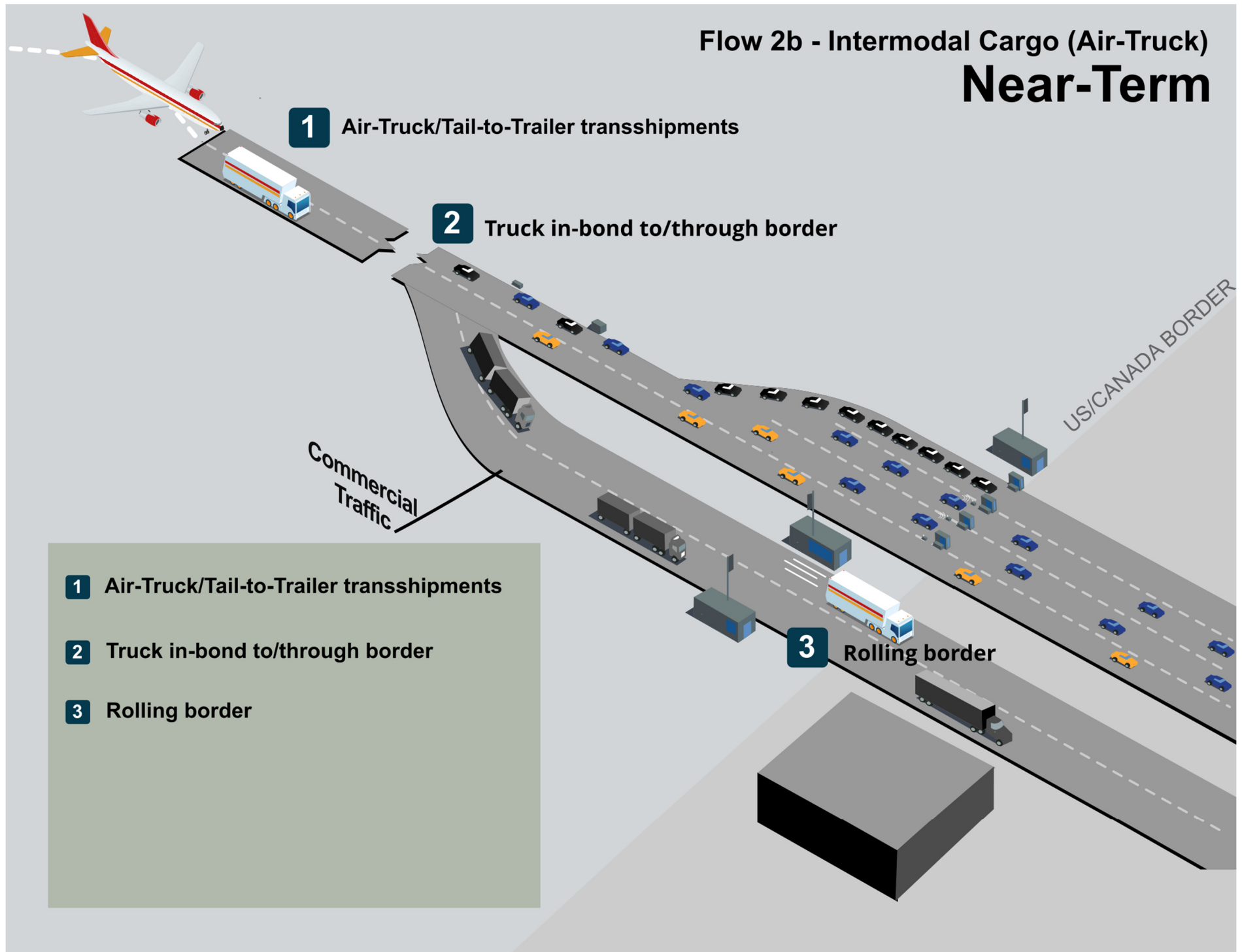
Solution	Description	Benefits
1 Air-Truck/Tail-to-Trailer transshipments	Goods can move directly from an aircraft to a truck trailer with holds only on an exception basis.	Ensures speed of air cargo and time sensitivity of perishable items.
2 Truck in-bond to/through border	Goods are considered in-bond while traveling along surface roads to and through the border.	Enables a rolling border solution to be implemented.
3 Rolling border	In-bond trucks arriving at the land border can roll through the border without stopping.	Reduces duplication and ensures high value/perishable goods can be delivered quickly and are unimpeded.

Long-Range Vision

The vision for the long-term for air to truck cargo and their corresponding benefits are as follows:

Solution	Description	Benefits
1 Automated truck platooning from the airport	Provide infrastructure to allow truck platooning (i.e. series of automated trucks led by a “master” truck) from the airport.	Increases transportation capacity and reduces reliance on truck drivers.
2 Fully automated vehicle lane	Automated vehicles use a dedicated/secure lane for transportation of goods and people.	Increases supply chain security and provides faster, more seamless, and safer road transportation.
3 At-speed border crossing	Border processing for trucks can take place at-speed. Border clearance is performed at the origin (i.e. automated truck does not drive to the border unless cleared)	Free-flow across the border and reduces duplicative border processing operations and infrastructure.

Flow 2b - Intermodal Cargo (Air-Truck) Near-Term



1 Air-Truck/Tail-to-Trailer transshipments

2 Truck in-bond to/through border

3 Rolling border

Flow 2b - Intermodal Cargo (Air-Truck) **LONG TERM**

1 Designed for automated truck platooning from airport



2 Fully Automated Vehicle Lane

3 At speed crossing without stopping

(Clearances done at origin)

2c. Aviation – Visa & Passenger Information Screening

Visas and passenger information screening have significantly improved over the past two decades. Biometrics, additional methods of electronic information submission as well as use of third party visa application centers have dramatically improved processing.

Yet, more work remains. U.S. and Canada have significantly higher wait times to process visas compared to other countries. Others have eliminated visas outright for growing tourism markets such as China. While Canada and U.S. have significant reasons to maintain control and screening of foreign nationals, there are improvements to help reduce the uncertainty of whether an individual should spend the money to become a tourist or connect through either country to a final destination.

Key Issues to Address

- **Uncertainty of approvals** - With authorization from multiple agencies, travelers face uncertainty from receiving approval from each agency. To avoid this uncertainty, travelers may choose other destinations that require fewer approvals or a simpler authorization process. This results in loss tourism and business travel revenue for U.S. and Canada versus other jurisdictions (e.g. Europe).
- **Limitations of places to collect biometrics** – Unlike other countries, U.S. and Canada have fixed locations within a country to collect biometrics – whether it is an embassy, consulate or, in the case of Canada, a third part visa processing center. While there are trust issues with

biometrics collected from consumer devices, several solutions are being used to collect information and use processes to fully combat fraudulent document/identity issues.

- **Duplicate traveler applications** - For transit passengers, apart from the Canadian Transit Without Visa program, travelers must submit applications for a visa and authorization from agencies like eTA, ESTA or EVUS, which request the same information from travelers. The duplication of traveler authorization for separate agencies creates costs for each agency that could be eliminated.
- **Visa wait times** - Wait times are variable and depend on the budgetary limitations within each source country.

Costs to Government/Industry

- **Application and response costs** - Travelers spend a significant amount of time providing the same information for different applications. These costs could be greatly reduced with a single window application that all agencies use.
- **Lost visitations** - U.S. and Canada are in a highly competitive market for new visitors. To ensure that both countries compete effectively, particularly for two-nation vacation (e.g. Niagara Falls, Victoria-Seattle-Vancouver), there are costs for potential loss of visitors, relative to the available seat capacity for traffic from high growth markets such as China

Flow 2c - Visa & Passenger Information Screening **CURRENT**

1 Apply to eTA and/or Visas

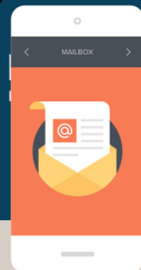


2 Get Confirmation



Apply to ESTA or EVUS **3**

4 Get Confirmation



5 Purchase Airline ticket(s)



Near-Term Solutions

The solutions proposed in the near-term for travel authorizations and their corresponding benefits are as follows:

	Solution	Description	Benefits
1	Single window ESTA/eTA application	Provide a single window for U.S. ESTA and Canadian eTA application(s)	Reduces duplicative application process for travelers

Near to Long-Term Solution

The vision for the long-term for travel authorizations and their corresponding benefits are as follows:

	Solution	Description	Benefits
1	Travel authorization and visa applications integrated with travel reservation system	All visa and travel authorization applications are submitted through a single interface for all travel reservations (i.e. airline ticket, hotel, car rental, etc.)	Reduces duplicative application processes for travelers

Flow 2c - Visa & Passenger Information Screening **NEAR TERM**

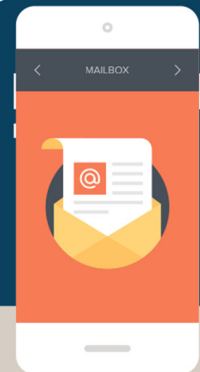
1 Apply to eTA and ESTA and/or Visas



1 Single window US ESTA and Canadian eTA application

Get Confirmation

2



3 Purchase airline ticket(s)



Flow 2c - Visa & Passenger Information Screening NEAR TO LONG TERM

1 Apply to ESTA/eTA and/or Visas and Purchase Airline Ticket Together



2d & e. Aviation – Air Travel

There are more than 275 million enplaned and deplaned international passengers through Canadian and U.S. airports annually, including passengers flying between the two countries. With the volume of air traffic forecasted to more than double in the next twenty years, the problems and costs for the aviation industry will only be compounded if not addressed. Significant advances occurred in 2018, with early reports from biometric entry processes in the United States (e.g. Los Angeles, Miami, San Jose, etc.) creating upwards of 50% throughput rate increases over current automated kiosk processing models. As a result, the near-term view is an aggressive change that helps with both arrivals to U.S./Canada or transiting through to another country.

Key Issues to Address

- **Common biometric approach** – The successes in the United States for the move to 100% biometrics on arrivals is revolutionizing the way airports are operating for arrivals clearance. A joint U.S.-Canada approach is needed to ensure that the capabilities are also implemented for Preclearance as well as for other processes (e.g. transit).
- **Inefficient use of existing data** - Despite the availability and duplication of biographical data and other information that is held by government agencies, airlines, airports, and industry stakeholders; there is inefficient use of available data for processing passengers. While there is significant border information sharing between countries (e.g. traveler entry information used for exit purposes at the land border), government agencies from the same country still use duplicative systems (e.g. Electronic Travel

Authorization system and Advanced Passenger Information/Passenger Name Record).

- **Further facilitation of transit traffic** - Significant advancements have been made to facilitate air passenger transit traffic in Canada recently. Additional opportunities exist for international air transit passengers who are not entering the country (e.g. who have a requirement for a transit or standard visa). For example, for passengers traveling from Asia to South America, these additional requirements decrease the desirability of using U.S. and Canadian airports as connecting hubs for their flight routing. Avoiding Canadian and U.S. airports results in loss of air passenger traffic to other international hubs, such as in the Middle East and Europe.

Costs to Government/Industry

- **Transactional duplication** - Travelers must undertake multiple transactions for bookings and visas/ESTA/eTA applications. This creates redundant transactions for travelers as they must provide the same information to multiple government agencies and companies through different portals. Each government agency and company incur a direct cost for maintaining their system and independently collecting/processing this information.
- **Lost traffic and low aircraft loads** - Uncertainty and risk are created for travelers when multiple visa approvals are required for different countries. Travelers are less likely to use a U.S. or Canadian airport as a connecting point as a result. Travelers mitigate this uncertainty and risk by taking direct flights and avoiding connecting flights or by using alternative international hubs.

- **Inefficient government resource usage** - Low and high-risk travelers are not differentiated from one another and undergo a homogenous transaction. This results in a higher average cost per transaction as low risk traveler transactions require the same amount of resources that a high-risk traveler transaction requires. Through streamlining low risk travelers, resources can be reallocated towards other efforts such as reviews of higher risk travelers while also freeing capacity in the system.

International Aviation Arrivals Primary Processing TECHNOLOGICAL EVOLUTION

1971- Primary Booths (Canada & US)



2006 & 2012-Present Border Kiosks (US & Canada)

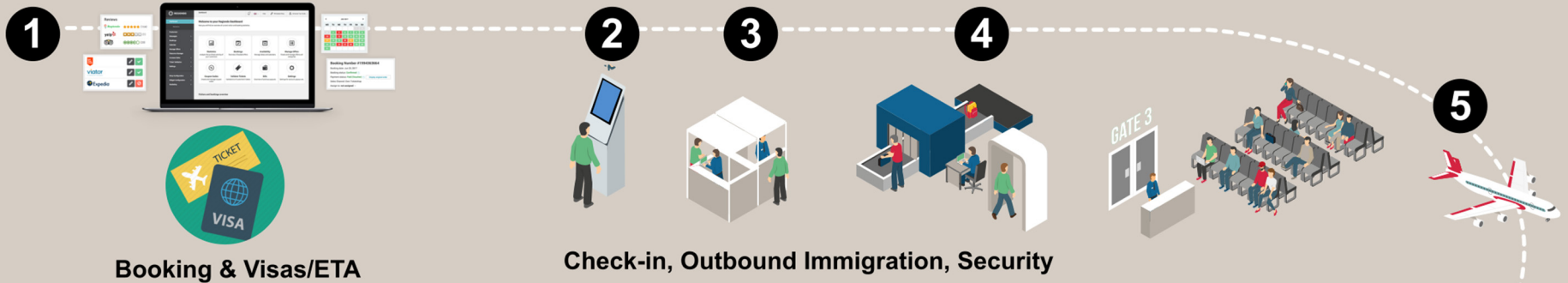


2018- Biometrics (US only)



Flow 2d - International Aviation Transit **CURRENT**

Origin (e.g., Asia)



Connecting Airport
(US or Canada)

Destination (e.g., South America)



Near-Term Solutions

The near-term solutions proposed for air travel connections and benefits are as follows:

	Solution	Description	Benefits
1	Single window ticket-biometric visa or ETA	A single window interface is provided for the airline ticket and biometric visa or electronic travel authorization.	Reduces repeated data entry and reduces error for traveler, airlines, and government.
2	Board/No-Board	A dynamic board/no-board system is implemented that is based on passenger information.	Increases border and aviation security.
3	Kiosk or free-flow	Use of kiosks or free-flow of passengers for connection border processes using advanced passenger information submitted at check-in.	Allows faster, more seamless connections for traveler and airlines.
4	Third country visa recognition	Recognize final destination or third-country visas in place of transit visa.	Reduces additional transaction processing for travelers leaving the country
5	One-stop security	Recognize passenger screening from origin airport to allow faster connection process.	Allows faster connections for traveler and airlines and reduces duplicative process.

Near to Long-Term Solutions

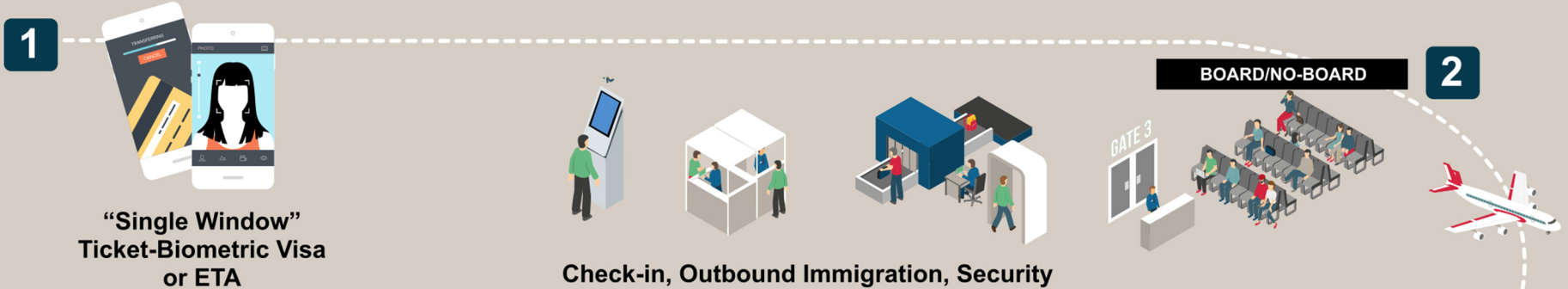
Additionally, there is a long-term vision proposed for biometric token solutions which includes destination countries (e.g. Latin America, Asia). The Canada/U.S. portion should be achievable in the near term, but other countries may need more time to deal with legislative/regulatory requirements mandating air carriers to have passports as a default document type.

Consequently, the proposed vision for the long-range for air travel and their corresponding benefits are as follows:

	Solution	Description	Benefits
1	Biometric token	Use of a single biometric token created upon check-in for all processes (self-bag drop, outbound immigration, security, self-boarding, free-flow connections, and destination arrival border processing). A solution for the requirement for passengers to physically hold a valid passport when traveling must also be developed.	Enables a seamless door-to-door travel experience while enhancing security.

Flow 2d - International Aviation Transit **NEAR-TERM**

Origin (e.g., Asia)



Connecting Airport
(US or Canada)

5 One-stop
Security

3 Kiosk
or Free-flow

4



Destination or
Third-country Visa Recognition
In Place of Transit Visa

Destination (e.g., South America)



Flow 2d - International Aviation Transit NEAR TO LONG TERM

Origin (e.g., Asia)



"Single Window"
Ticket with Merged
Visa/ETA Product

1



BIOMETRIC TOKEN

BOARD/NO-BOARD



Self-Bag Drop, Free-Flow Outbound Immigration and Security

Connecting Airport
(US or Canada)

One-stop
Security

Free-flow



Destination or
Third-country Visa Recognition
In Place of Transit Visa

Destination (e.g., South America)

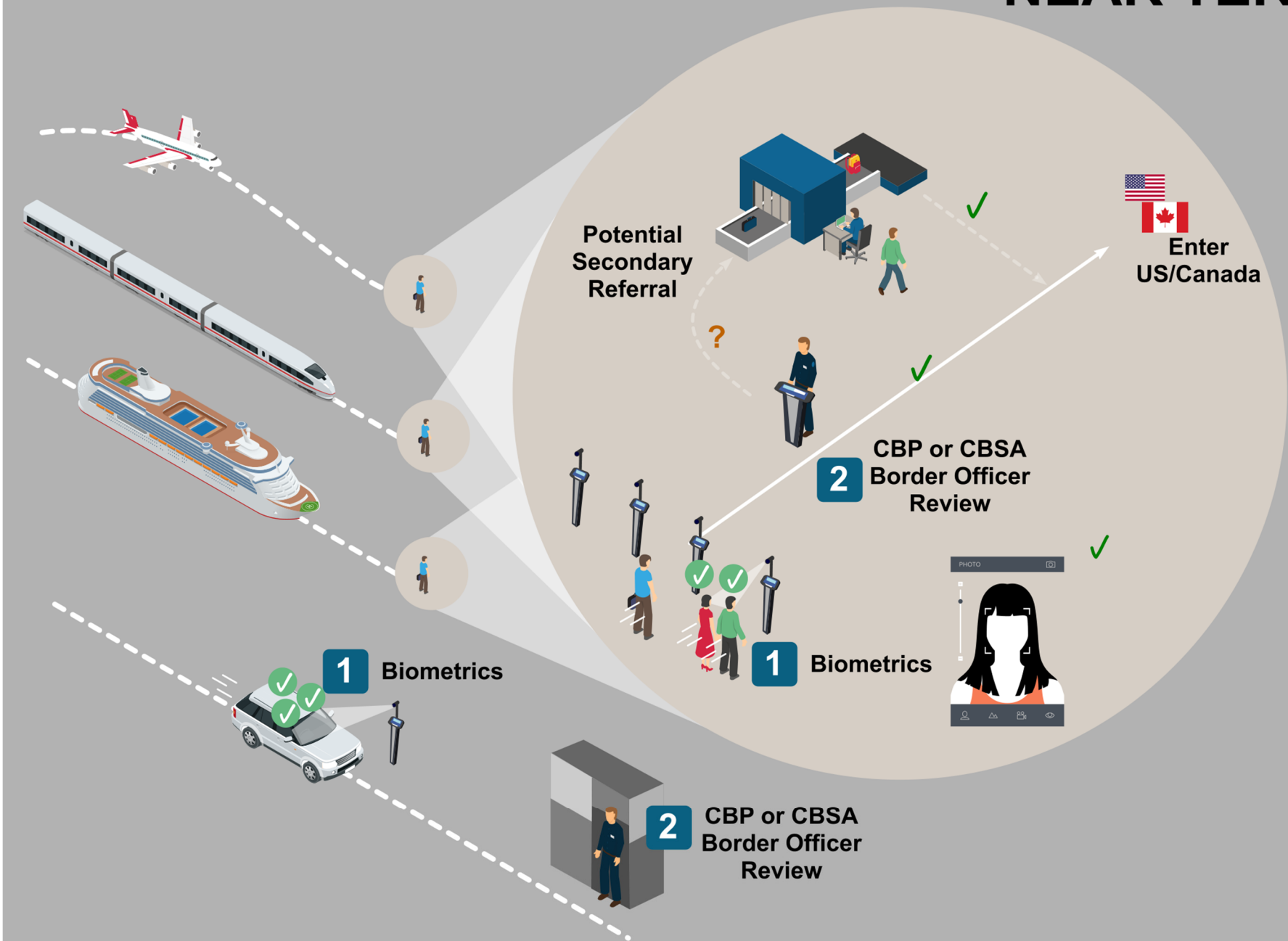


Near-Term Solutions

The near-term solutions proposed for international arrivals (whether for air, cruise, rail, or personal vehicle passengers) is as follows:

	Solution	Description	Benefits
1	Biometrics	Create an opt-in system through Immigration, Refugees and Citizenship Canada to make Canadian passport holder biometrics available. At the international arrivals hall, traveler biometrics are captured via advanced cameras that work for travelers who are in motion, for groups, and through vehicle windshields. Biometric identification/ verification takes place just before the traveler appears at the border officer.	Use of technology to increase processing capacity and ensure free-flow of travelers.
2	Border Officer Review	CBSA or CBP border officer reviews the biometric Primary processing result. Travelers are directed to Secondary as required.	Increases border security.

