

Literature Synthesis of Studies that Relate Amount of Enforcement Activity to Safety Outcomes

Vision Zero NYC

November 2022

Catherine Taylor

Senior Economist

Research Question



What is the impact of an incremental change in the level of an enforcement activity on the magnitude of safety outcomes?



Study Sponsor: NHTSA and GHSA under the National Cooperative Research and Evaluation Program (NCREP)

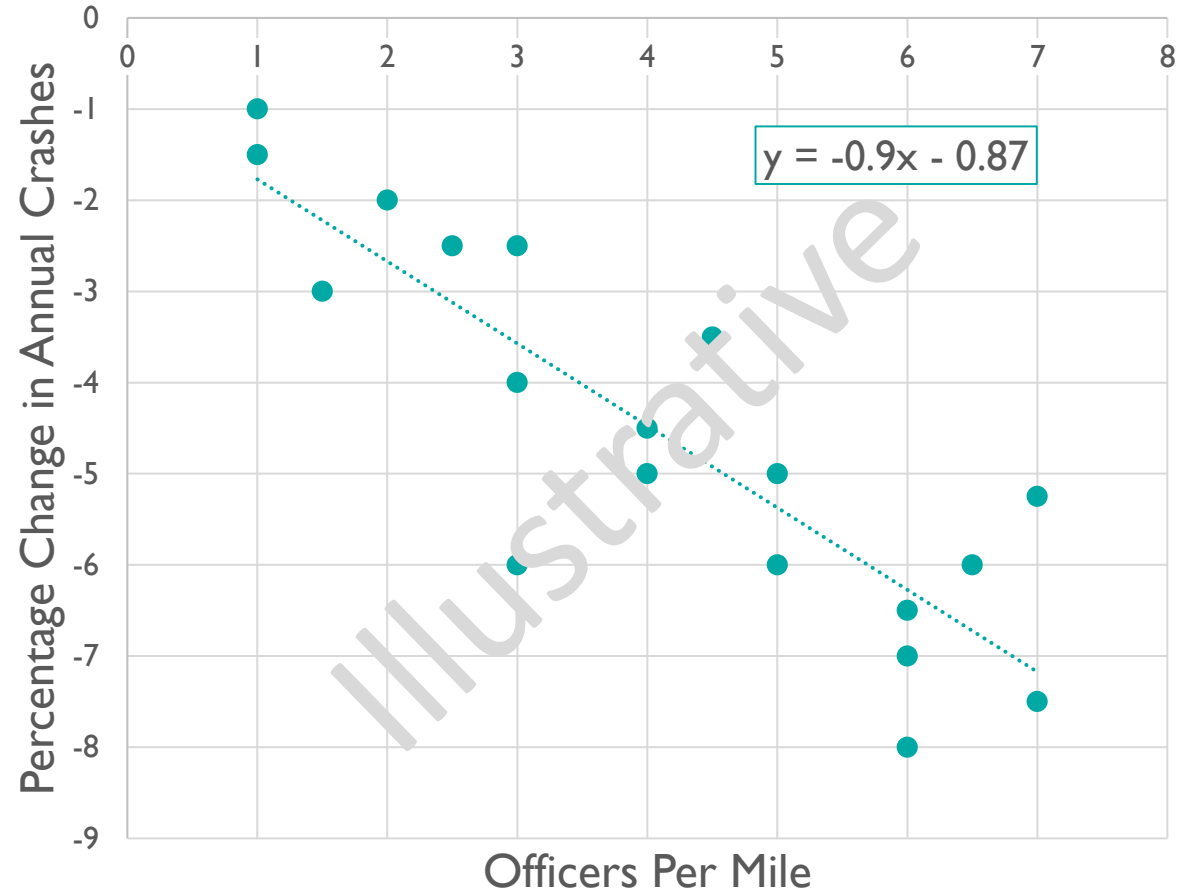
Scope—Targeted Behaviors

- **Occupant Protection**
- **Distracted Driving**
- **Impaired Driving (alcohol)**
- **Speeding**



Methodology

- Review existing literature
 - No new data collection
- Identify data points from which to estimate a dose-response curve
- Studies using data from 1990 to 2018 (literature scan completed May 31, 2018)
- Normalizing for size of community is critical: statewide campaigns v. town/city campaigns



Takeaways for Researchers

- ***Few studies reported enough detail on the level of enforcement (\$s, officer-hours, number of checkpoints, etc) for inclusion in this literature synthesis***
- ***Several different ways to measure safety outcomes made comparisons difficult***
- ***Most studies look at special enforcement campaigns and do not explore impact of different “baseline” levels of enforcement***
- ***Most studies measure safety outcomes during the campaign, so existence of lasting impacts are unknown***

