European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

WGs and MC Meeting at ISTANBUL, 3-5 December 2014

SENSEable Cities

Massachusetts Institute of Technology

senseable city lab:.::

SMART
Singapore-MIT Alliance for Research and Technology

Dr. Marguerite Nyhan

Keynote speaker

Fulbright – EPA Scholar for Climate Change & Sustainable Environment

SENSEable City Laboratory,

Massachusetts Institute of Technology, Cambridge, USA

Singapore-MIT Alliance for Research & Technology, Singapore

cost
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

EuNetAir
European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability

COST is supported by the EU Framework Programme

ESF provides the COST Office through a European Commission contract


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70% of the world's population will live in cities in the year 2050

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3.2 million premature deaths worldwide due to air pollution in 2010.

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CURRENT AIR QUALITY MONITORING IN BOSTON

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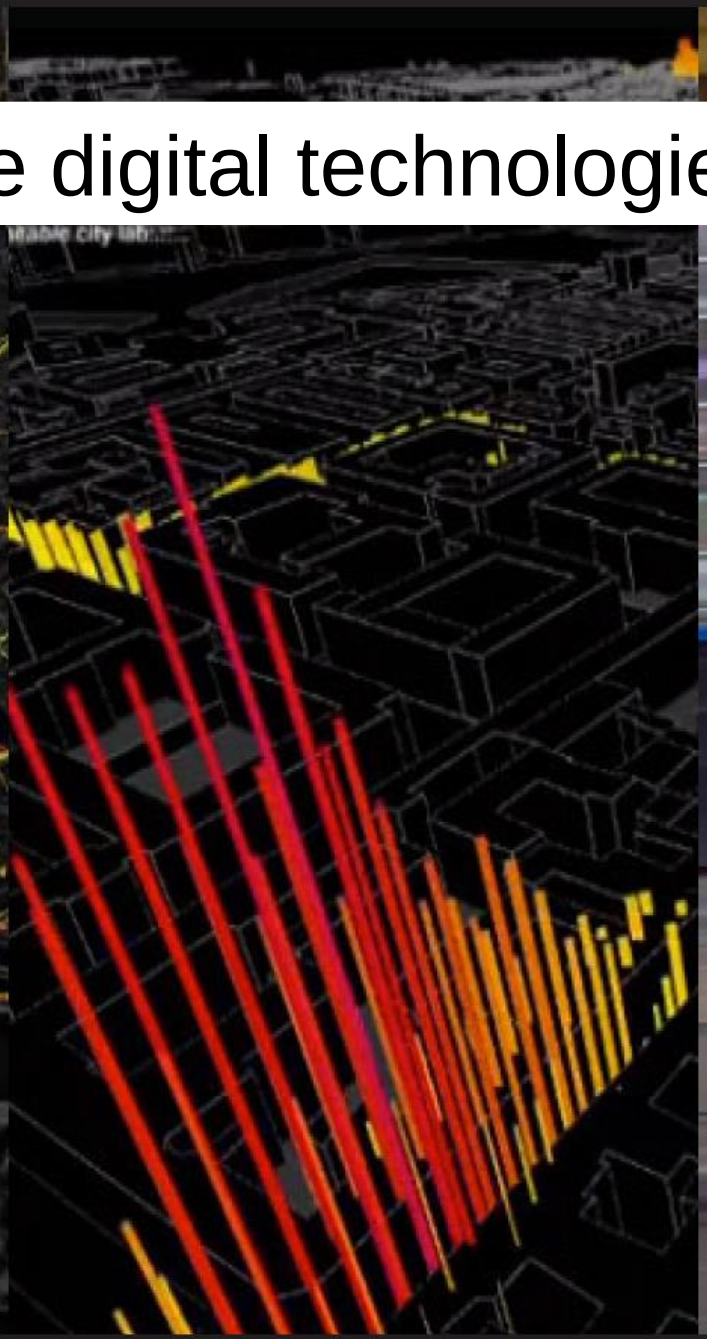
With pervasive digital technologies



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AIR
QUALITY
+
PEOPLE
?
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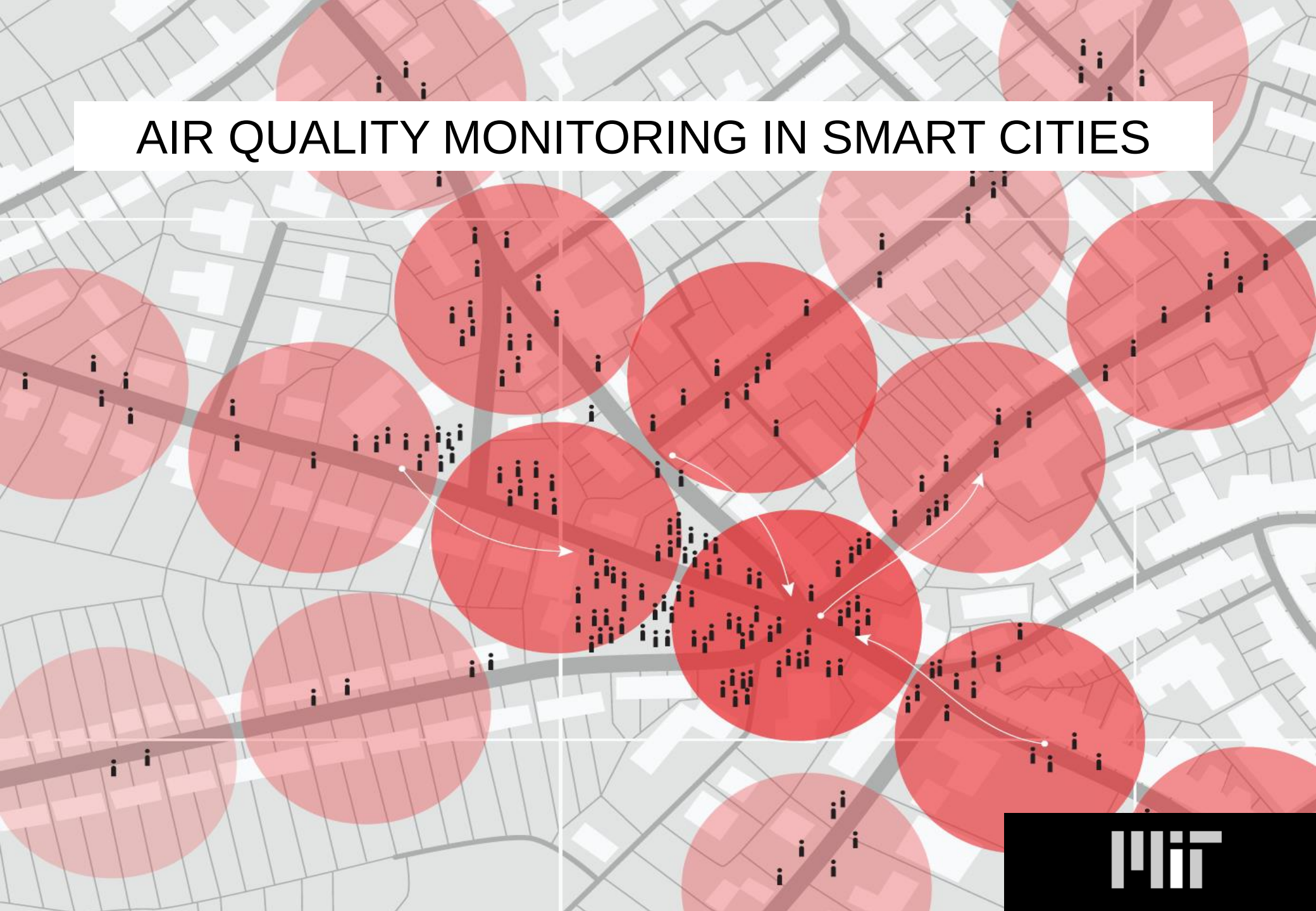
AIR QUALITY + PEOPLE

