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TARGET SETTING FOR 2022
SAFETY
PERFORMANCE MEASURES

Ar DOT
ARKANSAS DEPARTMENT OF TRANSPORTATION

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

DATA SOURCES

Fatality Data: Fatality Analysis Reporting System (FARS).

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 on January 1, 2018.

Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries: FARS 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 pedalcyclists 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 Federal Highway Administration (FHWA) and the Arkansas Department of Transportation (ArDOT).

TARGET SETTING REQUIREMENTS

State DOTs:

- Must establish targets for all public roads.
- Must establish statewide annual targets by June 30th of each year and report targets by August 31st of each year in the HSIP Report.
- 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).
- State DOTs shall coordinate with Metropolitan Planning Organizations (MPOs) when establishing targets, to the maximum extent practicable.

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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 Arkansas Highway Safety Office, FHWA, the National Highway Traffic Safety Administration (NHTSA), all MPOs, and other stakeholders, a methodology to determine the targets was finalized in 2017.

Description of Methodology

The target-setting method, similar to 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 (2011-2015, 2012-2016, 2013-2017, 2014-2018, and 2015-2019).
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 fact that 2020 crash data is incomplete, 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	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
2011	551	1.672	3,239	9.829	149						
2012	560	1.671	3,226	9.624	147						
2013	498	1.487	3,066	9.154	149						
2014	470	1.381	3,154	9.270	141						
2015	550	1.576	2,888	8.276	112	2011-2015	525.8	1.557	3,114.6	9.231	139.6
2016	561	1.569	3,032	8.480	154	2012-2016	527.8	1.537	3,073.2	8.961	140.6
2017	525	1.443	2,816	7.739	189	2013-2017	520.8	1.491	2,991.2	8.584	149.0
2018[1]	516	1.407	2,272	6.195	205	2014-2018	524.4	1.475	2,832.4	7.992	160.2
2019[2]	511	1.377	2,389	6.440	213	2015-2019	532.6	1.474	2,679.4	7.426	174.6

Notes:

[1] 2018 Fatalities are from FARS Final

[2] 2019 Fatalities are from National Safety Council (NSC)

Table 2 – Calculation of the Averages

Performance Measure	2011-2015	2012-2016	2013-2017	2014-2018	2015-2019	Average
Number of Fatalities	525.8	527.8	520.8	524.4	532.6	**526.3**
Rate of Fatalities	1.557	1.537	1.491	1.475	1.474	**1.507**
Number of Serious Injuries	3,114.6	3,073.2	2,991.2	2,832.4	2,679.4	**2,938.2**
Rate of Serious Injuries	9.231	8.961	8.584	7.992	7.426	**8.439**
Number of Non-Motorized Fatalities and Serious Injuries	139.6	140.6	149.0	160.2	174.6	**152.8**

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 2.

Legalization of medical marijuana in Arkansas, and increase of opioid use
There is considerable uncertainty regarding the impact of medical marijuana and opioid use on highway safety. Arkansas State Police have noticed a significant increase in crashes involving drug use in the state over the past couple of 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. Due to 2020 crash data being incomplete, we are uncertain how this will impact highway safety.

Sudden decrease 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 led to more high-speed collisions which resulted in more severe crashes. We are uncertain if VMT will continue to remain this low in the coming years.

Increase in speeding citations
Citations involving a vehicle traveling at speeds greater than 100 miles per hour (mph) increased by seventy-seven percent in 2020 when compared to 2019 (1,292 citations in 2019 and 2,285 citations in 2020).

