



2045 RTP

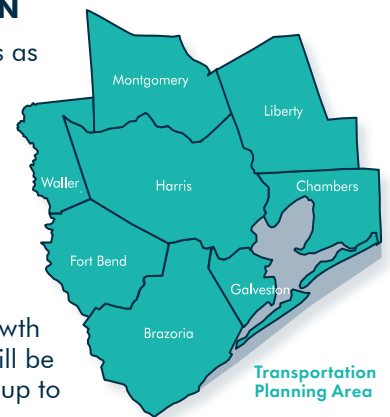
REGIONAL TRANSPORTATION PLAN

SUMMARY



THE 2045 REGIONAL TRANSPORTATION PLAN

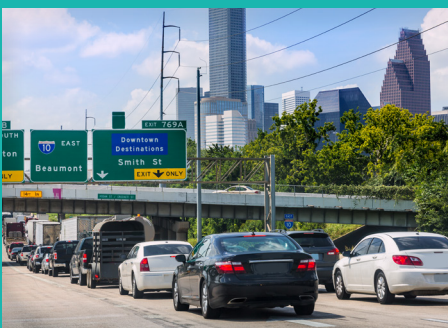
The Houston-Galveston region consistently ranks as one of the fastest growing metropolitan areas in the United States and is home to one of the nation's largest employment hubs. The population in the region rose from approximately 3.1 million residents in 1980 to about 6.8 million in 2018 – an increase of nearly one million residents per decade. Similarly, employment in the region grew by about half a million new jobs between 2010 and 2015, indicative of a strong and diverse economy. This growth trend is expected to continue. By 2045, the region will be home to about 10.7 million people and will support up to 4.8 million jobs.



As the designated Metropolitan Planning Organization (MPO), the Houston-Galveston Area Council (H-GAC) is responsible for planning for the orderly growth and development of the eight-county transportation management area, in coordination with several planning partners. The long-range Regional Transportation Plan (2045 RTP) represents a coordinated effort to address the present transportation concerns and to prepare for the mobility needs of the future. The fiscally constrained investments selected for inclusion in the 2045 RTP are based on the unique needs and characteristics of the MPO region and will guide transportation decision-making in the region over the next 25 years.

TRANSPORTATION SYSTEM CONCERNS

Congestion is a leading transportation concern in the Houston-Galveston region. It affects the reliability of the transportation system, impacts economic activity, and influences the quality of life of area residents. Sixty percent of the most congested roads in Texas are in Harris County. The West Loop Freeway (IH 610 W) and Southwest Freeway (IH 69S/US 59 S) top the list as the first and second most congested road segments in the state. The annual cost due to congestion in 2016 was estimated at about \$1.12 billion.



Safety is another serious concern for roadway travel in the region. Between 2012 and 2016, motor vehicle crashes increased regionwide by more than 40%. Fatalities from vehicle accidents increased by over 20% within the same period. Vehicle crashes cost the region as much as \$6.4 billion in 2016 and is one of the leading causes of death among persons in their teens and twenties.

Funding for the different transportation needs is a challenge faced throughout the nation. Federal revenue comes largely from the Highway Trust Fund whose major source is the 18.4 cents tax per gallon of gasoline. Expenditures from this fund have

Five goals were selected to direct the work towards this vision. Each goal is associated with quantifiable performance measures that indicate the progress made towards achieving the goal. Finally, three strategies – MANAGE, MAINTAIN, and EXPAND – help to identify specific projects that support each goal.

MANAGE [System Management and Operations]

System and operations management techniques are designed to make more efficient use of existing roadway facilities through low-cost solutions such as traffic signal synchronization, rapid incident management, and

MAINTAIN [Asset Management]

Keeping the bridges, roadways, transit facilities, railroads, and port facilities in a state of good repair is a fundamental need for our region’s transportation system. The Maintain strategy directly supports all five RTP goals and accounts for about 37% of the total 2045 RTP expenditure. Adequate maintenance extends the life of the facilities and promotes the safety of the traveling public at a fraction of the cost of constructing new ones. Projects recommended to implement this strategy in the 2045 RTP will maintain and improve existing roadways and the network of walkways and bikeways.

