Assessing Safety Performance
Highway Safety Improvement Program
2020 Targets

Target Summary

Measure (5-year rolling average)	Baseline Condition (2014-2018)	2020 Targets (2016-2020)
Number of Fatalities	987.4	999.4
Rate of Fatalities per 100 million VMT	0.99	0.97
Number of Serious Injuries	5,415.6	5,520.4
Rate of Serious Injuries per 100 million VMT	5.41	5.34
Number of Non-motorized (Pedestrian and Bicycle) Fatalities and Serious Injuries	742.4	735.8

Vehicle Miles Traveled (VMT)

Performance Measure Description

Five performance measures were established for the purpose of carrying out the Highway Safety Improvement Program (HSIP), as noted in the Target Summary, and are based on a 5-year rolling average. The measures will be used to assess traffic fatalities and serious injuries on all public roads regardless of jurisdiction. The intent is to improve national safety data by providing greater consistency in reporting, improve transparency through use of a public reporting system, and enable targets and progress to be aggregated at the national level. The regulation will provide the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA) the ability to better communicate a national safety performance story.

Establishing targets is a coordinated effort between the Michigan Department of Transportation (MDOT), the Michigan State Police Office of Highway Safety Planning (MSP-OHSP), and the Michigan Metropolitan Planning Organizations (MPOs). Targets for three of the five measures must be reported to both FHWA and NHTSA, by MDOT and MSP-OHSP respectively, and must be identical. The three measures are: The number of fatalities, rate of fatalities per 100 million Vehicle Miles Traveled (VMT), and number of serious injuries.

MSP-OHSP annually reports the baseline and targets for the subsequent year to NHTSA by July 1 in the Highway Safety Program, thus significant effort must be made to reconcile crash data by May 1 to meet the deadline. The program focuses on reducing fatalities, injuries, and economic losses result from vehicle crashes through behavioral traffic safety programs. MDOT reports the baseline condition and targets to FHWA by August 31, 2019, as part of the HSIP report, and the MPOs have an additional 180 days to report their respective targets to MDOT. The HSIP focuses on reducing fatalities and injuries on all public roads through infrastructure programs and projects to improve safety.

Methodology

Existing Trend

The Code of Federal Regulations, Title 23, Chapter I, Subchapter E, Part 490, Subpart B §490.207 prescribes the calculation methodology for each of the five performance measures, summarized as follows: Each performance measure is based on a five-year rolling average. The calculation is the sum of the most recent five consecutive years ending in the year for which the targets are established, dividing by five, and rounding to the tenth decimal place for each measure. The data is obtained from either the Fatalities Analysis Reporting System (FARS) or the State of Michigan Crash Database. For each rate measure, first calculate the number of fatalities or serious injuries per 100 million VMT for the most recent five consecutive years, divide by five, and round to the tenth decimal place.

External/Exogenous Factors and Risk Assessment

The respective parties agreed to utilize a fatality prediction model developed and maintained by the University of Michigan Transportation Research Institute (UMTRI). The UMTRI model relies on results of a recently completed research report titled Identification of Factors Contributing to the Decline of Traffic Fatalities in the United States, which was completed as part of the National Cooperative Highway Research Program project 17-67 (presentation). The model, predicting the change in counts of fatalities, relies on the correlation between traffic crashes, vehicle miles traveled (VMT), and risk. UMTRI identified four factors that can influence the outcome: the economy, safety and capital expenditures, vehicle safety, and safety regulations. Within the model, economic factors such as the Gross Domestic Product (GDP) per capita, median annual income, the unemployment rate among 16 to 24-year old's, and alcohol consumption had the greatest impact at approximately 85 percent.

