COMMONWEALTH *of* VIRGINIA

Office of the

SECRETARY *of* TRANSPORTATION

Transportation Performance Management
2023 Safety Measure Targets

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Safety Performance Management Background

- MAP-21 federal law establishes performance targets for Safety
  - (5 measures)
- Safety targets must be established annually
- VDOT and Department of Motor Vehicles' Highway Safety Office coordinate on 3 of the 5 performance measures
- DMV must report targets to NHTSA by June 30
- VDOT must report targets to FHWA by August 31
- FHWA makes an annual determination of a states progress towards achievement of its targets

Safety Performance Management
Federal Measures

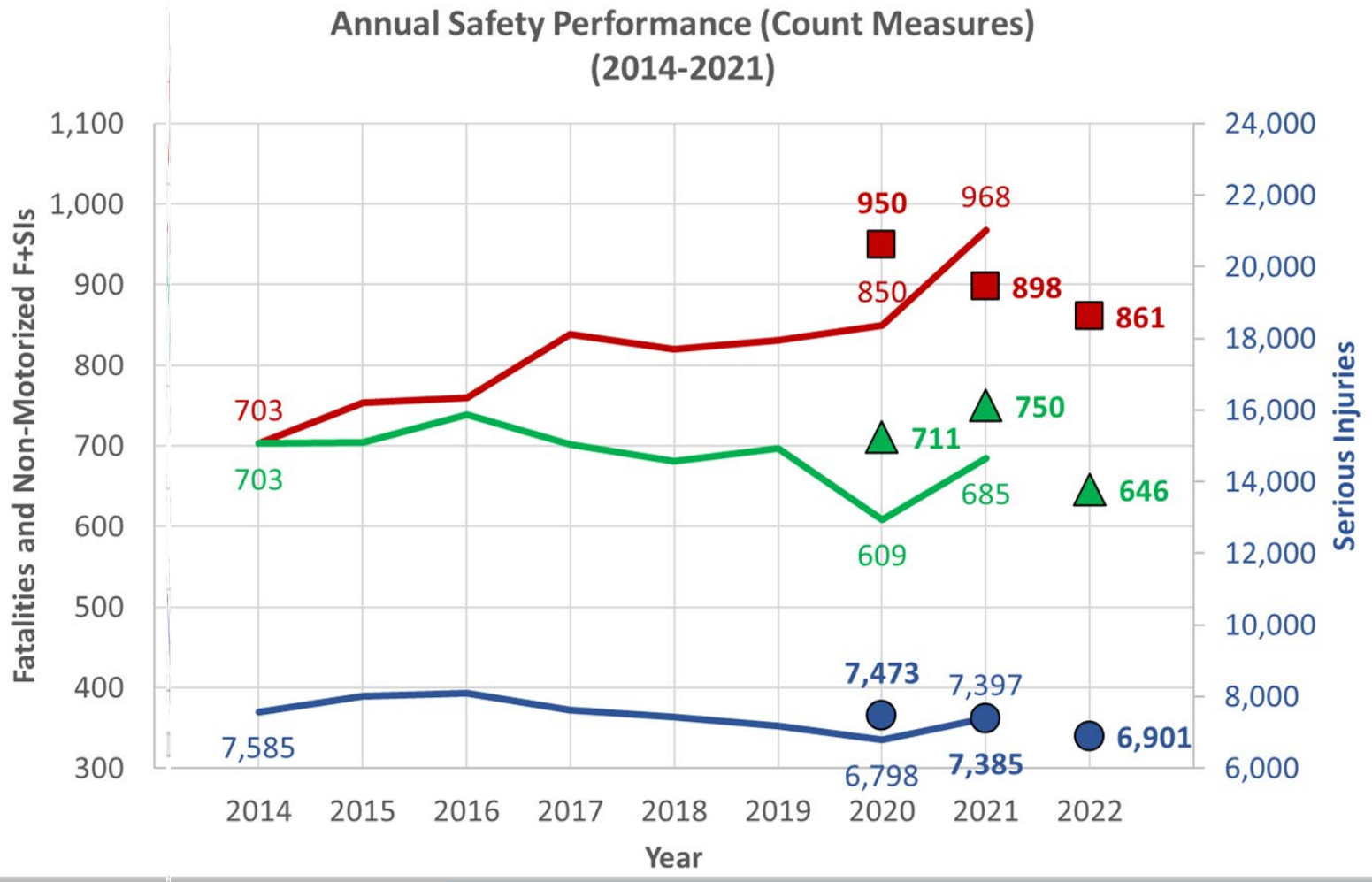
What do we measure?

