

Capire le città con i big data

Bruno Lepri (FBK)



Some cities are alive, others less so



How do we capture
death & life of cities?



The systematic acceleration of urban life

 Social
human-interactions

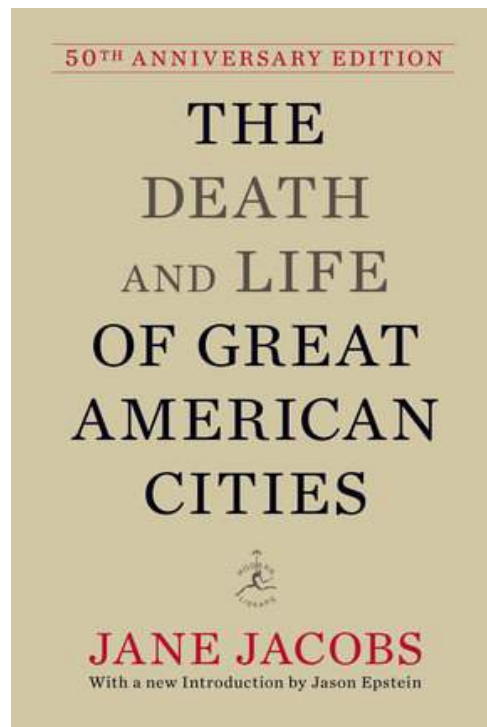
 Economical
GDP, wages, patents

 Issues
violent crimes, contagious diseases, pollution

- Bettencourt, Luís MA, et al. "Growth, innovation, scaling, and the pace of life in cities." PNAS 104.17 (2007): 7301-7306.

- Milgram, Stanley. "The experience of living in cities." Crowding and behavior 167 (1974): 41.

The theory: Jane Jacobs

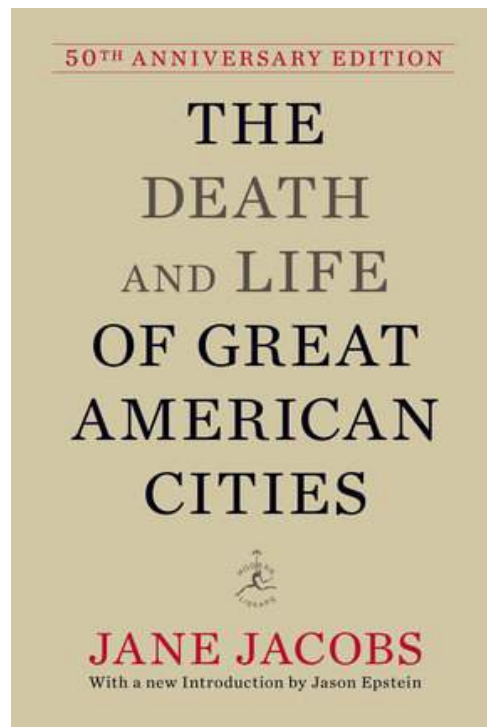


One of the **most** influential books in city planning

- planning models that dominated mid-century planning
- American housing policy (HOPE VI)
- Melbourne, Toronto etc.

Klemek, C. (2011) 'Dead or Alive at Fifty? Reading Jane Jacobs on her Golden Anniversary' *Dissent*, Vol. 58, No. 2, 75–79.

The theory: Jane Jacobs



One of the **most** influential books in city planning

- **Death:** caused by the elimination of pedestrian activity
- **Life:** created by a vital urban fabric at all times of the day

Jacobs' diversity conditions

LAND USE	SMALL BLOCKS
AGED BUILDINGS	DENSITY

Diversity => Urban vitality

There are **4 diversity conditions**



To be ensured in each city's district (10,000+ inhabitants)

Land Use Mix

LAND USE	SMALL BLOCKS
AGED BUILDINGS	DENSITY

2+ primary uses (contemporarily)



