

Comprehensive Understanding of Traffic Accidents in Catalonia by Pacha Ibrahim



Introduction:

Welcome to our exploration of road challenges in Catalunya. We will understand and analyze accidents that happened from 2010-2021.

Together, we will dive into crucial factors of all accidents. We will also explore the challenges of safe driving and roads in Catalunya.

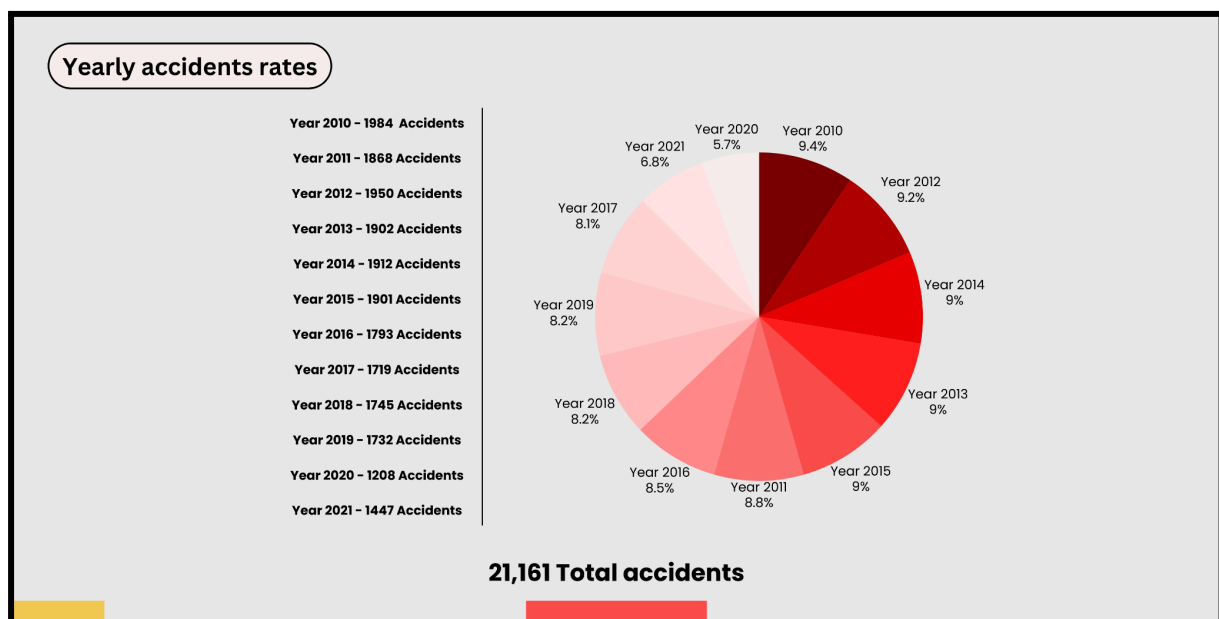
We'll navigate through the data we have analyzed. We will use it to uncover meaningful insights. This will spread awareness and ease the way for safer roads. We will focus on understanding challenges and finding solutions. We want to ensure that the insights we uncover are understandable and helpful. So, let's begin our meaningful journey:

- **General Trends:**

- What are the overall trends in traffic accidents, fatalities, and serious injuries in Catalonia from 2010-2021?

We have found trends in traffic accidents in Catalonia from 2010 to 2021. We observe significant patterns in accident counts, fatalities, and serious injuries.

- **Traffic Accident Count:**



- **The data shows** that accidents decreased by 0.79% on average from 2010 to 2015. This means there was a general trend of fewer accidents over that time.

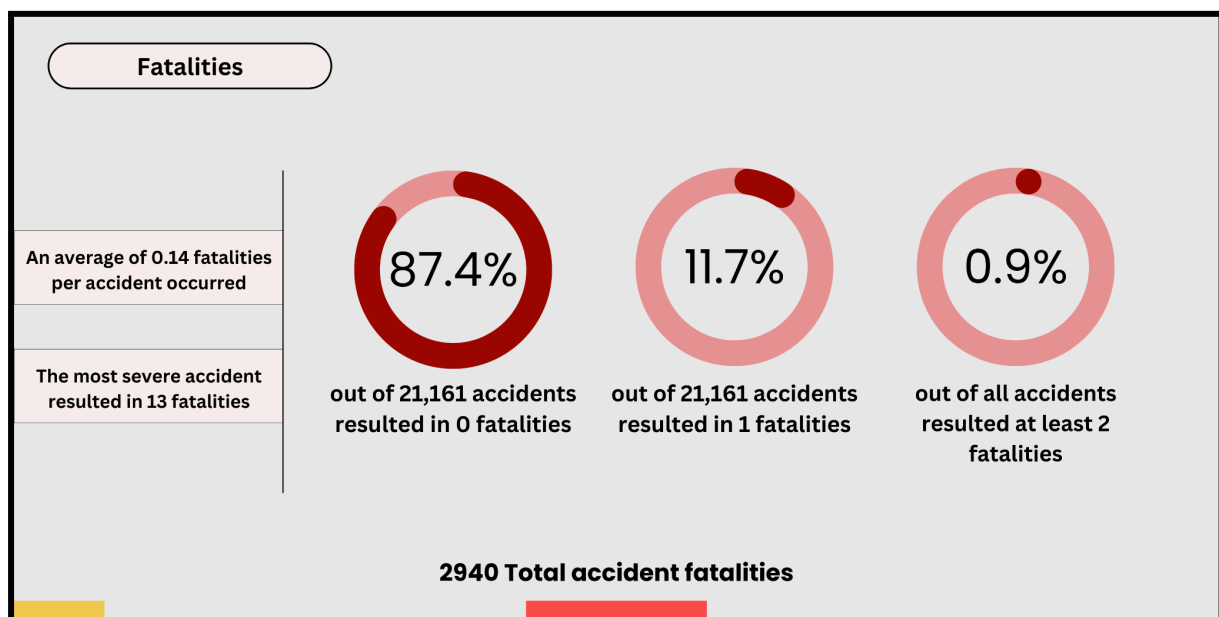
- **From 2015 to 2019**, We saw a significant improvement in road safety. On average, this period had 2.3% fewer accidents compared to the previous period, 2010 to 2015. This suggests that the steps taken to make roads safer are leading to a noticeable decrease in accidents during this later period.

- **In 2020**, there was a significant drop in accident count, going down by around 30.35%. This was because of the COVID restrictions and quarantine that affected people's movements.

During the pandemic, fewer people were on the roads. As a result, accidents decreased this year.

- **In 2021**, We saw an increase in accidents by about 20%. The lifting of some restrictions caused more movement and resulted in more accidents. But even though the numbers went up, they are still not as high as before the pandemic.

- **Fatalities:**



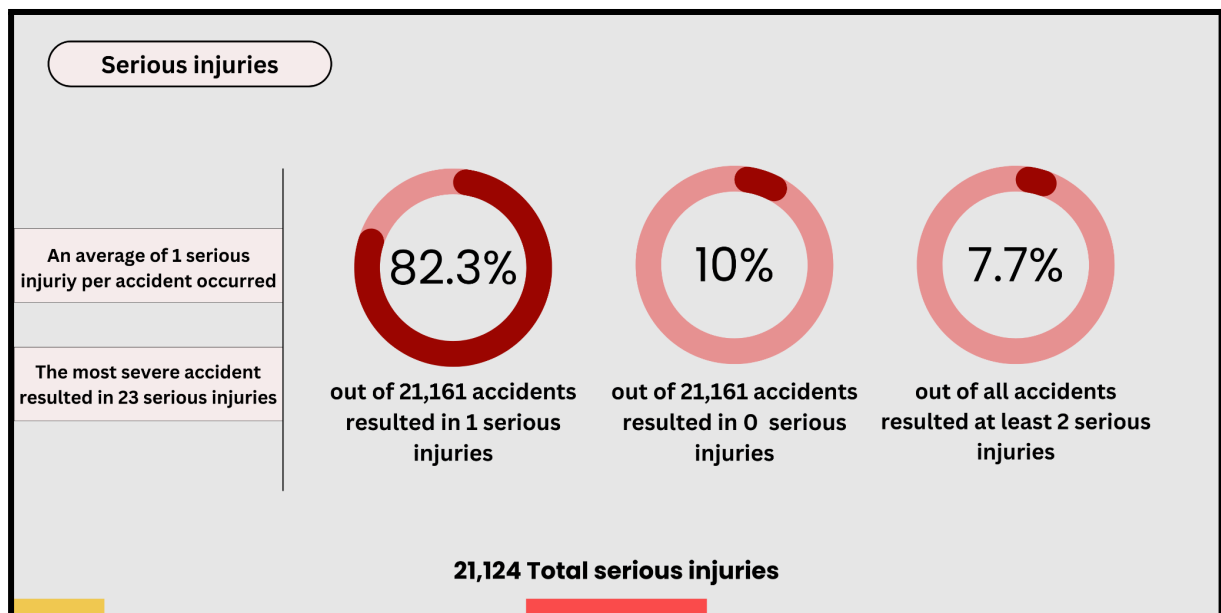
- **Between 2010 and 2015**, we saw a gradual decrease in the number of people deaths in traffic accidents. In 2010, there were 339 fatalities, but by 2015, that number had gone down to 261. This indicates ongoing efforts to make the roads safer. It led to fewer severe accidents during this time.

- **After 2015**, the number of fatalities in traffic accidents went up and down. In 2016, there was a notable decrease, with 231 deaths. But, in the following years, the numbers stayed around this range. By 2019, there was a slight increase, with 242 fatalities, showing that we still need to pay attention to road safety to keep these numbers from increasing.

- **In 2020**, A massive decrease in accident fatalities. The fatalities decreased by more than 35%, a significant decrease. This aligns with the fact that the accident count also decreased by around 30% during 2020 compared to 2019.

- **In 2021**, we noticed a roughly 20% increase in accident fatalities compared to 2020. This happened as the restrictions from COVID-19 started to ease up. this increase in fatalities also aligns with a decrease in the accident count in 2020.

- **Serious Injuries:**



- **From 2010 to 2016**, serious injuries kept changing. Sometimes it went up, sometimes, it went down. There wasn't a clear and steady trend during those years.

- **The number of serious injuries** decreased from 2007 in 2010 to 1839 in 2016. During this time, the count of serious injuries had an inconsistent pattern.

- **In 2017**, there was a significant drop in serious injuries. They went down by about 7%. So, that year had a noticeable decrease in the number of serious injuries in accidents compared to 2010 to 2016.

- **From 2018 to 2021**, things went up and down again. It wasn't a steady pattern. serious injuries count kind of bounced back a bit to the period from 2010 to 2016.

- **In 2020**, the number of serious injuries went down significantly by more than 30.5%. This happened because of the global pandemic and the rules that were in place. After that, because there were fewer accidents in general.

- **In 2021**, more serious injuries were increasing by over 22%. This suggests that things started returning slightly to how they were before the pandemic.

● **Conclusion**

- Serious injuries occur more often than deaths and light injuries. A major reason for this is the speed at which accidents happen. We found that about 68.4% of accidents occur when vehicles drive faster than 50 Km. The high speed has contributed to the higher occurrence of serious injuries and the increased severity of accidents.

- Over the whole time, 2940 total fatalities in accidents. Another 21124 people got seriously injured. About 14% of accidents resulted in someone losing their life. Nearly every accident had at least one person getting seriously injured.

- The most severe accident from 2010 to 2016 occurred in 2016. In Montsia County, on the road (AP-7), 13 people died, and 23 were seriously injured in this accident.

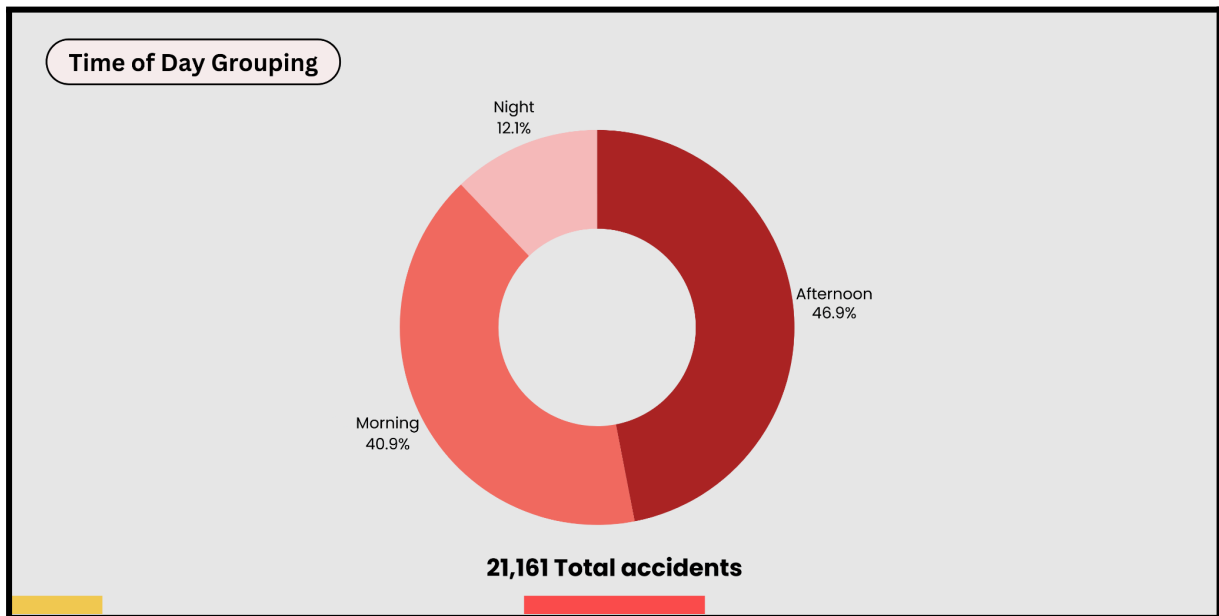
● **Accident Characteristics**

- What common characteristics (time of day, type of road, etc.) are observed in the most severe accidents?

- We have analyzed the 21 most severe accidents where the total victims ranged from 12 to 49 victims including (Fatalities, serious and light injuries).

