

# Measuring the Health Benefits of Walking and Bicycling

## Nashville Area Metropolitan Planning Organization (MPO)

**About the Nashville Area MPO:** The Nashville Area Metropolitan Planning Organization (MPO) is the regional transportation planning agency for the seven-county region in and around Nashville, Tennessee. The MPO facilitates strategic planning for the region's multi-modal transportation system by serving as a forum for collaboration among local communities and state leaders to dedicate federal transportation dollars to transportation projects and programs. The MPO aims to help improve public health with the transportation projects it funds, while providing access and mobility for the 1.7 million people who live and work in the region.

**Success:** Policy, Funding, Projects, Research and Forecasting that incorporate health benefits in the transportation planning process.

---

### Transportation and Health:

In the last ten years, increasing childhood and adult obesity rates have brought national attention to the health of people in the United States. Obesity is related to numerous diseases including cancers, diabetes and heart disease, to name a few. There are two factors that are primary contributors to obesity and much of health in general: how much individuals eat and how much they move. During this same timeframe, demand for more transportation options has increased. Our roadways have reached capacity for the number of vehicles they can accommodate, and as a nation we are running out of both room and money to build more roads. National polls show that people want transportation options such as walking, bicycling and transit.

Given that 50% of the trips taken in cities are three miles or less, walking and bicycling not only provide options that are often faster and cheaper than driving, they also provide opportunities for people to move. Transportation-related physical activity often happens in small increments – a 10 minute walk to the bus stop or a walk to get a cup of coffee. These small trips provide opportunities to get physical activity, even if we are not actively thinking of transportation as “exercise.”

In response to worsening public health, decreasing transportation funding and increasing interest in transportation options, communities are building more sidewalks, bikeways and transit systems. Although these structures are often much less expensive than new roadways, there is pressure to “prove” that walking, bicycling and transit provide benefits. Fortunately, studies are published almost daily illustrating that cities with transportation options tend to have stronger economies, fewer traffic-related crashes and often populations with lower rates of obesity.

Upon moving to downtown Nashville from the Washington, DC metro region, my ability to get to the places I needed to go markedly decreased. While I chose to live within walking or biking distance from work, making most of my daily commute easy, quick and reliable, a vast majority of the places I've needed to travel have been inaccessible or too dangerous to get to by transit, walking or bicycling. A broken car for three months certainly did not help. Getting to grocery stores, shops, meetings, restaurants, coffee shops, community centers and friends' homes is more difficult, which means I go to these places less often and spend less money at local businesses. My social circles have also become more difficult to engage. With my friends and colleagues living in different parts of the city, mostly accessible via car in a city with worsening congestion, we are more at the mercy of traffic than I faced in DC. That means we have less time to enjoy each other's company or have productive meetings out of the office.

Since it's not easy or comfortable to walk or bicycle between most destinations, any discussion about how much we *should* be active as part of our daily routine becomes moot. If I am having so much trouble getting places – someone who enjoys and is used to walking and biking in the city – there's much more that needs to be done to make it easy, safe and friendly enough for the average person to travel on foot and bicycle.

Who makes decisions to build our roads, sidewalks, bikeways and transit systems and how are they using data to support transportation investments? In the U.S., Metropolitan Planning Organizations (MPOs) are responsible for long-range planning and near-term prioritizing of transportation projects for urban areas with more than 50,000 residents. MPOs arose from the Federal Highway Act of 1962, which mandated cities have a continuing, comprehensive and cooperative planning process to qualify for federal transportation funds. MPOs routinely work to improve mobility. However, health is typically a factor only in decisions regarding air quality and road safety. The Nashville Area MPO is among the first to recognize the broader interplay of transportation and public health, including transportation's potential to increase physical activity, access to destinations such as food stores and healthcare centers, and general quality of life.

The Nashville region faces several important transportation and health problems. First, Nashville is the most congested among cities with 1-3 million residents in the U.S., with commuters experiencing 47 hours of annual traffic delay. Second, Tennessee is the least active U.S. state, with 61% of adults failing to meet aerobic physical activity guidelines. Third, Tennessee is home to many residents who are overweight (3<sup>rd</sup> among states, 37% of adults) or obese (15<sup>th</sup> among states, 29% of adults).

### **Shifting Policy and Funding**

The Nashville Area MPO recognized the potential to address these problems by implementing multi-modal transportation policies in its 2035 Regional Transportation Plan, adopted in 2010. This shift in policy came from the public's strong interest in expanding public transit, increasing walking and bicycling options, and preserving existing roadways over building new roads. These preferences were voiced in a 2010 survey of 1,100 randomly-selected households, which the MPO repeated with similar results in 2014.

Next, the MPO devised a system in which 60% of the criteria used to score and select transportation projects for federal funding quantified how a future roadway project could increase opportunities for active transportation, improve air quality and reduce crashes.

