FIU Florida International University

Connected And Automated Vehicle Data for Safety Performance Measurement

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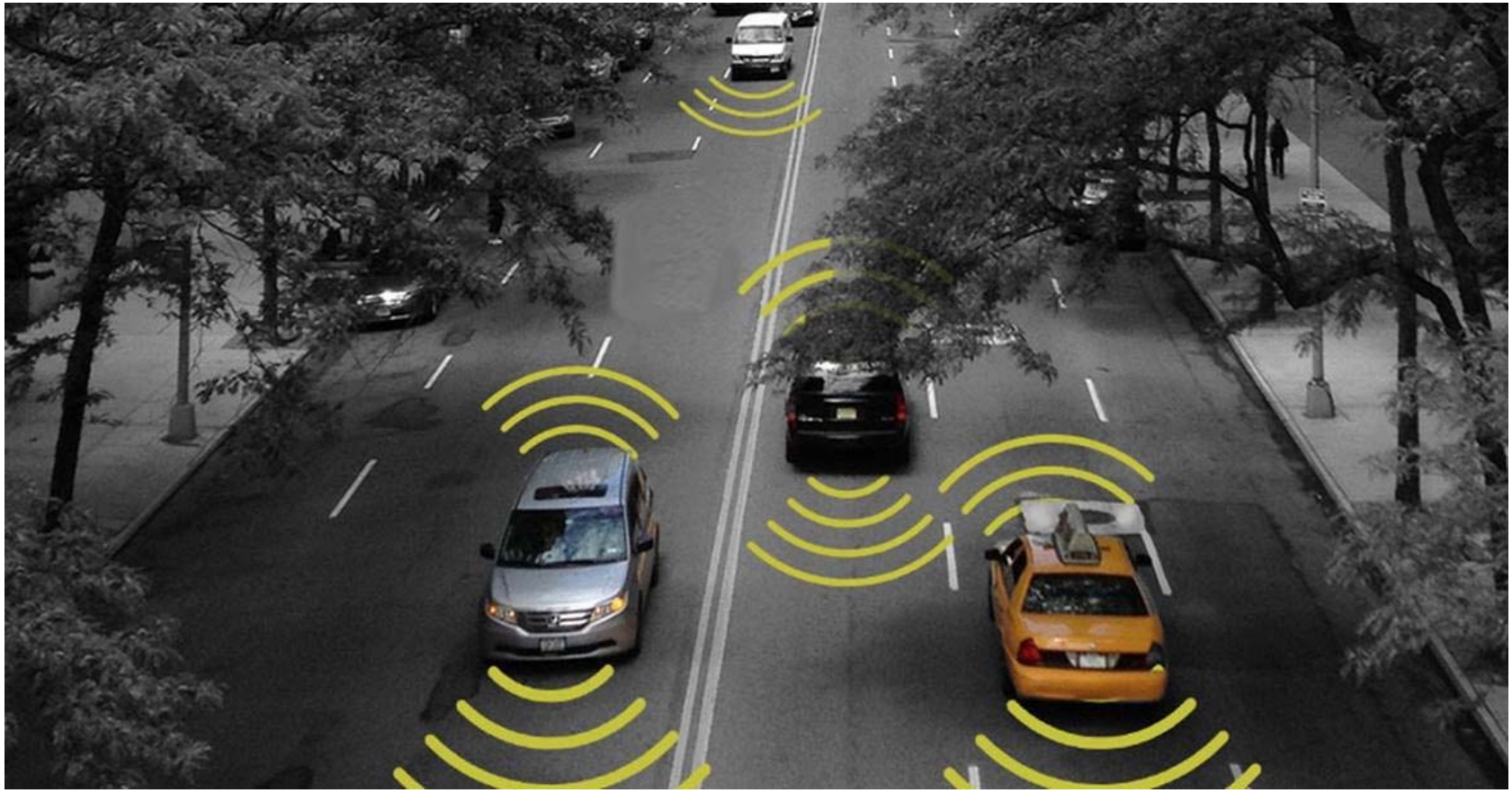
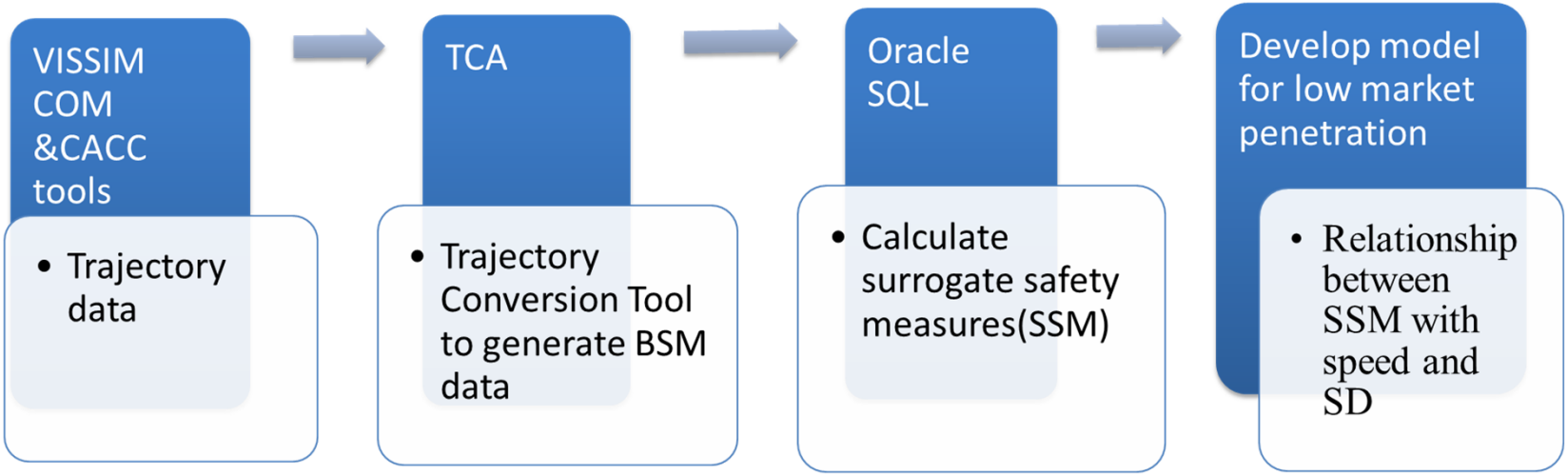
CV data : An alternative source of data for performance measurement