Flow 2e - International Arrivals **NEAR TERM**



2f. Aviation – Air Travel Joint Preclearance

The U.S. has adopted an aggressive target to expand U.S. Preclearance to reach 33% of passengers precleared (from the current 18%). New sites in Sweden, Netherlands and the Dominican Republic are expected in the coming years, along with dozens of other sites based on two rounds of calls for proposals.

Canada too has committed to expanding Preclearance in the coming years, to land, rail and marine modes of transportation, as well as cargo. Air preclearance could also be developed at U.S. airports for flights to Canada.

Key Issues to Address

Strategy for international Preclearance - There is an opportunity to add functionality to U.S. Preclearance to process flights bound for Canadian airports. This includes expanding market reach to places that CBP already serves (e.g. Nassau, Aruba, Dublin).

Model for Canadian preclearance - Electronic preclearance may be a model that is pursued to virtually clear passengers destined for Canada from foreign airports.

U.S. overseas preclearance expanding - With the number of U.S. CBP officers increasingly being deployed at preclearance airports, the potential capacity during non-peak times for processing Canadian bound travelers also increases. This provides an opportunity for joint processing or oversight overseas to leverage U.S. and foreign airport investment.

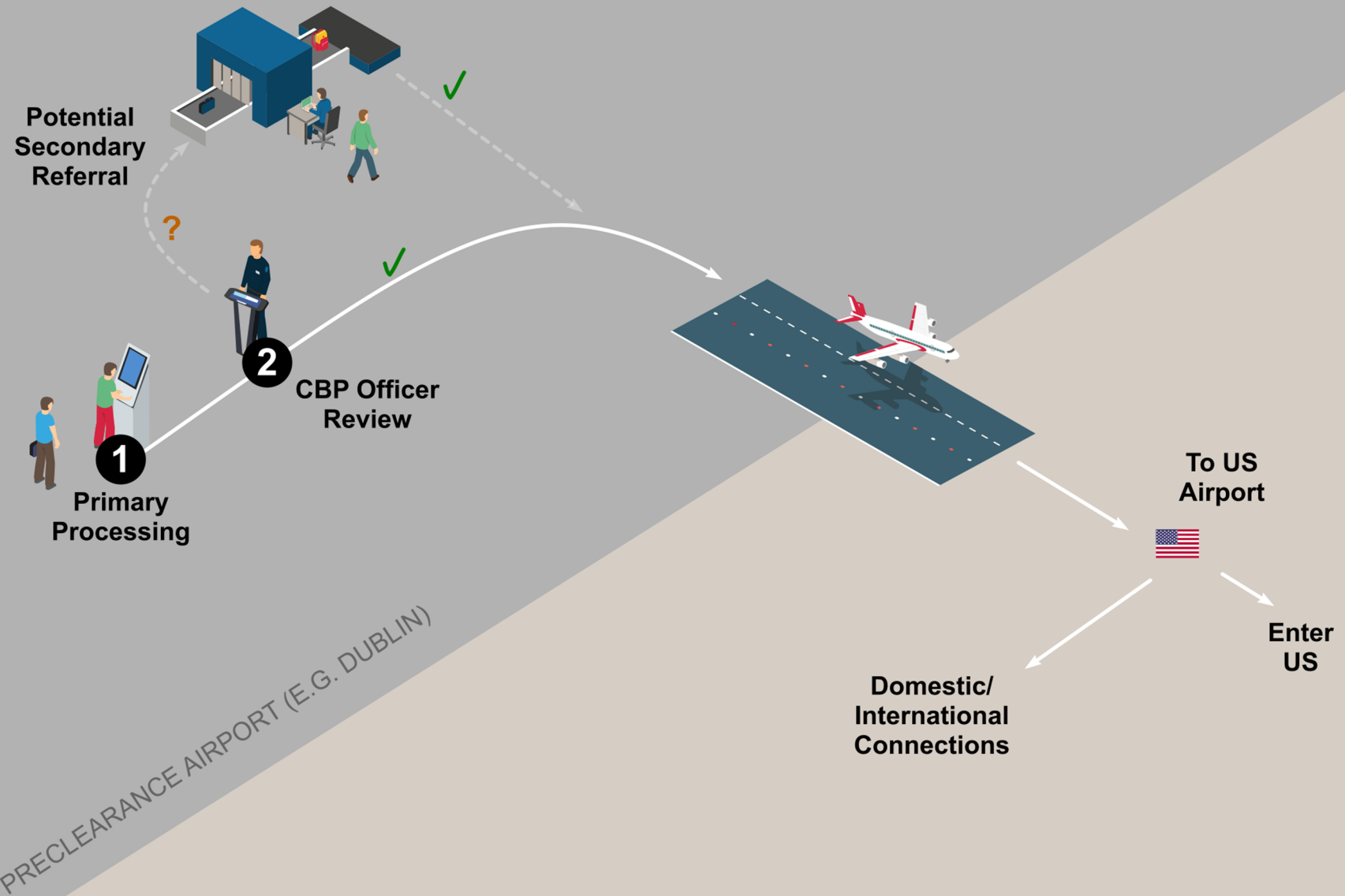
Costs to Government/Industry

Market access limitations - At smaller and medium sized airports there are a limited number of CBSA officers. This constrains airlines' block times to certain days of the week and time periods limiting the departure and arrival times at other airports.

Time savings - Preclearance for international travelers into Canada is not currently available. There could be time savings arising from shorter connection times and fewer departure delays during peak hours caused by congestion for border processing. In addition to saved time for travelers and airlines, there are also time savings to meet limitations for CBSA processing within Canada.

Terminal space - International arrivals halls currently occupy significant portions of terminal space. If passengers are precleared, less terminal space may be required for international arrivals since these passengers would be arriving domestically.

Flow 2f - US Preclearance Model **CURRENT**



Near-Term Solution

The near-term solutions for joint preclearance at a foreign airport (e.g. Dublin) into Canada and its benefits are as follows:

	Solution	Description	Benefits
1	Country-specific screens	Automated Passport Control kiosks can switch between U.S. and Canadian processing	Technology solution for flexibility in operations to make best use of lulls in passenger traffic
2	X-ray images transmitted to Canada	Remote Secondary processing of passengers checked bags can be performed with x-ray images	Technology solution that allows virtual processing/screening to take place
3	Video Secondary with CBSA	The Secondary interview may take place with CBSA via video with oversight by CBP	Technology solution that allows virtual processing/screening to take place
4	Airline gate biometrics	Access to boarding gates takes place via eGate biometric identification and confirmed board/no board decision by CBSA	Increases border and aviation security

Long-Range Vision

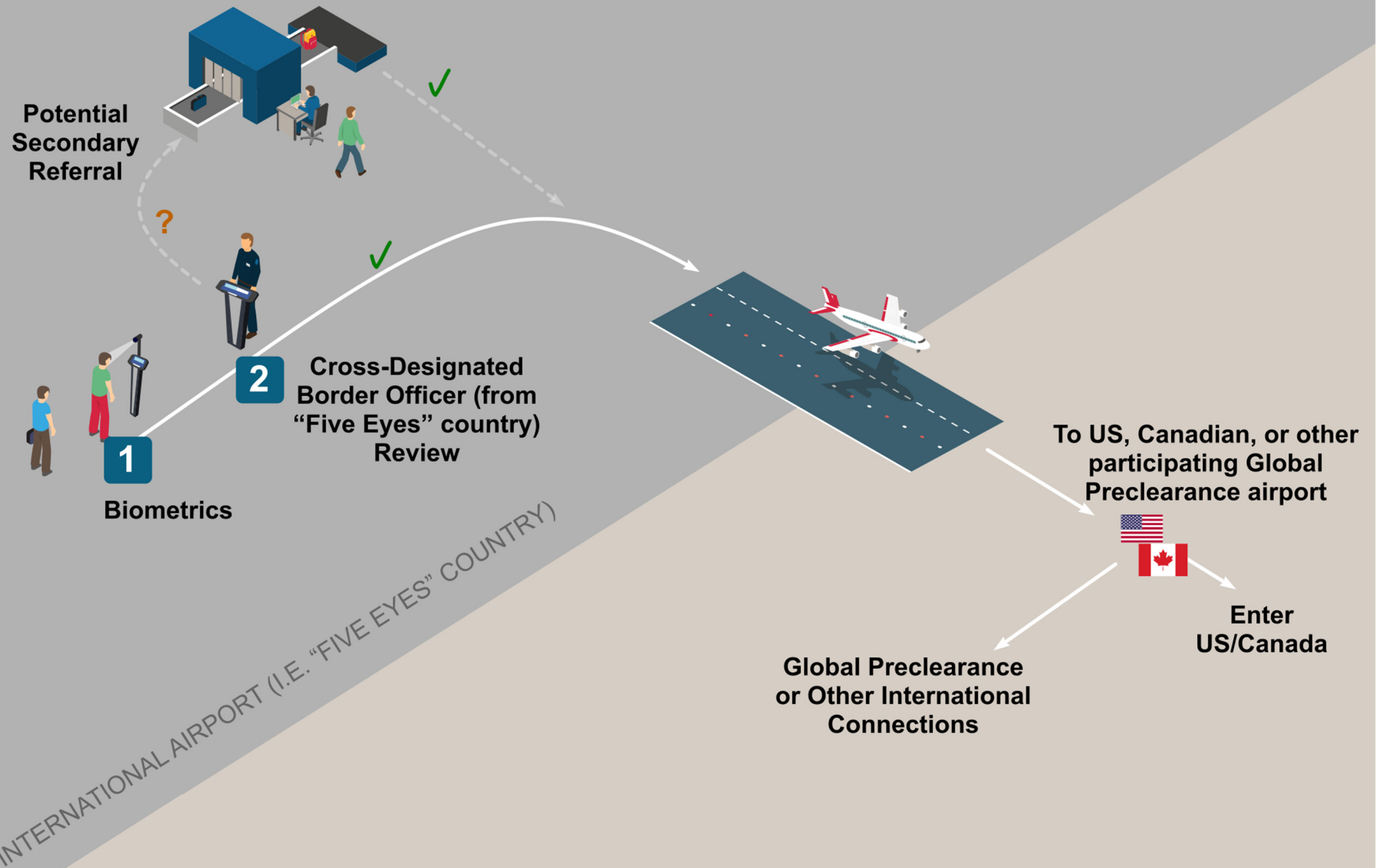
The long-range vision is for a global preclearance model that would allow cross-designated border officers of the host country to perform preclearance into U.S., Canada, and the participating countries. The implementation would start with trusted countries from the “Five Eyes” nations (i.e. the U.S., Canada, Australia, New Zealand, and the United Kingdom) and expanded to others (e.g. Schengen countries). The global preclearance model would be fully rooted on biometrics and have the following benefits:

	Solution	Description	Benefits
1	Entry biometrics for Primary processing	Biometric identification and verification of travelers would be used for Primary processing	Technology solution that provides significant processing efficiencies and increased border security
2	Cross-designated border officer	Border officers from the participating host nation (i.e. “Five Eyes” countries) are cross-designated to review the Primary process result. Officers refer passengers to Secondary, as required. Passengers arrive with no further border processing formalities required and may travel directly to any of the other participating nations.	Efficient use of officer resources to provide review function of biometrics

Flow 2f - Joint Preclearance Model **NEAR TERM**



Flow 2f - Global Preclearance Model LONG RANGE



Anticipated Cost Savings for Aviation

The anticipated cost savings for aviation were calculated based on fully implementing near-term solutions and the long-range vision. Although there are numerous secondary or indirect drivers of cost savings, the primary factor is from the removal of border processing requirements.

Aviation – Goods Movement

The estimated savings were calculated by taking into account factors that impact annual operating costs such as:

- Annual volume of air cargo
- Freight capacities for several cargo or mixed aircraft
- Estimated border process time savings
- Aircraft block hour operating costs
- Supply chain value of delays and uncertainty

Estimated Annual Cost Savings for Air Cargo	\$3,228 M per year
--	---------------------------

The reduction in border processing requirements may result in some space and equipment savings in terms of capital cost avoidance.

Aviation – Travelers

The estimated savings for air travel were calculated by considering factors that impact annual costs such as:

- Number of deplaned air passengers between Canada/U.S.
- Number of deplaned passengers from other international origins
- Estimated border wait and process time savings
- Percent of business versus personal travel
- Value of travel time

Estimated Annual Cost Savings for Rail Travel (USD millions)	\$106 M per year
---	-------------------------

The reduction in border processing requirements will result in significant space savings (e.g. elimination of connection screening area, Primary processing queuing space, etc.) and avoid equipment purchases (e.g. border kiosks) or defer major airport expansion expenditures. While there will always likely be a need for a border processing facility for air passengers at airports, the implementation of biometrics at several airports have demonstrated significant capital cost savings/avoidance can be realized. The exact extent of the cost savings is dependent on the airport size, passenger traffic, construction costs, percentage of international traffic, etc.

3a & b. Rail – Goods Movement

Each year, close to 200,000 trains cross between Canada and the U.S. with over 15 million rail cars of goods according to the U.S. Bureau of Transportation Statistics. This represents 90 million tons of rail cargo into the United States and 44 million tons into Canada annually per Statistics Canada. Some of it is containerized intermodal cargo arriving from overseas, while the majority originates from within the United States and Canada.

The following section describes some of the issues faced by intermodal rail cargo and non-containerized carload shipments (i.e. bulk, breakbulk, and other commodities transported in boxcars, centerbeam flat cars, hopper cars, etc.). The fluid flow of these goods into the Canada/U.S. perimeter and between the two countries is of utmost importance to the cargo supply chains for both countries.

Key Issues to Address – Intermodal Cargo

International freight stopping at the border – Despite pre-screening that takes place at foreign ports and processing that takes place at the U.S. or Canadian port, trains carrying international intermodal cargo must still stop at the border for inspection.

Difficulty addressing needs of other agencies - The primary issue is the ability to address the needs for agencies beyond CBP and CBSA, whether at a Canadian/U.S. maritime port or at the rail border crossing. Because of the requirements from other agencies such as USDA/AAFC and FDA/CFIA, additional inspections may be required for selected rail cars/containers. Further to the need for inspection, the hours operations may be limited, and their facilities may be located at a distance from the border itself.

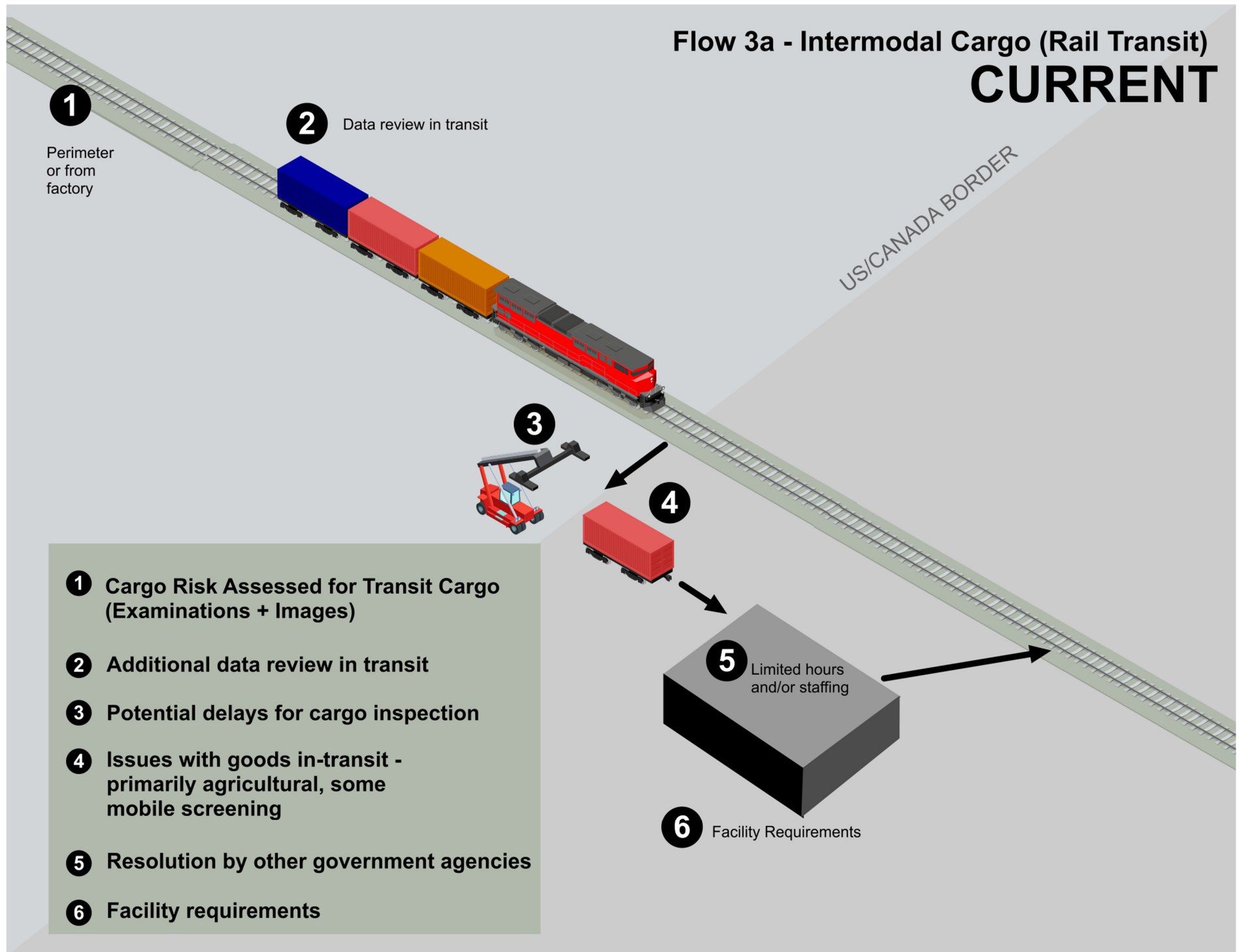
Costs to Government/Industry

Delay of shipments of selected rail cars – For rail cars selected for additional inspection by other agencies, there may be a delay in the shipment of goods when potential multiple day delays can occur if the train is crossing the border outside of the hours of operations or over weekends for these other agencies. The delay of shipments can result in significant costs to the shipper, freight forwarder, and/or the importer.

Delay of shipments of non-selected rail cars - While individual containers on particular rail cars may be selected for inspection at the border, the entire train cannot move until the specific containers or rail cars are removed from the unit train. If the container lift or required personnel are not immediately available, further delays for the entire train results. While the order of magnitude of such delays may be short, the delay costs are multiplied across the total number of rail cars in the train.

Duplicated inspection - International container shipments are also subject to delay and inspection while on rail cars at inland border points, despite pre-screening that takes place at foreign ports that can include risk assessment, smart box seals, radioactive screening, secondary inspections as needed, and load/no load decisions. As previous pilots have indicated, these inspections are driven by a small number of known issues.

Flow 3a - Intermodal Cargo (Rail Transit) **CURRENT**



Key Issues to Address – Non-Intermodal Cargo

North American shipments stopping at the border –Years of work between governments, brokers, shippers, receivers and carriers have resulted in a generally smooth crossing process for carload rail shipments within North American. However, railcars are still delayed in transit and set aside at the border because clearance processes and requirements are still complicated and changing.

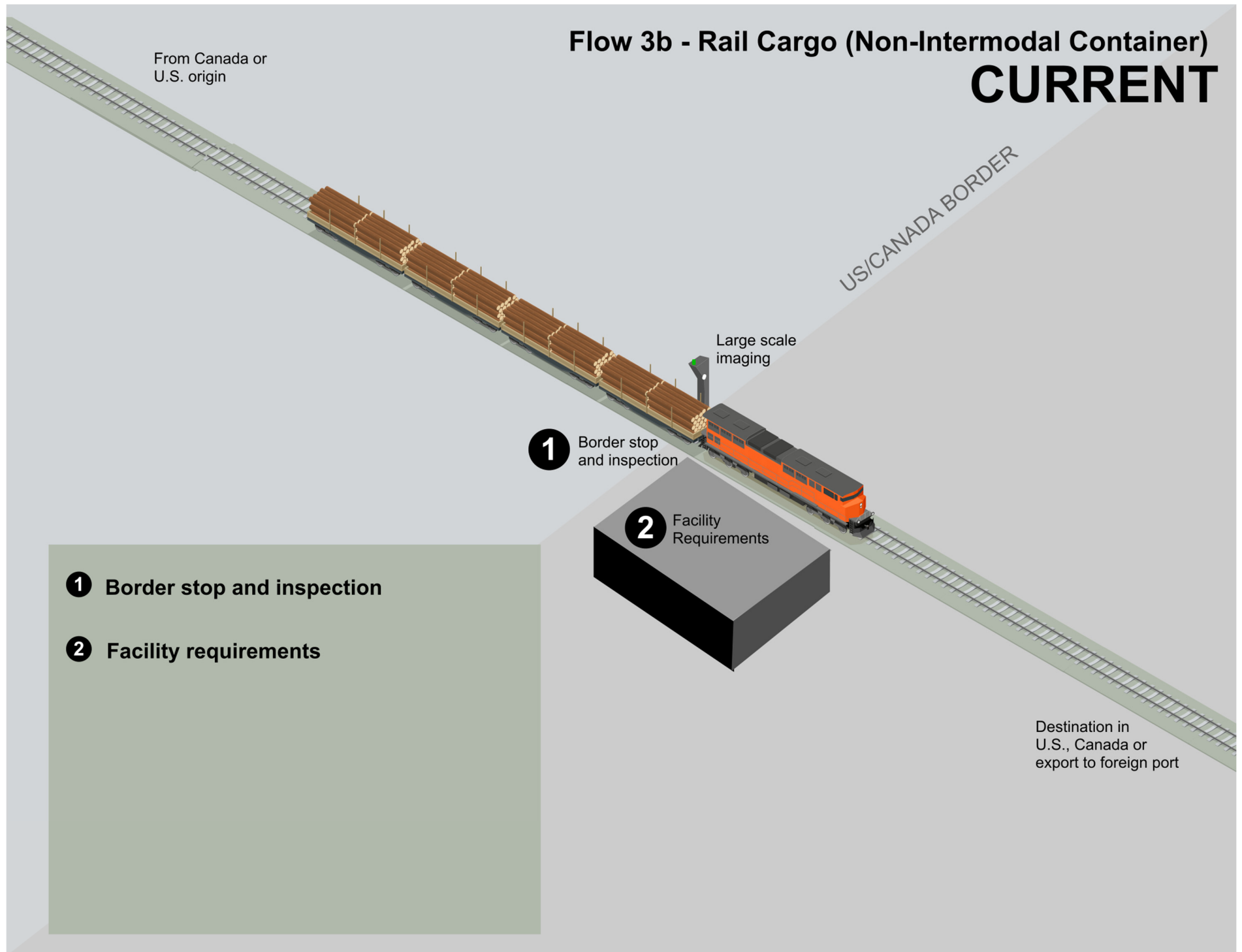
Homogenous, repeated shipments processed similarly each time – Bulk and breakbulk rail shipments are often homogeneous, low risk rail cargo (e.g. lumber, grain cars) that must stop every time such cargo is crossing the border regardless of the transactional history for repeated shipments of the same commodities from the same shipper, same rail carrier, and same receiver. Data collected for shipment transactions should be used to establish whether shipments can undergo considered low-risk and be processed in an expedited fashion without necessarily being part of a trusted trader program.

