Creating a "lighting hierarchy"

Wisely planned urban lighting reduces the negative effects of illumination and emphasizes the special features of the city.

What is a lighting hierarchy?

Every city has its own type of urban environment: important buildings or monuments with historical or cultural background, public areas with a certain atmosphere, unique landscapes, commercial centres, and residential spaces.[1,2]

A lighting hierarchy is about giving an importance to this special formation of the city. For instance, the Town Hall should be the brightest façade in the city, instead of a department store. High-traffic streets are brighter than streets with low traffic. Lighting can act as a guide for people to navigate around the parks. In a dim environment, we need less light to give a spatial accent compared to brighter surroundings. The lighting hierarchy makes it feasible to have darker areas with less light without losing safety.

A responsible lighting helps people to orient, adds safety to traffic, and prevents crimes. And, at the same time, lighting creates a beautiful city filled with lively energy.

Objectives of a lighting hierarchy

A lighting hierarchy − or a lighting master plan − develops a system for defining and meeting various societal needs.

- A good lighting concept gives structure and orientation.
- Lighting design makes the city unique.
- Lighting bridges main urban spaces.
- Light enhances neighbourhood characteristics.
- A lighting hierarchy preserves the darkness.
- A lighting master plan defines the city's overall appearance.

How to create a lighting hierarchy

- Define objectives for the lighting hierarchy.
- Develop lighting categories for the different types of urban spaces.
- Integrate existing lighting concepts.
- Understand spatial relationships between various neighbourhoods.
- Accentuate the city's prominent architecture.

Photo: Topi Haapanen

A lighting hierarchy − or a lighting master plan − allows the city to be more environmentally sustainable. A lighting hierarchy helps to avoid problems associated with a harmful lighting (e.g. light pollution).

What is special about the city? [2,3]

With a lighting hierarchy, the public can better understand important places and buildings around the city. Lighting visualises skylines and essential structures, highlighting unique features of the chosen space. A well-developed lighting hierarchy assists the citizens by giving a visual guidance for spatial identification.

Example: *Lake Binnenalster, in the inner city of Hamburg, is a lake in darkness. The surrounding façades are illuminated with warm white light. The Town Hall in the background, with historical and political importance, is brighter than the office buildings and department stores. Through the lighting contrast from the dark lake, the lighting hierarchy can be achieved with only a small amount of lighting and energy consumption.*

A lighting hierarchy **reduces overall brightness and light pollution**

A lighting hierarchy defines the maximum luminance for the city's important places and buildings, and subsequently, the appropriate brightness level for less important façades around the city. Following the same principle, private lighting should always be less bright than lighting for priority features. In the overall lighting scheme, it is also important to consider the surrounding brightness. Using a lighting hierarchy, the city should limit the maximum luminance and the surrounding brightness through a policy for the use of individual lighting in shop-windows, windows, walls, and roofs.

Example: *The luminance of the façade of the Town Hall in Hamburg is pretty low; it is about 3–4 Candela per square meter.*
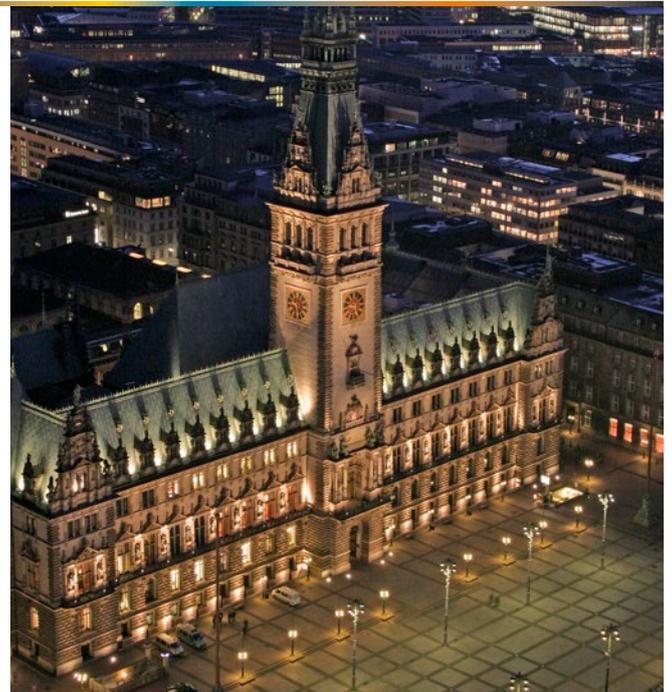
Photo: Brandi Lichtdesign

A lighting hierarchy creates a **safer environment around the city**

A lighting hierarchy also includes considerations for the street lights. By defining a hierarchy based on the typology of streets or paths, traffic intensity, environment, and road safety, the city can achieve lower brightness for the overall city without necessarily compromising the public's safety.

Human eyes adapt to brightness. Therefore, it is critical to provide a low brightness-contrast for the surroundings to prevent glare, while maintaining regularity of the luminance level for the streets. It is also important to take into account the overall illuminance for the public areas.

Example: *Illumination for the paths in a park. It is safer for the public to illuminate a single path with the highest traffic, than to illuminate multiple paths and scattering the traffic flow.*

References:

1 Oldenziel, Ruth et al: (2016): Cycling Cities: The European Experience. Hundred years of Policy and Practice. Eindhoven/Munich.

2 Light on the green path (2017): https://lightingmetropolis.com/projects__post/light-on-the-green-path/

3 Gouvernement du Grand-Duché de Luxembourg (2018): Mouvement écologique (Leitfaden „Gutes Licht" im Außenraum für das Großherzogtum Luxemburg. Wirkung nächtlicher, künstlicher Beleuchtung auf Fauna und Flora). Luxembourg. www.emwelt.lu

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