



IMPROVING CROSS- BORDER MOBILITY AND TRADE

A Border Transportation Planning Framework for
the 21st Century

MOMENTUM

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WHY CONSIDER BORDER TRANSPORTATION PLANNING TO IMPROVE CROSS-BORDER MOBILITY AND TRADE?

Cross-border mobility plays a crucial role in enhancing economic development between countries and regions. For sustainable interregional trade to occur, people and goods must be able to move between countries efficiently and equitably. Efficient cross-border mobility is dependent on a range of factors, including:

- Availability and functionality of the transportation infrastructure through which movement can physically occur;
- Safety and security of people involved through transportation networks and at border crossings;
- Facilitation and operation of associated processes and programs to advance trade and mobility at border crossings; and
- Impact on border communities and the environment.



Insufficient transportation planning and implementation, or poorly developed border areas and transportation infrastructure, can lead to a wide range of cross-border issues, including disruption of trade flows and reduced economic development. Delays at border crossings can have direct and indirect impacts on trade, such as increased labor costs, increased transportation-related expenses, and potential damage to goods.

Land border crossing facilities as well as multimodal transportation networks that connect border crossings in neighboring countries, come with their own specific challenges. Focusing on land borders and road transport, the following are major challenges facing cross-border mobility and trade:



Safety: Transportation safety concerns at borders linked to infrastructure, vehicles, and facilities, can affect multiple groups of people including frontline workers at border crossing areas, drivers and passengers in vehicles or trucks passing through borders and through networked border routes, as well as surrounding communities. Examples of safety challenges for these groups can range from vehicle crashes due to inaccessible or undesignated multimodal transportation lanes, risk or harm posed to border crossing workers due to unsafe structural facilities or transportation infrastructure, or risks to workers or surrounding community residents due to unsafe transportation construction practices or hazards.



Security: Transportation security concerns at the border can play a role in inhibiting sustainable and equitable trade and mobility. The transportation networks at and near border crossings can experience the illegal movement of goods (e.g., drugs and weapons), the illegal movement of people (e.g., smuggling of migrants and human trafficking), organized crime, and other illegal or unregulated activities which disregard the law.¹ These activities cause harm to people, cultivate a sense of distrust and insecurity, and impede sustainable economic development. Security concerns are especially challenging as they can proliferate across borders through wider transportation networks and routes between regions.



Operations: Transportation operations challenges can result from programs, processes, practices, administration, technology, and infrastructure impeding the efficient flow of movement across borders. Examples of operations challenges in border crossing areas include crossing demand exceeding capacity, lack of parking and layover space, poor signage, and lack of space for cross-border inspections.² Delays, congestion, as well as safety and security issues can result from operational process constraints and mismanagement at the border. Operational deficiencies can also lead to accessibility and equity concerns if institutional, technical, cultural, language, or information barriers exist.³



Environment: Air quality at border crossings and in neighboring communities is negatively impacted by traffic congestion and the resulting emissions from idling vehicles waiting to cross the border. Emissions at border crossings also contribute to climate change.

Governments can address border challenges and improve mobility and trade through the development and adoption of border transportation plans. Border transportation plans are comprehensive, cooperative, and forward-facing. In this respect, multimodal transportation plans should be developed with the aim to improve and support border mobility and trade between countries.

This border transportation planning toolkit provides a practical approach for countries to establish cross-border planning coordination and develop border master plans. The toolkit provides a framework to set border transportation goals as well as identify, implement, and evaluate the success

¹ <https://www.unodc.org/roseap//en/resources/toc/border-management.html>

² https://static.pmg.org.za/C-BRTA_Strategic_Plan_2021-2025.pdf

³ [Medeiros, E. \(2019\). Cross-border transports and cross-border mobility in EU border regions. Case Studies on Transport Policy. 7 \(1\), 1-12](#)

of projects and strategies to improve cross-border mobility at land borders. The framework is applicable to many different contexts and is intended to be interpreted and applied in a flexible way. The toolkit is intended for use by government entities as they coordinate with stakeholders to develop plans to enhance cross-border mobility.



HOW CAN BORDER TRANSPORTATION PLANNING IMPROVE MOBILITY AND TRADE?

Border transportation planning involves identifying needs, gaps, issues, challenges, and opportunities for facilitating the efficient and sustainable movement of people and goods across national borders. Effective border transportation plans focus on connectivity for all modes of transportation to fully support trade and mobility. Border transportation planning considers the needs and benefits of local communities surrounding border crossing areas, which improves the quality of life of its residents and is beneficial for stimulating broader economic growth.

Border transportation planning can improve cross-border mobility and trade in the following ways:



Facilitate cross-border connectivity through the identification of projects, programs, and policies to help countries achieve their border transportation goals. For example, a border transportation plan can include the creation of travel lanes at border crossing areas for pedestrians, passenger vehicles, and trucks to reduce the risk of crashes, decrease border wait times, and lead to the development or strengthening of broader cross-border multimodal networks.



Opportunity for cooperation and increased mutual benefit between neighboring countries through shared and aligned border transportation goals and actions. Developing border transportation plans allows neighboring countries to take steps toward increasing local, national, and regional lines of communication for the development of stronger, sustained relationships across borders. Strengthened communication between neighboring countries can facilitate knowledge and information sharing, as well as increase understanding of other perspectives at the border region, which helps to address and minimize needs and gaps.



Address environmental and climate change impacts by prioritizing efficient and sustainable infrastructure projects and identifying improved systems and operations to reduce emissions. Border transportation plans can help governments set and achieve goals to move people and goods across the border with minimal environmental, air quality, and climate impacts.



Promote economic development, trade, and economic competitiveness through strengthened transportation connectivity.⁴ Border transportation plans can focus on improving border access, connectivity, and movement, which facilitate economic activities such as tourism and visitor spending, in addition to trade. Movement across borders can also allow people to use facilities or resources they may not have access to otherwise, such as for healthcare or recreation.

⁴ https://www.wto.org/english/tratop_e/devel_e/a4t_e/promotingconnect17_e.pdf



For more information:

- Federal Highway Administration [Border Planning Focus on the U.S. Borders](#)
- Federal Highway Administration [Border Planning for the 21st Century](#)
- Federal Highway Administration [Greening Transportation at the Border](#)

WHAT ROLE CAN GOVERNMENTS PLAY TO SUPPORT OR IMPROVE CROSS-BORDER MOBILITY AND TRADE THROUGH THE DEVELOPMENT OF BORDER TRANSPORTATION PLANS?

Governments can play multiple roles to support and improve cross-border mobility and promote trade through furthering border planning coordination efforts and developing border transportation plans. Depending on the government structure, national, regional, and local governments and authorities can each have distinct roles in border transportation planning. It is important for governments to commit to ensuring transportation and economic needs and goals are met at the borders to support local, regional, and national goals.

