

Evaluation *Insight* Note

New insights from existing evidence to inform decisions, address knowledge gaps, and enhance operational learning

Transport Decarbonization

November 2022

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The World Bank can do more to exploit opportunities for decarbonization as its approach has until recently been timid against the needed contribution to the Climate Change Action Plan.



The World Bank has steadily increased the number of projects with decarbonization content, especially in low-income countries, and has recently put together a strong knowledge base on transport decarbonization.



Despite important regional variations, overall, the composition of the transport lending portfolio has not changed much since FY08, suggesting that decarbonization opportunities are being missed, especially in urban and rail transport.



Country-specific decarbonization diagnostics and analytical work has been limited and transport decarbonization seldom makes it on the World Bank's strategic country agenda.



The World Bank has rarely measured transport decarbonization directly.



Eight opportunities have been identified for World Bank action on transport decarbonization



The work under this EIN was limited to climate mitigation and focused on the Transport GP; consisting of methodological approaches involving rapid literature, portfolio, and document reviews.

Drawing from the Independent Evaluation Group's rich knowledge repository, Evaluation Insight Notes respond to the need for more rapid and focused evaluative evidence. These notes systematically analyze data from a range of evaluations, validations, and other studies to generate insights in a timely manner around important strategic and operational issues.



How Has the World Bank Been Approaching Transport Decarbonization?

Transport is a major contributor to greenhouse gas (GHG) emissions and a priority action area under the World Bank's Climate Change Action Plan. Climate action in the transport sector is essential as the sector emits approximately 24 percent of the global total of energy-related carbon emissions and, without aggressive measures, the World Bank expects emissions from transport to grow 60 percent by 2050 (World Bank Group 2021). Therefore, the World Bank envisages a transition to a low-carbon and resilient development pathway for the transport system.

Environmentally sustainable transport has been on the World Bank's agenda for over 20 years, though the World Bank has yet to conduct a review of its approach to decarbonization. Since the late 1990s, the World Bank has emphasized the integration of economic, social, and environmental dimensions in a sustainable transport policy (World Bank 1996); the importance of sustainable, low-emission transport, especially in urban areas (World Bank 2002, 2008); and the need to support countries in developing sustainable mobility alternatives (World Bank Group 2016).

This Evaluation Insight Note (EIN) explores how the World Bank has approached transport decarbonization since the publication of the Transport Business Strategy 2008–2012 (World Bank 2008). An EIN identifies new insights by synthesizing secondary evidence with a focus on addressing knowledge gaps and contributing to enhanced operational learning in the World Bank. This EIN identifies patterns in the World Bank's transport decarbonization work. It uses existing evidence from the self-evaluation system of the World Bank, including Implementation Completion and Results Reports prepared by the project teams and the associated Independent Evaluation Group (IEG) validations, relevant information from other project documents, literature from policy and academic sources, advisory services and analytics, country strategies, and existing IEG evaluations. It heavily draws on data from the ongoing portfolio because of the limited evaluative evidence on transport decarbonization and the need to capture the latest evolutions to ensure practical relevance.



Transport is a major contributor to greenhouse gas (GHG) emissions and a priority action area under the World Bank's Climate Change Action Plan.

Figure 1. Transport decarbonization activities



Source: SLOCAT Partnership (<https://slocat.net/asi>).

What Are the Four Main Insights from This Synthesis?



The World Bank has steadily increased the number of projects with decarbonization content, especially in low-income countries, and has recently put together a strong knowledge base on transport decarbonization.

The share of Transport Global Practice (GP) investment project financings (IPFs) and Programs-for-Results (PforRs) with decarbonization activities has steadily increased from 41 percent of projects in FY08 to close to 70 percent of projects in FY21 and FY22, first quarter (Q1). The main types of decarbonization activities supported in the first and

the second periods did not change (box 1). Countries in which the World Bank supported projects that included transport decarbonization activities increased from 38 between FY08 and FY14 to 55 between FY15 and FY22, Q1.

Box 1. Main Decarbonization Activities, Fiscal Years 2008–14 and 2015–22, Quarter 1

The main decarbonization activities included in projects in the periods of fiscal years 2008–14 and 2015–22, quarter 1, were the following:

- » Construction and rehabilitation of passenger and freight railway lines and ancillary facilities
- » Construction and improvements in bus rapid transit systems, bus lanes, metro lines, and ancillary facilities
- » Advanced and intelligent systems for public transport and trains
- » Technical assistance to implement and improve rail and urban transport systems, including reforms, institutional strengthening, and capacity building
- » Improvement and construction of inland waterway facilities, equipment, systems, and vessels
- » Inland waterway and multimodal transport studies, plans, institutional strengthening, and capacity building
- » Construction and improvement of nonmotorized transport infrastructure and studies
- » Acquisition of cleaner buses and trains, and implementation of vehicle inspection systems and vehicle renewal schemes
- » Energy-efficient lighting and energy-efficient systems for rail and airports.

