

# How can cities increase the safety of large vehicles in urban areas?

Large vehicle traffic is a common sight on U.S. city streets. From waste disposal and utility trucks, to delivery vans and buses, these large vehicles make up a small fraction of vehicles on urban streets, but they are disproportionately involved in fatal crashes, particularly involving people walking and riding bicycles.

1. Recognizing the inherent risks of large vehicles
2. Investing in proven safety equipment, such as side guards
3. Establishing side guard procurement policies
4. Partnering with advocates and industry leaders
5. Revising existing programs to include safety requirements

In multi-modal, urban environments, the differences in speed, size and mass between large vehicles and the most vulnerable road users are significant and contribute to both the risk and severity of crashes. In order to achieve Vision Zero -- the goal of eliminating traffic deaths and serious injuries -- it is imperative that leaders prioritize large vehicle safety measures in plans to increase safety on their streets.

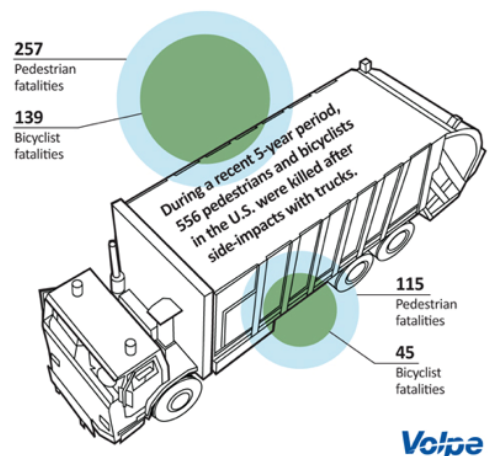
Unlike other important Vision Zero strategies that require longer-term investments in infrastructure and culture change (both internally within city agencies and amongst the public), making relatively simple, inexpensive technology, policy, and training improvements to large vehicles can be a quick and easy win for cities, including those in the early stages of Vision Zero. In most cases, cities, regional governments and transit providers have some degree of jurisdiction over their vehicles, whether in the form of contract agreements with vendors, procurement practices, or by operating and maintaining their own fleets. Early-adopter Vision Zero cities such as New York, Boston, Washington D.C., and San Francisco have experienced success in recent years, following cities in Europe, Asia, and Latin America that have documented safety improvements after implementing similar policies.

## Why are large vehicle crashes so dangerous?

The consequences to human life of a crash involving a truck are more severe than a comparable collision with a personal automobile, especially to vulnerable road users. Although large trucks comprise only 3.6% of vehicles in New York City, they are responsible for 32% of bicyclist fatalities and 12% of pedestrian fatalities. During a recent 5-year period, 1,746 pedestrians and bicyclists in the U.S. were killed from impacts with large trucks, according to the National Transportation Safety Board.

The design of large trucks itself presents inherent safety challenges. Contributing design factors to these crashes include blind spots on trucks and the common occurrence of 'side underride', when a person is swept under the rear tires of a truck after side impact.

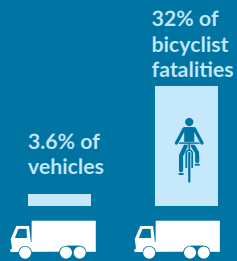
**Nearly half of bicyclists and more than one-quarter of pedestrians killed by a large truck first impact the side of a truck.**



A suite of interventions are necessary to address this challenge, including driver training, education, infrastructure and policy changes (such as restricting access to large vehicles on streets that prioritize pedestrian activity). Additionally, there are a range of low-cost vehicle-based safety devices that can be retroactively installed on large trucks to immediately improve safety. These technologies include cross-over and convex mirrors, cameras, and alert devices that warn the driver of people in the truck's path that may not be visible. One of the most simple and effective technology improvements to mitigate crash severity are side guards; panels installed between the wheels that help prevent people from being pulled under the large vehicle during a side-impact collision. Side guards have demonstrated success in averting underride incidences and greatly decreasing fatalities.

## Safety Design Features: Side guards

In a 2005 U.K. study of side guard effectiveness, bicyclist fatalities dropped 61% and pedestrian fatalities dropped 20% in side-impact crashes. Citing their effectiveness, nations throughout Europe, Japan, and South America have required side guards on trucks since the 1980s. As a result, manufacturers of large vehicles now include them as standard



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Trucks retro-fitted with side guards. Source: City of Boston, Volpe/USDOT

equipment on vehicles sold in those locations — but not yet in the United States.

