Chicago Car Crashes

Injury Classification

Jesse Markowitz
Angie Rincon
Meaghan Ross

BUSINESS PROBLEM

- Analyze data from car crashes in Chicago
- Determine best predictors for severity of injury/fatality
- Make recommendations to the Chicago Department of Transportation (CDOT) to improve outcomes

DATA

- Available from Chicago Data Portal:
  - Traffic Crashes - People
  - Traffic Crashes - Crashes

- Data from 2013 to present
- Over 800,000 records

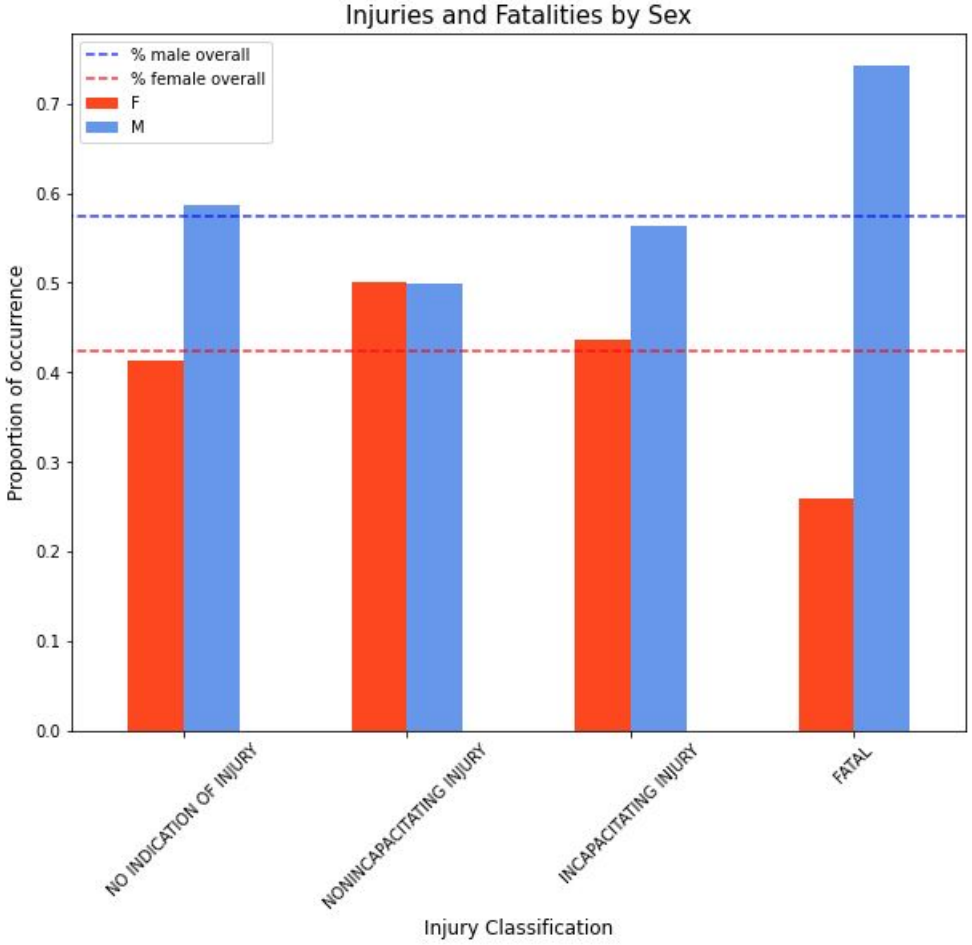
CHICAGO DATA PORTAL

Predicted Class

- Building models to predict level of injury

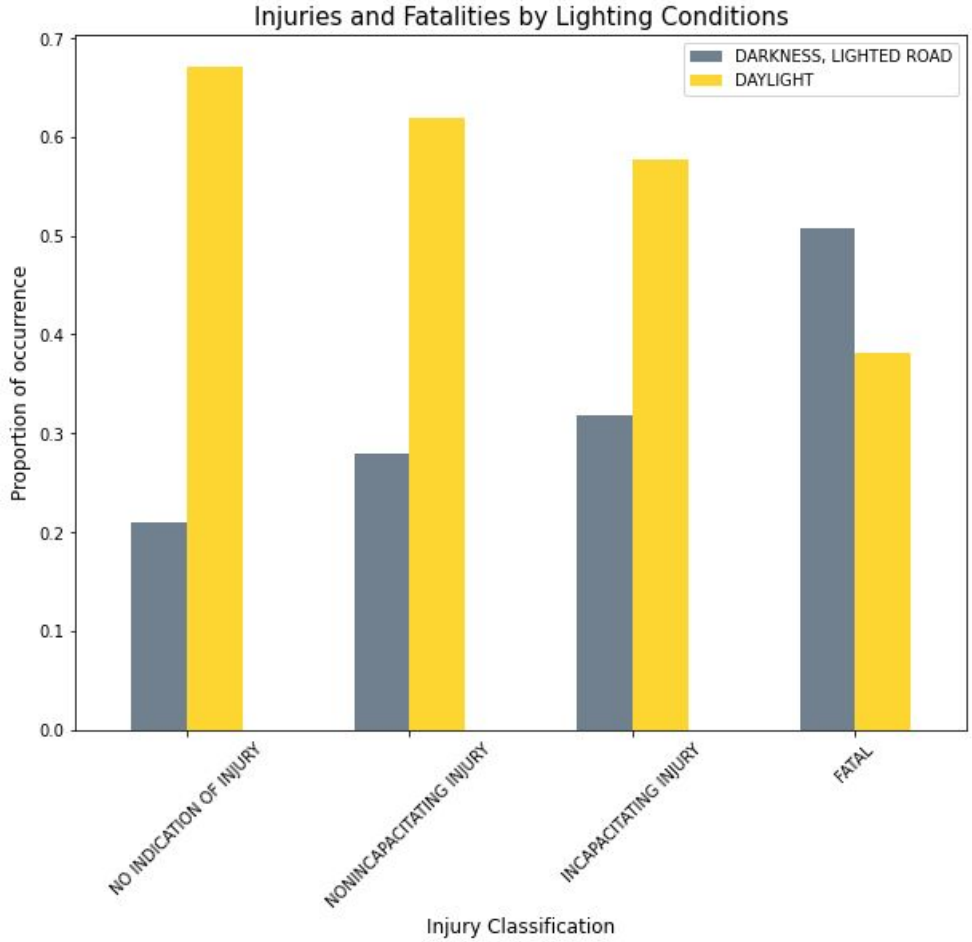
SEVERITY OF INJURY	PERCENT OF DATA
No Injury	91.73%
Non Incapacitating Injury	7.31%
Incapacitating Injury	.91%
Fatal	.05%

