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Wider effects of transportation planning: focusing on socioeconomic dynamics and issues

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Introduction

Motivations and Goals

Motivations

- **Cost Benefit Analysis** (CBA) is a useful method to verify the effectiveness of a given solution, but it is intrinsically **inadequate for identifying and responding to the social implications** posed by the project under evaluation (Cavallaro et al. 2022).
- Traditional CBA techniques primarily **focus on quantifiable monetary factors** and tend to overlook the intangible and non-financial outcomes associated with transport investments.
- **The absence of a comprehensive appraisal tool for transportation projects hinders authorities' ability to adequately assess social implications**, impeding informed decision-making and the development of effective side policies (Bruzzone et al., 2023).

Goals

- Critically **review the existing literature on social implications and theories** within the transportation sector, specifically focusing on the railway sector.
- **Investigate innovative conceptual support** for the social appraisal in Cost-Benefit Analysis (CBA) in the order to enhance decision-making processes and promote socially equitable transportation development.

Source: Author's processing

The impacts of transportation

Source: Author's processing based on Adobe Stock

Main methods for assessing transportation impacts

An 11-petals flower

Environmental Impact Analysis (EIA)
Evaluation of the effects significantly affecting the environment

Cost-Benefit Analysis (CBA)
Measure of a project's societal value in monetary terms based on individuals' Willingness-To-Pay from their private income

Sustainability Assessment (SA)
Evaluation of sustainability indicators

Cost-Effectiveness Analysis (CEA)
Comparison of different project's relative costs with their related outcomes

External Costs Assessment (ECA)
Estimation of main externalities of transport in monetary terms

Economic Impact Assessment (EIA)
Estimation of the impact of an investment on the general economy

Territorial Impact Analysis (TIA)
Evaluation of impacts on the whole territory involved by a project

Wider Economic Impacts (WEI)
Appraisal of economic impacts beyond the CBA usual ones

Social Impact Analysis (SIA)
Evaluation of the effects of transport on society and individuals

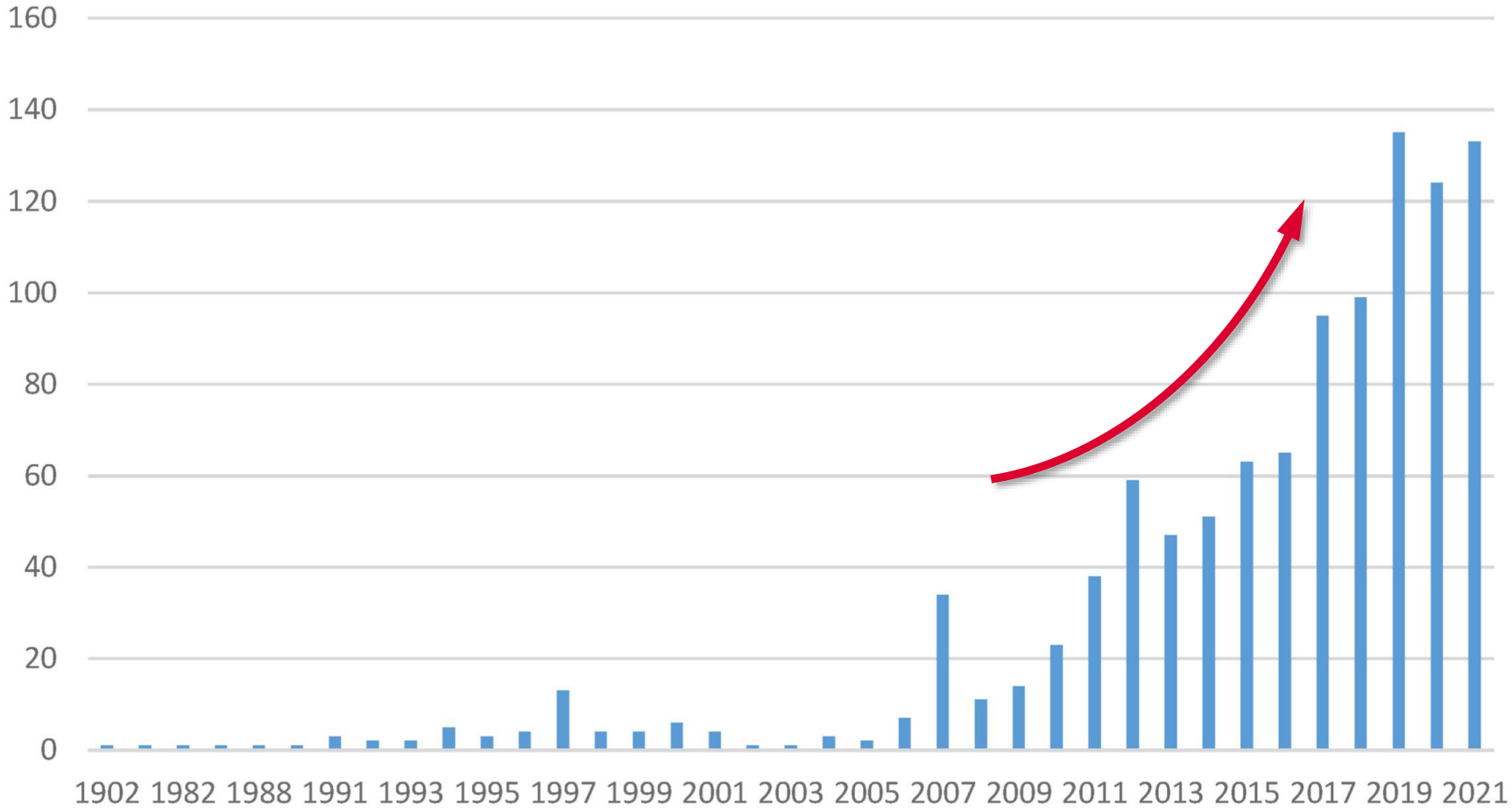
Multi-Criteria Analysis (MCA)
Appraisal of policy options using normalized and weighted measures of their effects