Objective and Methodology

- Using CV data with low CV market penetration for real-time assessment of the safety of the system
- Examine a number of surrogate safety measures to allow estimating safety in low market penetration of CV



Surrogate Safety Measures

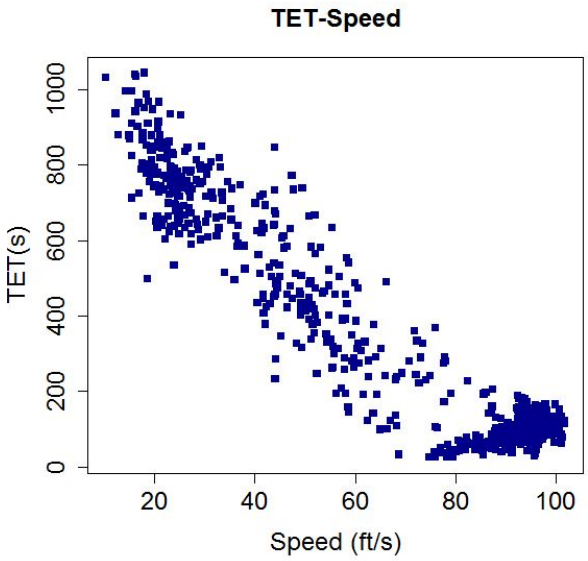
- TTC=Time-To-Collision

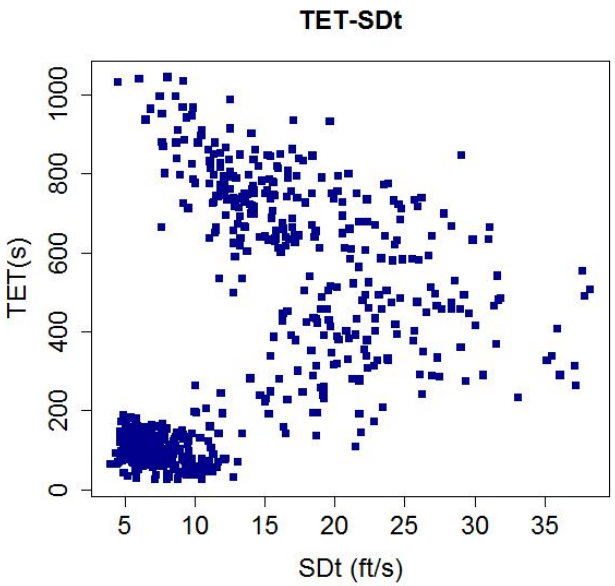
Lower TTC is a good indicator of the probability of collision

- TET=**Time Exposed time–to–collision**

Reflecting the total time spent under dangerous traffic conditions

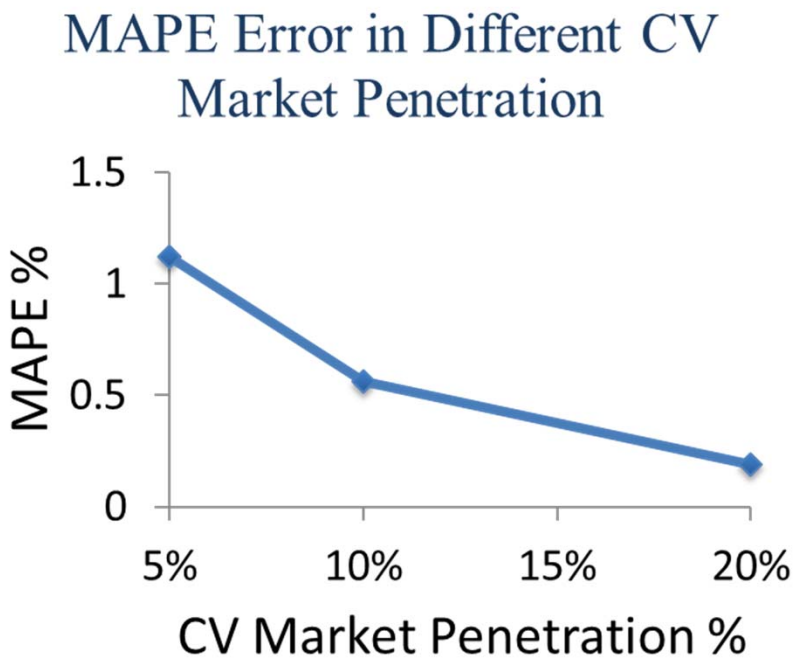
$$TET = -423.35\ \log(Speed) + 3.94SD_T + 2024.82$$