RELATIONSHIP BETWEEN 2045 RTP STRATEGIES, GOALS AND PERFORMANCE MEASURES

GOAL	STRATEGIES			PERFORMANCE MEASURES
	MANAGE Improve System Management & Operations	MAINTAIN Asset Management	EXPAND Multimodal Network Capacity	
Improve Safety	●	●	●	Reduce Crash Rates of Fatalities and Serious Injuries
Achieve/Maintain State of Good Repair	●	●	●	Pavement & Bridge Conditions and Transit Asset Management
Move People and Goods Efficiently	●	●	●	Increase Reliability, Expand Multimodal Network and Improve Incident Response
Strengthen Regional Economic Competitiveness	●	●	●	Increase Truck Travel Time Reliability and Increase Multi-Occupant Vehicle Use
Conserve and Protect Natural and Cultural Resources	●	●	●	Emission Reductions and Reduce Impacts Requiring Mitigation

● Direct Impact ● Related Impact

outpaced revenues. Federal regulations require the RTP to be financially constrained to resources estimated to be reasonably available within the life of the plan. Funding limitations influence the ability to assist otherwise beneficial transportation projects.

VISION, GOALS, PERFORMANCE MEASURES, AND STRATEGIES

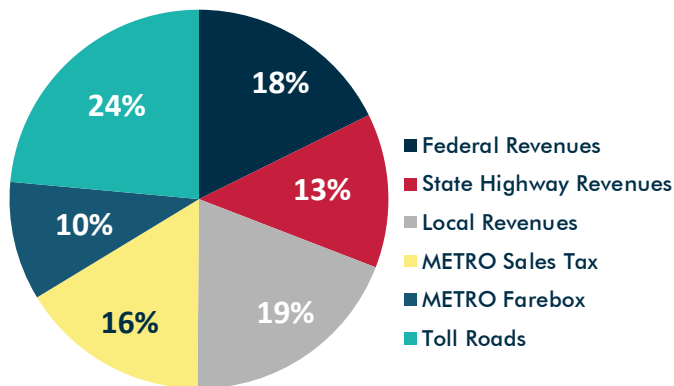
“In the year 2045, our region will have an integrated multimodal transportation system, achieved through coordinated public and private investments that support a desirable quality of life, enhanced economic vitality and increased safety, access and mobility.”

traveler information systems. Projects recommended to implement this strategy in the 2045 RTP will alleviate congestion and address traffic safety by improving access management on the roadways, adding grade separations at intersections, removing traffic bottlenecks, and the reducing vehicular traffic through the increased use of transit and other alternate commute solutions. The congestion management process (CMP) is an integral part of the overall strategy. The Manage strategy supports all five goals of the 2045 RTP and accounts for about 27% of the total plan expenditures.

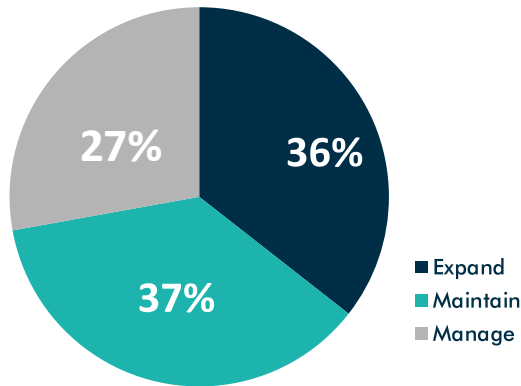
EXPAND [Multimodal Network Capacity]

The Expand strategy focuses on adding capacity across all the modes of transportation. Network expansion could enhance safety, improve incident response, and provide travel alternatives and relief to currently congested facilities. Projects recommended to implement this strategy include roadway widening, grade separations, building interconnected networks of walkways and bikeways, and promoting design practices that improve safety on new roadways. The Expand strategy accounts for about 36% of the total 2045 RTP expenditures.

Revenue by Source Total: \$147 Billion



Expenditures by Strategy Total: \$132 Billion



FINANCING THE 2045 RTP

Federal regulations require the 2045 RTP to be financially constrained. This means that projects and programs may be included in the plan only if funding can be identified for them. These funds must come from revenues that can be reasonably expected over the plan horizon.

