

FMPO POLICY COMMITTEE RESOLUTION NO. 2018-6

TO ADOPT THE FEDERAL FISCAL YEAR (FFY) 2019 TARGETS FOR SYSTEM PERFORMANCE (PM 3) AS REQUIRED BY 23 CFR 490, SYSTEM PERFORMANCE/FREIGHT/CMAQ FINAL RULE (PUBLISHED ON JANUARY 18, 2017 WITH AN EFFECTIVE DATE OF MAY 20, 2017)

WHEREAS, the Farmington MPO is the designated metropolitan planning organization for the cities/town of Aztec, Bloomfield, Farmington, Kirtland, and the urbanized area of San Juan County; and

WHEREAS, the Farmington MPO Policy Committee is the decision-making body for the MPO; and

WHEREAS, the Farmington MPO Technical Committee provides the MPO Policy Committee with technical advice and recommendations, and concurs with this resolution; and

WHEREAS, the Farmington MPO is responsible, with the New Mexico Department of Transportation, for addressing the planning process in accordance with 23 CFR 450.334; and

WHEREAS, the Farmington MPO annually addresses the major issues in the metropolitan planning area; and

WHEREAS, the federal laws under Moving Ahead for Progress in the 21st Century (MAP-21) and Fixing America's Surface Transportation Act (FAST Act) require states and metropolitan planning organizations to develop and adopt system performance/freight/CMAQ performance targets; and

WHEREAS, federal regulation 23 CFR 490 requires states to set PM 3 measures as follows: 1. Two measures to assess system performance: a. Percentage of person-miles traveled on the Interstate System that are reliable; b. Percentage of person-miles traveled on the non-interstate National Highway System (NHS) that are reliable; 2. One measure to assess Freight Movement: a. Truck Travel Time Reliability (TTTR) Index; 3. Three measures to assess the CMAQ Program: a. Annual Hours of peak-hour excessive delay per capital – NM is not required to set a target to this measure; b. Percent of non-single occupancy Vehicle (SOV) travel – NM is not required to set a target for this measure; c. On-Road Mobile Source Emissions Reduction – NM is in non-attainment for Particulate Matter (PM) 10 in one area, covered by El Paso Metropolitan Planning Organization (EPMPO); and

WHEREAS, federal regulations also require metropolitan planning organizations to adopt system performance targets.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE FARMINGTON METROPOLITAN PLANNING ORGANIZATION (FMPO):

SECTION 1: The NMDOT System Performance (PM 3) Targets for the Federal Fiscal Year 2019, as set out in EXHIBIT A, are hereby adopted as the System Performance Targets for the Farmington Metropolitan Planning Organization.

SECTION 2: This resolution will take effect immediately upon its adoption.

PASSED, APPROVED AND ADOPTED this 15th day of November, 2018.

Sean Sharer

Sean Sharer, FMPO Policy Committee Chairman

SEAL



ATTEST:

June E. Markle
June Markle, FMPO Administrative Assistant

Legal Department

[Signature]
10/22/17



**Performance Measure (PM) Target Report – PM 3
Federal Fiscal Year 2019 – Revised**

This document outlines the Federal Fiscal Year (FFY) 2019 Targets for System Performance (PM 3) for New Mexico, as required by 23 CFR 490, System Performance/Freight/CMAQ Final Rule published January 18, 2017 (effective May 20, 2017). The New Mexico Department of Transportation (NMDOT) Statewide Planning Bureau (SPB) is responsible for coordinating the setting of PM 3 targets.

