



# The impact of light on people's health and wellbeing: insights from ENLIGHTENme project

SC1-BHC-29-2020

Innovative actions for improving urban health and wellbeing - addressing environment, climate and socioeconomic factors



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA



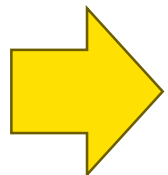
ENLIGHTENme has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 945238

## Light and health: which are the consequences for urban policies?

Many objectives are proposed for **healthy cities** from both scientific literature and OMS. A recent review is proposing 99 indicators to assess them. **None of the indicators is addressing the lighting domain.**

On the other hand, **urban lighting masterplans are not directly targeting the human's health and wellbeing**, mostly focusing on:

- . Safety and visibility (traffic, urban security)
- . Heritage valorization and beauty
- . Quality of light in urban areas (vivability)
- . Sustain economic, social and urban development (attractiveness)
- . Increase efficiency of lighting systems (savings)
- . Environmental impact and energy efficiency
- . Protection of dark sky and light pollution reduction



**Human health and wellbeing are not having an adequate space into public lighting policies, as well as, health-related urban policies are not considering the impact of light on people's health and wellbeing**

# ENLIGHTENme in a Nutshell



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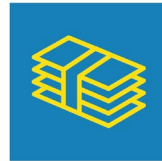
Innovative Urban Lighting Policies for Better Health and Wellbeing



Start  
March 2021



Duration  
48 Months



Budget  
5 Mio €



22 Partners  
10 Countries

## Overall objective

to improve **older adults' health and wellbeing** by addressing **public policies** related to **indoor and outdoor lighting**.

**Target group:** older adults (+65)

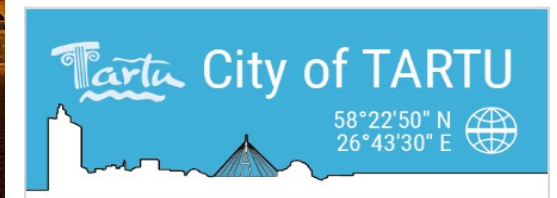
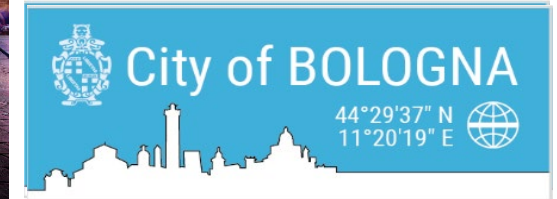




