

CITI-SENSE CITIZENS' OBSERVATORIES AND WHAT THEY CAN DO FOR YOU

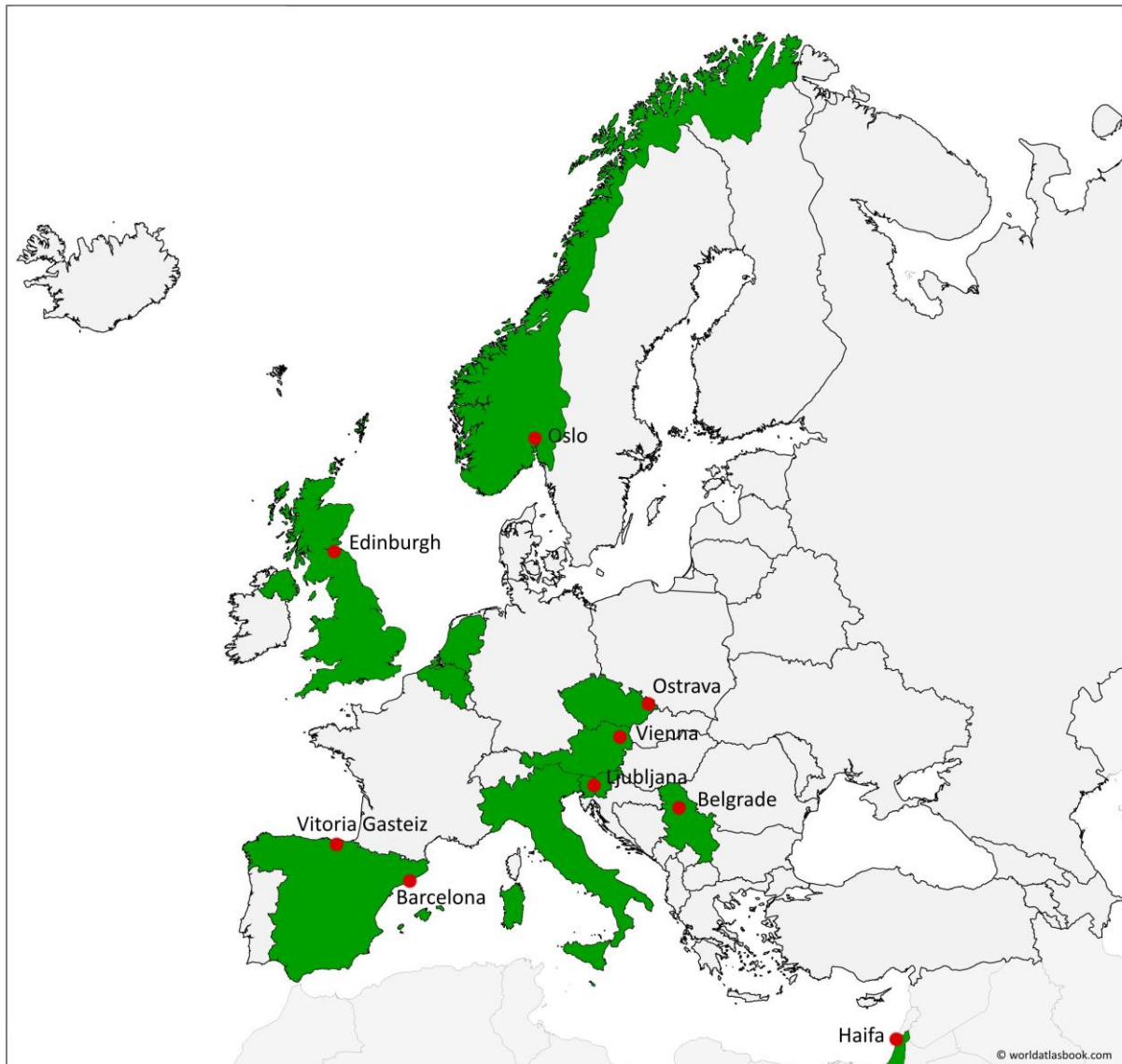


Table of Contents

CITI-SENSE Citizens' Observatories and what they can do for you	3
OVERVIEW	4
1. CITIZENS' OBSERVATORIES WEB PORTAL	5
What is it about?	5
How to use it?	6
Where to look for data?.....	6
How to find it?	6
2. PERSONAL AIR MONITORING TOOLKIT	7
What is it about?	7
Technical elements.....	7
LEO - Little Environmental Observatory	7
ExpoApp smartphone application for Android.....	7
A computer application for sensor management	8
How to use it?	9
Where to look for data?.....	9
How to get it?.....	10
3. CityAir SMARTPHONE APP.....	11
What is about?.....	11
How to use it?	11
Where to look for data?.....	11
How to get it?	12
4. ON-LINE AIR QUALITY PERCEPTION QUESTIONNAIRE	13
What is it about?	13
How to use it?	13
Where to look for data?.....	13
How to get it?.....	14
5. ENVIRONMENTAL MONITORING TOOLKIT for PUBLIC PLACES	15
What is it about?	15
Technical elements.....	15
The Kestrel® 4000 Pocket Weather Meter	15
Sensor Data Storage.....	15
SENSE-IT-NOW	16
CityNoise	17
How to use it?	17
Where to look for data?.....	18
How to get it?.....	18
6. DATA VISUALIZATION WEB PAGE	19
What is it about?	19
How to use it?	19
How to get it?.....	20
7. DATA DOWNLOAD WEB PAGE	21
What is it about?	21
How to use it?	21
How to find it?	21
8. EXTERNAL CONTRIBUTION: Phone application to display air pollution in Cities....	22
What is it about?	22
How to use it?	22
How to get it?.....	22



CITI-SENSE Citizens' Observatories and what they can do for you

This brochure is an overview of the main tools developed in the CITI-SENSE project (2012-2016). The aim of these tools is to involve citizens in assessments of air and environmental quality to empower them to participate in environmental governance. In CITI-SENSE, we are targeting people connected to our nine participating cities - Barcelona, Belgrade, Edinburgh, Haifa, Ljubljana, Ostrava, Oslo, Vienna and Vitoria, but most of the tools are available to everybody, everywhere, as long as the project infrastructure is in place.

If you are a public authority or a public interest organization and you would like to try these products in your city or area, do not hesitate to contact us (aba@nilu.no).

If you are a developer of apps, a web designer, or have monitoring devices that provide similar information that you will see on the following pages, we are pleased to make available to you the tools that will enable you to connect to our platform, so you can use the information there for any.

With this brochure, we invite all individuals, groups, organisations and businesses who would like to help make their cities better places to live in, to try our products. We are grateful for your inputs, feedback and suggestions!

Alena Bartonova and the CITI-SENSE team

Oslo/Kjeller, March 2016

Contact: alena.bartonova@nilu.no



OVERVIEW

CITI-SENSE has been working for and with people to share objective and subjective information about air quality, and acoustic and thermal comfort. Our tools are accessible through our web portal (<http://co.citi-sense.eu>). This brochure gives a first glance of our most widely used tools.

The **CITI-SENSE Citizens' Observatories Web Portal** (p. 6) provides an access point to all our apps, widgets, web pages and sensor based tools and questionnaires. You can get information about how to acquire, install and use them. You can also access the data already collected. For the technically minded, you can get information about the sensing devices, and about how to use our data for your own applications. And of course, you can also learn about the project that brought this to you, CITI-SENSE, and links to our social media platforms.

The **Personal Air Monitoring Toolkit** (p. 8) allows you to assess air quality in your immediate surroundings. It is based on a sensor device that monitors three gases (nitrogen dioxide, nitrogen monoxide and ozone).

The **City Air Smartphone App** (p. 13) allows you to share your perception of air quality, and the dominant pollution source, anytime, anywhere.

The **On-Line Air Quality Perception Questionnaire** (p. 15) can be used in campaigns to assess citizens' perception of air quality and get feedback.

The **Environmental Monitoring Toolkit for Public Places** (p. 17) can be used in campaigns to assess thermal comfort, soundscapes and visual qualities of outdoor places such as parks or public areas in need of rehabilitation.

The **Data Visualisation Web Page** (p. 21) provides an overview of all our sensor-based tools. If a measurement is taken using our tools, you should be able to find it there in some form or shape (sometimes, for privacy reasons, as part of an aggregated picture).

The **Data Download Web Page** (p. 23) provides access to sensor device data from the CITI-SENSE platform and enables their download in CSV format or directly into an Excel sheet.

Externally contribution: phone application to display air pollution in cities (p. 24) demonstrates that it is possible to use data collected within the CITI-SENSE framework to create your own services.

