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# Economic Impacts of Bicycle and Pedestrian Street Improvements - Summary Report

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Available at: <https://works.bepress.com/jenny-liu/62/>

# **ECONOMIC IMPACTS OF BICYCLE AND PEDESTRIAN STREET IMPROVEMENTS**

# OVERVIEW

*This research project explores the economic impacts of bicycle and pedestrian street improvements in the United States using multiple data sources and analytical approaches. Building on studies in New York City and San Francisco, researchers examined before-and-after data for street improvements on 14 corridors in six cities: Indianapolis, Memphis, Minneapolis, Portland (OR), San Francisco, and Seattle.*

## WHY DO THIS STUDY?

To make cities more livable and in response to growing concerns over climate change and rising social inequality, cities across the country are promoting active transportation, and advocates are arguing for robust bicycle and pedestrian infrastructure. While studies have shown how such upgrades improve traffic safety, quality of life, and mobility for city residents, the question remains how such infrastructure improvements affect economic outcomes.

A frequent argument against bicycle and pedestrian infrastructure improvements is the concern that bike lanes could discourage customers and reduce revenues.

In 2013, the New York City Department of Transportation commissioned a first-of-its-kind study prepared by Bennett Midland,

using sales tax data to evaluate the economic effects of street improvements, examining 7 improved corridors and 19 control corridors in three boroughs.<sup>1</sup> The study found “convincing evidence that improved accessibility and a more welcoming street environment created by these projects generate increases in retail sales in the project areas.” In 2014, the San Francisco Municipal Transportation Agency used a similar methodology focused on sales tax data to conclude that “streetscape improvements are associated with improved economic performance for the locations studied.”

This current study builds on past work by examining additional cities and incorporating new research methods and data sources.

## WHAT DID WE STUDY?

For the 14 corridors that received active transportation street improvements, as well as 14 control corridors for comparison, we looked at before-and-after metrics related to business activity. We examined data on retail and food sales, as well as retail and

food service employment and wages. We excluded businesses that are specifically geared toward cars, such as gas stations, and concentrated rather on the types of business establishments that could be frequented by any type of road user.

## WHAT DID WE LEARN?

This study provides policymakers and planners with a robust analytical framework and evidence to support non-motorized transportation infrastructure investment. Overall, the study found very little evidence of active transportation street

improvements having a negative impact on business or economic outcomes. In many cases, improved bicycle and pedestrian infrastructure was shown to have positive impacts on sales and employment in the retail and food service sectors.

### IN GENERAL WE FOUND:

- **Street improvements had either positive or non-significant impacts on corridor employment and sales.**
- **The food service industry seems to benefit the most from the addition of active transportation infrastructure. Even in cases where a motor vehicle travel lane or parking was removed to make room for a bike lane, food sales and employment tended to go up.**

- **The retail industry benefits somewhat from the addition of active transportation infrastructure. In nine of our 14 case studies, retail sales and/or employment were positively impacted by the street improvements. Two case studies showed no impact, and three of the case studies generated mixed results, with some positive and some negative impacts on retail. Further study is needed to isolate causes and effects of these impacts.**

1. To view the 2013 New York City Department of Transportation study prepared by Bennett Midland, using sales tax data to evaluate the economic effects of street improvements, visit: <http://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf>

# OUR APPROACH

We used a variety of data sources and analysis methods to address the challenges of conducting research in this field. Each of our data sources includes variables that represent a different element of economic activity, such as **wages, employment, and sales tax receipts from nearby businesses**. These are all components of business activity, but they can shift or grow in different ways depending on the situation.

**For example, an increase in sales revenue could be interpreted in two different ways.**

1. *An increase in the number of people shopping and buying in the establishment, resulting in greater overall sales volume.*
2. *An increase in the price of each product sold, potentially due to rising lease costs, rather than increased consumer activity.*

### MULTIPLE DATA SOURCES:

*We examined before-and-after effects of each street improvement using:*

- **LEHD (longitudinal employer-household dynamics) employment data**
- **QCEW (Quarterly Census of Employment and Wages) employment and wages data**
- **NETS (National Establishment Time Series) employment and sales data**
- **Retail sales tax data**

Similarly, while data on employment and wages is a strong indicator of economic activity in the long term, it is not an effective measure of immediate shifts in consumer activity, which can be affected by changes in travel patterns, like street improvements.

By using several different data sources and analytic approaches, we sought to counteract these challenges and provide a holistic picture of the complex dynamics of business activity. For the same reason, we did our analysis in six cities rather than just one, in the hopes of uncovering some more or less “universal” trends among the complexity.

### MULTIPLE ANALYTIC METHODS:

*We used three different methods of econometric analysis to understand the impacts of street improvements on retail and food service sales, employment, and neighborhood economics. For more detail on how these methods worked, refer to our final report. The three methods were:*

- **Aggregated trend analysis**
- **DID (Difference-in-difference) analysis**
- **ITS (Interrupted time series) analysis**


# RESULTS SUMMARY: NATIONAL STREET IMPROVEMENT STUDY

KEY:

POSITIVE, SIGNIFICANT IMPACT

NO SIGNIFICANT IMPACT

NEGATIVE, SIGNIFICANT IMPACT




Motor vehicle travel lane(s) reduced

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On-street parking removed

?