# ENLIGHTENme in a Nutshell

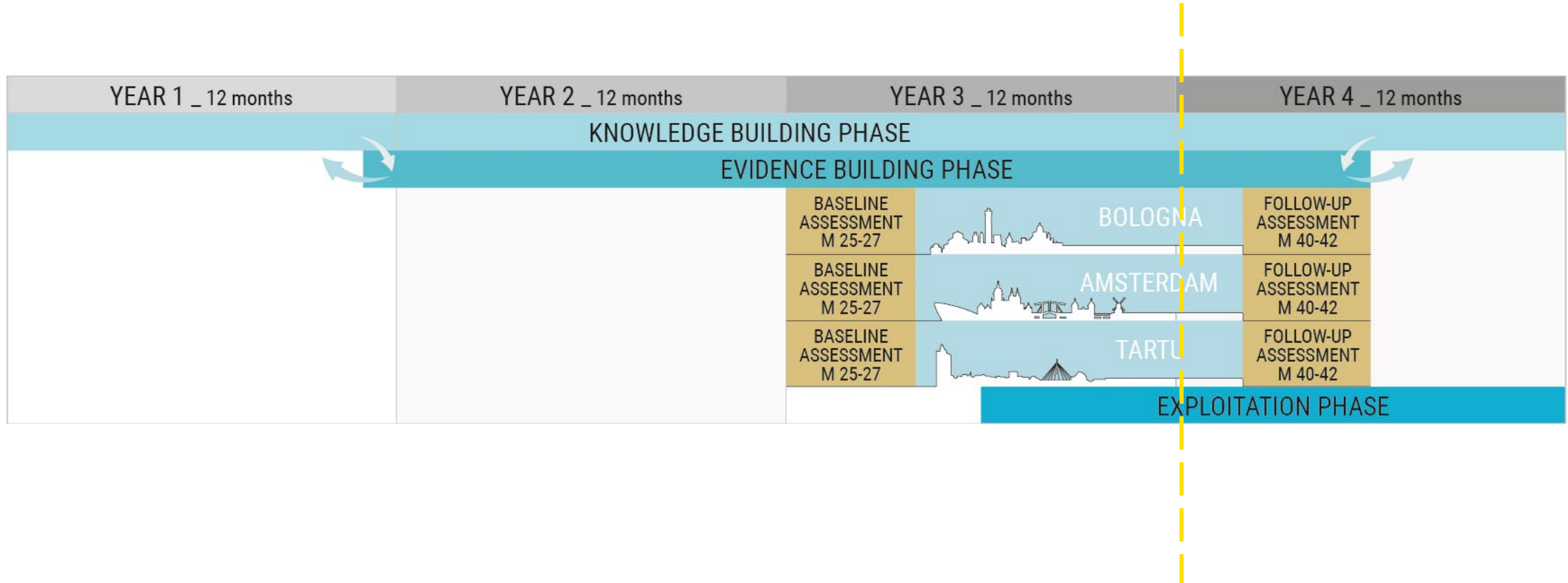


Innovative lighting interventions are ongoing in the selected district through the establishment of **Urban Lighting Labs** and the execution of the **population-based study**



# ENLIGHTENme in a Nutshell:

## 3 main phases





# Knowledge building phase

## ENLIGHTENme Atlas and maps

LANDING PAGE

ATLAS - Lighting, health and ageing resources library

AMSTERDAM

Vulnerability Indexes

Socioeconomic Indicators

Urban Indicators

Light Indicators

Health Indicators

Urban Maps

Light Maps

3D Maps

BOLOGNA

NORTH AMERICA

SOUTH AMERICA

Atlantic Ocean

Atlas

©2024 OSM ©2024 TomTom Microsoft Az

Author or Organization

Search 'geo-tagged items'

All

Key Words

Filter Options....

Resource type

All

Search

Clear filters

Organization

International Commission on Illumination

Keywords:

standards; regulation; lighting professionals

Project/Case Study

Designing for Darkness

Author:

Taylor Stone

Keywords:

darkness; light

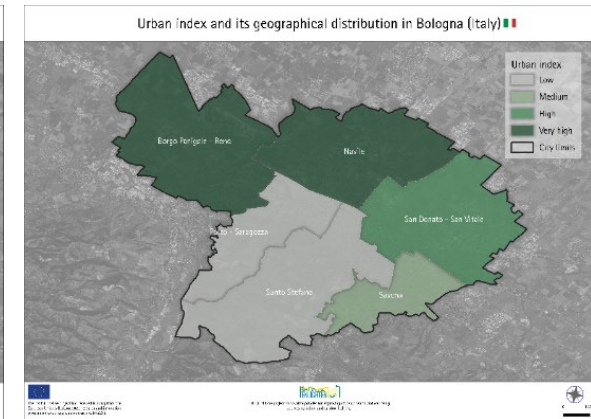
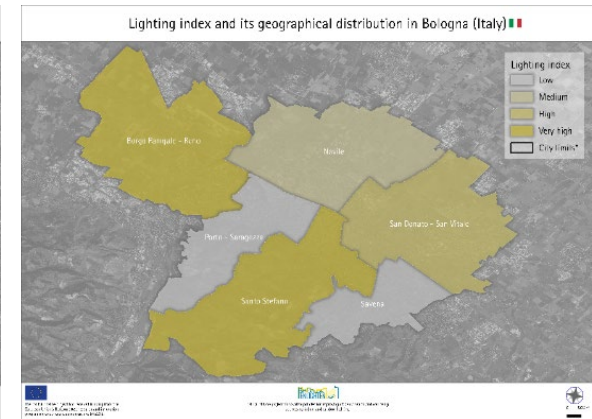
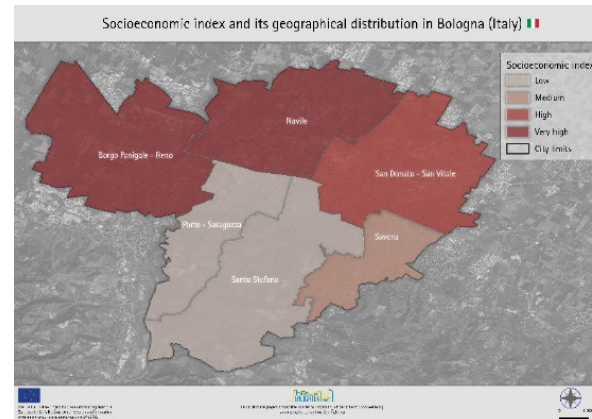
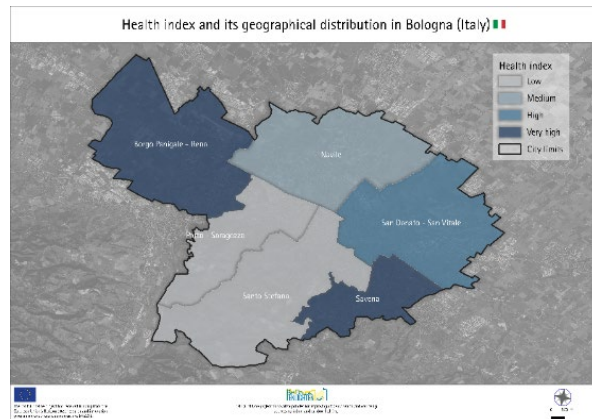
Organization

