

AN ASSESSMENT OF THE **CINCINNATI** **STREETCAR STUDY**

The Cincinnati Streetcar: Fast track to economic prosperity or slow boat to economic stagnation?

All over town, people are discussing and debating the prospect of a streetcar line for Cincinnati. Proponents say streetcars will attract more of the “creative class,” reduce our carbon footprint, and stimulate private investment in the urban core. Detractors say streetcars are merely tourist attractions that serve to drain public coffers and divert funding from more important needs like schools.

It’s difficult to know what to believe and it’s certain that the true impact of a streetcar line could only be tested if we build one.

So the primary question for a thoughtful person may be how to weigh the risks versus benefits of a streetcar for Cincinnati. That’s what this report was commissioned to do. UC’s Center for the City asked the Economics Center for Education & Research to evaluate the studies already on the table and to draw some conclusions on the validity of those studies. In short, to “check the math” on the suggested benefits and test their credibility. Read on for the conclusions drawn by center director George Vredeveld and his colleagues. As you read, you might consider these questions:

- Are the estimated costs and benefits reasonable and complete? Do they allow for uncertainties?
- Who will benefit from the streetcar and who will bear the costs? Will the community as a whole benefit?
- Does development of a streetcar system yield greater benefits to the community than other transportation investments?
- Is streetcar development in accordance with the city’s vision for its future?

Wherever you sit on the streetcar debate platform, we hope you will find this report informative. The Center for the City looks forward to providing similar analyses of other community issues in the future.

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INTRODUCTION

The recent proposal for construction and operation of a streetcar system in Cincinnati has created significant discussion and debate. To become well informed about the value of a streetcar system for Cincinnati could be a daunting task.

In response to the complexity of the debate issues, the Economics Center for Education & Research at the University of Cincinnati assessed the validity and accuracy of the various studies and critiques related to the streetcar proposal.

The first section of this report focuses on the HDR Streetcar Feasibility Study, which was commissioned by the City of Cincinnati. The second section looks at the experiences of various cities to evaluate possible impacts of streetcar in Cincinnati. The last section interprets those findings for decision-making purposes.

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SUMMARY OF HDR'S CINCINNATI STREETCAR FEASIBILITY STUDY

Types of Benefits

HDR conducted a benefit-cost analysis of a four-mile streetcar line in the City of Cincinnati. The study determined that the proposed streetcar system is expected to bring substantial economic benefit to downtown and Over the Rhine. These benefits can be summarized under two major categories, as shown in the table below.

Ridership Benefits

As the streetcar attracts passengers away from the use of personal vehicles, the system generates savings by reducing vehicle operating costs, accidents, emissions and traffic congestion. In addition, because the streetcar increases the mobility in the area, more people have access to affordable trips and social services. Both the cost savings and mobility benefits are directly generated by the ridership. Ridership benefits constitute approximately 10 to 15 percent of total benefits to the proposed streetcar system.

Economic Development Benefits

Streetcars are assumed to produce substantial economic development benefits due to private investment, which will result in property value appreciation and increases in the density of development. Based on the experiences from other cities this assumption is expected to apply to both residential and commercial properties. These development benefits constitute 85 to 90 percent of the total benefits of a streetcar system.

Comparison of Benefits and Costs

According to the HDR study, the present value of total benefits from the streetcar project is expected to be \$431.6 million. After deducting total costs, the present value of the average net benefits figure is expected to be \$315.8 million. The average expected benefit-cost ratio is 2.7. This means that the economic return over 35 years is expected to be 2.7 times greater than the original investment in the system.

Weighing benefits and costs is complicated by the fact that future outcomes are uncertain. To address the issue of uncertainty about the project, the HDR study uses a risk analysis framework. Within the framework, each value is calculated for two different levels: low risk (90% certain) and high risk (10% certain). The table below summarizes the projected benefits and costs for the period 2008-2042.

The risk analysis shows with 80 percent certainty that the net benefit will range between \$186.8 million and \$450.4 million. It also asserts that there is a 90 percent chance of a benefit-cost ratio above 1.6, and a 10 percent chance that it may exceed 3.9.

The HDR risk analysis suggests that, even using the conservative "low risk" numbers, the proposed streetcar system is economically worthwhile.

EVALUATION OF HDR STREETCAR FEASIBILITY STUDY

In evaluating the HDR study, three aspects were considered: the methodology employed in the analysis; the assumptions used; and the reasonableness of the findings.

Is Benefit-Cost Analysis a Reasonable Approach?

Benefit-cost analysis generally plays a major role in the evaluation of proposed urban rail projects. Most analysts accept this method as appropriate, but it does have limitations. As noted earlier, the study makes appropriate use of a risk analysis framework to address uncertainties associated with future costs and benefits. The study does not include a side-by-side comparison of alternatives, but it does employ sound economic analysis to present information for decision-makers.

