



# How parking data and innovative computer vision technology improve smart parking management and optimise enforcement : the case of Vevey



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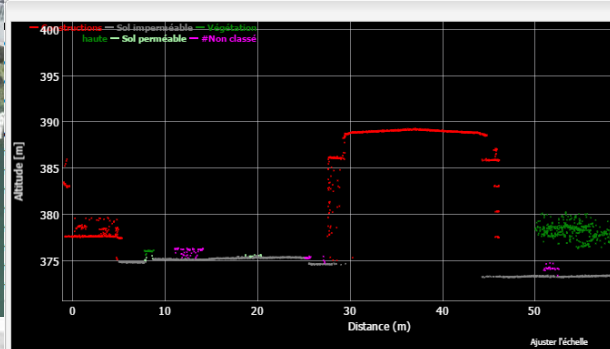
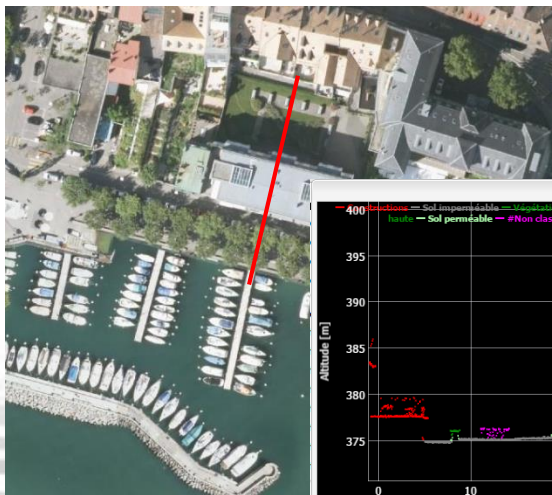


- The GIS (geographic information system) of Vevey
- Context, goals and history
- Technical architecture
- Functionalities (for users and police assistants)
- Live demo





- Main missions :
  - Maintenance and development of regional webGIS **Cartoriviera**
  - Projects of **geodata acquisition** (3D data, aerial imagery, etc.)
  - Development of **cartographic applications** for city and regional services (police, trade police, urban planning, etc.)
  - Development and maintenance of **smart parking projects**





## Marketplace context

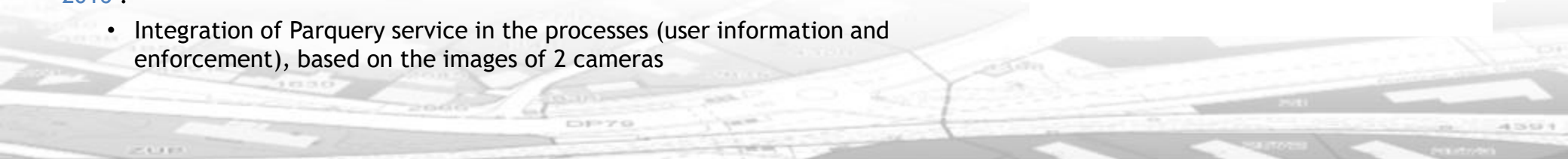
- 443 parking spaces, with meters
- Physical access control unwanted by politicians
- Regular occupations (markets, circus, events, etc.)

## Goals

1. Inform user in realtime on city parkings occupancy
2. Get usage statistics, essential for futur rehabilitation planned in 2020
3. Improve enforcement efficiency

## History

- **Spring 2014 :**
  - Ground sensors project -> refused by city council -> aborted
- **Beginning 2015 :**
  - Setting up realtime communication with meters
    - > development of a map based enforcement application
    - > realtime estimate of occupation
- **Summer 2015 :**
  - Negotiations with private parkings to get realtime occupation data
  - Installation of signals at city entrances
  - Development of a mobile application for users [www.parkings-riviera.ch](http://www.parkings-riviera.ch)
- **2016 :**
  - Integration of Parquetry service in the processes (user information and enforcement), based on the images of 2 cameras





10 underground parkings  
(Vevey / Montreux) with barriers



Free places

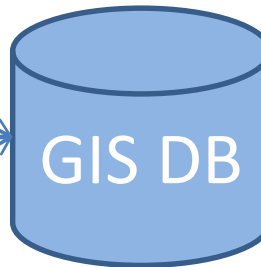


Parking time /  
Free spaces



Vevey Marketplace

Payments /  
Free places



parkings-riviera.ch



Realtime free spaces

P	Panorama	547
P	Pl. du Marché ~	547
P	Centre Manor	XXX
P	Simplon-Centre	547
		<input type="text"/>

www.parkings-riviera.ch

City entrances signals



Marketplace - Enforcement



Usage statistics



## Realtime free spaces calculation (2 parallel systems)

### 1 – Based on meters data

- every minute, communication with meters and counting of payed places
- estimated number of free spaces (taking into account non payment, other means of payment, time)
- subtraction of possibly reserved spaces (markets, events, etc.)
  - approximate results
  - works only during paying periods (not sunday)

### 2 – Based on cameras

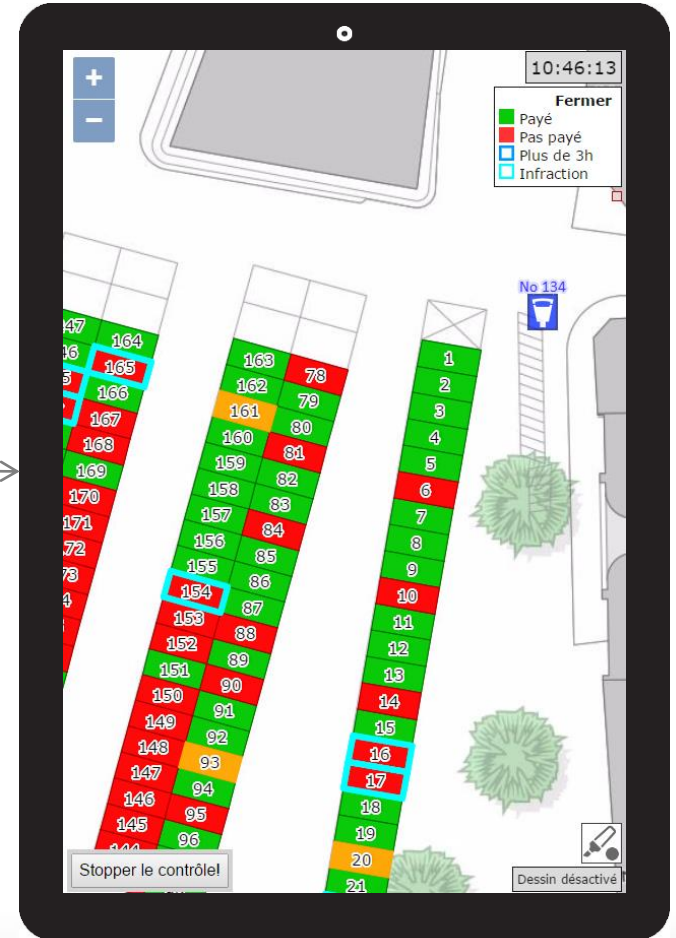
- every 3 to 5 minutes, data retrieval of Parquetry service
- automatically switches to system 1 in case of place reservation (bad visibility of vehicules) or poor visibility
  - doesn't work in darkness (cameras are not infrared and place is not well illuminated)



# Functionalities- enforcement



<http://msap.roundshot.com>



Enforcement map based application for marketplace