air quality

population density

crowd dynamics

AIR QUALITY MONITORING IN SMART CITIES



The CLAIRITY network

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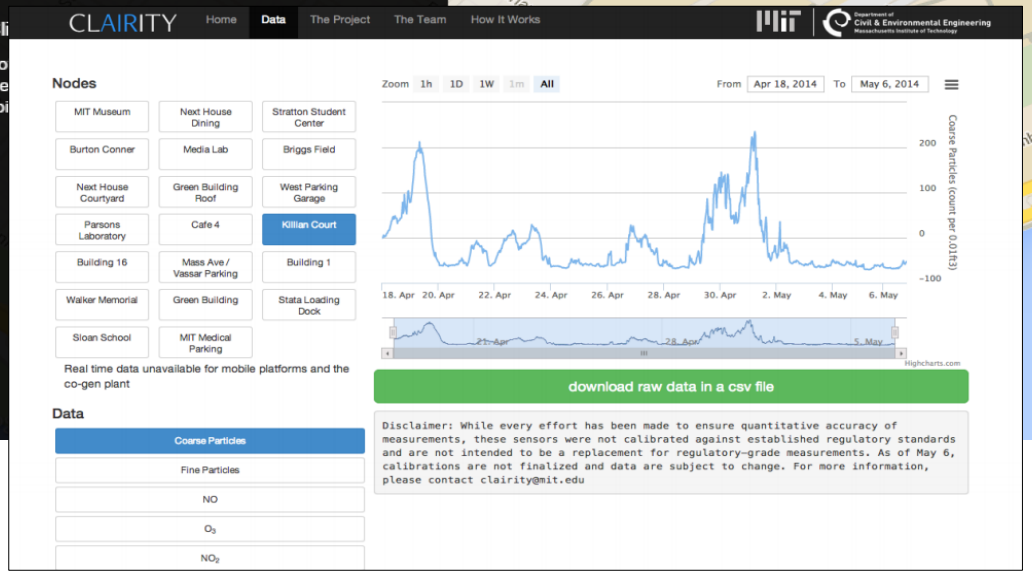
CLAIRITY Home Data The Project The Team How It Works

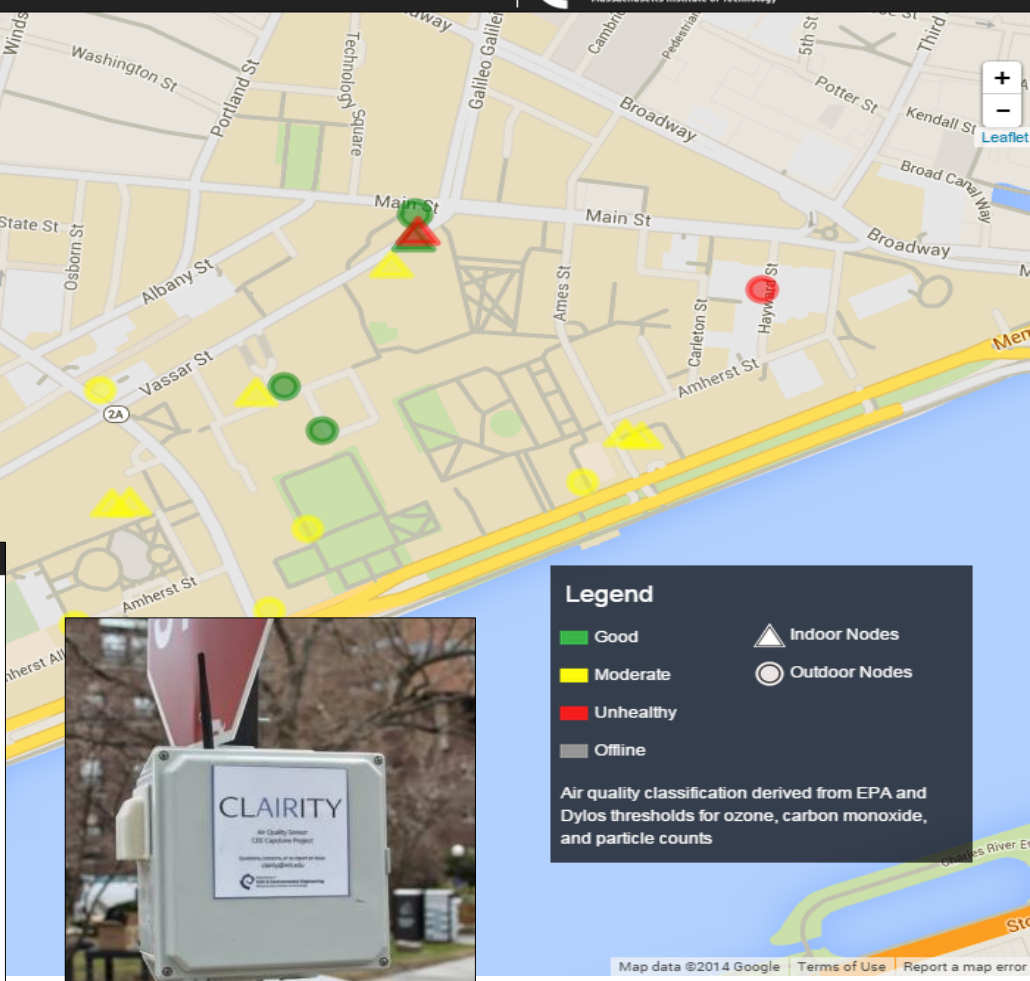
Department of Civil & Environmental Engineering, Massachusetts Institute of Technology

Mass Ave/ Memorial

Last Updated: 11/06/2014 21:43 UTC

CO	91	ppb
Carbon Monoxide		
NO	3	ppb
Nitric Oxide		
NO_2	26	ppb
Nitrogen Dioxide		
O_3	20	ppb
Ozone (Uncalibrated)		
Fine Particles	673	per 0.01 ft^3
Particle Count		
Coarse Particles	12	per 0.01 ft^3
Particle Count		





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Building the CLAIRITY network

