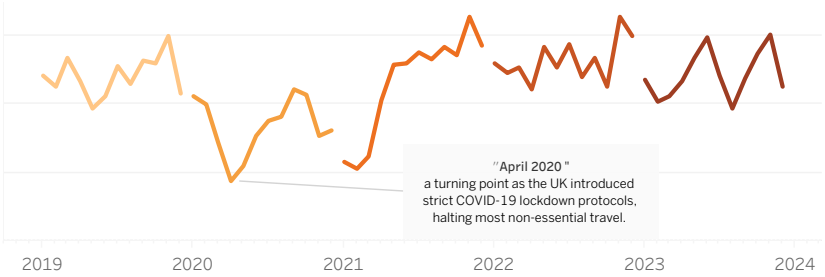
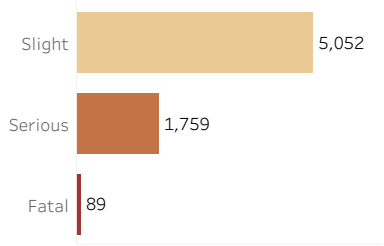
Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Overall Analysis of Road Traffic Accidents in Leeds, UK (2019 - 2023)

# Accidents	# Casualties	# Vehicles Involved
6,900	8,883	12,673

This dashboard presents a comprehensive view of road traffic accidents in Leeds over a five-year period. It visualizes key metrics including the total number of accidents, casualties, and vehicles involved, along with time trends and geographical distribution.



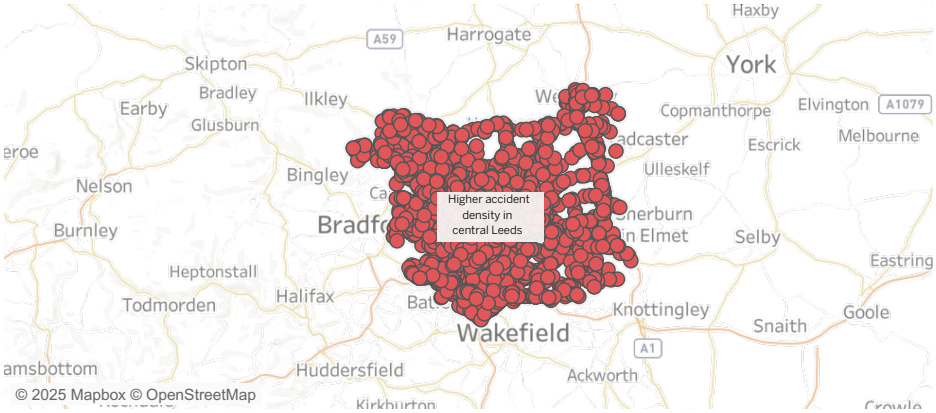


COVID-19 Impact: *2020 lockdown caused a sharp drop in accidents and casualties.*

Post-Lockdown Recovery: *Incidents rose again post-lockdown with restored mobility.*

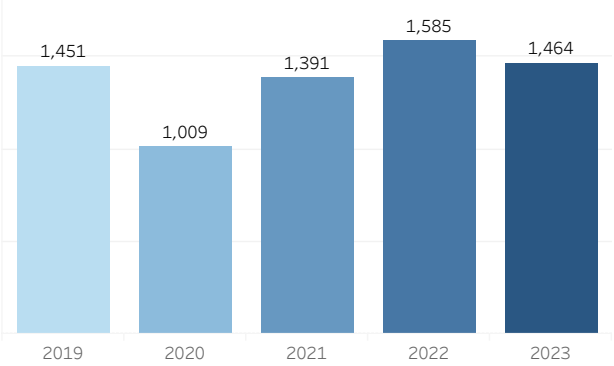
Geographical Clustering: *Urban hotspots (central Leeds) show higher accident frequency.*

Severity: *Majority of accidents were slight (5,052 incidents), accounting for over 70% of all cases.*



Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

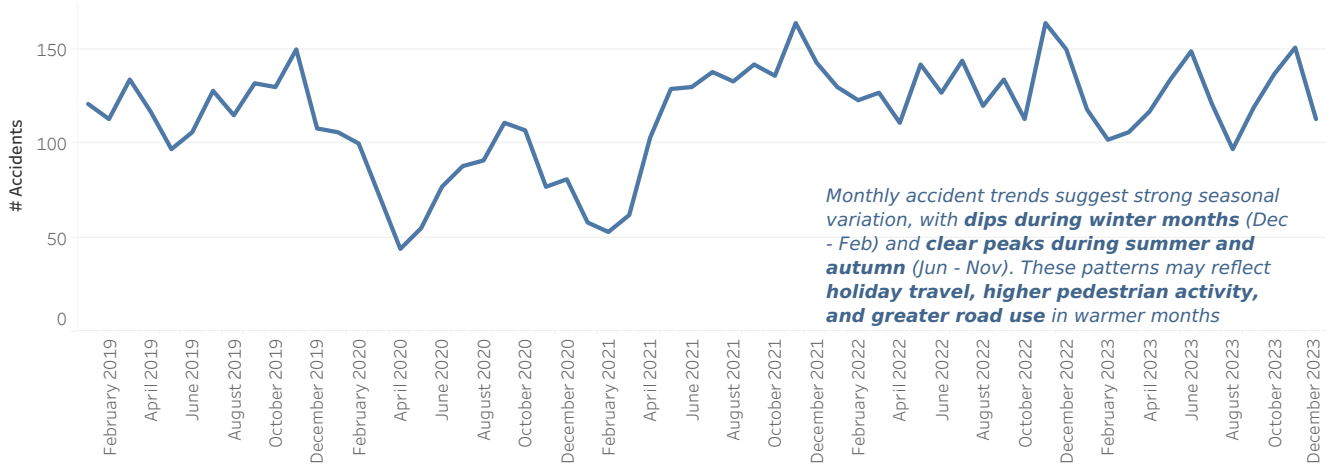
Temporal RTA Trend: Annual and Seasonal Insights



*> Clear **drop in 2020**, explained by **COVID-19 lockdowns** (reduced mobility)*
*> 2021 shows **recovery**.*
*> 2022 reached **peak post-pandemic volu..***

*This monthly trend plot reveals a **major decline** in road traffic accidents during the **early 2020 pandemic lockdown** period, followed by a **steady return to pre-pandemic levels** by mid-2021 - **back to regular travel patterns**. A slight drop in 2023 may warrant further investigation, possibly related to policy, infrastructure changes, or improved awareness.*

