

# Spatial Planning Information Modelling

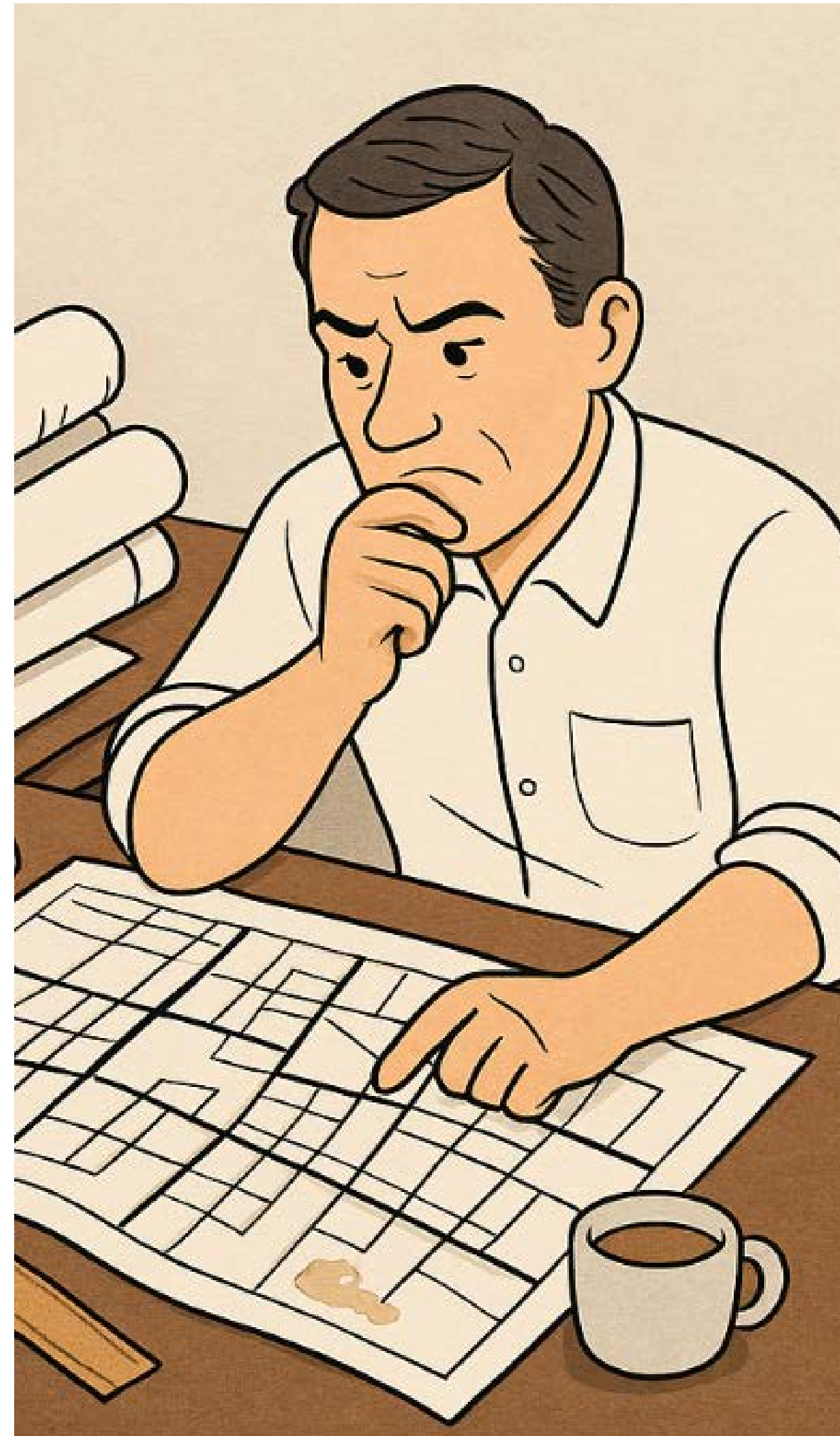
Real future or nice to have innovation?



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# Why this topic?

