

SCaaS – Smart City as a Service

Where Smart City technology met Advanced financing
/ Acceleration of all Smart City projects



The implementation of new Smart City infrastructure and IoT devices in future cities offers novel perspectives on revenue streams and business models for city governments, thereby giving them a crucial role. Collaborating with private entities that offer a combination of advanced technology and innovative business models can accelerate Smart City projects significantly in various regions, including Europe, the Middle East, Asia, America, and Africa.

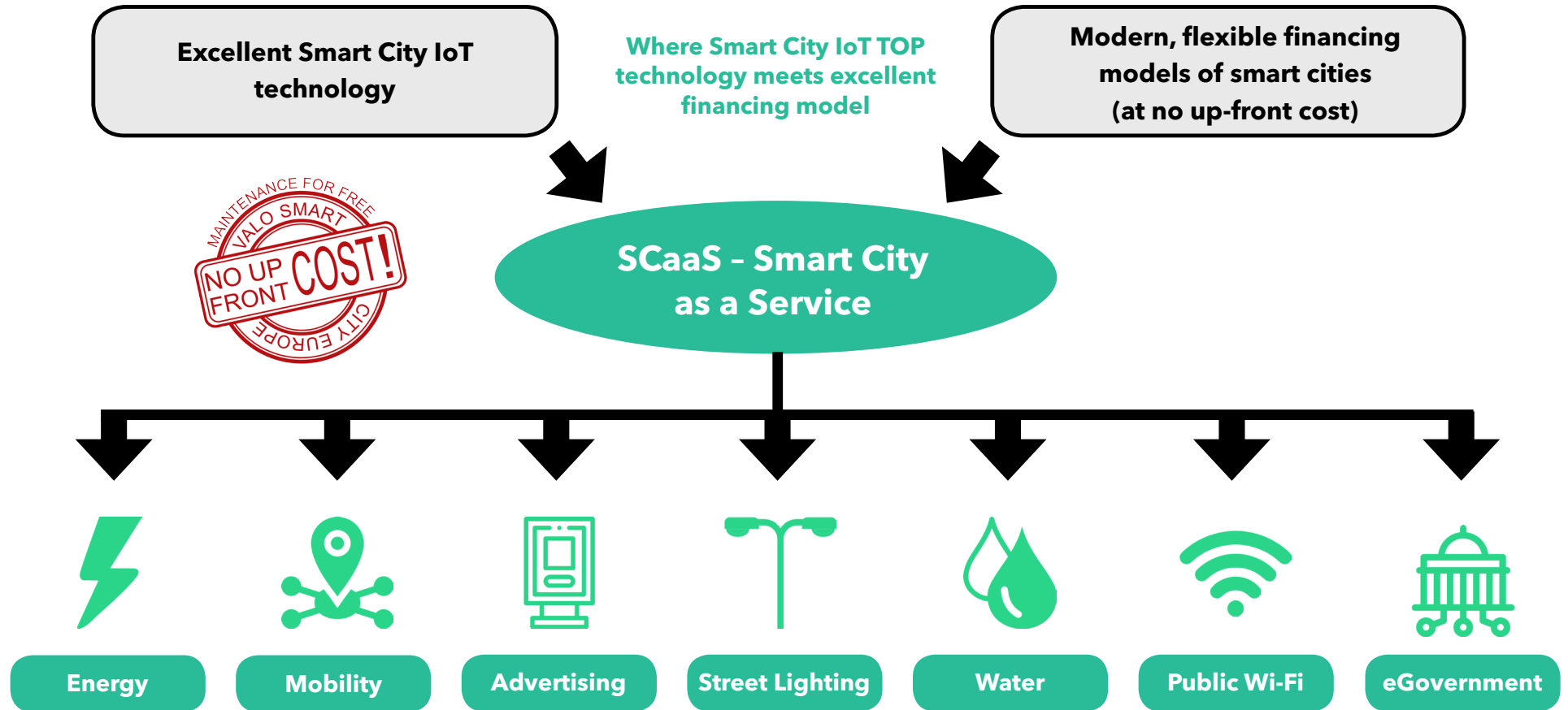
Rather than the city's wealth or the government's financial resources, what truly matters in accessing the vast potential of this blue ocean of incomes is the establishment of sustainable processes.



Christian Macedonschi

President
Smart City Brasov Association

The connection of Technology and Finance



Why to go for the SCaaS model?

01

Shift from CAPEX to OPEX

The financial model behind SCaaS makes the shift from Capital Expenditure to Operating Expenditure for Cities available, substantially improving budgetary planning for Cities.

02

Holistic and sustainable Smart City Ecosystem from day one

VALO's connection of technology and finance enables the holistic deployment of Smart Cities from day one. This way, SC Infrastructure does not become the agglomeration of individual systems, but one holistic and interoperable system.

