Light plan - space for people

a public space strategy towards a 24 hour vitality and socio-spatial integrated inner city for Brussels
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MSc. Thesis Report
Light plan - Space for people
a public space strategy towards a 24 hour vitality and socio-spatial integrated inner city for Brussels

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Cities at night are fascinating places. There are different movements going on and different people are taking part in public life than during the day. The day environment is consciously designed and developed, while the night scenery is often a weak attempt to create similar conditions. In essence day and night are opposites and should be handled accordingly; different.

The illumination of the public domain was the main fascination to kick-off this MSc. Thesis. Lighting designs the night environment and should be consistent with the day design in order to be integrative in time. This leads to the second fascination that influenced the direction of the project; 24/7 environments. Again, looking at today’s society and practice, time is a dimension to be handled with care and spaces more than ever have to be able to uptake flexible uses. This is not only the case for inner cities, but especially there the needs are clearly visible regarding this aspect.

As a result of this reasoning, Brussels seemed a logic location to apply the research and possible interventions on. It is a European capital of which the inner city is suffering by the daily movements taking place around the city. The identity of the inner city is undefined and questioned because of this and it prevents the city from a qualitative growth and encourages the feelings of fear in the inner city during the after office hours. If there is one inner city which is in need for around the clock vitality, it is Brussels.

This graduation project is a practical research on the way light can be used within the urban context to create vital environments during 24 hours of the day. The connection of the lighting design with the urban design is explored with the goal of integration and regeneration of a disconnected area in the inner city of Brussels.

keywords:
public lighting, public space, regeneration, integration, inner cities, accessibility, 24/7 environments, urban vitality
light plan space for people
Part 1 gives insight into the research and framework of the project as a whole by stating the problem statement, and resultant methods, research questions and the overall planning of the project. It presents the conditions in which the thesis is developed and the constraints related to this.

Part 2 contains the theoretical framework and support on which decisions are based later in the process. It places the project in the bigger academic and practical context of the urban debates and discusses its relevance towards this context and society.

Part 3 shows research done by comparison study. This part focusses mainly on the combination of urban design with lighting in a specific context. And how to integrate lighting successfully into the urban development.

Part 4 provides the reader with a detailed context description and analysis of Brussels and the intervention site. Both the city scale and the local scale are thoroughly analysed, discussed and cross-relations are made.

Part 5 presents the detailed end results of the project together with a brief overview on description of problems, aim, context and approach which led to these end results. The end results consist of a vision for Brussels, a strategy for the inner city and the neighbourhood of Kuregem, and finally a design.

The thesis plan ends with a conclusion and reflection on the project and the process. It will formulate some critical reviews on the work done and contains recommendations and suggestions for future work related to the topics handled in the framework of this master thesis.
Part 1 starts off this thesis report by giving an insight into the research and framework of the project as a whole. First an introduction into the main problems and themes of the thesis are explained in the problem statement.

This part is separated into 3 sub themes or topics. First of all the main interest of fascination that forms the basis of the project is touched; lighting in urban development and strategies. After this the context in which interventions will take place is introduced; Brussels capital and Brussels inner city. In relation to this a broad and more general context is described. And the 3rd theme is more specific to the location of the intervention. The importance of this location to the rest of the city is discussed and some site specific problems are elaborated.

This problem statement results into a set of research questions and related methods to provide sufficient answers to these questions. And finally the chapter ends with an overview of the planning of the process. The planning presented here is the actual division of time throughout the process and reflects in an accurate way how the different topics were developed over the time available.
As stated in the preface of this thesis report, the main theme that forms the basis of this project is public lighting in the urban context. Lights are a necessary addition to the public domain taken care of by civil engineers calculating illumination levels according to civil laws. It is hardly the case that the lighting is an integral part of the development or intervention.

The effects of public lighting on public space becomes especially visible during temporary events like ‘lighting festivals’ (see p.24). By illuminating specific places focus points are created, which might be correlated to where activities take place during the day. Lighting as well as public space can create focus within urban fabric and bring people together. Well designed lighting and public space are important aspects of accessibility of the public domain and the way they are shaped can include or exclude groups of using space.

Currently cities are developing more and more so-called ‘lighting plans’ (see p.24). These plans pay attention to the public domain after sunset and are focussed on energy reduction as much as city branding, but less on urban regeneration and city development. This aspect needs to be explored in today’s practice where there is a clear tendency visible towards adding light plans to the tools of urban planners and designers, while no hard knowledge is available on this topic.
Brussels is not only capital of Belgium, but also of the European Union, which creates a big attraction pole for companies and governmental institutions, as well as for people. The city represents more than 150 nationalities from all different social and economic standards (Goossens and Colinet, 2009). The growth of the city is mainly due to migration from abroad and natural growth of the relatively young population of the city. The migration inside the country is negative for the capital, more people tend to leave the city and go to Flanders or Walloon (Wayens et al., 2010).

Brussels is frequently called the ‘Mosaic City’, because it is inhabited by people from various socioeconomic backgrounds, all putting their own mark on their neighbourhood. At the same time the Capital Region exists out of 19 different municipalities with their own political actors and agendas.

The more wealthy and successful middle class does not live in the city of Brussels but finds them selves migrating every day from the green outskirts towards the business areas around the centre. When looking at more exact numbers about this phenomenon of job-migration, it becomes very clear that out of 710.000 jobs available, 370.000 are filled by people who do not live in Brussels Capital Region. On the other hand there are 65.000 inhabitants who migrate every day for their job to a place outside the boundaries of Brussels, either to another Belgian region or abroad (Cerexhe, 2011).
This is possible because of the high connectivity in the networks of highways, trains, high-speed trains and air traffic going in and out of the city at almost any time of the day. Inside the city there are train, tram, metro networks covering the territory and busses that even go beyond the boundaries. The inner city is the one place where activity connected to culture as well as jobs, shopping and evening-and nightlife activities come together inside Brussels.

It requires a high flexibility of the public space and at the same time it is questioning the ownership of these spaces at any moment of the day when used by different people. The community issues that determine any federal political debate the past few years are feeding this lack of sense of place and ownership within the capital. The political struggle between the Dutch and French speaking communities is leaving the position of the federal capital undecided in the middle. As in reality Brussels Capitals main spoken language is rather French than bilingual, the Dutch community has no feeling of connection with their federal capital. Brussels might be a strong European capital, it does not have such a strong national position.

However, when looking just across the borders of the inner city, the weaker socioeconomic groups are mainly found in a sickle shaped area embracing and overlapping with the west side of the central pentagon (see schemes on the next page). Here weaker ethnical minorities are settled. When looking at the housing market, there is a clear separation visible between the East and West-side of the centre. On the East side there is the European District and the business areas connected to the North and Midi railway station are located just in between both sides. The inner city is surrounded by socio-spatial fragments, which in essence have nothing directly to do with each other. This becomes clear when looking at the dispersion of functions and when looking at the spatial connections between the fragments. On the next page an image can be found showing the location of the fragments as described.
Different types of fragments can be identified along the borders of the central pentagon. This separation between East and West has roots that go back to the historic development of the city. Industrialisation, the following de-industrialisation and the shift of economic activities towards the service sector take a big role in it. The current political situation of Belgium is not capable of creating the conditions to implement the changes needed to change something fundamental in this current state of affairs.
On the other hand the geographical difference between the upper town and down-town already generates a natural difference between the 2 parts and the big destructions of the 60s only encouraged the process of moving out of the centre by the more wealthy middle class families. This process was called *randverstedelijking* (fringe urbanisation). At this moment in time the point is reached that slowly by slowly a new movement back to the city can be observed, and gentrification is noticeable in some districts. However there is no clear perspective to which direction this will evolve in the future, or where policy makers want it to evolve towards. The process seems money-driven. Again, this has its reflections in the occupation and ownership of the public spaces, whether it allows strangers and for who it is designed.

The daily movements of commuters in combination with the socio-spatial fragments around the city centre, create a very specific problem. There is not only a big shift between day and night use of these more central areas, but also there is the danger of the inner city to loose its vitality because of the island it is in the bigger city region and the duality it is surrounded by. At this moment this is being observed in more inner cities around Northern Europe (Falk, 1996).

Concluding this general problem statement of Brussels, there are several issues touched. The diversity of inhabitants and functions of the city, which are due to historic developments and the movements that take place in and around the city every day. These issues result into a varied set of uses of public space during 24 hours, depending on the user groups and the spatial connectivity of public space within the network. There is a question of ownership of space, who feels responsible for the built environment and who claims and dominates it. This is again an issue related to the time of the day, as the function is determined by this.
Zooming in to the local context of the intervention area extends this problem statement and makes it more specific.

Kuregem is part of the ‘poor sickle’ covering the areas West of the city centre. However, the poor sickle used to be the motor of the Brussels economy because of the industries located there. These are now moved out, leaving behind emptiness and decay. It has a high rate of rental housing and therefore it is popular among migrants and other socioeconomic vulnerable groups.

Typically the area is a going through area. Only the slaughterhouse market and the international Midi train station attract visitors from an higher scale of influence of the city. Inhabitants have their basic needs covered in the area, but do not attract visitors on a bigger scale. The uses of the public space are determined by certain inhabitant groups of the area. This is mainly noticeable during evening and nighttimes because less going through movements are taking place in the area. For visitors this is threatening and it does not provide a very accessible image to the area.
slaughterhouse site

old slaughterhouse of Kuregem

Midi tower at the Midi train station

Brussels’ palace of Justice

the canal to Charleroi

view on the slaughterhouse site of Kuregem and the rest of the neighbourhood
source: flickr.com, Erasmushogeschool Brussel.
The scheme on the facing page summarises the 3 parts of the problem statement. The site specific problems are separated by level of influence. The big scale reflects Brussels’ position in Europe and Belgium. The intermediate scale positions the inner city of Brussels to the rest of the city. And finally the local scale of the neighbourhood of Kuregem handles about the very local problems.

This approach of different level of scales is also used to structure the end products. For level 1, the big scale, there is a vision developed. Level 2 is tackled through a strategy positioning the inner city according to the vision. And for the 3rd level there is a local design intervention, reflecting the strategy and vision in a very concrete way. For each level the problem statement of lighting in urban development and strategies is applicable and is applied. The results can be found in part 5 of this thesis report; the products.
important location within Europe and Belgium
high connectivity within the urban networks
important job provider and numerous job migrations
counteracting the fringe urbanisation

rather poor socioeconomic situation in and around the centre
socio-spatial fragmentation around the centre
question of ownership of public space due to higher scale movements
high flux of movements going in and out

specific local conditions of 1 of the fragments defined within the context of Brussels inner city
this will be defined in part 3 of this thesis plan
research questions

How can lighting be used in the design of public spaces to encourage 24/7 urban vitality in the inner city of Brussels?*

The main research question is related to both the specific context of Brussels as well as a 24-hour vitality, the use of public space and its relation to lighting. In order to keep the overview the sub research questions are divided according to which theme they relate most; lighting, the context, or the integration of lighting and urban regeneration.

light

What are the requirements for sustainable urban vitality within the context of Brussels and how does this relate to a successful introduction of 24-hour urban vitality and public space usage?

How can urban lighting, in the context of the 24-hour city in Northern Europe, influence the use of public space by pedestrians in the city centre and areas adjacent to it during the dark hours?

integration

What are the success parameters of a combined intervention strategy on lighting and urban design?

How can the 24-hour use of public space be implemented, in order to enhance existing qualities of the neighbourhoods and increase living conditions?

context

How do the different socio-spatial fragments of the inner city relate to each other and the bigger networks around them, in physical and socioeconomic terms?

What are the current and historic reasons behind the fragmentation in the inner city of Brussels and how does this relate to policies?

How can a more integrated inner city of Brussels strengthen the position of the centre towards the more suburban residential areas of Brussels Capital Region?

What public space networks currently exist in the city of Brussels during 24 hours of the day and what kind of use do they facilitate by whom?
methods & products

During the project different research methods were used. All methods were used with the aim to reach the expected outcomes and end products. The end products are like the problem statement covering 3 layers of influence. To have a influence and meaning any intervention on any scale has to be supported by the other levels of influence as well in order to be solid. To reach such a combination of interventions as an outcome, following methods were used for each topic.

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<td>urban lighting in urban regeneration</td>
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<td>fragmentation</td>
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<td>urban vitality</td>
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timeplanning

The planning of the thesis structures the different methods and parts of the research questions in time as can be seen in the scheme on the next page. By P1 the preliminary research was done to clearly formulate the problem statement and research questions. By P2 these parts of the thesis are more complete defined. A big part of the literature research is also done by P2 through the literature review paper, as well as some comparison studies on good and bad examples concerning urban lighting.

After P2 this theoretical underpinning continued and at the same time was used to start the process of designing and strategy definition. The design process is taking over from the research by developing a strategic plan for the bigger context and the intermediate context of the inner city. This development at the same time reflected through research & design on the very local scale of Kuregem. This process is a continues interaction between the design in progress and the research on which it is based, while at the same time the design also determines the topics of research. The definition of the program is an integral part of the developments on the different scales and is therefore mentioned as a separate entity in the time line.

By P3 a preliminary design-concept, vision and strategy on 3 levels was presented as work-in-progress. The comparison studies were also presented as finalised and the theory framework was completed by the outcomes of conducted interviews.

For P4 all the expected end products were in draft shape, in order to be completed and evaluated accurately and thoroughly by P5. In this last period the final thesis report was written, documenting the whole process into a coherent story with a start and an end. This is supported by a reflection on the process of the work done and concluded with a set of recommendations towards future work to be done regarding the topics handled in the framework of this graduation project.
Preliminary research

Problem statement & research questions

Review paper

Comparison study light & urban regeneration

Good/bad practice examples 24/7 use of public space & light

Literature research

Reflection to site specifics and 24 hour context

Strategic plan & vision development

Research by design

Program definition & implementation

Final report

Reflection & evaluation

Evaluation

Ongoing research activities

Design activities
part 2

This part of the thesis report contains the theoretical framework and support of the thesis project. It places the project as a whole in a broader academic field of urban debates and dynamics, which are taking place in the academic environment and today’s society. The chapter will start with a short overview on frequently used notions that will return on a regular basis in the thesis report. After that there will be a more in-depth analysis of literature on a few of the notions.

On one side it will handle about the role of inner cities in North-Western Europe and how they can maintain their position or re-invent it. In relation to this place-making theories are discussed and 24/7 environments are particularly looked at due to its relation with around the clock vitality and activity. On the other hand, the position artificial lighting takes and can take in urban development and regeneration projects is explored. The explored theories are the basis on which arguments are being built later in this report. At the same time it sketches potential gaps of research concerning light and urban development and urban regeneration. This will be summarised in the conclusion of this part.

An attempt to construct arguments inside these gaps of knowledge is done in part 3 of this thesis report, where will be looked at practice to complement this theory framework.
frequently used notions

Below some of the frequently used notions will be defined in order to create a common understanding of the content of this thesis report. Some of these concepts are elaborated more extensively further on. Here, the definition from most referred authors are used.

As described in the problem statement, spatial and socio-spatial fragmentation define Brussels and form the basis of several problems this city is facing today. At the same time there is a continues question of centrality and the role it has in this world. This in its turn relates to the users of cities and the kind of environment they are part of. 24/7 environments is based on a concept that has been defined in the context of 24/7 economies but less in relation to urban vitality and activity in the public domain. And this is again related to users and the spatial structure of the city. At last lighting festivals and plans are being defined in the perspective of today’s practice.

Spatial fragmentation
In general when revealing literature, a common understanding is already defined concerning spatial fragmentation.

“It is characterised by discordance of urban land use and the physical properties of space and a general lack of integration of the city. In particular, increasing separation of functions like housing, business, recreation and shopping, over the urban space is defined as an important problem area.” (Altinok and Cengiz, 2008, pp. 3-4)

An other aspect related to spatial fragmentation is a political-administrative fragmentation, that can be observed in metropolitan regions and bigger cities, that are divided into numerous administrative units and failing of local administrative units to introduce an integral approach for the space with collaborative policies and strategies is deliberated.” (Altinok and Cengiz, 2008, p. 4)

Socio-spatial fragmentation
This type of fragmentation is manifested in spatial means as defined earlier, as well as by the social condition of the inhabitants.

“Different zones selected by different social or cultural groups, isolated spaces and lifestyles, social integration problems of a massive urban organism divided into various subsystems functioning in a fragmented manner, loss of collective urban memory and citizen sensitivity as a result of lacking integration, vanishing of collective public area concept etc.” (Altinok and Cengiz, 2008, p. 4)

The social fragmentation is based on otherness and class based segregation.

Centralities
Next to a critical mass of people, specific functions and a good accessibility, centralities also need to be part of bigger network. Furthermore they need to have an impact, which goes beyond their own borders. The distinctiveness and unique identity should be present in order to compete on a sustainable basis with other centers. (Krebs, 2011) Norberg-Schulz (2003) argues in the same line of this theory and states that centres are the focus of their surroundings. Here Heidegger is also mentioned who relates centres with ownership:

“spaces receive their being from locations and not from space”(Heidegger, 1971, p. 154, in Norberg-Schulz, 2003, p. 120).

Lynch defines it as a core in his book Image of the city (1960), however the definition again is similar to the one stated above. In essence a core is a node that strategically functions on the scale of a district. A node is a junction of paths and movement and can be physically manifested in several ways, and often includes concentration. The size of a node is depending on the level of consideration.(Lynch, 1960) Through Bill Hillier (1993) it is proven that above all attraction and movement are initiated by the spatial configuration of urban areas; theory of natural movement. In essence this means that centralities of any kind are determined by the spatial form of the city. The movement flow through these spaces results out of the supportive urban form and generates activities. As a reaction to this more movement can be initiated.
Users
The users of public space are literally all people that move through the urban tissue of the city and use the spaces provided by it. Within this thesis report, pedestrians are recognised as the most important users, as they interact directly with the built environment, more than for example car drivers do.
A user group is a group of people that share a common habit when consuming public space or have similar intrinsic characteristics. Examples of user groups are men, women, children, residents, commuters and tourists. In general, however, the users can be categorized in two main groups: occasionally and place specific visitors (Carr, 1992). Gehl (1987) classifies the activities being facilitated by space into 3 main types: necessary, optional and social or resultant activities, as visually represented in img.24. Especially the type of resultant activities is contributing to urban cohesion.

24/7 environments
24/7 environments are used during 24 hours of the day by a wide range of users implying different means of use of space. A 24/7 environment or around-the-clock urban vitality of an area is not meant for all urban areas of a city. This is dependent on functional-spatial requirements as well as combinations of users and how these users behave in space. Tan and Klaasen (2007) approached the concept through 24/7 economies and the type of users these environments generate and the spatial requirement related to it. This seems irrelevant to more residential areas, however the requirements for spaces to flexible to all uses during anytime of the day becomes more and more a necessity to all urban environments.

Urban vitality
“It refers to the numbers of people in the street (pedestrian flows) across different times of the day and night, the uptake of facilities, the number of cultural events and celebrations over the year, the presence of an active street life,...” (Montgomery, 1998, p. 97).
Successful urban places are transaction based, in a complex sense of understanding. The place-making theory formulated is based on several theories by others, concluding into 3 main components that make place; activity, physical setting and meaning. In this theory activity is the component that directly reflects urban vitality, physical setting and meaning support it. The place-making theory will be more elaborated later in this chapter.

Lighting plan
Outside of the urban context lighting plans are being developed for indoor locations and occasions by lighting designers to get the most out of a certain space related to the expected use of it. For cities, Lyon (France) was the first city to explore the potential of lighting applied to the urban context for more reasons than just safety and comfort. The idea of public lighting shifted towards a concept of lighting that creates the city at night and, potentially, can interfere with the behaviour of people. For example, lighting which guides people through centers (Van der Spek, 2005). Today the sustainable use of energy resources is integral part of all lighting plans being developed. Within this thesis public lighting is one of the main themes handled and explored within practice of urbanism. A light plan is a illumination plan, in this thesis it will is only used in the urban context.

Lighting festival
With the rise of lighting plans for cities, there was a simultaneously trend visible of lighting festivals taking cities all around the world. There is no precise definition suitable for all different lighting festivals that are taking place. The origin of each festival is different and each festival has its own focus. However there are several aspects that can be found in the context of almost every lighting festival. Typically the festivals are big branding campaigns for the city, with a focus on the aspects that make the city unique. The festivals last for several days and extraordinary installations and techniques are used creating a unique atmosphere which is mainly focussed on pedestrian participation in the public domain. Lighting festivals in essence are spectacles of art and theatre using the city as their stage to perform where light plays the main role.
inner cities

The context, in which this thesis is placed, can be roughly characterised by the increasing socioeconomic duality in the world and cities. Northern European cities are facing stagnation in their natural growth, and are redefining the role of their inner cities. This is an historical process and typical for post-industrial cities, that made the shift from industries towards the service sector. Generally it can be argued that industries were the causing factor that made the more wealthy classes of society moving out to so-called suburban areas.

