

Chapter IX

Regional Performance

In recent years, performance-based planning and project programming have increasingly been employed by the North Central Texas Council of Governments (NCTCOG) in the development of its short- and long-range planning documents. The most recent federal transportation funding legislation and subsequent federal rulemakings mandate the incorporation of performance-based planning and programming into the development of Metropolitan Transportation Plans (MTP) and Transportation Improvement Programs (TIP). This chapter outlines the performance measures and targets required to be considered and tracked when conducting transportation planning and programming activities in the region. It will also highlight current and future efforts to consider these measures and work toward achieving the targets in the current and future TIPs.

National Performance Requirements

Federal legislation passed in 2012 introduced a new requirement to incorporate a performance-based approach into the transportation planning process. The legislation, the Moving Ahead for Progress in the 21st Century Act, known as MAP-21, requires state Departments of Transportation, Metropolitan Planning Organizations (MPO), and transit authorities to set coordinated targets, report on a required set of performance measures, and prioritize projects using a coordinated performance-based planning process. These performance requirements were continued and bolstered by the Fixing America’s Surface Transportation (FAST) Act, which was signed into law in 2015.

Since then, four Transportation Performance Management final rules have been released by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) and are now effective. Each final rule lists the required measures, data sources, and calculation procedures. The final rules include:

- Highway Safety Improvement Program, known as PM1 (81 FR 13881, 23 CFR 490)
- Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program, known as PM2 (82 FR 5886, 23 CFR 490)
- Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program (CMAQ), known as PM3 (82 FR 5970, 82 FR 22879, 23 CFR 490)
- Transit Asset Management (81 FR 48889, 49 CFR 625, 49 CFR 630)

Addressing Performance in the 2019-2022 TIP

Federal performance measure final rules establish deadlines for target setting and reporting for each of the required performance measures. For the measures identified in each final rule, MPOs are required to include adopted targets, baseline performance measures, and progress toward the targets in TIPs adopted two years after the effective date of the final rule. The four performance measure final rules currently effective were established at different times; and therefore, have different target-setting and implementation deadlines, as seen in Exhibit IX-1.

Exhibit IX-1: Federally Required Performance Measure Implementation Schedule

Final Rule	Rule Effective Date	Target Setting Deadlines			Required to be Included in TIPs
		Provider	State DOT	MPO	
Safety (PM1)	4/14/2016	N/A	8/31/2017	2/27/2018	4/14/2018
Pavement and Bridge Condition (PM2)	5/20/2017	N/A	5/20/2018	11/16/2018	5/20/2019
System Performance/Freight/CMAQ (PM3)	5/20/2017	N/A	5/20/2018	11/16/2018	5/20/2019
Transit Asset Management	10/01/2016	01/01/2017	10/01/2017	12/27/2017	10/01/2018

As of the acceptance of the May 2020 Revisions to the 2019-2022 TIP/STIP, the following apply:

- All four performance measure rules are effective.
- The Regional Transportation Council (RTC) has taken action regarding targets for all four performance measure rules.
- These performance measures are required to be included in the 2019-2022 TIP and all subsequent TIPs.

Performance measurement also played an integral role in project selection and prioritization for *Mobility 2045* and subsequently, the 2019-2022 TIP as federal regulations mandate that projects and programs in a MPO’s TIP must also be in that MPO’s long-range transportation plan. *Mobility 2045* includes performance measures that go above and beyond those that are required by the final rules. These supplemental performance measures affirm the importance of tracking performance measures and performance-based planning processes across all aspects of the transportation system. While these measures are in various stages of development, all are measures that NCTCOG intends to track, report on, and eventually incorporate into planning processes. These additional measures are being utilized and will continue to be when conducting project selection and programming efforts for the TIP.

The performance measures presented in this chapter are mentioned throughout *Mobility 2045* in relevant sections, which demonstrates how the measures apply to and are integrated into planning processes and project selection efforts. It also demonstrates NCTCOG’s commitment to a performance-based transportation planning process.

Required Performance Measures

Safety (PM1)

The Safety performance measure final rule includes five measures related to the safety of the transportation system. The measures are all five-year rolling averages, including:

1. The number of traffic fatalities
2. The rate of fatalities per 100 million vehicle miles traveled

3. The number of serious injuries
4. The rate of serious injuries per 100 million vehicle miles traveled
5. The number of non-motorized fatalities and non-motorized serious injuries

The Regional Transportation Council (RTC) established a regional policy that even one death on the transportation system is unacceptable. Subsequently, the RTC directed NCTCOG staff to work with regional and State partners to develop projects, programs, and policies that assist in eliminating serious injuries and fatalities across all modes of travel. That being said, the RTC recognized the need to set realistic targets needed to work toward the ultimate goal of zero fatalities. This policy was reaffirmed by subsequent RTC action on these targets.

NCTCOG worked closely with the Texas Department of Transportation (TxDOT) to establish annual targets for each of these measures. Coordination between stakeholders is key when setting targets for performance measures. As part of the TxDOT Strategic Highway Safety Plan (SHSP) development process, stakeholders from TxDOT, NCTCOG, local governments, law enforcement, emergency medical services, educators, and others worked collaboratively utilizing a data-driven, multi-year process to develop both statewide and regional safety performance measure targets. Due to increasing population in both the region and the state, volume on the roadway system, and congestion, it is unlikely that a decrease in the number of crashes could be achieved, so the consensus of the SHSP stakeholder and executive teams was to establish targets that by 2022 would reduce the rate at which each measure is increasing. Specifically, the targets call for a 2 percent reduction from the original projection for 2022. The proposed reduction of 2 percent by 2022, which only

applies to trends where measures are increasing over time, would be achieved by reducing each intermediate year by the following reduction percentages:

Year	Reduction Target
2017	0.0%
2018	0.4%
2019	0.8%
2020	1.2%
2021	1.6%
2022	2.0%

Measure 1: Number of Traffic Fatalities

2020 Target: NCTCOG supports TxDOT’s targets for this measure. These targets seek to reduce the expected increase in fatalities by 2020. This target would reduce the projected number of fatalities to 4,068 for the state, and a reduction in the region to 589.3. The 2020 target expressed as a five-year rolling average is shown in Exhibit IX-2.

