Technical University of Munich

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RTG Urban Green Infrastructure

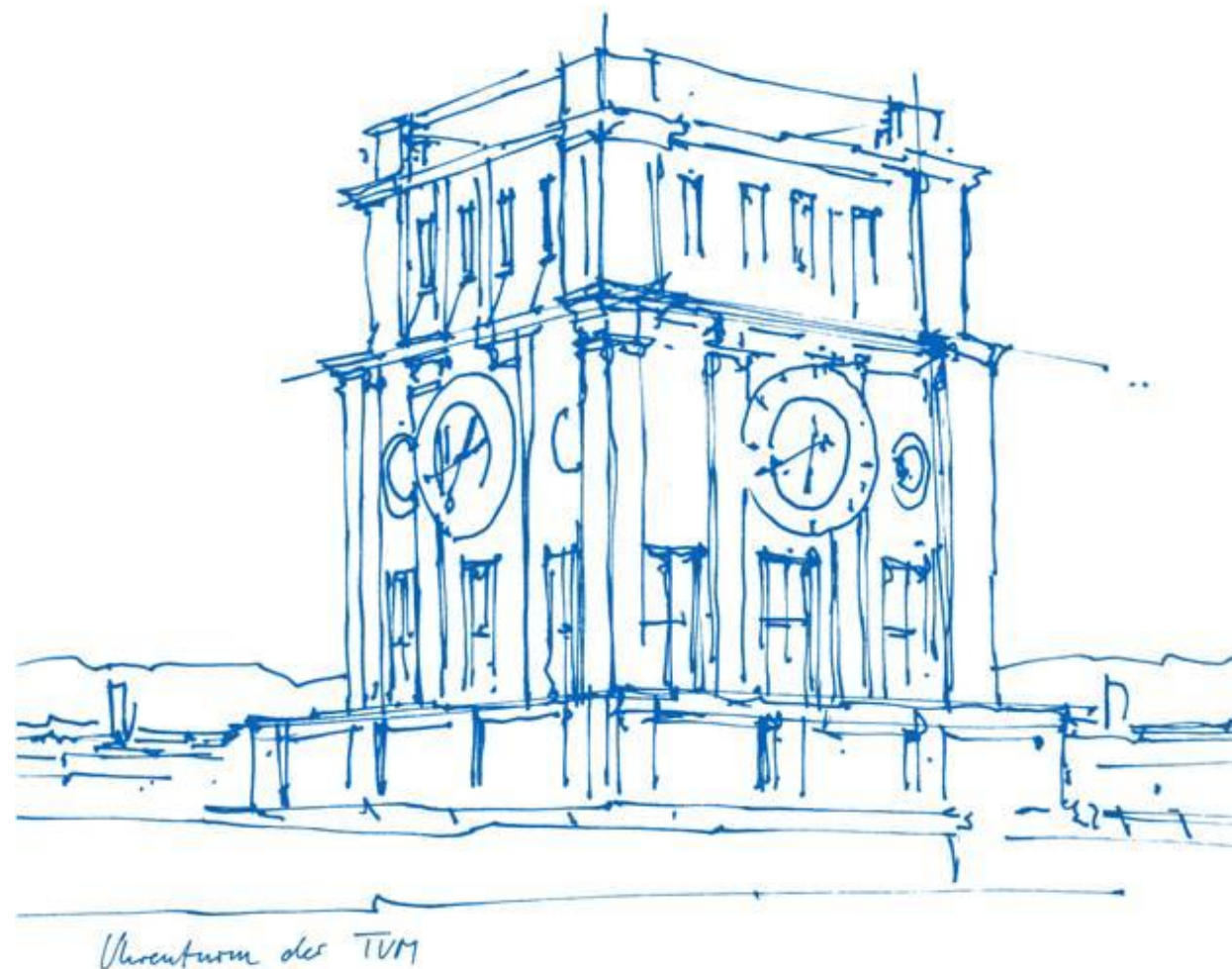# Role of Urban Green Infrastructure in 15-minute city

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Uhrenturm der TUM

Let's brainstorm!

