1.0 INTRODUCTION

The 2040 Long-Range Transportation Plan (LRTP) presented herein represents the latest update of the Mississippi Gulf Coast Area Transportation Study (MGCATS) initiated more than 35 years ago. Like its predecessors the 2040 LRTP is intended to establish a regional vision and course of action for addressing the transportation needs of the Mississippi Gulf Coast Metropolitan Planning Area (MPA) over the next 25 years. Its recommendations are the result of public input, technical analysis, and close coordination among local counties and municipalities, Coast Transit Authority (CTA), the Mississippi Department of Transportation (MDOT), Gulf Regional Planning Commission (GRPC) and other members of the Mississippi Gulf Coast Metropolitan Planning Organization (MPO). The 2040 LRTP employs a performance-based approach to metropolitan transportation planning described in detail in Chapter 2 ("Plan Development Process").

1.1 THE METROPOLITAN PLANNING ORGANIZATION (MPO)

The MPO is a legislatively mandated policy-making body and technical support group made up of representatives from local government and transportation agencies with collective responsibility for the coordination of transportation planning and programming in the MPA. The *Federal-Aid Highway Act* (Public Law 87-866), adopted by Congress in 1962, made metropolitan transportation planning a condition for receipt of Federal funds for transportation projects in urban areas with a population of 50,000 or more. That act encouraged a *continuing, cooperative, and comprehensive* (3-C) transportation planning process involving the combined efforts of MPOs, state agencies and public transit providers in metropolitan areas. Laws enacted since the original act, and U. S. Department of Transportation (USDOT) regulations adopted pursuant thereto, have periodically reiterated the commitment to 3-C planning in metropolitan areas.

Purpose and Function of the MPO

According to the Federal Highway Administration (FHWA) report, *The Transportation Planning Process: Key Issues* (FHWA, no date, p. 4), there are five core functions of an MPO:

1. Establish a setting: Establish and manage a fair and impartial setting for effective regional decision-making in the metropolitan area.

2. Identify and evaluate alternative transportation improvement options: Use data and planning methods to generate and evaluate alternatives. Planning studies and evaluations are included in the Unified Planning Work Program or UPWP.

3. Prepare and maintain a Metropolitan Transportation Plan (MTP): Develop and update a long-range transportation plan for the metropolitan area covering a planning horizon of at least twenty years that fosters (1) mobility and access for people and goods, (2) efficient system performance and preservation, and (3) good quality of life.

4. Develop a Transportation Improvement Program (TIP): Develop a short-range (four-year) program of transportation improvements based on the long-range transportation plan; the TIP should be

designed to achieve the area's goals, using spending, regulating, operating, management, and financial tools.

5. Involve the public: Involve the general public and other affected constituencies in the four essential functions listed above.

The Metropolitan Planning Area

The MPO is designated by the governor of a state to fulfill the responsibilities enumerated above for a metropolitan area incorporating an urban area inhabited by at least 50,000 persons. Urban areas are defined by the U. S. Census Bureau after its decennial population count; non-urban areas are classified as rural. After identifying all of the urban areas in the United States and its territories, the Census Bureau further classifies all urban areas as either *urbanized areas* or *urban clusters*. Urbanized areas are those urban areas with population of at least 50,000; all others are labeled urban clusters, having population ranging from 2,500 to 49,999.

MPO authority within the MPA is formalized by agreements between each of the affected jurisdictions and the governor. Typically the MPA is delineated to include at a minimum a core area, based on a *smoothed* approximation of the urban area boundary, and all adjacent areas expected to become urbanized within the next 20 years. The MPA boundary may also be influenced by jurisdictional lines, physical features of the landscape, or major roadways.