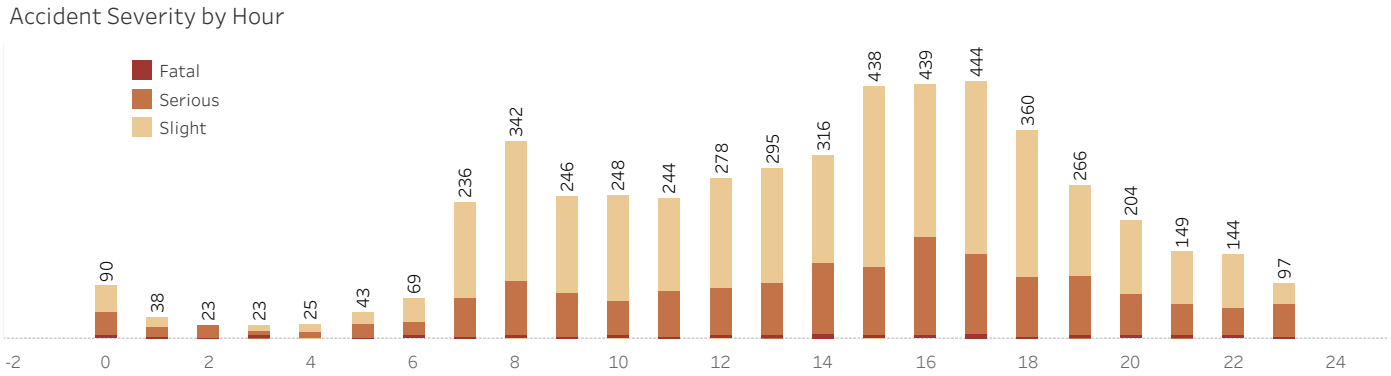
Monthly Accident Trend

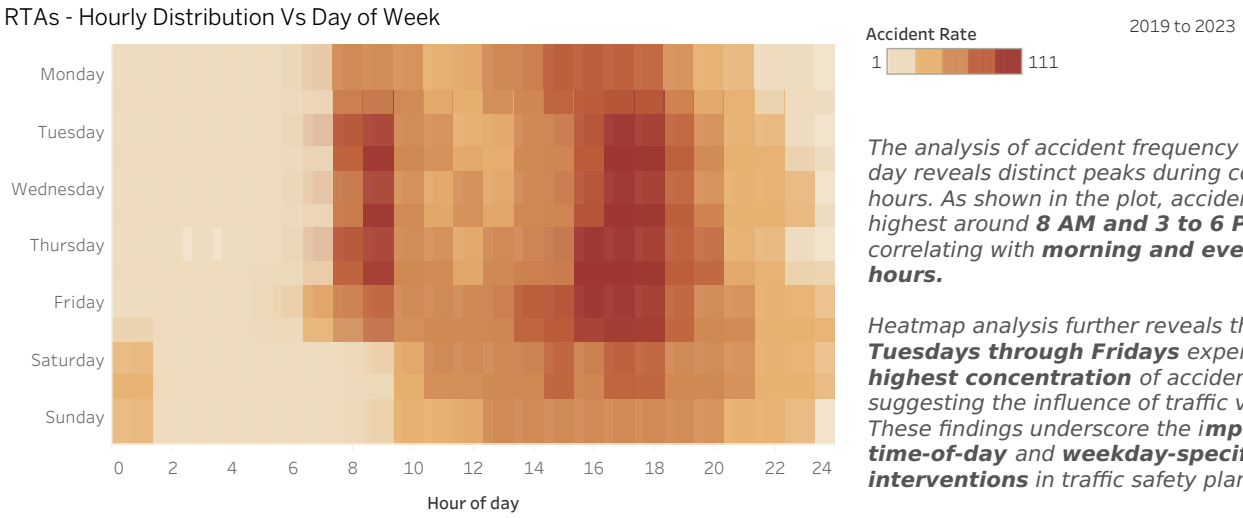


*Monthly accident trends suggest strong seasonal variation, with **dips during winter months** (Dec - Feb) and **clear peaks during summer and autumn** (Jun - Nov). These patterns may reflect **holiday travel, higher pedestrian activity, and greater road use** in warmer months*

Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Hour & Day-wise Analysis in Accident Frequency and Severity



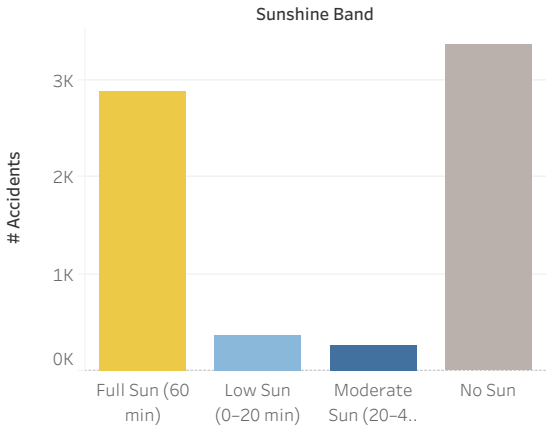


*The analysis of accident frequency across the day reveals distinct peaks during commuting hours. As shown in the plot, accident volume is highest around **8 AM and 3 to 6 PM,** correlating with **morning and evening rush hours.***

*Heatmap analysis further reveals that **Tuesdays through Fridays** experience the **highest concentration** of accidents, suggesting the influence of traffic volume. These findings underscore the i**mportance of time-of-day** and **weekday-specific interventions** in traffic safety planning.*

Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Sunlight Exposure & Temporal Accident Patterns

