



/ solution partner of the Intelligent Lighting Institute at TU/e



## Deep Dives on Societal Needs

Research results WP1.2 - 19 December 2013

dr.ir. Elke den Ouden & dr.ir. Rianne Valkenburg

**TU/e** Technische Universiteit  
Eindhoven  
University of Technology

**Intelligent Lighting  
Institute**

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# Introduction

Enlightenment & Innovation,  
Ensured through Pre-Commercial Procurement in cities





## The ENIGMA project

### Introduction

Led by Eindhoven, ENIGMA aims to implement a joint transnational pre-commercial procurement (PCP) procedure in the field of lighting.

The project's partner cities Eindhoven, Malmö, Stavanger, Espoo and Bassano del Grappa, will define a common public lighting challenge and launch a European call for solutions. After initial research and idea screenings, possible solutions will be piloted in real life environments within each partner city.

Over the course of three years, this piloting process will be accompanied by knowledge exchanges and learning through visits between the participating municipalities and through in situ and online courses in PCP development and management.

While lighting will be ENIGMA's main theme, related issues such as energy efficiency, safety and cultural heritage will also be taken into consideration according to the specific requirements of each pilot site.

### Partner cities

In the ENIGMA project the five partner cities will jointly procure a smart lighting solution to improve societal health and implement the system in a pilot area.

#### Eindhoven

With a population of 220,000 inhabitants, the city of Eindhoven is the 5th largest municipality in The Netherlands. As a knowledge based and innovation oriented city, Eindhoven focuses on creating the needed support structures in the domains of innovation, labour market, technology development and business development. The municipality has a political ambition to become a Living Lab for innovative technology solutions, a smart city, dramatically improving the quality of life of its citizens.

#### Malmö

Malmö is Sweden's third largest city and the commercial centre of southern Sweden. The municipality has had a strong focus on creating a safe, attractive and environmentally aware city, a city where the citizens feel safe using public areas. The last decade has seen Malmö consciously

reinventing itself as a sustainable multi-cultural city. The local authority has given priority to activities aimed at creating a green, attractive and environmentally aware city, and has gained international recognition for its undertaken efforts.

#### Espoo

Located in the western part of the Helsinki Metropolitan Region and with a population of 260,000 inhabitants, Espoo is the second largest city in Finland. It has the largest concentration of science and innovation facilities in Northern Europe, belonging to the famous Otaniemi – Keilaniemi – Tapiola triangle. Espoo, together with the other cities, universities, research centres and industry in the Helsinki Region operates already as a EU Smart Region, pioneering several Europe 2020 high-level innovation developments, particularly in the field of lighting.

#### Stavanger

Located on the South West coast of Norway, the city of Stavanger and its 130,000 inhabitants represent the country's most densely populated municipality. As the local authority strives to improve its local lighting

system via its newly introduced Light Plan, Stavanger also underlines the importance of combining energy efficiency, urban design and public safety considerations when planning its system upgrades.

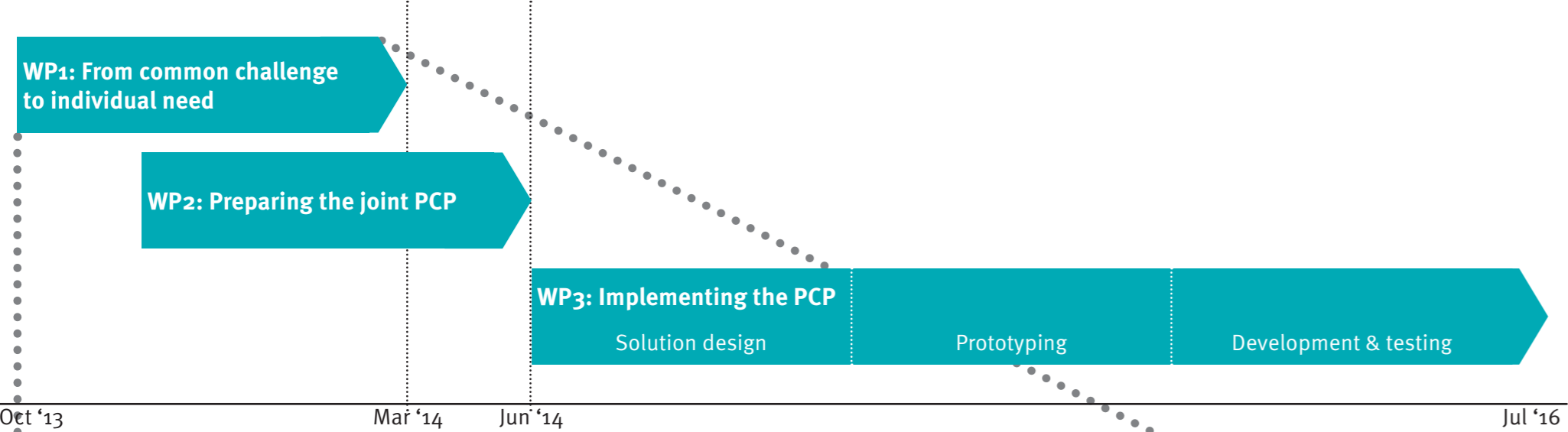
#### Bassano

Bassano del Grappa, is a historic city belonging to the Province of Vicenza, located in the Veneto Region, in North East Italy. The management of public lighting is an increasingly important topic within the city administration, as the municipality is aiming to quickly adapt to new EU and Italian legislation in this field. Due to its cultural heritage, the city is looking to combine within its public lighting solutions energy efficiency considerations with the need to highlight its historic city centre.

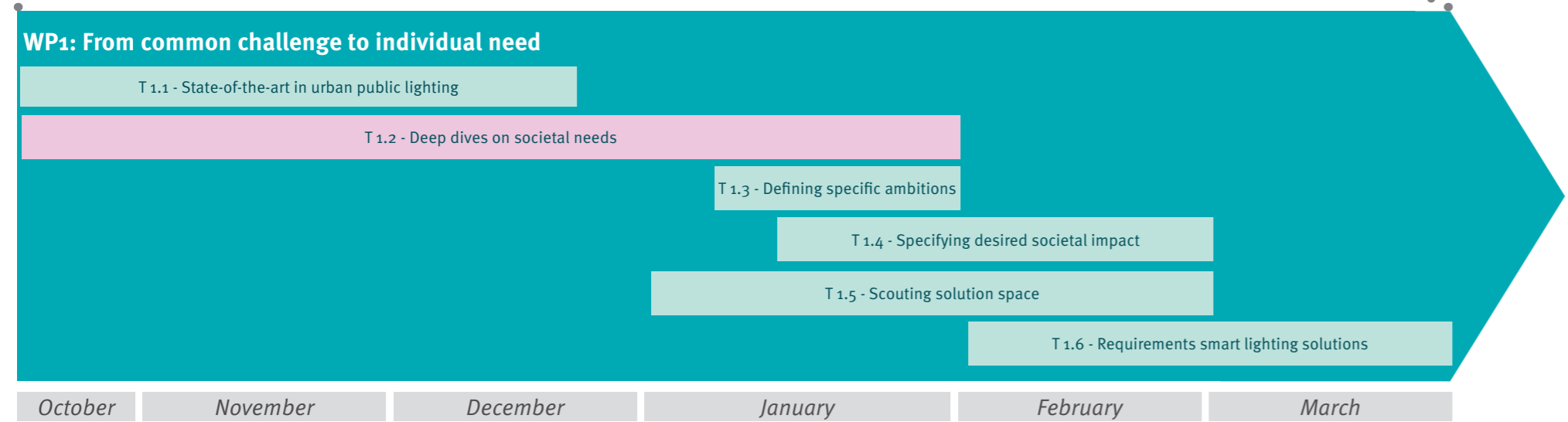
#### Pilot areas

Each of the partner cities has selected a pilot area for the ENIGMA project.

Overall planning of the Pre-Commercial Procurement process of ENIGMA



Planning of WP1



Work package 1: From common challenge to individual needs

Work Package 1 starts from the defined common challenge and commences work on the definition of the state-of-the-art in innovative urban lighting urban lighting solutions and the creation of a joint ambition for smart urban lighting systems, bringing together the common challenge and the 5 sets of individual needs and contexts.

This work package gathers existing experience and knowledge on societal needs and related innovation opportunities in the lighting domain from both within the partners and from other sources and use this to synthesise an ambition suitable for use across European national boundaries. This process focuses on the societal impact specification of the smart lighting solution to achieve Cities’ societal ambitions.

Work package 1 provides input for the preparation of the joint PCP.

Common challenge

The aim of the ENIGMA project is to procure a public lighting infrastructure as a carrier to improve societal health.

Public lighting and public infrastructure can play a significant role in achieving ambitions of cities to reach significant improvements on energy consumption, public safety and crowd control, traffic management and quality of life. Lighting is also a useful instrument in making the city an attractive place to live.

The partner cities have defined as common challenge for the joint PCP process:

**ENIGMA Common challenge**  
To upgrade their public lighting infrastructure and system, using ICT solutions, to enable cities to offer a wide range of intelligent and integrated services benefiting society and individual citizens and bringing the cities closer to the ambition of becoming Smart Cities.

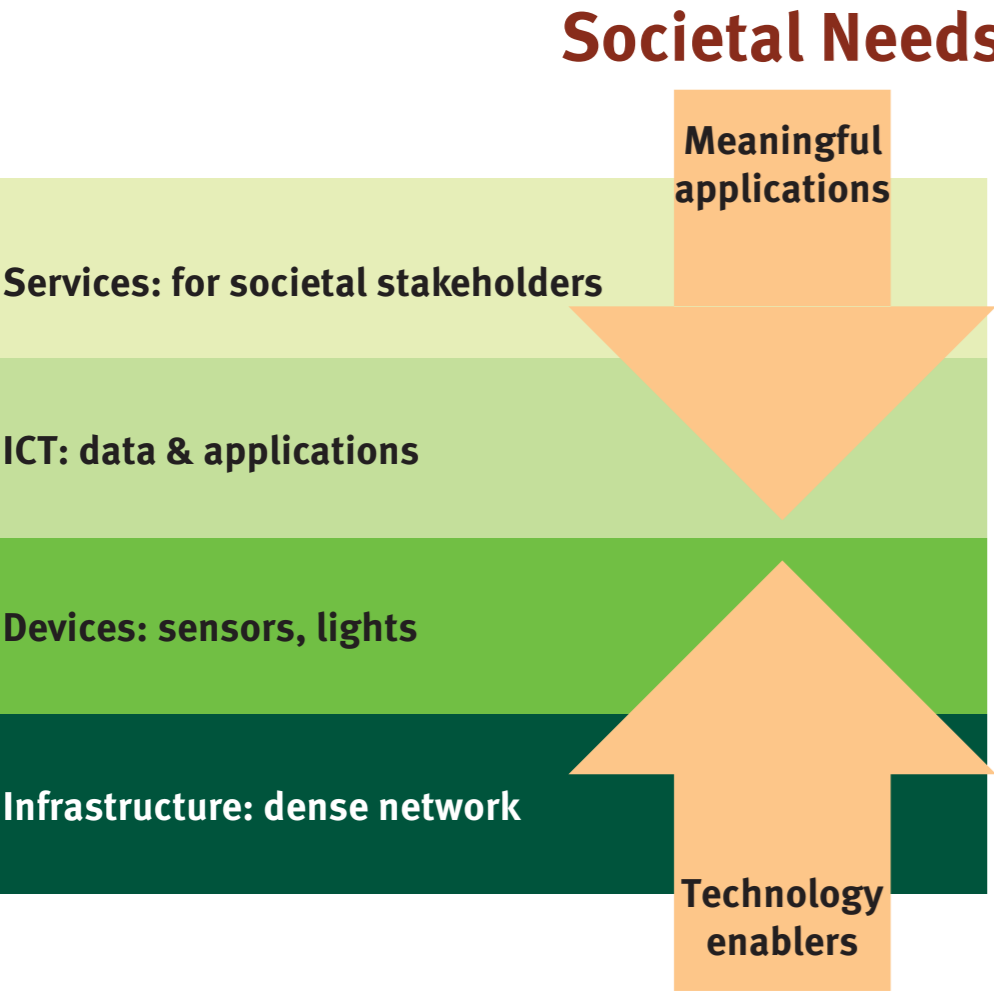


Towards a joint ambition

The ENIGMA project will extend and deepen this collaboration and challenge the market to enhance the utilisation and improvement of the infrastructure using interoperable dynamically adapting SSL for societal health. The PCP process will focus on the development of new integrated and innovative systems for public supervision, control and lighting systems which go beyond the traditional lighting functions and include more functionalities enhancing quality of life. Crucial for this development is the formulation of a common set of ambitions, based upon the already defined ENIGMA common challenge, in cities and the capacity to translate this into a well defined set of demands within the PCP call. The systems will be addressing these ambitions, but will also have to include the flexibility to address individual cities’ unique features and wishes.

To collect and define the societal needs for the pilot areas in the five partners cities, Deep Dive sessions were held in each city, where both internal and external stakeholders were involved in the definition of the ambition and needs.

# Intelligent lighting solutions



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Innovative lighting solutions have the potential to increase health, safety and well-being. However, to achieve these effects, new lighting solutions need to be defined that specifically address these societal level ambitions. In the recent past procurement processes focused on buying released products from the catalogues of suppliers to achieve illumination of roads. Today, with the growing capacities of ICT and sensor technologies, lighting and the lighting infrastructure have become a key tool for urban planning, creating value and wealth for the city, attracting investment, promoting heritage, changing perceptions, bringing together new partnerships, and also just illuminating roads and paths. This transition to buying solutions that aim for societal impact require a different way of defining ambitions and specifying solutions to drive innovations into the desired directions.

Commonly practiced ways of working to specify illumination levels would not lead to the procurement of innovative solutions that radically improve the quality of life in cities that requires collaboration across multiple disciplinary borders (such as lighting, traffic, mobility, health, energy).

## Integrated lighting and ICT solutions

Public lighting and public lighting infrastructure can play a significant role in achieving ambitions of cities in making the city an attractive place to live. Technological developments include an upgrade of the public lighting infrastructure and system by connecting to ICT solutions. This enables cities to offer a wide range of intelligent and integrated services benefiting society and individual citizens and bringing cities closer to the ambition of becoming smart cities. This integrated lighting- and ICT solution can best be explained by describing 4 levels of the system: infrastructure, devices, ICT and services, see also the picture on the facing page.

In this four level model, technology is considered an enabler. Technological developments create new opportunities for applications. These applications become meaningful when they address relevant societal needs.

<b>Infrastructure</b> The level of the infrastructure can be seen as the ‘road’ that enables all ‘traffic’. Traditionally for public lighting this meant the underground wiring for power. Nowadays it also includes internet connectivity as well as wireless solutions. In the coming years, the infrastructure will become a dense network to enable the connection of all kinds of devices and communicate all kinds of data.	<b>Devices</b> The number of devices is growing rapidly. Traditionally, devices in public lighting contain public lighting luminaries and traffic lights. This is gradually expanding with other types of sensors and actuators, either with low bandwidth, such as timers, light intensity sensors, microphones, movement sensors, fine-dust sensors or high bandwidth for example camera’s, interactive displays, touch screens, and smart phones. Many devices collect or use data and are therefore connected (the internet of things).	<b>ICT</b> On the ICT level the connection is made with data and software applications. The data that is collected through different devices contains e.g. time, people counting or proximity measurements, weather information, movements, energy consumption, camera data, etcetera. Mash-ups and data analytics will lead to insight in emerging patterns or correlations that can be used for various software applications.	<b>Services</b> At this level meaningful services are developed that provide value for the relevant stakeholders. In urban lighting there are often different stakeholders that use the area, with different needs and wishes. The ultimate goal of urban lighting solutions is to create value for societal stakeholders by creating a healthy and liveable city. Smart lighting can offer valuable services for different stakeholders using the ICT based lighting platform.
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## Deep Dives

Task 1.2 of the ENIGMA project is to collect and define the desired societal needs for the partner cities’ pilot areas. WP1 does not cover the specific brief, selection criteria etc. for the call, though it delivers generic items. Whilst it would be very easy to simply copy the processes of one of the partners this would not allow the active participation of the remaining partners. This active participation delivers greater understanding of the benefits.

In addition, this project requires adaptations in the way of specifying urban lighting solutions in order to

achieve the desired societal impact because it differs significantly from buying lighting hardware. In order to drive innovation from quality of life in the city, a clear joint ambition needs to be defined.

As societal needs differ across the partner cities, it required each partner to actively participate in this work package to ensure a joint ambition is defined that over-arches the societal needs of the individual cities. Deep dives, in the form of workshops on-site were held with the people from the respective cities to gather information on what their ambitions are in

relation to lighting, what the societal needs are in the city and how they are specified. The main purpose is to understand how the societal value of solutions is defined, how the value is translated into selection criteria and how societal impact can be part of decision-making. With the output of the deep dives a joint ambition will be defined (T1.3), which will then be used to scout the solution space (T1.5). All information gathered is then used to set an ambition for the smart lighting solution to be developed, that is extending beyond the products planned for market intro-

duction in the coming years, but also feasible for pilots within the context of this project (T1.6).

### Deep Dive structure

Each deep dive consisted of four workshops to ensure that both strategic ambitions as well as societal needs are collected from internal and external stakeholders. Next to the workshop a presentation was given on the opportunities in smart urban lighting to provide the cities with some background information. The four workshops are described below:

#### Workshop with policy makers

In this interview the important policy makers of the city were asked to provide input on the cities ambitions and interests on city level. The objective was to understand:

- The current highlights and challenges in the city.
- The most important drivers for the cities policies and specific strategic ambitions of the city.
- When the pilot can be considered a success from the cities strategic point of view.

#### Workshop with strategic/integral project managers

In this interview the people with a strategic view on multi-disciplinary projects were asked to provide input on the integral ambitions and interests across city departments. The objective was to understand:

- Highlights and challenges.
- Strategic ambitions from the different perspectives.
- Measuring success of the pilot.

The questions are similar to those of the policy makers, but dive deeper to achieve an understanding from different departmental perspectives.

#### Workshop with internal stakeholders of the pilot area

In this workshop the societal needs in the pilot area were identified from the perspective of different departments in the municipality. The objective was to understand:

- The current highlights and challenges in the pilot area.
- The societal needs relevant for the pilot area.
- Potential impact of smart (lighting) solutions on the needs.
- Measuring success of the pilot.

