**Summary and Recommendations**

**Key Insights**

**1. State and City-Level Trends:**

**- Data Coverage:** The dataset does not include accidents from New York State, covering only 49 states.

**- Top 5 States with Highest Accidents Per Capita:**

1. South Carolina (SC)

2. Oregon (OR)

3. California (CA)

4. North Carolina (NC)

5. Utah (UT)

**- Top 5 Cities with Most Accidents:** Miami, Houston, Los Angeles, Charlotte, and Dallas. These cities report the highest accident numbers.

**- Distribution:**

* The number of accidents per city decreases exponentially.
* Less than 8% of cities record more than 1,000 accidents annually.
* Over 1,000 cities have reported just one accident in 7 years, which warrants further investigation.

**2. Time-Based Accident Insights:**

**- Rush Hours:** A high percentage of accidents occur between 5 AM and 10 AM and 3 PM and 6 PM, aligning with peak commuting times.

**- Weekdays vs. Weekends:**

* Weekdays see more accidents compared to weekends**.**
* On Sundays, accidents peak between 10 AM and 3 PM.
* On Mondays, a wider accident window occurs from 5 AM to 10 PM.

**- Yearly Trends:**

* Accidents increased steadily from 2017 to 2022.
* A decrease was observed in 2023, possibly due to incomplete data (data is only available until March 2023).

**3. Weather Conditions:**

* The highest number of accidents occur under fair weather conditions, indicating that weather is not a primary cause of accidents.
* Fair weather may lead to higher traffic volumes, increasing the likelihood of collisions. Other factors, such as human error, vehicle maintenance, and road conditions, may play a more significant role in accidents.

**4. Temperature Correlation:**

* A weak positive correlation (value of 0.30) was found between temperature and accidents. This suggests that as temperature increases, the number of accidents slightly increases, though the relationship is not strong.

**5. Data Quality Issues:**

* Missing data was noted for 2016 and potentially 2017.
* Issues with Source1 data were identified, impacting data completeness and reliability.

**Recommendations**

**1. Data Validation and Completeness:**

* Investigate missing and incomplete data, especially for 2016, 2017, and Source1, to improve data quality and consistency.

**2. Focus on High-Risk Areas:**

* Concentrate on high-accident states and cities for targeted road safety programs and infrastructure improvements.

**3. Investigation of Outliers:**

* Investigate cities with only one reported accident over seven years, as this anomaly may indicate data errors or underreporting.

**4. Traffic Management:**

* Implement measures to manage congestion during peak hours (e.g., flexible work hours, optimized traffic signals).
* Develop educational campaigns targeting weekday commuters to reduce accident risks.

**5. Human Error Reduction:**

* Promote the use of advanced driver-assistance systems (ADAS) and regular vehicle maintenance to reduce accident risks caused by human error.

**6. Weather Awareness:**

* Enhance driver awareness campaigns emphasizing that fair weather does not eliminate risks, and safe driving practices should be maintained in all conditions.

**Conclusion**

This analysis provides a comprehensive overview of US traffic accidents and highlights key areas requiring attention. The insights underscore the importance of addressing human-related factors, improving traffic management, and focusing on high-risk locations to reduce accident occurrences. By leveraging these findings, government can implement informed strategies to enhance road safety nationwide.