

# Inclusive 3D Campus Map

Technical presentation

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## Who?

### Diversity & Inclusion Office

Represented by:

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## Goal?

Fostering an

- Inclusive
- Welcoming
- Equitable

campus community for all students and staff



## How?

### Inclusive Campus Map

To promote:

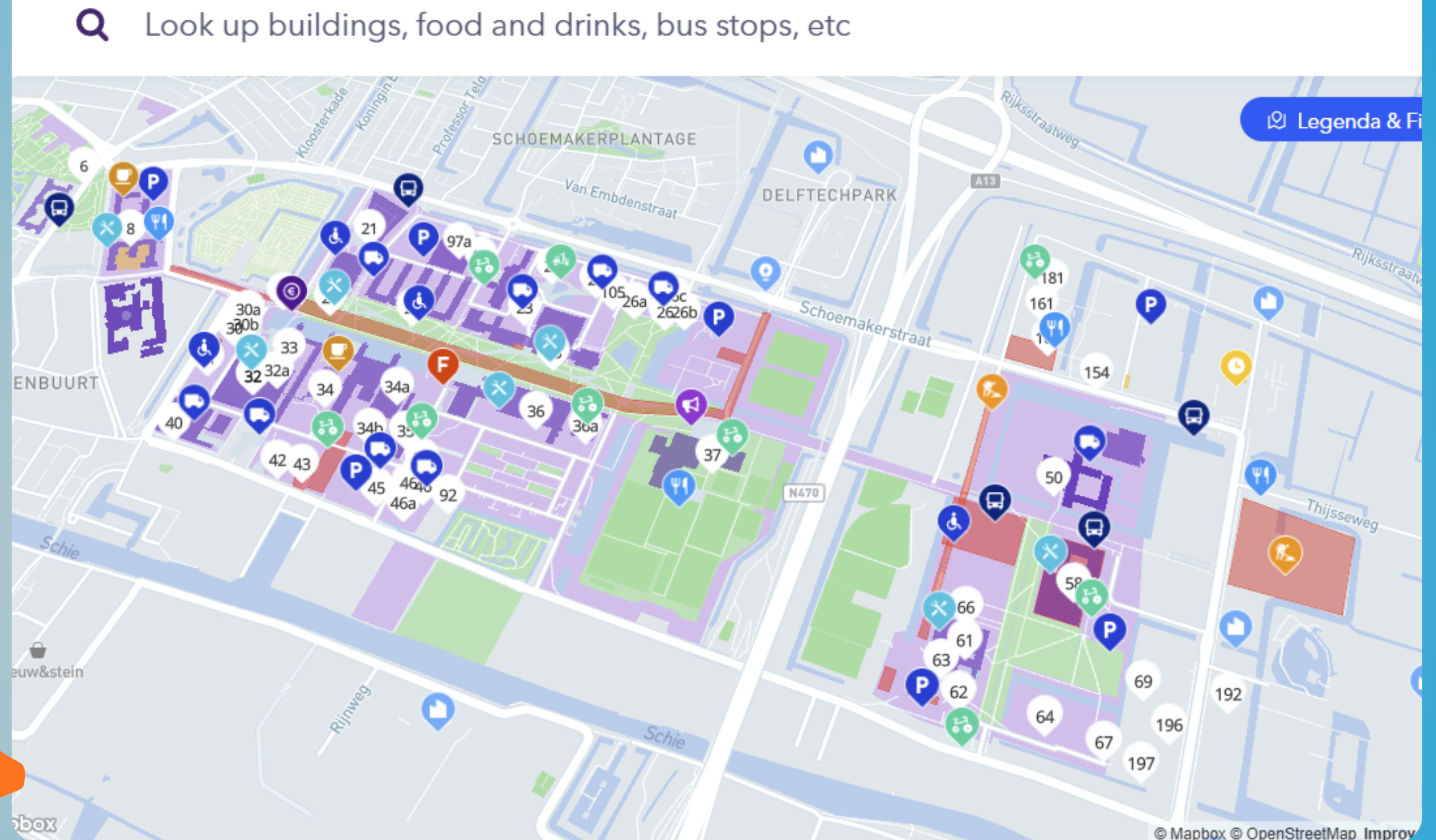
Awareness and access to TU Delft facilities



