



# **Community and Economic Benefits of Bicycling in Michigan**

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**Michigan Department of Transportation**

**PHASE I FINAL REPORT**

**Phase I Final Report**

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# **Community and Economic Benefits of Bicycling in Michigan**

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# **SECTION I.**

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**Introduction and  
Summary of Statewide Results**

# SECTION I

## Introduction and Summary of Statewide Results

In an effort to better understand the community and economic impacts of bicycling in Michigan, the Michigan Department of Transportation commissioned BBC Research & Consulting and R. Neuner Consulting (“the study team”) to conduct a study of the economic and community benefits of bicycling statewide and in five case study communities in Michigan. This report and the accompanying case study community reports are the result of the first phase of the study. The second phase focuses on the economic and community benefits associated with bicycle related tourism and events.

### Study Objectives and Overview

The study objectives include:

1. Estimating the community and economic benefits of bicycling in Michigan;
2. Estimating the community and economic benefits of bicycling in five case study communities throughout the state;
3. Providing in-depth qualitative information on links between bicycling and the economy according to business owners, government officials and bicycling advocates;
4. Estimating the economic benefits to Michigan from out-of-state participation in bicycling events; and
5. Estimating the economic benefits to Michigan from bicycle-related tourism.

Phase I of the project addresses the first three objectives and Phase II provides research on the fourth and fifth objectives. The following five communities were studied as a part of the case study process:

- The City of Ann Arbor;
- The City of Grand Rapids;
- The City of Holland;
- The City of Traverse City; and
- Two neighborhoods in Detroit – the Conner Creek Greenway Corridor and Southwest Detroit.

This study is based on a methodology developed from a comprehensive literature review of economic benefits and impacts studies on bicycling. While numerous studies have been

conducted on this topic, the majority have been conducted using a large geographic region such as a state or country or on a specific corridor or infrastructure element. The studies that focus on large geographies often use state or national averages from secondary sources and apply those estimates to the population in order to estimate economic impacts. Corridor studies frequently use primary data collected through intercept surveys. Given the scope of this study, a hybrid approach was used incorporating secondary data for some estimates and relying on primary data collection in the form of a household survey for certain community-specific estimates.

Many communities, including those studied in this report, lack robust information about bicycling within their community. While communities with a large share of bicyclists, such as Portland, Oregon and Madison, Wisconsin, have installed bicycle counters on key infrastructure, the most common method for collecting data on ridership relies on annual volunteer counts. Many communities do not collect data in this manner. Given this limitation, in-depth interviews were conducted in the five case study communities with key stakeholders including city officials, city staff, local business representatives and representatives from local bicycle advocacy organizations. These interviews gathered additional data available publically and provided insights and opinions related to the role of bicycling in each case study community.

The following components were included in the calculation of economic benefits for each community and for the State of Michigan:

- Household spending on bicycles and related goods and accessories;
- Bicycle or component manufacturing;
- Household spending on events and tourism; and<sup>1</sup>
- Benefits from avoided health care costs and reduced absenteeism.

The approach used avoids double counting of benefits and provides a conservative, yet reasonable, estimate of benefits accrued from bicycling. Section II of this report provides a detailed description of the methodology employed in the study.

## **I.1 - Summary of Statewide Results**

The total benefits calculated for the state of Michigan is approximately \$668 million including:

- Household retail spending on bicycling - \$175 million;
- Manufacturing - \$11 million;
- Avoided health care costs - \$256 million;
- Reduced absenteeism - \$187 million; and
- Event and tourism spending - \$38 million.

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<sup>1</sup> Note that the Phase II economic impact study provides greater detail and more information about statewide economic benefits associated with bicycle tourism and events.

## **I.2 - Structure of the Report**

This report includes three chapters, including this introduction along with three appendices. Section 2 provides an explanation of the methodology used for Phase I of the study. Section 3 summarizes the economic and community benefits of bicycling in the State of Michigan. Appendix A is a review of the literature compiled for this study. Appendix B contains a description of data sources used in the study and Appendix C includes a copy of the household survey instrument. The report is also accompanied by five separate case study reports. Each case study report includes an infographic summarizing key data from the study. An infographic is also provided detailing statewide results.

## **SECTION II.**

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Methodology

## SECTION II.

# Methodology

This section details the methodology employed to measure the economic impact of bicycling and the most prominent measurable elements associated with bicycling in the state of Michigan and five case study communities. Research approaches conducted in other states and countries were utilized, and innovative techniques were added in order to draw informative and actionable results.

### II.1 - Approach Overview

While numerous studies have been conducted investigating the economic impacts and benefits of bicycling, there are few, if any, studies that provide quantitative and qualitative information on a number of different communities throughout a state as well as information regarding the state as a whole.

As a result, a thorough literature review was conducted (discussed below and in Appendix A), and elements from many different research efforts were combined in order to compile this report. The key elements of the approach included:

- A review of relevant state and community studies;
- Gathering quantitative information from existing sources such as the U.S. Census Bureau, Dun & Bradstreet and the Michigan Department of Community Health;
- An online survey of residents of each case study community;
- An online survey of bicyclists throughout the state; and
- In-depth interviews with key stakeholders throughout the state and in each case study community.

This approach not only provides detailed information on the economic benefits of bicycling on the case study communities and the state, but it also helps illustrate the unique ways bicycling impacts each community. The remainder of this section provides an overview of the literature review, quantitative research methods, economic impact model and qualitative data collection.

## **II.2 - Literature Review**

An extensive review of the existing literature pertaining to economic benefits of bicycling was conducted. Although bicycling advocates, government officials and ordinary citizens are giving increasing attention to the subject, exhaustive studies on the matter remain limited in number.

Nonetheless, city-, state- and nationwide studies have been conducted in recent years in the United States and Europe. Reports on bicycling in cities such as Portland and New York, states such as Iowa and Colorado, and nations like the United Kingdom have provided numerous data, utilizing increasingly sophisticated methodology. The studies examined vary substantially in scope and scale. Many of the studies relied mainly on available national and state data, while others augmented secondary sources with primary data collection.

The literature review provides research approaches related to:

- Household survey design;
- Relevant data sources; and
- Classification of individuals based on bicycling participation.

In addition to employing methods used in previous studies, innovative approaches were utilized including:

- Determining the value citizens place on using bicycle infrastructure;
- Providing qualitative information from stakeholder interviews to help clarify the link between bicycling and the economy; and
- Documenting community and economic benefits, both statewide and for specific communities.

The application of custom approaches in combination with more generic, proven research methods yielded results that are both reliable as well as pertinent to bicycling in Michigan.

A bibliography and synthesized literature review are included in Appendix A.

## **II.3 - Case Study Approach**

While a statewide approach to measuring the economic impacts of bicycling in Michigan yields valuable results, it was important that the report provide detailed information on specific communities within the state. By analyzing bicycling at a community level, the study provides insight into the local policies, organizations and infrastructure that support bicycling. For example, a city like Ann Arbor might make more transportation-related bicycle investments for commuters whereas coastal communities such as Holland might focus on bicycle tourism.

The individual case study communities were selected based on the following criteria:

- Presence of a local bicycling industry;
- Presence of active bicycle groups and organizations;

- A local government concerned with the bicycling industry; and
- Considerable willingness among local stakeholders to support the study.

In addition to possessing the aforementioned characteristics individually, a proper combination of case study communities was sought. Collectively, the five communities were selected based on the following criteria:

- A general variety in terms of size, location and economic drivers; and
- A variety of types of bicycling participation (i.e. commuting vs. recreation).

After careful consideration of many potential communities, the following five communities were selected based on the above sets of criteria:

- Ann Arbor;
- Grand Rapids;
- Holland;
- Traverse City; and
- Detroit Neighborhoods (Southwest Detroit and Conner Creek Greenway Corridor).<sup>1</sup>

**Ann Arbor.** Ann Arbor is home to a significant and growing bicycling community and is one of only two Michigan communities to be awarded silver status as a Bicycle Friendly Community<sup>SM</sup> by the League of American Bicyclists. The city is home to 115,000 residents and the University of Michigan, a bronze Bicycle Friendly University<sup>SM</sup>, and has one of the largest proportions of bicycle commuters in the state.

**Grand Rapids.** Grand Rapids is the second largest city in Michigan (with a population of 189,000) and is the heart of the largest metropolitan area in Western Michigan. The city has a history of a strong manufacturing sector as well as several prominent post-secondary educational institutions. It has recently experienced a sharp increase in bicycling participation as well as bicycle infrastructure investment. Grand Rapids has been awarded bronze status as a Bicycle Friendly Community<sup>SM</sup> by the League of American Bicyclists.

**Holland.** Holland is located in Southwestern Michigan and has more than 150 miles of side paths and shared use paths for bicycling. The proximity of Lake Michigan promotes a tourism economy that attracts Michigan residents as well as visitors from the Chicago area. Holland has a population of approximately 30,000 residents making it the second-smallest case study community.

**Traverse City.** Traverse City is the smallest and most northerly case study community. It is home to 15,000 residents and has a high share of bicycle commuting as reported by the

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<sup>1</sup> Southwest Detroit is defined as ZIP codes 48201, 48208, 48209 and 48216. The Conner Creek Greenway Corridor is defined as ZIP codes 48213, 48214, 48215 and 48234. The study combines the two neighborhoods into one case study community. The four remaining case study communities are defined by city limits.

American Community Survey. Tourism plays an important role in the local economy, and it has been cited as a desirable retirement destination. The area has a number of recreation trails that can be used for bicycling. Traverse City has been awarded bronze status as a Bicycle Friendly Community<sup>SM</sup> by the League of American Bicyclists.

### **Detroit Neighborhoods (Southwest Detroit and Conner Creek Greenway Corridor).**

The study team worked with MDOT to develop an approach that would include part of Detroit as a case study. Conducting a case study of all of Detroit would have been challenging and may not have provided useful information for communities trying to understand the link between bicycling and the economy. Given the recent increase in bicycling and bicycle related events, the study team focused on two areas in Detroit, the Southwest Detroit neighborhood and the area around the Conner Creek Greenway, a planned nine-mile path connecting from Eight Mile south along Conner Creek to the Detroit River. These two neighborhoods have total population of 163,000 residents.

The approach for completing the case studies synthesized data and real-life experiences from the public and private sectors, community organizations, and community members. This approach helped determine the diverse characteristics of each community, enabling the completion of detailed studies that stakeholders can apply to similarly-situated communities.

## **II.4 - Quantitative Research and Analysis**

A number of bicycling industry elements were identified to be quantified and reported. Some of the metrics served as components of the primary model used to calculate the total economic impact of bicycling, while other metrics provided key information about bicycling participation and non-monetized impacts.

**II.4.1 - Data sources.** A wide variety of primary and secondary data sources related to bicycling in Michigan were utilized in the study. Secondary data sources include but are not limited to:

- U.S. Census Bureau;
- U.S. Centers for Disease Control;
- Dun & Bradstreet;
- Michigan Department of Community Health; and
- Various Michigan bicycling organizations.

A complete list of the data sources used in the study is contained in Appendix B. While secondary data regarding community health, local businesses and other aspects proved useful to the study, extensive data on the bicycling habits of Michigan residents was also collected using primary research methods.

**Household survey.** As a part of the study, an online household survey was conducted collecting information from Michigan residents about their bicycling habits and spending. Responses were collected through a variety of means including:

- Outreach to statewide bicycle advocacy organizations and events;
- Information distributed at businesses and other public locations in each of the case study communities; and
- Post cards mailed to a random selection of households in each of the five case study communities.

Over 3,200 Michigan residents responded to the survey including 744 responses from the random post-card mailing. For general population estimates, study team relied on the responses gathered from the responses collected through the mailing effort as these responses were the most representative of typical residents.

The survey data collected provides information on many aspects of bicycling in Michigan including, but not limited to the frequency of:

- Residents' use of bicycle infrastructure;
- Bicycle-related retail purchases;
- Participation in bicycle-related tourism; and
- Attendance at local bicycle events.

The full survey instrument is included in Appendix C.

**II.4.2 - Primary community and economic benefits model.** The community and economic impact approach used avoids double counting of benefits and provides a conservative estimate of benefits accrued from bicycling. Using these guidelines, the study team identified a number of elements to be included in the primary community and economic benefits model. After identifying the components that would be used to calculate economic impact, a quantitative model was built and applied to the five case study communities plus the state as a whole. The model consists of the following categories:

- Household spending;
- Bicycle manufacturing;
- Events and tourism;<sup>2</sup> and
- Health and absenteeism

Each category consists of sub-components detailed in the statewide and case study sections of this report. For example, the health and safety portion comprises health care costs avoided because of bicycling activity and productivity losses avoided because of bicycling. The total economic impact is the sum of the categorized impacts. This analysis of economic impact includes the direct and indirect benefits of avoided health care costs and absenteeism. Given the

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<sup>2</sup> Note that the Phase II economic impact study provides greater detail and more information about statewide economic benefits associated with bicycle tourism and events.

lack of data on the location of spending by household on retail goods and events, the study only reports direct spending for these categories.<sup>3</sup>

Calculations used to estimate these impacts are described as follows:

**Health and absenteeism.** The primary economic and community impact model includes a calculation of the avoided health care costs for stroke and heart disease due to bicycling and an estimate of the benefits from reduced absenteeism due to bicycling.

*Avoided health care costs:* Avoided health care costs were calculated using the following steps for each geographic area analyzed (the five case study communities and the state of Michigan):

1. Estimating the annual number of hospitalizations due to strokes and heart disease in the state or case study community (using data from the U.S. Centers for Disease Control [CDC] and the Michigan Department of Community Health [MDCH]);
2. Multiplying the annual number of hospitalizations due to strokes and heart disease by the MDCH's estimated direct and indirect costs of strokes and heart disease, respectively, to find the total annual cost of each ailment in the state or case study community;
3. Multiplying the total annual cost of strokes and heart disease in the state or case study community by the proportion of the conditions caused by physical inactivity (based on estimates from The World Health Organization); and
4. Multiplying that figure by the proportion of residents who are physically active using their bicycle (using the proportion of residents who reported riding their bicycle two or more days each week in the household survey and the total population of the area analyzed).