Overview of PM 3 Measures

The PM 3 measures are as follows:

1. Two measures to assess system performance:
 - a. Percentage of person-miles traveled on the Interstate System that are reliable
 - b. Percentage of person-miles traveled on the non-interstate National Highway System (NHS) that are reliable
2. One measure to assess Freight Movement:
 - a. Truck Travel Time Reliability (TTTR) Index
3. Three measures to assess the CMAQ Program:
 - a. Annual Hours of peak-hour excessive delay per capita – NM is not required to set a target for this measure
 - b. Percent of Non-Single Occupancy Vehicle (SOV) travel – NM is not required to set a target for this measure
 - c. On-Road Mobile Source Emissions Reduction – NM is in non-attainment for Particulate Matter (PM) 10 in one area, covered by El Paso Metropolitan Planning Organization (EPMPO)

Coordination with Metropolitan Planning Organizations (MPOs)

The NMDOT undertook a coordinated effort with the Metropolitan Planning Organizations (MPOs) and other stakeholders to set the targets, as follows:

1. On March 29, 2018, NMDOT SPB staff discussed the PM 3 measures with the MPOs at the Joint Meeting with the MPOs and Regional Transportation Planning Organizations (RTPOs).
2. On May 17, 2018, NMDOT consultants, High Street Consulting (“High Street”), provided a webinar to the MPOs, attended by Mesilla Valley and Farmington MPOs. The webinar outlined the PM3 data, methodologies and recommended targets. SPB staff emails the presentation slides to the MPOs upon request.
3. On June 5, 2018, SPB staff presented this draft report to the MPOs at the MPO Quarterly meeting in Farmington.
4. On June 18, 2018, SPB staff emailed a draft of this report, outlining the adopted state PM3 targets, to the MPOs for review and comments by July 9, 2018. SPB received one comment on July 10, 2018 from Mid Region MPO, as follows: “Although this is a bit late, Mid-Region has no comments on the proposal except to be sure the wording allows MPOs to establish their own targets if they want to in the future. We are not planning on doing so at this time, but I am concerned about the targets for city streets on the NHS.” SPB staff responded that the report outlines the NMDOT targets and the MPOs have the option of adopting the NMDOT targets or setting other targets.
5. The MPOs have until November 20, 2018 to adopt the NMDOT PM 3 targets or set their own quantifiable targets.

Data Methodologies and Assumptions

The FFY2019 PM 3 targets are set based on future System Performance and Freight Movement forecasts developed by High Street on behalf of NMDOT. The forecasting methodology relates current roadway volumes and capacities to performance metric scores. Future volumes and capacities are updated based on assumed traffic volume growth and

programmed capacity enhancement projects. Future Capacity Enhancement projects are derived by training statistical models based on current condition and performance data, and updating the model inputs based on assumed future traffic volumes and capacities.

Data Sources

1. PM3 System Performance and Freight Movement segment-level metric scores for NMDOT’s road network, calculated by High Street based on 2017 NPMRDS data in accordance with FHWA guidance
2. Segment-level Free-Flow traffic speeds, as reported in NPMRDS for March 2018
3. Traffic Volumes, as reported by NMDOT in its 2015 HPMS submission
4. Roadway Attributes, including functional class and urban / rural designation, as reported by NMDOT in its 2015 HPMS submission and conflated to the NPMRDS TMC network by Texas Transportation Institute / FHWA
5. Traffic Volume Growth Rates, based on the functional class / regional growth rates provided by NMDOT (see “Table 1: Growth Rates” and discussion under “Assumptions,” below)
6. Capacity Enhancement Projects, from NMDOT’s e-STIP, with project boundaries and projected completion dates

Methodology

The forecasting methodology consists of four steps:

1. Setup: Calculate current performance, volume, and capacity.
 - a. Segment-level Level of Travel Time Reliability (LOTRR) scores based on 2017 NPMRDS data for all vehicles and Truck Travel Time Reliability (TTTR) scores based on 2017 NPMRDS truck data are calculated for all NMDOT TMC segments. For modeling purposes, scores are shifted from being left-bounded at 1.0 to left-bounded at 0.0.
 - b. HPMS AADTs are converted to Passenger Car Equivalent (PCE) where Single-Unit Trucks and Buses are equal to 1.5 PCEs and Combination Trucks are equal to 2.0 PCEs.
 - c. Roadway capacities are calculated by assigning functional-class capacity assumptions (based on the Highway Capacity Manual and other sources, see “Table 2: Functional-Class Capacity Assumptions”), and updating these capacities based on observed free-flow speeds reported in the NPMRDS.
2. Model Fitting: Log-level linear regression models are fit relating LOTTR to roadway volumes and capacities, and TTTR to roadway location (urban / rural) and volume / capacity ratio. The model coefficients and model R² scores are presented in the tables below.