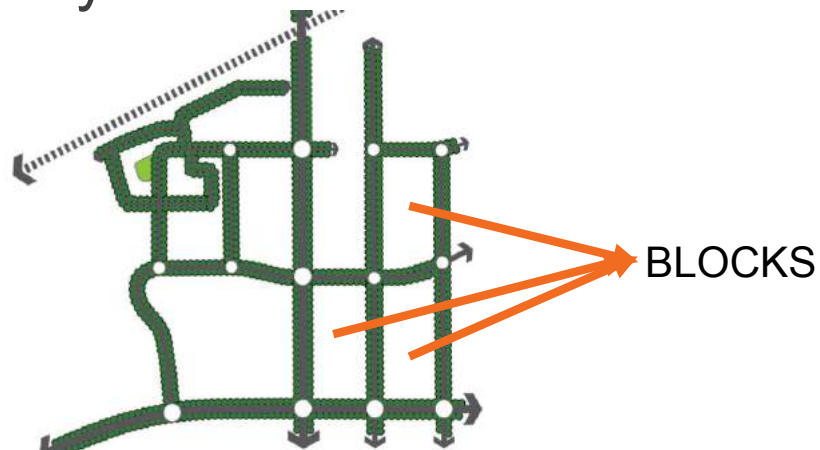
JACOBS' VIEW: People come for different purposes, continuously

EFFECT: "sidewalk ballet" and "eyes on the street"

Small blocks

LAND USE	SMALL BLOCKS
AGED BUILDINGS	DENSITY

City blocks should be small/short



JACOBS' VIEW: improves *walkability*

EFFECT: Increase face-to-face interactions

Aged buildings

LAND USE	SMALL BLOCKS
AGED BUILDINGS	DENSITY

Buildings mixed (age and types)



JACOBS' VIEW: To ensure economic diversity

EFFECT: high-/low-income residents
new/small enterprises

Density

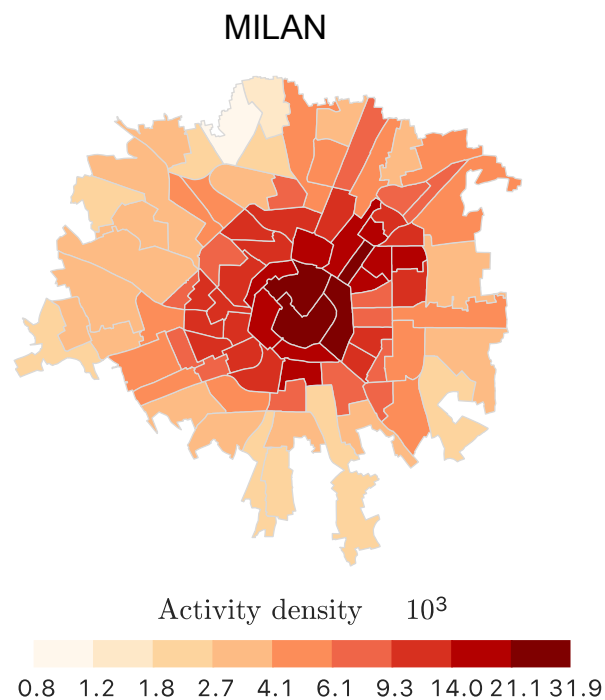
LAND USE	SMALL BLOCKS
AGED BUILDINGS	DENSITY

