VISION ZERO, CHICAGO. ANALYSIS OF CAR CRASHES WITH INJURIES

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Project Team:

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"Safety doesn't happen by accident."
Jerry Smith

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INTRODUCTION

- Business Problem
- Key Idea
- Data Sources & Methods

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RESEARCH

- Current situation
- Data Exploration
- Modeling

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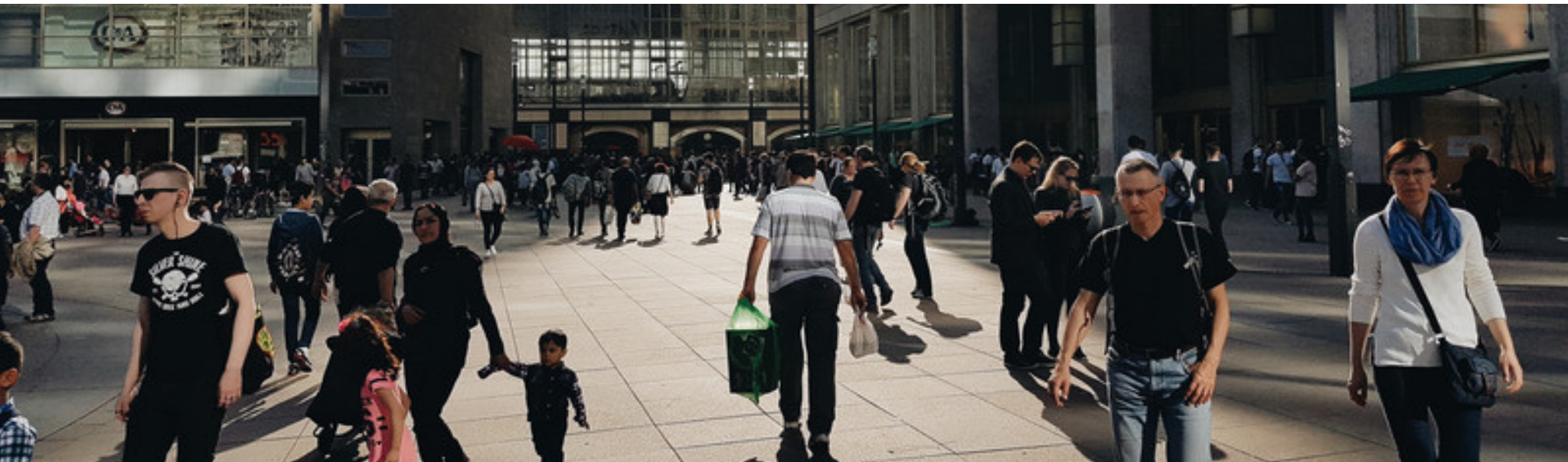
FINALIZE

- Business recommendations
- Next Steps



INTRODUCTION

- Business problem
- Key Idea
- Data sources & Methods

BUSINESS PROBLEM

- Our team was hired by a government agency CMAP (Chicago Metropolitan Agency for Planning) **to create a model which predicts injuries during car crashes.**

- Our model should provide customers with an insight into the **major factors that increase the probability of injury** during a car crash.

- We should explore the data and find useful insights about crash safety issues.

KEY IDEA BEHIND

- Key principle:

"**Human life and health are paramount** and take **priority over mobility** and other objectives of the road traffic system."

- Fundamental approach:

"People make mistakes on the road, and if there are crashes, **it is a design problem**."

- Philosophy:

"The philosophy that uses traffic calming, protected bike lanes and intersections, pedestrian zones, and activated public spaces to **create predictable behavior among the different modes of transit sharing our city streets."**

