New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

Performance Measure (PM) Target Report – PM 1
2023 Safety Targets

This document outlines the 2023 Safety Targets (PM 1) for New Mexico, as required by the 23 CFR 490, Final Rule on the Highway Safety Improvement Program (HSIP) published March 15, 2016 (effective April 14, 2017). The New Mexico Department of Transportation (NMDOT) Multimodal Planning and Programs Bureau (MPPB) is responsible for coordinating the setting of PM 1 targets.

Overview of PM 1 Measures

The state is required to set annual targets for five performance measures:

1. Number of Total Fatalities
2. Number of Serious Injuries
3. Fatality rate: fatalities per 100 million vehicle miles travelled (HMVMT)
4. Serious injury rate: serious injuries per HMVMT
5. Number of Non-motorized Fatalities and Serious Injuries

The first three are common measures and must be identical to the targets established for the Highway Safety Plan (HSP).

Coordination with Stakeholders

The NMDOT undertook a coordinated effort with the Metropolitan Planning Organizations (MPOs), the HSP team and other stakeholders to set the targets.

1. NMDOT staff from the Traffic Safety Division (TSD) and the MPPB met in spring of 2022 to review preliminary data and discuss methodology. These meetings included the TSD staff responsible for setting and reporting the National Highway Traffics Safety Administration (NHTSA) HSP targets and staff from MPPB responsible for the HSIP FWHA targets. Also included were staff from the University of New Mexico, Geospatial and Population Studies, Traffic Research Unit who under contract maintain the state's crash database, and consultants under contract with MPPB who provide technical support for the HSIP.
2. On May 26, 2022, the NMDOT Traffic Safety Division held a meeting with stakeholders to discuss and adopt the targets required in the (HSP).
3. On June 15, 2022, MPPB staff presented the targets to the MPOs.
4. On June 22, 2022, the draft of the PM1 Target Report was emailed to the MPOs for review and comment.
5. On July 21, 2022, the NMDOT Safety Committee reviewed and approved the 2023 Safety Targets as outlined in this report for submittal in the 2022 HSIP Annual Report.
6. The MPOs have until February 28, 2023, to formally adopt the NMDOT PM 1 targets or set their own quantifiable targets.

Data Methodologies and Assumptions

In setting the 2023 safety targets, NMDOT and stakeholders did not rely solely on the crash data projections but used the data in combination with their discussions regarding other relevant factors and their assessment of the potential safety impacts of various strategies and projects. NMDOT worked with UNM to determine methodologies and assumptions required to set the targets. These are as follows:

- NMDOT used Excel to plot a linear best fit line based on 6-years of actual data to project for future years.
- The preliminary Annual VMT for 2021 was provided by the Data Management Bureau of the NMDOT Planning Division.
- VMT from 2016 through 2021, with 2020 excluded was used to calculate projected 2022 and 2023 VMT.
- Crash Data for 2021 is preliminary and provided by UNM.
- The source data table is attached as Appendix B. This data was used to calculate the linear regression equations that yield the 2022 and 2023 projections. It also contains the data that was used to calculate the five-year moving averages.
- On target number 2, Number of Serious Injuries and target number 4, Rate of Serious Injury blue is used to denote where the initial projection was not suitable as the target and further explanation of the methodology is provided.

