

Transit Benefits

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Basic View of Benefits

- Benefits can be viewed as those consequences that are valued by some segment of the population.
- Benefits exist because people believe they are important, whether or not they can be measured.

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Issues in Benefits Measurement

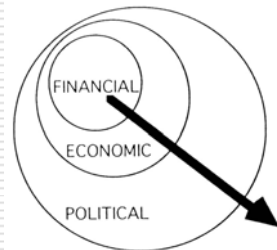
- Perception vs. measured benefits
- Internal shifts, transfer payments
- Double counting
- Valuation on a common scale
- Uncertainty in estimates
- Success may not show up as a positive benefit



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Viewpoints

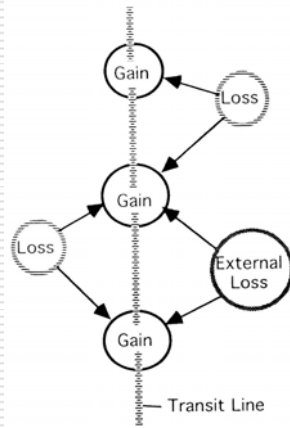
- Financial view of benefits
 - Recover benefits as income
- Economic view of benefits
 - Willingness to pay, substitute money for benefit
 - No easy way to recover benefits (time savings)
- Political view of benefits
 - Choices by elected officials reflect community valuation of benefits



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National vs. Regional vs. Local

- As the geographic scope is increased, shifts between areas become internal and may no longer be viewed as benefits.
- Is it a true gain or merely a shift?



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Considerations

- Definition of the null alternative
 - Benefits are found from a comparison of the world with an alternative vs. the world without the alternative.
 - What would the existing system look like if it was operated at its best?
- Perceived vs. measured benefits
 - Benefits occur because people believe them to occur
 - Difficult to measure, especially community prestige issues.

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Technical issues

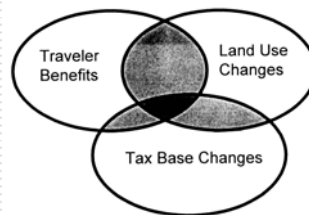


- Size of the universe
 - Relative measures (percentages) depend on how large an area you include (the denominator) and can be misleading
- Aggregation issues
 - Linear sum of measures assumes no relationships between terms
 - Scaling of data (valuation) can be done different ways and give different results

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Double Counting

- Double counting
 - Will occur whenever attempts to combine several measures into a single number.
 - Travel time savings land value changes and tax base changes are all related and overlap.
 - Accident savings, operating costs, fuel taxes, energy savings, pollution effects are interrelated and depend on amount of travel
- The simplest way to avoid double counting is to not combine benefit measures



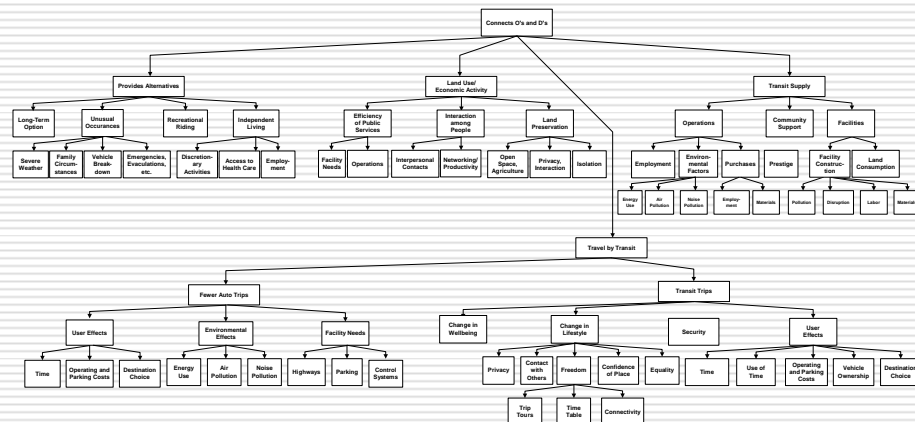
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Transit Benefit Tree

- ❑ Goal to provide a structure to understand the benefits of transit
- ❑ The benefits tree: Shows how benefits are related and can be used to avoid double counting
- ❑ Transit service fundamentally connects origins and destinations, as a result of that, other consequences occur
- ❑ See also, TCRP report 78: Estimating the Benefits and Costs of Public Transit Projects: A Guidebook for Practitioners

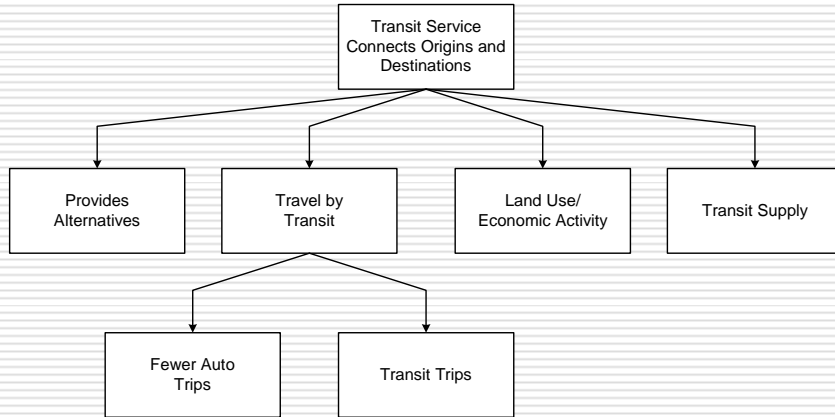
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As a result of connection between origins and destinations, these consequences occur ...



