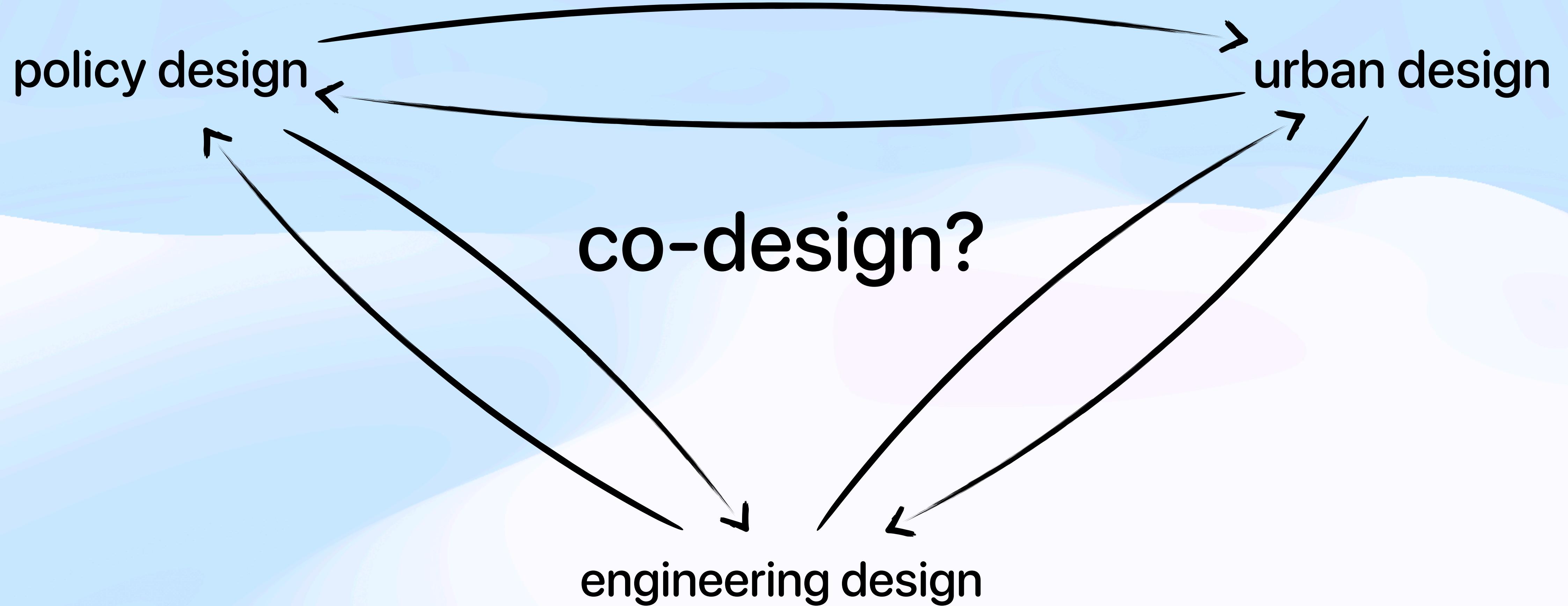


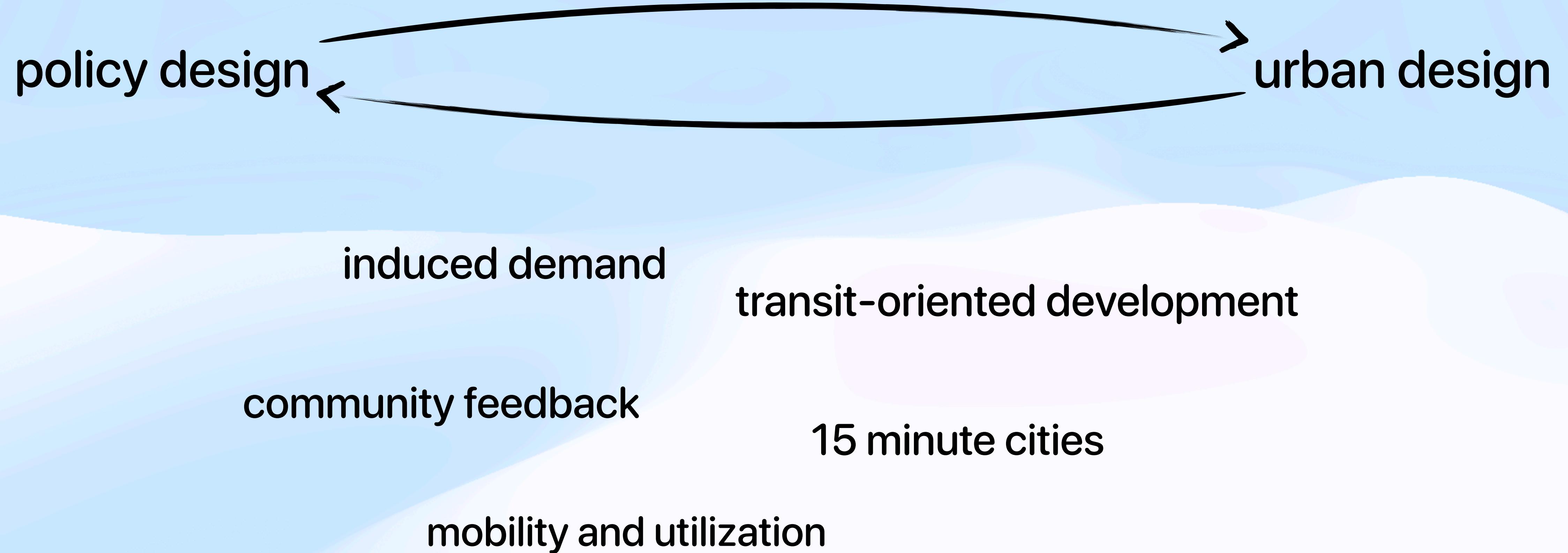
The Composable Life of Small Urban Spaces

Deniz Aydemir

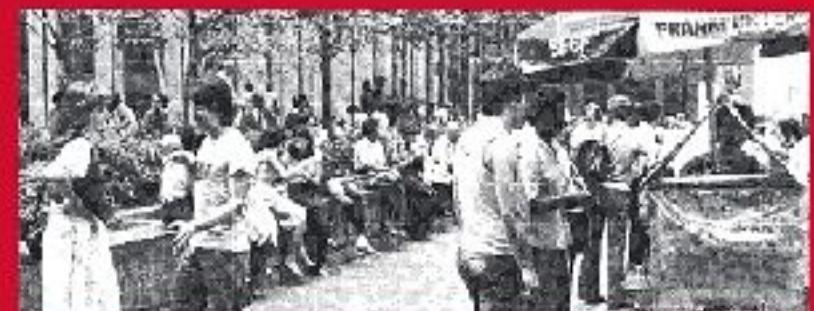
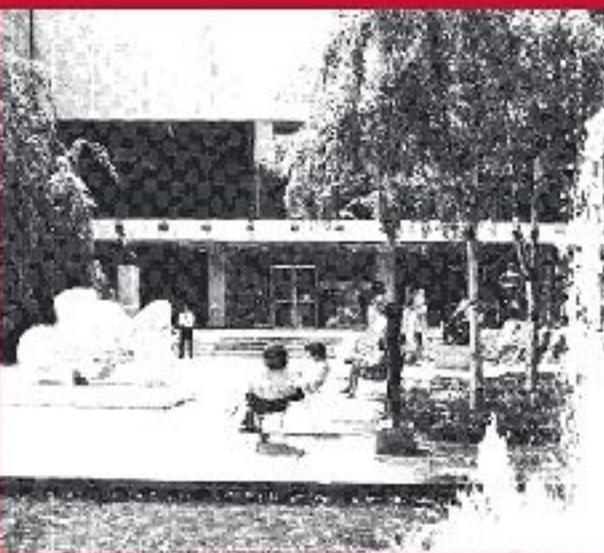
Motivation