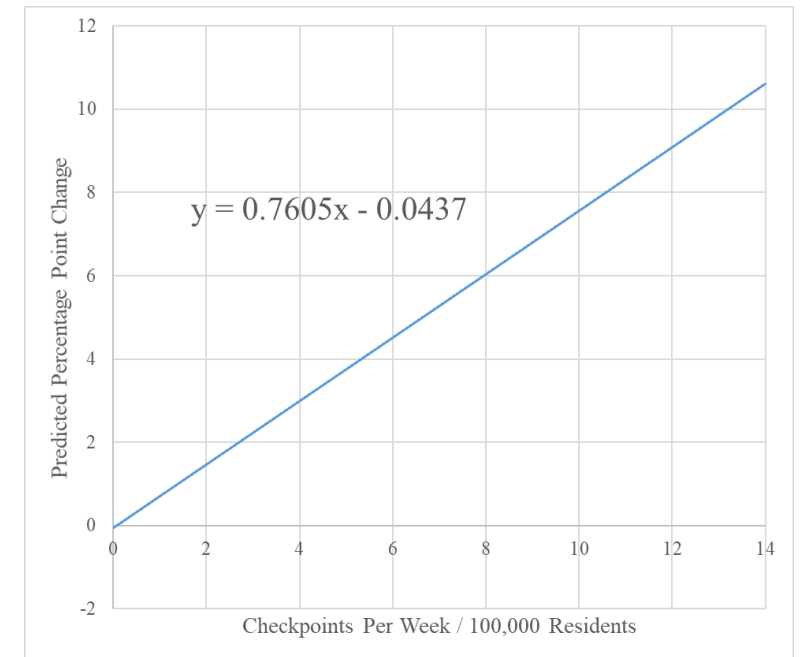
Literature Search

Over 15,000 studies identified by key word search and multiple search engines
However, relatively few contained information describing the level of enforcement activity in quantitative terms

Targeted Behaviors	Studies
occupant protection	38
distracted driving	5
alcohol impaired	19
speeding	13

Occupant Protection

1. Overall, HVE campaigns were successful – increasing seatbelt by 3.5 % points
 - 77.9% pre campaign → 81.4 % post –campaign
 - Typically measure 1-2 week pre-campaign, 1-2 weeks after start of campaign (did not measure lasting impact)
2. One additional checkpoint per 100,000 people per week in an HVE occupant protection campaign is expected to increase seat belt use by 0.76 percentage points (6 studies, n= 23)
 1. Changing from 0.4 checkpoints per 100,000 people (the 25th percentile) to 2.4 checkpoints per 100,000 people (the 75th percentile) would increase 1.5 percentage points
3. Occupant protection enforcement campaigns are *more effective* in places with *lower* rates of seatbelt use
4. No statistically significant relationship with number of officer enforcement hours was identified



Distracted Driving

- **Overall, HVE efforts are effective at reducing handheld phone use.**
- No relationship between magnitude of safety outcomes and level of enforcement could be identified for distracted driving enforcement.



