DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK GROUP

TECHNICAL GUIDANCE TO ALIGN IDB GROUP OPERATIONS WITH THE PARIS AGREEMENT

TRANSPORT

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ABBREVIATIONS

LAC	Latin America and the Caribbean
PA	Paris Agreement
IDB	Inter-American Development Bank
CC	Climate Change
UNFCCC	United Nations Framework Convention on Climate Change
COP	Conference of the Parties
CO_2^e	Equivalent Carbon Dioxide
GHG	Greenhouse gases
IPCC	Intergovernmental Panel on Climate Change
LTS	Long Term Strategies
MDB	Multilateral Development Banks
ESPF	IDB Environmental and Social Policy Framework
NDC	Nationally Determined Contributions
CCAP	IDB Group Action Plan on Climate Change
PBL	Policy-based Loans
SESP	IDB Invest Social and Environmental Sustainability Policy

I. INTRODUCTION

1.1 This document is a preliminary technical complement to the Paris Agreement Alignment Implementation Approach (PAIA). The PAIA has been developed by the IDB Group (IDB, IDB Invest, and IDB Lab), as a methodological tool to pursue the objective of aligning to the Paris Agreement (PA) new operations and projects that have been reformulated. Both the PAIA and this technical guidance are based on the Joint Framework for the assessment of PA alignment in direct investment operations, developed by Multilateral Development Banks (MDB).[1]

1.2 The PAIA outlines IDB Group's strategy to assess the alignment of operations to the PA with the objective of informing decisions on project activities to be financed and ongoing country dialogue. To do so, it establishes a set of principles to guide the consistent and equitable interpretation of the Joint MDB framework when performing the assessment; and it lays out a series of methodical steps to be followed along the preparation cycle of projects.

1.3 The PAIA builds upon the Environmental and Social Policy Framework (ESPF) and IDB Invest's Environmental and Social Sustainability Policy (ESSP). All operations covered by the ESPF and the ESSP must *comply* with these policies during the preparation, execution, and closing of projects. In contrast, PA alignment assessment is meant to *inform* project design before approval using the information and tools at the disposal of the IDB Group at the time it is made.

1.4 This document contains technical guidance that complements the PAIA for operations related to transportation. It provides IDB Group personnel with additional criteria to interpret the Joint MDB Framework, with specific considerations that are relevant to operations and tools at the IDB Group. [2]

1.5 The objective of this guidance is to help IDB Group personnel design operations aligned to the temperature and CC adaptation goals of the PA; and ensure they present the necessary elements to determine, justify, and disclose all necessary information to support this alignment at approval.

1.6 This document will be revisited by Management on a yearly basis upon its approval and updated as necessary to reflect the lessons learned by the IDB Group and other institutions as they work towards aligning operations and other financial flows with the goals of the PA. Updates will respond to possible adjustments in the MDB Joint Framework, as well as to the need to incorporate the experience during its implementation, consider technological and knowledge advancements in the region, among others.

1.7 **Scope of this document**. This guidance note covers IDB Group operations regarding investment loans, grants[3] and guarantees (i.e., operations involving capital expenditures, referred to as "direct investments" in the MDB frameworks) and policy-based loans and guarantees; it also provides guidance applicable to products with financial intermediaries and corporate finance, which have specific methodological approaches.

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1 Technical Note BB1 and BB2: Joint Framework of the MDBs for the Assessment of Alignment with the Paris Agreement of Direct Investment Operations. (November 2021 working document).

2 In case this document presents discrepancies with the Joint MDB Framework, the second prevails except in cases explicitly justified in this guidance.

3 As established in the PAIA, grants with an approved amount greater than US$3 million.

1.8 **Relation to other IDB Group Documents.** This technical guidance elaborates on the Line of Action for IDB Group Work in the Transport Sector included in the Transportation Sector Framework document (GN-2740-12), which aims to optimize the transportation systems while also enhancing their resilience to natural disaster and climate risks, reducing emissions of local pollutants and greenhouse gases, and promoting more inclusive and sustainable mobility. The technical guidance is also related to the Climate Change Sector Framework (GN-2835-8) and IDB's Group Climate Change 2021-2025 Action Plan, which emphasize the Bank's commitment to adapt and build climate resilience, decarbonize and build effective governance in all sectors.

II. THE TRANSPORTATION SECTOR AND CLIMATE CHANGE

2.1 The PA adopted in 2015 aims to "strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty" (UNFCCC, 2015).

2.2 Infrastructure and transportation services are fundamental for the construction of more inclusive and sustainable societies. They allow for the mobilization of people, goods and services, and constitute the means of access to more and better markets and opportunities for work, health and education. Thus, infrastructure and transportation contribute to the reduction of poverty and inequality, and to the improvement of quality of life and productivity in the LAC region (WEF, 2020) (BID, 2020).

2.3 In the 2030 Agenda for Sustainable Development of the United Nations, the provision of transport infrastructure and its services is an integral part for the fulfillment of the Sustainable Development Goals (SDGs) and their respective targets, particularly those related to food security, health, energy, economic growth, and sustainable cities and human settlements. In the urban sphere, access to high-quality transport networks generates more inclusive cities by increasing mobility and opportunities for its inhabitants; particularly for low-income and vulnerable people such as the elderly, people with disabilities and ethnic minorities (BID, 2022b). In interurban and rural areas, greater connectivity and quality of the road network contribute to improving territorial integration and living conditions of their populations, through a reduction in time and costs for access to and distribution of goods, services and income-generating activities; and by promoting productive development as well as the country's inclusion in regional and global value chains.

2.4 Thus, the main challenges for LAC countries to comply with the SDGs will be ensuring a more efficient and inclusive socio-environmental mobility while closing the infrastructure gap, turning transportation into a catalyst for regional competitiveness, having solid and transparent institutions, and leveraging the benefits of new technologies to achieve an efficient, inclusive and sustainable transport system.

2.5 Compared to developed countries, which have already reached high levels of coverage and quality of transport infrastructure and services, LAC still has a significant challenge ahead. With respect to road infrastructure, while coverage in OECD countries reaches an average of 1.3 km per km2 of territory, in LAC this figure is barely 0.5 km/km2. In terms of road density per population, while Europe has more than 4,500 kilometers of roads for every million inhabitants and the United States 8,500 km per million, LAC's road coverage is roughly 2,000 km/million inhabitants (BID, 2022). In terms of the quality of this infrastructure, all countries in the region are well below the levels of the leading countries. Indeed, the percentage of km of paved roads in the OECD countries (74.7%) more than doubles LAC's (WEF, 2019).

2.6 In addition, LAC is the most urbanized region in the developing world. Indeed, more than 80% of its inhabitants live in cities (BID, 2020b), where the average travel time in the megacities of the region is almost 90 minutes (BID, 2014). Urbanization in LAC has not stopped growing. This constitutes a challenge for cities in their efforts to meet transportation needs and services, given the high congestion rates and limited coverage of transportation systems.

2.7 Likewise, the motorization rate in the region presents an average annual growth equivalent to 4.7 percent, one of the highest worldwide. (BID, 2019). In 2015, the average motorization for LAC reached 201 vehicles per 1,000 inhabitants, a figure that remains below the levels in Europe (471 vehicles per 1,000 inhabitants), the US and Canada (805 vehicles per 1,000 inhabitants) (BID, 2020b). In addition, it should be born in mind that the age of the region's vehicle fleet is above world averages. In some countries the importation of used vehicles is still allowed, there is a tendency to increase the use of motorcycles and the number of fatalities from road accidents remains unacceptably high (the average rate in LAC is 20.1 annual deaths per 100,000 inhabitants where the global rate is 18.2 deaths per 100,000 inhabitants) (OMS, 2018).

2.8 Likewise, intercity transport also poses challenges. Eighty five percent of cargo (by weight) in the region, is transported by road (only Brazil and Mexico move a significant percentage by rail), but the productivity of land transport, however, is low. Indeed, the number of kilometers that a truck travels per year in LAC is 40% less than in the United States or in the European Union (EU). (BID, 2020b). In turn, logistics costs in LAC are between 16 and 26% of their GDP, well above the 9% in OECD countries.[4]

A. The transportation sector and the mitigation Goal of the PA

2.9 The transportation sector accounts for approximately 15% of total greenhouse gas (GHG) emissions worldwide (IPCC, 2022) and about 24% of global energy-related CO2 emissions (fuel consumption) (IEA 2020). In turn, the IPCC reported that the largest source of emissions from the transportation sector in 2019 was the movement of passengers and goods in land transport (urban and interurban) (6.1 Gt CO2e, 69% of the total for the sector). International maritime transport is the second largest source of emissions, contributing 0.8 Gt CO2e (9% of the total for the sector), and international aviation is the third with 0.6 Gt CO2e (7% of the total for the sector). All other sources of transport emissions, including rail, are comparatively minor, totaling 1.4 Gt CO2e in 2019 (IPCC, 2022). It is expected that, under a scenario of not implementing corrective and preventive actions, CO2 emissions from the transportation sector will increase by almost 16% by 2050 (ITF, 2021).

2.10 In LAC, the transportation sector represents around 37% of energy-related CO2 emissions (fuel consumption) (OLADE, 2018), much higher than the world average (24%); and most are produced by road transport of passengers and cargo, with a similar distribution between both.

2.11 For this reason, one of the main challenges for the transportation sector in LAC is to reduce the emissions generated by the movement of passengers and cargo. If ambitious decarbonization programs are implemented in the urban area and in freight transport, it will be possible to reverse the growth trend in transport emissions. To achieve this, simultaneous work is required to develop and implement comprehensive public policies focused on (1) The renewal and transformation of the private and public fleet of cargo and

[4] Transportation Sector Framework Document, IDB – Sept.2020.

passenger vehicles. This implies a progressive process of renewal of the vehicle fleet accompanied by a technological advance, which allows improving energy efficiency and speeding up the use of electric vehicles and low-carbon fuels that meet higher environmental and road safety standards; (2) Implementing comprehensive and efficient transport systems that prioritize the use of public transport and non-motorized modes, and implement systems for effective demand management that reduce congestion levels, the number of trips and the use of private vehicles as the main mode of transport: and (3) The design of efficient systems for the decarbonization of freight transport that include cargo consolidation, optimization of operations so that supply chains are shortened, digitization processes and standardization of processes are promoted as well as modal integration. Likewise, it is important that in order to catalyze the necessary investments in the region, the role of the private sector is taken into account from the initial moment policies are conceived.