The Client

## Existing Campus Map

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



Inclusive 3D campus map

Students, employees, visitors

Equitable access

# Problem Statement

## Ideal

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



Map Scope

## Practical

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



## 1. Mapping Process

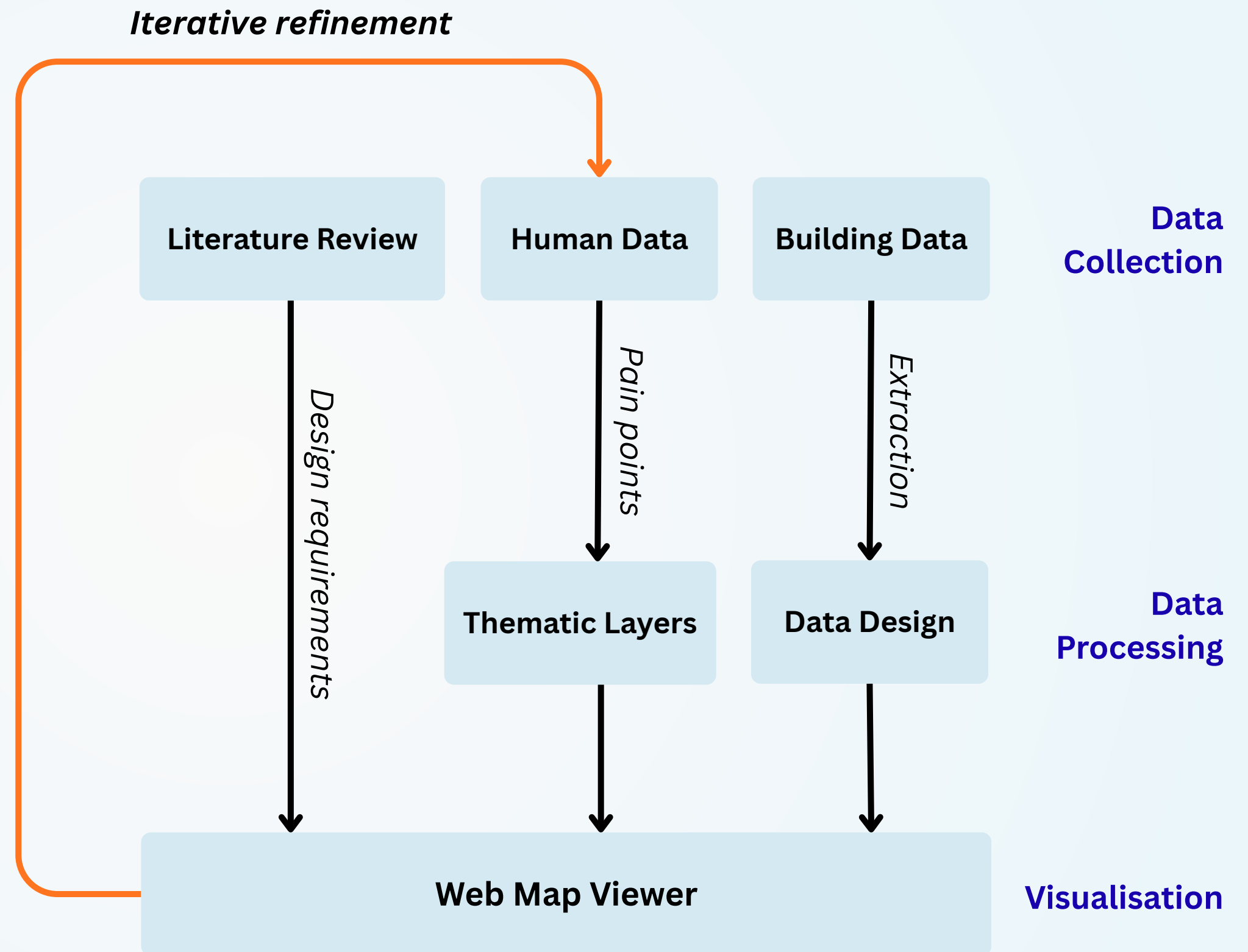
- Continuous
- User Involvement

## 2. Content

- Inclusive facilities for diverse needs

## 3. Representation

- Inclusive information in the foreground
- Visually Accessible UI



# Inclusivity Definition & Methodology



## **1. Extensibility of Project**

Foundational map via:

- Modular code
- Scalable data structure

## **2. Designing for Inclusivity**

Improve map and campus experience:

- Information access
- Ease-of-use

**Project Goals**

## Modelling

**Source:** 3D BAG, IFC, PDF files

**Goals:**

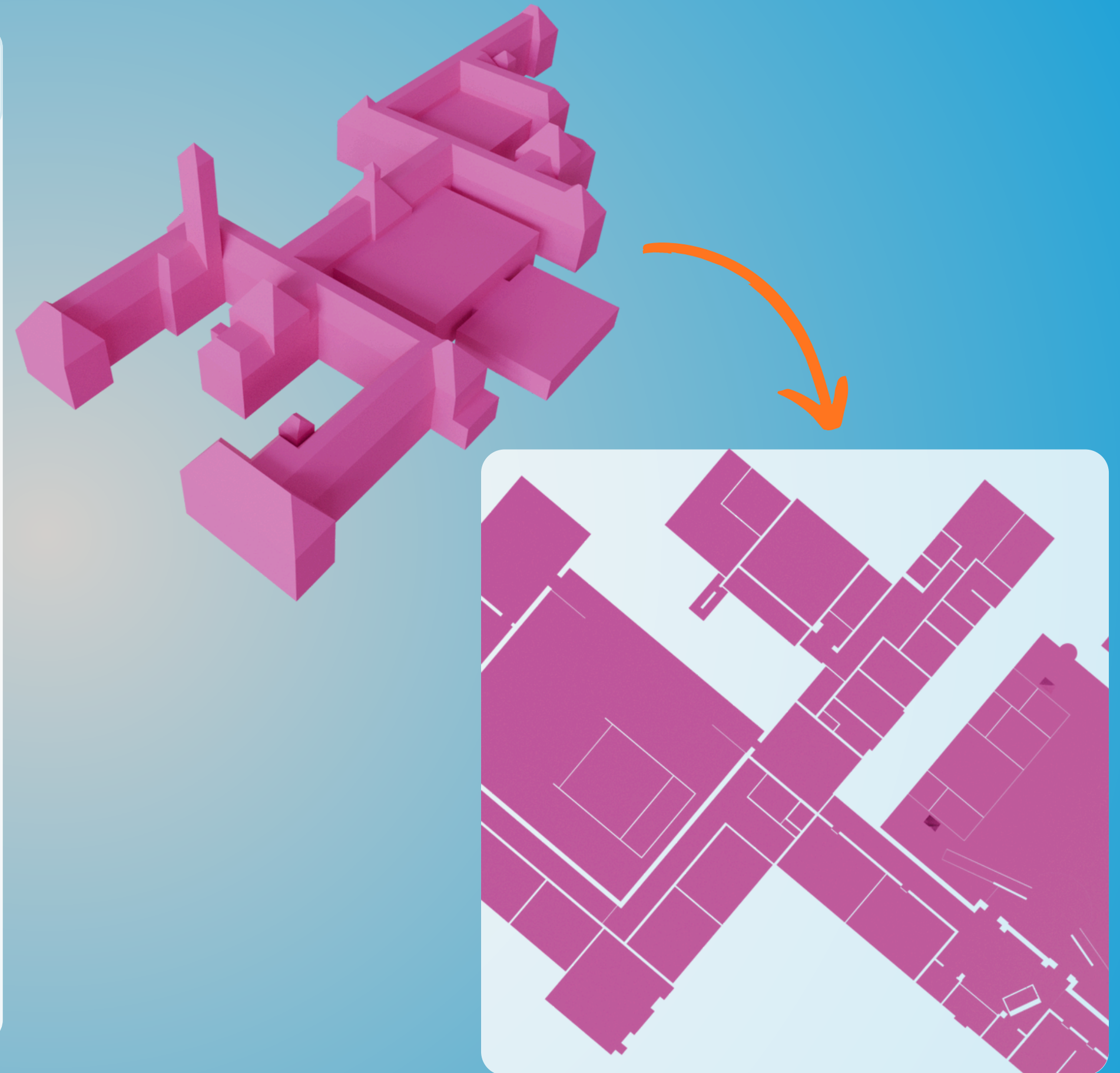
Simplified 3D shells

Extract room geometry

**How:** Blender, exported as glTF

**Benefits of shell improvement:**

1. Simpler geometry
