Direct Vision

Request for Information

Assessment of the availability of trucks in the market with smaller blind zones/increased direct vision

ISSUED BY

Streets Cabinet, City of Boston
Office of Emerging Technology
Boston Public Health Commission

RFI Issue Date: Tuesday, July 16, 2024, noon EST
RFI Closing Date: Friday, August 09, 2024, 5:00 pm EST

INQUIRIES

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1. NOTICE TO RESPONDENTS

City of Boston
Boston Transportation Department, Boston Public Health Commission, and Office of Emerging Technology

The City of Boston aims to increase the number of right-sized, electric vehicles with increased direct vision in the City fleet. Prior to creating new procurement guidelines for vehicles, the City is looking for truck and bus manufacturers and vendors to share information with us on what types of vehicles are available.

The City of Boston (the City), acting through its Office of Emerging Technology, invites submittals for the Request for Information (RFI) generally described above, and particularly as set forth in the RFI. The RFI will be available from **Tuesday, July 16, 2024, at noon** on the Large Vehicle Safety section of the City of Boston website.

We would appreciate receiving your response by **5:00 pm on Friday, August 02, 2024,** via completing and submitting a Google form. Refer to Section 3.0 of this RFI for complete information on the submission process and details.

2. OPENING LETTER

Dear Truck Manufacturer and Vendors,

The Federal Highway Administration recognizes that to get to zero traffic deaths, we need to adopt a Safe System Approach, and a key pillar of that approach is to have safer vehicles. Vehicles with large front hoods and small windows tend to have large blind zones, where drivers are unable to see people walking, riding a bike, or using a wheelchair. Additional factors such as vehicle mass, hood height and slope, and the existence of open spaces between the front and rear wheels impact the force and harm caused to vulnerable road users (VRUs) when there is a crash.

As the City charts its way towards eliminating serious and fatal traffic crashes on city streets by 2030, we need to explore new vehicle designs for our large trucks and buses that have smaller blind zones and are safer to drive. To date, most efforts to address blind-zone fatalities have focused on mirrors, cameras, and sensors, also known as "indirect vision" tools. While these tools can be somewhat effective, there is a significant increase in driver reaction time that comes with indirect vision. Drivers who can directly see people outside the vehicle - without the aid of cameras, mirrors, and sensors - react up to ¾ of a second faster than drivers using cameras, mirrors, and sensors. These split seconds, even with technological assistance, can mean the difference between life and death. We see this on our streets, as large vehicles cause a disproportionately greater number of injuries and fatalities to VRUs. From 2016-2022, three out of the six bicyclist fatalities in Boston resulted from crashes with larger vehicles. In adjoining Cambridge, up to 80 percent of traffic fatalities over the past 10 years have involved trucks.

Our research to date suggests that there are not many models of large trucks available in the US that are designed to have good direct vision. However, there appears to be promise with newer, electric vehicle designs. The City of Boston is considering whether we can achieve better safety along with advancing our emission reduction goals by switching to EV trucks. Our goal with this RFI is to signal to truck vendors, dealerships, and manufacturers that Boston and other cities will be prioritizing downsized vehicles with better direct vision, especially electric vehicles, in the near future.

This is a safety as well as a public health issue. With safer vehicles on our city streets, we will have fewer avoidable deaths and injuries, and residents and visitors will feel more comfortable choosing walking, rolling, and biking to get to work and school and for other transportation needs. Procuring smaller, electric vehicles with more direct vision will reinforce Boston's transition toward becoming a healthier and more resilient community.

Sincerely,
City of Boston

3. RFI BACKGROUND AND GOALS

For about a decade, entities have been exploring different rating systems in order to classify the safety of vehicles in cities. In 2021, Transport for London (TfL) and the Mayor of London implemented a Direct Vision Standard (DVS) as part of the city's Vision Zero approach. This first-of-its-kind standard applies to all vehicles over 12 tonnes (26,455 lbs), or Heavy Goods Vehicles (HGVs), entering London and assigns a star rating from zero to five. The star rating is based on measurements of a driver's direct vision through the HGV windows.