Men die in crashes disproportionately



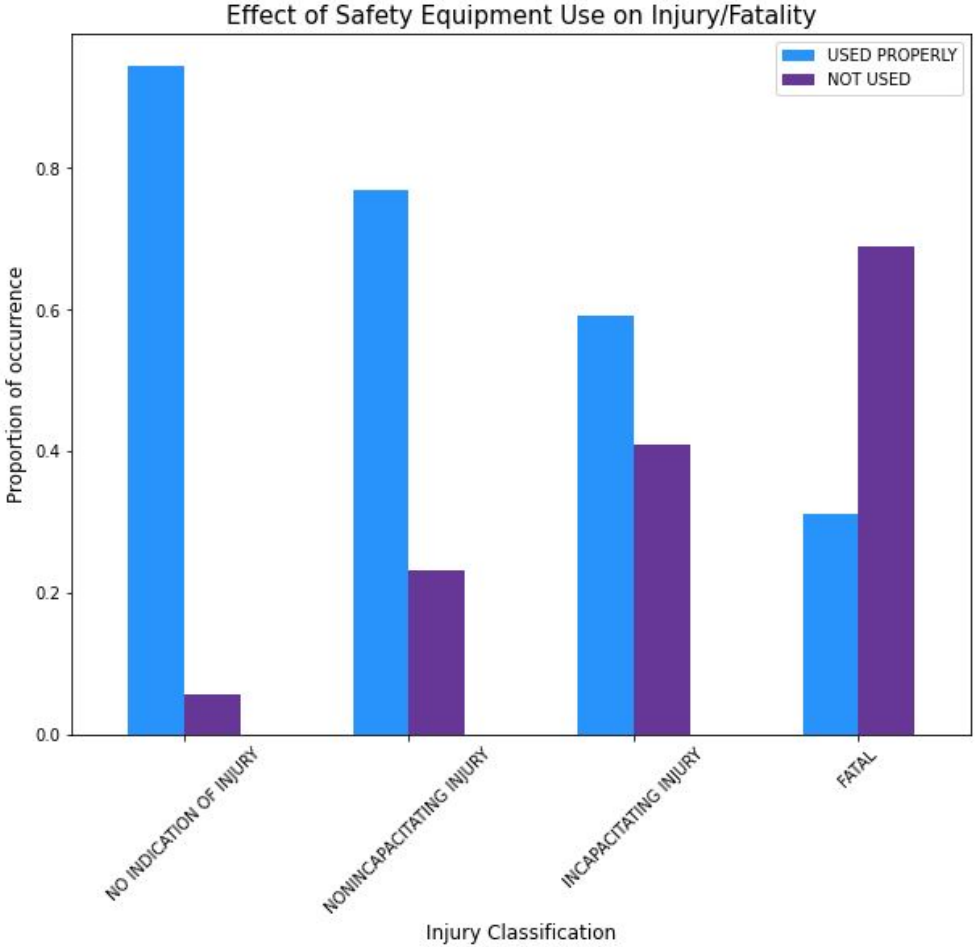
FINDINGS

Fatalities increase at night, but only on lighted roads



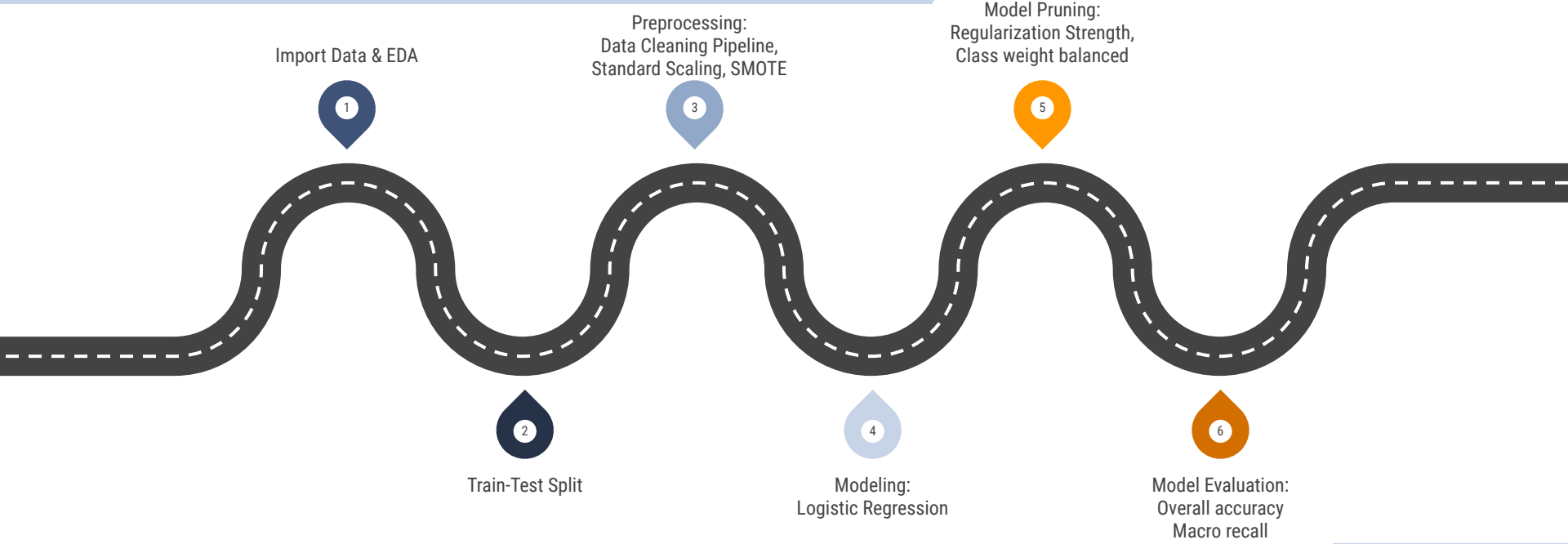
- Fatalities are consistently low across all other times of day and lighting conditions