NMDOT PM 1 (Safety) 2023 Targets

1 Number of Total Fatalities

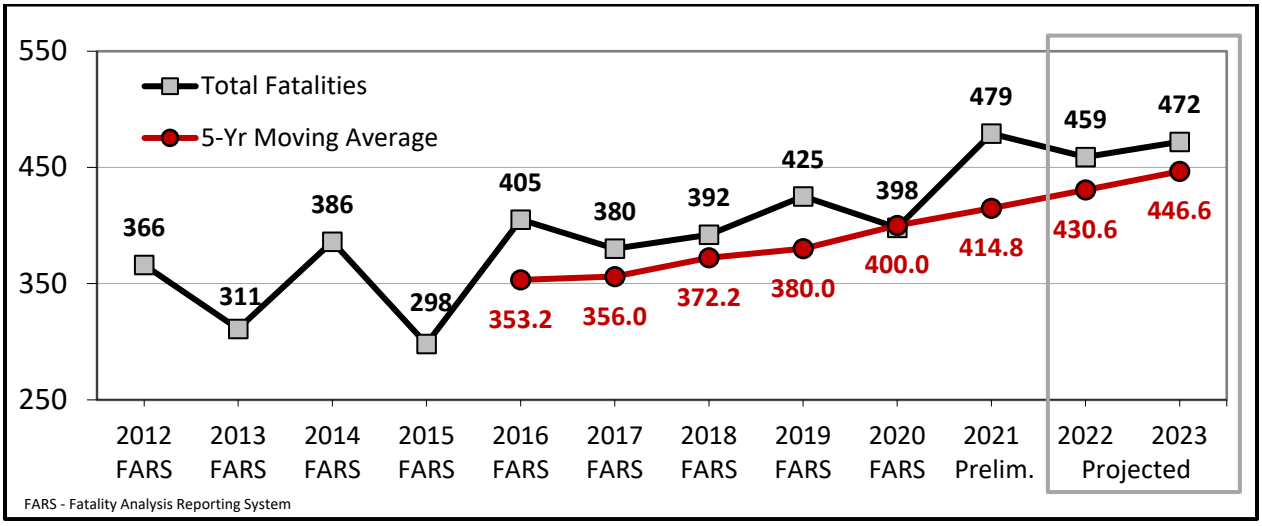

Figure 1

NMDOT 2020 Target for Number of Total Fatalities: 401.9
NMDOT 2021 Target for Number of Total Fatalities: 411.6
NMDOT 2022 Target for Number of Total Fatalities: 421.9
NMDOT 2023 Target for Number of Total Fatalities: 446.6

NMDOT Justification: The preliminary reported number of fatalities for 2021 increased by about 20 percent from 2020, as it rose from 398 to 479 fatalities. The five-year moving average (5YMA) fatalities from 2022 to 2023 are also projected to rise, although less aggressively, by 3.7 percent (430.6 to 446.6). With fatalities projected to keep rising, the five-year average projection of 446.6 (shown in Figure 1) is determined to be the 2023 target.

2 Number of Serious Injuries

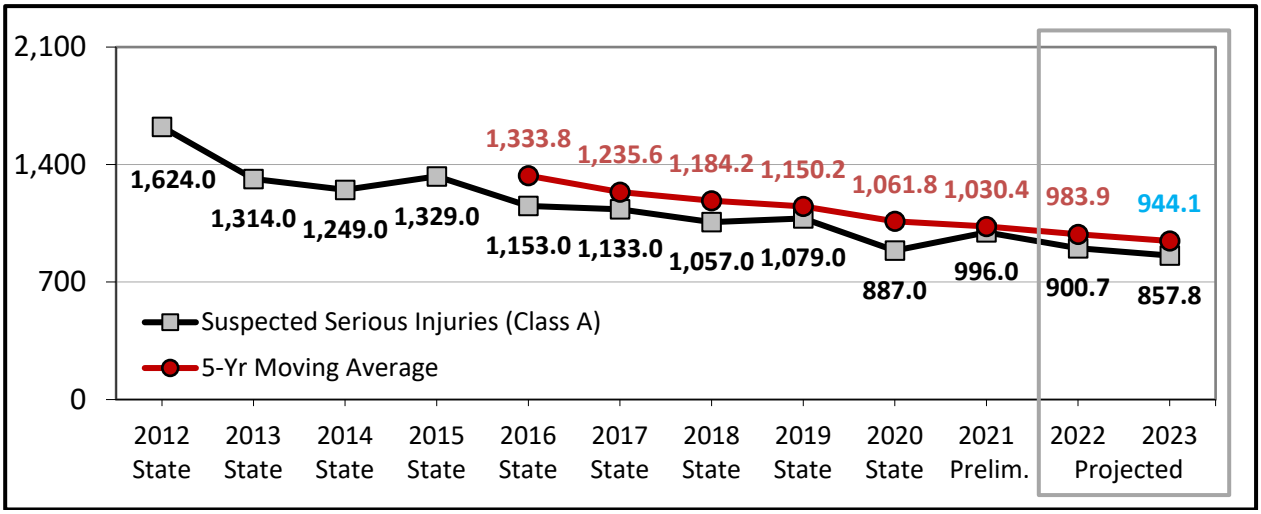

Figure 2A

NMDOT 2020 Target for Number of Serious Injuries: 1,074.2
NMDOT 2021 Target for Number of Serious Injuries: 1,030.5
NMDOT 2022 Target for Number of Serious Injuries: 1,030.5
NMDOT 2023 Target for Number of Serious Injuries: 995.4

