VIRGINIA'S 2022 SAFETY PERFORMANCE TARGETS

Predicting Future Outcomes in Uncertain Times

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Safety Performance Management
Refining Target Setting - Data-Driven Method

Key steps to develop 2022 targets:

1. **Analyze external factors to predict 2020 baseline crash safety measure counts for validation**
   - assess new factors and traffic impacts
   - update and refine model for 2022 predictions

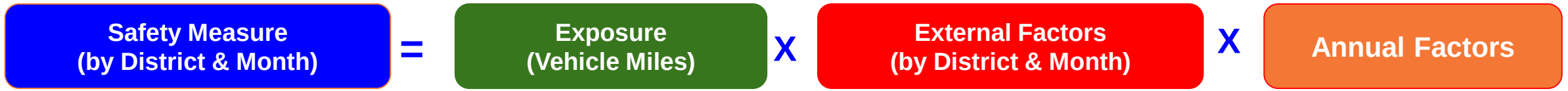
2. **Evaluate anticipated benefits of recent (or soon to be completed) infrastructure projects**

3. **Combine the baseline predictions with project benefits to establish data-driven targets**

Step 1: Analyze External Factors to Predict 2022 Baseline

Refining the predictive baseline models includes three steps:

1. **Assess past and new external factors with annual factors to calibrate the models**
2. **Validate the model external and annual calibration factors with 2020 data**
3. **Forecast external and annual calibration factors for future measure predictions**



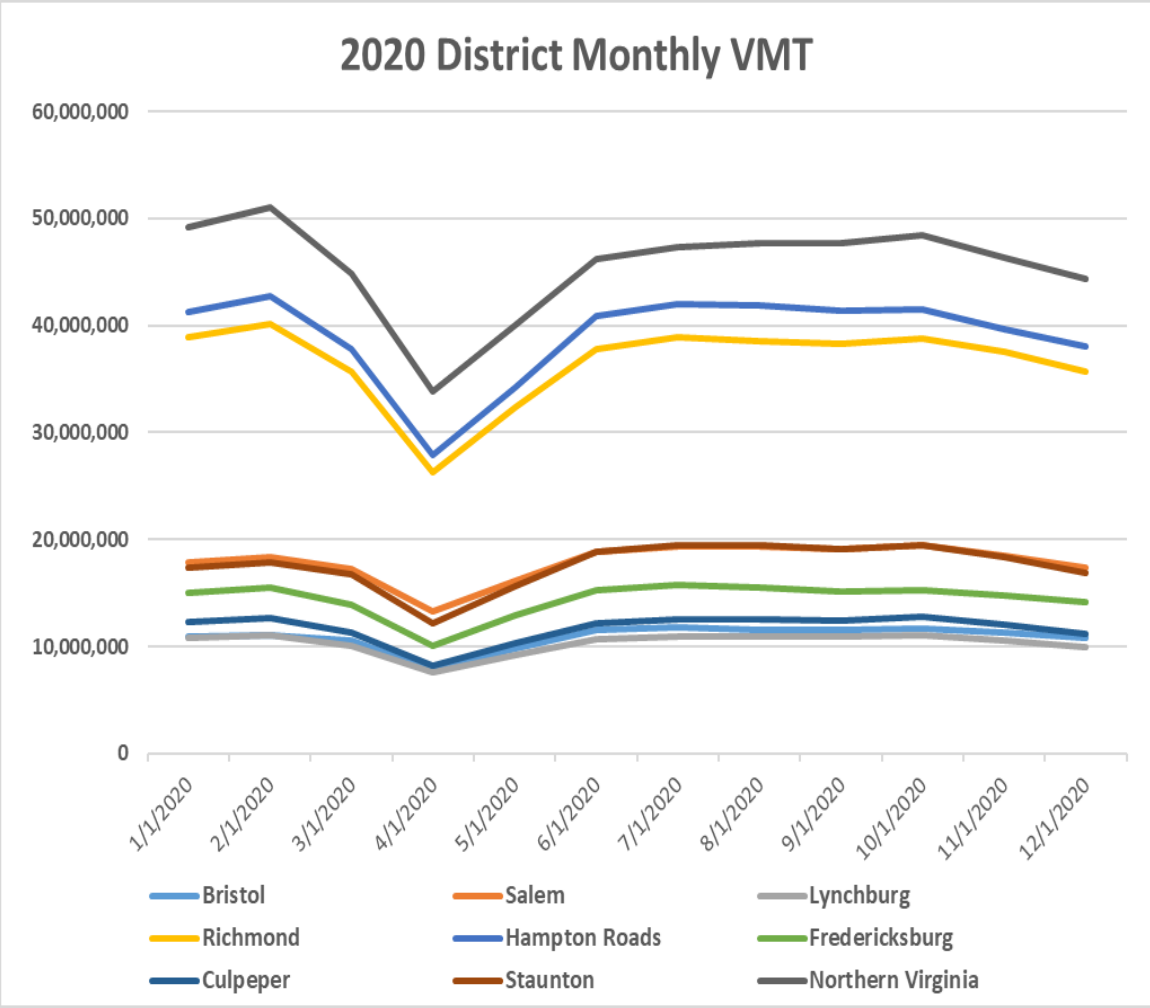
Step 1 - Findings From the 2021 Prediction Model Factors and 2022 Modifications

