

The Purpose of Boston's Autonomous Vehicle Testing Program

The City of Boston's autonomous vehicles testing program is rooted in the transportation priorities of our constituents.

In the public engagement for [our long term transportation plan](#), our constituents voiced a clear call for a transportation network that is safer for all modes, that is more accessible for all neighborhoods, and that is more reliable for all trips. They also voiced a desire to cut carbon emissions and free up more of our streets for pedestrians and cyclists.

We believe that autonomous vehicles have the remarkable potential to help achieve all of these goals, if they are electric, if they are shared, and if they integrate well with pedestrians, cyclists and mass transit. We believe, however, that that future that is not a given and may not be realized in our nation's urban areas where our streets are most complex.

Our testing program, consequently, is established with those outcomes in mind.

We want to support the technical testing of autonomous vehicles in Boston so that autonomous vehicles can bring greater transportation safety, accessibility and reliability to our constituents. And, we want to support the development of uses of AVs that, in particular, cut emissions, free up streets for alternative uses, and extend access to areas of our city least well served by transit today.

With those goals in mind, the three requirements of our testing program are outlined below.

Requirement #1: Phased Roll Out

For the safety and understanding of both partner companies and other road users, testing on Boston streets takes a phased approach. As you gain experience on our streets, you gain flexibility in the time, place and manner you can conducting testing.

During all training phases, all partners must conduct testing in accordance with all state and local traffic laws, including abiding by all rules of the road, speed limits, and traffic signs and signals.

| Phase A - Off-Road or Off-Site Testing | |
|---|--|
| <i>Place</i> | <i>Milestone</i> |
| Testing must not occur on a City street. | <p>A partner must document or demonstrate the following before moving to Phase B1:</p> <ul style="list-style-type: none"> • Ease of manual takeover from AV • Emergency braking and emergency stop functionality • Safety alert system for the driver to take over control • Automatic braking upon detection of an obstacle • Basic driving capabilities, such as staying within a lane. |

| Phase B1 - The Raymond L. Flynn Marine Park | | | |
|---|---|---|--|
| <i>Time</i> | <i>Place</i> | <i>Manner</i> | <i>Milestone</i> |
| Testing must occur in daylight hours only during weather without precipitation. | Testing can only occur within the Marine Industrial Park. | Vehicle must have a safety driver behind the wheel. | After documenting 100 miles logged in Phase B1, the partner may request to move to Phase B2. |

| Phase B2 - The Raymond L. Flynn Marine Park | | | |
|---|--|---|--|
| <i>Time</i> | <i>Place</i> | <i>Manner</i> | <i>Milestone</i> |
| <p>Testing must occur in both during daytime and nighttime hours.</p> <p>Testing must include periods during precipitation.</p> | Testing can only occur within the Marine Industrial Park, an area defined in attachment | Vehicle must have a safety driver behind the wheel. | After documenting 100 miles logged in Phase B2, the partner may request to move to Phase C1. |

| Phase C1 - A Second, Mutually-Agreed Upon Geography | | | |
|---|--|---|--|
| <i>Time</i> | <i>Place</i> | <i>Manner</i> | <i>Milestone</i> |
| Testing must occur in daylight hours only during weather without precipitation. | Testing can only occur within the South Boston Waterfront, an area defined in attachment | Vehicle must have a safety driver behind the wheel. | After documenting 200 miles logged in Phase C1, the partner may request to move to Phase C2. |

| Phase C2 - A Second, Mutually-Agreed Upon Geography | | | |
|---|---|--|---|
| <i>Time</i> | <i>Place</i> | <i>Manner</i> | <i>Milestone</i> |
| <p>Testing must occur in both during daytime and nighttime hours.</p> <p>Testing must include periods during precipitation.</p> | <p>Testing can only occur within the South Boston Waterfront, an area defined in attachment</p> | <p>Vehicle must have a safety driver behind the wheel.</p> | <p>After documenting 200 miles logged in Phase C2, the partner may request to move to Phase D1.</p> |

| Phase D1 - City of Boston | | | |
|--|---|--|---|
| <i>Time</i> | <i>Place</i> | <i>Manner</i> | <i>Milestone</i> |
| <p>Testing must occur in daylight hours only during weather without precipitation.</p> | <p>Testing can only occur within the City of Boston, an area defined in attachment</p> <p>....</p> <p>Vehicle can only operate on roads with a speed limit at 30 mph or less.</p> | <p>Vehicle must have a safety driver behind the wheel.</p> | <p>After documenting 400 miles logged in Phase D1, the partner may request to move to Phase D2.</p> |

| Phase D2 - City of Boston | | | |
|---|---|--|------------------|
| <i>Time</i> | <i>Place</i> | <i>Manner</i> | <i>Milestone</i> |
| <p>Testing must occur in both during daytime and nighttime hours.</p> <p>Testing must include periods during precipitation.</p> | <p>Testing can only occur within the City of Boston, an area defined in attachment</p> <p>....</p> <p>Vehicle can only operate on roads with a speed limit at 30 mph or less.</p> | <p>Vehicle must have a safety driver behind the wheel.</p> | <p>N/A</p> |

Upon completion of a milestone, you may apply to advance to the next training phase by submitting complete documentation to the City confirming your safe, successful completion of a training phase. The City will review the documentation provided and issue a written determination as to whether you may advance to the next training phase.

Requirement #2: Sharing Key Data Publicly

The intent of the data sharing, at this stage, is to ensure public transparency of the results of the testing that is occurring. The following data must be shared with the City:

Crash Reports:

The City of Boston must be notified of any crash, no matter the severity. In addition, within 24 hours, the partner must submit a crash report detailing any crash that occurs with the autonomous test vehicle, regardless of the reason for the crash. A more detailed analysis of the crash and any corrective measures taken will be detailed in a future report delivered within a reasonable time period.

Quarterly Usage Reports:

These reports detail the use of the autonomous vehicle including, by vehicle:

- Miles driven
- Locations driven
- Conditions driven in
- Crash reports
- Failures with autonomous mode
- Disruptions while driving in autonomous mode

In a narrative section, a description of the conditions relating to unintended transitions from autonomous to safety driver-operated.

Requirement #3: Sharing Research Accomplishments

We have a research agenda. We want to learn:

- What infrastructure do we need on our streets?
- What policies do we need at the City and State level?
- What data should we collect and what structures do we need for governance?
- What partnerships do we need to enable with other transit providers?

We also want to know and share your agenda. We believe that this will accelerate a common understanding of the state of autonomous vehicles and build energy around solving some of the hardest challenges. To support this objective, you agree to participate in a minimum of two community events or collaborative activities, where you will demonstrate your technology and answer questions.

As you solve challenges, we want to help you share those accomplishments with a broader audience. This would include posting links to your research on the City's website and distributing information on it to partner cities.

Updating These Requirements

These requirements may change as the testing program evolves and as the City evaluates data generated by the program. The City reserves the right to periodically update and supplement these requirements in its sole discretion.