*Absenteeism:* The study team calculated the economic benefits due to reduce absenteeism using the following methodology:

1. Active bicyclists also tend to miss one less day of work per year according to the London School of Economics;<sup>4</sup>
2. Estimating the number of residents who are physically active using their bicycle (using the proportion of residents who reported riding their bicycle two or more days each week in the household survey and the total population of the area analyzed);
3. Estimating the cost of one absent day (using data from the Journal of Occupational and Environmental Medicine);<sup>5</sup> and

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<sup>3</sup> The Phase II study will analyze the direct, indirect and induced economic impacts of spending by individuals who travel to Michigan for bicycling events. Phase II does not include any avoided-cost benefits and analyzes spending on a statewide basis.

<sup>4</sup> The British Cycling Economy Gross Cycling Product Report. London School of Economics

4. Using the values calculated in steps 1, 2 and 3 to estimate the total economic benefits from reduced absenteeism.

**Household spending.** The household survey asked all respondents to estimate their total annual bicycle-related spending. The study team applied the average reported spending to the total number of households in each geographic area to estimate the total economic impact from bicycle-related spending.

**Bicycle-related manufacturing.** The study team estimated the direct economic impact due to bicycle-related manufacturing using the total revenues of manufacturers in each study area from Dun & Bradstreet.

**Event and tourism spending.** For each geographic area, the economic benefits due to event and tourism participation were calculated using the following results from the household survey:

1. The proportion of residents who reported taking a bicycle-related vacation or participating in a bicycle-related event; and
2. Household estimates of spending related to bicycle events and tourism.

These values were applied to the total number of residents in each geographic area in order to estimate the total spending associated with events and tourism.

**II.4.3 - Other metrics.** There are a number of ways to analyze the effects of bicycling in a community that may not be directly related to the local economy, but are still valuable for stakeholders and community residents to understand how residents using bicycles benefit the community. Many of these types of data were measured for each case study community. These elements include, but are not limited to:

- Proportion of bicycle types owned;
- Non-commuting transportation;
- Barriers to increased bicycling; and
- Value individuals place on the ability to use bicycle infrastructure.

These and other metrics are detailed in the statewide and case study portions of this report. Such figures are vital to understanding the reach, prevalence and nature of bicycling, even though they are not direct input to the economic impact.

The study team also reported employment for the bicycle retail and manufacturing establishments. The impact of these jobs is included in the model of economic and community benefits as a part of the revenues for the two types of businesses.

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<sup>5</sup> The Health and Productivity Cost Burden of the "Top 10" Physical and Mental Health Conditions Affecting Six Large U.S. Employers in 1999, by Dr. Ron Z. Goetzel, et al.

## II.5 - Qualitative Research

While some of data are available concerning bicycling metrics at a community level, quantitative information regarding bicycling participation and impacts remain quite limited. Qualitative interviews with community leaders, government officials and business owners provided additional data on bicycling in each case study community.

Each case study community was visited to conduct interviews with representatives of:

- Public agencies such as transportation planning entities, chambers of commerce, and city councils;
- Private businesses that support and are supported by bicycling activities; and
- Bicycling organizations and events.

Stakeholders discussed the opportunities and challenges associated with bicycling and provide insight about the ways in which bicycling is important within their local communities. A number of interviews with key representatives of statewide organizations were also conducted. These interviews provide substantial information about the current trends and activities of bicycling in Michigan as well as thoughts about the next steps required to increase bicycling by Michigan residents. A list of all parties who provided input to the study can be found in Appendix D.

## **SECTION III.**

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### **Community and Economic Benefits of Bicycling in Michigan**

# SECTION III

## Community and Economic Benefits of Bicycling in Michigan

### Introduction

Michigan boasts a number of recent developments that support bicycling for both transportation and recreation including:

- Michigan is a national leader in rails-to-trails conversions, a program which converts former rail to multi-use paths, and has over 2,700 miles of rail-trails across both peninsulas.
- A number of communities have adopted complete streets policies that are designed to enable safe access for users regardless of transportation mode, age or ability. According to the Michigan Complete Streets Coalition, since 2009 more than 70 Michigan communities have adopted complete streets resolutions and another 24 communities have ordinances on their books.
- Over the past three years Michigan has established two U.S. Bicycle Routes, a system of routes designated by the American Association of State Highway and Transportation Officials (AASHTO). Designated in 2011, United States Bike Route 20 is an east-west route of more than 300 miles between Marine City and Ludington. United States Bike Route 35 was designated in 2012 and is a 500-mile route stretching from Indiana to Sault Ste. Marie, Canada that generally follows the Lake Michigan shoreline.

In addition to statewide developments, a number of communities across the state have seen growth in the number of bicycling events and use of bicycles for transportation.

This report section provides details on the economic and community benefits of bicycling in the State of Michigan along with qualitative information from stakeholders across the state about the links between bicycling and the economy. The statewide report includes the following subsections detailing findings related to bicycling in Michigan:

1. Economic and community benefits of bicycling in Michigan;
2. Data sources;
3. Household spending and bicycle-related manufacturing;
4. Health benefits;
5. Bicycle commuting and reduced absenteeism;
6. Events and tourism;
7. Infrastructure, placemaking and policy; and
8. Background on bicycling in Michigan.

For more information on the methodology and data sources, please see Section II – Methodology and Appendix B – Data Sources from the full statewide report.

The statewide report is accompanied by an infographic highlighting key statistics from the research.

### **III.1 - Economic and Community Benefits of Bicycling in Michigan**

Below is a summary of economic and health benefits calculated by the study team for Michigan due to bicycling including:

- Household spending on bicycling (for both bicycle-specific and general retail) - \$175 million;
- Manufacturing - \$11 million;
- Avoided health costs - \$256 million;
- Reduced absenteeism - \$187 million; and
- Event and tourism spending - \$38 million.

The total benefits calculated for the state of Michigan is approximately \$668 million.

Based on interviews with key stakeholders throughout the state, a number of themes emerged regarding the relationship between bicycling and the economy including:

- Bicycling fits into a larger agenda focusing on placemaking as an economic development strategy;
- Michigan could see substantial benefits from bicycle-related tourism with appropriate investment;
- There is a gap between available funding and the demand for new bicycling infrastructure;
- Even in spite of the funding challenges, Michigan is viewed as a leader in adopting bicycle-friendly policies;
- Bicycles are increasingly seen as viable transportation options, not just recreational vehicles; and
- Communities and regions see opportunities to link key trail infrastructure.

These themes are further explored below, along with more details about the calculation of the economic and community benefits accrued from bicycling in Michigan.

While qualitative information collected from various parties across the state proved to be of great value, the views and opinions expressed by stakeholders cited in this report do not necessarily represent those of MDOT.

## III.2 - Data Sources

Below is a brief discussion of the data sources used to calculate the economic and community benefits associated with bicycling in Michigan.

**The American Community Survey (ACS)** – The ACS is a survey conducted by the United States Census Bureau on an ongoing basis. It provides statistically reliable information on residents throughout the United States for a variety of topics including basic demographics, employment, transportation and payments for essential goods and services.<sup>1</sup>

**2013 Michigan Department of Transportation Household Survey on Bicycling** – A household survey was conducted as a part of the five case study communities throughout the state. Responses were collected through a random postcard mailing to residents in each of the case study communities and through outreach to statewide bicycle organizations, social media, and cards distributed in public locations in each of the case study communities. The study team collected 744 survey responses from the mail-to-web postcards and more than 2,500 from residents who learned about the survey from friends, social networks and email lists.

While the 2,500 responses from residents throughout Michigan provide a wealth of information regarding bicyclists in specific, it does not provide representative information on the proportion of bicyclists in Michigan. Where information regarding the proportion of bicyclists in the state was required, the study team used information from the household survey combined with data from the 2008-2012 American Community Survey regarding the relative frequency of bicycle commuting for the case study communities and Michigan as a whole to appropriately estimate bicycling participation.<sup>2</sup>

**Michigan Department of Community Health (MDCH)** – The Michigan Department of Community Health provides health services to millions of Michigan residents each year and provides information on the rate of certain diseases and medical conditions such as stroke and heart disease. MDCH provided data estimating the number of stroke and heart disease cases and the average costs associated per case. This data was used to estimate the number of such cases and costs incurred statewide. These estimated costs were applied to the World Health Organization's estimate of the percent of stroke and heart disease cases attributable to inactivity, thereby allowing an estimation of costs avoided by active bicyclists (those who ride two days a week or more).

**The Centers for Disease Control and Prevention (CDC)** – The CDC is operated by the United States Department of Health and Human Services and collects data on health problems

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<sup>1</sup>For commuting by bicycle data were taken from the U.S. Census Bureau; American Community Survey; 2008-2012 5-Year Estimates, Table S0801 Commuting Characteristics by Sex. For information on the population and number of households in Michigan, data were taken from U.S. Census Bureau; American Community Survey; 2008-2012 5-Year Estimates, Table DP02 Selected Social Characteristics in the United States. Both tables were accessed at <http://factfinder2.census.gov/>.

<sup>2</sup> Given the relatively low number of survey respondents from the Detroit case study and that the Detroit case study did not encompass all of Detroit, the statewide estimates were based on ACS and household survey data from the four other case study communities.

throughout the country. CDC data were used in calculating avoided health costs due to bicycling, as described above.

**Dun & Bradstreet (D&B)** – D&B provides information on businesses by industry and location. Data from Hoovers, a D&B subsidiary, provides information on the revenues and employment of bicycle-related manufactures and retailers throughout the state.

Where appropriate, this study provides comparisons between other economic research related to bicycling and the results of this study.

### III.3 - Household Spending and Bicycle-related Manufacturing

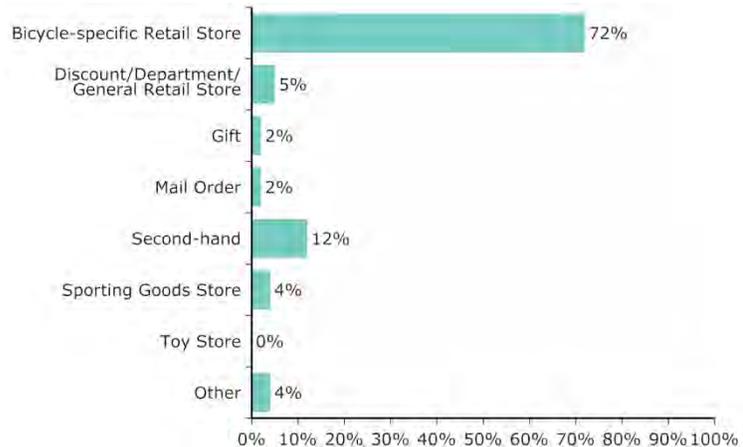
In the household survey, respondents were asked to quantify their total annual household spending on bicycling. Using information from case study communities (via the household survey) and the relative share of commuting bicyclists in those communities compared with the state, the study team estimated the annual average household spending for the state on bicycling was \$46. Applying this value to the 3.8 million households in Michigan provides an estimate of \$175 million annually in household spending on bicycles and related equipment and accessories.<sup>3</sup>

The overwhelming majority of Michigan bicyclists purchased their primary bicycle from a bicycle-specific retail shop, as shown in Figure 1 below. About 12 percent of survey respondents obtained their bicycle second-hand, while 5 percent purchased their primary bicycle from a general retail store.

**Figure 1.**  
**Primary Bicycle Source**

Source:  
BBC Research & Consulting from 2013 Michigan  
Department of Transportation Household Survey  
on Bicycling.

n = 2,852



**III.3.1 - Bicycle retailers in Michigan.** Dun & Bradstreet data report that the three-year average of revenues for bicycle retailers in Michigan is \$63 million and that these businesses employ approximately 757 individuals. These data serve as a conservative estimate of the bicycle-specific retail sales and employment statewide, given that there may be new businesses founded since the data were collected and that many establishments that might be bicycle-

<sup>3</sup> U.S. Census Bureau; American Community Survey; 2008-2012 5-Year Estimates, Table DP02 Selected Social Characteristics in the United States.

specific shops may be categorized more broadly by Dun & Bradstreet (for example as a sporting goods retailer). Also, a number of establishments are bicycle specific during the summer months and specialize in winter sporting goods during the winter. These establishments might be classified as winter sporting goods stores or general sporting goods establishments.

**III.3.2 - Non-bicycle-specific retail spending.** Given the variety of types of retailers that sell bicycles and related accessories, the study team used results from the household survey to estimate the bicycle-related expenditures at general retail establishments. Michigan bicyclists reported spending approximately 11 percent of their annual bicycle purchases (approximately \$19 million) at general retail businesses.

**III.3.3 - Bicycle-related manufacturing in Michigan.** According to stakeholders, the state's bicycle industry is growing but remains smaller than some other Midwestern states. Many stakeholders suggested that Michigan's manufacturing legacy means the state has opportunities to build a stronger industry.

Based on data regarding bicycle-related manufacturing from Dun & Bradstreet, Michigan bicycle-related manufacturers earn approximately \$11 million annually in revenues and employ 133 individuals. As with the data regarding bicycle retailers, some bicycle-related manufacturing may be classified in a broader category, and thus this represents a conservative estimate of the manufacturing-related benefits from bicycling in Michigan.

## **III.4 - Health Benefits**

The study team used information from a variety of sources to estimate a few of the health and workplace benefits derived from bicycling statewide.

**III.4.1 - Health benefits from physical activity.** Physical activity helps reduce the risk of a number of costly medical conditions. Economic benefits for Michigan residents who frequently ride their bicycles were calculated for the avoided medical costs associated with strokes and heart disease. The information used came from a variety of sources including:

- Data on the proportion of the conditions caused by physical inactivity from the World Health Organization;<sup>4</sup>
- The annual number of cases of these conditions in Michigan from the Centers for Disease Control (strokes) and the Michigan Department of Community Health (heart disease);
- The annual direct and indirect costs per case from the Michigan Department of Community Health; and
- The proportion of residents who reported riding their bicycle two or more days each week in the household survey.