- Urban planning is the foundation of building lifecycle
- Visual contrast: Paper zoning plans vs. interactive 3D model
- Current practice = outdated
- Digital methods bring clarity, speed, compliance



Decoding the Da Vinci Code: Zoning Edition.



SimCity? No, it's just Tuesday at the planning office.

A person wearing a hat is sitting in a folding chair in a field of yellow wildflowers, reading a book. To the left is a dark wooden house with a gabled roof. The background is filled with lush green trees and foliage. The scene is peaceful and idyllic.

What is the purpose?

Best place to live in, desired destination to arrive to

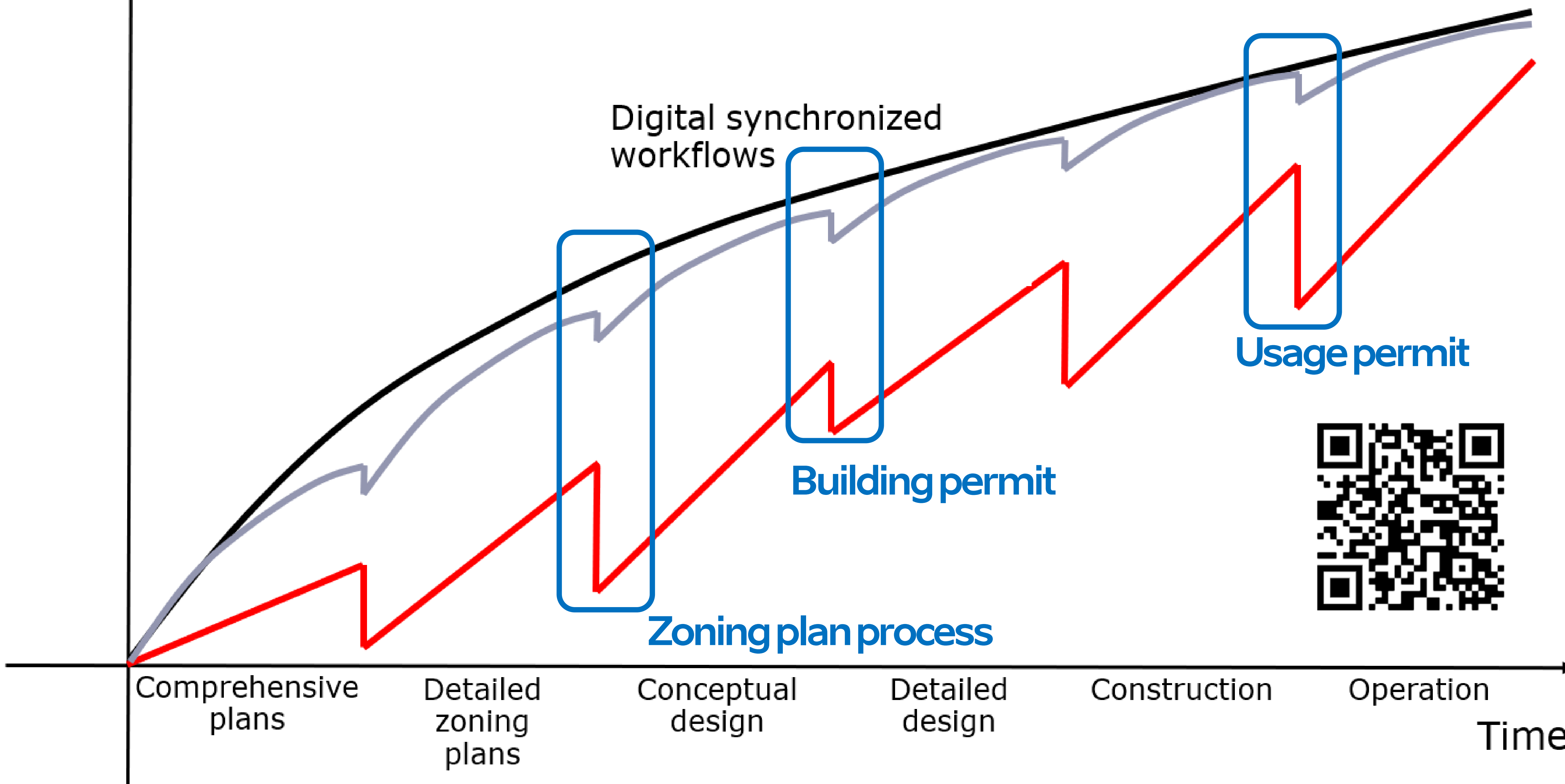
A atmospheric night scene of a narrow, cobblestone street in a European city. The street is wet and reflective, mirroring the warm, yellow light of several street lamps. A thick layer of fog or rain mist hangs in the air, softening the distant lights and buildings. On the left, a wooden bench with a dark metal frame sits on the sidewalk. Various street signs, including a circular blue sign with a white 'P' and a triangular warning sign, are visible on poles. The buildings lining the street are dark, with some windows showing interior lights. The overall mood is quiet and mysterious.

