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The International Automotive Lighting and Light Signalling Expert Group

Reversing projection
Statistical data supporting GRE/2024/20 Rev.1

92nd GRE session
22-25 April 2025

Statistical data supporting GRE/2024/20 Rev.1

Overview

Nr.	Region	Title	Researcher / Submitter
1	Germany	Emergency braking systems for reversing (Notbremssystem für Rückwärtsfahrt)	ADAC (FIA)
2	United Kingdom	Casualties in Greater London during 2023	Transport for London
3	France	Collisions between pedestrians and reversing vehicles in public settings in France	HAL open science
4	United Kingdom	Analysis of police collision files for pedestrian fatalities in London, 2006-10	Transport Research Laboratory TRL
5	Japan	Accidents when four-wheel vehicles are reversing	Itarda
6	South Korea	Traffic accidents statistics and traffic accidents during reversing in Korea	TMACS
7	European Commission	Road Traffic Fatalities Europe 2022	EC Mobility and Transport (EU Care Database)
8	United Kingdom	Reported road casualties in Great Britain: pedestrian factsheet, 2023	Dpt. of Transport
9	Europe and North America	2023 Statistics of Road Traffic Accidents	UNECE

Statistical data supporting GRE/2024/20 Rev.1

Key figures and GTB conclusion

REVERSING ACCIDENTS INVOLVING PEDESTRIANS ARE VERY SIGNIFICANT WORLDWIDE

France (p. 8):	reversing accounts for 7% of pedestrian accidents in public setting and 39% of manoeuvres were made for entering or leaving a parking space
Germany (p. 5):	17% of all pedestrian and vehicle collisions are taking place at the rear end
Japan (p. 10):	77% of the fatalities / serious injuries while reversing were accounted by vulnerable road users, and pedestrians accounted for 57% of the VRU
Korea (p. 11):	even though the overall number of accidents has decreased in recent years (-15%), the number of accidents during reversing is still rising (+30%)

THE NUMBER OF VRUs HAVE INCREASED, particularly pedestrians and cyclists

Europe (p. 14)	in urban areas, more than 68% of all registered fatalities affected VRUs, of which 49% are pedestrians
UK (p. 15):	the pedestrian traffic (distance walked) has increased by 19% between 2004 and 2023
Europe (p. 16):	the COVID-19 pandemic may have led to an increase in the number of VRUs, particularly cyclists

DISTRACTED PEDESTRIANS

UK (p. 9):	48% of the pedestrians were recorded as “failed to look properly” and this factor was observed for all age groups *In Korea, Germany and Netherlands the governments have installed in-ground traffic lights for smartphone zombies (link)*

MORE SUBSTANTIAL REDUCTION IN FATALITIES AMONG CAR USERS COMPARED TO VRUs is a general trend in Europe

Europe (p. 16):	UK -25% vs. -15% Spain -55% vs. -10%
Japan (p. 10):	looking at the accidents of four-wheel vehicles while reversing: the number is gradually decreasing, certainly related to the introduction of the back monitor BUT the composition rate considering all casualty accidents is increasing of 1%, reaching 5%

GTB conclusion: statistical data from different regions of the world clearly indicate that more efforts shall be made to reduce accidents involving VRUs, in particular pedestrians that are more and more distracted by smartphones while walking. The increasing number of electric vehicles represents an additional risk factor in the future due to the lack of engine noise in slow maneuvering such as reversing.

→ **Reversing projections represent a valid solution to improve the safety of VRUs**

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Annex

Statistical data supporting GRE/2024/20 Rev.1

Germany - Emergency braking systems for reversing

Nr.	Region	Title	Researcher / Submitter
1	Germany	Emergency braking systems for reversing (Notbremssystem für Rückwärtsfahrt) Link: https://www.adac.de/rund-ums-fahrzeug/ausstattung-technik-zubehoer/assistenzsysteme/parkassistent-bremsfunktion/ Link: ÖAMTC: Fünf Parkassistenten mit Notbremssystem im Test | ÖAMTC Link: Fünf Parkassistenten mit Notbremssystem im Test | ÖAMTC	ADAC (FIA)

- Vehicles need more safety features for reverse movement, an automatic brake assistant is the most promising feature.
- 17% of all pedestrian and vehicle collisions are taking place at the rear end.

  This is an extra risk for elder pedestrians as secondary injuries become more relevant.
- One of the major reasons is the restricted sight from inside the vehicle.
- Euro NCAP included braking assistants as a safety benefit since 2020.