**Figure 1 – Vehicle Miles Traveled (VMT) in Arkansas**
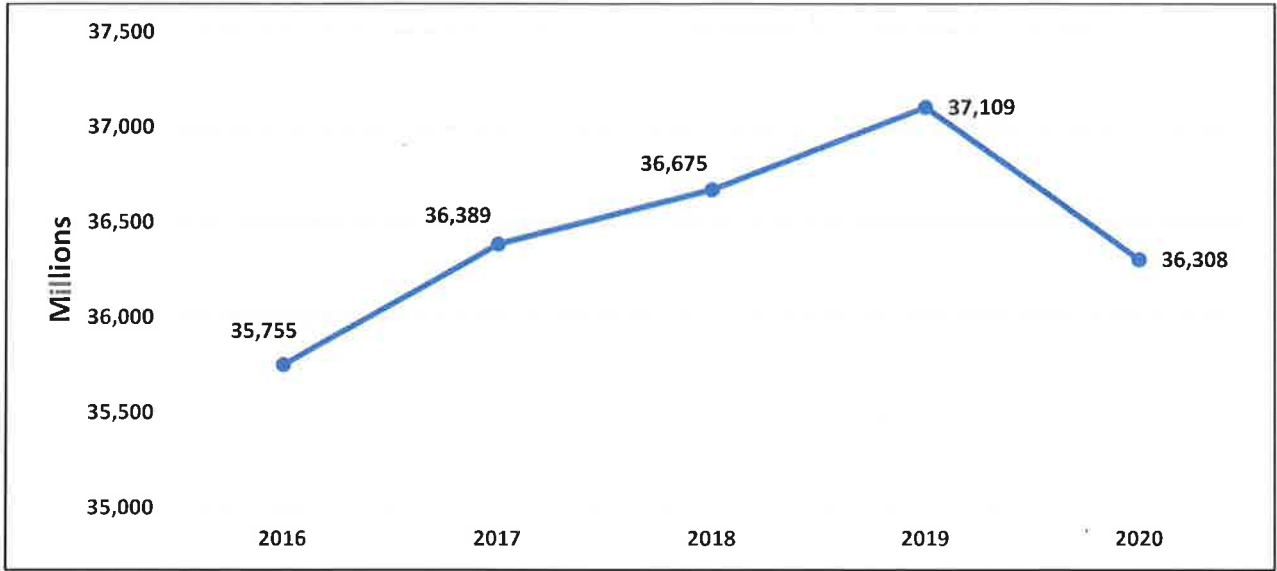
Data Source: FHWA and ARDOT

Continued transition to eCrash system

The eCrash system has made crash reporting more timely and consistent. Since first implemented by Arkansas State Police in 2015, law enforcement agencies throughout Arkansas have been transitioning to the eCrash system. To date, 87 percent of all law enforcement agencies now use eCrash as shown in Figure 2. However, there are still several agencies that have yet to make the transition.

Figure 2 – eCrash Use in Arkansas
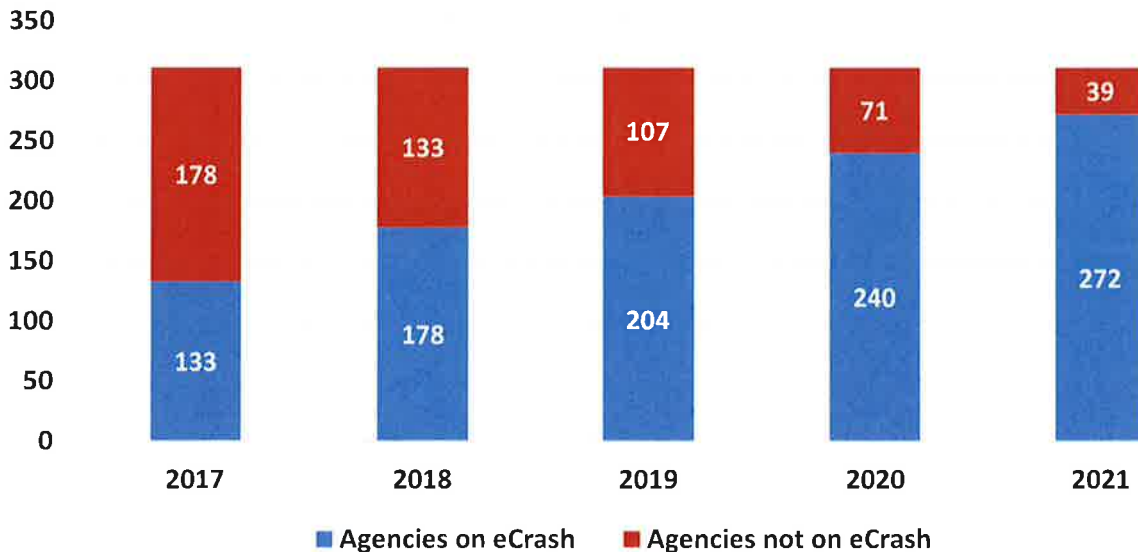
There is uncertainty regarding data quality not entered through eCrash, primarily regarding serious injuries. Although Arkansas State Police has an official definition of suspected serious injuries, it has been noted in the past that the definition was not applied consistently. Until all law enforcement agencies

