ON TO 2050
2018 SYSTEM PERFORMANCE REPORT

CMAP

Contents

Introduction

In requirements recently established under federal law,[1] state departments of transportation (DOTs), transit agencies, and metropolitan planning organizations (MPOs) are given separate responsibility for establishing short-range performance targets (one to four years) and using a set of performance measures to track progress toward meeting those targets for a variety of transportation areas including traffic safety, bridge and pavement condition, air quality, freight movement, system reliability, and transit state of good repair. For all of the highway measures, MPOs can choose either to set quantitative targets for their metropolitan planning areas or commit to help implement the state's target by planning for and programming appropriate projects. For the transit measures, MPOs must set quantitative targets. MPOs have 180 days to establish targets after the state or transit agency do so, but MPOs may set targets sooner. Once the targets are established, the MPO must show how the investments in the transportation improvement program (TIP) help achieve the targets. Furthermore, the performance measure baseline and targets must be included in a system performance report in the MPO's long-range transportation plan.

This appendix contains all 2018 federally required performance targets for the CMAP MPO. It is organized into 4 sections:

- Highway Safety
- Pavement and Bridge Condition
- System Performance
- Transit Asset Management

Each section includes a description of the research that informed the target selection and a description of CMAP's efforts to integrate the targets into the programming process and the TIP. Note that ON TO 2050 also includes a number of long-range quantitative indicators that partly overlap the federally required performance measures. For these overlapping measures, this appendix presents the short-range target (for 2019, 2021, or 2022, depending on the measure), while the indicators appendix presents the longer term target for the measure.

These performance measures have been discussed at a series of committee meetings, as noted below by meeting and topic (upcoming meetings are in italics):

- July 17, 2015 – Transportation Committee – Planning Information Forum: Setting Pavement Condition Targets
- November 20, 2015 – Transportation Committee – Outcomes from "Setting Pavement Condition Targets" Forum

[1] Federal Highway Administration, "Transportation Performance Management Statutes website", accessed April 2018 https://www.fhwa.dot.gov/tpm/about/statutes.cfm#measures

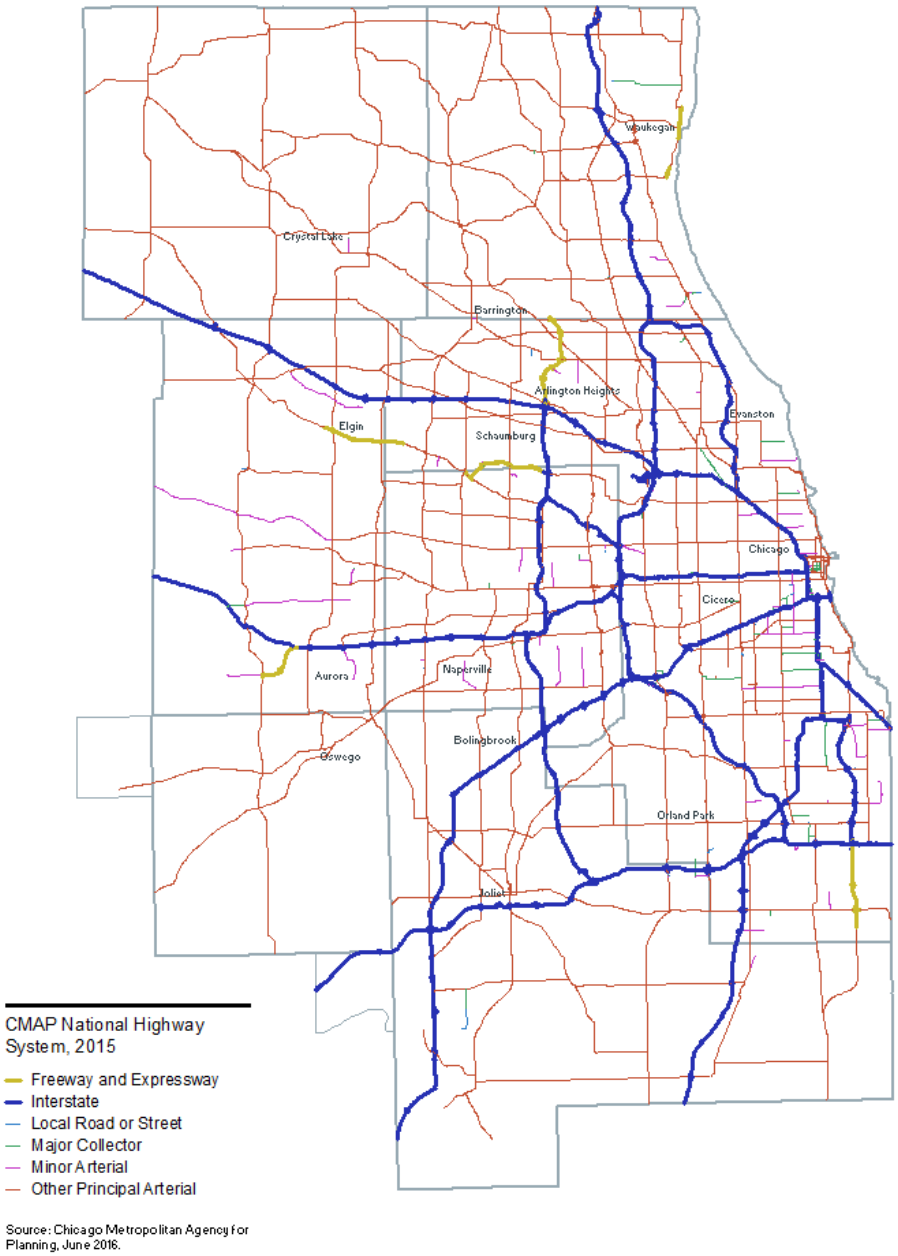
- November 18, 2016 – Transportation Committee – Asset Management Paper Key Directions: Update of Federal Rulemaking
- January 12, 2017 – MPO Policy Committee – Update on MAP-21 Federal Performance Measurement Rules
- January 14, 2017 – CMAP Board – Regional Transit Asset Condition Targets for 2017
- March 3, 2017 – Transportation Committee – MAP-21 Performance Measures Update
- April 28, 2017 – Transportation Committee – Regional Transit Asset Condition Targets for 2017
- June 8, 2017 – MPO Policy Committee – Regional Transit Asset Condition Targets for 2017
- September 29, 2017 – Transportation Committee – Options for Establishing 2018 Regional Safety Targets
- November 2, 2017 – CMAQ Project Selection Committee – CMAQ Performance Measures Memo
- November 17, 2017 – Transportation Committee – 2018 Regional Safety Targets
- November 17, 2017 – Transportation Committee – Transportation Indicators
- January 10, 2018 – CMAP Board – 2018 Highway Safety Targets
- January 11, 2018 – MPO Policy Committee – 2018 Highway Safety Targets
- January 19, 2018 – Transportation Committee – Asset Management Recommendations
- February 23, 2018 – Transportation Committee - Proposed Mobility Indicator Targets
- March 8, 2018 – MPO Policy Committee – Intergovernmental Agreement between IDOT and CMAP- Performance Measures
- March 21, 2018 – Bicycle-Pedestrian Task Force – ON TO 2050 Plan Indicators
- April 27, 2018 – Transportation Committee – Intergovernmental Agreements concerning Federal Performance Measures
- *June 15, 2018 – Draft ON TO 2050 Plan Released for Comment (with performance measures)*
- *August 3, 2018 – Transportation Committee – Federal Performance Measure Target Recommendations*
- *October 10, 2018 – CMAP Board and MPO Policy Committee – ON TO 2050 Plan Adoption (with performance measures)*

Performance Measures and the Transportation Improvement Program

As required by federal law, CMAP will be describing the anticipated effect of projects in the TIP toward achieving performance targets. This process will evolve over time, as additional data are collected and trends become clear. CMAP is currently requesting that implementers identify projects that impact performance measures in eTIP by checking the box or boxes corresponding to seven performance target groups: safety, transit asset condition, pavement condition, bridge condition, travel reliability/ congestion, non-SOV travel, and emissions reduction. Additional questions, directly related to each performance measure will be added in the future in order to better understand the magnitude of a project's impact.

The National Highway System (NHS) is the focus of the road performance measurement requirements. The NHS is a federal designation for roadways considered important to the nation's economy. In the CMAP region, this includes all interstates, many principal arterials, and limited mileage of intermodal connectors that provide important access to the NHS. The NHS has changed over time. Historic data reflects the NHS approved in the reporting year, and has not been adjusted to reflect the 2018 NHS or expected future changes.

National Highway System in northeast Illinois, 2015



Highway Safety

The safety performance measures require state DOTs and MPOs to establish safety targets as five-year rolling averages on all public roads for:

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

Injuries and fatalities from traffic crashes vary considerably from year to year due to numerous factors, and the five-year average is meant to smooth large changes. The region has made significant progress in decreasing the number of traffic related fatalities in the region from 687 in 2000 to 470 in 2016. Yet the recent upward trend of both fatalities and serious injuries is worrisome.

MPOs can either choose to set quantitative targets or commit to help implement the state's target by planning for and programming safety projects. CMAP has chosen to support IDOT's 2018 safety targets.[2] The IDOT safety targets are fairly aggressive due to the year-to-year fatality and serious injury reductions needed. For each measure, baseline data is shown for both the state and CMAP area. All targets shown for safety are state targets. The CMAP data is provided for context and informational purposes only.

Research and projects

The ON TO 2050 white paper on traffic safety[3] builds from the understanding that traffic deaths and injuries are preventable. Infrastructure improvements can improve the safety of our roads, particularly when paired with policy recommendations such as increasing the importance of traffic safety in programming decisions. In general, however, the paper concludes that behavioral change is by far the most important factor in safety improvement.

In addition to the traffic safety white paper, two other reports have significant analysis of safety in the region. The Highway System Performance Trends[4] looks at safety trends for the CMAP

[2] Note that by agreeing to support IDOT's safety targets, the MPO is not agreeing to any specific share of the decrease in fatalities and serious injuries. Instead it is agreeing to integrate the targets as goals in the metropolitan planning process and to plan and program projects that help meet the State's targets.