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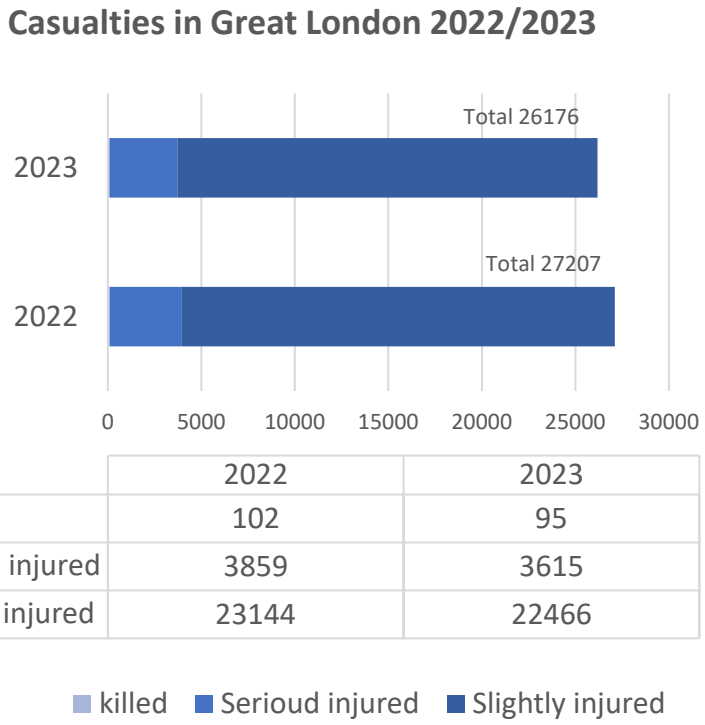
UK - Casualties in Greater London during 2023

Nr.	Region	Title	Researcher / Submitter
2	United Kingdom	Casualties in Greater London during 2023 Link: https://content.tfl.gov.uk/casualties-in-greater-london-2023.pdf	Transport for London

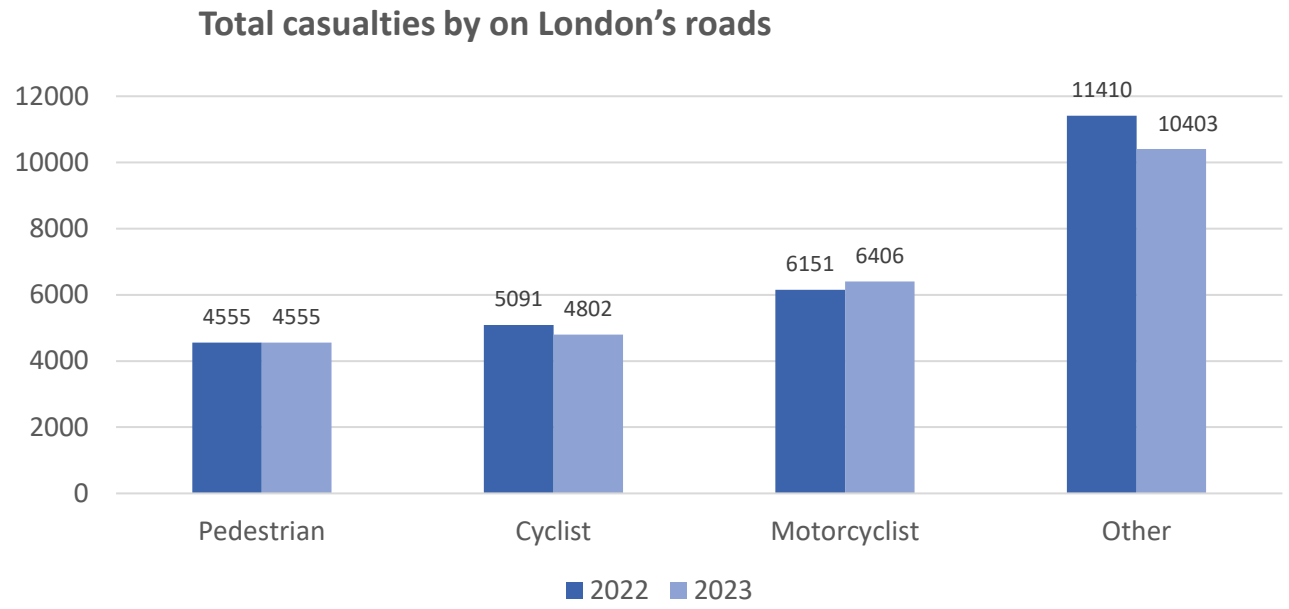
- Car occupant fatalities dominate in 2023 for the rest of Great Britain (47%), whereas in London pedestrians represent the largest percentage of fatalities (52%)
- **Accidents During Reversing**: a significant number of accidents involving casualties occur during reversing maneuvers. These accidents often involve vulnerable road users like pedestrians and cyclists who may not be easily visible to drivers.
- **Accidents During City Turns:** Turning maneuvers in city environments are another common scenario for accidents, especially involving pedestrians and cyclists.