begin using eCrash, and proper training on the definition is conducted, there will continue to be much 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 has an impact on both fatality data and non-motorized crash data. As shown in Figure 3, the number of non-motorized fatalities and serious injuries can vary significantly. The variability of the Number of Non-Motorized Fatalities and Serious Injuries performance measures compared to other safety performance measures is illustrated in Attachment A. As shown in this attachment, the coefficient of variation for this performance measure is at 21 percent, which is significantly higher than the other performance measures ranging from 4 to 13 percent.

Figure 3 – Number of Non-Motorized Fatalities & Serious Injuries

Non-motorized Fatalities (blue) / Non-motorized Serious Injuries (red)

Year	Non-motorized Fatalities	Non-motorized Serious Injuries
2015	35	77
2016	53	101
2017	53	136
2018	65	140
2019	60	153
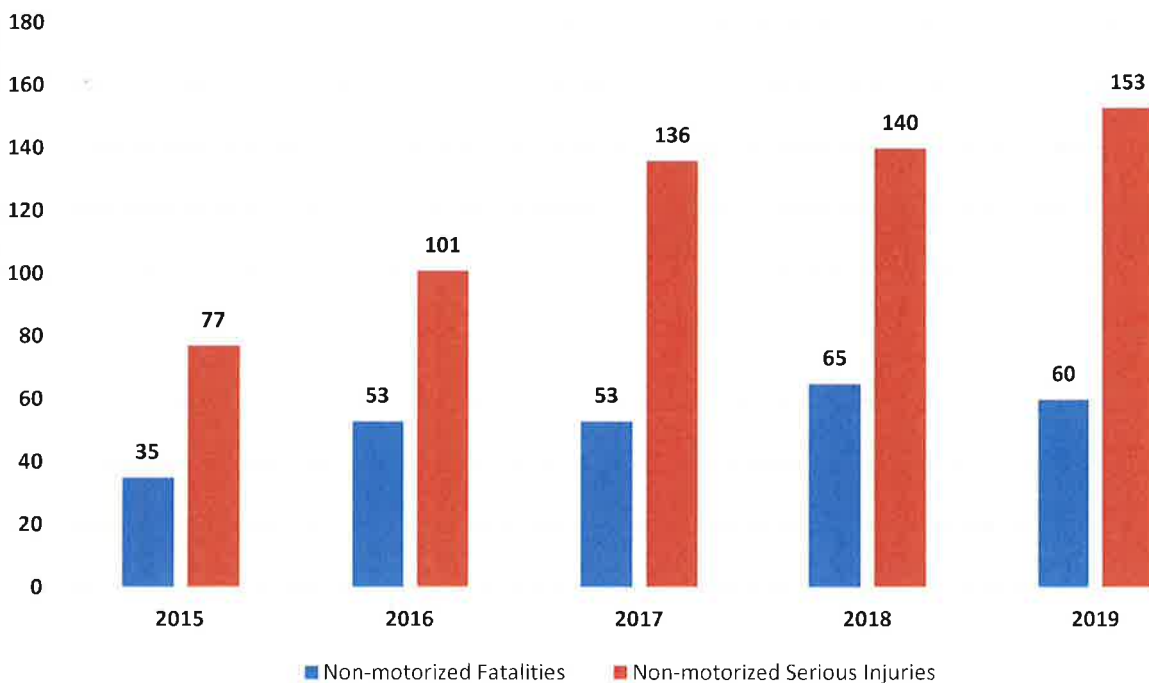
Step Four: Apply Adjustment Factors

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 twenty percent adjustment factor can be justifiably applied to the Number of Fatalities and Rate of Fatalities safety performance measures. This adjustment factor is based on the average percent increase of multiple external factors such as the increase in speeding citations (77%), DWI citations (3%), aggressive operation crashes (35%), and agencies reporting crashes (18%).

