

# SLAM

Smart Lamppost Asset Marketplace

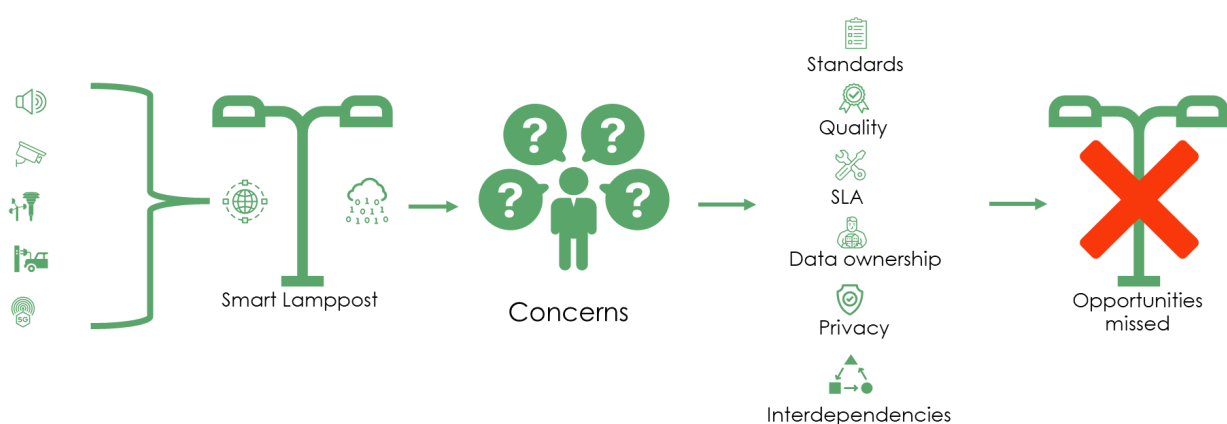
# Smart Lamppost Asset Marketplace

## Challenge & Context

Promises about the opportunities data offers for cities are countless. Data from IoT assets in public spaces can make processes more efficient, improve service delivery and contribute to livable, sustainable and inclusive cities. The reality is that there are legitimate concerns about privacy, ethics, ownership, standards, and interdependencies. So we have a chicken and egg situation. As a consequence, many smart city projects get stuck in good intentions.

These challenges are clearly visible when it comes to the smart lamppost. For years, a promising perspective has been painted of the lamppost as a multifunctional device, combining sensors, cameras, EV-charging, connectivity and other functions. However, between the many opportunities described and the current implementation practice, many barriers exist and there is a lack of insight.

To create a breakthrough, we need secure and trusted data-sharing regarding administrative data (such as SLA's and contracts), sensor data and process data about the roles and responsibilities of each party involved.

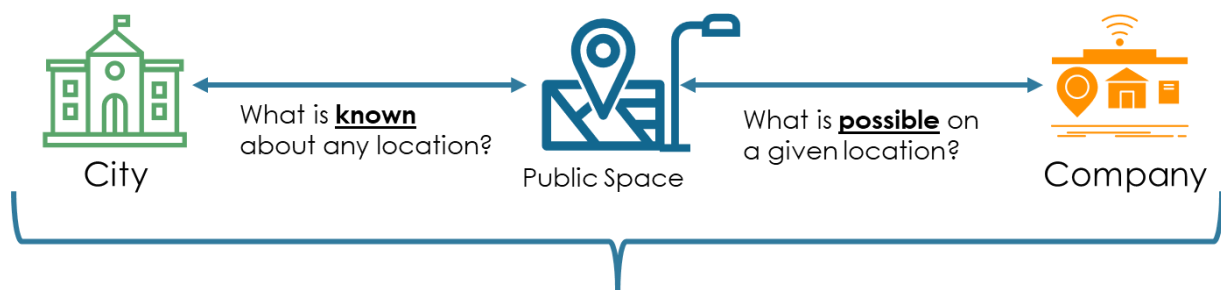


*Current situation: Data from IoT assets in public space can make processes more efficient, improve service delivery and contribute to livable, sustainable, inclusive cities. Many solutions are available and a lamppost offers opportunities for smart assets. Government agencies have concerns about privacy, ethics, and data ownership and neglect these opportunities*

## Solution and how it works

To remove the concerns, we need to create trust and insight. The Smart Lamppost Marketplace takes a two-step approach to this.