Exhibit IX-2: Five-Year Rolling Average for the Number of Traffic Fatalities

Year	Source	Statewide Data		Regional Data		
		Percent Reduction	Target or Actual Data	Projection or Actual Data	Target or Actual Data	Fatalities Reduced
2016	FARS	N/A	3,797	591	591	N/A
2017	FARS	0.0%	3,722	599	599	N/A
2018	CRIS	0.4%	3,631	518	515.9	2
2019	Target	0.8%	3,980	586.1	581.4	5
2020	Target	1.2%	4,068*	602.4*	589.3	13
2020 Target expressed as 5-year average			3,840		575.3	

*Based on linear trend analysis from 2014-2018 FARS data.
 FARS: National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System
 ARF: FARS Annual Report File
 CRIS: TxDOT Crash Records Information System

Measure 2: Rate of Fatalities per 100 Million Vehicle Miles Traveled

2020 Target: NCTCOG supports TxDOT’s targets for this measure. These targets seek to reduce the expected increase in deaths per 100 million vehicles miles traveled in 2020. This target would reduce the projected deaths per 100 million vehicle miles traveled (MVMT) in 2020 to not more than 1.48 per 100 MVMT statewide. The regional target for 2020 is 0.770, which is less than one death per 100 MVMT. The 2020 target expressed as a five-year rolling average is shown in Exhibit IX-3.

Exhibit IX-3: Five-Year Rolling Average for the Rate of Fatalities

Year	Source	Statewide Data		Regional Data		
		Percent Reduction	Target or Actual Data	Projection or Actual Data	Target or Actual Data	Rate Reduction
2016	FARS	N/A	1.40	0.85	0.85	
2017	ARF	N/A	1.37	0.84	0.84	
2018	CRIS	0.4%	1.31	0.711*	0.708	0.003
2019	Target	0.8%	1.47	0.779	0.773	0.006
2020	Target	1.2%	1.48*	0.779*	0.770*	0.009
2020 Target expressed as 5-year average			1.406		0.788	

*Based on linear trend analysis from 2014-2018 FARS data.

Measure 3: Number of Serious Injuries

2020 Target: NCTCOG supports TxDOT’s targets for this measure. These targets seek to reduce the expected increase in serious injuries in 2020. This target would reduce the expected increase in serious injuries to not more than 18,602 in 2020 statewide and 3,177.4 at the regional level. The 2020 target expressed as a five-year rolling average is shown in Exhibit IX-4.

Exhibit IX-4: Five-Year Rolling Average for the Number of Serious Injuries

Year	Source	Statewide Data		Regional Data		
		Percent Reduction	Target or Actual Data	Projection or Actual Data	Target or Actual Data	Serious Injury Crashes Reduced
2016	CRIS	N/A	17,573	3,970	3,970	N/A
2017	CRIS	N/A	17,535	3,990	3,990	N/A
2018	CRIS	0.4%	14,892	3,058	3,046	12
2019	Target	0.8%	18,367	3,342.0*	3,315.3	27
2020	Target	1.2%	18,602*	3,216.0*	3,177.4	39
2020 Target expressed as 5-year average			17,394		3,499.7	

*Based on linear trend analysis from 2014-2018 CRIS data.

Measure 4: The Rate of Serious Injuries per 100 Million Vehicle Miles Traveled

2020 Target: NCTCOG supports TxDOT’s targets for this measure. These targets seek to reduce the expected increase in the rate of serious injuries per 100 million vehicle miles traveled in 2020. This target would reduce the rate of serious injuries per 100 million vehicle miles traveled statewide to 6.56 in 2020. The regional target is a reduction to 4.005. The 2020 target expressed as a five-year rolling average is shown in Exhibit IX-5.

Exhibit IX-5: Five-Year Rolling Average for the Rate of Serious Injuries

Year	Source	Statewide Data		Regional Data		
		Percent Reduction	Target or Actual Data	Projection or Actual Data	Target or Actual Data	Rate Reduction
2016	CRIS	N/A	6.48	5.69	5.69	
2017	CRIS	N/A	6.42	5.61	5.61	
2018	CRIS	0.4%	5.37	4.198	4.181	0.017
2019	Target	0.8%	6.60	4.391*	4.356	0.035
2020	Target	1.2%	6.56	4.053*	4.005	0.048
2020 Target expressed as 5-year average			6.286		4.768	

*Based on linear trend analysis from 2014-2018 CRIS data.

Measure 5: The Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries

2020 Target: NCTCOG supports TxDOT’s targets for this measure. These targets seek to reduce the expected increase in non-motorized fatalities and serious injuries in 2020. This target would reduce the number of non-motorized fatalities and serious injuries to not more than 2,477 in 2020 statewide. At the regional level, the target is a reduction in non-motorized fatalities and serious injuries to not more than 658 in 2020. The regional target is shown in Exhibit IX-7. The 2020 targets expressed as a five-year rolling average are shown in Exhibits IX-6 and IX-7.

Exhibit IX-6: Five-Year Rolling Average for the Number of Non-Motorized Fatalities and Serious Injuries (Statewide)

Year	Source	Percent Reduction	Target or Actual Data
2016	FARS-CRIS	N/A	2,304
2017	ARF-CRIS	N/A	2,146
2018	CRIS	0.4%	2,104
2019	Target	0.8%	2,394*
2020	Target	1.2%	2,477
2020 Target expressed as 5-year average			2,285.0

*Based on linear trend analysis from 2014-2018 FARS and CRIS data.