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 has

increased in 2019 compared to previous years, as shown in Figure 3. Therefore, it was determined that the 50 percent adjustment factor continue to be applied to the Number of Non-Motorized Fatalities and Serious Injuries performance measure, as it has been in previous years.

It was also mutually agreed upon by safety stakeholders that an adjustment factor of two percent should be applied to the Number of Serious Injuries and Rate of Serious Injuries safety performance measures. This adjustment factor is less than others due to the serious injury definition change in 2018, which caused the total number of serious injuries to decrease significantly.

TARGETS

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

Table 3 – 2022 Performance Targets

Performance Measure	Average[1]	Adjustment Factor[2]	Target
Number of Fatalities	526.3	+20%	631.5
Rate of Fatalities	1.507	+20%	1.808
Number of Serious Injuries	2,938.2	+2%	2,996.9
Rate of Serious Injuries	8.439	+2%	8.608
Number of Non-Motorized Fatalities and Serious Injuries	152.8	+50%	229.2

[1] See Table 2

[2] 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 2021 & 2022 Performance Targets

Performance Measure	2021			2022		
	Average	Adjust.	Target	Average[1]	Adjust	Target
Number of Fatalities	525.8	+2%	536.3	526.3	+20%	631.5
Rate of Fatalities	1.529	+2%	1.560	1.507	+20%	1.808
Number of Serious Injuries	3,042.9	+2%	3,103.8	2,938.2	+2%	2,996.9
Rate of Serious Injuries	8.886	+2%	9.043	8.439	+2%	8.608
Number of Non-Motorized Fatalities and Serious Injuries	146.8	+50%	220.3	152.8	+50%	229.2

[1] See Table 2

FHWA ASSESSMENT OF 2020 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 2020, the assessment will be made in December of 2021 by comparing the actual 2016-2020 performance to the 2020 targets and the 2014-2018 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 all of the targets except for the total number of fatalities. Therefore, FHWA will consider ARDOT as having "made significant progress" and thus avoid the penalty associated with safety performance.

Table 5 – 2020 Performance Assessment

Performance Measure	2016-2020 Average	2020 Targets	2014-2018 Baseline	Meets Target?	Better than Baseline?	Met or Made Significant Progress?
Number of Fatalities	550.6[1]	541.2	524.4	No	No	**YES** (4 out of 5 targets met or made significant progress)
Rate of Fatalities	1.512[1]	1.595	1.475	Yes	No	
Number of Serious Injuries	2,583.4[2]	3,201.4	2,832.4	Yes	Yes	
Rate of Serious Injuries	7.097[2]	9.441	7.992	Yes	Yes	
Number of Non-Motorized Fatalities and Serious Injuries	199.4[2]	300.3	160.2	Yes	No	

Notes:

[1]Value is based on the actual FARS fatality numbers for 2016, 2017 and 2018, NSC numbers for 2019 and 2020.
Example: Number of Fatalities = (561+525+516+511+640)/5=550.6

[2]Value is based on the actual serious injury numbers for 2016-2019, and an assumed number for 2020.

