Management **O**f **N**etworked **I**oT Wearables – Very Large Scale Demonstration of **C**ultural and Security **A**pplications

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Using wearable and IoT data to create situational awareness

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Co-funded by the European Union

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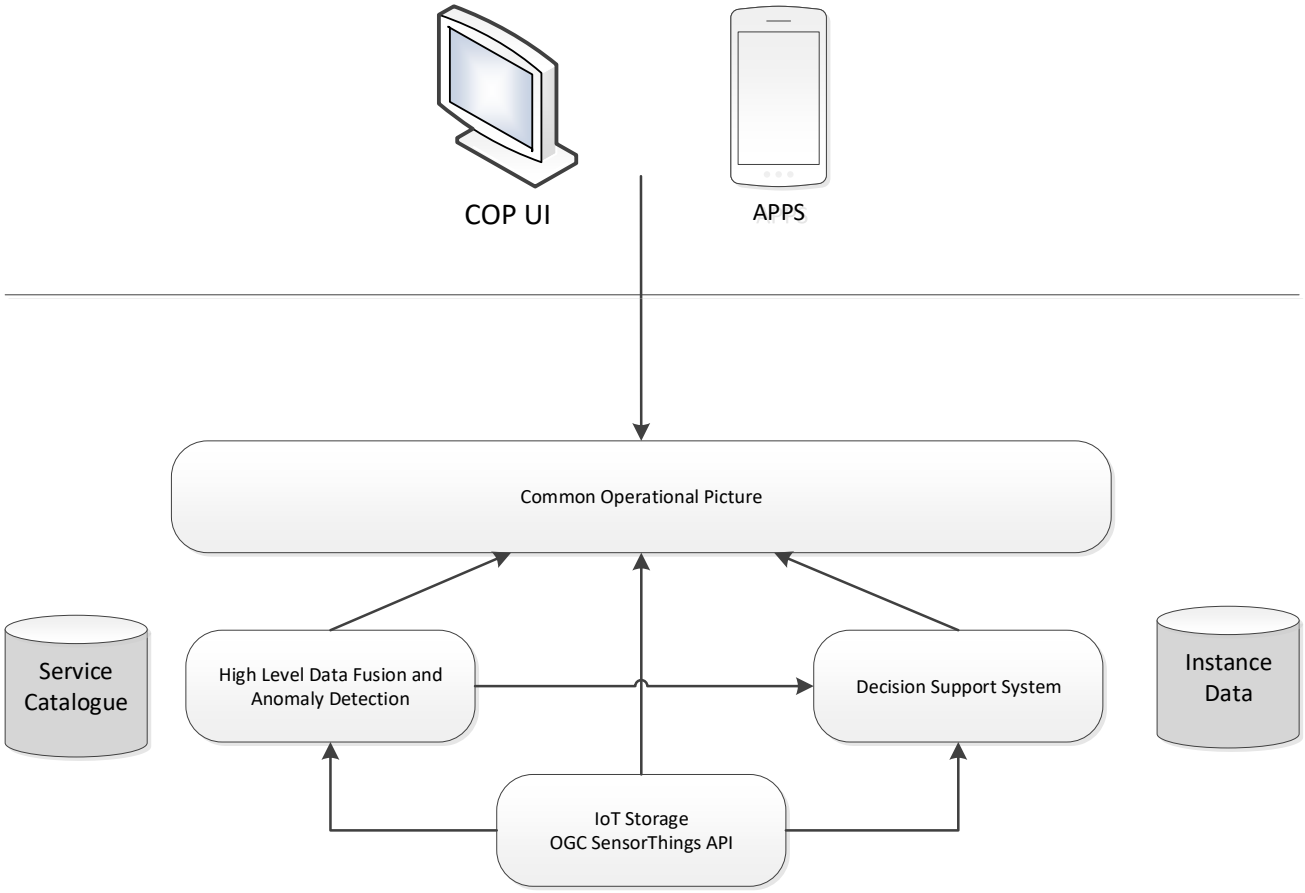
Using wearable and IoT data to create situational awareness

- Overview of components involved
  - Instance Data
- Common Operational Picture UI (COP)
  - Examples of visualisations

