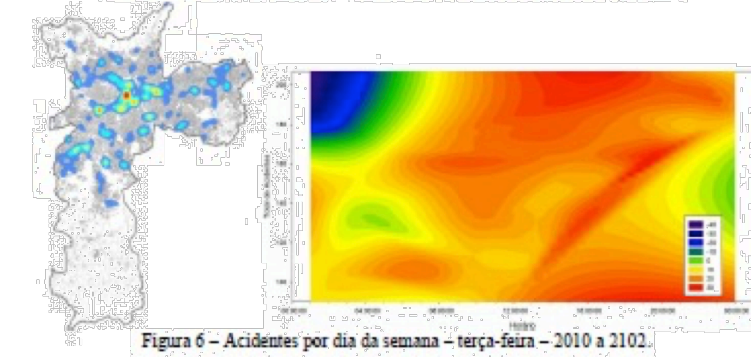
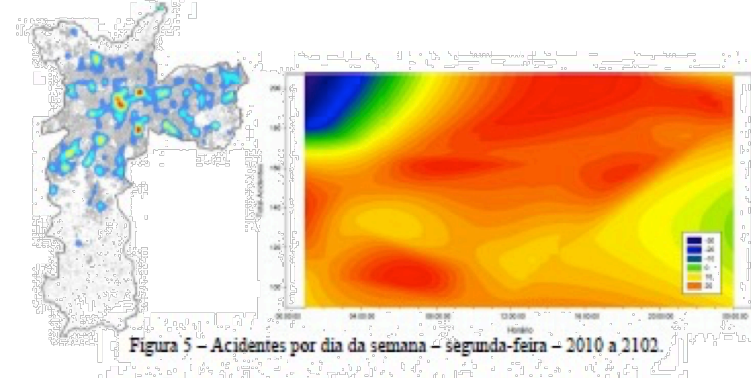
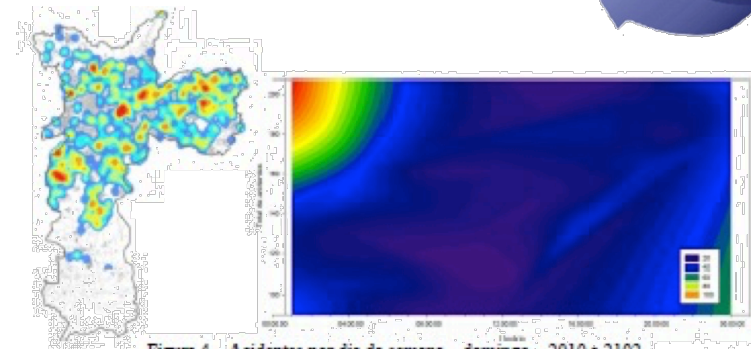


# Pesquisas no PTR



## ➤ Informações Espaciais

- ✓ GIS / Remote Sensing Lab (LabGEO)
- Project: *Space-Time Analysis of Accidents (Road and Urban Environments) to Support Prevention Measures.*

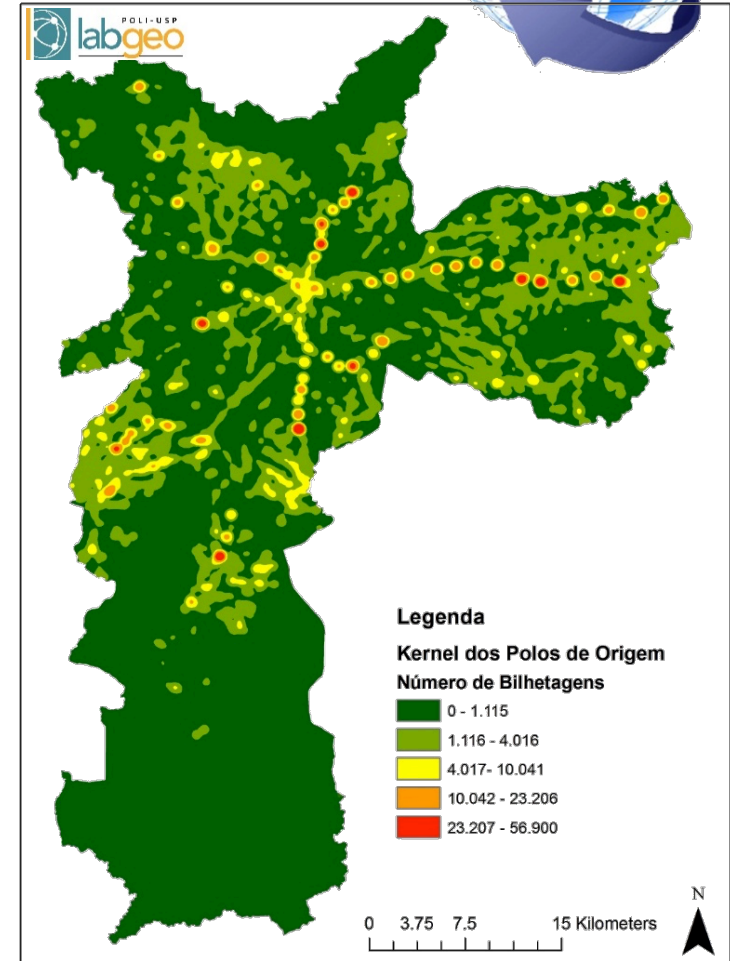
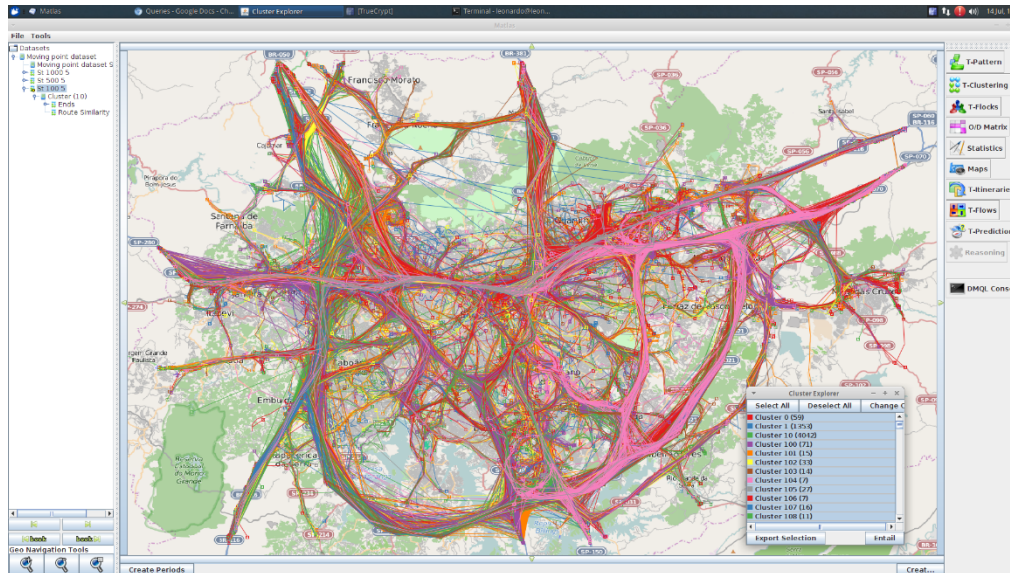


# Pesquisas no PTR



## ➤ Informações Espaciais

- ✓ GIS / Remote Sensing Lab (LabGEO)
- Project: *Spatial Big Data Mining to Support Accessibility and Mobility Mapping* .