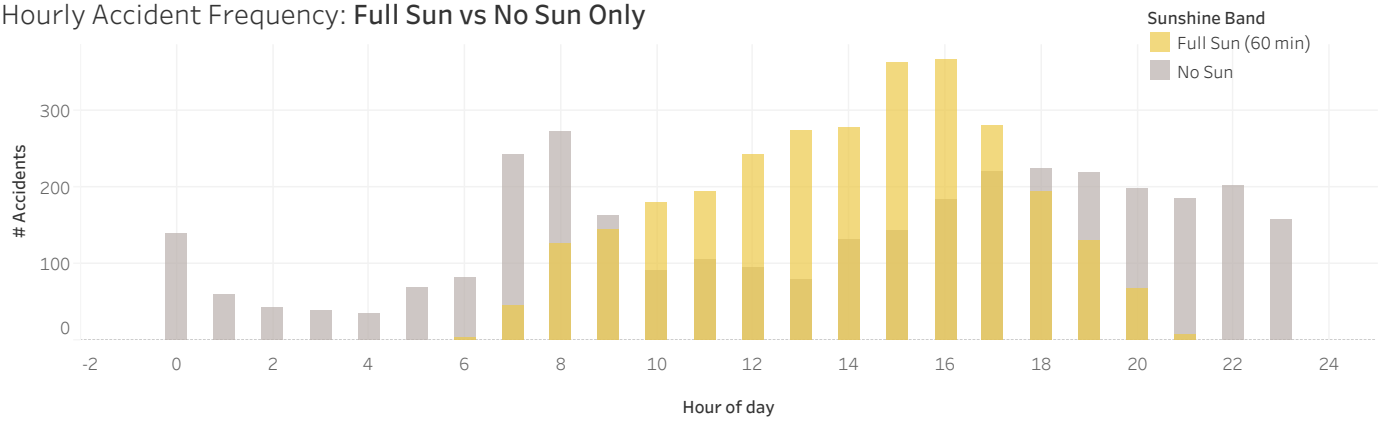


2019 to 2023

The U-shaped pattern suggests that both no sunlight (low visibility) and full sunlight (likely glare) are associated with increased accident risks, while partial sunlight appears safer. This supports exploring glare-related accident peaks by time o..

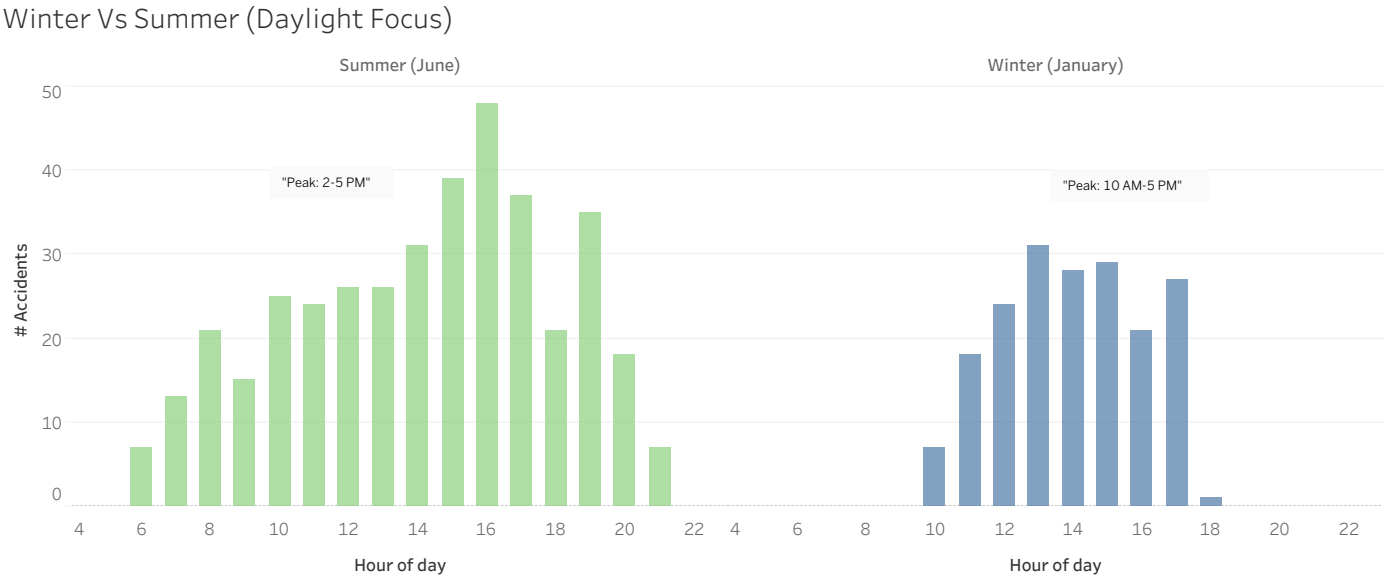
Hourly patterns reveal that accidents under full sun conditions spike sharply between 2 PM and 5 PM, coinciding with low sun angles and high glare potential. By contrast, no-sun accidents are more evenly distributed across the day. This supports the hypothesis that glare-related visibility issues, particularly in late afternoon, are a contributing factor to accident risk.

