

Group – 9

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1. Understanding Traffic Accident Severity Over Time

Over the last ten years, the seriousness of road accidents has gone up and down, much like a hilly road. Our traffic safety Visualization uses what we call the Accident Severity Rate (ASR) to show us the share of accidents that were really bad or deadly each year. In 2013, the chart spikes up to over 17%, telling us that this year saw a lot more of the serious stuff. It's straightforward to track these shifts think of it like a weather chart, where a green arrow pointing skyward means more severe accidents, and a downward red one means things weren't as bad. This simple view quickly points us to times, like 2013, that might need a closer look to see what was going on.

With these ups and downs laid out, we can start digging into the "whys" and "hows" of these changes. For instance, in 2011 there was a big leap in severe accidents, nearly doubling from previous years. But by 2014, it's as if someone hit the brakes, with serious accidents dropping by a quarter. Our chart acts like a guide, suggesting where to zoom in—maybe we had rough roads or not-so-great traffic laws in those high years. By figuring out what caused these swings, the folks who focus on keeping our streets safe might be able to fix things up, using these yearly clues to steer us toward safer days on the road.

KPI - Accident Severity Rate (%) by Year

Accident Severtiy Rate = (# of Fatal + Serious Accidents)/Total # of Accidents

Date									
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
15.36%	15.71% 2.27%▲	16.11% 2.54%▲	15.88% -1.46%▼	15.30% -3.65%▼	14.97% -2.13%▼	15.54% 3.79%▲	15.94% 2.58%▲	17.03% 6.84%▲	15.62% -8.29%▼

















KPI - Casualty Rate (%) by Year

Date									
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
208.18%	202.72% -2.62%▼	210.98% 4.07%▲	209.54% -0.68%▼	210.24% 0.33%▲	211.31% 0.51%▲	229.71% 8.71%▲	208.57% -9.20%▼	298.38% 43.06%▲	224.79% -24.66%▼

2. Crash Connections: What Happens Where Cars Meet Roads?

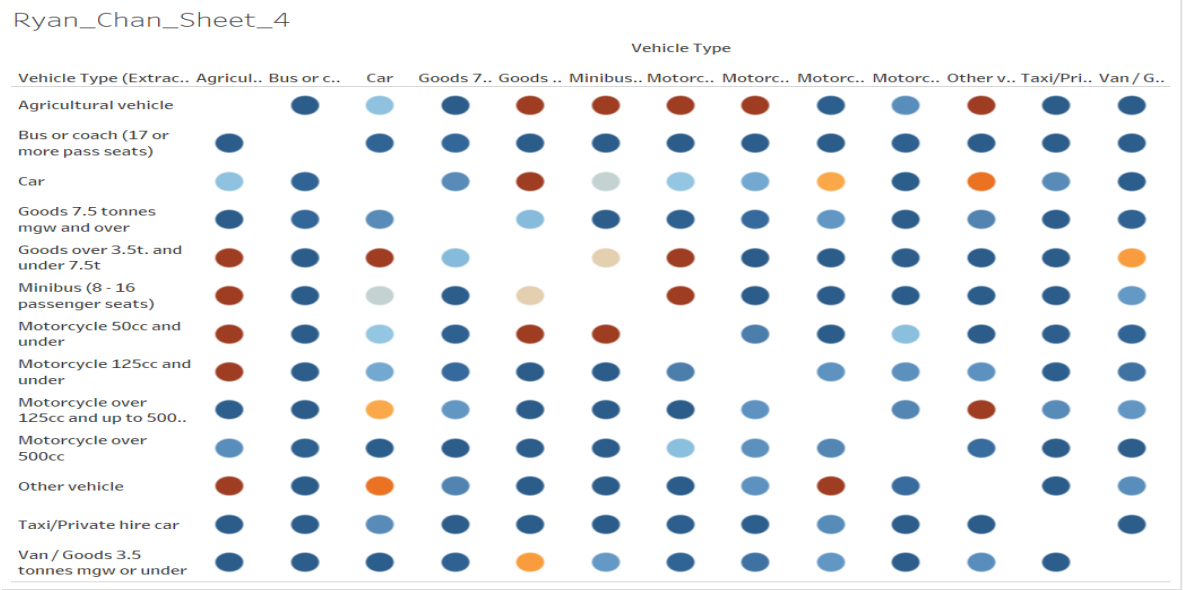
The visualization show a pattern for some vehicle types like buses and cars at crossroads, there is a strong positive correlation, as shown by the larger circles. In contrast, for other types like motorcycles at T or staggered junctions, the correlation is weaker, indicated by the smaller squares. This matrix allows for a quick visual assessment of where the strongest relationships lie, potentially directing traffic safety efforts more effectively. For example, high positive correlations at busy junctions may suggest the need for improved signage or signal timing. Conversely, the negative correlations might point to areas where current safety measures are effective or where accidents are less severe. This analytical tool aids in making informed decisions by highlighting the specific conditions under which severe accidents are more likely to occur.

