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FACILITATION OF TRANSPORT AND TRADE IN **LATIN AMERICA AND THE CARIBBEAN**

Trade facilitation in Latin America and the Caribbean: formalities, infrastructure and logistics

Introduction

International trade is subject to a great many documentation requirements, in addition to goods inspection procedures and the payment of various duties and charges. Taken together, these formalities can considerably delay and increase the cost of export, import and transit operations. →

This issue of *FAL Bulletin* provides an overview of progress by the region's countries in implementing their respective trade facilitation agendas and of the main challenges still to be met in this area.

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For example, Gerzee (2022) notes that the documentation required for an individual shipment by sea may involve the exchange of 50 sheets of paper between up to 30 actors, such as exporters, importers, customs, port and sanitary authorities, customs brokers and carriers, among others. The costs in time and money created by cumbersome or duplicative procedures are particularly significant for trade associated with international production networks, which involves multiple border crossings for inputs, parts and components as well as final goods. In this context, trade facilitation has become increasingly prominent on public policy agendas around the world, especially since the World Trade Organization (WTO) Agreement on Trade Facilitation came into force in 2017. The major disruptions to global supply chains caused by the coronavirus disease (COVID-19) pandemic also highlighted the need to ensure that essential goods could move easily across borders.

WTO defines trade facilitation as "the simplification, modernization and harmonization of export and import processes". Similarly, the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) defines it as "the simplification, standardization and harmonization of procedures and associated information flows required to move goods from seller to buyer and to make payment" (ECE, 2012). It should be noted that many of the documents and formalities required for trade in goods serve important purposes, such as tax collection, protection of public health, the environment and the cultural heritage, and the fight against smuggling and drug trafficking. Consequently, the objective of trade facilitation is to make trade faster, less costly and more predictable, while ensuring that these public policy objectives are met. Recent WTO estimates for the period 2017–2019 attribute average increases of 5% in world trade in agricultural products, 1.5% in manufacturing trade and 1.17% in total trade to the Agreement on Trade Facilitation (WTO, 2023).

This *FAL Bulletin* provides an overview of progress by the countries of Latin America and the Caribbean in implementing their respective trade facilitation agendas and of the main challenges still to be met in this area.[1] Section I reviews the results of the fifth United Nations Global Survey on Digital and Sustainable Trade Facilitation, conducted during the first half of 2023 and coordinated in the region by the Economic Commission for Latin America and the Caribbean (ECLAC). Section II then examines the major challenges facing the region as it seeks to improve its transport and logistics infrastructure, an essential prerequisite for smoother trade flows and increased competitiveness. Lastly, section III presents some conclusions and policy recommendations.

[1] The contents of this FAL Bulletin are a summary of chapter III of the *International Trade Outlook for Latin America and the Caribbean*, 2023 (ECLAC, 2023c).

I. Trade facilitation in the region: an overview

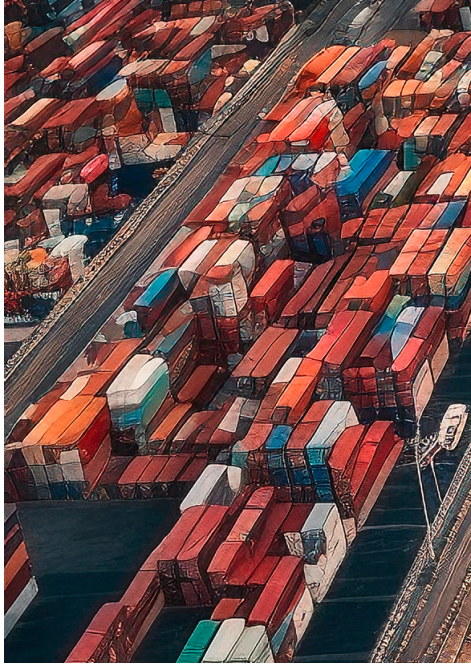
Quantifying the costs of the formalities involved in foreign trade is a very complex task, since it is a case-by-case exercise. Formalities vary according to the type of operation (export, import or transit) and also according to the good in question, and further requirements may be imposed in addition to customs requirements in relation to sanitary, phytosanitary, environmental or intellectual property matters, among others. Formalities also vary according to the method of transport used and even the characteristics of the companies involved. In an import operation, for example, the likelihood of a shipment being subject to physical inspection depends on the risk profile not only of the content declared, but also of the importing company. Moreover, while some formalities have a set monetary cost (e.g. the fee for sanitary inspection of a container), costs often take the form of time (the duration of the procedure), whose monetary equivalent is not always obvious.

Given these complexities, any attempt to measure the cost of trade formalities using a common metric that permits cross-country comparisons must involve certain assumptions and simplifications. For example, one of the 10 components of the World Bank Doing Business report (discontinued in 2021) sought to measure the cost and time entailed in the logistical process of exporting and importing goods, on the basis of three elements: documentation requirements, cross-border controls and domestic transport. Given the impossibility of carrying out this exercise for the whole universe of each country's products and trading partners, cases considered representative were chosen. For export operations, the country's main export product was considered, and the main market for that product was taken as the destination. In the case of imports, a common product (vehicle parts) was considered for all countries, even though the country of origin might vary (for each country, the main supplier was taken into account). Information on costs and times was obtained from questionnaires sent out to freight forwarders, customs agents, port authorities and traders in each country assessed.

The limitations of the methodology used meant that the findings in the *Doing Business* report only provided an initial approximation of the cost (in money and time) of trade formalities in each country. On the other hand, the use of a common methodology for all countries made it possible to calculate regional averages and to compare the overall performance of the different regions. The results of its last edition, which presents the situation in 2019, show that, on average, Latin America and the Caribbean lagged far behind the high-income economies of the Organisation for Economic Co-operation and Development (OECD).

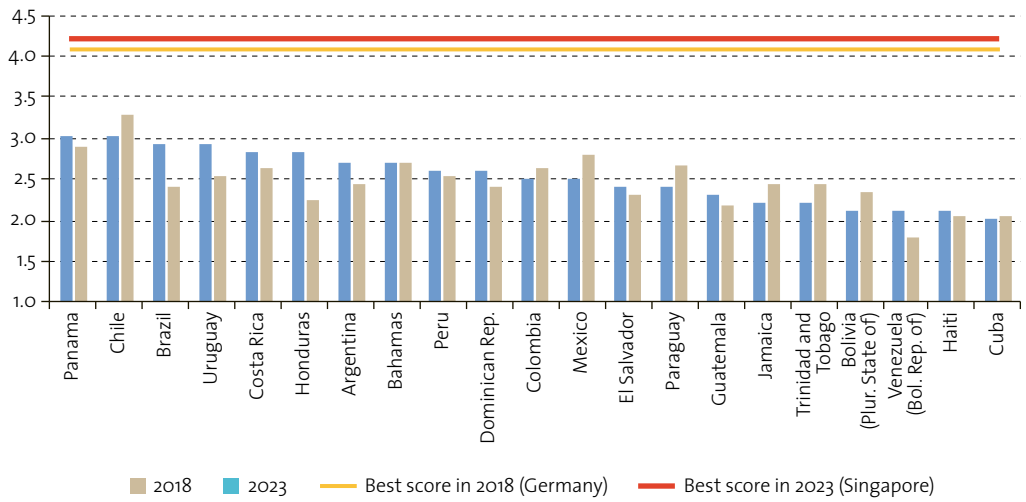
Another important international instrument is the logistics performance index (World Bank, 2023). One of its six components assesses the efficiency of trade formalities handled by customs and other border control agencies in terms of speed, simplicity and predictability. The assessment is based on the opinions of experts consulted between September and November 2022, and the scale used ranges from 1 (very low) to 5 (very high). All participants from the region scored between 2 (low efficiency) and 3 (average efficiency) and ranked between positions 47 and 130 out of a total of 139 participating countries. In some cases, the experts consulted perceived the situation as having worsened since the previous version of the index, conducted in 2018 (see figure 1). This could be put down, in part, to the disruptions caused by the COVID-19 pandemic in the functioning of customs and other border control agencies.

There are also several metrics to assess the degree of implementation of the trade facilitation agenda in the region. One is the rate of implementation of the provisions of the Agreement on Trade Facilitation, calculated by the WTO Secretariat on the basis of notifications by the countries themselves to WTO. The trade facilitation indicators developed by OECD provide an alternative metric (Sorescu and Bollig, 2022). They measure the degree of compliance with 155 measures, many of which reflect the contents of the Agreement. In doing so, they rely on a combination of publicly available



information and consultations with official sources in the countries assessed. Figure 2 shows the results for the countries of the region on both indicators. It is worth noting that performance in the trade facilitation indicators is lower than the reported rate of implementation of the Agreement in almost all countries. While the average regional rate of implementation of the Agreement was 82% in April 2023 (6 percentage points above the global average), the average score on trade facilitation indicators was only 60%. This is explained by the fact that formal compliance with the commitments in the Agreement (i.e. the existence of a corresponding regulatory framework) does not necessarily imply full implementation in practice, which is the dimension assessed by the indicators. With few exceptions, the Caribbean performs below the regional average on both indicators.

