

# SYNCHRONICITY

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## CITY CARDS



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Switzerland



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# ANTWERP

**Population:** 520,500  
**Urban area:** 204.5 km<sup>2</sup>

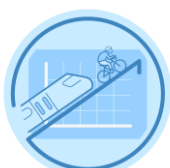
Currently Digipolis and the City of Antwerp have established the Antwerp City Platform as a Service (ACPaaS) that connects and discloses relevant operational city-owned and city-linked systems.

Antwerp demonstrates its ambition as a Smart City and invites the local ecosystem to explore, pilot and validate new innovations in for example the domains of mobility and logistics and environmental wellbeing.

## THEMES & CHALLENGES



Encouraging more non-motorised transport



Enabling and improving mobility as a service



Reducing air and noise pollution



Climate Change mitigation



Open challenge

## CITIES VALUES & PRIORITIES

- The city of Antwerp is looking for solutions that help to achieve a 50/50 modal split in the Antwerp region by 2030.
  - A modal shift from cars or trucks to more sustainable and less congestion-sensitive modes, both cycling and multimodal trips.
  - A time shift for trips and transports.
  - A mental shift about the need for mobility.
- The city of Antwerp wants to be an exemplary 'ecocity' and aims to be climate-neutral by 2050.
  - Environmental quality (air quality/noise pollution).
  - Circular economy.
  - Waste management

## What's available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

### DATA

#### Government sites

##### **Datasets on the Antwerp City Platform ACPaaS.**

e.g. LEZ Inbound car traffic counters (15 minute aggregated from ANPR), Bike tracking data, Big Belly usage.

<http://portaal-stadantwerpen.opendata.arcgis.com/datasets>

##### **Datasets on opendata.vlaanderen.be**

More than file based 5000 datasets

e.g. Traffic counters updated and aggregated per minute.

309 API based datasets from Antwerp

e.g. Bike sharing and public transport stations.

#### Public transport sites

Realtime data API for train (NMBS).

Realtime data API for tram and bus (DeLijn)

Contact Digipolis if you want to integrate the datasets from the government sites in your solution. Digipolis will assess the feasibility to harmonize the dataset to NGSI data models on our local Synchronicity framework

*GENERAL: Available datasets are shared using OASC standardised formats on the Antwerp city platform marketplace. (Full context information management capabilities through Orion and STH Comet APIs will be implemented by September). The use of data is free of charge. Authentication is based on the OAuth2 standard.*

## What's available in the City?

### DATA

- Road infrastructure and furniture
- Origin-Destination matrices
- Socio-demographic
- Data about travellers
- Disruptive event notifications-
- Traffic counts for all travel modes (including bike, pedestrian counts)
- Congestion / occupancy of transport modes
- Pollution / air quality levels-
- Journey tracking (e.g. tracking mobile location)
- Park and ride facilities
- Private vehicle data
- Cycle hire data-
- Points of Interest“
- Air quality

### ASSETS

- Parking sensors
- Availability of unloading zones
- Availability of a number of parking spots on an underground city
- Owned private parking lot (test area)
- Degree of filling of garbage containers –
- Degree of filling of trash cans
- A\*Sign Smart Signage - Data “Slimnaar Antwerpen” (~”Smart travelling to Antwerp”)
- Camera feed - Derived data from camera feed analysis
- CitizenBike sensors
- PLATFORMS
- Antwerp City Platform - City of Things R&D testbed for IoT & Smart City innovation - The Datatank

# CAROUGE

**Population:** 21,000 City of Carouge

**Urban area:** 2.7 km<sup>2</sup>

**Pilot area:** Carouge, Geneva

Carouge sits next to the Lake Lemman and the city of Geneva. Population of the Canton of Geneva: 500,000 habitants. Geneva hosts a lot of international organization such as the United Nation, the ITU, the Red Cross, among others.

Carouge has 21,000 habitants and 25,000 jobs and is oriented toward the well being of its citizens, innovation, transparency and privacy. The city welcomes any IoT projects that bring value to its employees or the population.