- Number of fatalities* - person involved died at scene or within 30 days
- Number of serious injuries* - suspected serious injury, typically taken to hospital
- Rate of fatalities per 100M vehicle miles traveled*
- Rate of serious injuries per 100M vehicles miles traveled
- Number of non-motorized, bicyclist and pedestrian, fatalities and serious injuries

*Federal measures requiring coordination with the Governor's Highway Safety Office.

Safety Performance Management
Performance and Targets

How are we doing?

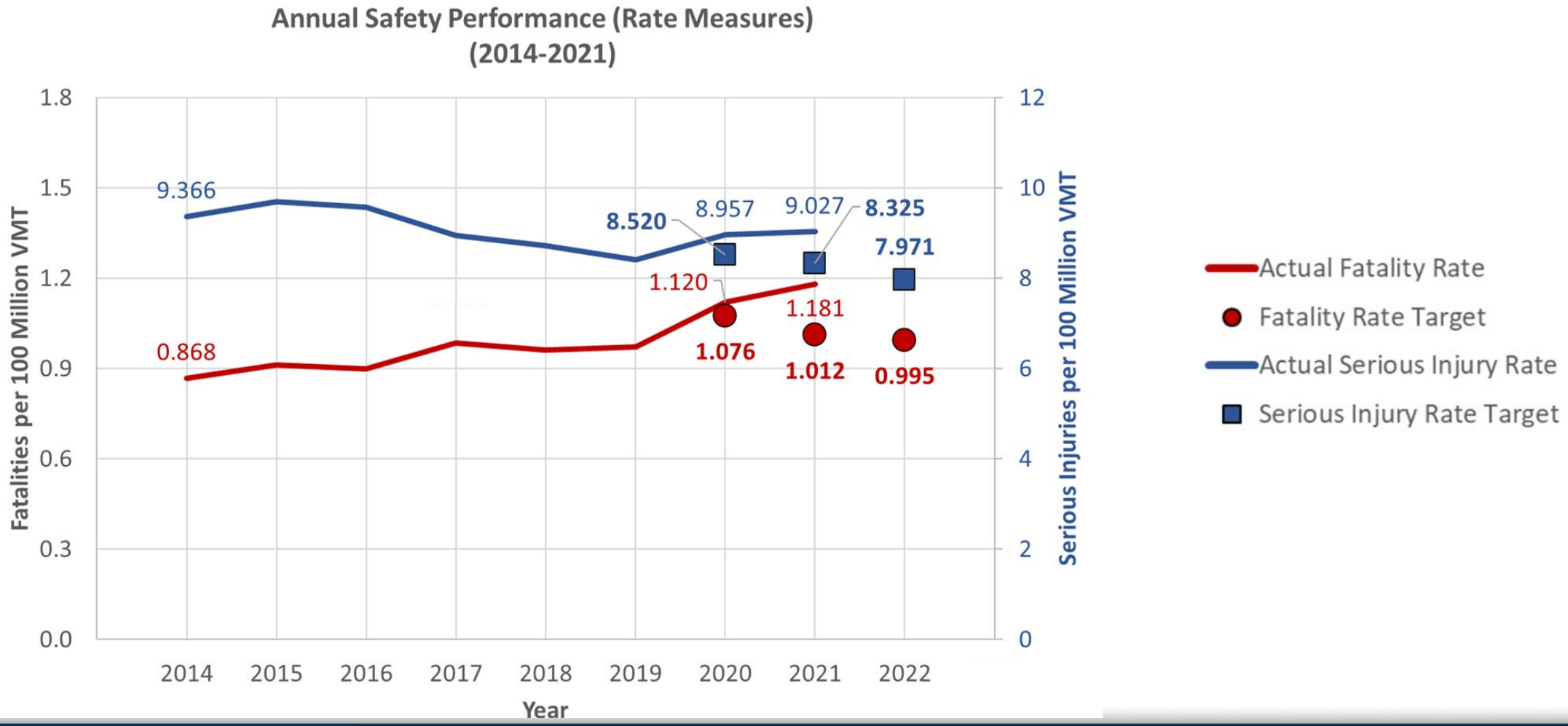


Board adopted targets beginning in 2019 using a model-based approach

- Actual Annual Fatalities (FARS)
- Fatalities Target
- Actual Annual Non-Motorized F+SI
- Non-Motorized F+SI Target
- Actual Annual Serious Injuries
- Serious Injuries Target

Safety Performance Management
Performance and Targets

How are we doing?



FHWA Determination of "Significant Progress"

- Annually, FHWA makes a determination of **Significant Progress** towards meeting the safety performance targets based on five-year average measures submitted
- **Significant Progress** determination - at least four of the five targets were met OR target must be better than the baseline (two years prior) value
- If **Significant Progress** is not made, the state must:
  1. Prepare and Submit an Highway Safety Implementation Plan to FHWA by June 30 stating what the state is doing to meet targets, and
  2. Must obligate 100% of the amount of HSIP funds for the year that the targets were set

Based on FHWA's determination, Virginia **MADE Significant Progress** towards the 2020 targets

- Four of the Five targets were met
- The Rate of Serious Injury target was not met

Safety Performance Management
Target Setting Steps

Key steps to develop 2023 targets:

Step 1: Update and refine predictive model to establish baseline target values