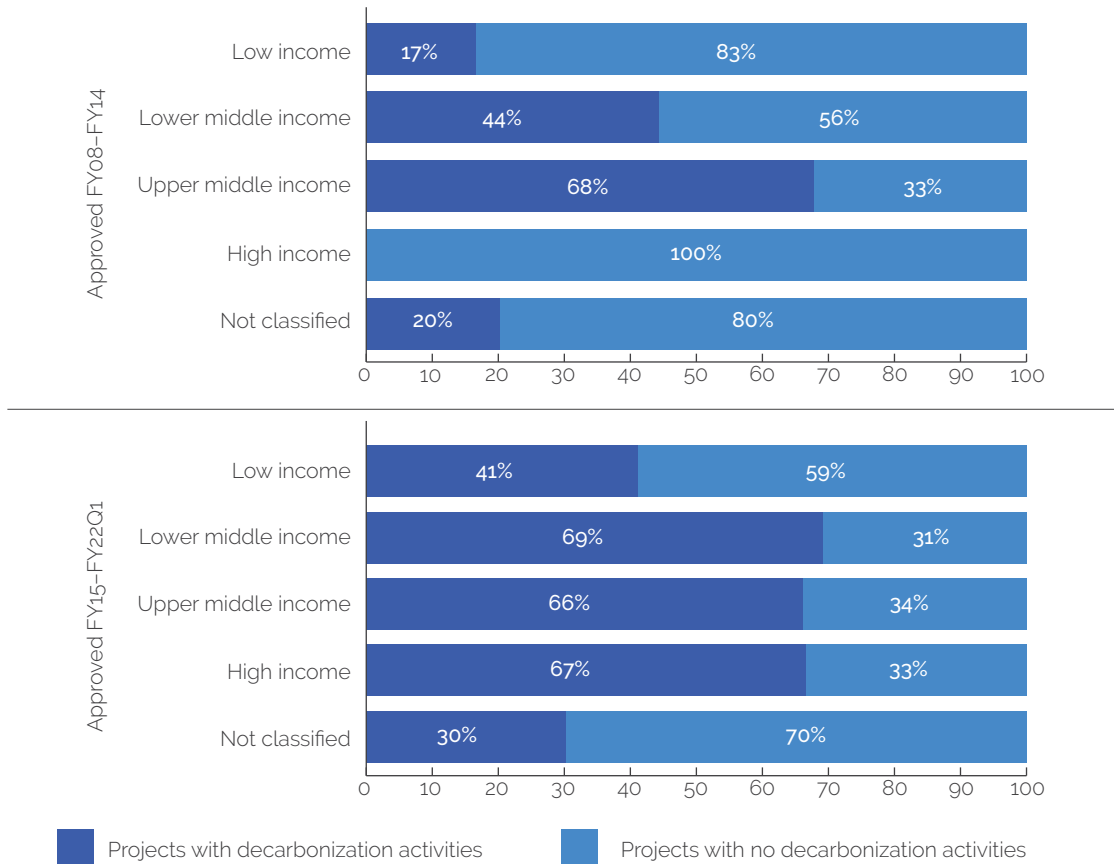
Source: Independent Evaluation Group.

Note: N = 342; n = 79.

The share of projects with transport decarbonization activities in low-income countries—where a high-carbon pathway can still be avoided—has increased by 141 percent (but starting from a very low base) between FY08–14 and FY15–22, Q1 (figure 2). These projects are often in Africa, which has low transport-related CO₂ emissions, a low share of the population living in urban areas, but the highest urban growth rates in the world (World Bank 2020). As such, it is significant that in Africa not only did the number of projects with decarbonization activities substantially increase but so did the urban transport commitments (the latter increased in Sub-Saharan Africa from 11 percent of commitments in FY08–14 to 23 percent in FY15–22, Q1). In lower-middle-income coun-

tries, projects with decarbonization content have increased by 57 percent. An emphasis on decarbonization in low-income settings is important because large-scale transport infrastructure projects can lock in car-based and carbon-intensive transport systems that are not easily reversible (Banister 2011; Ewing and Cervero 2010).

