**TEMPLATE - Connected and Automated Vehicle Capstone Report DRAFT V0.0**

6/30/2019

# Executive Summary

[to be added upon completion of report body]

# Introduction

## Overview of Pillar

The continued growth of CAVs technologies is anticipated to significantly change the way vehicles move and the way travelers achieve mobility. This will have a significant impact on energy consumption as well as many other facets of transportation both at the individual vehicle as well as system level. CAV technologies are unique in that they can positively and negatively impact both vehicle-miles traveled (VMT) and efficiency (VMT/VHT; VHT- Vehicle Hours Travelled). Additionally, CAV technologies are highly diverse, which means that they need to be disaggregated into specific system operating concepts before they can be analyzed. For example, automation systems without connectivity have very different traffic effects from those with connectivity. These different operational concepts will also show dramatically different sensitivities to penetration level and operational usage and thus an additional layer of analysis must be added to assess the various concepts across a range of scenarios. Lastly, interactions between vehicle connectivity/automation and emerging powertrain technologies will be investigated to establish whether the benefits of a particular powertrain technology will increase or decrease in a highly connected and automated world.

CAV technologies offer XXX.

### Overview of Connected and Automated Vehicle Technologies

As part of a collaborative research discussion facilitated by LBNL and supported by the other CAVs projects and SMART pillars, a preliminary project XXX.

#### Vehicle connectivity only (without automation)

These can be treated as independent features that can be combined as desired, since they are not closely coupled with each other and their impacts on energy usage are largely decoupled from each other:

* Cooperative collision warning systems (V2V, I2V) – These systems use wireless communication systems to enable vehicles to broadcast information about their motions XXX.

* V2I/I2V route planning, parking information and reservations (eco-trip planning and routing) – Drivers XXX.

* V2I/I2V based Variable Speed Limit/Advisory (VSL/VSA) – The V2I/I2V technology XXX.