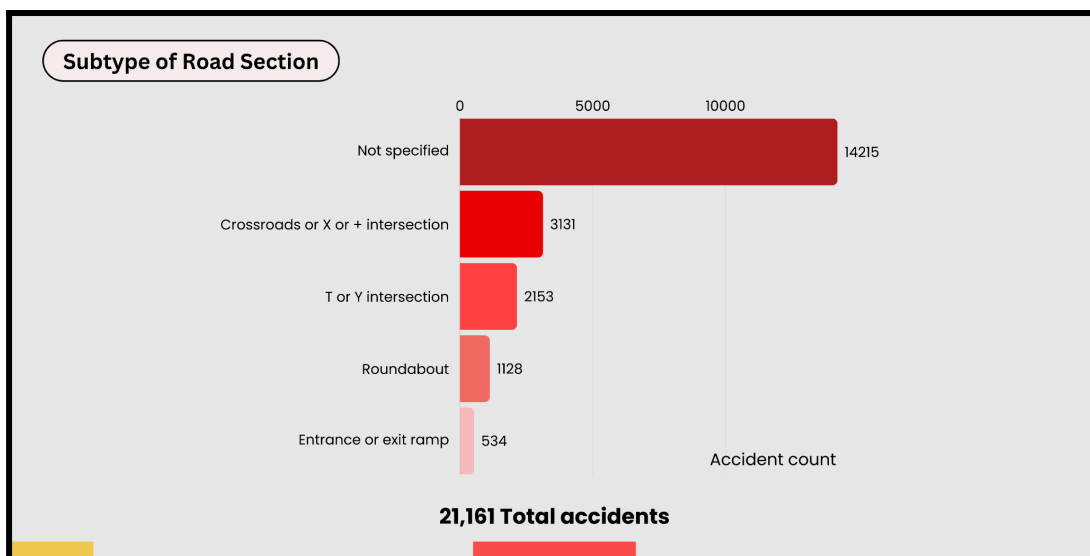
- **Time of day:**

- 47.62% of the 21 most severe accidents we have analyzed occurred in the morning.
- 38% of these accidents occurred in the afternoon.
- And 14.3% occurred at night.

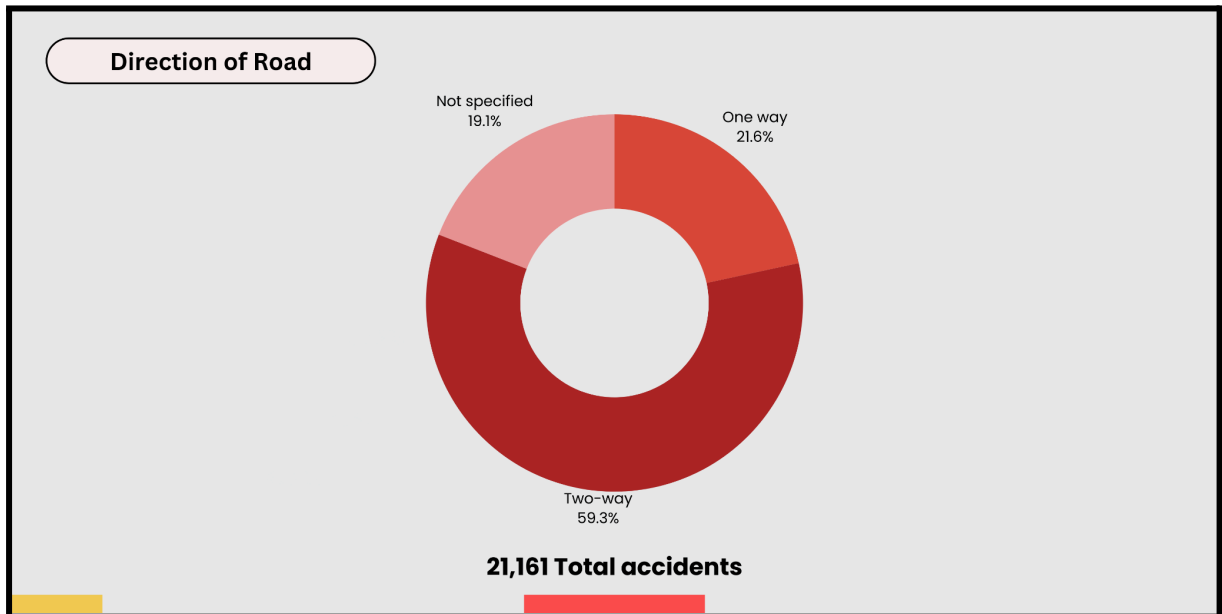


- **Type of road:**

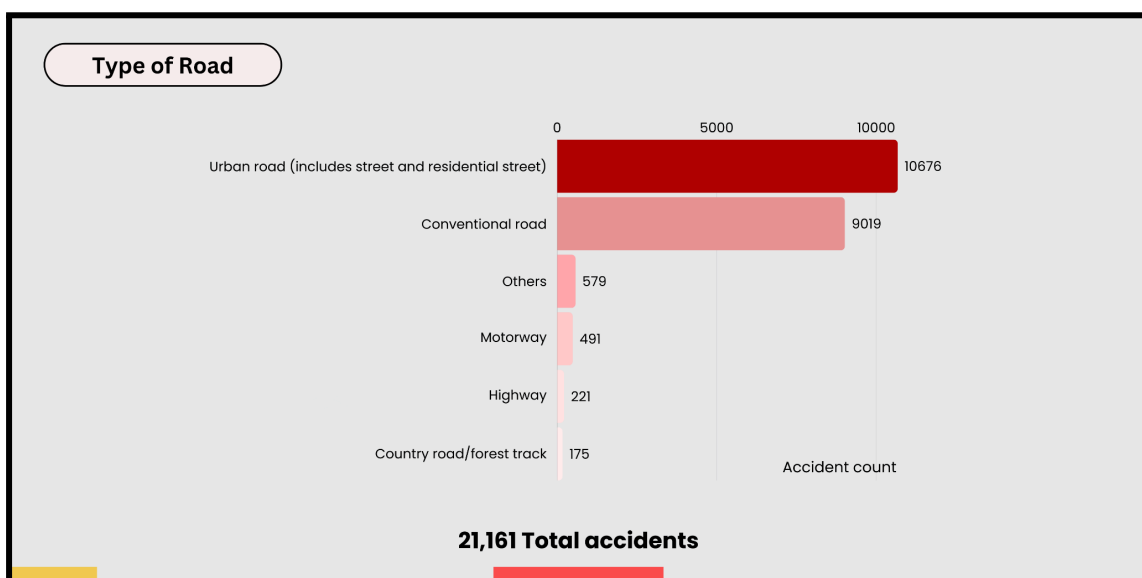
- 76.2% Of the most severe accidents occurred on specific road sections.
- While 23.8% occurred within intersections.



- 66.66% of severe accidents happened on roads with two-way traffic.
- While 19% occurred on roads with one-way traffic.
- And the rest was not specified.

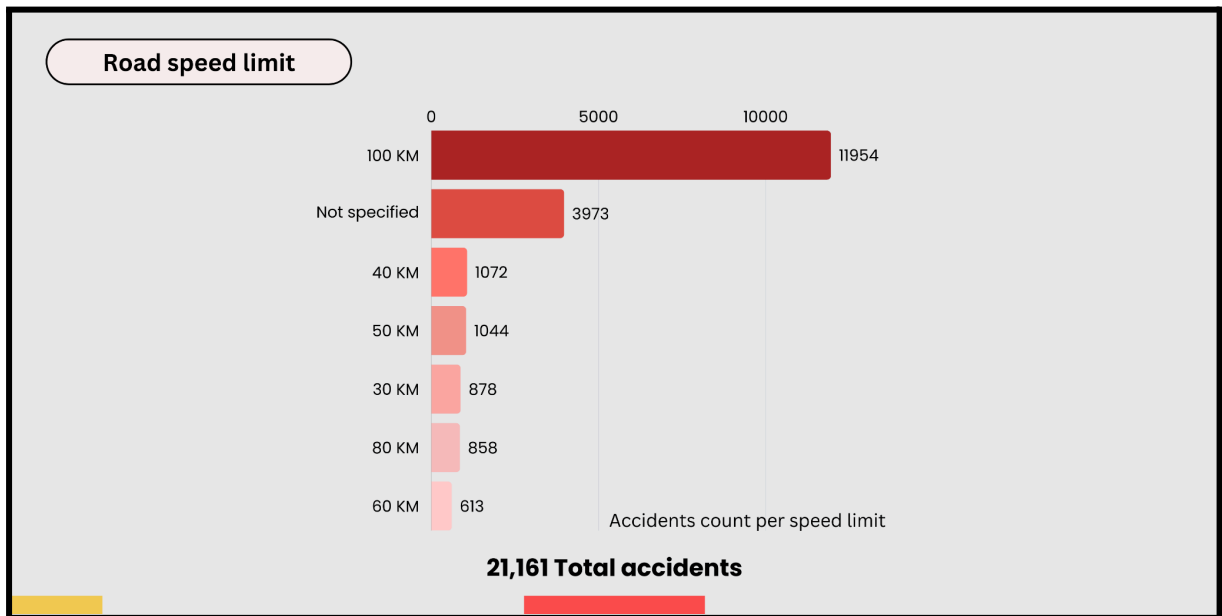


- 66.66% of severe accidents happened on conventional Roads.
- 14.3% on urban roads
- And 19% on freeways and highways.
- 85.7% of the most severe accidents occurred on roads, while 14.3% happened in urban areas.



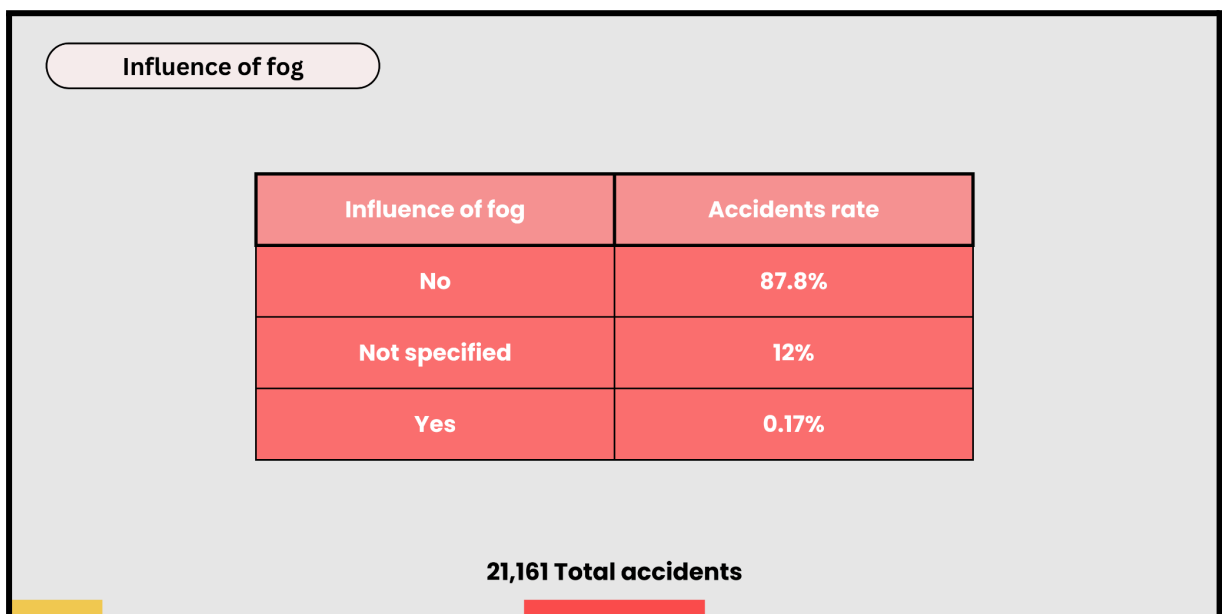
- **Road Speed Limit:**

- 66.7% of the most severe accidents occurred at road speeds of 100 km.
- and the 33.3% happen on roads with more than 40 km speed limits.



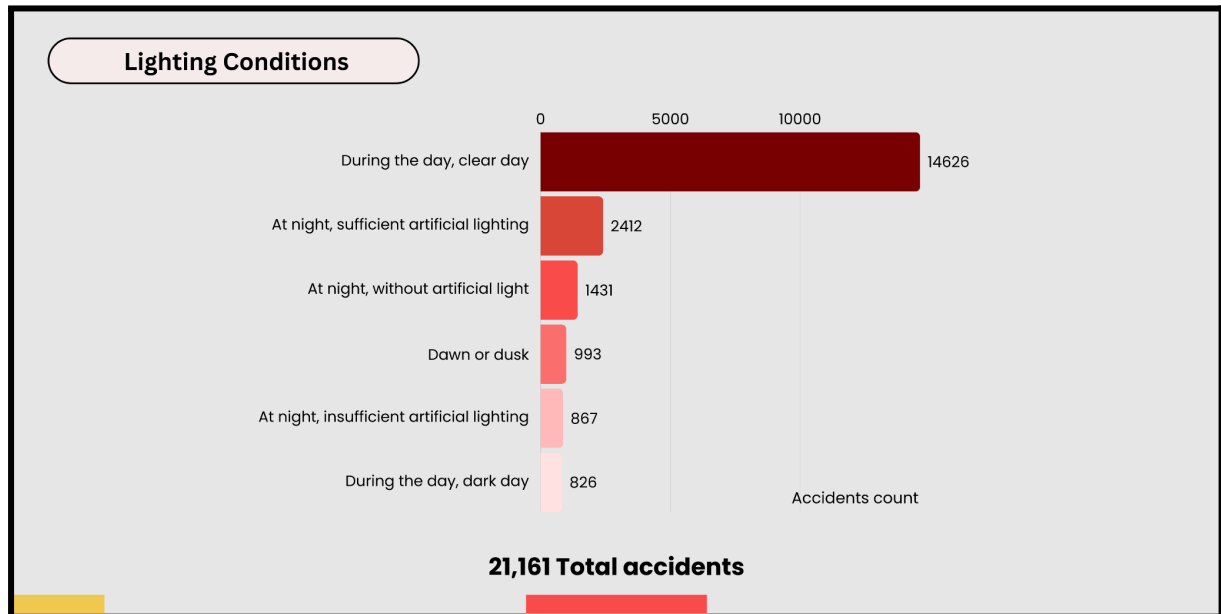
- **Influence of fog:**

- 85.7% of the most severe accidents were not affected by fog.
- And the 14.3% were either not specified or influenced by fog.