Deliberative Appraisal (DA)
Rational and informed judgment by citizens

Source: Author's Venn diagram processing

Socioeconomic implications in the transport sector

Example: trend of publications related to the socioeconomic impacts of HSR



Social Theories for the Transport Sector

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Beyond the monetary implications

Justice and Equity

JUSTICE

- **Distributive Justice**: Equitable distribution of benefits and burdens in society.
- **Procedural Justice:** Fairness in decision-making processes and distribution procedures
- **Rights and Entitlements:** Recognition and enforcement of individual rights and entitlements.

EQUITY

- **Impartiality Demand** (Sen, 2009)**:** Equal treatment without bias or favoritism
- **Proportionality** (Schweitzer & Valenzuela, 2004): Reward aligned with individual effort.
- **Differentiated Treatment** (Rawls, 1999): Tailored to individual differences for fairness.
- **Contextual Ethical Consideration** (Barry, 1965): Reflecting specific circumstances in judgments

Beyond the utilitarianism: other justice theories

Egalitarianism and Sufficientarianism theories

CBA is based on Utilitarianism theory, which aims to maximize total community benefits. Anyway, some other theories about justice could be applied to transportation, e.g. Libertarianism, Intuisionism, Egalitarism, Sufficientarianism Capability Approach and so on.

EGALITARIANISM

- Egalitarian theory states that **society should treat everyone equally** (Sen 1992; 2009).
- Moving away from journey-time savings as the primary valuation method and **towards accessibility to basic services.**
- Egalitarian theories are particularly advantageous in supporting policies that aim to **achieve equal accessibility.**

SUFFICIENTARIANISM

- Sufficientarianism **prioritizes basic needs** and overall well-being for all individuals up to a minimum threshold.
- It aims to ensure access to an **adequate standard of living**, promoting social justice and equality.
- Sufficientarianism provides an ethical justification for developing policies that provide a **minimum threshold level of accessibility to key destinations**

Beyond the welfare

The capabilities approach

Functions

Functions encompass the gamut of goods, services, activities, and positions that a person would like to consume, undertake, etc.

Capabilities

Capabilities represent the actual combinations of functions that a person can achieve and accomplish.

Capabilities approach

Capabilities and Transportation

- Define capabilities and desired goods/services in transportation decision-making.
- Assess the project's impact on mobility and access for diverse groups, especially disadvantaged populations.
- Establish minimum requirements for a full and free life.
- Address disputes over minimum thresholds.
- Adapt benchmarks to local conditions in socially diverse contexts.