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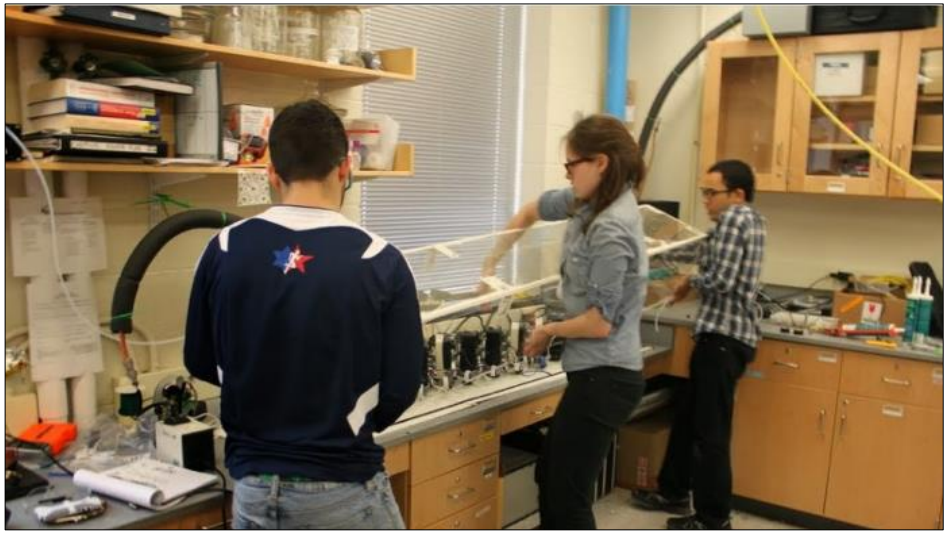
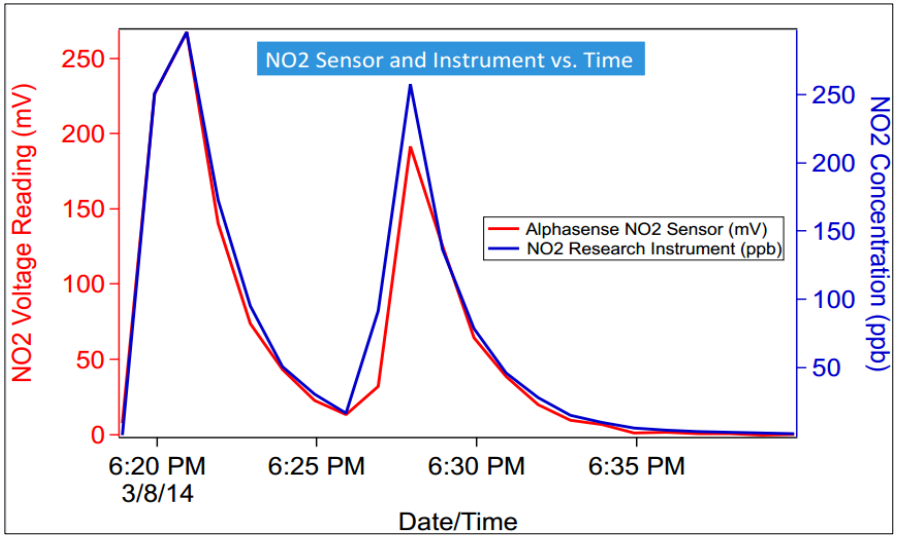
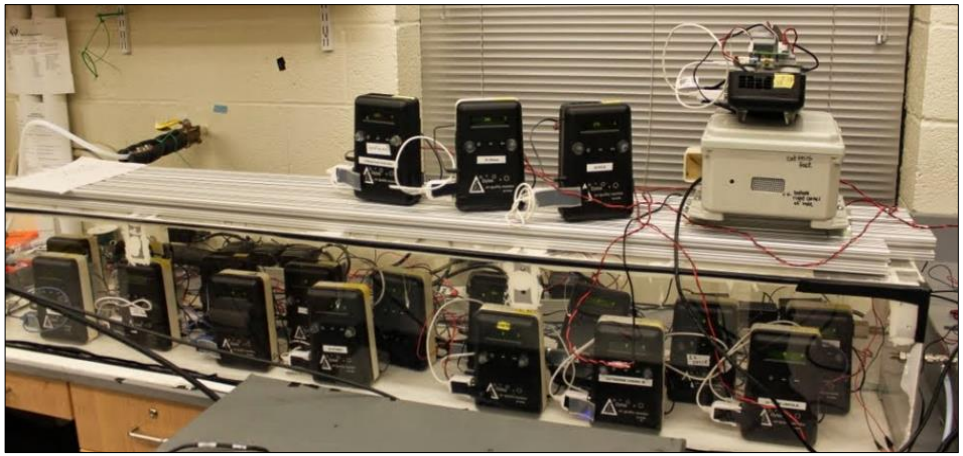
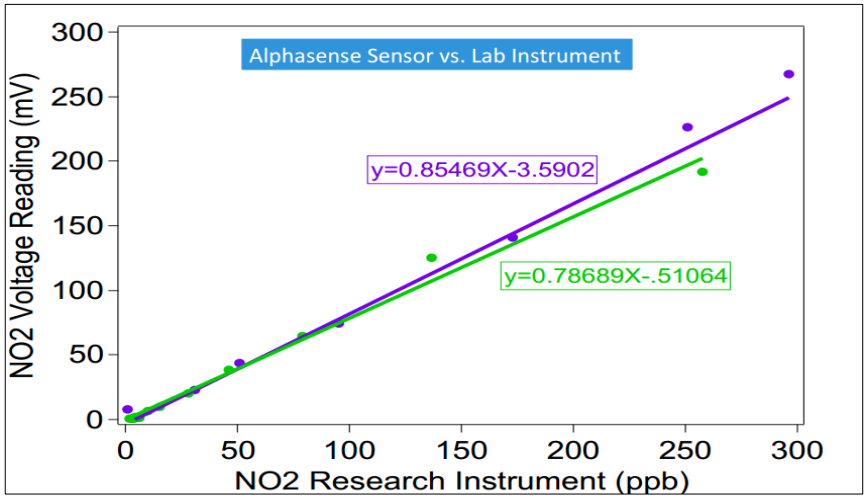
Challenges + future considerations









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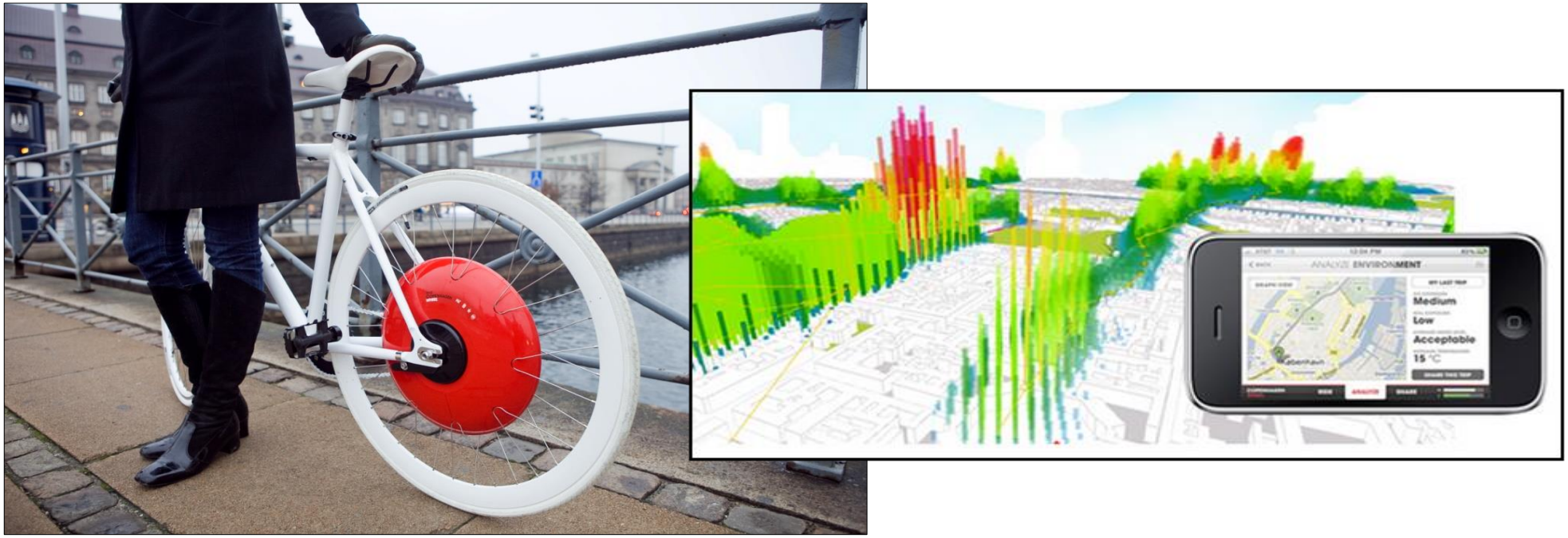
THE COPENHAGEN WHEEL

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Benefit for the citizen
- Informed Citizens
- Environmental awareness
- Healthy route planning applications

