

# How Do Complete Streets Matter for Communities? The Case of Richfield, Minnesota

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# HOW DO COMPLETE STREETS MATTER FOR COMMUNITIES? THE CASE OF RICHFIELD, MINNESOTA

## FINAL REPORT

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# TABLE OF CONTENTS

<b>INTRODUCTION TO THE REPORT .....</b>	<b>1</b>
1.1 Overview .....	1
1.2 Background on Complete Streets .....	2
1.3 Outcomes and Measures used in this Study .....	3
1.4 Overview of Research Design and Methodological Approach .....	5
1.5 Key Findings .....	5
1.6 Organization of Report .....	7
<b>CHAPTER 2: RICHFIELD’S COMPLETE STREETS STUDY SITES.....</b>	<b>8</b>
2.1 Introduction and Overview.....	8
2.2 Selection of Improvement Sites .....	9
2.3 Improvement Sites .....	11
2.3.1 66th Street Reconstruction .....	11
2.3.2 Portland Avenue Reconstruction .....	13
2.3.3 Lyndale Avenue Reconstruction.....	14
2.3.4 Penn Avenue Reconstruction .....	15
<b>CHAPTER 3: USER EXPERIENCE AND LIVABILITY .....</b>	<b>16</b>
3.1 Overview .....	16
3.2 Literature Review.....	16
3.3 Richfield Sweet Streets and User Experience .....	18
3.3.1 Methodology and Data .....	18
3.3.2 Richfield Streets in an Historical Context .....	18
3.3.3 Designing for Pedestrians in Richfield .....	20
3.3.4 Designing for Public Transit Users in Richfield .....	26
3.3.5 Designing for Recreational and Commuting Cyclists.....	29

3.3.6 Discussion and Recommendations for Future Analysis .....	33
3.4 Livability: Measuring Change in Residential Property Values .....	34
3.4.1 Methodology and Data .....	34
3.4.2 Analysis.....	36
3.4.3 Findings .....	38
3.4.4 Discussion.....	39
3.4.5 Recommendations for Future Analysis .....	39
<b>CHAPTER 4: ECONOMIC VITALITY .....</b>	<b>41</b>
4.1 Overview .....	41
4.2 Literature Review.....	41
4.3 Methodology and Data .....	43
4.4 Findings.....	46
4.4.1 The Benefits of Complete Streets Reconstructions .....	46
4.4.2 Transportation Patterns of Owners, Employees, and Clients/Customers .....	46
4.4.3 The Effects of Sweet Streets on Revenue .....	47
4.4.4 General Perceptions of Richfield’s Roads and Safety.....	48
4.4.5 Additional Findings.....	49
4.5 Discussion .....	50
4.6 Recommendations for Future Analyses .....	51
<b>CHAPTER 5: INDIVIDUAL AND COMMUNITY HEALTH.....</b>	<b>53</b>
5.1 Overview .....	53
5.2 Literature Review.....	53
5.3 Methodology and Data .....	55
5.4 Findings.....	56
5.4.1 Levels of Activity, Counts .....	56

5.4.2 Levels of Activity, Qualitative and Survey Data.....	57
5.5 Discussion .....	59
5.6 Recommendations for Future Analysis.....	60
<b>CHAPTER 6: TRANSPORTATION AND SAFETY .....</b>	<b>62</b>
6.1 Overview .....	62
6.2 Literature Review.....	62
6.3 Methodology and Data .....	64
6.4 Findings.....	65
6.4.1 Perceptions of Safety .....	65
6.4.2 Safety.....	66
6.5 Discussion and Recommendations for Future Analysis.....	69
<b>CHAPTER 7: MEASURING THE IMPACT OF RICHFIELD’S COMPLETE STREETS IN THE FUTURE .....</b>	<b>71</b>
7.1 Overview .....	71
7.2 Conduct Surveys of Richfield Residents in Summer 2022 .....	75
7.2.1 Intercept Surveys .....	75
7.2.2 Representative Citywide Survey.....	75
7.2.3 Survey Topics.....	76
7.3 Monitor Changes in Activity and Commuting Patterns .....	76
7.4 Monitor changes in businesses and industry in Richfield.....	78
7.5 Replicate Statistical Analysis to Assess Changes in Livability IN 2022 .....	80
7.6 Analyze Changes in Crash Statistics Using Data From 2019-2022 .....	80
<b>CHAPTER 8: CONCLUSION .....</b>	<b>83</b>
<b>REFERENCES.....</b>	<b>84</b>
<b>APPENDIX A RICHFIELD SWEET STREETS, POTENTIAL IMPROVEMENT SITES</b>	
<b>APPENDIX B WHO USES RICHFIELD’S STREETS? SUPOPULATIONS IN THE CITY</b>	

## APPENDIX C METHODOLOGICAL APPENDIX FOR STATISTICAL ANALYSIS IN CHAPTER 3

## APPENDIX D METHODOLOGICAL APPENDIX FOR BUSINESS INTERVIEWS

## APPENDIX E CITYWIDE INDUSTRY SALES REVENUE STATISTICS, 2016

## APPENDIX F HEALTH SURVEY FLYER AND SURVEY INSTRUMENT

### LIST OF FIGURES

Figure 2-1 Location of Sweet Street Sites within the City of Richfield considered for study .....	9
Figure 3-1 Intersection of 73rd Street and Portland Avenue South Prior to and Following Reconstruction .....	22
Figure 3-2 Intersection of 66th Street and Lyndale Avenue South Prior to and Following Reconstruction .....	25
Figure 3-3 Transit Stops Prior to and Following Reconstruction .....	28
Figure 3-4 Different Types of Bike Lanes on Reconstructed Roads .....	30
Figure 3-5 Presence of Bike Lanes on 66th Street Prior to and Following Reconstruction .....	31
Figure 3-6 Intersection of 66th Street and Nicollet Avenue South.....	32
Figure 3-7 2017 Streets Selected for Difference in Difference Analysis .....	35
Figure 3-8 Parcel Data Used in Difference-in-Difference Analysis (2013-2018) .....	36
Figure 3-9 Trends in Average Residential Property Values for Nicollet Avenue and Portland Avenue, 2008-2018 .....	37
Figure 4-1 Storefronts Located on Penn Avenue .....	44
Figure 4-2 Storefronts Located on 66th Street .....	44
Figure 6-1 66th Street Project Corridor Crash Analysis (2007-2009) ( <i>Reprint of Exhibit 5 in SRF Consulting Group Inc. 2014</i> ).....	68

## LIST OF TABLES

Table 1-1 Complete Streets Outcomes and Measures .....	3
Table 2-1 Overview of Sweet Streets Improvement Sites .....	10
Table 3-1 Results from Difference-in-Difference Analysis of Property Values (2013-2018) .....	38
Table 5-1 Hennepin County 48-Hour Count Data for Bicyclists .....	57
Table 7-1 Recommended Methods and Measures for Future Research .....	74
Table 7-2 Changes in Cycling Activity in Richfield, 2015-2021 .....	77
Table 7-3 Change in Commuting Patterns in Richfield, 2012-2021 .....	77
Table 7-4 Change in Sales/Prevalence across Industries, 2016 to 2021 .....	79
Table 7-5 Change in Crash Rates for Select 66th Street Locations .....	81
Table 7-6 Change in Crash Rates for Select Lyndale Avenue South Locations .....	82

## EXECUTIVE SUMMARY

Complete Streets is an approach to transportation policy that aims to accommodate multiple modes of transportation and different types of users. As Complete Streets policies expand across Minnesota, there is a need for local leaders and policymakers to better understand how such policies are impacting residents and communities.

In 2013, Richfield, a suburb located just south of Minneapolis in the Twin Cities metro area, enacted a particularly innovative Complete Streets policy. Branded as “Richfield’s Sweet Streets” to the public, this policy emphasizes both the local and citywide benefits of street redesign. While the specific design elements of each project are refined through extensive engagement with the local community, the Sweet Streets program aims to improve the wellbeing of the larger community through the redesign and reconstruction of transportation infrastructure throughout the city.

In 2018, Richfield partnered with the Humphrey School of Public Affairs at the University of Minnesota to analyze how the city’s Sweet Streets projects were affecting the local community. In this Minnesota Department of Transportation-funded project, researchers from the Institute for Urban and Regional Infrastructure Finance worked with city officials and a Technical Advisory Panel (TAP) to gather and analyze data on the relationship between street reconstruction projects and user experience and livability, economic vitality, transportation and safety, and individual and community health. Because several major street projects were completed during the course of the work, the analysis focused on understanding the community’s early response to Sweet Streets and identifying measures to track in the future.

This report is the product of nearly two years of research on the nature and potential consequences of Richfield’s Sweet Street projects. The data analyzed include quantitative data collected by Hennepin County and the U.S. Census Bureau; original interview and survey data gathered by the research team; and an array of local reports, articles, project documentation, and historical images and records pertaining to the development and evolution of Richfield’s streets. The analysis provides evidence of how Richfield’s residents and local businesses are experiencing the changes to the streets and identifies a set of methods and indicators to track how the changes affect residents and the community over time.

Key findings of the analysis include the following.

**User Experience and Livability:** The data show that at the time of this study, residents and business owners were still adjusting to the changes in street design. Survey data attest to residents’ continuing confusion about roundabouts. We recommend monitoring changes in user experience for certain subpopulations and transportation modalities prioritized by Richfield’s Sweet Streets program. This can be performed by observing activity at select sites, conducting intercept surveys, or fielding a citywide survey in summer 2022 or later.

With respect to livability, our difference-in-difference analysis finds no current impact on residential home sales. We discuss replicating this analysis in the future using similar data or more detailed measures.

**Economic Vitality:** Our interviews with local businesses suggest an immediate negative impact of the reconstructions on commercial revenues for at least some organizations. However, apart from the impact of construction, business owners perceive a limited impact of the street on business activity generally and an uncertain impact of redesigned roads on future business activity. In addition, when business owners do specify positive benefits, they tend to articulate these benefits broadly. Together, these findings have led to two sets of recommendations for future analysis: conducting surveys or interviews with a set of business owners; and monitoring future changes at the city level, including citywide changes and growth in particular industries and in private investment.

**Individual and Community Health:** Our analysis of levels of activity among Richfield residents reveals limited cycling for either recreational or commuting purposes. Residents are expected to use the roads more in summer. Given the extensive network of bike paths and trails, cycling patterns will be an important area to monitor in the future, using either Hennepin County, Census, or StreetLight data. We also discuss various approaches for analyzing levels of activity in the future using either intercept surveys or a representative citywide survey.

**Transportation and Safety:** Our data indicates that some of the design elements in Richfield's street redesigns have alleviated safety concerns while introducing others. Survey data, while not representative, suggests that perceptions of unsafe roads are particularly salient for families with children. We recommend assessing perceptions of safety as part of intercept or citywide surveys.

In addition, there is a considerable amount of research on the safety of design elements that are prominent in Richfield's Sweet Street projects, such as roundabouts. Some of this research is specific to Richfield and Minnesota. We recommend relying on this research to demonstrate improvements in street safety in roundabouts, rather than replicating the extensive analyses. We also discuss several measures that can serve as baseline indicators of safety for the 66th Street and Lyndale Avenue South reconstructions.

The data reveal two key findings that are relevant for future research. First, consistent with expectations, the data show that at the time of this study, residents and business owners were still adjusting to the changes in street design. Second, the data suggest that residents and business owners are affected by Sweet Street projects even if they do not live on or immediately adjacent to a reconstructed road.

The analysis calls for continuing the analysis of Richfield's Sweet Streets in 2022 or later, depending on the course of the COVID-19 pandemic. We divide our recommendations into two groups. The first are relatively low-cost options with the potential to reveal benefits that have occurred alongside the Sweet



Streets reconstructions. The second are higher-cost options that can reveal a stronger link between the reconstructions and outcomes.

The set of recommendations in the first group include:

1. Conducting intercept surveys to collect data on user experience and perceptions of safety
2. Monitoring changes in bicycling and commuting using Hennepin County multi-modal statistics, Census data, or StreetLight data
3. Observing levels of activity (walking and biking) along reconstructed versus non-reconstructed roads
4. Monitoring changes in aggregate sales and composition of industry in Richfield

The set of recommendations in the second group include:

1. Conducting a citywide representative survey to assess user experience, perceptions of safety, and health
2. Replicating crash analyses for 66th Street and Lyndale Avenue South sites, using pre-construction analyses as a baseline
3. Replicating difference-in-difference analysis using residential home values or real estate transaction data, potentially with a comparison street outside of Richfield
4. Conducting surveys or in-person interviews with a set of businesses that represent key segments of the Richfield business community (industry, size, age of business, ownership, etc.)
5. Descriptively comparing trends in home values, business activity, levels of activity, and health outcomes for Richfield and a comparable city (such as St. Louis Park)

# CHAPTER 1: INTRODUCTION TO THE REPORT

## 1.1 OVERVIEW

Complete Streets is an approach to transportation policy that aims to accommodate multiple modes of transportation and different types of users. Whereas traditional transportation policies emphasize vehicle travel, Complete Streets policies prioritize safely accommodating pedestrians, bicyclists, special populations, and those using public transit. Although the fundamental goal of Complete Street policies is to improve transportation safety for all street users, advocates of this approach also draw attention to benefits related to accessibility, economic vitality, individual and community health, and livability and community cohesion (McCann and Rynne 2010).

Cities and counties across Minnesota have turned to Complete Streets in an attempt to develop more usable roads for their residents. In 2013, Richfield, a suburb located just south of Minneapolis in the Twin Cities metro area, enacted a particularly innovative Complete Streets policy. Known locally as “Richfield’s Sweet Streets,” the policy has led to the reconstruction of several major roads across the city. The Sweet Streets approach is citywide, rather than focused on a specific street or city area. Unlike conventional Complete Streets approaches, transportation users are prioritized differently in the redesign and reconstruction of Richfield’s roads, with the needs of pedestrians considered first. In addition, each project relies on extensive community input throughout its duration.

As Complete Streets policies expand across Minnesota, there is a need for local leaders and policymakers to better understand how such policies are impacting residents and communities. To this end, an analysis of the economic and noneconomic impacts of Richfield’s street reconstruction for street users, business owners, and city residents can provide evidence of how Complete Streets matter for local communities. In addition, Richfield’s experience offers an example for other localities of a novel approach to the reconstruction of transportation infrastructure — one that is community-wide, supportive of multimodal travel, and firmly embedded in community values.

In 2017, Richfield partnered with the Humphrey School of Public Affairs at the University of Minnesota to analyze how the city’s Sweet Streets projects are affecting the local community. In this Minnesota Department of Transportation-funded project, researchers from the Institute for Urban and Regional Infrastructure Finance worked with city officials and the Technical Advisory Panel (TAP) to gather and analyze data on the relationship between street reconstruction projects and user experience and livability, economic vitality, transportation and safety, and individual and community health.

This report is the product of nearly two years of research on the nature and consequences of Richfield’s Sweet Streets. The data analyzed include quantitative data collected by Hennepin County, and the U.S. Census Bureau; original interview and survey data gathered by the research team; and an array of local reports, articles, project documentation, and historical images and records pertaining to the development and evolution of Richfield’s streets. The analysis provides evidence of how Richfield’s residents and local businesses are experiencing the changes to the streets and identifies a set of methods and indicators to track how the changes affect residents and the community over time.

In this chapter, we provide an overview of Complete Streets initiatives in Minnesota and across the United States. The first section identifies motives for adopting Complete Street policies and common design elements, highlights engagement processes that typically accompany Complete Streets projects, and elaborates on the unique characteristics of Richfield's Sweet Streets approach. The second section provides a high-level description of the data and methods used in the study and the third section reviews the central findings. The final section provides an overview of the report.

## 1.2 BACKGROUND ON COMPLETE STREETS

Complete Streets policies are becoming increasingly common across the United States. One review of municipal Complete Streets policies found that over 900 such policies were established between 2004 and 2016 (Gregg and Hess 2018). In Minnesota, a statewide Complete Streets policy was enacted in 2010 (State of Minnesota 2018), followed by the Minnesota Department of Transportation's (MnDOT) Complete Streets Policy, adopted in 2013 (MN Department of Transportation 2016). MnDOT's policy states that:

"The Minnesota Department of Transportation must follow a complete streets approach in all phases of planning, project development, operation, and maintenance activities" (MN Department of Transportation 2016).

Cities and counties across Minnesota, including Richfield and Hennepin County, of which the city is a part, have also affirmed their commitment to multimodal travel by developing their own Complete Streets policies (Hennepin County, MN 2009, City of Richfield, MN 2018).

Richfield's Complete Streets policy, adopted in 2013, aims to improve the "safety, access, convenience, and comfort of all users of all ages and abilities" (City of Richfield, MN 2018). While Complete Streets are often focused on a particular street or community area, Richfield's policy is citywide. The approach is also unique in that it seeks to organize such efforts around a modal hierarchy, prioritizing pedestrians first, followed by transit users, cyclists, and vehicles (Broz 2018).

Complete Street projects vary in terms of their motivation and design. Enhancing safety for pedestrians, transit users, and cyclists, as well as special populations such as the elderly and those with physical disabilities, is often a prominent goal (Retting, Ferguson, & McCartt, 2003). Some projects also prioritize improving different users' experience of the street by incorporating landscaped boulevards, trees to provide shade, public art, and transit shelters and benches (Harvey and Aultman-Hall 2015).

Proponents of Complete Streets highlight additional impacts on individuals and community health, as well as economic vitality. Redesigning streets by widening sidewalks and adding bike lanes can lead to improvements in health if a greater number of residents engage in active living behaviors – walking rather than driving to work, for example (Anderson, et al. 2015). Such changes may also contribute to increases in commercial activity by encouraging pedestrian and bicycle traffic (Burden and Litman 2011).

Complete Streets initiatives are as much about the process of developing transportation solutions as they are about the intended outcomes. Such policies are often connected with a collaborative approach

to transportation policy known as Context Sensitive Solutions (CSS) (Slotterback and Zerger 2013). CSS approaches seek to engage a diverse array of stakeholders, including public agencies, interest groups, and community members, in developing and implementing transportation projects that are attentive to local circumstances (Federal Highway Administration. US Department of Transportation 2017).

Richfield’s Complete Streets Policy embodies this approach. A central component of the policy vision is for all streets and roadway projects to be:

“Determined with consideration of the community values identified on a project-by-project basis using a thorough public involvement process that invites all residents and impacted parties to participate as stakeholders” (City of Richfield, MN 2018).

The Complete Streets Policy states that public engagement is important throughout a project’s development and implementation, from the start of planning and design work to the project’s completion. In addition, the public is to be involved on all types of roadway projects, including new construction and reconstruction of existing roadway space (City of Richfield, MN 2018).

Because Complete Streets initiatives are attentive to local conditions, different projects tend to emphasize different design elements. Yet there are commonalities across projects, including the addition of infrastructure such as bicycle lanes and bicycle parking; aesthetic improvements such as landscape strips, sidewalk improvements, and altered medians; and traffic calming measures such reduced speed limits and roundabouts (McCann and Rynne 2010, Litman 2015b, AARP 2014).

### 1.3 OUTCOMES AND MEASURES USED IN THIS STUDY

As discussed above, Complete Streets projects prioritize many different types of goals. Desired outcomes range from improving safety and promoting multimodal travel to enhancing livability, health, and sustainable transportation solutions (Center for Inclusive Design and Environmental Access (IDEA) 2014). Some goals — such as enhanced pedestrian safety — can be achieved relatively quickly while other goals — such as sustainability — are longer term. The prioritization of different goals and associated outcomes depends largely on local conditions, including the preferences of local stakeholders as well as the characteristics of existing roadways and financial constraints.

Early discussions with Richfield city leaders as well as a review of documents pertaining to the city’s Sweet Streets projects revealed that user experience and livability, transportation and safety, economic vitality, and individual and community health were key goals for the city. As a result, our study focused on analyzing past research and collecting new data on this set of outcomes. In addition, because Richfield Complete Street Policy prioritizes pedestrians, followed by public transit users, cyclists, and vehicles, the study adopts a similar prioritization.

Table 1.1 summarizes the common outcomes and measures used to examine the impact of Complete Streets on safety, economic vitality, and individual and community health in Richfield.

**Table 1-1 Complete Streets Outcomes and Measures**

Desired Outcomes	Measures Used and/or Recommended for Future Use
User Experience and Livability	
<ol style="list-style-type: none"> <li>1. Improved usability and satisfaction</li> <li>2. Enhanced livability</li> </ol>	<ol style="list-style-type: none"> <li>1. Perceptions of usability and satisfaction among pedestrians, cyclists, and transit users</li> <li>2. Residential home values</li> </ol>
Economic Vitality	
<ol style="list-style-type: none"> <li>1. Business and/or industry growth</li> <li>2. Increase in commercial activity</li> </ol>	<ol style="list-style-type: none"> <li>1. Change in industry and aggregate sales (citywide)</li> <li>2. Private investment</li> </ol>
Individual and Community Health	
<ol style="list-style-type: none"> <li>1. Increase in physical activity of residents</li> <li>2. Lower incidence of chronic disease, including asthma, and obesity</li> </ol>	<ol style="list-style-type: none"> <li>1. Mode share/usage data and/or residents' self-reported level of activity</li> <li>2. Levels of chronic disease within the city</li> </ol>
Transportation and Safety	
<ol style="list-style-type: none"> <li>1. Increase in perceived safety</li> <li>2. Reduction in vehicle/pedestrian and vehicle/cyclist accidents</li> <li>3. Reduction in injury/fatality resulting from accidents w/vehicles</li> </ol>	<ol style="list-style-type: none"> <li>1. Residents' perceptions of safety</li> <li>2. Incidence of accidents</li> <li>3. Severity of injury and extent of fatality from accidents</li> </ol>

It is important to note that several major Sweet Streets projects in Richfield occurred relatively recently, which had implications for our design and analysis of different outcomes. For example, the reconstruction of 66th Street — one of the only projects to involve a busy commercial corridor in the city — was completed in summer 2019. Assessing the impact of the reconstruction on local businesses is an important goal for Richfield officials. However, too little time had passed to examine the impact in this study. As a result, our analysis focuses on refining outcomes related to economic vitality and identifying a design and data collection strategy for analyzing such outcomes in the future.

## 1.4 OVERVIEW OF RESEARCH DESIGN AND METHODOLOGICAL APPROACH

For each set of outcomes, we employ a different research design and data collection and analysis strategy. In large part, this is due to the recency of Richfield's Sweet Streets projects and the goals of city leaders. Although leaders are interested in a range of outcomes, analyzing the impact of street redesign on all outcomes would have been premature given that major reconstructions were in progress or completed during the course of the study. We were able to assess the impact of street redesign and reconstruction for one outcome (livability) through an analysis of changing home values for one project completed in 2016.

Rather than an analysis of impact, our research team focused on developing a baseline understanding of the consequences of the street changes for Richfield residents and identifying and measuring a set of indicators for the city to track over time. Because the design differs across outcomes, each empirical chapter contains its own design and methodological section, as well as its own literature review. In general, appendices provide more detail on the various methodologies adopted and the data collection and analysis. We conclude each empirical chapter with suggestions for monitoring outcomes and assessing impact in the future.

## 1.5 KEY FINDINGS

The analysis reveals two general findings that are relevant for future research.

First, the data show that at the time of this study, residents and business owners were still adjusting to the changes in street design. This was particularly true for more significant changes such as the conversion of a signalized intersection into a roundabout. In interviews, business owners expressed uncertainty and apprehension about the impact of the new street design on sales. Survey data attest to residents' continuing confusion about using roundabouts. Conversations with Richfield residents also reveal uncertainty about the impact on active living because residents had not yet had the opportunity to experience the roads in summer. Because the construction phase of the projects still loomed large for many residents and business owners, as well as the disruptions in summer 2020 caused by the COVID-19 pandemic, we recommend waiting until summer 2021 or later to continue data collection and analysis.

Second, the data suggest that residents and business owners are affected by Sweet Street projects even if they do not live on or immediately adjacent to a reconstructed road. For instance, business owners on Lyndale Avenue South communicated changes in behavior based on the experiences of business owners on 66th Street (completed prior to Lyndale Avenue South). Residents talked about walking and biking on 66th Street in summer 2020 despite living in another part of the city. This is consistent with the intent of the program: The city's projects are branded as "Richfield Sweet Streets" to the community, encouraging residents to think of the projects as part of a community-wide effort.

This means that spillover effects are likely, as residents and business owners in one part of the city are affected by changes that occur in another part of the city. While this was an intended outcome of

Richfield's Sweet Streets approach, the implication for future research is that it may be difficult to isolate the impact of any given project. For instance, an analysis of changes in recreational cycling may show no impact if the addition of bicycling infrastructure on 66th Street leads to more cycling among residents who live near the reconstructed road as well as residents who live on the opposite end of the city. This suggests that it may be useful to monitor future changes at a city level, rather than on an individual or street level, for at least some indicators.

The analysis also reveals findings in each outcome area.

With respect to user experience, Richfield's Sweet Street projects prioritized certain subpopulations and transportation modalities. We recommend monitoring changes in user experience for these groups using either intercept surveys or a citywide survey in summer 2021. With respect to livability, our analysis suggests no current impact on residential home sales. We discuss replicating this analysis in the future using similar data or more detailed measures.

Our interviews with local businesses suggest an immediate negative impact of the reconstructions on commercial revenues for at least some organizations. However, apart from the impact of construction, business owners perceive a limited impact of the street on business activity generally and an uncertain impact of redesigned roads on future business activity. In addition, when business owners did specify positive benefits, they tended to articulate these benefits broadly. Together, these findings lead to the recommendation to monitor future changes at city level, including citywide changes and growth in particular industries and in private investment, and/or conduct surveys or in-depth interviews with a set of business owners representative of the larger Richfield business community.

With respect to transportation and safety, there is a considerable amount of research on the safety of design elements that are prominent in Richfield's Sweet Street projects, such as roundabouts. Some of this research is specific to Richfield and Minnesota. We recommend relying on this research to demonstrate improvements in street safety due to roundabouts, rather than replicating the extensive analyses. We also discuss several measures that can serve as baseline indicators of safety for the 66th Street and Lyndale Avenue South reconstructions.

Our data indicate that some of the design elements in Richfield's street redesigns have alleviated safety concerns while introducing others. Survey data, while not representative, suggest that among those that responded to the survey, perceptions of unsafe roads are particularly salient for families with children. We recommend assessing perceptions of safety in summer 2021 as part of the intercept or citywide surveys and relying on analyses conducted by the Richfield Public Schools (RPS). RPS recently hired a Safe Routes to School Coordinator, who is currently conducting surveys of parents with children in Richfield Public Schools using a national survey instrument that includes questions related to the safety of the streets for students. We recommend relying on this analysis for baseline indicators of perceptions of safety for this subpopulation.

Our analysis of levels of activity among Richfield residents reveals limited cycling for either recreational or commuting purposes. Given the extensive network of bike paths and trails, cycling patterns will be an important area to monitor in the future, using either Hennepin County, Census, or StreetLight data. We

also discuss various approaches for analyzing levels of activity in the future using either intercept surveys or a representative citywide survey.

## 1.6 ORGANIZATION OF REPORT

The report proceeds as follows. In the next chapter, we describe Richfield's Complete Street initiative, locally branded as *Richfield Sweet Streets*. We identify projects throughout the city and discuss our methods for selecting the four improvement sites analyzed in this study. This chapter also provides detail on each of the improvement sites, including the motivation, key design elements, and timeline.

Chapters 3-6 present our analyses of user experience and livability (Chapter 3), economic vitality (Chapter 4), individual and community health (Chapter 5), and transportation and safety (Chapter 6). Due to the breadth of research on each of these topics, as well as differences in terms of existing data and the requirements for new data collection, each chapter contains its own literature review, methodology and data, key findings and discussion, and recommendations for future research.

Chapter 7 synthesizes our findings and recommendations into a coherent design for future analysis and Chapter 8 concludes.



## CHAPTER 2: RICHFIELD'S COMPLETE STREETS STUDY SITES

### 2.1 INTRODUCTION AND OVERVIEW

The City of Richfield, Minnesota, is an inner-ring suburban community of approximately 36,151 people, located just south of Minneapolis in the Twin Cities metro area of Minnesota (US Census Bureau 2018). In recent years, citywide planning efforts have focused on improving transportation options for the many different users of the city's streets (City of Richfield, Minnesota 2018). Complete Streets, which are roads that are designed to safely accommodate pedestrians, cyclists, vehicles, and transit riders, are one component of a broader focus on multimodal travel within Richfield. City leaders have developed a Complete Streets Policy, a set of guiding principles for transportation and land use planning, and specific plans for cyclists, pedestrians, and those with physical disabilities (Zan Associates 2018).

Richfield has prioritized such an approach to transportation policy for over a decade. Branded as "Richfield Sweet Streets" to the public, this approach focuses attention on the needs of different types of street users and multiple forms of transportation. Richfield Sweet Streets aim to change the experience of the road for all types of users. The reconstructions are therefore not simply about encouraging walking, cycling, and transit use, but are also about enhancing the *experience* of walking, cycling, and transit use throughout the city.

Richfield's Sweet Streets differ from conventional Complete Streets approaches in several ways. Perhaps most significantly, the approach is citywide, involving the redesign and reconstruction of streets throughout the city. The city employs a modal hierarchy, prioritizing pedestrians first, following by transit users, cyclists, and finally, vehicles. In addition, community input is seen as integral to the success of Sweet Streets, and each project involves extensive community engagement from the start of the planning process to the end of the construction phase.

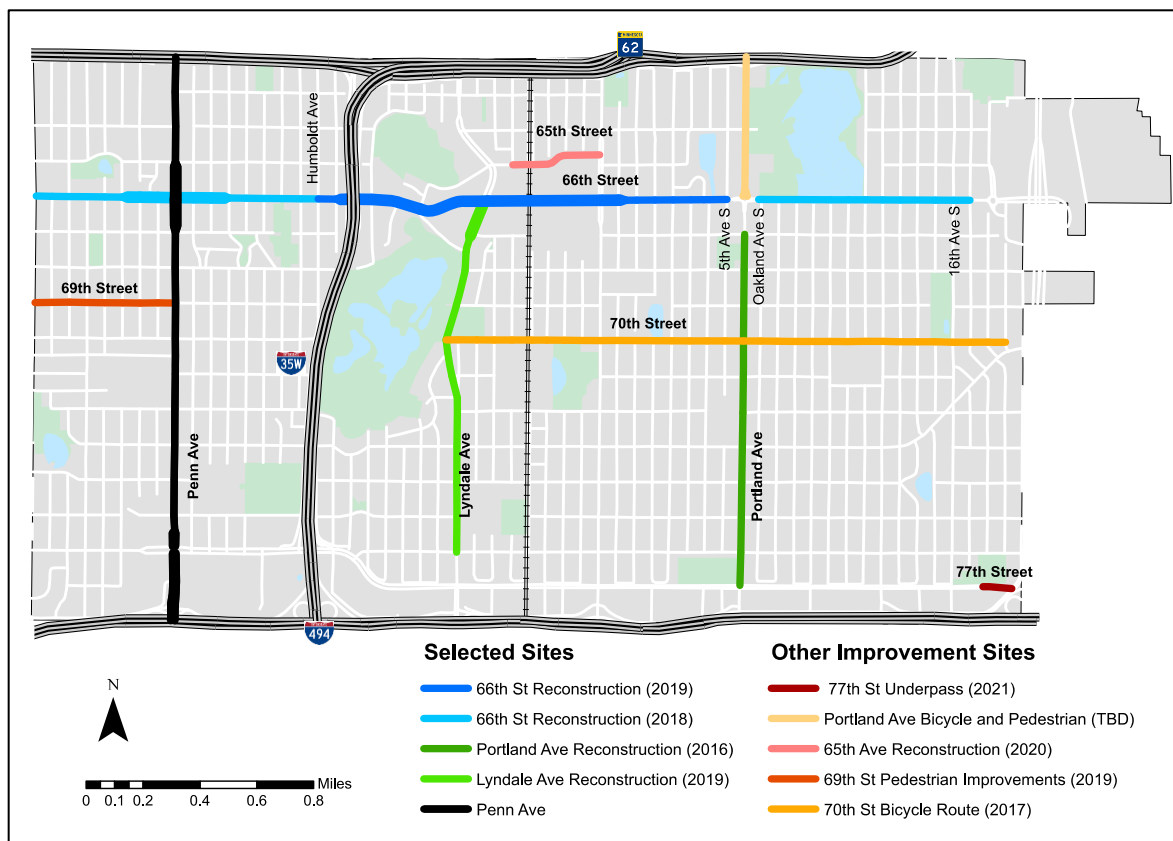
In 2008, the City of Richfield began one of its first Complete Streets projects, reconstructing the 76th/75th Street corridor as part of a planned upgrade to the sewer system (Edgerton and Mason 2012). In 2013, the city formally adopted its Complete Streets Policy, which aims in part to improve the "safety, access, convenience, and comfort of all users of all ages and abilities... through the design, operation and maintenance of the transportation network" (City of Richfield, MN 2018).

