

# Transport Decarbonisation Index (TDI)

## Methodology Brief

### Introduction

A systemic transformation in transport and mobility is urgently needed, particularly in low- and middle-income countries (LMICs) across Sub-Saharan Africa and South Asia, which are marked by rapidly growing populations, spiralling urbanisation, rising private motorisation and an underperforming transport sector. The growth in greenhouse gas emissions stemming from the surface transport of LMICs in these regions is expected to outpace the global average in the coming decades, underscoring the need for urgent action to keep global warming within the 1.5 degrees Celsius target of the Paris Agreement on climate change.

Adding to the challenge, transport decarbonisation efforts would have to be pursued in parallel with initiatives to enhance transport access and connectivity, which are central to advancing socio-economic development in these regions. However, many LMICs lack the capacity, data and policy frameworks necessary to implement sustainable transport solutions and to attract international climate finance.

Against this backdrop, the **Transport Decarbonisation Index (TDI)**, through its diagnostic toolkit, aims to **support policy makers in LMICs in their efforts to reduce emissions from surface transport while advancing broader sustainable development objectives**. By delivering a data-driven overview of where countries stand in their journey towards net zero greenhouse gas emissions and complementing it with tailored, yet non-prescriptive policy advice, the TDI seeks to enable evidence-based, time-sensitive and targeted decisions on surface transport decarbonisation. More than a diagnostic tool, the TDI seeks to act as a **catalyst for knowledge sharing, partnership building, and collaborative learning**, supporting LMICs in aligning national policies with global climate and sustainability agendas.

A robust methodology is essential for any effective composite indicator system. Similarly, a well-defined and user-friendly diagnostic toolkit is crucial for promoting the widespread, independent use of indexes such as the TDI. The TDI guides users in interpreting the resulting scores and accompanying policy recommendations, which are key to maximising the benefits of the index for all user groups.

This methodology brief provides a **clear and comprehensive overview of the TDI methodology** – from the selection criteria; to the normalisation, weighting and aggregation of the indicators; to the eventual provision of policy advice. The brief also details the main application approach of the TDI: combining the indicator assessment with policy guidance, the diagnostic toolkit and its functionalities.

### The TDI: kicking off a virtuous circle for policy makers

The TDI covers a range of surface transport modes – including road, rail and inland waterways – across both passenger and freight transport. The project provides a diagnostic toolkit that enables policy makers in LMICs to evaluate the current state of their transport sectors, identify their respective strengths and gaps, and undertake high-impact policy actions towards a decarbonisation pathway.

Importantly, the TDI is designed not as a tool for casting blame or shaming countries with lower scores but as a platform for mutual learning, collaboration and inspiration. By approaching a low score as an indicator of significant untapped decarbonisation potential, policy makers can make informed decisions regarding the policy and financing efforts needing prioritisation.

Countries can leverage the index to:

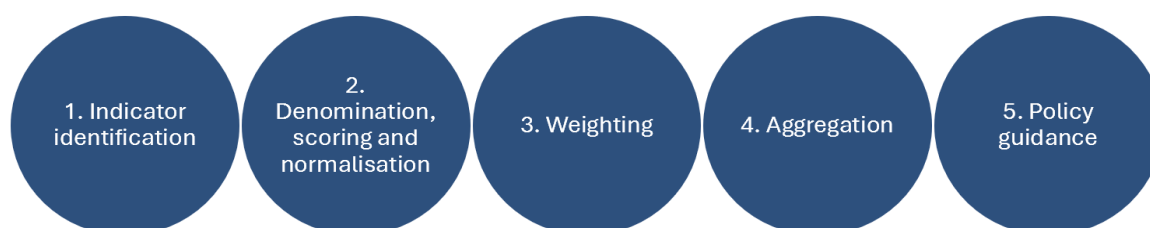
- address knowledge and capacity gaps
- build investor trust through transparency
- strengthen partnerships with financial and development institutions
- mobilise financial and technical support
- devise impactful policies for sustainable, low carbon transport
- fast-track progress towards net zero emissions by 2050 by benchmarking against global pathways aligning to sustainability and decarbonisation goals and
- improve public awareness and engagement.

These activities can help foster alignment with global agendas, including the Paris Agreement and the 2030 Agenda for Sustainable Development. To realise the TDI's full potential, dissemination of the index's scoring results would have to be tailored to the needs, knowledge and data literacy of its target audience. The engagement from the outset of all relevant stakeholders – including policy makers, practitioners and others – is key to ensuring relevance and to increasing the sense of ownership among end users.

### The methodological framework

The TDI methodology follows a comprehensive framework for assessing transport in LMICs. It combines quantitative and qualitative aspects into relevant indicators to capture the complexity of transport systems, focusing on both current performance (e.g., emission levels) and future commitments (e.g., targets in Nationally Determined Contributions). In doing so, the methodology is designed to balance robustness with flexibility, allowing application in countries that have varying data availability.

The following paragraphs, outlining the methodological framework of the TDI, aim to familiarise users with the development process of the TDI. The methodology of the TDI revolves around five main elements, which are common to any major composite indicator system:



For the complete methodology, see the [TDI Methodology Report](#).

#### 1. Indicator identification

The TDI encompasses a broad range of indicators across eight dimensions, including passenger mobility, freight systems, finance and economics, governance, energy and context. Based on the **A-S-I-F (Activity-Structure-Intensity-Factor of emissions) framework**, these dimensions reflect core elements of surface transport sustainability and decarbonisation.