#### Workshop with external stakeholders of the pilot area

In this workshop the societal needs in the pilot area were identified from the perspective of different external stakeholders (e.g. residents, entrepreneurs, school kids, police, etc.). The objective was to understand:

- The current highlights and challenges in the pilot area.
- The relevant stakeholders, their drivers and their societal needs.
- Potential impact of smart (lighting) solutions on the needs.
- Measuring success of the pilot.

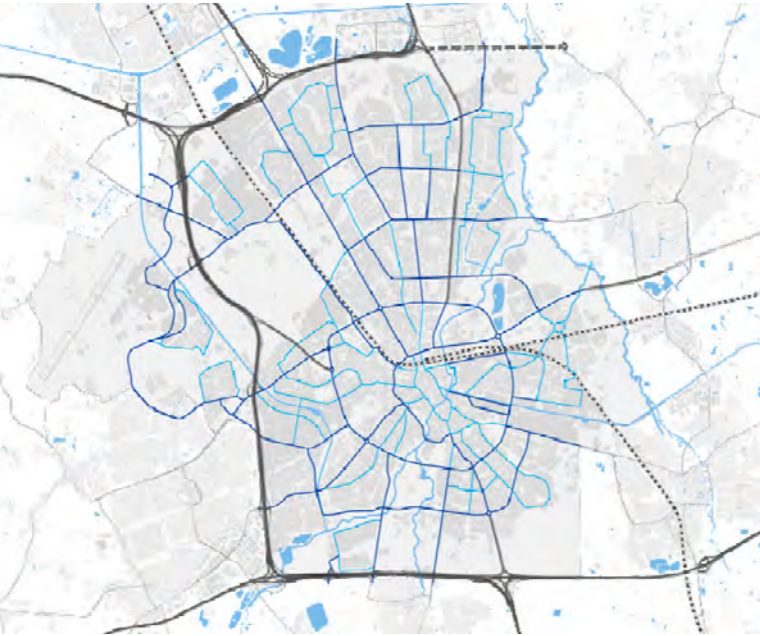


# Deep Dive Eindhoven

6, 7, 8 November and 4 December 2013



# Introduction Eindhoven



Improving quality of life in the city with innovative public lighting solutions, is the ambition of the municipality of Eindhoven. The ‘vision and roadmap urban lighting Eindhoven 2030’ ([www.ili-lighthouse.nl/RoadmapEhv2030EN.html](http://www.ili-lighthouse.nl/RoadmapEhv2030EN.html)) describes this aim and aspires to inspire partners that will cooperate the coming years in applying smart lighting solutions in urban learning labs.

According to a recent publication by the European Committee ‘Lighting the Cities’ Eindhoven is seen as forerunner in smart lighting solutions in Europe.

The municipality would like to consolidate its role in public lighting innovation and several applications are already developed and in different states of implementation. In the bar district Stratumseind a pilot is set up to experiment and investigate the impact of lighting scenes on the mood and behaviour of visitors. At the former Philips area Strijp-S the newest lighting technologies and services are applied and tested.

The coming years more and more pilot areas will be appointed and developed to unroll the roadmap and achieve the vision for 2030.

Vision and roadmap urban lighting Eindhoven 2030



## High Lights of the city

The top three things that the city is most proud of:

### Hands-on mentality of citizens, stakeholders and municipality

- Doing instead of talking: the fun of making things happen
- Active involvement of citizens and stakeholders
- Citizens creating connections across city districts
- Many initiatives and lots of energy in the city

### Continuous innovation

- Exploring new possibilities, daring to take risks
- Creativity and design
- Front-runner in realisation of innovation
- Continuously seeking for opportunities
- Connecting people and opportunities

### Green village-like city

- Village-like atmosphere
- Spacious green public spaces
- Relatively small and compact city
- Clear structure and orientation
- Much functionality in relatively small area

## Low Lights of the city

The top three things that the city would like to improve:

### Fragmented city

- Limited connection between separate parts in the city
- Experienced distances larger than actual distances
- Diversity in experience in different districts, without a clear Eindhoven identity

### Ambiguous identity

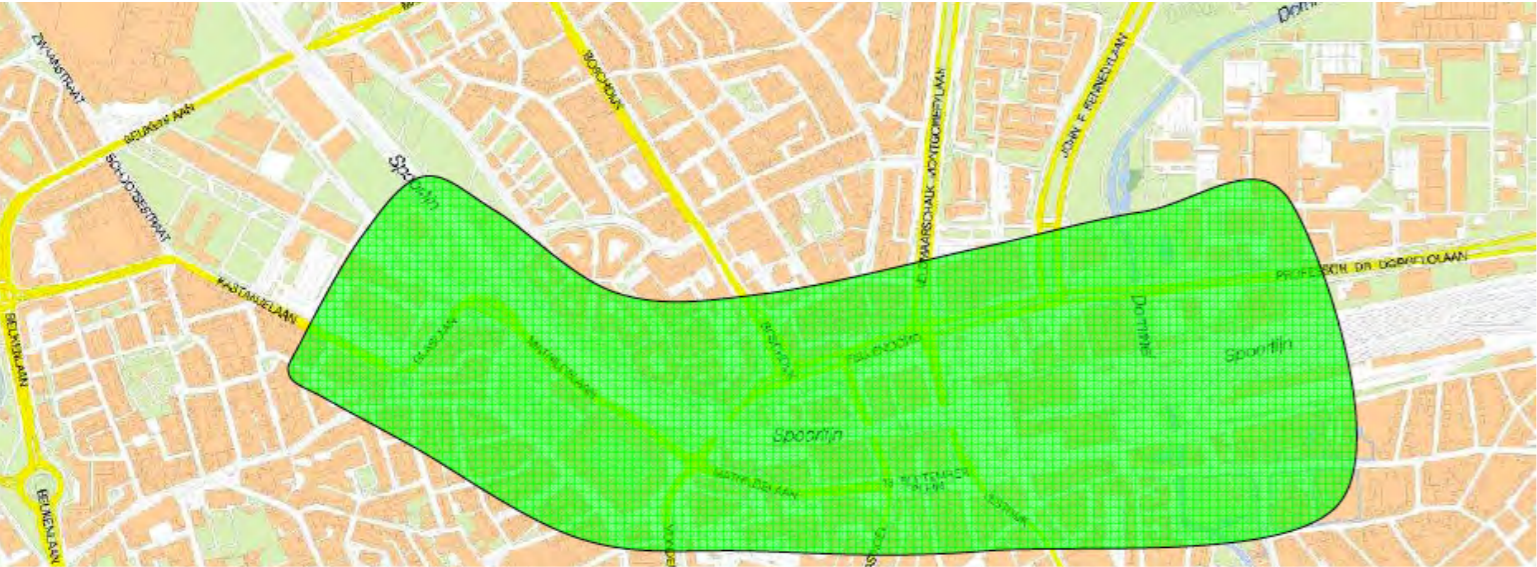
- Limited awareness of citizens of dependence on high tech (economy & quality of life)
- Lack of pride of the city among citizens
- Doing high profile with a low profile

### Lack of focus

- Not able to choose
- Wanting to be the best at everything, over and over again



# Pilot area: Chimney Alley



Chimney Alley is the area between the University of Technology Eindhoven and Strijp-S. This area is located at the north side of the centre of Eindhoven. A main access road is situated in this area. Various facilities are situated in the area, such as the central railway station, various office buildings and the PSV football stadium.

The area includes a main road, a tunnel underneath a railway line and over about 600 meters of the railway area a free track for high quality urban public transport between the railway station and Eindhoven airport. Alongside the route there are several services such as train and bus stations, hotels the WTC, office space and the PSV football stadium.

### Some figures of Chimney Alley

- Total length: 1.500 m
- Lighting situation: High pressure sodium lighting
- Number of light-points: 170 st
- Height of the points: varying between 10 m to 18 m
- System power: 66 kW
- Age: average 22 years

## High Lights of the area

The three strong aspects of the pilot area:

### Green urban character of area, combined with a city experience

- Nature along the river provides a pleasant atmosphere
- Total experience of area, with nature, urban architecture, landscape, lighting
- Central square providing overview enabling understanding of the structure of the city
- High quality in functional and user experience

### Many and diverse users

- hundreds of students walk through the area per day
- many pedestrians visit events at the football stadium, Strijp-S or Beursgebouw
- 225 thousand transport users per day

### Diversity of functionalities and connections

- Providing many connection to different parts of the city
- Football stadium in the heart of the city
- Connection many different transport modalities (car, bike, bus, train, pedestrian)
- Lots of activity and changes during the day and night time.

## Low Lights of the area

The three aspects to improve in the pilot area:

### Forgotten pedestrian

- Pedestrian is the only one not having designated space
- Pedestrian paths are disconnected and fragmented
- Experienced distances are larger than actual distances due to lack of specific pedestrian routes
- Pedestrians cross everywhere

### Lack of focus

- Lack of clear connectivity to diverse functions in the area (railway station, football stadium, shopping square, museum etc.)
- Designed for day time: lack of equivalent quality in the night time
- Aiming for young people without excluding the older target groups
- The wide road provides good car-mobility, but blocks other users

### Experience and perception of safety

- Unpleasant experience due to lack of atmosphere
- Perception of safety
- Incoherent spatial design
- Blind walls in all tunnels



Chimney Alley in daylight



Chimney Alley at night



# Societal needs

## Eindhoven’s strategic ambitions

Relevant policy and strategic needs for the city

Eindhoven wants to realise an identity that reflects the strengths of the city as hands-on, creative, innovative, technology and design.

Eindhoven wants to create a diversity in experiences with a coherent identity.

Eindhoven wants to provide a pleasant atmosphere, that combines functionality and experience on a human scale as a warm welcome to the city.

Eindhoven wants to facilitate mobility for all users of the public space.

Eindhoven wants to provide an open and flexible system to facilitate continuous innovation, driven by societal needs (including open connectivity of the infrastructure, open access of devices, open data for new service design, and open knowledge on societal impact).



## Needs for the pilot area: Chimney Alley

Relevant societal needs for the specific pilot area

Having an attractive area with an identity to create pride by the users and stakeholders

Students want to spend a good time in Eindhoven and the university to stay high in the ranking of light- and technology city.

Alumni students want to feel proud and inspired in their remembrance of Eindhoven.

The hotel wants the public space in the area to be attractive, usable, understandable and safe for visitors to feel at ease.

Residents and future residents want social cohesion and self-reliance.

Beursgebouw (exhibition hall) wants to be more attractive and reachable through routing and illumination to attract more visitors.

Perceive a good and coherent atmosphere in the area by creating the appropriate experience.

Citizens want to feel comfortable and welcome anytime by having the appropriate experience.

Strijp-S wants to create ‘stepping stones’ in the functionality of buildings to connect the city centre and Strijp-S in a coherent and natural way.

Strijp-S wants an integrated and tuned program of activities and events in the different areas.

Perceiving an inviting atmosphere in the evening by having the appropriate experience.

Citizens want to perceive an inviting atmosphere in the evening.

Having a qualitative good area between the buildings, providing safety and attractiveness

Citizens want to be at ease (and perceive a feeling of safety) in a coherently designed area.

PSV / Philips football stadium, football supporters and event visitors want good lighting around the stadium in public space.

Rabobank wants an attractive environment with clear and safe entrance (both to the building and the area) for the clients/customers and for the employers.

The hotel wants illumination of the building in correlation with the other buildings to make a clear and attractive identity as business as well as a city (Eindhoven City of Light).

Having continuous and dedicated routing and guidance for all road users between areas.

Citizens want to feel welcome as pedestrian and being able to quickly understand the best route to your destination.

The hotel wants a safe connection to the city centre for their customers to make them feel welcome and comfortable.

Strijp-S wants infrastructural coherence: connections for cyclists and pedestrians, green structures, which are interconnected, and guidance through lighting.

PSV football supporters and event visitors want a clear routing from all directions to reach the stadium safely and clearly.

# Measuring success of the pilot

## Needs for the pilot area: Chimney Alley

Relevant societal needs for the specific pilot area

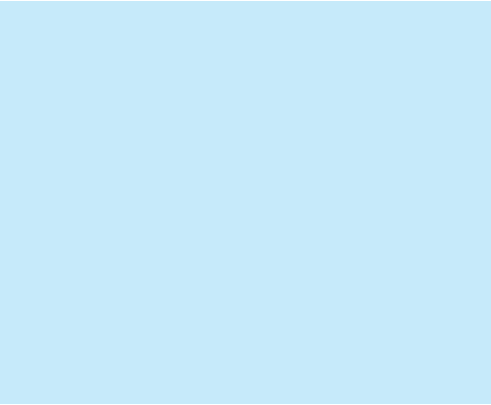
Having an attractive area with an identity to create pride by the users and stakeholders.

Perceive a good and coherent atmosphere in the area by creating the appropriate experience.

Perceiving an inviting atmosphere in the evening by having the appropriate experience.

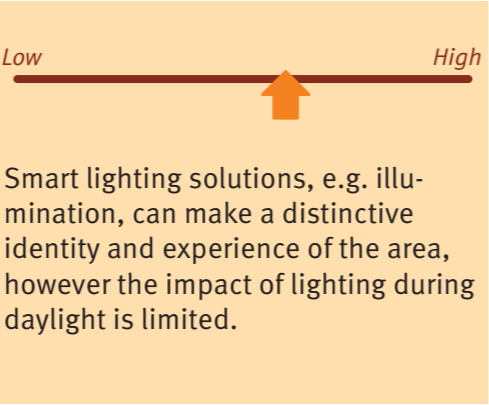
Having a qualitative good area between the buildings, providing safety and attractiveness.

Having continuous and dedicated routing and guidance for all road users between areas.

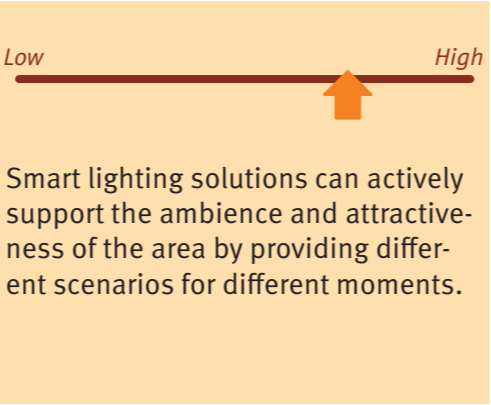


## Impact of intelligent lighting solutions

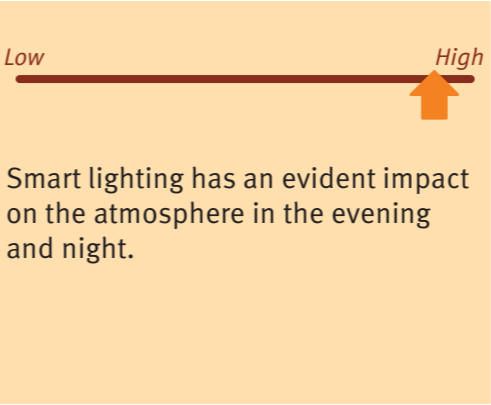
Potential impact of ICT based lighting systems and services on the identified needs



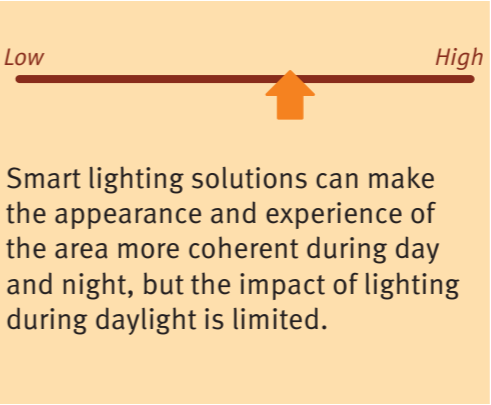
Smart lighting solutions, e.g. illumination, can make a distinctive identity and experience of the area, however the impact of lighting during daylight is limited.



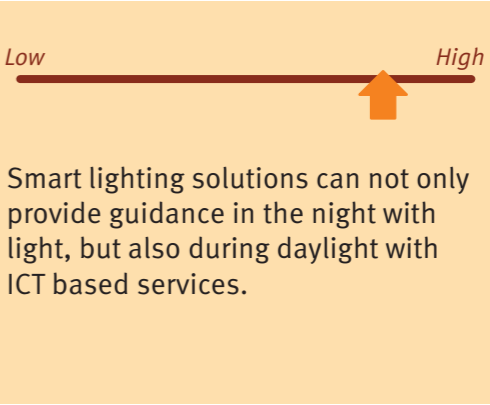
Smart lighting solutions can actively support the ambience and attractiveness of the area by providing different scenarios for different moments.



Smart lighting has an evident impact on the atmosphere in the evening and night.



Smart lighting solutions can make the appearance and experience of the area more coherent during day and night, but the impact of lighting during daylight is limited.



Smart lighting solutions can not only provide guidance in the night with light, but also during daylight with ICT based services.



## Measuring success

In what way can the success of the pilot and the expected value of the intelligent lighting solution be measured?

What concrete, direct and indirect measurements, experiments or tests can be done?

- Interview users
- Interview visitors of the hotel and stadium events
- Through social media
- Digi panel
- Better economical climate (less empty buildings)
- Local media

- Interview users
- Through social media
- Digi panel
- Better economical climate (less empty buildings)
- Number of activities
- Count the number of tourists
- 

- Interview users
- Through social media
- Economical: profit of restaurants, bars and hotels
- Sound measurement

- Interview users
- Sensors to follow human behaviour
- Digi panel
- Police: number of robberies, incidents with violence, etceteras
- Higher ranking in “the safest town of NL”

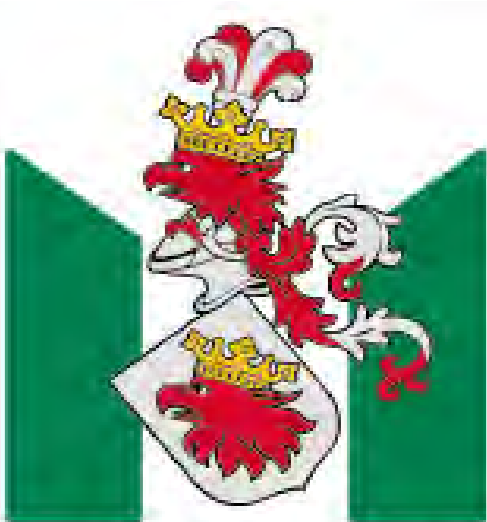
- Counting routes (expert evaluation)
- Counting the use of routes
- Existing pedestrian flows: guidance (e.g. TU/e, Fontys)
- Influence changing behaviour by creating new routes (e.g. Strijp-S)

- Other measures:
- Better energy-use
  - Number of new business models in cooperation with stakeholders for joint interests
  - The number of apps, created by people onto the open system



# Deep Dive Malmö

21 and 22 November 2013



Malmö stad



# Introduction Malmö



Malmö, a city in the south of Sweden has 300 000 residents, of which 30% are born abroad in 175 different countries and 48% of the population is less than 35 years old. Malmö is making the transformation from industrial town to knowledge based city. The municipality organization Malmö Stad has 20 000 employees.