B. The transportation sector and the adaptation goal of the PA

2.12 Some analyses of the Bank such as the DIA 2020 show evidence of the impact that natural disasters can have on transport infrastructure, especially the road network, which is highly vulnerable in some areas. Climate change is expected to exacerbate these risks, threatening current and future infrastructure (BID, 2018). This risk is confirmed by various studies[5] that show a reduction in the useful life of pavements and an increase in the cost of their life cycle.[6] Additionally, the occurrence of events generates disconnection in the social and economic fabric, affecting access to economic opportunities, education and health. Investing in resilience and disaster risk prevention in infrastructure is estimated to be highly profitable, generating benefits of between four and seven times the costs, in terms of losses reduced and avoided.[7]

2.13 Adaptive capacity will determine the net physical and economic impact of climate change on economic activities, society and ecosystems (Samaniego et al., 2019); being a complex, heterogeneous process, difficult to define with precision in the transportation sector (World Bank, 2015) and with a high level of uncertainty. However, it is possible to identify actions that reduce the vulnerability of the transport infrastructure, for example, prioritizing infrastructure maintenance investments to ensure that assets are able to perform without failures or interruptions (Pastor, 2019), improving their response capacity, including in the event of a natural disaster[8]. In addition, a low number of project cycles consider the adaptation capacity and resilience of the infrastructure to climate change. This could damage or destroy the infrastructure with important social and economic costs as result, which are estimated between 1.5% and 1.5%. 5% of regional GDP (SCPAL, 2015).

2.14 Incorporating climate change criteria as part of the design, construction and operation of transportation infrastructure requires strengthening planning and pre-investment systems, through: (i) incorporation of adaptation parameters, such as the adoption of methods and

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5 Ponderando Quiao et al. (2015), *Evaluating the effects of climate change on road maintenance intervention strategies and Life-Cycle Costs*.

6 Temperature increases (above 45ºC) that: (i) increase the risk of rutting in the asphalt, washing and cracking of bituminous surfaces; and (ii) increase in the frequency of intense precipitation, which increases flooding, soil erosion, and saturation in drainage works.

7 United Nations Office of Disaster Risk Reduction, 2011; Kull, et al., 2013.

8 A good example of improved maintenance schemes is the Rehabilitation and Maintenance Contracts based on service levels in Uruguay, which show greater efficiency (measured through the quality of the pavement) than traditional management contracts (which separate construction and maintenance) (Pérez, 2020).

materials for resilient construction; (ii) disaster and climate change risk assessment[9], such as the assessment of extreme climate vulnerability, or *Blue Spot Analysis*[10], for asset management and the identification and prioritization of interventions that guarantee the resilience of the transport network; and (iii) updating national infrastructure design guidelines and the adoption of technical standards that ensure that transportation infrastructure is resilient to climate change.

III. ASSESSMENT OF OPERATIONS: ALIGNMENT WITH THE PA MITIGATION GOAL (BB1)

3.1 The joint MDB methodology serves as the basis for determining the alignment of operations with the PA. The application of the guide will result in two possible scenarios: "aligned", or "not aligned". In this context, an operation is "aligned" if it does not go against the mitigation (BB1) and adaptation and resilience (BB2) goals of the PA.[11] This section presents and describes the procedure to determine the alignment with the mitigation goal.

3.2 BB1 focuses on whether the operation in question is consistent with a low GHG development trajectory in the country where the operation is located and does not hinder or harm the transition to a decarbonized economy, both at the country and global levels.

A. Activities universally aligned with the PA mitigation goal

3.3 **Activities considered universally aligned**. According to Annex 1 of the Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations, some activities can be considered to be aligned to the mitigation goal of the PA across countries and under all circumstances. In the transport sector, Box 1 captures universally aligned activities as long as i) their economic feasibility does not depend on the extraction, processing and/or transportation of fossil fuels; ii) their economic feasibility does not depend on fossil fuel subsidies; and iii) the operation does not depend significantly on the direct use of fossil fuels.

3.4 In addition, the MDB Joint Framework also suggests that the design of operations should reinforce the preservation of high carbon stocks (HCS),[12] an aspect that should be reviewed in conjunction with the IDB's Environmental and Social Policy Framework (ESPF) and IDB Invest's Environmental and Social Sustainability Policy (ESSP), as applicable.

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9 The Bank has its own Disaster and Climate Change Risk Assessment Methodology (DCCRA) to help facilitate the identification and assessment of disaster and climate change risks and opportunities for resilience in all relevant projects during their identification, preparation and implementation phases.

10 The Blue Spot model is a method to identify road sections of high/medium/low vulnerability and criticality, with hydrological adaptations and models for various climatic futures, based on precipitation statistics, soil morphology information, demographics and traffic loads of the road network, among other aspects (Climate-ADAPT, 2020).

11 In operations with activities or use of funds that cannot be defined at the time of approval (e.g., operations with financial intermediaries, corporate loans, etc.), the methodologies specifically defined for this type of operations will be used.

12 Under this approach, it is recognized that secondary forests provide essential carbon storage services and forest products for local communities that are often not considered to be of conservation value and therefore are not protected.

Table 1. Activities of the transport sector considered universally aligned with the mitigation goal of the Paris Agreement according to Annex 1 of the MDB Joint Framework

Sector	Eligible operation type	Conditions and guidance
Transport	Electric and non-motorized urban mobility	
	Roads with low traffic volumes providing access to communities which currently do not have all-weather access (for example, connecting farmers to markets or providing access to a rural school, hospital, or better social benefits)	Except if there is any risk of contributing to deforestation
	Electric passenger or freight transport	
	Short sea shipping of passengers and freight ships	
	Inland waterways passenger and freight transport vessels	
	Port infrastructure (maritime and inland waterways)	
	Rail infrastructure	
	Road upgrading, rehabilitation, reconstruction, and maintenance without capacity expansion	

Source: Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations

3.5 **Table 2** of this guidance below details the type of priority activities and/or projects in the IDB Group portfolio which are considered universally aligned with the PA in accordance with the IDB Group's interpretation of Annex 1 of the MDB Joint Framework. Therefore, these projects do not require a specific analysis to validate their alignment with the mitigation goal. As described in the PAIA, the assessment of a project as universally aligned will be made during the eligibility stage of the activity/operation and will be confirmed as the details of the operation become clearer during the preparation of the loan proposal.

Table 2. Typology of activities in the transportation sector considered universally aligned under IDB Group guidance

Transport sub-sector	Eligible operation types	Typology of projects financed by the Bank
Land[13]	Electric and non-motorized urban mobility.	• Acquisition of vehicle fleet associated to the operation of public transport services at the urban level. • Development of road infrastructure for the exclusive or preferential operation of public transport systems such as buses or BRT´s,[14] or necessary for the operational integration with other

[13] Sustainable materials for construction and sustainable technologies will be approached in the operations as part of the mainstreaming efforts (climate finance). Per the principles of risk commensurability and pragmatic and evidence-based approaches (paragraphs 2.15 and 2.16 of the PAIA) the absence of use of such materials in road operations will not be considered when determining if the operation requires a specific assessment of alignment with the mitigation goals of the PA. In addition, the Paris Agreement alignment approach focuses on detecting deviations from low emission trajectories in the long term (vs. the detailed quantification of lifecycle emissions, for instance). Therefore, unless it is considered that certain construction materials of an operation will have a strong potential scaling effect, such level of detail will not be considered significant for Paris alignment matters. This will be assessed by the transport and climate change specialists along with the environmental solutions unit, on a case-by-case basis.

[14] In line with what has been established for the Transport Sector in the document *Common Principles for Climate Mitigation Finance Tracking* dated 2021 of the MDBs.

Transport sub-sector	Eligible operation types	Typology of projects financed by the Bank
		systems of higher hierarchy such as subways/metros, that: 1. show evidence of a modal shift that allows for a reduction in CO_2e[15] and ii) that operate on cleaner operational technologies. [16] • Electric aerial cable systems.
	Roads with low traffic volumes providing access to communities which currently do not have all-weather access (for example, connecting farmers to markets or providing access to a rural school, hospital, or better social benefits in the rural context).	The intended connectivity in a rural context must be analyzed considering the socioeconomic context of the project's area of influence; countries and regions with lower economic development indicators will be prioritized. Priority will also be given to the countries and regions included within the categories of Country Context of the IDB Technical Not "*Ámbitos y Factores para la Provisión de Infraestructura Vial para el Desarrollo Económico y Social de América Latina y el Caribe*." • Construction (greenfield) and/or improvement and rehabilitation (brownfield) of low transit rural roads,[17] bridges and access roads for rural and/or vulnerable populations to community services and of the local products to consumption and export markets.
	Electric passenger or freight transport.	• Acquisition of vehicle fleet associated to the operation of public transport services at the suburban level. • Development of transit infrastructure for the exclusive or preferential operation of public transport systems such as buses or BRT´s,[18] or necessary for the operational integration with other higher hierarchy systems such as subways/metros, that: 1. show evidence of a modal shift that allows for a reduction in CO_2e[19] and 2. that operates on cleaner operational technologies.[20]
	Road upgrading,[21] rehabilitation, reconstruction, and	• Paving and rehabilitation of urban, suburban, and interurban highways.

15 Considering the substitution of trips made in highly pollutant public transport vehicles based on EURO III emissions technology or of lower requirements.

16 Reference is made to electric vehicles.

17 Low transits will be defined as set forth by the transit design standards of each country. If such standards do not exist, average daily transits lower than 10.000 vehicles per the rural roads criteria of *the Manual Centroamericano para el Diseño Geométrico de Carreteras – 2011*, serve as a reference value.

18 In line with what has been established for the Transport Sector in the document *Common Principles for Climate Mitigation Finance Tracking* dated 2021 of the MDBs.

19 Considering the substitution of trips made in highly pollutant public transport vehicles based on EURO III emissions technology or of lower requirements.

20 Reference is made to electric vehicles.

21 Transit improvement comprises solving current bottlenecks (for instance when a level E-service is experienced) or when serious road safety problems have to be solved due, for example, to the occurrence of bidirectional circulation in highways of a single lane.

