

# URBAN CO-CREATION DATA LAB

## #5 Emergency



Co-financed by the Connecting Europe Facility of the European Union

# Problem



- Road traffic accidents are responsible and cause of considerable losses, as traffic accidents can result in injury, incapacity, death and in economic prejudice to the people involved and to society in general.
- To reduce and minimize the disastrous effects in human health that traffic accidents can cause, is important that emergency services can define strategies to reduce the time that they take to provide first aid to injured individuals

# Business understanding

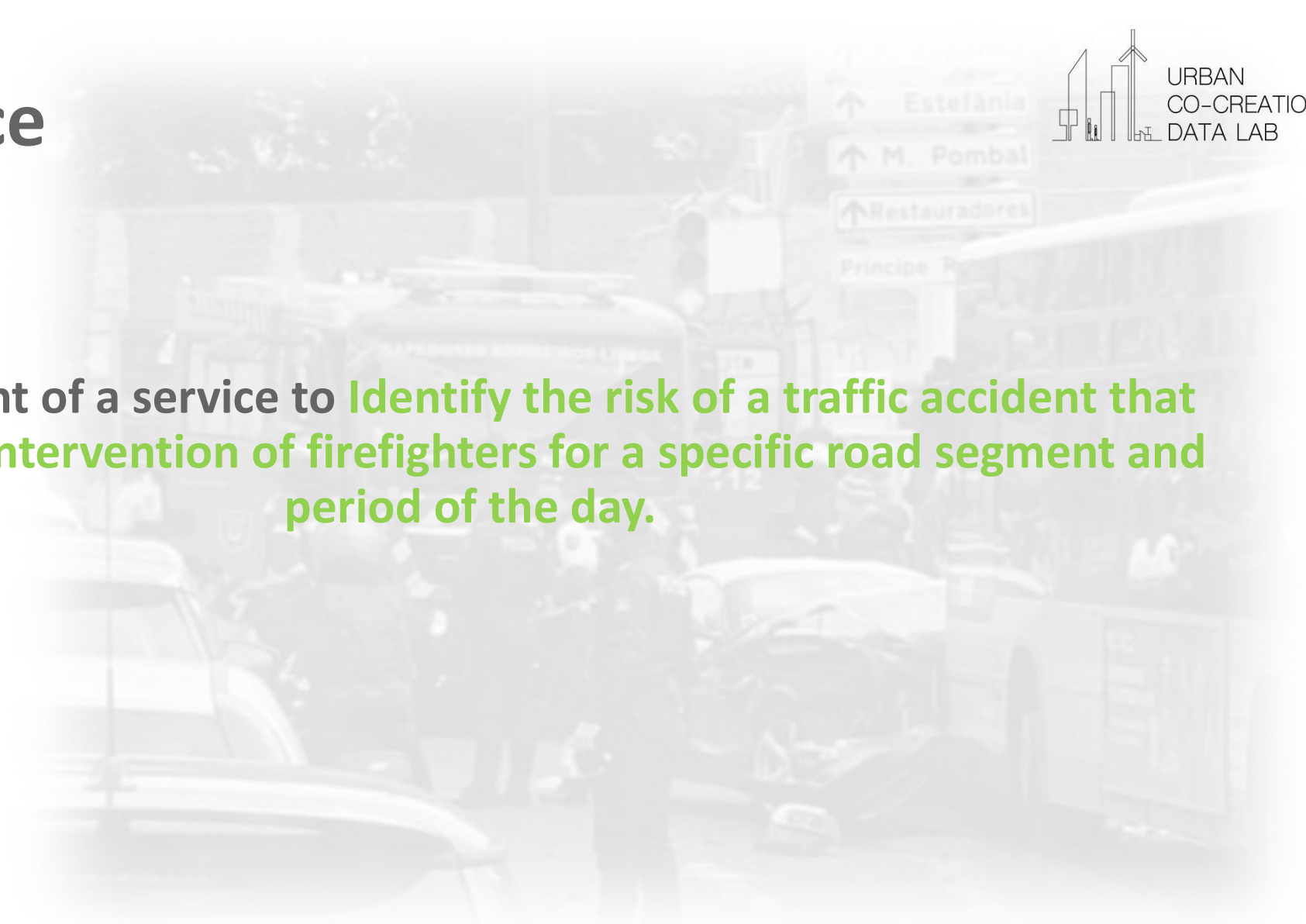


- Emergency services have interest to **optimize the location of emergency vehicles to respond to emergencies**
- Nowadays this location is made based on their **daily acquired knowledge**
- There's the need to **locate more efficiently emergency vehicles**


# Service



Development of a service to **Identify the risk of a traffic accident that involve the intervention of firefighters for a specific road segment and period of the day.**