Governments can:

- **Gather** data that helps identify gaps and set goals for border transportation plans. Data helps to quantify impacts and show the full picture of challenges and opportunities.
- **Develop** and implement plans, policies, and procedures to address border transportation challenges. Border transportation plans are critical to addressing specific challenges in border regions and should be linked to broader networks, plans, and policies.
- **Coordinate** with relevant governments, agencies, organizations, and stakeholders to achieve shared border transportation goals. Border transportation planning can involve regional cooperation and binational or multinational agreements to achieve outcomes and build upon joint efforts.
- **Mobilize** resources, funding, staffing, and tools needed to develop and support border transportation plans. Governments can build or strengthen capabilities to implement projects and programs to achieve border transportation planning goals.
- **Seek, promote, and share** effective border transportation planning best practices from around the world. Governments can tailor global practices that fit its context to help meet the goals of border transportation plans.

African Development Bank regional cross-border network planning conference

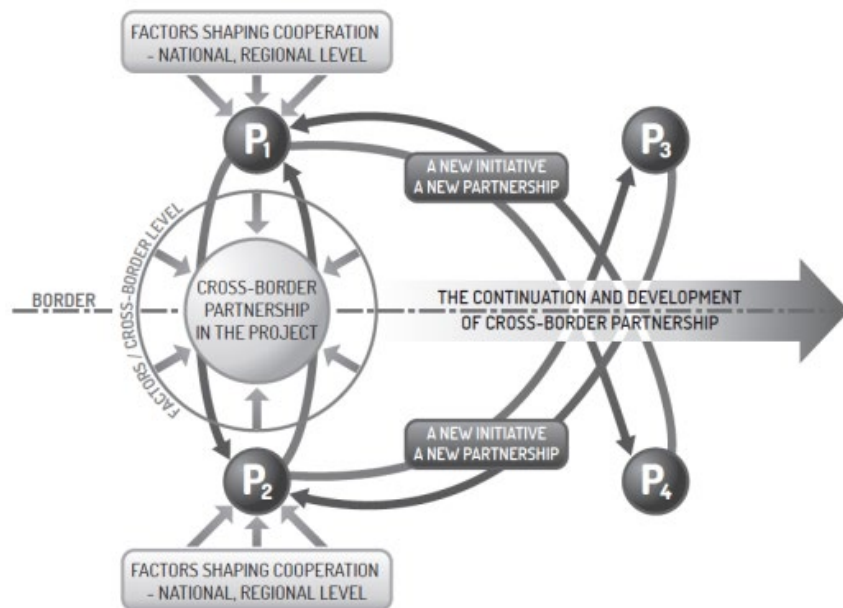
The African Development Bank coordinated a regional cross-border trade and network planning conference in September 2022. It brought together representatives of several African country government agencies, industry representatives, and development partners to discuss the future of border infrastructure investment. Regional alliances can support and facilitate governments to come together to strengthen trade and transportation networks.

HOW CAN GOVERNMENTS COORDINATE BORDER TRANSPORTATION PLANNING WITH NEIGHBORING COUNTRIES?

Governments should coordinate with bordering countries and other stakeholders to facilitate cross-border transportation plans and other related planning efforts. This process involves one or more entities from neighboring countries to collaborate on setting and achieving cross-border mobility and trade goals. Cooperation of governments and stakeholders is not only an approach toward economic development, but a pathway to strengthening regional cohesion, aligning project development, fostering regional cooperation, and coordinating policies for building stronger relationships for future growth.⁵

Sustainable Planning of Cross-Border Cooperation: A Strategy for Alliances in Border

The figure illustrates a European model for sustainable cross-border inter-organization cooperation developed by Korowska-Pysz et al (2018), where P_n is a partnership formed by matching resources and identifying common problems, needs, and goals in keeping with principles of sustainable development.



The success of this coordination may depend on several factors, which are important to consider in advance of attempting to establish relationships with neighboring countries, agencies, and other stakeholders. Governments can consider whether the nation is landlocked and is therefore dependent on limited avenues for trade. Governments can also consider how developed the respective borders and transportation infrastructures are in relation to each country. It is also important to consider relations and the political environment between the two countries, as these

⁵ [Sustainable Planning of Cross-Border Cooperation: A Strategy for Alliances in Border Cities](#)

factors may determine if border transportation plans and coordination efforts are feasible to initiate. Governments must make well-informed, data-driven decisions to move forward with the process of engaging with neighboring countries in the coordination of border transportation planning.

Actions for governments to implement for coordinating border transportation planning with neighboring countries include:

- **Develop formal bi-national or multinational agreements** to secure commitment to coordination and drive the development of border transportation plans. The development of formal agreements requires planning, resources, and coordination among participating governments. Roles and responsibilities of the agreement development process should be agreed upon ahead of time, along with funding or other resources required for the implementation of the agreement. It is important that the process is transparent, and that the contents of agreements are agreed upon by all parties involved.
- **Enact measures to maintain and update agreements** as the development of border transportation plans evolves over the long and short term. Governments can consider changes in political environments as part of agreements and plan for strategies if challenges or changes arise during the border transportation planning process or implementation. After plans are completed, updates to agreements are needed to ensure the continuation of alliances.
- **Identify shared goals, objectives, priorities, and stakeholders.** Cross-border alliances can create opportunities and benefits for governments.⁶ Neighboring countries can come together to align short- and long-term border mobility and trade goals and priorities. Governments should identify stakeholders in their respective countries to join efforts to achieve border transportation plan goals. Establishing objectives with a shared vision for international, national, and regional growth will solidify trust and ensure countries are working in alignment in the border transportation planning process.
- **Determine the scope of resources needed** to implement the coordinated development and implementation of the border transportation plan. Resources include funding, logistical resources, personnel, and time for border transportation plan development and the implementation of projects, policies, and programs identified in the plan. Also, consider that resources may be needed for the development of committees or working groups to ensure border transportation plans are coordinated, executed, and evaluated.
- **Pinpoint coordination gaps and challenges** in advance and consider them in the border transportation planning process. Gaps may include differences in capacity to carry out border transportation planning; language barriers; economic disparities and resource contribution capabilities; terrain or physical access barriers; sociocultural differences linked

COVID-19 and Cross-Border Mobility in the APEC Region: Addressing Uncertainties at the Border

The Asia Pacific Economic Cooperation (APEC) published a report exploring the impact of the COVID-19 pandemic on APEC economies' cross-border mobility and connectivity, as well as border travel uncertainties and inconsistencies. This type of regional effort to identify coordination gaps and opportunities for regional cooperation can be useful to inform border transportation plans.

