

# Measuring direct vision for truck cabs

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# Agenda

- Direct vision of truck (and other vehicle) cabs
- Why direct vision? Why now? Why trucks?
- Volpe contribution and future work
- Assembling an advisory group and stakeholders

# Direct vision





# Direct vision

Status Quo  
Truck Cab



Incremental  
improvements

Peep window:



Sloped hood:



Cab forward:



Transformative  
improvement

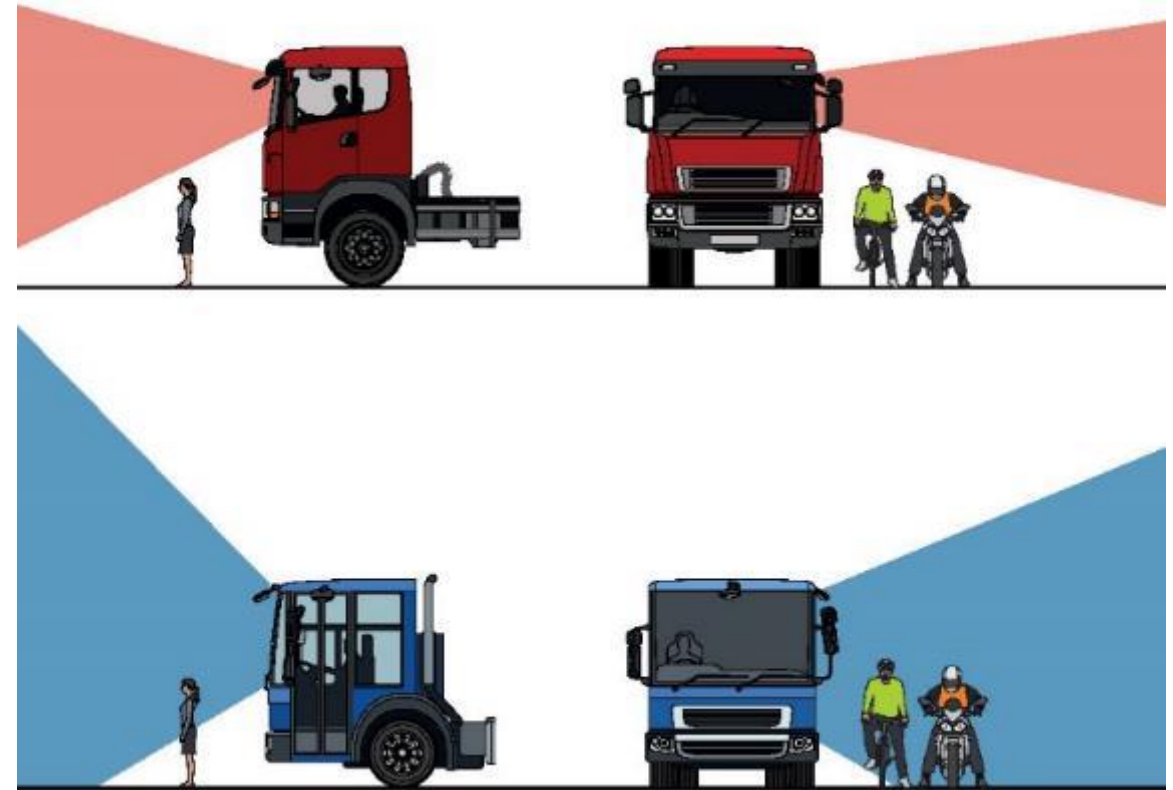
Low-entry, high-vision truck cab:



# Why direct vision?

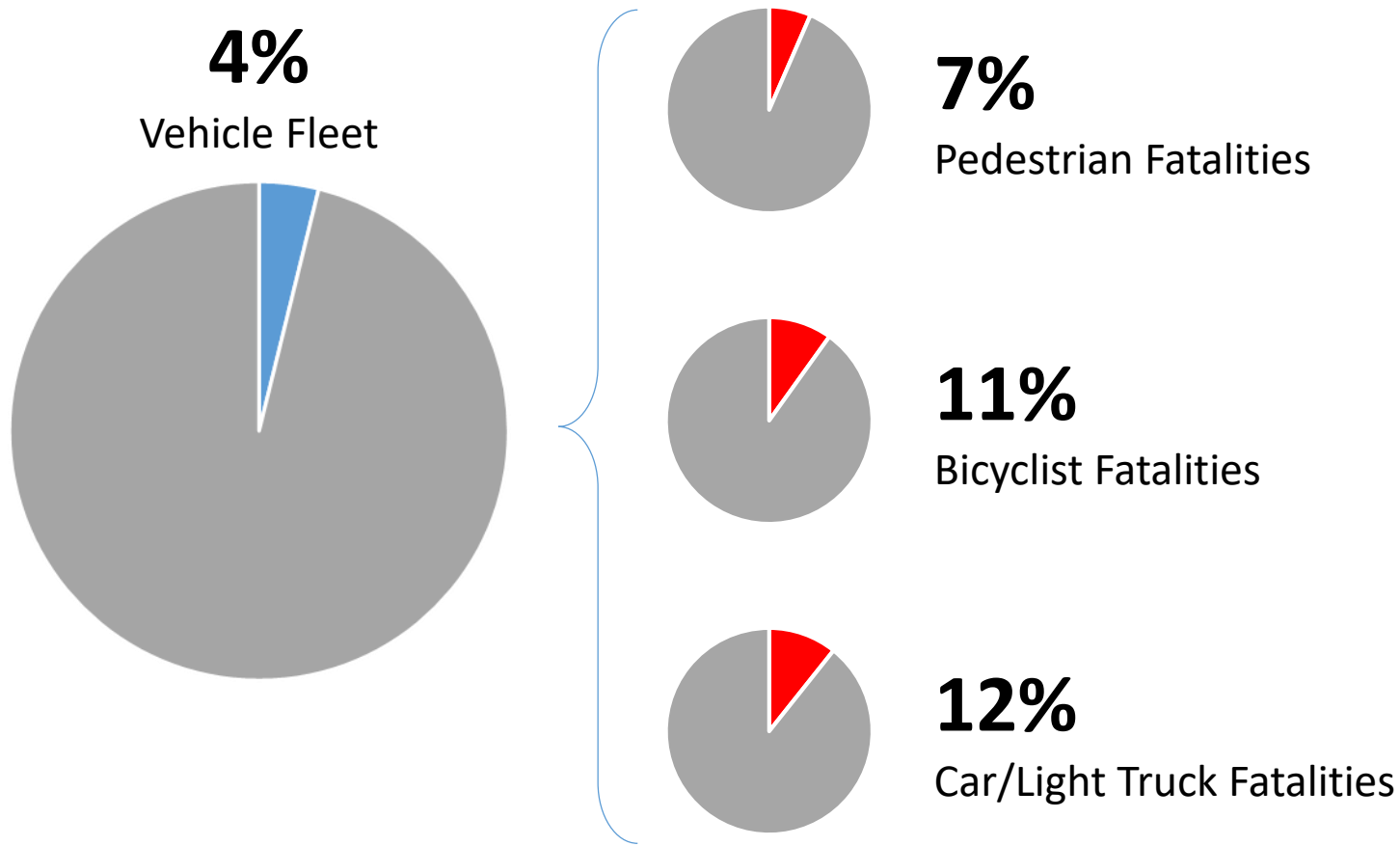
# 50%

faster reaction time through direct vision



Credit: TFL

# Why trucks?



Credit: FMCSA

# WHY TRUCKS: CRASH CAUSATION (UK)

Accidents between HGVs and cyclists		Accidents between HGVs and pedestrians	
No. of accidents	Causation category	No. of accidents	Causation category
<b>723</b>	<b>Failed to look properly</b>	<b>284</b>	<b>Failed to look properly</b>
357	Failed to judge other person's path or speed	<b>125</b>	<b>Vehicle blind spot</b>
321	Passing too close to cyclist	105	Poor turn or manoeuvre
257	Poor turn or manoeuvre	101	Passing too close to horse rider or pedestrian
219	Careless, reckless or in a hurry	80	Careless, reckless or in a hurry
<b>159</b>	<b>Vehicle blind spot</b>	50	Failed to judge other person's path or speed

- Due to the difficulties in ascertaining the exact cause of an accident after the fact these data must be treated with caution
- However, **vision related causal factors account for nearly 37% of all accidents involving a truck and a pedestrian and 33% involving a truck and a cyclist**
- **This trend was consistent whether at a National level or purely in London.**