In 2023, the U.S. DOT Volpe National Transportation Systems Center (the Volpe Center) and the City of Boston (the City) developed a simple method to assess direct vision that we refer to as "the cone method". The cone method is intended to be meaningful and rigorous yet streamlined enough to be doable by anyone with a vehicle, a tape measure, and two traffic cones. Using this method. Volpe and the City measured and rated the blind zones of a sample of Boston's Public Works trucks, all of the fire department trucks, and 99% of Boston Public School buses and summarized the findings in a report titled Boston Blind Zone Safety Initiative.

The feedback from this RFI will help us create achievable direct vision standards and specifications for future vehicle purchases and will also help us create an informed implementation plan and timeline for the transition to a safer fleet. The implementation plan may follow a similar model to Boston's side guard ordinance, which covers city-owned as well as city-contracted vehicles.

DOWNSIZING OR RIGHT-SIZING VEHICLES TO FIT CITY STREETS

As we think about reducing blind zones, we also need to keep in mind that city streets can be narrow - in some cases, 16 feet curb to curb, with 10' wide travel lanes. We are interested in identifying vehicles optimized for safe urban driving that can maneuver and get the job done while also prioritizing direct vision and the safety of other road users. This is referred to as downsizing or right-sizing vehicles for an urban environment.

ADDITIONAL INFORMATION

For more information about the Boston Blind Zone Safety Initiative led by the Volpe Center with the City of Boston, visit the U.S. Department of Transportation's online National Transportation Library. This report provides additional context on the project, plus a sampling of direct vision measurements using the city's existing fleet. It also sets the stage for how Boston might procure vehicles with better direct vision in the future.

For information about the Direct Vision Five Star Rating System based on the Boston initiative that was developed by the global non-government organization Together for Safer Roads, visit their website at togetherforsaferroads.org. The website has several resources

on this topic, including a Direct Vision Rating Guide with instructions for assessing the Direct Vision Star Rating of any vehicle.

To learn more about Boston's commitment to track and eliminate fatal and severe crashes on our roadways, visit Boston's Vision Zero website. In the meantime, in order to mitigate fatal and severe crashes in the near term, several technologies can be retrofitted into existing vehicles to enhance safety and efficiency. You can refer to Optimizing Large Vehicles for Urban Environments document to learn more about the ways in which Advanced driver assistance systems (ADAS), a variety of vehicle safety technologies that use onboard radar, camera, and other sensors to scan the vehicle's surroundings and either alert the driver or automatically intercede on the driver's behalf to prevent or mitigate a wide range of crash types.

Additional references are listed in Section 6 below.

4. HOW TO ASSESS DIRECT VISION USING THE CONE METHOD

Instructions are provided below, but you can also refer to the Direct Vision Rating Guide by Together for Safer Roads, which proposes the use of an extendable "monopod" in place of traffic cones.

Position the driver's seat at the mid-track and mid-height location:

- Set the driver seat to the lowest vertical height. Note that non-power seats typically have a lever that pumps to lower or raise the seat height.
- Move the driver seat to the forwardmost longitudinal position and record the distance from the front of the seat to a point on the dashboard at the height of the seat.
- Move the driver seat to the rearward most longitudinal position and record the distance from the front of the seat to a point on the dashboard at the height of the seat.
- Calculate the mid-track distance using the average of these two numbers and position the seat at the midtrack.
- From midtrack, use the vertical seat adjustment and record values of the lowest and highest seat position.
- Calculate mid-height using the average of these two numbers and adjust the seat to that height.

