Methodological Considerations in Assessing the Urban Economic and Land-Use Impacts of Light Rail Development

Lyndon Henry
Transportation Planning Consultant
Mobility Planning Associates
Austin, Texas

Olivia Schneider
Researcher
Light Rail Now
Rochester, New York

David Dobbs
Publisher
Light Rail Now
Austin, Texas
Evidence-Based Consensus: Major Transit Investment Does Influence Economic Development …

Valley Metro: Development along light rail tops $8 billion

… But by how much? How to evaluate it? (No easy answer)

Screenshot of Phoenix Business Journal headline: L. Henry
Study Focus: Three Typical Major Urban Transit Modes

- **Light Rail Transit (LRT)**
  - Rapid
  - Streetcar

- **Bus Rapid Transit (BRT)**
Why Include BRT?

• Particularly helps illustrate methodological issues

• Widespread publicity of assertions promoting BRT has generated national and international interest in transit-related economic development issues
Widely publicized assertion:

“Per dollar of transit investment, and under similar conditions, Bus Rapid Transit leverages more transit-oriented development investment than Light Rail Transit or streetcars.”

Institute for Transportation and Development Policy (ITDP)
Key Issues in Evaluating Transit Project’s Economic Impact

- Was transit project a **catalyst** to economic development or just an **adjunctive amenity**?
- Other salient factors involved in stimulating economic development?
- Evaluated by analyzing preponderance of civic consensus and other contextual factors.
Data Sources: Economic Impacts

- Formal studies
- Tallies/assessments by civic groups, business associations, news media, etc.
- Reliability evaluated by preponderance of community endorsements, contacts with civic leaders, media reports/analyses, extent of civic consensus, etc.
Data Sources: Features and Performance of Installed Projects

- National Transit Database profiles
- APTA quarterly ridership reports
- Transit agency fact sheets, special analyses, civic reports, news media reports, etc.
Commonly Used Methods to Assess Economic Impact

- Typically undertaken by local entities
- Special focused research study
- Watershed before-after study: Tally of economic development before vs. after project completion, within watershed distance from line (typically 0.25-0.5 mile)
Return on Investment (ROI) Calculation

\[
\text{ROI (\%)} = \frac{\text{Total Value of Economic Development Attributable to Project}}{\text{Total Capital Investment in Transit Project}} \times 100
\]
# Project Cases Studied (15)

<table>
<thead>
<tr>
<th>Rapid LRT</th>
<th>Streetcar LRT</th>
<th>BRT</th>
</tr>
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<tr>
<td>Portland MAX</td>
<td>Portland Streetcar</td>
<td>Cleveland HealthLine</td>
</tr>
<tr>
<td>Dallas DART</td>
<td>Cincinnati CB Connector</td>
<td>Boston Silver Line (Washington St.)</td>
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<td>Salt Lake City TRAX</td>
<td>Detroit QLine</td>
<td>Kansas City MAX (Main St.)</td>
</tr>
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<td>Hudson-Bergen LRT</td>
<td>Kansas City KC Streetcar</td>
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<tr>
<td>Minneapolis/St. Paul (Twin Cities) METRO</td>
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<td>Phoenix Valley Metro</td>
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<td>Los Angeles Gold Line (Foothills)</td>
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</table>
Project Cases Studied
Route Lengths

Route Lengths
(Miles)

Rapid LRT
Streetcar
BRT

Portland  Dallas  Salt Lake City  Hudson-Bergen  Minneapolis  Los Angeles  Phoenix  Portland  Cincinnati  Detroit  Kansas City  Cleveland  Boston  Kansas City  Grand Rapids
Project Cases Studied
Capital Investment Costs

Capital Investment Costs
($Millions)

Rapid LRT
Streetcar
BRT

14TH NATIONAL LIGHT RAIL & STREETCAR CONFERENCE
Salt Lake City TRAX — Comprehensive independent study included all rail transit modes in region

Dallas LRT — Highly focused joint research study by University of North Texas and DART
Cases Studied
Economic Impact Estimation Issues

- Cincinnati Streetcar— Assessment via local publication survey of business owners and developers; project still in process of stimulating development
- Kansas City Streetcar — Watershed-type tally by Downtown Kansas City organization adjusted to 80% to account for other influences on economic development
Cases Studied
Economic Impact Estimation Issues

- Cleveland HealthLine BRT — Watershed-type tally by transit agency adjusted to 42% to account for other specific significant influences on economic development

- Boston Washington St. BRT — Watershed-type tally by Project Evaluation adjusted to 20% in respect of other much stronger influences on economic development
Cases Studied Economic Impact Estimation Issues

