Name: **Assisted Cruise Control System**

Alias: None

Use: In a Hands-Free Driving System the vehicle needs a way to maintain speed. The vehicle will use an assisted cruise control system to do that.

Content Description: Assisted cruise control helps the vehicle maintain a speed that ensures it does not collide with the vehicle in front of it.

Supplement: None

Name: **Lane Assist System**

Alias: None

Use: Maintain lane location.

Content Description: The lane assist system will maintain the vehicles location relative to the lane that it is in. Continuous calculations and sensor readings must be integrated and corrections performed in order to determine and correct lane deviances.

Supplement: None
Name: **Continuous Vehicle Location Monitor**

Alias: None

Use: Determine vehicle location.

Content Description: The Continuous Vehicle Location Monitor continuously monitors the location of the vehicle.

Supplement: None

Name: **Road Condition Monitor**

Alias: None

Use: The vehicle will determine if the road conditions are safe. If the road conditions are deemed unsafe by the vehicle, the Driver will have to take control.

Content Description: The vehicle will run checks to determine if road conditions merit the activation or continued use of the system.

Supplement: None

Name: **Driver Attention Monitor**

Alias: None

Use: The vehicle will detect if the Driver is keeping his/her eyes on the road. It will alert the driver of anything happening on the road.

Content Description: The Driver Attention Monitor uses sensors and cameras to detect if the Driver is focused on the road.

Supplement: None

Name: **Path Prediction System Mapping**

Alias: None

Use: The vehicle will calculate the path of the road ahead for comparison with the vehicle’s predicted location.

Content Description: The vehicle will use precision LiDAR maps, as well as calculating the vehicle’s location and trajectory, in order to ensure that the vehicle follows the road.

Supplement: None

Name: **Electronic Control Module**

Alias: None

Use: Integrate sensor data and control system inputs and outputs.
Content Description: The Electronic Control Module integrates information coming from multiple centers into inputs to vehicle control systems and messages to the user. Also accepts messages from the user to change the state of the system.

Supplement: Assisted Cruise Control System, the Lane Assist System, the Continuous Vehicle Location Monitor, the Road Condition Monitor, the Driver Attention Monitor, and Path Prediction System Mapping.

Name: **Steering Input**

Alias: None

Use: Steering Input.

Content Description: The steering input act on vehicle steering system to change the direction of the car.

Supplement: None.

Name: **Acceleration Control**

Alias: None

Use: Acceleration Control will maintain a reasonable speed to the vehicle in front of it.

Content Description: Accelerations acts on the systems acceleration system to increase the speed of the vehicle.

Supplement: None.

Name: **Brake Control**

Alias: None

Use: Brake Control.

Content Description: Acts on the vehicle’s brake systems to decrease the speed of the vehicle.

Supplement: None.

Name: **Vehicle Control System**

Alias: None

Use: The Vehicle Control System will display the information given by the systems mentioned in the Content Description.

Content Description: The Brake System, Acceleration Control, and Brake Control are contained in the vehicle Control System

Supplement: Steering Input, Acceleration Control, and Brake Control.

Name: **Road Conditions Warning System**

Alias: None
Conceptual Domain Model and Data Dictionary

Use: The Road Conditions Warning System tells the driver that the system will not be able to function due to road conditions.

Content Description: The Road Conditions Warning System uses sensors to detect if the roads are slippery and detect temperature.

Supplement: Steering Input, Acceleration Control, and Brake Control.

Name: **Driver System Override**

Alias: None

Use: Enables the driver to disable the system.

Content Description: Driver input to the accelerator, brake, or steering wheel will disable the system.

Supplement: None

Name: **System Failure Warning System**

Alias: None

Use: Enables the system to communication the need for control handoff.

Content Description: Displays warnings that the system needs the user to take over for a variety of reasons. Will prompt the user, but if no user input is detected, will eventually pull over and stop the vehicle.

Supplement: None

Name: **User System Engagement**

Alias: None

Use: Driver enables system.

Content Description: The Driver may attempt to enable the system. Once environmental and system integrity checks are performed, system will become operable if able.

Supplement: None

Name: **Driver Inattention Warning System**

Alias: None

Use: System indicates to Driver that their attention is waning.

Content Description: The system will provide escalating warnings to the Driver in cases of insufficient driver attention. Eventually the system will attempt to disengage, pulling over if the driver does not respond.

Supplement: None

Name: **Human Interface**
Conceptual Domain Model and Data Dictionary

Alias: None
Use: A screen for the Driver to send commands and receive messages through.
Content Description: The human interface will display specific messages relating to system functionality, road conditions being viable, as well as receive commands from the user such as to attempt to enable hands free driving mode.
Supplement: None

Name: LiDAR Sensor
Alias: None
Use: Used to sense a cars environment.
Content Description: A sensor that utilizes LiDAR technology.
Supplement: None

Name: Radar Sensor
Alias: None
Use: Used to sense a cars environment.
Content Description: A sensor that utilizes radar technology.
Supplement: None

Name: Camera
Alias: None
Use: Used to sense a Driver’s attentiveness.
Content Description: A sensor that detects wavelengths in the visible light spectrum.
Supplement: None

Name: GPS Tracker
Alias: None
Use: Used to sense a car’s location.
Content Description: A sensor that location using the GPS satellite system.
Supplement: None