Week 4

Divided Cities:
Urban Inclusion and Segregation

Timur Abbiasov, Cate Heine

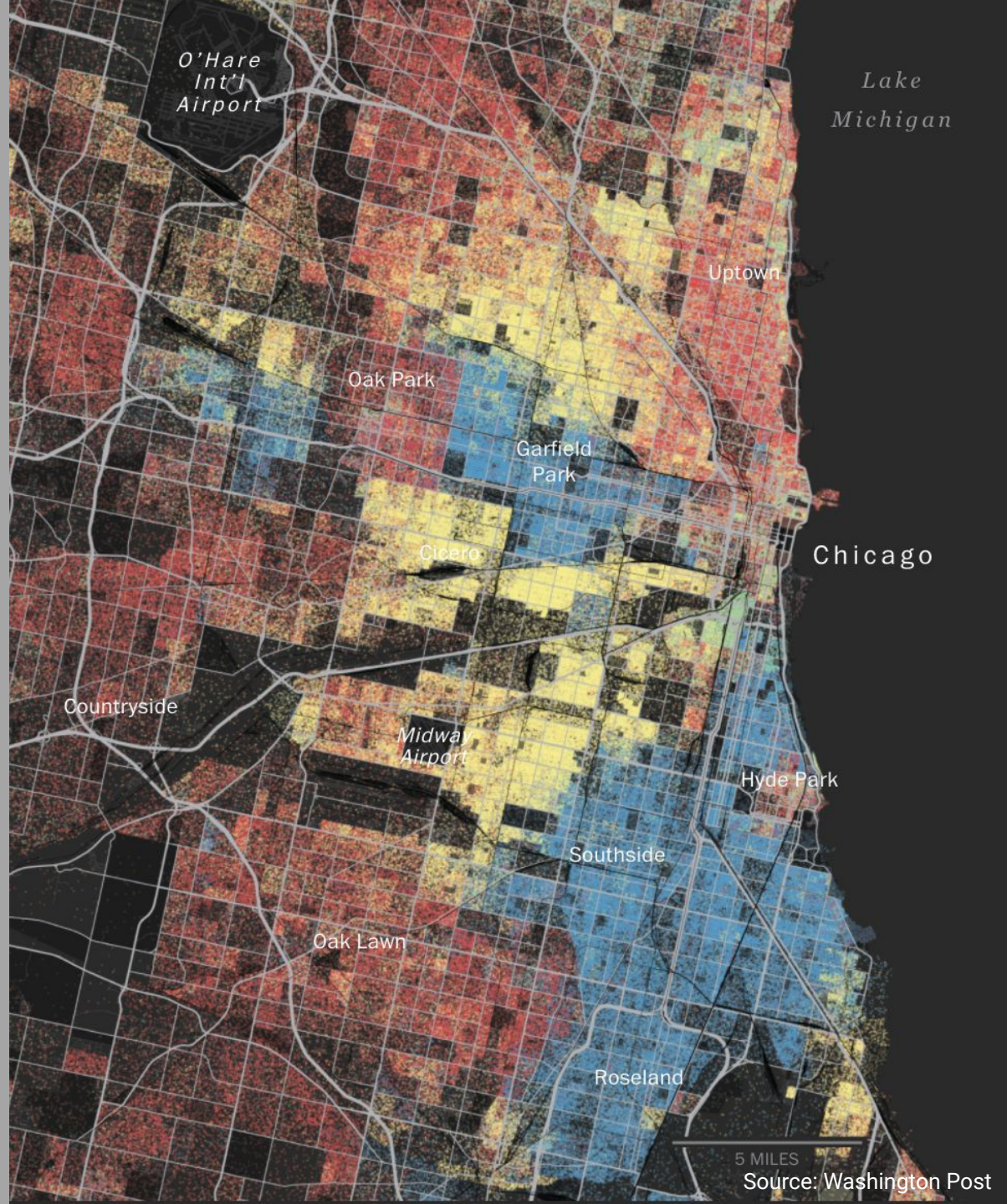
Divided Cities

Past and Present

DIVIDED CITIES: PAST AND PRESENT

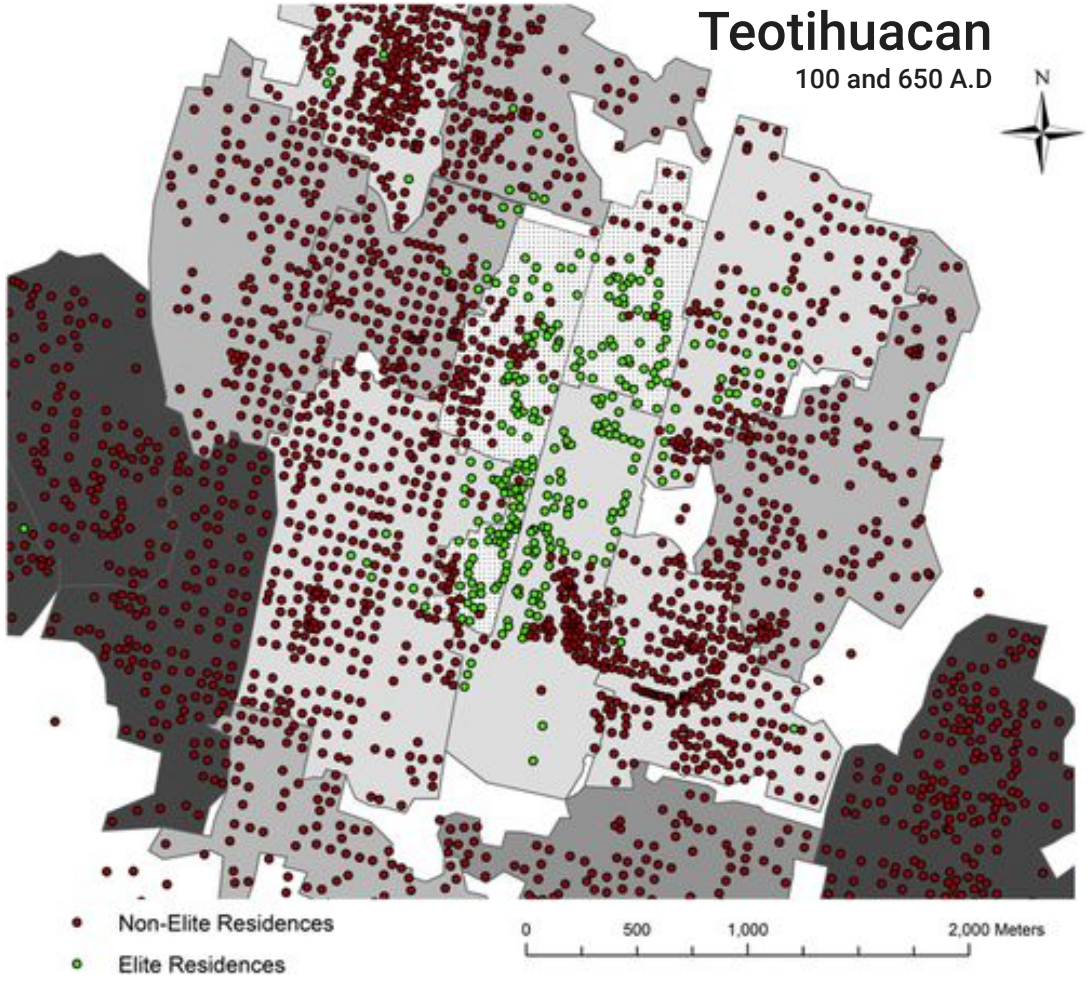
For [cities] are each one of them many cities, not a city, as it goes in the game. There are two at the least at enmity with one another, the city of the rich and the city of the poor

Plato, The Republic, Book IV 1937 edn.