- Kansas City Main St. BRT — Watershed-type tally reported by ITDB adjusted to 5% reflecting overriding role of pre-existing, ongoing downtown development boom

- Grand Rapids Silver Line BRT — Ancillary economic development “nonexistent”
Part 2

Presented by Olivia Schneider
Cases Studied
Economic Impact Assessment Results

Value of Engendered Economic Development
($Millions)

- Portland
- Dallas
- Salt Lake City
- Hudson-Bergen
- Minneapolis
- Los Angeles
- Phoenix
- Portland
- Cincinnati
- Detroit
- Kansas City
- Cleveland
- Boston
- Kansas City
- Grand Rapids

Rapid LRT
Streetcar
BRT
Cases Studied
Economic Impact Assessment Results

ROI (%) — Economic Development Benefits of Transit Project Investments

- Streetcar
- Rapid LRT
- BRT

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Cases Studied
Economic Impact Assessment Results

- Detroit QLine — Highest ROI at 3,889%
- Ridership 3,000 per weekday
# Methodological Observations

## Types of Evidence

<table>
<thead>
<tr>
<th>Types of Evidence</th>
<th>Our adjustments or requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ridership</td>
<td>Weekday average</td>
</tr>
<tr>
<td>Transit construction cost ($)</td>
<td>Converted to 2018$</td>
</tr>
<tr>
<td>New construction near transit project</td>
<td>Construction begun since project was announced</td>
</tr>
<tr>
<td>Total investment near transit project</td>
<td>Within (\frac{1}{4}-\frac{1}{2}) mile of transit line (ideally transit stop)</td>
</tr>
<tr>
<td>Residential property values</td>
<td>Via tax assessment</td>
</tr>
<tr>
<td>Commercial property values</td>
<td>Various sources, including developers</td>
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Methodological Observations
Methods of Measurement

Watershed

• A tally of all construction development occurring within a given radius of the transit project

• Some cases: Before-After methodology
  – “Before” indicates before official announcement of transit project, to account for anticipatory effects

• Causal relationship between nearby development and transit may be weak
Portland MAX LRT — Spatial-analysis model provides higher degree of accuracy (more details in our paper)

— Development and redevelopment near stations measured through tax assessments

Analysis covers 20+ years of development
Methodological Observations
Methods of Measurement

- Hudson-Bergen LRT — Economic benefits such as positive impact on residential property values
- Spatial analysis methodology compared tax-assessments of property values
- Special attention to excluding areas where impact potential was limited, i.e. areas already well-served
- Analysis limited to residential property values, which do not provide a comprehensive measure for ROI
Los Angeles Foothills LRT — Transit construction agency pursued aggressive policy to foster TOD and economic development by encouraging regional collaboration/coordination among various public and private stakeholders.

Three-step methodology

- "During" measure of follow-through on recommended uses
- "Before" construction assessment of land-use potential near stops, with recommendations
- "After" measure of actual development
Methodological Observations

Contextual Factors

- Age of System
  - Question of exposure
- Connectivity to other systems
  - Impact potential
- Projects envisioned as LRT, realized as BRT
- Funding sources
  - Does funding source impact desired goals?
Methodological Observations
Mode-Related Factors

• Roadway alignments vs. “abandoned or lightly used railway alignments” benefit from different methodologies for ROI

• Transit projects part of corridor revitalizations, so the transit mode itself is an element of the plan

• Property developers value stability of transit infrastructure – but is repurposed street lane, or bus service in mixed traffic, an asset as stable as tracks and other infrastructure of LRT?
Methodological Observations
Mode-Related Factors

• LRT and BRT are not direct comparisons
  – LRT on average exhibits 3x the ridership levels of BRT
  – Other metrics such as carbon emissions, reduction in road miles traveled, or mobility performance are relevant

• Cities with BRT and LRT systems in them offer natural comparisons
Methodological Observations
Voices in Research

- What are the motivations of the authors of the reports?
- Developers produce analysis but may offer biased calculations
Recommendations

- Develop basis for determining independent evidence of transit development effects
- Avoid ascribing credit for development to nearby transit project automatically
  - Consider comparison groups for study
- Create data-based methodological tool for establishing causal link in development
Further Research

- Standards for metrics
- Accuracy in measurement
- Feasibility of creating consistent ROI estimate standards
For More Information

Lyndon Henry  
512.441-3014  
nawdry@gmail.com

Olivia Schneider  
248.935-4919  
omdobbs@gmail.com

Dave Dobbs  
512.905-6237  
publisherlrn@gmail.com