Figure 1
Latin America and the Caribbean (21 countries): scores on the customs formalities efficiency component of the logistics performance index, 2018 and 2023
(1: Very low to 5: Very high)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of J.-F. Arvis and others, *Connecting to Compete 2018: Trade Logistics in the Global Economy*, Washington, D.C., World Bank, 2018, and J.-F. Arvis and others, *Connecting to Compete 2023: Trade Logistics in the Global Economy*, Washington, D.C., World Bank, 2023.

Since 2015, every two years the five United Nations regional commissions have conducted the Global Survey on Digital and Sustainable Trade Facilitation, the main objective of which is to monitor each region's progress in implementing the Agreement on Trade Facilitation and digitalizing trade procedures in general. The main results for the region from the fifth edition of the Global Survey, conducted between January and May 2023 with the participation of governments in 26 countries, are presented below.[2]

Latin America and the Caribbean had an average implementation rate of 71% across the 31 core measures of the 2023 Global Survey (see figure 3). This figure is slightly higher than the average for the 163 countries that participated in the Global Survey, which was 69%. There is considerable dispersion of results in the region, with a difference of 41 percentage points between the best-rated country (Mexico, with 88%) and the worst-rated (Saint Lucia, with 47%). Of the 11 countries with scores below the regional average, 8 were in the Caribbean, including the bottom 5.

[2] See [online] www.untfsurvey.org. See Herreros (2023) for more details on the findings of the fifth Global Survey in the region.

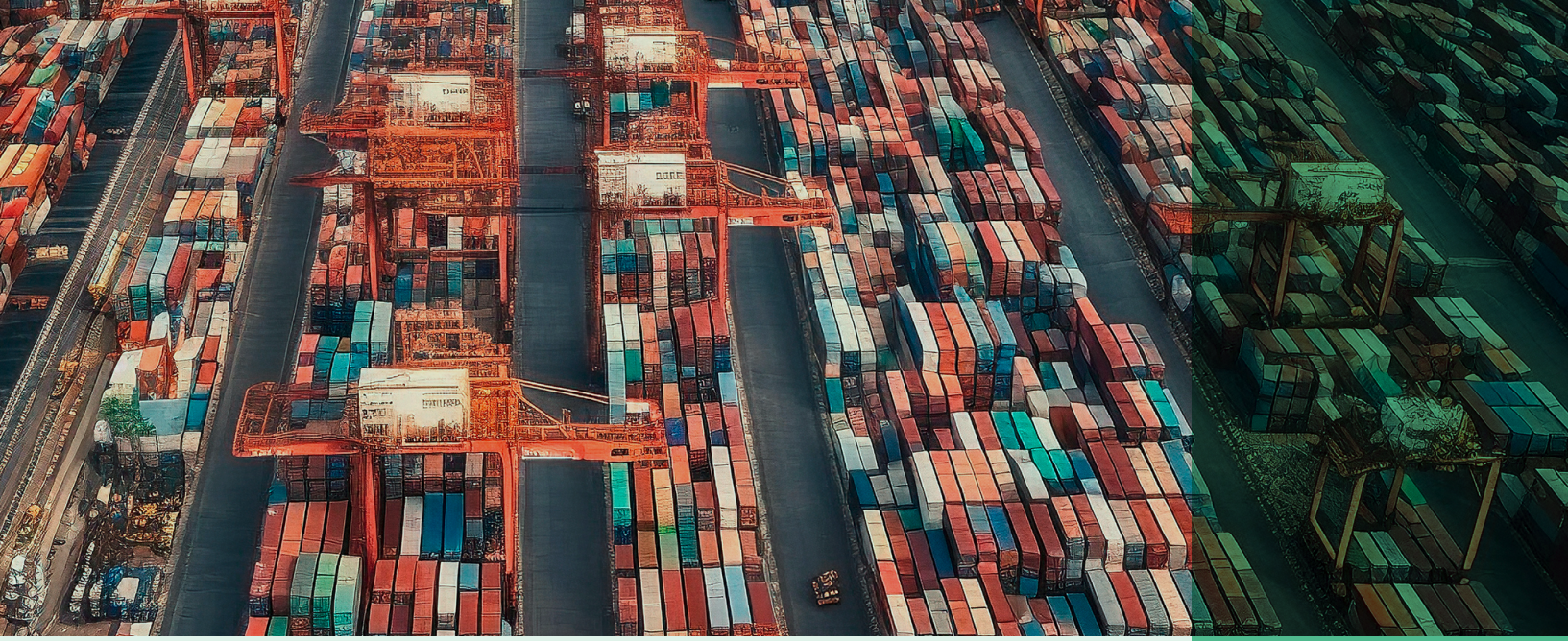
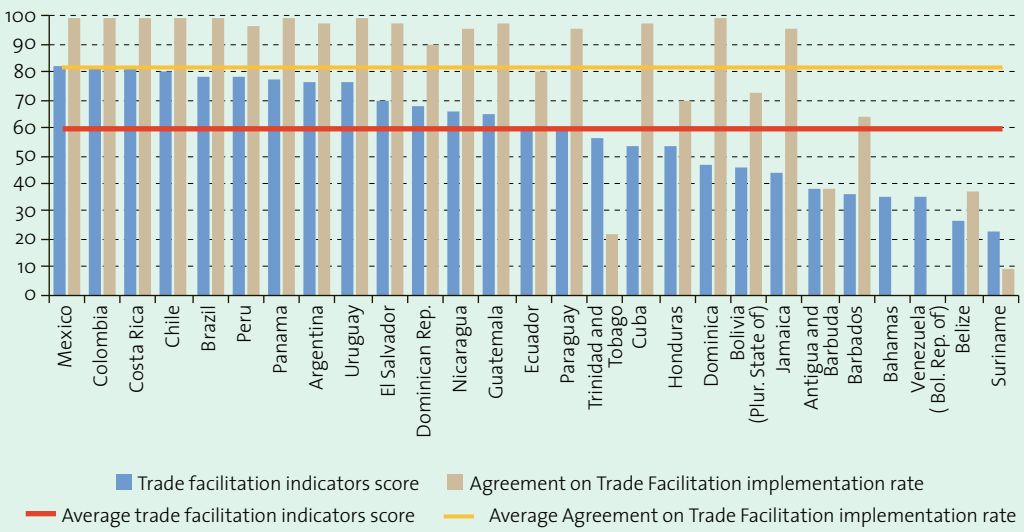


Figure 2
Latin America and the Caribbean (27 countries): rates of implementation of the WTO Agreement on Trade Facilitation, as of April 2023, and scores on the trade facilitation indicators of the Organisation for Economic Co-operation and Development, 2022
(Percentages)

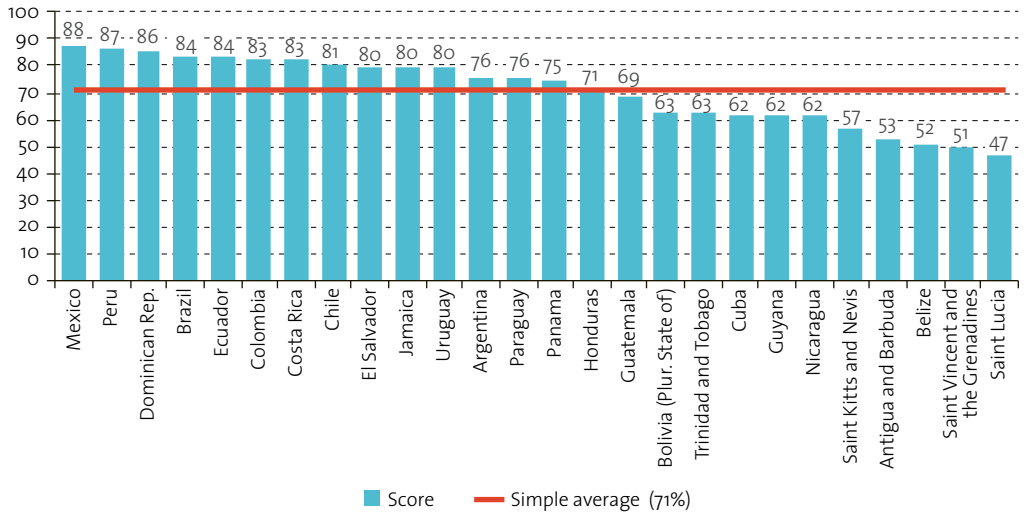


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Trade Organization (WTO), Trade Facilitation Agreement Database [online] https://www.tfadatabase.org/es and Organization for Economic Co-operation and Development (OECD), "Trade Facilitation" [online] https://www.oecd.org/trade/topics/trade-facilitation/
Note: No information is available on the implementation rate of the Agreement on Trade Facilitation in the Bolivarian Republic of Venezuela or the Bahamas. The Bahamas is not a WTO member.