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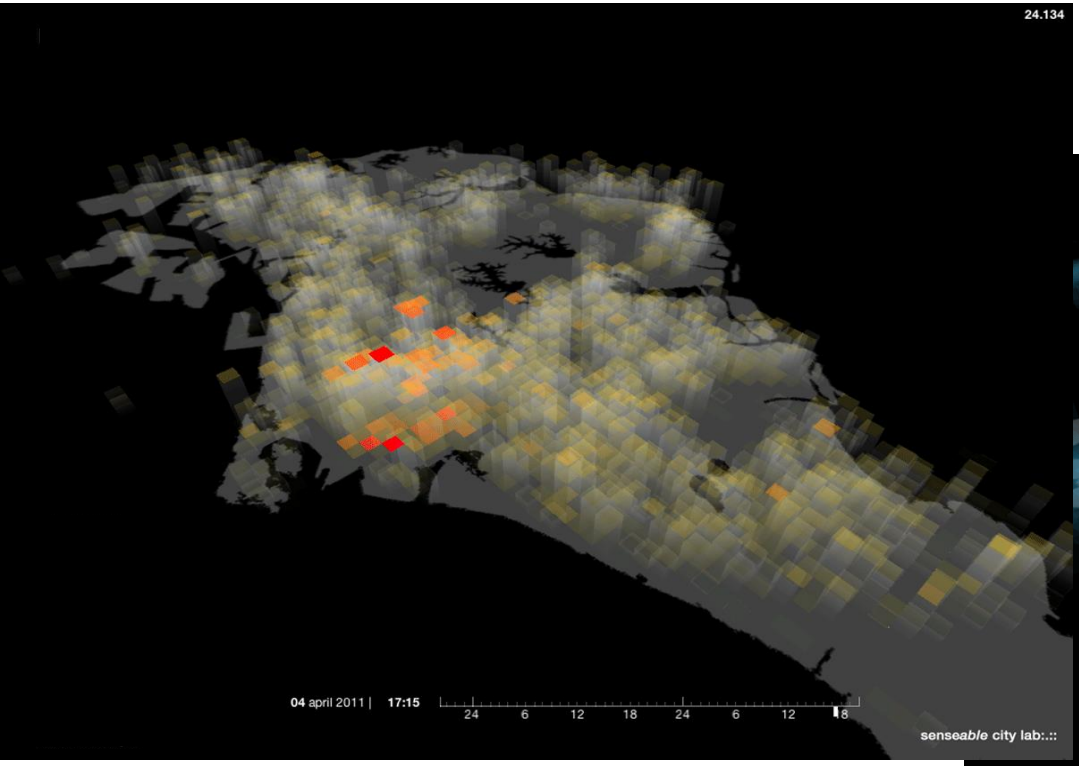
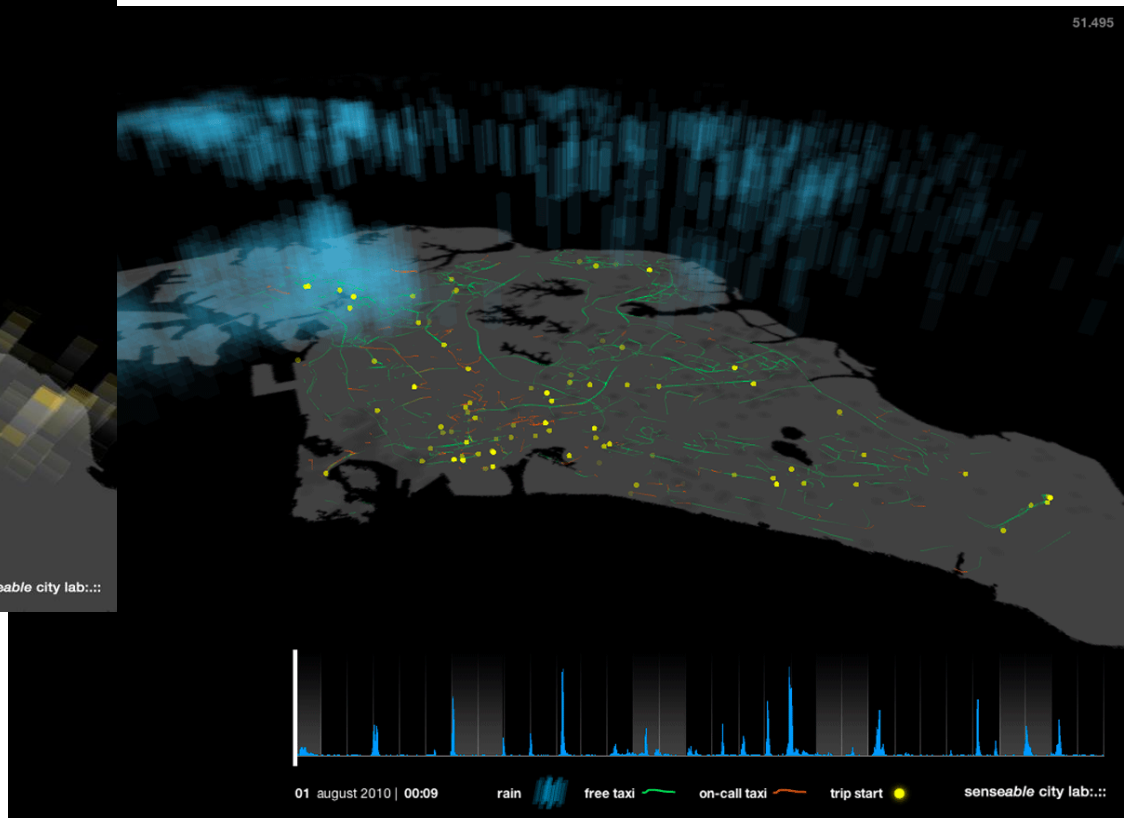
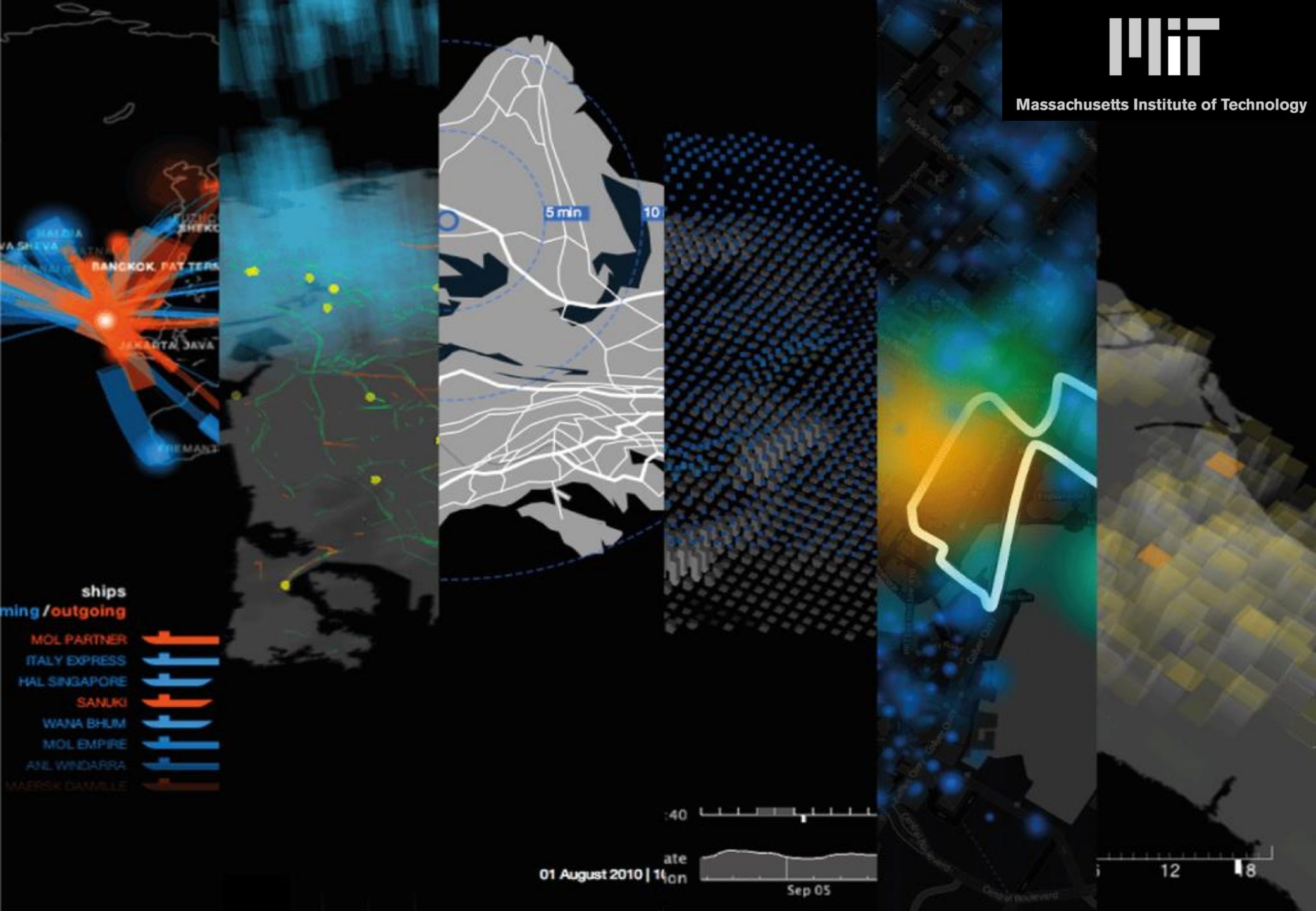
Communication of data - URBAN DASHBOARDS