SLAM provides insight into requirements imposed on IoT devices in public spaces, such as Data Privacy Impact Assessments (DPIA), registration of sensors in a public registry, device certifications, openness and transparency and compliance with (spatial) legislation and use of open API's/standards/models. This information is combined with actual locations, functions and the data collection of IoT devices and sensors in public spaces.



As part of the Smart Lamppost Asset Marketplace, an assessment framework has been developed to validate sensor/device suppliers. This framework consists of multiple questions regarding hardware, software, data collection and provisioning, service and support, and documentation.

## Registreer Add: Sensor Solution (PRCS001)

Onderstaande vragenlijst helpt u om alle informatie aan te leveren over uw sensoroplossing. Deze informatie wordt gebruikt om uw oplossing te presenteren in de WeCity Catalogus. Het proces bestaat uit enkele stappen waarin vragen over verschillende onderdelen worden gesteld, te weten: de hardware, de software, de data, de service aspecten, de kosten en de beschikbare documentatie.

Productnaam

Deze naam is zichtbaar in de Catalogus

De korte omschrijving wordt getoond op de overzichtspagina van de Catalogus. De lange omschrijving is zichtbaar op de specifieke productpagina van uw oplossing. Zorg voor een korte en bondige omschrijving.

Korte omschrijving

Lange omschrijving

Volgende

Kies uit onderstaande lijst de sensor(en) die u gebruikt. In de WeCity Catalogus nemen wij deze sensor(en) op. Daarbij gebruiken wij de informatie zoals die wordt opgegeven. Ontbreekt er een sensor, laat ons dat weten. Wij helpen u het invullen van de vragenlijst.

Sensoren

Sensation - SHT41  
Alphasense - H2S p-type Metal Oxide  
FastSensor003  
Alphasense - NO2-A43F  
Alphasense - NH3-B1

Welke sensor(en) en/of hardware gebruikt uw oplossing?

Volgende

☐ Zijn er terugkerende kosten? <sup>1</sup>

☐ Wordt de koper eigenaar van de sensor? <sup>1</sup>

☐ Kan de sensor na afloop van de contractperiode nog gebruikt worden? <sup>1</sup>

Upload de documentatie over uw sensoroplossing. Hoe duidelijker en completer de informatie, hoe beter de gebruiker de juiste keuze kan maken. Onderstaande checklist kan daar bij helpen:

- Links naar online documentatie/video's (API, handleidingen, installatie-instructie, etc.)
- PDF's met handleidingen of specificaties
- Afbeeldingen van het product
- Infographics over de werking, het gebruik en/of data-visualisatie
- Referenties naar projecten waar de sensor is toegepast
- [Data] Privacy Impact Assessment (DPIA)

Voeg bijlagen toe

Choose Files No file chosen

Volgende

The information that is collected with the assessment framework gives comfort to government agencies and provides companies with new business opportunities.

The second part of SLAM is about trust. There is a strong need for better monitoring and management of the whole smart city value chain and service process: from assessing an IoT device, to implementation, data management and maintenance. During all these steps data is collected and shared between stakeholders: sensor data, KPIs on performance and support, legal, financial and process data.

SLAM offers a trusted catalog of validated (sensor) suppliers. The Catalog shows all relevant information, enabling organizations to select the solution that fits their need and ask for a quote or more information.

[Catalogus](#)
[Account](#)
NL

## Snuffelfiets

Luchtkwaliteit meten met de fiets  
aangeboden door TestMaarRaak B.V.