2. Cleaner aesthetic
3. Easier texturing



## Data Modelling

## Ramps and stairs

**Source:** Physical verification (BK)

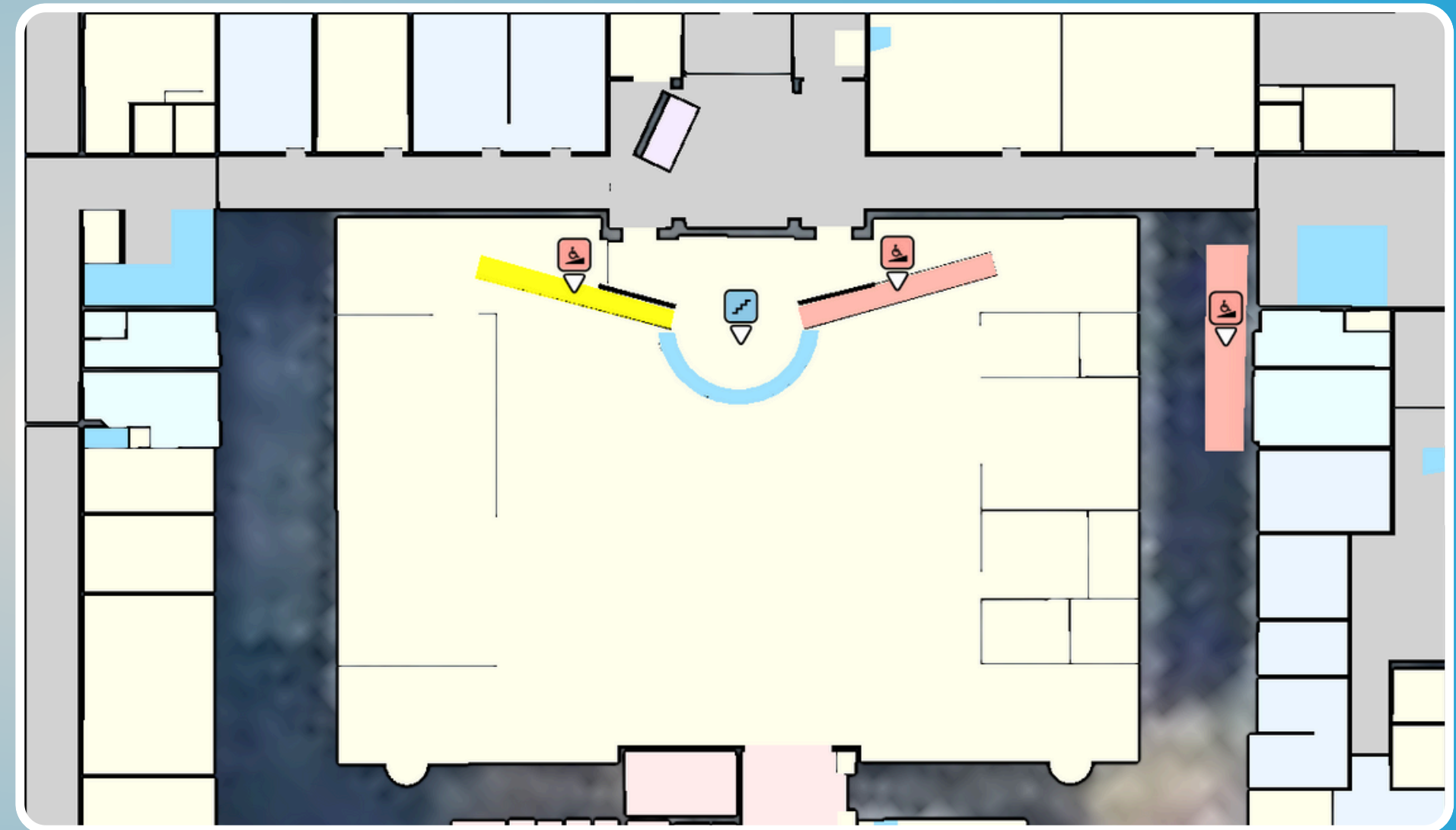
**Goal:**

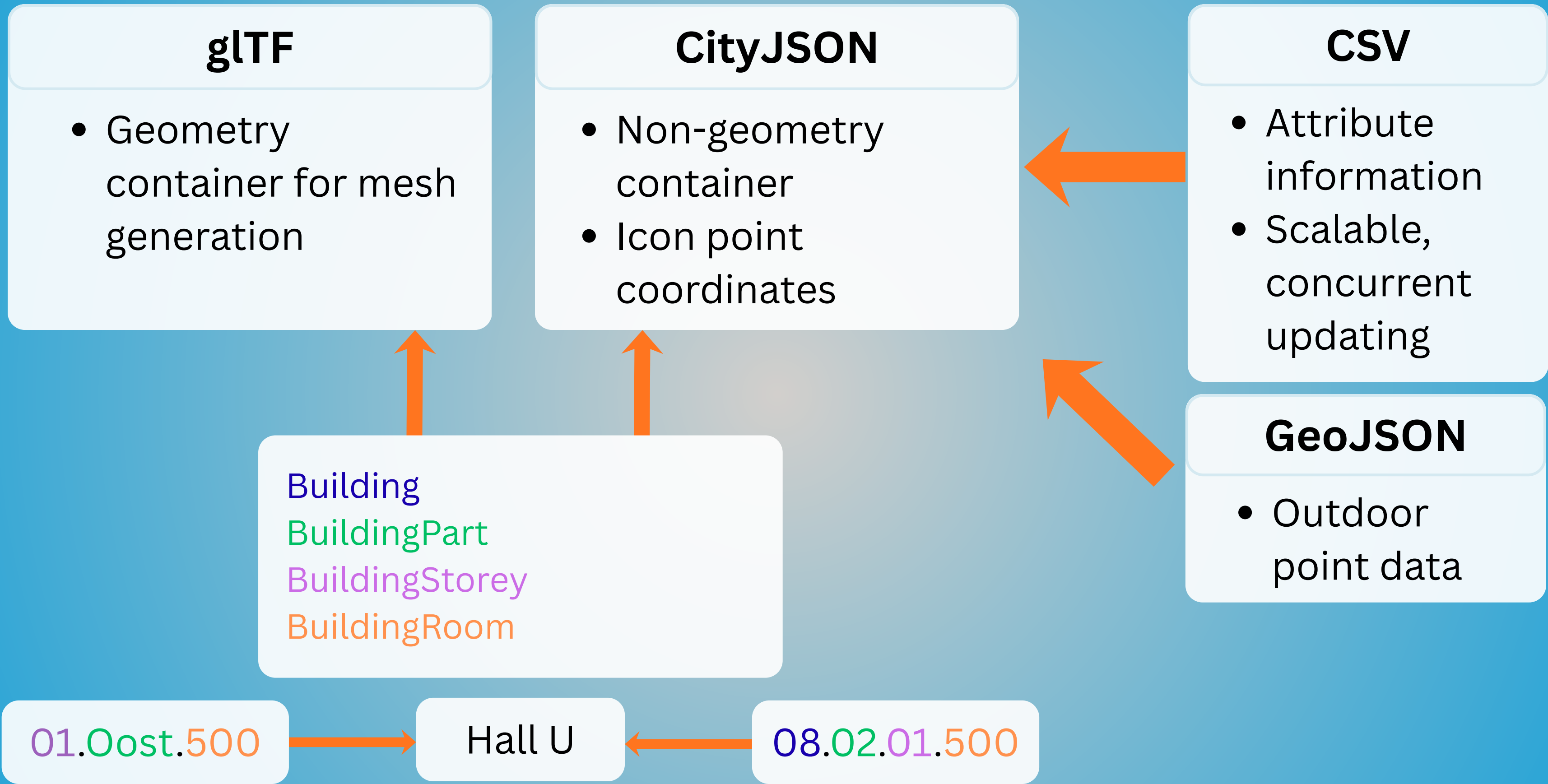
Identify accessible entrances  
Expose indoor elevation differences