03

New revenue streams with City Revenue Share

A key element of the VALO model is the revenue sharing with the City, whereby both partners, private and public, are motivated to deliver the best possible quality of life to the citizens.

A look at the rapidly growing amount of Smart City IoT infrastructure

Cities nowadays



Some examples of NOWADAYS Smart infrastructure:

Smart buildings:

- Sensors optimize energy use
- Sensors for lighting, temperature, and security

Smart transportation:

- intelligent traffic management systems
- real-time travel information

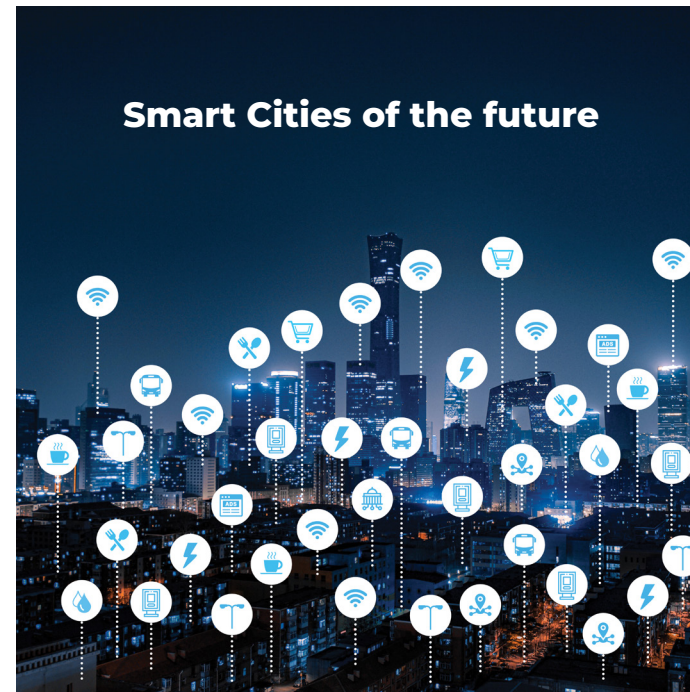
Smart energy systems:

- smart grids sensors to manage electricity supply

Smart water management:

- sensors and analytics to monitor water usage

Smart Cities of the future



Examples of FUTURE smart infrastructure, that it will includes number of IoT devices and infrastructure:

Smart Transportation:

- IoT devices traffic flow
- Parking sensors
- Smart Bus Shelter
- V2I autonomous vehicles infrastructure
- Smart Mobility Hub
- Sharing mobility
- EV chargers / AC, DC
- eBuses / EV chargers
- Dynamic traffic counter
- ATMS

Smart Waste Management:

- IoT devices - monitor waste levels / optimize waste collection routes
- Automatic detection of illegal waste dumping, ...

Smart Water Management:

- IoT devices and sensors will be integrated into water management systems
- IoT devices for monitoring and managing water usage and distribution
- Water quality sensor inside of water pipeline, ...

Public Lighting Pole:

- Public Wifi
- 5G small cels
- Enviro / Meteo sensors
- EV chargers, ...

Smart advertising and communication devices:

- Smart Digital Signage
- Smart advertising board
- pDOOH

Smart Energy system

- Energy storage system
- Photovoltaic roof systems

Smart Public Safety:

- IoT devices and sensors to improve public safety
- Emergency services powered by IoT devices
- IoT devices and AI for monitoring Public spaces
- Number AI behind a cameras, ...

Unique opportunity to create most effective City network



CENTRAL EDGE UNIT



LED LUMINAIRE



CAMERA



ENVIRO MODULE



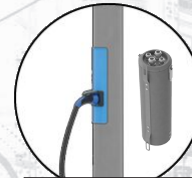
TRAFFIC COUNTER



C-V2X UNIT



DIGITAL SIGNAGE



EV CHARGER



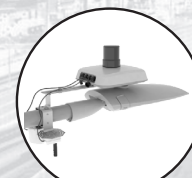
SMALL CELLS 5G UNITS



PUBLIC WI-FI



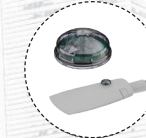
SPEAKER COMMUNICATION CITY INFRASTRUCTURE



SMART IoT HUB

BENEFITS:

- Public lighting network and electricity grid of public network is used as a communication bus
- There is no need to create any additional infrastructure in Cities
- Ability to connect 3rd party devices
- Cameras, radars, sensors, charging modules, SOS bottoms and other devices are seamlessly to install
- Permanent 24/7 power supply on public poles because the luminaires are switched off digitally
- Homogeneous coverage throughout the city 35-50 m apart
- Ideal height 6, 8, 12 m
- Anti-vandal



LED LUMINAIRE
Lumen Output: 10200lm
64W Power Consumption
CCT: 4000K
Various optics
DALI control



WEATHER STATION
Temperature, Humidity,
Wind speed,
Wind direction,
Brightness, Twilight,
Air pressure



