



Squeezing insights from safety data

A multimodal safety score, leveraging data from
connected cars, pedestrian & micro-mobility

PROBLEM

CONTEXT

SOLUTION

PRODUCT

DATA

CASE STUDY

PROCESS

STRENGTH

PILOT

THE PROBLEM

As mobility is getting more complex, safety remains more than ever a major issue for cities

Crashes involving pedestrians & cyclists

41%

of accidents involved a car and another mode

Micro-mobility on the rise

+20%

growth YoY in micro-mobility trips (McKinsey, 2019)

Cyclists crashes

+24%

in serious injuries in 2021 (EU Commission)

On my way to the Paris office - sharing space with vans

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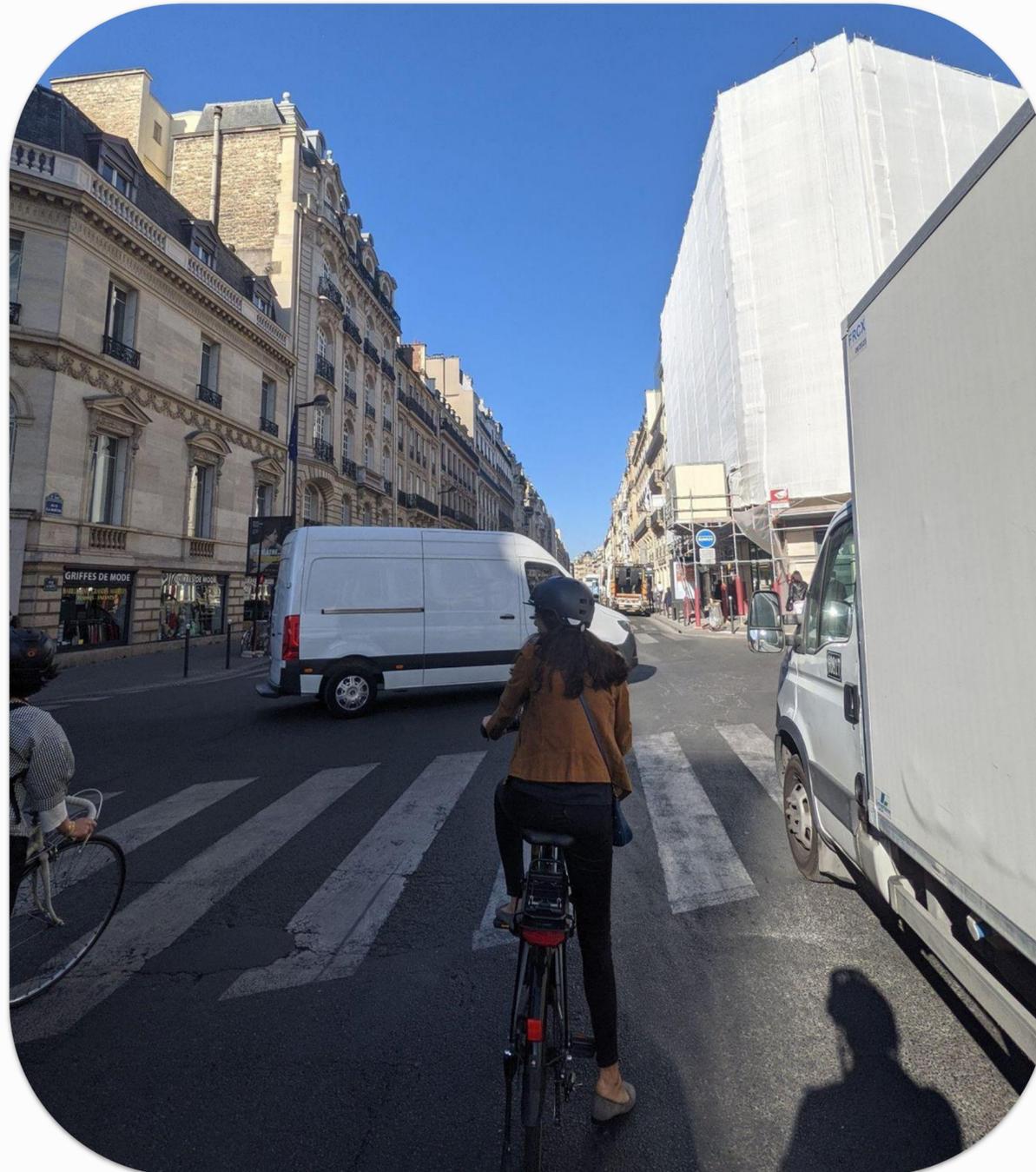
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Mobility changes rapidly, road safety needs to be proactive