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

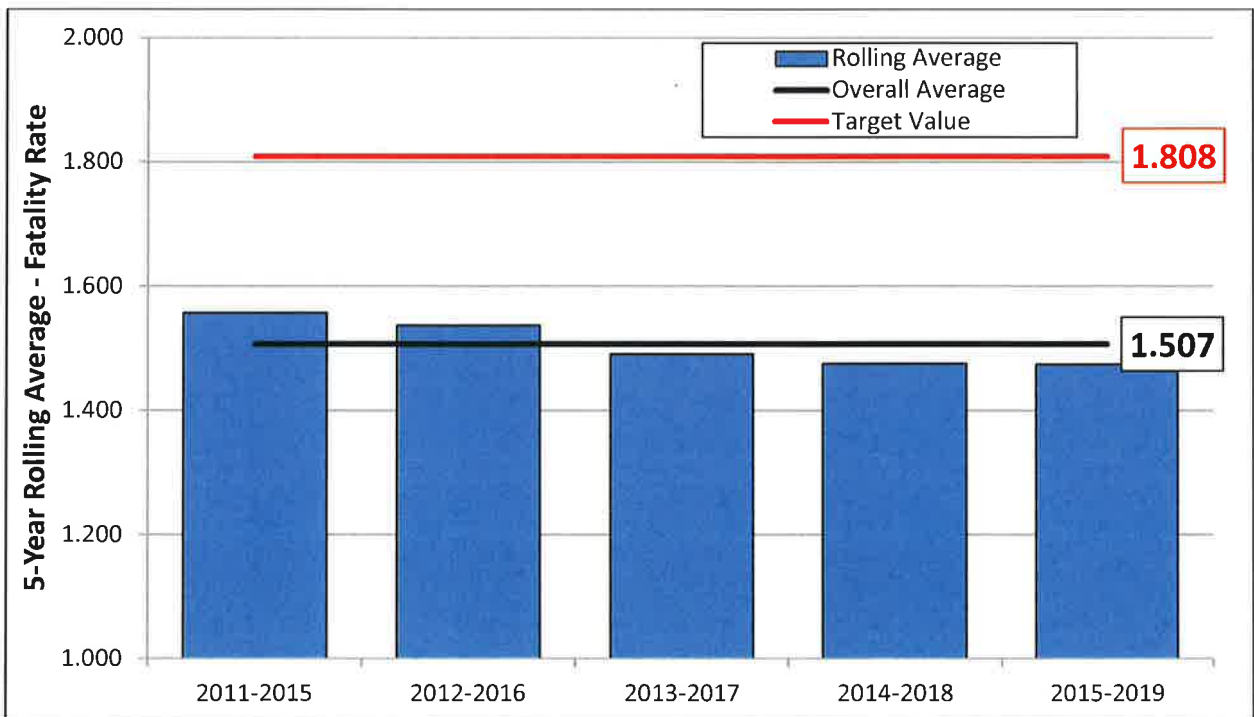| Number of Fatalities				
2015	550	Mean	532.6	
2016	561	Standard Deviation	20	
2017	525	Coefficient of Variation	4%	
2018	516			
2019	511			
Rate of Fatalities				
2015	1.576	Mean	1.474	
2016	1.569	Standard Deviation	0.083	
2017	1.443	Coefficient of Variation	6%	
2018	1.407			
2019	1.377			
Number of Serious Injuries				
2015	2,888	Mean	2679.4	
2016	3,032	Standard Deviation	296	
2017	2,816	Coefficient of Variation	11%	
2018	2,272			
2019	2,389			
Rate of Serious Injuries				
2015	8.276	Mean	7.426	
2016	8.480	Standard Deviation	1	
2017	7.739	Coefficient of Variation	13%	
2018	6.195			
2019	6.440			
Number of Non-Motorized Fatalities and Serious Injuries				
2015	112	Mean	174.6	
2016	154	Standard Deviation	37	
2017	189	Coefficient of Variation	21%	
2018	205			
2019	213			

