Improving Bicyclist and Pedestrian Safety Using Truck Side Guards

Alexander Epstein
VOLPE National
Transportation Systems Center

Kris Carter
City of Boston

Credit: Kris Carter, City of Boston

Monday, June 12, 2017

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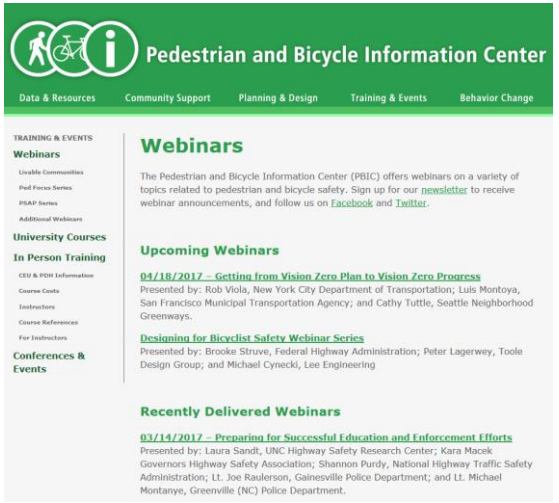

Volpe

The National Transportation Systems Center

Pedestrian and Bicycle Information Center

Improving Bicyclist & Pedestrian Safety Using Truck Side Guards

Advancing transportation innovation for the public good

June 12, 2017

U.S. Department of Transportation
Office of Research and Technology
John A. Volpe National Transportation Systems Center

Presentation outline

- Introduction
- Technical Considerations
- Implementation Considerations

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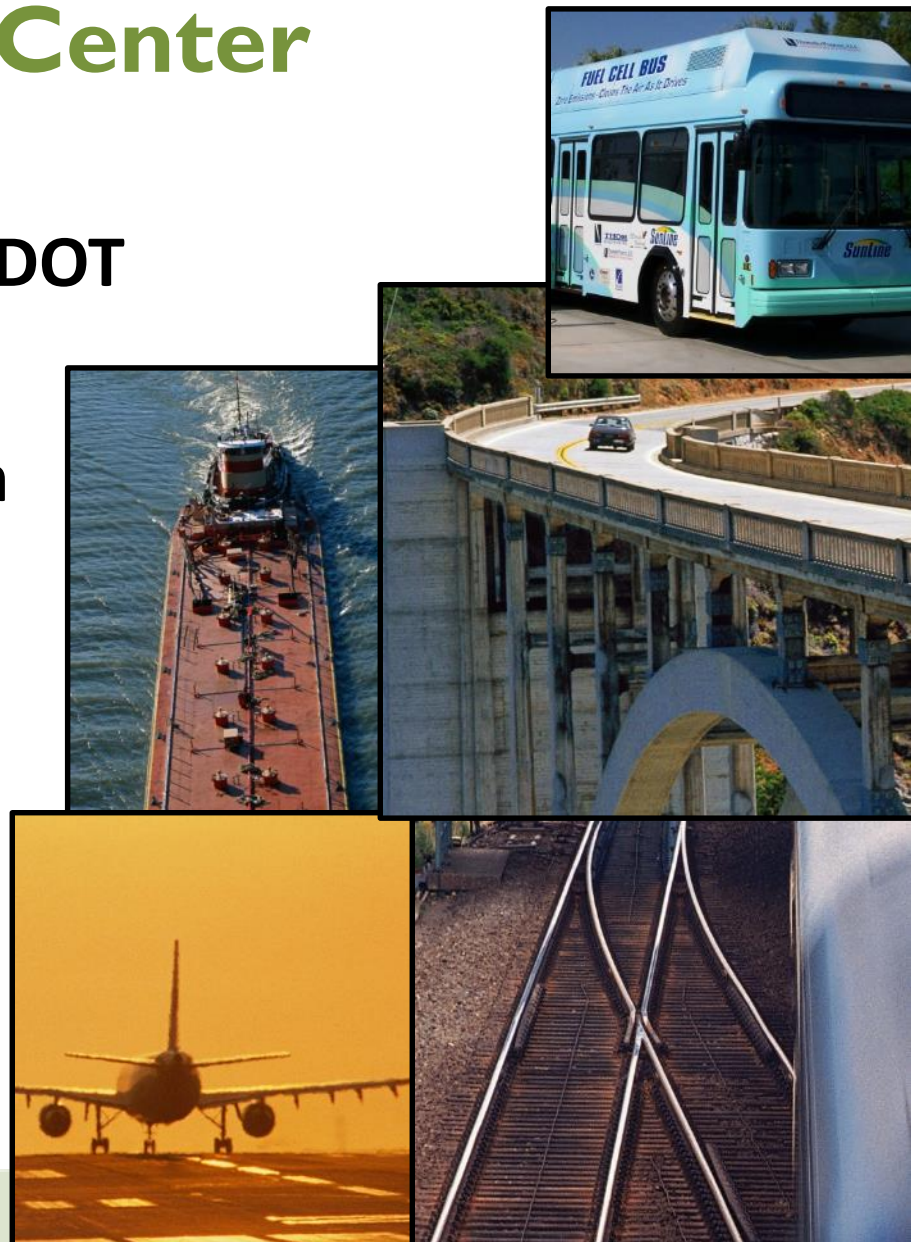
- Introduction
- Technical Considerations
- Implementation Considerations

Volpe, The National Transportation Systems Center

- Unique agency within **U.S. DOT**
- 100% fee-for-service
- All modes of transportation
- Cross-disciplinary
- **570 federal staff**,
  400 onsite contractors
- Based in Cambridge, MA



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CBS Boston

HOME NEWS SPORTS WEATHER TRAFFIC HEALTH EAT. SEE. PLAY VIDEO AUDIO EVENTS

Bicyclist Dies After Being Struck By Truck In Cambridge

June 23, 2016 8:35 PM

Filed Under: Bicycle Crash, Cambridge, Christina Hager, Inman Square, Lana Jones

A woman on a bicycle was struck and killed in Cambridge (Christina Hager/WBZ-TV)

EYEWITNESS NEWS

SECTIONS TRAFFIC WATCH Los Angeles

NEWS

STUDENT FATALLY STRUCK BY CITY SERVICE TRUCK IN HIGHLAND PARK

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EMBED </> MORE NEWS VIDEOS

A 17-year-old student was fatally struck by a city service truck while walking to school in Highland Park Tuesday morning, police said. (KABC)

Bicyclist killed in crash on Commonwealth Ave. in Allston; fifth biker killed in Boston this year

12/06/2012 12:22 PM

E-mail | Print

David L. Ryan/Globe Staff

DAILY NEWS | NEW YORK

NYC Crime Bronx Brooklyn Manhattan Queens Education Weather Obituaries

Truck driver arrested after fatally striking cyclist in Brooklyn

BY MEGAN CERULLO THOMAS TRACY GRAHAM RAYMAN

NEW YORK DAILY NEWS Updated: Tuesday, June 7, 2016, 7:05 PM

SECTIONS SEARCH Chicago Tribune

THURSDAY SEP. 8, 2016 BREAKING SPORTS TRENDING OPINION SUBURBS ENTERTAINMENT BUSINESS ADVERTISING

News / Local news / Brea

Police: Semi driver veered into bike lane, killing art student

A 20-year-old SAIC student died after she was hit by a semi while riding a bicycle in Chicago's Goose Island neighborhood Tuesday morning, Aug. 17, 2016. (CBS Chicago)