# Direct Vision Standard (DVS)

Alina Tuerk and Vicky Sims  
Transport for London

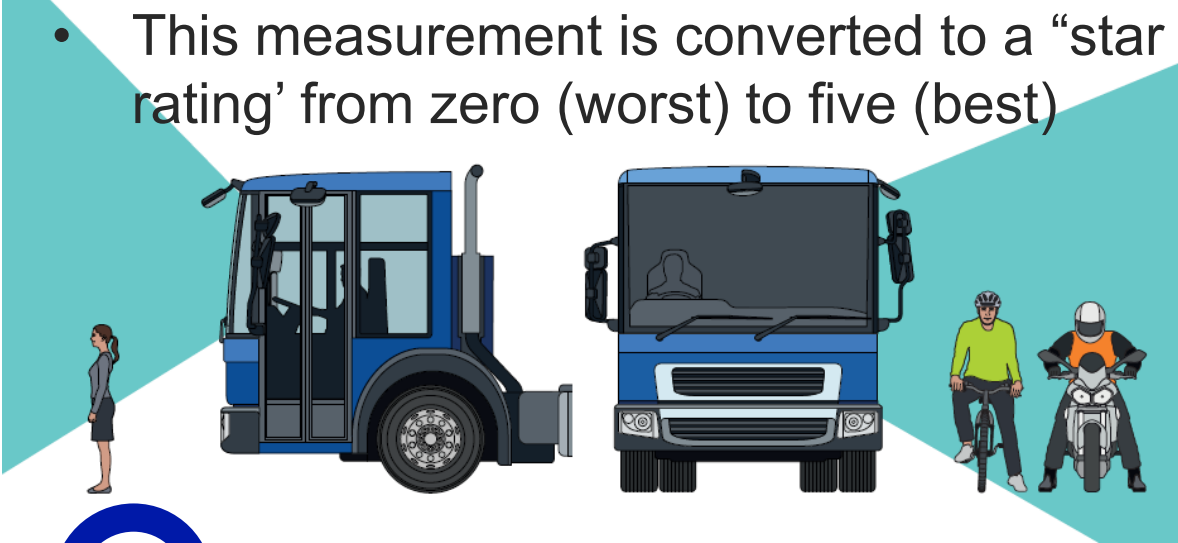




## Why Now?

### Direct Vision Standard (DVS)

- TfL world's first Direct Vision Standard for HGVs
- Objective measurement of the 'volume of space' weighted by risk to other road users
- This measurement is converted to a "star rating" from zero (worst) to five (best)



- **UNECE to support the minimum 1 STAR definition in all new trucks by 2024 and all trucks on the road by 2028**
- **An EU impact assessment has shown that this could save 550 lives every year in Europe**