Motivation



The Social Life of Small Urban Spaces



William H. Whyte

Project for Public Spaces

Motivation

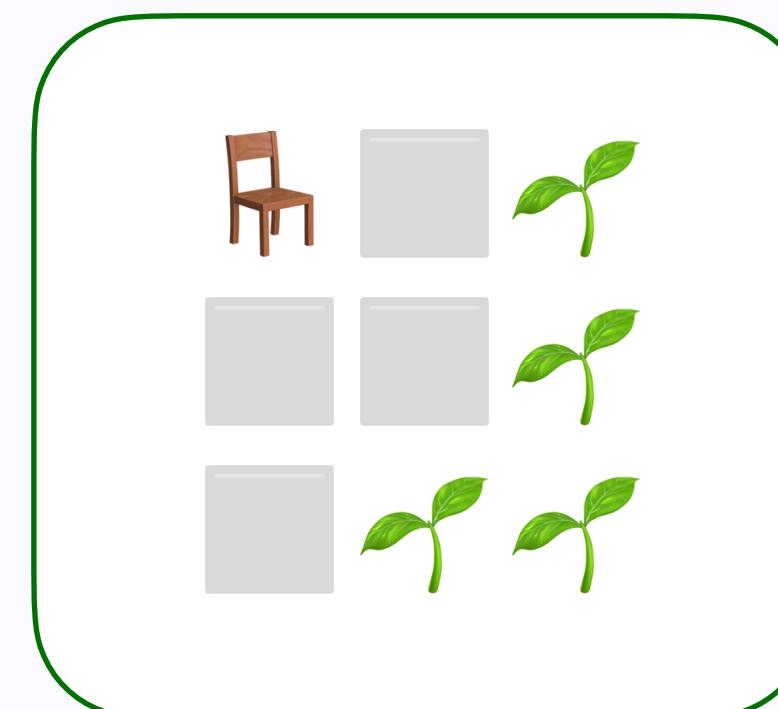
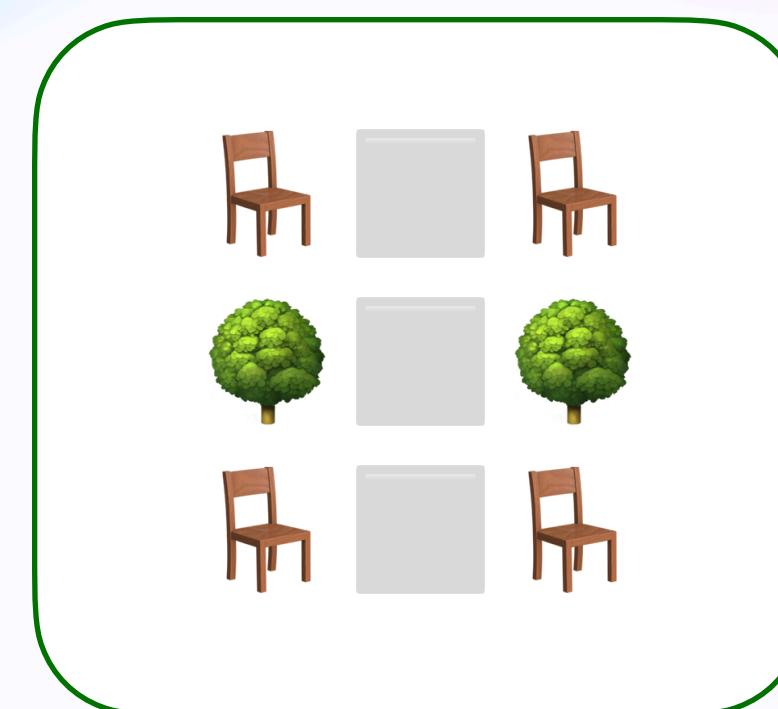
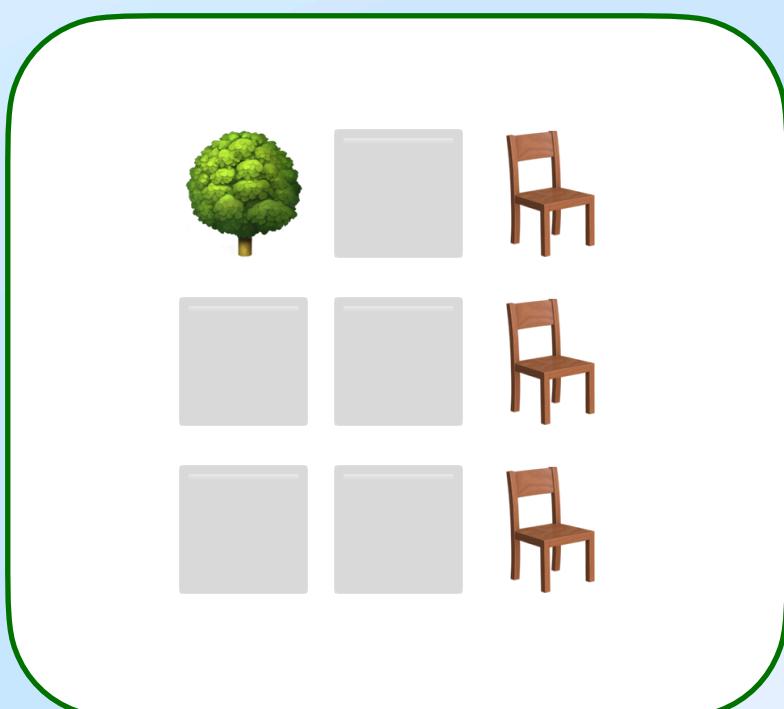


Small Urban Spaces

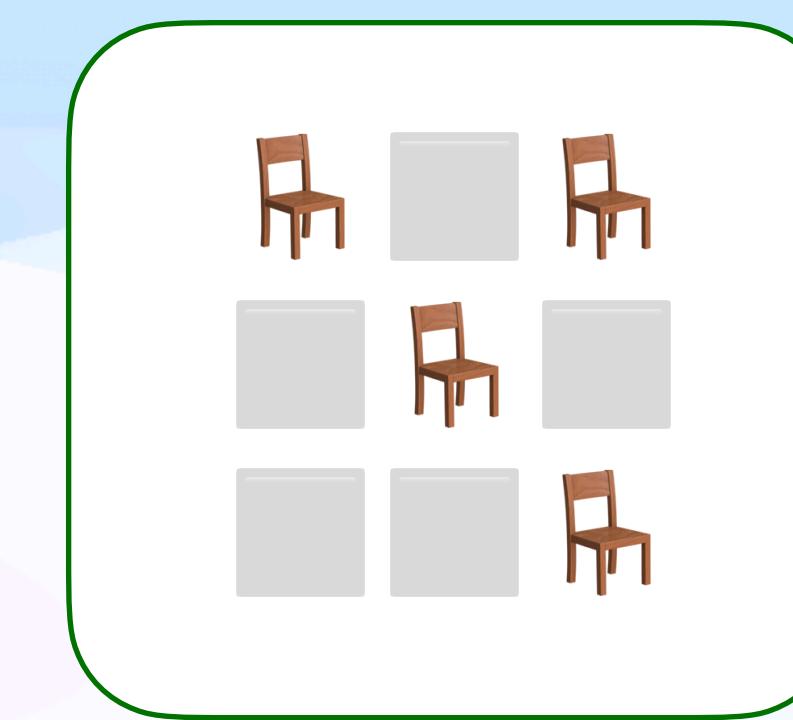
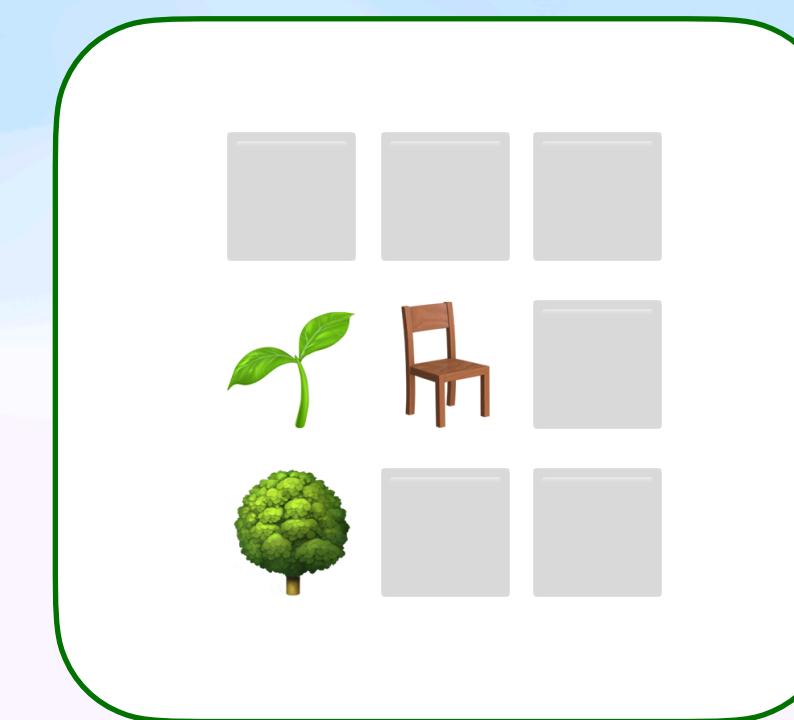
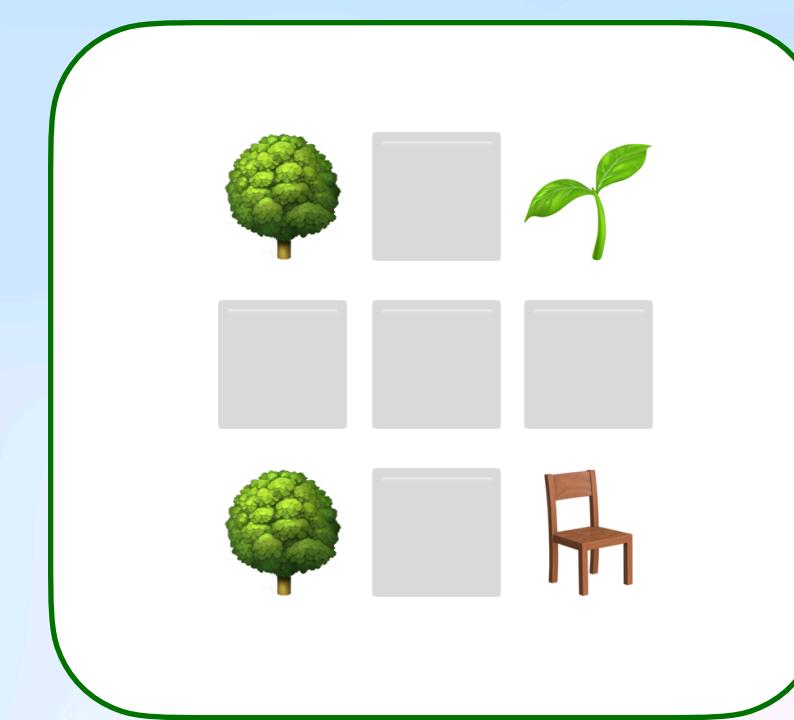
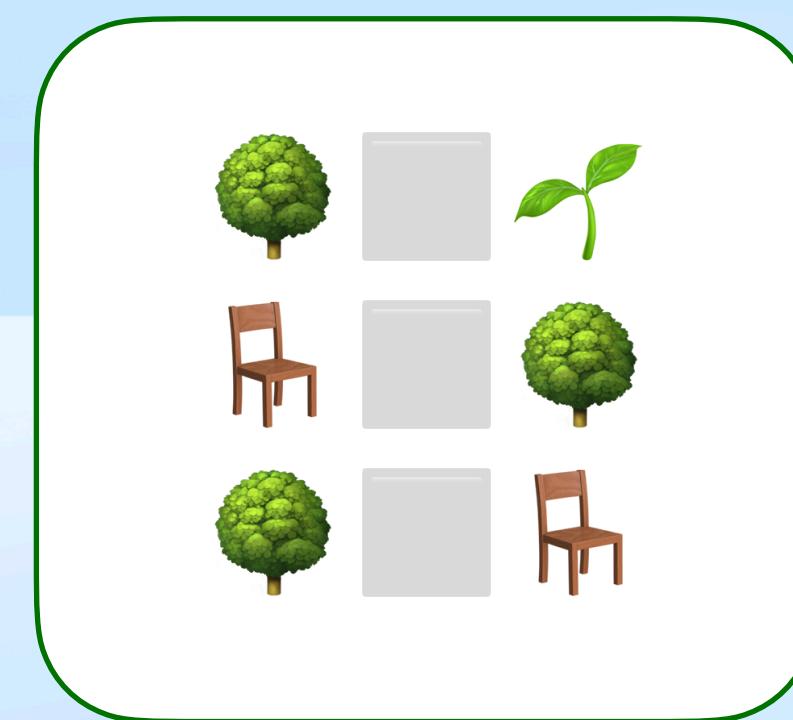
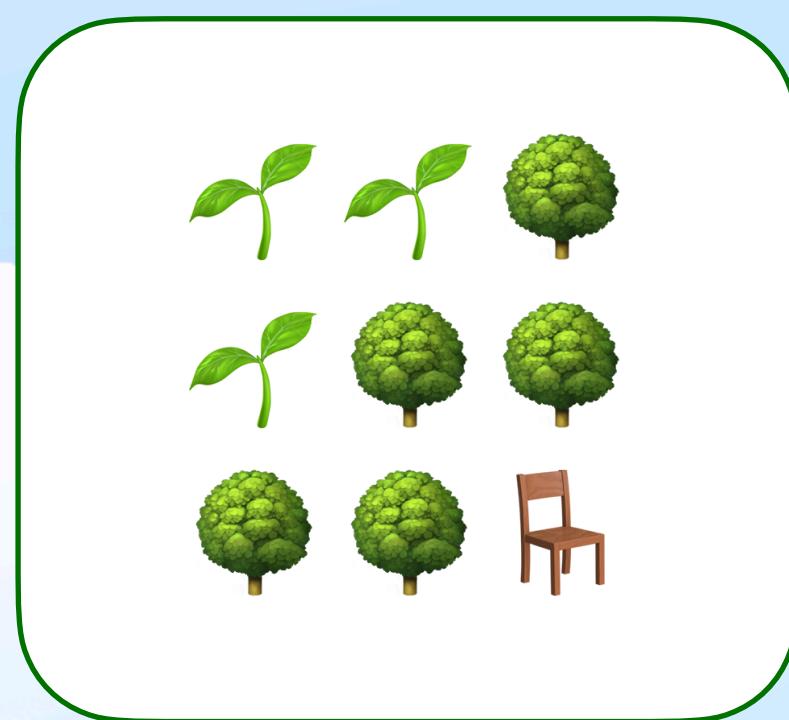
Small Urban Spaces