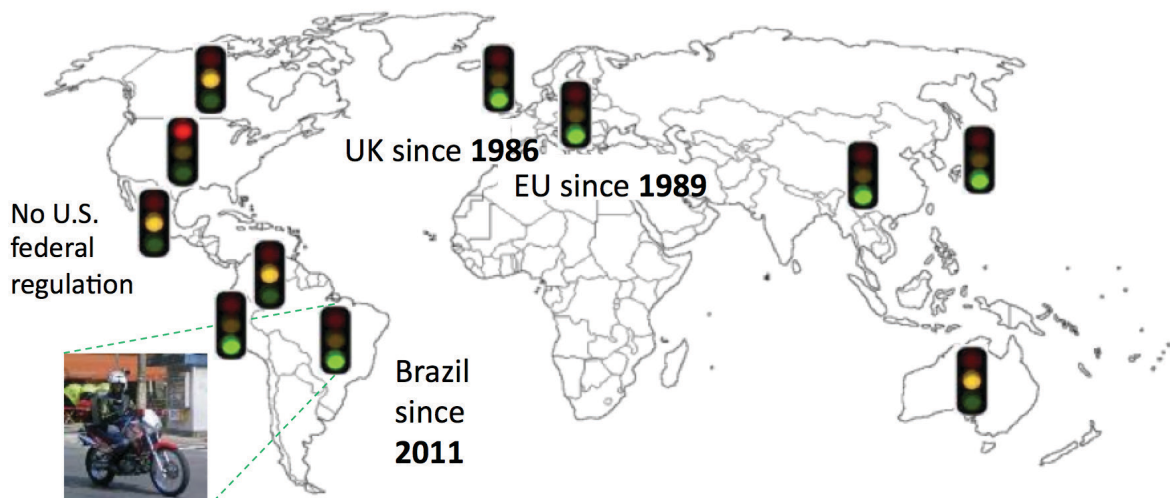
There are no U.S. federal regulations governing the use of side guards. So far, policy advancement on this proven life-saving device has been locally led. Boston, New York City, Portland, Ore., Washington D.C. and Cambridge, Mass. are some of the cities to create policies (all quite recently) requiring side guards on trucks in certain circumstances.

The Volpe Center, a transportation research entity which is part of the U.S. Department of Transportation, has done extensive studies on large vehicle safety improvements and recently published a federal voluntary side guard design standard.

Alex Epstein, Ph.D., an engineer at Volpe who has focused much of his work on large truck safety, says the guidelines will help guide local governments interested in implementing requirements in their own communities.

### What have cities done?

While future federal regulation on the use of side guards may someday be the most efficient tool to disseminate this important safety innovation, many local governments are taking the lead with side guard and other truck safety equipment policies. There are a variety of tactics cities can take to improve the safety of large vehicles on city streets. What follows are examples from cities around the world.

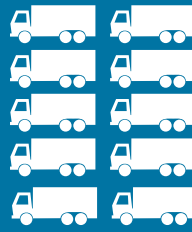


Growing adoption of side guards. Source: Volpe/USDOT.



## \$600-\$2500

The investment for side guards is minimal—they cost between \$600 to \$2,500 for a single truck, depending on the vendor and specific design of the guard



## 10,000 vehicles

NYCDOT has installed side guards on more than 500 City-owned vehicles to date, with the goal of 1,000 by FY17 and 10,000 trucks (4,500 City trucks and 5,500 City-regulated, private garbage trucks) by 2024.

### London: Strong Policy and Leadership to Remove the Most Dangerous Trucks from City Streets

Mayor Sadiq Kahn recently announced a phased citywide ban on dangerous large vehicles. Those with a zero rating, (vehicles that the data showed to be the most dangerous — primarily construction trucks with a high cab and wheel clearance), will be banned from London streets by January 2020. By 2024, only trucks rated three stars of five and better will be allowed. This bold policy change didn't come out of the blue; the UK Capitol has spent the past decade conducting research and promoting voluntary safety measures to help gradually ease the burdens of adjustment to industries that rely on large vehicles.