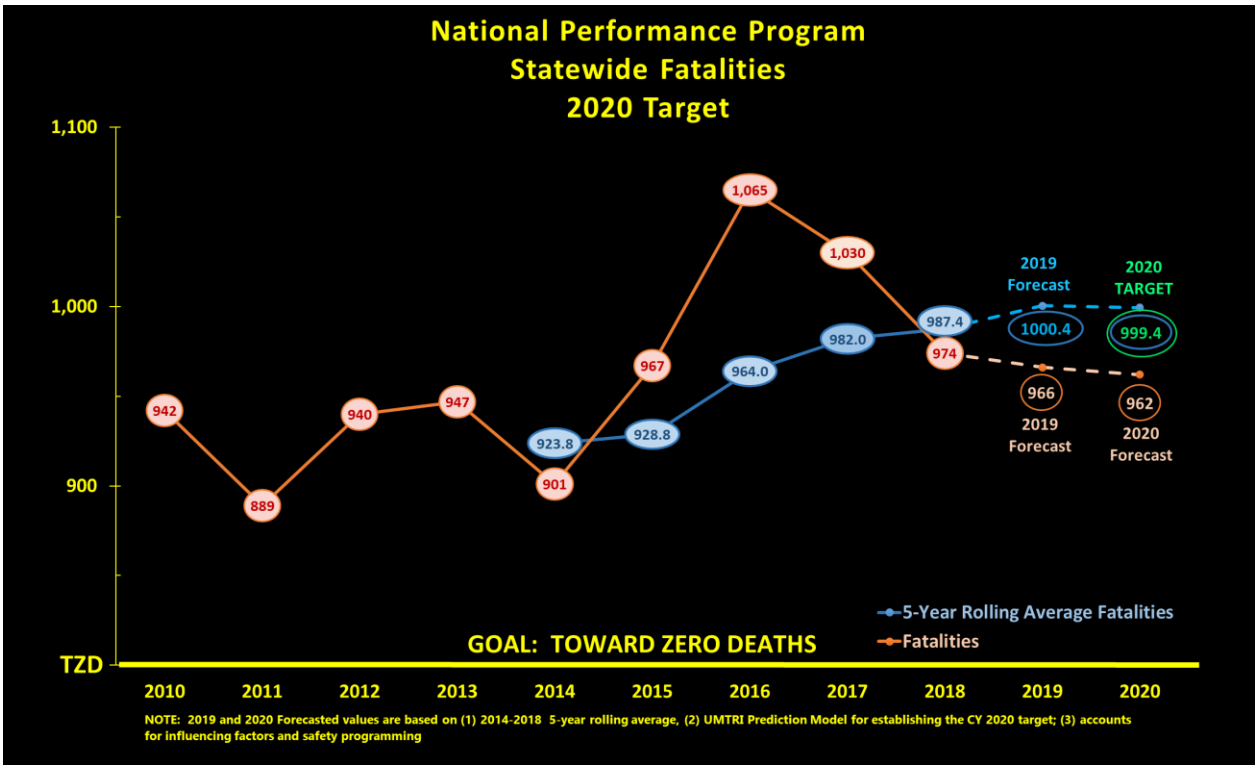
Target Overview

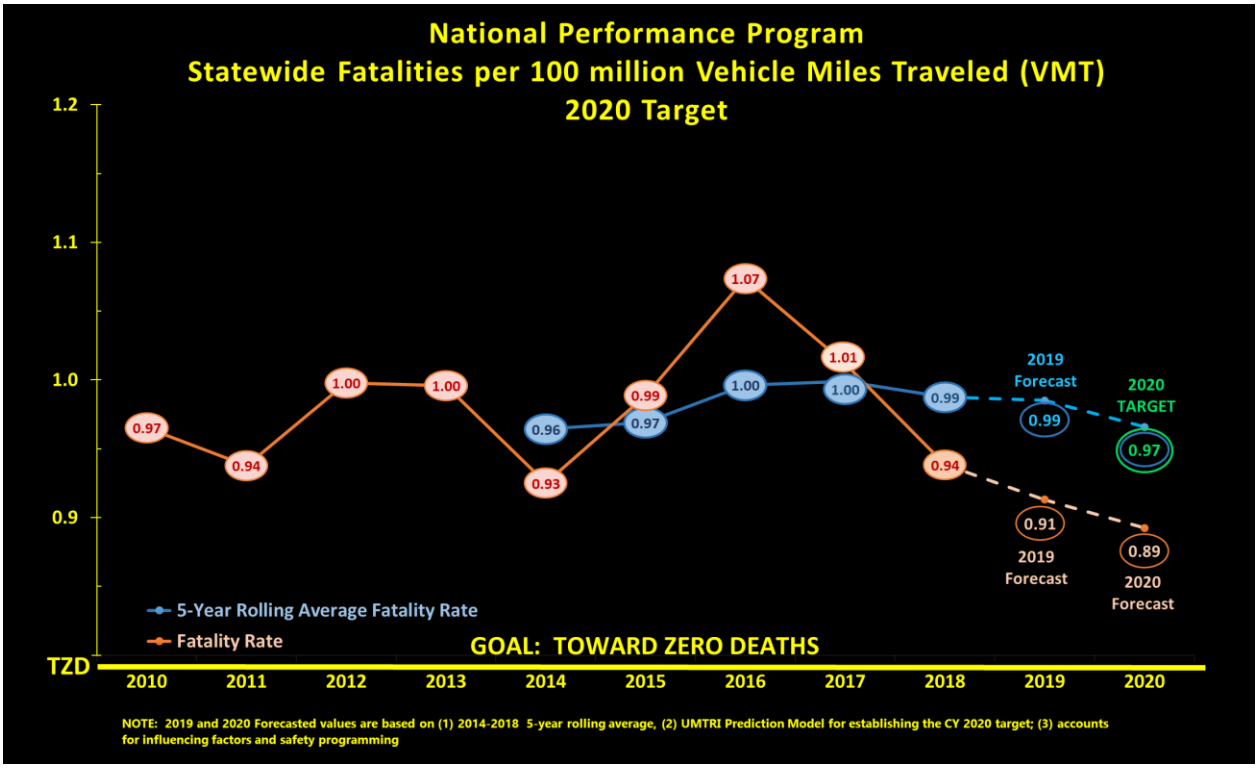
To determine a forecasted value for the five-year rolling average for the first four measures listed above, the decision was made to use the model created by UMTRI like that used for establishing CY 2019 targets in 2018. The change model created by UMTRI predicts 966 fatalities in CY 2019, and 962 in 2020. While serious injuries have fluctuated over the past three years, the linear relationship of the ratio of serious injuries and fatalities (A/K) is still evident. However, this trend suggests greater reduction in serious injuries. Therefore, a quadratic trend is being used that projects a flattening pattern. The model predicts 5,181 serious injuries in CY 2018, and 5,117 in 2019.