⁶ <https://www.mdpi.com/2071-1050/10/5/1416>

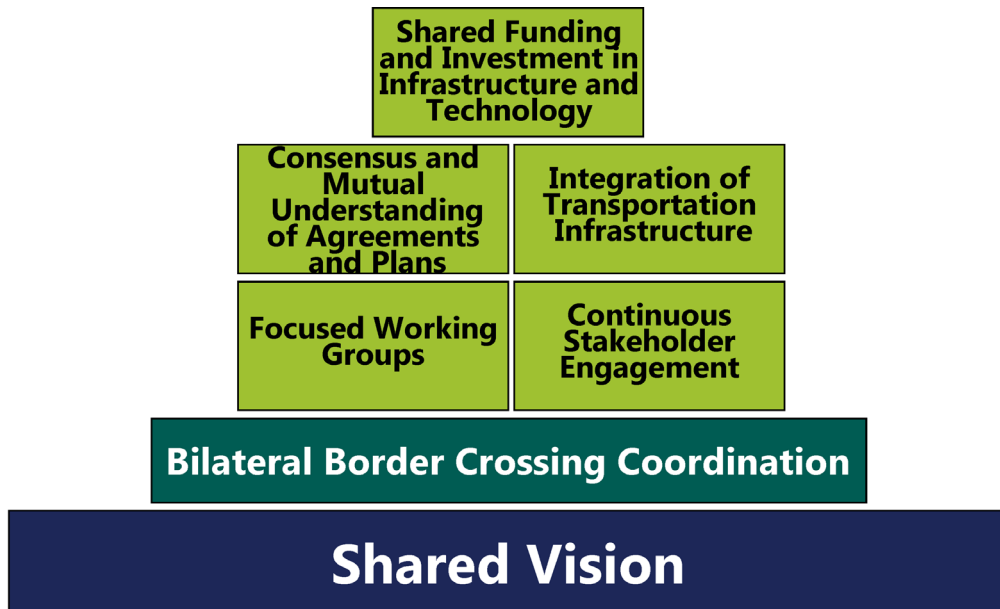
to transportation; and heritage protection. Governments should work together to clarify roles and responsibilities based on an understanding of each entity’s capacity. Additionally, identifying gaps can help governments figure out in advance how to work through opportunities and challenges.

Border Infrastructure Investment Plan Canada – United States

The United States and Canada developed the binational Border Infrastructure Investment Plan (BIIP) in 2013 to support and facilitate an integrated border transportation system, border security, and trade relationship along the longest shared international border in the world. The five-year plan, renewed annually, established a mutual understanding of funding, responsibilities, coordination, and upgrades needed to enhance border infrastructure and benefit both countries economically.

Since 2013, the BIIP has been documented and updated by representatives from both countries including Transport Canada, U.S. Department of Transportation, Canada Border Services Agency, and U.S. Customs and Border Protection, with a [version 3.0](#) available as of June 2022. In addition to the local, State or Provincial, and Federal stakeholders who were coordinated and consulted for the BIIP, the Plan established bilateral working groups to focus on specific areas of border crossings ensuring consensus between the two countries. Examples include a working group for small and remote border crossings and one focused on border wait times between the two countries.

The success and longevity of the BIIP between the U.S. and Canada is guided by a shared vision and includes the regular involvement and coordination of various stakeholders, sharing of funding and resources to bring plans into action, and other factors. The figure below depicts a simple model of bilateral coordination and cooperation based on the relationship between the U.S. and Canada for the BIIP.



Greater Mekong Subregion Cross-Border Transport Facilitation Agreement

An Asian Development Bank report (2011) on the agreement between the Greater Mekong Subregion (GMS) Economic Cooperation Program highlights regional efforts to strengthen physical infrastructure and facilitate transport and trade across nations. Since its initiation in the 1990s by six countries, all GMS countries have signed and ratified the regional agreement, known as the Cross-Border Transport Facilitation Agreement (CBTA). Through this agreement, GMS nations aim to facilitate transport; reduce costs and barriers to trade and the movement of people, goods, and vehicles; and stimulate economic integration across borders. The agreement is an example of how countries can unite and advance cross-border economic development through effective and comprehensive agreements and protocols, which remain relevant for decades.



Photo source: [GMS Website](#)

WHAT STAKEHOLDERS ARE INVOLVED IN BORDER TRANSPORTATION PLANNING?

Border transportation planning processes can be strengthened by the involvement of relevant stakeholders in setting border transportation goals, sharing and analyzing data, and implementing border transportation projects, policies, and mobility strategies. Meaningful stakeholder engagement

The California-Baja California border region Border Master Plan involves multiple government entities from the U.S. and Mexico. Since the border region has seven ports of entry, the border planning process brought together 40 agencies at various levels to work together toward the development of a Border Master Plan. A border plan summary for this region is available in the form of a [story map](#).

ensures border transportation plans include multiple and diverse viewpoints and address the needs of groups impacted by cross-border mobility.

Although the stakeholder type and level of involvement will vary by government structure context, the types of stakeholders to consider include the following:

Multilevel governments in border regions are important stakeholders. They can help identify border transportation challenges, gaps, and opportunities, and participate in the development of border transportation plans. They include local, national, territory, or regional agency representatives and/or policy makers, depending on a nation's governing structures.

Transportation agencies should also be included as stakeholders (as relevant to specific needs) from rail, transit, road, port and maritime, multimodal, and air transportation agencies.

Agencies that address such topics as environmental protection, housing, and public health are also important to involve in border transportation planning processes to provide input to strategic planning for relevant aspects of the plan.

Regional government alliances include networks of governments which unite to progress toward shared goals. Regional alliances may be involved to connect border transportation plans to regional issues and provide additional support to facilitate planning across nations.

Cross-border agencies or border management authorities can help identify goals, gaps, and challenges, as well as provide guidance for best practices at the border. Cross-border agencies aim to achieve efficiency in border administration, coordination, and collaboration with other agencies or authorities.

Customs or border protection agencies can offer guidance on how best to protect borders. Their role

A Bangladesh, Bhutan, India, and Nepal (BBIN) Motor Vehicles Agreement was signed in 2015 for the regulation of passenger, personal, and cargo vehicular traffic across these four neighboring countries. Ministries from the countries in the subregion developed the agreement to facilitate safe, sustainable, and economical cross-border movement, with the overall aim to increase regional trade. The BBIN Agreement showcases how shared goals can bring stakeholders together to improve cross-border trade and mobility.

involves ensuring security at borders, which can include counterterrorism, trans-national crime, illegal entry, lawful trade, and lawful travel.⁷ Staff at local ports of entry should also be engaged to share their local knowledge on lawful enforcement of entry of people and goods across the border.



Source: U.S. Customs and Border Protection

Trade, consumer protection, or economic development agencies or authorities can provide guidance on sustainable economic development, trade opportunities, trade patterns and statistics, growth estimates, future planning, finance, or funding opportunities.

Freight stakeholders can be useful to involve and engage to obtain a variety of perspectives on trade and mobility challenges and opportunities they experience directly. Freight stakeholders (e.g., port authorities, freight carriers) have local and regional knowledge of practices, challenges, and opportunities of transport networks, trade, and policies which directly affect their businesses.⁸ Customs brokers (specialists who work with government or port authorities to assist businesses in clearing goods through customs) can also be a source of local knowledge on trade practices, policies, and processes to inform border transportation plans.

Research institutes can be useful partners and stakeholders in the development of border transportation plans. They can provide data, knowledge, information, and guidance to understand cross-border mobility, transportation, and trade issues, as well as opportunities or tools to address issues.

⁷ <https://www.cbp.gov/about>

⁸ Example of Central Asia, the Caucasus, and Western Balkans: https://unece.org/sites/default/files/2021-02/T13%20SCELP%20_21240.pdf

Local community stakeholders to involve in border transportation plans include residents in border communities, relevant community organizations, civil society groups, business and trade alliances, and landowners in border regions. These stakeholders allow governments to understand local perspectives and provide opportunities to meet the needs of local border communities and members.

