Measuring the Health Benefits of Walking and Bicycling

Nashville Area Metropolitan Planning Organization Applies the Findings

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The Nashville Area Metropolitan Planning Organization (MPO) has experienced success in incorporating health benefits into the transportation planning process through policy, funding, projects, research, and forecasting. The MPO’s mission is to provide access and mobility for the 1.6 million people who live and work in Middle Tennessee—and at the same time to have a positive impact on public and environmental health.

As the federally designated regional transportation planning agency for the seven counties in and around Nashville, Tennessee, the MPO facilitates strategic planning for a multimodal transportation system. The MPO also serves as a forum for collaboration among local communities and state leaders to apportion federal funds for transportation projects and programs.

The Nashville Area MPO was among the first to recognize the interplay of transportation and public health, including transportation’s potential to increase physical activity while providing access to destinations—such as employment, housing, food stores, and health care—and improving the general quality of life.

Transportation and Health

In the past 10 years, the increasing rates of childhood and adult obesity have drawn national attention to health in the United States. Obesity is related to several diseases, including cancers, diabetes, and heart disease. The two primary contributors to obesity and to health status in general are how much individuals eat and how much they move. Of the trips taken in urban areas, 50 percent are 3 miles or less; walking and bicycling provide options that are often faster and less expensive than driving but also extend opportunities for physical activity.

Transportation-related physical activity often occurs in small increments—for example, a 10-minute walk to a bus stop and a midmorning walk to buy a cup of coffee. These small trips provide opportunities for physical activity, even if partici-
pants do not consider the trips exercise. National polls show that people want transportation options that include walking, bicycling, and transit.

The Nashville region faces several transportation and health problems. Nashville is the most traffic-congested U.S. city with 1 to 3 million residents; commuters experience 47 hours of annual traffic delay. In addition, Tennessee ranks 49th among states in level of physical activity—58 percent of adults fail to meet the guidelines for aerobic physical activity, and more than 68 percent of adults in the state are either overweight or obese.

**Shifting Policy and Funding**

The Nashville Area MPO recognized the potential to address these problems by shifting the transportation policy focus to public transit, walking, and bicycling. Surveys showed that public interest already was strong in expanding public transit, in increasing the active transportation options of walking and bicycling, and in preserving roadways and adding sidewalks, bikeways, and transit instead of building new roads. A 2010 MPO attitudinal survey of 1,100 randomly selected households identified these preferences, and a survey in 2014 confirmed the results.

The MPO devised a scoring and selection system for transportation projects; 60 percent of the criteria quantified ways that a roadway project could increase opportunities for active transportation, improve air quality, reduce crashes, and increase physical activity. The MPO then programmed 70 percent of its largest revenue source—funding from the Surface Transportation Program (STP)—to support complete streets projects, which safely accommodate all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities.

The MPO reserved 15 percent of STP funding for a newly created Active Transportation Program (ATP) for bicycle- and pedestrian-specific infrastructure and programs. In comparison, transportation budgets nationwide spend approximately 1 to 2 percent of funding on walking and bicycling facilities. By designating 15 percent, the Nashville Area MPO made a significant commitment to walking and bicycling.
bicycling projects in addition to the sidewalks and bikeways to be built as part of the complete streets projects.

Transit projects received 10 percent of the STP funds, and technology such as electronic signs and pedestrian signals received 5 percent. The MPO believes that innovations in transportation technology can improve transportation efficiency without having to build more roadways.

With the policy changes in the MPO’s 2035 Regional Transportation Plan, almost 70 percent of roadway projects included active transportation elements such as sidewalks and bikeways. In the previous 2030 plan, approximately 2 percent of roadway projects included these elements. Beyond roadway projects, the newly funded ATP has awarded $13.6 million for active transportation infrastructure and education projects.

Prioritizing with Equity
In prioritizing transportation projects that have a potential for improving health, the MPO wanted to concentrate on greenways, bikeways, and sidewalks in areas with high rates of health disparities and chronic diseases. This type of health data, however, often is not available for areas smaller than a county, such as a neighborhood or a street.

The MPO therefore consulted U.S. Census data as a proxy and identified areas with higher-than-average concentrations of low income, poverty, and adults over age 65. Overlaying these three groups allowed the MPO to focus on areas with populations

Integrating Health and Transportation in the Rural Context

Don Kostelec

Rural areas have higher highway fatality rates and offer fewer opportunities for complete active transportation networks than urban areas do. Three examples highlight ways that rural jurisdictions are addressing these topics and integrating health and transportation initiatives.