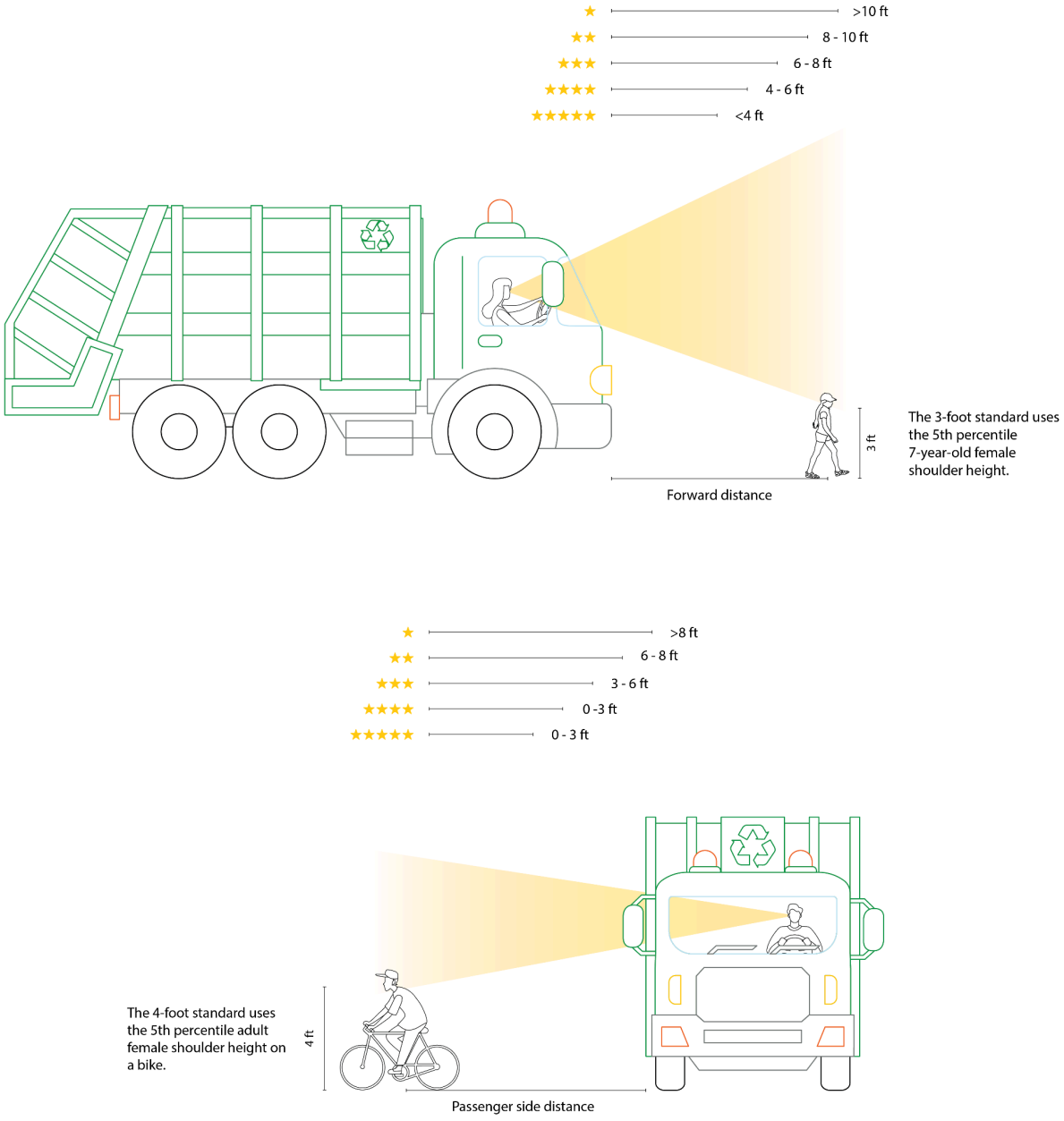
Using two traffic cones (one 3-foot and one 4-foot) and a tape measure, measure how far forward a driver can see the 3-foot cone to the front and the 4-foot cone to the passenger side as follows:

- Provide the distance forward of the center of the vehicle bumper at which the driver can first see the top of a 3-foot cone.
- Provide the distance beyond the passenger side of the vehicle's footprint (or beyond the right side outermost plane of the vehicle) at which the driver can first see the top of the 4-foot cone. If the 4-foot cone is visible at any distance, provide the distance at which the driver can first see the top of a 3-foot cone.
- Provide the height of the person in the driver's seat who you are using to see the two cones. Because taller drivers can see farther, we will standardize for height.

