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Integrating health and transportation in Nashville, Tennessee, USA: From policy to projects



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ABSTRACT

The Nashville Area Metropolitan Planning Organization (MPO) is among the first MPOs in the United States to recognize the interplay of transportation and public health, particularly regarding physical activity, air pollution, and traffic crashes. The Nashville MPO has taken a multifaceted approach to simultaneously improve the transportation system, quality of life, and health status of the region's population. The purpose of this paper is to describe the multiple programs and projects that the MPO has undertaken to this end, so that other cities might learn from Nashville's example.

The MPO's strategy comprised six processes. First, the MPO conducted the Regional Bicycle and Pedestrian Study in 2009 and 2014 that established priority issues to be addressed by bicycle and pedestrian projects in Regional Transportation Plans. Second, the MPO responded to public opinion by adopting new transportation policies in the 2035 and 2040 Regional Transportation Plans, including increasing bicycle and pedestrian options and expanding public transit. Third, the MPO created scoring criteria for proposed roadway projects that prioritized health impacts. Fourth, the MPO reserved funding for projects selected under the new criteria and established a new funding program, the Active Transportation Program. Fifth, the MPO conducted the Middle Tennessee Transportation and Health Study, one of the first regional studies in the nation linking transportation and health. Finally, the MPO implemented the Integrated Transport and Health Impact Model which predicts and monetizes population-level health impacts of shifting the population towards active transportation modes.

Recent inventories of bicycle and pedestrian infrastructure suggest these interrelated processes are increasing opportunities for walking, bicycling, and public transit use in the region. Further, each of these projects has contributed to a growing appreciation in the region of the links between transportation and health, and continued evaluation efforts can determine if transportation behaviors and health outcomes are changing.

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1. Introduction

The Nashville Area Metropolitan Planning Organization (MPO) is the federally-designated regional transportation planning agency for 1.5 million people in a seven-county region around Nashville, Tennessee ([Nashville Area MPO, 2016](#)).

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The MPO performs strategic planning for the region's multi-modal transportation system and serves as a forum for collaboration among local communities and state leaders to allocate federal transportation dollars for transportation projects and programs. The MPO works with its members, which include local governments, public transit agencies, and the Tennessee Department of Transportation, to identify likely regional transportation needs at least two decades in the future (as required by federal law), and then allocate funding for projects to address these needs. Through transportation planning, the Nashville Area MPO aims to positively impact public and environmental health while providing access and mobility for the people who live and work in the region.

The Nashville region faces several important transportation and health problems. Nashville is among the most congested large US cities, with commuters experiencing 45 h of annual traffic delay on average ([Texas A&M Transportation Institute, 2015](#)). Nashville is the capital of Tennessee, which has the second highest prevalence of adult inactivity among US states, with 62% of adults failing to meet aerobic physical activity guidelines ([Centers for Disease Control and Prevention, 2016](#)). Additionally, many adult Tennessee residents are overweight (37%, ranked third among states) or obese (29%, ranked 15th among states) ([Centers for Disease Control and Prevention, 2016](#)), which increases the risk for several chronic diseases. The Nashville Area MPO recognized the potential to address adverse transportation and health outcomes created by traditional transportation planning. The purpose of this paper is to describe the efforts the MPO has undertaken to this end.

The MPO's approach to improve transportation and health in the region consisted of six actions that produced data or established policies and procedures that prioritized public health impacts in transportation decision making. Integral to the approaches were significant public engagement to inform both MPO staff and policy makers that interest in and demand for walking and bicycling facilities was wide-spread. Specifically, the MPO:

1. Conducted a Regional Bicycle and Pedestrian Study in 2009 and 2014 that resulted in a prioritized list of bicycle and pedestrian projects in the MPO region
2. Responded to public opinion by adopting three guiding transportation policies in the 2035 and 2040 Regional Transportation Plans
3. Created scoring criteria for roadway projects as part of the 2035 and 2040 Regional Transportation Plans that prioritized health and complete streets components ([Smart Growth America, 2016](#))
4. Reserved funding for projects selected under the new scoring criteria and established an Active Transportation Program to fund additional bicycle and pedestrian projects and programs
5. Conducted the Middle Tennessee Transportation and Health Study, one of the first regional studies in the nation about the relationship between transportation and health
6. Implemented the Integrated Transport and Health Impact Model which estimates and monetizes population-level health impacts of shifting transportation trips from motorized personal vehicles to active transportation modes.

This paper provides a description of each of the six actions so that other transportation or public health organizations interested in pursuing similar goals can learn from Nashville's experience. Each action is described sequentially in [Section 2](#), but in practice, many actions were done simultaneously.

2. Description of components

2.1. Conducting a regional bicycle and pedestrian study

The Regional Bicycle and Pedestrian Study (RBPS) was first conducted in 2009 to establish a strategic vision for improving walking and bicycling opportunities in the greater Nashville region. A detailed explanation of the RBPS is publicly available ([Nashville Area MPO, 2016](#)). The study was a collection of projects that together shared four objectives, including creating an inventory of existing bicycle and pedestrian facilities; informing the public about the health and transportation benefits of improved walking and bicycling infrastructure connectivity; guiding development of a process to select bicycle and pedestrian projects for the MPO's regional transportation plans; and providing guidance on future engineering, education, enforcement, encouragement, and evaluation activities around walking and bicycling safety. The 2009 and 2014 editions of the study were led by the MPO's Bicycle and Pedestrian Advisory committee, which was first convened in 2008 and comprised of stakeholders from bicycle and pedestrian non-profit organizations, local and state governments, transit agencies, law enforcement, medical colleges, public schools and others.

The RBPS began with an inventory of bicycle and pedestrian facilities on collector roads, arterial roads, and greenways to provide data for the five projects of the RBPS, which are presented in [Table 1](#). The results of the five projects were ranked for importance by the bicycle and pedestrian committee and used to create a 100-point scoring system that identified the locations in the region that were the most important priorities for expanding bicycle and pedestrian infrastructure. This score was also added to project proposals submitted to the MPO for consideration in the 2035 and 2040 Regional Transportation Plans so that projects that provided bicycle and pedestrian facilities to Health Priority Areas ([Table 1](#)) were ranked appropriately.

While conducting the RBPS, the committee and MPO staff were unable to find publicly-available health data at a geographic scale smaller than a county. This forced them rely on demographics to identify areas that likely suffered from poorer

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