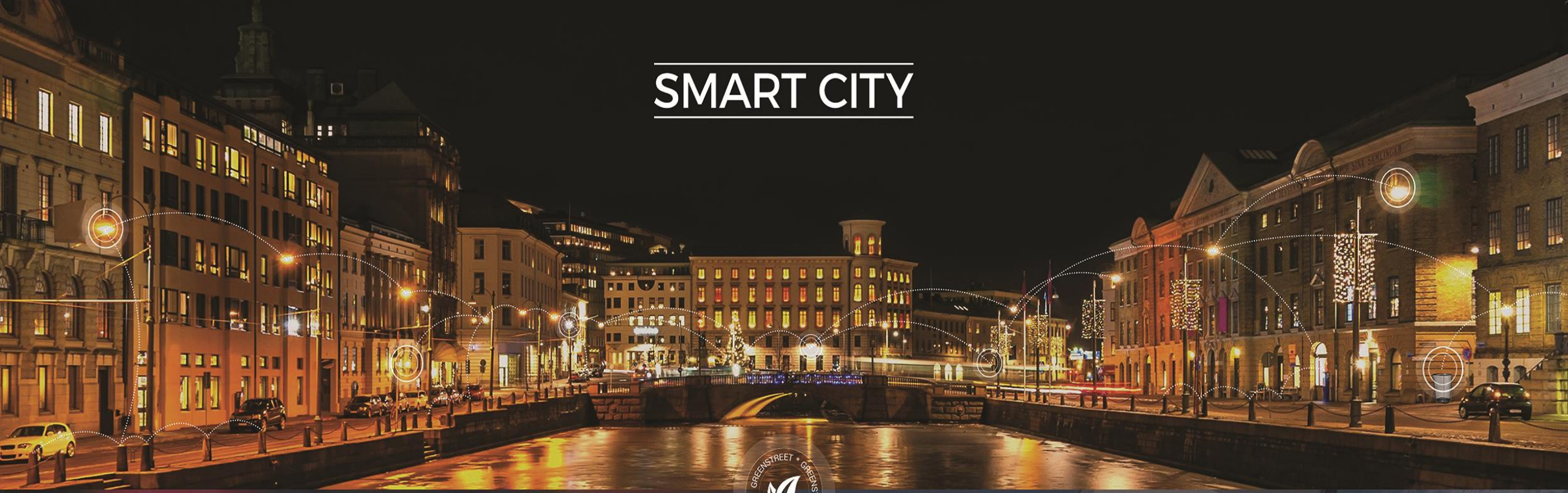
SMART CITY



SAVE

WHAT WE DO

Company Background

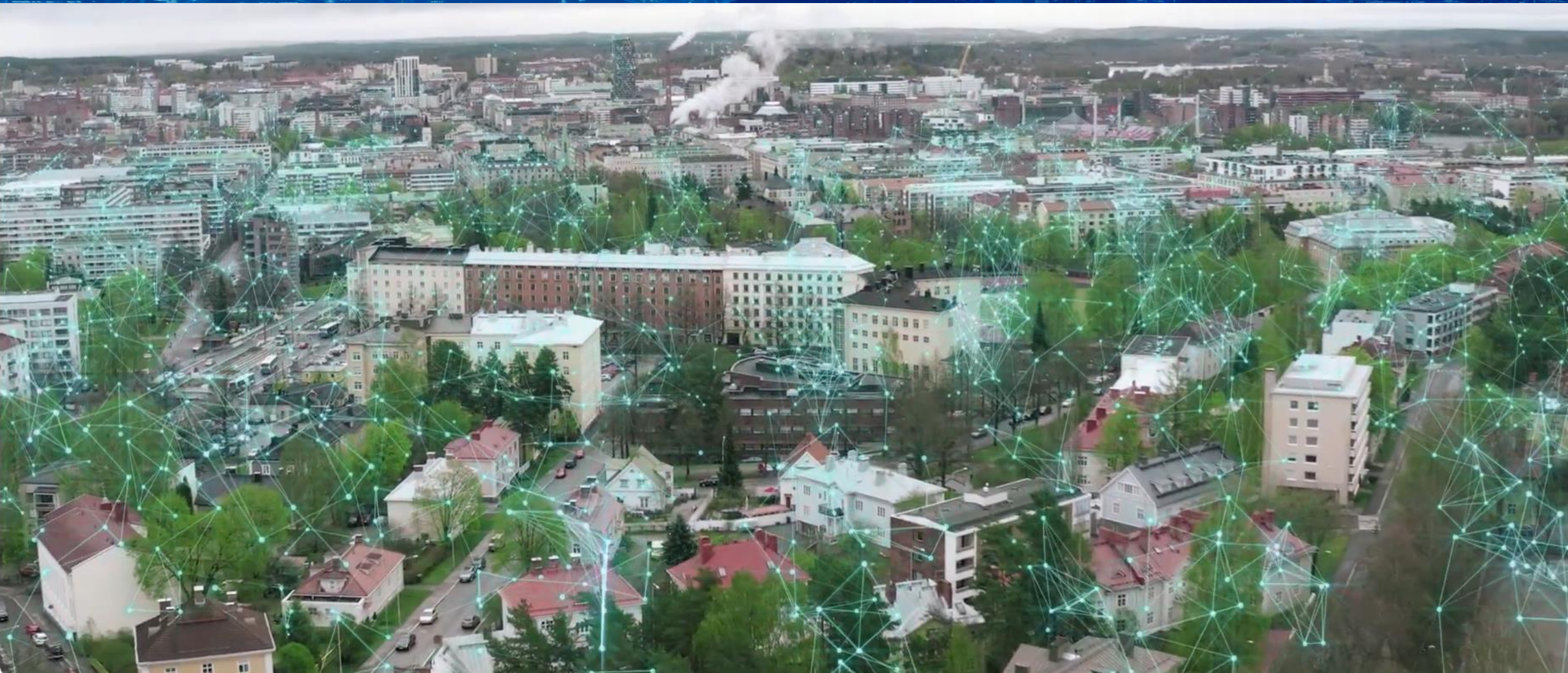
- Founded 1996 in Sweden
- Provided products and services for Streetlight Control since 2007.
- 65+ municipales in Sweden and the Road Administration including the three biggest cities in Sweden.
    - Also in Finland and the Netherlands via partners
- Partner with Snap4City since 2020
- Since 2025 part of the Fagerhult Group

GREENSTREET IOT

Wireless Outdoor Light Controllers

GLC series

Capelon – Connecting Streetlights



Capelon - Snap4City

Capelon

Connected Streetlights

Capelon - Snap4City

Dynamic Control based on city context

Live Demo – Thermal Cameras

S4C has context information about the city.