International Dark-Sky Association

Keywords:

light pollution; darkness; ethics; night

Most deprived and vulnerable neighbourhoods



## Co-created urban lighting interventions in the three ENLIGHTENme cities

**Urban Lighting Labs** have been established in each ENLIGHTENme cities, after district selection, aiming at:

- Engage communities and cities to generate qualitative data and provide laboratory to test lighting interventions,
- Conduct qualitative research and technical lighting measurement in districts before, during and after outdoor and indoor lighting interventions
- **Co-design and implement** outdoor lighting installations and indoor lighting interventions





## Social lighting research

### Aim:

how do diverse and unequal people use and experience this space? How can lighting support their practices?

### Approach

Ethnographic:

- start from how different people understand their space
- Develop a conversation about their lives...with only a few chats about light

Observation

Interviews

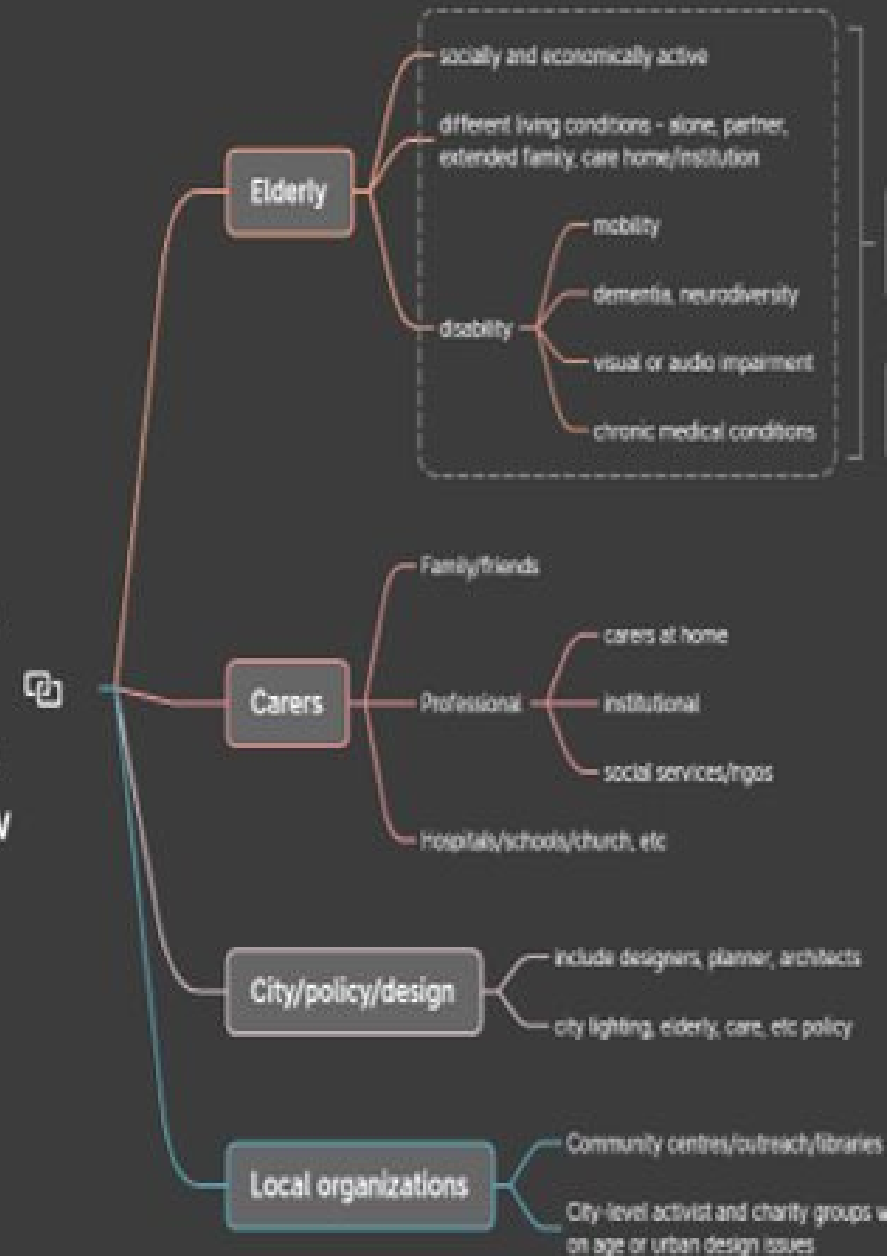
Walkabouts/Nightwalks

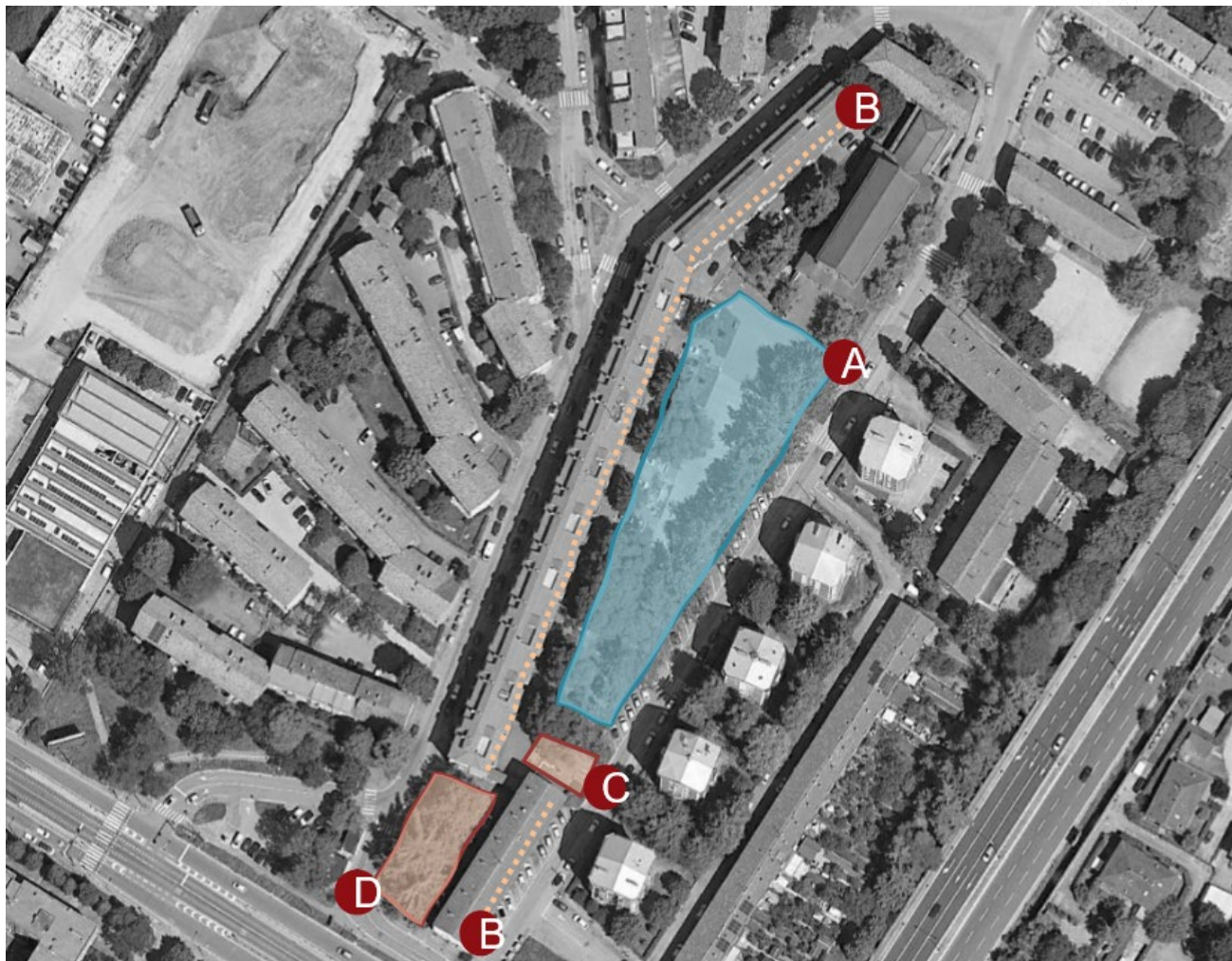
Photo/video documentation

Workshops

Participants to involve: These are people...