# Data understanding



Traffic accidents (2013 – 2020)  
6076 occurrences




Road




Weather



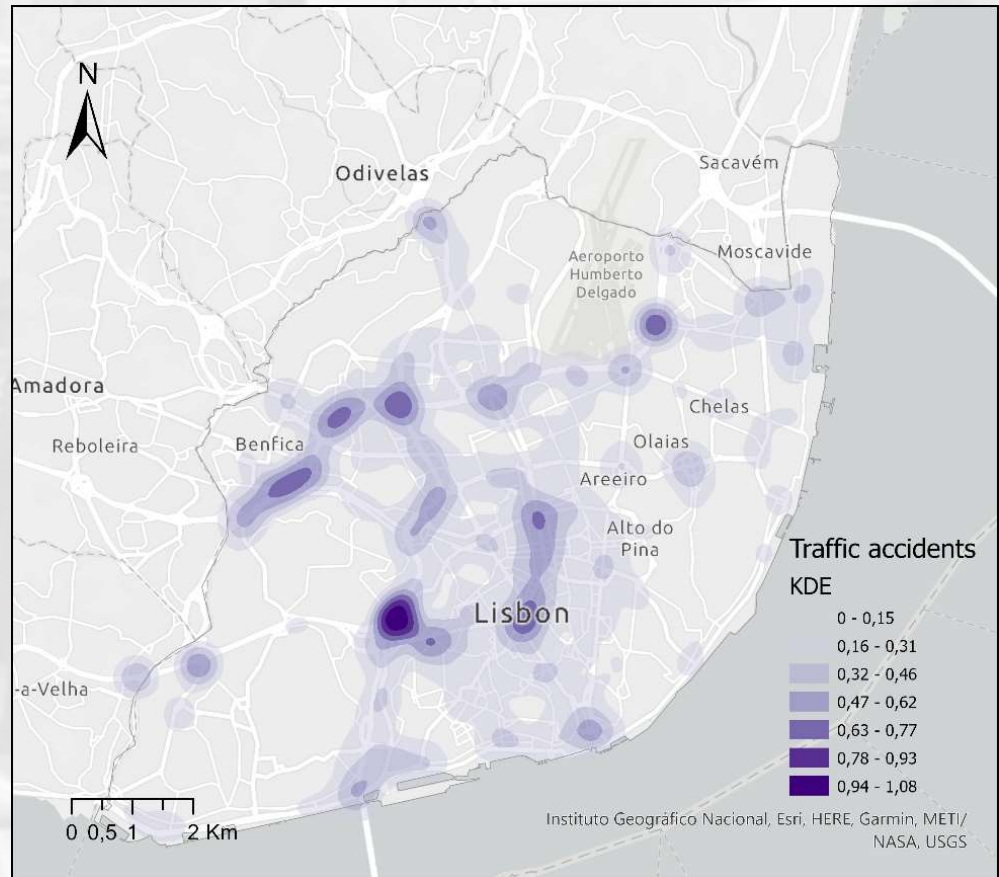