What is the purpose?

Still the same — best environment

Information  
level

# Where is the problem?



# Starting point

- Process length
- PDF and DOC
- Machine-readability
- User-hostile participation
- **Best urban environment?**







# Spatial Planning Information Model

SPIM is not	SPIM is
A 3D zoning drawing for visualisation only	A structured information model encoding both geometry and regulatory meaning
A static 2D plan with tags added afterwards	A machine-readable dataset designed for validation, integration, and reuse
A full replication of physical reality in high detail	A hybrid model combining 2D, 2.5D, and 3D elements at fit-for-purpose levels of geometry
Over-detailed models of every planning aspect	Selective modelling of elements critical for zoning logic, compliance, and spatial layout
A closed, proprietary or tool-specific format	An open, vendor-neutral schema (e.g. IFC) aligned with geospatial and land administration standards
A disruptive change requiring new software from scratch	A workflow-compatible approach that builds on familiar tools (e.g. Civil 3D, ArchiCAD) with IFC export
A way to accelerate approval speed alone	A means to enhance clarity, transparency, and quality of planning decisions

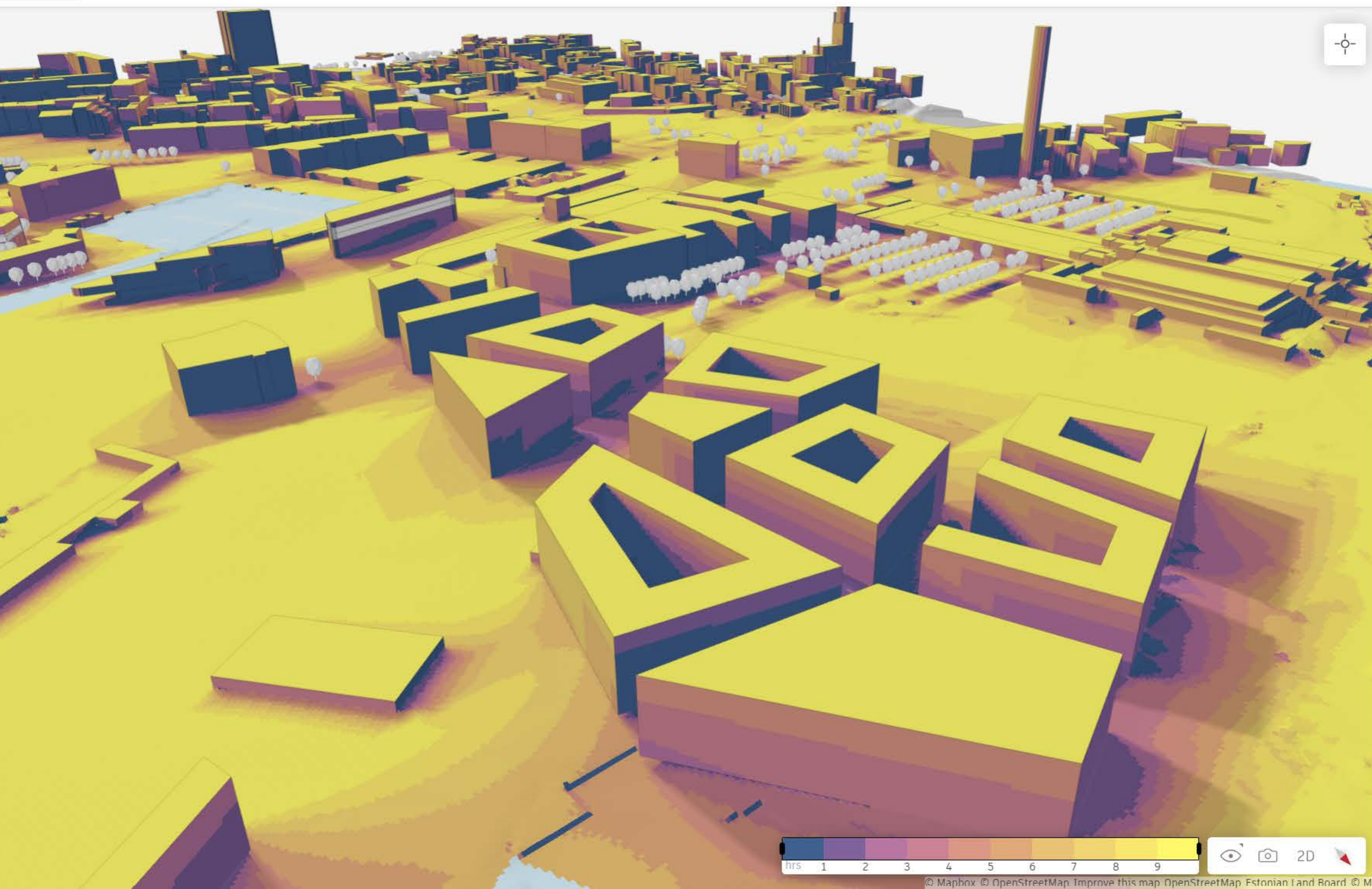
# Gaps in IFC

- Zoning area needs geometry under IfcSite
- No parcel entity to represent land plots
- Buildable envelopes  $\neq$  buildings — schema lacks dedicated abstraction
- Thematic layers (transport, greenery, utilities) underspecified in current classes
- Proxy-based workarounds erode semantic clarity and cross-jurisdictional reuse
- **IFC is powerful, but it doesn't yet speak the language of planning – and should it?**



How about gdb/geojson/cityGML/good old dwg?





Ground

hours	m <sup>2</sup>		%
0 - 1	125541	<div></div>	9
1 - 2	87398	<div></div>	6
2 - 3	88307	<div></div>	6
3 - 4	88192	<div></div>	6
4 - 5	94719	<div></div>	7
5 - 6	94072	<div></div>	6
6 - 7	102433	<div></div>	7
7 - 8	107714	<div></div>	7
8 - 9	127233	<div></div>	9
9+	545768	<div></div>	37
Total	1461377		100

Geometry

hours	m <sup>2</sup>		%
0 - 1	416882	<div></div>	20
1 - 2	169575	<div></div>	8
2 - 3	136527	<div></div>	7
3 - 4	136393	<div></div>	7
4 - 5	149840	<div></div>	7
5 - 6	155010	<div></div>	7
6 - 7	122384	<div></div>	6
7 - 8	86089	<div></div>	4
8 - 9	80703	<div></div>	4
9+	638229	<div></div>	30
Total	2091632		100