Using these estimates, the study team estimates that the total avoided costs for strokes and heart disease in Michigan due to bicycling is approximately \$256 million. A number of other costly

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<sup>4</sup> The World Health Report 2002: Reducing Risks, Promoting Healthy Life.

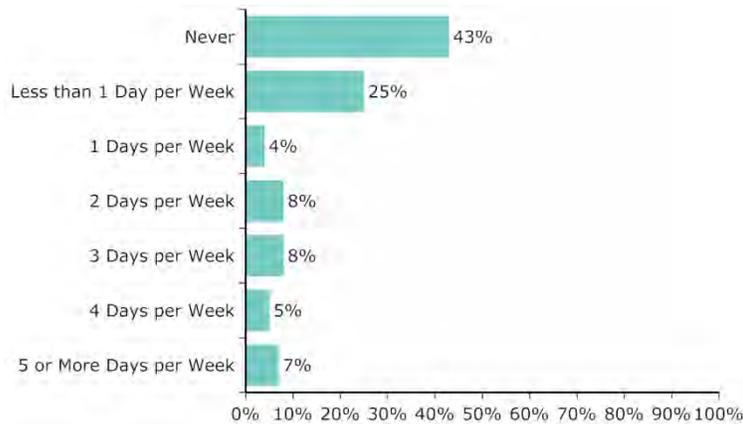
medical conditions can also be linked to reduced physical activity including diabetes and some forms of cancer. Adequate data were not available to estimate the potential avoided health costs for these diseases.

### III.5 - Bicycle Commuting and Reduced Absenteeism

According to the 2008-2012 American Community Survey, approximately 0.5 percent of Michigan workers reported that they “usually” commuted to work on a bicycle during the week prior to the survey.<sup>5</sup> ACS respondents are asked to only report the type of transportation which accounts for the majority of the distance. As a result, it may underreport the prevalence of bicycle commuting in Michigan given that some individuals may not “usually” bicycle and that many bicycle commuters may combine their bicycle commute with other types of transportation including transit and carpooling.

As a part of the household survey, bicyclists were asked to report how often they use their bicycle for commuting. Figure 2 shows the results from the household survey for all Michigan bicyclists.

**Figure 2.**  
**Average Frequency of Commuting among Bicyclists**



Source: BBC Research & Consulting from 2013 Michigan Department of Transportation Household Survey on Bicycling.  
n = 2,813

**III.5.1 - Reduced absenteeism.** Increased bicycling for transportation or recreation can have benefits for employers. The London School of Economics estimates that active bicyclists in the workplace miss one less day of work per year than non-bicycling workers,<sup>6</sup> and research

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<sup>5</sup> U.S. Census Bureau; American Community Survey; 2008-2012 5-Year Estimates, Table S0801 Commuting Characteristics by Sex. For comparison, 2 percent of respondents of a survey conducted for MDOT in 2013 reported getting to work via bicycle (Attitudes Perception of Transportation in Michigan: A 2013 Survey of Michigan Adults, [http://www.michigan.gov/documents/mdot/MDOT\\_2013\\_AP\\_SurveyReport\\_439065\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT_2013_AP_SurveyReport_439065_7.pdf)) and the State Long Range Transportation Plan 2005-2030 Travel Characteristics Technical Report estimates bicycle mode share at 0.5 percent. ([http://www.michigan.gov/documents/MDOT\\_TravCharTR\\_Final20060804\\_167340\\_7.pdf](http://www.michigan.gov/documents/MDOT_TravCharTR_Final20060804_167340_7.pdf))

<sup>6</sup> The British Cycling Economy Gross Cycling Product Report, London School of Economics.

published in the Journal of Occupational and Environmental Medicine estimates that one work day absent equates to an average of \$341 in lost productivity.<sup>7</sup>

Based on analysis of the household survey, the proportion of active bicyclist (those who ride two days a week or more) in Michigan is 11 percent.<sup>8</sup> Using this proportion along with the cost of absenteeism per day, the study estimated that the total benefits to Michigan due to reduced absenteeism are approximately \$187 million.

### **III.6 - Events and Tourism.**

The League of Michigan Bicyclists (LMB) in partnership with MDOT provides an annual Michigan Ride Calendar listing bicycling events ranging from races to tours and advocacy events. The 2014 calendar lists more than 200 events. LMB and MDOT also provide information for visitors to Michigan who may be interested in incorporating bicycling into their vacation. LMB produces a tourism packet including:

- A ride calendar;
- A booklet on the relevant Michigan laws and policies regarding bicycling;
- Trail and route information;
- Bicycle touring information; and
- A copy of the Michigan Bicyclist magazine.

MDOT also provides a substantial amount of information on bicycling in Michigan for use by residents and tourists including maps and route information for the two U.S. Bicycle Routes designated in the state.

Results are presented below from the Phase I analysis on the economic and community benefits of bicycling events and tourism. Phase II of this study provides more detail on the impact of these types of activities.

**III.6.1 - Bicycling events in Michigan.** Most statewide advocacy groups also host major bicycling events that help them raise both funds and awareness about bicycling in Michigan. The Michigan Trails and Greenway Alliance's Michigander ride draws more than 750 people participants, and generates more than \$50,000 in net revenue for the organization.

The advocacy community's involvement in coordinating events has helped them better understand how communities are embracing bicycling. Most stakeholders expressed the sense

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<sup>7</sup> The Health and Productivity Cost Burden of the "Top 10" Physical and Mental Health Conditions Affecting Six Large U.S. Employers in 1999, by Dr. Ron Z. Goetzel, et al.

<sup>8</sup> The 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behaviors reported that 16 percent of respondents in National Highway Traffic Safety Administration (NHTSA) Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin) rode a bicycle in the past week. Results were not available on a state-by-state basis or regionally regarding the frequency of riding. Schroeder, P. & Wilbur, M. (2013, October). 2012 National survey of bicyclist and pedestrian attitudes and behavior, volume 2: Findings report. (Report No. DOT HS 811 841 B). Washington, DC: National Highway Traffic Safety Administration.

that more communities are embracing bicycle events and the idea that they bring an infusion of money into a community. As Rich Moeller, the Executive Director of the League of Michigan Bicyclists, said:

*“Communities are glad that we are there; they thank us for bringing our tour through. We had to re-route the ride this year and had one local business that moved their tent to another community to capture the sales. There are little stories like that where business owners are going the extra mile to capture impact from rides and tours.”*

Stakeholders highlighted the notion that there are a growing number of organized bicycle events. “We hear from more and more organizations that are turning to bicycle events as fundraisers,” said John Lindenmayer, the advocacy and policy director of the League of Michigan Bicyclists.

The Michigan Mountain Biking Association (MMBA) has their own Mountain Bike Race Series, with a total of 10 races per year. They typically report around 4,000 registrations across the 10 events. The event locations range across the state.

**III.6.2 - Bicycling-related tourism in Michigan.** Many stakeholders view bicycle-related tourism as a substantial opportunity for economic development in Michigan and suggested ways to support and grow this type of economic activity. As Mr. Lindenmayer said,

*“I think with Pure Michigan, more people are looking at our state as an attractive tourist destination. We receive a lot of calls from folks that are excited to come to Michigan to bike. It certainly feels like we are seeing an increase in bicycle-related tourism.”*

Many interviewees had recommendations for ways that the public and private sector might improve bicycle tourism in Michigan. Among the ideas were:

- Ensure that current information on bicycle-specific tourism is available in the same places as general tourism resources;
- Continue to have the Department of Natural Resources promote mountain biking in State Parks;
- Create a bicycle-related tie-in to the Pure Michigan campaign; and
- Improve infrastructure connections between trails, on-road infrastructure, and tourism amenities such as hotels and restaurants to make it easier for tourists on bicycles to support these establishments.

**III.6.3 - Economic impact of events and bicycle-related tourism.** Based on the household survey, 4 percent of Michigan residents participated in a bicycle related event or vacation during the past year as shown in Figure 3. About half of those who participated in events reported participating in more than two events.

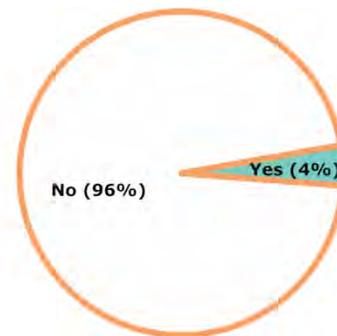
**Figure 3.**  
**Percent of Bicyclists that Participated in a Bicycling Event or Bicycling-Oriented Vacation in Michigan in the Past Year**

Source:  
BBC Research & Consulting from 2013  
Michigan Department of Transportation  
Household Survey on Bicycling.

Note:  
Participation is estimated based on ACS  
bicycling participation data and data collected  
in the case studies.

n = 670

Have you participated in an organized bicycle event in Michigan (e.g. Bike Ypsi Fall Ride, Tour de Troit) or taken a vacation in Michigan during which bicycling was a key activity (i.e. bicycling-oriented vacation) in the past 12 months?



Respondents who participated in bicycle-related events and vacations were asked to estimate their expenses for food, travel and other expenses. Using this information, the study team estimates that bicyclists in Michigan spend approximately \$38 million annually on bicycle-related events and travel.

### III.7 - Infrastructure, Placemaking and Policy

Many cities and communities have made substantial investments in bicycle infrastructure in the last five years. In Detroit, the Detroit Eastside Community Collaborative has completed six miles of a nine-mile path called the Conner Creek Greenway, while the City of Grand Rapids has a goal of completing 100 miles of bicycle lanes by 2015. Statewide, as previously noted, MDOT has worked with AASHTO to designate two U.S. Bicycle Routes since 2010. Bicycle infrastructure development has been linked closely with the complete streets and placemaking movements and is seen by many officials and stakeholders as a tool for economic development.<sup>9</sup> This subsection discusses the following topics related to investment in bicycle infrastructure:

- Resident value of bicycling networks
- Trails and trail linkages;
- Complete streets policies;
- Placemaking; and
- Funding for infrastructure.

The combination of infrastructure, tourism potential and recent shifts in policy means Michigan has an opportunity to become one of the most bicycle-friendly states in the nation. Norm Cox, principal of The Greenway Collaborative, an Ann Arbor-based planning and design firm that does work across the state, highlighted this opportunity:

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<sup>9</sup> The Project for Public Spaces, a nonprofit working to build stronger communities, says placemaking is “both an overarching idea and hands-on tool for improving a neighborhood, city or region.

*"We're the number one state for rail trails – we have so many opportunities...as a state, it is time to grab on to the bicycle as a way to re-brand ourselves."*

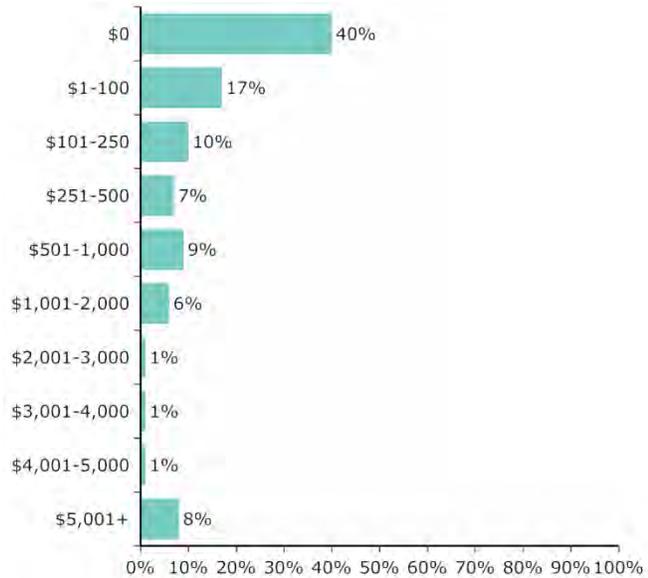
**III.7.1 - Resident value of bicycling infrastructure.** The study team also wanted to quantify the value placed on bicycle-specific infrastructure such as bicycle lanes, cycle tracks and bicycle paths. As shown in Figure 4, 44 percent of residents placed an annual value of accessing bicycle infrastructure at over \$100.<sup>10</sup>

**Figure 4.**  
**Annual Value of Bicycling Infrastructure**

Source:  
BBC Research & Consulting from 2013 Michigan Department of Transportation Household Survey on Bicycling.

Note:  
Infrastructure valuation is estimated based on data from the five case studies.

n = 756



In a recent survey by MDOT, nearly one-quarter of residents rated bicycle infrastructure as important (a rating of 5 out of five), while many residents reported low satisfaction with the availability of lanes and pathways for bicycling.<sup>11</sup>

**III.7.2 - Trails and trail linkages.** Michigan has a substantial network of multi-use paths, trails and other non-road infrastructure for use by bicyclists throughout the state. According to the Rails-to-Trails Conservancy, Michigan has the most rail-trail miles of any state with 2,716 miles of trail across 121 trails. The Conservancy also reports that Michigan has over 250 miles of potential project trails planned. Many tourist areas feature paved shared-use paths such as the Mackinac Island path, the Portage Bikeway and the Leelenau trail. Many stakeholders reported that trails such as these provide an economic boost for local businesses. For example, Michael

<sup>10</sup> It is important to note that while respondents reported a high value for a network of bicycling infrastructure, this does not suggest that Michigan should implement taxes or fees for residents to access this infrastructure. Bicycle registration and fee collection have been considered by a few jurisdictions in the past decade and have not been implemented or have been repealed for a variety of reasons (Ottawa: <http://www.ottawasun.com/2012/01/13/staff-to-council-no-bicycle-licenses>; San Diego: <http://calbike.org/san-diego-repeals-bicycle-license-law/>; Minneapolis and Minnesota: <http://www.dot.state.mn.us/bike/other.html>, Long Beach: <http://latimesblogs.latimes.com/lanow/2011/02/long-beach-eliminates-bike-registration-law-that-dealt-steep-fines.html>).

<sup>11</sup> Abacus and Associates. *Attitudes Perception of Transportation in Michigan: A 2013 Survey of Michigan Adults*, (accessed at [http://www.michigan.gov/documents/mdot/MDOT\\_2013\\_AP\\_SurveyReport\\_439065\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT_2013_AP_SurveyReport_439065_7.pdf)). Pages 54 and 55.