External Factor	Effect on Fatal Crashes	Effect on Serious Injury crashes	Effect on Bike/Ped crashes
VMT growth	↑	↑	↑
Increasing local functional class % 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 % of VMT			↓
Increased non-motorized behavioral program spending			✕
Increased gas prices			✕

⇧ = Additional factor

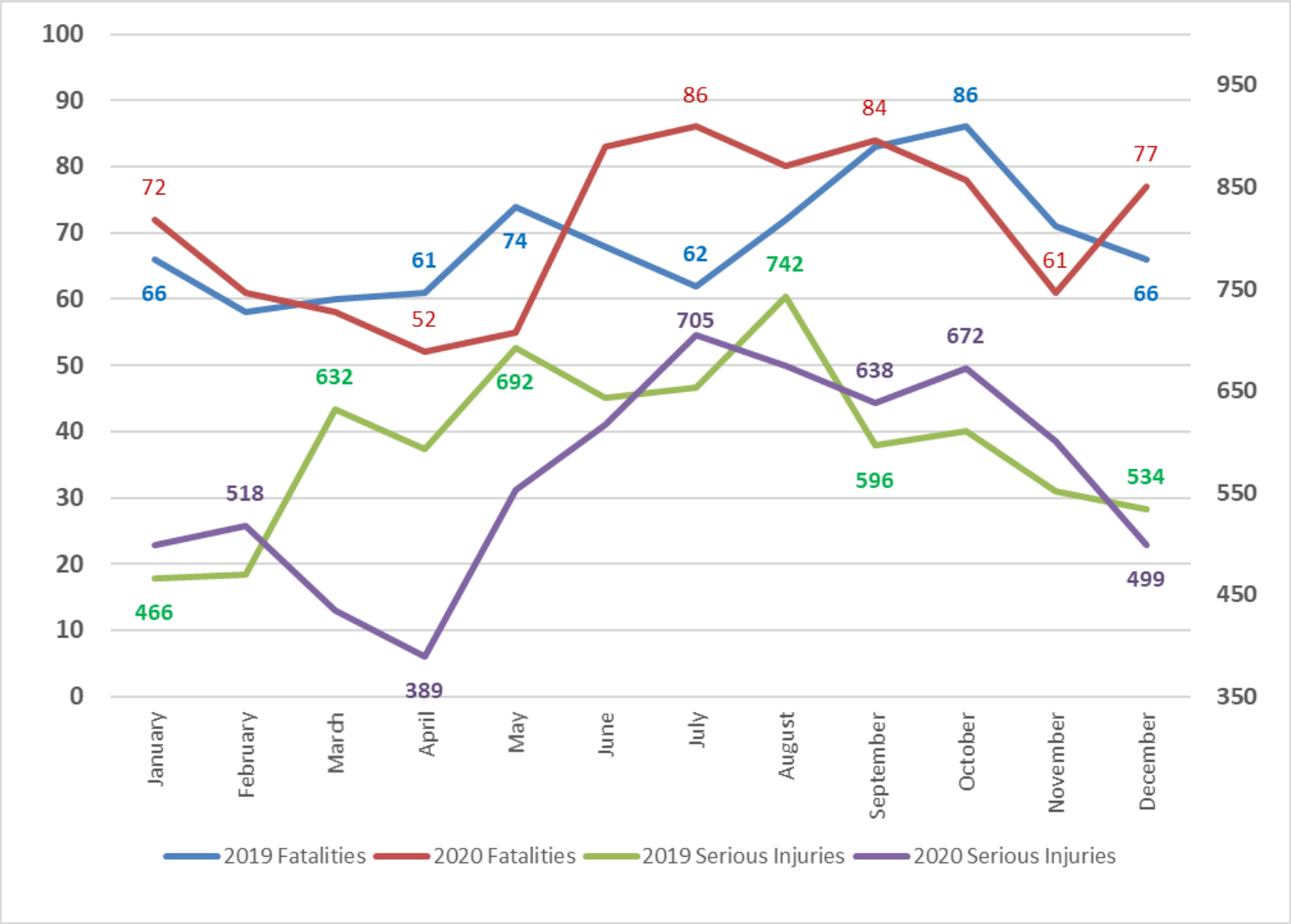
✕ = Removed factor

Validation: What happened to 2020 VMT



- Jan - Feb reflect growth over same months in 2019