Sensors

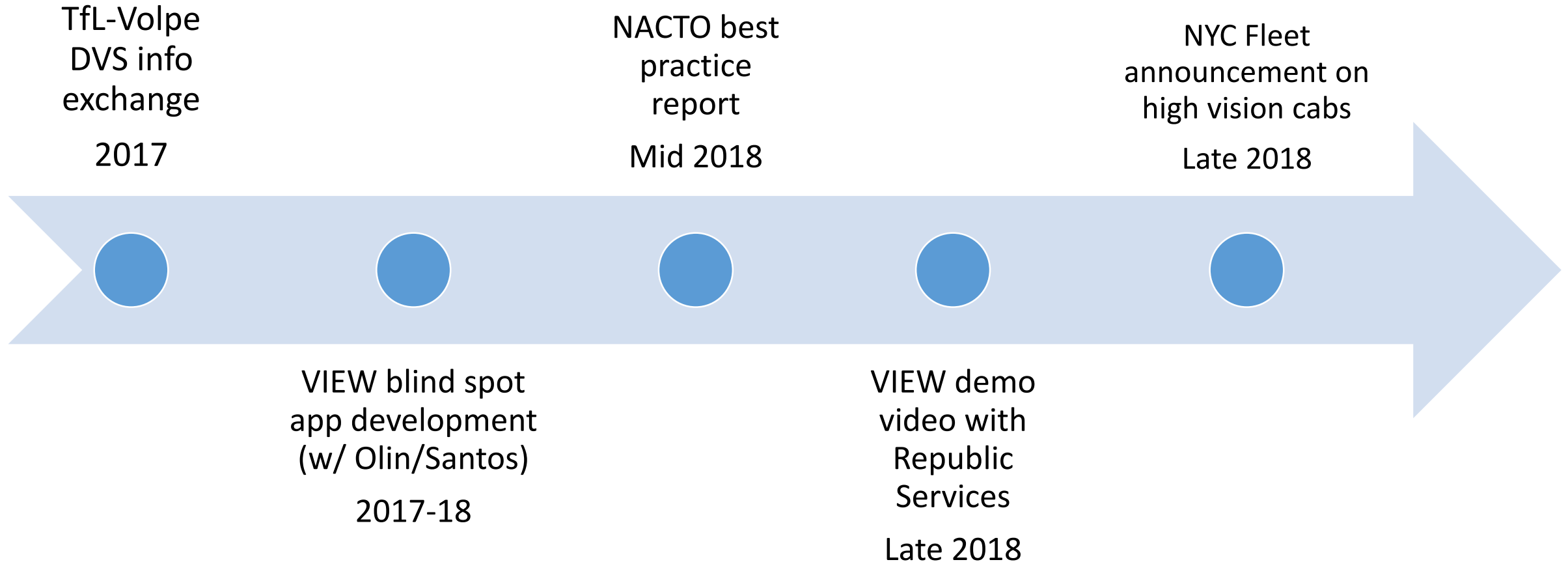
Cameras

Sideguards

Mirrors

Audible  
warningDriver  
training

# Volpe contribution and future work



# VIEW Blind Spot Measurement App: DATA COLLECTION



**1. Place the height measurement pole & camera stand**



**2. Take vehicle measurements**



**3. Capture field of view photo**





Measurements are taken from the pole to the front bumper, from the bumper to the camera lens.

And from the ground to the camera lens.

MORE VIDEOS



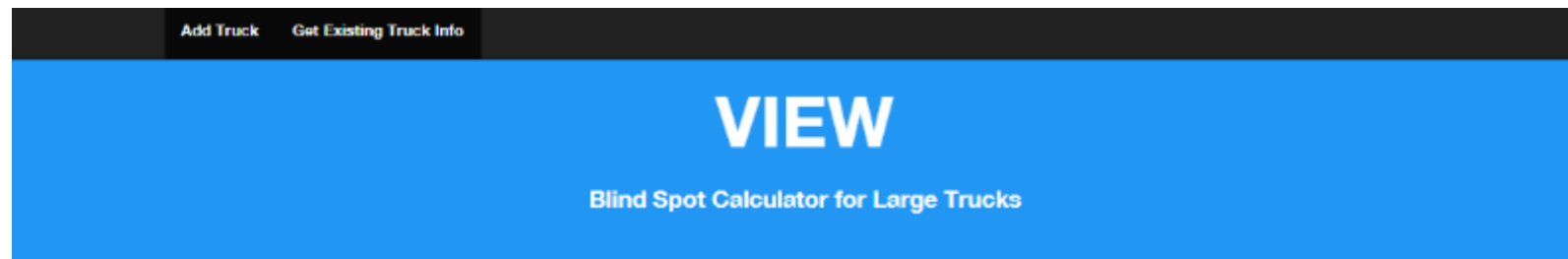
# IMAGE PROCESSING



# WEB APPLICATION

- Upload panoramic photo
- Outputs visibility percentage
- Option to add truck information to database

