**HFDS3 Requirements:**

1. The system must automatically control the steering, braking, and acceleration of the vehicle while in hands-free mode.
2. Driver Assist System will validate road conditions, current trajectory, sensor input and predicted path
3. If path is determined safe, user can opt to enter hands-free mode and once engaged user can remove hands from steering wheel
4. The system may only engage on highways that have been is enabled by the Path Prediction System.
5. Driver must be alerted when they are entering/exiting hands free mode
6. Once the driver has entered hands-free mode, the vehicle will enter adaptive cruise control state and will stay within existing lane for duration of session
7. System will automatically steer, accelerate and brake the vehicle
8. Take appropriate action depending on the behavior of other vehicles
9. System must be aware of surrounding vehicles and take appropriate action to prevent a collision with other vehicles.
10. Evaluate inaccuracies with the predicted and current path and take appropriate action
11. Drive at a speed matched to other vehicles
12. The system must maintain a safe distance between lead cars when in hands-free mode.
13. Driver Attention System will monitor driver’s eyes and head movements to ensure attentiveness.
14. If driver is inattentive, warnings will occur until final warning which vibrates the driver
15. If after the final warning, no corrective action is taken by the driver, the vehicle must disengage the hands-free mode and if needed, come to a stop.
16. If the system determines that there is a failure to maintain hands-free driving, a notification warning will be issued to the driver that they must retake control of the vehicle.
17. If final warning is unsuccessful, system will abort hands-free mode and come to a stop if needed
18. Camera monitoring should work in all lighting conditions
19. System will disengage if user adjusts the steering wheel, braking, or accelerator.
20. System will detect, notify and give up control to user if any single point of failure is detected
21. Hardware and sensor redundancies must be in place to ensure safe operation and provide time for the driver to become reengaged with the vehicle if a problem occurs
22. The system shall require a destination input before entering into the hands-free mode

**HFDS3 Questions:**

* If an object is detected in the road how will the system mitigate the collision?
* What is the system budget?
* Will drivers be allowed to enable the system on non-highway roadways?
* Can drivers use the system on non-path prediction subsystem highways?
* Under what conditions would the system have to relinquish control to the driver?
* Will the system be able to send training data back for better navigation on highways?
* How are software updates to the system handled?
* How is stopping handled if system detects that the user is not paying attention to the road?
* What happens if the Driver Attention System camera is blocked or malfunctions?
* What determines proper driver engagement with road?
* What are the various warnings? Audio warnings, visual warnings?
* Are there different warnings for if the driver needs to reclaim control versus if the driver is distracted?
* What do you mean by “monitor the driver’s eyes to ensure active engagement with the road”?
* How soon should the system recognize its blue path is different from its current path? What are safe vs unsafe driving conditions?
* What do you consider a safe distance between vehicles? Should we allow the driver to change this distance?
* What is considered an adequate LiDAR mapping?
* What would a HUD for the system look like? How will the user interact with it? Would this interfere with the Driver Attention System?
* Where should the vibrations be sent?
* What is the Path Prediction Subsystem and what does it do?
* How should the system respond after a user disengages the system by adjusting the steering wheel, braking, or throttle? Will it reengage automatically, or will it have to be manually reengaged? Should it reengage upon centering the vehicle back in the lane?