Source: Washington Post

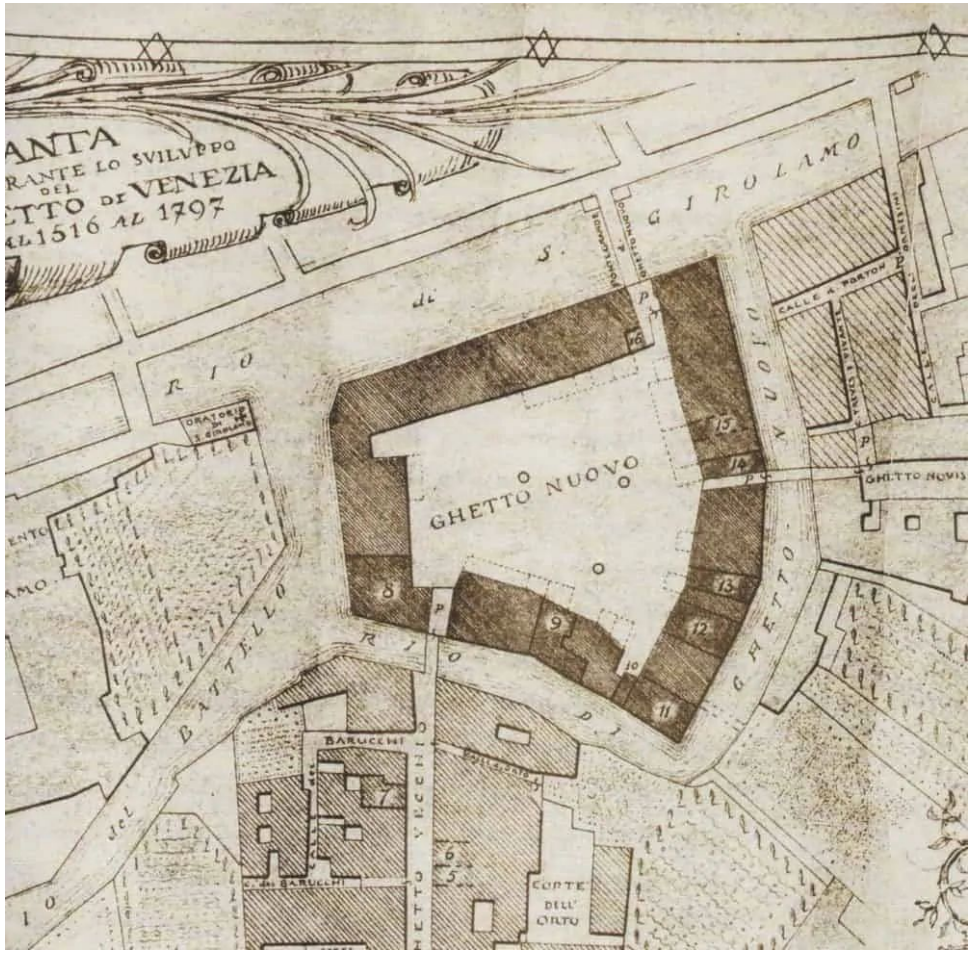
EARLY CITIES



Teotihuacan: central Mexico between 100 and 650 A.D Composite Access Rank (CAR) and elite (green) and non-elite (red) residences. Darker colors equal greater absolute distance and worse relative access to service facilities.

Dennehy, Timothy J.; Stanley, Benjamin W.; Smith, Michael E. (2016). Social Inequality and Access to Services in Premodern Cities.

PRE-MODERN CITIES: THE FIRST GHETTO



The first Jewish ghetto, sixteenth-century Venice

"Dr. Beak", The Nation

20TH-CENTURY GHETTOS

14 PAGES A Better Newspaper

The Michigan Chronicle

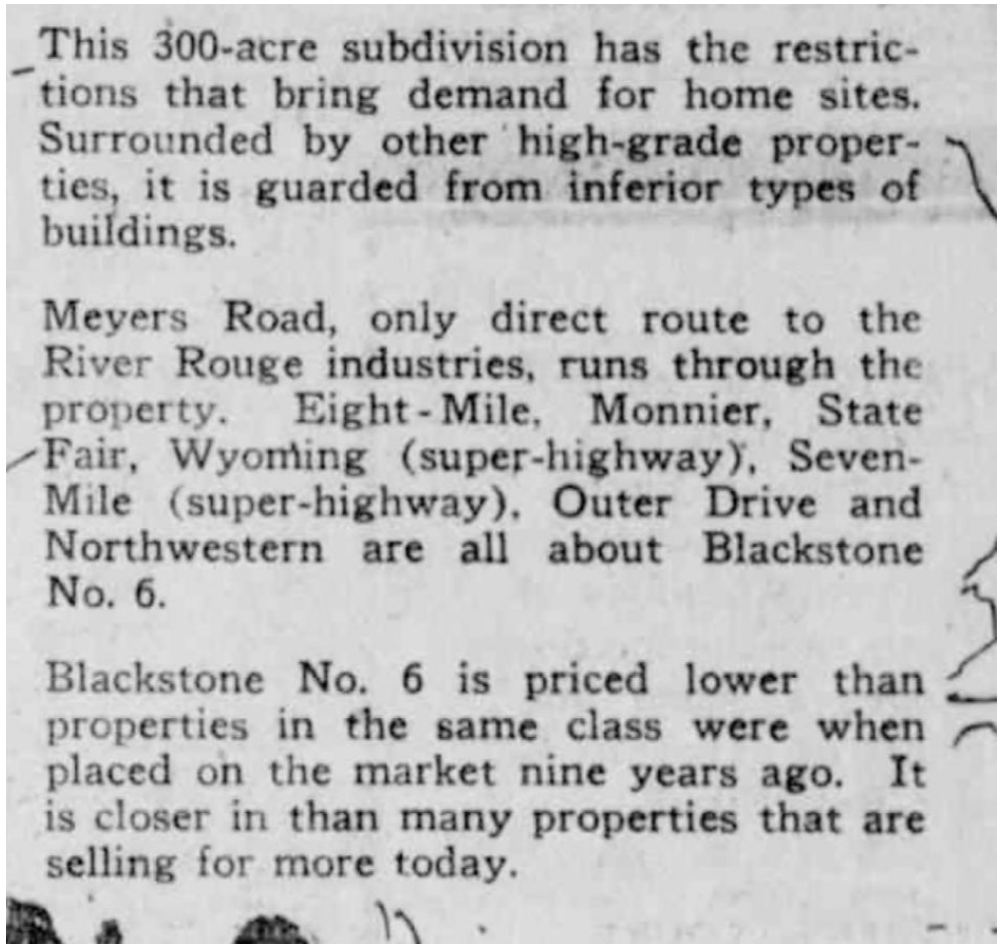
A RELIABLE INDEPENDENT NEWSWEEKLY

CITY EDITION 5 CENTS And Worth It

VOLUME 6 | Main Office: 268 Eliot Street | DETROIT, MICHIGAN, SATURDAY, JULY 5, 1941 | Telephone TEmple 1-8878 | NUMBER 14

CHARGE WALL BUILT TO SEPARATE RACES

The Birwood wall, in Detroit's Eight Mile-Wyoming neighborhood, built in 1941.



This 300-acre subdivision has the restrictions that bring demand for home sites. Surrounded by other high-grade properties, it is guarded from inferior types of buildings.

Meyers Road, only direct route to the River Rouge industries, runs through the property. Eight-Mile, Monnier, State Fair, Wyoming (super-highway), Seven-Mile (super-highway), Outer Drive and Northwestern are all about Blackstone No. 6.

Blackstone No. 6 is priced lower than properties in the same class were when placed on the market nine years ago. It is closer in than many properties that are selling for more today.

An ad for Blackstone No. 6 that appeared in the Detroit Free Press in 1925.

“LIMINAL GHETTO”

“Instead of being split obvious dividing lines — as in the ancient Venetian ghetto — we quietly divide ourselves according to where we go and whom we talk to in the course of a day”.

(Ratti & Sennett, 2022)

“Singapore Calling”, MIT Senseable City Lab, 2019

Divided Cities

Segregation in the 20th century U.S.

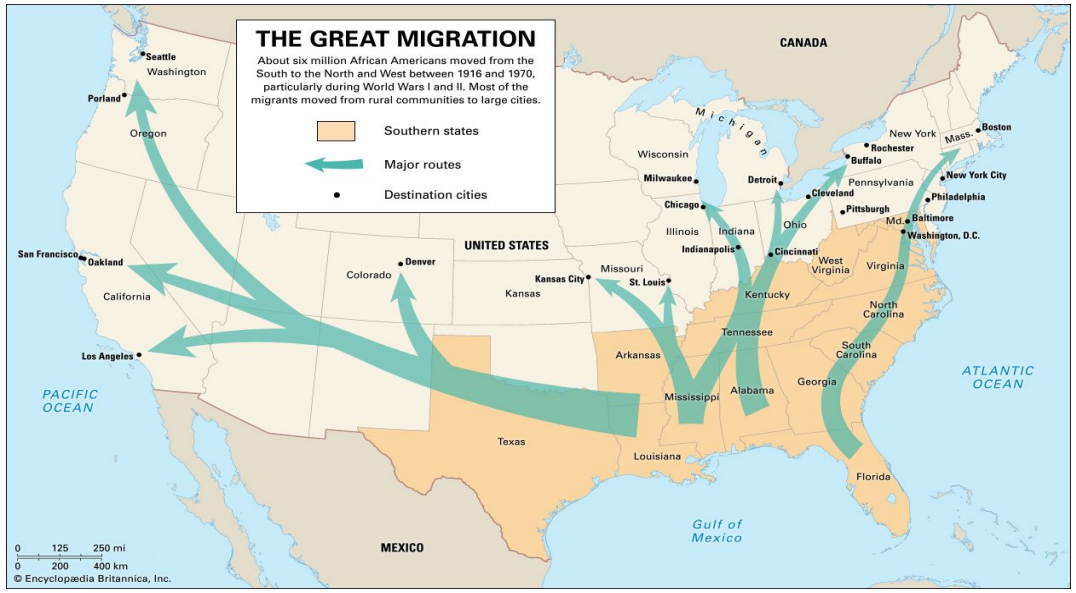
SEGREGATION IN THE 20TH CENTURY U.S.