[3] CMAP report, "Traffic Safety White Paper," 2018, http://www.cmap.illinois.gov/documents/10180/845900/Traffic+Safety+white+paper.pdf/06054fe6-2a39-2e87-6d38-3f88e37e9e35

[4] CMAP snapshot, "Highway System Performance Trends," 2017, http://www.cmap.illinois.gov/documents/10180/71423/Highway+Performance_FINAL_9-15-17.pdf/6b33ea28-1138-cf8f-8691-bdd4a8af575c

region in comparison to the rest of the state. In addition it details the location and type of facility for serious injuries and crashes. The Non-motorized Transportation Report[5] dives deep into pedestrian and bicycle crashes in the region and identifies steps that local communities can take to improve safety for these users.

CMAP coordinates with IDOT on safety both at the staff level and with IDOT representation on several committees. IDOT has prepared a Highway Safety Plan (HSP)[6] and Strategic Highway Safety Plan (SHSP),[7] as required by federal law. These state documents set priorities for the primary safety-focused programs in Illinois.

Plans and reports from IDOT, CMAP, and other partners informed selection of the federal performance targets below and the recommendations in the ON TO 2050 long range plan. In addition, these recommendations will be incorporated into the programming process and reflected in the TIP.

Incorporating safety measures into local programming

While numerous actions are needed by the public and private sectors to improve traffic safety, CMAP has a particular role in some areas. Building upon CMAP's role in project selection for locally programmed federal funds, CMAP can incorporate safety performance as a larger priority in transportation project selection. Incorporating safety performance measures into programming decisions will help achieve regional safety targets and make sure this vital aspect of transportation receives adequate consideration. These programs include CMAQ, TAP, and STP.

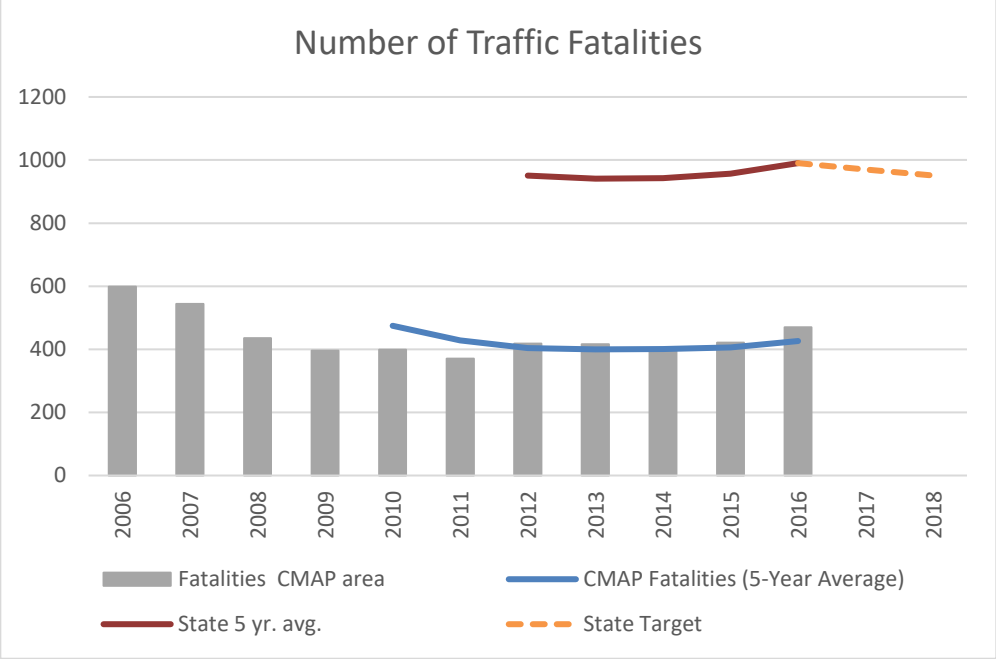
Fatalities

Measure:	This measure tracks the five-year rolling average of the number and rate of vehicle related fatalities in the CMAP region on all public roads.
Methodology:	Traffic fatalities are identified in the Fatality Analysis Reporting System (FARS). This data is used to calculate the number of fatalities that occur per year within the CMAP region. VMT data comes from CMAP analysis of IDOT published data.

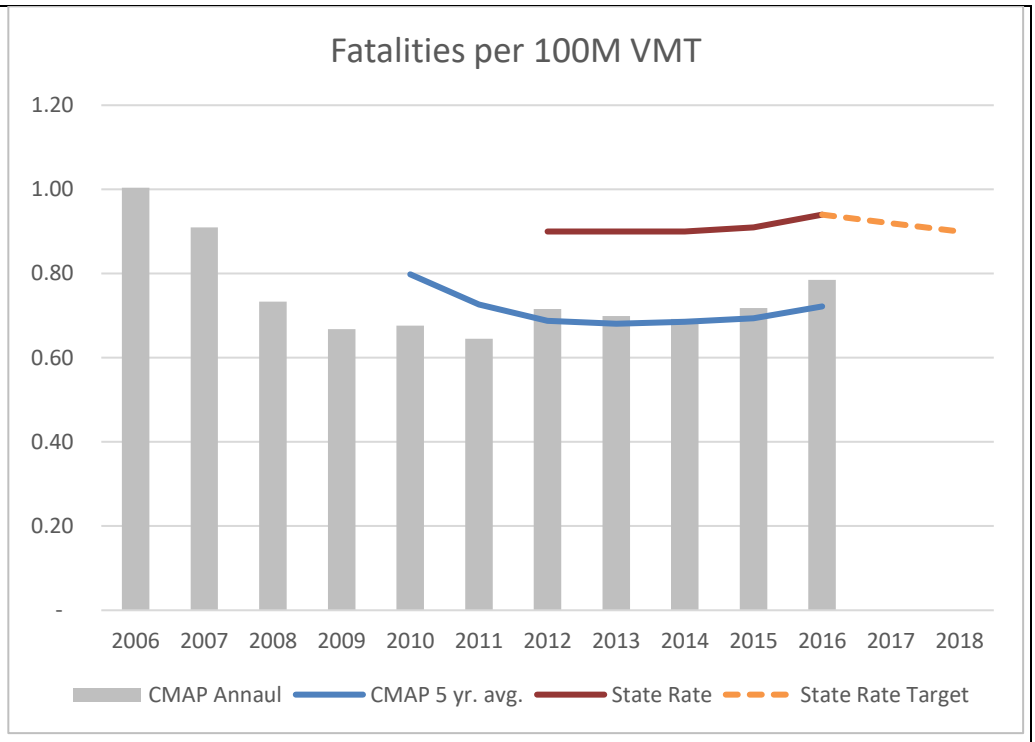
[5] CMAP report, "Non-motorized Transportation Report," 2017, http://www.cmap.illinois.gov/documents/10180/620327/Non-motorized+transportation+report.pdf/1efedfc4-51cc-ec4b-e44f-aad460bef600

[6] IDOT report "Illinois' Highway Safety Plan, " 2018, http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/HSP/Illinois%202018%20Final%20HSP.pdf

[7] IDOT report "Illinois Strategic Highway Safety Plan," 2018 http://www.idot.illinois.gov/transportation-system/transportation-management/planning/SHSP

Proposed Targets:	**CMAP supports IDOT's goals:**[8] To reduce the statewide traffic fatalities from 990.2 (2012-16 average) to 951 by December 31, 2018.  And To reduce the statewide traffic fatality rate per 100 million vehicle miles traveled (VMT) from 0.94 (five-year 2012-16 average) to 0.90 (five-year 2014-18 average) by December 31, 2018.

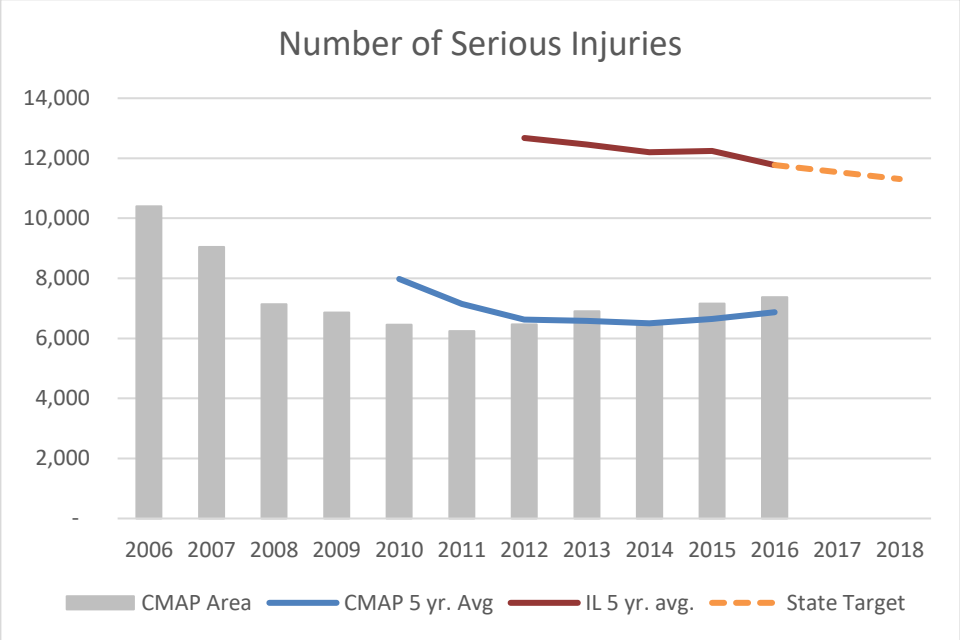
[8] IDOT report, "Illinois' Highway Safety Plan," 2018, http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/HSP/Illinois%202018%20Final%20HSP.pdf



