APPENDIX E:
GOALS AND PERFORMANCE MEASURES

Appendix E: RTP Goals and Performance Measures Background

GOALS

The goals presented below lay the foundational components intended to help achieve our vision.

Improve Safety:

Safety is a top regional priority. Although motorists are the largest group of system users injured or killed in crashes, pedestrians and cyclists are also at risk. Addressing this goal will not only benefit regional health, but the community's quality of life, and economic competitiveness. A safe regional transportation system operates reliably, delivers goods and services on time, and returns users home at the end of their trip.

Current and Anticipated Conditions:

- In 2012, the region experienced a significant increase in the number of vehicle crashes compared to 2011[1].
- Fatalities from impaired driving crashes are up 10% in the same time period, also up over the last 5 years[2].
- This region has two of the top ten counties for impaired driving-related fatalities, one of which also has- the highest rates of DUI fatalities per capita.

Key Challenges and Opportunities:

- Population and economic growth will increase system demand, increasing congestion and contributing to system deterioration, both of which are implicated in safety issues.
- Technology is emerging that enables vehicle-to-vehicle and vehicle-to-infrastructure interaction enabling vehicles to have the capability to sense threats and hazards, issue driver warnings, and take preemptive actions to avoid accidents[3].

Manage and Mitigate Congestion:

Economic growth, especially in freight-intensive sectors such as energy and manufacturing, is increasing traffic and overall travel demand on the roadway and rail system. The ability to manage and reduce congestion will help sustain the regional economy—and better position us to maintain our status in the future. Successful implementation of this goal will ensure that residents will be able to travel and work reliably via whichever mode of transportation they desire.

Current and Anticipated Conditions:

- In just one year, the Daily Vehicle Miles of Travel (VMT) in the eight-county area increased 1% (an additional 1.5 million vehicle miles traveled each day).
- Since 2009, VMT has grown 5%. Increasing daily VMT also increased congestion costs 2% last year.
- High growth suburban areas will experience traffic increases and will strain the performance of the network.
- The dominant form of transportation for households within the region is the automobile. In 2012, a majority of households in the region drove alone to work[4].
- Development trends indicate that suburban to suburban commuting will force traffic to travel into the core and then out to region fringes.

Key Challenges and Opportunities:

- As the region continues to grow and develop, the landscape of travel patterns, origin and destination pairs, and travel demand will change.
- The prevailing hub-and-spoke transportation system will not be able to served future demand as effectively if current patters of population and employment development persist.
- Local area agency thoroughfare plans present leverage opportunities that could provide key alternatives to currently congested roadways.
- Alternative means of travel—by bus, bicycle, or train—could also tip the scales in favor of regional congestion mitigation. However, these alternatives must demonstrate significant time and/or cost savings in order to be prioritized highly.
- Transportation funding is lagging far behind observed demand, both at the local, state, and federal levels. This puts renewed emphasis on travel demand management, alternative commute solutions, and low-cost, high-level mitigation tools such as the Congestion Management Plan Process.

Ensure Strong Asset Management and Operations:

In light of declining resource availability, the region must ensure optimal system performance, maintain an acceptable state of repair for system assets, and consider replacement costs for aging facilities. Promoting and sustaining asset management and operations activities can expedite the movement of people and goods by accelerating project completion, reducing regulatory

[1] TxDOT Safety Data 2012

[2] TxDOT Safety Data 2012

[3] http://www.its.dot.gov/research/v2v.htm

[4] US Census Bureau, 2012 American Community Survey Five-Year Estimates

delays in project delivery, and promoting a state of good repair for our region's transportation assets.

Current and Anticipated Conditions:

- The percentage of state-maintained roadways rated in "good or better" condition is 84% in 2012.
- The percentage of bridges rated "good or better" increased to 83%.
- Due to declining motor vehicle tax revenues, TxDOT expenditures for maintenance fell 13% to $276 million in 2012.

Key Challenges:

- As resources become more limited, the ability to maintain the current condition of all system assets will be uncertain. Agencies will be forced to do more with less, resulting in deferred and delayed maintenance.
- As maintenance is delayed, it becomes exponentially more expensive to perform.[5]
- Limited resource issues are compounded as facilities approach their end of life, requiring additional resources to be directed towards facility replacement.