In case you missed it

Bicyclist killed on Gold … just gotten off work as …

JUN. 16, 2016

Large truck safety context

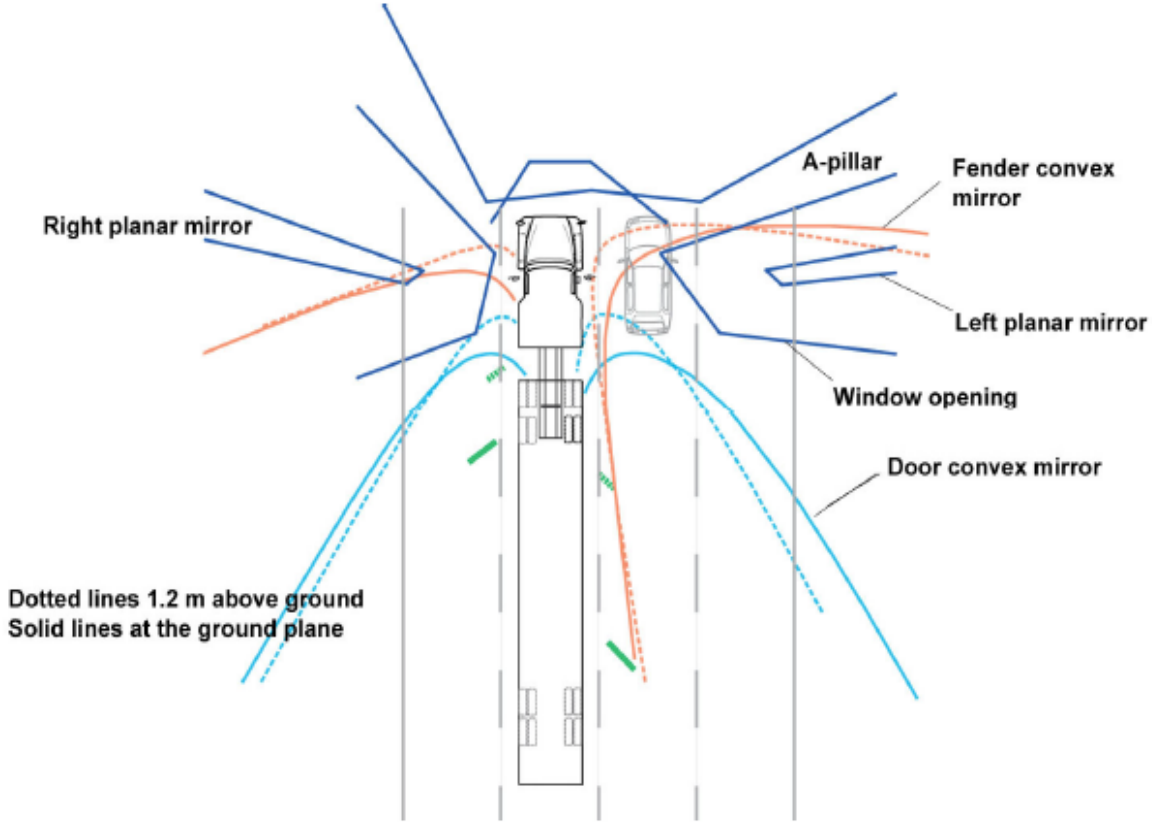
Large truck design presents inherent challenges for vulnerable road user safety

- **~4%** of all vehicles
  - **US: 11%** of bicyclist fatalities, **7%** of ped fatalities
  - **NYC: 32%** of bicyclist fatalities, **12%** of ped fatalities

Key contributing factors

1. Large blind spots → increase likelihood of crash
2. Side underride → fall under rear wheels

Issue 1: blind spots



Driver's fields of view from the cab of a combination vehicle

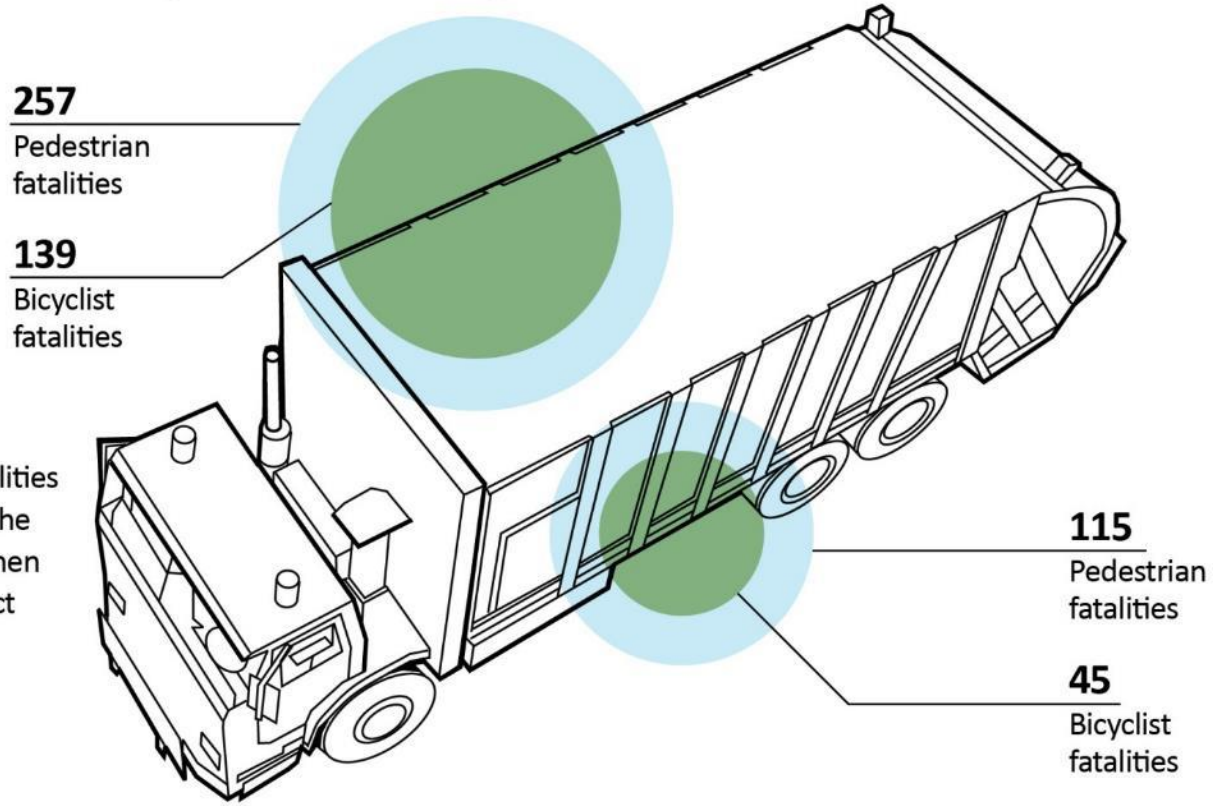
Transport for London: /https://www.youtube.com/watch?v=Y9E1_1M-qhU

Source: Blower, D., Truck Mirrors, Fields of View, and Serious Truck Crashes, 2007.
http://deepblue.lib.umich.edu/bitstream/handle/2027.42/58728/99830.pdf?sequence=1

Issue 2: underride

During a recent 5-year period, 1,746 pedestrians and bicyclists in the U.S. were killed from impacts with large trucks

32% of these happened after an initial impact with the side of a truck.



U.S. DOT/Volpe Image

One proven vehicle-based safety strategy:

Truck Side Guards

Bicyclist fatalities

Pedestrian fatalities

Side guard concepts

Rails

Panels

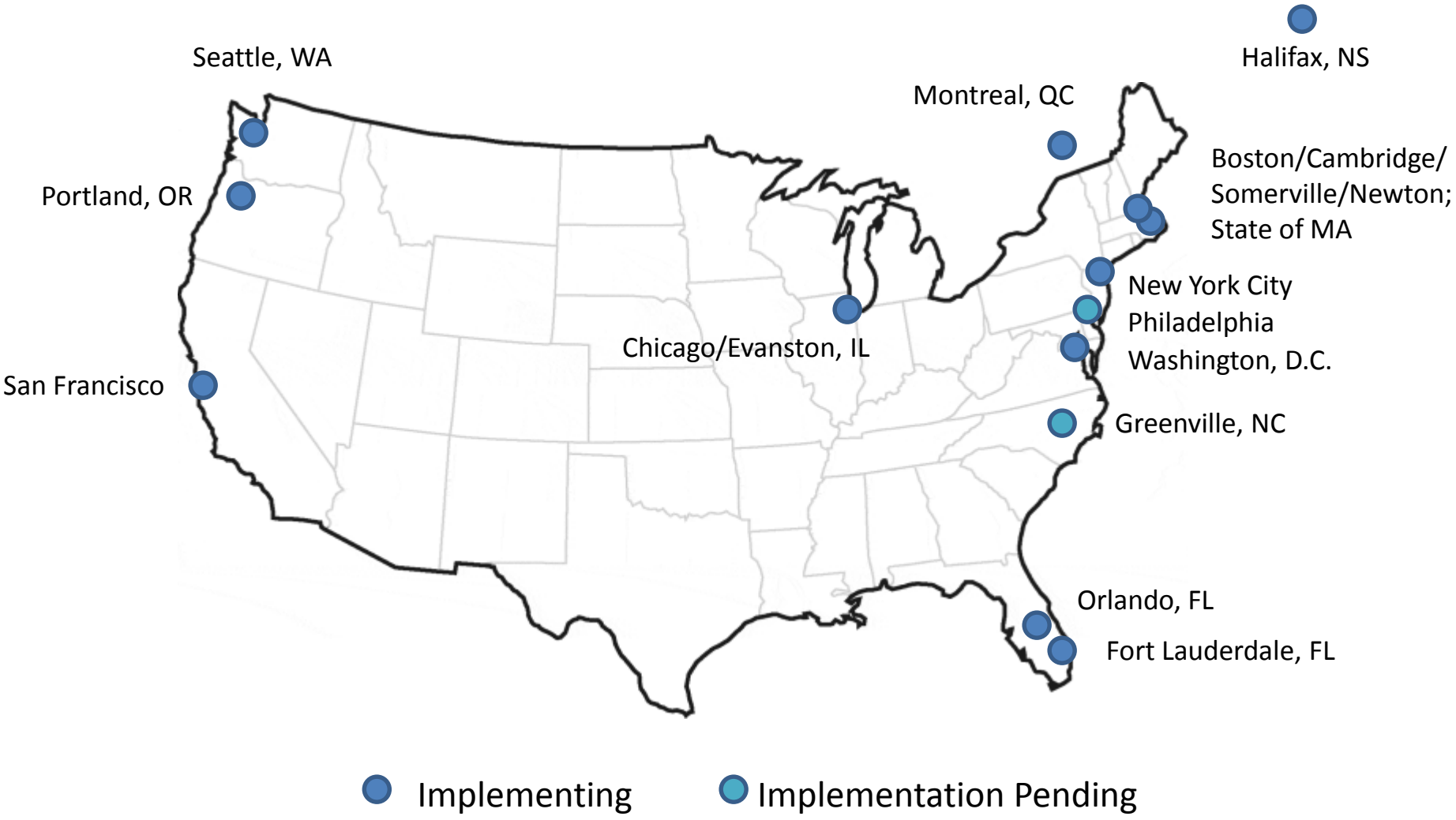
Side guard global precedents

Narrow rails

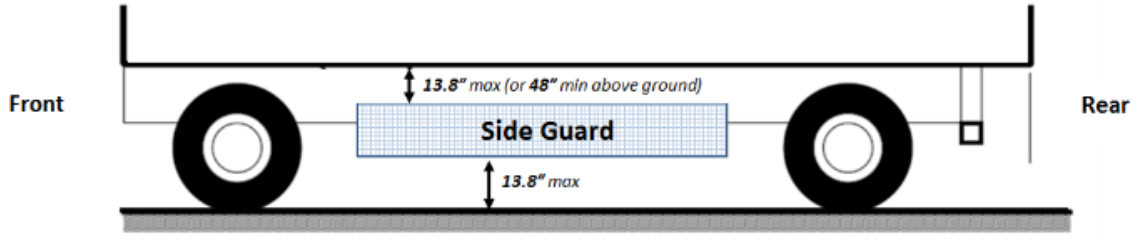
Wide rails

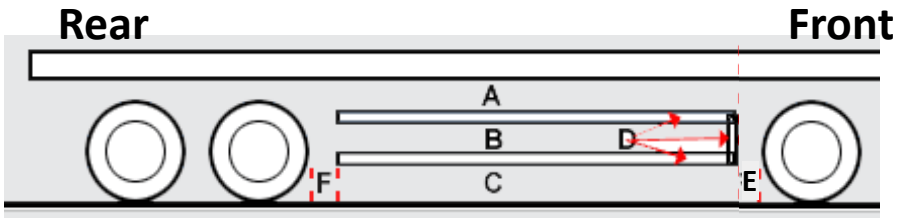
Panels

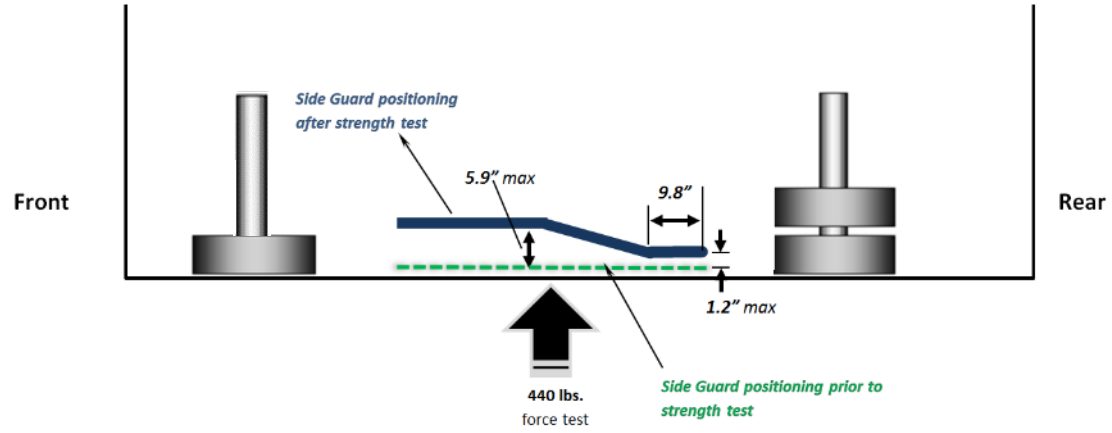
Cities take the lead on side guards



Volpe & cities developed recommended specifications







Representative U.S. sideguard installs

Seattle

Chicago

New York City

New York City


Portland, OR

Boston, MA

Cambridge, MA


Washington, DC

Representative costs and side guards vs. side skirts

U.S. city	Reported approximate cost per vehicle	Side guard type
Boston	$1,200 - $1,800	Steel rail; fiberglass panel
New York City	~$2,000 plus installation	Fiberglass panel; aluminum rail

Source type	Reported approximate cost per vehicle	Side guard type
European suppliers, e.g., Takler	~$300-$1,500; $847 average	Typically rail
Select trailer skirt suppliers, e.g., Transtex	~$1,000 plus installation	Rigid panel/trailer skirt

<------Aerodynamic fuel consumption savings----->

[1] http://www.cityofboston.gov/news/default.aspx?id=20121
[2] http://www1.nyc.gov/office-of-the-mayor/news/101-15/city-begins-installing-truck-side guards-protect-pedestrians-cyclists
[3] Interview with Don DePiero and Donny Leader, City of Portland City Fleet, Bureau of Internal Business Services, November 30, 2012.

- Introduction
- Technical Considerations
- Implementation Considerations

Limitations faced by cities in implementing vehicle-based safety

- Lack of local jurisdiction over **vehicle safety specifications** for the general vehicle fleet
  - **Federal** oversight of vehicle design
  - **State** oversight above and beyond federal safety standards, e.g., crossover mirror laws

- Lack of local jurisdiction of **commercial driver license training**
  - **State** oversight with federal minimums

Mechanisms to implement

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 vehicle
2. Investing in proven safety equipment, such a
side guards
3. Establishing side guard procurement policies
4. Partnering with advocates and industry leade
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.

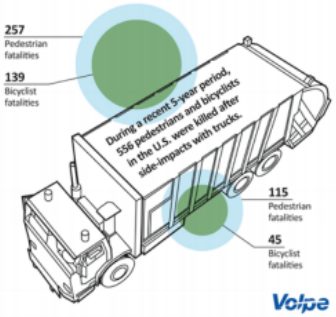
Unlike other important Vision Zero strategies that require longer-term investments in infrastructure and culture change (both internally within city agencies and amongst the public), making relatively simple, inexpensive technology, policy, and training improvements to large vehicles can be a quick and 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

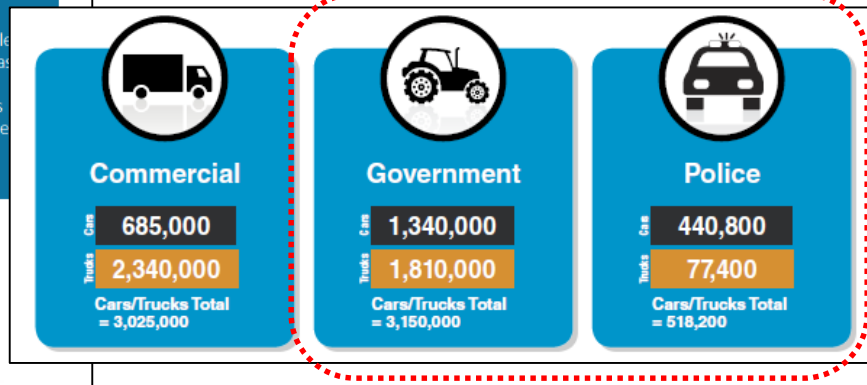
Nearly **half of bicyclists** and more than **one-quarter of pedestrians** killed by a large truck first impact the side of a truck.