Overview of Components for Situational Awareness

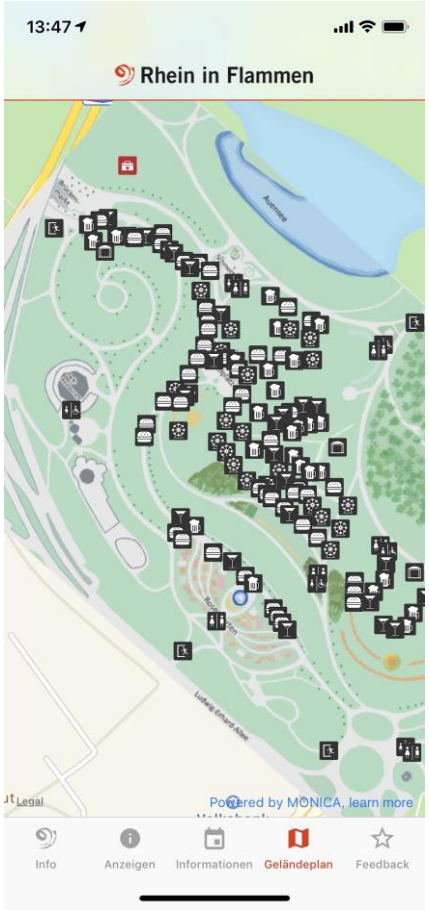


Overview of Components for Situational Awareness

- High Level Data Fusion and Anomaly detection
  - Fuse data from different sources, e.g. people heatmap
  - Detecting anomalies such as ”High risk queues”
- Decision Support System
  - intervention strategies for incidents of different types
  - No automatic resolvement of incidents
- Common Operational Picture COP
  - Maintains the current state of the event
- Service Catalogue
  - Implemented on top of OGC SensorThings API
    - Most high-level services act as data streams

Instance Data: Event specific information

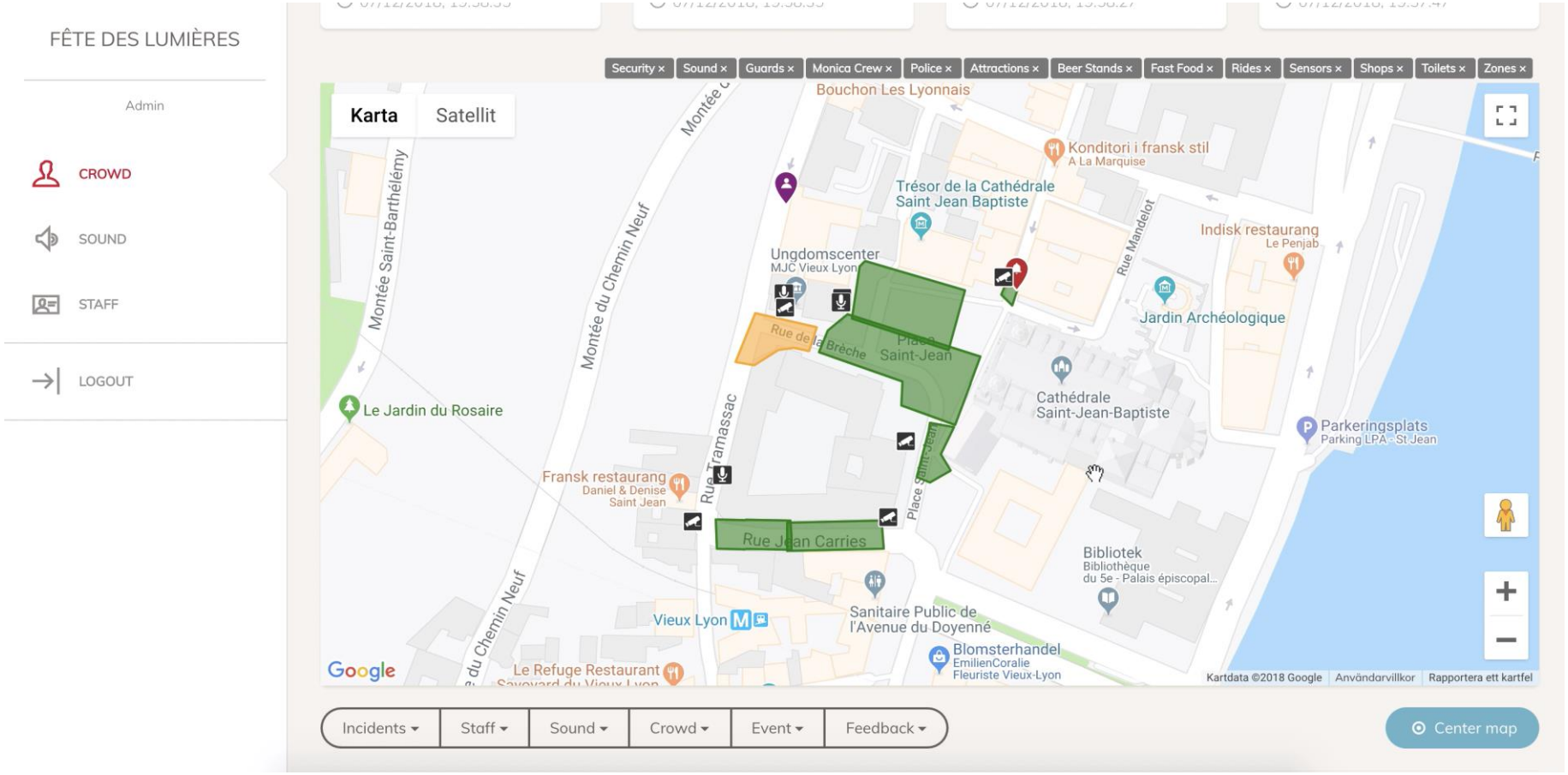
- Limits
  - Sound / people density
- Intervention plans
- POIs
  - Sensor positions
  - Event POIs
    - Stalls, toilets, rides et c.
- Areas of interest
  - Exclusion zones
  - Camera coverage areas