LOTRR Model Model Specification:

$$\log(\text{LOTRR} - 1) \sim (\text{intercept}) + \text{cars} * x_i + \text{capacity} * x_i + v/c * x_i + \text{error}$$

Coefficients	Estimate (Exponentiated)	Std. Error	Interpretation
(Intercept)	-0.02	0.059	The model intercept is 0.02 (i.e. LOTTR = 1.02, interpreted as “a road with zero traffic and zero capacity would be expected to have a LOTTR score of 1.02”)
cars (thousands)	0.06	0.000	Each additional 1000 cars of daily volume is associated with a 6% increase in LOTTR
capacity (thousands)	-0.03	0.000	Each additional 1000 cars of daily capacity is associated with a 3% decrease in LOTTR
Volume / Capacity Ratio	-0.63	0.000	An increase in V/C Ratio from Zero to One is Associated with a 63% decrease in LOTTR, all else equal (captures slight non-linearity in relationship between cars and LOTTR)

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R² 0.375

All estimates statistically significant at p < 0.001

TTTR Model Model Specification:

$$\log(\text{TTTR} - 1) \sim (\text{intercept}) + v/c * x_i + \text{urban} * x_i + \text{error}$$

Coefficients	Estimate (Exponentiated)	Std. Error	Interpretation
(Intercept)	0.07	.005	The model intercept is 0.07 (i.e. TTTR = 1.07, interpreted as “a road with zero volume / capacity ratio would have a TTTR score of 1.07”
Volume / Capacity Ratio	19.89	0.29	An increase in V/C Ratio from zero to one is associated with a 1989% increase in TTTR
Location: Urban	2.19	0.076	All else equal, urban Interstate segments have, on average, TTTR scores 2.19 higher than rural segments

R² 0.412

All estimates statistically significant at p < 0.001

3. Source Data Updates: Future Roadway Volumes are calculated based on geometric growth using the Growth Rates specified. Future Roadway Capacities are updated where segments overlap with capacity projects, based on each project’s expected completion date. For more details, see “Assumptions” below.
4. Score Update: Updated segment scores are calculated using the forecasted future volume and capacity, and the original segment scores are updated by the forecasted difference in future performance

Assumptions

The following tables and information outline the assumptions used in the methodologies.

Table 1: Growth Rates used for Forecasting

f_system	location	Growth rate
7	Rural	0.013
7	Urban	0
6	Rural	0.013
6	Urban	0.01
5	Urban	0.014
5	Rural	0
4	Urban	0.059
4	Rural	0
3	Urban	0
3	Rural	0.036
2	Urban	0.013
2	Rural	0.01
1	Urban	0.0165
1	Rural	0.02

These growth rates are based on the most recently available fixed-traffic-count station year-over-year estimates. The NMDOT FFY2019 PM 3 Targets Report – 7/16/18; Revised 9/17/18

growth rates in the table have been modified based on traffic volume trends. As traffic volumes are declining on portions of New Mexico’s road network, it is assumed that the roads with negative traffic growth rates are not, by in large, roads experiencing significant traffic congestion.