Since that time, the city has completed or is in the process of completing over fifteen Sweet Streets projects. These projects vary in scope and scale. Some involve minor changes to the existing roads – for example, changes to pedestrian networks or the addition of bicycle infrastructure. Others involve the full reconstruction of existing roadways, including changes to the number of vehicle lanes, the addition of sidewalk and bicycle paths, and the addition of medians and roundabouts to address safety concerns.

## 2.2 SELECTION OF IMPROVEMENT SITES

To select the project's improvement sites, we reviewed all of the projects described on the Richfield Sweet Streets website. At the time, the site listed nine past projects and eight current and future projects. We excluded projects in which the primary focus was on improving road conditions to upgrade utilities; redevelopment projects; and trail projects.<sup>1</sup> This left a total of ten projects for consideration as improvement sites. To this list, we added one project (Penn Avenue South Reconstruction, which is a future reconstruction site) based on the recommendation of the Technical Advisory Panel.

Figure 2-1 shows the location of the Complete Streets reconstruction sites within the city that we considered.<sup>2</sup> Of the eleven, four were selected as improvement sites. The improvement sites run east-west in the northern region of the city (66th Street), as well as north-south through the western (Penn Avenue South), central (Lyndale Avenue South), and eastern (Portland Avenue South) regions of the city.



**Figure 2-1 Location of Sweet Street Sites within the City of Richfield considered for study**

<sup>1</sup> Excluded projects include: West Richfield Stormwater Improvement Project, Centerpoint Energy Main Replacement, Taft Lake/Legion Lake Water Quality Improvement Project, Centerpoint Energy Nicollet Avenue Project, Centerpoint Energy Richfield 2019 Reconstruction Project, and Richfield Parkway/Chamberlain Development. We also excluded the Nokomis-Minnesota River Regional Trail, as it is a collaboration between the cities of Richfield, Bloomington, and Minneapolis, with project boundaries extending beyond Richfield.

<sup>2</sup> The Mill and Overlay project is citywide and not shown on the map.

For each project, we reviewed material available on the Richfield Sweet Streets website. In selecting the improvement sites, we considered the scope of the reconstruction, timeline, and project goals. Our goal was to select sites that would permit an analysis of the four outcomes described in the first chapter (user experience and livability, economic vitality, transportation/safety, and individual and community health). We prioritized projects that involved an extensive rebuilding of the road, as such projects are better suited to assess a range of outcomes.

From this review, we selected the following improvement sites: 66th Street Reconstruction (2013-2019); Portland Avenue South Reconstruction (2013-2016); Lyndale Avenue South Reconstruction (2017-2019); and Penn Avenue South Reconstruction (future). Table 2-1 lists the project name and the years it was (or will be) constructed. It also provides a description of the project including identifying the geographic scope of the project, its goals, and its major advantages as one of the study's improvement site.

**Table 2-1 Overview of Sweet Streets Improvement Sites**

<b>Projects</b>	<b>Description</b>	<b>Years</b>
66th Street Reconstruction	66th Street, extending from Xerxes to 16th Avenues. Goals included addressing deteriorating pavement, utility, drainage concerns, non-motorized accommodations, and stormwater quality conditions, alongside side improvements to livability/accessibility for non-motorized forms of travel. Key advantages: extensive reconstruction affecting a commercial area.	2013 - 2019
Portland Avenue Reconstruction	Portland Avenue from 67th to 77th Streets. Goals include improving pavement conditions/sidewalks and underground utilities; improving safety for pedestrians, bicyclists, and vehicles; improving livability through landscaping amenities, transit facilities, and traffic calming measures. Key advantages: extensive reconstruction affecting a residential area; higher likelihood of detecting an impact given the number of years since project completion.	2014 - 2016
Lyndale Avenue Reconstruction	Lyndale Ave from 66th to 76th Streets. Goals include improving pavement conditions/sidewalks and underground utilities; improving safety for pedestrians, bicyclists, and vehicles; improving livability through landscaping amenities, transit facilities, and traffic calming measures. Key advantages as an improvement site: extensive reconstruction affecting a mix of commercial, residential, and public areas; provides opportunity to collect data during construction phase.	2017 - 2020
Penn Avenue Reconstruction	Geographic scope TBD. Key advantages as improvement site: extensive reconstruction affecting a mix of commercial and residential areas; provides opportunity to collect data prior to reconstruction; provides opportunity to develop and refine measures for concepts that lack a straightforward measure or data.	TBD

## 2.3 IMPROVEMENT SITES

Below, we elaborate on each improvement site, providing a description of the project's motivation and aims and the central Complete Street design features. Each description pulls from information on the Richfield Sweet Streets website as well as project documents and materials, such as environmental assessment and traffic analysis evaluation reports, handouts from community engagement events, and project videos describing updates. We also reviewed materials with a broader but related focus, such as the City of Richfield's Comprehensive Plan, Complete Streets Policy, Bicycle Master Plan, and Pedestrian Master Plan. Each description provides links to supplemental project material (such as detailed project maps) in the footnotes.

### 2.3.1 66th Street Reconstruction

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#### 2.3.1.1 Overview of the Project

66th Street (County Road 53) is located in the northern part of the City of Richfield and runs the entire east-west width of the city. It is a major roadway that is often used by motorists as an alternative to Highway 62, which runs along the northern edge of the city. On an average day, between 12,000 and 22,000 vehicles use the road.

The corridor includes a mix of commercial, residential, and open space land use, with concentrations of commercial activity on the western and eastern sections of the road as well as the center. The road also attracts different types of transportation users, including pedestrians, cyclists, and high-frequency buses (Ezekwemba & Hooper, 2016).

The 66th Street Reconstruction was conducted by the City of Richfield in partnership with Hennepin County and is funded by federal, county, and city sources (City of Richfield, 2019). The project section is approximately 3.3 miles, running nearly the full width of the city from Xerxes in the west to 16th Ave South in the east.

Public engagement related to the project began in fall 2013 and continued throughout 2014 and 2015. Major construction began in 2017 and has proceeded in stages (Hennepin County and City of Richfield, 2018). Pre-construction work, including demolition and relocation of private utilities, occurred in 2016. Major street and utility reconstruction between Xerxes and Humboldt (western section of road) and Oakland and 16th Avenue South (eastern section of road) occurred in 2017 (red stripes in Figure 2-1) while reconstruction of the road between Humboldt and 5th Avenue S (central section of road) occurred in 2018 (green stripe in Figure 2-1). The project ended in 2019, with restoration and completion of sidewalks, driveways, and streetscaping in 2018 work areas (Hennepin County, 2019).

#### 2.3.1.2 Project Motivation

The 66th Street Reconstruction has two primary goals: to improve safety for pedestrians, cyclists, and vehicles and to replace deteriorating roadways, sidewalks, and underground utilities.

Safety concerns, documented by a Hennepin County environmental assessment report, were a primary impetus for the project. Prior to the reconstruction, much of 66th Street in Richfield consisted of a four-lane undivided highway lacking left- and right-turn lanes.<sup>3</sup> Sidewalks existed on both sides of the corridor, but lacked safety features such as separation from the curb, were not ADA compliant, and were in disrepair in many areas. In addition, bicyclists were prohibited from using the sidewalks due to city ordinance and were thus required to use the road, which lacked usable shoulders or shared use paths for cyclists.

Multiple segments of 66th Street had higher than average crash rates between pedestrians, bicyclists, and vehicles, as well as between vehicles. Hennepin County crash data revealed crash rates exceeding the average rate for similar roadways – and in some cases, indicating more severe crashes – for several sections of 66th Street. Specifically, eight of thirteen road segments indicated higher than average crash rates as compared to similar roadway types, while six of the eight road segments had more severe crash rates. Moreover, a traffic analysis revealed vehicle speed consistently above the posted 35 MPH limit (Ezekwemba & Hooper, 2016).

Concerns related to safety were echoed by Richfield residents in a series of open houses related to the proposed 66th Street reconstruction. Residents communicated concerns regarding sidewalks placed too close to roads, difficult road crossings due to high traffic volumes and speeds, and poorly maintained sidewalks. Residents also stated that high traffic volumes speeds and a lack of dedicated space of bicyclists discouraged this form of transportation (City of Richfield, 2019).

In addition to safety concerns, the Hennepin County report also revealed concerns related to the condition of the road. Specifically, the report indicated deteriorating pavement throughout much of the roadway, as well as obsolete traffic signals (Ezekwemba & Hooper, 2016). Other concerns related to utility and drainage and stormwater quality were also noted (Hennepin County, 2019).

#### 2.3.1.3 Central Design Elements

The 66th Street Reconstruction involved numerous changes to the existing roadway, including a full reconstruction of the road, vehicle separation features, new pavement and traffic signals, roundabouts, pedestrian and bicycle infrastructure, improvements to enhance functionality and user experience, and upgraded utilities.<sup>4</sup>

The road was fully reconstructed to include vehicle separation features such as raised concrete medians and continuous two-way left-turn lanes. New pavement was installed throughout the project as well as new traffic signals located at key intersections. To reduce delays and the potential for accidents, two

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<sup>3</sup> See (Ezekwemba & Hooper, 2016) for a more detailed description of the road prior to reconstruction. Some sections did have divisions and left- and right-turn lanes prior to reconstruction, but much of the road did not.

<sup>4</sup> Complete project map is available at <http://cityofrichfield.org/home/showdocument?id=8625>. Landscaping layout is available at <https://www.richfieldsweetstreets.org/wp-content/uploads/Updated-Richfield-Render-12052016.pdf>.

roundabouts were installed at the intersections of 66th Street and Nicollet and 66th Street and Lyndale (The City of Richfield and Hennepin County, 2019).

Pedestrian and bicycle infrastructure were also added. Sidewalks and one-way cycle tracks were installed through much of the project area, while shared use paths were installed near the western side and center/eastern side of the project area. Landscaped medians, grass boulevards with trees separating vehicles and pedestrians/cyclists, and decorative surface treatments on sidewalks were also included, for both functional and aesthetic purposes.

Finally, utilities were also upgraded, sometimes as part of another project running concurrently to the 66th Street Reconstruction. For instance, overhead utilities were relocated underground. Such changes included improvements to the regional sewage system (Metropolitan Council, 2019) and installation of a natural gas distribution main (Center Point Energy, 2019).

### **2.3.2 Portland Avenue Reconstruction**

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#### **2.3.2.1 Overview of the Project**

Portland Avenue (County Road 35) is on the eastern side of the City of Richfield and runs north-south. The area surrounding Portland Avenue is largely residential, with some public areas (including City Hall and park space) located along the northern segment of the road. Approximately 12,000 vehicles travel on Portland Avenue per day (Minnesota Department of Transportation, 2019).

Like the 66th Street Reconstruction, the Portland Avenue Reconstruction was conducted in partnership with Hennepin County. Funding came from federal, county, and city sources, with approximately half of the total funding coming from the City of Richfield. The limits of the project were 67th Street in the north and 77th Street in the south (Richfield Sweet Streets, 2019).

Public engagement on the Portland Avenue Reconstruction began in 2013 with a series of open houses on both the Portland Avenue Reconstruction and the 66th Street Reconstruction. Construction started in 2015 and was completed in October of 2016.

#### **2.3.2.2 Project Motivation**

The goals of the Portland Avenue Reconstruction were to improve roadways by updating pavement, replacing deteriorating sidewalks, and upgrading utilities, and to improve safety for different types of users of the road. With respect to safety, sections of Portland Avenue had previously been converted from a 4- to 3-lane road to reduce vehicle accidents (Hennepin County, 2019) and community feedback from engagement events indicated that residents had continuing concerns related to safety for pedestrians and bicyclists (City of Richfield 2019). In addition to improving roadways and enhancing safety, the project also sought to increase livability in this largely residential area through the implementation of landscaping amenities, transit facilities, and aesthetic enhancements.

### 2.3.2.3 Central Design Elements

As was the case for the 66th Street Reconstruction, the Portland Avenue Reconstruction involved the full reconstruction of the road and the replacement of underground utilities, including sanitary, storm, and water mains. To enhance safety and improve livability, landscaped medians were installed between vehicle lanes at pedestrian crossings and to separate pedestrians on sidewalks from vehicles on the road. New street lamps and trees were added to medians, and crosswalk striping was added to pedestrian crossings. Designated bike lanes were installed on both sides of the roadway. In addition, other improvements such as sidewalk poetry were also included as part of the project.

## 2.3.3 Lyndale Avenue Reconstruction

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### 2.3.3.1 Overview of the Project

Lyndale Avenue is located just west of center in the City of Richfield and runs north-south. A mix of commercial, residential, and mixed land uses surround Lyndale Avenue, which also abuts public spaces including the Wood Lake Nature Area and Lyndale Field and is in close proximity to the Richfield Lake Park area. The road is currently a four-lane undivided roadway and approximately 11,000 to 12,700 vehicles travel the road on an average day (Nemeth, 2018).

The limits of the project are approximately 66th Street to 76th Street – similar to the limits of the Portland Avenue Reconstruction.<sup>5</sup> Public engagement related to the event began in fall 2017 and continued through 2018. Construction is scheduled to begin in 2019 and end in 2020. The project is funded through the City's street reconstruction bonds, stormwater bonds, and state aid funds.

### 2.3.3.2 Project Motivation

The goals of the Lyndale Avenue Reconstruction are similar to those of the 66th Street and Portland Avenue reconstructions: to improve the conditions of the road, including improving pavement conditions, replacing deteriorating sidewalks, and upgrading utilities, while improving operational safety for pedestrians, bicyclists, and vehicles. The Lyndale Avenue Reconstruction also focuses on enhancing livability throughout the corridor (Richfield Sweet Streets, 2019a).

Reducing vehicle speeds and improving safety for pedestrians and bicyclists are particularly important aims of the project. A traffic analysis found that several intersections on Lyndale Avenue had crash rates that exceeded the state average rate for similar intersections (Nemeth, 2018). In addition, residents communicated concerns with high vehicle speeds and safety for pedestrians and bicyclists at public engagement events surrounding the project (Richfield Complete Streets, 2017).

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<sup>5</sup> Full project layout is available at: <http://www.richfieldmn.gov/Home/ShowDocument?id=15407>

### 2.3.3.3 Central Design Elements

As with the projects described above, the Lyndale Avenue project will involve full reconstruction of the roadway. The four-lane undivided roadway will be converted to a 3-lane roadway and underground utilities will be updated. The proposed pedestrian facilities include updated sidewalks that are separated from the road by a landscaped median. Proposed bicycle facilities include installing bike lanes and tracks, either on the road or next to sidewalks (shared-use path).

To address vehicle speeds and safety, the project proposal also includes the installation of three compact roundabouts and one larger roundabout at key intersections along the northern segment of the road, as well as traffic signals at key intersections along the southern segment of the road.

### 2.3.4 Penn Avenue Reconstruction

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Penn Avenue is located on the western side of the City of Richfield and runs north-south. Like Portland Avenue and Lyndale Avenue, Penn Avenue is classified as an “A-Minor Reliever” – one that provides direct relief to 35W to its east. The roadway runs through a mix of commercial and residential (both high and low density) areas. The commercial area is along the northern segment of the road and is somewhat unique in that it contains a greater proportion of locally owned business relative to other commercial areas in the city. The residential areas are along the central and southern segments of the road, with higher density housing options located in the southern area.

Penn Avenue was included as an improvement site in order to provide an opportunity to collect data on a Sweet Street project before the project begins. Penn Avenue is similar to the other improvement sites in several ways. Like Portland Avenue and Lyndale Avenue, Penn Avenue has the same roadway designation and runs north-south. Penn Avenue and 66th Street are also two of the commercial corridors in the city. With Penn Avenue as an improvement site, we are able to draw descriptive inferences about the consequences of Sweet Streets by comparing data collected from Penn to data *before the reconstruction* collected from the other sites *after the reconstruction*.

In addition, while some outcomes and measures are straightforward (for example, safety as an outcome and crash rate as a measure), others – such as resident experience of the road – are less so. Resident experience of the road may require developing and refining new measures through qualitative or quantitative data collection. Because Penn Avenue includes a mix of commercial and residential areas, we used this site to develop new ways to measure concepts that are important to a range of community actors, which will allow the city to better assess the impact of the Sweet Streets program in the future.

In the next chapter, we turn to the analysis of Richfield’s Sweet Streets, user experience, and livability.



## CHAPTER 3: USER EXPERIENCE AND LIVABILITY

### 3.1 OVERVIEW

In this chapter, we investigate the relationship between Richfield's Sweet Street reconstruction, user experience, and livability. Existing research shows that user experience and livability can be defined and measured in a myriad of ways and context is critical to how different types of users experience the road. Our analysis therefore focuses both on measure development and analysis of impact using a common indicator of livability.

The chapter begins by exploring the literature on user experience and livability. Though user experience is more often associated with research on product design and technology, livability – a similar construct – has often been examined in the studies of Complete Streets. We investigate both user experience and livability in this chapter, though the goals of the two parts of the analysis differ.

Given the importance of context for users' experiences of the street – as well as the recency of several major reconstructions, the first section of the analysis aims to develop a methodology and set of measures for analyzing user experience in the future. In this section, we provide historical information about the use of the streets in the past and present a descriptive analysis of how Richfield's Sweet Street reconstructions aimed to enhance user experience for salient subpopulations within the city. We then use this analysis to develop a methodology and set of measures to guide future analyses of user experience.

The second part of the analysis examines the relationship between the Portland Avenue South reconstruction and residential home values, which has frequently been used as a measure of livability. Though the analysis reveals no impact of the reconstruction on home values, there are reasons to treat the findings cautiously. We conclude the section by recommending strategies for analyzing the impact of Sweet Streets on livability in the future.

### 3.2 LITERATURE REVIEW

User experience is a term often associated with product design and technology. Broadly, the term refers to the accumulated experiences of a user who is interacting with some form of product, system, or interface. It encompasses both the usability of a product or system (for example, does a particular smart phone enable reliable internet access?) as well as the feelings and perceptions that arise from the interaction with the product or system (was it complicated or frustrating for the phone's user to go online?). The purpose of observing or measuring user experience is typically to improve a product or system, as well as future interactions with that product or system (Albert and Tullis 2013).

In the context of Complete Streets, user experience refers to how different groups of users – pedestrians, cyclists, public transit users, and drivers, but also special populations such as older individuals and families – use and experience Richfield's roads. Are recreational cyclists able to ride at a safe distance from vehicles? Are drivers able to travel from point A to point B with limited backups? Do

older individuals feel safe crossing at major intersections? Do wider sidewalks create a welcoming environment for neighboring families to congregate?

As an outcome, user experience lends itself to an array of definitions and measures. It encompasses the usability of a street as well as the perceptions of specific users as they interact with the street. The usability of a street arises in part from specific design features of the street, but also broader features of the context (such as the traffic volume). In addition, the satisfaction and perceptions of individual users are critical to the construct. Thus, user experience differs from other commonly used measures in transportation (such as a level of service measure) that prioritize how the design features of a street accommodate different types of users.<sup>6</sup>

Although user experience is not often the subject of transportation research, it is closely associated with the concept of livability (Sustainable Cities Initiative 2017), which refers to the social and environmental quality of a street or area (Appleyard 1980, Duany, Plater-Zyberk and Speck 2000, Herrman and Lewis 2017). Livability has often been examined in context of Complete Streets. Definitions of livability vary, with some definitions emphasizing the physical characteristics of a streetscape at various scales and others prioritizing the experience of using the street (Harvey and Aultman-Hall 2015). In general, scholars posit that livability is enhanced when streets create a safe and welcoming space that serves as an extension of a home, where neighbors can connect, children can play and explore, and residents can use multiple modes of travel to access goods and services.

Livability can be measured in different ways. Social interaction is one indicator of livability (Appleyard, Gerson and Lintell, *Livable Streets* 1981) while place identity and attachment, observed behavior, or perceptions of aesthetic appeal and safety are other indicators (Harvey and Aultman-Hall 2015). Because improvements in the social and environmental quality of an area may be associated with an increase in home values in residential areas (Federal Highway Administration, US Department of Transportation 2010, Burden and Litman 2011, AARP 2014), residential home values offer another measure of livability.

While residential home values represent a relatively accessible measure, research is inconclusive regarding the impact of Complete Streets on home values. Notably, a recent study using a rigorous, quantitative research design found no impact of Complete Street policies on local home prices (Vandegrift and Zanoni 2018). Yet several design elements such as tree canopies, walkability, and street layoff, are associated with economic improvements in academic research in urban planning,

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<sup>6</sup> Within the field of transportation studies, a level of service (LOS) measure is a similar metric intended to capture how different types of users are served by a road's design. LOS measures quantify multiple observable elements of the roadway (such as width of lane, buffer areas, etc.) and produce a "grade" for each roadway based on observable characteristics of the road (National Academies of Sciences, Engineering, and Medicine 2008). However, with a LOS measure, physical design features of a street figure more heavily than the actual *interaction* between a user and a road, and the thoughts, feelings, and experiences that this interaction generates. Thus, we decided against using a LOS measure to assess user experience.

transportation, and design (Song and Knaap 2003, Leinberger and Alfonzo 2012). Such studies provide support for the argument that Complete Streets reconstructions can enhance the livability of an area.

### **3.3 RICHFIELD SWEET STREETS AND USER EXPERIENCE**

#### **3.3.1 Methodology and Data**

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The importance of context in defining and measuring user experience, alongside the recency of Richfield’s Sweet Streets reconstructions, led our research team to prioritize developing a methodology and set of measures for analyzing user experience in the future. We begin by using historical data – including excerpts from interviews conducted part of the Minnesota Historical Society’s “Richfield in the Postwar Era Oral History Project,” Census data, and newspaper articles – to show how over the years, Richfield’s streets increasingly became out of sync with the needs of residents.

We then elaborate on how the street redesigns intended to enhance the usability and experience of using the roads for salient subpopulations, using images archived on Google Maps, Census data, and original survey and interview data collected as part of this project.<sup>7</sup> While all types of individuals are important to consider in street redesign, Richfield’s Complete Streets policy follows a modal hierarchy, in which pedestrians are prioritized first, followed by transit users, cyclists, and vehicles. Families with children, older populations, households lacking access to a vehicle, and bicyclists were particularly important in the design of Richfield’s Sweet Streets. The descriptive analysis, therefore, focuses on how the Sweet Streets aimed to change the experience of the roads for these subpopulations.

The intersections and road segments that we focus on in the descriptive analysis are based on areas within the city that have relatively high concentrations of each group. For instance, because Census data reveal that many older residents are located in the Census tract containing the intersection of 66th Street and Lyndale Avenue South, we focus on pre/post images from this intersection, drawing out the implications for older individuals. Whenever possible, we compare before and after images of the same intersection or road segment. For Portland Avenue South, we also compare images of reconstructed areas to comparable areas on Penn Avenue South, which has not yet been reconstructed. Additional information about the distribution of subpopulations throughout the city is available in Appendix B.

#### **3.3.2 Richfield Streets in an Historical Context**

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Richfield’s transformation from a farming town into a suburban community of approximately 36,000 residents provides helpful context for understanding city leaders’ motivation for the Sweet Streets program. In particular, this history highlights how the original design of many of Richfield’s streets, while meeting the needs of many users at the time of its development, failed to keep pace with the changing needs of its population.

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<sup>7</sup> See Chapters 4 and 5 for additional information on interview and survey methods used.

The town of Richfield, established in 1858, remained largely a rural farming community for its first forty years. Though developers had begun to parcel farm acreage into smaller lots by the early 1900s, it was during the 1940s and 1950s that the modern suburban form of Richfield began to emerge. Following the end of the Second World War, the number of single-family homes in Richfield grew dramatically, hastening Richfield's transformation from a village into a suburban city. The population grew as well, increasing by 363 percent between 1940 and 1950 (Johnson 2008).

During this period of growth, the automobile was exerting a strong influence on the design and development of emerging suburbs across the country (Judd and Swanstrom 2015). Homes, streets, and shopping areas were all designed with the expectation that the automobile would serve as the primary mode of transportation in the future (Melosi 2010). Many of Richfield's homes were built with two doors: a front door and a side door allowing access to a driveway. Though few homes were built with garages, residents often obtained city permits to construct their own (Johnson 2008).

Street design, too, emphasized the centrality of the automobile. For instance, while Minneapolis streets had sidewalks to accommodate pedestrians as well as carriages, streetcars, and later, automobiles, Richfield intentionally avoided building sidewalks, viewing the streets as sufficient and welcoming the demarcation between the central city and the growing suburb (Johnson 2008).

Despite its rapid growth, Richfield viewed itself as a "bedroom community" where workers drove daily into the city and returned home to the suburbs at night. One individual interviewed for the "Richfield in the Postwar Era Oral History Project" noted that Richfield's distinctive non-urban character was a primary motivation for moving to the area:

"I didn't see any reason to go to Minneapolis, and Richfield was a new area and I liked it here. I liked to be out as far as I could get from a big city. I think that's the reason, because I didn't want to be in the city. I wanted to be outside of the city and that was Richfield at that time" (Minnesota Historical Society 2007).

During the post-war period, suburbs such as Richfield attracted a large number of young families eager to escape the central city (Judd and Swanstrom 2015). Oral histories suggest that in addition to providing families with affordable houses, Richfield's streets also served the interests of young families by offering an open and safe space for children to play.

For example, one respondent explained that unlike in Minneapolis, children in Richfield often played in front of houses and in the streets. In Minneapolis, she explained: "there was a very busy street with a streetcar in front, so I couldn't let this child out of the house unless I went with him. .... But when I got to Richfield the street was not busy and there were hoards of other kids so it was great" (Minnesota Historical Society 2007). Another drew attention to the safety of the roads despite the absence of sidewalks: "We never had any sidewalks in our area at all. ...But you weren't worried because there weren't that many cars anyway. And people were careful" (Minnesota Historical Society 2007).

While local streets had relatively few cars – particularly during the day, the daily traffic volume was higher on several of the major roads. Lyndale Avenue, for example, was widened in the 1920s due to the

fact that nearly 22,000 automobiles and streetcars used the road each day. The construction of Interstate 35W and 494 in the 1950s, and Highway 62 in the 1960s, however, drew much of the traffic off the local roads and increased the accessibility to services and goods located in other areas, such as the new Southdale mall in Edina (Johnson 2008).

Car ownership and use expanded in the latter half of the twentieth century, which led to changes in the use of the road. In 1960, 60 percent of Minnesota residents drove to work, while 8 percent took a bus or streetcar and 12 percent walked (US Census Bureau 1960). By 2000, 88 percent of Minnesotans and 87 percent of Richfield residents drove to work (U.S. Census Bureau, 2000). Such changes – which were not unique to Richfield – altered the character of many streets. As one scholar notes, across the United States:

“It was becoming much less safe to gather in the streets without the protection of a vehicle, to let children play their games in what passed for an early playground, or to extend a front-porch culture into a road abutted by several neighboring houses. The use of the streets as social and recreational gathering places was threatened and indeed supplanted by the requirements of increasingly rapid and mounting vehicular traffic” (Melosi 2010).

The historical record suggests that as automobile use became more widespread in communities across the United States, the experience of using the roads for other types of street users changed. In Richfield, the changes were especially salient for the families who made up a significant portion of the population.

The Sweet Streets program was motivated in part by the recognition that streets designed to accommodate vehicles create an unwelcoming environment for other users of the road. Streets designed for cars often lack adequate protection for pedestrians and bicyclists, such as sidewalks for pedestrians or separate lanes for cyclists. Indeed, information gathered through community outreach prior to the Portland Avenue South and 66th Street reconstructions drew attention to problems related to usability (primarily uneven or unmaintained sidewalks), safety, and social engagement on streets prior to reconstruction.

### **3.3.3 Designing for Pedestrians in Richfield**

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Richfield’s roads are used by residents and non-residents alike. The city’s 36,000 residents use the streets to commute to work and school, access goods and services, and for exercise and recreation. With its central location and easy access to highways, Richfield also draws a large number of non-residents who come to the city to visit local businesses or pass through on their way to the airport, Minneapolis to the north, or neighboring suburbs.

While Richfield’s Complete Streets policy aims to improve the “safety, access, convenience, and comfort of all users of all ages and abilities” (City of Richfield, MN 2018), the city also organizes its efforts around a modal hierarchy, prioritizing pedestrians first, followed by transit users, cyclists, and vehicles (Broz, 2018). This section focuses on the nexus between pedestrian need and two prominent subpopulations: families with children and older populations. Specifically, the section examines how the Sweet Street reconstructions were designed to enhance user experience for these groups.

### 3.3.3.1 Families with Children

As the previous section notes, the City of Richfield has long attracted families with children. Census data reveals that the city is home to over 7,500 children and over a quarter of Richfield's households currently have a child under the age of 18. Research suggests that in residential areas with children, street design is particularly important because accidents often result from child error. For instance, street modifications aimed at slowing vehicle speeds can give a motorist more time to respond if a child inadvertently darts into the road (Retting, Ferguson, & McCartt, 2003).

In Richfield, areas located on the eastern side of the city tend to have a higher percentage of families with children, relative to the city as a whole. In Census tracts located between 12th Avenue South and Cedar Avenue South, over 50 percent of households have a child under age 18, relative to 26 percent for the city as a whole (U.S. Census Bureau, American Community Survey 5-year Estimates 2018).<sup>8</sup>

Below, we compare before and after images of the intersection of 73rd Street and Portland Avenue South. This is an important intersection for families with children because it is within the “walk zone” (or, within 1-mile) of several schools, including the Richfield Dual Language School, S.T.E.M. School, and Centennial Elementary, as well as Richfield High School. Prior to reconstruction, it was a likely crossing for children living east of Portland Avenue South who walk or bike to school due to the presence of sidewalks on the northern side of 73rd Street.