Capelon

Connected Streetlights

High Traffic at xxx

Heavy rain at xxx

Excellent conditions

Snap4City

Horizontal Smart City Collaboration Platform

Pilot Project:
”Safe Places” in Karlstad City.

Bracelet with built-in panic button sends an alarm that can also be received by the street lighting system.

The lighting is adjusted to MAX light and red light is switched on and a speaker is activated.

I klippet visar Carolin Maule hur överfallslarmet fungerar. **Foto: Filip Jemtelius/SVT**

Armband kopplade till larmade lyktstolpar ska öka tryggheten bland unga i Karlstad

UPPDATERAD 27 SEPTEMBER 2024 PUBLICERAD 27 SEPTEMBER 2024

För att öka tryggheten bland ungdomar undersöks ett överfallslarm som är kopplat till lyktstolpar. Tanken är att larmet ska tända belysningen i närheten och göra ljud för en avvärjande effekt.
– Barn och unga är vår framtid, känner de sig trygga gör vi alla det, säger projektledaren Carolin Maule.

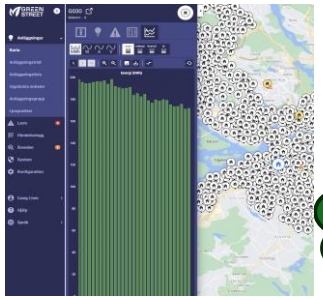
Dynamic Control to assist during Assault Alarm

Luminaires in an area can indicate Red Color Alert.

Capelon - Snap4City

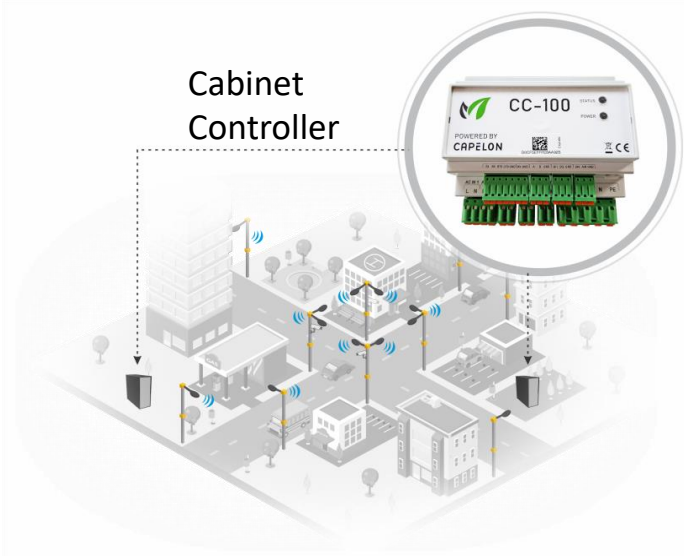
Collaboration with a smart city platform as Snap4City to dynamically adapt streetlights to improve various situations throughout the city.

Our Solution - Briefly



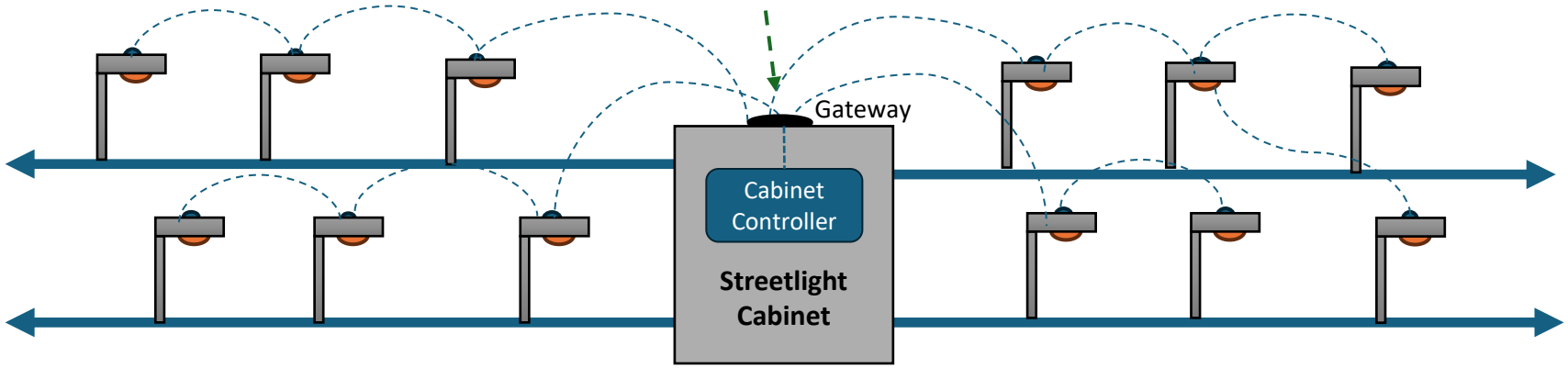
CMS

ON/OFF System



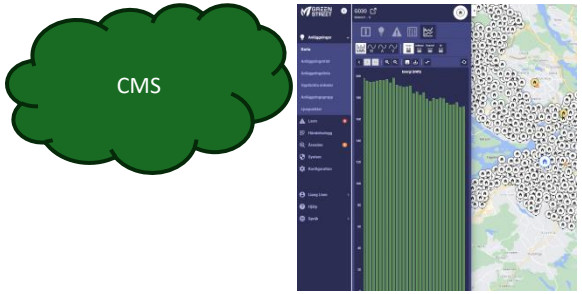
- Switch ON and OFF
- Monitor power consumption and other electrical parameters
- Monitor contactor operation, fuses etc.