*AVL data from Trucks in São Paulo Megacity (Territory Identification, Parking and Consolidation to Support Urban Logistic Planning) .*

*Smart Card Data Analysis from São Paulo Megacity (Calculating Travel Time to Measure Accessibility Indexes)*

# Pesquisas no PTR



- **Informações Espaciais**
- ✓ **GIS / Remote Sensing Lab (LabGEO)**
- *Project: Urban Remote Sensing to Identify Urban Foot Print and Characterize Urban Land Use.*

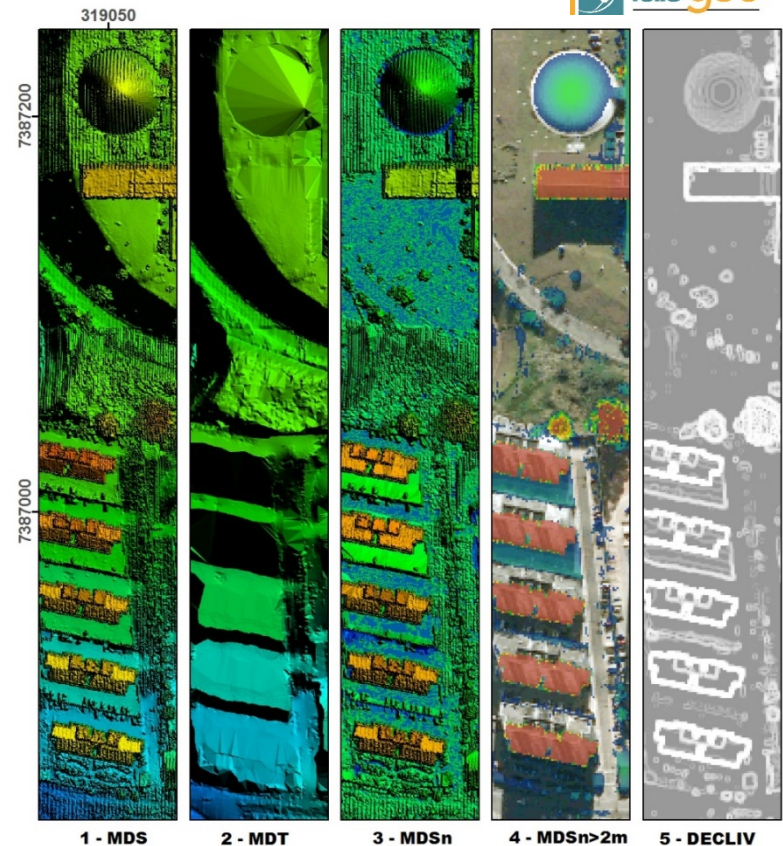
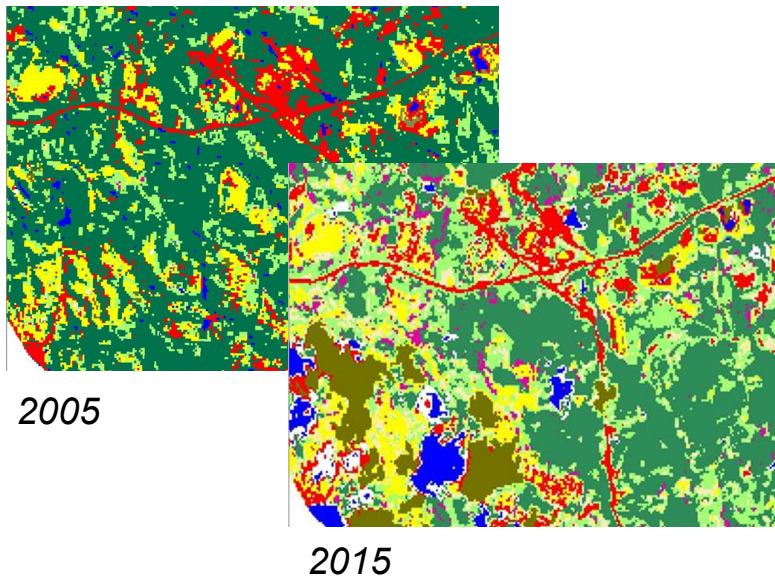
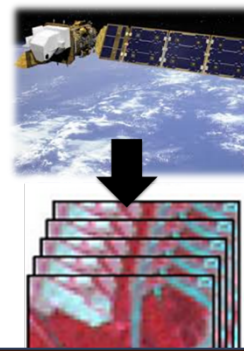


Figure: Lidar, Orbital Image and Aerial Photography Classification of Land Cover.

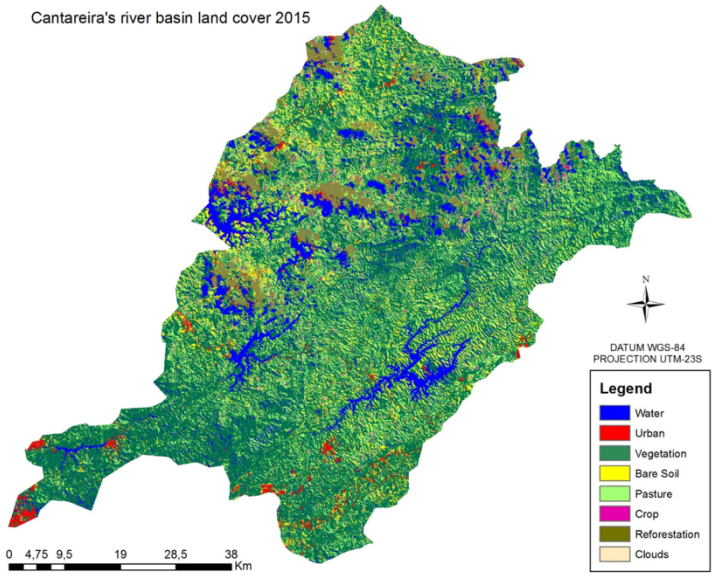
# DETER MANANCIAIS PROJECT



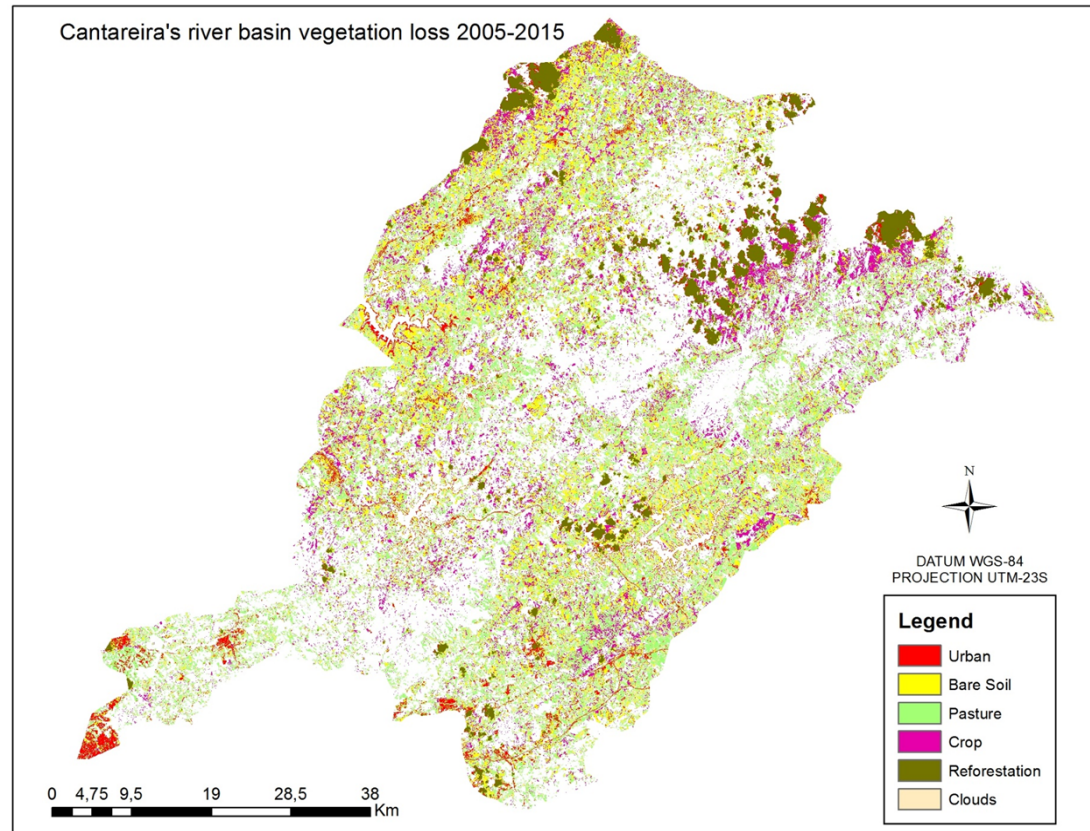
The main objective is to present a methodology to process an extensive temporal series of Landsat imagery and classify land cover changes associated with forest loss in water supply reservoir areas. This is done in order to support the definition of *priority areas* for water and landscape management, which could be better investigated based on high resolution remote sensing