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<sup>8</sup> See Appendix B for maps and additional data.



*Panel A: Prior to reconstruction – April 2012*



*Panel B: Following Reconstruction – April 2018*

Source: Google Earth, <https://earth.google.com/web/>

**Figure 3-1 Intersection of 73rd Street and Portland Avenue South Prior to and Following Reconstruction**

Figure 3-1 shows the intersection of 73rd Street and Portland Avenue South in 2012 (Panel A - left image) and 2018 (Panel B - right image). Prior to reconstruction, the intersection lacked many of the features designed to increase safety for pedestrians, bicyclists, and public transit users. No designated crosswalk exists. The sidewalk pavement is uneven, and the curb has not been updated. There is no lighting at the corner of the intersection where the public transit stop is located; indeed, there is only one streetlight on the southeastern corner of the intersection.

The image on the right shows that the reconstructed intersection includes several features designed to increase the visibility and safety of pedestrians and cyclists, including a marked crosswalk and center median with a pedestrian refuge. Though difficult to see from this image, signs increase the visibility of the center median to vehicles. Lighting has been added to both sides of the streets and is positioned to illuminate a pedestrian or cyclist to oncoming traffic and before a vehicle crosses an intersection. The street lighting is also positioned above the public transit stop.

Panel B also shows that the sidewalks are maintained, with a landscaped buffer along the eastern side of Portland Avenue South, as well as on-street bike lanes on both sides of the road, separating pedestrians from vehicles. Trees are planted in the landscaped buffer, which will eventually provide shade for



pedestrians and bicyclists. Though not visible from this image, an original poem by Ellen Orzoff is stamped into the sidewalk on the southwestern corner of the intersection, designed to enhance the aesthetic appeal of the street and improve the experience of using the sidewalks for pedestrians.

In addition to enhancing safety for families with children – and pedestrians generally – such changes were intended to make the experience of walking along the relatively busy road more enjoyable.

Open-ended survey responses reiterate the importance of well-maintained sidewalks and pedestrian crossings for families with children in particular. One survey respondent, for example, drew attention to the importance of well-maintained sidewalks:

“I push my kids in a stroller. Portland and 66th are great to walk on, but the sidewalk on Nicollet (the closest through street to my house) hasn't been maintained or updated as recently so there are some rough spots for pushing the stroller.” (37-year-old white male)

Other respondents note the importance of both crossings and sidewalks in this area, and a desire to see: “More pedestrian crosswalks painted on intersections close to schools;” “More sidewalks... so pedestrians can walk safer. Especially kids going to schools like STEM and RDLS; and “Improved sidewalk on 12th Ave, along with speed bumps between 67th & 70th. People go really fast between the stop signs and there are a lot of kids around because of the schools at 70th.”

While these statements suggest concerns related to the safety of some of the streets for families and children, they also provide examples of design elements that alleviate such concerns for parents. For instance, in the above quotes, respondents mention sidewalks, pedestrian crosswalks, and traffic calming measures such as speed humps as alleviating many safety concerns. Several of these design elements, including updated sidewalks and pedestrian crossings, were incorporated into the design of Portland Avenue South.

### 3.3.3.2 Older Populations

Households with older individuals are a relatively large minority in Richfield. Approximately 16 percent of Richfield residents are age 65 or older, while 37 percent of Richfield households contain an individual age 65 or older (U.S. Census Bureau, American Community Survey 5-year Estimates 2018). Moreover, these percentages are expected to increase in the future as the baby boomer generation continues to age while remaining in the city (City of Richfield 2018b).

Older populations are a particularly important subpopulation to consider in street redesign because they are less likely than younger Americans to own and operate a vehicle and thus rely more heavily on walking and public transportation. Aging also involves challenges that may place older individuals at greater risk on the roads, including declining vision, difficulty walking, cognitive limitations, and increased reaction time (AARP Public Policy Institute, 2009).

Within Richfield, certain areas of the city have a particularly high concentration of households with older individuals. In particular, in the northern center of the city (specifically, Census tract 244), over 41



percent of residents are age 65 or older (U.S. Census Bureau, American Community Survey 5-year Estimates 2018). Several multi-unit senior residences, including the Pines Senior and Assisted Living, Gramercy Park Cooperative, and Village Shores Senior Community, are located within this tract.

Perhaps due to the concentration of older individuals, this area also contains higher than average rates of disabilities that make walking difficult. Relative to the city as a whole, approximately 13.7 percent of individuals in this census tract possess an ambulatory difficulty, compared to 6.2 percent for Richfield as a whole (U.S. Census Bureau, American Community Survey 5-year Estimates 2018).<sup>9</sup> For residents who have difficulty walking or use walkers or wheelchairs, design elements that bring streets up to date with federal rules related to the Americans with Disabilities Act (ADA), such as ADA-compliant pedestrian crossings and curbs, are particularly important.

Several older Richfield residents who responded to our survey noted the importance of sidewalks that are wide enough to accommodate wheelchairs and have American Disability Act-compliant curbs are important.<sup>10</sup> As one survey respondent noted: “My family has 2 wheelchair users and the sidewalks are broken or ramps so poor that “walk” in neighborhood is uncomfortable.” (White female, 50 years old). A lack of well-maintained sidewalks was also mentioned as a concern in our conversations with several individuals at Open Streets at Penn Fest – particularly for those with disabilities that make walking difficult.

Figure 3-2 shows this intersection of 66th Street and Lyndale Avenue South before and after the 66th Street reconstruction (2016 and 2019, respectively). This intersection is just east of several of the senior living facilities. Panel A (top) shows that prior to reconstruction, the road contained several features that likely created difficulty for older individuals and those with ambulatory difficulties. For instance, the distance to cross Lyndale Avenue South is far, and both streets lack a median refuge for pedestrians. While curbs are present, crosswalk visibility is low, and the crosswalk markings are faded. In addition, the street itself is rough.

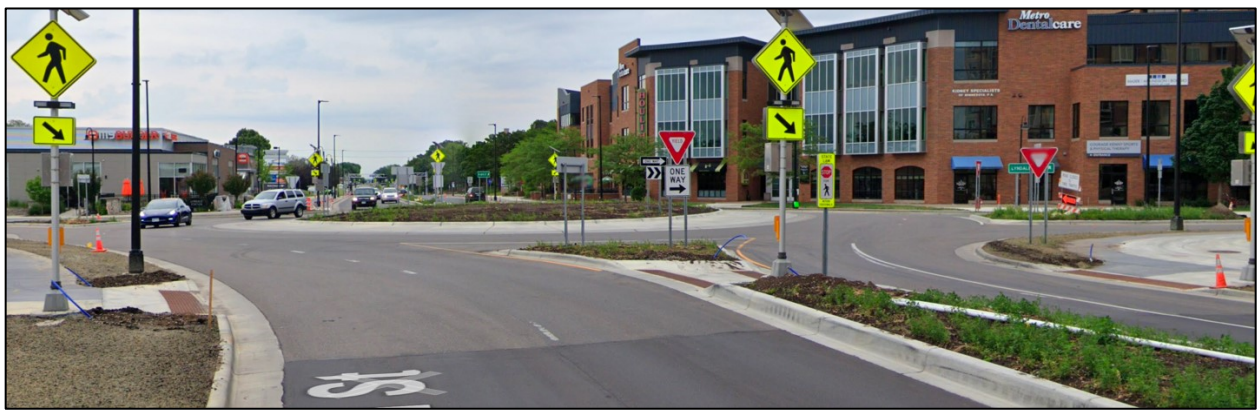
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<sup>9</sup> An ambulatory disability is defined as “having serious difficulty walking or climbing stairs.” (U.S. Census Bureau, American Community Survey 5-year Estimates 2018)

<sup>10</sup> The following Department of Justice/Department of Transportation Joint Technical Assistance memo provides guidance on the requirements for providing curb ramps when streets are altered. The guidance is available at the following site: [https://www.fhwa.dot.gov/civilrights/programs/doj\\_fhwa\\_ta.cfm](https://www.fhwa.dot.gov/civilrights/programs/doj_fhwa_ta.cfm)



Panel A. Prior to reconstruction – August 2016



Panel B. Following Reconstruction – June 2019

Source: Images from Google Maps (Google, 2019)

### Figure 3-2 Intersection of 66th Street and Lyndale Avenue South Prior to and Following Reconstruction

Panel B (bottom) shows the same intersection following reconstruction. The four-way intersection has been replaced by a two-lane roundabout. Crosswalk visibility has increased due to the presence of signage on both sides of the street, as well as on the median, which also offers protection for pedestrians crossing the road.<sup>11</sup> The pavement is smoother, and texture has been added to curbs to help visually impaired individuals recognize the crosswalk. Finally, the intersection is more visually appealing due to the presence of landscaping in the medians as well as the center of the roundabout.

In part, these changes intended to make it safer and more enjoyable for individuals to walk to restaurants, shops, and other businesses, as well as access public transportation. For the individuals living in the nearby senior residence, such changes may be particularly important for increasing access to the goods and services at Lyndale Station and the Richfield Hub and West Shopping Center (“the Hub”), located just to the east. Indeed, numerous individuals that we spoke to at Open Streets at Penn

<sup>11</sup> Crosswalk striping had not yet been added at the time of this picture.

Fest highlighted the importance of sidewalks that are updated and maintained for increasing access and activity among the elderly and those with difficulty walking.

Perhaps reflecting the recency of the reconstructions, survey respondents communicated ongoing concerns related to pedestrian crossings at roundabouts. Several older respondents drew attention to the difficulty of the new crossings: “Cars continually go through the yellow lights at roundabouts...and Portland doesn't even have one. I was almost hit twice the other day crossing at the roundabout, during rush hour in the morning both to and from my appointment at Allina” (White female, age 62). This suggests that residents are still learning how to navigate the new design elements of the road.

Of those respondents who recommended improvements in pedestrian crossings, several identified driver awareness and/or education as critical to improving the experience of crossing the roundabouts:

“Somehow improve how pedestrians cross streets. As a driver I know there are so many distractions with signs, lights and other traffic that I really don't see pedestrians sometimes. As a walker I am nervous about crossing. Some education would be helpful.” (White female, age 78)

A 73-year old white man also summed up his recommendation as follows: “To teach drivers how to drive through roundabouts and how to respect pedestrians.” Though the City of Richfield has invested considerably in roundabout education for drivers, pedestrians, and cyclists (including crossing the roundabouts with residents), the survey data suggest continuing confusion. Given the ongoing concerns related to roundabout use, monitoring perceptions of roundabout safety, alongside driver behavior vis-à-vis pedestrians and cyclists, is likely to be particularly important for continuing to enhance user experience along reconstructed roads.

### **3.3.4 Designing for Public Transit Users in Richfield**

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When individuals lack access to a vehicle – either because they cannot afford one or choose not to own one – they are reliant on walking, cycling or scooting/rolling, and public transportation to access employment, goods, and services. Although a majority of Richfield residents drive to work, approximately 4.6 percent of households with a worker age 16 and older lack a vehicle in the household. The lack of a household vehicle is relatively more common in the southeastern area of the city: nearly 13 percent of working households located in the Census tract in the southeastern corner of the city lack access to a car (U.S. Census Bureau, American Community Survey 5-year Estimates 2018).

For these households, access to public transportation is likely to be particularly important. Census data show that approximately 7.2 percent of Richfield residents commute to work via public transportation, with higher concentrations of transit users in the southern and central areas of the city. In addition, there is evidence that public transit use has increased in Richfield over the past decade. Census data from 2007 indicate that just under 4 percent of Richfield residents commuted by public transportation during this time (U.S. Census Bureau, American Community Survey 3-year Estimates 2008). The addition of Metro Transit Bus Route 515, a high frequency bus route that runs along 66th Street, is also an indication of increasing demand for public transit options.

Although the modal hierarchy used by the City of Richfield prioritizes public transit users after pedestrians, many of the design elements meant to enhance the experience of walking along the street can improve the experience of the road for those using public transportation. For instance, marked crosswalks, median refuges, and the addition of buffers between sidewalks and vehicles can make it safer and more pleasant for transit users to walk to a bus stop.

Figure 3-3 illustrates two similar intersections on Penn Avenue South (73rd Street and Penn Avenue South; not reconstructed) and Portland Avenue South (73rd Street and Portland Avenue South; reconstructed from 2014 to 2016) in order to highlight how Richfield's Sweet Street changes aimed to enhance the experience of the road for those using public transportation.

Panel A (top) shows a transit stop located on the southwestern corner of the intersection of 73rd Street and Penn Avenue South – an intersection that is located in the Richfield Census tract with the highest percentage of households lacking a vehicle.<sup>12</sup> At this intersection, no marked crosswalk exists to help transit users safely cross to the transit stop. A buffer exists between the sidewalk and vehicles, but it lacks the aesthetic appeal of the landscaped buffers on reconstructed roads. There is no lighting above the stop to illuminate individuals waiting at the transit stop or crossing the road, nor is there any shade or weather protection provided by a transit shelter or mature trees.

In contrast, Panel B shows a transit stop located on the southwestern corner of the intersection of Portland Avenue South and 73rd Street. Unlike the transit stop located on Penn Avenue South, this stop has trees and a protected shelter with bench. A streetlamp increases the visibility of those waiting at the stop and illuminates those in the crosswalk to oncoming traffic. There is a crosswalk across Portland Avenue South, as well as a median refuge to help transit users safely cross the busy street. Such features increase the safety – and likely enhance the experience – of walking to and waiting at the transit stop.

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<sup>12</sup> Penn Avenue South is used as a comparison for Portland Avenue South because historical images are not available for this intersection of Portland Avenue South.





*Panel A. Prior to Reconstruction (Penn Avenue South) – June 2019*



*Panel B. Following Reconstruction (Portland Avenue South) – June 2019*

*Source: Images from Google Maps (Google, 2019)*

**Figure 3-3 Transit Stops Prior to and Following Reconstruction**

Few survey respondents commented on public transit stops within the city (though the survey did not ask about this directly). A few noted being pleased with having transit stops nearby and two reported interest in increased frequency of buses. In addition, one recommended adding a safe pedestrian crossing at a location (63rd Street and Lyndale) where pedestrians regularly cross from the gas station to the bus stop. It is likely that open-ended responses about pedestrians' experience of the roads also encompass those of public transit users. For instance, one individual advocated for: "More sidewalks or better lighting - it is dangerously dark walking down my street to the bus stop in the winter mornings/evenings" (34-year-old white female). This respondent draws attention to how street improvements will improve her experience using public transit by improving the walk to the bus stop.

### **3.3.5 Designing for Recreational and Commuting Cyclists**

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The City of Richfield provides numerous opportunities for both recreational and commuter cyclists. The City boasts nearly 30 miles of existing bike trails, with 24 miles of additional routes to be added in the near future (City of Richfield, 2012). The city also has 23 parks containing approximately 450 acres of land and is part of an intercity network of regional trails (City of Richfield, 2020). In 2017, the League of American Bicyclists awarded the City a Bronze Level Bicycle Friendly Community designation (League of American Bicyclists 2017).

Although the city offers considerable cycling infrastructure, few residents commute to work or school via bicycle. Data show that less than 1 percent of residents bike to work (U.S. Census Bureau, American Community Survey 5-year Estimates 2018) while between 0 and 5 percent of school-aged children bike to school (City of Richfield 2014). Few data sources measure the extent of recreational bicycling in the community. There are strong reasons to suspect latent demand for biking, given the extent of park land and access to both Richfield locations and locations outside the city as more cycling infrastructure is installed.

Both recreational and commuter bicyclists were prioritized when developing the Sweet Street projects. Figure 3-4 shows two types of bike lanes that exist on reconstructed roads. On the left is an off-street bike lane on 66th Street. This lane is separated from pedestrians by markings on the road and is separated by vehicles by the landscaped buffer. The image on the right shows an on-street bike lane on Portland Avenue South.

The two designs are intended to support different types of residents. Recreational bikers who cycle slowly and who may be less comfortable riding next to cars can use the off-street cycle paths, while commuting cyclists who ride at faster speeds can use the on-street cycle paths. Not shown is another type of path, designed for advanced cyclists, that has a bike lane located between parked cars and moving vehicles. This type of design was implemented on a segment of Lyndale Avenue South. Another type of bicycling infrastructure is a trail. On Portland Avenue South, one side of the street is a sidewalk and another side of the street is an off-street trail, which is meant to support recreational cyclists. Portland Avenue South also has an on-street bike lane, meant to accommodate commuting cyclists.



*Panel A: Bike Lane on 66th Street*



*Panel B: Bike Lane on Portland Avenue South*

*Source: Images from Google Maps (Google, 2019)*

#### **Figure 3-4 Different Types of Bike Lanes on Reconstructed Roads**

The presence of bike paths on reconstructed roads differs significantly from the infrastructure available for cyclists prior to the Sweet Street reconstructions. Figure 3-5 shows the intersection of 66th Street and Nicollet Avenue South prior to (April 2012) and following (June 2019) reconstruction. This area is particularly likely to see cyclists as it is positioned between two large outdoor areas: Richfield Lake Park to the north and Wood Lake Nature Center to the south.

Panel A (top) shows that prior to reconstruction, cyclists were relatively unaccommodated on the road. While sidewalks exist, no designated bike lane exists either on or off the road, with bikers only able to ride with traffic on the 4-lane road.

Panel B (bottom) shows the same segment of road following reconstruction. This image shows significant changes following reconstruction, including a reduction in the number of lanes on 66th Avenue South, the installation of a two-lane roundabout, and the widening of areas for pedestrians and cyclists. This image shows that bicyclists have a separate, one-way cycle track set off the busy street and separated from vehicles by a buffer. This track is a darker shade of gray to distinguish it from the pedestrian walkway.





*Panel A. Prior to Reconstruction – April 2012*



*Panel B. Following Reconstruction - June 2019*

Source: Google Earth, <https://earth.google.com/web/>

**Figure 3-5 Presence of Bike Lanes on 66th Street Prior to and Following Reconstruction**



At the time that the image in Panel B (Figure 3-5) was taken, crosswalk striping had not yet been added to the street. Figure 3-6 shows an alternate view of the reconstructed intersection, after striping had been added. This image reveals additional design elements that enhance the usability of the street for cyclists and the visibility of both pedestrians and bicyclists to vehicles.



*Source: Author's image, taken October 2019*

**Figure 3-6 Intersection of 66th Street and Nicollet Avenue South**

Figure 3-6 shows that the crosswalk has clear markings for both pedestrians and those using other forms of transit. In addition to the presence of lighting to illuminate individuals in the crosswalk to oncoming traffic, the crosswalk now includes prominent signs that illuminate and flash when the pedestrian crossing button is pushed.

It is important to note that Richfield residents have had a limited opportunity to use the new bicycling infrastructure. While the majority of the 66th Street reconstruction was completed prior to summer 2019, some of the streetscaping work (such as crosswalk striping) was added during the summer months. In addition, much of the Lyndale Avenue South construction took place during summer 2019. To the extent that the reconstructions activate latent demand for bicycling by making it safer and more enjoyable to cycle in Richfield, they are most likely to do so during the summer months. Summer 2020 or 2021 is likely to provide the best estimate of the impact of the reconstruction on bicycling activity in Richfield.

### 3.3.6 Discussion and Recommendations for Future Analysis

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Our analysis of user experience prioritizes the following populations: pedestrians (including seniors and families with children), transit users, and both recreational and commuting cyclists. These populations reflect the modal hierarchy established in Richfield's approach to Complete Streets as well as prominent groups of Richfield residents. The recommendations for future analysis mirror this prioritization and include the following:

- (1) **Because user experience depends on the interaction between different sets of users and the street, our recommendation is to conduct either intercept surveys of a citywide survey of Richfield residents.**

If intercept surveys are used, we recommend conducting the surveys at the following locations: the entrance to Walgreens, located in the Hub shopping center; the Richfield Farmers Market, located in Veterans Park just north of the 66th Street and Portland Avenue South intersection; and the transit stops located on the Northeast (Nicollet Avenue South) and Northwest (66th Street) corners of the intersection of 66th Street and Nicollet Avenue South. These locations prioritize the following populations: pedestrians and cyclists (Farmers Market), transit users (transit stops), as well as seniors (Walgreens). Our recommendation is to conduct these surveys in summer 2022, when residents will have had more opportunity to adjust and adapt to the changes along 66th Street.

In addition to basic demographic information (including race, age, and gender), we recommend that these surveys cover, at a minimum, the following topics:

- (a) Use and usability
  - How did you travel here today? How do you typically travel to this location?
  - Where did you travel from to get to this location?
  - How easy would it be for you to (walk/bike/drive) to this location?
  - Did you travel here today with anyone else? How many people arrived with you today?
- (b) Satisfaction
  - How safe did you feel on your (walk/ride/drive) to this location?
  - How enjoyable was the (walk/ride/drive) to this location?
  - What were the most enjoyable aspects of your (walk/ride/drive)?
  - What were the least enjoyable aspects of your (walk/ride/drive)?

In addition, although families with children represent an important population in the city, we do not recommend prioritizing families with children in this analysis. This is because the Richfield Public School District is already collecting data on transportation patterns and perceptions of families with children as part of its Safe Routes to Schools efforts. We discuss this effort in greater detail in Chapter 7.

## 3.4 LIVABILITY: MEASURING CHANGE IN RESIDENTIAL PROPERTY VALUES

### 3.4.1 Methodology and Data

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To estimate the impact of Richfield's Sweet Streets on residential property values, we conducted a difference-in-difference (DID) analysis. The DID analysis is a quasi-experimental research design that allows an estimation of the effects of an intervention (or treatment) over time by comparing to similar groups, only one of which experiences the intervention or treatment. In this analysis, we analyzed the relationship between a Sweet Streets reconstruction (the treatment) and residential property values by comparing trends in the appraised values of residential properties along Portland Avenue South (the treatment group; hereafter *Portland Avenue*) with trends in the values of properties along Nicollet Avenue South (the control group; hereafter *Nicollet Avenue*).

For this analysis, we focused on the years during and immediately following Portland Avenue's reconstruction (2013-2018). Portland Avenue was selected as the treatment group because it has a large proportion of residential properties and because the project was completed in 2016, thereby allowing time to observe potential changes in property values. We selected 2013 as the first year in the analysis because public outreach about Portland Avenue's reconstruction began in the fall of that year.

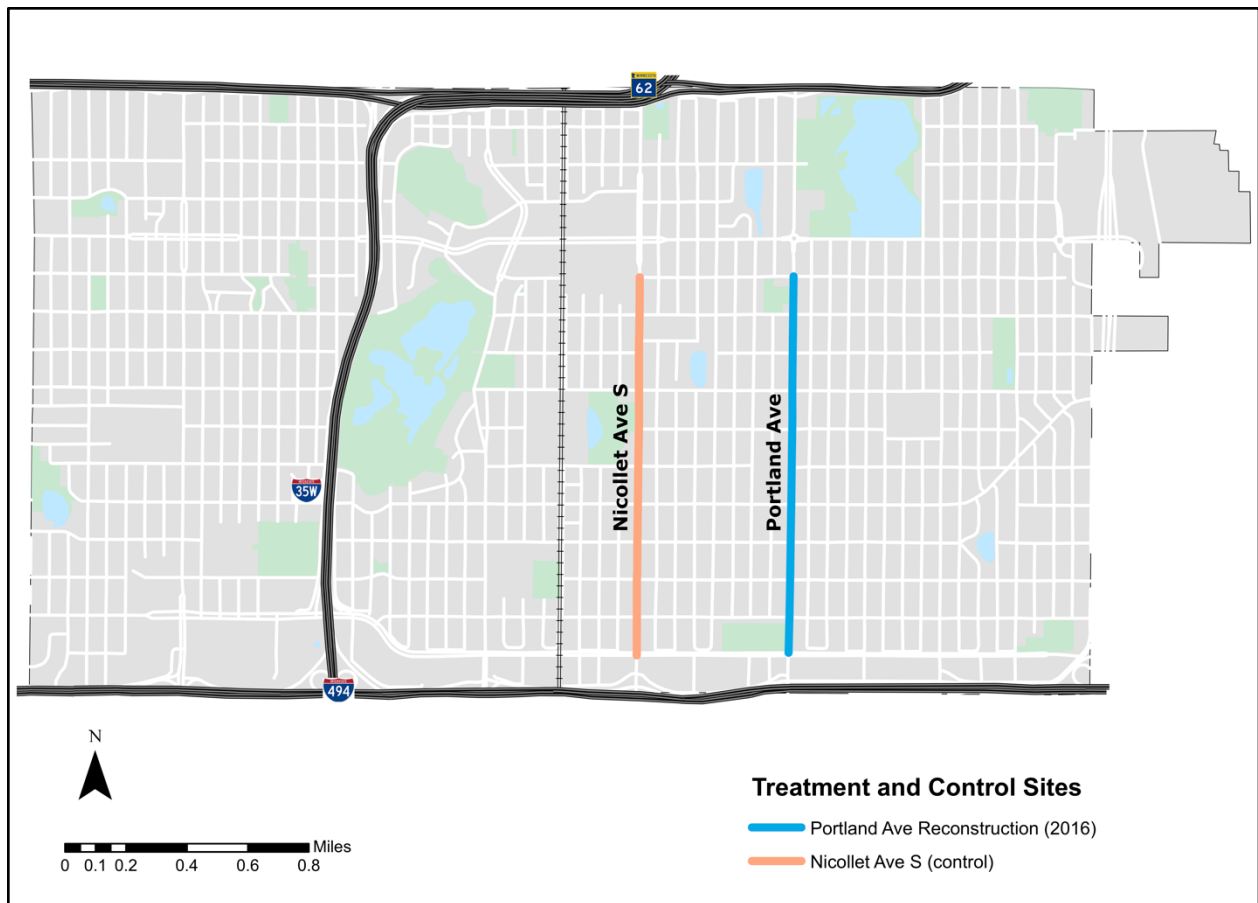
The Portland Avenue reconstruction stretched from 67th Street in the northern half of the city to 77th Street in the southern half. The goals of the reconstruction were to improve roadways by updating pavement, replacing deteriorating sidewalks, and upgrading utilities, and to improve safety for different types of users of the road. With respect to safety, sections of Portland Avenue had previously been converted from a 4- to 3-lane road to reduce vehicle accidents (Hennepin County, 2019) and feedback from engagement events indicated that residents had continuing concerns related to safety for pedestrians and bicyclists (City of Richfield 2019). Sidewalks were therefore widened, street lighting improved, and bike lanes installed.

In addition to improving roadways and enhancing safety, the project also sought to improve the experience of street users in this largely residential area through the implementation of landscaping amenities, transit facilities, and aesthetic enhancements, such as stamped poetry on the several sidewalks. Construction on the project began in 2014 and ended in 2016.

We selected Nicollet Avenue as the comparison street for several reasons, elaborated upon in Appendix A.<sup>13</sup> In addition to having similar land-use patterns, the two streets are surrounded primarily by detached residential properties, with small areas of public space on the western side of each road.

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<sup>13</sup> For this analysis, Penn Avenue does not serve as an adequate comparison site because land use patterns along Penn Avenue differ from land use patterns along Portland Avenue. Relative to Portland Avenue, Penn Avenue contains more commercial areas along the northern segment of the road and attached residential areas along the southern segment (City of Richfield 2018b).



**Figure 3-7 2017 Streets Selected for Difference in Difference Analysis**

Second, the streets are similar in that they run north to south. This is important because in Richfield, traffic patterns are more alike on the north-south streets than they are on the streets that run west to east.<sup>14</sup> Though the streets have a different functional classification (Portland Avenue is an A Minor Arterial and Nicollet Avenue is a B Minor Arterial), Hennepin County’s Multi-Modal Count Map indicates that traffic volumes along the identified segments of the roads are similar.<sup>15</sup>

Third, the City of Richfield’s Pedestrian Plan shows that demographic patterns, while not identical, are similar with respect to the population living in poverty, as well as pedestrian demand (see Appendix A) (Zan Associates 2018). Such demographic factors are important because they may relate to trends in property values. In addition, pedestrian demand is important because it likely influences the relative value of a reconstruction to residents.

<sup>14</sup> See Minnesota Department of Transportation, Traffic Mapping Application. Available at: <https://mndot.maps.arcgis.com/apps/webappviewer/index.html?id=7b3be07daed84e7fa170a91059ce63bb>

<sup>15</sup> See Hennepin County Multi Modal Count Map, <http://hennepin.maps.arcgis.com/apps/webappviewer/index.html?id=14c650982d904132a4854f399c71e1f2>.

### 3.4.2 Analysis

Figure 3-8 shows the parcels included in the analysis. In addition to properties located on Portland and Nicollet Avenues, we included residential properties on adjacent streets to account for the fact that reconstructed streets may affect the values of homes on neighboring streets. In the figure below, the parcels associated with Nicollet Avenue South are shown in orange and those associated with Portland Avenue South are shown in blue.