[Informatie aanvragen](#)
[Offerte aanvragen](#)

Algemeen

Technische specificaties

|                                    |                     |
|------------------------------------|---------------------|
| Gewicht (kg)                       | 0.00                |
| Hoogte (cm)                        | 5.00                |
| Breedte (cm)                       | 5.00                |
| Lengte (cm)                        | 12.50               |
| Waterdichtheid                     | IP56                |
| Stroomvoorziening                  | RECHARGABLE_BATTERY |
| Gebruiksdur volle batterij         | 1 Days              |
| Opladtid batterij                  | 1 Hours             |
| Opladkabel meegeleverd?            | ✓                   |
| Bevestigingsmateriaal meegeleverd? | ✓                   |
| solution software                  | ✓                   |
| Doel van de software               | OTA                 |
| Hoe wordt de software geupdate?    |                     |
| software open source               | ✗                   |

Service

Data

Ingelogd als Arjen Hof Uilloggen  
[Contact](#)  
[Over WeCity](#)

(c) WeCity 2022

Algemene voorwaarden  
[Privacybeleid](#)  
[Cookieverklaring](#)

*The first iteration of Catalog provides all relevant information to make a choice*

Once a solution has been bought and implemented, all information is made available in the “City Support Centre”. It allows users to manage all data and service-related aspects in one place. It provides access to contracts, SLAs, tickets, data sources, statistics, and other relevant information.

The sensor itself is connected to the FIWARE Context Broker within the platform and the appropriate smart data models are applied. By standardizing the data according to the smart data models and the NGSI-LD standard, data sharing is improved.