Casualties in London during reversing and city turns

Source : Transport of London



	2022	2023
killed	102	95
Serioud injured	3859	3615
Slightly injured	23144	22466



- **Pedestrians:** The number of casualties remained constant at 4,555 each year **(17,41%).**
- **Cyclists:** There was a decrease in casualties from 5,091 in 2022 to 4,802 in 2023 **(~18,4%).**
- **Motorcyclists:** The number of casualties increased from 6,151 in 2022 to 6,406 in 2023 **(~24,5%).**

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France - Collisions between pedestrians and reversing vehicles in public settings

Nr.	Region	Title	Researcher / Submitter
3	France	Collisions between pedestrians and reversing vehicles in public settings in France Link: https://hal.science/hal-01702228v1	HAL open science

Table 2. Mutual detection and related accident mechanisms.

	Number of cases	Percentage
Pedestrian detection by the driver (n = 30)		
– failed to see the pedestrian	26	87%
– saw the pedestrian too late	4	13%
Total number of cases with sufficient information in the police report	30	(100%)
Perception of the vehicle by the pedestrian (n = 25)		
– failed to see the vehicle (had his/her back turned to the vehicle)	8	32%
– failed to see the vehicle (was looking in the opposite direction)	6	24%
– saw the vehicle but failed to anticipate its manoeuvre	5	20%
– saw the vehicle but lacked time or did not have the capability to get out of its path	6	24%
Total number of cases with sufficient information in the police report	25	(100%)

- Reversing accounts for 7% of pedestrian accidents in public setting.
- 39% of reversing manoeuvres were made for entering or leaving a parking space.
- in 20% of the cases the pedestrian failed to anticipate the vehicle's manoeuver
- in 24% of the cases the pedestrian saw the vehicle but did not have the capability to get out of its path

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UK - Analysis of police collision files for pedestrian fatalities in London, 2006-10

Nr.	Region	Title	Researcher / Submitter
4	United Kingdom	Analysis of police collision files for pedestrian fatalities in London, 2006-10 Link: https://content.tfl.gov.uk/pedestrian-fatalities-in-london.pdf	Transport Research Laboratory TRL

This study analyzed **197 police fatal** files where a pedestrian was killed in **London** in the period **2006-2010**.
The sample was selected to be broadly representative in terms of pedestrian age group, the vehicles involved and geography (inner or outer London).

Summary:

- **64% of the collisions** were within 20m of a junction; most commonly at a T, staggered junction or crossroads;

- **48% of the pedestrians** were recorded as "failed to look properly" and this factor was observed for all age groups

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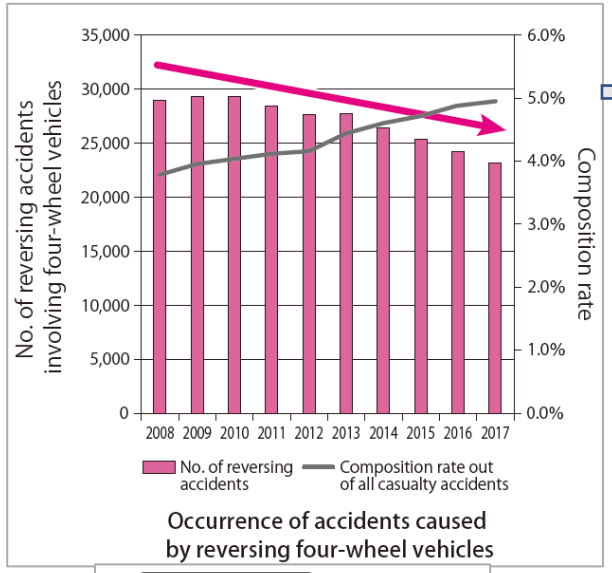
Japan - Accidents when four-wheel vehicles are reversing

Nr.	Region	Title	Researcher / Submitter
5	Japan	Accidents when four-wheel vehicles are reversing Link: https://www.itarda.or.jp/contents/95/info128_e.pdf	Itarda



> In **Japan**, during the period **2008-2017**, looking at the **accidents of four-wheel vehicles while reversing**:

- the **number is gradually decreasing**, certainly related to the introduction of the back monitor
- BUT **the composition rate considering all casualty accidents is increasing**, reaching 5%