Transport sub-sector	Eligible operation types	Typology of projects financed by the Bank
	maintenance without capacity expansion.[22]	• Road improvement projects that are required to complete and/or improve the primary and secondary road networks of countries,[23] to remove bottlenecks including segments that require specifications of up to two lanes per direction, or to improve road safety conditions in critical accident points that: i) are aligned with at least one of the criteria set forth in the IDB Technical Guidance "*Operaciones del BID en el contexto de cambio climático y el acceso a los servicios e infraestructura de transporte - Ámbitos y Factores para la Provisión de Infraestructura Vial para el Desarrollo Económico y Social de América Latina y el Caribe"*, as applicable, and ii) complies with at least one of the following: • When, at the moment of assessing the project, there is a preexisting traffic volume that is equal or higher than a Service level E.[24] • When the current road specifications (geometry, alignments, etc.) present deficiencies and require meeting the specifications established in the manuals that apply to the geometric design in each country, or, in their absence, in international standards accepted as optimal for the road typology under analysis. • When in interurban roads it is desired to optimize the current conditions needed to obtain uninterrupted flow conditions, such as: improvement of urban accesses and last logistical miles, suppression of signalized intersections, and/or level crossings, construction of roads service and road access control, among others, provided that these interventions always promote the safety and convenience of pedestrian users. In the case of urban areas, the aforementioned criteria will apply, additionally observing that the project does **not** represent an exclusively dedicated infrastructure and/or that mainly encourages the use of private vehicles, as in the case of elevated toll highways, or expansion of

[22] Regarding capacity expansion, for purposes of this guide, the alignment with the mitigation goals of the Paris Agreement consists in verifying that the Bank's financing is not destined to support models that perpetuate a GHG emissions-intensive development. The IDB Group considers that not every "capacity expansion" (generically defined in the MDB Framework) complies with the materiality principle (paragraph 2.15 of the PAIA) to be considered an enabler of a model that is GHG emissions intensive in the long term. The instances in which this condition is not fulfilled and therefore the operation may be considered universally aligned are described in column 3 of Table 2 *Therefore, capacity expansion takes place when, for the purposes of this guide, the proposed project is greenfield , when the technical and financial feasibility of the proposed project depend on future traffic , or when* there is an intention to add one or more lanes to a highway that already has technical specifications of 2 lanes per direction. For all those cases, the guide establishes the need to assess these projects through the analysis provided in Phase 2 of this guide.

[23] These projects must, simultaneously, comply with the social and environmental policies of the Bank.

[24] For a Service E level, the following can be considered as a reference value for roads of 88km/h: a v/c relation close to 1.0 (Highway Capacity Manual HCM - TRB 2000). A Service F level is understood as a relation v/c equal or larger than 1.0. (HCM – TRB 2011). This is subject to the availability of detailed studies and/or the provisions set forth in the applicable legal framework of each country.

Transport sub-sector	Eligible operation types	Typology of projects financed by the Bank
		the urban road network to new urban development areas of high socioeconomic strata that do not incorporate comprehensive public transport solutions.
Maritime	Short sea shipping[25] of passengers and freight ships	• Renewal or acquisition of a fleet of ships, ferries and other electric vehicles. • Electrification of operating vehicles (utility vehicles, cranes, etc.).
	Inland waterways passenger and freight transport vessels	• Renewal or acquisition of fleet of ships [26]. • Renewal of tugging fleet and port operation equipment. • Navigation control, navigation aid, buoyage, and demarcation systems. • Implementation of technological systems to improve the management of the supply chain in the port area. • Electrification of operating vehicles (utility vehicles, cranes, etc.).
	Port infrastructure (maritime and inland waterways)	• Increasing capacity to receive larger-scale ships. • Works to protect moorings from waves (dams, dredged channels, locks, piers and docks). • Renewal or provision of communications equipment. • Improvement, expansion, or provision of lighting systems. • Construction,[27] maintenance or expansion of infrastructure for storage, for customs control, free zones, logistics platforms and others that have a green building certification, if these do not correspond to or are not associated with the import or export of fossil fuels and do not compromise the future capacity that may be required for the use or storage of non-fossil fuels. • Improvement in road and maritime accesses and port facilities and service docks. • Updating or implementing reefer systems. • Improvement and refurbishment of outer ports, land accesses, modernization of the systems for access and appointments in port terminals and roll-on roll-off systems. • The interventions above must enable, to be carried out, the appropriate harmonization of the port area with its surroundings (beyond its hinterland); in such a way that favorable and environmentally sustainable socioeconomic development conditions are generated for the population to be

[25] Reference is made to passengers and freight maritime transport for relatively short distances, in contrast to intercontinental maritime transport or Deep-sea shipping. Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Short_sea_shipping_(SSS)

[26] That comply with global standards of the World Maritime Organization (WMO) regarding environmental performance and reduction of GHG, including Index e Energy Efficiency of ships- EEDI.

[27] In the case of greenfield ports an assessment under the Phase 2 Criteria (per this guide) shall be performed.

Transport sub-sector	Eligible operation types	Typology of projects financed by the Bank
		benefited. This implies, among other aspects, considering the particularities of each LAC country, as well as the associated impact that, in terms of resettlement, gentrification, land use, public space and urban mobility, among others, may occur.
Rail	Rail infrastructure	• Construction,[28] maintenance or expansion of rail infrastructure[29] • Infrastructure works for urban railways (metro, tram, etc.), suburban and/or interurban, regardless of the energy they currently use, if they do not block the path towards future decarbonization. • Road infrastructure works for access to railway stations and facilities. • Construction, expansion and rehabilitation of stations, platforms, workshops, control towers and other service buildings on the railways. • Public spaces and parks, associated with the railway. • Passenger, baggage, and cargo control systems. • First and last mile works to interconnect rail systems, ports, and accesses.
	Vehicles for passenger or freight rail transport	• Acquisition of electric locomotives, except for those projects exclusively destined to the transport of thermal coal or peat for power generation. • Acquisition of non-motorized rolling material for Passenger and freight rail. • Reconversion and/or replacement of vehicles and equipment that use fossil fuel to electric vehicles (e.g., utility vehicles, service fleet, cranes, etc.).

Source: Analysis by the IDB Transportation Division

3.6 To consider a road improvement operation or activity as Universally Aligned, its scope and components must be in accordance with the provisions of the Technical Guidance: IDB Operations in the Context of Climate Change and Access to Services and Infrastructure Areas and Factors for the Provision of Road Infrastructure for the Economic and Social Development of Latin America and the Caribbean (hereinafter the "Technical Guidance"), pursuant to the criteria and areas that apply according to the type of activity/operation to be evaluated and complying with at least one of the considerations set forth therein.

a. If the alignment of the activity/operation with the Technical Guidance is verified, subsequently, the bank verifies whether the activity is included within the typologies contained in **Table 2** of this guidance.

b. Road improvement interventions that imply an increase of three (3) or more lanes in each direction in all or most of its extension, or those that depend on an increase in traffic in the short term (traffic induced) to achieve economic viability will not be considered to be Universally Aligned. For these cases, the case-by-case evaluation contained in Stage 2 must be carried out.

[28] In the case of greenfield rail infrastructure an assessment under the Phase 2 Criteria (per this guide) shall be performed.

[29] Considering the general conditions of exemptions to the UA List.

3.7 For all activities/operations not explicitly listed as universally aligned according to the aforementioned conditions and criteria (such as roads with expansion capacity of more than 2 lanes in each direction or airport construction), the evaluation set forth in Stage 2 must be implemented based on an analysis according to the Specific Evaluation Criteria (SC) included in the MDBs Framework, which is described below.

B. Activities that must validate their alignment with the mitigation goal of the PA

3.8 Based on the projects omitted from the list of universally aligned activities and the active portfolio of the IDB Group, the following types of investments and associated policies **will require a specific assessment of alignment with the CC mitigation goal of the PA.** Please note this list is not exhaustive and may be supplemented over time:

a. Road upgrading with significant addition of lanes or that rely on short-term increase of traffic to be economically viable

b. Other works that can be considered capacity expansion of roads

c. Projects in the aviation sector

d. In addition, based on the MDB guidance, any of the following operations will require a specific analysis: (i) operations whose economic viability depends on external activities for the extraction, processing and transportation of fossil fuels; (ii) operations whose economic viability depends on existing fossil fuel subsidies (e.g., a fishing fleet that would be unviable without fossil fuel subsidies); and (iii) operations that depend significantly on the direct use of fossil fuels (e.g., a production plant or irrigation system that relies entirely or substantially on fossil fuel pumps).

C. Criteria for the specific assessment

3.9 If the activity/operation/project cannot be characterized through the initial analysis carried out in Stage 1, an analysis should be carried out based on the following five questions applying the specific evaluation criteria (SC) that take into account the national circumstances and other context specific to the sector and subsector where the operation/project is proposed.

3.10 The criteria dictate the analysis that must be carried out and the considerations applicable to the transportation sector in Stage 2. Compliance with each and every one of the SCs must be observed simultaneously for an operation under evaluation to be deemed as aligned. The analyses required for this purpose must be carried out during the development of the POD of the operation. The specific evaluation criteria and their manner of evaluation are detailed in the following table and further developed in the context of transportation below.

Table 3 Specific criteria of the MDB Joint Framework for Alignment with the PA

Specific Criteria (SC)
SC1: Is it inconsistent with the Nationally Determined Contribution of the country? *The NDC of the country should not explicitly or implicitly phase-out this type of activity.*
SC2: Is it inconsistent with the Long-Term Strategy of the country? *The LTS (or similar long-term low-GHG strategy) of the country should not explicitly or implicitly phase-out this type of activity in its lifetime.*
SC3. Is it inconsistent with the global sector-specific decarbonization pathways in line with the PA, considering countries' common but differentiated responsibilities and respective capabilities? *The operation/activity should be checked against widely accepted findings in the global literature to inform the analysis, given the local context and equity.*
SC4: Does it prevent the transition to PA-aligned activities or primarily support or directly depend on non-aligned activities? *The type of operation/ activity should be compared to lower-carbon alternatives and consider the risk of (i) carbon lock-in or (ii) preventing future deployment of Paris-aligned activities.*
SC5: Do transition risks or stranded assets make it economically unviable? *Once CC considerations are included in the economic and/or financial analysis of the operation, it should meet thresholds for viability.*

Note: Insufficient information will not lead to non-alignment. Information to answer SC4 is expected to be available for all operations.

3.11 Specific Assessment Criterion 1 (SC1) - Review of the Nationally Determined Contribution (NDC) of the country. It should be verified if the operation/activity is inconsistent with the NDC of the country in which it is intended to be carried out. For this purpose, it will be considered that there is consistency between the activity and the NDC, unless it is explicitly mentioned in the NDC that said activity/operation of the transportation sector is excluded or must be gradually eliminated. If this consistency is verified, it will be possible to continue with the evaluation in light of SC2; otherwise, the operation is considered not aligned with the PA.

3.12 Specific Assessment Criterion 2 (SC2) - Review of the country's Long-Term Strategy (LTS). It should be verified whether the operation/economic activity in its lifetime is inconsistent with the LTS or other similar long-term low GHG national strategies with an economy-wide scope, sectoral or regional (including subnational), which are compatible with the mitigation objectives of the Paris Agreement. When the country does not have an established or approved LTS, it will be understood that the activity/operation is consistent and therefore it must be evaluated under SC3. In contrast, if there is an LTS and an inconsistency is identified between said LTS and the activity/operation to be carried out, it will be considered that there is no alignment with the PA.