Reuter, the owner of American Cycle and Fitness, a chain of bicycle shops across the state, noted that he sees a direct impact from infrastructure projects on his bottom-line:

*“Access is improving. When we see a trail project open near one of our shops, we see an uptick in the number of bikes we sell.”*

Stakeholders highlighted a shared desire by both communities and residents to increase the links within Michigan’s vast trail network.

*“A lot of people would like to see a more concerted effort to link trails. That is becoming more and more of a rallying cry as opposed to starting new trails. And that’s coming from all sorts of directions. It just makes sense for everyone involved.” – Matt McCauley, Director for Regional Planning & Community Development, Northwest Michigan Council of Governments*

Trails are more expensive than non-separated bicycle lanes. Cost can start at \$500,000 per mile and exceed \$1 million per mile.<sup>12</sup>

**III.7.3 - Complete streets.** Michigan has been a leader in the complete streets movement, with nearly 100 communities that have adopted complete streets policies. Many interviewees highlighted Michigan’s leadership in embracing complete streets policies as having a major positive impact on bicycling and the local economy.

*“Local communities are implementing the complete streets legislation and are looking at it from a bicycling point of view more than anything else. Small communities are implementing policy around non-motorized transportation now. That’s a big shift in the last few years, and it’s mainly due to the complete streets legislation.” – Matt McCauley*

**III.7.4 - Placemaking.** Many statewide and local stakeholders discussed the prominent role of bicycle infrastructure in placemaking; a multi-faceted approach to the planning, design and management of public spaces. Placemaking is a frequently cited economic development strategy for communities in Michigan. It capitalizes on a local community’s assets, inspiration, and potential, ultimately creating good public spaces that promote people’s health, happiness, and well-being.

*“We’re doing placemaking well. We’ve been pushing this work for years. If we’re going to rebrand for the new economy, this is how you do it. Other states aren’t doing this – some cities are, but not at the state level. Not like we are in Michigan.” – Norm Cox*

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<sup>12</sup> Based on per mile estimates of the Conner Creek Greenway (<http://www.connercreekgreenway.org/conner-creek-greenway-2/>), the Ohio Department of Transportation (<https://www.dot.state.oh.us/Divisions/Planning/SPR/bicycle/Funding/FAQs%20on%20Funding.PDF>) and VTrans Bicycle and Pedestrian Unit Cost Database ([http://vtransengineering.vermont.gov/sites/aot\\_program\\_development/files/documents/ltf/Report%20on%20Share%20use%20and%20sidewalk%20costs.pdf](http://vtransengineering.vermont.gov/sites/aot_program_development/files/documents/ltf/Report%20on%20Share%20use%20and%20sidewalk%20costs.pdf))

*“Communities like Marquette and Traverse City are actively marketing themselves as places for young professionals. They recognize that walking and biking are important to that end.” – John Lidenmayer*

**III.7.5 - Funding for Infrastructure.** Many stakeholders across the state commented on Michigan’s fiscal challenges over the last decade and a state-specific transportation funding crisis have made it difficult to afford investments in bicycle infrastructure.

But this challenge was also seen as an opportunity by some interviewees. For example, some interviewees identified road diets as a uniquely Michigan solution to adding bicycle infrastructure without major construction expenses.

Additionally, a study of 58 projects across the country showed that for every \$1 million in investment in bicycling infrastructure jobs, a total of 11.4 jobs were created in the state where the project was located.<sup>13</sup>

### **III.8 - Background on Bicycling in Michigan**

The household survey and stakeholder interviews also provided information on the nature of cycling in Michigan including:

- Overall ridership;
- An overview of recreational riding;
- Opportunities related to bicycling for transportation;
- Barriers to increased bicycling; and
- The role of bicycle-related promotion and encouragement in Michigan.

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<sup>13</sup> Garrett-Peltier, Heidi. “Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts.” Political Economy Research Institute. June 2011.

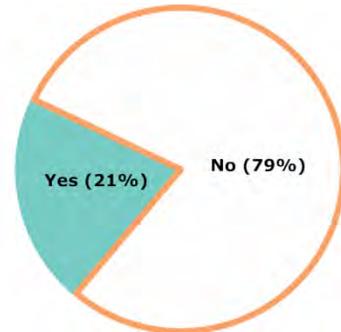
**III.8.1 - Riding in Michigan.** Based on the case study responses, the study team estimates that about 20 percent of Michigan residents rode a bicycle in the past year, as shown in Figure 5 below.<sup>14</sup>

**Figure 5.**  
**Residents Who Have Ridden in the Past Year**

Source:  
BBC Research & Consulting from 2013 Michigan Department of Transportation Household Survey on Bicycling.

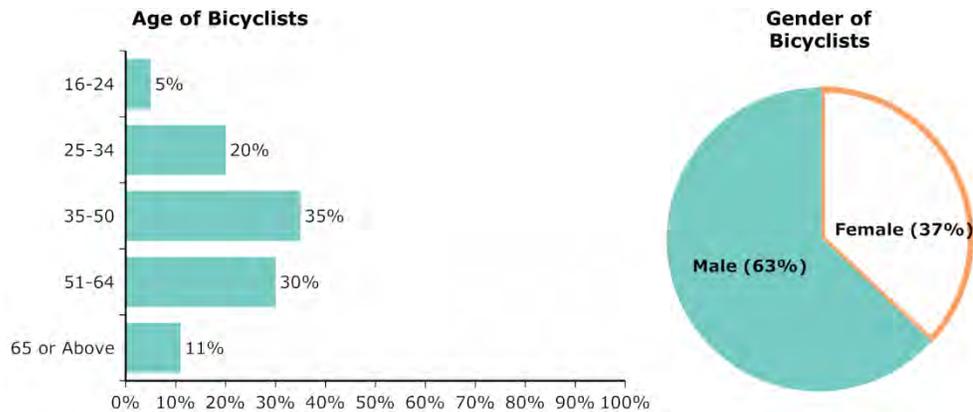
Note :  
Estimate produced using household survey data and the relative frequency of bicycle commuting in Michigan from the 2008-2012 American Community Survey.

**Have you personally ridden a bicycle for any reason in the past year?**



**III.8.1.i - Demographics.** The household survey also asked respondents to report some basic demographic information. Nearly two-thirds percent of bicyclists were male. Roughly three-quarters of bicyclists were over the age of 35, as shown in Figure 6 below.

**Figure 6.**  
**Age and Gender of Bicyclists**



Source: BBC Research & Consulting from 2013 Michigan Department of Transportation Household Survey on Bicycling.

n = 3,050; 3,043

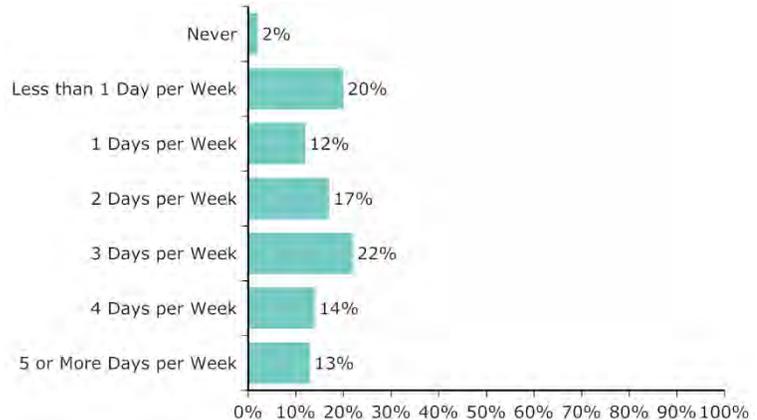
<sup>14</sup> The 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behaviors reported that 42 percent of respondents in National Highway Traffic Safety Administration (NHTSA) Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin) rode a bicycle in the past year. Results were not available on a state-by-state basis. Schroeder, P. & Wilbur, M. (2013, October). 2012 National survey of bicyclist and pedestrian attitudes and behavior, volume 2: Findings report. (Report No. DOT HS 811 841 B). Washington, DC: National Highway Traffic Safety Administration. A 2013 MDOT survey estimates that 39 percent of households had at least one member that used a bicycle as a means of transportation in the past year (this would likely include residents under the age of 18 taken from Attitudes Perception of Transportation in Michigan: A 2013 Survey of Michigan Adults, [http://www.michigan.gov/documents/mdot/MDOT\\_2013\\_AP\\_SurveyReport\\_439065\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT_2013_AP_SurveyReport_439065_7.pdf)).

**III.8.1.ii - Recreational cycling.** Figure 7 provides the frequency of recreational cycling. Just under half of Michigan bicyclists report riding their bicycle for recreation at least three days per week.

**Figure 7.**  
**Average Frequency of**  
**Recreational Bicycling among**  
**bicyclists**

Source:  
BBC Research & Consulting from 2013 Michigan  
Department of Transportation Household Survey  
on Bicycling.

n = 2,824



**III.8.2 - Bicycling for transportation.** A major trend highlighted in interviews conducted across the state was a shifting perception of the bicycle as a purely recreational vehicle toward a legitimate transportation option. Government officials and stakeholders alike highlighted that this perception is transitioning. As Sarah Panken of the Michigan Fitness Foundation said:

*“Some people still don’t see bicycles as anything more than recreation...Bicycling is still largely dominated by recreation, trail riders. There are more and more commuters. Families, people with younger children that want to be able to ride safely in their neighborhood. There are a lot of different communities [of riders].”*

Another stakeholder, Kathryn Gray, with Transportation for Michigan, highlighted that communities across the state still do not see bicycles as a way of solving other transportation problems, such as congestion or parking shortages:

*“[Communities] don’t yet see the full breadth of how it could have an impact. They recognize [the bicycle] as a tool for getting around, and are doing so more than before, but acceptance of the bicycle as a transportation solution is still not as broad as it could be.”*

Stakeholders highlighted how this changing definition impacts funding decisions about bicycle infrastructure:

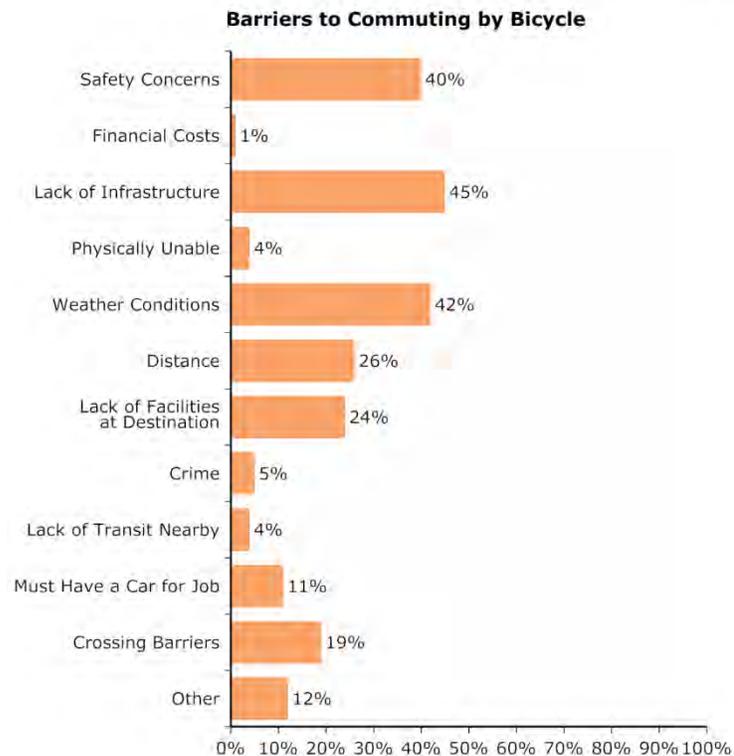
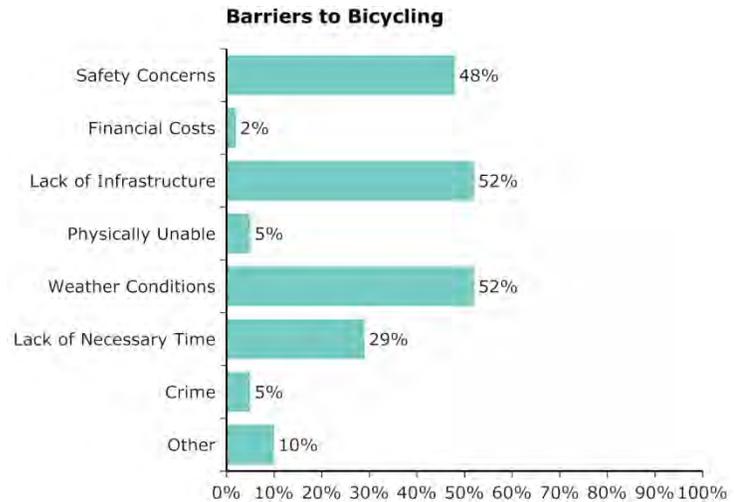
*“A big battle to be had among policymakers is the idea of why we should use public dollars for bike infrastructure. If it becomes more about transportation and not just recreation, you’ll find more value and support.” – Matt McCauley*

**III.8.3 - Barriers.** Survey respondents were asked to cite which of a list of factors were barriers to bicycling or bicycling more frequently. As seen in Figure 8, lack of infrastructure (52%), weather conditions (52%) and safety concerns (48%) were the most commonly reported barriers to increased bicycling.

**Figure 8.**  
**Barriers to Bicycling and Commuting**

Source:  
BBC Research & Consulting from 2013 Michigan  
Department of Transportation Household Survey  
on Bicycling.

n = 3,277



Respondents were also asked to identify barriers unique to commuting by bicycle. Lack of infrastructure (45%), weather conditions (42%) and safety concerns (40%) remained the most frequently mentioned barriers. Distance (26%) and lack of facilities at destination (24%) were also frequently mentioned.