Reasonably available revenue is estimated by annual financial reports from local agencies, relevant TxDOT data and projections, and trends related to debt financing and regional revenues. Federally, the main source of funding is provided by the Highway Trust Fund. At the state level, revenues are derived from the State Highway Fund, and two

voter-approved constitutional amendments—Proposition 1 and Proposition 7. Locally, revenues are estimated based on future capacity of local municipalities, counties, transit agencies, toll road authorities, and other qualified public entities to invest in regional transportation by providing a local match, or in sponsorship of the recommended projects and transportation programs presented in the 2045 RTP.

The total estimated revenue available for the 2045 RTP is approximately \$147 billion while the total expenditure for the three 2045 RTP strategies combined is estimated at \$132 billion.

REGIONAL HIGHWAYS

The Houston-Galveston Area's transportation system supports approximately 180 million vehicle miles of travel on an average week-day. These vehicle miles are travelled on 27,000 miles of regional roadway network containing interstate highways, toll-ways, US routes, State highways, arterials, collectors and local roads. With expected growth in population and jobs, regional travel is expected to increase by 63% and reach 295 million miles a day in 2045.

To support this significant growth in regional travel, the 2045 RTP recommends \$64 billion of investments to manage, maintain and expand (additional 2,900 lane miles) the regional highways. Some of these highway investments are as follows:

- #### NORTH HOUSTON HIGHWAY IMPROVEMENT PROJECT:

Reconstruction and widening roadway capacity, improve safety, and alleviate congestion on IH 45 between downtown Houston and

Montgomery County. Reconfigure and reconstruct and IH 45/US 59/ IH 69/IH 10 complex interchange in downtown Houston

- #### GRAND PARKWAY/SH 99:

Completion of the remaining segments (B, C, G, H, I-1, and I-2) of Grand Parkway/SH 99 and widening of Grand Parkway/SH 99 Segment D

- #### IH 10 W:

 Reconstruction and widening of IH 10 W to add two managed lanes

- #### IH 10 E:

 Construction of direct connectors to Grand Parkway/SH 99, reconstruction of interchanges to reverse overpasses at various locations in Chambers County

- #### IH 45 S:

 Reconstruction and widening of IH 45 S between downtown Houston and City of Galveston

- #### IH 610:

 Construction of direct connectors on IH 610 at future SH 35 (Spur 5)

- #### IH 69/US 59:

 Conversion of IH 69 N to Freeway, construct direct connectors at Grand Parkway/SH 99 in Liberty County

- #### US 290:

 Installation of new pavement markings for off peak HOV lanes

- #### SH 288:

 Reconstruction and widening of SH 288, construction of grade separations at multiple county roads in Brazoria County

- #### SH 249:

 Construction of a toll road between Spring Creek and FM 1774 in Montgomery County, construct direct connectors at Grand Parkway/SH 99 in Harris County

- #### SH 146:

 Widen from 4 to 6- main lanes and reconstruct frontage roads, Construct railroad overpass, Installation of active traffic management system in Harris County