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Planning and managing safety initiatives has been reactive, not proactive

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- Labor intensive,
- Biased, based on historic crash data
- Ad-hoc, location specific project
- Little feedback loop



Zurich, August 6th, 2022

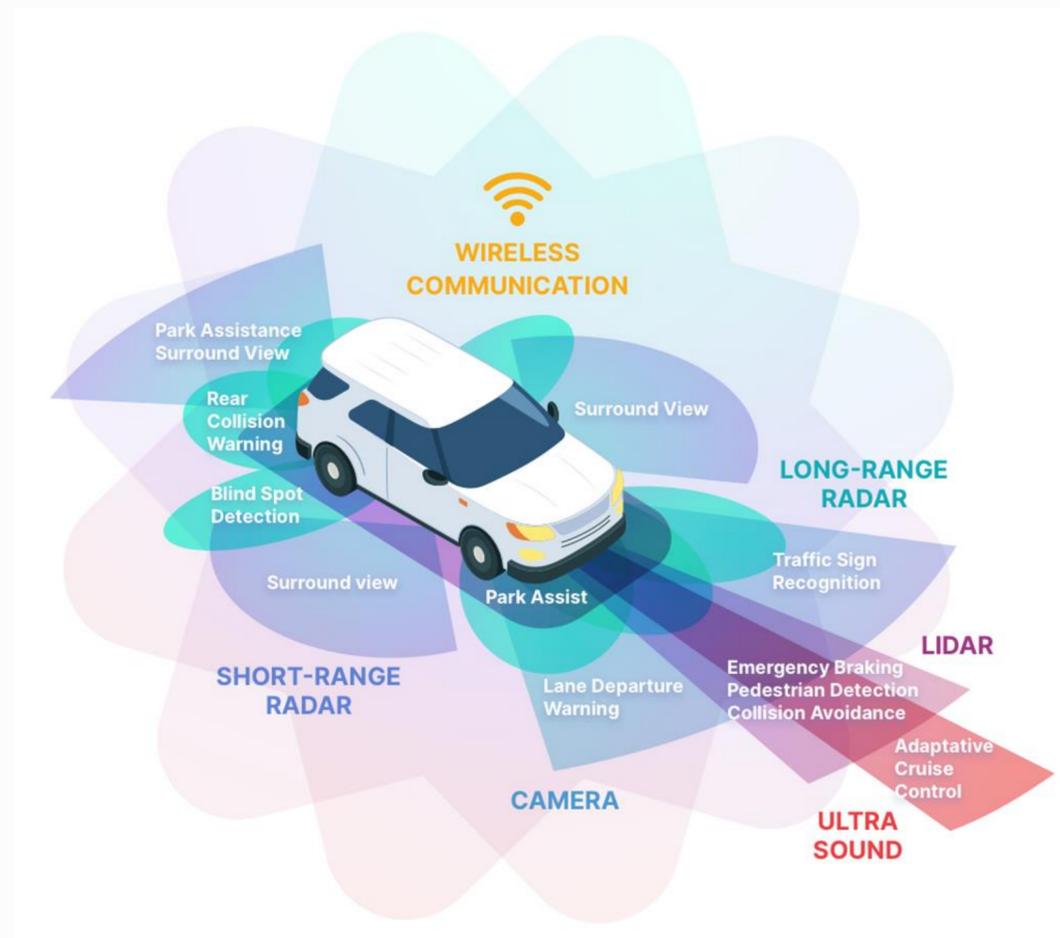


Leveraging connected vehicles data to map risky events

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Using connected vehicle data

- **Abnormal events:** emergency braking, over-stirring, speeding
- **Detection of vehicles & pedestrians** with sensors
- **Wireless communication** of events to the cloud



UN launches AI for Road Safety global initiative

“There is an untapped opportunity to harness AI to close the digital and road safety divide around the world”

Jean Todt
UN Road Safety Envoy

the good data to make cities safer

Road safety dashboard to visualise & analyse risky hotspots

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Easier decision making for

- Identifying risk hotspots for all users, especially Vulnerable Road Users (cyclists, pedestrians, scooter riders)
- Ranking dangerous zones to plan safer intersections, crossings, or cycling lanes

Visualisation of risks, incorporating:

By time of day, day of week & any road segment or geography:

- **Historical collisions** and their severity
- **Abnormal driving events** & clusters: emergency braking, over-steering, over-speeding
- **Pedestrian and cyclists flows**
- **Street-based risk score**