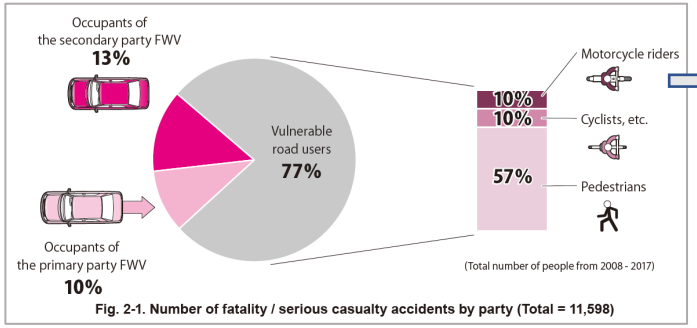


Fig. 2-1. Number of fatality / serious casualty accidents by party (Total = 11,598)

Accidents of four-wheel vehicles while reversing
3/4 of the fatalities / serious injuries were accounted by **vulnerable road users**,
and **pedestrians** accounted for **3/4 of the VRU**

> Reversing accidents frequently occur at relatively low speeds **below 10km/h**.
> **Pedestrians** often get into such accidents while **walking within parking lots** or in the vicinity around their entrances.
> **Bicycles and motorcycles** often get into such accidents while **traveling along uninterrupted road section or at intersections** (including the vicinity around them).

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South Korea - Traffic accidents statistics and traffic accidents during reversing in Korea

Nr.	Region	Title	Researcher / Submitter
6	South Korea	Traffic accidents statistics and traffic accidents during reversing in Korea Link: https://tmacs.kotsa.or.kr/web/TG/TG200/TG2100S/Tg2102.jsp?mid=S1202# (TMACS - Traffic Safety Information Management Complex System)	TMACS

In **Korea**, during the period **2019-2023**, even though the number of accidents and casualties for all types of accidents have decreased over the years by roughly 15%, the number of **traffic accidents during reversing** and the involved casualties continuously increased:

- **+31% number of traffic accidents during reversing**
- **+28%** number of **persons killed or injured** involved in these accidents

Traffic Accidents Statistics in Korea

Source : TMACS (Traffic Safety Information Management Complex System in Korea)

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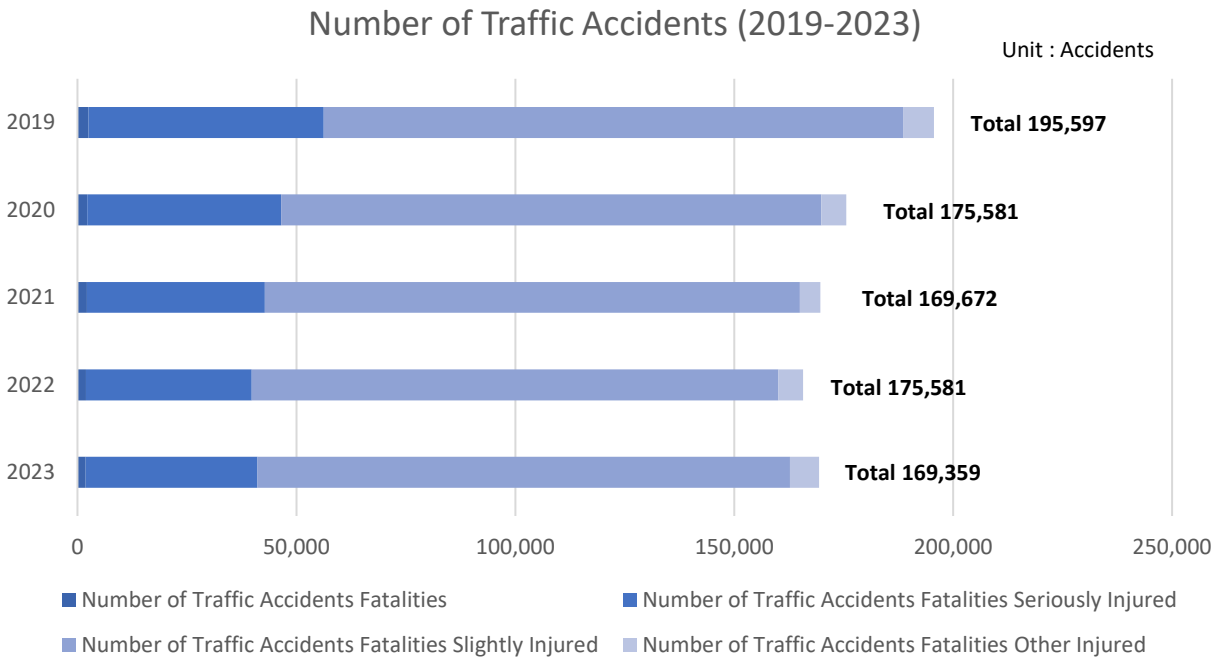

