

PENN STATE STUDY QUANTITATIVELY DEMONSTRATES FLARES DRAMATICALLY INCREASE THE SAFETY ZONE

Flares Cause 16% Reduction in Speed

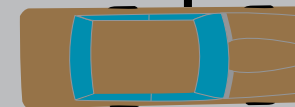
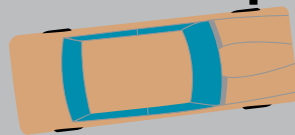
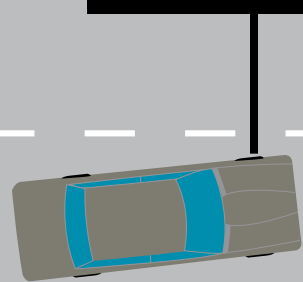
- Earlier perception of emergency ahead
- Increased braking distance
- Dramatic expansion in depth of safety zone

Flares Cause 85% Increased Lateral Separation

- Gets passing traffic farther from emergency scene

Flares Cause 89% Right Lane Volume Reduction

- Creates better visibility around emergency scene
- Dramatic lateral expansion of safety zone



FLARE SAFETY ZONE

NO FLARE SAFETY ZONE

- Safety response in passing traffic improves as more flares are deployed

- Use of road flares with police cruiser light bar activated maximizes safety zone

- Increasing the safety zone will save lives...maybe yours!

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CONCLUSIONS & SUMMARY RESULTS

HYPOTHESIS	CONCLUSIONS & SUMMARY RESULTS
<p>1. The combined effect of police presence with activated light bar and deployment of emergency road flares will generate the <u>greatest</u> impact on the behavior of passing motorists, creating a significantly larger safety zone than police presence with activated light bar and no emergency road flares.</p>	<p>True. When flares were deployed along with a police presence and activated light bar: (i) the speed of passing traffic was reduced 16.2% or 11.2 mph, representing a 5.1% improvement (3.1 mph decrease) as compared to a police car alone with no flares; (ii) 5.7% of the passing traffic changed lanes to avoid the emergency event, representing a 5.3% improvement compared to the police car alone with no flares; and (iii) lateral separation (for those few vehicles that did not change lanes) increased 85% (an additional 32.2 inches), representing a 16.3% improvement (or an additional 9.8 inches) compared to a police car alone with no flares. To maximize the safety zone, flares should be deployed in combination with an activated police light bar.</p>
<p>2. Deploying more flares will have a greater impact on the behavior of passing motorists than configurations with fewer flares – use of more flares enlarges and enhances the safety zone.</p>	<p>True. In all deployment scenarios involving a police car with flare deployment, the use of 6 flares created a larger safety zone than that created by using 3 flares (i.e., when 6 flares were deployed instead of 3, the speed of passing traffic was further reduced, more vehicles moved to the left lane and lateral separation from the emergency event increased). While testing constraints only allowed for a comparison of 3 versus 6 flares, real-world variables will dictate the actual number of flares needed (i.e., traffic volume and speed, lighting conditions, terrain, atmospheric conditions, severity of event, etc.).</p>
<p>3. Deployment configurations with flares spaced more closely together (5 paces apart) will have a greater impact on the behavior of passing motorists than flares spaced farther apart (10 paces apart).</p>	<p>Primarily true. The most significant speed reduction and lane-changing behavior occurred with flares spaced 5 paces apart.</p>
<p>4. The combined effect of police presence with activated light bar <u>and</u> deployment of emergency road flares will generate the <u>greatest</u> impact on the behavior of passing trucks, creating a significantly larger safety zone” than police presence with activated light bar and no emergency road flares.</p>	<p>True. When flares were deployed along with a police presence and activated light bar (i) the speed of passing trucks was reduced 11% or 7.2 mph, representing a 4.1% incremental improvement (2.6 mph decrease) as compared to a police car alone with no flares; and (ii) 98% of all trucks changed lanes to avoid the emergency event, thereby enlarging the safety zone.</p>
<p>5. The deployment of emergency road flares, even in the absence of a police presence with activated light bar, will have a dramatic safety impact on the behavior of passing motorists by enlarging the safety zone around the emergency event.</p>	<p>True. The use of emergency road flares without any police presence or activated light bar caused passing traffic to undertake significant speed reduction (12.2% or a decrease of 8.4 mph), dramatic lane-changing behavior (79.4% improvement) and increased lateral separation from the emergency event (97.6% improvement or increase of 36.8 inches). The data illustrate that a disabled vehicle deploying flares will create a safety zone around the emergency event nearly equal to that created by a police car with activated light bar.</p>