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The Benefits Tree - simplified



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Categories of Benefits

- Transit traveler benefits
- Benefits to users of other modes
- Option value
- Land use and economic effects
- Transit supply



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Transit Traveler Benefits

Direct User Benefits

- Time, use of time
- Operating and parking costs
- Vehicle ownership
- Destination choices

Transit Traveler Benefits

Effects on Lifestyle

- Privacy, contact with others
- Freedom of schedule, trip tours
- Confidence of place
- Equality
- Security

Benefits from Vehicle Ownership Avoidance

- ❑ If a person or household can reduce the need to own additional vehicles, the effect can be substantial
- ❑ Typical cost of owning, repairing, and insuring one vehicle per year is \$3000 -\$5000
- ❑ Example:
 - Milwaukee County Transit has a daily average ridership of 180,000 or about 90,000 people.
 - If 2/3 are captive users (with no car available), the yearly benefit is approximately \$240 million, vs. \$100 million in public costs to operate the system.
 - Benefit/cost ratio = 2.4 from this alone.
 - Additional benefits from fuel savings, parking, etc.

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Auto System Benefits from Transit

- ❑ User benefits
 - Time savings because of system efficiency (walk, wait, travel, transfer)
 - Operating and parking cost savings
 - Destination choices
- ❑ Environmental effects
 - Energy use
 - Reduced emissions that lead to air pollution
 - Reduced noise levels
- ❑ Facility cost savings
 - Highways
 - Parking
 - Control system



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Benefits from Transit as an Alternative – Option value

There is a benefit of transit if it exists and it is not used by an individual, this is known as the option value, an option to use something is a benefit even if it is not used.

Long Term Option, Unusual Occurrences

- Severe weather
- Family circumstances
- Vehicle breakdown
- Emergencies: Evacuations, etc.

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More option value benefits

Recreational Riding

Independent Living

- Discretionary activities
- Access to health care
- Reduced cost
- Employment
- Welfare



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Land Use and Economic Benefits

- Land use changes are a result of travel time or cost savings and economists would argue that to include them separately would be a double counting of benefits
- Nonetheless, the presence of transit may lead to more efficient land use patterns which can lead to other benefits

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Land Use and Economic Benefits

- Efficiency of Public Services
 - Facility needs
 - Operations
- Interaction Among People
 - Interpersonal contacts
 - Networking/Productivity
- Land Preservation
 - Open space, agriculture
 - Privacy, interaction

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Transit Supply Benefits- 1

Since a transit system exists, there are effects, positive and negative that result from the presence of the organization

Operations

- Employment
- Environmental Effects
- Energy use
- Air pollution
- Noise pollution

Purchases

- Employment
- Materials



Transit Supply Benefits- 2

Community Support

- Prestige
- Facilities

Facility construction

- Pollution
- Disruption
- Labor
- Materials

Land consumption

Consumer Surplus

- The area beneath a demand curve indicates how much travel would occur at different prices vs. actual travel.
- Some users are willing to pay more than the price charged

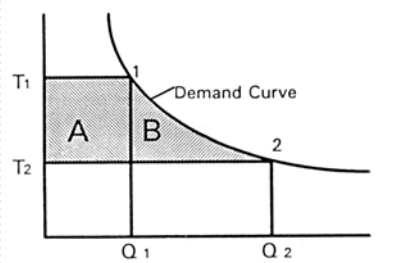
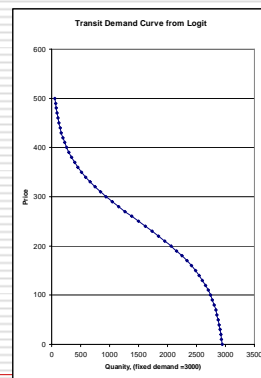
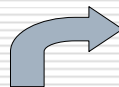
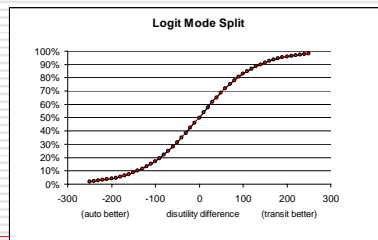


Figure H.1. Calculating net consumer surplus from a demand curve.

Demand curve

- The logit mode split curve provides a demand curve for transit when tipped sideways.



Enhanced Consumer Surplus/Disutility Approach

- With 'good' travel forecasting methods, consumer surplus can be measured by using the parameters of the mode split model
 - Savings in travel time, wait time, access time, transfers, costs of travel and mode bias by trip purpose and for each mode
 - If a person chooses a different travel behavior, there must be a net positive benefit

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FTA New Starts Analysis

- Uses an enhanced consumer surplus approach to assess user benefits
- User benefits consist of changes in the following components of trip characteristics:
 - In-vehicle time
 - Walk and wait time
 - Number of transfers
 - Mode specific constants

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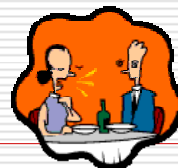
Sources of Information

- Beimborn, Horowitz, Schuets and Gong, Measurement of Transit Benefits, Report to Federal Transit Administration, June 1993, <http://www.uwm.edu/Dept/CUTS//benefits/index.htm>, also summarized in TRB Record 1496
- TCRP Report 78: Estimating the Benefits and Costs of Transit Projects: A guidebook for Practitioners. 2002, Order from: <http://www.tcrponline.org/bin/publications.pl>

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Acknowledgements

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