Costs to Government/Industry

Requirement to provide border facilities –Even though physical inspections are rare, authorities continue to require that facilities and infrastructure be built and maintained for these inspections. Rail operators are required to provide facilities (capital and operating costs) for these border crossing points that are often understaffed. The costs to construct these facilities easily run into the millions and yearly maintenance costs are, likewise, in the millions of dollars for very little use.

Network costs – Costs to customers and carriers increase whenever trains are slowed or stopped. As described previously, these delays at the border may be due to several reasons. The impact of delays extends far beyond the specific railcar or container impacted, or even the train involved, as trains are slowed and stopped far from the border crossing as they wait for the impacted train to move.

Flow 3b - Rail Cargo (Non-Intermodal Container) **CURRENT**



Near-Term Solutions

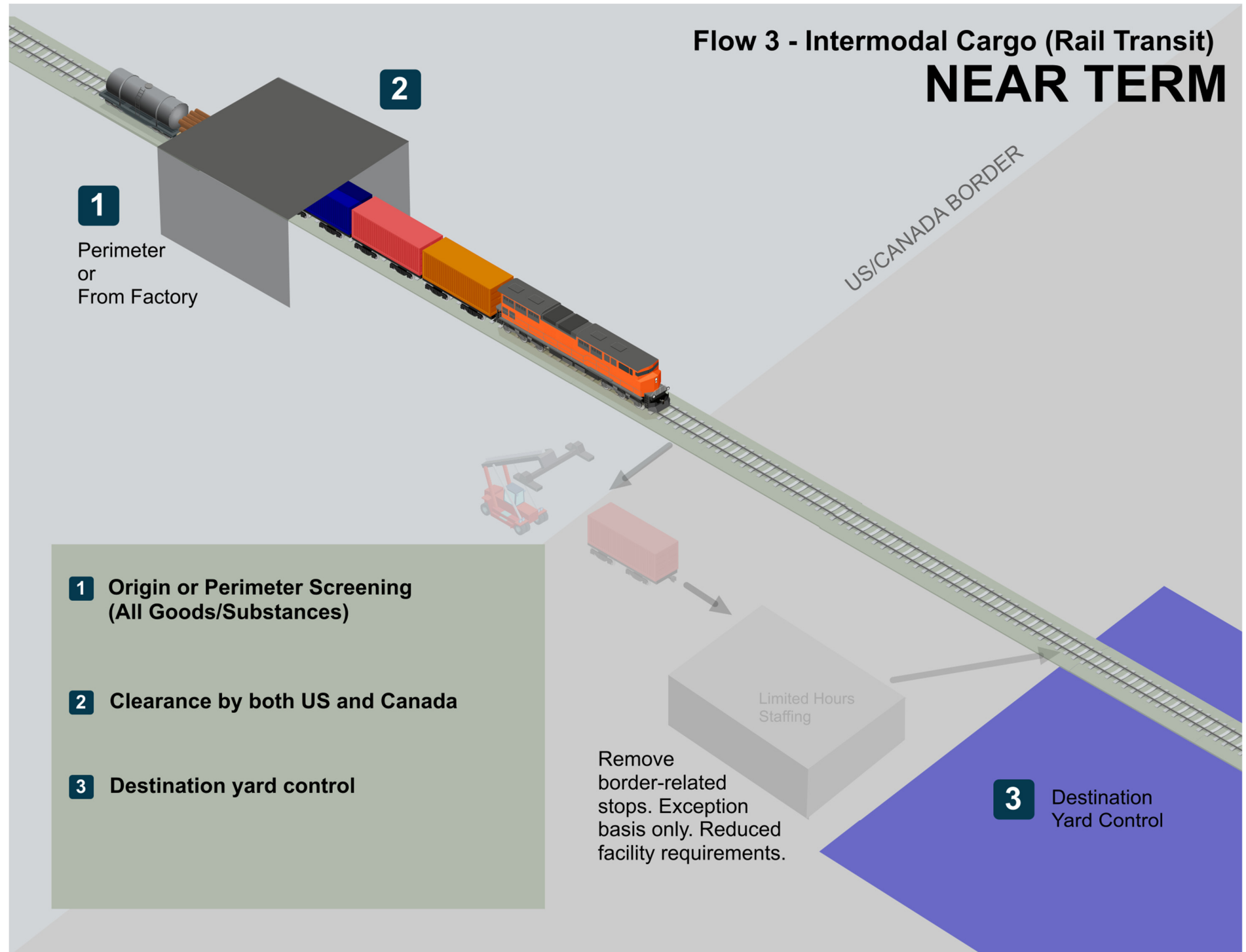
The solutions proposed in the near-term for intermodal freight container rail and their corresponding benefits are as follows:

Solution	Description	Benefits
1 Origin or perimeter screening	Screening from point of origin (i.e. from factory or perimeter screening) with seamless screening for all goods and substances to satisfy all agencies.	Increased security that is seamless and does not impede flow
2 Clearance by both U.S. and Canada	Items are cleared by all respective U.S. and Canadian agencies for free flow within and between U.S.-Canada and not border-related stops.	Reduces duplicate screening, potential border delays, and at-border facility requirements.
3 Destination yard control	For non-immediate threat risks, issues are addressed at the destination yard.	Fluidity of goods across the border with administrative issues dealt with at destination and stopped at border only on exception basis

Long-Range Vision

The long-range vision for containerized intermodal rail cargo is for the investment in large scale imaging or other equipment by rail lines at the maritime port of entry, remote screening at foreign ports, or more convenient ports further inland instead of providing underutilized facilities and equipment at the border itself. Further to this, any issues that may need to be resolved can take place at destination yards. Industry is only willing to make these investments if it results in a more seamless border process with a good ROI.

Flow 3 - Intermodal Cargo (Rail Transit) **NEAR TERM**

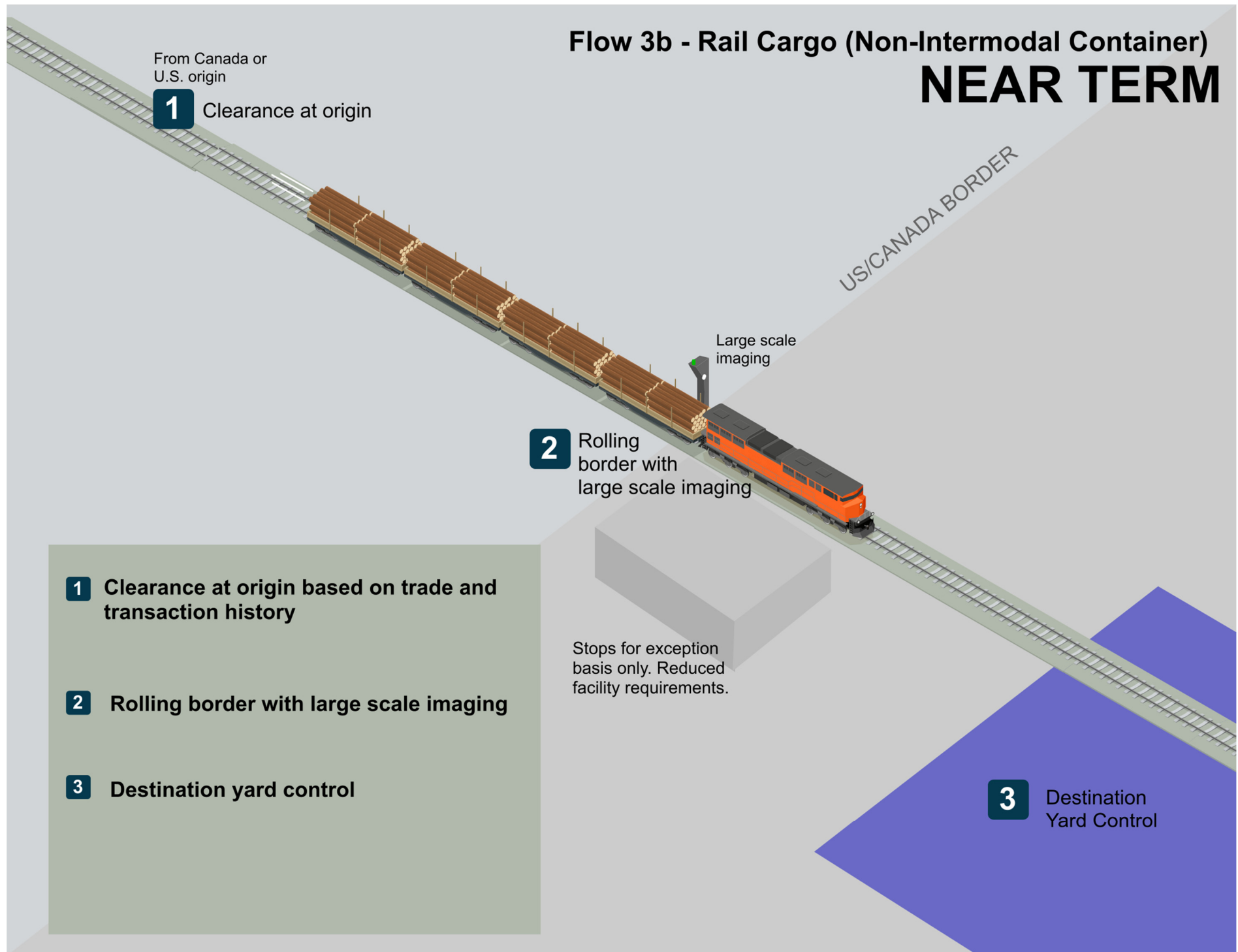


Near-Term Solutions

The solutions proposed in the near-term for non-intermodal container rail freight (i.e. bulk, breakbulk, and other) and their corresponding benefits are as follows:

	Solution	Description	Benefits
1	Clearance at origin	Provide clearance at origin based on trade and transaction history (i.e. risk-based approach) for regularly-scheduled rail shipments with homogeneous goods in/on rail cars.	Risk-based approach to focus efforts and resources on higher/unknown risk goods. Reduces potential border delays.
2	Rolling border	Allow rolling border stops with large scale imaging for low-risk trains that have been cleared at origin. Stops at the border on an exception basis.	Increases speed and flow through the border and reduces at-border facility requirements while maintaining security.
3	Destination yard control	For non-immediate threat risks, issues are addressed at the destination yard.	Fluidity of goods across the border with administrative issues dealt with at destination and stopped at border only on exception basis.

Flow 3b - Rail Cargo (Non-Intermodal Container) **NEAR TERM**



Anticipated Cost Savings for Rail

The anticipated cost savings for rail were estimated from fully implementing the near-term solutions and long-range vision. Although there are numerous secondary or indirect drivers of cost savings, the primary factor is from the removal of border processing requirements at the border.

Rail – Goods Movement

The estimated savings were calculated by considering factors that impact annual operating costs such as:

- Number of trains
- Full versus empty rail containers
- Estimated border process time savings
- Supply chain value of delays and uncertainty
- Train crew time/cost

Estimated Annual Cost Savings for Freight Rail

\$4,596 M per year

The capital cost avoidance from removing the requirement for a border processing facility that is dependent on the number of commercial rail ports of entry and the average border crossing infrastructure cost.

Rail – Travelers

The estimated savings were calculated by taking into account factors that impact annual operating costs such as:

- Number of train passengers
- Percent of business versus personal travel
- Estimated border wait and process time savings
- Value of travel time

Estimated Annual Cost Savings for Rail Travel
--

\$1.4 M per year

There are capital cost savings to be realized from removing the requirement for a border processing facility between Canada and the U.S. (some of which are currently Pre-inspection/Preclearance facilities) in the long-term. In the near-term with the establishment of rail Preclearance operations, however, there could be additional facility costs for building the required facility.

4. Land Border – Goods Movement & Travelers

In 2017 the total number of vehicles crossed Canada to the U.S. was 41.3 million vehicles. This figure includes trucks (empty and full), personal vehicles, and busses. This number grew by over 130 thousand vehicles from 2016. As traffic continues to grow, congestion will increase at land borders with the current model that is in place.

Key Issues to Address

Congestion blocking vehicle access to certain lanes - During peak traffic times, mixed traffic congestion blocks access to designated traffic lanes before they start. This eliminates the benefit of having designated traffic lanes at land borders that separate vehicles by trusted traveler, ready lane/ RFID documents, traditional passports, and commercial traffic.

Required stop at border for low risk traffic - Low risk traffic is currently required to stop at the border, which reduces potential throughput rates. During peak hours, the queueing and stopping of low risk vehicles require a large amount of resources that could be better allocated to unknown and high-risk vehicles.

Preparation for Level 4/5 Automation and beyond - Trucks and private vehicles have significant changes expected over twenty years - how will the advantages of automation be fully leveraged for border crossings, building upon Ontario/Michigan and France/Germany pilot projects for vehicle automation?

Costs to Government/Industry

Commercial traffic - Profit margins for business can be negatively impacted by three factors: direct costs, indirect costs, and loss of sales. The direct costs for commercial traffic include fuel, driver's wages, and maintenance. The indirect costs include overhead, driver support, and the value of time for delivering. This can also cause a loss of sales for logistic companies that operate across the border.

Private vehicles - For business travelers and tourists, costs include fuel, maintenance, and the value of time. Time and resources are wasted when there is congestion at the border.

Vehicle emissions - There is an environmental cost created from vehicle emissions. Emissions at the border are highest during peak periods of traffic due to slow moving flows across the border.

Supply chain delays - Delays in supply chains are also caused from congestion at land borders creating costs for firms further in the supply chain. This can create a backlog of production putting stress on the entire supply chain.

Flow 4 - Vehicular Traffic Streaming **CURRENT**

1 Mixed Flows of Vehicles

2 Streaming by Type

Commercial Traffic

FAST

Trusted Traveler

Ready Lane/RFID documents

Passport

US/CANADA BORDER

1 Mixed Flow of Vehicles

2 Streaming by Type

3 Primary Processing

4 Secondary Processing
and/or Other
Government
Agencies

4

Limited Hours
Staffing

Near-Term Solutions

The near-term solutions proposed for the vehicular land border and benefits are as follows:

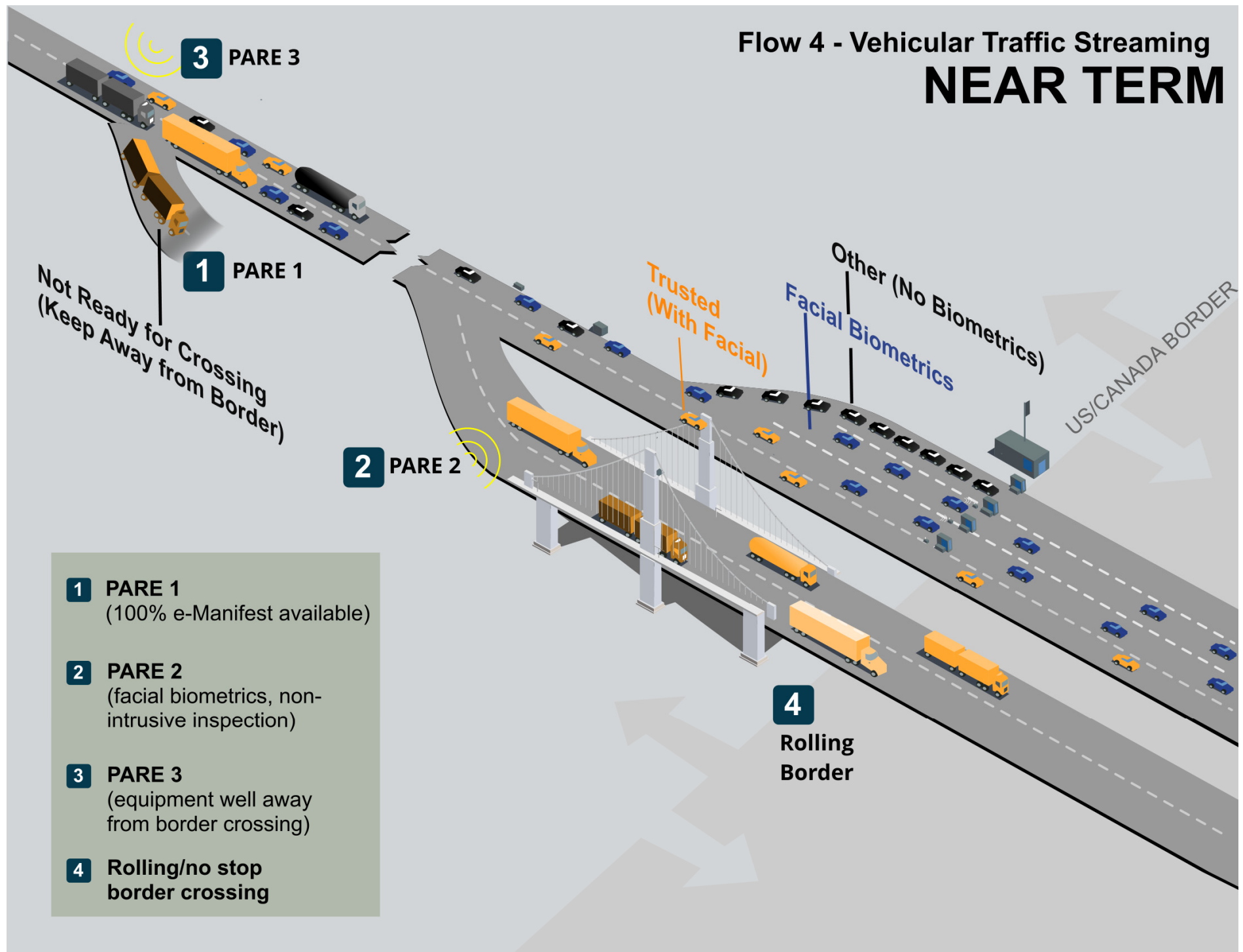
	Solution	Description	Benefits
1	PARE 1	Implement Pre-Arrival Readiness Evaluation (PARE) phase 1; ensure e-manifests are complete and available using license plate readers for commercial traffic.	Reduces congestion at the border crossing from not fully prepared trucks.
2	PARE 2	Deploy PARE phase 2; facial biometrics of truck drivers. Similarly deploy facial biometrics for trusted travelers and “Ready Lane” users.	Use of technology to increase processing capacity at the border.
3	PARE 3	Implement PARE phase 3; deploy equipment away and upstream from the physical border for trucks and personal vehicles.	Allows rolling border crossing to take place.
4	Rolling border crossing	For all participating truck and personal vehicle traffic with biometrics and personal data, provide rolling border.	Seamless flow of commercial and personal vehicle traffic flows for participants.

Long-Range Vision

The proposed vision for the long-range for vehicle land border crossings and their corresponding benefits are as follows:

	Solution	Description	Benefits
1	Automated truck platooning from origin	Provide infrastructure to allow truck platooning (i.e. series of automated trucks led by a “master” truck) from origin factory, port, airport, or warehouse.	Increases transportation capacity and reduces reliance on truck drivers.
2	Fully automated vehicle lane	Automated vehicles use a dedicated/secure lane for transportation of goods and people.	Increases supply chain security and provides faster, more seamless, and safer road transportation.
3	At-speed border crossing	Border processing for both commercial and vehicles can take place at-speed. Border clearance is performed at the origin (i.e. automated vehicles do not drive to the border unless cleared)	Free-flow across the border and reduces duplicative border processing operations and infrastructure.

Flow 4 - Vehicular Traffic Streaming **NEAR TERM**



- 1 PARE 1**
(100% e-Manifest available)
- 2 PARE 2**
(facial biometrics, non-intrusive inspection)
- 3 PARE 3**
(equipment well away from border crossing)
- 4 Rolling/no stop border crossing**

Flow 4 - Vehicular Traffic Streaming **LONG TERM**

1 Designed for automated truck platooning from origin (factory/port/airport/warehouse)



2 Fully Automated Vehicle Lane

100% Facial Biometric Confirmed

Flexible Location for Secondary

3 At speed crossing without stopping

(Clearances done at origin)

Anticipated Cost Savings for Land Borders

The anticipated cost savings from vehicle land borders were calculated from fully implementing the near-term solutions and long-range vision. It is noted that CBP is already working with a range of stakeholders on expedited land border processing, including active lane management non-intrusive inspection and pre-arrival readiness evaluation. CBP reports that there is upwards of four times the efficiency possible, including maintain velocity through remote verification. As a result, the primary driver of cost savings is from removal of border processing requirements at the U.S./Canada border.