Serious injuries

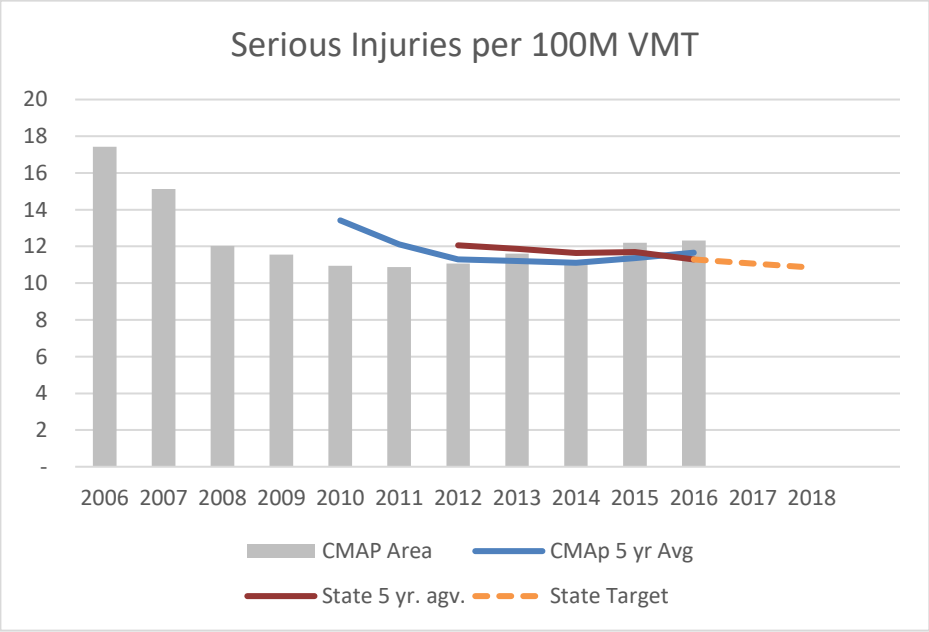
Measure:	This measure tracks the five-year rolling average number and rate of serious injuries resulting from traffic crashes in the CMAP region on all public roads.
Methodology:	Illinois traffic crash data provided by IDOT are used to calculate the number of serious injuries that occur per year within the CMAP region. VMT data comes from CMAP analysis of IDOT published data.
Proposed Targets:	**CMAP supports IDOT's goals:**[9] To reduce the statewide severe injuries from 11,774.4 (five-year 2012-16 average) to 11,231.1 (five-year 2014-18 average) by December 31, 2018.

[9] IDOT report, "Illinois' Highway Safety Plan," 2018, http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/HSP/Illinois%202018%20Final%20HSP.pdf

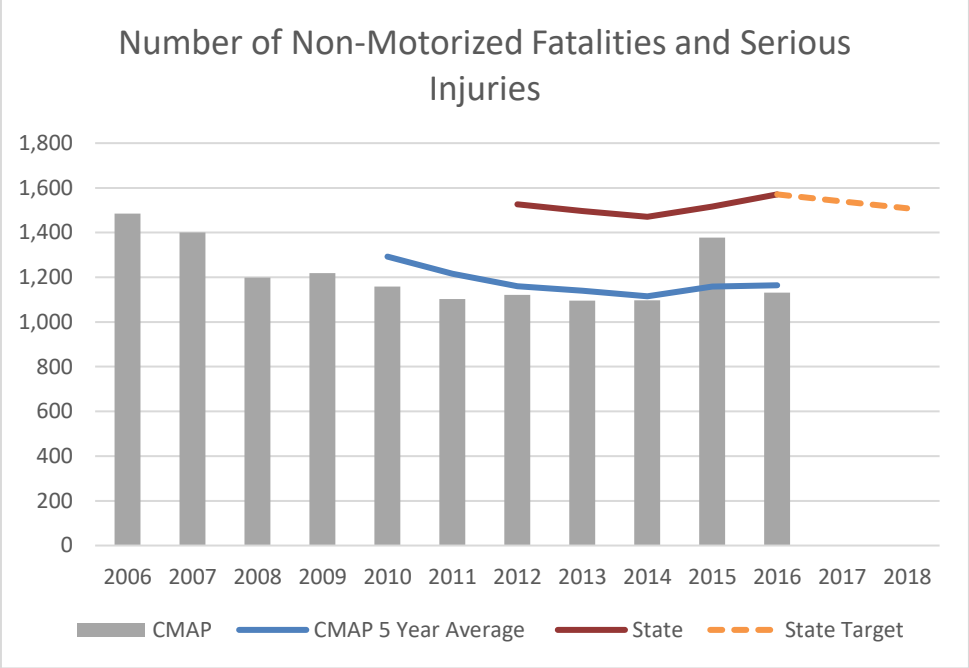


And

To reduce the statewide severe injury rate per 100 million vehicle miles traveled (VMT) from 11.29 (five-year 2012-16 average) to 10.83 (five-year 2014-18 average) by December 31, 2018.



Non-motorist fatalities and serious injuries

Measure:	This measure tracks the five-year rolling average of the number of non-motorist fatalities and serious injuries resulting from traffic crashes.
Methodology:	Traffic fatalities are identified in the Fatality Analysis Reporting System (FARS). Illinois traffic crash data provided by IDOT are used to calculate the number of serious injuries that occur per year within the CMAP region.
Proposed Targets:	**CMAP supports IDOT's goal:**[10] To reduce the number of statewide non-motorized fatalities and serious injuries from traffic crashes from 1570.8 (five-year 2012-16 average) to 1508.6 (five-year 2014-18 average) by December 31, 2018. 

[10] IDOT report, "Illinois' Highway Safety Plan," 2018, http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/HSP/Illinois%202018%20Final%20HSP.pdf

Pavement and Bridge Condition

A well-maintained system is a primary concern of every transportation agency. Given the maturity of the system in the Chicago area, the majority of highway agency investment has been devoted to maintaining roads and bridges. As a result, over the past decade and a half, road and bridge condition has improved on the NHS, but that improvement has stalled in the past few years as agency budgets have diminished. Furthermore, many major reconstruction projects needed on the expressway system remain unfunded.

In recognition of limited nationwide data, the federal pavement measures through 2021 should be based on the International Roughness Index (IRI), a metric for ride quality that is widely available. After 2020, the measures should incorporate a combination of IRI and metrics for faulting, rutting, and cracking. The bridge condition measures are based on the conventional rating scale in the National Bridge Inventory (NBI).

Research and projects

In preparation for the ON TO 2050 plan, CMAP compiled the Highway System Performance Trends[11] report that examines the condition of the highway system and strategies for improvement. CMAP's research on transportation asset management was summarized in a memorandum[12] and committee presentation. Findings included opportunities to expand and better utilize pavement management systems as well as supporting IDOT and local agencies as they develop asset management plans. Because of CMAP's concern with infrastructure investment and trends that affect infrastructure condition, many other CMAP reports indirectly touch on pavement and bridge condition. For example, a changing climate has potential to significantly impact pavement and bridges. CMAP's Climate Resilience Strategy Paper[13] details how the region will be impacted by climate change and highlights the need to build a resilient transportation network that has strong infrastructure, multiple transportation options, and adopts best practices in infrastructure management.

[11] CMAP snapshot, "Highway System Performance Trends," 2017, http://www.cmap.illinois.gov/documents/10180/71423/Highway+Performance_FINAL_9-15-17.pdf/6b33ea28-1138-cf8f-8691-bdd4a8af575c

[12] CMAP memo, "ON TO 2050 Transportation Asset Management Recommendations", 2017 http://www.cmap.illinois.gov/documents/10180/517091/AssetManagementRecommendations.pdf/d23d60e1-4092-cd58-f7e8-e1601d234f76

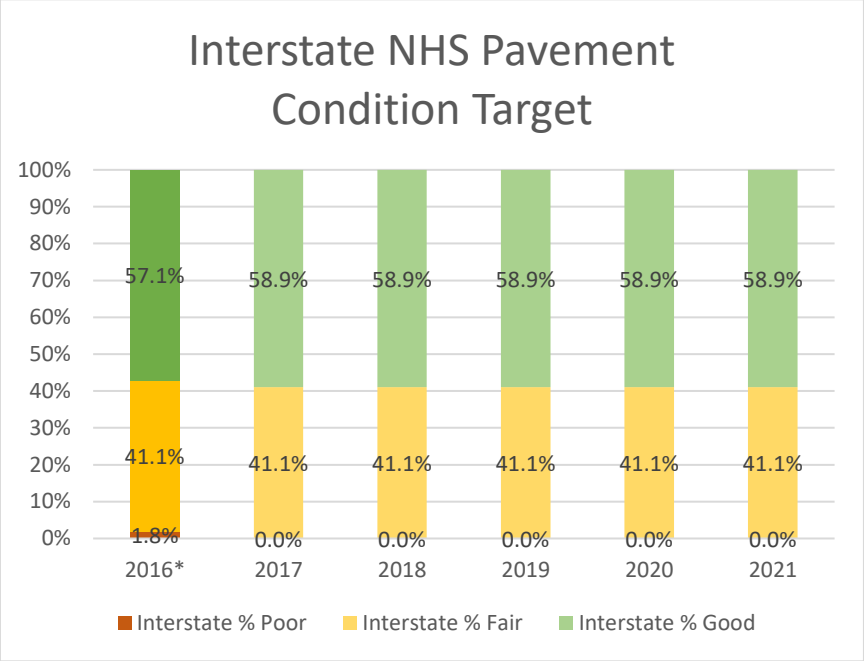
[13] CMAP ON TO 2050 Strategy Paper, "Climate Resilience", 2016, http://www.cmap.illinois.gov/documents/10180/517388/Climate+Resilience+Strategy+Paper.pdf/dd610883-d00f-407d-808b-484f9800a3f6

Incorporating pavement and bridge condition into local programming

Of the locally programmed federal fund sources, only the Surface Transportation Block Grant program is used for pavement and bridge condition improvement. Pavement condition measures are widely included in Councils of Mayors project selection methodologies, with some prioritizing projects on the National Highway System. It is also expected that the federal performance measures will be incorporated into programming for bridges and pavement for the "shared fund" component of the local Surface Transportation Program.