**III.8.4 – Promotion and encouragement.** Michigan has a small but growing community of stakeholders working at the state level to connect communities to resources and to promote and encourage people to bicycle. Stakeholders see opportunities to increase bicycling among all Michigan residents and feel that bicycling can play an important role in economic development:

*“One thing I think Michigan has going for us is that there are more voices talking about bicycling than ever before. Diversified groups are all working together to promote and advocate for better bicycling in our state.” – John Lindenmayer*

*“There are pockets of momentum starting to build. It’s not coordinated and comprehensive. There are untapped opportunities for economic development, tourism, as well as new communities that haven’t traditionally been involved.” – Sarah Panken*

A number of stakeholders also noted that the population of bicyclists in the state is growing more diverse and that plans for bicycle infrastructure and policy need to adapt to address this shift.

# **APPENDIX A.**

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## **Literature Review**

# APPENDIX A.

## Literature Review and Bibliography

This appendix provides a bibliography and detailed review of all existing literature explored during the course of the study.

### Overview

Research for this report began with an extensive review of the existing literature on community and economic impacts of bicycling. The review continued throughout the study, as new research was published and stakeholders highlighted unique aspects of the case study communities. Literature reviewed for the study included peer-reviewed publications, reports from consultants, periodical articles, analyses by all levels of government and publications by advocacy groups. The geographic scope of the literature ranged from focus on a specific piece of bicycling infrastructure to the impacts of bicycling on an entire country.

Although bicycling advocates, government officials and ordinary citizens are giving increasing attention to the subject, studies similar in nature to this effort are rare and the data sources available on bicycling remain limited. While an exhaustive review of all reputable literature on the topic is not feasible, over 70 articles and reports were reviewed in order to establish a reliable foundation for the rest of the study.

The literature review was specifically useful in revealing relevant data sources, recent important bicycling phenomenon and applicable methodology such as survey design techniques.

Nonetheless, city-, state- and nationwide studies have been conducted in recent years in the United States and Europe. Reports on bicycling in cities such as Portland and New York, states such as Iowa and Colorado, and nations like the United Kingdom have provided numerous data, utilizing increasingly sophisticated methodology. The studies examined varied substantially in scope and scale. Many of the studies relied mainly on available national and state data, while others augmented secondary sources with primary data collection.

### Key Studies

Three previously conducted studies provided particular value to this report. They are listed and reviewed in detail below.

Center for Research in Economic and Social Policy. "The Economic Impact of Bicycling in Colorado." 1999.

The estimated economic impact of bicycling in Colorado is about \$1 billion. Manufacturing produces the largest share of bicycling-related revenue, followed by retail and tourism.

Thirty bicycle and related products manufactures were identified in Colorado, with combined estimated annual revenue of \$762.7 million and payroll of \$18.1 million.

Retailers reported total annual revenue of \$200 million and payroll of \$16 million. Half of bicycle purchases came from either bicycle-specific businesses or general sporting goods stores, making up 79 percent of bicycle expenditures. Average bike price was \$619.

Ski resorts attract 700,000 bicyclists annually, who spend \$56-76 million each year. Seventy percent of these bicyclists are from out of state.

Ten percent of Coloradans report having taken a bicycle-related vacation in the past year, spending an average of \$360 per vacation.

Defined sectors of the bicycling economy include manufacturing, retail, tourism and other activities. Other activities include touring, racing and charity events. These categories could be lumped into one "event" sector of the bicycling economy in future studies. The revenue, full-time equivalent employment, and payroll are estimated for each sector.

Surveys of manufacturers, retailers, ski resorts, chambers of commerce and households were conducted. The amount of bicycling at ski resorts is relatively unique to Colorado, though parallel secondary bicycling use infrastructure could be explored in other locales.

Bike sale outlets were categorized by store type, and the distribution of number of bikes sold and proportion of bike expenditures by store type were estimated.

Grous, Alexander. "The British Cycling Economy."

The report defines "cycling economy" and offers a gross bicycling contribution to the economy, quantified at £2.9 billion or £230 per bicyclist per year as of 2011. Bicycling participation is growing, and a projected growth trend of one million additional "regular bicyclists" would add £141 million to the economy between 2011 and 2013. Several factors are attributed to this growth including the tripling of the National Cycle Network (in miles).

Benefits to the British economy include 2010 cycle sales of £1.62 billion (28 percent annual increase), £853 million in accessory sales and maintenance, 23,000 direct jobs earning over £500 million and providing over £100 million in tax revenue, and health benefits estimated to save the economy £128 million per year. Health benefits include reduced costs of treating obesity and reduced absenteeism (bicyclists report missing work 1.3 days per year less than non-bicyclists). Bicyclists are estimated to be saving the economy £193 million in absentee costs. Barriers to the growth of bicycling include safety and self-confidence concerns among individuals, time constraints, an increase in the proportion of children being driven to school, and limited public funding for infrastructure.

Unlike in the nearby Netherlands, most (70 percent) British bicyclists are male. A high (42 percent) proportion of children own bicycles, but more than half do not ride regularly. The report explores latent demand, represented by the 2.2 million Britons who desire to cycle have yet to due to lack of information or funds. These potential bicyclists represent £516 million of economic potential.

Bicycling employment data is broken down into three categories: retail sales, manufacturing, and bicycling infrastructure. Bicyclists are divided into three major segments — occasional bicyclists, regular bicyclists who bicycle more than 12 times per year, and frequent bicyclists who bicycle at least once per week. Four sub-segments are also defined — family, consisting of parents and children who ride together; recreational users; commuters; and enthusiasts.

There are an estimated 13 million bicyclists in the U.K., representing 27 percent of the population. Thirty-three percent are classified as regular bicyclists, 41 percent as occasional bicyclists, and 26 percent as frequent bicyclists. Despite being the smallest classification, frequent bicyclists account for 38 percent of the sales and accessory market.

The report draws extensive comparisons to other northern European countries, which is beneficial in part because of similar climate, riding seasons, and population and infrastructure densities. Similarly, comparing Michigan's bicycling characteristics to those of other Midwestern states would prove beneficial.

The exploration and quantification of latent demand proves telling. Assessing the number of people desiring to cycle but prevented from doing so by barriers, while outlining the benefits of a growing bicycling economy and defining those barriers, would be valuable to those taking action and would be crucial to informing decisions regarding the deployment of capital.

Sustainable Tourism and Environment Program. "Economic and Health Benefits of Bicycling in Iowa." Fall 2011.

Iowa has over 1,600 miles of trails. Seven percent of Iowans mountain bike, while 41 percent use trails for biking or walking. There are an estimated 150,000 recreational riders who generate \$367 million in direct and indirect economic impact and save the state \$74 million in health care costs. There are an estimated 25,000 commuter bicyclists who generate \$52 million in direct and indirect economic impact and save the state \$713 million in health care costs.

Twenty-nine percent of Iowans do not meet recommended levels of physical activity, while 67 percent are overweight or obese. Obesity-related health care costs in Iowa are estimated at \$783 million, not including absenteeism or low productivity costs.

There are 61 bicycle-specific retail businesses in the state and 18,300 bikes sold in 2010 (20 percent road bikes, 11 percent children's bikes, 21 percent mountain bikes, and 48 percent leisure bikes). Revenues totaled \$8.1 million in bikes, \$1.9 million in clothing, \$4.2 in accessories, and \$3.7 million in repairs. Fifteen year-round bicycle organizations were identified, averaging 106 members and an average budget of \$22,000. The economic value of these organizations' volunteers is estimated at \$340,000. Register's Annual Bicycle Ride Across Iowa (RAGBRAI), Iowa's highest profile bicycling event created an estimated \$16.9 million in direct spending by 8,802 traveling parties (\$1,921 per party).

Primary research was conducted via surveys of individual bicyclists, bicycle-specific retailers, and bike organizations. Data was collected regarding demographics, bike usage,

events, and business statistics. For the sake of conservative estimates, median figures were used in calculating impacts.

Individual bicyclists were divided into commuters and recreational bicyclists. A further division of recreational bicyclists would prove beneficial, as it would distinguish bicycling enthusiasts from casual recreational riders.

Retail data was collected regarding type, number, revenue of bike sales, expenses and revenues, employment figures, and customer information. Employment and sales data such as number of sales, category of sales, and revenue are relevant and applicable to most any bicycling impact study. Less useful is the report's summing of revenues and expenses to provide a total impact figure for retailers. Non-bike specific retailers were not included in the study. This could be done by applying general athletic retailers' sales data to their proportion of bike sales to total sales.

Bicycle organizations provided data on number of members, volunteer types and hours, event participation, and budget. Budget allocation information would prove beneficial.

Health care cost savings were determined by applying Centers for Disease Control data to individual bicyclists riding information.

## **Supporting Studies**

The following studies and articles were utilized to varying degrees during the course of the study.

Abacus Associates. "Attitudes & Perceptions of Transportation in Michigan: A 2013 Survey of Michigan Adults." Prepared for The Michigan Department of Transportation. October 21, 2013

Study providing information on transportation satisfaction of Michigan residents as a part of the MDOT State Long Range Transportation Plan.

Active Living Research. "The Economic Benefits of Open Space, Recreation Facilities and Walkable Community Design." Robert Wood Johnson Foundation. May 2010.

Paper synthesizes previous research in regards to the economic value of outdoor recreation facilities, open spaces and walkable community design. Focuses on the private benefits that accrue to nearby homeowners as well as other users of open space.

Adventure Cycling Association. "Bonjour Cycle Tourism!" 3 October, 2012.

Alliance for Biking & Walking. "Working with the Business Community." 11 July 2012.

Discusses opportunities and tips for working with and consulting to local businesses and business districts.

Alta Planning & Design. "Bicycle-Related Industry Growth in Portland." Boulder, CO. June 2006.

Analyzes the economic impact of bicycling to the City of Portland by conducting a survey of over 100 businesses. Survey consisted of four questions related to gross revenue related to bicycles, growth in revenue over the past decade, the effect of Portland's bike-friendly reputation on business, and how the bicycle-related activities of the City could help their business grow.

Alta Planning & Design. "The Value of Bicycle-Related Industry in Portland." Boulder, CO. 2008.

America Bikes. "Bike Spending per Capita."

List of estimated annual revenue per state.

American Hiking Society. "The Economic Benefits of Trails." February 2004.

Archambault, Dennis. "Detroit's New Bicycle Economy." *Model D Media*. 09 October 2012.

Badger, Emily. "Cyclists and Pedestrians Can End Up Spending More Each Month Than Drivers." *The Atlantic Cities*. 05 December, 2012.

Beierle, Heidi. "Byways via Bicycle: Seeing the United States on Two Wheels." *The Journal for America's Byways*. October 2011.

Discussion of bicycle tourism in the United States, including: types of bicycle tourists, route and path characteristics across the nation, general discussion of travelling cross-country via bicycle.

Belden, Russonello & Stewart LLC. "2011 Community Preference Survey National Association of Realtors." 2011.

Bicycle Federation of Wisconsin. "Bicycling: Good for Wisconsin." 17 December, 2010.

Briefly discusses the benefits of bicycling in the state of Wisconsin.

Bicycle Federation of Wisconsin. "Wisconsin Bicycling Businesses." 17 December 2010.

A list of 200 bicycle-related businesses in Wisconsin.

Bicycle Federation of Wisconsin and Wisconsin Department of Transportation. "The Economic Impact of Bicycling in Wisconsin."

Presents the impact of bicycling on Wisconsin and its economy in three parts: overall benefits from bicycling to the state of Wisconsin, economic data on the bicycling industry in Wisconsin, as well as anecdotal data on the economic impact of bicycle tourism and recreation. Total impact is calculated to be \$556 million and 3,420 jobs in addition to an undetermined but significant additional economic benefit from bicycle tourism.

Bikes Belong Coalition. "Bikes Belong Survey: The Size & Impact of Road Riding Events." November 2009.

Survey was conducted to estimate the size, number, and direct economic impact of recreational road bicycling events in the year 2008. Total 2008 revenue from recreational road riding events calculated to be \$240 million in 2008.

Boston Cyclists Union. "Bike Lanes – Good for Business, Good for Taxpayers."

Describes in detail the benefits to taxpayers from bicycling in the categories of healthcare costs, infrastructure costs, clean air, increased tourism, improvements in traffic safety, and bike lane popularity.

Buehler, Ralph and John Pucher, eds. "City Cycling." *The MIT Press*. November 2012.

Cheng, Elaine et al. "Shopping, Parking, and Transportation In the East Village."

Examines transportation habits and shopping and spending patterns of residents and visitors on 2<sup>nd</sup> Avenue between Houston St. and 14<sup>th</sup> St. in the East Village, Manhattan. Analyzes mode of transportation to the area and its relationship with average spending per capita, resident vs. non-resident automobile use, attitudes towards travelling to the area given less/more parking spaces

Clifton, Kelly et al. "Examining Consumer Behavior and Travel Choices." Portland State University. February 2013.

Report looks at consumer spending and travel choices across 89 businesses in the Portland metropolitan area. Study finds that there are differences between the amount consumers spend at various businesses by their mode of travel, but that this difference is less pronounced when controlling for customer demographics. Furthermore, the built environment (employment density, proximity to rail transit, etc) is key to explaining the use of non-automobile modes.

Cortright, Joe. "New York City's Green Dividend." CEOs for Cities. April 2010.

Analyzes the "Green Dividend" of New York, the amount of money that New Yorkers save on auto-related expenses per year that is then spent locally, stimulating the city's economy. Looks at Vehicle Miles Travelled (VMT) per day in New York as compared to the 50 largest U.S. metro areas and calculates savings by multiplying the difference in VMT by the cost of operating a motor vehicle per mile.

Danielle, Sinnett et al. "Making the Case for Investment in the Walking Environment." June 2011.

Puts forth arguments and evidence for investing in the walking environment. Discussion topics include: why invest in walking environments, wider benefits of walking friendly environments, what makes a good walking environment, and the cost effectiveness of investments in walking environments.

Dean Runyan Associates. "Proposal – Oregon Bicycle Economic Impacts." 29 March, 2012.

Proposed project will provide a detailed description of the magnitude of bicycling from a manufacturing and retail sales industry and recreational travel perspective by documenting the various ways that bicycles and bicycling provide economic benefits to the state and its residents.

Dean Runyan Associates. "The Economic Significance of Bicycle-Related Travel in Oregon." April 2013.

