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# **Chapter I**

## **Introduction**

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## PURPOSE OF THE TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

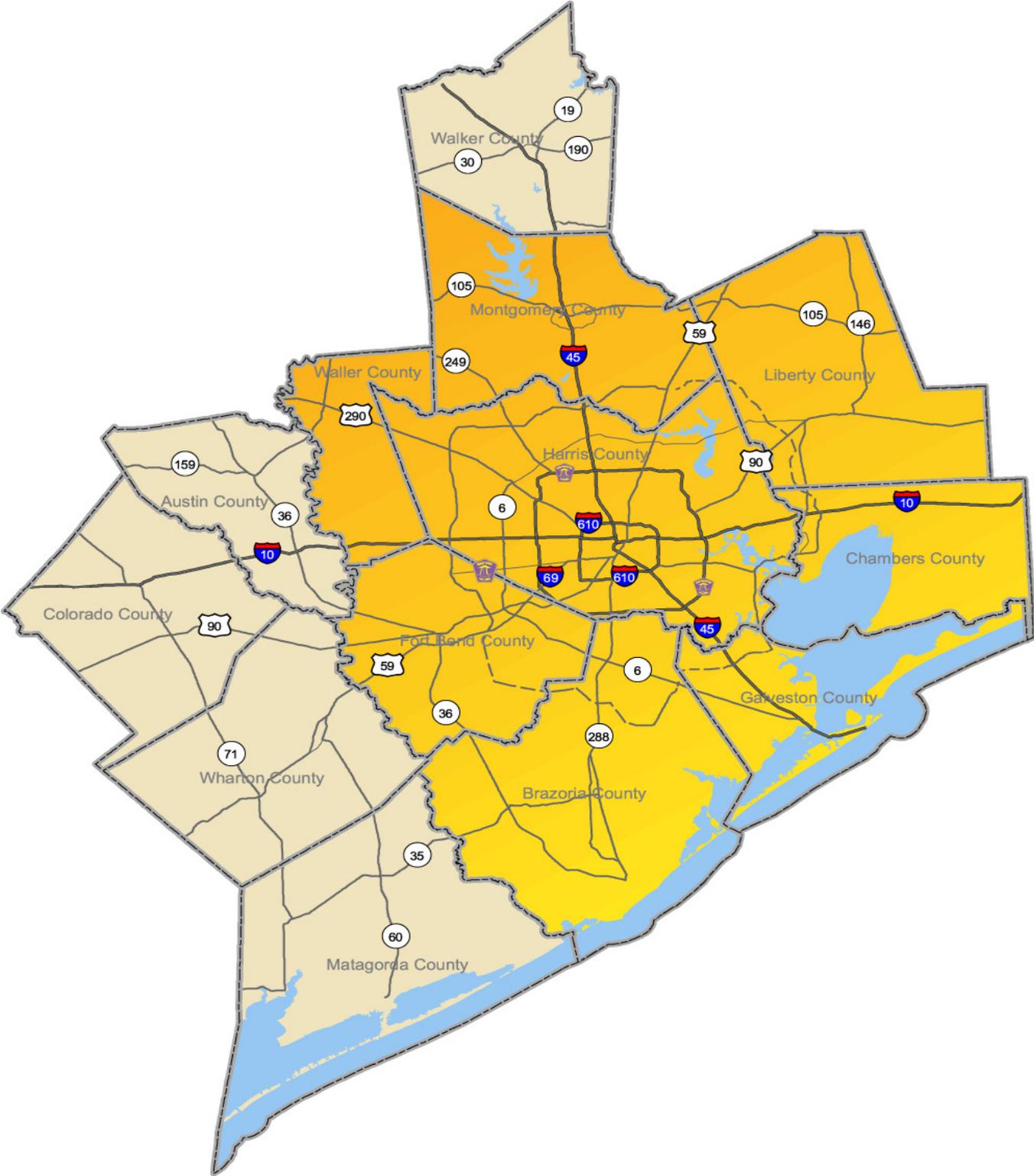
The Transportation Improvement Program (TIP) is a staged, four-year program of surface transportation projects that are either proposed for federal funding or for which federal approval is required, along with regionally significant projects to be implemented with non-federal funds. The TIP is mandated by federal transportation legislation, currently the “Fixing America’s Surface Transportation” (FAST) Act, and provides assurance that the federally supported transportation system is being adequately operated and maintained nationwide. Inclusion in the TIP is a major milestone in the project development process as it signifies regional consensus on the value of a project and approval for federal funding. Although the TIP covers four years of project programming, the schedule of projects is updated every two years - in line with the federal fiscal calendar.