## THEMES & CHALLENGES



Encouraging more non-motorised transport



Increasing citizen engagement in decision making



Increasing a greater level of diversity in political engagement



Reducing air and noise pollution



Climate Change mitigation



Open challenge

## CITIES VALUES & PRIORITIES

- Strong commitment to citizens to enhance of the well being
- To facilitate and help the work of the city employees
- GDPR compliant Safeguarding public interest, ensuring transparency and privacy.
- Development of citizen-centric services
- Increasing the link between the population and the city and creating links cross-generations
- Use of clean energy (solar), efficient use of water, water quality control

## What's available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

### DATA

- Mobility public transports
- Air quality
- Noise
- Parking (indoor & outdoor)
- Meteorology

### ASSETS

- LWAN (LoRaWAN) network
- Fiber
- Wifi
- Noise Monitoring as Smart parking sensors

## What's available in the City?

### DATA

- Smart parking
- Noise monitoring
- Public transportation
- Weather conditions

### ASSETS

- LoRa wan and fiber networks are available along with free wifi for any connected devices
- Smart Parking - parking slot occupancy (300 + 16)
- 3D Street Noise Monitoring (1000)
- Camera's for street security
- Tourist App
- Public Wi-Fi that covers whole City of Carouge

# EINDHOVEN

**Population:** 228,000  
**Urban area:** 88.87 km<sup>2</sup>  
**Pilot area:**

*Elected as “Smartest Region in the world” and one of the 7 best global cities for startups, Eindhoven is internationally recognized as a global hotbed for (social) innovation.*

*Today the City of Eindhoven is at the heart of the so-called Brainport Eindhoven region: a strong knowledge intensive manufacturing region, specialized in ‘high tech systems’ and ‘design’, and one of Europe’s most innovative and R&D intensive areas ([www.brainport.nl](http://www.brainport.nl)).*

## THEMES & CHALLENGES



Encouraging more non-motorised transport



Enabling and improving mobility as a service



Open challenge



Reducing air and noise pollution



Climate Change mitigation



Increasing a greater level of diversity in political engagement



Increasing citizen engagement in decision making

## CITIES VALUES & PRIORITIES

- Privacy by design approach and citizen control of their own data
- Safeguarding public interest, transparency and mutual trust
- Citizen-centric services and collaboration
- Energy, Green & Water, Health, and Education.

## What’s available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

## What’s available in the City?

### DATA

- Road infrastructure and furniture
- Origin-Destination matrices- Only Origin analysis
- Disruptive event notifications
- Traffic counters for all travel modes (including bike, pedestrian counts)
- Pollution / air quality levels - Areas
- Park (and ride) facilities

### ASSETS

- V2I communication - Basic Safety Message
- Traffic Light Controllers
- Telephone in Vehicle 2 Infra – Floating Car data, travel time
- ViSense: Intelligent real-time system for object recognition, plus traffic distinguishing and counting
- Areas air boxes - Air quality (6 criteria pollutants), temperature and humidity
- Opticom infrared sender - Fire (and ambulance) vehicles approaching
- Connected street Lighting nodes - Energy consumption, failure messages, status information
- Detection loops, Push buttons, Bus, Radar - Presence traffic at/near traffic lights
- Short distance radio sender (=KAR) -Public Transport busses approaching
- ViNotion people and bicycles counters
- Slippery detection system stations inroads EHV
- Environmental sensor modules collocated with connected lighting infrastructure
- Parking sensors/ barriers - Availability of a number of parking spots on city-owned private parking lots
- PRIS displays - Indication number of available/free parking slots
- City Beacon - information station with POI and available services, local/city announcement screens, help/panic button
- Free WiFi, ready for 5G and mobile payment, possible (=currently disabled)
- Safety camera and lighting, traffic flow camera/journey tracking, air quality sensor