The Institute for Transnational and Euregional Cross-Border Cooperation and Mobility (ITEM) is an interdisciplinary institute of Maastricht University in the Netherlands in coordination with other educational institutions and local government agencies. The Institute researches cross-border mobility and cooperation bottlenecks and opportunities, provides information on regulations and best practices, conducts annual cross-border impact assessments, and engages in information exchanges with border information points focused in Europe.

WHAT ELEMENTS DO EFFECTIVE BORDER TRANSPORTATION PLANNING PROCESSES INCLUDE TO ACHIEVE TRADE AND MOBILITY GOALS?

Border transportation planning may include a wide range of elements, processes, and activities that address different short- and long-term needs, goals, and contexts. As changes occur over time, governments may develop border transportation plans through an iterative process, or update plans after certain scheduled periods of time. Plans may involve ad hoc, short-term, or temporary planning

The U.S.-Mexico Joint Working Committee on Transportation Planning develops a work plan every two years to update its Regional Border Master Plan. Each work plan centers around different goals or focus areas for the committee to discuss, along with updates on ongoing activities, projects, and priorities.

and project aspects which would require governments to respond to and plan for varying timeframe elements.

As governments work to develop their border transportation plans, they can consider the following elements of border transportation plan development:

Purpose and vision. A clear purpose, vision, and expected outcomes for improving trade and mobility set the tone for border transportation plans. Plans are centered around the purpose and vision to ensure that identified projects, programs, and policies work toward the common goals of the bordering nations and stakeholders involved.

Focus areas. There is a wide range of focus areas border transportation plans can address depending on the purpose and vision and/or the context of the border region. Generally, governments can consider addressing the following focus areas in a border transportation plan:

- ***Border crossing congestion*** causes longer wait times and can be prioritized if congestion causes additional challenges.⁹
- ***Community traffic impacts*** can be a focus of a border transportation plan if congestion of traffic volumes at the border crossing causes challenges for the bordering community quality of life. Traffic impacts can also be prioritized by projecting future traffic growth in surrounding local communities and border areas.
- ***Economic impacts*** can include the current and projected economic impacts and costs of transportation to/from the border, border delays, and development of routes and corridors, which provide context on the current performance as well as the potential of economic growth expected. Data on the cross-border trade contributions to the country's gross domestic product, identifying top trading partners, and potential trade route improvements can be included as part of this focus area.
- ***Technology and Intelligent Transportation Systems (ITS)*** includes integration of technology, addition of emerging technologies, upgrading of existing technology at various levels, as well as system-wide planning to improve efficiency, and may be an important focus area to consider.





⁹ Examples of analyses: https://www.jica.go.jp/english/our_work/thematic_issues/transportation/pdf/research_cross-border01.pdf

- ***Safety and security*** priorities ensure people, personnel, goods, and systems at the border, as well as those involved in transporting through corridors and networks, safely move across borders while the security of the border is maintained.
- ***Transportation network connectivity*** enhances and strengthens existing multimodal transportation networks and routes, develops new connections for more complete networks, and integrates existing routes with others to form a corridor.
- ***Environmental impacts*** of border transportation can be prioritized if there are negative environmental and public health impacts that affect the immediate border crossing area or surrounding communities. Emissions from traffic congestion, long vehicle wait times, and idling can reduce air quality and increase exposure to particulate matter, ozone, and other toxic air pollutants.
- ***Vulnerability and risk assessment*** can address impacts on border transportation infrastructure and operations from extreme weather events and natural or man-made disasters.



Data collection. Trans-national research and the collection of data on existing conditions at borders allow for problem identification and can lead to setting a baseline understanding of needs. Border transportation planning processes involve gathering data on existing border infrastructure and use, transportation network connectivity and performance, economic and trade data, and other areas focused on goals and objectives. Governments should work with stakeholders to gather associated population, broader transportation infrastructure, employment, trade, land use, economic, environmental, and socio-economic data.

The table below includes data collection considerations within the broader border planning challenges categories.

BORDER CHALLENGE	TYPES OF DATA
	<p>Safety</p> <ul style="list-style-type: none"> • Infrastructure condition/quality • Accessibility infrastructure • Signage • Available multimodal transportation options • Crash data • Infrastructure upgrades
	<p>Security</p> <ul style="list-style-type: none"> • Existing regulations and policies • Level/type of enforcement • Crime/human trafficking data
	<p>Operations</p> <ul style="list-style-type: none"> • Infrastructure in place to facilitate operations • Operational constraints and mismanagement at the border • Disruption and emergency event preparation/capacity • Process efficiency • Current technologies used • Border crossing delay data • Regional traffic congestion • Operations vulnerabilities and risks • Language or information barriers • Socio-economic data
	<p>Air quality, greenhouse gas emissions, and climate change</p> <ul style="list-style-type: none"> • Air quality in border areas • Emissions from idling vehicles • Quality of life and public health data of bordering communities • Occurrence and impacts of natural disasters, wildfires, storms, extreme heat, and flooding risk • Climate-related data • Climate vulnerability risk factors

Maps are useful tools to visualize and coordinate the development of transport corridors and networks within a country, through borders and routes, or across a region. Examples in the African context include this [*working map of border crossings in Zambia*](#) and the [*TTTFP Africa regional corridors*](#). Key transport corridors upcoming in the African region are showcased in a report [here](#).

Analysis and gaps. Once relevant data is collected, governments and their partners can analyze the data to identify current conditions and gaps. Data analysis can help to identify where improvements are needed, forecast growth or future conditions, guide policies and regulation, and prioritize areas for investment. There should be clear links among the purpose and vision, the needs and gaps that are identified through data analysis, and the development of border transportation planning strategies.

Examples of data analysis to conduct include:

- Assessment of who and what are moving across borders
- Information on how processes occur
- Pinch points
- Infrastructure needs
- Impacts on the surrounding communities
- Environmental conditions
- Impacts on economic development
- Types of vehicles passing through and associated operations adjustments
- Purpose of trips
- Population growth and projections
- Efficiency of trips
- Equitable access
- Border wait times
- Connectivity needs between neighboring countries, trade routes, and within border regions.

Researchers have established methodologies for conducting analyses relevant to border transportation plans.

One example is a methodology to measure the quality of cross-border transport infrastructure developed by the European Union, but applicable internationally. The tool and indicators help to identify where transport infrastructure can be improved in cross-border areas.

Another example, from the Horn of Africa region, provides a multiscale and multimodal methodology for assessing regional transport network connectivity. The methodology provides an approach to measure inter-city road connectivity within regional transport networks.

Stakeholder coordination and engagement. Stakeholder identification, engagement, and alliances are key to the border transportation planning process. Stakeholder participation provides an understanding of how cross-border mobility and trade affect various entities, groups, and communities. Governments should plan meaningful engagement opportunities with stakeholders. Governments should consider including procedures and evaluation mechanisms for determining the effectiveness of stakeholder engagement and ways to improve future public engagement.

The Trusted Traveler Program, established by the U.S. Customs and Border Protection Agency, includes programs such as the Free and Secure Trade (FAST) for Trade and Commercial Vehicles program, applicable for Canada and Mexico, which aims to expedite processing for cross-border truck traffic through a designated lane equipped with the FAST technology. Importers, carriers, and drivers who apply and pass a security clearance may participate in the FAST program to reduce border crossing wait times.