Risk Assessment: The analysis uses a study period of 35 years, a reasonable term since most benefits occur well after investment. However, it is unrealistic to think long-term impacts can be known conclusively and precisely. As noted elsewhere in this report, the HDR study uses a risk analysis framework to address uncertainties associated with future costs and benefits. While using this approach, one should pay attention to the value range caused by high and low risks. The wider the gap, the more uncertain the situation is. In the the HDR study, the

BENEFITS (\$ millions)

	Range	Average
Ridership Benefits	\$36.9 to \$69.8	\$52.7
Economic Development Benefits	\$249.5 to \$509.1	\$378.9

BENEFIT-COST COMPARISON (\$ millions)

	Average	Low Risk	High Risk
Total Benefits	\$431.6	\$303.0	\$565.7
Total Costs	\$115.8	\$113.8	\$117.9
Net Benefits	\$315.8	\$186.8	\$450.4
Net Benefit-Cost Ratio	2.7	1.6	3.9

certainty level can be observed in the total benefits, for which the range (between high and low risk) is plus or minus 30% of the mean. Such ranges are not uncommon.

Alternatives: The HDR study does not discuss other investment alternatives that might be considered by the City of Cincinnati. It does use economic analysis to consider whether the anticipated future benefits outweigh the probable costs. A comparison with other types of investment would have been more valuable for citizens and community leaders, but this may have significantly increased the cost of the study, and it was not part of the requested analysis. Consequently, any comparison of investment options must be considered in other ways in the decision-making process.

Are Study Assumptions Well-founded?

Because the streetcar project is in its early stages, many uncertainties exist and many assumptions had to be made for the analysis. These assumptions, which are a practical necessity, constitute the primary limitation of the study. Numerous cost components are estimated, but the study gives reasonable and clear explanations for these assumptions in the appendices. Still, not all the assumptions associated with the benefits are as clearly explained, so it is somewhat harder to assess the overall potential benefits.

Evaluating the Assumptions: One of the main hypotheses of the study is that the streetcar will decrease the congestion in downtown (p. 7), mostly due to the switch from automobiles to transit. All the travel cost savings such as decreased pollution costs, decreased safety/accident costs, and decreased vehicle operating costs are considered “incremental” effects of this assumption. However, the ridership assumption foresees an increase

over the years, partially based on the fact that the streetcar will facilitate mobility. This combination of assumptions must be carefully considered so that benefits associated with new trips are not exaggerated.

Evaluating the Findings

Because the HDR study finds that about 90 percent of total benefits stem from economic development, assessing these benefits is particularly important. The study’s conclusion is based on evidence from other cities that the development of streetcar systems:

- leads to increased development density in their vicinity
- stimulates housing demand around stops, and
- causes greater appreciation in property values.

The risk analysis offers a reasonable way to handle the potential magnitude of these effects in Cincinnati.

Evaluating the Findings: The study estimates property appreciation in Cincinnati on the basis of experiences from other cities. The assumption is that the increase in property values will follow the same pattern as in those benchmark cities, but it is not clear to what extent these appreciation rates are applicable to the circumstances in OTR. The study suggests that transit access stimulates the demand for residential units located in the vicinity of transit stops and raises property market values. It is asserted that the appreciation attaches primarily to those properties within ¼ to ½ mile of a transit station. Similarly, another expectation is that transit development will increase land use density in its vicinity.

Some financial aspects of the streetcar proposal are not fully addressed. It would be helpful to have a more thoroughly

developed pro forma for the system’s operations, as this is a vital consideration for its long term viability. For example, ridership revenues generally cover no more than about half of the total operations costs, so careful planning needs to be given to funding operations.

Because the streetcar plan is in an early stage, it lacks certain details. In some cases, it is hard to evaluate the basis for particular assumptions. However, given the inevitable constraints for this type of analysis, the HDR study mostly draws a reasonable picture in terms of its assumptions.

EXPERIENCES FROM OTHER CITIES

Memphis offers what may be the best benchmark for Cincinnati because the condition of its urban core and the areas it connects are perhaps the most comparable to the situation in Cincinnati.

According to a 2006 presentation about the Memphis streetcar system, it is both “a circulator within the downtown area” and a connection between “the CBD and Medical District, the two largest employment centers in the region.”

Streetcar ridership was 530,000 in 2004, its first full year of operation, when 2.2 of the 6.7 miles were open. In the latest available annual data, the number of passenger trips was over 1,000,000.

Portland has had more research had more research and writing about its streetcar system than any other community. As a result, it may offer some useful insights about the likely effects of Cincinnati’s streetcar plan. When Portland launched its streetcar system in July 2001, they projected 3,000 riders a day. They exceeded that by 65 percent. Over the years, Portland has doubled the



size of the streetcar system and ridership now approaches 12,000 per day. The economic development along the line has been impressive (see chart on p. 5) generating billions of dollars in investment within two blocks of the line.

The Cato Study: Some critics of Cincinnati's streetcar plan have cited a 2007 Cato Institute study entitled, "Debunking Portland: The City That Doesn't Work." While the study is generally critical of Portland's transit system, the applications to the proposal for Cincinnati's streetcar plan are limited. Most of the Cato report deals with the metropolitan transit system, not streetcars. There are a few points that may have some relevancy.