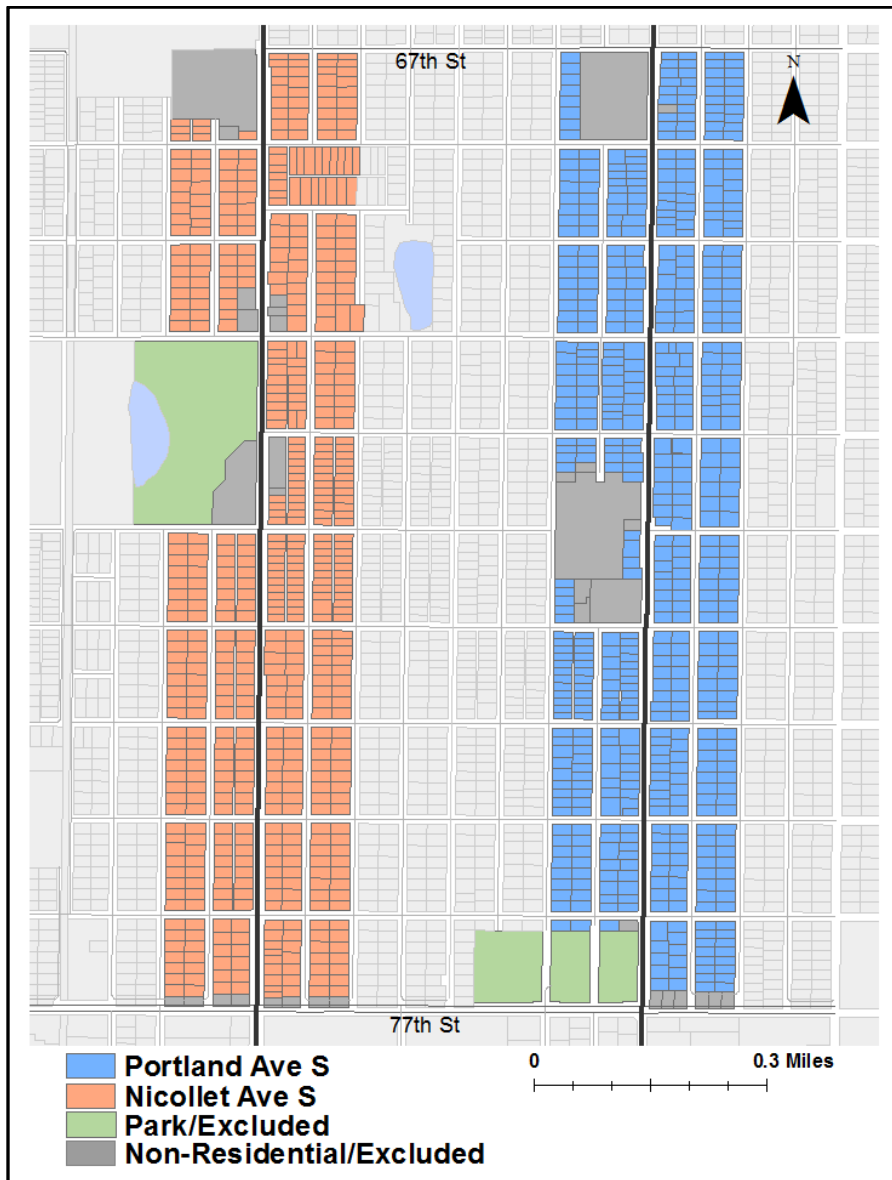
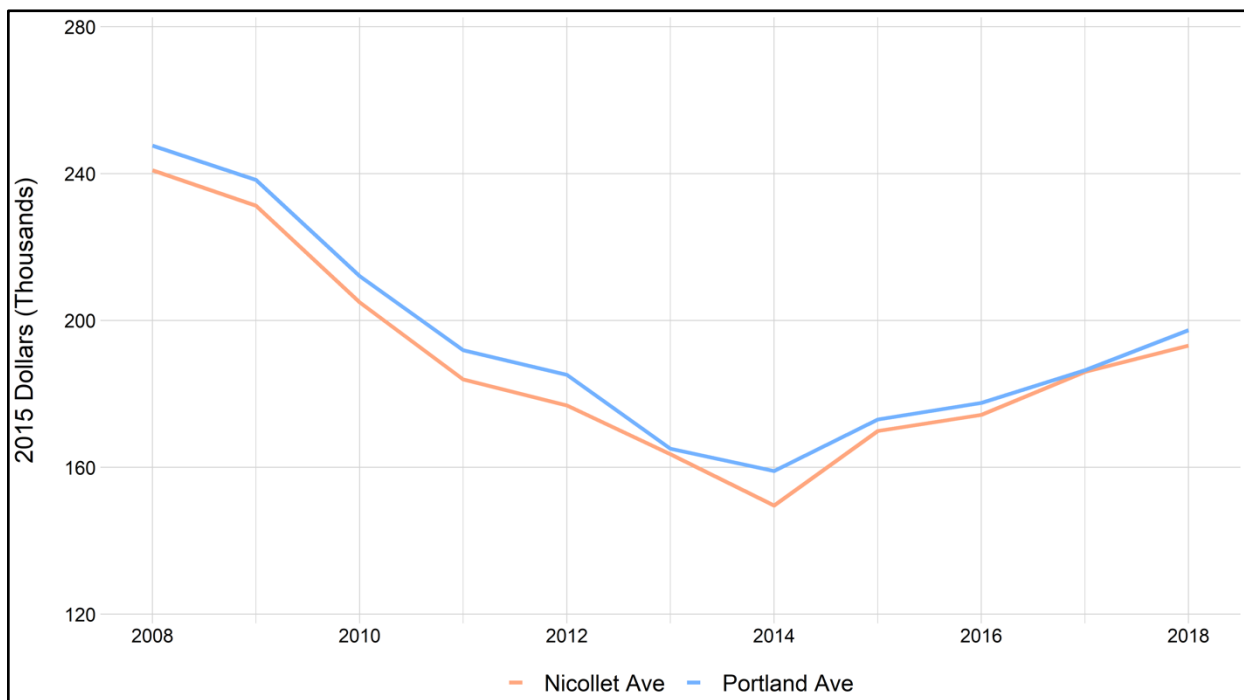


Figure 3-8 Parcel Data Used in Difference-in-Difference Analysis (2013-2018)

Because we were interested in residential home values, we excluded non-residential properties (including city-owned property, land that is owned by churches, vacant properties, and several apartment complexes) and properties lacking an appraised value (in the Figure colored in grey and green). All property values were adjusted using the Consumer Price Index.<sup>16</sup>

A key assumption of DID is that the outcome variable of the treatment group and the control group have parallel trends prior to the treatment. It is this assumption that allows the inference that changes in the outcome variable can be attributed to the treatment. For this analysis, property values of properties along Portland Avenue (treatment group) and Nicollet Avenue (control group) should have parallel trends prior to the roadway construction in 2013. Figure 3-9 shows average trends in property values in the sample areas on and surrounding Portland Avenue and Nicollet Avenue. This figure shows that the properties in the samples had similar trends before the construction work, though there are slight differences from 2012 to 2014.



**Figure 3-9 Trends in Average Residential Property Values for Nicollet Avenue and Portland Avenue, 2008-2018**

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<sup>16</sup> Consumer Price Index data is available from the Federal Reserve Economic Data (FRED) at the St. Louis Fed. Available at: <https://fred.stlouisfed.org/>.

### 3.4.3 Findings

Table 3-1 shows the treatment effects of the Sweet Street reconstruction on residential home values. In this table, the first column shows the results when property values are adjusted to constant 2015 dollars using the Consumer Price Index and the second column shows the results with non-adjusted property values.

The variable *time* is an indicator for the pre- and post-intervention phases, while the variable *treated* indicates those properties that are located in an intervention area vs those that are not. The variable *DID* is the interaction between the first two variables and is of particular interest to answer whether or not the treatment had an effect on property values. The model controls for factors that differ across properties but are constant over time and eliminates the bias from unobservable factors that change over time but are constant over properties. Results in Table 3-1 correspond to the DID analysis using two blocks of data. A robustness check was performed with data from one block away and the results are consistent across models.

**Table 3-1 Results from Difference-in-Difference Analysis of Property Values (2013-2018)**

VARIABLE	Property value (2015 dollars)	Property value (non- adjusted)
Time	29,347*** (1,602)	43,536*** (1,647)
Treated	1,928 (1,601)	1,896*** (1,645)
<b>DID</b>	<b>2,885.8 (2,261)</b>	<b>3,205 (2,325)</b>
Constant	162,941*** (1,134)	160,191*** (1,166)
Observations	2216	2,2216
R-squared	0.252	0,406

Note: Standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.005$ ,  $p < 0.1$

For our purposes, the interaction variable, *DID*, is of most interest. If we expect Portland Avenue's roadway reconstruction to increase property values significantly, then we would expect to see a positive and significant coefficient on this variable. We observe a positive coefficient, which indicates that Portland Avenue's roadway reconstruction could increase property values. However, as Table 1.1 shows, neither of the two DID estimates reach conventional significance levels.<sup>17</sup> Therefore, Portland Avenue's roadway reconstruction has not significantly impacted residential property values for the period examined.

<sup>17</sup> We conducted robustness checks by including properties on one additional street on each side of Portland Avenue and Nicollet Avenue. The inclusion of the additional properties did not change the results.



#### 3.4.4 Discussion

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The null findings are not unexpected, as they are generally consistent with past research in this area. Though some studies show that features of the built environment (sidewalks, landscaping, etc.) are associated with residential home values (Song & Knaap, 2003; Leinberger & Alfonzo, 2012), the most rigorous research on the impact of Complete Streets has failed to find an impact (Vandegrift & Zanoni, 2018). Notably, a recent study analyzing the economic impact of Complete Streets using a rigorous, quantitative research design found no impact of Complete Street policies on local home prices (Vandegrift & Zanoni, 2018).

At the same time, there are reasons to approach these findings cautiously. Perhaps most significantly, only two years have passed since the completion of Portland Avenue's reconstruction. Though previous research suggests that such reconstructions may impact commercial sales after two years (New York City Department of Transportation, 2013), effects on residential home values may take longer.

Second, this analysis used appraised home values rather than actual real estate transaction data. Appraised home values are publicly available and offer a consistent annual measure of real estate value. However, the appraised value does not take into account many features of the roadway in the estimate of home value. While it incorporates factors like the average traffic volume on a road, it does not take into account factors such as improved sidewalk quality or the presence of a bike path or pedestrian median.<sup>18</sup> Such factors would likely be important to a prospective buyer, potentially driving up the sales price of a home.

#### 3.4.5 Recommendations for Future Analysis

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Based on this analysis, we have the following recommendation for assessing the relationship between Sweet Street reconstructions and residential home values in the future.

- (1) Conduct a difference-in-difference analysis in 2022 using either residential home values or real estate transaction data (both available from Hennepin County's Open GIS site).** This approach would incorporate additional years of data and would be relatively straightforward using the methodology described in this chapter and elaborated upon in Appendix A. There are advantages and disadvantages to this approach, which we elaborate upon below.

First, as we discuss above, appraised home values offer a consistent annual measure but do not take into account features of the roadway. As a result, appraised home values may underestimate the impact of the Sweet Streets redesign. Real estate transactions are a stronger measure because buyers are likely to incorporate external factors (sidewalks, bike paths, etc.) into their valuation of a home. Using real estate transactions, however, would require waiting

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<sup>18</sup> This information is based on a conversation with the Hennepin County Assessor for the City of Richfield, 8/22/19.



until a sufficient number of transactions had occurred on both Portland Avenue and Nicollet Avenue to compare mean changes over time.

Second, comparing home values on Nicollet Avenue South to home values on Portland Avenue South requires assuming that any changes in home values on Nicollet Avenue South will be unaffected by the roadway changes on Portland Avenue South. As we discuss in other chapters, there are reasons to question this assumption – particularly as the reconstructions extend to other streets in the community. Sweet Streets is a community-wide initiative and our data suggests that residents and business owners perceive an impact of the changes whether or not they live or work on a reconstructed road. Because spillover effects likely exist, it may be more reasonable to select a comparable street outside of the City of Richfield for future analyses.

## CHAPTER 4: ECONOMIC VITALITY

### 4.1 OVERVIEW

The economic benefits of Complete Streets are widely touted. Proponents argue that designing streets that are more accommodating of pedestrians, public transit users, and bicyclists can lead to changes in transportation patterns, consumer behavior, and the overall desirability of an area. This, in turn, can have a positive impact on business activity, home prices, and public and private investment in an area. This chapter analyzes the relationship between Richfield's Sweet Street reconstructions and economic activity. Specifically, we focus on the perceptions of business owners and managers along affected roadways.

Our interviews with 30 business and nonprofit owners and managers representing 25 organizations reveal several themes. Nearly all individuals interviewed report that employees and customers utilize vehicle-based transportation (cars or busses) to access the organization. Respondents generally perceived a limited (positive or negative) impact of the road itself on business activity. Perhaps unsurprisingly, a majority of those we interviewed found the road construction itself quite disruptive, with responses ranging from a slight to a significant disruption. Many individuals in our sample reported that the updates to the road were necessary, however, and respondents overwhelmingly view the reconstructions as aesthetically pleasing. Finally, some owners and managers expressed concern about traffic congestion and flow, as well as safety for cyclists on reconstructed roads.

In the next section, we review past research on the impacts of Complete Streets on economic vitality. We then discuss the methodological approach and data, followed by the analysis of interviews with business owners and managers. In the final section, we synthesize this information and elaborate on future measurements and analyses.

### 4.2 LITERATURE REVIEW

The economic benefits of Complete Streets are widely touted. Proponents argue that designing streets that are more accommodating of pedestrians, public transit users, and bicyclists can lead to changes in transportation patterns, consumer behavior, and the overall desirability of an area. This in turn can have a positive impact on business activity, home prices, and public and private investment in an area.

Complete Streets influence business activity in several ways. Changing the street design by widening sidewalks, adding public transportation stops, or adding bicycle parking may encourage pedestrian and bicycle traffic (Burden and Litman 2011). Adding aesthetically to the public space by adding trees, benches, or other enhancements may encourage people to remain in an area for a longer period and frequent more business establishments (Federal Highway Administration, US Department of Transportation 2010). These, in turn, may increase the customer base for local businesses and lead to

higher retail sales. Conversely, removing vehicle lanes or parking may decrease the number of potential customers and depress retail sales.<sup>19</sup>

Over the longer term, positive changes in the local economy may generate additional growth and investment, while negative changes may lead to a decline. There is also evidence to suggest that Complete Street initiatives may have industry effects. For instance, transportation projects that prioritize bicycle and pedestrian infrastructure have been shown to generate more employment than other types of transportation projects (Garrett-Peltier 2011). In addition, investment in projects that promote non-vehicular modes of transportation may generate growth in both bicycling and tourism industries (Hales and Anderson 2015, Colorado Department of Transportation 2000).

Although business owners are often apprehensive about changes that can decrease automobile traffic, several reports show a positive association between the development of Complete Streets and local business conditions. One study of fourteen Complete Streets projects across the United States showed improvements in new business development at Complete Street sites, relative to comparison sites (Anderson, et al. 2015). Similarly, another study of seven Complete Street improvement sites in New York City showed greater increases in business sales at Complete Streets sites relative to comparison sites for a majority of the sites considered (New York City Department of Transportation 2013).

The economic impacts of Complete Streets are typically measured in terms of business sales, rents, and home prices. Retail sales tax filings provide perhaps the most direct measure of economic vitality, while commercial rents and home prices offer a more indirect measure. Real estate transactions and business establishment and loss also provide a measure of economic vitality, but small sample sizes typically limit the usability of such data (New York City Department of Transportation 2013). In addition, studies that employ qualitative approaches often measure the perceptions of business owners and customers about local economic activity.

Many reports focusing on the economic impacts of Complete Streets, or design elements typical of Complete Streets, utilize qualitative research designs – typically survey and interview-based approaches (Stantec Consulting, Ltd. 2011, Drennan 2003). Such approaches provide valuable data on the preferences and perceptions of customers and retailers. Yet because they rely on voluntary participation and self-reported data, they are limited in their ability to provide systematic and reliable data on the full range of businesses in an area. More recently, studies have sought to employ quantitative approaches that use administrative data sources, such as tax records. For instance, at 2013 report by the New York

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<sup>19</sup> Over the longer term, positive changes in the local economy may generate additional growth and investment, while negative changes may lead to decline. There is also evidence that Complete Street initiatives may have industry effects. For instance, transportation projects that prioritize bicycle and pedestrian infrastructure have been shown to generate more employment than other types of transportation projects (Garrett-Peltier, 2011). In addition, investment in projects that promote non-vehicular modes of transportation may generate growth in both bicycling and tourism industries (Hales & Anderson, 2015; Colorado Department of Transportation, 2000).

City Department of Transportation analyzed trends in retail sales at seven Complete Streets sites relative to a set of comparison sites (New York City Department of Transportation 2013).

Within the academic literature, few studies focus on the economic impacts of Complete Streets. Notably, a recent study analyzing the economic impact of Complete Streets using a rigorous, quantitative research design found no impact of Complete Street policies on local home prices (Vandegrift and Zanoni 2018). Yet several design elements within Complete Streets, such as tree canopies, walkability, and street layoff, are associated with economic improvements in academic research in urban planning, transportation, and design (Song and Knaap 2003, Leinberger and Alfonzo 2012). Such studies provide support for the argument that Complete Streets may have a positive impact on the local economy.

#### 4.3 METHODOLOGY AND DATA

To analyze the relationship between Richfield’s roadway reconstructions and business activity, we conducted semi-structured interviews with owners and/or on-site managers of businesses and nonprofit organizations located along three commercial areas in Richfield. We decided upon this approach due to the limited availability of administrative revenue data, concerns over the reliability of revenue data collected via survey, and the relative lack of knowledge of issues relevant to business owners located on affected (or potentially affected) roads (see Appendix D for more information on data limitations).

The target areas for the interviews include:

- 66th Street E (11th Avenue S to Bloomington Avenues S) (hereafter: *66th Street*)
- Lyndale Avenue S (74th Street W to 76th Street W) (hereafter: *Lyndale Avenue*)
- Penn Avenue S (63rd to 65th Streets W, 66th to 69th Streets W) (hereafter: *Penn Avenue*)

In this design, 66th Street represents a “post-reconstruction site,” Lyndale Ave serves as a “mid-reconstruction site,” and Penn Ave represents a “pre-reconstruction site.”

The identified segments of road are similar in that they are predominately commercial areas in which businesses occupy a relatively small amount of retail space, compared to other areas in the city that contain larger lot sizes and “big box” shops (such as 66th Street between Lyndale Avenue and Nicollet Avenue, the commercial area located just north of the 494 corridor, and the commercial area north of 66th Street along Cedar Avenue South). Storefronts along these segments are also located close to the street, creating a higher likelihood that the businesses will be impacted by the roadway and/or changes to the roadway. Figures 4-1 and 4-2 show storefronts located along the street on Penn Avenue and 66th Street, respectively.



Source: Image from Google Maps, taken in June 2019 (Google, 2019)

**Figure 4-1 Storefronts Located on Penn Avenue**



Source: Image from Google Maps, taken in June 2019 (Google, 2019)

**Figure 4-2 Storefronts Located on 66th Street**

There are 104 organizations located along the three targeted areas: 19 along Lyndale Avenue, 57 along Penn Avenue, and 28 along 66th Street. These organizations represent an array of industries and specializations, from restaurants and childcare organizations to automobile shops and specialty health clinics. While most of the organizations are businesses, there are also several nonprofit organizations (See Appendix B for additional information about the three target areas).

We received clearance from the University of Minnesota's Institutional Review Board to begin data collection on July 26, 2019. We began data collection in September because we anticipated obtaining a lower response rate during August due to the vacation schedules of business owners and employees. Letters and emails were sent to all business owners and nonprofit organizations in the three target areas during the week of September 3rd (see Appendix B). The letter explained the project and noted that a University of Minnesota researcher would be visiting organizations later in the month. We received two responses from this initial contact.

During the week of September 16<sup>th</sup>, we began going door to door to request interviews. This data collection continued through late October. Nearly all individuals that we approached agreed to be interviewed. Because we found that an informal and conversational approach led to the most successful interviews, we employed a verbal (rather than written) consent and did not record the interviews.

To ensure that the information obtained in the interview was captured, interviewers took notes and created a detailed field note for each site immediately following the interview. From these notes, a case file was created for each organization describing the responses to the interview questions, relevant details of the interview respondent (such as general reception to the interview and the roadway reconstruction), and when possible, the organizational setting (appearance of the storefront and building interior, distance of the building from the road, number of customers present, etc.).<sup>20</sup> These case files were then coded and analyzed using NVivo qualitative software.

In total, we interviewed 30 individuals representing 25 businesses and nonprofit organizations, including: 9 organizations located on 66th Street (N=9 individuals), 9 located on Penn Avenue (N=12 individuals), and 7 on Lyndale Avenue (N=10 individuals). Five interviews were conducted over the phone and 20 interviews were conducted in person. One interview was conducted in Spanish and the rest were conducted in English.

The organizations interviewed represent a range of commercial enterprises, including small and mid-size retail shops, restaurants and grocery stores, health clinics, automotive shops and gas stations, and specialized service providers. Organizations range in size; the smallest has only 2 employees and the largest has over 100 employees. A slight majority of organizations have been in their current location for over 10 years. For just under half of the organizations, the business owner is also the landowner. The remaining organizations lease the property from a different landowner.

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<sup>20</sup> Three interviews included more than one respondent. When respondents from the same business or nonprofit organization responded differently to a question, these differences were recorded in the case file.



In the next section, we describe key findings from our analysis of the interviews.

## 4.4 FINDINGS

The interviews were designed to elicit information related to perceptions of the roadway and the reconstruction (for 66th Street and Lyndale Avenue), perceptions of safety, economic activity of the business, and perceptions of how the roadway influences commercial activity (see Appendix B). Our goal was to provide a descriptive analysis of the perceptions of a selection of Richfield business owners. Due to the nature of the data collection and analysis, the results are not generalizable to the broader business community in Richfield. However, the analysis described below provides insights into the concepts and related quantitative indicators that may be important to collect in future studies.

### 4.4.1 The Benefits of Complete Streets Reconstructions

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The vast majority of business and nonprofit personnel that we interviewed reported being pleased with the look of the reconstructed roads on 66th Street and Lyndale Avenue. On Penn Avenue, several owners and managers communicated that the roads were in need of an updated look. The upgraded utilities were less frequently mentioned by the owners and managers in our sample – only one mentioned the benefit of upgraded utilities in the interview, though we did not ask about this directly.

For some respondents, the value of the updated look of the roads was diminished by the outdated look of the storefronts. This appeared to be particularly salient for owners and managers on Penn Avenue: owners or managers at four of the nine organizations communicated concern about outdated storefronts, even if the road were to be reconstructed in the future.

Few business owners and managers that we spoke with viewed the updated roads as *directly* benefitting their business. Consistent with the literature on Complete Streets, two restaurant owners and one owner of a health clinic speculated that the reconstructed roads could encourage pedestrian traffic into their establishment. Another – an owner on 66th Street – reported that the visibility of their business was likely enhanced by the reconstructed road.

More often, respondents who viewed the updates as having a positive impact spoke about the benefits broadly, with (potential) indirect benefits for businesses. For instance, several respondents communicated that customers or clients coming from outside of Richfield would be “pleasantly surprised” by the updated look of the roads. One owner (Lyndale Avenue) reported that developers in particular would view the changes positively and that land value and private investment in Richfield would likely increase. Another manager (Penn Avenue) stated that improvements in safety on 66th Street due to slower traffic would yield positive benefits for the community.

### 4.4.2 Transportation Patterns of Owners, Employees, and Clients/Customers

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One of the most striking findings is the extent to which the owners and managers we interviewed rely upon cars, and to a lesser extent, public transportation, to transport employees and clients/customers

to the business or organization. For all but one organization, interview respondents report that employees of the organization typically arrive to work via car or public transportation.

Perhaps more significant is the fact that customers and clients also overwhelmingly appear to utilize vehicles to access the businesses and nonprofits in our sample. Only a few organizations reported that a small number of local customers walk to the establishment. Several owners reported strategically locating in Richfield due to its proximity to highways as well as its centrality in the Twin Cities. Others appear to have relied upon this advantage over time – particularly those “destination” organizations that draw clientele from across the metro area and to a lesser extent, from Minnesota as a whole.

Our interviews suggest that Richfield’s centrality and proximity to highways are important for different types of businesses. For instance, several businesses in our sample that provide specialized retail or services report that the ease of access for customers throughout the metro is a valuable asset of their location. At the same time, others that rely on customers dropping in (“convenience” stores such as gas stations or fast food establishments) also depend upon the proximity to highways and other landmarks such as the Minneapolis – St. Paul airport and the Mall of America.

#### **4.4.3 The Effects of Sweet Streets on Revenue**

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The interview data reveal that apart from the construction period, respondents overwhelmingly feel that their business or organization is or was doing well in terms of sales of goods or services and that Richfield offers a strong area to locate. Of the 25 organizations, only two organizations (both on Penn Avenue) reported that the area was somewhat “slow” for businesses, though one of these two organizations also reported better-than-expected sales over the previous year for their organization. Several respondents, both located on either Lyndale Avenue or 66th Street, stated that their location within Richfield was getting better for business, in part due to the city’s investment in Sweet Streets reconstructions.

It is important to note that half of the organizations we contacted had been at their location 10 or more years. Many of these organizations have built up a loyal customer base over the years – often capitalizing on the access provided by Richfield’s centrality and proximity to highways and in spite of their location on roads that had not been reconstructed until recently.

Yet a slight majority of owners located on reconstructed roads reported a negative impact of the construction period on business activity. Six of nine businesses on 66th Street and four of seven businesses on Lyndale Avenue communicated that sales were down during the construction period.<sup>21</sup> In addition, several owners located on Penn Avenue stated that their business would likely not survive a future reconstruction.

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<sup>21</sup> Several of the businesses located on 66th Street opened near the start of construction and reported that it was difficult to decipher the impact of the construction relative to the impact of starting a business in a new location.



Of the personnel we interviewed on 66th Street and Lyndale Avenue, perceptions of the construction period ranged from “an inconvenience” and “growing pains” to “nearly killing” the business. For three businesses on 66th Street and two businesses on Lyndale Avenue, the impact was significant. Details surrounding the decline in business activity were readily available to these respondents, who easily listed off monthly revenue lost, decline in annual sales, and decline in annual enrollment in services.

In general, these owners and managers perceived that the reconstruction had impacted sales by making it difficult for customers to access the property (by closing lanes of traffic in front of a store or eliminating parking spaces) or creating confusion about how to access the property during reconstruction. This created an inconvenience to customers, who then became less willing to come to the business. As one respondent noted: “If it is inconvenient, people aren’t going to do it.”

Business owners and managers reacted to the disruption in different ways. One owner of a retail store discussed meeting customers on corners of adjacent streets to deliver retail products. Several owners described how they regularly updated maps on their websites with construction information, or proactively reached out to customers to alert them to changes in road access.

With respect to revenue over the longer term, several respondents located on 66th Street and Lyndale Avenue reported continuing concerns with the road and the impact on their business. For some, this concern was related to the perception of the “congestion” created by taking four lanes down to two lanes for the same volume of traffic. For these respondents, congestion was created by both the volume and the continuous flow of traffic in either direction, limiting the ability of business personnel and customers/client to turn in and out of parking lots.<sup>22</sup> Two respondents also viewed congestions as resulting from the lack of a turnout for busses on 66th Street.

For others, there was concern about the change in parking for customers – either because parking spots were taken to facilitate the reconstruction or due to new on-street parking that lacks time limits. Finally, several business owners on both 66th Street and Lyndale Ave communicated concern about vehicle visibility and snow removal in the winter months.

#### **4.4.4 General Perceptions of Richfield’s Roads and Safety**

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The business and nonprofit owners and managers that we interviewed perceived limited *direct* impact of the street on their business’ success. To the extent that owners articulated a direct connection between the street and business activity, it was around visibility. Two individuals speculated that the 66th Street reconstruction would increase visibility to both drivers and pedestrians due to improved lightening and street design, as well as by slowing down traffic. Four owners/managers on Penn Avenue

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<sup>22</sup> The “congestion” experienced by business owners and managers differs from the technical definition of congestion, which is characterized by slower speeds and longer trip times. Analyses by Richfield staff suggest that the reconstructed roads are able to accommodate the same number of vehicles without lengthening trip times.

also discussed problems related to visibility, with one hypothesizing that increased foot traffic (if Penn Avenue were reconstructed) may increase the visibility of the business.

With respect to safety, several owners and managers viewed the slowing down of traffic as making the roads safer. Several owners and managers drew attention to continuing safety concerns on Penn Avenue (largely due to speeding and merge located just south of 67th Street), though few connected these concerns with business activity. Notably, only a few individuals reported concerns with safety prior to reconstruction (on 66th Street and Lyndale Ave). One business owner discussed the benefit of a buffer between pedestrians and traffic on both Lyndale Ave and 66th Street. This owner drew attention to the proximity to traffic when out shoveling or sweeping, and the continuing presence of debris in the road (glass, rocks, etc.), prior to Lyndale Avenue's reconstruction. Another viewed a new crosswalk on Lyndale Ave as safer for pedestrians. Generally, however, safety was not a dominant concern of respondents.

During discussions of the safety of the road, several respondents had differing opinions regarding the safety of the streets for cyclists. One interviewee expressed excitement about riding bikes on the reconstructed roads in the summer. In two interviews, respondents stated that having a bike lane between parked cars and traffic is unsafe for cyclists. In another interview, a respondent reported that cyclists were difficult for drivers to see when crossing the street from an off-road bike lane.

#### **4.4.5 Additional Findings**

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Several additional findings are worth highlighting. First, Sweet Street reconstructions are relevant to businesses located on and off reconstructed roads. This is certainly true for businesses located close to, but not on, a Sweet Street site. For instance, several owners and managers on Penn Avenue described changes in customer experience and traffic during 66th Street's reconstruction. Other owners and managers highlighted the experiences of businesses on 66th Street as relevant to their perceptions of how a reconstruction would impact their business.

This is related to a general tendency of respondents to describe the benefits of Sweet Streets reconstructions broadly and in terms of their impact on the community, rather than individual businesses. As noted above, multiple owners and managers drew attention to the benefits of improved safety, usability, and aesthetic appeal for the city as a whole. Notably, such a tendency is not true for descriptions of costs – which are typically articulated in terms of the impact on the business itself.

Second, for the business owners and managers that we interviewed, the construction phase of the projects dominated perceptions of the impacts of the reconstructions. This is most apparent in descriptions of the costs of the street redesign on business activity and revenue. Several owners and managers on 66th Street, and nearly all of those we interviewed on Lyndale Avenue, were still experiencing disruptions in customer experience and revenue loss due to the reconstructions.

Third, a preoccupation with the construction phase among our respondents occurred alongside difficulty in imagining future impacts of the street redesigns. For example, owners and managers who had not yet experienced the new road in winter could only speculate about piles of plowed snow would impact

visibility and safety. Those who had not yet experienced the summer months were not sure whether the streets would activate latent demand for walking and cycling. In addition, even several owners on 66th Street found it difficult to determine how the reconstructed road might change their behaviors and business activity. Collectively, the interviews suggest that business and nonprofit owners and managers on 66th Street – and certainly on Lyndale Ave – were still adjusting to the changes in the road.

## 4.5 DISCUSSION

Interviews with business owners and managers were designed to help city officials better understand how the Sweet Streets reconstructions are impacting local businesses and to identify key areas for future analysis. Our analysis of the interview data highlights several themes, which we synthesize below before elaborating on recommendations for future analysis.

In terms of the benefits:

- Respondents overwhelmingly view the reconstructed roads as aesthetically appealing.
- Few respondents perceive the street reconstructions as having a direct positive impact on their business. This is related in part to the fact that respondents perceive a limited impact of the road generally and in part due to the recency of the street redesigns.
- Benefits are often articulated as broadly impacting the community, rather than individual businesses.
- Only a few respondents report concerns related to safety prior to a street’s reconstruction.
- Respondents draw attention to the benefits of slower traffic, a buffer between pedestrians and vehicles, and additional crosswalks. For others, the safety benefits are limited, with several respondents raising ongoing concerns for cyclists on reconstructed roads.

In terms of the costs:

- Sweet Street reconstructions are viewed as disruptive to business activity, largely through limiting access to businesses and creating confusion for customers. Perceptions of the disruption range from “an inconvenience” to “a significant” interruption.
- Multiple respondents report concern about current and future customer access and experience (often articulated in terms of traffic “congestion”). This is a particularly salient concern for owners and managers on 66th Street, where a lack of bus turnouts is perceived as slowing traffic.

Other findings:

- Respondents overwhelmingly report vehicle-based transportation patterns for both employees and customers/clients. Indeed, businesses appear to have structured their activity around Richfield’s central location and easy vehicle access (access to freeways, proximity to major landmarks, etc.)
- In general, the owners and managers in our sample do not appear overly concerned with roads that have not been reconstructed, apart from their aesthetic appeal.

- Respondents report uncertainty over future impacts – such as snow removal during the winter months or increased walking/cycling on reconstructed roads.

#### 4.6 RECOMMENDATIONS FOR FUTURE ANALYSES

Our analysis leads to the following recommendations for monitoring business impacts in the future.