Safety equipment use reduces injuries and fatalities

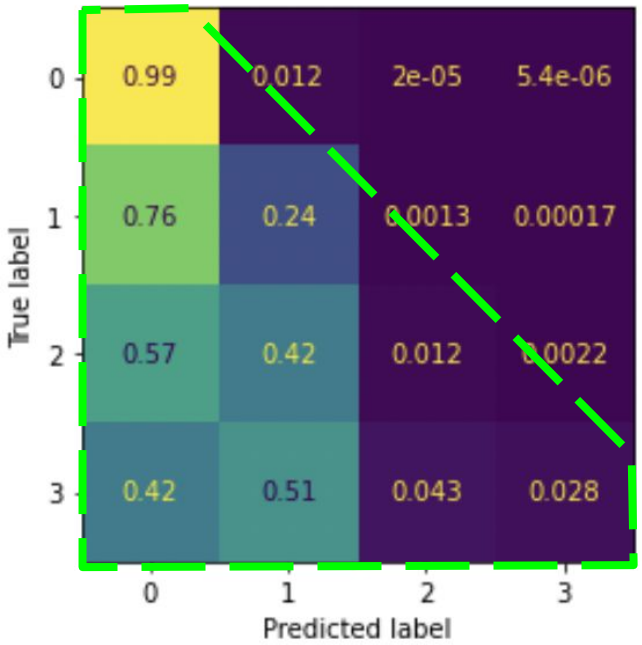


- Includes seatbelts, motorcycle helmets, and child car seats

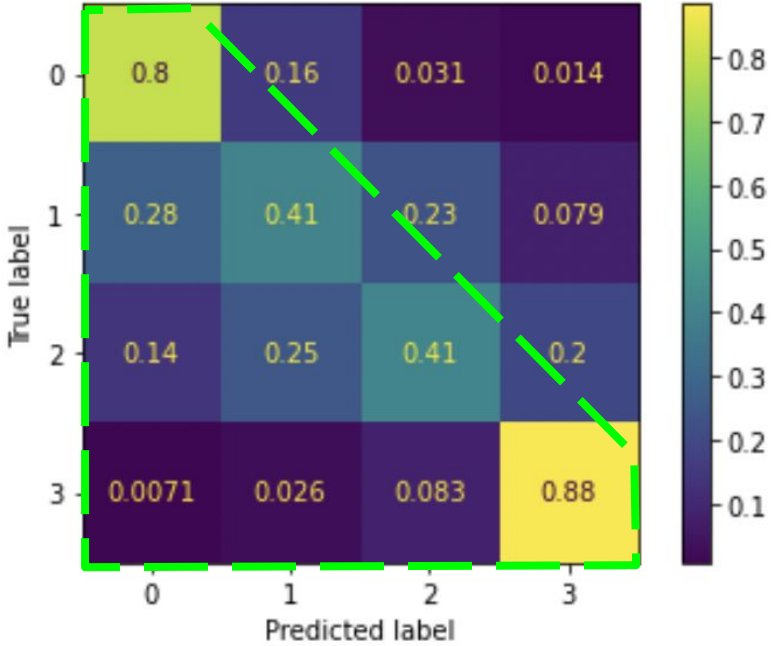
MODELING


Import Data & EDA
1
Train-Test Split
2
Preprocessing:
Data Cleaning Pipeline,
Standard Scaling, SMOTE
3
Modeling:
Logistic Regression
4
Model Pruning:
Regularization Strength,
Class weight balanced
5
Model Evaluation:
Overall accuracy
Macro recall
6

MODEL PERFORMANCE



Macro Recall: 31%



Macro Recall: 56%

RECOMMENDATIONS

In order to prevent serious injuries and fatalities, Chicago DOT should:

1. Increase public awareness of the importance of using safety equipment
2. Investigate nighttime crashes despite good lighting
3. Investigate sex differences in injury/fatality rate

FUTURE EXPANSIONS

1. Further exploration of crashes involving bicycles.
2. Include information about vehicles to explore how car make and model impact severity of injury.

THANK YOU!

Jesse Markowitz

Email:

jess.markowitz@gmail.com

GitHub:

@jmarkowi

Angie Rincon

Email:

angiekay.rincon@gmail.com

GitHub:

@AngieKay

Meaghan Ross

Email:

mer423@nyu.edu

GitHub:

@mross715