Think about your past walking or cycling trips.

Do you remember the moments you felt pleasant or comfortable?

Choose the top 3 most important group of factors for you.


Go to: menti.com

Enter the code: 8882 6124

Problem Statement

Promoting walking and cycling **is one of the core principles of 15-minute city**

On the other hand, pedestrians and cyclists have the most interaction with their surroundings including urban greenery. Therefore, active mobility could potentially be greatly encouraged or discouraged by Urban Green Infrastructure (UGI).

What is the share of UGI in the comfort of walking and cycling?
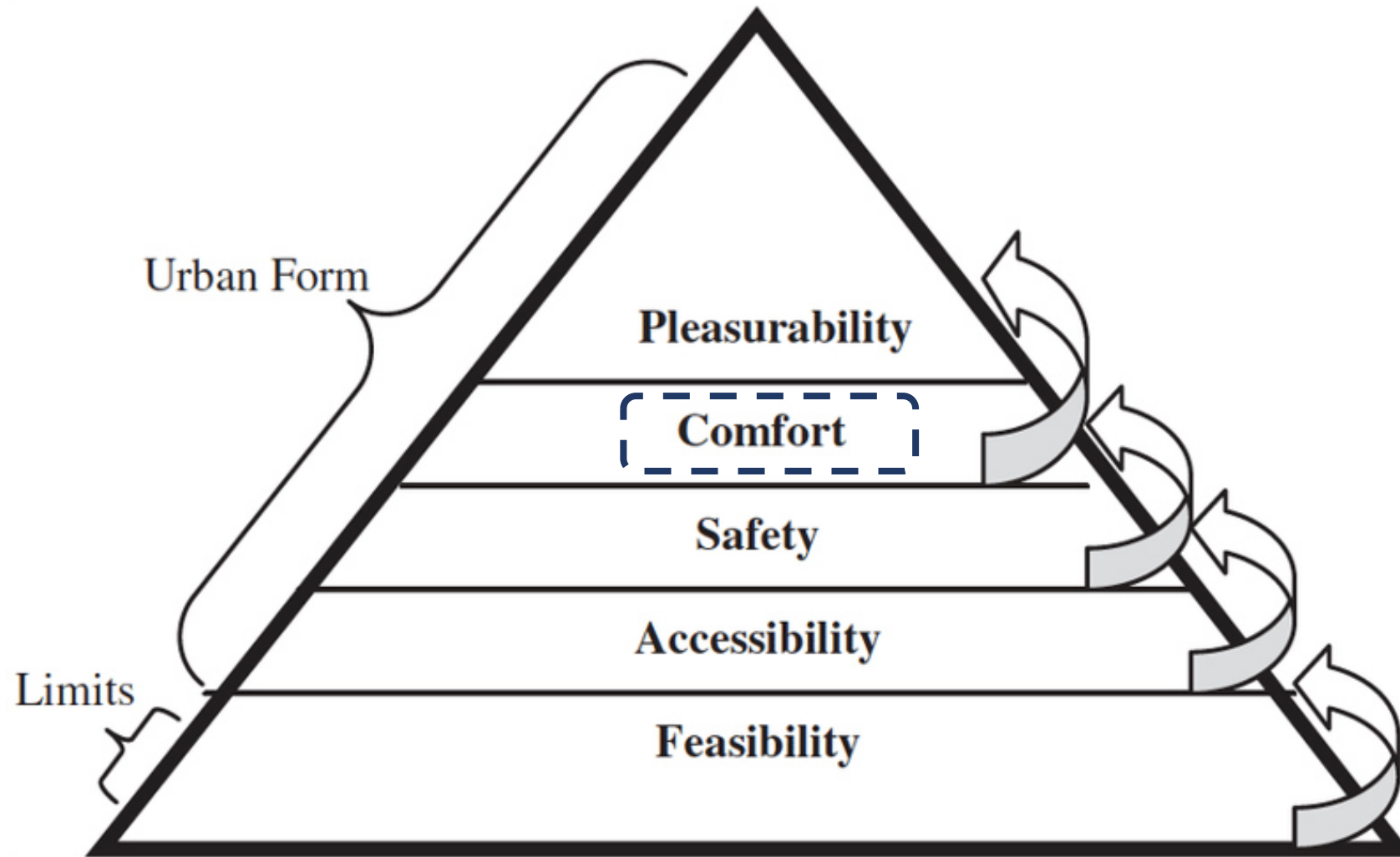
Walking hierarchy of needs (Alfonzo, 2005)
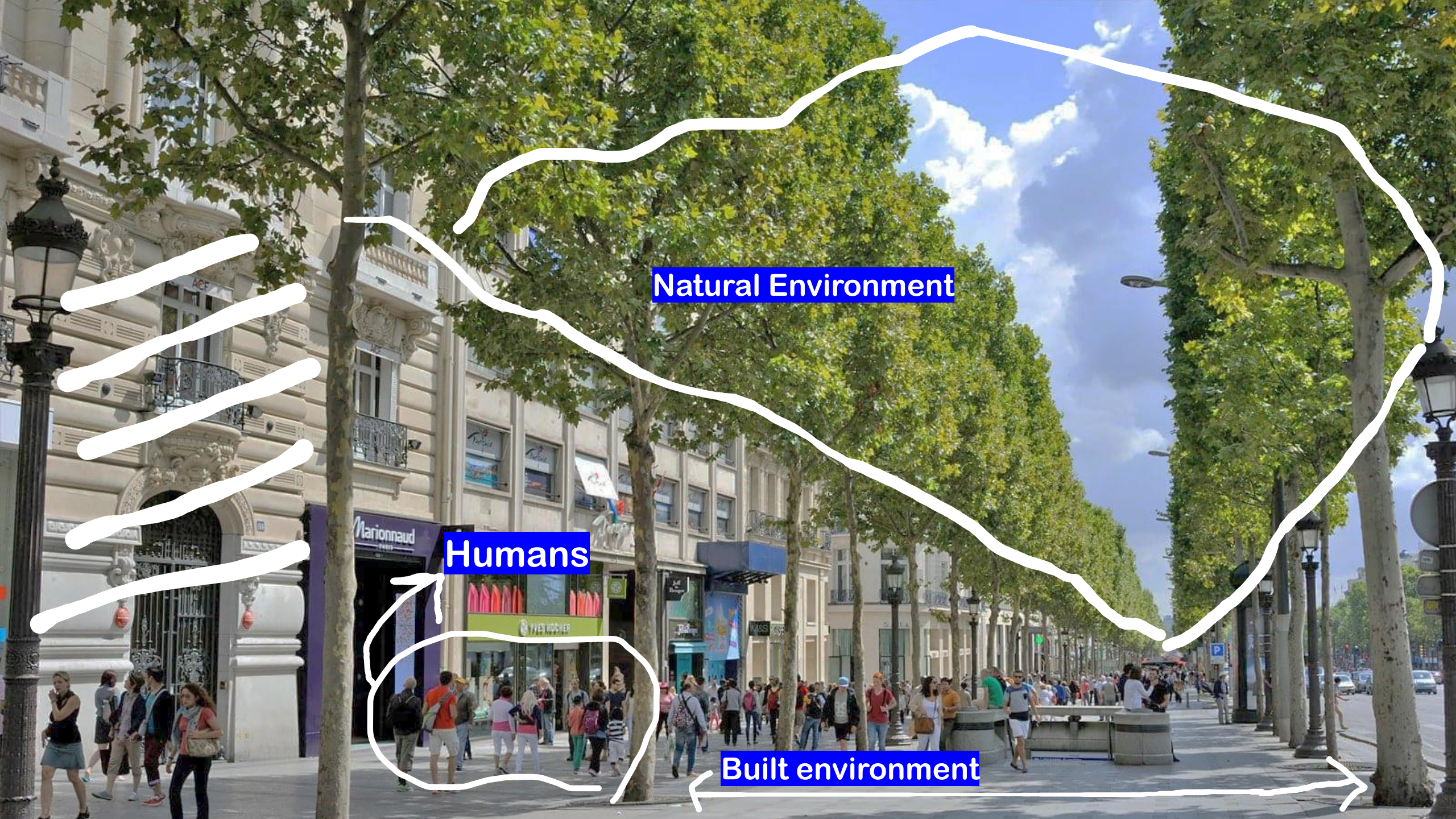
Natural Environment