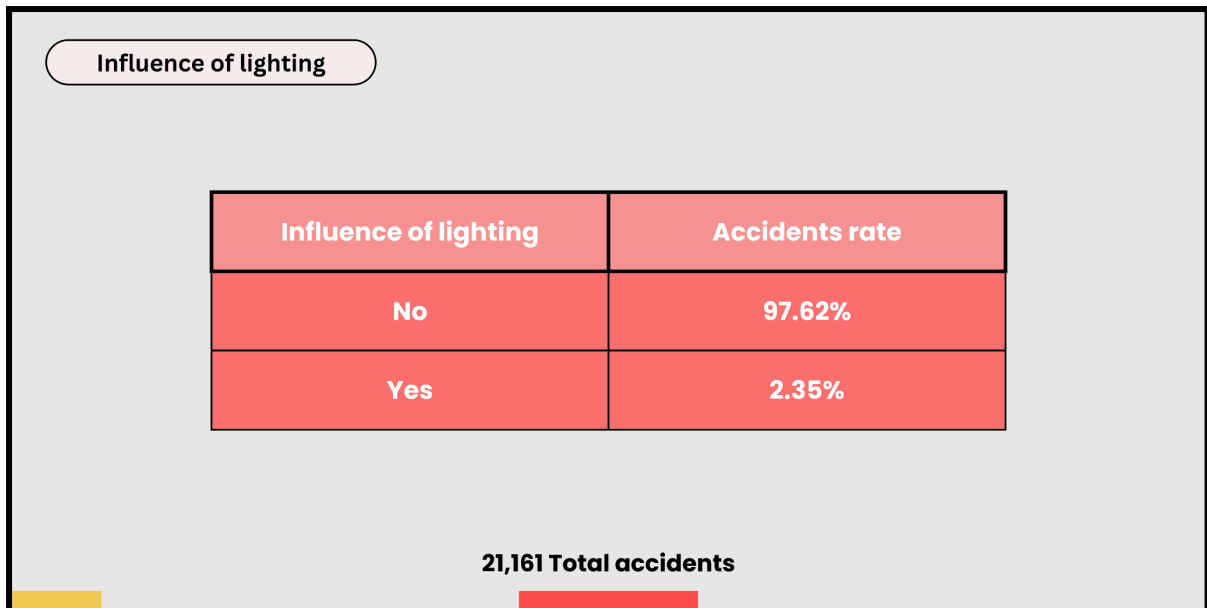
- **Influence of Lighting:**

- 90% of the most severe accidents were not affected by light.
- While 10% of accidents, lights played a crucial role.

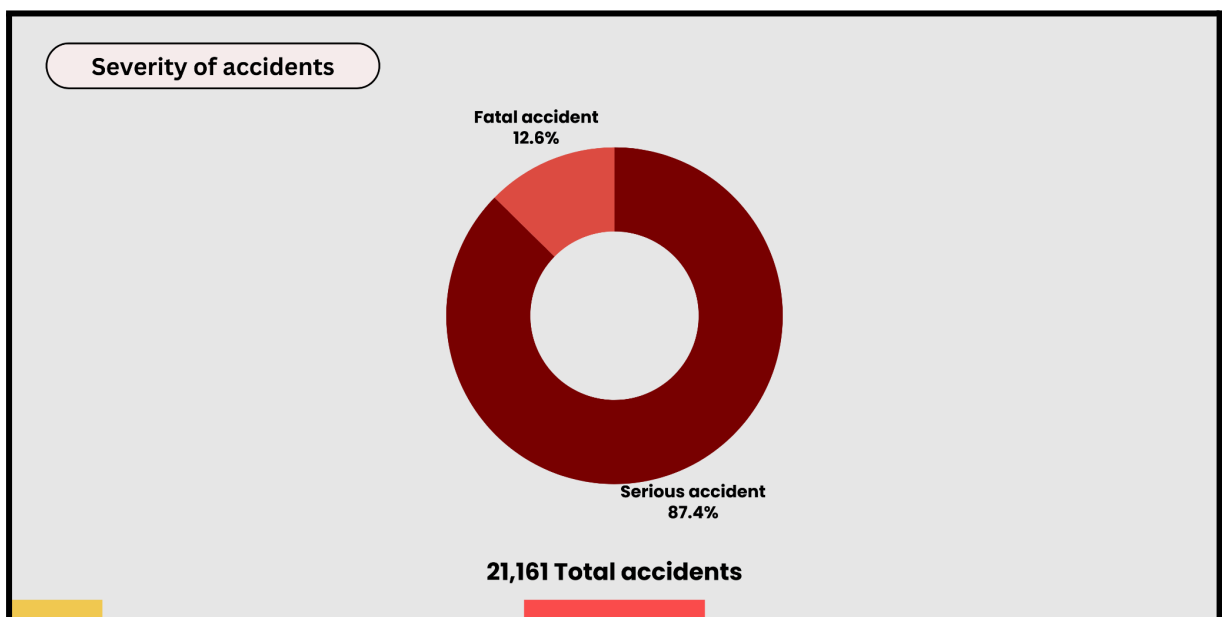


- **Conclusion**

- We found that accidents, especially severe ones, can happen at different times. They can happen in the morning, night, afternoon or evening. This highlights the need for safety measures all day long. Whether driving to work in the morning or heading home in the evening, staying safe on the road is crucial. It's like ensuring we have safety measures in place 24/7 to protect everyone on the road.
- Lighting did not seem to be a significant factor in most accidents.



- We can notice that speed is a crucial factor in the severity and number of accidents.

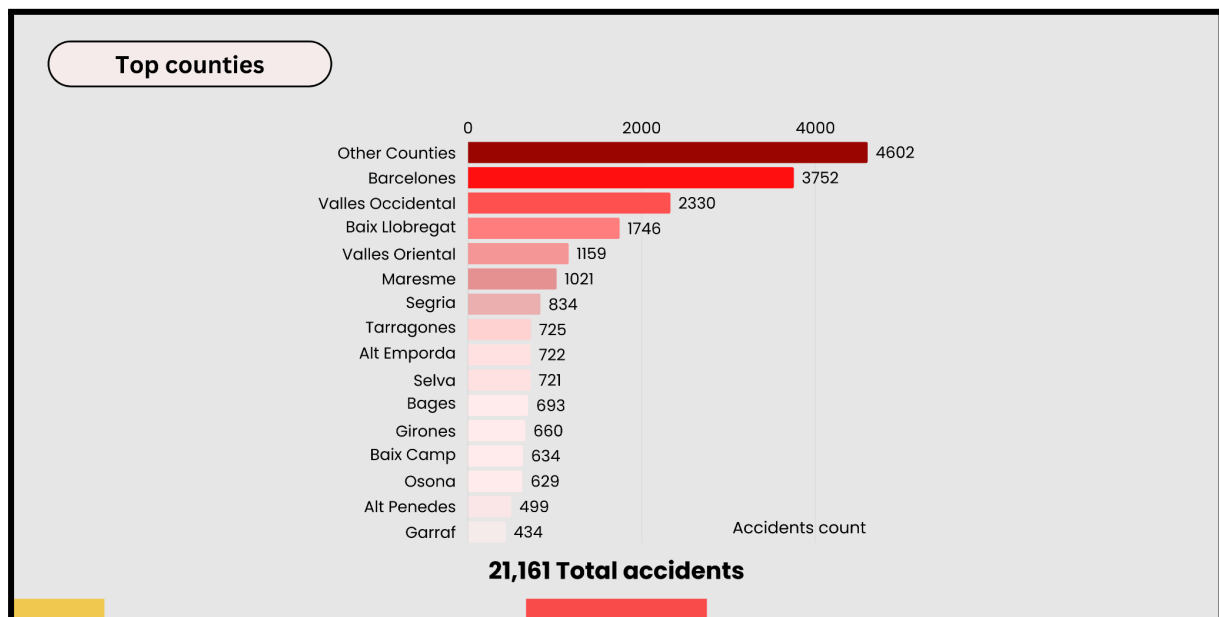


● Geographical Insights

- Which municipalities or counties in Catalonia have the highest incidence of traffic accidents? How does this correlate with population density or road network characteristics?

- **Correlation between Accidents and Population:**

- We noticed that counties with more people tend to have more traffic accidents. This is not surprising. More people mean more vehicles on the road. This is a key factor that leads to more accidents.
- Counties like Barcelones, Valles Occidental, Baix Llobregat, Valles Oriental, and Maresme. Have the most accidents at 47.3% of all accidents.



- We also found that the 5 highest counties by accident counts are the densest. They also have the highest populations.
- Barcelones has a population density of 15876.3 people/km², Valles Occidental has 1627.5 people/km², Baix Llobregat 1,729.6 people/km², and Maresme 1,172.8 people/km². according to “**Idescat**”
- Population density is a crucial factor in causing most accidents. This is because many accidents happen in rush hours.
- Counties like "Osona" and "Alt Emporda" both have the lowest rate, 5.33% of all accidents. This aligns with their lowest

population densities among all counties. Osona has 134.5 people/km², and Alt Penedes has 189.8 people/km².

● Conclusion

- accident counts vary by area. They are often linked to population and crowding. But it's not that simple. Some places might have more accidents. This is not because more people live there. It's also due to road design, traffic flow, and law enforcement.

Imagine two towns with the same number of people. One town might have wider, safer roads. It also has strict traffic rules, leading to fewer accidents.

The other town might have narrow, less safe roads and lack law enforcement. This would cause more accidents, even though the population is the same. Population and population density are key for predicting accidents. But we also need to consider factors like road quality and traffic flow. We also need to consider how well the rules are enforced. To get a full picture, we need to see these factors.

● Yearly Trends

➤ How have traffic accident patterns (frequency, severity) changed yearly from 2010 to 2021?

- **The number of accidents** went down from 2010 to 2015 by 0.79% decreasing average. So, during those years, there were fewer accidents on the road where people got into accidents. This could be seen as a positive trend for safety efforts during that period.

- **in 2016**, accidents went down by 5.7% compared to the 2015 accident count.

- **However**, after 2016 there were some small ups and downs, indicating that while the general situation on the roads

remained steady, there were still minor variations in the number of accidents from year to year.

- **From 2017 to 2019**, the situation on the roads didn't change much and went down a bit. So, during those years, the number of accidents stayed about the same or went slightly lower. In 2017 the number of accidents decreased by 4.1% compared to 2016.

- **In 2020**, the COVID-19 restrictions affected the accident count significantly, and we saw a 30% lower number of accidents.

- **The number of accidents** increased by about 20% in 2021 compared to the year before (2020).

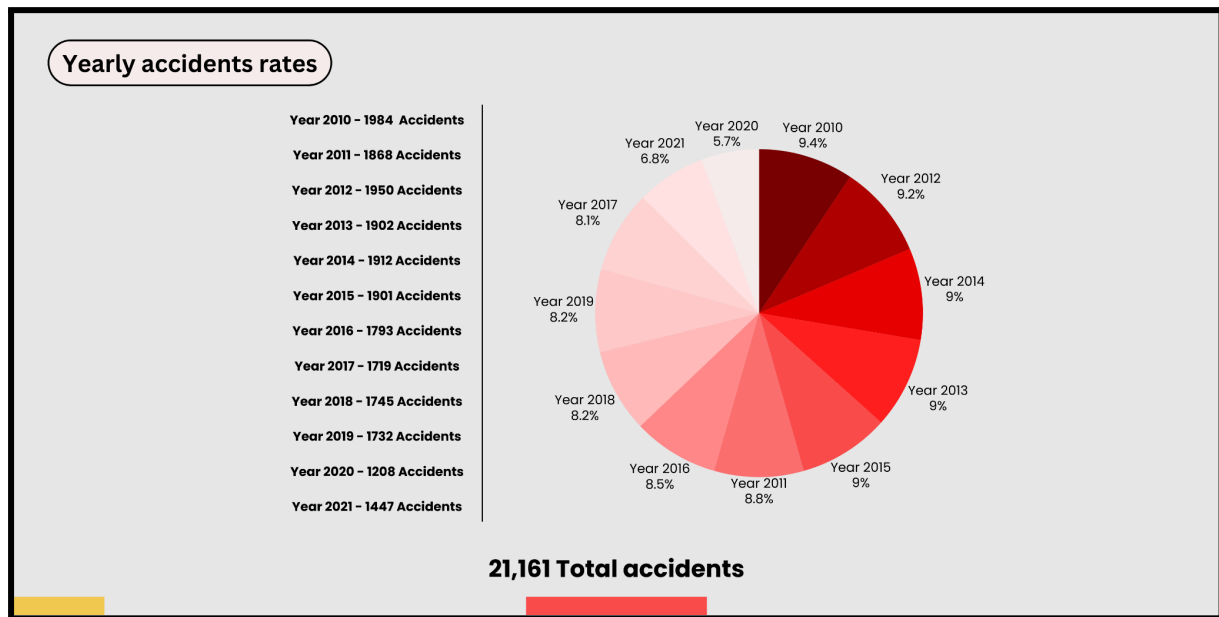
- The most significant number of accidents happened in 2010, with 1984 incidents. After that, the number of accidents gradually went down until 2021. So, over those years, the situation on the roads improved, and there were fewer accidents each year, starting after the peak in 2010.

- **Concerning severity**, We have analyzed the severity of accidents and found that there's a general trend of decrease in the severity from 2010 to 2019, with an average decrease rate of 2.13%.

- **in 2010**, we had 3229 total victims, and in 2019, it went down to 2576.

- **In 2020**, the total number of victims decreased by 34% compared to 2019 and the pre-pandemic rates due to COVID-19 restrictions.

- **In 2021**, after the situation got back to normal, the number of total victims increased by 27% but remains below the pre-pandemic rates by a decent amount.



● Conclusion

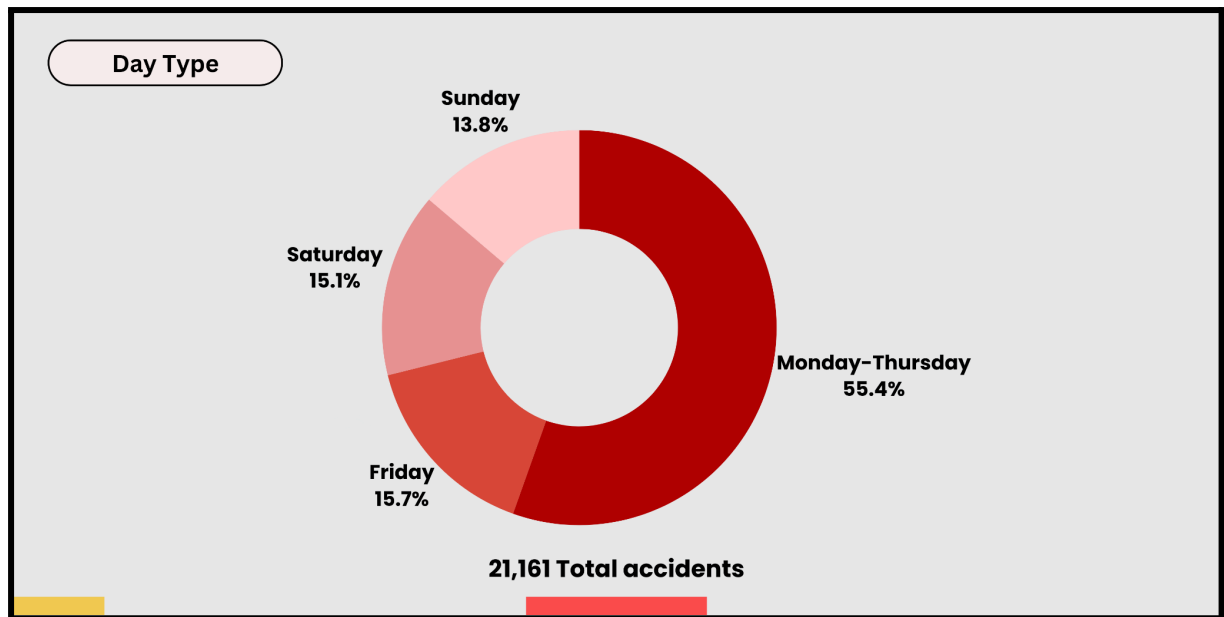
- Consider targeted safety campaigns during periods of increased accidents.
- Evaluate the effectiveness of COVID-19-related road safety restrictions for future strategies.