Day period



Weekends  
and holidays

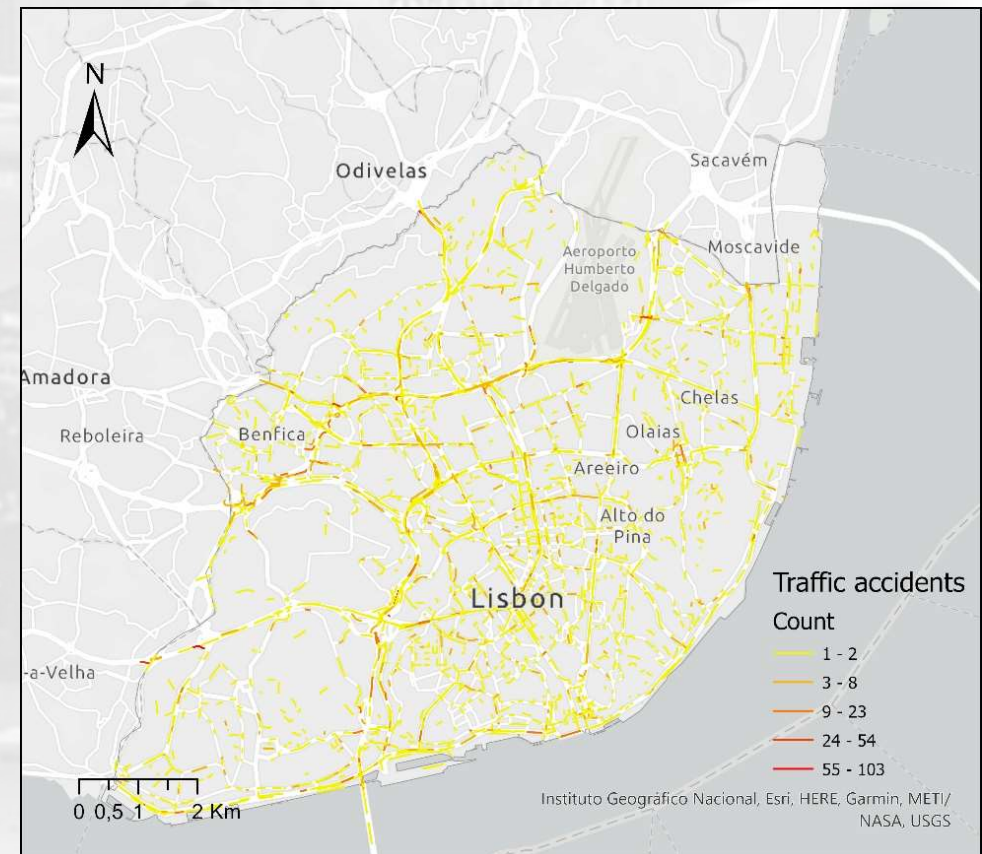


POIs (education, transportation)