The TIP contains a detailed description of every included project, documents the costs at each project phase and is financially constrained for each program year. Since it is designed to implement the goals, strategies, and priorities of the approved long-range transportation plan, the TIP must be consistent with the RTP. Moreover, when a planning region is designated a “non-attainment” or a “maintenance” area under the federal air quality standards, the TIP must meet the requirements of the Clean Air Act by conforming to the State Implementation Plan (SIP) to reduce pollution.



It should be noted that inclusion in the TIP is not a guarantee that a project will be implemented given the fact that unforeseen obstacles could impact funding, project readiness, or sponsorship. In addition, the TIP is not a final project implementation schedule. Federal regulations permit amendments to the TIP after it has been adopted in order to add new projects, delete projects, or else to advance or delay projects in the schedule as circumstances necessitate.

The 2021 – 2024 TIP was developed by the Houston-Galveston Area Council (H-GAC) in cooperation with the Texas Department of Transportation (TxDOT), local government entities, and local transportation agencies. The multi-year/multimodal project list is the product of a comprehensive, cooperative, and continuing regional transportation planning process and consists of projects identified as priorities for the Houston-Galveston metropolitan region.



Map 1-1: H-GAC Region showing the Eight TMA Counties

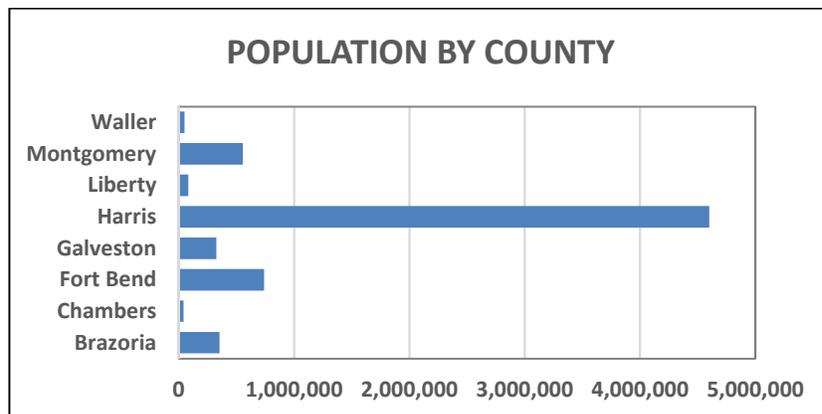
**THE PLANNING REGION**

H-GAC is the federally designated metropolitan planning organization (MPO) for the 8-county Houston-Galveston metropolitan region. The H-GAC Metropolitan Planning Area (MPA) is comprised of the counties of Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller, covering an area of approximately 8,800 square miles – slightly larger than the State of New Jersey (Map 1.1). The MPO is a federally funded transportation policy-making organization made up of representatives from local government and state transportation authorities. Creating the designation of MPO is however by agreement of the several general-purpose local governments within the region and the Governor of Texas. As MPO, H-GAC coordinates the transportation planning activities and decides how federal transportation dollars are spent within the planning region.

The Houston-Galveston metropolitan region also has federal designation as a Transportation Management Area (TMA) – which is a metropolitan region with a population greater than 200,000 (Figure 1-1). The H-GAC TMA boundary is identical to the boundaries of the MPA. This region is home to an ethnically diverse population of over 6.7 million residents and consistently ranks as one of the fastest growing regions within the nation. Population growth is driven by a robust rate of natural increase coupled with a positive net migration. These two factors have contributed to a population increase of over one million residents in the area since the year 2010. Although the rate of population growth has dipped in the recent years, especially within Harris County, the region’s overall population is still increasing at the rate of about 90,000 new residents per annum.

