

## City Scanner

*The Senseable City Lab employs garbage trucks and taxis to sense the city*

CAMBRIDGE, MA, 20 February 2017- Researchers at MIT Senseable City Lab, in collaboration with Cisco, have created a lightweight sensing platform, called City Scanner, designed to be attached to urban vehicles such as garbage trucks and taxis. Joining forces with Cambridge, MA, Department of Public Work, researchers have attached the modular system on a number of the large, orange city trash trucks. Equipped with a set of non-intrusive sensors including thermal cameras, air quality, temperature, humidity, WiFi scanner, accelerometer and GPS sensors, the trucks are covering large areas of the city on a weekly basis, capturing over 1.6 million data points.

Recently, portable sensors, with high accuracy and embedded communication technologies, have become available and affordable. It is now possible to combine different sensors in a modular and portable sensing package. By mounting the sensing package on vehicles circulating throughout the city in different areas and times it is possible to create a dense sensor network. "With just a few sensors you can scan an entire city regularly" explains Carlo Ratti, Professor of the Practice of Urban Technologies at MIT and Director of the Senseable City Lab. "Compared with traditional fixed sensors, City Scanner radically reduces sensor and deployment costs, providing data about many urban areas and allowing on-demand configurations based on citizen input".

With the explosive growth of urban information, cities can be seen as data factories that produce huge amounts of information from multiple sources. Collecting this data has become crucial in order to understand urban environments and provide better services for citizens. For instance, thermal imaging can be used to assess the energy efficiency of building envelopes, or particle counts can inform epidemiological research and urban health policies.

"Fresh data means a faster response time in case of an emergency. By gathering urban data on a regular basis, one can detect anomalies quickly and trigger the needed response", says Amin Anjomshoaa, project lead and visiting scholar at the Senseable City Lab. "When gathered in fixed monitoring stations, sensors can only measure certain areas and can't be relied upon to keep an eye on fluctuations across an entire city, or even across different sides of the same street. This significantly changes with City Scanner."

Data collected from City Scanner can be explored through an interactive map which lets anyone discover the environmental characteristics of any part of the city by exploring over 1.6 million data points. Using five different sensors and multiple granularity, the city can be visualized at different resolutions. In addition to the interactive map, researchers are planning to make the captured information available as open data via the Open Data portal of Cambridge. "We want to provide better data to citizens, so that they can better understand the environment they live in. We see the platform as a basis for engaging people and democratizing urban data" adds Ratti.

City Scanner has been designed with deployment in additional cities in mind, using an extended set of sensors and providing data analytics services based on the collected data. The

overarching goal is to create a new source of information for decision makers informing public health, security and boosting new urban services.

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**ABOUT THE MIT SENSEABLE CITY LAB:**

The Senseable City Lab at the Massachusetts Institute of Technology is a transdisciplinary research group that studies the interface between cities, people and technologies. Not bound by the methodologies of a single field, the Lab is characterized by an omni-disciplinary approach, and speaks the language of designers, planners, engineers, physicists, biologists and social scientists. Senseable is as fluent with industry partners as it is with metropolitan governments, individual citizens and disadvantaged communities. Through design and science, the Lab develops and deploys tools to learn about cities—so that cities can learn about us.