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



Public entities purchase **almost 40%** of all Class 1-5 fleet trucks in the US

http://www.automotive-fleet.com/statistics/detail/2015-fleet-vehicles-by-industry-segment.aspx

National side guard specification

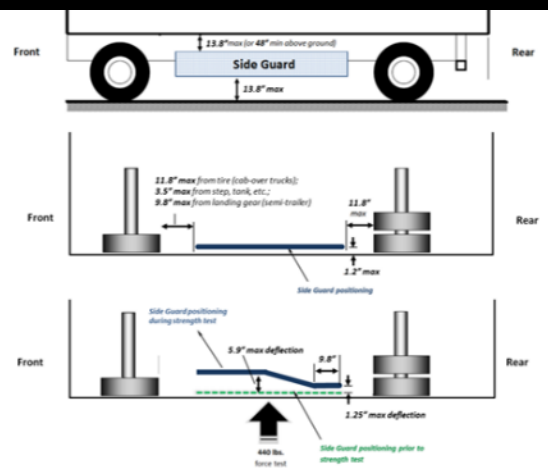
Volpe The National Transportation Systems Center

Truck Side Guard Specifications

Recommended Standard DOT-VNTSC-OSTR-16-05

This document is intended to be used by (1) public or private medium/heavy-duty truck fleets considering adding side guards; (2) jurisdictions or customers that require side guards through policy or procurement; (3) manufacturers of side guards; and (4) truck manufacturers and dealers.[1] The specifications below are based on previously published Volpe recommendations (Reports DOT-VNTSC-DCAS-14-01 and DOT-VNTSC-SFMTA-16-01) and may be referred to as the "Volpe side guard standard" or "Volpe side guard specifications." This standard can be used as a basis for design, production, testing, review, and procurement of side guards and side-guard-equipped vehicles.

Can be incorporated by reference in local/state laws and policies

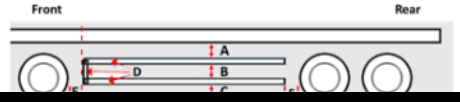


U.S. Department of Transportation
John A. Volpe National Transportation Systems Center

Last doc. revision Sept. 23, 2016

A side guard meets the strength requirement if it is capable of withstanding **440 pounds** of force applied perpendicularly to any part of its surface by the center of a flat, circular plate of diameter no greater than **8.7 inches**, such that the deflection of the loaded side guard measured at the center of the plate does not exceed (1) **5.9 inches** anywhere, or (2) **1.25 inches** in the rearmost **9.8 inches**. A manufacturer may also demonstrate compliance using a valid engineering calculation, such as finite element analysis.[2]

2. Additional dimensional specifications for rail-style side guards



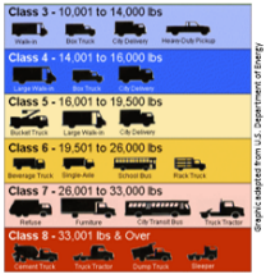
C	13.8 inches max
D	4.0 inches min
E	11.8 / 3.5 inches max*
F	11.8 inches max

A **turned-in vertical bar** connecting the forward ends of the horizontal rails should be incorporated if the forward gap exceeds **3.5 inches**. The bar need not be turned in or can be omitted if the distance is less than 3.5 inches.

3. Vehicle weight threshold and flexibility of design

Side underride protection should be included on **Class 3** and above vehicles, which have a gross vehicle weight rating (GVWR) of **10,000 pounds** and higher.

Acceptable side underride protection can be provided by **any combination** of vehicle body, fuel tanks, tag axles, tool boxes, or purpose-built side guards comprising a smooth surface flush with the vehicle sidewall, meeting the Volpe dimensional and strength specifications set forth above.



Graphic adapted from U.S. Department of Energy

[1] This document was prepared for the Office of the Assistant Secretary of Research and Technology.

[2] A third option for demonstrating strength compliance is type approval by the United Kingdom Department for Transport Vehicle Certification Agency or other recognized side guard homologation with equal or greater stringency. A side guard with such type approval that also meets the Volpe dimensional criteria may be considered to meet the Volpe standard.

www.volpe.dot.gov/side-guards

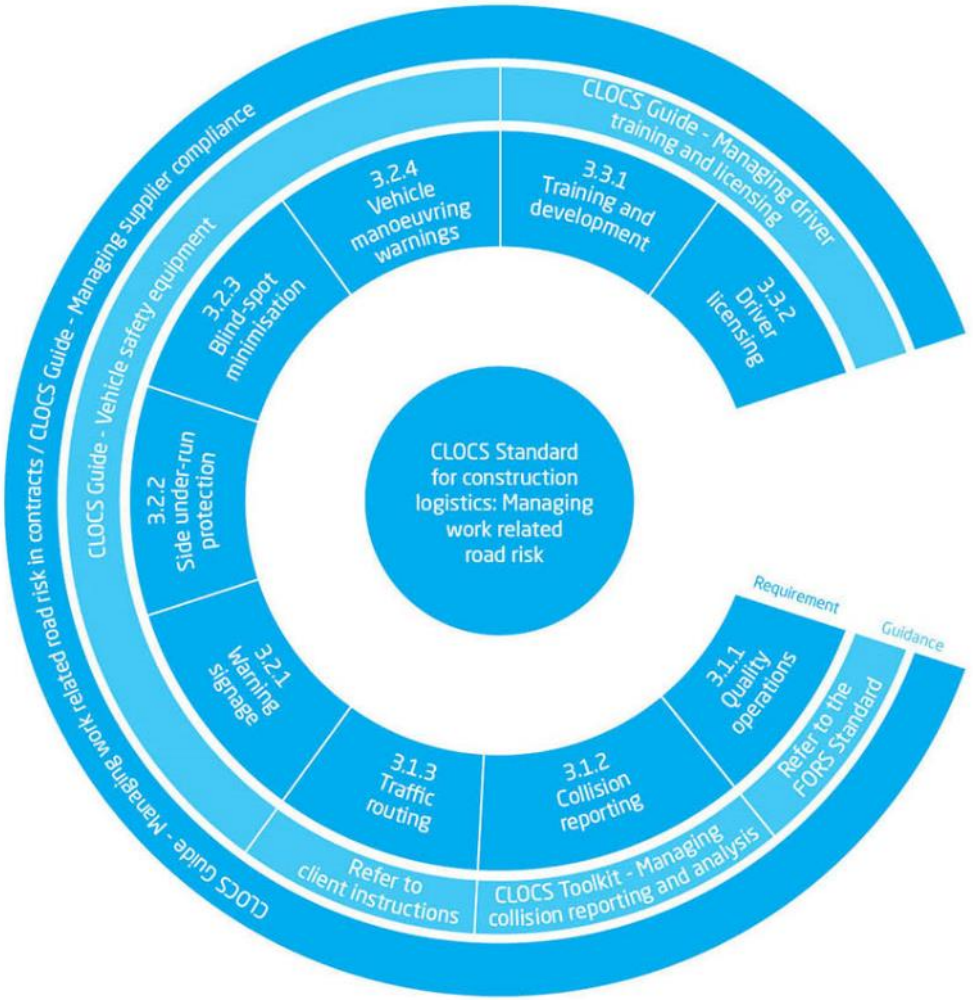
Volpe

Side guards as part of safer truck design

Formalizing vehicle-VRU safety strategies through procurement

CLOCS | Looking out for vulnerable road users

Construction **LO**gistics and **C**yclist **S**afety



http://image.shutterstock.com/z/stock-vector-map-of-the-united-kingdom-of-great-britain-and-northern-ireland-80867542.jpg