ENVIRO MODULE
Temperature,
CO₂, NO₂, SO₂, O₃,
Humidity, Pressure,
Dust(PM_{2.5}, PM₁₀),
Light, UV Index,
Noise

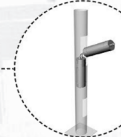
SECURITY CAMERA
2 MP IR, Varifocal Bullet,
Network Camera,
1/2.8" CMOS,
1920 x 1080 @30fps,
Behavior analysis,
Face detection

DIGITAL SIGNAGE
55" Outdoor display
Luminance >7000 Cd/m²
4G /Wi-Fi / mobile APP

TRAFFIC COUNTER
Road flow control,
Highway traffic monitoring,
Traffic violation reporting,
Queueing, Parking,
Speeding, Perimeter,
Heat maps

EV CHARGER
AC charging up to
22kW
Socket TYPE 2
Control unit
Energy meter
RFID reader

POLE
Galvanized steel or
Aluminium body
Various lengths
Various mounting

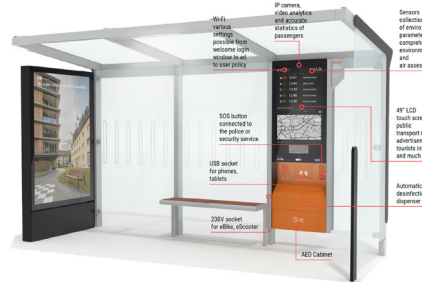


The intelligent shift of bus shelters

From standard shelter to an important, digital infrastructure, advertising and community point of the future city



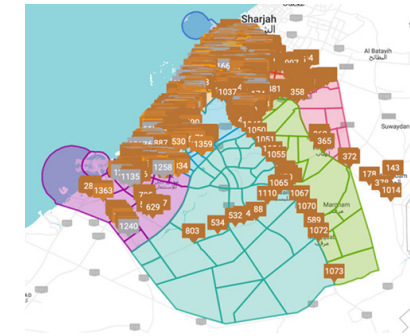
Standard Bus Shelter as weather protection + simple advertising, or passenger info solutions



The integration of digital IoT services into the bus stop to increase comfort and digitization of public transport



Smart Bus shelter equipped with advanced dynamic and programmable DOOH LCD screens controlled according to real time measured audience and Public Wi-Fi access equipped with applications to support advertising and emergency notifications



All part of a uniform infrastructure network where each point has its own connection and can become an ideal place for the placement of advanced infrastructure – sharing mobility, autonomous vehicles, environment sensors, XG,...

Or the seamless deployment and integration of IoT devices to support the development of Smart City services

SmartIoT Hub gen3

Wi-Fi network available for passers-by.

Meteorological station measures wind speed and direction, temperature, humidity, precipitation, time, date, position of sun and more.

Smart IoT Hub can be also equipped with **sensors** to measure air quality, CO2 & VOC and dust particle concentration with accuracy of PM2,5 & PM10. Comprehensive evaluation of measured parameters is available via CitySys platform on user-friendly screen. Historical data can be accessed through standardized API.

Camera serves to increase security around Smart IoT Hub but can also be used to video analytics of the surroundings (counting people, face recognition, ripping around the device, etc.)

Graffiti Buster is a unique, intelligent system with acoustic monitoring and detection of acoustic display of graffiti vandalism. Based on detection of the sound of the ball in a spray and the sound of spraying itself it generates alarm event through the speakers. This way it secures preventative effect on graffiti vandalism connected with prevention of damages on object, historical monuments, rail vehicles and other property.

Real time **noise monitoring** is another great feature of Smart IoT Hub. **Lighting Control system**: enables our customers a remote access to the luminaire either through DALI driver in the luminaire or through NEMA Socket installed on our IoT Hub. You will also need a IoT Master installed in your Electrical Distribution Box for communication between devices.



A holistic approach is the key to building a sustainable Smart City

Here are some key elements to consider when taking a holistic approach to building smart cities:

- Citizen engagement
- Infrastructure
- Sustainability
- Innovation
- Data-driven decision-making

By taking a holistic approach to building smart cities, cities can create more equitable, and prosperous urban environments for their citizens.

Step V. Public Wi-Fi + Citizen / Passenger digital card



Public Wi-Fi

- Hot spots: necessary hardware (router, hot spots, antennas, etc.)
- IoT devices
- Installation
- Maintenance
- Monitoring
- Software platform

Citizen ID card, Passenger urban mobility card, ...

- Communications: citizens - municipality
- Sending info about city activities
- Online research, voting
- Safety services to authorities
- Key messages to reach audience
- Other services on request

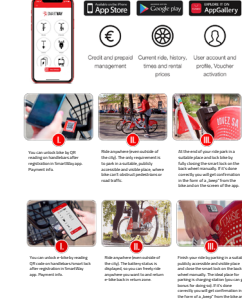
Step IV. Smart Bus shelter system



Smart Bus shelter system

- Modules: bus shelter
- IoT Devices
- Installation
- Maintenance
- Advertising screen / double sided
- Monitoring

Step VI. Urban Microbility - eBikes, eScouters, eMotorbike,...



