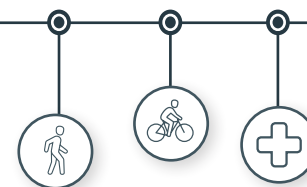




## CASE STUDY: NASHVILLE, TN

# Prioritizing public health benefits through better project evaluation



### THE BOTTOM LINE

Backed by data from two comprehensive studies on health and transportation and growing public demand to make biking and walking safer and more convenient, the Nashville Area Metropolitan Planning Organization (MPO) designed a scoring and selection process to prioritize the projects that will maximize public health outcomes. This new approach substantially increased the amount of funding in the MPO's long-term transportation budget dedicated to making it safer and more attractive to walk or ride a bicycle in Middle Tennessee, helping the region make strides toward improving the health of its residents.

## THE CONTEXT

The Nashville region's economy has been one of the country's most successful over the last decade, resulting in significant growth in the entire Middle Tennessee region. The U.S. Census Bureau estimates that the population in the MPO's seven-county area grew by 10.4 percent between 2010 and 2015.

Against that backdrop of economic prosperity, Tennessee has the country's fourteenth highest adult obesity rate, the fourth highest obesity rate among high school students,<sup>1</sup> and the ninth highest physical inactivity rate among adults. Six out of ten Tennessee adults fail to get adequate physical activity.<sup>2</sup> In the Nashville region, more than half of the residents never walk for transportation and only one in five walk for transportation five days or more per week. The average Middle Tennessee resident travels by foot or bicycle only three minutes a day.<sup>3</sup>

## THE PROBLEM

While some jurisdictions in the seven-county region have created thriving town centers and improved the conditions for people walking or biking, the region overall lacks walkable places, basic connective sidewalk infrastructure, and a wide range of transportation options. Rapidly increasing traffic congestion, automobile and pedestrian crashes and fatalities, and regional housing affordability have become pressing concerns.

To help address these issues, the Nashville Area MPO aimed to increase the region's active transportation investments and direct them to the places where they would make the greatest impact on health, social equity, and infrastructure usage. Since 2010, the MPO has worked to incorporate health, safety, and social equity considerations into its project selection process for transportation projects. In order to devise transportation policies that meet the specific needs of Middle Tennessee's population, the MPO first needed to collect targeted data on residents' health outcomes, health-related behaviors, and active transportation rates.

*The MPO's most recent long-range transportation plan directed funding to sidewalks and other improvements along many corridors. Planned complete streets improvements along Dickerson Pike, pictured below, received the full 11 out of 11 "health equity" points in the MPO's scoring process for the long-range transportation plan.*



*People navigate a section of Dickerson Pike that lacks sidewalks, curbs and other basic infrastructure to make walking safe and convenient.*

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## WHAT THEY DID

The Nashville Area MPO used data from two comprehensive studies (detailed in the following section) to inform the creation of a 100-point transportation project scoring process, which was used to develop its 2040 long-range regional transportation plan known as Middle Tennessee Connected. Generally speaking, for any project to receive money from an MPO, it has to be included in the region's current long-range transportation plan, required by federal law to be drafted every five years. Under the project evaluation process illustrated below, projects received up to a certain number of points for each of the eight factors.<sup>4</sup>

With up to 80 of the available 100 points relating to public health, safety, or social equity, the new process prioritized active transportation projects with the greatest public health benefits

to the community. This represented a 20-point increase compared to the MPO's previous long-range plan, where 60 out of the 100 points assessed projects' impacts on health, safety, or social equity.

The MPO also first dedicated 15 percent of its Urban Surface Transportation Program (STP) resources for walking, bicycling, and transit-supportive projects in 2010.<sup>5</sup> The MPO Bicycle and Pedestrian Advisory Committee created criteria to score those particular projects and, along with MPO staff, conducted reviews of proposals submitted by jurisdictions throughout the MPO's region. Eighteen walking and/or bicycling projects have been funded so far, creating connections to schools, downtowns, jobs, libraries, public transit stops, and other important destinations.