1. to involve in the ULL; 2. to interview

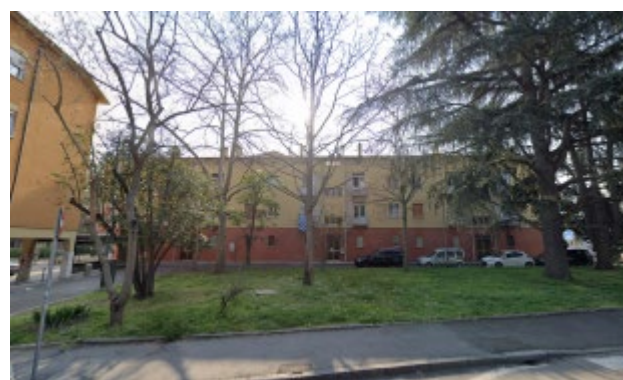




## Pilot area in Bologna: state of art



A - Square



B - Portico





- Very **low uniformity**, which contributes to not feeling the space as welcoming and attractive.
- Very low vertical lighting levels which increase the **sense of unsafety**.
- The lighting poles are **not adequate** to light properly the green areas.
- **Longer adaptation time** for the eye of pedestrians to adjust to the changing lighting condition (sense of disorientation)
- **No uniformity in CCT:**  
square -> 2400K,  
street -> 4000K,  
some projectors under the portico ->6000K



# Evidence building phase

TUBMED



13 May 2022  
Public meeting

Presentation of ENLIGHTENme aims and activities

12 May 2022  
Workshop and virtual nightwalk through Piazza Lambrakis

Workshop to illustrate the different qualities of light

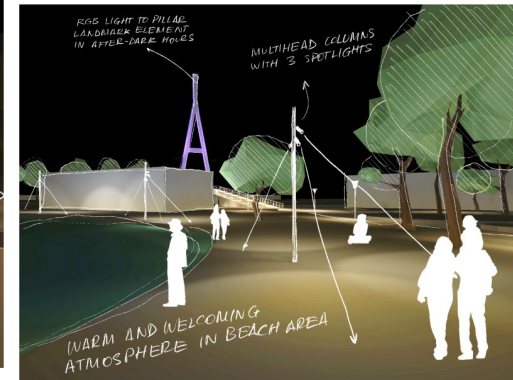
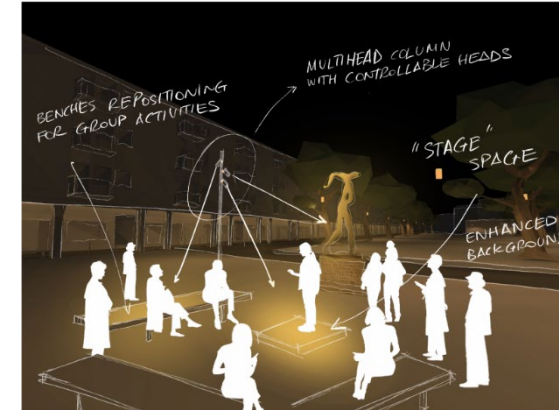


19 May 2022  
Workshop

Co-designing lighting installation

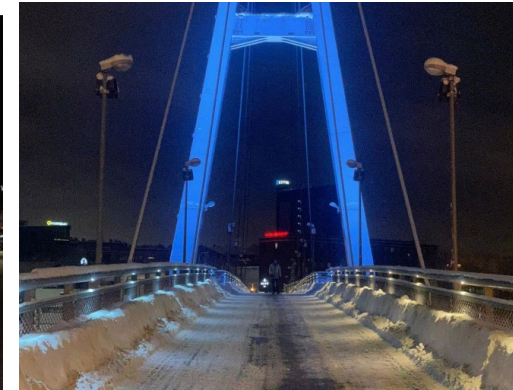
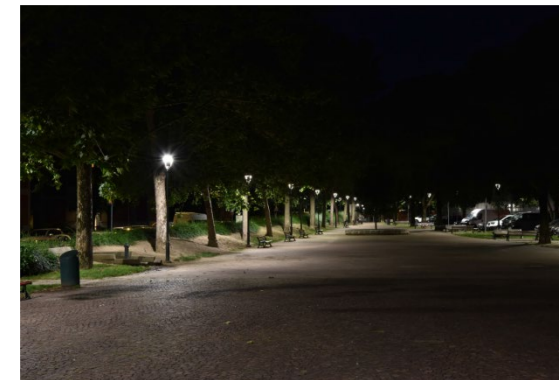
Throughout daily/weekly  
Engagement with local social networks

Contact with specific informal groups that meet regularly in the area. These provide relationships with local informants, creating longer-term contact and discussions.



