

07

System Functional Requirements

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Overview

The following table (Table 7.1) presents a set of common vehicle specifications that might be used in procurement. Individual AV manufacturers may have potential requirements and/or capabilities that go beyond those described in this chapter and throughout this document. As such these specifications may evolve over time as the City of Lincoln moves towards a larger implementation of the concept. Lincoln will soon be in the process of engaging with firms and vendors to discuss the pilot project. These efforts may result in the City learning new information that will impact the specifications.

Table 7.1 System Functional Requirements

Spec. Number	Requirement Priority	Requirement Statement
Physical Requirements		
PHY_001	Mandatory	The vehicle shall be no wider than 8 feet.
PHY_002	Mandatory	The vehicle shall be no longer than 25 feet.
PHY_003	Valued	If provisioned for standing passengers, the vehicle shall have an interior height for standing passengers of at least 7 feet.
PHY_004	Mandatory	The vehicle shall have a ground clearance of at least 10 inches while in motion.
PHY_005	Mandatory	The vehicle shall have a mechanism for City of Lincoln staff to re-fuel the vehicle.
Operational Requirements		
OP_001	Mandatory	The vehicle shall be able to be legally operated on public streets. <i>Note: Some vehicles may only be legal for operations when in dedicated lanes.</i>
OP_002	Mandatory	The vehicle shall be able to operate in mixed traffic general purpose travel lanes.
OP_003	Mandatory	The vehicle shall be able to operate within a 10' lane.
OP_004	Mandatory	The vehicle shall be capable of ascertaining right of way at intersections.
OP_005	Mandatory	The operational speed of the vehicle shall be at least 12 mph and no more than 35 mph at grade.
OP_006	Mandatory	The vehicle shall be capable of being operated in an autonomous fashion. <i>Note: The term "Autonomous" conveys the intent for the vehicle to be able to be operated without an on-board or remote operator. Normal driving functions such as (a) stopping, (acceleration/deceleration), traveling to the next station, and (c) detecting and reacting to potential hazards in the vehicle path are included in this definition.</i>
OP_007	Mandatory	The vehicle shall be capable of operating on a fixed route.
OP_008	Mandatory	The vehicle shall be capable of operating on a dynamic schedule based on rider demand.
OP_009	Mandatory	The vehicle shall be capable of utilizing pre-defined short cuts based on rider demand.
OP_010	Mandatory	The vehicle shall be capable of receiving ride requests via smart phone application.
OP_011	Valued	A full complement of passengers should be able to embark/disembark from the vehicle within 20 seconds upon the vehicle coming to a complete stop.
OP_012	Mandatory	The vehicle shall be capable of operating continuously for a minimum of five hours without refueling. <i>Note: This requirement includes those conditions where climate controls are required.</i>
OP_013	Mandatory	The vehicle shall be able to be refueled overnight. <i>Note: Overnight is defined as a continuous period of inactivity of 8-10 hours.</i>

OP_014	Mandatory	The vehicle shall be capable of being manually operated for maintenance or emergency purposes. <i>Note: Examples of maintenance operations include positioning the vehicle for refueling, changing tires, fixing minor structural damage, etc. Examples of emergency purposes would include navigation around an unexpected obstacle encountered.</i>
OP_015	Mandatory	The vehicle shall be capable of disembarking passengers in the event of an emergency. <i>Note: For example, if there is a system failure within the vehicle, a medical emergency among passengers, etc.</i>
OP_016	Valued	The vehicle shall be capable of being locked. <i>Note: Locked refers to the ability of securing the vehicle to prevent unwanted entry and operation of the vehicle.</i>
OP_017	Valued	The vehicle shall be equipped with an emergency stop capability that can be activated by passengers.
OP_018	Mandatory	The vehicle shall provide to City of Lincoln real-time location information at a frequency of at least once per minute (60 seconds). <i>Note: Location information is expected to consist of Latitude, Longitude, Timestamp, Heading, and Speed.</i>
OP_019	Mandatory	The vehicle shall capture and notify City of Lincoln of a traffic issue/ incident within 60 seconds of occurrence.
OP_020	Valued	The vehicle shall be able to count and report to City of Lincoln daily the number of passengers transported.
OP_021	Valued	The vehicle shall have the ability to monitor in real-time the conditions within the vehicle's cabin. <i>Note: Visual monitoring would be preferred.</i>
OP_022	Valued	The vehicle shall be able to provide visual monitoring of the conditions external to the vehicle.
Passenger Comfort and Safety Requirements		
PC_001	Mandatory	The vehicle shall be capable of simultaneously transporting a minimum of 10 able-bodied persons.
PC_002	Mandatory	The vehicle shall be able to simultaneously accommodate at least one person in a wheelchair and at least six (6) other able-bodied persons.
PC_003	Valued	The vehicle shall have a mechanism enabling the entry and exit of the vehicle by a person in a wheelchair without requiring infrastructure-based equipment or ramps.
PC_004	Mandatory	The vehicle shall have provisions for a minimum of three persons to simultaneously travel in a seated position.
PC_005	Valued	The vehicle shall include provisions to secure occupied wheelchairs during transportation movements.
PC_006	Valued	The vehicle shall be capable of transporting a motorized scooter.
PC_007	Valued	The vehicle shall be equipped with seat-belts or other safety devices such as air-bags for the protection of occupants in vehicle crashes.
PC_008	Mandatory	The vehicle shall be equipped with climate control equipment capable of maintaining an interior cabin temperature of between 68 - 72 degrees Fahrenheit during transportation operations when the outdoor air temperature is between 20-90 degrees Fahrenheit.