3.13 Specific Assessment Criterion 3 (SC3) - Review of global low emission development trajectories. This criterion requires considering whether the activity/operation in question is inconsistent with the global trajectories of the sector aligned with the PA, considering the principle of equity and in accordance with the common but differentiated responsibilities of the countries, and their respective capacities.[30] This criterion reflects, on the one hand, the

[30] This principle is reflected in Article 3 of the United Nations Framework Convention on Climate Change.. https://unfccc.int/resource/docs/convkp/convsp.pdf

pace and content of the changes in policies and technologies that are anticipated to be transformative for the decarbonization of the sector; and on the other hand, the specific circumstances of LAC that cause a rate of decarbonization that is different from that of more developed economies at a global level. Due to the latter, this aspect is considered useful especially in those cases in which the country in question does not have an LTS.

3.14 Therefore, the application of this criterion should not be construed as a constraint on the growth of the transportation sector, but rather, as an intention to optimize the sector's transition towards more sustainable models and technologies, even considering that zero emissions scenarios have proven to be simultaneously compatible with an increase in the number of both passenger and cargo trips[31]. This will also require the efficient and sustainable development of infrastructure associated with these scenarios.

3.15 Therefore, for the evaluation of this SC-3, this guidance establishes four independent sub-criteria, whose applicability will be determined, in the first place, based on the capacity of the operation to contribute to the global decarbonization trajectories in the country (Sub-criterion SC3-1).

a. **Sub-criterion SC3-1: Global decarbonization trajectories**. To date, the milestones for the transportation sector to move towards emission neutrality have been developed mainly through IPCC and International Energy Agency (IEA) models. These are summarized in Appendix 1: *Low Carbon Pathways Relevant to the Transportation Sector, by Type or Transport Subsector*. To reach this scenario, the IEA assumes: (i) modal shift policies; (ii) more efficient operations in all modes of transport; (iii) transition to electric mobility; (iv) transition to the use of low GHG fuels; and (v) comprehensive transportation planning with urban development and land use planning. Based on the foregoing, the IEA forecasts a reduction in the use of petroleum derivatives for transportation by more than 25% in 2030, and approximately 90% by 2050. (Net Zero by 2050, 2021:133). **Table 4** below shows some indicative milestones in the global transformation of the transportation sector in trajectories consistent with the PA, according to the IEA's "Net Zero" report to illustrate the progressivity in decarbonization efforts that should be undertaken by the transportation sector globally. However, as it will be indicated below, the capacity of each country to implement these trajectories will depend on their specific individual development situation.

[31] International Energy Agency (IEA) modeling towards net zero emissions shows an eventual doubling of passenger travel and a 2.5-fold increase in freight transport levels; this includes an increase in the passenger car fleet from 1.2 billion vehicles in 2020, to almost 2 billion in 2050.

Table 4. Global transformation milestones of the transportation sector in trajectories consistent with the PA according to the IEA "Net Zero" report

Category	
Road transport	• 2035: no new passenger internal combustion engine car sales globally
Aviation and shipping	• Implementation of strict carbon emissions intensity reduction targets as soon as possible.

Category		2020	2030	2050
Road transport				
Share of PHEV, BEV and FCEV in sales:	cars	5%	64%	100%
	two/three-wheelers	40%	85%	100%
	bus	3%	60%	100%
	vans	0%	72%	100%
	heavy trucks	0%	30%	99%
Biofuel blending in oil products		5%	13%	41%
Rail				
Share of electricity and hydrogen in total energy consumption		43%	65%	96%
Activity increase due to modal shift (index 2020=100)		100	100	130
Aviation				
Synthetic hydrogen-based fuels share in total aviation energy consumption		0%	2%	33%
Biofuels share in total aviation energy consumption		0%	16%	45%
Avoided demand from behaviour measures (index 2020=100)		0	20	38
Shipping				
Share in total shipping energy consumption:	Ammonia	0%	8%	46%
	Hydrogen	0%	2%	17%
	Bioenergy	0%	7%	21%
Infrastructure				
EV public charging (million units)		1.3	40	200
Hydrogen refuelling units		540	18 000	90 000
Share of electrified rail lines		34%	47%	65%

Note: PHEV = plug-in hybrid electric vehicles; BEV = battery electric vehicles; FCEV = fuel cell electric vehicles.

(i) **SC3-1 Sub-criterion Analysis:** In reviewing this criterion, operations involving direct investment in vehicles must consider the source of energy for their operation. In turn, operations in transport infrastructure must address decarbonization trajectories through dialogue with countries and counterparts and, to the extent possible, justify under this criterion how the proposed infrastructure does not obstruct these changes in demand and in the technologies, and on the contrary, how said infrastructure enables said changes and technologies (in connection with *SC4: Non-obstruction of the transition*), which will include, if applicable, the trajectories for the agriculture, forestry and land use sector (AFOLU). At the level of policy support, the argument will have to be similar but also consider the role of GHG emission regulations in the sector, that of fiscal policies for the removal of subsidies for fossil fuels in transport, among other applicable reforms to the transportation sector that are recognized as necessary to achieve the proposed trajectories (OECD/IEA/NEA/ITF, 2015).

(ii) In order to support the validation of this sub-criterion, **Matrix 1**: *Matrix of Avoid/Change/Improve measures in operation/investment project in road infrastructure to achieve alignment with the Paris Agreement*, of this document, should be consulted in its measures identified as Policy (P), to verify that the activity/operation includes or is consistent with the type of proposed interventions, so that they can support the country's decarbonization trajectories.

b. For road improvement projects, in the event that it is not possible to evaluate Sub-criterion SC3-1, said projects must be evaluated under sub-criteria SC3-2 (i), SC3-2 (ii), or SC3-2 (iii), generated from of what is established in the Technical Guidance regarding the Country Context, strengthening of social inclusion and improvement of road safety conditions, as detailed below:

c. **Sub-criterion SC3-2: Specific considerations to the development context of the operation, given the differentiated capacities and responsibilities**. The principle of equity is a reference in the application of this criterion because the PA and the United Nations Framework Convention on Climate Change (UNFCCC) recognize that the rate of decarbonization must be faster in more developed countries. The latter have greater transit capabilities and have also historically contributed more to global GHG emissions.[32] In turn, less developed countries will decarbonize at a slower rate, although it is in their best interest to migrate as soon as possible to clean technologies in the sector.[33] Therefore, in some cases (particularly those where *SC4: No Obstruction of Transition* states that lower emission alternatives are unfeasible to implement), lower GHG emissions solutions supported by global transportation sector trajectories will not be fully applicable to the local context. When this is the case, the economic viability of introducing low-emission technological alternatives will have to be analyzed in light of the following three sub-criteria, and if any of them are found to be applicable, the activity/operation will be deemed consistent with the global trajectories of decarbonization and should continue with the evaluation in light of *SC4: No obstruction of the transition*:

   (i) **Sub-criterion SC3-2 (i) Analysis:** Development of urban and suburban public transport systems, in their infrastructure and operation components[34] that include technological advances necessary to accelerate the path of decarbonization**.** This sub-criterion considers taking into account, for some particular cases, the degree of technological development, as well as the current conditions of Latin America and the Caribbean - LAC in terms of development of the renewable energy industry, automotive industry, fiscal situation of governments and the financial health of public transport operators, among other factors. These factors may complicate the viability of implementing in the short-term solutions based 100% on electric technologies. If this is the case, operations/activities that enable a technological transition and ensure greater technical and financial viability are considered viable in light of this sub-criterion for operations whose purpose is to achieve a change towards less intensive modes in the use of carbon (such as BRT[35] systems) when compared to current highly carbon-intensive situations[36], as long as implementation of a project does not impede future transition to less carbon-intensive technologies (carbon lock-in).

   (ii) **Sub-criterion SC3-2 (ii) Analysis: Development of rail and maritime transport projects (of their infrastructure and operation components[37]) which include the necessary technological advances to accelerate the**

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[32] Wei, T. et.al (2012): Developed and developing world responsibilities for historical climate change and CO2 mitigation. PNAS | August 7, 2012|vol. 109|no. 32|12911–12915 Earth, Atmosphere & Planetary Sciences.

[33] For an example, see: Groves, D. et.al (2020): "Costs and benefits of the decarbonization of the Costa Rican economy: Evaluation of the National Decarbonization Plan under uncertainty." Inter-American Development Bank.

[34] Includes acquisition of rolling stock if necessary.

[35] Based on Euro IV, Euro V or higher Technologies, or fleets with hybrid technology.

[36] Considering the substitution of trips made in highly polluting public transport vehicles based on EURO. III emission technology or with lower specifications.

[37] Includes acquisition of rolling stock if necessary.

decarbonization path. This sub-criterion considers taking into account for some particular cases, the degree of technological development, as well as the current conditions of Latin America and the Caribbean - LAC in terms of: development of the renewable energy industry, state of the art and maturity of the railway rolling stock and shipping industries, the fiscal situation of governments and financial viability of the operational structures of the project, among other factors, which can complicate the viability of implementing solutions based 100% on electrical technologies in the short term. If this is the case, operations/activities that enable a technological transition and ensure greater technical and financial viability are considered viable in light of this sub-criterion for operations whose purpose is to achieve a change towards modes less intensive in the use of iron or maritime carbon, when compared with current highly carbon-intensive scenarios; provided that the implementation of the project does not prevent the future transition to less carbon-intensive technologies, (carbon lock-in).

(iii) **Sub-criterion SC3-2(iii) Analysis: Condition of socioeconomic development and infrastructure of the country or region to intervene in the framework of the development of new infrastructure**. Viability in some LAC countries may be compromised because LAC economies are poorly diversified or developed and endure high logistics costs as result of their limited ability to generate economies of scale or highly competitive environments. Some LAC countries are framed in insular areas with high vulnerability to climate change effects, and/or low level of development of their road infrastructure. In such cases, even if the project is expected to produce a certain amount of travel in emission-intensive modes of transport, they cannot be considered contrary to global decarbonization trajectories. In line with the foregoing, the Technical Guidance should be consulted to ensure the alignment of the activity/operation with it, with regard to the Country Scope, Regional Scope, and Suburban and Urban Scopes[38]. Special attention must be paid to activities/operations likely to be carried out within the countries defined in **Table 5** below. However, criterion *SC4: No Obstruction of Transition* will be applied to ensure that the lowest GHG emissions alternative feasible in the local context is implemented.

Table 5. Countries with higher priority due to their special geographic and development conditions

Country Category	Description	LAC countries
Least Developed Countries (LDCs)	Developing countries facing major structural challenges to sustainable development.	**Haiti** is the only LAC country belonging to this category in which there are 45 other countries**.**
Landlocked developing Countries (LLDCs)	Landlocked developing countries.	**Paraguay** and **Bolivia**
Small Island Developing States (SIDSs)	Countries that face high costs of importing and exporting goods, as well as a volume of irregular international traffic. However, they must rely on external markets for many goods due to the narrow resource base.	**Bahamas, Barbados, Belice, República Dominicana, Guyana, Haití, Jamaica, Surinam and, Trinidad and Tobago**.