**How:** Blender, exported as glTF

**Benefits:**

Support wheelchair users in  
making routing decisions

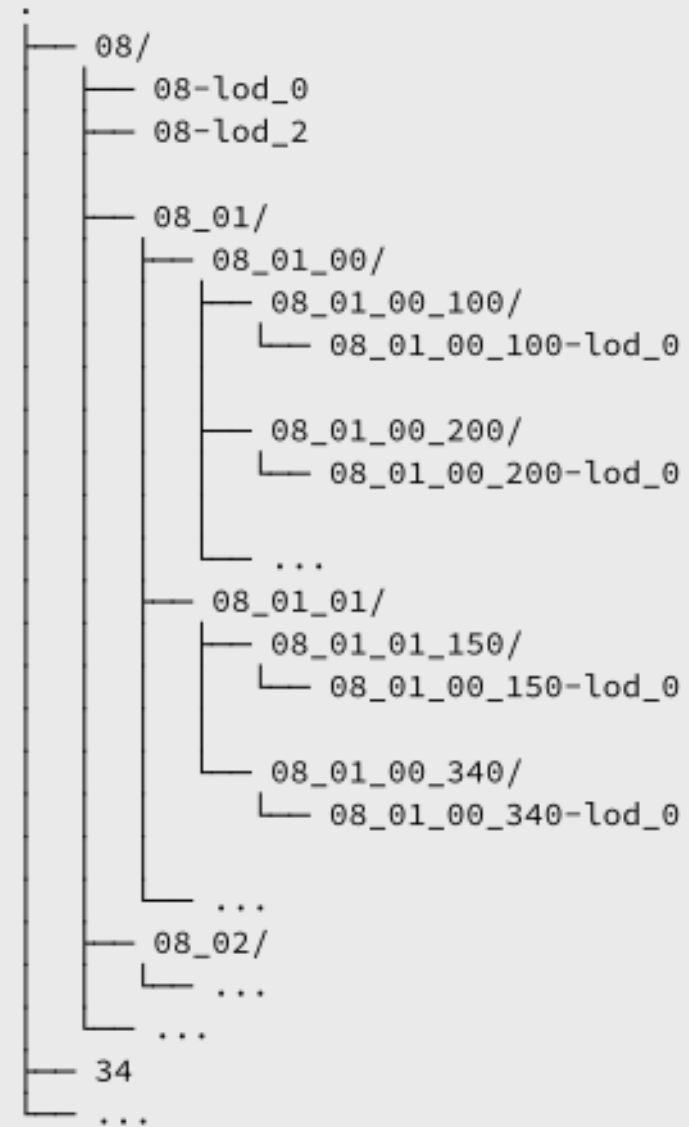




## Data structure

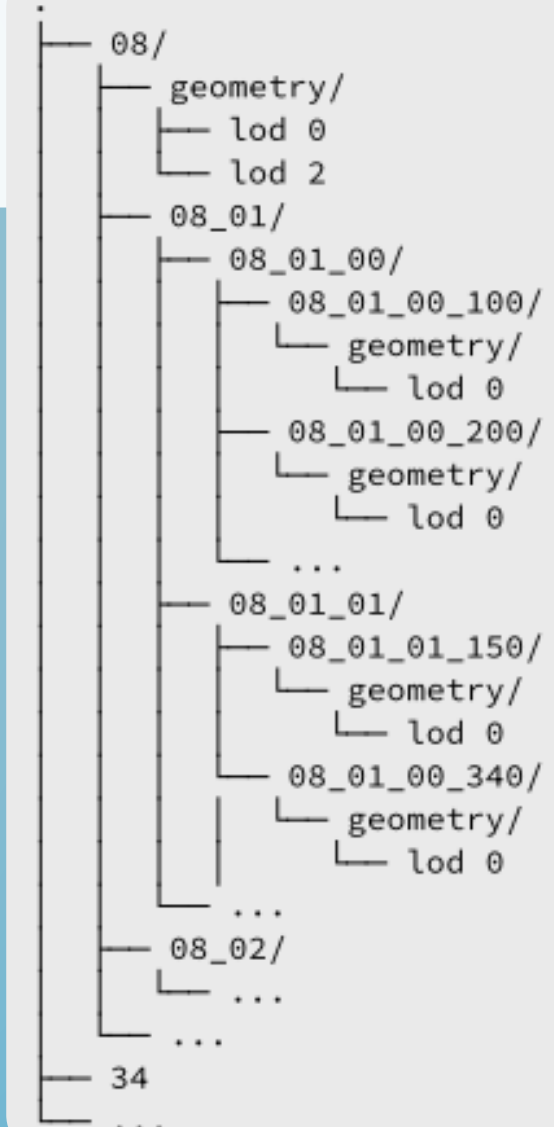