DATA UNDERSTANDING

Sources

- **Database Traffic Crashes - Crashes. Years: 2017 - now**

Provided by City of Chicago

https://data.cityofchicago.org/Transportation/Traffic-Crashes-Crashes/85ca-t3if

- **Database Traffic Crashes - People. Years: 2017 - now**

Provided by City of Chicago

https://data.cityofchicago.org/Transportation/Traffic-Crashes-People/u6pd-qa9d

- **Database Traffic Crashes - Vehicles. Years: 2017 - now**

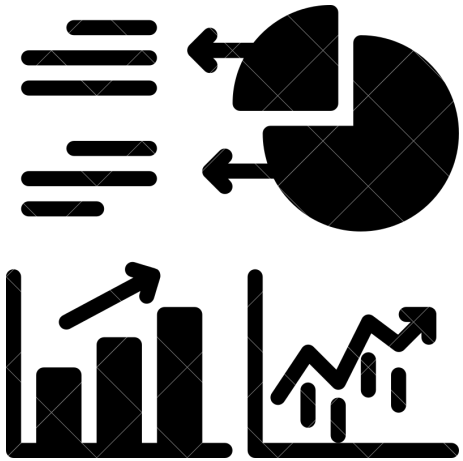
Provided by City of Chicago

https://data.cityofchicago.org/Transportation/Traffic-Crashes-Vehicles/68nd-jvt3

Methods

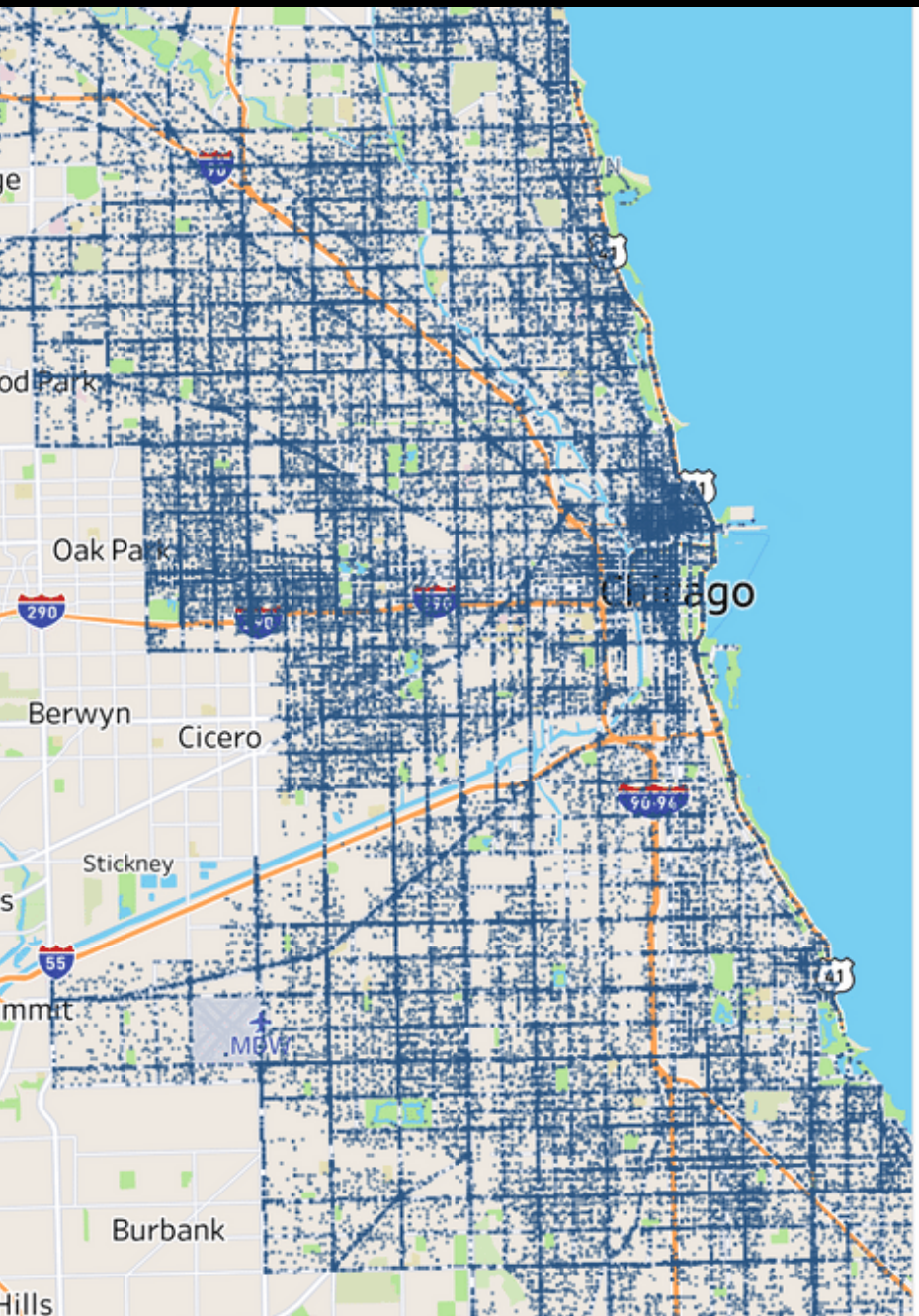
- Exploratory data analysis (EDA)
- Geoinformation scraping
- Determine statistically significant features
- 9 types of major prediction models for classification problems.

RESEARCH



- Current situation
- Data exploration
- Modeling
- Data Assessment

CURRENT SITUATION



CAR CRASHES IN CHICAGO

(2021 year)

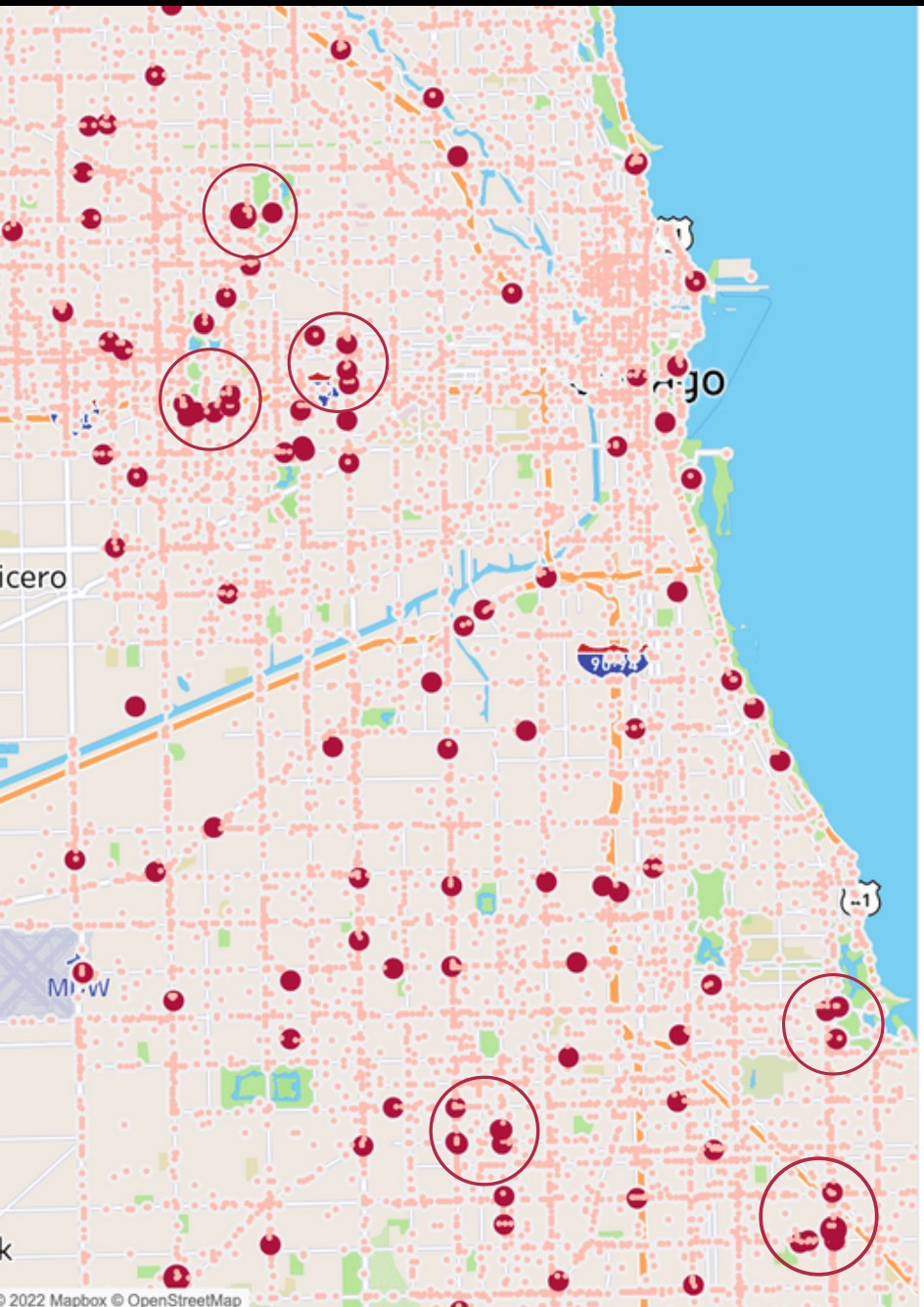
> 100 000 CAR CRASHES IN 2021:

15% OF THEM HAVE INJURIED PEOPLE

2% OF THEM BROUGHT DISABILITY

0.3% OF THEM LEFT DEAD BODIES AFTER

DATA EXPLORATION

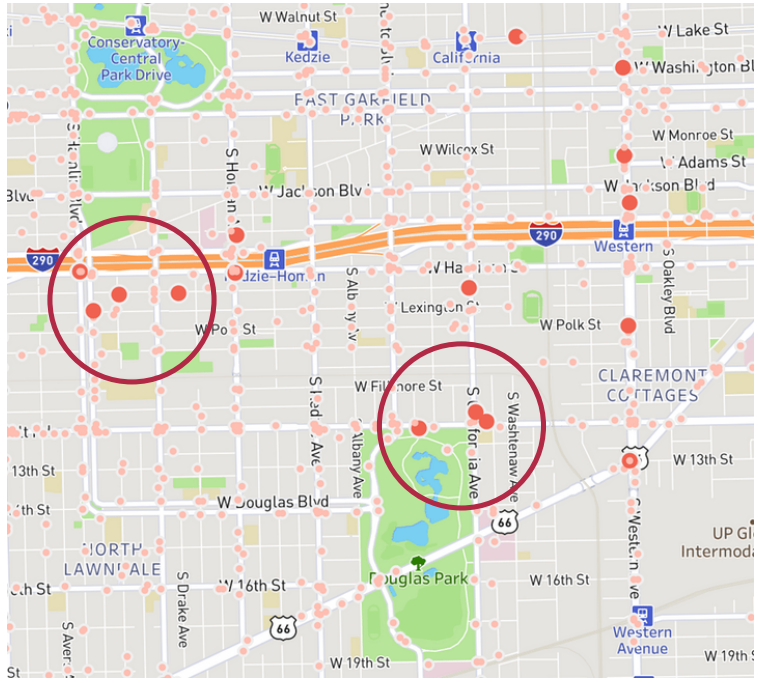


FATAL CAR CRASHES

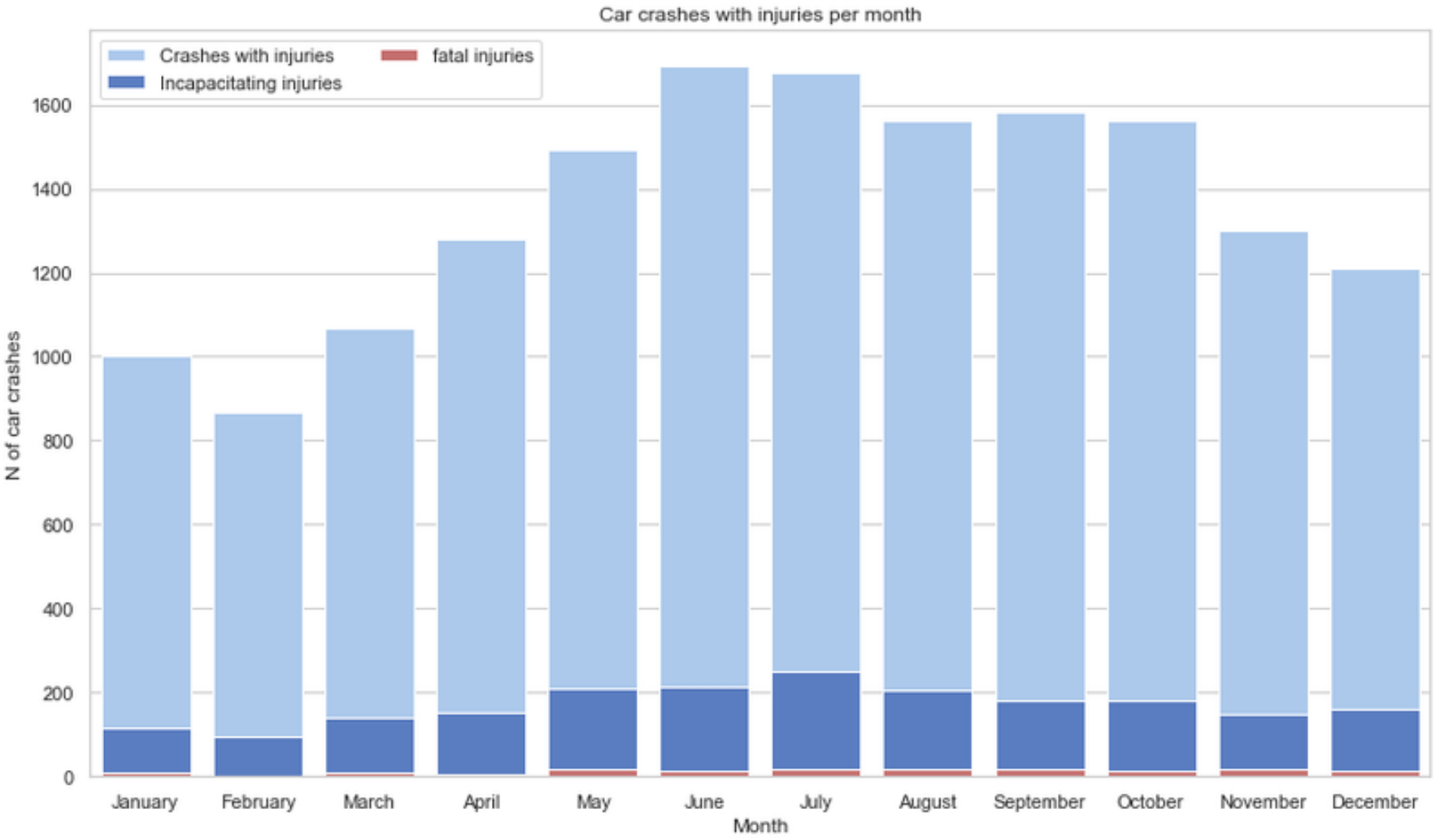
(2021 year)