“Industrialization brought rising affluence, the growth of the middle class, cheap cars, cheap oil, highways…”

“As people were socially freer to move about, the means of separation from each other were encouraged by technological advance, especially the automobile.”

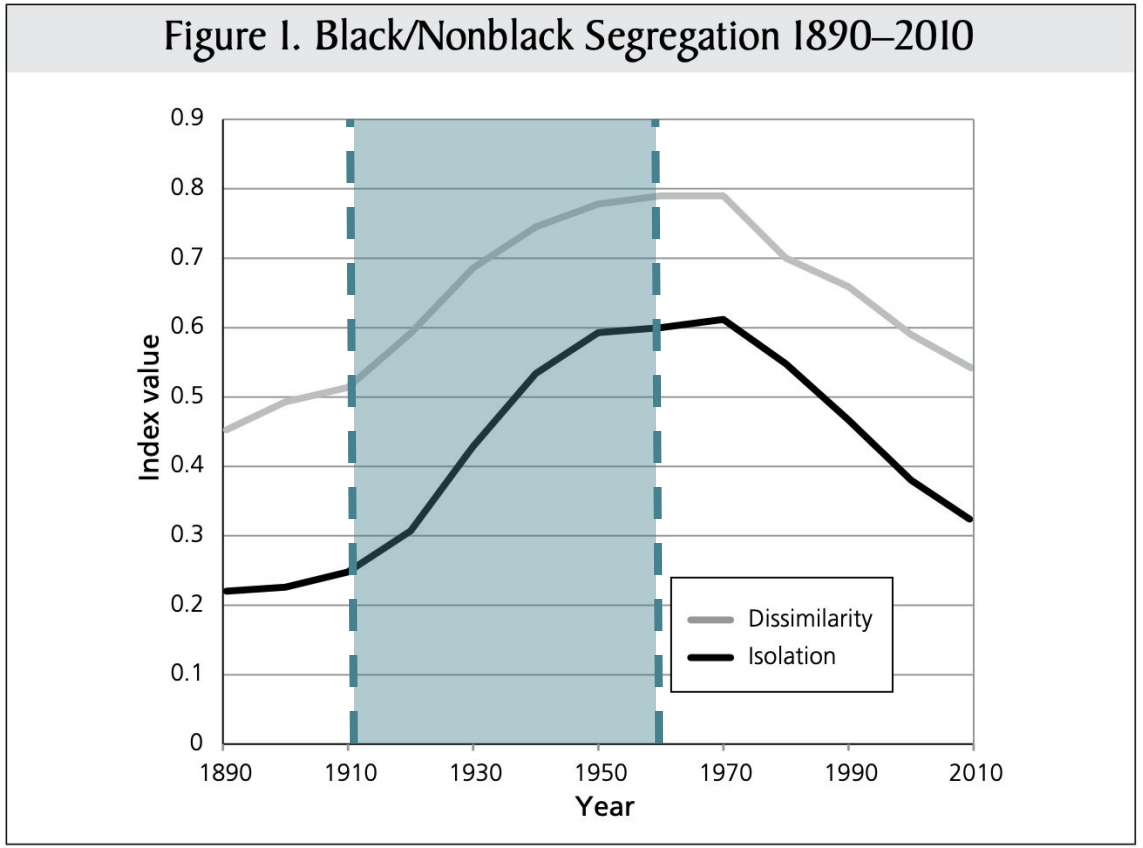
(Emily Talen, 2012)

SEGREGATION IN THE 20TH CENTURY U.S.



"...combined with racial and class intolerance, [this] created a toxic mixture that sparked the most extraordinary sprawling out and spatial sorting of cities the world had ever seen."

(Talen, 2012)



Glaeser & Vidgor (2012)

SEGREGATION IN THE 20TH CENTURY U.S.

A vacant lot on East 110th Street in New York in 1952. Credit: William C. Eckenberg/The New York Times

"In post World War II America, many Whites believed that the only physical context associated with Blacks was urban blight…" *(Talen, 2012)*

White households left central cities to avoid living in racially diverse neighborhoods *(Boustan, 2010)*

Sunkist Gardens, 1950. Image courtesy of California Eagle

SEGREGATION IN THE 20TH CENTURY U.S.

...No. 40,256 —NEW YORK, FRIDAY, APRIL 12, 1968—

RESIDENT SIGNS
VIL RIGHTS BILL;
EADS FOR CALM

a Day After Final Vote
easure That Stresses
n Housing in Nation

MUCH TO BE DONE

House Ceremony,
s for Enactment
of His Program

U.S.
SET
GI
POLICY
Clifford
Job Will
Over

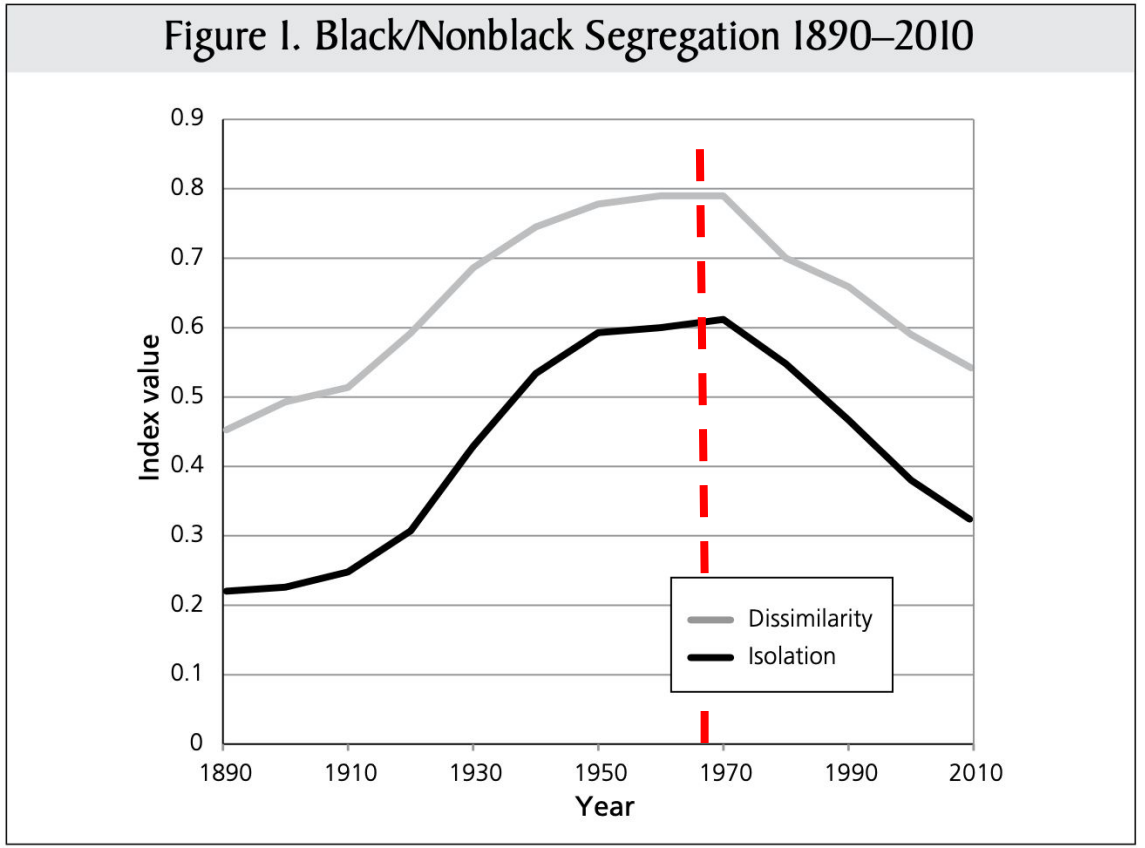
RIGHTS BILL BECOMES LAW: Around President Johnson are, from the left: Senator Hugh Scott, Representative William M. McCulloch, Senators Edward W. Brooke and Jacob K. Javits; House Speaker John W. McCormack; Representative Emanuel Celler; Senator Walter F. Mondale and Supreme Court Justice Thurgood Marshall.