Study aims to provide a detailed description of the magnitude of bicycling from a recreational travel perspective by using a detailed questionnaire. Data shows that in 2012 travelers who participated in bicycle-related activities while traveling in Oregon spent nearly \$400 million – approximately 4.4 percent of direct travel spending in the state.

Dobes, Leo. "Economic Evaluation of Bicycle Infrastructure."

Appendix 4 in a larger paper, "Walking and Cycling Trunk Infrastructure Report." Appendix provides an outline of the Cost Benefit Analysis methodology used to estimate the benefits of enhanced bicycle lanes and facilities in Canberra. Authors of the paper want to apply only a damages-avoided approach with value of statistical life based on the human capital approach, as opposed to the willingness to pay based on choice modeling.

East Central Florida Regional Planning Council. "Economic Impact Analysis of Orange County Trails." 2011.

Attempts to determine the economic impact of the Little Econ Greenways, West Orange and Cady Way Trails on Orange County Florida's local economy. A general survey was distributed to trail users in an attempt to collect data on the spending habits associated with using the three trails. In order to determine economic impact, data from the surveys was analyzed via the Regional Economic Model, Inc. (REMI).

Economic and Policy Resources, Inc., Local Motion, and Resource Systems Group, Inc. "Economic Impact of Bicycling and Walking in Vermont." 6 July, 2012.

Estimates the total economic benefits of walking and biking in the state of Vermont, with a more comprehensive approach than simply analyzing revenue from tourism and visitor spending. Study finds the overall economic contribution of bicycle and pedestrian oriented activities in Vermont in 2009 to be \$82 million dollars in output and 1,418 jobs coming from infrastructure and bicycle-pedestrian events and businesses.

Flusche, Darren.. "Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure." *Advocacy Advance*. July 2012

Highlights the impact the bicycle industry and bicycle tourism can have on state and local economies, discusses the cost effectiveness of investments, points out the benefits of bike facilities for business districts and neighborhoods, and identifies the cost savings associated with a mode shift from car to bicycle. Evidence shows that investments in bicycle

infrastructure are a cost-effective way to enhance shopping districts and communities, generate tourism and support business.

Garrett-Peltier, Heidi. "Estimating the Employment Impacts of Pedestrian, Bicycle, and Road Infrastructure." Political Economy Research Institute. December 2010.

Case study that estimates the employment impacts of various transportation infrastructure projects in the city of Baltimore, particularly in regards to the differences in employment resulting from different project types – projects that focus on bicycle and pedestrian infrastructure vs. those that do not. In descending order of total jobs per million dollars spent, projects are ranked in the following order: Pedestrian projects, bike lanes (on-street), bike boulevard (planned), road repairs and upgrades, and road resurfacing.

Garrett-Peltier, Heidi. "Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts." Political Economy Research Institute. June 2011.

Analyzes the employment resulting from the design and construction of pedestrian and bicycling infrastructure projects. Data were gathered from Departments of Transportation using detailed cost estimates on a variety of projects to create an input-output model that studies the direct, indirect, and induced employment that is created through the design, construction, and materials procurement of bicycle, pedestrian, and road infrastructure.

Gotschi, Thomas. "Costs and Benefits of Bicycling Investments in Portland, Oregon." *Journal of Physical Activity and Health*. 2011.

Objective is to assess how costs of Portland's past and planned investments in bicycling relate to health and other benefits. Compares costs of investment plans with health care cost savings and value of statistical life savings. Results show that investments of between \$138 and \$605 million will result in health care cost savings of \$388 to \$594 million, fuel savings of \$143 to \$218 million, and savings in value of statistical lives of \$7 to \$12 billion.

Grabow, Maggie, Micah Hahn, and Melissa Whited. "Valuing Bicycling's Economic and Health Impacts in Wisconsin." The Nelson Institute for Environmental Studies Center for Sustainability and the Global Environment, University of Wisconsin-Madison. January 2010.

Assesses the economic and health benefits of bicycling recreation in the state in addition to demographic trends characterizing current and future bicyclists. Economic impact is determined by quantifying the number of bicycle person-days, determining the average expenditure of bicyclists, and then modeling total economic impacts using an input/output model. Study estimates total economic impact of bicycle recreation and tourism in Wisconsin to be \$924 million in addition to the total potential value of health benefits at \$410 million.

Griffin, Robert, Jennifer Hoag, and Michael Toma. "Coastal Georgia Greenway Market Study and Projected Economic Impact." *Armstrong Atlantic State University Center for Regional Analysis*. December 2003.

Study estimates annual use and economic impact of a 150-mile multi-use trail that exists as part of the Georgia component of the East Coast Greenway. Analyzes both non-quantifiable as well as quantifiable economic benefits given differing base assumptions regarding percentage of trail users that are local residents.

Hollowell, Dana. "Cycling tourists, rails-to-trails boost Michigan as two-wheeled vacation destination." *Bridge Magazine*. 05 April 2012.

Krizek, Kevin. "Estimating the Economic Benefits of Bicycling and Bicycle Facilities: An Interpretive Review and Proposed Methods." *Essays on Transportation Economics*. 2007.

Paper reviews and interprets existing literature regarding the economic benefits of bicycle facilities and suggests strategies to evaluate economic benefits in future work. Discussion of central issues and confounding factors in the analysis of bicycle benefits as well as how the framework presented in the paper can be built upon.

Lawrie, Judson et al. "Bikeways to Prosperity – Assessing the Economic Impact of Bicycle Facilities." Institute for Transportation Research and Education. February 2006.

Determine if benefits gained from North Carolina Department of Transportation investments in bicycle facilities in the Outer Banks justify the investment in additional facilities across the state. Economic Impact Analysis looks at the degree to which bicycling tourists were drawn to the area because of bicycle facilities. Study suggests that public investments in other coastal and resort areas could return similar benefits.

League of Michigan Bicyclists. "2012 Sunrise Bicycle Tour – Survey Results."

League of Michigan Bicyclists. "State of Michigan Bicycle Profile." 16 April, 2013.

Lists different bicycle-related organizations, groups, and bicycle-friendly businesses across the State of Michigan.

Lee, Karen. "Creating Healthy Communities Through Design." 28 June, 2011.

Overview of how community design impacts health by looking at trends in community design and their correlation with increases in obesity and diabetes and general declines in health. Also provides data on co-benefits of creating or improving access to places for physical activity such as environmental improvements, money saved to the consumer, and job creation.

Liechty, Rachel and Ingrid Schneider. "Lake County Scenic Byway: Awareness, impact on quality of life & economy." University of Minnesota Tourism Center. December 2010.

Study aims to identify, via a questionnaire, consumer awareness of the Lake County Scenic Byway, the byway's impact on quality of life among residents, and the economic impact of byway travelers to the regional economy. Economic impact is estimated at \$32 million in economic output and 512 full-time, part-time, and seasonal jobs. Litman, Todd. "Economic Value of Walkability." Victoria Transport Policy Institute. 12 December 2007.

Litman, Todd. "Economic Value of Walkability." Victoria Transport Policy Institute. 2007.

Describes ways to evaluate the benefit of walking and walkability from the viewpoint that walking is currently undervalued in conventional transportation planning. Potential walkability impacts include accessibility, consumer cost savings, public cost savings, efficient land use, livability, public fitness and health, economic development, and equity. Three approaches to integrate the value of walkability in transportation planning decisions are discussed: as a proportional share of total travel activity, a cost allocation approach, and a cost-benefit analysis approach.

Lovy, Howard. "Bike trails bring two-wheel tourism to northern Michigan businesses." *Crain's Detroit Business*. 26 September, 2012.

Meisel, Drew. "Bike Corrals – Local Business Impacts, Benefits, and Attitudes." *Portland State University School of Urban Studies and Planning*. 2010

Aims to research and closely examine the perceived benefits and impacts of bike corals on local businesses proximate to a corral. Web-based survey administered for all businesses within one half-block of a bike corral. Survey results show bike corrals are perceived to help promote sustainability, enhance street and neighborhood identity, increase foot and bike traffic, etc.

Michigan Department of Transportation. "State Long Range Plan 2005-2030. Travel Characteristics Technical Report." Prepared with assistance from Wilbur Smith Associates. August 8, 2006.

National Transportation Enhancements Clearinghouse. "The Social and Economic Benefits of Transportation Enhancements."

Showcases 10 projects that demonstrated the potential of the Transportation Enhancements (TE) program to bring about positive change and economic growth in local communities.

National Bicycle and Pedestrian Clearinghouse. "The Economic and Social Benefits of Off-Road Bicycle and Pedestrian Facilities." Technical Assistance Series, Number 2. September 1995.

Nelson, Charles et al. "Rail-Trails and Special Events: Community and Economic Benefits." Michigan State University.

Discusses community and economic benefits associated with two recreational bicycle special events held on the Pere Marquette Rail-Trail (PMRT) in Midland County Michigan. Both events brought into over \$450,000 total in direct spending in the year 1999.

New York City DOT. "Measuring the Street: New Metrics for 21<sup>st</sup> Century Streets." 2012.

Discusses key approaches to street design projects, as well as how to measure results against goals for safety. Using a cross-section of recent NYCDOT street design projects, the report details the metrics which NYCDOT uses to evaluate street projects. Metrics include: crashes and injuries, volume of vehicles, traffic speed, economic vitality, user satisfaction, and environmental and public health benefits.

Nighswander, Matt. "Bike lanes may benefit small businesses." *NBC News*.

Outdoor Industry Foundation. "The Active Outdoor Recreation Economy." Boulder, CO. 2006.

Analyzes the active outdoor recreation economy and calculates its total economic impact in the United States. Looks at subgroups of the industry such as different types of recreation, participation across different regions, sales revenue generated, jobs involved in supporting the industry.

Pew Center on the States and The Rockefeller Foundation. "Measuring Transportation Investments: The Road to Results." May 2011.

Identifies which states have the essential tools in place to make more cost-effective transportation funding and policy choices. Conclude that states generally have the goals, performance measures, and data to help them measure progress in regards to safety and infrastructure preservation. In other important areas such as jobs, commerce and environmental stewardship, policy makers as well as the public need better and more information about the results they are getting for their money.

Rails-to-Trails-Conservancy. "Active Transportation Beyond Urban Centers: Walking and Bicycling in Small Towns and Rural America." Washington, DC.

New analysis of 2009 National Household Travel Survey for five different types of rural areas improves upon previous research which placed all types of rural areas in one category. Report shows that, for some categories of rural communities, human-powered mobility is as common as in urban areas. Discusses the need for federal investments in smaller communities as compared to more urban areas.

Rails-to-Trails Conservancy. "Active Transportation for America: The Case for Increased Federal Investment in Bicycling and Walking." Washington, DC. 2008.

Report quantifies the benefits from bicycling and walking under business-as-usual scenario, modest scenario, and substantial scenario. Benefits include avoided driving, fuel savings, CO2 emission reductions, and physical activity. Benefits to the economy range from \$4.1 billion per year in the BAU case to \$65.9 billion in the substantial scenario.

Rails-to-Trails-Conservancy. "D&L Trail 2012 User Survey and Economic Impact Analysis." December 2012.

Study conducted in 2012 to quantify the number of users on different sections of the Delaware and Lehigh National Heritage Corridor across different sections of the trail.

Surveys were also available along the trail that asked questions regarding trail usage, distance travelled to use the trail, amount of money spent while visiting the trail/region, etc.

Rails-to-Trails-Conservancy. "Trail User Surveys and Economic Impact: A Comparison of Trail User Expenditures 2009." March 2009

Report focuses on reported dollars spent from trail user surveys completed on seven rail-trails in Pennsylvania.

Rodgers, Anthony and Patrick Vaughan. "The World Health Report 2002: Reducing Risks, Promoting Healthy Life." World Health Organization. 2002.

Describes the amount of disease, disability and death in the world today that can be attributed to a selected number of the most important risks to human health. Also calculates how much of the current burden could be avoided in the next couple of decades if these risk factors are reduced.

Ryan, Bill. "Economic Benefits of a Walkable Community." *Let's Talk Business – Ideas for Expanding Retail and Services in Your Community*. July 2003.

Sayer, Jim. "Calculating the Value of Bicycle Travel." Adventure Cycling Association. 21 March, 2012.

Powerpoint presentation on the value of bicycle travel and associated projects in different locations worldwide.

Schroeder, P. & Wilbur, M. (2013, October). "2012 National survey of bicyclist and pedestrian attitudes and behavior, volume 2: Findings report." (Report No. DOT HS 811 841 B). Washington, DC: National Highway Traffic Safety Administration.

Snyder, Ryan. "The Economic Value of Active Transportation." Ryan Snyder Associates, LLC.

Fact sheet detailing the benefits of active transportation and how it relates to community design.

Southwick Associates. "The Outdoor Recreation Economy: Technical Report on Methods and Findings." 31 August, 2012.

Study updates and expands upon 2006 study of active outdoor recreation by adding an additional survey to gauge the broader economic contributions of outdoor recreation. In order to combine economic contributions from the two surveys, a set of activities was defined that encompasses both types of recreation (motorized and non-motorized). Total economic impact is calculated as a sum of direct, indirect, and induced effects.

The Center for Research on Economic and Social Policy (CRESP) of the University of Colorado at Denver. "Bicycling and Walking in Colorado: Economic Impact and Household Survey Results." April 2000.

Provides statistical information regarding the economic impact of bicycling in Colorado. Data are gathered from phone and mail surveys of bicycle manufacturers, retail bicycle shops, and ski resort operators in Colorado. Economic impact from bicycling in Colorado calculated to be over \$1 billion annually, primarily from bicycle manufacturing.

Tomes, Patricia and Carl Knoch. "Trail User Surveys and Economic Impact: A Comparison of Trail User Expenditures 2009." Rails-to-Trails Conservancy. March 2009.

Compares survey responses completed on seven rail-trails in Pennsylvania to seven user surveys completed on comparable trails in the northeast U.S. Report reviews a selection of trail user surveys analyzing the economic impact of rail-trails, compares the data and methodology used, and creates a comparative table which details dollars amount spent per trail user on each trail.

Transportation Alternatives. "Streets to Live By." August 2008.