**1. Preservation and enhancement** of the existing transportation system  
**10 POINTS**

**2. Quality growth** in an area with existing population and employment centers  
**15 POINTS**

**3. Multi-modal improvements** that provide transit, bicycling, and walking options  
**15 POINTS**

**4. Congestion management** to mitigate existing or anticipated traffic congestion with motorized and non-motorized improvements  
**15 POINTS**

**5. Safety & security** to reduce crashes, fatalities, and injuries by all modes of transportation  
**20 POINTS**

**6. Freight & goods** movement to efficiently and safely move freight traffic in areas with high commercial vehicular activity  
**5 POINTS**

**7. Environment and health** to provide vulnerable populations with active transportation options and mitigate negative environmental impacts  
**15 POINTS**

**8. Project support & history** to ensure that a proposed project is a local priority and will move forward in a timely manner  
**5 POINTS**

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## HOW THEY DID IT

Leading up to the development of the long-range Middle Tennessee Connected plan in 2015, the MPO conducted two studies to inform the prioritization process to fund transportation projects that would improve safety and access for those traveling on foot or bicycle.

### 1 The MPO created a process to determine which areas in the region had the greatest need to improve their residents' health in order to prioritize active transportation projects in those areas.

Using results from a comprehensive study, the Middle Tennessee Transportation and Health Study (MTTHS), the MPO analyzed data on public health outcomes and behaviors related to transportation, physical activity, and nutrition to establish "Health Priority Area" census block groups.<sup>6</sup> Active transportation projects in these areas were given a greater number of points in the scoring and evaluation of projects by MPO staff.

MTTHS included several components that were designed with assistance from public health experts (listed below). With their assistance, the Nashville Area MPO added six health-related questions to Middle Tennessee's household travel survey. Adults in approximately 6,000 households answered these additional questions related to health status, physical inactivity, nutrition, height, and weight and completed a travel diary on one day. In addition, adults in about 600 of these 6,000 households answered an expanded questionnaire of 42 questions, completed a

travel diary and wore a GPS device for four days. In addition, one adult in each of these 600 households wore an accelerometer for those four days to collect important health-related data on the time spent walking and bicycling, and the intensity of those activities.

All of this data helped the MPO determine four demographic characteristics most highly correlated with being in "poor" health:

1. Being impoverished, measured by an annual household income of \$24,300 or less for a family of four;
2. Being unemployed;
3. Being over the age of 65; and
4. Not owning a car.

The MPO's scoring process awarded more points to projects that included a walking or bicycling feature and directly served a census block group with a higher than average rate of at least three out of four of the above characteristics. These census block groups are labeled "Health Priority Areas" in Middle Tennessee Connected.

In addition, projects with walking or bicycling infrastructure also received additional points if the project would serve a census block group with a higher than average rate of single-parent households, unemployment or six other characteristics of socioeconomic disadvantage. This process allowed projects providing bicycling and walking connections in areas with higher rates of vulnerable populations to receive up to 11 points in the MPO's evaluation, scoring, and selection process, points not available to projects in other areas.

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2

**The MPO used a second study to identify where active transportation infrastructure projects would most likely be utilized by the community.**

The Non-Motorized Demand and Physical Activity Assessment of the MPO's 2014 Bicycle and Pedestrian Study allowed the MPO to identify geographic places in the seven-county region where more bicycling and walking trips would likely take place.<sup>7</sup> Since walking or biking for transportation are more likely to happen in mixed-use areas with higher density and a diversity of destinations, the MPO awarded more points to walking and bicycling projects in these areas — bringing great benefits for relatively small expenditures.