Information is also available through CITI-SENSE Twitter and Facebook, and on YouTube:

Twitter:

<https://twitter.com/citizensobs>

<https://twitter.com/CitObsBCN>

Facebook:

<https://www.facebook.com/int.cit.obs/>

<https://www.facebook.com/oslocitizensobservatory/>

<https://www.facebook.com/CitiSenseLjubljana/>

<https://www.facebook.com/BarcelonaCitObs/>

<https://www.facebook.com/obcanskapozorovatelna/>

<https://www.facebook.com/Citi-Sense-Vitoria-Gasteiz-785414554863775/?fref=ts>

<https://www.facebook.com/CitiSenseGimVic/>

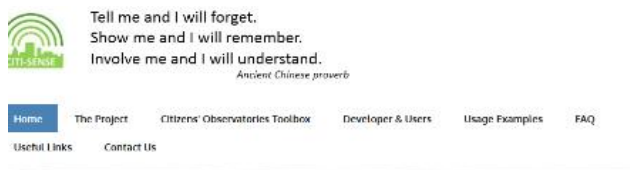
<https://www.facebook.com/cityairapp/>

YouTube

<https://www.youtube.com/channel/UCaDdfpvLONuybNBV9cNGIbQ>



1. CITIZENS' OBSERVATORIES WEB PORTAL



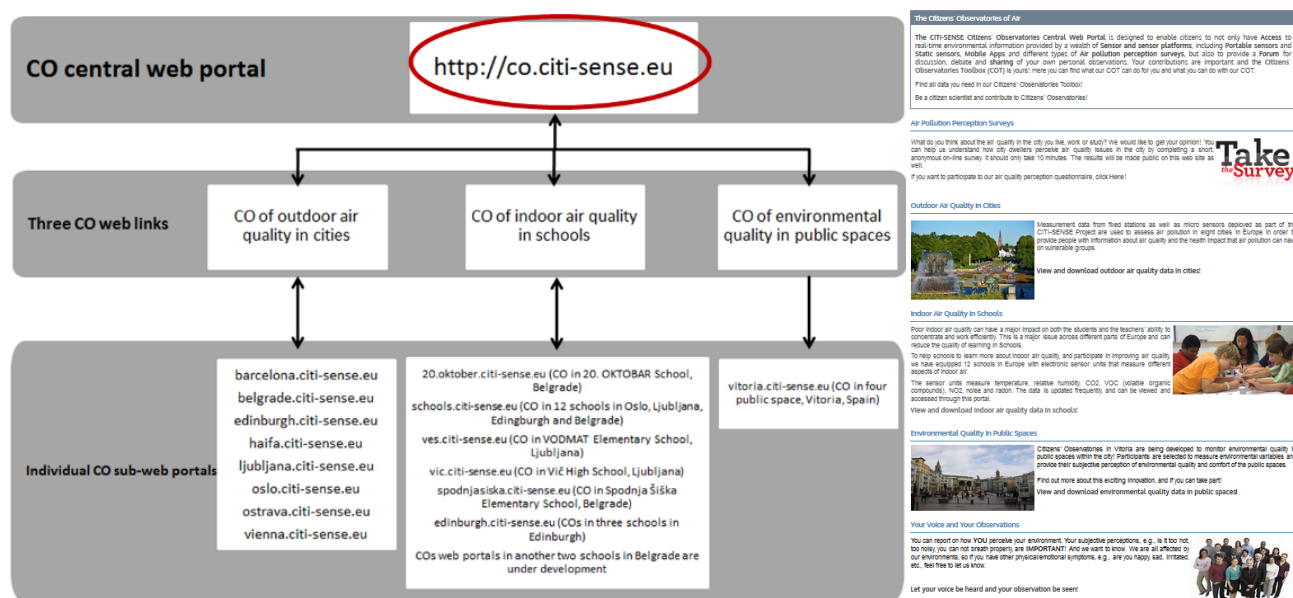
Hi there! Welcome to the CITI-SENSE Citizens' Observatories Central Web Portal!

Gateway to the Citizens' Observatories Toolbox is now open...



What is it about?

The CITI-SENSE Citizens' Observatories Central Web Portal is a gateway to the Citizens' Observatories Toolbox (COT). It provides interested parties access to our products and services, e.g., mobile apps and air quality perception surveys, and serves as a forum for discussion, debate and sharing of the citizens' own personal observations. The products and services include those based on outputs from several sensor platforms for air quality monitoring, and those based on subjective perceptions contributed by the public.

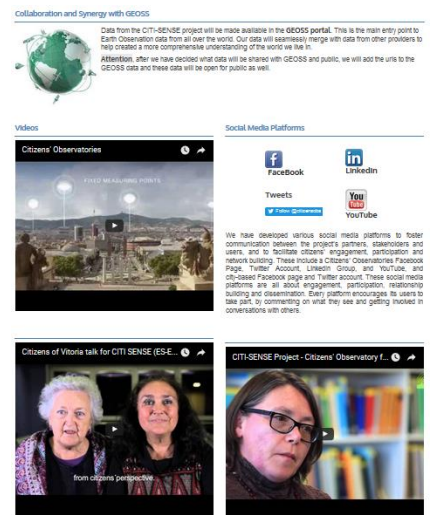


The CITI-SENSE Citizens' Observatories (CO) Web Portal is a gateway to the COs developed within the project. It has three layers - the CO central web portal, thematic areas, and individual web portals of participating cities. The thematic areas are Air Pollution Perception, Outdoor Air Quality in Cities, Indoor Air Quality in Schools and Environmental Quality in Public Spaces, The portal is structured in an intuitive and easy to navigate manner:

- Home
- The project
- Citizens' Observatories Toolbox
- Developers & Users
- Usage Examples
- FAQ
- Useful Links
- Contact Us.



The home page describes also the CITI-SENSE relationship to the Global Earth Observations (GEO) and gives a link to the GEO System of Systems (GEOSS).



More information is accessible using the embedded videos, hosted on YouTube. Social media platforms are presented with links as well.

How to use it?

The user can:

- View and access the CITI-SENSE data and products using the ‘Citizens’ Observatories Toolbox’;
- Access information for developers and those who are using the CITI-SENSE products and services from the ‘Developer & Users’ page ;
- Complete the air pollution perception surveys and social media platforms;
- Link to the information and data from the thematic CITI-SENSE COs;
- Access the GEOSS data, including the data by CITI-SENSE;
- Watch videos developed by the CITI-SENSE project;
- Get overviews of examples from real-life campaigns in the ‘Usage Examples’;
- Check out similar projects in the world, other types of sensor devices and monitors, air quality information, and collaboration and synergy with GEOSS, under ‘Useful Links’;
- Contact us and the tools providers through the ‘Contact Us’ page.

Where to look for data?

For data from each of the thematic COs, there are the following options:

- To click the link ‘View and download data’ in each tab of the three COs in the front page.
- To click on the ‘Web portals’ under ‘Citizens’ Observatories Toolbox’ for the thematic COs web portals.
- To click on ‘Data’ on the page ‘Citizens’ Observatories Toolbox’, where a link to each of the thematic COs data is available.

For all data from the CITI-SENSE project, there are the following options:

- To click on the tab ‘Collaboration and Synergy with GEOSS’ on the front page
- To click on ‘Data’ in the figure that is presented on the page ‘Citizens’ Observatories Toolbox’.

For data from each of the nine participating locations/cities, these are the ways to do so:

- To click the sub-page ‘Web portals’ under ‘Citizens’ Observatories Toolbox’, find each of the three COs web portals, and then each location-based web portal.
- To click on ‘Data’ in the figure that presents the COT at the page ‘Citizens’ Observatories Toolbox’, find the link to each of the three COs data, and find the link to each-location based COs data.

How to find it?

Please go to the web portal <http://co.citi-sense.eu/>, and find the detailed contact information there or contact Hai-Ying Liu from NILU-Norwegian Institute for Air Research, hyl@nilu.no.



2. PERSONAL AIR MONITORING TOOLKIT



What is it about?

This toolkit includes three different tools that when combined, allow to measure and visualize personal air quality in the user's immediate surroundings:

- Mobile sensor unit LEO (Little Environmental Observatory)
- Android app that connects to the sensor unit, reads and upload data to a server (ExpoApp)
- Computer application for sensor management (firmware upgrade).

Technical elements

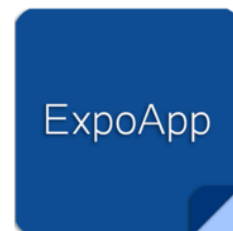
LEO - Little Environmental Observatory



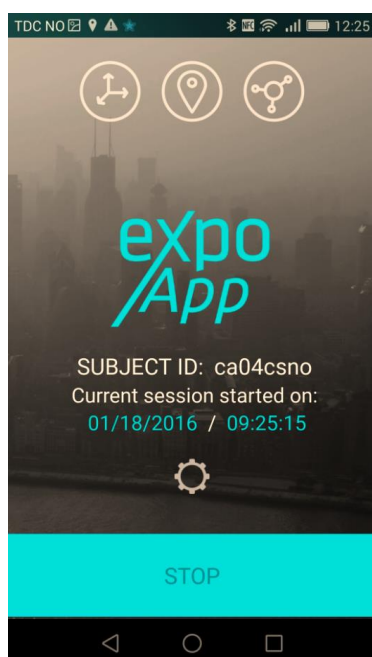
The LEO is a portable sensor pack. It measures NO, NO₂ and O₃ using electrochemical sensors. It also provides information about the current temperature and relative humidity. It can be used both, outdoors and indoors, but its primary use is for outdoors.

ExpoApp smartphone application for Android

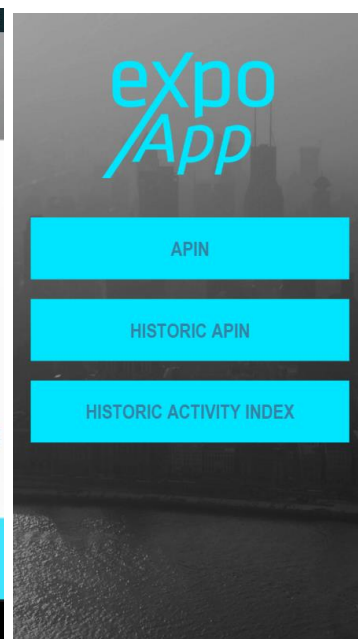
ExpoApp is an application for Android devices that communicates with the LEO. It reads and uploads the observations from the LEO and it also reads and uploads information from the user's smartphone about location and physical activity recorded by the so called accelerometer that is already built-in in each smart phone.