LINDSAY ASSAILS THE LEGISLATURE

2-Block U.N. Expansion Is Planned for East Side

ISRAEL REPORTED

Fair Housing Act of 1968 made housing-market discrimination illegal

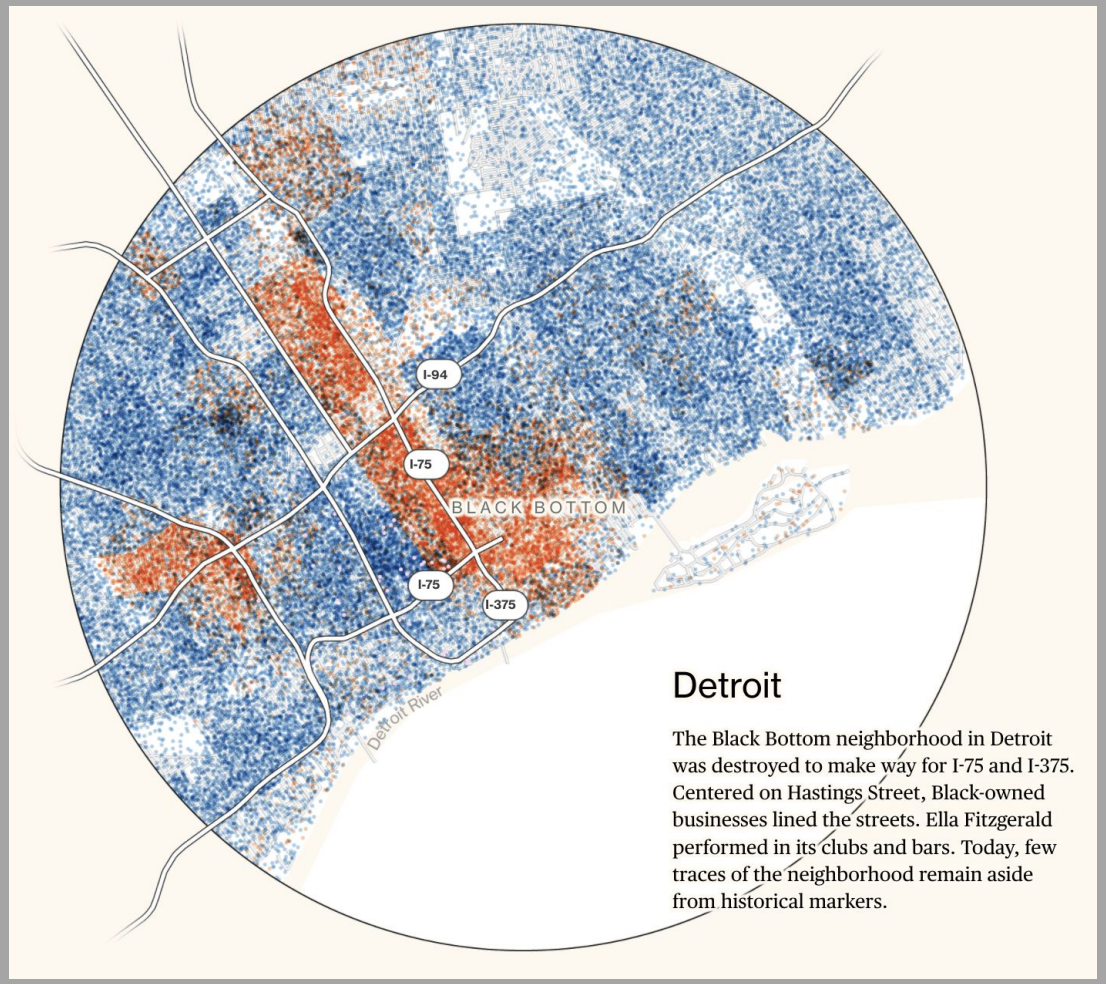


Glaeser & Vidgor (2012)

Divided Cities

City planning and digital interfaces

DIVIDED CITIES: THE ROLE OF CITY PLANNING



Source: Bloomberg

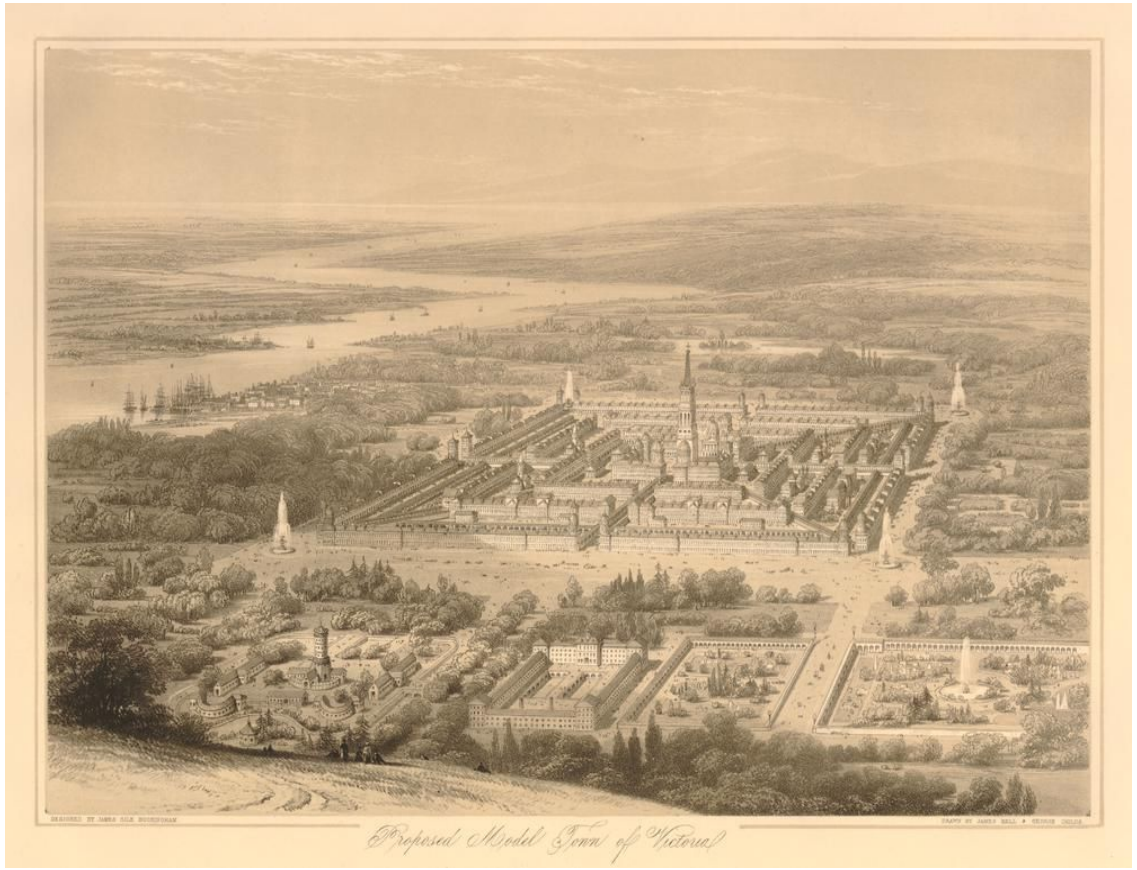
20th century city planning created an “armature” of “conflict avoidance”

(Sorkin, 1999)

Zoning and highways had reduced the city’s capacity to foster its primary function of human exchange

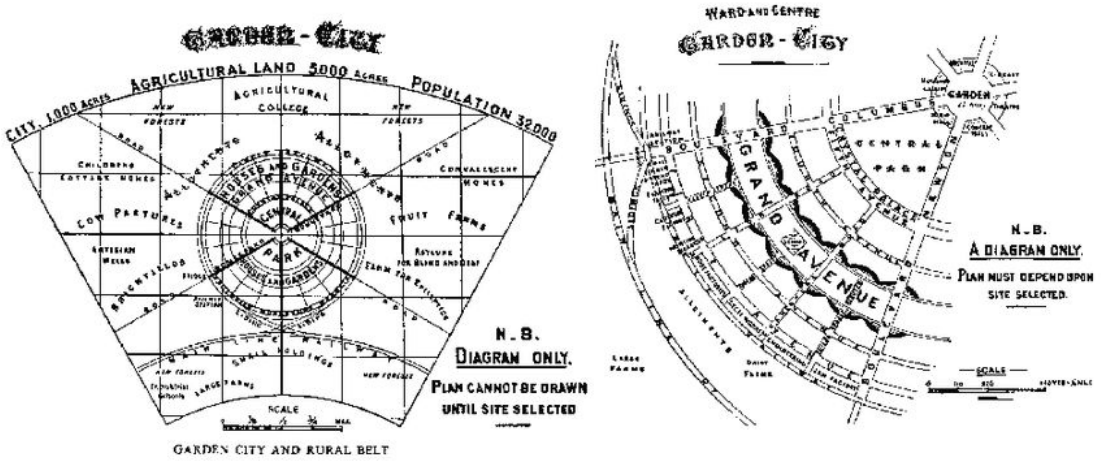
(Mumford, 1949)