# Alto Tietê and Cantareira Cascade Water Supply System (2005 – 2015)

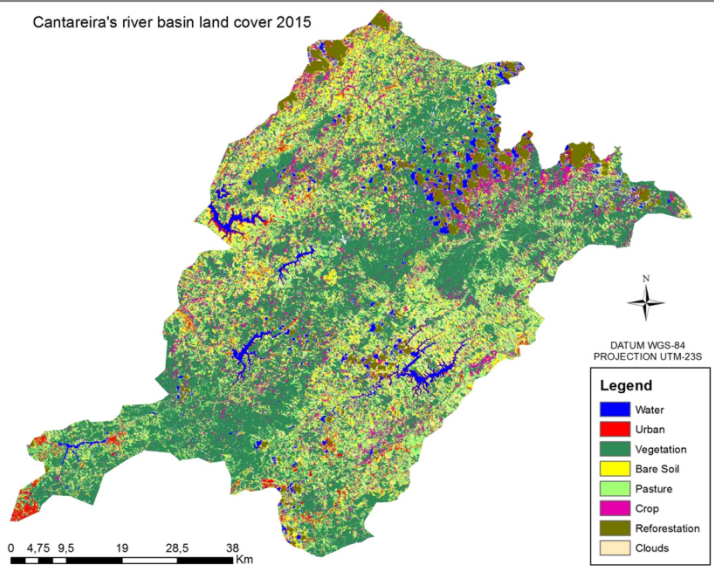
Cantareira's river basin land cover 2015



Cantareira's river basin vegetation loss 2005-2015



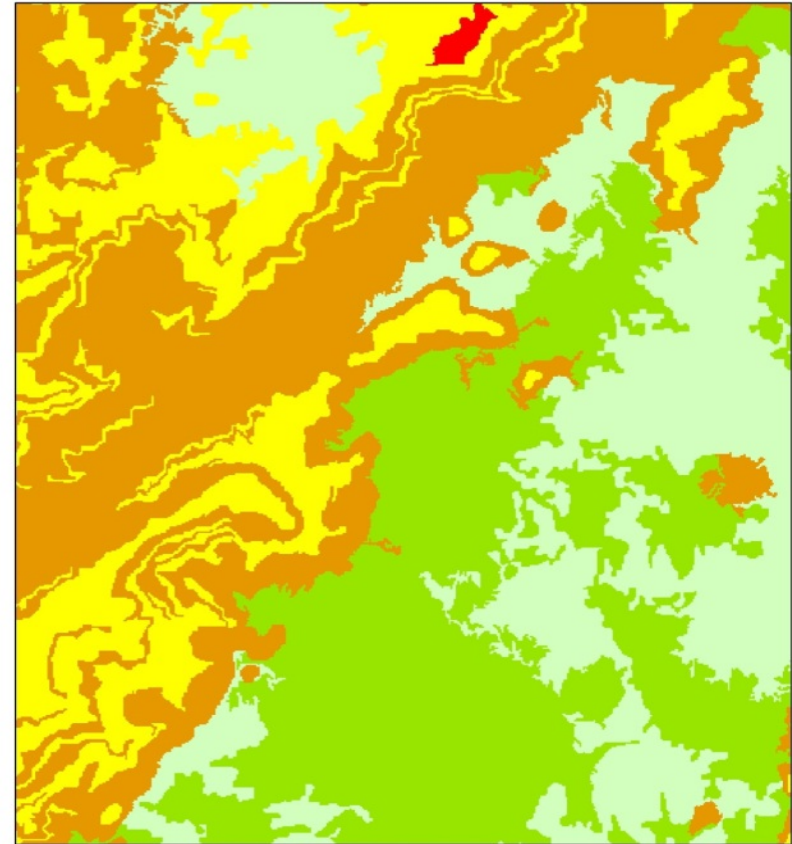
Cantareira's river basin land cover 2015



**Vegetation loss/ conversion  
classes**  
**Reservoir area  
Shrinkage**

# Relief Subdivision

Relief Features at the  
landslide region



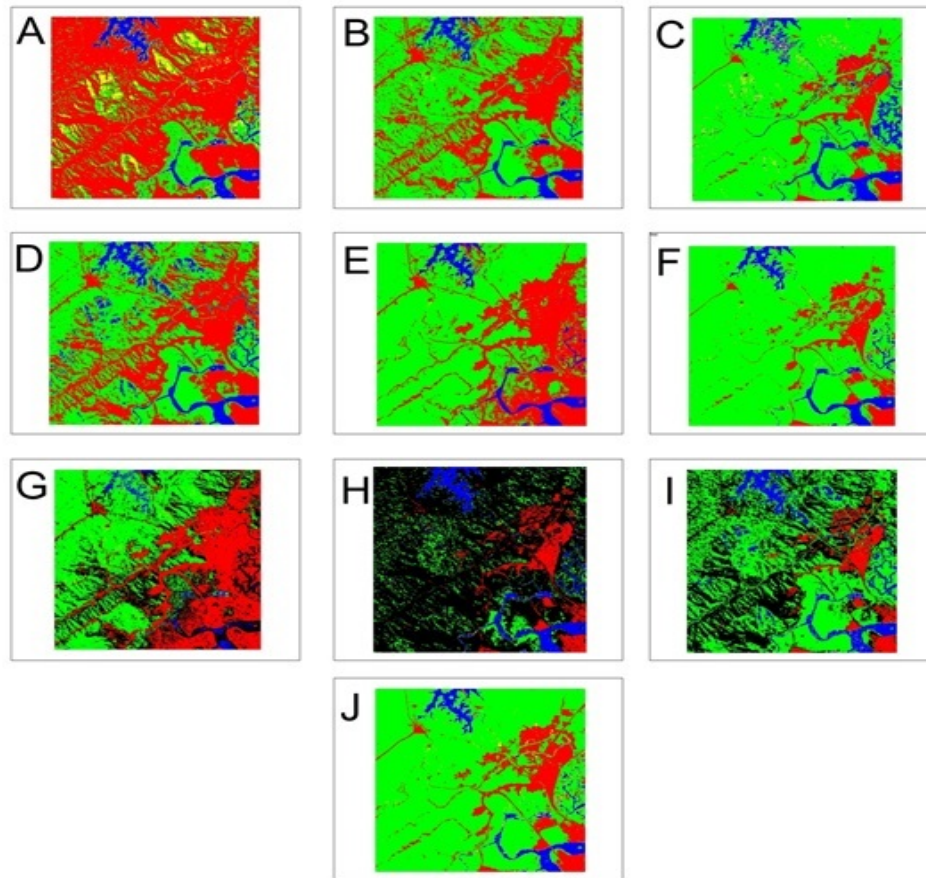
## Legend

- Flood Plains
- Erosion Plains
- Convex Hills
- Concave Hills
- Convex Mountains