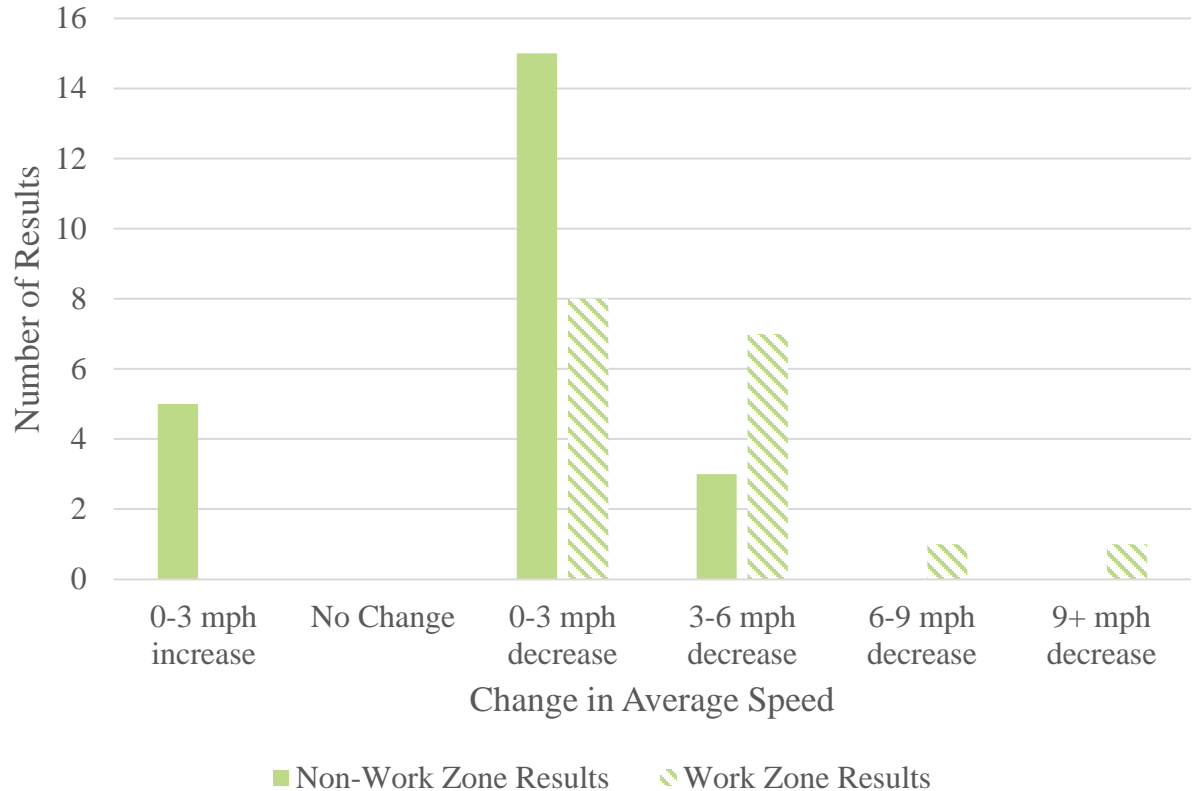
Alcohol-Impaired Driving

- Many different ways to measure safety outcomes made comparisons difficult: crash rates v. BAC levels
- Overall, produced positive impacts
- Probability of getting 57 positives out of 95 chances due to pure chance is less than 2%
- No statistically significant relationship between level of enforcement and alcohol-impaired driving could be identified

Enforce ment Activity	Number of study locations	Reduction in crashes or prohibited behavior	Mixed results	Increases in crashes or prohibited behavior
HVE	90	52 (58%)	2 (2%)	36 (40%)
Checkpoints	2	2 (100%)	0 (0%)	0 (0%)
Publicity	1	1 (100%)	0 (0%)	0 (0%)
Unspecified	2	2 (100%)	0 (0%)	0 (0%)
All	95	57 (60%)	2 (2%)	36 (38%)

Speeding

- Difficult to measure intensity of enforcement. Typically as “yes/no” situation (speed feedback sign or visible patrol car)
- Average speed reduction of 4.16 mph in workzone
- Average speed reduction of 0.99 in non-workzone



Conclusion

- The available literature shows that overall, enforcement campaigns improve safety measures during and shortly after campaign
- Largely unsuccessful at identifying a relationship between level of enforcement and magnitude of safety outcomes
- Reasons:
 - Low number of studies reporting sufficient information on level of enforcement
 - Diversity of metrics used to measure safety outcomes and level of enforcement

Recommendations for Researchers

- Improve consistency of data reporting, develop and use consistent metrics: number of enforcement hours, number of check points, number of patrols, dollar amount of paid media, etc
- Evaluations should describe baseline levels of enforcement prior to campaign
- Report safety outcomes several weeks or months after campaign has ended to investigate long-lasting impacts
- Adopt an experimental design approach – randomly select test sites and assign varying levels of enforcement in a pre-determined manner

Recommendations for Practitioners

- Conduct HVE programs with all elements. Available literature confirms that combining enforcement and visibility and publicity is an effective strategy
- Collect data describing level of enforcement effort and the achieved outcomes. This will help develop resource allocation strategies in the future.

Publication Info

- Title : Synthesis of Studies that Relate Amount of Enforcement to Magnitude of Safety Outcomes
- Authors: Catherine L. Taylor, Angie Byrne, Kaitlin Coppinger, Don Fisher, Christina Foreman, and Kendall Mahavier
- Published Date : 2022-06-01
- URL : <https://rosap.ntl.bts.gov/view/dot/62379>
- Technical Appendix <https://rosap.ntl.bts.gov/view/dot/62377>

Questions?

Catherine Taylor
Senior Economist
617-596-1859
Catherine.Taylor@dot.gov

www.volpe.dot.gov



Our Purpose

Advancing transportation innovation for the public good.

OUR CORE VALUES



Public Service



Innovative Solutions



Collaboration and Partnering



Professional Excellence



Employee Well-Being