The Department of Internal Services takes care of for example maintenance and care of streets, parks and real estate, emergency work, technical services and school restaurants .

The Business unit Municipal Properties manage the city owned buildings such as schools, kindergartens, elderly care, residential care, cultural and recreational properties. In total 1.6 million square meters.

Malmö was elected Green City of the year in Sweden both 2010 and 2013 and has a goal to become climate neutral in 2020 and to use 100 % renewable energy in 2030.

## High Lights of the city

The top three things that the city is most proud of:

### A sustainable and environmentally aware city

- Using sustainable energy
- Relatively small area and compact city
- Many parks and green areas
- Flat area, good for cycling

### One of the world's best metropolitan areas

- Good (broadband) infrastructure
- International population (35% foreigners)
- Near to water (offering possibilities)
- Large harbour

### Young and rapid growing city

- Popular city for young people
- Young people interested in social innovation and entrepreneurship
- Gaining pride over the last years
- Up to speed in modernisation
- Paradigm shift from industrial town to knowledge based city
- Activity around local university

## Low Lights of the city

The top three things that the city would like to improve:

### Violence & segregated city

- Segregation
- Education level of children (e.g. foreigners without prior education)

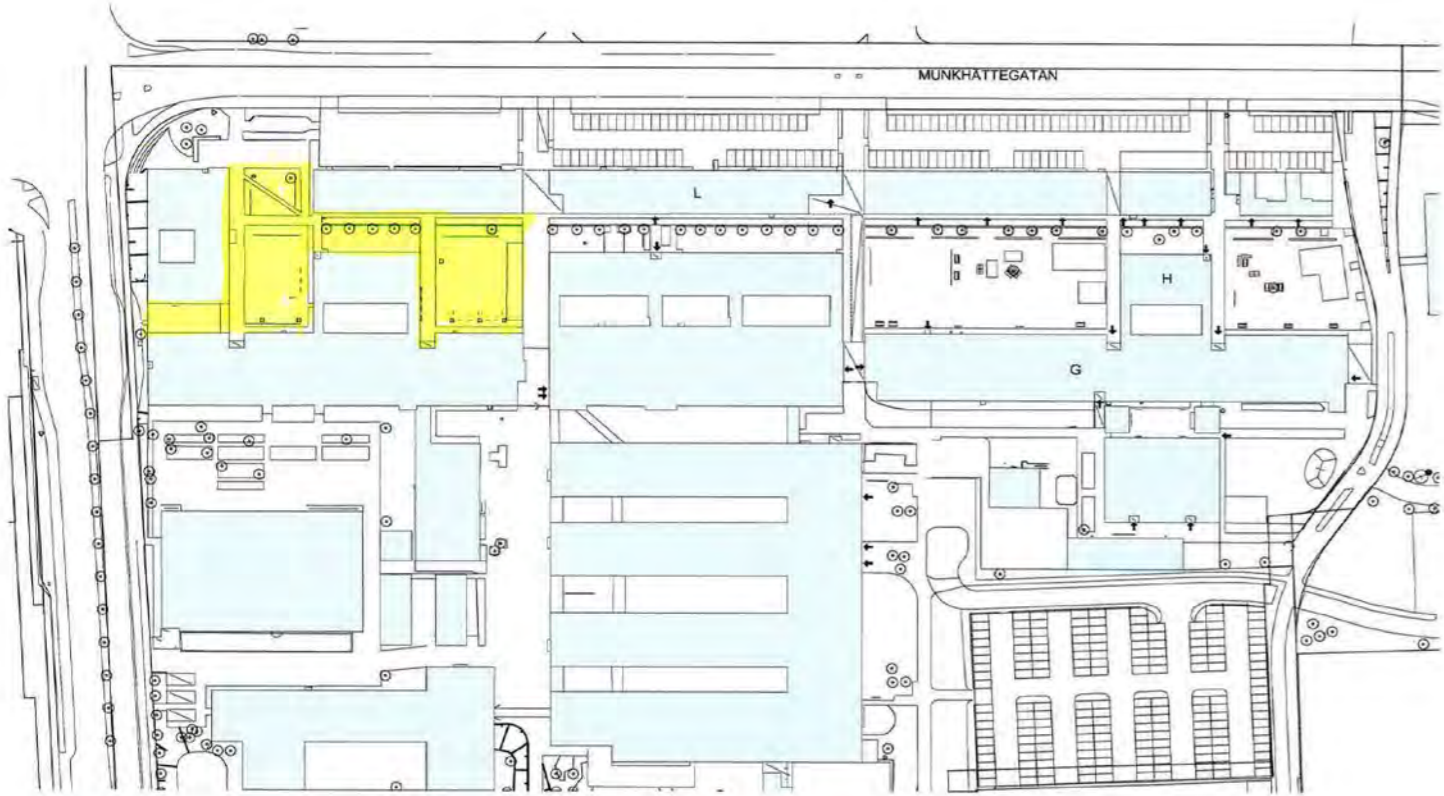
### Availability of jobs and affordable residences

- Jobs
- Cheaper residential areas

### Identity

- The cities identity need to keep up with the paradigm shift and strong growing population.

# Pilot area: Heleneholm



## The property ”Heleneholm 4”

Heleneholm 4 is located in the southern part of Malmö, in the area Heleneholm. Heleneholm is a residential area with a mixture of light industrial and commercial premises. Most buildings were erected in the 1950s. The disposable income of the inhabitants is slightly lower than average in Malmö. The property Heleneholm 4 consist of 51 000 m² leasable area.

## Heleneholm School

Heleneholm School was designed by Carl Nyrén in 1962. It was well known for modern architectural style with two floors and atriums. The building has won a Kasper Salin-prize, which one of Sweden’s finest architecture awards.

Businesses in the area include preschools, elementary school, high schools, music college, district administration and dental practice.

Malmö city continually attempts to find new and innovative ways to:

- Increase the feeling of security
- Reduce the risk of vandalism and haunt.
- Contribute to an enjoyable outdoor environment.

## High Lights of the area

The three strong aspects of the pilot area:

### Architectural quality of the area

- Won prestigious architectural prize
- Very nice building, with very good indoor atmosphere
- Very good building for school activities
- Multifunctional outdoor spaces are planned
- Beautiful area, with nice indoor patios with trees and greenery

### Security at daytime

- Little traffic
- Secure for children
- Open area, no places to hide

### Surrounding areas

- Nearby sports area with activities in the evening

## Low Lights of the area

The three aspects to improve in the pilot area

### Problems in the night: burglary & vandalism

- Copper (part of the architectural elements of the building) gets stolen
- Easy access to different levels of the building because of ‘step like’ design
- Gathering area for gang
- Too little activities in the evening
- Lot of vandalism, resulting in big fences and barbed wires - resulting in 300k€ intentional damage in the last 5 years

### Sad and boring place

- Outdoor environment is boring but OK. New outdoor environment is planned
- The place looks sad, not enough green (grass, plants), too much concrete
- There is no need to enter the area, because there is not much to do
- Boring colours

### Energy consumption

- High energy consumption, but Business of Municipality is working to improve energy efficiency of the building

Heleneholm in daylight



Heleneholm at night



# Societal needs

## Malmö’s strategic ambitions

Relevant policy and strategic ambitions for the city

**Malmö wants to provide a secure and safe city that is accessible for all citizens in all seasons (with clean streets, good transportation system).**

**Malmö wants to provide a good environment for children to enable social cohesion through good education and pleasant outdoor environment where people like to be and meet.**

**Malmö wants to provide a sustainable city by using 100% renewable energy and citizens taking responsibility for their environment.**

**Malmö takes a lead role as a transforming actor to build a sustainable city by (social) entrepreneurship.**



## Needs for the pilot area: Heleneholm

Relevant societal needs for the specific pilot area

**Being at ease and perceiving a safe environment that is attractive to spend more time.**

Citizens want to feel at ease and perceiving a feeling of safety to make the area attractive.

The city wants to attract people to the area that enjoy spending their time, and at the same time making the area unattractive for undesired activities (such as violence, vandalism and crime).

**Having a safe place with a low risk of crime and vandalism.**

Property management wants a safe place with low risk of crime and vandalism.

**Having an attractive place that invites to stay and meet others to explore entertaining activities .**

Citizens want to perceive an attractive area that invites to stay and to explore new activities that make the area more lively in the evening.

Students want more engaging activities in the school yard to enjoy themselves and to have a place to stay.

Nearby residents want a place where they can entertain themselves with various activities in an area where they can also meet others.

**Having an enjoyable environment that helps to diffuse stress from school and relax.**

Students want more fun and an enjoyable environment that helps them to decrease stress from school and to calm down.

**Having a sustainable place, with low energy use and low maintenance cost.**

Property management wants low maintenance costs and low energy use.

**Showing the impact of innovative smart (lighting) solutions by creating a smart area that adapts to time, people, activities etc.**

The city wants to show the impact of smart (lighting) solutions by implementing innovative products and services to create a smart area that adapts to time, people, activities, etc.



# Measuring success of the pilot

## Needs for the pilot area: Heleneholm

Relevant societal needs for the specific pilot area

Being at ease and perceiving a safe environment that is attractive to spend more time.	Having a safe place with a low risk of crime and vandalism.	Having an attractive place that invites to stay and meet others to explore entertaining activities .	Having an enjoyable environment that helps to diffuse stress from school and relax.	Having a sustainable place, with low energy use and low maintenance cost.	Showing the impact of innovative smart (lighting) solutions by creating a smart area that adapts to time, people, activities etc.
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## Impact of intelligent (lighting) solutions

Potential impact of ICT based lighting systems and services on the identified needs

<div>LowHigh</div> <div>Smart (lighting) solutions can have a strong impact on (the feeling of) safety.</div>	<div>LowHigh</div> <div>Smart lighting solutions can make the place more attractive to stay and increase the social coherence, thereby indirectly making it more attractive to vandals/criminals. It can also make it unpleasant to stay at certain times.</div>	<div>LowHigh</div> <div>A smart (lighting) solution has to a certain extent impact on the attractiveness of the area.</div>	<div>LowHigh</div> <div>A well designed dynamic lighting system can create a relaxing atmosphere (additional to e.g. a green environment) and an interactive system can create a playful environment for the students.</div>	<div>LowHigh</div> <div>Smart (lighting) solutions can reduce some of the energy use and maintenance costs.</div>	<div>LowHigh</div> <div>A smart solution can act as a showcase for the possibilities and impact of such adaptive systems.</div>
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## Measuring success

In what way can the success of the pilot and the expected value of the intelligent lighting solution be measured?

What concrete, direct and indirect measurements, experiments or tests can be done?

<ul style="list-style-type: none"><li>• Perception measurements</li><li>• Business interest</li></ul>	<ul style="list-style-type: none"><li>• Safety index &amp; statistics</li><li>• Number of vandalism and criminal acts in the area</li><li>• Number of reported burglaries</li><li>• Reduction of repair costs (baseline measurements)</li><li>• Tracing of gangs (with camera's)</li></ul>	<ul style="list-style-type: none"><li>• Perception measurements (interviews): of attractiveness and perceived safety</li><li>• Number of people in the area</li><li>Monitoring social media (e.g. facebook likes, twitter mentioning)</li><li>• Number of students applying for this school</li></ul>	<ul style="list-style-type: none"><li>• Perception measurements</li></ul>	<ul style="list-style-type: none"><li>• Actual maintenance costs</li><li>• Actual energy consumption</li></ul>	<ul style="list-style-type: none"><li>• Perception measurements of media, identity of the city, visitors</li><li>• Business interest to develop products and services to meet the identified needs and create business</li><li>• Number of projects to scale up after the pilot (e.g. to other school areas)</li><li>• Economical activity with services in Europe</li></ul>
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# Deep Dive Espoo

28 and 29 November 2013





# Introduction Espoo



Espoo is the second largest city in Finland, situated in the western part of the Helsinki Metropolitan Region. Known for Kone, Fortum, ex-Nokia, and Angry Birds Rovio. It is a fast growing urban area; at the end of 2012 there were 256760 inhabitants and 13787 employees, growing with 4000-5000 new inhabitants per year. Espoo has the largest concentration of science and innovation in Northern Europe in the Otaniemi – Keilaniemi – Tapiola –area. And home city of Aalto University centre, featuring a new campus in the future This provides an excellent focus as the test site for an European intelligent lightning project.

Espoo covers 5 large area projects:T3 in Tapiola, Espoon Keskus, Finnoo, Leppävaara, Suurpelto and Matinkylä. A new metro rail road is planned from Leppävaara to Kauklahti, with new station-based centres. Investments to infra structure cover 130 million Euros per year (not including metro, city railroad and some large road projects).

Espoo was given first prize in quality of urban spaces, specially the parks, by the society of Finnish Urban Planning Year 2012. The area also covers 95 lakes, 38 streams, 58 kilometres of seaside, archipelago,3074 hectares of Nature preservation areas, 5000 hectares of forests.

## High Lights of the city

The top three things that the city is most proud of:

### Diversity of the area

- Combination of urban and nature
- Development of the seaside and archipelago
- Variety of available features (easy transport, urbanisation, green parks, lakes, seashore, harbour, islands)
- Cultural heritage and historical sites (e.g. mansions)
- Large area with low population density
- Green living areas and public parks

### Good place to live

- Wealthy and healthy city
- Life works well in Espoo
- Services work well
- Strong economy
- Many different places to live
- High traffic safety
- Good pedestrian routes and bridges (kids can walk to school)
- Safe and clean streets

### Multiculturalism

- Multi-cultured population, creating a lot of possibilities
- People are equally spread along the area
- Segregation is smallest in Finland
- Highly educated and diverse population

## Low Lights of the city

The top three things that the city would like to improve:

### Growing pains

- City in transition
- Rapid growth of the city (2nd largest city of Finland)
- Growing need for transportation

### Availability of affordable high quality housing

- Housing for families with middle income
- Many streets and buildings from the 70's need renovation and modernisation
- Public areas and rental housing should be better maintained and cleaned

### Green public transportation

- Too much car mobility and private car ownership
- More efficient transport system needed (metro and railway)
- Need for friendlier mobility for all types of users: walking routes, cycling paths

# Pilot area: Leppävaara Centrum



The pilot area is Leppävaara, a large area located between the city centre and Helsinki. The area now contains vacant factory buildings, apartment buildings from the 1970s and unused spaces. A small river runs through the area.

The whole area is under development. A new city plan is proposed, including a new to build residential area for 5100 people.

The area also covers a square, main street, high landmark buildings, parking area and green areas between the buildings. The ground level is proposed for small businesses and shops.

The main square is supposed to function as a ‘living room’ for the residents.

The building of the residential houses starts in 2014.

## High Lights of the area

The three strong aspects of the pilot area:

### Central location & good reachability

- Good connections to Helsinki & Turku (train, highways, and soon also tram)
- Near to services
- Well embedded in area: lots of different working places & jobs, variety of activities etc.
- Good connection to recreation areas
- Characteristic historical buildings and sites: mansion, Alberga mansion with surroundings, Gallen-Kallelan museum

### Pleasant and green atmosphere

- Green character of the area, part of long green structure
- Water stream & nearby seaside
- Parks and nature
- Walk-able distance from the sea
- Pleasant bicycle routes
- Connection between urban area and nature
- Pleasant atmosphere, not noisy

### Public-private partnerships

- 10.000 m<sup>2</sup> per year build in public/ private partnerships since 15 years
- Model for working in public/private partnership (city does not own the land)
- Opportunities for new development

## Low Lights of the area

The three aspects to improve in the pilot area

### Image

- Typical 70’s monotonic architecture
- Vacant old assembly factories and radio stations in the area
- Air quality during construction work
- Frequenting of the area with ‘thirsty boys from Lakitori’

### Risk of flooding

- Low lying area risk of flooding from sea and river
- Older people are concerned that heightening of the area will introduce too many steps/stairs

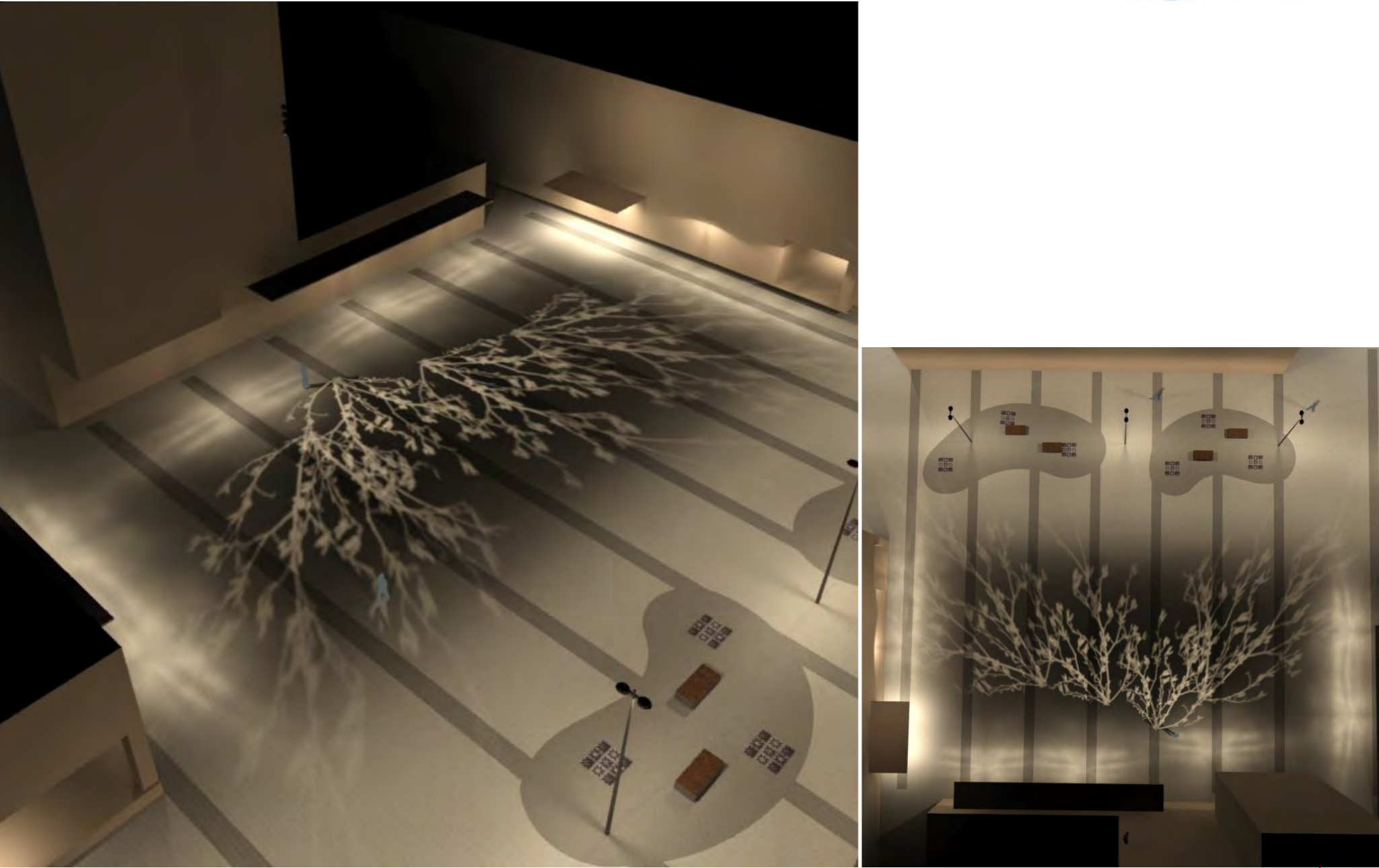
### Duration of procedures

- Administrative procedures & approvals
- Risk of delay because of claims to court in all phases of the development
- How long will the development take in all? 5 to 10 years?
- Difficult soil to construct

Leppävaara Centrum in daylight



Leppävaara Centrum at night



# Societal needs

## Espoo’s strategic ambitions

Relevant policy and strategic needs for the city

Espoo wants to provide connected green areas through the city where citizens can enjoy the restorative quality of nature.