Start to connect the cabinet



As a next step luminaries can be connected to create an infrastructure

Streetlight Products & Services



Gateway

Cabinet Control
ON/OFF

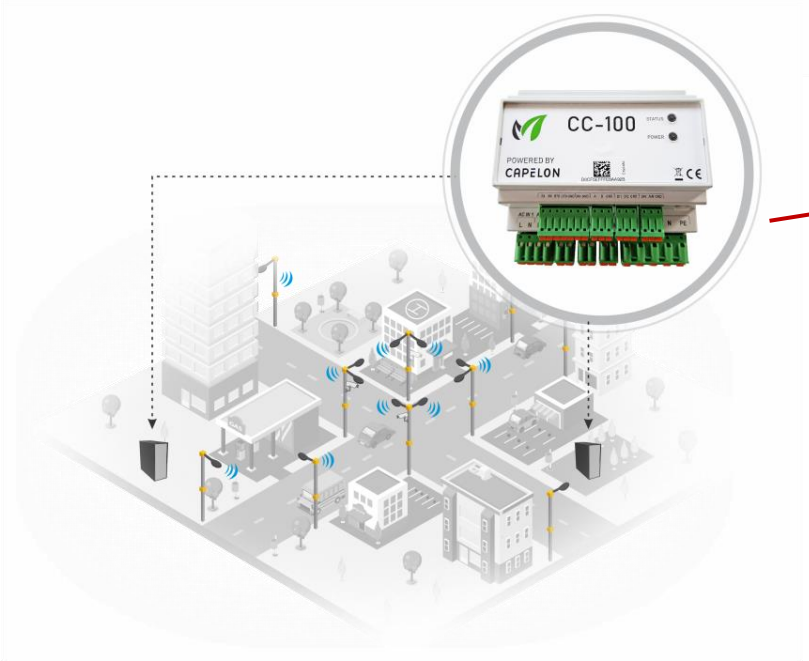
Cabinet Controller

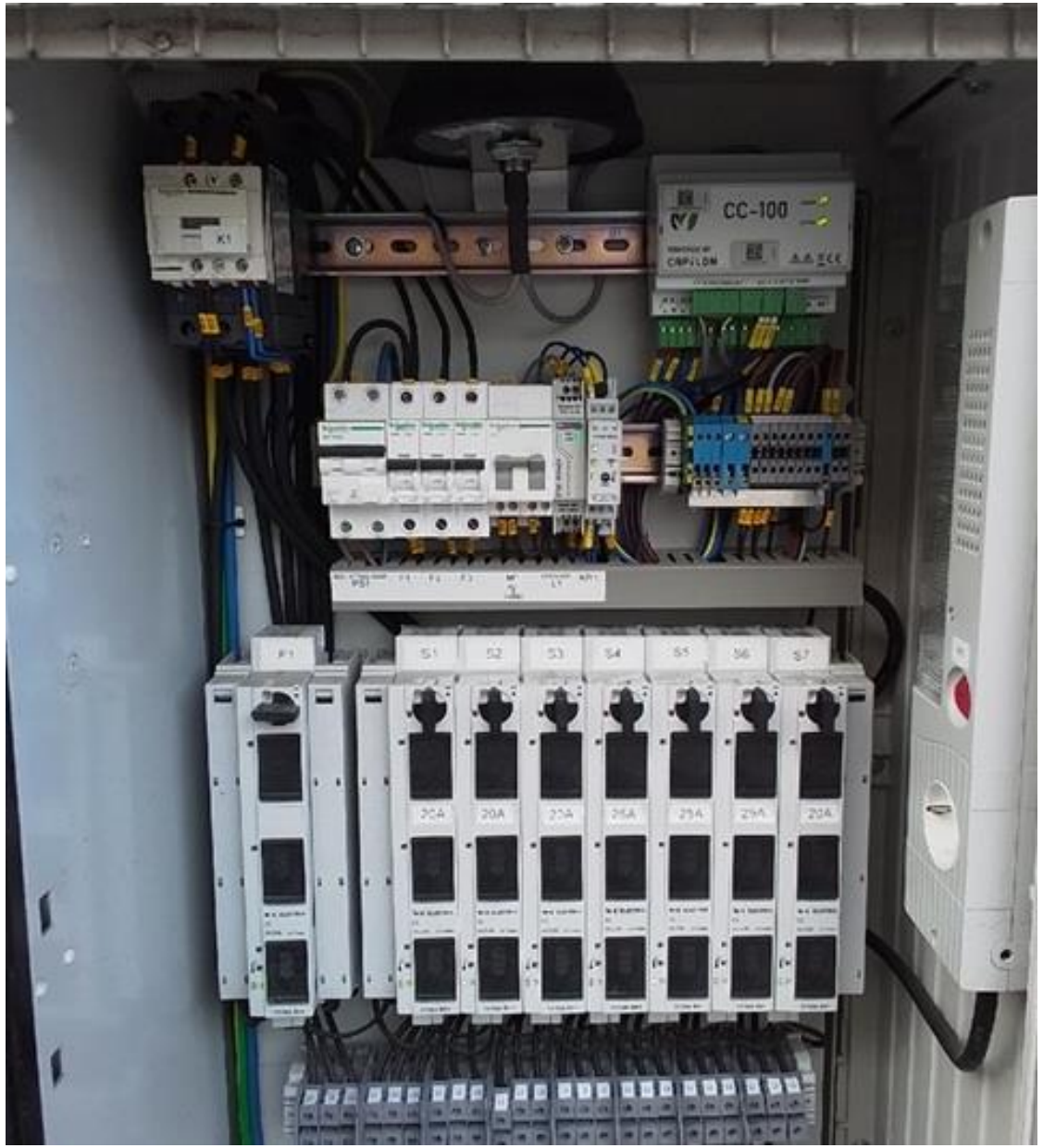
Lamp
Controllers

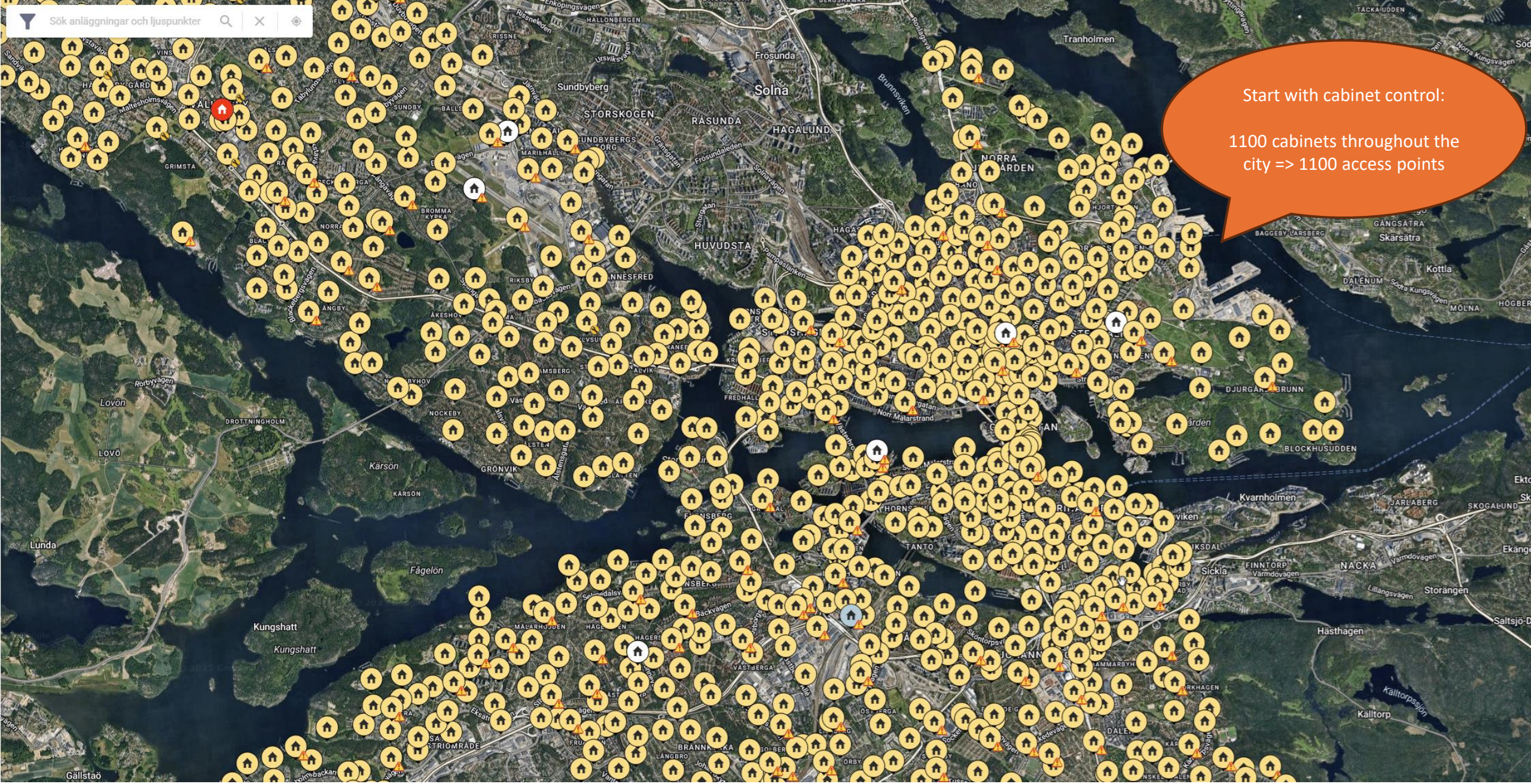
ZHAGA

NEMA

Cabinet Control