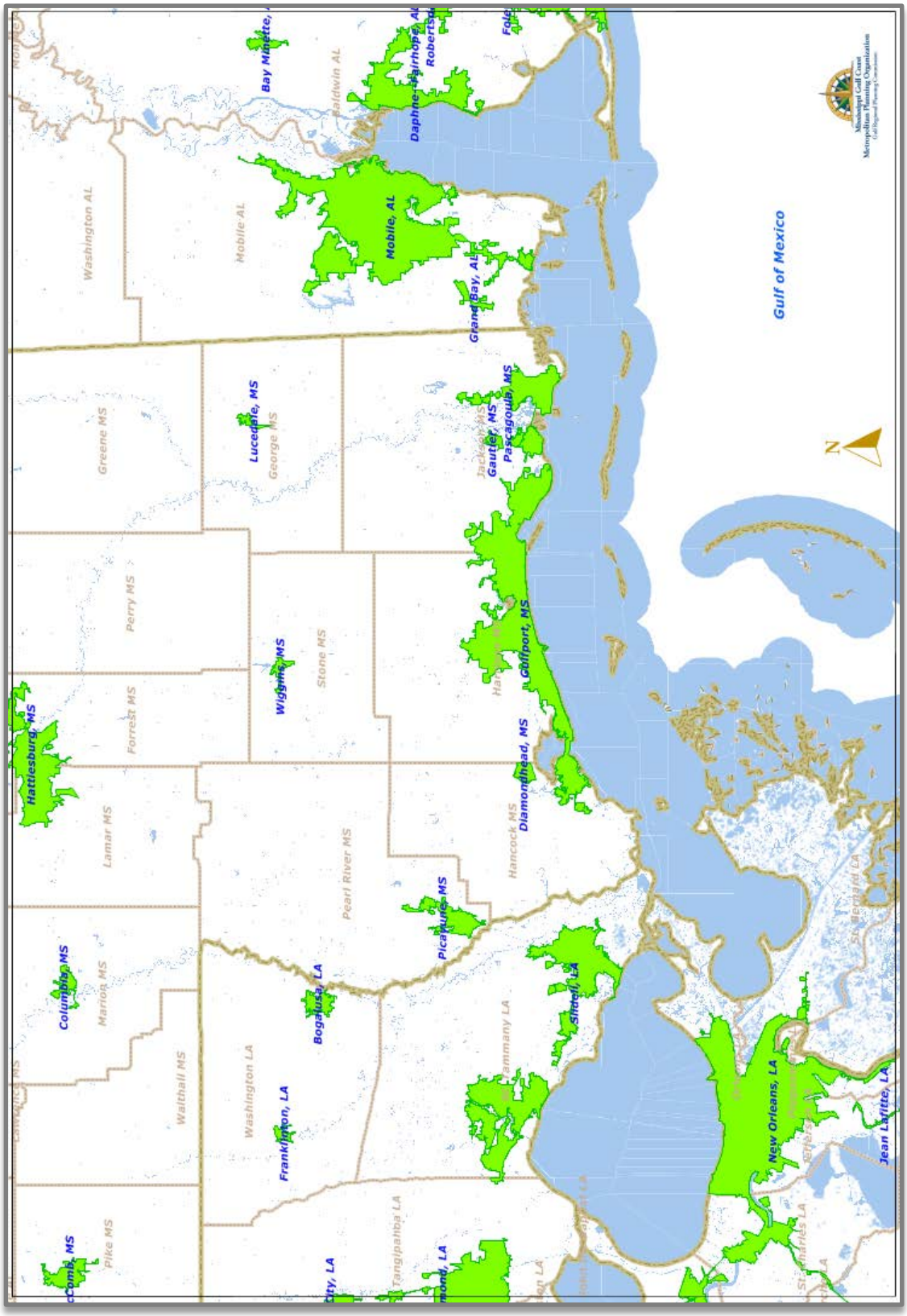
After the 2010 Census, urban areas were defined by identifying a densely settled core of census tracts and/or census blocks meeting minimum population density requirements. Next adjacent territory occupied by non-residential urban land uses was added to the high-density residential core. Finally adjacent low-density areas were included to link outlying high-density territory with the densely settled core. Census Bureau criteria stipulate that to qualify as an urban area, the territory identified must encompass a population of at least 2,500 and 1,500 of those living in the area must reside outside institutional group quarters. This process resulted in the identification of more than 450 urbanized areas in the United States. Those located in the vicinity of the Mississippi Gulf Coast are depicted in Figure 1-1.

Structure of the Mississippi Gulf Coast MPO

Gulf Regional Planning Commission (GRPC) was designated by the governor of Mississippi to serve as the Mississippi Gulf Coast MPO on December 20, 1973. GRPC performs the principal planning and programming functions of the MPO under the direction of a Transportation Policy Committee (TPC) advised by a Technical Coordinating Committee (TCC). The TPC, as the designated policy-making body of the MPO, holds the ultimate responsibility for making decisions regarding the regional transportation system in accordance with federal legislation (23 USC 134(b) and 49 USC 5303(c)). The TCC provides technical input to the decision-making process.

The Mississippi Gulf Coast MPA encompasses three counties in which are located 12 municipalities: Waveland, Bay St. Louis and Diamondhead in Hancock County; Pass Christian, Long Beach, Gulfport, Biloxi

Figure 1-1: Urbanized Areas Located in the Vicinity of the Mississippi Gulf Coast



Source: U. S. Census Bureau; Neel-Schaffer, Inc.

and D'Iberville in Harrison County; and Ocean Springs, Gautier, Pascagoula and Moss Point in Jackson County. There are actually two distinct urbanized areas within the MPA: the Gulfport Urbanized Area (UZA) which stretches from Bay Saint Louis to Ocean Springs and includes portions of all three coastal counties; and the Pascagoula UZA located in the eastern half of Jackson County. (The consolidated urban planning area is represented in Figure 1-2.) Federal law requires that MPO membership include the "representation of local elected officials, officials of agencies that administer or operate major modes or systems of transportation and appropriate state officials" (23 CFR 450.306). Accordingly members of the TPC for the Mississippi Gulf Coast MPO include the following officials or their designated representatives:

- President of the Board of Supervisors for each of the three counties in the MPA;
- Mayor or city manager for each of the 12 municipalities;
- Gulf Regional Planning Commission chairman;
- Coast Transit Authority chairman;
- Mississippi Department of Transportation executive director;
- Gulfport International Airport executive director; and
- Port directors for each of the three maritime port operators in the MPA: Hancock County Development Commission (Port Bienville), Mississippi State Port Authority (Mississippi State Port at Gulfport) and Jackson County Development Commission (Port of Pascagoula).