On-street parking removed














New bike infrastructure








New pedestrian infrastructure

IMPROVEMENT TYPE		KEY FINDINGS
INDIANAPOLIS		
MASSACHUSETTS AVENUE (2009)		
<div><div></div><div></div></div>	RETAIL	While growth in retail employment and sales revenue was observed in the years following the construction of the protected bike lane on Massachusetts Avenue, we are unable to calculate pre- and post-construction growth rates due to zero retail employment in some of the years. However, the DID and ITS approaches both indicate that the bike lane installation <b>did not significantly impact retail employment, either positively or negatively</b> , along this corridor.
	FOOD SERVICE	<b>Significant positive impact on food services employment</b> following protected bike lane construction, indicating an improvement in business vitality. Food services employment growth significantly outpaced growth in Indianapolis as a whole.
VIRGINIA AVENUE (2009)		
<div><div></div><div></div></div>	RETAIL	Bike lane installation <b>did not significantly impact retail employment, either positively or negatively</b> .
	FOOD SERVICE	The corridor shows significant and <b>substantial growth in all food service industry metrics</b> —employment, sales, and wages—indicating a positive effect on business vitality following the street improvements.
MEMPHIS		
MADISON AVENUE (2011)		
<div></div>	RETAIL	<b>Positive and statistically significant improvement in retail sales.</b> A slight increase in retail employment after the 2011 installation was followed by decreases in retail employment. Madison performed worse than two of the three control corridors and worse than city-wide, indicating that the street improvement on Madison may have had a <b>negative impact on retail employment</b> .
	FOOD SERVICE	<b>Significant positive impact on food employment:</b> After bike lane installation, food employment dropped significantly in level, but dramatically recovered & surpassed previous levels over the next two years.
BROAD AVENUE (2010)		
<div></div>	RETAIL	Contradictory data patterns: Some sources show increase in retail sales and employment, but <b>results are not conclusive</b> .
	FOOD SERVICE	<b>Strong positive impact on food employment</b> , supported by the aggregated trend analysis and ITS estimation results across both the LEHD and QCEW employment data sources.

IMPROVEMENT TYPE		KEY FINDINGS
MINNEAPOLIS		
CENTRAL AVENUE (2012)		
<div><div></div><div><div>?</div></div></div> <div></div>	RETAIL	<b>Retail employment increased:</b> The ITS approach shows a positive growth trend from the bike lane construction using LEHD data and QCEW wages data.
	FOOD SERVICE	<b>Dramatic increase in restaurant sales, along with increase in food service employment following installation</b> (confirmed by both trend analysis and the ITS approach).
FRANKLIN AVENUE (2011)		
<div><div></div><div><div>?</div></div></div> <div></div>	RETAIL	Retail employment and total wages in the retail sector appear to be growing at a faster pace in the improvement corridor, possibly indicating a shift in the type of retail businesses in the area. However, evidence from the ITS approach shows a <b>statistically non-significant causal relationship</b> between bike lane installation and employment growth.
	FOOD SERVICE	<b>Food employment greatly increased</b> two years after bike lane installation, exceeding the growth rate of both the control corridor and greater city trends.
RIVERSIDE AVENUE (2009)		
<div><div></div><div></div></div> <div></div>	RETAIL	LEHD data analysis shows increase of retail service employment, but the ITS approach suggests that this increase is because of economic growth in the region and not because of the street improvement. Retail service-related sales dropped while restaurant sales grew. We suspect a shift from retail business toward more food service businesses after the street improvement. <b>Given mixed results, analysis was inconclusive.</b>
	FOOD SERVICE	Restaurant sales increased and food service employment grew, but rigorous econometric approaches indicate that these increases may not be caused directly by the street improvement on this corridor. Given mixed results, the analysis was inconclusive.
LYNDALE AVENUE SOUTH (2008)		
<div><div></div><div></div></div>	RETAIL	<b>All three approaches indicate a significant positive impact on retail sales in the improvement corridor.</b>
	FOOD SERVICE	<b>Food service employment increased gradually after the street improvements.</b>
NORTH SECOND STREET (2011)		
<div><div></div><div><div>?</div></div></div> <div></div>	RETAIL	<b>No causal impact of bike lane construction on retail employment.</b> The corridor saw a <b>dramatic jump in retail sales</b> immediately after bike lane installation, indicating a positive impact of bike lanes on retail sales. However, the great jump could also be related to other one-time changes, such as a large new store opening. <b>Further investigation needed.</b>
	FOOD SERVICE	<b>Positive and significant impact of bike lane installation on food employment.</b>