08 June 2023  
New lighting installation at Piazza Lambrakis

Official introduction of the new lighting installation on the square together with the local residents who have co-created the design.



## Bologna



BEFORE



AFTER



PORTICOS: BEFORE

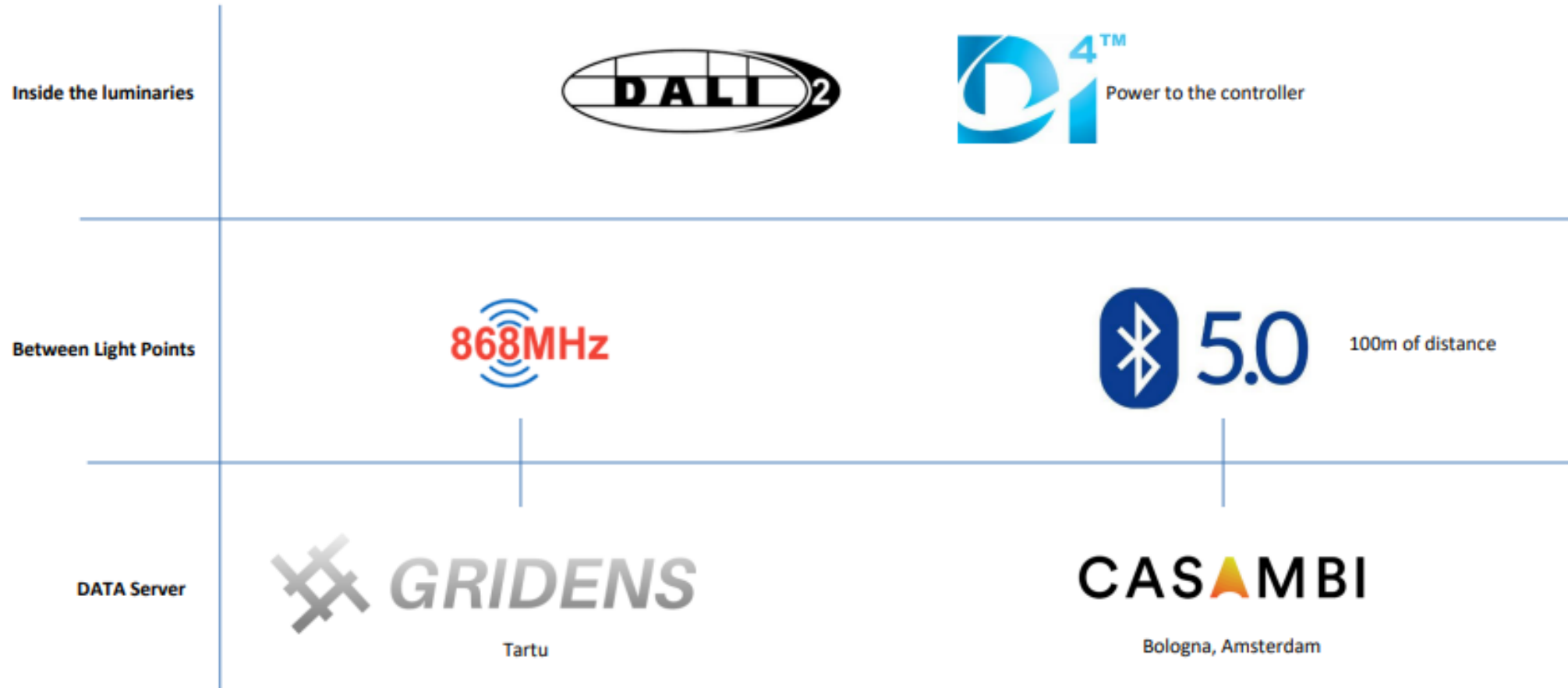


PORTICOS: AFTER





## The control systems adopted



With digital signals through cables and wireless, it is possible to set up different controls: Dim when it's a presence, dim according to a time scheduling etc.