In selecting the indicators, a balance has been struck between the need for minimal coverage and pragmatism regarding data availability. Additionally, the selection has been guided by interpretability for user

understanding and relevance for measuring progress towards net zero greenhouse gas emissions from surface transport, both within and across countries.

Priority has been given to indicators from international databases, given their broad coverage and regular updates across the majority of LMICs. However, restricting data collection, validation and scoring efforts to international databases carries the risk of excluding highly relevant indicators that are not systematically reported and collected globally.

Overcoming data gaps and addressing missing data is crucial for the TDI. Proxies constitute one method for bridging gaps but should be used sparingly, with the underlying assumptions clearly stated. Importantly, the TDI can perform even if the data for some indicators are missing. (For more on overcoming data limitations, see the [TDI Benchmarking Report](#).)

## [2. Denomination, scoring and normalisation](#)

After the data are collected, the indicators are “normalised” to make them usable for aggregation. This begins with “denomination”, which adjusts the indicators based on population to enable cross-country comparisons. Indicators that reflect extensive monetary values (e.g., fossil fuel subsidies) or physical quantities (e.g., paved road length) are denominated by total population, whereas urban-specific metrics (e.g., rapid public transport) are denominated based on urban population size.

Once denominated, the indicators are “scored” either by using min-max scoring methods or “best-in-class” values, or by grouping values into discrete bins. Scoring ensures comparability across different units of measurement, distributions, variances and scales. Following the scoring of the individual indicators, a second level of normalisation of the variables is added to ensure that they are on a common scale before aggregating them into composite values.

## [3. Weighting](#)

Weighting is a critical step in index development, often sparking debate over the optimal approach. The default weighting system of the TDI is equal weighting, attributing equal importance to each indicator within a dimension. This approach allows for automatic adjustment based on available indicators within dimensions and minimises bias towards certain aspects while enabling flexibility in cases where indicators are missing.

## [4. Aggregation](#)

In the final step, the treated, denominated, normalised and weighted indicators are aggregated into final dimension scores. Specifically, the TDI shows the dimension scores derived from the sum of the normalised and weighted indicator scores for the indicators in each respective dimension. Thus, the aggregation indicates scores from 0 to 1 for the dimensions, with “1” constituting the best performance possible, whereas “0” signals severe challenges in the context of transport sustainability and decarbonisation.


## [5. Policy guidance](#)

Each country is provided with illustrative and non-prescriptive advice in relation to its two lowest-scoring dimensions, with the intention of supporting evidence-based and informed policy making. These policy actions should be regarded within the context of each country, accounting for characteristics linked to levels of development, the availability of natural resources, the presence of manufacturing capacity, and the existence of specific geographical characteristics, among others. To be impactful, policies require an enabling financial, political and institutional environment.

The TDI is not to be used in isolation but should be considered in parallel with a range of policy and financing instruments to effectively steer the sector towards a low carbon pathway. Learn more about how countries can boost their ambition for transport mitigation, adaptation and resilience in their Nationally Determined Contributions 3.0 and how to facilitate access to climate finance for transport in LMICs.

## The spreadsheet toolkit

The TDI enables users to **self-assess a country's transport system through the spreadsheet toolkit**, which is provided in the form of an Excel file to enable broad accessibility for practitioners and policy makers in LMICs. The toolkit and its dedicated user guide can be downloaded from the [HVT website](#) and used as a local file without an internet connection. Upon inputting transport data on a specific sheet, users are provided with a score for the dimensions. The results are accompanied by explanations about the scores' meanings and corresponding policy guidance specifically for the two lowest-scoring dimensions.

 <b>Transport Decarbonisation Index (TDI)</b> <b>Spreadsheet Toolkit</b>	
Worksheet	Content description
<a href="#">Overview</a>	Current sheet with a table of contents, version number and brief descriptions about the involved partners.
<a href="#">1.a - Toolkit introduction</a>	Detailed presentation of the project, including context, approach and methodology, selected scope of the study and other information.
<a href="#">1.b - User instructions</a>	Step-by-step instructions explaining how to use the toolkit.
<a href="#">1.c - Indicator description</a>	Detailed description of every individual indicator used in the TDI. For every indicators, this sheet contains information about metrics, relevance and sources.
<a href="#">1.d - Policy guidance</a>	Explanation about the informed policy recommendations connected to the indicator assessment. This sheet provides a detailed list of policies including material and sources to study more about them.
<b><a href="#">2- TDI Composite Score</a></b>	Results of the TDI based on the provided data. It also include explanations about how to interpret the results and draft relevant conclusions.
<a href="#">3- Input</a>	Main sheet to input data for the calculation of the TDI.

**Version: 1.0, released in December 2024**

>	Overview	1.a - Toolkit introduction	1.b - User instructions	1.c - Indicator description	1.d - Policy guidance	2 - TDI Score	3 - Input	...	+
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## Conclusion

A clear methodology that includes rigorous processes for indicator selection, normalisation, weighting and aggregation is at the heart of any successful composite indicator system. A well-defined and user-friendly diagnostic toolkit will be equally important in facilitating the independent and widespread use of the TDI. Besides enabling transport assessments, the TDI will be paramount in guiding users in interpreting the scoring results and their related policy recommendations. This is crucial to maximising the TDI's benefits for all user groups while safeguarding its effectiveness not only as a diagnostic tool, but also as a catalyst for knowledge sharing, partnership building and collaborative learning – supporting LMICs in their efforts to transition to low carbon, sustainable and resilient transport systems.