

# MoDOT Statewide Safety Targets

August 2023 (reported in HSP and HSIP)

Targets based on 5-year rolling average from CY 2020-2024:

Performance Measure	Crash Data				5-Year Rolling Average Baseline (2018-2022)	5-year Rolling Average Statewide Target CY2024
	2021 Final	2022 Preliminary	2023 (Using Target Setting Methodology)	2024 (Using Target Setting Methodology)		
Number of Fatalities*	1016	1057	998	918	972.4	~972.4
Fatality Rate per 100 Million VMT*	1.273	1.340	1.253	1.141	1.258	~1.258
Number of Serious Injuries*	5268	5047	4766	4486	4861.8	~4861.8
Serious Injury Rate per 100 Million VMT^	6.602	6.398	5.982	5.575	6.281	6.227
Number of Non-Motorized Fatalities and Serious Injuries^	530	594	561	525	523.0	~523.0

\*Performance Measures to be reported in the 2023 Highway Safety Plan.

^Performance Measures to be reported in the 2023 Highway Safety Improvement Program Annual Report.

**Target Setting Methodology:** Targets are based on Zero by 2030 fatality reduction, Zero by 2040 serious injury reduction, 1% VMT increase, and non-motorized reduction based on overall fatality and serious injury reductions. An exception is made for instances where the baseline 5-year rolling average is less than the calculated target using the parameters previously described. When this occurs, the baseline will be used as the target.

~The Number of Fatalities, Fatality Rate per 100 Million VMT, Number of Serious Injuries and the Number of Non-Motorized Fatalities and Serious Injuries using the target setting methodology resulted in a target above the baseline.

Concur: lht  
Date: 7/28/2023 JDW

# TARGET SETTING FOR 2024

## SAFETY

### PERFORMANCE MEASURES



In accordance with 23 CFR 490.207, the national performance measures for State Departments of Transportation (DOTs) to use in managing the Highway Safety Improvement Program (HSIP) for all public roads are shown below.

Performance Measures
*Number of Fatalities
Rate of Fatalities (per 100 million vehicle miles traveled)
*Number of Serious Injuries
Rate of Serious Injuries (per 100 million vehicle miles traveled)
*Number of Non-Motorized Fatalities and Serious Injuries

*\*Note: These values represent the numbers of individuals, not the number of crashes.*

#### DATA SOURCES

**Fatality Data:** Fatality Analysis Reporting System (FARS) (2014-2020),  
National Safety Council (NSC) (2021-2022)

**Serious Injury Data:** State motor vehicle crash database. Updated definition for "Suspected Serious Injury (A)" from the *Model Minimum Uniform Crash Criteria* (MMUCC) 4th edition was adopted by Arkansas State Police (ASP) on January 1, 2018.

**Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries:** FARS/NSC and State motor vehicle crash database. Fatalities with attribution codes for pedestrians, bicyclists, other cyclists, and persons on personal conveyance are included. Serious injuries are associated with pedestrians or bicyclists as defined in the *American National Standard Manual on Classification of Motor Vehicle Traffic Accidents* (ANSI D16.1-2007).

**Volume Data:** State Vehicle Miles Traveled (VMT) data is derived from the Arkansas Department of Transportation's (ARDOT) official submittal of Highway Performance Monitoring System (HPMS) data to the Federal Highway Administration (FHWA).

#### TARGET SETTING REQUIREMENTS

##### State DOTs:

- Must establish targets for all public roads.
- State DOTs shall coordinate with the State Highway Safety Office to set identical targets on three common performance measures (Number of Fatalities, Rate of Fatalities, and Number of Serious Injuries). However, FHWA and the National Highway Traffic Safety Administration (NHTSA) issued a joint final rule on June 5, 2023 that waives the requirement that targets for the common performance measures be identical to the targets in the HSIP Report, for fiscal year 2024 only.

- Must establish statewide annual targets by June 30 of each year, due to coordination requirements with NHTSA (waived for 2024), and report targets by August 31 of each year in the HSIP Report.
- State DOTs shall coordinate with Metropolitan Planning Organizations (MPOs) when establishing targets, to the maximum extent practicable.

### **Metropolitan Planning Organizations (MPOs):**

- Shall support the relevant State DOT annual target or establish their own targets within 180 days after the State DOT target is established.
- Shall report their established targets to their respective State DOT in a manner that is documented and mutually agreed upon by both parties.
- Shall report baseline condition/performance and progress toward the achievement of their targets in the system performance report in the metropolitan transportation plan.

## **METHODOLOGY**

Through extensive coordination with the ASP Highway Safety Office, FHWA, NHTSA, all MPOs, and other stakeholders, a methodology to determine the targets was finalized in 2017.

### **Description of Methodology**

The target-setting method, like in previous years, is generally described below:

1. Calculate moving averages for the last five years. A moving average smooths the variation from year to year. For this target setting, the moving average was calculated for the last five years that crash data is available (2014-2018, 2015-2019, 2016-2020, 2017-2021, and 2018-2022).
2. Calculate the average of these five data points.
3. Consider external factors to account for uncertainties. Past safety performance alone is not necessarily the best indicator of future performance given numerous external factors outside of ARDOT's control. For instance, to account for the 28.4% increase in the number of agencies turning in crash reports from 2015 to 2021, which contributed to an increase in total crash reports from 67,607 in 2015 to 82,301 in 2021, an adjustment factor may be considered to account for the uncertainty of what the final numbers will be, rather than attempting to predict exact numbers.
4. Apply any adjustment factors as needed based on Step 3 to the averages calculated in Step 2 to determine targets.