Humans

Built environment

How to study comfort?

Approach

Qualitative

Methods

Travel Diary + UX mapping workshops

Walking group and Cycling group

Winter and Summer rounds

2 weeks of recording per season

Open time, origin/destination and trip length

Example study and findings

Study: Enhancing the Cycling Experience:
Investigating Level of Traffic Stress (LTS) and
Comfort Factors Valued by Cyclists in Urban Areas of Munich

Methods: LTS Methodology, Survey, and User Experience
Workshops!

Example study and findings

Extensive literature review found 11 primary comfort factors:

1) Cycling infrastructure
2) Interaction with other modes
3) Land use
4) Green infrastructure
5) Weather conditions
6) Surface conditions

7) Gradient
8) Connectivity
9) Security
10) Travel time
11) Surrounding environment

Example study and findings

**Some Survey Results (Pertaining to Green Infrastructure):**

158 responses (139 cyclists, 19 non-cyclists)

Survey Structure: Likert Scale, 1 – Uncomfortable to 5 - Comfortable

Example Question: Imagine you're embarking on a cycling adventure, pedaling through your route. As you cycle, how does the presence of the following elements in your surrounding environment affect your comfort level.

	Office.	Comfortable (66.66%)
Green Infrastructure	Street trees.	Comfortable (67.63%)
	Green pavement (grass, parks).	Comfortable (65.47%)
	Shrubs/plants.	Comfortable (64.03%)