- Clear V reduction when we typically have highest volume months
- Lack of full recovery in Aug-Dec compared to 2019
- In consultation with TED count data staff, 2020 Annual Factors and validation ignore “V” months as trends for F and SI were more consistent in Jan-Feb and Aug-Nov

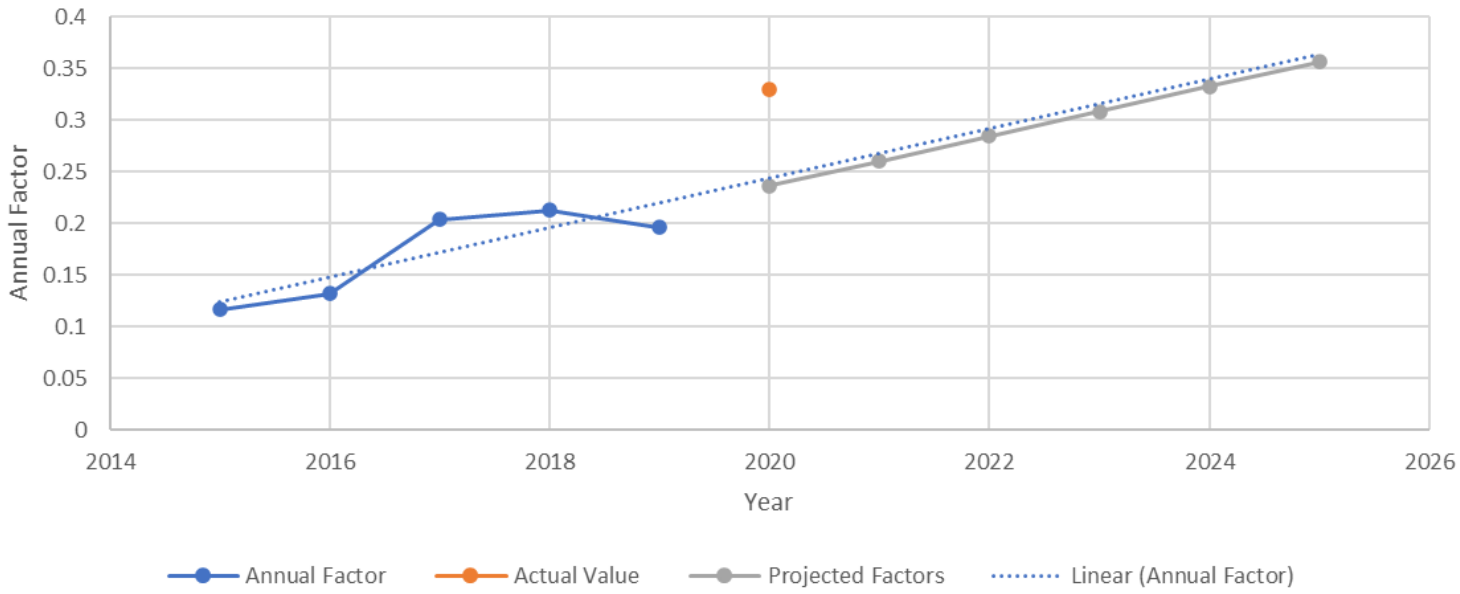
Validation: What happened to 2020 F and SI



- Same Jan - Feb increase
- Unexpected F summer increase until Sept; then yoyo months for both F and SI

