City Rhythm

From reality to data and back

19 June 2017

Workshop

From reality to data and back

- Working towards September workshops
- How does this model apply to our project?
- Neighborhoods vs. Grids
- Validation of the model
  - Presentation of preliminary findings (grid X)
  - Per finding
    - Do you recognize your neighborhood?
    - Discussion of usefulness for policy making: what do you like / what do you miss?

Working towards September workshops

Validation workshops

- Today: dry run
  - How does this model apply to our project?
  - Show preliminary results of the model
  - Exemplary neighbourhood in Amsterdam
  - Feedback and evaluation

- September: validation of the model and outputs in 6 workshops
  - Do you recognize your neighbourhood?
  - What do you like / what do you miss?
  - Is this useful for policy making?

- How will this work?

Working towards September workshops

Validation workshops

Who will be part of the workshops?

- Participants who work or are active in the neighborhood
- Participants who are ready to work with other disciplines in order to improve social cohesion
    - Citizens
    - Welfare and healthcare professionals
    - Shop associations and local entrepreneurs
    - Etc.

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How does this model apply to our project?

Can we use this model to analyze a neighborhood?

- Research idea: identify and analyze rhythm in neighborhoods using data
- Neighborhoods and their dynamics are very complex systems (not observable)
  - Example: Holendrecht
- Difficult to pinpoint causal relationships between everything that's happening
  - Not only looking at change in %elderly but entire development of neighborhood
- HMM is able to capture underlying factors of such dynamics in *(hidden) states*
  - Hidden states are not visible, only their output is
  - HMM show patterns within and across neighborhoods and time
  - Especially useful with large datasets when not all characteristics can be tracked separately
- Movement through hidden states represents the rhythm of a neighborhood

How does this apply to our project?

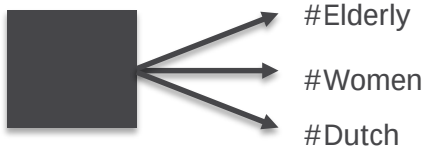
Hidden States

Recap: HMM assumes that the data we observe is *generated* by a number of states

What does this actually mean?

- Data we observe (per area):
  - #elderly/children, #women/men, #Dutch
  - Years 2011 - 2014

- States generate data
  - Black box of variables affect characteristics of a neighborhood (#elderly, #women, etc.)
  - For simplicity, think of states as characteristics of a neighborhood: how does the neighborhood look like?



We want to find black boxes that affect “our” neighborhood.

How do other neighborhoods compare and how is that useful?

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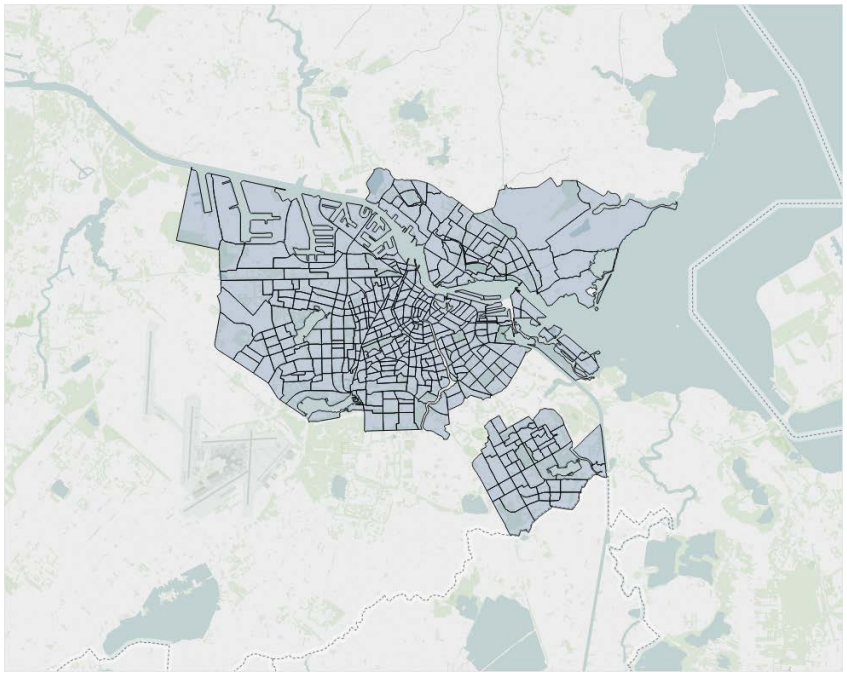
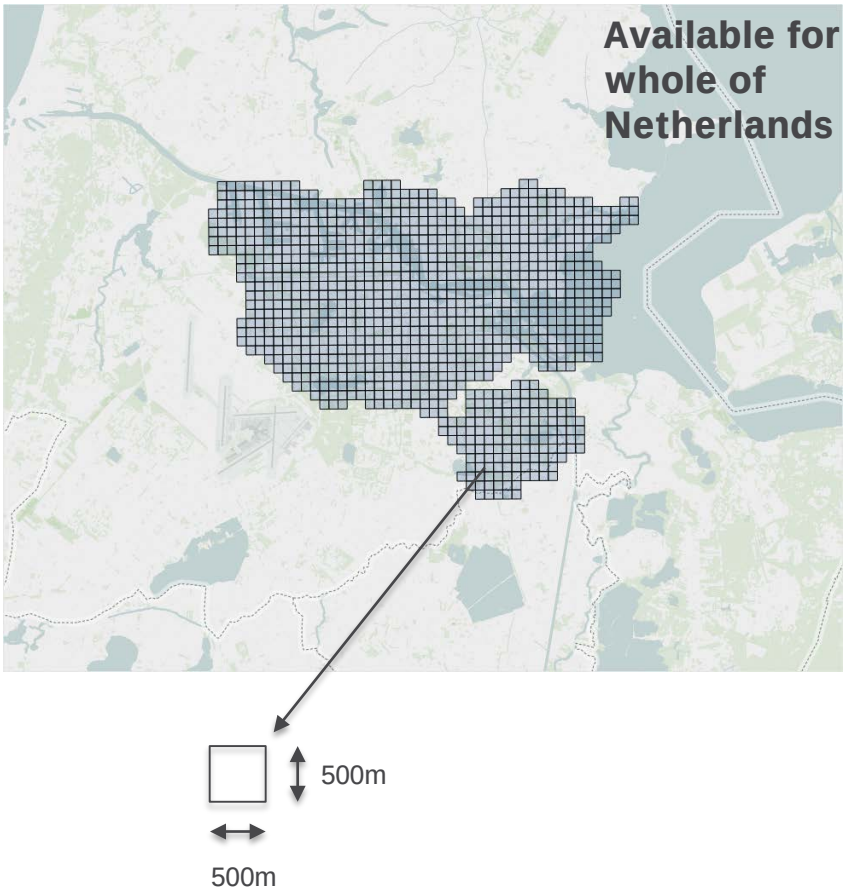
Neighborhoods vs. Grids