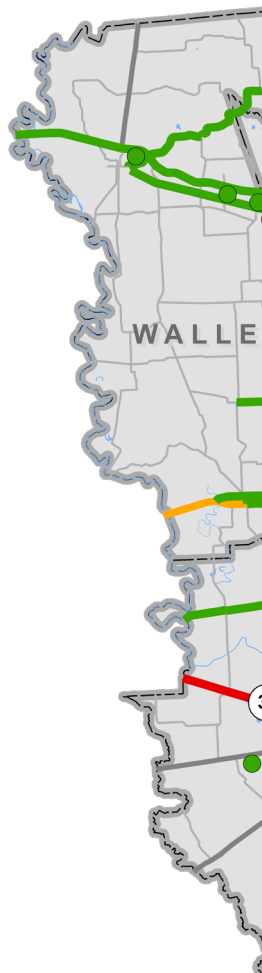
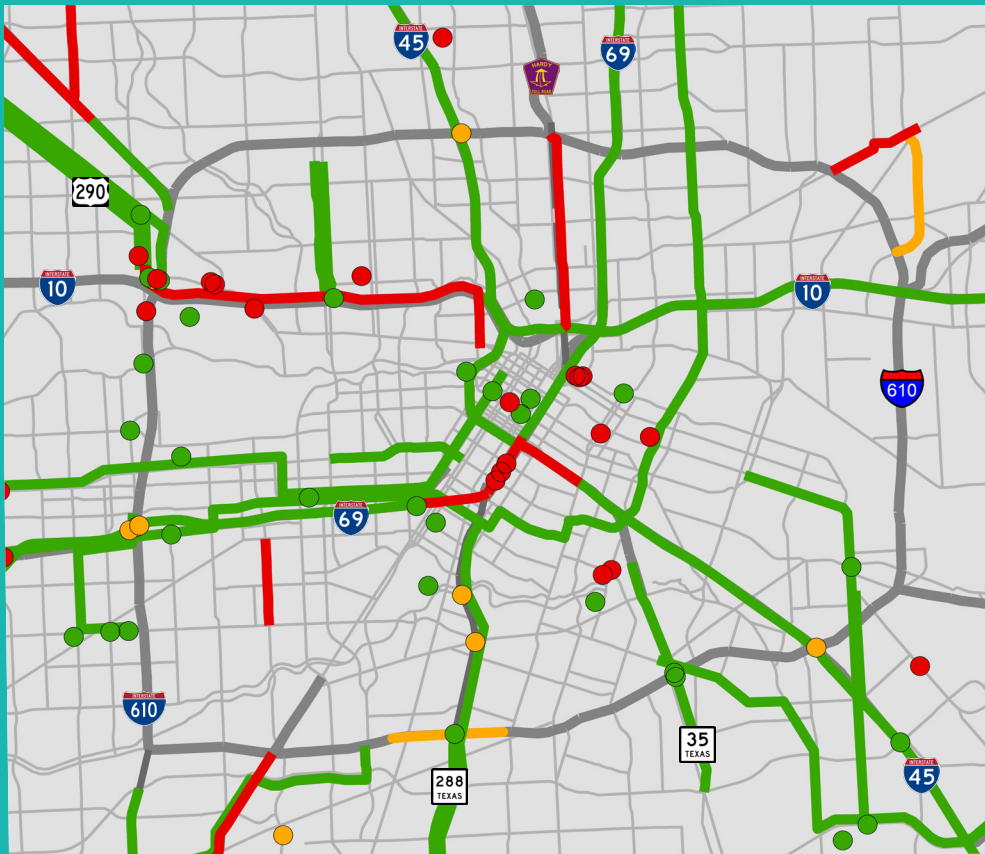
- #### SH 36:

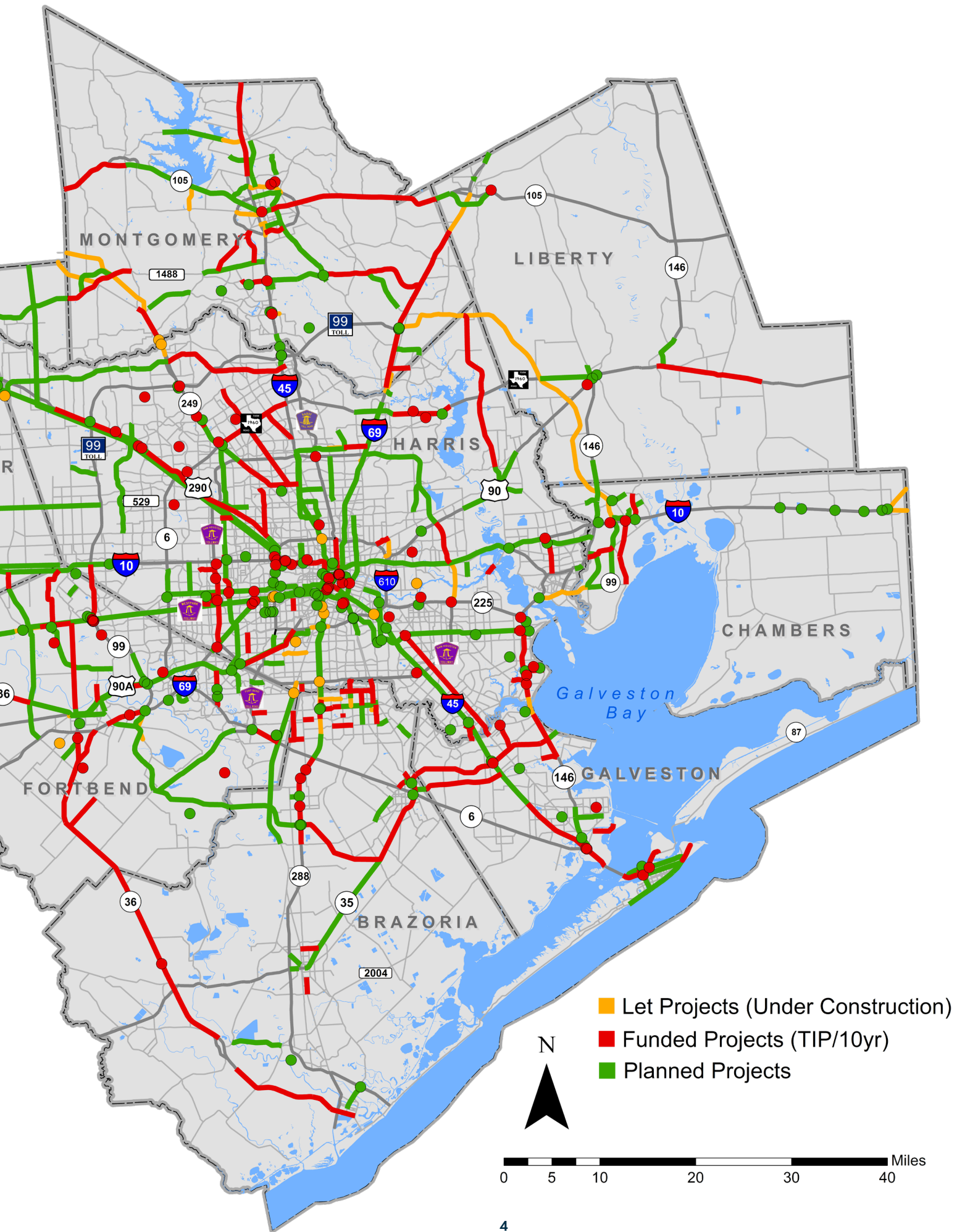
 Reconstruct and widen main lanes, construct grade separations and intersection improvements at various locations in Brazoria and Fort Bend Counties

2045 RTP Projects

The 2045 RTP for the Houston-Galveston area sets the investment priorities for the multimodal transportation system that connects people to the places where they live, work, play, and efficiently moves goods from, to and through the region.

IH 610 Inset





HIGH CAPACITY TRANSIT

High capacity transit (HCT) is designed to transport a large number of people rapidly and efficiently and is considered the key to improving access and mobility within heavily congested areas like the Houston Metropolitan region. The H-GAC High Capacity Transit Task Force has recommended the HCT “Priority” Network for inclusion in the 2045 RTP. This financially-constrained conceptual network includes new high capacity transit services such as commuter rail, light rail, and bus rapid transit, and a supportive network of enhanced bus service, local and regional bus routes, suburban park and ride facilities options, and two-way HOV lanes designed at a total investment of approximately \$31 billion to meet the region’s transportation needs for 2045. The Priority Network also proposes concepts that encourage transit use such as a regional fare system and universal accessibility. Anticipated benefits to travelers in time savings, reduced vehicle crashes, and increased personal income total over \$520 billion. Some of the High Capacity Transit Priority Network recommendation include:

- Provide High Capacity service on high-demand corridors
 - North-South (Gessner, Lockwood) and East-West (Westpark/Richmond, Inner Katy “Gap”)
- Expansion of Commuter Services
 - Conversion of existing HOV facilities to two-way, all day service
 - New facilities/commuter corridors to Galveston, Mont Belvieu, Tomball, Crosby/Dayton, Pearland, and Fulshear
 - “Suburb-to-Suburb” service
- Bus priority treatments along multiple major thoroughfares (Signature service)
- New Local and Regional services
 - Connect outlying communities to each other and core
 - New local routes where need exists
 - Flex zones for areas hard to serve with traditional transit
- Allowances for universal accessibility and State of Good Repair