[5] *It's About Time: Investing in Transportation to Keep Texas Economically Competitive*, 2030 Commission, 2011.

Strengthen Regional Economic Competitiveness

An efficient, reliable, and safe system is critical to ensuring the region's economic competitiveness. Addressing freight mobility needs and allowing the region to remain attractive to a high-skilled workforce will ensure that the region continues to remain an attractive place for businesses to thrive.

Current and Anticipated Conditions:

- Total tonnage at ports increased 2% to 332 million "short" tons (2,000 lbs each) at the region's four ports: Houston, Galveston, Freeport, and Texas City.
- The Port of Houston is number -one in the nation in foreign tonnage handled[6]
- The regional freight system transported a mass of more than a billion tons of tradable goods last year.
- The number of passengers traveling from Bush Intercontinental and Hobby airports increased 1% to 25 million in 2012.
- Retail and wholesale trade employment will grow at a projected 10% rate, far outpacing the state rate of 2%.
- Railroad and water-borne goods' share of activity may increase in the future, but will almost invariably require movement by truck.

Key Challenges:

- Increasing demand on the transportation freight network will contribute to increasing bottlenecks within the system. Sustaining access to ports and manufacturing sectors within and through our region will be critical in ensuring economic competitiveness.
- The increase of suburban employment centers will result in the rise of suburb-to-suburb commute patterns, compounding existing congestion, safety, and condition issues.
- Historical divides between commuter and freight needs could continue to dominate characterization of system improvement investments. A more up-to-date paradigm would prioritize investments by how well they address both sets of needs, with the understanding that while freight may not "vote" or voice disagreement the way commuters can, it sustains the economy that attracted the commuter in the first place.

Conserve and Protect Natural and Cultural Resources

Significant impacts to natural and cultural resources are often a consequence of economic growth and travel demand such as those experienced in our region. Identifying these potential impacts and supporting the conservation

[6] http://www.portofhouston.com/business-development/trade-development-and-marketing/trade-statistics

and enhancement of natural and cultural resources will promote a higher quality of life and help reduce project development delays and costs. This goal also addresses the need of individuals to lead a healthy lifestyle, enjoying clean air and water by promoting opportunities for active transportation.

Current and Anticipated Conditions:

- Extensive development has resulted in the conversion of open space. Growth forecasts indicate that this trend is not likely to subside in the future.
- Increasing activity on the transportation system will result in increased emissions, compromising our ability to meet emissions budgets and attainment of national air quality standards.

Key Challenges

- As travel demand continues to grow, the need to "conserve and protect" will need to be balanced with "prepare and adapt" for further economic expansion. The more critical question is not *which* to pursue, but rather *how best* to accomplish both initiatives.
- Limited funding for transportation in general both endangers and heightens the need for investments to accomplish this goal area.
- Continued greenfield development will reduce the location of suitable mitigation banks, increasing the potential for delays and costs.
- As economic activity continues to increase, it is likely that mobile source emissions will continue to increase, impacting our ability to meet national air quality standards