Source: Transportation Sector Technical Guidance -IDB, based on UN categorization

[38] At least one of the considerations that the Technical Guidance proposes for the different areas of road infrastructure development must be complied with.

(iv) **Sub-criterion SC-3 2(iv) analysis: Projects that solve a security problem in a section of the network**. Activities/operations that resolve critical points in terms of security for the benefit of users, in accordance with the provisions of the Technical Guidance may not be considered contrary to global decarbonization trajectories, even when additional trips are generated in emission-intensive modes of transport. Additionally, criterion *SC4: No obstruction of the transition* will be applied to ensure that the lowest feasible alternative in GHG emissions is designed in the local context.

(v) **Sub-criterion analysis SC-3 2(v): Projects that ensure connectivity or improve accessibility to a low-income zone/area.** In terms of social inclusion, and in accordance with the provisions of the Technical Guidance, activities/operations that promote the generation of transport options that improve accessibility in areas where urban consolidation or rural accessibility is weak, or where it is required to improve accessibility to the most vulnerable, to ensure better development conditions must be prioritized[39]. Such cases, even if the project is expected to produce some additional travel in emission-intensive transport modes, it may not be considered contrary to global decarbonization trajectories. Additionally, criterion *SC4: No obstruction of the transition* will be applied to ensure in the local context that the lowest feasible alternative in GHG emissions is designed.

(vi) **Sub-criterion SC-3 2(vi) analysis: Projects that ensure resilience to the national grid by substituting a network segment of low resilience and/or high vulnerability.** In accordance with the Technical Guidance and supported by tools such as the *Blue Spot Analysis - BSA*, this criterion should promote the progressive robustness of interurban road networks in the face of adverse weather events compromising their connectivity and navigation. Therefore, new sections of the network that replace highly vulnerable sections -and therefore ensure greater resilience at the network level- should receive special priority.

3.16 Specific Evaluation Criterion 4 (SC4) - No obstruction of the transition: The activity/operation should be compared to lower carbon alternatives[40] in terms of risks associated with: (i) creating a technological dependence on solutions that are intensive in GHG emissions or (ii) preventing the future implementation of activities aligned with the PA in a broader context.[41] The activity/operation must consider low GHG alternatives that are technically and economically feasible. Under SC4, investments will be considered aligned where the alternative selected for its preferable technical and economic feasibility is the result of the comparison with another type of asset, infrastructure, or transportation solution that has

[39] This type of operation will have to consider that, although road coverage in OECD countries reaches, on average, 1.3 km per km^2 of territory, in LAC this figure is barely 0.5. In terms of road density, while Europe has more than 4,500 kilometers of roads per million inhabitants and the United States more than 8,500, LAC does not exceed 2,000. In terms of the quality of this infrastructure, all the countries in the region are well below the levels of the leading countries: the percentage of km of paved roads in the OECD countries (74.7%) more than doubles that from LAC (33.2%).

[40] This principle is reflected in Article 3 of the United Nations Framework Convention on Climate Change https://unfccc.int/resource/docs/convkp/convsp.pdf

[41] CE4 considers the impact that the operation could have on the possibility of achieving the transition to low GHG emissions beyond the immediate scope of the operation, when applicable ("does the operation obstruct or prevent opportunities for the transition?").

lower GHG emissions.[42][43] In this context, the IDB Group considers that the solution should incorporate as much technological innovations as possible aimed at improving the provision of infrastructure and demand management, considering the technological innovations available in the local context. Specifications for model projects applicable to the context of IDB Group operations under SC4 are listed below:

a. **Specific analysis for road transport infrastructure with capacity expansion as established in the Technical Guidance for interurban and rural areas.** For a project to be considered in compliance with this alignment criterion, said project must include an analysis of multimodal alternatives in which other more sustainable modes such as river or rail are not possible to implement. Failing that, the project must promote an efficient modal exchange. The analysis will also consider the measures set forth in **Matrix 1**, i.e., incorporate emission mitigation actions -that are feasible to implement in the context of the project- from the Avoid/Change/Improve approach.

b. **Specific analysis for road transport infrastructure with capacity expansion in urban areas.** In order to be considered in line with this criterion, the project must be aligned with the provisions regarding the urban area of the Technical Guidance[44] and, in turn, it has to include an analysis of the options to reduce GHG emissions in the sector, focusing on the Avoid/Shift/Improve[45] approach provided in **Matrix 1**. These actions can be deployed at the technical design level of the project or at the policy level; for example, commitments to replace internal combustion vehicles with electric vehicles. These commitments are regularly included in a country's NDCs and LTS. Note that the measures identified as Policy (P) are: (i) activities that contribute to climate actions consistent with the strategies to achieve the objectives of the PA, and (ii) activities that have a negligible negative impact and that do not harm or block the transition towards long-term strategies to reduce GHG. In this way, the actions included in the NDC's and LTS will be evaluated as part of the policy measures. The Bank will carry out an analysis of how the transportation sector and its respective subsectors are addressed in the NDCs and LTS in each of the LAC countries in order to speed up the evaluation of the incorporation of the Avoid/Change/Improve principles of operations and projects proposed for IDB Group financing.

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[42] Such alternatives must recognize that in this sector, it is often not the infrastructure itself that directly emits GHG, but the transport activity that it induces; therefore, the options to reduce GHG emissions in the sector focus on Avoid/Shift/Reduce, recognizing scope 1, 2 and 3 GHG emissions.

[43] Operations that expand or promote expansion towards areas of high value due to their absorption of carbon or high biodiversity. Aspect whose traceability must be evaluated by the teams in conjunction with ESG. In the case of the IDB, this will be through the application of the ESPF 6 Standard filter.

[44] Complying with at least one of the recitals that the Technical Guidance proposes for this area.

[45] This approach proposes in general terms to: **Avoid** inefficient or unnecessary trips, **Change** towards more efficient or environmentally friendly modes of transport, and **Improve** energy efficiency and the intensity of carbon use in vehicles through technological, operational, regulatory or price control.

Matrix 1. Avoid/Shift/Improve in the road infrastructure investment operation/project to achieve alignment with the Paris Agreement under SC3-SC4

	Measures	Executer (E) or Policy (P)	Urban and Semi-urban roads			Inter-urban Roads				Observations
			Highways	*Arteries*	*Collectors and bypasses*	*Highways*	*Arteries*	*Collectors*	*Country roads*	
Avoid	Plans for integrated transportation and urban development oriented towards modal shifts and GHG reductions	E	X	X	X	X	X			
	Transit oriented development (TOD)	P	X	X	X	X	X			
	High speed internet and teleworking promotion	P	X	X	X	X	X			
	Fuel price policy	P	X	X	X	X	X	X	X	
Shift	Lanes for High Occupancy Vehicles (HOV) and/or High Occupancy Toll (HOT) lanes	E	X	X		X				
	Sidewalks and bike paths (segregated)	E		X	X		X	X	X	Crossings in populated centers.
	Docks, stops, terminals and parking for public transportation	E	X	X	X			X	X	
	Exclusive BRT lane for public transportation	E	X	X	X		X	X		
	Infrastructure for bicycle parking and share used of bicycles	E		X	X		X			
	Promotion of non-motorized transportation (others)	P	X	X	X	X	X			
	Subsidized public transportation	P	X	X	X	X	X			
	Company car taxation – Bonus-malus systems (BMS) Impuestos al uso de vehículos empresariales – Sistema bonus-malus (BMS)	P	X	X	X	X	X			
	Vehicle taxes and fees for ICE models	P	X	X	X	X	X			
	Parking pricing management (Dynamic pricing)	P	X	X	X					
	Congestion charging for ICE vehicles.	P	X	X	X					
	Transportation and travel demand management (others)	P	X	X	X	X	X			
	Carpooling promotion	P	X	X	X	X	X			
	Highways with Dynamic tolls to disincentivize vehicle congestion	P	X	X		X				
Improve	Speed limit controls	E	X	X	X	X	X	X	X	
	Vehicle retirement programs									
	Ducts for electric wiring to feed rapid charging stations for electric vehicles (EV)	E	X	X	X	X	X	X		
	Charging infrastructure for electric vehicles (EV)	E	X	X	X	X	X			
	Installations to control the weight and emissions of freight	E	X	X	X	X	X			
	Carbon footprint reduction through materials and processes utilized in road construction	E	X	X	X	X	X	X		Pavement recycling, modified asphalt using rubber, etc.
	Emissions compensation programs through carbon capture, using property adjacent to right of way.	E	X	X	X	X	X			
	Internet connectivity in the road grid	E	X	X	X	X	X			
	Programs to retire/scrap vehicles	P	X	X	X	X	X			
	Promotion of electric vehicles (private vehicles, freight vehicles, public transportation, official fleets, etc.)	P	X	X	X	X	X			
	Efficiency standards for fuel-efficient motors in line with GFEI benchmark	P	X	X	X	X	X			Gradual implementation, in time.
	Gradual prohibition of sales of ICE vehicles.	P	X	X	X	X	X			

Notes: The classification E/P corresponds to the degree of control that the Ministry or Executing Agency (E) have in the implementation of measures. The letter "X" corresponds to the degree of application of the corresponding policy/project design measures.

Source: Adapted from (New Climate Institute, 2020)

c. **Specific analysis for airport infrastructure within the framework of SC-4.** Investments in the improvement, rehabilitation and in some cases expansion or construction of new airports are important for the development mandates of the IDB Group (see **Table 6**). To be considered in compliance with this alignment criterion,

the project must have included an analysis of multimodal alternatives in which other more sustainable modes such as river or rail are not possible to implement, or failing that, promote an efficient modal exchange.

Table 6. Typology of operations/projects that are considered universally aligned in the aerial sector

Sector	Eligible operation type	Specific activities for airport operations
Buildings and public Installations	Buildings	• Construction, expansion and rehabilitation of terminals, control towers and other service buildings, as long as they meet green building certification criteria as established by each individual MDB, which in the case of the IDB Group will be reflected in a forthcoming sector guidance on Buildings. For the time being, some references include EDGE[46] and the Airport Carbon Accreditation Programme[47])..
	LED lighting[48]	• Installation or replacement of runways and aprons, and beaconing using LED technology
	Parks and open public spaces	• Public spaces and parks associated to the airport, excluding energy-consuming installations[49]
Information and communications technology (ICT) and digital technologies	Information and communication, excluding data centers	• Installation and/or replacement of communication equipment (e.g. control tower) • Terrestrial Navigation aids[50] and instruments (e.g. ILS, VOR, meteorological stations, etc. • Control systems (X rays) for passengers, luggage, freight
Cross-sectoral activities	Conversion to electricity of applications that currently use fossil fuels	• Reconversion and/or replacement of vehicles and equipment that uses fossil fuels to electric models (e.g. ramp equipment, catering vehicles, utility vehicles, etc.)