Examines the costs and benefits of a wide-ranging "livable streets" program in NYC, a program that aims to increase pedestrian and bicycle usage of City streets. Paper reviews the Livable Streets movement, how the movement will benefit the community and the economy, and how to best make NYC livable. Recommendations include making livable streets the rule, increasing the amount of walking in NYC, promoting livable streets on the basis of public health and in business districts, etc.

Vancouver Area Cycling Coalition. "How do Bikes Benefit Business?"

Vogt, Christine, Chuck Nelson, and Joel Lynch. "Business Analysis Report – Impacts of the Pere Marquette Rail-Trail on the Economy and Business Community of Midland and Isabella Counties, Michigan." *Department of Park, Recreation and Tourism Resources, Michigan State University*.

Powerpoint describing the benefits and costs related to the construction and use of the Pere Marquette Rail-Trail.

Woehrer, Julia. "New Pavement Means New Customers for Local Businesses." *Northwest Michigan's Second Wave*. 23 October, 2012.

Yates, Gus. "The Economic Case for Carfree Development." *CarFree City, USA*.

Powerpoint presentation detailing the benefits of a car-free development plan. Benefits include less automobile-related fatalities, lower levels of obesity, pollution decreases, decreases in household transportation costs, infrastructure savings, etc.

# **APPENDIX B.**

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## **Data Sources**

## APPENDIX B.

# Data Sources

A number of data sources were used in calculating the overall economic and community benefits and reporting on bicycling in Michigan including:

**2013 Michigan Department of Transportation Household Survey on Bicycling** – as a part of the study, an online household survey was conducted collecting information from Michigan residents about their bicycling habits and spending. Responses were collected through outreach to statewide bicycle advocacy organizations, social media, cards distributed in each of the case study communities and post cards mailed to a random selection of households in the case study communities. Over 3,200 Michigan residents responded to the survey including 744 responses from the random post-card mailing. For estimates of bicycling participation and household spending, study team relied on the responses gathered from the responses collected through the mailing effort as these responses were the most representative of typical Michigan residents.

**The American Community Survey (ACS)** – The ACS is a survey conducted by the United States Census Bureau on an ongoing basis. It provides statistically reliable information on residents throughout the United States for a variety of topics including basic demographics, employment, transportation and payments for essential goods and services.

**Dun & Bradstreet (D&B)** – D&B provides information on businesses by industry and location. Data from Hoovers, a D&B subsidiary, provides information on the revenues and employment of bicycle-related manufactures and retailers throughout the state.

**Michigan Department of Community Health (MDCH)** – The Michigan Department of Community health provides health services to millions of Michigan residents each year and provides information on the rate of certain diseases and medical conditions such as stroke and heart disease.

**The Centers for Disease Control and Prevention (CDC)** – The CDC is operated by the United States Department of Health and Human services and collects data on health problems throughout the country.

**Journal of Occupational and Environmental Medicine** – The Journal of Occupational and Environmental Medicine publishes scholarly research on various issues at the intersection of health and the workplace, including investigations on how illness impacts business and employees.

**National Bicycle Dealers Association (NBDA)** – The NBDA promotes the interest of bicycle retailers across the country and provides data on bicycle sales in the United States.

**National Survey on Recreation and the Environment (NSRE)** – The NSRE collects data regarding the recreational patterns of Americans, including the popularity of various outdoor activities and the spending profiles associated with each.

**League of Michigan Bicyclists (LMB)** – The LMB advocates for bicyclists in Michigan and provides policymakers with valuable information on bicycling in the state. The League organizes events and collects and distributes data and reports.

# **APPENDIX C.**

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## **Survey Instrument**

# APPENDIX C.

## Survey Methodology and Instrument

This appendix provides a description of the methodology used for 2013 Michigan Department of Transportation Household Survey on Bicycling followed by a copy of the survey instrument.

### Background

The survey was conducted online via Survey Monkey and responses were collected through a variety of means including:

- Outreach to statewide bicycle advocacy organizations and events;
- Information distributed at businesses and other public locations in each of the case study communities; and
- Post cards mailed to a random selection of households in each of the five case study communities.

As an incentive for participating in the survey, participants were offered the opportunity to participate in a random drawing for one of five donated \$50 gift certificates to Michigan businesses.

### Survey Participation

In all, 3,266 individuals participated in the survey, including the following overall responses from the case study communities:

- Ann Arbor: 519
- Detroit (two neighborhoods): 88
- Grand Rapids: 314
- Holland: 215
- Traverse City: 310

In order to gather information from a more representative sample of households in the case study communities, the study team used mailing address data from Survey Sampling International (SSI), a national firm that provides survey sampling data for research purposes.

Using the information from SSI, the study team mailed a total of 38,078 postcards to households in the five case study communities. Postcards were mailed to 7,680 randomly sampled households in each of the four larger case study communities: Ann Arbor, Grand Rapids, Holland and the two Detroit neighborhoods. The study team mailed postcards to all 7,358 provided in the SSI database for Traverse City. The numbers of households in each case study community that took the survey in response to the postcard are listed below:

- Ann Arbor: 207
- Detroit: 58
- Grand Rapids: 132
- Holland: 156
- Traverse City: 177

## Survey Instrument

The Michigan Department of Transportation (MDOT) is conducting a study assessing the economic impacts of bicycling throughout the state. Along with a study team consisting of BBC Research & Consulting and Rory Neuner Consulting, MDOT is interested in learning more about bicycling participation and related spending habits of Michigan residents. Even if you do not participate in bicycling, your input is very valuable.

Please take a few minutes to complete the following survey. The survey should take you no more than 10 minutes to complete. There are no right or wrong answers, your answers are anonymous and every answer is very important to us. Thank you for your participation!

1. How many bicycles does your household own?
  - a. 0
  - b. 1
  - c. 2
  - d. 3
  - e. 4
  - f. 5
  - g. 6 or more
  
2. Have you personally ridden a bicycle for any reason in the past year?
  - a. Yes
  - b. No **(Skip to 12)**
  
3. What type of bicycle do you primarily use?
  - a. Road bicycle
  - b. Mountain bicycle
  - c. Touring
  - d. Commuter bicycle
  - e. Cruiser bicycle
  - f. Other
    - i. \_\_\_\_
  
4. Where did you purchase your primary bicycle?
  - a. Bicycle-specific retail store
  - b. Sporting goods store (e.g., REI, Dicks' Sports, Dunham' Sport)
  - c. Discount/department/general retail store (e.g., Walmart, Meijer)
  - d. Toy store (e.g. Toys-R-Us)
  - e. Mail order
  - f. Second-hand (e.g., craigslist, garage sale)
  - g. Gift
  - h. Other

5. How much did you pay for your primary bicycle?
  - a. \$1-100
  - b. \$101-250
  - c. \$251-500
  - d. \$501-1,000
  - e. \$1,001-2,000
  - f. \$2,001-3,000
  - g. \$3,001-4,000
  - h. \$4,001-5,000
  - i. \$5,001 or more
  
6. Approximately how many total years do you expect to use your primary bicycle before getting a new one?
  - a. Less than 1 year
  - b. 1 year
  - c. 2 years
  - d. 3 years
  - e. 4 years
  - f. 5 years
  - g. 6 years
  - h. 7 years
  - i. 8 or more years
  
7. On average, how many days per week do you ride a bicycle for any purpose throughout the year?
  - a. Less than 1 day per week
  - b. 1 day per week
  - c. 2 days per week
  - d. 3 days per week
  - e. 4 days per week
  - f. 5 or more days per week
  
8. What is the average distance you travel on a day you ride your bicycle?
  - a. Less than 1 mile
  - b. 1-2 miles
  - c. 3-4 miles
  - d. 5-10 miles
  - e. 11-15 miles
  - f. 16-20 miles
  - g. 21 or more miles
  
9. How frequently, on average, do you use a bicycle to commute to work or school?
  - a. Never
  - b. Occasionally, but less than 1 day per week
  - c. 1 day per week
  - d. 2 days per week
  - e. 3 days per week
  - f. 4 days per week
  - g. 5 or more days per week

10. How frequently, on average, do you use a bicycle for transportation other than to work or school? (e.g., shopping, social activities)
- Never
  - Occasionally, but less than 1 day per week
  - 1 day per week
  - 2 days per week
  - 3 days per week
  - 4 days per week
  - 5 or more days per week
11. How frequently, on average, do you use a bicycle for recreation or exercise?
- Never
  - Occasionally, but less than 1 day per week
  - 1 day per week
  - 2 days per week
  - 3 days per week
  - 4 days per week
  - 5 or more days per week
12. How much money does your household spend annually on bicycle-related expenditures including bicycles, equipment, apparel, and maintenance?
- \$0
  - \$1-100
  - \$101-250
  - \$251-500
  - \$501-1,000
  - \$1,001-2,000
  - \$2,001-3,000
  - \$3,001-4,000
  - \$4,001-5,000
  - \$5,001 or more
13. What percentage of your annual bicycling expenditures is specific to commuting to work by bicycle?
- 0% (i.e. I do not commute by bicycle or do not spend more money because I commute)
  - 1-10%
  - 11-20%
  - 21-30%
  - 31-40%
  - 41-50%
  - 51-60%
  - 61-70%
  - 71-80%
  - 81-90%
  - 91-100%
  - Don't know

14. What is the annual value you would place on being able to access bicycle infrastructure (e.g. bicycle lanes, paths and racks), rather than using non-bicycle infrastructure (i.e. sharing infrastructure with automobiles and pedestrians)?
- \$0 (i.e. the ability to use bicycle infrastructure is of no value to me)
  - \$1-100
  - \$101-250
  - \$251-500
  - \$501-1,000
  - \$1,001-2,000
  - \$2,001-3,000
  - \$3,001-4,000
  - \$4,001-5,000
  - \$5,001 or more
15. Which of the following are barriers that prevent you from cycling in general or prevent you from cycling more than you currently do? (Check all that apply.)
- Safety concerns
  - Financial costs
  - Lack of infrastructure (e.g. bicycle lanes, bicycle racks)
  - Physically unable
  - Weather conditions
  - Lack of necessary time
  - Crime
  - Other
  - i. \_\_\_\_\_
16. Which of the following are barriers that prevent you from commuting by bicycle or prevent you from commuting by bicycle more than you currently do? (Check all that apply.)
- Safety concerns
  - Financial costs
  - Lack of infrastructure (e.g. bicycle lanes, bicycle racks)
  - Physically unable
  - Weather conditions
  - Distance (i.e. commute is too long)
  - Lack of facilities at destination (e.g. shower, changing room)
  - Crime
  - Lack of transit nearby
  - Must have a car for job
  - Crossing barriers (e.g. rivers, highways/major roadways)
  - Other
  - i. \_\_\_\_\_
17. Have you participated in an organized bicycle event in Michigan (e.g. Bike Ypsi Fall Ride, Tour de Troit) or taken a vacation in Michigan during which bicycling was a key activity (i.e. bicycling-oriented vacation) in the past 12 months?
- Yes
  - No **(Skip to 28)**

18. How many organized bicycling events in Michigan (e.g. Bike Ypsi Fall Ride, Tour de Troit) did you participate in during the past 12 months?

- a. 0 **(Skip to 20)**
- b. 1
- c. 2
- d. 3
- e. 4
- f. 5 or more

19. In which event(s) did you participate? (Check all that apply.)

- |                                       |   |
|---------------------------------------|---|
| a. Wish-a-mile Bicycle Tour           | u. Addison Oaks Fall XC Race                |
| b. TART Trails' Tour de TART          | v. Bell's Beer Copper Harbor Trail Festival |
| c. West Michigan Bike MS Ride         | w. Bell's Beer Iceman Cometh                |
| d. Holland 100 Bicycle Tour           | x. Triple Trail Challenge                   |
| e. 100 Grand Bicycle Tour             | y. Michigan Mountain Mayhem                 |
| f. MSU Grand Fondo                    | z. Ore to Shore                             |
| g. Covered Bridge Bike Tour           | aa. Zoo-De-Mackinac                         |
| h. The Cone Axalia Classic Road Race  | bb. Pedal and Paddle Bicycle Tour           |
| i. Bike Ypsi Spring Ride and Festival | cc. The 100,000 Metre T-shirt Ride          |
| j. One Helluva Ride                   | dd. PALM (Pedal Across Lower Michigan)      |
| k. Cycle Into Spring                  | ee. Michigander (2-day)                     |
| l. Tour de Troit                      | ff. Michigander (6-day)                     |
| m. Green Cruise                       | gg. Ability Tour                            |
| n. Tailwind Racing Lower Huron        | hh. Other                                   |
| o. Petoskey Northmen Cross            | i. _____                                    |
| p. Swamp Thing CX #2                  | ii. Other                                   |
| q. Kisscross Holland                  | i. _____                                    |
| r. Big Bad Wolf Adventure Challenge   | jj. Other                                   |
| s. CXPreX Ann Arbor                   | i. _____                                    |
| t. Ithaca Grand Prix of Cyclocross    |   |

20. How many days did you spend participating in bicycling events and bicycling-oriented vacations in Michigan over the past 12 months?
- a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. 5-7
  - f. 8-10
  - g. 11-15
  - h. 16-20
  - i. 21 or more
21. How much money did you spend per day on lodging (e.g. hotels, campgrounds, cottages) related to bicycling events and bicycling-oriented vacations in Michigan?
- a. \$0
  - b. \$1-25
  - c. \$26-50
  - d. \$51-100
  - e. \$101-250
  - f. \$251-500
  - g. \$501-1,000
  - h. \$1,001-2,000
  - i. \$2,000 or more
22. How much money did you spend per day at restaurants and bars related to bicycling events and bicycling-oriented vacations in Michigan?
- a. \$0
  - b. \$1-25
  - c. \$26-50
  - d. \$51-100
  - e. \$101-250
  - f. \$251-500
  - g. \$501-1,000
  - h. \$1,001-2,000
  - i. \$2,000 or more
23. How much money did you spend per day on groceries (i.e. food and beverage **not** at restaurants and bars) during bicycling events and bicycling-oriented vacations in Michigan?
- a. \$0
  - b. \$1-25
  - c. \$26-50
  - d. \$51-100
  - e. \$101-250
  - f. \$251-500
  - g. \$501-1,000
  - h. \$1,001-2,000
  - i. \$2,000 or more