### **Step One: Calculate Moving Averages**

Calculate the moving average for each of the performance measures for the last five years, as shown in Table 1.

### **Step Two: Calculate the Average**

The average of the five data points for each of the performance measures is then calculated, as shown in Table 2.

**Table 1 – Calculation of Moving Averages**

Data						Moving Averages					
Year	Number of Fatalities <sup>1</sup>	Rate of Fatalities	Number of Serious Injuries	Rate of Serious Injuries	Number of Non-Motorized Fatalities and Serious Injuries	Years	Number of Fatalities	Rate of Fatalities	Number of Serious Injuries	Rate of Serious Injuries	Number of Non-Motorized Fatalities and Serious Injuries
2014	470	1.381	3,154	9.270	141						
2015	550	1.576	2,888	8.276	112						
2016	561	1.569	3,032	8.480	154						
2017	525	1.443	2,816	7.739	189						
2018	516	1.407	2,272	6.195	205	2014-2018	524.4	1.475	2832.4	7.992	160.2
2019	511	1.377	2,389	6.440	213	2015-2019	532.6	1.474	2679.4	7.426	174.6
2020	653	1.925	2,582	7.612	284	2016-2020	553.2	1.544	2618.2	7.293	209.0
2021	695	1.813	2,721	7.096	280	2017-2021	580.0	1.593	2556.0	7.016	234.2
2022	644	1.677	2,694	7.017	259	2018-2022	603.8	1.640	2531.6	6.872	248.2
Notes:											
<sup>1</sup> 2021 and 2022 Fatalities are from National Safety Council (NSC), all other years are from Fatality Analysis Reporting System (FARS)											

**Table 2 – Calculation of the Averages**

Performance Measure	2014-2018	2015-2019	2016-2020	2017-2021	2018-2022	Average
Number of Fatalities	524.4	532.6	553.2	580.0	603.8	<b>558.8</b>
Rate of Fatalities	1.475	1.474	1.544	1.593	1.640	<b>1.545</b>
Number of Serious Injuries	2,832.4	2,679.4	2,618.2	2,556.0	2,531.6	<b>2,643.5</b>
Rate of Serious Injuries	7.992	7.426	7.293	7.016	6.872	<b>7.320</b>
Number of Non-Motorized Fatalities and Serious Injuries	160.2	174.6	209.0	234.2	248.2	<b>205.2</b>

**Step Three: Consider External Factors**

As shown below, several external factors that may have an impact on safety performance were identified through coordination with safety stakeholders mentioned on page two.

Legalization of medical marijuana in Arkansas and increase in opioid usage

There is uncertainty regarding the quantifiable impact of medical marijuana and opioid use on highway safety. However, ASP has continued to notice a significant increase in crashes involving drug use in the state over the past few years.

Speed limit increase on rural freeways in Arkansas in 2020

State Act 784 of 2019 increased the maximum allowable speed limit for motor vehicles on rural freeways to 75 miles per hour (mph) effective July 1, 2020.

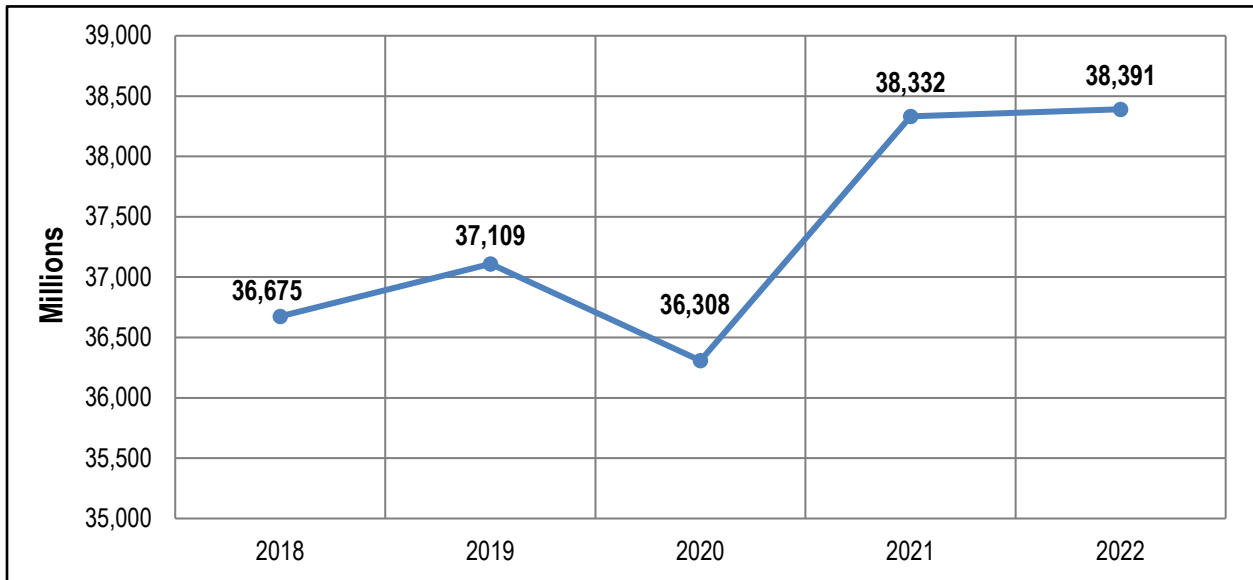
Large fluctuation in vehicle miles traveled in Arkansas