Tying it back to Vision Zero…

Vision Zero

Gradually aligning vehicle ***speed*** to the inherent safety of the system

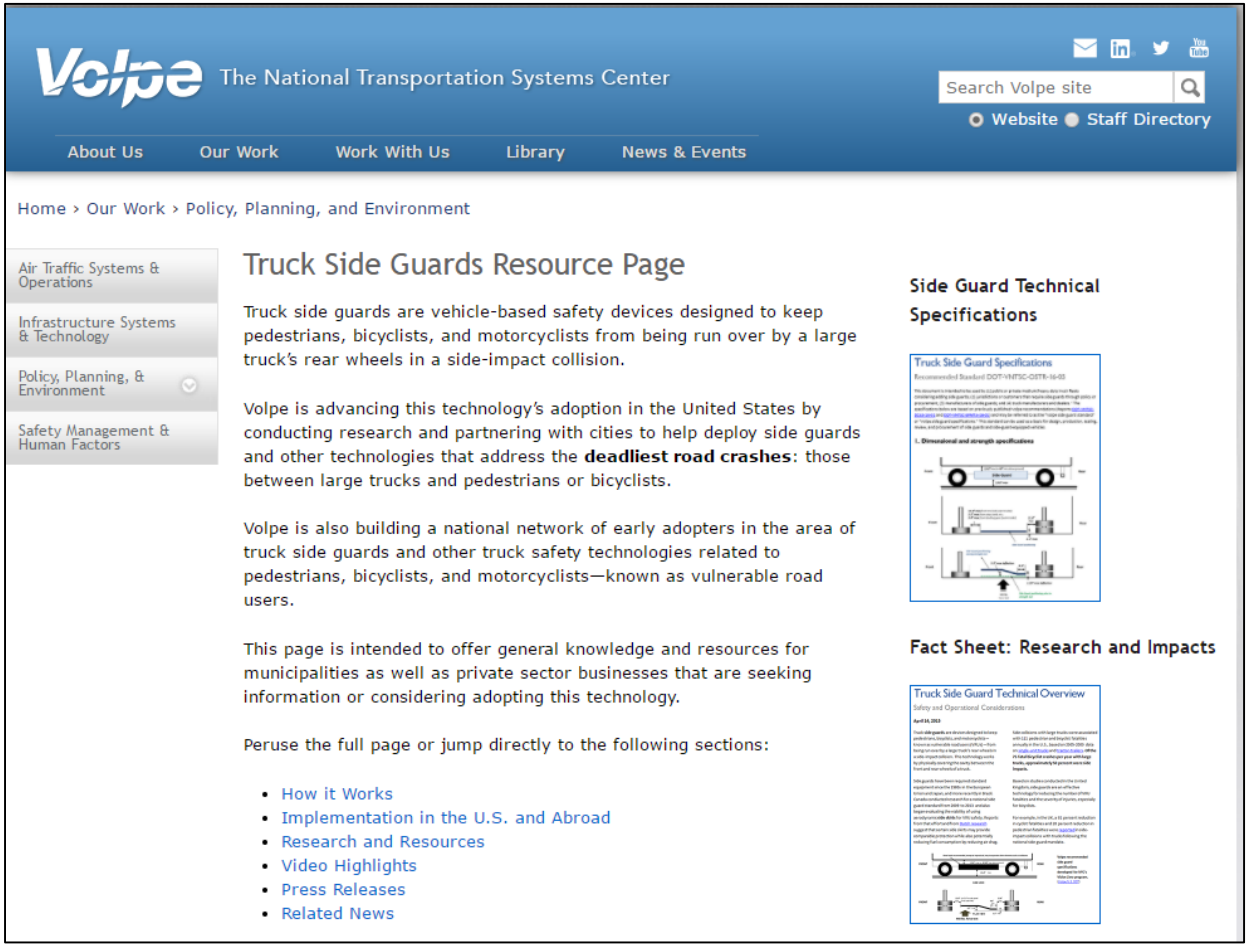
Improving ***vehicles*** to address driver behavior issues

Stimulating the ***community*** to use the system in a safer way

[Sweden: “Operational Strategy” by Tingvall and Haworth, 1999]

Volpe side guard resource website

www.volpe.dot.gov/side-guards



Questions?

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Coralie Cooper
Margo Dawes
Sean Peirce
Eran Segev

Example implementation paths

- **Internal policy** for city-owned fleet and city drivers → lead by example
  - Boston, SF, NYC, DC, Portland OR, UW-Seattle
- **Procurement policy** for city-contracted vendors
  - Boston, Cambridge, SF, NYC (c.f. Local Law 77)

- **Policy/local law** for City-regulated private fleets
  - NYC (BIC)
- Require via existing **permitting** for construction, utility, and other work sites
  - London; U.S. cities already impose noise and construction emission standards
- Require via existing **commercial loading zone** programs?
- Require via existing **clean diesel/clean truck** programs
  - Hunts Point Clean Truck Program (NYC)

- Advance **state laws** for in-state registered/based trucks
  - DC's bicycle safety enhancement law; crossover mirror laws in OR, WA, and NY; side guard bill in MA; SF's effort to add urban content to CA CDL
- Pay attention to **federal rulemakings**
- Work with state to spec safety equipment for new vehicles bought with **Volkswagen EPA settlement fund** – Chicago/Illinois
- Engage **insurance companies/state insurance commissions**

- Encourage **voluntary private sector** adoption
  - NYC, SF, Boston… [and London]

A comprehensive approach to vehicle safety

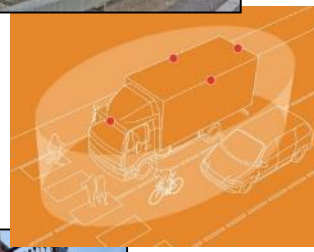
Comprehensive Safe Truck Approach

Crash avoidance

- Mirrors
- Lenses
- Cameras
- Alert systems
- Enhanced direct vision

Crash mitigation

- Side guards
- Automatic braking



Evaluation

- Driver education
- Telematics
- Crash analysis

The National Transportation Systems Center

Call for interest

Vision Zero for Buses & Trucks

Join Volpe & NACTO to create an actionable roadmap to address large-vehicle injury risks through smarter vehicle design and technology.

The pooled research funding will:

- ☐ **Fund the creation of actionable research products**
- ☐ **Support a multi-city/agency Working Group**
- ☐ **Develop messaging and support opportunities**

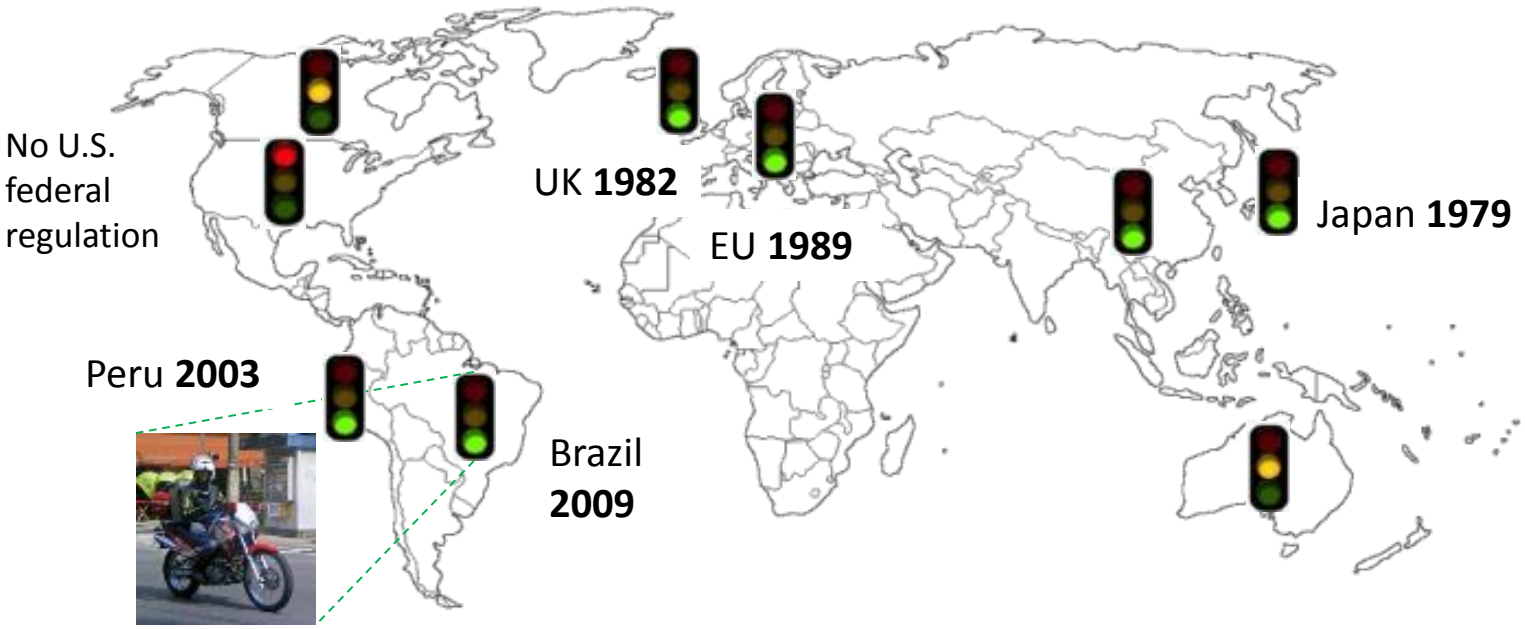
The National Transportation Systems Center

