ReNormAction!

IBE-BIV seminar 10 November 2022

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Obtrusive light

Bénédicte Collard

IBE-BIV Seminar 10 November 2022

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BELGISCH INSTITUUT voor VERLICHTINGSKUNDE
INSTITUT BELGE de l'ECLAIRAGE
CIE NATIONAL COMMITTEE – NBN SECTOR OPERATOR

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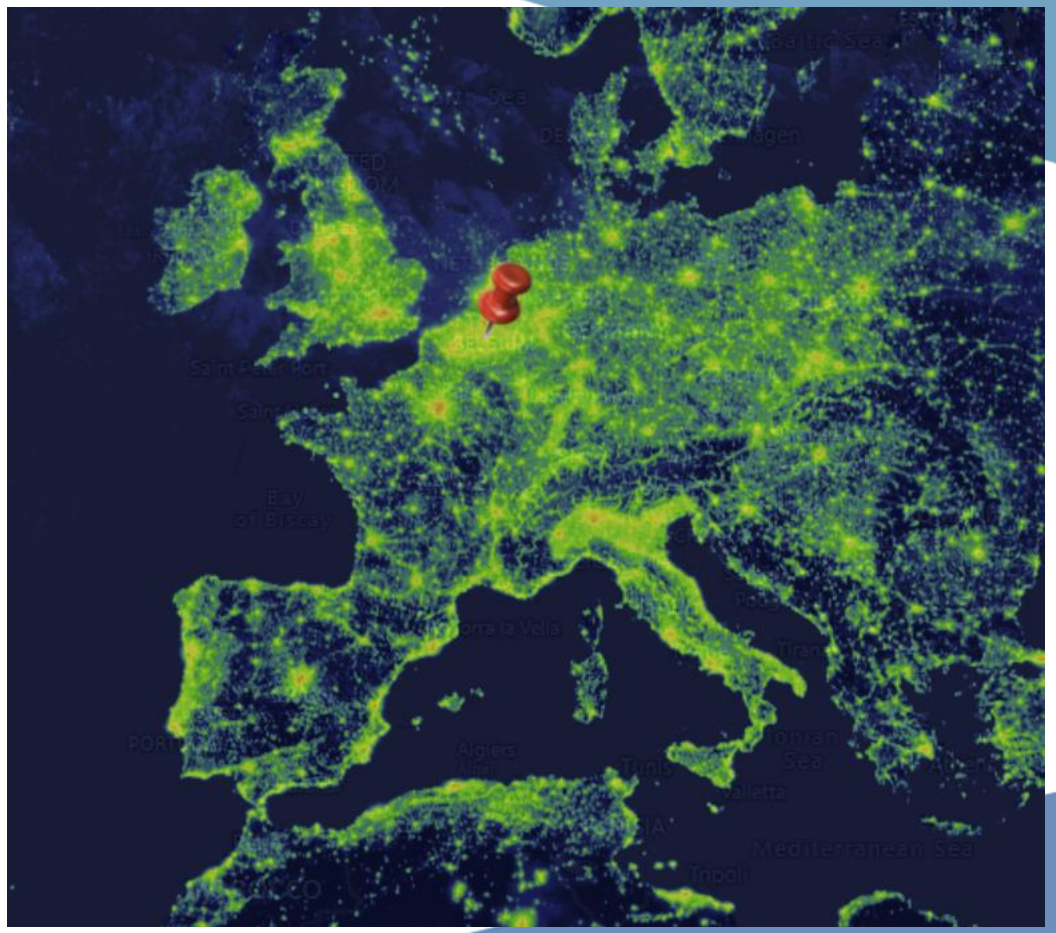
Obtrusive light – Status and challenges

1. Awareness & willingness to act
2. The challenges of standardization
3. Technical solutions
4. Environmental knowledge
5. Design method
6. Synthesis



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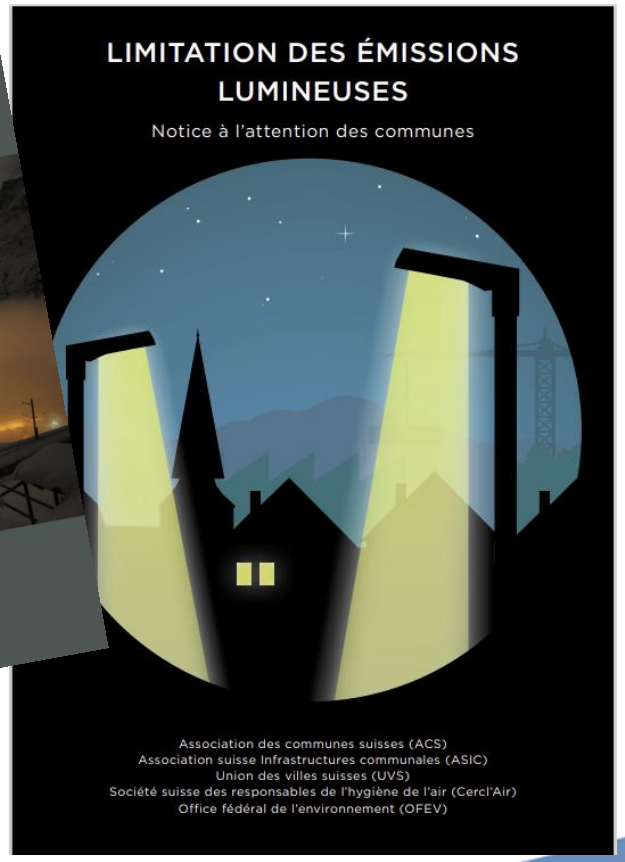
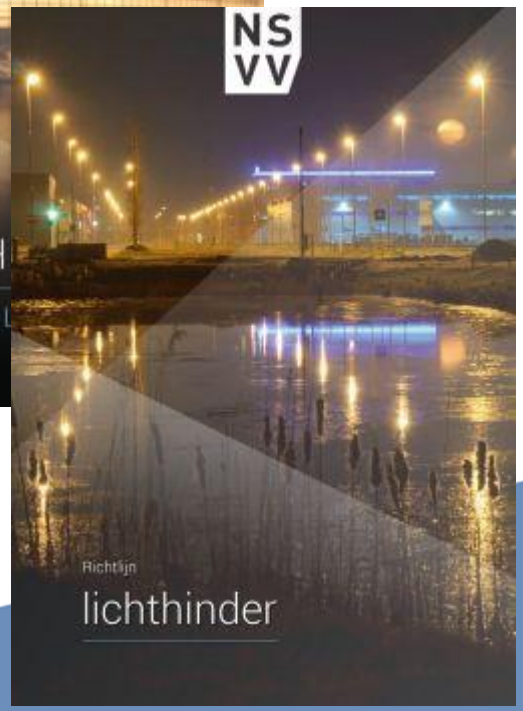
1. Awareness & willingness to act?

In Switzerland, the Netherlands, France, …





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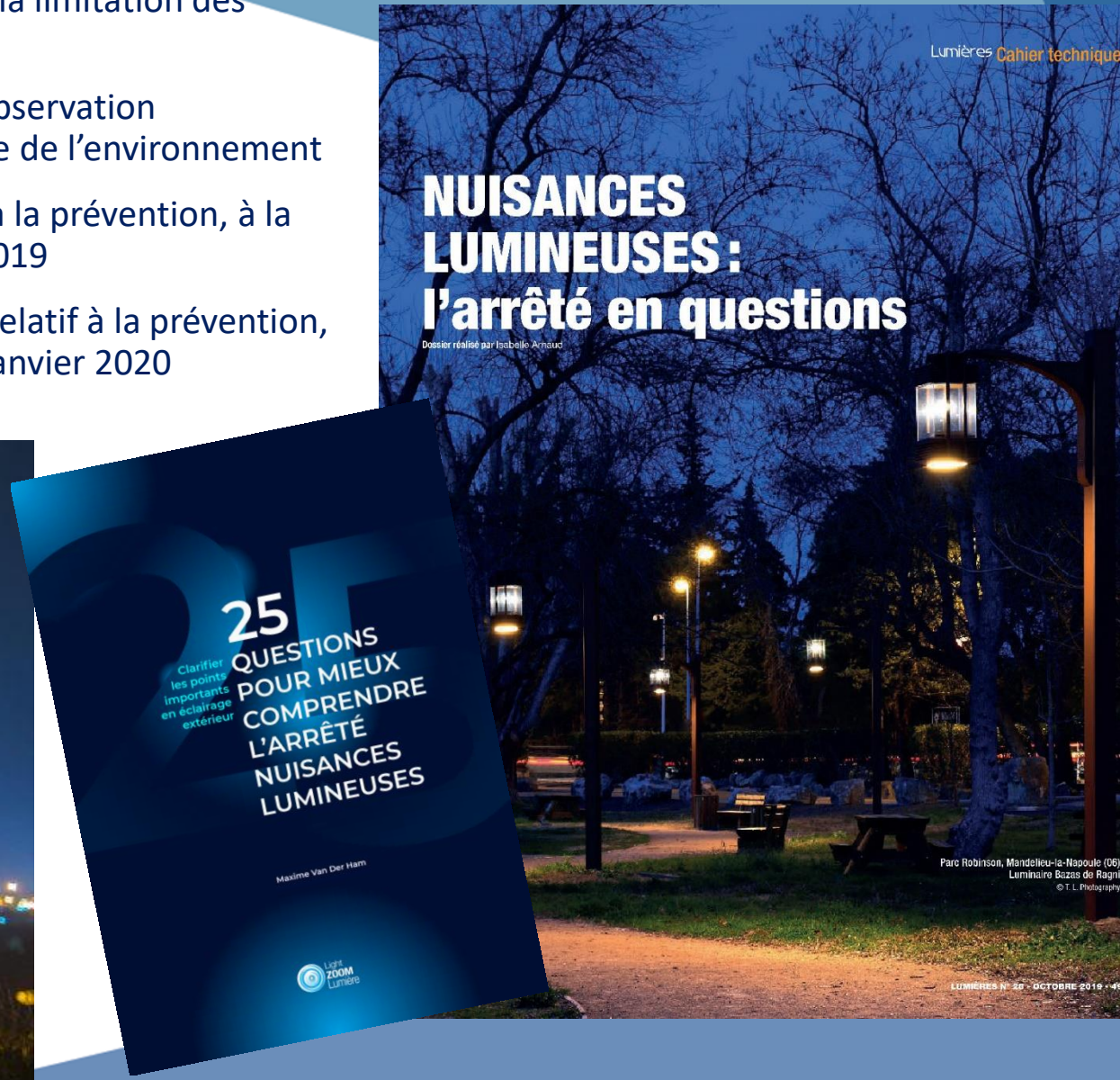
- Arrêté du 27 décembre 2018 relatif à la prévention, à la réduction et à la limitation des nuisances lumineuses
- Arrêté du 27 décembre 2018 fixant la liste et le périmètre des sites d'observation astronomique exceptionnels en application de l'article R. 583-4 du code de l'environnement
- Arrêté du 29 mai 2019 modifiant l'arrêté du 27 décembre 2018 relatif à la prévention, à la réduction et à la limitation des nuisances lumineuses, paru le 29 juin 2019
- Arrêté du 24 décembre 2019 modifiant l'arrêté du 27 décembre 2018 relatif à la prévention, à la réduction et à la limitation des nuisances lumineuses, paru le 1er janvier 2020