Due to highly connected networks and increased possibilities of mobility, this process was not being counteracted. It resulted into inner cities struggling to define their identity and position within a more regional context (Falk, 1996). When talking about lively and sustainable city centres, Falk states that retail industries in Europe get most of their inspiration from the USA; big mega malls at the edge of cities. This post-industrial process reached the point of ‘edge cities’ or ‘American doughnut’; leaving a whole in the middle of USA cities. The European continent is facing the challenge

“to use the space vacated by industrial contraction to promote a diversity and critical mass of attractions”; “creating a living heart instead of a sullen shopping centre is becoming priority” (Falk, 1996, p. 110).

This process goes hand in hand with the danger of inner cities to loose their vitality (Montgomery, 1998):

“Vitality is what distinguishes successful urban areas from the others.” “In the long term urban vitality can only be achieved where there is a complex diversity of primary land uses and (largely economic) activity.” (Montgomery, 1998, p. 98).

When inner cities are facing the leave of retail and the wealthy classes of society this vitality is very likely to be non-existing anymore.

An inner city that does not take clear position in this debate will not be able to counteract the process. In contrary; it will create a clear shift between day and night use of the public space in city centres (Thomas and Bromley, 2000, p. 1404), and thereby only enhance the existing courses of action. In the paper by Thomas and Bromley (2000) the 5pm flight by the working class is closely related to current inner city problems; lacking vitality and flexibility to react to current changes.

Montgomery has defined urban vitality as an essential part of successful urban places (1998). The place-making theory he formulated, is based on several theories by others, concluding into 3 main components that make place; activity, physical setting and meaning. This theory is elaborated on the next page. The 3 components of the theory all incorporate the urban lighting aspect within space. Urban lighting facilitates activities; it contributes to the physical setting of space in lightening it up and creating a certain atmosphere and meaning. This relation is more explored from page 31 on.

Within this theory, vitality is causing activity together with the concept of diversity of actions and users. It is important to realise that this definition is handling about more than day time. The importance of designing night time environments as well implies the necessity to evaluate the role public lighting plays in the urban design practice.

On the next page the place-making theory and urban vitality are more elaborated upon. This part is followed by theories on 24/7 environments where urban vitality during the 24-hours of the day is related to spatial requirements for these kind of environments to occur.
place-making theory

This theory of Montgomery is supported by and based on Jacobs (1969, in Montgomery, 1998, p. 99) who argues a “fine grain city economy”. Successful urban places are transaction based, in a complex sense of understanding. When looking in history,

“providing the space of transaction, across the day and night is what cities have always done”, “… it is important to help build the evening economy of urban places, for where this is lacking a place can only be said to work half of the time.” (Montgomery, 1998, p. 99)

There is a need to redefine the role of the centre of Brussels within the bigger context (relation to fringe) as well as its relation to the more local context. The shift between day and night use creates a lack of ownership, as described in the problem statement. In order to create some ownership there is a need for a sense of place; it will mentally and physically connect different users to the centre by creating a clear identity in activity, form and meaning. These are the 3 concepts that make place. The 3 parts of Montgomery’s (1998) place-making theory are explained here.

Activity

diversity, vitality, street life, people watching, café culture, events & local traditions/pastimes, opening hours, flow, attractors, transaction base, fine grain economy

Activity is the result of both diversity and vitality of space. A mix of users and uses next to each other in the same space cause vitality and thereby activity. These theories are mainly based on Jacob’s Death and Life of Great American Cities (1969). “As a rule, the most lively and interesting urban areas tend to be places of complex variety, with a large representation of small-scale business activity which trades not only with ‘consumers’ but with other businesses.”(Montgomery, 1998, p. 99) It is important to realise that activity are influencing the image of an area. Meeting places create shared memories, which support a certain image or adjust and maybe even change it.

Image (cognition, perception, information)

Symbolism & memory, imageability & legibility, sensory experience & associations, knowledgeability, receptivity, psychological access, cosmopolitan/sophistication, fear

Image of a place is created by perception and the existing identity; it is based on the feelings of an individual. Lynch (1960) already defined imageability of the urban environment; “the extent to which the components of the environment make a strong impression on the individual.” (Montgomery, 1998, p. 100)

This is supported by the legibility of a city to be coherent and have a recognizable pattern. According to several authors paths and landmarks are the important elements that construct the image of place (Montgomery, 1998). At the same time people derive their human identity by the place they connect with (Norberg-Schulz, 2003). “Identity and orientation are primary aspects of man’s being in the world.” (Norberg-Schulz, 2003, p. 125) So, when one does not feel involved or has a sense of belonging to the place, there is most likely no responsibility feeling towards it; there is a lack of psychological access. When strangers do not feel tolerated in space by its inhabitants, there is a very strong local ownership of the space that is not very receptive.

This receptivity adds to the imageability of the urban environment. Extra activities and an active social urban life increase the knowledgeability of an area; one gets to know more people and what drives them.
Form

Scale, intensity, permeability, landmarks, space to building ratios, stock (adaptability and range), vertical grain, public realm (space systems)

It has been questioned before if city form can create an impulse for activity and a good image at the same time; create sense of place. However it is argued that a naturally grown city should develop a life of its own, there are interventions, which can influence this in a positive way. Density of developments supports the idea of diversity of activity, however it also has a physical shape. There is a need for a high density and plot coverage, as well as mixture in building envelope and sizes. The adaptability of these buildings is higher and therefore as well more easy to react on sudden changes, in order for an area to remain vital.

In order for mixed use to reach the full goal there are several conditions to be met: people should use the same streets and (some of the) same activities, and activities should be spread during the day. Vertical zoning can be another tool to assure an active street life and well-chosen locations for people attractors or landmarks assure the presence of public in the open space. The human scale of the built as well as permeability of building blocks makes it easier for people to interact with their surroundings and for small enterprises to sustain their presence. On the other hand, it also increases the visibility between blocks and the chance for human contact. A divers horizontal grain of economic activities assures the activity and natural surveillance, which causes a higher feeling of safety. (Montgomery, 1998)
The creation of places and vitality of these places is one of the main topics and the main problem to be tackled in this thesis. The scheme on the right shows the relation between the thesis methods and the creation of place according to the theory explained on the previous pages.

The scheme structures the information according to 3 theoretical & analytical pillars supporting this thesis; 24-hour use of public space and its image, the users and their actions, and the actual built form of Brussels. This structure completes the scheme of page 13 and 54 which relate problem statement to interest, tools and research questions. This scheme is based on the theoretical part, which forms the framework of the thesis and its further used methods.

Starting from the motivation, fascination and the academic and societal relevance a research question and problem statement is derived. This all together forms the basis of the theoretical framework, which supports the thesis. The problem statement can be concluded in socio-spatial fragmentation. From here the place making theory is used to frame all other theory in. The different aspects of the projects will be analysed using different methods.

When it comes to the 3-layered end product, every aspect has another focus or goal on the separate scales of intervention. Only the metropolitan scale has not really separate goals for each aspect of the problem, as it is a matter of positioning the big scale towards the smaller scale; it serves rather a reflective purpose. The final goal, combining different levels and different aspects is to eventually create an integrative inner city during the 24-hours of the day.

This approach is based on a reflective working method between big scale and smaller scale. It is a combination of top-down (1 image of the centre towards the fringe) and bottom-up (enhancing the local area by using local assets).
motivation & fascination
relevance

Research Questions

problem statement
spatial & social fragmentation

place-making theory

Theoretical framework

24 hour use of public space

public safety
local participation
city lighting
sphere

Methods

observations
good/bad practises
literature

Design intervention
local design

inner city - strategic plan
Brussels Capital Region - vision

24-hour flexible space
addapt to future usage

1 inner city image
positioning center to fringe areas

Users of public space
socioeconomic actions

staying/go through
commuters' city
urban vitality
ownership

spatial policies
political structure

1 inner city image
positioning center to fringe areas

Brussels’ mosaic
actual space

soico- spatial
fragmentation
local assets
spatial configuration
spatial patterns

balance between
staying <> going through

improve situation for
existing users

positioning center to fringe areas

positioning center to fringe areas

create a vital place during 24-hours of the day

crossing layers of intervention

public space design, strategic plan, vision

creating a vital place during 24-hours of the day

crossing layers of intervention

public space design, strategic plan, vision

end products

evaluation and reflection

evaluation and reflection

approach to interconnect
the different scales

reflect to design

24/7 environments

The idea of evening economies is closely related to the notion of 24/7 economies and 24-hour cities. However, there are different understandings of these notions, which were introduced during the 90s of the previous century by various authors. In the field of economics it means something rather different than in the scope of urbanism. It is more than an area with 24/7 accessibility, incorporating a variety of shops and services (Tan, 2007). In any form, these environments are indicators of urban vitality.

The 24/7 environments evolve out of several combined conditions that generate or support development. These conditions are formulated by Tan and Klaasen (2007, pp. 704-709):

- diversity in culture and religion (e.g. sabbatarianism),
- changes in work culture and in family unit (e.g. increasing amount of home-workers, night shifts),
- changes in demographic tendencies such as growing individualism and an increase in female labour force participation,
- increasing consumerism and affluence (e.g. licensing rules),
- globalisation (e.g. contribution to breaking down of time-based boundaries),
- growth of service economy, leisure economy, population density and adequate user bases (a certain quantity is needed to assure viability),
- accessibility (by a wide variety of users),
- public space (e.g. encouraging outdoor activities),
- climate (24/7 have during the year always a certain level of activeness).

All together these features of 24/7 environments result into areas, which are used during 24 hours of the day by a wide range of users implying different means of use of space. A 24/7 environment or around-the-clock urban vitality of an area is not meant for all urban areas of a city. This is dependent on functional-spatial requirements as well as combinations of users and how these users behave in space. By Tan and Klaasen (2007) three broad types were observed; Hedonists, Residents and Tourists, which result in different types of environments, respectively defined by leisure, trade and tourism. For obvious reasons, this is more likely to be successful in central areas of cities and inner cities than in suburban areas.

Artificial lighting should be an integral aspect of the built environment supporting the 24/7 vitality as described above, this is not explicitly mentioned by Tan (2007). It can be argued, that this aspect of space can be seen as a part of several of the supporting conditions of 24/7 environments, as mentioned above. For example the accessibility of spaces and areas in evening times; the climate of Northern-Europe; the way public space is designed in general; the way the rules of intervention in space are set up by the different actors of governance.
lighting in urbanism - theory

As can be read above, lighting is seldom an issue of discussion when talking about urban vitality or 24-hour urban environments. Indirectly it is part of several concepts that are mentioned in the argumentation. However, it is still free for interpretation how public lighting is manifested in this.

There are examples in practise of public lighting contributing to the vitality of cities, which enhance public space quality and create a positive atmosphere. This is also being described in the paper of Alves (2007) handling about art, lighting and urban development, by using the clear example of Lisbon’s Luzboa-project. This paper recognises the tendency of cities to use lighting and arts as a way to rediscover public space. It could be seen as the very concrete implementation of Montgomery’s formulations of cultural quarters (2003).

The Luzboa project illustrates not only the fact that lighting gives identity to space, but also has the power to be an instrument to transform it.

“Light has started playing new roles mainly in the way it may help quite decisively to forge new ties of identity between people and the places they live in” (Alves, 2007, p. 1254).

It is clear that lighting has undergoing a shift of interpretation and application in recent years. It used to be an architectural issue only, while today it is also being related to what is going on in the public domain. These activities are more than just architectural.

This is also shown by Van der Spek (2005), who wrote about the ability of lighting to guide people and to create points of reference within space. Lighting is taken to another level of possibilities, from only technical and comfort issues (e.g. safety and visual comfort), to a complex combination of these issues related to social aspects of navigating through cities.

“This quote proves the power of the interactions that take place in public space. At the same time it proves, together with the previous, the influence of lighting and lighting festivals on the participation of public space by different people. Special events like different type of lighting could be one of the stimuli of activity.

On the other hand there are no specific details known about the consequences on a longer term of specific urban lighting in public space. Also any details on a relation to the behaviour of people in between urban fabric are lacking in current available literature.

A paper that comes close to this, relates to the restorative aspect of lightening-up specific sceneries, comparing greenery vs. parking lots. An example of 2 different way of illuminating the same street can be seen in img.26-27. The study shows that

“lighting is a health and well-being issue that takes effect through person-environment transactions; people shape and are shaped by their environments.” (Nikunen and Korpela, 2009, p. 37)

The experiment proves that lighting has a considerable effect on the experiencing of nightscapes. Viewing green sceneries influences the well being of the spectator in a more positive way, than high lighting parking lots. It can be concluded out of their experiments, that lighting

“can be regarded as a tool to enhance or weaken the restorativeness of urban nightscape” (Nikunen and Korpela, 2009, p. 38).

It is unclear if the effect of lighting can be taken to a higher level, stating that lighting can upgrade an area.
Van der Spek’s paper (2005) on the guiding principle of lighting through cities, explains lighting more as a strategy towards enhancing existing qualities. In his paper the lighting master plan of Rouen is used as an example to underpin this statement. The lighting is adapted to the rhythms of its users and hierarchy of spaces. It makes it easier for different people to navigate through the night sceneries of the city; it is a matter of accessible public spaces. On the other hand the lighting balances between the demands of and on the environment. It shows the great beginning of how to provoke life between buildings (as quoted earlier by Gehl and as a requirement for urban vitality). However, it does not explore what it is exactly the beginning of; what kind of life between buildings.

Alves (2007) argues in a similar way that lighting adds to the readability of cities. It can even overcome physical disorder of urban growth or lessen topographical barriers by use of coherent lighting. It increases the identity of a place, by more than just putting light on a spot; it is the quality of the light that ensures safety and comfort. These 2 goals play a strategic role in bringing public spaces to life, claims Alves (2007). The example demonstrating the previous statement is located in the outskirts of Paris. Lighting is used here to understand and articulate the landscape. The result of the efforts was shown off later by de-marginalisation of what used to be an unattractive area. Another example shows the ability of the wrong type of lighting to add to the feeling of disconnection to the urban network; lighting here is a barrier preventing public space movements.

In general the configuration of space is not the only factor to influence the successful implementation of artificial lighting. As stated in the paper by Nikunen and Korpela (2009), to create a pleasant atmosphere it is more important what is illuminated than what is there in total. In a way this is the advantage of the darkness; the choice to decide on shadows as well. By highlighting these positive aspects of space, the identity is enhanced and the total image is improved. If the positive aspects are simply not present, they cannot be enlightened either.

At the same time the users are the ones who make public space successful. The use of public space however, is depending on its configuration and function. It can be concluded that this spatial configuration, if coherent and well connected within the network, supports the successful implementation of urban lighting. It can even overcome physical barriers as stated earlier. With adapted lighting, an existing logical spatial connection can be made strong and consistent during the darker hours of the day. The spatial support of good urban lighting is mostly by means of the existing urban networks, and spatial quality within public space to be illuminated.
Regarding the influence of lighting on the functionality of an area in a direct way, a preliminary conclusion can already be formulated. Literature is quite clear on the reach of influence of lighting being limited to the available qualities present in space. Through Bill Hillier (1993) it is proven that above all attraction and movement are initiated by the spatial configuration of urban areas. In essence this leads to the statement that basic intervention should be in the physical form on which functions and light can be applied and from which attractions and movement will result.

In more practical terms, it can be noted that lighting together with an urban design intervention complete each other. By consciously developing the lighting plan of an area, it is possible to create spaces that function well during every hour of the day according to the uses and users. At the same time it makes it possible to clearly state the difference of both environments; let the dark be dark.

This last concept is promoted by Leni Schwendinger who observes and states the importance of designing with light in the current environment. She shows the nightscape of the cities with different eyes, by not only focussing on the designed public light, but also on the accidental light, such as signalisation and commerce (Schwendinger, 2012). The type of public lighting she describes in uncontrolled by authorities, but indirectly a sign of vitality and activity within a certain area. This is supported by an example of the city Ghent, which cooperates with the local shop owners to reduce light emission (see further).

Brandi on his turn provides clear insights in how a lighting plan can be added to an urban area. The urban aspects with which the light can interfere are, according to him:

- hierarchy of streets and paths, spatial appearance of squares, facades and their reflection, parks, outstanding architecture and the appearance of objects from far away and close-by (Brandi and Geissmar-Brandi, 2006, p. 38).

He describes add-ons to the urban tissue to express the built environment in a more suitable way during evening times. Although he does not take clear positioning towards the occupation of these spaces. He acknowledges the fact that lighting can add to upgrading processes of new urban developments, although it remains unclear what are the exact tools and the long term results of such interventions.

A clear understanding of the tools in the urban environment is generated through this reading. However, the smart application of lighting on an area and what it means in terms of socioeconomic dynamics is lacking in this publication. This aspect so far has not been traced in academic writings or whatsoever. A full conclusion cannot be drawn out of the currently available literature, for the simple reason that there is a lot of research still to be done in this field. Especially the consequences lighting has on the activity within the public domain is blurry. The closest conclusion regarding this can be found in part 3, the comparison study.
There are several purposes of lighting that add to the vitality of an area. For obvious reasons these purposes are in principle: 

**safety, orientation and decoration.** The examples on the following pages will show how these different purposes of lighting can add to the vitality of an area, or enhance ownership of place.

### safety

Lighting can enhance the feeling of safety by the concept of inter-visibility (van Nes, 2008). This concept is based on the social aspect in the built environment; inter-visibility of entrances, relation of dwelling to the street and topological depth between public and private. The quantity of these kind of spatial relations from private towards public can be an indicator of liveliness on the streets (Gehl, 1987). On the other hand there is also the human connection on the street; when people are able to recognise each other’s faces they generally feel more secure.

### orientation

Orientation within the city is of great importance for its users but also for the city itself, to function in a proper way. Guidance of users and having point of reference make people move and discover. It is clear that lighting can create guidance through urban tissue by focussing on main connections and by distinguishing them from the less important streets. These connections are related to the spatial features of space, as well as to the socioeconomic add-ons. This is again a matter of enhancing the existing quality and at the same time strengthening the social structure of the city guidance through lighting.

### decoration

Lighting festivals, as explained earlier, are mainly meant to show the aesthetics of a city. It puts focus on architectural heritage by means of lightshow projections. It is a way to decorate the city, show the beauty, without doing much more. However, as stated in the review paper, this can be an important trigger for the less wealthy neighbourhoods to create a feeling of ownership and identity with place. Therefore this aspect of urban lighting should not be played down.

When relating these 3 purposes of lighting to the place-making theory as explained earlier in this report, safety can be placed under image and activity, orientation has to do with form and activity and decoration has purely to do with image.
The Why Factory project on glowing canals, Amsterdam

As part of The Why Factory studio at Delft University of Technology, students were thinking about ‘green’ projects with a bigger spatial impact than is usually the case. While most green initiatives start at the individual, this studio focussed on the bigger picture, and what can be done there. The glowing canals project is one of these bigger ‘green’ examples. Although the project of glowing the canals of Amsterdam with luminescent bacteria is quite a visionary idea, and not very likely to be implemented in the near future, it is a good example of how the local assets of place can be used to enhance street safety and at the same time create a feeling of belonging and ownership. By enlightening this entity, the canal is also at night an aspect of the identity of the city, as it is during the day. So, apart from illuminating the public space, the glowing canal also strengthens the identity of space, which is an important factor to assure urban vitality.

Veldstraat, Ghent

The example of one of the main shopping streets of Ghent, Belgium, Veldstraat is at this moment being a test case of collaborative action towards sustainable street lighting, also after closing hours. Although street safety is not the main purpose of the project, it is a secondary result of the combined effort of the different stakeholders. The shop owners of the different stores have impact on the street life by means of their show windows, which are illuminated also after closing hours. At the same time there is the municipality of the city who puts effort in street lighting in the whole city according to public safety rules. The illumination of the shop windows combined with the traditional lighting in such a dense shopping street as the Veldstraat results into an over-illuminated street. The energy cost of this system is higher than it could be, as well as the light pollution, if the different actors involved would cooperate. Therefore there is now set-up cooperation, in order to reduce the use of energy to make the system more sustainable. Using the lights of shop windows adds to the inter-visibility of the street as it illuminates pedestrians from aside as well, instead of only from above. It makes faces easily recognisable and the shops itself add a quality to the urban nightscape by the possibility of window-shopping.
Lærdalstunnelen, Norway

The tunnel of Lærdal in Norway is also not a directly applicable example to the situation of Brussels. However it is a good example of creating orientation within movement. The tunnel of Lærdal is more than 24 kilometers long, this length would result into a boring ride in most tunnels. However, this tunnel has spots inside that make depth within the journey through it, and show the movement by passing by different coloured ‘rooms’. The light of each room has a different colour, which splits the long ride into several shorter rides from one room to another. The colour of the lighting makes sure that the driver knows where he is within the tunnel. This way of orientation within movement could also work within the built environment, for example by program, urban form or street lighting.