NMDOT Justification: The calculation for the (5YMA) of serious injuries in 2023 resulted in a projection of 944.1 serious injuries, as shown in Figure 2A. This is roughly a 10% decrease from the previous year's target of 1,030.5. A decrease of 10% is a considerably more aggressive decrease when compared to the typically observed year-over-year (YOY) decrease of 5YMA serious injuries dating back to 2017.

To illustrate this, the black line in Figure 2B shows the YOY percent change values of the 5YMA for serious injuries. It is important to observe a 10% decrease has not yet been achieved. For this reason, the 5YMA target for serious injuries has been adjusted to 995.4 to be more consistent with the observed YOY decrease of 5YMA serious injuries.

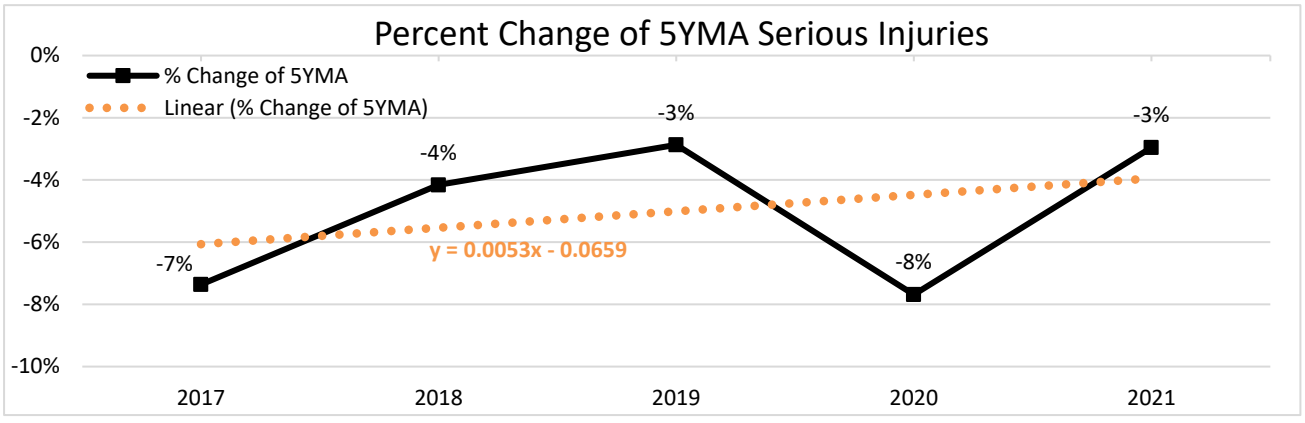

Figure 2B

To show how the adjusted target of 995.4 was calculated and how the percent change values were integrated into the calculation, consider the data for years 2016 and 2017. The 5YMA of serious injuries for these two years are 1,333.8 and 1,235.6, respectively, as shown in Figure 2A. With these two values in mind, the 2017 YOY percent change can be calculated by the following:

$$2017\ YOY\ \%\ Change\ = \frac{(2017\ 5YMA - 2016\ 5YMA)}{2016\ 5YMA} = \frac{(1{,}235.6 - 1{,}333.8)}{1{,}333.8} = \frac{-98.2}{1{,}333.8} = -7.4\%$$

Table 1 shows the YOY percent change for 2017 through 2021.

Table 1

Year	2016	2017	2018	2019	2020	2021
Serious Injury 5YMA	1,333.8	1,235.6	1,184.2	1,150.2	1,061.8	1,030.4
YOY Percent Change of 5YMA	NA	-7.4%	-4.2%	-2.9%	-7.7%	-3.0%

In order to calculate an adjusted 5YMA target of serious injuries, the YOY percent changes from 2027-2021 were used to generate a linear regression equation (Figure 2B):

$$Y = (0.0053 * x) - 0.0659$$

The corresponding x-value for each year, which is inserted into the linear regression equation, can be obtained from Table 2.