Source: Joint MDB Framework and analysis by the IDB Transportation Division.

The design of the operation may evaluate the applicability of the measure basket proposed by the International Civil Aviation Organization (ICAO), as part of its path towards the decarbonization of the aviation sector, and their objective of having carbon-neutral growth from 2020: [51] (i) improvement in aircraft technology, through the incorporation of a fleet with more efficient engines in fuel consumption, (ii) operational improvements in air traffic management, in particular continuous climb and descent operations,[52] (iii) the development of sustainable aviation fuels, and (iv) market-based measures, such as carbon offset schemes.[53]

Given that fuel substitution alternatives for air transport are even more technologically limited compared to, for example, coal or oil for electricity generation, further consideration of the specific context (geographical, social, subsector and country circumstances) of the airport infrastructure operation/project is required in aviation. In particular, for investments in the expansion of runways, taxiways and aprons, an

46 EDGE, Excellence in Design for Greater Efficiencies (EDGE). See case: Clark International Airport
47 Airport Carbon Accreditation Programme.
48 https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap_2.html
49 Energy-consuming installations are those beyond lighting and routine maintenance such as watering. Examples are major built-up area (i.e., buildings) or energy-intensive installations (e.g., fountains or playground and recreational equipment that need a non-renewable power source).
50 https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap_1.html
51 ICAO – ICAO Environment.
52 European Continuous Climb and Descent Operations Action Plan, Nov.2020, Eurocontrol.
53 ICAO - Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). In Europe they operate under mechanisms of the European Emission Trading Scheme (EU ETS). Source: Destination 2050, NLR – Feb.2021.

analysis similar to the Avoid/Change/Improve applied to highways is proposed (see **Matrix 2**).

Matrix 2: Matrix of Avoid/Shift/Improved measures in operation/investment project in airport projects with capacity expansion to achieve alignment with the Paris Agreement

	Measures	Measure under the control of the Executor (E) or that require a Policy (P)	Observations
Avoid	Discourage the use of private, executive, military or commercial aviation with low-efficiency aircraft, carrying out works that enable the operation of more modern and efficient aircraft (e.g., new generation key C aircraft).	E	Works focused on operational safety and carbon footprint reduction
	Avoid trips in private or individual vehicles over distances greater than 800 km, replacing them with trips on passenger planes, with a lower GHG footprint per passenger-km, and greater safety.	P	
	Limit the growth of air travel in areas that are already served by alternative transportation infrastructure (for example, in Europe that already has a robust rail network). The International Energy Agency in the aviation section of the Net Zero report[54], recommends considering the viability of fast train connections or maritime options to replace new short flights.	P	
Change	Install ground-based electrical power units (GPUs) and air-conditioning units on boarding bridges instead of fossil fuel-powered equipment.	E	
	Replace the consumption of network electricity with generation through photovoltaic or solar parks[55]	E	
	Replace ramp service equipment fleet (buses, belts and baggage carts, pushback tractors, stairs, etc.) and other utilities, with vehicles and equipment powered by electricity from sustainable sources[56]	P	Through policy or as a result of an airport collaborative decision making program (ACDM).
Improve	Reduce fuel consumption in aircraft operations through improvements in air traffic management (ATM)[57], airspace redesign (routes and PBN approaches) and the implementation of continuous climb and descent operations[58]	E/P	Includes the initial development of a National Air Navigation Plan.
	Reduce fossil fuel consumption in the movement of aircraft on the ground (taxi) and in services (electricity and air conditioning) when parked.	E	Includes airport collaborative decision making (ACDM) programs[59]
	Provide rapid charging infrastructure for electric vehicles operating on ramps	E	
	Provide rapid charging infrastructure for private electric vehicles in parking lots	E	
	Facilitate the introduction and use of sustainable aviation fuels (SAF) [60] and promote their use through financial	P	

54 IEA, 2021.
55 Centre for Aviation, CFA.
56 See for example the case of Munich airport.
57 Measure highlighted by the International Panel on Climate Change (IPCC) in its special report on aviation, chapter 6. 3.
58 See: European Continuous Climb and Descent Operations Action Plan, Nov.2020, Eurocontrol -
59 See article Airport Collaborative Decision Making & Total Airport Management by the International Air Transport Association (IATA)
60 See: Fueling Net Zero, How the aviation industry can deploy sufficient sustainable aviation fuel to meet climate ambitions, Waypoint 2050, Air Transport Action Group (ATAG), ICF Sept.2021. -

Measures	Measure under the control of the Executor (E) or that require a Policy (P)	Observations
incentives and/or tariff discounts [61]		
Establish low-emission plans at the airport level with clear goals for reducing emissions from domestic aviation (UNFCCC CCAP:64) and establish operational policies that allow managing demand and/or offsetting emissions from the sector.[62]. As a reference, teams could refer to the International Civil Aviation Organization (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).[63]	E/P	
Improve the connectivity of isolated or distant cities (e.g., islands, cities more than 800 km away from the destinations with the greatest connection), where the plane is the only means of transport or the most efficient in terms of emissions per passenger-km.	P	

Source: IDB Transport Division Analysis.

d. **Specific analysis for road, port and railway infrastructure associated with fossil fuels in the framework of SC-4.** Pursuant to Annex 1 of the MDB Joint Framework, activities related to **port infrastructure**, both maritime and inland waterways, as well as **railways**, are considered consistent with low-emission and climate-resilient development and are therefore universally aligned with the PA, except for those operations whose economic viability depends on external activities of production, processing and transportation of fossil fuels (for example, a railroad that will have a significant income from the transportation of coal from a coal mine, or a port dedicated mainly to the export of oil and gas); or whose economic viability depends on existing subsidies for fossil fuels (such as, for example, the case of a fishing fleet that would be unviable without subsidies for diesel fuel), for which the review of the specific criteria should be advanced taking into account the country's sector strategies to align with APs. The above considerations can also apply to **land transportation** projects.

For the cases above, compliance with SC-4 must be determined based on the expert judgment of a bank's specialist, and through analyses that take into account that:

(i) it is feasible to determine, through an analysis of alternatives, that the option to be financed is the only one that is considered technically and economically viable to meet the stated objective.

(ii) during the scheduled useful life of the asset/solution to be financed, including legal agreements, eventualities such as the following are foreseen:

(1) Foreseeable technological changes in the fossil fuel market associated with investment in this context.

(2) Avoid that during the life cycle, design and operating arrangements of the transportation asset/solution, said asset/solution continues to support emission-intensive activities, even when expected changes in the market would allow for such activities to be replaced by lower GHG emission options.

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61 See, for example, the case of the US$740 billion Inflation Reduction Act approved in August 2022 by the US Senate, which grants tax credits to SAF purchases..

62 See for example: Heathrow Net Zero Plan.

63 See: CORSIA

(3) Provide that the assets and/or solutions to be financed by the IDB Group are credibly converted to uses that support low or zero GHG emissions throughout their useful life and generate specific plans for this purpose.

(iii) Given the role of IDB Group financing in this context, define, assign and assess the risk of contributing to policy and market dynamics that undermine the transition to clean energy that mitigation goal of the Paris Agreement require.

3.17 Economic viability given transition risks (SC5). This criterion implies analyzing the risks of climate transition (that is, those associated with a future scenario that keeps the rise in temperature well below 2°C), and monetizing –to the extent possible– the associated costs and benefits.

3.18 An operation will be considered non-aligned in light of SC5 if, once the quantitative or qualitative implications of climate change have already been incorporated into the analysis, the project does not meet the thresholds of economic and financial viability required by the IDB Group.

Table 7. The approach of the Task Force on Climate Related Financial Disclosures TCFD[64] and transition risks in the transportation sector

The IDB Group, both in the public and private spheres, has begun to monitor the risks of climate transition in its portfolio based on internationally recognized methodological approaches. Mainly the one established by the Task Force on Climate Related Financial Disclosures (TCFD), which proposes to consider the sub-criteria outlined in this guidance:

a. Changes in policies and regulations associated with the transition;

b. Technological improvements and innovations in the sector;

c. Potential changes in supply (for example, investor decisions) and/or consumer behaviors; i.e., changes in the markets.

The transportation sector is susceptible to regulatory risks such as a global or national price for carbon, or the need to participate in compensation schemes, for example. The analyses available for the sector indicate that the airline industry is the most exposed to transition risks in the long term, followed by cargo transport by sea and land.[65] Changes in countries' policies and international and regional markets in response to climate change, and the transition required by PA compliance are heterogeneous and subject to a context evaluation.

The greatest advances in this sector are anticipated in the transition from internal combustion vehicles to electric vehicles and hydrogen-based fuel cells. Likewise, the sector has recently initiated a major research and development effort in the automotive industry that aims to reduce life cycle emissions associated with the manufacturing process, for example, with high-gauge aluminum.[66]

In addition to these climate transition risks applicable to the transportation sector, the analysis of the Alignment with Paris and the dialogue with the countries will have to prioritize the challenges and opportunities of a fair transition for the sector. It is anticipated that changes in value chains will affect workers involved in production of technologies in transition; for example, those involved in the manufacture of internal combustion vehicle parts.

