

Agenda

- Brief introduction to Volpe/USDOT
- Truck-on-bicycle/pedestrian crashes
 - Crash mitigation: **sideguards**
 - Crash prevention technologies
- The opportunity for DOTs and fleets
- Q&A

Volpe 2

- 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

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


Vehicle-based safety: Trucks

Large truck design presents inherent challenges for pedestrian and cyclist safety

- 4% of vehicles in U.S. (urban and rural)
 - 11% of cyclist fatalities, 7% of ped fatalities
- 3.6% of NYC vehicles
 - 32% of cyclist fatalities, 12% of ped fatalities

Key contributing factors

1. Large blind spots (London video)
2. Side underride → cyclists/pedestrians fall under wheels in side impact → **110+ per year**



Legislation and Enforcement

Education

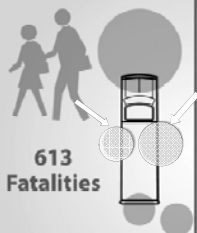
Complete Streets Infrastructure

Vehicle-based Safety

Volpe 4

Vehicle-based safety: Trucks

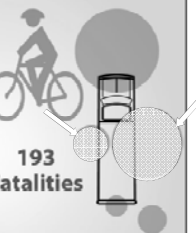
PEDESTRIAN/TRUCK IMPACT AREAS



613 Fatalities

| Impact Area | Pedestrians | % |
|-------------|-------------|----|
| Front | 354 | 58 |
| Back | 53 | 9 |
| Right | 97 | 16 |
| Left | 54 | 9 |
| Other | 55 | 9 |

CYCLIST/TRUCK IMPACT AREAS

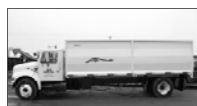



193 Fatalities

| Impact Area | Cyclists | % |
|-------------|----------|----|
| Front | 92 | 48 |
| Back | 6 | 3 |
| Right | 67 | 35 |
| Left | 17 | 9 |
| Other | 11 | 6 |

Volpe 5

Vehicle-based countermeasure: sideguards


➔


Side underride guards ("sideguards"):

- Can block cyclists/pedestrians from falling under rear wheels

International safety record—UK:
 61% decrease in cyclist fatalities in side-impact crashes with large trucks
 20% decrease in same types of pedestrian fatalities

Volpe 6

Technical complexities

- ❑ Different, demanding vehicle uses (trash, snow, construction...)
- ❑ Unique vehicle body designs

Questions:

- ❑ What should be core safety-based specifications?
- ❑ Can innovative designs maximize safety?

Volpe 10

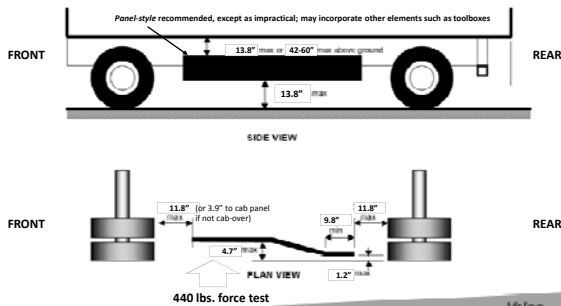
International sideguard standards and recommendations

| Attributes |
|----------------------------------|
| Vehicles covered |
| Exemptions |
| Strength requirement |
| Max. ground clearance |
| Height for top of sideguard |
| Gap between sideguard and wheels |
| Designs allowed |
| Other vehicle components |

Volpe 11

Recommendation schematic

Based on EU and UK standards and on Monash Univ, Transport Research Lab and Volpe recommendations



Volpe 12

Representative sideguard OEM

- Sideguards on sanitation collectors (EU and China)

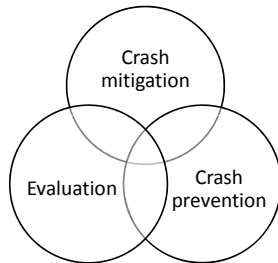


Innovative sideguard retrofit

- Panel sideguard on cement mixer with flip-up rail sideguard for city operation; also includes sensor and alarm (UK)

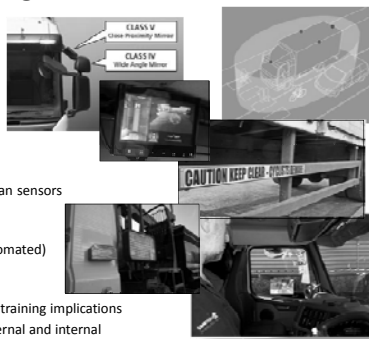


A comprehensive approach to VRU safety



Opportunity: evaluate and prioritize among technologies to save the most lives

- ❑ Different sideguard designs
- ❑ Blind spot mirrors
 - Front
 - Side
- ❑ Blind spot cameras
 - Directional
 - 360-degree
- ❑ Blind spot Fresnel lenses
- ❑ Blind spot bicyclist/pedestrian sensors
 - Ultrasonic, radar, etc.
 - Interior/exterior alerts
- ❑ Turn alarms (manual or automated)
 - Audible
 - Visual
- ❑ Human factor and operator training implications
- ❑ Educational messaging: external and internal



Volpe 16

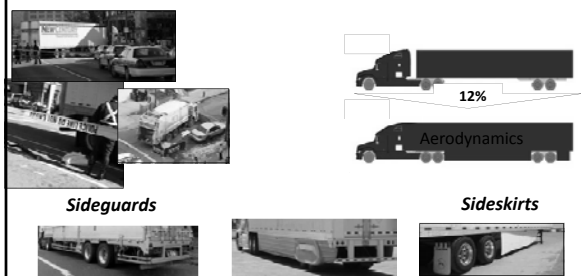
Opportunity: Private fleets “race to the top”



Source: <http://www.standard.co.uk/news/london/will-this-hitech-lorry-be-the-key-to-slashing-death-toll-of-cyclists-on-london-streets-9634866.html>

Volpe 17

Opportunity: achieve fuel savings payback through aerodynamic design



Sideguards

Sideskirts

12%

Aerodynamics

Volpe 18

Opportunity for Cities and Fleets

- ❑ Lead other U.S. cities and the nation in truck-VRU safety
 - Pilot and prioritize **multiple** safety technologies
 - Design and perform a pilot evaluation
- ❑ Demonstrate co-benefit of aerodynamic fuel savings
- ❑ Build on Volpe's safety work with Boston and NYC



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Advancing transportation innovation for the public good

References

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- ❑ Volpe sideguard report for NYC DCAS
<http://www.nyc.gov/html/dcas/downloads/pdf/fleet/DCASVolpePhaseFinal.pdf>
- ❑ Boston Vulnerable Road User sideguard ordinance
<http://www.cityofboston.gov/news/default.aspx?id=14853>
http://meetingrecords.cityofboston.gov/sirepub/view.aspx?cabinet=Published_Meetings&fileid=117884
- ❑ Volpe article on urban truck safety for VRUs
<http://www.volpe.dot.gov/news/cities-take-steps-increase-bicyclist-and-pedestrian-safety>