Table 2

Year	2017	2018	2019	2020	2021	2022	2023
x-value	0	1	2	3	4	5	6

Using the linear regression equation and an x-value of 6 from Table 2 to arrive at a 2023 target, the adjusted 5YMA target can be calculated as:

$$Y = (0.0053 * 6) - 0.0659 = -0.034 = -3.4\%$$

Using a percent change of -3.4% and applying it to the 2022 target of 1,030.5, a new 2023 5YMA target value of 995.4 serious injuries is obtained. The calculations that lead to this value of 995.4 are shown below.

$$2023\ YOY\ \%\ Change\ = -3.4\% = -0.034 = \frac{(Adjusted\ 2023\ 5YMA - 1{,}030.5)}{1{,}030.5}$$

$$-0.034 * 1{,}030.5 = Adjusted\ 2023\ 5YMA - 1{,}030.5$$

$$Adjusted\ 2023\ 5YMA = (-0.034 * 1{,}030.5) + 1{,}030.5$$

$$Adjusted\ 2023\ 5YMA = 995.4$$

3 Rate of Fatalities

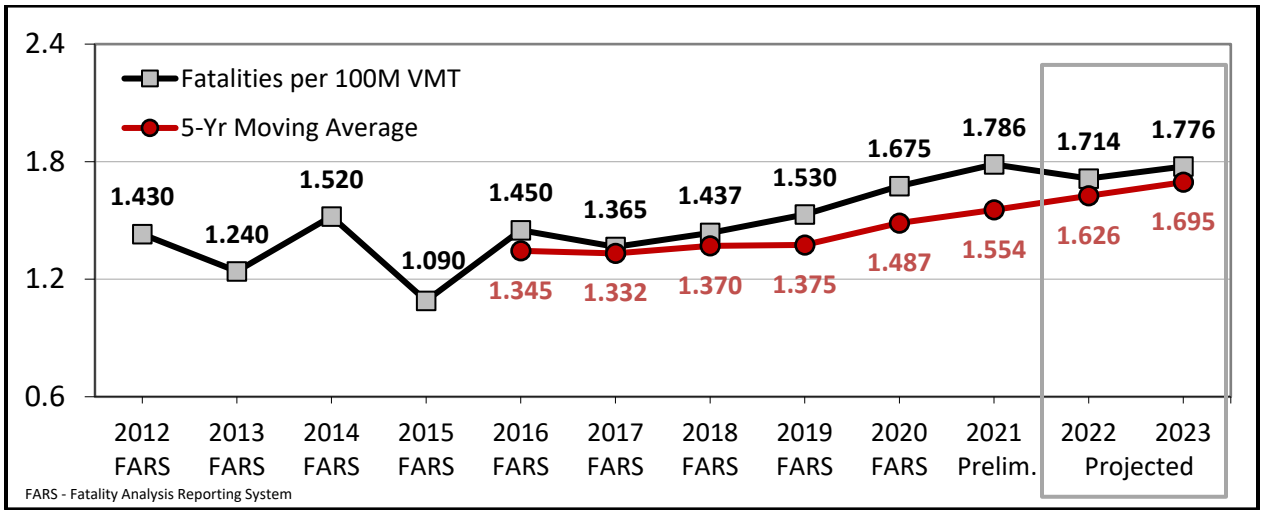

Figure 3

NMDOT 2020 Target for Rate of Fatalities: 1.429
NMDOT 2021 Target for Rate of Fatalities: 1.486
NMDOT 2022 Target for Rate of Fatalities: 1.645
NMDOT 2023 Target for Rate of Fatalities: 1.695

NMDOT Justification: The projected rate of fatalities for 2023 increased due to the stability projected for VMT in 2021-2023. Combined with the fact the preliminary total fatalities for 2021 shows a large increase and the 2022 projected fatalities also show increases, the fatality rate is also projected to increase, as shown in Figure 3. Observing that the VMTs are not increasing in step with the observed fatality numbers, as shown in Appendix B, this impacts the 5YMA, resulting in an increased fatality rate for 2023. As shown in Figure 3, the 2023 projected fatality rate of 1.695 is generally consistent with the rate of change in the five year moving average as observed since 2017.