Figure 2. Transport Global Practice Projects with Decarbonization Activities by Income Group and Period (FY08–14 and FY15–22, Q1)



Source: Independent Evaluation Group.

Note: N = 342 investment project financings and Programs-for-Results (FY08–14: low income, n = 18; lower middle income, n = 79; upper-middle income, n = 80; high income, n = 2; not classified, n = 10. FY15–22, Q1: low income, n = 22; lower middle income, n = 68; upper-middle income, n = 50; high income, n = 3; not classified, n = 10). "Not classified" includes regional projects, which tend to be in low-income countries in Africa. FY = fiscal year; Q1 = quarter 1.

In the past few years, the World Bank has made significant efforts to create a strong knowledge base on transport decarbonization. Its analytical work has been strongly increasing since 2021, especially with the ongoing development of the transport decarbonization

flagship publications.¹ Analytical work with direct transport decarbonization content includes studies on transport sector or subsector decarbonization, e-mobility, cleaner fuels, energy efficiency, measures to reduce transport GHG emissions, and sustainable transport with a view to reducing fuel consumption or emissions. Analytical work that indirectly covers decarbonization includes studies, for instance, on public transport improvement, public transport finance and subsidies, inland waterway transport capacity strengthening, railway reform, and transit-oriented development. In calendar year 2021, the World Bank published 14 studies with direct transport decarbonization content, more than in all previous years since 2012, and 8 studies with indirect decarbonization contents. In calendar year 2022, Q1, it had already published 4 studies with direct decarbonization content and 7 with indirect content.



Nevertheless, transport decarbonization in World Bank lending remains timid against the needed contributions to the Climate Change Action Plan.

Despite important regional variations, overall, the composition of the transport lending portfolio has not changed much between the periods of FY08–14 and FY15–22, Q1, suggesting that decarbonization opportunities are being missed, especially in urban and rail transport. There is a strong rationale to focus on sustainable transport in urban areas as they account for over 70 percent of all CO₂ emissions (Dasgupta, Lall, and Wheeler 2022), and a growing share of the world's population lives in urban areas (World Bank 2020). Urban transport projects have a high potential to reduce GHG emissions, and despite greater focus on urban transport in Sub-Saharan Africa, the Middle East and North Africa, and South Asia, the commitments for urban transport projects have negligibly increased overall since 2015. Meanwhile, commitments for railways, which provide a cleaner alternative to cars and trucks, have actually decreased by seven percentage points (figure 3, panel a). Urban transport commitments have increased in low-income and lower-middle-income countries, but they have decreased in upper-middle income countries. Railway commitments have decreased in all three country types (figure 3, panel b).²

¹ The flagship activities started in April 2021. They consist of 17 deliverables to be delivered in a two-year period. The flagship brings together the knowledge base on transport decarbonization, including decarbonization strategies for specific subsectors in developing countries, funding and financing, pathways for transport sector decarbonization, and ex post and ex ante analysis of national-level transport decarbonization policies.

² This analysis used a larger population than the remaining analyses to ensure full consistency with the way the Transport Global Practice calculates the split by subsectors. N = 535 includes 342 investment project financings and Programs-for-Results mapped to the Transport Global

