

Inclusive 3D Campus Map

Geomatics Day

Alexandre Bry
Daan Schlosser
Lars van Blokland
Mingjie Teo
Phuong Anh Ho



2nd-year MSc Geomatics Students



Alena | Phuong Anh



Alexandre



Daan



Lars



Mingjie

About the Team

Who?

Diversity & Inclusion Office (D&I Office)



Stavroula Manolaki



Albaraa Khalil

Goal?

Fostering an

- Inclusive
- Welcoming
- Equitable

campus community for all students and staff



How?

Inclusive Campus Map

To promote:

Awareness and access to TU Delft facilities

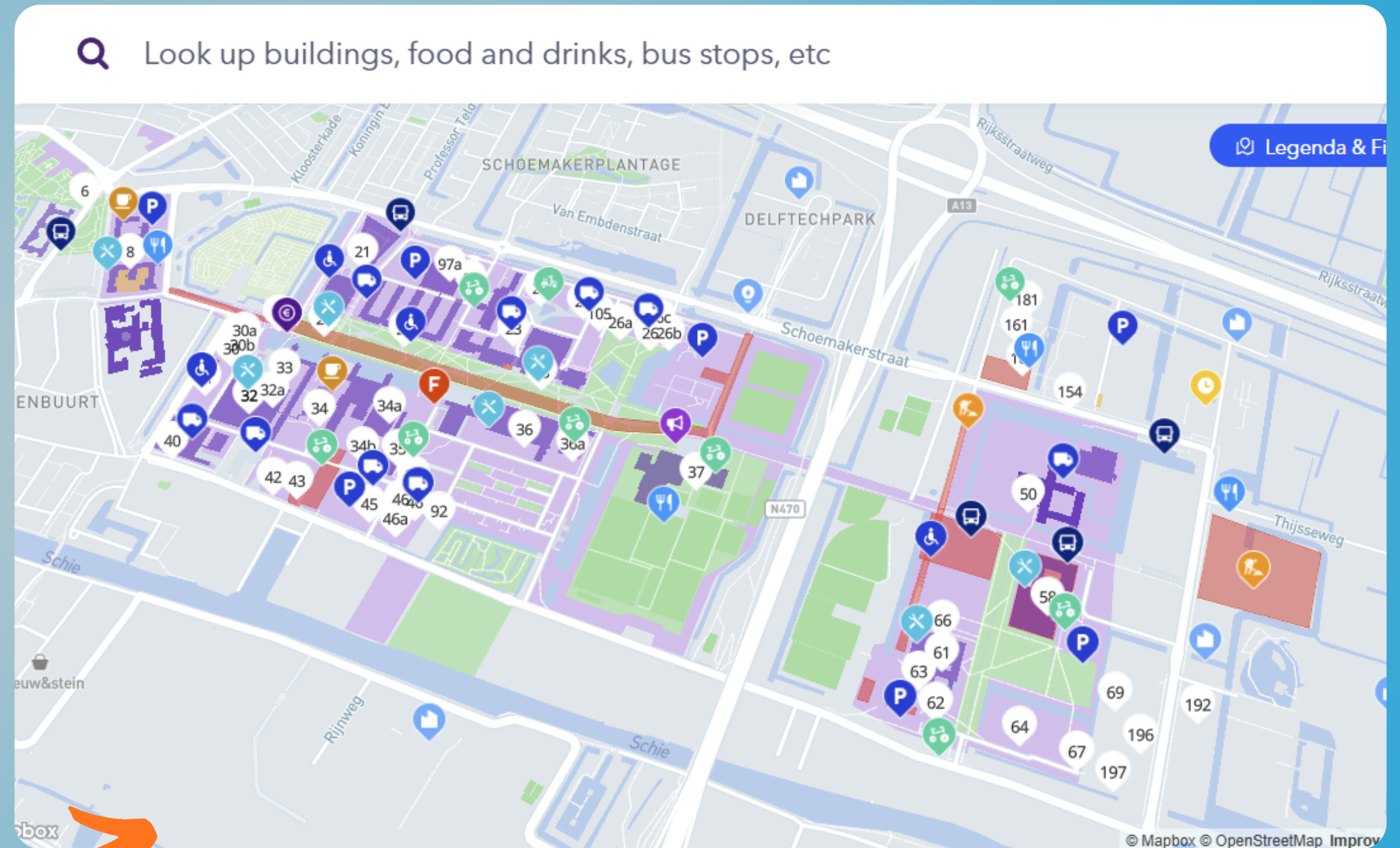


The Client

Existing Campus Map

- Investor-targeted
- Visual clutter
- Missing indoor details
- Limited inclusive facilities shown

Imagine if you are a wheelchair user



Existing Campus Map

How can we design an **inclusive 3D campus map** that improves the campus experience **for students, employees and visitors** of TU Delft, particularly in terms of **equitable access** for marginalised groups?