4 Rate of Serious Injuries

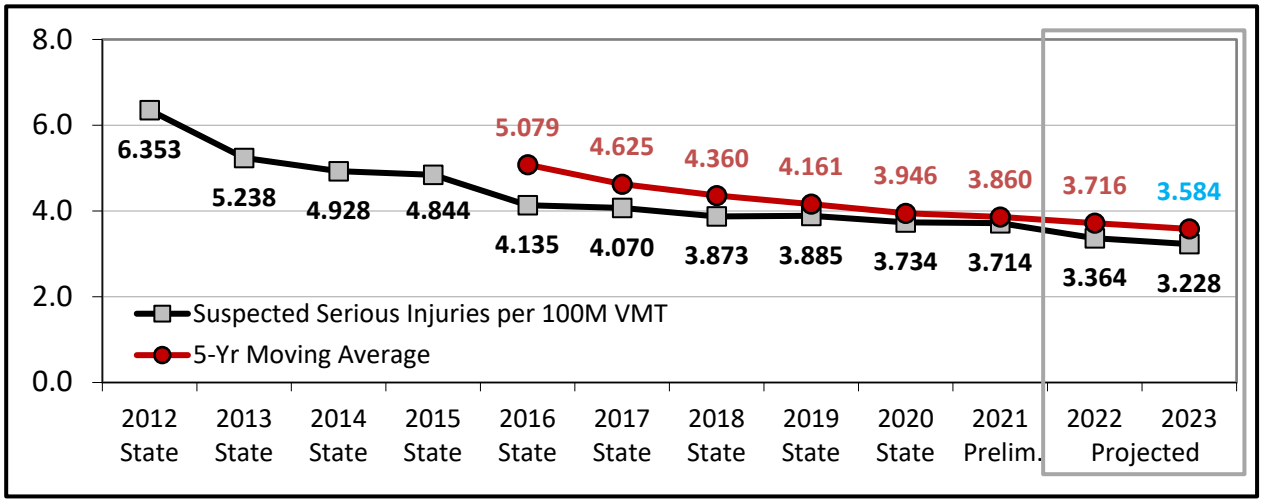

Figure 4A

NMDOT 2020 Target for Rate of Serious Injuries: 3.820
NMDOT 2021 Target for Rate of Serious Injuries: 3.842
NMDOT 2022 Target for Rate of Serious Injuries: 3.842
NMDOT 2023 Target for Rate of Serious Injuries: 3.801

NMDOT Justification: The calculation for the 5YMA of serious injuries per HMVMT for 2023 resulted in 3.584, as shown in Figure 4A. This is a considerably higher decrease compared to the typically observed decrease in rate of serious injuries dating back to 2017. The 2022 target is 3.842 and while the serious injury rate is declining, a change to 3.584 from 3.842 is not consistent with past trends.

For this reason, the 5YMA target for the rate of serious injuries per HMVMT has been adjusted to 3.801 to be more in line with the observed YOY decrease of 5YMA for the rate of serious injuries per HMVMT.