hrs 1 2 3 4 5 6 7 8 9

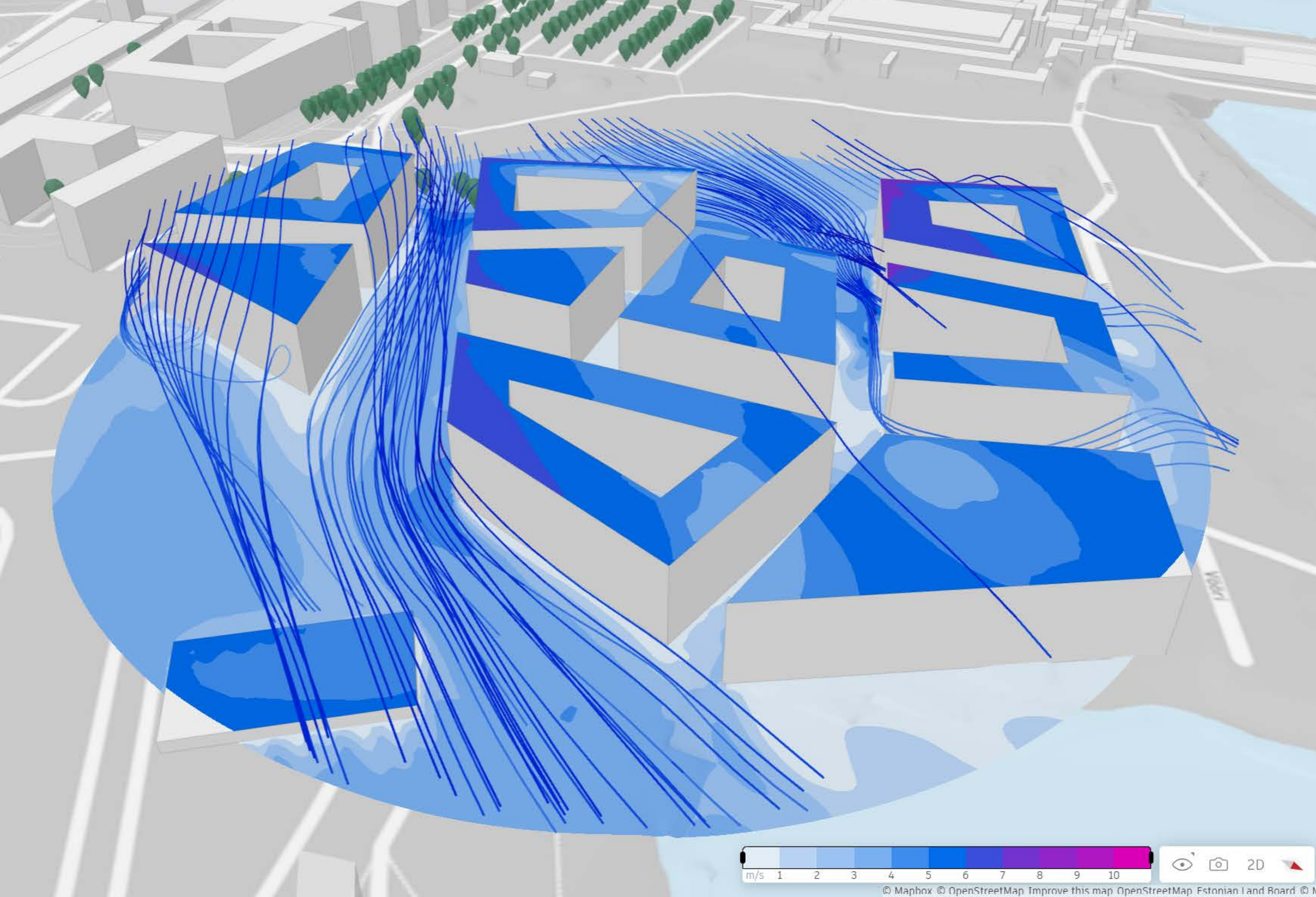
👁

📷