# HELSINKI

**Population:** 640,000

**Urban area:** 215 m2

**Pilot area:** City center,  
Kalasatama and Jätkäsaari  
residential areas

*Helsinki's vision is to be the world's most functional city. Helsinki develops digital solutions, which make it easy for residents to follow and engage in matters of interest and concern to themselves, regardless of whether they are the city's or other actors'.*

*Helsinki's operating model is based on openness and transparency. Helsinki is the world's leading city in opening up and utilizing public data.*

## THEMES & CHALLENGES



Encouraging more  
non-motorised transport



Enabling and improving  
mobility as a service



Open challenge



Reducing air  
and noise pollution



Climate Change mitigation



Increasing a greater  
level of diversity in  
political engagement



Increasing citizen  
engagement in  
decision making

## CITIES VALUES & PRIORITIES

- Be the world's most functional city.
- Helsinki develops digital solutions, which make it easy for residents to follow and engage in matters of interest and concern to themselves, regardless of whether they are the city's or other actors'.
- Helsinki's operating model is based on openness and transparency. Helsinki is the world's leading city in opening up and utilising public data..

### What's available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

#### DATA

- Noise Level
- Air Quality

### What's available in the City?

#### DATA (<https://dev.fvh.fi/> )

- [Park & rides](#)
- [Helsinki road signs and parking lots](#)
- [Traffic Accidents in Helsinki](#)
- Real-time location information of all trams, metros, most buses (whole city), [open API](#)
- [Public transit APIs](#)
- [Public transport routing API consisting of all modalities](#)
- [Public transport network & timetables](#) (GTFS)
- [HSL OpenMaaS API](#) (retail interface for single tickets)
- [Pollution/ air quality, description of the sensor stations](#) (in Finnish)
- [Helsinki region greenhouse gas emissions](#) (in Finnish)
- [Traffic emissions in Helsinki metropolitan area](#)
- [Traffic noise zones in Helsinki metropolitan area](#)
- Realtime air quality, 100 measurement points (PM2.5, NO2)
- [Mesoscale weather forecasts](#)
- [Foreca Weather API](#)
- HSY real time air quality
- Helsinki region energy consumption
- [Energy Atlas with e.g. solar power potentials](#)
- [City3D model open data CityGML](#)
- Large set of static data and geospatial (2D, 3D) open data
- [Map API](#) (<https://dev.hel.fi/apis/service-map-backend-api/>)
- [Geocoding API](#)
- [Open Ahjo - open decision-making API](#)
- [Service map API for Helsinki city services](#)
- [CitySDK API Package](#)

#### ASSETS

- LoRa
- SigFox

#### IOT INFRASTRUCTURE

- EV charging points
- Sensor (air quality) - 10 devices
- Sensor (telematics) - 2 devices
- Sensor (water meter) - 10 devices
- City NFC Travelcard (0,8M users), access control and identification and loyalty points (identity and services in chip)
- 22 public interactive displays in street scape for pedestrian mobility management
- Platforms
  - Helsinki Region Transport HSL APIs (<https://www.hsl.fi/en/opendata>)
  - Open Helsinki APIs (<http://dev.hel.fi/apis/>)
  - OpenTripPlanner (<http://www.opentripplanner.org/>)
  - Helsinki Region open data platform ([www.hri.fi](http://www.hri.fi))
  - National and Helsinki Region journey planner (<https://digitransit.fi/en/developers/>)
  - Government open APIs (road use) (<https://www.liikennevirasto.fi/web/en/data>)

# MANCHESTER

**Population:** 540,000

**Urban area:** 115.7 km<sup>2</sup>

**Pilot area:** Corridor Manchester

*Manchester is the second largest economy in the U.K. The City is one of ten local authorities which make up the Greater Manchester conurbation. Historically, Manchester was a flourishing city which played a leading role in world textile manufacture and production in the late 18th century, a position it maintained until the 1960s. Manchester has now transformed: physically, economically, and environmentally.*

*The City supports innovation and there are a number of organisations, initiatives and funding opportunities designed to help the cities creative and digital businesses grow. The Smart City agenda in Manchester has developed in recent years. Currently the city has a number of activities underway. Manchester is also home to the UK's IoT Smart Cities demonstrator, CityVerve. CityVerve enables IoT testing at scale, providing a replicable model for other cities in the UK and beyond.*

