

# Martin Brynskov

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Chair, Open & Agile Smart Cities (OASC)

Coordinator, SynchroniCity / NGIoT

Chair, Danish Standards Committee on SCC (ISO TC268)

Vice-Chair, ITU-T FG-DPM IoT & SCC (WG1 requirements chair)

Assoc. Prof & Research Director, AU Smart Cities, Aarhus University





**Mission:** To create a global smart city market based on the needs of cities and communities

—  
Demand-side

—  
Global network of national networks

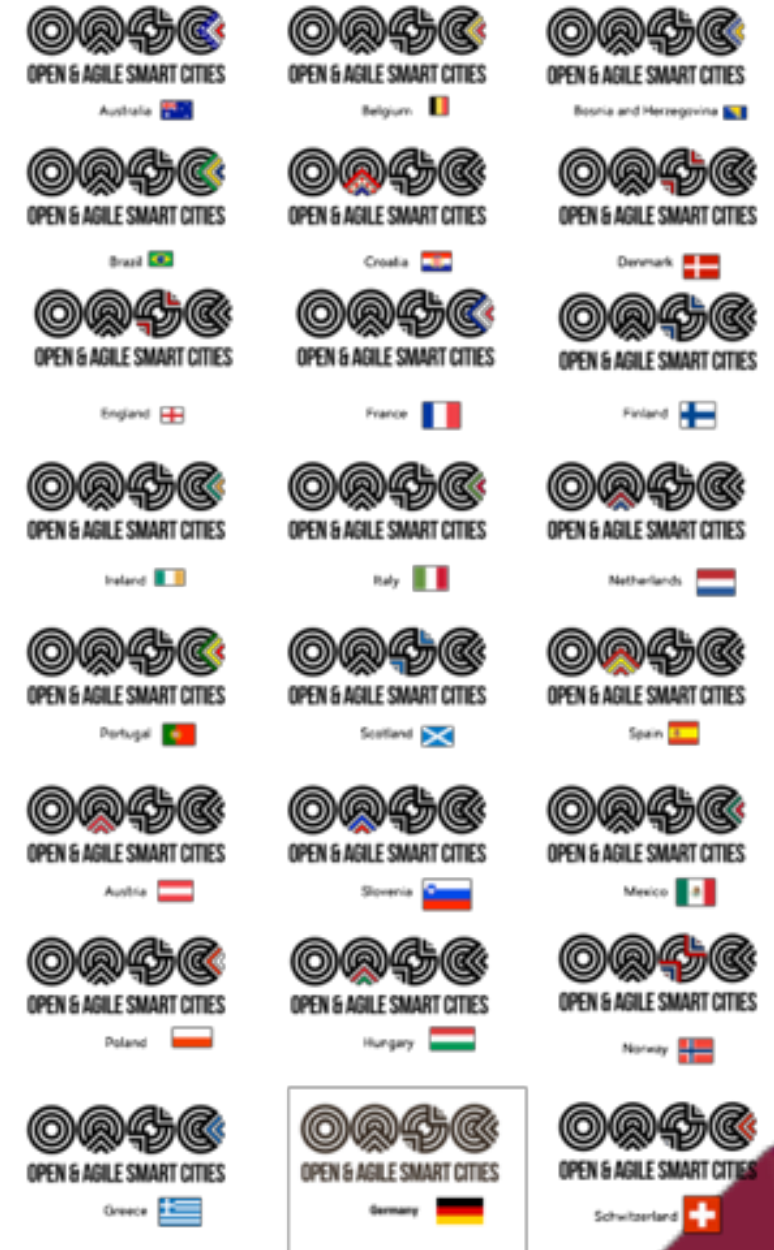
—  
**130** cities

**28** countries

Europe, Latin America, Asia-Pacific

—  
Council of Cities Coordinator: Ghent

BoD representative: Carouge (Geneva)





## OPEN & AGILE SMART CITIES



European Committee  
of the Regions



SYNCHRONICITY

tmforum



AIOTI



SELECT  
for Cities



CATAPULT  
Future Cities





OPEN & AGILE SMART CITIES

# SYNCHRONICITY

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## IoT Large-Scale Pilot for Smart Cities & Communities



This project has received  
funding from the European  
Union's Horizon 2020 research  
and innovation programme  
under grant agreement  
No.731149

Co-funded by



Switzerland



South Korea




Mexico



**A robust model for  
standards-based  
innovation and  
procurement of  
IoT- and AI-enabled  
services across domains**



# Common Technical Ground

1. **OASC** neutral branding (based on standards and consensus specifications)
  2. **OASC** Minimal Interoperability Mechanisms (MIMs)
  3. **SynchroniCity** reference implementation (standards-based)
  4. **SynchroniCity** cloud hosting (option)
- 



# OASC Interoperability Mechanisms

## MIM

1

**Context Information Management**

This API allow to access to real-time context information from the different cities.