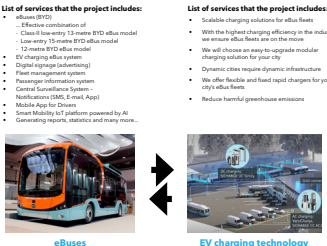
Urban Microbility - eBikes, eScouters, eMotorbike, ...

- App Store
- Google play
- Application
- Credit and account management
- Current info, history, times and rental prices
- User account and profile, voucher activation

Advantages of modular construction

- FASTER
- SAFER
- GREENER
- MORE AFFORDABLE
- FLEXIBLE
- EASIER TO USE

Step I. eBus + EV charging



eBuses

- Effective combination of:
 - Class II low entry 12-meter BTD eBus model
 - Low entry 12-meter BTD eBus model
 - 12-meter BTD eBus model
- EV charging eBus system
- Digital signage (advertising)
- Fleet management system
- Passenger information system
- Control Surveillance System
- Notification (SMS, Email, App)
- Mobile App for Drivers
- Smart Mobility IoT platform powered by AI
- Generating reports, statistics and many more...

EV charging technology

- Scalable charging solutions for eBus fleets
- With the highest charging efficiency in the industry, we ensure eBus fleets are on the move
- We will choose an easy-to-upgrade modular charging solution for your city
- Dynamic cities require dynamic infrastructure
- We offer flexible and fast rapid chargers for your city eBus fleets
- Reduce harmful greenhouse emissions

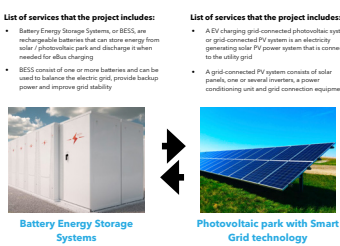
Step VII. City Bus Stations of Modular Construction



Advantages of modular construction

- FASTER
- SAFER
- GREENER
- MORE AFFORDABLE
- FLEXIBLE
- EASIER TO USE

Step II. Solar park + Energy grid + Battery storage system



Battery Energy Storage Systems

- A grid-connected PV system consists of solar panels, one or several inverters, a power conditioning unit and grid connection equipment

Photovoltaic park with Smart Grid technology

- A EV charging grid-connected photovoltaic system, or grid-connected PV system is an electricity generating solar PV power system that is connected to the utility grid
- BESS consists of one or more batteries and can be used to balance the electric grid, provide backup power and improve grid stability

Step III. Public transport passenger management system



INFO SYSTEM / ROUTE FINDER

PASSENGER INFORMATION SYSTEM

- VEHICLE:
 - ✓ Routes
 - ✓ Operator
 - ✓ Contact
 - ✓ Arrivals
- REAL TIME INFO:
 - ✓ Routes
 - ✓ Delay
 - ✓ Vehicle info
 - ✓ Prediction
- STOPS:
 - ✓ Stop
 - ✓ Name
 - ✓ Stop
 - ✓ Routes