WE CAN VISUALLY SEE "HOT SPOTS":

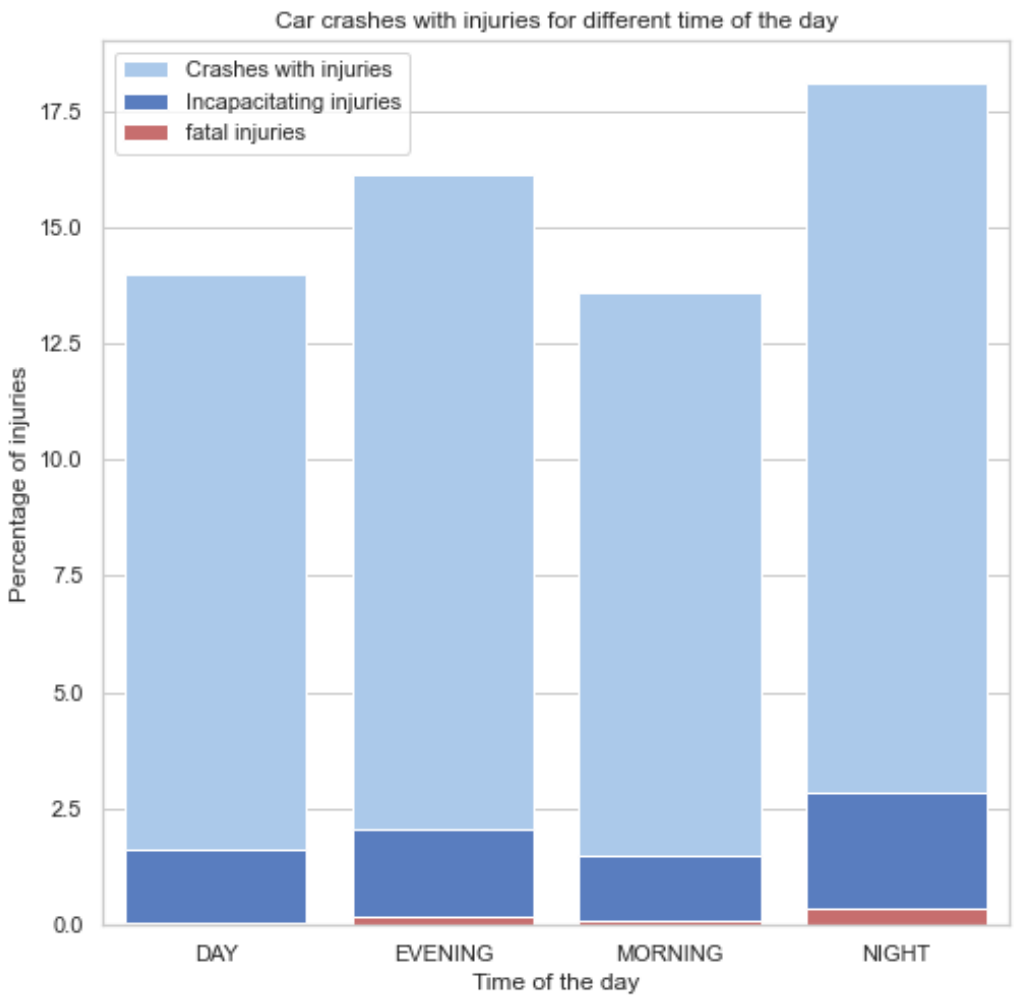
PLACES WITH HIGH RATE OF FATAL CAR CRASHES

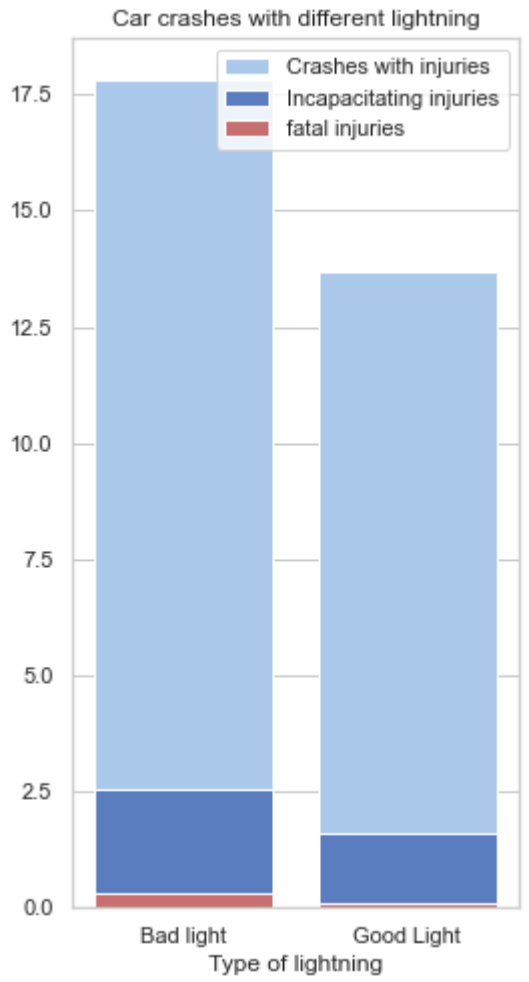


