Proceedings

PLDC 4th Global Lighting Design Convention,
Convention Proceedings

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The city, today, extends beyond its physical borders and territorial features; it is a perceptual-communicative-relational network [1,2] a deep structured social landscape made up of perceptions, activities, gestures and events happening at human scale [3]. Focusing on this social layer during the dark hours, we would like to access the perceived night-time image of the city [4]. Often ignored by urban planners, night-time is part of people’s experience of the city and therefore it shapes social and cultural values toward the public realm after dark [5]. For this reason, a bottom-up approach, starting from the micro-scale of citizens and urban communities, is hypothesized to be strategic for limiting the risk of urban lighting decisions that take into account only technological transformation, energy efficiency and economical savings. Understanding the urban social layer [6] means:

- mapping the urban nightlife
- mapping the perceived luminous urban atmosphere
- contributing to social participation and engagement.

With this multidisciplinary and social approach, an explorative case study was developed in the city of Milan by involving its inhabitants in a critical reflection on urban lighting as a social service. Looking at Milan from a satellite image (Fig. 1), we get a view of a lively city that is alive around the clock. In reality, it is a misleading visual map showing the nocturnal city as a network of lit paths and routes without making the connection with human activities, presence or urban patterns of use. Lighting is revealing the material layer and not the social one [7]: the luminous map of the city, built in the name of the overseeing authority [8], does not properly follow the needs and expectations of the people.

**Methodology**

The research framework is comprised of three phases. In the first phase, the research was based on “flaneuring” in the city in search of spaces where people congregate at night. Observations and pictures of differently lit environments were collected in order to create a database of HDR (High Dynamic Rendering) images for a more realistic representation of the nocturnal scenes. In addition to this, luminance maps were derived to provide an understanding of the lighting distribution in the spaces. (Fig. 2)

In the second phase, people were invited to directly participate in a virtual exploration of the city at night, surfing into an image-based SEETY of Milan [9]. Participants were first of all asked to provide some general information and were then invited to select five images, as if they were travelling through the city. For each selected image, they were asked to complete a short revised atmospheric questionnaire [10] and also invited to leave comments and keywords about their impressions of the luminous atmosphere. There were 78 participants in total (55 per cent male, 45 per cent female, with an average age of 36) with a majority being Italian (87.2 per cent) and the remaining (12.8 per cent) of international origin. The third and final phase involved qualitative and quantitative analyses in order to derive urban lighting insights.

**Results**

The analysis of data consisted of appraising the level to which lighting contributed to a positive experience of the city at night. Even if the experiment was not as diffused...
3: Most selected zones in the on-line survey SEETY plan.

The selection of one zone was presented to citizens as expected and advocated, the low participation was considered sufficient to gather a preliminary (and statistically relevant) overview of Milan's nighttime image. Urban public lighting was considered by the majority of the participants (96 per cent) to provide a special service to the city. Their activities included visiting the virtual city, going for a night-time walk (60.3 per cent), travelling home from work (19.2 per cent) or finding an evening together with friends (7.7 per cent). Remaining 12.8 per cent were foreigners, visiting the city for the first time.

The urban areas most frequently visited were Navigli, Sforzesco Castle, Sempione Park and the Columns of San Lorenzo. From the observation of the city’s activities by night, these three zones were highly lively and their lighting reinforces the recognition that downtown Milan presents the core of urban social life. They also have similar features in common: natural elements (water lilies and green areas) set amongst both prestigious buildings and monuments and entertainment spaces, after-hour shops, restaurants, etc.). (Fig. 3)

Lighting is one of the elements that contributed to the nighttime image of urban spaces. In particular, two correlating dimensions were identified (Factor Analysis – Pearson Correlation): on the one hand the sociable atmosphere, with its perceived sense of comfort, relaxation and pleasantness related to the use of certain tones of lighting; on the other hand, the perception of safety was associated with higher brightness; this factor was also slightly linked to the sociability of the space. (Fig. 4)

The results showed that people focused their attention on images with certain common lighting variables. Perceived warm luminous colour was considered very pleasant and determined a more sociable and comfortable atmosphere. The perception of a comfortable, relaxed and safe atmosphere was also linked with the sociability of the space. As expected, the presence of people in the space was also a factor of perceived sociability and low perception of danger due to the “eyes on the street” [11] phenomena. When the atmosphere of the space was perceived lifeless and not sociable, it was also perceived as less comfortable, tense and darker.