3

**The MPO predicted better health outcomes with future increases in active transportation rates.**

In addition to these two studies, the MPO worked with the Centers for Disease Control and Prevention (CDC) to communicate the potential public health benefits of active transportation projects to residents in the region by using a modeling tool, the Integrated Transportation and Health Impact Modeling Tool (ITHIM).<sup>8</sup> Together, the MPO and CDC worked to input data and run several scenarios using ITHIM, allowing the MPO to show that increases in active transportation rates could result in decreased rates of 12 chronic diseases and respiratory conditions. For example, in one scenario produced by the model, if the average Middle Tennessee resident walked 82 minutes

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*The MPO is funding complete streets improvements in the City of Columbia, TN (population approx. 35,000), seen in the image below of James Campbell Blvd. The project will provide a multi-use path on the north side of the street and a sidewalk on the south side. Since the project will serve census block groups with higher rates of five characteristics identified with underserved and vulnerable populations, it received eight out of eleven possible "health equity" points in the MPO's 100-point scoring system.*



*People walk in the grass alongside rapidly moving traffic on James Campbell Blvd in Columbia, TN, a road slated to receive improvements due to the MPO's prioritization process.*

per week and bicycled 12 minutes for transportation per week, 112 deaths resulting from chronic diseases per year could be averted. The fatalities, injuries and disabilities avoided could save \$116 million annually due to reduced direct treatment costs and gains in productivity.

Learn more about ITHIM on the MPO's website and in a forthcoming technical memo from the MPO.<sup>9</sup>



**13 minutes /day**  
of active transportation  
could reduce rates of  
**12 chronic diseases**

## PREDICTED DECREASES IN CHRONIC DISEASES DUE TO INCREASED WALKING AND BICYCLING

Moderate	Δ Disease Burden	Δ DALYs Per Year
Cardiovascular Diseases	-4.0%	↓ 1639.3
Diabetes	-3.9%	↓ 434.2
Depression	-1.4%	↓ 236.1
Dementia	-1.7%	↓ 394.4
Breast Cancer	-1.4%	↓ 61.7
Colon Cancer	-1.3%	↓ 45.3

ITHIM predicts decreases in 12 chronic diseases and respiratory conditions due to increases in minutes residents walk or bicycle for transportation. DALY, a disability-adjusted life year, is used to quantify the burden of disease from both mortality and morbidity; it is one year lost due to death or time spent living with sickness or injury.

A proposed project will provide a multi-use path on the north side and a sidewalk on the south side of James Campbell Blvd. in Columbia, TN. Because the project will provide active transportation infrastructure to census block groups with higher rates of eight specific demographic characteristics, the project received eight out of 11 "health equity" points.



Town Planning and Urban Design Collaborative

Bicycle and pedestrian improvements along James Campbell Blvd will be funded through the MPO's long-range transportation plan.

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## KEY PARTNERS

The Nashville Area MPO leveraged the expertise of several public health and planning organizations to develop the products described in this case study.

Organizations that helped design the MTTHS included the University of North Carolina at Chapel Hill, the Metropolitan Nashville Health Department, the CDC and Westat/Geostats, a research company with experience on geospatial mobility and physical activity data. An MPO adjacent to Nashville, the Clarksville Urbanized Area MPO, also participated in the MTTHS and data were collected in its region to help provide a fuller picture of regional travel trends. RPM Transportation, a local consulting firm specializing in active transportation-related issues, updated the MPO's Bicycle and Pedestrian Study and wrote the Non-Motorized Demand and Physical Activity Assessment.<sup>10</sup> Expertise and staff time from the CDC enabled the MPO to run ITHIM for the Middle Tennessee region.

### Partners included:

- Centers for Disease Control and Prevention
- Metro Nashville Health Department
- University of North Carolina at Chapel Hill
- Westat/Geostats
- Clarksville Urbanized Area MPO
- RPM Transportation

## BARRIERS ALONG THE WAY

Many decision-makers in the Nashville region did not historically consider investments in bicycle and pedestrian infrastructure priorities in the transportation system. However, since the adoption of the MPO's long-range transportation plan in 2010, a growing number of local leaders, business owners, and residents have demanded improvements to make walking and bicycling safer and more attractive. The MPO changed policy and funding criteria so that bicycle and pedestrian infrastructure and programs were part of mainstream transportation decisions, not add-ons requiring special funding sources.

Further education is still needed to help policymakers, planners, and engineers understand that communities with safe walking and bicycling infrastructure often have fewer injuries and deaths caused by crashes, stronger small businesses and local economies, and healthier residents.