The vehicle miles traveled (VMT) in Arkansas decreased significantly in 2020 due to the COVID-19 pandemic. As shown in Figure 1, the VMT in Arkansas was increasing yearly until 2020. While the total number of crashes decreased in 2020, it is believed that the lack of congestion and law enforcement presence led to more high-speed collisions which resulted in more severe crashes. In 2021, VMT rebounded to eclipse even 2019 levels with 2022 VMT surpassing 2021 levels.

Increase in speeding citations

Citations involving a vehicle traveling at speeds greater than 100 miles per hour (mph) increased on average of 136% in 2022 over 2019 (2,333 citations in 2022 and 987 citations in 2019) and are not expected to decrease to 2019 numbers.

**Figure 1 – Vehicle Miles Traveled (VMT) in Arkansas**

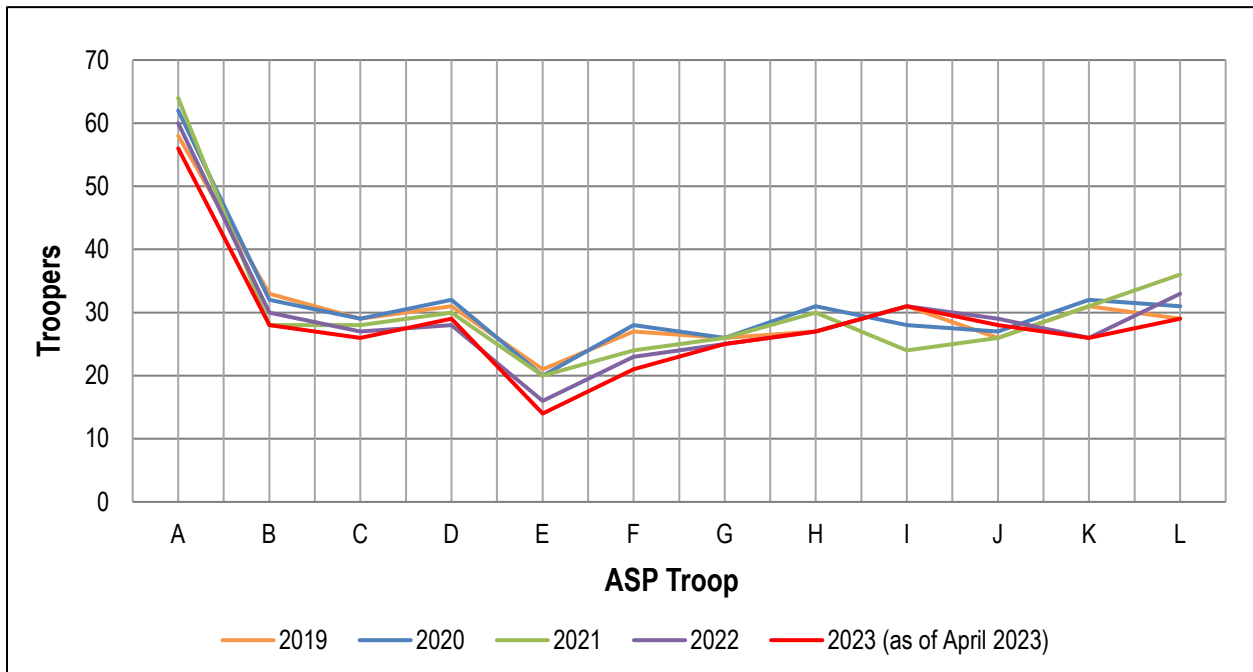


Data Source: FHWA and ARDOT

Lack of law enforcement officers statewide

There has been a shortage of law enforcement officers across all agencies since 2019. Local law enforcement agencies have had to reprioritize resources regarding traffic safety operations. As shown in Figure 2, ASP Highway Patrol has been on a downward trend of available troopers and has yet to return to 2019 levels. ARDOT Highway Police (AHP) has also suffered from a shortage of law enforcement officers.