## glTF

- Building geometry
- Room geometry



## CityJSON

- All attribute information



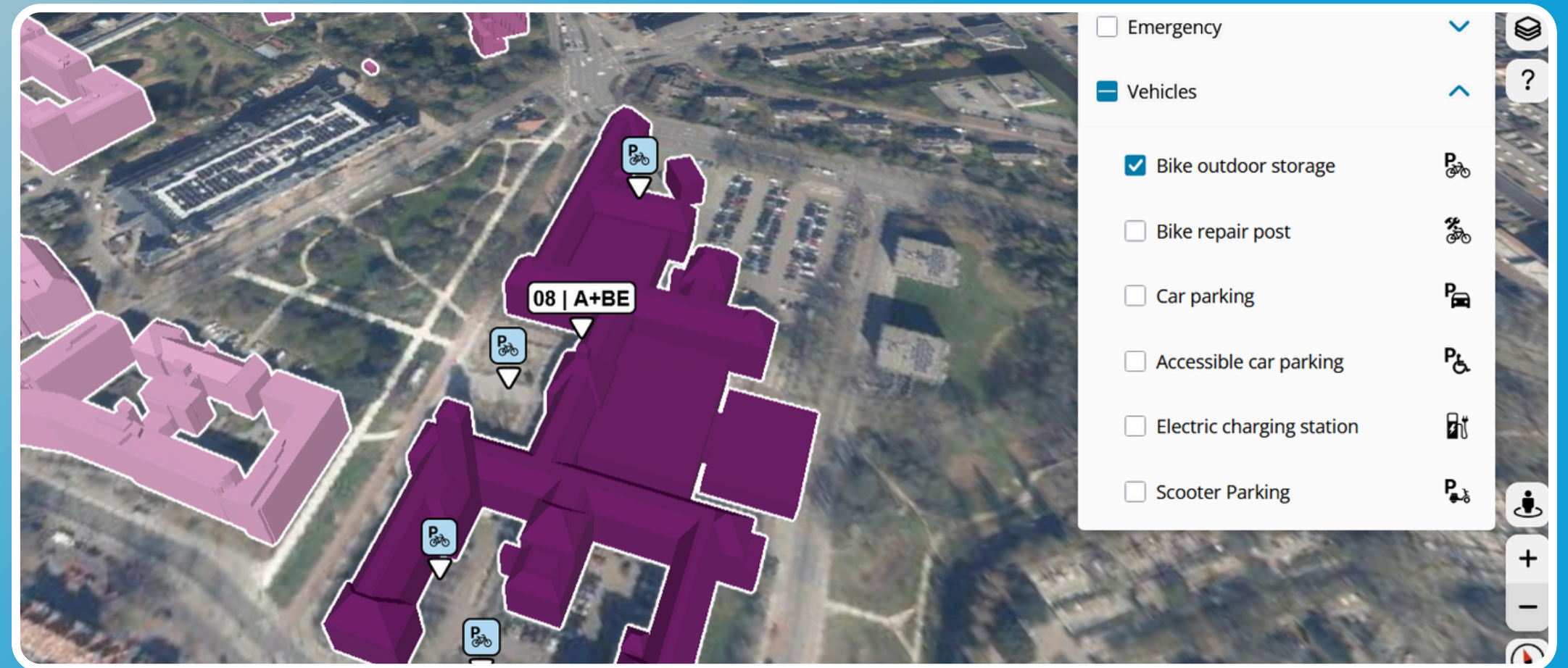
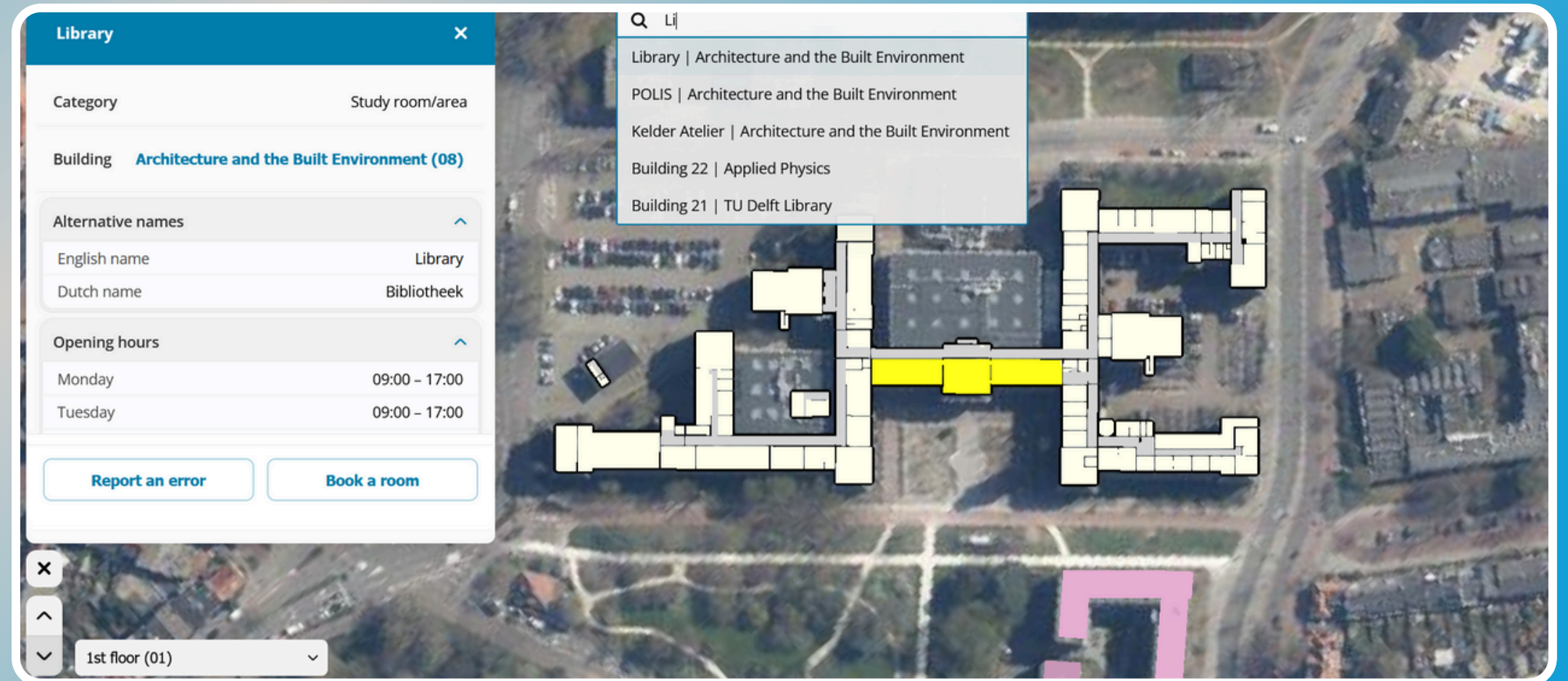
## BuildingUnit