Step 2: Incorporate anticipated annual reductions of projects that were recently or soon to completed

Step 3: Combine results from steps 1 and 2 to establish proposed 2023 targets

Step 1: Update and Refine Predictive Model to Determine Baseline

Updating and refining the predictive baseline model involves:

A. Updating with new data and calibrating the model

B. Validating against actual 2021 data

C. Updating model factors* to predict 2023 baseline target values

2023 Baseline Predictions				
Year	Fatalities	Serious Injuries	Ped/Bike Fatalities + Serious Injuries	VMT
2023	**1021**	**7551**	**677**	**83,216**

*Factor: variables that can influence safety outcomes.

Prediction Model Factors and Measure Effects

Factor By District	Effect on Fatal Crashes	Effect on Serious Injury Crashes	Effect on Bike/Ped Crashes
VMT growth	↑	↑	↑
Increasing local functional class percent of VMT	↑	↑	↑
Increasing young population (15-24)	↑	↑	↑
Increasing aging population (75+)	↑	↑	
Gallons Liquor Sold		↑	
Liquor licenses			↑
Increased highway resurfacing spending	↓		
Increased emergency/incident management spending	↓		
Increased total behavioral programs spending	↓	↓	↓
Increased roadway maintenance spending		↓	
Increased average snowfall per month			↓
Increased rural functional class percent of VMT			↓

VMT: Vehicle Miles Traveled

↕ = Increases Effect
= Decreases Effect

Step 2: Incorporate Anticipated Annual Crash Reductions from Projects

A. Identify SMART SCALE and HSIP projects completed or to be completed between January 2022 and March 2023

B. Categorize projects by crash type - **spot and corridor projects**, **hybrid projects**, and **systemic improvement** projects

C. Identify crash history for each project and evaluate project scope to estimate potential reductions in crashes that may result from project construction