Small Urban Spaces



Small Urban Spaces

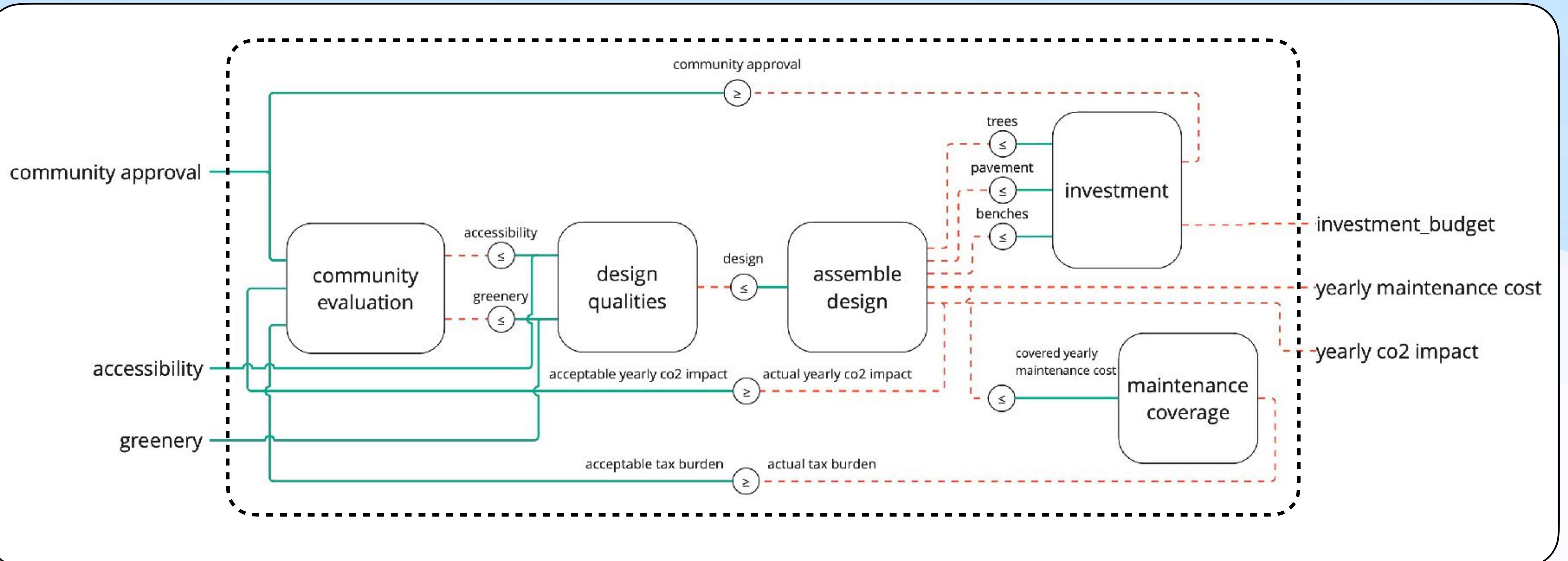


Small Urban Spaces

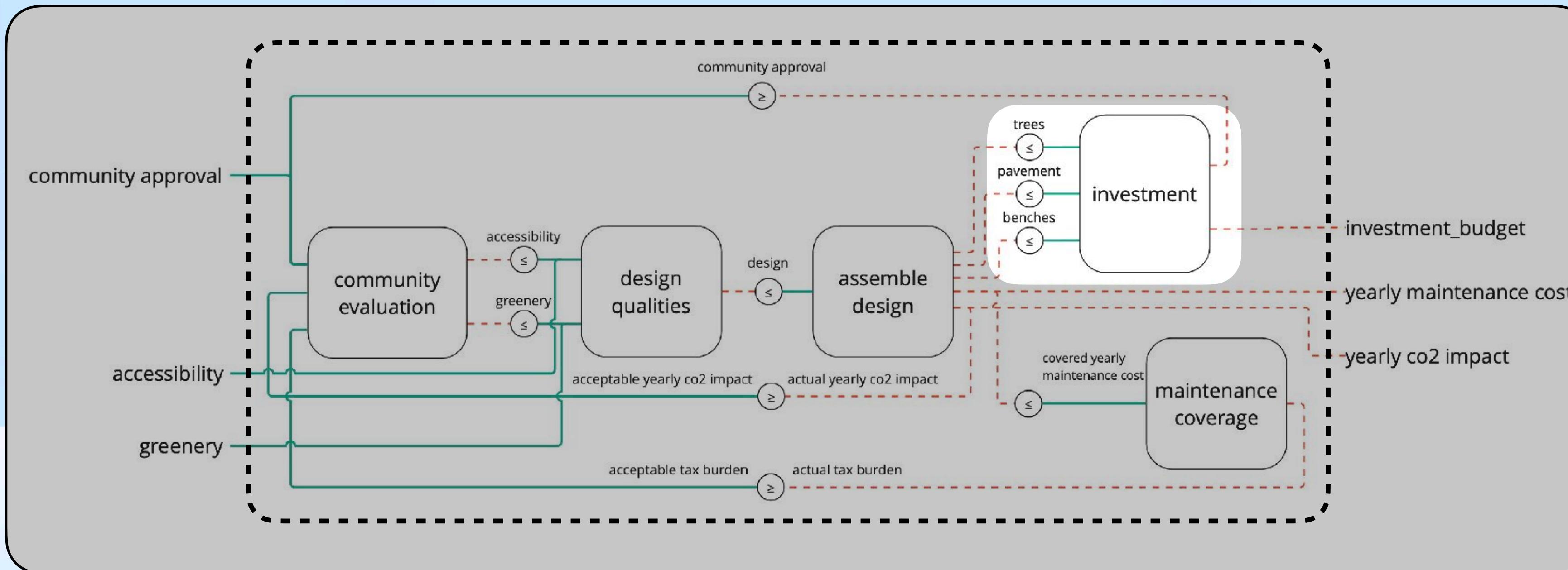
Composable Life



Design Problem



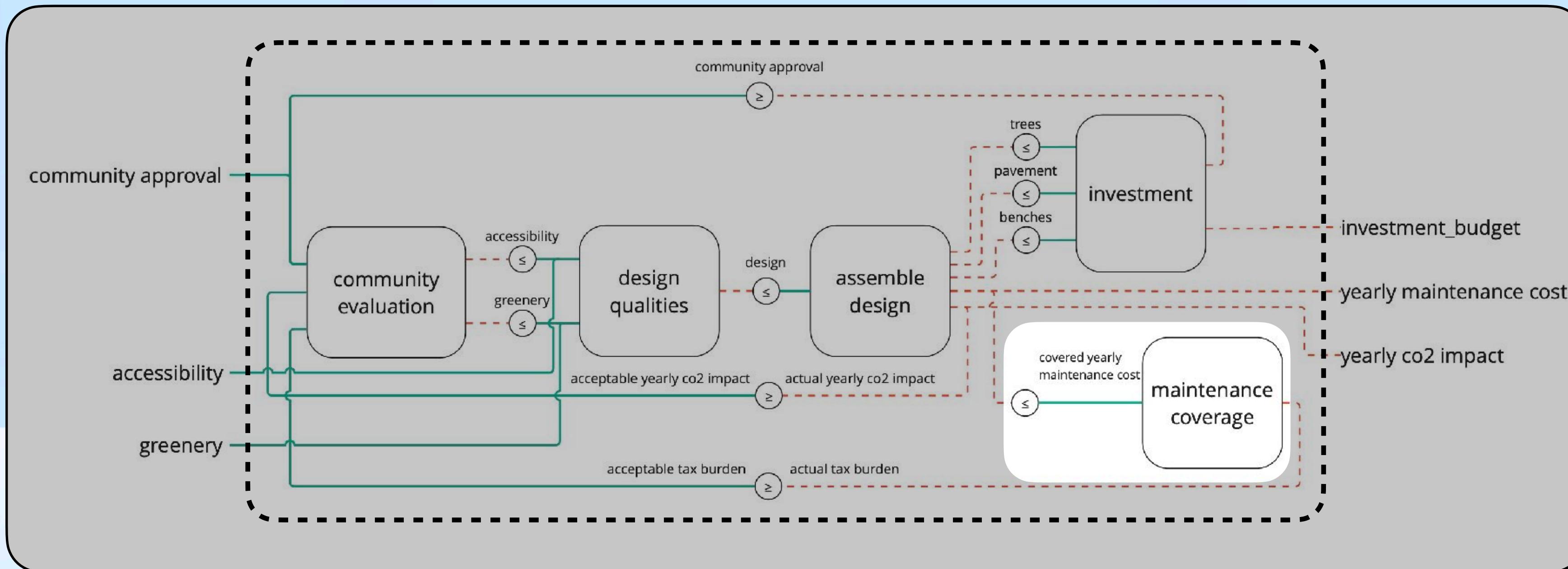
Design Problem



```
# community approval between 0 and 1
budget_flex = 1 + (required community_approval)
```

```
required initial_budget * budget_flex >= (provided trees * 1000 $) +