● Day and Time Patterns

- On what days of the week and times of day do most accidents occur? Are there notable differences between weekdays and weekends?

● Accidents by Days:

- Monday to Thursday has the highest total number of accidents, with 11,733 accidents. Which is 55.44% of total accidents.
- Friday has 3317 accidents, which is 15.67% of total accidents.
- Saturdays and Sundays have the lowest accident rate, 28.9%, compared to weekdays.

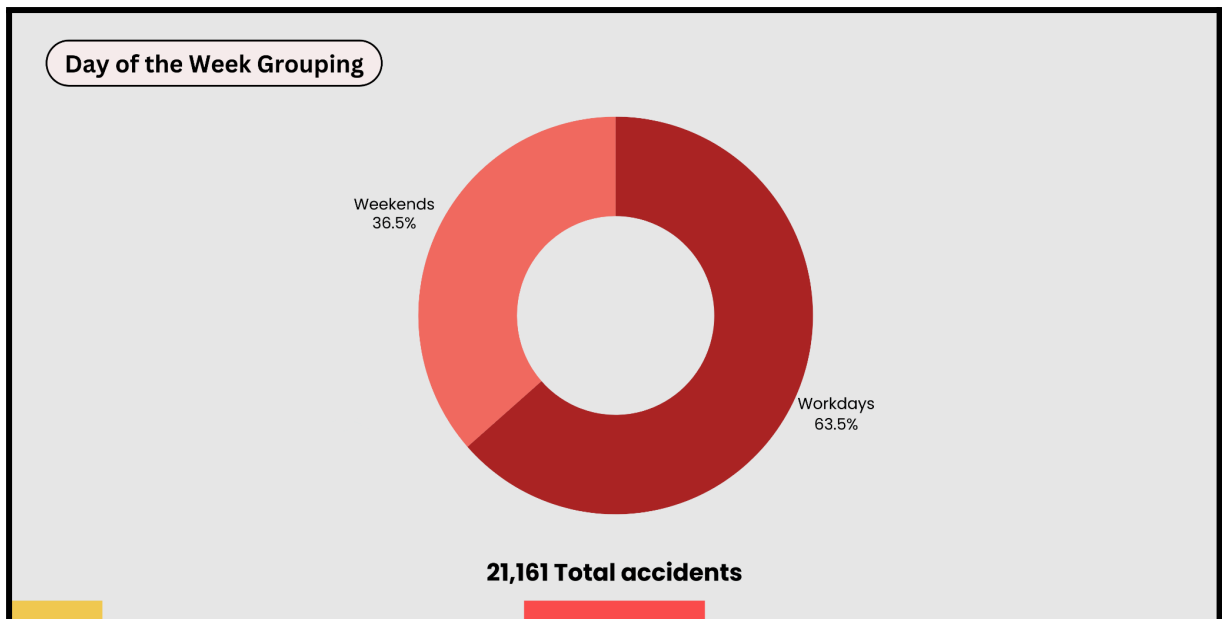


- **Weekdays vs. Weekends:**

- There is a notable difference between weekdays (Monday to Thursday) and weekends (Friday, Saturday, Sunday).

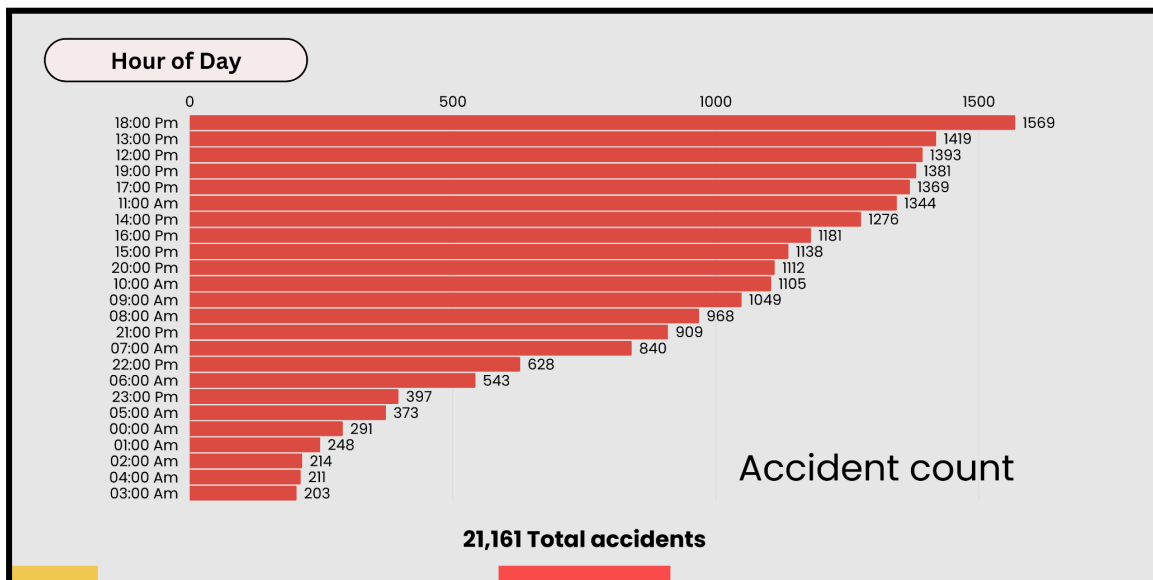
Weekdays have a higher total number of accidents compared to weekends.

- More accidents happen on weekdays. This is especially true from Monday to Thursday. The reason is that those days are when people are busier and more active. Weekdays are typically workdays. More people are out, commuting to work, running errands, and doing other activities. So, weekends have fewer accidents. People might be more relaxed, and there might be less activity.



- **Peak Hours:**

- The hour with the highest number of accidents is 18:00 with 1569 accidents. This means that 7.41% of accidents occurred at 18:00.
- Other peak hours include 13:00, 12:00, and 19:00 around 20% of accidents occur during these hours.



- **Late Hours:**

- Accident counts decrease again during the late evening and early morning hours.

- The hours between 0:00 and 5:00 have fewer accidents. Around 1540 accidents occurred in this time, which is 7.28% of the total accident number. The lowest rate was at 3:00, with only 203 accidents.

- **Morning Rush:**

- more accidents tend to happen when people are heading to work or school in the morning 21.3% of accidents occur during this period.

The number of accidents starts going up as the morning rush begins at 6:00 AM, and it reaches its highest point at 10:00 AM.

This could be because of heavy traffic. People are in a hurry to get to their destinations during the busy morning hours.

So, it's a time when we need to be especially careful on the roads.

- **Evening Rush:**

- Another peak occurs during the evening rush hours, with the highest at 19:00 to 22:00, 19% of accidents occur during these hours.

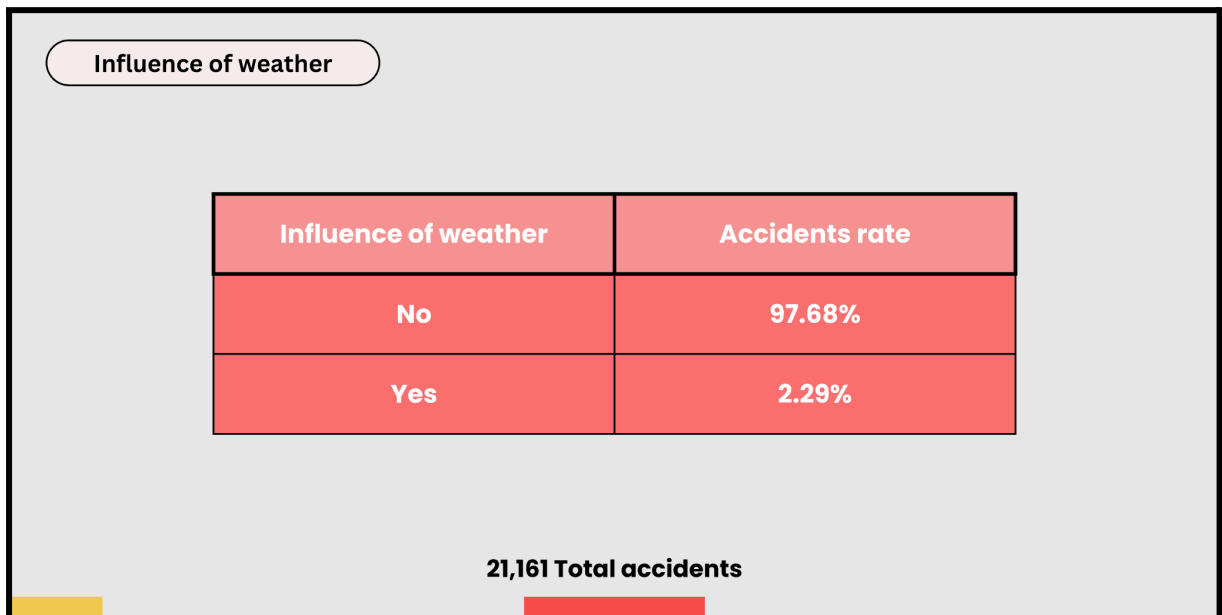
- **Conclusion**

- These patterns show that accidents are more likely to occur during peak commuting times and in the early evening. So we suggest that we put strict guidelines in place during such time and spread the word so people can watch out for themselves and others.

- **Environmental Impact:**

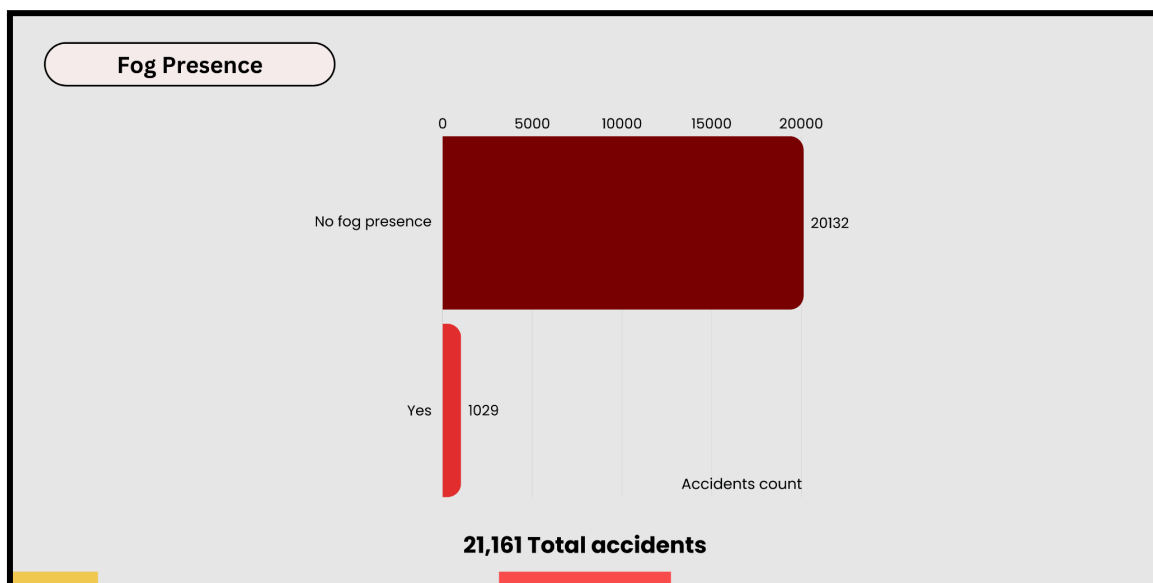
- How do different weather conditions affect the likelihood of accidents? Is there a correlation between visibility, road conditions, and accident severity?

- The influence of weather:

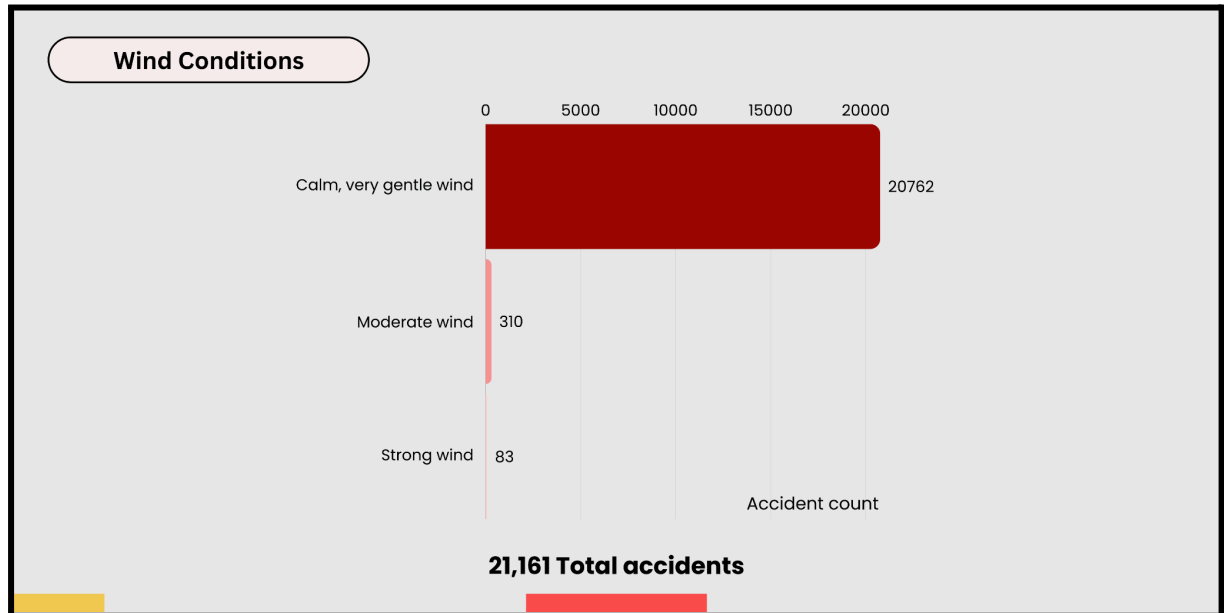


- Weather does not cause most accidents. 97.68% of accidents happened in good weather. The rest of the accidents occurred because of the weather. It was a small rate. So, weather is not a big factor in the likelihood of accidents.