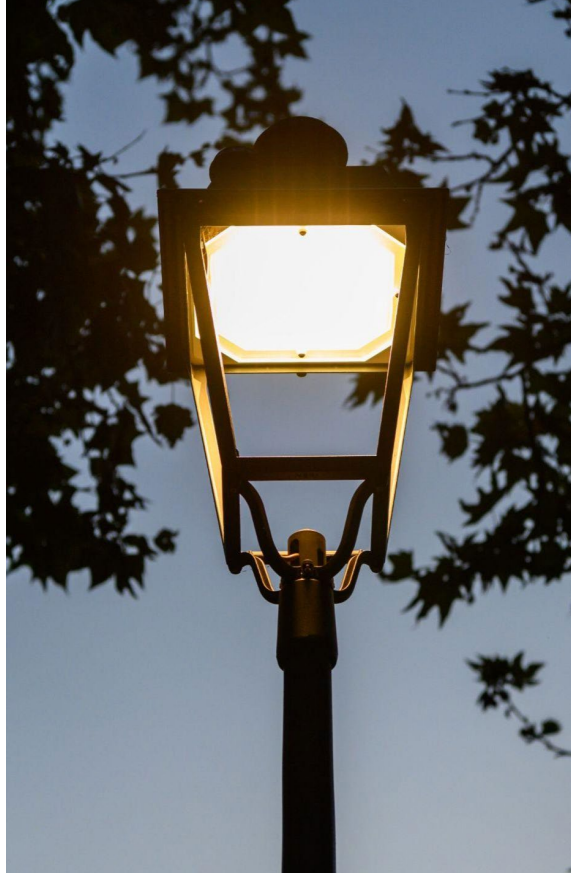
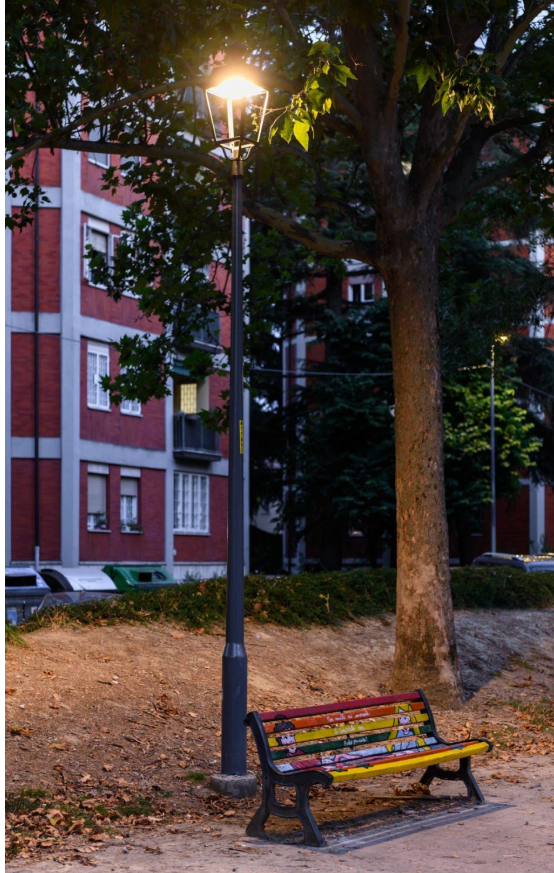
## Bologna and Amsterdam:

All the firmware of CASAMBI controllers have been changed to a CCT range of 2200K-4000K.





## Bologna



OUTDOOR CINEMA, JULY 2023



### Population-based lighting study on older adults

Assess the impact of outdoor and indoor lighting innovations on entrainment of **circadian rhythms**, sleep and personal light exposure, mental and physical health, and the **cost effectiveness** of the performed interventions

- recruitment of 500 participant per city is ongoing
- a baseline and a follow-up study after 3 MONTHS light therapy is performed



- A cost effectiveness analysis of the performed interventions will be carried on.