Pearson Correlation Between Accident Severity Rate (%) & Casualty Rate (%) Over Junction Detail & Vehicle Type

Vehicle T..		Junction Detail									
		Crossroads	Mini-round..	More than ..	Not at junc..	Other junc..	Private driv..	Roundabout	Slip road	T or stagge..	
Agricultur..	Cas..	500.00%									
Bus or coach (1..	Cas..	500.00%	0.810	0.810	0.810	0.810	0.810	0.810	0.810	0.810	
Car	Cas..	500.00%	0.844	0.844	0.844	0.844	0.844	0.844	0.844	0.844	
Goods 7.5 tonnes m..	Cas..	500.00%	+	+	+	+	+	+	+	+	
Goods over 3.5t..	Cas..	500.00%	0.753	0.753	0.753	0.753	0.753	0.753	0.753	0.753	
Minibus (8 - 16 pass..	Cas..	500.00%	0.577	0.577	0.577	0.577	0.577	0.577	0.577	0.577	
Motorcy..	Cas..	500.00%									
Motorcycl e 125cc a..	Cas..	500.00%	+	+	+	+	+	+	+	+	
Motorcycl e over 12..	Cas..	500.00%	*	*	*	*	*	*	*	*	
Motorcycl e over 50..	Cas..	500.00%	0.842	0.842	0.842	0.842	0.842	0.842	0.842	0.842	
Other vehicle	Cas..	500.00%	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045	
Taxi/ Private h..	Cas..	500.00%	0.677	0.677	0.677	0.677	0.677	0.677	0.677	0.677	
Van / Go..	Cas..	500.00%	0.790	0.790	0.790	0.790	0.790	0.790	0.790	0.790	
		50.00%	20.00%	50.00%	50.00%	20.00%	50.00%	50.00%	20.00%	50.00%	
		Accident Se..	Accident Se..	Accident Se..	Accident Se..	Accident Se..	Accident Se..	Accident Se..	Accident Se..	Accident Se..	

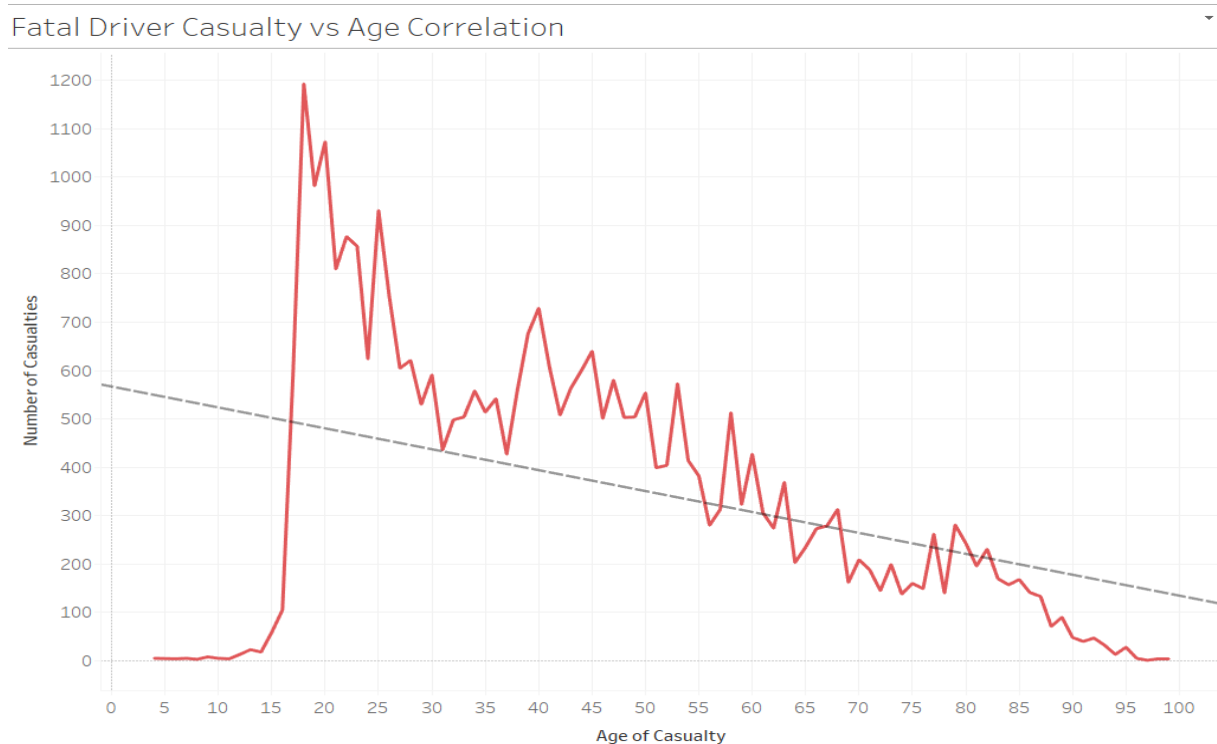
3. Vehicle Types and Their Links to Road Safety