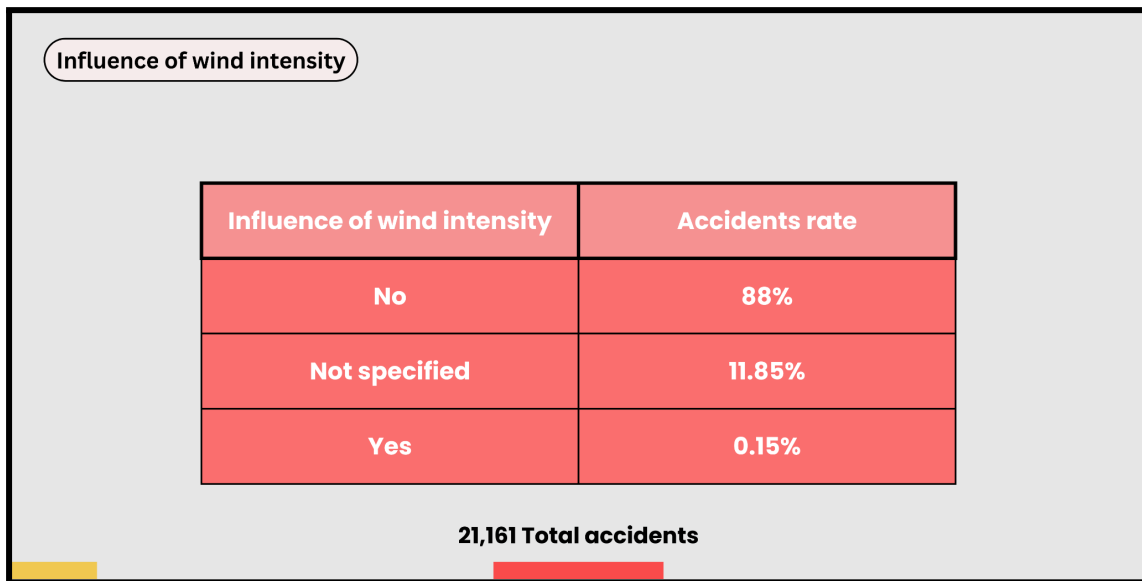
- **Most accidents occur** when there is no fog present. 95.14% of accidents happened without the fog being present. Only 4.86% of accidents occurred in the presence of fog.



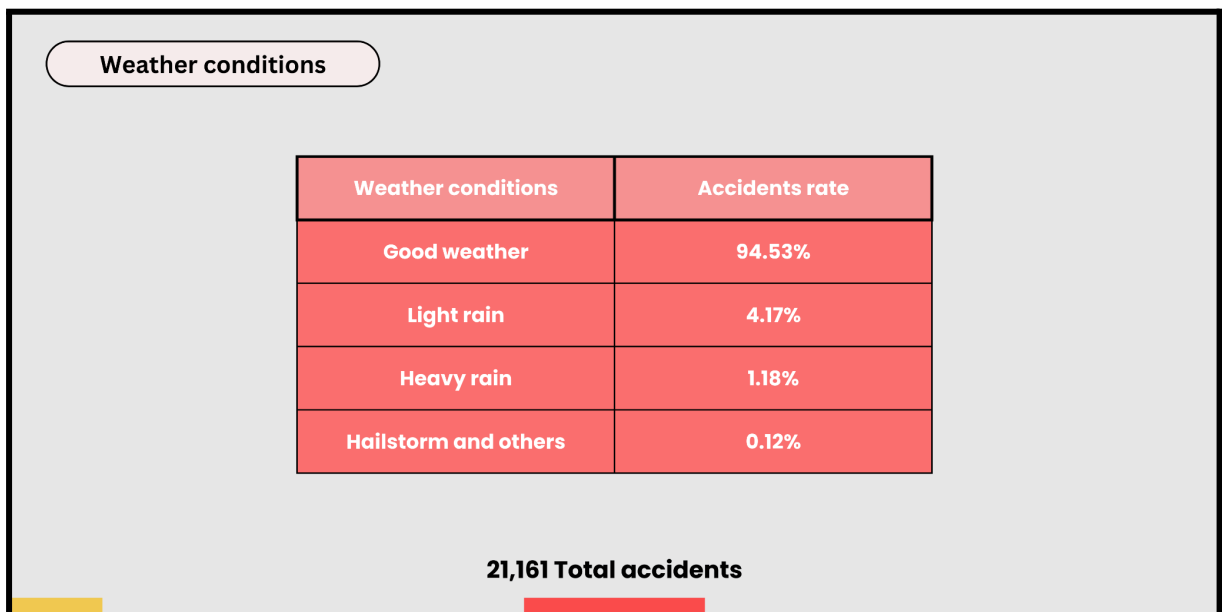
- This probably is because people comply with fog warnings.
- **Most accidents occur** during calm or very gentle wind conditions. About 98.11% happened with good or very gentle wind conditions.



- This insight means that accidents occur most probably because of human faults.
- **The majority of accidents** are not influenced by wind intensity. 88% of accidents were not influenced by wind intensity. And the data shows that the rest of the accidents were not specified.



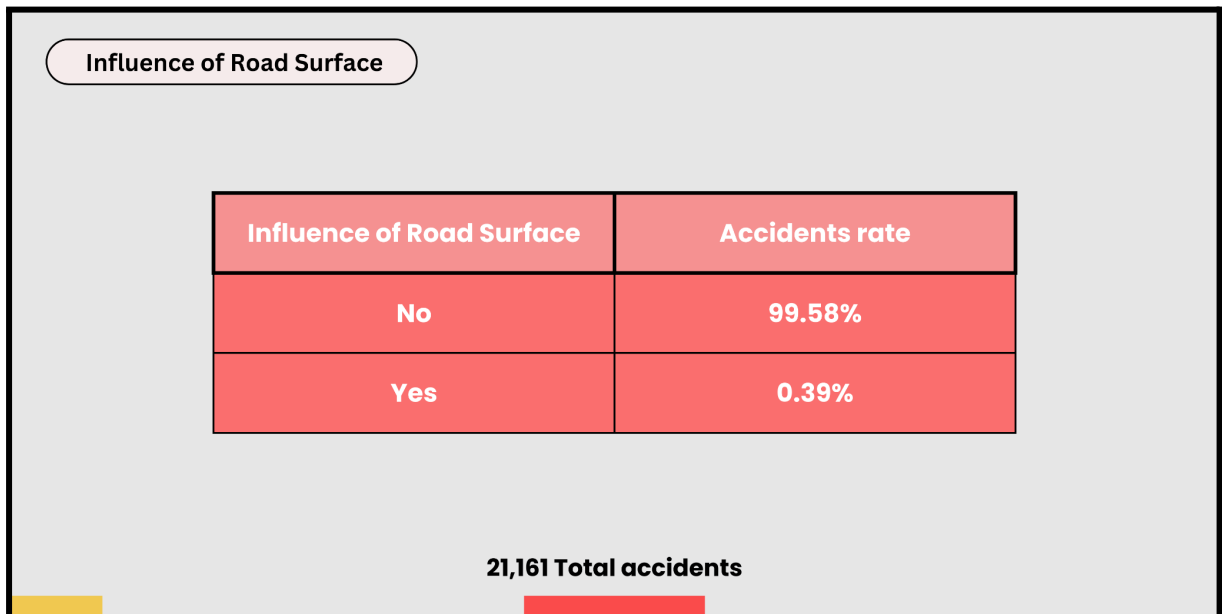
- **94.53% of accidents** occurred in good weather conditions.
- **4.17% of accidents** occurred during light rain.
- **While 1.2% occurred** in heavy rains or storm weather conditions.



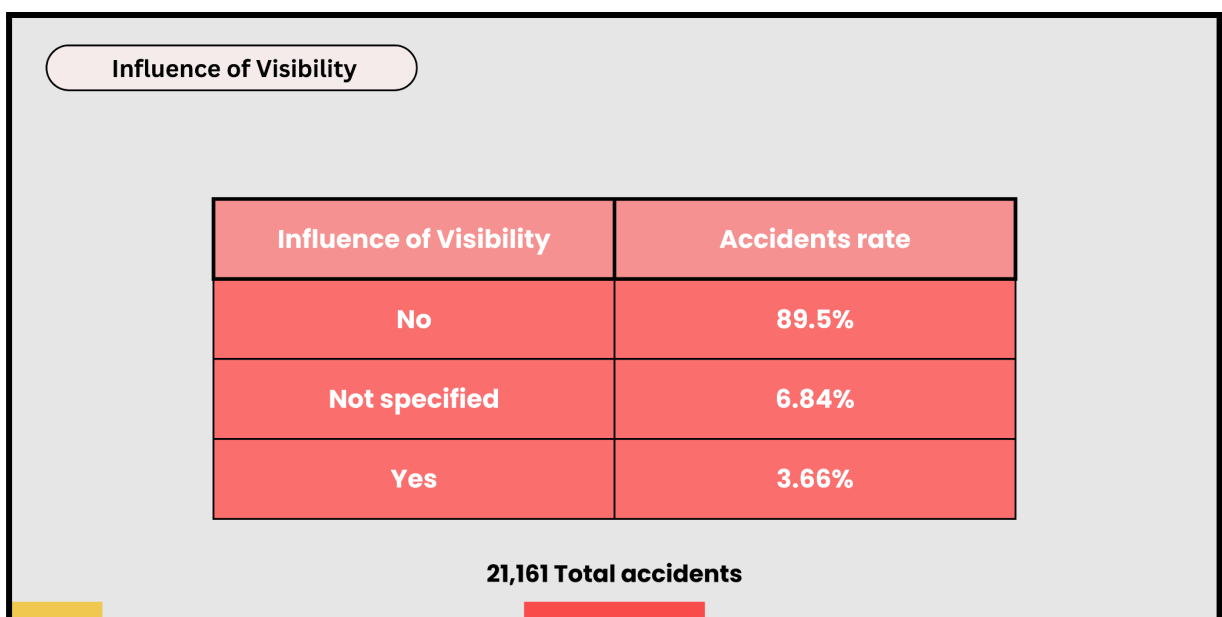
- This means that light rain or stormy weather is dangerous, and people should avoid being out or driving during such times.

- **Correlation between visibility and road conditions with severity:**

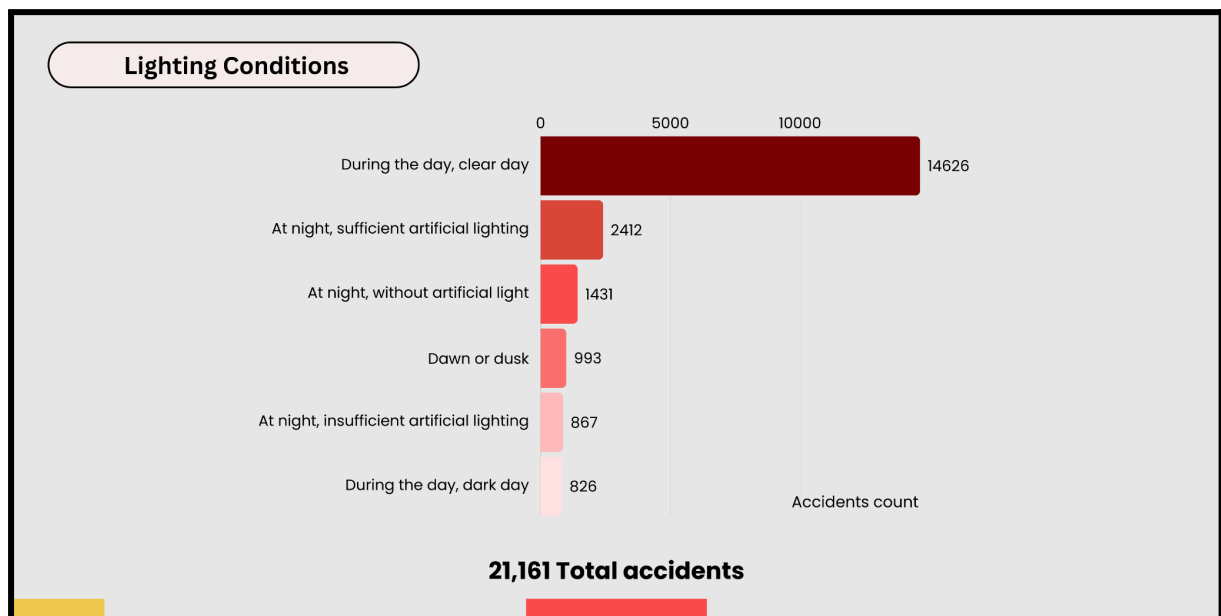
- **99.58% of accidents** are not influenced by the road surface conditions. Accidents influenced by road surface conditions are significantly low.



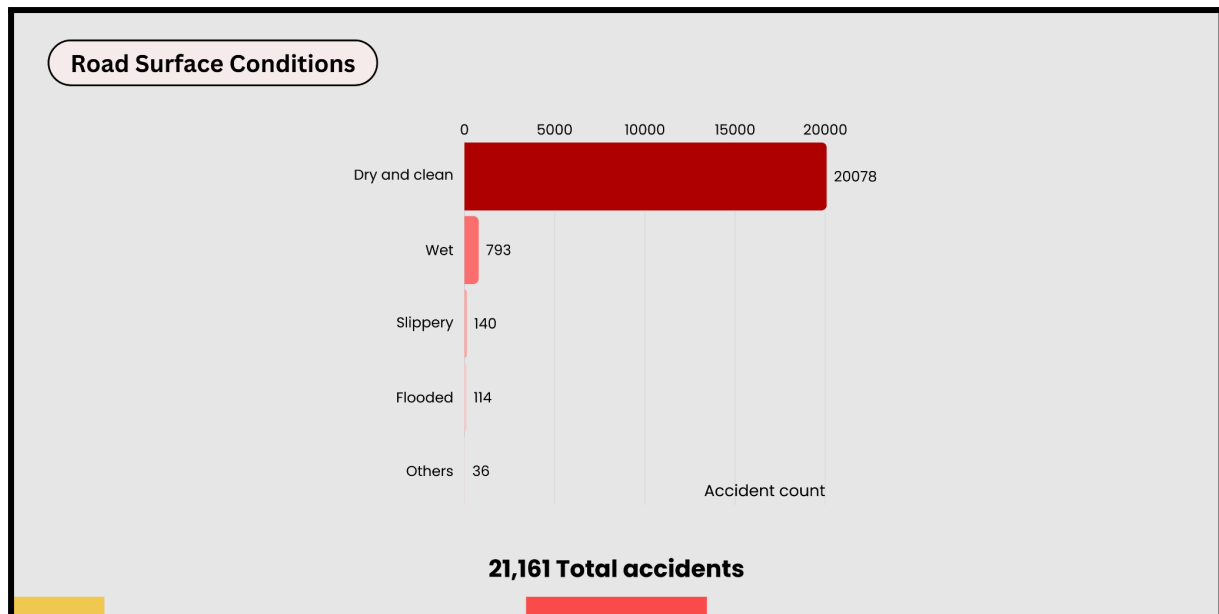
- **Visibility conditions do not** influence 89.5% of accidents. While Accidents influenced by visibility are 3.66%.