Example study and findings

Comfort levels, factor: Green infrastructure
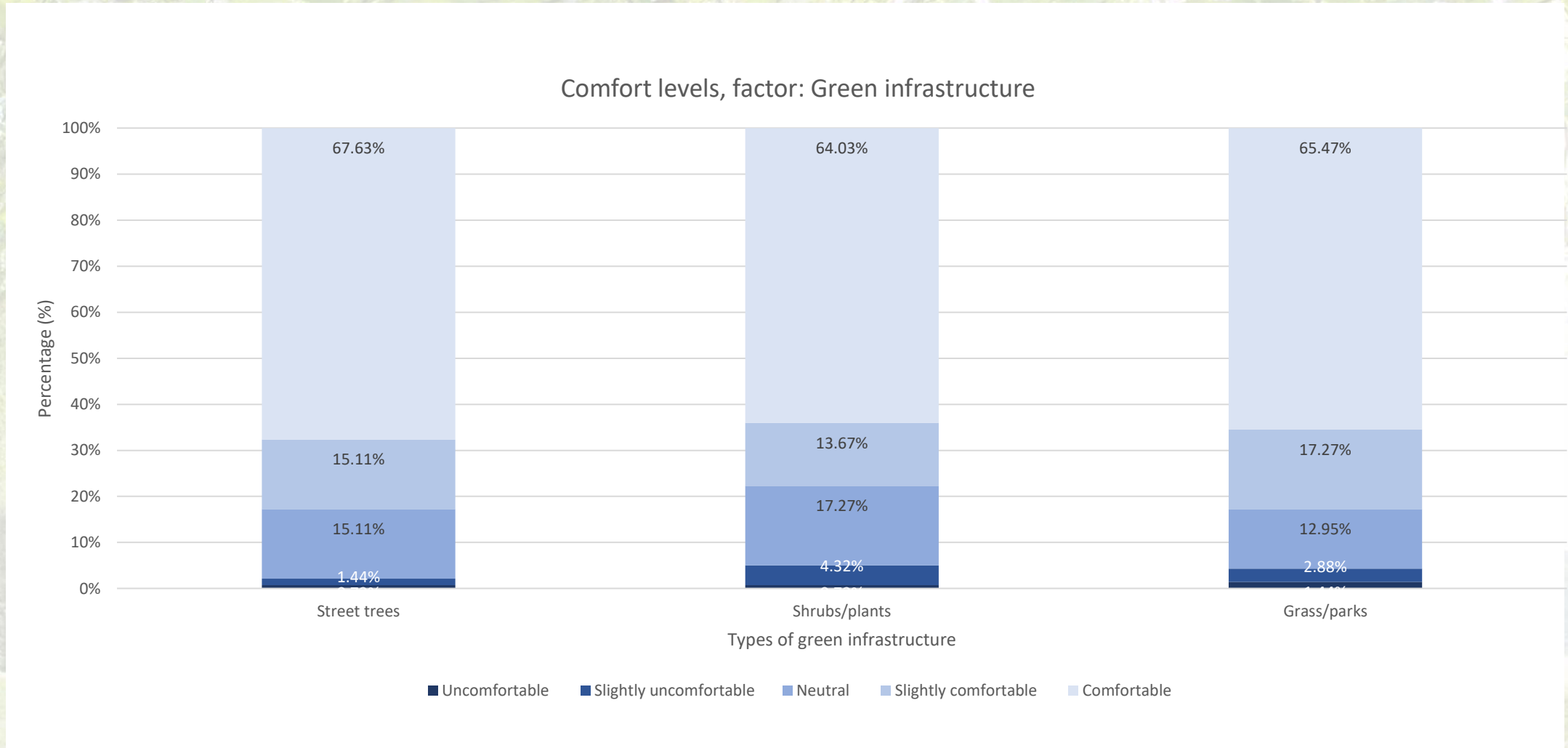
Example study and findings