(provided sidewalks * 400 $) +
(provided benches * 2000 $)
```

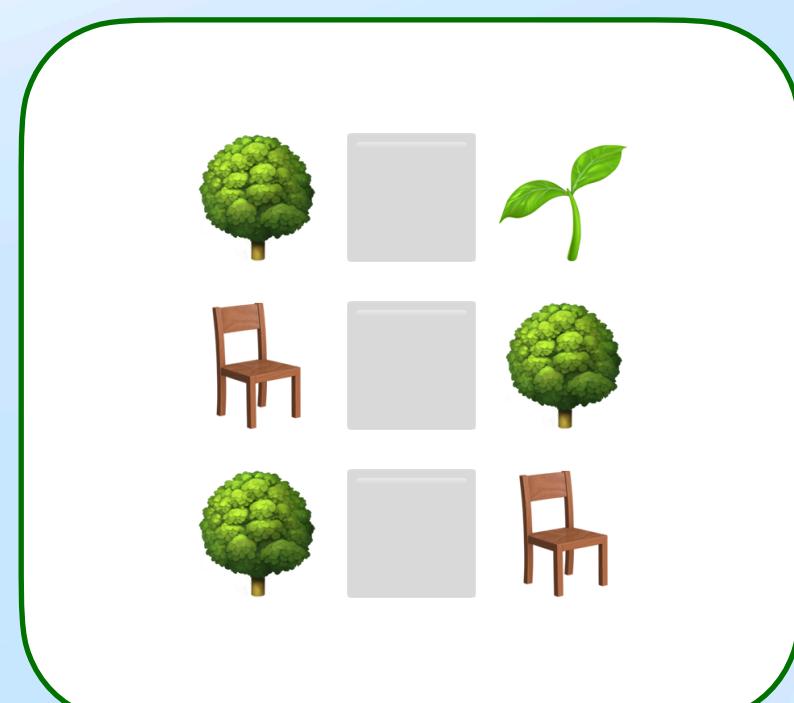
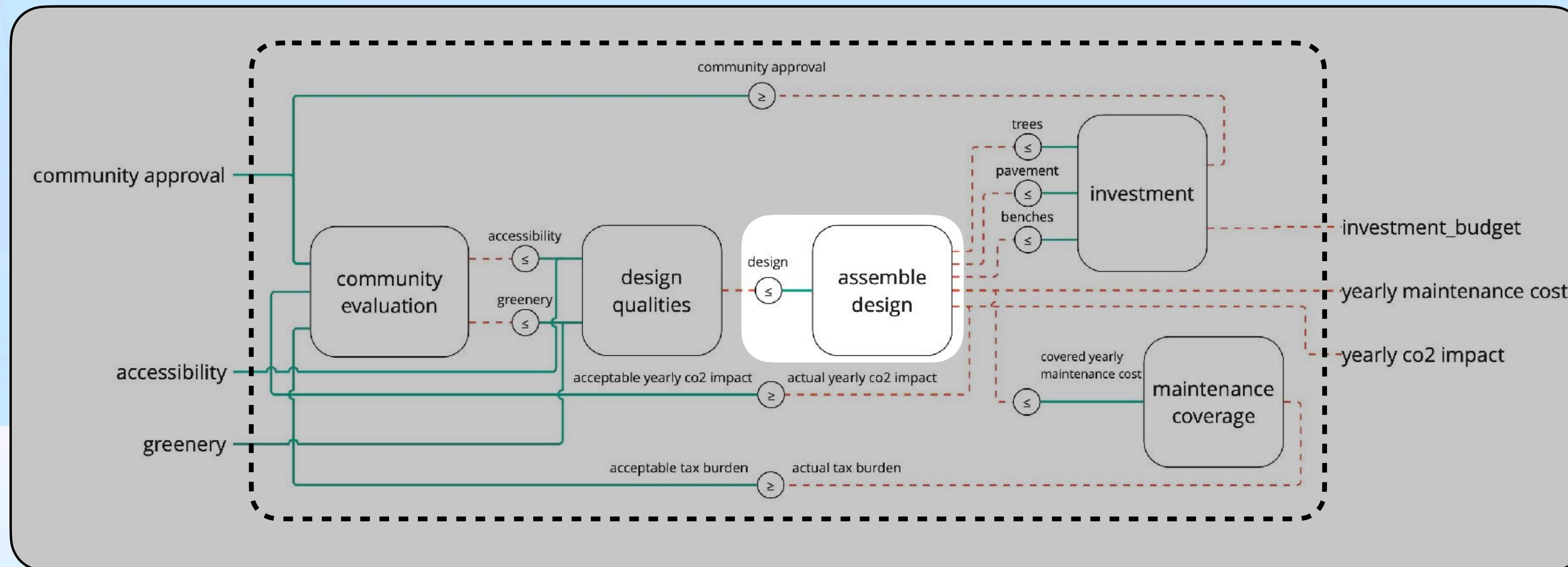
Design Problem



`taxpayer_count = 10000 [Nat]
maintenance_budget = 1000 [$]`

`required tax_burden * taxpayer_count >= (provided cost_yearly - maintenance_budget)`

Design Problem



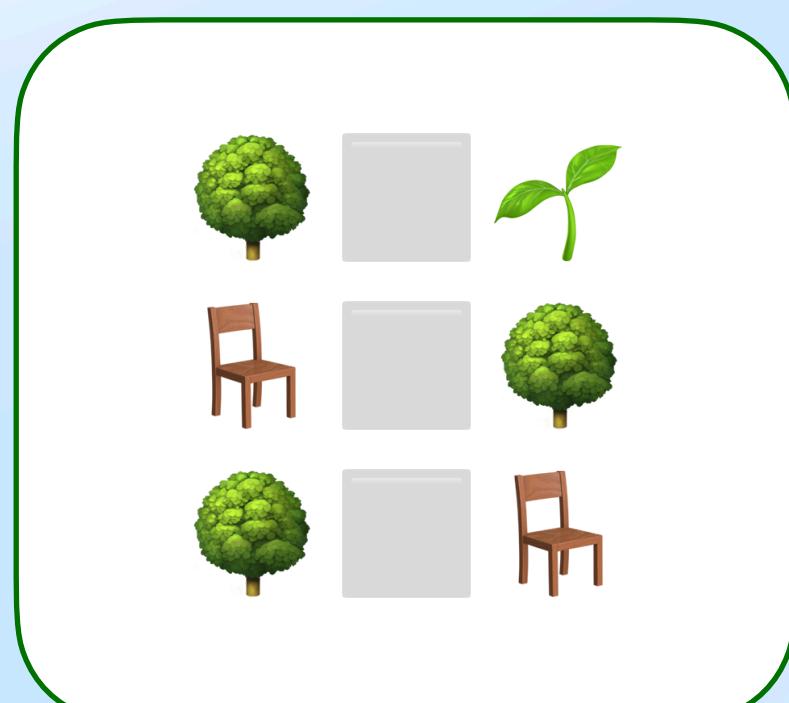
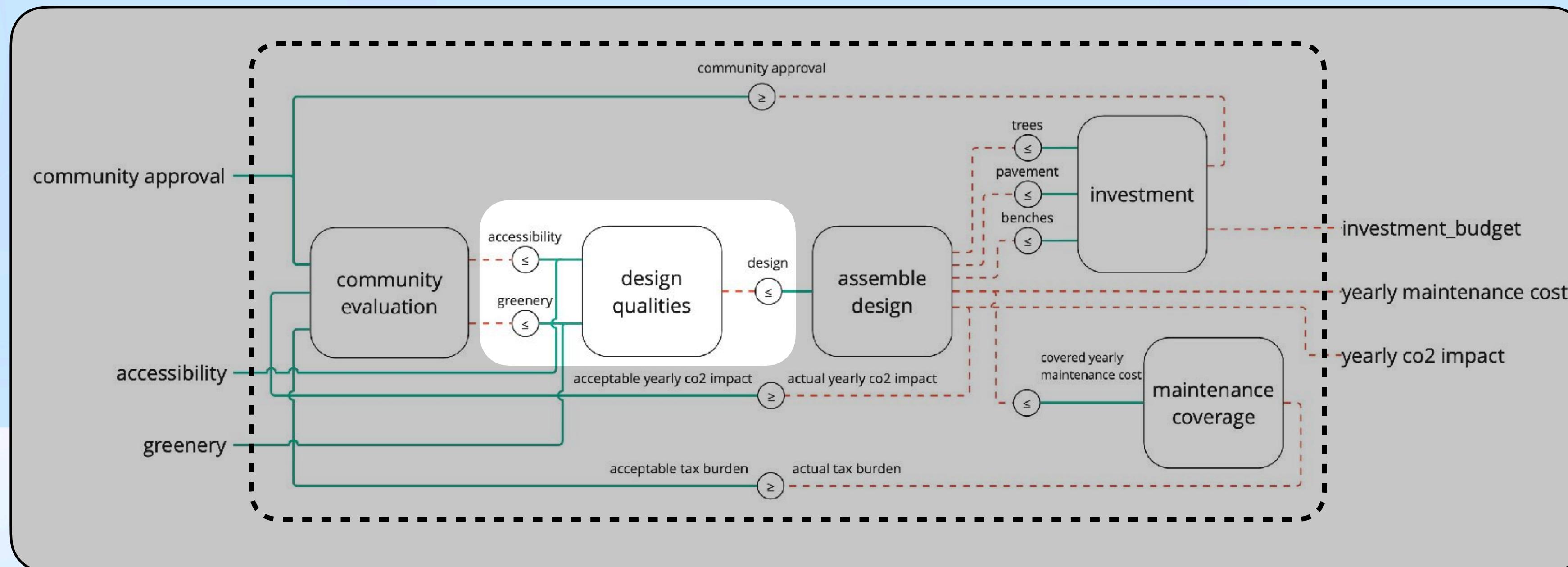
yearly maintenance cost