Exhibit IX-7: Five-Year Rolling Average for the Number of Non-Motorized Fatalities and Serious Injuries (Regional)

Year	Source	Fatalities			Serious Injuries		
		Projection/Actual Data Bike & Ped (Fatal)	Target/Actual Data	Fatalities Reduced	Projection/Actual Data Bike & Ped (Incap. Injury)	Target or Actual Data	Serious Injury Crashes Reduced
2016	FARS-CRIS	163	163	N/A	417	417	N/A
2017	ARF-CRIS	156	156	N/A	403	403	N/A
2018	CRIS	179	178.3	1	420	418.3	2
2019	Target	199.1*	197.5	2	437.1*	433.6	4
2020	Target	216.2*	213.6	3	449.8*	444.4	5
2020 Target expressed as 5-year average			181.7			423.3	

*Based on linear trend analysis from 2014-2018 FARS and CRIS data.

Infrastructure Condition (PM2) and Asset Management Plans

The FAST Act requirements have placed a greater emphasis on transportation system preservation and asset management. Asset management can generally be defined as a strategic process to maintain and replace assets in a desired state of good repair over their lifecycles at a minimum practicable cost. Existing federal statutes and regulations now require that each state Department of Transportation (DOT) and each MPO establish performance targets to assess and monitor the condition of pavements and bridges on the National Highway System including the Interstate System (23 U.S.C. 150 and 23 CFR 490). As with other performance measures rules, the MPO has the option to either adopt the same performance targets set by the state DOT or establish its own regional targets.

The National Highway System (NHS) network within the 12-county North Central Texas region is the largest among the 25 metropolitan areas in Texas with over 12,000 lane-

miles of pavement. About 70% of the NHS network in this region are state highways under the jurisdiction of TxDOT (i.e. “On-System” roadways) and about 30% are county roads, city streets, and non-TxDOT toll roads managed by other agencies (i.e. “Off-System” roadways). The NHS network in the region also includes over 3,600 bridges with about 87 percent managed by TxDOT and about 13 percent managed by other agencies.

For NHS pavement conditions, NCTCOG must set targets for the percentage of pavements (based on lane-miles) of the Interstate System and the Non-Interstate NHS in “good” or “poor” condition as defined in federal regulations. NCTCOG has chosen to support the pavement performance targets set by TxDOT. In recognizing that NHS Local Off-System Arterials only represent about 24 percent of DFW’s NHS network, but have a disproportionately high “poor” rating of about 74 percent, NCTCOG also approved a policy statement to work with local governments to focus on the improvement of NHS Local Off-System Arterials in “poor” condition.

For NHS bridge conditions, NCTCOG must set targets for the percentage of NHS bridges (based on bridge deck area) classified in “good” or “poor” condition as defined in federal regulations. NCTCOG has chosen to support the bridge performance targets set by TxDOT. In addition, NCTCOG approved a policy statement to expedite the programming of funding to improve NHS bridge in “poor” condition. To achieve this aim, NCTCOG partnered with TxDOT on the submittal of a \$113 million grant application from the Infrastructure for Rebuilding America (INFRA) program for the North Texas Strategic NHS Bridge Program, which would involve the reconstruction or replacement of 14 NHS bridges in the counties of Dallas, Denton, Hunt, Johnson, Kaufman, Parker, and Tarrant. As a result of this effort a total of \$8,775,000 was awarded and will be utilized on four bridges within the region.

- 1) Farm-to-Market Road (FM) 460 at US 80 will reconstruct a new bridge to carry added thoroughfare capacity for FM 460, along with an increased span and vertical clearance below to accommodate additional general purpose lane capacity planned as part of a concurrent US 80 corridor project in Kaufman County.
- 2) In Parker County, a project at Interstate Highway (IH) 35W northbound general purpose lanes over the left-hand IH 35W southbound exit ramp to Business IH 35W in Alvarado will remove the current bridge and rebuild the IH 35W northbound general purpose lanes at-grade. Additionally, construction will include an adjacent northbound two-lane frontage road link enabling continuous one-way travel for between US 67 and County Road 604, as well as the reconfiguration of entrance/exit ramps within that same segment for improved operations and area accessibility. The project will also facilitate one-way travel conversion for the southbound frontage road.
- 3) U.S. Highway (US) 180 westbound lanes over Dry Creek will replace the bridge with an increased elevation and shoulder width, as well as railings and end treatments to match the adjacent eastbound bridge. The project will also include implementation of new channel armoring below the new bridge to address future scour and slope erosion issues.
- 4) The proposed project at US 287 southbound in Tarrant County will complete comprehensive repairs to the existing bridge, including a full deck replacement with high-performance concrete, new railings, and sealed expansion joints.

Additionally, roadway approaches will be resurfaced, new safety upgrades will be incorporated into the bridge end treatments, and new drainage improvements will be added to redirect runoff away from slope areas beneath the repaired structure.

In addition to setting performance targets for NHS pavement and bridge conditions, existing federal statutes and regulations now require that each state DOT develop and implement a risk-based transportation asset management plan (TAMP) for the NHS facilities within each state (23 U.S.C. 119 and 23 CFR 515). At a minimum, the TAMP must include 1) a summary listing of NHS pavement and bridge assets and their condition; 2) identification of asset management objectives, measures and performance gaps; and 3) a lifecycle cost and risk management analysis, financial plan, and identification of investment strategies. In addition to supporting TxDOT’s federally required NHS bridge performance targets, the NCTCOG’s INFRA application for the North Texas Strategic NHS Bridge Program implements the FHWA performance requirements identified in TxDOT’s Initial TAMP that was prepared and submitted to FHWA in 2018.