Filter

Values

All

Display

Pretty

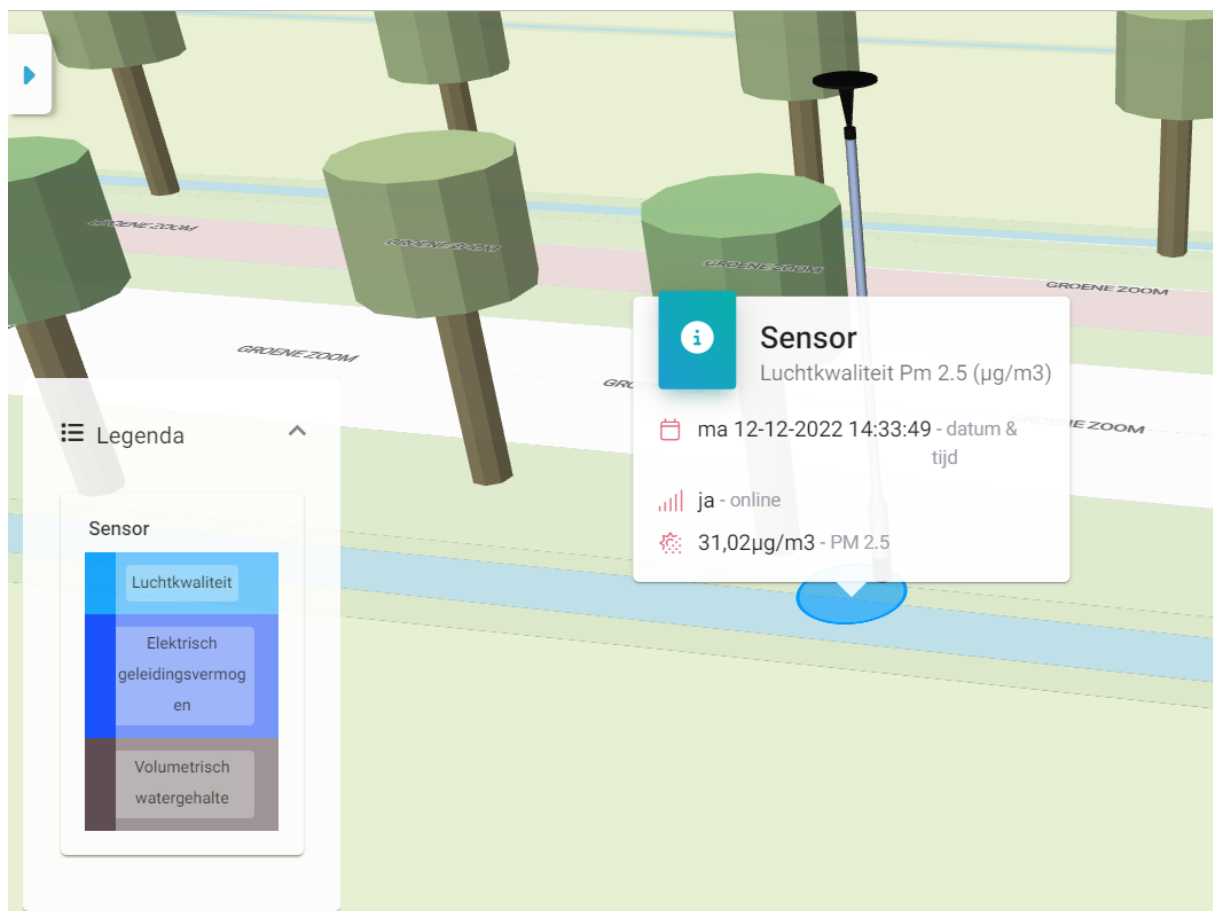
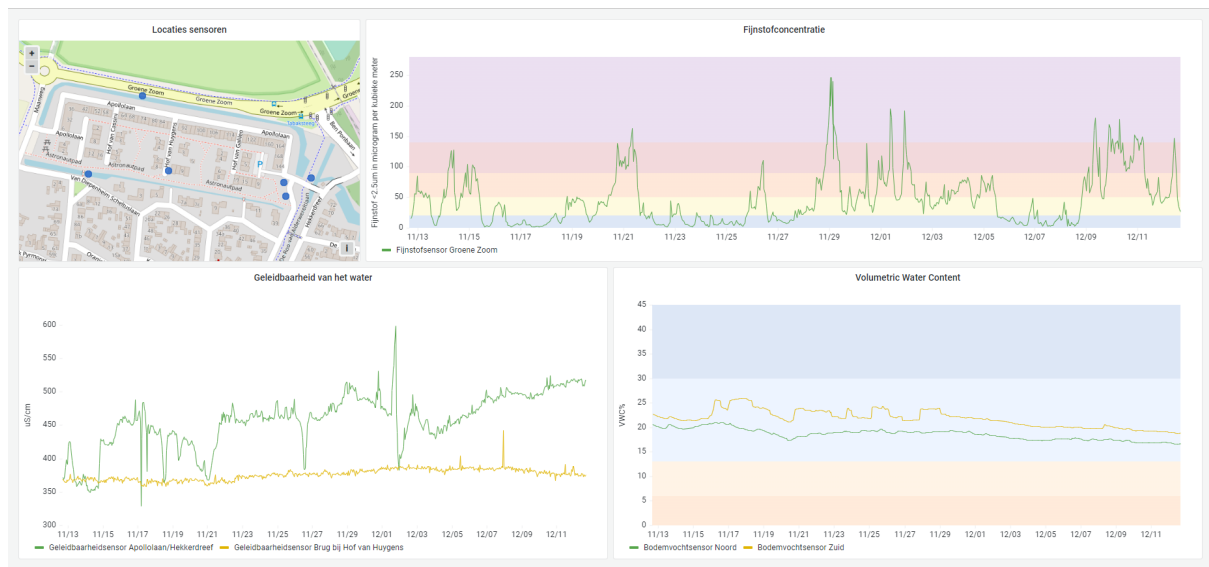
Raw

```
{
  "imei": "359215105799275",
  "timestamp": 1670945083000,
  "batteryVoltage": 4.18,
  "boardTemperature": -2,
  "waterEC": 513,
  "waterTemperature": 7.78,
  "fixAge": 1,
  "lat": 52.122572,
  "lon": 5.410098,
  "altitude": 0,
  "speed": 0,
  "course": 0,
  "satInFix": 5,
  "timeActive": 39642,
  "lastResetCause": 32,
  "water_ph": "",
  "sw_major": 2,
  "sw_minor": 4,
  "sw_revision": 20,
  "sw_version": "v2.4.20",
  "name": "EC 569",
  "@context": {
    "sodaq_ld": "https://gitlab.com/sensative/smart-data-models/-/blob/main/sodaq-ld/modelExample.jsonld"
  },
  "conductivity": {
    "type": "Property",
    "value": 513
  },
  "dataObserved": 0
}
```

*Example in SLAM of a water quality sensor connected to the Context Broker with the appropriate smart data model.*

When needed, all data can be stored in a time series database to allow historical analysis of the data.

To allow trusted data sharing, the Smart Lamppost Asset Marketplace has implemented the iSHARE-scheme. With the partners in SLAM, two showcases have been developed. With the iSHARE-policies, a data owner can grant access to different consumers.



