1. WHITHIN THE DC, THE ADS SHALL FACILITATE COMMUNICATION BETWEEN THE TRUCK AND THE DC INFRASTRUCTURE. (V2I)
2. WHILE DRIVING ON THE DC, THE TRUCK SHOULD BE ABLE TO SEND SIGNALS TO AND RECEIVE SIGNALS FROM OTHER TRUCKS PRESENT WITHIN THE DC (V2V).
3. THE SYSTEM SHALL PROVIDE A GUI TO THE USER.
4. THE ADS SHALL BE ABLE TO DRIVE A TRUCK AUTONOMOUSLY BETWEEN TWO SPECIFIED LOCATIONS ON THE DC.

* The ADS shall avoid collision of the truck with other objects.
* The ADS shall not change the dynamics of the provided truck model.
* The ADS shall maintain the existing manual driving ability of the truck.
* The ADS should switch from manual driving mode to autonomous driving mode of truck within 10 seconds when the ADS receive the designated signal from the driver.
* The ADS shall switch from autonomous driving mode to manual driving mode of truck within 10 seconds after parking at the designated parking place.
* The ADS should show the driver the current driving mode.
* ADS shall receive the coordinates of objects within the map of the DC from the Localisation system.
* The ADS shall receive the desired destination from the DC operator.
* The ADS shall find the shortest possible path between the truck and the desired destination based on the object coordinates.
* The ADS shall choose the shortest possible path.
* (WILL BE DERIVED LATER, E.G. FORWARD DRIVING PATH/BACKWARD DRIVING PATH, THROUGH EMPTY PARKING PLACES OR AVOIDING EMPTY PARKING PLACES)
* The ADS shall find a path around the objects present on the map of DC while determining the path.
* The ADS shall ensure that physically impossible positions of the truck and trailer are avoided while determining the path.
* The ADS shall take into consideration that the truck has to park backwards at a dock while determining the path.
* The ADS shall be able to drive the truck on the final generated path.
* The ADS shall ensure that the truck and the trailer follow the final generated path with a maximum deviation of 0.1 meter during forward driving.
* The ADS shall ensure that the truck and the trailer follow the final generated path with a maximum deviation of 0.1 meter during reverse driving.
* The ADS shall ensure that the trailer is parked orthogonal to the docking door (angle of 90 degrees) during docking.
* The ADS shall ensure that the trailer is docked with a maximum deviation of 2 degree
* The ADS should ensure that the maximum steering angle does not exceed the physical capabilities of the truck’s steering ADS.

1. THE SYSTEM(ADS) SHALL BE ABLE TO OBTAIN POWER FROM POWERTRAIN TO DRIVE THE TRUCK IN DC.
2. The system should provide automatic charging capability for the trucks.
3. THE ADS SHALL BE OPERABLE ONLY IN THE DIGITAL TWIN ENVIRONMENT. (Non-functional)
4. THE ADS SHALL ADHERE TO THE AUTOMOTIVE SAFETY STANDARDS (ISO 26262). (Non-functional)