# Making Data Visible in Public Space

Sage Cammers-Goodwin and Naomi van Stralen

Naomi van Stralen


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# Context

- Paper under final revisions at McGill Law School
- MX3D Bridge → Universal Framework

# Methodology





Data in the City
Part I: Ethics

## Information Smart Bridge

You are invited to participate in a study concerning the MX3D bridge signage.

This study is conducted by Naomi van Stralen, Industrial Design Engineering, University of Twente for her thesis.

The purpose of this study is to gain insight on what people desire when encountering a smart object in their city.

Your results may be quoted in the thesis.

It will take approximately 10 minutes to complete. The data will be used to determine what people find important when they encounter the bridge in Amsterdam.

Your participation is entirely voluntary and you can withdraw at any time. You may omit any question.
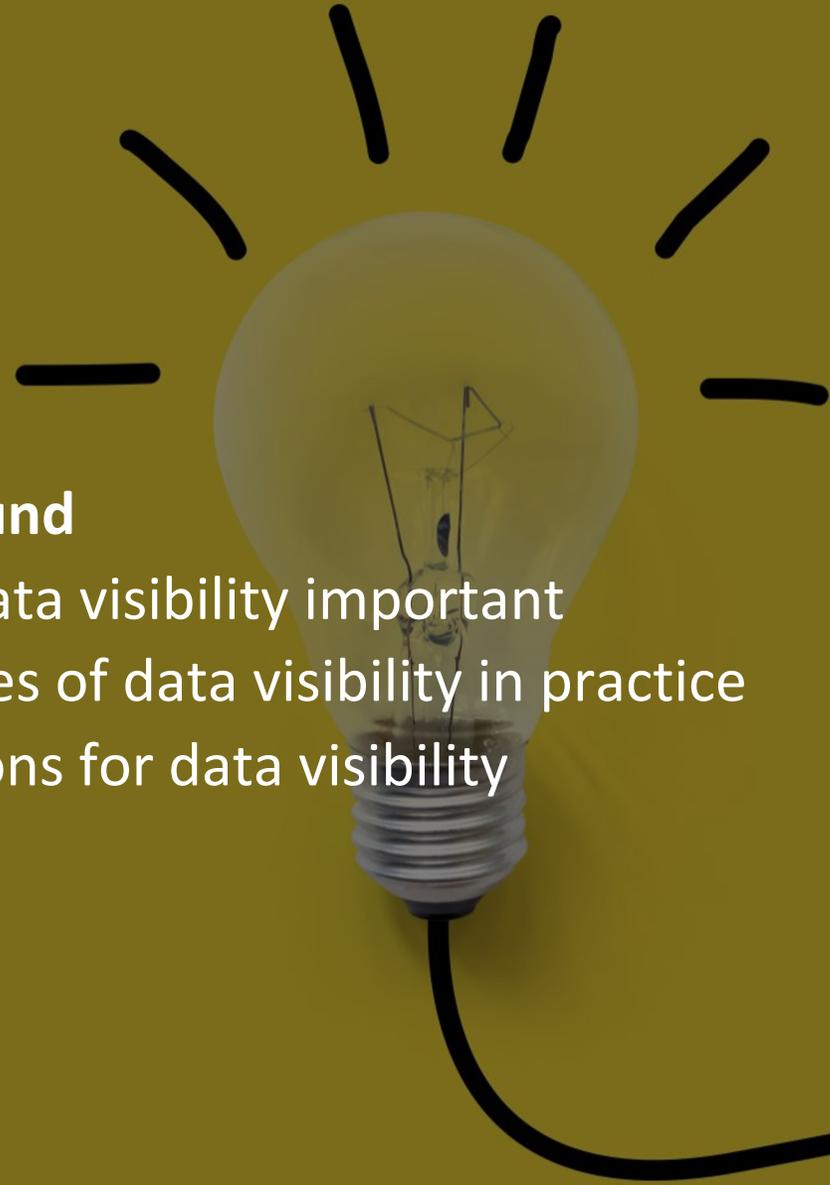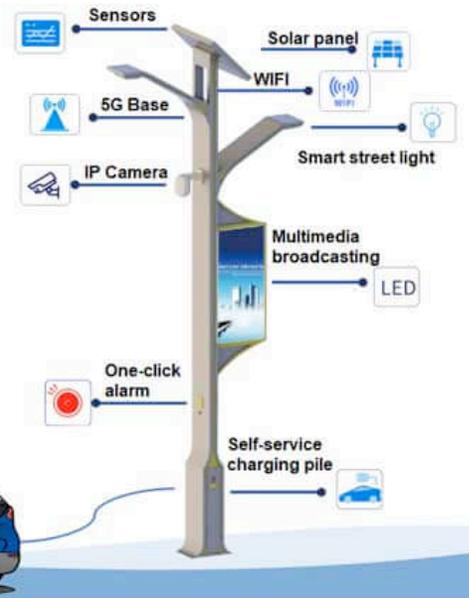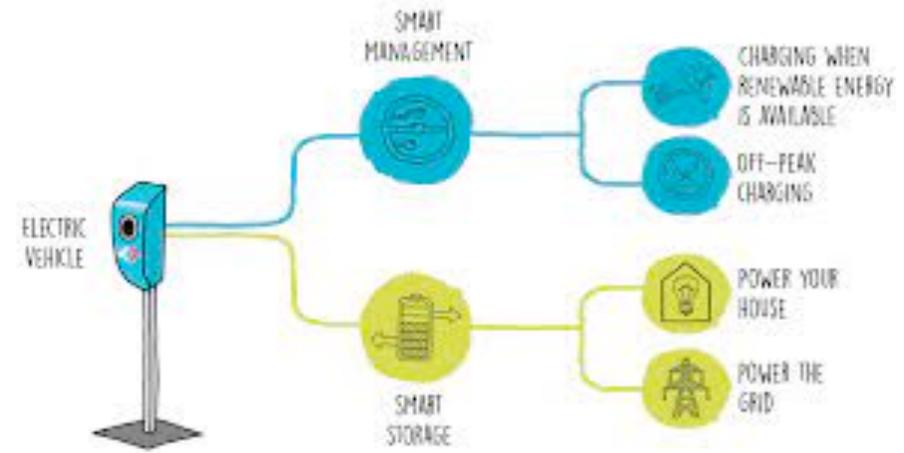
# This is not!