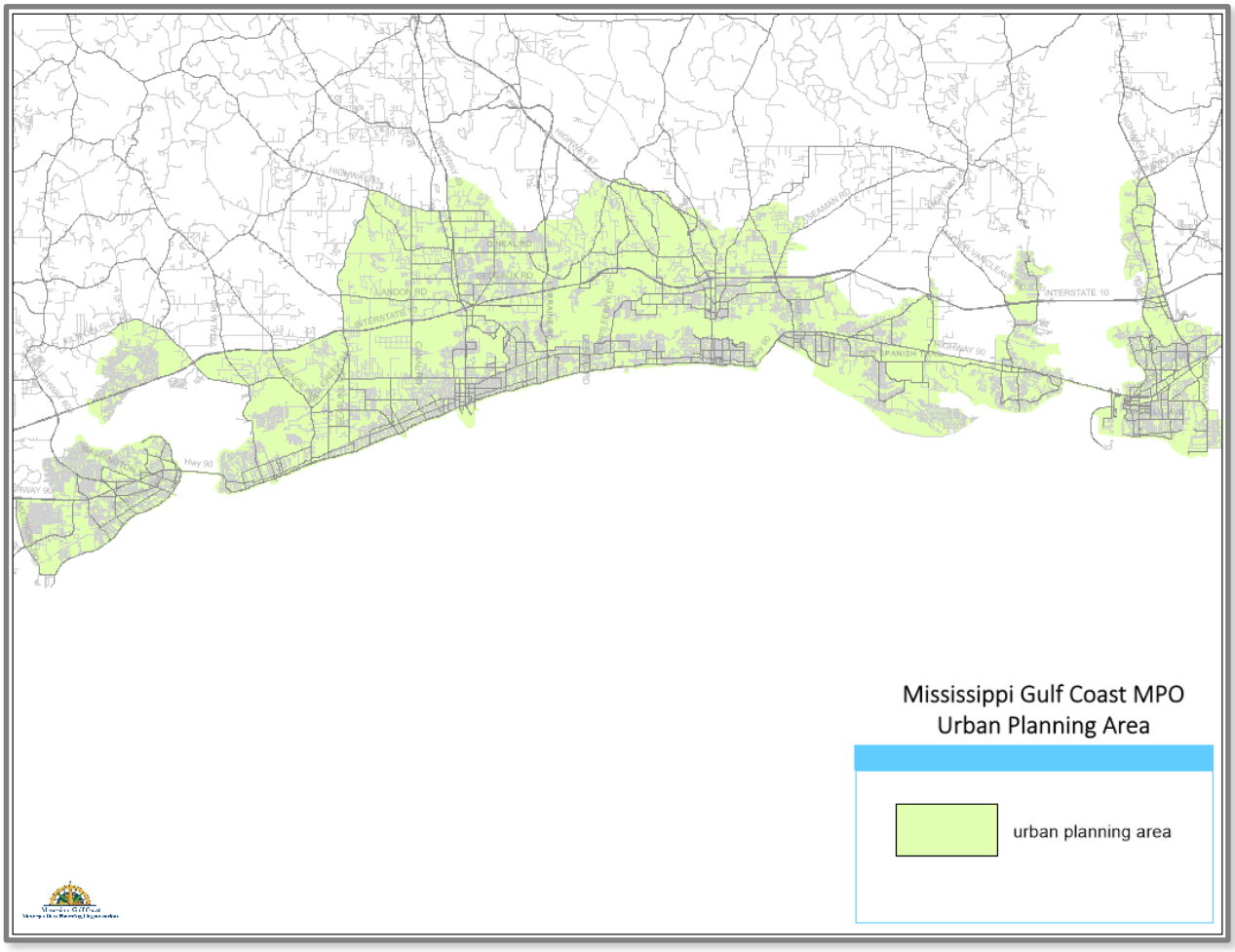
Non-voting members of the TPC include the following:

- Mississippi Trucking Association president;
- Heritage Trails Partnership designee;
- Federal Transit Authority Region IV administrator;
- Federal Highway Administration Mississippi Division administrator; and
- Mississippi Gulf Coast Business Council president.