##### (1) Monitor annual change in the businesses and industries located in Richfield

There are several reasons to expect the Sweet Streets redesigns to impact the types of businesses located in Richfield. Many of the business owners and managers we interviewed perceived a limited impact of the street itself on business activity, beyond the access that the road provides to customers. Longstanding businesses in our sample appear to have prospered *in spite* of the condition of the roads, with many relying upon customers' easy access via vehicle. In our sample, this was true for "destination" stores that draw dedicated clientele from throughout the region, as well as "convenience" stores that rely on customers popping in. This suggests that the positive changes brought about by the street redesigns may have limited impacts on existing businesses.

In addition, it is clear that the construction itself represents a significant disruption and that businesses have differing abilities to survive such a disruption. While our sample did not include businesses that were no longer operating, multiple businesses on 66th Street and Lyndale Avenue were still experiencing a large reduction in revenue. We also heard anecdotally of businesses that had gone out of business in the previous year. The disruption caused by the construction, alongside businesses models that rely on easy customer access via vehicle, may make it more likely that we would see a *negative* impact of the redesigns on the sales of existing businesses.

The data suggest that the roadway changes may have an impact on the types of businesses that chose to locate in Richfield. Specifically, the altered roadways may encourage more businesses that benefit from pedestrian or cycling traffic to locate on Richfield's reconstructed roads.<sup>23</sup> As a result, the types of businesses that are located on reconstructed roads may be an important indicator of the changes brought about by the Sweet Streets reconstructions.

Monitoring change in the businesses located in Richfield would be relatively straightforward. One approach would be to conduct an annual or biennial census of the businesses located along particular segments of reconstructed road, documenting at a minimum the businesses' name and industry sector. Much of this information would be available through simple observation and could be validated in cooperation with the Richfield Chamber of Commerce and/or calls to property owners.

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<sup>23</sup> Indeed, during the course of the study we learned of one new business (ERIK'S Bikes, Skis, Boards) that chose to locate in Richfield in part due to the city's investment in bicycling infrastructure (Saltvold, personal communication 3/5/20)

An alternative approach would be to monitor changes in local businesses using aggregate revenue data from the Minnesota Department of Revenue (DOR). Each year, the DOR publicizes summary information compiled from sales and use tax returns and business registration information that the department receives from sales tax files. This information is available at the city level and provides a snapshot of the types and number of businesses present in Richfield, as well as the annual sales.<sup>24</sup>

**(2) Assess business owners’ perceptions of customer travel experience and access, travel mode of employees and customers, and use of the street to increase business visibility, via survey or interview, for a set of businesses representative of the larger business community.**

If the city seeks more detailed information about the impact of the redesigned streets on businesses, an alternative approach would be to conduct an in-person survey or series of more detailed interviews with business owners located along 66th Street and along Lyndale Avenue South, in summer 2022. To ensure that a wide range of businesses are included in the surveys or interviews, the city could work with the Richfield Chamber of Commerce to identify a set of businesses that vary with respect to characteristics such as industry, size, ownership (woman/minority-owned vs other), and length of time in business at that location.

Topics to cover in these surveys/interviews include: commuting patterns of employees; perceptions of customer travel and experience; perceptions of road safety; use of redesigned street to promote business (for instance, using the road to increase visibility); and general trends in revenue. We *do not* recommend monitoring precise changes in the revenue of businesses located on reconstructed roads. This is due to an inability to access revenue data (see Appendix D) and concerns related to the reliability of quantitative data collected via survey or interview.

**(3) Measure annual increases in commercial land value and private investment.**

In our interviews, business owners and managers were more likely to articulate the benefits of Sweet Streets broadly in terms of their impact on the community, rather than their impact on individual businesses. It may be the case that the Sweet Streets reconstructions will have a positive effect on the community beyond the effect on businesses located on affected roads. This suggests the importance of monitoring indicators on the street – or more likely, the community-level. Potential indicators to monitor include the average land values on affected roads, an increase in private investment on or near affected roads (collected from project data), and/or a decrease in the number of vacancies on reconstructed roads. It may be useful to measure change in indicators for both Richfield and a comparable city, a recommendation we elaborate upon in the final chapter.

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<sup>24</sup> Appendix E presents citywide statistics for 2016 – the year before major construction began on 66th Street.

## CHAPTER 5: INDIVIDUAL AND COMMUNITY HEALTH

### 5.1 OVERVIEW

In this chapter, we examine the relationship between Richfield’s Sweet Street reconstructions and health. Although the design features common to Complete Streets have the potential to influence a range of health outcomes, including obesity, chronic illness, and mortality (Frank, Andresen and Schmid 2004, Ekelund, et al. 2016)., this analysis focuses on levels of activity. First, research suggests that any impact on health outcomes, except for injury or death due to accidents with vehicles, occurs largely through an impact on activity. As a result, we would expect to see any relationship with levels of activity emerge before an impact on other outcomes. Second, there are significant data constraints on accessing health data – particularly data that can be disaggregated below the city level.<sup>25</sup>

Our research design, discussed in greater detail below, involves the analysis of quantitative data and survey data, supplemented with qualitative data gathered in conversation with Richfield residents at Open Streets at Penn Fest and through interviews with Richfield business owners. As in previous chapters, the goal of the analysis is to provide the City of Richfield with a baseline understanding of how different groups of residents are experiencing the Sweet Street reconstructions, identify salient indicators to continue monitoring, and identify data sources to systematize data collection and analysis in the future.

### 5.2 LITERATURE REVIEW

A central component of Complete Streets policies is an emphasis on accessibility. Traditionally, transportation policies have prioritized *mobility*, or the movement of someone or something from one point to another. In contrast, Complete Street policies prioritize *accessibility*, or the ability to reach desired goods, services, and activities. A focus on accessibility elevates different types of outcomes – namely, outcomes that take into account varied modes of travel, such as the extent of bicycle or pedestrian travel, over outcomes related exclusively to vehicles, such as the number of vehicle miles traveled or the speed of travel (LaPlante and McCann 2008, Litman 2018).

By increasing accessibility for pedestrians, public transit users, and bicyclists, Complete Streets policies promote active forms of transport, such a walking or bicycling. One study of multiple Complete Streets policies found that pedestrian activity increased for 12 of 13 projects and cycling activity increased for

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<sup>25</sup> Both federal and state law place considerable constraints on the use of existing health data. In our attempts to secure health data, we talked with individuals at the State of Minnesota, the City of Richfield, and Blue Cross/Blue Shield. We also met with staff at the Bloomington Public Health Department (which covers the City of Richfield). From these conversations, we learned that very limited health data exists below the city level in Richfield and that pursuing access to administrative health data (via health systems or governments) would likely not prove successful.

22 of 23 projects examined (Anderson, et al. 2015). Improving accessibility may have a particularly important influence on the mobility of special populations. For instance, well-designed sidewalks and street networks can make it easier for those in wheelchairs or vision impairments to rely on public transportation (McCann and Rynne 2010). Complete Streets may also improve the accessibility and activity of older Americans, who tend to have transportation needs even after driving abilities deteriorate (AARP Public Policy Institute 2009).

Levels of physical activity matter for a range of health outcomes, including chronic illness, morbidity, and mortality. Research finds that individuals who are more active physically have a lower risk of chronic illnesses such as diabetes and heart disease (Frank, Andresen and Schmid, Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars 2004b, Ewing, et al. 2008). Physical activity is also associated with a lower incidence of mental health problems such as depression, particularly for older adults (Strawbridge, et al. 2002). In addition, higher levels of physical activity are associated with lower mortality rates (Ekelund, et al. 2016). Because Complete Streets policies facilitate various forms of active transportation, they are reasons to suspect an association between Complete Streets and activity levels and a variety of health outcomes (Sallis, et al. 2009).

There is a robust academic literature on the built environment and health (Renalds, Smith and Hale 2010). Research in this area is broad, examining the association between individual activity, health, and a range of street and community features, including the presence of green space, the condition of sidewalks, traffic flow, and perceptions of safety. In general, studies find that features of the built environment are related to physical activity and health. For instance, research suggests that the walkability of an area is associated with higher levels of physical fitness and a lower likelihood of obesity among residents (Frank and Kavage 2009). In addition, studies have demonstrated a positive relationship between the availability of active transit options (such as bike path access or sidewalks) and residents' level of activity (Zaccaro and Atherton 2017).<sup>26</sup>

The short- and long-term health effects of Complete Streets projects, and characteristics of the built environment more broadly, are measured in a variety of ways. Individual levels of physical activity, weight and body mass index, and health outcomes are often assessed through surveys or interviews (Renalds, Smith and Hale 2010). For instance, an evaluation of the California Safe Routes to School Program, which aimed to increase safety and accessibility for pedestrians and bicyclists through modifications to street design, used surveys as well as observations of vehicle, pedestrian, and cycling

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<sup>26</sup> In addition to the direct influence on individual activity and health, Complete Streets projects may have indirect and long-term impacts on health through improvements to air quality. Research shows that in areas characterized by mixed-use development, greater street connectivity, high residential density, and retail shops that accommodate pedestrians, individuals are more physically active and as a result, produce fewer emissions through fewer vehicle miles traveled (Frank, Sallis, et al. 2006). It is also important to note that improved traffic safety resulting from decreased vehicle use is associated with decreased injury and mortality.

patterns, to examine levels of physical activity at project sites (Boarnet, et al. 2005). In addition, chronic health problems are often assessed using hospital or health records (Ewing, et al. 2008).

### 5.3 METHODOLOGY AND DATA

Part of our design involved investigating existing sources of data that could be easily accessed in the future, when more time has elapsed since the Sweet Street reconstructions. Our analysis identifies several sources of data that can provide a baseline estimate of levels of activity among Richfield residents and in the community as a whole.

To provide additional insight on the relationship between the roads and resident health, we fielded a survey of Richfield residents using a convenience sample in which residents self-selected into the survey. We opened the survey at Open Streets at Penn Fest on September 15<sup>th</sup>, 2019 and closed the survey on November 23<sup>rd</sup>, 2019. In addition to a presence at Penn Fest, we advertised the survey through the City of Richfield's Facebook page as well as the community Facebook page. We also conducted targeted outreach to increase the number of responses from particular cultural communities. The survey was available in both English and Spanish (see Appendix F for survey instrument).

Our goal in fielding the survey was to provide information to guide future data collection on the relationship between the streets and individual and community health. We were interested in measuring levels of activity for the subset of individuals that responded to the survey but were also interested in how people explain the relationship between the roads and their activity and health, with the goal of helping the City of Richfield prioritize certain outcomes in future data collection. Thus, we include in our analysis survey respondents' answers to open-ended questions as well as insights gathered from conversations with residents during Penn Fest.

A total of 318 Richfield residents completed the survey.<sup>27</sup> Of these respondents, approximately 84 percent reported living on or near a reconstructed road (Portland Avenue South, 66th Street, or Lyndale Avenue South). It is important to note that due to the nature of the approach, the results should *not* be interpreted as representative of the Richfield community.<sup>28</sup> In particular, white and female residents are overrepresented among survey respondents, and we weigh the responses by gender to more closely mirror the gender distribution within the city. Yet despite the fact that we did conduct targeted outreach to cultural communities, too few African American and Asian residents responded to the survey to weigh the responses by race as well.

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<sup>27</sup> A total of 361 individuals completed the survey. However, 43 of these individuals were not Richfield residents. There are just over 36,000 individuals in Richfield. Thus, the number of survey respondents is a very small percentage of Richfield's population.

<sup>28</sup> Due to the breadth of the study, it was not possible to conduct a random sample of Richfield residents in order to examine levels of activity. Such an approach might be used in the future if Richfield is interested in continuing to prioritize health outcomes. We discuss this approach in the final section of the report.



Because respondents self-selected into the survey, it is likely that the residents who responded to the survey were more interested in the topic of Richfield’s roads and the Sweet Streets reconstructions, relative to other Richfield residents. It is also likely that respondents were relatively more advantaged, having access to both a computer and the time to complete the brief survey. The results should, therefore, be interpreted as providing descriptive information about a subset of Richfield residents – both in terms of their use of the road and their perceptions of the roadway reconstructions.

We incorporate additional findings from our conversations with Richfield residents at Open Streets at Penn Fest (September 2019), as well as a series of semi-structured interviews conducted with owners and/or on-site managers of businesses and nonprofit organizations located along three commercial areas in Richfield (see Chapter 4). The organizations include a range of commercial enterprises, including small and mid-size retail shops, restaurants and grocery stores, health clinics, automotive shops and gas stations, and specialized service providers. While most findings from the business interviews were described in the previous chapter, this report incorporates findings related to the commuting patterns of employees as well as perceptions of safety among business owners and managers.

## 5.4 FINDINGS

### 5.4.1 Levels of Activity, Counts

There are two publicly accessible sources of data that provide information on levels of activity within Richfield. One source comes from the Census – specifically, from questions about commuting patterns. Data from the American Community Survey (2013-2017) reveal that few Richfield residents walk or bike to work. Citywide, 2.7 percent of residents walk and 0.7 percent bicycle to work. However, the percent of residents walking to work varies across the city. Richfield workers who live in the Census tracts on the southern part of the city are more likely than other workers to commute by walking. For instance, 10.1 percent of workers in the Census tract located in the southeastern corner of the city (Census tract 243) commute to work on foot (U.S. Census Bureau, American Community Survey 5-year Estimates 2018).

A second source of activity data comes from Hennepin County’s Multi-Modal count data, specifically, from the County’s 48-hour counts.<sup>29</sup> Table 5-1 shows the Average Annual Daily Bicyclists (AADB) volume for two areas in Richfield: Nicollet Avenue South just north of 76th Street, and Portland Avenue South

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<sup>29</sup> Hennepin County also collects manual count data from the intersections of 66<sup>th</sup> Street and Nicollet Avenue South, and 76<sup>th</sup> Street and Penn Avenue South, for 2016 through 2019. The estimated daily traffic (EDT) for a location is calculated from a 2-hour manual count based on a methodology developed by the National Bicycle and Pedestrian Documentation Project. The counts provide one regular source of data on street usage by pedestrians and cyclists. However, because the data are based on a single point in time and do not control for a range of factors that can impact road usage, the counts are only suggestive of broader patterns. Therefore, we decided not to include them in this analysis.

just north of 74th Street. Every other year, Hennepin County uses tube counters placed across a roadway to count the number of bicyclists riding over the tube in a 48-hour period. The methodology controls for factors, such as weather, that may influence the extent of biking in a 48-hour period (Hennepin County 2017).

**Table 5-1 Hennepin County 48-Hour Count Data for Bicyclists**

	Nicollet Ave South, north of 76th Street	Portland Ave South, north of 74th Street
	Bike AADB	Bike AADB
2015	21	66
2017	15	30
2019	39	29

*Notes: AADB = Average Annual Daily Bicyclists volume. Portland Avenue was reconstructed from 2014-2016.*

The 48-hour count data may provide a useful indicator of bicycling activity moving forward. Hennepin County's 2017 study of bicycling reveals that the top five sites in the county have upwards of 120 average daily bicyclists. Both the Nicollet Avenue South and Portland Avenue South sites show decreases in AADB from 2015 to 2017, which was shortly after the completion of Portland Avenue South's reconstruction. Data from 2019 shows an increase in AADB for Nicollet, but a slight decrease for Portland Avenue South. Unlike previous years, Nicollet Avenue South has a larger number of cyclists than Portland Avenue South. Monitoring these counters over time may provide insights into the relationship between the Sweet Street reconstructions and cycling activity – particularly if the changes to bicycling on Portland Avenue South (reconstructed from 2014-2016) differ from changes in bicycling on Nicollet Avenue South (not reconstructed).

#### **5.4.2 Levels of Activity, Qualitative and Survey Data**

Qualitative and survey data provide additional insights about how a subset of Richfield residents use the road and how they understand the relationship between the roads and their levels of activity. As mentioned earlier, the results should not be interpreted as representative of the Richfield community. Rather, the findings are meant to suggest patterns that may exist on a broader level, while highlighting how residents who responded to the survey use the road and how they understand the relationship between the roads and their activity.

Those who responded to the survey include a large percentage of individuals who live on or near a recently reconstructed road: approximately 84 percent live on or within a 5-minute walk of 66th Street, Lyndale Avenue South, or Portland Avenue South. Respondents also tend to be quite active and in good

health. A majority of those who responded to the survey report being in “excellent” or “very good” health, with over 90 percent reporting that they engaged in at least 30 minutes of physical activity in the previous 30 days. For these residents, the mean number of days of physical activity in a week is 3.9.

The survey data also show that among those who responded to the survey, activity and health differ for those living on or near a recently reconstructed Sweet Street compared to those living on other roads. Relative to other survey respondents, those living near a Sweet Street are more likely to report being in excellent health (22 percent compared to 12 percent) and less likely to report a physical limitation that interferes with activity (15 percent compared to 21 percent). While the two groups are similarly likely to report being active in the last 30 days, those living near a Sweet Street report a greater number of days active in the previous week (an average of 4 days compared to 3 days). While only suggestive, this data is consistent with a recommendation to continue monitoring levels of activity for those on or near a Sweet Street in the future, relative to those that live on roads that have not been reconstructed.

In general, those respondents living on or near a Sweet Street reconstruction report similar attributes of the road (lighting, traffic, access to public transportation, etc.), relative to other respondents. The open-ended survey responses highlight the importance of sidewalks for the activity of Richfield residents. Of 318 respondents, 94 mentioned sidewalks – with all but one arguing for more sidewalks or better sidewalk maintenance. The responses also highlight how exactly sidewalks matter for levels of activity, with numerous residents highlighting how a lack of sidewalks presents a danger for children playing outside given speeding traffic or creates a need to walk in the middle of a street because cars are parked near the curb. For example:

“WE NEED SIDEWALKS!! Richfield is such a great city, the biggest issue is the lack of sidewalks on all streets besides the main roads (Portland, 66th, Nicollet, Lyndale, etc). If all the streets had sidewalks I would walk much more often to the many businesses and parks that are scattered around Richfield.” (34-year-old, white female)

“I would love to have more sidewalks in my neighborhood. I feel as if I am at risk at being hit every time I walk my dog since people drive down the neighborhood streets so quickly. Even having sidewalks on one side would drastically improve my overall safety as well as be a benefit for drivers.” (28-year-old, white male)

“Sidewalks! We have children riding bikes and skateboards in the street. ... Drivers don't want to stop for signs... Usually going way too fast.” (White female, 73 years old)

As the above statements suggest, survey respondents associate the absence of sidewalks with creating unsafe conditions for pedestrians – especially children. In addition to sidewalks, lighting and pedestrian crossings also emerge as a salient topic for many Richfield residents.

The survey data are consistent with other data that show relatively low levels of bicycling among respondents. On average, respondents cycled less than one day of the previous seven, despite the fact that respondents have high levels of activity in general. This finding of low levels of cycling is echoed in

qualitative data gathered in the course of business interviews, where several owners and managers noted seeing few bicyclists use the bike paths on 66th Street or bike on the street on Lyndale.

As with pedestrians, open-ended responses highlight the value of additional infrastructure for cyclists. For example, one respondent argued for:

“More sidewalks/recreational paths that could connect the new(er) paths on Cedar, Portland, Lyndale, 66th and 76th without having to go a mile between each. A path or paths that bisect or are between them would give more safe biking/running options for kids or those uncomfortable in the street with cars.” (36-year-old white female)

Another noted the desire for:

“Protected bike lanes in the street (not on the sidewalk like was done for 66th...). I love to bike but I don’t do it often because of the lack of bike lanes on main streets. Would love if there was some type of barrier between the bike lane and cars... there are too many distracted drivers not looking out for cyclists.” (37-year-old white female)

Several respondents spoke highly of the bike lanes – and noted excitement about using them in 2020. Given that both quantitative and qualitative data suggest relatively low levels of cycling, this may be a particular important area to monitor in the future, especially if the installation of cycling infrastructure activates latent demand to bike for work or pleasure.

It is important to reiterate that these data are only suggestive of broader patterns that may exist within Richfield. Different aspects of the roads may emerge as important for groups that are underrepresented in this survey (such as different cultural communities).

## 5.5 DISCUSSION

The analysis of Richfield’s Sweet Streets and resident health focuses on levels of activity among residents, as any changes in levels of activity will likely precede changes in other health outcomes (such as obesity or chronic illness). Commuting patterns provide one measure of active transportation patterns. Census data reveal that commuting via foot or bicycle is rare; the vast majority of Richfield residents commute via private vehicle. However, walking or biking to work is more common in certain areas, especially in the southern part of the city.

While the survey data do not provide a representative snapshot of the Richfield population, responses do provide insights regarding residents’ understanding of the relationship between the roads and their activity. Open-ended responses indicate that residents who responded to the survey perceive sidewalks – especially the lack of sidewalks on residential streets – as shaping the activity of both adults and children. In addition, the survey responses, alongside qualitative data, are consistent with relatively low levels of recreational and commuting cycling indicated by quantitative data, suggesting that cycling may be a particularly important area to monitor in the future. This is despite the fact that a majority of those who responded to the survey report being in “excellent” or “very good” health, with over 90 percent reporting that they engaged in at least 30 minutes of physical activity in the previous 30 days.

The qualitative data also illustrate the complexity of the Sweet Street reconstructions and levels of activity within Richfield. Some survey respondents express concern about walking across roundabouts because they fear that drivers will not stop. Other respondents describe how they would walk or bike more if sidewalks were present on residential streets. At the same time, those we interviewed and surveyed overwhelmingly find the Sweet Street reconstructions aesthetically appealing. The data suggest that at least some residents are anticipating walking or biking more on the redesigned roads. This complexity is related in part to the fact that residents experience many different types of roads in the community: for example, a family planning to bike on 66th Street may still need to traverse local roads lacking sidewalks or bike lanes.

## 5.6 RECOMMENDATIONS FOR FUTURE ANALYSIS

These findings lead to the following recommendations for future analysis.

- (1) Monitor the extent of walking and cycling (for both commuting and recreational purposes) using Census data and Hennepin County multimodal count data.** Specifically, we recommend using the American Community Survey (ACS) to examine the distribution of driving, walking, and cycling to work, and Hennepin County's multimodal count to examine counts of pedestrians and cyclists. Our recommendation is to begin examining this data in summer 2022.

The ACS variable that measures commuting patterns is based on a 5-year estimate. The reconstructions of Portland Avenue South, 66th Street, and Lyndale Avenue South were completed in 2016, 2019, and 2020, respectively. Thus, while the measure will include data from years preceding reconstruction in some sites, it will also incorporate data from several years following reconstruction. Examining the data in 2022 will provide an indication of trends in commuting patterns without waiting too long to obtain relevant data.

Hennepin County's next Richfield count will occur in 2021. In previous years, the adjusted counts become publicly available the following spring. The 2021 data should therefore be available in summer 2022.

- (2) Survey Richfield residents about levels of activity using either intercept surveys, a representative sample of Richfield residents, or StreetLight (SL) data for the city as a whole.**

Intercept surveys, described in greater detail in Chapter 3, will allow the city to examine modes of transportation and levels of activity among a non-representative sample of Richfield residents. A representative sample, while more costly, will allow the city to examine relationships between location and levels of activity in greater detail, as well as generalize the findings beyond the surveys' respondents. For instance, a representative sample would allow the city to assess whether living on or near a reconstructed road is associated with walking or cycling more. Such an approach would allow a more rigorous assessment of the impact of the street redesigns. We elaborate on the pros and cons of each approach in Chapter 7.

We adapted our survey questions from the Behavioral Risk Factor Surveillance System Questionnaire, a national telephone survey that is used across the country to collect annual prevalence data on a range of health behaviors and outcomes. Demographic variables are consistent with Census questions. We recommend using similar questions in future surveys.

StreetLight (SL) offers another source for monitoring levels of activity. SL is a mobility analytics platform that relies on anonymized data from smart phones and navigation devices. The data can be used to estimate pedestrian, biking, and vehicle patterns along specific stretches of road, including origin and destination points of street users. The data can also be used to estimate change over time along a particular road segment. SL data is also likely to provide a more reliable measure of pedestrian and biking activity because it is free of the bias that may result from survey or interview respondents overestimating their levels of activity. Because Hennepin County has access to the SL platform, it may be possible to conduct an analysis of select Richfield streets.

### **(3) Monitor other health outcomes at the city level using data from the Minnesota Department of Health and the Center for Disease Control and Prevention.**

Monitoring health outcomes at the city level is straightforward due to the fact that considerable health data exists at the zip code level and Richfield has only one zip code. While a small part of zip code 55423 extends into Edina, health statistics from this zip code can provide an indication of trends in asthma,<sup>30</sup> obesity,<sup>31</sup> and chronic obstructive pulmonary disease.<sup>32</sup> Aggregate data on Richfield students in grades 5, 8, 9, and 11 is also available via the Minnesota Department of Education (current available files include annual data from 2013, 2016, and 2019).<sup>33</sup> As in previous chapters, we recommend analyzing trends in health outcomes in Richfield relative to a comparison city.

It is important to note that this approach would not allow Richfield to attribute any changes in health outcomes to the Sweet Street reconstructions; changes in health outcomes could just as easily reflect different types of people moving into the city or other city or state investments. However, such data may be able to show changes in the community that have occurred alongside the investment in the roads.

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<sup>30</sup> MN Dept of Health Data on asthma available at: [https://data.web.health.state.mn.us/asthma\\_staticmaps](https://data.web.health.state.mn.us/asthma_staticmaps)

<sup>31</sup> MN Dept of Health Data on obesity available at: <https://data.web.health.state.mn.us/web/mndata/obesity>

<sup>32</sup> MN Dept of Health Data on COPD available at: <https://data.web.health.state.mn.us/web/mndata/copd>

<sup>33</sup> MN Dept of Education student survey data available at:  
<https://public.education.mn.gov/MDEAnalytics/DataTopic.jsp?TOPICID=11>

## CHAPTER 6: TRANSPORTATION AND SAFETY

### 6.1 OVERVIEW

Proponents of Complete Streets often draw attention to the safety benefits of streets that support multimodal travel. Because transportation policies have traditionally prioritized vehicular travel, streets often lack adequate protections for pedestrians and bicyclists, such as sidewalks for pedestrians or separate lanes for cyclists. As a result, drivers, cyclists, and pedestrians often share the road uneasily. Thousands of Americans are injured or killed in accidents with vehicles each year. In 2016, nearly 7,000 cyclists and pedestrians were killed in motor vehicles accidents across the United States (National Highway Traffic Safety Administration 2018a and 2018b).

By incorporating modifications to the road designed to reduce traffic speeds, separate pedestrians and cyclists from vehicles, and increase the visibility of pedestrians, cyclists, and public transit users, Complete Streets can lead to a reduction in traffic conflicts and accidents and an improvement in the perceived safety of the road (Campbell, et al. 2004, King, Carnegie and Ewing 2003, Persaud, et al. 2001). In this chapter, we examine the relationship between Richfield's Sweet Street reconstructions, perceptions of safety, and vehicular accidents.

Methodologically, we draw on data described in previous chapters, as well as previous research on Richfield to provide a measure of improvements in safety and to identify baseline measures to assess in future analyses.

### 6.2 LITERATURE REVIEW

Several types of policies seek to enhance safety for road users, including pedestrian and cyclist education, changes to vehicle design, and stricter enforcement of traffic laws. Changes to the built environment through policies such as Complete Streets also represent a strategy for improving road safety. Researchers distinguish three types of modifications that provide protection to pedestrians and bicyclists. These include modifications that reduce vehicle speed; those that separate pedestrians and cyclists from vehicles either physically or temporally; and those that increase the visibility of pedestrians and cyclists (Retting, Ferguson and McCartt 2003).

Because higher speeds are associated with an increase in the incidence and severity of pedestrian- and bicycle-vehicle crashes (Zajac and Ivan 2003, Kim, et al. 2007), Complete Street designs often incorporate measures designed to reduce vehicle speeds. Reducing vehicle speeds by instituting roundabouts or multiway stop sign control is associated with reduced pedestrian-vehicle crashes, both in the United States and internationally (Persaud, et al. 2001). Traffic calming measures, such as narrow lanes and speed humps, are also associated with reduced speeds and safer conditions for pedestrians and cyclists, although some evidence suggests that calming measures alone may be insufficient to reduce vehicle crashes with pedestrians (Bunn, et al. 2003).

Complete Streets can also provide protection to pedestrians and cyclists through design elements that separate them from vehicles by time or space. For instance, traffic signals that halt vehicle traffic for pedestrian crossings are associated with a reduction in pedestrian and vehicle conflicts (Retting, Ferguson and McCartt 2003). There is also research demonstrating that pedestrian safety is enhanced by modifications including the presence of sidewalks and walkways, pedestrian barriers, and pedestrian islands (Campbell, et al. 2004). Similarly, roads that incorporate bicycle-specific infrastructure (such as bike lanes) are associated with a decreased bicycle injury risk, relative to major streets lacking similar infrastructure (Teschke, et al. 2012).

In addition, measures that increase the visibility of pedestrians and cyclists, including street lighting, redesigned intersections, and bus stop placement, may decrease the risk associated with vehicle accidents, particularly for transit users (King, Carnegie and Ewing 2003). Increased lighting can reduce the incidence of nighttime collisions by making pedestrians and cyclists more visible (Wanvik 2009), while moving bus stops or changing vehicle parking can decrease the number of pedestrians who attempt a road crossing in front of a stopped bus or parked car (Berger 1975). However, there is evidence to suggest that on their own, crosswalks may be ineffective and in some cases, negatively associated with pedestrian safety (Zegeer, et al. 2001).

Finally, it is worth noting that modifications that improve street design for pedestrians and cyclists, whether aimed at reducing speeds or separating and increasing the visibility of different types of users, are particularly important for special populations, including children, the elderly, and people with disabilities (Clifton, Bronstein and Morrissey 2014). For instance, in residential areas with children, modifications aimed at reducing vehicle speeds improve safety because accidents often result from child error and slower speeds give motorists more time to respond (Retting, Ferguson and McCartt 2003). Similarly, modifications that decrease the risk of collisions between vehicles and pedestrians are particularly important for the elderly and disabled individuals, who are less likely to own and operate a vehicle (AARP Public Policy Institute 2009).

Roundabouts deserve special attention because they have been the subject of considerable debate in Richfield (Smetanka 2011, Harlow 2018). Yet research demonstrates that roundabouts are associated with reduced pedestrian-vehicle crashes, both in the United States and internationally (Persaud, Retting, Garder, & Lord, 2001). Roundabouts enhance safety by reducing vehicle speeds as drivers approach the intersection and reducing the number of potential conflict points between vehicles (AARP 2014; FHA 2019).

Minnesota roundabouts have been the subject of considerable research. A 2017 study of 144 roundabouts across the state found that the installation of a roundabout was associated with an 80 percent reduction in fatal and serious injury crashes. However, this study also found that many dual roundabouts, which have two full circulating lanes, saw an increase in the total crash rate and the frequency of crashes, at the same time as they reduced the incidence of serious injury crashes (Minnesota Department of Transportation 2017).



Despite the fact that roundabouts are associated with a reduction in serious crashes, experience suggests that drivers, pedestrians, and bicyclists are often apprehensive about replacing a signalized intersection with a roundabout. The qualitative data collected for this project, described in greater detail below, suggests that there is still quite a bit of confusion about the new roundabouts on 66th Street and Lyndale Avenue South. It is worth noting that current disagreements about roundabout safety echo the community's earlier experience with the 66th Street and Portland Avenue South roundabout, which was installed in 2008 (Smetanka 2011).