## THEMES & CHALLENGES



Encouraging more non-motorised transport



Enabling and improving mobility as a service



Open challenge



Reducing air and noise pollution



Climate Change mitigation



Increasing a greater level of diversity in political engagement



Increasing citizen engagement in decision making

## CITIES VALUES & PRIORITIES

- Manchester City's enduring values are: innovation, radicalism, and international outlook.
- The City of Manchester developed the 'Our Manchester' Strategy. Our Manchester Strategy is the notion that new technology and environmental necessity provide a stimulus and opportunity to find local solutions to those challenges and sell these ideas to international markets.
- The strategy identified the following priorities: highly skilled city; a progressive and equitable city; a liveable and low-carbon city; a connected city
- The City of Manchester also puts the citizens in the heart of its services. It values collaboration, connectivity and creativity.

## What's available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

### DATA

- Air quality
- Pedestrian counting

Soon, other data will become available through the SynchroniCity framework.

## What's available in the City?

### DATA

Real-time data

- Air quality
- People counting
- Cycle counting
- Car park occupancy
- Cargo bike journeys
- Bike journeys
- Building energy usage data (restricted)

Static Data

- Transport data (e.g. bus stops)
- Location of assets and buildings (e.g. schools)
- Planning data



The Manchester pilot area will be the Corridor Manchester. Corridor Manchester is an Innovation district, south of the city centre running the length of Oxford Road from St. Peter's Square to Whitworth Park, and west from Higher Cambridge Street to Upper Brook Street in the east. A small geographic area it has 60,000 workers, with 26,000 in Knowledge industries, and accounts for 21% of the city's GVA, and has seen some 3 billion pounds of investment. It is home to 2 Universities, teaching hospital, science park, cultural institutions and civic buildings.

### ASSETS

Platforms

- [CityVerve](#) ""Platform of Platforms"" - Programmable City API [BT Data Hub](#)
- [City Council Open Data](#)
- [Manchester-I](#)

IoT Infrastructure

- People counting cameras and WiFi sensors
- Air quality sensors
- LoRa Network (requires permissions - part of CityVerve)
- Open LoRa Network (ThingsManchester)

# MILAN

**Population:** 1,351,562  
**Urban area:** 1 980 km<sup>2</sup>  
**Pilot area:** Porta Romana  
Vettabia

*Second largest city in Italy, Milan is the administrative and business centre in the largest Italian metropolitan area, and the main city of Lombardy, Italian more populated and rich region. As of the 1st of January 2015, Milan turned into a Metropolitan City with 134 Municipalities of the Milanese region and more than 3 million inhabitants, representing 10% of National GDP.*

*Milan has been ranked as the smartest city in Italy by City Rate in 2014, 2015 e 2016 (Forum PA) on the basis of 72 KPI on economy, living, environment, people, mobility and governance.*

## THEMES & CHALLENGES



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Increasing citizen engagement in decision making

## CITIES VALUES & PRIORITIES

One of the high priority objectives for the city of Milan is to improve city services and sustainability implementing an effective Smart City strategy in order to be part of the European and international big cities network. Digital Transformation and specifically "Digitisation of processes and Open Data" is one of the main strategic objectives of the municipality. The latter has a Digital Transformation Policy consisting of infrastructures and services which includes a dense-fibre-optic-networks, wi-fi-hot-spots, digital-areas, portals and open-data, among other things. All these have the aim of creating a more attractive, welcoming, resilient, flexible, changing city, and complement policies already in place such as big-data-analysis, city time structure plans, and so on. The municipality prioritises initiatives in urban mobility but other focus areas include:

- Physical and Digital Accessibility
- Energy management
- Citizen's engagement
- Innovation and industry 4.0 policies
- Social Innovation

## What's available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

### DATA

- Meteorological data (temperature and humidity) coming from weather sensors (LAMPPOST API)