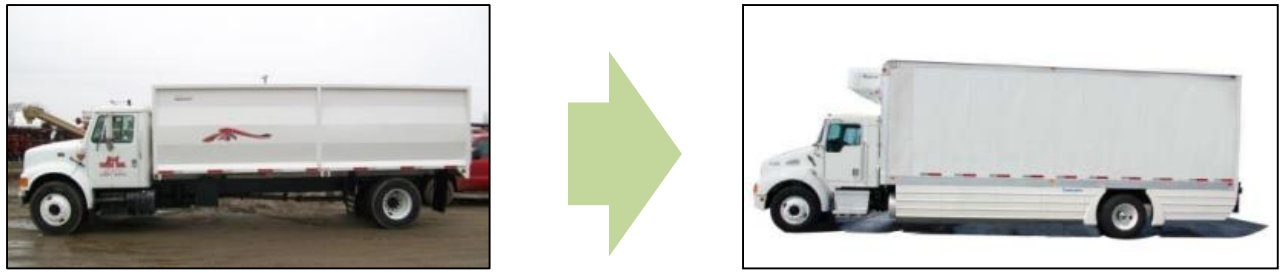
Call for interest

Potential Research Areas

- Direct vision truck cab blind spot assessment and reduction
- Indirect vision systems, e.g., mirrors, Fresnel lenses, back-up and 360° cameras
- Truck side guards
- Bus wheel guards
- Proximity sensors, e.g., radar, ultrasound
- Driver and VRU) alerts (audible, visual)
- Smart backup alarms
- Automatic emergency braking
- Advanced driver assistance systems (ADAS)
- Vehicle downsizing/rightsizing
- Directional signals and conspicuity

Growing adoption of side guards





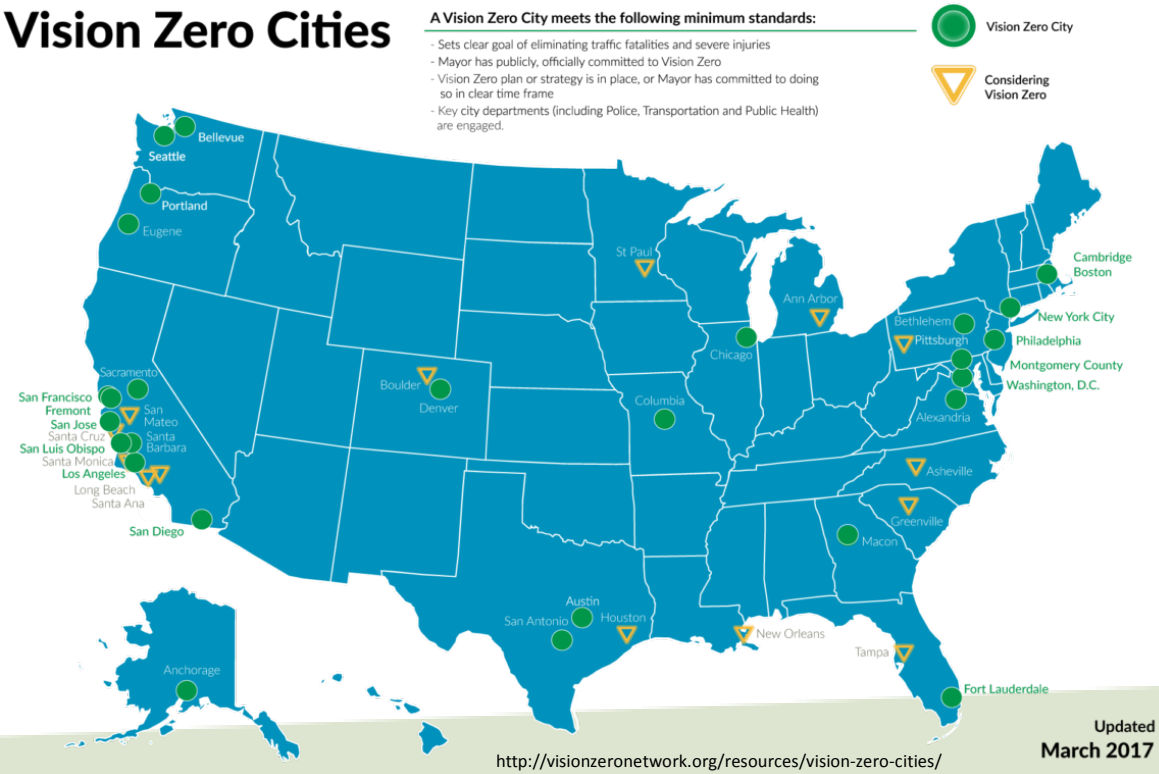
Vision Zero

- Legislation and Enforcement
- Education
- Street design & Engineering
- **Vehicle-based Safety**

Vision Zero Cities

A Vision Zero City meets the following minimum standards:

- Sets clear goal of eliminating traffic fatalities and severe injuries
- Mayor has publicly, officially committed to Vision Zero
- Vision Zero plan or strategy is in place, or Mayor has committed to doing so in clear time frame
- Key city departments (including Police, Transportation and Public Health) are engaged.

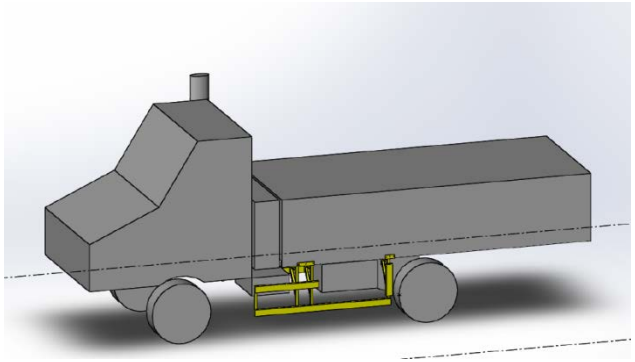


http://visionzeronetwork.org/resources/vision-zero-cities/

Updated March 2017

NYC Side Guard Installs

Implementation



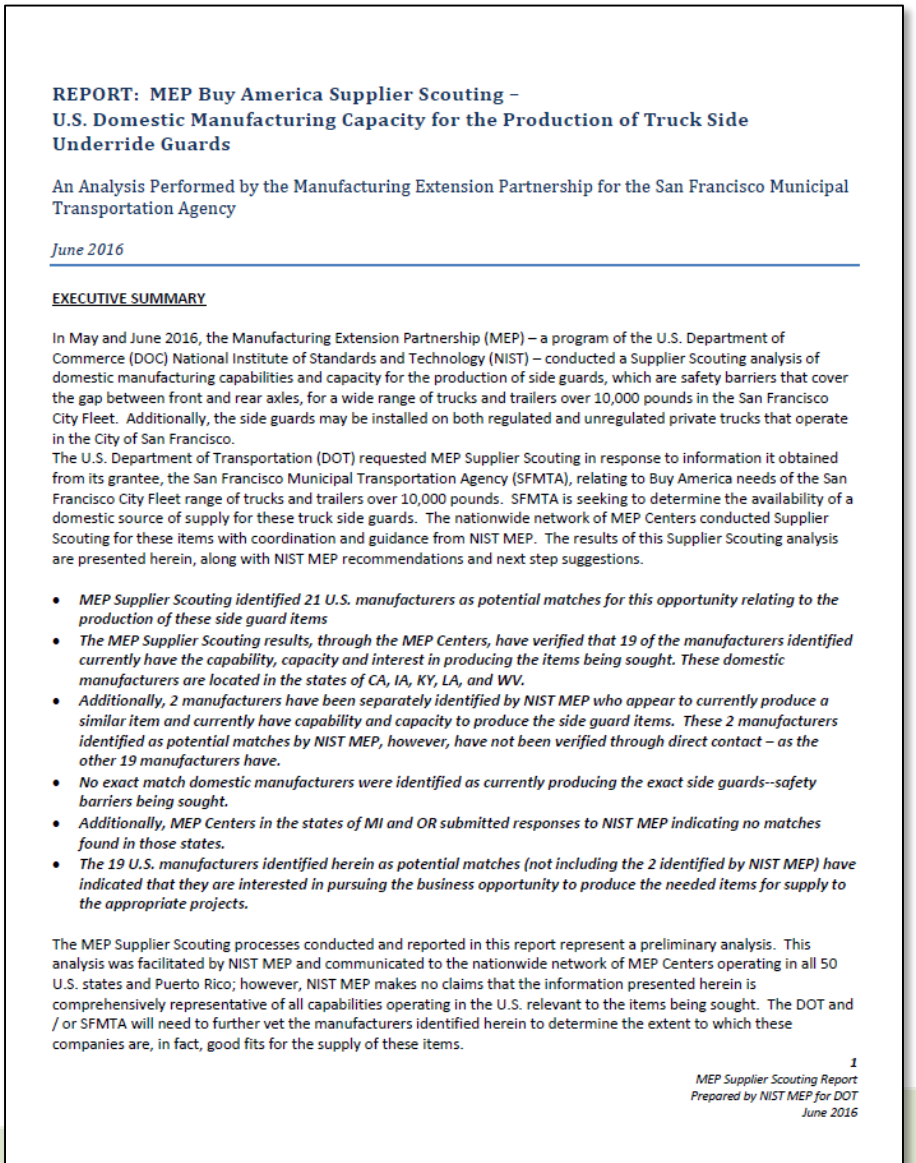
- Volpe Report
- Manufacturer Research and Selection
  - Installation approach
- Installer Selection
- Selection of pilot units
  - Agency cooperation
- Installer training
  - Manufacturer/Installer partnership
- Volpe Feedback

