

Truck Side Guard Technical Overview

Safety and Operational Considerations

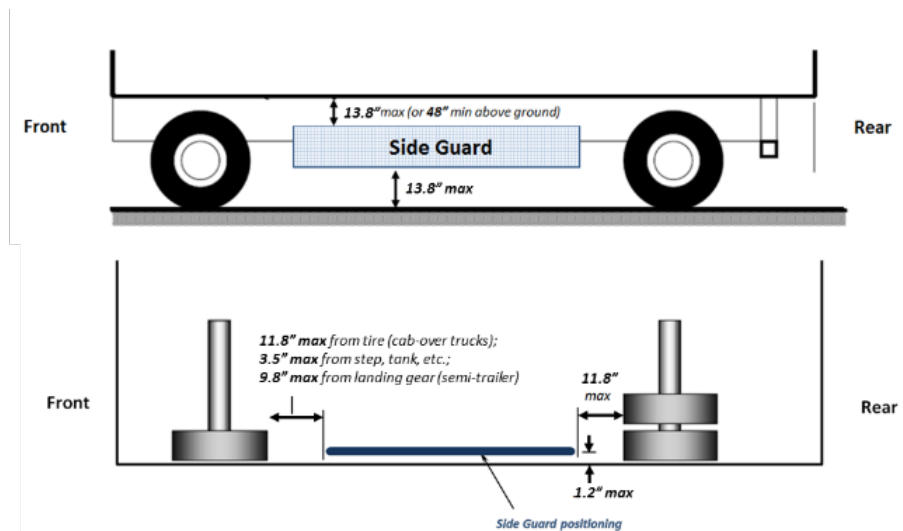
Truck **side guards** are devices designed to keep vulnerable road users (VRUs)—pedestrians, bicyclists, and motorcyclists—from being run over by a large truck’s rear wheels in a side-impact collision. This technology, which can also be designed to protect automobile occupants, works by physically covering the exposed space between the front and rear wheels of a truck.

Side guards have been required since the 1980s in the European Union and Japan, and more recently in China, Brazil, and Peru. Canada conducted research for a national side guard standard from 2009 to 2013 and also began evaluating the viability of using aerodynamic side skirts for VRU safety. Reports from that effort and from [Dutch research](#) suggest that certain side skirts may provide comparable protection while also potentially reducing fuel consumption by reducing air drag.

Side collisions with large trucks were associated with 111 pedestrian and bicyclist fatalities annually in the U.S., based on 2005-2009 data on [single-unit trucks](#) and [tractor-trailers](#). **Of the 75 fatal bicyclist crashes per year with trucks, approximately 50 percent were side impacts.**

Based on studies conducted in the United Kingdom, side guards are an effective technology for reducing the number of VRU fatalities and the severity of injuries, especially for bicyclists. For example, in the UK, a 61 percent reduction in cyclist fatalities and a 20 percent reduction in pedestrian fatalities were [reported](#) in side-impact collisions with trucks following the national side guard mandate.

Rail-style side guards designed to protect VRUs cost an average of [\\$847](#) and add between [6 and](#)



Schematic of truck side guard specifications from Volpe/U.S. DOT [Recommended Standard DOT-VNTSC-OSTR-16-05](#).





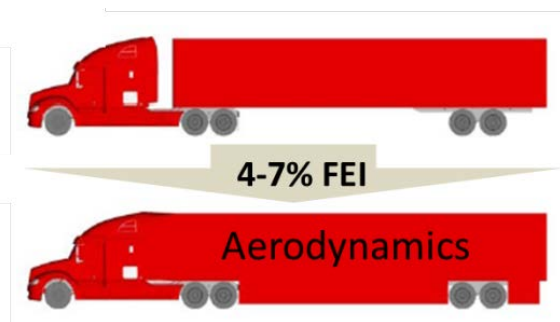
Truck side guards are shown installed on single-unit as well as combination trucks. At top right, a rigid aerodynamic side skirt installed on a trailer. (Top right: Courtesy of Laydon Composites Ltd. All others: Alexander Epstein/Volpe, 2012-2015.)

[73 pounds](#) to the weight of the truck. VRU side guards could potentially be [built even lighter](#) and still meet the minimum strength requirements of the [Volpe standard](#).

There has been growing side guard adoption in the United States that includes public and private truck fleets in Portland, OR; Washington, D.C.; Boston, MA; Fort Lauderdale and Orlando, FL; Seattle, WA; San Francisco, CA; and [New York City](#). Boston's [ordinance](#) was the first to require both city-owned and city-contracted fleets to install side guards. NYC's [law](#) will lead to more than 10,000 trucks being fitted by 2024, and the Washington, D.C., [law](#) is

the first to require side guards on all trucks registered in the jurisdiction.

At the same time, aerodynamic truck side skirts (or fairings), which are primarily designed to save fuel for trucks by decreasing air drag but which may also protect VRUs in side-impact collisions, have been voluntarily installed over the last decade on many North American tractor trailers and some [straight trucks](#). This trend is being driven by rapid payback from [fuel savings](#) and by medium- and heavy-duty vehicle fuel efficiency standards. For a long-haul tractor trailer, the fuel savings from installing a rigid skirt can reach \$5,000 per year, or several months to breakeven, depending on mileage and speed. EPA SmartWay verified that side skirts provide [4 to 7 percent](#) fuel economy improvement.



EPA SmartWay has verified that trailer side skirts provide 4-7 percent fuel economy improvement. (Adapted from DOE)

Even for city vehicles, limited fuel economy benefits may still be realized, depending on overall drive cycle. A dual-purpose side guard/skirt may therefore potentially offer both VRU safety and fuel ROI.

www.volpe.dot.gov/side-guards