3.19 **It is necessary to determine if there are material transition risks in the sub-sector of the operation.** If so, these will have to be incorporated as scenarios in the financial sensitivity analysis of the project. Based on this, it will be evaluated if the investment

64 See: "Recommendations of the Task Force on Climate-related Financial Disclosures" (2017).

65 Shim, H. & Singla R. (2022): "Transportation Long-Term Climate Vulnerability Scores: The exposure of Airlines, Shipping and land Transport to Long-Term Climate Risks." Fitch Ratings Special Report

66 See Hannon, E. et.al (2022): "Mobility's net-zero transition: A look at opportunities and risks" McKinsey Insights.

design may be considered robust vis-a-vis the transition. In this context, the main guiding questions will be:

a. **What is the contribution of the project to GHG emissions and, therefore, to what extent could it be impacted by policies and regulations?** Considering: i) the volume of emissions associated with the investment; and ii) how would it be affected by policies (for example, a carbon price) or regulatory restrictions (for example, a maximum threshold of GHG emissions) aimed at achieving the goal of the PA in the target market? This means that an asset can face risks and even become stranded if there is a legal restriction that limits or prohibits its operation due to GHG intensity. A concrete example of this type of risk is the "Carbon Border Adjustment Mechanism".[67] Another example is the elimination of fossil fuel subsidies, which would impose a new cost on logistics transport companies that depend on them, reducing their future income and, therefore, the current value of their business.

b. **What is the potential impact of low GHG emissions technology improvements on the subsector?** Assess: i) current and emerging substitute technologies in the specific market of the operation; ii) possible evolution of its technical and economic competitiveness[68] in the short term (less than one year) or medium term (up to 5 years), also in the specific market and considering the costs of climate change externalities (for example, using a shadow price for carbon).[69] Based on this, evaluate if any of the options could offer the same service as the option being financed, but with lower GHG emissions. The analysis of the projections of CO2 prices towards 2050 is key in order to compare whether technologies about to mature in the market become more economically feasible given the expected evolution in operating costs. An example of this is if an electric bus fleet credibly competes with the acquisition of a hybrid fleet in a specific market. Finally, it may also be appropriate to assess whether the selected technology alternative faces the risk of becoming a stranded asset. Meaning, if due to innovations and technological shifts these may lose their value until they become obsolete before their programmed useful life comes to an end.

c. **What is the potential impact of changes in the markets?** The transformations related to global decarbonization trajectories in the transportation sector are already impacting the decisions of investors and governments.[70] To understand the transition risks associated with the evolution of the markets, it is necessary to consider their segmentation based on the levels of GHG emissions associated with the energy assets/solutions considered in the investment. A growth in the differentiation of markets (national and international) associated with the intensity of GHG emissions is anticipated; the same asset/solution, produced in different ways (with different emission levels) should have different markets and prices. This market segmentation

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67 The Carbon Border Adjustment Mechanism (CBAM) is a carbon pricing system for imports into the European Union. Its objective is to adjust the price of certain imported products to the amount of CO2 emissions incorporated in them, in order to equalize the cost of carbon between EU products and these imports.

68 Said estimates must also consider the probable evolution of operating costs.

69 Although the IDB does not have a mandatory policy or guideline for the use of the shadow price of carbon, project teams that include it in their analyzes are recommended to use low and high estimates consistent with the Report of the High Level Commission on Price of Carbon. In this context, SPD recommends starting with a price of US$40/tCO2 and US$80/tCO2, respectively, in 2020 and increasing it to US$50/tCO2 and US$100/tCO2 by 2030. The low and high values in the prices of carbon are extrapolated from 2030 to 2050 using the same growth rate of 2.25% per year that is implied between 2020 and 2030, resulting in values of US$78/tCO2 and US$156/tCO2 for 2050.

70 See: Agarwal A. & Kesting K. (2022): ESG-aligned transport investing. J.P. Morgan Asset Management.

is a consequence of the companies' strategies (and how they perceive the preference of their consumer market). For consumers of transport services, achieving the goals of the PA implies changes in behavior towards a reduction in kilometers traveled in private vehicles, in favor of public transport, shared cars and non-motorized alternatives (McKinsey, 2022), as well as corporate policies on remote work, inhibiting commute. This criterion applies to trip demand estimates that consider projects' financial analysis.

3.20 **Some Specific Types of Transition Risks to Consider in Project Design and Analysis:**

a. **Passenger land transport**. The International Energy Agency (IEA) "Net Zero" scenario indicates that by 2035, all sales of new passenger vehicles will be electric models. By November 2021, six of the largest automotive companies and thirty countries – including Costa Rica – had already committed to eliminating the sale of gasoline vehicles, initially in the "leading markets" and by 2040 in the rest of the world.[71] The regulatory impacts of the transition to low emissions trajectories are varied for this type of project and will depend on the goals established by each country.[72]

b. **Land freight transport**. Land freight transport is considered to be more exposed to transition risks than land passenger transport, since around 30% of its costs are linked to fuel prices; in addition to being exposed to other transition risks of a regulatory nature, since it is part of value chains of export products (Fitch Ratings, 2022). Therefore, the intensity of associated GHG emissions may affect the commercialization of transported products in international markets.

c. **Aviation.** The analyses available for the sector indicate that the airline industry is the most exposed to transition risks in the long term, followed by cargo transport by sea and land.[73] The carbon intensity of internal or short-haul flights is up to twice as high as that of long-haul flights, making the former more susceptible to transition risks (Fitch Ratings, 2022). Domestic aviation is subject to accounting for emissions in national GHG inventories and, therefore, to goals that could be introduced in the NDCs of the countries.

d. **Maritime transport.** According to Fitch Ratings (2022) analysis, this subsector is one of the most difficult to decarbonize due to the long life cycle of the assets, its high dependence on energy and the limited number of low GHG alternatives. The IMO has proposed a strategy to reduce emissions from this sector by at least 50% compared to 2008 levels by 2050. Although this is not binding, it is expected that before 2030 there will already be more specific energy efficiency regulations for the design and use of this subsector's assets. The use of green ammonia and liquefied petroleum gas vessels are anticipated as likely technological developments in this area.

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[71] Ford, Mercedez-Benz, General Motors, Volvo, Jaguar Land Rover y BYD. "6 Automakers and 30 Countries Say They'll Phase Out Gasoline Car Sales" Nov 9 2021.

[72] The European Investment Bank (EIB) uses environmental sustainability criteria to determine what types of vehicles are considered aligned with the goals of the Paris Agreement and therefore they are able to finance: cars that emit a maximum of 115g of CO2/v-km WLTP (Worldwide Harmonized Light Vehicle Test Procedure); light commercial vehicles with a maximum of 182g CO2/v-km WLTP; buses with emissions equal to or less than 50g of CO2/p-km (this tolerates hybrid trucks, or diesel models as long as they have high load factors).

[73] Shim, H. & Singla R. (2022): "Transportation Long-Term Climate Vulnerability Scores: The exposure of Airlines, Shipping and land Transport to Long-Term Climate Risks." Fitch Ratings Special Report.

3.21 For more guidance on how to apply the specific alignment criteria with the PA mitigation goals in private sector projects, please refer to the additional IDB Invest document developed for the transportation sector (under development).

3.22 The above five specific evaluation criteria – (SC) and their technical principles will be reviewed and updated in light of the lessons learned after a first phase of implementation of the IDB Group's approach to align its operations with the PA, and the dynamic evolution of the elements that Multilateral Banks consider pertinent in order to deem bank's operations as aligned with the mitigation goal of the PA.

IV. ASSESSMENT OF OPERATIONS: ALIGNMENT WITH THE PA ADAPTATION GOAL (BB2)

4.1 The evaluation of alignment with PA adaptation goal focuses on establishing whether the operation manages its climate vulnerability and risk[74] and is consistent with a climate-resilient development of the country. Specifically, it focuses on determining whether the long-term achievement of the operation's development objectives is vulnerable to the effects of climate change, and whether the activities are consistent with climate resilience trajectories defined at the national or subnational level. For this purpose, it focuses on three criteria:

a. **Criterion 1–Climate risk and vulnerability context.** Determine if the operation is vulnerable to CC, identifying and evaluating its exposure to physical climate impacts. Depending on the type of operation, these may be impacts on assets, on the services it plans to provide, on human and natural systems, and/or on its beneficiaries. If the operation is considered to be at risk, it continues with Criterion 2. Operations with low or immaterial climate risk can skip Criterion 2 and go directly to Criterion 3.

b. **Criterion 2–Definition of climate resilience measures**. Have climate adaptation and resilience measures been identified and incorporated into the operation to manage physical climate risks and/or to contribute to climate resilience?

c. **Criterion 3–Does not contravene plans for climate resilience.** Depending on relevance and availability, consider policies, strategies, and plans at the territorial, local, national, or regional level, as well as community or private sector priorities. The operation should not be inconsistent with them.

4.2 In the case of the IDB and IDB Lab, the first two of the three criteria must follow what is established in the Bank's policies, in particular in IDB's Environmental and Social Policy Framework (ESPF), which, under the Environmental and Social Performance Standard 4 reinforces the resilience of projects to anticipate and avoid adverse impacts on the project itself in the face of natural disaster hazards and climate change during the project cycle. In these cases, the "Disaster and Climate Change Risk Assessment Methodology for IDB Projects" (DCCRA) will determine those instances where greater consideration of the physical impacts of climate change is necessary to ensure alignment of transportation projects. All projects complying with the DCCRA methodology will be considered aligned under the first two alignment criteria with the adaptation goal established by the MDBs. The third criterion will be applied in the formulation of the project in accordance with the provisions of the PAIA, identifying whether the operation is related to the national or subnational priorities of the country in terms of adaptation, and if so, how the planning efforts have been considered.

[74] The Disaster and Climate Change Risk Assessment Methodology for IDB projects (DCCRA) includes specific measures according to the type of infrastructure after evaluating the criticality.

4.3 In the case of IDB Invest, the alignment in terms of the first two criteria will be done in accordance with the provisions of IDB Invest Environmental and Social Sustainability Policy (ESSP) and IDB Invest Climate Risk Assessment methodology (CRA).

A. Considerations for the assessment of alignment with the adaptation goal of the PA in the transport sector

4.4 The effects of climate change and disasters caused by natural hazards[75] constitute a major challenge for the sustainable development of the Latin American and Caribbean (LAC) region. The vulnerability of transport systems tends to be a function of the potential impact of CC, which is based on the location, exposure and sensitivity of the infrastructure and its associated services (World Bank, 2015). In the region, CC has important effects reflected, among others, in a general increase in the median, extreme and average temperatures, variations in rainfall regimes, floods, sea level rise, greater occurrence of hurricanes, landslides and water current floods, among others.

4.5. In particular, LAC is highly vulnerable due to its geography and the location of urban settlements, where transport infrastructure is one of the most affected by different natural phenomena, causing great economic[76] social consequences.

4.6. Understanding the phenomena and their consequences is essential for development planning processes as the support for guiding and prioritizing the current and future actions of a given territory (Melo et al., 2017). In this context, high-quality data and analysis are required to serve as the basis for solid and transparent decision-making (IDB, 2020). In this way, the principles that the Transportation Sector will apply in the design of operations to support long-term climate resilience are based on strengthening planning systems with information related to climate events and improving designs to provide adaptation and resilience to the transportation infrastructure. Resilient infrastructure plays a key role in evacuation efforts and allowing permanent connectivity in cases of extreme events or natural disasters.

4.7. **Additional opportunities to strengthen climate resilience**. In addition to strengthening the alignment with the PA in operations where this methodology is implemented, its application allows for the identification of additional opportunities for support and dialogue with the countries. These are opportunities that contribute to the achievement of PA goals and whose implementation may require non-reimbursable resources. For example, for the development of robust, inclusive and ambitious private climate resilience plans, as well as to initiate dialogue and engagement on relevant critical issues.