FLEET CONTROL / PLANNING

- VEHICLES
- MAINTENANCE
- REDUCED
- DRIVERS
- RISKS
- ALARMS

FLEET CONTROL / PLANNING

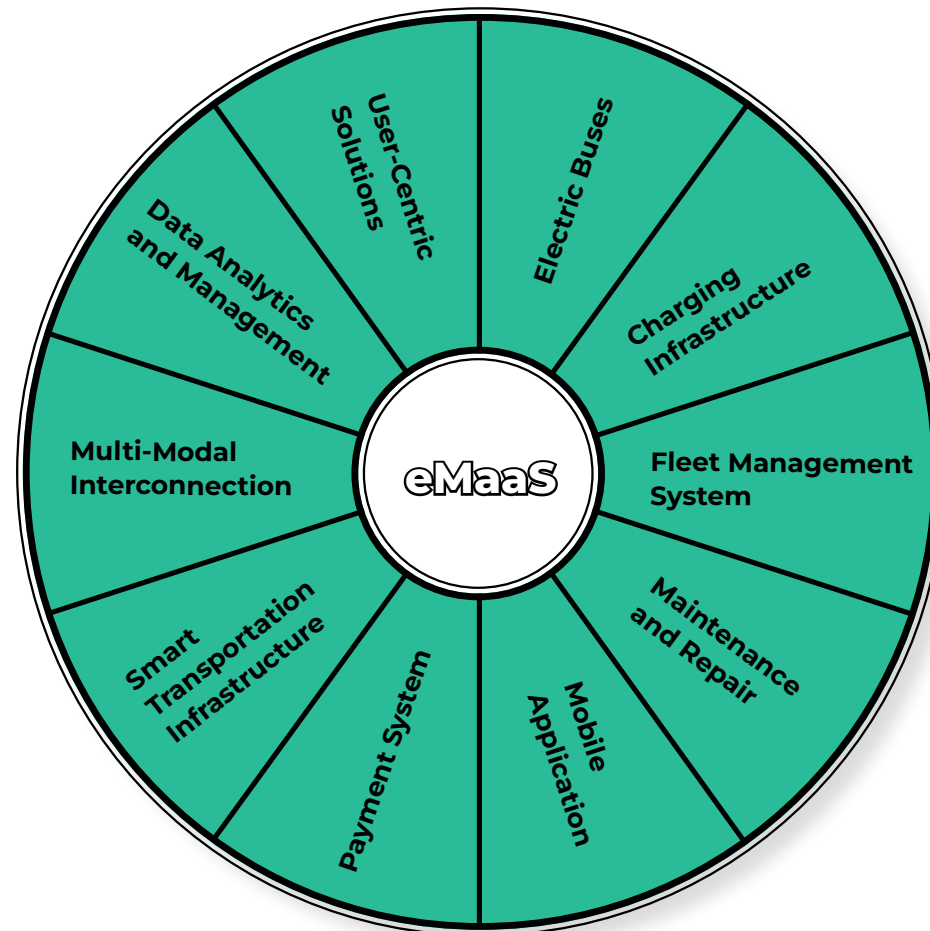


FLEET CONTROL / PLANNING

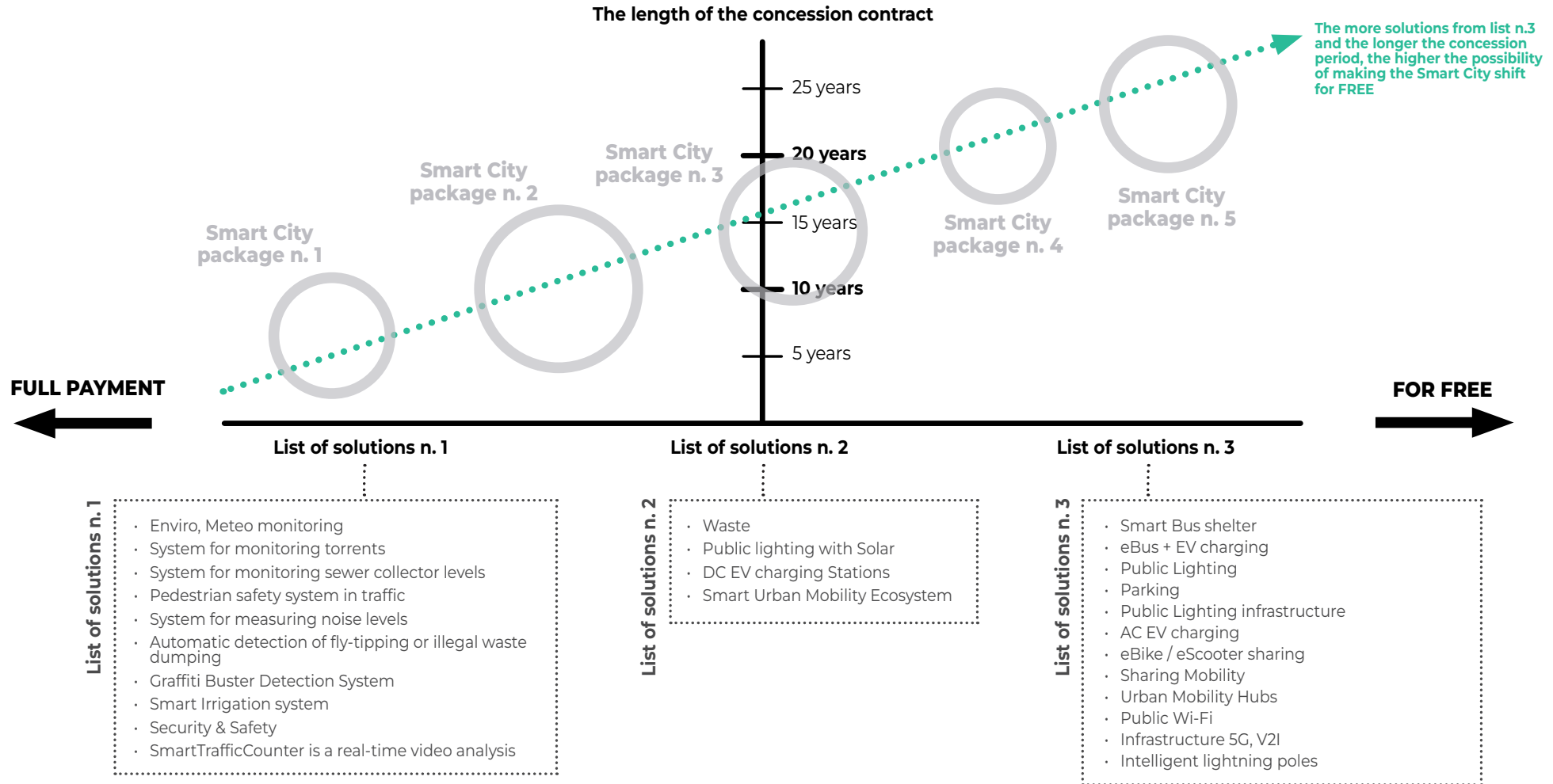
- ROUTES
- BUS STOPS
- SCHEDULING
- OPERATIONAL CHANGES
- PLATFORMS
- VEHICLES

Cities need an integrated ecosystem, not only the assembly of individual services