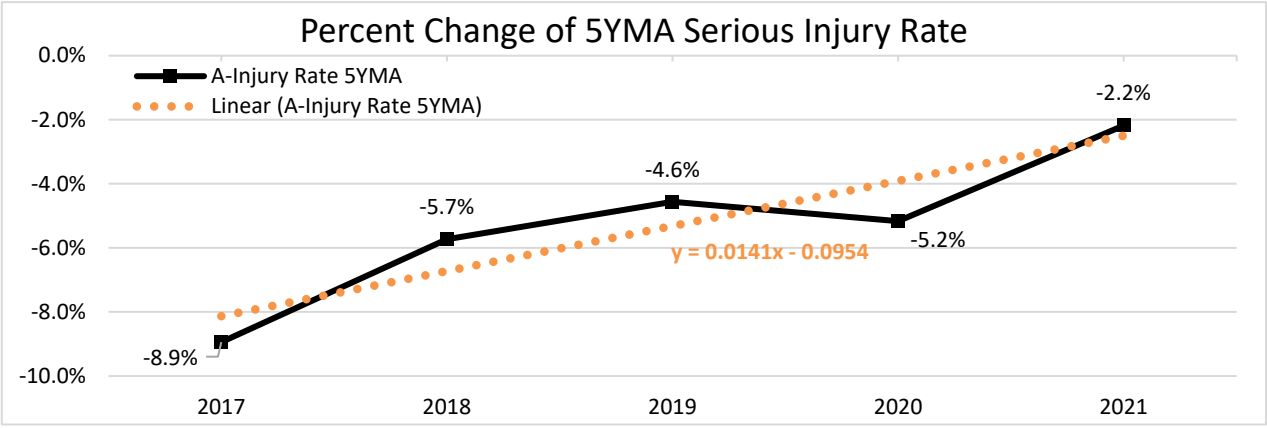

Figure 4B

To show how the adjusted target of 3.801 was calculated and how the percent change values were integrated into the calculation, consider the data for years 2018 and 2019. The 5YMA rate of serious injuries for these two years are 4.360 and 4.161, respectively, as shown in Figure 4A. With these two values in mind, the 2019 YOY percent change can be calculated by the following:

$$2019\ YOY\ \%\ Change\ = \frac{(2019\ 5YMA - 2018\ 5YMA)}{2018\ 5YMA} = \frac{(4.161 - 4.360)}{4.360} = \frac{-0.199}{4.360} = -4.6\%$$

Table 2 shows the YOY percent change for 2017 through 2021.

Table 2

Year	2016	2017	2018	2019	2020	2021
Serious Injury Rate 5YMA	5.079	4.625	4.360	4.161	3.946	3.860
YOY Percent Change of 5YMA	NA	-8.9%	-5.7%	-4.6%	-5.2%	-2.2%

In order to calculate an adjusted 5YMA target of serious injury rate, the YOY percent changes from 2027-2021 were used to generate a linear regression equation (Figure 4B):

$$Y = (0.0141 * x) - 0.0954$$

The corresponding x-value for each year which is inserted into the linear regression equation can be obtained from Table 2.

Table 3

Year	2017	2018	2019	2020	2021	2022	2023
x-value	0	1	2	3	4	5	6

Using the linear regression equation and an x-value of 6 from Table 2 to arrive at a 2023 target, the adjusted 5YMA target can be calculated as:

$$Y = (0.0141 * 6) - 0.0954 = -0.0108 = -1.1\%$$

Using a percent change of -1.1% and applying it to the 2022 target of 3.842, a new 2023 5YMA target value of 3.801 serious injuries per HMVMT is obtained. The calculations that lead to this value of 3.801 are shown below.

$$2023\ YOY\ \%\ Change\ = -1.1\% = -0.0108 = \frac{(Adjusted\ 2023\ 5YMA - 3.842)}{3.842}$$