Espoo wants to provide efficient public transportation (rail grid, diagonal connections, trams and metro) to reduce car dependence.

Espoo wants to create an inviting urban space for citizens of all ages to spend more time outside (walking, biking, staying) and feel comfortable and safe.

Espoo wants to provide high quality and affordable indoor and outdoor spaces for housing and business.

Espoo wants to pay more attention to pedestrians and cyclists and provide them with safe and easy accessible walking/cycling routes.



## Needs for the pilot area: Leppävaara Centrum

Relevant societal needs for the specific pilot area

**Enjoying a green environment.**

Citizens want good public parks, nice and green streets to enjoy living and feel good.

**Having good public transport connections for all stakeholders.**

Citizens want good public transport connections to fluently connect from A to B.

Citizens want clear orientation.

**Having an attractive area that invites to do different activities outside.**

Citizens of all ages want an outside area that invites to be active and socialise in their spare time in playgrounds, city gardens and other recreational activities.

Project developers want to provide houses with attractive public spaces that cater for different demands of potential buyers / tenants.

Citizens organisations want safe and functional spaces to achieve good quality of life for every age.

The municipality wants an socially attractive area for the citizens.

**Having a high quality living environment with a variety of functionalities.**

Residents want an attractive and high quality area with good services and variety of functionalities: grocery store, parking places, sports-field, meeting points and recreational possibilities.

**Having good and affordable indoor and outdoor spaces.**

The municipality wants to provide high quality (functionality and durability) and affordable lighting (with the right price level, payback time and low maintenance costs).

**Having attractive and safe walking and cycling routes.**

Citizens of all ages want safe and functional traffic routes which are nice for walking and cycling.

Visitors want good, clear routes to achieve smooth orientation.

# Measuring success of the pilot

## Needs for the pilot area: Leppävaara Centrum

Relevant societal needs for the specific pilot area

Enjoying a green environment.

Having good public transport connections for all stakeholders.

Having an attractive area that invites to do different activities outside.

Having a high quality living environment with a variety of functionalities.

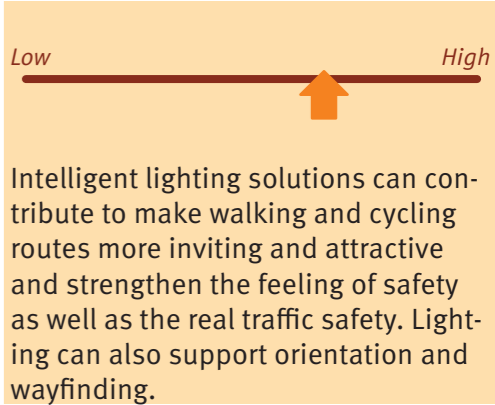
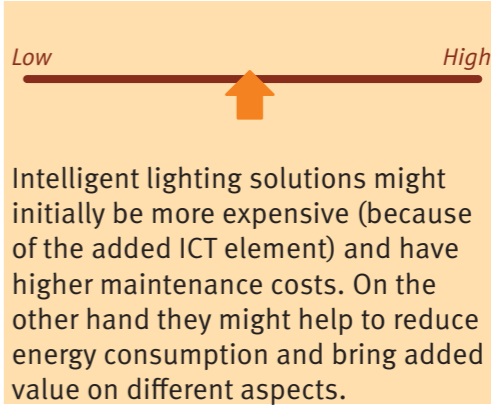
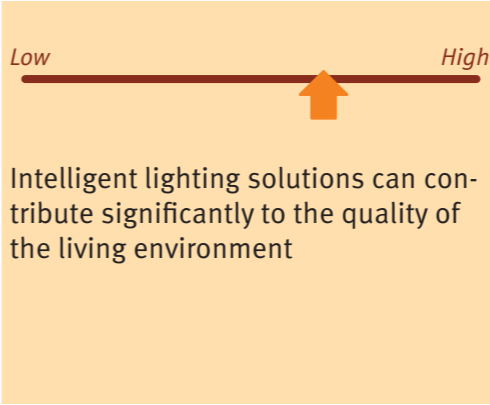
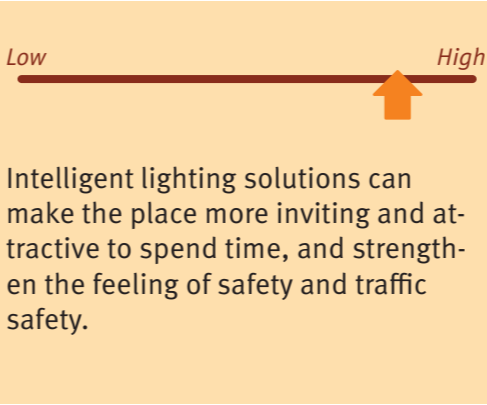
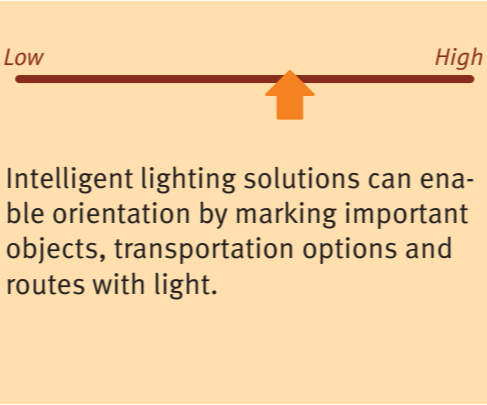
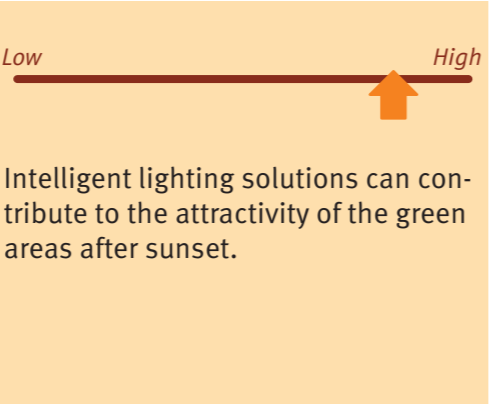
Having good and affordable indoor and outdoor spaces.

Having attractive and safe walking and cycling routes.



## Impact of intelligent lighting solutions

Potential impact of ICT based lighting systems and services on the identified needs



## Measuring success

In what way can the success of the pilot and the expected value of the intelligent lighting solution be measured?

What concrete, direct and indirect measurements, experiments or tests can be done?

- Number of walkers in the green areas
- Number of bikers in the green areas

- Statistics on use of car/public transportation means
- Car owning statistics
- Usage of streets and bicycle paths
- Feedback given to customer service (and the lack of negative feedback)
- Number of bicycle accidents and car damage (recorded by police and insurance companies)

- Measuring the quality (subjective)
- Measuring the number of people being outside & time spend outside
- Measuring the number of movements of cars/bikes
- Added income from new business models with interactive solutions
- Measure the number of people wanting to move there & sales of houses

- Balance the different needs of different stakeholders = more flexibility to adapt to different wishes
- Feedback from citizens through internet pages & questionnaires
- Through the contact centre (no complaints)
- Evening meetings with citizens and other stakeholders during projects (part of the standard process)

- Value based: measuring other criteria, beyond just Euro's
- Questionnaires with citizens
- Comparison to other areas
- Comparison to other technologies
- Real and actual costs, not just estimates
- Measuring lumen/watt ratio and energy savings
- Measuring actual lifetimes

- Number of people using the walking and cycling routes
- Number of incidents reported (police, insurance company)



# Deep Dive Stavanger

5 and 6 December 2013



STAVANGER KOMMUNE

# Introduction Stavanger



Stavanger is a city on the south-west coast of Norway, with a population of approximately 130 000 inhabitants in an area of 71 km², making it the most densely populated area in the country. It has a mild coastal climate with significant precipitation. The average temperature during the winter is -2.6 °C . Snow is infrequent. Being this far north the autumn and winter is long and dark – with dark mornings and evenings.

Stavanger has approx. 160 km with gravelled or paved pedestrian walk ways – of this approx. 100 km is lit up. The amount of illumination depends on type of walk way, area, and type of lighting source. Existing lighting has varying height and type of armature. In new projects – parks and open areas – pole height is 4-5 m using LED technology. The width of the roads are 2.5-3 m with gravelled or paved surface.

The local authority strives to improve its local lighting system and underlines the importance of combining energy efficiency, urban design and public safety considerations when planning the upgrade of its systems.

The city of Stavanger is currently working on a master plan for lighting the walk ways.

## High Lights of the city

The top three things that the city is most proud of:

### Ambitious

- Ambitious city that not just talks the talk but also walks the walk: once decided it will be done
- Ambition to be front-runners & take the lead
- International oriented
- Well managed and we can afford it because it is a wealthy city

### Strong history /culture that enables the future

- Cultural richness
- Proud of historical buildings (e.g. cathedral)
- Vibrant city centre with nice public spaces & big festivals
- Rich city, spending it on culture, green, parks, etc.

### Green city with a balance between development and environment

- Environmentally friendly city
- Close to nature (mountains, fjords)
- Green structure (one of the best in the world)
- Fast growing, low unemployment, proud residents



STAVANGER KOMMUNE

## Low Lights of the city

The top three things that the city would like to improve:

### Too much use of private cars

- Higher CO2 emission
- Traffic congestions
- Insufficient development of biking and pedestrian routes

### Keeping high quality city with growing population

- How to build a dense city with high quality, when there is little space left?
- Most dense area in Norway
- Property prices are rising and it becomes too expensive for young people

### Increasing segregation

- More segregation
- Challenge is to take care of the lower income group
- Awareness on healthy living

# Pilot area: Vannassen



Lighting the walk ways is an important ambition in the city of Stavanger and the main reason to have chosen Vannassen as the pilot area.

Vannassen is a recreational area measuring approx. 15 ha south of the city centre. It provides a vista point with a great view of Gands fjord and the mountains. The small lake Vannassen is situated in the centre of the area. For years it distributed water to the city of Stavanger.

Around the lake there is an abundant bird life and rich flora. The area provides walk ways and paths through woods and park-like areas. It has large trees and lawns.

A large playground is located centrally in the park and there is also a selection of sculptures. Along the outer rim there is a fenced area set aside for dogs and an area for agility.

To and from the area there is a network of walk ways, that connects Vannassen to other green areas in the city and to the fjord.

Public lighting is installed along some of the paths.

## High Lights of the area

The three strong aspects of the pilot area:

### Attractive nature: flora & fauna

- Ability to see the stars
- Lake
- Birds, deer, endangered species
- Green area, connected to other green areas near the sea and fjord
- Great view on fjord

### Good recreation area

- Good for walking, biking, running & skating
- Walking routes around the lake and in the forest
- Close to other walking areas (extend walking route to longer distance)
- Special area for dogs

### Used by all kinds of people

- Residential area nearby
- Lots of facilities by different groups: playground for children, gym by students, exercises by elderly, dog walking, ice activities.
- 6 schools and 5 kindergartens within 1km distance
- Nursing home nearby

## Low Lights of the area

The three aspects to improve in the pilot area

### Atmosphere & safety perception

- Dense bushes and spruce trees
- Some of the roads leading to the park are dark
- Not able to look around
- No clear guidance
- Perception of safety after dark

### Experiencing nature & view

- Benches lack view because of blocked view by trees (poor maintenance) and lack of corridors
- Noise from the road
- Lights on all night

### Quality of the facilities

- Water is not used for swimming anymore, no entrances into the water, too muddy
- Old lighting system with old technology and high energy use
- Old furniture and lack of group seating facilities
- No toilets, no shelters



STAVANGER KOMMUNE

Vannassen in daylight



Vannassen at night



STAVANGER KOMMUNE

# Societal needs

## Stavanger’s strategic ambitions

Relevant policy and strategic needs for the city

Stavanger wants to become a ‘walking’ city where it is easy to reach all facilities, by public transport, by bike or by foot.

Stavanger wants to provide its citizens with attractive public spaces and buildings.

Stavanger wants to be an attractive, safe and sustainable city.

Stavanger wants to apply smart & innovative solutions to create good experiences for its citizens.



STAVANGER KOMMUNE

## Needs for the pilot area: Vannassen

Relevant societal needs for the specific pilot area

Enjoying a clean and well-lit area all year/all day round that makes you feel welcome.

The elderly need good lighting all day, for all year use of the park.

Residents want a good and nice entrance with road marking and lighting on the paths to the area to perceive it as a welcoming area.

Sporting and exercising people want good (lighting) conditions on the paths to achieve good training facilities.

Handicapped people want a good lighting to achieve safety for all.

The parks and roads department want the right lighting to provide safety for all people.

Having good & well-maintained public facilities to increase the feeling of safety and make the area more attractive.

The city wants to improve the facilities in the place for people already using it.

The city wants to increase the feeling of safety by providing better lighting to enable more social control through more activity, but at the same time keep the ‘mysteriousness’ of nature.

The city wants to enable different activities for different users of all ages.

The citizens want good lighted trails, also to the nearby schools and nursing homes.

Meeting and socializing in a relaxing environment.

Citizens want facilities to meet and socialize in a relaxing (& dry) environment.

Residents want areas and spaces to enjoy calmness, relax and picnic.

The elderly need social meeting points to get outside and meet each other, with sitting facilities for groups to relax and talk.

Event organisers want spaces to organise events (e.g. bonfires) for people to meet.

Sporting and exercising people want good areas for training activities to be active in (larger) groups.

Balancing an undisturbed, preserved nature with the ability to enjoy nature, also as a learning experience.

Schools want a varied wild life for children to achieve knowledge about nature.

Visitors want to experience wildness (nature).

The parks and roads department wants to take care of the nature experience for better health of the citizens.

Birds want good quality of the water and undisturbed life.

Wildlife wants the lighting to be adapted to their day-and-night rhythm to make it a good place to stay in the night.

Embracing wild life and taking care of nature as a unique place in the city.

Citizens want to ensure good living conditions are created for the animals and plants by paying special attention in the selection of solutions.

Schools in the area want to use the area also for educational purposes.

Citizens want to experience true nature (not parks) with different trees and flowers, possibility to see wild life (birds, deer), hear the night animals and see the stars.

Providing an attractive area with smart & innovative solutions.

The city wants to attract new people to the area by providing new lighting experiences (adaptive and staying attractive).

The city wants to provide lighting that makes you feel well at night, but that also take care of the biodiversity.

The city wants to provide variations in lighting to enable different activities in the area to take good care of the different user needs.

# Measuring success of the pilot

## Needs for the pilot area: Vannassen

Relevant societal needs for the specific pilot area

## Impact of intelligent lighting solutions

Potential impact of ICT based lighting systems and services on the identified needs

## Measuring success

In what way can the success of the pilot and the expected value of the intelligent lighting solution be measured?

What concrete, direct and indirect measurements, experiments or tests can be done?

Enjoying a clean and well-lit area all year/all day round that makes you feel welcome.