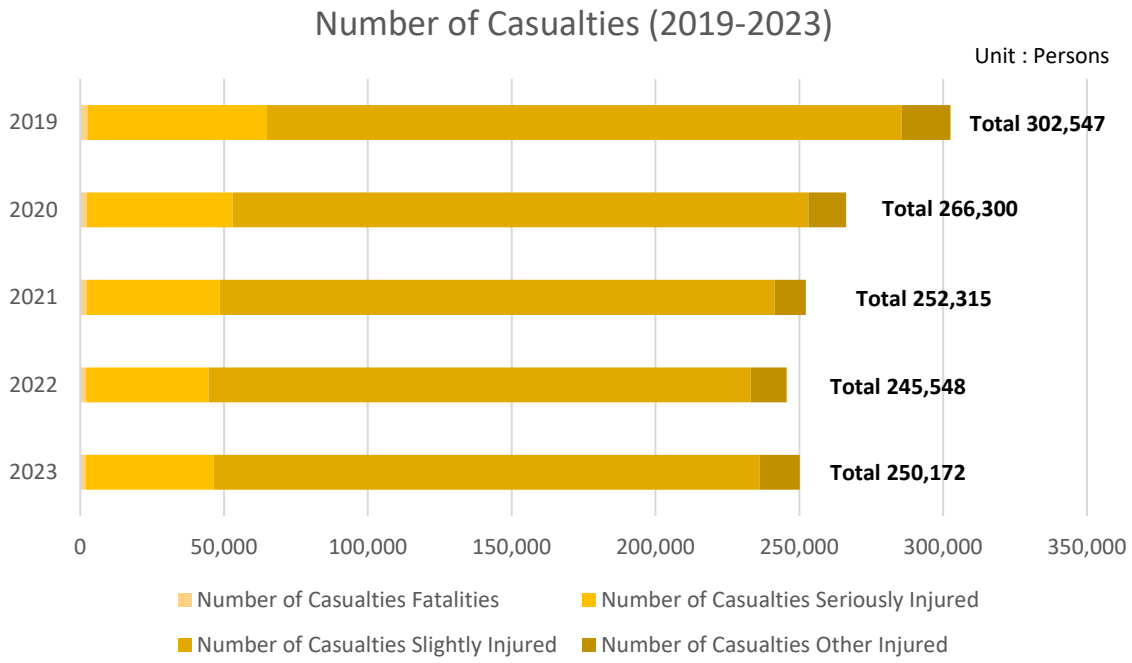

Unit : Accidents

Number / Year	Number of Traffic Accidents with				
	Total	Fatalities	Seriously Injured	Slightly Injured	Other Injured
2023	169,359	1,889	39,191	121,677	6,602
2022	165,754	1,943	37,863	120,257	5,691
2021	169,672	2,130	40,679	122,144	4,719
2020	175,581	2,246	44,277	123,378	5,680
2019	195,597	2,516	53,755	132,430	6,896
Average	175,193	2,145	43,153	123,977	5,918

Unit : Persons

Number / Year	Number of Casualties				
	Total	Fatalities	Seriously Injured	Slightly Injured	Other Injured
2023	250,172	1,962	44,506	189,649	14,055
2022	245,548	2,011	42,654	188,457	12,426
2021	252,315	2,220	46,256	192,969	10,870
2020	266,300	2,334	50,650	200,117	13,199
2019	302,547	2,620	62,303	220,561	17,063
Average	263,376	2,229	49,274	198,351	13,523

Source : TMACS (Traffic Safety Information Management Complex System, https://tmacs.kotsa.or.kr/web/TG/TG200/TG2100S/Tg2102.jsp?mid=S1202#)

Traffic Accidents During Reversing in Korea

Source : TMACS (Traffic Safety Information Management Complex System in Korea)