4.8. In the specific case of actions in the public sector, the following is recommended as part of this agenda:

a. **Strengthening infrastructure planning systems.** Strengthening data collection and processing related to climatic events, the conditions of the infrastructure and its historical effects, allows evaluating the vulnerability of current transportation systems, as well as identifying the actions that will have a greater impact in increasing resilience to climatic phenomena. With this information and through the application of risk

[75] Consult the Disaster and Climate Change Risk Assessment Methodology for IDB projects (DCCRA), which defines the risk of disasters and climate change based on hazard, exposure and vulnerability.

[76] The analysis of the effect of the El Niño Phenomenon in Colombia showed that the economic costs of similar climatic variability events would reduce at least the equivalent of 0.7% of GDP, if the country does not take the necessary measures to adapt to climate change. (Melo et al., 2017). In the Dominican Republic between 2016 and 2017, 15 provinces and 644 road infrastructure works and bridges had to be rebuilt as a result of climatic events with reported damages of US$394,000,000 (MOPC, 2018).

management methodologies[77] better planning is achieved, providing a framework to assess and mitigate the impacts of climate change and other climate-related natural hazards on transport and other systems, and to choose actions to improve your resilience (Jones et al., 2014; Lempert et al., 2018). The application of these tools allows to: (i) model vulnerability and criticality for climate scenarios; (ii) estimate expected damages and losses, identifying priority intervention areas; and (iii) propose and prioritize mitigation measures in the designs, especially in hydraulic and drainage structures, protection against erosion and slopes, among others.

b. **Improve design processes.** Incorporate conclusions of data analysis and infrastructure resilience evaluation, as well as the results of the application of the risk management methodology, in the design of new systems, so that an environmental sustainability approach and climate change events resilience are systematically implemented, while adopting technical standards that improve the infrastructure required for the operation of transportation systems. To this end, it is proposed to: (i) incorporate adaptation parameters such as the adoption of resilient construction methods and materials; (ii) in the case of road infrastructure, for example, improve disaster risk assessment and management by integrating network criticality analysis with hazard mapping and climate change exposure (*Blue Spot Análisis*)[78], allowing for the identification and prioritization of investments that guarantee the resilience of the transport infrastructure and at the same time strengthening decision-making and the prioritization of projects; and (iii) plan projects with an environmental conservation approach, for example through the efficient use of resources (water, energy and even the potential reuse of waste in construction), or the use of ecological or recycled construction materials (pavement).

4.9. The technical principles for adaptation will also be reviewed and updated in light of the lessons learned after a first phase of implementation of the IDB Group's approach to align its operations with the PA, and the dynamic evolution of the elements that Multilateral Banks consider pertinent in order to consider the operations as aligned with the mitigation goals of the PA.

[77] An example of these methodologies is the 'DMDU Guide for transport planning in a climate change scenario' (BID, 2021b).

[78] The Blue Spot model is a method to identify road sections of vulnerability and criticality, with hydrological adaptations and models for future climates, based on precipitation statistics, soil morphology information, demographics and road network traffic loads, among other aspects (Climate-ADAPT, 2020).

APPENDIX

In support of the response to specific criterion #3, the following are global or sectoral trajectories that may be considered as a reference for the analysis in the relevant subsectors:

Appendix 1: Low carbon pathways for the transport sector

Sector or subsector	Pathways for the sector	Source
Transportation (general)	In the transportation sector, the share of low-emission final energy rises from less than 5% in 2020 to about 35-65% in 2050, compared to 25-45% for a 2°C global warming. (C.2.5, Summary for Policy Makers)	Rogelj, J. et al. (2018). "Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development", in Masson-Delmotte, V. et al. (eds) Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above preindustrial levels.
	According to the latest IPCC report a net zero emissions pathway must: "dramatically reduce and electrify energy demand for transportation. Ambitious sector- specific mitigation policies in industry, transportation and residential sectors are needed in the short run for emissions to peak in 2030 (Méjean et al., 2018).	
	In order to reach 1.5°C, the IPCC finds that model pathways of CO2 emissions decrease "45% from 2010 levels by 2030, reaching net zero around 2050" which "require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings)"	
	The Science Based Targets initiative, derived from the mobility model of the International Energy Agency suggest that both 2°C scenarios and below 2°C scenarios require not only large improvements in fuel efficiency and electrification of every mode of transport, but also a significant modal shift away from light duty passenger and freight vehicles.	Science Based Targets, 2018.
	CO_2 emissions decline even with rapidly rising passenger travel, which nearly doubles by 2050, and rising freight activity, which increases by two-and-a-half-times from current levels, and an increase in the global passenger car fleet from 1.2 billion vehicles in 2020 to close to 2 billion in 2050.	IEA 2021, p. 92 - IEA (2021): Net Zero by 2040 – A Roadmap for the Global Energy Sector.
	In the NZE, the share of oil drops to less than 75% in 2030 and slightly over 10% by 2050. By the early 2040s, electricity becomes the dominant fuel in the transportation sector worldwide in the NZE: it accounts for nearly 45% of total final consumption in 2050, followed by hydrogen-based fuels (28%) and bioenergy (16%). Biofuels almost reach a 15% blending share in oil products by 2030 in road transport, which reduces oil needs by around 4.5 million barrels of oil equivalent per day (mboe/d). Beyond 2030, biofuels are increasingly used for aviation and shipping, where the scope for using electricity and hydrogen is more limited.	
	In emerging and developing economies, electric light-duty vehicles account for about 50% of sales by 2030. Almost all sales are electric by the mid-2030s.	
	Reaching net-zero emissions will require low-emissions fuels[79] where energy needs cannot easily or economically be met by electricity. This is likely to be the case for some modes of long-distance transport (trucks, aviation, and shipping).	
	Electric vehicle sales should reach 15% by 2025 and 75% by 2030. For freight, ensuring zero-carbon freight for 5% of total freight volume by 2030 is needed (p. 47).	UNFCCC Climate Action Pathways for Transport (2021): Action Table.

[79] Biofuels, biogas, biomethane, hydrogen-based fuels that do not emit CO2 from fossil fuel directly when used and also emit very little when being produced.

Sector or subsector	Pathways for the sector	Source
Freight transport	For full decarbonization in line with the Paris Agreement targets, 5% of international and 15% of national shipping fuels will require reaching net zero by 2030 (UNFCCC CAP, 2021 Transport, p.50). Green ammonia and liquefied petroleum gas tankers are seen as possible technological developments in this area.	UNFCCC Climate Action Pathways for Transport (2021): Action Table.
	"Expected increases in tons transported by this mode [ground transportation] by 2050, in conjunction with the growing average age of the LAC fleet (15 years, reaching 21 years in countries such as Colombia and Dominican Republic, compared to 11.5 years in the European Union) – and therefore, lower energy efficiency –, make the decarbonization of freight an important challenge for the countries in the region."	BID 2021: Logística en América Latina y el Caribe: Oportunidades, desafíos y líneas de acción
	The freight sector at the global scale, in absence of action, will practically triple its CO_2 emissions: "The ITF estimates that freight volumes worldwide will increase by a factor of 4.3 between 2010 and 2050 (measured in tons-kilometers) and this will be accompanied by an increase of 290% of CO2 emissions of international trade. Freight transportation in LAC is responsible for the generation of 141 million CO2 tons, of these 96% are produced by road transportation (ITS, 2019b, as quoted in: Calatayud, et.al. 2021, pp. 123-124)	BID 2021: Logística en América Latina y el Caribe: Oportunidades, desafíos y líneas de acción
Aviation	In the NZE, the global use of jet kerosene declines to about 3 EJ in 2050 from 9 EJ in 2020 (and around 14.5 EJ in 2019 before the Covid-19 crisis), and its share of total energy use falls from almost 100% to just over 20%. The use of sustainable aviation fuel (SAF) starts to increase significantly in the late-2020s. This is estimated to increase the ticket price for a mid-haul flight (1 200 km) by about USD 3 per passenger. Operational improvements, together with fuel efficiency technologies for airframes and engines, also help to reduce CO2 emissions by curbing the pace of fuel demand growth in the NZE. These improvements are incremental, but revolutionary technologies such as open rotors, blended wing-body airframes and hybridisation could bring further gains and enable the industry to meet the International Civil Aviation Organization's (ICAO) ambitious 2050n efficiency targets (IEA, 2020b).	IEA 2021, p. 92 - IEA (2021): Net Zero by 2040 – A Roadmap for the Global Energy Sector.
Maritime transport	Shipping is one of the few transport modes that does not achieve zero emissions by 2050 in the NZE. Nevertheless, emissions from shipping decline by 6% annually to 120 Mt CO2 in 2050. […] Significant emissions reductions are achieved in the NZE by switching to low-carbon fuels such as biofuels, hydrogen, and ammonia. For the latter two, their combined share of total energy consumption in shipping reaches around 60% in 2050. Large ports become industrial hubs to produce hydrogen and ammonia for use in both chemical and refining industries, as well as for refuelling ships.	IEA 2021, p. 92 - IEA (2021): Net Zero by 2040 – A Roadmap for the Global Energy Sector.
Rail transport	Passenger rail almost doubles its share of total transport activity to 20% by 2050 in the NZE, with particularly rapid growth in urban and high-speed rail (HSR), the latter of which contributes to curbing growth in air travel. Global CO2 emissions from the rail sector fall from 95 Mt CO2 in 2020 (100 Mt CO2 in 2019) to almost zero by 2050 in the NZE, driven primarily by rapid electrification. Oil use, which accounted for 55% of total energy consumption in the rail sector in 2020, falls to almost zero in 2050: it is replaced by electricity, which provides over 90% of rail energy needs and by hydrogen which provides another 5%.	IEA 2021, p. 92 - IEA (2021): Net Zero by 2040 – A Roadmap for the Global Energy Sector.
	"In order to avoid overshooting the 1.5°C temperature threshold to limit the risk of dangerous climate change, the emissions from Land Use,	Rogelj, J. et al. (2018). "Mitigation

Sector or subsector	Pathways for the sector	Source
AFOLU	Land Use Change, and Forestry (LULUCF) must reach net-zero by 2030; before 2050 the sector must turn into a significant net-sink in order to compensate for remaining emissions in other sectors."	Pathways Compatible with 1.5°C" IPCC Report. Chapter 2.
	The IEA recommends reducing deforestation in two-thirds by 2050, instituting improved forest management practices and planting around 250 Mha of new forests.	IEA 2021, p. 92 - IEA (2021): Net Zero by 2040 – A Roadmap for the Global Energy Sector.
	Decisions will be most effective if they focus on decarbonising the entire value chain, taking into account the energy and infrastructure networks that supply transportation solutions, as well as wider considerations including the role of urban planning in the transportation sector.	

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