- Estimate reductions using SMART SCALE scoring methodology

A. Calculate annual crash reductions by crash type

Step 2: Quantify Anticipated Annual Crash Reductions from Projects

Reviewed 200 SMART SCALE and HSIP

- More than 5,500 Fatal and Serious Injury crashes at those project locations
- Systemic project return on investment is 50 to 90 times greater than spot/corridor projects

Anticipated Annual Crash Reductions from Projects*			
Description	Fatalities	Serious Injuries	Ped/Bike F + SI
Spot/Corridor Reduction	2	16	2
Hybrid Reduction	1	3	0
Systemic Reduction	6	67	13
Total Anticipated Annual Reductions (Benefits)	**9**	**86**	**15**

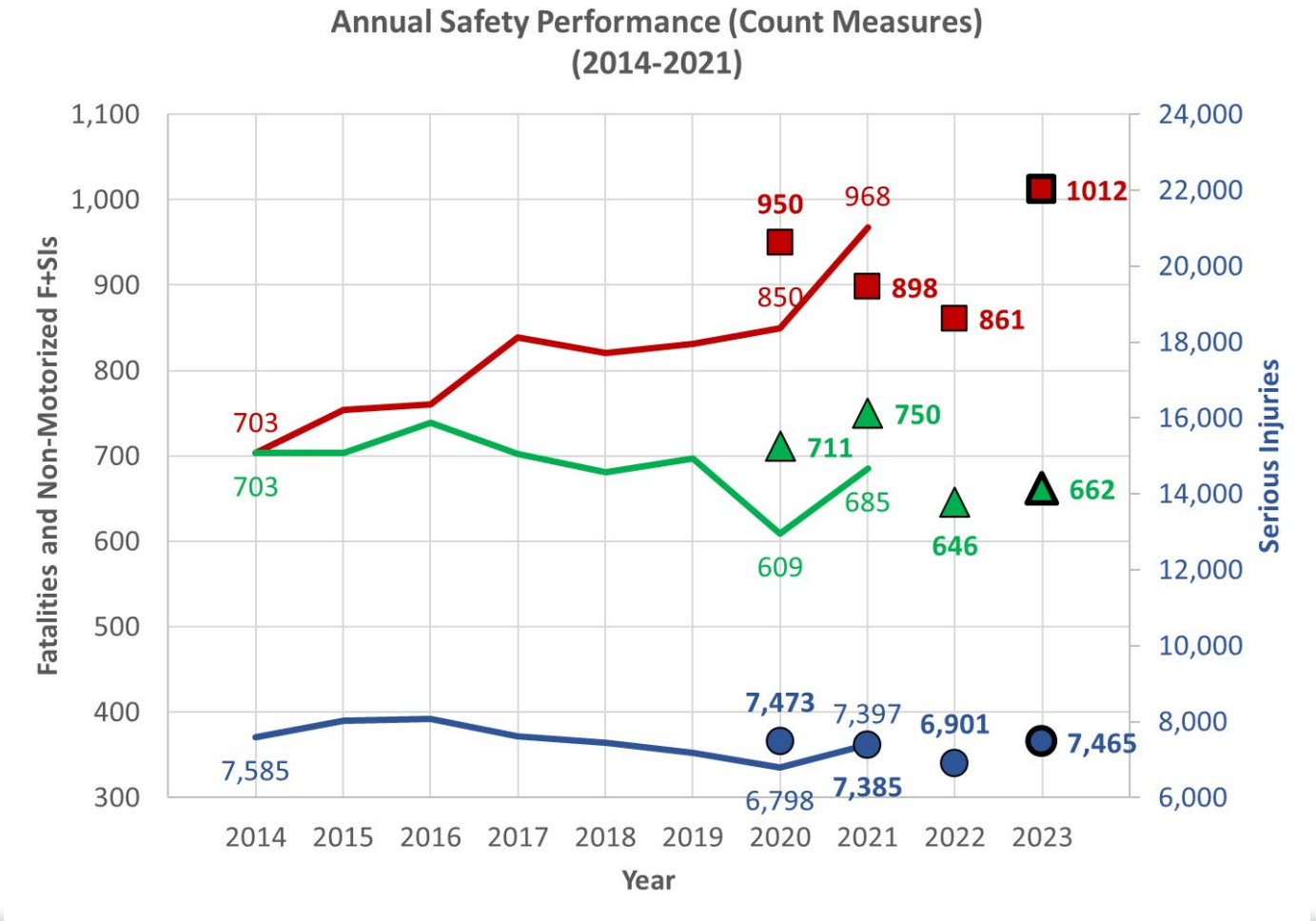
*All values have been rounded

Step 3: Proposed 2023 Safety Measures Targets

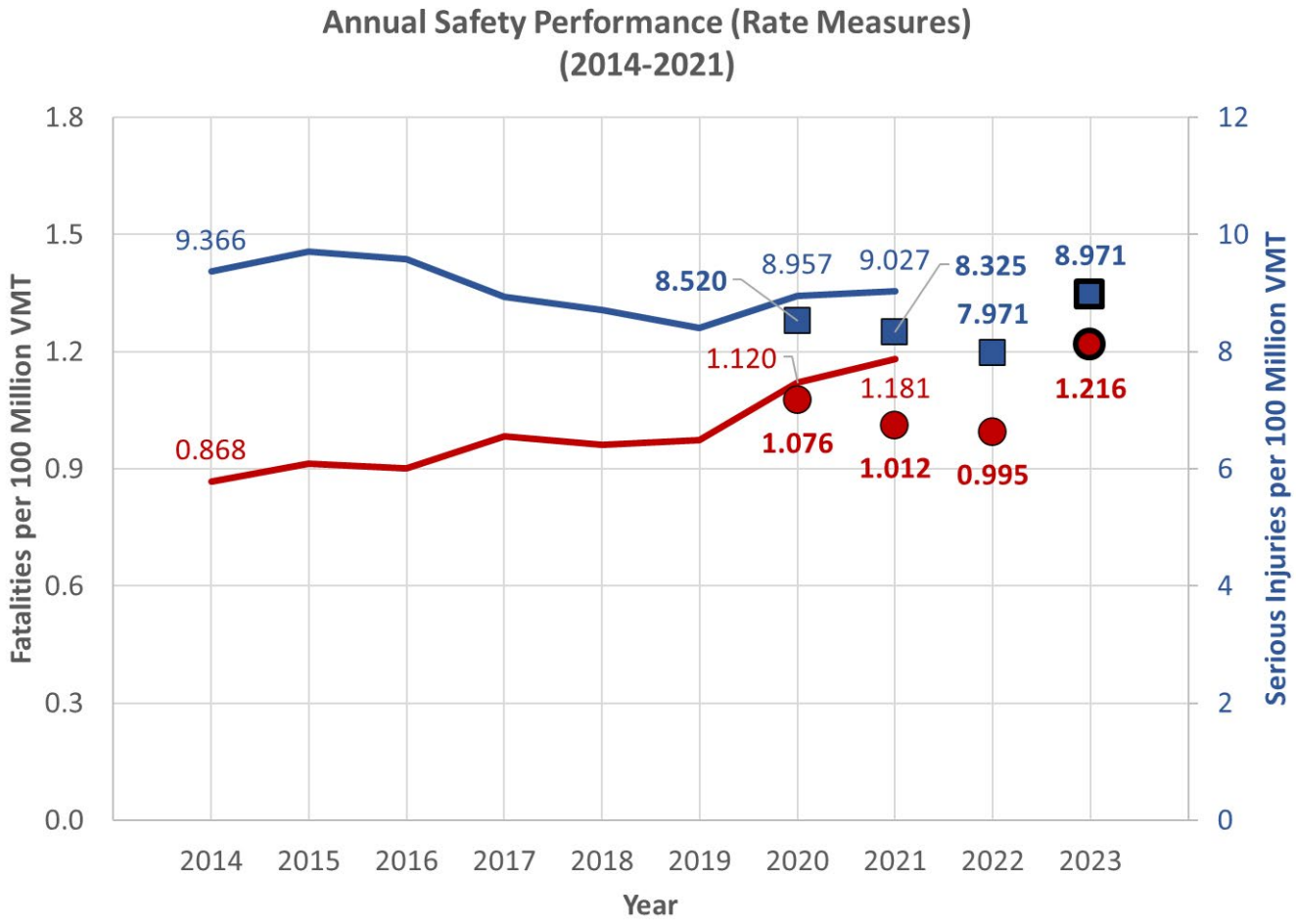
Combine the baseline predictions (Step1) with project benefits (Step 2) to establish targets