Common Operational Picture User Interface

- Goals
  - Give an overview of the status of the event
  - Provide more detailed information when needed
  - Indicate problems/incidents and provide support for resolving them
- Two main flavours
  - Crowd and Security
    - Focus on security incidents
    - Crowd monitoring
    - Staff tracking
  - Sound
    - Sound monitoring
    - Sound incidents (Both over threshold and sound quality problems)

Crowd Counting Visualization



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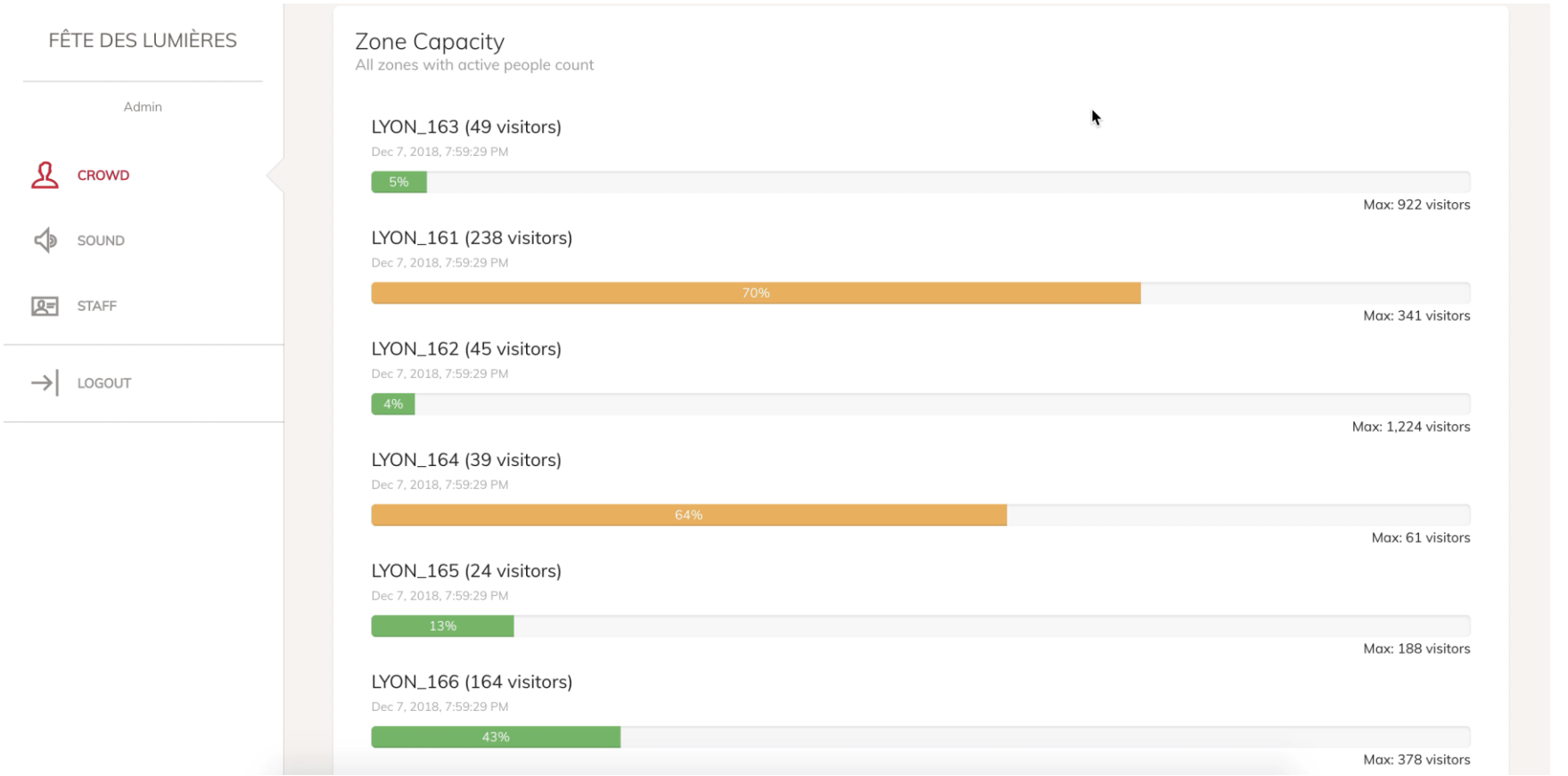
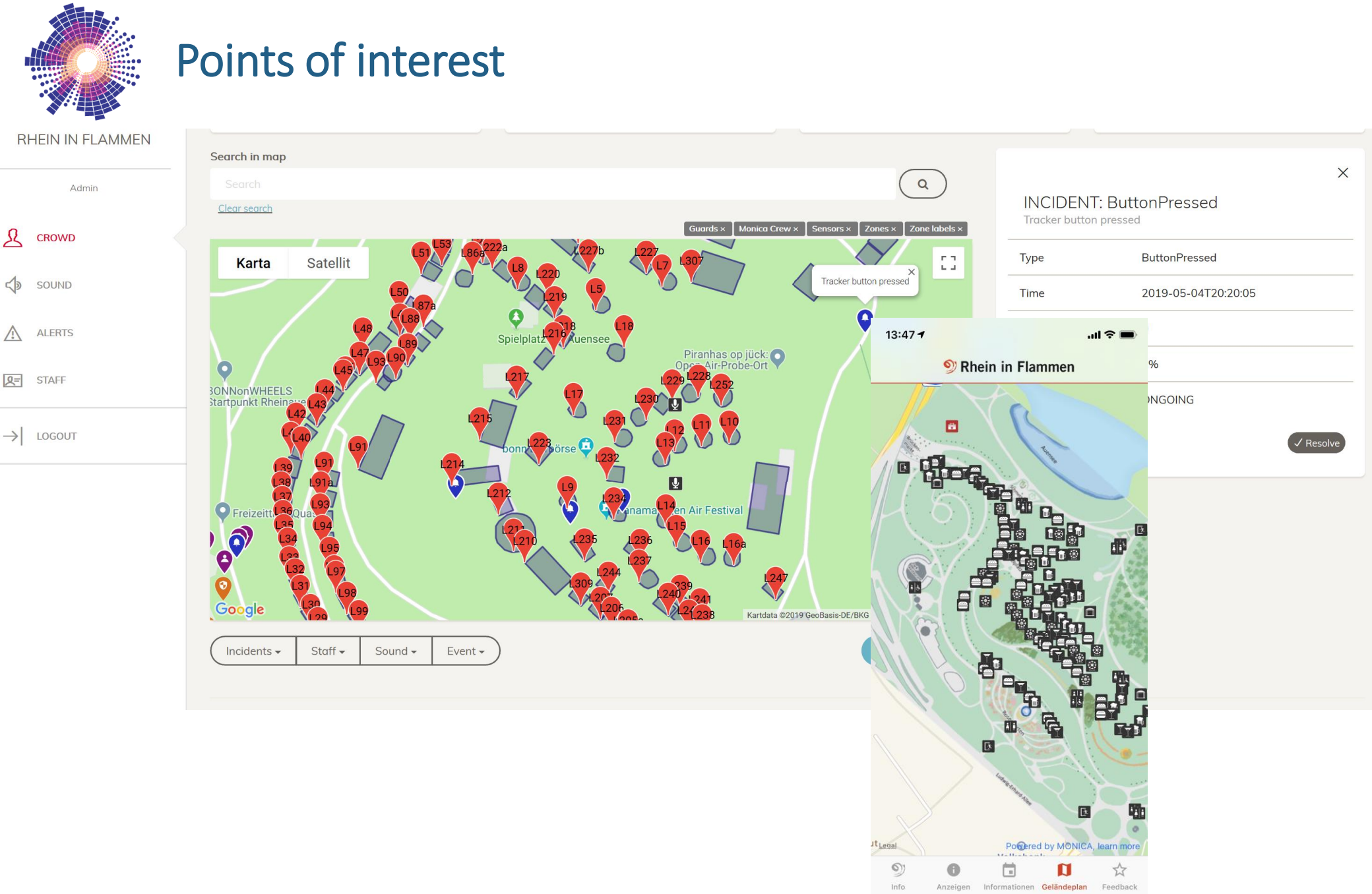
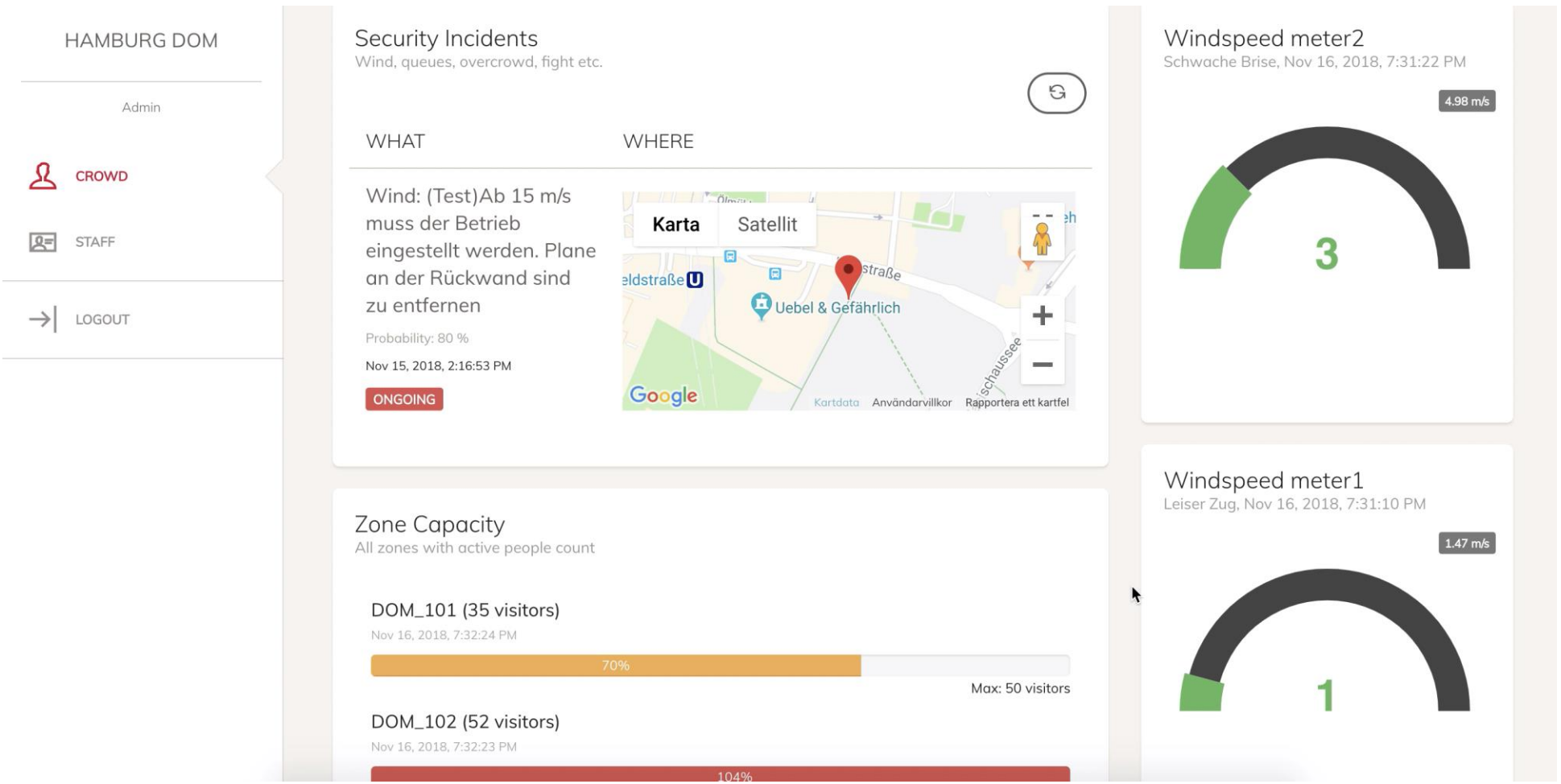