Concentration of people and enterprises



JACOBS' VIEW: People have a reason to live in a district
EFFECT: Attract people

“Operationalize” Vitality



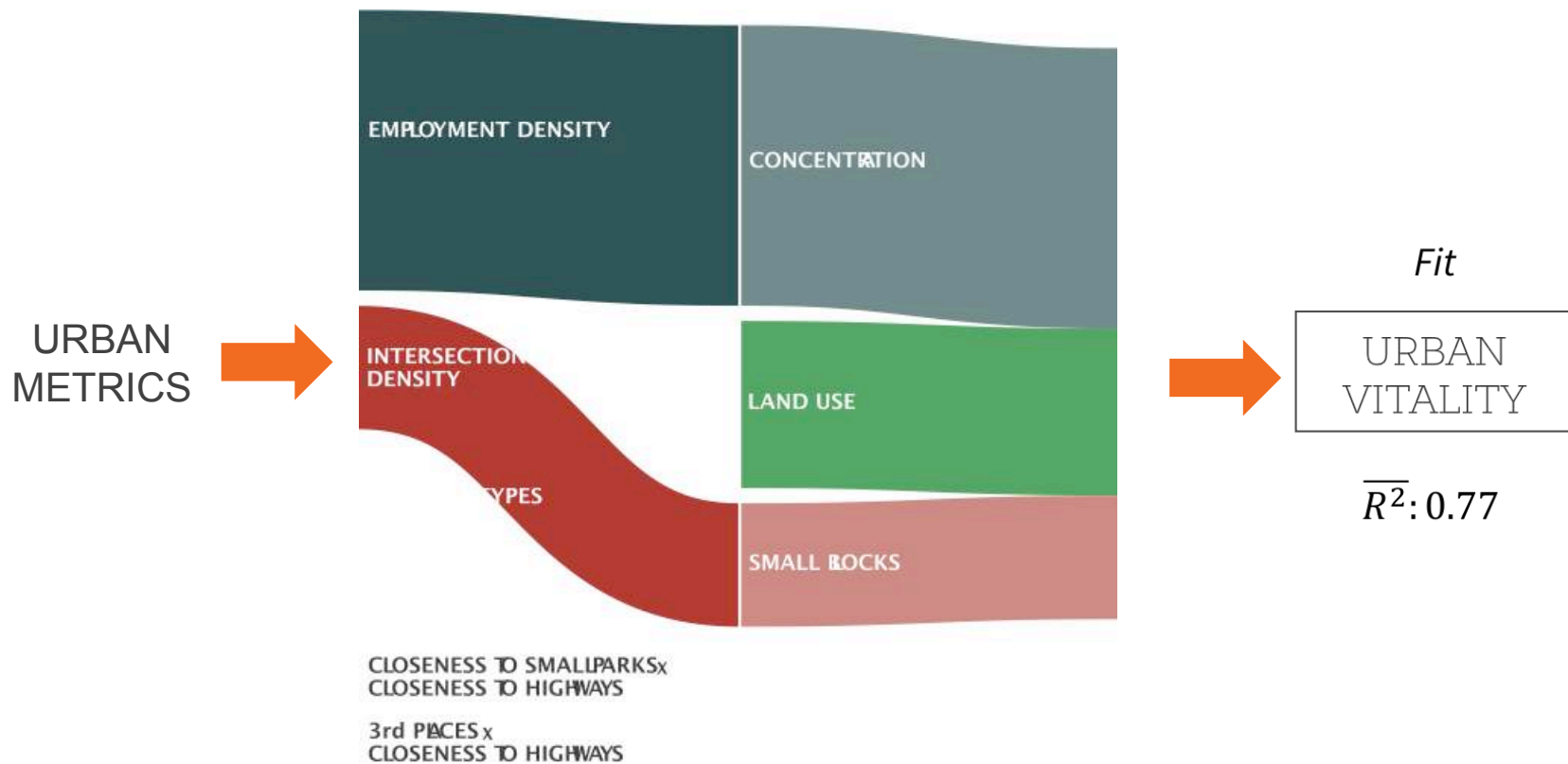
- Mobile phone Internet activity as a proxy for urban vitality
- We calculate the activity density in each district i