<https://blindspotcalculator.herokuapp.com/>

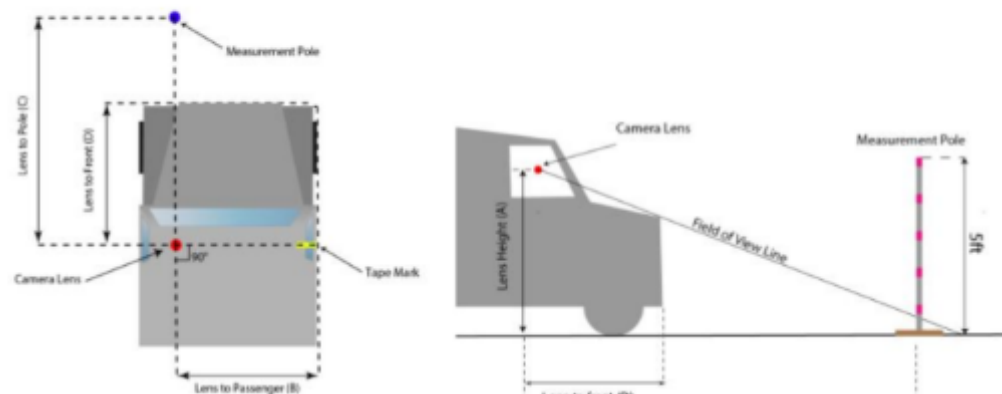


Choose field of view image to upload

Choose File No file chosen

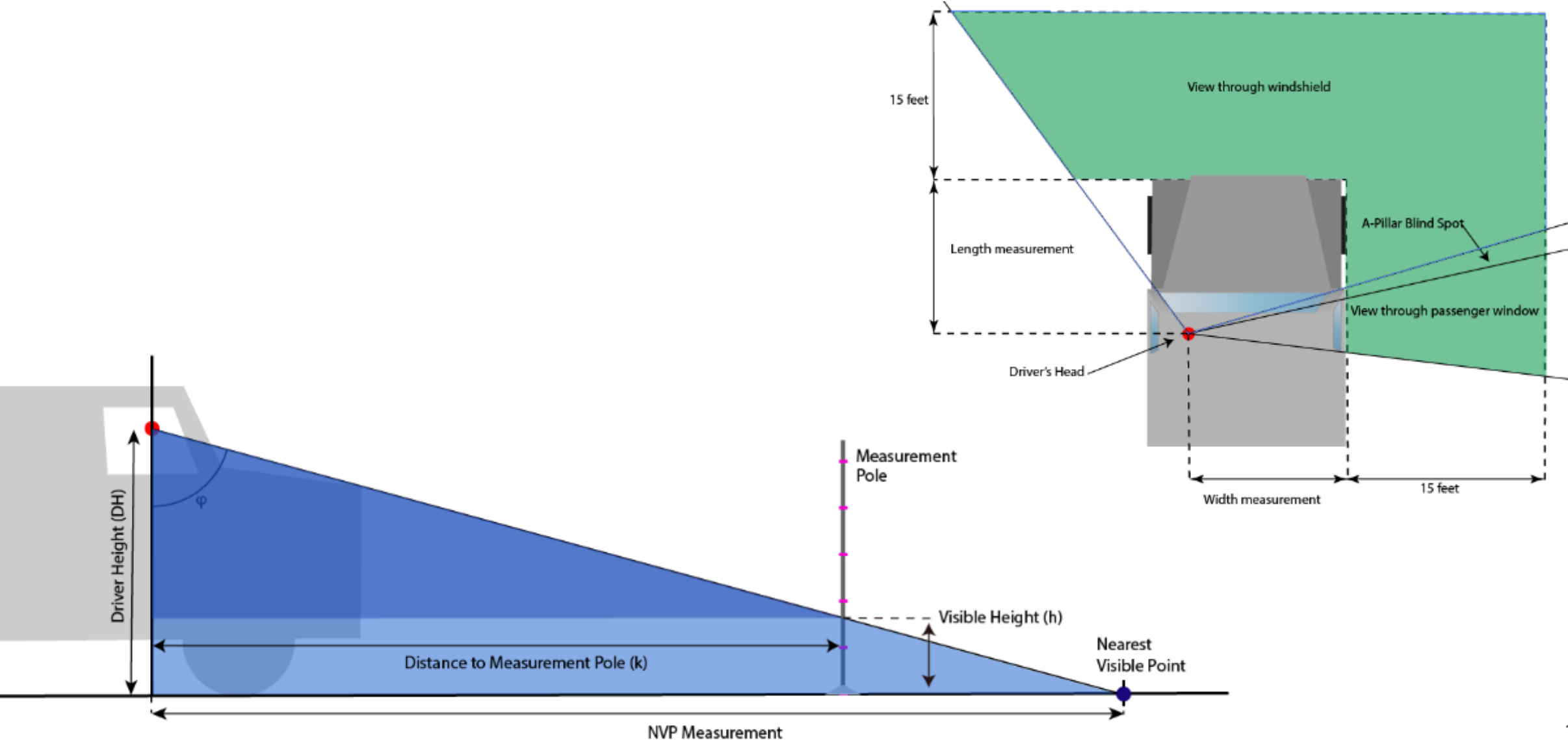
## **i** Instructions

- The image you upload will look warped, that's okay
- You may want to consider cropping your image if the windows do not make up the majority of the photo
- Try to be as accurate as possible
- You will need the four measurements shown here:





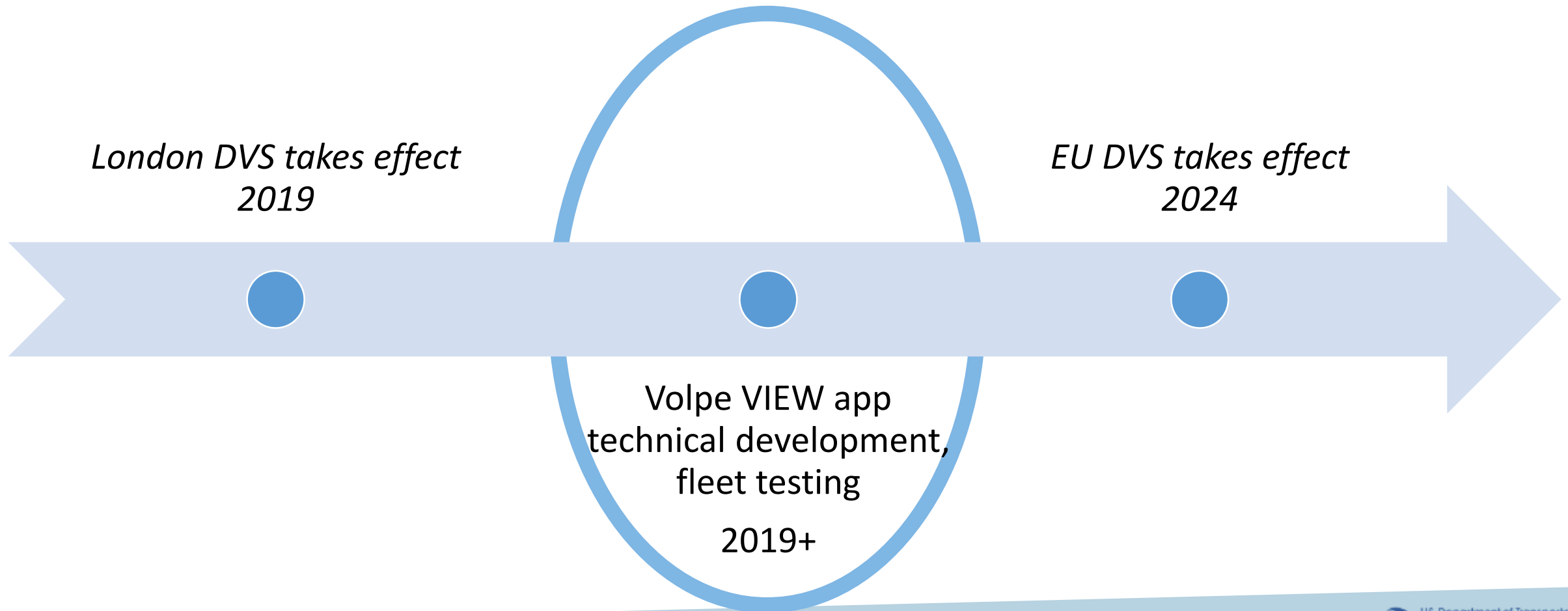
# BLIND AND TOTAL VOLUMES



# Blind Spot Comparison



# Volpe contribution and future work





# Stakeholders, awareness and next steps

Is this an issue you were aware of or thinking about?

What other stakeholder agencies or organizations are working in this space? (beyond the table)

What is the path forward to understanding and managing direct vision as an emerging issue?

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**OA / Office**

**FMCSA Technology Division**

**FMCSA Vehicle and Roadside Operations Division**

**NHTSA HF**

**FHWA Safety and Human Factors**

**NIOSH Division of Safety Research**

**NHTSA VRTC**

**NHTSA Electronic Systems Safety**

**NHTSA Research**

**CVSA**

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# Thank you

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