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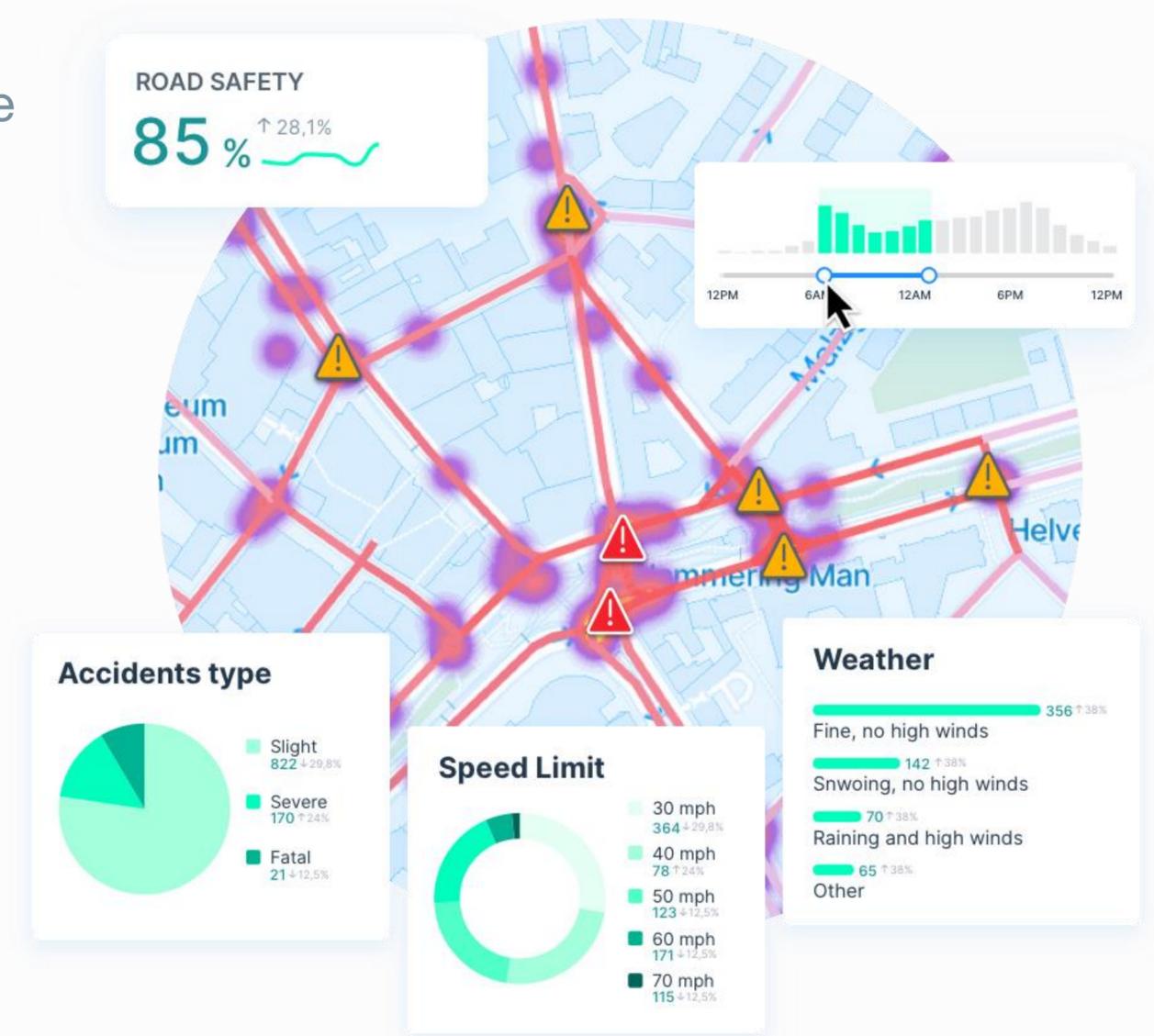
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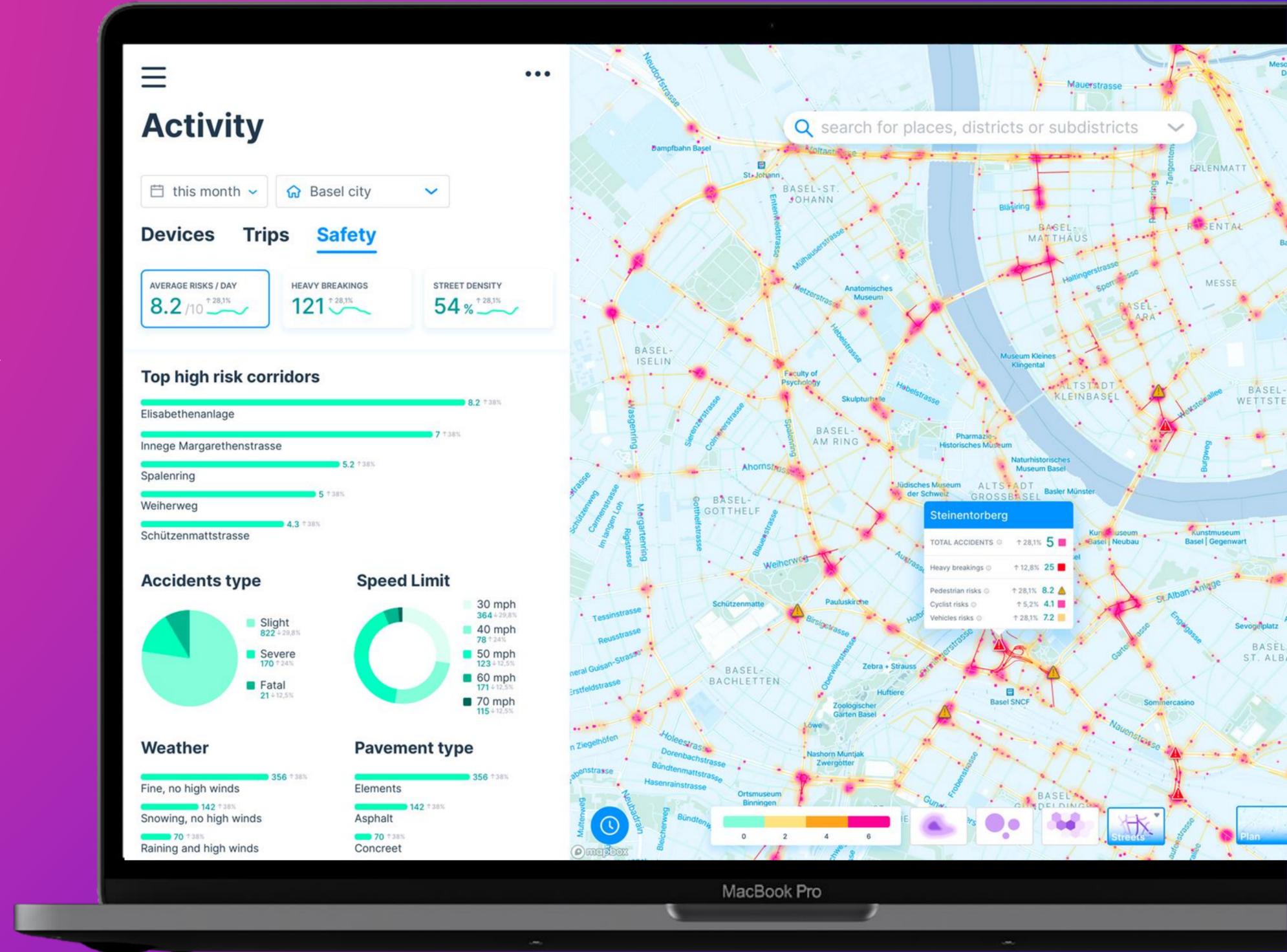
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Empowering road safety experts to easily understand & track risk hotspots, and prioritise interventions