The eMaaS structure includes the following components:



The length of the concession and the choice of Smart City solutions as variables of effective SCaaS financial models

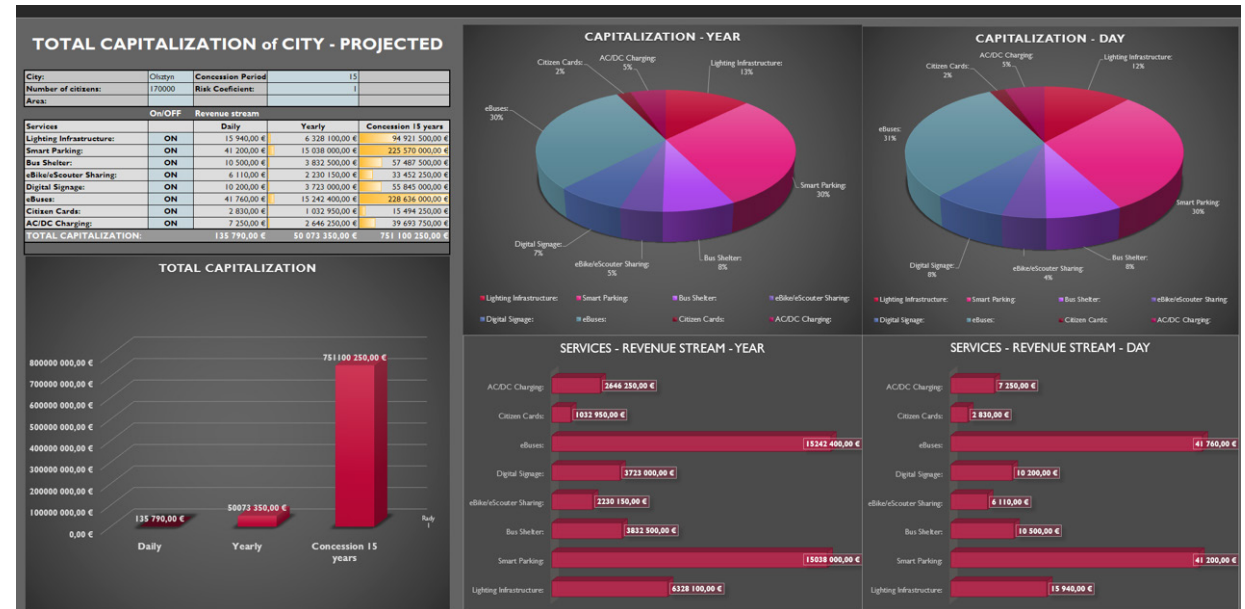


Snowball of income performance of Smart city after effective deployment during the first decade