Nationale-Nederlanden - Rotterdam, Netherlands

The building of Nationale-Nederlanden, a Dutch insurance company, located closely to Rotterdam Central station is a more literary example of pedestrian orientation and guidance within the urban tissue, both during day and night. This 151 meters tall building is built in 1991 and was until 2009 the highest building of The Netherlands. By this presence and the combination with a few other blocks, it is a very recognisable structure within the skyline of Rotterdam. The building itself was a few times used for commercial promotion purposes, however during the winter months since 08/09 it was subject of an artistic installation by Studio Vollaerszwart, who covered the buildings with 3500 LED-lamps, creating an artificial night sky. The sun charges the LED-lamps during the day, this makes the whole installation climate neutral. Because of its strategic position close to Central station the installation is a very powerful point of orientation and guidance through the city. It also creates a warm welcome to visitors during winter. The counter point of this example is that fact that when actually approaching the building nearby it does not connect on the ground level; there is no interaction with the very specific localities on scale of the sidewalks.
Limelight: Saturday night, Sans Façon

This installation is nothing more than an event, touring around big cities. It replaces a normal streetlight by a big theatre spot. By doing this, it creates a free stage for the users of the public space to take the stage and make a show. It shows the public space in its pure meaning, a democratic place or platform for all. Like the lighting festivals, it does not do something new, and it is not permanent. By temporary changing something from ordinary to extraordinary, it can be the start of something new; questioning the everyday life and involving the people in what is happening. The event creates a sudden sense of place; the question is what happens after this event, to make the change more long-lasting.

Piazza San Magno - Legnano, Italy

This Italian square is redesigned to generate a flexible and social environment. The urban design and lighting are integrated with each other and supporting each other. The square is separated in several smaller entities which are bringing back the scale of the pedestrians. At the same time the illumination of the facades adds to the orientation within space and the city. The square as a whole gives a good balance between safety or intervisiblility of the space, orientation within the city and decoration of it.
'clutter’ on the streets

The clutter of light that can be found on the streets, as it is called sometimes, can be found in both commercial and living environments. While several authorities aim to remove this clutter and make all lighting in public domain controlled by themselves, advocate others, like Schwendinger, to use and adapt to this accidental lights in the streets. Accidental illumination sources refer to entities such as signalisation, shopwindows and use of buildings. By using these sources together with the directed public lighting would bring a more balanced public lighting in the built environment. Like the example of Veldstraat in Ghent, it adds to safety but also orientation by the activities that are related to the illumination sources.

18 septemberplein - Eindhoven, Netherlands

This square in Eindhoven is enclosed by a variety of different architectural styles. The illumination of the square aims to connect these different styles and environments. The light aims to unity in a place where any unity is absent.
Platform 5 - Sunderland, England

Jason Bruges studio developed this 144m long piece at Sunderland station. It presents a virtual platform filled with passengers' shadows within a glass block wall. Behind the wall is a disused platform, which long ago used to see passengers waiting for trains. Now the tracks are long gone and the old platform is hidden from view, ghostly characters appear behind the glass wall opposite passengers waiting for the trains. source: JasonBrugesstudio.com
Fatih Mosque - Eindhoven, Netherlands

Although the comparison of Kuregem with Brugse Poort provides a cohesive set of outcomes (see part 3), it does not give clear insights in the long-term effects of the combined efforts. The plans are still in progress or just finished, meaning that the overall result of the intervention on a longer term remains unclear.

To examine these effects an other example will be used of which an analysis of the longer term results is possible: Fatih Mosque, Eindhoven. This is an architectural project, but within its bigger urban context it has a significant influence on how the city is being perceived and imagined.

The idea of applying a special kind of lighting to the Fatih Mosque in Eindhoven did not come from the authorities developing the light strategy for the city, but from the management of the mosque. They wanted to give the mosque a place in the nightscape of the city, as it belongs as much to the city as any other remarkable building. The mosque before the intervention was not part of the readability of the urban area of Eindhoven neither of significant importance in vision for the city.

Since this Mosque is in the picture of Eindhoven’s nightscape. It received over double as much visitors than before the intervention. The community connected to the mosque is being seen within the city and curiosity and interest is generated by it. The city now incorporated the mosque in its nightscape vision. For many the mosque has reached a place in their mental map of the city; it became a landmark for orientation and enhanced local identity.

This is one of the scarce examples known of specific artificial urban lighting interventions that had a remarkable impact on the structure and readability of the city; social-spatial effect of lighting are not easily to be researched. The key to this success is not specifically known.

Based on source: presentation by Luxlab during the symposium of LUCI city under microscope Eindhoven, 16/03/12.
relevance - ethical dimension

This project is about overcoming barriers and integration of neighbourhoods, it should however be clear that this is a selective process, which always comes back to either enhancing strengths or solving weaknesses or even intervening in the middle position between those two, which negotiates between the weaknesses and the strengths. The position taken in this process is in essence an ethical choice based on political statements and points of view.

By intervening in an area, another area is not looked at and assessed on its needs. This is again a prioritising issue, although in this project it will be taken into account that an area is part of a bigger context. Replacing a certain problem is not a solution which is morally acceptable. At the same time, however, one must realise that it is impossible to solve all problems within the framework of this project. Again, it is a matter of choice and selection criteria, what intervention will serve the aims of the project best. When intervening in the public domain the public should be served, which does not allow any inclusion or exclusion of the public domain of minority groups.

The site of this thesis project is one of the poorer and weaker neighbourhoods of the city of Brussels. This location was chosen for several reasons, but one of them is the impact an intervention on this location can have in the bigger context of Brussels and Belgium. This choice, of putting this area in the picture makes the project more critical than any other, because of the tensions within society in relation to this type of neighbourhoods.

Last but not least, flexibility of use should not only be taken into account in the sense of usage during the day. At the same time a design has to anticipate on future developments and changes. This is again a moral issue, as the designer and planner cannot initiate any process, but is relying on society and should act accordingly.
relevance academical & societal

Inner cities are in need of a way to keep themselves vital and able to deal with changing society. Day- and nighttime use require different qualities and different experiences of public space. Light shapes a big part of the experiences after sunset, from safety point of view light is needed. When looking at the BeNeLux region from the sky, it is one of the most sky-polluted areas of Europe.

Public city lighting is an actual expensive cost and not really a profitable and sustainable business, like more interventions in public space. It would be more valuable to invest in this if it could enhance the socio-spatial qualities of public space and add to a coherent structure of the city, as needed in Brussels.

So far there has not been extended research on the facilitation of a 24-hour use of public space. Also the relation with urban lighting and more long term consequences it has for the developments of public spaces is relatively unknown. With the current new lighting techniques there are more possibilities than before, however there are very few practical implementations of this methods and the long term effects are gradually exposed only by now.

The field of urbanism does not focus upon lighting issues as this is mostly seen as belonging to industrial design or artists. Therefore current lighting plans mostly focus on architecture or spatial conditions, but never look beyond the borders to the driving forces of the city, such as networks and the socioeconomic context.

Taking Brussels as the city to apply these lighting issues on is not a random choice. The high amount of daily migrations this city is undergoing demands a flexibility in use of spaces, and at the same time it divides the city, leading to the incline of the image of the inner city. This is a trend that can be found in more Western cities, where mobility become a more common good and the role inner cities play is under question.
A network of cities which is growing mainly in Europe is Lighting Urban Community International (http://www.luciassociation.org). This association creates a platform for cities and their professionals to share knowledge on lighting in the urban domain. The professionals all come from various backgrounds and thereby build up a basis for future generations to develop and continue the practice, which so far is not been written down as literature research has shown. Together the members have developed a charter on public lighting which states their view on lighting and sustainability as well as a common vision on urban lighting (LUCI Urban Community International, 2010).

The interest shown by local authorities in developing a solid lighting concept for the cities on their turn, proves the relevance of the topic and this project. Taking into account the current economic circumstances of Europe, does not prevent cities of investing in their night environments. Examples of efforts are more dynamic lighting systems that react on the activity in public space or the introduction of LED which decreases energy resources.

A very recent example proving the actual relevance of this project can be found in Oslo, Norway. In the fall of 2011 the city had a problem of unsafety on the streets after sunset. Therefore a large national newspaper came up with the application on their website where the public could point the places they are familiar with that lack decent lighting or where lighting is not doing what it should do. The application is quite a success a lot of people added their experiences to it, in order to make the city a more pleasant place in the dark hours. At the same time this application is a good assessment tool for city officials to evaluate the functionality of the city at night and the vitality of it.

![Interactive map of Oslo](http://www.aftenposten.no)
Finally the literature research and the theoretical framework as a whole has indirectly shown there is work to be done in this field. Especially long-term consequences of artificial urban (public) lighting and lighting master plans in city centres. At this point the developments are in an early stage, and lighting is a trending issue. Systematically research is needed to come up with arguments for and against urban lighting applications in inner cities.

The public space of inner cities is in crisis. Without taking position between suburban areas and inner city, the role of the centre will decrease to an empty hole, only functioning during 9 to 5 working hours. Together with the declining democracy of public spaces, a rise of semi-private spaces can be spotted. All together this demands a positioning of the different levels of governance to react and interact. To assure an active inner city, urban street life, the concept of 24/7 environments or 24-hour cities can be applied. This concept can be observed in several inner city environments and is a way of sustaining urban vitality during 24 hours. It takes different user groups and their patterns as a starting point to make spaces used during the hours of the day, and serving different purposes.

Within this framework lighting can be used to enhance this principle of urban vitality and to assure its successfulness. The influence of applying public lighting in this situation goes beyond simply safety and comfort issues. It can take the role of guidance and orientation, as well as image building and creating a feeling of belonging (referring to the place making theory of Montgomery). It must be noted at the same time that lighting does not add anything new to an existing situation; it only works with the qualities present, by illuminating them. There are several good examples to be found in literature and practice, however, as this is quite a new trend there are no long-term effects known yet. Fatih Mosque in Eindhoven gives a hint to the long-term possibilities, but this example can not be generalised.

The effects of lighting highly depend on the existing situation and the assets of it. Lighting can enhance urban quality of public space, however the initial quality is in the space and the design. The site specifics are therefore an important factor to understand what lighting could be and how it can be applied. Equally important is to gain understanding on the interaction between lighting design and the urban design. This will be further discussed in the comparison study (part 3), as literature proved to be insufficient on this topic.

24/7 environments are suitable environments for the exploration of this topic because of the around-the-clock scope of activities and the variety of uses and users that relate to these spaces. If the conditions needed for this type of environment are present, it is crucial to design the nightscape of an area as precisely as the daytime scenery to adapt to the different uses and for the space to be democratic and flexible to all users.

conclusion
Part 3 shows research done through comparison study. This part focusses mainly on the combination of urban design with lighting in a specific context.

It starts with a comparison study between Brugse Poort in Ghent and Kuregem, Brussels. The reason why this area is compared with Kuregem is because of the similarities in socio-demographic specifics of the area. At the same time it went through a comparable historic development. The difference is that the intervention in Brugse Poort already took place, meaning an attempt to generate conclusion on the effects of the intervention can be done.

The comparison focusses mainly on the possible connection between the light plan and an urban design intervention. As the city of Ghent already started developing its light plan in the 90s, it is one of the few examples possible to look at in the context of lighting in urban development and strategy.
The purpose of this comparison is to explore the connection between a lighting plan for an urban area and an urban design intervention. The choice of location is based on its similarities with Kuregem, to get clear understanding in the socio economic conditions and changes possible here. Apart from that, the basic requirement is the presence of a lighting plan and design intervention, which were developed almost simultaneously.

The city of Ghent is working with applied public lighting in the city since 1998. The first light plan covered only the city centre, the more recently developed 2nd light plan crosses the boundaries of the centre and integrates the different city parts with eachother. The area which will be compared with Kuregem is located just within the border of the city centre; Brugse Poort. A more comprehensive context analysis on Kuregem can be found in part 4 of this thesis report.

This comparison study will elaborate shortly on the context, explain the design and light intervention and give insight in the development process behind both plans and how they relate to eachother. Within this context, the issues that will be looked at are related to: the use of public spaces, integration of the neighbourhood to other city parts, local identity enhancement and ownership.

It ends with defining the fields of influence of lighting in relation to the design intervention and how they on their turn relate to the theory of Montgomery on place-making.
context

The area of Brugse Poort is not part of the city centre of Ghent. And even though it does not directly seem related to the centre, due to its location at the outside of the inner city ring, it takes a similar role and position as Kuregem takes towards the city centre of Brussels. On the next pages it will become clear that the similarities between both neighbourhoods are striking. However while assessing this, it should be taken into account that the cities have different backgrounds and identity.

The city of Ghent is a students’ city, a regional centre, while Brussels has an international metropolis function. This means there are different dynamics influencing the practise of development and these have to be dealt with. To use the outcomes of this comparison in an adequate way, this should be taken into account.

facts & figures

<table>
<thead>
<tr>
<th>Kuregem versus Burgse Poort</th>
</tr>
</thead>
<tbody>
<tr>
<td>density</td>
</tr>
<tr>
<td>8k inh/km² (2011) - 7.5k inh/km² (2010)</td>
</tr>
<tr>
<td>surface</td>
</tr>
<tr>
<td>2.2 km² - 2.1 km²</td>
</tr>
<tr>
<td>ethnic minority group</td>
</tr>
<tr>
<td>unknown - 31.1%</td>
</tr>
</tbody>
</table>

Most people have an age between 20 and 40, which is relatively young. There are around 500 students living in the area in Ghent. For Kuregem these numbers are unknown. Typical for both areas is the high unemployment rate and, overall presence of social weaker groups of society and a high diversity in ethnic background.
facts & figures  Brussels (BHG) versus Ghent
density  7,1k inh/ km² (2011) - 1,6k inh/km² (2011)
surface  161,38 km² - 156,18 km² including Ghent seaport

A complete site analysis on Kuregem can be found in part 4 of this thesis report.
historical development

Brugse Poort is developed during the period of 19th century industrialisation. It is located on the old route to Bruges and its function was connected to textiles industries. Today it still contains a high percentage of the typical (low quality) worker houses, while the industries moved out a long time ago already, together with the higher classes of society (city flight). Due to low priced housing and the relatively bad image of the area the neighbourhood attracts a variety of immigrants looking for cheap housing. The area today is known for its mixed demographic structure, the low quality housing, higher criminality rates and drugs abuse.

On the other side of this, various small local initiatives stimulate the community. A good example is the theatre and cultural centre ‘bij de vieze gasten’ which is closely involved in the socio-economic development of the area.

key issues in the area before urban renewal

A bad image was dominating the area. Qualitative public space and attention for the slow users was lacking. Due to the well defined boundaries around the neighbourhood, it was closed inside, not taking advantage of its good location.
The former activity of the area was industrial and related to the slaughterhouse and meat industry. Currently the industrial plots are still there. Car dealers are using them for their businesses. This leaves the area with a lack of diversity in function. During the day a flow of people is guaranteed due to the positioning of the area between fringe and centre, as well as an eye on the street that comes along with the presence of people. The urban vitality is rather limited.

Historically the urban form of the area is related to industry, and rather permeable. The typology of the built is similar to some other city parts constructed in the same period. There is a limited amount of landmarks and qualitative open space is scarce.

There is a strong negative mental image concerning the area, fed by the national media. This causes a feeling of fear and low psychological accessibility. The quality of the built and the public spaces is low, the users of these spaces do not feel ownership of the whole neighbourhood.

The historic development of both areas are similar, and so is the current demographic structure. A difference lies in size and direct positioning of the neighbourhoods. Brugse Poort being within the inner city ring road makes it perceived as part of the city more than Kuregem is for Brussels. This is also related to the governance structure of both cities, where Brussels is subdivided with municipalities, Brugse Poort is part of the city of Ghent and has the same governmental rules as the city centre has.

The way these governmental institutions have been handling both areas is therefore also very different. The municipality of Ghent tries to involve its inhabitants for a longer time already, where Anderlecht (of which Kuregem is part of) did not have the reasons and means for a long while to interfere in the area and to engage the community from the inside.

Although Brugse Poort knows a lot of local sociocultural initiatives, there is still a very negative connotation with the neighbourhood in a general perspective. So far this negative image and the poor quality of housing is preventing the area of strong gentrification processes. However, slowly this is already taking place.
design ‘zuurstof voor Brugse Poort’

initiation of the project: 2002
supportive vision: 2003 (structuurplan)
realised: under construction / finalised
rode loper and connected public spaces are nearly finished

aims: opening up the density,
need for more and accessible green,
reverse the city flight,
 improve building stock,
increase readability of neighbourhoods,
divers building stock,
encourage mixed use public space,
strengthen local neighbourhood identities

The project ‘zuurstof voor Brugse Poort’ (Oxygen for Brugse Poort) is a framework in which several smaller developments are placed. Several squares are being designed, the housing stock is slowly by slowly renewed and a neighbourhood participation process is initiated to match needs and generate involvement, community feeling and identity, to sustain an ownership of the newly created spaces and structures.

The projects all together from a varied mix of interventions working with the different forces present in the area. They vary from neighbourhood participation processes, cultural engagements and programmatic changes to redesigning squares, renewal of the housing stock and the creation of new cross connections through the neighbourhood towards other city parts. These projects are developed through cooperation between public and private sector and the local stakeholders, through an NGO (non-governmental organisation) which monitors side effects of the projects and is the voice of the inhabitants.

One of the spatial intervention projects forms the backbone of the renewal of the whole area; project ‘rode loper’ (red carpet).

This slow traffic route crossing through the area connects the neighbourhood with the adjacent areas, it provides a qualitative backbone to the higher structures of the neighbourhood; local movements have a place now and interconnect with different levels of the city (from more global to local).

The carpet connects different meaning-full spots with each other, making the facilities more accessible to locals and opening up the dense structure by new squares and green structures. The neighbourhood literally gets more space to breath. The relation with program and heritage strengthens at the same time the local identity and feeling of history and belonging.
light plan ‘Gent Lichtplan II’

Light plan I 1998
status ongoing / finished
Light plan II 2009
status develop / implementing fase will start soon
based on ruimtelijk structuurplan Gent (RSG) - structural vision for Ghent 2003
follow-up Light plan III in study fase, after that IV will be studied

The second light plan of Ghent was developed after the very successful first light plan of Ghent was finished and implemented. Where the first light plan focusses on the historic centre of the city, the second plan preaches an integral approach of all public space and bases itself on the vision plan of 2003 for the city. Next to this it gives direction and image to the small local centres and city parts, while keeping in mind bigger structures that shape the city as a whole (img.66 & 70).

The main principles as developed in Light plan I form the basis for all other lighting interventions and designs. The light should show a clear city structure by:

- lighting up entrances and beacons (orientation)
- show the skyline (form)
- special treatment for commercial axes (activity)
- respect living in the city (activity)
- extra attention for differences in space and time (activity)

The common approach to these principles is a totally integrated light solution. This is in a bigger scale also applied on Light plan II.

One of the city parts with its own light plan is Brugse Poort - Rooigem. The way the different road types are treated by the light plan is by a set-up of guidelines used for the whole city. Special local features are designed in small detail, and thereby giving the local its identity while drawing a coherent picture of the whole city.

The site Pierkespark, which plays a key role in the development of Rode Loper, is marked in the light plan as a secondary local centre. This way the light plan supports the role of this urban intervention and it give the park the prominent position it needs to fulfill (and is fulfilling right now after completion) for the community of the neighbourhood. In this way the light plan strengthens the local identity by supporting not only the old structures as historic cores marked by churches but also acknowledges the new shape of society and community values.
Both plans (light plan and design) have been explained and aim to work together on reaching their combined goal. The process in which they come together is crucial to gain understanding in the full meaning of both plans and their implementation. The scheme on this page shows the process by the sequence of official plans and documents to reach the final result. It shows clearly that the light is subordinate to the plans for the public domain and the vision of the city. However, the light plan is developed in close cooperation with the developers of the other plans. This cooperation in fact aims to integrate the lighting to the pre set-up vision and goals. The light plan makes the other plans stronger and more powerful.
conclusion

Lighting adds to:

- *readability* of the structure of the city, cutting through scales from international to local neighbourhood
- it is about *way-finding* in/out
- *orientation*
- value of a place from international to local
  this value adds to *ownership, participation and vitality*

Therefore a lighting plan is not a generic add-on to a city, which can be easily copy-pasted from one city to another. It depends on local variables such as the population and their values as well as program and function connected to space.
Keeping this in mind, flexibility is important; the circumstances can easily shift.

Brugse Poort and Kuregem do have some of these circumstances in common, but still are very different from each other. The case of Brugse Poort is an eye-opener on how the design by clustering program and the light plan by adding orientation to this, work together in creating a local backbone for this vulnerable neighbourhood, while remaining part of the bigger picture. Being seen within the bigger picture of the city, can also be a boost of trust towards the local inhabitants.

Within the place making theory of Montgomery lighting adds on all of the 3 pillars, but mostly on form.

