INTRODUCTION

As communities across the country struggle to keep up with transportation demands, there is growing recognition that healthy and thriving communities need to balance the various modes of transportation and create an integrated multimodal strategy that allows members of the community a range of options for getting from one place to another. This approach creates a system in which each mode of transportation supports the others, working to move people and goods more effectively, more safely, and more efficiently.

Furthermore, there is an increasing awareness that our land use patterns greatly influence the quality of our lives and efficiency of our transportation investments. Many cities have also begun to look beyond transportation infrastructure alone, and are reexamining the relationship between development patterns and the transportation system.

The Memphis Urban Area Metropolitan Planning Organization (Memphis MPO), created in 1977, is responsible for the transportation policy development, planning, and programming for all of Shelby County, Tennessee and DeSoto County, Mississippi and portions of Fayette County, Tennessee and Marshall County, Mississippi (Figure 1.1). The Memphis MPO has committed itself to creating livable communities: places where transportation, housing and commercial development investments have been coordinated so that people have access to adequate, affordable and environmentally sustainable travel options. As one method of improving livability, the MPO’s vision seeks to take advantage of the benefits that bicycling and walking can offer to the region to improve the quality of life for every resident. These benefits include improved public health, reduced environmental impact, transportation efficiency, improved public safety, and increased economic development and opportunity.

Bicycling and walking have become key factors for measuring a community’s quality of life. Communities become more competitive in attracting new talent and investments in private and public infrastructure by improving the availability of safe and efficient bicycling and walking networks. Achieving this is not an easy task, as it requires a significant cultural shift within the region and will require that the cities, towns, counties, and states within the MPO planning area reconsider their current and future funding and development patterns. This plan represents a vital step toward a future where bicycling and walking are legitimate and viable components of a robust and sustainable multimodal transportation system.

PURPOSE OF THE PLAN

This plan is intended to identify opportunities for encouraging and enhancing bicycle and pedestrian travel within the Memphis MPO region. The intent of the plan is not to secure funding for every project. Instead, the recommendations contained herein should be used as a guide for local jurisdictions in taking advantage of these opportunities.

The Memphis MPO Regional Bicycle and Pedestrian Plan will serve as the bicycle and pedestrian component of the MPO’s Regional Transportation Plan (RTP). The RTP is a planning
CHAPTER 1

Implementation of the plan’s recommendations will provide for a comprehensive bicycle and pedestrian transportation system that focuses on safety, connectivity, accessibility, and mode shift. These goals, discussed in further detail later in this section, create the framework by which the plan’s recommendations and performance measures are created.

LIVABILITY

The Memphis MPO has committed itself to planning and supporting the development of livable communities: places where transportation, housing and commercial development investments have been coordinated so that people have access to adequate, affordable and environmentally sustainable travel options. Livability is about tying the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, quality schools, and safer streets and roads. The Federal Highway Administration (FHWA) supports livable communities through funding transportation related projects and sponsoring activities like Context Sensitive Solutions and public involvement that enables people to live closer to jobs, save households time and money, and reduce pollution.

A key livability principle focuses on expanding transportation choices which make it convenient for

---

3. MATA Short Range Transit Plan, 2011 http://matatransit.com/uploadedFiles/Main_Site/Content/About_Us/Projects_and_Plans/MATA%20SRTP%20Final.pdf

people to meet some or all of their daily travel needs without having to drive an automobile. This goal requires the development and evaluation of different multimodal transportation improvement strategies at the regional or corridor level. As the regional transportation planning agency, the Memphis MPO supports livability in our communities through several strategies:

- Regional visioning
- Promoting economic development
- Complete Streets design & implementation
- Land use & transportation planning
- Planning for operations
- Project prioritization

The MPO’s vision seeks to take advantage of the benefits that bicycling and walking can offer to the region to improve the quality of life for every resident. These benefits include improved public health, reduced environmental impact, transportation efficiency, improved public safety, and increased economic development and opportunity.