The Learning Curve

- Open lines of communication
  - Feedback
- Challenges
  - No two truck are the same
  - Ladder, boxes, access
  - New discoveries
- Willingness to test
- Common goal

Whole-vehicle safety retrofit

Building a supplier network with MEP



REPORT: MEP Buy America Supplier Scouting –
U.S. Domestic Manufacturing Capacity for the Production of Truck Side Underride Guards

An Analysis Performed by the Manufacturing Extension Partnership for the San Francisco Municipal Transportation Agency

June 2016

EXECUTIVE SUMMARY

In May and June 2016, the Manufacturing Extension Partnership (MEP) – a program of the U.S. Department of Commerce (DOC) National Institute of Standards and Technology (NIST) – conducted a Supplier Scouting analysis of domestic manufacturing capabilities and capacity for the production of side guards, which are safety barriers that cover the gap between front and rear axles, for a wide range of trucks and trailers over 10,000 pounds in the San Francisco City Fleet. Additionally, the side guards may be installed on both regulated and unregulated private trucks that operate in the City of San Francisco.
The U.S. Department of Transportation (DOT) requested MEP Supplier Scouting in response to information it obtained from its grantee, the San Francisco Municipal Transportation Agency (SFMTA), relating to Buy America needs of the San Francisco City Fleet range of trucks and trailers over 10,000 pounds. SFMTA is seeking to determine the availability of a domestic source of supply for these truck side guards. The nationwide network of MEP Centers conducted Supplier Scouting for these items with coordination and guidance from NIST MEP. The results of this Supplier Scouting analysis are presented herein, along with NIST MEP recommendations and next step suggestions.

- ***MEP Supplier Scouting identified 21 U.S. manufacturers as potential matches for this opportunity relating to the production of these side guard items***
- ***The MEP Supplier Scouting results, through the MEP Centers, have verified that 19 of the manufacturers identified currently have the capability, capacity and interest in producing the items being sought. These domestic manufacturers are located in the states of CA, IA, KY, LA, and WV.***
- ***Additionally, 2 manufacturers have been separately identified by NIST MEP who appear to currently produce a similar item and currently have capability and capacity to produce the side guard items. These 2 manufacturers identified as potential matches by NIST MEP, however, have not been verified through direct contact – as the other 19 manufacturers have.***
- ***No exact match domestic manufacturers were identified as currently producing the exact side guards--safety barriers being sought.***
- ***Additionally, MEP Centers in the states of MI and OR submitted responses to NIST MEP indicating no matches found in those states.***
- ***The 19 U.S. manufacturers identified herein as potential matches (not including the 2 identified by NIST MEP) have indicated that they are interested in pursuing the business opportunity to produce the needed items for supply to the appropriate projects.***

The MEP Supplier Scouting processes conducted and reported in this report represent a preliminary analysis. This analysis was facilitated by NIST MEP and communicated to the nationwide network of MEP Centers operating in all 50 U.S. states and Puerto Rico; however, NIST MEP makes no claims that the information presented herein is comprehensively representative of all capabilities operating in the U.S. relevant to the items being sought. The DOT and / or SFMTA will need to further vet the manufacturers identified herein to determine the extent to which these companies are, in fact, good fits for the supply of these items.

1
MEP Supplier Scouting Report
Prepared by NIST MEP for DOT
June 2016

- Three-way supplier scouting partnership between Volpe, San Francisco, and NIST MEP
- Up to 21 manufacturers identified
- At least one already in use by Seattle

DCAS-NYC Fleet

Citywide Administrative Services

- Largest municipal fleet in the country
  - 28,000 owned/leased vehicles.
- DCAS Fleet works directly with the 10 largest agencies and directly manages 40 agencies with smaller fleets
  - Involved with safety, sustainability, transparency, & shared services
- Over **500** side guards installed to date
  - Original goal of 240, 10% of eligible truck fleet
  - **1,000** by end of FY17
  - **10,000** by 2024 (City + City-regulated)

Leveraging Municipal Fleets and Purchasing Power to Protect Vulnerable Road Users

June 12, 2017

Kris Carter, Co-Chair
Mayor's Office of New Urban Mechanics
@newurbanmechs

THE MAYOR'S OFFICE OF NEW URBAN MECHANICS BOSTON

City of Boston
Mayor Martin J. Walsh

THE MAYOR'S OFFICE OF
NEW URBAN MECHANICS

The Department of Yes

A City agency formed in 2010, we pilot experiments that offer the potential to significantly improve the quality of City services.


MONTH
DAY
YEAR
HOUR
MIN
DEC
07
2012
AM
PM
07
45
DESTINATION TIME
MONTH
DAY
YEAR
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26
1985
AM
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01
22
PRESENT TIME
MONTH
DAY
YEAR
HOUR
MIN
OCT
26
1985
AM
PM
01
20

2012

Bicyclist Hit, Killed On Morrissey Boulevard

September 14, 2012 7:47 AM

Filed Under: Bicyclist Killed, CBS Boston, Dorchester, Morrissey Boulevard, WBZ

Cyclist Killed On Notoriously Dangerous Stretch In Boston

June 2, 2012 11:07 AM

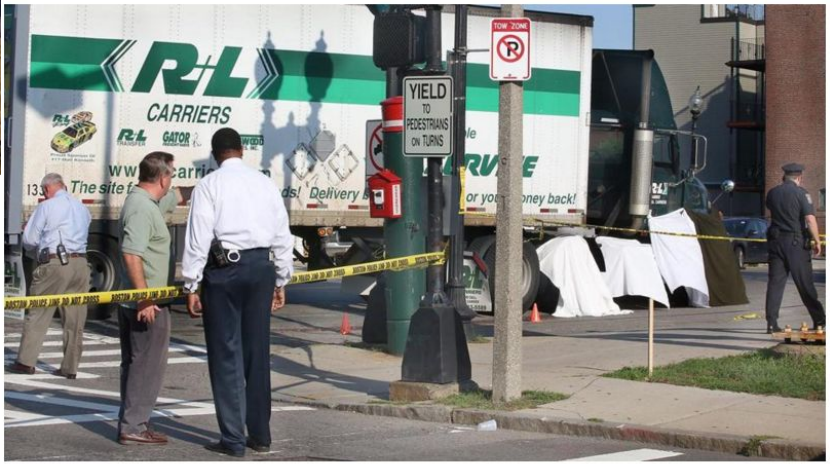
Filed Under: Cyclist Killed, Huntington Ave., Huntington Avenue, Kim Tunnicliffe, MBTA Bus, Woman Kille

A cyclist was struck and killed on Huntington Avenue Friday night.

Bicyclist struck, killed by MBTA bus

Allston location called dangerous

Bicyclist struck and killed by tractor-trailer truck



BILL BRETT FOR THE BOSTON GLOBE

THE MAYOR'S OFFICE OF
NEW URBAN MECHANICS
BOSTON

City of Boston
Mayor Martin J. Walsh


BU Today
Campus Life
Student Cyclist Killed on Comm Ave
COM grad student was talented photojournalist
CARRIER
H8018

Local Data Picture: 2012

4 out of the 5

cyclist fatalities in Boston involved large vehicles

Local Data Picture: 2012-2015

9 out of the 10

cyclist fatalities in the Boston-area involved large vehicles

Brockton, Wellesley, Northampton, Worcester, Cambridge, Westfield...

