# Uber – Safety Operations

## FARS Case Study – Operational Strategy

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# Introduction

- **In 2022, there were 42,514 fatalities from 39,221 crashes recorded** in the Fatality Analysis Reporting System (FARS). A 2019 study linked rideshare services to a 3% increase in traffic fatalities. According to **Uber's 2022 U.S. Safety Report, the company recorded a slight increase in fatalities compared to previous years, though these incidents remain rare.** While overall traffic fatalities have risen by 17.8% since 2019, there is no evidence to suggest that Uber-related fatalities now exceed the 3% estimate from earlier studies.

- In Q4 2023, *55%* **of Uber's revenue came from Mobility** alone, which indicates the initiatives we propose to increase road safety, **should encourage, grow, or retain Uber's main source of revenue** and **should not negatively impact the user experience or driver earnings.**

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University of Chicago News. (2019). Ride-hailing services may be driving traffic deaths. news.uchicago.edu, Uber Technologies Inc. (n.d.). Safety Report. uber.app.box.com, TRIP. (2023). Traffic Safety in the U.S.: Inequitable Risks and Solutions. tripnet.org, National Highway Traffic Safety Administration (NHTSA). Traffic Crash Death Estimates for 2022. NHTSA Press Release, April 20, 2023.

# Harmful Events & Collision Types

## HOW

- **Vehicle collisions account for 41% of fatalities**, with angle, front-to-front, and front-to-rear crashes making up 93% of vehicle collisions in transport.
- Non-vehicle collision events, especially **pedestrian incidents, have the highest fatality rates** (41%), suggesting a need to enhance driver awareness.
- Though less frequent, **collisions with trees, ditches, and embankments are highly fatal** (>70%), emphasizing the need to prevent drivers from leaving the road.

## WHY

- **Pedestrians are highly mobile** and are capable of making independent decisions that can conflict with focused drivers.
- Most incidents occur between 6 PM and 10 PM, peaking at 9 PM, suggesting lack of visibility is a key factor.

Szubski, E. (2023, January 16). The difficult task of avoiding pedestrians while driving at night. Warren Forensics, (2023). What do people hit most often in fatal crashes? Stone Rose Law.

# Proposed Solutions PEDESTRIAN

- **Educate and encourage high beam usage in low-lit areas.** The effective use of high beams can **increase recognition distance by 102% in low-visibility areas**. This can be achieved through safety training for drivers who primarily work at night or by **implementing real-time alerts** based on pedestrian activity. These alerts could be delivered as non-distracting notifications encouraging high-beam usage during critical periods, **potentially reducing fatal events by 13%**.
- **Encourage reflective light attachments for vehicles** to improve visibility to pedestrians. Incentivizing drivers who use reflective tape can promote usage while also educating them on proper placement so as to not confuse other drivers.
- **White cars can typically reduce the chances of getting into a crash by 12%.** Simply defaulting rides to white cars could have a similar effect.
    - **Disproportionately affecting drivers in other vehicles** reduces driver satisfaction, thereby imposing a business risk. Further research by analyzing car colors in areas with significant pedestrian activity and comparing them to areas with high fatality rates could yield insights.

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Reagan, I. J., & Cicchino, J. B. (2016). Use, motivations for use, and opinions about advanced headlight technology (Report No. 2129). Insurance Institute for Highway Safety, *Reflective.info. (n.d.). Basics of reflective tape, (2023, August 28). Does Car Color Really Affect Your Risk of a Crash? Car Accident Attorney.

# Proposed Solutions PEDESTRIAN

- **Deploy experienced human drivers who can anticipate pedestrian behavior in high-risk, popular pedestrian locations**, instead of self-driving vehicles. There are many added benefits to having autonomous vehicles operate where there isn't a regular requirement to adjust speed. **This could even be beneficial in resolving commute issues in rural areas that don't have enough human drivers.**
  - An associated risk would be the cost associated with idle autonomous vehicles or maintaining AVs without sufficient demand to justify the expense.
  - One can also argue that there is significant data to show that AVs are becoming indistinguishable from human drivers, however, the legal impact of fatalities or injuries caused by AVs can outweigh the cost of human-triggered events.

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Chicago Injury Lawyers. (2025, January 17). Can autonomous vehicles be counted on to see pedestrians?