Annual Factor Trends for Unaccounted Variables

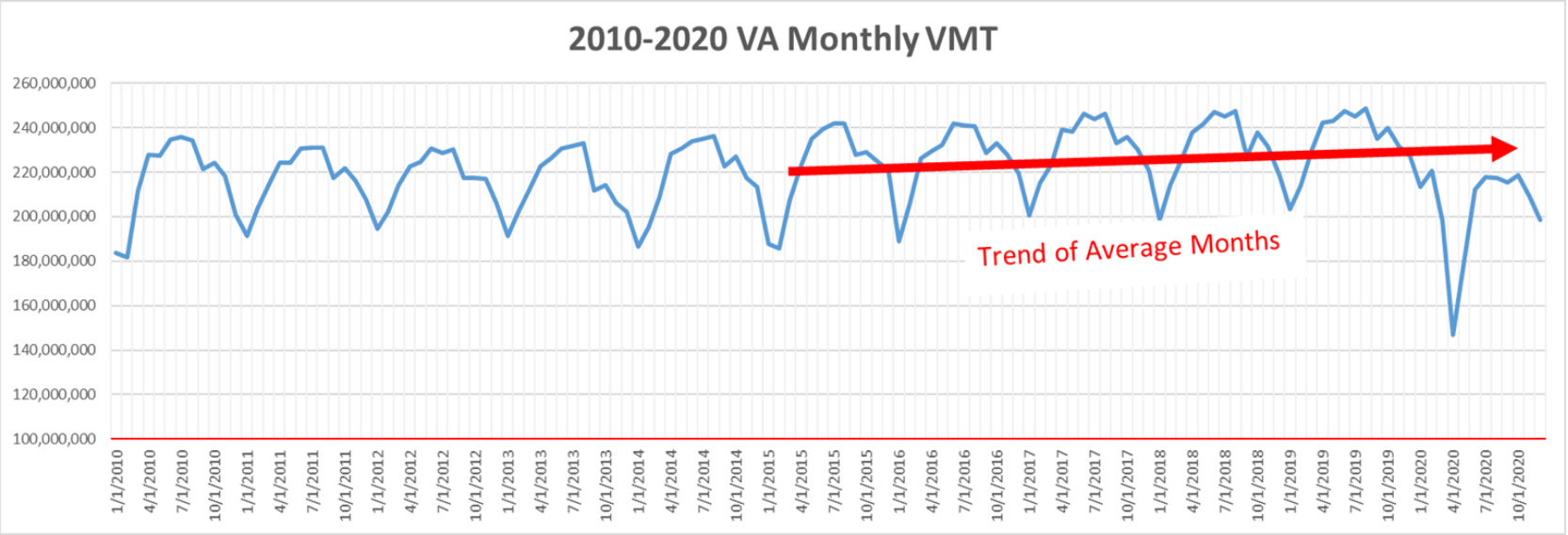
- 2020 AF value an outlier compared to previous years – may be accounting for shifts in VMT not captured by unknown rural/urban and local/nonlocal
- Shown projected values do not include 2020 – if included, would shift predicted fatalities upward



2021 and 2022 VMT Growth Scenarios

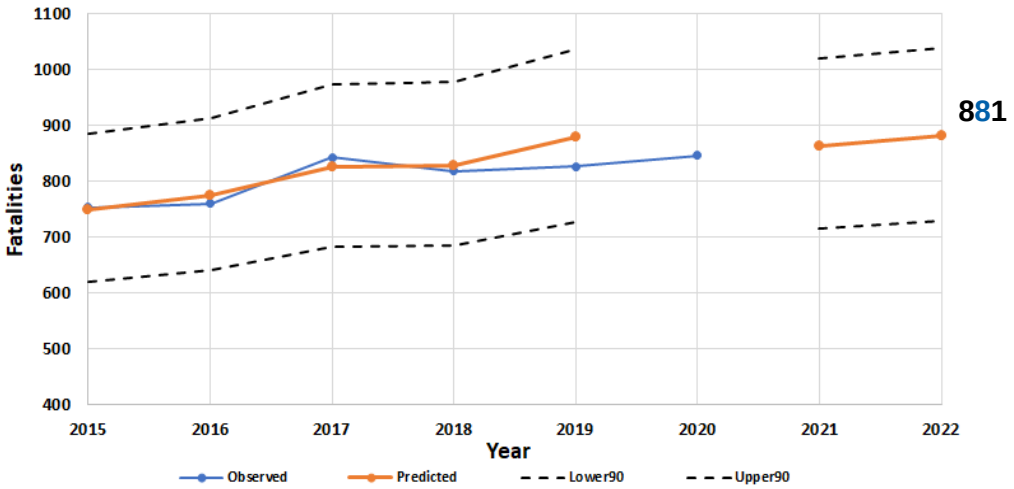
- **New Normal: Rural districts recover and urban have new lower baseline but all grow. Start District VMT growth in 2021 (from Dec 2020) based on past 3 years district growth rates**