afe
Association française de l'éclairage
Strasbourg.eu
Les Ma 12 et Me 13 octobre 2021
à Strasbourg
#JNL2021
Les journées nationales de la lumière de l'AFE

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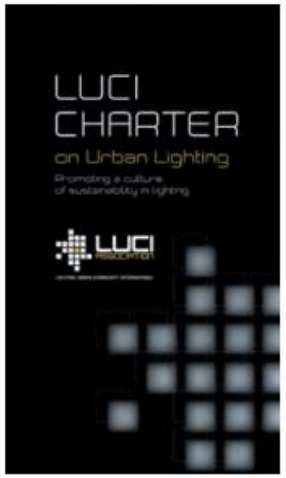
LUCI ASSOCIATION 20 YEARS

LIGHTING URBAN COMMUNITY INTERNATIONAL

The LUCI Charter on Urban Lighting marks the network's commitment to sustainable development.

The Charter addresses challenges common to all, including: energy efficiency, improvement of the quality of life, reduction of light pollution, maintenance, recycling, the cultural and social dimensions of light. Above all, it provides a reference framework within which cities can develop their own sustainable lighting strategies.

The Charter is the product of contributions from more than 40 cities around the world. It was launched in September 2010, after over a year of work led within the network by the City of Leipzig (Germany).



In 2021, two new member cities, Kazan (Russia) and Vilnius (Lithuania), signed the LUCI Charter, joining over 60 cities committed to implementing public lighting policies that respect sustainable urban development.

The Charter has been translated and is available in four languages: FR/EN/DE/SP. See the list of over 60 cities that have signed or committed to sign the charter here

Thus, we the member cities of LUCI, hereby declare our commitment to taking into consideration the following issues in our lighting policies:

2.1 Optimising energy consumption

Urban lighting is a major consumer of electric power in our cities and therefore contributes significantly to their carbon dioxide emissions. The climate change challenge can be dealt with only through utilising new intelligent approaches and technologies, which minimise power consumption while improving the light quality in our cities.

Two levels of CO_2 emissions must be taken into consideration:

ENERGY SOURCES

To reduce the environmental impact of urban lighting to a minimum, cities must promote and use renewable energy sources (solar energy, wind energy, energy derived from plants (biomass) or from water) wherever possible rather than energy derived from fossil fuels. Cities should also promote research in this field.

OPERATING ENERGY

Urban lighting must contribute to energy efficiency objectives through the implementation of innovative strategies and concepts developed in urban lighting design as well as through up-to-date technologies applied to lighting equipment and management systems.

2.2 Minimizing the environmental impact of all operating and production aspects

Cities must take into consideration the entire life cycle of materials: this includes all the resources that are needed for the production of lamps, luminaires and columns, as well as the cost of their transportation.

At the end of the lighting's life cycle, all products used must be disposed of without risk for man and the environment. Recycling must be set as a priority in all cities.

2.3 Maintenance and quality control

Maintenance is one of the most important responsibilities of cities and is vital for energy efficiency. The financial, human and material cost and impact of maintenance must be identified at the beginning of any project and a maintenance plan prepared. Lighting designs should ensure that installations are easily accessible for maintenance and easy to maintain. Cities should also take responsibility to control the quality of their lighting and its photometrical characteristics.

2.4 Reducing light pollution

Light pollution obscures the stars in the night sky for city dwellers, interferes with astronomical observatories, and, like any other form of pollution, disrupts ecosystems and has adverse health effects.

Two main aspects related to light pollution should be taken into consideration by cities:

HUMAN HEALTH AND BIODIVERSITY

Urban lighting strategies must take into account the potential nuisances of intrusive or disruptive lighting. Beyond the feeling of discomfort, disturbing the natural light-dark cycle can create a malfunction of the circadian rhythm of humans, animals and plants and thus have a negative impact on their health and the environment. Cities must aim at creating comfortable light environments and protect darker areas.

PRESERVING THE DARK SKY

Due to light pollution the stars in the night sky have become invisible in many metropolitan areas. As a result of poor lighting design and improper products, waste light is emitted towards the sky instead of illuminating the areas to be lit. The use of luminaires with improved photometrics that limit waste light, careful lighting design and sensitive handling of urban lighting can reduce light pollution and help make starlight visible again.

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LUCI ASSOCIATION 20 YEARS

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Special Mention: Light+Darkness in the City – City of London Corporation

"The Jury wanted to give a special mention to the vision developed by the City of London for its firm commitment to incorporating an approach in which light and darkness are balanced to meet both the functional and aesthetic needs."

LUCI CITIES & LIGHTING AWARDS

Pour les années académiques 2019-2020 et 2020-2021, l'IBE n'a pas attribué le prix annuel IBE pour les travaux de fin d'études. Une mention honorable a toutefois été attribuée à **Killian Forton**, de l'UCL, pour son travail intitulé **« Le maillage noir : manifeste pour un paysage moins anthropocentré ».**

Killian Forton
Mention honorable pour Killian Forton

LIÈGE université Gembloux Agro-Bio Tech
heCh CHARLEMAGNE
ULB Faculté d'Architecture La Cambre Hor

ETUDE DE LA POLLUTION LUMINEUSE DANS LE CADRE DE LA CREATION D'UNE TRAME NOIRE. APPROCHE TRANSVERSALE POUR LA VALORISATION DES PAYSAGES NOCTURNES.

LE CAS DU PARC NATUREL BURDINALE-MEHAIGNE, WALLONIE

Charlotte ANGERAND

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1. Awareness & willingness to act?

For more than 10 years, annual increase of more than 2% worldwide in the luminosity of the Earth's night. Jevons paradox (Rebound effect).

The more technology allows us to reduce consumption for one use, the more we multiply the number of uses.

Besides, due to LED, greater sky glow effect, related to wavelenghts < 500 nm.

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2. The challenges of standardization

2.1 Clarification of concepts

- Light pollution >< Obtrusive Light?
- ALAN (Artificial Light @ Night) >< Sky glow?
- Only during night or also during daytime? (Switzerland mentions daytime too – daylight modification due to buildings – e.g. sun reflection)
- Pollution or nuisance?

2. The challenges of standardization

2.1 Clarification of concepts

Light pollution : the sum total of all adverse effects of artificial light

Obtrusive light : spill light which, because of quantitative or directional attributes, gives rise to annoyance, discomfort, distraction, or a reduction in ability to see essential information such as transport signals

IBE-BIV

2. The challenges of standardization

2.1 Clarification of concepts

Pollution or nuisance? Do the effects disappear immediately if switched off?

- Human beings: sleep disturbance - **?**
- Human beings : glare, loss of visibility - **NUISANCE**
- Fauna and flora: impacts on ecosystems - **?**
- Astronomers: loss of visibility of the celestial vault – **NUISANCE**

Sky glow = light reflection on **air pollution**

IBE-BIV

2. The challenges of standardization

2.2 Openness to technological developments

A.o. adaptive lighting – TR 13201-1

The use of adaptive lighting can provide significant reduction in energy consumption, compared with operating the normal lighting class throughout the night. It can also be used to reduce energy consumption by reducing the light output of the light source to the maintained value when the installation is clean and the light sources are new.