Points of interest

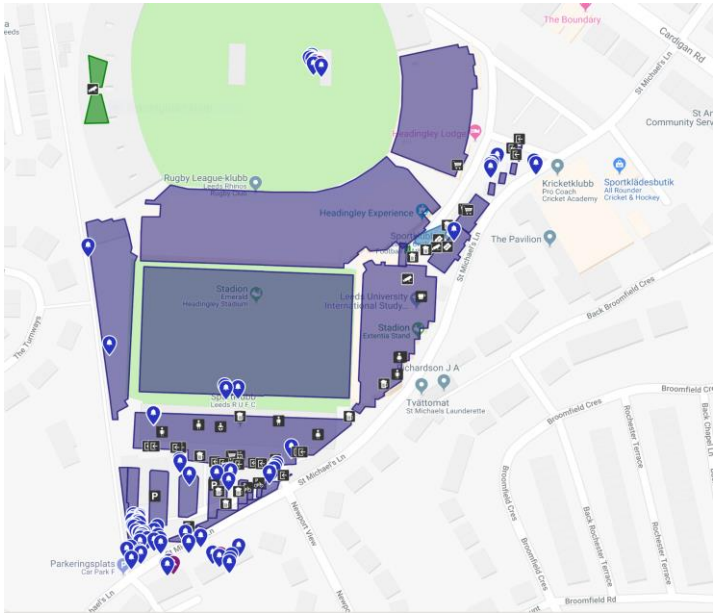


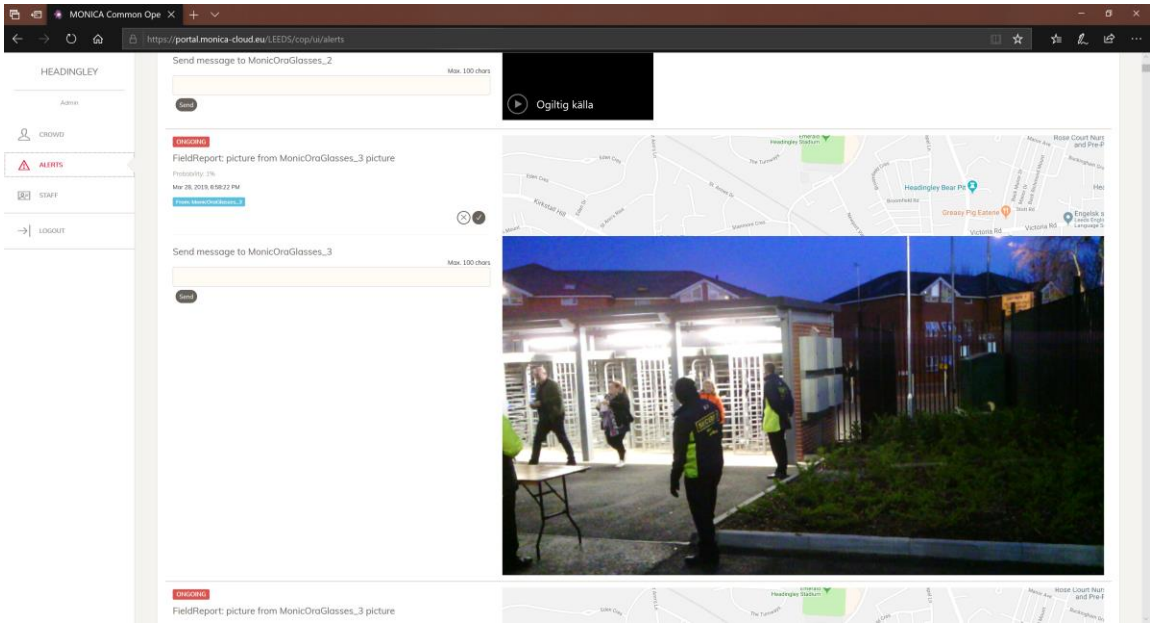
Incident and intervention plan



Smart Glasses

- Integrated in the COP
  - Localization
  - Create incidents in the COP using text/video/pictures
  - Receive commands and images from the COP