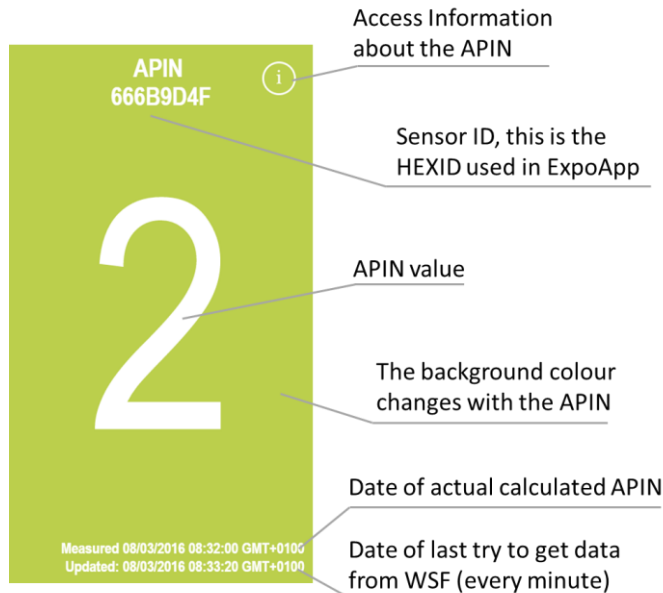


The ExpoApp allows the user to establish the connection between the LEO device and the smartphone via Bluetooth (left). It also provides a quick access to information about the status



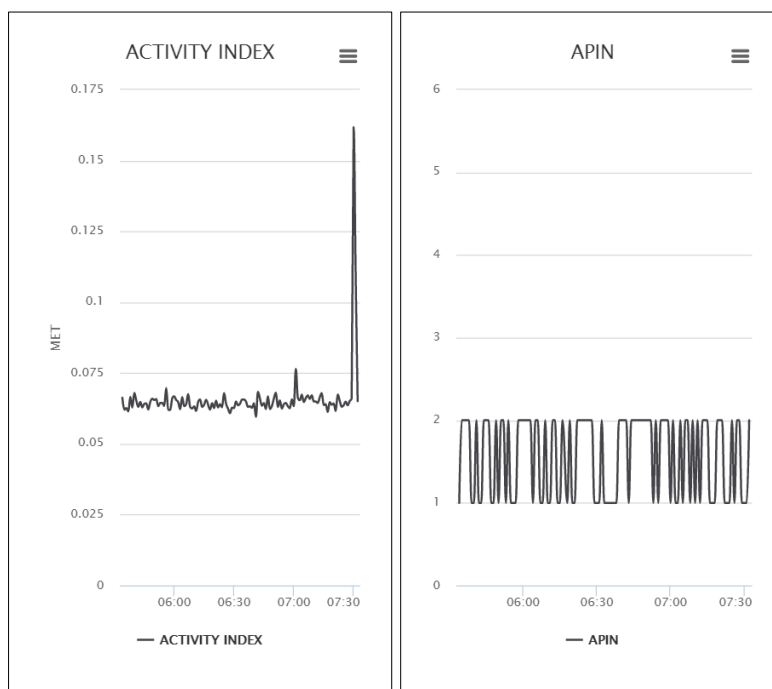
of the communication between the smartphone and the sensor (Last Message) and the smartphone and the server (Last Upload) (right).





The results are displayed as an APIN - air pollution indicator value (left). This indicator is related to a Common Air Quality Index CAQI, but cannot directly be compared as the air quality monitoring methods underlying the measurements differ.

The user can also check for the last 2 hours of data. The historic plots display the APIN, and the ACTIVITY Index calculated with the smartphone.



A computer application for sensor management

Ateknea Sensor Tool is used by the technical support to update the LEO, and not directly by the user. It has also functionalities for reading the raw data from the sensor unit, and for adding calibration values.



How to use it?

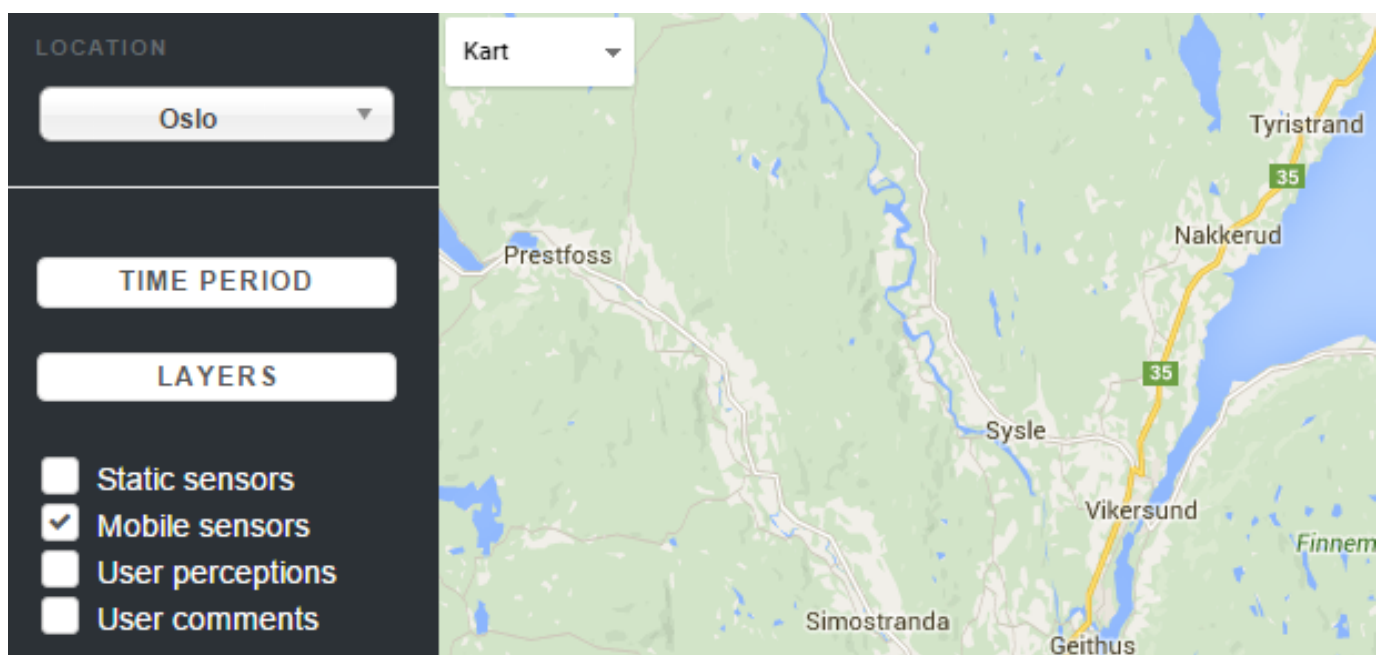
The **Personal Air Monitoring Toolkit** provides an opportunity to monitor personalized levels of air pollution and their changes in time and place. The LEO sensor unit can be carried on the outside of a jacket or on a belt. The user's android smartphone can then be paired with the sensor unit via the mobile's Bluetooth. Once paired, the ExpoApp can be set up to read and store the data from the device. Processed data from all users, without personal identification, are publicly available.

The measurements give an indication of pollution levels and their changes, as the user moves through different locations and types of environments. They help to identify where (and when) the pollution is higher than other places, as such situations sometimes can be avoided. The project team takes great care to provide measurements of good quality, but as the methods are not the same as methods used in air quality monitoring by the authorities, the official air quality information should be consulted on air quality levels.

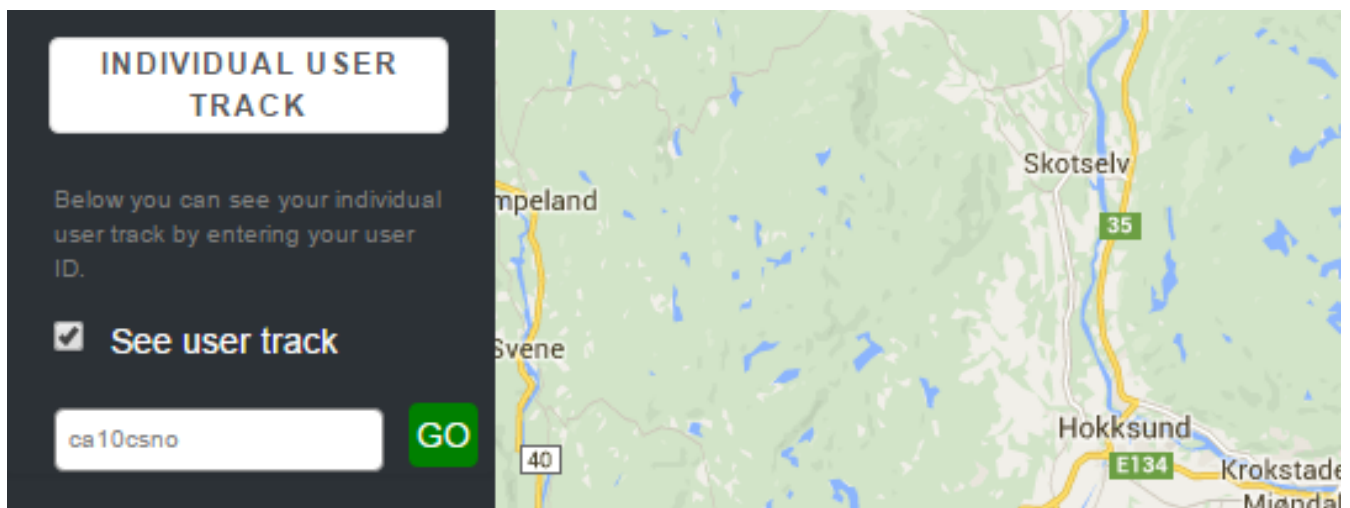
Where to look for data?

The user can **view** data at <http://srv.dunavnet.eu/new/citisense/OutdoorDataPortal>.