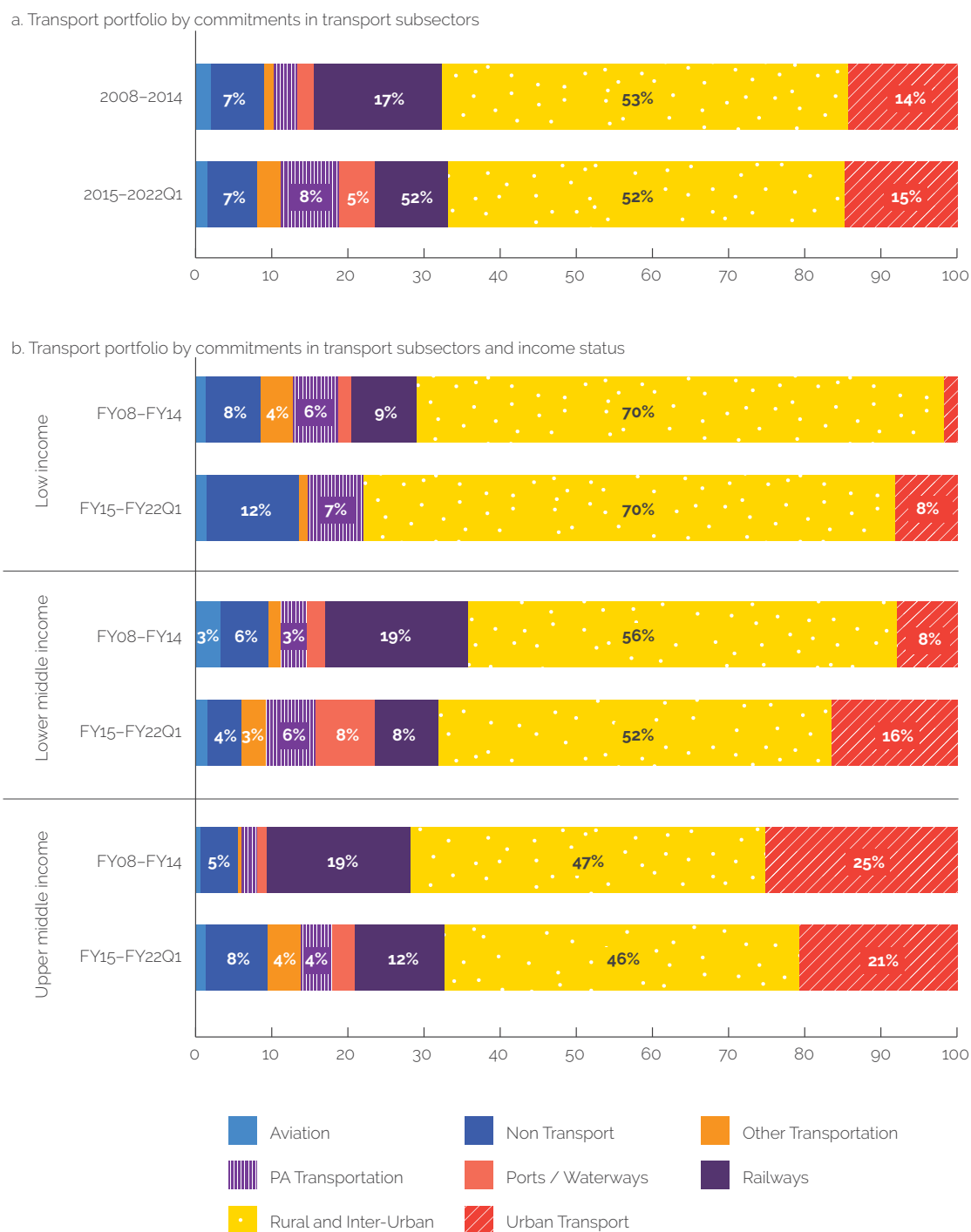
In 45 percent of IPFs and PforRs, the decarbonization content is low, with the cost of the decarbonization activities amounting to only 15 percent or less of the project cost. Low decarbonization content is mostly found in road and air transport projects, which account for 77 percent of projects with low decarbonization content. Reassuringly, the share of road projects with decarbonization activities has increased from 25 to 34 percent, and the share of air transport projects with decarbonization activities has increased from 5 to 6 percent from FY08–14 to FY15–22, Q1. But there is a danger of overstating decarbonization claims for some of these projects—such as those that only (i) include minor decarbonization activities; (ii) claim CO₂ emission reductions from improved roads and regular maintenance; or (iii) support greener infrastructure construction, such as recycling road pavements or using local or more energy-efficient materials, environmentally optimized designs, and energy-efficient equipment, or planting trees—for which it is unclear if it is simply business as usual or a genuine, additional effort to decarbonize.

The World Bank has not exploited the development policy operation (DPO) instrument to support transport decarbonization. During the period FY08–21, on average, 28 percent of transport prior actions in DPOs had the potential to contribute to transport decarbonization. These transport prior actions as a share of total transport prior actions oscillate from year to year, and there is no increasing trend. This is lamentable. DPOs could be powerful tools to advance the decarbonization agenda because many decarbonization activities, such as public transport improvements, transport demand management (TDM), or energy-efficiency standards, require policy, legal, and regulatory changes. For instance, DPOs have introduced policies to integrate mass transit systems, improve vehicle inspection systems, and establish public transport agencies. Two DPOs have also supported TDM measures. However, as discussed below, reforms that introduce TDM are not often prioritized by countries. DPOs with transport decarbonization prior actions have also primarily taken place in higher-income countries, such as Brazil, Colombia, Mexico, and Morocco.³ Because DPOs do not have explicit transport decarbonization objectives and do not directly measure decarbonization achievements, reporting on cases of success is not possible in this EIN.