yearly co2 impact

~ linear based on tiles

~ linear based on tiles, includes maintenance

Design Problem

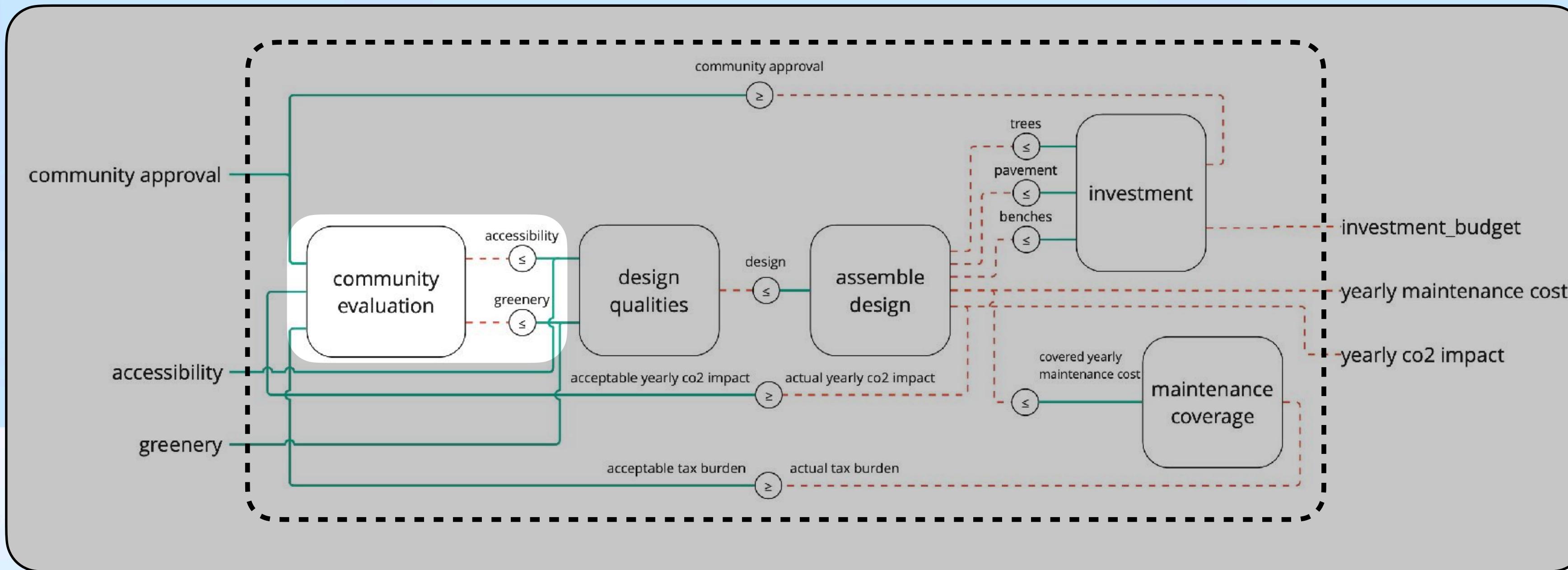


accessibility
greenery

~ shortness of crossings + benches + pavements + grass
~ trees * (adjacent benches + pavements) + grass



Design Problem



greenery and accessibility are always between 0 and 1

quality = required greenery * required accessibility

disapproval_per_co2_kg = 0.005 [dimensionless]

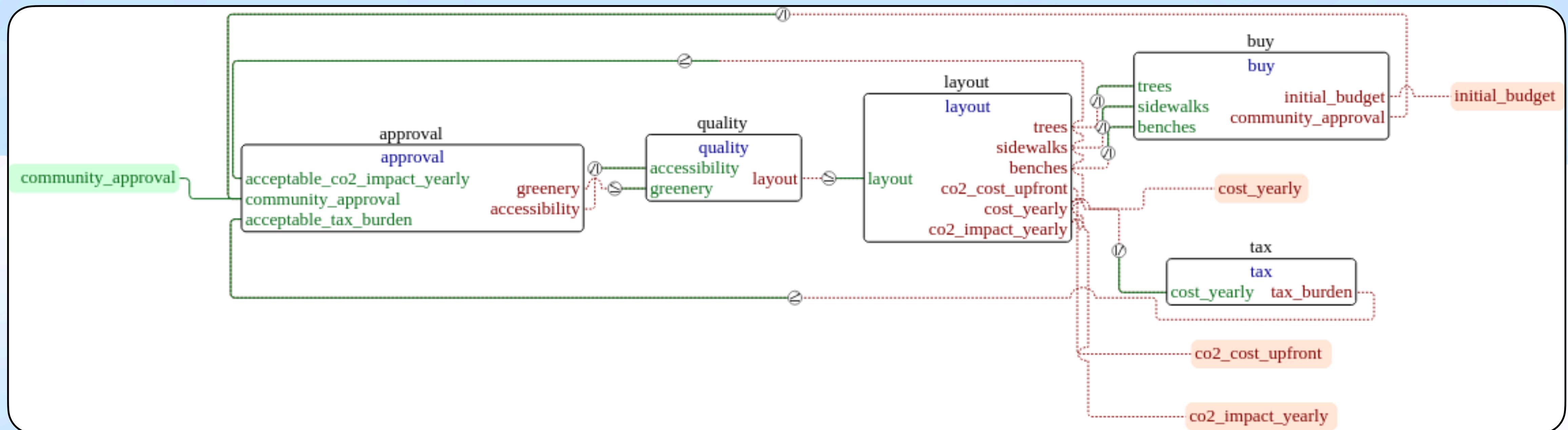
co2_disapproval = disapproval_per_co2_kg * provided acceptable_co2_impact_yearly

disapproval_per_dollar = 0.01 [dimensionless/\$]

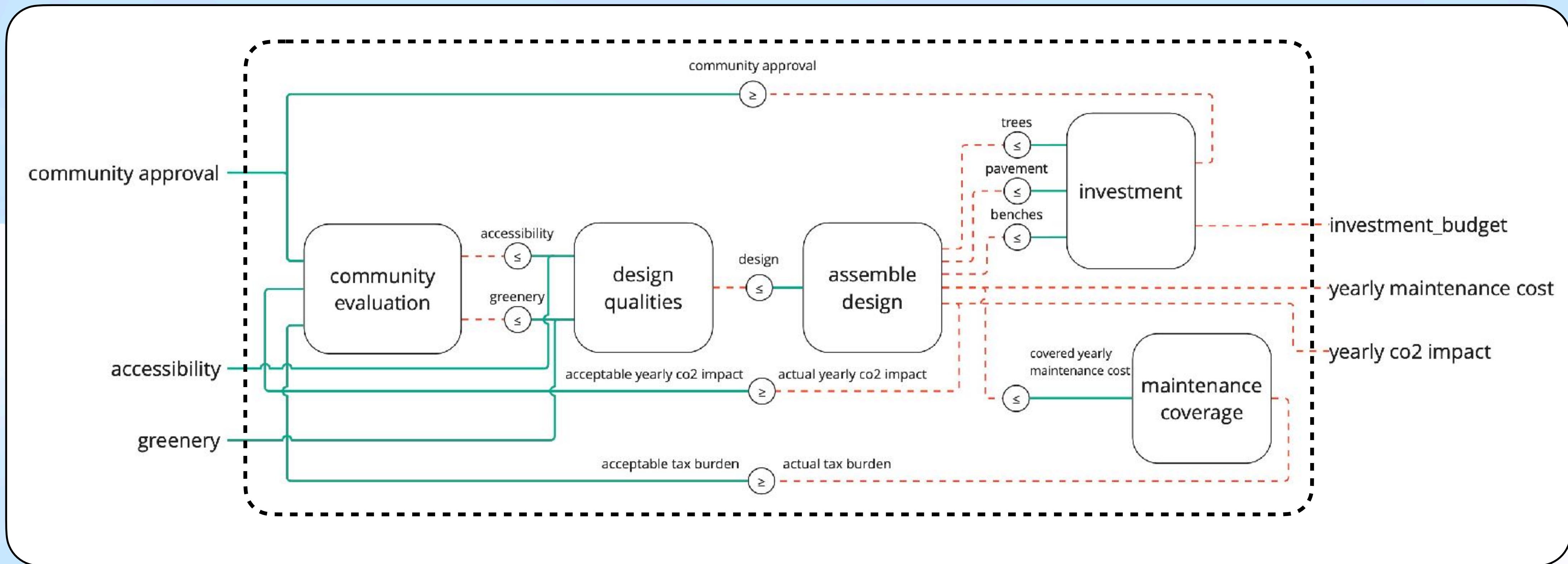
tax_disapproval = disapproval_per_dollar * provided acceptable_tax_burden