To monitor progress towards achieving these NHS performance targets and complying with TAMP requirements, TxDOT and NCTCOG have taken the following initial actions:

- 1) TxDOT annually reports statewide bridge inspection data (including NHS bridges) to FHWA in support of the National Bridge Inventory;
- 2) A summary of network-level bridge information (including NHS bridges) is published on TxDOT’s website (www.txdot.gov/government/reports/texas-bridges.html). Each “Report on Texas Bridges” contains bridge conditions and funding information on a biennial basis;
- 3) TxDOT has developed a dashboard spreadsheet containing statewide bridge data relevant to bridge performance. The intent of this spreadsheet is to inform MPOs of current bridge conditions in their area and to help establish a historical baseline for MPOs to set their own bridge targets if they so choose. The source of these calculations are bridge-year records which can be searched, sorted, and filtered to produce tables of bridge-by-bridge data if needed;
- 4) NCTCOG currently includes status updates on NHS bridges in poor condition as part of

its “Federal Performance Measures” web page (www.nctcog.org/pm);

- 5) NCTCOG and TxDOT have already executed a “FAST Act Planning Memoranda of Understanding” to coordinate on the sharing of NHS inventory and condition data and on the establishment of NHS bridge performance targets; and
- 6) To demonstrate its support for the NHS, the Regional Transportation Council for NCTCOG adopted a resolution on November 8, 2018 with policy statements to focus on the improvement of NHS pavements and bridges in “poor condition”.

System Performance, Freight, and CMAQ (PM3)

The System Performance, Freight and CMAQ measures (commonly collectively known as PM3) cover a broad variety of observed measures across multiple modes of the transportation system. As with the Pavement and Bridge Condition (PM2) measures, the final rule for these measures establishes a cycle of four-year performance periods, the first of which began on January 1, 2018. Most measures require a target for both the midpoint and end of the performance period. In the case of this initial performance period, the relevant target years are 2020 and 2022. In most cases, 2017 is used as the baseline year for establishing targets. With these and most other measures, MPOs have the option to either support the state DOT’s targets or to adopt their own quantitative targets. For most PM3 measures, NCTCOG chose to adopt its own targets.

Reliability

Observing the current performance of the roadway system is an important component of assessing the system’s needs and planning for its future. The North Central Texas Council of Governments has data collection programs in place to observe the current roadway system. Several of the new federal performance measures are designed to summarize the observed performance. With these new federal requirements have come data-sharing agreements that allow NCTCOG to access powerful new datasets of observed travel time, most notably the National Performance Management Research Dataset (NPMRDS). These datasets will allow for calculation of the required measures and support additional analyses.

Despite efforts to reduce roadway congestion, the region’s increasing population and inadequate transportation funding may make congestion worse despite the improvements being recommended in *Mobility 2045* and being implemented via the 2019-2022 TIP, as well as future TIPs. While all congestion has social, economic, and environmental impacts, congestion that is inconsistent and difficult to predict has greater impacts than congestion that can be readily anticipated. With this in mind, federal performance final rules related to congestion have tended to focus on the reliability and predictability of travel as opposed to absolute measures of congestion.

While a majority of person miles of travel on both the Interstate System and Non-Interstate NHS are reliable in the Metropolitan Planning Area, reliability can be increased by implementing programs and projects that reduce non-recurring congestion and boost the overall reliability of the system.