REGIONAL FREIGHT

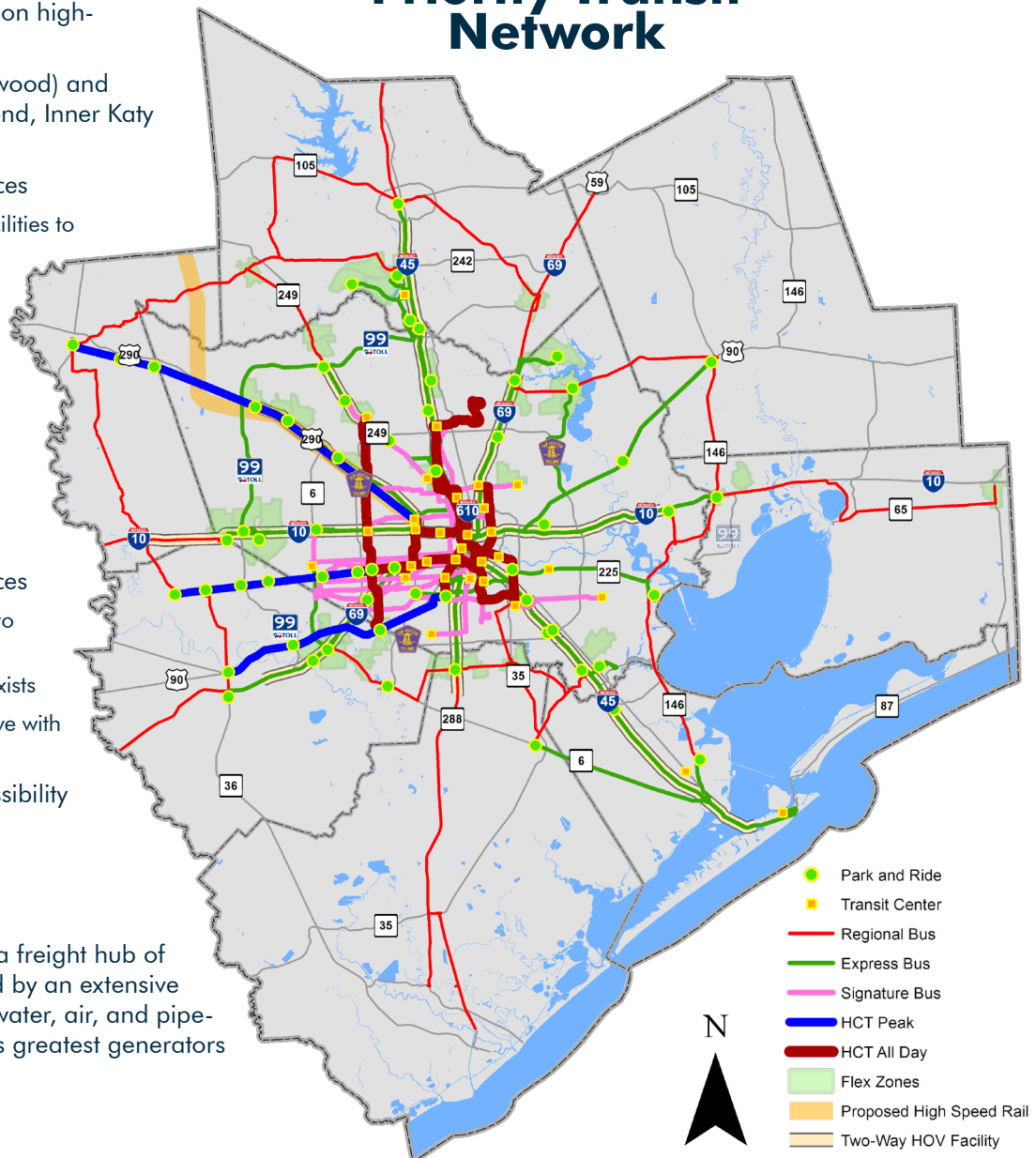
The Houston-Galveston region is a freight hub of national significance and is served by an extensive intermodal network of road, rail, water, air, and pipeline facilities. Ports are the region’s greatest generators

of freight and require a reliable road and rail network with the capacity to handle large amounts of traffic. The demand placed on the transportation network will continue to intensify with population growth, an expanding economy, and increased freight movement.