Land – Goods Movement

The estimated savings from commercial trucking were calculated by taking into account factors that impact annual operating costs such as:

- Number of empty trucks
- Number of full trucks (i.e. carrying goods)
- Estimated border wait time and process time savings
- Supply chain value of delays and uncertainty
- Value of truck driver time

Estimated Annual Cost Savings for Trucking

\$3,878 M per year

There are significant capital cost savings that could be realized by governments from avoiding any further construction of land border crossing facilities between Canada/U.S. Land border facilities are typically funded by governments with a few significant exceptions, especially for privately operated bridges crossing between the U.S. and Canada.

Land – Travelers

The estimated savings for personal vehicle cross-border travel was calculated by considering the following factors that impact annual costs such as:

- Number of personal vehicle passengers
- Percent of business versus personal travel
- Estimated border wait and process time savings
- Value of travel time

Estimated Annual Cost Savings for Personal Vehicles
--

\$162 M per year

As mentioned previously, vehicular land ports of entry infrastructure are generally government-funded (except for several bridges), and could result in significant capital cost savings to both the governments of Canada and the U.S.

5a & b. All Modes – Returning Americans/Canadians and Trusted Traveler

The total number of border passages by Americans and Canadians traveling abroad returning to their respective countries in 2017 was approximately 325 million and 55 million. There are currently over 6.8 million members enrolled in of the U.S. and Canadian trusted traveler programs (Global Entry, CANPASS, NEXUS, SENTRI, FAST), with 1.9 million new members in 2017 alone.

The sheer volume of historical transaction data provides a significant opportunity to re-think the arrivals process for returning citizens and trusted travelers.

Key Issues to Address

- **Limited use of historical passenger data for border clearance** - Each year, millions of border passages are processed for returning citizens, but the historical transaction information is not used for subsequent border crossings.
- **Inconsistent benefits and applicability** - The member benefits from enrolling in a trusted traveler program and for travel varies significantly by country and by mode.
- **Long approval/enrolment time** - While strides have been made to improve the application approval and trusted traveler enrolment time, it is often months from the time of submission to the receipt of the trusted traveler membership card.

Costs to Government/Industry

- **Opportunity cost of time spent on regular travelers** - A significant amount of resources and time are used to process regular passengers, who may have a very rich transaction history through the border, that may be better used to deal with high/unknown risk passengers.
- **Opportunity cost of lost potential trusted travelers** - The long process time to become a trusted traveler can be a significant enough disincentive for many potential trusted travelers to simply not apply for the program.
- **Duplicating applications and eligibility requirements** - There is a cost of duplication for applying for and meeting eligibility requirements for international travelers who have already been vetted by their own country's trusted traveler program.

Flow 5a - Arrivals Process to US/Canada: Returning Citizens

CURRENT

June 2001	Aug 2001	Oct 2001	Feb 2002	Mar 2002
✓	✓	✓	✓	✓
July 2002	Aug 2002	Nov 2003	Dec 2003	Jan 2004
✓	✓	✓	✓	✓
Apr 2004	Oct 2004	Feb 2005	Nov 2005	Apr 2007
✓	✓	✓	✓	✓
Jan 2011	Apr 2012	Sept 2015	Oct 2017	Feb 2018
✓	✓	✓	✓	✓

1



Every border transaction is “new”

2



Model of “Primary” and “Secondary” still the same as 1971 when it was introduced



Near-Term Solutions

The near-term solutions proposed for the arrivals process for U.S./Canada returning citizens and benefits are as follows:

	Solution	Description	Benefits
1	Risk-based algorithms using historical passage data	Make use of historical traveler passage data to develop a risk probability profile for risk-based algorithm for primary processing determination.	Automates portion of processing and uses existing data for low-risk travelers.
2	Minimal population of unknown risk or high risk	With interactive advanced passenger information (IAP) board/no-board systems and other passenger targeting methods, the population of unknown risk or high-risk individuals is minimized. It allows resources to be focused on processing these travelers.	Increases security and effective use of resources on unknown risk and high-risk individuals.

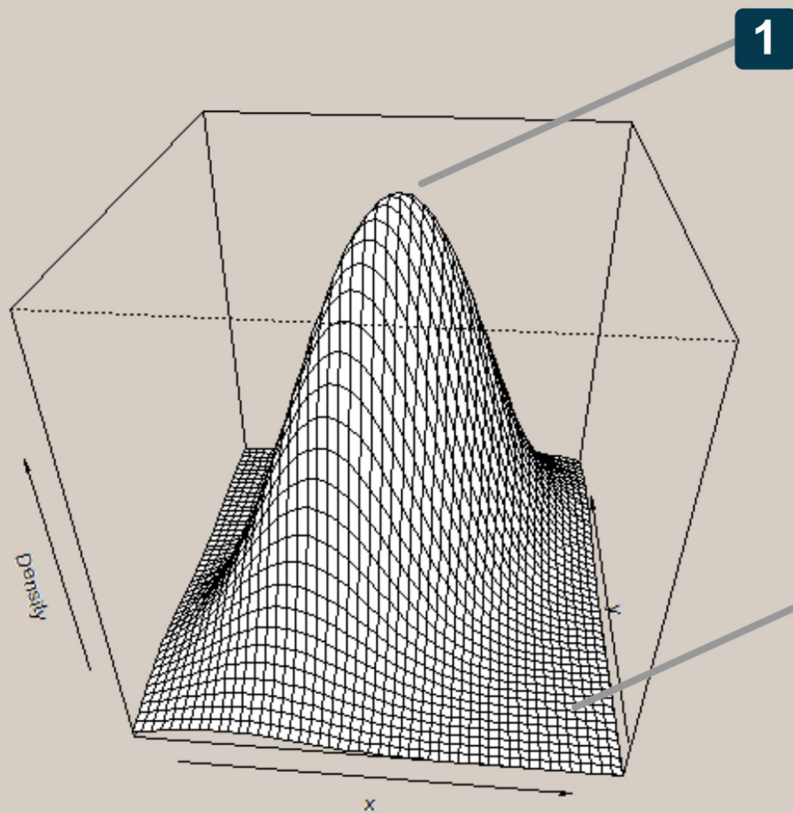
Long-Range Vision

The long-term vision for the arrivals process for U.S./Canada returning citizens and benefits are as follows:

	Solution	Description	Benefits
1	True probability-based model using travel history	Use travel history for risk probability-based model for pre-arrival determination of travelers.	Uses big data to automate portions of processing. Ensures more scrutiny for high or unknown-risk flows.
2	Tie-in to biometric token	Use biometric identity (i.e. facial) as the token for travel through non-intrusive biometric capture.	Increases security with biometric identity confirmation.
3	Free-flow for all through border processes with random	Seamless flow through border processing area with a certain percentage random review for compliance.	Increase flow and reduces congestion through border processing.

Flow 5a - Arrivals Process to US/Canada: Returning Citizens

NEAR-TERM



1



I've had no issues crossing the border 74 times in the past 10 years.

What is the probability of a problem for the 75th or 76th time?

2

Population of true "unknown risk" or "high-risk" diminished significantly with IAPI board/no-board and other passenger targeting methods

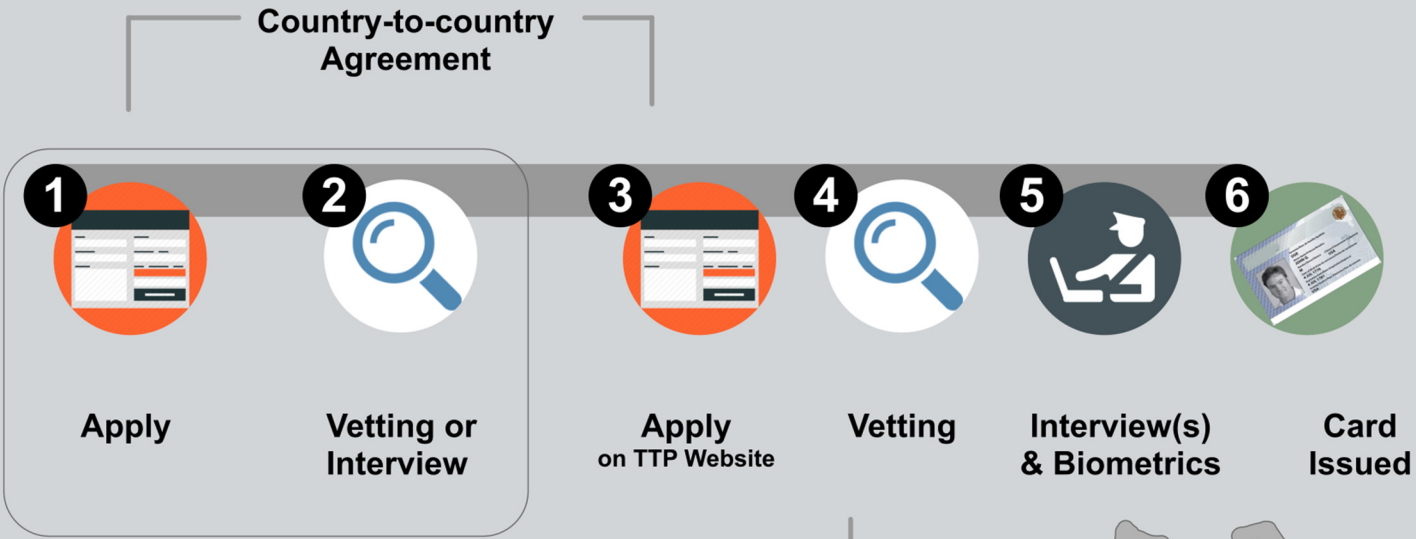
Flow 5a - Arrivals Process to US/Canada: Returning Citizens

LONG TERM VISION



Flow 5b - International Trusted Traveler

CURRENT



Does not apply to US/Canada NEXUS Applicants. Mandatory (e.g., Germany, S. Korea, UK) to Global Entry or Mexican Nationals to NEXUS

	Nexus	GE
CBP	✓	Air Only
CBSA	✓	
CATSA	✓	✓
TSA	✓	✓

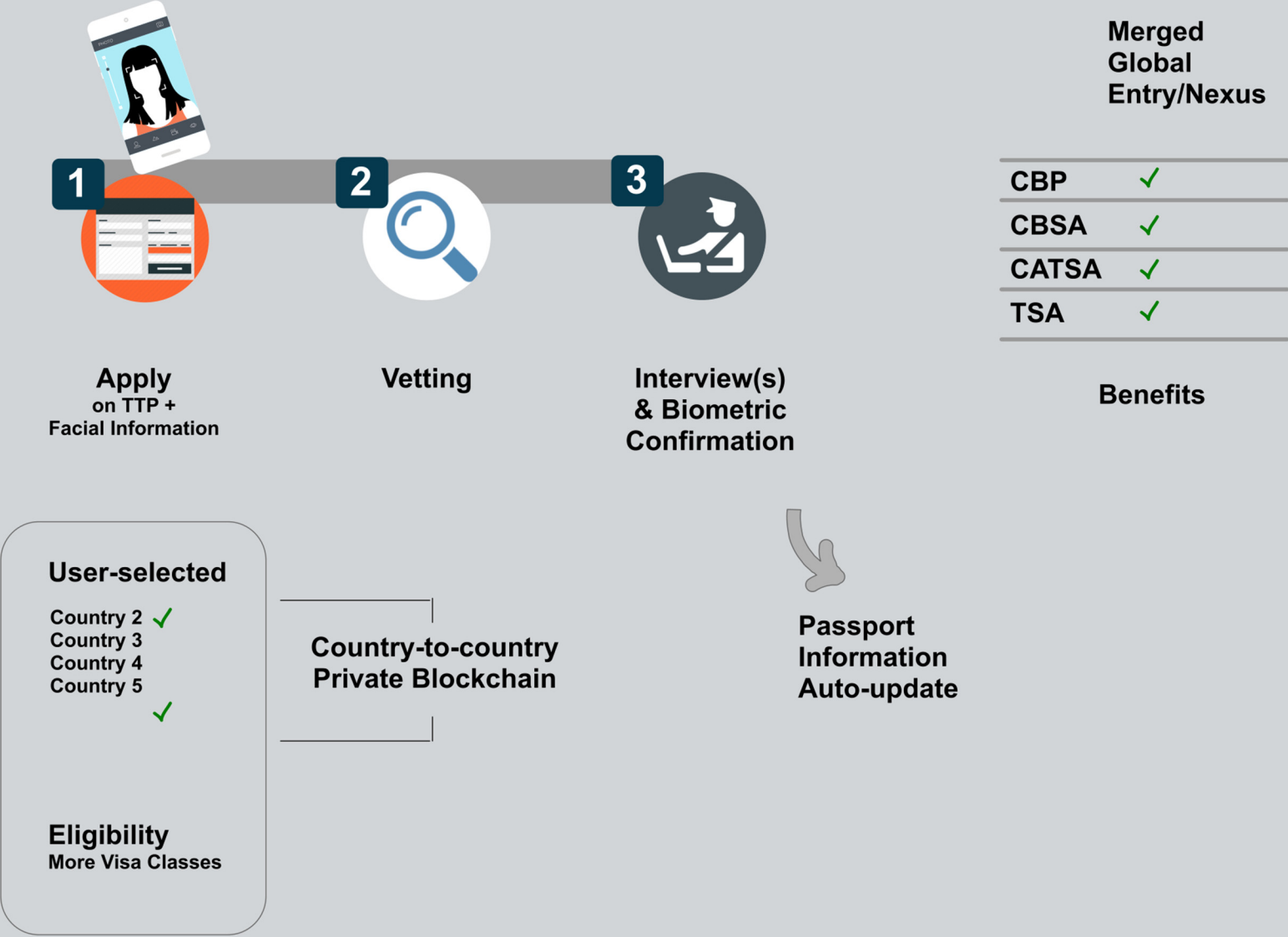
Benefits

Order can be switched with CBP "Enrollment on Arrival" for GE only

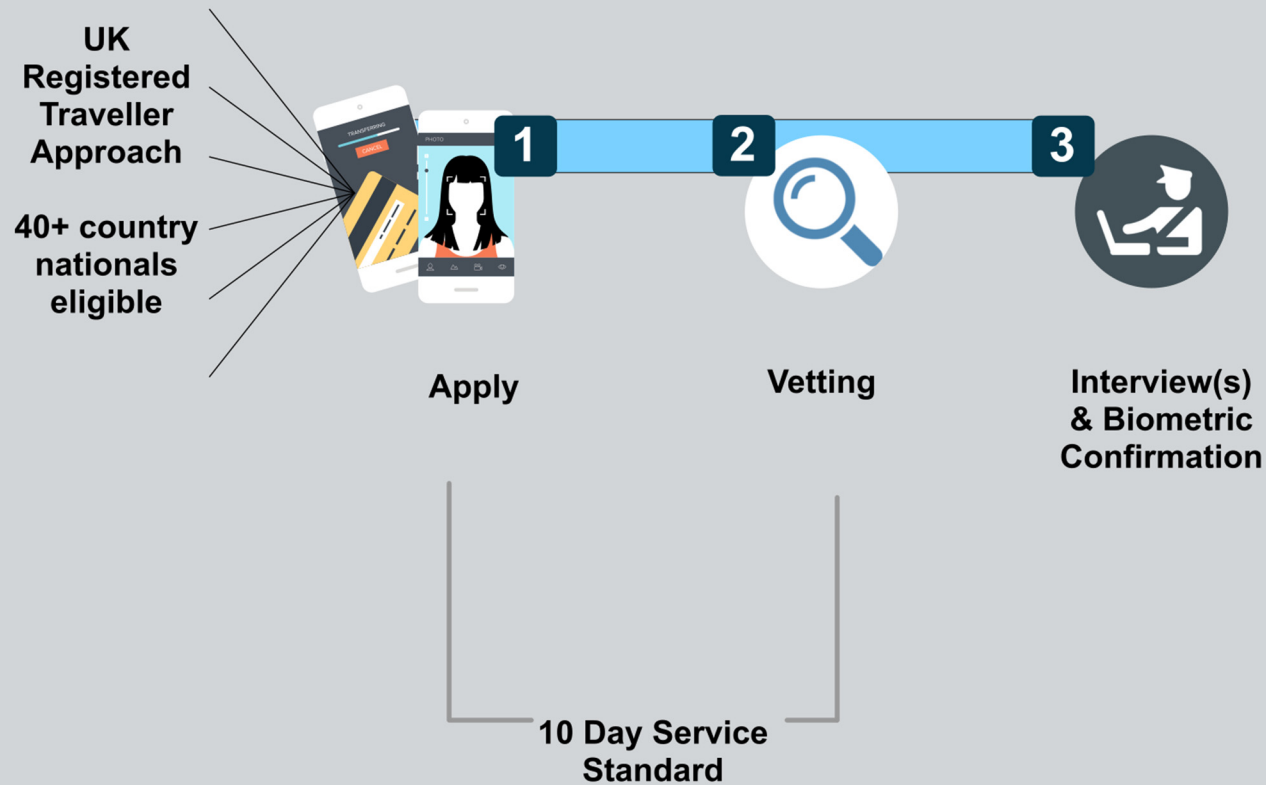
Long Time Lag

"on average you can expect your application to be processed for Global Entry and FAST within 1-2 weeks, and SENTRI and NEXUS 3-5 months."

Flow 5b - International Trusted Traveler
NEAR TERM



Flow 5b - International Trusted Traveler **LONG RANGE VISION**



5c. All Modes – Trusted Trader

Government and industry have worked collaboratively to develop trusted trader programs that facilitate the movement of legitimate, low-risk goods securely through supply chains on both sides of the border. Customs–Trade Partnership Against Terrorism (C-TPAT), Partners in Protection (PIP), Free and Secure Trade (FAST), Customs Self Assessment (CSA), and Known Shipper are just some of the programs available to industry.

Key Issues to Address

- **Vast variety of trusted trader/supply chain security programs** - While there is a considerable number and variety of programs available to trade, there are several issues impeding their success and effectiveness:
 - a) confusion - regarding the variety and applicability of the programs;
 - b) different eligibilities - by country and role within the supply chain; and
 - c) return on investment - may not be positive for all potential participants.
- **Cost and time to fix/improve likely outweigh benefits** - The level of effort to overhaul or progress some or all the existing programs is very high and is likely to be higher than any net gains that may be derived from consolidating or aligning the different programs.
- **Model not ready for full self-driving conveyance** - The wide deployment of connected and automated vehicles is rapidly approaching and will directly affect supply chains. The current border processing models are not ready for

Level 5 automation (i.e. full automation with or without the presence of a driver).

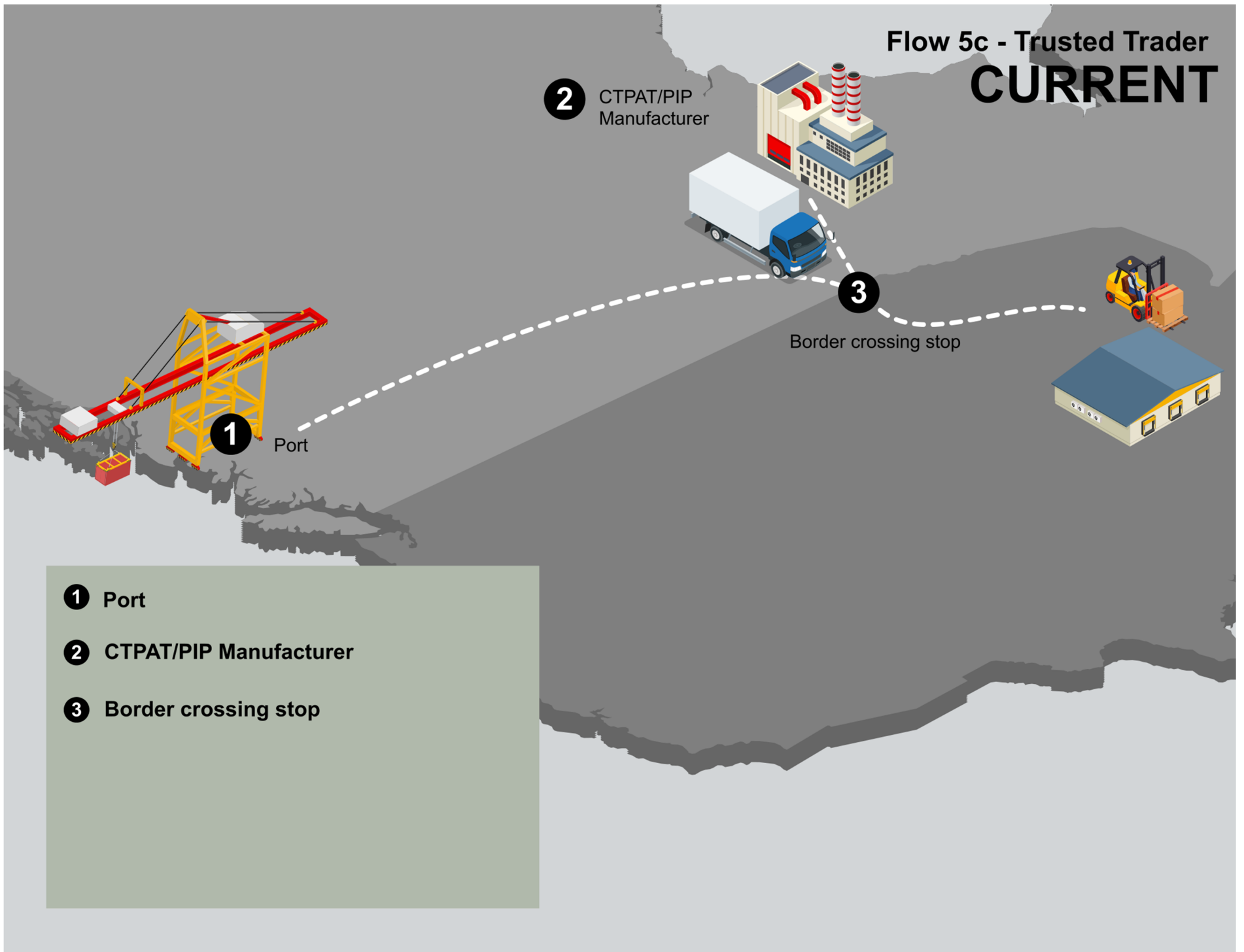
Opportunities

- **Heuristic data models** - A few government agencies are exploring the benefits of using artificial intelligence/machine learning against the immense set of historical transactional data available within trade databases to determine/establish freight shipments as low risk. The intelligent decision making could negate the need for voluntary trusted trader programs altogether.