- **Pandemic Over: Dec 2020 was below normal due to COVID spike and weather, so grow District VMT from Dec 2019 values based on past 3 years**



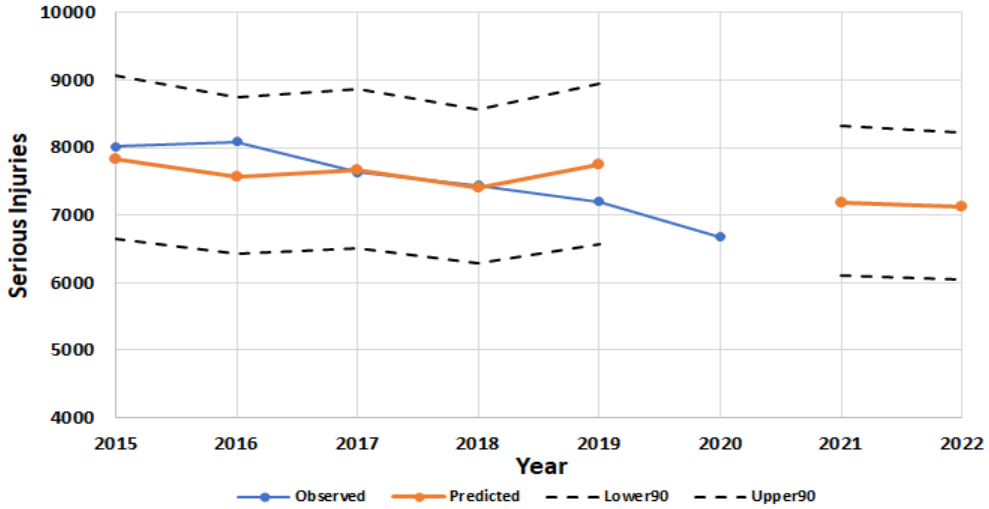
Observed and Predicted Baselines
Volumes Rebound with 2017-2019 Growth