Two examples of trusted data sharing with data consumers

SLAM builds entirely upon proven standards, data models and APIs from FIWARE and iSHARE. It offers a trusted, secure framework and platform for data sharing between all stakeholders involved in smart lampposts.

## **Benefits & Impact**

The Netherlands has approximately 3.5 million lampposts. Reuse of these existing assets, infrastructure, connectivity and electricity reduces implementation and maintenance costs, CO2-emissions and energy usage, and improves service delivery. It also facilitates more efficient data sharing. If a city with 7500 lampposts makes 2% of the lampposts really smart, it can save up to 2 million euros in 5 years.

The Smart Lamppost Asset Marketplace, with the Catalog, Data Market and Service Portal generates more relevant data, enables better data sharing between stakeholders, creates more compliant solutions, and less clutter of assets on the street. Above all, it builds a healthy, open ecosystem that is beneficial for suppliers, (data)consumers, government agencies and citizens. It supports policymakers, urban planners and citizens to make transparent decisions based on data

All the principles that apply to Smart Lamppost, also apply to other smart city themes like mobility hubs, urban development and energy transition.

## **Added value through FIWARE and iSHARE**

The Smart Lamppost Asset Marketplace uses several FIWARE components to collect, harmonize and provision data. The open IoT- and Device Management solution (Yggio) from SLAM-partner Sensative has the ability to connect any kind of sensor and harmonize all data sources. It uses the Orion-LD Context Broker (or Sensative's own Ratatosk Context Broker). Each data source is standardized according to the Smart Data Models and provisioned through the NGSI-LD API.

Data owners can monetize their data through the SLAM Marketplace. Different subscription models (plans and policies) can be applied to their APIs. In combination with the iSHARE-standard, it creates a trusted environment for data exchange.



The screenshot displays the 'SlamYggio\_ngsi-lid' API page in the 'Catalog' section of the 'i4Trust' platform. The interface includes a top navigation bar with 'Dashboard', 'Catalog', 'Applications', and 'Getting started'. A user profile for 'Arjen H.' is visible in the top right. The main content area features a 'Description' section, a 'Plans' section, and a 'Subscriptions' table.

**Description:**

This API connects to 6 sensors that are implemented in the new urban area "Maanwijk" in the city of Leusden. These sensors measure water quality, soil moisture and air quality. The sensors are from 3 different suppliers: Teneo (air), Sodaq (water) and Sensoterra (soil). The data from the sensors is standardized according to the FIWARE smart data models and available as NGSI-LD API.