Peek at this colourful dot grid that's all about seeing which vehicles tend to get into more scrapes on the road. It's like a checkerboard where each spot compares two kinds of rides to show if they often end up in the same kind of trouble. Big, bold coloured dots mean there's a strong chance they share the same safety issues, while pale dots are like quiet backroads not much to see there. For instance, the bright dots for minibuses might tell us they often have a lot in common with bigger buses when it comes to accidents. But when you look at motorcycles over 500cc, they're kind of doing their own thing, with different safety stories from other bikes. What's really is how this helps the safety savvy figure out where to focus their energy. Bright dots can flag where it might be good to dig deeper and maybe think up some new safety rules. And those pale dots? They could mean that some vehicles are already playing it safe or just that they're less common on the roads. Either way, this dot grid is a quick way to spot trends and figure out how to keep all our wheels turning safely out there.



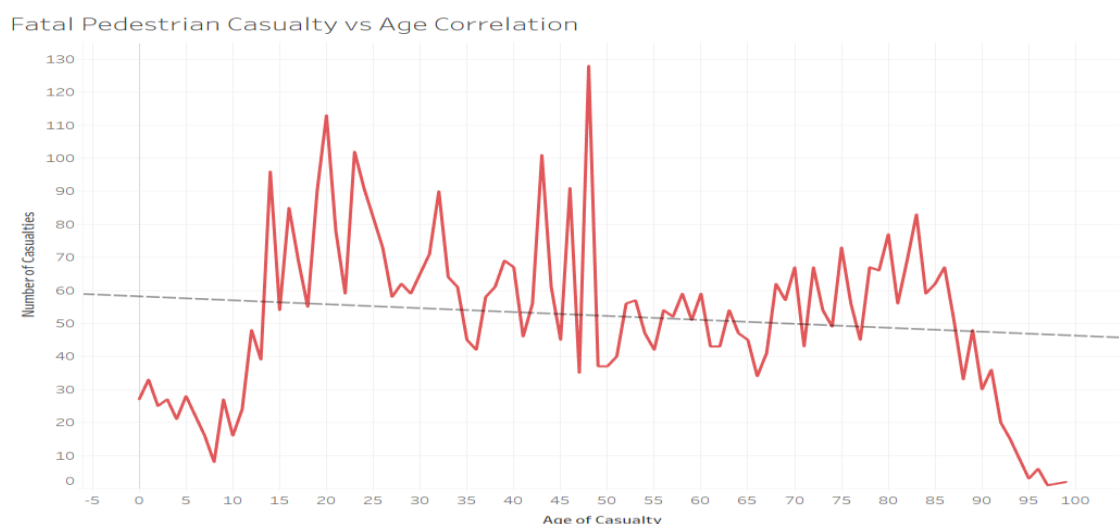
4. Fatal driver casualty vs age correlation

Our chart, "Fatal Driver Casualty vs Age Correlation," tells an important story about drivers' ages and their safety on the roads. It shows that the youngest drivers are in the most accidents, which could mean they're not as careful or just not used to driving yet. Then, as people get older, they tend to have fewer crashes, which might be because they're getting better at driving. But there's a twist: when drivers get much older, the risk of crashing goes up again. This could be because reflexes slow down with age, or health problems make driving harder. Knowing this, we can think of ways to help, like better driving classes for new drivers or health check-ups and special programs for older ones, to keep everyone safer on the road, no matter their age.