- A debate over whether IoT should be embedded in public space

An argument of data ownership

# Outline

- **Background**
- Why is data visibility important
- Challenges of data visibility in practice
- Regulations for data visibility

# Increasing Data



**SMART MANAGEMENT**
- CHARGING WHEN RENEWABLE ENERGY IS AVAILABLE
- OFF-PEAK CHARGING

ELECTRIC VEHICLE

**SMART STORAGE**
- POWER YOUR HOUSE
- POWER THE GRID

Sensors
Solar panel
5G Base
WIFI
IP Camera
Smart street light
Multimedia broadcasting — LED
One-click alarm
Self-service charging pile

▲ Overzicht kruispunt de Heurne/Kalanderstraat in het centrum van Enschede. © Emiel Muijderman

**Enschede niet akkoord met forse privacyboete om wifi-tracking: 'Wij volgen niet, wij tellen slechts'**

# Laws

- GDPR
- (Others: Brazil, Canada, China, Thailand, Australia, Japan*, South Korea*, Chile, New Zealand, India, South Africa, and the State of California)

"Personally Identifiable Data"

# Initiatives

- TADA

- Cities for Digital Rights
  - Amsterdam, Barcelona, New York in 11/2018
  - Now 50+

# Frameworks and Regulations

- Frameworks
  - DTPR
- AI Registers Saidot
  - Helsinki and Amsterdam
- Data Maps
  - Amsterdam and Barcelona
- Data Register
  - Amsterdam

# Transparency...what is it really?

- Frank, obvious, understandable

- Requires communication
  - Detailed signs everywhere
  - Educated public that can understand

- Currently most people are not aware

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# The Public

- Public space is operated and used by the public
- It is often unavoidable (esp. depending on income/politics it may be impossible to leave your city)
- **Elected** officials (in some countries) make decisions
- Taxpayer dollars fund infrastructure

# The Consequentialist Problem with PID

- Current laws focus on personally identifiable data
- Leads to an optimistic consequentialist justification of smart city developments
  - Only wrong doers are punished (speed cameras)
  - People only get hurt if it is not anonymous aka if there is no "risk" no need to inform
  - If people are informed they might act differently or be nervous which would cause more harm or ruin data validity

Sensor Network MX3D Smart Bridge

# Autonomy

- There is also a deontological perspective that gives more value to individual autonomy as opposed to utility of the city
- We cannot truly know the consequences of data collection, but we can inform as a means of sharing power
- The type of information we share must be affiliated with empowering the public as opposed to legally covering our asses
  - general location
  - type of data
  - who is collecting
  - what purpose (regardless of whether the data is personal in nature)