Performance Measures

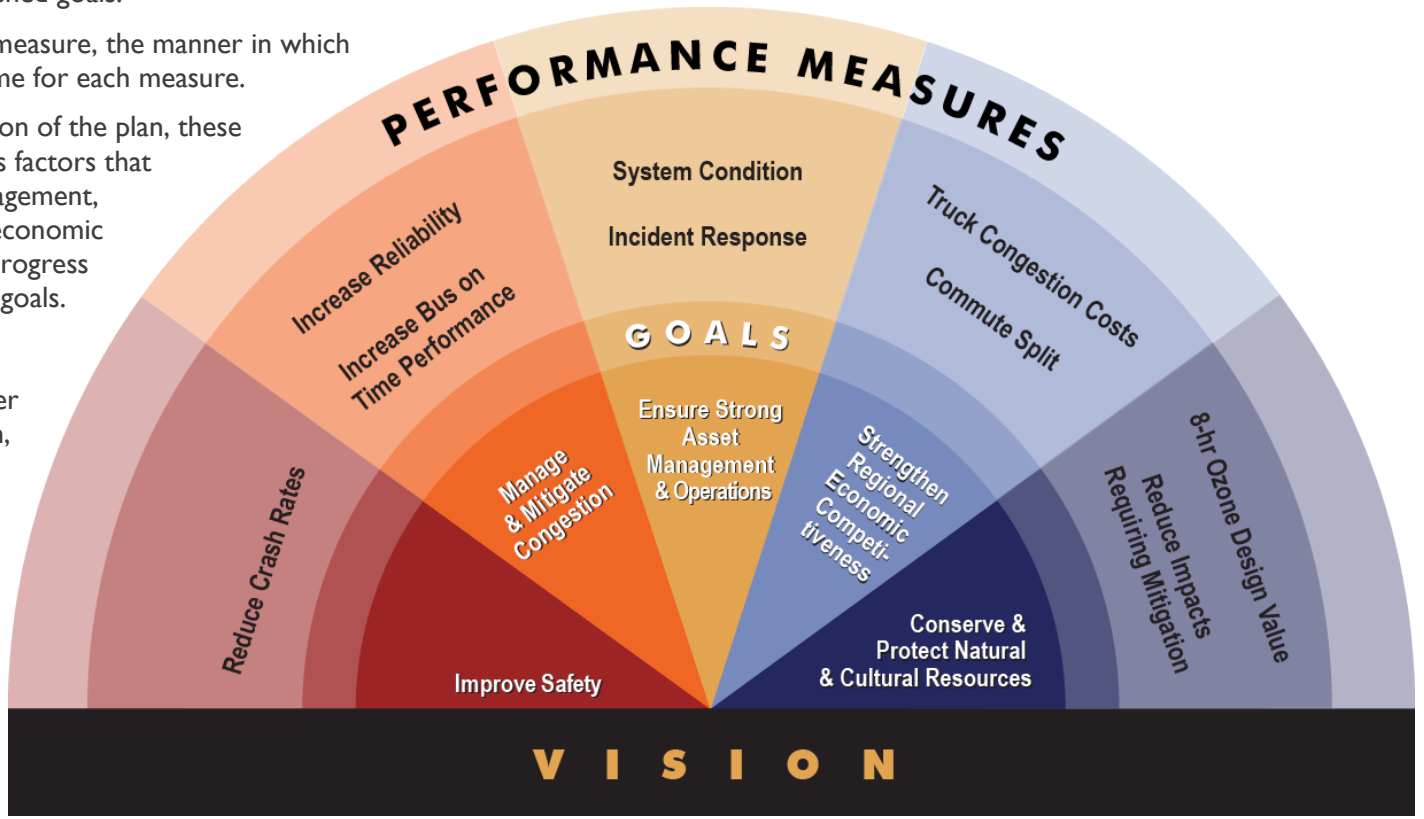
Recently, the federal government passed a two-year transportation funding and authorization bill called Moving Ahead for Progress in the 21st Century—commonly abbreviated as MAP-21. This bill, among other things, authorized transformational changes with regard to "performance-based planning". In order to comply with MAP-21 changes, MPOs across the country will need to adopt and implement programs and priorities based on "performance measures"—easy to understand indicators of achievement.

According to the law, performance will be judged on a system-wide level, and should be tied to project prioritization. Though the act of adopting the measures has been slowed by the regulatory approval process—thus pushing it beyond the scope of the 2040 RTP—this issue seems to be a genuine initiative of the federal government and transportation planning community as a whole.

As such, the 2040 RTP proposes certain performance measures to represent this principle at a regional level. Because MAP-21 requires that transportation system challenges be addressed through a data driven, performance based approach, measures selected that were chosen mainly because they were understandable, sensitive to various transportation modes, and had a nexus to the established goals.

The following section describes each measure, the manner in which it is measured, and the desired outcome for each measure.

Given the broad scope and time horizon of the plan, these performance measures identify various factors that encompass topics including asset management, congestion, safety, environment, and economic competitiveness that will help assess progress towards meeting the plan's vision and goals. While the desire is to see a dramatic improvement in each performance measure area, limited funding and other trends that influence system utilization, the desired outcomes for the performance measures cannot be reduced in absolute terms.