WINTER IS A SAFE TIME ON ROADS

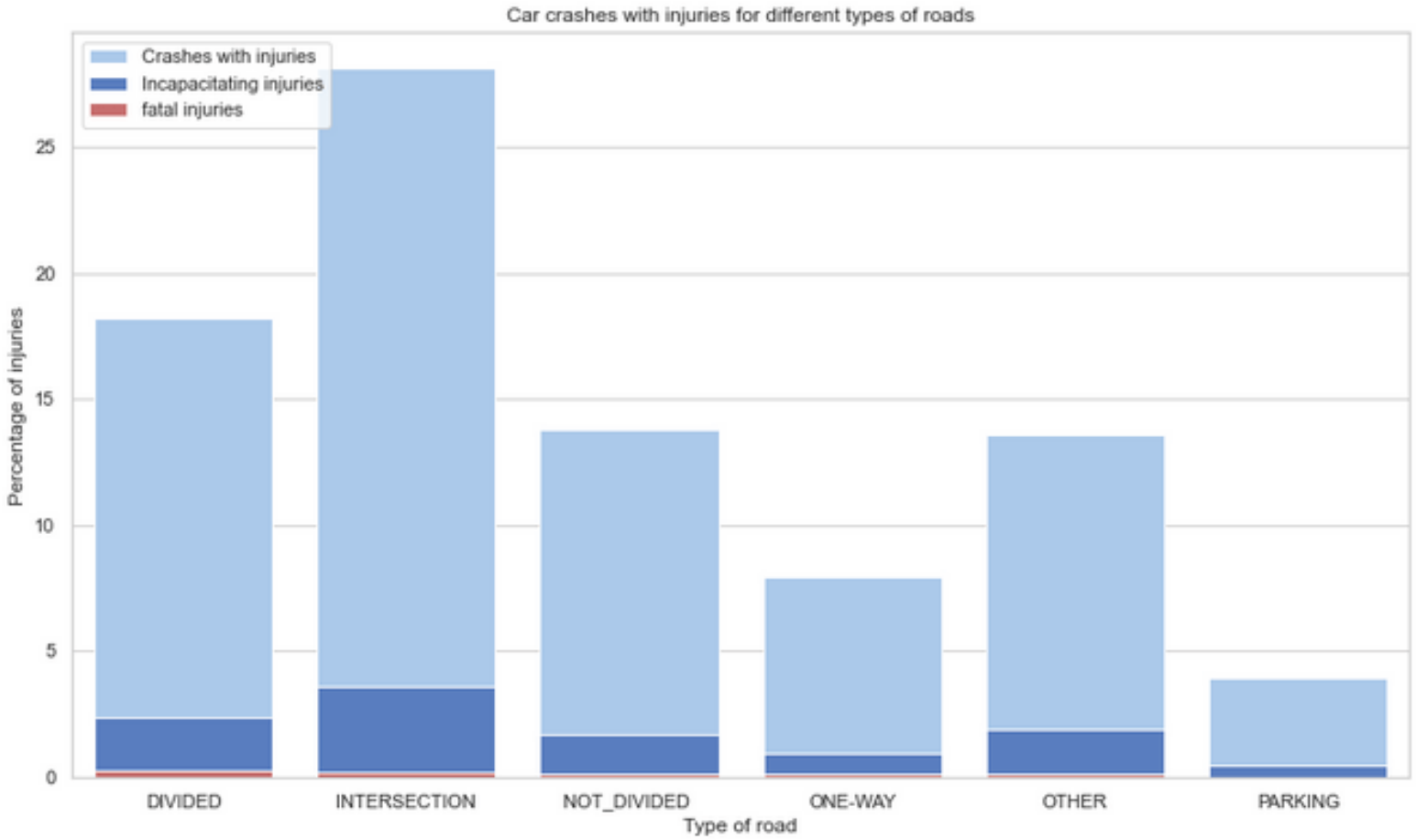


LIGHTNING MATTERS

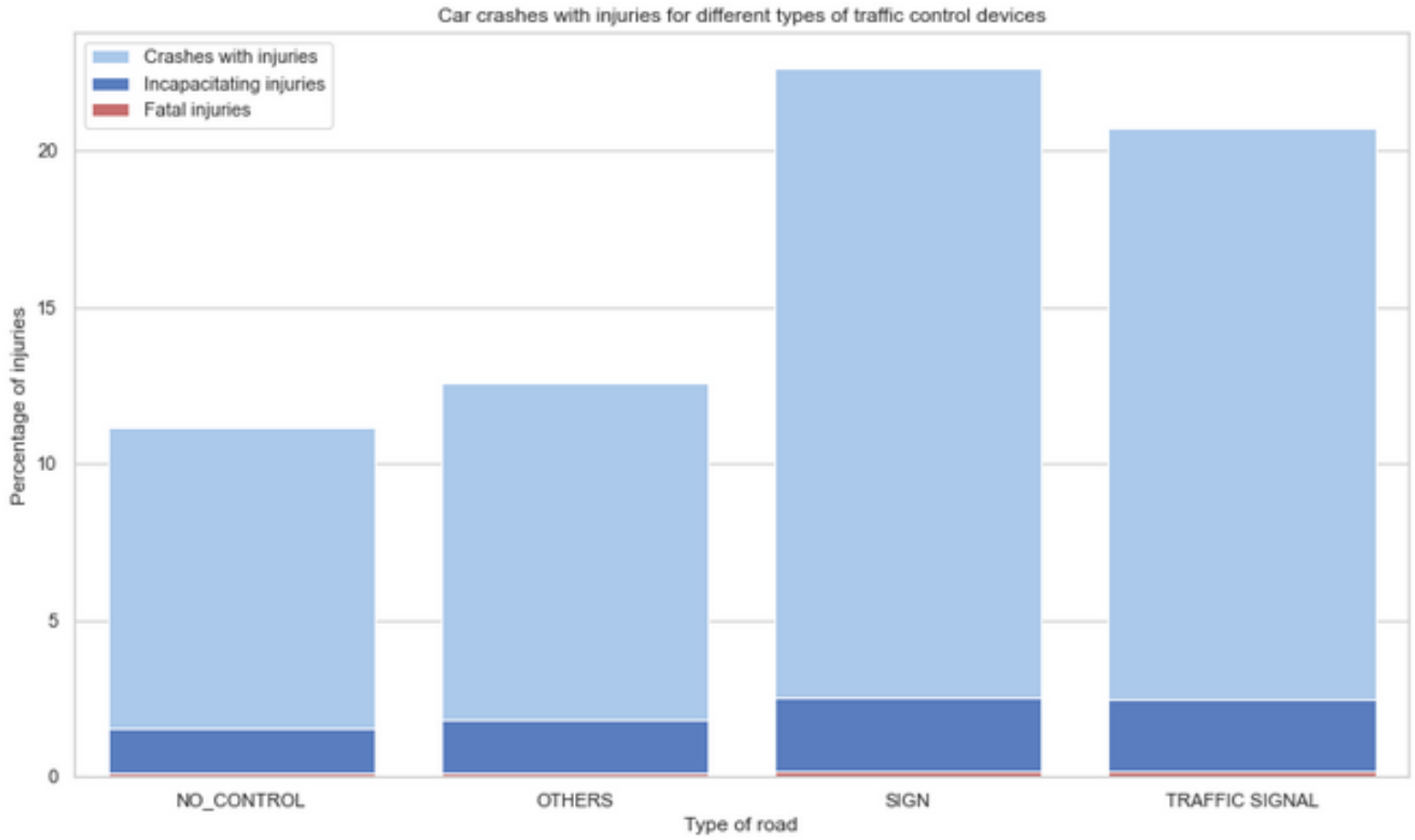