**Improved Public Health**

Physical inactivity has become a serious problem in the United States. 53% of adult men and 64% of adult women never get more than 10 minutes of physical activity per week\(^5\). About 14% of young people report no physical activity\(^6\). These trends are continuing, especially in the Memphis MPO region. In 2012, the nationwide median average for obesity (a Body Mass Index of 30 or higher, derived from a person’s weight and height) was 27.6%. During that same year, the median obesity rate for the Memphis MPO region was 35.1%\(^7\).

One of the reasons for Americans’ sedentary lifestyles is that bicycling and walking have been replaced by the automobile for almost all trips. Health professionals recommend that both children and adults participate in moderately intense physical activity for at least 30 minutes each day. For most people, this need can be met by simply bicycling to work or walking to school. A 15-minute bicycling or walking commute in the morning and again in the afternoon can provide the physical activity that is necessary to remain healthy.

In addition to combating obesity, physical activity, such as bicycling and walking, can help to prevent many other health-related problems, including coronary heart disease, stroke, certain types of diabetes, colon cancer, hypertension, osteoporosis, depression, and lower back pain. It can also help to improve a person’s immune system and respiratory function\(^8\).

There are many other positive health-related benefits that one can receive from being physically active. Some of these benefits include an improved psychological well-being, an improved metabolism, increased energy levels, improved concentration and memory, and improved strength, flexibility, and endurance.

These benefits are especially important to our society as it ages. Senior citizens who are regularly active have an increased chance of remaining independent as they get older. The low impact and aerobic nature of bicycling makes it an excellent form of exercise for senior citizens.

**Reduced Environmental Impact**

Motor vehicle emissions are responsible for approximately 34% of the carbon dioxide, 81% of the carbon monoxide, and 49% of the nitrogen oxides

---

\(^5\) http://www.pedbike.org/data/factsheet_health.cfm  
\(^6\) http://www.cdc.gov/nccdphp/sgr/adoles.htm  
\(^7\) Selected Metropolitan/Micropolitan Area Risk Trends from the Behavioral Risk Factor Surveillance System, BRFSS, 2012 (Centers for Disease Control and Prevention)  
\(^8\) http://www.pedbikeinfo.org/data/factsheet_health.cfm
that are released into the air in the United States\textsuperscript{9}. Exposure to elevated levels of carbon dioxide are associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, and difficulty in performing complex tasks\textsuperscript{10}. The Memphis area ranks among the nation’s top 20 places that have the greatest amount of pollution from cars and trucks, which contributes significantly to ground level ozone\textsuperscript{11}. Therefore, it is no surprise that, due to the number of high ozone days, the American Lung Association gave the Memphis MPO region an “F” grade for air quality in 2010\textsuperscript{12}.

Newer-model automobiles are designed to release fewer carbon dioxide emissions than vehicles from previous years. Although the emissions per vehicle have decreased, the total number of motor vehicles on our nation’s roadways has increased, resulting in an overall increase in vehicular emissions. The most damaging emissions from a motor vehicle occur during the first few minutes of operation, before the vehicle’s pollution control devices can work effectively. Therefore, short motor vehicle trips are the most damaging trips to the environment on a per mile basis\textsuperscript{13}. Unlike driving, bicycling and walking are pollution-free. A bicycle commuter who rides four miles to work, five days a week, avoids 2,000 miles of driving and (in the U.S.) about 2,000 pounds of carbon dioxide emissions, each year. This amounts to nearly a five percent reduction in the average American’s carbon footprint\textsuperscript{14}.

**Transportation Efficiency**

Like many other urban areas throughout the country, traffic congestion is a growing concern for residents in the Memphis MPO region. In addition to causing pollution, traffic congestion wastes time and energy and causes driver frustration. Traffic congestion in the region could be reduced if some of the trips made by single-occupancy vehicles (SOV) were converted to bicycling and walking trips. This goal is not unrealistic. Approximately 40% of all trips are less than two miles in length, a distance that can easily be covered for most during a ten minute bike ride or a 30 minute walk\textsuperscript{15}.

The need for roadway maintenance and improvements can also be reduced if SOV trips are converted to bicycling and walking. Bicycles do less damage to roadway surfaces than cars, and walking does practically no damage at all. As the number of bicycling and walking trips increase and the number of SOV trips decrease, roadway surfaces will require less maintenance. Also, because bicyclists and pedestrians take up less space per trip than motorists, the need for some roadway widening projects could be eliminated, or at least postponed.