**Figure 2 – ASP Highway Patrol Division Troopers**

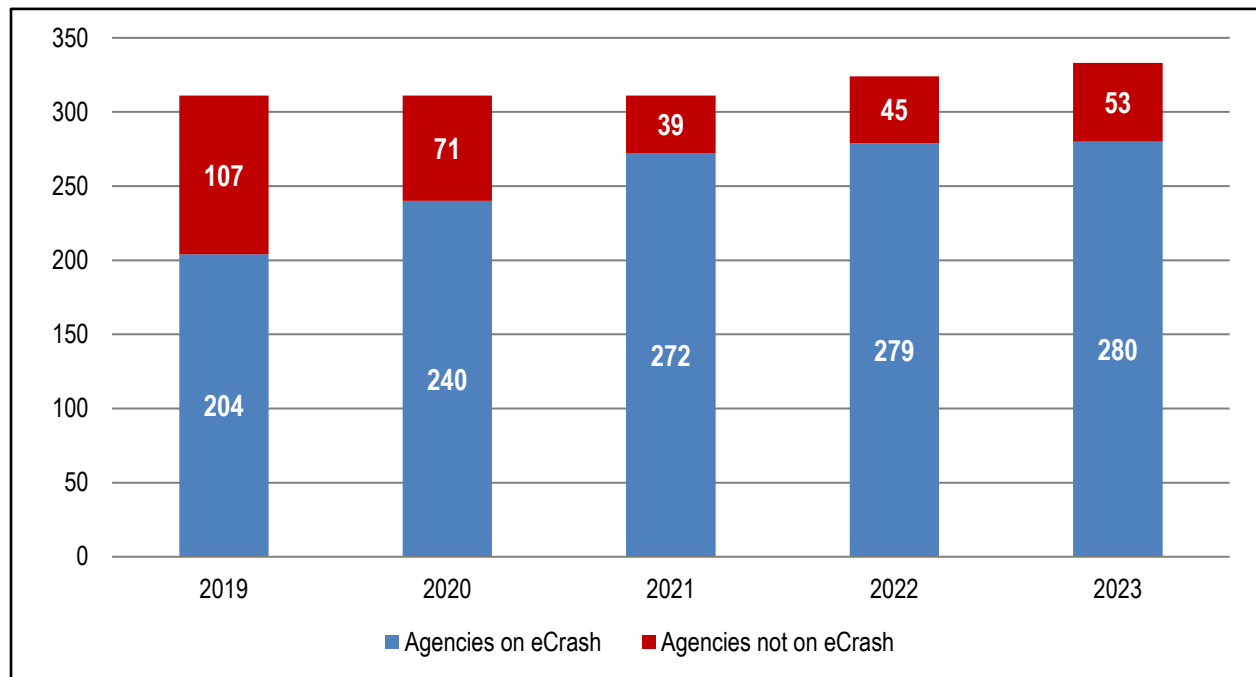


Data Source: ASP

Continued transition to eCrash system

The eCrash system has made crash reporting timelier and more consistent. Since first implemented by ASP in 2015, law enforcement agencies throughout Arkansas have been transitioning to the eCrash system. To date, 84% of all law enforcement agencies now use eCrash as shown in Figure 3. However, there are still several agencies that have yet to make the transition. Additionally, ASP discovered additional law enforcement agencies that are responsible for crash reporting, but had not submitted crash reports previously. Therefore, there was an increase in the total number of agencies in the state for 2022 and 2023, as shown in Figure 3.