5. Fatal Pedestrian Casualty vs Age Correlation

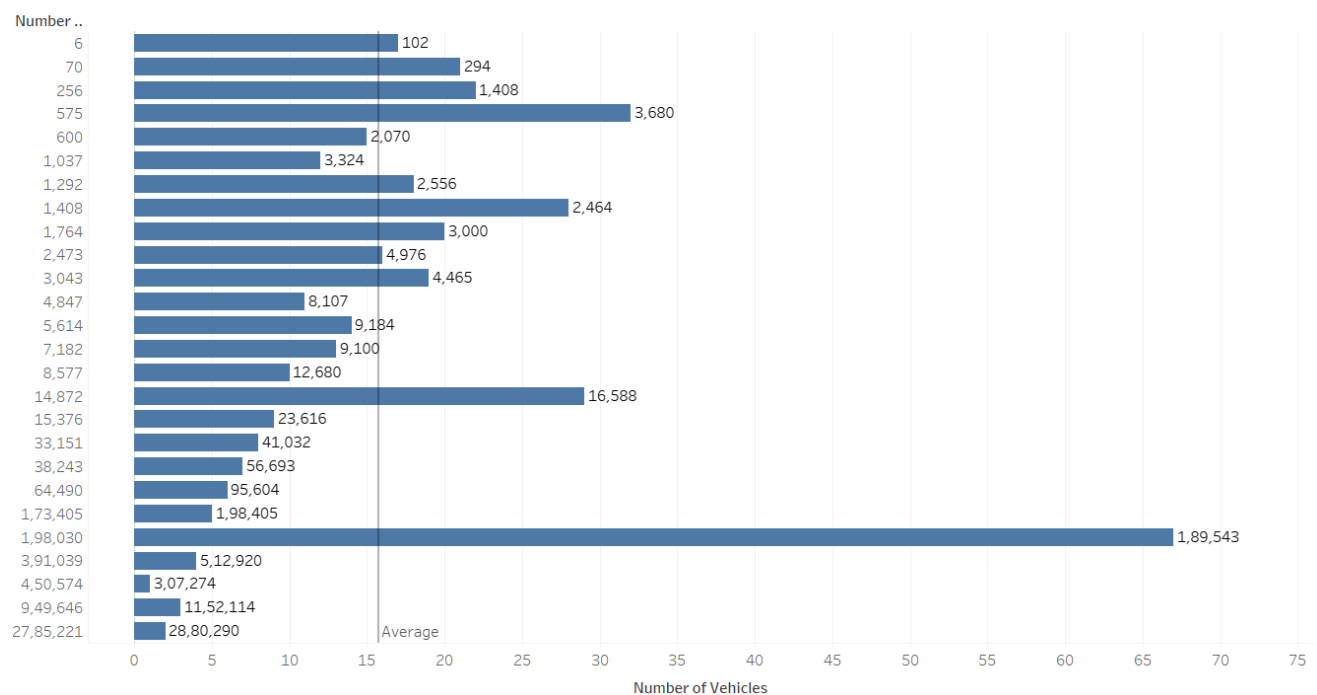
This line graph, "Fatal Pedestrian Casualty vs Age Correlation," traces the delicate line between age and pedestrian safety on our streets. It's a red line that spikes in places, showing us that certain ages, especially the very young and the elderly, are more likely to be involved in fatal accidents. Kids under 10 and seniors over 70 stand out with particularly high numbers, highlighting these groups as the most vulnerable when crossing roads or walking along them. This chart is more than just a bunch of ups and downs; it's a clear call to action to make crossings safer for our kids and grandparents, perhaps with more crosswalks, clearer signs, and better lighting to guide their way safely.