Exhibit IX-8: Reliability on the National Highway System

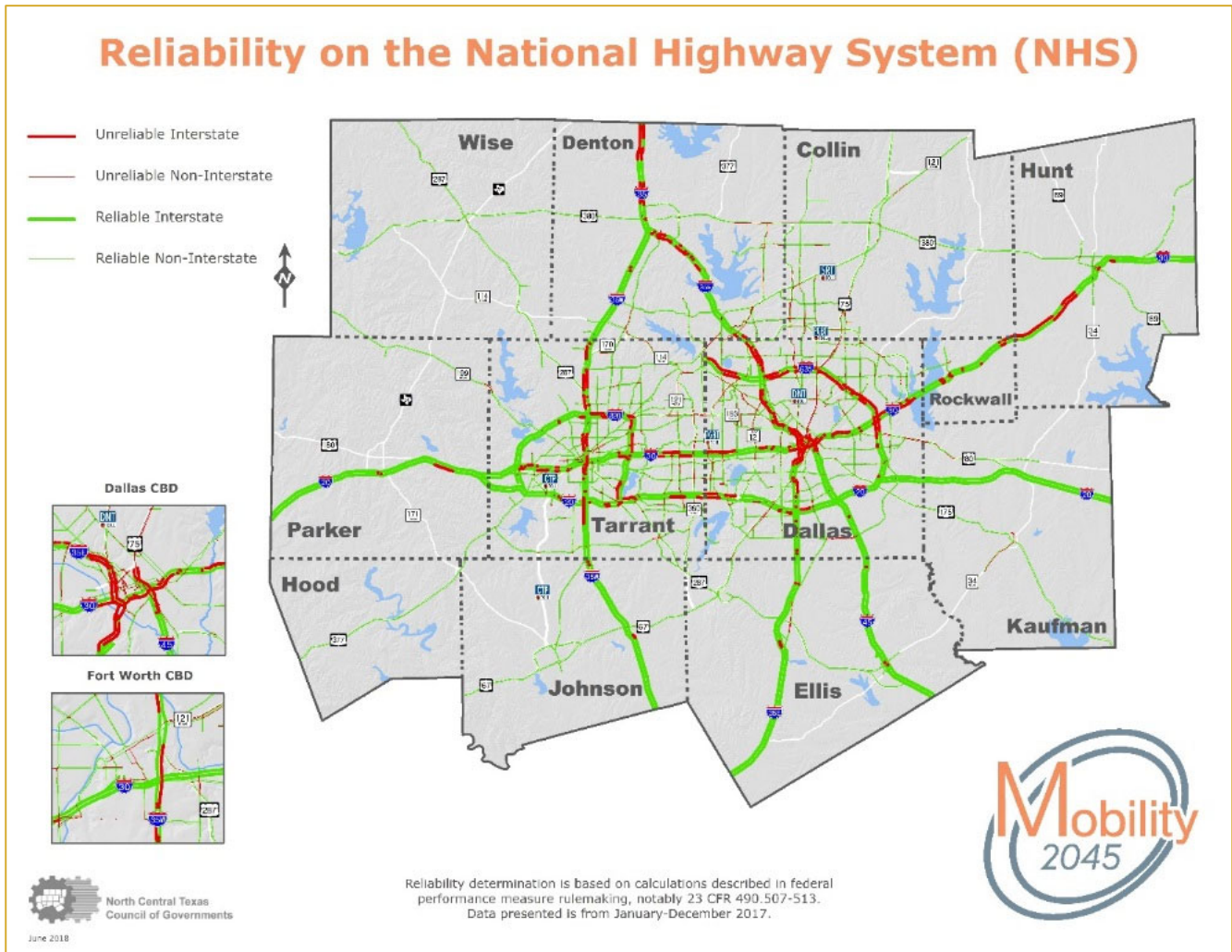
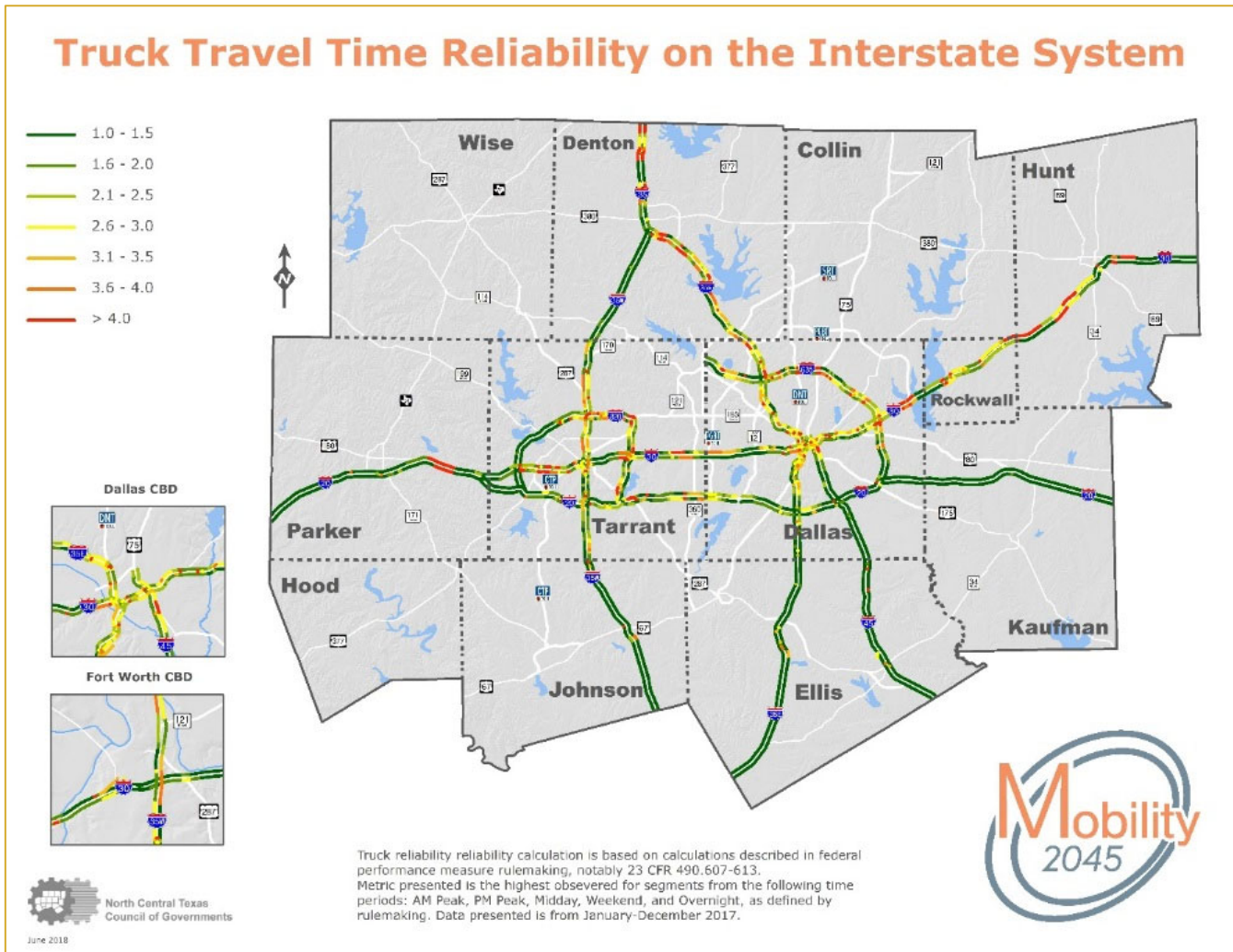


Exhibit IX-9: Truck Travel Time Reliability on the Interstate System



Freight Movement

The PM3 rulemaking also directly addresses freight movement with a required Truck Travel Time Reliability Index measure in the System Reliability/Freight/CMAQ (PM3) rulemaking. As with the Interstate/Non-Interstate Reliability measures, this measure is primarily calculated using the NPMRDS.

However, unlike other NPMRDS-derived measures, this measure does not need to be adjusted for auto occupancy and is reported as a simple regional index. A value of 1.0 indicates that any congestion on a facility that affects freight movement is consistent and predictable. Values above 1.0 indicate decreasing reliability. As depicted in Exhibit IX-9 and in the below preliminary calculation of the measure, there are areas on the region’s Interstate

facilities that have significant reliability issues. However, planned projects may improve freight movement in the region in coming years.