Crowd Heatmap

Sound Level data

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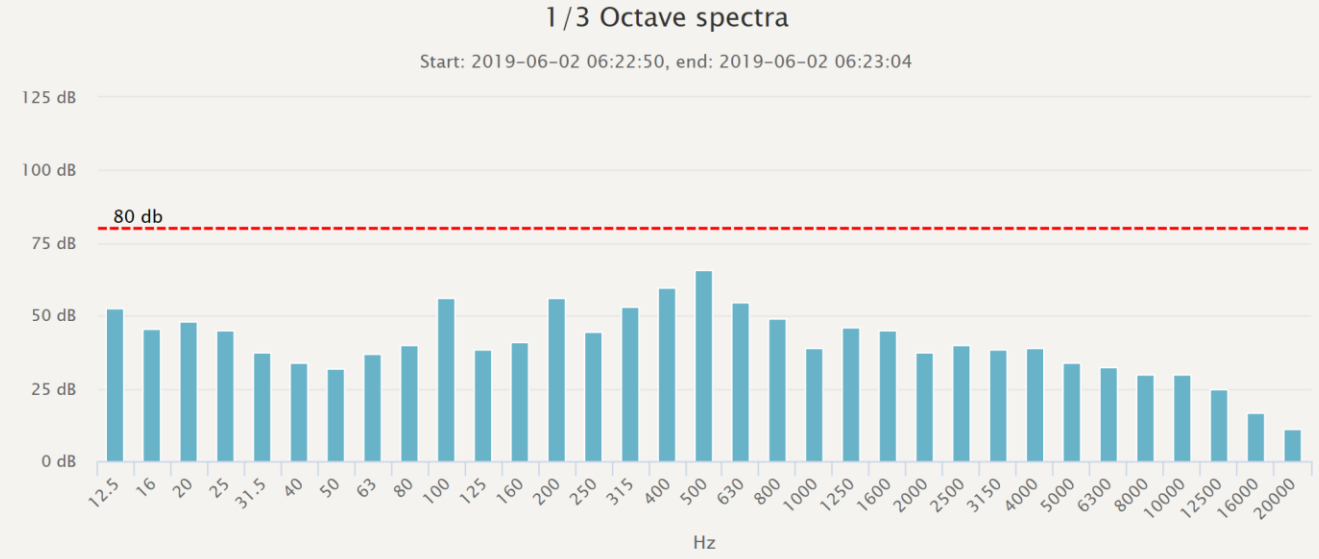