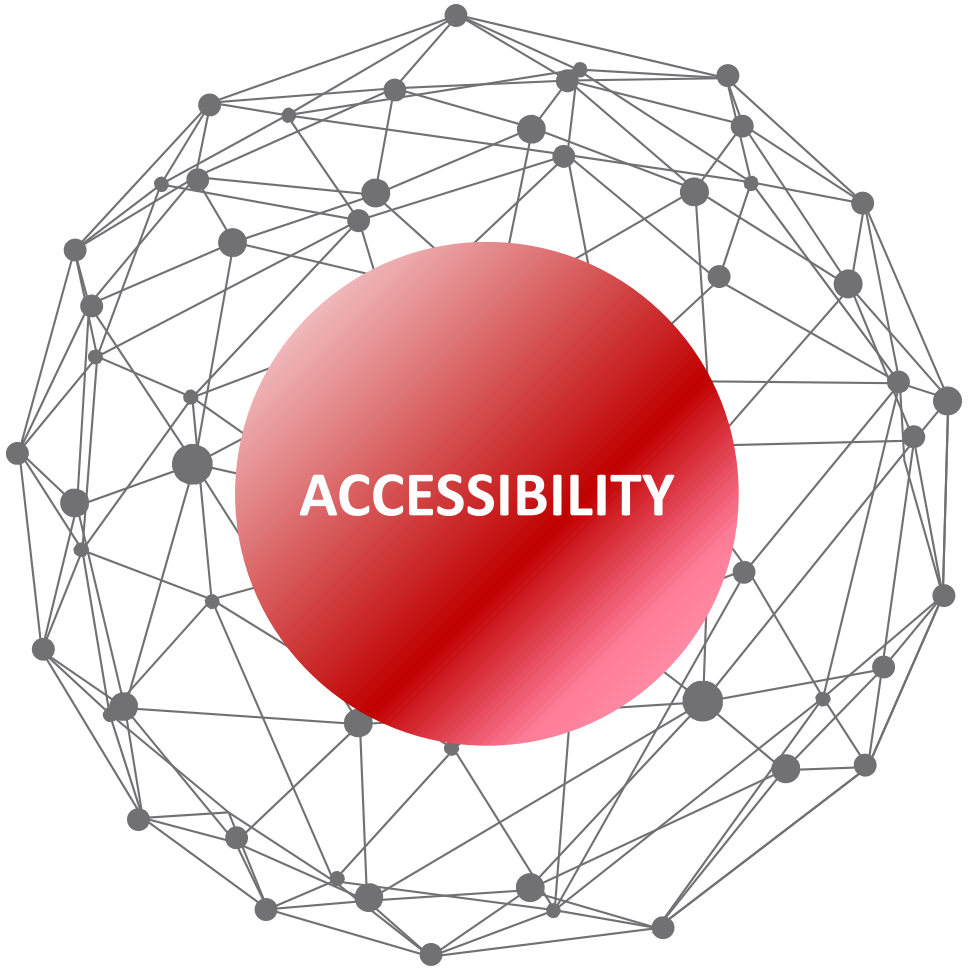
Capabilities and CBA: stages

1. Specify desired capabilities and functions for achievement.
2. Determine minimum conditions for dignified living, focusing on disadvantaged individuals in the region.
3. Design a project that effectively aligns with the approach's goals.

Prioritize desired results and determine means to achieve them, instead of solely focusing on infrastructure alternatives.

Emphasize optimal alignment with justice goals, rather than solely seeking the infrastructure project with the highest justice outcomes.

Accessibility in the equity and capabilities approach



- *Transport equity involves the **equitable distribution of transport accessibility among different social groups** and individuals (Van Wee and Roser, 2013).*
- *The utilization of the justice framework enables the reinterpretation of **transport equity as the impartial allotment of accessibility to attain parity in social prospects** (Bruzzone et al., 2023).*
- ***Accessibility** should be evaluated not only in terms of physical access to destinations but also **in terms of the opportunities and capabilities that transportation provides individuals to participate fully in society**.*

CBA and social implications: methods

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Methods to assist CBA

Ex-Ante		
Method	**Type**	**Family**
Analytic Hierarchy Process	Qualitative Quantitative	MCA
Social Life Cycle Assessment	Qualitative	LCA
STAR	Qualitative	Combination of CBA and MCA
Wider Economic Impact	Qualitative Quantitative	IAM
Spatial Impacts Analysis	Qualitative	IAM
Partial/ Spatial Equilibrium Model	Quantitative	Equilibrium models

Ex-Post		
Method	**Type**	**Family**
Gini Index/ Palma Index Suits Index/Atkinson Index	Quantitative	Index
Percentile Ratio	Quantitative	Index
Coefficient of Variation	Quantitative	Index
Gravity Indicators	Quantitative	Index
Potential Accessibility Index	Quantitative	Index

Note: MCA: Multi-criteria-Analysis, LCA: Life Cycle Assessment, IAM: integrated assessment model

Conclusions and Future Directions

- The review of literature on the social implications of Cost-Benefit Analysis (CBA) highlights the **importance of considering broader societal factors** beyond economic metrics.
- The literature emphasizes the need to incorporate **social equity, distributional impacts, and non-monetary** dimensions when assessing the social implications of projects.
- Various approaches, such as the capabilities approach, have been proposed as valuable tools for capturing these social dimensions in CBA.
- By integrating these insights into decision-making processes, policymakers and practitioners can promote more inclusive and equitable outcomes, ensuring that the **social implications of projects are adequately addressed.**
- Moving forward, further research and collaboration are essential to **refine and enhance the methodologies used in social impact assessments within the CBA framework**.

Thanks for your attention!

Any questions?

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