Research Question

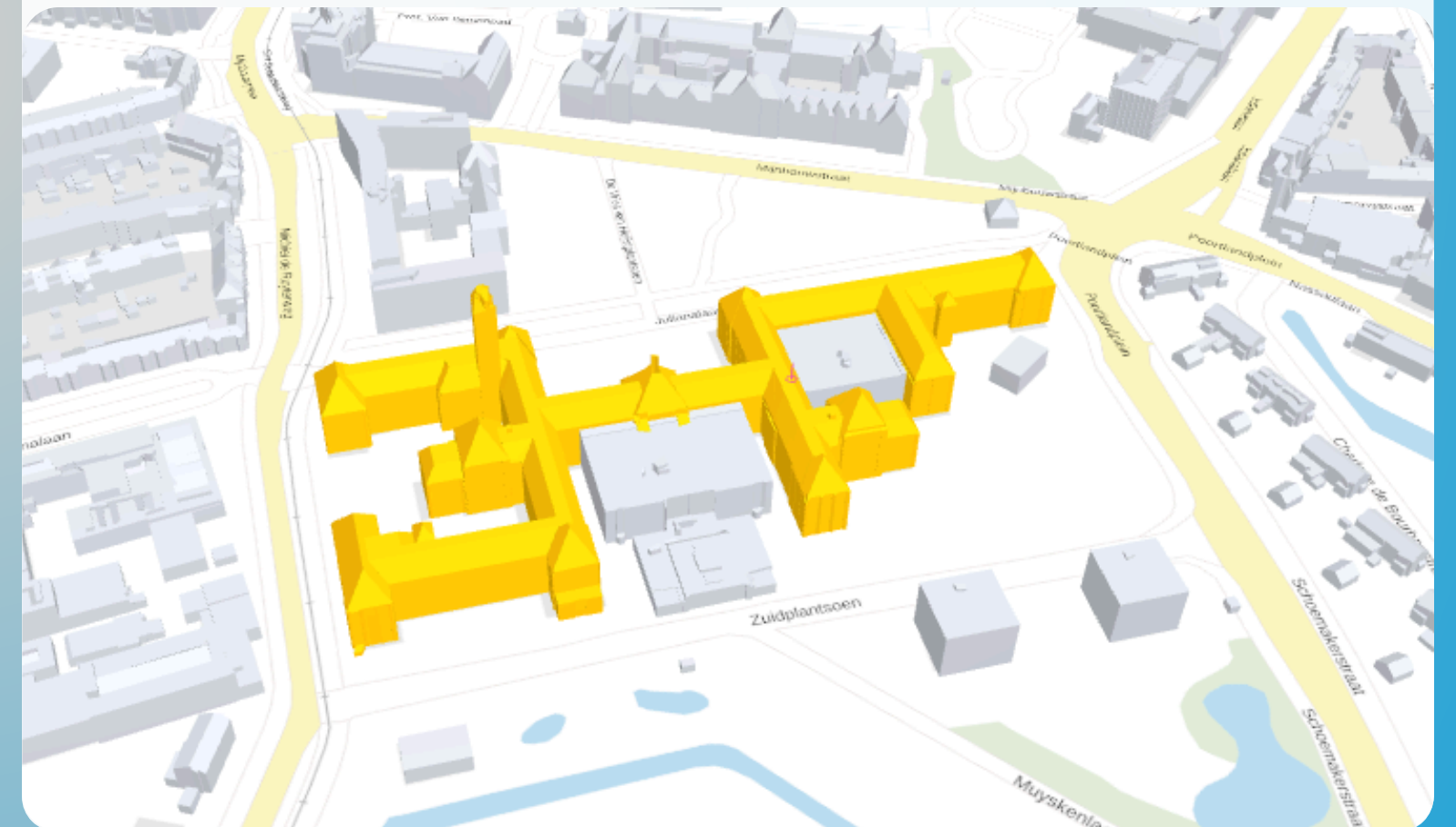
Ideal

- Full campus map
- All interior spaces modelled and labelled with thematic information



Implemented

- Proof of Concept
- Bouwkunde faculty
- Add more functionality with time



Map Scope

1. Extensibility of Project

- Foundational map
- Modular code
- Scalable data structure



2. Designing for Inclusivity

- Improve map and campus experience
- Information access
- Ease-of-use



Inclusivity

=

Multidimensional & Ambiguous

Early 2000s

Focus on physical
accessibility



Currently

Experiential
Ever-changing
Relational

Inclusivity in Literature

TU Delft

- Strategic Agenda → socially safe campus
- D&I Office → marginalised groups



Cartography

Accessibility of the data:

- Known
- Attainable
- Usable



Design

- Participatory process
- Guidelines for visual and non-visual access



What is Inclusivity?

Nothing about Us without Us

1. Mapping Process

- Continuous
- User Involvement

2. Content

- Inclusive facilities for diverse needs

3. Representation

- Inclusive information in the foreground
- Visually Accessible UI

Our Project Definition

Data Collection

Building Data

User Needs

Literature Review

extraction

pain points,
wishes

Data Processing

Data Design

Thematic Layers

design requirements

iterative refinement

Visualisation

Web Map



Methodology

Building Data

Source: 3D BAG, IFC, PDF files

Goals:

Simplified 3D shells

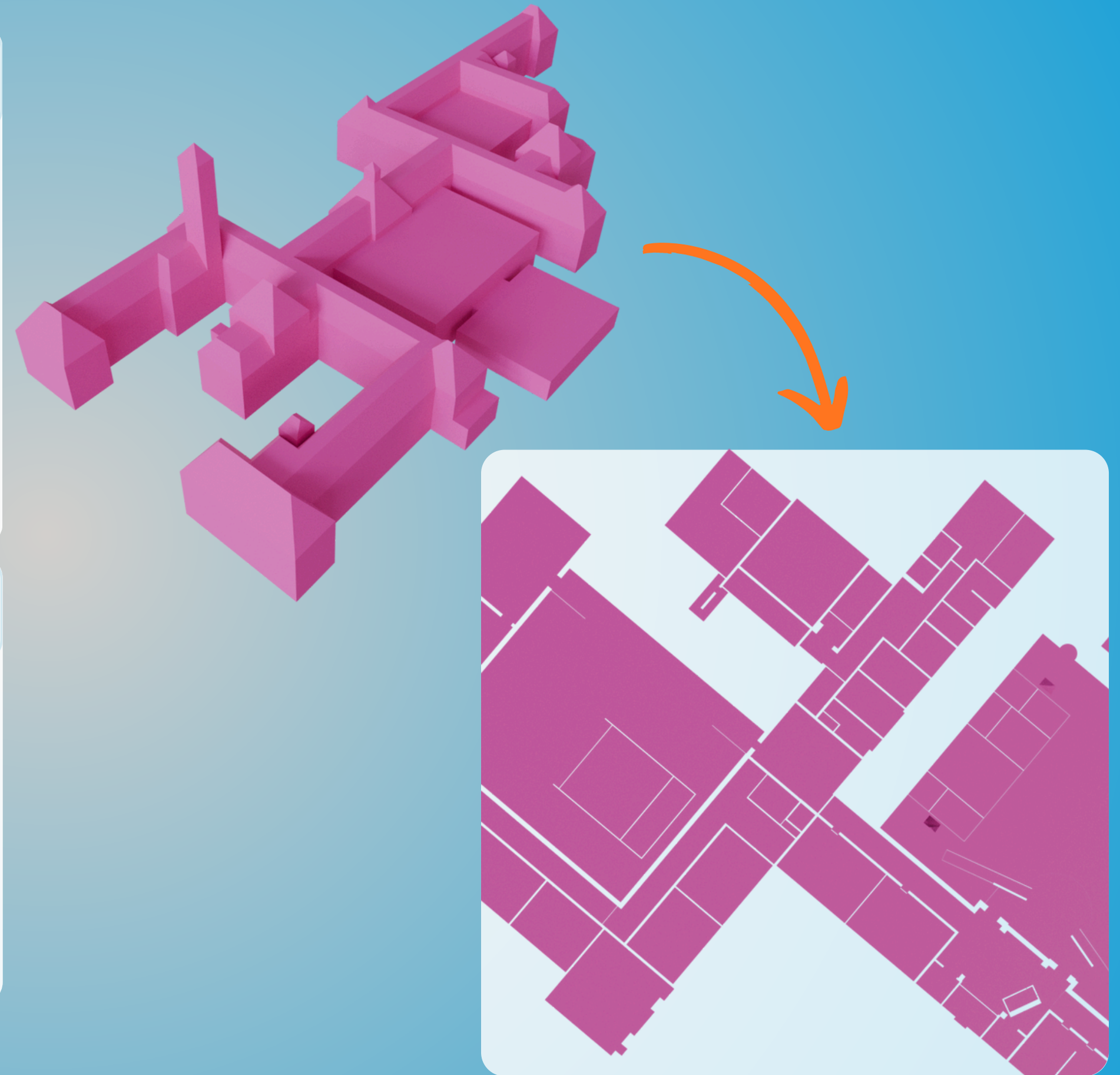
Extract room geometry

Room Labels

Source: Manual verification

Goals:

Thematic attributes for display



Data Modelling

Ramps and stairs

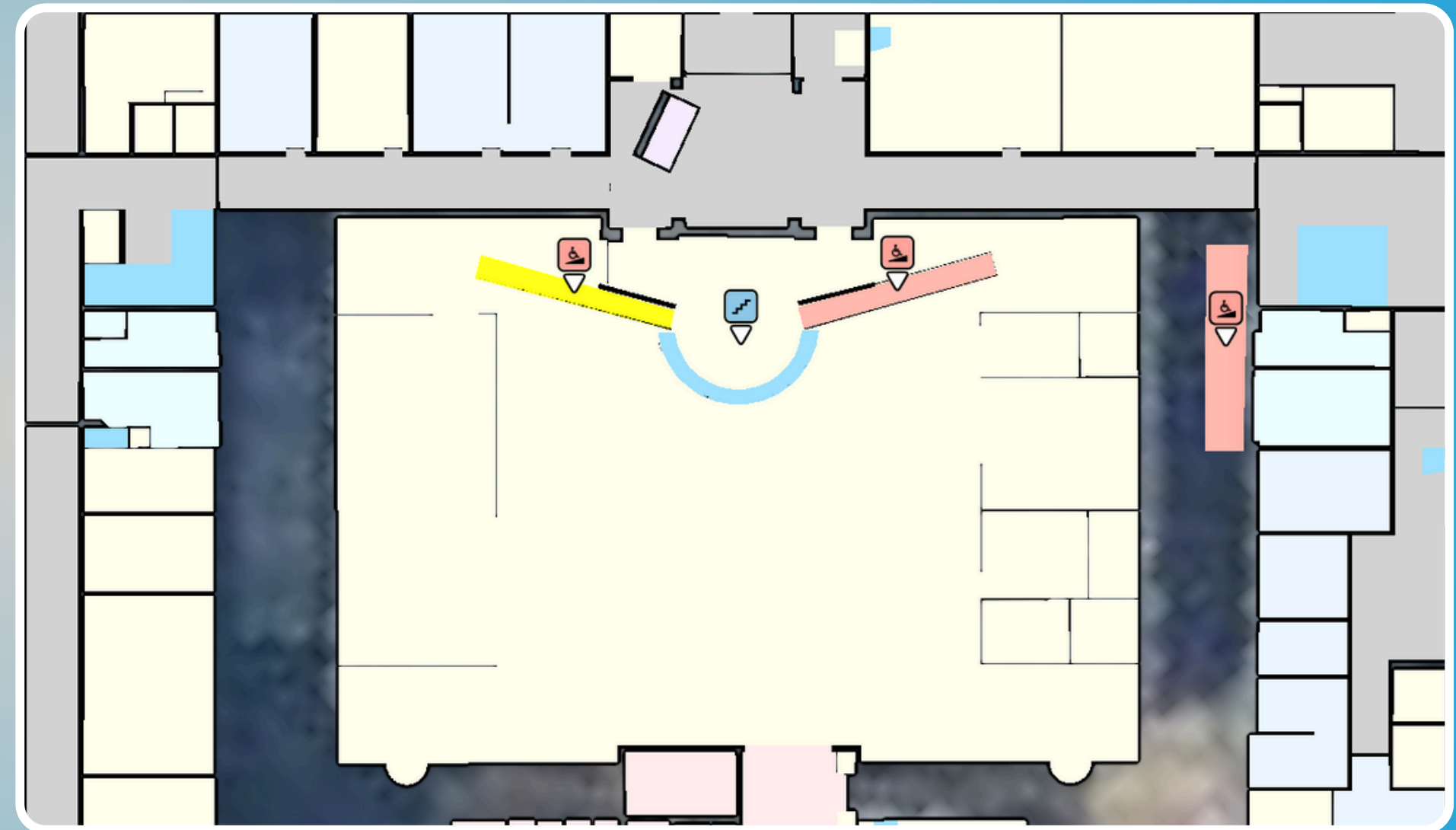
Source: Physical verification (BK)

Goal:

Identify accessible entrances
Expose indoor elevation differences

Benefits:

Support wheelchair users in making routing decisions



11 Participants

2x6 Sessions

Representatives

Ambassadors

Students

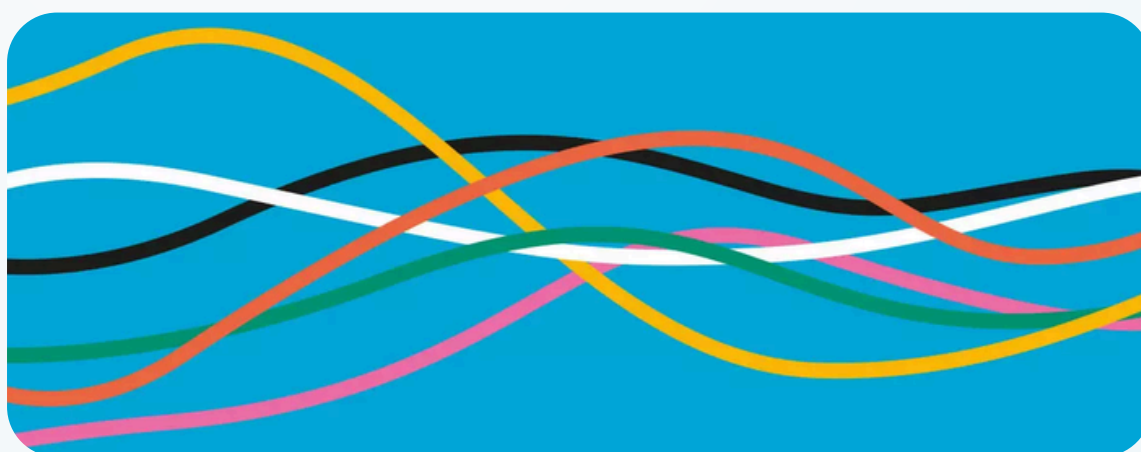
Staff

Physical accessibility

Neurodivergent needs

Gender-neutral spaces

& many more...