National highway system pavement condition

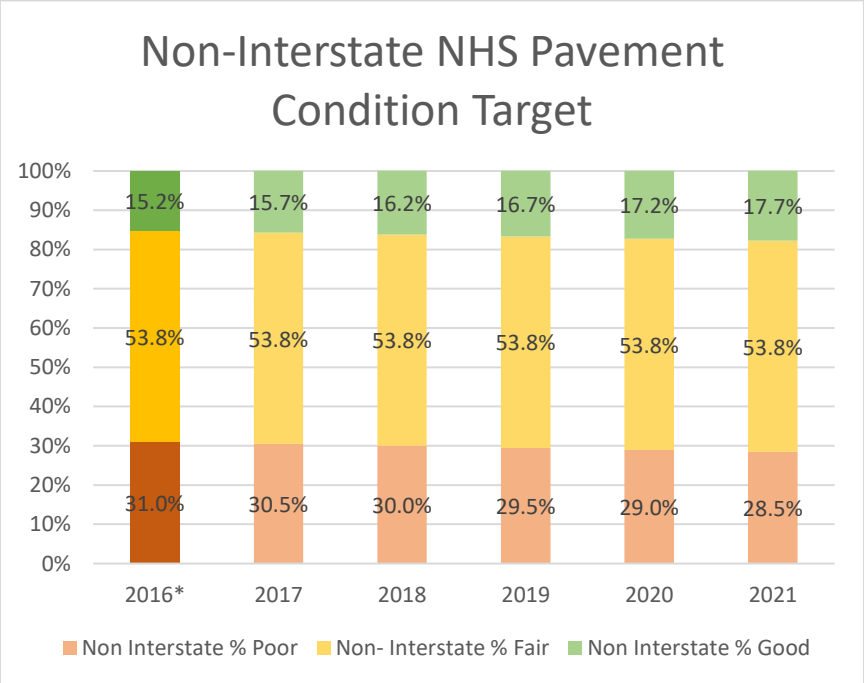
Measure:	This measures the percentage of NHS lane miles in the region that have "good" or "poor" ride quality. Good ride quality is defined by IRI score of less than 95, which measures the cumulative deviation from a smooth surface on a mile of roadway. Poor ride quality is defined by an IRI score of more than 170. Ride quality provides a good measure of user experience of the facility.
Methodology:	The IRI information comes from the Highway Performance Monitoring System (HPMS), and the lane miles for each classification are summed for all roads in the NHS. Interstate and non-Interstate roads are tracked separately.
Proposed Targets:	**Interstate NHS** **2021**: At least 58.9 percent good, none poor



*Only 2016 values are observed data. All other values are projected.

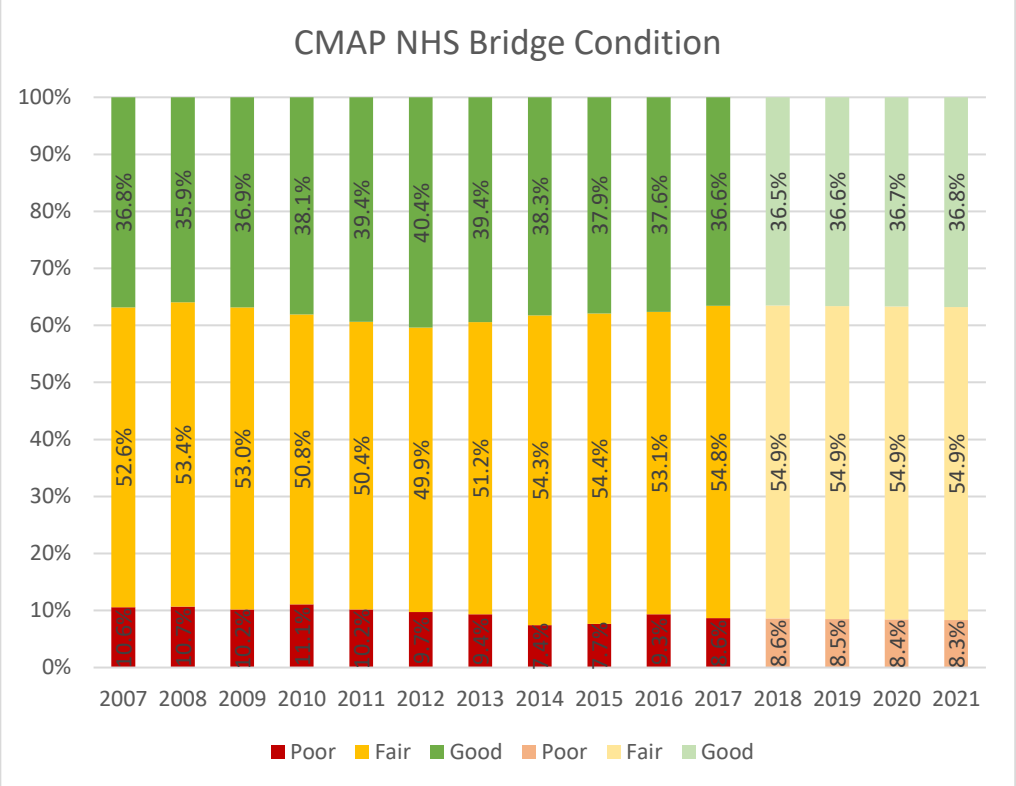
Non- Interstate NHS

2021: At least 17.7 percent good, no more than 28.5 percent poor



*Only 2016 values are observed data. All other values are projected.

National highway system bridge condition

Measure:	This measures the percentage of bridge deck area of NHS that are in "good" or "poor" condition. While a "poor" classification is the lowest condition rating for a bridge, it should be noted that it does not necessarily mean that a specific bridge is unsafe, only that it requires more frequent inspection.
Methodology:	Data come from the Federal Highway Administration's (FHWA) annual NBI. NBI data is available for all bridges that carry NHS routes and that are over twenty feet in length. Bridge Condition is determined through a scheduled inspection process and classified by the lowest rating of NBI condition ratings for Deck, Superstructure, Substructure, or Culvert. If the lowest rating is greater than or equal to 7, the bridge is classified as Good; if it is less than or equal to 4, the classification is Poor. Bridges with all components rated 5 or 6 are classified as Fair.
Proposed Targets:	**2021:** At least 36.8 percent good and no more than 8.3 percent poor  *Values 2017 and prior are observed data

System Performance

"System performance," the term utilized in the federal performance measure rulemakings, includes a variety of measures relating to the effectiveness of the Congestion Mitigation and Air Quality Improvement (CMAQ) program, truck travel time reliability, and use of alternative modes of transportation. These are relevant measures for the CMAP region, and ON TO 2050 emphases better utilization and management of the existing transportation system rather than significant capacity expansion. System enhancements typically have higher benefit to cost ratios than capacity expansion projects. Better utilizing the existing system means fewer single occupant trips, more reliable and less congested roads, and fewer toxic emissions. The Chicago region is also the nation's premier freight hub with $1.3 trillion in goods moving through the region each year; unreliable travel times not only impact commuters, but can impact the economic competitiveness of the region's freight industry.

Research and projects

A number of CMAP's ON TO 2050 papers address measures included under system performance. The Non-motorized Transportation Report[14], Transit Modernization Strategy Paper[15], and Transit Ridership Growth Study[16] each look at providing new and improving existing alternatives to driving such as transit, biking, and walking. Driving is expected to continue to be the most used mode in the region even after recommended improvements to other modes. The Highway Operations Strategy Paper[17] provides a variety of strategies for improving reliability and reducing congestion on the road network. Freight is an important part of the region's economy. CMAP has done extensive work on the freight industry including a summary of regional freight infrastructure[18] and a Regional Strategic Freight Direction[19].

---

[14] CMAP snapshot, "Non-motorized Transportation Report," 2017, http://www.cmap.illinois.gov/documents/10180/620327/Non-motorized+transportation+report.pdf/1efedfc4-51cc-ec4b-e44f-aad460bef600

[15] CMAP ON TO 2050 Strategy Paper, "Transit Modernization," 2017, http://www.cmap.illinois.gov/documents/10180/807381/TMI+FINAL+12-12-17.pdf/b4aaf491-cc7d-d9ca-148f-c492d8492c56

[16] CMAP report, "Transit Ridership Growth Study," 2017, http://www.cmap.illinois.gov/documents/10180/0/Transit+Ridership+Growth+Study_final.pdf/21bca990-9e7a-4af9-8ec1-6b8c8b11fd16

[17] CMAP ON TO 2050 Strategy Paper, "Highway Operations," 2017 http://www.cmap.illinois.gov/documents/10180/517371/Highway+Operations+Strategy+Paper.pdf/26cff0fc-876a-4843-9fe5-c9aedbf73ddd

[18] CMAP snapshot, "The Freight System: Leading the way," 2017, http://www.cmap.illinois.gov/documents/10180/517119/FY17-0095+Freight+Snapshot/3ae1174d-d8f4-4005-8a9f-e02eb87eeac2

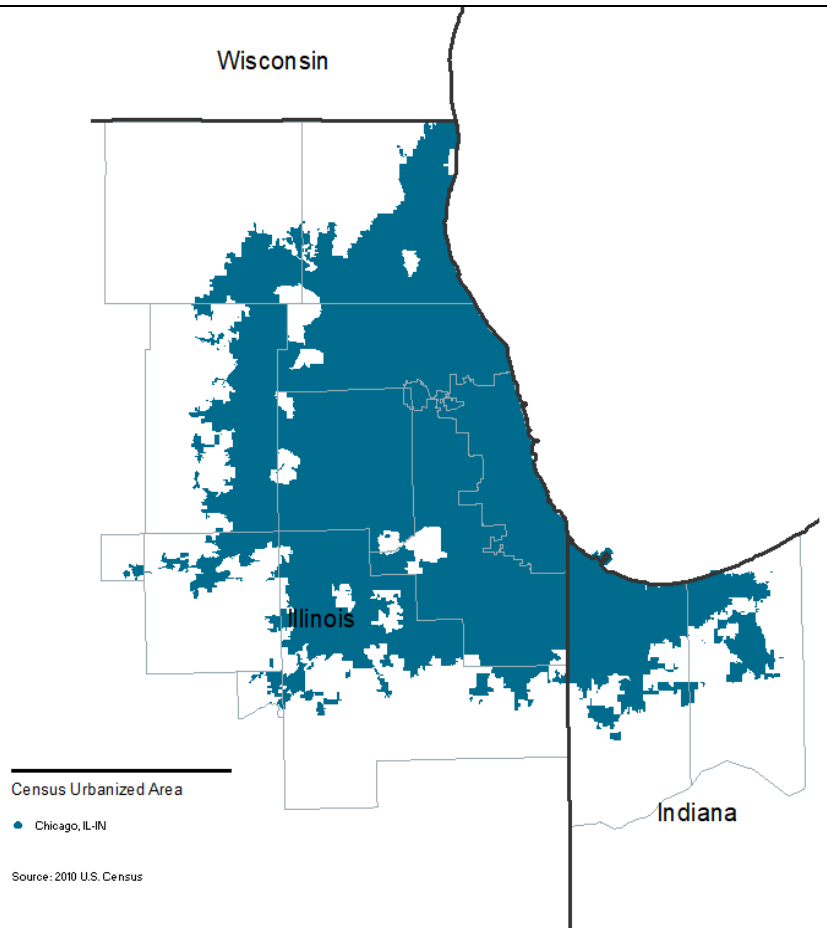
[19] CMAP report, "Regional Strategic Freight Direction," 2018, http://www.cmap.illinois.gov/documents/10180/826017/FINAL+Regional+Strategic+Freight+Direction+with+cover_2-6-18.pdf/88a957e1-249b-4b54-d093-f53b144ee102