Where the pattern of variation in parameter values is well known, such as from a record of traffic monitoring stations (TMS) and weather stations (AWS) on traffic routes, or can be reasonably assumed, as in many residential areas, a simple time based control system may be appropriate.

In other situations, an interactive control system linked to real-time data may be preferred. This approach will permit the normal lighting class to be activated in the case of road works, serious accidents, bad weather or poor visibility.

IBE-BIV

2. The challenges of standardization – EN13201

3.1.1
~~normal~~ ~~designed~~ **lighting class**

class with the maximum value of average luminance or illuminance at any period of operation
Note to entry Designed lighting class may also be referred to as normal lighting class
Note 2 to entry In adaptive lighting installation this is the condition for the most onerous situation

3.1.2
operational lighting class
class relevant the real needs after the risk assessment, with the weighting values (WVs) defined according to the actual or scheduled condition

3.x
operational lighting level
actual level of average luminance or illuminance at any period of operation

3.2
adaptive lighting
temporal controlled changes ~~in luminance or illuminance~~ in the lighting system installation in relation to traffic volume, time, weather or other parameters

Note to entry This change in luminance and/or illuminance levels may be due to a general variation of the luminous flux of the sources or to an adaptive photometrical distribution within the luminaires.

3.2.1
actual controlled lighting
temporal controlled changes in luminance and/or illuminance and/or emitted spectrum in relation to traffic volume, time, weather or other parameters which are continuously monitored in short time steps according and executed accordingly to real conditions.

Note to entry Monitoring of parameters may start before the beginning of the operation of lighting installation

Note to entry It may be recommended to combine scheduled and adaptive lighting. For example, the scheduled lighting could be the back-up recovery in case of failure of the adaptive lighting.

3.2.2
scheduled lighting
temporal controlled changes in luminance and/or illuminance and/or emitted spectrum according to the evaluation of actual condition given by the designer during the risk assessment.

Quantity
Spectrum
Distribution ?

q) nuisance by light intruding into properties. Some reduction of intrusive light can be obtained by selecting an appropriate optical system or accessory to reduce the light in the direction of properties ~~and/or by reducing source power;~~ and / or by reducing the luminous flux of the luminaire

IBE-B...

CEN/TR 13201-1:~~2014~~ 2022 (E)

8 Adaptive lighting

Note to entry according to the type of monitored data's and the size of the adaptive lighting installation, it could be recommended to consider an integration period or a delay before adapting the lighting installation.

Lighting classes may change within the dark hours depending on the different application and environmental conditions. Thus, requirements and recommendations for lighting can be adapted during these periods.

Beyond the rated lighting class, adaptive lighting provides the opportunity to respond to changing environmental parameters and to define alternative lighting classes for specific periods of time, provided that the lowest lighting class is not already in use. Thus, for example, energy can be saved, and the environment can be relieved by less stray light. In addition, adaptive lighting can be applied if the conditions regarding the necessary light distribution on the traffic area or for adjacent areas change. Examples of its application can be found in Annex XX.

By adjusting the parameters and thus the weighting values, a new lighting class may be determined for a specific period in time, using the same tables as for the design lighting classes. This new lighting class remains valid until one or more parameters change significantly. Then a different lighting class adapted to the current conditions can be used. Instantaneous changes in the subsequent operating lighting level by more than a factor of 2,5 is not recommended. A corresponding adaptation of the eye should be observed, and the change may also be continuous by means of a control or regulation.

When using adaptive lighting, additional care should be taken to ensure that a reduction or increase in the average lighting level does not cause the quality criteria of the specified M, C or P lighting classes to fall below the specified values. A reduction of the luminous flux of each light source by the same amount is the recommended method.

The following parameters, among others, can be considered for adaptive lighting, as long as they have no direct impact on the safe use of the traffic area:

- speed of road users;
- traffic volume;
- traffic density;
- composition of the traffic (traffic type);
- parked vehicles;
- luminance of the surroundings;
- visual guidance;
- facial recognition;
- weather conditions;
- legal or environmental influences.

2. The challenges of standardization – NBN L18-004

5 Exploitation nocturne

Sauf indication contraire, les classes déterminées ne valent que pour les heures d'obscurité.

Dans un contexte de saine gestion énergétique et de préservation de l'environnement, il est recommandé au gestionnaire de voirie ou à l'auteur de projet de recourir à un éclairage régulé, tenant compte des caractéristiques variables de l'espace public concerné en période d'exploitation nocturne.

En effet, les paramètres ayant amené à la sélection de la classe d'éclairage maximale peuvent varier durant la nuit (exemples : composition et densité du trafic, niveau lumineux ambiant, conditions météorologiques, zone accidentogène, zone sensible d'un point de vue environnemental, ...).

Cette régulation de l'éclairage se concrétise notamment par le recours au dimming, voire à l'extinction de l'installation.

Cette régulation peut s'étendre à des variations de photométrie des appareils d'éclairage ou de spectre (température de couleur), à condition que les exigences normatives soient rencontrées.

Deux possibilités sont à distinguer au niveau du dimming :

- Celle d'un dimming prédéfini sur base d'horaires : dans cette situation, le gestionnaire de voirie ou le responsable de projet peut adapter le niveau d'éclairement / de luminance de la voirie en effectuant une diminution de trois classes d'éclairage au maximum. Cette décision doit tenir compte de paramètres complémentaires tels que le sentiment d'insécurité ;
- Celle d'un dimming adaptatif, en temps réel ou temps quasi réel, par suite d'une variation du trafic, de la météo, … ou de toute autre donnée pertinente monitorée en continu et intégrée sur des périodes de temps réduites. À titre d'exemple, on peut citer la régulation de l'éclairage sur base de détecteurs de présence.

Quantity
Spectrum
Distribution

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2. The challenges of standardization – NBN L18-004

Recommandations :

- L'abaissement du niveau de lumière doit tenir compte des impositions techniques liées aux sources et auxiliaires de l'installation d'éclairage.
- L'abaissement du niveau de lumière doit être progressif, de sorte que l'utilisateur puisse difficilement le percevoir. L'effet psychologique de la réduction de l'éclairage public sur les utilisateurs est ainsi minimisé. Cela peut se concrétiser par le recours à des paliers / niveaux intermédiaires.
- Le choix de la gradation doit être considéré sur la base de plusieurs paramètres (présence de piétons et / ou de cyclistes à côté des voitures, congestion routière, utilisation de la voirie, conditions météorologiques, etc.).
- L'extinction complète de l'éclairage public pendant les heures creuses peut également être envisagée.
    - Celle-ci doit être envisagée avec une grande prudence.
    - Les carrefours, rond-point, giratoires et passages piétons peuvent être dimmés, dans la mesure du possible ils ne doivent pas être complétement éteints.
- Le retour au niveau lumineux maximal ou l'augmentation du flux lumineux peut être effectué, localement ou à distance, dans des circonstances spécifiques (intempéries, catastrophes, …).
- Les stratégies de dimming prédéfini et de dimming adaptatif peuvent être combinées, le dimming prédéfini pouvant par exemple servir de stratégie de repli en cas de défaillance du dimming adaptatif.
- Dépendant du type de données monitorées et de la taille de l'installation d'éclairage faisant l'objet d'un dimming adaptatif, il peut être recommandé de considérer une période d'intégration des données ou un délai avant modification des niveaux de lumière. Dans ce cas, le contrôle « en temps réel » est en fait un contrôle en « quasi-temps réel ».

La vérification de la pertinence du régime d'exploitation nocturne - et plus globalement de la performance énergétique de l'installation proposée – doit se faire conformément à la norme NBN EN 13201-5. Dans ce contexte, certaines particularités belges sont reprises en Annexe B de ce document."

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2. The challenges of standardization

2.3 Measurements

- From the ground – luminancemeter, … - V(λ) ➔ related to the International Measurement System (& human eye / scotopic!)
- From the sky – no correction by photopic filters – often pas de correction avec des filtres photopiques – souvent RGB camera // Lots of different measurement methods ➔ Non-comparable, uninterpretable results

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2. The challenges of standardization