provided community_approval + tax_disapproval + co2_disapproval <= quality

Design Problem



Design Problem



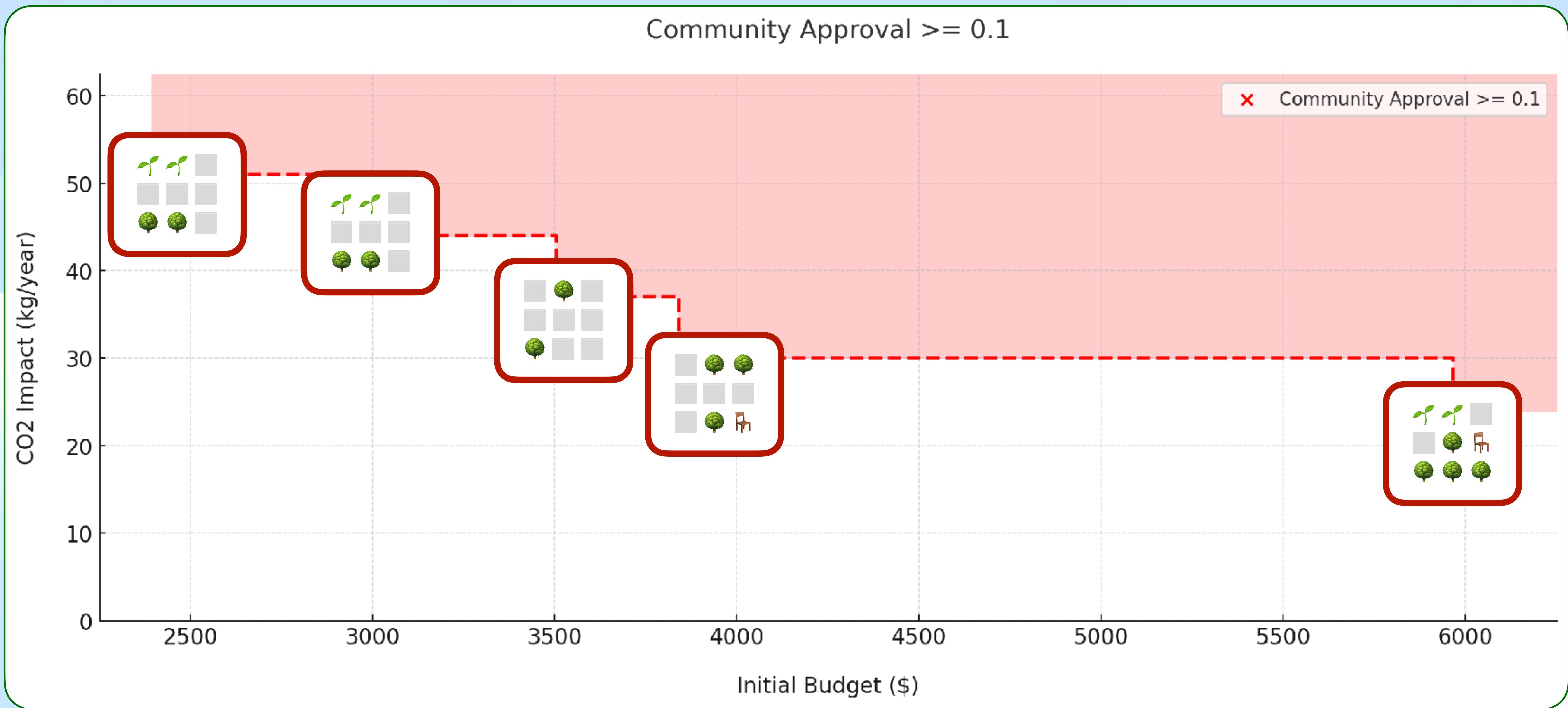
Composable Life

Composed Life



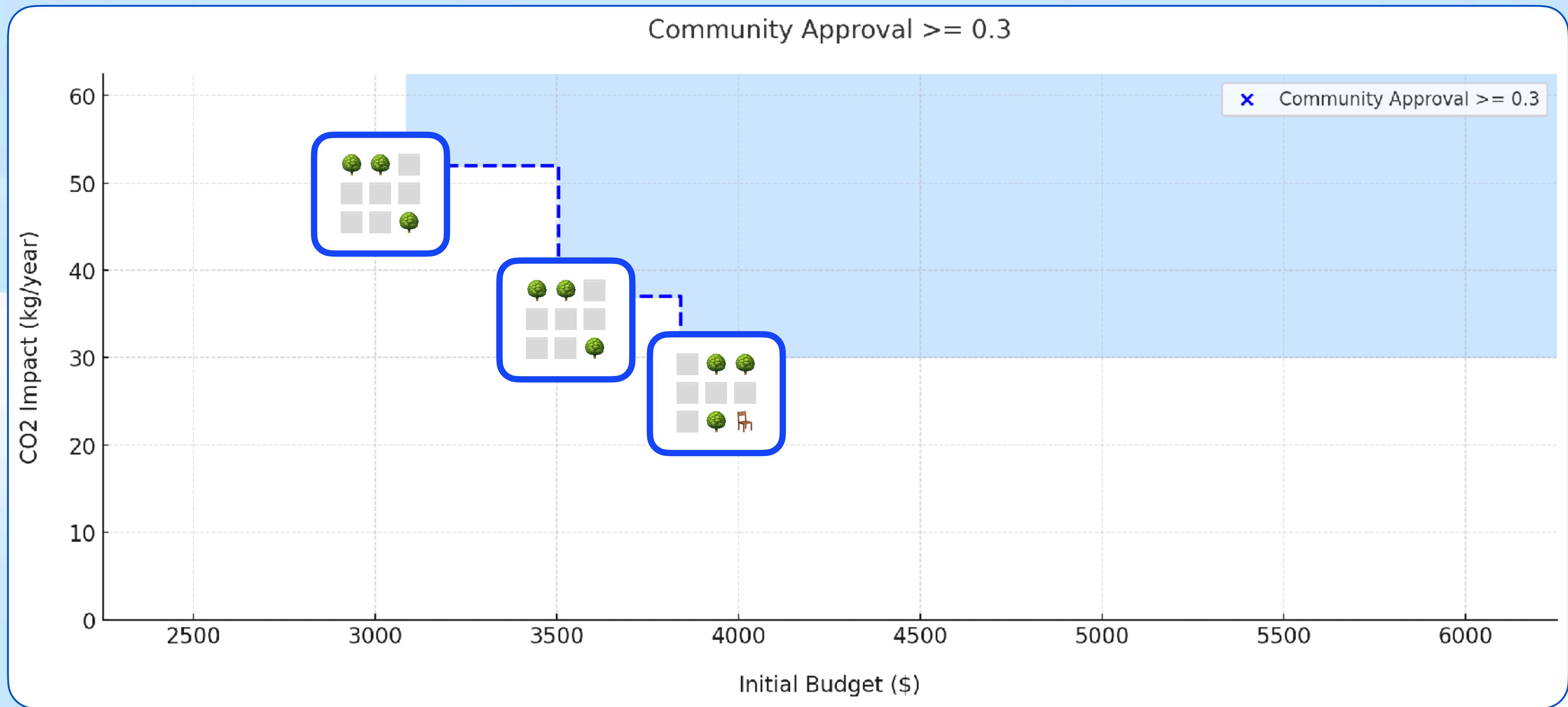
Results

200 designs with through-cutting paths
200 designs without



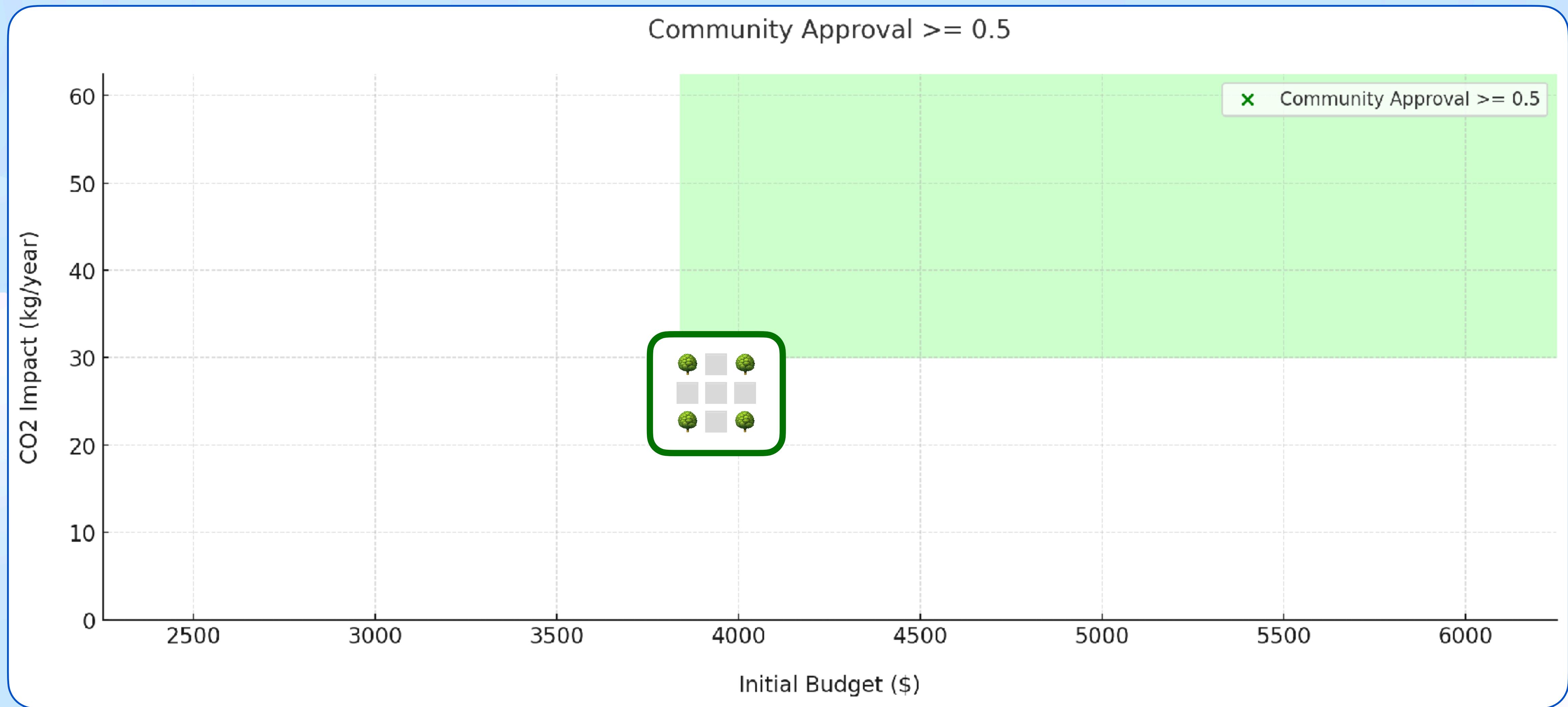
Results

200 designs with through-cutting paths
200 designs without



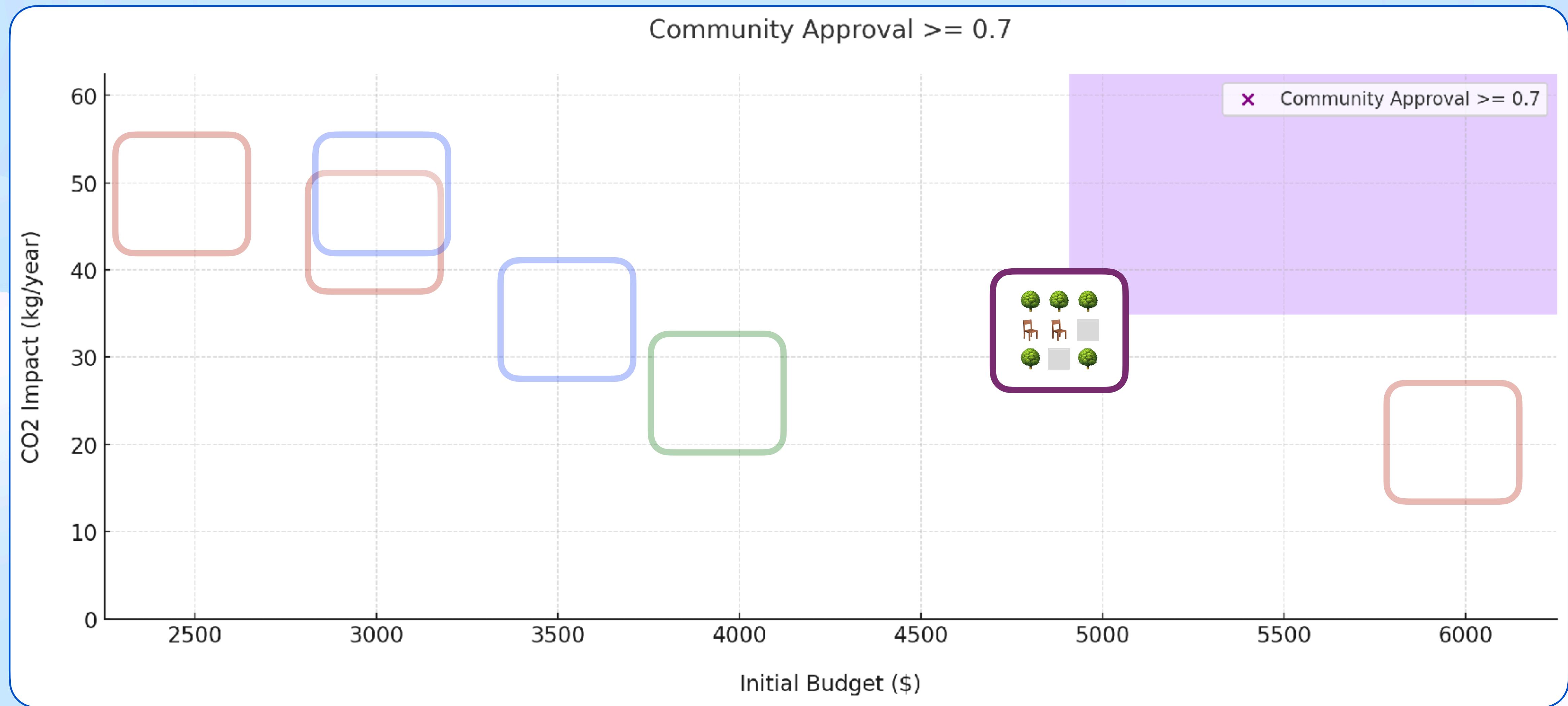
