Chicago Car Crashes Analysis Presentation

Audience: Chicago Department of Transportation
Purpose: To demonstrate how predictive modeling can help prioritize safety interventions to reduce injury-related crashes.
Duration: Approximately 5 minutes

Reducing Traffic Injuries in Chicago: A Data-Driven Approach Predictive Modeling for Safer Streets (2021-2023)

- Presented to: Chicago Department of Transportation
- Date: July 22, 2025
  We'll cover the problem of traffic crashes, our data and methods, key findings, and actionable recommendations to reduce injuries.

Why Focus on Traffic Crashes?

- Over 50,000 crashes in Chicago in 2022 alone.
- Injuries and fatalities strain emergency services and impact safety.
- Goal: Identify factors causing injury-related crashes to prioritize prevention.

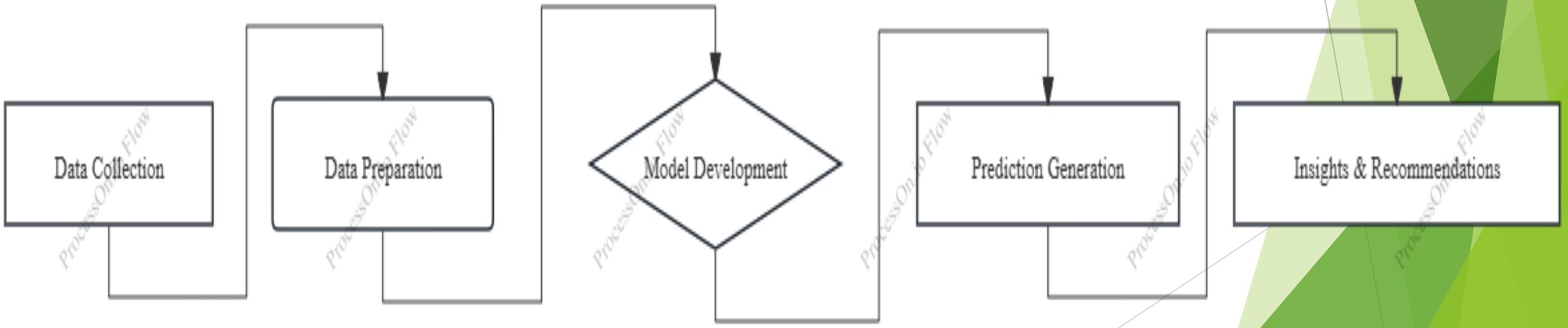
Data to Understand Crashes

- Source: Chicago Data Portal (2021-2023)
- Crash Data: 327,608 incidents (e.g., weather, speed limits).
- People Data: 712,248 individuals (e.g., age, injury status).
- Key Features: Number of people, fatalities, average age, weather conditions.

Feature	Average	Range	Key Insight
Number of People	~2 people	0–48 people	Most crashes involve 1–2 people; more people increase injury risk.
Fatalities	~0.001	0–3 fatalities	Fatalities are rare but signal severe crashes.
Average Age	~39 years	0–110 years	Older individuals may face higher injury risk.
Posted Speed Limit	~29 mph	0–70 mph	Most crashes occur in 30 mph urban zones.
Weather Condition	Clear (78%)	12 conditions	Clear weather is most common; rain may increase risks.

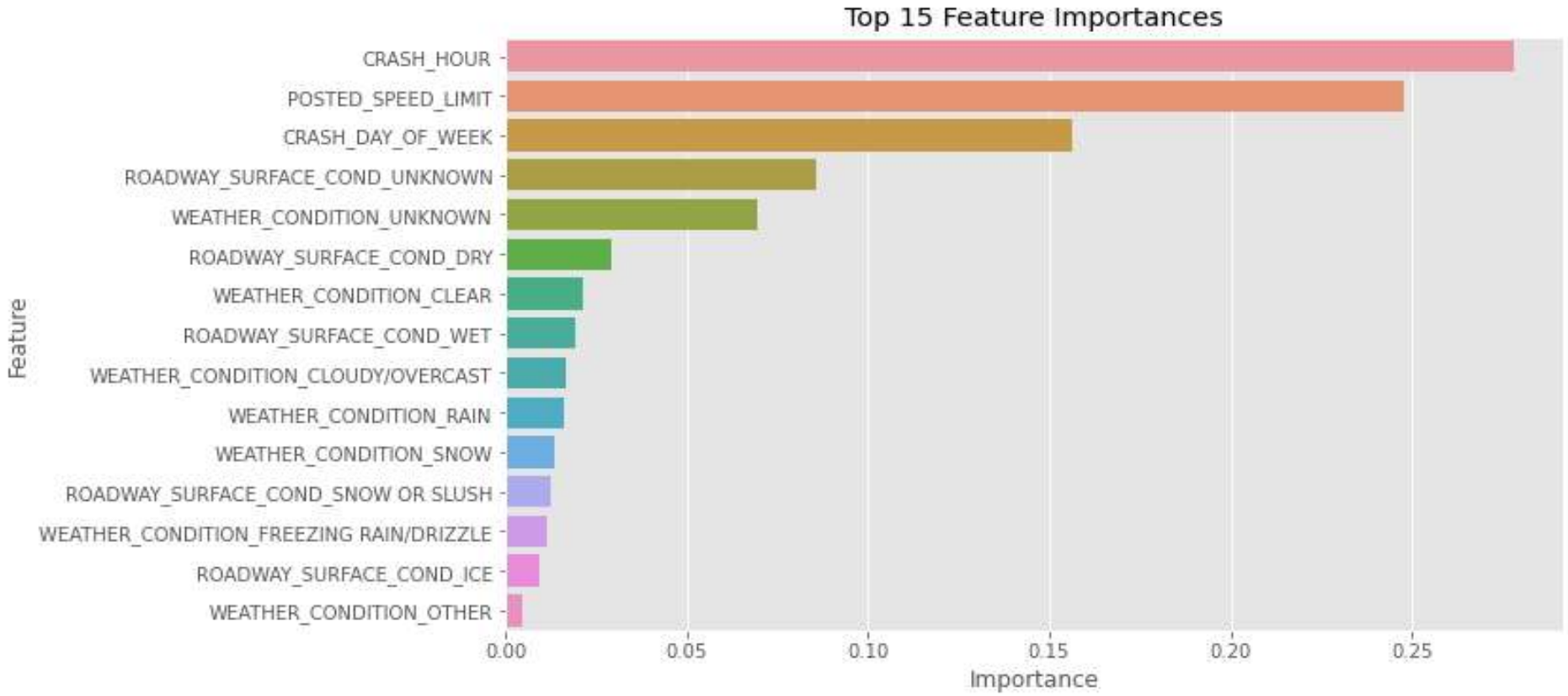
How We Analyzed the Data

- Merged crash and people data for a complete picture.
- Built a Random Forest model to predict injury-related crashes.
- Evaluated with recall (82%) to catch most injury cases.
- Identified key factors driving crash severity.



What Causes Injury-Related Crashes?

- More people involved = Higher injury risk.
- Older individuals linked to more severe crashes.
- Fatalities strongly predict injury outcomes.
- Weather and speed limits also play a role.



Actions to Improve Safety

- **Target High-Risk Areas**: Focus on intersections and public transport zones.
- **Educate Older Drivers**: Launch safety campaigns for older individuals.
- **Improve Data Collection**: Enhance reporting for better future predictions.

Making Chicago's Roads Safer

- Our model predicts injury-related crashes with 82% recall.
- Key factors: Number of people, age, fatalities, and weather.
- Next Steps: Implement targeted interventions to save lives and resources.

Thank you! Questions?