The MPO is also hoping to simplify costly data collection methods. The one-time cost to conduct the MTTHS was \$1.5 million and it is not clear how frequently the MPO will be able to repeat this type of study as originally designed.

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## RESULTS AND BENEFITS

Largely due to the MPO's data-based transportation project evaluation and selection process, 77 percent of projects selected for funding in the MPO's 2040 Middle Tennessee Connected plan include a bicycling or walking element. Over the 25-year plan cycle, \$206 million will be dedicated specifically to active transportation projects, and an additional \$1 billion will be allocated to roadway reconstruction projects that also include upgrades for people who bicycle, walk, or take transit. In addition, \$1.2 billion will fund regional fixed-guideway transit projects along major roadway corridors, and another \$269 million will help advance projects that reduce vehicle emissions and address air quality concerns.

Moreover, significant increases in sidewalk and bicycle lane-miles were added to counties in the MPO area after the long-range plan was adopted in 2010. Miles of sidewalk increased by approximately 15 percent (approximately 62 total miles of new sidewalks) and miles of bicycle facilities increased by approximately 74 percent (approximately 159 miles of bicycle facilities) between 2009 and 2014 on functionally classified roads in the MPO region.<sup>11</sup>

## LESSONS LEARNED

1

### Identify important issues and structure MPO processes to prioritize solutions.

Transportation investments impact far more than just the ability of residents to get from A to B. Providing people with a variety of transportation options, strengthening local economies, supporting the underserved, and helping people live healthier, more active lifestyles are important priorities to Middle Tennesseans. Identify the issues that are important to your region and work with your decision-makers to elevate the projects that align with those priorities. Then, communicate your goals in a way that the public can easily understand and support.

*“Over recent years there has been a growing demand from residents and businesses to improve access and connectivity by all modes of transportation – including walking and bicycling – throughout the entire region. By providing the data needed to understand not only our needs but also measureable outcomes, the Nashville Area MPO has been extremely effective in shaping plans to meet our county’s needs.”*

*- Wilson County Mayor Randall Hutto, chairman of the Nashville Area MPO Executive Board*



## 2 Lead with messages that resonate.

When integrating public health into transportation policy and programs, the Nashville MPO found that leading with economic impact and quality of life benefits resonated most with community and elected leaders. Safety, mobility, and health outcomes were important secondary benefits. To create a broad base of supporters, the MPO focused first on the economic benefits and return on investment of active transportation facilities because these messages resonated with decision-makers who hold these goals as priorities. For example, the MPO's representatives routinely pointed out that increasing safety, access, and transportation options improved the region's quality of life, making Middle Tennessee even more desirable to employers and their current and future employees.

## 3 Dedicate funding to increase awareness of and participation in building active transportation projects.

Because the Nashville Area MPO dedicated 15 percent of its STP resources for walking, bicycling, and transit-supportive projects, several of these kinds of projects have been funded and built across the region that may not have otherwise been created. The MPO helped its members focus on designing projects and developing applications to fund them. This work helped increase the visibility of bicycling and walking projects throughout the region by showcasing their benefits and increasing jurisdictions' experience needed to design these projects and seek funding for them. This may also help local jurisdictions identify and seek funding for active transportation projects through a variety of funding programs.



Davidson Street features a 1.75-mile two-way protected cycletrack connecting downtown Nashville with East Nashville and the Shelby Bottoms Greenway.

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## CONCLUSION

The MPO successfully increased the amount of funding in its long-term transportation budget dedicated to making it safer and more attractive to walk or ride a bicycle – and prioritized those funds for the region’s residents who could most benefit from improved health. Using data and leveraging public support for making biking and walking safer and more convenient, they successfully designed a scoring and selection

process that prioritized bicycling and walking projects to maximize public health outcomes. In a drastic change, 77 percent of projects funded in the MPO’s 2040 long-range plan include a bicycling or walking element, compared to just two percent in the plan adopted in 2005.