Datum WGS-84  
Projection Lat Long  
0 0.5 1 2 3 4 Km

# Multiple Classifiers System

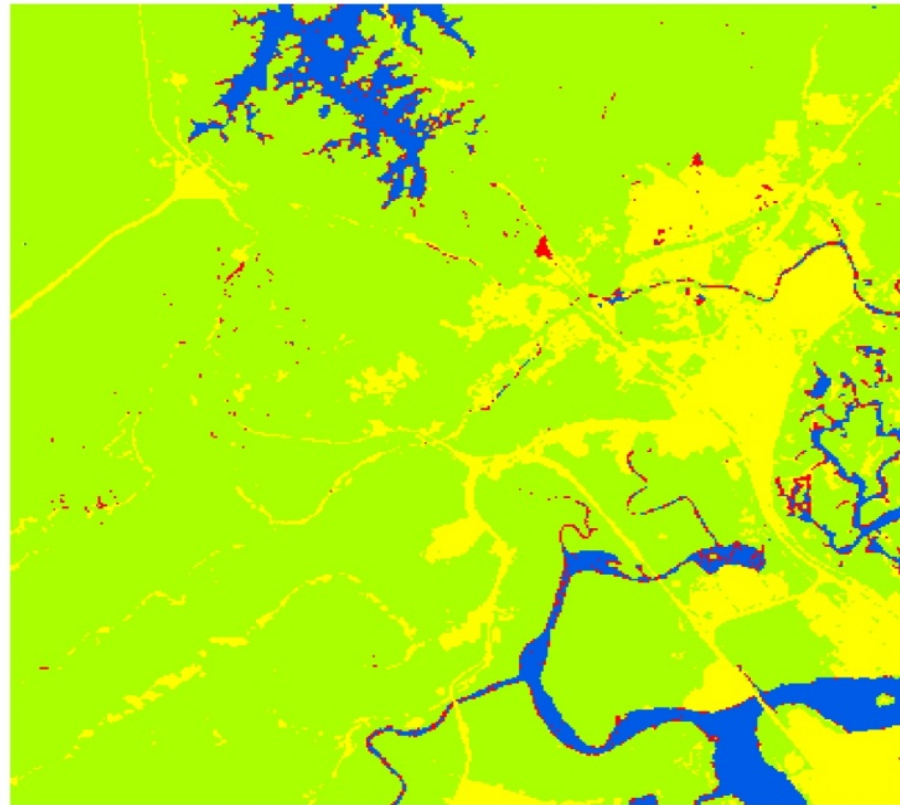


DATUM WGS-84  
UTM 23S

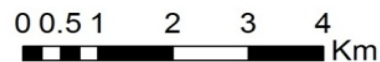
## Legend



# Landslide scars identification



DATUM WGS-84  
UTM 23S



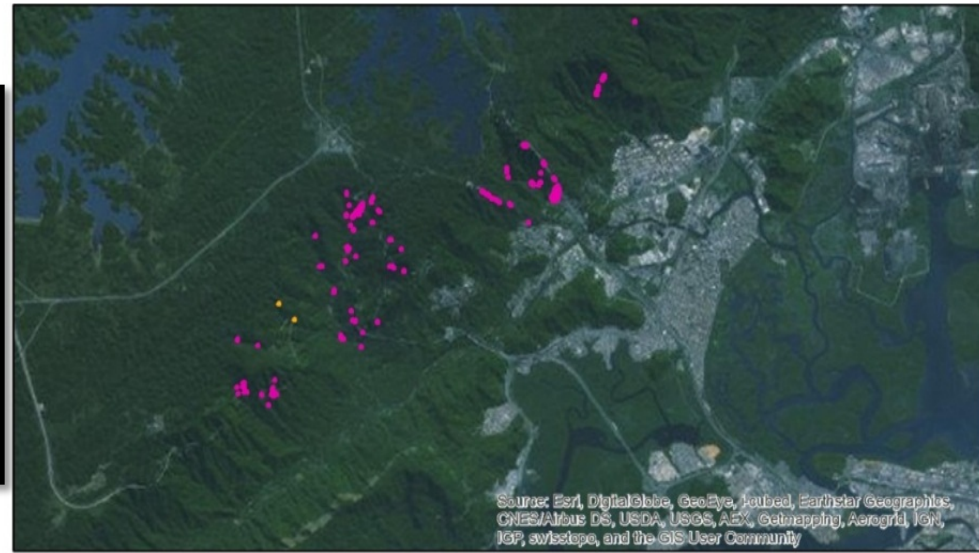
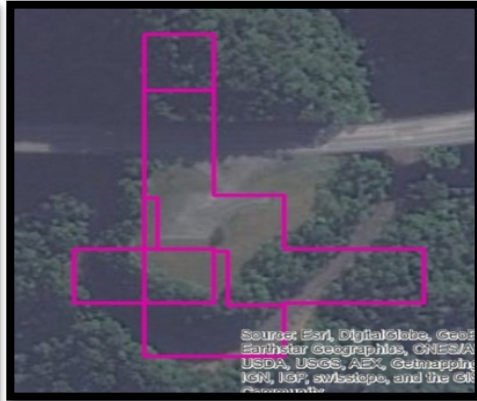
## Legenda

-  Deslizamento
-  Urbano
-  Água
-  Vegetação





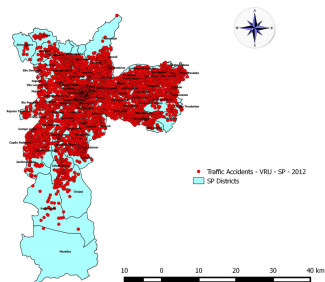
# Results Combination



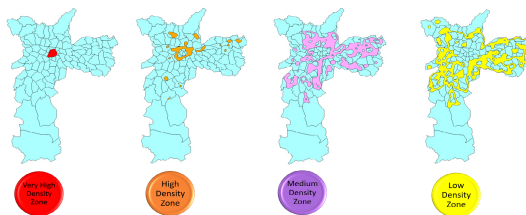
# Characterization of the sites of traffic accidents involving vulnerable road users (VRU) in São Paulo City, Brazil and Rome, Italy

## Kernel-Density Estimator Analysis

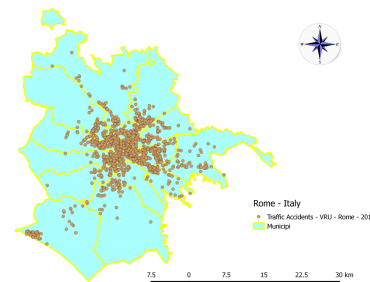
São Paulo - Traffic Accidents VRU - 2012



Black Spot Zones – Traffic Accidents – VRU - SP



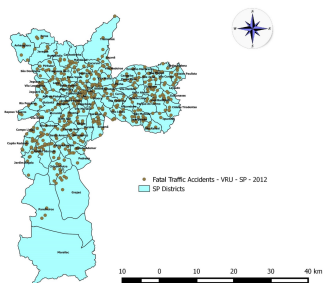
Rome - Traffic Accidents VRU - 2012



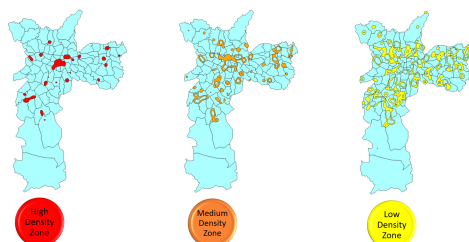
Black Spot Zones – Traffic Accidents – VRU - Rome



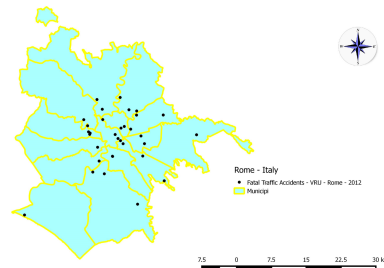
São Paulo - Fatal Traffic Accidents VRU - 2012



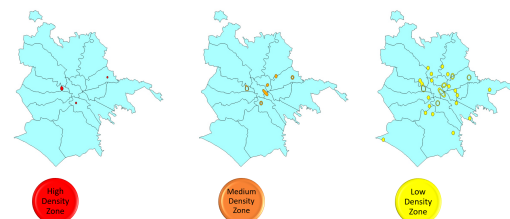
Black Spot Zones – Fatal Traffic Accidents – VRU - SP



Rome - Fatal Traffic Accidents VRU - 2012



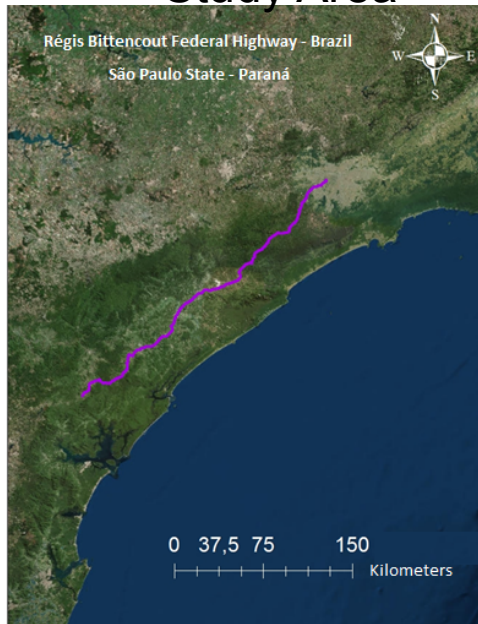
Black Spot Zones – Fatal Traffic Accidents – VRU - Rome