Decision-making & data-driven safety insights at your fingertips



Multi datasets & layering approach

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Car flows

Floating Car Data
(EU OEMs & Telematics)
 Speed, Position, Braking,
 Steering, Accelerating



Crashes

Open data or data
 provided by the city
 Crash position, timestamp &
 vehicles involved



Street segment

OSM for road
 segment
 and speed limits



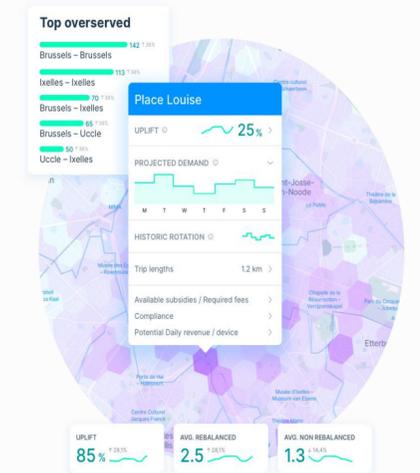
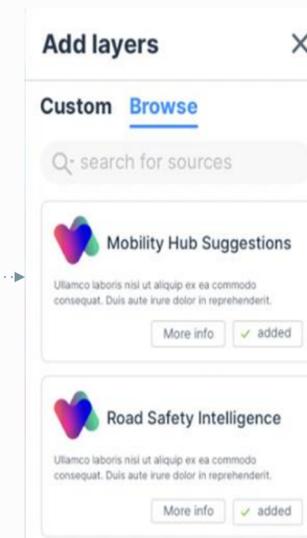
Cyclist & pedestrian