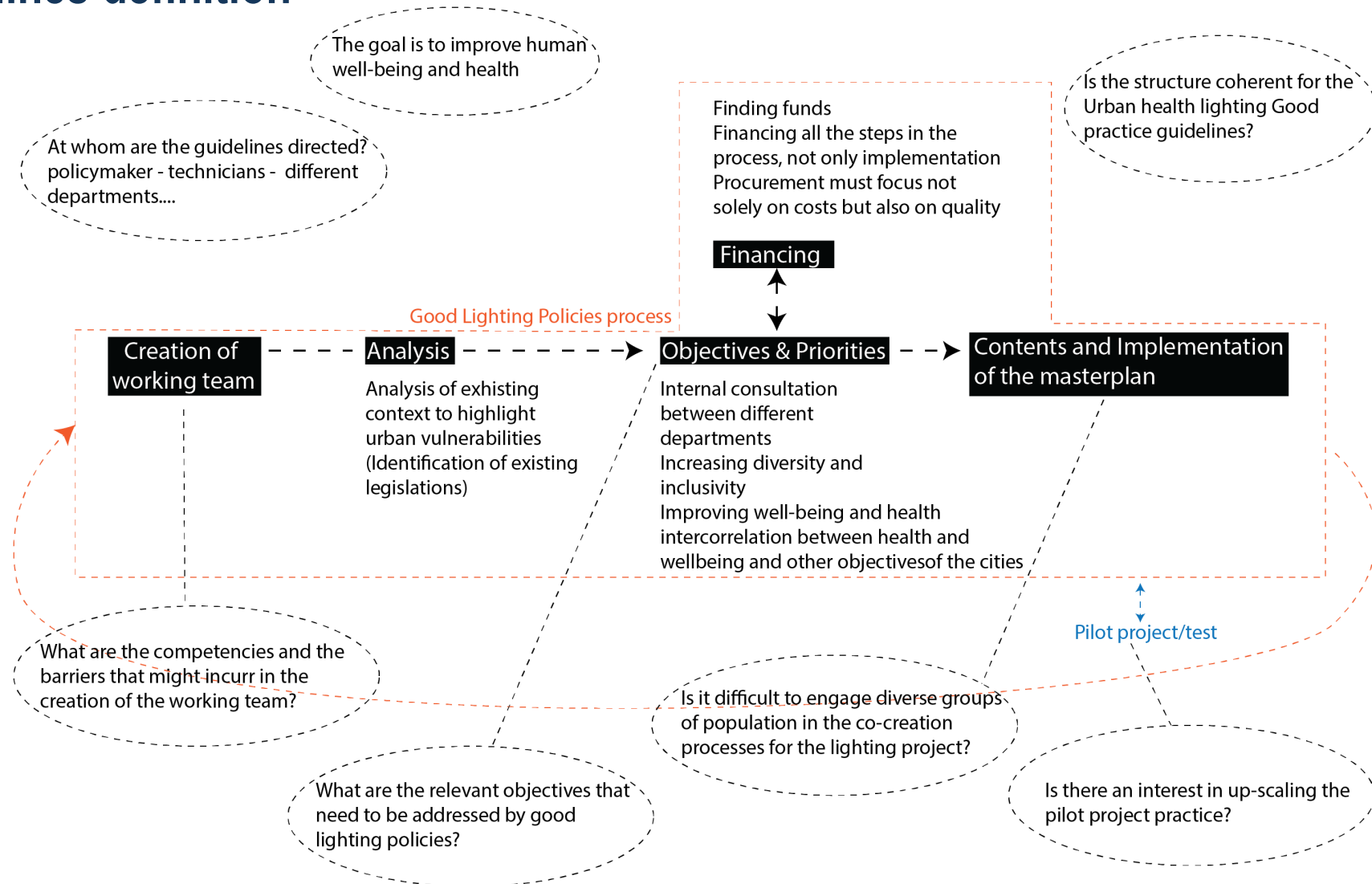
## Lighting policies and guidelines definition

## AIM:

to bring results and outcomes developed in ENLIGHTENme into the decision-making process concerning lighting policies and design

to seek synergies, and avoid harmful health impacts, thus improving urban health and reduce health disparities in cities.

Co-creation with Board of Lighting companies, Health and Urban Lighting Advisory Board, Scientific Advisory Board



### Health City Manager training

- Target: **personnel in local administrations**
- Aim: establishing into public administration a multidisciplinary expert to place health high on the agenda of policy-makers, facilitating the implementation of **inter-sectorial health promotion strategies**
- Two editions per each of the three ENLIGHTENme city, participants in presence. The first one is almost concluded
- Topics related to ENLIGHTENme project (e.g. the impact of light on health and wellbeing)

### Objectives

- discuss on how to implement the HCM approach in cities;
- raise awareness of health determinants and vulnerabilities in cities;
- share the methodology and scenarios in which the ENLIGHTENme project operates;
- explore good practices and the value of partnerships to overcome silos (e.g. “cities after dark” network)





**Thank you!**

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