Hourly Accident Frequency: **Full Sun vs No Sun Only**



Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Summer Glare vs Winter Congestion: Seasonal Accident Patterns



This view builds on the previous analysis of sunlight exposure and accident risk by exploring **seasonal differences in daylight patterns**.

~ Summer (June), Longer daylight from early morning until late evening. Accident peak **2 - 5 PM,** aligning with the high glare period from the previous dashboard.

~ Winter (January), Shorter daylight **10 AM - 5 PM**. While glare risk is lower, heavier traffic during limited daylight may raise congestion-related risks.

Why it matters:
Seasonal daylight patterns shift the main risks: ***glare*** *in summer vs* ***traffic pressure*** *in winter.*

Suggested Safety Measures:

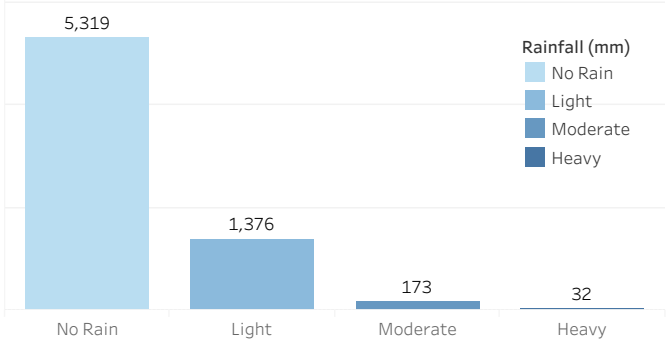
Summer*: Visor Adjustments, Anti-glare screens, Driver awareness, Clear road markings*

Winter*: Optimized signal timing, Flexible travel times, Targeted congestion control*

Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Rainfall Analysis on RTAs

How Rainfall Patterns Relate to Accident Frequency in Leeds?



Key Insight: *"Dry and Light-Rain Days Pose Greater Accident Risk"*

Contrary to common belief, ***most accidents occur on dry or light-rain*** *days, while* ***heavy rain sees fewer incidents****.*

This suggests road safety campaigns should also address common conditions, as ***road type and traffic volume*** *may play a bigger role than weather severity.*

"Why Light Rain and Dry Days May Be Riskier"

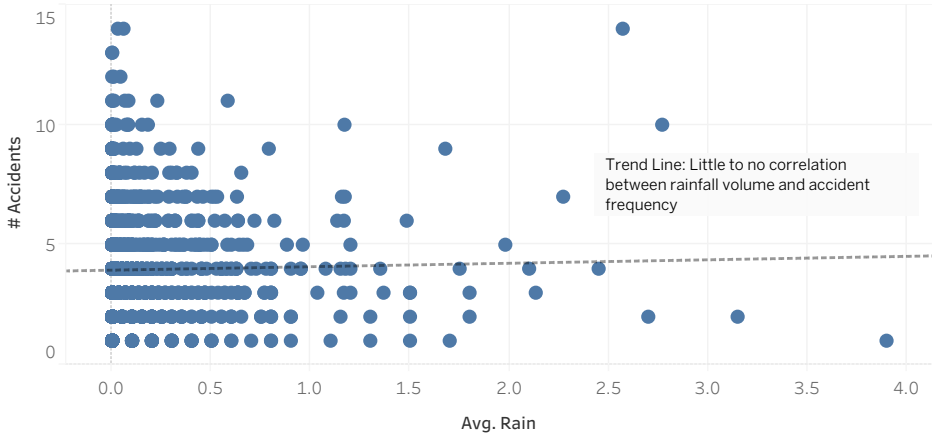
Light or no rain *may contribute more to road accidents than heavy rain, potentially due to two key behavioral factors:*

1) ***drivers may be less cautious during light drizzle,*** *underestimating its risks, and*
2) people are more likely to ***stay indoors during heavy rain*** *unless travel is essential.*

In contrast, when ***driving in heavy rain****, individuals tend to* ***reduce speed and drive more carefully****, which may mitigat..*

2019 to 2023

Daily Rainfall vs Accidents: Correlation



Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Who is Most at Risk on Leeds Roads?