6. The Bigger Picture of Traffic and Troubles

Our chart, "Correlation Between Number of Vehicles and Casualties in Traffic Accidents," offers a straightforward look into how the number of vehicles on the road might relate to the number of unfortunate incidents where people get hurt. At first glance, it's clear more cars can mean more trouble. The bar graph shows a general trend—when the count of cars goes up, so does the number of casualties. For example, on the busiest roads with over 27 million cars, we see the casualty numbers hitting nearly 190,000. But it's not just about counting cars and casualties the graph also has some math magic in it, with correlation coefficients that tell us how strong this relationship is. So, while we see a lot of traffic in some spots leading to lots of accidents, this chart is a key tool to help figure out just where we might need better lights, signs, or even speed limits to help keep everyone safer out there on the road.

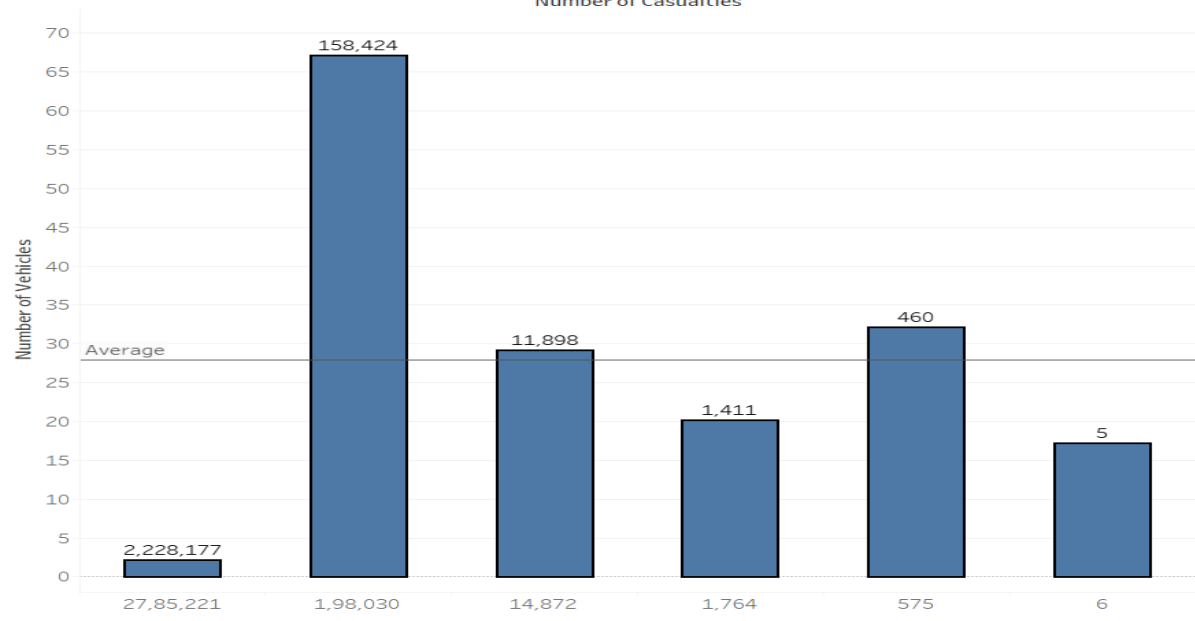
Correlation Between Number of Vehicles and Casualties in Traffic Accidents



7. Could Fewer Cars Mean Safer Roads?

Let's take a look at an idea what if there were fewer cars on the roads? Our chart, "Impact of Vehicle Reduction on Adjusted Casualties," shows that if we had 20% fewer cars out there, the number of crashes could drop big time. Right now, our roads are like a bumper-to-bumper game of tag, but our chart dreams up a calmer, less crowded place where accidents are way less common. It's a pretty neat thought that just taking some cars away could keep more of us safe. This idea could be a game-changer for the people who make the rules of the road, helping them think up new ways to lighten up traffic, like cheering on carpooling or making buses and bikes a better choice for getting around. It's about making less of a squeeze on the street and turning our daily drives into smooth sailing.