<table>
<thead>
<tr>
<th>24 hour use of public space</th>
<th>Users of public space socioeconomic actions</th>
<th>Brussels’ mosaic actual space</th>
</tr>
</thead>
<tbody>
<tr>
<td>public safety</td>
<td>staying/go through commuters’ city</td>
<td>soico- spatial fragmentation</td>
</tr>
<tr>
<td>local participation sphere</td>
<td>urban vitality</td>
<td>local assets</td>
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<tr>
<td></td>
<td>ownership</td>
<td>spatial configuration</td>
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<tr>
<td></td>
<td>spatial policies</td>
<td>spatial patterns</td>
</tr>
<tr>
<td></td>
<td>political structure</td>
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</tbody>
</table>

Lighting creates opportunities to determine focus during during 24hs of the day. This creates opportunities for cities to show the other side of the city. Create a nightscape that contributes to the dayscape and make the cityscape thereby more complete.
Part 4 provides the reader with a detailed context description and analysis of Brussels’ inner city and the local intervention area, Kuregem. First Brussels’ inner city is described and an analysis is done on the fragmentation that is happening on that level. Knowing these general context and assessing the placeness around the inner city provides enough basis to go to the local level.

On the local level Kuregem will be described in more detail and also policy structures on this level will be touched, relating the local practice to the complexity of the decision-making in Brussels Capital Region.

For the local level analyses the aim is to check the reality of some bigger scale problems as mentioned in the problem statement with the specific conditions of the local intervention area of Kuregem.

The analysis and feedback of this small scale to the bigger scale results into some outcomes, which would not have been able to be developed if this connection between scales was not made.

It ends with a set of conclusions from the analysis which are taken to the next level of developing the end products, which will be done in part 5.
context description - facts

161,38 km²
1,136,920 inhabitants (2011)
7,045 inw./km² (2011)
11,987,82 average income in Euro/inhabitant (2006)

official languages French & Dutch

500,000 or 11% of working inhabitants of Belgium moves daily to another region for their job, according to the numbers below 437,590 of the jobmigrations are in/out going Brussels region.

714,110 daily jobs in Brussels
371,700 jobs filled by workers from an other Belgian region (2010)
61,140 jobs in the other regions filled by inhabitants of Brussels (2010) or 15,5% of the employers of Brussels
4750 jobs abroad filled by inhabitants of Brussels (2010)

49,8 % of the inhabitants of Brussels is not born there (2001)
40,3% of the inhabitants of Brussels <18 is not born there
31,7% is born abroad
8,4% is born in Flanders
10,1% is born in Walloon

The capital region of Brussels is a combination of 19 different municipalities together. One of these municipalities is Brussels. Although generally speaking when talking about Brussels it usually means the capital region and not the municipal part of it. In this thesis the general way of speaking is used. When talking about the municipality it will be clearly mentioned.

The history of the development of Brussels, forms the basis of the fragmentation the central areas of the city are facing these days. The transition from industrialisation to the de-industrialisation period, caused problems that are still recognisable as such in the urban tissue. This is further elaborated on the historical development analysis on the next page. The very late empowerment of a government responsible for the territory of the capital as a whole (established in 1989) is another reason for the way the problems as touched upon in the problem statement have been treated until today.
context description - history

The history of the development of the city forms the basis of the fragmentation the central areas of the city are facing these days. The transition from industrialisation to de-industrialisation period, caused problems that are still recognisable as such in the urban tissue. The very late empowerment of a government responsible for the territory of the capital (1989) is another reason for the way the problems have been treated. A visualisation of the historic growth of the city can be found on the next pages.

1200
The city of Brussels in origin was a combination of several settlements. A harbour at the river Zenne and 2 small hilltop towns were merged together on the important trade route between Bruges and Cologne. In 1229 it received the first type of authority by the Duke of Brabant. A defence wall, later called the inner defence wall, surrounded this small settlement. Nowadays this wall is not visible anymore in the urban structure.

1350
Around 1350 the settlement had between 5,000 and 10,000 inhabitants. In this period the Dukes prefer Brussels over Leuven. This results into the development of luxury handicraft industries, and the city starts making money from cloth trade. A new wall is build surrounding the bigger settlement. This wall is now where the inner city ring is situated.

1550
Under the authority of Karel V there is a revival of trade and glory. A new canal is dug connecting the harbour of Antwerp to the harbour of Brussels. The Zenne river looses hereby the importance as main sea connection.

1745
After the Spanish war in 1713 the city become part of the Habsburger empire, together with this more luxury goods get produced inside the city like porcelain and carriages. In 1795 the French annex the city and the importance of the city degrades to district capital.
1819
In 1819 Brussels together with The Hague becomes the governmental capital of the new kingdom of the Netherlands. Due to industrial production the city is growing in importance. At this point there are 2 main type of industries on the west-side of the city where the river and canal are located. Bleaching industries and cotton related factories.

1830
In 1830 the country of Belgium becomes independent from The Netherlands. The defence wall gets demolished and is replaced by boulevards which now form the small inner city ring. In 1832 the canal to Antwerp is extended towards Charleroi and in use. In 1834 the first train is in use on the mainland of Europe, connecting Mechelen to Brussels. Due to the industrial revolution, the city is growing as well as the small villages surrounding Brussels. In this period the city tries to annex some of these surrounding settlements, with no success.

In 1840 Brussels has both a North and a South station. Short after both get connected via the western boulevard of the small ring. Meanwhile, the introduction of the slaughterhouse boosts developments of more industries in the west side of the city. The train plays an important role in this increase of work. In 1850 there is a first attempt to social city renewal to host all the new workers the industries attracted.

In 1863 the decision makers decide to start covering the river Zenne because of the polluted river it has become and the problems it frequently causes by flooding the valley. It also creates opportunity to make space for a more open inner city, inspired by Hausman in Paris.
1900
In 1902 there are the first registered thought of 1 province of Brussels containing all the new connected small settlements under 1 government. It will take until 1989 to realise something like this.

After the introduction of the electric train in 1935 the works start to realise a more direct North-South railway connection, crossing straight through the centre of the city. In the same period Brussels gets its own airport and airline company. In 1922 the canal is widened-up to create opportunity for a sea harbour close to the city. In 1948 the Taye law is introduced which makes it very easy for all people to build their own house. According to some writers this is one of the reasons that resulted into the urban landscape, which is so typical for Belgium nowadays.

1960
1958 is a very special year for the capital as it is the year of the world expo. Because of this expo the boulevards got widened up and big investments are done in infrastructure to make sure that all 41.500.000 visitors can navigate through the city. It is also the year the predecessor of the EU settles down in the city, and will, as we know now, not leave anymore.

In the 1960s the industries all start to move out to more open and spacious places. Because of the general introduction of the car they are not so location specific anymore as they used to be. The 1960s are also known as the years of great building speculation and the public works. For example in the North station area people have to move out of their homes to make place for big high-rises as we know them today. A tabula rasa takes over the city. The more wealthy part of society gets very soon fed up with this development and move out of the center: fringe urbanisation. It leaves the centre with its massive constructions, abandoned factories and great building speculations.
Today
This last movement described has been very typical for the city ever since. In the 90s the capital gets connected to the high speed networks of Europe, connections towards London and Paris are established from Brussels Midi station. And in 2009 the metro network get extended towards more outer areas of the by then called Brussels Capital Region.

Today
Brussels is very well connected within global networks

Today, most cities in Northern Europe are facing stagnation in their growth, Brussels is expecting and approximate growth of its inhabitants in the coming years of almost 30%.

"This requires the social and healthcare sector to expand in the upcoming years, as well as the educational and service sector to attract more employees." (Thys, 2009, p. 320)

At the same time the housing stock of the city is not prepared for this. It is the question if the city can keep up with these changes.
The map on the right shows the key intervention projects defined by governance of Brussels Capital Region. This is, as can be seen in the image, a very local approach to what are issues that affect the Capital Region. This is a result of the complicated structures of governance ruling over Belgium and Brussels.

Commissioned by the government of Brussels Capital Region, 3 visions were recently formulated on how to go from this point until 2040. They all provide carefully formulated ideas on how to deal with the current issues that are going around the current urban practice. The one thing that the 3 visions all have in common is the demand for strong political will to make a change that matters and to see the urban territory as a whole in which can be intervened and acted; an ideal Brussels that combines its forces to become stronger. In fact, this is more than a strong demand; it is a must for the city to survive and profile itself.
Based on sources: Smellinckx, 2001; Suy, 1997; Stad Brussel; Soete, 2004; Brussels Hoofdstedelijk Gewest, 2009; Gemeente Sint-Gillis, 2011; Anderlecht, 2011; Coordinatie Zenne, 2011

Image 89: Historical development of the city of Brussels
context description - fragmentation

The historical development of the growth of the city shows the causes of the different fragments around the centre of Brussels. It also explains a big part of the factual context presented earlier. This part will handle about the current existing fragments of the inner city and what their role is in relation to each other and the fringe areas. In order to create a more integrated inner city overcoming socio-spatial barriers, it is important to position the parts to each other. By understanding what is happening in each part and what place-identity is present an inventory can be made of the fragments and by that a judgement over the cohesion of the inner city can be made. To obtain a clear understanding of the sense of place in each fragment the 3 aspects of place making theory by Montgomery (1998) is applied.

This theory has been explained in the theoretical framework of this thesis report. It gives a set of pre-conditions of what a place is. Out of the problem statement a disconnection with space itself and a related question of ownership in the centre of Brussels was concluded. In other words, seemingly a connection between location and identity is lacking. By using the place making theory this will be examined for each fragment defined in the inner city of Brussels. The aim of this thesis to develop an integral approach of a 24-hour use of the public space networks can only be realised if the fragments fit the requirements to be a place or an observable centrality also after 5pm.
Looking at the inner city of Brussels, as argued before, 9 fragments can be recognised. See img.92.

When going through the characteristics of each of these fragments, they can be clustered into 5 types: city centre (yellow), big station nodes (darker blue), European District (light blue), mixed housing areas towards the East and South (darker green) and the ‘poor sickle’ (light green). This is shown by img.91.

This clustering is done by walking through the different areas, as well as by looking at statistical information of the areas on socio-economic standards of the inhabitant. However, the spatial structure of the city plays an important additional role to this social structure.

*img.91. different fragments of Brussels’ inner city grouped together according to their characteristics*

*img.92. specific location of fragmentation*
City centre

Although the city centre has a clear down and upper town, it is an historical centre and entity since the 14th century. Typically the upper town was the location of the noblemen, while the downtown was the centre of trade at the banks of the river Zenne. It is a centrality to tourists and still the epicenter of shopping and nightlife. It provides space to 1 of the 3 main stations of the city (Brussels Central) and is the crossing point of the metro lines serving the city. Various governmental buildings can be found here as well as the palace of justice.

There are a considerable amount of movements going through this area daily on a national and regional scale by train. The centre of Brussels has a few main routes that pass the centre via the small inner ring or even are going straight through the centre connecting North and Midi station by car or foot.

The inner city has various typologies of public spaces. Although most streets allow cars, there are some pedestrian areas. In general there is not a lot of space designated to slow users. The spaces are, due to the high functionality of the area, used at any hour of the day to stay, but also to go through. There is a strong sense of place.

The centre of Brussels expresses a very strong image towards tourists and other visitors. It is the centre of night life and culture, this is equally represented.

As this is the centre of most leisure day and night time activities the activity is guaranteed.

The urban form is of the centre is historically grown and therefore quite dense. At the same time it also contains some bigger monumental axes, which makes the area more easy to read and more permeable. The natural height differences allow for some easy recognisable structures or landmarks.
Big station nodes

By being 1 of the 3 main stations of the city of Brussels, these 2 fragments are centres and can be classified in a similar way. The North station is a national node, providing jobs easy accessible for people from outside the city. The Midi station, on the other hand, has an international train terminal connecting the city on an international level. Both stations are highly attractive office areas, although they have little to do with the direct related housing areas.

The connectivity to the movement of the train networks is the main asset of both areas. On a more local scale they are also related to the metro, bus and tram system; it is mainly an infrastructural node. The public spaces are designed for going through, staying is not facilitated in a proper way. Especially the North station area has very empty and big open spaces, while the Midi station facilitates the activities of inhabitants during the evening hours.

Stations like these 2 main stations in general have a strong spot within the memory of the public. As they are usually the spots where the city is entered or left, there are significant sensory experiences related to these places. However, this is only connected to the station function and not necessarily to the other functions present in this case.

Both in connection to North and Midi station a fine grain economy can be recognised. However the scope of this economy is in both cases rather limited. The business districts connected to both station space and lack diversity and activity. Therefore the vitality is rather time bound and fragile.

Both monotonous high-rise and more historically grown dense tissues can be found here. There is a variety in scale and stock, depending on the location towards the station.
European District

The European District is mainly designed for and inhabited by people related to this function. It contains all facilities and functions for the European representatives. The district is located at a main inner city entrance, and therefore faces a lot of going through traffic everyday. Most of the people that actually have business to do in these areas mostly already live in this area, or come in by metro or train. Car traffic is ruling the public spaces, bikes and pedestrians are secondary or placed on a separate layer.

This area has a rather strong international image because of the political power it inhabits. The physical image on the other hand can be perceived as rather strong by the big buildings and contrasting architecture when comparing with other areas of the inner city.

This is rather limited apart from the big daily going through movements. As the function of the area is not very divers and mainly focussed between 9am to 5pm inside the big buildings, a sense of vitality is lost.

The form of the built environment here is part of the image of the area. Although the stock is not diverse and the outdoor space does not contain a strong message, this area mainly retrieves its identity from its function.
‘Poor sickle’

The poor sickle in the West of the centre is a similar centrality as the east and south housing areas. However, the poor sickle used to be the motor of the Brussels economy because of the industries. These are now moved out, leaving behind emptiness and decay. It covers the municipalities of Molenbeek and Anderlecht mainly. The metro of the city is only recently extended towards the West station, which resulted in a ring line embracing the centre and the poor sickle. This is only one of the many attempts of the government of BCR to include this high potential area in the inner city.

Typically the area is a going through area with few functional nodes. Inhabitants have their basic needs covered in the area, but do not attract many visitors on a bigger scale. The uses of the public space are determined by certain inhabitant groups of the area. This is mainly noticeable during evening and nighttimes because less going through movements are taking place in the area. For visitors this is threatening and it does not provide a very accessible image to the area. This feeling and image are heavily supported by media.

There is a strong mental image concerning these areas, fed by the national media. Therefore there is a feeling of fear and low psychological accessibility.

The former activity of these areas was industrial, at this moment these are not being replaced by something else. This leaves the area with a lack of diversity in function. During the day a flow of people is guaranteed due to the positioning of the area between fringe and centre, as well as an eye on the street that comes along with the presence of people. The urban vitality therefore is rather limited.

Historically the urban form of the area is related to industry, and rather permeable. The typology of the built is similar to some parts of the centre and the East and South housing areas. There is a limited amount of landmarks and qualitative open space is scarce.

Hist. form

activity

form
East & South housing areas

The housing areas East and South from the city centre are very local centralities. Local markets attract local inhabitants, and there are few or none cultural attractions with a bigger reach located in these areas.

The areas are going through to locations connecting more outside areas with the inner city. The south area for example is located on the direction to the university district.

These areas are poor by income and inhabit various different nationalities. Typically the public spaces are living environments with an occasional market at a specific day of the week.

The uses are not very intensive, apart from the residents who occupy their spaces.

There are no big landmarks to be found in these areas. The scale and type of architecture are quite like the centre and the structure is still based on they way it grew in history; no big changes have been made.

These areas are not very well known by a big audience, however within Brussels they are becoming more and more accepted as decent areas to live. They have a low psychological threshold and residents from other neighbourhoods also frequent their markets.

There is a divers local economy present, and even though these areas are more residential, there are some attractions that have a reach crossing the boundaries; a vital street life can be recognised. The opening hours however are not very extended.

![Market in Sint-Gillis](source: www.bxel.net)

![img.123-124. source: alliance-francaise.nl, photobucket.com](source: www.bxel.net)

![img.125. Market in Sint-Gillis](source: www.bxel.net)
On the previous pages the different clusters were reviewed according to the place-making theory. It can be said that there is enough potential in all fragments to become a spot within a public space network. When assessing the activity in the fragments there is clearly not only a need for spatial support of this network but also functional support. In order to create an integrative inner city by a network strategy connecting the fragments, there is a need to intervene in relation to all 3 aspects of place making. Especially the image part requires attention, as it seems to go beyond the power of an urban design intervention; for example support of public media and political decisions is needed to change this in a longer term.

Knowing the context of the fragmented inner city of Brussels, now a close-up is made on the local intervention area. This should reveal the actual local dimensions of the problems as stated in the problem statement and showed in this fragmentation analysis. The analysis on this scale is done for the area next to the Midi station and part of the ‘poor sickle’, called Kuregem, part of the municipality of Anderlecht.
Kuregem

location of Kuregem within Brussels based on source: google earth
description Kuregem - facts

part of the municipality of Anderlecht
5,6 km perimeter
20,933 inhabitants (2006)
±8k inw./km² (2011)

46,8% female inhabitants
dominant age 20-30 years old
51,67% male inhabitants
dominant age 0-10 & 25-40 years old

building stock (2001)     Kuregem Brussels
appartment               47,6%    71,2%
1 family home            23,7%    28,2%
house with 3 or more free facades 6,5%

residence size (2001)
< 55 m²                   51,6%    34,7%
55-85 m²                  25,8%    29,1%
85-104                    8,6%     16,4%

average house size m² (2001) 61,9    74,4
average size/inh. m²      24,8    35,6
rooms/house               3,7     4,1
rooms/inh.                1,5     1,9

social housing (2009)
ratio social vs. private housing stock 10,9%    7,6%
comfort %                  91,3%    83,3%

housing property (2001)
own property               26,1%    41,5%
paying rent to a landlord  68,78%   72,8%

A visual impression of Kuregem can be found in the first appendix of this thesis on pag.159. Some important locations are shown by pictures taken recently.
description Kuregem - history

Kuregem is part of one of the earlier stated fragments of the inner city of Brussels. This analysis combines the Midi station with Kuregem, which is part of the ‘poor sickle’ covering the West side of the inner city. Sint-Gillis is located on the opposite side of the train station, as such it is also covered in this historic development analysis.

This historic analysis shows more precise where and what changed during the period of the industrial revolution. It is more focussed than the earlier historic development on page 62 of the whole territory of Brussels. The industrialisation was an important period for this part of the city, as it flourished during this period. This historic overview combines the socioeconomic development of the area with big spatial changes. Additionally it gives an insight in the current plans of the government for this area.

Before 1840
Kuregem and Sint-Gillis are villages in the rural, outside the city walls of Brussels. Windmills are the image of Kuregem at this time.
Around 1830 the city walls of Brussels are destroyed.

1840
Industries settle in the rural of Kuregem, the rest of Anderlecht is still rural like. The first South station is located in the boundaries of the old city (red). The Zenne river floods frequently (blue). The slaughterhouse (yellow) creates a big economic impulse for the area, next to traditional workshops.

1860-90
The developments of Kuregem cross the bridge towards Anderlecht. The South station moves to its current location (red). The process of covering the Zenne has started. At the same time there is a large district renewal taking place in Sint-Gillis: medieval tissue gets replaced by a grid-like structure. The veterinary school also generates housing renewal in its direct surroundings.
1903
Industrial activities expand to the other side of the canal. The Zenne is covered, the free space available as a result of these works is being used to build more working class houses and open up the city structure of the centre by big Hausman like lanes.

1950-60s
The big city works for the world expo are taking place. The North-South railway connection is established and businesses settle in the station area (orange). The city is left by the more wealthy classes.

Today
At the same time industries are being replaced elsewhere, resulting in the decay of Kuregem.

Today
Old industries are out of use, the car dealers are now having their businesses running at the canal sites. Kuregem is a popular migrant area facing a high flux of residential moving. Due to the high amount of immigrants living in the area without voting rights, it is not on the local political agenda. The governance of the capital region tries to do something by means of keyprojects.
The neighbourhood of Kuregem is one of the poorest neighbourhoods of Brussels. In order to deal with the decay of the area, Brussels introduced a new policy of neighbourhood covenants (wijkcontracten). For Kuregem this meant a change of political focus from demolition to revaluation. The local authorities have an important role in order to this new policies to succeed.

The covenants were introduced in the 1970s. It was a change from the building approach of revaluation towards the territorial approach. The areas of intervention were defined by social degradation. This is different from the more general political division of governance goods; everybody gets an equal share. The governance of Brussels Capital Region (BCR) picks several of these areas each year. The neighbourhoods are selected within the area for enhanced development of housing and city renewal (Ruimte voor Versterkte Ontwikkeling van de Huisvesting en Stadsvernieuwing - RVOHS), which is covering mainly all areas directly adjacent to the central pentagon on the West. When selecting an area social and ecological indicators are used.