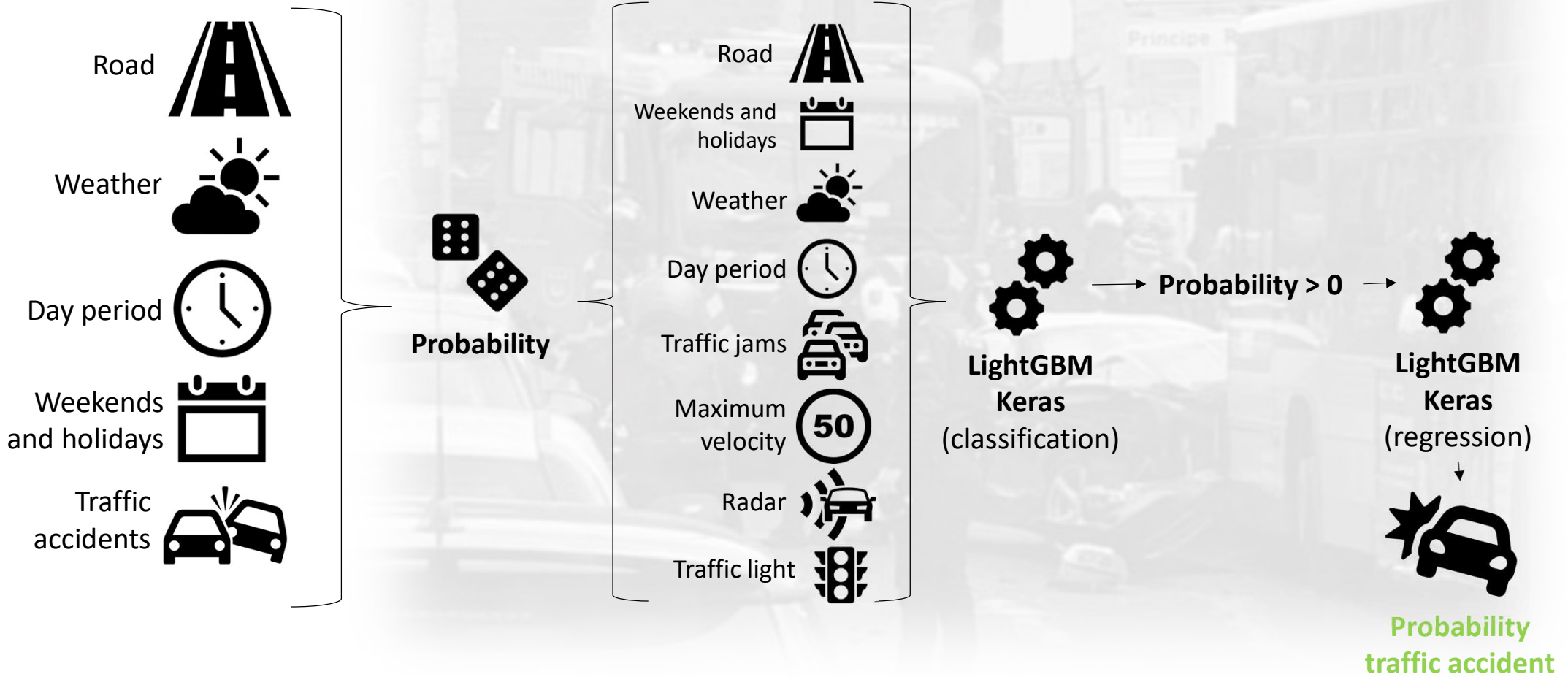


# Data preparation

- Traffic accidents and contextual features were aggregated to the nearest road segment
- Features with temporal component were aggregated in periods of 3 hours



# Modelling



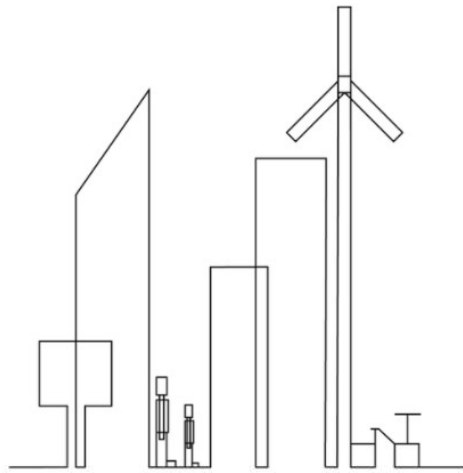
# Modelling

| Model    | Classification (AUC) | Regression (MAPE) |
|----------|----------------------|-------------------|
| Keras    | 0,78                 | 24%               |
| LightGBM | 0,80                 | 20%               |

The LightGBM model was chosen for evaluation



# Evaluation



URBAN  
CO-CREATION  
DATA LAB

## Emergency Challenge Accidents in Lisbon



Overview



Historical



Weather



Road Characteristics



Road Simulator

Beneficiaries:



Co-financed by the Connecting Europe  
Facility of the European Union



Barcelona  
Supercomputing  
Center  
Centro Nacional de Supercomputación

# Thank you

<http://urbandatalab.pt/>



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