RESULTS SUMMARY: NATIONAL STREET IMPROVEMENT STUDY

IMPROVEMENT TYPE		KEY FINDINGS
SAN FRANCISCO		
POLK STREET CORRIDOR (2000, 2009)		
 	RETAIL	NETS data and retail sales data analysis consistently indicate <b>positive significant impacts of the Polk Street corridor street improvement on retail employment and sales</b> , while analysis of LEHD data <b>did not yield significant results</b> .
	FOOD SERVICE	Analysis consistently reveals <b>positive significant impact of the street improvement on food sales</b> tax receipts when compared with the Van Ness Avenue control corridor.
17 STREET (2011)		
#  	RETAIL	Analysis of the NETS and LEHD data showed slightly different results. We generally find that there were either <b>positive impacts</b> or <b>non-significant impacts</b> of the bike lane installation on retail service employment and sales on 17th Street.
	FOOD SERVICE	Analysis of the NETS and LEHD data showed slightly different results. We generally find that there were <b>negative or no impacts</b> on food services.
SEATTLE		
SECOND AVENUE (2014)		
	RETAIL	We can conclude that the protected two-way bike lane <b>positively contributed to higher employment and improved business vitality in the retail sector</b> on the Second Avenue corridor.
	FOOD SERVICE	For the food services sector; analyses indicate that the protected bike lane <b>did not have a statistically significant impact</b> .
BROADWAY (2014)		
	RETAIL	The data show <b>retail employment growth</b> after the street improvement, but ITS analysis indicates this could be the result of a continuous pattern of growth along Broadway and <b>not necessarily an impact of the protected bike lane</b> .
	FOOD SERVICE	The protected bike lane on Broadway triggered a <b>significant employment increase in the food services industry</b> after installation, indicating an improvement in business vitality as a result.
PORTLAND		
STARK & OAK CORRIDOR (2009)		
 	RETAIL	Aggregated trend analysis and ITS analysis of QCEW and NETS data all consistently show that the street improvement on the Stark and Oak corridor had <b>positive and significant impacts on retail employment and sales revenue</b> .
	FOOD SERVICE	Three data sources indicated either no impact or positive impacts on employment and sales in the food services sector. Analysis of the LEHD data showed <b>no impact of the street improvement on food employment</b> .

REPLICATE THIS STUDY IN YOUR CITY

For those interested in exploring economic outcomes in their own city, we hope the methodology we have developed will prove helpful. Street-facing businesses are the entities most directly affected by active infrastructure improvements. By focusing on corridor-level economic evaluation, it is possible to capture the most direct economic impacts of street improvement.

The first step is selecting street improvement corridors that are located in business districts as treatment corridors, and corresponding control corridors that are similar to treatment corridors except for the street improvement. The selection process can be data-driven or guided by local experts with knowledge and understanding of regional conditions. In our project, with the exception of San Francisco and Portland, city partners participated in the project to choose the corridors and give other input. Choosing data sources can be complex and depends on the availability of data and the limitations of your project. To understand trends in employment and retail sales in tightly defined geographic areas, retail sales tax data would be the

most appropriate data source, when available. See the “data” section of the final report for further considerations. Selecting an analytic approach: In general, we found that the ITS analysis provided more robust results than the other approaches. However, this approach generally requires more data points post-intervention to achieve meaningful and valid impact estimations. Depending on your needs and scope, other methods may serve best. A detailed discussion of the tradeoffs and limitations of each analytic method can be found in our final report. For more detailed information about how to replicate this study in your city, please find a guidebook by PeopleForBikes here [add final link.]

ABOUT THIS PROJECT

This report is part of a National Street Improvements Study by Portland State University, Bennett Midland, and PeopleForBikes, with generous support from the Summit Foundation and the National Institute for Transportation and Communities.

**PeopleForBikes** is leading a movement to make riding better for everyone. By collaborating with millions of individual riders, businesses, community leaders, and elected officials, PeopleForBikes has created a powerful, united voice for bicycling and its benefits. **Portland State University** is home to the Toulan School of Urban Studies and Planning, the nation’s oldest continuously operating program in urban studies. PSU is also home to the Transportation Research and Education Center (TREC), an interdisciplinary center that houses the National Institute for Transportation and Communities (NITC).

**Bennett Midland** is a management consulting firm that works exclusively in the civic sector. In 2013, Bennett Midland prepared a first-of-its-kind study for the New York City Department of Transportation using sales tax data to evaluate the economic effects of street improvements, examining 7 improved corridors and 19 control corridors in three boroughs.<sup>2</sup> The study has been cited for its original methodology and its implication for city planning nationwide. This project is sponsored in large part by **The Summit Foundation** - a private family foundation, who seeks to promote the health and well-being of the planet – its people and its natural environment – by achieving gender equality, protecting the earth’s biodiversity and making cities livable.

2. To view the 2013 New York City Department of Transportation study prepared by Bennett Midland, using sales tax data to evaluate the economic effects of street improvements, visit: <http://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf>



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