Municipality **Open Data Platform** contains more than 290 datasets available. Among them:

- 25 datasets concerning mobility and transportation
- 6 datasets concerning environment
- 82 datasets concerning population data

## What's available in the City?

### DATA

- Upon subscription on the Regional E015 ecosystem API services about Culture, Events, Mobility, Smart Cities, Utility, etc (<http://www.e015.regione.lombardia.it/PE015/>)

### ASSETS

#### Platforms:

Municipality's Interoperability Platform based on WSO2

- Municipality's CKAN Open Data Platform
- Regional E015 platform gathering data from Milan's area service providers

#### IoT Sensors:

- Traffic Loops
- Gate cameras
- \* WIFI free spot
- Weather sensors (humidity, pressure, temperature)
- Parking Lots sensors (installation planned within may 2018)

# PORTO

**Population:** 238,000  
**Urban area:** 41.4 km<sup>2</sup>  
**Pilot area:**

The city of Porto is one of the major urban areas in Southern Europe. Located along the Douro river estuary in northern Portugal, Porto is one of the oldest European centres. Its settlement dates back to 2.000 years ago, when it was an outpost of the Roman Empire. Its Latin name, Portus Cale, has been referred to as the origin for the name "Portugal". One of its internationally famous exports is the Port Wine, which is produced exclusively in the Douro region and aged in cellars.

But beyond history, Porto has designed and embraced policy strategies focused on citizen's centred sustainability, energy efficiency, R&D and economic growth. By developing synergies and reducing fragmentation, the city becomes a tech, innovative and creative entrepreneurial hub.

## THEMES & CHALLENGES



Reducing air and noise pollution



Enabling and improving mobility as a service



Open challenge



Climate Change mitigation



Increasing a greater level of diversity in political engagement



Increasing citizen engagement in decision making

## CITIES VALUES & PRIORITIES

- Porto is implementing a digital and smart city strategy, which aims at developing citizen driven services with high impact, attracting talent and entrepreneurs to the city, developing solutions required by citizens, reducing social exclusion, and increasing security.
- To use ICT, sensing, communications and data to improve municipal services and urban processes; use an intelligent and integrated approach to create entrepreneurship and ICT focused companies; combine data on the municipal level across all departments and subsidiary institutions to enhance transparency and efficiency; and invest into organizational development in order to better manage a digital and smart city across the responsible units.
- Other specific priorities and interests comprise: Open and big data, data analytics and visualization; Urban and open data platforms; Fibre, Wi-Fi and LPWAN (in particular, LoRaWAN) communications; Pedestrian counters, parking sensors, trash bin sensors, environmental monitoring, heterogeneous sensor networks; Connected vehicles; Cybersecurity and privacy; Innovation and entrepreneurship support, service design, co-creation and citizen engagement.

## What's available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

### DATA

- Noise level
- Air quality data
- Meteorological parameters
- Vehicle location and speed
- Vehicle count
- Points of interest
- Events data
- Public transportation data (schedules, routes, lines, stops, etc.)
- Temporary traffic (scheduled events, accidents, etc.)
- Weather forecast service

## What's available in the City?

### ASSETS

- Environmental monitoring: noise, meteorology and air quality sensing stations\* (±30 units)
- Beacons\*: active (BLE, ±1.000 units) and passive (NFC+QR code, ±1.000 units)
- Traffic monitoring and access control: vehicle counters and speed meters\* (±120 units), video cameras (±120 units) and automatic retractable bollards
- Traffic management: traffic light signals (LED), controllers (±290 units, ±130 units remotely controlled) and RADAR speed detectors
- Water supply telemetry system: wireless water meters (±25.000 units) and data concentrators (±15 units)
- Street lighting (LED)
- Charging stations for electric vehicles
- Multimodal transportation system with wireless (RFID/NFC) card/mobile readers
- Beacons platform
- Commercial use: cellular (2G, 3G, 4G), electric cable (broadband), optical fiber (broadband), Sigfox
- MAN (optical fiber)\*: covers all the city with backbone, distribution and access optical fiber, in a total of ±200 km of cables and ±4.000 km of fibers; the backbone has a 10 Gigabit Ethernet connection
- WMAN (Wi-Fi)\*: ±180 wireless access-points (WAPs), covers ±120 hotspots and provides free Wi-Fi connectivity
- LPWAN (LoRaWAN)\*: pilot covering ±20% of the city area