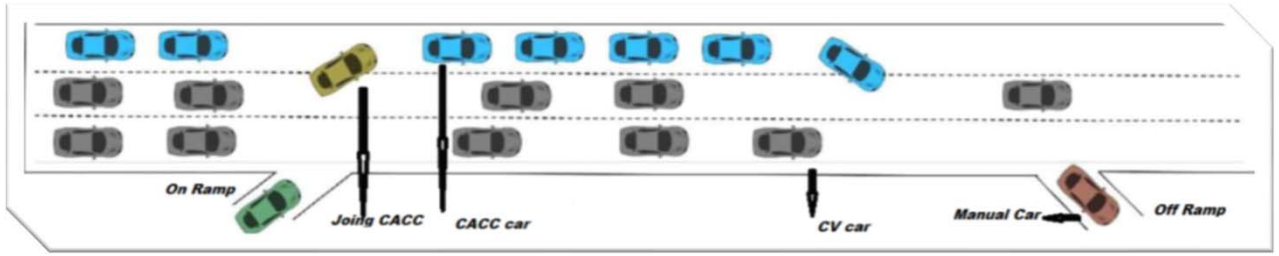
SD_T =Standard deviations of the speeds between vehicles

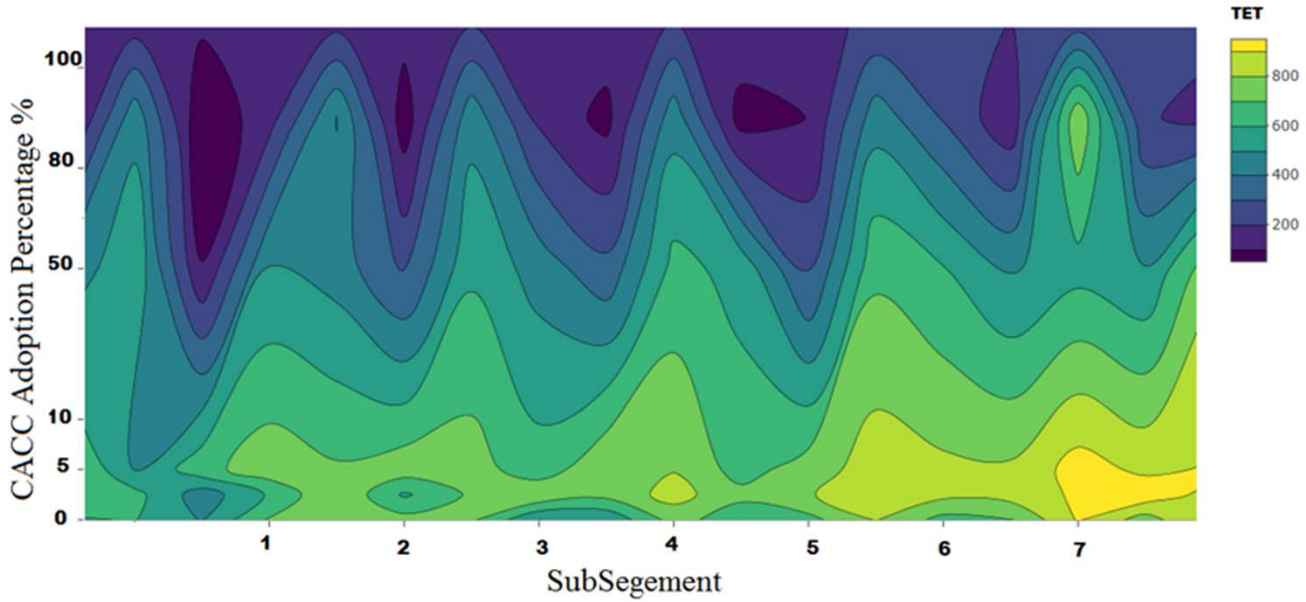
Accuracy of TET Under Low Market Penetration of CV



- Safety analysis based on surrogate measures can be assessed using CV data at relatively low market penetrations of CV
- TET can be accurately and reliably estimated at relatively low CV market penetrations (5%)

Safety Effects of CACC





The TET confirmed the benefits of CACC in reducing the potential for rear-end crashes under different percentages of CACC adoption