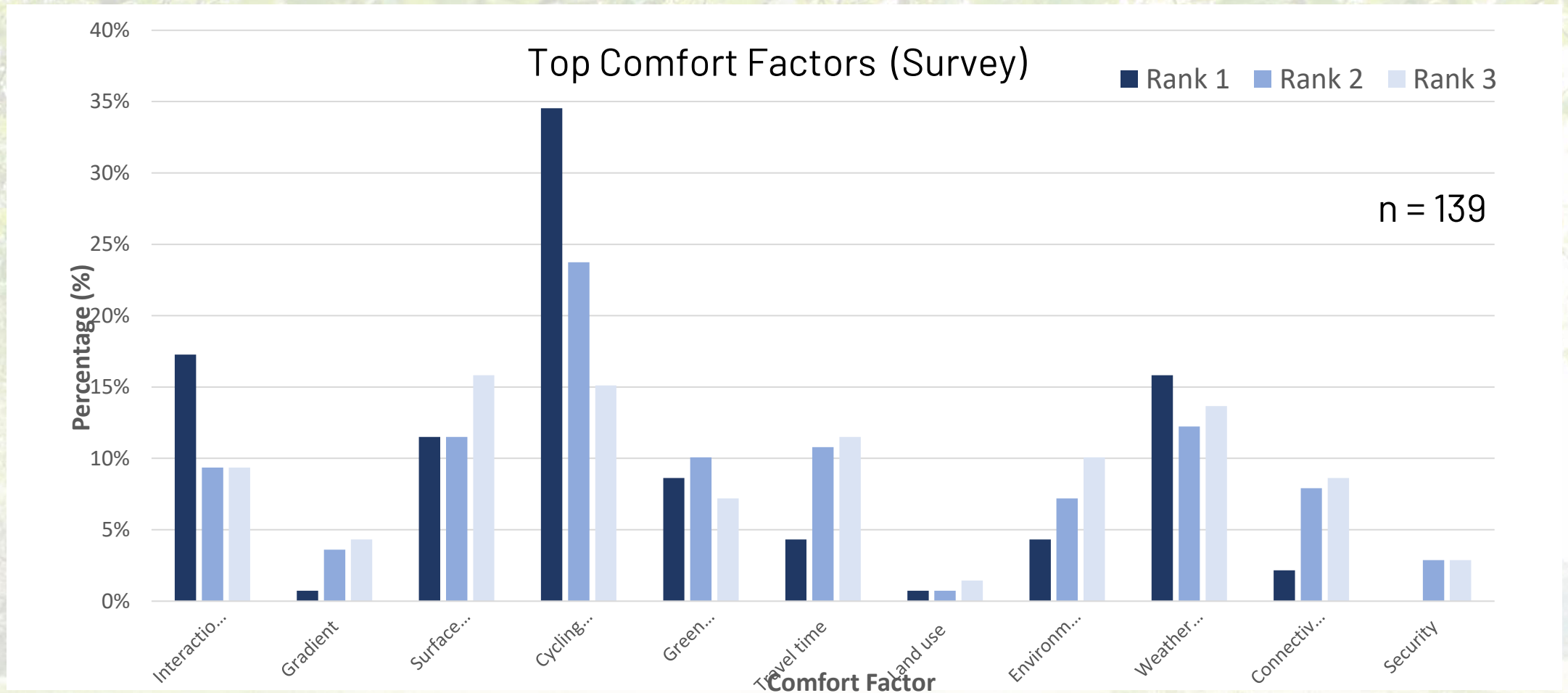
1) Cycling infrastructure, 2) Cycling infrastructure (if not ranked as first), 3) Surface conditions