CC-100 + Gateway

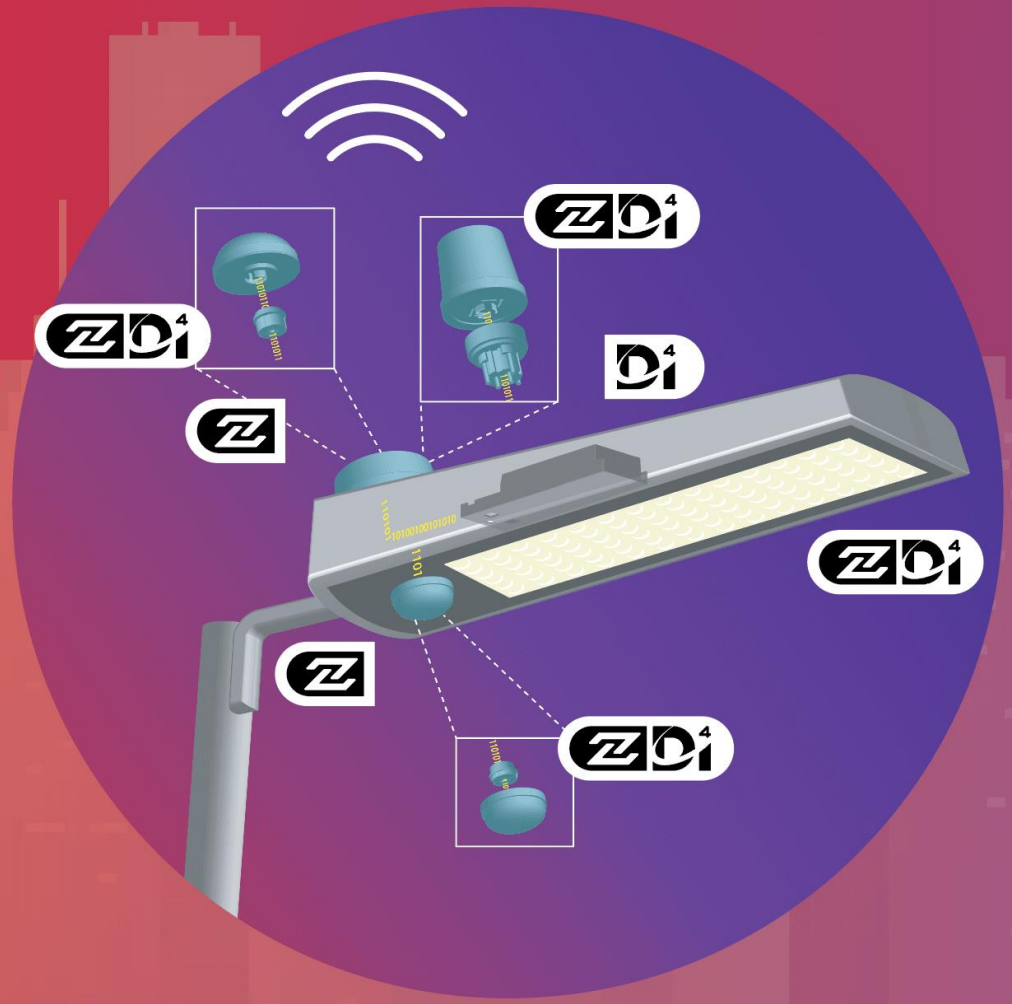


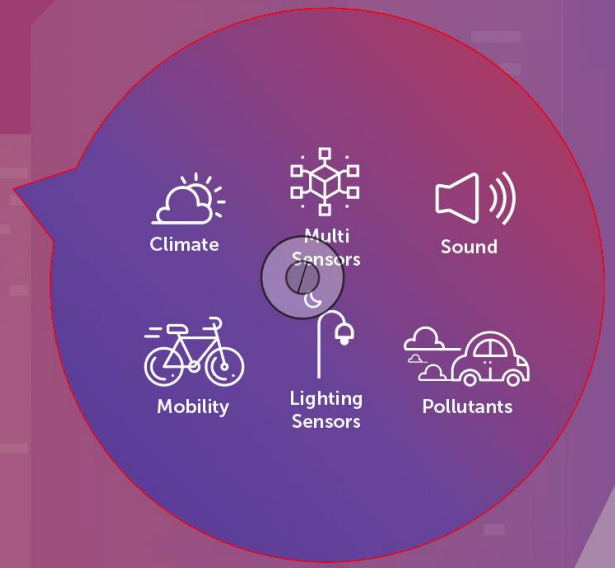

CC-100


Sök anläggningar och ljuspunkter
Start with cabinet control:
1100 cabinets throughout the city => 1100 access points
Solna
Sundbyberg
Frösunda
Tranholmen
STORSKOGEN
RASUNDA
HAGALUND
HUVUDSTA
Lovön
Kärsön
Fågelön
Kungshatt
Lunda
Gällstaö