Live Singapore!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Communicating urban data–web graphics

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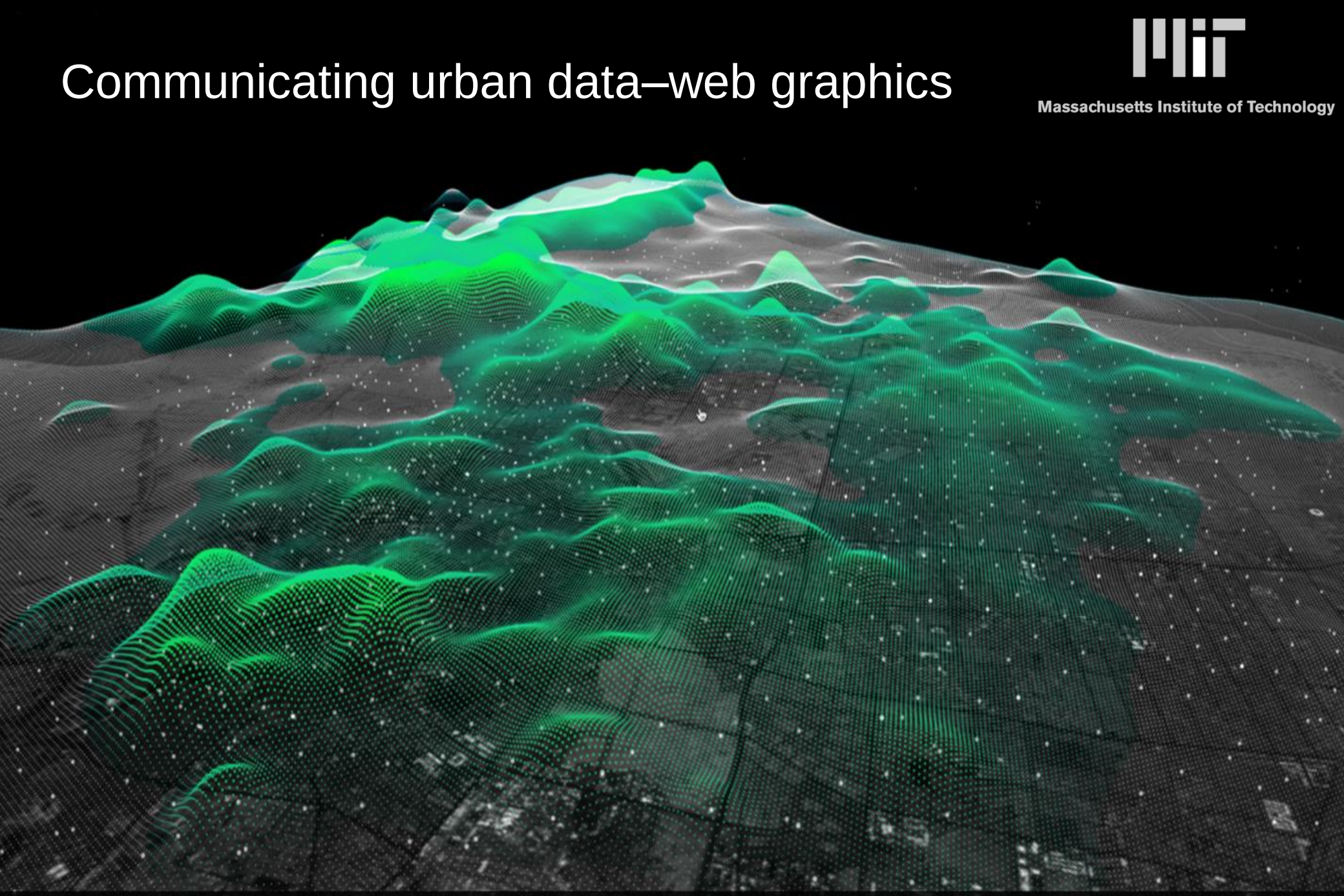

ONE COUNTRY TWO LUNGS

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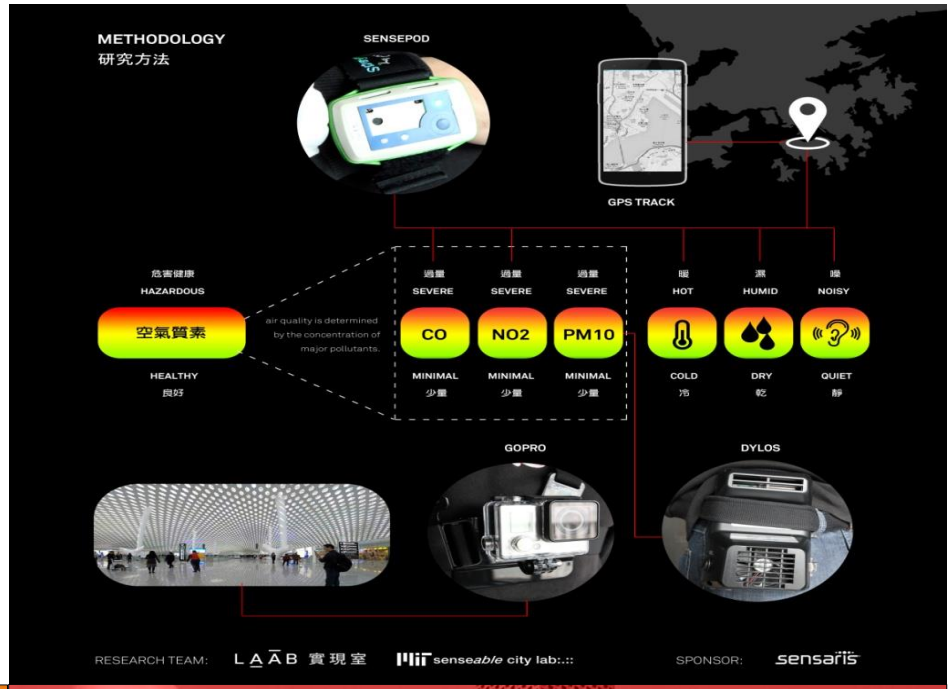