$$-0.0108 * 3.842 = Adjusted\ 2023\ 5YMA - 3.842$$

$$Adjusted\ 2023\ 5YMA = (-0.0108 * 3.842) + 3.842$$

$$Adjusted\ 2023\ 5YMA = 3.8005 = 3.801$$

5 Number of Non-motorized Fatalities and Serious Injuries

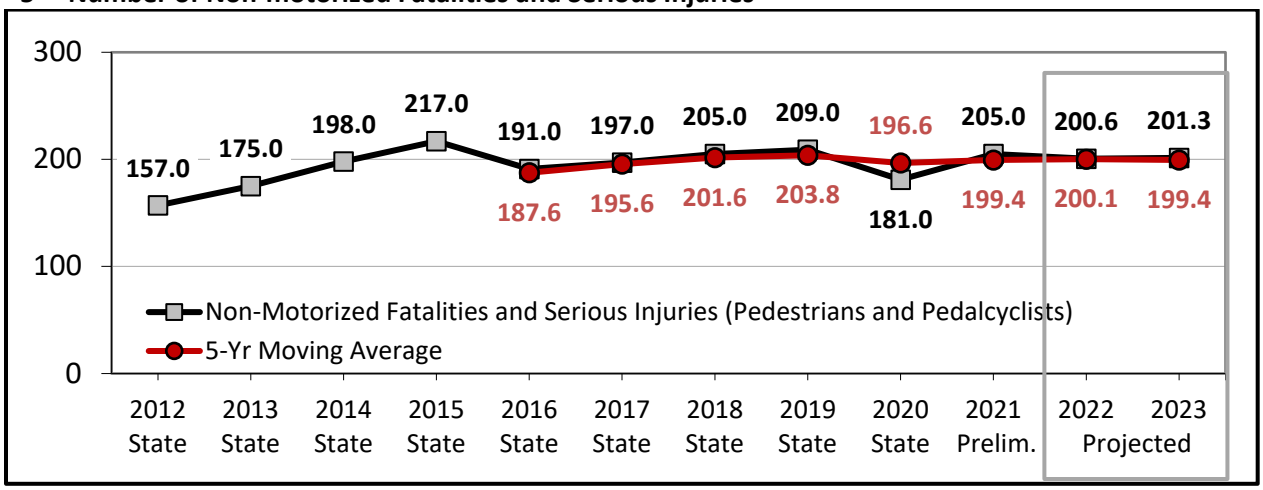

Figure 5

NMDOT 2020 Target for Number of Non-motorized Fatalities and Serious Injuries: 204.0
NMDOT 2021 Target for Number of Non-motorized Fatalities and Serious Injuries: 196.6
NMDOT 2022 Target for Number of Non-motorized Fatalities and Serious Injuries: 190.6
NMDOT 2023 Target for Number of Non-motorized Fatalities and Serious Injuries: 199.4

NMDOT Justification: The 5YMA non-motorized fatalities and serious injuries has been largely steady and flat since 2018. The 5YMA has been hovering around 200 with minor fluctuations annually. The 2023 projected 5YMA is no different, with a target of 199.4, as shown in Figure 5.

Appendix A: VMT (HMVMT)

The projected VMT values for 2022 and 2023, shown in blue numbers in Figure A1 were forecasted using a linear regression equation based on data from 2016 through 2019 and 2021 - VMT from 2020 was excluded. Figure A1 shows the numbers in red that were used in the forecasting of the 2022 and 2023 VMTs. After applying the forecast equation in MS Excel, the projected VMT for 2022 and 2023 are 267.75 HMVMT and 265.79 HMVMT, respectively.