Practice, plus their additional financings, three development policy operations, 23 small institutional development fund grants, one guarantee for road sector restructuring, and 36 projects without documents.

³ Upper-middle-income countries emit on average 1,003.71 kg of CO₂ per dollar of gross domestic product (GDP), lower-middle-income countries emit on average 378.96 kg of CO₂ per dollar of GDP, and low-income countries emit on average 125.70 kg of CO₂ per dollar of GDP. (Independent Evaluation Group calculation based on data from <https://datacatalog.worldbank.org/int/infrastructure-data>, and excluding República Bolivariana de Venezuela, because the relevant data for that country are not classified in terms of income.)

Figure 3. Transport portfolio by commitments in transport subsectors and income status (FY08-FY14 and FY15-FY22Q1)



Source: IEG.

Note: N= 342 IPFs and PforRs mapped to the Transport GP, plus their additional financings, 3 development policy operations (DPOs), 23 small institutional development fund grants, 1 guarantee for road sector restructuring, and 36 projects without documents. The use of an N plus is to ensure full consistency with the way the Transport GP calculates the split by subsectors. Projects categorized as "PA (public administration) Transportation" in the sample reviewed included mainly projects supporting public transport, multimodal transport, and energy saving activities, with medium to high decarbonization contents. "Non Transport" groups together the commitments in sector other than transport.

Measures to support TDM are not widely undertaken in the transport portfolio. The Bank has been more strongly supporting activities to shift passenger and freight to less carbon intensive modes, while opportunities could be further explored in integrated spatial and transport planning and TDM (tables 1 and 2). An IEG evaluation (World Bank 2017) found that projects that incorporated demand side measures together with supply side measures, such as the provision of public transport infrastructure, achieved more mobility improvements and sustained outcomes, and seemed to be more effective. Similarly, according to the World Bank urban transport strategy (World Bank 2002, page 2), "new road construction in the absence of a balanced development program that includes demand management, public transport provision, and supporting land-use policies may not improve traffic or environmental conditions".

Table 1. Transport decarbonization activities in IPFs/PforRs by target area (FY08-FY22Q1)

Areas Targeted by Transport Decarbonization Activities	Decarbonization Activities (no.)	Percentage of Total (%)
Public transport (transit, rail, and waterborne)	84	34
Multimodal freight transport	40	16
Multimodal freight and public transport	13	5
Nonmotorized transport	26	11
Vehicles and fuels	27	11
Integrated spatial and transport planning	9	4
Transport demand management	6	2
Energy efficiency in transport facilities	15	6
Road network use optimization or traffic management	11	4
Operational efficiency improvements	4	2
Greening transport infrastructure construction	12	5
Total	247	100

Source: Independent Evaluation Group.

Note: n =77 IPFs and PforRs with 247 decarbonization activities. Bold text highlights areas with high potential to do more for decarbonization in transport IPFs and PforRs. "Multimodal freight and public transport" captures activities that improve both passenger and freight railway and passenger and freight waterborne transport, such as the construction of rail lines and ancillary infrastructure for both passengers and freight. "Transport demand management" includes measures, such as congestion and road pricing, parking policies, and other pricing or subsidy measures, to encourage low-carbon transport modes. "Greening transport infrastructure construction" includes activities mentioned above. "Operational efficiency improvements" are typically related to freight transport and include measures such as studies on freight consolidation centers or more efficient freight transport routing. FY = fiscal year; IPF = investment project financing; PforR = Program-for-Results; Q1 = quarter 1.

Table 2. Transport Decarbonization Activities in IPFs or PforRs by Target Area (FY08–22, Q1)

Areas Targeted by Transport Decarbonization Prior Action	Decarbonization Activities (no.)	Percentage of Total (%)
Public transport (transit, rail, and waterborne)	84	34
Multimodal freight transport	40	16
Multimodal freight and public transport	13	5
Nonmotorized transport	26	11
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Transport demand management	6	2
Energy efficiency in transport facilities	15	6
Road network use optimization or traffic management	11	4
Operational efficiency improvements	4	2
Greening transport infrastructure construction	12	5
Total	247	100

Source: IEG.

Note: n= 26 DPOs with 50 transport decarbonization prior actions. Bold lines highlight areas with high potential to do more in DPOs. Target area are explained in the previous table.