2.3 Measurements

Étude déclassifiée de la seconde Guerre Mondiale

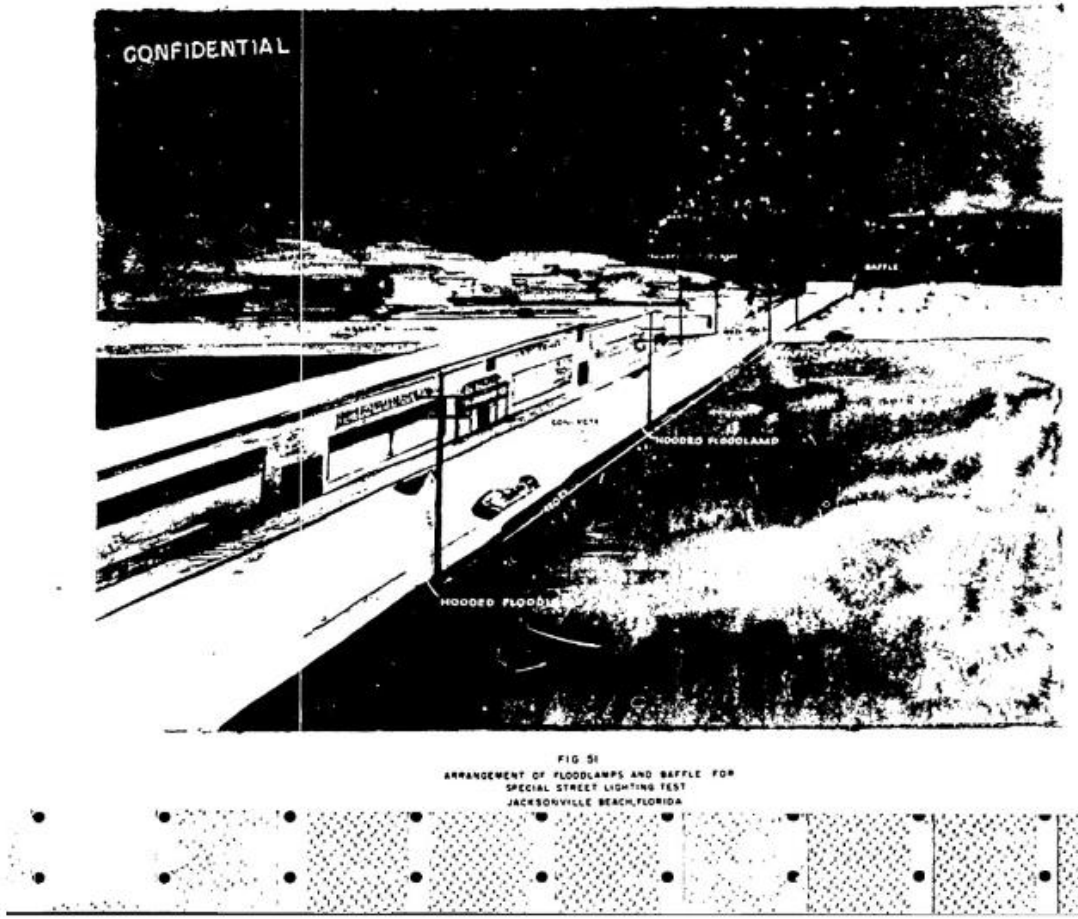
Étonnement, l'une des plus anciennes études se trouve dans ce rapport récemment déclassifié issue de la seconde Guerre Mondiale (en page 1 du Syllabus).

En 1943, l'Armée américaine cherchait à identifier les raisons de la luminance artificielle du ciel. Pourquoi ? Elle permettait aux sous-marins ennemis de repérer plus facilement les ombres des navires au large des côtes illuminées.

Méthode basique mais efficace. Seule l'armée était capable de mobiliser suffisamment d'hommes pour gérer et faire respecter les allumages/extinctions. La participation de l'éclairage public à l'illumination de la voute céleste fut alors établie à 53%. Elle généra les premières prescriptions « de bon sens » et qui restent toujours d'actualités (limitation des flux perdus, éclairage lorsque nécessaire...).

Point Pleasant & Jacksonville beach (1943) : 53% due to streetlighting

À Point Pleasant (NJ) et Jaksonville Beach (FLA) deux villes de la cote est des USA, l'armée avait donc étudié la pollution lumineuse grandeur nature. Elle avait allumé et éteint successivement les différentes sources de lumière : éclairage public, domestique, industriel vital (militaire) et secondaire. Objectif : mesurer depuis le sol (et plus précisément en mer), la part imputable de « pollution lumineuse » de chaque typologie.



Étude militaire déclassifiée sur la Seconde Guerre Mondiale sur la pollution lumineuse et l'éclairage public, extrait © War Department, The Engineer Board, US Army, April 30, 1943

2. The challenges of standardization

2.3 Measurements

Paris (2018) : 35% due to streetlighting
Reykjavik (2006) : 50 %
Vienne (2017) : 33%

Méthodologie du bureau d'étude DarkSkyLab

Deuxièmement, une méthodologie proposée par le bureau d'étude DarkSkyLab, assurant le croisement de données satellitaires, de géoréférencements et recoupements visuels in situ. Objectif : modéliser et recréer les composantes de formation du halo lumineux pour pouvoir ensuite l'exploiter plus finement car retranscrivant mieux les effets « vus du sol ».

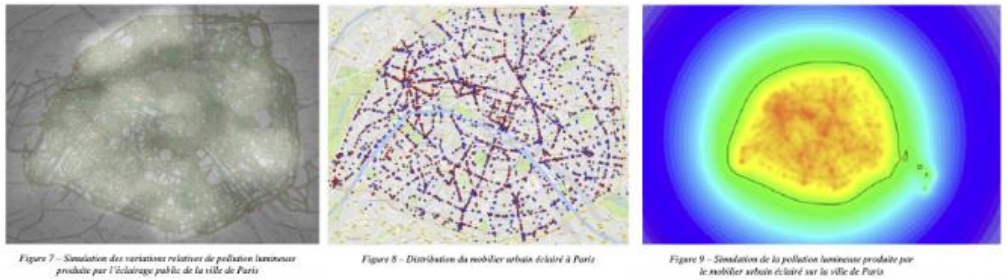


Figure 7 – Simulation des variations relatives de pollution lumineuse produite par l'éclairage public de la ville de Paris

Figure 8 – Distribution du mobilier urbain éclairé à Paris

Figure 9 – Simulation de la pollution lumineuse produite par le mobilier urbain éclairé sur la ville de Paris

Contribution du mobilier urbain éclairé a la pollution lumineuse – Ville de Paris © Philippe Deverchère, Sébastien Vauclair, Michel Bonavitacola, DarkSkyLab

C'est sur cette méthodologie que la ville de Paris avait étudié en 2018 ses domanialités éclairage public/privé, permettant de définir à 35 % la part imputable à son éclairage public (hors signalétique et mobilier de service, comme les abribus principalement). Mais d'autres études dans d'autres villes portèrent des résultats différents (Rekjavick 50% (2006) – Vienne 33% (2017)).

Ce croisement de données aériennes à h[illegible]olution et d'observations directes au sol a également permis une analyse fine du territoire du Grand Annecy. Elle identifie le statut souvent privé des points les plus perturbants : éclairage publicitaires et sportifs. Cependant, sans pouvoir en chiffrer rigoureusement les proportions respectives dans la fabrication du halo.

Orthophotographie nocturne de l'éclairage public – centre-historique Annecy – 21-22 novembre 2017 © Grand Annecy – Syane – Annecy, OpenStreetMap

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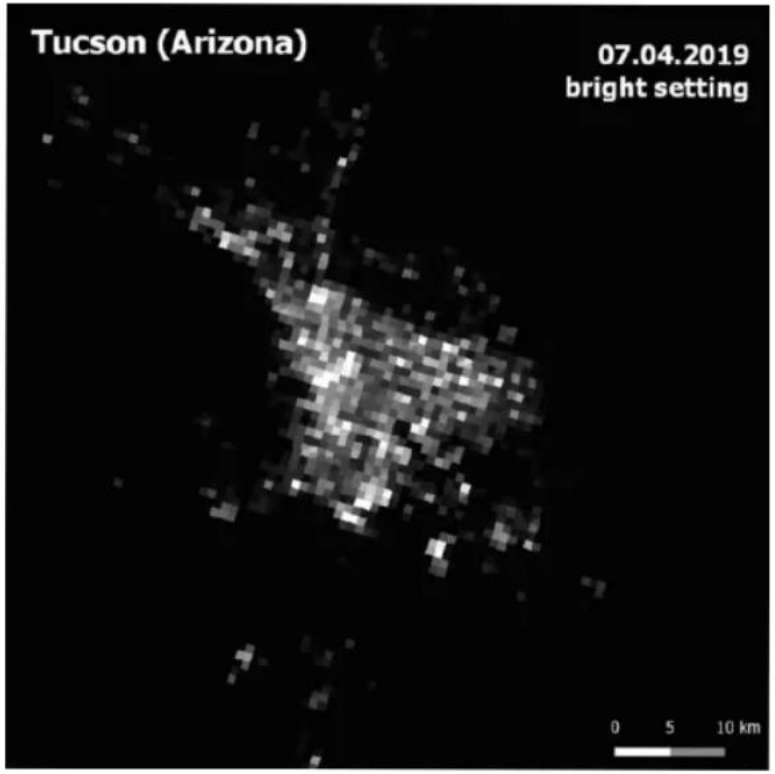
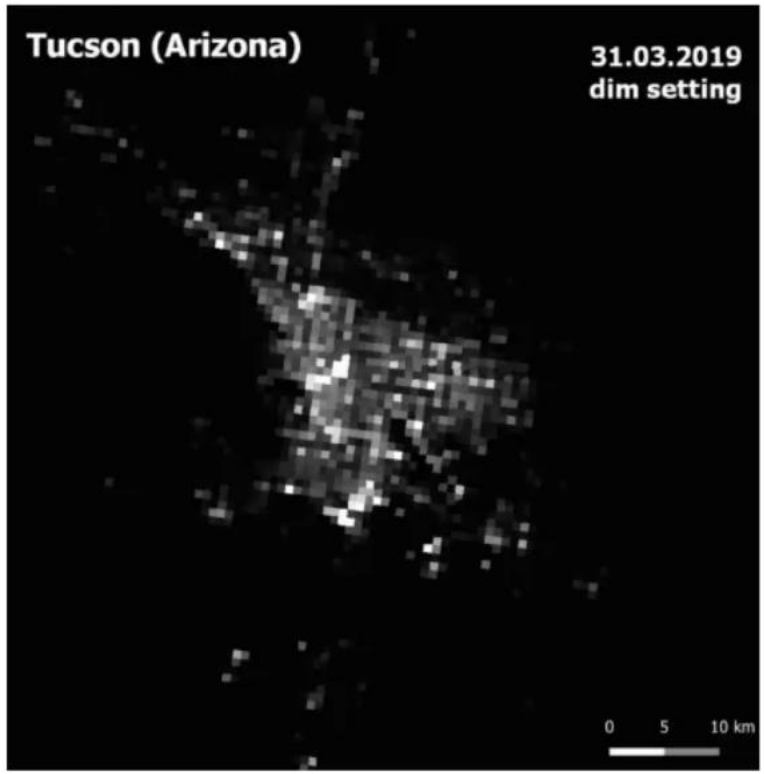
2. The challenges of standardization

2.3 Measurements

Tucson (2019) : 13% due to dimmed streetlighting, 18% without dimming





Tucson, une ville pionnière en éclairage public

Tucson, ce n'est pas n'importe quelle ville aux États-Unis. Il s'agit d'une ville pionnière en matière d'éclairage public. Nous ne pouvons pas transposer ce chiffre dans nos référentiels français !