VMT values have been predicted for CYs 2018, 2019 and 2020. Using the fatal and serious injury values, along with the respective predicted VMT, the forecasted fatality rates are 0.91 for CY 2019, and 0.89 for CY 2020, and annual serious injury rates of 4.90 for CY 2019, and 4.75 for CY 2020. Results from the UMTRI model (the fatality and serious injury relationship) were also used to generate non-motorized forecasted annual values of 710 for CY 2019, and 699 for CY 2020.

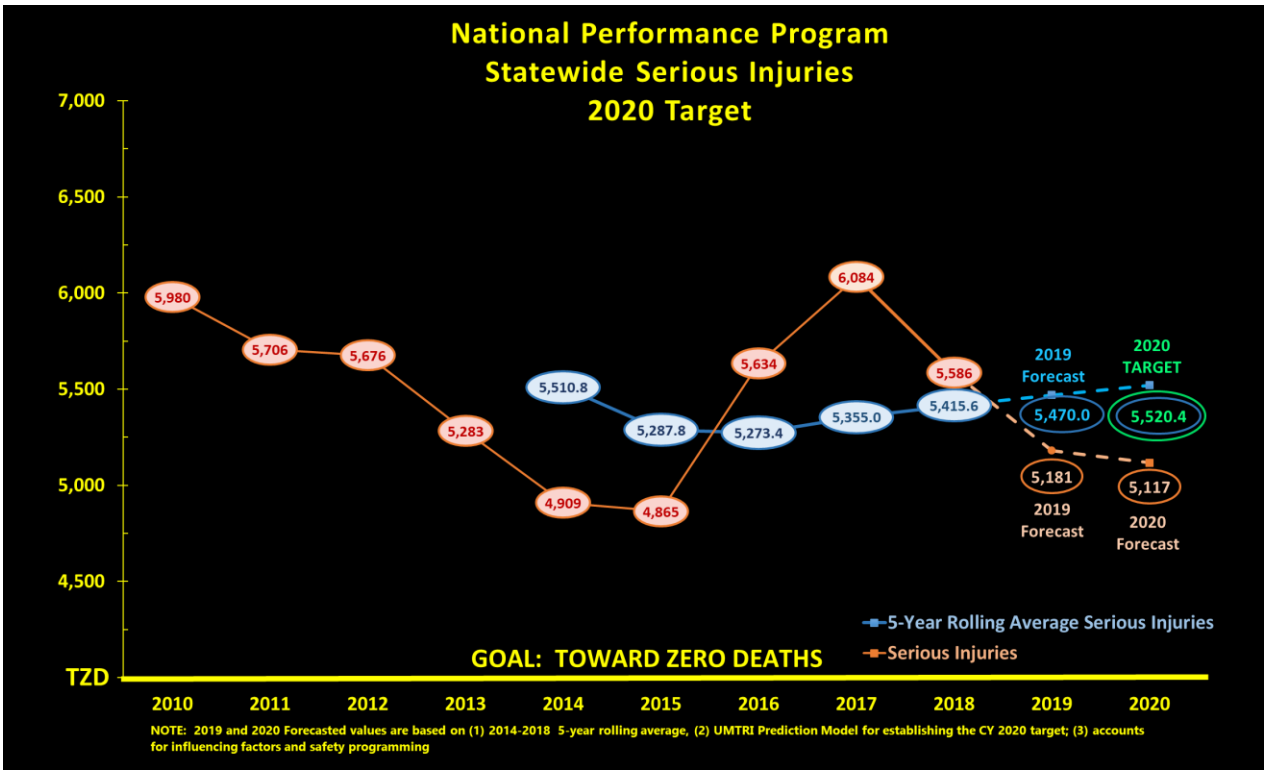
The above annual forecasted values for CY 2019 and CY 2020 along with the actual values from CY 2016 to 2018 to determine the 2020 Targets (five-year rolling average) are shown in the table. In addition, actual values dating back to CY 2010 are included as part of the determination of the 2018 baseline condition.

