

Economic Impacts of Transportation Investments

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Outline

- **taxonomy of economic impacts**
- **conventional methods of assessment**
- **dynamic impacts**
- **special issues for Tren Urbano**

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Two views of economic benefits of transportation infrastructure

- improve efficiency of transportation services
faster, better, cheaper
- promote and enhance economic development goals
economic growth
quality of life
equity / economic justice
removal of impediments

Two views of the function of transportation systems

- enhance mobility
- enhance accessibility

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Taxonomy of economic impacts

Ways of classifying impacts

by project stage

- *project impacts*: arising from the infrastructure construction project
- *service impacts*: arising from the provision of transportation services

by incrementality

- *generative impacts*: new benefits arising from investment
- *distributional impacts*: locational shift
- *transfer impacts*: financial transfer among people/institutions

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Two Way Classification of Transit Benefits

	Service	Project
Generative	User Benefits External Benefits - pollution - congestion Induced Economic Growth - productivity - labor matching - agglomeration Parking reduction	Skills creation "Technology push"
Distributional (locational)	Land development (?) local competitiveness	Construction employment/income (direct and indirect)
Transfer	O&M employment/income Property tax revenue	Construction employment/income (direct and indirect)

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Conventional Methods of Assessment

Input-Output Analysis for estimating total income from construction activities (multiplier):

input requirements \Rightarrow input-output model \Rightarrow total impact

Total impact:

- *direct*: project input purchases
- *indirect*: inputs needed to produce inputs
- *induced*: recirculation of wage income

For example, each \$1 spent on Tren Urbano project \$2.15 in total income is generated. (Tren Urbano EIS)

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Estimating service benefits from a new transit alternative

Some basic questions:

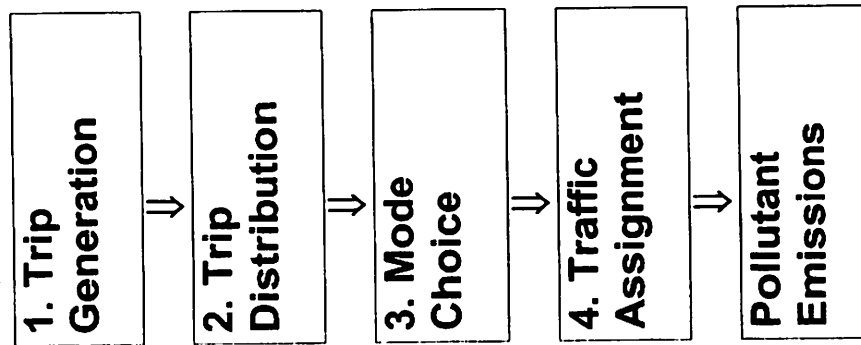
- How many people will use the new service?
- How will it affect their travel time?
- How will it affect the travel time of non-users?
- What effect will it have on pollution, accidents?
- How much revenue will it generate?

To answer these questions, you need 2 things:

- travel survey
- travel demand model

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Four-Step Travel Demand Model



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Outputs of Travel Demand Model

- number using new service
- their travel times
- impact on travel times of non-users
- impact on emissions

Shortcomings of this approach

- land use is exogenous (integrated models)
- focus on demand for trips rather than transportation service or accessibility (activity analysis)
- inability to capture changes in behavior or perceptions

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Cost-Benefit Analysis

Benefits

Benefits to travelers (cost savings, time savings, reduced accidents)

External Benefits (pollution reduction, global warming, safety)

Fare Revenue

Cost

Capital cost

Operation and Maintenance Cost

Both costs and benefits are discounted according to the period in which they occur.

Bottom line: Benefit / Cost > 1?

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Shortcomings of Cost-Benefit Approach

- user benefits other than time and cost savings often neglected
- time is treated as generic variable
- social benefits frequently neglected
- need to monetize environment, safety, etc.
- long-term benefits (land use) have minor effect due to discounting
- benefits stressed are those most easily quantified
- reduction of analysis to a single ratio gives false impression of precision

Alternative method: Total Cost Analysis

- combines user and provider costs for all alternatives
- assumes discretion of decision-maker

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Other Approaches

Econometric models: broader range of impacts, but heavy data requirements

Comparison studies: simple and intuitive, but hard to control for all factors

Expert opinion/ focus groups: less precise, but may be best for defining the full set of potential benefits

Development support analysis: instead of measuring benefit of transportation investment, measures benefit of things made possible by transportation investment

Most appropriate method(s) may depend on the type of benefits anticipated and the original motivation for the investment.

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Dynamic Impacts:

Effects of transportation investment that change the underlying structure of travel demand and other economic relations

The Transportation Land Use Connection

Transport Infrastructure ↔ Accessibility Patterns ↔ Land Use Patterns

Outcomes of recent trends

- increased land consumption
- increased driving
- increased public service cost
- economic isolation of low income

Why has this been overlooked?

- land use change is a slow and complex process
- discounting

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Other dynamic impacts of transportation infrastructure choices

Creation and destruction of civic space

- reduced social cohesion
- cutting off traditional channels for economic mobility

Effects on perceptions, preferences, and behavior

- existence of high quality transit option may change individual preference ordering of commuting options
- this in turn may affect preferences for social activities, retail, etc.

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Special Issues for Tren Urbano

- local multiplier effects of Tren Urbano vs. auto travel
- relative cost and time benefits of Tren Urbano vs. Highway Expansion
- long-term benefits of expertise developed during project construction
- impact on spatial patterns of accessibility and real estate values
- potential for Tren Urbano to extend tourism benefits more broadly in the San Juan Metropolitan Area
- potential for transit oriented development in new suburbs
- potential agglomeration in high order service activities
- gentrification and affordable housing in station areas

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