The approach of dealing with these areas is cross discipline-based. Both the social aspects as the urban play a role, looking at the reasons for the decay. Very concrete, it results into interventions on housing development by the government or a coalition between government and private investors, renewal of public space and introduction of collective services and subsidies for projects supporting social and economic revival.

The approach is based on a coalition between government, private sector and community groups. The key role is still governmental, but participation takes a big role in realisation of the projects.

The covenant is based on a contract between BCR and the municipality, which contains a 4-year based plan on the execution of the project and plus 2-years for the real estate projects. The budgeting is done both by regional government as well as by the local municipality.

The covenants are based on the idea of bottom-up from the local problems, involving the different actors and target groups.

Since 1997 there have been 6 covenants for (parts of) Kuregem. Not all of them reached satisfactory results, even though the covenants are not meant to solve all problems. Due to political unwillingness, vandalism, lack of a long-term vision and difficult participation of locals, the impact could have been higher.

On the other hand, one can also argue if these covenants are powerful enough to change something fundamental in these inner city areas. According to a BCR official in general terms it can be said that there are always multiple covenants needed to reach at least some positive result.

The RVOHS-areas are typical for their high foreign immigration and therefore part of the immigration policies and agenda. Politicians prefer to give priority to other areas, which resulted into building speculations and physical decay. This was one of the main reasons to introduce covenants in the policies of BCR.

Kuregem was also abandoned by municipal government, because of the low amount of inhabitants with actual voting rights (immigrants cannot vote). Some plans were to build a district like the business towers of the North station and a big road to connect main infrastructures to industries more South of Kuregem. These projects can be seen as institutional and political racism of the local government, that did not respect and value to local inhabitants. This was before the first covenant was kicked-off.

In 1997 the first project on revaluation took place. The project was supported by the local government but did not completely function according to the set-up goals. The local government supported the car dealers, although this had some severe environmental consequences and was not in line with residential goals of the covenants. There was a clear distrust between the local government and the inhabitants, this limited the reach of influence of the projects.

After a change in the political field and with a new generation of local officials working on the covenants there was a new positioning towards the residents. The new generation of officials did not fear the inhabitants but were rather positive towards local participation. At the same time the regulations of voting rights changed, causing a sudden interest in the 'new' votes that could be gained in Kuregem. The way the covenants are treated, very much relate to the political colour of the local government and the private investor. This is still the case today. Local actors can influence priorities, and are therefore crucial to the effect of the covenants. Even though their location is decided from above, the municipality has the biggest influence in their effectiveness.

This part is mainly based on source: Sacco, 2010.
A recent covenant study on a part of Kuregem resulted into this research of SUM, which forms the basis for the 4 year development of the area, 2011-2014. The plan respects the Regional Development plan and follows the Regional Land Use plan as well as the Local Land Use plans. See img. X.

Source: SUMResearch

A design for the Slaughterhouse site aiming for the site to be the 'belly of Brussels', in cooperation with Abatan NV. This development shows the potential there is in Kuregem to become meaningful within the tissue of Brussels. There are also several projects developed within the 2040 visions, all incorporating Kuregem as a keyproject. It is questionable if this project will ever be realised in this shape, as it relies on multiple municipalities and the BCR to cooperate and agree. It shows the complexity of the task to intervene in Brussels crossing the potential and interest of 1 municipality towards the bigger good.

Source: nieuwsblad.be

<table>
<thead>
<tr>
<th>Operational use (indicative)</th>
<th>Passive use (prescriptive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional level</td>
<td></td>
</tr>
<tr>
<td>Regional Development Plan</td>
<td>Regional Land Use Plan</td>
</tr>
<tr>
<td>(PRD, GemOP)</td>
<td>(PRAS, GBP)</td>
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<tr>
<td>12-09-2002</td>
<td></td>
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<tr>
<td>Municiple level</td>
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<tr>
<td>Local Development Plans</td>
<td>Local Land Use Plans</td>
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<tr>
<td>(PCD, GemOP)</td>
<td>(PPAS, BBP)</td>
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</tbody>
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An overview on the different policy instruments available in Brussels.
Source: Reijnen, 2011, based on Haumont et al., 2007, p.4

Source: bruplus.irisnet.be, wikimedia.org
analysis Kuregem - spatial

The goal of this socio-spatial analysis on the local scale of Kuregem is to assess the public space qualities and human relation to it. The inventory creates rather an objective viewpoint on the area. In the next section the social connection with the built environment will be explored. In the last section the social and spatial are related and some conclusions and recommendations are formulated. This is the hint towards a vision and design on the local scale, which is developed in part 5 of this thesis.

Volume

The 2 images below show the difference between the open space and the public space. The image below (img.134) gives in white all space accessible to the public. The grey zones are open to public but not public spaces and during several hours of the day, often at night, these spaces can be closed.

The image below (img.135) shows only the alignments of the building stock of the area. When looking at this level at building typology, the care of this residential neighbourhood can be easily recognised, with its fine grain. The surrounding industrial and business-like areas have a typical grain with bigger buildings, which are less strictly aligned than residential blocks.
Plinth
By looking at the openness of the plinth, the interaction with public and private is analysed. What happens on the street level interacts with what happens inside buildings on the same level. What becomes clear here already is the presence of several strong axes in the area. These will be recognised later as well in the functional analysis and will be supported by the findings of the static snapshots (see section on page 82). These axes are the main going through routes from centre to fringe.

Readability
This map made by the office of 51N4E supporting their 2040 vision, shows the urban entities in the inner city of Brussels that add to the readability of the city form. The area of Kuregem is marked. The midi station can easily be identified and is through form well connected to the edge of the centre, while the rest of Kuregem is scattered and does not have any relation with the centre or even each other. Cohesion between the separate readable entities is lacking. This will be further explored on the following pages.
Almost all functions are active during the day or normal working hours. Although some shops do not close at 5pm strictly, but rather around 20pm. Also it can be stated there is quite a wide variety of functions present in the area, serving the needs of a divers public.

From a users' perspective it can be argued that most functions are mainly targeted to local residents. Mainstreets can be identified according to the location of functions. Referring to Gehl’s theory on street activities related to quality of the built environment, both the necessary and optional activities are taking place during the day. The fine grain and mixture of functions supports these activities in space.

There is only a limited type of functions that has unusual opening hours; covering the late evening or the night. The map below shows bars, restaurants and hotels. Although it differs for each case what the exact hours of activity are. In general these places attract only a specific public, which is less diverse than during the day.

The dispersion of these evening functions over the area shows again the main axes of activity of Kuregem. The type of activity is again a mixture of optional and necessary activities, but at this time by a different audience.
When looking at the public transport lines running through the area, it becomes clearly visible how the area is connected on the scale of local public transport to the rest of the city. It is remarkable that the focus lies mainly on the South-West of the territory of BCR; the area keeps its gate function to the fringe areas.

The exact location of the bus and tram lines running through the neighbourhood are found at most of the main axes of activity.

The night busses are all centre focussed, only one of the lines connects the fringe areas through Kuregem with the centre, where all night functions are located.

What is important here is the exact location of this night bus through the area. Although the bus is not as frequent as they are during the day, this bus is a constant factor in the late night activities happening in the area and around the main axes.
static snapshots
Observations of the neighbourhood were done through the method of static snapshots. The same route through the area is taken each time and assessment of activity in the public domain is registered. The observations done for this project took place every 2 hours, due to the length of the route and the time-consuming drawing of the activity, which has to be done. The first lap started at 14h, the last round at 20h.

This method of observing an area, results into a static representation of the activity on the streets in an area. By doing this systematically, one gets a clear image of the activity during the day.

The snapshots done in Kuregem took place on a Sunday in December 2011 and a Wednesday in January 2012. Both days had similar climate conditions, sunset was around 17h. During the observations specific actions and usertypes were distinguished.

Movement: hanging, walking, sitting or standing
Users: male, female, family, couples, children, groups

The route through the area was choosen for its variety. It was based on the functional and spatial analysis on Kuregem, presented earlier in this booklet. The image below shows the exact route.

people attractors
Img. 145-148 show the results of this mapping, presenting the people attraction pole respectively for a weekday, an evening, a sunday, and all these moments together.

weekday observations
On a weekday the main axes, as in earlier analysis, are visible as well as 2 local squares. The squares are strategically located in the more residential part of the neighbourhood.

Sunday observations
On sunday there is a big market on the slaughterhouse site, which has a reach of influence further than just Kuregem and its municipality. The same local residential squares are visible as during the week.

evening observations
In the evenings, there tends to be more street activity around the corners and streets where bars and restaurants are located.

There are several points that are people magnets during the week and the weekend as well as evenings.

combined observations
The one spot is the station, which is always in function and has an international reach. It also contains shopping and restaurant functions. The other spot is one of the mainstreets as defined earlier in the functional analysis. It contains a high grade of functions attractive to various users. Its location at the old gate towards the centre also proves the strategic historic basis of the urban tissue.

The observations are supported by space syntax analyses of the urban form of Brussels inner city. This analysis can be found in appendix 2 on page 165.
lighting
The lighting of the area forms an important part of this thesis and of the end products. Therefore while assessing the activity of and movements through the neighbourhood, special attention has been payed to the lighting of the public domain.

special lighting
Only recently some of the squares of the area have had a new lighting design. In img.149. these spots are indicated by the green rectangle. Overlapping this image with the functionality map, the locations look rather random, especially the most right point.

The blue lighting spots are not directly illuminating the public space, but architecture. The slaughterhouse and the old gate to the centre still have a landmark function, while the church more to the South seems disconnected from any bigger structure.

absence of lighting
In img.150. in dark grey the remarkably dark areas are indicated. While the left one is a rather remote area with few functions, the more right location is directly located next to a spot with special lighting. One could argue here about the significant role the special lighting plays at this point.

combined observations
Lighting is incidently applied to the area. There is no clear consistancy between separate interventions and are mostly related to architectural beauty than to public space networks and the use of public space.
Img. 151. Town hall square (1), above
source: by author

Img. 152. Small square at Rue de Fliennes (2);
source: by author

Img. 153. Luchtvaart square (3), below
source: by author

Img. 154. Slaughterhouse (1), above
source: by author

Img. 155. Church Sint-Franciscus-Xaverius (2), below
source: by author
analysis Kuregem - global & local

As Kuregem is located on the border of the centre, several routes towards fringe areas cut through the area. Whether these through routes connect with the local core of the area depends on the connections between both entities as well as the activities related to both the global and local structure. The activities and movements were assessed on the previous pages. In this part the connection between local activity and global attraction is looked at.

The local structure is the historic core of Kuregem, and where the majority of the architectural heritage is located. The structure is quite compact and does not involve all landmarks and parks, it stays within the boundaries of the businesses and industries.

This compact core combined with the clearly articulated borders strongly define the neighbourhood of Kuregem: the boundaries of Kuregem are identified by strong urban entities. On the side of the centre this is the inner city ringroad. On the South and South-West the railway tracks brutally cut through urban tissue. In the North the canal is the border between Anderlecht and Molenbeek.
Out of the functional analysis some global attractors can be identified. The main locations that attractors visitors from higher scales of influence, such as other neighbourhoods and even other cities, are the Midi station, the slaughterhouse and the West station.

The Midi station is an international train station, while the West station functions on a more local scale; both attract a wide public. It is part of the vision of the city to upgrade the West station to make it gain importance and increase its reach.

The slaughterhouse site has several functions, but is mostly known for its big market. It is an exceptionally big unbuilt surface in the inner city and has a lot of potential to gain importance.

The through routes marked in red, are important traffic lines connecting the centre with the more Western areas of Brussels. The daily flux is rather high, and cars dominate the street view.

As a result of these activities a wide variety of functions can be found along these lines. Hillier’s theory (1993) on configuration, which results into movement and activity is clearly valid here (see page 23).

These movements have no causality inside the neighbourhood of Kuregem, as the 2 main global attractions of the area are not directly linked. The through movements are based on a higher scale of connectivity between attractions, in this case; fringe and centre. There is a disconnection on the local scale between global attractors.
The disconnection between global movements and local core should also be evaluated depending on a time frame. Activities change during the day, and so does the public using the spaces.

As stated above, there is a high flux of through movements during the day assuring activities along the movement lines. A direct connection with the local core is not clearly visible, however, several through movements cut through local tissue, therefore a certain influence can be expected. Although it cannot be clearly distinguished.
evening/night
In the current situation the slaughterhouse only functions on a bigger scale of influence during the day. The site is closed during the evening and night, so loses its role. At the same time this means that only the Midi station remains as a global attractor, this was also observed by static snapshots.

Naturally the through movements decrease during the evening and the night, which results into a local core that gets isolated from any bigger scale movement or attractions. Through the static snapshots it was also observed by the location of attractions which are mainly at the midi station and 1 important through route.

This has a lot to do with accessibility of Kuregem and orientation within. The fragmentation, as it was argued earlier, now illustrates itself.

local core

global through movements

![Image 162: Local core in relation to global attractors and large scale readability](image.png)

![Image 163: Global through movements in relation to global attractors and large scale readability](image.png)
conclusions

The spatial, functional and snapshot analyses generate a set of conclusions on the physical problems of the area. Out of the analysis as shown above the end products will be formulated. These results are presented in part 5 of the thesis report.

First of all the main through connections identified play an important role for the area to function. During the day vitality is assured, while during the evening and the night, a connection between the local core and global movement patterns is lacking. The Slaughterhouse is a potential to reconnect the area with higher scales of influence.

The image below shows the local core in blue gradient, in red the through connections and also indicates the more global attractions. The old veterinary school which currently does not have a function has a similar potential as the Slaughterhouse to become part of a bigger network.

The C-shape red area contains mainly industrial or office buildings, with quite some open space, but less ground level activity. There is a rough grain of urban tissue which causes low permeability. There is also a train track running through this C-shape. This causes tunneled connections between Kuregem and its adjacent neighbourhoods (open circles). In general the combination of the C-shape and the clear defined boundaries between local core and adjacent neighbourhoods give the area a clear shape. This can be the start of giving it a clear (positive) identity.

Earlier in the fragment analysis for the inner city of Brussels, the fragment was classified as going through. Looking at the amount of traffic that actually goes through, this is a valid statement. Going through on foot has not been observed as such. Pedestrian movement could be encouraged more and especially during the evening hours, more equally spread over the territory according to the functionality.
The user profiles that were observed during the snapshots and while processing various analyses are the following:

- Local shop owner
- Commuter, working in Kuregem
- Commuter, living in Kuregem
- Resident (kid or women)
- Visitor

During the day all of them are present and taking active part in the public domain, which creates the vital streetlife. During the evening, the local shops close, the commuters go back home, the resident often stays inside and the visitors goes back to where they come from. The evening environment is depending largely on the presence of the station; a true global attractor.

Adapted lighting tries to enhance existing quality on several spots. A clear consistency with underlaying user patterns and supportive structures is lacking. Because of this there is no real effect of this kind of lighting apart from the beautification or decoration purpose.

The outcomes of the local scale analysis on Kuregem is supported by the analysis of fragmentation taking place on the bigger scale of Brussels’ inner city. Through the analysis on the local scale the fragmentation visible on the bigger scale is further specified to a disconnection between global movements and local cores. This statement will be further elaborated on and developed in the strategy development which can be found in the last part of the thesis, part 5.

![Image](https://via.placeholder.com/150)

**img.166. Different users occupy public spaces during the hours of the day. Depending on the time of the year a considerable amount of time there is the need for artificial public lighting systems for the public domain to function. The given summer and winter daylight hours are extremes, based on reality in 2010 in Brussels, Belgium.**
Part 5 of this thesis report provides the detailed end results of the project together with a brief description of problems, context and approach. It forms the end product where the 4 previous parts of the thesis come together.

This part starts with a quick overview of the main problems forming the basis of the thesis. It formulates the aims and the end products of the thesis and how the end products function next to each other.

A public space strategy is formulated for the area of Kuregem together with a critical design intervention. These products are related to the large city scale and structure and fit in a vision and more abstract strategy formulated for this scale of intervention. The critical intervention implements the findings of theory on lighting in urban developments and strategy.

After implementing the outcomes of the research on the site specifics for Kuregem and Brussels an attempt is made to derive more generic solutions to handle similar projects in the future. This is elaborated in the conclusion of this chapter.

The end products will be evaluated further on page 150, evaluation & reflection. The more general conclusions of the whole thesis can be found on page 148, where on more objective terms the project will be completed.
aim of the project

The project is aimed to define a strategy to handle public space in the inner city of Brussels, in order to socio-spatially integrate the separate areas to each other and assure a 24 hour vitality of these places. In this lighting is used to provide integral solutions regarding a 24-hour use of the public space networks.

The specific context of Brussels experiences a variety of flows through the city by a variety of people during every hour of the day. Public space and urban lighting are the facilitators of all activities taking place in the public domain. Due to the structure of the urban form several areas are more connected on different levels of influence (local, global) within the urban network while others seem to be disconnected. The strengths of these spots or centralities depend on the hour of the day and the reach of influence they have.

This is specifically the case in Brussels, sometimes called the Mosaic city, where different fragments are close to each other but less closely related in means of network connection or use by different layers of society. This project aims to construct a solid basis for the mosaic to become 1 whole piece; the inner city of Brussels.

This project strives to find coherence between usage of public space within a 24-hour time frame and its place within the urban network. It explores the influence lighting can have on the success of urban developments and strategies. It deals with the cooperation between lighting, the urban networks, urban form and activities that take place on the public domain. And how these work together to reach the set-up goals by urban visions and strategies.

Lighting is an integral part of the urban design and is used as an important tool to shape the nightscape of the city to assure a 24 hour vital public environment.
How can lighting be used in the design of public spaces to encourage 24/7 urban vitality?

Brussels is a North-West European capital city that is facing major changes. It is one of the few cities in this context that is still growing, and is in need of big changes to adapt to these predictions. Brussels as a whole has problems with its image since the great urban restructuring of the 1960s. Since then there is a clear tendency of movements visible. Young families and the more wealthy classes of society leave the centre behind and settle in the suburban areas of the metropolitan territory. This has resulted into major commuter patterns around the city on a daily basis and a centre which questions its position and role within this context.

This process is not unique for Brussels. The European continent is facing the challenge,

“to use the space vacated by industrial contraction to promote a diversity and critical mass of attractions; creating a living heart instead of a sullen shopping centre is becoming priority” (Falk, 1996, p. 110)

The problems of Brussels on one side are caused by national and political forces. A majority of the citizens of Belgium does not feel ownership of their capital. This is supported by the complex governmental structures that divide the country. The current sociopolitical situation is a result of long term problem solving/making to make the country function under compromises (Lagrou, 2000).

On the scale of the city, the territory of Brussels Capital Region is subdivided by 19 different municipalities, each with their own political focus. This makes a coherent plan for the whole region complicated to formulate and implement, and it results more into a one on one approach to problems rather than combining forces and work on constructive solutions.

Brussels is the typical example of a commuters city. Those commuters are the ones who make the role of the centre questionable and even more the areas located directly outside the historic core of the city. This has a lot to do with users and their activity hours during the day. As there are major changes visible between day and night use, a careful design or positioning towards both day and night environments is necessary.

Lighting shapes the way the public perceives the built environment and its public spaces. It provides possibilities to design 24-hour environments which are accessible around the clock places. The conclusion of the literature review (see theory framework, part 2) stated the following about lighting and its effects on the public space:

“In order to assure an active inner city, urban street life, the concept of 24/7 environments or 24-hour cities can be applied. This concept can be observed in several inner city environments and is a way of sustaining urban vitality. It takes different user groups and their patterns as a starting point to make spaces used during the hours of the day serving different purposes.

Within this framework lighting can be used to enhance this principle of urban vitality and to assure that it is successful. The influence of applying artificial lighting in this situation goes beyond simply safety and comfort issues. It can take the role of guidance and orientation, as well as image building and creating a feeling of belonging. It must be noted at the same time that lighting does not add anything new to an existing situation; it only works with the qualities present by enlightening them. There are several good examples to be found in literature, however, as this is quite a new trend there are no long-term effects known yet.”

By using lighting as a tool for the development of an area, the solution ends up being more integral towards all hours and users. The design of the evening and night time environment is as important as for the day.
95

Built tissue of "bigger Brussels" in relation to the 3 political regions of Belgium

19 municipalities of Brussels Capital Region

The local intervention area next to Brussels centre

Kuregem close-up

Brussels South/Midi

safety, orientation

place-making related to purposes of lighting in public space
The area of Kuregem is part of the 19th century belt located mainly around the West part of the city centre pentagon. This area is an example where the problems of the city and the country are clearly visible locally. Therefore they are currently also the location of some key projects formulated by the government of Brussels Capital Region (fig.180).

The area used to be part of the booming industrial businesses located in the canal zone. After the 1960s when the industries moved out it left an area behind which now is very attractive to immigrants due to the low prices of the low quality building stock. The area has been neglected by the municipality of Anderlecht until some years ago. This was due to the high rate of people living there who could not vote until the regulations changed.