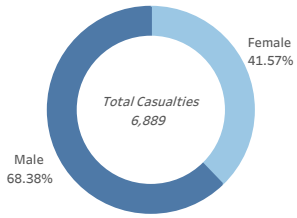
Males make up **68% of casualties**, showing that men are consistently at higher risk on Leeds roads as men drive more frequently and engage in higher-risk driving behaviours.

Passengers also appear often, esp in **female %**, highlighting the importance of **seatbelt use** and safer **in-vehicle awareness**.

Car occupants account for the majority of road casualties, but vulnerable road users (pedestrians, cyclists, motorcyclists) also form a **large minority share**, highlighting exposure risks outside vehicles.

This highly shows the need for safer streets.

2019 to 2023



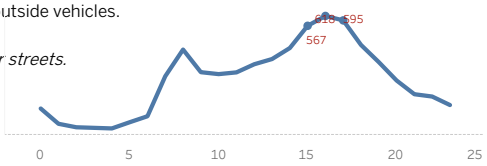
Cyclist risks: *Cyclists represent 1,114 casualties with* ***men making up 86%*** *of those affected, mostly aged 26–45. This reflect great amount of male participation in* ***sports/leisure cycling and delivery jobs*** *(food couriers)*

Pedestrian risks *: The* ***11–15 age group*** *is the most affected among pedestrians, likely due to* ***school commuting times*** *(3 - 6pm) and children walking unsupervised in busy urban areas.*

Recommendations:
~ Enforce speed limits in hotspots, esp schools
~ Partner with **delivery companies** (Deliveroo) **and cycling groups** for safer practices.
~ Expand **community-led programs** to build awareness from schools to workplaces.

Takeaway: Casualties in Leeds concentrate among men, young pedestrians, and cyclists - targeting these groups with **better roads, stricter enforcement, and awareness campaigns** can deliver the greatest safety improvements.

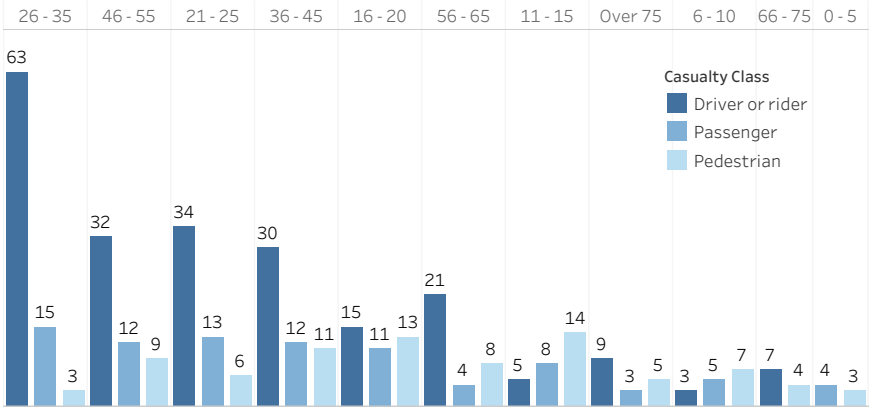
Hourly RTAs



Casualty Class
All

Casualty Type (group)	
Car occupant	3,390
Pedestrian	1,458
Cyclist	1,114
Motorcycle rider or passe..	578
Goods vehicle occupant	221
Bus or coach occupant	127
Taxi/Private hire car occu..	85
Other vehicle occupant	69
Mobility scooter rider	13
Agricultural vehicle occup..	6
Horse rider	1

Age Band Of Casualty



Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Analysis on Road Types, Junctions and Vehicles