Costs to Government/Industry

- **Variable proportional cost for participants** - The costs of participating in or maintaining trusted trader/supply chain security programs varies significantly by participant. However, the average relative cost of a given program is much higher (i.e. negative ROI) for small and medium businesses due to the high administrative and compliance costs versus the marginal benefits that are realized.

Flow 5c - Trusted Trader **CURRENT**



Near-Term Solutions

The near-term solutions proposed for trusted trader programs and benefits are as follows:

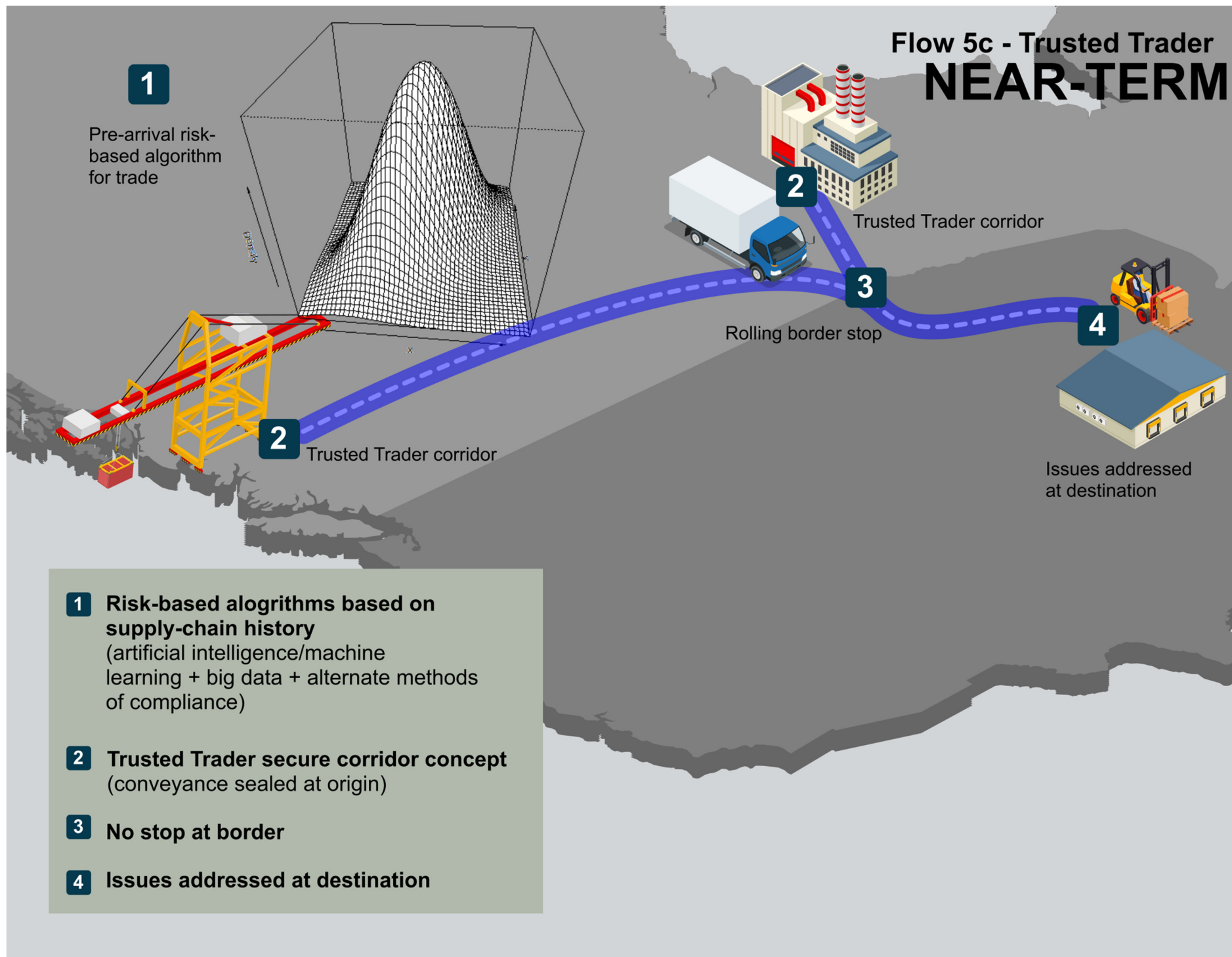
	Solution	Description	Benefits
1	Pre-arrival risk-based algorithms	Use of risk-based algorithms based on supply-chain history to perform pre-arrival screening. Employ artificial intelligence/machine learning techniques with big data and use alternate methods of compliance.	Maximizes use of new technology and computing power to efficiently increase security.
2	Trusted Trader secure corridor	From the origin port/manufacture or goods processing point, shipments can be considered sealed and move securely along a trusted trader corridor.	Increases supply chain security.
3	No stop at border	Trusted shipments roll through border with no stop required.	Increases speed of delivery and eliminates unnecessary processing of low-risk goods movements.
4	Issues addressed at destination	Any issues with a particular shipment can be addressed at the destination in cooperation with the trusted trader.	Ensures fluidity through the supply chain to only have to address exceptions at the destination.

Long-Range Vision

The long-term vision for trusted trader programs for the U.S. and Canada and benefits are as follows:

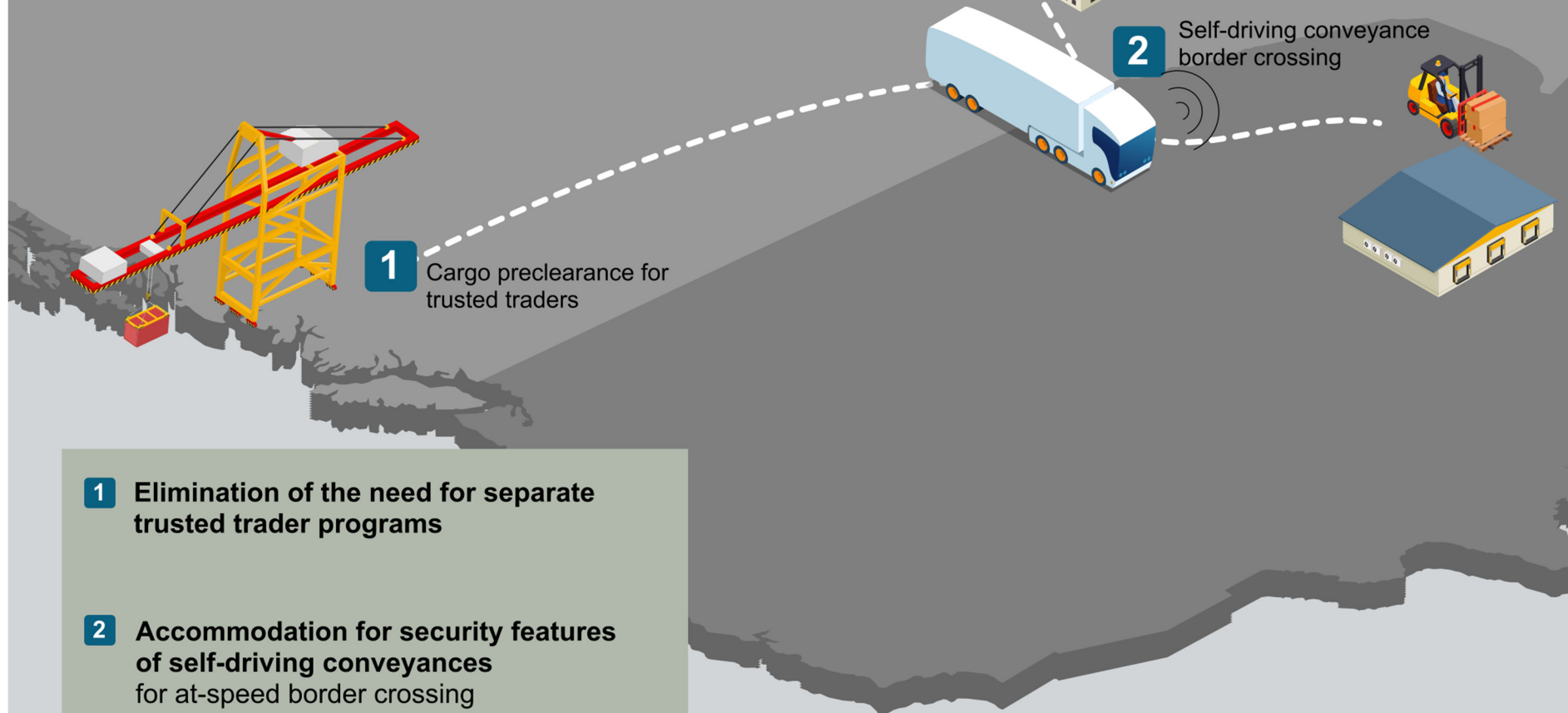
	Solution	Description	Benefits
1	Single cargo preclearance for trusted traders	Eliminate separate, duplicate trusted trader programs that considers both border processing and security.	Eliminates duplication of requirements and processing to simplify to one program.
2	Security features for self-driving conveyances	Provide border crossing point security features for self-driving conveyances for at-speed crossing (e.g. dedicated lane). Shipments with issues are automatically disabled from approaching the border.	Maximizes use of technology for supply chain security and fluid goods movement.

Flow 5c - Trusted Trader NEAR-TERM



- 1 Risk-based algorithms based on supply-chain history**
(artificial intelligence/machine learning + big data + alternate methods of compliance)
- 2 Trusted Trader secure corridor concept**
(conveyance sealed at origin)
- 3 No stop at border**
- 4 Issues addressed at destination**

Flow 5c - Trusted Trader LONG-TERM VISION



- 1** Elimination of the need for separate trusted trader programs
- 2** Accommodation for security features of self-driving conveyances for at-speed border crossing

6a & b. Transportation Automation

The U.S.-Canada border environment is built around the current modes of transportation and the evolution of technologies. Already described are the changes that are happening on automated vehicles and the revolution that is advancing on self-driving trucks and cars.

There are two additional areas that are worth including in the Beyond Preclearance vision – neither of which are completely clear in their role in supply chains.

Drones

While drones themselves are not new, the use of drones for small and e-commerce package delivery are currently being explored by several organizations.

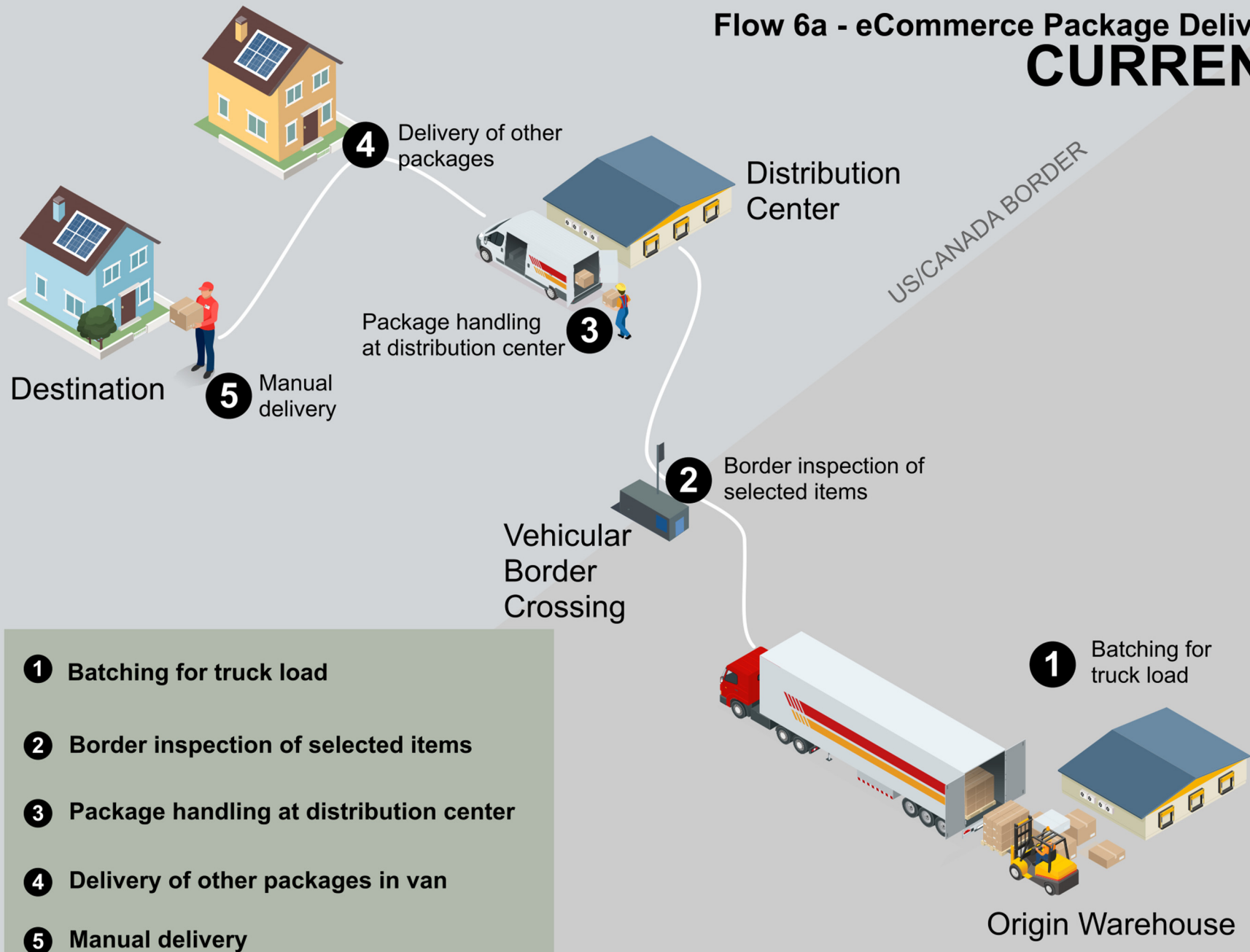
In building a future border for drones, we need to ensure that there is resolution to current issues associated with small package delivery:

- **Efficient border crossing for mixed truck loads** – Today, small package delivery by courier companies by truck results in trailers with a very heterogenous mix of items. The mix of items results in difficulty in applying a single solution for the entire contents of the trailer.
- **Batching for loads**– Courier companies generally batch sufficient number of packages to create a truck trailer load that will cross the land border instead of sending individual packages. This results in possible delays for supply chains, particularly if there is a very time-sensitive delivery required for a particular package.

- **Delays for truck loads crossing borders** – If a single package on a trailer is selected for additional screening, the entire truck load may be delayed at the border.
- **Operating distribution centers and local delivery** – Once the truck arrives in the appropriate city or region, courier companies must operate a distribution center and arrange for local delivery by van or other conveyance.

The following page outlines some of the changes for e-commerce package delivery that could be created.

Flow 6a - eCommerce Package Delivery **CURRENT**



Near-Term Solutions

The near-term solutions proposed for small package delivery via drone and benefits are as follows:

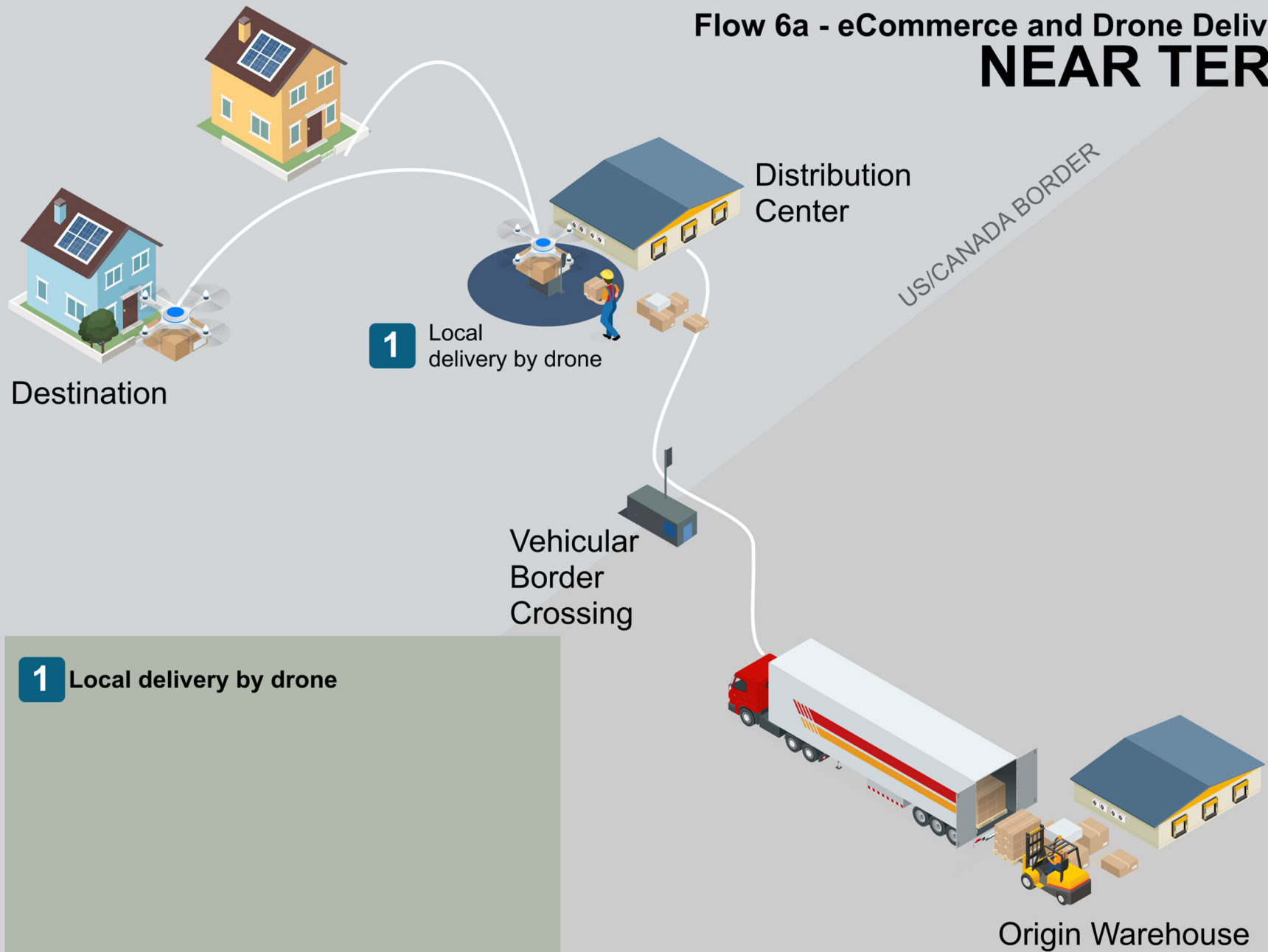
	Solution	Description	Benefits
1	Local delivery by drone	While truck tractors carrying individual packages cross the border in the same manner, the “last mile” delivery of packages takes place by drone instead of van	Reduces dependency on local van delivery

Long-Range Vision

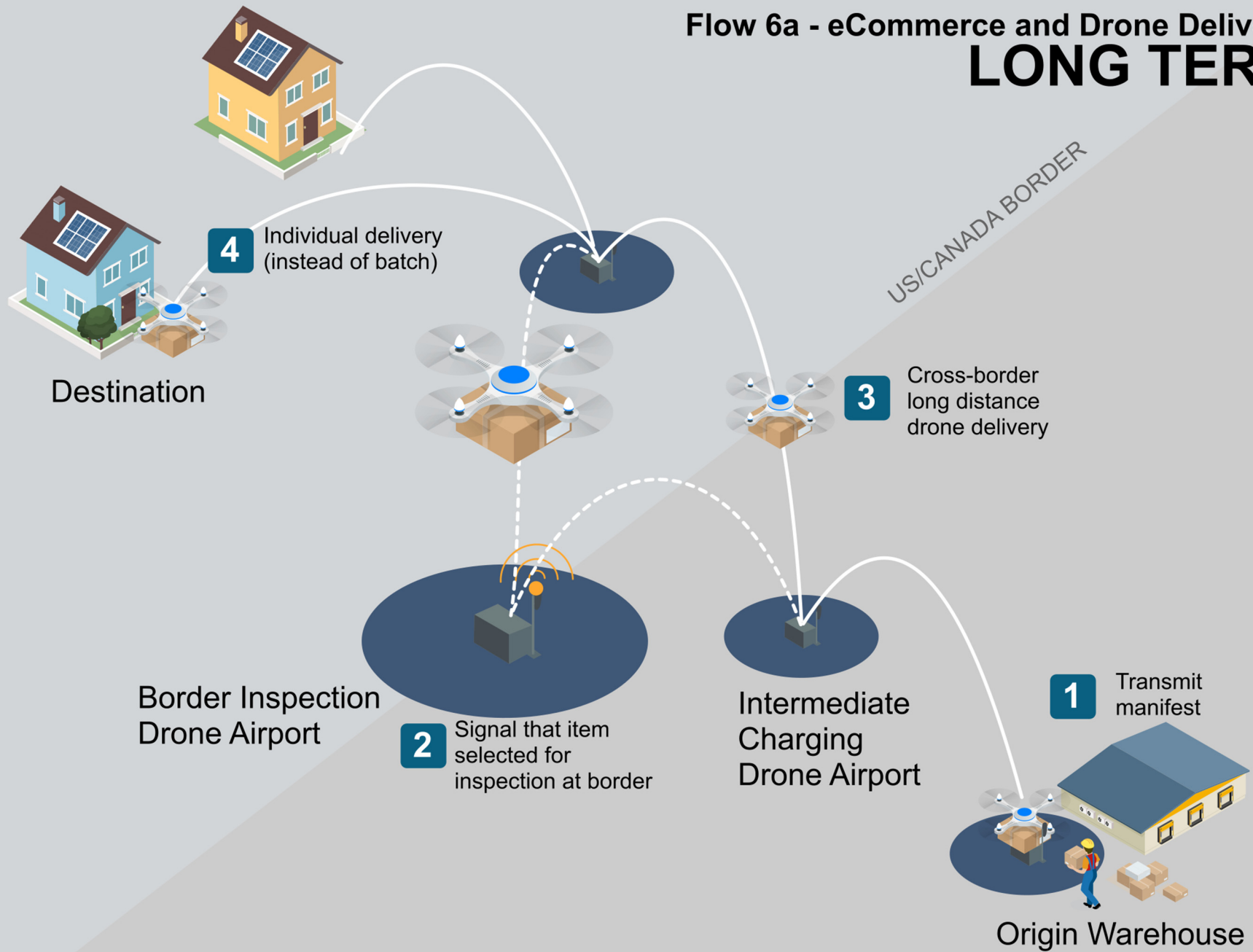
The long-term vision for drone delivery and benefits are as follows:

	Solution	Description	Benefits
1	Transmit manifest	Manifests for each individual package transmitted at time of departure	Makes data available for review by border agencies in real-time
2	Select individual packages for inspection	Border agencies can select individual packages for further inspection instead of stopping an entire truck load	Reduces potential for delivery delays for items that are not selected for additional inspection
3	Cross-border long distance drone delivery	Drone airport/recharge station network enables long-distance drone delivery	Extends range of drones instead of only to the “last mile”
4	Individual delivery	Each package is delivered individually instead of waiting for a batch	Can provide fastest delivery method for just-in-time or highly time-sensitive packages

Flow 6a - eCommerce and Drone Delivery **NEAR TERM**



Flow 6a - eCommerce and Drone Delivery **LONG TERM**



Hyperloop

Major disruptors in the transportation industry, such as drastic changes to traditional modes of transportation, may also play a role in shaping how people or goods are moved across the shared border.