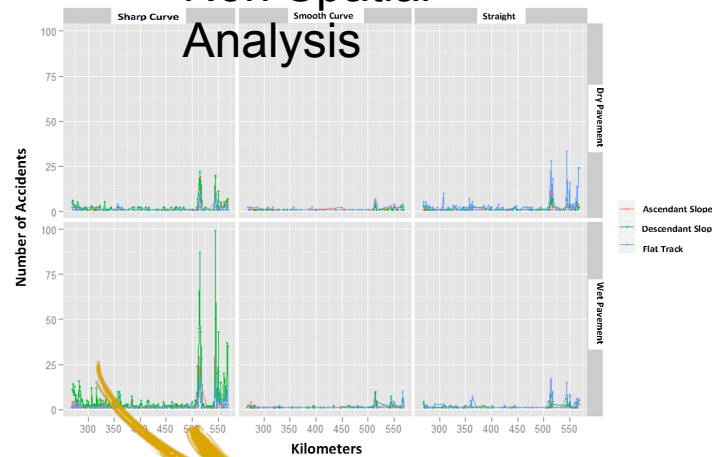
# SOLUTIONS TO REDUCE ROAD ACCIDENTS BY SKIDDING IN RAINY CONDITIONS

## ANALYSIS OF PAVEMENT TEXTURE

### Study Area

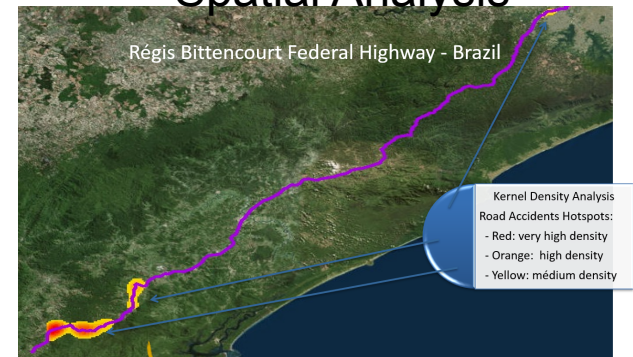


### Non Spatial Analysis



The most critical condition!

### Spatial Analysis



Non spatial analysis and spatial analysis indicate the same critical zones – accidents hotspots

***Spatial Data Infrastructure for  
Technological disaster: An Approach to  
Road Transport of Hazardous Materials.***

José Alberto Quintanilha – Associate  
Professor

Mariana Abrantes Giannotti – Doctor  
Professor

Brazil, September 2015

## **Main Goal**

- Bring up methodologies to GIS based in a SDI - to assist the developments of a system to support the management of technological disasters concerning road transport of hazardous materials (RTHM)

## **Thematic Relevance**

- Road Transport mode is main type of transport of hazardous materials (RTHM). Last decades has been increased the incidence of accidents with RTHM.
- The spatial data has been used to decision making policies for disasters management to provide methodological support to enrolled stakeholders in technological risk management

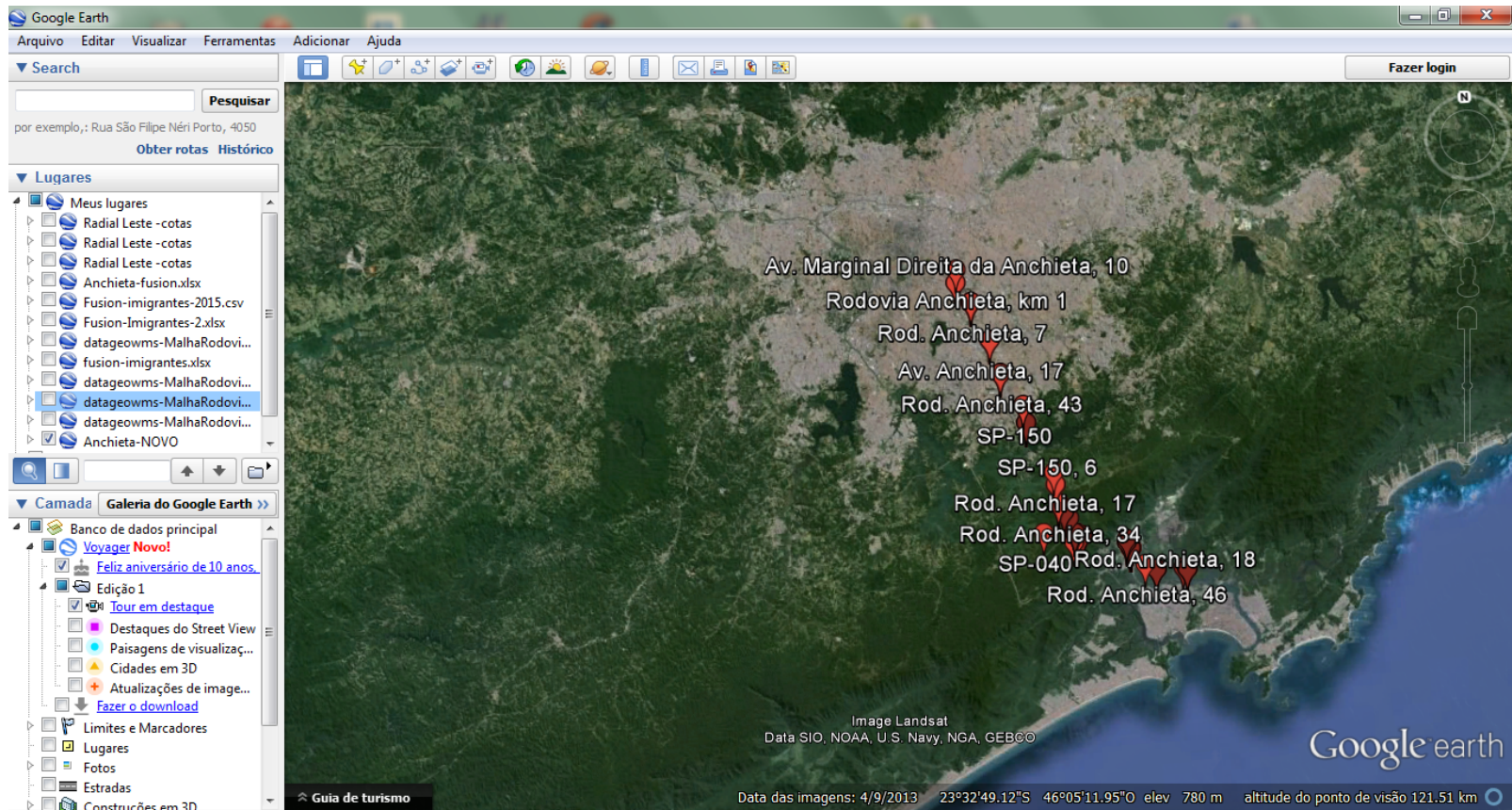
## **Description**

- High incidence of accidents with RTHM;
- To many different data providers;
- Methodologies to integrate spatial data sets;
- Specify a GIS to RTHM based on SDI