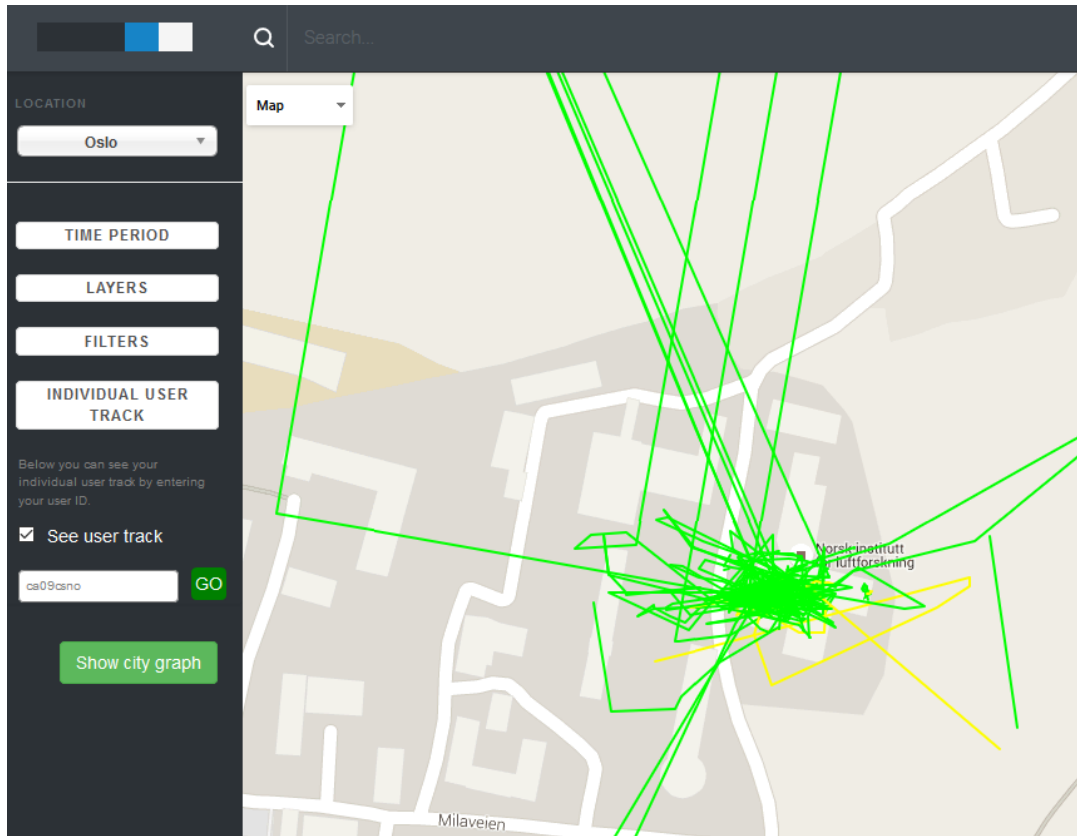
To **check for the last measured values** of all mobile sensors in a city, add filter criteria:



To **follow the user's own sensor unit**, add the user id registered on the ExpoApp:



After that, you will be able to track the sensor in a geographic area:



How to get it?

The package has been developed in the CITI-SENSE project, co-funded by the European Commission Seventh Framework Programme for Research, Technological Development and Innovation under grant agreement no 308524, active between October 2012 and September 2016.

More information about the package is available at: <http://citisense.ateknea.com/>

ExpoApp is available on Google Play

<https://play.google.com/store/apps/details?id=ateknea.eu.expoapp2>

Documentations, links to video tutorials, PC application download and user guides can be found here:

<http://citisense.ateknea.com/sensors/downloads>

<http://co.citi-sense.eu/CitizensObservatoriesToolbox/Sensorandsensorplatforms.aspx>

Until May 2016, interested users in Barcelona, Belgrade, Edinburgh, Haifa, Ljubljana, Oslo, Ostrava and Vienna can contact the project using the contact information provided in:

<http://co.citi-sense.eu/ContactUs.aspx>

After May 2016, The **LEO** sensor device can be purchased upon request from Ateknea Solutions, Carrer de Víctor Pradera, 45, ES-08940 CORNELLÀ DE LLOBREGAT +34 932049922; info.barcelona@ateknea.com; ateknea.com/es; ateknea.com/ct



3. CityAir SMARTPHONE APP



What is about?

CityAir is a smartphone application (App) for the public to express their perception of the outdoor air quality at their location. It allows users to collect and display individual perceptions of air quality, irrespective of where they are in the world. It also allows users to indicate the assumed source of the air pollution and write a comment.

CityAir gives the user the possibility to rate the air quality in their immediate surrounding by using a code of four colours:

- Green – very good air quality;
- Yellow – good air quality;
- Orange – poor air quality;
- Red – very poor air quality.

How to use it?

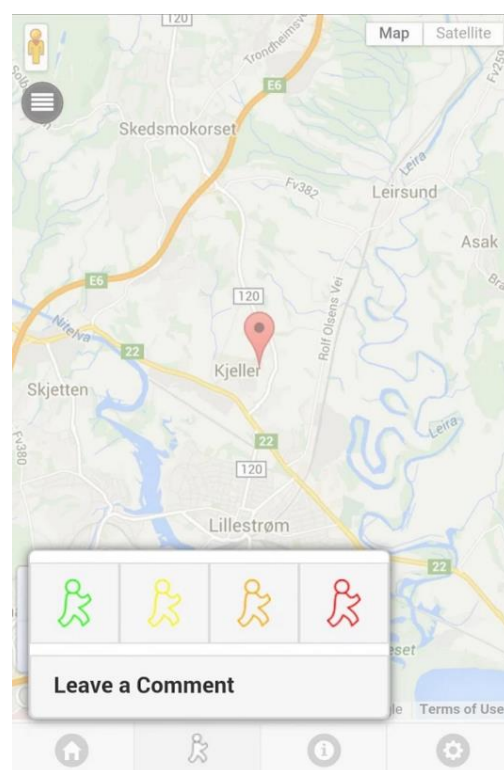
When the user has access to network and GPS signals, the App will display a map and mark the users' current position. When the user moves into another area, the home-button will re-position the marker onto the correct place at the map.

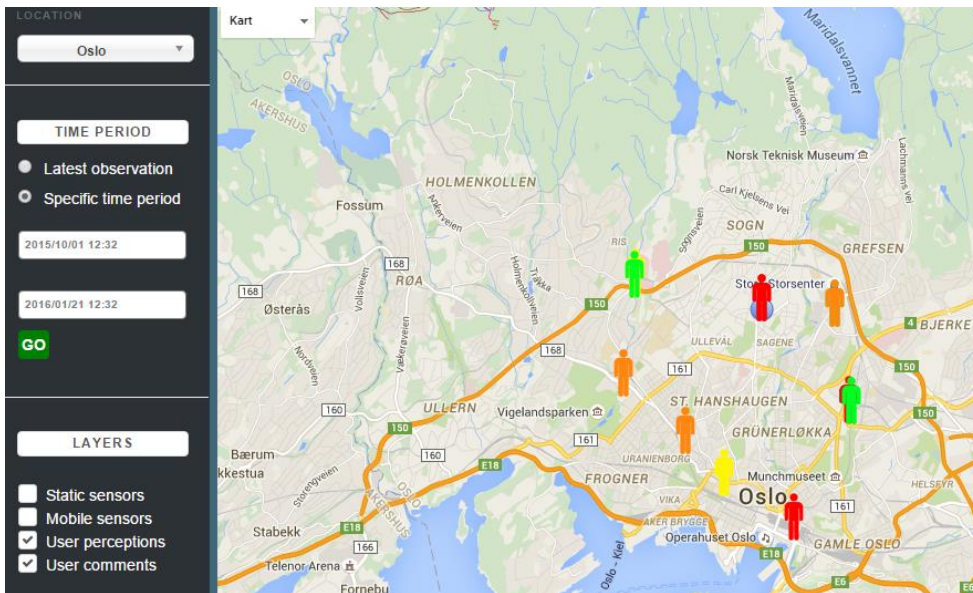
The user can add a perception marker for the current air quality, and suggest a pollution source or leave a comment. When the preferred network is available (chosen by the user), the App will upload the information provided by the user into the CITI-SENSE platform.

Before the first use of the App, the user can select a preferred language from a list. S/he will also be asked some personal information (gender, year of birth and education) for statistical purposes.

Where to look for data?

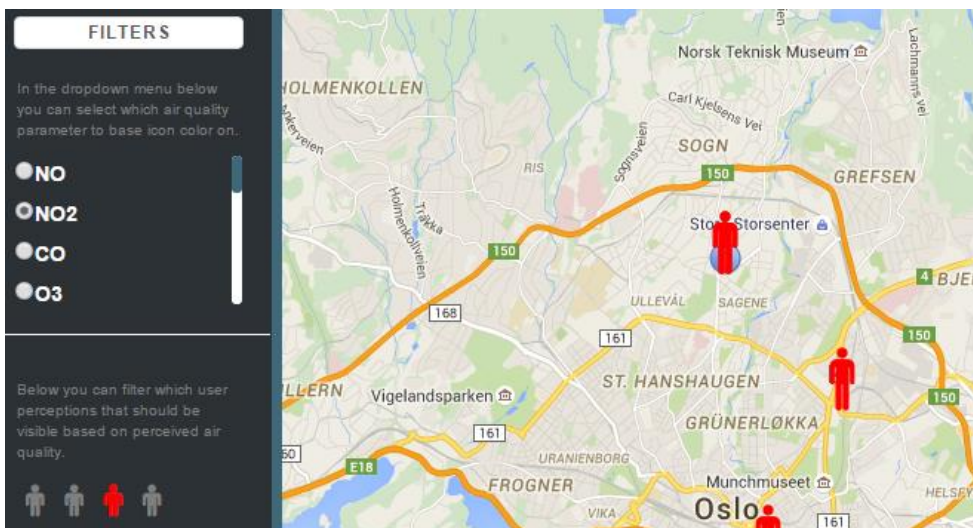
The user can choose to download other users' perceptions reported through **CityAir** for the same day, the last week or the last month, directly into the **CityAir** App on their smartphone.






CITI-SENSE Data Web Page

<http://srv.dunavnet.eu/new/citisense/OutdoorDataPortal> allows viewing the collected perceptions reported by all contributing users. The web page allows also for viewing the reported perceptions from a specific location, to only get the last observations, or observations made in a specific time period.



All perceptions can be found under the **User perceptions** and **User comments** layers. The user can also choose to filter the markers on the map according to perceived air quality (the pollution components in the picture do not apply).

How to get it?