Like the population, the mobility needs within the planning region are vast and diverse. The funding commitments documented in the 2021 – 2024 TIP respond to the regional aspiration for a safe, efficient, and reliable multimodal transportation system for its residents.

Figure 1-1: Population Distribution in the H-GAC TMA



Source: US Census Bureau, 2014-2018 American Community Survey 5-Year Estimates

### RELATIONSHIP TO THE TRANSPORTATION PLANNING PROCESS

Serving as the MPO for the Houston-Galveston planning region, H-GAC is responsible for preparing and maintaining three key elements of the regional transportation planning process: The Regional Transportation Plan (RTP), the MPO Ten Year Plan, and the Transportation Improvement Program (TIP). These three programs correspond respectively to the long-term regional planning vision, the intermediate-term planning guide, and the detailed short-term programming schedule. Federal regulations moreover require the TMA to implement a Congestion Management Process (CMP) in conjunction with their transportation planning activities. Because the Environmental Protection Agency (EPA) has designated the Houston-Galveston-Brazoria (HGB) area a nonattainment area for the pollutant Ozone under the National Ambient Air Quality Standards (NAAQS), the MPO must coordinate its transportation planning process with the process of developing transportation control measures designed to bring the region into attainment.

The 2021 – 2024 TIP maintains consistency with the following transportation planning documents:

- 2045 RTP: The H-GAC long-range Regional Transportation Plan
- H-GAC Ten-Year Plan
- TxDOT Unified Transportation Program (UTP)
- TxDOT Statewide Transportation Improvement Plan (STIP)

These planning documents and programs are briefly described below.

#### 2045 RTP

The long-range transportation plan “2045 RTP” is the defining expression of the regional vision for the future transportation system for the Houston-Galveston metropolitan area and serves as a guide for the expenditure of state and federal funds through the year 2045. The 2045 RTP is the product of a cooperative effort between H-GAC, local governments, TXDOT, transit operators, representatives of transportation providers, and the general public, and is required to be updated at least once every four years. Considering that the TIP is meant to implement the goals, strategies, and priorities expressed in the long-range plan, the project programming in the TIP is consistent with the first four years of the 2045 RTP.

The long-range plan evaluates the existing transportation system and defines a set of regional goals to improve the system as well as the implementation strategies for achieving those goals. The 2045 RTP vision statement articulates an aspiration for an integrated multimodal transportation system that promotes a desirable quality of life and enhances the regional economic vitality while improving safety, accessibility, and mobility. In developing the 2045 RTP, H-GAC hosted over 20 public meetings and open house events, providing interested stakeholders with an opportunity to participate in the plan development process. Over 1000 public comments were received over the course of the public outreach effort. These comments helped to inform the decisions that shaped the final plan. The 2045 RTP was approved and adopted by the H-GAC Transportation Policy Council (TPC) on May 24, 2019.

**THE MPO 10-YEAR PLAN**

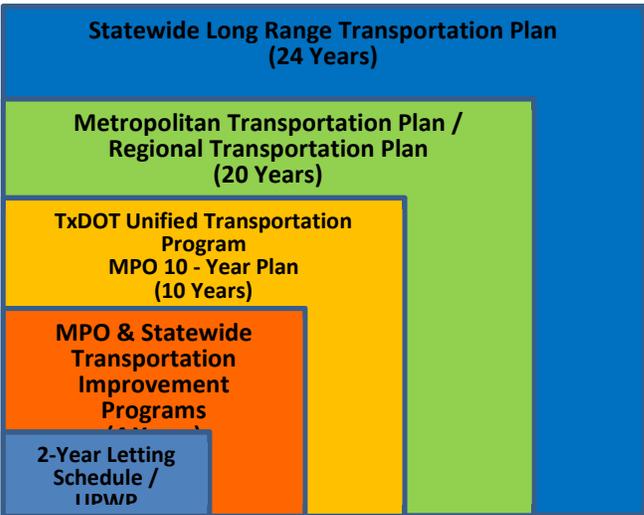
H-GAC has developed a 10-year Transportation Plan as directed by House Bill 20 (HB 20) which was passed by the 84th Texas legislature in 2015. HB 20 requires the MPO 10-year plan to specify how the transportation funding allocated to the Metropolitan Planning Area would be utilized. The 10-year transportation plan is consistent with and prioritizes projects from the regional transportation plan while the first 4 years of the plan must be consistent with the Statewide Transportation Improvement Program (STIP) and the H-GAC TIP. As directed by HB 20, the 10-year plan must consider and address congestion, safety, the effect of a project on economic development opportunities for area residents, available funding, air quality, and the project’s impact on the underserved communities.

