

# INFRASTRUCTURING IN ACTION

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**BACKGROUND**

# WHERE THIS COMES FROM

- 15 years of collaboration with engineers and architects around the topic of zero emission buildings and neighbourhoods
- Hired as expert on use of technology in everyday life but
  - occupants do not care much about zero emission technologies - except when they break down
  - they still make a difference for energy use
- Sociologist, working at an STS centre

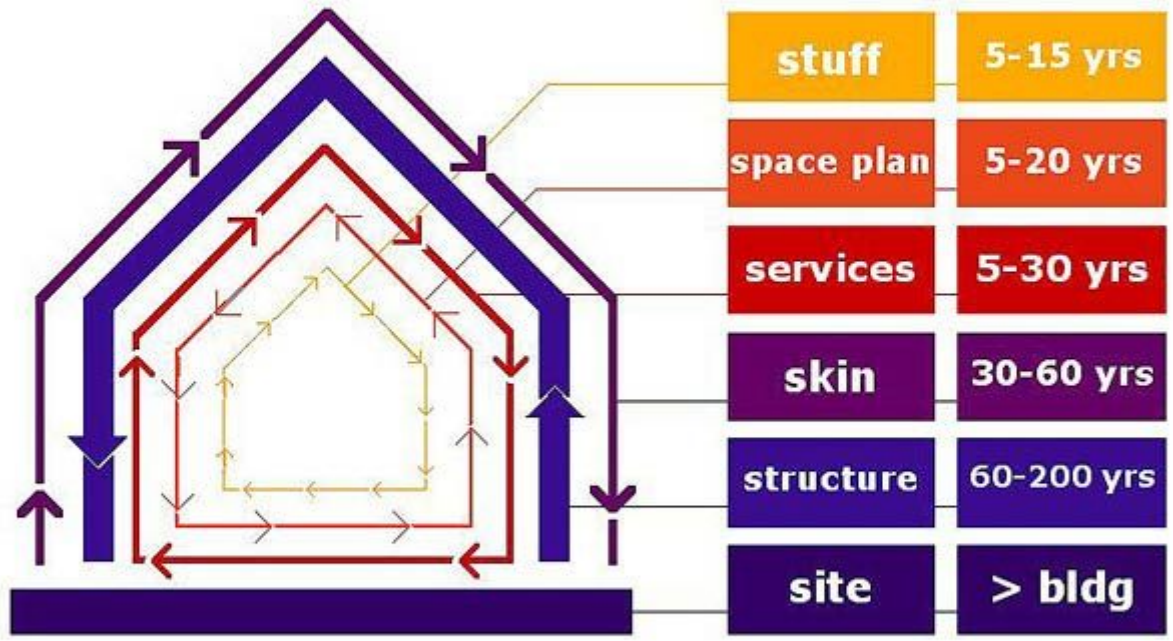
**RE-THINKING THE  
USE OF BUILDINGS  
THROUGH  
INFRASTRUCTURES**

Buildings are a classic example of infrastructure:  
transparent, embedded, etc

But also very present in daily lives

**INTRODUCING  
“INFRASTRUCTUREN  
ESS”**

# S. BRAND: HOW BUILDINGS LEARN





**CREATING  
“INFRASTRUCTURE  
N  
ESS”**

# A LITTLE HOW-TO: INCREASING AND DECREASING “INFRASTRUCTURENESS”

Heavily but somewhat selectively based on S.L. Star’s catalog of characteristics of infrastructures, illustrated with examples from our work with zero emission buildings/neighbourhoods

# TRANSPARENCY

- ↗ Make the building systems transparent in use: they are just there, adjusting automatically
- ↘ Force users to be aware of the building's inner workings to be able to use it

# EMBEDDEDNESS

- ↗ Embed the building in as many as large technical and social networks as possible (e.g. remote monitoring and operation of buildings)
- ↘ Disembed the building as far as possible, it should work stand-alone

# BEYOND SINGLE SITE PRACTICES

- ↗ Abstract the building systems away from single site practices, they should work in every building
- ↘ Make building systems specific to single site practices (maybe even on room-level)

# STANDARDS

- ↗ Search for standards and follow them, if there are none create standards by building on existing ones (e.g. standards regarding acceptable temperature ranges, zero emission building standard)
  - ↘ Avoid standards as far as possible

# LEARNING TO USE

- ↗ Hide the manuals, keep knowledge about the building's functionality on a need-to-know base
- ↘ Spread the manuals, teach as many about as much of its functionality as possible

# LITMUS TEST FOR “INFRASTRUCTURENESS”

Upon breakdown:

- ↗ High degree of interruption of daily lives upon breakdown - preferably complete stand-still until the experts have found the fix
- ↘ Low degree of interruption - easily fixed locally



**WHERE TO GO WITH  
THIS?**

# FOR ZERO EMISSION BUILDINGS/NEIGHBOURHOODS

- Occupant engagement + Passive energy design + PV (+ Batteries)
- Smart, automatic, active building systems: Rely as little on occupant control as possible

# BEYOND BUILDINGS

Solving climate crisis through solutions with high or low infrastructure-ness (e.g. electric cars vs bicycles)?



- only incremental change but on a large scale
- makes sense for businesses (economies of scale)
- is the natural way for engineers to design systems



- potentially large change but only on a one-by-one basis
- makes sense for democratization of technology (adding to human agency)
- underresearched (except: Cole 2010; de Laet & Mol 2000) - a kind of de-engineering?

# REFERENCES

- Cole, Raymond J., Zosia Brown, and Sherry McKay. 2010. "Building Human Agency: A Timely Manifesto." *Building Research & Information* 38 (3): 339.
- Laet, Marianne de, and Annemarie Mol. 2000. "The Zimbabwe Bush Pump: Mechanics of a Fluid Technology." *Social Studies of Science* 30 (2): 225–63.