Consider the Hyperloop in which high-efficiency above ground or underground sealed tubes may be used to provide the medium through which conveyances may be moved in an automated manner.

Hyperloop is primarily geared towards the urban environment, with existing tunnels in Hawthorne (by Los Angeles Airport) and proposed larger scale projects such as Chicago.

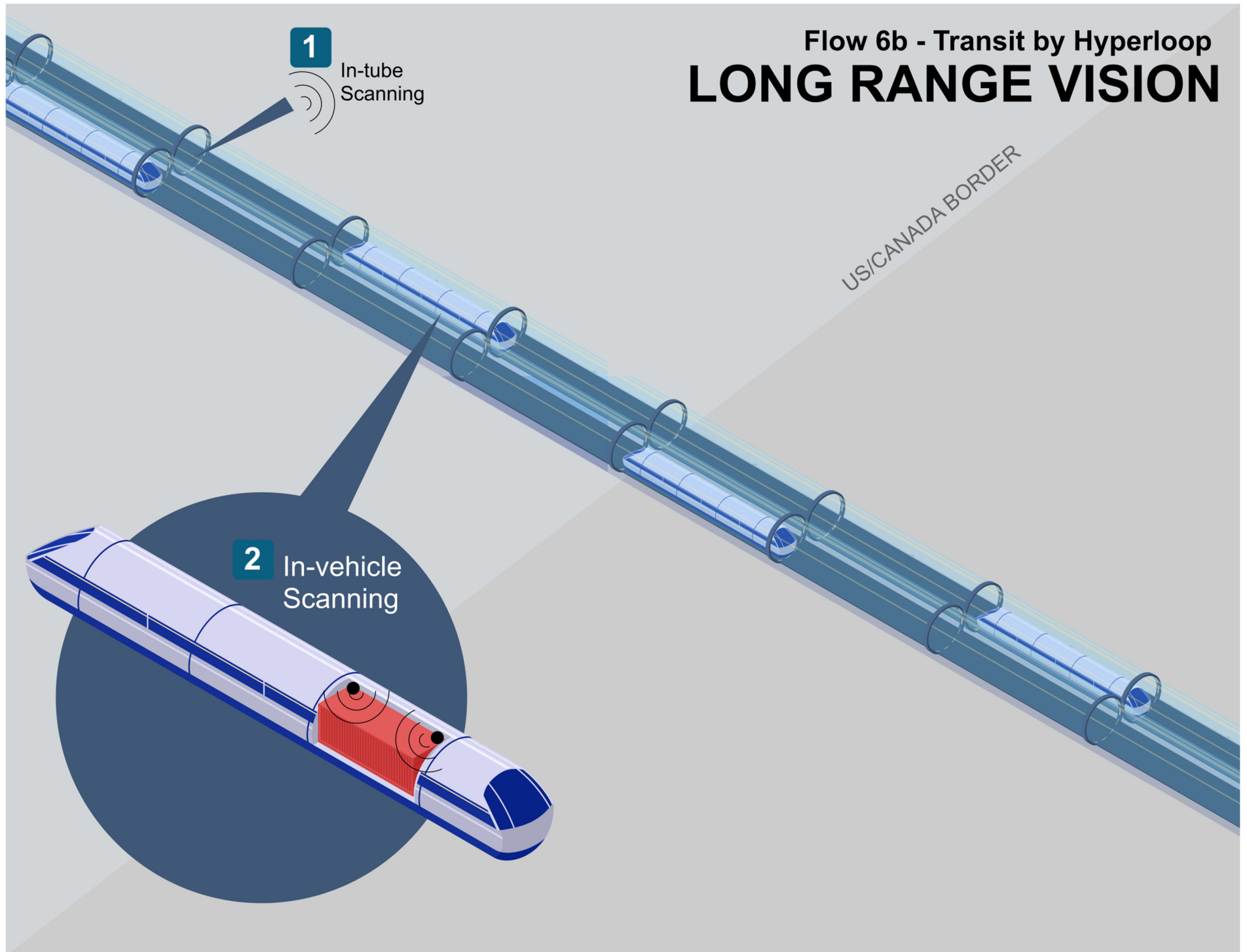
While it is unclear whether this form of technology is commercially viable and sustainable, it creates an interesting question – would we evolve the same solutions we have today for border movements? Or are there opportunities based on the hyperloop platform?

The possible long-range vision for goods moved via Hyperloop is depicted on the following page along with the potential benefits.

	Solution	Description	Benefits
1	In-tube scanning	Scanning of items being transported is integrated directly into the infrastructure	Technology solution to increase security and seamless cross-border transportation
2	In-vehicle scanning	Scanning of items being transported is built into the conveyance itself	Technology solution to increase security seamless cross-border transportation

Both the hyperloop example and unmanned aerial vehicles demonstrate new security capabilities from technology evolution that could be harnessed to make the U.S.-Canada border efficient if there are sufficient business cases to integrate the modes of technology into supply chains and travel networks.

Flow 6b - Transit by Hyperloop **LONG RANGE VISION**



Cost Savings Summary

Annual Cost Savings

The anticipated cost savings were estimated from fully implementing both the near-term solutions and long-range vision for each of the transportation modes for goods movement and passengers. Although there are numerous secondary or indirect drivers of cost savings, the primary factor is from the removal of border processing requirements at the U.S./Canada border.

The estimates were calculated from the perspective of industry and travelers for the status quo and does not include the additional benefits that would further accrue to government organizations from improved, more efficient border processing.

The following table summarizes the annual cost savings benefit for implementing the Beyond Preclearance vision for industry and travelers.

Mode	Traveler	Goods Movement	Total Annually
Maritime	\$5 M	\$1,245 M	\$1,250 M
Aviation	\$106 M	\$3,228 M	\$3,334 M
Rail	\$1 M	\$4,596 M	\$4,597 M
Land	\$162 M	\$3,878 M	\$4,040 M
Total Annually	\$269 M	\$11,702 M	\$13,221 M

Capital Cost Savings

There are considerable infrastructure implications from some of the border processing requirements for travel and transportation between Canada and the U.S. For some modes (i.e. rail and land) the need for facilities for ports of entries in both countries may be removed altogether and result in significant capital cost savings. For other modes, such as aviation and maritime, there is still a need for border facilities for goods and travelers arriving from outside of the U.S. or Canada. The anticipated benefit for these modes is space savings from reduced processing requirements through the facility that may be used for other purposes or lead to deferred capital expenditures for expansion.

The table below outlines the capital cost savings to for the implementation of the Beyond Preclearance vision.

Mode	Traveler	Goods Movement
Maritime	Industry will benefit from reduced requirements for some cruise border facilities and space savings.	Industry will benefit from space savings and equipment reduction at ports.
Aviation	Reduced processing requirements may lead to reclamation of space, space savings, equipment reduction, or deferred capital spending at airports.	
Rail	Industry and government will benefit from reduced requirements for some train station or border facilities.	Industry will benefit from reduced requirements for border facilities at several border crossings.
Land	Governments will benefit from reduced requirements for facilities at land borders/ports of entry, which are typically government funded.	

Chapter 5: Enabling the Vision

The detailed vision for Beyond Preclearance incorporates technologies and processes to create more capacity for border flows. Operational changes alone cannot help yield sizeable improvements. There needs to be concerted effort to ensure all parties co-ordinate on a range of policy and strategic areas.

For the ideas outlined in Beyond Preclearance to be successful, there must be a set of enabling mechanisms to help deliver an improved U.S.-Canada border agenda focused on governance, cooperation and research, as well as best practices and guidelines.



“The role of the World Economic Forum is to create Public Private Partnerships to drive change and technological update across sectors through systems initiatives.”

*Lori MacDonald, Assistant Deputy Minister for Safety and Security, Transport Canada
March 26, 2018*

Our Track Record

Over the last 25 years, Canada and the United States have delivered high-level declarations, agreements and action plans on border co-operation in a regular cycle.

Every four to seven years, there is a new ‘branded’ initiative – usually built around one or two buzzwords such as shared, smart, security, prosperity and perimeter. These are important to focus attention from disparate interests to a common goal – as all aspire to achieve a “smart” border.

The failing of using simplistic monikers is that significant energy is invested to pursue action plans, followed by dissipating interest as the cycle ends. Politically, as well as organizationally, there is consternation about “what next?”

When Beyond the Border stopped reporting on its action items, the perception was that there was little attention from the prime ministerial and presidential level. Co-operation has continued (TSA-Transport Canada, CBP-CBSA, etc.), especially in formulating the implementation of the Preclearance Agreement.

More importantly, the level of co-operation to develop new models of processing is accelerating for some modes of transportation, namely land border, container cargo and aviation. More work is needed in cruise, rail and other sectors to cross-pollinate innovation.

Finally, all sectors have raised the issue of the cost of providing free facilities to governments - a major cost burden on their operators. Some modes of transportation have found forms of financing (e.g. Tijuana Airport, Gordie Howe Bridge). Others have tried to develop facilities that meet outdated standards.

Key Enablers

Looking to the next 20 years, there need to be investments to ensure more sustainable solutions in five areas:

1. How will the country-to-country mechanisms evolve?
2. What is the investment case to achieve the Beyond Preclearance vision?
3. What will be the means creating the win-win solutions when the return-on-investment is different for stakeholders and governments?
4. How will we create ongoing research & development for the U.S.-Canada border?
5. Is there a better way to address facility requirements and to future-proof capital investments?

1. Bilateral Mechanisms/Governing Body

Canada and the U.S. are not the only two countries that have a close relationship. South Korea-Japan and Australia-New Zealand are examples of bilateral country pairs with cooperative arrangements. Australia and New Zealand have some mechanisms that have allowed greater process integrated – namely the agreement to use SmartGate in 2007 as a platform for border automation.

Beyond operations and technologies, however, there is the need for an overall set of governing elements to ensure policy cohesion.

Canada and U.S. have several bi-national organizations developed to address key areas of co-operation and management. They include, but are not limited to:

- NORAD
- International Joint Commission
- International Boundary Commission
- Regulatory Cooperation Council

Their focus is as diverse as military, environmental or other purposes prescribed in statutes. Governance structures are mixed but typically have a bi-national steering committee with a variety of mechanisms to execute actions.

NORAD is often cited as a model for country-to-country management of a “border zone” – that may be physical in nature (i.e. within 20 miles of the border) – but is more accurately conveyed as including a virtual environment that governs the entire overseas preclearance and arrival process into the U.S.-Canada region. The trust factor is clear: A Canadian commander happened to be in charge the day of the 9/11 terror attacks. NORAD’s command and control clearly worked.

We have greater complexity, however, with the number of departments and agencies *other* than CBP and CBSA. The FDA, Agriculture Canada and others need to be able to forge ahead with solutions outlined in Beyond Preclearance. As well, there is a difference between day-to-day operations and overall policy-making that must be factored into the functioning of any governing body.

It is important to create a body that stands at the policy/strategic level. If Canada and the United States can agree on a set of

objectives, performance targets and common interests, there must be a permanent mechanism charged with advancing the effort and reporting to designated leaders. We need to ensure responsibility and accountability rest in one place for delivery and implementation is supported by different levels of interaction with industry participants.

This effort is recommended to be structured at four levels and provide:

- A bi-national executive committee at senior levels of government for Canada and the United States
- Incorporate key trends and strategic priorities from industry participants
- Create actions and show results on a regular basis

As shown on the following page, there would be four groups:

1) Bi-national executive committee: meets twice a year, co-chaired at the minister level with representatives from multiple departments and agencies. The executive committee sets the agenda, conducts a yearly assessment of border performance, reviews the threat environment and directs work to bridge identified gaps. The executive committee would also have:

- A standing secretariat that would alternate every two years
- Bi-national industry representation, providing industry an opportunity to submit briefs and propose initiatives.

2) Work groups: designed by the executive committee to undertake short- to medium-term action meant to measurably advance critical border issues. Such a working group, for instance, could be designed to provide advice on the creation of a joint

border clearance entity, or determine the bi-national approach to biometric verification.

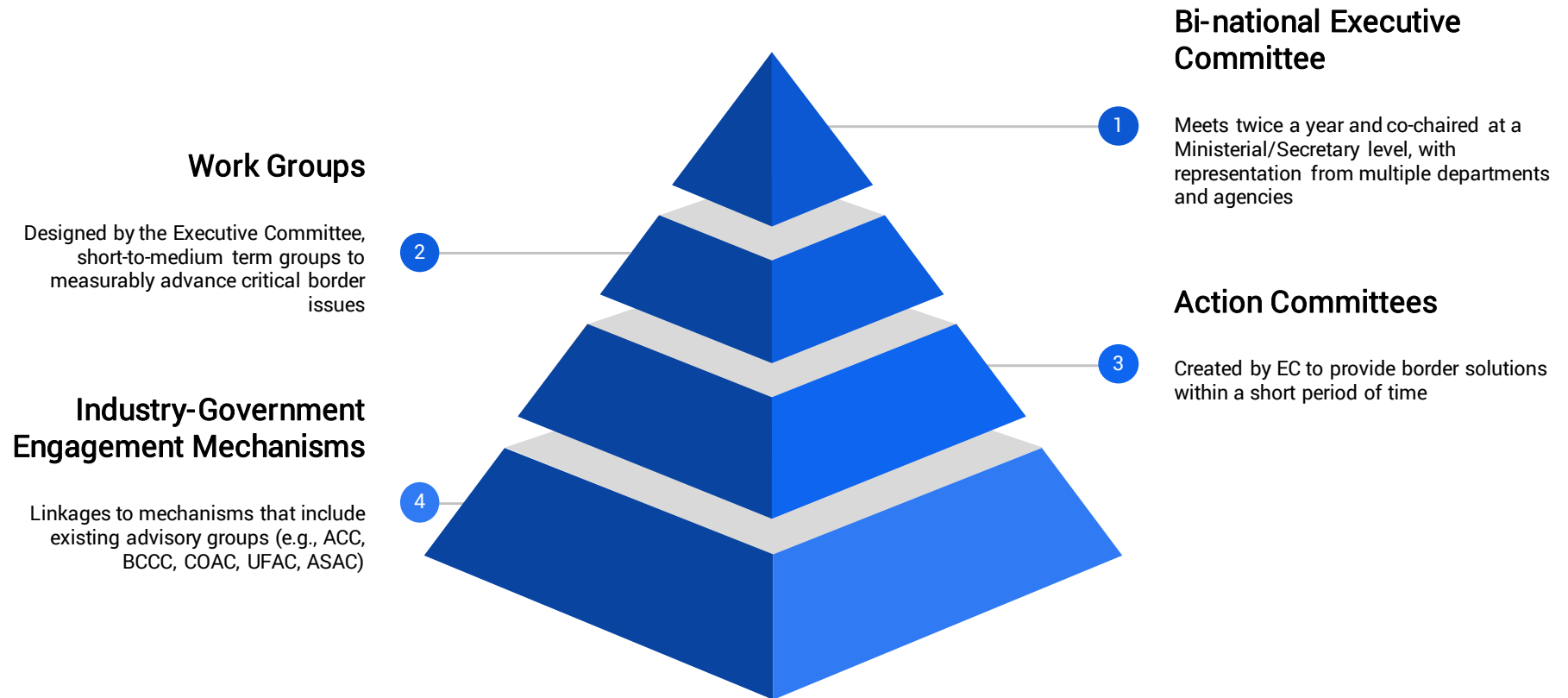
3) Action committees: to be created by the executive committee to provide solutions within a 3 to 6-month period with a specific designated lead in each country to ensure focus and progress on border improvement achievements. For example, it could develop quick fixes such as full recognition of Global Entry in Canada.

4) Industry Forums: There are also a wide array of linkages to mechanisms that could be modal-specific or confined to a specific topic. Many of these are statutory bodies and could incorporate additional inputs. Current mechanisms include:

- Canada
 - Air Consultative Committee (ACC)
 - Border Commercial Consultative Committee (BCCC)
- United States
 - User Fee Advisory Committee (UFAC)
 - Aviation Security Advisory Committee (ASAC)
 - Commercial Operators Advisory Committee (COAC)

There are already active industry-government initiatives that could be augmented to have a bi-national focus.

Proposed Structure of Bi-national Border Governance



2. U.S.-Canada Border/Security Funding

A second and important aspect of meeting the future vision of border management is the level of expected investment. As noted earlier in this document, the budgets for managing clearances of our borders and the screening of people/goods is estimated to be U.S. \$22 billion in total between both countries. It represents one of the single largest expenditures of public resources and is also backed with additional non-public expenditures in operations, facilities as well as administrative costs.

Looking into the future, the opportunities to reinvest in the platform to accommodate growth requires a fundamental rethink into the springboard for growth. The past two decades has seen major investments for international trade and travel that includes:

- More than \$20 billion in Automated Customs Environment and improvements to modernize trade information systems
- More than \$500 million spent on new visa and travel authorization systems;

These investments are supplemented by more than \$120 million spent by the travel industry on automated border kiosks.

38,000 New Officers by 2038 If Today's Model Continues

Yet even with these investments, the staggering pace of growth predicted over the next 20 years will stress the system further.

Growth for international border movements is forecast to be 4-6% per annum over the next 20 years. As noted previously, there is the need to hire some add some 38,000 new officers to be able to help process additional cargo and passengers.

Based on today's collective bargaining arrangements, 38,000 new officers by 2038 would add a total of U.S. \$3.5 billion in total for the U.S. and Canadian governments in total. The total incremental resources would be some \$37 billion over 20 years, assuming that:

- Today's service levels/queue lengths are preserved
- No other requirements are augmented to address yet-to-be seen security measures

Alternative needed: the Beyond Preclearance vision

Cost estimates were done for each of the 54 initiatives that formed part of the vision outlined in Chapter 4 from an order-of-magnitude perspective. The methodology involved:

- Reviewing the size and scale of recent large technology deployments
- Examining the best available information on recent systems deployments (biometrics, blockchain, etc.);
- Identifying potential scale of public investments, as well as shared elements between modes of transportation.

At the minimum, a total of U.S. \$7.4 to \$10 billion is estimated to be needed in incremental investments to be able to develop and complete the initiatives outlined in Chapter 4. The payback alone for both governments is expected to be within 8 years, based on improvements in efficiencies that could allow for reallocation of resources, deferring future increases in full-time equivalent staff, as well as sharing more resources between agencies and modes of transportation.

There are already promising developments being advanced through the introduction of new technologies. For example, the addition of biometrics for processing people is estimated to increase throughput by 20-50% -- with the same number of officers.

Initial Order of Magnitude Cost Estimates of Beyond Preclearance Initiatives (US \$)

Initiatives	Travel	Trade	Total
All/Multiple Modes	\$400 M to \$600 M	\$3,500 M to \$4,900 M	\$3,900 M to \$5,500 M
Maritime	\$200 M	\$300 M	\$500 M
Air	\$800 M	\$600 M	\$1,400 M
Rail	\$100 M	\$300 M	\$400 M
Land	\$600 M	\$600 M	\$1,200 M
Total	\$2.1-\$2.3 billion	\$5.3-\$6.7 billion	\$7.4-\$10 billion

Note that past the initial investment of \$7.4 to \$10 billion, additional funding is needed over 20 years to address lifecycle asset replacement as well as mature the use cases that can change the scope of future deployments.

Additional Benefits: Facilitating Trade and Travel

The investment of \$7.4 billion to \$10 billion to achieve the Beyond Preclearance vision is one aspect of delivering on new capabilities. In addition to the benefits within governments, the 54 initiatives provide a compelling case for the reduction of transaction time

through improved processes, reduced duplication and achieving full synergies between Canada and the United States.

As outlined in Chapter 4, realizing the changes in processing could create benefits upwards of:

- \$13 billion annually in value across all modes of transportation
- Over \$1 billion in facility cost savings in the next five years, with further savings potential based on future growth projections

These savings cannot be realized however without maturing the traditional public-private-partnership model. While P3's can generate quantum returns, there also needs to be a fourth element added: policy. As a result – a P4 model is called for in the U.S.-Canada relationship on borders – a private-public-policy partnership.