Table 2: Functional-Class Capacity Assumptions

Location	Functional System	Reference speed	Capacity (passenger cars per lane per hour)
Rural	Interstate	75	2100
Rural	Principal Arterial - Other		
Rural	Freeways and Expressways	60	1950
Rural	Principal Arterial - Other	55	1850
Rural	Minor Arterial	45	850
Rural	Major Collector	40	750
Rural	Minor Collector	35	650
Rural	Local	25	450
Urban	Interstate	65	2200
Urban	Principal Arterial - Other		
Urban	Freeways and Expressways	45	1200
Urban	Principal Arterial - Other	40	925
Urban	Minor Arterial	35	760
Urban	Major Collector	30	680
Urban	Minor Collector	30	680
Urban	Local	25	425

Reference Capacities Adapted from HCM 2000 and WATS RTM. Reference Capacity Updated Using NPMRDS Free Flow Speed. +150 PCPLPH per 5 mph over reference speed (max +600), -100 PCPLPH per 5 mph under reference speed (min -300).

Capacity Updates

To account for increases in future capacity due to capacity enhancing projects, the existing road network is updated to add +1 directional lane to affected (overlapping) TMC segments coinciding with project boundaries. Partially overlapping TMC segments are assigned a pro-rated partial additional lane. In some cases, due to the 15 meter conflation buffer used to relate project boundaries and TMC segments, some divided highways are updated with an additional lane in each direction.

Capacity updates are applied for the expected completion year and subsequent years.

As a result of applied updates, 2021 Lane Miles are forecasted at 14,039 NHS directional lane-miles, a 57 lane-mile increase from 2017’s 13,982 directional lane-miles.

EXHIBIT A
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Forecast Scenarios

To provide additional context for target setting (as well as to facilitate conservative target selection) three scenarios are presented:

		Expected Growth	High Growth
No Build	Current Capacity	"No Build" <ul style="list-style-type: none"> 1% Average Growth No Additional Capacity 	"No Build, High Growth" <ul style="list-style-type: none"> 2% Average Growth No Additional Capacity
Build	Programmed STIP Capacity & ITS Projects Completed On Time	"Build" <ul style="list-style-type: none"> 1% Average Growth Project-Based Capacity Expansion & Reliability Improvement 	

The follow tables and graphs reflect the scenarios for each target.

Table 3: Percentage of person-miles traveled on the Interstate System that are reliable

	Baseline (2017)	2018	Two Year Performance (2019)	2020	Four Year Performance (2021)
No Build High Growth	97.0	97.0	96.1	95.2	95.1
No Build	97.0	97.0	97	96.3	95.2
Build	97.0	97.0	97	97	96.9

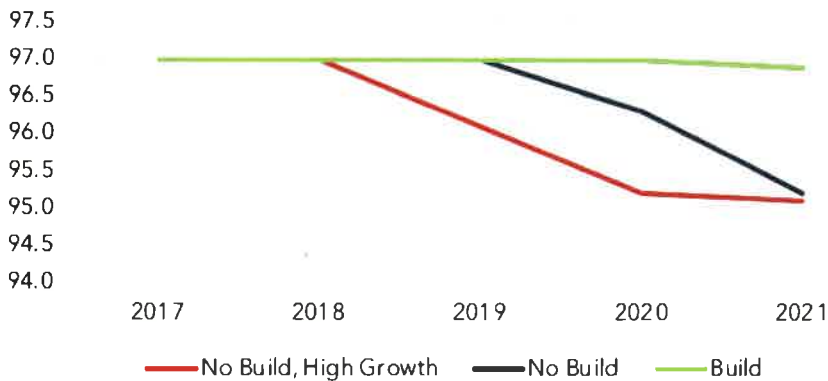


Table 4: Percentage of person-miles traveled on ~~FMPO POLICY COMMITTEE RESOLUTION NO. 2018-01~~ ~~FMPO POLICY COMMITTEE RESOLUTION NO. 2018-01~~

	Baseline (2017)	2018	Two Year Performance (2019)	Year 2020	Four Year Performance (2021)
No Build High Growth	90.5	90.5	90.5	90.4	90.4
No Build	90.5	90.5	90.5	90.5	90.5
Build	90.5	90.6	90.6	90.6	90.6

