

# Adaptive Lighting Design as a Holistic Approach to Public Lighting

## A contemporary case study in Portugal

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old city of Jerusalem/IL," by R. Narboni, 2012a, March/April, *Professional Lighting Design*, (82), p. 25. Copyright 2012 by VIA-Verlag Joachim Ritter.

*Figure 55.* Dynamic lighting project in a residential area in Glasgow, where the local weather conditions - temperature, wind speed and direction - determines the colour scheme. From *The social dimensions of light* (p. 44), by Stewart, A., Colombani, A., Junagade, N., & Leclerc, R. (2011), Lyon, France: LUCI Urban Strategies Commission.

*Figure 56.* The *Broken Light* project is an example of an unconventional approach to urban lighting, by suggesting the use of a shadow pattern in public lighting (left), produced by a custom made luminaire for the residential street of De Kaap, on the Katendrecht district, Rotterdam. The project also promoted social participation by including the residents' input into the final design solution. From *The social dimensions of light* (pp. 96-97), by Stewart, A., Colombani, A., Junagade, N., & Leclerc, R. (2011), Lyon, France: LUCI Urban Strategies Commission.

*Figure 57.* The indiscriminate use of technology. Examples of the poor rendering capabilities of low-pressure sodium light sources used in a profuse way in residential areas (on the left) and in a historical landmark (Belém Tower). Composed figure: Bairro do Armador, by R. Oliveira, 2006, Lisboa, Portugal. Unpublished photograph. Copyright 2006 by Rogério Oliveira (left) and from Wikimedia Commons, by J. van Rooyen, 2007, August 10. Public domain. Retrieved September 27, 2011, from [https://commons.wikimedia.org/wiki/File:Belem\\_toring.JPG](https://commons.wikimedia.org/wiki/File:Belem_toring.JPG)

*Figure 58.* Conventional light source and ballast/driver configuration. From *Assessment of framework condition (WP 2 1.9)* (p. 14) [PDF], by Energy Saving Outdoor Lighting, 2012. Copyright 2010 by Esoli consortium. Retrieved from [http://www.esoli.org/images/stories/WP\\_2\\_Final\\_Document\\_VS\\_1.9.pdf](http://www.esoli.org/images/stories/WP_2_Final_Document_VS_1.9.pdf)

*Figure 59.* Generic architecture of an outdoor adaptive lighting system. From *Assessment of framework condition (WP 2 1.9)* (p. 16) [PDF], by Energy Saving Outdoor Lighting, 2012. Copyright 2010 by ESOLi consortium. Retrieved from [http://www.esoli.org/images/stories/WP\\_2\\_Final\\_Document\\_VS\\_1.9.pdf](http://www.esoli.org/images/stories/WP_2_Final_Document_VS_1.9.pdf)

Albeit on a smaller scale, The *Broken Light* project (Figure 56), from the lighting designers Rudolf Teunissen and Marinus van der Voorden, from Daglicht & Vorm studio, is another good example of the ability to use lighting as an urban renovation tool through a non-standard lighting solution. Designed for the Atjehstraat street, in the residential area of De Kaap, Katendrecht district, Rotterdam, the designers proposed a bold lighting concept that, at first glance, could be seen as counter intuitive of “proper lighting” for an urban space. Note that until the 1980s, this was a harbour town famous for its crime problems and socially neglected until the beginning of 2000. In 2004, various art projects from the De Players/stitching DSPS platform initiated a cultural change in a collaborative process involving the local district council, local residents, housing corporations and planning engineers. Based on the idea of light as art, this “very unconventional and original solution to an everyday situation” (International Association of Lighting Designers [IALD], 2012, para. 4) explores a fluid wave-like pattern on the horizontal plane in contrast with the more rigid columns pattern on the vertical plane, creating a look and feel of in interior space. The patterns are possible thanks to a custom-made luminaire incorporating masks that produce the intricate pattern of light and shadow.



Figure 56. The *Broken Light* project is an example of an unconventional approach to urban lighting, by suggesting the use of a shadow pattern in public lighting (left), produced by a custom made luminaire for the residential street of De Kaap, on the Katendrecht district, Rotterdam. The project also promoted social participation by including the residents' input into the final design solution. From *The social dimensions of light* (pp. 96-97), by Stewart, A., Colombani, A., Junagade, N., & Leclerc, R. (2011), Lyon, France: LUCI Urban Strategies Commission.

Several on-site demonstrations, mock-ups and model reviews were carried out with the residents before the final implementation and to respect the Town Council requirements. Apart from the collaborative process, a communication strategy was put in place with all media for the inauguration. This original approach to urban lighting turned a street into a hub for cultural and media attention, improving the use of public space, economic activity and general safety (Stewart, *et al.*, 2011). In 2012, the project won the much acclaimed Radiance Award at the Annual IALD International Lighting Design Award (IALD, 2012).

One of the most interesting aspect of this project is that uniformity - one of the major requirements to observe in street lighting - was deliberately disregarded, through a collaborative process of design that culminated with a lighting solution that provided a balance between the feeling of safety, belonging and energy use. This example shows quite well how it is possible to create new flexible lighting solutions and work methods that do not follow standards – in a strict sense - and still maintain the desired levels of quality. It is an elegant case of perceptual lighting quality.

From this brief review, it was possible to demonstrate with real world lighting projects that the concept of quality is, at least partially, 'in the eye of the beholder'. This subjectivity should not be seen as a problem to overcome but as the exact opposite. When properly considered, tested and agreed upon, it means design flexibility. As seen, it is a necessary criterion for the development of truly innovative, sustainable lighting solutions that can be recognised as having *quality*.

However, it is also important to realise that although this broadband definition of lighting quality is accepted, it does not necessarily mean that it represents the common practice. Considering what was previously discussed regarding the use of standardised lighting solutions and the surrounding standard controversy, following his 1996 paper, Peter Boyce wrote a follow-up paper in 2013 on the democratisation of lighting quality. This paper reflects on how little this matter has changed over almost 20 years, even after the first CIE Symposium on Lighting Quality. For Boyce, the current and most used definition for lighting quality is still the level of compliance with the client's and designer's objective for a given installation, which he considers "both mundane and obvious" (2013, p.1), arguing that we cannot ignore context-related aspects and physical and psychological processes that influence the perception of quality. "It is this inherent variability that makes a single, universally applicable recipe for good quality lighting based on photometric quantities an