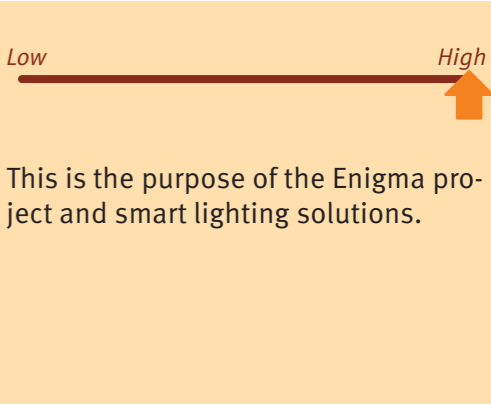
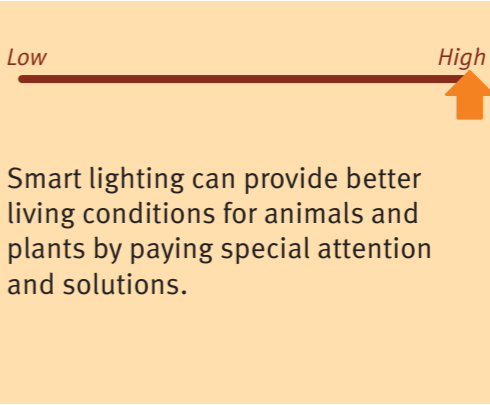
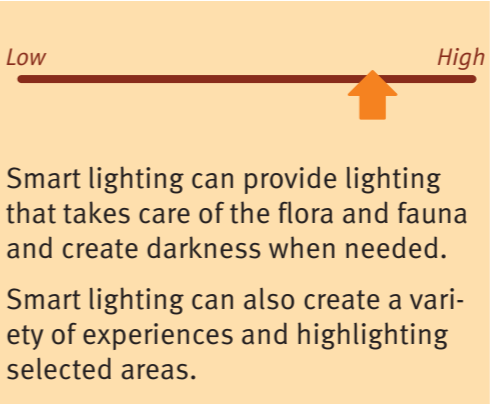
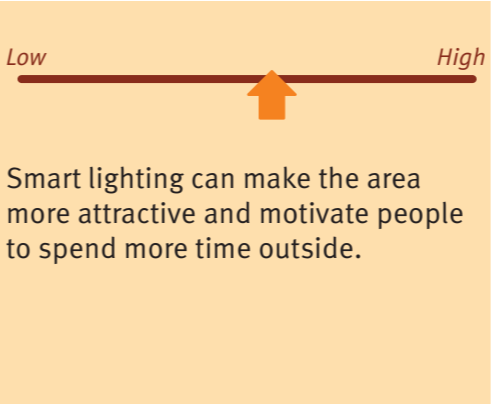
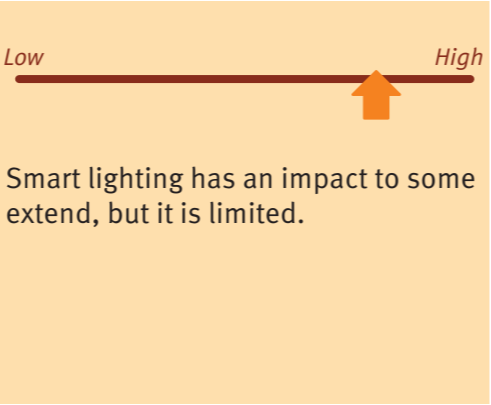
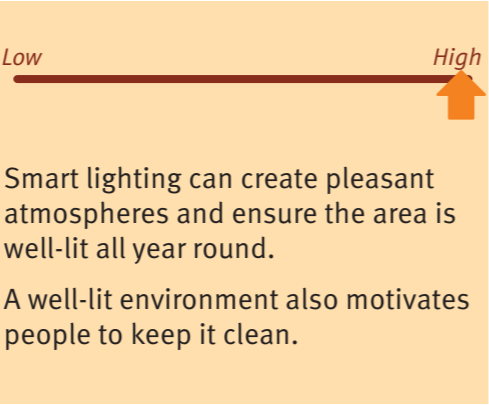
Having good & well-maintained public facilities to increase the feeling of safety and make the area more attractive.

Meeting and socializing in a relaxing environment.

Balancing an undisturbed, preserved nature with the ability to enjoy nature, also as a learning experience.

Embracing wild life and taking care of nature as a unique place in the city.

Providing an attractive area with smart & innovative solutions.



- less vandalism and garbage
- number of people using the area in the evening
- less people in the neighbouring area: Mosvannet

- fewer complaints
- less damage
- increased maintenance because of heavy use (e.g. paint on the benches)
- increased garbage in dustbins (no littering)

- number of people using the area (during the day)

- ask the residents
- visitors survey
- monitor changes in biodiversity

- monitoring birds, deer and other wildlife
- monitoring biodiversity
- measuring the quality of the water
- counting birds nests
- establish that the number of people in certain areas is decreasing
- preservation of flora and fauna

- counting people
- interview people (now and after 3 yrs)
- monitor the kind of people using the place
- citizen participation
- increase the score on living conditions (regular survey done by the city)



STAVANGER KOMMUNE



# Deep Dive Bassano del Grappa

10 and 11 December 2013



# Introduction Bassano del Grappa



Bassano del Grappa, is an historic city belonging to the Province of Vi-  
cenza, located in the Veneto Region,  
in the north East of Italy.

It lies between the Province of Vi-  
cenza, Padua and Treviso and at the  
bottom of the Alpine foothills of the  
Veneto Region, one of the richest Ital-  
ian region (industries, SMEs, tourism,  
agriculture) in the Venetian Piedmont  
area: where important infrastructures  
and historical towns and industrial  
cities live together.

The symbol of the city is the famous  
Alpines’ Bridge, a masterpiece of the  
architect Andrea Palladio, but it is  
also enriched by medieval remains as  
well as by the Venetian architecture,  
and moreover, it is surrounded by  
medieval walls.

In particular, Bassano is well known  
for its precious ceramics and for  
products DOC (controlled origin de-  
nomination), as the renowned liqueur  
‘Grappa’.

The lifestyle of the city is also very  
pleasant and full of events, the peak  
of which is the Opera Estate Festi-  
val Veneto when Bassano hosts a  
chain of great events, dance, music  
and theatre with renowned protago-  
nists of the Italian and international  
scenes.

## High Lights of the city

The top three things that the city is  
most proud of:

### Attractive historical city with many opportunities for activities, also for tourism

- Interesting historical sites (bridge,  
monuments in town centre,  
surrounding mansions)
- Known as town of the partisan’s  
resistance in both world wars
- Good biking paths, and extending  
cycle path to Venice and Milan
- One of the best places for paragliding

## Low Lights of the city

The top three things that the city  
would like to improve:

### More collaboration

- Too strong individualism, more  
collaboration is needed: politically,  
economically and technically
- Involvement of other stakeholders in  
developments
- Collaborate with neighbouring cities,  
where each keeps its own identity, but  
Bassano will take the lead in a joint  
strategy development program

### Unique cultural activities

- Many unique cultural events, some  
related to history
- Human figure chess games
- Dance & theatre festivals (one of the  
largest in Europe)

### Vibrant economy

- Many small and medium sized  
entrepreneurs, many family  
businesses
- Area is known for its hard working  
people
- Craftsmanship (ceramics, building,  
furniture and jewellery)
- Developing territorial marketing to  
promote area internationally

### Develop identity

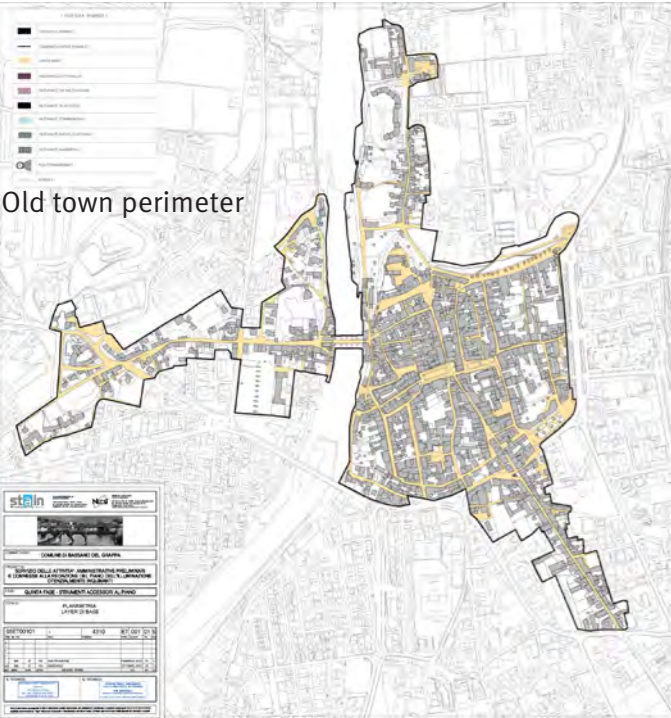
- Limited awareness of people on the  
possibilities
- Tourist could stay longer (if they only  
knew about the possibilities)
- Joint strategy for development and  
promotion of the area

### Keeping the centre alive

- Keep the city centre vibrant with small  
businesses and shops
- Find ways to combine the restrictions  
due to monumental regulations to  
match with business needs
- It is not easy for businesses to  
survive in the city centre with the  
development of commercial centres in  
the outskirts of the city



# Pilot area: Historic old town



Bassano is a town full of history, monuments and architectural assets and with a scenographic historic centre. Currently the lightening of the medieval old town (mainly characterized by artistic lighting device, on shelves and flows at SAP without any type of dimming) appears as flat and not adequate for the valorisation of scenarios, paths, panoramic views.

One of the objectives of the Bassano's lighting strategy - along with the energy efficiency, mitigation of lighting pollution and sustainable and innovative solutions - is the lighting requalification of the city historic old town which will combine all the above mentioned objectives with the quality of life improvement.

## Some figures of the old town

- Old town surface area 114.350 square meters
- N° old town residents (constant users) 4.750
- Type of lighting situation: high pressure sodium lighting
- N° light-points 588 (560 supporting devices, mostly artistic lamps)
- Height of the light-points ~4/5 m (on average)
- System power ~ 100 kW (on average)
- Age of light points ~ 10-15 years (majority not in line with current lighting regulation).

## High Lights of the area

The three strong aspects of the pilot area:

### Unique historical character

- Bridge, squares, arcades, monumental buildings
- Rich history and heritage
- Location of historical and architectural venues in the heart of the city

### Embedded in nature

- Natural landscape with river and mountains
- Diverse landscape
- Good climate to spend time outside

### High quality of living

- Beauty of the city
- Good living environment with lots of facilities for all day and all night activity (shops, bars, restaurants, events)
- Local habits and traditions: socializing for aperitif and outside dining
- Low crime rate

## Low Lights of the area

The three aspects to improve in the pilot area

### Incoherent lighting system

- Lighting system not well distributed
- Diversity in luminaries
- Low visibility
- Need for better compromise between touristical and residential needs
- Poor illumination of architecture (addressing the beauty of the city)

### Sustainable mobility

- Discussion on restriction of access for non-residents and pedestrian area
- Improvement of pedestrian lighting

### Light pollution

- Brightness of the entire environment
- Disturbance of astrophysical vision
- Impact on the environment
- Cost ineffective (waste of energy)
- Need the right light at the right time at the right place

Historic old town in daylight



Historic old town at night



Societal needs

Bassano del Grappa’s strategic ambitions

Relevant policy and strategic needs for the city

Bassano wants to create a vivid city centre for tourists, residents, shop owners etc. to foster a good economic climate.

Bassano wants to create flexible & adaptive smart (lighting) services to modernise the centre while doing justice to its historical character.

Bassano wants more sustainable solutions to reduce energy use & integral costs.

Bassano wants to create a more homogeneous city with an equal level of quality of life throughout the city.

Bassano wants to improve collaboration with local, regional and national stakeholders to create value for them.

Bassano wants to improve its internal/municipal processes to become efficient and have a more entrepreneurial way of working.



Needs for the pilot area: Historic old town

Relevant societal needs for the specific pilot area

**Having a good environment for business and commercial activities (such as restaurants and shops).**  
Shop owners and businesses want territorial marketing in Italy and abroad.  
Shop owners and businesses want better entrance roads and more parking facilities to improve access to the city.  
The city wants to create a good commercial environments and opportunities.

**Easy access to the cities facilities by car, public transport, foot and bike.**  
Shop owners and businesses want better entrance roads and more parking facilities to improve access to the city.  
Residents (students and elderly) want frequent public transportation to move access the city centre.  
Workers want to merge professional obligations to family duties in the same place (kindergarten, schools, etc.)  
Consumers want easy transfer from A to B with their purchased items.  
The city wants to improve mobility in the city centre and accessibility of public areas (and buildings).

**Making it easy to explore the cities gems (monuments, nature, etc.) by providing good information on location and history.**  
Tourists want to find the nice places, musea and cultural events easily to achieve a good time in Bassano.  
Tourists want to know what is happening in the city to achieve time well spend.  
Tourists want to immerse in the local culture and habits to experience the unique culture.  
The city wants to ensure the right and tailored monumental lighting to valorise the cultural heritage and guide residents and tourists to attractions and events.

**Paying more attention to pedestrians and provide good visibility, safety, routing & guidance.**  
The city wants to guide and route the users towards its cultural events and pedestrian paths.  
The city wants to provide functional lighting for citizens to improve visibility and safety.  
The city wants to guide cars to underground parking grounds and give the surface back to the pedestrians.  
The city wants to make the centre accessible for people in wheelchairs and mothers with strollers

**Provide high quality lighting for different activities (e.g. strolling through the city, watching the stars) with devices that do justice to the historical character of the city centre.**  
Residents (all) want less environmental pollution (CO2, noise, light).  
The astrophysics association wants better organisation and quality of lighting to have a better view on the stars for student and residents.  
The astrophysics association wants to better regulate private lighting (next to the public lighting).  
Residents (families and elderly) want good access to green areas for multiple purposes.  
The city wants the right and correct lighting furniture to respect the city characteristics and urban landscape.

**Reduce bureaucracy and more efficient and scientifically based decision making processes.**  
The municipality wants to speak more to the citizens directly to achieve better understanding of their needs.  
The municipality wants less bureaucracy and more efficient procedures to achieve time better spend for the citizens.  
The municipality wants to collaborate better between departments and other stakeholders to achieve better organisation.

# Measuring success of the pilot

## Needs for the pilot area: Historic old town

Relevant societal needs for the specific pilot area

Having a good environment for business and commercial activities (such as restaurants and shops).

Easy access to the cities facilities by car, public transport, foot and bike.

Making it easy to explore the cities gems (monuments, nature, etc) by providing good information on location and history.

Paying more attention to pedestrians and provide good visibility, safety, routing & guidance.

Provide high quality lighting for different activities (e.g. strolling through the city, playing, watching the stars).

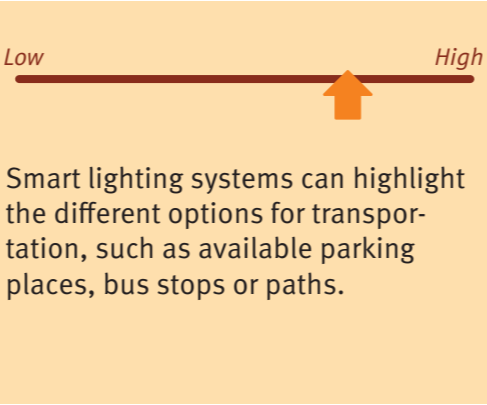
Reduce bureaucracy and more efficient and scientifically based decision making processes.

## Impact of intelligent lighting solutions

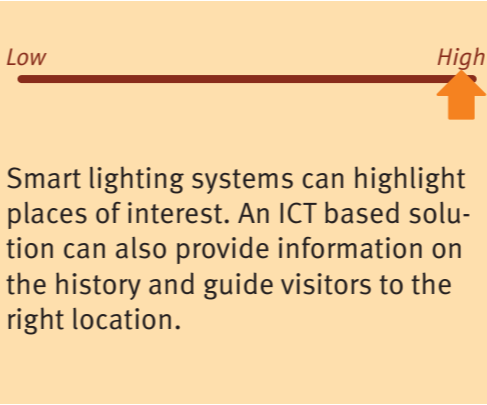
Potential impact of ICT based lighting systems and services on the identified needs



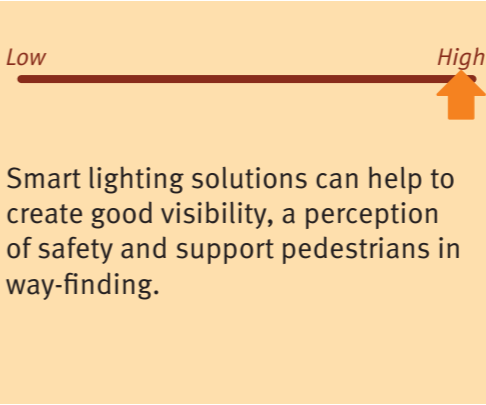
Smart lighting systems can help to make the centre more attractive and support commercial activities as part of smart city solutions.



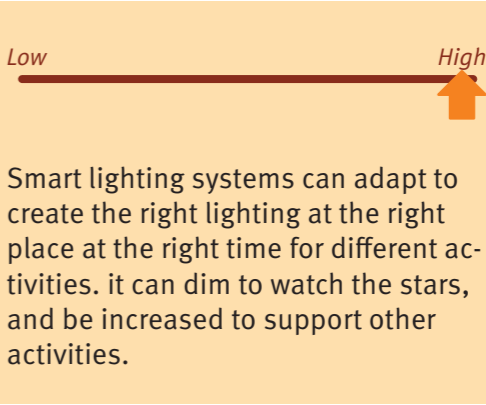
Smart lighting systems can highlight the different options for transportation, such as available parking places, bus stops or paths.



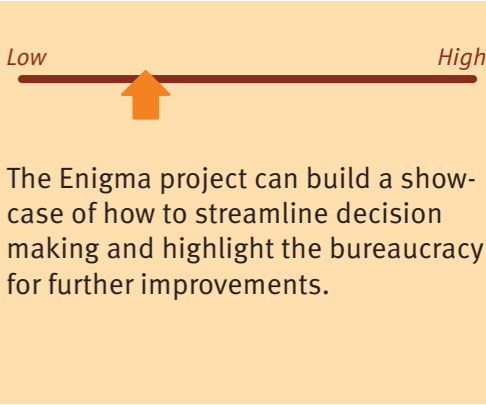
Smart lighting systems can highlight places of interest. An ICT based solution can also provide information on the history and guide visitors to the right location.



Smart lighting solutions can help to create good visibility, a perception of safety and support pedestrians in way-finding.



Smart lighting systems can adapt to create the right lighting at the right place at the right time for different activities. it can dim to watch the stars, and be increased to support other activities.



The Enigma project can build a showcase of how to streamline decision making and highlight the bureaucracy for further improvements.

## Measuring success

In what way can the success of the pilot and the expected value of the intelligent lighting solution be measured?

What concrete, direct and indirect measurements, experiments or tests can be done?

- Number of hotel bookings, restaurant visits
- Turnover generated in the city centre (and tourist tax)
- Tourist flow data from the province
- Number of new shops / restaurants opening in the centre (concessions)
- Tailored questionnaires for e.g. business association

- Survey with residents and visitors
- Number of parking lots used/available
- Number of people using the facilities
- Amount of time people use the facilities

- Number of visitors
- Surveys

- Survey to collect feedback from residents
- Collect feedback from specific groups: association of disabled people, volunteers
- No complaints

- More events, exhibitions and manifestations
- No complaints
- Costs of energy use

- Survey to collect feedback from residents and other stakeholders.





Malmö stad



STAVANGER KOMMUNE

## Towards a joint ambition

Results from the workshop with the 5 partners cities - 12 December 2013



# Introduction

The results of the Deep Dives are used to define a common set of ambitions, based upon the already defined ENIGMA common challenge. In this chapter we aim to provide a first overview of the commonality in the identified strategic ambitions and societal needs.

For this purpose a workshop was held in Bassano del Grappa on 12 December 2013 with representatives from all five partner cities.

During this workshop the results of all five Deep Dives were presented and the cities have clustered the strategic ambitions for the city and societal needs for the pilot area. The cities discussed the results in depth to gain a thorough understanding of the common items and specific items for the cities and their pilot areas.

On the following pages the clustered items for the common and specific ambitions and needs are given. The same colour code of the Deep Dives is applied: purple represents the strategic ambitions, blue represents the needs for the pilot area.

The results of the workshop will be used as an input for the definition of the joint ambition in Task 1.3 of the ENIGMA project.