Shared micro-mobility
 and mobile phone
 data



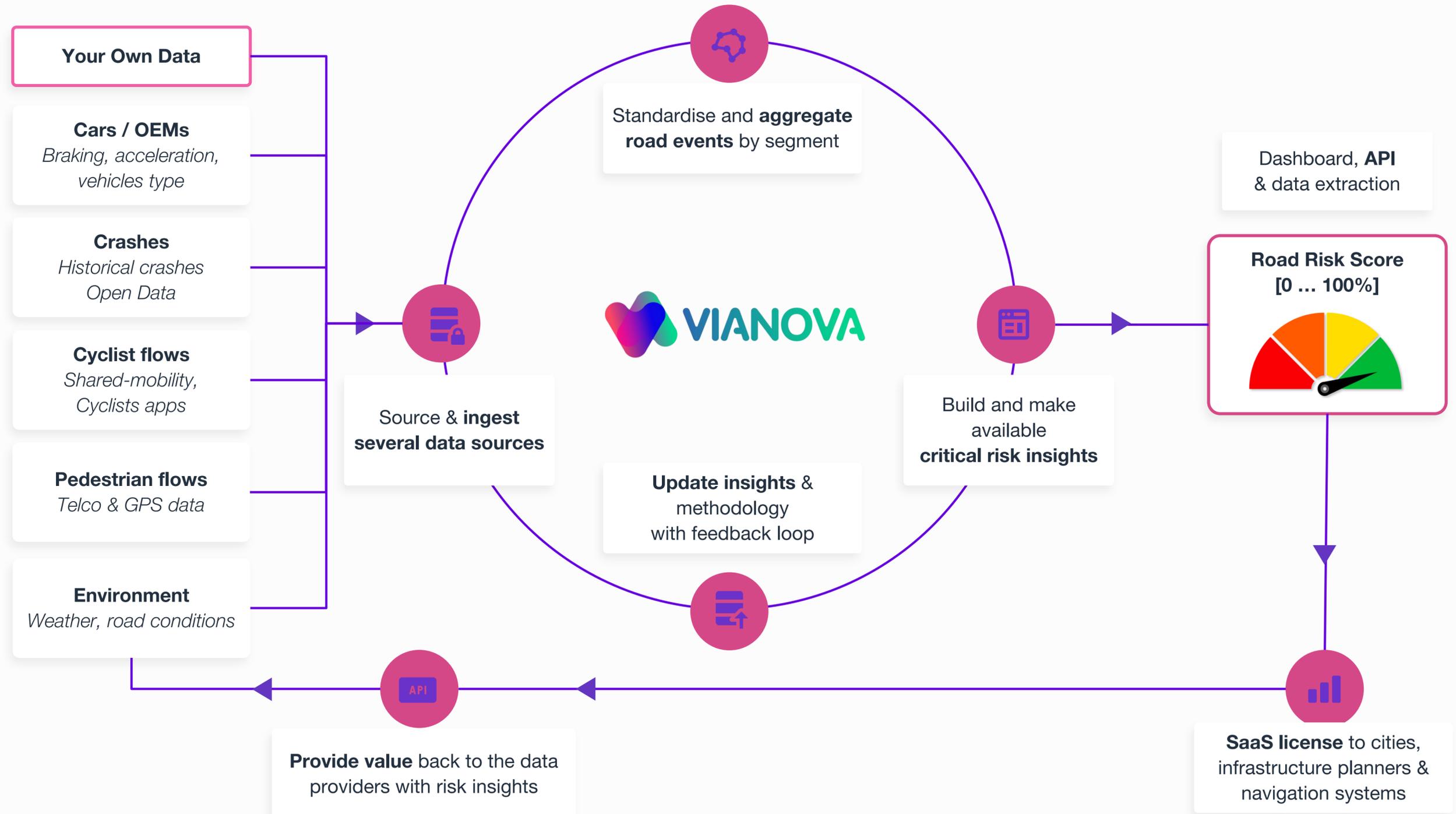
City data or other partner data

Integrate your own data
Waze incidents data, other incident data
Construction work data, city events