Incorporating system performance into local programming

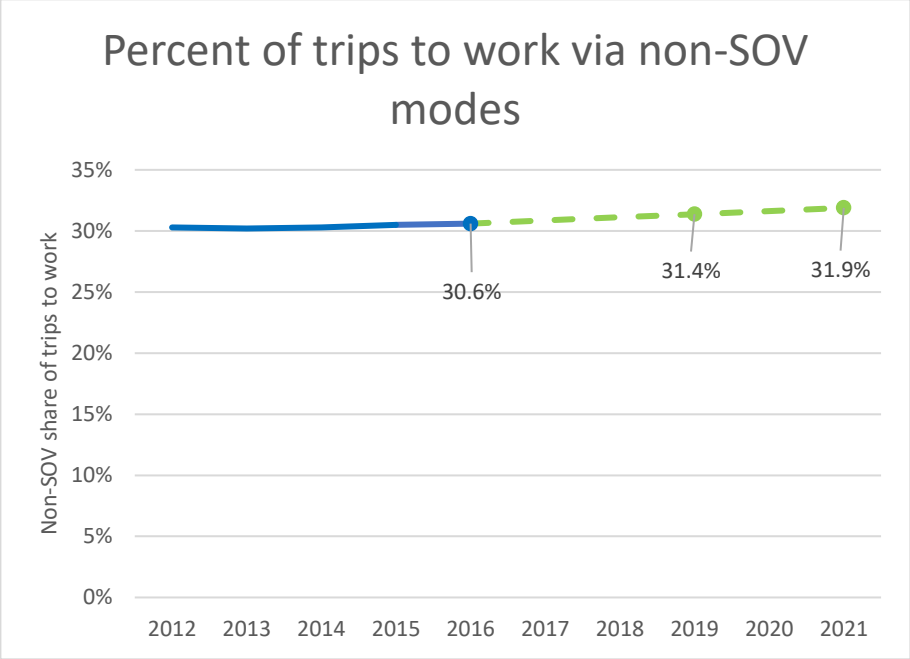
In northeastern Illinois, CMAP programs CMAQ funds through the MPO Policy Committee. The purpose of CMAQ is to fund transportation projects or programs that contribute to the attainment or maintenance of National Ambient Air Quality Standards in specific areas. The CMAP region receives CMAQ funds because of nonattainment and maintenance areas in the region. The primary consideration for CMAQ projects is the cost-effectiveness of their air emissions reductions, measured as either the cost per kilogram of volatile organic compounds (VOC) reduced or the cost per kilogram of fine particulate matter (PM2.5) reduced. Projects are ranked by their air quality cost-effectiveness within in their project type category. Additional Transportation Impact Criteria supplement project evaluation and cover performance areas similar to the federal system performance measures, including improving travel time reliability, increasing transit ridership, and reducing congestion. CMAP will be incorporating federal performance measures into all programming activities such as CMAQ.

Percent of trips to work via non-SOV modes

Measure:	This measure tracks the share of trips to work by non-single occupancy vehicle (non-SOV) modes for trips to work. These modes include carpooling, public transit, walking, "other means" and working from home. This measure is similar to the ON TO 2050 Indicator, but uses slightly different geography and Census data.
Methodology:	Five-year estimates from U.S. Census Bureau's American Community Survey (ACS) dataset – table DP03 – are used to track mode share in the urbanized area. The Chicago urbanized area is defined by the Census Bureau and includes portions of Indiana (see map below.) This measure tracks the percentage of commuters that predominantly do not commute by driving alone in a car, van, or truck. The below table shows this data for 2012-16.

	 Source: U.S. Census[20]
Proposed Targets:	**2019:** At least 31.4 percent **2021:** At least 31.9 percent

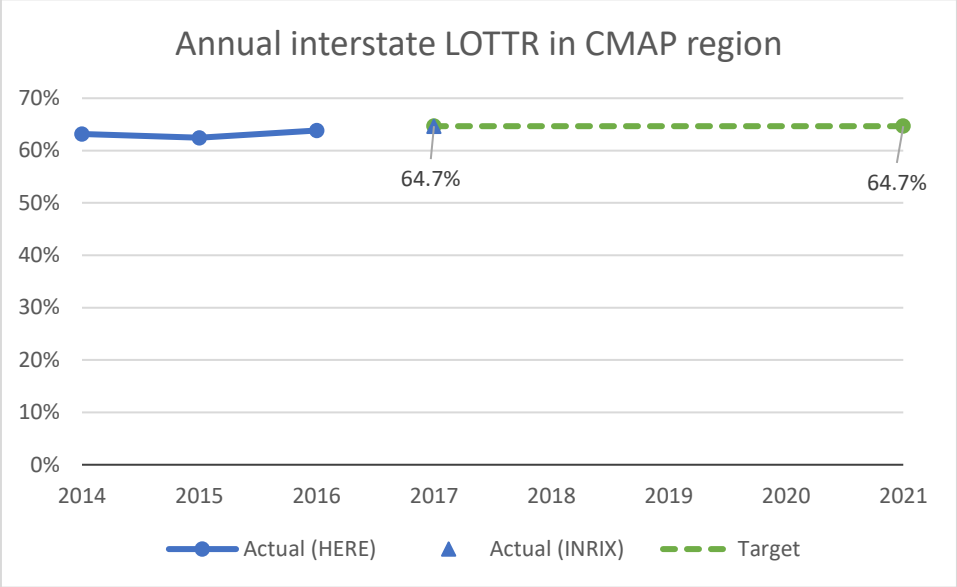
[20] U.S. Census Cartographic Boundary Shapefiles, https://www.census.gov/geo/maps-data/data/cbf/cbf_ua.html

	 *Targets will be set in coordination with all States and Metropolitan Planning Organizations associated with the Urbanized Area.*

Highway Reliability

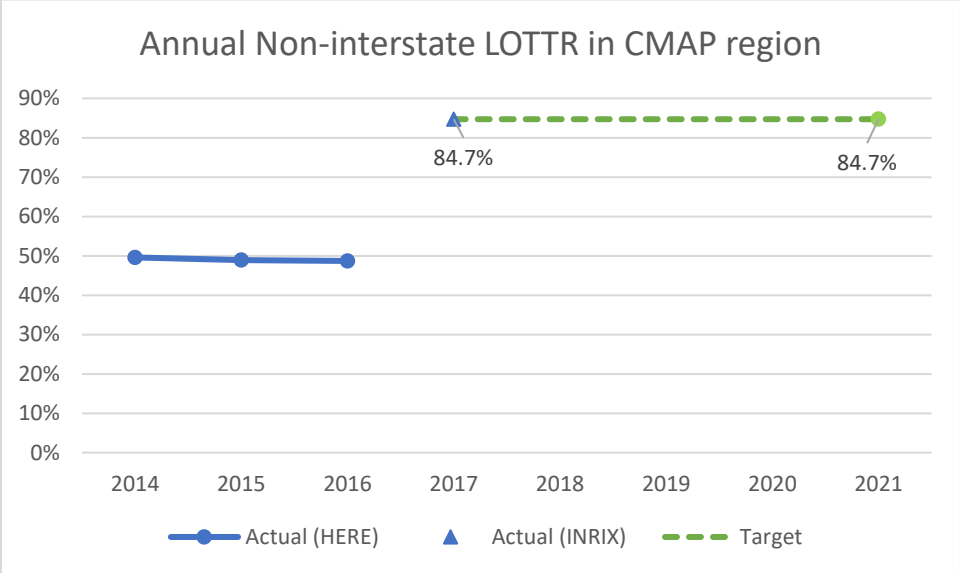
Measure:	The Level of Travel Time Reliability (LOTTR) is defined as the ratio of longer travel times (80th percentile) to a "normal" travel time (50th percentile) for a given roadway segment. The measure is the percentage of person-miles (vehicle miles multiplied by occupancy) traveled on the NHS where this ratio is less than 1.5, which is considered reliable. Using person-miles rather than vehicle-miles gives equal weight to all individuals using the roads. Non-interstate travel is generally more reliable than interstate travel for several reasons. Reasonable alternative routes are more often available for trips on non-interstates, especially in parts of the region with a grid street network. Lower volumes and speeds mean that incidents on non-interstates typically have a smaller impact.
Methodology:	This measure is calculated using data from the FHWA's National Performance Management Research Data Set (NPMRDS). The NPMRDS provides travel time by road segment for the NHS in 15-minute intervals. Travel times are provided for passenger, freight, and combined values. Along with the travel time information, a geographic file of the road

	segments is provided through the NPMRDS. The geographic file includes information for each road segment including length in miles, average annual daily traffic, functional classification, and other roadway attributes. The measure is calculated for both the Interstate and non-interstate systems using the combined vehicle travel times. The LOTTR ratio is generated by dividing the 80th percentile travel time of all vehicles by the normal travel time (50th percentile) of all vehicles for four reporting periods. The four reporting time periods include: • 6 a.m. – 10 a.m. weekdays • 10 a.m. – 4 p.m. weekdays • 4 p.m. – 8 p.m. weekdays • 6 a.m. – 8 p.m. weekends The segments length is multiplied by the annual traffic volume of the segment and the occupancy factor for vehicles. An occupancy factor of 1.7 was used, following the guidance published by the FHWA. The sum of reliable segments (LOTTR below 1.50 for all time periods) is divided by the total of all segments. This results in the ratio of person-miles of travel that are reliable to total person-miles of travel and expressed in the nearest 0.1 percent. The data for NPMRDS was collected by HERE Technologies from 2014 to 2016. In 2017, the vendor for this data was changed to INRIX. This resulted in data that may not be comparable.
Proposed Targets:	**Interstate NHS** **2021:** At least 64.7 percent