	<p>Available on Google Play: https://play.google.com/store/apps/details?id=io.cordova.CityAir</p>	<p>Available on AppStore: https://itunes.apple.com/no/app/cityair-perception/id1045646666?mt=8</p>
---	---	--



4. ON-LINE AIR QUALITY PERCEPTION QUESTIONNAIRE



What is it about?

The CITI-SENSE **Online air quality perception questionnaire** is a tool for collecting and analysing how users perceive air quality issues. The tool is being used in the nine participating cities/locations.

The questionnaire can be answered by anybody anywhere. Instances for new cities can be easily created for free using the CIVICFLOW platform. At the moment, the questionnaire is active for the participating sites.

The questionnaire includes three sections: participants' personal information, specific questions on the participants' air quality perception, and feedback from the participant. The questionnaire has also an optional part to collect user preferences on what information on air quality shall be fed back to the user. The data collected is seamlessly available for visualization and analysis through the CITI-SENSE platform.

How to use it?

The questionnaire can be answered from any web browser; for mobile phone users a QR code for accessing the survey is also provided. The questionnaire can be seamlessly integrated into existing proprietary mobile applications or web portals. Currently the online perception questionnaire is available in different languages for each city that is involved in CITI-SENSE.

Where to look for data?

After the local campaigns, the results will be available on the CO web page of each site, and through the citizens' observatories web portal <http://co.citi-sense.eu>.

Oslo	http://oslo.citi-sense.eu/Browsedata.aspx
Vienna	http://vienna.citi-sense.eu
Ljubljana	http://ljubljana.citi-sense.eu
Haifa	http://haifa.citi-sense.eu
Barcelona	http://barcelona.citi-sense.eu
Belgrade	http://belgrade.citi-sense.eu/
Edinburgh	http://edinburgh.citi-sense.eu/
Ostrava	http://ostrava.citi-sense.eu

Air quality in Oslo (English version)

About you

1. What gender are you?

Male
 Female

2. What year were you born? (Please use 4 digits, e.g. 1975)

3. What is the highest level of education you have completed to date?

Primary school
 Secondary school
 Undergraduate degree (University/college)
 Masters degree
 Doctorate degree or higher

4. What do you do in Oslo? (Tick all that apply)













Live
 Work
 Study
 Other

5. How interested are you in air quality in general?

Not at all interested
 Slightly interested
 Interested
 Very interested



How to get it?

<i>City</i>	<i>Web page questionnaire</i>	<i>QR access code</i>
Oslo	<p>Norwegian: http://w.civicflow.com/task/participate/153</p> <p>English: http://w.civicflow.com/task/participate/150</p>	  Norwegian English
Vienna	<p>German: http://w.civicflow.com/task/participate/159</p>	
Ljubljana	<p>Slovene: http://w.civicflow.com/task/participate/157</p> <p>English: http://w.civicflow.com/task/participate/162</p>	  Slovene English
Haifa	<p>Hebrew: http://w.civicflow.com/task/participate/158</p>	
Barcelona	<p>Castellano: http://w.civicflow.com/task/participate/156</p> <p>Català: http://w.civicflow.com/task/participate/154</p> <p>English: http://w.civicflow.com/task/participate/161</p>	  Castellano Català 
Belgrade	<p>Serbian: http://w.civicflow.com/task/participate/151</p>	
Edinburgh	<p>English: http://w.civicflow.com/task/participate/144</p>	
Ostrava	<p>Czech: http://w.civicflow.com/task/participate/155</p>	

5. ENVIRONMENTAL MONITORING TOOLKIT for PUBLIC PLACES



tecnalia Inspiring Business



What is it about?

The toolkit for public places is a collection of tools for subjective and objective monitoring of environmental quality and satisfaction, and for giving feedback at all kinds of public places. It consists of a Kestrel 4000 Pocket Weather Meter, Sensor Data Storage, Sense-It-Now app, a dedicated noise sensor and CityNoise app. The main use of this toolkit is in dedicated campaigns.

Technical elements

The Kestrel® 4000 Pocket Weather Meter

Kestrel® Pocket Weather Meter is a commercial sensor unit that measures wind speed, temperature, relative humidity and air pressure. To read data, it is connected to a smartphone via Bluetooth

Sensor Data Storage

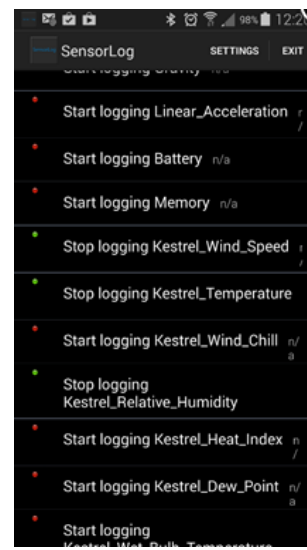
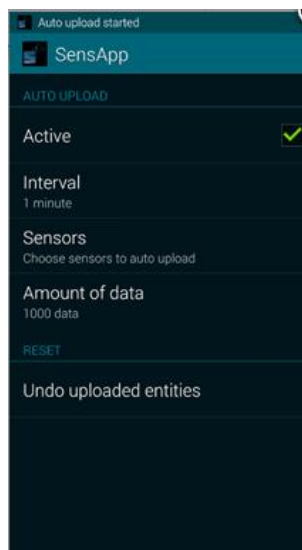
To read data from the Kestrel sensor and upload the data to server for storage, this toolkit combines three different elements. **SensorLog** is an android smartphone application for reading the Bluetooth stream from the sensor unit. **SensApp Android** is an android smartphone application that pushes the data read by SensorLog into the SensApp web services for storage and management. **SensApp Web Services** enable storage and retrieval.



SensorLog is an Android application which establishes communication with sensors and then pushes these data to the SensApp Android application. The client can find any referenced sensor contained in the Android host system and a predefined set of Bluetooth sensors.



The **SensApp Android** smartphone application provides a database shared with client applications on the android device. While the client applications can easily insert sensors and measures in the database, the **SensApp** android maintains and uploads data to remote SensApp server instances.





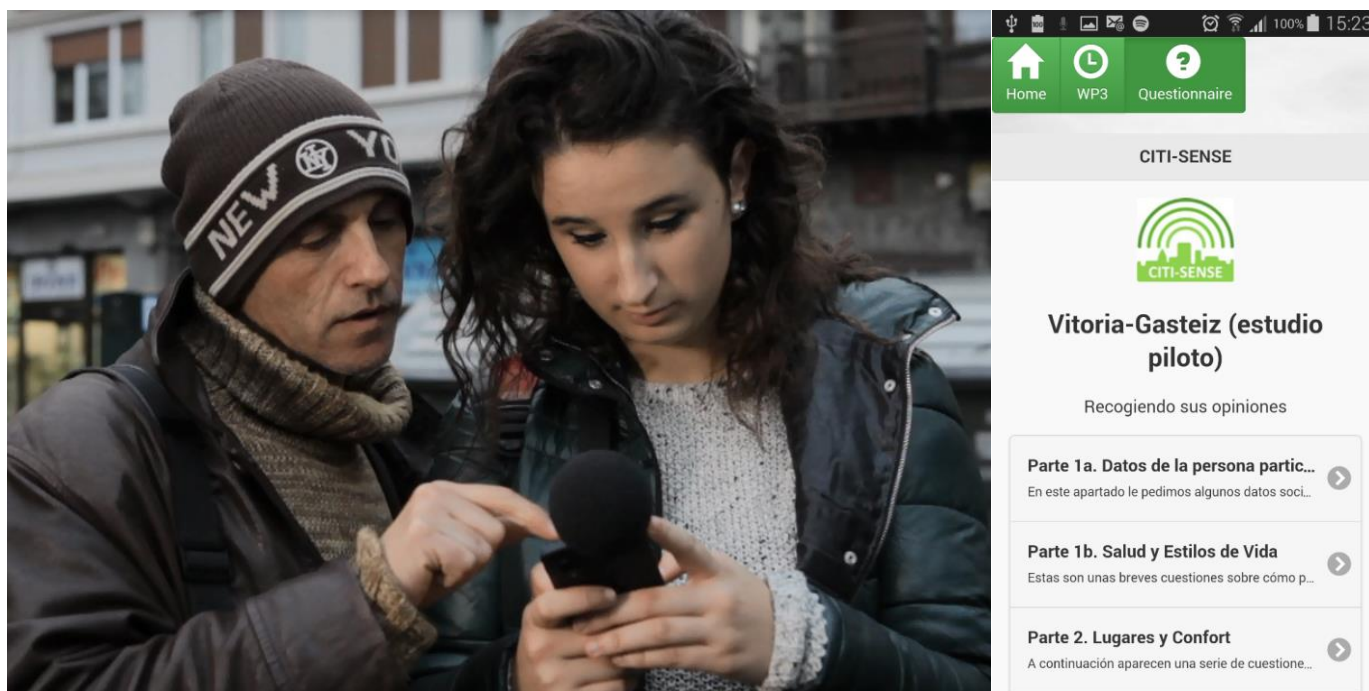
SensApp web services is composed of a set of web services that enable retrieving and storing sensor data. SensApp has a web page for sensor data management.