Improve Safety

This measure tracks the rate of traffic, bus, and rail to provide a sense of overall system safety. The regional system should function without endangering the people who use it.

How it is measured: Number of traffic crashes per 100 million annual VMT, bus accidents per 100,000 vehicle miles, METRO rail accidents per 100,000 vehicle miles, rail accidents at public railroad crossings, rate of bicycle accidents per 100 million VMT, and rate of pedestrian accidents per 100 VMT.

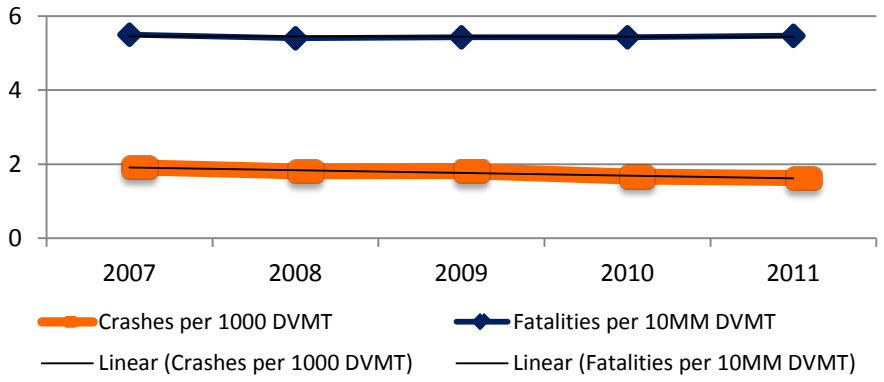
Baseline:

- Traffic Crashes: 182.1 (2012)
- Bus Accidents: 0.69 (2013)
- Metro Rail Accidents: 3.53 (2013)
- Railroad Crossing Accidents: 38 (2014)
- Bicyclist Accidents: 2.3 (2012)
- Pedestrian Accidents: 1.20 (2012)

Desired outcomes:

The 2040 RTP hopes to decrease all measure of crashes and accidents by mode.

Figure 26: Safety Trends 2007-2011



Increase Reliability

These measures attempt to provide a sense of system reliability by quantifying how much total travel time one should allow to ensure on time arrival and bus on time performance. The Planning Time Index for roadway reliability will track the time necessary to ensure that travelers are late only one day a month (95th percentile) or one day a week (80th percentile). These measures include typical delay as well as unexpected delay. The bus-on-time performance measurement will help regional stakeholders determine the service provided to transit system users. Rationally, those dependent on transit are better served by punctual bus routes; and those willing to consider transit as a viable, regular mode choice will be more willing, given the option of an on-time bus.

How it is measured: Planning Time Index (80th and 95th percentile) and bus on-time performance.

Baseline:

- **PTI:**

  80th: 1.84 (2011)

  95th: 3.67 (2011)

- **Bus on Time Performance: 71% in 2013**

Desired outcomes:

The 2040 RTP seeks to improve both reliability of travel as measured by PTI and bus on time performance.

System Condition

This measures the condition of the region's infrastructure asset system to include pavement, transit, and bridge facilities. System facilities must be preserved and enhanced through regular maintenance and updated operational strategies to ensure a safe and reliable transportation system.

How it is measured: Percent of pavement, bridge, and transit assets in "good" or better condition

Baseline:

- Roadway Pavement Conditions: 79.8% [7]
- Bridge Conditions: 91.2%[8]
- Transit Conditions: PB TO PROVIDE

Desired outcome:

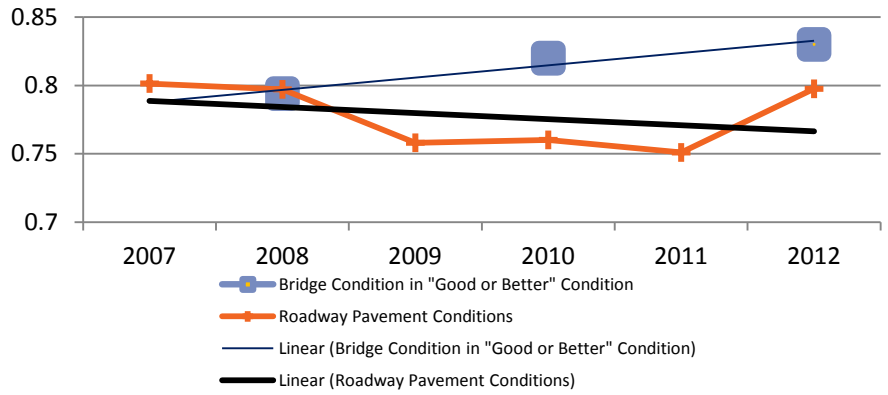
The 2040 RTP will track system condition in pursuit of maintaining pavement conditions, reducing the number of deficient bridges, and well-maintained transit capital investments.

[7] TXDOT 2012

[8] TXDOT 2012

- 2021 target: 70% or more in "Good" or better condition[9]

Figure 27: System Condition Trends 2007-2012



Incident Response

This measure tracks the average amount of time to clear a traffic incident since traffic incidents disrupt the flow of traffic and are a significant contributor to non-recurring congestion, increased emissions, and additional safety hazards.

How it is measured: Average time to clear a major accident.

Baseline: 31.4 Minutes in 2013

Desired outcome:

The 2040 RTP will seek to reduce major accident clearance through the installation and automation of a regional incident management system.

Truck Congestion Costs

This measure presents total congestion costs as a percentage of total truck commodity value ranked against other "Very Large" regions. The value of fuel and travel delay for the movement of goods and people within the region is an important measure for relating the performance of the system to economic competitiveness[10].

How it is measured: Total Truck Congestion Cost relative to total truck commodity value (in 2013 dollars).

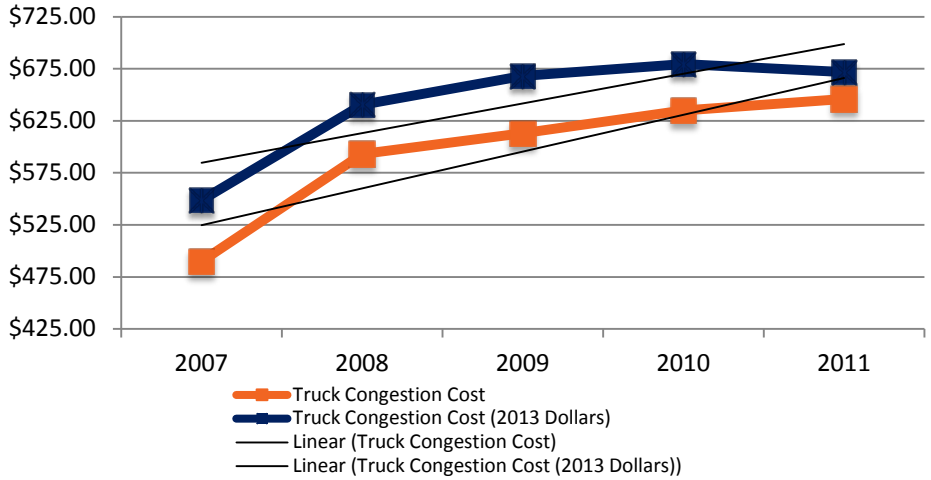
Baseline:

- Ranked #1 ($646MM total congestion costs relative to $233B in regional truck commodity value)

Desired outcome:

The 2040 RTP will work to fund projects that result in maintaining the region's #1 rank in truck congestion costs.

Figure 28: Congestion Cost Trends (in $MM) 2007-2011



Commute Split

This measures the utilization of active transportation such as transit, biking, and walking. Increasing the utilization of alternative modes helps increase access, increases quality of life, and offers health benefits.

How it is measured: Percentage of commuters utilizing means other than driving alone (transit, biking, walking, and telework) as means of transportation to work.