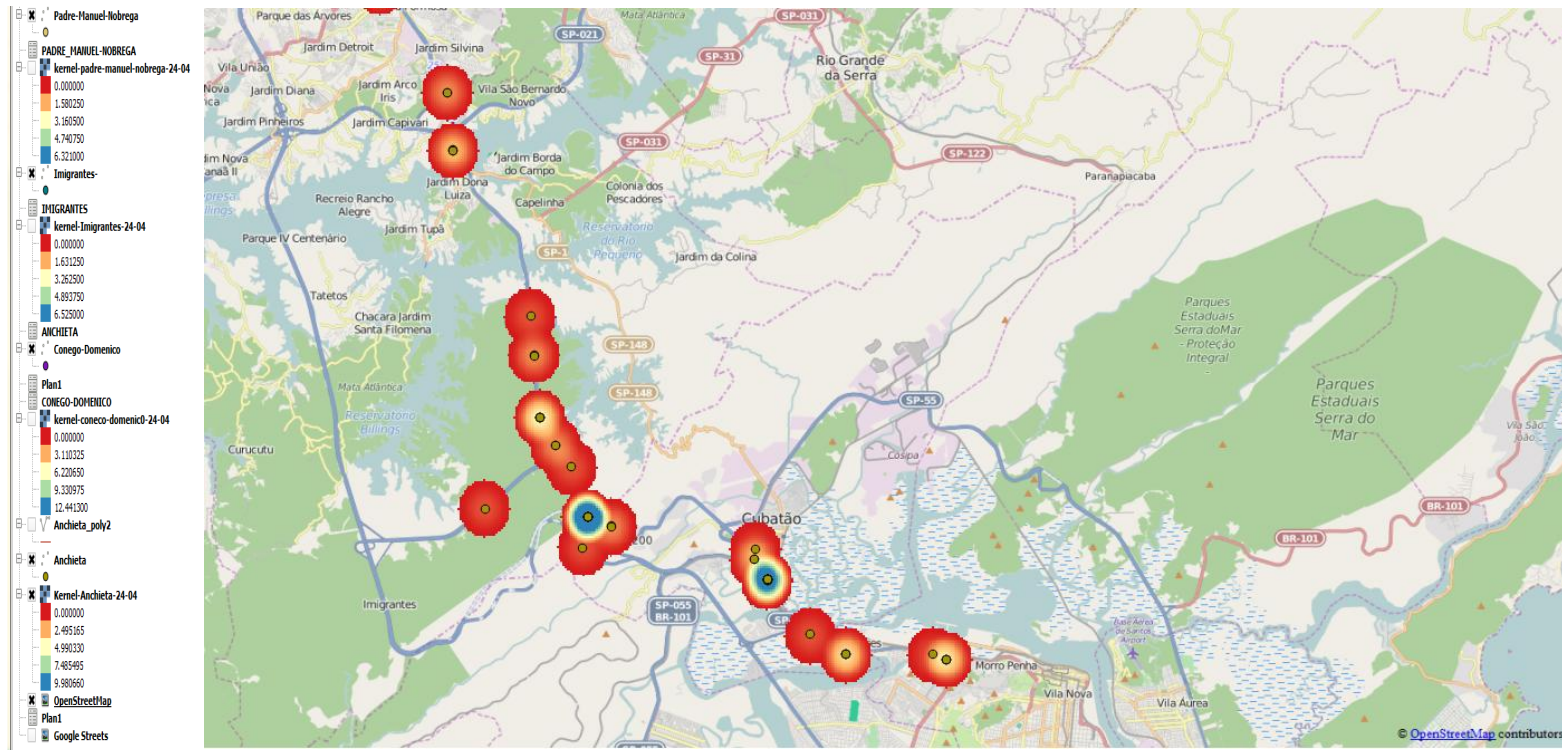
## **Methodology**

- Identify the data providers of the data bases, attribute information, the guides and specifications to the system interoperability;
- Modeling of GIS prototype based in a SDI;

# Georreferenciamento dos acidentes



# Georreferenciamento dos acidentes





## **The Expected Outcomes**

- Develop a methodology to spatial data sharing between different stakeholders to assist the management off technological disaster upon RTHM by a modeling of GIS prototype based in a SDI;
- Specify the data integration procedure;
- Tecnichal specification to provide methodological support to enroled stakeholders in technological risk management.

1.24 million people

died in a car accident in 20

(WHO)

**1.24 million people**

**died in a car accident in 20**

(WHO)

**Brazil: 43,869 deaths in 2010**

**52,260 homicides in 2010**

**Vietnam War: 58,193 U.S. deaths in 20 ye**

# 1.24 million people died in a car accident in 2010 (WHO)

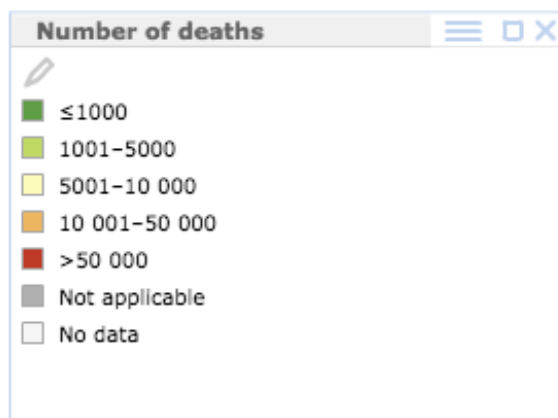
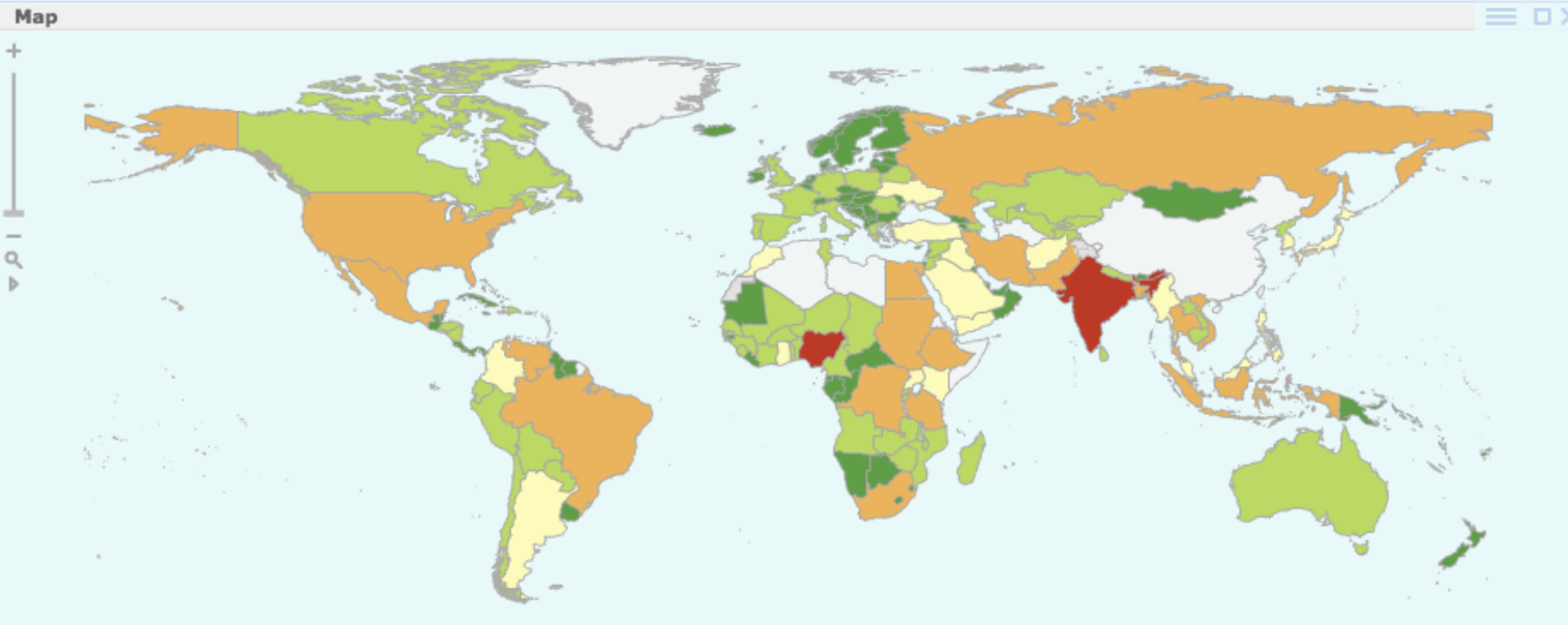
Brazil: 43,869 deaths in 2010