The international train station of Brussels South/Midi is located on the edge of the area but belongs to an other municipality. The presence of the station causes a high flux of movement through the area and thereby assures a certain level of activity, which remains after sunset. These activities are mainly based on natural going-through movements and have little to do with the localities of the place.

The difference between the type of users during the day is rather significant. The public spaces that can be found in the area do not fulfill the needs of all people present in the area or using the area on a daily basis. In general it can be stated that the psychological accessibility of the neighbourhood is perceived as low and visitors are not welcomed by the inhabitants.

In this area all the essential problems that characterise Brussels today can be traced. This is the reason to take Kuregem as a concrete case to research the possibilities for 24 hour public space vitality, which integrates the local core as a part of the bigger network of the city and thereby strengthens the inner city of Brussels as a whole.

The scheme on the facing page shows how the problem statement relates to the topic of artificial lighting in urban regeneration, the specific context and problems of Brussels and the integration of those two topics.

In part 2, the methodology part of this thesis report, this separation was also used to structure the different sub research questions that form the basis of the graduation project.
- readability
- placeness
- social support
- appearance

urban lighting in public space
physical environment

hierarchy of streets/paths
spatial appearance of squares
facades
integration of parks/greens
remarkable architecture
distance experiences
complementary design for different speed-levels/targetgroups

Image of Brussels
national political local

social consequences
commuters and migrations
mobility issues
intervention - city vision

In the problem field, summarising the problems of the thesis on page 94 of this booklet it was stated that now is the time for European inner cities to define their role within this globalising world. The centre is not the epicentre of activity anymore, as mobility networks are more and more accessible and powerful. This creates a potential for re-thinking and re-shaping the cities of today. Brussels, as a city with prospected growth, faces the extra challenge of facilitating changes in demographics and increasing its liveability and image at the same time.

As the high connectivity and the easy access to transport modes resulted in greater movements over the past years, it is now also the time to rethink the way cities have developed until now. Knowing there is a possibility to move around during 24 hours implies developing urban areas that are able to facilitate these movements at any hour, and adapt to them likewise. When taking this as a starting-point for urban regeneration and new developments in the context of Northern-Europe, lighting should be an integral part of the approach to each intervention. While urban environments are developed for daytimes and are related use, during the dark hours there can be a change of focus in users and the way the environments are being used. Artificial urban lighting determines the focus of these environments and can thereby adapt to the changes that occur between day and evening/night. Theories supporting these statements were discussed in part 2 of this thesis report; theory framework.

![Diagram](image1.png)

**img. 182.** Different users occupy public spaces during the hours of the day. Depending on the time of the year a considerable amount of time there is the need for artificial public lighting systems for the public domain to function. The given summer and winter daylight hours are extremes, based on reality in 2010 in Brussels, Belgium.

**img. 183.** Exhibition in BoZar EXPO of the study results done by 51N4E, l’AUC, Bureau Bas Smets; KCAP Architects&Planners and Studio 012 Bernardo Secchi Paola Viganò.
When formulating a vision for Brussels as a metropolitan area and capital of Belgium, the research done by others (e.g., 2040 vision commissioned by Brussels Capital Region government) was used as a basis for understanding of this level of scale. A start has to be made in the centre, starting from the existing forces and potentials counteracting the movement that is visible since the 1960s. Families that are moving outwards of the city towards the fringe areas. The aim is to strengthen the centre by providing space for qualitative growth, creating a local, national and international identity, generating ownership by its inhabitants by focussing on the whole instead of only the good parts of the city. By tackling the issues of the centre first, a gesture is made to not fear handling fragile topics apart from the fact that this is the location where actions and consitancy between them is most needed. The centre and the inner city should stand-out again through their balance between living, work and leisure functions. This can be achieved by acting on both a local scale for the neighbourhood as well as the city as a whole related to its national and international role.

This vision can only be accomplished through on one side strong formulated ideas while using existing potential and engaging and involving the local residents at the same time. On the other hand there is no chance for success if nothing fundamental will change in the policies and decision-making in Brussels Capital Region and, in an even wider scope, Belgium.

This graduation project is not aiming to solve the problems of the community of Belgium and Brussels, the underlying reasons for the current political complexity. By this vision and bigger strategy that crosses all boundaries it assures a higher impact of the smaller scale interventions. These smaller scale interventions can easily be realised in the current socio-political climate, and at the same time anticipate on future political changes in empowerment.
Different fragments can be identified around the centre of Brussels. These fragments exist by historic causalities and today shape the city as it is known by its inhabitants and visitors. It prevents the inner city to benefit from its variety while at the same time it limits the overall possibilities of the bigger city of Brussels.

The formulated vision for the city aims to create a more integrated inner city overcoming socio-spatial barriers by carefully positioning the separated parts of the urban tissue to each other. A thorough analysis of the fragmentation that can be identified in the inner city is to be found in part 4 of the thesis report; context analysis.

The vision is based on the importance of creating and linking vital urban places. Supportive theories can be found in part 2 of this booklet; theory framework.

Out of the problem statement a disconnection between activity and space itself, together with a related question of ownership in the centre of Brussels was concluded. In other words, seemingly a connection between place and identity is lacking. By using theories on place making this is examined for each fragment defined in the inner city of Brussels. The aim of this thesis to develop an integral approach to a 24-hour use of the public space networks by means of artificial lighting, can only be realised if the fragments fit the requirements to be a place or an observable centrality also after 5pm. By creating places, which either function on a bigger global scale or the more local scale the activity networks of the city will be strengthened, which also adds to the readability and accessibility of the city and ultimately its identity.

In the inner city of Brussels 9 fragments can be recognised. All parts have their own potential to become a place and distinguish themselves. They all have assets that makes a proposed integrative inner city possible under condition of readability and accessibility.
The office of 51N4E who studied the metropolitan area of Brussels, commissioned by the government of Brussels Capital Region, mapped the different parts of the city, which together make the city more readable and identify it as a combination of objects and structures. The map forms a collection of significant buildings, public spaces and other hybrid places. The figure above (img.186) shows this map zoomed-in for the inner city of Brussels. A part of the central pentagon shape is clearly visible, as well as the historic heart of the city. However, when ‘leaving’ the centre, the pieces are more scattered and connection between them seems lost or non-existing.

The map shows an overall structure on readable aspects that make the inner city of Brussels. However, when specifying the map into a day and night version, one of the main points of the problem statement becomes clearly visible; the isolated position of the centre (img. 187 & 188).

The day patterns cut through and connect the centre with the 19th century belt surrounding the pentagon. At a glance it results into a connected and integrative image of the inner city. The evening / night map shows the opposite; a central core and some spots outside of this structure that remain in function. It shows the places that keep attracting visitors on a bigger scale after office hours. At the same time it also shows that the current tissue is not able to make this one consistent structure but it is rather scattered and disconnected; the fragmentation as mentioned earlier is strongly visible here.

In the figure on the next page (img.189) the bigger readability of the inner city is overlapped with the local centres of the different neighbourhoods of the inner city to examine the relation between the bigger scale attractions of the inner city and the local reality of the places.
It seems the locality of the place relates to the bigger readability by going through movements from one attractor to the other. Only inside the historic heart of the centre the city scale and local scale completely fall together. For the other local centralities this implies a local fragmentation between the through movements happening next to the local centre, but not interacting. The local cores are not part of the overall readability of the city, while each core has its own potential to be part of it and benefit from each other and their location. It would make the inner city a stronger entity if its mosaic identity was used up to its full potential.

Theoretical support underpinning this assumption can be found through the scheme by Gehl (1987) as showed on the facing page (img.191). The theory states that there are 3 types of activities taking place in the public space. Necessary activities are taking place, more or less independent of the quality of the built environment, while resultant and optional activities are highly influenced by it. The global through movements present assures the presence of people, but does not say anything on activity. According to the theory of Gehl, these can be a potential public to take active part in the public space by means of optional activities; the global takes part in the local. This would eventually mean a higher social integration and accessibility of the neighbourhood and democratic public spaces towards all its (potential) users.

This forms the basis of the strategy on the scale of the inner city aiming to include the local cores to the global patterns and readability. By overlapping the day and night readability the missing links and connections to be strengthened can be easily identified (img.190). Combining these bigger scale outcomes to a smaller scale local and thorough analysis of the neighbourhoods leads to a local intervention strategy that has a reach of impact on a bigger scale than just its own context. It is needless to say artificial lighting plays an important role in the accessibility and readability of the city in the evening and night. A combined day and night strategy is therefore developed for the local scale showing how a 24 hour vitality is assured.

The local intervention strategy is elaborated on the next pages of this thesis report. It was developed simultaneously with the strategy of the inner city and thereby completes this strategy by showing how it could function on the local scale.
global movements taking a break

<table>
<thead>
<tr>
<th>Quality of the physical environment</th>
<th>Poor</th>
<th>Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necessary activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“Resultant” activities (Social activities)

img.190. Bigger city readability, local centralities and main routes and connectors going in and around the inner city

img.191. Scheme on the relation between activity and the quality of the physical environment, Gehl (1987)
intervention - local strategy

In essence the formulated strategy implies an integration of local and global actions and movements. Which these movements are, is determined by the attractions present in the area and on what hour of the day they attract what specific public. This 24 hour vitality is important for the inner city to gain coherency and strengthen the city as a whole, as argued earlier in this report.

Before a strategy can be formulated that functions during the 24 hours of the day, a theory framework was set up to research the influence lighting has on the readability and accessibility of an area as well as how far it can determine movements and patterns of usage. The research done regarding this can be found in part 3 of the thesis report. The figure on the right concludes the outcomes of the research done on the relation between lighting and readability, ownership of places and orientation within urban tissue.

Lighting plays an important role in the perception of space during the dark hours of the days. It shows the nightscape of the city, and determines what can be seen and what not. During the night, more than the day, the focus and orientation can be influenced and focussed. However, lighting can not create new environments or add quality which is not present. A similar statement can be made on the functionality of the locations. The functions cause activity and certain movement patterns in urban areas. However, the functions are placed by the most integrated locations, which is a reaction on the urban form of the area.

To gain meaningful results and outcomes of the strategic intervention an combined intervention strategy on the local scale is needed. This strategy works on form, functionality and lighting, incorporating also the dark hours of the day.
Stage 1

In stage one of the integration process 2 main global attractors are initiated. The Midi station is currently functioning like this already, the slaughterhouse has a full potential to become one, as several other entities present in Kuregem.

Connecting the strong entities of Midi station and the slaughterhouse cutting through the local generates a natural through movement.
Stage 2

After establishing the connection between the 24/7 global attractors Midi station and the slaughterhouse, the route is upgraded and links the through movement to the local context.

The connection gets strengthened by local program along the route; ‘rooms along the line’. These so-called rooms start to connect the global movement between the attractors with the local core of the neighbourhood.
Stage 3

While in stage 2 the first connection towards the local core is made, in this part the connection extends more into the urban tissue of Kuregem.

This extension is possible due to upgrading of the veterinary school to a more global attractor. By doing so, it generates a natural movement pattern and includes this part of the neighbourhood into the bigger scale, while at the same time incorporating the local. The network becomes more integrated.
The connection towards the veterinary school is taken to the next level in a similar way as done for the connection between slaughterhouse and Midi station. The network now embodies the local core with the global attractors of the neighbourhood. It connects and relates movements on the different scales with each other. This is beneficial for both.
local intervention design location

Midi station to Slaughterhouse in facts & figures
15 minutes walk
3 metro stops
1 km
intervention - design intervention

The strategy explained on the previous pages is translated in different design concepts for the day and evening environment, before a design was made. The concepts involve spatial and functional features which are simultaneously related to light concepts and design for the area. As this was concluded from the research on lighting in urban design and strategies.

During the day Kuregem is an area that connects the centre to fringe areas and vice versa. There is a natural going through movement generating activity and stimulating the local economies and community at the same time.

In the evening environment the functionality changes, as distinguished on the bigger scale, the global and local movement are more disconnected and separate than during the day. On the other hand the local has a need to be a place on its own as well, independent from global movement. Integration of the 2 layers of movement and strengthening the local are the key issues here.

Pictures of the current state of the proposed intervention site can be found in the first appendix of this thesis report (page 159) a small visual introduction to the intervention site can be found on the previous page. More background on the location can be found in part 4 of this thesis report where the site analyses can be found showing the background and insights to the location.

The proposed design intervention that is presented on the following pages aims to be an example of an intervention that fulfills the goals as formulated for the higher scales of influence and fits the vision according to the strategy, while providing a solution that incorporates lighting as a part of the solution from the start.

According to the possibilities and the role lighting can play in urban developments, as concluded from theory and practice, a more generic design approach is defined. Starting from the strategy the intervention has to be build up step by step, and integrate the light solutions in each step to be meaningful:

3. beautification
The spatial entities developed by sequence of spaces, the network and the activities get strengthened by this layer of beautification and detail. It adds to the consistancy of specific locations within the whole, while at the same time it can specify the local identity. The small scale of the intervention creates possibilities for ownership for the local community to get involved in sustaining and maintenance.

2. activity
Cluster and focus activity combinations on strategic locations of the movement flows as they are generated by the urban form; create places of activity. Enhance these developments by involving local community, property owners and private investors together from the start. Involvement of the local encourages the success of the intervention and can potentially strengthen the ownership by the community.

1. sequence of places & network
Use or generate the availability of multi-level attractors to assure a movement flow and activity level in the public domain. Make use of spatial and functional assets and potential assets. Focus on navigation through and orientation in the city, including the location with the bigger network structure. Develop a intermediate level structure to support the very small scale separate interventions on specific locations.

0. strategy
Provide an inclusive structure to the city that improves readability of the city. Instead of having a mosaic, make the inner city 1 tile. At the same time the strategy provides a framework to smaller scale interventions to the city and should balance them to each other and assure consistancy between them.
3. beautification
Strengthen the underlaying vision and urban form and activity related interventions. Raise the overall quality and appearance of the interventions of the other layers. Encourage neighbourhood engagement and sustain the positive long-term effects of the interventions of the other layers.

2. activity
Strengthen the underlaying vision and urban form by creating conditions that assure necessary activities and open this up to optional activities. Generate presence of people and sustain urban vitality by mix users and activities. Link activity with each other and their consistancy with the whole. Distinguish differences of the separate spaces and reconnect this bigger structure with the local conditions of the site in socio-spatial terms.

1. sequence of places & network
Create basic conditions for the activity and beautification layer. Create a supporting network following the aims of the underlaying vision focussed on guidance and orientation throughout the area. Follow the common city language aiming for inclusion and thereby generating conditions of necessary activities to happen as a result of the intervention (ref: Gehl).

0. strategy
Create an inclusive inner city, with a clear image and identity. The mental map of the inner city should be covering all big entities and show this inclusiveness. There is a social-spatial balance between the different entities that form together the inner city. And there is a framework for further strengthening and development of the inner city; to make it stronger in all its aspects.

Together with the formulated strategy for the large scale, the intervention strategy for Kuregem tackles local issues and city issues at the same time. The approach of working simultaneously on the local scale and the inner city and city scale is reflected in the outcomes of the research and design process. In fact, for the results to be effective there is a need for the different levels to work together.
Kuregem

112

img. 193. residential streets
relation between open spaces and the type of road

img. 194. secondary roads
relation between open spaces and the type of road

img. 195. main roads
relation between open spaces and the type of road

img. 196. all together
relation between open spaces and the type of road
The intervention location combines a set of very different public spaces with each other. On the facing page an overview can be found of the available open spaces in Kuregem and how these relate to the different type of streets in the neighborhood. In general there were 3 types of streets identified. *Residential streets*, with very few or no functions but housing, and no significant amount of through traffic. *Secondary roads* that connect on a local level and contain few or no functions. *Main roads*, as identified in the analysis conducted in part 4 of this thesis. In blue the spaces are marked which are part of the intervention, in green the remaining spaces are showed.

The flows around the neighborhood determine the use of the spaces. In the current situation as shown by analyses, the area is marked by going through traffic that cuts through the local, mainly focussed on cars. The area around the station does not give clear direction to the purposes of the spaces surrounding it. There is a bit of everything everywhere which makes navigation more complicated. At the same time, the big attraction pole of the station does not really connect to the rest of the neighborhood and the slaughterhouse. The strategy is aimed to solve this and integrate this global attractor the the local situation.

The proposal tries to reconnect Slaughterhouse and station in a direct way through pedestrian movement to involve the through-movements with the neighbourhood. Around the station, clear definitions are formulated for the separate public spaces, which makes orientation and navigation more natural and intuitive.
When zooming more into the actual public spaces along the proposed intervention location in the current situation, several clear places with an identity can be defined. However, any clear connection or cohesion between those is lacking (img.199).

To reach the goals defined in the strategy, this intervention aims to create multiple places along the route and connect them in a consistent way, as drawn in the picture above (img.200). The image shows the main directions of movements through the spaces as an indicator for the orientation and usage of the space.

On the facing page the intervention route is split into its separate entities. As one of the aims is not only relating places to each other and connect them, but at the same time be a place on their own functioning for the benefits of the local community. For the day situation the public spaces are meant to connect and invite a walking through environment. In the evening the main focus lies on creating spaces for the local community while not giving up this location within the bigger structure and movements. Especially to add this orientation during the evening, light plays an important role.

On the next pages the design proposal for this intervention route is presented both in a day and night situation, according to the concepts, vision and approach presented on page 110.
overall plan day
sections day
Legend:
- Existing building block
- Existing individual building
- Extended hour function
- Canal/water
- Bus lane
- Public road
- Public space
- Smaller public space entity
- Shared space city entrance
- Glasshouse frame structure
- Metro entrance
- Accessible green space
- Community gardens
- Small local enterprises
- Market
- City furniture

Existing urban elements include library, cafe, shops, and public transportation options such as bus lanes and metro entrances. The area aims to become more accessible with green spaces and community enterprises.
overall plan *night*
sections night
**design principles**

The previous pages show the overview of a possible design intervention that meets the aims and requirements of the strategy as it is explained before. It shows the coherence between the separate places along the route and at the same time the possibility of those places to be entities on its own. It gives a hint on how navigation and orientation will take place in the neighbourhood and how the quality will rise by this intervention.

To explain this proposed design in the perspective of the previous chapters of this booklet a set of design guidelines was subtracted and the design itself was split into several levels of intervention. These levels make it possible to carefully build up the intervention on the needs of the area and the impact the efforts will have.

The intervention levels are derived from research on light and urban design and strategies as it can be found in part 2 and 3 of this thesis. The levels are ranking the interventions to be done in the area in importance in order to make the meet the set-up aim and strategy. As seen in the theory framework, light can add to the intervention already from the start. This is where it often goes wrong in current practice, where it seems to be the ruling idea that lighting is a sort of add on for beautification purposes. When integrating lighting from the start with the development of the design a more integrative approach to the solution is generated. This is done for this part of Kuregem as an example on how this principle can function.

The scheme on the facing page shows how the different levels of the intervention relate to each other by vision, approach and tools, reading from bottom-up. The scheme provides a generic set of rules and guidelines for the design. In that sense the design as shown later is only a possible solution and under no circumstances the one and only solution for the specific problems of this location. For each design presented on the following pages the scheme will be applied to show how this possible solution functions.

An example solution is also shown in the scheme already to show spatially what said in more general terms. The example at the same time shows how lighting plan and design function next to each other and strengthen eachother.

**lighting, methods & tools**

The lighting and design intervention cooperate simultaneously on the different levels of the intervention. The methods and urban spatial elements mentioned below provide generic solutions where light is able to interfere and be meaningful to reach the pre-set aims as mentioned as a vision for each intervention level.