Bicycle and pedestrian facilities can also improve public transit ridership. In many European countries, bicycling accounts for 10% to 55% of trips to train stations. In Sweden, the addition of bicycle parking facilities at train stations caused bicycling trips to train stations to increase by 15% to 30%. Also, there was a reduction of 10% to 20% in motor vehicle trips to train stations\textsuperscript{16}. Providing bike racks and lockers at transit stops and transfer stations can encourage more people to use public transit, and it can encourage more transit users to bicycle to transit facilities instead of driving. Therefore, bikeways should connect to transit facilities.

Bicycle and pedestrian facilities provide a greater range of options within the transportation system for all users, regardless of age or economic status. Children, senior citizens, and other adults who chose not to, or cannot afford to, own a car have limited options for transportation. In the U.S.,...
approximately one in twelve households does not own an automobile, and approximately one-third of all Americans does not, or cannot, drive. Bicycle and pedestrian facilities can help provide these citizens with the same mobility as motorists, enabling them to travel throughout the community.

**Improved Public Safety**

In 2014, the Memphis MPO region was ranked as the fifth most perilous place in the U.S. for pedestrians. Bicyclists in the region fare better, but still represent a fair number of reported crashes compared to the percentage of trips made by bicycle.

Providing well-designed bicycle and pedestrian facilities can significantly improve safety for persons riding bicycles or walking within the Memphis MPO study area. Providing well-designed bicycle and pedestrian facilities can increase safety for motorists, as well as pedestrians and persons riding bicycles. For example, creating a properly designed bicycle lane on a roadway eliminates the need for motorists to encroach within three feet when passing a person riding a bicycle. Also, adding paved shoulders on a two-lane roadway reduces the frequency of run-off-the-road, head-on, and sideswipe motor vehicle crashes. The increased presence of bicycles on roadways can also help to reduce traffic speeds.

A reduction in crime may also be seen from an increased presence of pedestrians and persons riding bicycles on the street. Areas that have active bicycle and pedestrian facilities can provide an increased sense of security. The “eyes on the street” provided by pedestrians and persons riding bicycles create a feeling that help is readily available, if needed.

**Increased Economic Development and Opportunity**

Unlike driving, bicycling and walking are very affordable forms of transportation for everyone. The average family has to work for more than six weeks to cover the cost to operate a car for one year. In contrast, the cost of operating a bicycle for one year can be earned in less than a day, and walking is free. Individuals who can replace their automobiles with bicycles can free-up a significant portion of their annual incomes. This option may not be practical for everyone. However, families who use a bicycle for short trips may be able to avoid buying a second or third car, which will save thousands of dollars each year.

Converting to non-motorized forms of transportation can also result in reduced health care costs for individuals and families due to the health benefits that are associated with bicycling and walking.

Bicycling and walking can help residents stimulate their local economies by encouraging them to purchase goods and services locally. Instead of taking motorized trips to businesses in other communities, residents can take a short bike ride or walk to businesses in their own communities. The increase in dollars spent locally will result in more local jobs and higher revenues for the community. A recent study found that pedestrian and bicycle infrastructure projects create 11-14 jobs per $1 million of spending while road infrastructure projects only create approximately 7 jobs per $1 million of expenditures.

Public open spaces, such as bicycle and pedestrian facilities, improve the quality of life in a community and can result in improved economic growth for a community. A study of the impacts of

---

17. National Household Travel Survey, 2009
open spaces revealed that small business owners consider the availability of open space, parks, and recreation to be the most important factor in choosing new locations for their businesses. Similarly, CEOs of larger corporations have identified quality of life for employees as being the third most important factor when considering new business locations.

Tourism can result in a significant source of revenue for some communities. Providing for bicyclists and pedestrians can be an excellent way to increase local tourism. Bicycling and walking tours are fun activities for both tourists and local residents, and these activities can be easily organized by tourist offices, community groups, or other local individuals or organizations. A recent study by the North Carolina Department of Transportation estimates that the economic impact of cyclists is nine times the initial costs of the bicycle facilities in the Outer Banks region, supporting over 1,400 jobs and generating economic impact of $60 million annually.