**TXDOT UNIFIED TRANSPORTATION PROGRAM (UTP)**

The Unified Transportation Program (UTP) is TxDOT’s 10-year planning document and guides the planning, development and construction of a multimodal list of transportation projects that involve the highways, aviation, public transportation and the waterways and coastal waters within each TxDOT district. The Houston-Galveston metropolitan region includes territory from two TxDOT district offices – Houston and Beaumont. The UTP is developed annually in accordance with the Texas Administrative Code (TAC § 16.105) and is used as a guideline for programming projects in the Statewide Transportation Improvement Program (STIP). In developing the UTP, TxDOT collaborates with local governments, local transportation entities and public transportation operators. The UTP is approved by the Texas Transportation Commission. Projects in the UTP have Commission authorization for preliminary engineering work, environmental analysis, right of way acquisition, and design.

Figure 1-2: The Hierarchy of Transportation Plans

The UTP is an intermediate programming document that links the planning activities of the Statewide Long-Range Transportation Plan (SLRTP) and Metropolitan Transportation Plans with the detailed programming activities of the STIP and TxDOT’s two-year letting schedule. Figure 1-2 portrays the hierarchy of regionwide transportation plan documents and shows how they relate to one another. State regulations require the UTP to be financially constrained based on reasonably expected funding revenues. While the UTP is a critical tool in guiding transportation project development within the long-term planning context, it is not a budget, nor does it constitute a guarantee that a



listed project will be built. As projects move closer to construction or implementation, they advance from the UTP into the Statewide Transportation Improvement Program (STIP).

### **TXDOT STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)**

The STIP is TxDOT's four-year capital improvement program that fulfills federal (23 USC 135 and 23 CFR 450.218) and state (43 TAC 16.103) planning requirements. The STIP incorporates all the Rural Transportation Improvement Programs (RTIP) and the MPO Transportation Improvement Programs (TIP) statewide and presents the four-year list of transportation projects and services to be constructed or implemented within the entire state of Texas. A federally approved STIP is required for projects to be eligible for federal funding under Title 23 USC and Title 49 USC, Chapter 53. Similarly, projects in the MPO TIPs must be programmed into the STIP to be eligible for federal funding.

The STIP identifies projects, programs, and services that are within four years of being constructed or implemented to meet the transportation needs identified during the transportation planning process. The STIP must be both financially constrained and consistent with the SLRTP. The development of the STIP includes a statewide public involvement process which culminates in a public hearing in Austin before the STIP is approved and adopted by the Texas Transportation Commission. Once adopted by the Commission, the STIP must then be approved by the Federal Highway Authority (FHWA) and the Federal Transit Authority (FTA).

### **MANAGEMENT SYSTEMS**

The Houston metropolitan area ranks as one of the most congested urban areas in the United States. According to the Texas Transportation Institute (TTI), the Houston metropolitan area contains the single most congested roadway within the state of Texas and as many as twelve of the top twenty most congested roadways in the state. All metropolitan areas with populations greater than 20,000 residents like the greater Houston region are required to develop and implement a Congestion Management Process (CMP). The CMP is a systematic method for: (1) identifying roadways in the region that are chronically congested and determining the causes, (2) applying a range of congestion mitigation strategies to improve system performance and reliability and, (3) conducting a periodic assessment to evaluate the effectiveness of the selected strategies and to guide recommendations for future solutions to the congestion problem. The strategies typically employed to reduce congestion through the CMP generally focus on improving traffic operations, managing travel demand and when necessary, adding to roadway capacity.

The CMP is an integral part of the metropolitan transportation planning process and provides important input to the RTP development process and the programming of the TIP. For instance, the CMP analysis directly benefits the TIP when it generates system performance information that informs the evaluation of projects being considered for inclusion in the TIP. The system performance information also guides the selection of locations for corridor studies or roadway

segments in need of detailed analysis, while the robust modeling tools incorporated in the CMP analyses can help to assess the effectiveness of strategies proposed to manage regional congestion.