Implementing demand-side measures, however, is not easy. IEG recognized that TDM measures have proven less politically palatable (World Bank 2017). The World Bank's management response to IEG's findings pointed out that an approach combining supply and demand-side measures requires not only additional World Bank support but also political leadership and other enabling conditions to build public support over time. This indicates the importance of ongoing dialogue and a focused use of advisory services and analytics to support decarbonization efforts.



Country-specific decarbonization diagnostics and analytical work has been limited, and transport decarbonization seldom makes it onto the World Bank's strategic country agenda.

Most transport decarbonization analytical work has a broad coverage, with 45 percent having a worldwide scope—about half covering transport decarbonization directly and half indirectly. Less than a handful of studies include country-specific carbon diagnostics and solutions for transport. There are useful exceptions. A positive example of the country-specific solutions is the 2019 country study *Addressing Climate Change in Transport: Pathway to Resilient Transport in Vietnam*, which aimed to set out a vision and strategy for climate-smart transport to minimize the carbon footprint of the sector while ensuring its resilience against future risks. The multidonor Umbrella Trust Fund for Transport Decarbonization established by the World Bank in 2021,⁴ and strong consideration of transport in the Country Climate and Development Reports, might also constitute a promising step in the right direction.

The World Bank's transport decarbonization analytical work occurs unevenly among Regions, with lower-income Regions receiving less direct support. Twenty-two percent of transport decarbonization studies are in Sub-Saharan Africa, but all except 1 cover transport decarbonization only indirectly. Fifteen percent of transport decarbonization studies are in East Asia and Pacific, which is the Region with the highest number of studies directly covering transport decarbonization (5 of 30 studies). Latin America and the Caribbean, and Europe and Central Asia, have 7 and 5 studies on decarbonization. The Middle East and North Africa, and South Asia, have only 1 study each.

Transport decarbonization is only discussed in the country strategies of eight countries. These countries have eight or more mentions of transport decarbonization in several country strategies. They are mostly upper-middle-income and high-income countries in East Asia and Pacific and in Latin America and the Caribbean. Except for India and Vietnam, they are also among the larger CO₂ emitters from transport relative to gross domestic product. In Africa, the only country with an explicit focus on transport decarbonization in the Country Partnership Framework is South Africa.



The World Bank has rarely measured transport decarbonization directly.

⁴ The funding, knowledge, and project preparation support available under this trust fund are expected to enable developing countries to build non-emissions-intensive, safe, modern, inclusive, and resilient transport systems.

Transport decarbonization objectives are infrequently spelled out. Only 6 percent of projects with transport decarbonization activities include explicit transport decarbonization objectives. The latter are defined as objectives to reduce GHG or CO₂ emissions, achieve a modal shift to a less carbon-intensive mode, save fuel or energy from transport, or avoid trips. The projects with decarbonization objectives took place in Brazil, China, and Nigeria, and all were financed or linked to Global Environment Facility grants. None of the DPOs with transport decarbonization prior actions had an explicit transport decarbonization objective. Such objectives were also absent in country strategies, except for in China.

Given the limited attention given to transport decarbonization in project development objectives, it is rarely directly measured. Only 12 percent of IPFs and PforRs with decarbonization activities (nine projects in the sample evaluated) have indicators to measure decarbonization directly by capturing GHG emission reductions, modal shift to public transport, and fuel consumption reductions. Because several of these projects are still ongoing, it was not possible to assess what good decarbonization measurement looks like. Most of the closed projects measuring decarbonization achieved their decarbonization targets. No DPO with transport decarbonization prior actions measured transport decarbonization directly.

Many projects measured transport decarbonization indirectly. Forty-nine percent of IPFs and PforRs with decarbonization activities captured outputs or intermediate outcomes of these decarbonization activities. The most frequently found indicators measured increased public transport ridership and improvements, greater freight throughput, and improvements in cleaner modes. For DPOs with transport decarbonization prior actions, 88 percent measured it indirectly, capturing mainly public or urban transport and railway improvements, such as public transport services contracted out, public transport integration, railway reforms to separate infrastructure and operations carried out, and aspects related to fleet renewal and emission control.

The only measure of success, in the absence of results measurement, is the reasonably good track record in implementing decarbonization activities and follow-up on decarbonization prior actions in projects. Seventy-one percent of transport IPFs and PforRs with decarbonization activities at least partially carried out the planned decarbonization activities. In only 5 percent of projects was there clear evidence that these activities were not carried out. This is a good first step toward decarbonizing. Similarly, 64 percent of decarbonization prior actions had at least a partial follow-up on these prior actions, indicating some progress toward transport decarbonization.