Policy alignment and recommendations. Border transportation plans can establish new or update national, bi-national, regional, or local policies to achieve border mobility goals and improve cross-border transportation. Policies may address transportation rules and regulations related to border crossing facilities, system operations, safety, accessibility, equity, environmental conditions, and sustainability at borders.

Investment identification and prioritization. Governments can identify projects and other investments to address the needs or gaps and prioritize pursuing those investments based on how each project or investment meets the purpose and vision.

Funding and financing opportunities. Governments estimate project costs and potential sources of funding. Sources of funding may come from public (e.g., local, regional, or national governments) or private sources. Border transportation plans can also identify opportunities to combine funding with financing or to engage with the private sector through public-private partnerships (P3s).

Monitoring and evaluation. Border master plans may consider short- and long-term monitoring of various aspects related to border transportation planning, operations, and implementation. Monitoring and evaluation may be relevant for specific projects, policies, and programmatic aspects of border transportation plans.

To finance infrastructure, many countries in Africa have incorporated a range of financing sources including:

- Sovereign loans (mostly at middle income countries rates)
- Grants
- Development Finance Institutions
- Domestic mobilization options
- Public Private Partnerships
- Build-Own-Operate-Transfer
- Lease- Rehabilitate-Operate-Transfer
- Build-Transfer-Lease
- Joint Ventures

[Source](#)

Efficient Cross-Border Transport Models

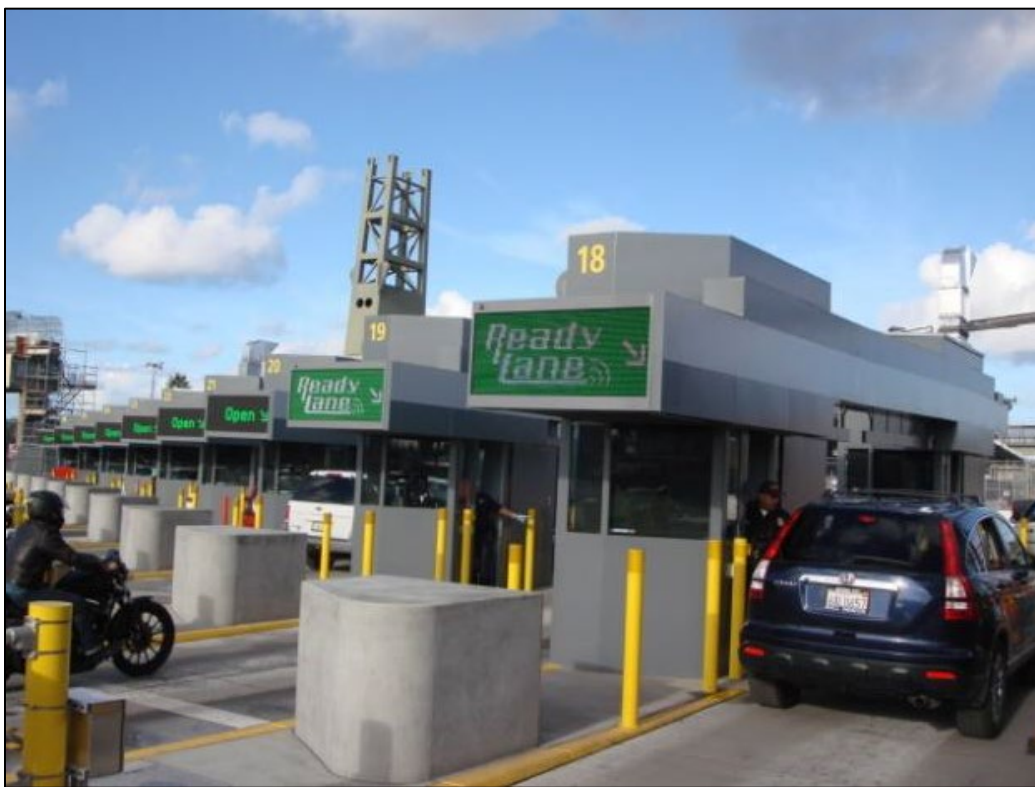
A report developed by the Economic and Social Commission for Asia and the Pacific (ESCAP), provides examples of analyses and models related to cross-border transportation for the Asia Pacific region to increase connectivity and cross-border road and rail transport. In addition to details of trade relations and operations between different bordering countries in the region, the report provides examples of useful frameworks and methods to improve operations, lower operating costs, and reduce non-physical barriers. The models and frameworks are examples of methods that can be incorporated into border transportation plans and processes.

For more information:

- Federal Highway Administration [Comparing a Year of Legal Inbound Travel: The United States and Canada - 2009](#)
- Federal Highway Administration [Gateways and Borders](#) Resources
- U.S. Bureau of Transportation Statistics [Border Crossing/Entry Data](#)
- U.S. Environmental Protection Agency U.S. Mexico Border Environmental Program [Border 2025 Framework](#)

HOW CAN GOVERNMENTS INCORPORATE TECHNOLOGY AND INTELLIGENT TRANSPORTATION SYSTEMS (ITS) IN BORDER TRANSPORTATION PLANS TO ADDRESS BORDER CROSSING CHALLENGES?

Governments can incorporate technology and intelligent transportation systems (ITS) in border transportation plans to reduce border crossing times, congestion, and delays. Through the integration of emerging technologies, upgrading existing technology, as well as system-wide planning, governments can facilitate the safe, secure, and efficient flow of people and goods at borders and in trade corridors.



Active Lane Management Signage ([Source](#))

The table below provides examples of relevant technologies governments can use to collect and archive border crossing data.

TECHNOLOGY	DESCRIPTION	FUNCTION FOR BORDER
Global Positioning Systems (GPS)	GPS provides location and time information for equipped devices. Depending on equipment configuration, the accuracy of GPS ranges from less than a centimeter (95 percent of the time) to about 100 meters.	GPS reader technologies can collect information from GPS-enabled vehicles on border crossing times and vehicle location.
Bluetooth Devices	Bluetooth is a data communications protocol used for wireless mobile	Bluetooth reader technologies can gather border crossing time

	communications. It can connect several devices simultaneously, helping to overcome problems of synchronization. It can exchange data over short distances from fixed and mobile devices.	data on Bluetooth enabled devices in vehicles.
Loop Detectors	Loop detectors are coils of wire embedded in the roadway to detect the presence of vehicles, measure their speed, and classify each vehicle as a car or a truck.	Loop detectors can be used to measure border congestion, activate traffic signals, and count vehicles.
Video Image Recognition	Video image recognition processing uses cameras to capture images of each passing vehicle and can extract individual vehicle information including vehicle length, width, color, and license plate. The extracted vehicle features from both upstream and downstream detection stations are then compared with each other to find the best matches.	Video image recognition can be used to count volume of vehicles and for toll/fee collection. It can be used as a substitute for loop detectors in environments such as bridge decks where loop detectors are unsuitable.
Radio-Frequency Identification (RFID)	An RFID transponder or tag is mounted on the windshield of participating vehicles. Readers located upstream of the queue and at customs primary inspection read the tags. The time lapse between the two readings of each transponder represents the travel time between the two readers.	RFID reader stations can scan RFID-readable tags carried by vehicles crossing the border to measure and relay accurate crossing times and wait times.
Radar	Microwave radar detectors transmit low-energy microwave radiation at the detection zone, and based on the frequency shift that results from relative motion between a frequency source and a listener, detect passing vehicles. The microwave radar detector measures this shift to determine vehicle passage and speed. A laser radar transmits multiple beams for accurate measurement of vehicle position, speed, and class.	Radar based detectors can count vehicles and denote vehicle classifications.
Variable Message Signs (VMS)	VMS are electronic traffic signs with adjustable messages to be conveyed to border crossers.	VMS can provide current information concerning border wait times, upcoming traffic, roadway conditions, and construction.
Mobile Applications	Mobile applications for smartphones can be used to provide information to a wide audience.	Mobile applications can share up-to-date border wait time data with travelers.