### TIP FUNDING AND PROJECT SELECTION

Although many critical transportation needs are identified in the RTP, they cannot all be implemented at once because funding is limited. The transportation project selection and approval process involves shared decision-making. The TPC has primary responsibility for project selection under the following funding categories:

- Category 2 – Metropolitan and Urban Corridor Projects
- Category 5 - Congestion Mitigation and Air Quality (CMAQ)
- Category 7 – Surface Transportation Block Grant (STBG) Program, and
- Category 9 – Transportation Alternatives Set-Aside Program (TASA)

These funding categories have specific eligibility requirements defined in the federal regulatory code.

The TPC approves all projects that are included in the TIP. Some projects are however developed and selected in other forums and subsequently added to the TIP. As an example, the Texas Transportation Commission selects major mobility, maintenance, rehabilitation, and safety projects on the state highway system. The Commission also selects bridge program projects, both on and off the state system. Furthermore, the state administers the region’s transit funding programs except within the Houston, Conroe, and The Woodlands Urbanized Areas (UZA). H-GAC facilitates discussions between the local transit agencies on the division of federal funds allocated to the UZAs.

Figure 1-3: The Transportation Improvement Program (TIP)



PERFORMANCE-BASED PLANNING AND PROGRAMMING

PERFORMANCE MEASURES

The objective of Transportation Performance Management is to focus federal funds on the achievement of national goals, increase accountability and transparency, and improve investment decision-making through performance-based planning and programming of transportation projects. The federal transportation legislation: “Fixing America’s Surface Transportation” Act or FAST Act requires the establishment of goals for which Metropolitan Planning Organizations, and state Departments of Transportation are required to set targets and to report on progress towards achieving those targets for numerous federal performance measures. H-GAC is responsible for these measures in key performance areas such as Safety, Pavement and Bridges, Reliability, Congestion, Air Quality and Transit Asset Management. Table 1-1 and Table 1-2 below list the specific measures in various performance areas for the transportation system for both highways and transit. A comprehensive report of H-GAC’s baseline conditions and targets for all performance areas is available in **Appendix B** of this document.

Table 1-1: Highway Performance Measures

Category	Performance Measure	Applicability	Reporting Frequency
Highway Safety	Number of fatalities	All public roads	Annually
	Rate of fatalities		
	Number of serious injuries		
	Rate of serious injuries		
	Number of non-motorized fatalities and serious injuries		
Pavement and Bridge Condition	Percentage of pavements of the Interstate System in Good condition	Interstate System	Biennially with four-year performance periods
	Percentage of pavements of the Interstate System in Poor condition	Non-Interstate NHS	
	Percentage of pavements of the non-Interstate NHS in Good condition		
	Percentage of pavements of the non-Interstate NHS in Poor condition	National Highway System (NHS)	
	Percentage of NHS bridges classified in Good condition		
	Percentage of NHS bridges classified in Poor condition		
Highway System Performance	Percent of the person-miles traveled on the Interstate that are reliable (Level of Travel Time Reliability)	Interstate System	Biennially with four-year performance periods
	Percent of the person-miles traveled on the Non-Interstate NHS that are reliable (Level of Travel Time Reliability)	Non-Interstate NHS	
	Truck Travel Time Reliability (TTTR) Index	Interstate System	
	Annual Hours of Peak Hour Excessive Delay Per Capita	National Highway System	
	Percent of Trips with Non-Single Occupant Vehicles	Urbanized area	
	Total Emission Reductions	Urbanized area	