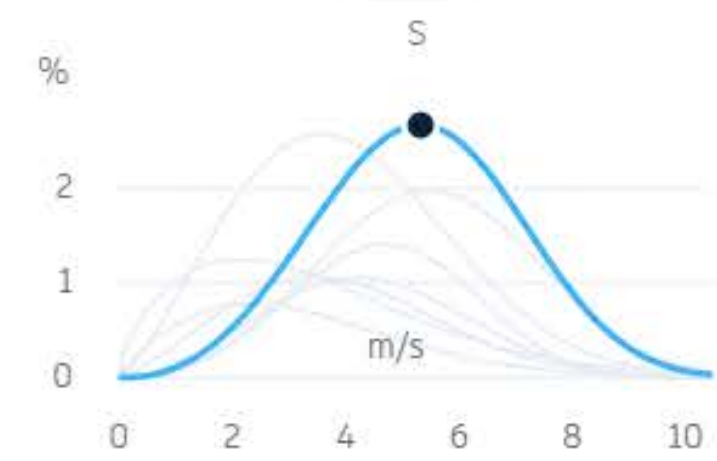
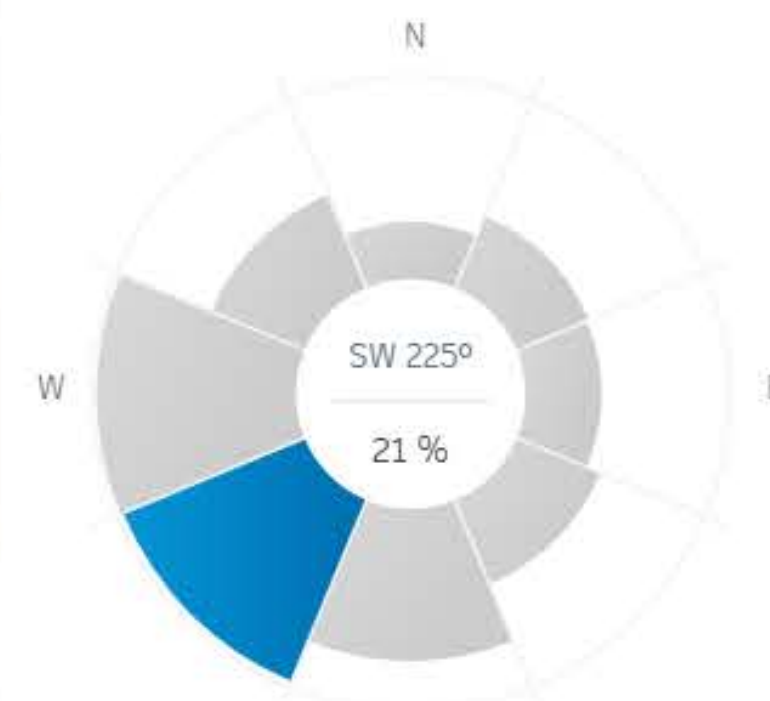
2D