DROTTNINGHOLM
GRÖNVIK
Kvarnholmen
Sickla
NACKA
Hästhagen
Källtorp
Storängen
Skärsätra
Kottla
BLOCKHUSUDDEN
DJURGÅRDSBRUNN

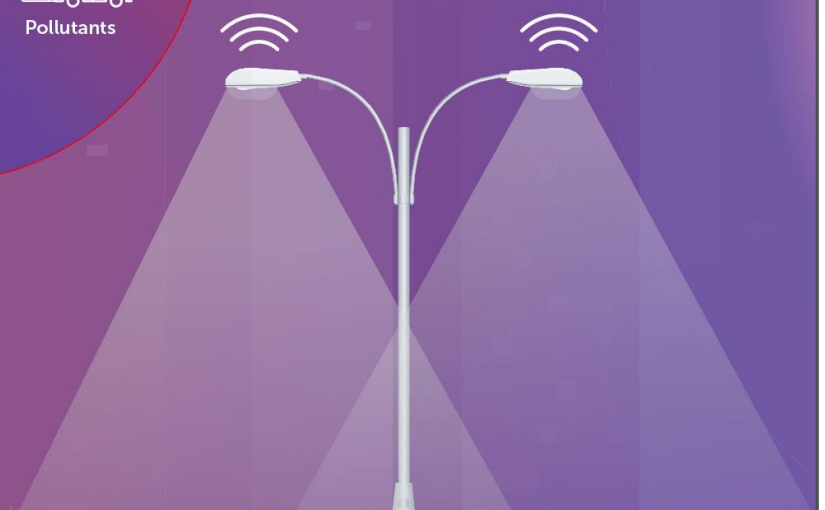

Sök anläggningar och ljuspunkter
Then connecting luminaires are easy when they are already available access points.
The more devices the better city network for other devices as such as sensors.