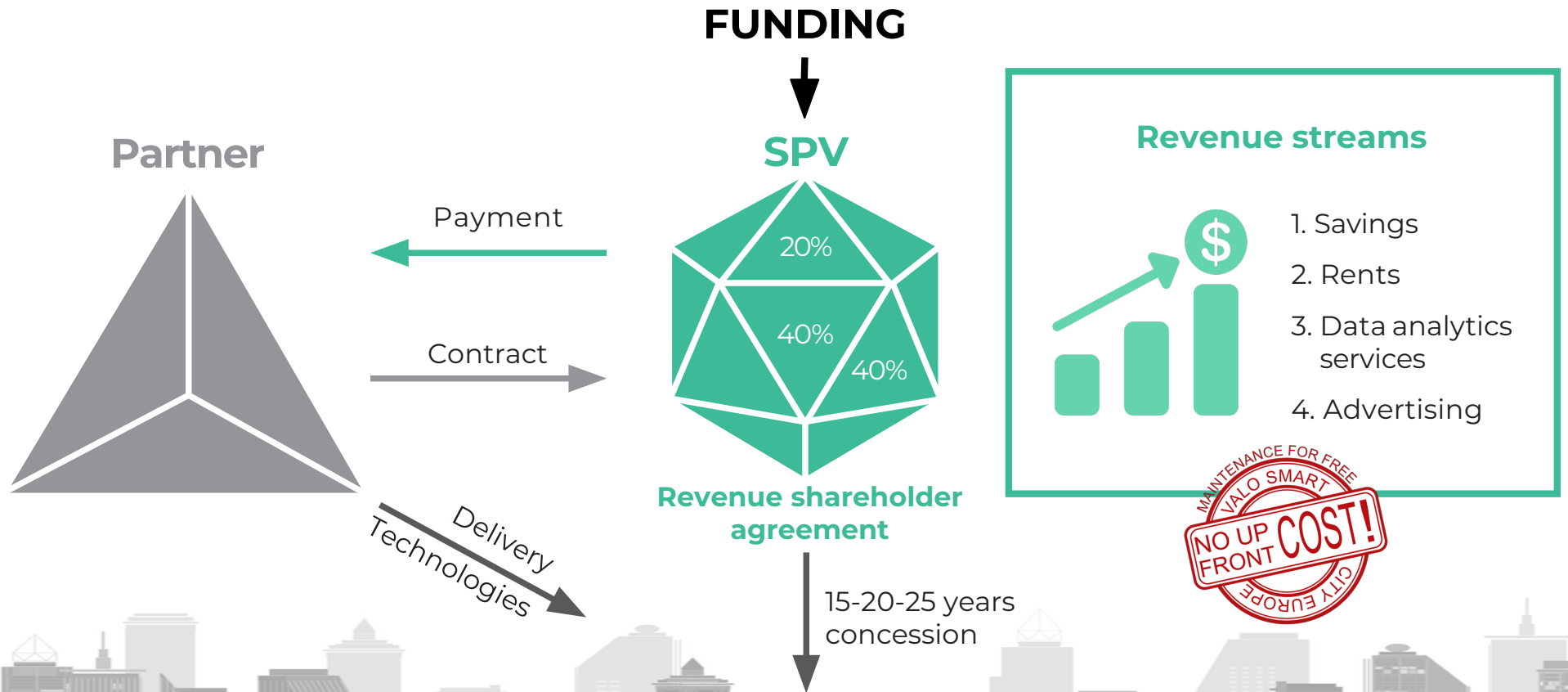
NEVER IN HISTORY HAS THERE BEEN SUCH AN OPPORTUNITY TO BUILD SUCH A DRAMATIC REVENUE STREAM POTENTIAL OF CITIES
 This is the main attraction of new Smart City period and disruption of existing PPP business models because CAPEX are zero, but in effective deployment of Smart city rules respecting holistic approach OPEX can move to zero as well.

- The model considers:
- the building of the city while respecting the holistic approach
 - based on Smart City as a Service - SCaaS business model
 - powered by VALO Smart City Europe new financing approach

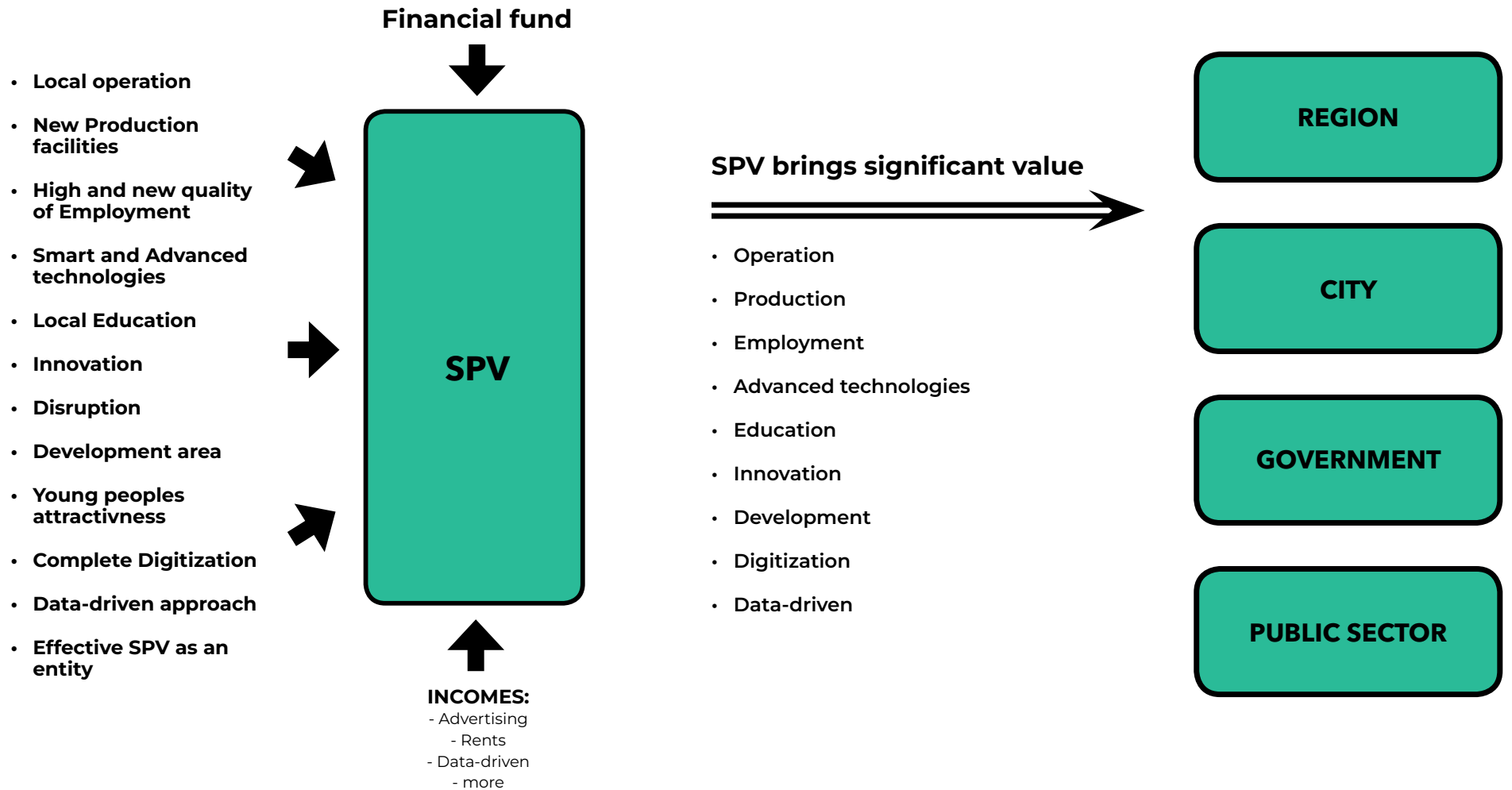
This example shows a European city with a population of 150,000 and with City development ratio INDEX = 6