**Figure 3 – eCrash Use in Arkansas**

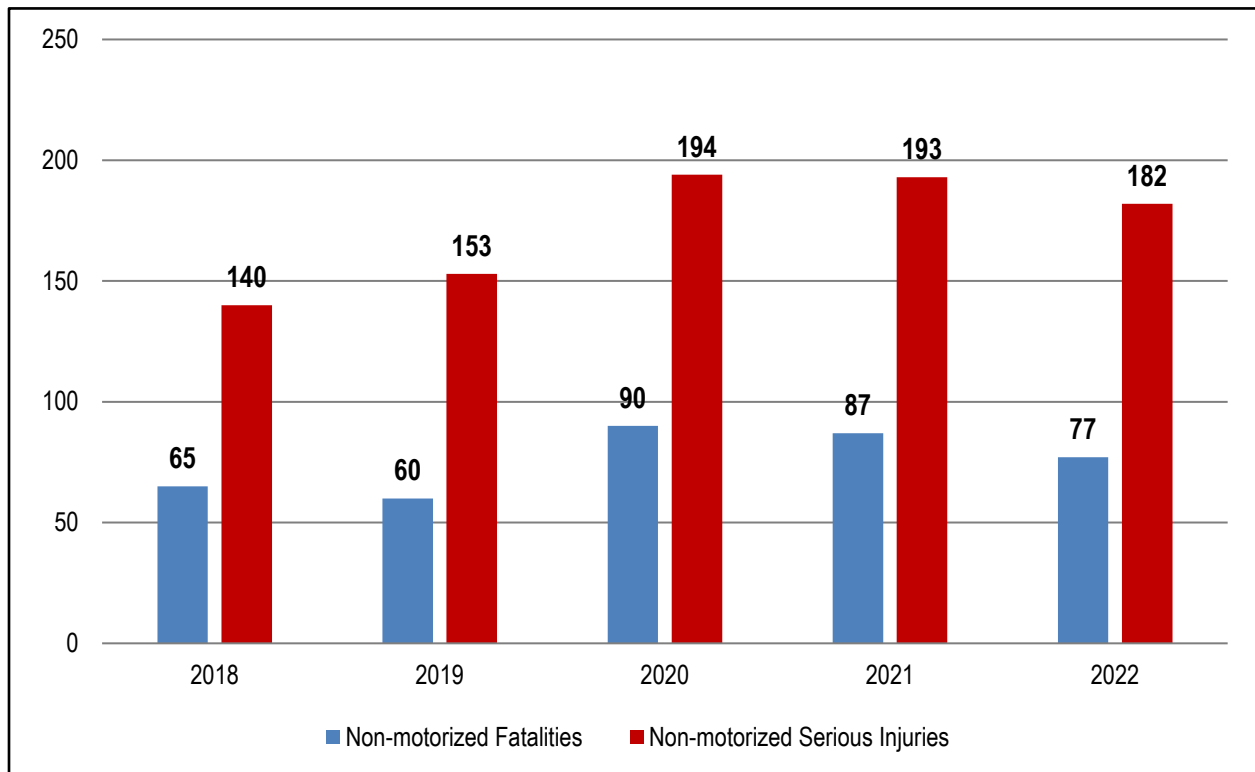


There is uncertainty regarding the quality of data not entered through eCrash, primarily regarding serious injuries. Although ASP has an official definition of suspected serious injuries, it has been noted in the past that the definition was not applied consistently. Future data integration with the Arkansas Department of Health’s National Emergency Medical Services Information System (NEMSIS) may provide more accurate crash severity parameters for suspected serious injuries. Until all law enforcement agencies begin using eCrash, and proper training on the definition is conducted, there will continue to be considerable uncertainty regarding data accuracy.

Underreported fatal crashes

It had been the general understanding that agencies not reporting their crashes were still reporting fatal crashes; however, in late 2020 ASP discovered that those agencies were also not reporting their fatalities. This underreporting contributed to an increase of 32.4% in reported fatalities between 2017 and 2021. The number of reported fatalities in 2023 is on pace to equal or surpass 2022. This underreporting also has an impact on both fatality data and non-motorized crash data. Generally, the number of fatalities, rate of fatalities, and non-motorized fatalities and serious injuries can vary. Figure 4 shows the significance of this variation for non-motorized fatalities and serious injuries. The variability of these performance measures compared to the serious injury performance measures is illustrated in Attachment A. As shown in the attachment, the coefficient of variations for these performance measures is 13%.

**Figure 4 – Number of Non-Motorized Fatalities & Serious Injuries**



#### **Step Four: Apply Adjustment Factors**

The various external factors mentioned under Step Three could impact Arkansas' safety performance. However, there is little to no research to justify the application of specific adjustment factors to account for external factors such as medical marijuana. With that said, in consultation with other safety stakeholders, it was determined that a 25% adjustment factor and a 20% adjustment factor can be justifiably applied to the Number of Fatalities and Rate of Fatalities safety performance measures, respectively. This adjustment factor is based on the percent increase of each measure from 2018 to 2022.

A higher adjustment factor has been applied to the Number of Non-Motorized Fatalities and Serious Injuries performance measure. The known number of non-motorized fatalities and serious injuries increased in 2022 compared to 2018, as shown in Figure 4. Therefore, it was determined that a 30% adjustment factor be applied to the Number of Non-Motorized Fatalities and Serious Injuries performance measure.

It was also mutually agreed upon by safety stakeholders that a 5% adjustment factor should be applied to the Number of Serious Injuries and Rate of Serious Injuries safety performance measures. This adjustment factor was calculated from the 2018 to 2022 VMT difference and is less than others in addition to the serious injury definition change in 2018, which caused the total number of serious injuries to decrease significantly.



## TARGETS

Based on the described methodology, targets for each of the five performance measures are shown below in Table 3, as well as in Attachment B.

**Table 3 – 2024 Performance Targets**

Performance Measure	Average <sup>1</sup>	Adjustment Factor <sup>2</sup>	Target
Number of Fatalities	558.8	+25%	<b>698.5</b>
Rate of Fatalities	1.545	+20%	<b>1.854</b>
Number of Serious Injuries	2,643.5	+5%	<b>2,775.7</b>
Rate of Serious Injuries	7.320	+5%	<b>7.686</b>
Number of Non-Motorized Fatalities and Serious Injuries	205.2	+30%	<b>266.8</b>

<sup>1</sup> See Table 2

<sup>2</sup> Description of justification found in Step Four

To gauge how these averages, adjustments, and targets compare to last year's targets, see Table 4.

**Table 4 – Comparison of 2023 & 2024 Performance Targets**

Performance Measure	2023			2024		
	Average	Adjust.	Target	Average <sup>1</sup>	Adjust	Target
Number of Fatalities	542.2	+30%	<b>704.9</b>	558.8	+25%	<b>698.5</b>
Rate of Fatalities	1.515	+25%	<b>1.895</b>	1.545	+20%	<b>1.854</b>
Number of Serious Injuries	2,735.4	+2%	<b>2,790.1</b>	2,643.5	+5%	<b>2,775.7</b>
Rate of Serious Injuries	7.662	+2%	<b>7.815</b>	7.320	+5%	<b>7.686</b>
Number of Non-Motorized Fatalities and Serious Injuries	185.4	+48%	<b>274.4</b>	205.2	+30%	<b>266.8</b>

<sup>1</sup> See Table 2

## FHWA ASSESSMENT OF 2022 PERFORMANCE TARGETS

FHWA will conduct an assessment to determine whether states have met or made significant progress toward meeting their previous year's targets in December of each year. For 2022 data, the assessment will be made in December of 2023 by comparing the actual 2018-2022 performance to the 2022 targets and the 2016-2020 baseline performance. At least four of the five targets must either meet (i.e., equal to or less than the target) or be better than the baseline performance to make significant progress. This means that states have two chances to pass the test for each performance measure. In some cases, a state may not be better than the baseline performance for any given measure but may meet the target it set. In such cases, the state would pass the test for that measure.