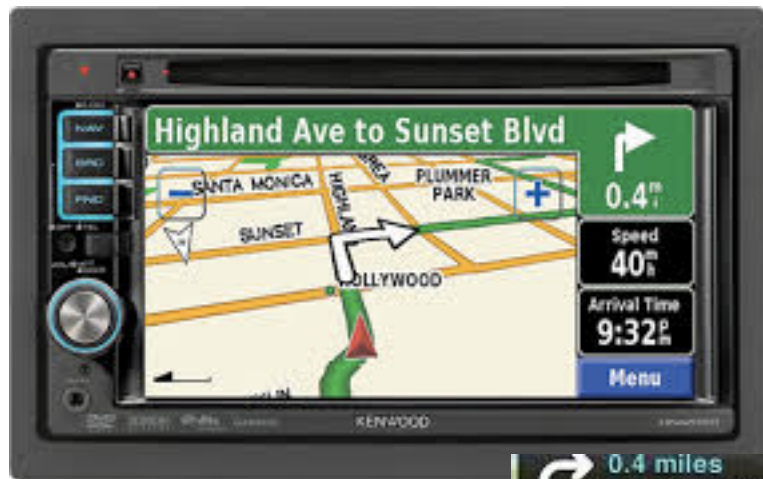
52,260 homicides in 2010

Vietnam War: 58,193 deaths in 20 years

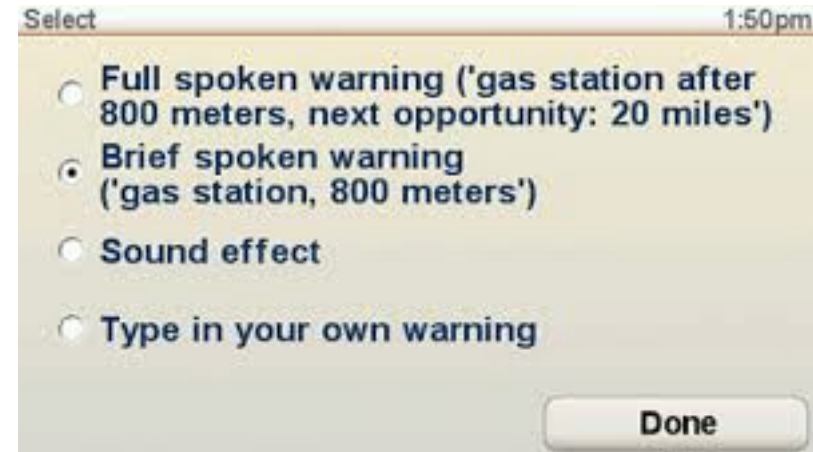
22 deaths/100,000 inhabitants

USA: 11.4 deaths/100,000 inhabitants



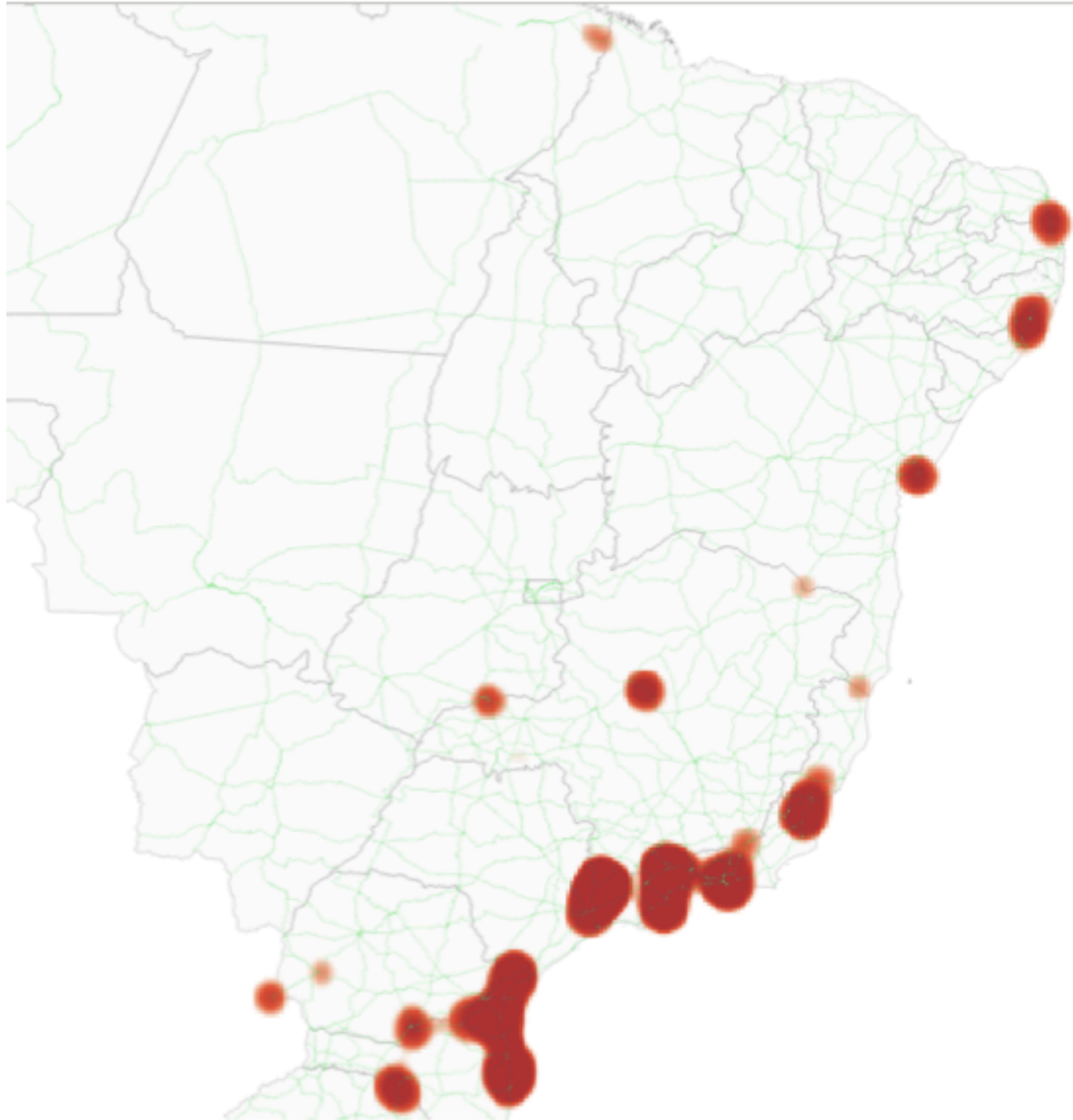


# Point-of-Interest proximity warning

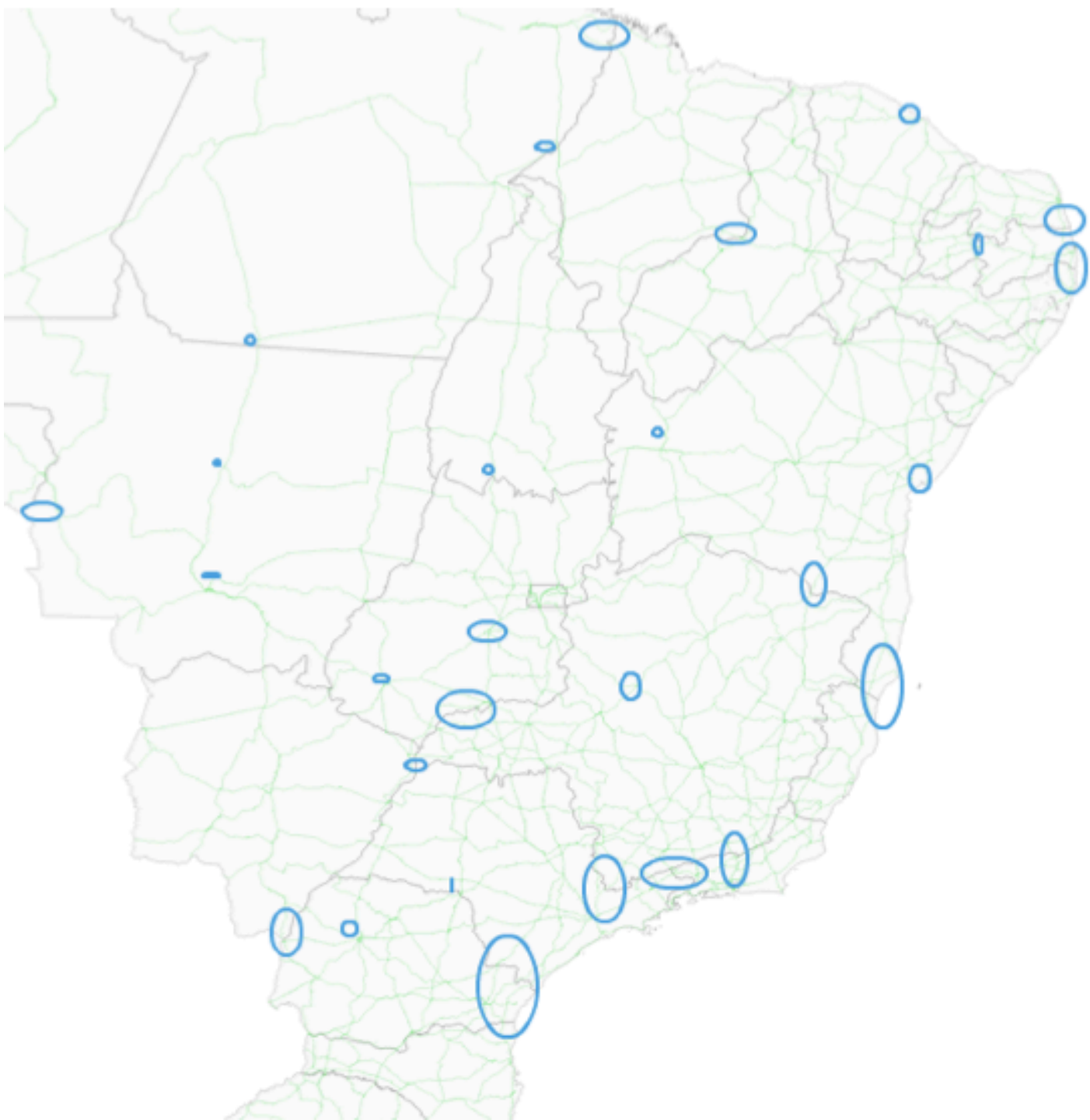


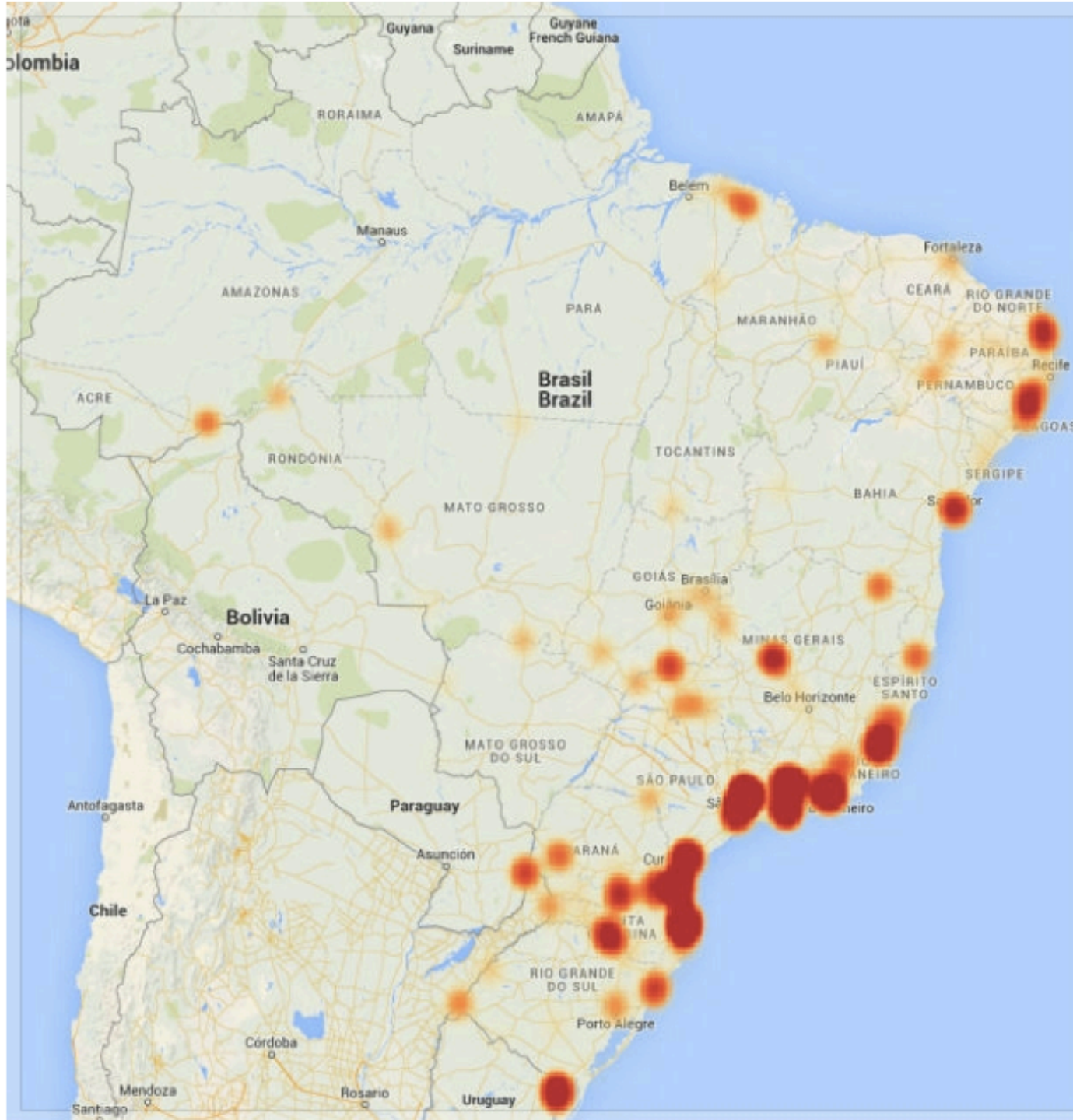
Used to announce:

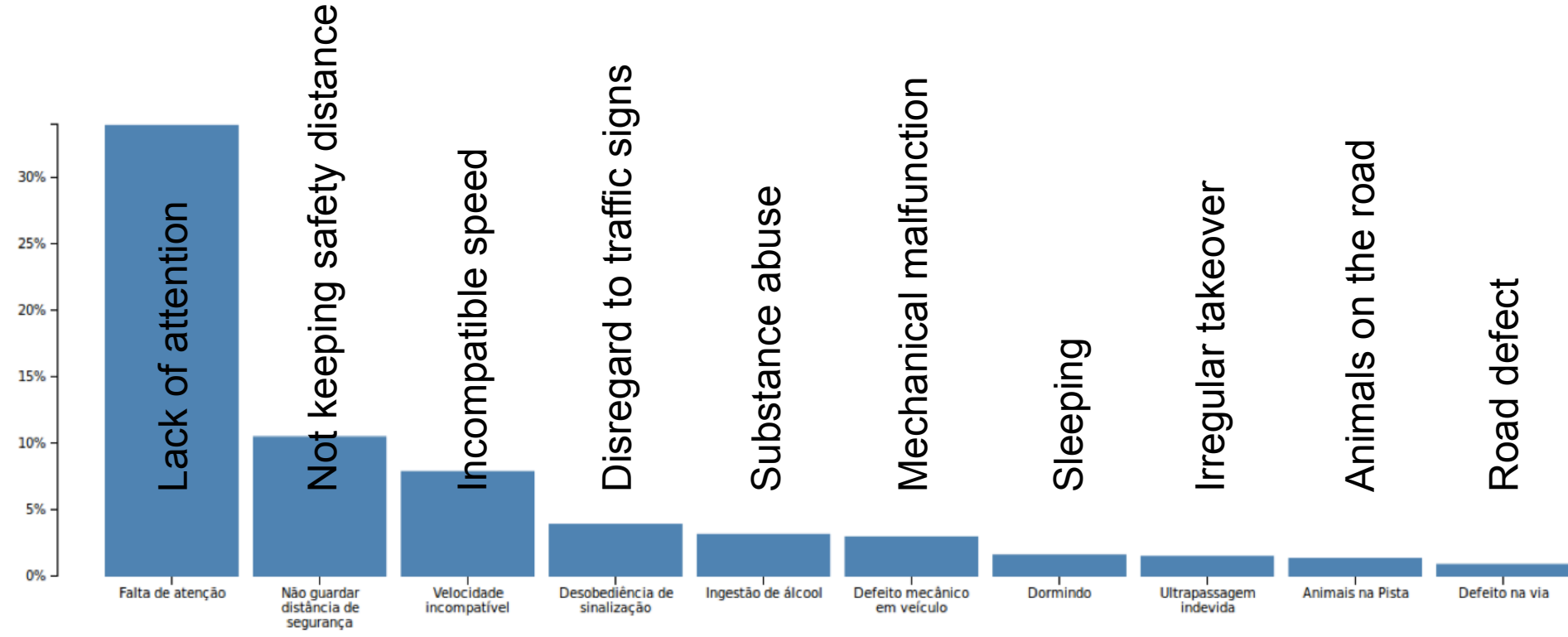
- Points along a planned trajectory
- Speed traps
- Speed cameras











# New use to POI proximity warning:

**Attention: in XXX meters**  
approaching point with a  
high concentration of  
highway accidents – reduce  
your speed and pay  
attention to road conditions



- Clean original data, obtain state/local data
- Enhance spatial analysis
- Define a suitable threshold to consider a point as dangerous
- Get traffic volume statistics per highway segment (normalization)
- Inform number of deaths in the segment
- Publish as GPS-ready POI data files
- Study the implementation for smartphones and the integration to existing navigation and traffic monitoring apps
- Study urban uses

The road safety targets have been included in the final text of the new Sustainable Development Goals adopted by UN member states in New York.

A specific stand-alone target in the Health Goal to reduce road traffic fatalities by 50% by 2020 and a target on sustainable urban transport in the Cities Goal has been approved, in a landmark achievement for the global road safety community.

The final wording of the targets, which will be formally adopted, is:

**“Goal 3:** Ensure healthy lives and promote well-being for all at all ages:

**3.6.** By 2020, halve the number of global deaths and injuries from road traffic accidents

**Goal 11:** Make cities and human settlements inclusive, safe, resilient and sustainable:

**11.2.** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.”

Our research group is applying to contribute to the implementation guide for academia, scientific and research entities and networks.