Businesses that promote active transportation can see an increase in productivity, improved employee health, and better customer relations, and a decrease in absenteeism, employee turnover, and health care costs. These companies tend to receive respect and support from the community, which can result in higher sales and greater customer loyalty.

Employers that provide bicycle racks and lockers will also enjoy lower parking costs. Automobiles require at least 20 times more space for parking than bicycles. By providing bicycle racks and lockers, companies can encourage their employees to bicycle to work instead of driving. This could result in a significant savings to the company. The Bicycle Commuter Act passed in 2009, makes it easier for employers to provide financial incentives to employees choosing to commute by bicycle.

Well-designed bicycle and pedestrian facilities offer economic and independent travel for people who might otherwise have limited options. These facilities provide mobility to citizens who cannot, or who choose not to, own a car. By providing adequate bicycle and pedestrian facilities and routes, cities can increase access to places of employment.

**PLAN GOALS**

Implementation of the plan’s recommendations will provide for a comprehensive bicycle and pedestrian transportation system that focuses on safety, connectivity, accessibility, and mode shift. These goals, discussed in further detail below, create the framework by which the plan’s recommendations and performance measures are created.

**Safety**

Safety is measured through analysis of historical crash data involving persons riding bicycles or walking. This analysis allows the MPO to prioritize locations with high frequencies of crashes. Additionally, safety also plays a role in how likely a person might be to using a particular corridor for travel by bicycle or by foot. To this regard, safety also includes an analysis of user expectations and perceptions that encourage or discourage bicycling or walking.

**Connectivity**

Connectivity is a measure of how well the bicycle or pedestrian networks allow for efficient travel between two points. Increasing the connectivity of the bicycle or pedestrian networks create an environment where short trips taken by bicycle or by foot rival the speed, time, and duration of trips taken by car.

---

29. http://www.bikeleague.org/content/bicycle-commuter-benefit

---

“Having spent time in cities that are populated and built more densely than Memphis, I came to recognize and enjoy the ease of living sans-car and made the decision to un-incorporate a personal vehicle from my daily routine.”
thereby creating an incentive to make those trips without using an automobile. In the same way that connectivity allows for convenient automobile travel, bicycle or pedestrian connectivity is crucial towards balancing the total transportation system.

**Accessibility**

Accessibility is a measure of how well bicycle and pedestrian modes of travel integrate with other modes of transportation, and is often given the specific meaning of providing accessibility to persons with disabilities. Often times, the connectivity between different modes of transportation, particularly bicycle, pedestrian, and public transportation, produce a synergy that allows greater access to common destinations than when a singular mode of transportation is used. This is especially important in understanding how residents access places of employment, grocery stores, parks, schools, and other key destinations. Additionally, the ability for a person using a mobility device to access the pedestrian and public transportation networks is critical to ensuring equal opportunity for all residents regardless of their ability. The plan’s concept of accessibility also reflects the U.S. Department of Transportation’s Planning Emphasis Area on Ladders of Opportunity, which addresses access to essential services like those listed above.

**Mode Shift**

Mode shift refers to those programs, policies, and projects that result in fewer trips being made by automobile, and more trips being made utilizing bicycling, walking, or public transportation. In some cases, there are predictive methods of estimating how many potential users would be inclined to make a trip by bicycling or walking after a key piece of infrastructure is completed. Other times, there may be educational or encouragement programs that tap into latent demand and produce highly visible examples of short trips being made by bicycling or walking.

Together, these four planning themes summarize the methods by which existing conditions and proposed improvements are formulated in this plan. They are also the themes by which metrics will be assessed and performance measured to understand over time, as implementation is carried forward, how the community is changing.

**THE PLANNING PROCESS**
The ATAC served as the steering committee for the update of this plan and helped to establish the framework by which public participation and data analysis took place. Through its regularly scheduled quarterly meetings, ATAC members worked through activities that

- Created the public participation plan for community involvement including the addition of focus groups,
- Provided feedback on the positive and negative aspects of the 2011 Regional Bicycle and Pedestrian Plan by which a work plan was established for the update,
- Established the key planning themes by consensus during a working committee meeting,
- Encouraged the participation of organizational members and key stakeholder contacts through public meeting invitations, survey responses, and the dissemination of information through email lists and other networking tools at their disposal, and
- Participated in activities that helped tailor the specific recommendations made in this plan for enhancing the ability to fund and prioritize improvements to bicycle and pedestrian travel in the MPO region.