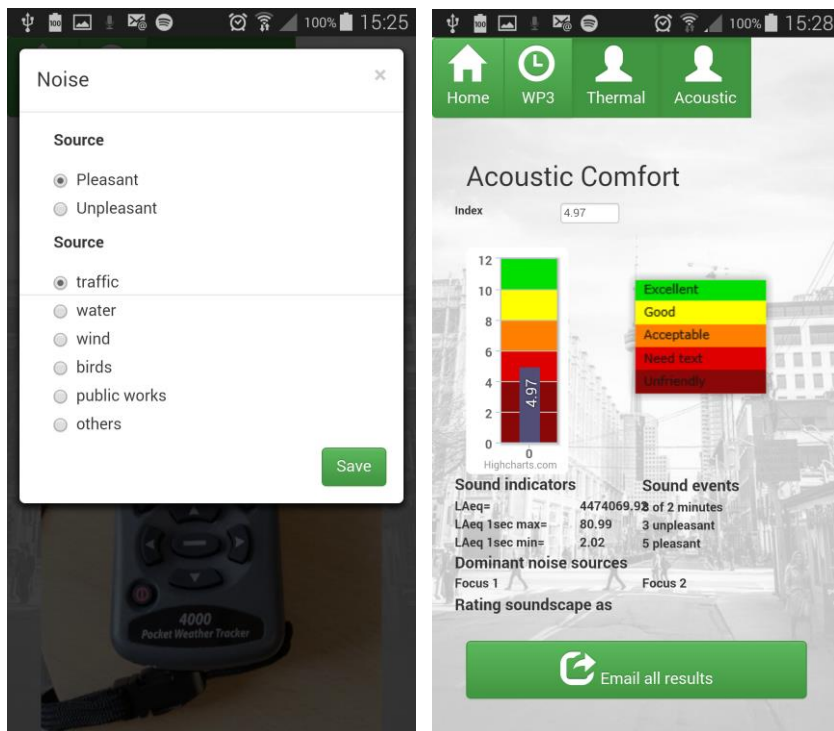
Name	Description	Creation date	Actions
A0019CTUBAQ_866cfafe9833391_Sunbuddy_LVA	TYPE_SUNBUDDY	2015-02-04 22:29:35	Edit Rate
A0019CTUBAQ_866cfafe9833391_Sunbuddy_LVB	TYPE_SUNBUDDY	2015-02-04 22:29:45	Edit Rate
ACC-x-Participant0302	ACC X axis	2015-02-17 10:44:55	Edit Rate
ACC-x-Participant0111214	ACC X axis	2014-12-11 09:18:33	Edit Rate
ACC-x-Participant0138115	ACC X axis	2015-01-19 12:46:26	Edit Rate
ACC-x-Participant0208115	ACC X axis	2015-01-26 15:55:40	Edit Rate
ACC-x-Participant0211214	ACC X axis	2014-12-11 09:17:39	Edit Rate
ACC-x-Participant02181214	ACC X axis	2014-12-18 16:31:22	Edit Rate
ACC-x-Participant0220115	ACC X axis	2015-01-20 18:05:23	Edit Rate
ACC-x-Participant0208115	ACC X axis	2015-01-09 11:18:47	Edit Rate

SENSE-IT-NOW

SENSE-IT-NOW is a smartphone application developed for Android devices that provides the following options:

- carry out online surveys;
- collect user provided information about their personal perceptions of the environmental quality by taking a photo and mark it with “Pleasant” or “Unpleasant”;
- show in real time the measurements of temperature, humidity and wind speed from the Kestrel sensor, and sound pressure levels from the microphone and the CityNoise App;
- calculate personal thermal and acoustic comfort;
- taking a photo of the area and reporting its perception (pleasant or unpleasant) .





CityNoise is a smartphone application/service developed for android devices to detect noise in the user’s surroundings. It runs in the background but provides feedback to the SENSE-IT-NOW application when changes in the soundscape are detected.

Based on the user feedback of the source, perception of the detected sounds, and specific questions answered through the SENSE-IT-NOW App, CityNoise will calculate an acoustic index and provide it to SENSE-IT-NOW.

The service provides a sound pressure measurement and detects sound events.

How to use it?

The toolkit can be used in dedicated campaigns. Prior to the user involvement, the team responsible for the campaign will initialize the toolkit, and give the users a short training.

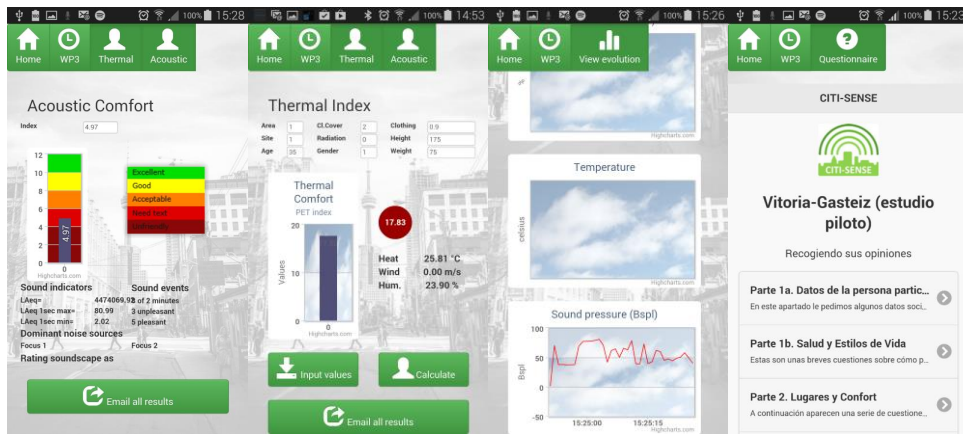
Each user will carry out a monitoring session of about 15 minutes. The user will carry a Kestrel sensor that is connected to an android smartphone with the four necessary apps and an external microphone attached. The user will first start a measuring session of noise levels, wind speed, humidity and temperature with the Kestrel sensor. While the measurements are ongoing, the user will complete a survey about her/his perception of the place. At the end of the measurements, the user can take pictures of the surroundings.

During the measurements, if the CityNoise App detects a noise event, the user will be alerted and will be able to provide feedback about the perception of the sound and possible source.

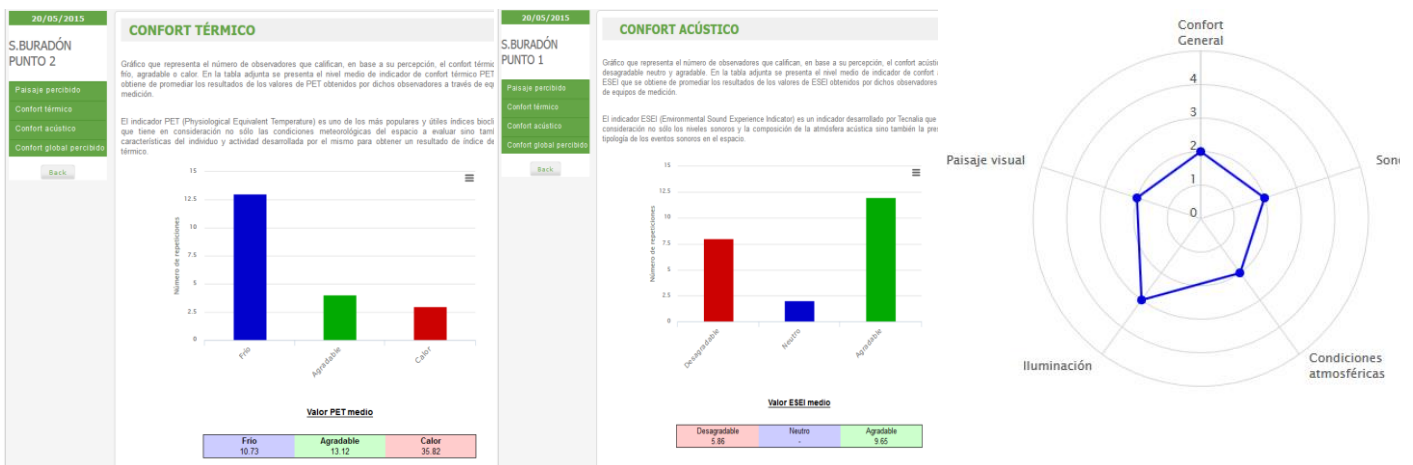
When the user chooses to end the measuring session, the information will be used to calculate an acoustic and a comfort index.

Photos and perceptions taken by other users can be also viewed. Additional visualization of data can be offered by the App in the smartphone.

Where to look for data?



The SensApp web services can be used for downloading the collected data. The data is displayed at the web page <http://vitoria.citi-sense.eu/en-gb/citisense.aspx> :



As a final step, the users can gather for a workshop to discuss their suggestions for area improvements.



How to get it?

Please contact:

Itziar Aspuru; itziar.aspuru@tecnalia.com

Área Sostenibilidad Urbana y Territorial/ Urban and Territorial Sustainability Area

División Energía y Medio Ambiente / Energy and Environment Division

TECNALIA

Parque Tecnológico de Bizkaia; C/Geldo, Edificio 700

E-48160 Derio - Bizkaia (Spain) www.tecnalia.com

T M 629 38 06 61; T 902 760 000*T +34 946 430 850 (International calls); T Div 902 760 005



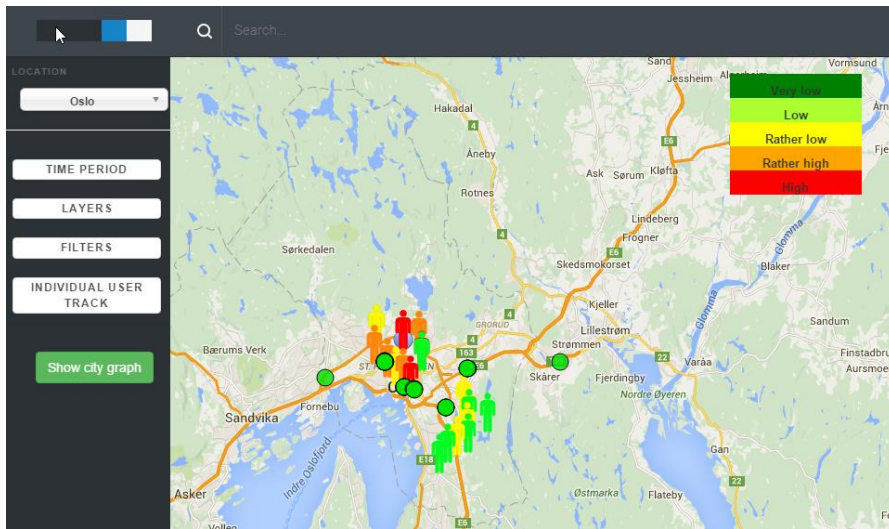
CITI-SENSE, www.citi-sense.eu, is a collaborative project co-funded by the European Union's Seventh Frame-work Programme for Research, Technological Development and Innovation, grant agreement no 308524.