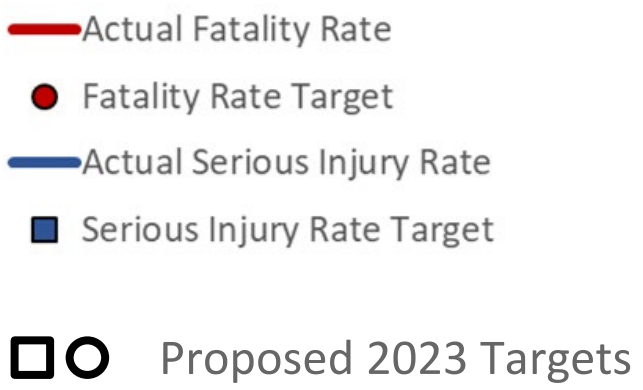
Calculating Proposed 2023 Safety Targets					
Description	**Fatalities**	**Fatality Rate**	**Serious Injuries**	**Serious Injury Rate**	**Ped/Bike F & SI**
STEP 1: Update and refine predictive model to establish baseline	1021	1.227	7511	9.074	677
STEP 2: Incorporate anticipated annual reductions of projects that were recently or soon to completed	9	---	86	---	15
STEP 3: Proposed 2023 Targets	**1012**	**1.216**	**7465**	**8.971**	**662**

Safety Performance Management
Target Performance Comparison



Safety Performance Management
Target Performance Comparison





Proposed 2023 Targets

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Thank you.

Crash Heat Maps By Emphasis Areas

2017-2021 Fatalities + Serious Injuries

	Impaired Driving	Speeding	Occupant Protection	Roadway Departure	Intersections	Young Drivers	Bicyclists	Pedestrians	Aging Road Users	Motorcyclists	Heavy Vehicles
Total	14,585	13,431	8,192	16,488	14,141	6,325	699	2,689	7,734	3,957	3,581
Impaired Driving	-	***5,497***	***3,949***	***7,058***	***4,496***	2,076	***172***	***1,071***	***1,935***	812	***1,054***
Speeding	***5,497***	-	***3,949***	***7,166***	***3,227***	***2,498***	59	295	1,724	***1,332***	***1,231***
Occupant Protection	3,949	***3,949***	-	***5,047***	2,131	1,318	0	11	939	2	709
Roadway Departure	***7,058***	***7,166***	***5,047***	-	0	***2,493***	27	0	***1,985***	***1,326***	***1,206***
Intersections	***4,496***	3,227	2,131	0	-	***2,372***	***412***	***1,225***	***3,426***	***1,383***	861
Young Drivers	2,076	2,498	1,318	2,493	2,372	-	***146***	204	633	322	331
Bicyclists	175	60	0	28	414	149	-	1	144	3	21
Pedestrians	1,103	309	11	0	1,240	208	1	-	632	7	147
Aging Road Users	1,938	1,726	939	1,985	***3,427***	633	144	***621***	-	604	775
Motorcyclists	824	1,348	2	1,333	1,399	327	3	7	612	-	105
Heavy Vehicles	1,054	1,231	709	1,206	861	331	21	141	774	103	-