In 2007, Transport for London (TfL), the local government body responsible for the city's transport system, began rolling out a range of initiatives targeting large vehicle safety, from driver training to truck design. A year later, TfL launched FORS, or the Fleet Operator Recognition Scheme, to improve the safety and environmental sustainability of large freight vehicles. FORS is a publicly funded, three-level voluntary certification program aimed at making sure freight companies have safe, sustainable working practices.

As consumers and local governments began to prioritize working with operators who were members of FORS, more companies joined the program. Vehicle manufacturing companies also began to adapt their design approaches to fit these new market demands.

In 2014, then-London mayor Boris Johnson took things a step further by announcing the "Safer Lorry Scheme", which required all public and private freight trucks to be retrofitted with safety equipment to protect cyclists and pedestrians, including side guards, convex and cross-over mirrors. The policy was created to support the city's goals of "reducing the number of people killed or seriously injured on London's roads by 40% by 2020," an interim metric toward zero deaths and serious injuries.

Even though operators bore the responsibility for paying for these truck upgrades, Glen Davies, Freight & Fleet Programme Manager at Transport

### London's Large Vehicle Rating Systems



#### FORS (Fleet Operator Recognition Scheme)

The FORS accreditation scheme is a voluntary accreditation program for fleet operators in the U.K., measuring safety, environmental sustainability, and efficiency.

**Bronze**-accredited companies follow good working practices. This is the entry-level.

**Silver**-accredited companies show commitments to being safer, more sustainable, and efficient.

**Gold**-accredited companies are exceptional, have met targets and are continuing to improve.

#### Direct Vision Standards

London's phased ban on dangerous trucks will use direct vision standards, which measures the ability for a driver to see someone directly through their windows. The standards use a star-rating system, from 0-5.



for London, noted there was little pushback. Trucking companies had been adopting safer policies as part of their involvement with FORS for years, so by the time the regulation came about, only a small percentage of trucks were forced to make the upgrades.

“Regulation generally follows industry practice,” Davies said. “If you try to regulate before the industry is responding to a change, there is going to be backlash.”

Davies says an easy way to start getting safer large vehicles on the road, is by putting requirements in public sector procurement. “Where the public bodies have control is where they spend their money, such as major infrastructure projects. If you want contractors to use a certain vehicle of those standards, start by first looking at those contracts.”

These requirements can be included in both new, as well as renewing contracts for vendors local governments already work with.

### **Boston: Leveraging High Profile Tragedies and Pilot Projects**

Side guards entered the public dialogue of Boston residents in 2012 after a string of three high-profile deaths, including that of 23-year old Christopher Weigl, who was killed when he collided with a large truck (which was not equipped with side guards) while on his bike. The family sued the driver and the company, Ross Express, for negligence.

There have actually been many cases when a trucking company has been sued for negligence for being involved in a collision with a bicyclist or pedestrian and they didn't have side guards installed.

It shouldn't take a tragic death to generate political will, but after the incidences, political and public support for improving safety of these large trucks was strong. A coalition of community advocates with leadership from Councilor Ayanna Pressley leveraged the heightened attention to lobby for a side guard ordinance. In 2013, the Mayor's Office of New Urban Mechanics and the Public Works Department began piloting truck side guards on the public works maintenance fleet, and subsequently on all trash hauling trucks contracted with the city. Each vehicle retrofit cost about \$1,800.

Armed with pilot project data showing the improvements to be effective, the Boston City Council approved a citywide truck side guard ordinance in 2014 that requires all city-owned



*Excerpt from SFTMA Training Video*

trucks purchased after July 1, 2014, as well as city-contracted vendors to be equipped with the following: side guards, convex mirrors, cross-over mirrors, and blind-spot awareness decals. All contracted vehicles must be approved before any work or services are provided.

### **New York: Using Data to Drive Internal Policy**

New York City owns and maintains a large fleet of service and maintenance vehicles. After launching its Vision Zero campaign in 2014, The NYC Department of Citywide Administrative Services partnered with the Volpe Center (USDOT) to conduct a review of the safety of its municipal trucks and provide recommendations. Supported by analysis from Volpe and a strong public commitment to Vision Zero from Mayor Bill de Blasio, NYCDCAS began installing side guards on the City fleet in 2015. They have installed side guards on more than 500 City-owned vehicles to date, with the goal of 1,000 by FY17 and 10,000 trucks (4,500 City trucks and 5,500 City-regulated, private garbage trucks) by 2024.