Baseline: 20.79% in 2012 [11]

Desired Outcome:

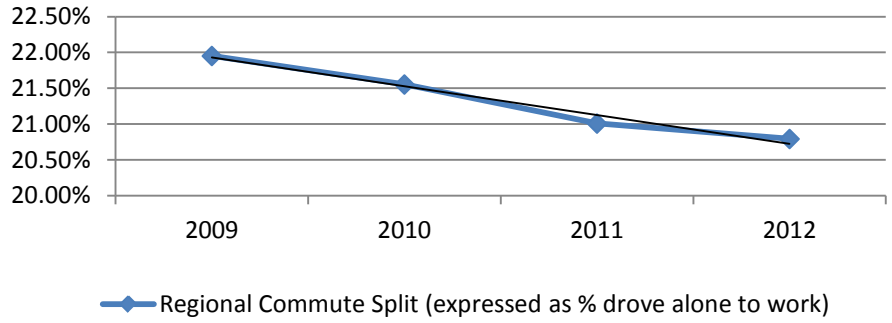
The 2040 RTP will improve transportation choices and increase the use of alternative modes.

[9] Consistent with TxDOT Multi-Tier Pavement Condition Goals

[10] Estimating Urban Freight Congestion Costs: Methodologies, Measures, and Applications

[11] 2012 ACS 5-Year Data

Figure 29: Commute Split Trends 2009-2012



Emissions

Transportation investments can help reduce emissions by increasing mobility options, enhancing connections, and by improving system performance. Ground-level ozone levels are a concern for the region and are formed by chemical reactions that involve sunlight, nitrogen oxides (NOx) and volatile organic compounds (VOCs). Modernizing fleets and cleaner fuels continue to reduce emissions within our region. These important emissions reductions contribute to cleaner air helping us meet national air quality standards and improved quality of life for all residents. This measures ground level ozone levels at monitoring stations throughout our region. Reducing these reductions contribute to cleaner air helping us meet national air quality standards and improved quality of life for all residents.

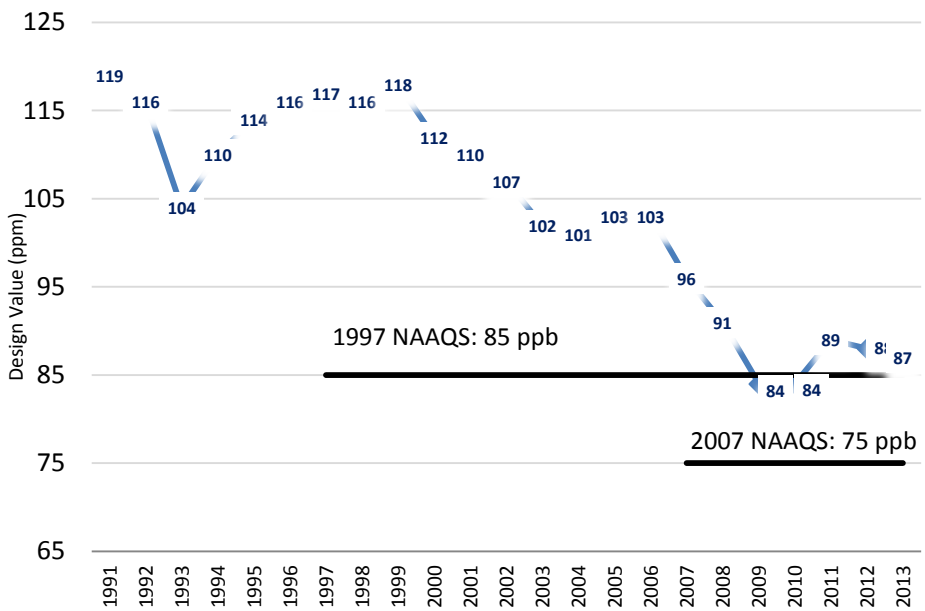
How it is measured: Ground level ozone – annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years.

Baseline: 87 ppb (2013)

Desired Outcome:

The 2040 RTP will seek to reduce the regional air quality measure to 75 parts per billion by 2015; and proportionally so throughout the plan's horizon.

Figure 30: Ground Level Ozone Trends 1991-2013



Reduce Impacts Requiring Environmental Mitigation

In certain cases, impacts on the natural and cultural resources of our region require mitigation techniques, in order to balance the negative effect. In order to conserve and protect natural and cultural resources, the 2040 RTP will measure the number of required impacts over time, in order to determine overall impact of transportation projects.

How it is measured: incident of required environmental mitigation