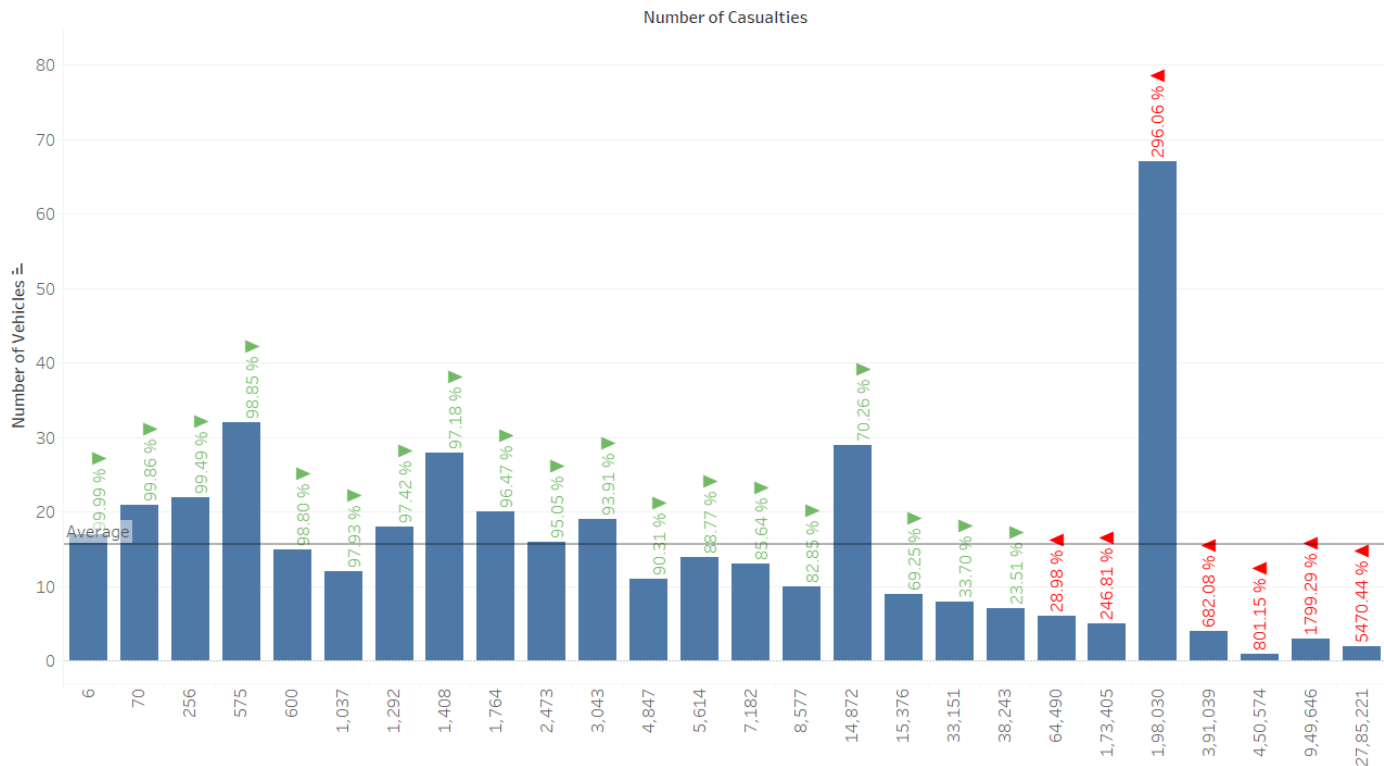
Impact of Vehicle Reduction on Adjusted Casualties