The three subregions exhibit fairly similar implementation rates for four of the five measures that make up the transparency category: publication of existing import-export regulations on the Internet, stakeholders' consultation on draft regulations, the publication or notification of new regulations before they come into force, and the existence of procedures for appealing customs decisions (see figure 4). As regards the issuance of advance rulings on the tariff classification and origin of imported goods, by contrast, there is a large gap between the implementation rates in Central America and Mexico and in South America (95% and 85%, respectively) and those in the Caribbean (37%).

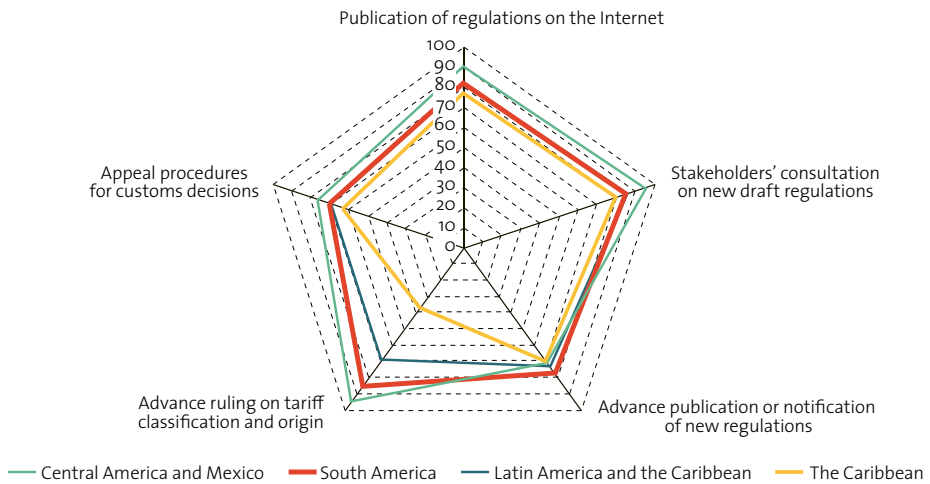
The importance of this measure, provided for in article 3 of the Agreement on Trade Facilitation, lies in the fact that advance rulings provide operators with certainty as to the treatment that will be given to goods upon entry into the importing country with respect to the aspects included in the relevant ruling.

Figure 3
Latin America and the Caribbean (26 countries): total scores in the United Nations Global Survey on Digital and Sustainable Trade Facilitation 2023
(Percentages of the maximum possible score)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Global Survey on Digital and Sustainable Trade Facilitation, 2023.

Figure 4
Latin America and the Caribbean (26 countries): average rates of implementation of transparency measures, by subregion, 2023
(Percentages)

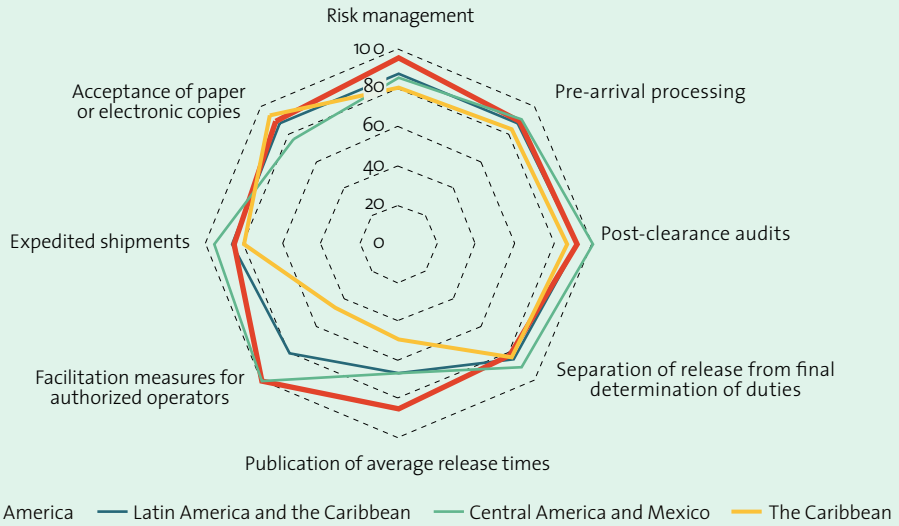


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Global Survey on Digital and Sustainable Trade Facilitation, 2023.

The three subregions exhibit fairly similar implementation rates for six of the eight measures in the formalities category: the use of a risk management system for customs control, pre-arrival processing of imported goods, post-clearance audits, separation of the release of goods from the final assessment of duties and other fees, facilities to

expedite the release of urgent shipments entering by air, and acceptance of copies of documents required for export, import or transit (see figure 5). The Caribbean performs much worse than the other subregions on the remaining two measures: publication by customs of average release times for goods and, especially, facilitation measures for authorized economic operators. While all participating countries in South America, Central America and Mexico reported having fully operational authorized economic operator programmes,[3] their implementation rate among Caribbean participants was only 47%.

Figure 5
Latin America and the Caribbean (26 countries): average rates of implementation of formality measures, by subregion, 2023
(Percentages)

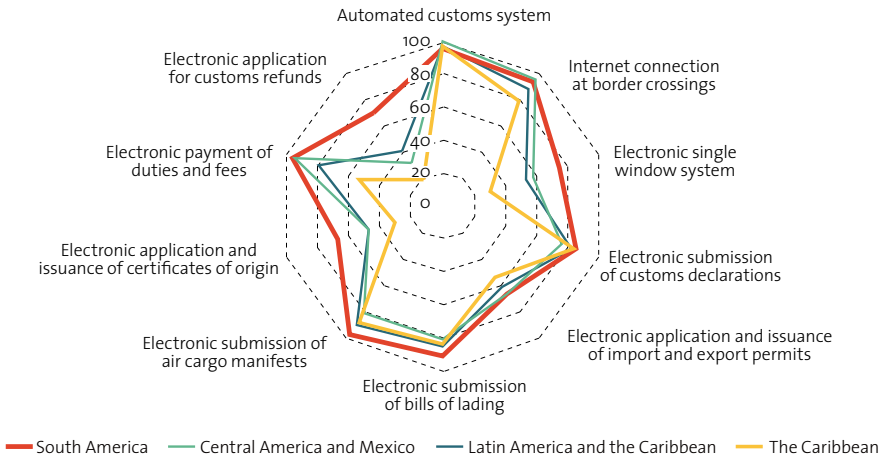


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Global Survey on Digital and Sustainable Trade Facilitation, 2023.

The paperless trade category includes 10 measures, relating both to specific electronic transactions and to the availability of the information and communications technology (ICT) infrastructure needed to carry them out. The region's performance in this area varies significantly (see figure 6). Almost all the countries participating reported having a fully operational automated customs system. These systems represent the first link leading to the subsequent establishment of an electronic single window for international trade. Also in the area of infrastructure, Internet availability for customs and other control agencies at border crossings is around 90%. Electronic payment of customs duties and other fees, and electronic filing of customs declarations and sea and air cargo manifests, show implementation rates of 80% or more. In contrast, implementation is only 62% when it comes to electronic application and issuance of licences and permits. The least implemented measures are electronic application and issuance of certificates of origin (47%) and electronic application for customs refunds (41%).

[3] These programmes consist of granting certain advantages to companies certified by customs as authorized economic operators, such as reduced documentation and physical inspection requirements and deferred payment of customs duties, taxes, fees and charges. Criteria for authorized trader certification include an appropriate record of compliance with customs laws and regulations, financial solvency and supply chain security.

Figure 6
Latin America and the Caribbean (26 countries): average rates of implementation of paperless trade measures, by subregion, 2023
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Global Survey on Digital and Sustainable Trade Facilitation, 2023.

The establishment of an electronic single window for international trade is crucial for switching to paperless trade. The single window is an information technology platform that allows parties involved in trade and transport to submit the documentation and information required for the import, export or transit of goods through a single entry point. It also ideally allows a large number of formalities associated with foreign trade operations to be completed, such as paying for various services and obtaining permits and licences. The single window is one of the most complex measures to implement in the Agreement on Trade Facilitation in terms of financial, technological and inter-agency coordination requirements. Six years after the Agreement entered into force, the average regional rate of implementation of the single window was only 53%, and nine countries reported that they still did not have this instrument in place (see table 1).

Table 1
Latin America and the Caribbean (26 countries): status of implementation of electronic single windows for international trade, as of May 2023

Fully implemented[a]	Partially implemented	Not implemented
Brazil	Argentina	Antigua and Barbuda
Colombia	Chile	Belize
Costa Rica	Cuba	Bolivia (Plurinational State of)
Mexico	Ecuador	Guyana
Paraguay[b]	El Salvador	Honduras
Peru	Guatemala	Nicaragua[c]
Dominican Republic	Jamaica	Saint Lucia
	Panama	Saint Kitts and Nevis
	Trinidad and Tobago	Saint Vincent and the Grenadines
	Uruguay	

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Global Survey on Digital and Sustainable Trade Facilitation, 2023.