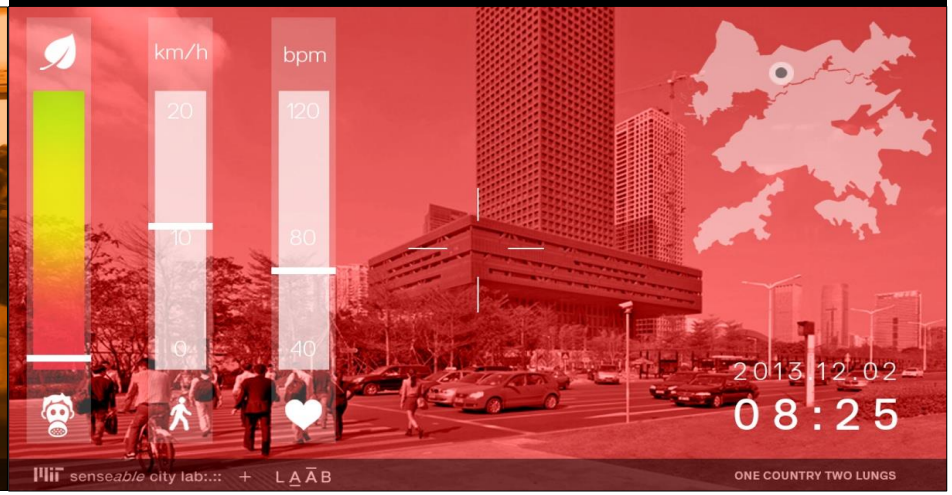

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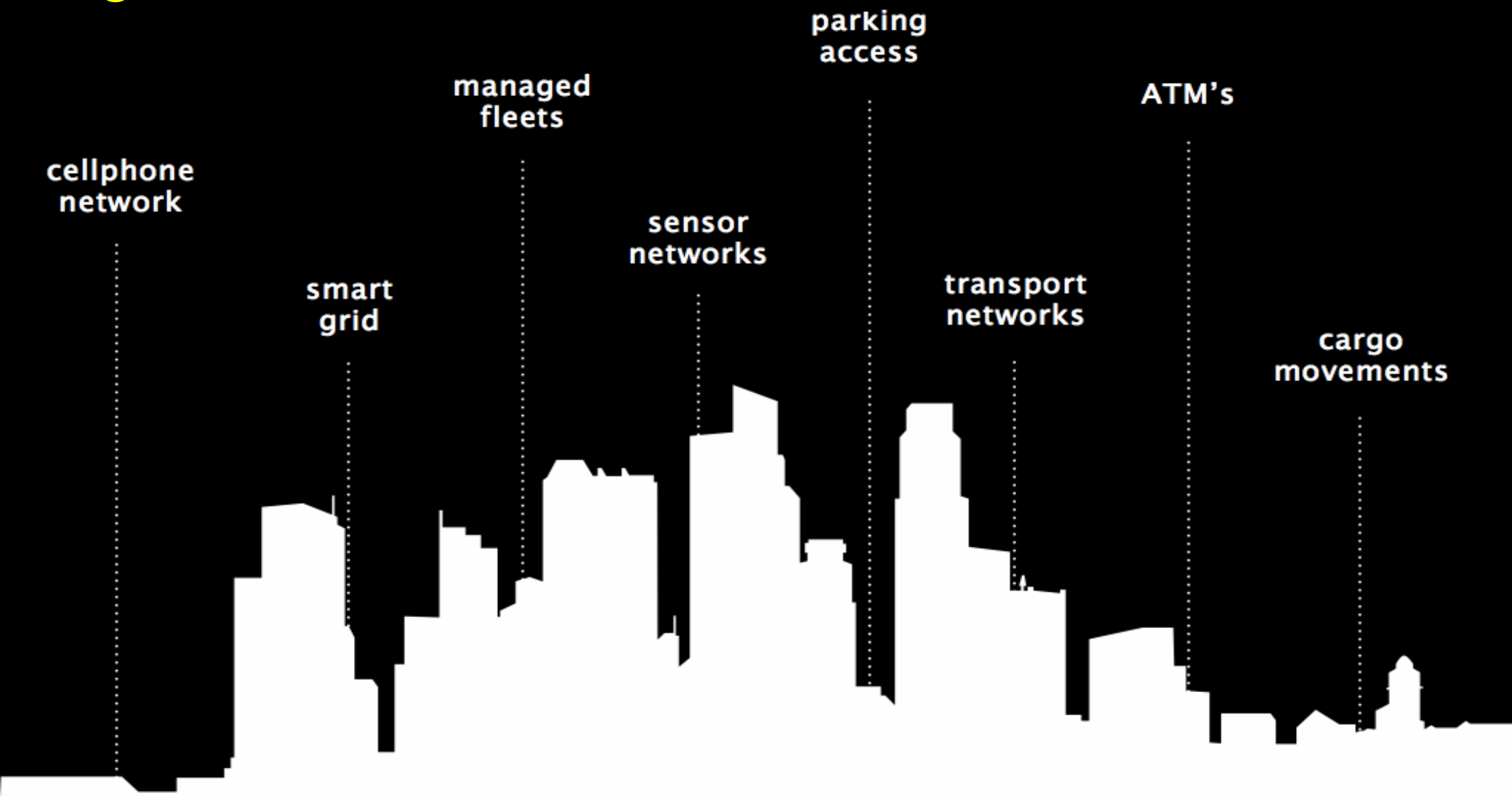
enormous amounts of data generated in our cities



MAKING INFERENCES about the ENVIRONMENT using data generated by cities

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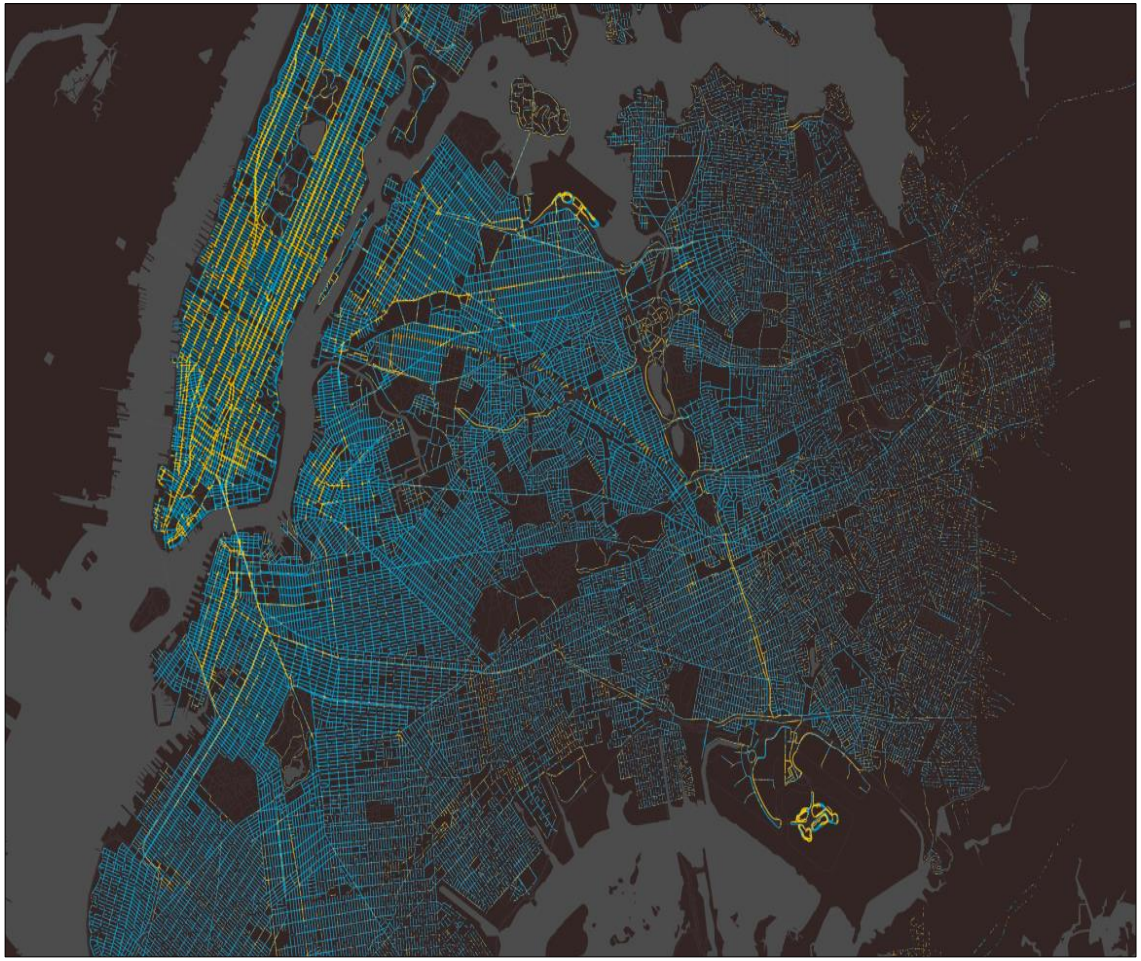
Urban data and air pollution