~480 neighborhoods and ~1,000 grids

Amsterdam in neighborhoods



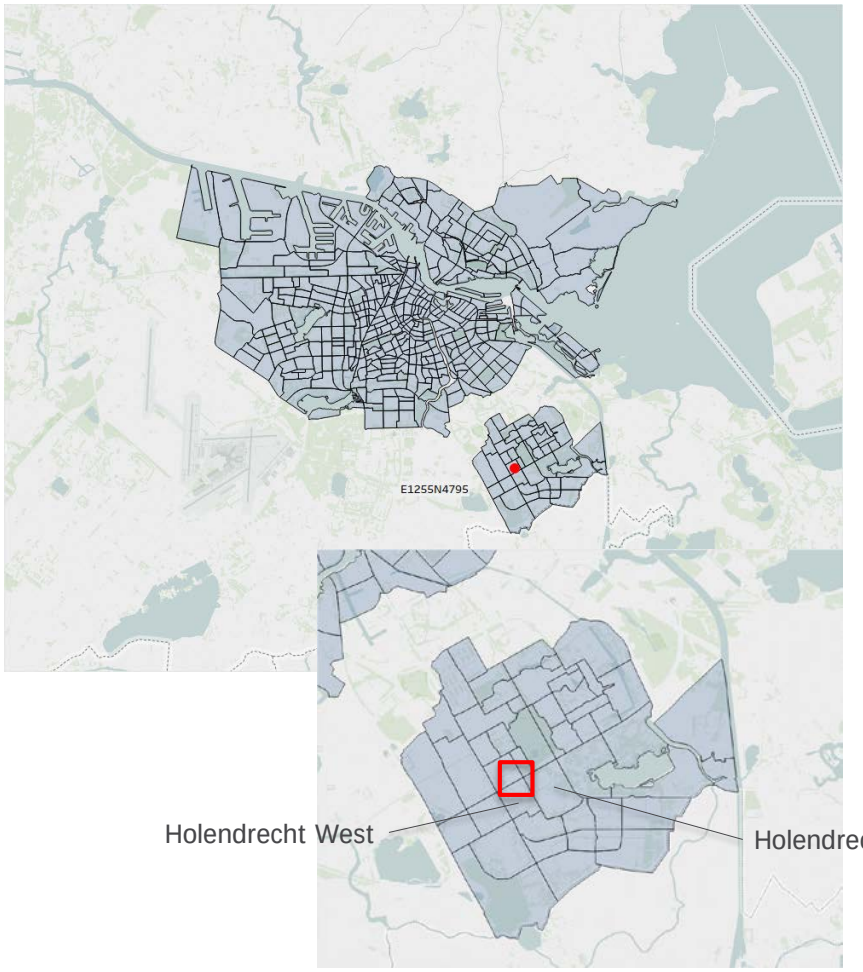
Amsterdam in grids



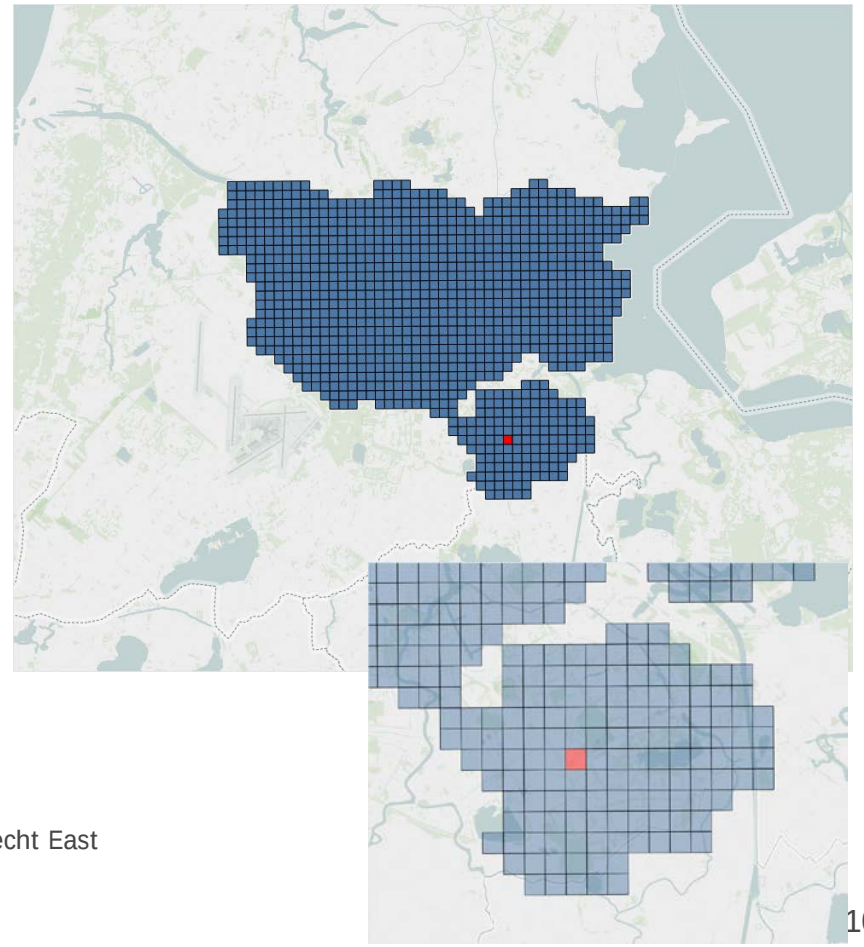
Neighborhoods vs. Grids

Focus on Grid X in Zuidoost

Amsterdam in neighborhoods



Grid X in Amsterdam



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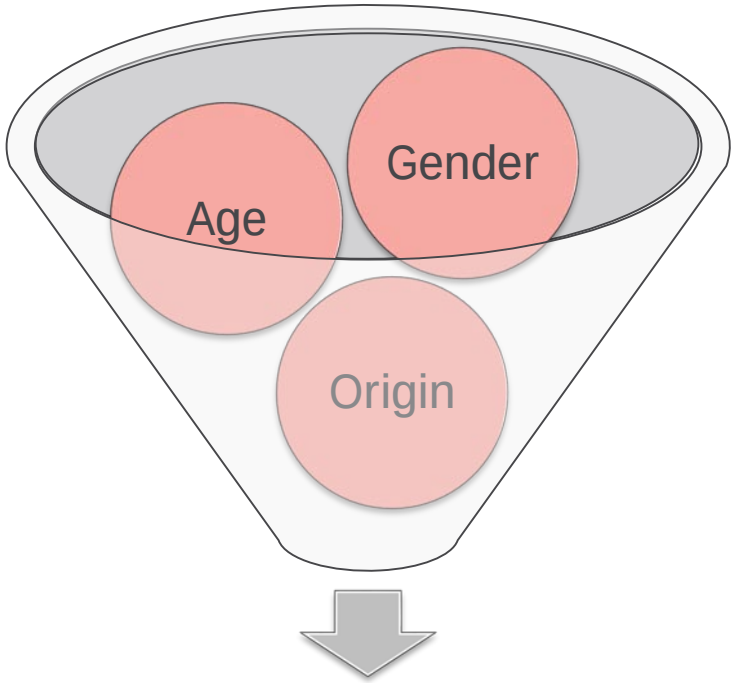