Zhaga Book 18 platform
Ecosystem of interoperable components

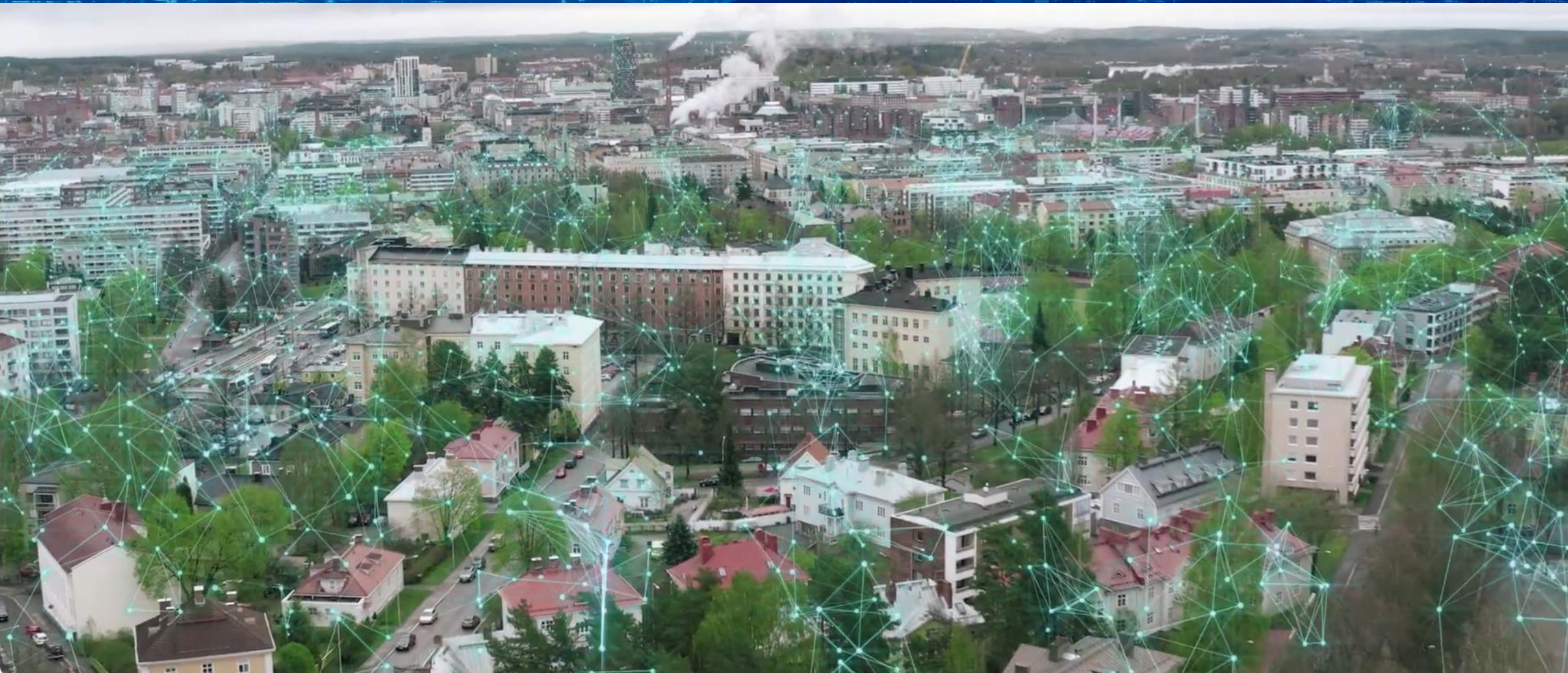




So the streetlights can become sensor stations.



Capelon – Connecting Streetlights



Capelon - Snap4City

What if the City Streetlight Infrastructure can also be a huge data source for the Smart City Platform?

Capelon

Connected Streetlights

Massive IoT

Huge amount of sensor data?

Snap4City

Horizontal Smart City Collaboration Platform

Streetlights as an infrastructure - Helsingborg City

Innovation Helsingborg

Developers /service providers of smart city services and applications

FIWARE

3. CMS / Cloud

Data Storage
Rules
Automation

Three layers in the Infrastructure that enable the smart city

TALQ

2. Communication

Backbone and streetlight control

City Wide Mesh

AP

1. Field Equipments

Network Bridge

"AB-Stolpe"

Fiber

3-part sensors (standard)

How can we build a distributed Wireless Infrastructure for smart cities?