2045 RTP recommendations to support and improve operations of the freight sector include:

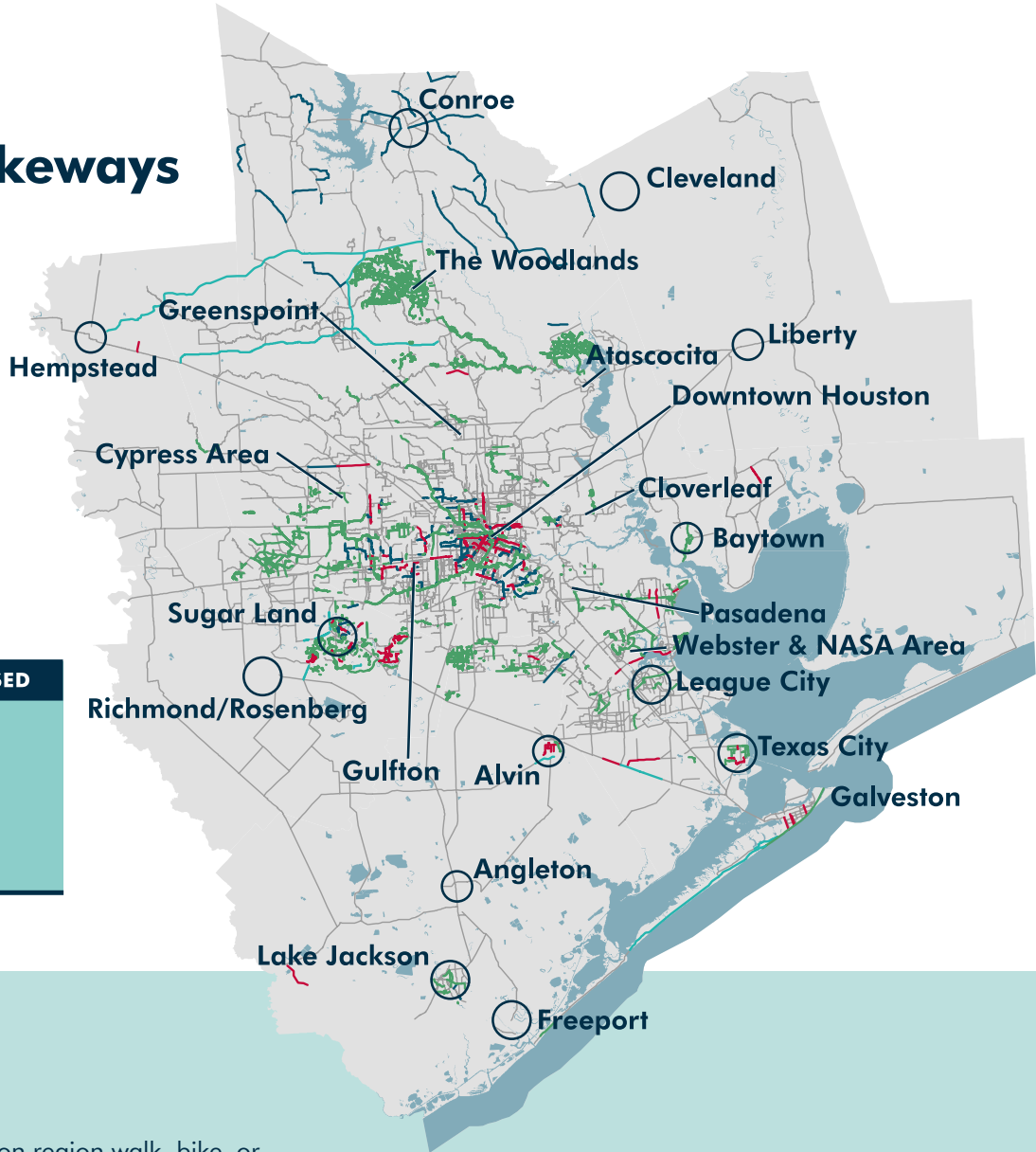
- Increase collaboration between regional partners to mitigate deficiencies in the freight significant network
- Develop an operational concept for a freight intelligent transportation system (ITS) program
- Improve container flow and reduce truck trips through a virtual container yard
- Provide access to growing economic centers outside the urban core