Presentation of preliminary findings

Input: data over time on the following characteristics

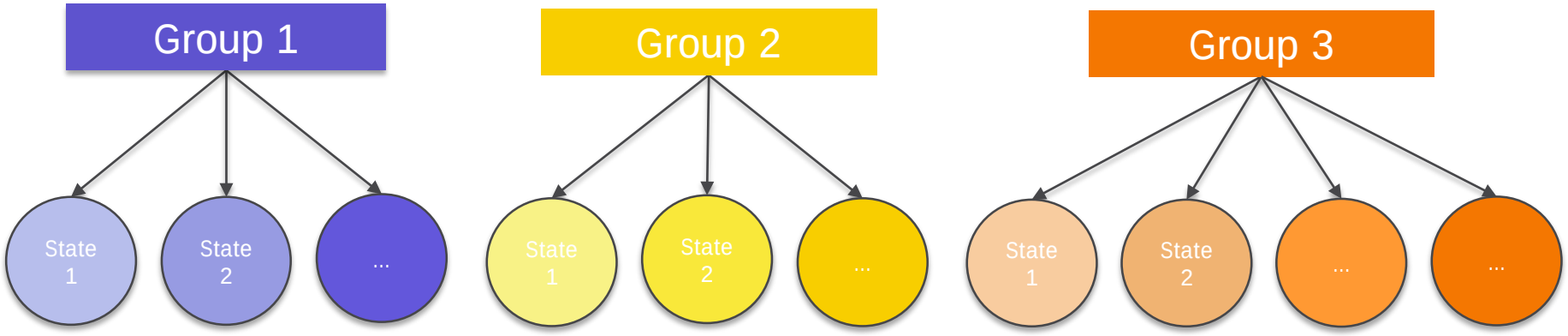


Output: the model will find states which explain the above

Division of grids into three groups

Based on similarity

By dividing grids in three groups, we receive states that better explain their differences



