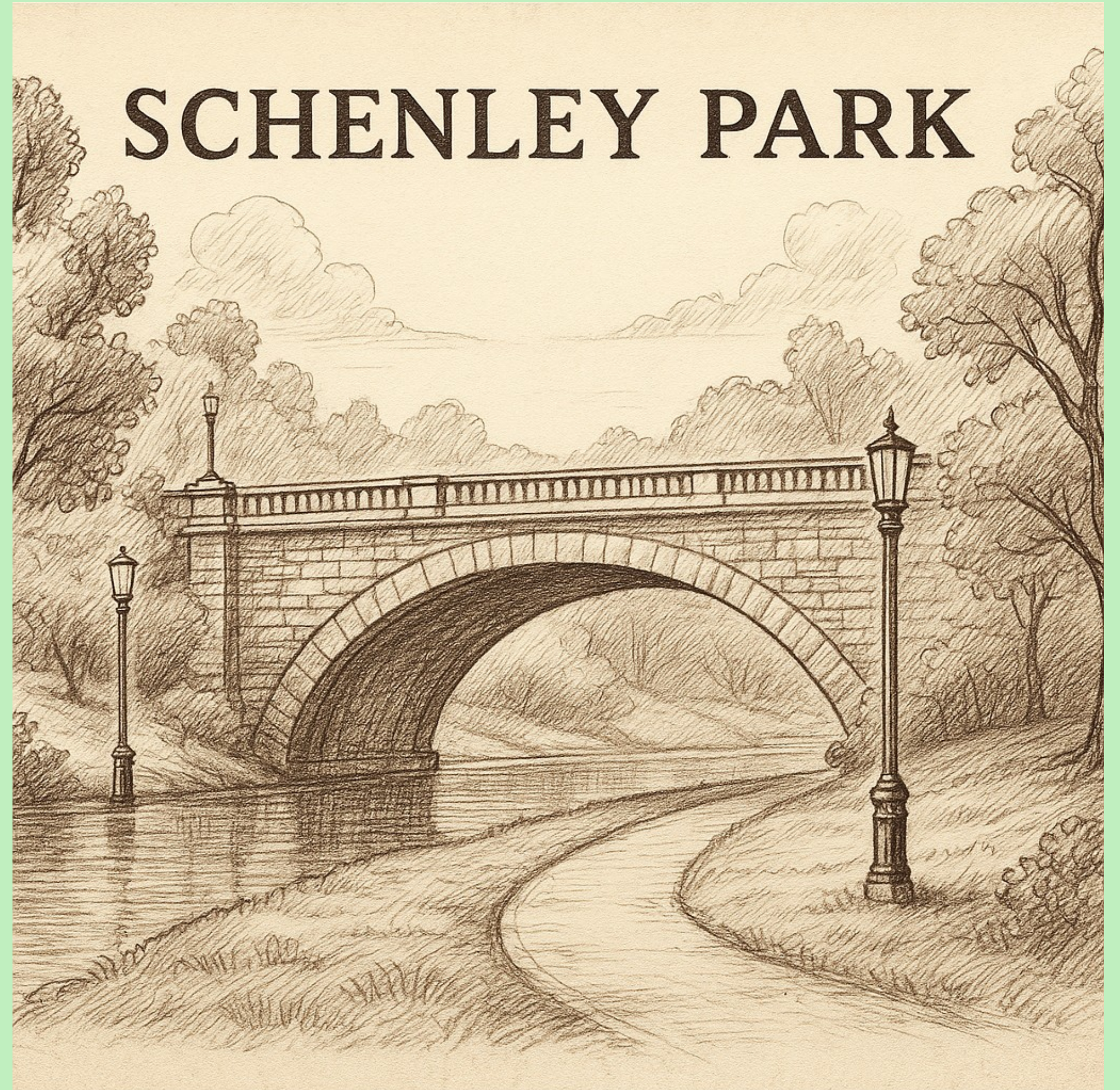


Dark Sky Overlay Plan

David Pinero-Jacome



Summer 2025 - Carnegie Mellon University

Overview

I The Problem

II Research

III Project Goal

IV Site Selection

V Design

VI Lessons Learned

VII References

Section I

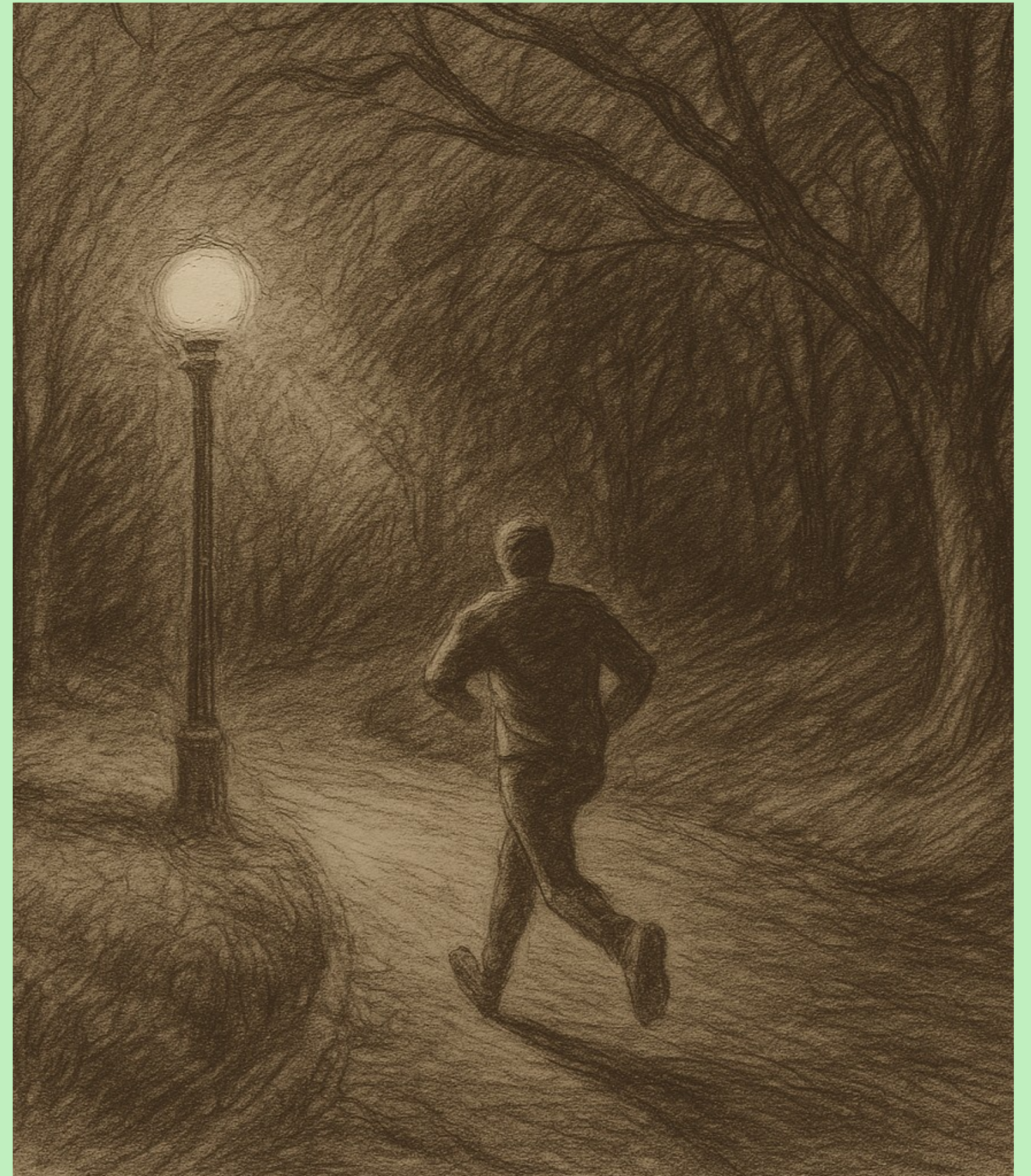
The Problem

Section: I

Pinero-Jacome

Why?

*Schenley Is Already Beloved— What If It Also
Became A Place To Experience _____?*



— Natural Darkness Is Vanishing: And With It, Countless Memories



In cities like Pittsburgh, artificial lighting has overrun the night. Schenley Park, while a beloved urban refuge, is no exception. Light pollution washes out the stars, disrupts local ecosystems, and robs residents of powerful nighttime experiences. Despite being a green space, the park offers little access to the sky’s full potential.