The fact that residents are still adjusting to the new roundabouts on 66th Street and Lyndale Avenue South indicates that it is premature to conduct an analysis of the safety impacts associated with these roundabouts. Because considerable confusion still exists, it would be difficult to identify whether any positive or negative associations observed were associated with the design features of the roundabout or the confusion of users as they adapt to the new design features of the street. Fortunately, the 66th Street and Portland Avenue South roundabout, which was installed in 2008, has been the subject of two MnDOT-funded studies of vehicle and pedestrian/cyclist safety. Given the relevance of the findings to this project, as well as the use of data collection tools unavailable for this project given its scope, we report on these findings in detail below.

The next section describes perceptions of safety among Richfield residents. We then elaborate on the safety of several design features of the Sweet Street reconstructions, with particular attention to the safety of the 66th Street and Portland Avenue South roundabout.

### 6.3 METHODOLOGY AND DATA

In this section, we draw from prior research and from the qualitative data sources described in previous sections and chapters. The analysis of perceptions of safety draws heavily from the survey and interview data described in Chapters 4 and 5.

We rely on past research to provide baseline indicators of safety (for 66th Street and Lyndale Avenue South) and changes in safety (particularly related to roundabouts) for several reasons. First, roundabouts – including the roundabout located at the Portland Avenue South and 66th Street intersection – have been the subject of considerable research. The City of Richfield can draw upon this research in assessing the safety impacts of its reconstructions.

Second, because the 66th Street and Lyndale Avenue South reconstructions were completed during the course of this study, we were not able to assess changes in traffic safety on these roads. However, traffic safety analyses were conducted prior to these reconstructions to inform project design and construction. These studies provide several baseline indicators of safety that future analyses can compare against.

## 6.4 FINDINGS

### 6.4.1 Perceptions of Safety

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The qualitative data suggest that the Sweet Street reconstructions have introduced many elements that have improved residents' perception of safety. For instance, several business owners highlighted road features designed to slow down vehicles – including replacing two lanes of traffic with one – as beneficial for both pedestrians and bikers. In addition, the survey responses discussed earlier in this report indicate that the presence of updated sidewalks, marked pedestrian crossings, and flashing pedestrian crossings have also improved residents' perceptions of safety.

However, as noted above, survey respondents frequently drew attention to a lack of sidewalks on local roads as presenting safety concerns. For instance, one resident noted a desire to “walk without being in the street and having to move around cars. Especially when it gets dark so early” (White female, 57 years old). Another expressed a desire to: “...have more sidewalks. I walk my dog every day, a few times per day. Sidewalks would make our walks safer, especially at night and due to drivers driving way too fast down the side streets” (White/Native American female, 39 years old).

These residents draw attention to the challenges posed to individuals who must walk in the middle of the street when cars are parked next to homes – especially at night or early in the morning when the streets are dark. In addition, survey responses discussed earlier in the report highlight the risks posed to children who are playing outside or walking/riding to school.

Others identified problems related to visibility and lighting. One recommended to “[g]et rid of the trees planted in the roundabouts. They will grow. Visibility will be reduced” (White male, 21 years old). Another noted: “The pedestrian crossing in the older roundabouts is in a bad place. It’s hard to see people crossing and we need lights in those roundabouts (Portland Ave ones for example)” (White female, 43 years old).

In these instances, survey respondents mention a perception that vehicles are failing to stop for pedestrians; the presence of bushes, trees, and snow that currently (or have the potential to) obscure drivers' view of pedestrians and cyclists; and confusion regarding the right of way in roundabouts as reasons for feeling unsafe. It is reasonable to suspect some of these circumstances to improve with time as drivers become more familiar with roundabouts and pedestrians and cyclists become more knowledgeable about the rules regarding crosswalks in roundabouts.

Despite the fact that roundabouts are associated with a reduction in serious crashes, drivers, pedestrians, and bicyclists are often apprehensive about replacing a signalized intersection with a roundabout. The qualitative data for this project suggests that there is still quite a bit of confusion about the new roundabouts on 66th Street and Lyndale Avenue South. For instance, one resident noted:

“[Roundabouts] are not safe. Witnessed too many accidents and it has caused major backup at 66th and Nicollet. So many that I now ... take a longer route to work and go through more residential neighborhoods.” (White female, 47 years old)

Several business owners echoed this sentiment – noting that some customers avoid the roundabouts due to confusion and the perception that the new road features are unsafe. It is worth noting that current disagreements about roundabout safety echo the community’s earlier experience with the 66th Street and Portland Avenue South roundabout, which was installed in 2008 (Smetanka 2011).

The fact that residents are still adjusting to the new roundabouts on 66th Street and Lyndale Avenue South indicates that it is premature to conduct an analysis of the safety impacts associated with these roundabouts. Because considerable confusion still exists, it would be difficult to identify whether any positive or negative associations observed were associated with the design features of the roundabout or the confusion of users as they adapt to the new design features of the street. Fortunately, the 66th Street and Portland Avenue South roundabout, which was installed in 2008, has been the subject of two MnDOT-funded studies of vehicle and pedestrian/cyclist safety. Given the relevance of the findings to this project, as well as the use of data collection tools unavailable for this project given its scope, we report on these findings in detail below.

#### 6.4.2 Safety

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Richfield’s Sweet Street reconstructions were designed to enhance safety in several ways. For the sake of clarity, we focus on the Portland Avenue South reconstruction in this section.

Prior to the reconstruction of Portland Avenue South, sections of the road had been converted from a 4- to 3-lane road to reduce vehicle accidents (Hennepin County, 2019). Medians and landscaped buffers were installed to provide a refuge for pedestrians and bicyclists at crossings and to separate pedestrians on sidewalks from vehicles on the road. New streetlamps were installed and repositioned to illuminate pedestrians and cyclists to oncoming traffic. In addition, designated bike lanes were installed on both sides of the roadway.

The roundabout located at 66th Street and Portland Avenue South was installed prior to the Sweet Streets reconstruction and has been extensively studied by researchers at the University of Minnesota. We report on those findings in detail below, as they are relevant for future analyses of the roundabouts installed during the 66th Street and Lyndale Avenue South reconstructions.

A 2012 report focused on the experience of pedestrians and cyclists at two Hennepin County roundabouts – one of which was the 66th Street/Portland Avenue South roundabout (Hourdos, Richfield and Shauer 2012).<sup>34</sup> In this project, cameras were installed in the center island to capture vehicle and pedestrian/cyclist behavior. Sixteen days were captured, leading to information on an average of 76 pedestrian crossings and 15 bicycle crossings per day. The data were reduced into a useable form and analyzed by researchers at the Minnesota Traffic Observatory at the University of Minnesota.

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<sup>34</sup> This study also provides information related to the experience of pedestrians and cyclists in roundabouts. Specifically, the study finds that despite the fact that pedestrians and cyclists experience a delay when drivers fail to yield, the delay is significantly shorter than a delay that would be experienced at a signalized intersection.

The findings of this study reveal that although Minnesota law requires drivers to yield to pedestrians in crosswalks, only 42 percent of drivers yielded to pedestrians at crossings at the Richfield roundabout. Drivers in this study were more likely to yield when entering a roundabout, when the vehicle was not closely following or followed by another vehicle, when a pedestrian or cyclist was starting from the island, and when there were two or more pedestrians or cyclists in a group. The failure of drivers to yield may contribute to a perception of unsafe conditions at the roundabouts and may pose a particular risk to pedestrians with visual impairments who are trying to use the crosswalks. There were no observed accidents between vehicles and pedestrians/cyclists over the 16 days of observation.

A 2014 report replicated the data collection procedure used in the study above to better understand the impact of changes in the signage and lane markings at Richfield's 66th Street/Portland Avenue South roundabout. This study was motivated by the fact that the installation of this roundabout was associated with an increased number of crashes: in the first 35 months in operation, 89 crashes were reported. The study analyzed driver behavior, focusing on yield violations, lane change violations, and turn violations. Researchers concluded that changes to the signage and striping – including extending the solid line leading to the intersection and replacing the traditional fish-hook style roundabout signs – was associated with a decrease in the incidence of driver violations (Hourdos and Davis 2014).

It is noteworthy that when the 66th Street/Portland Avenue South roundabout was installed, 2003 federal standards regarding the design, signs, and permanent markings of roundabouts were in place. Since that time, the standards have been significantly revised with additional guidance around striping and markings, as roundabouts have become more common across the United States (Hourdos and Davis 2014). The City has also had time to incorporate insights gained from this roundabout into the design and installation of the Sweet Street roundabouts and has invested in considerable education about roundabouts. Thus, there are reasons to suspect improvements in driver behavior (i.e. a reduction in the number of violations in roundabouts and yielding to pedestrians/cyclists) – and thus, improvements in safety, in the new roundabouts installed on 66th Street and on Lyndale Avenue South.

An additional source of data exists in evaluations prepared prior to the 66th Street and Lyndale Avenue South reconstructions. Prior to the 66th Street reconstruction, the Federal Highway Administration and Hennepin County prepared an Environmental Assessment for 66th Street, from Xerxes Avenue South to 16th Street. Part of this assessment involved an analysis of safety deficiencies along 66th Street, using crash data from 2007-2009.

The analysis calculates a crash rate and critical crash rate. The crash rate refers to the number of crashes per million entering vehicles. For an intersection or road section, the crash rate is compared to the state average for similar roadway intersections and section. An observed crash rate that exceeds the critical crash rate signals that the intersection or roadway operates outside the normal range of similar sites, indicating a safety problem.

The analysis of crash data on 66th Street (2007-2009) revealed the following (SRF Consulting Group Inc. 2014):

- Over the 3-year period, 20 pedestrian and bicycle crashes were reported. Sixteen of these crashes resulted in physical injury.
- Nine of 13 road segments along 66th Street exceeded the average crash rate for similar roadway types. Seven of the 9 segments had crash severity rates that exceeded the critical severity rate.

Figure 6-1 shows a reprint of the crash analysis prepared for the 66th Street report. This table shows the average crash rate, existing crash rate, and critical crash rate for intersections and segments along the 66th Street project corridor. The shaded boxes indicate crash rates and critical crash rates that exceed the average crash rate for similar intersections and road segments. These statistics can serve as a baseline for subsequent crash analyses of 66th Street intersections and road segments.

<b>CSAH-53 Intersections</b>	<b>Total Crashes <sup>(1)</sup></b>	<b>Average Crash Rate</b>	<b>Existing Crash Rate</b>	<b>Critical Crash Rate</b>
Vincent Ave	3	0.40	0.14	0.65
Sheridan Ave	1	0.40	0.05	0.66
CSAH-32 (Penn Ave)	13	0.43	0.32	0.61
Logan Ave	7	0.57	0.26	0.83
I-35W West Ramps	21	0.49	<b>0.64</b>	0.71
I-35W East Ramps	5	0.49	0.14	0.69
Lakeshore Dr	7	0.36	0.19	0.54
Lyndale Ave	15	0.43	0.38	0.61
Shopping Center Driveway	4	0.27	0.17	0.47
CSAH-52 (Nicollet Ave)	18	0.43	<b>0.53</b>	0.63
CSAH-35 (Portland Ave) <sup>(2)</sup>	79	N/A	N/A	N/A
12th Ave	7	0.57	0.49	0.93
Bloomington Ave	19	0.57	<b>1.19</b>	0.91
<b>CSAH-53 Street Segments <sup>(1)</sup></b>				
CSAH-31 (York Ave) to Vincent Ave	4	0.68	<b>1.55</b>	1.72
Vincent Ave to Sheridan Ave	1	0.92	0.42	2.15
Sheridan Ave to CSAH-32 (Penn Ave)	1	0.92	0.42	2.15
CSAH-32 (Penn Ave) to Logan Ave	9	0.68	<b>1.96</b>	1.42
Logan Ave to I-35W West Ramps	18	1.16	<b>2.46</b>	1.88
I-35W East Ramps to Lakeshore Dr	1	0.68	0.22	1.42
Lakeshore Dr to Lyndale Ave	2	0.68	0.47	1.45
Lyndale Ave to Shopping Center Dwy	12	0.68	<b>3.65</b>	1.58
Shopping Center Dwy to CSAH-52 (Nicollet Ave)	13	0.68	<b>5.94</b>	1.82
CSAH-52 (Nicollet Ave) to CSAH-35 (Portland Ave)	17	1.16	<b>2.32</b>	1.88
CSAH-35 (Portland Ave) to 12th Ave	12	1.16	<b>2.39</b>	2.05
12th Ave to Bloomington Ave	10	1.16	<b>4.33</b>	2.54
Bloomington Ave to Richfield Pkwy	2	1.16	<b>2.45</b>	3.74

<sup>(1)</sup> All crash data provided by Hennepin County for dates 2007-2009

<sup>(2)</sup> Crash rates were not identified for this intersection, due to the change in traffic control between 2007-2009 (traffic signal, under construction and roundabout)

**Figure 6-1 66th Street Project Corridor Crash Analysis (2007-2009) (Reprint of Exhibit 5 in SRF Consulting Group Inc. 2014)**

A similar analysis was prepared prior to the Lyndale Avenue South reconstructions. Specifically, a Traffic Analysis Evaluation was prepared to identify safety concerns. This analysis included an analysis of vehicle accidents (both incidence and severity) using crash data for the years 2013-2015, a traffic speed review, and an analysis of bicycle and pedestrian crashes for multiple intersections along Lyndale Avenue South (Bolton and Menk 2018). This analysis found that:

- A total of 66 recorded crashes from 67th Street to 76th Street.
- The following intersections had crash rates exceeding the state average: Lyndale Avenue South at Lakeshore Dr., Lyndale Avenue South at 75th Street, and Lyndale Avenue South at 76th Street. In addition, the first intersection (Lakeshore Dr.) had a particularly high severe crash rate.

The statistics reported in the two reports can serve as a baseline for analyzing improvements in safety following the reconstruction of 66th Street and Lyndale Avenue South. We elaborate on these baseline statistics in the next chapter.

Finally, though it is early to analyze the safety impacts of the 66th Street and Lyndale Avenue South reconstructions, anecdotal information suggests that Richfield officials are perceiving an improvement. Bill Stanger, Lieutenant of the Richfield Police Department, notes that the department has seen a reduction in speeding, traffic citations, and serious accidents on the newly reconstructed roads (Stanger 2020), providing support for the continued monitoring of safety indicators moving forward.

## 6.5 DISCUSSION AND RECOMMENDATIONS FOR FUTURE ANALYSIS

Although the qualitative data collected for this study suggest that it is early to analyze changes in crash patterns on reconstructed roads, other data and analyses exist that can provide information about the safety impacts of specific design elements and serve as baseline indicators of safety for future analyses. We outline our recommendations below.

- (1) Use existing studies of Minnesota roundabouts to highlight changes in safety due to the installation of roundabouts and to identify areas for improving safety.** Past research on roundabouts is extensive and overwhelmingly finds that roundabouts are safer than signalized intersections in terms of the severity of vehicle accidents. Any additional research on Richfield roundabouts will be costly and unlikely to reveal different findings.

The studies described above used extensive data and rigorous quantitative methods to examine the impact of roundabouts in Minnesota. A 2017 study of 144 roundabouts across the state found that the installation of a roundabout was associated with an 80 percent reduction in fatal and serious injury crashes. The study also showed that roundabout with two full circulating lanes saw an increase in the total crash rate and the frequency of crashes, at the same time as they reduced the incidence of serious injury crashes. In addition, a study of the Portland Avenue South roundabout shows that the addition of markers and striping was associated with a reduction in driver violations. A similar study found that drivers inconsistently yield to

pedestrians and cyclists at this roundabout, likely contributing to the perception that some Richfield residents hold of roundabouts as being unsafe.

**(2) Calculate the 3-year crash rate and critical crash rate for the road segments and intersections analyzed in the Traffic Analysis Evaluation for Lyndale Avenue South and the Environmental Assessment for 66th Street using crash data for 2020-2022 and 2019-2021, respectively.**

Comparing these statistics to the data compiled as part of the traffic safety evaluation (using 2013-2015 data) and Hennepin County Special Projects Analysis Report will provide an indication of changes in safety following the redesign of Lyndale Avenue South and 66th Street

**(3) Incorporate questions about perceptions of safety in surveys of Richfield residents and utilize data and analyses on perceptions of safety conducted as part of the Richfield Safe Routes to School efforts.** If surveys are used to assess user experience and levels of activity among Richfield residents, we recommend incorporating questions related to perceptions of safety into these surveys. Chapter 7 provides examples of topics to consider for inclusion and Appendix F contains our survey instrument, which includes questions related to perceptions of safety.

As noted earlier, we recommend incorporating analyses conducted as part of Richfield's Safe Routes to School efforts. In late 2019, the Richfield Public School District hired a Safe Routes to School Coordinator, Will Wlitzlo. As part of his work, he will be fielding two parent surveys as part of the district annual survey. The survey is based on a national template and includes the following topics: transportation to school, travel time to and from school, issues affecting parents' decisions to allow children to walk or ride to school (Wlitzlo 2020).

Specifically, the survey includes the following questions related to perceptions of safety:

- (a) What of the following issues affected your decision to allow, or not allow, your child to walk or bike to/from school? (Select ALL that apply) (Answers = Yes/No/Not sure)
- Speed of traffic along route
  - Amount of traffic along route
  - Sidewalks or pathways
  - Safety of intersections and crossings
  - Crossing guards
  - Violence or crime
- (b) Would you probably let your child walk or bike to/from school if this problem were changed or improved?
- Speed of traffic along route
  - Amount of traffic along route
  - Sidewalks or pathways
  - Safety of intersections and crossings
  - Crossing guards
  - Violence or crime



## CHAPTER 7: MEASURING THE IMPACT OF RICHFIELD'S COMPLETE STREETS IN THE FUTURE

### 7.1 OVERVIEW

This study has investigated the many potential impacts of Sweet Streets reconstructions on the health, safety, and well-being of Richfield residents, and the city as a whole. Previous chapters have detailed our central findings and offered suggestions for future research. In this chapter, we elaborate on our recommendations for continued monitoring and analysis of the impacts of Richfield's Sweet Street. We do not include all the options presented in previous chapters. Rather, we prioritize a subset of recommendations based on a set of factors including the ease of data collection and analysis, the potential for identifying noteworthy findings related to Sweet Streets investments, and the contribution to community knowledge and future Complete Streets investments.

Our recommendations call for continuing the analysis of Richfield's Sweet Streets in 2022, using data collected in 2021 or prior. By 2022, three years will have passed since the completion of 66th Street and two years will have passed since the completion of Lyndale Avenue South, allowing residents time to adjust and make use of the newly designed streets. It is likely that COVID-19 will shape the activities of residents in summer 2020 – potentially leading to more outdoor activity if residents remain sheltered at home, or conversely, dampening activity if residents fear contagion on sidewalks, trails, and parks. Waiting until 2022 to conduct the analysis will give residents at a minimum one full summer to experience the newly designed streets without the threat of the global pandemic.

We divide our recommendations into two groups. The first are relatively low-cost options with the potential to reveal benefits that have occurred alongside the Sweet Streets reconstructions. The second are higher-cost options that can reveal a stronger link between the reconstructions and outcomes.

The set of recommendations in the first group include:

1. Conducting intercept surveys to collect data on user experience and perceptions of safety
2. Monitoring changes in bicycling and commuting using Hennepin County multi-modal statistics and Census data
3. Observing levels of activity (esp. walking and biking) along reconstructed and non-reconstructed roads
4. Monitoring changes in aggregate sales and composition of industry in Richfield
5. Conducting surveys or in-person interviews with a set of businesses that represent key segments of the Richfield business community (industry, size, age of business, ownership, etc.)

The set of recommendations in the second group include:

6. Using StreetLight data to estimate differences in pedestrian and cycling behavior before and after a Sweet Streets reconstruction or on reconstructed vs. non-reconstructed roads.

7. Conducting a citywide representative survey to assess user experience, perceptions of safety, and health
8. Replicating crash analyses for 66th Street and Lyndale Avenue South sites, using pre-construction analyses as a baseline
9. Replicating difference-in-difference analysis using residential home values or real estate transaction data, potentially with a comparison street outside of Richfield
10. Descriptively comparing trends in home values, business activity, levels of activity, and health outcomes for the City of Richfield and a comparable city (such as St. Louis Park)

In Table 7.1 (next page), we organize these recommendations by outcome area. We expand on each approach in the following sections.

**Table 7-1 Recommended Methods and Measures for Future Research**

<b>Desired Outcomes</b>	<b>Methods/Measures Recommended for Future Use</b>
<b>User Experience and Livability</b>	
Enhanced livability, as measured by residential home values	Replicate difference-in-difference analysis using real estate transaction data (if possible) or residential home values in summer 2022
Improved user experience for pedestrians, transit users, and cyclists	Incorporate questions related to use and satisfaction of the streets into either intercept surveys or citywide survey, in summer 2022
<b>Economic Vitality</b>	
Commercial/industry change and growth	Examine change in distribution of industry and aggregate sales in each industry, using either 2016 as baseline or by examining trends in a similar city
<b>Individual and Community Health</b>	
Increase in levels of activity	<p>Monitor multi-modal bike counts from Hennepin County in 2021 and 2023; Use ACS data (2017-2021) to examine changes in commuting patterns at city- and Census tract-levels. Alternatively, use StreetLight data to monitor walking and biking along select road segments.</p> <p>Incorporate questions about levels of activity into either intercept surveys or citywide survey.</p>
<b>Transportation and Safety</b>	
Reduction in vehicle accidents and serious accidents	Calculate crash rate and severe crash rate for select 66th Street and Lyndale Avenue sites, using data from 2019-
Enhanced perceptions of safety	Incorporate questions about perceived safety for each mode of transportation in summer 2022 using either intercept or citywide survey

## 7.2 CONDUCT SURVEYS OF RICHFIELD RESIDENTS IN SUMMER 2022

Our first recommendation is to conduct intercept surveys or a citywide survey of Richfield residents to gather data on user experience, perceptions of safety, and levels of activity. We discuss the advantages and disadvantages of each approach below

### 7.2.1 Intercept Surveys

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Intercept surveys can be conducted quickly and at a relatively low cost. If this approach is used, we recommend conducting the surveys at the following locations:

- The entrance to Walgreens, located in the Hub shopping center;
- The Richfield Farmers Market, located in Veterans Park just north of the 66th Street and Portland Avenue South intersection; and
- The transit stops located on the Northeast (Nicollet Avenue South) and Northwest (66th Street) corners of the intersection of 66th Street and Nicollet Avenue South.

These locations prioritize pedestrians and cyclists (farmer's market), transit users (transit stops), as well as seniors (Walgreens).

Intercept surveys will depend on residents self-selecting into the survey after being prompted to do so. The data will yield descriptive information for a non-representative subset of Richfield residents, but cannot be generalized to the community as a whole. It may be the case that descriptive information from a subset of residents is sufficient to showcase improvements or identify continuing concerns given the city's goals. However, this approach will not allow the city to state that the Sweet Street changes caused any changes in experience, perceptions of safety, or activity, or that the changes reflect larger changes in the community.

### 7.2.2 Representative Citywide Survey

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If the city seeks a more rigorous analysis of the role of Sweet Streets in altering experience, perceptions of safety, and activity among Richfield residents, then we recommend fielding a representative citywide survey. Such an approach would be considerably more costly because it would involve developing a sampling strategy to ensure a sufficient number of responses, mailings to a large number of residences, and follow-ups either in person or other the phone.

A primary advantage of a citywide survey is that it would allow the city to generalize findings to the city as a whole. In addition, such an approach would facilitate examining responses by street – to analyze, for example, whether residents living near Lyndale Avenue South report walking and biking more now than residents living farther from a reconstructed road. A representative survey would likely yield findings of greater interest to researchers, policymakers, and funders.

### 7.2.3 Survey Topics

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In addition to basic demographic information (including race, age, and gender), we recommend that these surveys cover, at a minimum, the following topics:

- (a) Use and usability
  - How did you travel here today? How do you typically travel to this location/location A?
  - Where did you travel from to get to this location?
  - How easy would it be for you to (walk/bike/drive) to this location/location A?
  - Did you travel here today with anyone else? How many people arrived with you today?
- (b) Satisfaction
  - How safe did/do you feel on your (walk/ride/drive) to this location/location A?
  - How enjoyable was/is the (walk/ride/drive) to this location?
  - What were/are the most enjoyable aspects of your (walk/ride/drive)?
  - What were/are the least enjoyable aspects of your (walk/ride/drive)?
- (c) Perceptions of safety related to: children playing outside; walking/cycling in neighborhoods and on major roads; traffic speeds (legal speeds and typical driver speeds); street lighting; street crossings; and sidewalks (see Appendix F for question wording).
- (d) Levels of activity
  - Would you say that your health is: Excellent, Very good, Good, Fair, or Poor?
  - Are you limited in any activities because of physical problems?
  - During the past 30 days, other than your regular job, did you participate in any physical activity or exercises such as running, calisthenics, golf, gardening, or walking for exercise?
  - During the past 7 days:
    - How many days did you get at least 30 minutes of moderate physical activity?
    - How many days did you walk to get to and from places (such as work, stores, or to run errands)?
    - How many days did you bike to get to and from places?
    - How many days did you take public transportation to get to and from places?

## 7.3 MONITOR CHANGES IN ACTIVITY AND COMMUTING PATTERNS

Our second recommendation involves monitoring counts of cyclists and commuting patterns over time. It is relatively straightforward to obtain counts related to bicycling and commuting patterns in Richfield. As noted in previous chapter, cycling may be a particularly important area to monitor in the future given low levels of biking currently.

Table 7.2 shows the average annual daily bicyclists volume (AADB) for two locations in Richfield. This table shows the statistics for 2015, 2017, and 2019. The data is collected every two year, with data for 2021 likely available in summer 2022. The Portland Avenue South site will be particularly important to monitor, given the completion of the Portland Avenue South reconstruction in 2016.

**Table 7-2 Changes in Cycling Activity in Richfield, 2015-2021**

Average Annual Daily Bicyclist Volume	2015	2017	2019	2021
Nicollet Ave South, north of 76th Street	21	15	39	
Portland Ave South, north of 74th Street	66	30	29	

Source: Hennepin County Multi-Modal Counts

Table 7.3 presents baseline information regarding the distribution of commuting patterns for Richfield residents. This table shows that for the period 2012-2016, the vast majority of Richfield residents commuted to work in a car, truck, or van (85.7%). Only a small number of residents walked (3.5%) or biked (0.6%) to work. Collecting this data via the Census Bureau's website for the 2017-2021 period will allow the City of Richfield to determine whether commuting patterns have changed following the reconstructions of Portland Avenue South, 66th Street, and Lyndale Avenue South.

**Table 7-3 Change in Commuting Patterns in Richfield, 2012-2021**

Commuting: Transportation	(2012-2016)		(2017-2021)	
	Percentage	Margin of error	Percentage	Margin of error
Car, truck, or van	85.7%	+/- 1.7		
Public transportation	6.3%	+/- 1.1		
Walked	3.5%	+/- 1.0		
Bicycle	0.6%	+/- 0.3		
Taxicab, motorcycle, or other	1.0%	+/- 0.4		
Worked at home	3.0%	+/- 0.8		

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

A final possibility is to monitor activity levels using StreetLight data (SL). As mentioned in previous chapters, SL relies on anonymized data from smart phones and navigation devices to estimate local travel patterns. The data can be used to estimate pedestrian, biking, and vehicle patterns along specific stretches of road, including origin and destination points of street users. The data can also be used to estimate change over time along a particular road segment.

SL is likely to provide a more reliable measure of pedestrian and biking activity because it is free of the bias that may result from survey or interview respondents overestimating their levels of activity. In

addition, Hennepin County shares the Minnesota Department of Transportation’s SL license and has access to the data. Because some Sweet Streets reconstructions (notably, 66th Street) were funded in part by Hennepin County, the county likely shares an interest in identifying the impacts of these investments on active living. Partnering with Hennepin County to use SL to identify the impacts on walking and biking along 66th Street, for instance, may provide an instructive indicator of the role of Complete Streets redesigns on active living behaviors.

#### **7.4 MONITOR CHANGES IN BUSINESSES AND INDUSTRY IN RICHFIELD**

As we discuss in Chapter 4, monitoring change in the businesses located in Richfield is also relatively straightforward. One approach would be to conduct an annual or biennial census of the businesses located along particular segments of reconstructed road, documenting at a minimum the businesses’ name and industry sector. Much of this information is available through simple observation and could be validated in cooperation with the Richfield Chamber of Commerce and/or calls to property owners. This approach would permit an analysis of street-level changes in the types of businesses located along reconstructed roads, as well as any increase or decline in the number of vacancies along those roads.

An alternative (and less costly) approach would be to monitor changes in local businesses using aggregate revenue data from the Minnesota Department of Revenue (DOR), using 2016 data as a baseline. This information is available at the city level and provides a snapshot of the types and number of businesses present in Richfield, as well as the annual sales for each industry.<sup>35</sup> We recommend assessing change in 2022, using data from 2021 as comparison for 2016.

Of particular interest would be growth in industries likely to benefit from the Sweet Streets reconstructions, including retail stores and food services and drinking establishments, as well as overall growth in sales and the number of establishments.

Table 7.4 shows the number of establishments and gross sales for each industry in 2016. These statistics can serve as a baseline for an analysis of similar statistics using data from 2021.

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<sup>35</sup> Appendix E presents citywide statistics for 2016 – the year before major construction began on 66<sup>th</sup> Street.