Multidataset algorithm to compute road-based risk insights

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Flexible methodology to build a risk score based on risk factors

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ROAD INFORMATION	
Street Name	Stauffacherstrasse
Segment Length	97.8
Maximum Speed	30
Road Type	residential
<hr/>	
Total Risk Rank	41
Risk Rank Without Shared Mobility	410
Total Count of Streets	27317
<hr/>	
Collisions Percentile Bounds	[80-90]
Heavy Braking Percentile Bounds	[80-90]
Overspeeding Frequency Percentile B...	[60-70]
Overspeeding Intensity Percentile Bo...	[70-80]
Shared Mobility Percentile Bounds	[80-90]

- Road information**
Speed, Type, etc.
- Risk Rank**
Including or excluding VRUs
- Risk Contributor**
Percentile of contribution into Rank

Risk Score Methodology

Road Safety Risk [0% ... 100%] =

AVG per road segment

*(Historical Crashes [5 years],
Braking Events [12 months],
VRU Density [12 months],
Overspeeding Frequency [12 months],
Overspeeding Intensity [12 months])*

All risk variables are normalised on the street segment distance

Technology piloted in several cities including Zurich

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Context

- Zurich at the forefront of **road safety initiatives**
- Work with safety expert Wernher and part of his team
- **Current road safety methodology** from Federal Office



Goals

- **Collaborate** on the methodology
- Find innovative tech to be more proactive on road safety
- **Map risky hotspots** for Vulnerable Road Users
- Compare with existing methodology

Data collected

- **One OEM** floating car data
- Historical **collisions data**
- **Shared micro-mobility** flows
- (Soon: **ADAS** sensors data)