Spotlight: Border Wait Time Technologies

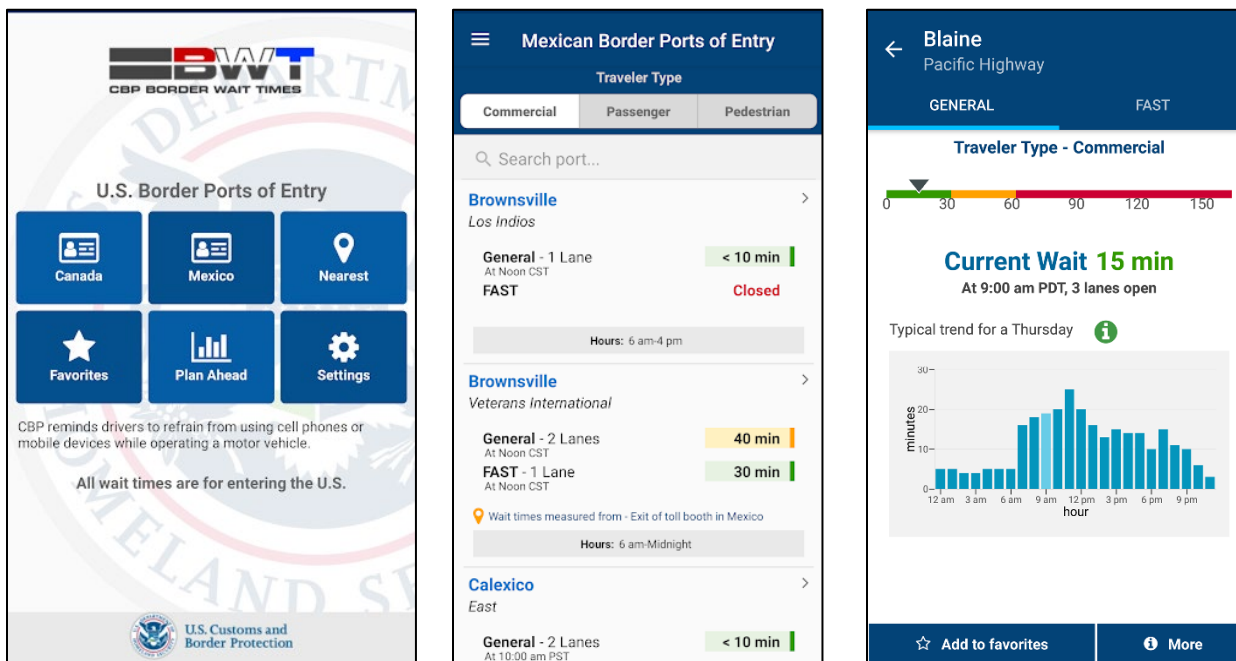
Automated systems and technologies that collect and disseminate border wait time information and data can offer a range of benefits to a variety of public, private, and individual stakeholders.

Governments can measure performance and prioritize actions; private agencies can plan operations and supply chain reliability; and individuals can use the data to inform and adjust their travel plans.

Additional benefits border crossing wait time technologies can provide include:

- Accurate wait time information, which can help manage delays, identify travel demand, and be used for trip planning purposes;
- Reduced idling and congestion resulting in fewer environmental impacts;
- Automated measurement of border wait times, which shifts staff focus to other important elements, such as border security and promoting cross-border trade and tourism;
- Informed planning and investment decision-making for border crossings; and
- Data collected over time can help improve the predictability, reliability, and consistency of wait time information, as well as help reduce errors and bias.

An example of a border crossing technology in action is the U.S. Customs and Border Protection Smartphone Mobile Application (app). The app features port of entry border crossing wait times for commercial, passenger, and pedestrian traveler types across shared Canada and Mexico borders with the United States.



Source: [U.S. Customs and Border Protection](#)

Improving Border Crossing Planning and Decision Making in Whatcom County, Washington, and British Columbia, Canada

U.S. and Canadian stakeholders from State, regional, and provincial agencies implemented and funded border wait time systems and a data archive to address high congestion levels at the border crossing area between the two countries. The data archive includes a portal for stakeholders and the public to access border wait time data, a measuring tool for infrastructure investment impact on average wait times, and other datasets, which have improved regional transportation coordination, planning, and decision making.

For more information:

- Federal Highway Administration Freight Management and Operations [Border-Wide Assessment of Intelligent Transportation System \(ITS\) Technology—Current and Future Concepts](#)
- Federal Highway Administration [Measuring Border Delay and Crossing Times at the U.S. – Mexico Border — Part II: Guidebook for Analysis and Dissemination of Border Crossing Time and Wait Time Data](#)
- Federal Highway Administration [Measuring Border Delay and Crossing Times at the U.S. – Mexico Border — Part II: Step-by-Step Guidelines for Implementing a Radio Frequency Identification \(RFID\) System to Measure Border Crossing and Wait Times](#)
- Federal Highway Administration [Measuring Border Delay and Crossing Times at the U.S. – Mexico Border — Final Report: Automated Crossing and Wait Time Measurement](#)
- Federal Highway Administration [Effort to Test, Evaluate and Deploy Technologies to Automate the Measurement of Real-Time Border Wait Times at United States - Canada Land Border Crossings](#)
- Federal Highway Administration [Improving Mobility at the U.S./Canada Border through Border Wait Time Data-Sharing: The Buffalo-Niagara Falls Region](#)
- U.S. Customs and Border Protection [Border Wait Time Website and Mobile App](#)

HOW CAN GOVERNMENTS INTEGRATE BORDER TRANSPORTATION PLANNING INITIATIVES WITH OTHER TRANSPORTATION PLANNING PROCESSES?

Border transportation plans can be integrated with existing initiatives and transportation planning processes to optimize efficiency, link resources, avoid duplicative efforts, and achieve better economies of scale. Integrating planning processes or activities at regional, national, or local levels would require coordination among the lead government agencies to align goals and resources.

Governments can start by identifying and cross-referencing projects to be included in the border transportation plan and/or including border transportation plans in other projects. For example, border transportation planning can be integrated and emphasized as a part of existing subnational, regional, or local long-range transportation planning processes or strategic plans. Other examples of plans to consider integrating with are freight, rail, safety, economic development, and climate resilience plans.