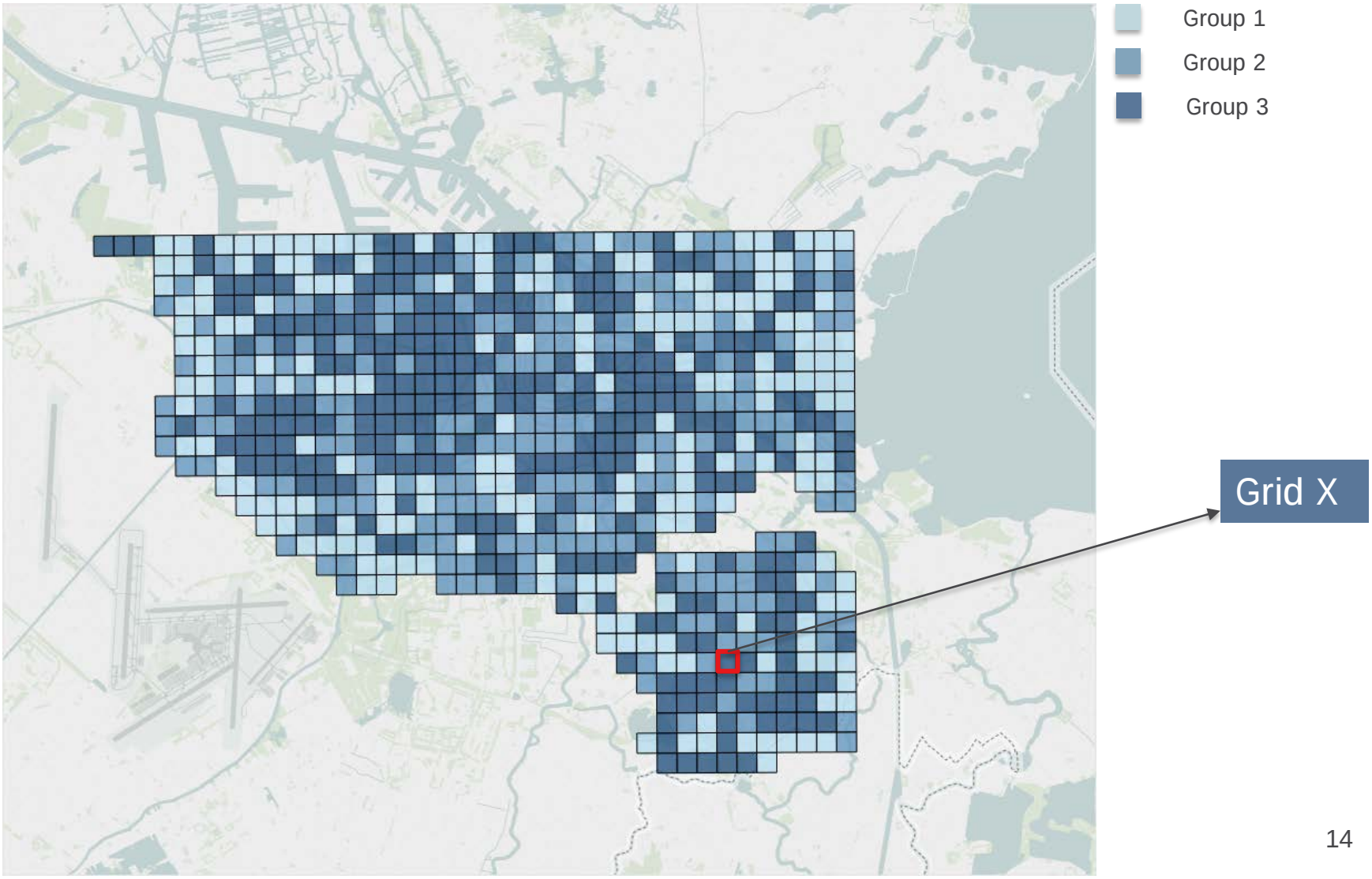
Grids can be grouped by

- Location
- Land use
- Nature

For now: grids that are close to each other are likely to be in same group

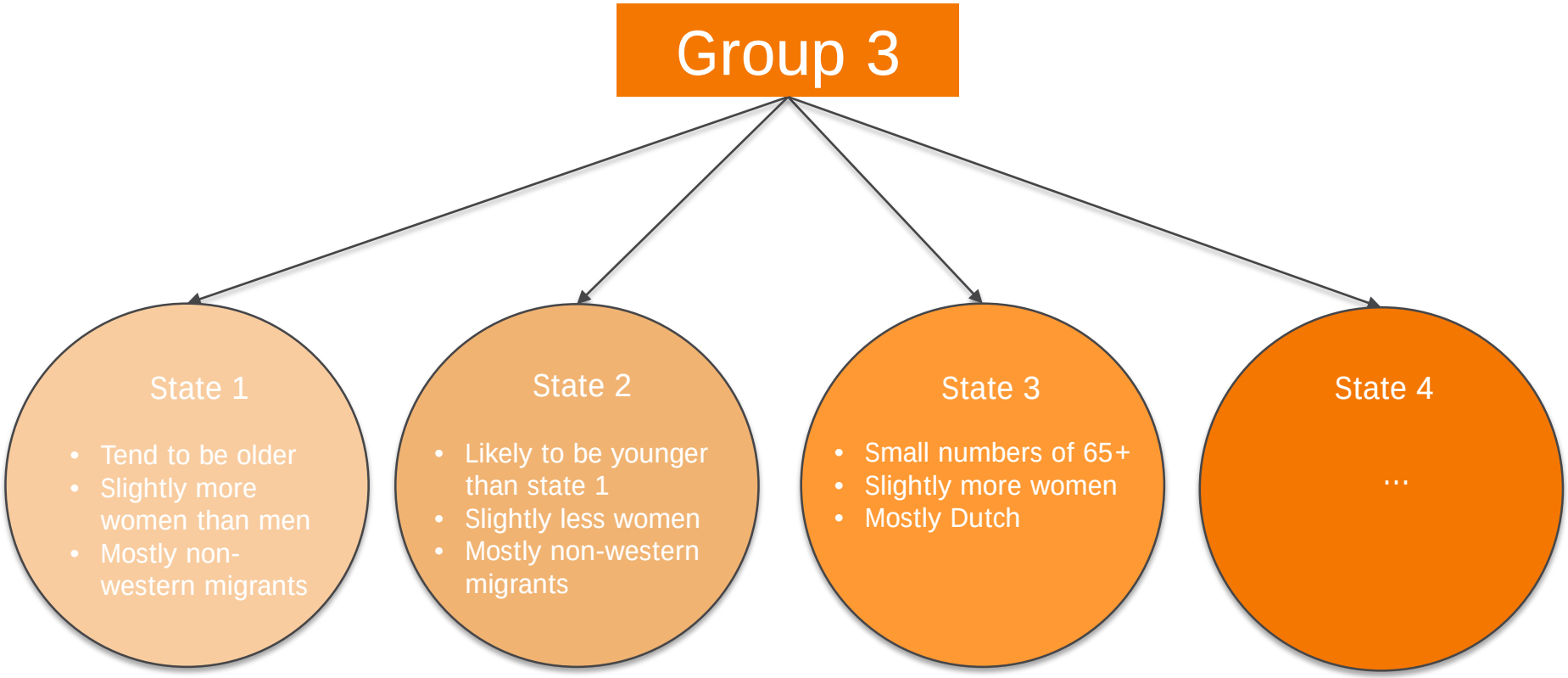
Which group does grid X belong to?