En 1972, Tuscon fut la seconde ville au monde (après sa voisine Flagstaff, chère à James Turrell pour son volcan le Roden Crater) à mettre en place une régulation de son éclairag public. La raison est simple : Tuscon est à moins de 50 km de l'un des plus grands centres d'astronomie mondial, le réseau d'observatoires de Kitt Peak.

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2. The challenges of standardization

2.4 Calculation and modeling

2.5 Correct classification of roads by lightdesigners

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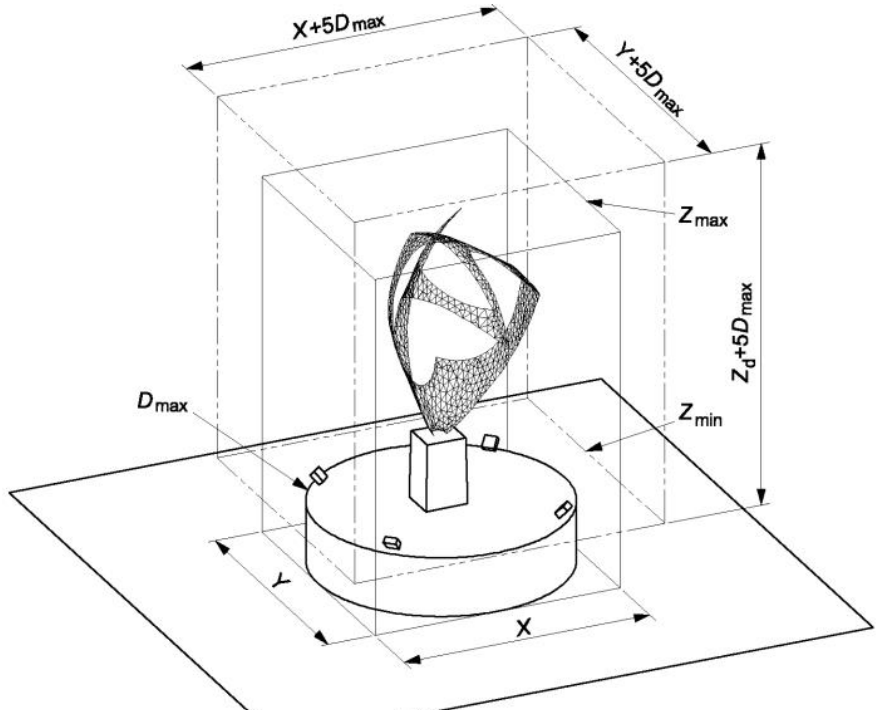
2. The challenges of standardization

- Background documents :
  - CIE 001: 1980 - Guidelines for minimizing urban sky glow near astronomical observatories
  - CIE 126 : 1997 - Guidelines for minimizing sky glow
  - CIE 150: 2017 - Guide on the limitation of the effects of obtrusive light from outdoor lighting installations

- Work in progress
  - CIE TC 2-95: MEASUREMENT OF OBTRUSIVE LIGHT AND SKY GLOW
  - CIE TC 4-58: OBTRUSIVE LIGHT FROM COLOURFUL AND DYNAMIC LIGHTING AND ITS LIMITATION
  - CIE TC 4-61: ARTIFICIAL LIGHTING AND ITS IMPACT ON THE NATURAL ENVIRONMENT

2. The challenges of standardization

- Work in progress
  - CEN 169/226 – WG 15: ASSESSMENT AND CONTROL OF OBTRUSIVE LIGHTING IN OUTDOOR SPACES
    - Kick-off 07/10/22
    - Italian proposal (Document N 7) to be discussed - UNI 10819 «Light and lighting - outdoor lighting application - lighting quantities and calculation procedures for the evaluation of the upward scattered luminous flux»
    - Next WG meeting: 21st November 2022



Italian standard scope

THIS STANDARD PRESCRIBES CALCULATION METHODS FOR THE EVALUATION OF THE LIGHT POLLUTION AND INTRUSIVE LIGHT EMITTED BY ALL LIGHTING SYSTEMS AND OTHER SYSTEMS COVERED BY THIS STANDARD, BOTH IN PUBLIC AREAS AND IN PRIVATE AREAS.

THIS STANDARD PRESCRIBES CALCULATION METHODS FOR THE EVALUATION OF THE LIGHT POLLUTION AND INTRUSIVE LIGHT EMITTED BY ILLUMINATED SIGNS AND ILLUMINATED ADVERTISING SYSTEMS IN OUTDOOR AREAS.

THIS STANDARD NOT CONSIDER ATMOSPHERIC CONDITIONS, SUCH AS AIR POLLUTION, DUE TO THE COMPLEXITY PHENOMENA AND SEVERAL ALTERATION ELEMENTS.

THIS STANDARD NOT AP TO LIGHTING SYSTEMS TUNNELS AND UNDERPASSES AND TO LIGHTING SIGNALIN DEVICES SUCH AS, TRA LIGHTS, ACTIVE ROA SIGNS AND THE LIKE, WELL AS TO VEHICLE HEADLIGHTS.

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3. Technical solutions

1. Switch off
2. Positioning and orientation (a.o. lowering height, shutters, …)
3. Lightflux variation, during the night or during the year (seasonal)
   - Pre-programed dimming
   - Connected lighting
   - Adaptive lighting (lightbubbles based on detectors, adaptation linked to weather or traffic conditions, …)

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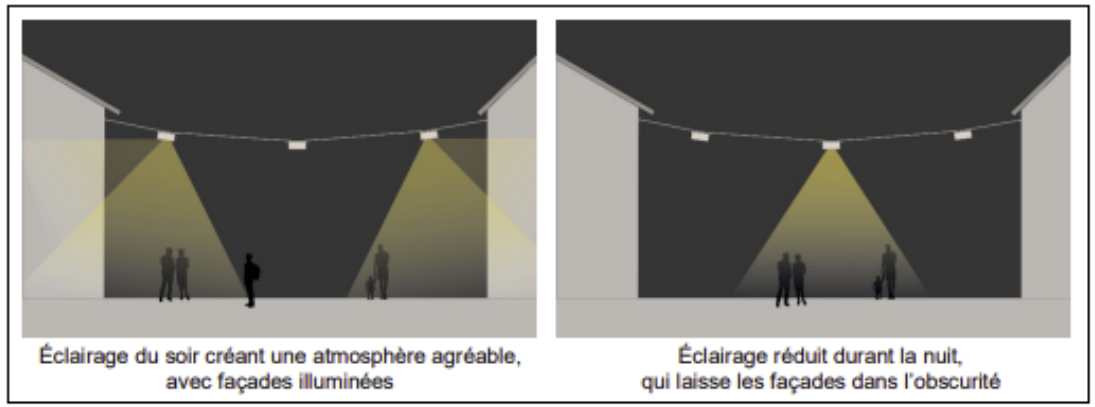
3. Technical solutions

4. Spectrum

- Choice of suitable fixed spectrum (2700 ou 3000K)
- Tunable White (during night / seasonal)

5. Light distribution adaptation



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3. Technical solutions – spectrum (LED)

	Abs. Power [W]	Min flux [lm]	Max flux [lm]	Min efficiency [lm/W]	Max efficiency [lm/W]	Comparison (min)	Comparison (max)
2200 – IRC 70	62	5700	6500	92	105	73	73
2700 – IRC 70	62	7100	8100	115	131	91	91
3000 – IRC 70	62	7800	8900	126	144	**100**	**100**
4000 – IRC 70	62	8000	9200	129	148	103	103

