

# Landscape after Dark: Lighting as Project

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**Abstract:** In this paper, we will present an innovative pedagogical initiative that integrates lighting in landscape education. In third-year studio, students articulate planning strategies at the regional scale through a critical framework, and address issues such as working landscapes, uses and margins, flows and infrastructure. We also engage students with light and lighting so that their project includes a nighttime project. Dusk-to-dawn hours are intrinsic to land uses, and they generate patterns of light and darkness which must be documented, analyzed and intended by design. In contrast to conventional curricular divisions, this integrative process expands the dimension of the landscape project, and contributes to promoting lighting as a critical design field beyond technique or technology.

**Keywords:** critical study, design, education, landscape, lighting, technique

## 1. Introduction

Every environment is also a night environment. Dusk-to-dawn hours are intrinsic to land uses, and they generate patterns of light and darkness which must be documented, analyzed and intended by design. However, students in design disciplines such as landscape architecture and urban planning seldom learn to design for the night. In an innovative pedagogical initiative created and taught by the authors since 2003 at the Ecole Nationale Supérieure in Versailles (ENSP) and since 2009 at the Ecole Nationale Supérieure d'Architecture et de Paysage in Lille (ENSAPL), third-year students in landscape architecture receive training in lighting design during an intensive workshop led by lighting designers and educators.

The workshops' objectives comprise (1) integrating lighting design in the planning and process of the landscape design project (daylight and artificial light), and (2) applying new knowledge –critical, compositional and technical- about light and lighting design.

The pedagogical content includes fundamentals about light and human factors (physiology and psychology of vision), light sources and technologies, lighting applications and best practices, and visualizations and communication strategies.

Students use design thinking to explore the formal and social practices of the nighttime, and to define the nocturnal context of their studio project. They survey and analyze existing site conditions, articulate a conceptual framework based on their programs and design propositions, and develop design lighting schemes that become integral to the studio projects.

As a result of this original educational endeavor, landscape architecture students gain knowledge on lighting design as a creative and critical design discipline, and they graduate with a greater understanding of collaborative processes and practices.

## 2. Learning Objectives: Lighting as Design

Lighting design is the art and science of lighting the human environment, and applies to both indoor and outdoor spaces. It is a comprehensive design discipline centered on the expertise of light, yet it is transdisciplinary within both art and science, and its practice

is inherently integrated, multi-faceted and trans-scalar. It integrates knowledge in the natural sciences and the social sciences, as well as technology, engineering and design. As a profession, it is distinct from architectural, interior, landscape and urban design, as well as electrical and electronic engineering, yet it intersects with all of these.

Lighting design requires expertise in the physics of light and the physiology and the psychology of light perception by humans, also known as ergonomics or human factors. Lighting designers compose space with contrast, both in brightness and hue. A key design principle is that in visual perception, nothing is absolute and all is relative, because humans have evolved a visual system that is attuned to relative relationships rather than absolute measures.

Any design project is a complex sum of parts yet must perform holistically. In order to create aesthetic compositions that provide appropriate answers to all programmatic specificities, lighting designers work with multiple variables. These include aesthetics, program, function (the users' visual tasks, safety, and orientation), context, identity, photometry, technology and sustainability.

Lighting design is also a spatio-temporal design field. Both daylight and electric light are dynamic, and their transitions require to be designed over the course of the day and night and varying programs and seasons. In addition, new and developing mandatory regulations on energy efficiency require both light levels and occupancy-based controls.

Outside of the lighting design field and industry, lighting is typically reduced to consumer products, energy, light bulbs and light pollution. However, both issues of light and sustainability and light and health are complex issues, and cannot be reduced to universal applications of low-consumption' light sources and 'dark sky compliance'. Notwithstanding the sustainable trade-offs that dense urban environments provide, our 21st-Century built environments are artifacts that separate us from the natural environment beyond starry skies. Moreover, unessential lights are a visible indicator of only a portion of the far greater problem of energy conservation at large. Additionally, current scientific research on the impact of the intensity and spectral emission of artificial lights on circadian and ecological systems is driving new trends on how we apply light and sources that will increase in the near future. These issues are

culturally transformative: they have begun and will continue to dramatically affect the critical, conceptual and technical aspects of the lighting design project.

Significantly, lighting design is also still a relatively young design discipline, and it is not a field known for its critical work. New research is needed to develop a more comprehensive understanding of how lighting contributes to the urban ecosystems that evolved within the constructed environment. New analytical frameworks can help us comprehend and expose how lighting applications express cultural beliefs, social networks, power structures and infrastructural models within modern global nightscapes. Through renewed critical inquiries and experimental studies, we can explore and propose idiosyncratic models as effective substitutes for the current models of practice and study that are in use today but remain largely borrowed from other disciplines. The role of lighting design and applications of light in the performance, presentation and perception of the modern built environment remains largely uncharted and ignored in critical discourses: too few scholars and academics address the cultural, political, economic and material dimensions of lighting.

Today, the grounds of lighting design professional practice are limited, whereas pervasive uses of lighting in the built environment would require a more widespread expertise. New specialized or integrated curricular structures are required to increase lighting education in order to disseminate its best practices as well as its emergent critical and scholarly culture.

A list of selected further readings on the topic of lighting is provided at the end of the paper

### 3. Pedagogy: Design and Technique

#### 3.1 Experiencing the Night

At the beginning of the workshops, students experience the night environment in two ways: a night walk and a visit of their sites at night.

##### 3.1.1 The Night Walk

Students take a local night walk guided by lighting faculty, and observe light in the nocturnal built environment, such as streetscapes, parks, plazas, buildings and landmarks.

