

# Smart Cities & Smart Street Lighting

Delivering carbon neutrality through technology



# Bright: portuguese integrated smart city operator

## Shareholder Structure



Experience in managing complex assets focused on operational efficiency and sustainability (owner of 25 shopping centers and responsible for >170 real estate assets)

Offices in >10 locations, providing services in diverse geographies (Europe, South America, North Africa and Asia)



Technological leader of Smart Cities in Portugal (6 projects implemented)

Specialist in communication networks (critical for smart cities projects)



30 years of experience in smart cities verticals

Specialist in verticals and public lighting (>1,000k installed luminaires)

Bright is an integrated **smart city operator** that combines the competencies of the 3 shareholders

# Integrated smart city solution financed by street light savings

## 1 Command and Control Center (“CCC”)

- Smart city and vertical platforms + equipped with artificial intelligence

## 2 Communication networks

- NB-IoT (sensor specific) + Wi-Fi

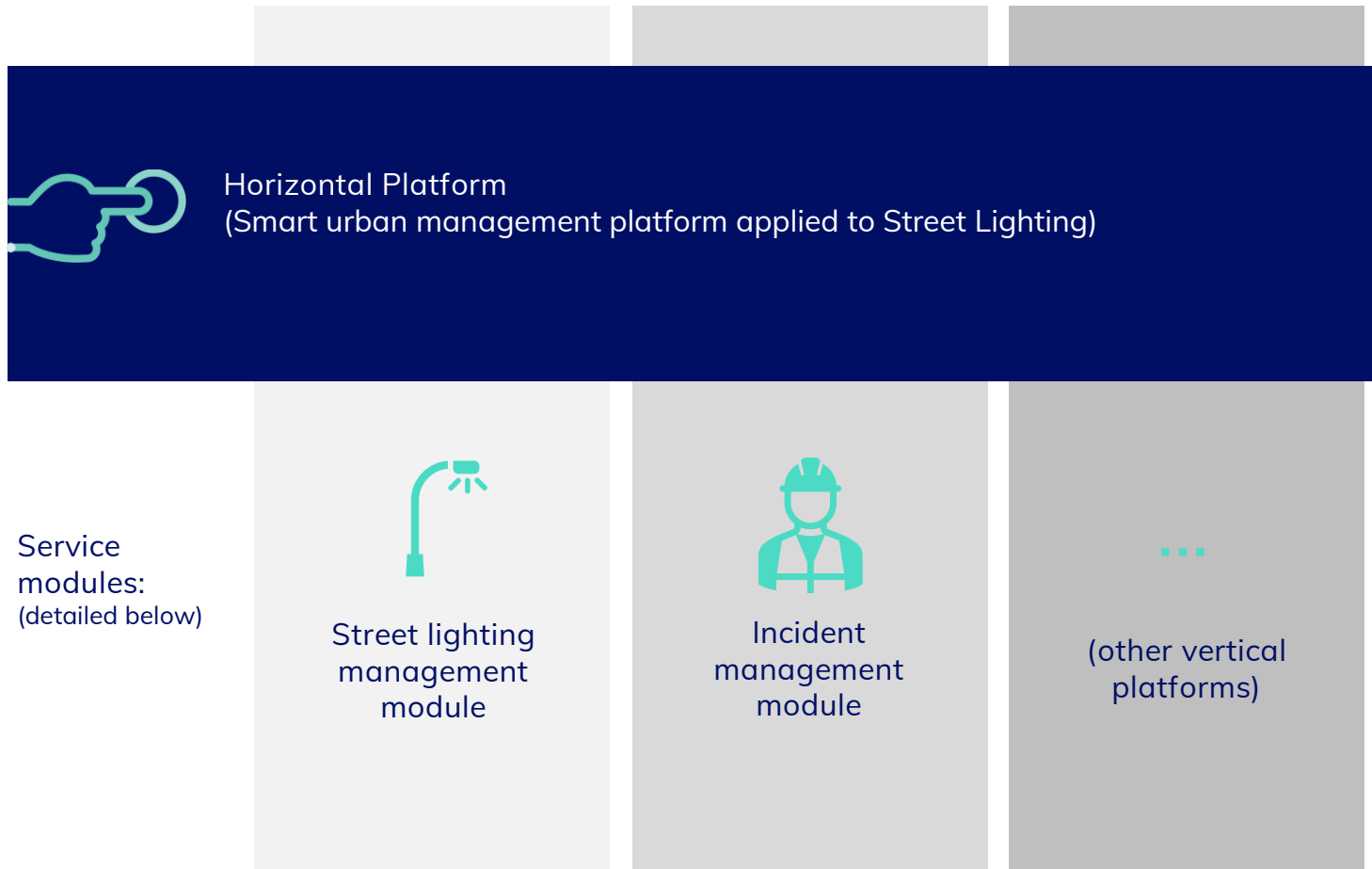
## 3 Operational verticals

- Street lighting
- Buildings/RECs
- Mobility
- Waste
- Water
- (...)



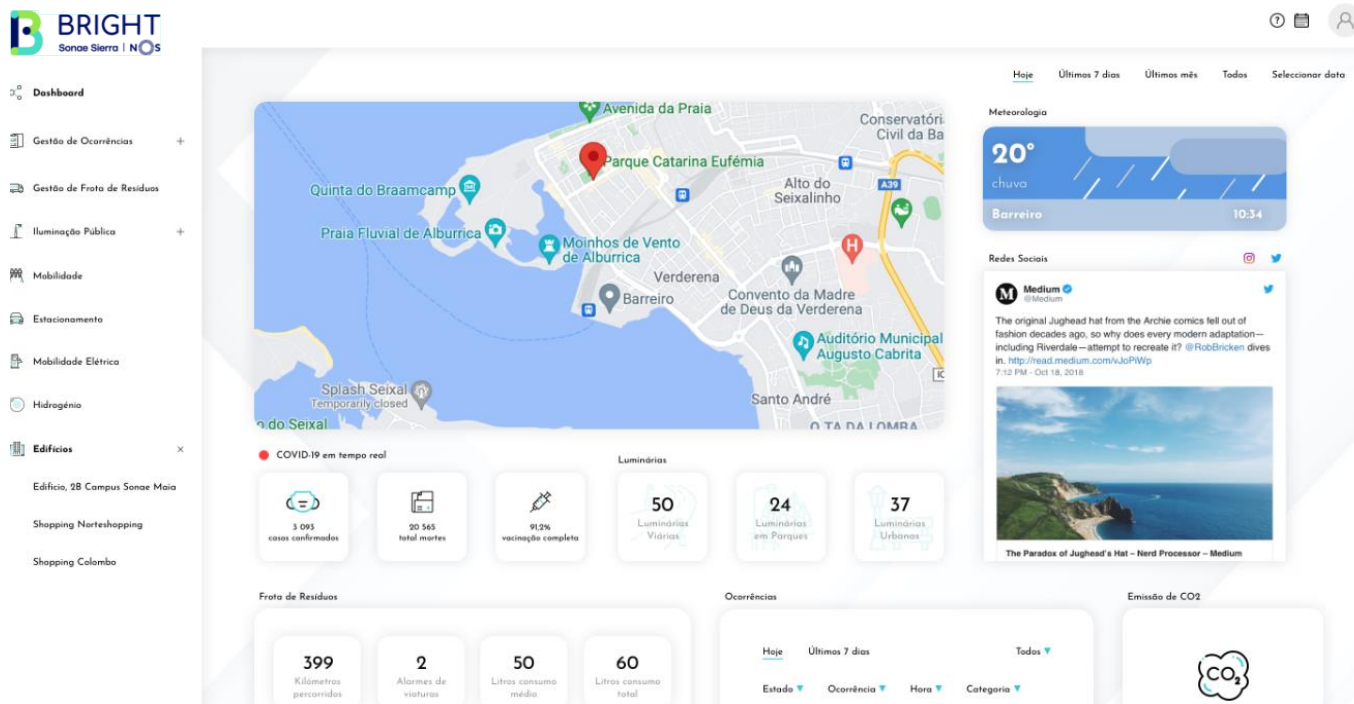
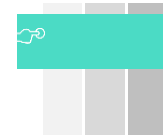
CCC and communication networks and the “smart cities” back bone

