



Driving Research: Advances in Methods

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CPS Synergy: Collaborative Research:
Formal Design of Semi-autonomous
Cyber Physical Transportation Systems

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We collected data on how people drive through intersections in a driving simulator.



How do (1) the traffic signal phase (green, yellow, red), (2) the time from an intersection when the yellow changes, (3) what other vehicles are doing (stopped, intrude, turn), (4) driver age & (5) gender, and (6) other factors that affect driving through intersections? -> examine speed, acceleration, jerk

Augmented reality warnings (a full windshield HUD) led to safer driving than other warnings.

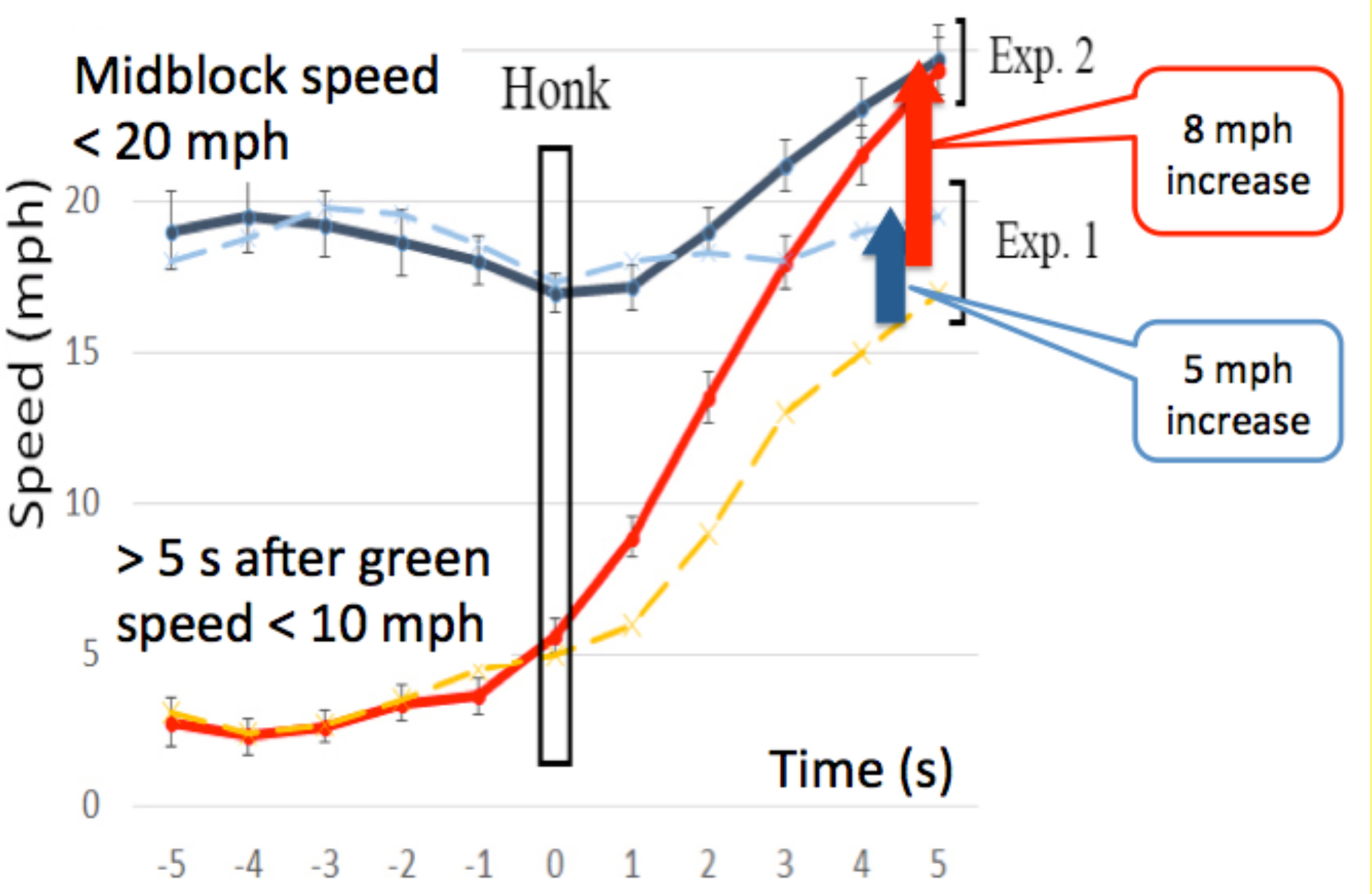


↑ Drawing attention to a hidden vehicle

← Highlighting a hazard

Extensive data have been collected. See the Del Vecchio - MIT poster.

Having following vehicles honk -> more realistic driving.



After 8 years, we finally got SAE Recommended Practice J2944 published, which officially defines driving performance measures and statistics. Compliance will be required in driving publications.