What Are the Top Opportunities for World Bank Action on Transport Decarbonization?

- » Do more to support sustainable transport subsectors. For a real breakthrough, the World Bank could give priority to projects that support sustainable transport modes, such as urban transport, rail, and inland waterways.
- » Dialogue with transport authorities and cities on TDM and on integrated land-use and transport planning. Although challenging to place on a country's agenda and requiring strong engagement and technical support, these measures could greatly enhance the impact of public and nonmotorized transport infrastructure interventions.
- » Use DPO prior actions to support transport decarbonization policies and reforms. DPO prior actions provide a useful tool, especially to support TDM, land-use planning, and energy-efficiency measures, which all require reforms or policy changes.
- » Include more substantial decarbonization content in all road projects. Several road projects have undertaken potentially more substantial decarbonization activities, such as vehicle scrapping schemes, driving and vehicle maintenance training, vehicle inspection systems, and measures on multimodal transport.
- » Ensure that decarbonization claims are not overstated. This will, for instance, require evidence on the decarbonization potential of greening transport infrastructure construction. If positive, such activities could be included systematically in all road projects.
- » Carry out more country-specific transport decarbonization diagnostics and analytical work and use country strategies to elevate the transport decarbonization agenda. A strong focus on transport in Country Climate and Development Reports, in analytical work and diagnostics tailored to a specific country, and in the dialogue at country level might provide important entry points for the transport decarbonization agenda, which can be further nurtured at the technical level. This is likely to require additional resources, both in terms of funding and people.
- » Systematically put transport decarbonization on the agenda of low-income, low-emitting countries. This means not only including decarbonization measures

in road projects but also helping avoid the high-carbon path through sustainable transport infrastructure (such as public transport systems) and urban planning.

- » Include decarbonization objectives in projects and invest in better data and measurement. If decarbonization is not part of the project development objective, it is less likely to be adequately measured. Good data and adequate measurement will increase understanding of what does and does not work and course-correct project activities and the overall portfolio. Regular monitoring of the evolution of the transport portfolio will increase understanding of the potential for changed contributions to GHG emission reductions.



Methodology

This EIN followed a tightly defined question, with its scope limited to climate mitigation only, and mainly focused on the Transport GP. The overall question guiding this synthesis is the following: How has the World Bank been approaching transport decarbonization? The focus on the Transport GP captures the main decarbonization activities, though other GPs contribute to transport decarbonization intensively, such as through integrated spatial and transport planning, emission and fuel standards, and energy efficiency from vehicles. In answering the evaluation question, the EIN focuses on the World Bank's operational knowledge of Transport GP activities across the globe. It covers (i) IPFs and PforRs mapped to the Transport GP and approved between FY08 and FY22, Q1, (ii) DPOs approved between FY08 and FY21 that include prior actions coded as transport prior actions, (iii) Country Assistance Strategies and Country Partnership Frameworks approved between FY08 and FY22 (February), (iv) Completion and Learning Review Reviews of closed Country Assistance Strategies and Country Partnership Frameworks, and (v) Transport GP advisory services and analytics published between calendar years 2012 and 2022, Q1.

The work under this EIN consisted of systematic data collection and methodological approaches involving rapid literature, portfolio, and document reviews:

- » A rapid review of selected literature covering transport decarbonization activities and typologies provided a framework to classify activities (EASAC 2019; International Transport Forum;⁵ Lefèvre et al. 2019; Nakamura and Yoshitsugu 2013; SUTP 2011).
- » A portfolio review process identified 342 projects mapped to the Transport GP, approved from FY08 to FY22, Q1.⁶ From these projects, text analytics and manual reviews identified the 188 projects with decarbonization content. From these projects, a representative sample of open and closed projects was drawn. It included 79 IPFs and PforRs. The sample corresponds to just over an 8 percent margin of error at a 90 level of confidence. Applying the framework from the literature review, planned decarbonization activities were coded using project appraisal documents (n = 79). In addition, implemented closed project activities were coded, using Implementation Completion and Results Report Reviews (n = 34). The portfolio review incorporated an analysis of the project development objectives of operations with transport decarbonization, indicators (IPFs and PforRs: n = 77; DPOs: n = 26), and decarbonization assessment methodologies in IPFs and PforRs with decarbonization objectives (N = 5). All DPOs with transport prior actions approved between FY08 and FY21 (N = 99) were reviewed, with coding of decarbonization prior actions and follow-up activities in Implementation Completion and Results Report Reviews (n = 26).
- » A range of other documents were reviewed. The prominence of transport decarbonization activities in country strategies approved between FY08 and FY22, Q3 (N = 173, at keyword level) and achievements in Completion and Learning Review Reviews related to transport decarbonization (n = 6) were assessed. All Transport GP advisory services and analytics published between calendar year 2012 and 2022, Q1 (N = 202) were also reviewed.