- **A significant number of accidents** (1,447 accidents) have unspecified visibility conditions.
- **80.51% of accidents** happened during the day with clear visibility and lighting, and At night, with sufficient artificial lighting.
- **19.49% of accidents occurred** during dark days, dawn/dusk, and insufficient or without artificial lighting.
- **Lighting conditions do not** influence 97.62% of accidents. While accidents influenced by insufficient lighting are 2.38% of the count.



- **As we mentioned** earlier, most accidents occur when no fog is present. 95.14% of accidents happened without the fog being present. Only 4.86% of accidents occurred in the presence of fog. This means the fog and low visibility could be factors in accidents.
- **94.9% of accidents** occur on dry and clean road surfaces. While 5.1% of accidents occur on slippery, wet, flooded, snow-covered, and icy road surfaces.



→ **Accidents during adverse conditions (slippery, wet, flooded, etc.) are less frequent but still notable.**

● Conclusion

- The data shows that visibility and road conditions have little influence on accidents. But, it's crucial to understand this doesn't mean they are unimportant. They can play a big role in accidents. Especially if people are not following safety rules. Or, if they lack awareness of certain dangers.

Imagine it like this: Even if the numbers don't show a direct correlation. But, that doesn't change the fact. Driving in poor visibility, like fog, or on slippery roads is risky. The low numbers may show that these conditions don't always cause accidents. But, when they do, the results can be severe.

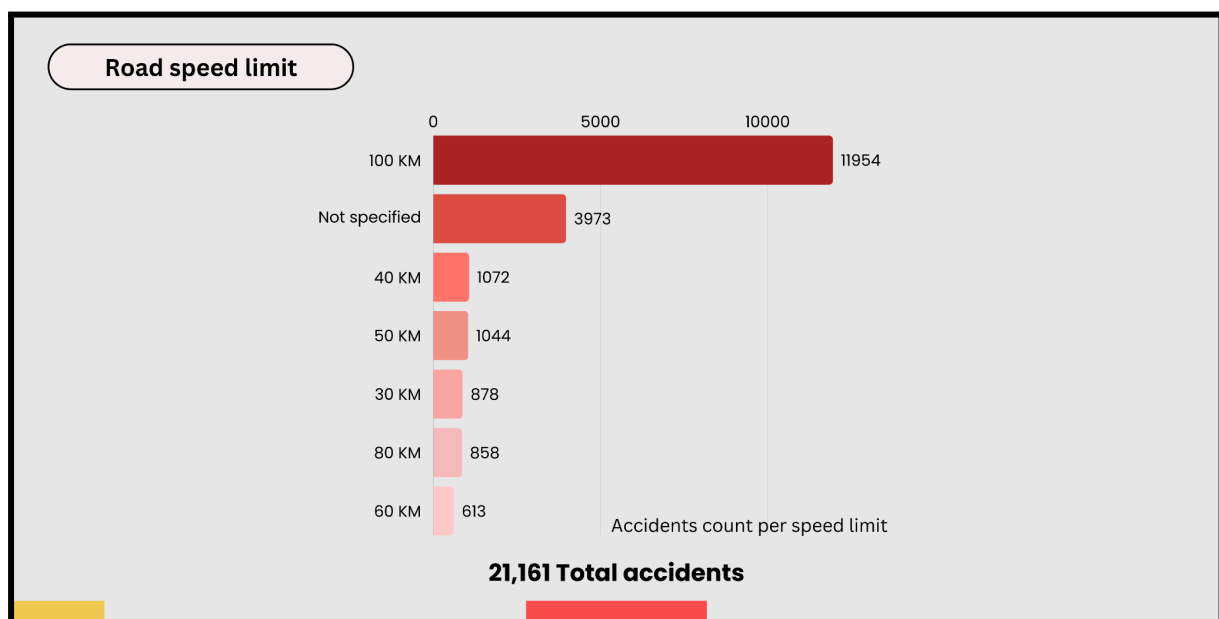
This emphasizes the importance of safety measures, awareness campaigns, and adherence to guidelines. especially during dangerous weather or road conditions. Even if the odds of an accident seem low in some conditions, the impact can be serious. This shows the need for caution and responsible driving.

● Road and Traffic Features

- What impact do road features (such as speed limits and road types) and traffic density have on the occurrence of accidents?

● Road Speed Limit impact:

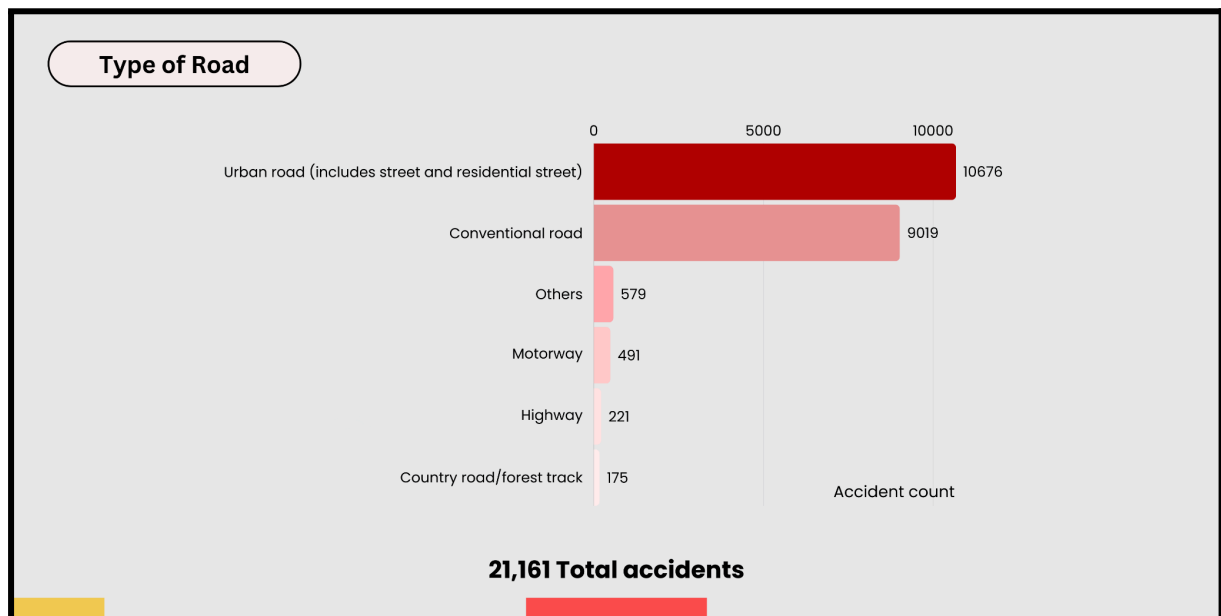
- **56.5% of accidents occur** on roads with a speed limit of 100 Km.
- **17% of accidents occur** on roads with a speed limit of higher than 40 Km to 80 Km. While 878 accidents happened on roads with a 30 Km speed limit.
- **We found that** in 18.77% of accidents road speed limits were unavailable.



● Type of Road impact:

- **50.45% of accidents** occurred on urban roads, While accidents on conventional roads significantly impacted the occurrence of accidents too 42.62% of accidents occurred on conventional roads.

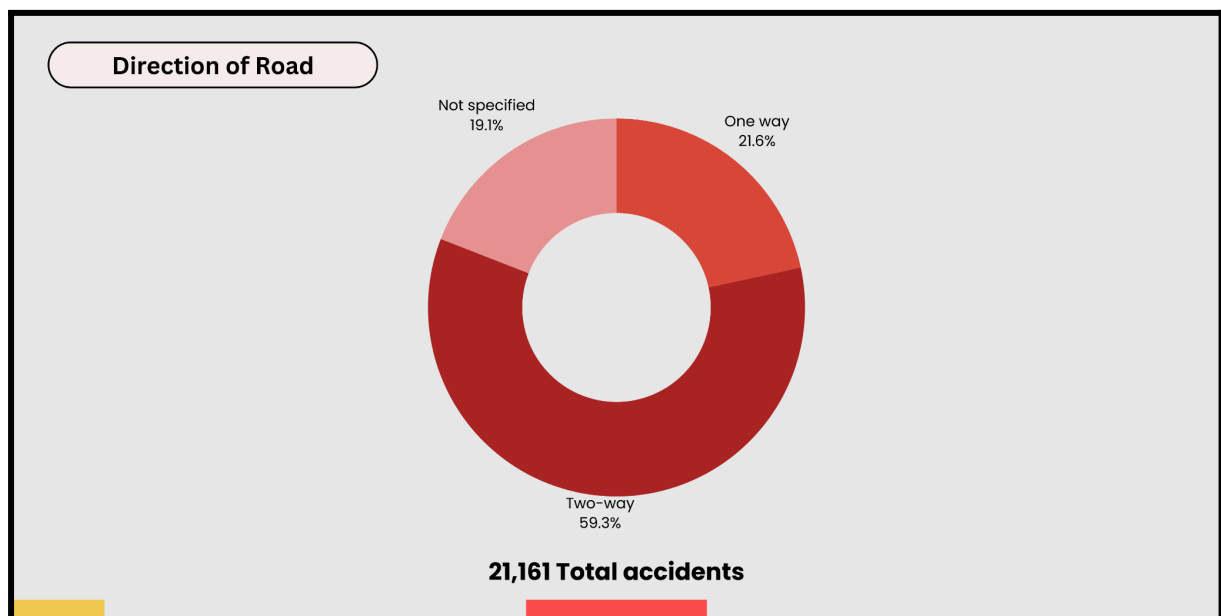
- **About 7% of accidents** occurred on Highways, motorways, Country roads/forest tracks, and other types of roads.



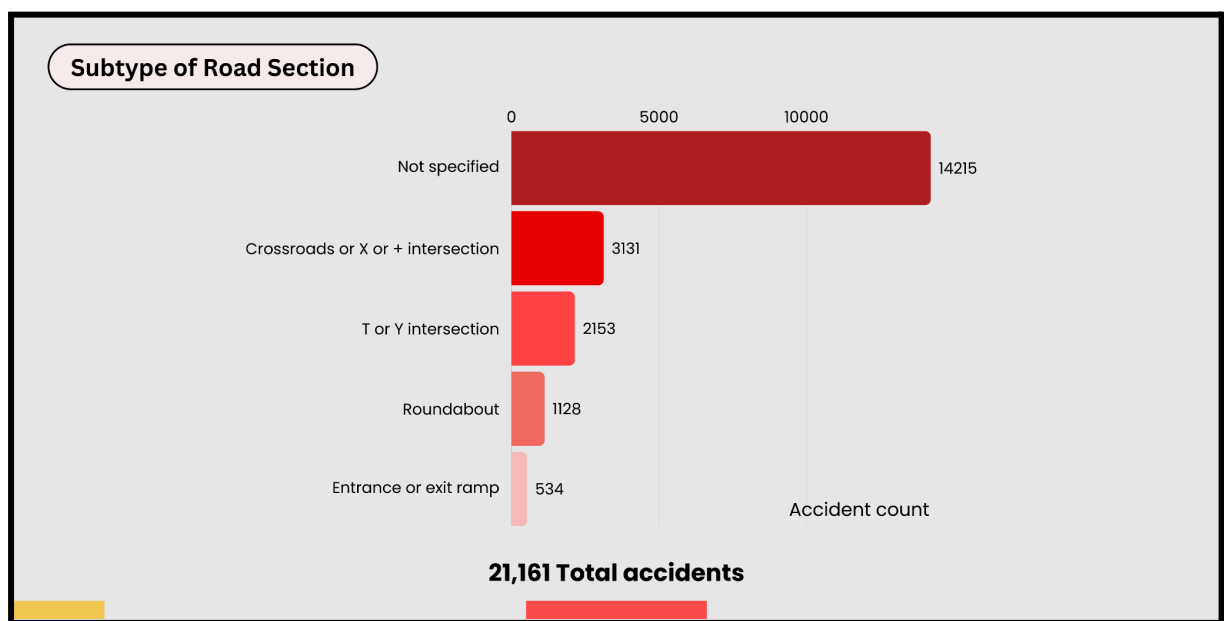
- **Direction of Road impact:**

- **Around 60% of accidents** happened on two-way roads. While 21.6% were on one-way roads.

- **A significant number** of 3,496 accidents have unspecified direction information.



- **Type of Road Section:**
- **14,212 accidents** their road section type was not specified.
- **Crossroads, X or + intersections, and T or Y intersections** were the highest road types that caused accidents, accounting for about 25% of accidents on these types of roads.
- **About 8% of accidents** occur on roundabouts and entrance or exit ramp types of roads.



● Conclusion

- The data clearly shows that road type and speed limits are significant. They play a big role in the number of accidents. We can share this information with people. We can encourage them to be cautious, drive safely, and follow the rules.

This can make a big difference in reducing accidents. It's like giving everyone a heads-up. It tells them which roads and speeds have more accidents. So they can take extra care in those situations.