## Societal needs for the pilot areas

The cities have clustered the societal needs for the pilot area and reflected if all statements together are a complete overview covering all relevant aspects.

The societal needs were divided by the cities into common needs and specific needs. The common needs are shared by all partners, the specific needs are more relevant to some pilot areas.

The items printed in *italics* are added during the workshop.

### Common needs

#### Lifestyle: activities

Having an attractive place that invites to stay and meet others to explore entertaining activities (Malmö).

Provide high quality lighting for different activities (e.g. strolling through the city, playing, watching the stars) (Bassano).

Meeting and socializing in a relaxing environment (Stavanger).

Having a high quality living environment with a variety of functionalities (Espoo).

*Increase the citizens health (Stavanger)*

#### Lifestyle: perception & attractiveness

Enjoying a clean and well-lit area all year/all day round that makes you feel welcome (Stavanger).

Perceive a good and coherent atmosphere in the area by creating the appropriate experience (Eindhoven).

Having an attractive area that invites to do different activities outside (Espoo).

Having an enjoyable environment that helps to diffuse stress from school and relax (Malmö).

Perceiving an inviting atmosphere in the evening by having the appropriate experience (Eindhoven).

Having good and affordable indoor and outdoor spaces (Espoo).

Having an attractive area with an identity to create pride by the users and stakeholders (Eindhoven).

Enjoying a green environment (Espoo).

#### Lifestyle: smart solutions

Providing an attractive area with smart & innovative solutions (Stavanger).

Showing the impact of innovative smart (lighting) solutions by creating a smart area that adapts to time, people, activities etc. (Malmö).

#### Low cost & sustainability

Having a sustainable place, with low energy use and low maintenance cost (Malmö).

Balancing an undisturbed, preserved nature with the ability to enjoy nature, also as a learning experience (Stavanger).

*Having an affordable and sustainable lighting for the area with low life-cycle costs (Espoo).*

*Achieving sustainability with low energy costs and low maintenance cost (Stavanger).*

*Achieving sustainable lighting: energy efficiency, cost efficiency and the right lighting in the right place (Bassano).*

*Improve sustainability to reach climate objectives (Eindhoven).*

#### Transportation & accessibility

Having good public transport connections for all stakeholders (Espoo).

Easy access to the cities facilities by car, public transport, foot and bike (Bassano).

Having continuous and dedicated routing and guidance for all road users between areas (Eindhoven).

Paying more attention to pedestrians and provide good visibility, safety, routing & guidance (Bassano).

Making it easy to explore the cities gems (monuments, nature, etc.) by providing good information on location and history (Bassano).

#### Safety & security

Having a qualitative good area between the buildings, providing safety and attractiveness (Eindhoven).

Being at ease and perceiving a safe environment that is attractive to spend more time (Malmö).

Having attractive and safe walking and cycling routes (Espoo).

Good & well-maintained public facilities to increase the feeling of safety and make the area more attractive (Stavanger).

Having a safe place with a low risk of crime and vandalism (Malmö).

### Specific needs

#### Taking care of nature

Embracing wild life and taking care of nature as a unique place in the city (Stavanger).

#### Business environment

Good environment for business and commercial activities (such as restaurants and shops) (Bassano).

#### Efficient processes

Reduce bureaucracy and more efficient and scientifically based decision making processes (Bassano).

#### Lighting design

*Right and correct lighting furniture to respect the city characteristics and landscape (Bassano).*

# Strategic ambitions of the cities

The cities have clustered the strategic ambitions of the cities and reflected if all statements together are a complete overview covering all relevant aspects.

The strategic ambitions were divided by the cities into common ambitions and specific ambitions. The common ambitions are shared by all partners, the specific ambitions are more relevant to some cities.

The items printed in *italics* are added during the workshop.

## Common ambitions

### Mobility

Eindhoven wants to facilitate mobility for all users of the public space.

Stavanger wants to become a ‘walk-ing’ city where it is easy to reach all facilities, by public transport, by bike or by foot.

Espoo wants to pay more attention to pedestrians and cyclists and provide them with safe and easy accessible walking/cycling routes.

Espoo wants to provide efficient public transportation (rail grid, diagonal connections, trams and metro) to reduce car dependence.

Malmö wants to provide a secure and safe city that is accessible for all citizens in all seasons (with clean streets, good transportation system).

*Bassano wants to enable sustainable mobility by providing pedestrian and cycle paths.*

### Outdoor environment

Espoo wants to create an inviting urban space for citizens of all ages to spend more time outside (walking, biking, staying) and feel comfortable and safe.

Stavanger wants to provide its citizens with attractive public spaces and buildings.

Eindhoven wants to provide a pleasant atmosphere, that combines functionality and experience on a human scale as a warm welcome to the city.

Malmö wants to provide a good environment for children to enable social cohesion through good education and pleasant outdoor environment where people like to be and meet.

Bassano wants to create flexible & adaptive smart (lighting) services to modernise the centre while doing justice to its historical character.

Espoo wants to provide high quality and affordable indoor and outdoor spaces for housing and business.

Stavanger wants to apply smart & innovative solutions to create good experiences for its citizens.

Eindhoven wants to provide an open and flexible system to facilitate continuous innovation, driven by societal needs (including open connectivity of the infrastructure, open access of devices, open data for new service design, and open knowledge on societal impact).

*Stavanger wants to be an attractive and safe city.*

### Coherent urban planning

Bassano wants to create a more homogeneous city with an equal level of quality of life throughout the city.

Eindhoven wants to create a diversity in experiences with a coherent identity.

Espoo aims to provide connected green areas through the city where citizens can enjoy the restorative quality of nature.

### Sustainability

Bassano wants more sustainable solutions to reduce energy use & integral costs.

Malmö aims to provide a sustainable city by using 100% renewable energy and citizens taking responsibility for their environment.

Stavanger wants to be an attractive, safe and sustainable city.

*Eindhoven wants to take responsibility for the environment by using renewable energy and improving sustainability.*

*Stavanger wants to use materials that can be recycled.*

## Specific ambitions

### Social entrepreneurship

Malmö takes a lead role as a transforming actor to build a sustainable city by (social) entrepreneurship.

Bassano wants to improve collaboration with local, regional and national stakeholders to create value for them.

### Creating an own identity

Eindhoven wants to realise an identity that reflects the strengths of the city as hands-on, creative, innovative, technology and design.

Bassano wants to create a vivid city centre for tourists, residents, shop owners etc. to foster a good economic climate.

### Internal processes

Bassano wants to improve its internal/municipal processes to become efficient and have a more entrepreneurial way of working.

# Appendices

In the appendices the notes as taken directly from the workshops and interviews in the deep dives are presented. The purpose of the appendices is to provide a complete overview of the elements mentioned as reference for the participants of the Deep Dives, but also to provide inspiration to others for the next steps in the ENIGMA project.

# Appendix A - Deep Dive Sessions Eindhoven



## Participants municipality

- Mary Ann Schreurs
- Staf Depla
- Irmo Kaal
- Jan Josten
- Antoinette Grips
- Jacques Splint
- Herman Kerkdijk
- Arjan uit het Broek
- Arthur Noordhoek
- Rik van Stiphout

## External participants

- Gerry Liebregt
- Tom Bergs
- Wouter Blom
- Pieter Ketting
- Willem Hovestad
- Peter Fossen
- Jos Roymans
- Max Hermers

# Policy & Strategic Societal Ambitions

## Strategic ambitions

Which strategic ambitions are relevant for the city?

<div>Creating an identity<ul style="list-style-type: none"><li>One coherent atmosphere, including advertisement</li><li>Extending the activities inside buildings to the public space</li><li>Create an identity</li></ul></div>	<div>Acknowledge the diversity in the area<ul style="list-style-type: none"><li>Connecting different functionalities</li><li>Create diversity in experience</li><li>Diversity in time and space</li><li>Experience and routing</li><li>Making comfortable space for people</li><li>Acknowledge them as people</li></ul></div>	<div>Atmosphere and ambiance<ul style="list-style-type: none"><li>Perception of comfort</li><li>Improve the climate</li><li>Beyond aesthetics</li><li>Attractive = functionality and experience on a human scale</li></ul></div>	<div>Continuous innovation<ul style="list-style-type: none"><li>Create an infrastructure as a base for continuous innovation</li><li>Open system &amp; data for app development</li><li>Open data and information</li><li>Flexibility on short term for events (e.g. fair or glow in the dark-solutions for bike parking at the theatre)</li><li>Flexibility on the long term for innovation and area development</li></ul></div>	<div>Facilitate mobility</div>			



# Ambitions for Chimney Alley

## Societal Needs

Which societal needs are relevant for the pilot area?

**Connection between areas**

- Connecting different areas
- Define continuous routings
- Connecting with green area and current infrastructure
- Connecting with water (the river Dommel)
- Creating the big picture and doing it ‘one time right’
- Complement the day-image (with green), with a night-image (with light)

**Inviting atmosphere in the evening**

- Night-route: what is visible and what experience is wanted?
- Improving the evening ambiance and experience
- Visibility of characteristic elements of the area
- What do you want to show as city?
- Exploiting the different qualities of the area
- Inviting to stroll and be there without a specific purpose
- Bridge difference between day and night time activities
- Support 24/7 activity in the area

**Connecting functionalities**

- Routing and guidance
- Less traffic dominance
- Connecting north – south
- From ‘transit space’ to a ‘living space’
- ‘Manhattan at the railway’
- Positive attention to the railway
- Public transport hub

**Feeling welcome, secure and comfortable**

- ‘Being’; using the public area
- A ‘piazza’; comfortable stay in public space
- Pleasant spacial area
- Romance/identity/character of the city centre
- Dynamics
- Feeling welcome
- Station = city entrance = meeting place
- Showing the historical character
- Opening up the closed building, such as the railway station

**Dedicated routing and guidance**

- Walking through and connecting green areas
- Clear and logical routing and guidance
- Different routes: city centre to Strijp-S, Woensel, TU/e
- Car free zones, parking outside centre
- ‘Green zone’ for bikes and pedestrians
- Less traffic, more strolling

**Atmosphere and ambiance**

- Business card of the city / the entrance
- Less anonymous
- Attention to pedestrians
- Inviting place that attracts new tenants for vacant buildings
- Clean: space and air
- Entrée for visitors
- Human scale

**Creating coherence in infrastructure and providing a clear routing and guidance**

- Strijp-S wants infrastructural coherence: connections for cyclists and pedestrians, green structures, which are interconnected, and guidance through lighting.
- PSV football supporters and event visitors want a clear routing from all directions to reach the stadium safely and clearly.
- Parking companies want clear routing for car drivers to guide them towards available parking spaces.
- Beursgebouw (exhibition hall) wants to be more attractive and reachable through routing and illumination to attract more visitors.

**Improve the atmosphere and perception of the area through connections (also in activities)**

- The hotel wants a safe connection to the city centre for their customers to make them feel welcome and comfortable.
- Strijp-S wants to create ‘stepping stones’ in the functionality of buildings to connect the city centre and Strijp-S in a coherent and natural way.
- Strijp-S wants an integrated and tuned program of activities and events in the different areas.

**Increase the attractiveness and identity of the area to create pride by the users and stakeholders**

- Students want to spend a good time in Eindhoven during their education.
- Students want Eindhoven to stay high in the ranking of light- and technology city.
- Alumni students want to feel proud and inspired in their remembrance of Eindhoven.
- Dutch railway (NS/Prorail) wants more users and visitors for their business.
- PSV / Philips football stadium, wants development on the north side of the stadium (auditorium built over the road) as a connection to Strijp-S.
- The hotel wants the public space in the area to be attractive, usable, understandable and safe for visitors to feel at ease.
- Residents and future residents want social cohesion and self-reliance.

**Improve the quality of the area between the buildings, providing safety and attractiveness**

- PSV / Philips football stadium, football supporters and event visitors want enough and qualitative lighting around the stadium in public space to highlight the stadium and connect it to the green corridor.
- Parking companies want to create a warm lighting atmosphere (not cold) to provide their customers with a perception of safety.
- Rabobank wants an attractive environment with clear and safe entrance (both to the building and the area) for the clients/customers and for the employers.
- Dutch railway (NS/Prorail) wants an attractive area between 6 AM and 12 PM as a service to their customers.
- Beursgebouw (exhibition hall) wants more attention for the public spaces between the buildings to make them safe and attractive.
- Beursgebouw (exhibition hall) wants logistics for exhibitions to be out of sight to create a user centred area around the building(s).
- The hotel wants illumination of the building in correlation with the other buildings to make a clear and attractive identity as business as well as a city (Eindhoven City of Light).

**Special attention to pedestrians**

- Seeing and deciding how to walk or bike
- Feeling welcome
- People density indication, to know where the buzz is (people radar)
- Crowd management
- Football club and supporters

**Social safety**

- Perception of safety in the tunnels
- Perception of safety
- Functionality of the tunnels
- Safe areas
- Safety is a condition
- Rabobank wants to contribute positively to the attractiveness and safety of the area.
- Dutch railway (NS/Prorail) wants a safe area to prevent vandalism and violence incidents.



# Stakeholders for Chimney Alley

## Stakeholder Needs

Which societal needs are relevant for the stakeholders of the pilot area?

### Stakeholders for Chimney Alley

- Residents
- Football supporters
- Students
- Visitors of the museum
- Visitors from other city areas
- Real estate
- Hotel (Holiday Inn)
- The bank (Rabobank)
- Dutch Railways (NS/Prorail)
- Police station
- PSV / Philips football stadium
- Beursgebouw (exhibition hall)
- Tourist information (Eindhoven 365)
- Police
- Parking companies
- Strijp-S
- event visitors

### PSV football stadium, football supporters and event visitors

- PSV / Philips football stadium, football supporters and event visitors want enough and qualitative lighting around the stadium in public space to highlight the stadium and connect it to the green corridor.
- PSV football supporters and event visitors want a clear routing from all directions to reach the stadium safely and clearly.
- PSV / Philips football stadium, wants development on the north side of the stadium (auditorium built over the road) as a connection to Strijp-S.

### Parking companies

- Parking companies want clear routing for car drivers to guide them towards available parking spaces.
- Parking companies want to create a warm lighting atmosphere (not cold) to provide their customers with a perception of safety.
- Parking companies want the same identity for their parking areas to provide recognizable spaces for their customers.

### Strijp-S

- Strijp-S wants infrastructural coherence: connections for cyclists and pedestrians, green structures, which are interconnected, and guidance through lighting.
- Strijp-S wants to create ‘stepping stones’ in the functionality of buildings to connect the city centre and Strijp-S in a coherent and natural way.
- Strijp-S wants an integrated and tuned program of activities and events in the different areas.

### Beursgebouw (exhibition hall)

- Beursgebouw (exhibition hall) wants to be more attractive and reachable through routing and illumination to attract more visitors.
- Beursgebouw (exhibition hall) wants more attention for the public spaces between the buildings to make them safe and attractive.
- Beursgebouw (exhibition hall) wants logistics for exhibitions to be out of sight to create a user centred area around the building(s).

### Students

- Students want to spend a good time in Eindhoven during their education.
- Students want Eindhoven to stay high in the ranking of light- and technology city.
- Alumni students want to feel proud and inspired in their remembrance of Eindhoven.

### Residents

- Residents and future residents want social cohesion and self-reliance.

### Rabobank

- Rabobank wants an attractive environment with clear and safe entrance (both to the building and the area) for the clients/customers and for the employers.
- Rabobank wants to contribute positively to the attractiveness and safety of the area.
- Rabobank wants a responsible implementation of lighting and energy to reach sustainable aims in the project.

### Dutch Railway (NS/Prorail)

- Dutch railway (NS/Prorail) wants a safe area to prevent vandalism and violence incidents.
- Dutch railway (NS/Prorail) wants more users and visitors for their business.
- Dutch railway (NS/Prorail) wants an attractive area between 6 AM and 12 PM as a service to their customers.

### The hotel(s)

- The hotel wants a safe connection to the city centre for their customers to make them feel welcome and comfortable.
- The hotel wants illumination of the building in correlation with the other buildings to make a clear and attractive identity as business as well as a city (Eindhoven City of Light).
- The hotel wants the public space in the area to be attractive, usable, understandable and safe for visitors to feel at ease.





# Appendix B - Deep Dive Sessions Malmö



## Participants municipality

- Sofia Traneflykt
- Johan Mattsson
- Jeanette Lövgren
- Peter Lindhqvist
- Olle Strandberg

## External participants

- Reine Karlsson
- Boelil Kjellsdotter
- Bojana Vujisic
- Felicia Lantz
- Mikaela Brock
- Lars Montelius

# Policy & Strategic Societal Ambitions

## Strategic ambitions

Which strategic ambitions are relevant for the city?

<b>Social sustainability &amp; social responsibility</b>	<b>Security and safety</b> <ul style="list-style-type: none"><li>safe public spaces</li><li>security and safety</li><li>less vandalism</li></ul>	<b>Better atmosphere outside</b> <ul style="list-style-type: none"><li>outdoor living in socially exposed areas</li><li>engaging people outdoor</li><li>more outdoor activities</li></ul>	<b>Energy ambition</b> <ul style="list-style-type: none"><li>the first city using only 100% sustainable energy</li><li>the city with no footprint</li><li>renewable energy</li><li>the connected capital of the world</li></ul>	<b>Education and good environment for children</b> <ul style="list-style-type: none"><li>better schools</li><li>better results in our schools</li><li>good education</li><li>good outdoor environment for children (playground / education)</li></ul>	<b>Improve integration</b> <ul style="list-style-type: none"><li>equality among people</li><li>schools better integrated, less segregation</li><li>better integration of population</li><li>social coherence</li><li>lively city environments in socially ‘hard’ areas</li></ul>	<b>Creating jobs</b> <ul style="list-style-type: none"><li>jobs, jobs, jobs</li><li>green jobs</li><li>more jobs for the young population</li><li>bridging school and jobs</li></ul>
<b>Pride</b> <ul style="list-style-type: none"><li>a feeling of presence</li><li>being part of the city</li><li>being proud of the city</li></ul>	<b>Improve social cohesion</b> <ul style="list-style-type: none"><li>connecting younger &amp; elderly people outdoors</li><li>be the city famous for our way of taking care of our elderly people</li><li>joint outdoor activities</li><li>more activities for younger people / less gangs</li></ul>	<b>Transport system</b> <ul style="list-style-type: none"><li>transport system for all road users</li><li>clean streets for elderly people</li></ul>	<b>Interconnection</b> <ul style="list-style-type: none"><li>connect with health care and e-health</li><li>smart city</li></ul>			



# Ambitions for Heleneholm

## Societal Needs

Which societal needs are relevant for the pilot area?