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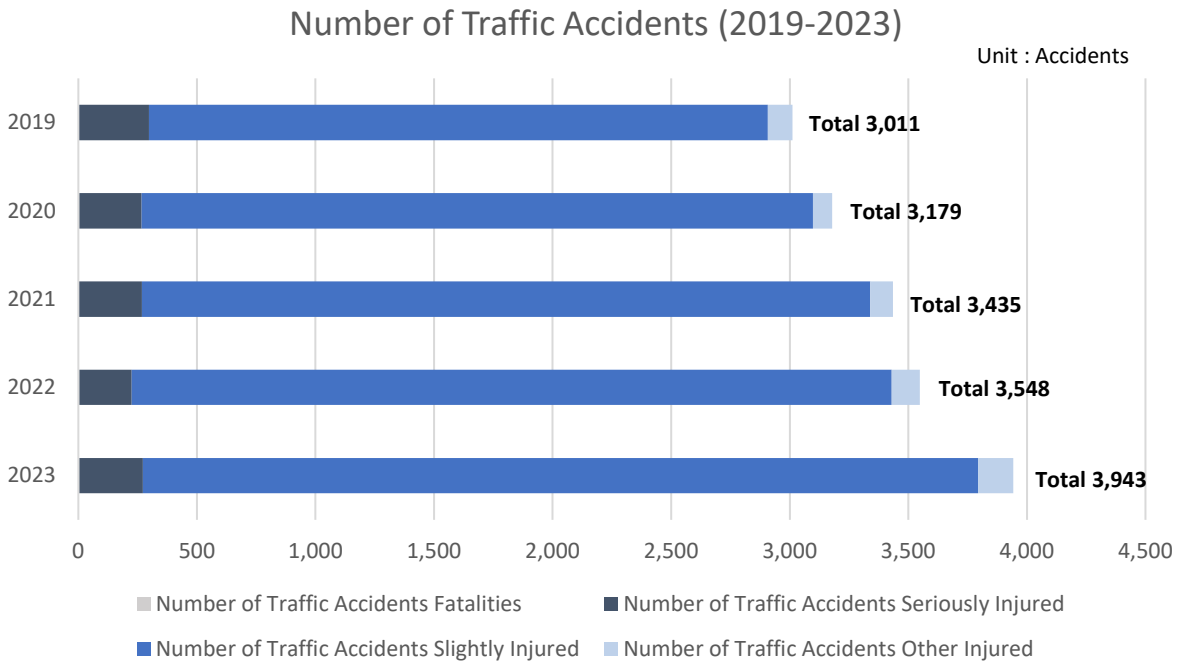

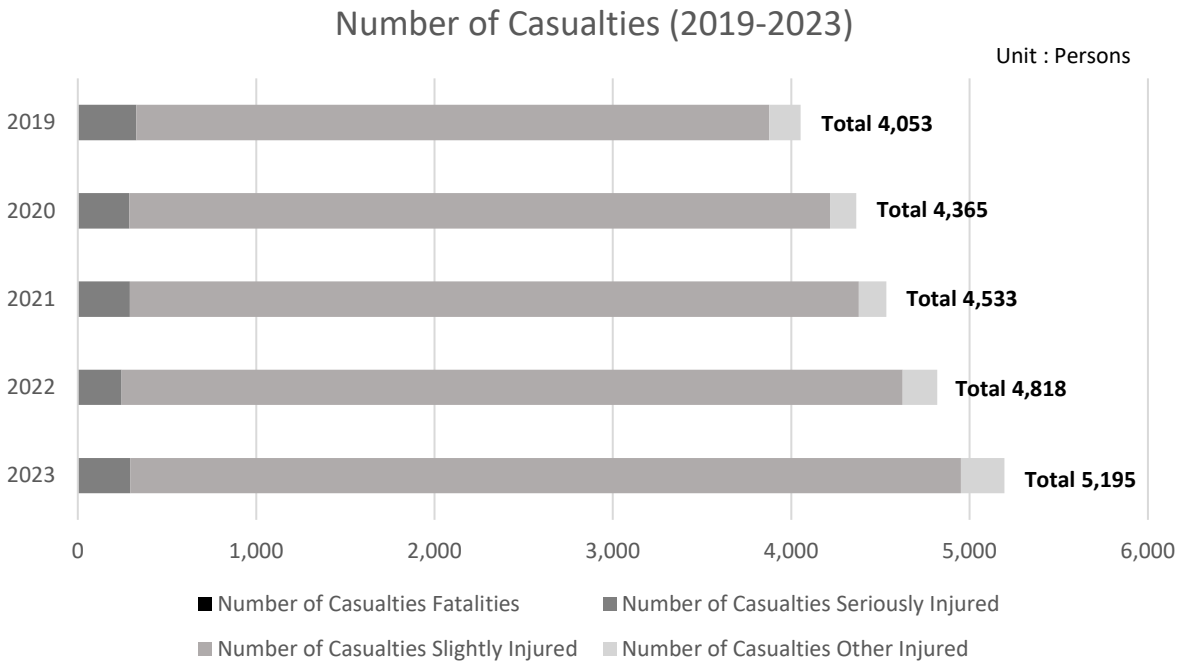

Unit : Accidents

Year \ Number	Number of Traffic Accidents with				
	Total	Fatalities	Seriously Injured	Slightly Injured	Other Injured
2023	3,943	3	269	3,522	149
2022	3,548	4	221	3,205	118
2021	3,435	1	267	3,071	96
2020	3,179	3	264	2,831	81
2019	3,011	0	298	2,610	103
Average	3,423	2	264	3,048	109