As shown in Table 5, it is predicted that ARDOT will meet four of the five targets for 2022 data. Therefore, FHWA should consider ARDOT as having “made significant progress.”

**Table 5 – 2022 Performance Self-Assessment**

Performance Measure	2018-2022 Average	2022 Targets	2016-2020 Baseline	Meets Target?	Better than Baseline?	Met or Made Significant Progress?
Number of Fatalities	603.8 <sup>1</sup>	631.5	553.2	Yes	No	Yes (4 out of 5 targets met or made significant progress)
Rate of Fatalities	1.640 <sup>1</sup>	1.808	1.544	Yes	No	
Number of Serious Injuries	2,531.6	2,996.9	2,618.2	Yes	Yes	
Rate of Serious Injuries	6.872	8.608	7.293	Yes	Yes	
Number of Non-Motorized Fatalities and Serious Injuries	248.2	229.2	209.0	No	No	
Notes:						
<sup>1</sup> Value is based on the actual FARS fatality numbers for 2018-2020, and NSC numbers for 2021-2022. <i>Example: Number of Fatalities = (516+511+653+695+644)/5=603.8</i>						

If FHWA determines that a state has not “made significant progress” toward meeting its safety targets, the penalty as outlined in 23 USC 148(i) is as follows:

- Use obligation authority equal to the HSIP apportionment for the year prior to the target year, only for HSIP projects.
- Submit an HSIP Implementation Plan that describes actions the state will take to meet or make significant progress toward meeting its targets.

# ATTACHMENT A

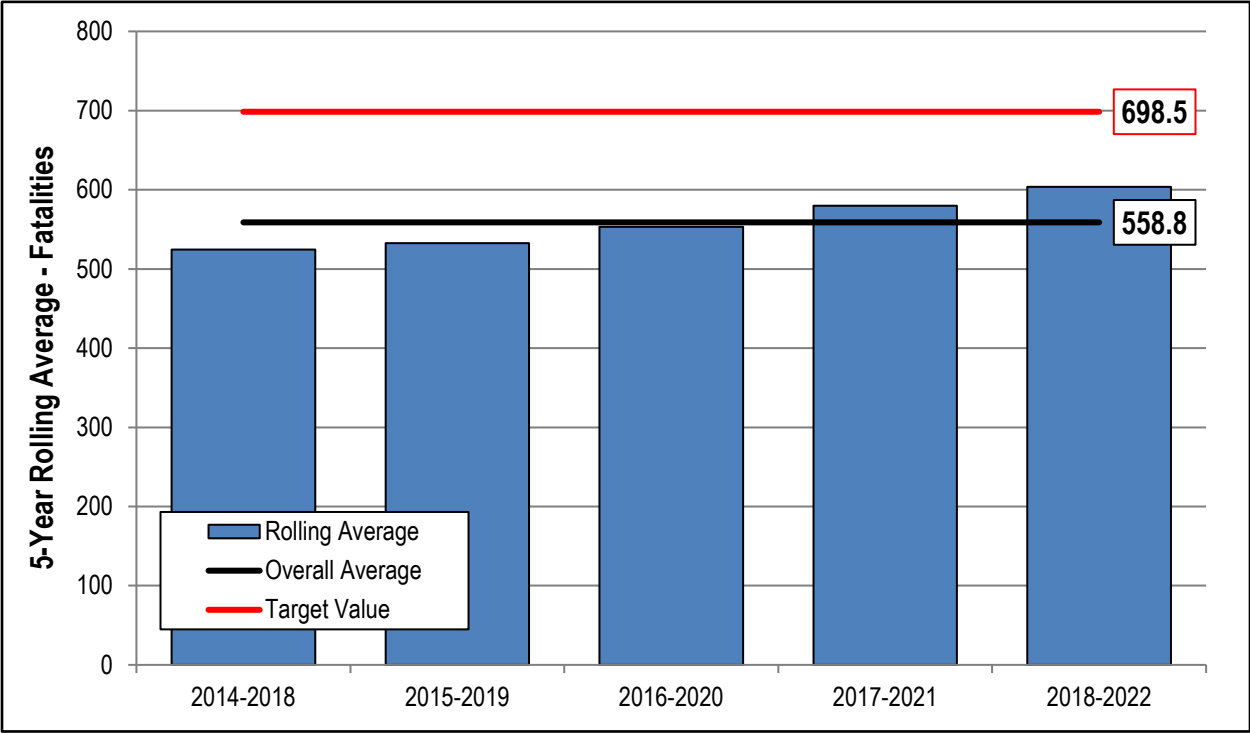
## Data Variability Analysis

Year	Number of Fatalities	Rate of Fatalities	Number of Serious Injuries	Rate of Serious Injuries	Number of Non-Motorized Fatalities and Serious Injuries
2018	516	1.407	2,272	6.195	205
2019	511	1.377	2,389	6.440	213
2020	653	1.925	2,582	7.612	284
2021	695	1.813	2,721	7.096	280
2022	644	1.677	2,694	7.017	259
<b>Mean</b>	603.8	1.640	2,531.6	6.872	248.2
<b>Standard Deviation</b>	75.7	0.217	174.7	0.503	33.2
<b>Coefficient of Variation</b>	13%	13%	7%	7%	13%