INTERSECTIONS ARE DANGEROUS



ROAD SIGNS AND INJURIES



MODEL HIGHLIGHTS:

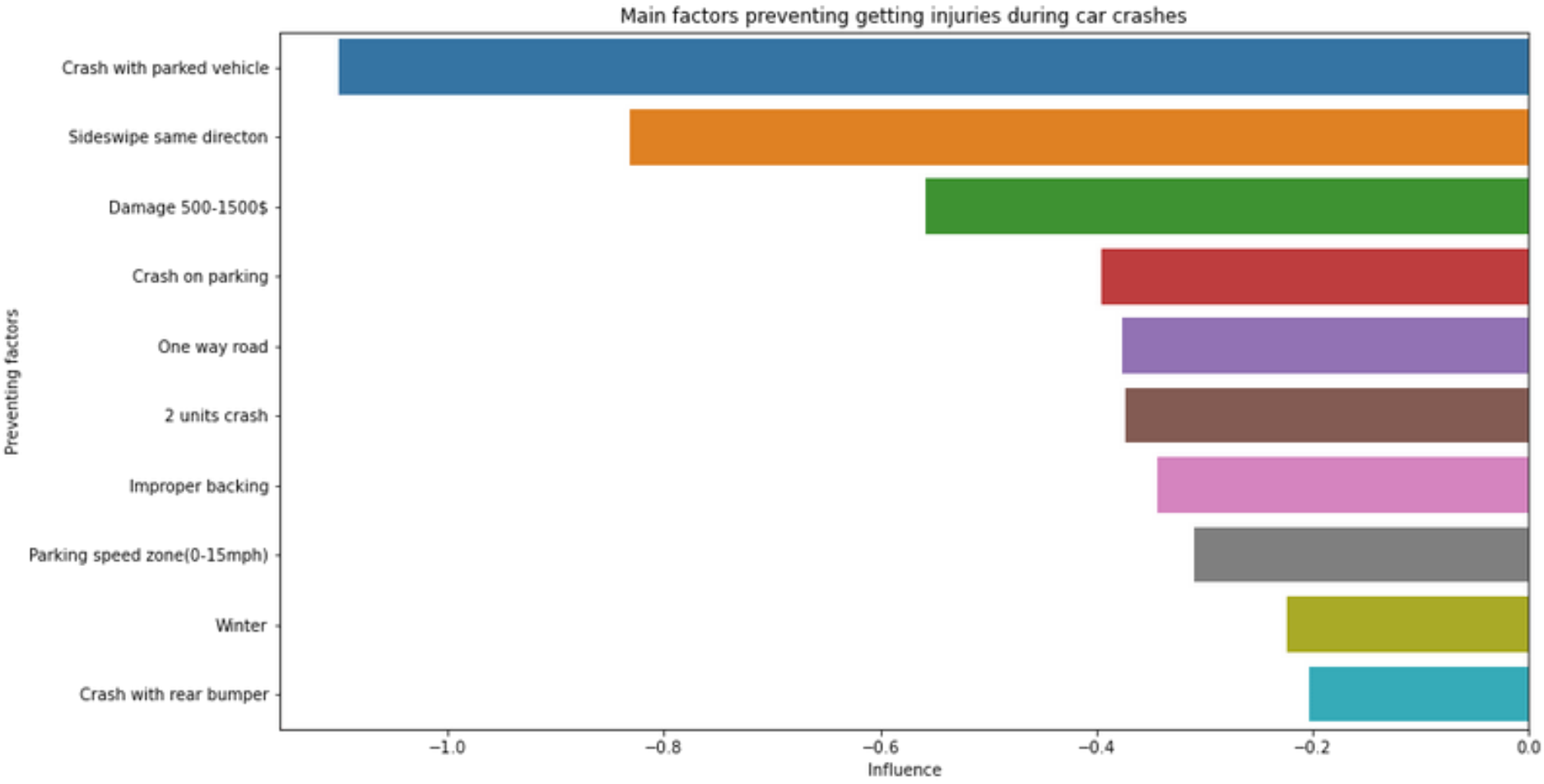
- TRAINED ON **100 000 RECORDS** IN CHICAGO 2021