Population exposure to air pollution -NYC

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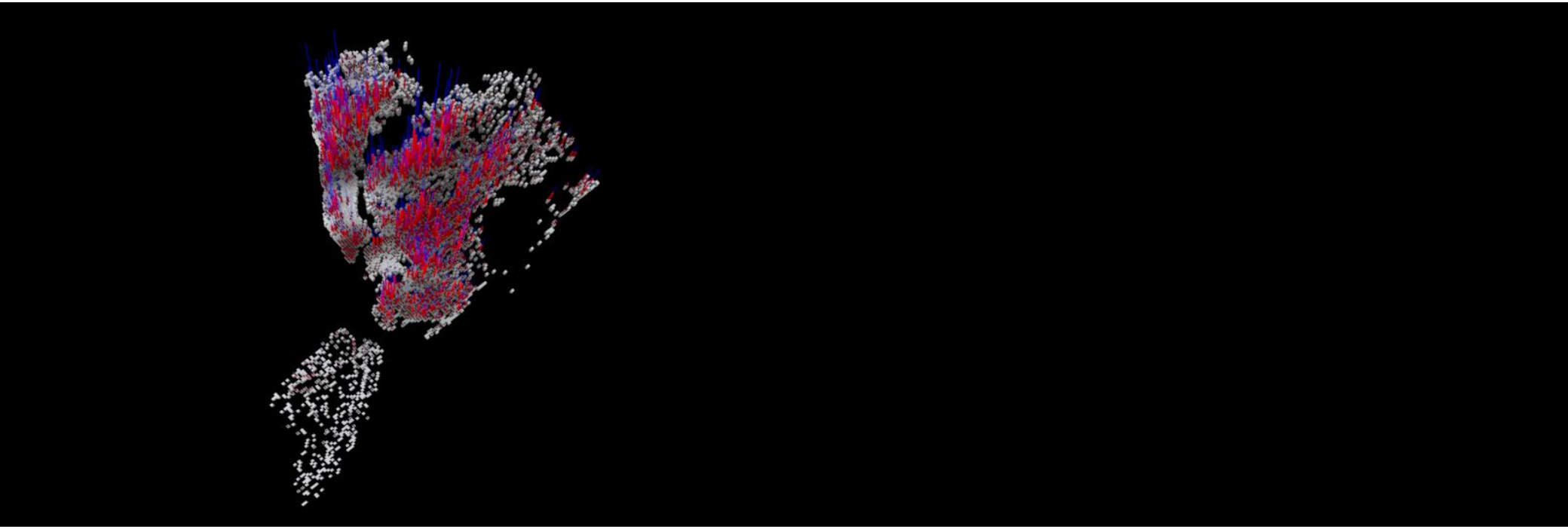
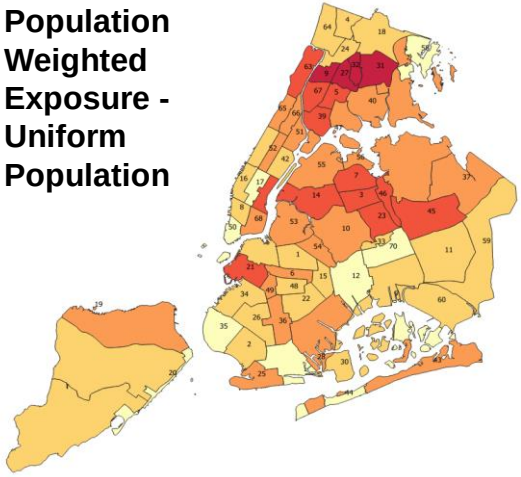
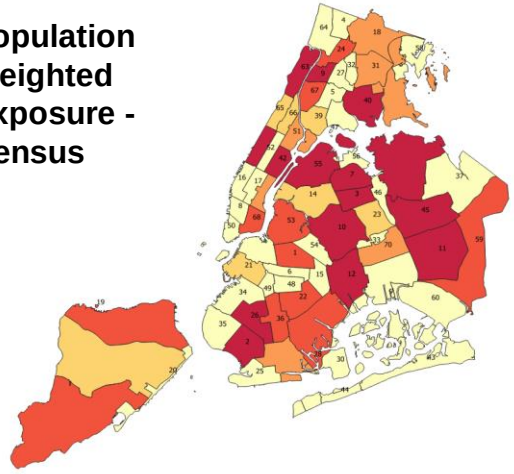


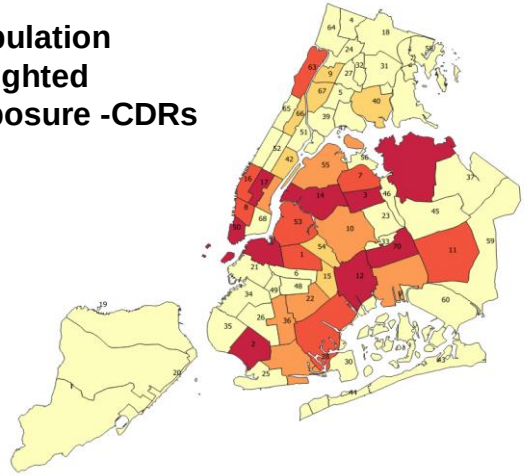
Population Weighted Exposure - Uniform Population