DECT NR+: World's first non-cellular 5G

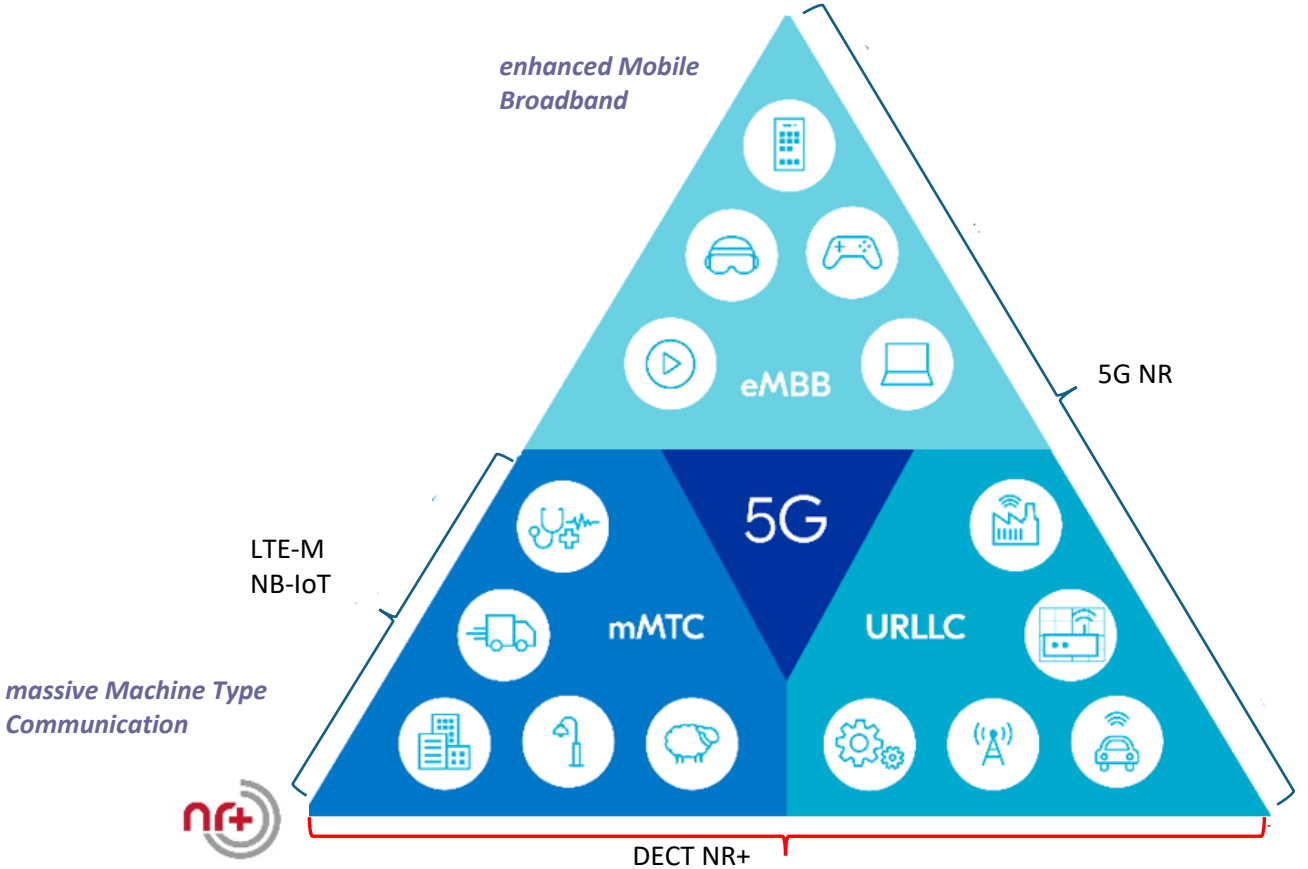
... a new dect wireless technology

ITU-R
"IMT-2020" = 5G

3GPP NR

5G	LTE-M
NR	NB-IoT

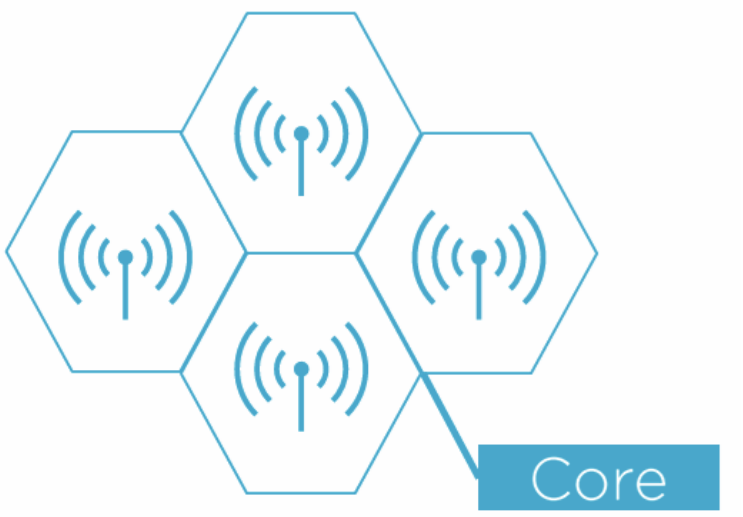
5G = 3GPP?
NO



DECT NR+ is non-cellular

... a new dect wireless technology

3GPP
LTE-M
NB-IoT

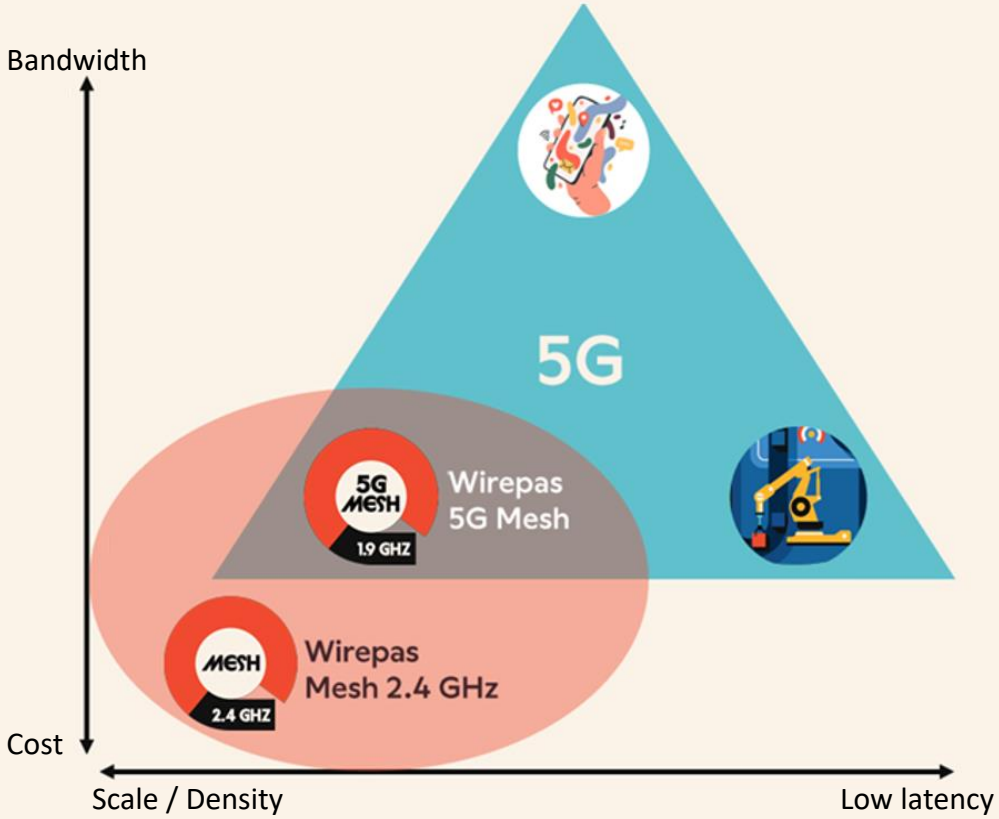


ETSI
ETSI TS 103 636
nr+

City-wide private 5G MESH

DECT NR+: World's first non-cellular 5G

... a new dect wireless technology



Wirepas Mesh

... a new dect wireless technology

	MESH 2.4 GHZ	MESH SUB-GHZ	5G MESH 1.9 GHZ
Radio level bitrate	1 Mbps	0.25 Mbps	Up to 3.4 Mbps
Maximum transmit power	10dBm	19dBm	23dBm
Range open space	200m	1200m	3km
Modulation	(G)FSK	(G)FSK	QPSK, 16-QAM / OFDM
Unlicensed band	Global ISM	Local regulation	Global, dedicated
Global standard	✗ No single physical layer standard	✗	✓
HARQ support			✓