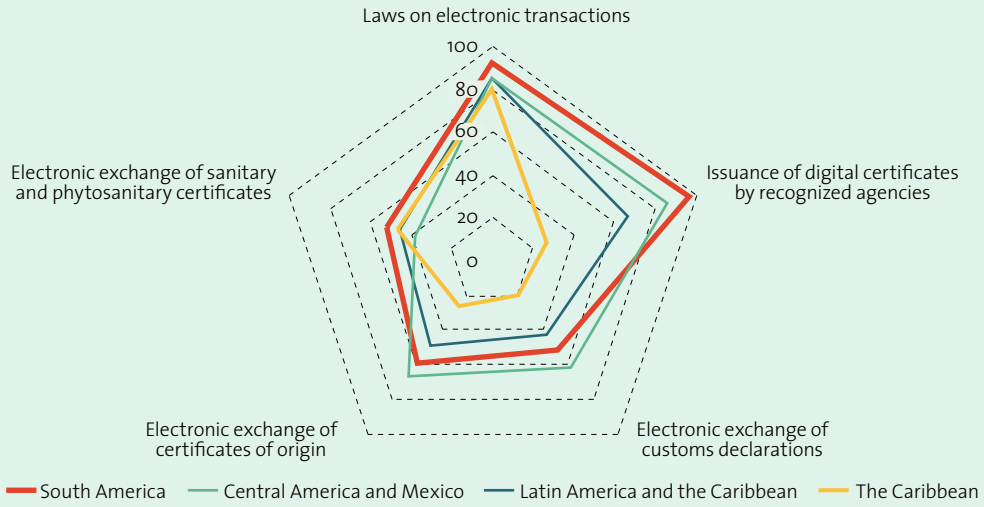
[a] The electronic single window for international trade is considered fully implemented when, according to the information provided by the country concerned: (i) all relevant stakeholders are connected to it and (ii) all government agencies with competences related to international trade are required to participate.

[b] Paraguay has one electronic single window for exports and another for imports.

[c] On 28 March 2023, the National Assembly of Nicaragua approved the law creating the Single Window for International Trade of Nicaragua (VUCEN).

The region is also highly heterogeneous when it comes to paperless cross-border trade (see figure 7). The most widely implemented measure is the existence of laws on electronic transactions (86%). This legislation is essential to provide a legal underpinning for cross-border trade transactions involving the use and transmission of documentation in digital format. The next most implemented measure is the existence of agencies authorized to certify the authenticity of electronic signatures in commercial transactions (67%, but only 27% in the Caribbean). The other three measures in this category have much lower implementation rates: electronic exchange of certificates of origin (49%), of sanitary and phytosanitary certificates (46%) and of customs declarations (42%). Because it is often the interoperability of national single windows that makes it possible to exchange such documents electronically, the fact that these do not exist in a number of countries limits the scope for applying the practice across the board.

Figure 7
Latin America and the Caribbean (26 countries): average rates of implementation of paperless cross-border trade measures, by subregion, 2023
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Global Survey on Digital and Sustainable Trade Facilitation, 2023.

Besides what has been achieved by individual countries in the region, progress has been made through regional or subregional cooperation, examples being mutual recognition of national authorized economic operator programmes and cross-border electronic exchange of documents. An important development related to the former was the signing in May 2022 of a regional mutual recognition agreement on authorized economic operators between the customs services of 11 countries in the region,[4] with other countries in the process of accession. With regard to cross-border electronic exchanges, the members of the Pacific Alliance have been exchanging phytosanitary certificates electronically since 2017 and certificates of origin since 2018. They are currently working to enable the electronic exchange of customs declarations and sanitary certificates. For their part, the Central American countries electronically exchange the document known as the Central American Single Declaration (DUCA), which also serves as a preferential certificate of origin for trade between the countries of the subregion. Again, the transmission of sanitary and phytosanitary certificates is in the pilot phase as part of the establishment of the Central American Digital Trade Platform (PDCC). In the case of MERCOSUR, the four founding members exchange customs declarations and certificates of origin electronically.

[4] Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Guatemala, Paraguay, Peru, Plurinational State of Bolivia and Uruguay.

II. The role of transport and logistics infrastructure in achieving more efficient and sustainable trade

This section aims to present an overview of the progress made by the countries of Latin America and the Caribbean in implementing their respective agendas for transport infrastructure and international trade logistics, and the main challenges remaining in this area. Improvements to transport and logistics conditions are essential to make the region's trade more fluid and to increase its international competitiveness. Constraints in this area have been a constant in the region's history, largely owing to its particular geographical, economic and demographic conditions. The COVID-19 pandemic brought these shortcomings to the fore and underlined the differences between countries, as well as their vulnerability to external shocks.

The region's poor economic growth over the past decade, averaging 0.7% per year between 2014 and 2022, has translated into low levels of public investment and thence an infrastructure stock that is insufficient to boost growth and promote productive development (ECLAC, 2023a). This situation calls into question the ability of most of the countries to make the investments needed to close the infrastructure gap. It will be more difficult for some countries than for others, whether because of their financial situation, the current state of their infrastructure, their social requirements or their relative isolation (as in the case of landlocked countries, for example, or those with natural obstacles to land communication).

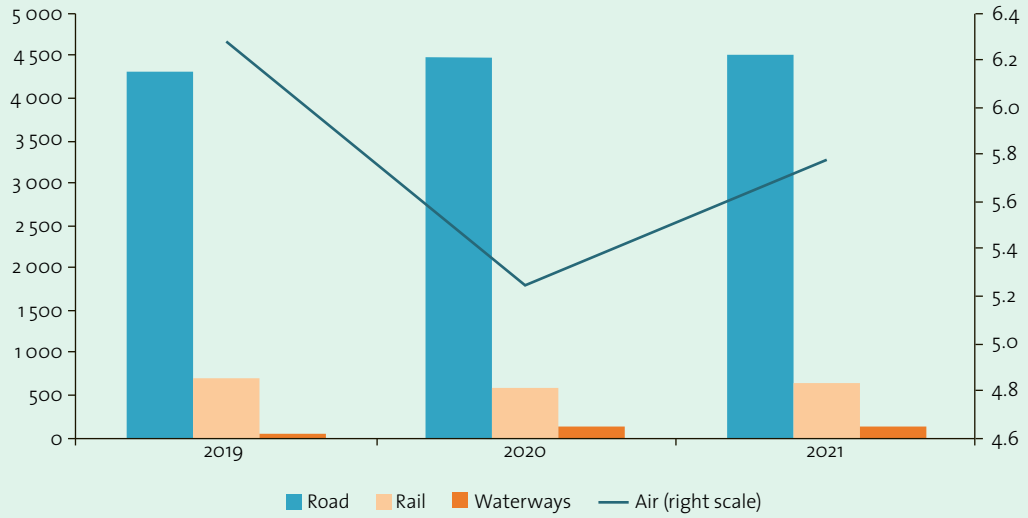
A. The state of connectivity and transport infrastructure

An economy's trade costs are determined by a set of variables including transport costs, which in turn largely depend on the infrastructure available. Such costs cover not only facilities at ports, airports, border crossings and international roads, but also domestic transport infrastructure and the availability of quality logistics services at competitive costs. A number of studies indicate that the lack of quality logistics infrastructure has resulted in costs being higher in Latin America and the Caribbean than in other regions, especially when the comparison is with more developed countries. For example, the cost of logistics services (road, rail, marine, air and urban transport) ranges from 10 to 15 cents per ton/km, while in Australia and Canada it is 5 cents per ton/km and in Spain and the United States it is as low as 4 cents per ton/km (Barbero and Guerrero, 2017).

In Latin America, deficiencies in transport infrastructure have a negative impact on trade flows (Sanguinetti and others, 2021). The differences between countries are very marked in terms of the quantity, efficiency and quality of their transport infrastructure. For example, while over 90% of the road network is paved in countries such as Panama, Mexico and Uruguay, the level is around 20% in others such as the Plurinational State of Bolivia and Colombia (Sanguinetti and others, 2021). Infrastructure deficiencies are even more visible in the poorest and most isolated areas. In rural Paraguay, for example, more than half the population (58%) does not have access to a road that is passable all year round within two kilometres of their homes. In Peru, 63% of inhabitants do not have easy access to a good road (ECLAC, 2023b).

The region is characterized by the predominance of road transport for freight movement, accounting for an average of 85% of freight transported in the three-year period 2019–2021 (see figure 8). The volume of rail and air freight fell in 2020, when the pandemic hit, while road transport held up well because it was used to supply food, medical inputs and other essential goods. Inland waterway transport increased, although it accounted for only 3% of all freight moved in 2021.

Figure 8
Latin America and the Caribbean: cargo volumes, by transport method, 2019–2021
(Billions of tons/km)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, Regional Knowledge Management Platform for the Sustainable Development Goals in Latin America and the Caribbean, "SDGs in Latin America and the Caribbean: Statistical knowledge management hub" [online] https://agenda2030lac.org/estadisticas/index.html.

To assess the current state of the region's connectivity and transport infrastructure, both in the internal networks it uses to distribute goods and in its capacity to export and import them, some indices that measure land connectivity (AC&A/CENIT, 2020) and logistics performance (World Bank, 2023) are presented below.