8. Fewer Cars, Fewer Crashes : Safer Path

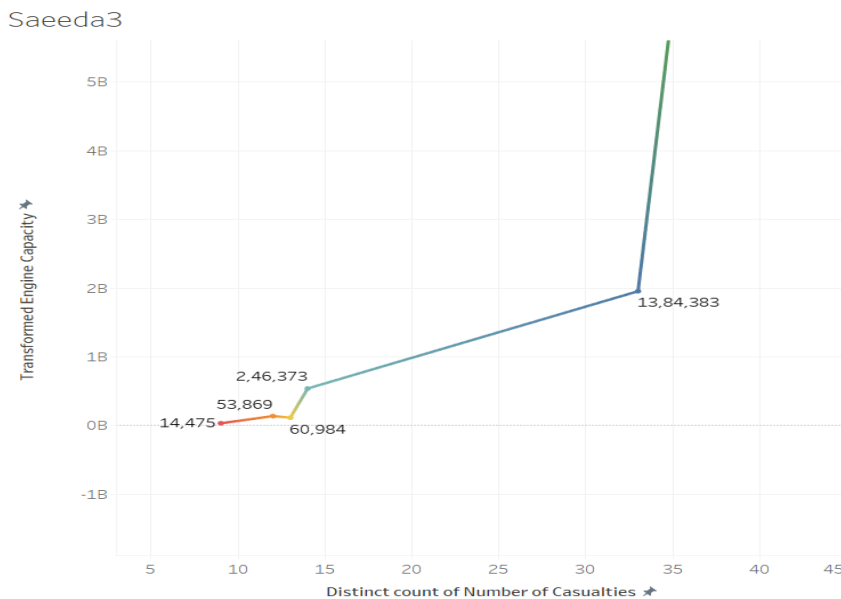
Our chart, "Impact of Changes in Number of Vehicles on Casualties," shows traffic and safety. It's like when you're at a super busy intersection, you can almost expect a fender bender or two. The chart backs this up, showing that when a ton of vehicles like over 27 million are out on the road, we end up seeing about 189,000 accidents. But in those quiet spots where only a handful of cars pass by, the accidents can be as low as 460. It's like the more room cars have to breathe, the fewer accidents we see. This isn't just counting who bumped into whom it's a hint that maybe making some room on the road could lead to a lot fewer accidents. It's a heads-up for the folks in charge that if we find cool ways to cut down on cars, like carpooling or better buses, we could all have a smoother ride.

Impact of Changes in Number of Vehicles on Casualties



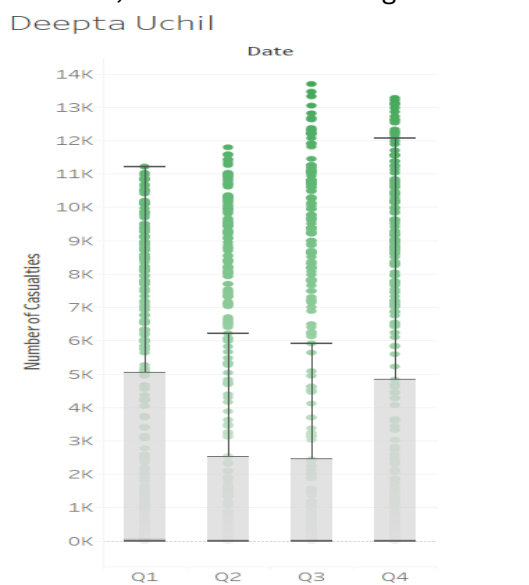
9. Big Engines, Bigger Risks

The graph we have, "Transformed Engine Capacity vs. Number of Casualties," shows something we all might have guessed but now can see clearly the bigger a car's engine, the more often it seems to end up in a crash. This is especially true on the fast-paced highways, where the crash count has hit an eye-opening number of 13,84,383. It's not just the speed-loving highways feeling the brunt even the less travelled roads see their fair share of accidents, just not as many. What this really highlights is a sort of danger zone that comes with powerful cars. They're like magnets for trouble on the tarmac, pulling in accidents at every turn. For people making the rules of the road and those designing the cars we drive, this graph is a goldmine. It's telling them where the trouble spots are and what might cause them, pushing for smarter safety measures—think tighter speed limits or cars that make us think twice about going full throttle. It's all about dialling back the dangers so that every trip, whether to the corner store or across the country, ends with a safe parking job and not a call to the tow truck.



10. When Cars Age: A Year-Round Look at Road Risks

This scatter plot, titled "Age of Vehicle vs. Number of Casualties," showcases how the age of vehicles correlates with the number of casualties in accidents over different quarters of the year. Each dot clusters around a quarter, rising and falling, painting a seasonal story of road safety. Notably, older vehicles tend to be involved in more accidents, a trend that's especially marked in certain parts of the year suggesting that maybe the wear and tear of vehicles could contribute to safety risks. This visualization isn't just for stats; it's a crucial hint for focusing on vehicle maintenance and could push for policies promoting regular check-ups or even incentives for newer, safer cars. It's a nudge towards safer roads with each passing season.



11. Pareto Chart

This Pareto chart is like a shortcut for finding out what causes most car accidents. It has a line that climbs really fast at the beginning and then sort of levels out, which tells us that most of the trouble comes from just a few problems. The taller bars at the start are like the few big reasons for most crashes, and if we focus on fixing those, we could make the roads a lot safer for everyone. It's a handy map for people looking to make driving less of a hazard by showing them the main spots where things go wrong.