# Data visibility is a power concern

- Seems to be a fear that making people aware will prevent the infrastructure from being installed
- Lack of public data awareness unjustly centers decision making power on those with the greatest economic and political control
- Those left uninformed are unjustly distanced from a debate that affects them
- Over the long term, ignoring the autonomy of members of the public will bias the ethical analysis of the IoT devices permitted to enter public space

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# Privacy Paradox and Privacy Fatigue

- Privacy is important, but people hardly act on it
- When over informed people care less and experience a loss of control

# Bridge Signage Options



Van Stralen



MX3D

0800 - 024 24 10
www.centercom.nl

# MX3D BRIDGE

2021

SMARTBRIDGEAMSTERDAM.COM

# MX3D

**MX3D** kicked off this project in 2015 when it proposed printing a metal bridge with its innovative large-scale, robotic 3D printing technology. The company's technology uses welding robots to build up metal objects layer by layer. The technology allows for high material efficiency and increased form liberty in the construction of large metal structures. The bridge is designed by **Joris Laarman Lab**.
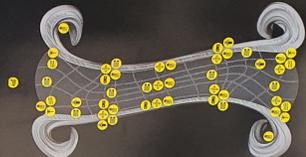
Equipped with a state-of-the-art sensor network, the **MX3D Bridge** is also an intelligent piece of infrastructure, able to make sense of its environment and own state. This **'Smart Bridge'** is a groundbreaking research project that allows the City of Amsterdam to analyze pedestrian and crowd behavior.
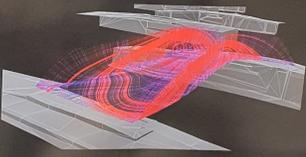
In a wider sense this project allows for exploring the role of IoT systems in our built environment. In concert with academic and industry researchers, the City will investigate questions regarding open data, data ethics, citizen ownership and the impact of tourism.

www.smartbridgeamsterdam.com

#MX3DBridge #smartbridgeamsterdam

www.mx3d.com

# Symbol Awareness

- Survey respondents had the following assumptions about what the sensor icon meant: "Loud sound," "Risk of vibrations," "Watch out for sound? I don't understand it," and "Alarm signal"

- (4/32) correctly guessed that the symbol meant that there were sensors present

# Transparency as Data Access

- Is fully open data ethical?

- Is raw data useful/understandable?
  - Surveyed individuals did not feel a strong right to access raw data

# Registries, Maps, and Accessibility

- Amsterdam, Helsinki, Barcelona (non-exhaustive list)

- DTPR found that the public wants to be informed about the purpose of a technology, who is responsible for it, and an easy way to obtain more information

- Instead, we often see the type of sensor with a link to more information
  - If you would change your behavior based on sensor knowledge you can be disenfranchised by not being able to plan or receive more information on the street level (Power)

