

MICROSIMULATION OF CONNECTED AUTOMATED VEHICLES IN WORK ZONES

Introduction:

- Work zones
- Connected Automated Vehicles (CAVs)
- Market Penetrations (MPR)

Objectives

- To evaluate the effectiveness of CAVs on efficiency of freeway work zones using mobility and safety indicators
- To determine at what MPR the impacts of CAVs will be noticed in traffic stream



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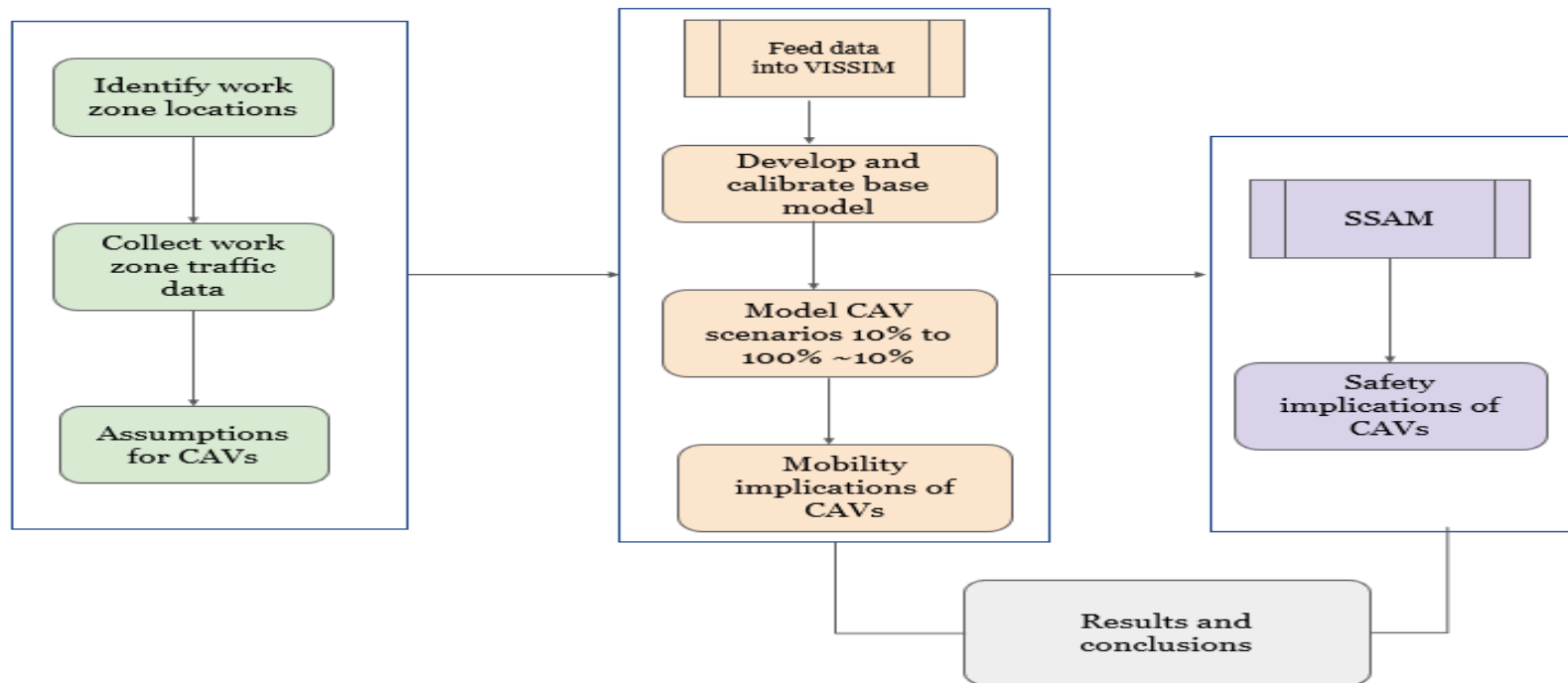


