

# REPORT: Side Guard Pilot Project



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Protecting Vulnerable Road Users



Bureau of Planning and Sustainability

Innovation. Collaboration. Practical Solutions.

City of Portland, Oregon



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## PROTECTING VULNERABLE ROAD USERS

### SUMMARY

According to the United States Department of Transportation's Volpe Center, blocking the side openings of large trucks mitigates risks associated with large trucks operating alongside vulnerable road users such as cyclists. The purpose of the Side Guard Pilot Project was to learn details about the installation of side guards; and to determine whether any performance issues might occur while using them on garbage and recycling trucks.

This information gathered from the results of this pilot will be used for future policy development. As mentioned in the Portland Bureau of Transportation's (PBOT) *Vision Zero Action Plan*, Portland's need for increased density causes increased risks for anyone who shares the road with large service vehicles.

### BACKGROUND

Finalized in 2016, the *Vision Zero Action Plan* places asks city contractors to install side guards by December 2021. Review the plan on PBOT's website: <http://www.portlandoregon.gov/transportation/71738>.

The City of Portland Bureau of Planning and Sustainability (BPS) oversees regulations for Portland's franchised garbage and recycling companies, which are included as contractors. To understand the cost and performance of side guards, the BPS funded and coordinated a pilot project to install side guards on 18 collection trucks.

Eleven companies participated in the pilot project: Arrow Sanitary, City Sanitary, City of Roses, Elmer's Sanitary, Gresham Sanitary, Heiberg Garbage, Portland Disposal and Recycling, Recology, Republic Services, Walker Garbage, and Waste Management. Once the side guards were installed, BPS received invoices for reimbursement for the project and conducted interviews with the participating companies to learn from their experience.

Other project partners included the Portland Bureau of Transportation, City Fleet, Metro and other local governments, General Equipment (contractor for installation of side guards), Walker Blocker and Taklr (side guard vendors).

### VOLPE SPECIFICATIONS

Volpe specifications are established through study review by staff at the Volpe Center in Cambridge. Volpe specifications are primarily intended for box trucks and didn't account for some of the idiosyncrasies of garbage and recycling trucks, like numerous tanks, levers and other moving components. To help BPS figure out how to account for these factors, Volpe staff recommended that side guards be used for minimum spaces between tires of two feet. This specification would be in addition to the established Volpe specifications.

## REPORT: Side Guard Pilot Project

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BPS recommend that any policy moving forward adhere to the Volpe specifications for trucks that have a side opening between the axles, greater than two feet. Review the specifications on Volpe's website:

<https://www.volpe.dot.gov/our-work/truck-side-guards-resource-page> .

### TRUCK TYPES

Front-loader and drop-box trucks—featuring wider open spaces on the sides—were typically the best candidates for this pilot project. The next best candidates were rear-loader trucks that often have large side spaces. Finally, side-loader trucks were the least likely to need side guards due to smaller spaces on the sides and moving components from the side-loading mechanism.

Any recommendation would include an assessment of all trucks regardless of their likelihood of needing side guards to ensure maximum safety. The truck types in the pilot project included six drop-box trucks, five front-load trucks, five rear-load trucks and two side-load trucks.

### PERFORMANCE ON ROUTE

Prior to the pilot, concern was expressed about whether the side guards would affect vehicle clearance and cause bottoming out during service operations. To address this issue, trucks in the pilot serviced customers from various parts of town, many were primarily downtown (highest vehicle and bike congestion) and a couple in the southwest hills (testing clearance). There was one reported incident of bottoming out due to lack of clearance at a curb, but no incidents on typical Portland street terrain.

### INSTALLATION

Retrofitting garbage trucks with side guards can be challenging because each truck is highly customized, and all have several moving components as part of its normal operations. In many cases, other components on the truck, such as levers, tanks and gages needed to be moved to make room for the side guards. Installation of side guards on new trucks will be more efficient because the truck builders will be able to coordinate the placement of all components at the same time.

Some side-loader trucks have drop frames to allow for the functionality of the side arm that lifts the cart to be emptied into the truck. In these cases, the body of the truck can be used to mount the side guards.

During the pilot, there were a couple of winter storms that caused an increase in maintenance for collection trucks due to accidents associated with slippery winter conditions. This diverted time and resources needed to install side guards into fixing trucks to continue collections.

### COSTS

There were two costs for this pilot project: 1) The purchase of the side guard equipment; and 2) The installation of the side guards. The purchase of the equipment happened through two different vendors and the installation was mostly hired out to a company that specializes in building garbage and recycling trucks. In some cases the garbage and recycling companies' mechanic staff performed the installation. Haulers that installed the side guards learned the Volpe specifications and how to meet them.

The average installation time was seven hours. It is estimated that costs will go down in two ways: 1) Mechanics becoming more efficient through repetition and experience with installation; and 2) Installation at the point of assembly, having the ability to coordinate space with other truck functions, storage and tanks.

In addition, at the beginning of the pilot, we weren't aware of the two-foot space minimum. A few side guards were installed in spaces that were smaller than that minimum. Some of the costs would have been avoided if we hadn't filled the smaller spaces, which contributed to a lower cost per truck for both equipment and installation. Average equipment cost: \$1813. Installation cost: \$865. Total cost per truck: \$2623.

### ALTERNATIVES TO SIDE GUARDS

Many haulers expressed interest in closing side spaces on trucks with usable equipment, such as storage boxes. While this is a viable solution, this strategy would still need to follow Volpe specifications for side guards to meet the prescribed safety measure. This means that storage boxes would need to be installed to be flush with the side of the vehicle and positioned to meet the other measurements of Volpe, including, but not limited to, impact analysis (440 lbs. pressure) and the space from the ground to the bottom of the storage box.

### RECOMMENDATIONS

Based on the pilot project, BPS staff will pursue the following policy actions:

- As of January 1, 2020, all new trucks with side openings greater than two feet will be required to adhere to the Volpe Specifications. These openings can be filled with side guards or other equipment, if the specifications are followed.
- As of January 2022, all trucks manufactured in 2010 and newer with side openings greater than two feet will be required to adhere to Volpe specifications. This requirement can be accomplished by using side guards or other equipment such as toolboxes or material compartments.

### SCOPE OF WORK AND BPS ASSISTANCE

Based on current truck inventories, BPS estimates that 195 trucks will need to be retrofitted before January 1, 2022. Based on the costs of the pilot retrofitting the 2010 to 2019 trucks would cost approximately \$432,795 across all garbage and recycling companies.

Truck Type	# of trucks servicing Portland	Est. # do not meet Volpe
Side Loaders	125	43
Front Loaders	50	57
Drop Box	55	63
Rear Loaders	30	32

To help offset the cost of retrofitting trucks, BPS will reimburse 50% of the cost of side guard equipment and labor for installation, up to \$1,000 per truck. Reimbursement will be contingent upon adherence with the Volpe specifications. BPS staff will conduct inspections

of trucks prior to reimbursement. Reimbursements will be available from Jan. 1, 2020 to Jan. 1, 2022.

### PROJECT CONTACT

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PHOTOS OF INSTALLED SIDE GUARDS



Left: drop-box truck with small openings and panel side guard and warning sticker. Below: drop-box truck with rail side guards. Bottom of page: side-load truck with panel guards and warning stickers.





Left: front-load truck with panel side guard.  
Below: front-load truck with panel side guards and warning sticker. Bottom of page: rear-load truck with rail side guards.