Boy hit and killed by truck on Battles St. in Brockton

Neighbors remember Wellesley Cyclist killed in crash

Bicyclist dies after being hit by truck in Brockton

Westfield child killed in accident identified as Michael Ryan, 7

Lexington cyclist killed after crash with 18-wheeler in Cambridge's Porter Square

81-year-old woman killed by dump truck was well-known in Worcester neighborhood

Armored truck kills cyclist at Smith

She was devoted to social justice

2013 - Sideguard Pilot Launch

$35,000 from the Streetscape Innovation Fund

18 City owned trucks

Mix of vehicles & guard types

At the time: The largest pilot in the nation

Evaluating for operations

2013 - Pilot Vehicle Types

2014 - Another side impact death

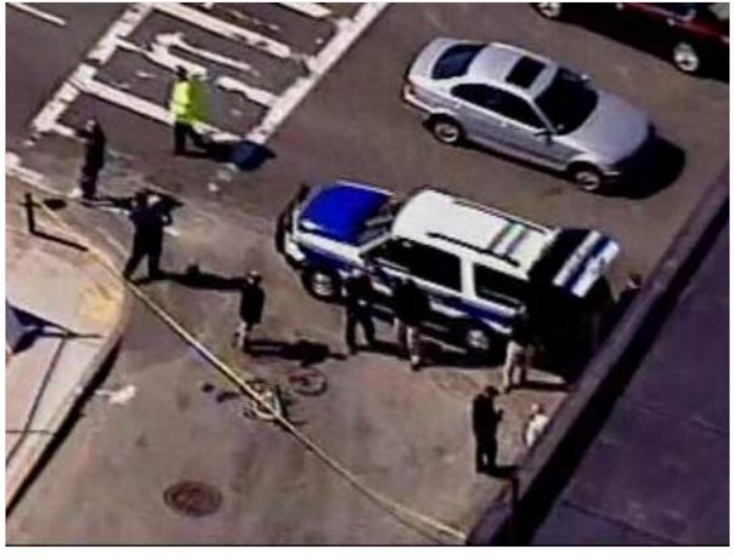
Bicyclist Struck, Killed by Truck in Sullivan Square

The cyclist reportedly was reportedly killed in the hit-and-run accident Thursday afternoon.

Charlestown, MA

Like Share 0

By MATT PERKINS (Patch Staff) - April 3, 2014 5:19 pm ET



First Opportunity: Waste Hauling Contracts

Bicyclist pulled out from under garbage truck at Mass. Ave. and Columbus

By adamg on *Tue, 07/29/2014 - 10:47am*

2014 - Mayor Asks for Tool to Expand

Boston Becomes 1st City in the Nation to Pass Truck Side Guard Ordinance Protecting Cyclists

Alex E. Weaver - Lifestyle Editor
10/29/14 @1:37pm in City News

9.3K

TWITTER | 437 | FACEBOOK | SEND VIA EMAIL | SHARE

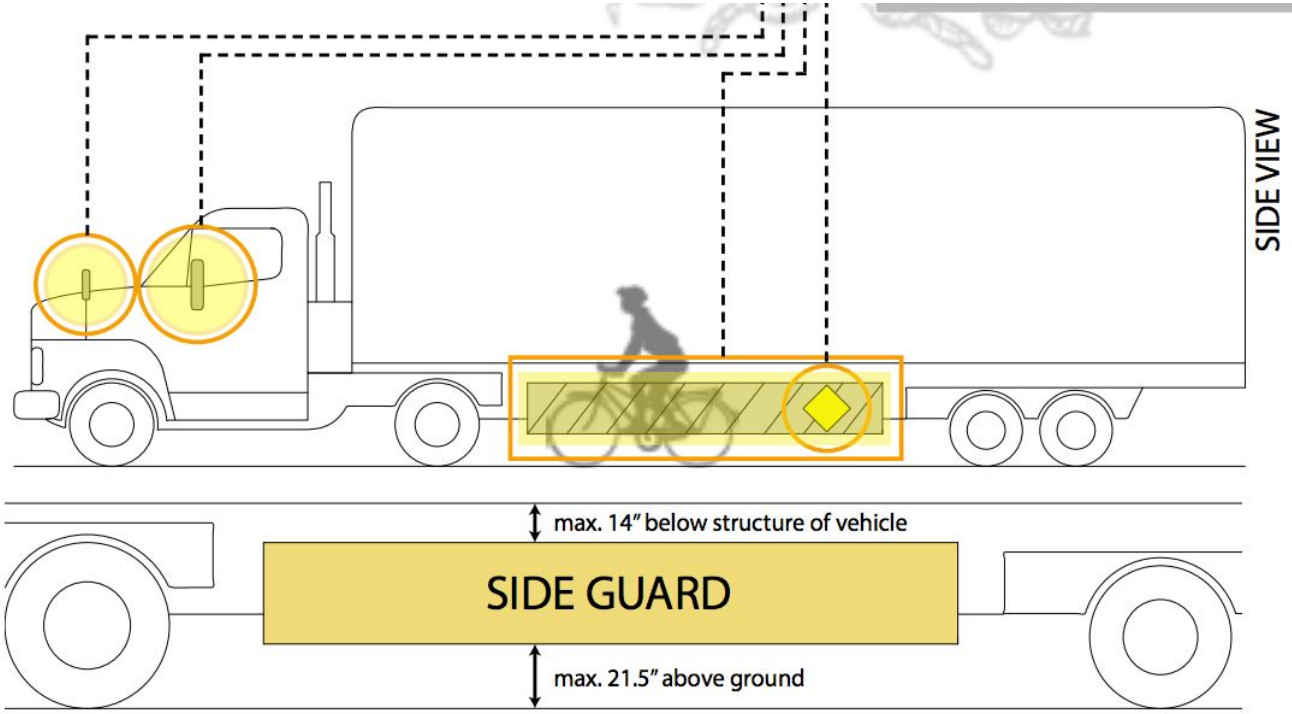
2014 - The City Ordinance

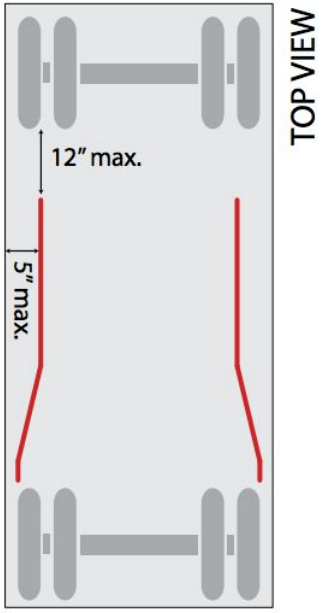
Applies to all vehicles over 10,000lbs with a city contract & City fleet*

Sideguards | Convex Mirrors | Cross-over Mirrors | Blind Spot Decals

**new purchases & model year 2015 and newer*

2014 - Mayor asks for bigger expansion tool





May 2015 - Ordinance goes into effect

City of Boston in three years

$34,500 initial investment → 106 Trucks Certified

2015 - Next round of expansion

Cyclist killed in Back Bay crash

A woman was killed on Massachusetts Ave. and Beacon Street on Friday morning.

Like Share 20 Tweet G+1 0

Police are looking for the driver of this truck. *Photo: Boston Police*

2016 - State Bill

The Boston Globe
January 6, 2016

After cycling deaths, a plea for truck safety guards

"If you look at communities around the Commonwealth, these tragedies are playing out in Cambridge, Brockton, Malden, Northampton, and Wellesley, just to name a few," said Kris Carter, cochairman of Boston's New Urban Mechanics office. Carter testified while sitting alongside Weigl.

Boston passed a side-guard ordinance in 2014, following a successful pilot program. Billed as a US first, it requires all large city-contracted vehicles to be fitted with side guards.

But Carter said trucks that are not contracted by the city aren't required to have the guards, and the city doesn't have authority to expand the requirement to other trucks.

"That's where we look to your leadership," Carter told the panel. "We look to your leadership in recognizing a simple fix that can greatly improve the streets across the Commonwealth for the people of Massachusetts, and set an example for the rest of the country."

2017 - Building the Coalition

Government Partners

Company Partners

Institutional Partners

2016 - Building the Coalition

Three actions you can take to save lives

1. Pilot side guards and crossover mirrors on one fleet vehicle

2. Include a side guard requirement in waste hauling contracts

3. File an ordinance in your municipality

Discussion

- ⇨ **Send us your questions** 
- ⇨ **Follow up with us:**
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  - ⇨ **Kris Carter kristopher.carter@boston.gov**
  - ⇨ **General Inquiries pbic@pedbikeinfo.org**
- ⇨ **Archive at www.pedbikeinfo.org/webinars**