The TPC is responsible for the periodic adoption of a Unified Planning Work Program (UPWP) and Transportation Improvement Program (TIP), and for the establishment of policies and procedures in compliance with federal regulations. The TPC is guided by recommendations developed and put forth by the TCC. The TPC meets quarterly, on the fourth Thursday of the month in March, June, September and December. The December meeting is a joint meeting with the TCC designated the *MPO Annual Meeting* at which officers are elected for the following calendar year. All TPC meetings are open to the public and include an agenda item offering an opportunity for public input regarding the planning process.

The TCC consists of individuals whose skills, training and professional status qualify them to take an active role in helping to shape and to oversee the transportation planning program for the region. The TCC is responsible for making recommendations to the TPC with respect to the adoption of the UPWP and TIP, as well as policies and procedures to be adopted by the MPO. TCC members also provide guidance to MPO staff regarding ongoing transportation planning activities. Each member entity (city, county, agency or organization) receives one vote on matters coming before a meeting of the TCC, regardless of the number of attendees who may be representing a specific jurisdiction, agency or organization. The TCC meets quarterly, on the fourth Thursday of the month immediately prior to TPC meetings (February, May and August) with the exception of the year-end joint meeting in December. All TCC meetings are open to the public and provide an opportunity for citizen comment on issues related to the ongoing transportation planning process.

Figure 1-2: Mississippi Gulf Coast Urban Planning Area



Source: Gulf Regional Planning Commission.

TCC members include the following:

- Representatives of the 15 city or county governments whose chief officers sit on the TPC;
- Gulf Regional Planning Commission executive director;
- Coast Transit Authority executive director;
- TCC Bike/Walk, Freight, Safety, Sustainability and Transit Sub-Committee chairmen;
- Mississippi Department of Transportation state planning engineer and District 6 engineer;
- Gulfport International Airport operations and planning director;
- Port planning directors for each of the three maritime port operators in the MPA; and
- Mississippi Trucking Association planning director.

Non-voting members of the TCC include the following:

- Federal Transit Authority Region IV representative;
- Federal Highway Administration regional planning engineer;

- Representatives of the U. S. Navy (Naval Construction Battalion Center), U. S. Air Force (Keesler Air Force Base) and National Aeronautics and Space Administration (Stennis Space Center); and
- Representatives of CSX Transportation, Inc., Kansas City Southern Railway Company, and the National Railroad Passenger Corporation (Amtrak).

1.2 THE METROPOLITAN TRANSPORTATION PLAN (MTP)

Beginning with the *Federal-Aid Highway Act* adopted by the U. S Congress in 1962, Federal legislation establishing or renewing highway and transit funding programs has required metropolitan transportation planning. The existence of a current long-range transportation plan, produced and adopted as a result of the ongoing metropolitan planning process, is a condition for the receipt of surface transportation funds appropriated for urban areas with a population of at least 50,000.

Purpose of the Metropolitan Transportation Plan

The primary purpose of metropolitan transportation planning (and hence the MTP) is to ensure that transportation planning in urbanized areas is carried out through a continuing, cooperative, and comprehensive (3-C) planning process. This 3-C process ensures that transportation planning is based on the most current information, reflects regional needs and priorities that are consistent with those of the state, takes into account all modes of transportation, and is consistent with land-use, economic development and other planning activities.

The metropolitan transportation planning process, as outlined in the FHWA publication, *Transportation Planning Process: Key Issues* (FHWA, no date: page 3), requires completion of the following tasks:

- Monitoring existing conditions;
- Forecasting future population and employment growth, including assessing projected land uses in the region and identifying major growth corridors;
- Identifying current and projected future transportation problems and needs and analyzing, through detailed planning studies, various transportation improvement strategies to address those needs;
- Developing long-range plans and short-range programs of alternative capital improvement and operational strategies for moving people and goods;
- Estimating the impact of recommended future improvements to the transportation system on environmental features, including air quality; and
- Developing a financial plan for securing sufficient revenues to cover the costs of implementing strategies.

Adoption of the MTP is the first step towards the implementation of any regionally significant transportation project, whether it is to be accomplished with Federal assistance or funding from other sources. Following formal adoption of the plan, a project can be programmed for design, right-of-way acquisition or construction in the Transportation Improvement Program (TIP), which identifies funding sources, fiscal year(s) of implementation, and the estimated amount of funding required.

Metropolitan Transportation Planning Requirements

Every MPO must prepare and update a transportation plan for its MPA in accordance with requirements set forth in Federal law (23 U.S.C. §134) and regulations adopted pursuant thereto (23 C.F.R. §450.322). The MTP must have a planning horizon of at least 20 years; foster mobility and access for both people and goods; facilitate the efficient performance of the transportation system and support its preservation; and seek to better the quality of life enjoyed by people living and working in the area (FHWA, no date: page 4). In addition to ensuring that the metropolitan transportation planning process is continuous, cooperative and comprehensive, the MTP must provide for consideration and implementation of projects, strategies and services that will address the following planning factors originally enumerated in the *Transportation Equity Act for the 21st Century* (Public Law 105-178):

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety and security of the transportation system for motorized and nonmotorized users;
- Increase the accessibility and mobility options available to people and for freight;
- Protect and enhance the environment, promote energy conservation, and improve quality of life;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system.