### DATA

- Points of interest (POIs): accommodation, eat and drink, shopping, education, useful information, leisure, business, health, public services, transports, visiting
- Events
- Noise
- Meteorology: air temperature, air relative humidity, wind direction, wind speed, rain, solar radiation, ultraviolet (UV) radiation
- Air quality: particles (PM2.5 and PM10), ozone (O3), nitrogen dioxide (NO2), carbon monoxide (CO)
- Mobility and public transportation network (static and real-time): infrastructure; traffic restrictions; trains, buses, metro, taxis

# SANTANDER

**Population:** 174,000  
**Urban area:** 33 km<sup>2</sup>  
**Pilot area:** Santander City

*In recent years, the city of Santander, ca. 174.000 inhabitants and capital of a small Spanish northern region, has moved into the vanguard of smart cities, improving public services and developing policies oriented towards its citizens and stimulating a new business model of productivity in the city.*

*Several years ago, the city government had the perception that a new economic model was needed in our city. At the municipal level, innovation is conceived as a transverse area to other areas of governance, coordinating the incorporation of new technologies with municipal services, which leads to their improvement and bringing direct benefits to citizens and visitors.*

## THEMES & CHALLENGES



Encouraging more non-motorised transport



Reducing air and noise pollution



Open challenge



Enabling and improving mobility as a service



Increasing a greater level of diversity in political engagement



Increasing citizen level of diversity in decision making

## CITIES VALUES & PRIORITIES

- Innovation in management and governance in order to provide qualitative improvements to the public services.
- Development of citizen-centric services
- The adoption of ICT technologies to improve the Citizens participation
- Attracting ICT companies and retaining talent in to the city.

## What's available through the SynchroniCity technical environment?

\* Please, check website for details and latest updates

### DATA

- Environmental data (Fixed & Mobile nodes):
  - Temperature (°C)
  - Humidity (%)
  - CO (mg/m<sup>3</sup>)
  - O<sub>3</sub> (ug/m<sup>3</sup>)
  - air particles (ug/m<sup>3</sup>)
  - NO<sub>2</sub> (ug/m<sup>3</sup>)
  - air Quality aggregated (ug/m<sup>3</sup>)
  - altitude (m)
- Noise Level
- Traffic Flow
- Street parking status (lots & areas)
- Bike sharing docking stations:
  - Location
  - Total number of slots
  - Available bikes....
- PoI information: Beaches, museums, shops...
- Parks&Gardens:
  - Soil temperatura (°C)
  - Soil moisture (%)
- Buses Info:
  - Buses: location, course, odometer, line
  - Bus stops: location, linked lines
  - Buses estimations: line, bus stop, time

### ASSETS

LoRa Network

## What's available in the City?

### DATA

[Open data platform.](#)

Some example links:

- [Real time information of available surface parking spots. Taxi stops](#)
- [Bike sharing facilities occupancy](#): information about stations existing municipal bicycle rental in the city of Santander is provided.
- [Bike lanes](#). A set of assets, including polylines that represent the lanes for bikes in the city of Santander.
- [Cultural agenda](#)
- [Pace of the city events](#) (reported incidents happening in the city).
- [Shopping information](#).
- [Information of the beaches in the city](#).

### ASSETS

- Real time information of available surface parking spots.
- Taxi stops
- Bike Sharing stops and occupation
- Bike lanes.
- Pace of the city events (reported incidents happening in the city).
- Shopping information.
- Information of the beaches in the city.
- Parks and gardens irrigation
- Participatory sensing
- Cultural agenda
- Points of interest

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