Stadt Zürich

Multi-modal intersections most dangerous in urban areas

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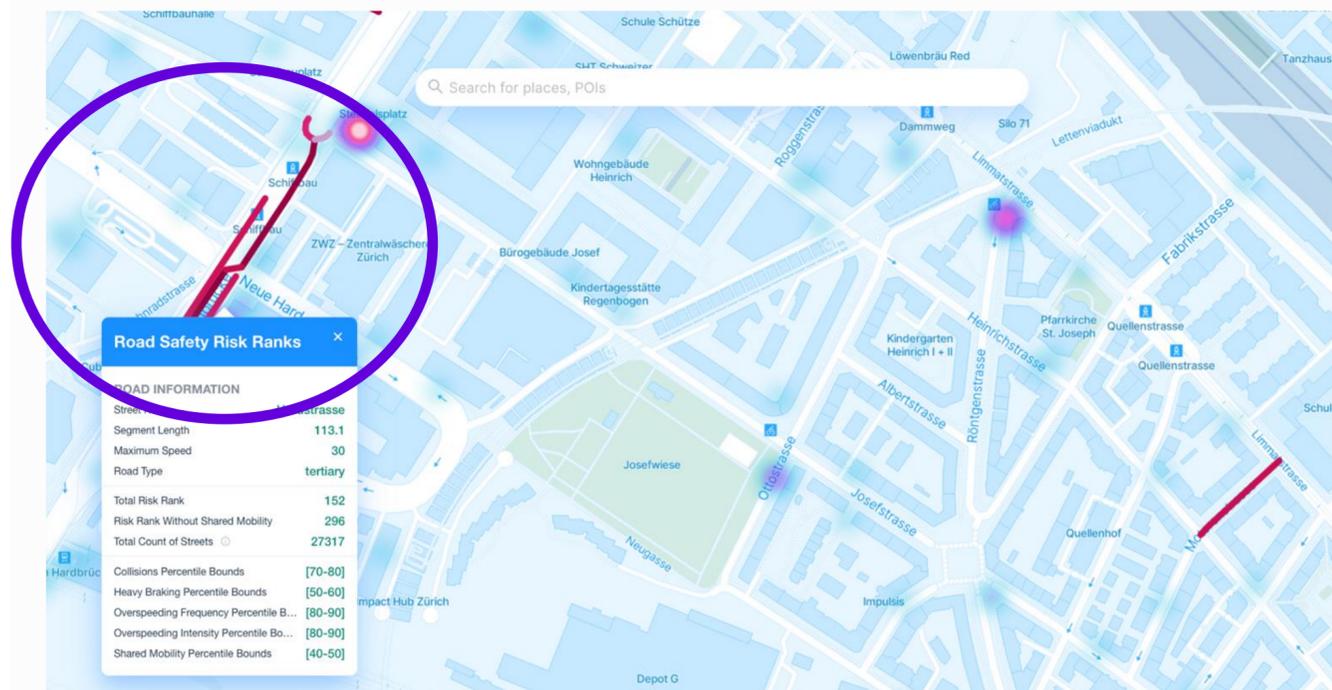
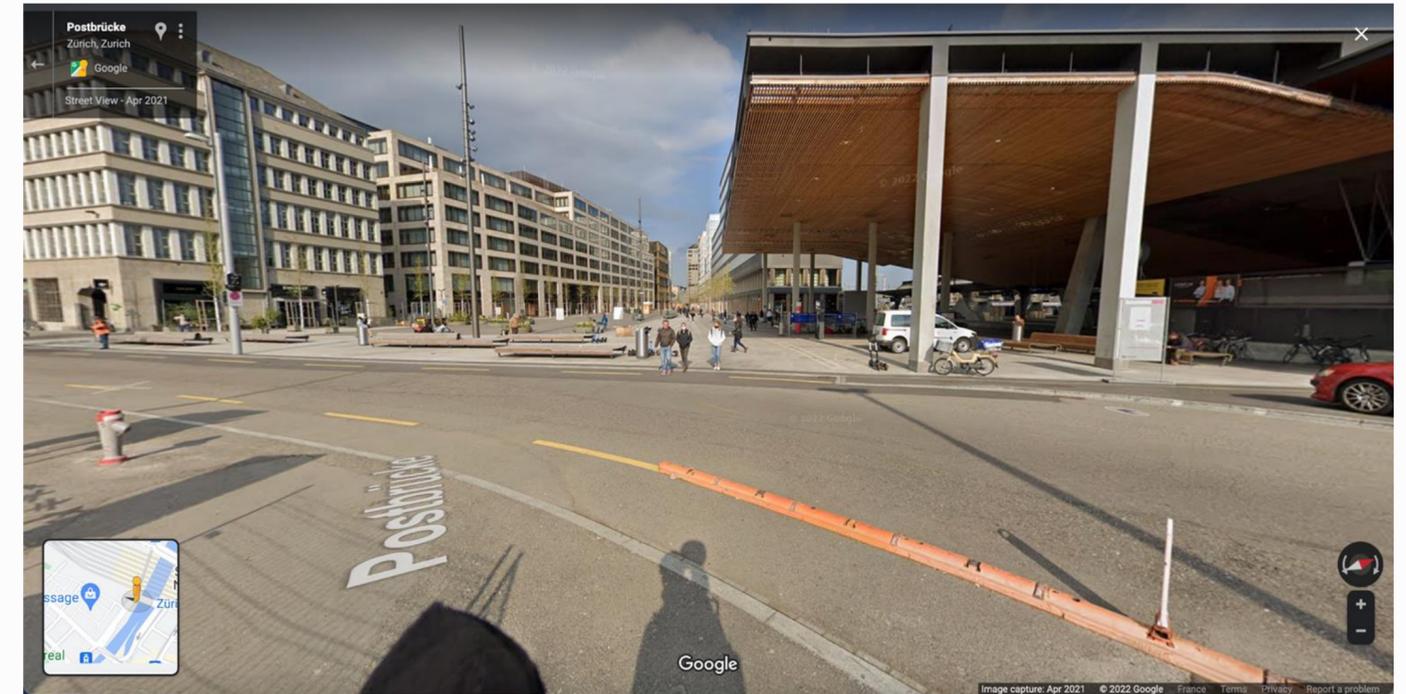
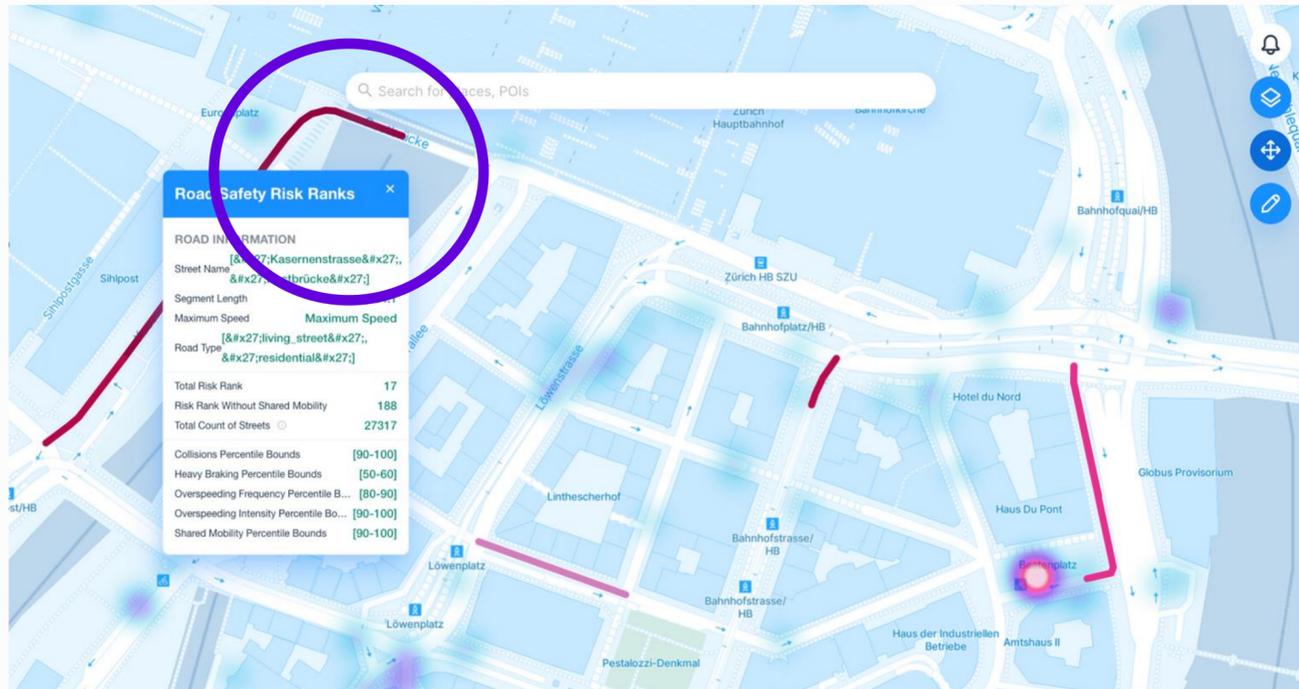
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From data ingestion to insights to actions