Table 1-2: Transit Performance Measures

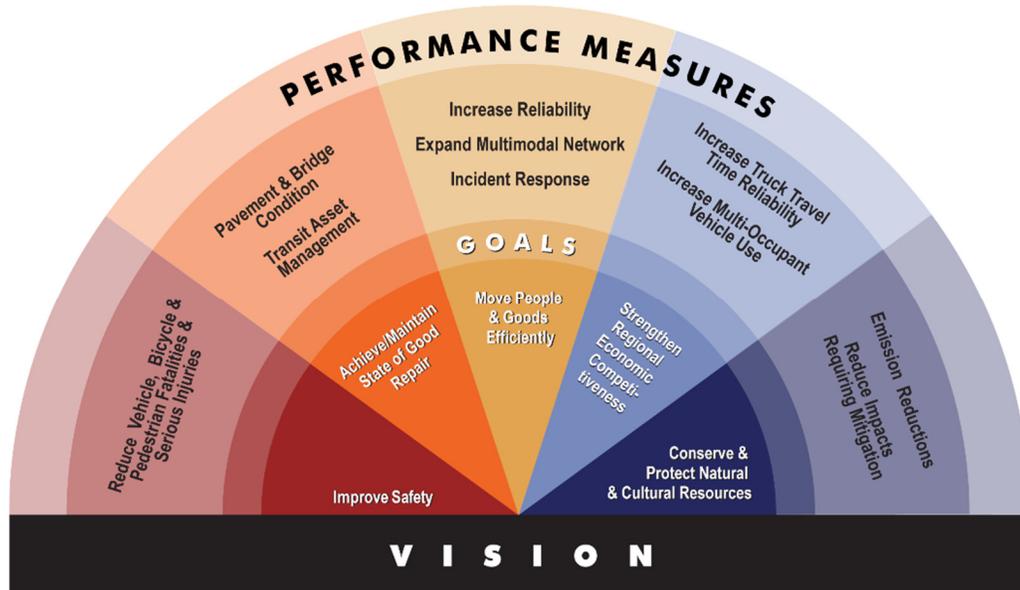
Category	Performance Measure	Applicability	Reporting Frequency
Transit Asset Management	Rolling Stock - percentage of revenue vehicles that exceed their Useful Life Benchmark	Region's transit providers who are recipients and subrecipients of federal transit assistance & HGAC	Annually
	Equipment - percentage of non-revenue service vehicles that exceed their Useful Life Benchmark		
	Facilities - percentage of facilities with a condition rating below 3 on the Transit Economic Requirements Model Scale		
	Infrastructure - percentage of rail track segments that have performance restrictions	METRO	
Transit Safety	Fatalities - total amount and rate of fatalities per total vehicle revenue miles	Region's transit providers who are recipients and subrecipients of federal transit assistance & HGAC	Annually
	Injuries - total amount and rate of injuries per total vehicle revenue miles		
	Safety Event - total amount and rate of safety events per total vehicle revenue miles		
	System Reliability (State of Good Repair) – mean distance between major mechanical failures		

The 2021-2024 TIP continues to build upon the goals and strategies articulated in the 2045 RTP. The performance measures included in the 2045 RTP were crafted in accordance with the FAST Act. The 2021-2024 TIP utilizes the progress already achieved to support decisions on transportation investment aligned with the following goals:

1. Improve Safety
2. Achieve/Maintain a State of Good Repair
3. Move People and Goods Efficiently
4. Strengthen Regional Economic Competitiveness
5. Conserve and Protect Natural and Cultural Resources

The project selection process utilized during development of the 2021-2024 TIP assessed major investment-level applications based on the 2045 RTP’s five goals and performance measures. By incorporating 2045 RTP goals into short-range programming activity, the performance measures have achieved a strong correlation between the region’s vision for the future and the investments made today.

Figure 1-4: 2045 RTP Goals and Performance Measures



**PLANNING FACTORS**

The FAST Act requires the inclusion of several new planning factors such as consideration of intercity bus connections, transit asset management, resiliency, and federally required performance targets. H-GAC adopted performance measure targets with the performance-based planning process within the time limit given by the FHWA. As a data clearinghouse, H-GAC will provide regional data to the Texas Department of Transportation when updates become available. A comprehensive report of how H-GAC is addressing Planning Factors is in **Appendix B** of this document. The summary of the Planning Factors and their compliance are identified in Table 1-3 below.