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.
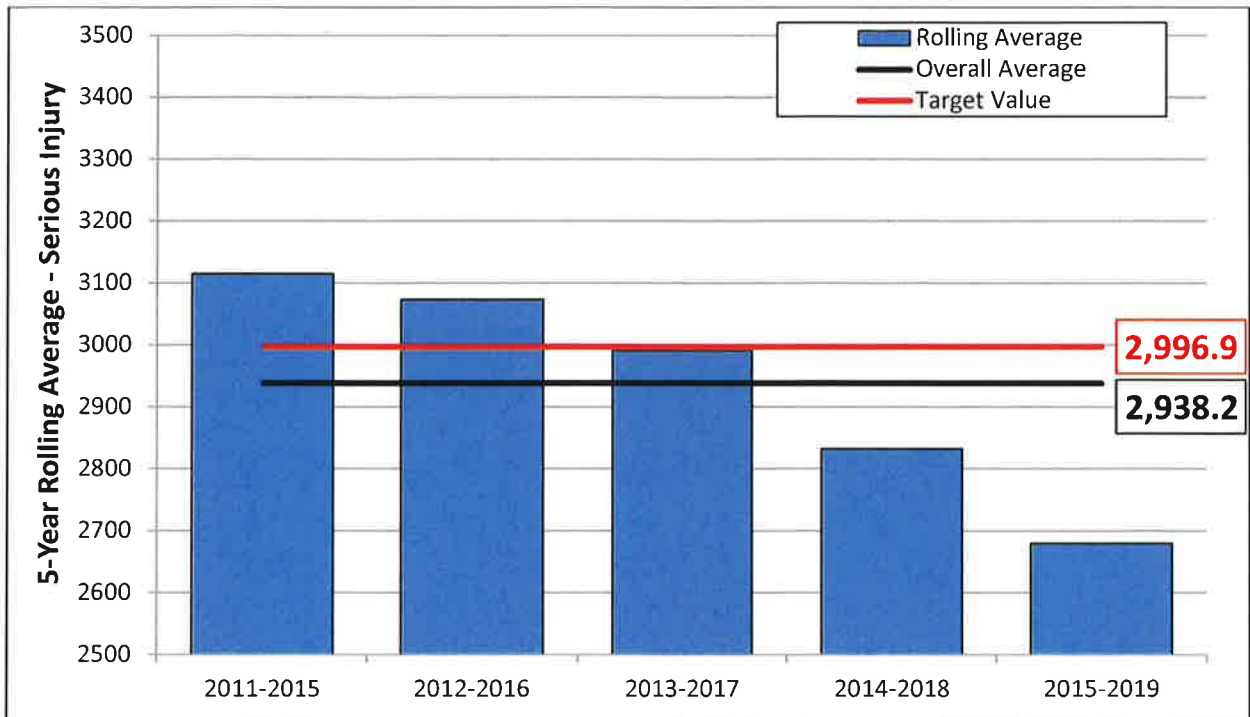
ATTACHMENT B