And which grids belong to the same group?

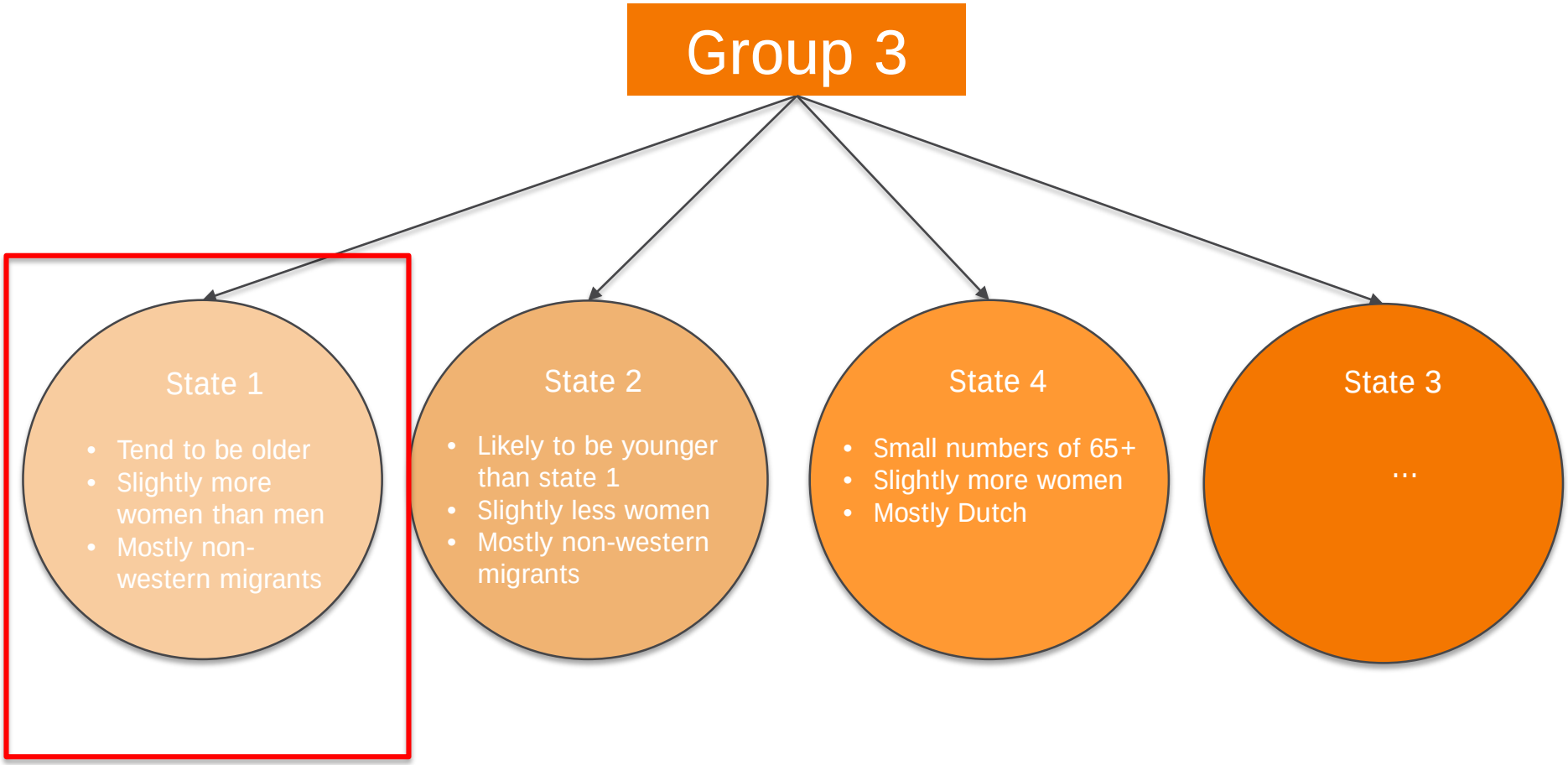


What does it mean to be in group 3?