LEGEND

EA Proportion by Column

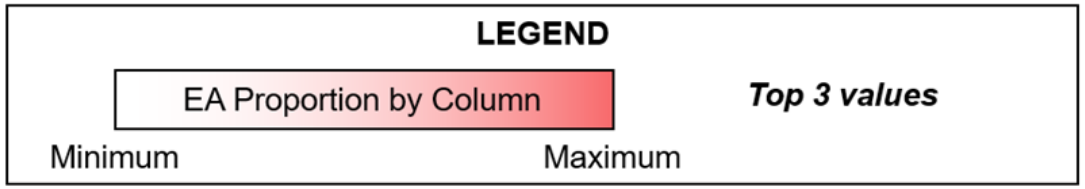
Minimum — Maximum

Top 3 values

Crash Heat Maps By Emphasis Areas

2017-2021 Fatalities

	Impaired Driving	Speeding	Occupant Protection	Roadway Departure	Intersections	Young Drivers	Bicyclists	Pedestrians	Aging Road Users	Motorcyclists	Heavy Vehicles
Total	1,895	1,857	1,587	2,239	1,132	480	63	600	1,107	473	577
Impaired Driving	-	***912***	***773***	***1,030***	***466***	195	***25***	***322***	***313***	***187***	***191***
Speeding	***912***	-	***840***	***1,105***	***431***	***281***	8	127	307	***242***	***208***
Occupant Protection	***773***	***840***	-	***1,112***	307	***209***	0	1	269	0	167
Roadway Departure	***1,030***	***1,105***	***1,112***	-	0	***268***	4	0	***442***	***204***	***230***
Intersections	466	431	307	0	-	127	***29***	***227***	***390***	172	124
Young Drivers	195	281	209	268	127	-	6	38	64	33	44
Bicyclists	25	8	0	4	29	6	-	0	19	0	3
Pedestrians	326	131	1	0	230	38	0	-	183	2	59
Aging Road Users	314	309	269	442	***391***	64	***19***	***181***	-	94	168
Motorcyclists	190	245	0	204	174	34	0	2	94	-	28
Heavy Vehicles	191	208	167	230	124	44	3	57	167	28	-



Crash Heat Maps By Emphasis Areas

2017-2021 Serious Injuries

	Impaired Driving	Speeding	Occupant Protection	Roadway Departure	Intersections	Young Drivers	Bicyclists	Pedestrians	Aging Road Users	Motorcyclists	Heavy Vehicles
Total	12,690	11,574	6,605	14,249	13,009	5,845	636	2,089	6,627	3,484	3,004
Impaired Driving	-	***4,585***	***3,176***	***6,028***	***4,030***	1,881	***147***	***749***	***1,622***	625	***863***
Speeding	***4,585***	-	***3,109***	***6,061***	***2,796***	***2,217***	51	168	1,417	***1,090***	***1,023***
Occupant Protection	3,176	***3,109***	-	***3,935***	1,824	1,109	0	10	670	2	542
Roadway Departure	***6,028***	***6,061***	***3,935***	-	0	***2,225***	23	0	***1,543***	***1,122***	***976***
Intersections	***4,030***	2,796	1,824	0	-	***2,245***	***383***	***998***	***3,036***	***1,211***	737
Young Drivers	1,881	2,217	1,109	2,225	2,245	-	***140***	166	569	289	287
Bicyclists	150	52	0	24	385	143	-	1	125	3	18
Pedestrians	777	178	10	0	1,010	170	1	-	449	5	88
Aging Road Users	1,624	1,417	670	1,543	***3,036***	569	125	***440***	-	510	607
Motorcyclists	634	1,103	2	1,129	1,225	293	3	5	518	-	77
Heavy Vehicles	863	1,023	542	976	737	287	18	84	607	75	-