The U. S. Department of Transportation (USDOT) metropolitan planning regulations cited above require that, at a minimum, the MTP shall contain the following elements:

- The projected transportation demand of people and goods over the period of the plan (at least 20 years);
- An inventory of existing and proposed transportation facilities, with an emphasis on those having national or regional significance;
- Operational and management strategies that improve the efficiency and safety of the existing transportation system;
- Consideration of the results of the congestion management process (CMP) in any transportation management area (TMA) (i.e., urbanized area with a population of 200,000 or more, as defined by the U. S. Bureau of the Census and designated by the U. S. secretary of transportation);
- Capital investment and other strategies to preserve the existing and future transportation system and improve multimodal capacity based on regional priorities and needs;
- Description of proposed improvements in sufficient detail to allow development of cost estimates;
- Evaluation of environmental impacts and potential mitigation activities;

- Pedestrian and bicycle transportation facilities;
- Transportation and transit enhancement activities;
- A financial plan that demonstrates that the plan is fiscally constrained.

The Federal guidance also requires that there be consultation with state and local agency officials responsible for land use management, natural resources, environmental protection, conservation and historic preservation for the purpose of comparing the transportation plan with State and local conservation plans and maps and natural and historic resource inventories. In addition the plan must contain a safety element that incorporates or summarizes the priorities, goals, countermeasures, or projects for the MPA contained in the State's Strategic Highway Safety Plan. Prior to its adoption there must be a reasonable opportunity for the public and all relevant parties to review the transportation plan and to provide comments.

Federal law and executive orders prohibit discrimination and/or exclusion from participation in any program or activity receiving Federal financial assistance on the basis of race, color, national origin, disability, income, minority-status or limited-English proficiency. The GRPC Public Participation Plan (PPP) specifies the manner in which the MPO complies with these non-discrimination requirements. The PPP is available on the GRPC website (grpc.com) and is discussed further in Chapter 2 ("Plan Development Process").

Title VI of the *Civil Rights Act of 1964* (Public Law 88-352, 78 Stat. 241) ensures that no person is excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving Federal financial assistance on the basis of race, color, or national origin.

The *Rehabilitation Act of 1973* (Public Law 93-112, 87 Stat. 355) and the *Americans with Disabilities Act* of 1990 (Public Law 101-336, 104 Stat. 327) encourage the participation of people with disabilities in the development of transportation and paratransit plans and services.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations"—issued by President William Jefferson Clinton in 1994—advances three fundamental environmental justice (EJ) goals:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency" was issued by President Clinton in 2000 to prohibit discrimination against non-native speakers of the English language. The order requires Federal agencies to examine the services they provide, identify any need for service to those with limited English proficiency (LEP), and develop and implement a system to provide those services so that potentially affected individuals can have meaningful access to them. This requirement applies to all recipients of Federal financial assistance, including MPOs.

The most recent Federal transportation legislation, the *Moving Ahead for Progress in the 21st Century Act* (Public Law 112-141, 126 Stat. 405), adopted by Congress in 2012 and commonly referred to as MAP-21, established a significant new requirement of the metropolitan transportation planning process in mandating *performance-based planning* for all MPOs. While the USDOT is currently still in the rulemaking stage regarding performance-based planning regulations, it is expected that in the future the MTP will have to be developed by means of a performance-driven, outcome-based approach that supports national goals stated in MAP-21. This subject is addressed in greater detail in the first section of Chapter 2 ("Plan Development Process").

Amendment of the Metropolitan Transportation Plan

Between five-year updates the need may arise for modification of the MTP in a way which may significantly alter the scope or budget of the plan as adopted. Typically this situation arises when existing projects are modified or removed or when new projects need to be added. Since federally funded projects included in the short-range TIP must be consistent with the fiscally constrained MTP, these modifications require either a formal amendment or an administrative modification. *Administrative amendment* is defined by the current Federal regulations in the following terms (23 C.F.R. §450.10s4):

> *Administrative modification* means a minor revision to a long-range Statewide or metropolitan transportation plan, Transportation Improvement Program (TIP), or Statewide Transportation Improvement Program (STIP) that includes minor changes to project/project phase costs, minor changes to funding sources of previously-included projects, and minor changes to project/project phase initiation dates. An administrative modification is a revision that does not require public review and comment, re-demonstration of fiscal constraint, or a conformity determination (in non-attainment and maintenance areas).