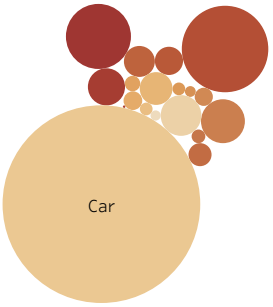
Single carriageways *account for the largest share of accidents, particularly in slight and serious cases, with* ***dual carriageways*** *following behind. This may be due to the greater prevalence of single carriageways in the UK, esp in Leeds.*

When looking at vehicles, ***cars dominate accident involvement****, followed by pedal cycles, which are more common in urban areas.*

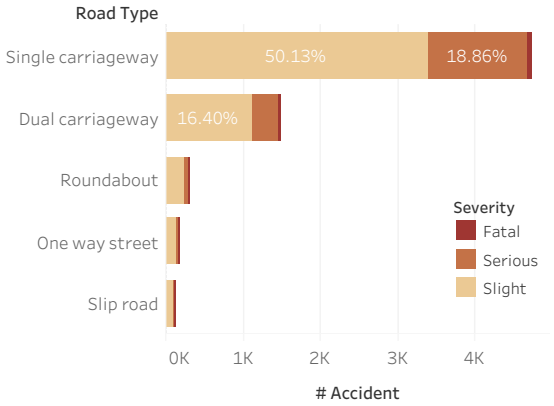
These trends highlight priority areas for infrastructure improvement and targeted safety measures such as better signage, traffic signals, and dedicated cyclist lanes.

2019 to 2023

Vehicles Involved



Accident Severity by Road Type



Junction Control Analysis

Junction Detail	Authorised person	Auto traffic signal	Give way or uncontrolled	Stop sign
		Junction Control		
Crossroads	8	423	370	8
Mini-roundabout			62	
More than 4 arms (not rou..		15	30	
Other junction	7	102	386	4
Private drive or entrance	2	2	58	
Roundabout	1	80	282	1
Slip road		25	96	
T or staggered junction	10	185	1,654	11

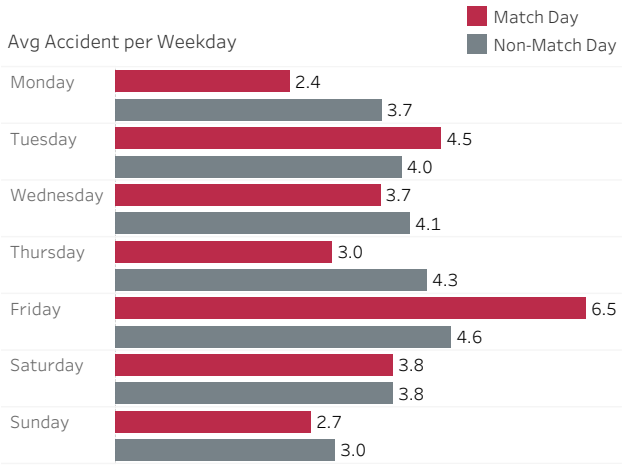
For junctions, ***'Give Way' signs or the absence of any control*** *are linked to the highest collision counts, particularly at* ***T or staggered junctions****, making these locations key priorities for safety improvements.*

Maintaining ***stop signs*** *or an* ***authorised person*** *at high-risk junctions can help reduce accident likelihood. Uncontrolled roads tend to see more collisions, but this risk can be mitigated by installing* ***auto traffic signals*** *at vulnerable spots such as T junctions, roundabouts, and slip roads.*

Interestingly, ***crossroads*** *also record a high number of accidents despite having traffic signals, possibly due to their frequent location on* ***dual carriageway roads****, which often carry higher tra..*

Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Analysis of How Leeds United Home Match Impact Accident Risks



"Map of Hotspots Around Elland Road Stadium"

The geographic view shows how accidents cluster around **Elland Road Stadium and main access routes**.

These are the **same roads where away fans arrive by coach or car** from nearby cities like Manchester, Sheffield, or Newcastle, both local residents and away fans **face parking pressure**, and **pedestrians surge** before and after matches.

The **±3 hour, 7 km threshold** captures this critical window where stadium-related activity is most intense.