AC&A/CENIT (2020) designed a system that brings together 18 indicators grouped into 6 categories: territorial coverage; quality and safety; productivity and operating costs; modal balance for the optimization of logistics; environmental and social sustainability; and institutional framework and public-private participation. This framework was applied in 11 countries of the region: Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Panama, Paraguay, Peru, Plurinational State of Bolivia and Uruguay. The details of each category are given below.

- **Territorial coverage**. This reflects the extent of the population's access to transport infrastructure. The indicators used for this are kilometres of total network per km², kilometres of total network relative to population, kilometres of total paved network per km² of surface area and percentage of the country's rural population with access to passable roads.
- **Quality and safety**. This measures whether the infrastructure is of high enough quality for safe travel. To this end, it includes perceptions of the road and rail network,[5] the percentage of the main network that is paved, motorways as a percentage of the main network, and accidents relative to the total number of vehicles. With regard to this last indicator, it should be noted that more than 80,000 people die in road traffic accidents in the region every year, which translates into an annual regional rate of 14.1 injuries and 0.9 deaths per 1,000 vehicles (WHO, 2018). On an international comparison, the region's rate stands at the global average. WHO (2018) estimates that the costs of road accidents worldwide represent between 1% and 3% of GDP.
- **Productivity and operating costs**. This includes indicators that provide a measure of the services provided by infrastructure to businesses, including kilometres per hour between nodal points and the trade- and transport-related infrastructure quality component of the logistics performance index.

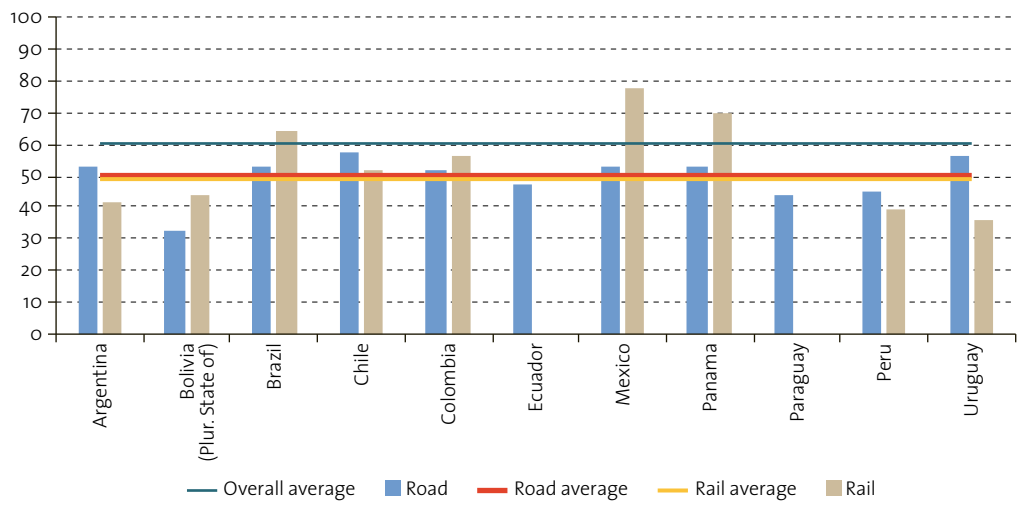
[5] Quality perception indicators for road and rail networks are regularly produced by the World Economic Forum (Schwab, 2019). The basic source of these data is an executive opinion survey.

- **Modal balance for the optimization of logistics**. This seeks to capture the availability of the different modes of land transport and the degree to which they complement each other to provide a better service. To this end, it measures the share of rail in freight transport and capacity usage on rail networks.
- **Environmental and social sustainability**. This incorporates indicators that measure the impact of transport on the environment and the coverage of the network in the most disadvantaged areas, including the average age of the vehicle fleet, carbon dioxide (CO_2) emissions per 1,000 inhabitants and network coverage in disadvantaged regions.
- **Institutional framework and public-private participation**. This measures the extent of private sector participation in transport infrastructure investments and the government's performance in managing these. It includes the percentage of the network under concession, the assessed performance of public-private partnerships (PPPs) and perceived government effectiveness.

For each of these indicators, the resulting measure is an index ranging from 0 to 1, where 0 indicates a complete lack of performance and 1 full performance. AC&A/CENIT (2020) highlight two points regarding the choice of indicators. First, they consider the indicators for rail and road transport systems both together and separately. Second, they stress that the selection of indicators was made on the basis of data availability. The authors add that it would be theoretically possible to have higher-quality indicators, but the necessary information is not available for the region, which makes them impossible to estimate. To strengthen this aspect, they recommend supporting the development of transport indicators in the region, as the Infralatam initiative has done in the area of investment.

As can be seen in figure 9, Brazil, Mexico and Panama scored the highest for overall performance and exceeded the regional average on both road and rail transport. They are followed by a group comprising Argentina, Chile, Colombia and Uruguay. Lastly, the countries scoring lowest are Ecuador, Peru, the Plurinational State of Bolivia and Paraguay.

Figure 9
Latin America (11 countries): land transport indicators, overall and disaggregated by rail and road transport systems, 2020
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of AC&A/Cenit, *Análisis de inversiones en el sector transporte terrestre interurbano latinoamericano a 2040*, Caracas, Development Bank of Latin America and the Caribbean (CAF), 2020.

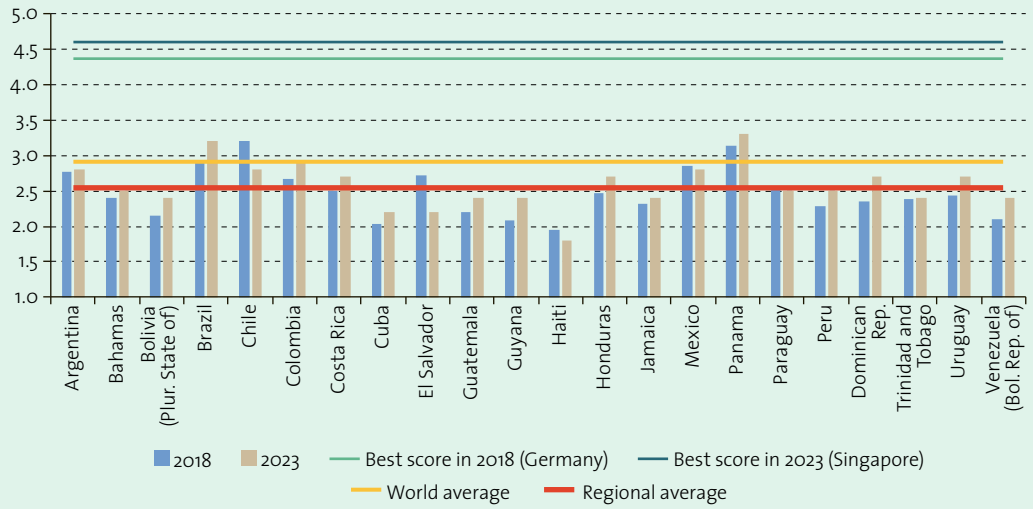
For road transport systems, Argentina, Brazil, Chile, Panama and Uruguay scored highest, followed by Colombia and Ecuador. With respect to rail transport, Mexico scored considerably better than the rest of the countries because of its high coverage and perceived quality, the importance of freight and private participation in management. The country was followed

by Brazil, Colombia and Panama, which maintain efficient rail systems. The development of rail systems in Argentina, Chile, Peru, the Plurinational State of Bolivia and Uruguay, on the other hand, is very limited. Lastly, Ecuador and Paraguay lack rail freight systems and therefore scored zero. The authors of the index argue that the countries where the two modes of transport (road and rail) have been most successfully developed have public-private participation models.

The World Bank logistics performance index provides a broader look at countries' connectivity beyond their borders (World Bank, 2023). The index breaks down into six components: (i) the efficiency of customs and border management clearance; (ii) the quality of trade- and transport-related infrastructure; (iii) the competence and quality of logistics services; (iv) the ability to track and trace consignments; (v) the timeliness of shipments; and (vi) the ease of arranging competitively priced international shipments. The assessment is based on the opinions of experts consulted between September and November 2022, and the scale used ranges from 1 (very low) to 5 (very high). Both at the aggregate level and in the different components, there is a performance gap between developed and developing countries, with high-income economies having the 12 best scores on the index.[6] In the region, Brazil scored highest, followed by Panama, Chile, Peru, Uruguay, Mexico and Colombia.

The logistics performance index component relating to the quality of infrastructure measures whether this is adequate, whether it is in good condition and whether services that depend on it, such as electricity, fuel and water, are of good quality and affordable. The countries of the region scored between 1.8 and 3.2 and placed between 32 and 136 out of a total of 139 participants. As can be seen in figure 10, the average for the region (2.55) was below the world average (2.9) and far below the best score, obtained by Singapore (4.3). The countries in the region with the best scores in 2023 were Panama (3.3), Brazil (3.2), Colombia (2.9) and Mexico (2.8), while El Salvador (2.2), Guatemala (2.2) and Haiti (1.8) scored lowest.