The juxtaposition of two different luminous colours, warm and cold, was also a preferred feature in the selection: in particular, the Columns of San Lorenzo and the Fountain of Sforzesco Castle were chosen mostly because of the contrast between the blue tones and the warm white atmosphere of the surroundings. Coloured lighting was only considered attractive if on a temporary basis: at Christmas the structures were lit in a completely different way from their traditional night-time image.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pleasantness</th>
<th>Interest</th>
<th>Brightness</th>
<th>Uniformity</th>
<th>Tones</th>
<th>Mysteriousness</th>
<th>Sociability</th>
<th>Comfort</th>
<th>Safety</th>
<th>Relax</th>
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<tbody>
<tr>
<td>Night</td>
<td>0.760</td>
<td>0.319</td>
<td>0.287</td>
<td>0.508</td>
<td>0.335</td>
<td>0.547</td>
<td>0.731</td>
<td>0.292</td>
<td>0.504</td>
<td></td>
</tr>
<tr>
<td>Evenings</td>
<td>0.319</td>
<td>0.251</td>
<td>0.407</td>
<td>0.508</td>
<td>0.335</td>
<td>0.547</td>
<td>0.731</td>
<td>0.292</td>
<td>0.504</td>
<td></td>
</tr>
<tr>
<td>Mysteriousness</td>
<td>0.287</td>
<td>0.149</td>
<td>0.407</td>
<td>0.261</td>
<td>0.021</td>
<td>0.354</td>
<td>0.372</td>
<td>0.293</td>
<td>0.312</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>0.508</td>
<td>0.416</td>
<td>0.385</td>
<td>0.261</td>
<td>0.021</td>
<td>0.354</td>
<td>0.372</td>
<td>0.293</td>
<td>0.312</td>
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* In bold are different from 0 with a significance level alpha=0.01

4: Perceived correlated factors: sociable atmosphere and perception of safety.
Such an unconventional lighting setting would become unacceptable in the long term [12]. Other interesting insights arose from the evaluations and descriptions added by participants. An emergent social concern was the excessive lighting: the sky glow above Sforzesco Castle was described as "polluted and excessive". People also expressed a greater appreciation of the darkest areas of the picture. In addition to this, "consumption and waste" of lighting and energy were perceived as negative aspects also in the case of Via Torino, in the downtown area of Milan, where there is increased lighting from shop windows, advertisement signs and billboards. In relation to these unconventional lighting elements, people commented on the "entertainment, playfulness and cheerfulness" triggered by the colourful displays on Corso Vittorio Emanuele or by the cold cathode advertising signs, and described it as "exciting" in contrast to traditional "quiet" public lighting.

The most recurrent feelings regarding the atmosphere in the city centre were serenity and relaxation, comfort and cosiness: "calm, restful, peaceful, tranquil" described the Naviglio Martesana, a path for pedestrians and cyclists along the canal. In this case, the lit urban space reflected by the still water was felt to inspire "meditation and contemplation", to create a sense of "surprise and curiosity" and was noted for "the beauty of the reflection of the environment". The relationship between lighting and natural elements is always popular given the way light is scattered and diffused by materials such as water or even grass [13], as is the case in Sempione Park where the illumination of the grass surface was described as "sparkling and shimmering".

This juxtaposition between darkness and light was also a recurrent topic: benches lit with high brightness were described as "exposed" while dark zones such as nearby bushes were described as "hidden". In the Columns of San Lorenzo, the area with low lighting levels was perceived as "a peaceful and convivial intimate situation", while on the other side of the street, a rhythmic juxtaposition of bright lamp posts was correlated with "a sense of curiosity" and "perception of safety". It seems that lighting for conversation, relaxation and congregation should be lowered to create a sense of intimacy and sociability [14]: dimmed lighting communicated "a calming effect", brighter lighting communicated a sense of liveliness and safety.