# 1 Command and Control Center (“CCC”) Architecture



Municipalities can use a **horizontal platform** to **manage all areas of a city** (energy, water, waste, mobility, among others) in an integrated manner

# 1 CCC | Horizontal platform



**Interoperability**  
Tools for data acquisition from sensors and articulation with other systems

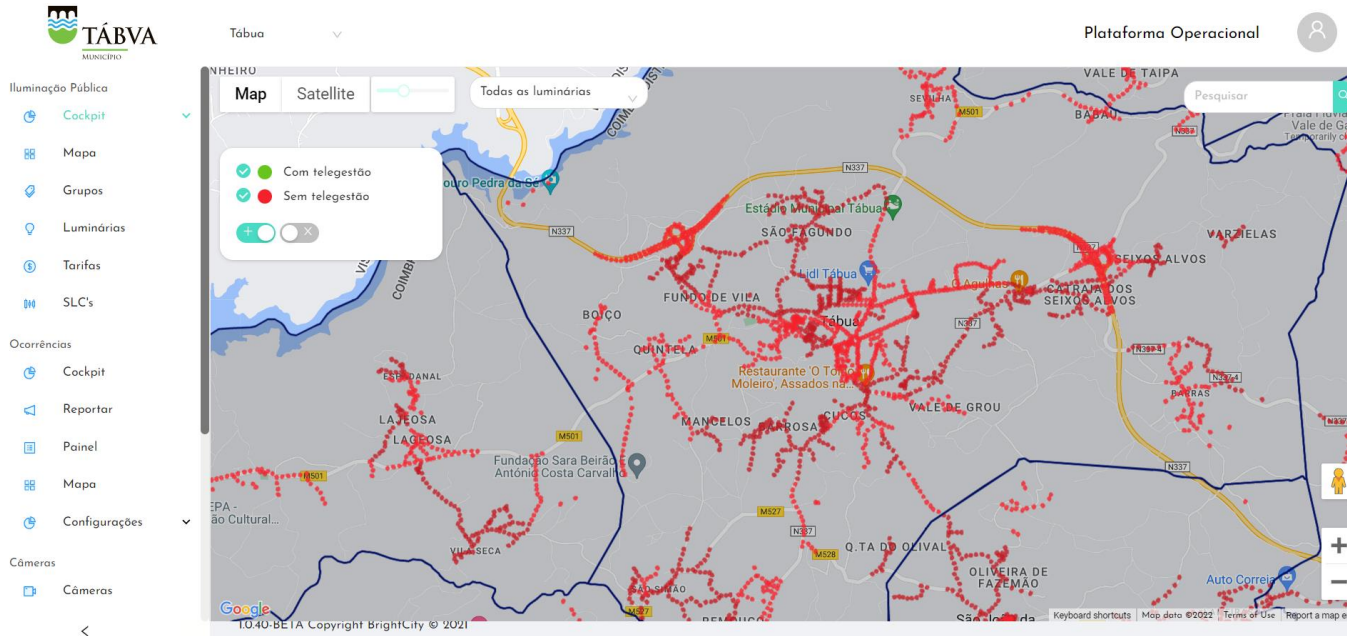
**Artificial Intelligence**  
Algorithms for data processing, correlation and analysis to support decision making

**Visualization**  
Tracking dashboards and information visualization

**Storage**  
Systematization of information and availability to third parties – open data

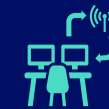
**Safety**  
Access control and cybersecurity mechanisms

# 1 CCC | Street lighting management module



## Integration of luminaires

Registration<sup>1</sup> of 100% of luminaires (with and without remote management)



## Remote management

Remote control of luminaires in real time, through the pre-scheduling of commands or through the creation of automatic rules in response to data (sensors or others)



## Monitoring

Real-time monitoring of luminaires with remote management<sup>2</sup>, automatic fault alert and follow-up reports

# 1 CCC | Incident management module (1/2)



**BRIGHT**  
Sonae Sierra | NOS

Olá, Nuno | Logout

Procurar por morada ou código da ocorrência...

