AERIS CACC Enabled Eco Approach / Departure Small Scale Test & Evaluation
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Use connected vehicle technologies to improve mobility and decrease fuel consumption / emissions for coordinated strings of vehicles by:

- Reducing the time spent idling
- Minimizing unnecessary accelerations and decelerations
- Improving traffic flow at signalized intersections and traffic progression

Employ wireless data communications sent from roadside equipment to connected vehicles

Vehicles leverage information from roadside and surrounding vehicles

- Signal Phase and Timing (SPaT) (via V2I communication)
- Intersection geometry data (MAP) (via V2I communication)
- Basic Safety Message (BSM) (via V2V communication)

System determines optimal speed profile needed to optimize mobility, fuel economy and emissions reduction
Infrastructure-side Contribution to CACC Enabled Eco A/D Function

- Infrastructure employs Basic Safety Message data, data from other available V2X communication, and data from infrastructure-based sensors at an intersection to:
  - Estimate/predict queue length and traffic volume at the intersection
  - Identify strings of Eco A/D vehicles
  - Determine whether an approaching string of Eco A/D vehicles will clear an individual intersection during the green phase

- Infrastructure assesses whether a minor signal timing adjustment can better accommodate an approaching string of Eco A/D vehicles if:
  - Entire Eco A/D vehicle string will not clear within the current green phase
  - Minor adjustment such as a green extension will allow the vehicle string to traverse the intersection cleanly
  - Traffic already waiting in a queue, or expected shortly, at other approaches to the intersection will not be significantly affected

- Infrastructure facilitates Eco A/D concept for all modes of signal operation
Desired Outcomes

• Demonstrate, through simulation then actual road testing
  – Measurable improvement in:
    • Traffic mobility
    • Fuel economy
    • Reduction in emissions

• Define the requirements needed to realize the deployment of an actual system