The Importance of Life Cycle Thinking for Urban Mobility

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Key Principle

As a key principle of the Sustainable Development Goals (SDGs), Life Cycle Thinking (LCT) enables us to consider the environmental, social, and economic impacts of a product, service, process, or technology from its conception (ecodesign) to its final disposal. This approach encompasses all stages of the life cycle: extraction of raw materials, production, distribution, use, and end-of-life (reuse, recycling, or final disposal - Waste Hierarchy).

Politics and Impact

A public policy focused on sustainable urban mobility must encompass a thorough understanding of the economic, environmental, and social impacts of transportation systems. It should also recognize that sustainable performance considers the entire life cycle of vehicles, fuel, and the infrastructure's construction and maintenance. While environmental impacts of transportation are often measured by atmospheric emissions from fuel consumption, it is essential to account for the impacts across the entire life cycle of the transportation alternative when making decisions.

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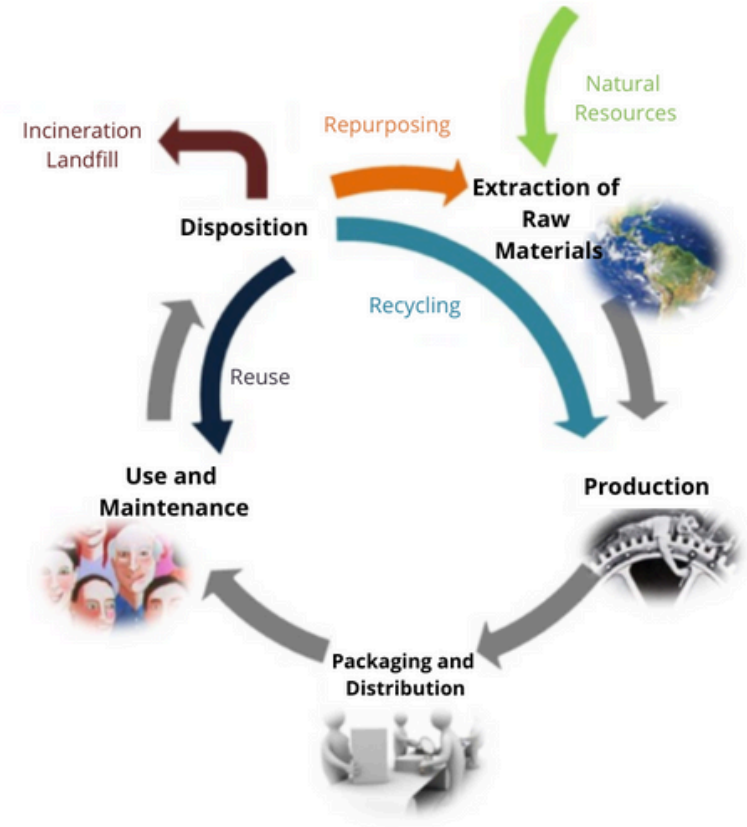
Decision making

A study on the BRT Transcarioca, presented at conferences in Brazil, Colombia, and Europe, clearly demonstrated the significant environmental impact of operating articulated buses, primarily due to diesel consumption. However, it also revealed that the construction and maintenance of the infrastructure are potentially critical steps for ensuring the sustainability of this transport system, given the high associated environmental impacts. In other words, promoting sustainability goes beyond the need to consider its three dimensions (economic, environmental and social), and also considers the LCT in planning public policies and decision-making.



Life Cycle Thinking

Considering the LCT when making decisions in urban mobility is crucial. For instance, the adoption of electric vehicles (EVs), along with strategies to increase the renewable share of our energy matrix, can significantly aid in the decarbonization of the sector. EVs can substantially reduce greenhouse gas (GHG) emissions when recharged with renewable energy. Since emissions generated during vehicle production, battery production, and electricity generation significantly contribute to total EV emissions, ensuring sustainable supply chains, ecodesign, reuse, and recycling of batteries - facilitated by effective reverse logistics - are essential integrated actions for promoting sustainability in the sector.

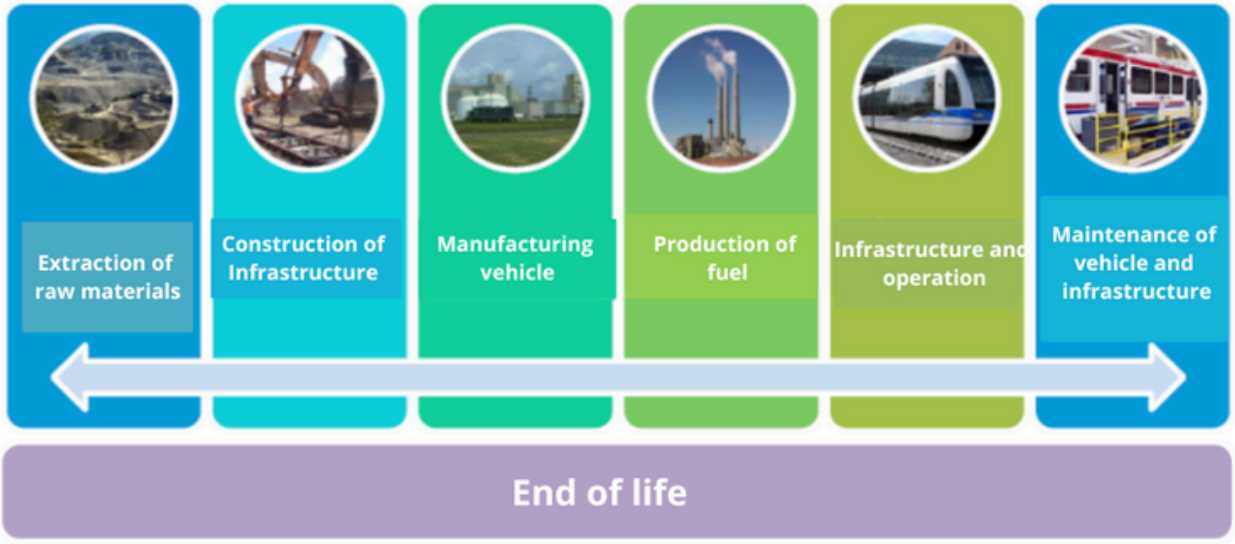
Strategy

When it comes to strategies for achieving sustainability in transport systems, we can look beyond the Sustainable Development Goals (SDGs), which are invaluable for decision-making in both the public and private sectors. Circular strategies also play a crucial role. These include reducing the consumption of natural resources for raw material production, eliminating waste and pollution (system externalities), maximizing the use of infrastructure and vehicles, and adopting biofuels, among others. These practices are essential for enhancing sustainable transport systems.

Urban Mobility

Linear practices in urban mobility, characterized by the extraction-production-disposal model of the linear economy, are counterproductive for cities. These practices not only result in high levels of congestion and wasted time but also generate significant externalities, including pollution, noise, depletion of finite resources, and adverse impacts related to urban land use.

Life cycle stages



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