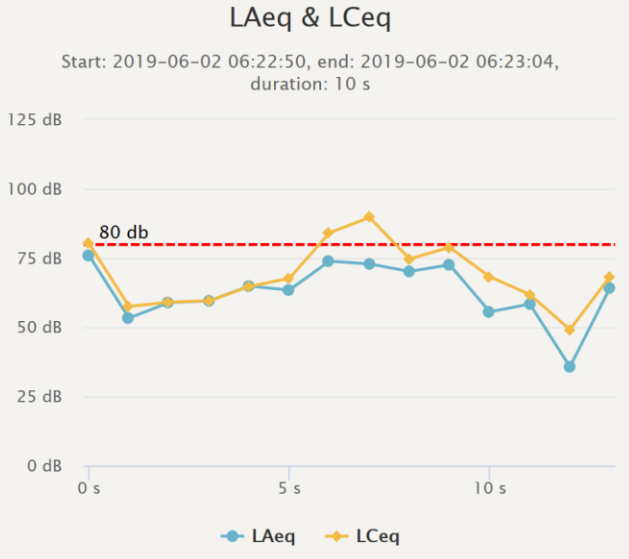
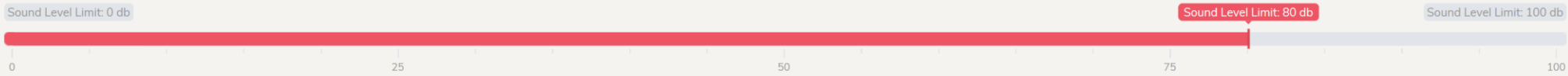
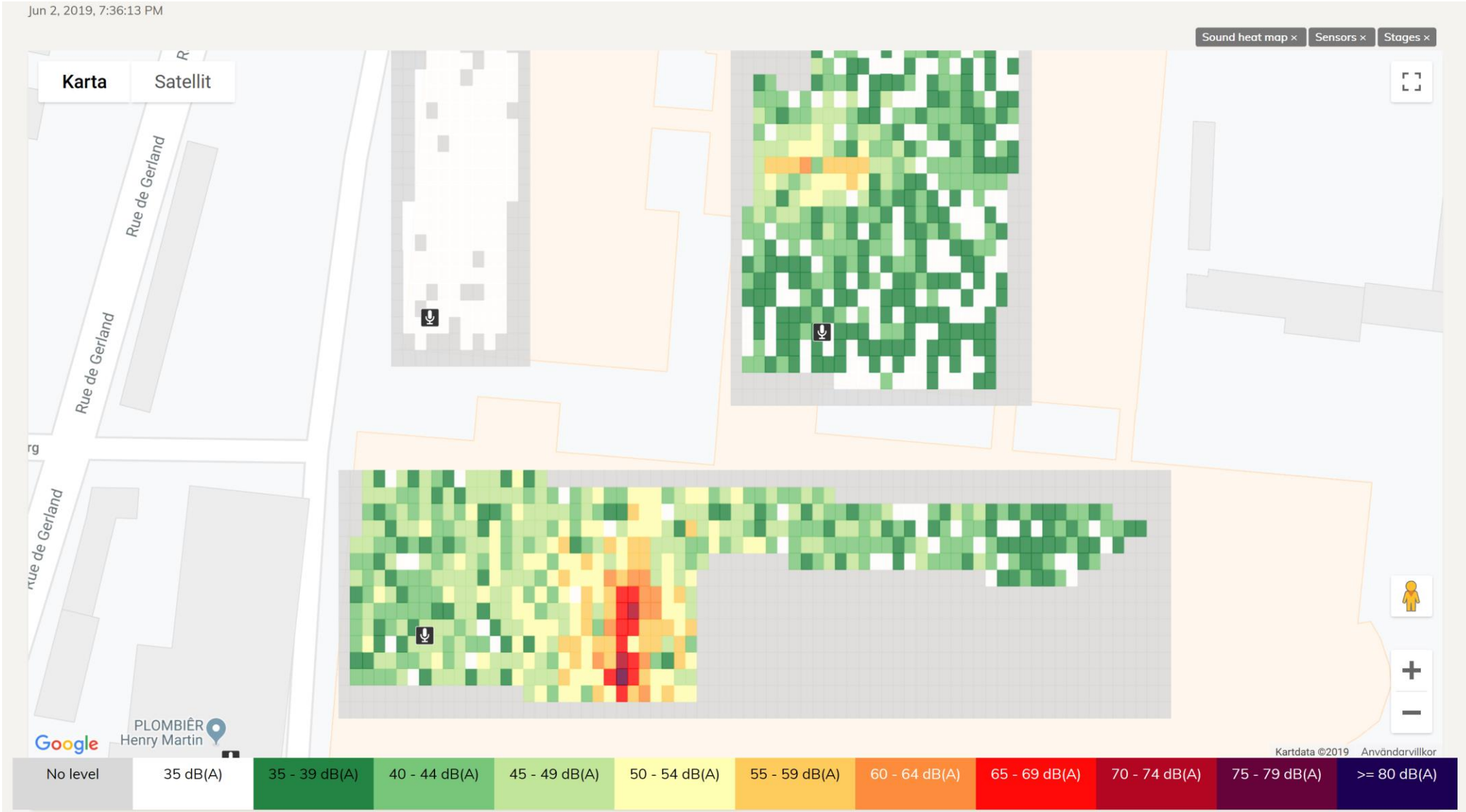