# Proposed Solutions NON-VEHICLE COLLISION

- **Explore geospatial detection to highlight potential danger "zones".** This could involve **investing in LiDAR sensors** strategically placed in vehicle blind spots to help improve the detection of roadside hazards. **By measuring proximity, simple alerts can appear to notify the driver.**
  - A major part of the success **would require a level of tooling and data based on previous rides' latitudes and longitudes correlated to previous crashes.**
  - **High-contrast notifications** can also promote quick identification of any oncoming risk. However, balancing this with the need to avoid distracting the driver is a challenge to consider.
- Prioritize driver familiarity **by extending a modified version of Area Preferences to all drivers,** not just Uber Pro Platinum and Diamond status holders.
- Allowing drivers to **set default driving areas based on frequently driven routes** or implementing an option for drivers to **restrict trips to familiar areas** can also promote controlled environments.
  - An associated risk could be the hypothesis that driving on familiar roads leads to drivers being less attentive. More data specific to Uber would need to be analyzed to prove this

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Budiu, R. (2017, November 19). Distracted driving UX: Designing mobile apps to minimize driving distraction. Nielsen Norman Group, Keysight Technologies. (2023, October 4). Everything you need to know about lidar in automotive. Keysight Blogs, Ahmed, N. K., Koo, I., & Kang, D. (2024). A Novel System for Collision Avoidance Using an Enhanced YOLOv8 Model. Journal of Advanced Information Technology, 15(3).

# Geographic Fatality Trends

## WHERE

- **California, Texas, and Florida account for 29% of US traffic fatalities**, likely due to their large populations. **Mississippi has the highest fatality rate** at 23.9 deaths per 100,000 people (2022).

- While Montana's fatality rate is lower (19.0 per 100,000), its average number of deaths is 6.3% higher than Mississippi's, and **its high fatality rate of 55%** highlights a critical road safety situation.

## WHY

- Montana experiences higher average fatalities along **Principal Arterial highways, particularly at 4-way and T-intersections.**
- The peak average of 2.33 fatalities **occurs between 11 PM and 11:59 PM**, highlighting a significant risk during late-night hours.
- **Montana is one of the least lucrative states for Uber drivers** due to long waiting times between rides. This has been identified as a key barrier to driver satisfaction and retention.

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IIHS. Fatality Facts: State by State. https://www.iihs.org/topics/fatality-statistics/detail/state-by-state, IIHS (Insurance Institute for Highway Safety). Fatality Facts 2022: State by State. IIHS, June 2024. , Route4Me. Turn Avoidance. Route4Me Support, Upgraded Points. The Most Lucrative States for Rideshare Drivers. Upgraded Points, Uber. Safety in the Driver's Seat. Uber Newsroom,

# Proposed Solutions

- **Most incidents occur primarily in rural areas**, with alcohol-induced driving being the biggest factor. Proposal to deploy more drivers equipped to handle rural roadways with significant training, and **potentially working in hand with local businesses to offer discounted rides** during drinking hours.
- **Enhanced education for drivers who work primarily in rural areas, preferably at onboarding.** Possible community engagement initiatives that prioritize public awareness of Montana-specific fatality rates.
- **Left turns are commonly identified as the top reason for T-intersection-related collisions.** Uber introduced safer rides by limiting left turns, so **an extension to this is to provide additional options available to drivers to default between left or right-focused turning to cater to their safety preferences.**
    - However, there could be a legal risk associated with state-specific laws on turns, as well as increased ride times

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Focus2Move. Building Safer Roads in Montana: Challenges, Innovations, and Future Plans. Focus2Move, Uber. Safety in the Driver's Seat. Uber Newsroom

# General Opportunities to Consider

- **Develop policies to rank or de-incentivize drivers** based on frequent instances of speeding, tailgating, or other harmful activities like distracted driving, **leveraging Uber's existing in-app detection capabilities.**
- **Enable automatic EMT alerts through SafetyCheck if there's no response after 5 minutes** of an incident. According to FARS, alerting authorities within the first 15 minutes can reduce average fatalities by 8.4%.
- **Empower riders with knowledge on how to assist during unsafe situations,** given that 95% of Uber-related fatalities are caused by third-party drivers (as per the 2022 Uber Safety Report). Simple measures like providing safety pamphlets can be effective.
- **More information on the preference of specific navigation systems over Uber’s app navigation** may also yield insights into what kind of UX drivers prefer and help understand if this correlates to road incidents.

# In Conclusion

- This analysis of vehicle-related fatalities reveals several key areas for improvement in ride-sharing safety. The data highlights the importance of addressing both collision and non-collision events, while also identifying the risks associated with lucrative options for drivers in rural areas.

- By implementing targeted strategies such as enhancing driver awareness, improving visibility, leveraging technology for early detection of hazards, developing comprehensive safety policies, utilizing existing in-app detection capabilities, and empowering both drivers and riders with safety knowledge can create a more robust safety ecosystem. These measures, when combined, have the potential to substantially decrease fatalities and improve overall road safety for all users.