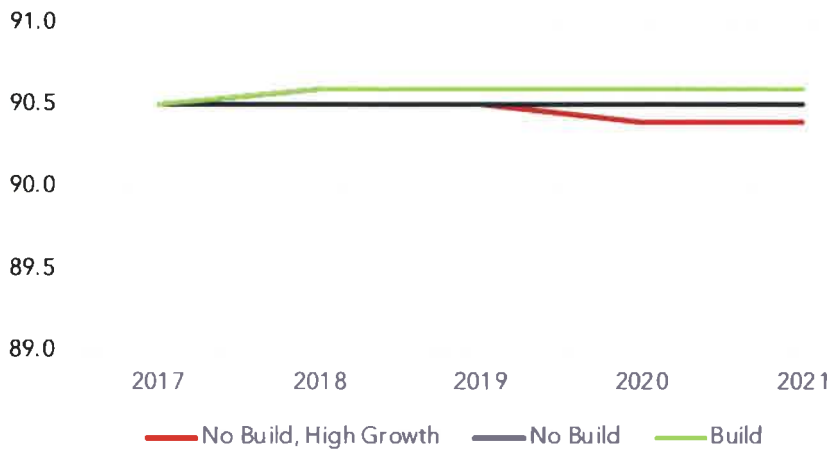
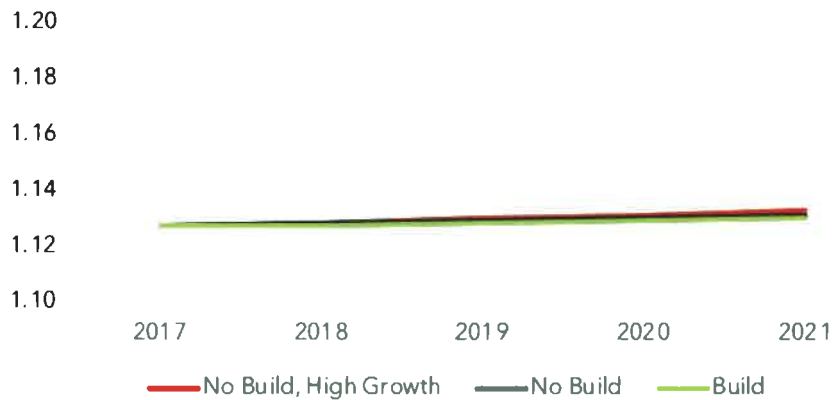


Table 5: Truck Travel Time Reliability (TTTR) Index

	Baseline (2017)	2018	Two Year Performance (2019)	Year 2020	Four Year Performance (2021)
No Build High Growth	1.13	1.13	1.13	1.13	1.13
No Build	1.13	1.13	1.13	1.13	1.13
Build	1.13	1.13	1.13	1.13	1.13



NMDOT PM3 Targets

1. Percentage of person-miles traveled on the Interstate System that are reliable

Measure	Baseline Score (2017)	NMDOT Target (2019)	NMDOT Target (2021)
Interstate Reliability	97.0%	96.1%	95.1%

NMDOT Target Statement: The percentage of person-miles traveled on the Interstate System will decrease slightly in the next four years, from a baseline score of 97% reliable in 2017 to 96.1% reliable in 2019, and 95.1% reliable in 2021.

NMDOT Justification: Recent modeling forecasted that with the currently programmed projects and forecasted traffic growth, the percentage of person-miles traveled on the Interstate System will remain high, may decrease slightly over this four year timespan.

2. Percentage of person-miles traveled on the non-interstate National Highway System (NHS) that are reliable

Measure	Baseline Score (2017)	NMDOT Target (2019)	NMDOT Target (2021)
Non-Interstate Reliability	90.5%	90.4%	90.4%

NMDOT Target Statement: The percentage of person-miles traveled on the non-Interstate National Highway System will decrease slightly in the next four years, from a baseline score of 90.5% reliable in 2017 to 90.4% reliable in 2019, and 90.4% reliable in 2021.

NMDOT Justification: Recent modeling forecasted that with the currently programmed projects and forecasted traffic growth, the percentage of person-miles traveled on the Interstate System will remain high, may decrease slightly over this four year timespan.