2

**Shared Data Models**

Guidelines and catalogue of common data models in different verticals to enable interoperability for applications and systems among different cities

3

**Ecosystem Transaction Management  
("Marketplace")**

It exposes functionalities such as catalogue management, ordering management, revenue management, Service Level Agreements (SLA), license management etc.  
Complemented by marketplaces for hardware and services.

**Security API**

API to register and authenticate user and applications in order to access to the SynchroniCity-enabled services.

**Data Storage API**

This API allows to access to historical data and open data of the reference zones.

**Adopted by the OASC Council of Cities January 16, 2019**

# Marketplaces (ETM)

- Data
  - Open
  - Personal
  - Commercial
- Hardware
- Services/Software
  - Applications
  - Atomic services
  - Components
- Training

These marketplaces are already live in SynchroniCity and partly in IoF2020 (IoT LSP Food & Farming)

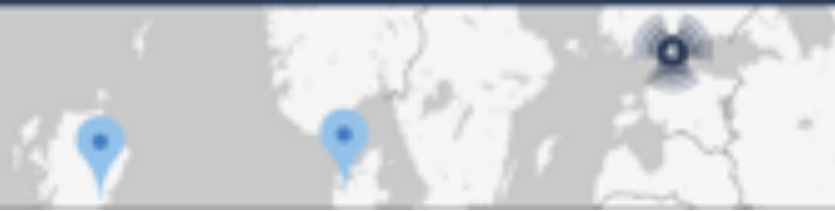




SYNCHRONICITY BOOTCAMP KICKS OFF PILOT PHASE

20 ... 50

CITIES & PILOTS





Theme: All themes

8



Active Travel Insights



Antwerp



ASAP-VALUE : A Standards-based Approach to enhancing



# New services

SYNCHRONICITY

- **50 service deployments**
- 18 cities (out of 55)
- 16 pilot groups (out of 133) – **led by SMEs**
- 6 months to deploy
- **Common technical ground (OASC MIMs)**
- Multi-sided supply-side
- Key input to national strategies

Integrates **architectures and marketplaces** between in Smart Cities ([SynchroniCity](#)), Food and Farming ([IoF2020](#)) and many other initiatives.



ASAP-VALUE : A STANDARDS-BASED APPROACH TO ENHANCING VALUE  
FROM CITY DATA LAKE

[www.synchronicity-iot.eu](http://www.synchronicity-iot.eu)

# Next Generation Internet of Things



*Scoping Paper on the proposed Research and  
Innovation Roadmap of the European Commission  
for the period 2020-2027*



# Today's IoT Challenges in Europe

## Market and business challenges

- Cost (?)
- IoT Monetization (?)
- Lack of digital skills (?)
- Lack of standardization (?)
- Regulatory and legal issues (which ones???)

## Technological challenges

- From big data to fast data
- Device cost vs Higher bandwidth
- AI for IoT
- Security and trust





# MISSION

**Help EU to drive the digital transformation  
of society and economy**

**by**

**Providing an up-to-date roadmap for the business,  
innovation and technology challenges  
of the Next Generation Internet of Things**





# **Our Journey**

**With your help and the help of EU IoT community  
we will provide provide a roadmap for IoT**

## **The first step will be**

**A scoping paper providing inputs to the next work  
programme, based on our vision, initial exchange  
with experts and your valuable feedback!**



# **R&D Priorities identified so far**

**Reliable, low-cost and scalable sensor networks**

**Next Generation IoT data processing architectures**

**Real-time decision making for IoT**

**Autonomous IoT solutions**

**Future proof trust and security**

**Human in the loop IoT**

# Key events 2019

- **IoT and Data Marketplaces**, Brussels (OASC), April 8
- **Procurement**, Brussels (BU25), May 2
- **Digital Transformation World**, Nice, May 14-16
- **World Economic Forum U20 (Mayors Summit)**  
→ **G20**, Tokyo/Osaka, Japan, May/June
- **IoT Week 2019**, Aarhus, Denmark, June 17-21
- **Asia Smart City Forum**, Yokohama, October 7-10
- **Smart City Expo**, Barcelona, November 19-21
- **Finnish EU Presidency**, December 10-11
- **Connected Smart Cities & Communities**, Brussels, January 23, 2020

# IOTWeek

## Invitation – VIP info meeting

April 30<sup>th</sup>, Central Denmark EU office, Brussels

Karsten Dehler, CCO

+45 22 80 77 55

KD@itforum.dk





# IoT Week 2019 in Aarhus, Denmark

Denmark is the “IoT place to be” in 2019 as the annual IoT Week will be held in Aarhus, Denmark from the 17-21 June 2019.

