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.
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

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
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?

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.
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

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
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

As a result of connection between origins and destinations, these consequences occur ...
The Benefits Tree - simplified

- Transit Service Connects Origins and Destinations
  - Provides Alternatives
  - Travel by Transit
  - Land Use/Economic Activity
  - Transit Supply
  - Fewer Auto Trips
  - Transit Trips

Categories of Benefits

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

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
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 know 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.

More option value benefits

Recreational Riding

Independent Living

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

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
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.

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

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
Sources of Information


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