6. DATA VISUALIZATION WEB PAGE



What is it about?

The CITI-SENSE project collects numerous types of data, and provides varied information. A dedicated web site, operating on input from the CITI-SENSE central data platform, allows to visualize this information.



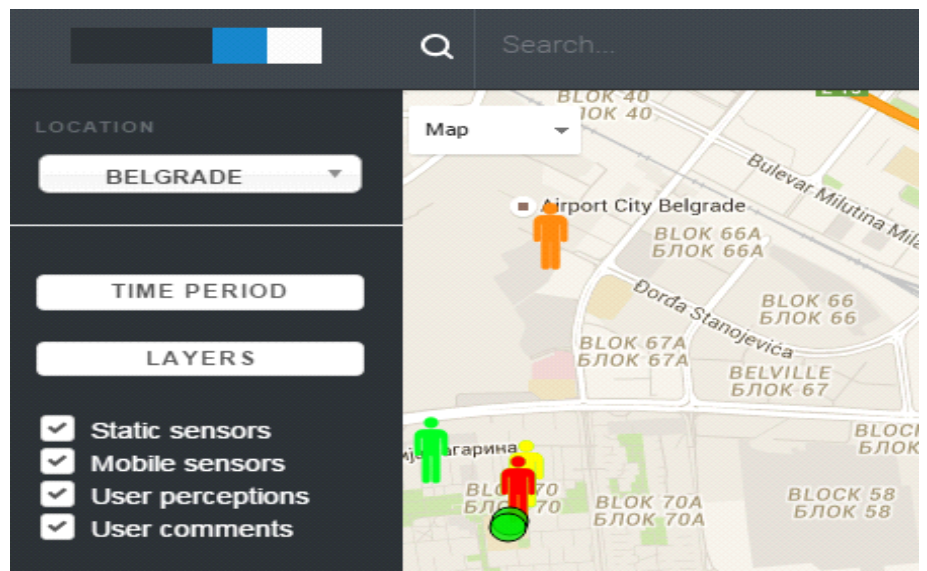
The CITI-SENSE data web page is a web tool for viewing collected data. It is based on input from the CITI-SENSE platform that collects anonymized information.

The user can choose to look at different data types and to combine these in a simple map.

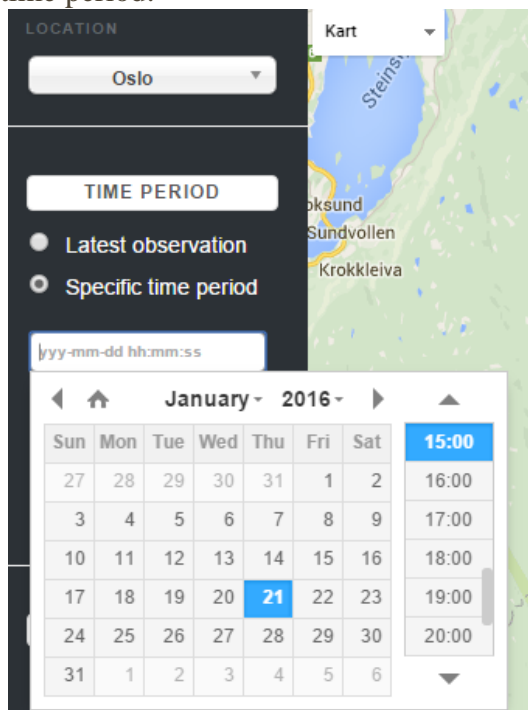
How to use it?

The user starts off by selecting a location from a predefined set of locations registered in our CITI-SENSE platform. When the location is chosen, the web page will upload as a default the last measured values on the following inputs:

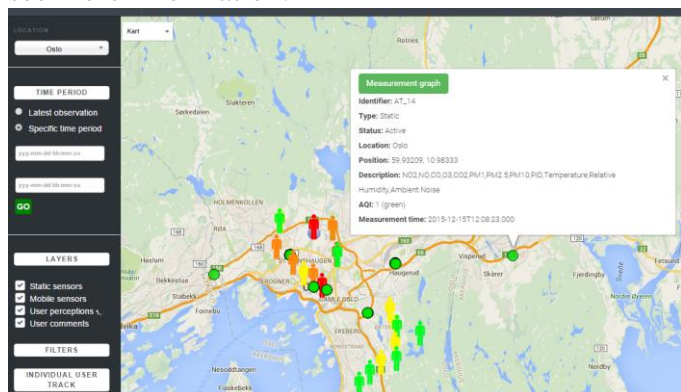
- Static sensors
- Mobile sensors
- User Perceptions
- User Comments



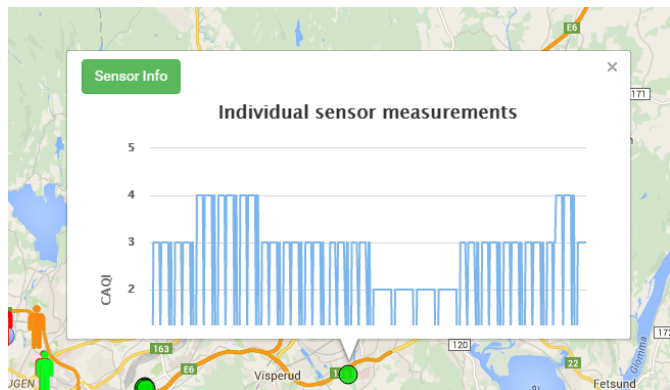
The user can choose to view data within a specific time period:



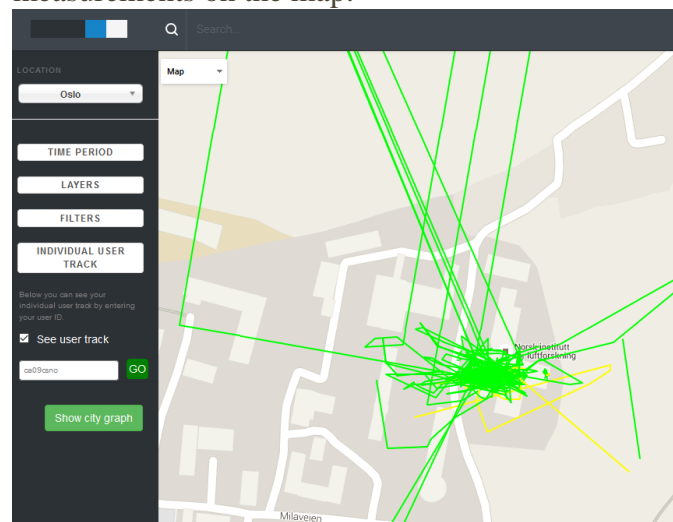
After clicking on a sensor on the map, the user will see more information:



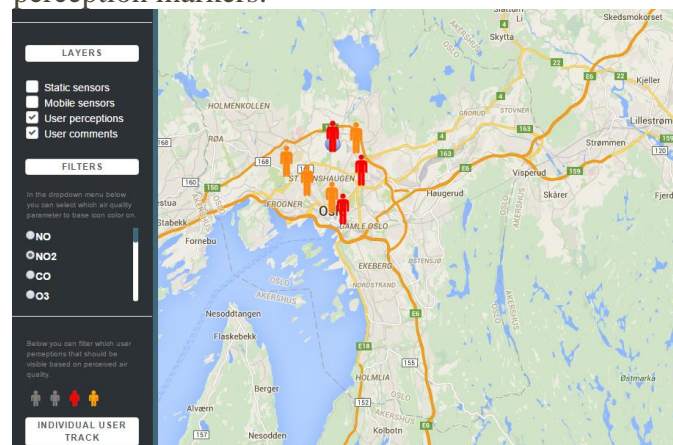
And the individual sensor's measurements:



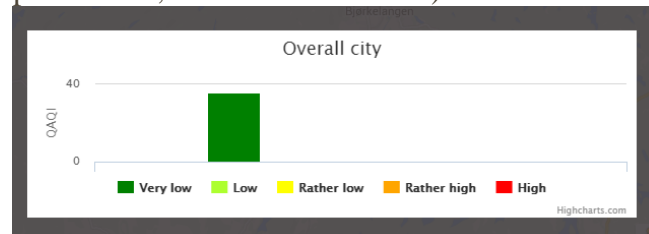
For mobile sensors, the user can fill in the unit's user ID from the ExpoApp and track their measurements on the map.



Several options are available for removing layers, or viewing individual air quality parameters and perception markers:



For each city, a summary graph indicates air quality as measured by the sensor units (please note that this may differ from the information from the public air quality information systems, due to differences in monitoring methods, device placements, and local conditions)



How to get it?

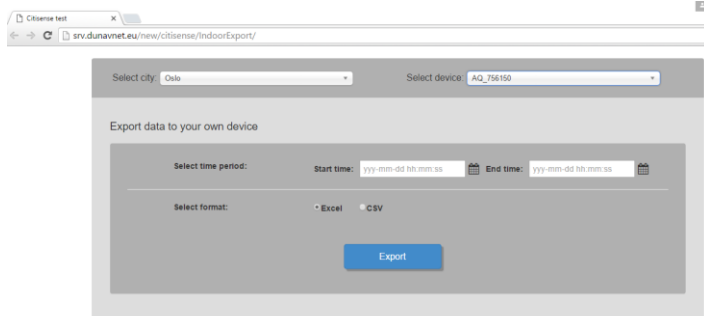
The web page can be found at this address:

<http://srv.dunavnet.eu/new/citisense/OutdoorDataPortal/>



CITI-SENSE, www.citi-sense.eu, is a collaborative project co-funded by the European Union's Seventh Framework Programme for Research, Technological Development and Innovation, grant agreement no 308524.

7. DATA DOWNLOAD WEB PAGE



What is it about?

The CITI-SENSE **Download Data Web Page** is a web tool for downloading sensor device data from the CITI-SENSE platform in CSV format or directly into an Excel sheet. It is intended for use within the CITI-SENSE project, but can be used by any interested party.