First, the study observes that there is potential for overstating the cost-benefit ratios by double-counting benefits when there are multiple transit components and unjustifiably taking credit for some portions of nearby development (pp. 8-9). While the potential for this exists, we did not see evidence of it in the HDR report.

Second, the Cato study criticizes the use of tax increment financing (TIF) because it may divert funds and sap spending on schools and social services. The Cato study acknowledges that under TIF, existing property taxes collected are frozen and they are distributed, as before, to schools and other services. If property values increase, the additional taxes would be used, for a period of time, to fund the streetcar project. The question is what would have happened to property values without streetcars. If the values would not have increased, there is no diversion. If values would have increased without the streetcar project, TIF financing would create a diversion of taxes. Some states, including Ohio,

protect schools against this diversion by guaranteeing they will receive their share of tax revenues on any increases in property values.

Third, while the study is generally critical of Portland's transit system, it does identify particular benefits. Two benefits specified are the relief of downtown parking and traffic congestion and provision of a valuable means of transportation for workers in the urban core (p. 6).

Encouraging redevelopment: In 2005, Eric Hovee studied the impact of the streetcar on development in the areas around the system. Hovee determined that development prior to the 1997 announcement of the streetcar alignment ranged from 30% of the allowable density within one block of the alignment to 40% in areas three blocks and further away. By contrast, in the eight years after the alignment was announced, developers had built at 90% of allowable density within one block of the alignment, 75% within two blocks of alignment, and 40% in areas three blocks and further away.

This research offers strong evidence for increased development, density, and property values, but the magnitude of these impacts in Cincinnati will depend on local factors and the characteristics of the streetcar system.

Other communities across the country offer a considerable amount of anecdotal evidence, but little systematic research has been done. This is due in part to the relative newness of the concept and the limited amount of actual experience with modern streetcar system development.

Several important points do seem to be validated by widespread evidence.

- First, the fixed routes of streetcar systems induce or at least encourage more extensive and intensive development.
- Second, systems that link major activity centers (employment, shopping, and recreation) generally experience higher levels of ridership.
- Third, other revenues sources will be needed to supplement fares to cover operations costs.
- Fourth, streetcar systems produce benefits in areas such as environmental and density effects that are not always fully captured or valued in a benefit-cost analysis.

One subject that was not addressed in the HDR study is the benefit of creating a more livable urban core. *Next American City*, a quarterly journal about urban innovation, examined workforce development in Baltimore and noted that cities must invest in transportation in order to attract people back to the center city (Feb. 2003).

Economic development experts feel that "lifestyle" issues are becoming increasingly more important. The competition is heating up for attracting young professionals, often viewed as a demographic group that is essential to economic growth. Cities that create vital downtowns with residential, entertainment, and public transportation options will have an advantage in this competition.

CONCLUSION

A streetcar system may be considered successful if it

- is used extensively;
- encourages economic development; or
- contributes to urban vitality.

It is our judgment that the HDR study is credible in its analysis of the costs and benefits of streetcars in Cincinnati and in its projections of the benefits of ridership and economic development.

Ridership benefits

Ridership related benefits are diverse. A streetcar, like any other types of public transportation, first provides service for the rider. This service offers increased mobility and promotes new ridership, which in turn generates incremental revenues. In addition, due to its likelihood of attracting passengers away from the use of personal vehicles to access jobs and shopping destinations, a streetcar system has the ability to reduce congestion in the downtown area. This congestion reduction results in the use of less fuel and time for those who use their personal vehicles.



Economic development benefits

Development accounts for most of the economic benefits of a streetcar system. The fixed rail aspect of a streetcar stimulates economic development along its line and its vicinity. An increase in property values and in land use density is likely to increase for both commercial and residential uses that are within three blocks of the line through new unit creation. Even though we cannot be certain how much development will occur, the experiences of other cities provides strong evidence that economic development will be substantial.

Lifestyle Effects

While the HDR study did not cover lifestyle issues, the streetcar has potential to make a positive contribution to lifestyle. On the whole, by encouraging livable and socially dynamic communities with new residential development in the downtown area, a streetcar can serve as a place-making amenity that attracts young professionals to its vicinity. The magnitude of this effect is unknown, but it is almost certain to be a positive benefit.

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Development Density Along Portland Streetcar Lines



THE ECONOMICS CENTER FOR EDUCATION & RESEARCH

The Economics Center for Education & Research is affiliated with the College of Business at the University of Cincinnati. For nearly 20 years, the Economics Center has served public and private sector clients throughout the Cincinnati region by providing reliable, impartial economic analysis for citizens, policy makers, and business people to guide them in improving their communities. Its recent work includes numerous economic and fiscal impact studies on developments in the Cincinnati area. The National Council on Economics Education named the Economics Center #1 nationally in terms of size and outstanding performance.

The Economics Center performs a variety of economic analyses. For example:

- Economic impact studies identify the contribution of activities, businesses or industries to the community's economic vitality.
- Tax studies show how changes in tax law affect potential for private sector economic growth and public sector revenue.
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The Economics Center also trains teachers and helps schools implement effective economics curriculum. Each year, the center works with more than 800 area teachers and 45 schools. The center also conducts economic studies and provides data for area businesses and public organizations.

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