

# Safe overtaking of bicyclists and the presence of shared lane markings

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# Research Questions

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- 1) Is the minimum overtaking distance (closest approach) given to the bicyclist by the driver impacted by the presence of shared lane markings?
- 2) Does the presence of shared lane markings increase the number of complete lane changes when overtaking the bicyclist
- 3) Are there age differences in overtaking behavior and how does this vary by the presence of shared lane markings?

# Data and Methods

## Literature Review

- Common bicycle crash types & characteristics

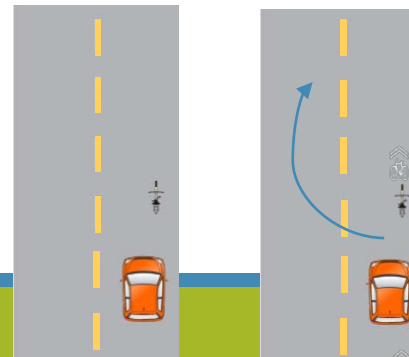
## Naturalistic cycling data analysis

- ~57hrs video and GPS
- Common safety event characteristics



## Select & design simulator event

- Event selection parameters: crash & injury risk, event frequency during bicycling, gaps in literature, feasibility within simulation & larger study design



## Test event in simulator

- NADS-1
- High-fidelity driving simulator
- 13 degrees of freedom motion base
- 48 adult participants



# Drivers in the shared lane markings group gave more space to the bicyclist during overtaking

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	Shared Lane Markings	No Shared Lane Markings
Closest approach, Mean (SD)*	5.7 (1.8) ft	4.1 (2.0) ft
Closest approach less than 3 feet	0%	37.5%
Older drivers (61-80 yrs)*	5.8 (0.9) ft	2.7 (1.0) ft

\*p<0.01

# Lane changing

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**81.3%** of participants (both groups) did not make a complete lane change to overtake bicyclist.

This did not vary by presence of shared lane markings.



# FUTURE RESEARCH DIRECTIONS

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Increase relevance to practice through comparative effectiveness studies of different bicycle-specific treatments and infrastructure

Further use of naturalistic bicycling data to inform simulation research and scenario and development

Drivers <18 years old and impact of bicyclist gender

Subgroup analyses for novice and older drivers

# Implications for practice

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Results from this study show that shared lane markings improve driver performance when overtaking a bicyclist compared to no markings, especially for older drivers (61-80 years)

Despite the benefits found for shared lane markings in this study, practitioners should consider effectiveness of all bicycle facility types, before making a selection.