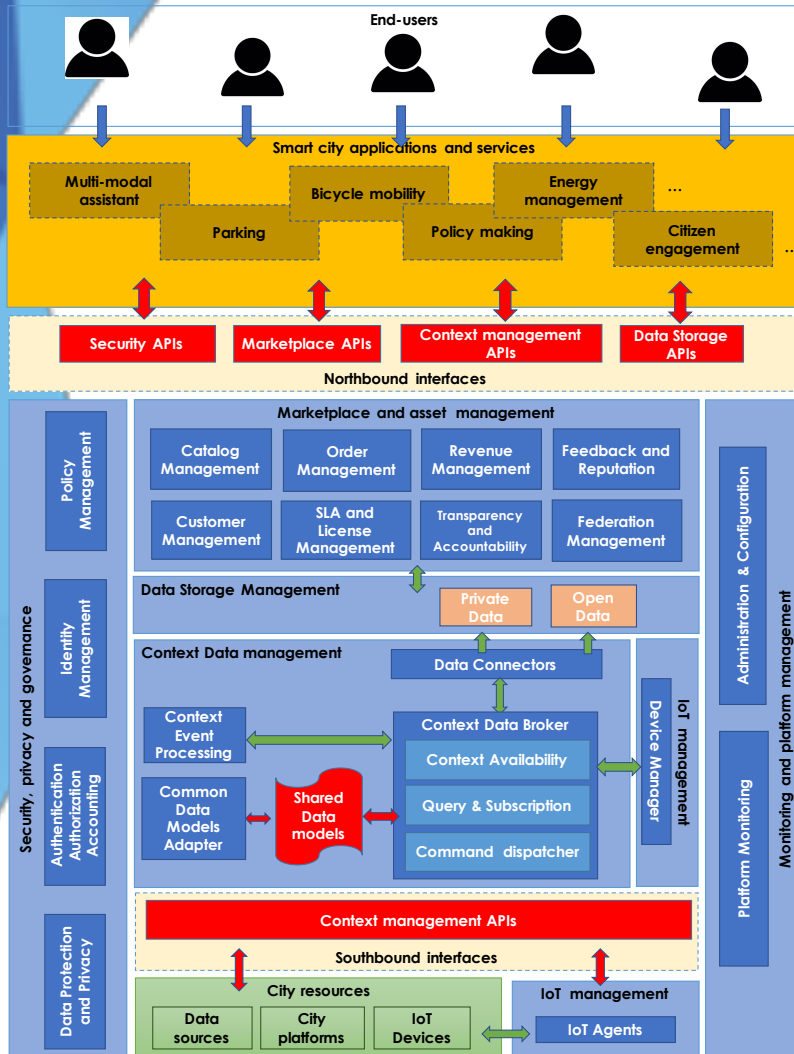
Meet Karsten Dehler, event-responsible for IoT Week in Denmark, and learn more about how the 12 tracks and new Public Expo will open up the event to both public and private decision makers.

IoT Week is for anyone who has an interest in discussing how it will affect society and how help us fulfil UN’s SDGs faster. Learn how you can participate and get involved:

Sign up by sending an email to [lg@centraldenmark.eu](mailto:lg@centraldenmark.eu)  
We look very much forward to welcoming you.

Join us from 1.00-2.30 PM at  
**Central Denmark EU office:**  
**Avenue De Tervueren 35**  
**B-1040 Brussels**

# SynchroniCity Architecture Model



- **IoT Management:** to interact with the devices that use different standards or protocols making them compatible and available to the SynchroniCity platform.
- **Context Information Management:** to manage the context information coming from IoT devices and other public and private data sources.
- **Data Storage Management:** to provide functionalities related to the data storage and data quality interacting with heterogeneous sources.
- **Marketplace:** to implement a hub to enable digital data exchange for urban data and IoT capabilities providing features in order to manage asset catalogues, orders, revenue management.
- **Security:** to provide crucial security properties such as confidentiality, authentication, authorization, integrity, non-repudiation, access control, etc.
- **Monitoring and Platform management:** to provide functionalities to manage platform configuration and to monitor activities of the platform services.