UTOPIAN VIEW OF DIVERSITY: GARDEN CITY MOVEMENT



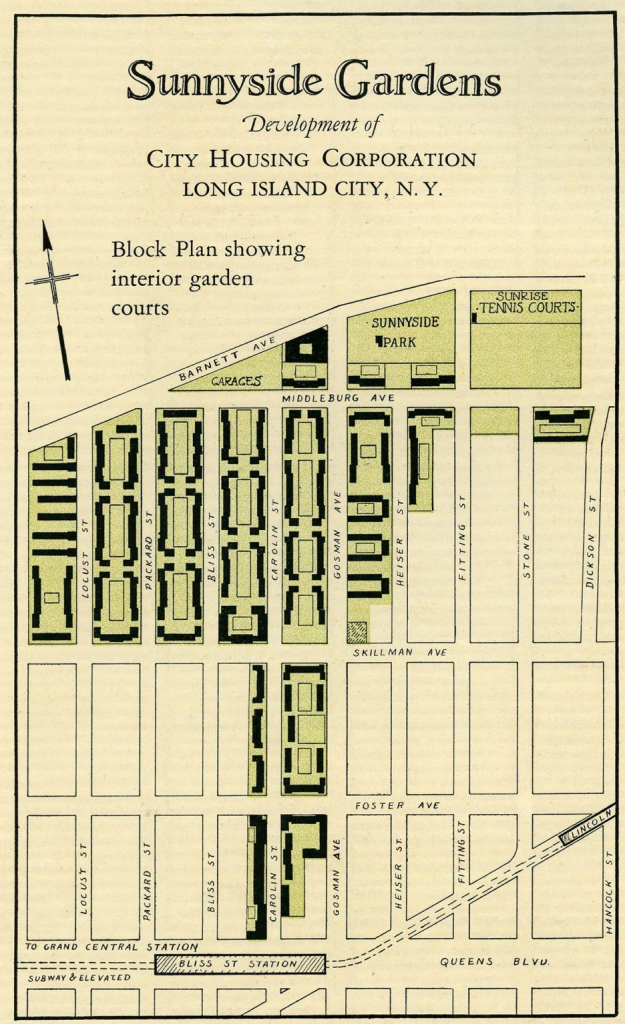
Proposed model town of Victoria, J.S. Buckingham, 1849

"... community must be composed of all the units of which older and larger cities are built up; every grade of social status must be represented; so mutually dependent has become class upon class." (A.R. Sennet)



The principle of the Garden City of Ebenezer Howard, 1898, (from Choay 1969).

CITY AS A SOCIAL ORGANISM: PATRICK GEDDES AND LEWIS MUMFORD

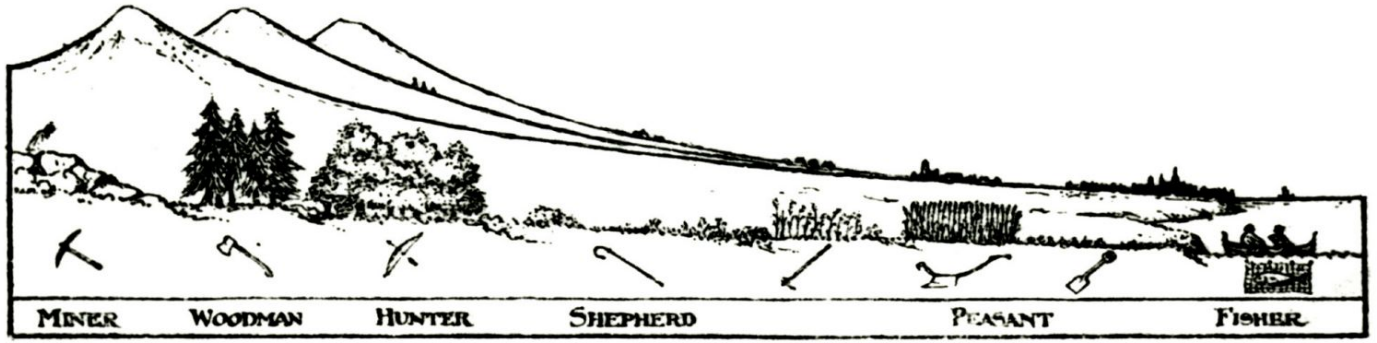


Plan of Sunnyside Gardens in Queens, NY (1924-1928). Russel Sage Foundation records.

Lewis Mumford:

"The city, if it is to function effectively, cannot be a segregated environment : the [segregated] city offers fewer possibilities for the higher forms of human achievement than a many-sided urban environment" (1938, p. 486)

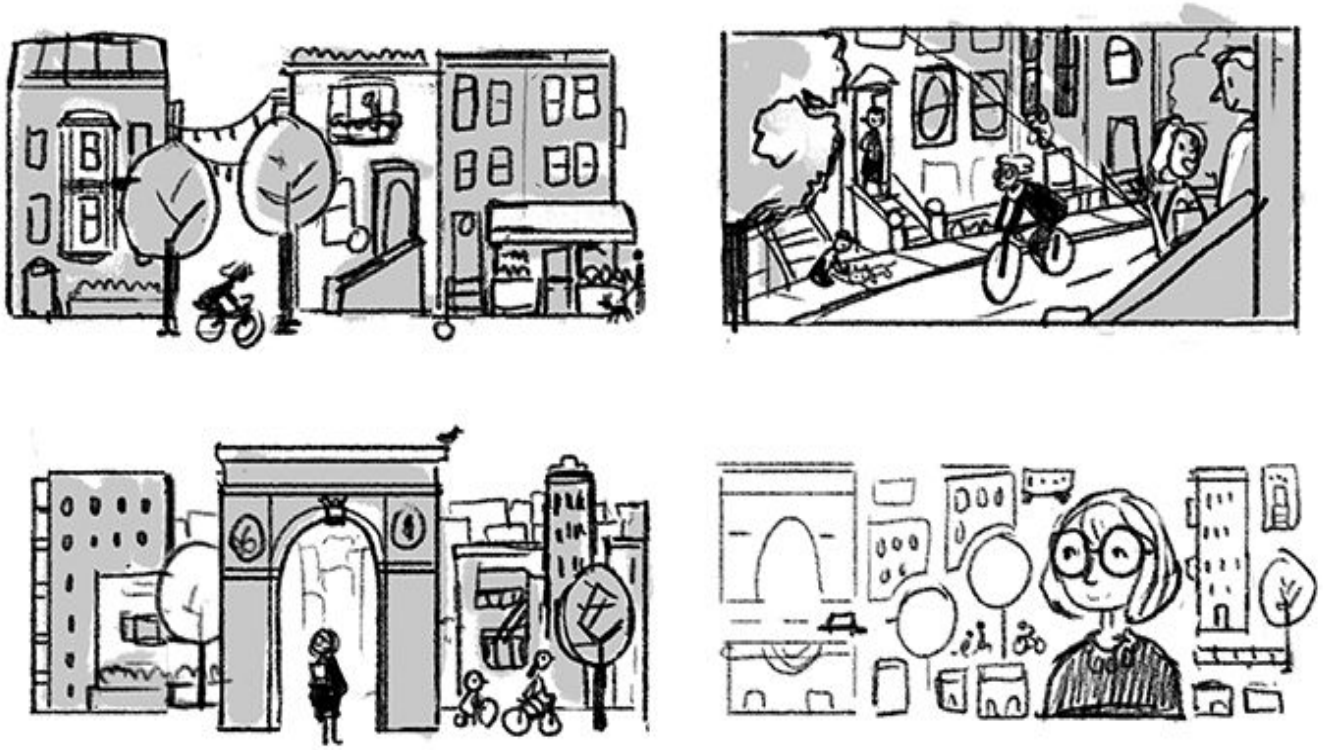
"A plan that does not further a daily intermixture of people, classes, activities, works against the best interests of maturity" (1968, p. 39).