Priority Transit Network



Existing and Proposed Bikeways

- Bike Lane
- Shared-Use Path/Trail
- Signed Shared Roadway
- Signed Shoulder Route
- Proposed Additions



FACILITY TYPE	MILES PROPOSED
BIKE LANE	277
SHARED USE PATH	1,366
SIGNED SHARED RDWY	339
SIGNED SHOULDER RT	4
UNDETERMINED	1,816
TOTAL PROPOSED	3,803

ACTIVE TRANSPORTATION

Over 120,000 people in the Houston region walk, bike, or use transit for their daily commute trips. Active transportation, as a mode of travel, helps to reduce roadway congestion, contributes to community health, and enhances the quality of life of area residents. Although the H-GAC region has over 19,000 linear miles of sidewalks and about 1,443 miles of bikeways, many neighborhoods still lack safe infrastructure for residents to walk or bike on.

Recommendations to bolster Active Transportation include:

- Improve safety for people walking, biking, and rolling
- Expand interconnected walkways and bikeways in focus areas such as employment centers, tourist destinations, and underserved neighborhoods
- Coordinate regional data collection on active transportation infrastructure
- Promote active transportation alternatives as a congestion management strategy

AIR QUALITY CONFORMITY

The H-GAC region is currently designated as a “nonattainment” area for federal ground-level ozone standards under the Clean Air Act. Consequently, the State must develop a plan demonstrating how emissions critical to the formation of ground-level ozone will be reduced to achieve designated federal air quality standards. This plan is known as the State Implementation Plan (SIP). The Clean Air Act requires that proposed transportation projects and air quality modeling be coordinated to ensure the Transportation Improvement Program (TIP) and the Regional Transportation Plan (RTP) are consistent with, or conform to, the motor vehicle emission budget established in the SIP. Conformity is demonstrated when the projected regional emissions from mobile sources are less than the emissions budgets for mobile sources contained in the SIP.



H-GAC is participating with METRO and Texas Southern University on an autonomous campus shuttle pilot project.

ADDITIONAL PLANNING FACTORS

The Fixing America’s Surface Transportation (FAST) Act, signed into law in 2015, introduced new planning factors that are relevant to H-GAC’s long-range transportation plans.

Automated and Connected Vehicles

As the Houston-Galveston region’s transportation system nears its capacity limits, traffic congestion levels remain high despite billions of dollars of investments in new or expanded highways. To sustain regional mobility, emerging technologies like connected and autonomous vehicles (CAV) are being explored for their potential to address some of the problems facing the regional transportation system. H-GAC created a Connected and Automated Vehicles Interagency Workgroup to lead local governments and stakeholders in maximizing the benefits of CAV technology across the region. The MPO will support its partners in planning for sustainable integration of Connected and Automated Vehicles that move people and goods with greater safety, reliability, and efficiency.

Resiliency

According to the Federal Highway Administration’s definition, Resiliency is the “ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.” Due to its low-lying coastal geography and semi-tropical climate, the Houston-Galveston region is vulnerable to extreme weather events like heat, drought, tropical storms, and floods. H-GAC is incorporating resiliency in its planning program through its participation in several programs and initiatives that assess the vulnerability of the regional transportation system, address flood management in area watersheds, organize resiliency planning workshops, and explore strategies to control the impact of stormwater on transportation assets and property.

Travel and Tourism

Travel and tourism is a growing industry in the Houston-Galveston region. The metropolitan area attracts about 14.8 million visitors annually and generates about \$1.1 billion in local and sales tax revenues. Excellent and reliable transportation service is a fundamental requirement for the industry. Enhancing tourism and travel in transportation can be accomplished, in part, by improving the transit system and enhancing connectivity between places and between the transport modes.