To increase funding available for healthy transportation choices, the MPO dedicated 70% of its largest revenue source – the Surface Transportation Program (STP) – to fund Complete Streets projects. Additionally, the MPO reserved 15% of STP funding for a newly-created Active Transportation Program (ATP) for bicycle- and pedestrian-specific infrastructure and programs. By comparison, the United States spends approximately 1-2% of its funding on walking and bicycling projects, so reserving 15% of this MPO funding source, in addition to supporting Complete Streets projects, represents a significant commitment to walking and bicycling.

What resulted from these policy and funding changes? Almost 70% of roadway projects included active transportation elements such as sidewalks and bike lanes. In the MPO's previous plan, adopted five years before in 2005, approximately 2% of roadway projects included these elements. What's more, the new ATP has awarded \$13.6 million to date for active transportation infrastructure and education projects.

### **Prioritizing with Equity**

Building greenways, bikeways and sidewalks in areas with high rates of health disparities and chronic diseases has an even greater potential to improve public health. The MPO had no data on which neighborhoods or streets people with greater incidence of disease actually live in the metro region. So the MPO mapped census blocks where people live with higher averages of low incomes, poverty rates and elderly residents because research has shown a correlation between these demographics and higher rates of chronic disease. If an active transportation project existed in one of these census blocks – called High Health Impact Areas – it received five full points in the MPO's project scoring and selection system. In this way, the MPO prioritized active transportation projects in places with greater socioeconomic determinants of poor health, making it more likely that a community with higher rates of chronic disease would be awarded a project to walk and bike from place to place.

### **Why We Decided to Conduct Unique Research on Health, Social Equity and Transportation**

Middle Tennesseans suffer from among the worst documented health disparities in the country. But the MPO largely only had anecdotes to describe people's habits or attitudes on walking or bicycling to get where they needed to go. We did not have data on how much people were walking or bicycling and where they were able to go on foot or bike. We certainly did not have data specific to our region that showed how the built environment and transportation network made it more or less likely that people would walk or bike, or how their active transportation habits correlated with their incidence of chronic diseases and health disparities. In order to ascertain how, more precisely, Middle Tennesseans' health could improve with more active transportation, we needed comprehensive, sub-county baseline data and a way to use those data to make projections of future health outcomes we could achieve with increases in walking and bicycling.

The MPO conducted the Middle Tennessee Transportation and Health Study (MTTHS) to measure residents' transportation behaviors and determine correlations of chronic disease. More than 6,000 households and 11,000 individuals participated in the first phase of the study by answering questions on their height, weight, general diet and health quality, and estimated time spent in physical activity and sitting. Participants also logged information about trips they took on a specific day in a travel diary.

The research conducted during the MTTHS yielded significant data about the transportation and health attributes of households throughout the MPO region. The data were used to create a new map of high health impact areas of the region. Respondents who have high Body Mass Index (BMI), low overall health quality, poor diet and low physical activity were analyzed for common demographic attributes. The results of the analysis showed that people who are classified as low income, unemployed, over the age of 65 or do not own a car are those that tend to have poorer health. These four attributes were mapped, and areas with three or more of the four attributes are considered priority areas for placement of walking and bicycling facilities. The new Health Priority Areas map helps the public and MPO staff see where active transportation projects could have the greatest impact on public health.

### **Predicting the Health Outcomes of Increased Walking and Bicycling**

The MTTHS data were also used to use the Integrated Transport and Health Impact Modeling (ITHIM) tool, which estimates the population-level health impacts of increased physical activity, reduced air pollution, and changes in transportation collisions that may be expected with more walking and bicycling. The ITHIM model suggests that changes in physical activity, air-quality, and collisions may contribute to reduced instances of diseases and deaths in the region.

For example, if the average Middle Tennessean gets 13 minutes a day in active transportation, cardiovascular disease could decrease across our region by 3% reduction and diabetes could decrease by 3%. Additionally, we could save \$32 million a year in health care savings. Given that the MPO dedicates approximately \$300 million a year to transportation projects, these health care savings would be significant for every dollar we spend creating new ways for people to walk and bike.

There were several innovative and exciting parts of this study. First, a study of people's active transportation levels across an MPO region in this level of detail – particularly with the use of GPS and accelerometer devices – had never been done before. Second, our region has never before been able to predict changes in chronic diseases among Middle Tennesseans if we can help people walk and bicycle more for their everyday transportation needs. Third, an MPO's first partnership with the CDC to undertake this kind of study is an example of the exciting work that can result from innovative partnerships. The expertise of CDC staff to use ITHIM has made it possible to predict how much rates of diabetes, heart disease, lung cancer, depression and more will decrease among Middle Tennesseans if we build a transportation network that makes walking and bicycling the easy choice.

### **Summary**

The Nashville Area MPO has made significant progress in integrating health into the transportation planning process by changing policy and project funding, as well as allocating funding for active transportation research and modeling.