GRPC policy identifies administrative modifications as revisions to the long-range plan that do not alter the fiscally constrained character of the MTP and thus do not affect the availability of funds. These modifications usually include, but are not limited to, the following:

- Minor changes in the description or termini of a project which do not have an impact on travel demand modeling or air quality analysis (e.g., the addition of roadway shoulders, bicycle lanes or sidewalks; the modification of intersections; or maintenance of facilities);

- Transfer of funding for a project from one fiscal year to another within an approved TIP, or the shifting of funds allocated for grouped projects within the TIP, provided fiscal constraint is maintained;
- Changing the Federal funding source program (e.g., from Highway Safety Improvement Program to Surface Transportation Program);
- Splitting an entry already made in the TIP, so as to create separate projects from (or phases of) the original, the intent being not to create a new program element but to facilitate development of the one already planned by phasing implementation;
- Removing a project already obligated or even completed;
- Making changes to correct errors or omissions in an approved project provided such modifications do not affect projects in other jurisdictions or the results of travel demand modeling or air quality analysis;
- Altering the amount of Federal funds programmed for a Surface Transportation Program (STP) project provided an increase does not exceed 15 percent.

In order to process administrative amendments, an updated listing of TIP projects is prepared and published on the GRPC website. A formal request is then made to the Mississippi Department of Transportation for incorporation of the modifications in the Statewide Transportation Improvement Program. A summary of administrative modifications is then presented to members of the Transportation Policy Committee at their next quarterly meeting. Administrative modifications do not require formal TPC approval or public review.

A formal amendment is required when a change meets one or more of the following criteria:

- A new project is added or one already programmed is deleted, other than under the conditions specified for administrative amendments;
- Substantial changes are made to the scope of a project (e.g., a change in the number of travel lanes, significant alteration of project termini, or the removal of bicycle/pedestrian elements);
- The amount of Federal funding programmed for a project is to be modified in excess of the amount authorized for an administrative amendment;
- A proposed change will affect the outcome of an approved air quality analysis or travel demand modeling assignment.

A formal amendment proposed for adoption will be evaluated on the basis of the project selection guidelines adopted by the MPO. The amendment will then be presented to the TCC for consideration following a 10-day public review period. All comments and recommendations will be forwarded to the TPC for consideration at a quarterly meeting of the committee. Formal adoption is required. Any

amendment that would affect an approved air quality analysis for the region will also be subject to review and approval by interested state and Federal agencies.

1.3 CURRENT TRENDS AFFECTING TRANSPORTATION PLANNING

There are a number of significant social and demographic trends affecting travel demand on a national level, and these are having a predictable impact on transportation in the Mississippi Gulf Coast MPA. Speaking broadly, the U.S. is projected to grow more slowly, age more rapidly, become more ethnically diverse, and experience population increase mainly in central urban areas and suburban areas.

Demographics of Changing Social Conditions

The U.S. Bureau of the Census projects that nationwide population will grow from 310 million in 2010 to 380 million by 2040. While substantial in absolute terms, the anticipated rate of growth during this period will be lower than it has been in recent decades. The declining growth rate is primarily attributed to lower fertility rates among U. S. women and decreasing rates of immigration. While a slackening rate of in-migration is foreseen by the Census Bureau, the majority of population growth over the next 25 years is expected to come from immigrants and their descendants.

At the same time, longer lifespans are creating a population that will continue to see its elderly cohort grow in both absolute and relative terms. This will likely translate to fewer overall trips per capita and especially to fewer automobile trips per capita.

The increase in ethnic diversity in the U.S. population will likely have a short-term effect that increases carpooling, transit ridership, walking and biking, while decreasing vehicle-miles traveled (VMT) per capita. However, as immigrants adapt to American culture, they may be expected to adopt travel patterns similar to native residents, leading to an increase in VMT per capita for immigrants and their descendants in later decades.

The American workforce is also changing, largely mirroring broader demographic changes. As the population ages, a lessening proportion will fall in the prime working-age group; and the overall labor force participation rate, already falling, will continue to decrease. While some of this decrease in labor force participation may be made up by retirement-age workers seeking part-time employment, it is anticipated that overall employment will fall by 2050 due to the growing impact of robotics and other technological influences. Since commuter trips are the principal factor contributing to peak-period congestion, structural workforce trends will have a major impact on transportation.

Although population and employment growth is anticipated to slow down, the uneven pattern of growth which has prevailed in recent decades will likely persist throughout the United States. Prevailing patterns of migration--from rural to urban areas and from states in the northeastern and midwestern regions to those in the southeastern and western parts of the country—will probably continue. However, growth within metropolitan areas is expected to change slightly. While suburban population and employment growth is anticipated to continue to outpace that of central urban areas, growth in the latter areas is projected to occur at a faster rate than it has in recent decades.

