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TCRP Report 95 Series – Chapter 17
Traveler Response to Transit Oriented Development

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Presentation Outline

- Introduction
- Types of TOD
- Traveler Response Summary
- End Notes
TCRP Report 95 Series – Chapter 17
Traveler Response to Transit Oriented Development

TCRP Report 95 series identified as one of the “most essential transportation publications” in a national survey of transportation professionals conducted by The Urban Transportation Monitor

Sources: As quoted in February 3, 2006 issue. Cover images from Transportation Research Board web site.
Project Overview
What the Handbook IS

- Travel demand impact manual
- Sourcebook on results of transportation actions
- Survey of information on usage and feasibility
Traveler Response Summary

Roadway transportation is a locomotion relative to utilities, and no one has been to the application of variable or peak-period pricing. In the United States, projects only began to take hold after the HOV lanes started demonstrating their value in the 1980s. Variable pricing clearly impacts traveler behavior. When observed traveler sensitivities to value pricing are expressed as price elasticities, most fall in the range of -1 to -2, similar to but marginally less than sensitivities to travel time. Since the price adjustments made by travelers in response to pricing include changes in mode choice, time of travel, mode choice, trip frequencies, and selection of activities and destinations, some choice adjustments are predominant when few highway alternatives are available. Long-term effects are less certain, and road value pricing may influence not only further decisions about trip making, but potentially also sustainable ownership and location choice for residences, employers, and activities.

The United States has seen public interest in implementing available pricing programs, and they have not been common internationally. The major example of longest standing is the Singapore area Road Pricing Scheme (now Electronic Road Pricing), in effect since 1975, which is expanded in an AM peak-period auto entry fee increased to almost 3 percent of a car-owner’s household average income, with 4 plus occupants free, or the pricing-reducing traffic entering the city by over 60 percent and greatly increased transit use and carpools. Enhancements over the years have kept the system’s central traffic under control. These fees have risen for a decade or more across areas £1.00 to £1.50 during weekday hours for crossing a ring around their central area. The traffic reductions obtained by diverting some travelers to other modes or hours was on the order of 2 to 3 percent. Early results from a new study about 40 percent reduction for covering travel between 7:00 AM and 6:00 PM indicate a 20 percent reduction in covering traffic. No U.S. area-scale projects are in place.

Some North American examples of corridor pricing have been implemented, most are not commonality that their evaluations are fully complete. Typically, pricing was already in place, and the value pricing was added as one of many discount or peak-period price changes. A study of toll demonstrations in Lee County, Florida, has shown a 20-50 percent decrease in peak period traffic during down changes enough to reduce AM peak-hour traffic of fragile drivers by 7 percent with a much lesser effect on the PM. A newly initiated off-peak 10% discount of $5.00 (28 percent relative to peak) F10 discount caused from New Jersey to New York, may be producing considerable peak hour reductions. In all the cases, U.S. and international, there is a great sensitivity of drivers to price, and the expected effects of shifting traffic away from periods with the highest changes has been considerably observed.

The United States has seen major projects of the large pricing variety. The SR 95 Express Lanes system and I-15 HOV Lanes project in California, and the Indiana I-65 HOV Lanes project in Indiana. Pricing has been successfully used to maintain good levels of service on the primary lanes while encouraging their use in the case of the HOV Lanes, and in financing and construction, and operation in the case of the SR 95 tollway. Only a minority of taxing commuters to use the special lanes regularly, as compared to only occasionally to use or occasionally to use travel on adjacent free lanes. The I-15 Toll facility has not demonstrated any of the HOV Lanes by HOV Users, indeed, I-15 Express lanes usage by HOV Users grew by over 20 percent over "before" volumes during demonstration years. Travel use has not been adversely affected, but questions remain concerning impact on after implementation, traffic volume data comparing efforts at the bridge and the basic road unchanged. This is best explained by the to the discount was small relative to the total change in the data. The discount level was about 15 percent of the total change, which was less than 5 percent of the total change, and it was about 15 percent of the total change. At the bridge, where an 18 percent increase to 10% AM discount period, associated with a 7 percent 2:00 to 3:00 AM. In surveys, approximately 30% said that they had altered their travel and found the change, and 30% indicated that they took the trip. Across the bridge. Of these making travel, 50% changed their route, and the change, and 30% indicated that they took the trip. The change, and 30% indicated that they took the trip.
Project Overview
What the Handbook Is NOT

- Best practices manual
- Implementation manual
- Design or operation manual
Handbook Organization
Topic Area Chapter Format

- Overview and summary
  - Objectives of [the system change]
  - Types of programs
  - Analytical considerations
  - Traveler response summary
- Response to [the system change]
- Underlying traveler response factors
- Related information and impacts
- Additional resources
- Case studies
- References
Presentation Outline

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## Types of TOD
### Definitional Dimensions

We selected three dimensions that significantly characterize TODs and along which traveler response varies:

- **Regional context**
  - City Center ↔ Suburban

- **Land use mix**
  - Less Diverse ↔ More Diverse

- **Primary transit mode**
  - Heavy Rail, Commuter Rail, Light Rail
  - Bus Rapid Transit, Traditional Bus
Types of TOD
TOD Index

We developed a TOD Index

- A construct for potentially characterizing “TOD-ness” in models

- Divided attributes into “essential indicators” and “supporting indicators”

- Case study presented with very basic construct
Types of TOD
TOD Index

- Among the key indicators
  - Centrally located transit with walking distances no more than 1/4 to 1/2 mile
  - Superior walkability with small blocks and pedestrian traffic management priority
  - Extended hours of highly-reliable transit service at 5 to 15 minute intervals
  - Land use mix to meet daily needs paired with good transit connectivity to other activities
  - Density sufficient to support cost-effective transit, retail services, and infrastructure
  - Managed parking with reduced supply relative to standard development
Presentation Outline

- Introduction
- Types of TOD
- *Traveler Response Summary*
- End Notes
Traveler Response Summary
Ridership Gains from TOD

- TOD concentrates trip ends around transit stations resulting in more transit ridership even if TOD transit mode shares were the same as those produced by conventional development.

