Integration of Sustainability Criteria

in strategic documents of the Ministry of Public Works of Chile

National Infrastructure and Mobility Plan 2020 - 2050
Highway Manual (Volume 9)

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Introduction

Transport infrastructure is a fundamental and structuring component in the development of cities and territories; It can carry out important transformations at different scales, with strong implications for the population and the environment. Adequate infrastructure contributes to improving competitiveness, economic development, socio-spatial integration and, increasingly, is associated with indicators of quality of life, equity and social inclusion. However, despite the size of the investment that a large infrastructure project normally entails and its long-term nature, its design has often focused on responding to a specific objective, rather than responding to other needs present in its environment.

Although in **Chile** the importance of incorporating a comprehensive approach to infrastructure design is recognized, there are important limitations to do so, many of them, derived from the sectoral approach that determines its planning, design and subsequent development. This makes it difficult to integrate multidimensional, interdisciplinary, and inter-scale points of view, from the beginning of the project and throughout its life cycle.

This work focused on advancing the conception of more **sustainable infrastructure** in the case of the development of transport infrastructure projects in Chile, within the framework of the Regional Technical Cooperation "Framework to promote sustainability in infrastructure projects" between the Inter-American Development Bank (IDB) and the Ministry of Public Works of Chile (MOP).

We supported MOP in integrating sustainability criteria in the following strategic documents:

National Infrastructure Plan for Mobility 2020-2050 (PNIM 2050)

Volume 9 of the Highway Manual (V9MC)

Figure1: MOP strategic documents

Objectives

This project aims to inform future transportation projects directed by the Ministry from a sustainable perspective. This integral approach will increase, not only economic benefits, but also promote more inclusive development and improvements in life quality, as well as include considerations for efficiency in the use of limited natural resources, ecosystem protection, and climate change mitigation.

- Develop a framework for integrating sustainability in the MOP.
- Propose a simple sustainability assessment methodology using a list of monitoring criteria and indicators at the planning level.
- Identify sustainability goals and objectives to measure the contribution of PNIM 2050.
- Identify sustainability criteria at the project level to include in the V9MC.

Figure 2: Key sustainability dimensions associated with transportation

Key results

1. Understanding sustainability

The Table (Figure 3) summarizes the key goals to consider in planning a sustainable transport system organized according to the four dimensions of sustainability.

Although this implies that each goal falls into a specific category, they often overlap. For example, pollution is generally considered an environmental problem, but it also affects human health (a social problem) and the fishing and tourism industries (economic problems).

Economic	Social	Environment
Economic productivity	Equity / Justice	Climate change mitigation and adaptation
Local development	Social security	Prevention of air pollution, noise, and water
Efficient use of resources	Community development	Preservation of non-renewable resources
Affordability	Heritage preservation	Preservation of open spaces
Operational efficiency	Public health and well-being	Biodiversity protection

Governance
Integrated, comprehensive and inclusive planning
Regulation and efficient prices

Figure 3: Dimensions and sustainability goals associated with transportation

2. Sustainability framework

The main feature of the framework is that it is a general procedure and a guide on how to combine and apply the different elements to move from principle to practice, as shown in Figure 4.

The framework was designed to allow addressing sustainability in the broad spectrum of focus areas of transportation agencies, including planning. Other stages, such as scheduling, project development, construction, operations, and maintenance could also be evaluated using the same organizational structure.

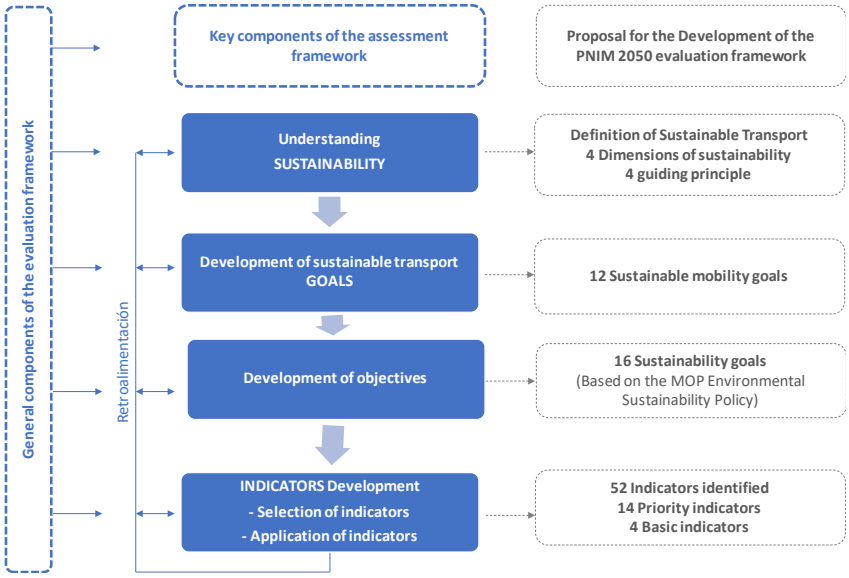
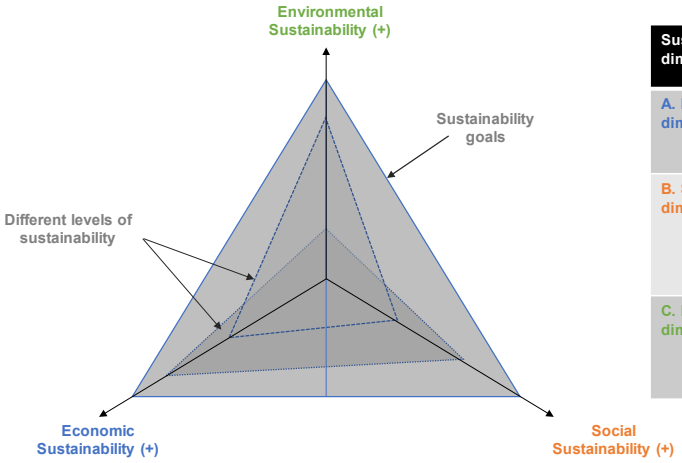


Figure 4. Elements of the proposed evaluation framework

3. Meassuring sustainability

Figure 5 summarizes a sustainability index comprised of a variety of performance measures (using the prioritized indicators identified) to clearly identify superior alternatives and consider tradeoffs when comparing different plans alternatives. The main objective is to present an evaluation guide that includes the critical elements for sustainability and demonstrate how a variety of indicator measures can be integrated into a multi-criteria evaluation.



Sustainability dimension	Indicators
A. Economic dimension	A.1 Equity A.2 Inclusiveness A.3 Affordability A.4 Security
B. Social dimension	B.1 Social profit B.2 Efficiency B.3 Public investment B.4 Private investment
C. Environmental dimension	C.1 Emissions C.2 Pollution C.3 Fossil fuels C.4 Land use C.5 Resilience

Figure 5: Sustainability index visualization tool to support decision making

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GeoAdaptive is a global interdisciplinary territorial intelligence research consultancy specialized in the analysis of territorial strategies that deliver inclusive forms of development. We have employed spatial economic techniques to analyzed and design multi-sectoral and geographically-explicit recommendations in more than 26 countries.

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