Peak Hour Excessive Delay

The Peak Hour Excessive Delay (PHED) measure recognizes that excessive congestion can have a detrimental impact on air quality. As with the travel time reliability and freight measures, this measure is primarily calculated using travel time data from the NPMRDS. However, unlike the other measures, this and the other CMAQ measures initially only apply to the Dallas-Fort Worth and other non-attainment areas in the State. As defined in the final rule, excessive delay is extra time spent in congested conditions where speeds are below a normally expected delay threshold. If the excessive delay

threshold on a hypothetical one-mile segment of road is 30 mph and the observed travel speed on that segment was 25 mph during a specific time interval, the 5 mph difference between the two would result in 24 seconds of excessive delay for each traveler on that segment during that time interval. These segment-level values are summed into a regional total for the calendar year. For the purposes of calculating the measure, the excessive delay threshold is specifically defined as travel occurring where speed is below 20 mph or 60 percent of the posted speed limit, whichever is greater. The baseline and targets for this measure are reported in Exhibit IX-10. Unlike other required measures, this and the Non-Single Occupant Vehicle Travel measure initially only apply to the Dallas-Fort Worth-Arlington Urbanized Area, and TxDOT and NCTCOG are required to come to a consensus on a single target for the urbanized area. The latest results and adopted targets are reported in Exhibit IX-10.

This means that on average, each resident of the urbanized area experiences 15.5 hours of delay on the region’s road network greater than the defined threshold for excessive delay.

Non-Single Occupant Vehicle (SOV) Travel

The Non-Single Occupant Vehicle (SOV) travel measure quantifies the mode share diversity of the region’s transportation system by reporting the total percentage

of commuters that use a mode of transportation other than traveling alone. This includes carpooling, using transit, biking, walking, telecommuting, and other modes. Federal rulemaking allows for a variety of data sources for this measure but strongly encourages use of 5-Year American Community Survey (ACS) results for the sake of consistency with state and federal partners. While results of the ACS are generally not available in the year they were collected, federal guidance explicitly allows the reporting agency to use the latest available ACS results for target-setting. As of the RTC’s November 2018 action establishing targets for this measure, 2016 was the latest year that data for this measure has been released. 2017 5-Year Estimates have since been released. As with the Peak-Hour Excessive Delay measure, this measure initially only applies to the Dallas-Fort Worth-Arlington Urbanized Area, and TxDOT and NCTCOG are required to come to a consensus on a single target for the urbanized area. The latest results and adopted targets are reported in Exhibit IX-11.

Exhibit IX-11: Non-SOV Measures and Targets

2016 (5-Year Est.) (Baseline)	2017 (5-Year Est.)	2020 Target	2022 Target
19.5%	19.5%	19.9%	20.2%

Exhibit IX-10: PHED Measures and Targets

Measure	2017 (Baseline)	2020 Target	2022 Target
Peak Hour Excessive Delay	15.5	N/A	15.0

Total Emissions Reductions (On-Road Mobile Source)

The on-road mobile source emissions performance measure is the total emissions reduction (two- and four-year cumulative estimated emissions reductions) for all CMAQ-funded projects, of each applicable criteria pollutant and precursor. For the Dallas-Fort Worth nonattainment area, the pollutants measured are NO_x and VOC.

To develop the baseline, NCTCOG staff compared existing local Transportation Improvement Plan (TIP) projects from 2014 to 2017 with projects entered into the Federal Highway Administration’s User Profile and Access Control System (UPACS) database for the same period. The results showed only a certain percentage of TIP projects were reported in the database, due the nature of UPACS reporting. UPACS was found to include an average of 78 percent of emissions benefits reported in the TIP for NO_x and 75 percent for VOC. The averages were applied to the total emission reductions for CMAQ-funded TIP projects (2014-2017). Due to NCTCOG’s 2019-2022 TIP not being fully programmed at the time, staff chose these amounts as the established baseline provided in Exhibit IX-12.

NCTCOG coordinates with local stakeholders and TxDOT in selection of CMAQ projects for deployment in the Dallas-Fort Worth ozone nonattainment area. These projects are selected to meet the program goals of reducing congestion and/or reducing emissions of ozone precursor pollutants. Emissions estimates for these projects are estimated by NCTCOG using methodologies developed as part of the Texas Guide to Accepted Mobile Source Emission Reduction Strategies (MOSERS). In cases where no practical MOSERS methodology exists, verified past emission reduction performance is used to create an emissions reduction estimate.

To establish targets for these measures, staff analyzed the behavior of emission factors over time and applied percentage reductions to the baseline in an effort to better correlate with potential future reductions. These cumulative targets are reported in Exhibit IX-12.

Exhibit IX-12: Emissions Reductions Measures and Targets

Pollutant	Baseline	2020 Target	2022 Target
NO _x (kg/day)	2,410.80	2,892.96	5,062.68
VOC (kg/day)	499.72	599.67	1,079.40

Transit Asset Management

Public transportation provides thousands of people in North Central Texas with daily access to life-essential opportunities. It is critical to have well maintained, reliable transit assets to help ensure safe, dependable, and accessible transit services. The North Central Texas region has a variety of transit assets. The three major transit authorities, Dallas Area Rapid Transit, Trinity Metro (formerly the Fort Worth Transportation Authority), the Denton County Transportation Authority, and smaller transit providers have transit assets, including over 700 buses, 300 small buses, and 150 light rail vehicles; 150 miles of rail track; transit support vehicles like service trucks and police cars; and stations, park-and-ride locations, and maintenance facilities.