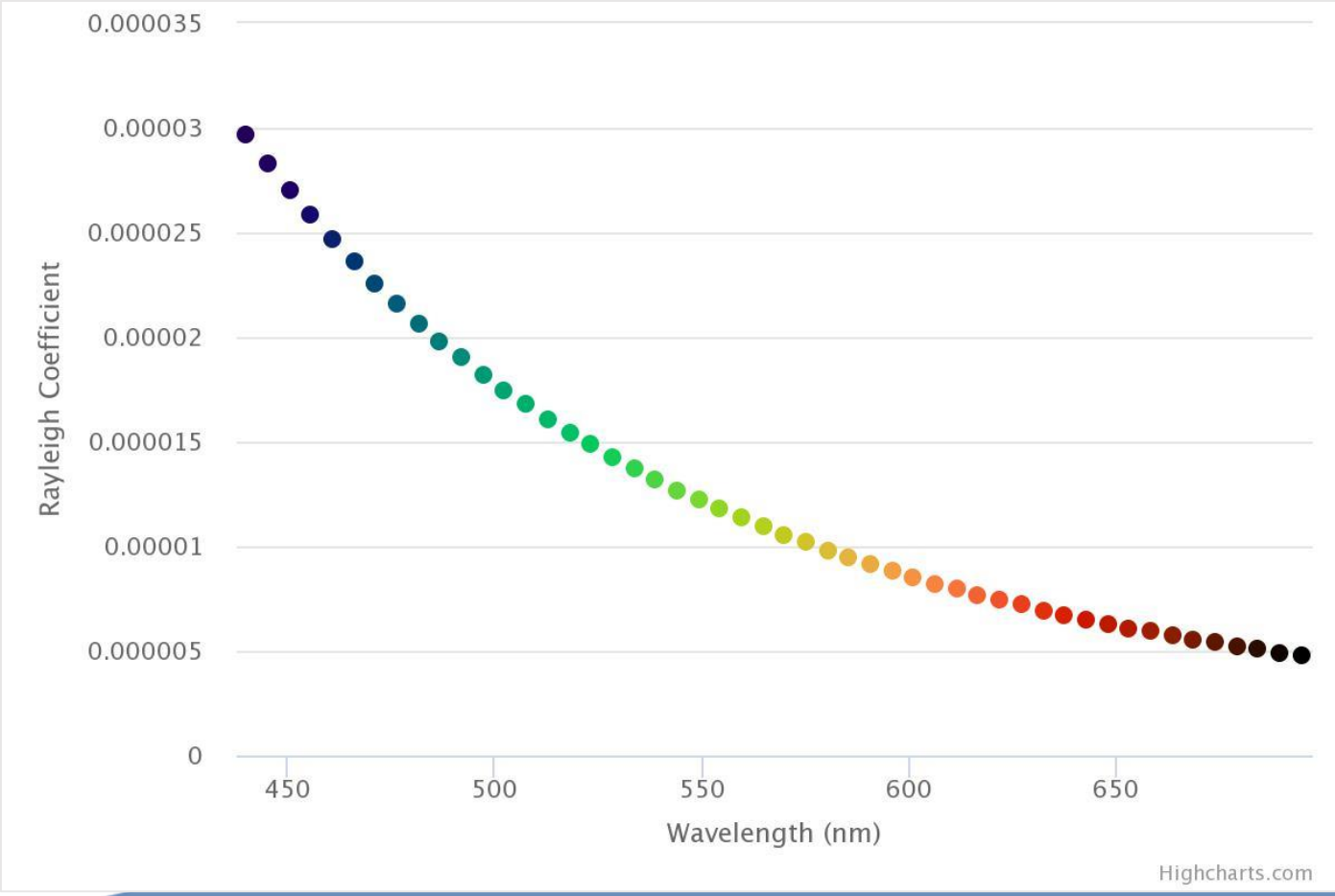
	Abs. Power [W]	Min flux [lm]	Max flux [lm]	Min efficiency [lm/W]	Max efficiency [lm/W]	Comparison (min)	Comparison (max)
2700 – IRC 70	165	17400	21400	105	130	96	96
3000 – IRC 70	165	18200	22500	110	136	**100**	**100**
4000 – IRC 70	165	19400	23900	118	145	107	106
5700 – IRC 70	165	19400	23900	118	145	107	106

IBE-BIV

3. Technical solutions

- Efficiency & lifetime (?)
- Tunable white vs. RGBW

Colour Temp.	Compared efficiency	Proposed value
2200	73 - 80	0,8
2700	91 - 95	0,92
3000	**100**	**1**
4000	103 – 106	1,05
5700	103 – 106	1,05



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4. Environmental knowledge

- Impact of lighting on different animal and plant species
- Precise knowledge of the place to be illuminated (corridors, dark frame)
- Multi-species knowledge (needs, rythms) and not only bats

Ex: bats (april up to october – early night) vs. migratory birds (Migration period)?

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5. Design method

- Constructive collaboration needed among environmentalists (« écologues ») and light specialists – ex.: BatLight District Jette

Nord de Jette – Contexte urbain

- Parcs Liebrecht, Jecta, de la Jeunesse, Garcet, Huybrechts, Roi Baudouin
- Bois du Laerbeek, du Poelbos ou de Dieleghem – classés Natura 2000
- Talus du Heymbosch

Partenaires

Jette

bruxelles environnement .brussels

Sibelga energizing the city

natagora

ENGIE Laborelec

RADIANCE 35

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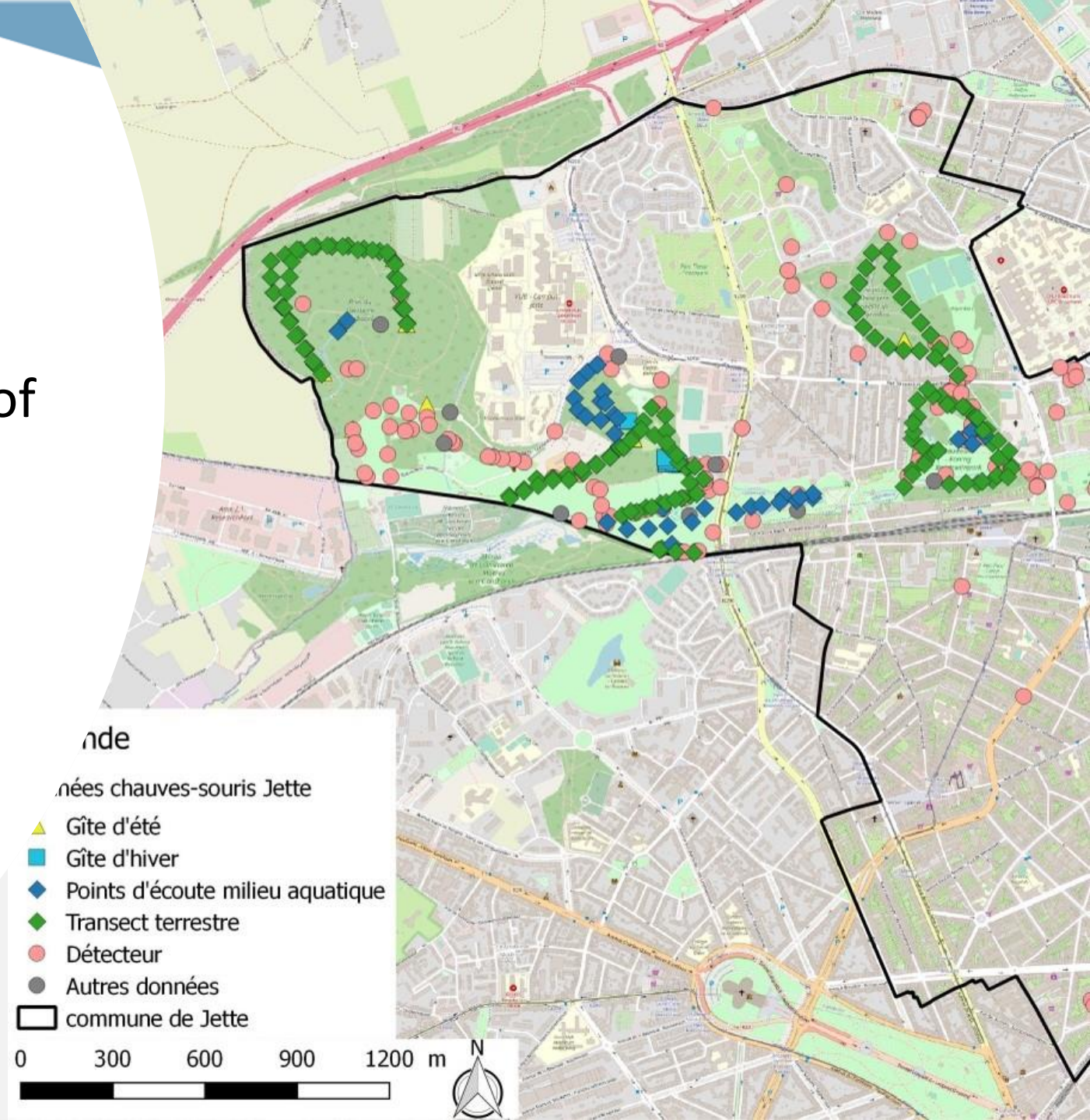
Batlight district - Jette

- At startup…
- An initiative of the « échevin » of Jette
- Measurements (transects & listening points) carried out by Natagora for Bruxelles-Environnement
- Sibelga's willingness to collaborate and learn