These changes in the patterns of population location have the potential to decrease VMT per capita, as urban residents are more likely than their rural counterparts to use transit, walk or ride a bicycle; and suburban areas have a greater opportunity to develop walkable and transit-oriented areas. At the same time, there is some potential for increases in VMT per capita which would be realized if destinations continue to scatter within metropolitan regions and transit does not effectively serve these areas and provide an attractive alternative to driving.

While some of the projected socio-demographic trends may have conflicting impacts on travel demand, the consensus view is that total VMT will increase in growing areas while VMT per capita will stagnate or decline and more trips will be made by public transit, walking, biking, carpooling, or other means.

Impact of Technological Innovation

The likely impact of technological innovation on transportation is understandably difficult to predict. However, just as science fiction projects current trends into the future and seeks the logical consequences of developing ideas, there is much that can be deduced by examining recent technological developments that are already influencing travel demand.

Telecommuting has been around for several decades now. While telecommuting increased at a rapid rate over the past couple of decades, it still represents a small percentage of work performed by the overall workforce. However, continued advances in communications and incentives provided by local governments, supporting *transportation demand management* (TDM) programs such as telecommuting and flexible work-hours, may encourage continued growth of this workplace trend, thereby reducing the demand for peak-period travel.

Technology is also improving the operation of both new and existing transportation infrastructure by facilitating improved *intelligent transportation systems* (ITS). According to the USDOT, ITS technologies "improve transportation safety and mobility, reduce environmental impacts, and enhance productivity through the integration of advanced communications-based information and electronic technologies into the transportation infrastructure and vehicles." ITS technologies that are likely to have a major impact on future transportation include connected vehicles, automated vehicles, and live data collection and dissemination. These technologies will enable new ITS solutions and improve existing ones such as traffic signal coordination, reversible lane systems, traffic monitoring, demand-based roadway and parking pricing, and real-time travel information.

Bikesharing and *carsharing*, ridesharing initiatives that apply relatively new and still evolving technologies, are already affecting travel demand, especially in urban areas. Both are essentially rental services that enable a traveler to pay for temporary use of a vehicle (bicycle or automobile respectively). There are numerous variants of each, but the common intent is to provide the convenience of a readily available means of transportation when one otherwise would not have access to a private vehicle. In urban areas where many trips can be made by walking, biking or riding public transit, bikesharing and carsharing are helping to meet the demand for transportation by means other than the privately owned and operated motor vehicle. As a result, these innovative rental services are making car-ownership less important for

urban residents. If these services become more widespread, VMT per capita, and perhaps overall VMT, might decline in many urban areas.

Ridesharing, according to the Victoria Transport Policy Institute, is a "carpooling or vanpooling service in which the vehicle carries additional passengers when making a trip, with minimal additional mileage." Ridesharing services are offered by various providers, such as public transit agencies, private taxi companies, vanpool operators and carpool-matching services. Continuing advances in the application of global positioning system (GPS) technology and use of mobile communications drive technological improvements in the delivery of ridesharing services. As with bikesharing and carsharing, traditional ridesharing offers an affordable alternative to the use of a privately owned and operated vehicle, especially for the daily journey to work and back.

Perhaps the most significant impact of technology on transportation relates to the change in consumer behavior resulting from commercialization of the internet. The Census Bureau reported on August 17, 2015, that U. S. retail e-commerce sales for the second quarter of 2015 amounted to an estimated $83.9 billion. That represented 7.2 percent of all estimated retail sales in the second quarter of 2015. E-commerce sales were up 4.2 percent over the preceding quarter and exceeded sales in the second quarter of the preceding year by 14.1 percent. Total retail sales in the second quarter of 2015 were up 1.6 percent over the preceding quarter and topped sales in the same quarter of 2014 by only 1.0 percent. That means that approximately 89.4 percent of the increase in second quarter sales from one year to the next was attributable to increased e-commerce activity. Non-internet sales were up by only $1.23 billion compared to increased e-commerce sales of nearly $10.37 billion. This trend has been tracking steadily upward since the Census Bureau began monitoring e-commerce activity at the beginning of 2006, and so far it shows no signs of leveling off.

Total vehicle-miles traveled (VMT) topped three trillion in 2007 and went up again in 2008 as had been the case in every year since 1981. However, in 2009 VMT fell back below the three-trillion-mile mark and remained below that level through 2014. This unprecedented flattening of the VMT curve applied only to total miles, however, as heavy-truck travel continued to rise (from 205 billion miles in 2000 to 288 billion in 2009 according to FHWA estimates). Conversely, travel by passenger car and other light-duty vehicles reached nearly 2.75 trillion vehicle-miles in 2005 but was down to 2.63 trillion miles by 2009. Average miles traveled per vehicle declined from 11,856 in 2005 to 11,218 in 2009. In a 2014 article entitled, "Per capita VMT drops for ninth straight year; DOTs taking notice," the State Smart Transportation Initiative (SSTI) noted, "Evidence suggests that the decline is likely due to changing demographics, saturated highways, and a rising preference for compact, mixed-use neighborhoods which reduce the need for driving. Some key factors that pushed VMT upward for decades—including a growing workforce and rising automobile ownership—have also slowed considerably."