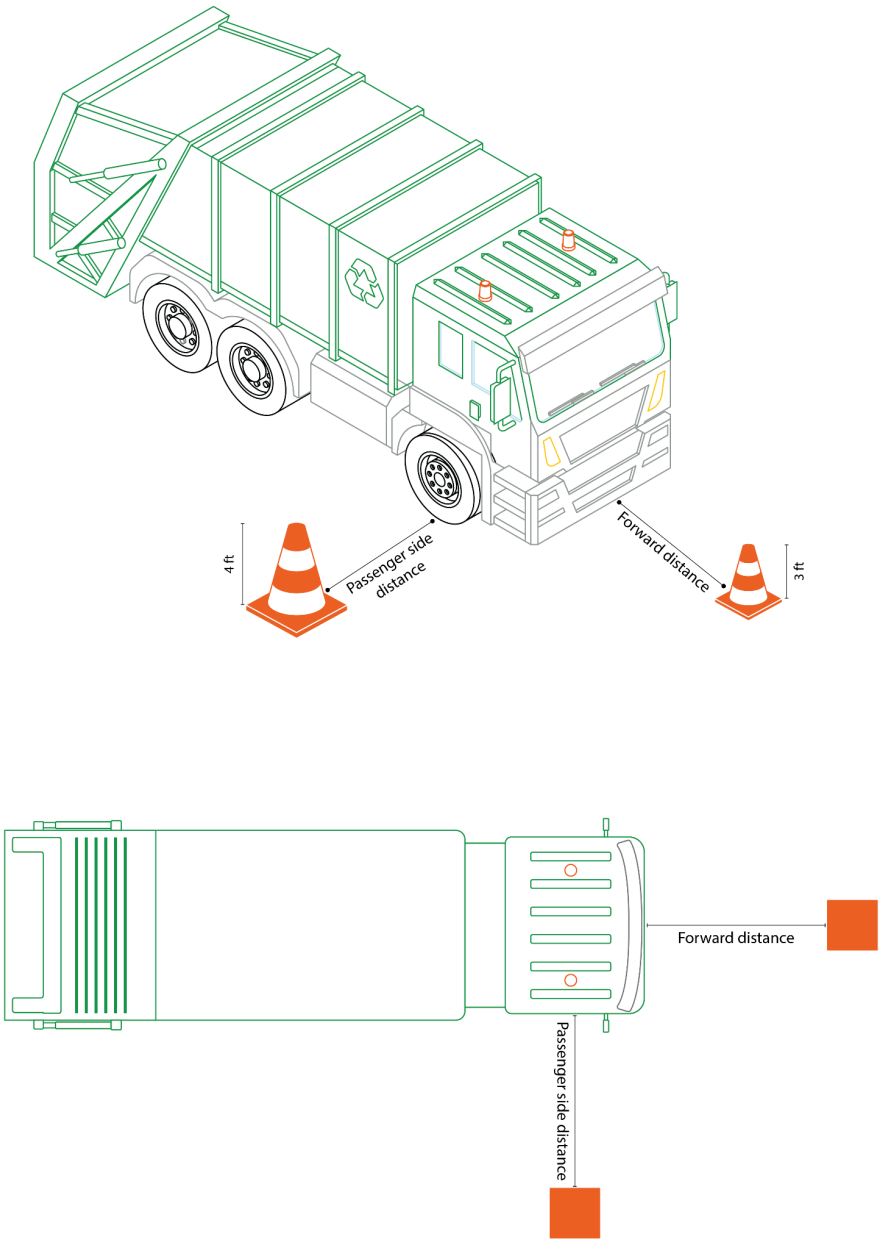
For reference:

- A 3-foot cone approximates a grade school child VRU:
    - Grade school child: 37 inches to shoulder
    - Grade school child bicyclist: 35 inches to shoulder
- 4-foot cone approximates an adult VRU:
    - Adult: 49 inches to shoulder

- Adult bicyclist: 47 inches to shoulder



Figures 1 and 2. Direct vision and star rating based on distance from the side and front of the vehicle.



Figures 3 and 4. Cone method of direct vision reporting for bidders.