Patrick Geddes, Cities in Evolution, 1915.,

JANE JACOBS: DOWNTOWN VITALITY AND “UNPLANNED” DIVERSITY OF USES

“There are physical qualities that create diversity in uses and users, and this is the basis of a well-functioning, vital and healthy city”



“Jane Jacobs’ 100th birthday” doodle, Google

Jane Jacobs (centre) in Washington Square Park, New York, in 1963.

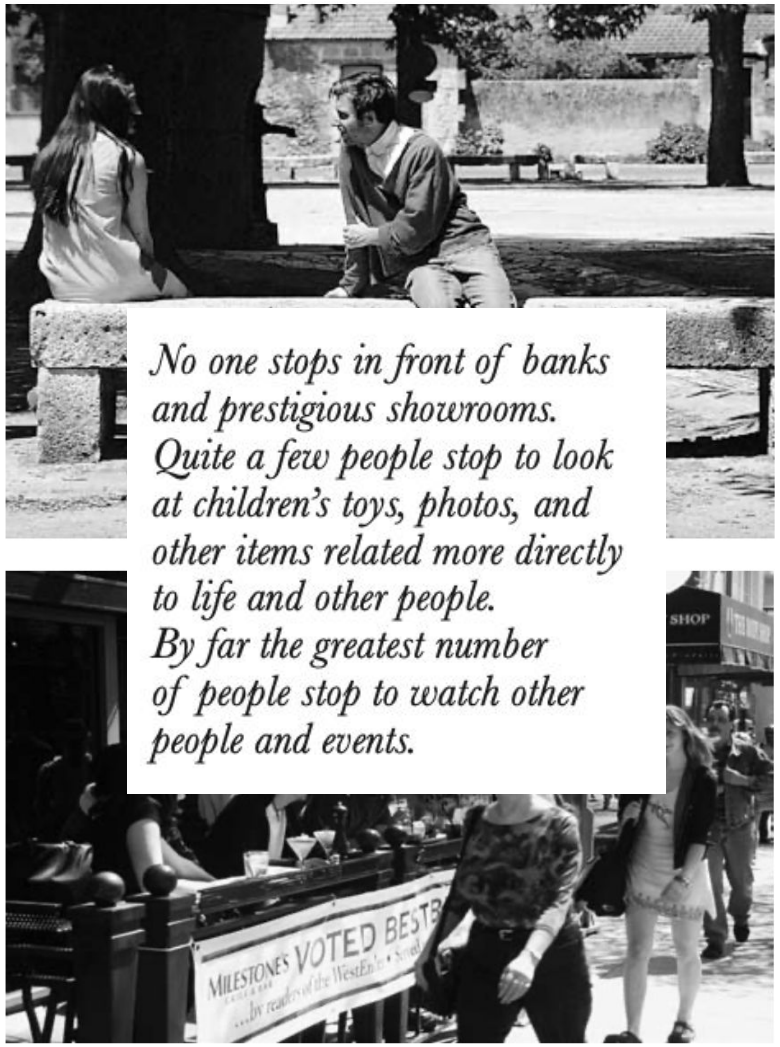
CITIES

Humanizing the urban fabric

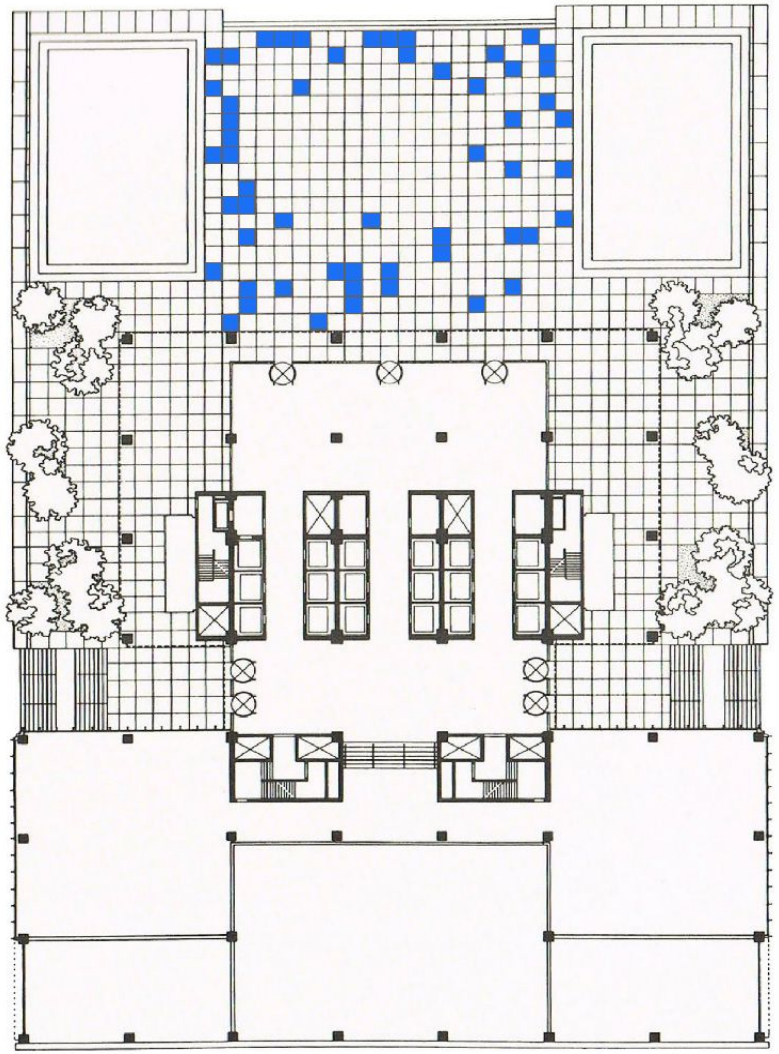
Williams, A. Cities: Humanizing the urban fabric. Nature (2016).

LIFE BETWEEN BUILDINGS: JAN GEHL & WILLIAM H. WHYTE

a possible beginning for contacts at other levels



J. Gehl, Life Between Buildings



William H. Whyte, The Social Life of Small Urban Spaces

DIVIDED CITIES: DIGITAL TRACES

Big Data revolutionizes the way we see our built environment, particularly by moving our focus from the physical city […] to the human interactions that take place within it.

These leftovers, harvested from phones, smart watches and the like, can be transformed into valuable raw material for the experimental urban scholar.

(Ratti & Sennett, 2022)

“After Whyte: The Social Life of Small Urban Spaces Forty Years Later”, XL Lab at SWA.

DIVIDED CITIES: LEARNING FROM BIG DATA

Experienced Segregation

Measuring racial segregation in everyday visits using cell-phone data (Athey et. al, 2020).

Socio-economic mixing in Stockholm using Twitter data (Heine et. al, 2021)

Segregation in Social Space

Quantifying segregation in an integrated urban physical-social space using geolocated call detail records (Xu et. al, 2019)

Role of Public Spaces

Streets as connecting spaces in Paris (Cate and Arianna, wp)

Effect of parks on racial diversity of everyday encounters in NYC (Timur, wp 2021)

Gender Segregation

Gender segregation and paradox of diversity within neighborhoods: using Foursquare venue visits (Caetano & Maheshri, 2019):.

OTHER ARGUMENTS FOR DIVERSITY AND SOCIAL CONNECTIVITY

Resilience

Neighborhoods where neighbors know each other, are more stable and resilient to crisis. (Klinenberg, Montgomery)

Life opportunities

Being surrounded by good peers in school or successful colleagues at work improves learning and leads to better future employment opportunities (Chetty).

Economic gains

Diverse human capital and knowledge flows can also stimulate economic progress and innovation (Florida, Glaeser).

“Contact hypothesis”

Chance encounters can: improve perceptions and reduce prejudice, create opportunities for new forms of contact (Amin, Gehl, Anderson)

Divided Cities

Quantifying segregation

I. **How do we measure segregation?**
Indices of segregation and the tradeoffs between them

II. **Empirical studies of segregation**
Historically: residential segregation
More recently: experienced segregation

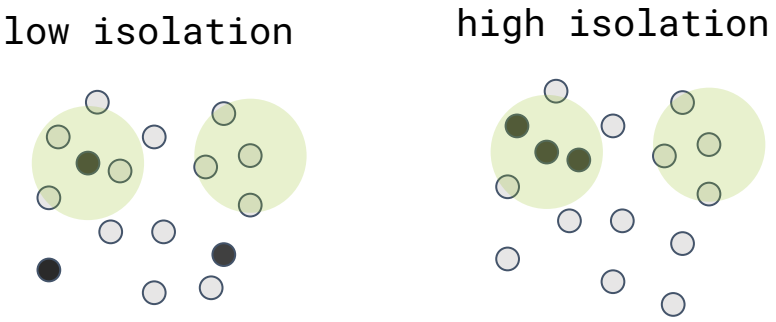
III. **Designing for integration**
Causal inference to identify the association between segregation + urban form

MEASURES OF SEGREGATION

Measures of Exposure

what is the probability of a minority member co-locating with another minority member (as opposed to a majority member)?