**Plans:**

Staging Published (3) Deprecated Closed

**Free Plan**  
Authentication: key\_less  
maximum of 10 API call/minute

**Business Plan**  
Authentication: api\_key  
10000 API calls per minute

**Subscriptions Table:**

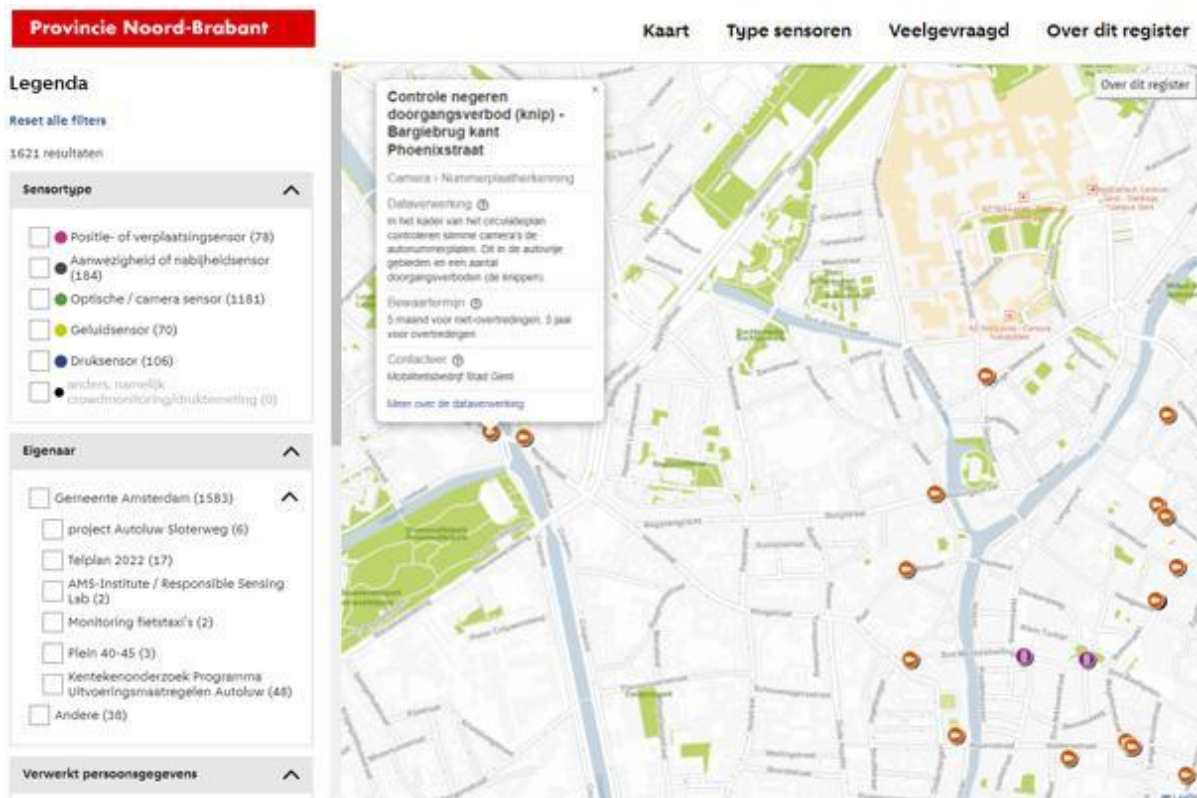
| Plan          | Application         | Created at          | Processed at        | Start at            | End at | Status |
|---------------|---------------------|---------------------|---------------------|---------------------|--------|--------|
| Starter Plan  | test                | 2022-09-16 13:13:51 | 2022-09-16 13:13:51 | 2022-09-16 13:13:51 |        |        |
| Starter Plan  | Default application | 2022-09-09 09:45:17 | 2022-09-09 09:45:17 | 2022-09-09 09:45:17 |        |        |
| Business Plan | Arjen Test          | 2022-09-07 17:10:07 | 2022-09-07 17:10:07 | 2022-09-07 17:10:07 |        |        |
| Starter Plan  | Slam Yggio          | 2022-09-03 16:40:56 | 2022-09-03 16:40:56 | 2022-09-03 16:40:56 |        |        |

*SLAM Data Market (Catalog) with API management for different plans and policies for data*

## Next Steps

SLAM is the reference case for an integrated smart city approach in which support is offered to cities from the selection of a solution through the implementation to the maintenance phase.

The "City Support Centre" shows all relevant information in one place and will be extended with more relevant modules, such as a sensor registry to provide the public with information about assets in public space, or DPIA templates to ensure compliance with GDPR requirements.



*Public sensor registry module to inform citizens about devices in public space*

The goal of SLAM is to enable both sides (suppliers and consumers) to benefit from validated smart city solutions to create more livable, sustainable and inclusive cities. By taking away the concerns and creating an open, scalable, trusted ecosystem.

## AUTHORS & CONTRIBUTORS

### Arjen Hof

CTO WeCity

[WeCity](#)

[Contact](#)

SLAM is a collaboration between Sensative, HubLogiq, Argaleo, Civity, Teneo IoT, SensoTerra, Mobility Sensing and WeCity.

**Disclaimer:** In accordance with our Guidelines concerning the use of endorsements and Impact Stories in advertising, please be aware of the following: Impact Stories appearing on the i4Trust site and partner's site or in other digital or printed materials. It is possible to hand in text, audio or video submissions. They are individual experiences, reflecting real life experiences of those who have used our technology and/or services in some way or another. We do not claim that they are typical results that customers will generally achieve. i4Trust partners reserve the right to revise the contents, make them shorter and adapt them as required.

# SLAM

Smart Lamppost Asset Marketplace

Do you have questions or want to know more?

[CONTACT US](#)

Founding Partners



i4Trust has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement no 951975.