Sound Heatmaps



Sound Level Data over time

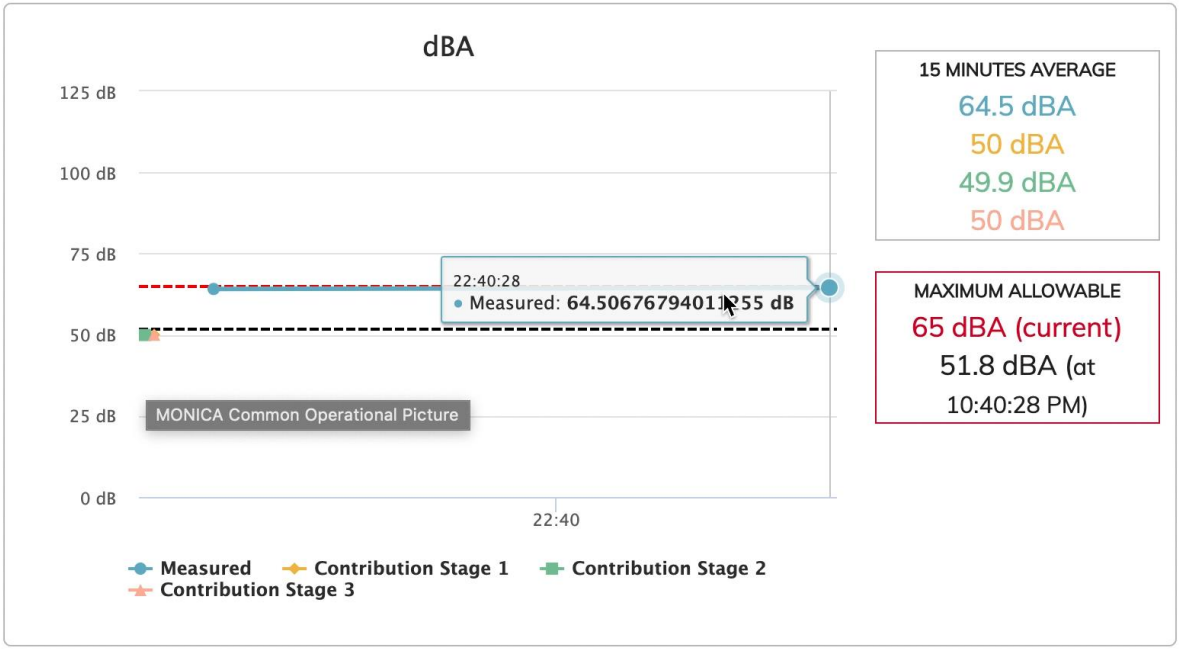
Sound Contribution

NUITS SONORES

Admin

- SOUND
- MAP
- AUDIENCE AREA
- NEIGHBOUR AREA
- RESTING AREA
- DOWNLOAD DATA
- LOGOUT

Overall Sound level



15 MINUTES AVERAGE
64.5 dBA
50 dBA
49.9 dBA
50 dBA

MAXIMUM ALLOWABLE
65 dBA (current)
51.8 dBA (at 10:40:28 PM)

Exceedings: 0

Octave bands

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