# Road accidents in France

Every year, around **560 billion** kilometers are being travelled by car in France. This is 1.5 million times more than the distance between earth and the moon.

As a direct consequence, yearly, more than 3'500 people die yearly on the French roads. Since 2005, the French government has been collecting data about accidents, and open-sourced the data on data.gouv.fr. There are several public actors in France in charge of the road safety : communes, departments, the state and private companies. These actors are responsible for 3 major objectives :

Sensitization

Local police and communes are working together on sensitization of the youngster on the road dangers. If they are involved in an accident, death rates among bike riders and pedestrians are incredibly high compared to other transportation means.

We created a Sankey diagram that shows the proportion of cars, bike riders, motorcycles and trucks involved in a crash, displays the survival rate among each category and distinguishes if they were wearing all security equipments. This graph clearly illustrates the fragility and the exposure of motorcyclists and bike riders, and contributes to sensitization of these populations.
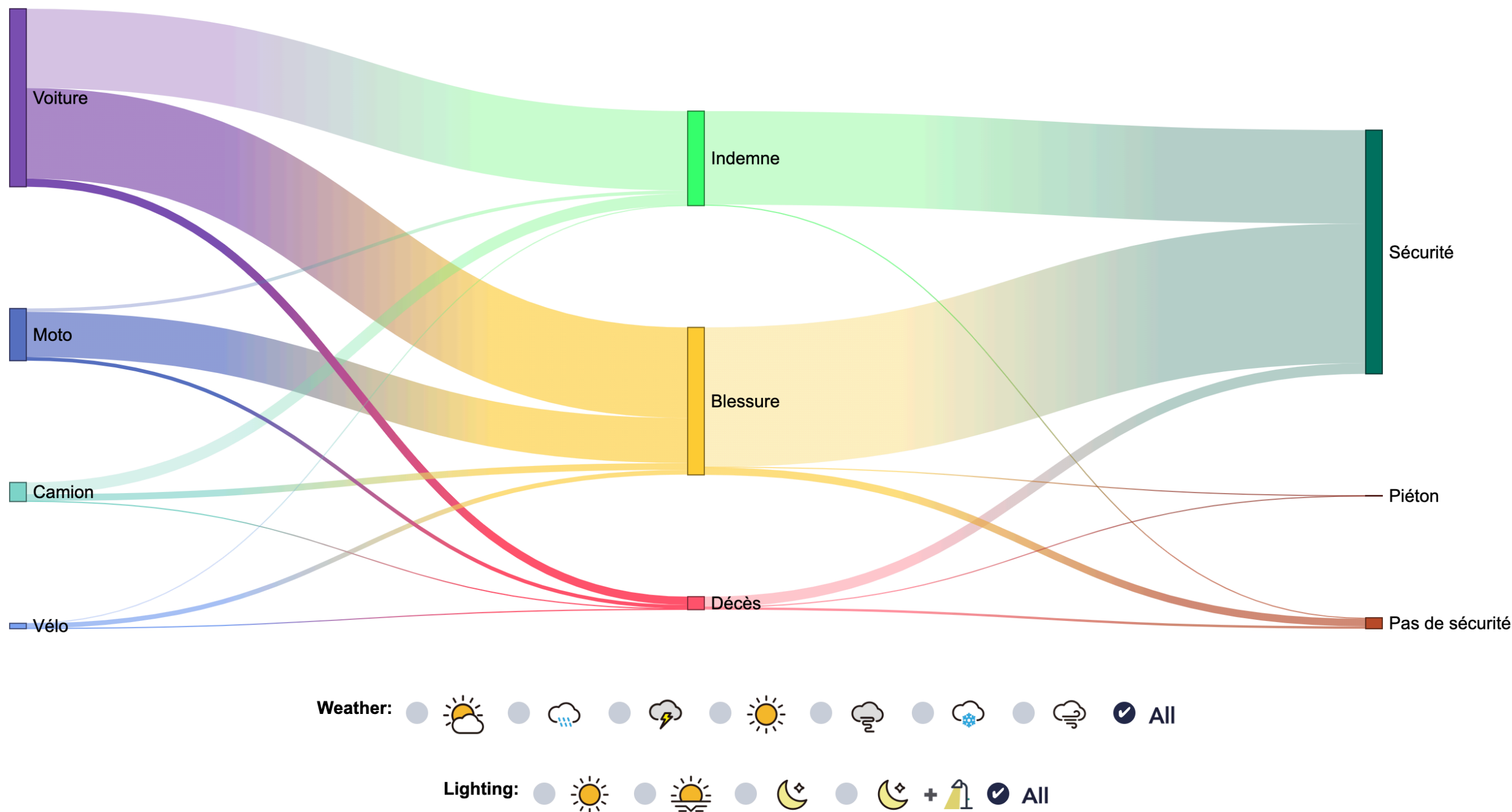
Prevention
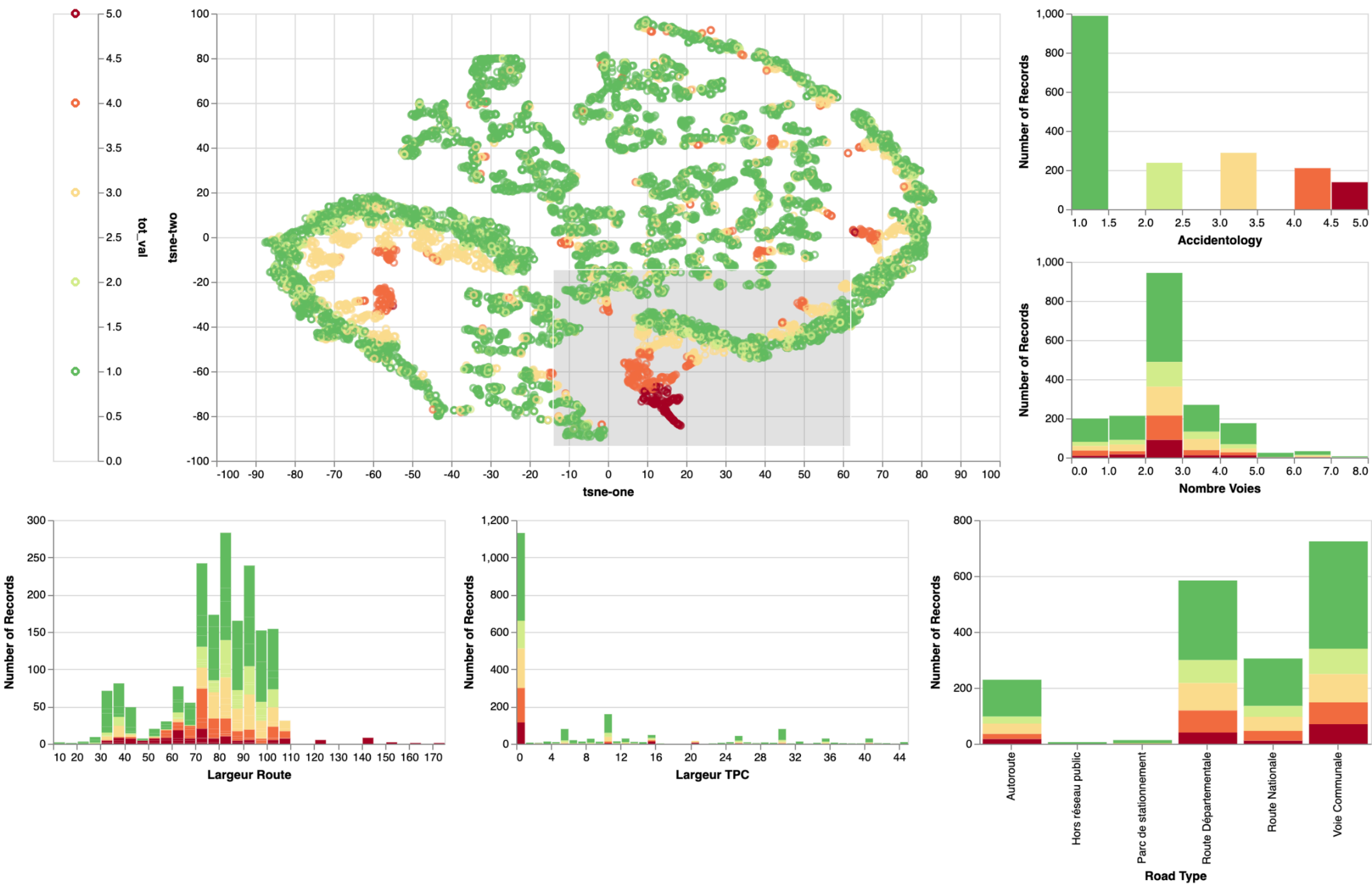
Can communes, departments, or even private companies prevent crashes before they occur? To answer this vast question, we created a graph whose role is to cluster the types of roads (width, surface, infrastructure, proximity of a school…), and their related accident rate, thanks to a T-SNE algorithm. We reduce dimension to allow the user to visualize high dimensional problems in a simple dashboard, and understand local distributions of features.

The user can select the type of road from the different pages (communal, departmental, national, highway), and in each case, observe the clusters created by T-SNE. The green clusters represent a low accident rate, and the red ones a high one. The user can hover on a given point to observe all the characteristics of a given road, and select a region in the T-SNE plot. When selecting a region, the histograms all around the plot are updated.

Monitoring

The last task of road services is to monitor the roads and the accident rate on each road. Additional security measures might be needed in certain cases, or certain conditions. Local authorities might have an idea of what type of road is dangerous, but our visualization brings a clear overall view and allows the user to understand a high dimensional spatial problem and the distributions of several features that impact the severity of an accident.

The user selects regions on the map of France, and all the histograms are updated live. This can be useful to understand the distributions in a given region, and by navigating though the different tabs of the website, focus on the different types of roads.

The map of France becomes a spatial trackpad in some sense, and the color scheme corresponds to the severity of the accidents.