24. How much money did you spend per day on general non-food shopping (clothing, souvenirs, etc.) related to bicycling events and bicycling-oriented vacations in Michigan?
- a. \$0
  - b. \$1-25
  - c. \$26-50
  - d. \$51-100
  - e. \$101-250
  - f. \$251-500
  - g. \$501-1,000
  - h. \$1,001-2,000
  - i. \$2,000 or more
25. How much money did you spend per day on non-bicycling recreation and entertainment (i.e. amusement park, movie theater, etc.) during bicycling events and bicycling-oriented vacations in Michigan?
- a. \$0
  - b. \$1-25
  - c. \$26-50
  - d. \$51-100
  - e. \$101-250
  - f. \$251-500
  - g. \$501-1,000
  - h. \$1,001-2,000
  - i. \$2,000 or more
26. How much money did you spend in total on transportation (e.g. gas, parking, bus, or train fare) during bicycling events and bicycling-oriented vacations in Michigan over the past 12 months?
- a. \$0
  - b. \$1-25
  - c. \$26-50
  - d. \$51-100
  - e. \$101-250
  - f. \$251-500
  - g. \$501-1,000
  - h. \$1,001-2,000
  - i. \$2,000 or more
27. How much money did you spend in total on entry or registration fees for bicycling events and bicycling-oriented vacations in Michigan over the past 12 months?
- a. \$0
  - b. \$1-25
  - c. \$26-50
  - d. \$51-100
  - e. \$101-250
  - f. \$251-500
  - g. \$501-1,000
  - h. \$1,001-2,000
  - i. \$2,000 or more

28. What is your age?
- a. 15 or below
  - b. 16-24
  - c. 25-34
  - d. 35-50
  - e. 51-64
  - f. 65 or above
29. What is your gender?
- a. Male
  - b. Female
30. Do you have a driver's license?
- a. Yes
  - b. No
31. Which city or area best describes where you live?
- a. Detroit - Southwest Detroit
  - b. Detroit - Conner Creek Greenway
  - c. Detroit - Other Neighborhood or Metro Area
  - d. Ann Arbor
  - e. Grand Rapids
  - f. Holland
  - g. Traverse City
  - h. Other
  - i. \_\_\_\_\_
32. What is your zip code?
- a. \_\_\_\_\_ (write in)
33. In what type of residence do you live?
- a. Single-family home
  - b. Townhouse/condo
  - c. Duplex/triplex/fourplex
  - d. Apartment
  - e. Mobile home/trailer
  - f. Dormitory/boarding house
  - g. Other
34. How many people in each of the following age ranges live in your household (including yourself)?
- a. \_\_\_ ages 0-4
  - b. \_\_\_ ages 5-15
  - c. \_\_\_ ages 16-24
  - d. \_\_\_ ages 25-34
  - e. \_\_\_ ages 35-50
  - f. \_\_\_ ages 51-64
  - g. \_\_\_ ages 65 or older

35. How many registered automobiles are owned by members of your household?
- 0 automobiles
  - 1 automobile
  - 2 automobiles
  - 3 automobiles
  - 4 or more automobiles
36. Which of the following best describes you? (Check all that apply)
- Employed - full-time
  - Employed - part-time
  - Homemaker **(skip to 38)**
  - Retired **(skip to 38)**
  - Student - Full-time
  - Student - Part-time
  - Unemployed
37. What is the one-way distance from your home to your place of work or school?
- Less than 1 mile
  - 1-2 miles
  - 3-4 miles
  - 5-6 miles
  - 7-8 miles
  - 9-10 miles
  - 11-15 miles
  - 16-20 miles
  - 21-30 miles
  - 31-40 miles
  - 41 or more miles
  - I do not leave my home for work or school
38. What is your annual household income?
- Less than \$20,000
  - \$20,001-30,000
  - \$30,001-40,000
  - \$40,001-50,000
  - \$50,001-75,000
  - \$75,001-100,000
  - \$125,001-150,000
  - \$150,001-200,000
  - \$200,001 or more
39. How did you hear about this survey?
- Postcard mailed to my home
  - Local business (e.g. bicycle retailer, coffee shop, etc.)
  - Direct contact with MDOT or the study team
  - Social media (e.g. Facebook)
  - Word of mouth
  - Other
    - \_\_\_\_\_

40. Please provide any additional comments or information not addressed in the survey
- a. \_\_\_\_\_ (text response)
41. Would you like to be entered into a drawing for a chance to win a \$50 gift certificate?
- a. Yes
  - b. No **(End survey)**
42. What is your name? (required for drawing)
- a. \_\_\_\_\_
43. What is your email address? (required for drawing)
- a. \_\_\_\_\_

# **APPENDIX D.**

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## **Qualitative Interview Participants**

# APPENDIX D.

## Qualitative Interview Participants

As a part of the study, a number of representatives from local governments, businesses and community organizations were interviewed about the relationship of bicycling to the economy. These stakeholders provided information and data on bicycling in the case study communities and Michigan as a whole. The study team would like to thank all of the individuals for their participation in the project. Below is a list of all of the interview participants.

Meg Ackerman, Michigan Fitness Foundation

Alex Allen, Detroit Eastside Community Collaborative (DECC)

Dennis Bean-Larsen, Fixed Gear Gallery and ERG! Energy Bar

Sandra Brewer, Velo City Cycles

Erica Briggs-Whitacre, Washtenaw Biking and Walking Coalition

Andrea Brown, Michigan Association of Planning

James Bruckbauer, Michigan Land Use Institute (MLUI) and Local Motion

Brian Burch, Holland City Council

Harry Burkholder, Land Information Access Association (LIAA)

Jane Clark, Michigan West Coast Chamber of Commerce

Julie Clark, TART Trails

Eli Cooper, City of Ann Arbor, Transportation Program Manager

Norman Cox, Principal, The Greenway Collaborative

Larry Deck, Washtenaw Biking and Walking Coalition

Mark DeWitt, Hope College

Joshua Duggan, Greater Grand Rapids Bicycling Coalition

Sean Fahey, Steelcase

Jason Fiedler, Back Alley Bikes and the Hub of Detroit

Tim Fischer, Michigan Environmental Council

Kathryn Gray, Transportation for Michigan (Trans4M)

Leah Groya, LivingLab

Laura Harris, Cross Country Cycle

Susan Hartger, CycleSafe

Richard Hartger, CycleSafe

Elisa Hoekwater, Macatawa Area Coordinating Council

Carra Hood, Event Planner, Tulip Time Festival

Gary Howe, MyWheelsAreTurning.org and Traverse City Commissioner

Abed Itani, Grand Valley Metro Council (MPO)

Kelli Kavanaugh, Owner, The Wheelhouse; Co-Director, Tour de Troit

Nancy Krupiarz, Michigan Trails and Greenways Alliance

Sally Laukitis, Executive Director, Holland Convention and Visitors Bureau

Libby Levy, Detroit Eastside Community Collaborative (DECC)

Piotr Lewak, City of Grand Rapids

John Lindenmayer, Director of Advocacy and Policy, League of Michigan Bicyclists

Jim Lively, Michigan Land Use Institute

Missy Luick, City of Traverse City

Mathias J. McCauley, Director for Regional Planning & Community Development, Northwest Michigan Council of Governments (NWMCOG)

Phil Meyer, Director of Community and Neighborhood Services, City of Holland

Rich Moeller, Executive Director, League of Michigan Bicyclists

Kevin Mulder, Clean Energy Coalition

Dennis Murphy, President, Michigan Mountain Biking Association

Richard Murphy, Michigan Suburbs Alliance

Prasad Nannapaneni, City of Detroit

Michael Norton, Traverse City Tourism

Heather Nugen, Back Alley Bikes and the Hub of Detroit

Sharon Nunnelee, Executive Director, West Michigan Trails and Greenways Alliance

Lisa Nuskowski, Wayne State University

Danielle Ostafinski, Catalyst Partners

Sarah Panken, Michigan Fitness Foundation

Melissa Periano, Grand Valley State University

Nate Phelps, Central District Cyclery

Rick Plite, Promoter, Kisscross and Barry-Roubaix

Michael Reuter, American Cycle and Fitness

Angela Reyes, Executive Director, Greater Detroit Hispanic Development Corporation (DHDC)

Matthew Roling, Rock Ventures / Quicken Loans

Matt Ruitter, Velocity Cycles

Suzanne Schulz, City of Grand Rapids

Todd Scott, Detroit Greenways Coalition

Heather Seyfarth, Clean Energy Coalition

Nancy Shore, getDowntown Program

Jessica Souillaire, Editor, ModeShift

Jeri Stroupe, Wayne State University

Sarah Szurpicki, Let's Save Michigan

Myra Tetteh, Detroit Complete Streets Coalition

Thomas Tilma, Greater Grand Rapids Bicycling Coalition

Mark Vanderploeg, City of Holland

Brad White, Velo City Cycles

Matthew Wiesen, Crystal River Outfitters and the Crystal River Cyclery

Keith Winn, Catalyst Partners

Andrea Winn, Catalyst Partners

Tom Woiwode, Community Foundation of Southeast Michigan

RJ Wolney, Rock Ventures / Quicken Loans

Jeff Yonker, Terra Trike/ WizWheelz Inc.

Theresa Zajac, Southwest Detroit Business Association

Michael Zonk, Grand Valley Metro Council (MPO)

Christopher Zull, City of Grand Rapids

# Bicycling in MICHIGAN



Population: 9,897,264

Total annual economic impact of bicycling  
**\$668 million**



Bicycling retail revenue

**\$63 million**

**44%**

Residents who place an annual value of at least \$100 on the ability to use bicycle infrastructure

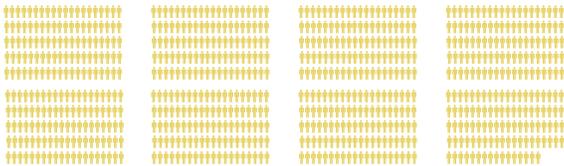
Total annual spending associated with bicycling events and vacations in Michigan

**\$38 million**

**39%**

Households that reported that someone in their home used a bike for transportation in the last year

People employed by bicycling industry: 796



**28%**

Bicyclists who commute by bicycle at least twice a week

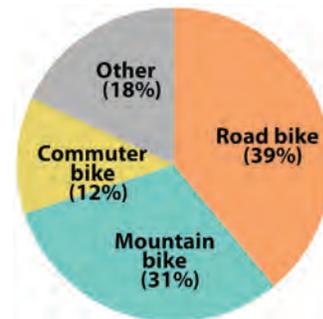
**4%**

Residents who participated in a bicycling event or bicycle-oriented vacation in Michigan in the past year

## Key barriers to bicycling



## Top primary bicycle types



Study funded by MDOT

For more information contact Josh DeBruyn, MDOT Bicycle and Pedestrian Coordinator at [debruynj@michigan.gov](mailto:debruynj@michigan.gov)

This infographic provides a one-page summary of bicycling in the state of Michigan based on information gathered by BBC Research & Consulting and R. Neuner Consulting for the Michigan Department of Transportation (MDOT) as part of the first phase of a two-phase study on the economic benefits of bicycling in Michigan. The infographic is accompanied by a report providing information on the state of Michigan and the data sources and methodology used for the study. A household survey was conducted with Michigan residents, which gathered the following information shown on the infographic:

- Annual spending associated with bicycling events and vacations;
- Key barriers to bicycling;
- Percent of residents who place an annual value of at least \$100 on the ability to use bicycle infrastructure;
- Percent of bicyclists who commute by bicycle at least twice a week;
- Percent of residents who participated in a bicycling event in Michigan in the past year; and
- Primary types of bicycles used by residents.

Below is a description of the data source for other data on the infographic:

- Population – provided by the U.S. Census Bureau 2012 American Community Survey;
- Miles of existing infrastructure – gathered from interviews with local officials during the case study process;
- Bicycle Friendly Community<sup>SM</sup> Rating – a rating based on a number of metrics related to bicycling support and participation from the League of American Bicyclists;
- Households that reported that someone in their home used a bicycle for transportation in the last year – from the *Attitudes & Perceptions of Transportation in Michigan: A 2013 Survey of Michigan Adults* ([http://www.michigan.gov/documents/mdot/MDOT\\_2013\\_AP\\_SurveyReport\\_439065\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT_2013_AP_SurveyReport_439065_7.pdf)).
- Bicycling retail revenue – based on the three-year average annual revenue of bicycle retailers in Michigan reported in Dun & Bradstreet;
- People employed by bicycling industry – based on the three year annual employment averages for retail bicycle shops and bicycle manufactures located in Michigan as reported in Dun & Bradstreet;
- Total annual impact of bicycling – calculated from the following components:
  - Total household retail spending on bicycling reported by Michigan residents in the household survey (\$175 million);
  - The total household spending on bicycle events and vacations as reported by Michigan residents in the household survey (\$38 million);
  - The average three-year annual revenues of bicycle-related manufactures in Michigan as reported in Dun & Bradstreet (\$11 million);
  - The avoided health care costs due to physical activity from bicycling based on (\$256 million):
    - The statewide rates of hospitalization for stroke and heart disease from the United States Centers for Disease Control;
    - The proportion of heart disease and stroke due to physical inactivity from the World Health Organization;
    - The proportion of residents who are physical active using their bicycle from the household survey; and
    - The average cost of hospitalization for stroke and heart disease from the Michigan Department of Community Health.
  - The avoided costs of absenteeism for Michigan employees due to bicycling based on (\$187 million):
    - The proportion of residents who are physical active using their bicycle from the household survey;
    - The cost of absenteeism per day from the Journal of Occupational and Environmental Medicine;<sup>1</sup> and
    - The number of days per year of avoided absenteeism due to cycling from the London School of Economics.<sup>2</sup>

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<sup>1</sup> The Health and Productivity Cost Burden of the “Top 10” Physical and Mental Health Conditions Affecting Six Large U.S. Employers in 1999, by Dr. Ron Z. Goetzel, et al.

<sup>2</sup> The British Cycling Economy Gross Cycling Product Report. London School of Economics