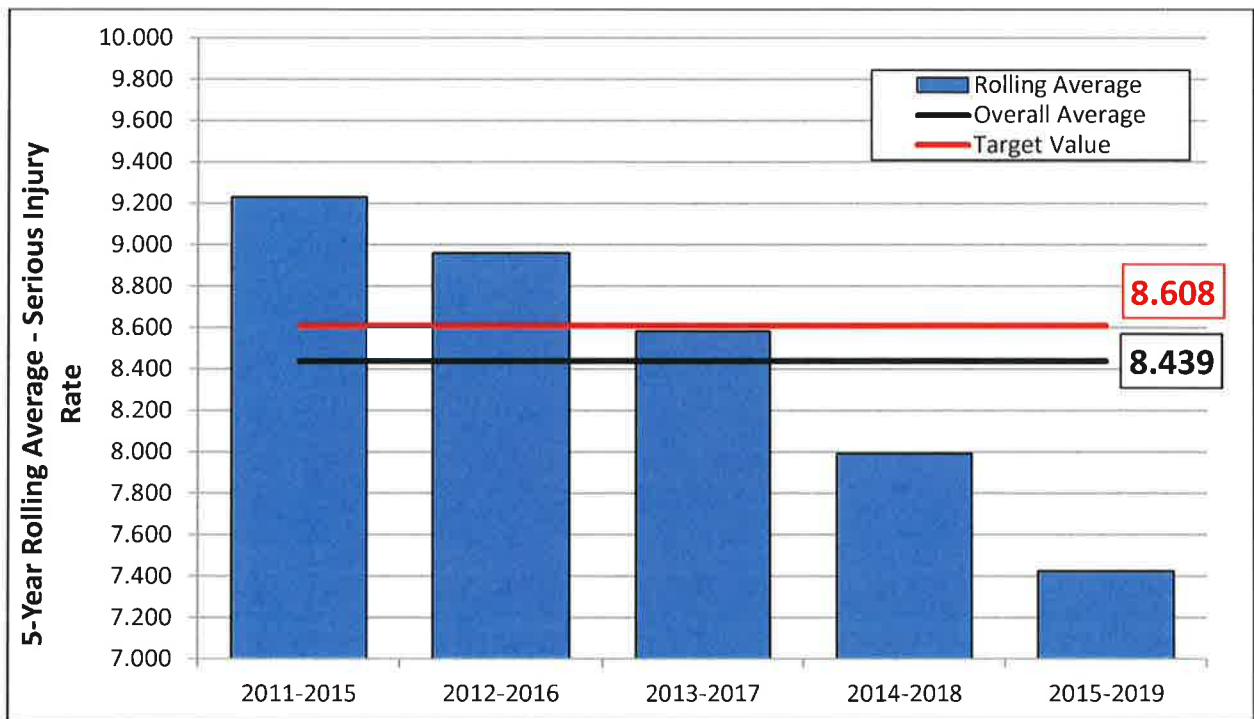## HSIP 2022 Target – Number of Fatalities
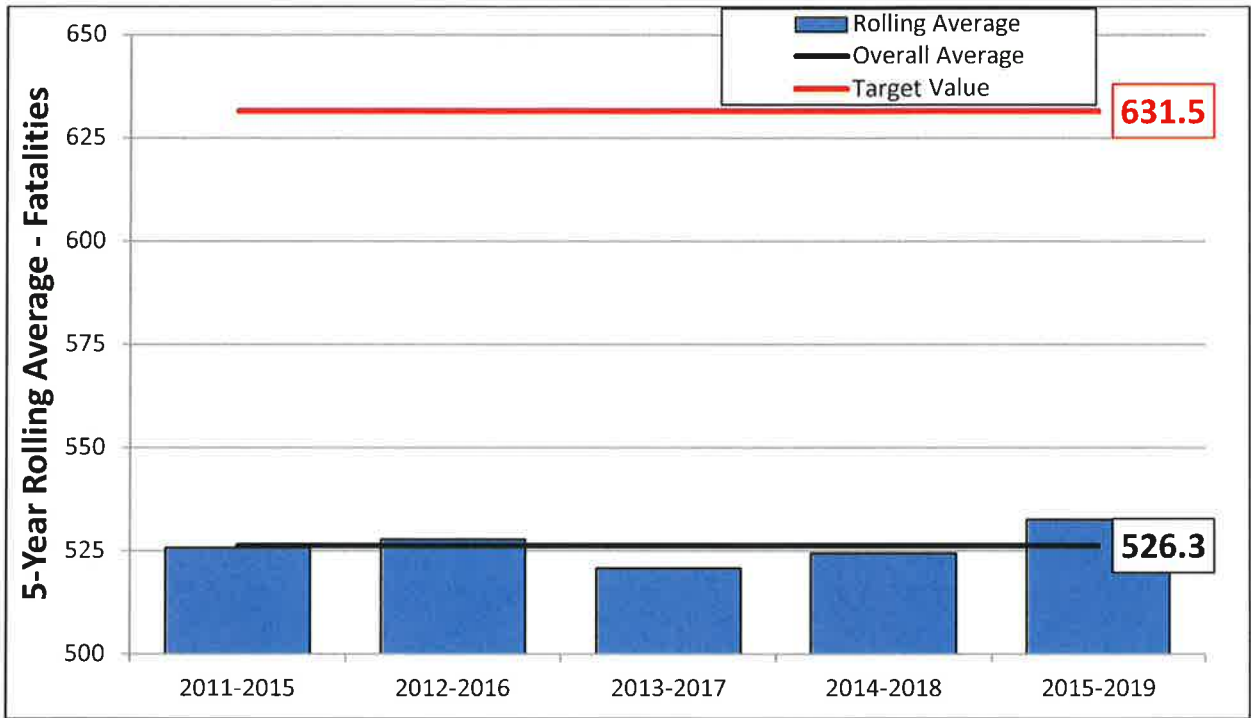
HSIP 2022 Target – Fatality Rate

HSIP 2022 Target – Number of Serious Injuries

HSIP 2022 Target – Serious Injury Rate

HSIP 2022 Target - Number of Non-Motorized Fatalities and Serious Injuries