Figure 10
Latin America and the Caribbean (22 countries): logistics performance index scores for the quality of trade- and transport-related infrastructure, 2018 and 2023
(1: Very low to 5: Very high)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, *Connecting to Compete 2023: Trade Logistics in the Global Economy*.

Note: The global and regional averages are for 2023.

[6] The top 12 places were taken by Singapore, Finland, Denmark, Germany, the Kingdom of the Netherlands, Switzerland, Austria, Belgium, Canada, Hong Kong (China), Sweden and the United Arab Emirates.

The results are very similar when the other components of the logistics performance index are assessed: quality of trade- and transport-related infrastructure; competence and quality of logistics services; ability to track and trace consignments; timeliness of shipments; and ease of arranging competitively priced international shipments.[7] In all four components, all the countries of the region scored between 2.0 and 3.5 out of a maximum of 5.0, and placed in the same range of positions, between 51 and 135 out of a total of 139 participants. Once again, the Latin America and Caribbean average was below the world average and far below the best score, obtained by Singapore.

B. The environmental impact of the transport system in the region

Between 1990 and 2022, global CO_2 emissions from transport grew at an average annual rate of 1.7%, faster than any other end-use sector except industry (IEA, 2023). To achieve net zero emissions by 2050, CO_2 emissions from transport would have to decrease by more than 3% per year until 2030. The International Energy Agency (IEA) points to the need both for stricter regulations and fiscal incentives and for considerable investment in infrastructure to enable low- or zero-emission vehicles to operate if this goal is to be reached. There is evidence confirming that trucks are the mode of transport that generates the highest CO_2 emissions globally, although the different information sources yield very disparate figures. This confirms the need to adopt other means of transport that have less impact on the environment.

In Latin America and the Caribbean, the transport sector is responsible for a high proportion of fuel-related greenhouse gas emissions. According to IEA (2020), CO_2 emissions from transport accounted for 38.2% of the total in Central and South America in 2019, which was much higher than the global share (24.1%). According to Viscidi and O'Connor (2017), the CO_2 emissions of the transport sector in the region were highly concentrated in road transport (73%), with much smaller shares for marine and inland waterway transport (8%) and air transport (6%). Only 1% came from rail transport.

According to Vergara, Fenhann and Schletz (2015), within the road transport category, freight and passenger transport are responsible for half of total CO_2 emissions apiece. Heavy trucks stand out for their high CO_2 emissions, contributing 28% of the road transport total. In the passenger segment, private cars are the largest source of CO_2 emissions (31%), while the bus fleet accounts for less than 10% of road transport emissions.

C. Infrastructure investment and financing

While logistical competitiveness and access to appropriate means of transport for the population require more investment than the region has historically achieved, public investment in infrastructure has contracted steadily since its peak in the 1980s, when it reached 4.1% of GDP (see figure 11). Total infrastructure investment (public and private) is currently some 2% of GDP, at a time when the region's countries need to upgrade their infrastructure to revive the economy.

It will be very challenging for the region to bridge the gaps between the current situation and what is needed to achieve the Sustainable Development Goals (SDGs) by 2030. Sánchez and others (2017) argued that the region would need to invest at least 4.7% of GDP per year in four infrastructure sectors (transport, electricity, telecommunications, and water and sanitation) between 2016 and 2030 under a 3.2% GDP growth scenario, while annual investment of 6% of GDP would be needed under a 3.9% growth scenario. More recently, ECLAC (2022, p. 168) has stated: "A recent literature review estimates the region's investment requirements for the provision of infrastructure services as equivalent to between 2% and 8% of GDP per year; and that the annual spending needed to address a variety of social challenges is 5% to 11% of GDP." This adds up to between 7% and 19% of annual GDP on top of what is currently being spent (Galindo, Hoffman and Vogt-Schilb, 2022). More conservative

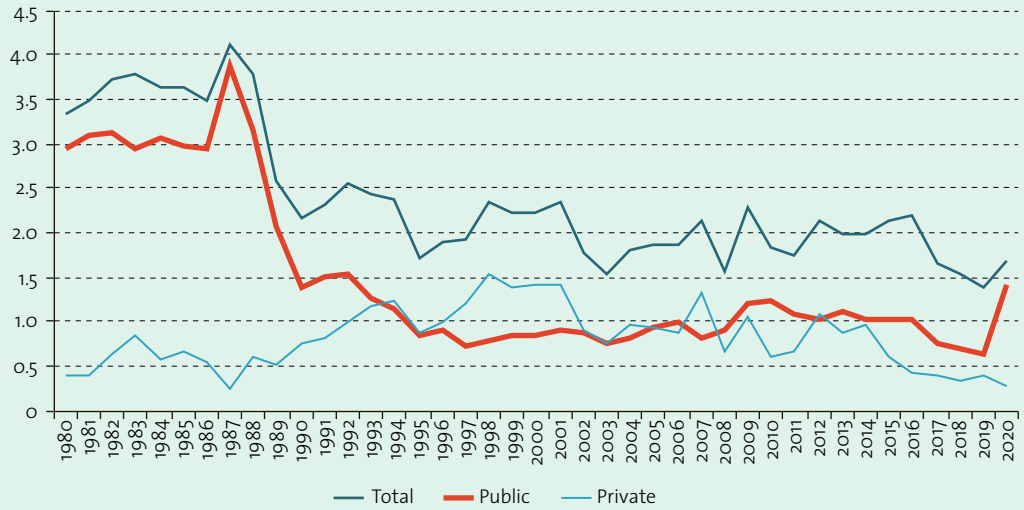
[7] The component related to the efficiency of customs clearance is analysed in section I of this *FAL Bulletin*.

studies put the figure at around 4% of GDP in emerging economies and 15% of GDP in the group of low-income countries (ECLAC, 2022). Either way, these are significantly higher amounts than are currently being spent on infrastructure.

Figure 11

Latin America (6 countries):[a] public and private sector infrastructure investment, 1980–2020

(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Economic Infrastructure Investment Data (INFRALATAM) [online] http://infralatam.info/; C. Calderón and L. Servén, "The effects of infrastructure development on growth and income distribution", Policy Research Working Papers, No. 3400, Washington, D.C., World Bank, 2004 and World Bank, Private Participation in Infrastructure (PPI) Database [online] http://ppi.worldbank.org.

Note: Includes investments in transport (roads and railways), electricity, telecommunications, and water and sanitation. Data are weighted averages from 1980 to 2014 for Argentina, Brazil, Chile, Colombia, Mexico and Peru. Private investment from 2015 onward only includes Argentina, Brazil, Colombia, Mexico and Peru. Data on public-private concessions or investments are not included.

[a] Argentina, Brazil, Chile, Colombia, Mexico and Peru.

The population of Latin America and the Caribbean is projected to increase from 665 million in 2023 to 751 million in 2056, before beginning to decline.[8] The demand for transport is therefore expected to keep increasing in the coming years. To support this greater demand, more infrastructure investment is needed within a framework of sustainability and efficiency. The challenge will thus be to finance the investments required to meet the transport needs of users and businesses in a way that minimizes negative externalities and without accumulating excessive debt.

Given the high levels of public debt in the region (ECLAC, 2023a), there has been growing interest in public-private partnerships to generate greater resources and thus accelerate infrastructure projects. In this connection, the United Nations Economic Commission for Europe (UNECE) has developed the UNECE PPP and Infrastructure Evaluation and Rating System (PIERS) An Evaluation Methodology for the SDGs.

Despite their attractiveness, public-private partnerships are not necessarily viable or the best financing alternative in all cases. There is also funding available from other sources that can be tapped as long as risk, return and creativity requirements are met. For example, institutional investors, including pension funds, are a major potential source of capital for investing in transport infrastructure over the long term. Other forms of financing include partnerships with international donors, development banks and other multilaterals (such as the Green Climate Fund), which can help governments attract private capital to finance projects with a high economic and social impact. For less "bankable" infrastructure projects, other investment vehicles such as blended funds and green bonds can bundle

[8] CEPALSTAT data [online] https://statistics.cepal.org/portal/cepalstat/index.html?lang=en.

projects with varying degrees of financial attractiveness or allocate risk differently for different types of investors, with development banks taking on more risk or accepting slightly lower rates of return than private investors, for example. Governments can also use various risk mitigants, such as loan guarantees, and transaction enablers, such as offtake agreements, to increase private investment in sustainable infrastructure (UNDP, 2021).

D. Options for more efficient and sustainable regional transport

The barriers to achieving better infrastructure and sustainable connectivity are diverse. Besides the availability of financial resources, it is crucial for governments to plan and use these resources strategically, without losing sight of the impacts that infrastructure can have on the environment. These are particularly evident in the case of road transport, which has historically been a priority on the region's investment agendas. The reasons are obvious, as it allows resources to be focused on interconnecting regions on several levels. Roads and highways connect populations, which need local roads, but also use primary routes for heavier and longer-distance connections. However, the focus on road investment has sidelined other alternatives that can be cleaner and more efficient.

Besides the obvious answer of expanding and renewing road infrastructure, there are at least two alternatives for improving transport under current conditions. One is to explore other transport options. Alternatives such as ferries, waterways and airships are not new, but, like trains, they have great potential to play an even greater part in the challenge of improving transport, while helping to mitigate the pollution and congestion generated by road transport. Some studies and developments that are important for the prospects of greater regional integration are presented below.