Non-interstate NHS

2021: At least 84.7 percent

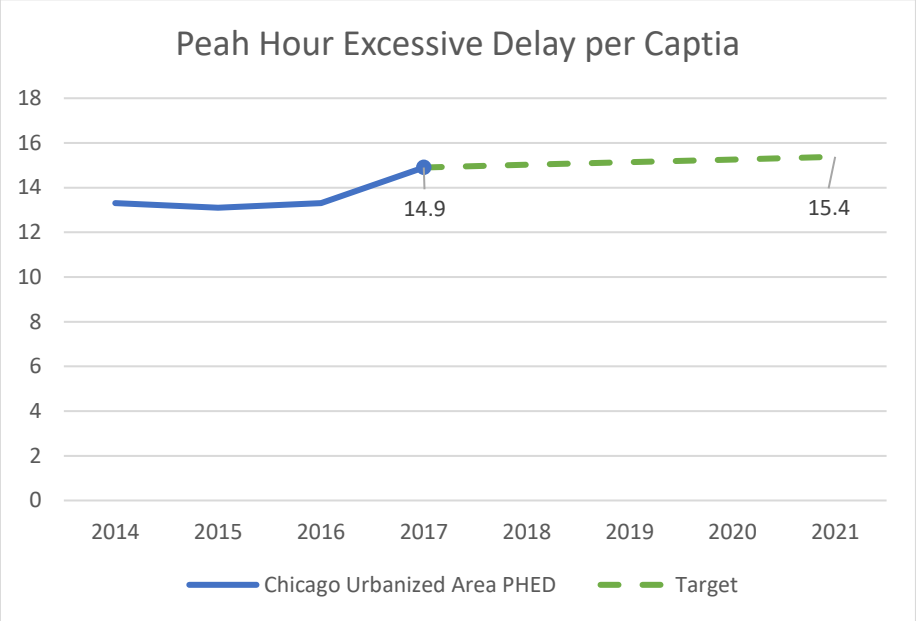


Annual hours of peak hour excessive delay per capita on the national highway system

Measure:	The Peak Hour Excessive Delay (PHED) measures traffic congestion. It is the extra amount of time people spend in congested conditions in their urban area during peak periods. The PHED is calculated using the travel time of 20 mph or 60 percent of the speed limit on the NHS in the urbanized area. It is weighted by vehicle volume and occupancy.

Methodology:	This measure is calculated using data from the FHWA's NPMRDS. The NPMRDS provides travel time by road segment for the NHS in 15-minute intervals. Travel times are provided for passenger, freight, and combined values. Along with the travel time information, a geographic file of the road segments is provided through the NPMRDS. The geographic file includes information for each road segment including length in miles, average annual daily traffic, functional classification, and other roadway attributes. A conflation process was used to assign speed limit information to the NPMRDS data. The 4:00 p.m. – 8:00 p.m. afternoon peak is used to be consistent with CMAP's travel model time periods. The PHED is calculated for each 15-minute interval in the peak periods for all segments in the Chicago urban area. The 15 minute interval PHED is calculated in the following steps: • Segment length divided by a segments speed threshold (larger of 20 mph, or 60 percent of speed limit) times 3,600 • Segment travel time minus the result from above step • If result from above step greater than 0, then result divided by 3600 • Result from above step multiplied by the 15-minute volume and the average vehicle occupancy for the segment • The results from the above steps are summed for the urban area and divided by the urbanized area population The total PHED is divided by the urbanized area population to calculate the peak hour excessive delay per capita. IDOT provided access to the Regional Integrated Transportation Information System (RITIS)[21] tool that was used to calculate this measure.
Proposed Target:	**2021:** 15.4 hours per capita

[21] Regional Integrated Transportation Information System www.ritis.org



Targets are set in coordination with all States and Metropolitan Planning Organizations associated with the Urbanized Area.(NIRPC, INDOT, CMAP, and IDOT)

Total emissions reduction of on-road mobile source emissions

Measure:	This performance measure tracks the emissions reduced by transportation projects funded through the CMAQ program[22] and is referred to as Total Emissions Reduction. The Total Emissions Reduction will need to be shown for the entire Chicago, IL-IN Urbanized Area which includes northwest Indiana. Northeastern Illinois' non-attainment criteria pollutants are Ozone and Particulate Matter 10 microns (PM_{10}) as reported in Environmental Protection Agency's Green Book[23]. The emissions that are the primary precursors for Ozone are Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx). In the recent past, the region was also in non-attainment for Particulate Matter 2.5 microns ($PM_{2.5}$) and only entered attainment status do to faulty monitoring data. It is likely that the region will again enter non-attainment status once reliable data is available in the next couple of years. Because of this targets are being shown for $PM_{2.5}$ but are not required at this time. Currently, PM_{10} emissions are not calculated as part of the CMAQ project evaluation process. Currently Lyons Township in western Cook County is declared a maintenance area for PM_{10}. The maintenance area is not the result of mobile source emissions but a point source problem related to quarry activities within the township. Because that emissions are unrelated to transportation and mobile sources the targets will be listed as zero.

[22] Details of the CMAQ program in northeastern Illinois can be found here: http://www.cmap.illinois.gov/mobility/strategic-investment/cmaq

[23] Environmental Protection Agency, "Green Book website," accessed May 2018, https://www.epa.gov/green-book

Methodology:	The Total Emissions Reduction measure for each of the criteria pollutants or applicable precursors for all projects reported to FHWA's CMAQ Public Access System[24] are calculated to the nearest one thousandths by using the daily kilograms of emission reductions. CMAP calculates the daily kilograms of emission reductions as part of the project evaluation and selection process and provides that information to IDOT for entering into FHWA's CMAQ Public Access System. CMAP has combined the total daily emissions for the current five-year CMAQ program (2018 through 2022) to develop an annual estimate which was used to generate the two-year and four-year targets.

	Daily VOC (kg)	Daily NOx (kg)	Daily $PM_{2.5}$ (kg)	Daily PM_{10} (kg)
2018-2022 Total Program	307.587	8,304.398	540.220	0.000
Annual Estimate	61.517	1660.880	108.044	0.000

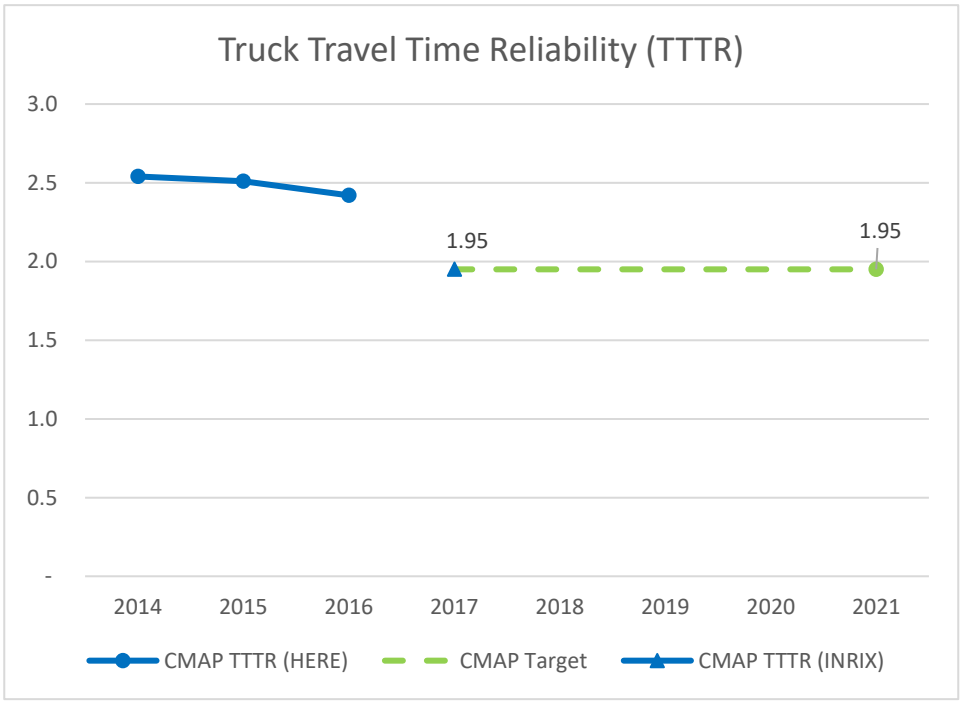
Proposed Targets:

	Daily VOC (kg)	Daily NOx (kg)	Daily $PM_{2.5}$ (kg)	Daily PM_{10} (kg)
2019 (2-year Target)	*123.035*	*3,321.759*	*216.088*	0.000
2021 (4-year Target)	*246.070*	*6,643.518*	*432.176*	0.000

Truck Travel Time Reliability (TTTR) Index

Measure:	The Truck Travel Time Reliability (TTTR) is defined as the ratio of the longer travel times (95th percentile) to a "normal" travel time (50th percentile) for a given segment on the interstate system. Higher values for this measure indicate that interstate travel is more unpredictable for local and national freight companies. The Chicago region is the nation's freight hub, so unreliable travel time on the interstate system can impact the entire country.
Methodology:	This measure is calculated using data from the FHWA's NPMRDS. The NPMRDS provides travel time by road segment for the NHS in 15-minute intervals. Travel times are provided for passenger, freight, and combined

[24] Federal Highway Administrations, "CMAQ Public Access System website", accessed May 2018 https://fhwaapps.fhwa.dot.gov/cmaq_pub/

	values. Along with the travel time information, a geographic file of the road segments is provided through the NPMRDS. The geographic file includes information for each road segment including length in miles, average annual daily traffic, functional classification, and other roadway attributes. The measure is calculated using freight travel times. Travel time for all vehicles may be used where there are no data for trucks. The TTTR ratio is generated by dividing the 95th percentile travel time by the normal travel time (50th percentile) for interstate segments only for five reporting periods. The five reporting time periods include: • 6 a.m. – 10 a.m. weekdays • 10 a.m. – 4 p.m. weekdays • 4 p.m. – 8 p.m. weekdays • 8 p.m. – 6 a.m. all days • 6 a.m. – 8 p.m. weekends The maximum TTTR ratio of the five periods is selected and multiplied by the segment length. The sum of all segments is then divided by the total Interstate system mileage.
Proposed Targets:	**2021:** Less than 1.95 

Transit Asset Management

The region's transit agencies face a massive state of good repair (SOGR) backlog, with limited resources expected to be available over the ON TO 2050 planning horizon. CMAP works with the RTA, CTA, Metra, and Pace to coordinate and support transit investment in the region. In addition to the work that each operating agency does, the RTA prepared annual 'Capital Asset Condition Assessment Reports'[25] for the entire region that is used to inform the ON TO 2050 financial plan. CMAP was partner in the RTA led transit strategic plan[26] for the region.