80%

of Americans have
never seen the Milk
Way

55%

of people have never
heard the term “light
pollution”

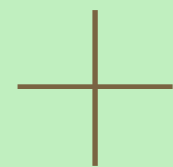
80%

of world population lives
under skyglow

Section II

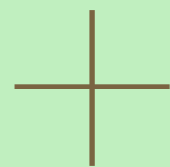
Research

Weeks 1-2



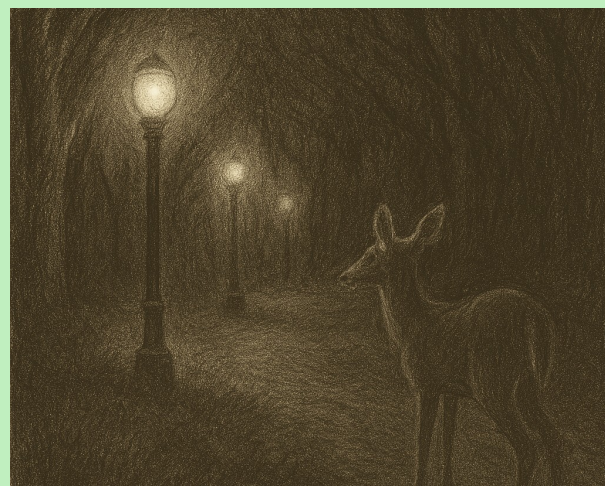
To understand the broader context of why darkness matters and how it's disappearing from urban life. This helped ground the project in both ecological and human-centered terms.

Weeks 1-2



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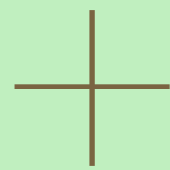
A



What we're losing in the dark:

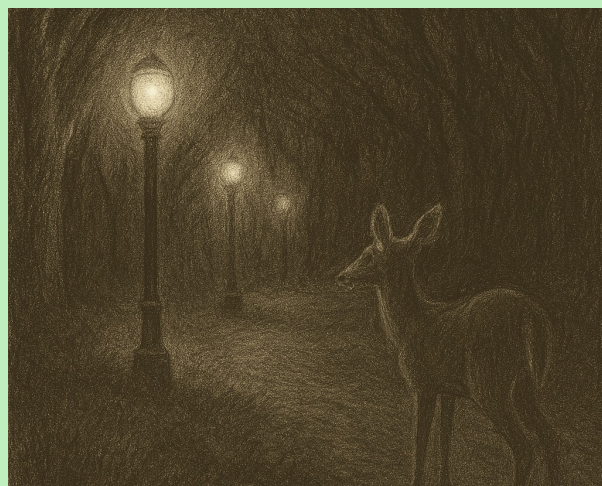
- Ecological rhythms
- Biodiversity

Weeks 1-2



To understand the broader context of why darkness matters and how it's disappearing from urban life. This helped ground the project in both ecological and human-centered terms.

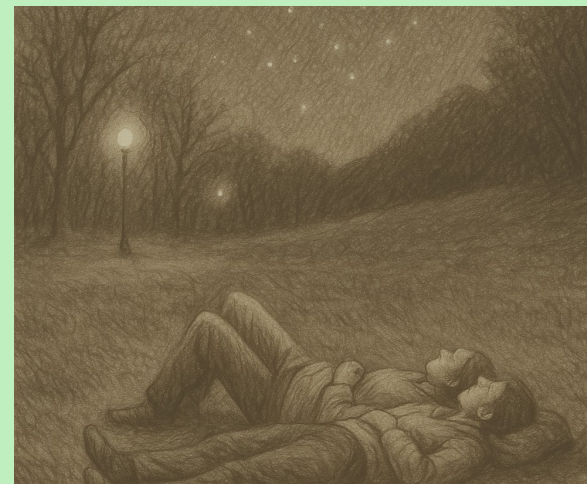
A



What we're losing in the dark:

- Ecological rhythms
- Biodiversity

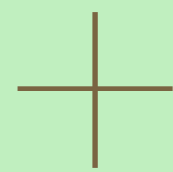
B



The human need for night

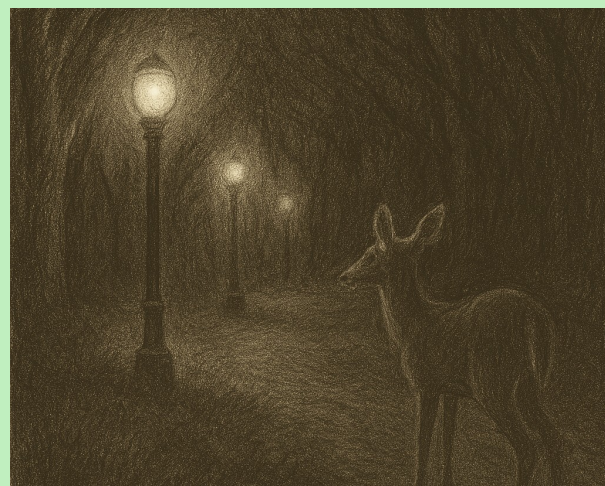
- Health necessity
- Passive pleasure

Weeks 1-2



To understand the broader context of why darkness matters and how it's disappearing from urban life. This helped ground the project in both ecological and human-centered terms.

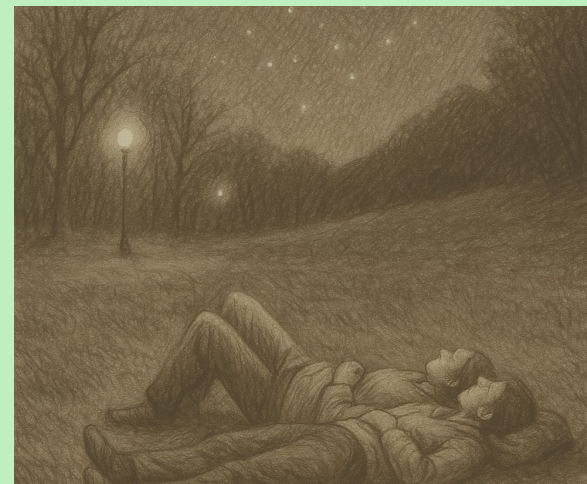
A



What we're losing in the dark:

- Ecological rhythms
- Biodiversity

B



The human need for night

- Health necessity
- Passive pleasure

C

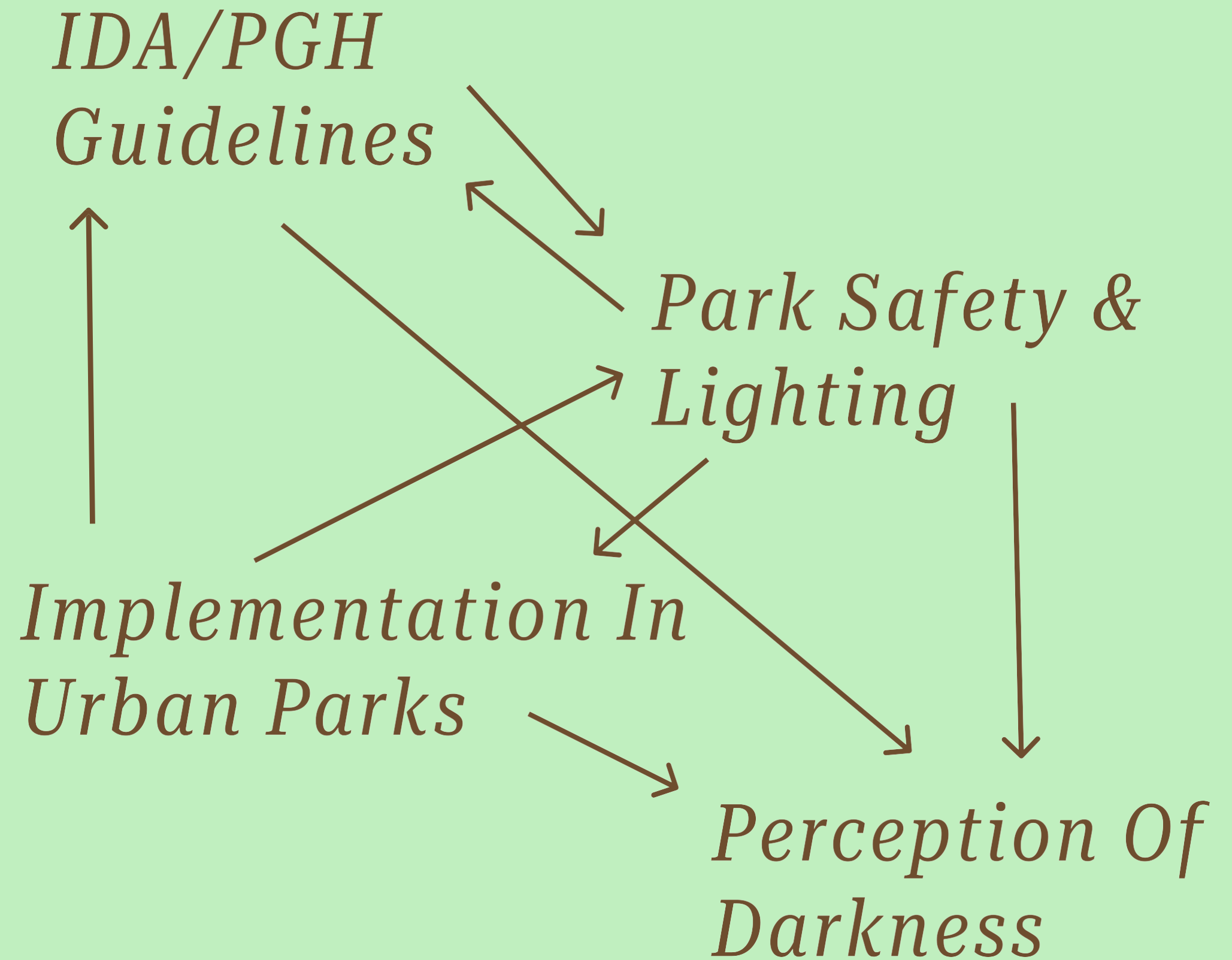


Light domes and city skies:

- Urban brightness
- Stargazing

Weeks 3-5

Focused on grounding the project in practical feasibility: studying dark-sky policies, park lighting guidelines, and public safety. I also explored cultural associations with darkness and how design might invite awe, not fear.



Section III

Project Goal

Storyteller.

This project aims to turn an optimal location in Schenley Park into a place people won't forget.

- Low-impact lighting
- Narrative-driven signage
- QR Voice-over

The final product will be a written proposal to park city officials.



Section IV

Site Selection

Criteria

What Makes A Spot Ideal?

Visibility

Minimal light pollution, clear view of stars

Accessibility

Close to existing trails, parking, and restrooms

Soundscape

Quiet enough for immersion

Section: IV

Pinero-Jacome



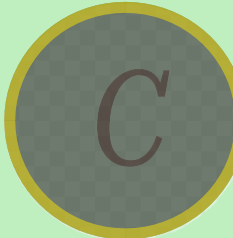
The Oval

Large open hill, excellent amenities. High light pollution due to excess street lamps, very little tree cover. Too exposed, lacks visual or emotional separation from city lighting



Overlook Shelter

Fewer light sources, darker at night, restroom nearby. Access to road closed, no trail connection, limited parking. Hard to integrate into walking experience



Visitor Center

Near Panther Hollow, enclosed in dense tree canopy, pitch black at night, isolated with no city skyline, stars visible through natural 'sky window', not ADA-accessible

Bortle Scale & Calculations

Spreadsheet --> Visual Studio Code

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\david> & C:/Users/david/AppData/Local/Microsoft/WindowsApps/python3.11.exe
Optimal Site Ranking:
1. Visitor Center - Score: 23.62
2. Overlook Shelter - Score: 9.60
3. Oval - Score: 1.70
PS C:\Users\david>
```