The second alternative is the integration of the different modes of transport into properly interconnected systems capable of exploiting the advantages of each mode and the existing infrastructure in a single multimodal system. The case of the corridors being established in South America is presented below.

1. Ferries

Ferries are a mode of transport with great connectivity potential that can provide an efficient and often less polluting solution. In the Caribbean, where vessels smaller than large commercial cargo and passenger ships must be used for regional transport, ferries are common and offer short-haul options suitable for transporting relatively light cargoes. Ferries also have great potential in Central America. On 10 August 2023, the cargo ferry between Puerto de La Unión in El Salvador and Puerto Caldera in Costa Rica began operating. This solution promises to cut distances and costs by offering an alternative to road transport, which involves longer routes. According to the Secretariat for Central American Economic Integration (SIECA), the implementation of this new logistics route promises to boost several economic sectors, including the production of paper for household use, packaging goods, prepared foods and dairy products. This ferry service will also contribute significantly to revitalizing trade between El Salvador and Costa Rica, which currently stands at something over US$ 680 million annually (Lima-Mena, 2023). In summary, the deployment of the ferry offers a number of advantages that include cutting travel times, boosting trade, reducing negative environmental impacts associated with road transport and enhancing the competitiveness of products by lowering transport costs (Gutiérrez Arias, 2020). As a fast and effective short-haul transport solution, ferries have the potential to expand rapidly to other nearby countries, such as Guatemala, Mexico and Panama (INCOP, n/d).

2. Inland waterways

Temer, Muraro and Paz (2023) point out that, despite having only 12% of the planet's total land area, South America has a river runoff equivalent to 25% of the global total, and the volume of water in its rivers represents almost half (47%) of all the world's watercourses.

This is due to the vast size of its major river basins, forming a system usable for river navigation with a total length of more than 50,000 km. However, the region has a low level of physical river integration, with the notable exception of the Paraguay-Paraná waterway. The three main river basins (those of the Amazon, the River Plate and the Orinoco), which cover most of South America's territory, present untapped opportunities for river interconnection, potentially interacting with the various road, rail and airport networks. In this context, it is feasible to build an enhanced system of sustainable river navigation in the region and to explore the advantages of intermodality in regional logistics.

3. Airships

Airships are another mode of transport with great potential to mitigate the impact of climate change, among other benefits. This technology offers technical capabilities that can help to significantly improve mobility and logistics networks in isolated areas, particularly in small island developing States (SIDS) (ESCAP/ECLAC, 2021). According to this study, airships do not compete with other means of transport, but rather complement them, improving co-modality and synchro-modality.[9] They also play an important social role by improving and accessibility, both domestically and externally.

4. Multimodal corridors

Besides the potential offered by the various modes of transport individually, the implementation of road, road-rail, rail and waterway corridors in the region can strengthen connectivity between multiple countries, opening up spaces for trade and productive integration and reducing the risk of shortages or interruption to supply chains. Road corridors also promise to be a particularly effective solution to the relative isolation of landlocked South American countries. Paraguay and the Plurinational State of Bolivia face major challenges because of their lack of access to seaports and consequent remoteness from international markets. Higher trade costs relative to their neighbours negatively affect their economic competitiveness and limit their ability to attract investment, finance, technology and services, elements that are considered essential to economic transformation (Sánchez, 2023).

The two main corridor projects being developed in South America, the bioceanic corridor and the rail corridor, involve coordination of efforts by different countries with a comprehensive, multimodal vision. The aim is to link a road corridor between the Atlantic and Pacific oceans with another corridor featuring new railways and to integrate both with the subregion's waterway system.

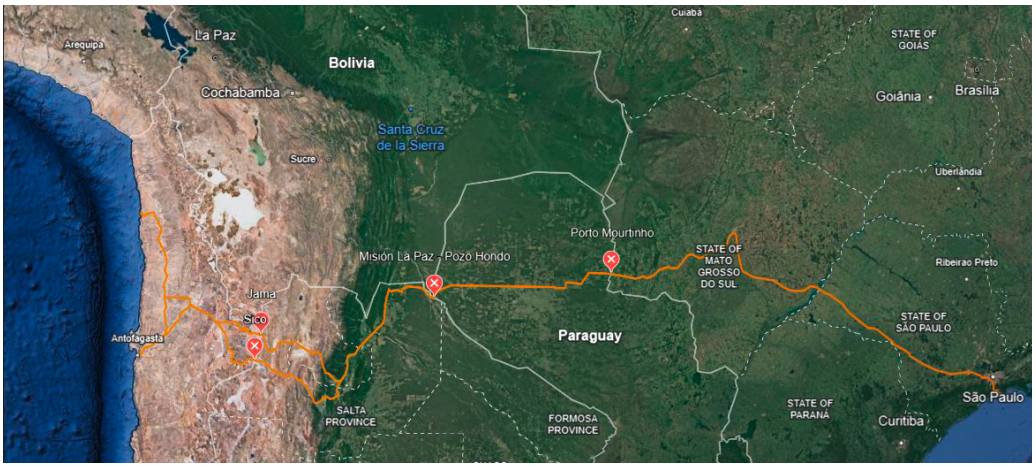
5. The bioceanic road corridor

The bioceanic corridor is located near the tropic of Capricorn and crosses the core of the Integration Zone of the Centre West of South America (ZICOSUR), taking in Argentine provinces, Brazilian states, departments of the Plurinational State of Bolivia, Paraguay and Uruguay, and regions of Chile and Peru (MAPFRE Global Risks, n.d.) (see map 1). The construction of this corridor is meant to transform the region into a logistics hub of international importance by providing the shortest route between Chilean ports on the Pacific Ocean and the Brazilian port of Santos on the Atlantic Ocean (MOPC, n.d.).

The corridor is designed initially to have three road sections, and studies on its potential impact on surrounding markets have yielded promising results. In Brazil, several locations in Campo Grande (Mato Grosso do Sul state) are seen as potential logistics hubs for exports to Asia, as well as storage and distribution sites for imports from Asia and other markets. In Argentina, there has been interest in establishing logistics centres in the provinces of Jujuy and Salta. In Chile, there is a major opportunity for a public-private partnership that can capitalize on the flow of goods to diversify the country's production, which until now has been predominantly oriented towards mining (MAPFRE Global Risks, n/d).

[9] Co-modality aims to maximize the efficient use of all modes of transport (road, rail, water and air), while synchro-modality efficiently and flexibly integrates all modes of transport to move goods in real time.

Map 1
South America: bioceanic road corridor



Source: Prepared by the author on the basis of J. C. Parkinson, "Multimodalidad en el transporte", presentation at the seventh Latin American and Caribbean Meeting of Port Logistics Communities, 22–25 August 2023, Santiago, Latin American and Caribbean Economic System (SELA)/Development Bank of Latin America and the Caribbean (CAF)/Economic Commission for Latin America and the Caribbean (ECLAC).

According to Parkinson (2023), the bioceanic corridor will reduce the physical isolation of certain regions, integrating underexploited areas and revitalizing spaces where production activity is latent. It will also favour the implementation of multimodal logistics solutions, integrating road, rail and waterway transport. Other expected benefits of the project include:

- Reducing logistics costs and travel times, which is beneficial for cargo in general and especially for perishable goods.
- Exporting products from Argentina, Brazil, Chile and Paraguay efficiently and more cheaply to Asia, the west coast of the American continent and Oceania.
- Stimulating the integration of regional producers and the creation of favourable conditions for projects of participation in global value chains.
- Promoting investments in national logistics and transport systems thanks to multimodality.

According to Rodríguez Laconich and Lupano (2021), the bioceanic road corridor is the most important project being carried out by the Ministry of Public Works and Communications (MOPC) of Paraguay in the Chaco region. The project uses the turnkey approach and involves an investment of US$ 445 million. The construction of this corridor is of great strategic value for Paraguay, as it has the potential to turn the country's western region into an international logistics hub by providing the shortest route between Chilean and Brazilian ports (Rodríguez Laconich and Lupano, 2021).

The initial phase of the corridor (section 1) was presented and inaugurated in Paraguay in February 2022. Construction began on 11 February 2019, and 275 kilometres of asphalted highway have now been built between the towns of Loma Plata (department of Boquerón) and Carmelo Peralta (department of Alto Paraguay) (MOPC, 2022). In March 2023, four contracts were signed with companies that will begin construction of section 3.[10] The planned investment for section 2 is approximately US$ 110 million,[11] and it is scheduled to be built after section 3, since the recently upgraded PY09 road already functions as a detour route connecting to the latter. This third segment will be 225 kilometres long and entail an estimated investment of some US$ 355 million (Itaipú Binacional, 2023).