Unit : Persons

Year \ Number	Number of Casualties				
	Total	Fatalities	Seriously Injured	Slightly Injured	Other Injured
2023	5,195	3	291	4,657	244
2022	4,818	4	241	4,380	193
2021	4,533	1	291	4,087	154
2020	4,365	3	286	3,928	148
2019	4,053	0	328	3,548	177
Average	4,593	2	287	4,120	183

Source : TMACS (Traffic Safety Information Management Complex System, https://tmacs.kotsa.or.kr/web/TG/TG200/TG2100S/Tg2102.jsp?mid=S1202#)

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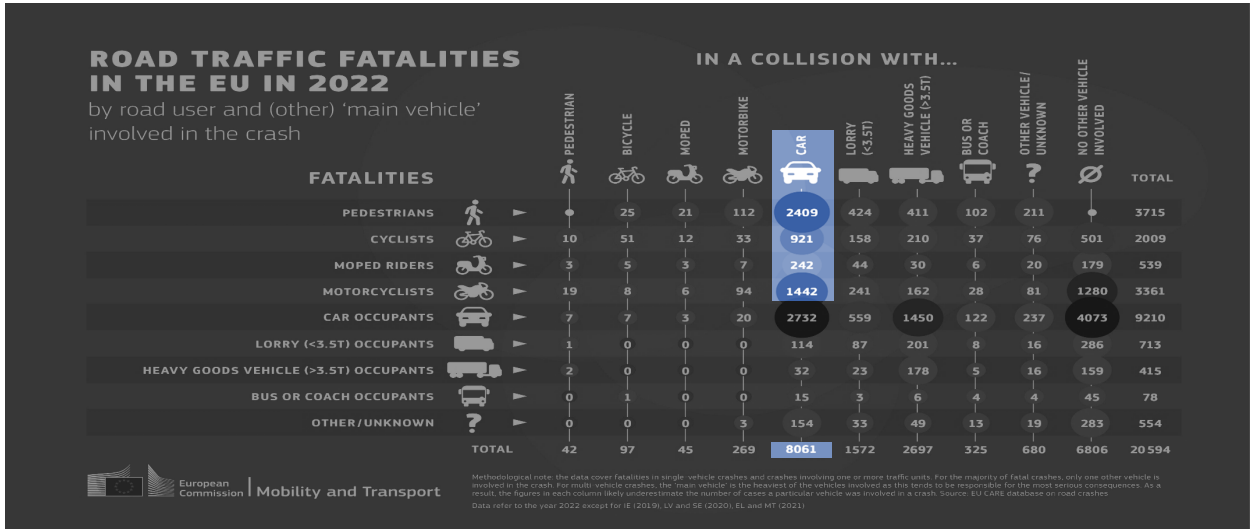
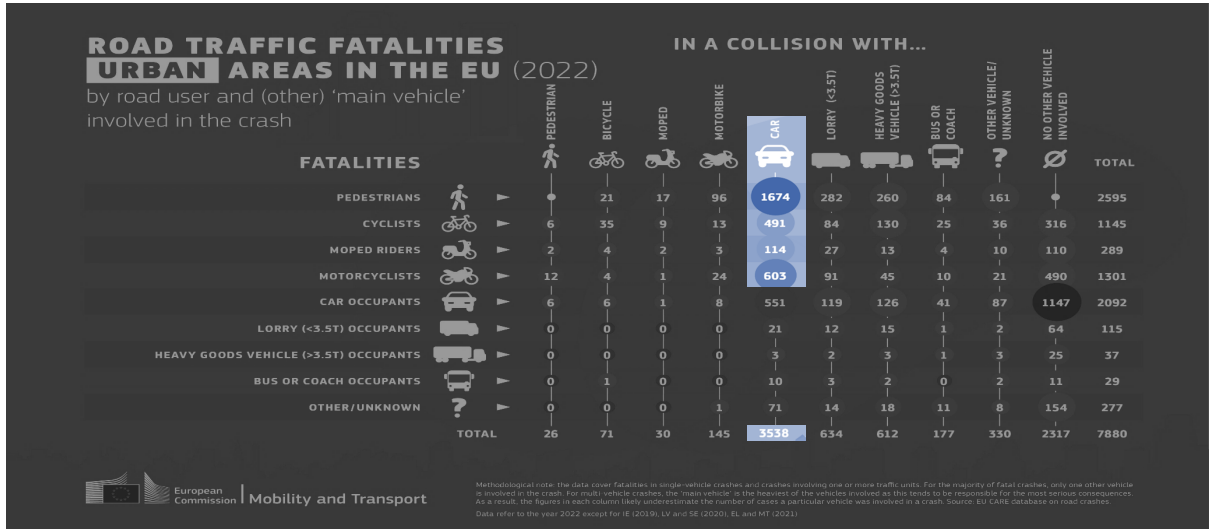
EC - Road Traffic Fatalities Europe 2022