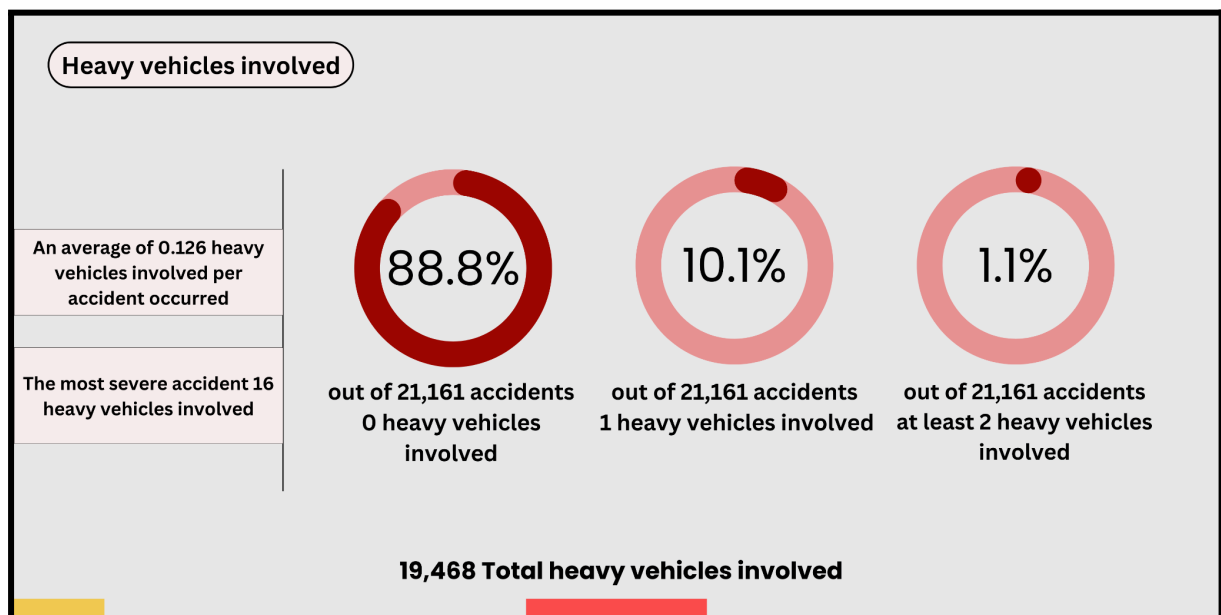
Driving fast when it's not needed is like taking an unnecessary risk. It's not a good idea for anyone on the road. Saving a few

minutes is not worth the potential cost to our lives or the lives of others. Even when we have to drive fast, it's crucial to stay focused and follow safety guidelines. Think of it as making choices that prioritize safety over small time-savings. It's not just about getting somewhere quickly; it's about getting there safely for ourselves and everyone else on the road.

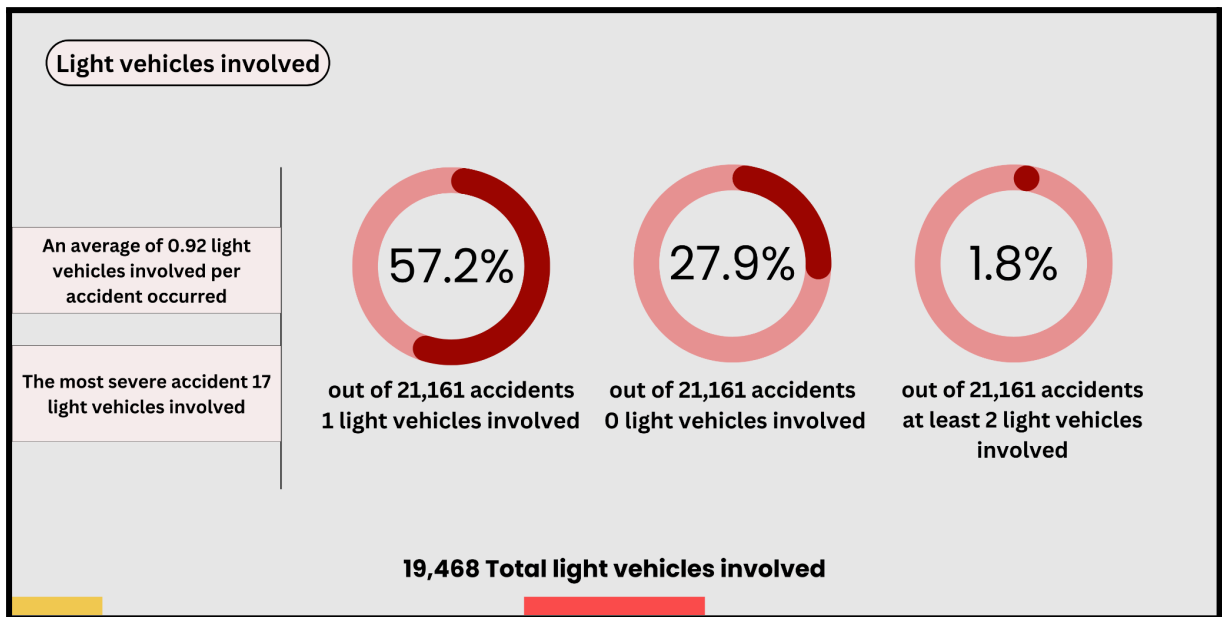
- **Vehicle Types and Accident Severity:**

- Does the involvement of specific types of vehicles (like heavy trucks and motorcycles) correlate with more severe accidents?

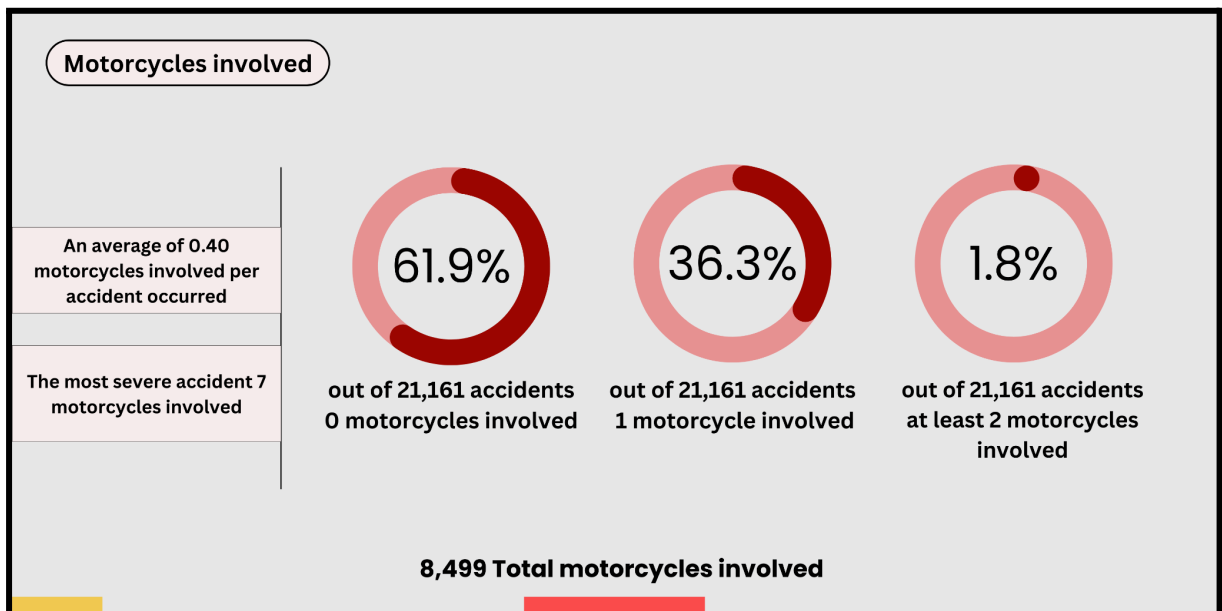
- **After analyzing all** severe accidents with more than 10 total victims, The data shows that at least 64.1% of these severe accidents had at least one heavy vehicle, and the more heavy vehicles we got, the more severe results will be found.



- **Light vehicles were** in at least 84.6% of the most severe accidents.



- **Motorcycles were found** in around 5% of the most severe accidents, whereas other vehicles like mopeds or bicycles were not found at all in these severe accidents. That means that there's no correlation between these vehicles and the severity of accidents.

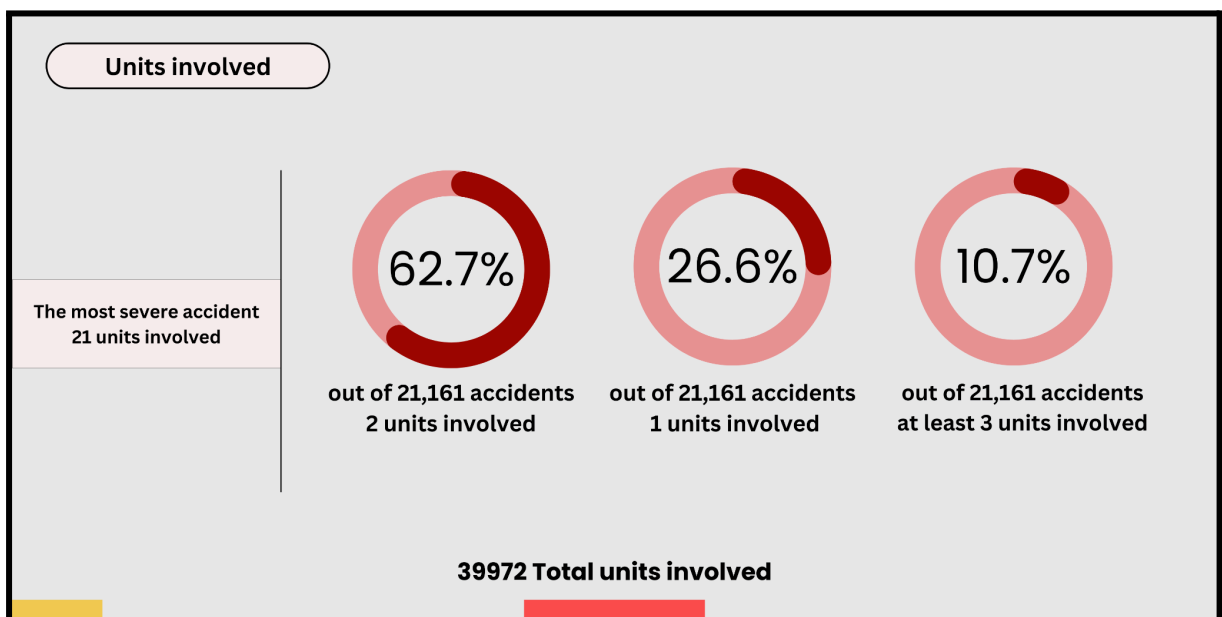


• Conclusion:

- The data clearly shows a strong connection between accidents involving heavy vehicles and the severity of the outcomes, like serious injuries and fatalities.

To tackle this issue, it's a good idea to create dedicated sections for heavy vehicles on the roads where they can travel at moderate speeds. This can help manage their impact and reduce the chances of severe accidents. Additionally, educating heavy vehicle drivers about safety guidelines and focusing strongly on the road can make a significant difference.

The advice for drivers of light vehicles is to steer clear of heavy vehicles and maintain a safe distance.

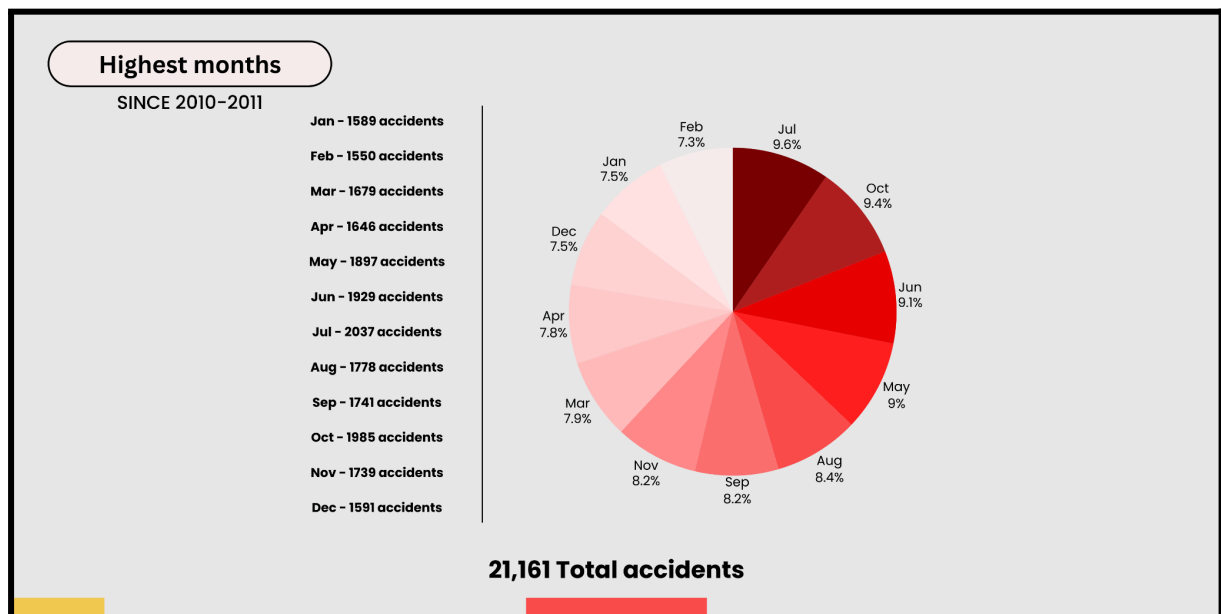


● Temporal Clustering:

- Are there specific periods (months, years) where accident patterns cluster significantly? What might be the causes for these clusters?

● Months cluster:

- **July has the highest accident count** with 2037 accidents from 2010 to 2021 period, followed by October, June, and May.
- **February, January, and December** have comparatively lower accident counts.
- **44.33% of accidents occur** from May to September
- **30.55% of accidents occur** from January to April
- **25.12% of accidents occur** from Oct to Dec



- **Years Cluster:**

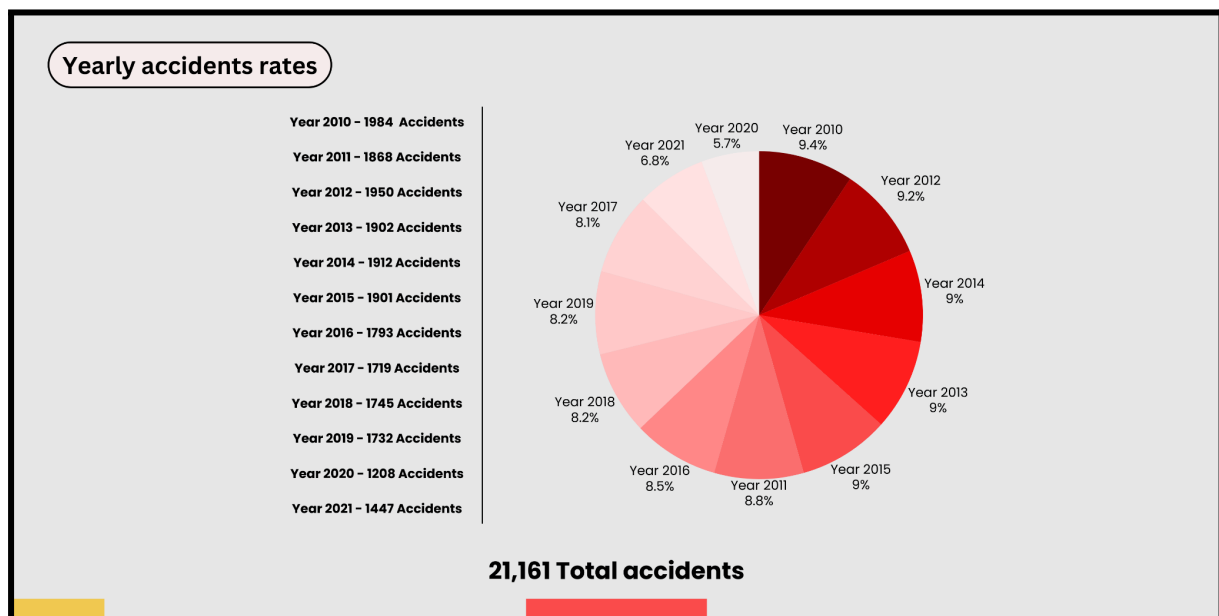
- **The year 2010** has the highest accidents count, with 1984 accidents, followed by 2012, 2014 and 2013.