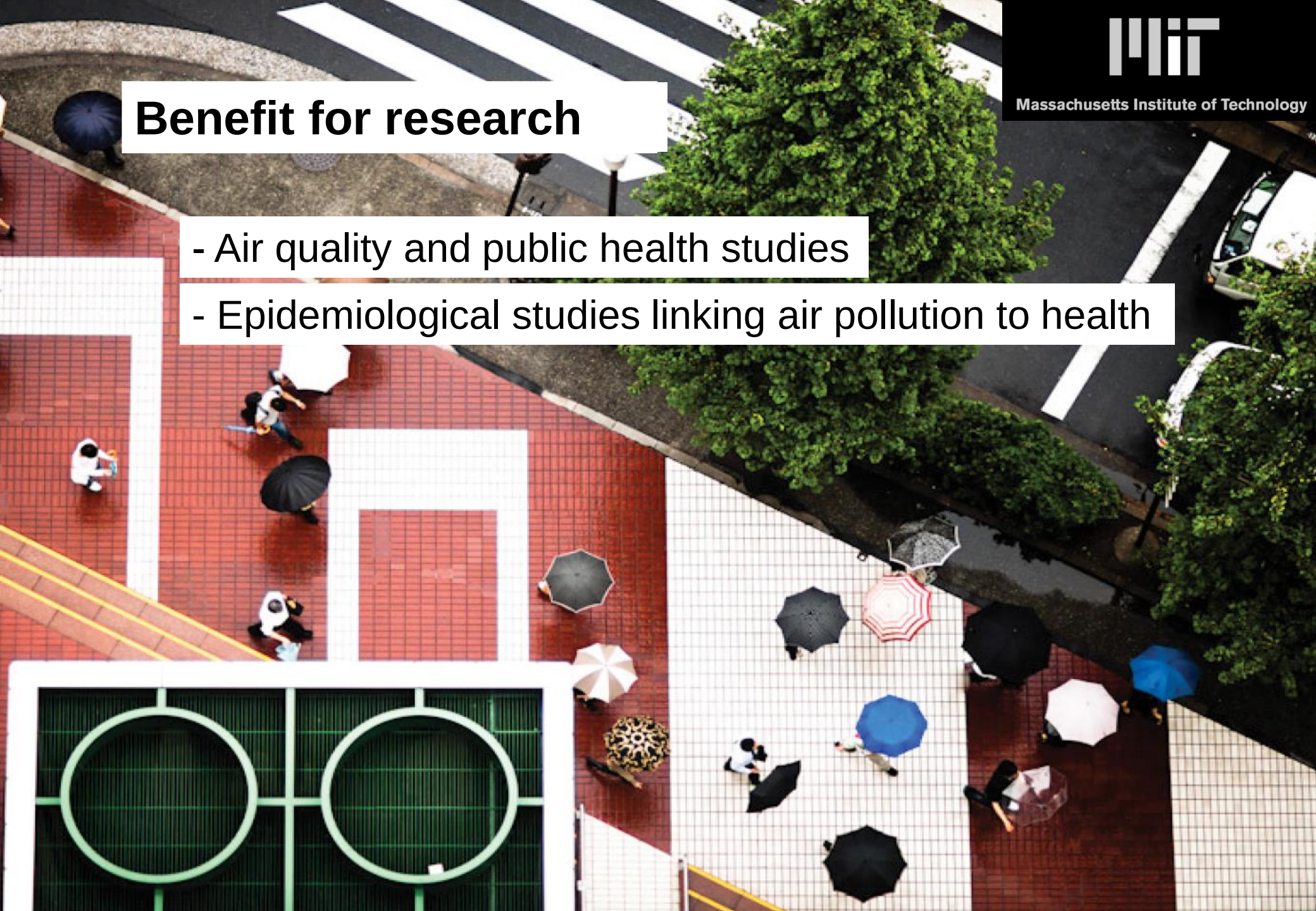


Population Weighted Exposure - Census



Population Weighted Exposure -CDRs





Benefit for research

- Air quality and public health studies
- Epidemiological studies linking air pollution to health

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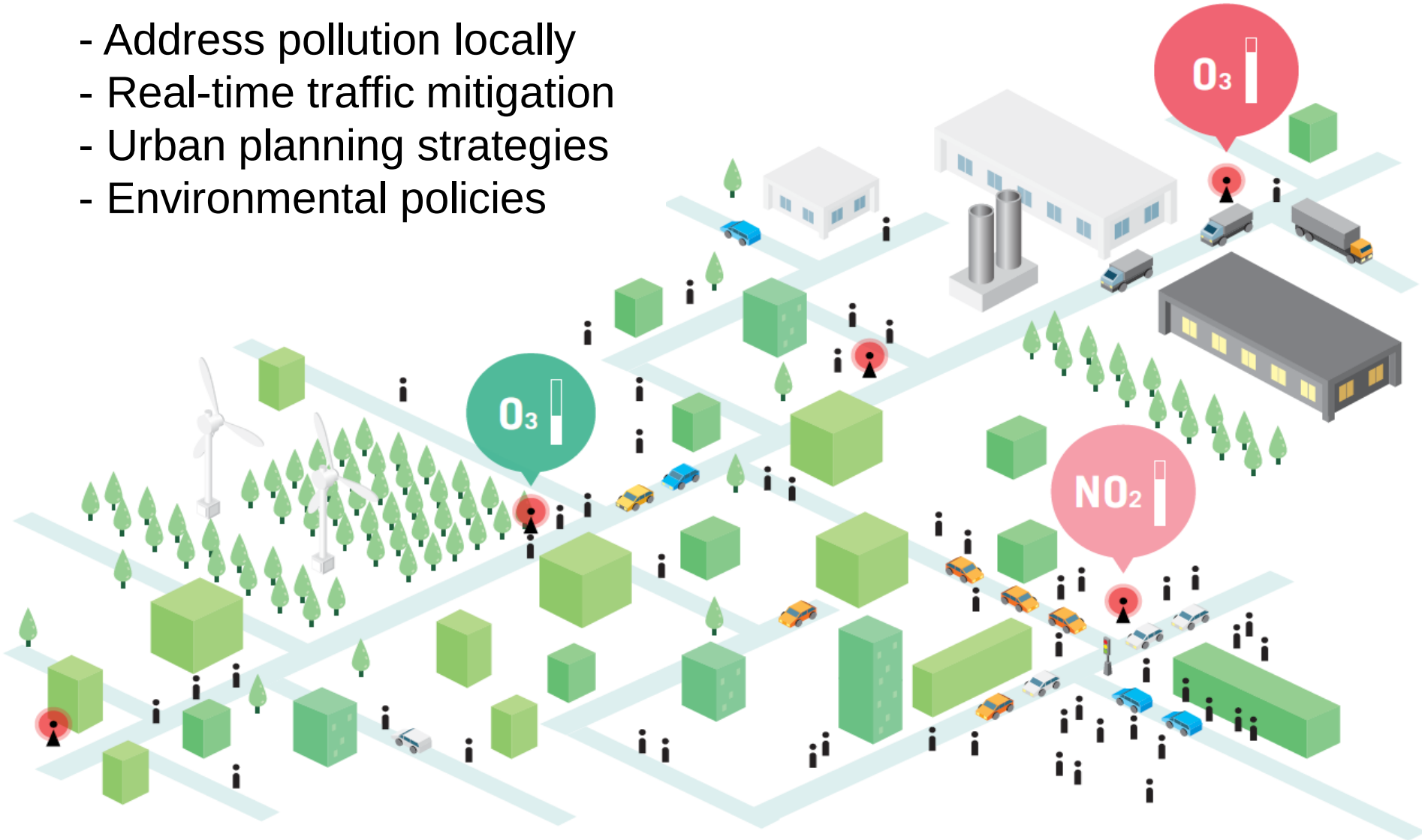
Benefit for the city

- Address pollution locally
- Real-time traffic mitigation
- Urban planning strategies
- Environmental policies



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To summarise

- Urbanisation - increased population exposure to air pollution - global health concern.
- Real need for air quality information in high spatial and temporal resolution, and networks of air quality sensors are the solution here.
- More research - sensor accuracy over time, and network resilience.
- Urban dashboards offer opportunities for engaging graphical displays of city data including from air quality sensors.
- Air quality data from networks of sensors need to be understood in the context of other types of urban data.
- This will help to ascertain the main local drivers of air pollution.
- Where people and pollution overlap – prioritisation.
- Optimal implementation of air pollution intervention strategies for the protection of human health.
- New metrics for environmental regulation!
- More research needs to be conducted which emphasises how population exposure to air pollution can be reduced in cities using fine-grained air quality data from networks of sensors.

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The students of Course 1.013 for their tremendous efforts on implementing the CLAIRITY project

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Fulbright – EPA Scholar for Climate Change & Sustainable Environment

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