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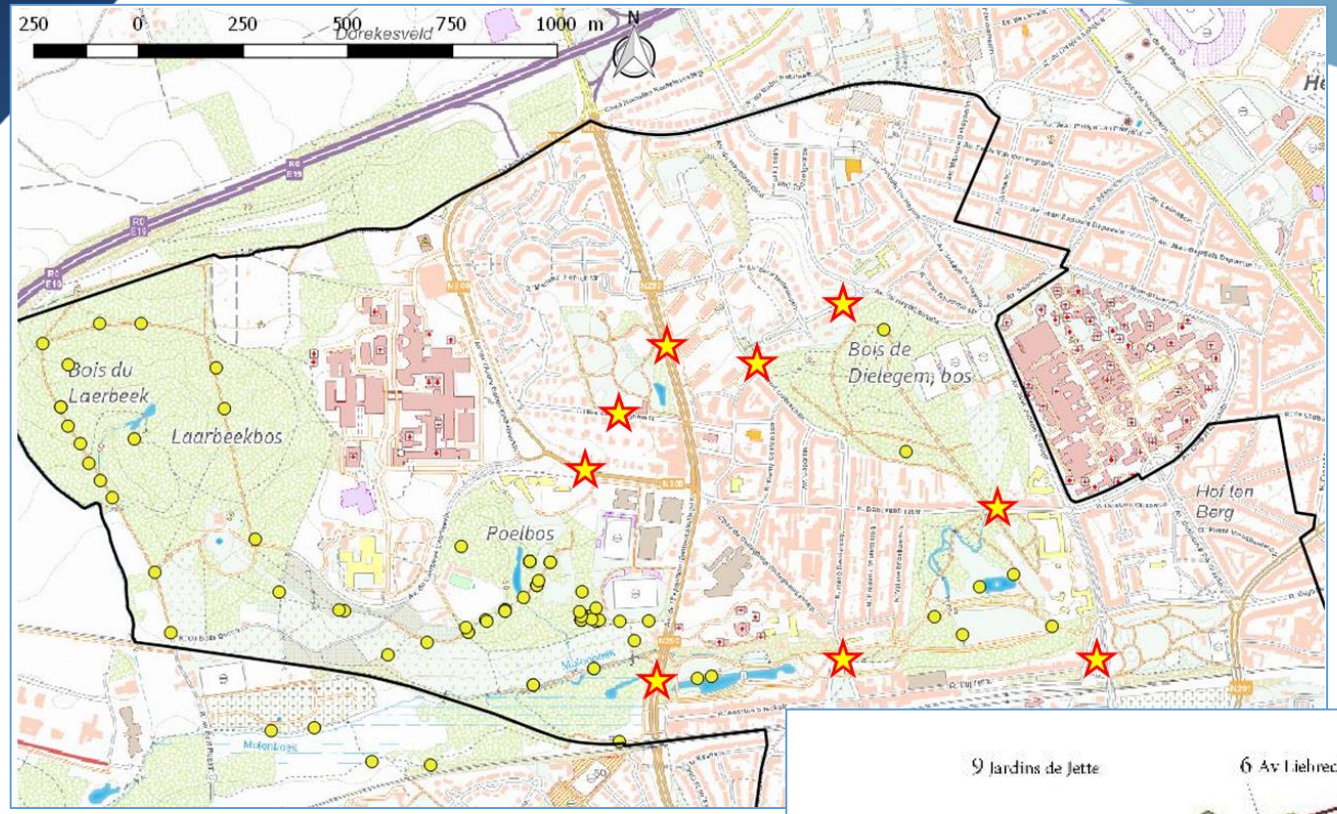
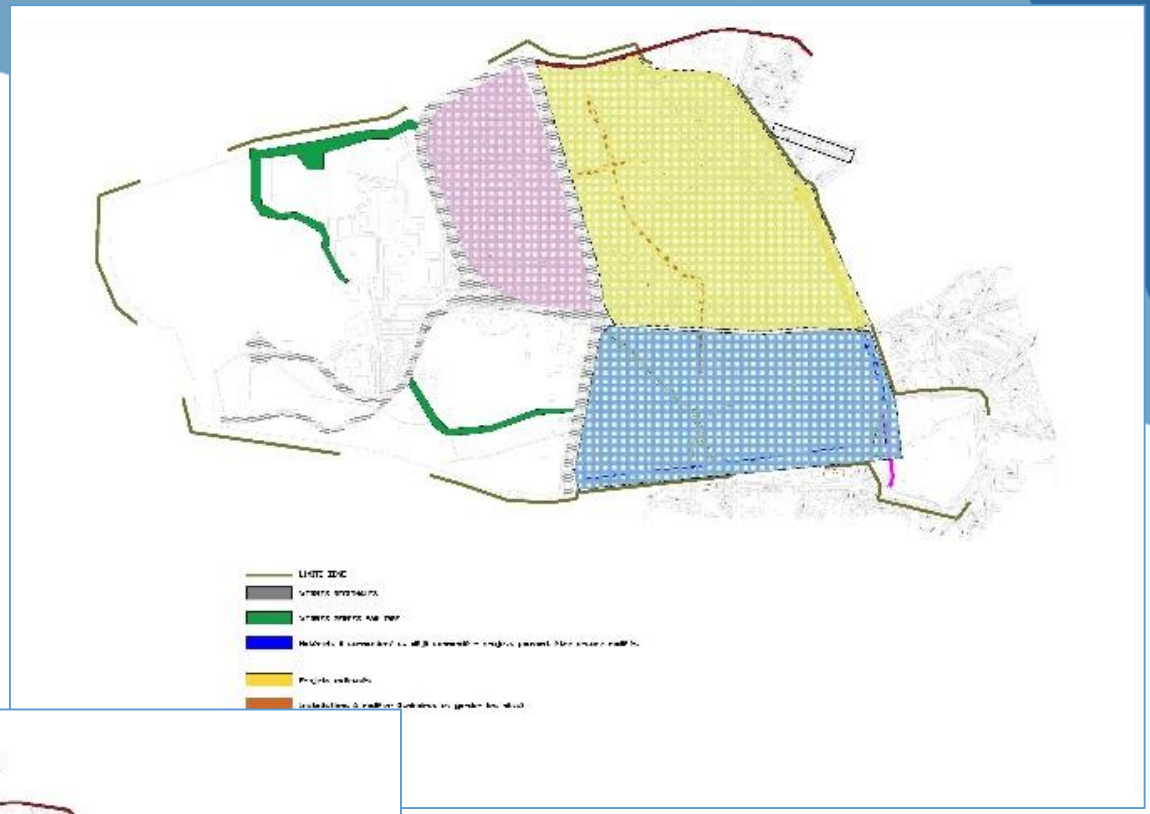
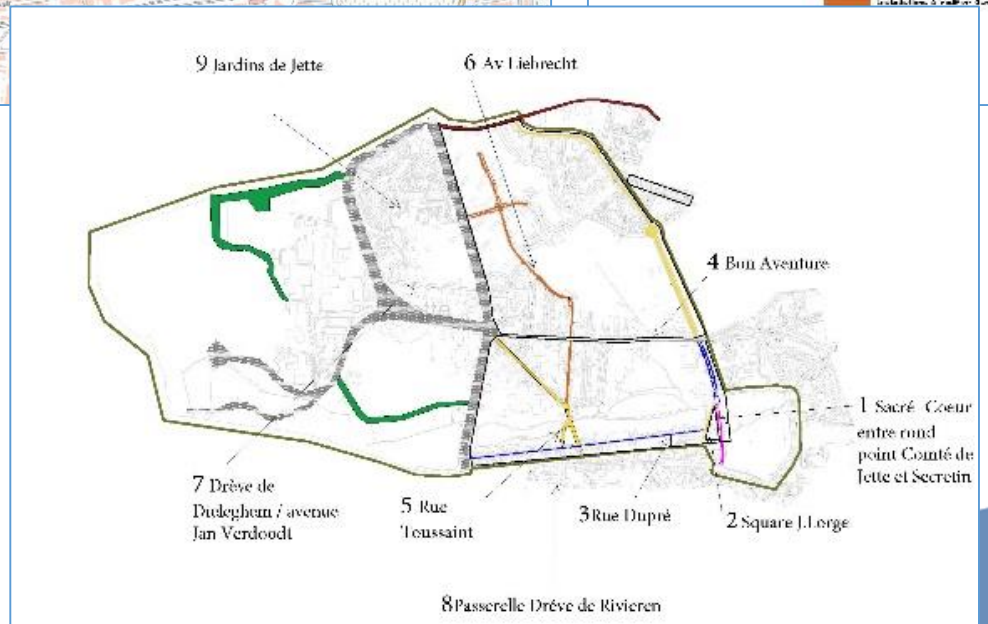

250 0 250 500 750 1000 m
N
Dorekesveld
Bois du Laerbeek
Laarbeekbos
Poelbos
Bois de Dielegem, bos
Hof ten Berg




9 Jardins de Jette
6 Av Liebrecht
4 Bon Aventure
1 Sacré Coeur entre rond point Comté de Jette et Secretin
7 Drève de Dudeghem / avenue Jan Verdoodt
5 Rue Toussaint
3 Rue Dupré
2 Square J.Lorge
8 Passerelle Dréve de Rivieren