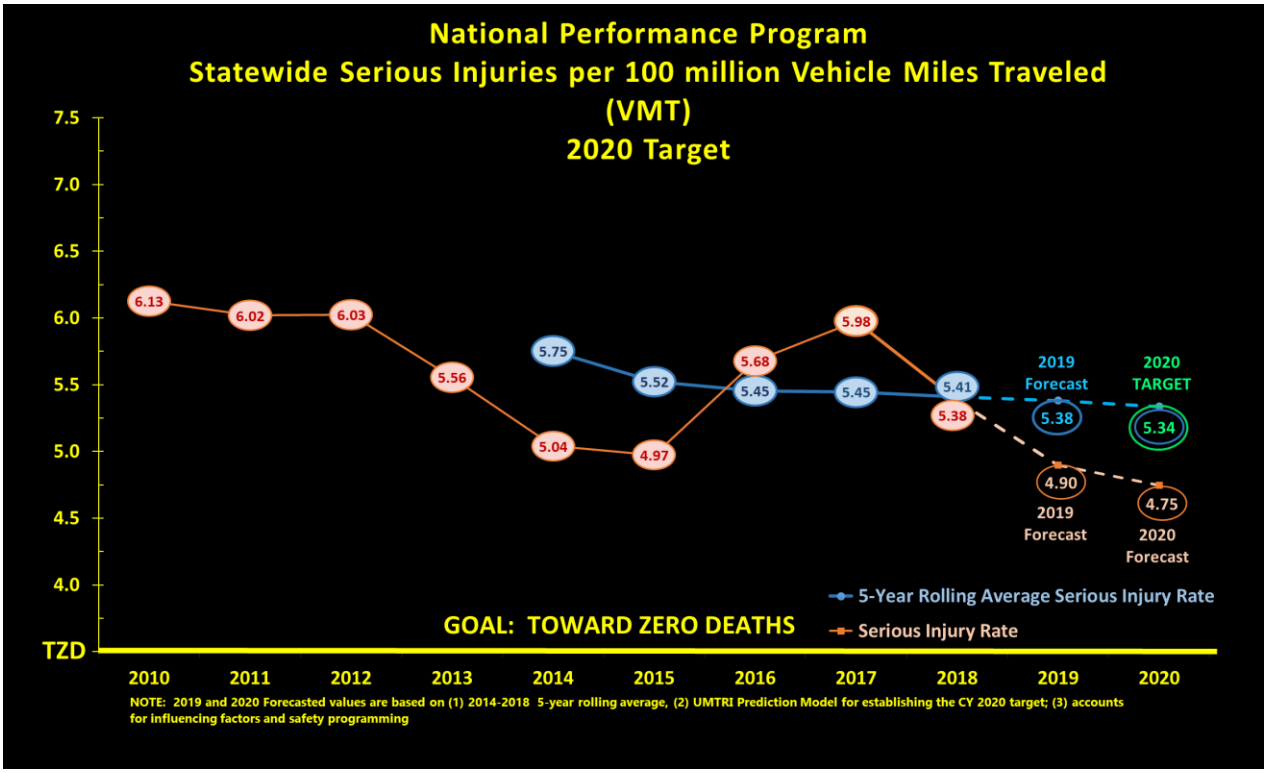
Assessing Safety Performance
Highway Safety Improvement Program
2020 Targets