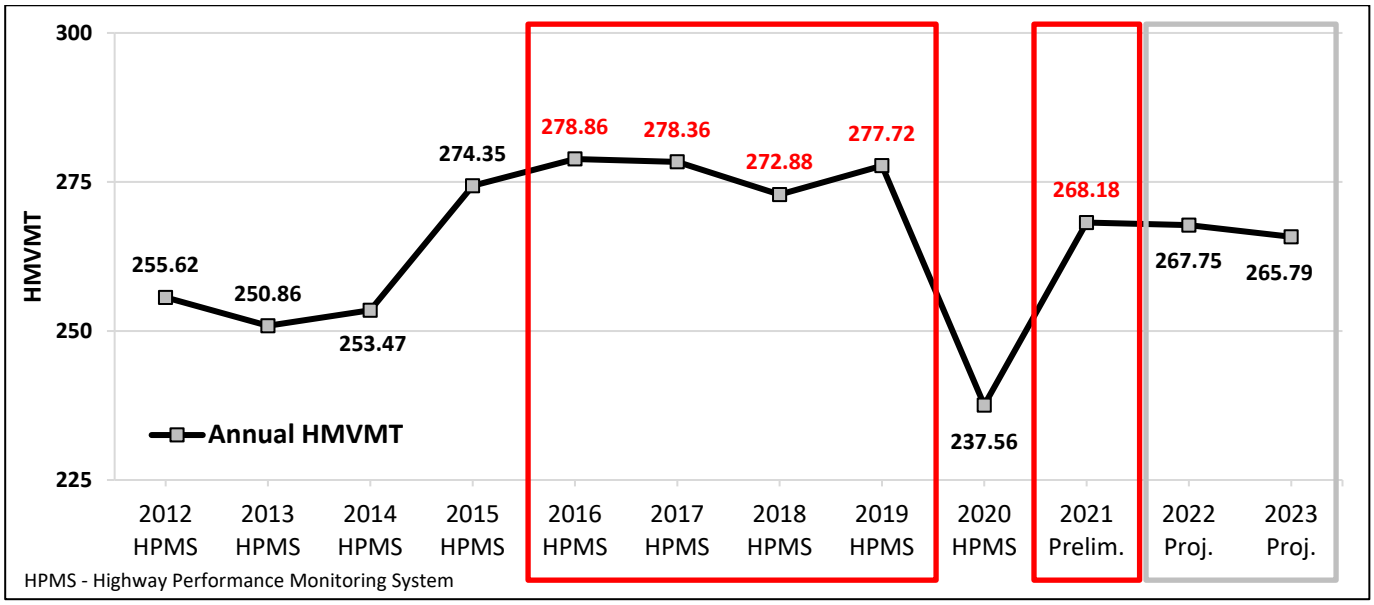

Figure A1

Appendix B: Data Values and Sources

Performance Measure	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Fatalities*	349	350	366	311	386	298	405	380	392	425	398	479	459	472
Serious Injuries**	1,922	1,709	1,624	1,314	1,249	1,329	1,153	1,133	1,057	1,079	887	996.0	900.7	857.8
HMVMT†	252.74	256.50	255.62	250.86	253.47	274.35	278.86	278.36	272.88	277.72	237.56	268.18	267.75	265.79
Fatality rate (per HMVMT)	1.381	1.365	1.432	1.240	1.523	1.086	1.452	1.365	1.437	1.530	1.675	1.786	1.713	1.774
Serious injury rate (per HMVMT)	7.605	6.663	6.353	5.238	4.928	4.844	4.135	4.070	3.873	3.885	3.734	3.714	3.364	3.227
Number non-motorized fatalities***	41	46	68	55	78	62	81	81	95	92	89			
Number of non-motorized serious injuries**	118	111	89	120	120	155	110	116	110	117	92			
Non-motorized fatalities and serious injuries****	159	157	157	175	198	217	191	197	205	209	181	205	200.6	201.3
Fatalities 5YMA				347.4	352.4	342.2	353.2	356.0	372.2	380.0	400.0	414.8	430.5	446.4
Serious Injuries 5YMA				1,693.6	1,563.6	1,445.0	1,333.8	1,235.6	1,184.2	1,150.2	1,061.8	1,030.4	983.9	944.1
Fatality rate (per HMVMT) 5YMA				1.361	1.388	1.326	1.345	1.332	1.370	1.375	1.487	1.554	1.626	1.695
Serious injury rate (per HMVMT) 5YMA				6.637	6.160	5.597	5.079	4.625	4.360	4.161	3.946	3.860	3.716	3.584
Non-motorized fatalities and serious injuries 5YMA				161.8	169.2	180.8	187.6	195.6	201.6	203.8	196.6	199.4	200.1	199.4
HMVMT 5YMA				255.2	253.8	258.2	262.6	267.2	271.6	276.4	269.1	266.9	264.8	263.4
									37806	37473	36835	36096		

*Source: 2009-2019 is from NHTSA: https://cdan.nhtsa.gov/SASStoredProcess/guest.

**Source: Dataset for 2013 to 2020 that was received from NMDOT on 4/27/2021.

***Source: 2009-2019 is from https://www-fars.nhtsa.dot.gov/People/PeopleAllVictims.aspx & see images on "FARS_Screenshots" sheet in this XLS file for additional non-motorized fatality information.

****Non-motorized definition per FHWA: pedalcyclists, pedestrians, other cyclists, or person on personal conveyance.

†HMVMT source (change four-digit year to desired calendar year in link): https://www.fhwa.dot.gov/policyinformation/statistics/2009/vm2.cfm.

2021 crash data is preliminary and originates from 5/20/2022 PDF titled "2023 HSP Target Setting" shared by UNM (Jessica Bloom).

Linear regression (best fit straight line; y = 13.029x + 367.4) based on 2016-2021 fatalities.

Linear regression (best fit straight line; y = -42.886x + 1,200.9) based on 2016-2021 A-Injuries.

Linear regression (best fit straight line; y = 0.7429x + 195.4) based on 2016-2021 non-motorized fatalities and A-Injuries.

The VMT for 2022 and 2023 are the forecasted values of the following five years: 2016-2019, 2021. The VMT for 2020 has been excluded from the forecast to obtain 2022 and 2023

Figure B1