<table>
<thead>
<tr>
<th>Vision</th>
<th>Method &amp; Approach</th>
<th>Urban spatial elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengthen the underlying vision and urban form and activity related interventions. Raise the overall quality and appearance of the interventions of the other layers.</td>
<td>The spatial entities developed by sequence of spaces, the network and the activities get strengthened by this layer of beautification and detail. It adds to the consistency of specific locations within the whole, while at the same time it can specify the local identity. The small scale of the intervention creates possibilities for ownership for to local community to get involved in sustaining and maintenance.</td>
<td>Application of greenstructures, city furniture in coherence with activity and presence of people on their movements and actions. Focus on spatial details of the urban form and show neighbourhood quality by focusing on special facades and remarkable architecture, during the evening house this is evidently done by means of lighting.</td>
</tr>
<tr>
<td>Create basic conditions for the activity and beautification layer. Create a supporting network following the aims of the underlying vision focused on guidance and orientation throughout the area. Follow the common city language aiming for inclusion and thereby generating conditions of necessary activities to happen as a result of the intervention (ref: Gelli).</td>
<td>Cluster and focus activity combinations on strategic locations of the movement flows as they are generated by the urban form; create places of activity that can function 24 hours. Enhance these developments by involving local community, property owners and private investors together from the start. Involvement of the local encourages the success of the intervention and can potentially strengthen the ownership by the community.</td>
<td>Locate the retail and other functions on strategic locations in the larger structure. By this, place identity is enhanced. Balance the spread and type of function over the time of the day assuring vitality at any moment. In relation to this the active frontages with related examination and eyes on the street improve the overall feeling of safety, which makes spaces more accessible in evening hours and thereby more used.</td>
</tr>
<tr>
<td>Create an inclusive inner city, with a clear image and identity. The mental map of the inner city should be covering all big entities and show this inclusiveness during 24 hours. There is a social spatial balance between the different entities that form together the inner city. And there is a framework for further strengthening and development of the inner city; to make it stronger in all its aspects.</td>
<td>Provide an inclusive structure to the city that improves readability of the city. Instead of having a mosaic, make the inner city 1 tile. At the same time the strategy provides a framework to smaller scale interventions to the city and should balance them to each other and assure consistancy between them.</td>
<td>A common language in space, form and lighting to generate similar understanding over the whole. By looking at the whole a balanced spread of functions and attractions can be reached. Then its turn should be interacting with the strategic locations of public transport nodes.</td>
</tr>
</tbody>
</table>

**Underlaying city vision**

Create an inclusive inner city, with a clear image and identity. The mental map of the inner city should be covering all big entities and show this inclusiveness during 24 hours. There is a social spatial balance between the different entities that form together the inner city. And there is a framework for further strengthening and development of the inner city; to make it stronger in all its aspects.

**Aim**

Provide an inclusive structure to the city that improves readability of the city. Instead of having a mosaic, make the inner city 1 tile. At the same time the strategy provides a framework to smaller scale interventions to the city and should balance them to each other and assure consistancy between them.

**Tool**

A common language in space, form and lighting to generate similar understanding over the whole. By looking at the whole a balanced spread of functions and attractions can be reached. Then its turn should be interacting with the strategic locations of public transport nodes.

**Underlaying level**

The levels are ranking the interventions to be done in the area on the needs of the area and the impact the efforts will have. This is only a possible solution and under no circumstances the one and only solution for the specific problems of this location. For each design presented on the facing page the scheme will be applied to show how this possible solution functions.
intervention (ref: Gehl).

necessary activities to happen as a result of the
for inclusion and thereby generating conditions of
the area. Follow the common city language aiming
following the aims of the underlaying vision
beautification layer. Create a supporting network
Create basic conditions for the activity and
effects of the interventions of the other layers.

engagement and sustain the positive long-term
overall quality and appearance of the interventions
and activity related interventions. Raise the
Strenghten the underlaying vision and urban form

The lighting and design intervention cooperate simultanously on the different levels of the intervention. The methods and urban spatial elements mentioned
lighting, methods & tools

the local conditions of the site in socio-spatial
spaces and reconnect this bigger structure with
whole. Distinguish differences of the separate
with eachother and their consistancy with the
vitality by mix users and activities. Link activity
activities and open this up to optional activities.

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development of the inner city; to make it stronger
is a framework for further strengthening and
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spatial balance between the different entities
inclusiveness during 24 hours. There is a social-
should be covering all big entities and show this

Create an inclusive inner city, with a clear image

Underlaying city vision

0. Inner city strategy

1. Network & sequence of places

2. Activities

3. Beautification

concrete solutions
design
public lighting

Example of Clemenceau Metro square.
Design references
The design for the station entrance is inspired on the example of superkilen, Copenhagen. The alienated colours and structure of this open space aims to integrated the open space with the neighbourhood and create a platform for sharing and interaction.

superkilen
BIG Topotek 1
2011 - Copenhagen
design concept, under construction

NDSM terrein
2005? - Amsterdam Noord
realised

flexible/shared spaces - identity - user groups

lent space
Interboro partners
2009 - Brooklyn
realised

Kuregem
The example of the temporary project ‘trop de bleu’ tries to connect a sequence of spaces that differ in essence from each other but are connected by this structure with which the public can interact.

The example in Sicily aims for a similar goal, but is located in a more urban setting. This structure incorporates furniture and green and could potentially also incorporate illumination sources and become a strong connective entity in the public space. The intervention for Kuregem tries to accomplish a similar goal by connecting the spaces in materialisation and lighting concept, while at the same time the different spaces are different in function and use. This is also reflected in the design. For Kuregem the connecting element is more subtle, however, in the details these ideas were taken into account.

Lent space on its turn uses flexible elements to structure space and engage local users with it by providing possibility to move it. The elements are easily placed and have the possibility to fulfill the wish for more green.

NDSM in Amsterdam is an example for a concept applied to the slaughterhouse site, where small enterprises are offered space to work and develop. This can engage the local community to step up in society.
The area around the Midi station is currently a rather complex set of entrances and direction towards either the centre of Brussels, the station itself or the neighbourhood. As shown in img.197 on page 113 the current situation is not clear towards the purposes of these different entrances. All flows go everywhere which causes a unclear situation. The proposed design intervention makes a clear distinction between each connection that is made around the station.

The current connection between the city centre of Brussels and Midi station is big but lacking human scale. By making it more dramatic and at the same time adding so spatial elements that bring back the human dimension generates an entrance which is pleasant and this city worthy.

The car connection between centre and neighbourhood (and beyond) is currently a wide traffic lane. The entrance towards the neighbourhood is lost in the speed of the movements. By uplifting a part of the bus station, the transit function of the station is put in the spot light, as well as the entrance of Kuregem.

The bus station itself almost remains in its current shape, apart from the uplifting of the signal part as well as a linear element creating an other platform for Midi station; the bus platform. The height difference is 0,5m. More close towards the station the metro stop is better articulated in space. The aim here is to extend the transit function of this station towards the bus and metro and generate a real transit zone.

The start point of the route towards the slaughterhouse is formed by the station square that is currently not to be found around the station. It is -0,5m to create a more closed atmosphere. This square in the evening could also function on a local scale, taken into account the functions adjacent to it.

In the evening the main focus is the entrance function towards neighbourhood and station and the articulation and relation between different places around the station. During the day the focus is more on directing flows on resultant activity easily can take place.

A visualisation of the promenade connecting the station with the centre is presented on the next pages.
Kuregem

- Cozy station square with local functions
- Bus platform and tram stop
- Visible and reachable metro stop
- Dramatic entrance, shared space, human scale
- 2nd pedestrian route towards the neighbourhood
- Inner city ringroad direction towards the centre

Important functions along the connection, enhancing activity

Midi station

Inner city ringroad direction towards the centre
Day view on the promenade connection the centre with Midi station.

Current situation

furniture to bring back the human scale, but focus remains on movement and connecting
Night view on the promenade connecting the centre with Midi station.

Midi tower functions as a landmark in the nightscape of the city.

The blind wall of the train track as a dynamic interactive illumination source directing movements towards the clear marked entrance.

Furniture functions as a source of illumination directing movement.

Light concept
The most important aspect of the intervention connected to Rue De Fiennes is the reshaping of the square by its materialisation, focus and relation to the functions around the square. In the current situation the square is located next to all flows and activities. The design of the square today shows it’s back to the movements and therefore is not influenced by its good location. Due to the high traffic flows connections with the other side of the road the square is disconnected to any bigger scale of influence.

In the proposed intervention incorporates the square the through route instead of being located next to it, it becomes an active part of the activities. In materialisation and focus the square turn optically from a place aside the road to a space connected to the through route connecting station and slaughterhouse. The orientation and navigation highly depends on the opening up of the short connection south of the square. This currently is a private owned park, which should be expropriated to become part of the network and to make this network connection function.

By shaping the square like this, the functions along the shaped part play a more active role in the definition of the public space and the activities in direct relation to it. This is important both during day and night as it is being part of the orientation within the urban tissue. These functions are currently already located around the square but this intervention can make them more noticable and more influencial in the public space.

A visualisation of this part is presented on the next pages.
Square shape keeps the direction towards station and slaughterhouse; focus remains.

Square incorporating through movement and actively taking part in it.

Small scale green; open views possible.
visualisation Fiennes

Day view on the square at Rue De Fiennes.

Current situation
Night view on the square at Rue De Fiennes.

- The connection to the slaughterhouse and station remains visible, but focus on local has priority.
- The available assets and historic structures are used to identify the space and adds to orientation at the same time.
- Orientation within the bigger networks of the city, while at the same time focusing on the locality of the place.

Legend:
- Existing building block
- Existing individual building
- Extended hour function
- Canal/water
- Bus lane
- Public road
- Public space
- Smaller public space entity
- Shared space city entrance
- Glasshouse frame structure
- Metro entrance
- Accessible green space
- Community gardens
- Small local enterprises
- Market
- City furniture
The biggest change in the square of the Clemenceau metro stop is the relocation of the metro entrance. Instead of the current 2 entrances, which split the square into 2 parts and leave an undefined open space in the middle. This square is located in the middle of an residential part of the neighbourhood, although some shops are connected to the square there is potential for more. Especially because of the strategic location at the metro stop and its enclosed character, it has some basic ingredients to become a residential active square.

In the new proposed intervention there is only 1 bigger entrance to the metro strategically located towards the square itself and the slaughterhouse, as the slaughterhouse does not have an own entrance, this entrance can function to both sides.

The square itself by its design directs movement in the right direction of the route slaughterhouse-station, while not preventing any other movements to take place or disturbing the local functionality of the square. The green hill provides green space to the locals, which they lack at the moment, while at the same time bigger movements can happen next to it, without disturbing each other.

During the night the focus is mostly on the neighbourhood function of the square, the metro stop becomes less important. For this square a more extensive visualisation is made, showing how the lighting functions on the 3 levels together with the design and makes the intervention stronger by that. These visualisations can be found on the next pages.
Change in direction by materialisation and green hill functions strengthen this.

Metro stop as a remarkable object towards all directions.

Metro square, open view to the slaughterhouse.
Day view on the square

- movement is directed by the green hill and the materialisation of the square
- active frontages enclose the square and sustain vitality
- the furniture is used to facilitate staying in the public space and at the same time it gives orientation to the square

Current situation

light concept
3. beautification

2. activity

1. network & sequence of place

Night view on the square

The facades around the square typically support the public illumination.

The elements which add general quality to the environment are used as light sources for guidance and orientation within the bigger network, but keep the inward orientation of the square.

The square as part of the bigger structure and strategy.
zoom Slaughterhouse

The slaughterhouse is changing functionality. According to the earlier formulated strategy and vision it becomes a part of the global structure covering the city both during the day and the night.

This can only be done by close cooperation of municipality and the associations of owners of the slaughterhouse site (NV Abatan). It requires their close cooperation and commitment. This is slowly starting to take place, this project anticipates to this process. Currently the site closes at 5pm and the open space is not constantly used, while there is a big amount of open space available. By adding a variety of functions to the existing purpose of the site and strengthening the existing ones as the market and the conference and exhibition places the site can become a more 24 hour global attractor for the city of Brussels (and beyond).

The strong market function that is currently to be found on this place remains and becomes partly permanent by means of some small scale enterprises and workshops. These are meant to enhance the local community. At the same time space for leisure and other use is generated for the benefit of the local community. The occasional entrances to the site should become permanent to make the site more easily connected to the urban tissue; it should become a public space.

The slaughterhouse is not the end point of the route, but can open up space further towards other entities or developments. The plans for the waterfront by the government of Brussels Capital Region are likely to take place, the proposed intervention can generate a close connection with these plans. In a similar way the slaughterhouse site can connect to the schools in South-West direction.

1. network & sequence places
   the private owned site of the slaughterhouse has to be opened to the public domain on a permanent basis, with clear entrances
   the materialisation sustains the coherency within the network and defines the space and defines more human scale areas within the bog plot

2. activities
   the functionality of the site should become more plural and divers to become a global attractor and involve the locals
   the market function is added by small scale enterprises flecible to any kind of use

3. beautification
   structural elements of green and city furniture enhance the character of the spaces and encourage opening up this developed part of the network to future developments and integrate those further
small scale workshops and enterprise opportunities

market related functions

open up the site towards possible future riverfront developments

first main entrance

green space for locals

open up the site towards the other functions surrounding it

second main entrance

side entrances opening up the enclosed site

side entrances opening up the site towards possible future riverfront developments
the market structures become more permanent, encourage the movement and orientation as an invitation to the rest of the site

a clear entrance gesture to the rest of the slaughterhouse site is made

connection towards the station remains visible through materialisation and orientation, guidance

Day view on the side entrance of the slaughterhouse site

Current situation
active frontages of the crossing street compliment with the function of the slaughterhouse site; orientation remains

furniture incorporates illumination sources by activity and results into easier navigation

Night view on the side entrance of the slaughterhouse site

light concept
The research question to be answered in this last chapter was: *How can lighting be used in the design of public spaces to encourage 24/7 urban vitality?* As an answer to this question a vision, strategy, local strategy and design intervention were developed, incorporating lighting from the start as a part of the solution to socio-spatially integrate the inner city of Brussels.

The strategy and vision for the city focus on bringing back the residential function to the inner city and higher the quality of this, by encouraging activity and cohesion the separate parts. The movements that already take place on a daily basis are used to strengthen local cores and reconnect them with each other.

For Kuregem this is translated into a direct connection focussed on the slow user between 2 city scale attractors; slaughterhouse and Midi station. The connection between station and slaughterhouse that is part of bigger network structures and can potentially open up to new structures as well. By connecting in this way to higher level networks, the vitality of the neighbourhood is protected and enhanced. This is explained in the local strategy which shows the process of integration after implementation of critical intervention; the route.

The tools used to develop this route were derived from literature research on the role lighting can play in urban developments, together with outcomes from comparison study on the relation between light and design.

The scheme on the next pages shows how the critical intervention relates to design guidelines, vision and approach for different levels of the intervention. The scheme is built up from bottom-up where the higher levels cannot function without consistency with lower levels. It forms a combination of the scheme showed on page 124 added by examples for the square around metro stop celmenceau and possible involved stakeholders for each level to be completed.

Ultimately the 4th level can be the level of consequences as a result of the other levels all together: an upgrade of the neighbourhood. This upgrade might result into a better balanced mix of inhabitants, the raise of investments in the area and a decrease of criminal actions. This effect cannot be measured nor predicted, but if the underlaying levels are developed successfully it can be expected to happen.
lighting, methods & tools

The lighting and design intervention cooperate simultaneously on the different levels of the intervention. The methods and urban spatial elements mentioned below provide generic solutions where light is able to interfere and be meaningful to reach the pre set-up aims as mentioned as a vision for each intervention level.

**Vision**

Strengthen the underlaying vision and urban form and activity related interventions. Raise the overall quality and appearance of the interventions of the other layers. Encourage neighbourhood engagement and sustain the positive long-term effects of the interventions of the other layers.

**Method & Approach**

The spatial entities developed by sequence of spaces, the network and the activities get strengthened by this layer of beautification and detail. It adds to the consistency of specific locations within the whole, while at the same time it can specify the local identity. The small scale of the intervention creates possibilities for ownership for to local community to get involved in sustaining and maintenance.

Create basic conditions for the activity and beautification layer. Create a supporting network following the aims of the underlaying vision focussed on guidance and orientation throughout the area. Follow the common city language aiming for inclusion and thereby generating conditions of necessary activities to happen as a result of the intervention (ref: Gehl).

Cluster and focus activity combinations on strategic locations of the movement flows as they are generated by the urban form; create places of activity that can function 24 hours. Enhance these developments by involving local community, property owners and private investors together from the start. Involvement of the local encourages the success of the intervention and can potentially strengthen the ownership by the community.

Create an inclusive inner city, with a clear image and identity. The mental map of the inner city should be covering all big entities and show this inclusiveness during 24 hours. There is a social-spatial balance between the different entities that form together the inner city. And there is a framework for further strengthening and development of the inner city; to make it stronger in all its aspects.

**Urban spatial elements**

Application of greenstructures, city furniture in coherence with activity and presence of people on their movements and actions. Focus on spatial details of the urban form and show neighbourhood quality by focussing on special facades and remarkable architecture, during the evening hours this is evidently done by means of lighting.

Locate the retail and other functions on strategic locations in the bigger structure. By this, place identity is enhanced. Balance the spread and type of function over the time of the day assuring vitality at any moment. In relation to this the active frontages with related illumination and eyes on the street improve the overall feeling of safety, which makes spaces more accessible in evening hours and thereby more used.

1. Network & sequence of places

2. Activities

3. Beautification

**Aim**

Provide an inclusive structure to the city that improves readability of the city. Instead of having a mosaic, make the inner city 1 tile. At the same time the strategy provides a framework to smaller scale interventions to the city and should balance them to each other and assure consistency between them.

The framework is not a blue print but guidance the infill and concrete layout is flexible for future changes.

**Tool**

A common language in space, form and lighting to generate similar understanding over the whole. By looking at the whole a balanced spread of functions and attractions can be reached. This on its turn should be interacting with the strategic locations of public transport nodes.

**Intervention levels**

1. Beautification to strengthening and building upon the levels below

2. Functions and activities to support and sustain the structure of the lower level

0. Inner city strategy

**Method & Approach**

The spatial entities developed by sequence of spaces, the network and the activities get strengthened by this layer of beautification and detail. It adds to the consistency of specific locations within the whole, while at the same time it can specify the local identity. The small scale of the intervention creates possibilities for ownership for to local community to get involved in sustaining and maintenance.

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**Intervention levels**

1. Beautification to strengthening and building upon the levels below

2. Functions and activities to support and sustain the structure of the lower level

0. Inner city strategy
concrete  solutions  design

For Clemenceau metro square all levels have to be more developed, therefore it is a good showcase example of the generic solutions on a specific site.

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The project is aimed to define a strategy to handle public space in
the inner city of Brussels, in order to socio-spatially integrate the
separate areas to each other and assure a 24 hour vitality of these
places. Lighting is used to provide integral solutions regarding a 24-
hour use of the public space networks.

Placing the project into the broader context, argues that public space
of inner cities is in crisis. Without taking position between suburban
areas and inner city, the role of the centre will decrease to an empty
hole, only functioning during 9 to 5 working hours. This demands a
positioning of the different levels of governance to react and interact.
To assure an active inner city, urban street life, the concept of 24/7
environments or 24-hour cities can be applied. This concept can be
observed in several inner city environments and is a way of sustaining
urban vitality during 24 hours.

Within this framework lighting can be used to enhance this principle
of urban vitality and to assure its successfulness. The influence of
applying public lighting in this situation goes beyond simply safety and
comfort issues. It can take the role of guidance and orientation, as
well as image building and creating a feeling of belonging (referring
to the place making theory of Montgomery). It must be noted at the
same time that lighting does not add anything new to an existing
situation; it only works with the qualities present, by illuminating
them.
Lighting adds to:
• *readability* of the structure of the city, cutting through scales
  from international to local neighbourhood
• it is about *way-finding in/out*
• orientation
• value of a place from international to local
  this value adds to *ownership, participation and vitality*

At the same time it creates opportunities to determine focus during 24
hours of the day. Create a nightscape that contributes to the dayscape and
make the cityscape thereby more complete.

This is needed in the inner city of Brussels where through movement have
no relation to the local context of the place. During the day vitality is
assured, while during the evening and the night, this disconnection
becomes clearly visible. The outcomes of the local scale analyses on
Kuregem support this statement and show how the fragmentation is
taking place in local dimensions. The slaughterhouse of Kuregem has
the potential to reconnect the area with higher scales of influence
of the city and integrate the neighbourhood more to the rest of the
inner city.
The strategy and vision that were developed for the city in part 5 of the report focus on bringing back the residential function to the inner city and higher the quality of this, by encouraging activity and cohesion the separate parts. The movements that already take place on a daily basis are used to strengthen local cores and reconnect them with each other.

For Kuregem this is translated into a direct connection focussed on the slow user between 2 city scale attractors; slaughterhouse and Midi station. The connection between station and slaughterhouse that is part of bigger network structures and can potentially open up to new structures as well. By connecting in this way to higher level networks, the vitality of the neighbourhood is protected and enhanced. This is explained in the local strategy which shows the process of integration after implementation of critical intervention; the route.

The design for this route combines research outcomes to a set of design principles which can be applied to reach the objectives of the intervention. This principles are leveled according to their importance for the success of the intervention. Without a lower level intervention a higher level intervention will not function they way it is aimed to (see page 146). Ultimately an intervention which is successful on all levels can result into an upgrade of the neighbourhood as a whole. This upgrade might result into a better balanced mix of inhabitants, the raise of investments in the area and a decrease of criminal actions. This effect cannot be measured nor predicted, but if the underlaying levels are developed successfully it can be expected to happen.
The project was aimed to research the way lighting can be used within the urban context to create vital environments during 24 hours of the day. The connection between the lighting design and the urban design was explored with the goal of integration and regeneration of a disconnected area in the inner city of Brussels. This evaluation and reflection chapter is structured by 3 main issues that shaped the project as it is. The knowledge on lighting in urban practice and academics is the most important one, which reflected upon urban design practice of today and some theories regarding this. These issues regarding content highly influenced the process of the project, which is the 3 topic of reflection.