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# A four pronged approach
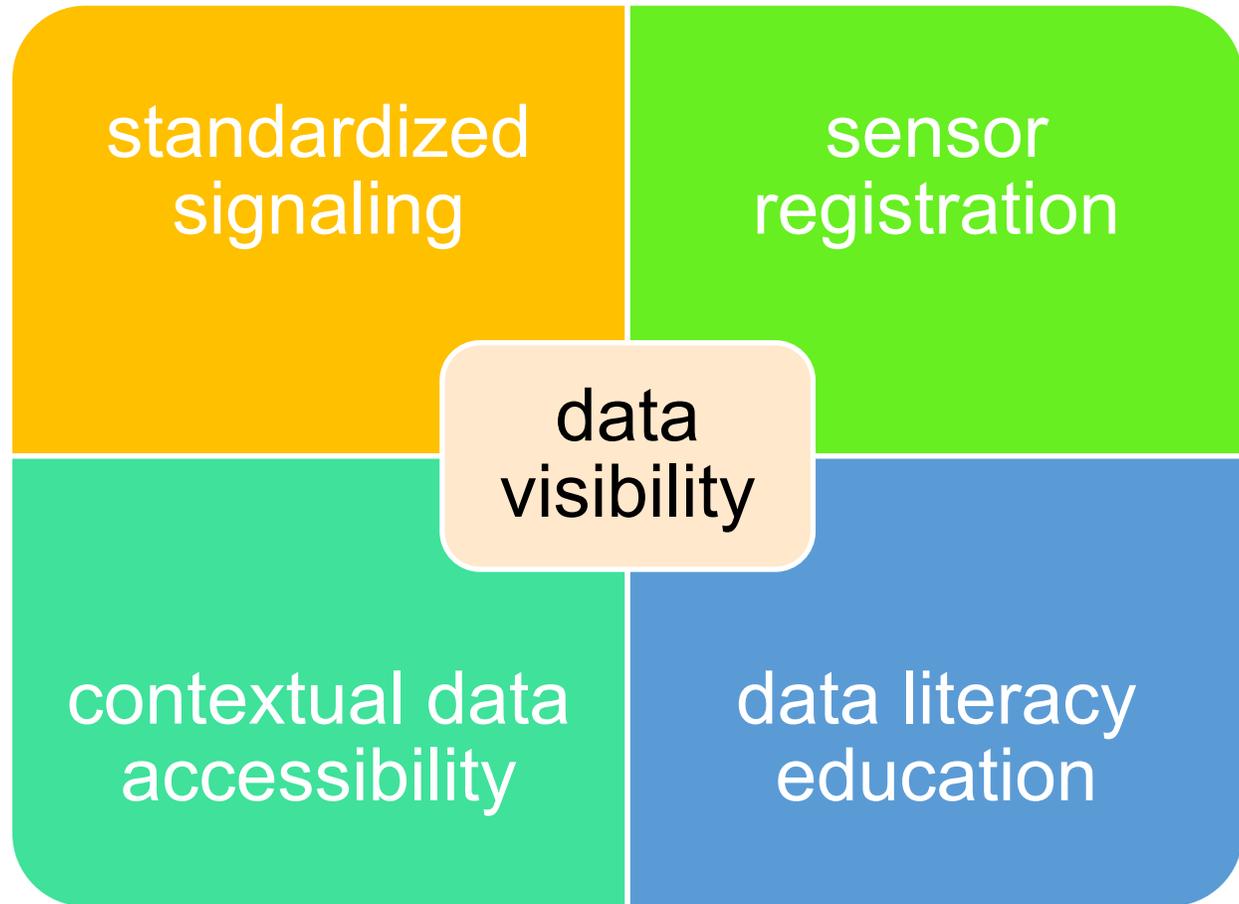
# Standardized Signaling

- Based on DTPR and Vienna Convention on Road Signs and Signals

# Data Register

Standardized process for registering so that agencies do not have to decide what is important to share
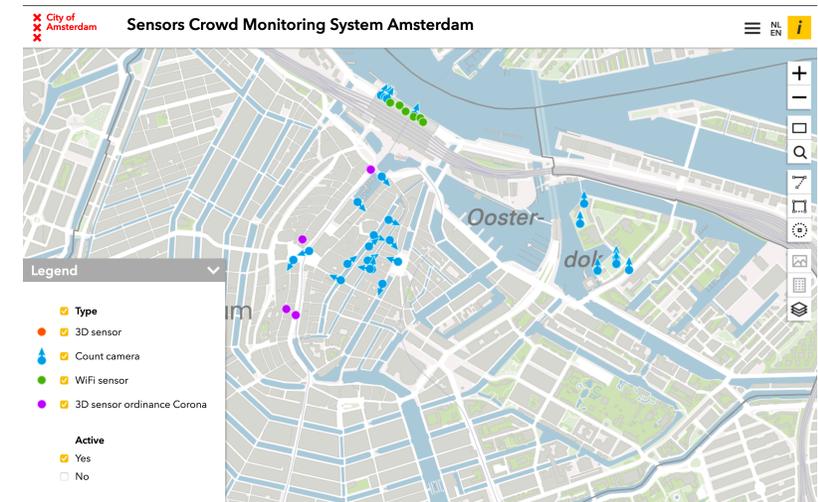
One and a half meter monitor



More detailed information on the system

Here you can get acquainted with the information used by the system, the operating logic, and its governance in the areas that interest you.

| | |
|---|---|
| Datasets | Show More ⌄ |
| Data processing | Show More ⌄ |
| Non-discrimination | Show More ⌄ |
| Human oversight | Show More ⌄ |
| Risk management | Show More ⌄ |

# Contextual Data Access

- Helen Nissenbaum 'Privacy as Contextual Integrity' (Washington Law Review, 2004)

- Prioritize public good over easy "transparency"

# Data Literacy Education

- Equalize Access

- Distribute Power

- Increase Transparency "Communication"

# Thank You!

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*Making Data Visible in Public Space*, McGill Law Review, Forthcoming