References

Banister, D. 2011. "Cities, Mobility and Climate Change." *Journal of Transport Geography* 19 (6): 1538–46.

Dasgupta, Susmita, Somik Lall, and David Wheeler. 2022. "Cutting Global Carbon Emissions: Where Do Cities Stand?" *Sustainable Cities* (blog), January 5, 2022. <https://blogs.worldbank.org/sustainablecities/cutting-global-carbon-emissions-where-do-cities-stand>.

⁵ Transport Climate Action Directory, <https://www.itf-oecd.org/tcad>.

⁶ Excluding (i) 23 small institutional development grants and a guarantee of US\$370.7 million for road sector restructuring and modernization mapped to the Transport Global Practice but not tagged as a lending product, (ii) all additional financings, (iii) information communication technology projects, (iv) development policy operations, and (v) projects without documents.

- EASAC (European Academies' Science Advisory Council). 2019. *Decarbonisation of Transport: Options and Challenges*. Leopoldina: German National Academy of Sciences.
-
- Ewing, R., and R. Cervero. 2010. "Travel and the Built Environment—A Meta-Analysis." *Journal of the American Planning Association* 76 (3): 265–94.
-
- Lefèvre, Julien, Yann Briand, Steve Pye, Jordi Tovilla, Francis Li, Ken Oshiro, Jean-Michel Cayla, and Runsen Zhang. 2021. "A Pathway Design Framework for Sectoral Deep Decarbonization: The Case of Passenger Transportation." *Climate Policy* 21 (1): 93–106.
-
- Nakamura, Kazuki, and Hayashi Yoshitsugu. 2013. "Strategies and Instruments for Low-Carbon Urban Transport: An International Review on Trends and Effects." *Transport Policy* 29: 264–74.
-
- SUTP (Sustainable Urban Transport Project). 2011. "Sustainable Urban Transport: Avoid-Shift-Improve (A-S-I)." GIZ, Eschborn. <https://sutp.org/publications/sustainable-urban-transport-avoid-shift-improve-a-s-i>.
-
- Van den Berg, Nicole J., Andries F. Hof, Lewis Akenji, Oreane Y. Edelenbosch, Mariësse A. E. van Sluisveld, Vanessa J. Timmer, and Detlef P. van Vuuren. 2019. "Improved Modelling of Lifestyle Changes in Integrated Assessment Models: Cross-Disciplinary Insights from Methodologies and Theories." *Energy Strategy Reviews* 26: 100420.
-
- Vanegas Cantarero, Maria Mercedes. 2019. "Decarbonizing the Transport Sector: The Promethean Responsibility of Nicaragua." *Journal of Environmental Management* 245: 311–21.
-
- World Bank. 1996. "Sustainable Transport: Priorities for Policy Reform." World Bank Policy Paper 15098, World Bank, Washington, DC.
-
- World Bank. 2002. *Cities on the Move: A World Bank Urban Transport Strategy Review*. Washington, DC: World Bank.
-
- World Bank. 2008. "Safe, Clean, and Affordable... Transport for Development: The World Bank Group's Transport Business Strategy 2008–2012." World Bank, Washington, DC.
-
- World Bank. 2017. *Mobile Metropolises: Urban Transport Matters*. Independent Evaluation Group. Washington, DC: World Bank.
-
- World Bank. 2020. *Demographic Trends and Urbanization*. Washington, DC: World Bank.
-
- World Bank. 2021a. "Georgia Can Unlock Potential for Green Growth, Says World Bank." Press Release 2021/ECA/101, May 17, 2022. <https://www.worldbank.org/en/news/press-release/2021/05/17/georgia-can-unlock-potential-for-green-growth-says-world-bank>.
-
- World Bank. 2021b. *Managing Urban Spatial Growth: World Bank Support to Land Administration, Planning, and Development*. Independent Evaluation Group. Washington, DC: World Bank.
-

World Bank Group. 2016. *World Bank Group Climate Change Action Plan 2016–2020*. Washington, DC: World Bank Group.

World Bank Group. 2021. *World Bank Group Climate Change Action Plan 2021–2025*. Washington, DC, World Bank Group.

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