Table 1-3: Transit Performance Measures (Planning Factors)

FAST Act Requirement	FAST Act Provision	Issues Addressed in 2021-2024 TIP	Where Addressed
Public Participation	23 CFR 450.316(a)	H-GAC’s Public Participation Plan (PPP) was updated in 2017 to expand the list of stakeholders to be engaged in transportation planning process.	Public Participation Plan <a href="http://www.h-gac.com/transportation-public-outreach/documents/h-gac-public-participation-plan.pdf">http://www.h-gac.com/transportation-public-outreach/documents/h-gac-public-participation-plan.pdf</a>
Memorandum of Understanding	23 CFR 40.314(h)	The Memorandum of Understanding was executed between H-GAC, TxDOT and the region’s transit providers.	Memorandum of Understanding <a href="http://www.h-gac.com/transportation-policy-council/meeting-agendas/documents/2018/may/ITEM-09-Interagency-MOU.pdf">http://www.h-gac.com/transportation-policy-council/meeting-agendas/documents/2018/may/ITEM-09-Interagency-MOU.pdf</a>
Consultation and Cooperation	23 CFR 450.316(b)	2021-2024 TIP was developed with continued consultation and cooperation with state and local officials and takes into consideration the planning activities of other agencies and organizations within the MPO region.	<ul style="list-style-type: none"> <li>Public Participation Plan</li> <li>Disaster Preparedness</li> <li>Travel and Tourism (Appendix B)</li> </ul>
Resiliency and Reliability	23 CFR 450.206(a)(9)	2021-2024 TIP incorporates an assessment of the vulnerability of transportation assets to extreme weather events and identifies initiatives to improve resiliency and increase the reliability of the regional transportation system.	<ul style="list-style-type: none"> <li>Resiliency and Reliability (Appendix B)</li> </ul>
Stormwater Impacts	23 CFR 450.206(a)(9)	2021-2024 TIP identifies roadways susceptible to impact by stormwater and includes a choice of projects and strategies aimed at mitigating these impacts.	<ul style="list-style-type: none"> <li>Resiliency and Reliability (Appendix B)</li> </ul>
Disaster Preparedness	23 CFR 450.316(b)	2021-2024 TIP identifies local emergency management operations serving the Houston-Galveston metropolitan region, details the designated hurricane evacuation routes and the Zip-Zone map.	<ul style="list-style-type: none"> <li>Disaster Preparedness (Appendix B)</li> </ul>
Travel and Tourism	23 CFR 450.206(a)(10)	2021 – 2024 TIP includes a review of opportunities to engage in recreational travel and tourism in the planning region and considers strategies to promote growth in this transportation sector.	<ul style="list-style-type: none"> <li>Travel and Tourism</li> <li>Public Participation Plan (Appendix B)</li> </ul>

FAST Act Requirement	FAST Act Provision	Issues Addressed in 2021-2024 TIP	Where Addressed
Intercity Buses	23 CFR 450.216(b) & 23 CFR 324(f)(2)	2021-2024 TIP examines the existing intercity bus services in the region and identifies opportunities to expand these services and grow additional routes and operations.	<ul style="list-style-type: none"> <li>Intercity Buses (Appendix B)</li> </ul>
Performance Measures	23 CFR 450.324(f)(3)	2021-2024 TIP includes the federal performance measures linked to the vision, goals, and project prioritization, establishes targets and documents the condition and performance of the	<ul style="list-style-type: none"> <li>Performance Measures System Evaluation Report (Appendix B)</li> </ul>

**AIR QUALITY**

Air quality is influenced by many factors including topography, weather conditions, and human activities such as agriculture, industry and manufacturing, domestic consumption, and transportation. Because transportation sources contribute significantly to air pollution, the Clean Air Act (CAA) identifies actions that must be taken by states and MPOs to reduce vehicular emissions.

The U.S. Environmental Protection Agency (EPA) has designated the 8-county Houston-Galveston-Brazoria region as a nonattainment area for ground-level ozone. While transportation is not the region’s sole source of ozone pre-cursor pollutants, it does constitute the largest portion of these pollutants. Due to this, continued reductions of pollutants from on-road vehicles are an essential part of H-GAC’s efforts to help the region attain clean air standards. Consequentially, it is the MPO’s role in air quality planning to assess the impact of planned transportation projects on air quality and to identify programs and projects that will help reduce emissions.