📍

Help



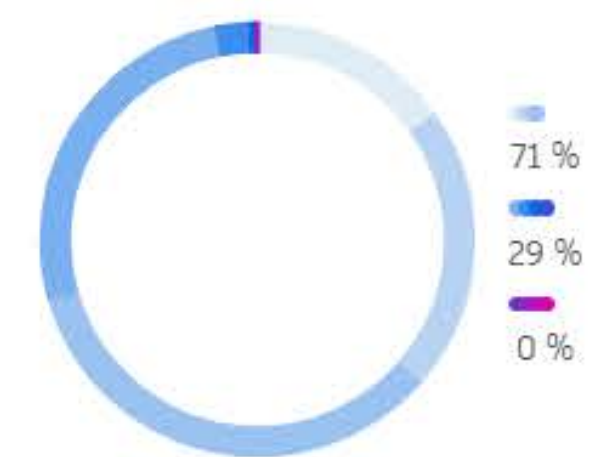
Comfort **Direction**



Streamlines Importance

Statistics

Ground



Roof



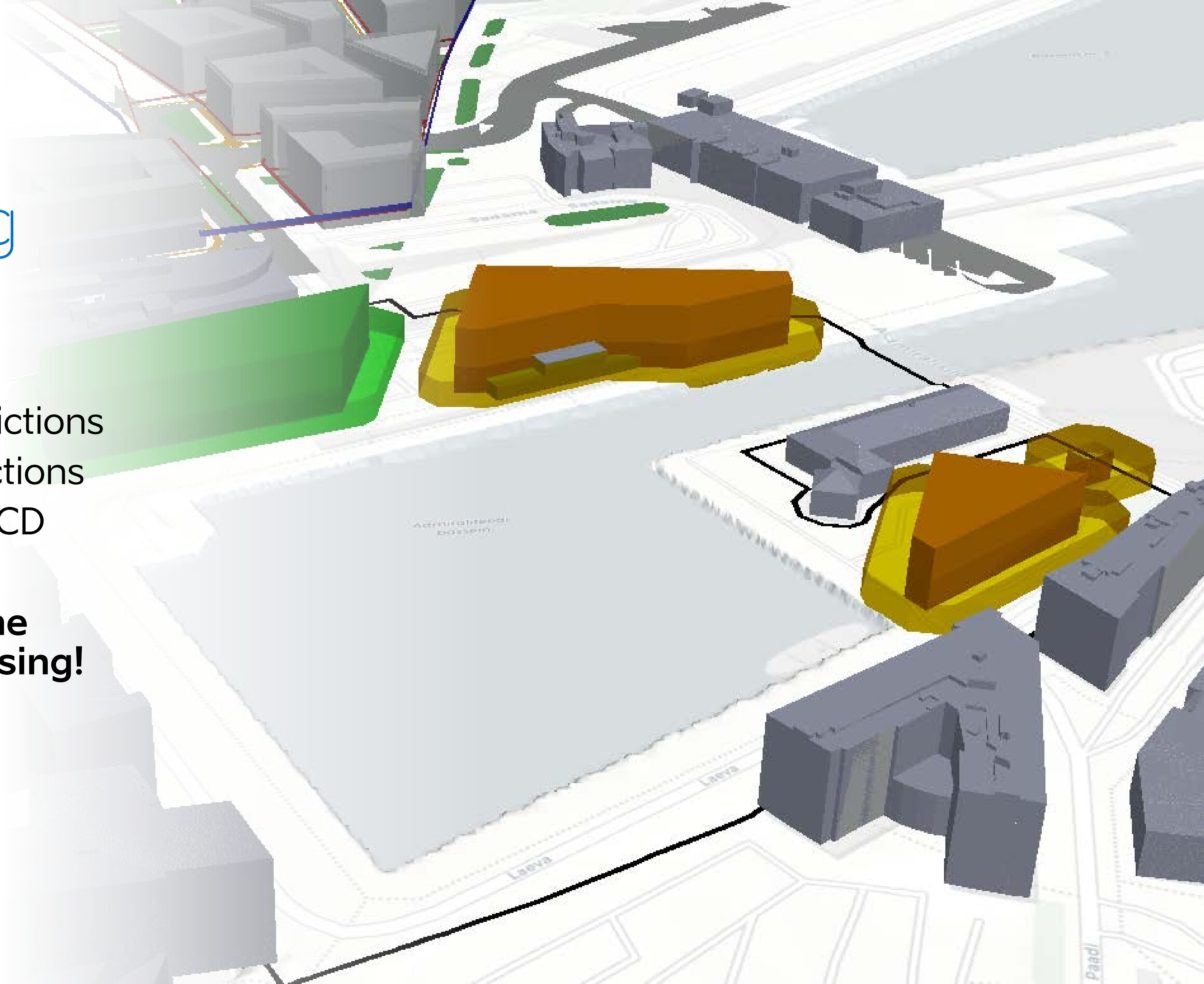
2D

Weather data GWA 3.0 | 0.39 | 1.75

Help

# (Automated) rule checking

- Visual checks
- Geometrical contradictions
- Semantical contradictions
- MP vs DZP vs DC vs CD
- Additional analyses
- **Possibility to check the results before processing!**





# Rules of the game and legislation

- [National minimum requirements](#) vs. additional needs of local governments
- Uniformity of local government requirements in case of overlaps
- Main land use vs. cadastral purpose vs. building usage purpose and their correspondence
- Planning information model — a municipal luxury or a national obligation?



# Challenges

- Limited standardization — planning as a form of art
- Stakeholder variety — understanding the solution, participation, and inclusion
- Automated checks — strict rules or lots of room for interpretation
- Analyses: benefits versus costs — software and training
- Resistance to change



# How to start anyhow?

- Georeferenced models in IFC format
  - Terrain elevation model of the planning area (IFC or LandXML)
  - Buildable area model
  - Building volume example model
  - Transport layers and greenery layers
  - Planning area layer and plots
- Define necessary property sets and link with bsDD (e.g., dp\_building\_area, dp\_landscaping, etc.)
- IfcBuildingElementProxy is better solution than no solution
- **Slow but steady wins the race!**



# Thank you!



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