**Table 7-4 Change in Sales/Prevalence across Industries, 2016 to 2021**

	2016		2021	
INDUSTRY	Gross Sales	#	Gross Sales	#
236 CONSTRUCT -BUILDINGS	\$1,947,267	5		
238 CONSTRUCT -SPECIAL TRADES	\$4,291,986	13		
323 MFG -PRINTING, SUPPORT	\$1,798,154	11		
325 MFG -CHEMICAL	\$1,733,507	4		
333 MFG -MACHINERY	\$49,407	4		
339 MFG -MISC	\$610,122	7		
423 WHOLESALE -DURABLE	\$5,090,888	14		
424 WHOLESALE - NONDURABLE	\$295,702	5		
441 RETL -VEHICLES, PARTS	\$119,397,856	14		
442 RETL -FURNITURE STORES	\$1,791,514	9		
443 RETL -ELECTRONICS	\$255,422,834	27		
444 RETL -BUILDING MATERIAL	\$83,733,881	6		
445 RETL -FOOD BEVERAGE STORE	\$87,806,956	21		
446 RETL -HEALTH, PERSONAL	\$36,134,973	13		
447 RETL -GASOLINE STATIONS	\$33,265,205	9		
448 RETL -CLOTHING, ACCESSORY	\$17,702,694	14		
451 RETL -LEISURE GOODS	\$40,424,712	22		
452 RETL -GENERAL MERCHANDISE	\$97,460,696	5		
453 RETL -MISC STORE RETAILER	\$98,816,074	59		
454 RETL -NONSTORE RETAILERS	\$83,736,655	25		

	2016		2021	
INDUSTRY	Gross Sales	#	Gross Sales	#
512 INFO -MOVIES, MUSIC IND	\$162,131	4		
517 INFO - TELECOMMUNICATIONS	\$2,631,676	4		
531 REAL ESTATE	\$3,037,340	9		
532 RENTAL, LEASING SERVICES	\$4,935,967	6		
541 PROF, SCIENTIFIC,TECH SERV	\$12,205,879	67		
561 ADMIN, SUPPORT SERVICES	\$102,057,592	74		
611 EDUCATIONAL SERVICES	\$30,580,065	12		
621 HEALTH -AMBULATORY CARE	\$24,799,770	32		
624 HEALTH -SOCIAL ASSISTANCE	\$48,726	5		
711 PERF ART, SPECTATOR SPRTS	\$492,094	17		
713 AMUSEMENT, GAMBLING, RECR	\$8,764,413	7		
721 ACCOMMODATION	\$9,224,868	4		
722 FOOD SERV, DRINKING PLACES	\$73,365,332	66		
811 REPAIR, MAINTENANCE	\$28,560,691	36		
812 PERSONAL, LAUNDRY SERVICE	\$10,518,017	50		
813 RELIGIOUS,CIVIC,PROF ORGS	\$4,493,449	11		
999 UNDESIGNATED/SUPPRESSED	\$28,630,992	32		
<b>TOTAL</b>	<b>\$1,316,020,085</b>	<b>723</b>		

## **7.5 REPLICATE STATISTICAL ANALYSIS TO ASSESS CHANGES IN LIVABILITY IN 2022**

As we discuss earlier in the report, the difference-in-difference analysis of residential home values can be replicated using the methodology described in Chapter 3 and elaborated upon in Appendix A. The advantages of replicating this analysis include the relative ease of data collection and analysis and the potential for a clean estimate of the impact of Richfield's Sweet Streets investments. Disadvantages include the possibility that changes to the roadway on Portland Avenue South, 66th Street, and Lyndale Avenue South have impacted home values or real estate transaction on other streets in the community. Because spillover effects may exist, the city might consider selecting a comparable street in a neighboring city for future analyses.

## **7.6 ANALYZE CHANGES IN CRASH STATISTICS USING DATA FROM 2019-2022**

Our final recommendation is to assess changes in crash patterns at select 66th Street and Lyndale Avenue South locations, using crash data from 2019-2021 and 2020-2022, respectively. Tables 7.6 (66th Street) and 7.7 (Lyndale Avenue South) show baseline statistics for locations that emerged as problematic in pre-reconstruction analyses of these streets. The tables show the existing crash rates and critical crash rates for these locations.

Calculating the crash rate and critical crash rate using future data will provide an indication of whether problematic intersections and road segments have improved with respect to vehicle accidents following the reconstruction of each road.

**Table 7-5 Change in Crash Rates for Select 66th Street Locations**

	2007-2009				2019-2021			
	Total Crashes	Average Crash Rate	Existing Crash Rate	Critical Crash Rate	Total Crashes	Average Crash Rate	Existing Crash Rate	Critical Crash Rate
Bloomington Ave Intersection	19	0.57	1.19	0.91				
CSAH-32 (Penn Ave) to Logan Ave	9	0.68	1.96	1.42				
Logan Ave to 1-35W West Ramps	18	1.16	2.46	1.88				
Lyndale Ave to Shopping Center Dwy	12	0.68	3.65	1.58				
Shopping Center Dwy to CSAH-52 (Nicollet Ave)	13	0.68	5.94	1.82				
CSAH-52 (Nicollet Ave) to CSAH-35 (Portland Ave)	17	1.16	2.32	1.88				
CSAH-35 (Portland Ave) to 12th Ave	12	1.16	2.39	2.05				
12th Ave to Bloomington Ave	10	1.16	4.33	2.54				

**Table 7-6 Change in Crash Rates for Select Lyndale Avenue South Locations**

	2013-2015				2020-2022			
	Total Crashes	Average Crash Rate	Observed Crash Rate	Critical Crash Rate				
Lyndale Ave at Lakeshore Dr Intersection	5	0.19	0.31	0.49				
Lyndale Ave at 75th St Intersection	3	0.19	0.23	0.53				
Lyndale Ave at 76th St Intersection	14	0.52	0.78	0.99				
77th St to 67th St (section)	66	3.87	3.62	5.08				

## CHAPTER 8: CONCLUSION

This study has revealed many noteworthy findings about the effects of Richfield's Sweet Streets on the community, as well as key areas for future research. Key findings and recommendations to build upon in future analyses include the following:

- Richfield residents and businesses are still adjusting to the changes in street design. Because the construction phase of the projects still looms large for many residents and business owners, we recommend waiting until 2022 to continue data collection and analysis.
- Residents and business owners are affected by Sweet Street projects even if they do not live on or immediately adjacent to a reconstructed road. This suggests that it may be useful to monitor future changes at a city level, rather than on an individual or street level, at least for some indicators.
- With respect to livability, our analysis suggests no current impact on residential home sales. We recommend replicating this analysis in the future using similar data or more detailed measures.
- Our interviews with local businesses suggest an immediate negative impact of the reconstructions on commercial revenues for at least some organizations. However, apart from the impact of construction, business owners perceive a limited impact of the street on business activity generally and an uncertain impact of redesigned roads on future business activity. In addition, when business owners did specify positive benefits, they tended to articulate these benefits broadly.
- Our data indicates that some of the design elements in Richfield's street redesigns have alleviated safety concerns while introducing others. Survey data, while not representative, suggest that perceptions of unsafe roads are particularly salient for families with children
- Our analysis of levels of activity among Richfield residents reveals limited cycling for either recreational or commuting purposes. Given the extensive network of bike paths and trails, cycling patterns will be an important area to monitor in the future, using either Hennepin County, Census, or StreetLight data.

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## **APPENDIX A**

### **RICHFIELD SWEET STREETS, POTENTIAL IMPROVEMENT SITES**

**Table A-1 Potential Improvement Sites in Richfield**

<b>Projects</b>	<b>Description</b>	<b>Years</b>
Portland Avenue Reconstruction	Portland Avenue between 67th and 77th Streets. Goals include improving pavement conditions/sidewalks and underground utilities; improving safety for pedestrians, bicyclists, and vehicles; improving livability through landscaping amenities, transit facilities, and traffic calming measures.	2014 - 2016
70th Street Bicycle Route	Added 2+ miles of bicycle routes on 70th Street (between Lyndale Avenue and Cedar Avenue). Aimed in part to provide safer bicycle connections to a range of public spaces and transit lines.	2016 - 2017
Northwest Richfield Bicycle Routes	Added 2.5 miles of planned bicycle routes north of 66th Street and west of 1-35W. Included new bicycle pavement markings, street name signs, and multi-use path construction.	2016
69th Street Pedestrian Improvements	Adds 0.5 miles of planned pedestrian facilities on 69th Street between Xerxes and Penn Avenues (which was a gap in the pedestrian network). The goal is to provide safer pedestrian connections between Edina's Southdale commercial district and Richfield's Penn Ave commercial districts. <i>Funding for project not identified as of 1/1/19.</i>	Began 2016
Lyndale Avenue Reconstruction	Lyndale Avenue between 66th and 76th Streets. Goals include improving pavement conditions/sidewalks and underground utilities; improving safety for pedestrians, bicyclists, and vehicles; improving livability through landscaping amenities, transit facilities, and traffic calming measures.	2017 - 2019
65th Avenue Reconstruction – Phase 1	65th Street between Nicollet Avenue and Grand Avenue. Multiple goals including improving roadway and sidewalk conditions, upgrading utilities, and improving operational safety for multiple modes of travel.	2018 - 2020
77th Street Underpass	Construct new bridge and underpass to carry Truck Highway 77 (Cedar Avenue) over 77th Street. Involves reconstruction of existing ramps as well as construction of sidewalk and regional trail.	2018 - 2021
Accelerated Mill and Overlay Program	Purpose of the project is to mill and overlay 85 of 100 miles of residential streets to preserve base life of asphalt roads.	2015 - 2020



66th Street Reconstruction	66th Street, extending between Xerxes and 16th Avenues. Timeline 2013-2018. Dual purpose of addressing deteriorating pavement, utility, drainage concerns, non-motorized accommodations, and stormwater quality conditions, alongside side improvements to livability/accessibility for non-motorized forms of travel.	2013 - 2019
Portland Avenue Bicycle and Pedestrian Improvements	Reconfiguration of a segment of Portland Avenue between 60th and 66th Streets. Portland Avenue is a heavily biked corridor. Project elements include a range of features to improve safety and accessibility for pedestrians, transit riders, and cyclists.	2018 - 2020
Penn Avenue Reconstruction	Geographic scope TBD. Key advantages as improvement site: extensive reconstruction affecting a mix of commercial and residential areas; provides opportunity to collect data prior to reconstruction; provides opportunity to develop and refine measures for concepts that lack a straightforward measure or data.	TBD

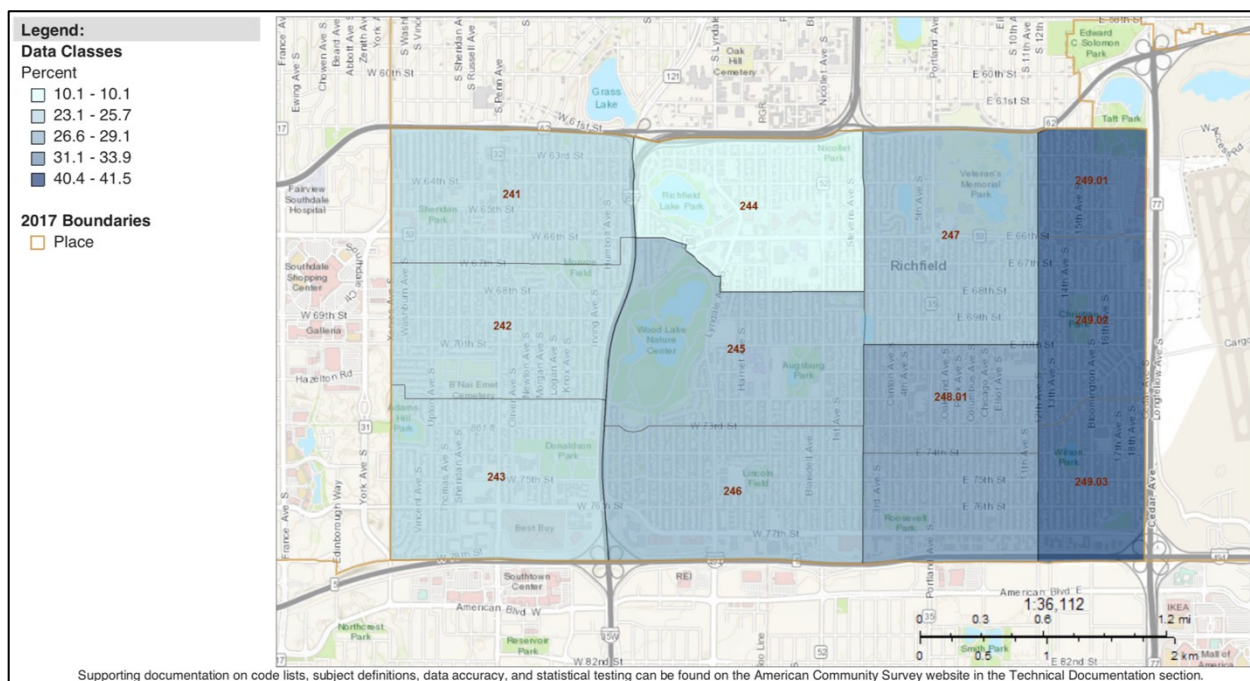
*Rows highlighted in blue are described in greater detail in the report.*

## **APPENDIX B**

### **WHO USES RICHFIELD'S STREETS? SUPOPULATIONS IN THE CITY**

In this appendix, we elaborate on the distribution of four salient subpopulations in Richfield: families, older populations, households lacking access to a vehicle, and commuting and recreational bikers.

**Families.** Census data reveals that the city is home to over 7,500 children and over a quarter of Richfield’s households currently have a child under the age of 18. Areas located on the eastern side of the city tend to have a higher percentage of families with children, relative to the city as a whole. Figure B-1 shows that in the Census tracts located between 12th Avenue South and Cedar Avenue South, over 50 percent of households have a child under age 18, relative to 26 percent for the city as a whole (U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates).



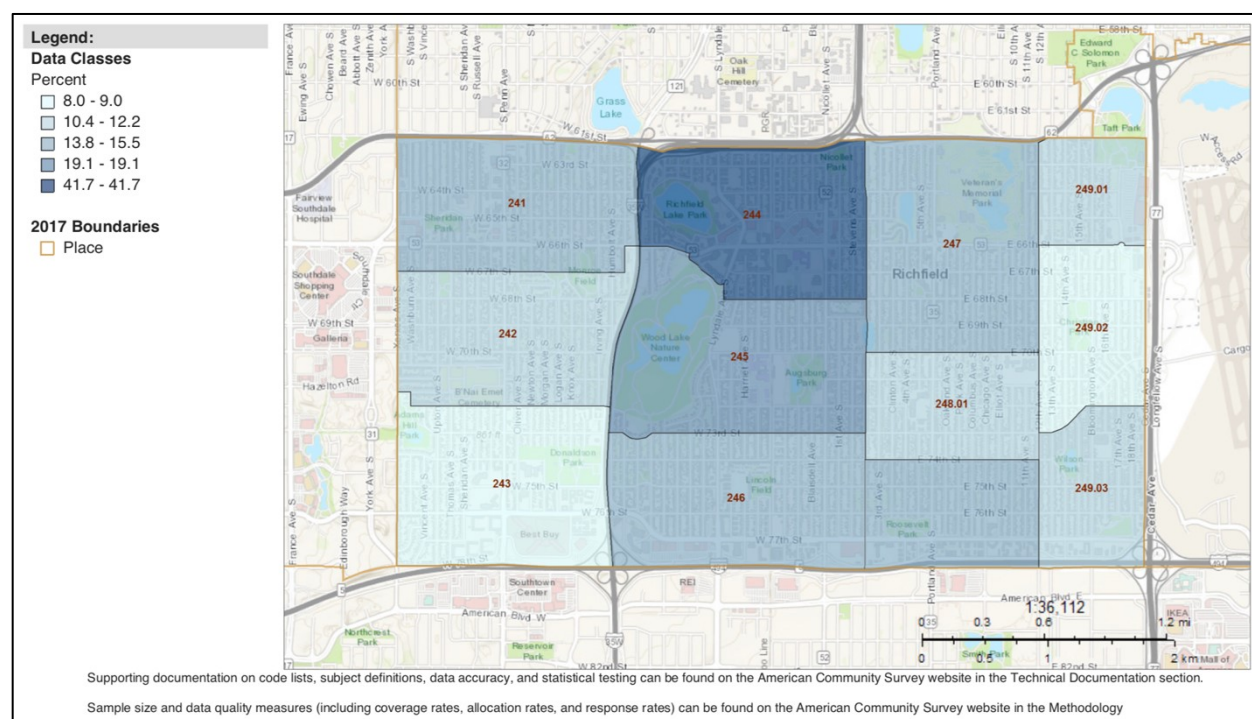
Source: U.S. Census Bureau, 2017 American Community Survey 5-Year estimates.

**Figure B-1 Households with One or More People under 18 Years**

**Older Populations.** Households with older individuals are a relatively large minority in Richfield. Approximately 16 percent of Richfield residents are age 65 or older, while 37 percent of Richfield households contain an individual age 65 or older (U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates).

Certain areas of the city have a particularly high concentration of households with older individuals. Figure B-2 shows that in the Census tract containing the intersection of 66th Street and Lyndale Avenue South (Census tract 244), over 41 percent of residents are age 65 or older (U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates). Several multi-unit senior residences, including the Pines Senior and Assisted Living, Gramercy Park Cooperative, and Village Shores Senior Community, are located within this tract.

This Census tract also contains higher than average rates of disabilities that make walking difficult. Relative to the city as a whole, approximately 13.7 percent of individuals within Census tract 244 possess an ambulatory difficulty compared to 6.2 percent for the City of Richfield as a whole (U.S. Census Bureau, 2013-2017 American Community Survey).<sup>36</sup>



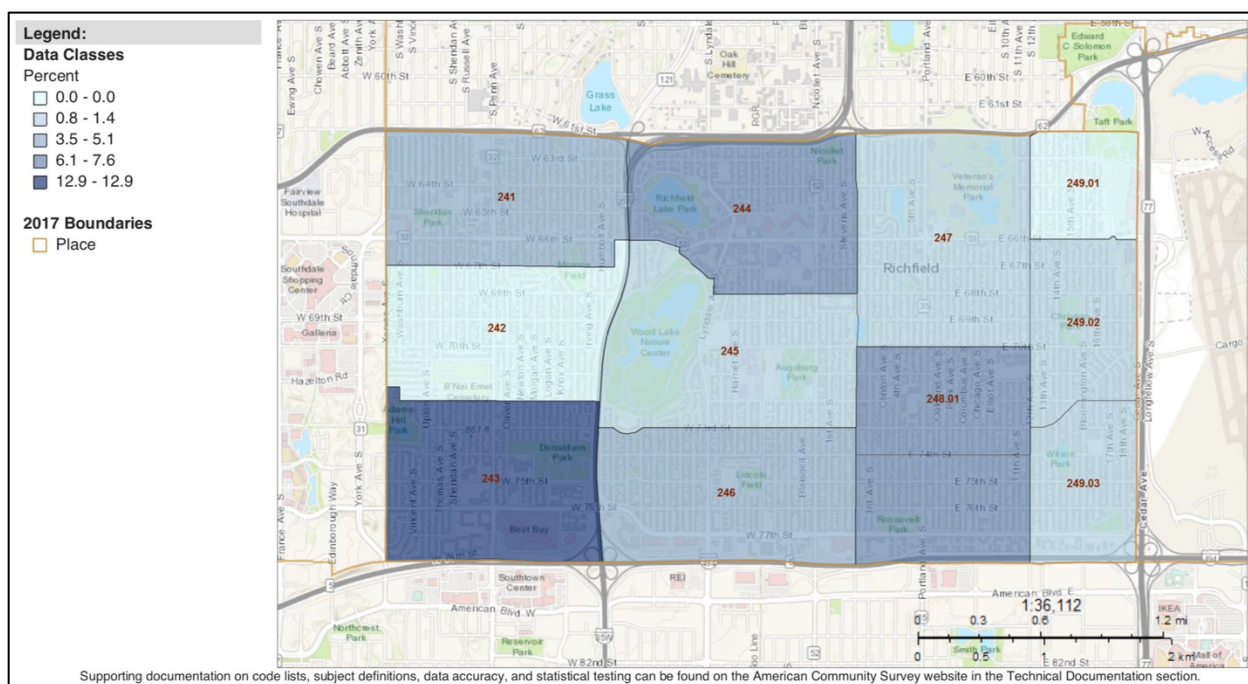
Source: U.S. Census Bureau, 2017 American Community Survey 5-Year estimates.

**Figure B-2. Individuals Age 65 Years and Older**

<sup>36</sup> An ambulatory disability is defined as “having serious difficulty walking or climbing stairs.” Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates.

**Households Lacking a Vehicle.** Although a majority of Richfield residents drive to work, approximately 4.6 percent of households with a worker age 16 and older lack a vehicle in the household. Figure B-3 shows that relative to the city as a whole, a larger percentage of households lack a vehicle in the southern half of the city. For instance, nearly 13 percent of working households located in the Census tract in the southeastern corner of the city lack access to a car (U.S. Census Bureau, 2013-2017 American Community Survey).

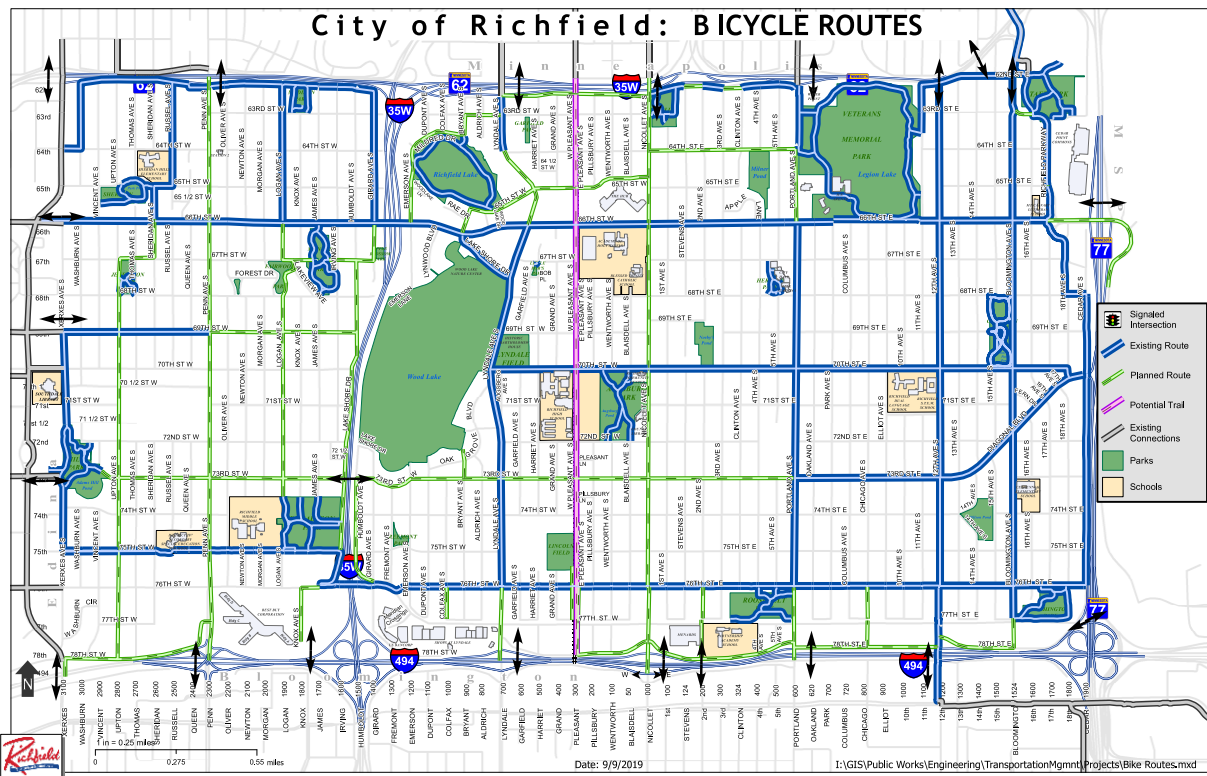
For these households, access to public transportation is likely to be particularly important. Census data show that approximately 7.2 percent of Richfield residents commute to work via public transportation, with higher concentrations of transit users in the southern and central areas of the city.



Source: U.S. Census Bureau, 2017 American Community Survey 5-Year estimates.

**Figure B-3 Percent of Residents Lacking Access to a Vehicle**

**Recreational and Commuting Cyclists.** The City of Richfield provides numerous opportunities for both recreational and commuter cyclists. Figure B.4 shows an image from the City of Richfield Bicycle Master Plan, showing the extent of bicycle trails (blue), regional trails (green and red) and parks located in the city.



Source: City of Richfield Bicycle Master Plan, 2019.

**Figure B-4 Bicycle Routes in the City of Richfield**

## **APPENDIX C**

### **METHODOLOGICAL APPENDIX FOR STATISTICAL ANALYSIS IN CHAPTER 3**



In this section, we describe the site selection, data collection, and analysis for the difference-in-difference (DID) analysis of residential home values. We present this information to provide the City of Richfield with a roadmap for replicating the analysis in the future.

As discussed in the fourth chapter, a DID analysis is a statistical technique that estimates the effects of treatment over time by comparing two similar groups, only one of which experiences the intervention or treatment. Our analysis compared residential property values of properties along Portland Avenue South (the treatment group) with residential property values of properties along Nicollet Avenue South (the control group).

A review of traffic counts, existing land use maps, and maps depicting demographic characteristics and pedestrian demand led us to select Nicollet Avenue South as a comparison for Portland Avenue South. First, Hennepin County's Multi Modal Count Map show that prior to the reconstruction of Portland Avenue South, both roads had similar annual average daily traffic volumes (AADT): in 2012, the AADT just south of 66th Street was 11,400 for Nicollet Avenue South and 10,900 for Portland Avenue South.<sup>37</sup>

Second, land use patterns along Nicollet and Portland Avenues South are similar – each road contains a large number of residential properties alongside several publicly owned parcels of land (City of Richfield, 2018). Penn Avenue South, which had a similar AADT to Portland Avenue South in 2012, does not serve as an adequate comparison site because land use patterns along Penn Avenue differ significantly from land use patterns along Portland Avenue. Relative to Portland Avenue, Penn Avenue contains more commercial areas along the northern segment of the road and attached residential areas along the southern segment.

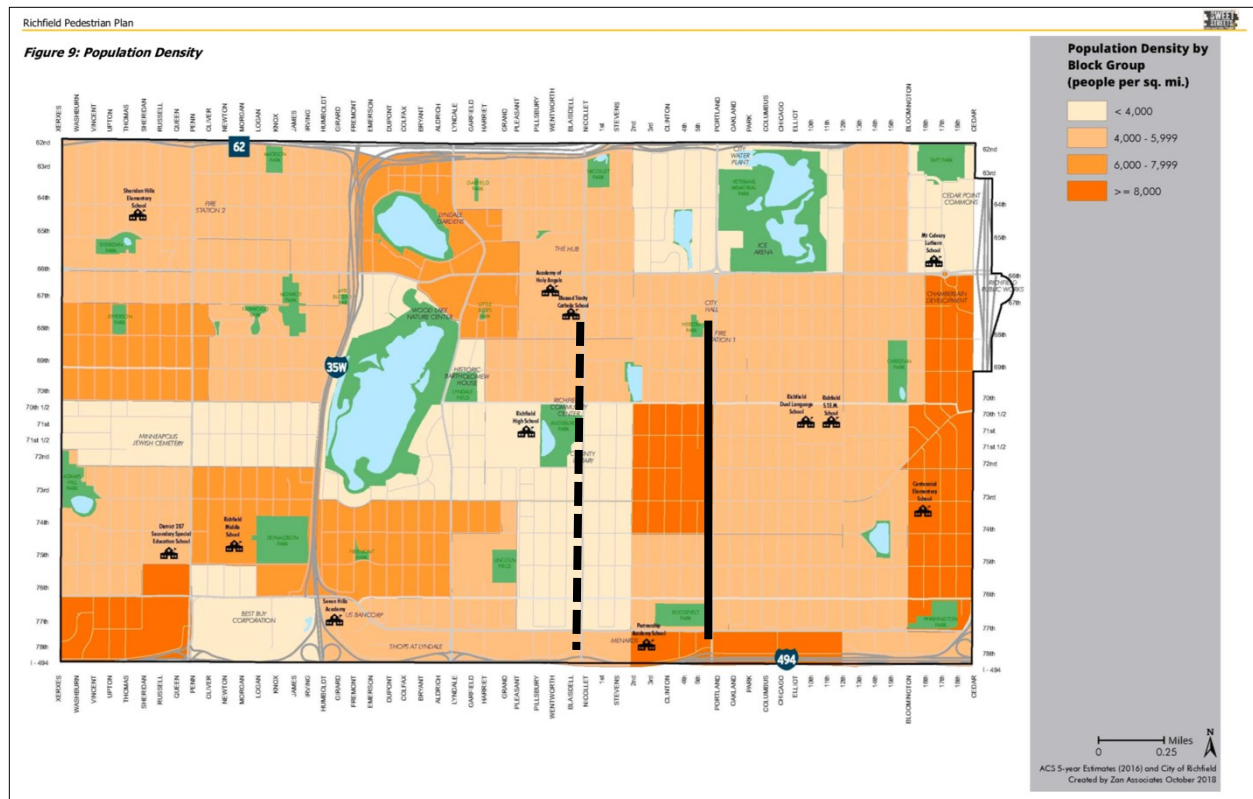
Third, analyses conducted as part of Richfield's Pedestrian Plan (Zan Associates, 2018) show similar – though not identical – demographic patterns along the identified segments of Nicollet Avenue South and Portland Avenue South. The three images below show the population density, percentage of people living in poverty, and the Citywide Pedestrian Demand, for the City of Richfield. In each figure, the Portland Avenue reconstruction area is shown by a black solid line and the Nicollet Avenue comparison area is shown by a black dotted line.<sup>38</sup>

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<sup>37</sup> Hennepin County's Multi Modal Count Map is available at the following link:  
<https://hennepin.maps.arcgis.com/apps/webappviewer/index.html?id=14c650982d904132a4854f399c71e1f2>

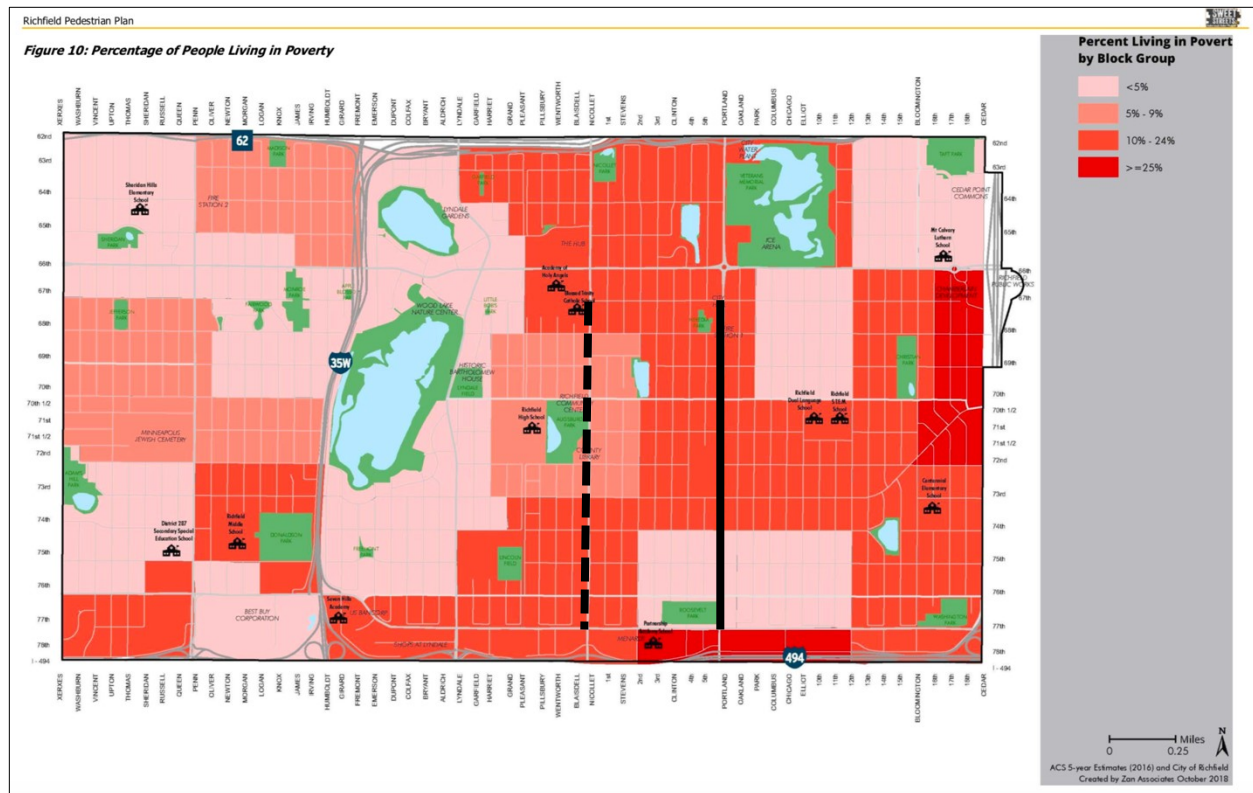
<sup>38</sup> All figures are from the *Richfield Pedestrian Plan: Final Report* (Zan Associates 2018).