- Associations beyond parent-child
- Objects with no associated geometry

Flexibility in organisation:

- Enable any arbitrary collection of objects
- Represent any feature as an icon
  - Dynamic events
- Re-associate geometry

## Data structure



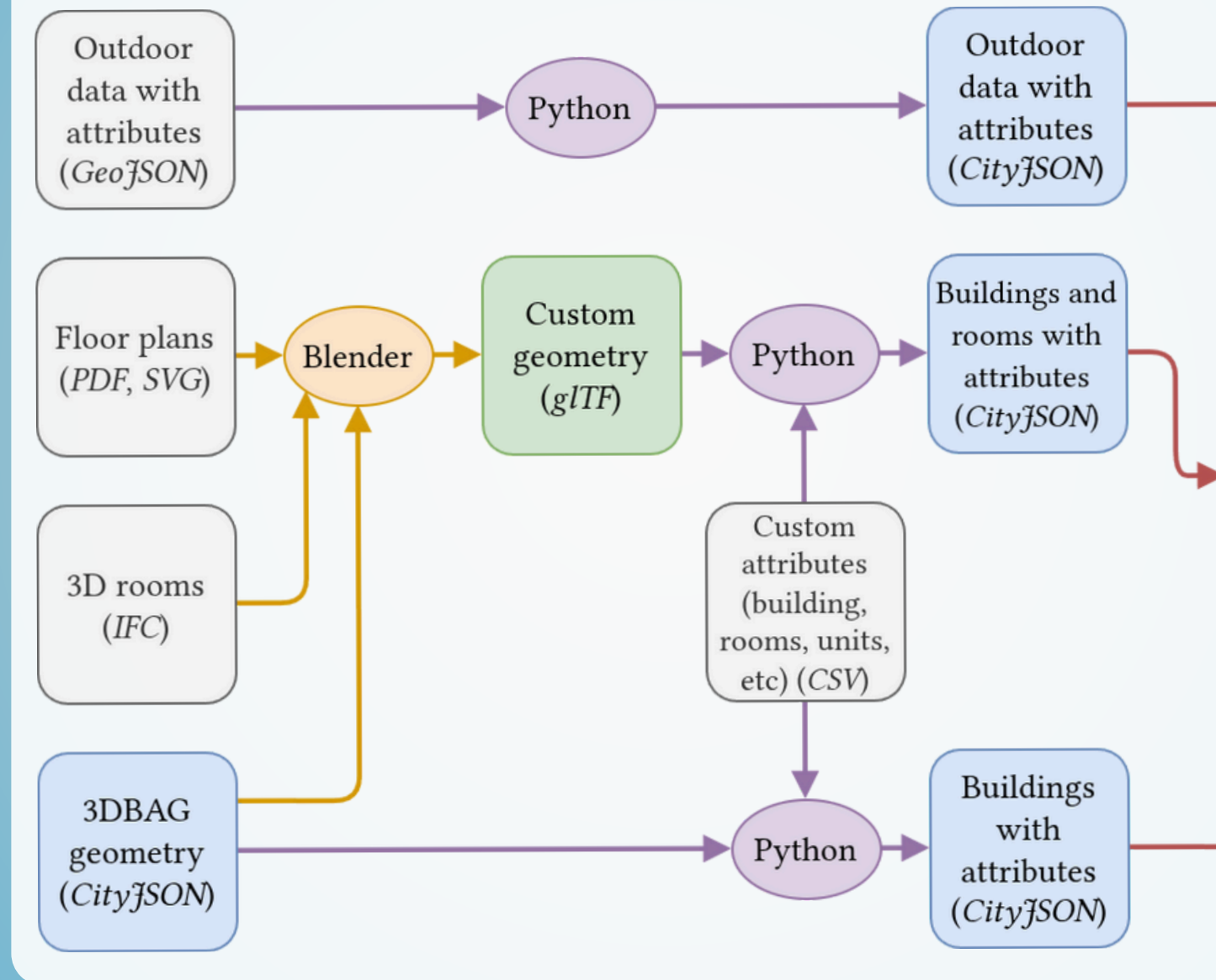
## 1. No database

Schema  
incompatibility:  
Missing data

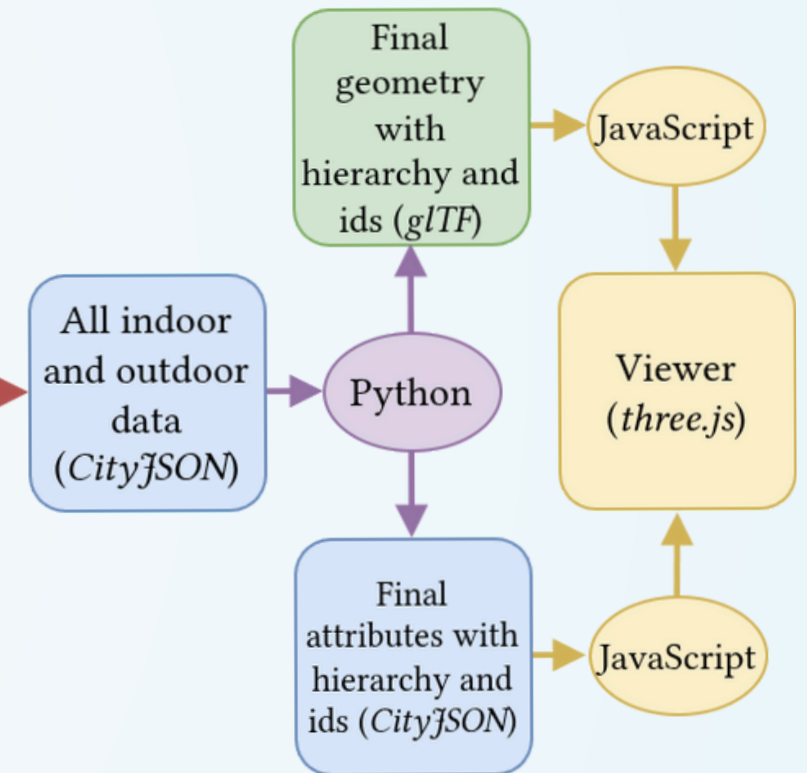
## 2. Fast & Semi automated

5 CLI commands  
2 minutes (less  
without geometry  
updates)

### Data processing



### Data formatting



# Pipeline

## 1. Extensibility of Project

Foundational map via:

- Modular code
- Scalable data structure

## 2. Designing for Inclusivity

Improve map and campus experience:

- Information access
- Ease-of-use

*Nothing about Us without Us*

**11** Participants

**2x6** Sessions

Representatives

Ambassadors

Students

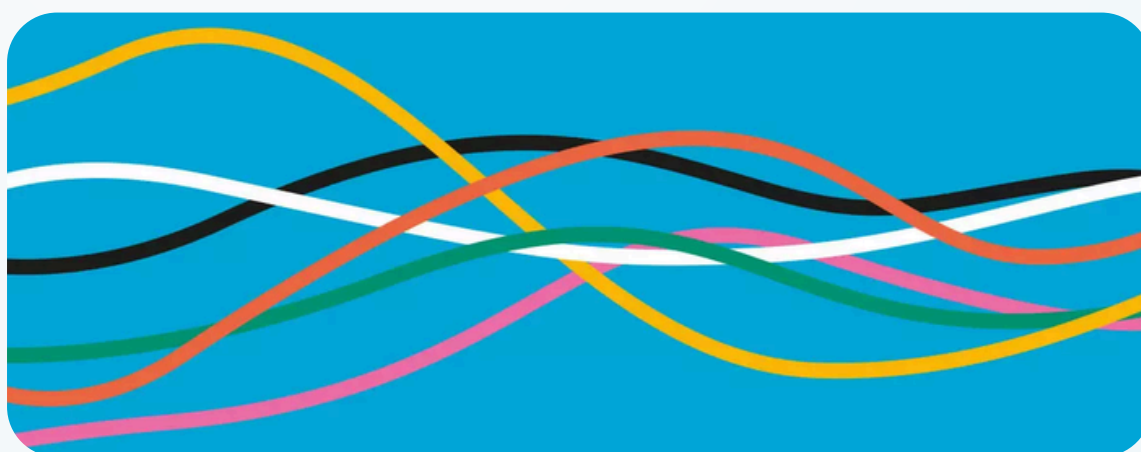
Staff

Physical accessibility

Neurodivergent needs

Gender-neutral spaces

*& many more...*



# Participatory Mapping

# Impact-Feasibility Matrix

## Prioritising features

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

## Translated into GitHub Issues

- Bugs, ToDo, Enhancements
- Milestones, Future Work

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

# Requirement Modelling

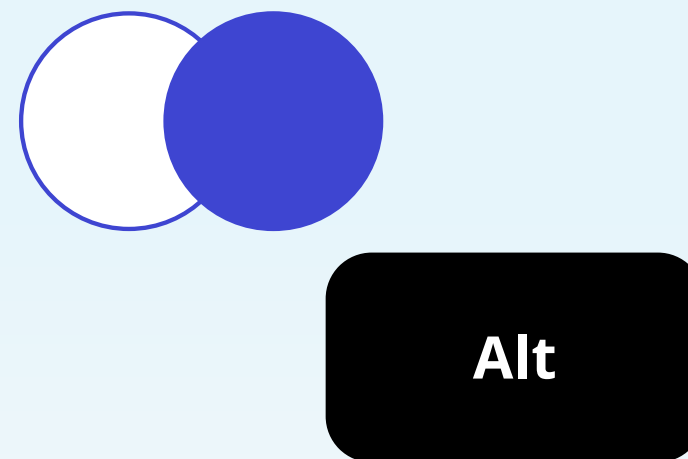
## User Interface (UI)

