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

\[ \text{TET} = -423.35 \log(\text{Speed}) + 3.94 \text{SD}_T + 2024.82 \]

\[ \text{SD}_T = \text{Standard deviations of the speeds between vehicles} \]
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%).
The TET confirmed the benefits of CACC in reducing the potential for rear-end crashes under different percentages of CACC adoption.