Results

200 designs with through-cutting paths
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Results

200 designs with through-cutting paths
200 designs without



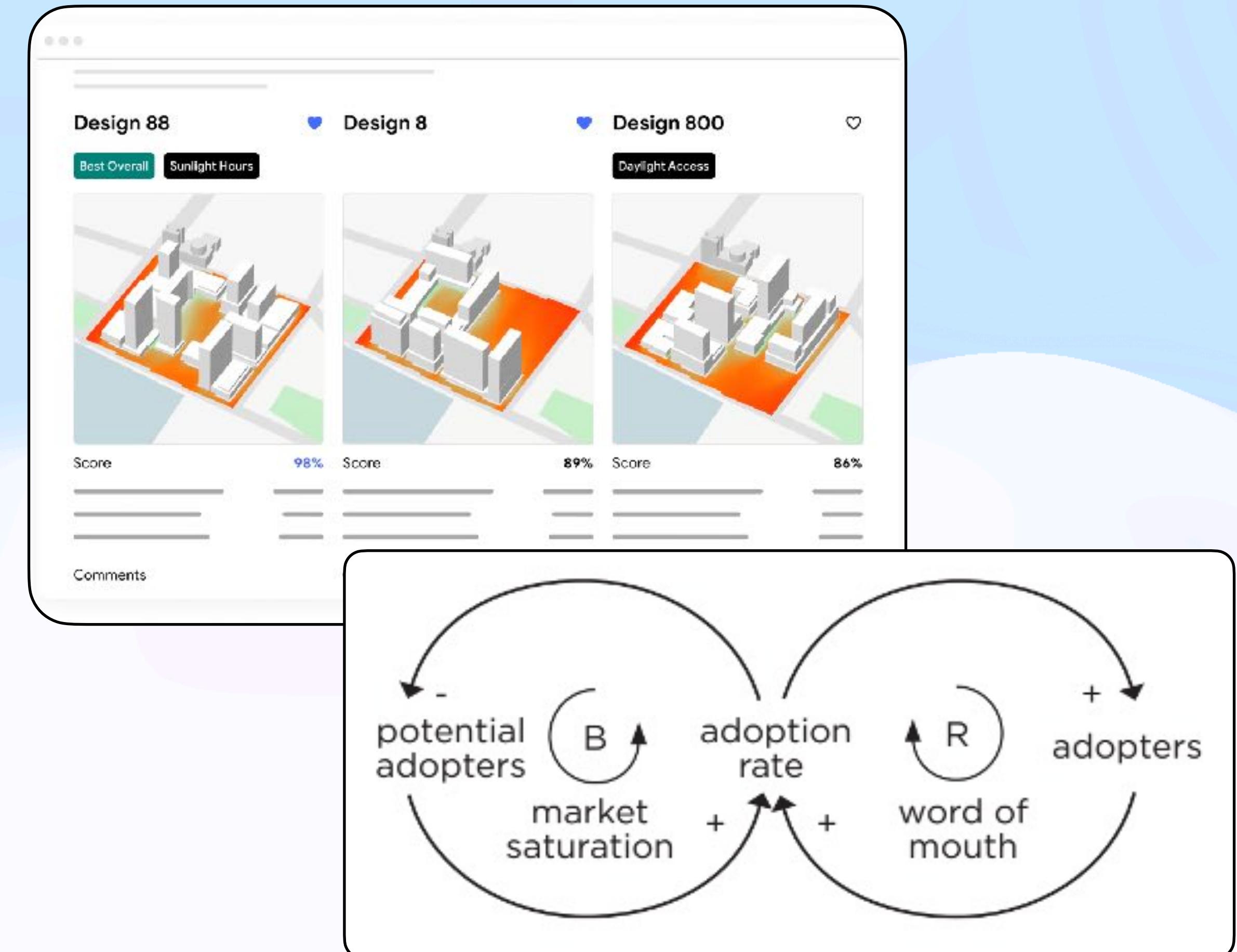
Composed Life



Thoughts

Thought 1: Computational System Design

- Improve poset leveraging in design layouts—enable more complex grids
- Parametric co-design?
- Co-design or category theory subsume System Dynamics?