### Showing & implementing the developments in smart solutions

- smart building (energy, safety, ICT, smart system)
- smart buildings and city areas
- show case
- innovative area (something to involve the whole part of the city)
- be smart and innovative
- test-bed for the rest of the city
- connecting all systems (security, lights, energy, etc)
- system intelligence
- sensors
- multi functional

### Adapting the light to time, people, and activities

- connecting inside and outside
- connecting activities and people
- seasonal change
- lighting supporting the architectural beauty
- personalised solutions
- adaptive light settings

### Perceived safety

- improve the security
- safety issues
- safe school-yards
- safe buildings
- security must increase

### Attractiveness ...

- attractive lighting to get people in
- make the area more attractive through activities outside school/work hours
- outdoor environment that attracts all sort of people
- engaging people: playground meeting place for people
- presence of mature people
- student activities in the evening
- a lively house at daytime and night-time
- could be resource for people in nearby residential areas

### ... and Unattractiveness

- make it unattractive for some target-groups
- crowd control
- mood control
- pleasant to go through or to stay

### Create a “good mood” through lighting

- have a lighting that effects people in a good way
- activity and mood assessment functions
- system and lighting that is happier
- meeting place between different cultures
- urban gardening
- playgrounds

### Attract new businesses

- facilitate and attract ‘other’ activities for businesses or organisations in the evening
- adult education
- restaurants
- production activities



# Stakeholders for Heleneholm

## Stakeholder Needs

Which societal needs are relevant for the stakeholders of the pilot area?

**Stakeholders for Heleneholm**

- Students
- Musician students
- Staff and teachers
- Preschool children and their parents
- Wheelchair students
- Police and surveillance
- Property management
- Homeless people
- Function entrepreneur / handyman
- People passing, going to the dentist
- Night people that do not belong there
- Burglars
- janitor

**Students**

- Students want coloured light to have a better atmosphere
- Students want flowers, trees and grass to have a enjoyable environment
- Students want dynamic projections to feel happier and make the place more attractive
- Students want colourful lighting, grass and flowers to achieve a much more fun, calming, cosy environment so the students want to be there
- Students want to achieve a feeling of being safe, calm down ad decease stress
- Students want more activities on the school-yard to achieve that more people stay around and enjoy themselves

**Wheelchair students**

- Wheelchair students want wider paths and ground lighting for safe and more fun driving around and walking around

**Property management**

- Property management wants good quality of installed products to achieve lower maintenance costs
- Property management wants energy effective solutions to achieve lower energy use and costs
- Property management wants a safe place with low risks of crime and vandalism to achieve lower costs and a better world
- Property management wants achieve a good school environment



# Appendix C - Deep Dive Sessions Espoo



## Participants municipality

- Pirjo Siren
- Merja Kiviluoto
- Päivi Ahlroos
- Kirsi Louhelainen
- Sari Knuuti
- Reijo Vuosalmi
- Seija Lonka
- Laura Yli-Jama
- Pekka Sillanpää
- Meiri Siivowa

## External participants

- Leena Tähhämö
- Liisa Halonen
- Stefan Ahlman
- Arja Salmi

Policy & Strategic Societal Ambitions

Strategic ambitions

Which strategic ambitions are relevant for the city?

**Provide restorative areas (to reduce e.g. stress)**

- providing quiet areas
- taking care of the forest and green areas
- taking care of cultural history
- give possibilities for our children to have their roots in Espoo
- cheering up during long winter time
- nature and green spaces available for all
- health equality
- dense centres with green areas close-by
- green belts to connect ecological zone

**Providing easy public transportation and reduce car dependence**

- efficient transportation
- increasing cycling
- creating a diagonal: create connections to other directions than Helsinki
- make people aware that it is possible to live without a car
- the city also provides ‘logistical routes’ as go-through for national transport
- good, easy and durable transportation: rail grids, trams, diagonal

**Inviting urban space for people to enjoy outdoors**

- enhance the river / lake / seaside
- usage and care-taking of landscape
- outdoor “living rooms”
- more pleasant, comfortable and inviting public spaces
- inviting and vibrant safe urban areas, to walk, bike and stay
- new main streets, squares and parks for the growing city
- hearing the needs of the citizens

**Easy living for all citizens**

- housing areas for everybody easy living for citizens during the lifetime
- healthy, good quality, usable residential areas

**Quality of the newly developed and new to develop areas**

- city railroad with its station area, centre, parks and squares
- new metro and its station squares
- quality of infra and landscape architecture in Espoo style (continue the earlier work)

**Collaboration between city, private companies and citizens**

- using resources of private companies and city together
- active participation
- hearing the voice of the citizens

**Taking care of nowadays areas**

- people also need infra services and other services and facilities in nowadays areas
- streets, water, parks
- create places for children

**To see our city in a holistic way, not as a combination of city centres**

**Provide outside areas that invite to spend time outside**

- good park services in living areas
- environments for everybody (people of every age; children, adults, young families, elderly)
- safety feeling
- places for all age-groups (children, teens, adults, seniors)
- perception of safety

**Pay more attention to walking and cycling**

- safe pedestrian and cycling routes
- green areas as a part of a network (not segregated areas)
- good possibilities to walk or cycle to school or work
- town where everyday life goes safely and easily (good transportation: buses, walking, etc.)
- easy maintenance, anti vandalism

**Perceived atmosphere and safety**

- better use of public space
- good recreation network
- routes in green areas

**High quality and affordable lighting**

- quality of the lighting in right price level
- reasonable prices and realistic payback time
- good functionality of lighting systems
- good lights, not too expensive
- lifetime of ICT and electronics

**Durable solutions with easy maintenance**

- energy saving by dimming since 1995
- cosy and nice townscape which can be effectively maintained

**Feeling proud of the city and be at home (identity)**

- town where people feel at home, people can be proud of and which has a special identity
- diversity in areas
- also including the cultural heritage

# Ambitions for Leppävaara

## Societal Needs

Which societal needs are relevant for the pilot area?

**Strengthen the feeling of safety**

- perceived safety (figures are good)
- safe solutions for kids
- everybody feel safe in the area
- enough light to make people feel safe
- guiding streets and routing
- safe traffic
- good visibility, traffic safety
- safety area for pedestrians

**Providing a good atmosphere where people enjoy living & feel good**

- useful and lively public space
- good public parks
- well built and planned parks
- nice and green streets because the parks are small
- Monikanpuro will be an attractive central theme of the parks
- providing good parking spaces, park routes, playgrounds, etc.

**Providing a high quality area**

- public spaces should be built with high quality materials and well-maintained because of the number of users
- quality in all parts of lighting to distinguish
- good maintenance, good quality
- quality for the area
- good street lights

**High quality living environment**

- Existing and neighbouring residents want to minimize the contrast between the old and new residential areas to gain economically (the costs of flats).
- Existing residents want to minimize the go-through traffic to achieve peaceful living conditions (noise, air quality, safety)
- Project developers, building companies and land owners want to create a higher image to the area compared to the old area to speed up the selling process.

**To be able to orientate by clear routes and landmarks**

- Visitors want good and clear routing to achieve smooth orientation.
- Radio station wants to have a lighted landmark if the link station can be saved.

**Clear and open communication and fast procedures on town planning**

- Existing, neighbouring residents want to know and be informed on schedules and plans to achieve a piece of mind.
- The municipality wants to speed up town planning procedures to achieve to gain more citizens and tax incomes.

**Providing different functionalities: public & private services**

- enough meeting points
- variety of recreation possibilities
- a grocery store
- parking places
- warming soccer fields, sport places
- right timing of all services

**Create an attractive, qualitative, good, connected, pleasant area**

- Citizens organisations want a good image and quality for the area to achieve attractiveness and good selling and renting.
- Businesses might want constructed 1th floor spaces to have space for business and shops.
- New residents want the city to plan and maintain the area according to the demands and significant positive effect on the quality of life.

**Good and affordable indoor and outdoor spaces**

- New residents want a variety of size/ quality/prize of apartments to have possibilities to move to the area and within.
- Businesses want affordable 1th floor rental prices to achieve spaces for business or shops
- Project developers, building companies and land owners want to maximise the volume of M2.
- The municipality wants to reach a positive balance between the costs of the infrastructure and the income of the town planning
- Maintenance co. wants good quality and long life expectancy to achieve loan costs
- Maintenance co. wants easy maintenance and machinery maintenance to achieve low costs.

**Enjoy an area that invites to do different activities outside (together)**

- Citizen organisations want safe and functional public spaces and blocks to achieve good quality of living for every age.
- Children want interesting playgrounds to have things to do and to get new friends (for children of all ages)
- Children want good, safe, pleasant places (for learning) to achieve knowledge and spare time activity.
- Church wants to have new type of participants to achieve active actions and to achieve positive social development.
- Project developers, building companies and land owners want a flexible town plan to meet up with different demands.
- City gardeners want the possibility to grow their own vegetables, flowers, etc. to ache ecological food and reduce their stress level.
- The municipality wants to do good quality town planning to achieve a socially attractive area.
- Horses want to run in Vermo and on riding paths to achieve their natural behaviour and good health.

**Connectivity: transport connections for all stakeholders**

- fluent connection from A to B
- good public transport connections
- well functioning pedestrian and cycleways
- good connections to Leppavaara centre and its services
- useful public transportation system\ safe traffic routes which are functional and nice for walkers, cyclists, elderly, children and cars

# Stakeholders for Leppävaara

## Stakeholder Needs

Which societal needs are relevant for the stakeholders of the pilot area?

### Stakeholders for Leppävaara

- Residents (existing, neighbouring, new)
- New residents
- People renting houses
- People owning houses
- Citizens organisations
- Schools and day care centres
- Students
- Visitors
- City gardeners
- People skiing
- Businesses (business park)
- Project developers
- Building companies
- Land owners
- The municipality
- Maintenance cooperation
- State radio / the radio station
- Horses
- The church
- The heating plant

### Residents

- Existing and neighbouring residents want to minimize the contrast between the old and new residential areas to gain economically (the costs of flats).
- Existing residents want to minimize the go-through traffic to achieve peaceful living conditions (noise, air quality, safety)
- Existing, neighbouring residents want to know and be informed on schedules and plans to achieve a piece of mind.
- 

### Children

- Children want interesting playgrounds to have things to do and to get new friends (for children of all ages)
- Children want good, safe, pleasant places (for learning) to achieve knowledge and spare time activity.

### Visitors

- Visitors want good and clear routing to achieve smooth orientation.

### City gardeners

- City gardeners want the possibility to grow their own vegetables, flowers, etc. to ache ecological food and reduce their stress level.

### Businesses

- Businesses might want constructed 1th floor spaces to have space for business and shops.
- Businesses want affordable 1th floor rental prices to achieve spaces for business or shops

### The municipality

- The municipality wants to speed up town planning procedures to achieve to gain more citizens and tax incomes.
- The municipality wants to reach a positive balance between the costs of the infrastructure and the income of the town planning
- The municipality wants to do good quality town planning to achieve a socially attractive area.

### Citizens organisations

- Citizens organisations want a good image and quality for the area to achieve attractiveness and good selling and renting.
- Citizen organisations want safe and functional public spaces and blocks to achieve good quality of living for every age.

### People buying and renting houses

- New residents want the city to plan and maintain the area according to the demands and significant positive effect on the quality of life.
- New residents want a variety of size/ quality/prize of apartments to have possibilities to move to the area and within.

### The maintenance co.

- Maintenance co. wants good quality and long life expectancy to achieve loan costs
- Maintenance co. wants easy maintenance and machinery maintenance to achieve low costs.

### Project developers, building companies and land owners

- Project developers, building companies and land owners want to create a higher image to the area compared to the old area to speed up the selling process.
- Project developers, building companies and land owners want to maximise the volume of M2.
- Project developers, building companies and land owners want a flexible town plan to meet up with different demands.

### The radio station

- Radio station wants to have a lighted landmark if the link station can be saved.

### The church

- Church wants to have new type of participants to achieve active actions and to achieve positive social development.

### The Horses

- Horses want to run in Vermo and on riding paths to achieve their natural behaviour and good health.



STAVANGER KOMMUNE

# Appendix D - Deep Dive Sessions Stavanger



## Participants municipality

- Ingjerd Bratterud
- Hilde Uberg
- Anne Cecilie Lassa
- Hilde Blokkum
- Felicitas Heimann
- Ib Mikkelsen
- Kjerstina Særsten
- Anja Vik
- Aina Lunde
- Helene Vastveit

- Paal Kloster
- Espen Svendsen
- Svein Bjørn Søreide
- Nils Henrik Haaland
- Jan Magne Forseth
- Ernst Olsen
- Jostein Førland
- Maren Skadsem
- Olav Stav
- Torgeir Esig Sørensen
- Lise Muurholm Storås

## External participants

- Jarl Hoogstad
- Kåre Walvik
- Berit Andersson
- Dick Andersson

# Policy & Strategic Societal Ambitions

## Strategic ambitions

Which strategic ambitions are relevant for the city?

**Keep the city as international renowned for its cultural history and identity.**

- To see the stars from the city
- An attractive and safe city
- Keep its identity and atmosphere
- Clean air

**Everybody shall have a good and ‘green’ house to live in.**

- Energy savings
- Everybody shall have a good house to live in
- Nice green neighbourhood with activities
- ‘Green’ houses: roof, eco, etc.

**Provide good (connections to) all kind of facilities.**

- Good living area connected to schools, kindergarten and sport facilities
- Attractive sports facilities
- Different and exciting sports facilities
- Great schools
- Space for creativity, learning and doing
- Energy saving

**Providing attractive outside spaces for people to meet and be happy.**

- Attractive social meeting places
- Easy for everyone to go outside
- Good design in public spaces
- A green city
- Pocket parks
- Maintain green spaces
- A good city for all phases in life

**Provide high quality public buildings.**

- Well kept public buildings
- The best building maintenance city in Norway

**Be a smart and innovative city using renewable energy and energy saving solutions, applying smart and innovative solutions to create good experiences.**

- To be a smart city
- Different lighting
- Lights where people need it
- Save energy
- Use renewable energy
- Beauty and joy in the outdoor environment
- Extend lighting experiences such as the cathedral

**Becoming a ‘walk-able’ city where it is easy to reach facilities by public transport or bike/foot.**

- A better net for public transport, bikers and walkers
- An attractive public transport system
- Fewer cars in the city
- Better cycle routes
- Norway’s best cycle city
- A 100% bike-able and walk-able city
- Energy saving



STAVANGER KOMMUNE

# Ambitions for Vannassen

## Societal Needs

Which societal needs are relevant for the pilot area?

**Attracting new people by making it attractive with new lighting experiences (continuous and adaptive).**

- always people around
- light up nice trees with coloured lighting
- music/sound from loudspeakers
- lights that change during the year
- colourful lighting
- a place of activity
- lights that make you feel well at night, but take care of the biodiversity
- diverse forest
- bright when needed
- different colours of light on roads and other places
- light effects
- use of the water in the lighting project
- an attraction in itself
- art
- a hidden diamond in the city
- wow effect
- light in the forest (nice trees)
- beautiful trees
- adaptive light

**Improving the area for people already using it: facilities.**

- benches and tables
- nice toilets
- a trail in the forest
- go swimming
- beach for swimming
- good quality of the park
- shelter for the rain
- a clean lake where you can swim
- a creek
- toilets
- lights on the water
- improve facilities
- more places to sit
- shelter
- good, lighted trails, also to the nearby schools
- improve access: cycle path east/west
- better accessibility of the area
- big, open lawns
- welcoming entrances

**Improving the place for people already using it: activities.**

- fishing
- picnic
- barbecue
- activities for adults
- fire pit
- outdoor yoga
- more activities for all ages
- development for activities for all ages
- meeting place for people
- kids can use it all day/evening
- open and good overview
- a wow-attraction, something special for the area
- nearby activities for the residents

**Embracing the wildlife and taking care of nature as a unique place in the city.**

- experience nature
- silence
- different trees/flowers
- a bright place with a view on the fjord
- trolls in the forest!
- areas that aren’t park areas (but nature)
- natural
- hear the night animals
- spruce trees with tree huts for climbing
- flowers
- hiding places
- see the stars
- possibility to see wild life, deer
- smaller paths
- romantic walking places
- to see the stars even when the paths are lighted

**Increasing the feeling of safety by providing better lighting and making it more attractive.**

- feel safe
- perceived safety at night
- safe, but still mysterious
- social control through more activity

**Balancing an undisturbed, preserved nature and the ability to enjoy nature and learn from/in it.**

- Children want a varied wild life to achieve knowledge about nature.
- Teenagers want facts about nature, bird-life and animals to achieve more knowledge.
- Visitors want to have organised wildness (nature).
- Birds want good quality of the water to achieve a good place to be a bird.
- Visitors want better quality of the water for swimming.
- Teenagers want watching towers to study birds and too achieve better views.
- Birds want sheltered areas to avoid disturbance.
- Parks and road department want to take care of the nature experience for better health of the users.
- Birds want the lighting to be adapted to day-and-night rhythm to make it a good place to stay in the night.

**Meeting and socializing in a relaxing (and dry) environment.**

- The elderly want sitting facilities for groups to relax and talk with others.
- Residents want areas and spaces for calmness, relaxation and picnic.
- Children want shelters for rainy days and to eat.
- Event organisers want tables with benches to give better eating possibilities.
- The elderly need shelters for rainy days to stay dry.
- The elderly need social meeting points to get outside and meet each other.
- Event organisers want a roof to provide shelter for grilling and communicating.
- The elderly in wheelchairs want to use the sitting groups to socialise.



STAVANGER KOMMUNE

# Ambitions for Vannassen (continued)

## Societal Needs

Which societal needs are relevant for the pilot area?

**Enjoying a clean and well-lit environment all year and all day.**

- The elderly need good lighting all day, for all year use of the park.
- Handicapped people want good and nice entrance to the area to perceive it as a welcoming area for all.
- Handicapped people want good lighting to achieve safety for all.
- Dog owners want dogs on a leash to provide safety for all people.
- Parks and road department want right lighting for all people to feel safe.

**Having a variety of activities that frequently vary to make exercise and play outdoor attractive.**

- Teenagers want several running roads to achieve variation in training.
- Children want playing possibilities in the forest to achieve strength and balance.
- The elderly want equipment for exercising and training to achieve strength and better health.
- Handicapped people want equipments to be of use for everybody to achieve that everybody is equal.
- Teenagers want challenging activities in the forest to achieve strength and balance.
- Children want an attractive playground to achieve outdoor experiences and activities.
- Parks and road department want different areas for different activities to achieve to take good care of the users different needs.