### Lighting

The main argument of this reflection is based on the fact that coherent research is lacking on lighting in urban development. Therefore a solid evaluation of the proposed strategy and intervention is also not possible, even though a first step is made towards the reach of influence and by means of the levelled approach.

The main reason for this was the lacking theories and academic knowledge on the topic as lighting design is multi-disciplinary, often more related to arts and product design. Distracting the right information valuable for the profession of urbanism was complicated and proven insufficient on some aspects. In the end the project now became a gathering of seemingly important information regarding the topic, however as long as the research is not complete this cannot be assumed.

Apart from the limited theoretical underpinning, there is hardly any knowledge or concrete examples on longer term effects of light plans as well as the combination between light plan and design. For future research it would be recommended to closely follow-up on recent projects regarding light in the profession of urbanism. Research like this is already taking place, but very carefully as it starts from the public domain in which people live, which makes them subject of real life testing. This is an ethical discussion taking place currently inside the academic world. At the same time the effects of lighting on behaviour is also related to psychology and social geography. In these fields research is done, but the spatial dimension is lacking, which makes the results less applicable and less useful for the urban practice on design and strategies.

When reading between the lines, it can be stated that in our fast economies and connected worlds, taking care of our environments when it is dark with the same care as when there is daylight seems a very valuable statement. Even though the impact of it cannot be
It is sometimes rather blurry whether the illumination of a landmark plays a strategic role in the mental map of the city and thereby becomes part of the underlaying city structure or if it should be put in the spotlights because of its function or whether it is simply an action of decoration and upgrading overall perception of quality of the built environment. This is hard to judge and even harder to measure.

The theories of Gordon Cullen on the concise townscape focusses on urban design as a set of places that follow up on each other. This project brings this theory to a next level by adding 2 arguments to it:

**places + network + time**

Positioning of places within the network is of importance for the places to function and take up activities and generate vitality. The addition of time to this reflects activity and vitality to a wider perspective of designing spaces that function 24 hours. This is, as it is seen in most literature, not only of importance for leisure environments or 24/7 economy related activities, but counts equally for residential areas. Evidently lighting plays an important role in relation to the time factor. Especially in Northern-European cities.

**the process**

The process of the project, due to the difficulties in gathering information, as described above, was rather unorganised at some points. As the theory was yet to be discovered a clear set-up action plan was impossible to make or follow. This resulted into a more scattered project outcome, which could have been more consistent within time. However the results combines all efforts in 1 consistent end product.

The literature research and the theoretical framework as a whole has indirectly shown there is work to be done in this field. Especially long-term consequences of artificial urban (public) lighting and lighting master plans in city centres. At this point the developments are in an early stage, and lighting is a trending issue. More systematically research is needed to come up with arguments for and against urban lighting applications in inner cities.

![urban design](image)

When starting the project the role of lighting in urban design was rather blurry. Often it was perceived as an addition to the design to make it look pretty. While it happens to be a more integral part of the design like the context or the network is part of the design.

It is a tool to strengthen the interventions on different levels. Starting from the strategy by developing a common light language for the urban networks, through place identity and activity to beautification. Although this seems a rigid division of elements, in practice it is not.
Special thanks to my both mentors Dr. A. van Nes and Dr. ir. S.C. van der Spek who encouraged and challenged me during the process to remain focussed on the aims and goals I defined, as well as their involvement and enthusiasm. It was a pleasure to work together from the start.

For a big part of my research on lighting I thank Philip De Roo and the city of Ghent for giving me insights into their experiences with light in urban development of the city, and for the introduction to LUCI. Related to this, I thank the municipality of Eindhoven and all participants of the LUCI city under microscope event, it was a true inspiration to share experiences on lighting in urban development.

In relation to Brussels’ complexity I thank Sven de Bruycker and the Brussels Capital Region for the cooperation and useful insights in the planning processes of the region. As well as my friends from Belgium who gave me clear understanding in this culture and society.

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154


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This appendix includes 3 parts of extra information supporting the content of the thesis report.

The first part consists of a set of pictures of the current situation and location of the proposed design intervention.

After that the results of space syntax analysis on the inner city of Brussels can be found.

The literature paper that forms the basis of the theory framework is the 3rd appendix.
appendix 1

crossing inner city ring road
Baraplein / Place Bara
Bara square
Barastraat / Rue Bara
Bara street
De Fienensstraat / Rue de Fiennes
Fiennes street
Clemenceau

Kuregem
Entrance to the Slaughterhouse site
Space syntax topological choice analysis
Looking at Kuregem with a radius of 3 through space syntax, the very local centres are shown. The more red a line is, the bigger the connectivity within the network, in this case on a local scale. These are usually the historic centres that become visible. Clearly Kuregem is not such a place, in fact it is quite de-connected, and obviously more going through between Anderlecht centre and Brussels centre.

After assessing the same analysis with a radius of 9, the intermediate main roads, which function on the scale between neighbourhoods are shown. For Kuregem, the old gate to Anderlecht is red, as well as the lines connecting Brussels centre to Bara square. These streets are now also the main entrances to the area, and have a high rate of functions connected to it.

With a 30 radius, more main city roads pop up. Especially the inner city ring is clearly visible in this graph. These roads are in reality the big infrastructures, which face a lot of through movement and form barriers within the movement of pedestrians and cyclists within the city. For Kuregem also Clemenceau Avenue gets a more orange-like colour, showing the importance of the connection between Kuregem en Molenbeek.

The last graph is derived by radius n, showing only the main roads, functioning on the scale of the whole Capital Region. It gives similar results to the graph with radius 30, but more clear. For Kuregem Clemenceau Avenue, the ring and what happens at the other side of the station is important.

To establish a network between different fragments all radius analyses are important as they all show a sort of connectivity and relation.
img.208. topological choice analysis radius 3

img.209. topological choice analysis radius 9

img.210. topological choice analysis radius 30

img.211. topological choice analysis radius n
appendix 3

The review paper written in relation to the course of Theory of Urbanism handles about the topics of urban lighting and the 24-hour city as well as its relation to use of public space and inner city vitality. The paper as can be found on the following pages, forms the basis of the theory framework as it was presented in this thesis report.
Abstract — The aim of this review paper is to explore within the existing body of knowledge the different discourses on urban lighting within the context of urban planning and design of Northern European inner cities.

Artificial urban lighting is an aspect of public space, which highly influences the appearance and comfort level of our built environment (van Bellen, 2010; Commandeur, 2010; van der Spek, 2005). Lighting is these days often seen by decision makers as a branding tool (Alves, 2007) and an instrument to solve public safety issues (Willis et al., 2005) within cities. However, it could also be a strategic tool for upgrading public space or influencing the use of it. This has been argued in the master thesis of Tan (2007) and papers by Tan and Klaasen (2007) in the context of 24/7 environments and Van der Spek (2005) on way-finding in inner cities.

The context can be characterised by the increasing socio-economic duality in the world and cities. Northern European cities are facing stagnation in their natural growth, and are redefining the role of their inner cities. Due to highly connected networks and increased possibilities of mobility, inner cities are not the epicentre of activity anymore (Falk, 1996). This creates a shift between day and night use of the public space in city centres (Thomas and Bromley, 2000). Meanwhile there is also the danger of the inner city to loose its vitality (Montgomery, 1998). Therefore there is a challenge to redefine urban lighting as a tool for design and urban development. In this paper certain definitions for public space and the 24-hour environment will be formulat. The literature for these definitions is mainly derived from Gehl (1987) who has defined successful public space in a very accurate way and Tan & Klaasen (2007) who made a start of defining 24-hour spaces. These spaces are not directly related to the 24-hour economy but rather to a democratic use of it.

This review paper starts by determining the context of the issues that will be handled in the main body of this writing. Then it proceeds to public spaces of inner cities will be described. Keeping this in mind the 24-hour environment will be placed in a contextual framework, exploring these notions within urban planning and design practise. This is directly related to the presence of day and night appearance and experience of public space. Here the link between urban vitality, as described by Montgomery (1998), and urban lighting will be examined. Subsequent to this, consequences of urban lighting and the conditions needed in order to have the city benefit from it will be expressed. Finally, this will be followed by expressing the more concrete applications of urban lighting in the field of urban design and planning practise. This is needed in order to make the findings of the review paper applicable to the MSc thesis at Delft University of Technology in the department of Urbanism on integral inner city development of Brussels.

Key words — urban lighting; 24 hour urban environments; Northern Europe; inner city vitality; use of public space

1 Democratic use of public space
Artificial urban lighting is influencing the way people perceive our built environment in terms of comfort and safety (van Bellen, 2010; Commandeur, 2010). Lighting is these days more and more seen by decision makers as a branding tool to establish a certain image (van Santen, 2006; Alves, 2007), and as an instrument to solve more technical public safety issues (Willis et al., 2005). However, it is proven that lighting can also be used in order to upgrade upgrading public space or influence the use of it (Tan and Klaasen, 2007; van der Spek, 2005), as will be documented later in this paper. The question that will be answered here is: How can urban lighting, in the context of the 24 hour city in Northern Europe, influence the use of public space by pedestrians in the city centre?

The aim of this review paper is to redefine urban lighting as a tool for design and urban development in order to develop public spaces that are pleasing to all different type of users. Eventually the public spaces should become more democratic spaces. As stated in the paper by Mitchell (1995), the rise of semi-public and semi-private spaces determines the inclusion or exclusion of groups from civil society. While public space used to be for all, as a space for free democratic interaction, it seems there has been created ‘a society that expects and created only private interaction, private communications, private politics, that reserves public spaces solely for commodified recreation and spectacle?’ (Mitchell, 1995, p. 121).

In this paper clear definitions for public space and the 24-hour environment will be formulated. The literature for these definitions is mainly derived from Gehl (1987) who has defined successful public space in a very accurate way and Tan & Klaasen (2007) who made a start of defining 24-hour spaces. These spaces are not directly related to the 24-hour economy but rather to a democratic use of it.

This review papers starts by determining the context of the issues that will be handled in the main body of this writing. Then it proceeds to public spaces of inner cities will be described. Keeping this in mind the 24-hour environment will be placed in a contextual framework, exploring these notions within urban planning and design practise. This is directly related to the presence of day and night appearance and experience of public space. Here the link between urban vitality, as described by Montgomery (1998), and urban lighting will be examined. Subsequent to this, consequences of urban lighting and the conditions needed in order to have the city benefit from it will be expressed. Finally, this will be followed by expressing the more concrete applications of urban lighting in the field of urban design and planning practise. This is needed in order to make the findings of the review paper applicable to the MSc thesis at Delft University of Technology in the department of Urbanism on integral inner city development of Brussels.

2 Crisis of inner cities’ public space in Northern Europe
The context, in which this paper is placed, can be roughly characterized by the increasing socio-economic duality in the world and cities, at present. Northern European cities are facing stagnation in their natural growth, and are redefining the role of their inner cities. This is an historical process and typical for post-industrial cities, that made the shift from industries towards the service sector. Generally it can be argued that industries were the causing factor that made the more wealthy classes of society moving out to so-called suburban areas. Due to highly connected networks and increased possibilities of mobility, this process was not being counteracted. It resulted into inner cities struggling to define their identity and position within a more regional context (Falk, 1996). When talking about the wealthy classes of society moving out to so-called suburban areas, Falk states that retail industries in Europe get most of their inspiration from the USA; big megamalls at the edge of cities. This post-industrial process reached the point of ‘edge cities’ or ‘American doughnut’: leaving a whole in the middle of USA cities. The European continent is facing the challenge ‘to use the space vacated by industrial contraction to promote a diversity and critical mass of attractions’; ‘creating a living heart instead of a sullen shopping centre is becoming priority’ (Falk, 1996, p. 110).

This process goes hand in hand with the danger of inner cities to loose their vitality (Montgomery, 1998): ‘Vitality is what distinguishes successful urban areas from the others.’ ‘In the long term urban vitality can only be achieved where there is a complex diversity of primary land uses and (largely economic) activity.’ (Montgomery, 1998, p. 98).

When inner cities are facing the leave of retail and the wealthy classes of society this vitality is very likely to be non-existing anymore in these places.

3 Day and night use of public space
An inner city that does not take clear position in this debate will not be able to counteract the process. In contrary; it will create a clear shift between day and night use of the public space in city centres (Thomas and Bromley, 2000, p. 1404), and thereby only enhance the existing courses of action.

In the paper by Thomas and Bromley (2000) the ‘sym Flight’ by the working class is closely related to current inner city problems. In this section urban vitality and 24-hour environments will be explored and related to urban lighting, placed in the context as described briefly above.

3.1 Urban vitality and successful urban places
Montgomery has defined urban vitality as an essential part of successful urban places (1998). The place-making theory he formulated, is based on several theories by others, concluding into 3 main components that make place; activity, physical setting and meaning. This is visualised in fig. 1. These 3 components all incorporate the urban lighting aspect within space. Urban lighting facilitates activities; it contributes to the physical setting of space in lightening it up and creating a certain atmosphere and meaning.
Within this theory, vitality is causing activity together with the concept of diversity. ‘It refers to the numbers of people in the street (pedestrian flows) across different times of the day and night, the uptime of facilities, the number of cultural events and celebrations over the year, the presence of an active street life...’ (Montgomery, 1998, p. 97). For the scope of this review paper the fact that this definition is handling about more than day times is important. The quote implies the importance of designing night time environments, in which lighting is, with no doubt, a significant tool to intervene and put a mark on public space.

The theory of Montgomery is supported by/based on Jacobs (1969, in Montgomery, 1998, p. 99) who argues ‘fine grain city economy’. Successful urban places are transaction based, in a complex sense of understanding. When looking in history, ‘providing the space of transaction, across the day and night is what cities have always done’, ... it is important to help build the evening economy of urban places, for where this is lacking a place can only be said to work half of the time.’ (Montgomery, 1998, p. 99)

3.2 24/7 environments

The idea of evening economies is closely related to the notion of 24/7 economies and 24-hour cities. However, there are different understandings of these notions, which were introduced during the 90s of the previous century by various authors. In the field of economics it means something rather different than in the scope of urbanism. It is more than an area with 24/7 accessibility, incorporating a variety of shops and services (Tan, 2007). In any form, these environments are indicators of urban vitality.

The 24/7 environments evolve out of several combined conditions that generate or support development. These conditions are formulated by Tan and Klaasen (2007, pp. 704-709): diversity in culture and religion (e.g. sabbatarianism), changes in work culture and in family unit (e.g. increasing amount of home-workers, night shifts), changes in demography (e.g. growing and an increase in female labour force participation, increasing consumerism and affluence, governance (e.g. licensing rules), globalisation (e.g. contribution to break down of time-based boundaries), growth of service economy, leisure economy, population density and adequate user bases (e.g. to assure viability), accessibility (by a wide variety of users), public space (e.g. encouraging outdoor activities), climate (24/7 have during the year always a certain level of activeness).

All together these features of 24/7 environments result into areas, which are used during 24 hours of the day by a wide range of users, defining different means of use of space. A 24/7 environment or around-the-clock urban vitality of an area is not meant for all urban areas of a city. This is dependent on functional-space requirements as well as combinations of users and how these users behave in space. By Tan and Klaasen (2007) three broad types were observed; Hedonists, Residents and Tourists, which result in different types of environments, respectively defined by leisure, trade and tourism. For obvious reasons, this is more likely to be successful in vibrant areas of cities and inner cities than in suburban areas.

Artificial lighting should be an integral aspect of the built environment supporting the 24/7 vitality as described above, this is not explicitly mentioned by Tan (2007). It can be argued, that this aspect of space can be seen as part of a several of the supporting conditions of 24/7 environments, as mentioned above. For example the accessibility of spaces and areas in evening times; the climate of Northern-Europe; the way public space is designed in general; the way the public space is designed, are set up by the different actors of governance.

3.3 Urban lighting

As can be concluded above, lighting is seldom an issue of discussion when talking about urban vitality or 24-hour urban environments. Indirectly it is part of several conditions that are mentioned in the argumentation. However, it is still free for interpretation how urban lighting is manifested in this.

There are examples in practise of urban lighting contributing to the vitality of cities, which enhance public space quality and create a positive atmosphere. This is also being described in the paper of Alves (2007) handling about art, lighting and urban development, by using the clear example of Lisbon’s Luzboa-project. This paper recognises the tendency of cities to use lighting and arts as a way to rediscover public space. It could be seen as the very concrete implementation of Montgomery’s formulations of cultural quarters (2003).

The Luzboa project illustrates not only the fact that lighting gives identity to space, but also has the power to be an enabler of urban development. Starting from the idea of starting played new roles mainly in the way it may help quite decisively to forge new ties of identity between people and the places they live in’ (Alves, 2007, p. 1254). It is clear that lighting had undergone a shift of interpretation and application in recent years. It used to be an architectural issue only; today it is also being related to the lighting that is going on in the public space. These activities are more than just architectural.

This is also shown by Van der Spek (2005), by writing about the ability of lighting to guide people and to create points of reference within space. Lighting is taken to another level of possibilities, from only technical and comfort issues (e.g. safety and visual comfort), to a complex combination of these issues related to social aspects of navigating through cities.

When overlaying this new way of looking at lighting with the earlier stated definitions of urban vitality and urban environments, one can identify a discourse in which the 3 topics meet and interact with each other. This will be examined in the next part of this paper.

4 Consequences of urban lighting

‘Life between buildings is potentially a self-reinforcing process. When someone begins to do something, there is a clear tendency for others to join in, to either participate themselves or just to experience what the others are doing. In this manner individuals and events can influence and stimulate one another. Once this process has begun the total activity is nearly always greater and more complex than the sum of the originally involved component activities.’ (Gehl, 1987, p. 75)

This quote proves the power of the interactions that takes place in public space. At the same time it proves, together with the previous, the influence of lighting and lighting festivals’ on the participation of public space by different people. Special events like different type of lighting could be one of the stimuli of activity.

On the other hand there are no specific details known about the consequences on a longer term of specific urban lighting in public space. Also any details on effects on the user bases or weaken the restorativeness of urban nightscape’ (Nikunen and Korpela, 2009, p. 38) It is unclear if the effect of lighting can be taken to a higher level, stating that lighting can upgrade an area.

Van der Spek’s paper (2005) explains lighting more as a strategy towards enhancing existing qualities. In his paper the lighting master plan of Rouen is being used as an example to underpin this statement. The lighting is adapted to the rhythm of its users and the as hierarchy of spaces. It makes it easier for different people to navigate through the night sceneries of the city; it is a matter of accessible public spaces. On the other hand the lighting balance between the demands of and on the environment. It shows the great beginning of how to provoke life between buildings (as quoted earlier by Gehl and as a requirement for urban vitality). However, it does not explore what it is exactly the beginning of; what kind of life between buildings.

Alves (2007) argues in a similar way that lighting adds to the readability of cities. It can even overcome physical disorder of urban growth or lessen topographical barriers by use of coherent lighting. It increases the identity of a place, by more than just putting light on a spot; it is the quality of the light that ensures safety and comfort. These 2 goals play a strategic role in bringing public spaces to life, claims Alves (2007). The example presenting the previous statement is located in the outskirts of Paris. Lighting is here used to understand and articulate the landscape. The result of the efforts was shown off later by de-marginalisation of what used to be an unattractive area. Another example shows the ability of the wrong type of lighting to
add to the feeling of disconnection to the urban network; lighting is here being a barrier preventing public space movements.

4.1 Spatial support of lighting
In general the configuration of space is not the only factor to influence the successful implementation of artificial lighting. As stated in the paper by Nikunen and Korpeila (2009), to create a pleasant atmosphere it is more important what is lightened than what is there in total. In a way this is the advantage of the darkness; the choice to decide on shadows as well. By highlighting these positive aspects of space, the identity is enhanced and the total image is improved. If the positive aspects are simply not present, they cannot be enlightened either.

At the same time the users are the ones who make public space successful. The use of public space however, is depending on its configuration and function. It can be concluded that this spatial configuration, if coherent and well connected within the network, supports the successful implementation of urban lighting. It can even overcome physical barriers as stated earlier. With adapted lighting, an existing logical spatial connection can be made strong and consistent during the darker hours of the day. The spatial support of good urban lighting is mostly by means of the existing urban networks, and some sort of quality within public space to be lit.

5 Conclusions
The public space of inner cities is in crisis. Without taking position between suburban areas and inner city, the role of the centre will decrease to an empty hole, only functioning during 9 to 5 opening hours. Together with the declining democracy of public spaces, a rise of semi-private spaces can be spotted. All together this demands a positioning of the network, supports the successful implementation of urban lighting. It can even overcome physical barriers as stated earlier. With adapted lighting, an existing logical spatial connection can be made strong and consistent during the darker hours of the day. The spatial support of good urban lighting is mostly by means of the existing urban networks, and some sort of quality within public space to be lit.

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