**Goal:** Information equity

**How:**

- Literature Review
- Focus Groups

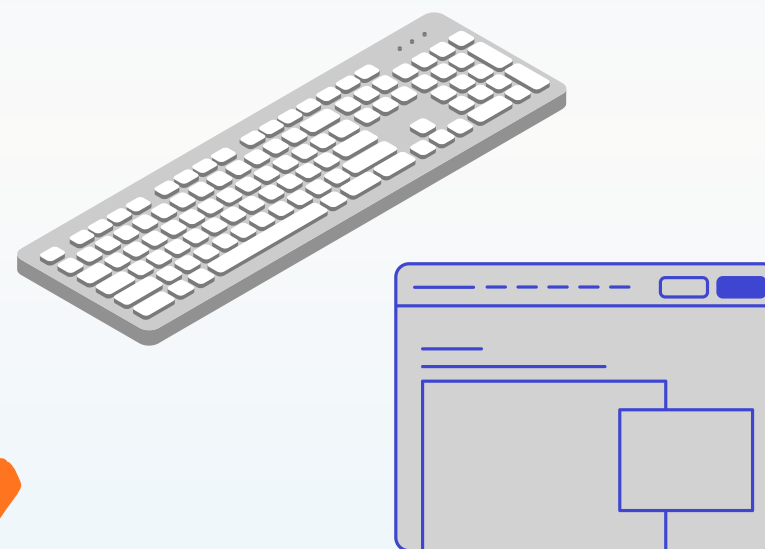
## Perceivable



## Understandable



## Operable

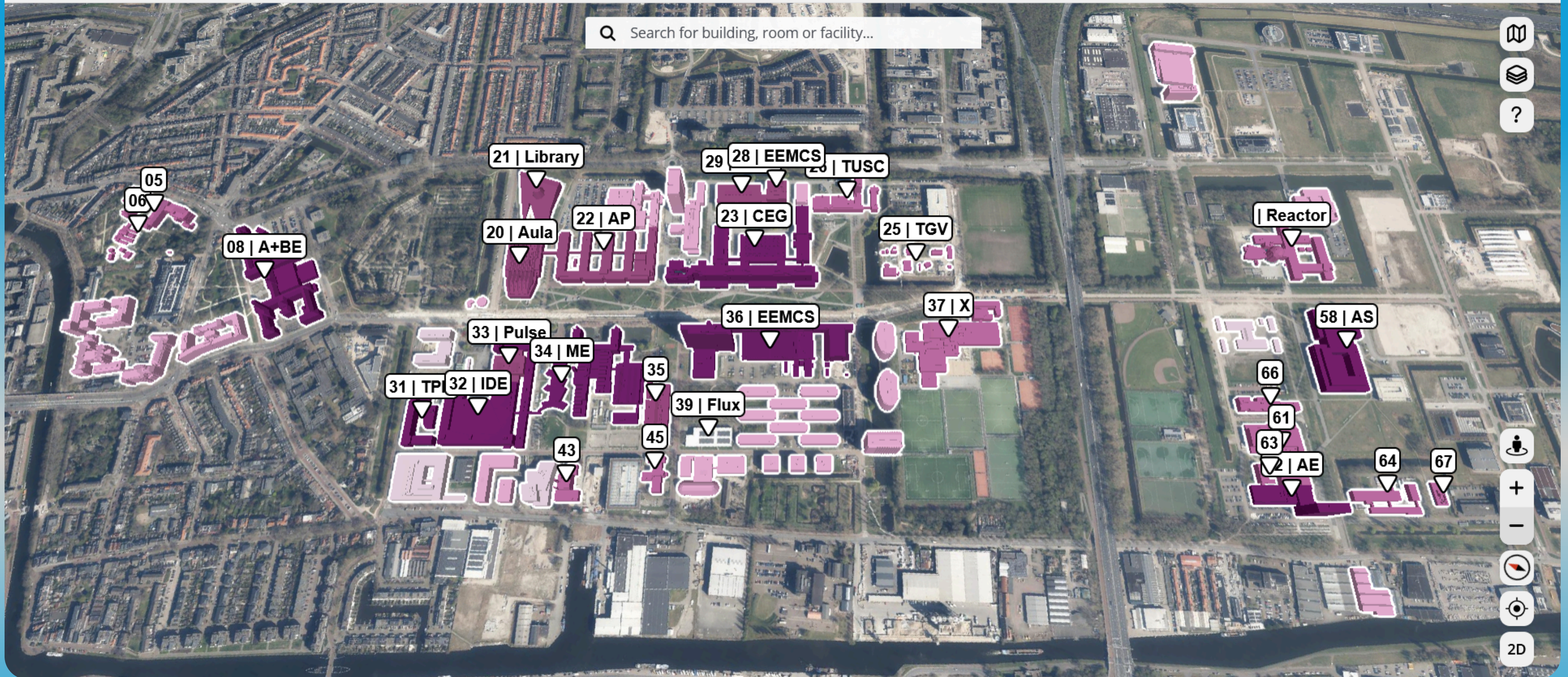


## Robust



**WCAG Principles**

**Accessible map visuals**



# Map Showcase



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

**Thank you for your attention!**