**Having a well-maintained and good-accessible area that make you feel welcome.**

- Residents need road marking and lighting on the paths leading to the area.
- The elderly want easy access to the area to increase its use.
- Sporting and exercising people want good conditions of the paths to achieve good training facilities.
- Handicapped people want good and nice entrance to the area to perceive it as a welcoming area for all.
- Visitors want art and culture to create calmness and lighting can be art in itself.
- Visitors want the sculptures and art to be illuminated.
- Residents want the quality of maintenance increased on the road lights, vegetation and water.
- Dog owners want a lot of litter bins to achieve a clean area.

**Having good places for (larger) group activities (play, sports, socializing)**

- Sporting and exercising people want good areas for training activities to achieve that they can be active in (larger) groups.
- Children want areas for football and other ball games to achieve more activity.
- Children want more playing equipment that facilitate big groups to be able to play together.
- Event organisers want a scene to provide a better show and performance.



STAVANGER KOMMUNE

# Stakeholders for Vannassen

## Stakeholder Needs

Which societal needs are relevant for the stakeholders of the pilot area?

### Stakeholders for Vannassen

- Residents
- Families
- Handicapped people
- Elderly
- Elderly homes
- The park and roads department of the municipality
- Children
- Schools
- Kindergarten
- Teenagers (of adjacent schools)
- Students
- People exercising (football teams, fire departments, etc.)
- People sporting (runners, etc.)
- Bikers
- Dog owners
- Visitors
- Event organisers
- Political council
- Centre for former alcoholics
- Birds

### Residents

- Residents need road marking and lighting on the paths leading to the area.
- Residents want areas and spaces for calmness, relaxation and picnic.
- Residents want the quality of maintenance increased on the road lights, vegetation and water.

### Handicapped people

- Handicapped people want good and nice entrance to the area to perceive it as a welcoming area for all.
- Handicapped people want good lighting to achieve safety for all.
- Handicapped people want equipments to be of use for everybody to achieve that everybody is equal.

### Elderly

- The elderly want sitting facilities for groups to relax and talk with others.
- The elderly want easy access to the area to increase its use.
- The elderly need good lighting all day, for all year use of the park.
- The elderly in wheelchairs want to use the sitting groups to socialise.
- The elderly want equipment for exercising and training to achieve strength and better health.
- The elderly need shelters for rainy days to stay dry.
- The elderly need social meeting points to get outside and meet each other

### The parks and roads department of the municipality

- The parks and roads department want different areas for different activities to achieve to take good care of the users different needs.
- The parks and roads department want right lighting for all people to feel safe.
- The parks and roads department want to take care of the nature experience for better health of the users.

### Teenagers

- Teenagers want several running roads to achieve variation in training.
- Teenagers want watching towers to study birds and too achieve better views.
- Teenagers want challenging activities in the forest to achieve strength and balance.
- Teenagers want facts about nature, bird-life and animals to achieve more knowledge.

### Children

- Children want areas for football and other ball games to achieve more activity.
- Children want more playing equipment that facilitate big groups to be able to play together.
- Children want playing possibilities in the forest to achieve strength and balance.
- Children want an attractive playground to achieve outdoor experiences and activities.
- Children want a varied wild life to achieve knowledge about nature
- Children want shelters for rainy days and to eat.

### Sporting and exercising people

- Sporting and exercising people want good lighting to achieve safety as a user of the area in the dark period.
- Sporting and exercising people want good conditions of the paths to achieve good training facilities.
- Sporting and exercising people want good areas for training activities to achieve that they can be active in (larger) groups.

### Dog owners

- Dog owners want a lot of litter bins to achieve a clean area.
- Dog owners want dogs on a leash to provide safety for all people.

### Visitors

- Visitors want better quality of the water for swimming.
- Visitors want art and culture to create calmness and lighting can be art in itself.
- Visitors want the sculptures and art to be illuminated.
- Visitors want to experience wildness (nature).

### Event organisers

- Event organisers want a scene to provide a better show and performance.
- Event organisers want a roof to provide shelter for grilling and communicating.
- Event organisers want tables with benches to give better eating possibilities

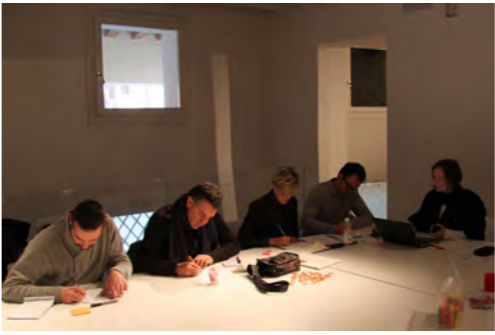
### Birds

- Birds want sheltered areas to avoid disturbance.
- Birds want good quality of the water to achieve a good place to be a bird.
- Birds want the lighting to be adapted to day-and-night rhythm to make it a good place to stay in the night.



STAVANGER KOMMUNE

# Appendix E - Deep Dive Sessions Bassano del Grappa



## Participants municipality

- Adriano Ferraro
- Marta Krakowiak
- Paolo Montagna
- Roberta Michelon
- Stefano Cimatti
- Andrea Zonta
- Franco Barone
- Ivo Zancarli
- Marco Meggiolaro

## External participants

- Mr. Adamo Bellini
- Mr. Riccardo Colleghin
- Ms. Bruna Benesso
- Mr. Leopoldo Dalla Gassa

# Policy & Strategic Societal Ambitions

## Strategic ambitions

Which strategic ambitions are relevant for the city?

<b>Sustainable lighting plan</b> <ul style="list-style-type: none"><li>improve lighting quality</li><li>Bassano is the first to have a sustainable lighting plan</li><li>become the leader in lighting development</li></ul>	<b>Sustainable energy plan</b> <ul style="list-style-type: none"><li>Think wisely about the way we spend out money; sustainability and energy use.</li><li>improve sustainability in energy use</li><li>decrease energy use</li></ul>	<b>Sustainability in environment</b> <ul style="list-style-type: none"><li>improve environmental awareness</li><li>increasing number of volunteering groups</li><li>regulations for green areas: in areas under development plans required for cycle routes, waste management parks, etc.</li></ul>	<b>Sustainability in buildings</b> <ul style="list-style-type: none"><li>improve energy consumption of buildings</li><li>National required labelling of buildings is C, Bassano requires minimum A</li><li>improve energy use in historical buildings</li><li>all restored buildings must include panels for electricity and water use.</li></ul>	<b>Improve the identity and awareness of the city and area to attract more people and make them stay longer</b> <ul style="list-style-type: none"><li>improve connectivity for tourists</li><li>add value to the area</li><li>offer value and services to people to come and stay</li><li>highlight the features of the city</li><li>to achieve more than good lighting: e.g. sustainable mobility. New systems can make use of camera's or mobile devices.</li></ul>	<b>Improve cooperation in developing the area with local, international and commercial partners</b> <ul style="list-style-type: none"><li>In these long time projects find different ways to work, cooperate and involve partners (also for maintenance)</li><li>improve local economic standards</li><li>create new markets</li><li>cooperate with commercial associations (regional and national)</li><li>improve the business and shops in the old city centre</li><li>attract investors</li><li>create area identity</li></ul>	<b>Sustainable mobility plan</b> <ul style="list-style-type: none"><li>reduce car mobility</li><li>reduce energy use in mobility</li><li>create more cycle paths</li><li>facilitate access for handicapped people</li></ul>
<b>Bassano as a hub for events (cultural &amp; exhibitions)</b> <ul style="list-style-type: none"><li>important events for tourists and habitants, e.g. live chest play, historical bicycle race, cultural festival.</li></ul>	<b>Creating better &amp; attractive services (including lighting) with special attention to the historic centre.</b> <ul style="list-style-type: none"><li>attractive and tailored lighting where and when needed</li><li>extension of services to all city area (ADSL, optical fibre, methane gas for heating)</li><li>intelligent lighting: link the innovative technology (LED) to lighting points that fit the historical centre</li></ul>	<b>Improving the use of sustainable and energy efficient solutions</b> <ul style="list-style-type: none"><li>improvement and implementation of energy policies in view of the 2020 priorities</li><li>more attractive city with more responsible and intelligent use of energy</li><li>Bassano as a leader and best practice provider for neighboured cities</li><li>use of new and energy efficient solution for buildings, lighting devices</li></ul>	<b>Keeping the city alive to attract tourism and business (shops)</b> <ul style="list-style-type: none"><li>city that attracts tourists through the innovative lighting solution applied at the historical attractions</li><li>reinforce territorial marketing</li><li>revitalization policies for the old town to keep it vivid, alive and commercially active</li><li>improvement of city touristical image; the historical and natural paths</li></ul>	<b>Improving the internal processes and organisation for public lighting procurement</b> <ul style="list-style-type: none"><li>more simple and faster procedures</li><li>a manager for the city old town; integration of all: projects, architecture, cooperation public and private</li><li>to link and harmonize the commercial (private) lighting with the public lighting solutions.</li><li>change the way of working, becoming more entrepreneurial. Just do things, change things to achieve something</li></ul>	<b>Improve infrastructure and attractions for tourists</b> <ul style="list-style-type: none"><li>slow food tourism</li><li>creation of agri-food centre as a hub in Bassano</li><li>to create nice pedestrian and cycle paths with the right lighting solutions</li></ul>	<b>create a more homogeneous and unified city</b> <ul style="list-style-type: none"><li>improve the quality of services for all residents</li><li>light in all parts of the city</li></ul>



# Ambitions for Historical old town

## Societal Needs

Which societal needs are relevant for the pilot area?

**Highlighting of and providing information on monumental buildings, also for touristical attractiveness**

- lighting to match with the architecture
- flexible lighting to change over the day and evening and night
- panoramic views to attract more visitors
- create temporary lighting to highlight the monuments and events
- guide residents and tourists to attractions and events
- keep building façades good renovated to keep the historical character
- ensure right and tailored monumental lighting to valorise cultural heritage
- Extraordinary highlighting (touristical)
- a need for information (on history, directions, etc.)
- information on monuments

**Provide a good environment for businesses and commercial activities (restaurants and shops)**

- highlight opportunities
- use lighting for marketing purposes
- create good commercial environments and opportunities
- sell the image of the city

**to create a sense of belonging by connecting to the history of the town through events and a good atmosphere**

- need for thematic events to attract people and to link residents to their heritage
- tell the story of the bridge to the young people
- provide a good atmosphere and sense of belonging

**Pay more attention to pedestrians and provide them with good visibility, safety, routing and guidance**

- guidance and routing
- functional lighting for citizens
- visibility and safety
- good quality pedestrian paths
- improve surfaces of pedestrian paths
- guidance to underground parking grounds and give the surface back to the pedestrians
- lighting to guide the city users towards its cultural events and pedestrian paths
- make the centre accessible for people in wheelchairs and mothers with strollers

**Creating a coherent environment between squares and the bridge in the historical centre**

- it is not equal everywhere
- create a coherent and integrated area
- integrate and connect all areas to the main square and bridge

Consumers want a more homogeneous commercial system, especially for time spend and methods to pay (bank-o-mat).

**People want better quality of lighting for different activities**

- Residents (all) want less environmental pollution (CO2, noise, light).
- The astrophysics association wants better organisation and quality of lighting to have a better view on the stars for student and residents.
- The astrophysics association wants to better regulate private lighting (next to the public lighting).
- Residents (families and elderly) want good access to green areas for multiple purposes.

**People want to know the activities and attractions unique in the area to come here and to have a good time here.**

- Tourists want to find the nice places, musea and cultural events easily to achieve a good time in Bassano.
- Tourists wan to know what is happening in the city to achieve time well spend.
- Tourists want to immerse in the local culture and habits to experience the unique culture.
- Shop owners and businesses want territorial marketing in Italy and abroad.

**People want easy access to the cities facilities by car, public transport, foot and bike**

- Shop owners and businesses want better entrance roads and more parking facilities to improve access to the city.
- Workers want free parking to reach their job.
- Residents (students and elderly) want frequent public transportation to move access the city centre.
- Workers want efficient public buildings.
- Workers want more bus stops.
- Workers want to merge professional obligations to family duties in the same place (kindergarten, schools, etc.)
- Consumers want to park easily and for free near shops.
- Consumers want easy transfer from A to B with their purchased items.
- Improve mobility in the city centre
- Accessibility of public areas (and buildings)

**People want less bureaucracy and more efficient, scientifically based decision making**

- The municipality want s to speak more to the citizens directly to achieve better understanding of their needs.
- The municipality wants less bureaucracy and more efficient procedures to achieve time better spend for the citizens.
- The municipality wants to collaborate better between departments and other stakeholders to achieve better organisation.
- The environmental agency wants to ask consulting services to the agencies (instead of private agencies) to achieve agreements in a faster way.
- The environmental agency wants the consultancies to set targets and verify results to achieve good quality decisions and scientific consistency of the interventions.
- The environmental agency wants proactive communication between administrations and citizens.
- Shop owners and businesses want incentives/grants to recover not maintained buildings.



# Stakeholders for Historical old town

## Stakeholder Needs

Which societal needs are relevant for the stakeholders of the pilot area?

**Stakeholders for Historic old town**

- Residents in he city centre
- Families
- Young people
- Elderly
- Students
- Tourists
- Police
- Owners of monuments
- Shop owners
- Astrophysics (looking at the stars)
- Business owners in the city centre
- Consumers
- Workers
- Environmental & sustainability protectionists
- Municipality
- Policy makers

**Residents in the city centre**

- Residents (all) want less environmental pollution (CO2, noise, light).
- Residents (students and elderly) want frequent public transportation to move access the city centre.
- Residents (families and elderly) want good access to green areas for multiple purposes.

**The municipality**

- The municipality want s to speak more to the citizens directly to achieve better understanding of their needs.
- The municipality wants less bureaucracy and more efficient procedures to achieve time better spend for the citizens.
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**Tourists**

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- Tourists want to immerse in the local culture and habits to experience the unique culture.

**ARPAV (Agenzia Regionale Protezione e Preventionione Ambientêle Veneto)**

- The environmental agency wants to ask consulting services to the agencies (instead of private agencies) to achieve agreements in a faster way.
- The environmental agency wants the consultancies to set targets and verify results to achieve good quality decisions and scientific consistency of the interventions.
- The environmental agency wants proactive communication between administrations and citizens.

**Shop owners and businesses**

- Shop owners and businesses want territorial marketing in Italy and abroad.
- Shop owners and businesses want better entrance roads and more parking facilities to improve access to the city.
- Shop owners and businesses want incentives/grants to recover not maintained buildings.

**Consumers**

- Consumers want to park easily and for free near shops.
- Consumers want a more homogeneous commercial system, especially for time spend and methods to pay (bank-o-mat).
- Consumers want easy transfer from A to B with their purchased items.

**Workers**

- Workers want free parking to reach their job.
- Workers want efficient public buildings.
- Workers want more bus stops.
- Workers want to merge professional obligations to family duties in the same place (kindergarten, schools, etc.)

**Astronomi e associazioni astrofici**

- The astrophysics association wants better organisation and quality of lighting to have a better view on the stars for student and residents.
- The astrophysics association wants to better regulate private lighting (next to the public lighting).



# About the TU/e Intelligent Lighting Institute

The TU/e Intelligent Lighting Institute (ILI) was established in 2010 to investigate novel intelligent lighting solutions that will become within our reach by the large-scale introduction of LED technology, with a special emphasis on how these new solutions might affect people. We do this in collaboration with departments of the TU/e and partners in the public and private sectors. The lighting research performed at ILI is producing unique know-how and a technological head start for the participating parties, the Brainport Region, and as part of Europe.

## Research

ILI's mission is to search for revolutionary lighting solutions. It does this using an interdisciplinary approach that takes society as its laboratory. Well-being and sustainability are given top priority in all facets of its research and resonate throughout all of the strategic programs.

## Five lines of research

The lines of lighting research at ILI have been created to address concrete issues faced by society. This approach is also known as 'design for need'. The institutes research programs tackle practical matters:

- The Brilliant Streets research program aims at future outdoor lighting systems
- Researchers in the Sound Lighting program explore other applications of light that could be beneficial to health and well-being
- Computational methods for illumination optics and rendering of light patterns
- If researchers in the No Switches Allowed program get their way, radical change is on the way
- The Open Light program explores all of the possibilities of a particular technology, without any preconceived application ideas

## Brilliant Streets

The Brilliant Streets research program aims at future outdoor lighting systems. Outdoor lighting is there to enhance traffic safety and to increase feelings of comfort and safety for people on the street. This goal remains, but opportunities for advanced applications are plenty because of technological advantages: new lighting technology (LED), advanced sensing, wireless communication and embedded processing.

These new technologies make interactive systems possible, and allow for precise control of lighting. It is, however, not known how people experience adaptive lighting and what this brings about emotionally. The challenge is to use technological advances to improve user experience while minimizing energy use. Brilliant Streets regards outdoor lighting systems and one of the subsystems of a Smart City. Sensing and communication capabilities will be used in the future to enhance city services.

## LightHouse

The ENIGMA project is carried out by LightHouse, the solution partner of ILI. LightHouse aims to disclose the knowledge of the ILI research programs for society. This is realised by applying the knowledge, methods and designs in intelligent lighting solutions through concrete projects for external organisations.



dr.ir. Elke den Ouden

Program manager Brilliant Streets & Strategic director LightHouse

e.d.ouden@tue.nl



dr.ir. Rianne Valkenburg

Value producer LightHouse

a.c.valkenburg@tue.nl

For more information:

[www.tue.nl/ili](http://www.tue.nl/ili)

[www.ili-lighthouse.nl](http://www.ili-lighthouse.nl)

[www.facebook.com/ililighthouse](https://www.facebook.com/ililighthouse)



*/ solution partner of the Intelligent Lighting Institute at TU/e*

This report presents the results of the Deep Dives on Societal Needs carried out as part of the ENIGMA FP7 Pre-Commercial Procurement project (Work package 1, task 1.2). The Deep Dives were done by the Intelligent Lighting Institute of the Eindhoven University of Technology, partner in the ENIGMA project.

In the participating cities of Eindhoven, Malmö, Espoo, Stavanger and Bassano del Grappa interviews and workshops were conducted to identify the strategic ambitions and societal needs for the selected areas for the pilot projects. The results will be used to define a joint ambition for the pre-commercial procurement tender that will be issued as part of the ENIGMA project.

For more information on the ENIGMA project, please visit: [www.ili-lighthouse.nl/Enigma.html](http://www.ili-lighthouse.nl/Enigma.html)

Eindhoven, 19 December 2013