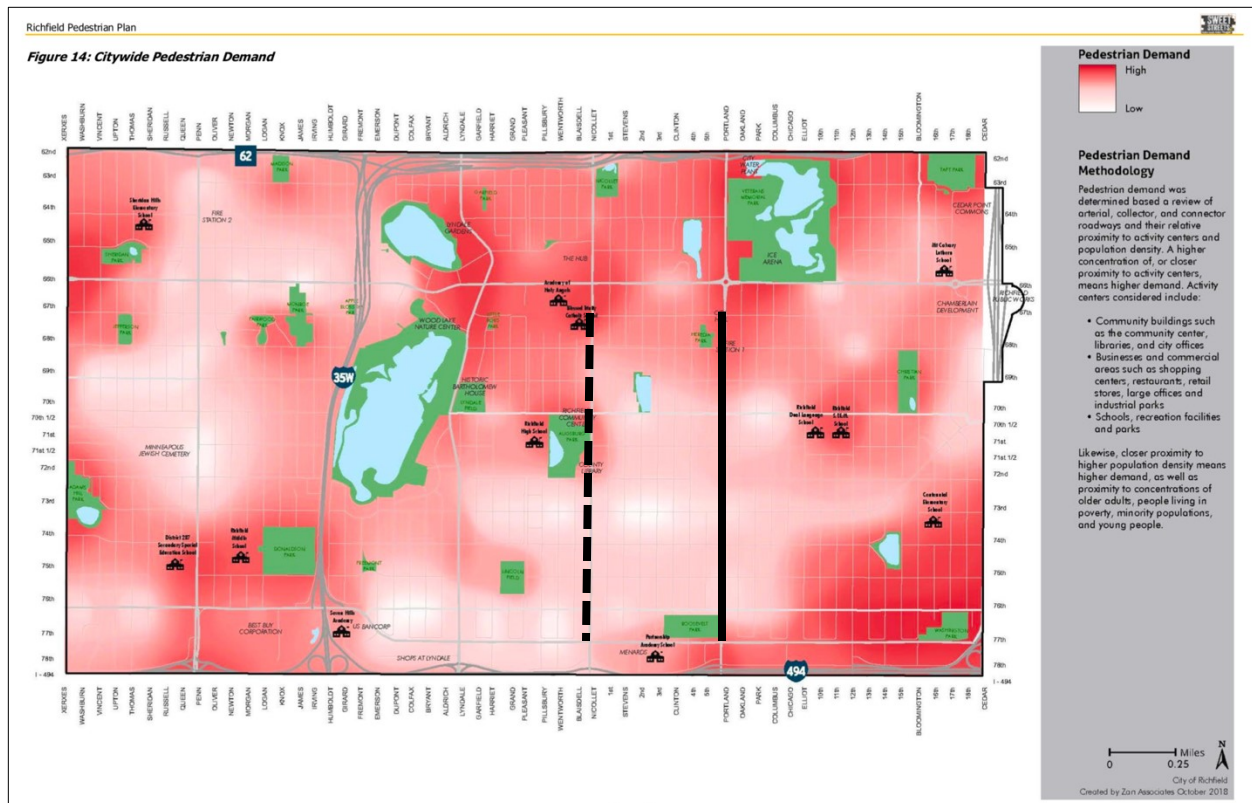
**Figure C- 1 Population Density for the City of Richfield (Reprint from *Richfield Pedestrian Plan: Final Report*, Zan Associates 2018)**

The figure above shows that Nicollet Avenue and Portland Avenue have similar population densities between 67th Street and 70th Street, but that Nicollet Avenue is considerably less dense between 70th Street and 77th Street. Portland Avenue also has an area of particularly high population density between 70th Street and 74th Street. It should be noted, however, that some of this land was excluded from our analysis due to the presence of nonresidential or other public land – particularly between 71st Street and 73rd Street.



**Figure C-2 Percentage of People Living in Poverty for the City of Richfield (Reprint from *Richfield Pedestrian Plan: Final Report*, Zan Associates 2018)**

Figure C.2 shows the percentage of people living in poverty, by Census block group, for the City of Richfield. This figure shows that both Nicollet Avenue and Portland Avenue have relatively high concentrations of people living below the poverty line (between 10 and 24 percent), particularly relative to the western half of the city. Both streets have areas of lower rates of poverty – Nicollet Avenue between 68th Street and 73rd Street and Portland Avenue between 74th Street and 77th Street.



**Figure C-3 Citywide Pedestrian Demand (Reprint from *Richfield Pedestrian Plan: Final Report*, Zan Associates 2018)**

Figure C.3 shows pedestrian demand throughout Richfield. Pedestrian demand is a calculation that considers the type of roadway (arterial, collector, or connector) and the proximity of the roadway to activity centers (community buildings, businesses, etc.) and population density. In this figure, darker red shadings indicate higher pedestrian demand. This figure shows that the pedestrian demand surrounding Nicollet Avenue South and Portland Avenue South is quite similar, with relatively higher areas of demand north of 72nd Street for Nicollet Avenue and north of 69th Street for Portland Avenue South.

Though demographic patterns are not identical, Nicollet Avenue South represents the most comparable street to Portland Avenue South when considering traffic volumes, land use, and demographic patterns.

Data for the statistical analysis came from the following sources:

1. Parcel data for 2013 through 2018 was collected from annual Metro Regional Parcel Datasets available through the Minnesota Geospatial Commons.<sup>39</sup> This data included the shape files necessary for geospatial analysis, as well as property values expressed in current currency of the year analyzed, and property classification.
2. Shape files for water features in 2012 came from the Minnesota Geospatial Commons.<sup>40</sup>
3. Information for street centerlines came from Hennepin County Open GIS.<sup>41</sup>

The parcel data was restricted to the area of study using ArcGIS. Properties within one and two blocks of Portland Avenue South and Nicollet Avenue South between 67th and 77th Streets were selected to be part of the analysis. The data was then edited further to remove all parcels that were non-residential or lacked an appraised value. Excluded parcels included city, religious, and commercial properties. These exclusions were cross-referenced with the Hennepin County Property Interactive Map to ensure accuracy.

The original parcel value data was adjusted for inflation using the annual Consumer Price Index. Monthly inflation was retrieved from the St. Louis Federal Reserve.<sup>42</sup> The annual Consumer Price Index was calculated by the authors by averaging monthly CPI values over a year.

The difference-in-difference (DID) analysis was performed using the eligible properties within one and two blocks of Portland Avenue as the treatment group and the properties within one and two blocks of Nicollet Avenue as the control group. The one and two blocks of data were used to perform a sensitivity analysis to test the robustness of the DID results. All statistical analysis was conducted using Stata 15.

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<sup>39</sup> Information available in the following link: <https://gisdata.mn.gov/dataset/us-mn-state-metrogis-plan-regional-parcels-2018>

<sup>40</sup> Information available in the following link: <https://gisdata.mn.gov/dataset/water-dnr-hydrography>

<sup>41</sup> Information available in the following link: <https://www.arcgis.com/home/item.html?id=2c68a692df4b4e47af378a00452d85b0>

<sup>42</sup> Information available in the following link: <https://fred.stlouisfed.org/series/CPIAUCSL>

## **APPENDIX D**

### **METHODOLOGICAL APPENDIX FOR BUSINESS INTERVIEWS**

This appendix provides supplemental information for the semi-structured interviews with business owners and managers. In Fall 2019, we conducted semi-structured interviews with owners and/or on-site managers of businesses and nonprofit organizations located along three commercial areas in Richfield. We decided upon this approach for several reasons.

First, the economic impacts of Complete Streets have typically been measured in terms of commercial revenues. Retail sales tax filings provide perhaps the most direct measure of economic vitality, but many studies collect revenue information via interviews due to the limited availability of administrative data. Business establishment and loss also providing a measure of economic vitality, but small sample sizes typically limit the usability of such data (New York City Department of Transportation, 2013).

While we considered using commercial sales data to measure the impact of Richfield’s reconstructions on commercial activity, we ultimately decided not to pursue this approach for two reasons. First, previous research suggests that effects on retail sales typically take 1-2 years to observe. Because the 66th Street reconstruction – which affected a large number of businesses – was completed in 2019, we are unlikely to observe any impact on retail sales, even if the reconstructions ultimately do end up increasing sales.

Second, retail sales data is highly restricted in the state of Minnesota. Minnesota law classifies revenue data as “nonpublic,” meaning that the data are private to the subject or organization and may not be disclosed to the public (Minn. Stat. §270B.02, subd. 1). Though the Department of Revenue has access to tax data, they generally do not partner with outside organizations because permission to use tax data for a purpose other than administration of the tax code must be specified in legislative statute. In addition, for a project such as this, there is a concern that the narrow geographic area may inadvertently identify a business – for instance, if an unusually large business opens or closes in the area.<sup>43</sup>

Many studies of the economic impacts of Complete Streets or design elements typical of Complete Streets utilize qualitative research designs – typically survey and interview-based approaches (Stantec Consulting, Ltd., 2011; Drennan, 2003). Such approaches provide valuable data on the preferences and perceptions of customers and retailers. Yet because they rely on voluntary participation and self-reported data, they are limited in their ability to provide systematic and reliable data on the full range of businesses in an area.

The target areas for the interviews included:

- 66th Street E (11th Avenue S to Bloomington Avenues S) (hereafter: *66th Street*)
- Lyndale Avenue S (74th Street W to 76th Street W) (hereafter: *Lyndale Ave*)
- Penn Avenue S (63rd to 65th Streets W, 66th to 69th Streets W) (hereafter: *Penn Ave*)

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<sup>43</sup> This information is based on communication with the Director of the Tax Research Division of the Minnesota Department of Revenue (email communication, 8/21/19). It is worth noting that the Department of Revenue regularly releases revenue data at a city level. As a result, it is possible to measure trends in commercial sales over time – though not for particular roadway segments.

In this design, 66th Street represents a “post-reconstruction site,” Lyndale Ave serves as a “mid-reconstruction site,” and Penn Ave represents a “pre-reconstruction site.”<sup>44</sup>

Figures D-1, D-2, and D-3 provide more detail on the areas targeted for interviews: 66th Street is shown in Figure D-1, Lyndale Ave is shown in Figure D-2, and the two segments of Penn Ave (63rd Street to 65th Street and 66th Street to 69th Street) are shown in Figure D-3. In each figure, the shaded red boxes illustrate the commercial properties that are included in our study while the shaded grey boxes illustrate properties that were excluded, either because they are not commercial properties, because the land is vacant, or because they are properties owned by the City of Richfield. A property may contain a single business or nonprofit organization, or multiple businesses and/or nonprofit organizations. In addition, a single business or nonprofit organization may occupy two or more properties located adjacent to one another.

At the time of our interviews, there were 104 organizations located along the three targeted areas: 19 along Lyndale Ave, 57 along Penn Ave, and 28 along 66th Ave. These organizations represented an array of industries and specializations, from restaurants and childcare organizations to automobile shops and specialty health clinics. While most of the organizations were businesses, there were also several nonprofit organizations.

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<sup>44</sup> The original target areas for Penn Avenue was 63<sup>rd</sup> Street to 65<sup>th</sup> Street and **67<sup>th</sup> Street to 69<sup>th</sup> Street**. However, we decided to extend one of our target areas from **66<sup>th</sup> Street to 69<sup>th</sup> Street** because the road segment from 66<sup>th</sup> Street to 67<sup>th</sup> Street more closely resembles the target areas of Lyndale Avenue South and 66<sup>th</sup> Street prior to reconstruction. Specifically, at 67<sup>th</sup> Street, Penn Avenue South merges from four lanes into two lanes. Thus, all the businesses located from 67<sup>th</sup> Street to 69<sup>th</sup> Street are located on a two-lane road, distinguishing them from the other businesses that are (or were, prior to reconstruction) located on a four-lane road. By including the segment from 66<sup>th</sup> Street to 67<sup>th</sup> Street, we able to target more businesses located on stretches of road similar to 66<sup>th</sup> Street and Lyndale Avenue South prior to reconstruction. We avoided interviewing businesses located on the corner of Penn Avenue South and 66<sup>th</sup> Street, as these businesses were directly impacted by the 66<sup>th</sup> Street reconstruction.



Figure D- 1 Target Area #1 - 66th Street E (11th Avenue S to Bloomington Avenue South)





Figure D- 2 Target Area #2 – Lyndale Avenue South (74th Street W to 76th Street W)

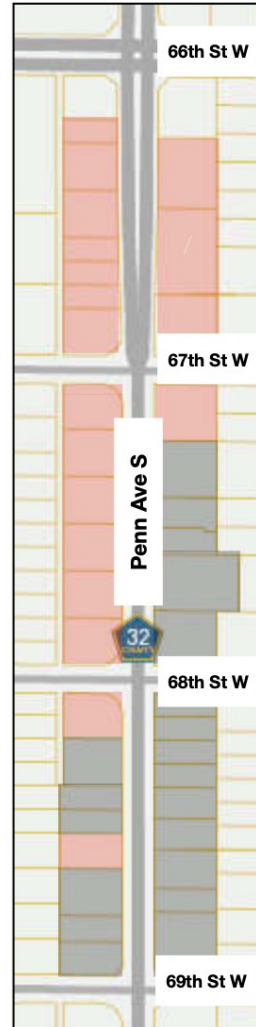
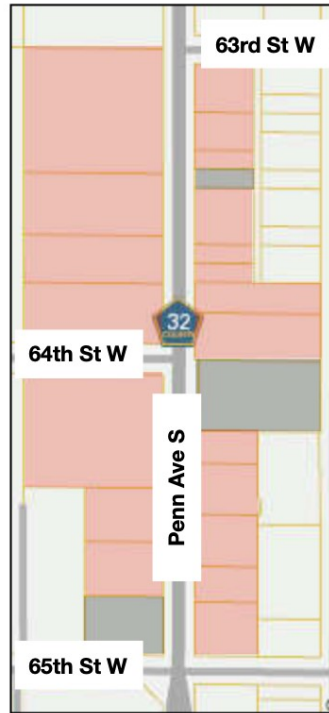


Figure D- 3 Target Area #3 – Penn Avenue South (63rd Street W to 65th Street W and 66th Street W to 69th Street W)

Letters and emails were sent to all business owners and nonprofit organizations in the three target areas during the week of September 3, 2019 (see Figure D-4). The letter explained the project and noted that a University of Minnesota researcher would be visiting organizations later in the month. We received only two responses from this initial contact and began going door to door to request interviews during the week of September 16<sup>th</sup>. This data collection continued through late October.

Nearly all individuals that we approached agreed to be interviewed. Because we found that an informal and conversational approach led to the most successful interviews, we employed a verbal (rather than written) consent and did not record the interviews. The semi-structured interview instrument is shown in Figure D-5. To ensure that the information obtained in the interview was captured, interviewers took notes during interviews when possible and created a field note for each site immediately following each interview.

From these interview and field notes, a case file was created for each organization describing the responses to the interview questions, relevant details of the interview respondent (such as general reception to the interview and the reconstruction), and the organizational setting (appearance of the storefront and building interior, distance of the building from the road, number of customers present, etc.).<sup>45</sup> These case files were then coded and analyzed using NVivo qualitative software.

In total, we interviewed 30 individuals representing 25 businesses and nonprofit organizations, including: 9 organizations located on 66th Street (N=9 individuals), 9 located on Penn Ave (N=12 individuals), and 7 on Lyndale Ave (N=10 individuals). Five interviews were conducted over the phone and 20 interviews were conducted in person. One interview was conducted in Spanish, and the rest were conducted in English.

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<sup>45</sup> Three interviews included more than one respondent. When respondents from the same business or nonprofit organization responded differently to a question, these differences were recorded in the case file.



Dear Richfield Business Owner,

For the past several years, the City of Richfield has been working to improve the quality of its roads through the Richfield Sweet Streets program. These reconstruction projects can have many consequences for businesses like yours—both good and bad.

The City of Richfield recently partnered with the University of Minnesota to study the impacts of the Sweet Streets reconstruction projects. We are writing to ask for your participation in an in-person or telephone interview about how the existing roads and the reconstruction projects have affected *your* business.

The interview will be 20-30 minutes and will cover topics related to safety, commercial activity, and general perceptions of Richfield's roads. The information you provide will help the city understand how the existing roads and Sweet Street reconstructions impact the local business community. The findings will be used to inform future roadway reconstructions, both locally and statewide.

**We will be visiting Richfield businesses from September 16th through the 27th and would love to hear your perspective.** We are also scheduling phone interviews in September and October. For more information on the project, or to let us know if you're willing to participate, please contact Robin Phinney at [rphinney@umn.edu](mailto:rphinney@umn.edu) or 734-657-6097.

Thank you for your participation. With your input, we can help the City of Richfield continue to support its thriving business community.



## We'd love to talk with you!

We will be visiting Richfield businesses **September 16th through the 27th**. To let us know if you'd be available for a 20-30 min interview, either in person or over the phone, please contact Robin at 734-657-6097 or [rphinney@umn.edu](mailto:rphinney@umn.edu)



Figure D-4 Initial Letter Sent to Business Owners and Managers

## INTERVIEW INSTRUMENT

### Richfield Sweet Streets Study

#### Opening

*Thank you for taking some time to speak with me today. As you know, I am working with the University of Minnesota and the City of Richfield on a research project about Richfield's Sweet Streets. As part of this project, we are talking with business owners on current, former, and future Sweet Street reconstruction sites. The purpose of our discussion today is to learn more about how the Sweet Streets reconstructions have impacted or may impact your business. We will use this information to help the city better understand how the Sweet Streets are affecting businesses like yours.*

*I want to stress that everything we discuss today is anonymous. Nothing will ever appear that would identify you specifically and compromise these terms. Your participation is completely voluntary and you don't have to answer any questions that make you uncomfortable. Do you have any questions or concerns about this process or the project before we begin?*

#### General information

Individual's Name & Position: \_\_\_\_\_

Business Name: \_\_\_\_\_

- a. What type of business is this?
- b. How long have you been working here?
- c. How long has the business been at this location?
- d. Does the business own or lease this property? If lease, who is the landlord?
- e. Whom does the business typically serve? (Type of clientele – local/regional, families/individuals, etc.)

#### Transportation

1. My first question is about the transportation patterns of you, your customers, and your employees.
  - a. How do you typically commute to work? (*Prompt: Do you walk, drive, take public transportation, other*)
  - b. How do your employees typically arrive to work?
  - c. How do your customers arrive to reach your business?
  - d. Site specific question
    - **66th:** Have you noticed a change in the transportation patterns of either your customers or employees over the past year? *Probe patterns*
    - **Lyndale:** Do you expect transportation patterns of either your customers or employees to change once the city completes the Lyndale Avenue reconstruction? Why/why not?

- **Penn:** Would you expect transportation patterns of either your customers or employees to change if the city reconstructed Penn Avenue into a Sweet Street? Why/why not?

### Revenue/Sales

2. My next set of questions are about business activity and revenue. In your opinion, is this particular area of Richfield generally getting better, worse, or staying the same for businesses like yours? *If better/worse – what are the main reasons why?*
3. On average, how have your gross sales changed over the past three years? Have they increased/decreased/stayed the same?
  - a. What do you think are the primary factors leading to this increase/decrease/stability in sales?
  - b. Site specific question
    - **66th:** Have the street reconstructions had an impact on sales? How?
    - **Lyndale:** Do you expect the street reconstructions to affect sales during the construction phase? Why/why not? Do you expect the street reconstructions to affect sales once they are completed? Why/why not?
    - **Penn:** Would you expect changes in the roadway – wider sidewalks, bike lanes, better lighting, for example – to improve sales?

### Reconstruction, general

4. Site specific
  - a. **66th Street.**
    1. Have you noticed any improvements in safety since the completion of the roadway?
    2. Have the changes led you to change your business strategy or decisions in any way?
    3. Have the roadway reconstructions had any other impact on your business?
  - b. **Lyndale Avenue:**
    1. Do you expect that the completed roadway will improve safety?
    2. Will the reconstruction lead you to change your business strategy or decisions in any way? *(Prompt during and after construction)*
    3. Do you expect the roadway reconstruction to have any other impact on your business?
  - c. **Penn Avenue:**
    - i. What impact do you think that reconstructing the road would have on your business, if any?
    - ii. Do you think it would lead to any improvements in safety?
    - iii. Would such reconstructions lead to any changes in your business strategy or decisions?
5. Is there anything else about the roadway reconstructions that you think we should know?

Figure D-5 Interview Instrument Used in Interviews with Business Owners and Manager

## **APPENDIX E**

### **CITYWIDE INDUSTRY SALES REVENUE STATISTICS, 2016**

**Table E-1 Aggregate Sales, Taxes, and Number of Businesses, by Industry (Richfield 2016)**

INDUSTRY	GROSS SALES	TAXABLE SALES	SALES TAX	USE TAX	TOTAL TAX	#
236 CONSTRUCT -BUILDINGS	\$1,947,267	\$511,199	\$35,144	\$89,028	\$124,172	5
238 CONSTRUCT -SPECIAL TRADES	\$4,291,986	\$1,401,402	\$96,346	\$461	\$96,807	13
323 MFG -PRINTING, SUPPORT	\$1,798,154	\$1,203,794	\$82,763	\$1,285	\$84,048	11
325 MFG -CHEMICAL	\$1,733,507	\$78,202	\$5,377	\$0	\$5,377	4
333 MFG -MACHINERY	\$49,407	\$38,954	\$2,678	\$0	\$2,678	4
339 MFG -MISC	\$610,122	\$8,139	\$560	\$21	\$581	7
423 WHOLESALE -DURABLE	\$5,090,888	\$750,008	\$51,562	\$12,988	\$64,550	14
424 WHOLESALE -NONDURABLE	\$295,702	\$216,646	\$14,894	\$523	\$15,417	5
441 RETL -VEHICLES, PARTS	\$119,397,856	\$14,187,202	\$975,371	\$15,523	\$990,894	14
442 RETL -FURNITURE STORES	\$1,791,514	\$1,538,928	\$105,803	\$1,142	\$106,945	9
443 RETL -ELECTRONICS	\$255,422,834	\$186,435,015	\$12,817,406	\$2,775,711	\$15,593,117	27
444 RETL -BUILDING MATERIAL	\$83,733,881	\$80,343,996	\$5,526,931	\$30,879	\$5,557,810	6
445 RETL -FOOD BEVERAGE STORE	\$87,806,956	\$24,019,181	\$1,898,175	\$7,803	\$1,905,978	21
446 RETL -HEALTH, PERSONAL	\$36,134,973	\$9,767,567	\$671,523	\$32,524	\$704,047	13
447 RETL -GASOLINE STATIONS	\$33,265,205	\$4,757,226	\$327,063	\$722	\$327,785	9
448 RETL -CLOTHING, ACCESSORY	\$17,702,694	\$3,090,270	\$212,456	\$1,558	\$214,014	14
451 RETL -LEISURE GOODS	\$40,424,712	\$26,383,984	\$1,813,899	\$19,080	\$1,832,979	22
452 RETL -GENERAL MERCHANDISE	\$97,460,696	\$41,968,553	\$2,885,337	\$23,708	\$2,909,045	5
453 RETL -MISC STORE RETAILER	\$98,816,074	\$47,986,291	\$3,299,065	\$12,387	\$3,311,452	59
454 RETL -NONSTORE RETAILERS	\$83,736,655	\$83,023,290	\$5,707,854	\$41,123	\$5,748,977	25
512 INFO -MOVIES, MUSIC IND	\$162,131	\$56,012	\$3,851	\$0	\$3,851	4
517 INFO - TELECOMMUNICATIONS	\$2,631,676	\$2,615,250	\$179,798	\$0	\$179,798	4
531 REAL ESTATE	\$3,037,340	\$1,886,051	\$129,669	\$2,314	\$131,983	9
532 RENTAL, LEASING SERVICES	\$4,935,967	\$4,488,103	\$680,126	\$697	\$680,823	6
541 PROF,SCIENTIFIC,TECH SERV	\$12,205,879	\$2,445,001	\$168,086	\$5,116	\$173,202	67
561 ADMIN, SUPPORT SERVICES	\$102,057,592	\$7,643,428	\$525,485	\$111,985	\$637,470	74
611 EDUCATIONAL SERVICES	\$30,580,065	\$58,092	\$3,995	\$4,362	\$8,357	12
621 HEALTH -AMBULATORY CARE	\$24,799,770	\$834,504	\$57,373	\$37,044	\$94,417	32
624 HEALTH -SOCIAL ASSISTANCE	\$48,726	\$25,586	\$1,758	\$0	\$1,758	5
711 PERF ART, SPECTATOR SPRTS	\$492,094	\$58,357	\$4,013	\$467	\$4,480	17
713 AMUSEMENT, GAMBLING, RECR	\$8,764,413	\$4,776,515	\$328,682	\$1,439	\$330,121	7
721 ACCOMMODATION	\$9,224,868	\$8,179,207	\$565,823	\$4,405	\$570,228	4
722 FOOD SERV, DRNKING PLACES	\$73,365,332	\$68,869,737	\$4,842,158	\$9,442	\$4,851,600	66
811 REPAIR, MAINTENANCE	\$28,560,691	\$10,425,683	\$716,774	\$23,887	\$740,661	36
812 PERSONAL, LAUNDRY SERVICE	\$10,518,017	\$3,963,429	\$272,483	\$4,216	\$276,699	50
813 RELIGIOUS,CIVIC,PROF ORGS	\$4,493,449	\$2,345,305	\$194,312	\$448	\$194,760	11
999 UNDESIGNATED/SUPPRESSED	\$28,630,992	\$1,715,326	\$117,927	\$4,646	\$122,573	32
	\$1,316,020,085	\$648,095,433	\$45,322,520	\$3,276,934	\$48,599,454	723

Source: Minnesota Department of Revenue. Sales and Use Tax Revenue by City (Richfield, 2016). Available at <https://www.revenue.state.mn.us/2017-sales-and-use-tax-revenue-city>



## **APPENDIX F**

### **HEALTH SURVEY FLYER AND SURVEY INSTRUMENT**



Complete  
the 5-minute  
survey for a chance  
to win a \$50 gift  
card!

## Richfield, we want to hear from you!

Help us learn more about your health, transportation  
patterns, and thoughts on Richfield's roadway  
reconstructions.

Complete the brief survey at:  
[z.umn.edu/SweetStreets](https://z.umn.edu/SweetStreets)



The Sweet Streets survey is now open!

The City of Richfield has partnered with the University of Minnesota to study the health benefits of Richfield's Sweet Streets. The goal of the study is to help the city better support the needs of all pedestrians, cyclists, transit users, and drivers.

For more questions about the survey or more information about the project, please contact Robin Phinney at [rphinney@umn.edu](mailto:rphinney@umn.edu).



*La encuesta también está disponible en español.*

Figure F-1 Advertisement for Health and Transportation Survey

# Richfield Sweet Streets Survey

You are being asked to participate in a research study of Richfield's Sweet Streets. Sweet Streets are road reconstructions designed to make the streets more accessible for all types of transit users. This study is being conducted by researchers at the Humphrey School of Public Affairs at the University of Minnesota, in partnership with the City of Richfield and the Minnesota Department of Transportation.

Your participation involves filling out an online survey that will take about 5 minutes to complete. The survey is designed to gather information about the health effects of Richfield's Sweet Streets. The findings will be used to inform research and future reconstruction projects in Richfield.

Your participation is voluntary and you may withdraw at any time. All responses to the survey will remain confidential and all data stored securely on a University of Minnesota server. If you have any questions about the survey or the larger research study, you are encouraged to contact Dr. Robin Phinney at [rphinney@umn.edu](mailto:rphinney@umn.edu).

Thank you for your participation in this study. With your help, we can help the City of Richfield support the needs of all roadway users.

---

## The first set of questions are about your health and activity.

Would you say that your health is:

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

Are you limited in any activities because of physical problems?

- ☐ Yes
- ☐ No

During the past 30 days, other than your regular job, did you participate in any physical activity or exercises such as running, calisthenics, golf, gardening, or walking for exercise?

- ☐ Yes
- ☐ No

During the past 7 days, other than your regular job:

a. How many day did you get at least 30 minutes of **moderate physical activity**?

*Moderate physical activity refers to activity that causes a small increase in your breathing or heart rate.*

b. How many days did you **walk** to get to and from places (such as work, stores, or to run errands)?

c. How many days did you **bike** to get to and from places?

d. How many days did you take **public transportation** to get to and from places?

Please enter a  
number  
between 0-7

# Richfield Sweet Streets Survey

## The next set of questions are about your neighborhood

Do you currently live in the City of Richfield?

- ☐ Yes  
☐ No

If yes, please indicate whether you live within a 5-minute walking distance of any of the following roads.

- ☐ 66th Street, between Xerxes Avenue and 16th Avenue  
☐ Portland Avenue, between 67th Street and 77th Street  
☐ Lyndale Avenue, between 66th Street and 76th Street  
☐ I do not live within 5 minutes walking distance of any of these roads.  
☐ Not applicable; I do not live in Richfield.

**The next questions are about access to services.** Please select the answer that best applies to you and your neighborhood. For these questions, "walking distance" means within a 5-10 minute walk.

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
Stores are within easy walking distance of my home.				
There are many places to go within easy walking distance of my home.				
It is easy to walk to a transit stop (bus, train) from my home.				

## The next set of questions are about the roads in your neighborhood.

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
There are sidewalks on most of the streets in my neighborhood.				
The sidewalks in my neighborhood are well maintained.				
My neighborhood streets are well lit at night.				
There are crosswalks and pedestrian signals to help walkers cross busy streets in my neighborhood.				
There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighborhood.				
The speed of traffic on most nearby streets is usually slow (30mph or less).				

# Richfield Sweet Streets Survey

If I could change one thing about my neighborhood streets, it would be:

---

**The last set of questions are about you. We are asking these questions to make sure that we capture a diversity of voices within Richfield.**

What is your age?

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to answer

What was your annual 2018 household income from all earners and sources?

- ☐ Less than \$10,000
- ☐ \$10,000 - \$14,999
- ☐ \$15,000 - \$24,999
- ☐ \$25,000 - \$34,999
- ☐ \$35,000 - \$49,999
- ☐ \$50,000 - \$74,999
- ☐ \$75,000 - \$99,999
- ☐ \$100,000 - \$149,999
- ☐ \$150,000 - \$199,999
- ☐ \$200,000 or more

What is your race? Please check all that apply.

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Other (specify) \_\_\_\_\_

Are you of Hispanic or Latino origin?

- ☐ Yes
- ☐ No

What is your employment status?

- ☐ Employed for wages
- ☐ A stay-at-home parent or homemaker
- ☐ Student
- ☐ Unemployed or out of work
- ☐ Retired
- ☐ Unable to work because of a disability

**Thank you for your participation! Remember to enter your first name and phone number for a chance to win a \$50 giftcard!**

Figure F-2 Health Survey Instrument