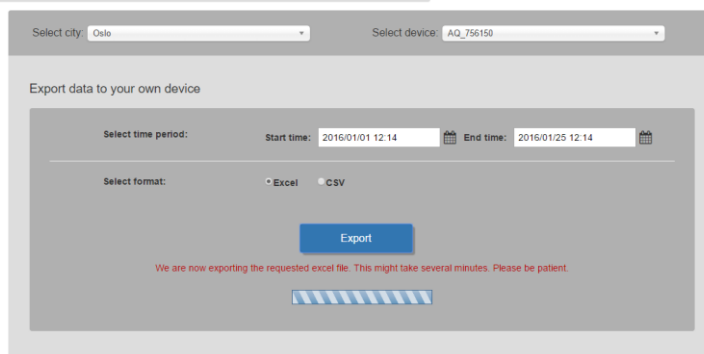
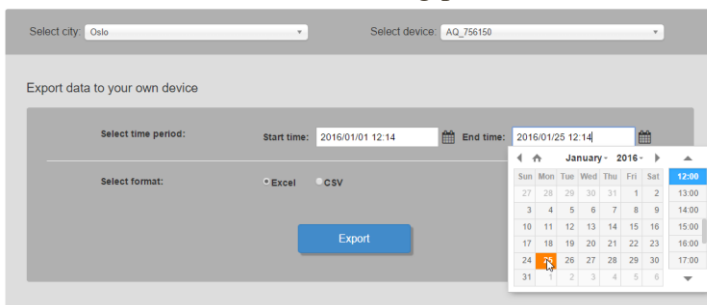
Participants in the CITI-SENSE school use cases can access data at <http://schools.citi-sense.eu/> (password-protected).

The **Download Data** web page has the following five mandatory filter criteria:

- (1) Location, (2) Sensor device, (3) Start time, (4) End time (5) Format CSV/Excel.

How to use it?

The user selects from a drop-down menu the area (city), and chooses the device to view. Then s/he defines the start and end of the measuring period, chooses the output format, and clicks the Export button:



	A	B	C	D	E	F	G	H	I	J	K	L
	Observation ID	Sensor ID	Time	Total Count	NO2 (µg/m3)	CO (mg/m3)	O3 (µg/m3)	Temperature (°C)	Relative Humidity (%)	Absolute pressure	Noise Level	Noise Peak
1	710690001	AQ_756150	1.1.16 12:15:00	3,646								
2	710690002	AQ_756150	1.1.16 12:30:00	3,802								
3	710690003	AQ_756150	1.1.16 12:45:00	3,282								
4	710691000	AQ_756150	1.1.16 13:00:00	2,912	10,795	114,269	-6,583	2,6	90,4	1017	572	736
5	710862000	AQ_756150	1.1.16 13:00:00	3,326	10,795	114,269	-6,583	2,6	90,4	1017	572	736
6	710862001	AQ_756150	1.1.16 13:15:00	3,05								
7	710862002	AQ_756150	1.1.16 13:30:00	2,398								
8	710862003	AQ_756150	1.1.16 13:45:00	2,368								
9	711029000	AQ_756150	1.1.16 14:00:00	2,382	8,093	120,471	-5,237	2,8	89,9	1017,4	676	855
10	710863000	AQ_756150	1.1.16 14:00:00	2,382	8,093	120,471	-5,237	2,8	89,9	1017,4	676	855
11	711029001	AQ_756150	1.1.16 14:15:00	2,912								
12	711029002	AQ_756150	1.1.16 14:30:00	3,202								
13	711029003	AQ_756150	1.1.16 14:45:00	3,442								
14	711030000	AQ_756150	1.1.16 15:00:00	3,442	7,922	127,062	-3,832	2,8	89,9	1017,8	711	911
15	711205000	AQ_756150	1.1.16 15:00:00	3,436	7,922	127,062	-3,832	2,8	89,9	1017,8	711	911
16	711205001	AQ_756150	1.1.16 15:15:00	3,026								
17	711205002	AQ_756150	1.1.16 15:30:00	3,026								
18	711205003	AQ_756150	1.1.16 15:45:00	3,026								
19	711206000	AQ_756150	1.1.16 16:00:00	2,654	4,391	133,978	-4,929	2,6	90	1018	723	909
20	711373000	AQ_756150	1.1.16 16:00:00	2,654	4,391	133,978	-4,929	2,6	90	1018	723	909

How to find it?

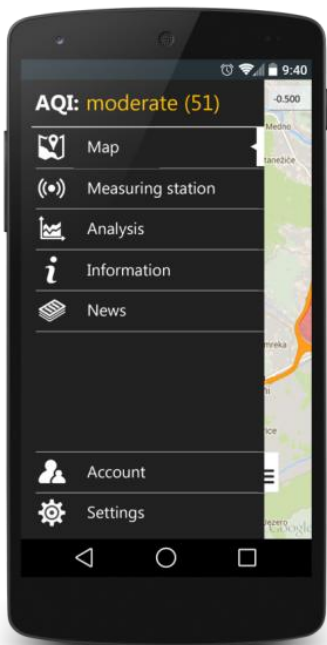
The web page can be found at this address: <http://srv.dunavnet.eu/new/citizensense/IndoorExport/>



8. EXTERNAL CONTRIBUTION: Phone application to display air pollution in Cities

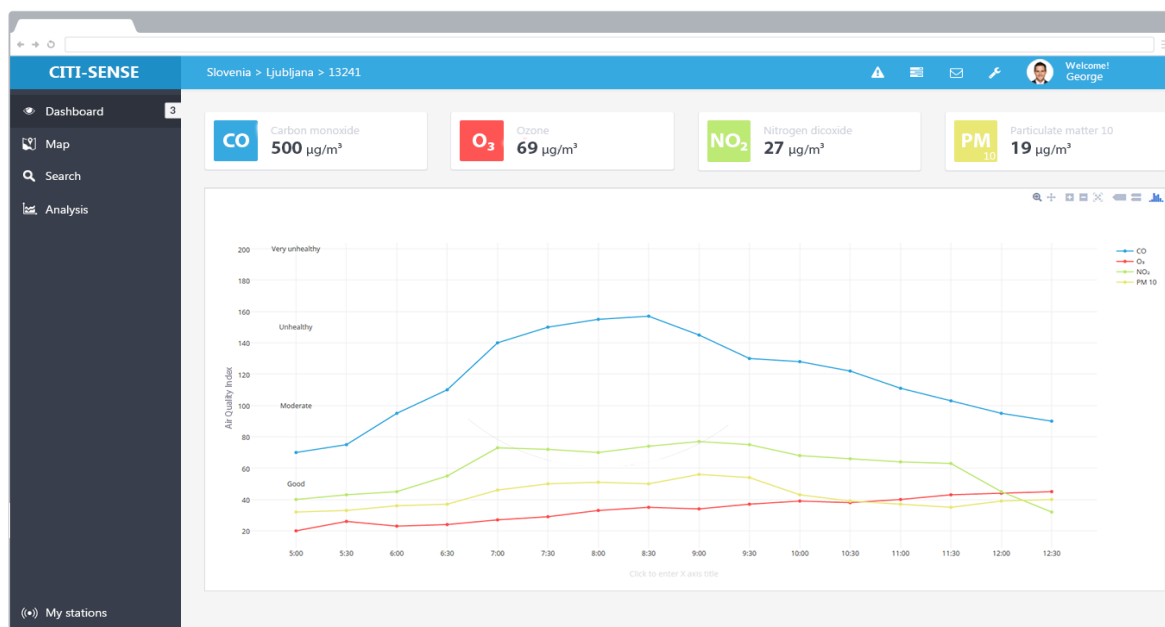
What is it about?

A centralized open source phone application for Android and iOS which visualizes air quality by using effective colour schemes. Semi-transparent overlays of pollution are generated according to Air quality index (AQI) scale (only for areas with sufficient number of measuring points per area) which is displayed as layers over Google maps.



How to use it?

The application will be accessible from any modern device, whether from a native app or via web interface. On areas with several measuring stations, AQI heat maps of pollution will be generated. The Android and iOS app will also support portable measuring units. With the portable units, the user will get information at any location he is staying during the day. The application is designed to interpret the data from the available measuring units from the CITI-SENSE project, but it also enables inclusion of data/measurements from any amateur weather station as well as any commercially available air monitoring products (e.g. Netatmo, Cubesensors).



How to get it?

The app will be available on Google Play on June 2016 at the latest.



CITI-SENSE, www.citi-sense.eu, is a collaborative project co-funded by the European Union's Seventh Framework Programme for Research, Technological Development and Innovation, grant agreement no 308524.



CITI-SENSE, www.citi-sense.eu, is a collaborative project co-funded by the European Union's Seventh Framework Programme for Research, Technological Development and Innovation, grant agreement no 308524.

CITI-SENSE, “Development of Sensor-Based Citizen’s Observatory Community for Improving Quality of Life in Cities”, aims to strengthen the ability of citizens to participate in environmental decision making. It provides citizens with tools to ‘sense’ and appraise their environment through new devices, at the same time raising awareness about pollution issues, and allowing to communicate valuable environmental information between various stakeholders.

To address its objective, CITI-SENSE builds on an intensive dialogue between the technical, scientific, and social aspects of environmental information, its production, and its use. The project is building a technical infrastructure that allows to collect data from numerous information providers (sensor devices, citizens, environmental databases), and to develop information products partly using co-design techniques.

As one of the aims is to provide information to GEOSS, our infrastructure complies with the necessary standards. Own data collection using microsensor devices gives substantial attention to quality assurance and control issues. The potential for the use of the data, ultimately aiming at empowerment, is investigated in case studies in nine European cities.

The project, www.citi-sense.eu, is a collaborative project co-funded by the European Union's Seventh Framework Programme for Research, Technological Development and Innovation, grant agreement no 308524, and is executed by a consortium of 30 partners.