Key Features

... a new dect wireless technology

Self-healing

Self-organizing topology

Changes roles based on network needs

Decentralized

Autonomous mesh

No centralized control

Each node makes autonomous decisions

Robust

Long Range (up to 3km)

High speed (up to 3.4 Mbps)

Interference avoidance

Low latency (1-10ms)

Leveraging advanced techniques (cellular)

Highly scalable

1 square kilometer covered by 100 nodes up to 1 million

Key Benefits

... a new dect wireless technology

Low cost of ownership

No base stations

No SIM needed

No subscription

Easy install

Scalable and reliable

Completely autonomous mesh

Security & Over the Air updates

Scale from 100 to 1M nodes per sq-km

>99.99% reliability

License-exempt frequency

Access to 1,9 GHz DECT band

Globally* allocated

License-exempt

DECT NR+: World's first non-cellular 5G

... a new dect wireless technology

Capelon presents the world's first non-cellular Wirepas 5G Mesh Smart Streetlight solution based on DECT NR+ standard.

RANGE
- 3km point-to-point

SCALING?
- YES, almost unlimited due to decentralized network

RADIO BITRATE
- 1-3 MBPS

LICENSE REQUIRED?
- NO! License-Exempt.

STANDARD OR PROPRIETARY?
- Global standard, ETSI TS 103 636 parts 1-5

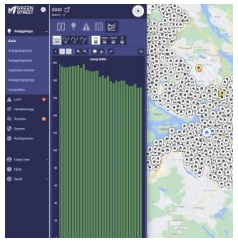
INTERFERENCES?
- NO! Using a dedicated global 1.9 GHz band with polite spectrum access.

Massive IoT – data to be managed by Snap4City

One million devices within one square kilometer

nr+

EXEDRA



Streetlight Application

Smart City Platform e,g

SNAP4CITY

So the Streetlight network can be huge data source for a smart city platform!

Communication and Data Integration plattform

CAPELON

TALQ

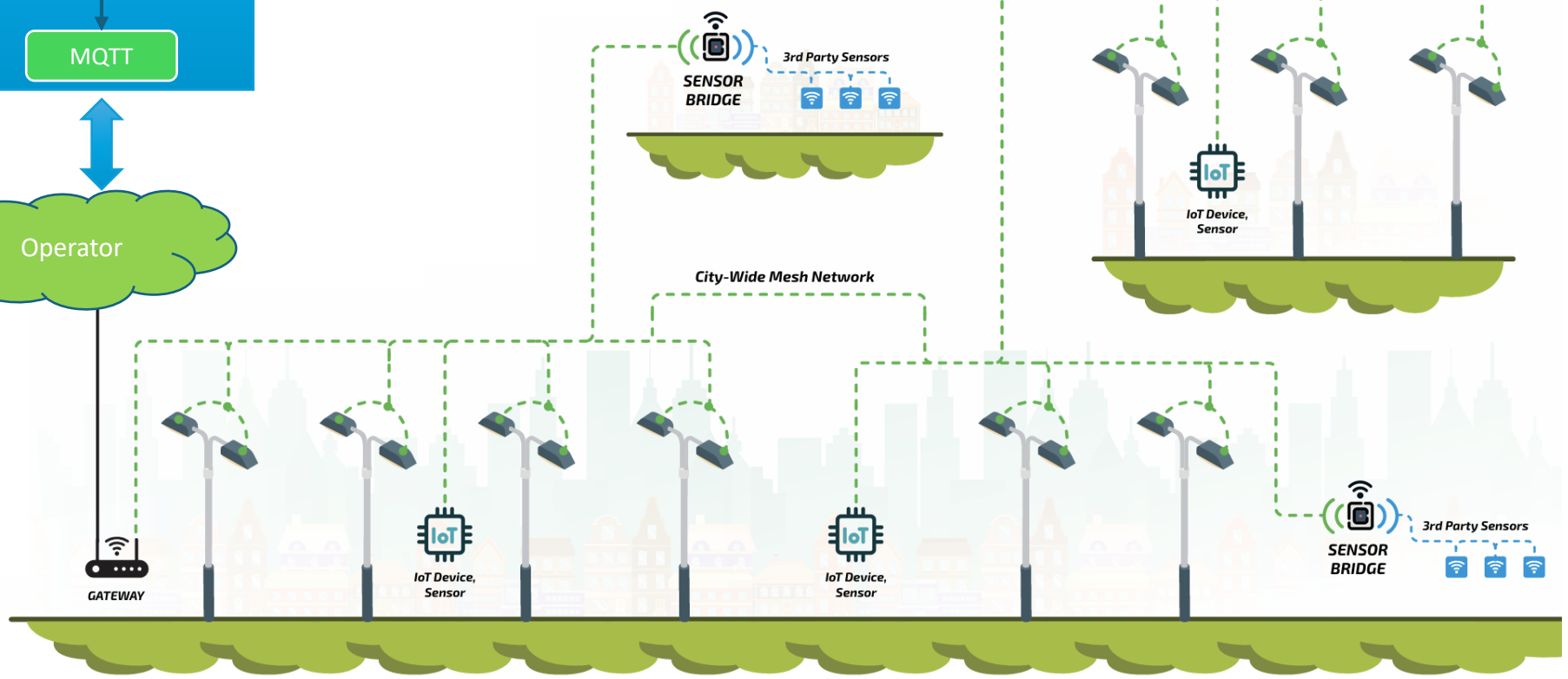
Fiware

GreenStreet Cloud

MQTT

Operator

The Streetlight Network together with a collaboration platform such a Snap4City could really help accelerate the smart city development for a city.



Streetlights as an infrastructure

Learn more

CAPELON

SNAP4CITY

HALL P2 - Level 0 Street D Stand 170