Insights were gathered also in relation to the meaningful use of lighting in terms of spatial recognition and rendering: lighting was appreciated when used to underline rhythmic elements in the urban space, such as on the lit façade of Sforzesco Castle "making the monument look more slender" or when applied to the Columns, rendering the columns "in an elegant and rhythmic way". Structured lighting layouts within the architectural elements seemed to be appreciated for its sense of harmony, coherency and usefulness in terms of comprehension of the space.

The use of coloured lighting was also underlined: orange or warm white colour temperatures (CCT) were associated with the feeling of warming up the space, whilst cold white lighting and blue tones were associated with cold temperatures. "A disorderly feeling" was negatively associated when too many different colours were juxtaposed without any evident design explanation: the coloured lighting of Sforzesco Castle was described as "messy and artificial". This response was expected due to the fact that this lighting scheme is interpreted as far too unconventional and removed from both traditional lighting design schemes and the expectations of the majority of respondents (Italians), who are generally fairly conservative when it comes to coloured lighting on ancient monuments [15]. The negative feedback arose from the use of colour without apparent advantages over a traditional lighting system. It was also perceived as disturbing the historical and civic identity of the city.

Conclusions and discussion

The study confirms that people are interested in the lighting of their city as it is one of the elements found to be beneficial for its accessibility. The night-time experience and usage of the city is dependent on several factors where the variables of lighting are critical but not exclusive [16]. Lighting variables that support the creation of "relaxed, peaceful, comfortable and welcoming" urban space are the colour tonality of lighting and luminance contrast. Several stereotype reactions linked with the two lighting axioms "more lighting = more safety" and "no coloured lighting on ancient buildings" are better elaborated in relation to different situations, although further research is needed for better evaluation.

In relation to participatory tools, even where several limits are encountered, such as the percentage of involved users, digital based platforms could really become effective in allowing the community to express its views toward an inclusive lighting masterplan of the city. Social engagement is regarded as a positive factor for communicating, exchanging and critically reflecting with people about the importance of urban lighting at night [17].

References

Vladan Paunovic/DK
Learning from Scandinavia.

As a newcomer to Scandinavia I had the unique opportunity to design the lighting for three interesting projects in three different Nordic countries over last three years. This paper is conceptualized as a comparative analysis of the three projects – from the initial sketch, through the design process to the final result. Through the analysis I will communicate my experience of designing lighting in the Scandinavian cultural context.

New lighting design for Stavanger Cathedral and the adjacent urban area (Norway)
Key words: historic and exclusive, site-specific, safety, technically advanced.

Stavanger Cathedral is the oldest cathedral in Norway. In 2009 Ramboll Lighting won the competition to design a new lighting scheme for the cathedral and the surrounding area. After the detailed design phase, the project was completed and officially opened in December 2011. The new lighting is designed to highlight the characteristic spatial features in Stavanger’s cityscape as well as to improve the subjective feeling of safety in the area.

The inspiration for the lighting concept came from Stavanger’s cityscape, which is a unique symbiosis of man-made urban elements interwoven into vivid and beautiful Norwegian nature. In downtown Stavanger the terrain rises and falls in an irregularively lively rhythm always offering interesting views for the visitor to discover.

Ramboll Lighting developed a strategy where the visual focus is set on the vertical layers which appear one behind another in the visitor’s different fields of view. The lighting ‘grows’ in scale and intensity from very low lighting level on the outskirts of the area towards the cathedral, which, as the most important and visually the most dominant element in the area, became the agreed visual focus for all viewpoints.

In the detailed design phase the project was divided into several micro areas in order to pay the necessary attention to the design of technically advanced details. These areas are: Domkirken (the Cathedral), Domkirkeplassen (the square), Kongsgård (the School Yard), Byparken (the Town Park), and the waterfront next to Breiavatnet.

The cathedral is primarily illuminated by floodlights from a system of poles with light fittings integrated into the bodies of the poles. This solution was chosen in order to reduce the visual impact of the poles on the surroundings in the daytime. The poles are located around the cathedral in a pattern aligned to the cathedral’s volume.

In order to communicate the visual properties of the natural stone the building is made of lighting is installed in the ground along the cathedral’s parameter to graze the surface of the stone. The grazing produces shadows and creates contrast and depth in the facade. The illuminated arcs of the windows located in the upper section...