In order to help build shared ownership and commitment to Vision Zero internally, New York City created an annual Vision Zero Fleet Safety Forum tailored to reach municipal fleet managers and operators. The Forum helps educate the public and on-the-ground operators of the large vehicles about the safety improvements and addresses questions they may have about the equipment.

Additionally, NYCDCAS has conducted early pilots of collision avoidance systems such as driver alert systems; installed telematics (vehicle tracking) devices in most of the City fleet to track and address aggressive or reckless driving; and implemented the first no-hands-free-device policy for all municipal drivers to combat distraction. They are currently working on a comprehensive Safe Fleet Transition Plan that prioritizes a suite of vehicle-based safety equipment for the entire fleet.

## San Francisco: Building a Consensus and Engaging with the Private Sector

Following an increase in the number of bicyclist and pedestrian fatalities due to collisions with large vehicles in 2013, The City and County of San Francisco and the San Francisco Municipal Transportation Authority (SFMTA) created a “Safe Streets Working Group” to address the issue.

The group included a variety of stakeholders, including FedEx, UPS, the San Francisco Bicycle Coalition, Walk SF, and the California Trucking Association, among others. They held meetings for three months to address the issues and conversations were also held with members of the community. A final report, released in the spring of 2014, included short and long-term solutions to increase the safety of San Francisco streets.

One of the recommended short-term solutions, driver education, was initiated in 2015. San Francisco initiated a policy to require that any city-employed truck driver or bus driver, as well as commercial shuttle drivers take a safety course emphasizing safe operations of large vehicle in urban areas. San Francisco is unique among cities in that its public transportation agency is housed and managed within the City Department of Transportation, giving it direct access to the training and operations protocols for bus drivers.

The momentum generated from the Safe Streets Working Group encouraged San Francisco Public Works to commence a pilot project to evaluate the effectiveness of side guards on selected vehicles, and in 2016, SFMTA partnered with the Volpe Center (USDOT) to research how side guards can best be implemented in the city.

### Other opportunities

The Volpe Center (USDOT)'s Epstein says that cities shouldn't forget about programs they already have in place that may support large vehicle safety

policy improvements. For example, most cities have commercial loading zone programs. In addition to dictating the time periods and location for these deliveries, local governments also have the opportunity to include certain safety specifications or restrictions on truck size, as in Seattle and New Orleans.

The investment for side guards is minimal—they cost between \$600 to \$2,500 for a single truck, depending on the vendor and specific design of the guards. Convex mirrors can cost around \$100 and cameras can range in price from \$200 to \$1,000.

### Conclusion

Undoubtedly, large vehicles bear a disproportionate danger on city streets, particularly to those walking and bicycling. For this reason, they should be elevated as a priority in local Vision Zero efforts. While the reality is that the federal government – not to mention state governments – should be taking a more active leadership role in this area, local governments shouldn't delay taking actions for improving large vehicle safety as part of comprehensive Vision Zero efforts. While serious policy consideration and data analysis should also be directed to the access large vehicles have to densely populated multi-modal environments and whether the negative safety and quality of life impacts are justified, enabling common sense side guard ordinances and policies, along with other effective safety technologies, is a pragmatic first step.

The key to being successful in this this battle toward creating safer policies, Epstein says, is collaboration.

“We have to do better and we can do better to bring new city agencies as well as progressive companies to the table,” Epstein says. “We have to connect the dots as policy makers and innovators to use all the policies and programs we already have in place to make progress on multiple fronts to achieve the goal of zero deaths on our roadways.”

## Top Take-Aways

Large vehicles are involved disproportionately in bicyclist and pedestrian fatalities, but there are a variety of relatively simple, inexpensive technology, policy, and training improvements to large vehicles that cities can implement. In most cases, cities, regional governments and transit providers have some degree of jurisdiction over their fleets,

whether in the form of contract agreements with vendors, procurement practices, or by operating and maintaining their own fleets.

Integrating safety requirements into these existing practices and agreements can be a great approach cities can take to get safer large vehicles on the streets.

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