Answers to the initial set of project requirements questions. Note: If a question was about implementation rather than requirements, was too broad, or I didn't understand it, it may not be listed here.

LMS

- How are intentional lane departures distinguishable from accidental ones? What factors should our system monitor to tell an intentional departure apart from an accidental one?
  You will need to determine if the driver is intentionally trying to steer such as by signaling a turn (with their blinkers) or intentionally turning the wheel.

- What are the speed thresholds for activation and use of the lane management systems? Why are these thresholds in place?
  These should probably be parameters to be set after some testing. Some of the subsystems are designed for when the car is at cruising speed (such as on the highway or back roads) rather than when it is in city traffic.

- What does the Lane Centering System do?
  It keeps the vehicle in the middle of the lane.

- Can the system detect different kinds of lane markers?
  It will need to be able to do so.

- Can systems talk to one another? It would be much easier to know the prediction of another vehicle if we can know the future movement of another.
  The vehicles currently do not have the ability to communicate with other vehicles.

- If the images and lane sensing equipment receive invalid information, how long should our system continue to predict lane curvature before alerting the driver?
  The system should notify the driver if there is a problem.

- Once the system is activated, at what points should it deactivate?
  The driver should be able to activate and deactivate the system.

APA

- What is considered a reasonable period of time for the parking event to be completed?
  Normal maneuvers should be completed in 15 seconds or less.

- How will the driver need to be aligned with the parking spot to ensure the car will park properly?
  The car may need to perform parallel, perpendicular, and diagonal parking.

- If a user aborts the parking functionality, would it be possible to resume the functionality from where the car is situated?
  The car should be able to resume or restart the parking maneuver.

- What if the car is manual transmission?
  This system is only being installed on automatic transmission vehicles.

- What happens if the driver tries to manually steer the vehicle during the active park assist?
  The system should probably cede control back to the driver.

- What is the range of the cameras and sensors?
  About 15 ft.
• What is the HMI?
The HMI is a control panel that the driver can use to adjust settings in the car and initiate the auto-pilot features (like APA).

• When the system is determining where to park the care and there are no other cars in the lot, how does the system determine the boundaries of the parking spot?
The car should use the line markings to determine the available parking spaces and try to park in a nearby open space.

• Does the vehicle have to be stopped to initiate the APA system?
The vehicle should be stopped before initiating the system.

• What if there are multiple spots open next to each other?
The vehicle should park cleanly in one of the spaces. It should not double park.

SCC

• Can the system detect and react to different environmental conditions? Regular roads, wet, and snowy roads will present different conditions and require different breaking to adjust for slippery roads. Detecting the environmental conditions is a feature that would need to be added. The cars all have ABS to help with slippery roads.

• How does the user disable AEB after it activates?
The AEB should deactivate automatically when breaking is no longer required.

• If the driver exceeds the speed limit through throttle input, does that increase the set cruise control?
The vehicle should return to the programmed speed after releasing the throttle.

• What triggers the AEB?
The AEB triggers when the vehicle detects an imminent collision.

• Why must the driver set speed be greater than 25 mph? Is there a safety reason for this that we should be made aware of?
At speeds below 25 mph, the vehicle is probably in a neighborhood, parking lot, or other area where cruising is inappropriate as there are likely to be pedestrians, animals, or other vehicles going about in unpredictable manners.

• When setting the speed of the cruise control, does the driver have to speed up to the desired speed or is it set through some sort of dial?
Currently the cruise control matches the speed of the vehicle when the system is initiated, with two additional buttons for increasing and decreasing the cruise speed.

• Is the set speed a minimum or a maximum? The set speed is a target; the vehicle accelerates if going slower and coasts if it is going faster. The driver can continue to accelerate to above this target.

CACC

• How is the lead vehicle, the first vehicle in the platoon, updated?
The lead vehicle maintains a regular set speed, similar to normal cruise control.

• What determines a safe following distance? How does this distance change for varying weather conditions?
The vehicle should follow at about a 4 second trailing distance. During dangerous weather, this follow distance should be increased.
• What happens if the platoon gets split up by other vehicles cutting off one of the vehicles in the platoon?
The platoon will need to split to make room for the new vehicle, forming two smaller platoons until the interloper leaves.

• Does the vehicle notify the driver when the speed is adjusted (in any way other than the speedometer changing)?
The car can simply match the speed of the vehicle ahead of it.

• Is this system only intended for highway use?
The system is intended for use when the vehicle will maintain a constant speed over a longer distance, such as highways and surface roads in the country.

• How are the breaking and acceleration capabilities gotten for each vehicle to be used in that calculation?
Each vehicle calculates a recent historical average of its capabilities and shares them wirelessly with the other vehicles in the caravan.

• What information is able to be gathered from the forward radar and camera sensors?
The sensors are able to detect the presence of objects and their locations. The radar can estimate their speed through Doppler shift.

**Non-requirements questions**

• Are there a required number of meetings a group must have?
You must have at least one meeting a week. Minutes from these meetings need to go on your team website.

• How much time will be given for the presentation?
Each team will have about 15 minutes to present, including time for questions.

• Do we need to implement the system we create, or simply design it?
You will need to implement a throwaway prototype. As a prototype, not all of the features need to be fully implemented.

• What's the purpose of the website?
The website conveys information about your team and project. It helps keep all of the resources in one place.

• Are we hosting our own prototypes?
Yes. It must be available from your team website.