$$\frac{1}{|H|} \sum_{h \in H} |internet\ records_i|$$

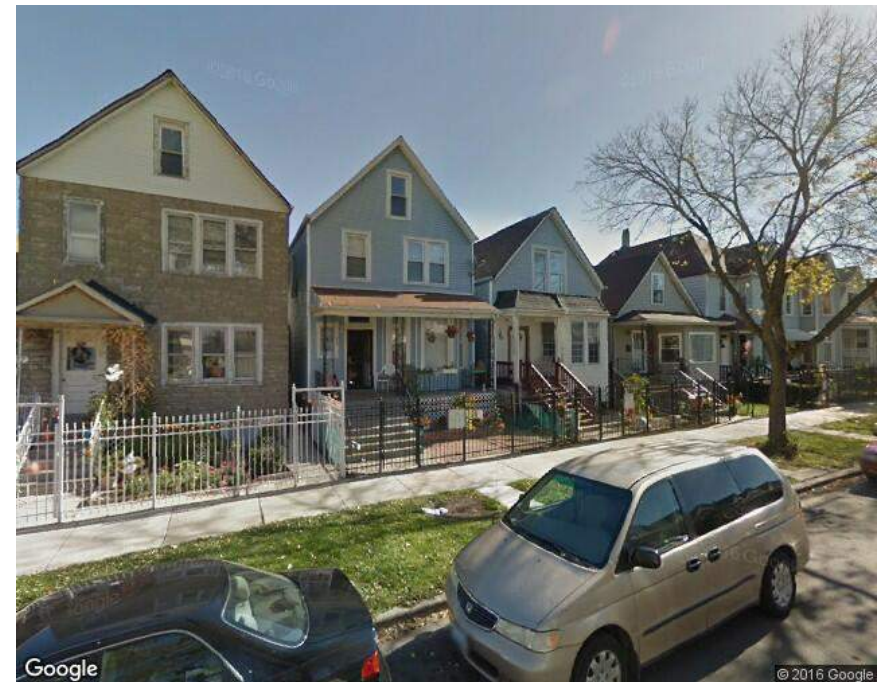
H : set of hours (180 days x 24h)

- Six Italian cities with **100,000+ inhabitants** (e.g. Rome, Milan...)
- **6 months** time span (in 2014)

Jacobs' theory holds and is still valid



Which place looks safer?



The theory: Broken Windows

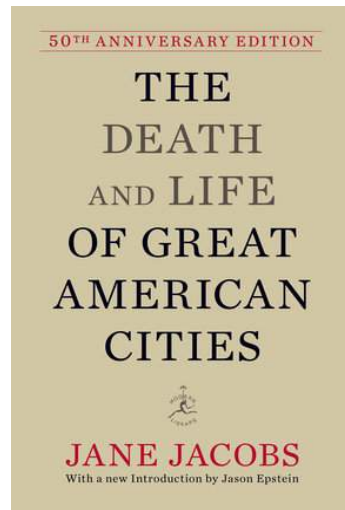


- City mismanagement
- Dirty places
- Poor infrastructure

Lead to **misbehavior** => **Crime**

Wilson, James Q., and George L. Kelling. "Broken windows." Critical issues in policing: Contemporary readings (1982): 395-407.

The theory: Jane Jacobs + Oscar Newman



Two of the **most** influential books in city planning

- Lit streets
- Street-facing windows
- Physical demarcation private-public

Klemek, C. (2011) 'Dead or Alive at Fifty? Reading Jane Jacobs on her Golden Anniversary' *Dissent*, Vol. 58, No. 2, 75–79.