Fatalities



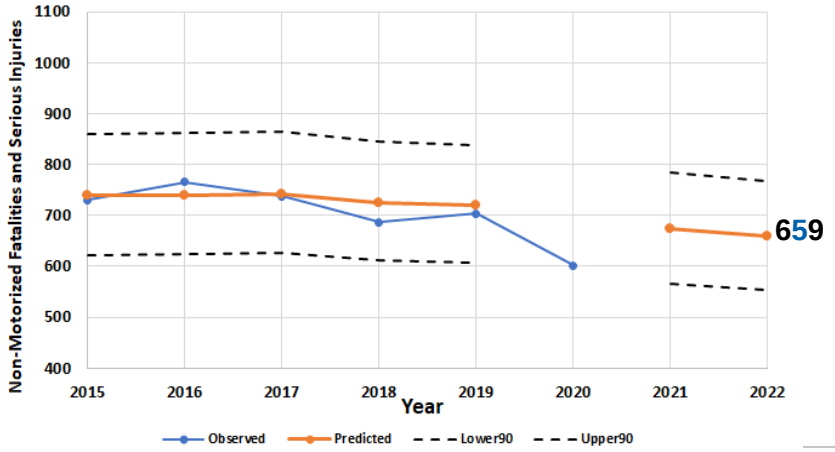
881

Serious Injuries



7,117

Non-M Fatal + Serious Injury



659

Observed Measure

Prediction

90% Conf. Limit

Step 2: All Projects Expected Reductions and Cost per Annual Reduction

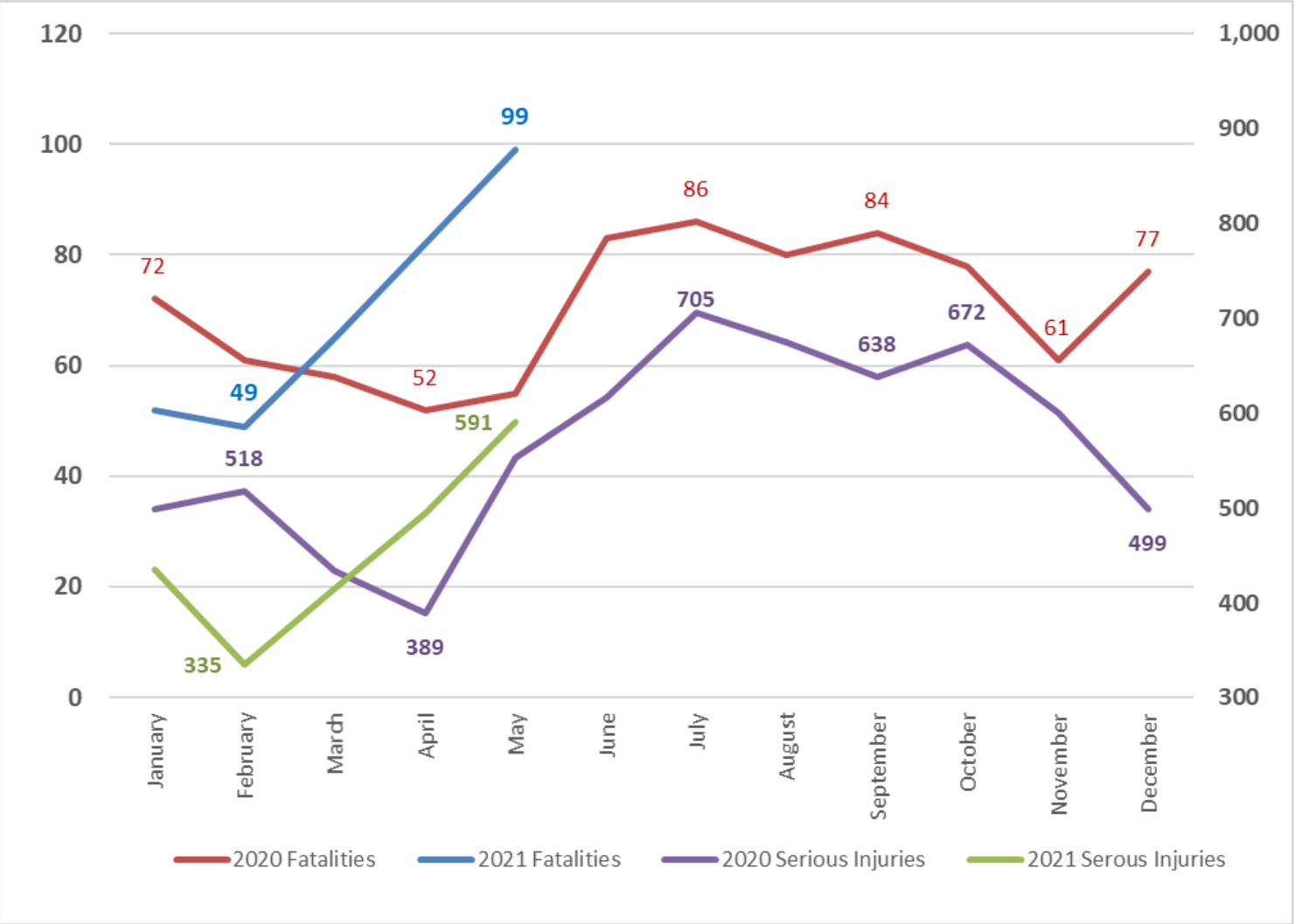
Description	Fatalities	Serious Injuries	Ped/Bike F + SI
Spot/Corridor Reduction	1.4/yr	17.0/yr	1.5/yr
Spot Cost / Annual Reduction	$764.3 M	$62.9 M	$713.3 M
Hybrid Reduction	2.2/yr	8.2/yr	0.2/yr
Hybrid Cost / Annual Reduction	$18.7 M	$5.0 M	$206.5 M
Systemic Reduction	5.9/yr	76.8/yr	11.7/yr
Systemic Cost / Annual Reduction	$11.9 M	$0.9 M	$6.0 M
Total Expected Annual Reductions	**9.5/yr**	**102/yr**	**13.4/yr**

Step 3: 2022 Safety Measures Targets

Description	Fatalities	Fatality Rate	Serious Injuries	Serious Injury Rate	Ped/Bike F & SI
STEP 1: 2022 Target Baseline (Model)	881		7117		659
STEP 2: Expected Project Annual Reductions	10	---	102	---	13
New: Expected Reductions Handheld Ban	10		114		**
STEP 3: Proposed 2022 Targets (Model)	**861**	**0.995**	**6901**	**7.971**	**646**
CTB 2021 Adopted Targets (Model)	898	1.012	7,385	8.325	750
CTB 2020 Adopted Targets (Model)	950	1.080	7,473	8.520	711

** A method is not available to estimate the proportion of non-motorized fatalities and serious injures expected to be reduced by handheld bans.

How are we doing in 2021?



- 347 vs 298 fatalities (+ 16%)
- 2,270 vs 2,393 serious injuries (- 5%)