- **54.42% of accidents occurred** from 2010 to 2015.

→ **We have found that July 2010 has the highest accident count with 221 accidents which is the highest month of all months in the entire period.**

- **We are likely** to see that the reasons for these clusters are holidays and events Accidents may rise during certain months as the highest months are May, June, and July when people go for holidays or events due to increased travel.

- **And the cluster** in the October months because of the start of the autumn semester when students start studying.



- **The high number of accidents** in July 2010 can be attributed to the excitement and celebrations around the FIFA World Cup.

Spain won the competition in July. During such events, people tend to travel and gather to watch matches. July has 11.14% of all accidents occurred in 2010.

- **Conclusion:**

- As we can see, increased road activity likely contributed to a higher accident count for months and years in general. It's a reminder that big events and celebrations can change traffic patterns. It's crucial to be extra careful then to keep everyone safe on the roads.

It's good to have strict rules during busy months with events and holidays to keep everyone safe. These rules can help prevent more accidents and ensure the safety of everyone on the roads. This is crucial. On average, all accidents involve at least one serious injury.

So, clear and strict guidelines at these times reduce the occurrence of accidents. They also ensure everyone gets to their destinations safely. It's like taking extra steps. We do it when we know there's a higher chance of traffic and risks.

- **Time-Series Forecasting:**

- Based on past trends, create a model to forecast the number of accidents, fatalities, or serious injuries for the upcoming year.

- **What could occur in 2024?**

Based on our ARIMA model results regarding:

- **Accident count forecasting:**

- **The results suggest that** 1536 to 1673 accidents may occur in 2024.

- **The accuracy rate is usually within $\pm 18.35\%$.** Imagine you're making predictions. On average, your guesses are about 18.35% off or more from the actual results. It's like estimating

the number of candies in a jar – you might be slightly off or more, but not too far.

- **Mean Absolute Error (MAE) is 231**

→ **MAE (Mean Absolute Error)** is a common measure of forecast error in time series analysis. It is the mean of the absolute value of the difference between predictions and actuals. This helps you understand the average size of prediction errors without considering if they are above or below actuals.

- **Fatalities forecasting:**

The forecasting model shows that 242 to 292 fatalities might result from accidents in 2024 according to the data.

- **The accuracy rate is** usually within $\pm 19.97\%$

- **Mean Absolute Error (MAE)** is 33.

- **Serious injuries forecasting:**

The forecasting model shows that 1518 to 1682 serious injuries might result from accidents in 2024 according to the data.

- **The accuracy rate is** usually within $\pm 21.53\%$

- **Mean Absolute Error (MAE)** is 272.

- **Forecasting Model:**

- We've created a predictive model using the ARIMA method. It forecasts accident counts, fatalities, and serious injuries. This model looks at patterns in past accident data.

It provides insights into future accident counts, fatalities, and serious injuries. It's like having a tool that learns from the past. It uses that to give us a heads-up on what to expect for road safety. Analyzing historical data will help us expect and

understand road risks. It will help us take preventive steps and improve safety.

- Type of Model:

Our forecasting tool is like a smart assistant using ARIMA. This method is great at understanding and predicting change over time. It's perfect for situations like road accidents and their results. It looks at patterns, trends, and seasonal variations in past data. It uses them to make educated predictions about future results.

It's like a reliable friend. It learns from the past to give us a heads-up on what to expect. This makes it simpler to plan and stay safe on the roads.

- Model Structure:

Our ARIMA model is like having three settings on a forecasting machine. The labels are p, d, and q. 'p' helps the model learn from past values. 'd' makes the data more predictable. 'q' smooths out fluctuations. It's like adjusting the dials on a radio to get the best signal.

To find the best settings, we did a bit of a search. We tried different combinations. We did this to see which ones gave us the best predictions. It's like finding a recipe. We tested various ingredient amounts until we got the perfect mix for our model.

Think of 'p' as a detective in our forecasting model. This detective looks at the past. he tries to figure out today's weather based on what happened in the previous days. The higher the 'p' value, the more days the detective looks back to gather clues for making predictions. It's like saying, 'If it rained a lot in the last few days, there's a good chance it might rain today too.' So, 'p' helps our model learn from recent history to make more accurate guesses about the future.

- **Specific Features and Techniques:**

ARIMA model features and techniques are great and they simply are, AutoRegressive (AR) Component (p): It's like looking at recent patterns. To learn and predict the future.

We also have, Integrated (I) Component (d): It's making the data more understandable. If the daily temperatures vary a lot, 'd' helps to smooth them out. This makes it easier for the model to see trends.

Last but not least, Moving Average (MA) Component (q): Think of this as a filter that helps catch sudden changes. If there's an unexpected cold day after a week of warmth, 'q' helps the model not overreact to these sudden shifts.

- **Factors Influencing the Decision:**

The ARIMA model is like a wizard. It's great at predicting things, especially when it looks at one type of data at a time. It's excellent for guessing what might happen with yearly accidents. This includes counts of fatalities and serious injuries. The magic happens because the wizard learns from the past. It studies how accidents occurred in previous years. It uses that knowledge to make predictions.

This makes it very accurate and trustworthy. It tells us what might happen in the future based on the past.

- **Why the ARIMA model?:**

We chose the ARIMA method. It's like a superhero for understanding change over time. It's good at spotting patterns in data. The data unfolds over time, like our yearly accident counts. Plus, it's speedy, it can crunch through lots of numbers without slowing down.

It's the right tool for the job. ARIMA is like the perfect detective for solving time-based data mysteries. It's accurate, fast, and efficient.

- Model Training and Validation

Testing / Training Split is 80/20. This is like setting aside a part of your data to check how well your model is doing. Here's a simple explanation:

Imagine you have a big box of candies, and you want to see how good you are at guessing the flavors. You keep 80% of the candies for practice. You keep the other 20% hidden to test your guessing skills later.

It's like practicing with most candies to get better at predicting. Then, you check your accuracy on the candies you didn't taste during practice.

This tells you if your guessing skills work for new candies. Or if you need more practice. This shows why the ARIMA model is best for forecasting time-series data.

● Conclusion:

The ARIMA model, while demonstrating a moderate accuracy rate, the ARIMA model provides valuable insights into the temporal patterns of road accidents and their consequences. Continuous improvement will be considered to enhance forecasting accuracy.

Final words

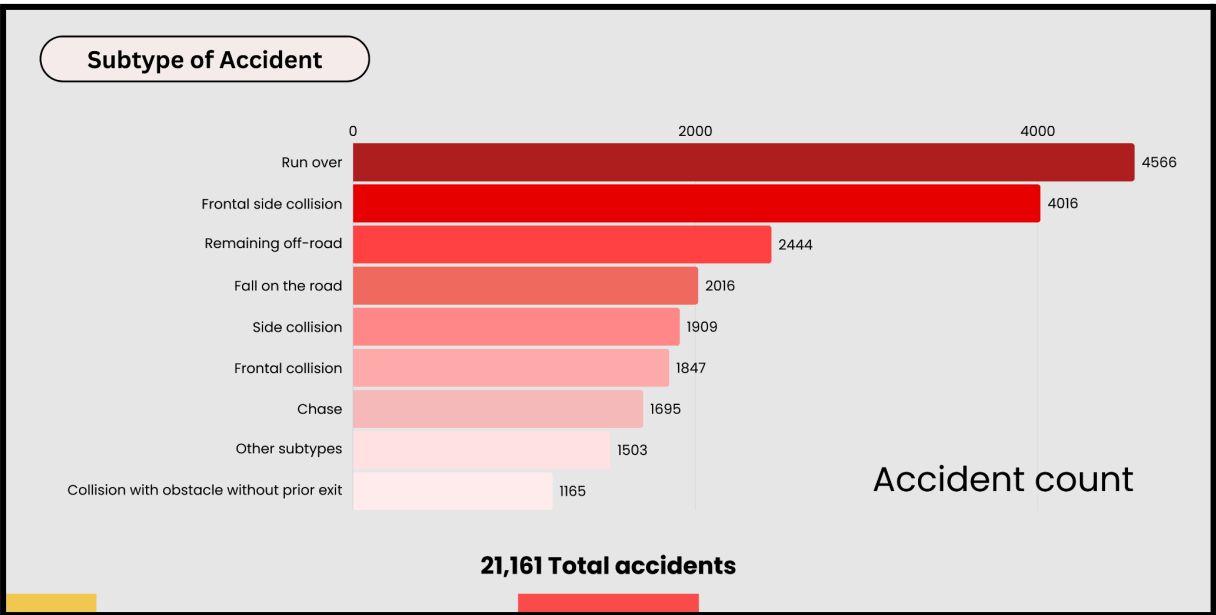
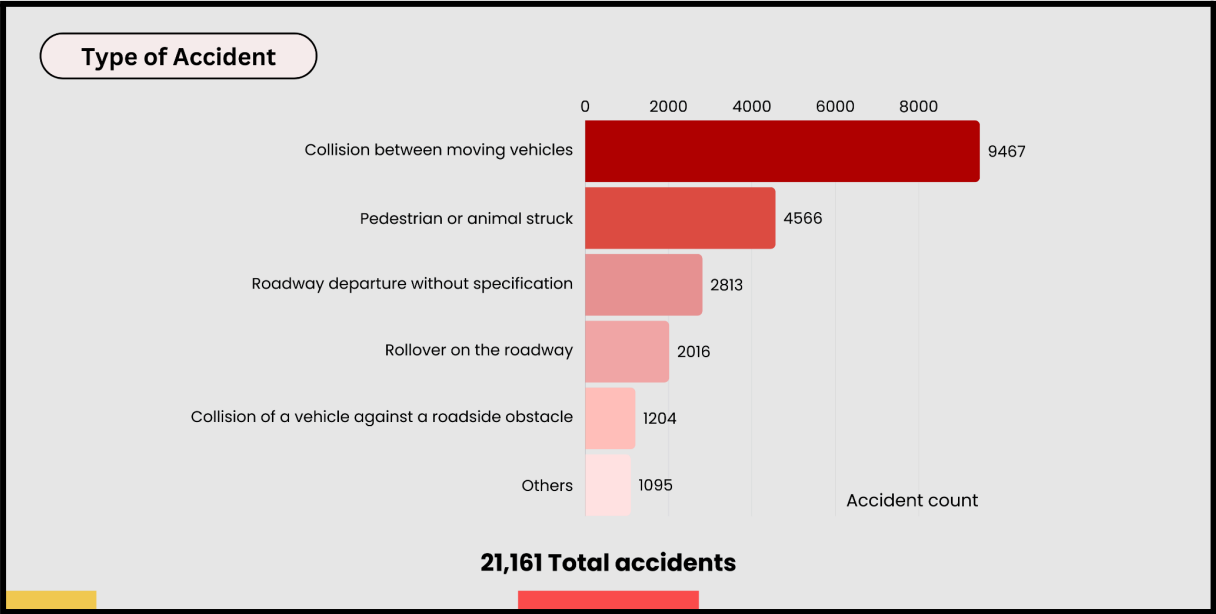
In conclusion, our exploration of traffic accidents in Catalonia reveals crucial insights for road safety. Over the years, accidents have shown varying trends, influenced by factors like time, weather, and road features. Notably, efforts to enhance safety have led to fewer accidents, though challenges persist.

- Key takeaways:

- Accidents tend to cluster during peak hours and months with events or holidays, emphasizing the need for heightened caution during these times.
- Heavy vehicles play a significant role in severe accidents, emphasizing the importance of dedicated road sections for them.
- Weather and road conditions, while they are not major contributors to accidents, require ongoing awareness and adherence to safety guidelines.
- The ARIMA forecasting model predicts a potential range of accidents, fatalities, and serious injuries for the upcoming year, providing a tool for proactive planning.

In closing, I would like to express my sincere gratitude. Thank you for joining us on this journey through the intricate landscape of traffic accidents in Catalonia. Your engagement and interest contribute to the collective goal of fostering safer roads. As we conclude, let's remain vigilant, promote awareness, and work together towards a future with fewer accidents and improved road safety. Thank you for your time and commitment to this important cause. I wish you safe driving!

Appendix



Intersection Characteristics

Intersection Characteristics	Accidents rate
Approaching or exiting intersection up to 50m	5.4%
Inside intersection	27.67%
In section	66.93%

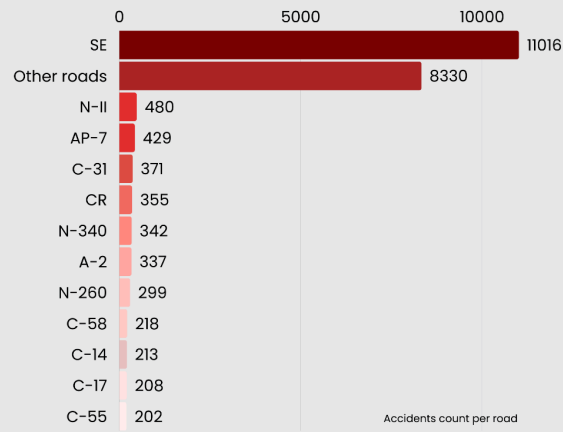
21,161 Total accidents

Hit and run behaviour

No	Yes
20569 97.2%	418 1.97%
Not specified	
174 0.83%	

21,161 Total accidents

High Accident Roads



21,161 Total accidents