Establishing Service Standards

To be globally competitive, throughput rates and wait times through security screening and border control must be comparable, if not better than international peers. Government agencies should consider setting national standards to help justify investments by industry partners.

3. Return on investment for solutions

From a national and bi-national point of view, effective border management is a vital contributor to each country's economic objectives. Whether it is trade, tourism or other sectors of industry, there is a strong dependency on a seamless and secure border environment to manage flows. In general, governments serve as regulator, legal enforcer and key service deliverer. Private-sector interests are generators of economic activity as well as a vital on-the-ground operational resource to help with border/security flows.

If both countries have clearer performance standards and there is an opportunity to establish a new partnership to fairly distribute costs, responsibilities and to create solutions that work for both national governments and industry stakeholders.

Based on new models of processing with biometrics, contactless solutions and other improvements that CBP, in particular, has innovated, there is upwards of 2-4x return on investment that could fundamentally alter the current methodologies to create new value in border/security operations.



Changes Going Forward

The traditional division of costs and responsibilities have been outpaced by advances in technology, mounting labor costs and a threat environment that drives security costs. It's worth noting the actual set of security drivers is not always known to private-sector

interests – given the sensitivity of information associated with the threat environment.

In the last 10 years, there has been an acceleration of requests for the private sector to absorb more in cost recovery. Whether it is the reimbursable services program for CBP or the use of external charging policies, there are many operations that are in excess of 15% of operational costs borne by the private sector for border and security clearances.

The business risk to the private sector is in absorbing a set of public procurement practices or labor agreements where an individual airport/port/rail carrier or land border crossing has no influence at all. That is not to say reimbursing the government has not created value – there are many examples of new routes and new border crossings paid for by the private sector. These have created new trade and travel possibilities. However, these are localized and are not easily transferrable to all regions and all geographies.

For example, smaller ports do not have the economies of scale to sustain the ability to pay cost recovery or reimbursement.

Value Creation

The answer is to refocus “return on investment” in full towards value creation. A couple of recent examples come to mind:

- An airport that has implemented 100% facial biometrics with CBP reporting it no longer needed to dip into overtime reimbursable services
- The creation of the Transportation Security Innovation Task Force has changed the model for aviation security screening, paid in large part by airline investments

- The testing of the Pre-Arrival Readiness Evaluation pilot at the Peace Bridge is transforming the way land borders will be planned
- Canadian transit passenger processing implementation in 2017-18 has fundamentally shortened the connection time at major airports

These are examples of how new relationships are developed to drive positive economic returns – for private and public interests alike.

Whereas responsibilities and performance outcomes need to be clearer, designs must be adjusted to local circumstances. Predictability must be a common objective for users, partners and stakeholders

Under a new model, there may need to be a fundamental redefinition of the creation of value in four areas – people, process, technologies and facilities.

	Public Sector Border/Security Agencies	Private Sector/Facility Operator
People	Primary	Secondary
Process	Primary	Secondary
Technology	Primary/shared	Secondary/shared
Facilities	Secondary	Primary

People

Public funds are the primary source of funding for labor resources. There are however shortfalls being advanced due to budgetary constraints. Today's model has private-sector operators compensating for the lack of resources in government agencies through a variety of methods to pay for additional staffing. This occurs in Canada and the United States in a variety of methods, including recent advancements related to the Canada-U.S. Preclearance Agreement and the reimbursement of time for aviation security screening.

Several areas to advance evaluation include:

- Cross-designation to enable U.S. and Canadian entities to act on behalf of their national counterpart organizations
- Alternate service delivery to enable a private contractor, for example, to provide labor to screen goods remotely
- Remote-designation, allowing economies of scale for smaller operations to conduct video screening

These three areas, along with other technological improvements, could provide a mechanism to reduce the dependency on sometimes cumbersome reimbursable services agreements, which should be used only in select cases of creating new market opportunities.

Process

The actual process of border management traditionally is fully within the domain of the public sector. Private-sector facility operators have started to play a role in processes through the suite of trusted trader programs. For example, the ability to invest in a secure facility could generate reduced secondary inspections.

While this concept is sound, there needs to be:

- Greater transparency on actual benefits
- Investments as noted in Chapter 5 for large data set/heuristic algorithms to better manage risks
- Additional bi-national efforts to ensure that easy to fix operational changes are implemented

As an example, changes to reduce transaction time by as little as five seconds per truck are collected efforts that reduce the amount of labor needed to process people and goods

Technology

Public-sector technological solutions have dominated the delivery of border and security solutions over the last 25 years. A shift occurred in 2006 with the emergence of the private sector leading solutions development in partnership with public entities – namely in border automation.

For airports, cruise lines and ports that participated in border kiosk automation, the investment was based on:

- Significant line-ups to for processing – sometimes up to 3 hours to be able for processing
- No certainty of new staffing to be delivered
- Lack of facility space to grow for new air services or cruise ship processing.

This model yielded a return-on-investment for the transportation sector, such as spending \$3 million on new technologies to defer \$100 million in new facility construction. This model may be

replicated in future for other “win-win” situations that can help manage growth of trade and travel.

Facilities

As noted previously, the vast majority of border and security processing facilities are paid for by the private sector free of charge to federal entities. Public-sector border and security agencies also have support facilities whose cost must be factored into growth forecasts. Due to cost escalations in delivering facilities, this area represents the number one concern of facility operators.

The business risks for transportation operators to deliver facilities are:

- Overbuild: providing too much capacity for the requirements and thus greater carrying costs to finance assets
- Lack of flexibility: inability for the rail/air/land border/cruise operator to adapt to new requirements or flexibly increment new phases
- Impact on commercial objectives: reducing the ability to create land or terminal-based opportunities to profit from transportation activities

These three risks are endemic across the U.S.-Canada border environment across all modes and create inefficiencies due to added capital expenditures. Moreover, the opportunity cost of the actual space is an increasing problem for facility operators – both in the financing of facilities and as alternate revenue-generating sources leading to serious evaluation and consideration of effective joint facilities.

4. Research & Development

All the ideas that are presented in this vision and strategy white paper are predicated on focused use of technologies. The opportunity to focus non-governmental expertise to develop further research, innovation and process improvements is an important part of realizing the Beyond Preclearance vision.

There are major changes needed to address the future of technological change and the know-how to sustain improvements. For example, despite major cooperation between countries, there is no mechanism for joint research and development for the future of the U.S.-Canada border. Some joint procurement has occurred for border wait-time technologies, but the results are mixed. As well, there is only one academic research institution (Border Policy Research Institute) with a focus on U.S.-Canada border issues.

The speed of change in new ways of doing business necessitates more attention to the role of applied research, technology acceleration, as well as research and development.

Technology acceleration

The speed of incubating ideas and technological adoption is accelerating faster than any one entity can keep up with. While there are many examples of the ability to change processes in security and border controls, performance is mixed. The fastest examples of deploying changes to border or security processes are all related to solid private- and public-sector commitment. Namely: the introduction of connections improvements by CBSA at Canadian airports, the introduction of facial biometrics by CBP across different modes and the advancement of TSA automated screening lanes and CATSA Plus.

There is the need to find faster models, such as “hackathons,” to ensure we are solving today’s issues as opposed to responding to the problems from the previous generation of technologies. Consequently, technology accelerators/incubators/living labs are all important developments that will help find ways to replicate the speed of commercializing technologies. A conventional two-year cycle to deploy solutions could shrink to two months if there is the ability to quickly learn from failures and successes to scale to new products.

Applied research

As noted previously, even though there is significant attention at policy and operational levels to the future of border and security movements, little is being advanced bi-nationally on applied research. In older initiatives such as the Security and Prosperity Partnership, research funds were allocated to ensure the review of root causes of border delays, as well as forward-thinking policy recommendations.

The efforts of academic institutions such as the Border Policy Research Institute, as well as think-tanks affiliated with industry groups are disparate and not fully engrained within a structure to respond to emerging needs.

The Cooperative Research Program (CRP) model administered by the National Academy of Sciences and Transportation Research Board is a model that Canada and the United States should follow. Whether it is related to highways, airports or other modes, the co-operative research program has:

- Representation from government, academia and industry
- A set process to receive “problem statements” that are evaluated and prioritized

- Commissioned research projects that respond to future needs

A companion program emerged under National Safe Skies Alliance known as Program on Applied Research in Aviation Security (PARAS) that is aimed at CBP/TSA/DHS issues. However, it has a U.S. domestic focus.

A version is needed to provide applied research, creating ongoing knowledge and insights into what improvements are necessary. Some examples include:

- Creating a standing econometric model to determine the economic impacts of new rules in border and security across Canada and the United States
- Benchmarking best practices between modes and between countries
- Investigating detailed metrics of new processes that are currently more anecdotal than fully researched results

Research & Development

Finally, there is the need for more emphasis on U.S.-Canada research and development. CBP, CATSA, TSA, CBSA and other federal entities each have different labs for testing and evaluation. Government's ability to leverage technology to get to the vision outlined in Chapter 4 has traditionally been slower than in the private sector. Large federal procurements in both countries have often languished with delays and performance issues – sometimes unresolvable before the end-of-life obsolescence of the product.

The border is one of the few areas where both federal governments must provide broad-based technologies and work with multiple stakeholders to provide dynamic front-line services.

The border is unique in terms of federal governments having to manage the smooth entry and exit of hundreds of millions of people and billions of dollars in goods while collecting billions in revenue.

As private-sector stakeholders are better enabled to modernize quickly and more apt to implement technology in a timely fashion, a new research and development model must be applied to developing, testing and implementing effective methods and technologies at the border.

5. Progressing Facilities

As noted previously, all modes of transportation have the need to provide space, free-of-charge, to government entities for operations. Feedback from Beyond Preclearance sponsors demonstrated many cases across all modes of under-utilized or unused facilities, some of which are arguably located in locales where it is impossible to staff them viably.

Overall, each government department and agency have different approaches and standards for facilities. Some of these include:

- Canadian Air Transport Security Authority (CATSA)
- Canada Border Services Agency (CBSA)
- U.S. Customs and Border Protection (CBP)
- Transportation Security Administration (TSA)
- U.S. Department of Agriculture (USDA)
- U.S. General Services Administration (GSA)

Successive border agreements have pointed the way to achieve true joint facilities and co-location of both country inspection staff/processing. These are laudable objectives and need to extend further to the group of all participating government agencies that require space.

There is also a difference in the way facility requirements are managed. Most government agencies have technical standards – i.e. you must provide a certain square footage for a functional purpose. There are limited mechanisms for developing planning guidelines to create better facilities that will last 20, 30 or even 60 years.

Facility planning documents in the U.S.-Canada border and security environment could benefit from the following changes:

- **Less prescriptive and more flexible:** moving from hard technical standards to planning guidelines and recommended practices
- **Collaborative:** TSA's Planning & Design Guidelines process, for example, has a best practice through broad industry input for updates
- **Living, breathing documents:** Recognizing that new developments in biometrics, for example, could significantly alter the planning requirements for new facilities

Co-location is something touted between both governments for over a decade. There may be further opportunities to implement co-located facilities not just in the small ports context, but also for shared global preclearance facilities such as those that CBP is advancing for implementation in Europe, Latin America and Asia.

Lastly, the Beyond Preclearance initiative contends that when it comes to facilities the fundamental question to ask is this: Why must the facility be constructed? With the flows outlined in Chapter 5, there are a series of opportunities to move facilities inland (e.g. to a factory) or even overseas (e.g. joint Preclearance to U.S./Canada). If there is a model that can push the borders out fully, then the cost of having facilities at the physical border itself is not necessarily needed in the long-term vision of processing people and goods.

Chapter 6: Next Steps

In the seven years since the Beyond the Border Action Plan was advanced, significant changes in policies, technologies and opportunities for improvements in border/security management have been created. We are at the precipice of fundamental and sustained changes that can unite together disparate interests towards a common vision of:

- Improved security through measurable changes in detection and advanced processing
- Greater facilitation of legitimate trade and commerce
- Cooperation between governments and industry stakeholders

To realize the benefits outlined in the Beyond Preclearance initiative, there must be a concerted effort to act upon new possibilities, as well as increment our joint approaches to an end state.

Key Themes for Initial Projects

Five themes have emerged that can unlock the potential for U.S. and Canada to evolve its processes for a \$100 trillion economy. These themes cut across all modes, geographies and size of operation. The five themes from Beyond Preclearance give rise to 17 pilot projects that are described in this section.

- **Theme 1: Adopt a Remote Clearance Approach:** Preclearance is extremely positive for both countries and the relationship since 1952 needs to evolve beyond the current model. Preclearing requires physical presence from a faraway location. Remote clearance allows activities to occur from afar – whether it is interviewing, scanning or inspecting goods/people.
- **Theme 2: Screen Once, Accept Multiple Times:** The mantra of the past 25 years of border innovation is “screen once, accept twice.” CBSA and CBP, in particular, have major advances in this regard, as have Transport Canada and TSA. Other government departments also need to be part of this objective as well – to get to multiple clearances in one interaction.
- **Theme 3: Manage to a Trusted Secure Token:** The adage of “garbage in, garbage out” is the risk to any modernized system. Secure traceability to the origin is needed – whether it is through a biometric or trustmark approach.
- **Theme 4: Move Away from Fixed Checkpoints to Clearing Flows:** When border were fixed lines on a map, the idea of having a single border checkpoint was engrained. Similarly, security screening is geared towards a fixed geography for activities to occur. The elimination of line-ups depends on moving the model to managing flows of people/goods rather than a checkpoint approach.
- **Theme 5: Harness Big Data:** Over 100 terabytes of data exists related to border/security movements. This must be leveraged more to modernize the aged-old approach to finding the needle in the haystack through sophisticated algorithms and machine learning techniques.

Pilot Projects

Pilot projects are a mechanism to test out new ideas as well as assess the potential implementation challenges in live operating considerations. The term “pilot” has a slightly different meaning in the U.S. context as compared to Canada.

In general, there are several product-specific pilot projects. For example, a “block-chain pilot” or a “biometrics pilot.” It is important in Beyond Preclearance that there’s also an outcome-based approach to pilot project definition that is dependent on technology, but not *defined* by technology.

The U.S.-Canada environment in late 2018 has some 78 different pilot projects in a range of goods and people border/security clearances. From industry-led initiatives to joint government testing, these are factored into the definition of the kinds of activities that will be most important for the implementation of the Beyond Preclearance vision.

17 pilot projects are defined across five themes that are based on criteria of

- Relevance to a variety of different modes of transportation
- Applicability to size of border/security operations
- Ability to demonstrate the return on investment outlined in the previous chapters.

The list of pilot projects is outlined to the right with a more verbose description that follows in this Chapter. Further work is needed as next steps to define a project charter and analyze the full business case for changes.

Recommended Pilot Projects

Theme 1: Adopt a Remote Clearance Approach

- A. Remote Screening & Clearance
- B. Overseas Joint Preclearance
- C. Remove all internal re-screening

Theme 2: Screen Once, Accept Multiple Times

- A. Multi-government agency screening
- B. Joint U.S.-Canada Travel Authorization
- C. Five Eyes Country Coordination

Theme 3: Manage to a Trusted Secure Token:

- A. Biometric token – from visa to destination
- B. Traceability of goods

Theme 4: Move Away from Fixed Checkpoints to Clearing Flows

- A. Deploy mobile technologies for all modes
- B. Integrate automated trucking pilot projects
- C. Clear at origin
- D. Facial biometrics at land borders

Theme 5: Big Data Risk Management

- A. Retrofit trusted traveler programs
- B. Renew trusted trader approaches
- C. Travel or trade history-based vetting

Summary of Recommended Pilot Projects

1A: Remote Screening

Scope

Advances in medical science and imaging technology allow for large scale imaging to be conducted in real-time from thousands of miles away.

Pilot projects are needed to extend remote imaging systems to enable:

- Voice and video interviews
- Sharing of x-ray screening images

Specific applicability to small/remote ports that could be managed similar to a video call-center approach. For example, a small port in South Dakota or in Newfoundland could serve as a central mechanism to enable remote activities nationally, bi-nationally or even for other geographies around the world.

Applicability

All modes of transportation have opportunities to be able to share images tied to a unique identifier (i.e. single token or commodity traceability standard).

1B: Joint Overseas Preclearance

Scope

U.S. Customs and Border Protection is targeted 33% of passengers to be precleared into the United States with new sites to be opened in Europe, Asia and Latin America. Potential exists for Canadian-bound flights to leverage off the model, potentially coupled with remote interview/screening.

Applicability

Limited to the aviation mode of transportation but could be used for several areas that have cruise, rail or land-border crossings that could use the same model.

1C: Remove all internal Canada/U.S. re-screening

Scope

While Canada and U.S. have agreed to a framework for one-stop screening, there are several examples of connections (e.g. Ottawa-Toronto-United States) that still require re-screening for U.S.-bound passengers in Toronto. Image-sharing could be advanced to bridge the gap in any potential risks.

Applicability

Applicable in aviation only.

2A: Multi-government agency screening

Scope

Clearances are not fully conducted for all government departments. Partly this is due to the inability to fully sample goods that have commodity-specific requirements (e.g. agriculture).

Solutions could include:

- Cross-designating a Canadian agriculture specialist to conduct clearances on behalf of USDA
- Contracting to a set of performance specifications to a third party to clear items

Applicability

There are many examples that a multi-government agency screening could be beneficial. The ability for 24/7 CBSA or CBP

operations to be able to provide visibility to USDA/FDA could dramatically streamline trade for all modes of transportation.

2B. Joint U.S.-Canada Travel Authorization

Scope

A patchwork of requirements exist for visa-required and non visa-required foreign nationals visiting Canada, the United States or both. Adopting a mechanism based on block-chain technologies to house information on existing and past ETA/ESTA/visa/biometrics for foreign nationals could greatly facilitate the ability for two-nation vacations, return visits, as well as enabling multi-modal trips.

Applicability

All modes of transportation could benefit, in addition to markets that have a high component of cross-border international tourism (e.g. Niagara Falls, Vancouver-Victoria-Seattle, Alaska cruise ships, etc.)

2C. Five Eyes Country Coordination

Scope

Some countries such as Mexico and the United Kingdom have elected to recognize foreign visas as equivalent to one issued by the country. The Canada-U.S. framework does move towards mutual recognition but has not expanded beyond the bilateral relationship to other allied countries.

The group of five countries coordination security and immigration matters (UK, Australia, New Zealand, Canada, United States) could further coordinate a joint documentation approach – potentially through a blockchain method.

Applicability

Benefits are first within the air mode of transportation but could be expanded for any cross-border movement by rail, land or maritime.

3A. Biometric token – from visa to destination

Scope

Multiple biometric types exist for visa and documents. Most have centered on facial biometrics. However, Canada and U.S. do not have a common biometric strategy that centers on a single token. Many have advocated for the single-token of biometrics to be used for the end-to-end journey. More is however needed to make sure that the source biometric is registered up to 365 days before the day of travel.

Testing the ability to collect biometrics in a common fashion to be able to achieve end-to-end from visa issuance to destination, in addition to the activities of a shared biometric for transiting during the day-of journey.

Applicability

Applies to air movements, with connections to other modes of transportation.

3B. Traceability of Goods

Scope

The existing work of tracing goods from country of origin or commodity (i.e. GS1) is positive but it is at its infancy in full potential to move towards a single token applied to cargo. As a result, the ability to expand track and trace initiatives to a range of commodities in the U.S.-Canada environment is needed. The pilot projects could help to address limitations in counterfeit detection as well as commodity-specific issues.

Applicability

Goods movement for all modes of transportation. Moving to product identity origin to destination to increase seamless process, increase security, reduce cost to government and trade, and could interdict counterfeit.

4A. Deploy mobile technologies for all modes

Scope

Both Canada and the U.S. have started to leverage smartphone technologies. From Mobile Passport Control to Canada e-Declaration, there are initial apps used to be able provide information and pre-processing for travelers. The vision CBP articulated to have text messaging for passengers and the trade community could be further expanded with a set of pilot projects that could see:

- Mobile Passport Control used for land borders to help provide advance passenger information
- Corrections for minor data issues associated with manifests for goods movement
- Other ways of being able to provide directional information for drivers or passengers at a port

Applicability

As the ratio of smartphone devices to population moves to record highs, there are a range of consumer and trade-related applications for all modes.

4B. Integrate automated trucking pilot projects

Scope

The proliferation of new automated trucking presents opportunities to integrate next-generation sensors and information systems into the future definition of cross-border trucking. With automated platooning, there could be rules-based approaches that can help to keep flows moving at-speed across our traditional border checkpoints.

Applicability

Pilot projects are already advanced domestically for unmanned aerial vehicles in each country. Cross-border applications and extending the Ontario-Michigan trial in 2017 could be important to assess the capability of Level 4 and Level 5 automation for vehicles to strengthen border security

4C. Clear at origin

Scope

From wood plants, factories to airports/ports, the ability to clear goods movement at origin is integral to the future model of clearances.

While preclearance is geared around replicating border plazas in a different geographical location, the ability to clear goods before departure for high volume flows is important to ensure that there is a future to flow goods across borders.

Applicability

All modes.

4D. Facial biometrics at land borders

Scope

While there is a lot of attention on aviation and cruise ship modes of passenger biometrics, there is strong potential for facial biometrics for truck drivers. Particularly with those enrolled in Free and Secure Trade, there is already a photo gallery suitable for deployment.

Applicability

Trucking

5A. Retrofit trusted traveler programs

Scope

Both governments spend in excess of \$50 million a year to keep border trusted traveler programs functional. Growth continues, fueled by the interest in aviation security screening facilitation benefits such as PreCheck.

The use of travel history to establish a real-time update and validation of low-risk passage is needed to move to a different platform of trust. A migration to a trusted traveler program based purely on the facial biometric and travel history of the individual could be dramatically less expensive to administer than the application/membership/card-based system used today.