**302**  
Ocorrências

Submetida  
Em resolução  
Concluída

Animais	10
Estradas e Sinalizações	1
Ambiente / Espaços Verdes	1
Zoo da Maia	
Iluminação Pública	2
Teste Trigger	267
Estradas e Sinalização	1
Outros pedidos	1
Higiene Urbana	2

Power by Bright.City



## Opening of incidents

- Automatic opening through alarms generated by the street lighting management system
- Possibility of manual opening through the WebApp



## Treatment

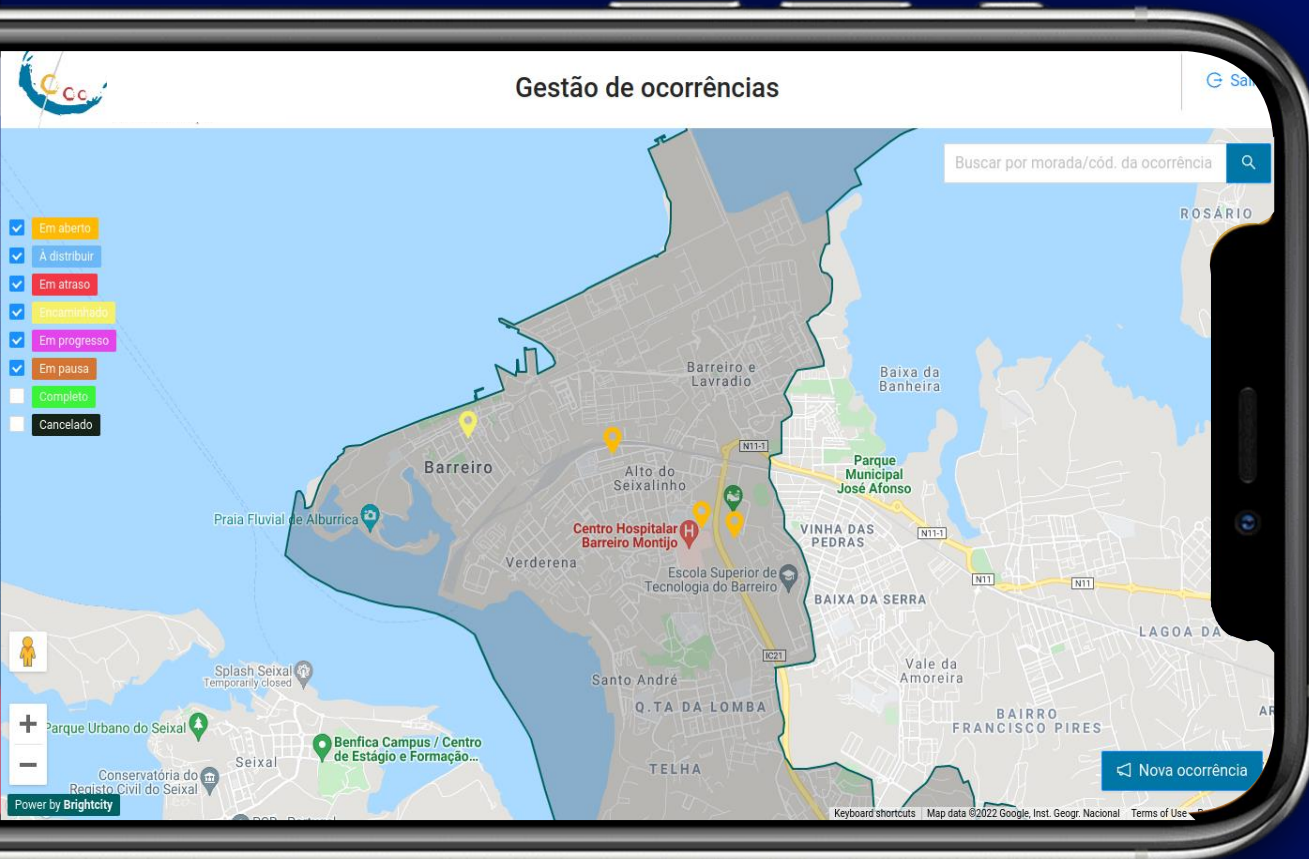
- Automatic assignment (and notification) of the responsible technicians
- Registration of actions taken in the treatment of the incident
- Notification of the citizen who reported the incident