Which states affect which characteristics in our neighborhood?



What are the characteristics of grid X now?

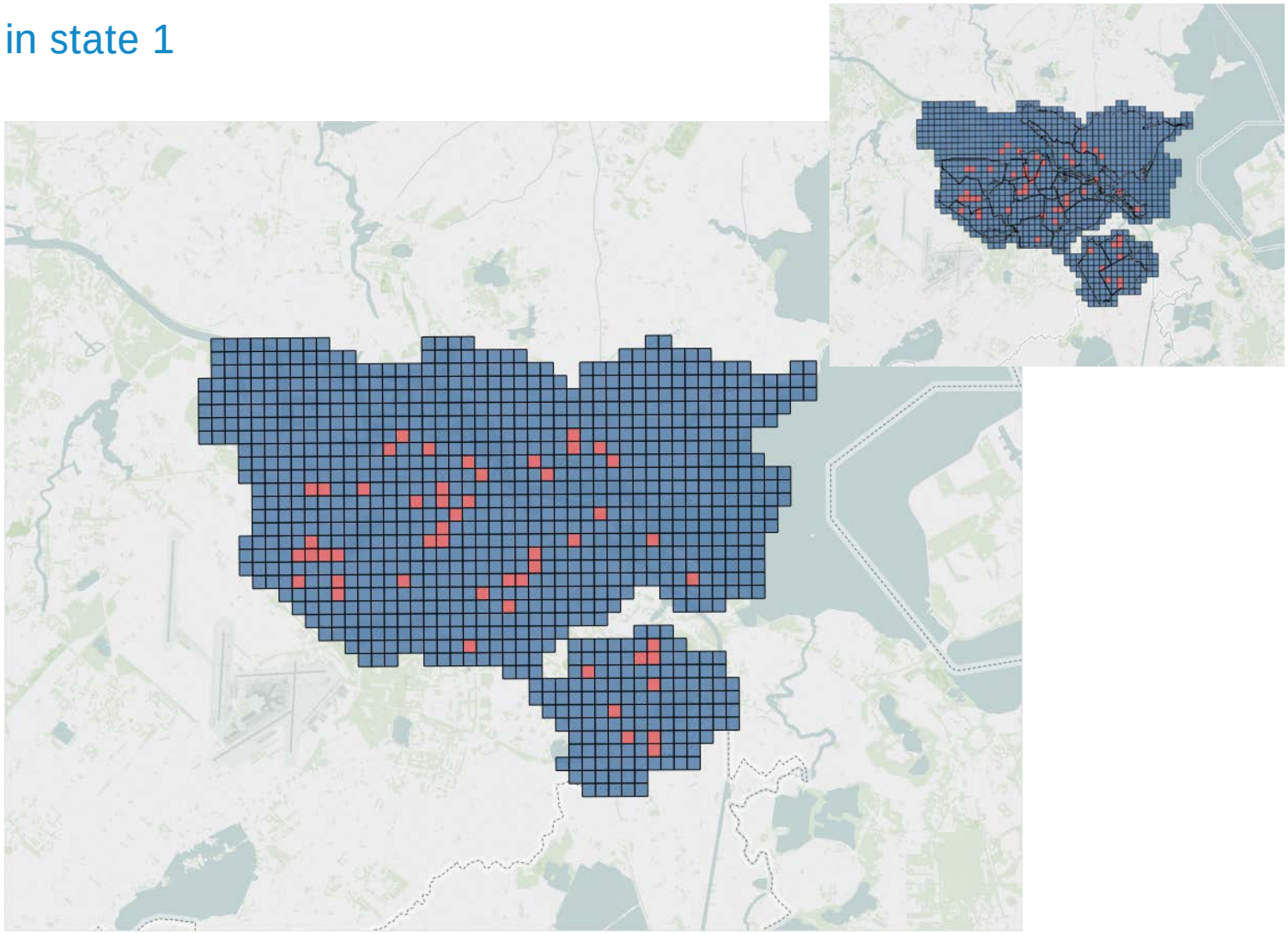


Validation

- Do you recognize your neighborhood in this?
- What do you like / what do you miss?

Which grids are similar in Amsterdam?

Other grids in state 1

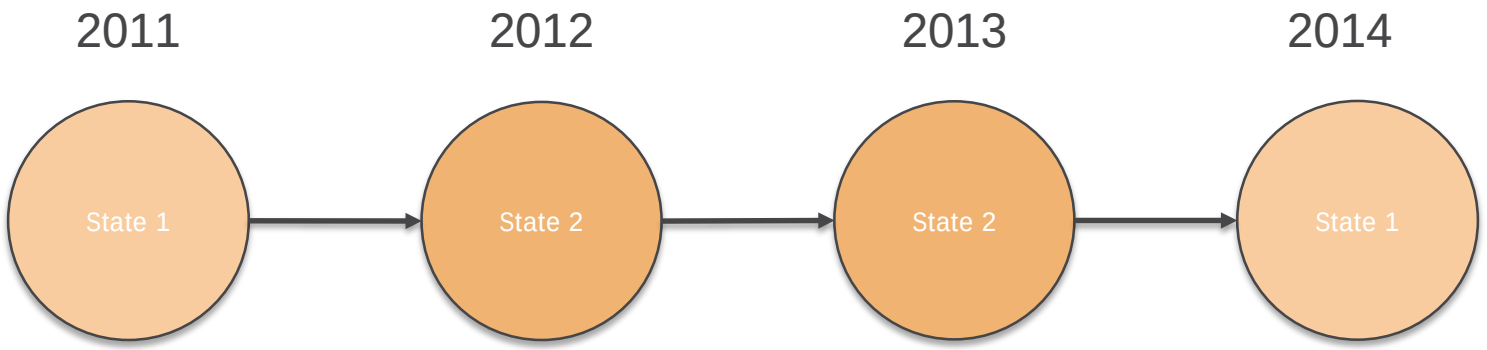


Validation

- Do you recognize your neighborhood in this?
- What do you like / what do you miss?