*“As Nashville’s population grows, we have to expand our transportation choices for all people. By developing a thoughtful process to prioritize transportation projects based on multiple factors—including health, social equity, and safety – as a region we are making better investments to improve not just mobility and access, but our quality of life.”*

*- Michael Briggs, transportation planner, Metropolitan Nashville Planning Department*

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## NOTES

1. Trust for America's Health and Robert Wood Johnson Foundation. The State of Obesity 2015. Washington, D.C.: 2015. Available online: <http://stateofobesity.org/files/stateofobesity2015.pdf> and <http://stateofobesity.org/states/tn/>.
2. Trust for America's Health and Robert Wood Johnson Foundation. The State of Obesity 2015. Washington, D.C.: 2015. Available online: <http://stateofobesity.org/lists/least-physically-active-states/>.
3. According to findings from the Middle Tennessee Transportation and Health Study: [http://www.nashvillempo.org/docs/research/Nashville\\_Final\\_Report\\_062513.pdf](http://www.nashvillempo.org/docs/research/Nashville_Final_Report_062513.pdf)
4. A detailed summary of this prioritization methodology can be found in Appendix E to the 2040 long-range plan, available here: [http://www.nashvillempo.org/docs/2040RTP/Adopted/2040\\_Evaluation\\_DRAFT.pdf](http://www.nashvillempo.org/docs/2040RTP/Adopted/2040_Evaluation_DRAFT.pdf)
5. The federal STP program provides flexible funding to states and metro areas. The flexible nature of this program allowed the MPO to carve out funding for bicycle, pedestrian and transit-supportive projects.
6. [http://www.nashvillempo.org/docs/research/Nashville\\_Final\\_Report\\_062513.pdf](http://www.nashvillempo.org/docs/research/Nashville_Final_Report_062513.pdf)
7. The "Non-Motorized and Physical Activity Assessment" tech memo is available at: [http://www.nashvillempo.org/regional\\_plan/walk\\_bike/regional\\_study.aspx](http://www.nashvillempo.org/regional_plan/walk_bike/regional_study.aspx) as "Tech Memo Number 2: 2014 Non-Motorized Demand, Physical Activity Assessment." 8. [http://www.nashvillempo.org/regional\\_plan/health/](http://www.nashvillempo.org/regional_plan/health/)
8. Maizlish N, Woodcock J, Co S, Ostro B, Fanai A. Health co-benefits and transportation-related reductions in greenhouse gas emissions in the San Francisco Bay area. American Journal of Public Health. 2013;103:703-9. Available online: [https://www.cdph.ca.gov/programs/CCDPHP/Documents/ITHIM\\_Technical\\_Report11-21-11rev3-6-12.pdf](https://www.cdph.ca.gov/programs/CCDPHP/Documents/ITHIM_Technical_Report11-21-11rev3-6-12.pdf).
9. Information about ITHIM is available at [http://www.nashvillempo.org/regional\\_plan/health/](http://www.nashvillempo.org/regional_plan/health/)  
A forthcoming technical memo by the MPO in final review stages explains how the Nashville MPO used the ITHIM tool, calibrated the model and ran the numbers. When published, it will also be available at [http://www.nashvillempo.org/regional\\_plan/health/](http://www.nashvillempo.org/regional_plan/health/).
10. The Non-Motorized and Physical Activity Assessment memo is available at [http://www.nashvillempo.org/regional\\_plan/walk\\_bike/regional\\_study.aspx](http://www.nashvillempo.org/regional_plan/walk_bike/regional_study.aspx) as "Tech Memo Number 2: 2014 Non-Motorized Demand, Physical Activity Assessment."
11. This is an approximation and based on available and comparable data in five counties in the MPO region.

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## WHO WE ARE



Transportation for America is an alliance of elected, business and civic leaders from communities across the country, united to ensure that states and the federal government step up to invest in smart, homegrown, locally-driven transportation solutions. These are the investments that hold the key to our future economic prosperity. [www.t4america.org](http://www.t4america.org)

*Design: Cecily Anderson / Anagramist.com*