An SSTI white paper published in 2013 made only passing mention of "online shopping" (along with telecommuting and car-sharing) as a potential source of reduced VMT in the future, noting, "[T]he impact of these factors on VMT is not yet fully understood." Nevertheless, it seems reasonable to suggest that the rather dramatic increase in e-commerce in recent years has meant significantly fewer trips to regional shopping malls and downtown retail centers. And the fact that it has coincided with a sudden and

unforeseen cessation of growth sustained over decades lends credence to the notion that this change in consumer behavior may be not merely a potential factor in reducing future VMT but a significant contributor to the reduction already observed.

The ability of technological innovation to transform human behavior in sudden and unexpected ways is worth keeping in mind as we contemplate the rapid emergence of car-sharing in large urban areas and the looming advent of what might be called *local airborne delivery systems*.

Increasing Emphasis on Environmental Issues

According to a report prepared for the FHWA in 2008 (*Integrating Climate Change into the Transportation Planning Process*), "There is general scientific consensus that the earth is experiencing a long-term warming trend and that human-induced increases in atmospheric greenhouse gases (GHGs) are the predominant cause. The combustion of fossil fuels is by far the biggest source of GHG emissions. In the United States, transportation is the largest source of GHG emissions, after electricity generation. Within the transportation sector, cars and trucks account for a majority of emissions (FHWA, 2008: page 1).

The authors of the report also maintain that, "In addition to contributing to climate change, transportation will likely also be affected by climate change. Transportation infrastructure is vulnerable to predicted changes in sea levels and increases in severe weather and extreme high temperatures. Long-term transportation planning will need to respond to these threats" (FHWA, 2008: page 1).

While acknowledging that current law and regulatory guidance do not require consideration of climate change in the preparation of state or metropolitan transportation plans, the authors encourage such a course and cite legislation (23 USC 143(a)), regulations (23 CFR 450.200, 206, 208, 214, 306 and 320; 49 CFR 613.100 and 200) and the eight Federal planning factors listed at 23 CFR 450.206a and 23 CFR 450.306(a).

The potential environmental effects of proposed transportation improvements must be considered at the outset if the MPO is to avoid including plan elements that will not meet the requirements of the *National Environmental Policy Act* (Public Law 91-190, 823 Stat. 852 (NEPA)). FHWA strongly encourages linking the transportation planning and environmental analysis processes in ways that facilitate the transition from one to the other as a project advances from planning to active development. This can mean screening the project site or study area for wetlands, floodplains, cultural resources, recreational facilities, hazardous waste or other potential obstacles to the implementation of the contemplated improvement. Alternatively it may mean undertaking what amounts to a preliminary environmental study, setting the stage for a fully developed environmental assessment or impact statement.

The identification of potential neighborhood or community impacts is especially important, because of the requirements associated with environmental justice. As previously noted, Executive Order 12898 directed "each Federal agency [to] make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. . . ." Moreover, it required each agency to ensure "that such programs, policies, and

activities do not have the effect of excluding persons" from participation, "denying persons" benefits made available, or "subjecting persons" to discrimination because of their race, color, or national origin. Finally, it directed that "each Federal agency, whenever practicable and appropriate, shall collect, maintain and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have substantial environmental, human health, or economic effect on the surrounding populations, when such facilities or sites become the subject of a substantial Federal environmental administrative or judicial action." Thus an adverse impact on a particular locale, or a designated portion of the human environment afforded special protection under the executive order, can represent an obstacle to project development that cannot be overcome and needs to be identified as such early in the planning process.

Declining Travel Demand and Transportation Revenues

The recent downturn in the demand for travel, as measured by VMT, has already been discussed. While the reversal of the long-term trend, manifested by seemingly inevitable annual increases in VMT, has had its positive effects—reduced traffic congestion, pollutant emissions and vehicular collisions—it also has its more problematical side. Both state and Federal transportation revenues are largely dependent on the consumption of motor fuels. Reduced travel, combined with improved fuel economy, has resulted in declining tax revenues tied to sales of gasoline and diesel. The Federal Highway User Fee has been fixed at 18.4 cents per gallon for gasoline and 24.4 cents per gallon for diesel fuel since 1996. The State of Mississippi taxes both gasoline and diesel at 18.4 cents per gallon. Fuel tax revenues in Mississippi peaked at $469 million in 2004; since then annual revenues have averaged approximately $434 million. Federal fuel tax revenues declined by 18 percent from 1999 to 2013. The result is a looming crisis in funding for transportation programs in the years ahead.