3. Index of the Interstate System mileage providing for reliable truck travel times that are reliable

Measure	Baseline Score (2017)	NMDOT Target (2019)	NMDOT Target (2021)
Truck Travel Time Reliability Index	1.13	1.14	1.15

NMDOT Target Statement: The index of truck travel times on the Interstate System may be reduced slightly in the next four years, from a baseline index of 1.13 in 2017 to an index of 1.14 in 2019, and an index of 1.15 in 2021.

NMDOT Justification: Recent modeling forecasted that with the currently programmed projects and forecasted traffic growth, the truck travel time index value will remain high, but the reliability index may be reduced slightly over this four year timespan.

4. Annual Hours of peak-hour excessive demand **EPMPO POLICY COMMITTEE RESOLUTION NO. 2018-6**

NMDOT Target Statement: In the initial performance period (2017-2021), the rule applies to urbanized areas of more than 1 million people that are also in nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. At this time, there are no such urbanized areas in New Mexico.

NMDOT Justification: Based on current urbanized area populations and nonattainment or maintenance thresholds.

5. Percent of Non-Single Occupancy Vehicle (SOV) travel

NMDOT Target Statement: In the initial performance period (2017-2021), the rule applies to urbanized areas of more than 1 million people that are also in nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. At this time, there are no such urbanized areas in New Mexico.

NMDOT Justification: Based on current urbanized area populations and nonattainment or maintenance thresholds.

6. On-Road Mobile Source Emissions Reduction

NMDOT Target Statement: New Mexico is included in the list of 42 State DOTs required to establish targets and report performance for On-Road Mobile Source Emissions (Total Emissions Reduction Measure for Criteria Pollutants). The measure is limited to nonattainment or maintenance areas, which in New Mexico applies exclusively to the Sunland Park, Anthony and Southern Doña Ana County area for Particulate Matter 10 (PM10). This part of NM is within the El Paso MPO (EPMPO) planning area. The EPMPO coordinates with the NMDOT on programming New Mexico CMAQ funds allocated to the EPMPO. It was, therefore, mutually agreed upon by NMDOT and the EPMPO to develop the baseline, 2- and 4-year targets for applicable criteria pollutants, in this case PM10, for the state of New Mexico by developing a cost benefit analysis (see method below) using projected future CMAQ allocations for New Mexico and applying the *ESTABLISHED emissions* targets for Texas to *PROJECT* emissions targets in the New Mexico portion of the EPMPO planning area.

NMDOT Justification:

TX allocation next 2-year and 4-years / 2-year and 4-year targets kilograms (kg) per day ESTABLISHED for EPMPO-TX = 4-year cost per criteria pollutant TX

NM Allocation next 2-years and 4-years / 2-year and 4-year cost per criteria pollutant TX = 2-year and 4-year target in kg per day PROJECTED for EPMPO-NM

This methodology assumes that the future (next 2 and 4 years) NM CMAQ project(s) quantifiable emissions will be the same in NM as in TX based on type of projects, methodology used to quantify projects, data, assumptions, etc.

These quantifiable targets are reflective of the anticipated cumulative emission reductions for the EPMPO to be reported in the CMAQ Public Access System as required in 23 CFR 490.105 for establishing targets for MPOs.

The projected EPMPO 4-year targets for on-road mobile source emissions in New Mexico is:

- 2-year = 0.65 kg/day for Particulate Matter less than or equal to 10 microns (PM-10)
- 4-year = 1.79 kg/day for Particulate Matter less than or equal to 10 microns (PM-10)
- Baseline = 0.17 kg/day

The NMDOT on-road mobile source emission targets for PM10 in New Mexico is:

- 2-year = 0.65 kg/day for Particulate Matter less than or equal to 10 microns (PM-10)
- 4-year = 1.79 kg/day for Particulate Matter less than or equal to 10 microns (PM-10)
- Baseline = 0.17 kg/day