The night walks offer nocturnal experiences during which students are both users and observers, and they learn by observation how to connect issues of visibility, face recognition and orientation with comfort and mood. These observations greatly serve the acquisition of new knowledge on light and lighting such as Color/ Distribution/ Effect/ Perception. A strong emphasis is placed on the subjective experience of these night environments. For instance, students are asked to qualify elements or spaces with a matrix of non-technical terms such as Warm/ Cold; White/ Color; Bright/ Dark; Soft/ Harsh; Appealing/ Deterring.

Field observations are later directly connected to knowledge gained in class, and can be transposed into design propositions.

##### 3.1.2 Site Visit at Night

Students are also required to visit their sites at night, to document these nocturnal environments with a photographic survey, and to synthesize their findings. The resulting analyses provide a framework that informs their conceptual propositions and lighting design

projects. Since the third-year studio projects address the regional scale, these preliminary studies of the nocturnal environment require from the students that they observe and document all scales within. This exercise is particularly useful for them to understand the visual similarities and differences between the nocturnal and diurnal spatial experience.

At the large scale, they can contrast for instance how the perception of depth varies between day and night, and how lighting becomes an indicator of uses rather than of space. At the application scale, such as infrastructural networks or urban elements, they can observe critically the interaction between light and materiality (textures, colors, transparency/ opacity, specularly on vertical and horizontal surfaces) and lighting and program/ uses (uniformity, brightness, density).

Students can also observe how lighting strategies translate into technical implementations such as placement, spacing, mounting conditions of luminaires, and mounting height, intensity and selection of light sources.

#### 3.2 Lectures: Light and Lighting

A series of lectures are offered throughout the workshops, which can be categorized as follows: fundamentals about light and vision; lighting design creative practice and applications; and visual communication in lighting design.

The fundamental lectures on light and vision address human factors such as the visual and psychological perception of light. Current lighting technologies such as sources and optics are presented within the comparative framework of the physics of light and optics, such as spectra, color, color rendition, intensity and distribution. Sample luminaires are used to illustrate the properties explained. Lectures on lighting applications present how a lighting design project is developed, from an analytical framework of existing conditions and program requirements to conceptual propositions and technical implementation. They include examples of conceptual frameworks and compositional proposition for built and unbuilt projects, as well as visuals that illustrate design effects and their technical implementation.

In addition, lectures engage students in a critical study of designed or vernacular lighting applications.

Lastly, the workshops include a section on graphic communication. Lighting Design raises unique visualization questions. The visual communication of a lighting design project should implicitly and explicitly provide qualitative and quantitative information about light, space, and time. The properties of light are absolute, yet materiality and human vision make lighting effects relative in the experience of space. Moreover, nested scales of time imply temporal design variations (a.k.a. 'lighting scenes' for various times of the day or year).

*During the workshop, students are provided with a glossary to use precise words when communicating about light and lighting, as well as reading References.*

#### 3.3 Studio Project: Designing Lighting

The intensive lighting workshops operate within the studio process and environment, in which students interact one-on-one with the faculty. The pedagogy follows the principles of what is known as 'project-based learning': the studio projects are used to situate the lighting design projects. These include the development of analytical

and conceptual frameworks as bases for design, and the articulation of multi-scalar design propositions and detailed implementations. The third-year studios focus on the regional scale, and require that students address issues such as topography, identity, economy, policy and politics at the regional and local scales as part of their design projects. During the lighting workshops, students apply design thinking as they explore similar or different parameters that construct the night environment. Within the context of their landscape architectural project, inquiries of scale, access, uses, temporality, visibility, identity and economy help define the scope of their night project, and articulate how lighting can reveal, highlight, transform, announce and connect spaces and uses.

The workshop culminates in a final presentation of the lighting design project. The presentation requirements include a project title that expresses the design intent (the title of the lighting project may relate or not to the title of the studio project), and a short project narrative (50-100 words). The graphical presentation must comprise at least the following documents: a synthesis of the existing conditions; a lighting plan; reference images which illustrate the design intent and intended effects; plans and sections that describe lighting applications; and technical details that show luminaire selection and integration.

All project documentation is presented during a class-wide critique, and is partially integrated in the studio project as deemed relevant by the students.

#### 4. Conclusion

2013 marks the tenth anniversary of the first workshop at ENSP. Both ENSP and ENSAPL have now integrated these intensive lighting workshops in their third-year curricula. To date, approximately 300 students who graduated from both institutions have received this innovative training as part of their education.

In contrast with conventional curricular divisions, the integrative project-based pedagogy expands the dimension of the landscape project, and contributes to promoting lighting as a critical design field. Critical observation and reasoning are foundational for creativity and effective learning. Knowledge transfer is only a part of the instruction provided in the lighting workshops: these foster learning through experimental and analytical skills, and expand the students' perception and knowledge to the spatio-temporal context of the nighttime. Students are challenged to expand their creative and critical design thinking as they complement and resolve their own designs from a new perspective. As a result, the workshops offer a strong pedagogical integration of design and technique, which is inherent to design fields in general and the field of lighting design in particular.

Lighting design is a discipline that is currently taught at the undergraduate and graduate levels in only a few academic programs worldwide. Many interior design and architectural programs offer a few fundamental courses on lighting design. Integrating the art, science and technique of light in the education of landscape architects and urban planners is critical to scale up the positive contribution that lighting design makes in the built environment.

As a general assessment, the integration of these intensive lighting design workshops greatly enhances the education of students in

landscape architecture. They represent an innovative pedagogical initiative that advances multidisciplinary culture in education, and directly and indirectly support better professional practices. Expanding and exchanging transdisciplinary expertise across academic design disciplines serves the dissemination of creative practices that are ergonomic, sustainable, ecological, and esthetic. Greater knowledge about the night environment benefits professionals in creative and critical practices in landscape and lighting design, and by extension to all related stakeholders and constituencies.

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