Once construction of all phases of the route is complete, it will connect the most important seaports on the Pacific and Atlantic oceans, lead to the creation of 2,500 additional jobs and open up a wide range of opportunities for the communities of the Paraguayan Chaco

[10] This will be at the western end of route PY15 and run from Mariscal Estigarribia to Pozo Hondo, a town on the border with Argentina. The eastern section of the road will connect with the bridge of the bioceanic route.
[11] The 102 kilometre-long section 2 will run from Cruce Centinela to Mariscal Estigarribia.

(MOPC, n/d). This project is also expected to benefit indigenous communities, as it includes improvements in productive infrastructure, mobility and transport, as well as training and capacity-building programmes (STP, 2022).

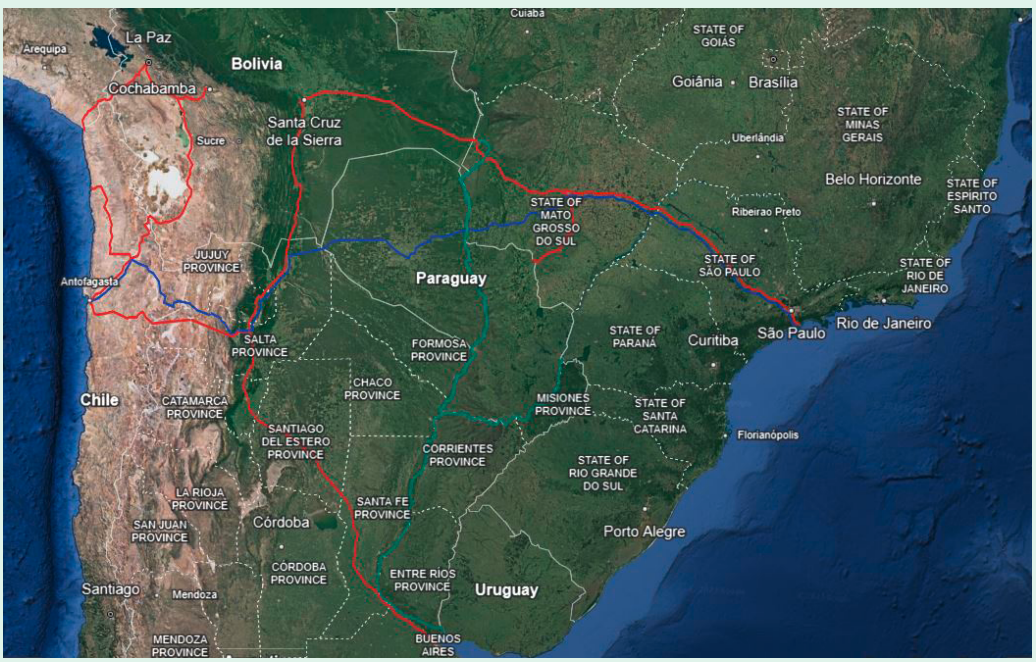
(i) The central bioceanic rail corridor

The purpose of this is to connect the port of Santos in Brazil, on the Atlantic Ocean, and the port of Ilo in Peru, on the Pacific Ocean (see map 2). This link will not only lower exporting and importing costs, but will provide a sustainable means of transport that integrates coherently with the river routes of the Plate and Amazon basins (PARLASUR, 2017). For the two landlocked South American countries, this corridor and the bioceanic road corridor will open up connections within the region and to international trade. In particular, the rail corridor is a priority project for the Plurinational State of Bolivia.

(ii) Paraná-Paraguay-Uruguay waterway

Map 2 shows how the road corridor integrates with the rail corridor and the Paraná-Paraguay-Uruguay waterway. This is the river system formed by the Paraguay and Paraná rivers from the port of Cáceres in Brazil to the port of Nueva Palmira in Uruguay, including the mouths of the Paraná River and the Tamengo channel, a tributary of the Paraguay River, shared by the Plurinational State of Bolivia and Brazil (Muñoz Menna, 2012). Its total length is approximately 3,400 kilometres and its area of direct influence is 1.75 million km^2, with a population of around 17 million inhabitants (Muñoz Menna, 2012). This territory has great potential to integrate regions where various crops (soybeans and their derivatives, cotton, sunflower and wheat, among others), minerals and industrial products are produced.

Map 2
South America: road, rail and waterway corridors



Source: Prepared by the author on the basis of J. C. Parkinson, "Multimodalidad en el transporte", presentation at the seventh Latin American and Caribbean Meeting of Port Logistics Communities, 22–25 August 2023, Santiago, Latin American and Caribbean Economic System (SELA)/Development Bank of Latin America and the Caribbean (CAF)/Economic Commission for Latin America and the Caribbean (ECLAC).

The morphology of these rivers makes them a natural waterway which, unlike most of the world's great river valleys, presents only a very shallow slope that does not require lock systems to be constructed to allow fluvial transport. Muñoz Menna (2012) adds that the use of natural river transport creates a natural basis for integration via the balanced development of the region's economies. On this basis, he highlights three advantages of

river transport: (i) environmental protection, since it significantly reduces greenhouse gas emissions (each of the barges used on the waterway can transport 1,500 tons, equivalent to the carrying capacity of 60 trucks); (ii) lower costs than other alternatives (freight costs are approximately US$ 0.035 per ton/km by road and US$ 0.025 per ton/km by waterway); and (iii) large energy savings.

III. Conclusions

Progress with trade facilitation is crucial for Latin America and the Caribbean for a number of reasons. Since small and medium-sized enterprises (SMEs) in the region are particularly penalized by administrative barriers to trade, reducing such barriers is conducive to the internationalization of these firms and to intraregional trade, in which SMEs have a strong presence. The resulting increase in the number of firms participating in international trade may in turn contribute to export diversification. Furthermore, the expeditious movement of intermediate and final goods across borders is essential for the smooth functioning of international production networks. Progress with trade facilitation can therefore help to attract new investment from multinational companies that are considering relocating some of their operations to the region as part of nearshoring processes. Moreover, by fostering transparency and reducing the face-to-face interaction usually associated with bureaucratic procedures, trade facilitation can contribute to greater State efficiency and the fight against corruption.

The great progress made by the region's countries of the region in trade facilitation will have a larger impact on trade flows and productive integration if this progress can be coordinated among a number of countries. There have been a variety of promising developments in this regard in recent years, mainly at the subregional level. This is the case, for example, with the cross-border electronic exchange of trade documents and data and the growing number of agreements on mutual recognition of national authorized economic operator systems. Stepping up these efforts should be a priority in the coming years. Also, given the recent experience of the pandemic and the increasing frequency of extreme weather events impacting international supply chains, the countries of the region should increase their levels of preparedness through concerted actions at regional level. The negotiation of a regional agreement on trade facilitation and paperless trade could be a useful vehicle to this end.

In addition to streamlining trade procedures and formalities, the countries of the region need to progressively deal with the infrastructure gaps that have been highlighted by various international indicators and that limit their development prospects. This means not only increasing the regional infrastructure stock, but also allocating adequate resources to the maintenance and repair of existing infrastructure, improving technical and regulatory frameworks and preparing for the challenges of climate change and the extreme events accompanying it. However, increasing the amounts allocated to infrastructure investment is a major challenge given the context of fiscal stringency facing most countries in the region. Different innovative financing options therefore need to be explored, particularly those associated with the development of green infrastructure.

The region's countries have traditionally favoured the development of road transport over other modes. However, multimodality has great potential that should be harnessed to enhance the advantages of each mode of transport in an integrated, more efficient and less polluting system. Alternatives such as rail, ferries, airships and river transport can make a major contribution to this. A promising example of multimodality are the ongoing projects to develop bioceanic integration corridors in South America. These initiatives may particularly benefit the region's landlocked countries by facilitating their access to the Atlantic and Pacific coasts and thence their participation in international trade.

In sum, trade facilitation requires simultaneous progress in streamlining trade procedures, improving infrastructure for the various modes of transport and ensuring the availability of quality transport and logistics services at competitive costs. In the absence of substantive progress in all three dimensions, the impact of improvements in any one of them will necessarily be limited. For this reason, national trade facilitation committees should include all three in their work agendas, seeking to maximize synergies between them.

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V. Publications of interest

FAL Bulletin No. 396

Strengthening road traffic enforcement in the State of Pará, Brazil: a successful road safety project

Francisca Pinto
Miryam Saade Hazin
Eliana Barleta

This issue of *FAL Bulletin* shows how the adoption of appropriate road safety measures has not only contributed to reducing the number of traffic-accident fatalities and injuries in the Brazilian State of Pará, but has also become a road safety benchmark for other entities and countries.

Available in: English Spanish

FAL Bulletin No. 394

Proposal for the implementation of a ferry service through Public Private Partnerships (PPP's) in the Eastern Caribbean Region

Diogo Aita

This *FAL Bulletin* is part of the reflections on infrastructure and connectivity that have been frequently addressed in documents of the Economic Commission for Latin America and the Caribbean (ECLAC). It contributes to the reflections under the project "Transport and Trade Connectivity in the Age of Pandemics: Contactless, Seamless and Collaborative UN Solutions". This edition analyzes the possibility of implementing a ferry network in the Eastern Caribbean region through Public Private Partnerships (PPP's) to promote better and more fluid connectivity.

Available in: English Spanish