Facial biometrics could then be used to grant preferential access or expedited screening at TSA/CATSA checkpoints.

Applicability

Air, land and maritime

5B. Renew trusted trader approaches

Scope

Similarly, there is the need to retrofit C-TPAT and PIP to be able to provide greater supply chain security trusted traveler approaches. A block-chain that stores all information about the associated transactions and tier of security level may prove to be a faster method to get to a joint bi-national approach towards encouraging greater supply chain security. There will be a greater ability to also deal with subtle eligibility restrictions that are difficult to change within the current Canadian and U.S. constructs of the same program.

Applicability

All Modes

5C. Travel or trade history-based vetting

Scope

After testing the migration of trusted trader and trusted travelers to use travel history in combination with biometrics, the same approach could be phased in to all other categories of supply chain/travel categories.

Several areas of migration could occur that are tied to broader objectives. For example, the migration of APEC business travel card members to pilot a blockchain approach to vet company credentials could prove to be a more viable approach for Canada and the U.S. to reach full status within this multi-lateral program.

Applicability

All modes (APEC is primarily for air travel)

Business Case & Validation

The next steps will be to further develop and assess pilot projects based on the five themes. These will occur at industry-government meetings, including the Aviation Border Summit in October 2018 and other venues.

The pilot project themes are framed intentionally to be modal independent – there are enough opportunities to create benefits to the predictable, secure and integrated vision in each mode. Use cases and specific benefits to each mode of transportation, travel/trade sector and governments will be further refined in 2018-19.



“The challenge of the border leadership in the next 10 years is actually to create joint border management that respects sovereignty, but recognizes that the flows are more important than the lines in the world we live in.”

Alan Bersin

*Former Assistant Secretary for Policy and International Affairs,
Department of Homeland Security*

March 26, 2018

Appendix A:

Consultations

Methodology

Considerable research and consultation have been undertaken in support of this White Paper. In addition to formal consultative processes held with industry, government and members of academia, input was gathered from coalition members and other industry groups. Research included reviews of past co-operative initiatives between the United States and Canada, as well as work related to border management that has been undertaken and is currently underway in each country.

The global environment continues to evolve, and research included examining emerging threats and global trends in the movement of people and goods. Technological advancements have changed the way commerce operates and governments have responded with innovative changes in how they conduct risk assessment and process goods and people at the border. Technology offers both challenges and opportunities for future enhancements and this report highlights some of the most promising advances.

Events

There were six major events held to gather input.

Woodrow Wilson Center

The formal consultation processes began in March 26, 2018, with a session held at the Woodrow Wilson Centre in Washington, D.C. This session included approximately 25 participants representing the governments of both countries, various industry groups and other organizations (e.g. think tanks and academic institutions).

Public Policy Forum

Two sessions were hosted by the Public Policy Forum in Canada, one in Ottawa, June 12, 2018, focused on the evolution of technology with approximately 25 participants, the second in Toronto, June 18, 2018, on border policy in the global context with approximately 25 participants.

Passenger/Living Lab Workshop

A passenger workshop was held in Ottawa on July 10, 2018, with approximately 50 government and industry participant that was designed to elicit input on current border flows and issues, as well as highlighting where improvements could be made. The session also looked at some of the work currently being done by various organizations to examine where technological and other advancements are showing promise. This included a demonstration of the Vancouver Airport Authority's FutureExpress Living Lab.

PNWER Summit Roundtable

Pacific Northwest Economic Region 2018 Summit held on July 23, 2018, in Spokane, Washington, with approximately 25 participants, provided another opportunity to engage with stakeholders and to obtain feedback on areas that need to be strengthened to ensure a smooth flow of travelers and commerce into and between our two countries.

Cargo Workshop

A cargo workshop was held in Ottawa on August 21, 2018, which once again brought together approximately 25 participants representing government and industry participants to discuss issues facing the movement of goods across borders, reviewing cargo flows and solutions that could be used to improve them.

Key Issues - What we Heard

The level of interest and input at these sessions and with individual submissions has been invaluable in shaping the recommendations being made in the Beyond the Preclearance White Paper. While it was clear that substantial progress has been made within each country and with past partnership initiatives, challenges remain for industry as well as government. Some areas of work need to be further refined to be of maximum benefit. Emerging threats, changes in the global market and advances in technology offer significant opportunities to further modernize border management and prepare for the future.

Numerous issues were identified by stakeholders; some were industry or mode specific and others more generally applicable to all border flows. In addition, while CBSA and CBP are the primary agencies at the border, many challenges identified were not within their control. They involved other government agencies or dealt

more with overall government priorities, procurement and funding mechanisms.

The key areas of input were clustered around the following themes:

1. Coordination
2. Return on Investment
3. Government Constraints
4. Future Investment Decisions

1. Coordination

Lack of Harmonization

While data requirements for business are more closely aligned today between Canada and the United States, there continue to be differences in program requirements and processes are generally not harmonized. This increases the cost of doing business for industry and often results in multiple transactions per shipment. The requirement to submit separate applications and the duplication of paperwork/entries is both inefficient for industry and government.

This is an issue that applies equally to the movement of goods and travelers. Travelers may need to provide similar information to more than one government and agency to obtain the visa(s) and/or travel authorities they require, depending on their destination and travel itinerary. This can have particularly significant impacts when decisions are being made on travel plans that could involve a connecting airport or the choice of travel destinations.

The lack of harmonization is also evident at border crossings. Technology and processes can vary from location to location and

between governments and can be confusing to individuals and companies needing to navigate the different requirements. The resulting delays are costly.

Multiple Agencies Involved

Border clearances are conducted by CBP and CBSA on behalf of many other agencies, with numerous requirements related to goods being imported or exported. While the border agencies can conduct a large portion of the transactions at the border, the legislative and regulatory requirements of other agencies are often significant and complicate the smooth and efficient passage of cargo into and transiting both countries.

The Single Window Initiative under the Beyond the Border Action Plan was an effort to address this issue. However, while great progress was made with the submission of data requirements, this initiative did not go far enough to ensure that the risking and clearance process was integrated into a single window for industry. This is a critical step in modern commercial border management both within each country and on a bi-national basis.

Several pilots were conducted under the U.S./Canada Beyond the Border Agreement to assess the potential for goods to be screened, examined and cleared for both countries at the first point of arrival in either country. These pilots did highlight some issues, including additional steps necessary to address the requirements of other agencies. These issues have yet to be reconciled and impact heavily on the success of a one-clearance approach.

Policy Issues:

Frequently the focus on the introduction of new technology and systems to deal with challenges in border processing. However, some items raised in the consultations indicated that often it is policy decisions that create more complex border processes. A policy that might have been appropriate when it was first created may be outdated. Likewise, with current systems in place there are new security features which should be considered in determining what places need to be maintained.

One of the examples frequently cited is Canada's de minimis threshold, the value below which international shipments are exempt from customs processes, duties and taxes. Canada has one of the lowest threshold in the world, Cdn\$20. This is barrier for Small and Medium Enterprise (SMEs) and inhibits growth in this area. A higher LVS threshold would also allow shipments to flow through the border faster, cause fewer delays and take the stress off customs warehouses.

Another example deals with the requirement for a "wet-ink" signature on documents giving power of attorney. It has become common practice in business transactions to use an electronic signature, which reduces the administrative burden. This and other business practices are areas where government could look to modernize its requirements.

It is important that modernization efforts not be focused on automating current processes but to ensure that it is a holistic exercise that includes both policies and processes. In some instances, a fairly straightforward policy change can make a significant difference to the cost of doing business, both for industry and government.

2. Return on Investment (ROI)

Infrastructure and Operational Requirements

There are significant requirements for industry to provide specific infrastructure, supporting tools and equipment for border processing activities, including offloading of cargo and inspections. The facility requirements (size and specifications) are often based on older, less efficient models of processing and do not reflect the efficiency gains of new technology and alternative processing models. As a result, facilities are often overbuilt and cost more than is necessary. While this problem applies to several modes, it is a particularly acute issue for the rail industry when it is necessary to make extensive changes to accommodate inspection at the border. Significant reductions in investment could be achieved if inspections could be undertaken at existing private sector facilities at the destination.

Given the continual growth in trade and travel there is a need for service levels to increase, including at the border. It is impossible for governments to meet this demand solely with the addition of more border officers. Cost recovery is often the method that is used to provide service outside traditional hours of service or in more remote locations. There is little flexibility to change hours of operation to meet new demand. The cost for acquiring additional service can be significant. There are concerns that there is an increasing attempt to download government operational costs onto industry. Frequently there is not a strong return on investment (ROI) for business. While automation and technology have been used to help alleviate the pressures, their adoption has not always been as tailored and timely to meet demands.

Another concern is that even when industry does provide the necessary requirements for government, there are still delays. Of

particular frustration are the frequent situations where an inspection is required by another agency, such as the U.S. FDA or the USDA, and there is no one available to conduct this activity as they do not have corresponding hours to CBP. This creates a delay which can be significant, particularly if it is a perishable or time-sensitive commodity and may delay other cargo on the same load that do not even require inspection.

Equity between modes/locations and type/size of business:

The requirement for the private sector to provide both facilities and operational resources for border agencies has a particularly negative affect on remote and smaller locations where solutions that may provide a ROI where there are large volumes of traffic may not be viable as a processing solution elsewhere. An example of this would be the automated primary processing that occurs at larger airports using kiosks. Airports have invested in this technology as it has assisted them to keep infrastructure costs down while dealing with large increases in travelers. This has been a positive private/public sector partnership but does not have the same ROI for a smaller-volume location. There needs to be more attention to solutions that would work at these sites.

Outcomes are Uneven

There have been many initiatives introduced which have had a goal of simplifying border clearance for low-risk travelers and trade, assisting governments to concentrate their limited resources on high or unknown risks, enhancing security, and creating certainty for industry. Many of these programs have involved some level of private sector co-operation and investment. Frequently new systems and technology have been involved.

While it is clear some of the intended benefits have been achieved, the outcomes have been uneven. Trusted trader and traveler participants have achieved certain privileges but there continue to be a confusing array of programs on both sides of the border and they are not fully aligned. A traveler may cross the border in one mode as part of a trusted traveler program, but when they return in another mode the program is not recognized and they experience a different clearance process. Likewise, businesses may be required to submit multiple applications and site verifications to account for differences in the trusted trader programs which is costly in terms of time and resources. There is little return on investment if the programs are not harmonized or mutually recognized.

Over the last number of years several initiatives have succeeded in allowing agencies to gather advance information for travelers and cargo. This was intended to ensure that risk assessment processes could be done prior to their arrival in the Canada and the United States. Further enhancements have introduced a board/no board decision point before embarkation. In addition to enhancing security, these changes were intended to expedite passage for low risk goods and travelers. However, despite the increased availability of information and the sophistication of the risk assessment processes, there are still interventions at the border. While frequently automated, frequent low-risk travelers continue to experience a primary inspection process. Likewise, commercial goods are often held up for inspection.

Not only have the projected facilitation benefits of advance information programs not fully materialized, industry has invested in its own systems to be able to collect and submit the required information. In the case of air carriers, the board/no board process has not changed their liabilities and concerns have been

expressed that this is an area that requires review should future advancements look to their expanded participation.

This situation is similar to the submission of ACI for cargo. Significant investments have been made but the system is labor intensive for parts of the trade chain such as couriers, where there are typically thousands of shipments per trailer. Not only are shipments delayed but couriers still face high administrative monetary penalties (AMPs) for first offences while at the same time CBSA is working to streamline the process.

There is consistent feedback from industry that there should be flexibility from government in looking at infrastructure and inspection options that require a minimum of investment; that additional requirements need to demonstrate a real benefit for industry as well as government, and that liabilities should be appropriate and not activated until initiatives have fully matured and are operating as anticipated.

3. Government Constraints

Bi-national Partnership, Priorities, Funding

There is a long history of co-operation between the United States and Canada in managing its unique border. They have moved forward together to enhance information sharing and to develop programs that ensure border integrity in terms of security and a healthy economy. They have also worked with like-minded countries to modernize border management and to deal with emerging challenges and threats.

Notwithstanding the strong relationship between border agencies, progress between the two countries has been uneven at times, given the differences in their governance structures and how

priorities are determined. In addition, each government has certain national imperatives and they may not always be aligned with some of their border initiatives. New and emerging global threats, changes in government and the state of the economy are but some of the issues that can redirect government priorities.

This is not to say that there has not been progress at the national level within each country. The United States has made great strides in advancing its preclearance programs and Canada has been innovative in adapting processes and technology to expedite the movement of transiting passengers. Both countries have introduced various technologies to assist with the border clearance process and work continues to examine potential future enhancements. However, history has shown that the most significant improvements and benefits to travelers and traders are achieved when there has been a formal partnership agreement with specific goals and milestones. This allows for greater harmonization and reduced costs for both government and the private sector.

Government Processes

Many enhancements require changes in legislation and regulations, the development of new policies and the allocation of funding to support development. The processes to obtain approvals for these changes and to obtain the associated funding can be complex and time-consuming.

Even when Initiatives are approved for implementation, development has been impacted by challenges with new technology, procurement and change management. In addition, success often relies on industry being able to make corresponding changes to their systems which can also involve significant investments. Past initiatives have often taken years to fully implement and in some instances do not actually fully address the

issues intended as the environment and demands have continued to evolve. Unfortunately, it can be a matter of “too little, too late”.

The business world operates in a rapidly changing environment that demands innovation and the need for immediate attention. The traditional government processes are increasingly unable to keep up with these global and business demands.

Privacy Issues

Privacy issues are top of mind for governments and the advent of new technology platforms has increasingly highlighted vulnerabilities both in terms of the governance of data as well as the sharing and use of personal and company information. Traditionally, new programs and systems have been developed with a privacy lens in the form of a Privacy Impact Assessment. Frequently client consent has been used to ensure that the sharing of information is on a volunteer basis with knowledge of its intended use.

However, the speed of change and complexity of technology have raised concerns that more attention needs to be paid to this area. Is consent truly informed? Recent issues with social media have highlighted the unintended consequence of the development of platforms for use by a mass of individuals without pre-determined parameters. In addition, identity authentication is critical to border management and a form of biometric identifier is increasingly becoming the norm as the “token.” The work to build in privacy protections at the outset of the design is important, as is ensuring there is a clear understanding of how governments will use and share this information

4. Future Investment Decisions

The importance of Transit for Cargo/Travelers:

While there has been a strong focus on dealing with arriving cargo and travelers, a large percentage of traffic is actually transiting through either Canada or the United States. The final destination may be in North America, but it can also be elsewhere.

Transiting traffic is of vital importance to industry. In some instances, it means the difference in whether a carrier can support a flight from a foreign destination. Transiting passengers may not be staying in the country that they are transiting through, but they may make the difference in having a sufficiently full flight to make the route worthwhile. Should the connecting process require additional documentation, cost and timely processing, travelers might well choose to book a different itinerary.

Cargo frequently enters one country via one mode, such as marine, then is loaded onto a rail car or truck and transported across the border. The smooth transfer and transportation of goods can be greatly affected depending on the number of distinct processes and time required to enter both countries. Multiple entries and duplicate processes, including inspections, can be a significant cost and deterrent for importers.

There was a clear level of disappointment that the supporting initiatives under the U.S./Canada Beyond the Border Action Plan had not produced tangible results in this area. In particular, there were pilot programs conducted in relation to the Integrated Cargo Security Strategy (ICSS) and work done to explore conducting joint assessments and audits for plant, animal and food safety systems. Unfortunately, lessons learned were not pursued to see how measures could be introduced which would minimize re-inspections of goods at the border.

Future investments need to include a recognition of the importance of traffic that is transiting through either country and minimize duplication.

Model for New Technology Introduction:

While technology has been used extensively to enhance security and to improve fluidity at the border, there have been many challenges for both industry and government. Many initiatives have involved large-scale systems changes and building new programs on legacy systems. Some developments have been undertaken over several years with new functionality released in phases and industry making corresponding changes to their systems with the capture of vast amounts of data.

While there have been improvements, there are frequently further enhancements that are necessary to truly reap the benefits (e.g. the addition of OGDs to complete single window). Unfortunately, the size, cost and time necessary to implement these changes have resulted in frustration, lost business opportunities, and labor-intensive processes for government officials and outside stakeholders. In addition, there have been missed opportunities for government to implement smaller changes that result in a quicker return.

There is a need for government to adopt other mechanisms to respond to the rapidly changing environment, emerging security threats and the increases in global trade and travel. Governments need to move to an approach that involves smaller, incremental development and implementation, not adding to big legacy systems. The advancements in cloud computing, blockchain, artificial intelligence and other technology platforms should be part of the government lexicon. There are many organizations outside government that specialize in the emerging technologies

and platforms and can provide the service more quickly than governments trying to replicate the expertise internally.

Systems Resilience

Given the greater reliance on technology, the continual changes in the environment and the challenges associated with cyber threats, attention needs to be paid to systems resilience. In the past, there was an ability to use paper when there was a system outage. This is increasingly a challenge in all quarters.

Partnerships

Partnerships are an essential mechanism to take advantage of external expertise. There are some good examples of public-private partnerships where initiatives have been quicker to launch. The private sector has been able to procure and invest in some of the technological platforms and other equipment that have allowed government to focus on the risk assessment and other aspects of the clearance process. The result has been beneficial for both industry and government. A good example of this type of partnership is between the Vancouver Airport Authority (YVR) and CBSA with the Automated Border Clearance (ABC) program. The airport developed and procured the kiosks to support CBSA's primary inspection process. This model expanded to other airports in Canada and the United States. CBP entered into a partnership with YVR to introduce a similar initiative, APC, at U.S. airports.

These opportunities need to be further explored and a new model of partnerships embraced that includes research and development, technology development and procurement, risk assessment and other areas of border management. It is not that there needs to be a model that bypasses government requirements but rather one that recognizes the strengths that

each partner brings to the table and a mechanism to fully exploit opportunities to jointly implement a strong vision for the future.

Appendix B:

Glossary of Terms

Acronym	Full Name
AAFC	Agriculture and Agri-Food Canada
ABC	Canadian Automated Border Clearance
ACC	Association of Corporate Counsel
ACE	U.S. Automated Commercial Environment
ACI	Canadian Advanced Commercial Information
ACI-NA	Airports Council International – North America
ACI-World	Airports Council International - World
AI	Artificial Intelligence
AMP	Canadian Administrative Monetary Penalties
ASAC	U.S. Aviation Security Advisory Committee
APC	U.S. Automated Passport Control
APEC	Asia Pacific Economic Cooperation
APHIS	U.S. Animal and Plant Health Inspection Service
API	Advance Passenger Information
APP	Advance Passenger Processing
AV	Autonomous Vehicles
AWS	Amazon Web Services

Acronym	Full Name
BCCC	Border Commercial Consultative Committee
CANAMBT	Canadian American Border Trade Alliance
CANPASS	Canadian Passenger Accelerated Service System
CATSA	Canadian Air Transport Security Authority
CBP	U.S. Customs and Border Protection
CBSA	Canada Border Services Agency
CFIA	Canadian Food Inspection Agency
CGLR	Council of the Great Lakes Region
COAC	U.S. Commercial Operators Advisory Committee
CRP	Cooperative Research Program
CSA	Canadian Customs Self Assessment
CSI	U.S. Container Security Initiative
C-TPAT	U.S. Customs Trade Partnership Against Terrorism
DHS	U.S. Department of Homeland Security
ECOC	Electronic Chain of Custody
EDI	Electronic Data Interchange
ESTA	U.S. Electronic System for Travel Authorization
eTA	Canadian Electronic Travel Authorization
FAST	Free and Secure Trade
FDA	U.S. Food and Drug Administration
FTZ	Free Trade Zone

Acronym	Full Name
GE	U.S. Global Entry
GS1	International Global Standards 1
GSA	U.S. General Service Administration
GOES	U.S. Global Online Enrolment System
IAP	Interactive Advanced Passenger Information System
IBET	Integrated Border Enforcement Team
ICSS	Integrated Cargo Security Strategy
IMO	International Maritime Organization
IMTC	International Mobility Trade Corridor
INSPASS	U.S. Immigration Naturalization Service - Passenger Acceleration Service System
IRCC	Immigration, Refugees and Citizenship Canada
ISPS	Canadian International Ship and Port Facility Security Code
IT	Information Technology
ITDS	International Trade Data System
KPI	Key Performance Indicator
LMRA	Land, Marine, Rail and Air Preclearance Agreement
MPC	U.S. Mobile Passport Control
NAFTA	North American Free Trade Agreement
NASCO	North American Strategy for Competitiveness
NORAD	North American Aerospace Defense Command

Acronym	Full Name
OARS	U.S. Outlying Area Reporting Station
OECD	Organization for Economic Co-operation and Development
OGD	Canadian Other Government Departments
PASAS	Program Applied Research in Aviation Security
PARE	Pre-Arrival Readiness Evaluation
PGA	U.S. Partner Government Agencies
PIP	Canadian Partners in Protection
PNR	Passenger Name Record
PNWER	Pacific Northwest Economic Region
PPP	Public-Private Partnership
RFID	Radio Frequency Identification
ROAM	U.S. Reporting Offsite Arrival – Mobile
ROI	Return on Investment
SENTRI	Secure Electronic Network for Travelers Rapid Inspection
SME	Small and Medium Enterprises
SSP	Security and Prosperity Partnership
TEU	Twenty-Foot Equivalent Unit
TSA	U.S. Transportation Security Administration
TTP	U.S. Trusted Traveler Programs
TWOF	Transit Without Visa
UAV	Unmanned Aerial Vehicle
UFAC	U.S. User Fee Advisory Committee

Acronym	Full Name
USDA	US Department of Agriculture
USMCA	U.S.-Mexico-Canada Agreement
VACIS	Vehicle and Cargo Inspection Systems
WCO	World Customs Organization
WTO	World Trade Organization



www.beyondpreclearance.org