5. RFI RESPONSES

I. RFI SUBMISSIONS

A. Please describe your plans or understanding of the truck industry for downsizing, rightsizing, electrifying, and increasing the direct vision of the trucks you manufacture and/or sell for urban driving. Truck types include but are not limited to:

- Work trucks, including but not limited to tow and refuse
- Pickup trucks and SUVs
- Freight and other commercial trucks
- Buses, including school buses and vans

B. Please use the cone method to rate the direct vision of vehicles you currently offer or vehicles in the pipeline that you believe would best meet the city's goals for safety, functionality, and direct vision.

C. Please provide an estimated cost (or approximate cost range) for each rated vehicle type.

We would like to discuss this with you in a virtual or in-person meeting to make sure it is clear and to help with measurements if you are local. Please contact us at directvision@boston.gov at your earliest convenience, and we will work with you to find a time for this.

Please complete the Google Form by **5:00 pm Boston local time on Friday, August 09, 2024.** Within the form, please make sure to respond to all questions asked. Responses can include all information you believe could be important or useful for the City.

II. RFI TIMELINE

The table below includes relevant events and deadlines for this RFI.

Event	Date and Time
RFI Issue Date	Tuesday, July 16, 2024, at noon
Virtual Meeting for Interested Parties	Wednesday, July 24, 2024, at 9:00 am Wednesday, July 31, 2024 at 9:00 am
RFI Closing Date	Friday, August 09, 2024, at 5:00 pm

The City of Boston may change these dates at its sole discretion.

III. RFI VIRTUAL INFORMATION SESSION

We will host a virtual meeting to discuss our goals, walk through the RFI, hear your feedback and suggestions, and answer any questions you may have. Attendance is not mandatory but is highly recommended. Please use the link below to join the virtual meeting.

Details to join the virtual meeting:
Join Zoom Meeting
https://zoom.us/j/97818324557?pwd=yMUyy57IwQBQqNJ4uUSFYNl2tT82iO.1

Meeting ID: 978 1832 4557
Passcode: 7m9uv5

IV. RFI CONTACT

Should you have any questions, please contact:
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V. CONFIDENTIALITY

The City of Boston is subject to public records laws and must comply with associated obligations. A Guide to the Massachusetts Public Records Law is available. Your response will be public record. If respondents do not wish to provide certain components of the requested information, please share as much information as can be provided.

6. REFERENCES

Brodeur, Alyssa, Eric Englin, Alexander K. Epstein, Ph.D., and Alessandra Vennema, U.S. Department of Transportation, Volpe Center. Boston Blind Zone Safety Initiative: Current Fleet Analysis, Market Scan, and Proposed Direct Vision Rating Framework. August 2023.

Chiarenza, Jonah, Margo Dawes, Alexander K Epstein, Ph.D., Donald Fisher, Ph.D., and Katherine Welty, NACTO, Volpe Center. Optimizing Large Vehicles for Urban Environments. December 2018.

Merwin, Robert. Solving Blind Zones for Fleets with Direct Vision Truck Cabs. Motor.com. June 2022.

Together for Safer Roads. TSR Direct Vision 5 Star Rating System. Togetherforsaferroads.org. Accessed July 2024.

Transport for London, Arup, and the University of Leeds PAC Lab. Exploring the Road Safety Benefits of Direct Vision. November 2016.

United Nations Economic Commission for Europe. UNECE Regulation 167 Addendum 166: Uniform Provisions Concerning the Approval of Motor Vehicles with Regard to Their Direct Vision. June 2023.

7. APPENDIX (DISCLOSURE)

This RFI is for information and planning purposes only and shall not be construed as a solicitation or as an obligation on the part of the City to issue any competitive procurement or award a contract.

The City will not award a contract on the basis of responses to this RFI nor otherwise pay for the preparation of any information submitted, for any vendor presentation, or for the City's use of such information.

All responses to this RFI will be on public record under the Massachusetts' Public Records, Law, Mass. Gen. L. ch. 66 s. 10, regardless of confidentiality notices to the contrary.

By submitting, the applicant authorizes the City of Boston to publicize, refer to, and use your application as it sees fit.