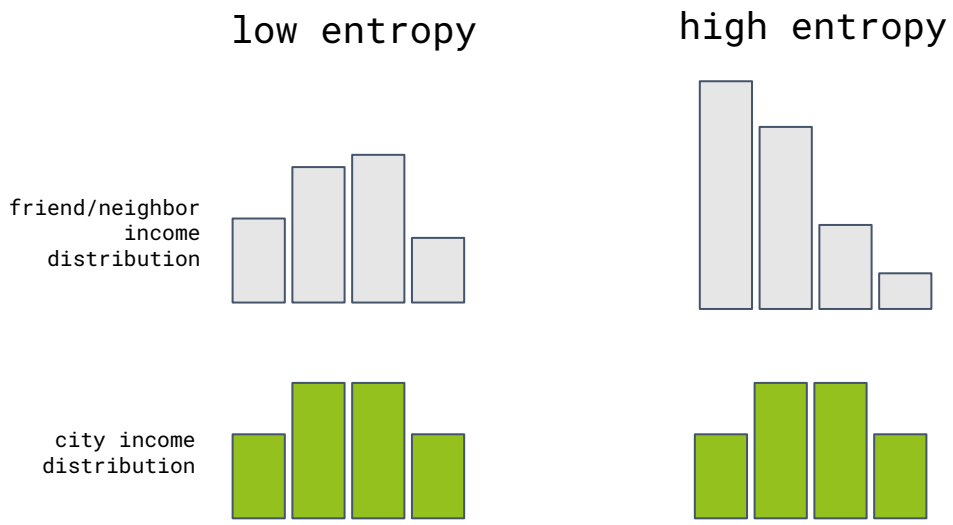
Isolation index, exposure index



Measures of Evenness

what is the difference between the distribution of people you encounter and the distribution of people across the whole city?

Dissimilarity index, Theil's entropy, Gini coefficient



MEASURES OF SEGREGATION

Measures of Exposure

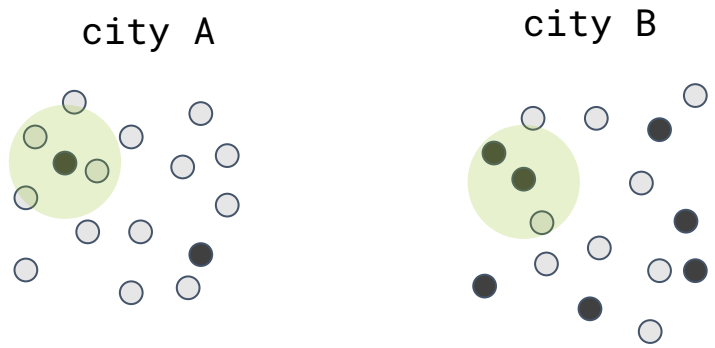
what is the probability of a minority member co-locating with another minority member (as opposed to a majority member)?

Isolation index, exposure index

Measures of Evenness

what is the difference between the distribution of people you encounter and the distribution of people across the whole city?

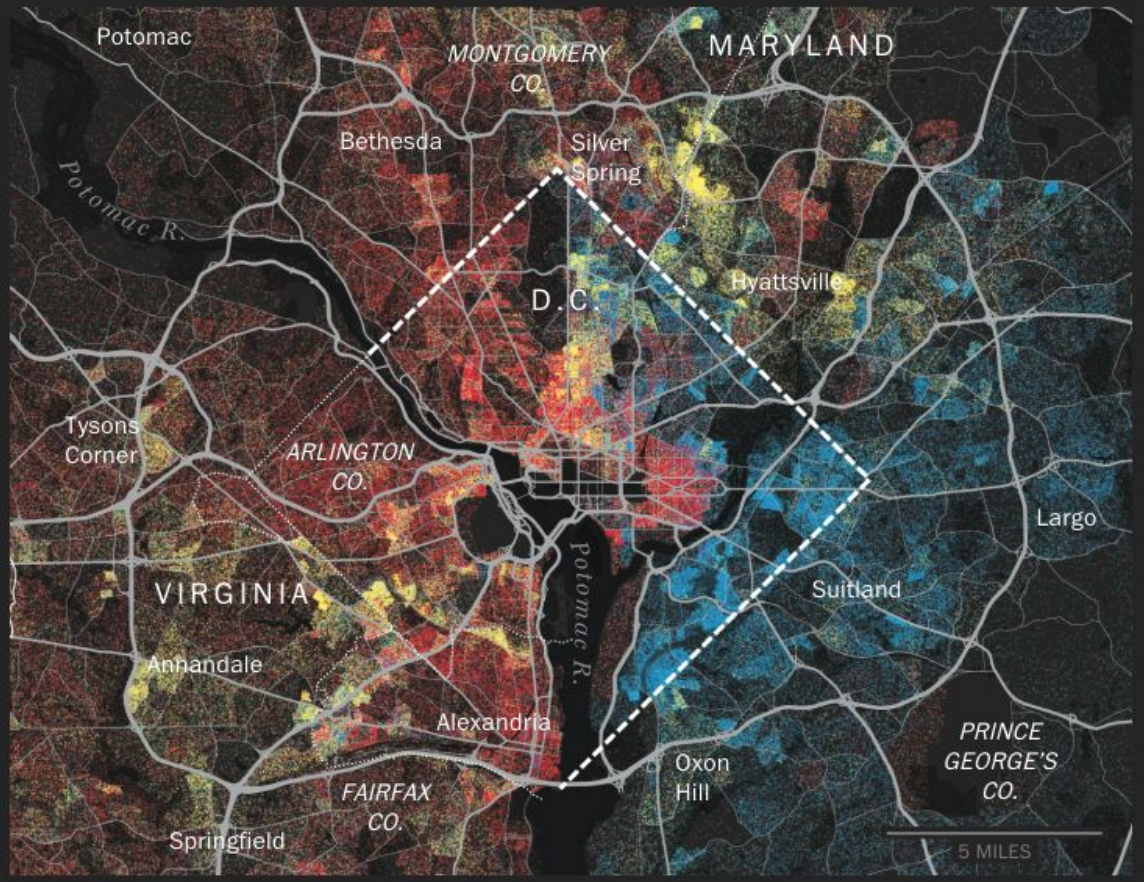
Dissimilarity index, Theil's entropy, Gini coefficient



cities A and B have a similar evenness index

city A will have a higher exposure index by some measures: minority members are proportionally more exposed to majority members by nature of there being fewer of them

TRADITIONAL STUDIES OF SEGREGATION ARE BASED ON RESIDENTIAL DATA

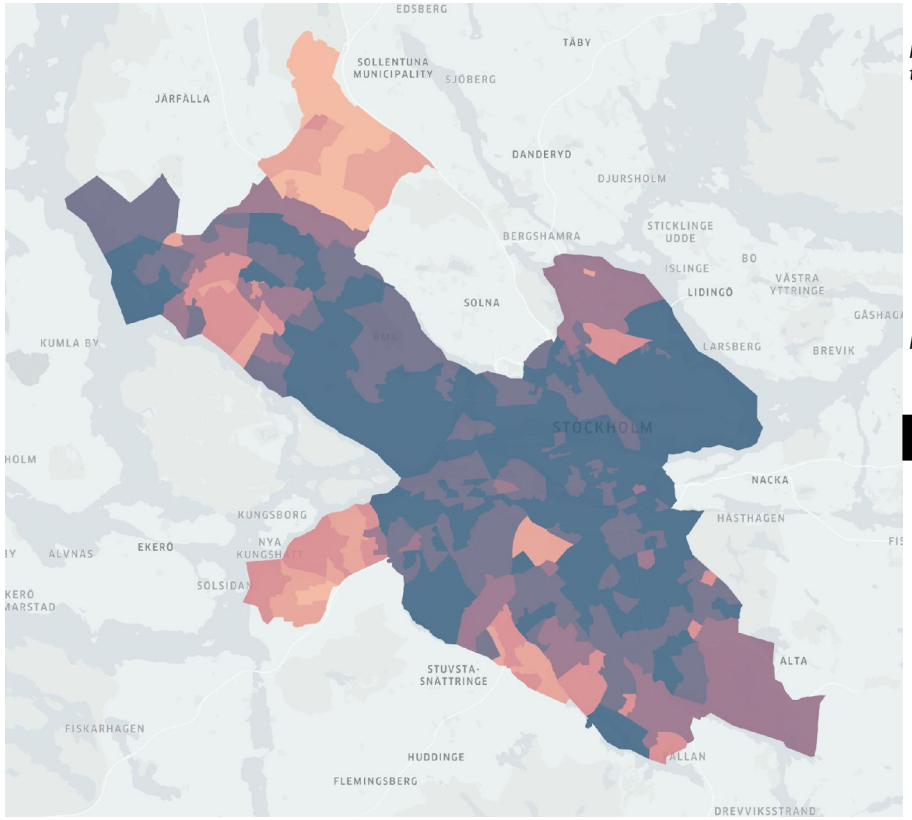


● Black ● White ● Hispanic
● Asian/Pacific Islander ● Native American ● Multi-race and other