The 2045 RTP and the 2021-2024 TIP are required to conform to emissions limits established by the Texas Commission on Environmental Quality (TCEQ) and approved by the EPA. The CAA requires TCEQ to develop and submit a document called a State Implementation Plan (SIP) to show how the state will meet the National Ambient Air Quality Standards (NAAQS) for ozone. These limits are then applied to MPO-funded activities within the region through the conformity and TIP development processes. To this end, the 2021-2024 TIP relies on demonstration of air quality conformity approved on August 2, 2019 by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). Conformity determination is made using motor vehicles emissions budgets for the ozone precursors nitrogen oxides (NOx) and volatile organic compounds

(VOCs) that were developed for the Houston-Galveston-Brazoria Attainment Demonstration and Reasonable Further Progress State Implementation Plan Revision for the 2008 8-Hour Ozone Standard (SIP). Further detail on the current conformity analysis is available on H-GAC’s website at <http://www.h-gac.com/transportation-conformity>.

**PUBLIC INVOLVEMENT AND THE TIP**

The Houston-Galveston Area Council has a robust public participation process which is guided by the agency’s Public Participation Plan. Public involvement is an ongoing aspect of the transportation project planning and implementation process and provides an opportunity for the public to become fully informed about proposed projects while providing a forum for them to contribute their input to plan development. H-GAC manages several important programs to foster public involvement by all members of the regional community including the residents protected by Title VI non-discrimination regulations and those identified as sensitive for environmental justice.

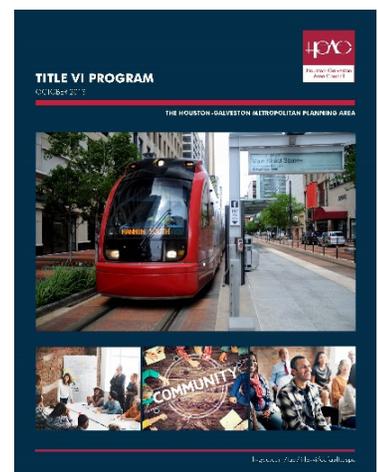
**TITLE VI AND ENVIRONMENTAL JUSTICE PROTECTIONS**

Planning activities must be performed for the benefit and with the involvement of all residents in the region, including members of the traditionally underserved communities. As it performs its planning activities, H-GAC is guided by the federal mandates of Title VI of the Civil Rights Act of 1964 and the 1994 Presidential Executive Order 12898 on Environmental Justice. Keeping with these regulations the agency continually strives to maintain a transparent and inclusive planning process.

**TITLE VI**

Title VI prohibits discrimination against a person or group of persons in any program or activity that receives federal financial assistance. The Act states: “No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance.” This includes the transportation programs and activities that receive any funding through the Federal Transit Administration (FTA), the Federal Highway Authority (FHWA), or the Federal Aviation Administration (FAA).

The TIP development process is calculated to promote participation by all residents and to achieve the nondiscrimination requirements of federal law. More information about H-GAC’s Title VI Program can be obtained at: <http://www.h-gac.com/title-vi-program/default.aspx>.



**ENVIRONMENTAL JUSTICE**

The U.S. Environmental Protection Agency (EPA) defines environmental justice as “the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin, or educational level with respect to the development, implementation and enforcement of environmental laws, regulations and policies.” Within the field of transportation, the principles of environmental justice check that projects such as highway expansions do not have a disproportionately negative impact on minority and low-income populations, and that these communities receive a share of the benefits of transportation expenditure and are given meaningful opportunities to participate in the decisions that apportion federal funds.

Following the rules outlined in H-GAC’s Public Participation Plan, effort is taken to ensure that area residents have reasonable access to information about ongoing transportation projects and are given reasonable opportunity to provide their input to the pertinent discussions. The H-GAC Public Participation Plan also includes a Language Assistance Plan (LAP) to address the needs of residents with Limited English Proficiency (LEP) or some other communication disability.

The LAP outlines the demographic basis for establishing a language assistance program and defines the kind of language assistance services that are available through the agency. The LAP also informs the public on the procedures for requesting an offered service.

Other elements of the public involvement process may be obtained from the Public Participation Plan which is available at <http://www.h-gac.com/transportation-public-outreach/documents/h-gac-public-participation-plan.pdf>.