What transitions has grid X gone through?

Rhythm in change



- Tend to be older
- Slightly more women
- Mostly non-western migrants

- Likely to be younger than state 1
- Slightly less women
- Mostly non-western migrants

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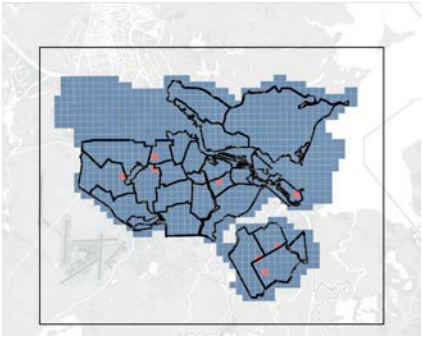
Big datasets over more time periods lead to diverse rhythms in neighborhoods.

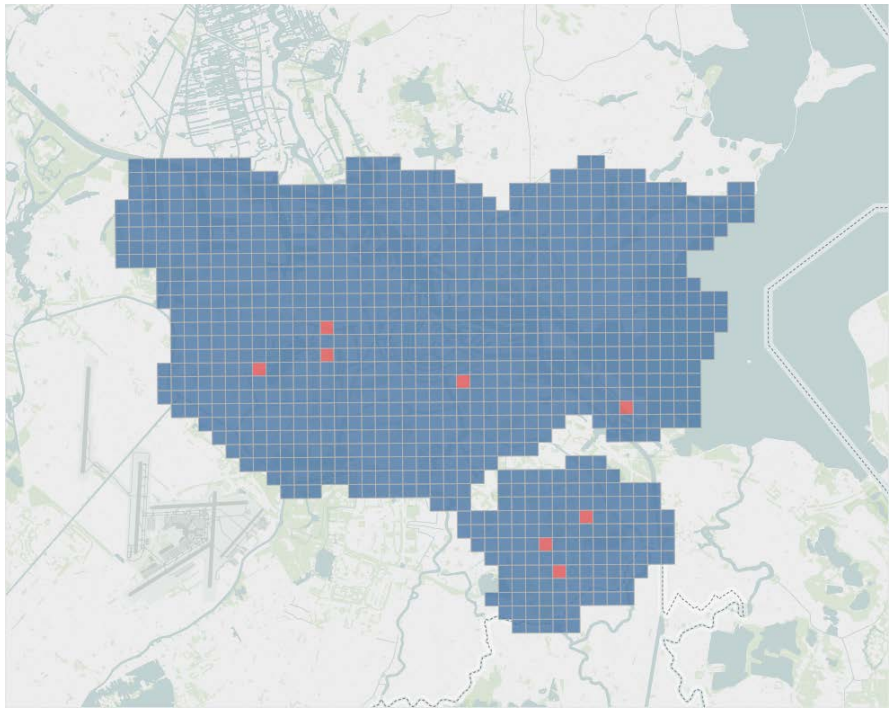
Validation

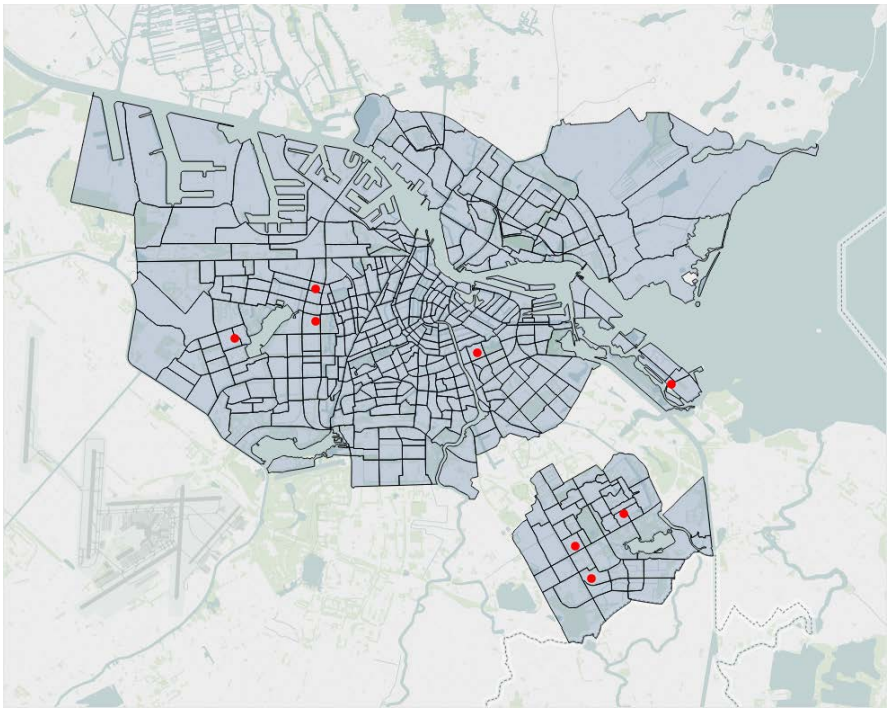
- Do you recognize your neighborhood in this?
- What do you like / what do you miss?