```
1 sites = [
2     {
3         "name": "Overlook Shelter",
4         "NELM": 5.72,
5         "SQM": 19.33,
6         "TreeDensity": 3,
7         "Amenities": 3,
8         "Accessibility": 3,
9         "Noise_dB": 34
10    },
11    {
12        "name": "Oval",
13        "NELM": 5.65,
14        "SQM": 19.2,
15        "TreeDensity": 1,
16        "Amenities": 5,
17        "Accessibility": 4,
18        "Noise_dB": 39
19    },
20    {
21        "name": "Visitor Center",
22        "NELM": 6.64,
23        "SQM": 21.17,
24        "TreeDensity": 5,
25        "Amenities": 4,
26        "Accessibility": 3,
27        "Noise_dB": 31
28    }
29 ]
30
31 weights = {
32     "NELM": 2.0,
33     "SQM": 2.0,
34     "TreeDensity": 1.5,
35     "Amenities": 1.0,
36     "Accessibility": 1.0,
37     "Noise": 1.5
38 }
39
40 def score_site(site):
41     score = 0
42     score += weights["NELM"] * site["NELM"]
43     score += weights["SQM"] * site["SQM"]
44     score += weights["TreeDensity"] * site["TreeDensity"]
45     score += weights["Amenities"] * site["Amenities"]
46     score += weights["Accessibility"] * site["Accessibility"]
47     score -= weights["Noise"] * site["Noise_dB"]
48     return score
49
50 ranked_sites = sorted(sites, key=score_site, reverse=True)
51
52 print("Optimal Site Ranking:")
53 for i, site in enumerate(ranked_sites, 1):
54     print(f"{i}. {site['name']} - Score: {score_site(site):.2f}")
55
```

	A	B	C	D	E	F	G	H	I
1	Location	NELM	SQM	Moon Phase	Approx Bortle Class	Tree Density (1-5)	Amenities (1-5)	Accessibility (1-5)	Noise (dB)
2	Overlook Shelter	5.72	19.33	15%	4 - Rural/Surburan	3	3	3	34
3	Oval	5.65	19.2	15%	5 - Suburban sky	1	5	4	39
4	Visitor Center	6.64	21.17	15%	5 - Suburban sky	5	4	3	31

Section: IV

Pinero-Jacome

Final Site Selection



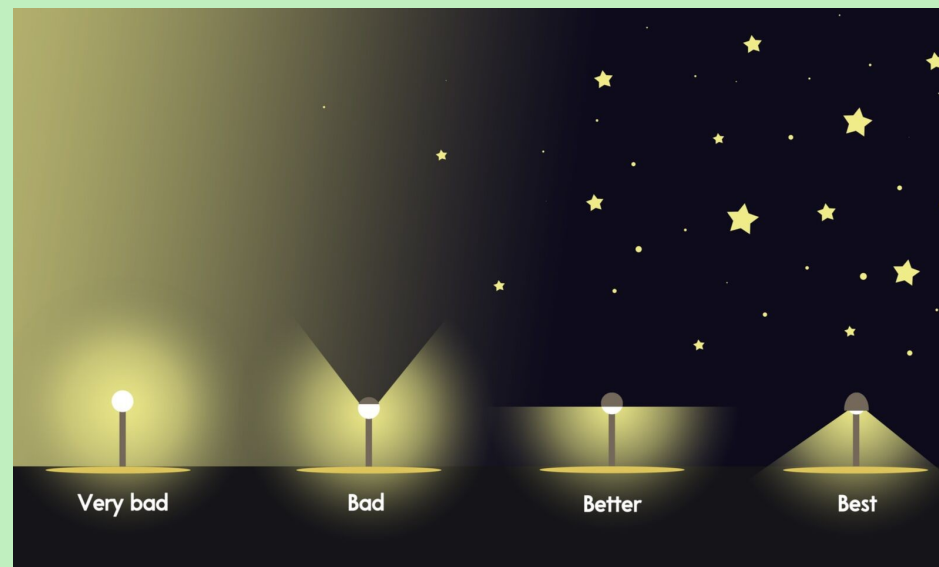
Visitor Center - Panther Hollow Trail

Section V

Design

Implementations

Lights



Backed by IDA.

Signage



Wrote with storytelling in mind.

Narration



Script narrated by AI (or IDA representative)

Section VI

Lessons Learned

Designing For Darkness Taught Me
That User Experience, How People
Feel, Move, And Wonder In A Space,
Is Just As Important As Sky Quality
In Reconnecting Communities With
The Night.

Section VII

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Images:

Sketches generated with OpenAI DALL·E 3.

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Thank You!