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1

Data collection & integration

Abnormal driving events (harsh braking, acceleration, over-speeding, harsh-cornering)

2

Data aggregation & enrichment

Combining other data-sets for explanation: road conditions, pedestrian & cyclists flows, traffic flows

3

Risk score & algorithm

Multi-factor risk factor calculation - risk factor will be adjustable in the near-future

4

Data contextualisation & visualisation

Time of day, day of week, weather, cycling lanes or pedestrian crossings, speed limit

5

Prioritisation, intervention & tracking

Prioritisation of risk hotspots with thresholds methodology (risk score, # of events, etc.)

Most representative insights & highly experienced city team

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The largest connected car dataset: 6 OEMs

Insights can only be as good as the data we inject

We aggregate data from 6 leading OEMs & telematics (cars, trucks)



Road safety applied to vulnerable road users

Unique data-sets of pedestrians & micro-mobility

Risk score methodology that specifically accounts for VRU risks



An extensive experience working with the public sector

60 cities currently customers for shared-mobility management

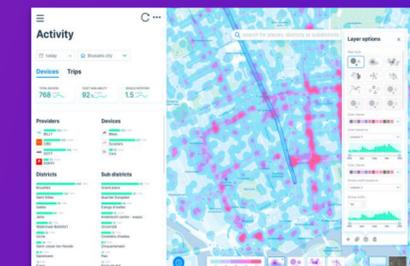
Traffic engineers and customer success to support projects & methodology



Visualisation tool for integrated experience

Plug-in your own data-sets to enhance your analysis (specific reports, Waze, etc.)

Visualisation & triage of risks intuitive in industry-leading mobility dashboard



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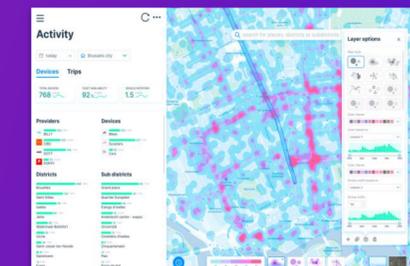
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Iterating and Improving On New Data to Fit the Model

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Weather

Special Events

Pedestrian Telematics

Time of Day

Road Conditions



Which risk factors would you select ? call for cities

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Call for cities interested for 3-6 months pilot



We take care of:

- Data gathering: historical crashes, OEMs & VRU data
- Project run and data-science expertise

You bring:

- Innovation energy: about 2 days per month for 3 months
- Road safety expertise
- Understanding of the city and its realm



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Thank you!

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