Research and projects

In preparation for ON TO 2050, CMAP staff developed several reports that make recommendations regarding transit asset management. Many aspects of the transit system were illustrated in the Transit Trends Snapshot[27]. CMAP brought together a group of partners and experts to make recommendations for the Transit Modernization Strategy Paper.[28] Finally, asset management practices for the region were reviewed in a Transportation Asset Management Recommendations Memo[29].

Incorporating transit asset management into local programming

With one of the oldest transit systems in the nation, the Chicago region spends a significant portion of transit capital funding on maintenance and repairs. When programming projects, CMAP with transit agencies make progress toward reducing their state of good repair backlog. CMAP will be incorporating federal performance measures in all programming activities.

---

[25] Regional Transportation Authority, "Capital Asset Condition Assessment Reports website," accessed May 2018 https://www.rtachicago.org/index.php/finance-management/program-management.html

[26] Regional Transportation Authority, "Invest In Transit The 2018-2023 Regional Transit Strategic Plan for Chicago and Northeast Illinois," 2018, http://www.rtachicago.org/index.php/plans-programs/regional-transit-strategic-plan.html

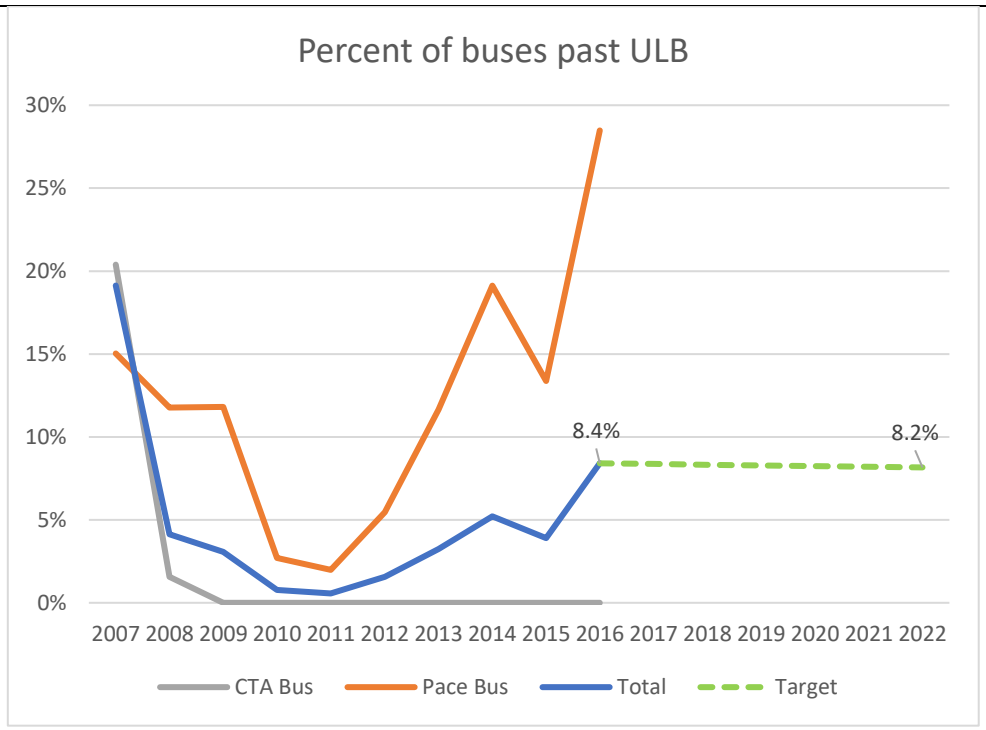
[27] CMAP snapshot, "Transit Trends," 2017, http://www.cmap.illinois.gov/documents/10180/517201/FY18-0043+Transit+Trends+Snapshot_pages.pdf/0b6b9aca-f1ef-eb98-dbf1-f21901fe3a1d

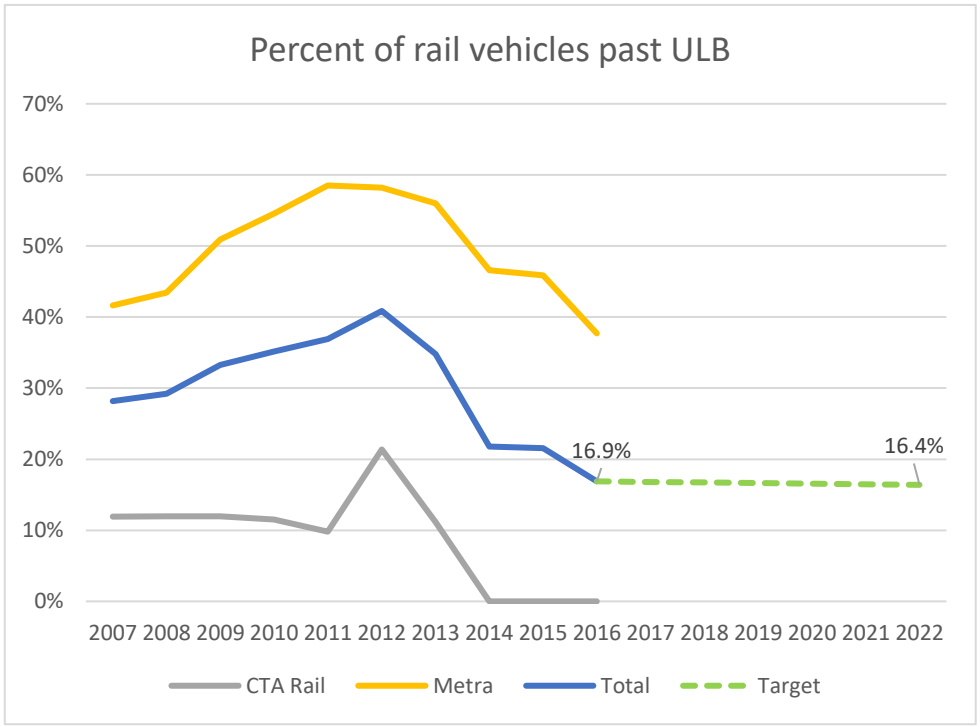
[28] CMAP ON TO 2050 Strategy Paper, "Transit Modernization", 2017, http://www.cmap.illinois.gov/documents/10180/807381/TMI+FINAL+12-12-17.pdf/b4aaf491-cc7d-d9ca-148f-c492d8492c56

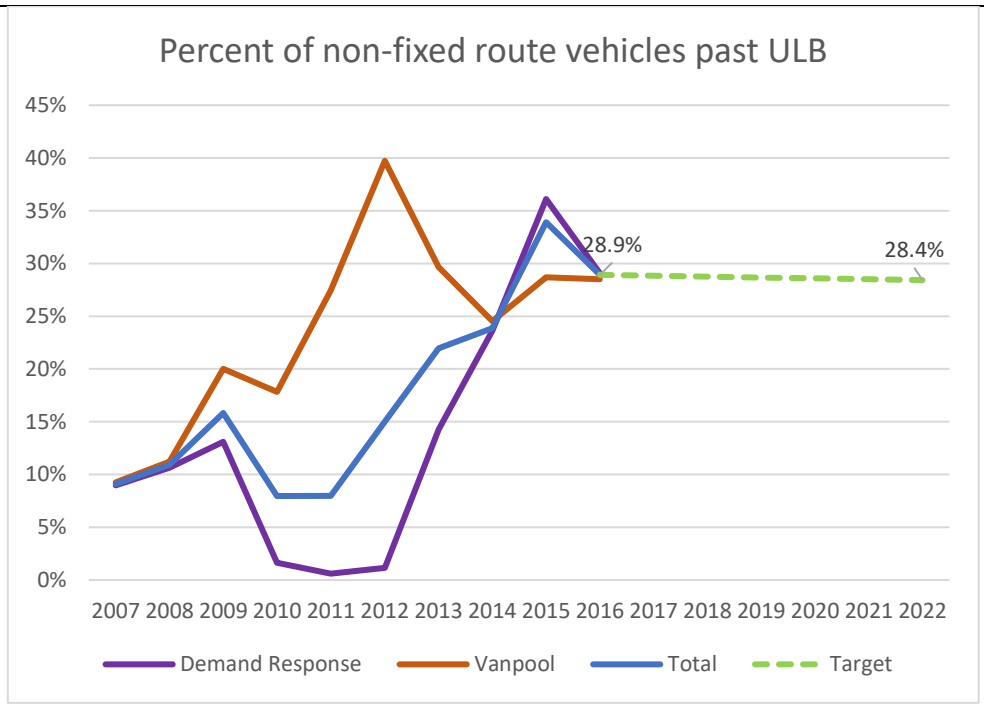
[29] CMAP memo, "Transportation Asset Management Recommendations", 2017, http://www.cmap.illinois.gov/documents/10180/517091/AssetManagementRecommendations.pdf/d23d60e1-4092-cd58-f7e8-e1601d234f76

Transit rolling stock

Measure:	***Percent revenue vehicles that have met or exceeded their useful life*** This measures the percent of active revenue public transit vehicles that have exceeded their useful life, or the age when it is typically most cost effective to replace the vehicles.
Methodology:	A snapshot of the active vehicle fleet is reported each year to the National Transit Database (NTD), including the year of manufacture. The useful life benchmark (ULB) represents the age where maintenance cost and vehicle performance issues are likely to increase. CMAP has chosen to use the same ULB as each transit agency to improve consistency. Note that Pace has revised their ULB downward several times, which increases the estimate of need for the agency. Useful life benchmarks: Bus: CTA – 15 years, Pace – 12 years Rail: CTA – 34 years, Metra- 30 years Non-fixed route: Pace – 4 or 5 years (This includes a variety of services such as paratransit, vanpool, dial a ride, and call and ride)
Proposed Targets:	**2022 Targets:** Bus: Less than 8.2 percent of vehicles past ULB Rail: Less than 16.4 percent of vehicles past ULB Non-fixed route: Less than 28.9 percent of vehicles past ULB