Example study and findings

User Experience Workshops – Think Aloud Protocol

- Participants verbalize their real-time thoughts while cycling, thoughts captured via video/audio recording.

- Helps to identify segments of the route where participants feel comfortable or uncomfortable and understand their reasoning, particularly in the context of the 11 comfort factors.

EXAMPLE! ➡

Example study and findings

Participants Demographics

Age: 18-24 y/o
Sex: Female
Highest education: Bachelor's degree
Occupation: Student
German citizen: No

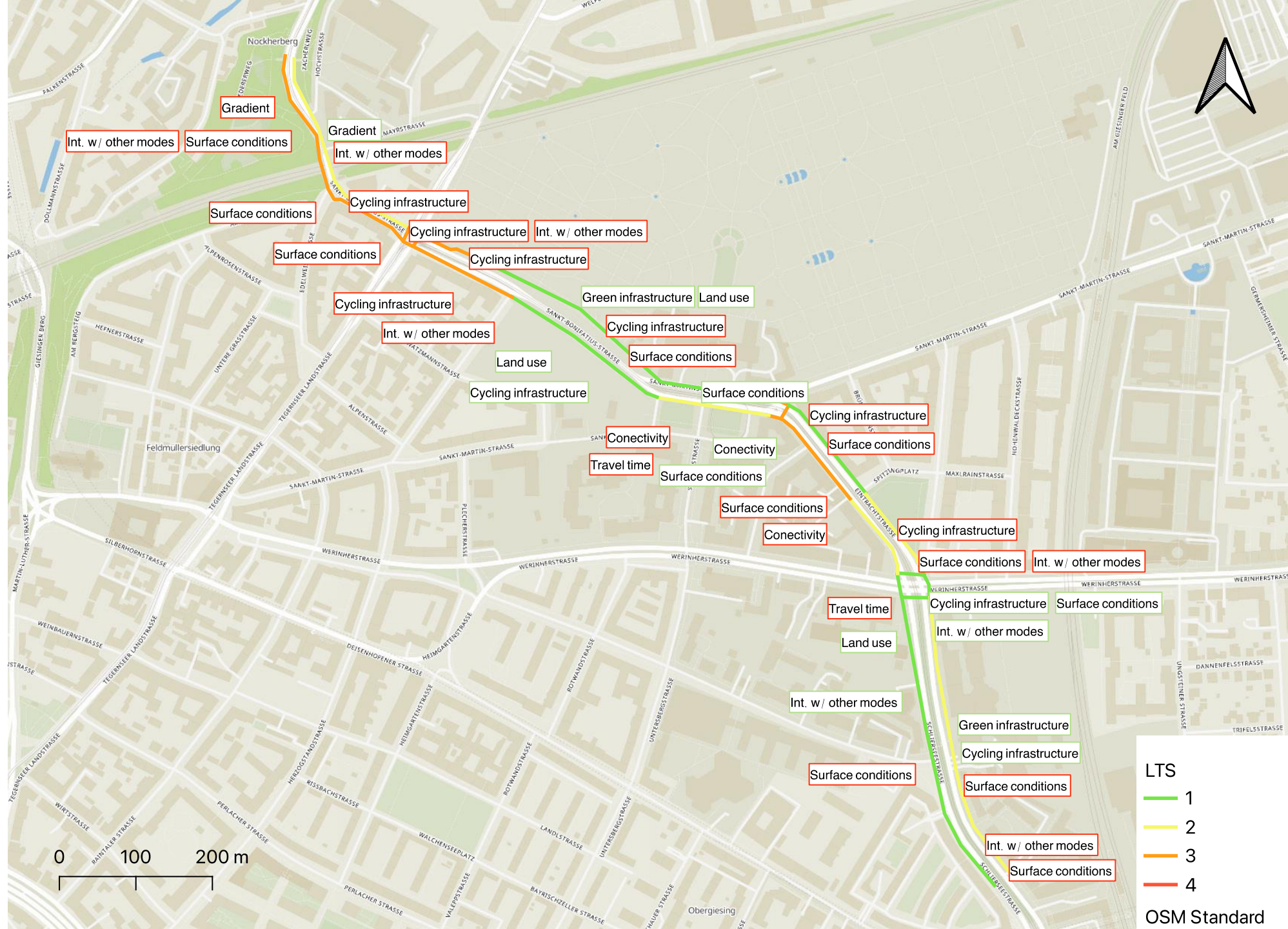# Example study and findings

Qualitative Coding of Workshops

Categorizes excerpts from the video/audio recordings into the 11 comfort factors.

Example:

"The roads are very bumpy here..." -> Comfort factor: surface conditions (negatively).

"I like that there is green space between me and the cars when cycling…" -> Comfort factor: green infrastructure (positively).

Gradient

Int. w/ other modes   Surface conditions

Gradient

Int. w/ other modes

Cycling infrastructure

Surface conditions

Cycling infrastructure   Int. w/ other modes

Surface conditions

Cycling infrastructure

Cycling infrastructure

Green infrastructure   Land use

Int. w/ other modes

Cycling infrastructure

Land use

Surface conditions

Cycling infrastructure

Surface conditions

Conectivity

Conectivity

Travel time

Cycling infrastructure

Surface conditions

Surface conditions

Surface conditions

Conectivity

Cycling infrastructure

Surface conditions   Int. w/ other modes

Travel time

Cycling infrastructure   Surface conditions

Int. w/ other modes

Land use

Int. w/ other modes

Green infrastructure

Cycling infrastructure

Surface conditions

Surface conditions

Int. w/ other modes

Surface conditions

0   100   200 m

LTS

1
2
3
4

OSM Standard

Example study and findings

Top Comfort Factors (Workshop)