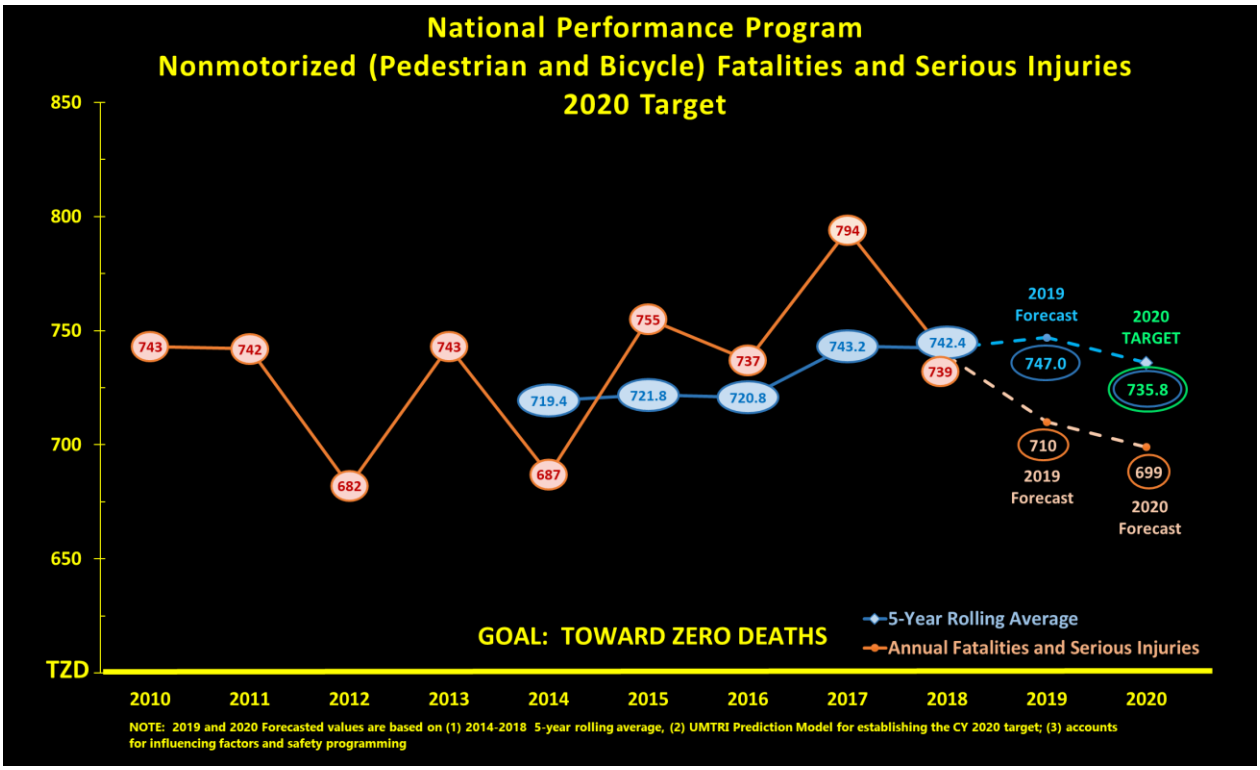


Assessing Safety Performance
Highway Safety Improvement Program
2020 Targets





Assessing Safety Performance
Highway Safety Improvement Program
2020 Targets



*Vehicle Miles Traveled (VMT) are shown in 100 million miles traveled. Calendar year 2018 to 2020 values were estimated were made by determining the percent change in VMT for prior years of actual data and estimating future years by applying the percent change. Bolded values are forecasted, not actual.

State Safety Target Data – Calendar Year 2020 Targets in Red

Year	Fatality	Serious Injuries	5yr Moving Average		VMT*	Fatality Rate	Serious Injury Rate	5yr Moving Average		Bike Ped Fatality/ Serious Injuries	Bike Ped Fatality/ Serious Injuries 5yr MA
			Fatality	Serious Injuries				Fatality Rate	Serious Injury Rate		
2010	942	5,980			976	0.97	6.13			743	
2011	889	5,706			948	0.94	6.02			742	
2012	940	5,676			942	1.00	6.03			682	
2013	947	5,283			951	1.00	5.56			743	
2014	901	4,909	923.8	5,510.8	974	0.93	5.04	0.96	5.75	687	719.4
2015	967	4,865	928.8	5,287.8	978	0.99	4.97	0.97	5.52	755	721.8
2016	1,065	5,634	964.0	5,273.4	992	1.07	5.68	1.00	5.45	737	720.6
2017	1,030	6,084	982.0	5,355.0	1018	1.01	5.98	1.00	5.45	794	743.2
2018	974	5,586	987.4	5,415.6	**1038**	0.94	5.38	0.99	5.41	739	742.4
2019	**966**	**5,181**	**1,000.4**	**5,470.0**	**1058**	**0.91**	**4.90**	**0.99**	**5.38**	**710**	**747.0**
2020	**962**	**5,117**	999.4	5,520.4	**1078**	**0.89**	**4.75**	0.97	5.34	**699**	735.8