## Monitoring

- Visualization and filtering of incidents (georeferenced and in dashboards)
- Periodic monitoring reports of recorded incidents

# 1 CCC | Incident management module (2/2)



Interface with the Municipality so that it can report (and receive feedback on) problems in street lighting (and other urban management problems if the Municipality deems it necessary)

48/72 hours SLAs responding to street lighting incidents

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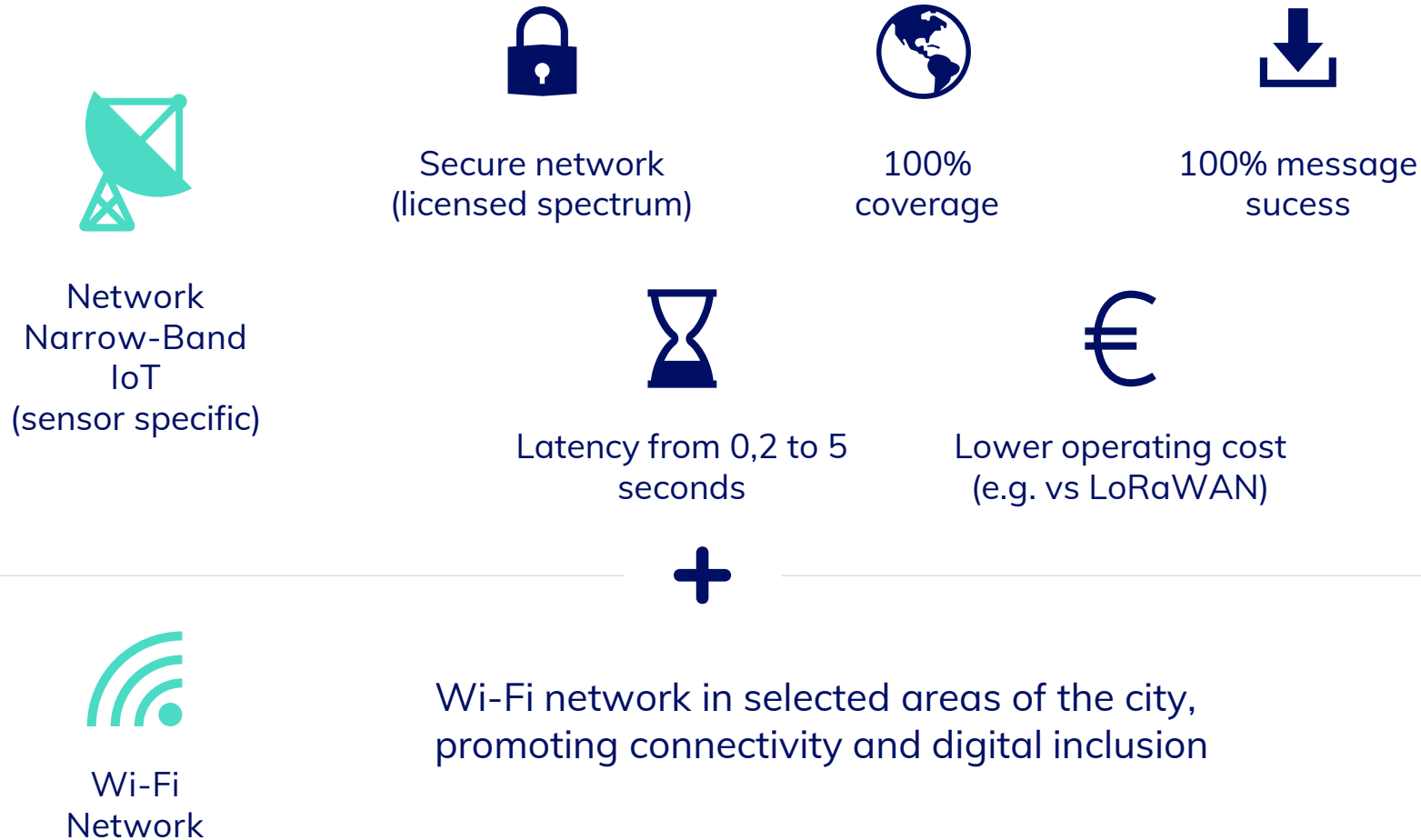
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CCC and communication networks and the “smart cities” back bone