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PREVIOUS WORKS

- Bierstedt et. al (2014)
- Stanek et. al (2017)
- Atkins 2016

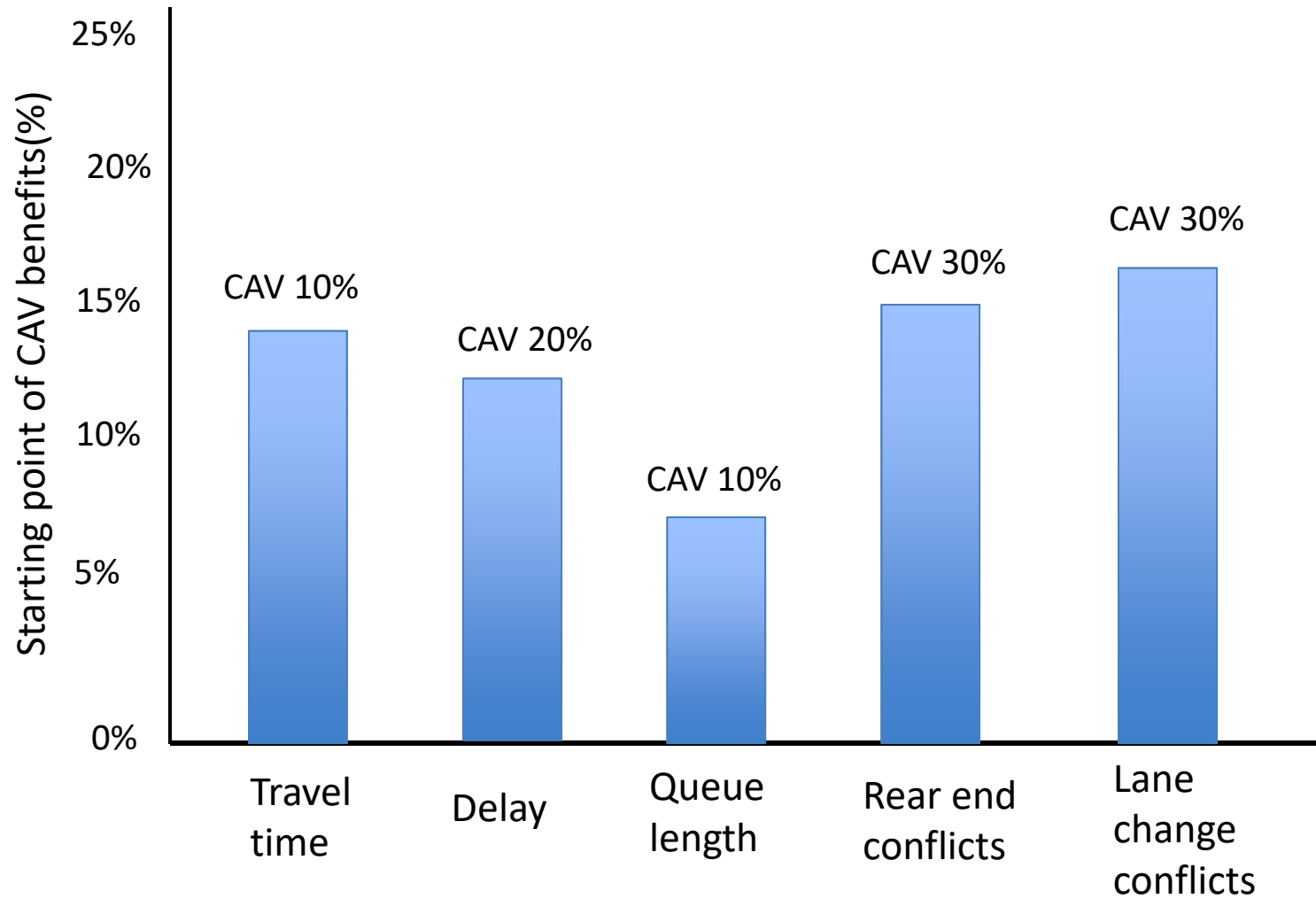
RESEARCH APPROACH



PREVIEW OF RESULTS

Performance Measure	Hypothesis vs. Results
Travel time (seconds)	 CAVs market penetrations will improve travel time 
Travel time variability	 CAVs lower travel time variability 
Delay (average vehicle per seconds)	 CAVs lower average vehicle delay 
Queue length (feet)	 CAVs reduce queue length 
Rear end conflicts	 CAVs reduce rear end conflicts 
Lane change conflicts	 CAVs reduce lane change conflicts 
Total number of Time to Collision Conflicts (TTC)	 Percentage of conflicts in work zones 

WHAT ARE THE FIGURES?



FINDINGS & CONCLUSIONS

- Advances in vehicle technologies can greatly improve traffic situations in work zones.
- CAV mobility benefits begin to appear even at lower market penetration rates (10% ,20%, 30%)
- These benefits are more significant in congested networks
- CAVs are safer than unequipped vehicles and are able to offset safety benefits at lower market penetrations
- CAV manufacturers can gain insight on the driving parameters to include in their products

Thank you for listening



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