♦ In Haywood County, North Carolina, a bicycle plan defined investments that were likely to yield the highest positive impact on community health. The plan applied data on the body mass index (BMI) of students in nine schools and on changes in BMI; these data were combined with Census data to pinpoint investments in the geographic areas with the poorest health conditions.

♦ Buncombe County, North Carolina, integrated a health impact assessment (HIA) into a greenway plan and applied data from the State Center for Health Statistics (SCHS) to identify the locations most in need of project investment. SCHS compiled 13 datasets from the Census, the American Community Survey, and health records. The HIA overlaid these data to identify facilities for greenways in census tracts with the highest prevalence of poor health conditions.

♦ The Kansas Health Institute evaluated the health impacts of casino development in southeast Kansas and noted that “choices about transportation, education, and taxation are not made in what is typically thought of as the ‘health sector,’ and yet each has a profound influence on well-being and balancing a variety of scientific, policy, and economic considerations.”

The study included discussion of the impacts of traffic—for example, on safety, with the additional vehicle trips likely to increase the number of injuries from crashes. The report recommended ways to mitigate the effects of alcohol-related behaviors, such as a safe ride program to curb driving under the influence of alcohol and to provide transportation options for employees. The report noted that “during off-peak hours, safe ride buses can be used to help residents who do not own cars access needed services such as grocery stores, recreational facilities, and health care providers.” The study postulated that increases in liquor excise taxes could pay for the services.

As these examples show, the rural context is diverse. Because the datasets and resources for rural communities are limited, contextual approaches are needed to integrate health and transportation.

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likely to have higher rates of health disparities, more chronic disease, and less car ownership.

Providing opportunities for travel that incorporate physical activity not only addresses transportation options for people who depend on transit, walking, and bicycling but also provides opportunities for physical activity for everyone, including people with chronic diseases. Most chronic diseases have a high rate of positive response to physical activity, which may help to decrease or cure instances of disease.

Additional Research
To obtain more detailed information about health disparities and chronic disease at the subcounty level, the MPO conducted the Middle Tennessee Transportation and Health Study (MTTHS) to measure transportation behaviors and health attributes; the study encompassed 6,000 households and more than 11,000 individuals. Health questions included height, weight, general diet, and health quality and estimated the time spent in physical activity and sitting.

The MTTHS yielded significant data about the transportation and health attributes of households throughout the MPO region. The data generated a new map of high health impact areas in the region.

Common demographic attributes were analyzed for respondents with a high body mass index, low quality of health, poor diet, and low physical activity. The results showed that people who were classified as low income, unemployed, over age 65, or who did not own a car tended to have poorer health.

These four attributes were mapped, and areas with three or all of the four attributes were designated as priority locations for walking and bicycling facilities. The Health Priority Areas map enables MPO staff to prioritize transportation projects with potential positive health benefits in those areas.

Predicting Health Outcomes
The MTTHS data also were used to calibrate the Integrated Transport and Health Impact Modeling (ITHIM) tool, which estimates the population-level health impacts of increased physical activity, reduced air pollution, and altered transportation collision patterns. The tool creates population-level goals for physical activity related to transportation trips and determines the effects on diseases and deaths.

The MPO chose three transportation-related scenarios for the physical activity of walking and bicycling: 6 minutes a day, 10 minutes a day, and 150 minutes a week per person. According to the ITHIM projections of the changes in physical activity, air quality, and collisions, the 10-minutes-a-day scenario for all members of the population would yield an 11 percent reduction in population-level cardiovascular disease and an 11 percent reduction in diabetes, among other health benefits; the health care cost savings would amount to $200 million annually.

In contrast, the MPO allocates approximately $300 million a year in transportation projects. Monetizing the health savings has helped to illustrate the potential positive fiscal impacts on health care from transportation investments that provide opportunities for increased physical activity.

The Nashville Area MPO continues to integrate health into the transportation planning process by changing policies and project funding, as well as by allocating funds for active transportation research and modeling.

A midblock crossing on Belmont Boulevard increases the visibility of pedestrians and cyclists, making it easier for residents to use non-motorized modes of travel.

Active transportation features in 70 percent of roadway projects in the Nashville Metropolitan Planning Organization’s 2035 Regional Transportation Plan.