Nr.	Region	Title	Researcher / Submitter
7	European Commission	Road Traffic Fatalities Europe 2022 Links: road traffic fatalities EUROPE 2022 road traffic fatalities in URBAN areas EUROPE 2022	EC Mobility and Transport (EU Care Database)

In Europe:

- More than 47% of all registered fatalities affected VRUs, of which 39% are pedestrians
- More than 62% of fatalities originated by a car affected VRUs, of which 48% are pedestrians.
- In Urban areas: more than 68% of all registered fatalities affected VRUs, of which 49% are pedestrians





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UK - Reported road casualties in Great Britain: pedestrian factsheet, 2023

Nr.	Region	Title	Researcher / Submitter
8	United Kingdom	Reported road casualties in Great Britain: pedestrian factsheet, 2023 Link	Dpt. of Transport

- It should be noted that it has been long known that a considerable percentage of non-fatal casualties are not reported to the police.
  This should be borne in mind when analyzing and interpreting the data.
- Pedestrian traffic (distance walked) has increased by 19% between 2004 and 2023
- 66% of pedestrian fatalities occurred on urban roads
- The weekday peak time for pedestrian killed or seriously injured casualties is from 3pm to 6pm. By contrast, the peak is later in the early evening at weekends
- The most common contributory factor allocated to pedestrians in fatal or serious collisions (FSC) with another vehicle was ‘Pedestrian failed to look properly’
- Further contributory factors assigned to pedestrians were ‘pedestrian careless, reckless or in a hurry’ followed by ‘failure to judge vehicle’s path or speed’

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UNECE - 2023 Statistics of Road Traffic Accidents

Nr.	Region	Title	Researcher / Submitter
9	Europe and North America	2023 Statistics of Road Traffic Accidents Link: https://w3.unece.org/roadsafety/2023/	UNECE

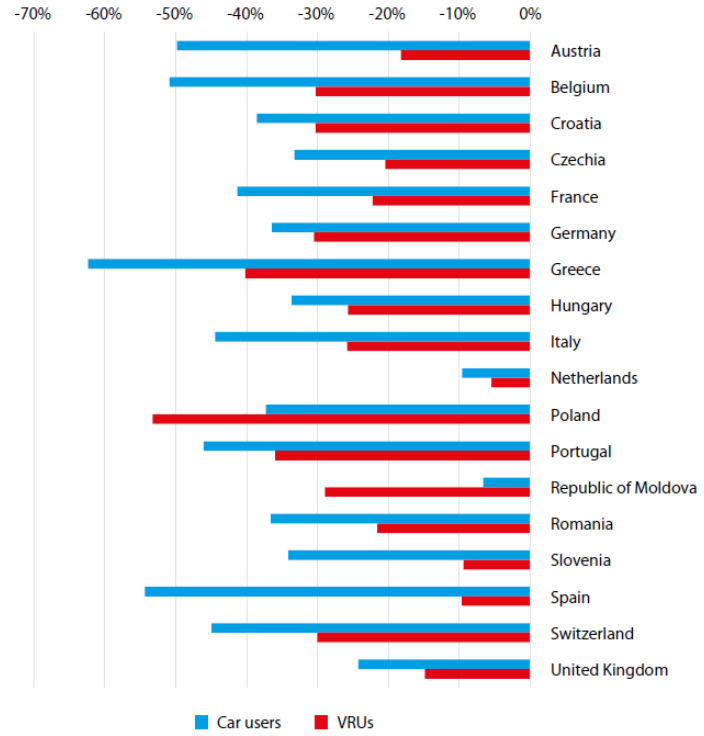
Road traffic accidents involving vulnerable road users

- the general trend indicates a more substantial reduction in fatalities among car users compared to VRUs

- the COVID-19 pandemic may have led to an increase in the number of VRUs, particularly cyclists.

- this could result in higher fatality rates within this group, especially if road infrastructure and safety measures have not adapted to accommodate the change.

Figure V Percentage decreases in road traffic fatalities of car users and VRUs in selected countries, 2011-2021



Source: UNECE Transport Database.