Summary of Partnership



SPVs bring significant value to each City, Region or Country



Which are the best and most effective business models and what is their role?

1/ Financing model payments

Payments received that match agreed cost (including finance) amounts, allowing full coverage of expenditure and agreed returns over time.

Concrete services:

- Lighting with Solar power - pay us USD 490 per year per point
- Delivery of eBuses - pay us USD 2.35 per km
- Delivery of eBuses - pay us 50% of the fare collection

2/ Savings sharing

Certain services will generate savings for the public sector. If quantifiable and accountable, those savings can generate a budget to help fund the associated assets / service.

Concrete services:

- Public Lighting - Saving sharing – 50-50%, 30-70%,

3/ Utility fees

The uniform network of infrastructure can be rented to partners providing additional or other types of services, such as 5G networks.

Concrete services:

- Public Lighting - Public Wi-Fi - rent for Wi-Fi operator
- Smart Bus Shelter - Public Wi-Fi - rent for Wi-Fi operator
- Public Lighting / Smart Bus Shelter - rental of 5G, 6G small cells

4/ Rate type payments

The public sector collects revenues from the public and utilizes to pay the private sector for specific services / assets (e.g. power generation / water utilities).

Concrete services:

- power generation
- water utilities

Which are the best and most effective business models and what is their role?

5/ User fees

Users pay directly for services, whereby services are provided and revenue is shared with the city.

Concrete services:

- Bike or eBike or Scooter sharing
- Smart parking
- Ticket sales for public transport
- Citizen ID cards and connected services

6/ Advertising-based

Revenue streams are generated by selling advertising on asset space, rather than collecting from individual users. This allows VALO to provide services for inexpensively or for free to users.

Concrete services:

- Smart Bus shelter with Totem (Digital signage / Kiosk)
- Totem (Digital signage / Kiosk)
- AC, DC EV charger with Digital advertising board (Digital signage / Kiosk)
- Smart Public Pole with Digital advertising board

Road Map of implementation

- 1 Target City identification
- 2 City infrastructure request placement
- 3 Smart City design and indicative financial offer for holistic SCaaS system
- 4 Signature of Memorandum of Undertaking with City
- 5 Establishment of a local joint venture SPV in the respective country
- 6 Contract signature between the City and SPV
- 7 Investment into the SPV
- 8 Installation and operation of Smart City Infrastructure
- 9 Continuous creation and sharing of Revenue

What BENEFITS does Smart City as a Service - SCaaS and our Financing model offer?

For the Cities

- quick deployments rather than long discussions
- integration of existing and renewal of requested infrastructure into one ecosystem
- improved city finances by revenue sharing of all created revenue by VALO
- increased city attractiveness for new citizens, which means higher incomes and growth
- increased city attractiveness for developers, financial investors, and industrial investors
- new attractive digital processes decreasing operational load for the city
- effective data-driven city

For Citizens

- increase the quality of life of citizens
- new attractive environment for young people
- increased comfort for citizens thanks to new infrastructure
- additional digital services
- improved connectivity
- increased safety and security

For Technology Partners

- increase of the speed of deployment of their technology
- help in building effective integrated ecosystem infrastructure
- inclusion in our list of proven solutions worldwide
- connection to the Advanced and Smart technology network for cities around the world