Border transportation plan initiatives can improve connectivity by linking with existing or upcoming corridors or network plans to enhance transport corridors. Transportation corridors make connections between fragmented, smaller economies and can link people, goods, and services for more efficient movement, sustained growth, and increased trade opportunities.¹⁰



Source: U.S. Customs and Border Protection

Existing information on routes and networks can be used to inform border transportation plans. Examples of South Asia and Southeast Asia trade and transport routes are available, along with broader Asian transportation network data through the Asia Highway Network. These resources provide a basis for understanding how existing routes can be integrated or linked with border transportation corridors to produce efficient trade flows, improve connectivity, and strengthen economic development.

¹⁰ https://static.pmg.org/za/C-BRTA_Strategic_Plan_2021-2025.pdf

PUTTING STRATEGIES INTO ACTION

Governments can take the lead in improving trade and mobility at the border through border transportation planning.

The following are key steps for initiating a border transportation planning process:

- Develop formal bi-national or multinational agreements to document how the countries will work together and to establish protocols for maintaining and updating plans and agreements
- Work with counterpart government agencies in the bordering country to identify shared goals, objectives, priorities, and stakeholders
- Determine the scope of the border transportation plan and the necessary resources to develop and implement it
- Pinpoint coordination gaps and methods for addressing them

Once those steps are complete, the border transportation planning process can begin. Key elements to consider in a border transportation plan can include:

- Purpose and vision
- Focus areas identification
- Data collection
- Analysis and gaps
- Stakeholder coordination and agreement
- Policy alignment and recommendations
- Investment identification and prioritization
- Funding opportunities
- Progress monitoring and evaluation

Governments can consider integration of border transportation plans into existing or future, broader transportation plans and integration in existing or planned transportation corridors or transportation networks.

Spotlight: Strategies in Action

COSIPLAN, *Border Integration and Facilitation, South America*

The South American Council of Infrastructure and Planning (COSIPLAN) was created in 2009 as a forum for political and strategic discussions to improve and develop South American infrastructure, foster regional cooperation through strategic alliances, promote compatibility of regulatory frameworks, and encourage the integration of projects. These objectives work toward broader goals to strengthen regional connectivity, improve quality of life, and enhance the capacity of local and regional populations. The member countries of COSIPLAN are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela.

Member countries of COSIPLAN recognize the importance of border cooperation and integration in the broader strategic planning of infrastructure across South America, as cross-border

transportation can play a role in sustainable development processes, bilateral cooperation, and social and economic processes. The member countries also recognize that cross-border integration in the strategic planning process requires the convergence of regional, bilateral, and subregional (local) level planning to achieve outcomes. The integration and facilitation of cross-border mobility in the COSIPLAN's Strategic Plan and planning process align with key areas of the border transportation planning process described in this toolkit.

Examples

- **Develop formal bi-national or multinational agreements to document how the countries will work together and to establish protocols for maintaining and updating plans and agreements.** COSIPLAN facilitates several formal agreements between the bordering neighbors of its member countries. These include strategic plan agreements, priority integration project agenda agreements, work plan agreements, and working group agreements, among others.
- **Work with counterpart government agencies in the bordering country to identify shared goals, objectives, priorities, and stakeholders.** Government agencies for member countries schedule joint meetings and events to discuss the integration of the border areas in economic, social, and bilateral cooperation aspects of the strategic planning process. They develop binational work plans and implementation plans collaboratively. Work plans lay out joint planning efforts and focus areas to advance border understanding. The work plans follow stages of preparation, analysis of general border country contexts, consultation and strategic analysis, and the development of territorial integration programs and action plans. Implementation plans are related to broader strategic plan activities but share progress on border-related action items and developments such as an expansion of work teams. These processes allow for counterpart government agencies to work together to achieve shared goals, priorities, and objectives toward improving border transportation infrastructure and processes.
- **Determine the scope of the border transportation plan and the necessary resources to develop and implement it.** COSIPLAN member countries determine the scope of the strategic plan, which includes integration and facilitation of border transportation, through various working groups. For example, to consider resources needed for working groups to carry out activities, they established a working group on financing mechanisms and guarantees. Member countries also develop reports to characterize demand projections for multimodal transportation at borders in the region with research and data relevant for integration in the strategic plan. Other reports include reflections on the regional capacity to achieve goals and other considerations.
- **Pinpoint coordination gaps and methods to address them.** COSIPLAN member countries make efforts toward identifying regional issues and developing plans to address them. They have developed a [disaster risk management](#) methodology in the event of a natural disaster, an [environmental and social assessment](#) approach to integrate these issues in planning, and a [productive and logistics integration](#) methodology to streamline the logistics of a group of projects. These methodologies have been developed to fit the needs of member countries in the region and can inform border transportation aspects of strategic plans.



The COSIPLAN Strategic Action Plan 2012-2022 includes plans for cross-border infrastructure development. ([Source](#))

Cross-Border Road Transport Agency, Strategic Plan for 2021-2025, South Africa

The Cross-Border Road Transport Agency (C-BRTA) in South Africa was established to improve mobility and cross-border transport for commuters and freight operators. As most of the goods and passenger traffic in the South African region flow through road transport, cross-border connectivity is crucial to facilitate trade and link regions.

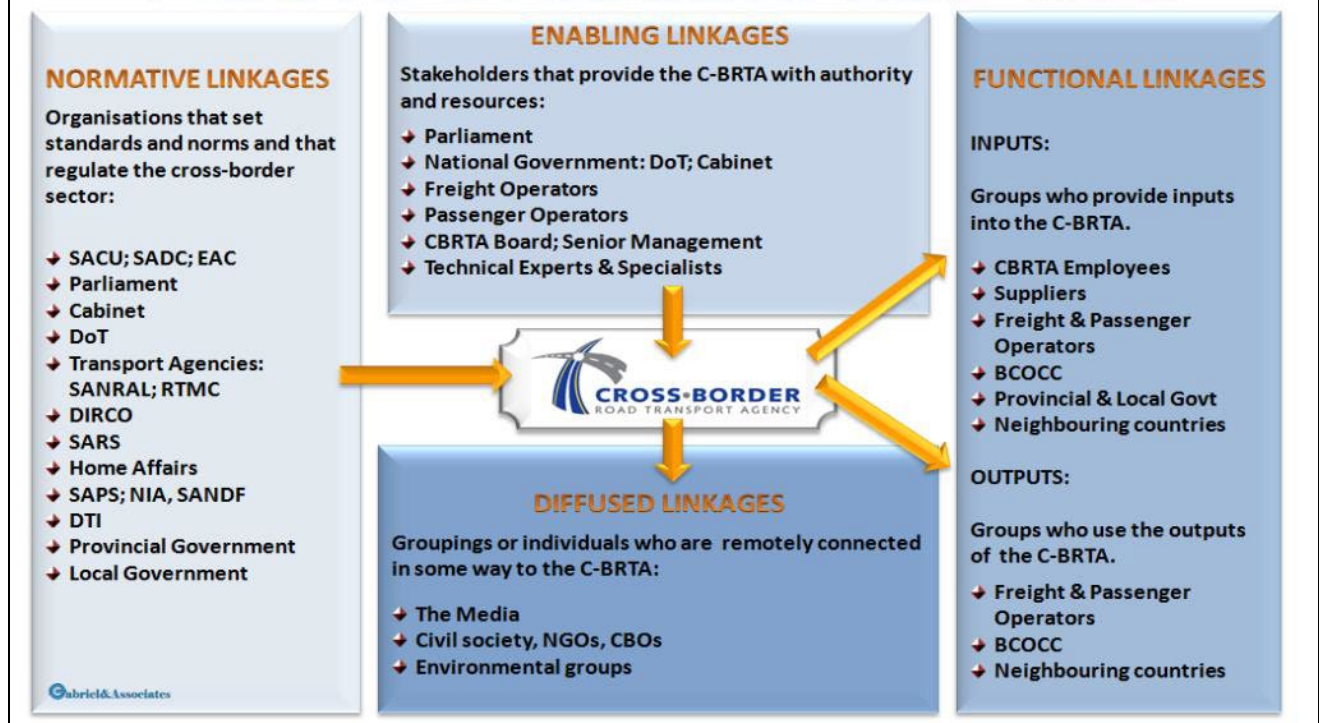
Through its [Strategic Plan for 2021-2025](#), the C-BRTA aimed to develop a comprehensive and economically viable regulation and facilitation document for cross-border operations. The Strategic Plan is designed to ensure that cross-border trade, regional integration, and economic development are enhanced through a strategic approach. In its approach, the C-BRTA Strategic Plan includes several elements which are relevant and applicable to border transportation planning outlined in this toolkit.