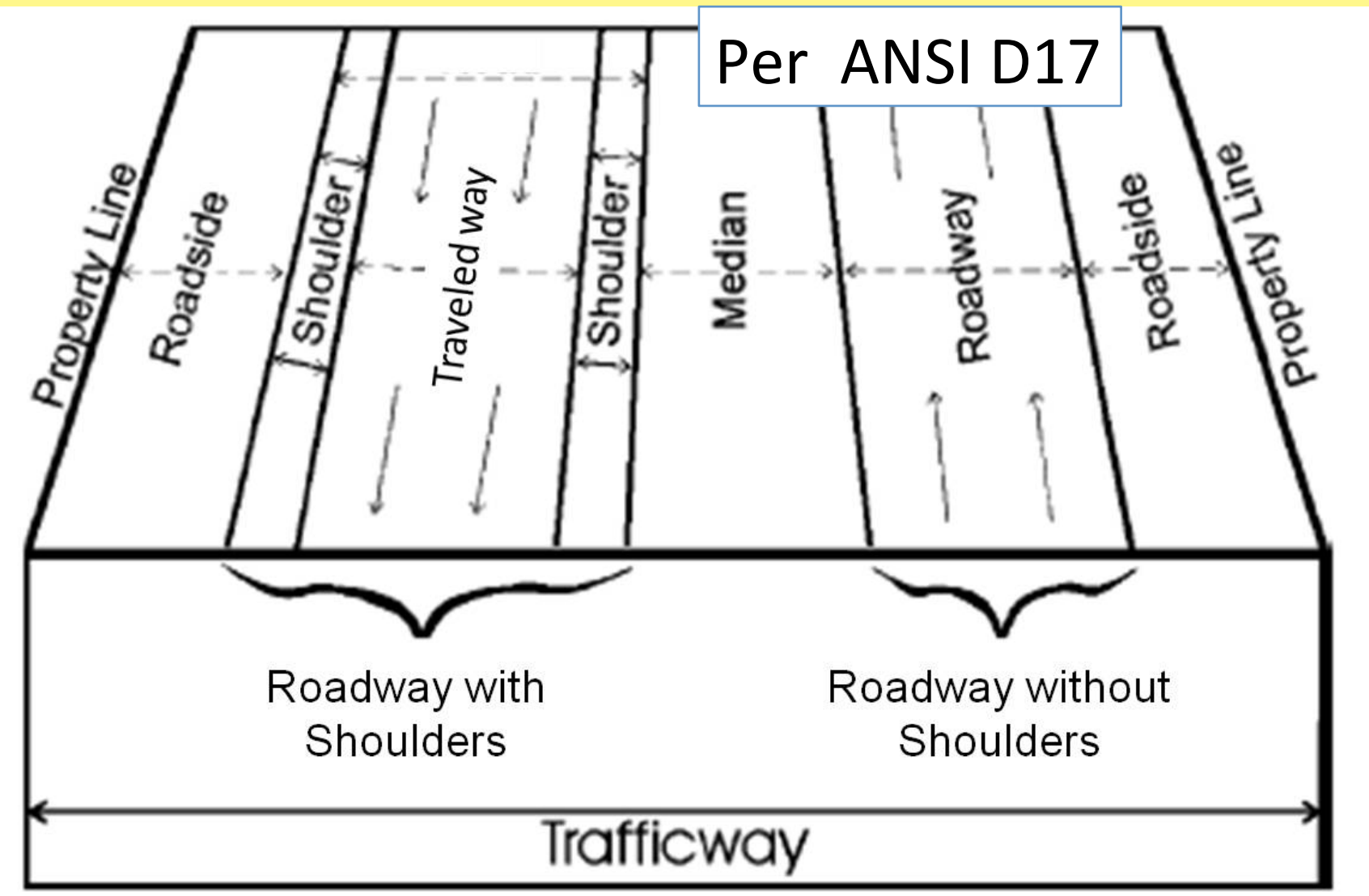
Test your knowledge:

How are road departures defined? (Hint: 4 official definitions.)

- (1) including usable shoulders (option A - AASHTO),
- (2) including parking lanes but not bicycle lanes (option B - MUTCD/FARS/HCM),
- (3) excluding usable shoulders (option C - ANSI), and
- (4) excluding shoulders and opposing lanes (Option D - FHWA)

How are these terms defined?

Response time (15) Lateral lane position (3)
Time to collision (2) Lane departure (11)
Time to line crossing (3) Lane change (5)



We developed a new driving simulator for student and research use. It is 1/15 the cost of the UMTRI simulator. We are now at the 2nd generation.



For undergrad classes, we use the OpenDS free driving simulator. The trick is to identify the hardware (Logitech G27 steering wheel and pedals) as “reserve books” at the library that students can borrow.



G27

\$250