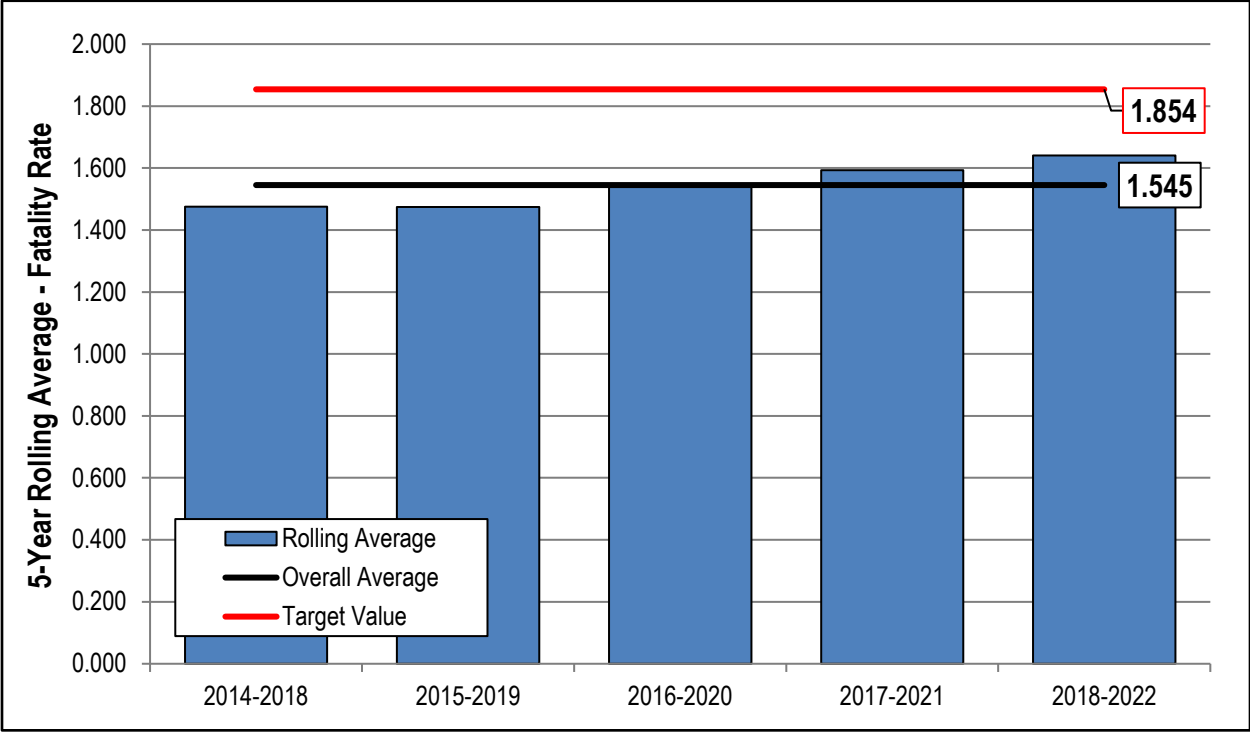
The Coefficient of Variation is a statistical measure of the dispersion of data around the mean. It is a useful statistic for comparing the degree of variation from one data set to another, even if the means are drastically different from one another.