Examples

- **Purpose, vision, and focus areas:** The Strategic Plan includes a clear vision, purpose, and value statements, which are linked to the strategic focus of the document. The plan includes a problem statement, impact statement, alignment to government priorities, and measure of outcome indicators at 5-year targets centered around 5 focus areas: regulatory services, law enforcement, facilitation, research and advisory, and administration.
- **Data collection:** The Strategic Plan includes data gathered related to corridors and networks, inadequate infrastructure, law enforcement stoppages, economic, social,

- technology, political, legal, and environmental data. The plan also includes [Country Profile Reports](#) for each neighboring country, which detail yearly cross-border flows, trade volumes and values, operation information, and other relevant data.
- **Analysis and gaps:** The C-BRTA identified gaps in the deployment of existing cross-border programs and projects which were put in place to improve infrastructure and trade. They also identified human resource and capacity gaps and needs. These and other details are captured in various documents used to inform the Strategic Plan. The [Corridor Performance Indicator Report](#) is an example, which includes stakeholder survey analyses and ways to address cross-border corridor barriers.
 - **Stakeholder coordination and agreement:** The Strategic Plan includes the stakeholder process and outcomes of stakeholder engagement. The C-BRTA recognized the critical role of stakeholders in cross-border transport and operations, particularly the role of neighboring political leaders in the region (i.e., Botswana, Mozambique, Swaziland, Lesotho, Namibia, and Zimbabwe). A wide range of stakeholders was identified, including continental and regional government entities and operators. As part of the stakeholder engagement process, the C-BRTA developed a stakeholder map in which stakeholder groups were linked together based on level and type of engagement. These groups were sent targeted messages through the grouped channels of communication, allowing for a streamlined engagement process. The C-BRTA also facilitated neighboring country [Bilateral transport agreements](#) which describe authorization processes, administrative and technical matters, and other agreed-upon provisions.
 - **Policy alignment and recommendations:** The Strategic Plan highlights existing, relevant policies that guide cross-border transport, traffic, and tourism, as well as mandates such as agreements, MOUs, and protocols. These policies and mandates are aligned with the strategic goals and priorities of the Strategic Plan. Existing strategy documents and plans related to freight logistics, road safety, and green transport, along with upcoming programs, plans, and improvement projects were gathered as a baseline to inform and guide the Strategic Plan.
 - **Investment identification and prioritization:** Resource considerations, including operation expenditures, capital expenditures, PPE, and intangibles are included in the Strategic Plan. Expenditures are also presented by the focus areas: regulatory, law enforcement, stakeholder relations, research and development, and administration. Additionally, the C-BRTA provides an explanation of the contribution of resources by other programs to support its activities related to cross-border transport planning, including stakeholder risks and mitigation strategies.
 - **Progress monitoring and evaluation:** The C-BRTA develops [annual performance plans](#) to guide agency activities and Strategic Plan implementation. Part of this effort is to set performance indicators and targets for budget programs and to ensure activities are aligned with the goals, objectives, and focus areas established in the Strategic Plan.

C-BRTA STAKEHOLDER MAP



The stakeholder map in the C-BRTA Strategic Plan illustrates the grouped approach of the stakeholder engagement process. ([Source](#))

GLOSSARY



Border: A boundary between geographical areas, especially countries.

Border area: The area or land close or adjacent to the administrative border between two countries.

Border crossing: A place on the border between two countries where people can cross from one country to the other.

Climate: The average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

Climate change: A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent human-caused changes in the composition of the atmosphere or in land use.

Greenhouse Gas (GHG): Gaseous constituents of the atmosphere that absorb and emit radiation at specific wavelengths within the spectrum of terrestrial radiation emitted by the Earth's surface, the atmosphere itself and by clouds. This property causes the greenhouse effect. Water vapor (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary GHGs in the Earth's atmosphere.

Memorandum of Understanding (MOU): A document providing a general description of the responsibilities that are to be assumed by two or more parties in their pursuit of some goal(s).

Mobility: The ability to move or be moved from place to place.

Multimodal: The availability of transportation options using different modes within a system or corridor.

Pedestrian: Any person not in or on a motor vehicle or other vehicle. Excludes people in buildings or sitting at a sidewalk cafe.

Risk: The potential for negative consequences where something of value is at stake. In the context of the assessment of climate impacts, the term risk is often used to refer to the potential for adverse consequences of a climate-related hazard. Risk can be assessed by multiplying the probability of a hazard by the magnitude of the negative consequence or loss.

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt


SELF-ASSESSMENT QUESTIONS



Take some time to think through border transportation planning in your country and how your government is working to facilitate trade and mobility across countries.

Consider the following questions:

- **What challenges does your country face related to border transportation, cross-border mobility, and/or cross-border trade?**
 - How has your country addressed border transportation, mobility, and/or trade issues?
- **What government agencies, sectors, or organizations are involved in border transportation planning and/or cross-border mobility and trade in your country?**
- **What stakeholders does your country work with to manage, facilitate, problem-solve, and/or plan cross-border transportation, mobility, and/or trade?**
 - How are stakeholders involved in the planning and/or implementation of cross-border transportation, mobility, and/or trade improvements?
 - Does your country have formal agreements with neighboring countries to plan or implement border transportation plans?
- **Does your country coordinate with neighboring countries to develop border transportation, mobility, and/or trade plans?**
 - Does your country have an existing border transportation or cross-border mobility and/or trade plan in place?
- **How has your government implemented technology and/or intelligent transportation systems to address border transportation challenges?**
- **What data is available or needed to support border transportation planning?**
- **What policies are planned, under development, and/or in place to support border transportation planning and/or cross-border mobility and trade?**
- **How does your government incorporate border transportation planning in other transportation or strategic plans?**

 For more information about border transportation planning, or to learn more about partnering with MOMENTUM, please contact us at momentum@dot.gov.