## 2 Communication networks



Smart lighting solution / smart city can be articulated with a

# 5G

network reinforcement in municipalities, reinforcing the value proposition

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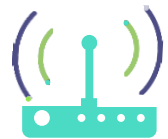
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### 3 Street lighting solution



#### Led light luminaires

Replacement of current luminaires by smart LED luminaires (>150 lumens/watt), prepared for remote management and with pre-scheduling dimming levels



#### Remote management

Equipment for remote management of luminaires with solid memory (without battery) for >30 days and protection against current surges up to 10KV

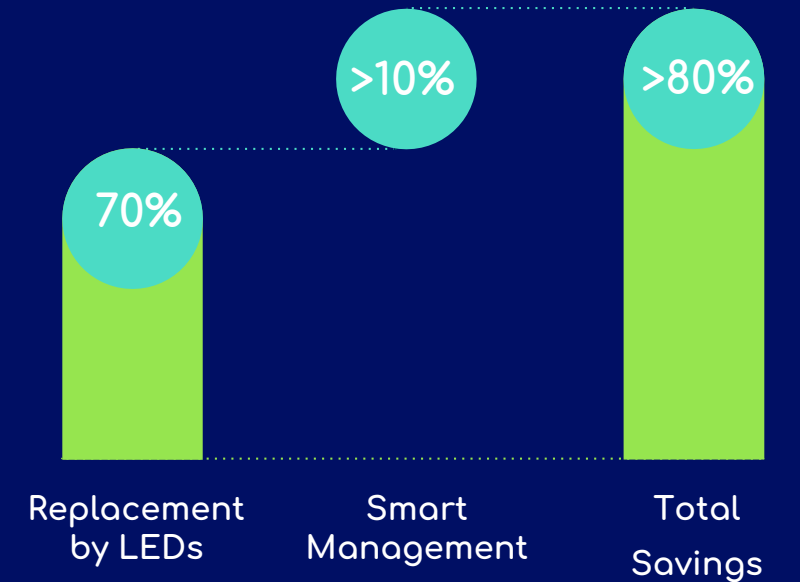


#### Real time video analytics

Natural light analysis and street motion detection (differentiated between cars, people and animals)

## Impact

Cost reduction with Public Lighting



80% reduction in CO2 emissions



Reduction of white light emissions at night

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# Other verticals



## Buildings

### Technical solutions

- Smart buildings (consumption management)
- Renewable Energy Communities



### Potential impact

> 50% reduction in consumption



## Water

- Reduction of losses in distribution
- Smart watering



> 80% loss reduction



## Waste

- Pay-as-you-throw
- Optimization of collection routes



20-40% operational cost optimization



## Mobility

- Mobility-as-a-service
- Sustainable light mobility



> 20% reduction in CO2 emissions



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