- TOD transit shares are typically higher – and automobile mode shares are lower – than for non-TOD due to the special transit-usage-supportive attributes of TOD.

- Few actual examples of ridership gains that can be clearly attributed to TOD implementation because of the many sources of ridership and multiple confounding factors typically present.

- We provide examples in the chapter from many areas and transit systems in the U.S.
Traveler Response Summary
Mode of Transit Access

- TOD positions large numbers of transit riders close enough to their transit stop that they can and will walk to it in preference to auto use for the access mode

- The greater the concentration of transit trip generation within station areas, the higher a station’s overall walk access share will tend to be

- TOD residents were found to be generally associated with lower automobile ownership rates
Traveler Response Summary
Vehicle Trips and VMT

- The degree to which TOD can reduce vehicle trips and vehicle miles of travel (VMT) from a regional perspective is poorly established.

- The seemingly ideal measure would be the change in travel choices made by individual TOD residents when they move and settle in, but very few studies were encountered that provide comprehensive observations.

- VMT itself has not generally been an observable measure (usually model derived) creating further problems with drawing conclusions in this area.
Traveler Response Summary

Influencing Factors

- Several interactive factors contribute to traveler response
  - Land use and site design
  - Automobile ownership
  - Relative transit and highway accessibility
  - Parking supply
  - Parking pricing
  - Transit support
  - Self-selection of residents

- More than just good transportation policy required to develop high-quality and effective TOD
Traveler Response Summary
Self-Selection and TOD

- Attraction of “transit oriented residents” to TOD housing has been dubbed “self selection”

- Could higher transit mode shares normally observed in TODs simply result from self selection? If so, then TOD would not cause increased transit use from a regionwide perspective

- Modest proportions of TOD residents surveyed made their housing choice with good transit use opportunities as one of their top reasons

- For there to be no increase in regional transit use going forward, the transit usage of TOD individuals must — on average — not change overall with the level of TOD

- TOD resident self-selection could be a positive force in reducing regional auto travel and enhancing ridership
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End Notes

- **Chapter 17 Authorship**
  - Lead Authors – Jay Evans, Dick Pratt
  - Contributing Authors – Andrew Stryker, Rich Kuzmyak

- **Getting the Handbook**
  - TRB website – Type “TCRP Report 95” in search box
  - Free download of PDF versions
  - Purchase hardcopy from TRB Bookstore
  - Free hardcopy via APTA’s www.tcrponline.org
  - Chapter 17 was published August 1, 2007
Additional Information
Handbook Usage
Important Considerations

- Concept of elasticity
- Degree-of-confidence issues
- Impact assessment methods
- Demographic considerations

RRD #61 (Interim Chapter 1)

Transit Cooperative Research Program
Sponsored by the Federal Transit Administration

TOC:
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Traveler Response to Transportation System Changes:
An Interim Introduction to the Handbook

The objective of this project is to develop an understanding of traveler behavior that can be used to predict and explain the demand for travel as it is affected by transportation system changes and the built environment. This provides a tool for decision-making in transport policy development and evaluation. This interim introduction is published in TCRP Report 16.

This interim summary for the Traveler Response Handbook, contains the pertinent schedule and information availability, provides guidance to the. The Handbook uses and includes the Handbook appendix 3, which contains the travel-time demand and travel-demand determinant, provides guidance to the traveler.

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Chapter 1 in the first of 99 summary chapters to be published in TCRP Report 16.
Handbook Organization
General Sections and Topic Area Chapters with Status

- Ch 1 – Introduction (with Appendices A, B)
  - Multimodal/intermodal facilities
    - Ch 2 – HOV Facilities
    - Ch 3 – Park-and-Ride and Park-and-Pool
  - Transit facilities and services
    - Ch 4 – Busways, BRT, and Express Bus
    - Ch 5 – Vanpools and Buspools
    - Ch 6 – Demand Responsive/ADA
    - Ch 7 – Light Rail Transit
    - Ch 8 – Commuter Rail
  - Public transit operations
    - Ch 9 – Transit Scheduling and Frequency
    - Ch 10 – Bus Routing and Coverage
    - Ch 11 – Transit Information and Promotion
Handbook Organization
General Sections and Topic Area Chapters with Status (continued)

- Transportation pricing
  - Ch 12 – Transit Pricing and Fares
  - Ch 13 – Parking Pricing and Fees
  - Ch 14 – Road Value Pricing

- Land use and non-motorized travel
  - Ch 15 – Land Use and Site Design
  - Ch 16 – Pedestrian and Bicycle Facilities
  - Ch 17 – Transit Oriented Development

- Transportation demand management
  - Ch 18 – Parking Management and Supply
  - Ch 19 – Employer and Institutional TDM Strategies