- FOCUSED ON PREDICTING **CAR CRASHES WITH INJURIES**

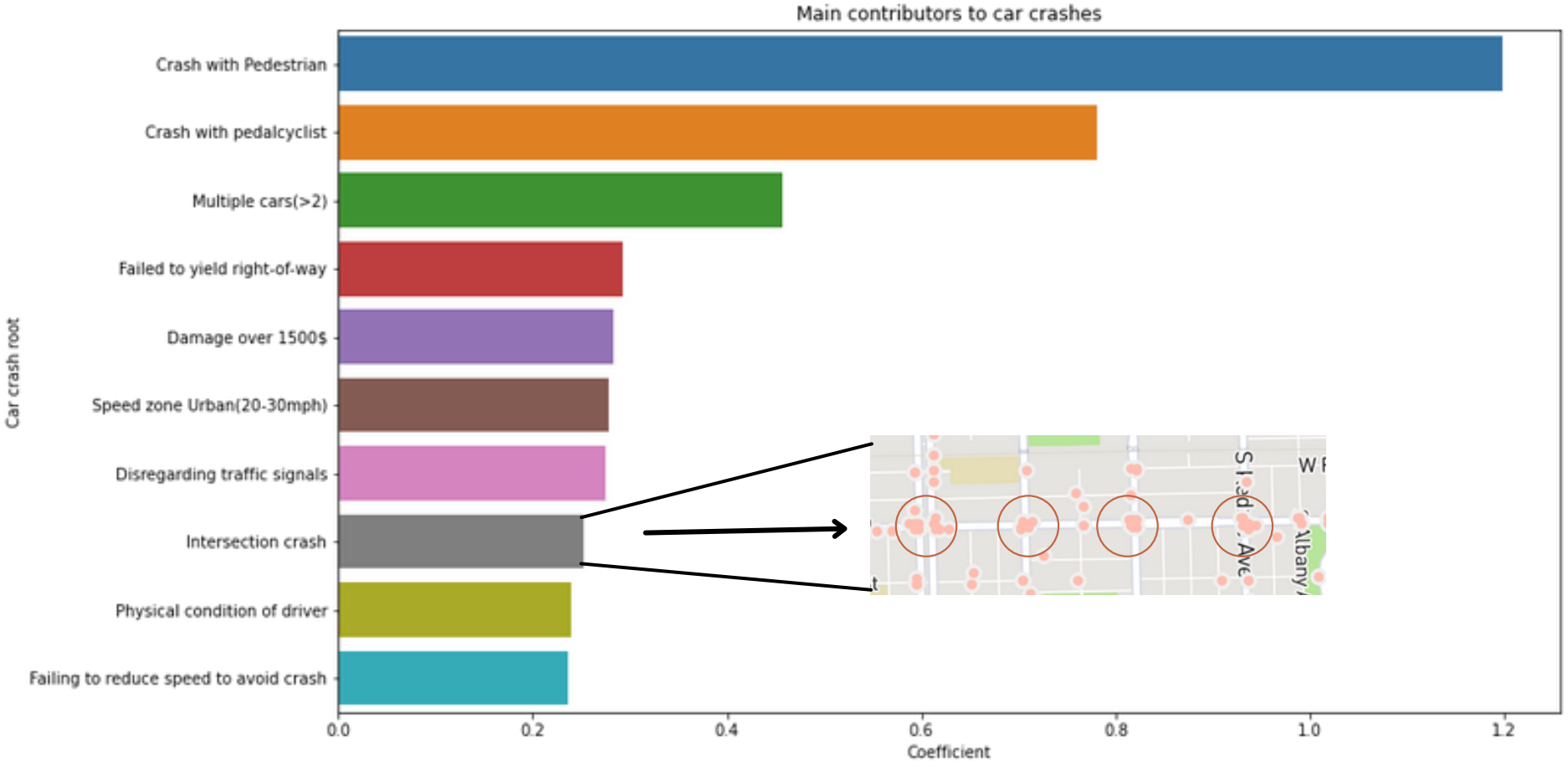
- WAS CHOSEN FROM **MORE THAN 100 CANDIDATES**

- CORRECTLY **PREDICT > 75% CAR CRASHES**

ARTIFICIAL INTELLIGENCE THAT **SERVES FOR HUMANITY**

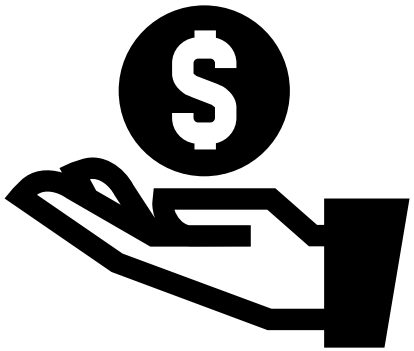


MAIN FACTORS PREVENTING FROM INJURIES
WHEN A CAR CRASH HAPPENS
(BASED ON POLICE REPORTS)