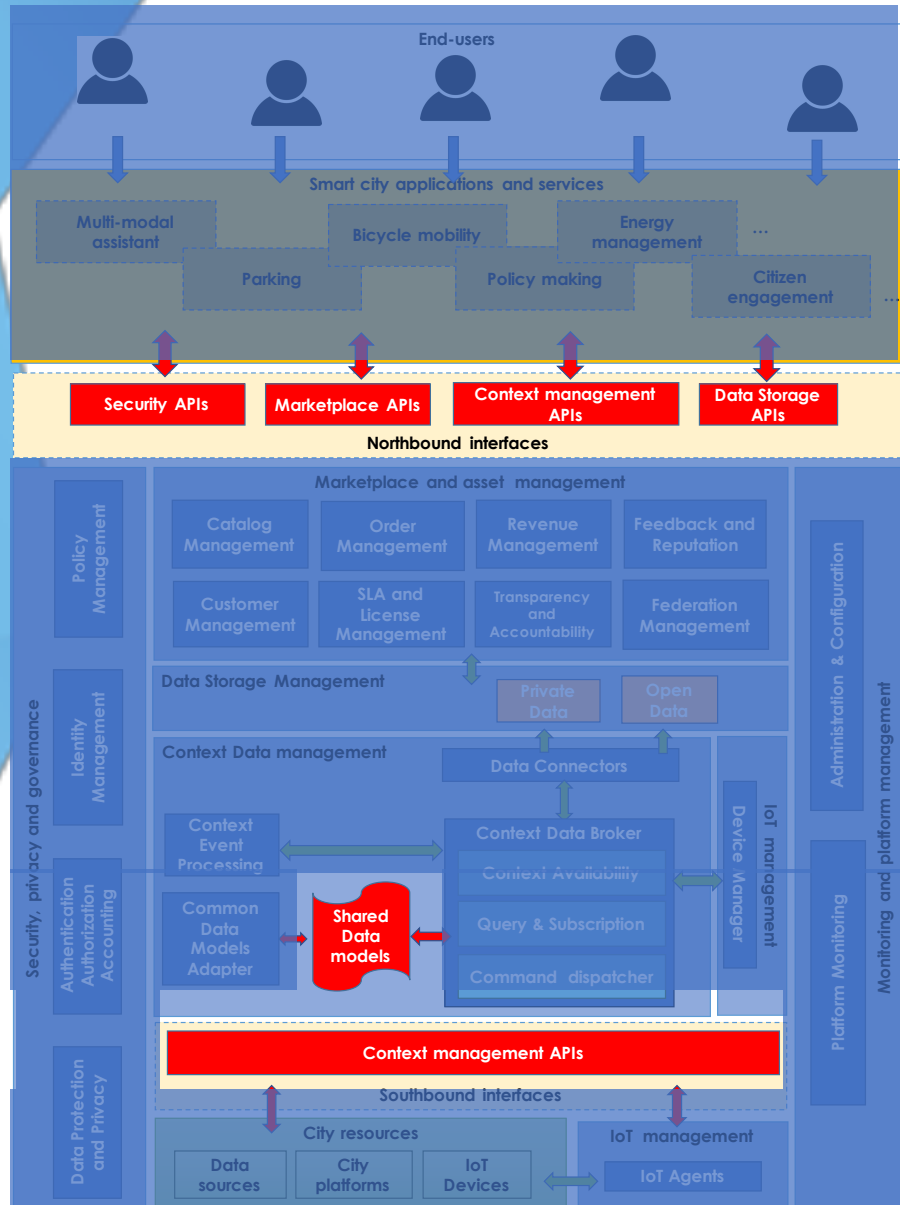
Baseline: SynchroniCity Cities/Reference Zones, OASC, FIWARE, EIP-SCC, NIST IES-CF.

Related standards: ITU-T SG20\*/FG-DPM\* (\*drafts), ISO TC268.

Spec. doc.: Reference Architecture for IoT Enabled Smart Cities (D2.10)

<http://synchronicity-iot/docs>

# Interoperability Points



- **Interoperability Points** represent the main interfaces that allow a city (or any Reference Zone, RZ) and applications to interact with SynchroniCity platform
- Interoperability points are independent from the specific software components that realize them and can be implemented by cities in different steps to reach different levels of compliance
- The architecture has been designed following the OASC principles and the definitions of **Minimal Interoperability Mechanisms (MIMs)**. MIMs, are the actual specifications of the interfaces at the Interoperability Points: they are standard API and guidelines that have to be implemented by a city in order to be compliant with the SynchroniCity framework