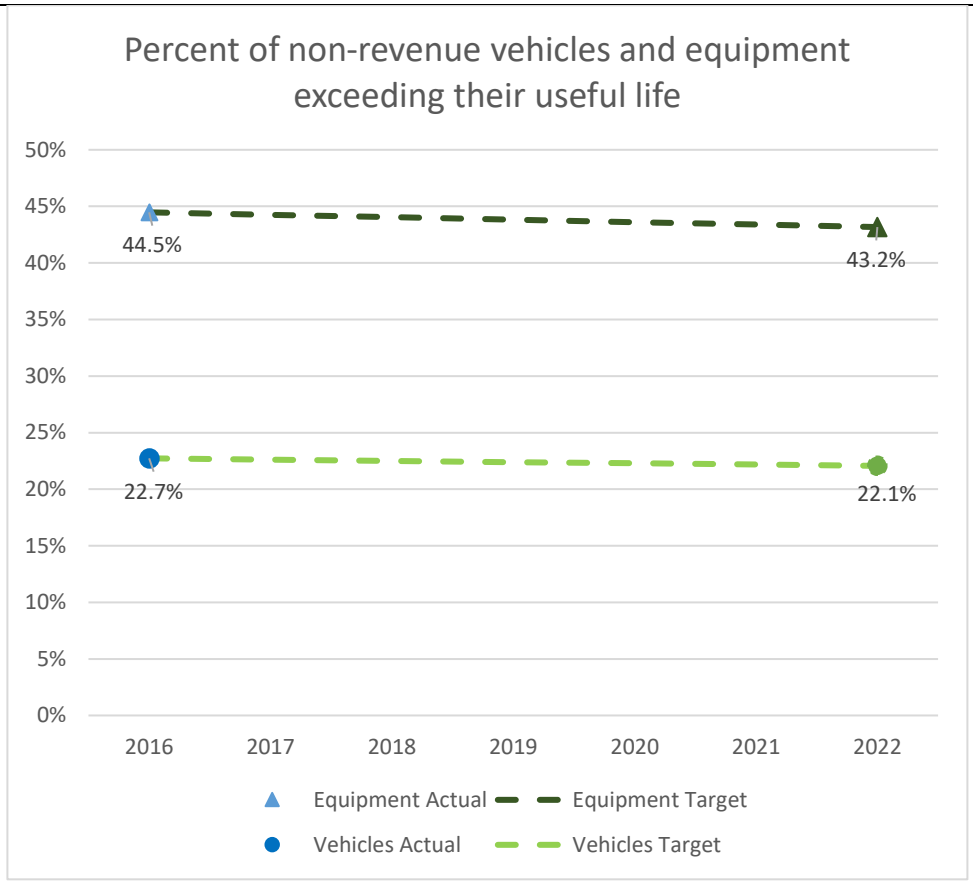

Percent of buses past ULB
30%
25%
20%
15%
10%
5%
0%
8.4%
8.2%
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
CTA Bus
Pace Bus
Total
Target


Percent of rail vehicles past ULB
70%
60%
50%
40%
30%
20%
10%
0%
16.9%
16.4%
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
CTA Rail
Metra
Total
Target



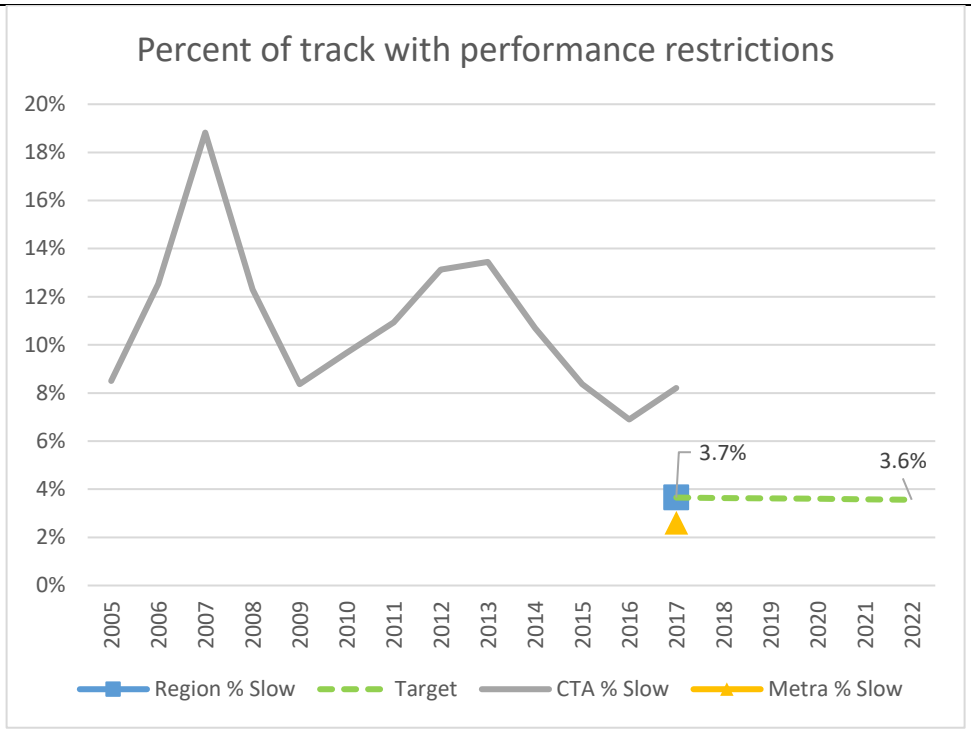
Transit non-revenue service vehicles and equipment

Measure:	***Percent of non-revenue vehicles and equipment that have met or exceeded their useful life*** This measures the percent of non-revenue vehicles that have exceeded their useful life. This represents the number of vehicles that have reached an age where maintenance cost and vehicle performance issues are likely to increase. The vehicles types include trucks, cranes, and trailers. Much of the equipment is used for rail maintenance such as ballast cars, rail grinders, tie pluggers.
Methodology:	The useful life benchmark is determined by the transit agencies and varies by asset type for both non-revenue vehicles and equipment from 10 to 25 years. Each transit agency maintains an inventory of vehicles and equipment including the year of manufacture.
Proposed Targets:	**2022:** No more than 22.1 percent for non-revenue vehicles, no more than 43.2 percent for equipment



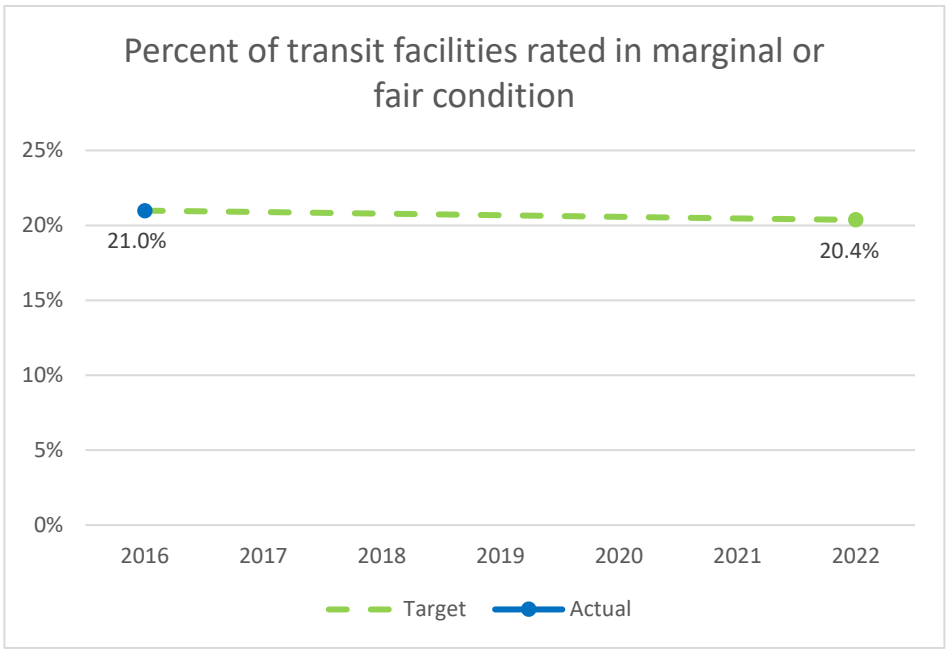
Transit infrastructure

Measure:	***Percent of directional rail route miles with track performance restrictions*** This measures the percent of transit rail track with performance restrictions. The CTA refers to these as "slow zones", where trains are required to operate at slower than normal speeds. This could be the result of track age, construction, power systems, signals, or other issues.
Methodology:	Each month the CTA reports on track slow zones by rail line. Annual averages are calculated from these monthly values. Metra follows Federal Railroad Administration standards for track condition, which differ from FTA standards.
Proposed Targets:	**2024:** Less than 3.6 percent

Transit facilities

Measure:	***Percent of transit facilities with an asset class rating below 3 on the FTA's Transit Economic Requirements Model scale.*** This measure measures the condition of transit facilities including maintenance buildings, administrative buildings, passenger stations, and parking facilities.
Methodology:	The Federal Transit Administration has developed a 5 point scale for classifying the condition of assets called the Transit Economic Requirements Model (TERM). TERM Scale: 5 – Excellent 4 – Good 3 – Adequate 2 – Marginal 1 – Fair Transit agencies assess the condition of the components (such as plumbing and HVAC) of major facilities then aggregate the component level data to obtain an overall facility condition rating. A facility is deemed to be in good

	repair if it has a condition rating of 3, 4, or 5 on this scale and is deemed to not be in good repair if it has a rating of 1 or 2.
Proposed Targets:	**2022:** No more than 20.4 percent 

Conclusion

The emphasis on setting and achieving performance targets represents a major change in the federal transportation program ushered in by the Moving Ahead for Progress in the 21st Century bill in 2012. The required MPO targets are a chance for the region to connect short-term performance measurement to longer-term regional priorities. For the MPO targets set in upcoming years, the focus should be on high-level resource allocation, that is, whether more effort and funding should be directed to improving certain measures or asset classes. The MPO target-setting requirements also give the region another avenue to call attention to the large investment and funding needs for different elements of the system. CMAP will continue tracking and updating these measures as needed.

312-454-0400
info@cmap.illinois.gov
www.cmap.illinois.gov

The Chicago Metropolitan Agency for Planning (CMAP) is our region's comprehensive planning organization. The agency and its partners developed and are now implementing ON TO 2050, a new long-range plan to help the seven counties and 284 communities of northeastern Illinois implement strategies that address transportation, housing, economic development, open space, the environment, and other quality-of-life issues. See www.cmap.illinois.gov for more information.

FY19-0023 E | OCTOBER 2018