Transit asset management (TAM) is a business model that prioritizes funding based on the condition of transit assets to achieve or maintain transit networks in a state of good repair. TAM supports a series of practices to achieve a transit state of good repair including, but not limited to:

- Regular maintenance
- Inspections
- Tracking asset condition over time
- Planning for maintenance and replacement costs
- Replacing each asset at the appropriate time

Based on the federal performance measure final rule on TAM issued in July 2016, MPOs are required to coordinate with transit providers to set performance targets and integrate individual transit providers’ performance targets and TAM plans into planning documents. NCTCOG reached out to all transit providers in the region and requested transit asset data and agency-level metrics and targets. Based on the data received from transit providers, the Regional Transportation Council established regional targets for the four transit asset categories.

Exhibit IX-13 lists the regional metrics and associated targets. The metrics consider the condition of transit assets against a federally defined default metric. The adopted regional targets represent that none of the transit assets to be in worse condition than the federal default metric.

Exhibit IX-14 shows a baseline for the region’s transit asset management performance, showing the targets and

current status in achieving those targets. Transit agencies may have agency-level targets that differ from the proposed regional targets. These agency-level targets may better meet their needs in planning for state of good repair. NCTCOG will continue to coordinate with transit agencies to report, track and adjust the metrics and targets over time. Transit agencies completed their transit asset management plans and NCTCOG is incorporating those plans into required planning documents.

Exhibit IX-14 presents Fiscal Year 2017 performance for rolling stock compared to the Fiscal Year 2019 target. The

Fiscal Year 2017 performance for rolling stock was developed from Fiscal Year 2017 National Transit Database forms prepared by transit agencies. The performance of infrastructure, equipment, and facilities will be available starting with Fiscal Year 2018 when reporting on the condition of those transit asset categories will be mandatory. NCTCOG is currently analyzing Fiscal Year 2018 performance for all categories and comparing them to the regional targets. Future funding investments may be made based on Fiscal Year 2018 performance.

Exhibit IX-13: Transit Asset Management Targets for 2019

Asset Category	Target	Metric
Rolling Stock (transit vehicles)	0%	Vehicles that meet or exceed the industry standard, defined as the Federal Transit Administration’s Default Useful Life Benchmark
Infrastructure (rail track)	0%	Rail track segments with performance restrictions
Equipment (transit support vehicles)	0%	Vehicles that meet or exceed the industry standard, defined as the Federal Transit Administration’s Default Useful Life Benchmark
Facilities (buildings, stations, park and rides)	0%	Transit facilities rated below “Adequate” (3.0) on the industry standard Transit Economic Requirements Model (TERM) scale

*These vehicles are as old as or older than the industry standard.

The next four tables show a baseline for the region’s transit asset management performance, showing the targets and current status in achieving those targets for each of the four metrics. Transit agencies may have agency-level targets that differ from the proposed regional targets. These agency-level targets may better meet their needs in planning for state of good repair. NCTCOG will continue to coordinate with transit agencies to report, track and adjust the metrics and targets over

time. Transit agencies completed their transit asset management plans and NCTCOG has incorporated those plans into required planning documents and will communicate any change in Transit Asset Management plans throughout the region. Exhibit IX-14 summarizes rolling stock performance compared to the Fiscal Year 2019 target. The Fiscal Year 2018 performance for rolling stock was developed from Fiscal Year 2018 National Transit Database information.

Exhibit IX-14: Rolling Stock Performance Compared to Targets

(Percent of revenue vehicles that have met or exceeded their useful life benchmark)

Asset Type ¹	Fiscal Year 2017 Performance	Fiscal Year 2018 Performance
Bus	6%	4%
Small Bus	3%	9%
Light Rail Vehicle	0%	0%
Commuter Rail Locomotive	0%	0%
Commuter Rail Passenger Car	0%	0%
Articulated Bus	0%	0%
Commuter Rail Passenger Coach ²	35%	40%

¹Rolling stock assets include a small number of vehicles reported to the National Transit Database as “inactive”

²Includes assets rebuilt near the end of their useful life with the assumption of a minimum useful life extension of 10 years, which may be too conservative (i.e., vehicles may be in better condition than expected based on completed rebuild activities).

The performance of infrastructure, equipment, and facilities was available starting with Fiscal Year 2018 when reporting on the condition of those transit asset categories was mandatory. NCTCOG analyzed Fiscal Year 2018 performance for all categories and compared them

to the regional targets. That performance is summarized in Exhibits IX-15, IX-16, and IX-17.

Exhibit IX-15: Infrastructure Performance Compared to Targets

Rail Mode	Fiscal Year 2018 Performance	Fiscal Year 2019 Target
Light Rail	0.20%	0%
Commuter Rail	0.09%	0%
Streetcar Rail	0%	0%
Hybrid Rail	2.05%	0%

Exhibit IX-16: Equipment Performance Compared to Targets

Asset Type	Fiscal Year 2018 Performance	Fiscal Year 2019 Targets
Automobiles	32%	0%
Steel Wheel Vehicles	0%	0%
Trucks & Other Rubber Tire Vehicles	19%	0%

Exhibit IX-17: Facilities Performance Compared to Targets

Asset Type	Fiscal Year 2018 Performance	Fiscal Year 2019 Targets
Administrative/Maintenance	0%	0%
Passenger/Parking	0%	0%

Additionally, each transit provider was federally required to develop and implement a TAM plan, individually or through a group-sponsor such as the MPO or TxDOT. Designated or direct recipients of Federal Transit Administration’s Urbanized Area Formula Program, Formula Grants for Rural Areas, and Enhanced Mobility for Seniors and Individuals with Disabilities Program funds sponsor and develop a Group TAM Plan for subrecipients that are Tier II providers of public transportation. The group plan sponsor is responsible for developing and writing the plan, as well as reporting on behalf of participants. Participating subrecipients are responsible

for collecting and submitting data to the sponsor and implementing the plan within their respective agencies. NCTCOG coordinated with public transportation providers in the region to ensure all agencies either developed their own TAM Plan or participated in a group-sponsored plan offered by NCTCOG or TxDOT. Exhibit IX-18 outlines how each agency developed their own plan or participated in a group plan to meet the October 1, 2018, deadline.