Thought 2: Values → Posets

- Anything that matters exists in a poset?
- `provided community_approval + tax_disapproval + co2_disapproval <= required accessibility * required greenery`
- Posets to improve communication about and designing for good outcomes? Policy design?
- Potentially related to Spivak's Plausible Fictions
- Collaborative games for co-design

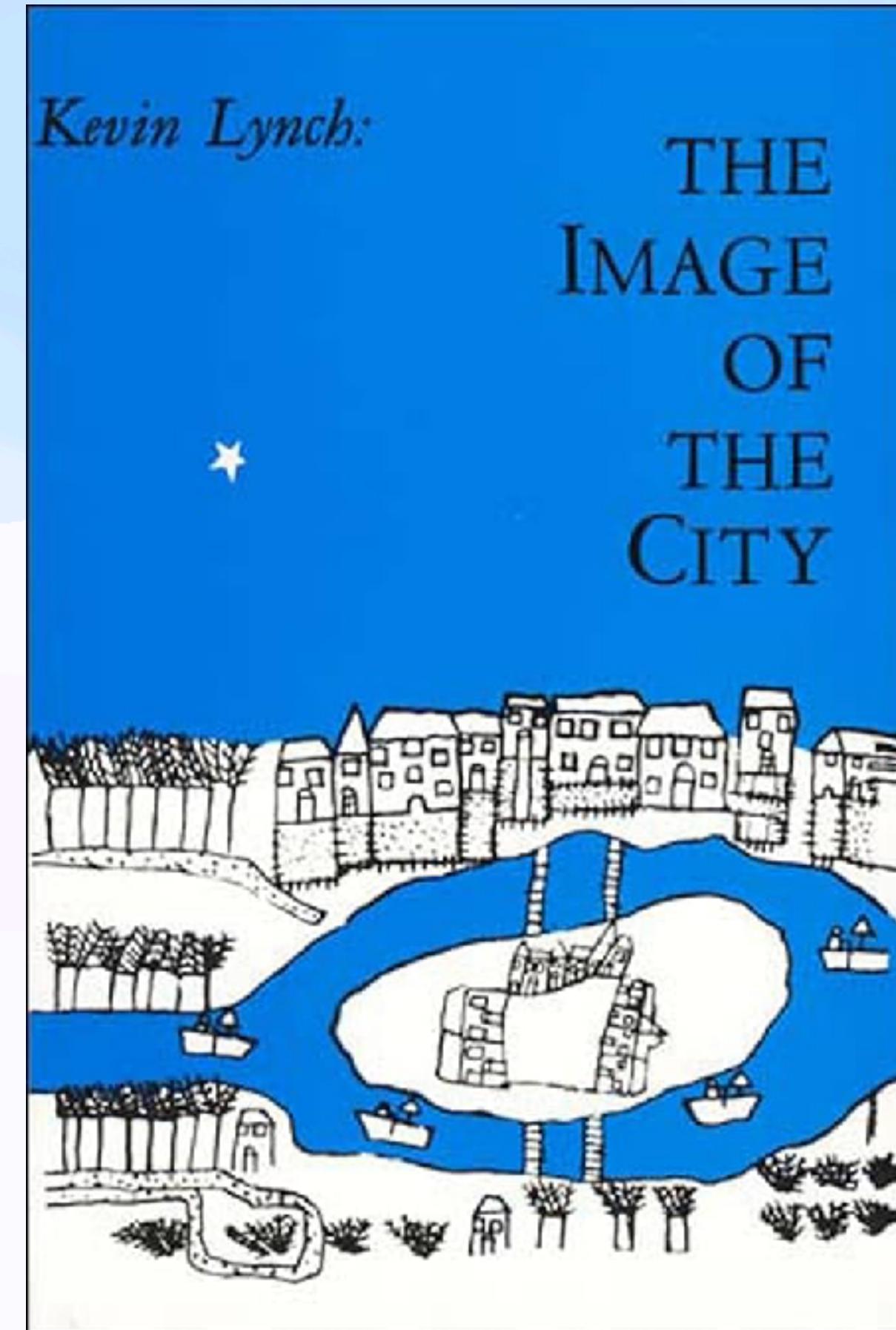
Wonderful

Great

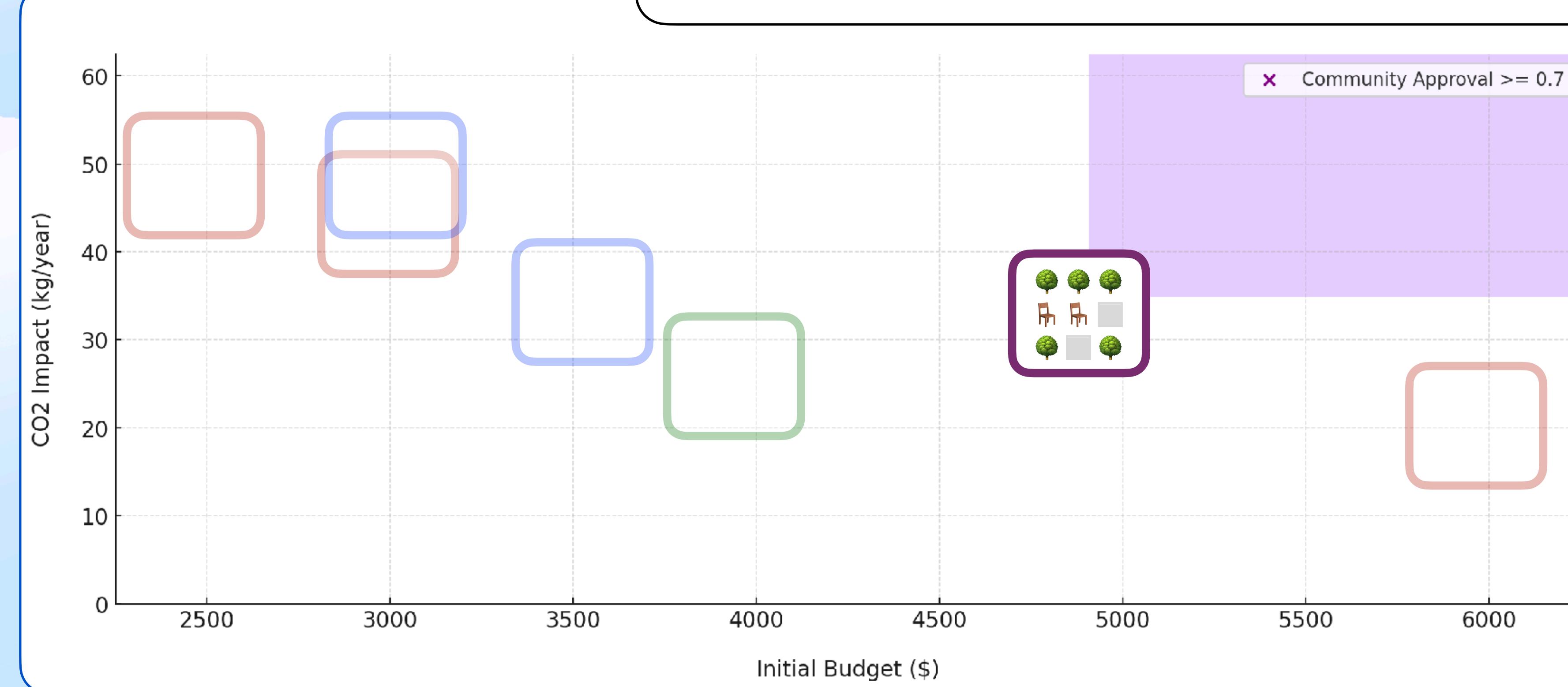
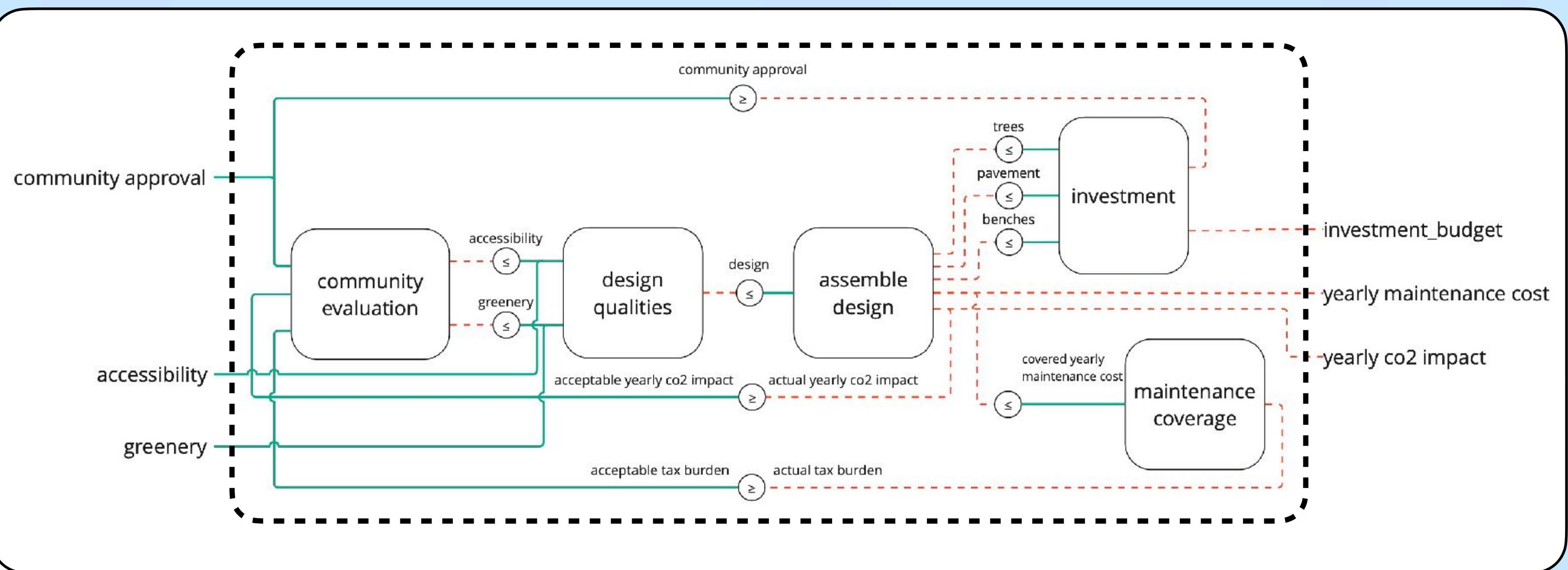
Good

Thought 3: Composing the City

- The Category of the City
- What are the functionalities provided and resources required by businesses?
Transportation? Zoning?
- Are there interfaces (posets) that would be useful to standardize? Might we find surprising connections?
- Spatial co-design



Composable Life of Partially Ordered Spaces



Questions?

Design Problem