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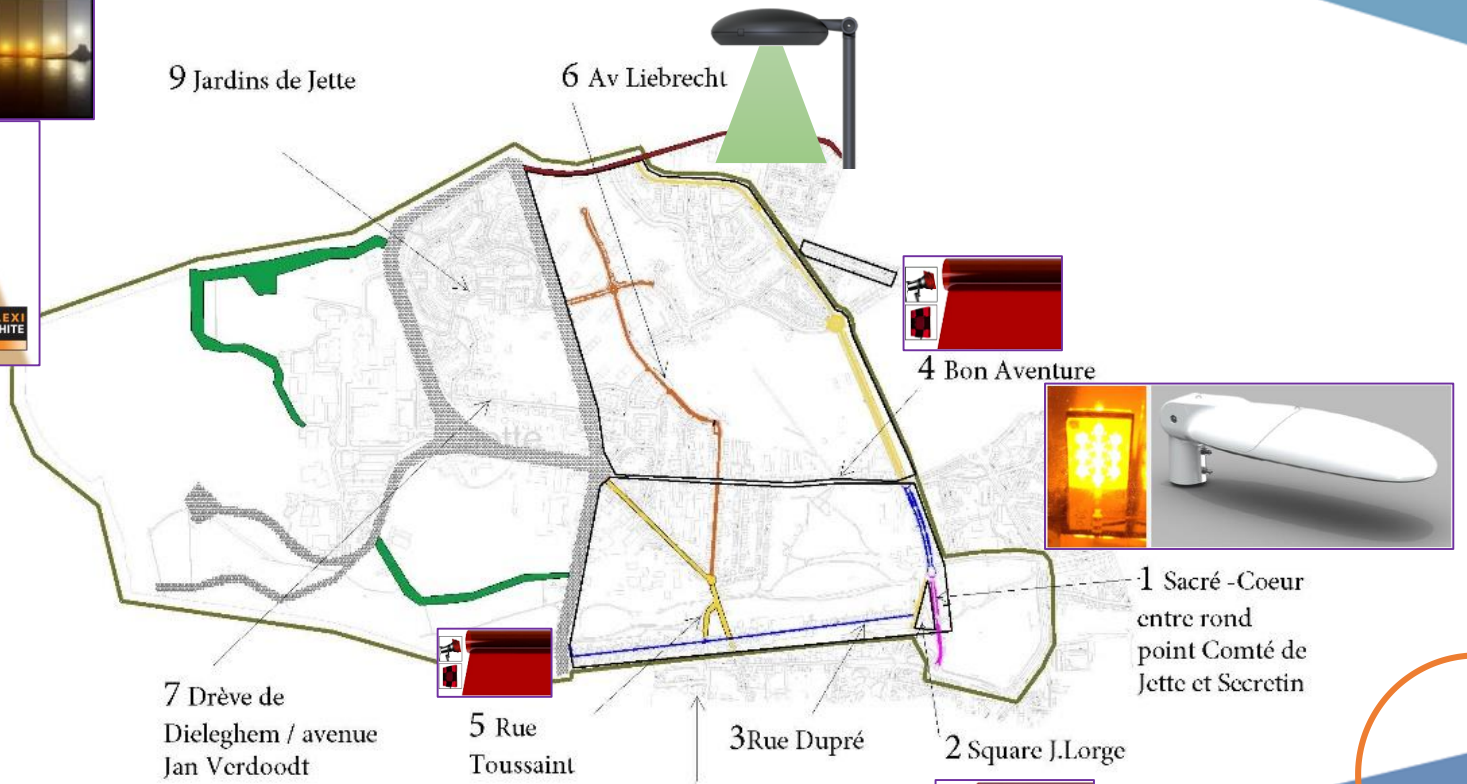
Quickly, technological choices, planning… and monitoring!



IBE-BIV

Quickly, technological choices, planning… and monitoring!

Works between october & april

Measurements between may & september:

Transects Natagora, 7 fixed batloggers, dynamic measurements (car) of lightlevel, spectrum & batlogger in June, July & October (yearly)

In addition, acceptance of residents to validate

Period	Activity
< April 21	**1** (except the bridge)
April 21 – October 21	Monitoring
October 21 – April 22	End of **1** (bridge) + **2, 4, 5** + **3** + **6**
April 22 – October 22	Monitoring
October 22 – April 23	**7 + 8**
April 23 – October 23	Monitoring
October 23 – April 24	**9**
April 24 – October 24	Monitoring

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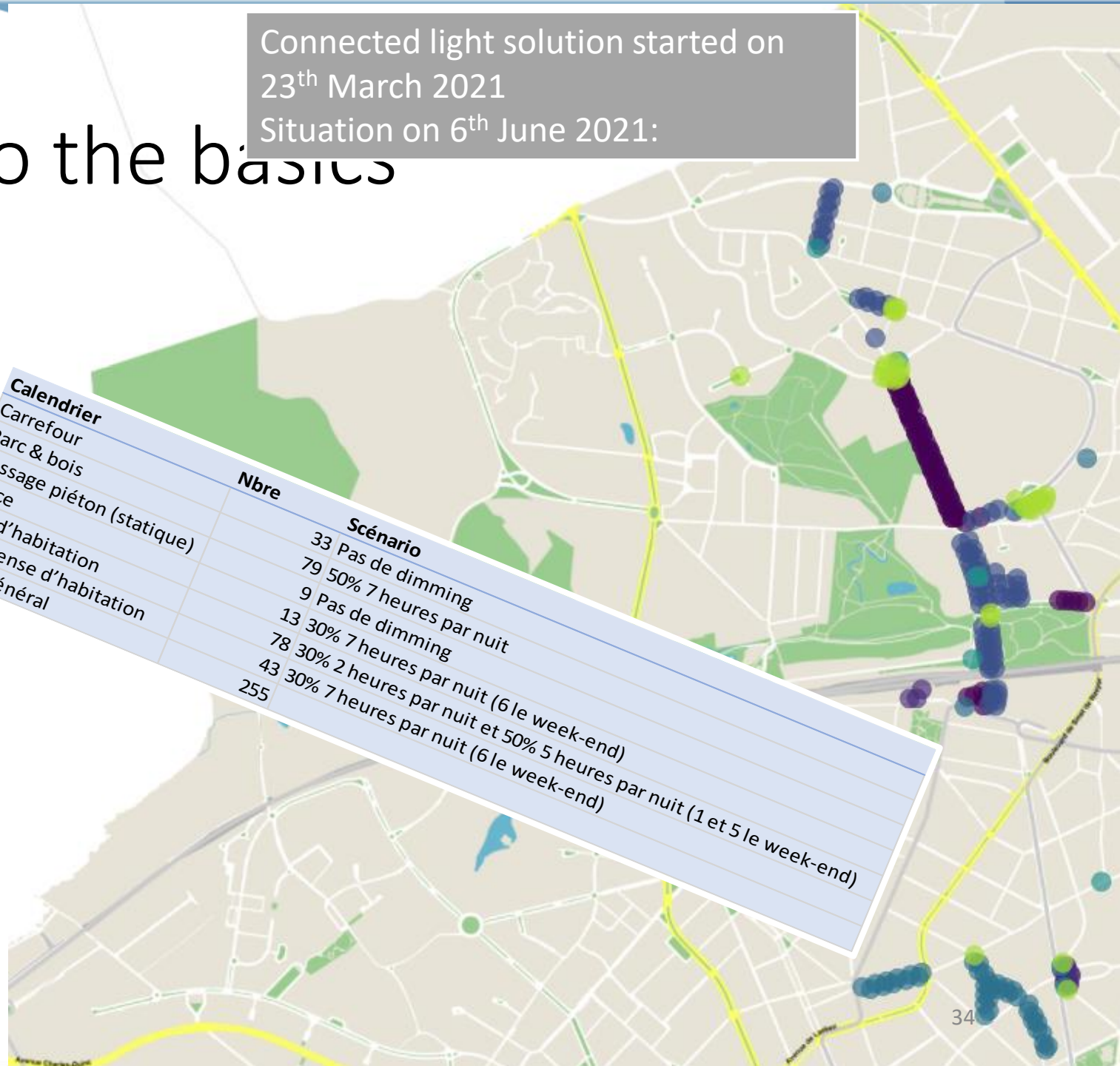
And always back to the basics

- General colour temperature <= 3000 K
- Standards respect – no more !
- Limited height, compliant with Lighting Master Plan
- Rear cut off for lighting fixtures on façades (intrusive lighting)
- Connected lighting fixtures & calendar with dimming

Connected light solution started on 23th March 2021
Situation on 6th June 2021:

Calendrier	Nbre	Scénario
Carrefour	33	Pas de dimming
Parc & bois	79	50% 7 heures par nuit
Passage piéton (statique)	9	Pas de dimming
Place	13	30% 7 heures par nuit (6 le week-end)
Rue d'habitation	78	30% 2 heures par nuit et 50% 5 heures par nuit (1 et 5 le week-end)
Rue dense d'habitation	43	30% 7 heures par nuit (6 le week-end)
Total général	255	



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6. Synthesis

Domaine	Prêt ?
Conscientisation & volonté d'agir	
Normalisation	
Solutions techniques	
Connaissance environnementale	
Méthode de conception	

Thank you

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BELGISCH INSTITUUT voor VERLICHTINGSKUNDE
INSTITUT BELGE de l'ECLAIRAGE
CIE NATIONAL COMMITTEE – NBN SECTOR OPERATOR

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AVEC LE SOUTIEN DU

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