n = 8
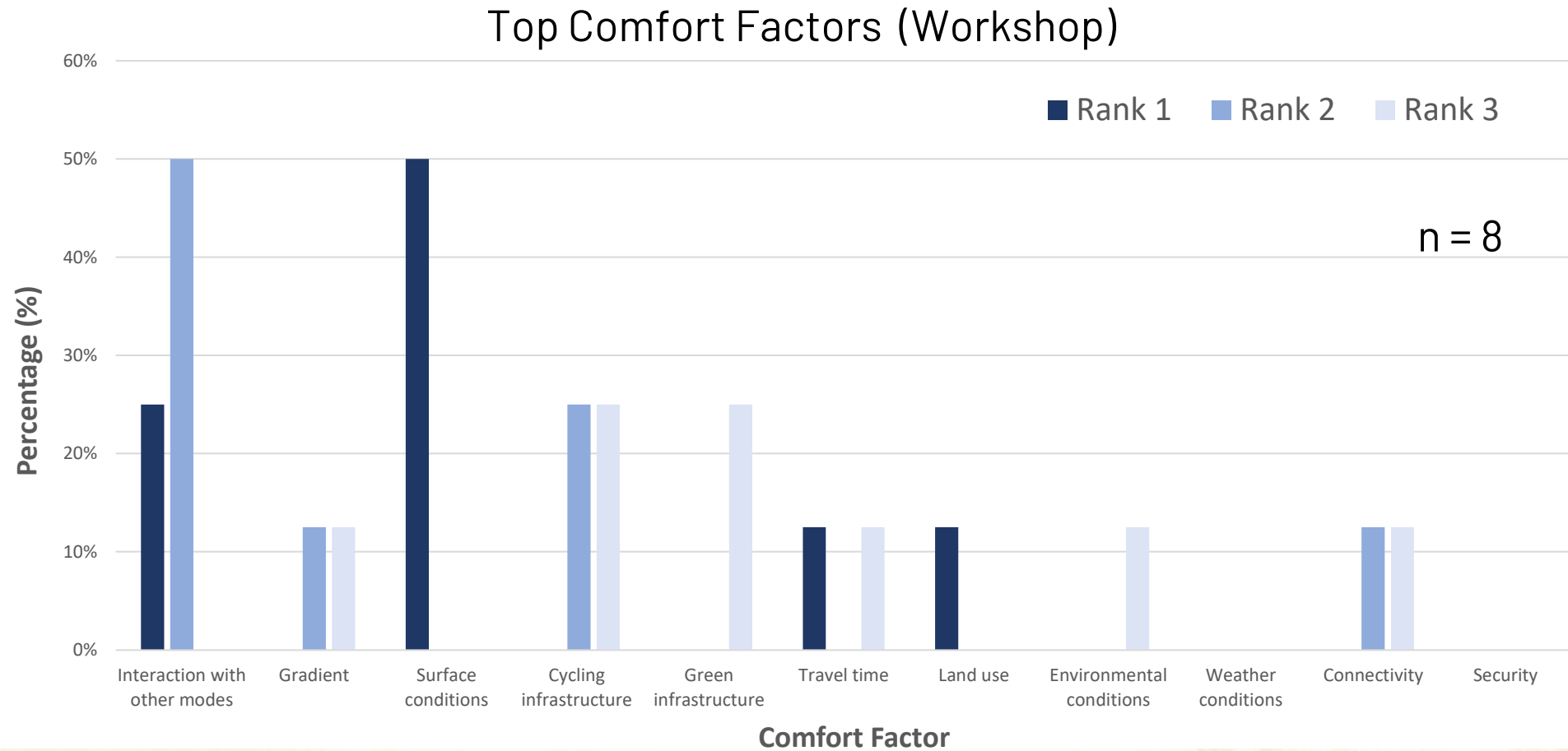
1) Surface conditions, 2) Interaction with other modes, 3) Green infrastructure, Cycling infrastructure

What do you think?

Why is urban-nature integration not a core principle in a 15-minute city?

Should it be?

Thank you!
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Read more about RTG UGI project

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