# ATTACHMENT B

## HSIP 2024 Target – Number of Fatalities

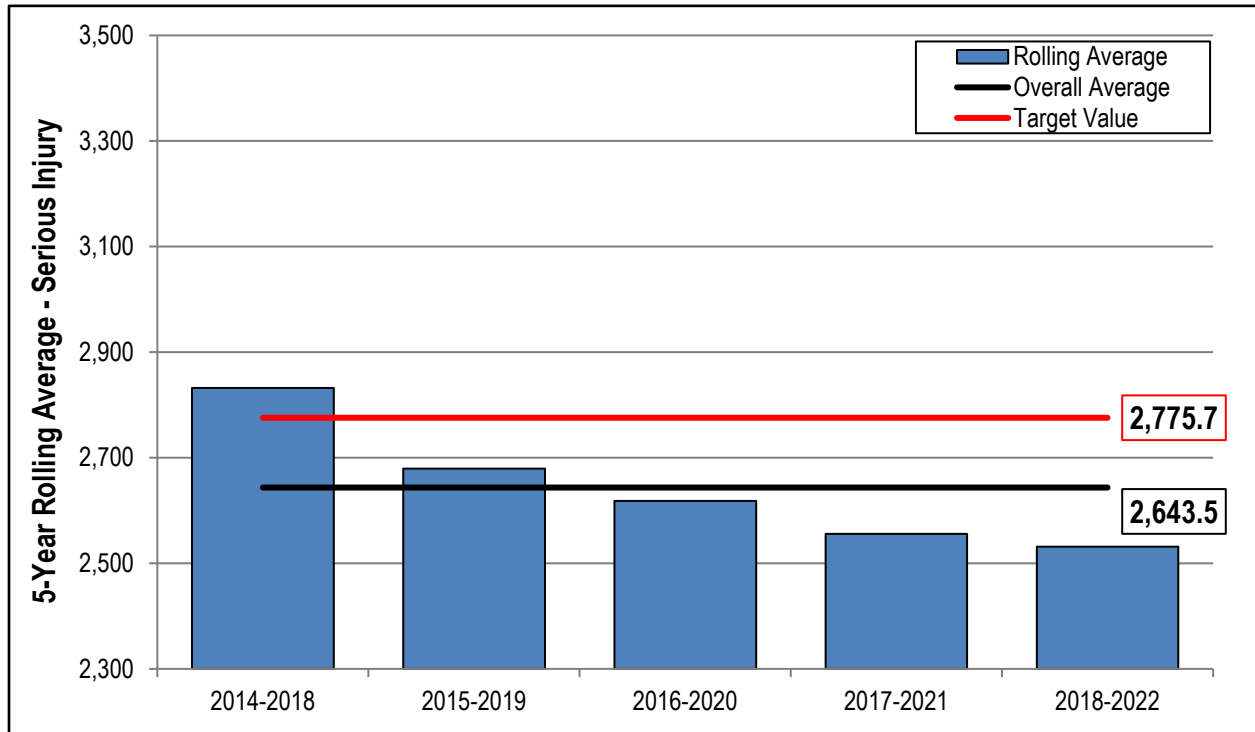


## HSIP 2024 Target – Fatality Rate

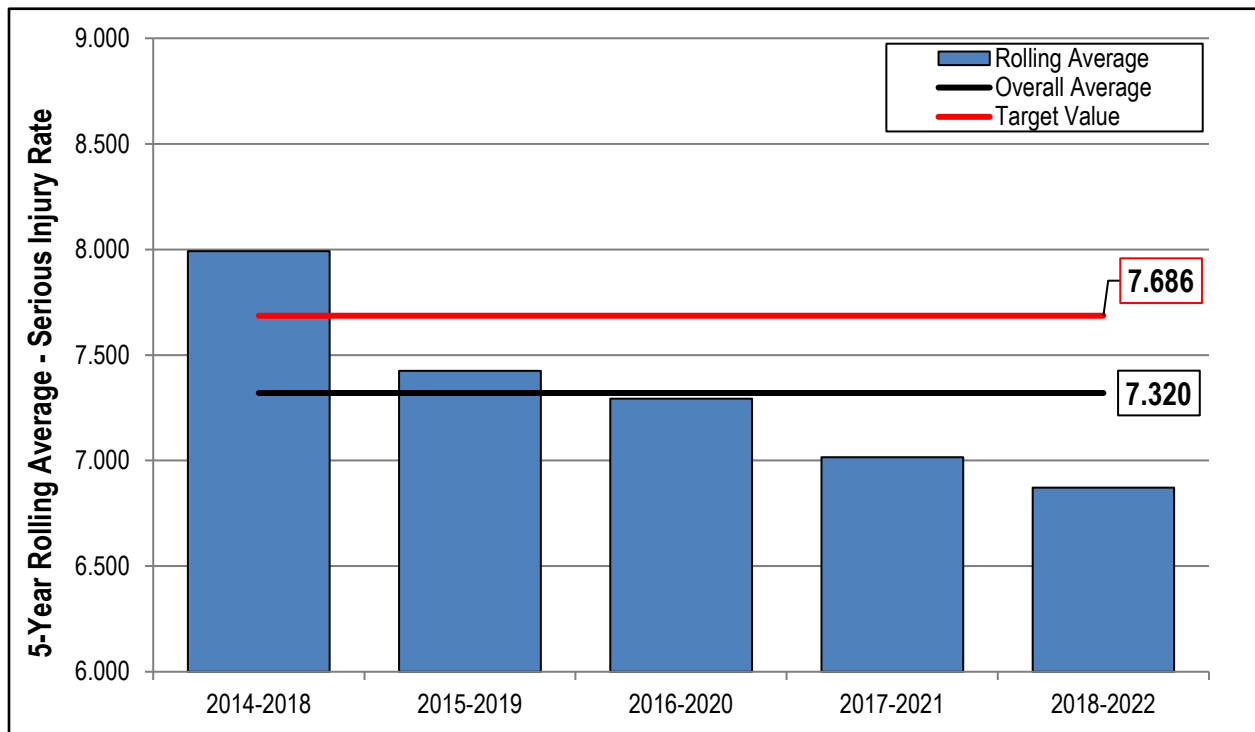


# ATTACHMENT B

## HSIP 2024 Target – Number of Serious Injuries



## HSIP 2024 Target – Serious Injury Rate



# ATTACHMENT B

## HSIP 2024 Target – Number of Non-Motorized Fatalities and Serious Injuries