**Public Participation**

An initial public meeting was held on March 26, 2014 to officially kick-off the update process. Participants discussed strategies for completing the update in regards to numerous other planning efforts taking place at the MPO and were advised of the timeline and future opportunities to provide input on the plan update. The meeting included a presentation on the phasing of the plan update, the public participation plan, and the timeline for completion. This meeting also served as the staging ground for establishing the new key planning themes that are used in this plan document. Later, the ATAC used the results from this activity to officially establish those planning themes.

From March to July 2014, the MPO conducted an informal questionnaire by which MPO residents could provide their feedback about the needs, attitudes and habits related to bicycling and walking in the planning area. The survey, although not statistically accurate, due to voluntary response rather than random sampling, generated a wide response from diverse communities in the region. Typically, those who participated already had an interest in bicycling and walking. The survey was available both on-line and in hard copy format. Over 1,100 people responded to the survey. The MPO utilized its database of contacts as well as those developed by ATAC members to spread the questionnaire to as many communities as possible. Additionally, print and online advertisements were purchased in four of the largest regional news publications to increase the dissemination of information. Finally, MPO staff attended public meetings and community events during this time with paper copies of the survey in order to reach communities without online access.

Bicycle and pedestrian counts were conducted at 39 sites across the Memphis MPO study area. These counts were used to validate analyses in subsequent chapters and will be used as baseline numbers for future benchmarking of future iterations of this plan.

Meetings with the planning and engineering staffs of each of the MPO member jurisdictions were coordinated to gain further input on ongoing efforts and to insure consistency with local plans impacting the development of the Regional Bicycle and Pedestrian Plan. Each jurisdiction was presented with maps and a list of projects from the previous plan and asked to clarify or revise project limits, scopes, and implementation according to local needs and priorities.

MPO staff hosted fourteen public meetings across the MPO region during the summer of 2014 to seek additional input on specific aspects of the plan’s development. Presentations were given describing
The reasons for updating the 2011 Regional Bicycle and Pedestrian Plan as well as the key features that were being updated. Each of the meetings contained hands-on exercises that allowed participants to provide specific feedback on elements of the plan update to either validate other forms of input, such as the questionnaire, or to provide a more nuanced understanding of some of the elements.

The full results of the survey and meeting exercises are provided on page 108 in the plan’s Appendix.

**Data Analysis and Recommendations**

Once the existing conditions information was compiled and public input had been completed through the various methods previously described, the MPO staff began to analyze the data. Through careful spatial analysis and by cross-referencing hard data points against the more nuanced perception data gathered during the questionnaire and at public meetings, MPO staff used the data to create a snapshot of current conditions in accordance with the four key planning themes of this plan. From here, the MPO staff created a matrix by which project prioritization was assigned and worked through each jurisdictions’ preferences to create a tailored set of recommendations that worked to meet the regional goals of this plan with the local insight and priorities gathered from each municipal leader.

An implementation plan was developed in an effort to provide a clear guide towards completing the plan. The implementation plan includes policies and programs that address engineering, education, encouragement, enforcement, and evaluation. Performance measures for monitoring the progress of the plan were also included.

**Documentation and Review**

MPO staff began developing the physical document for this plan in August 2014. Two meetings were held in Fall 2014 to review and provide comment on the draft documents as they moved towards adoption. The first meeting was held on September 2, 2014 at which the first draft methodology was released for public review. The meeting included an overview of the plan’s analysis and recommendation as well as a presentation of the ways by which community members could provide their feedback during the public review period. The second meeting, held October 7, 2014, included a presentation of the draft plan based on the previous month’s comments and provided another opportunity for public engagement in the plan update process. The plan was taken before the MPO’s ATAC and Engineering Technical Committee (ETC) prior to its adoption by the Transportation Policy Board (TPB) on November 20, 2014.