Which grids have similar history?

Movement through similar states



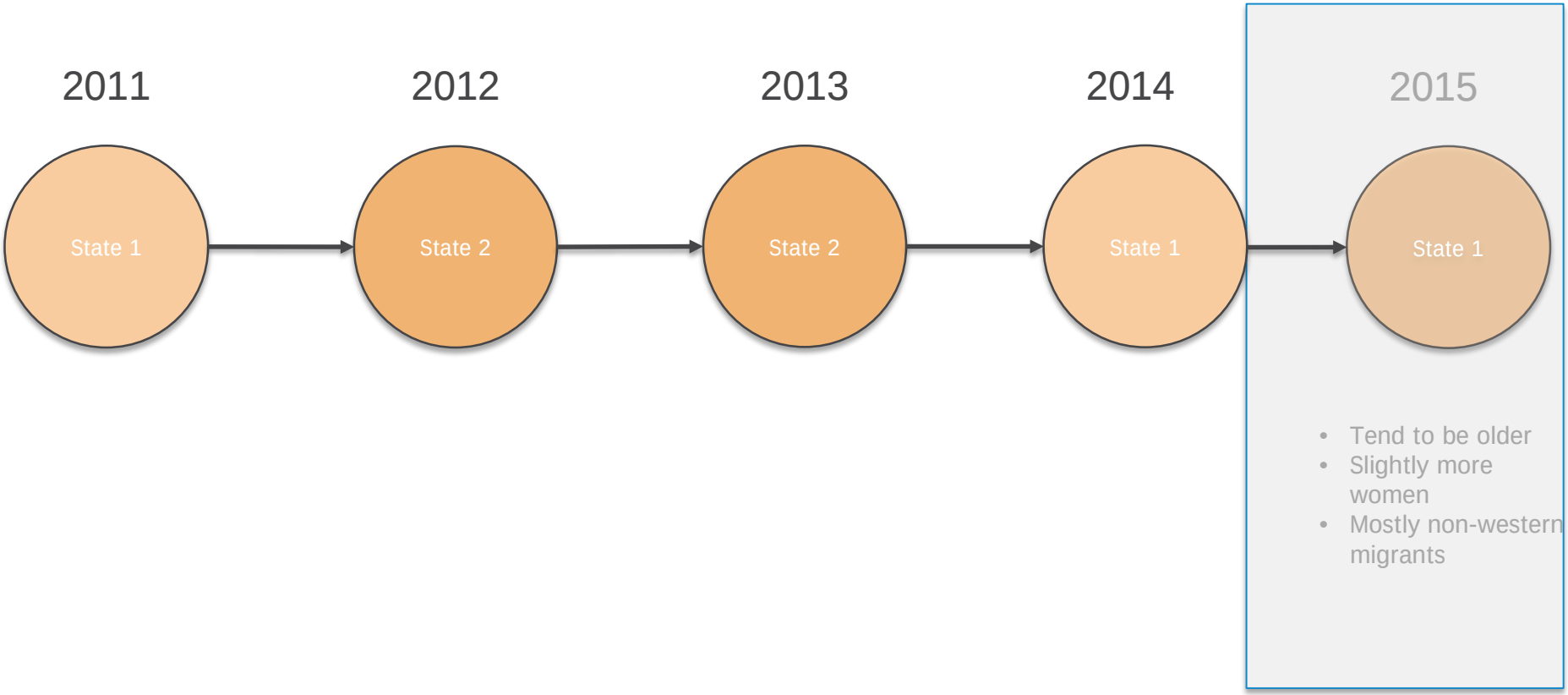




- In total 8 grids in Amsterdam with similar state sequence
- Are they actually comparable?

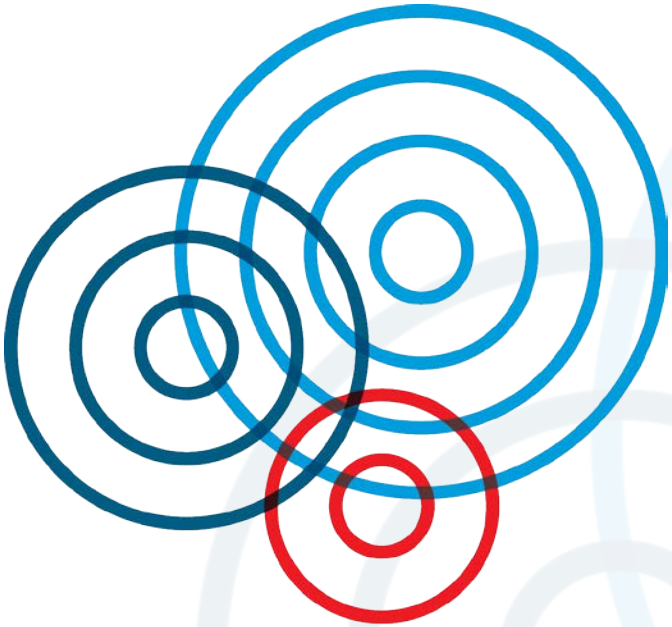
What can we learn from their history?

Future transition



Validation

- Do you recognize your neighborhood in this?
- What do you like / what do you miss?



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