The multi-modal approach

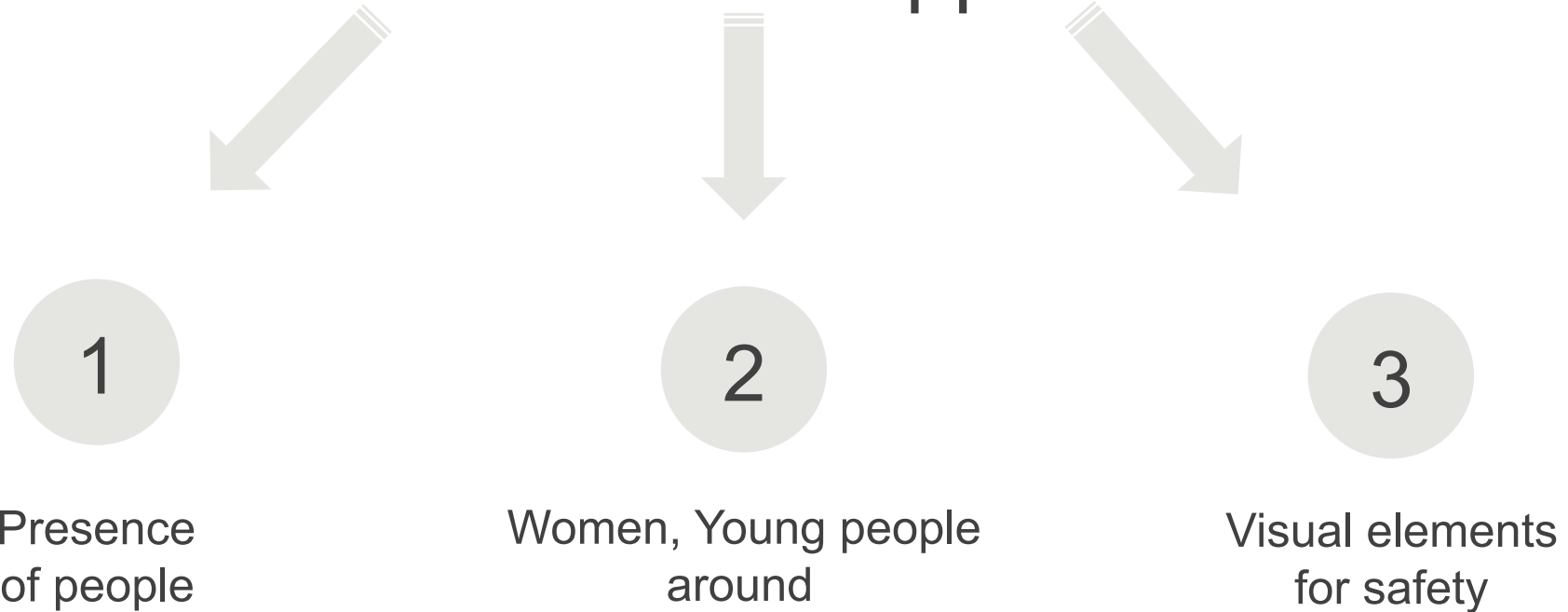


SAFETY PERCEPTION



LIVELINESS

Safety perception and liveliness a **multi-modal** approach

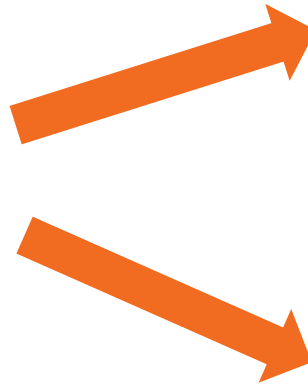


Visual elements for safety perception



HIGH SAFETY PERCEPTION

RANDOMLY OBSCURE
PART OF THE IMAGE
AND PREDICT



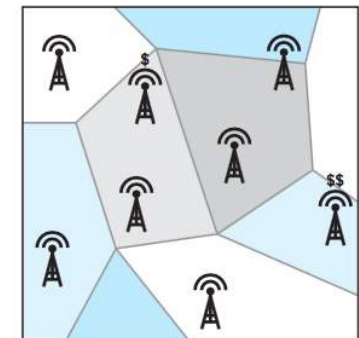
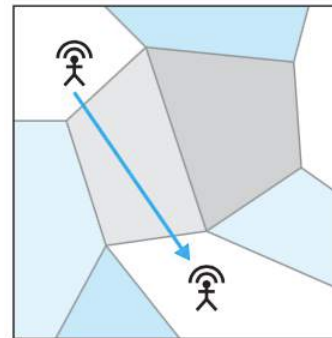
Now that we have new tools to **measure aesthetics**, we can **estimate** its consequences

...

to understand the relative **value of improving the aesthetics** of neighbourhoods

Crime in cities: Place matters – no one fits it all

- Urban fabric + Social disorganization + Mobility of people
- Boston, Bogotá, Los Angeles, Chicago
- New sources of data (Mobile phones, OSM)



Thanks!
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