Recommendations:

> Smarter **traffic control** on approach roads.

> Expand **park-and-ride & parking controls**.

> Promote **public awareness** of high-risk times/routes...

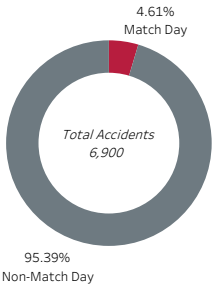
"Event Impact on Road Accident Risk"

Leeds United home matches bring **a surge of people and vehicles into the Elland Road** area. This dashboard explores how these events impact road accident risks.

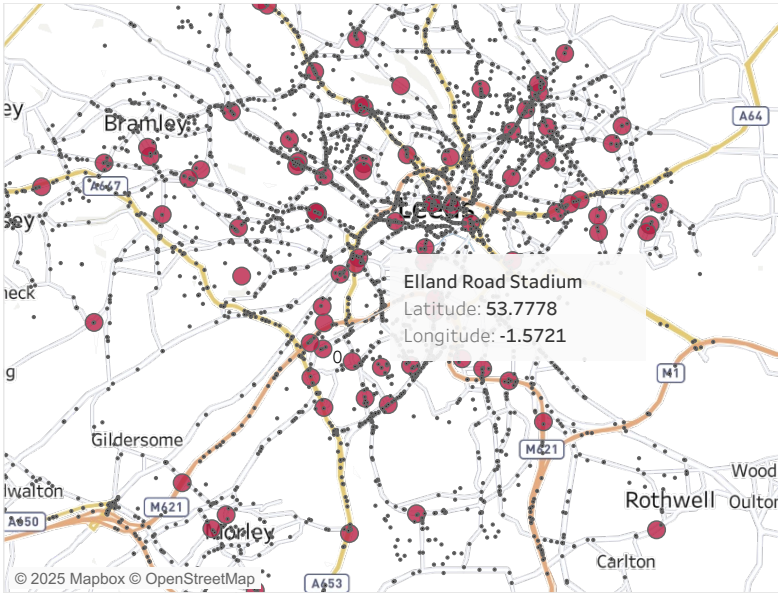
Match vs Non-Match:

Event Share of Accidents: Only **4.6%** of accidents happen on match days, but they cause a bigger traffic impact than the numbers suggest.

Friday Spike: Avg accidents are generally similar across weekdays, but **Fridays stand out with a sharp rise on match days (6.5 vs 4.6)**, suggesting evening kick-offs overlap with peak commuter traffic.



Accidents near Elland Road rise within a 7 km radius and ±3 hours of Leeds United home matches, showing potential matchday traffic impacts



Analysis of RTAs in the UK from 2019 to 2023 (Leeds-specific)

Final Wrap-Up: Road Traffic Accidents in Leeds (2019 - 2023)

Key Insights

Time & Events: Peaks at **8 AM & 3 - 6 PM** (school + commuter hours). **Friday** shows highest risk, especially on **Leeds United football match days** with **localized spikes near Elland Road:** *Away fan traffic and parking trouble*.

Weather: Glare (full sun) and **short winter daylight** raise risks with most accidents surprisingly happen on **dry/light rain days**.

Demographics: Men (68%) dominate casualties (mostly drivers). **Female passengers** & **pedestrians aged 11 to 15** are especially vulnerable. **Cyclists** (86% male), including many **delivery riders & commuters**, face high urban risk.

Roads & Vehicles: Single carriageways and **T-junctions/Give Way junctions** are most accident-prone. Cars dominate, but **cycles** also form a major share.

Recommendations

Targeted timing: Focus enforcement and safety measures at **rush hours & school zones**.

Weather safety: Promote **glare awareness** (summer), **congestion control** (winter), and safe driving on **light rain/dry days**.

Protect vulnerable groups:

Safer **cycling lanes** & delivery rider training.
School pedestrian programs for **11 to 15 aged children.**
Stronger **seatbelt checks** for passengers.

Infrastructure Upgrade: Add **signals/stop signs** at high-risk junctions and improve signage on **single carriageways**.

Event-day management: Smarter **traffic control**, **park-and-ride expansion**, and extra **pedestrian crossings** around Elland Road.