TrueU



Pink Closet

Participatory Mapping

Impact-Feasibility Matrix

Prioritising features

- Frequency
- Feasibility
 - Available data
 - Estimated implementation time
- Impact
 - Participant's perspective

Goals	Feature Groups	Features	Mentioned	Feasibility	Impact	Done
Map contents	Target groups	Gender-neutral bathrooms	2	3	3	Yes
		Disabled parking spaces	1	3	3	Yes
		Elevators	2	3	3	Yes
		Contemplation rooms	4	3	3	Yes
		Prayer rooms	0	3	3	Yes
		Lactation rooms	3	3	3	Yes
		Quiet rooms	2	3	3	Yes
		Wheelchair-accessible entrances	4	3	3	Yes
		Supplier/ logistic entrances	1	2	2	Yes
		Outdoor accessibility	1	1	3	No
		Doorway dimensions	2	1	2	Yes
		Pavement material	1	1	2	No

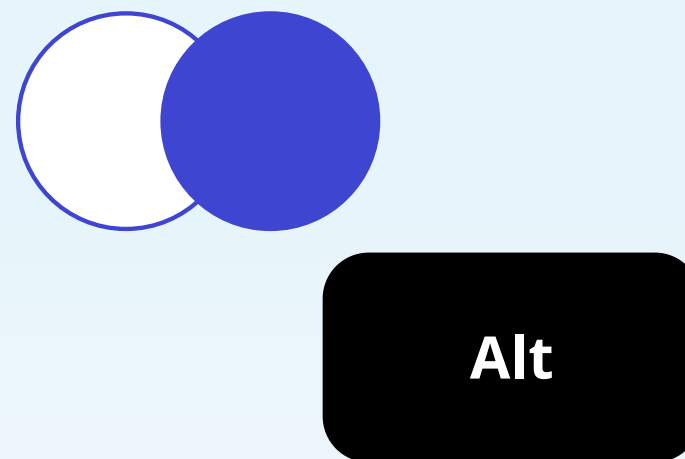
User Interface (UI)

Goal: Information equity

How:

- Literature Review
- Focus Groups

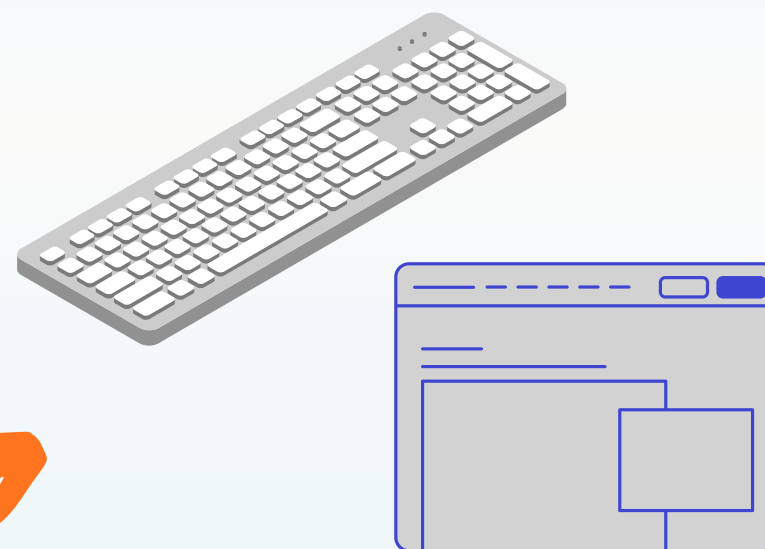
Perceivable



Understandable



Operable

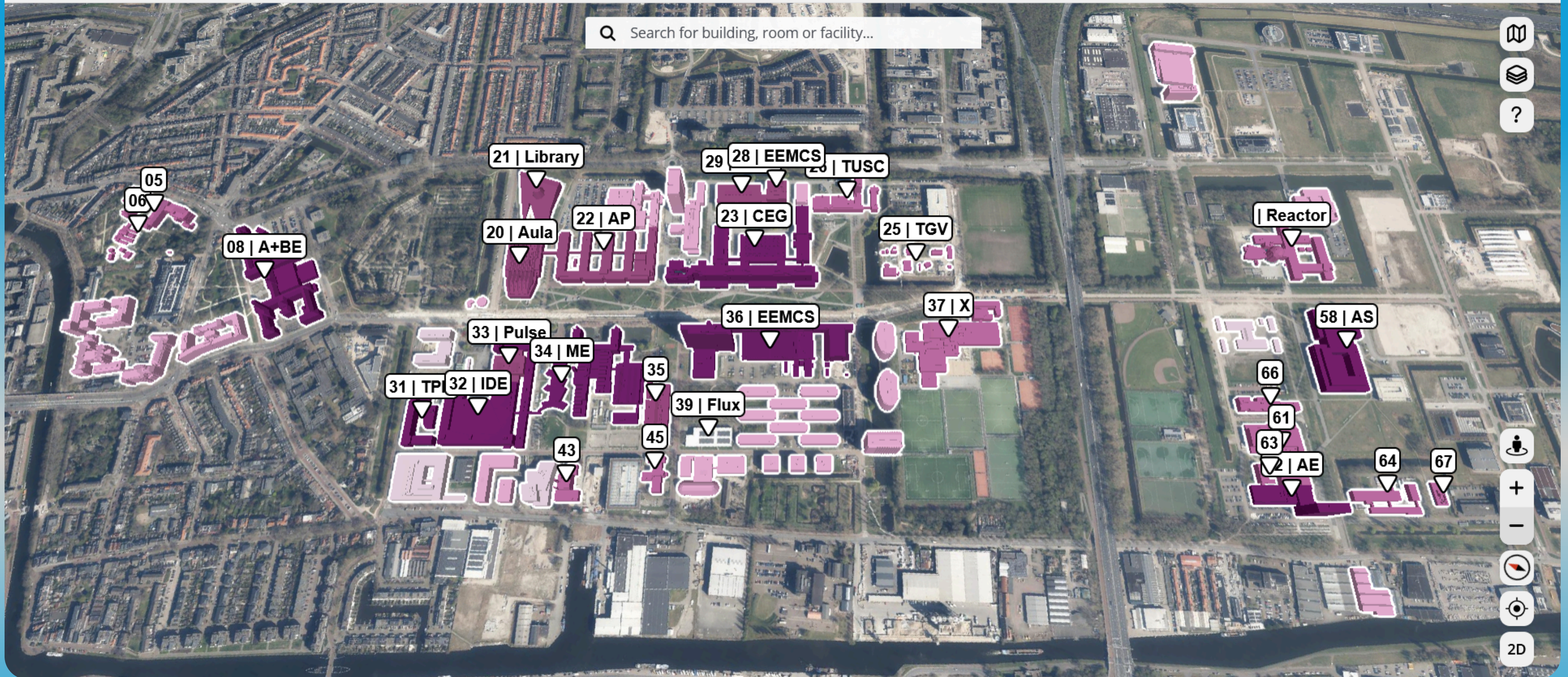


Robust



**Web Content
Accessibility Guidelines**

Accessible map visuals



Map Showcase

Inclusive map



Serving:

- General users
- Specific needs

Map integration



Combining:

- 2D and 3D
- Interior and exterior

Map for action



Inclusivity in:

- TUD policymaking
- Your context?

Project Value



<https://inclusivecampusmap.bk.tudelft.nl>

Note: Mobile version works best on Chrome, Firefox and Safari

Thank you for your attention!