Exhibit IX-18: Transit Asset Management Plans Established by October 1, 2018

Individual TAM Plan	Group TAM Plans	
	NCTCOG Group Plan Participants	TxDOT Group Plan Participants
Dallas Area Rapid Transit (DART) Trinity Metro Denton County Transportation Authority (DCTA) Public Transit Services (PTS)	City of Arlington City of Grand Prairie City of McKinney City of Mesquite Dallas/Fort Worth International Airport Northeast Transportation Services (NETS)	City of Cleburne (dba City/County Transportation) Community Services (dba Community Transit Service) Senior Center Resources and Public Transportation (SCRPT) SPAN STAR Transit Texoma Area Paratransit System (TAPS) The Transit System (TTS)

Project Selection Efforts

When working to select and program projects, MPO staff factor in a variety of performance measures. Given that projects and programs in a MPO’s TIP must be included in and consistent with its MTP, the MTP and the performance measures that support it are critical to the development of the TIP. The projects that are recommended in the MTP and eventually programmed in the TIP go through a review to determine whether they are warranted.

The RTC selects projects through one of two primary methods: calls for projects and funding initiatives. Funding initiatives can take one of two forms, funding programs that have one or two primary objectives and larger funding initiatives that do not focus on a single objective. Performance measures and targets are being addressed through both of these options.

One of the funding programs recently approved by the Regional Transportation Council (RTC) was dedicated to funding projects and programs that sought to address safety issues and/or system resilience or include benefits for incident management and first responders. The program includes funding for two projects that address flooding issues in the region, improvements near a major airport that aim to reduce crashes, and funding for a region-wide program that will focus on mitigating safety issues (e.g., program wrong-way driving, dangerous intersections). This specifically addresses PM1. Two other recently approved funding programs (Sustainable Development Round 4: Turnbacks Program, Context Sensitive, & Transit Oriented Development and the Transit Program) invested in transit projects and projects that emphasize non-vehicular modes of transportation and context-sensitive design. Both programs address parts of PM3 and the Transit Asset Management performance measures.

Performance targets related to transit projects approved by the RTC are also addressed through the annual transit funding process. While many transit projects relate to maintaining existing operations of public transportation services, other transit projects relate directly to the maintenance, repair, and replacement of capital assets. These projects are evaluated against the TAM regional performance targets and individual transit provider's TAM plans to ensure consistency. As mentioned previously, regional performance targets for TAM were established and coordinated with each transit provider.

Each TAM plan addresses capital assets used in the provision of public transportation and requires prioritization of investments for repair, maintenance, and replacement. This requirement allows transit providers to strategically plan for funding of capital assets and allows the MPO to make effective funding decisions for projects included in the TIP. All TAM plans include investment prioritization tools to assist in determining funding priorities to maintain an overall state of good repair. NCTCOG developed decision support tools for each asset category that includes various weighted categories based on common factors that affect overall life of the asset. The transit projects in the TIP will help the region meet the adopted transit state of good repair performance targets by providing funding to replace vehicles that meet or exceed the industry standard, defined as the Federal Transit Administration's default useful life benchmark.

Performance targets are also being addressed via larger funding initiatives that do not necessarily specify achieving progress toward a certain target as the reason for the initiative. One of the RTC's most recent project selection initiatives, the Regional 10-Year Plan required by Texas House Bill (HB) 20, includes many projects that address congestion reduction, connectivity, and safety issues, in addition to other criteria like pavement and bridge condition. A notable example is the proposed reconstruction of IH 635 East in Dallas County. In addition to being one of the most congested roadways in Texas, this roadway has an average annual crash rate that is 60 percent higher than similar urban interstates in Texas. Part of the proposed project involves bringing IH 635 up to current design standards that will help mitigate the contributing factors in crashes on the facility. As a major roadway reconstruction project, it will improve pavement and bridge conditions along the 11-mile corridor. And, it will reduce congestion by adding roadway capacity. Ultimately, the project will address multiple performance measures, which is what made it a regional priority.

This emphasis on projects that have multi-faceted benefits also applies to the other performance measures and targets that will be utilized in the coming years. Many projects that have been selected by the RTC fall into this category where the improvements do not strictly address one issue. An interchange project may be selected primarily for its expected congestion relief, but it can address a structurally deficient bridge at the same time. A project that increases capacity will often also address a pavement deficiency through the reconstruction of all existing lanes in addition to constructing the new ones.

In addition to the measures and targets described above, there are other focus areas that are being considered when determining whether a project is selected and programmed. These include environmental justice, improved air quality, added active transportation options, increased freight movement, geographic dispersion, and many more. The region has also made a concerted effort to provide funding for active transportation improvements as part of roadway projects. When vetting projects, NCTCOG and the RTC consider a variety of measures pertaining to each of these areas when applicable.

Summary

NCTCOG has a robust performance-based planning process in place, which has been bolstered in the 2019-2022 TIP and *Mobility 2045* by new federal performance requirements. These requirements are being incorporated into planning and programming processes. Current processes include performance measures based on both observed and forecasted data sources, both of which will continue to be strengthened in future TIPs and MTPs. The region faces a continuing challenge to implement transportation improvements that will have a lasting positive benefit for the region. These improvements must address continued population growth, yet they are constrained by financial resources that are insufficient to meet the needs created by that growth. By continuing to evaluate and monitor the region's transportation system using a performance-based planning process, policymakers can ensure that the most beneficial and effective projects and programs are implemented.

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