MAIN CONTRIBUTORS TO INJURIES
WHEN A CAR CRASH HAPPENS
(BASED ON POLICE REPORTS)

FINALIZE



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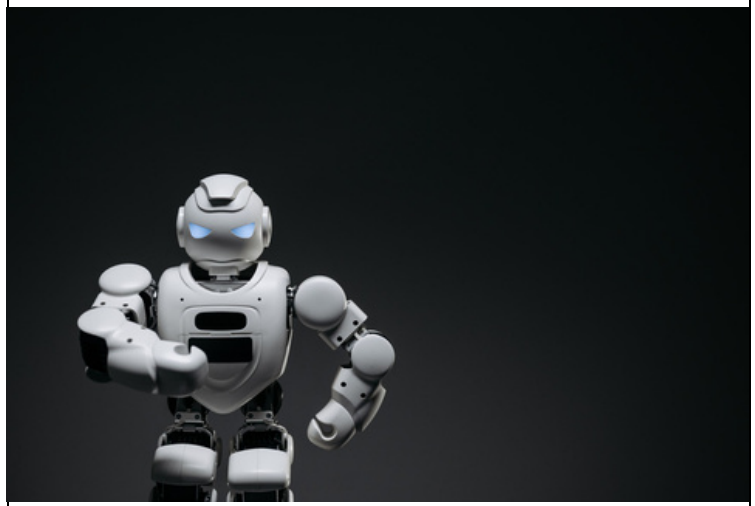
Recommendations



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INFLUENCE OF FACTORS

Places with a lot of pedestrians should be protected

02

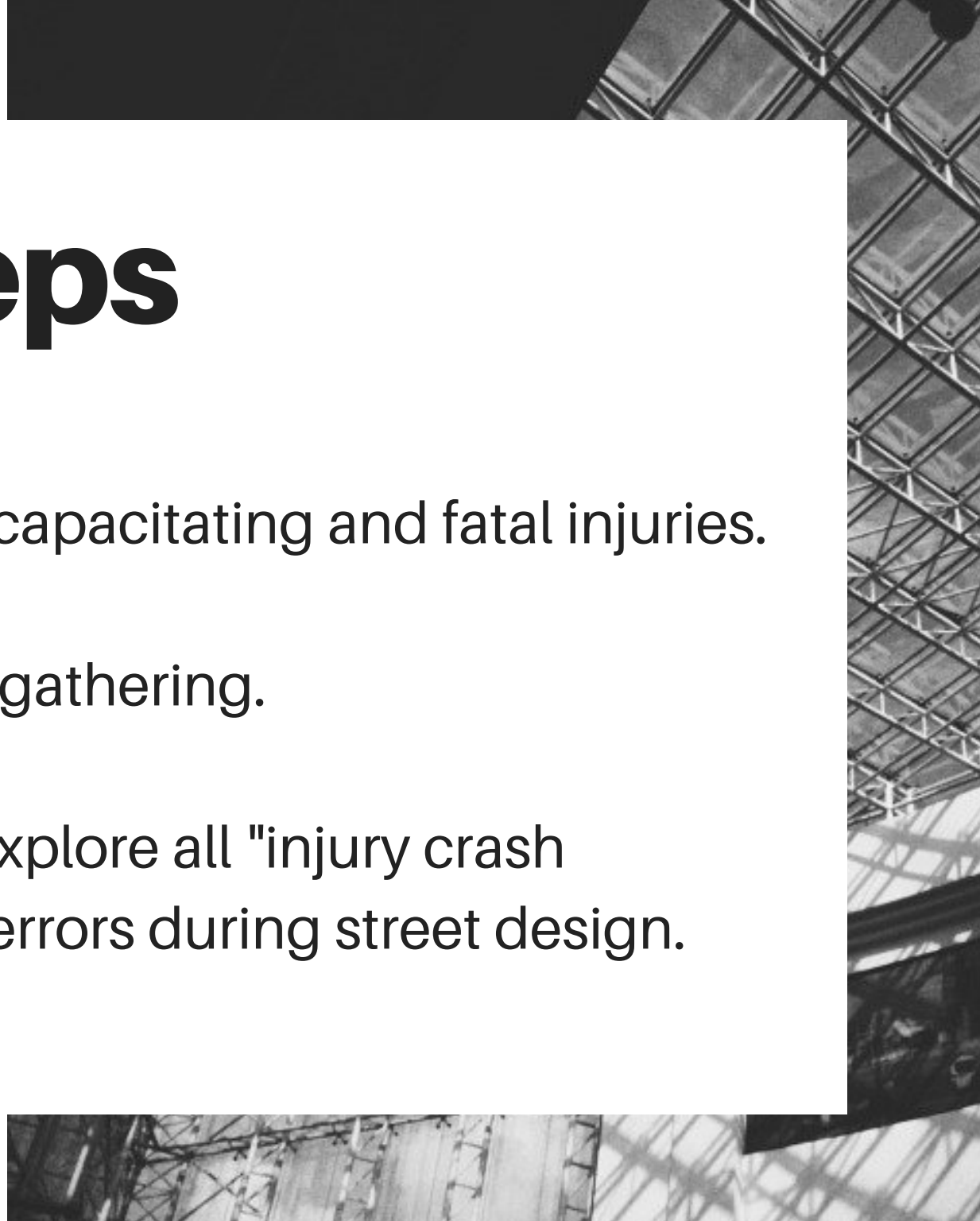
HOTSPOTS

Injuries hotspots should be investigated for additional measures.

03

INFORMATION INPUTS

Data gathering should be modified to reflect "driving skills factor"



Next steps

- Investigate incapacitating and fatal injuries.
- Improve data gathering.
- Identify and explore all "injury crash hotspots" for errors during street design.


"NEVER NEGLECT AN OPPORTUNITY FOR IMPROVEMENT"
SIR WILLIAM JONES

Q & A:

Thank you for joining today's presentation.

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