DIVERSITY SCALE

Less diverse — More diverse

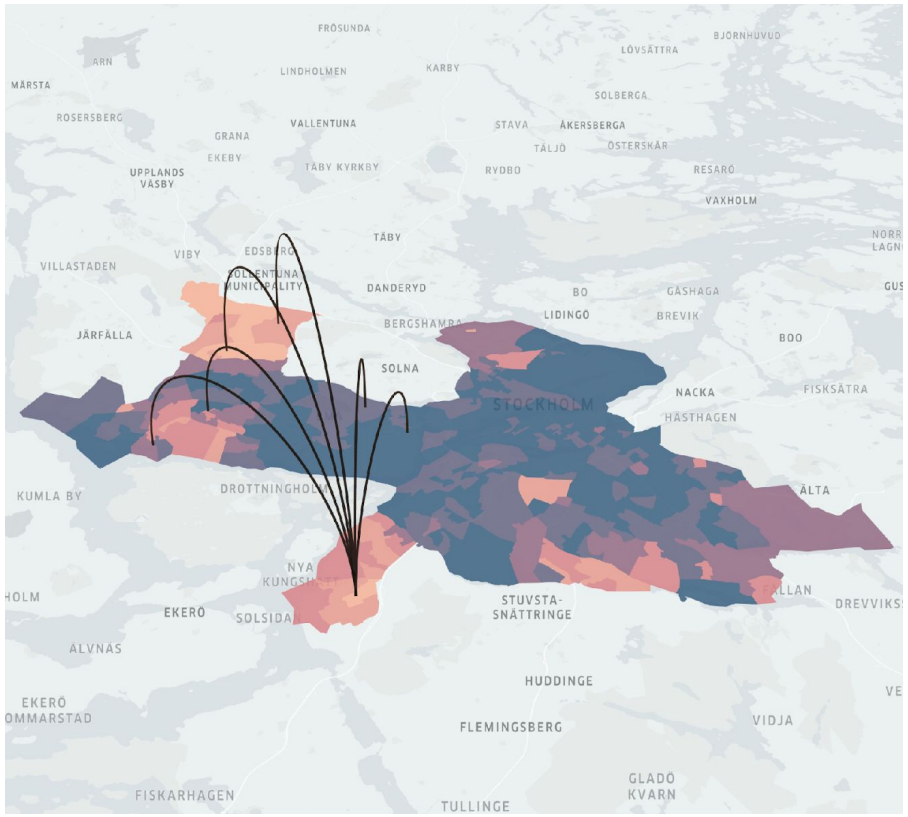
BUT WE EXPERIENCE SEGREGATION BEYOND OUR HOMES AS WELL



Residential immigration segregation in Stockholm.

Mostly immigrants to Sweden

Mostly Swedish-born



Daily movements.

NEW DATA SOURCES TO STUDY EXPERIENCED SEGREGATION

I. **Global Positioning System (GPS) data**

Case study: *Experienced Segregation*, Athey et al., 2019

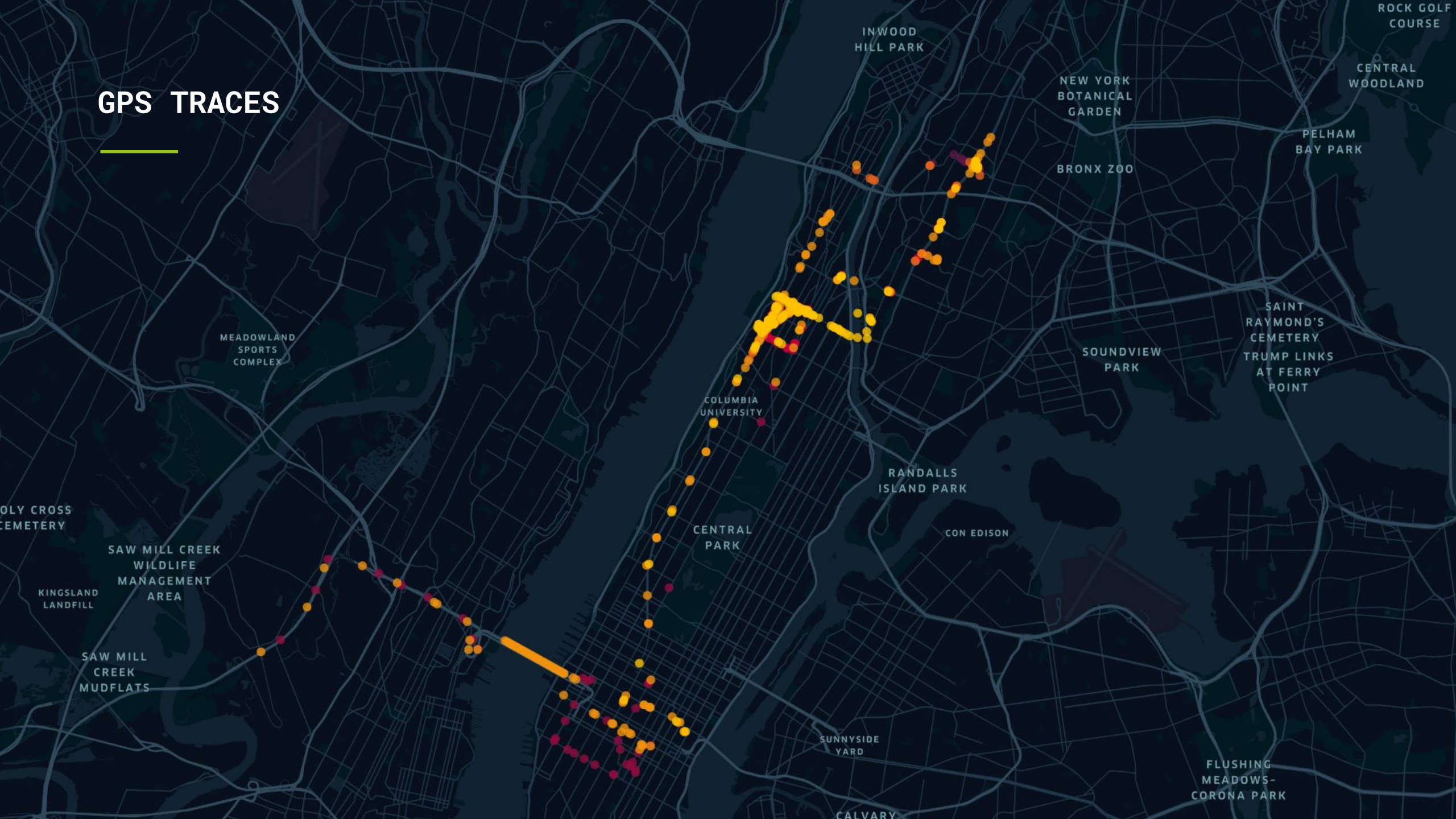
II. **Call Detail Record (CDR) data**

Case study: *Quantifying segregation in an integrated urban physical-social space*, Xu et al., 2019.

III. **Social media data**

Case study: *Analysis of mobility homophily in Stockholm based on social network data*, Heine et al., 2021.

GPS TRACES


INWOOD HILL PARK
NEW YORK BOTANICAL GARDEN
ROCK GOLF COURSE
CENTRAL WOODLAND
PELHAM BAY PARK
BRONX ZOO
MEADOWLAND SPORTS COMPLEX
SAINT RAYMOND'S CEMETERY
SOUNDVIEW PARK
TRUMP LINKS AT FERRY POINT
COLUMBIA UNIVERSITY
RANDALLS ISLAND PARK
CENTRAL PARK
CON EDISON
SAW MILL CREEK WILDLIFE MANAGEMENT AREA
KINGSLAND LANDFILL
SAW MILL CREEK MUDFLATS
SUNNYSIDE YARD
FLUSHING MEADOWS-CORONA PARK

GPS TRACES TO COMPARE RACIAL ISOLATION ACROSS US CITIES

Athey et al. (2019)

Isolation index:

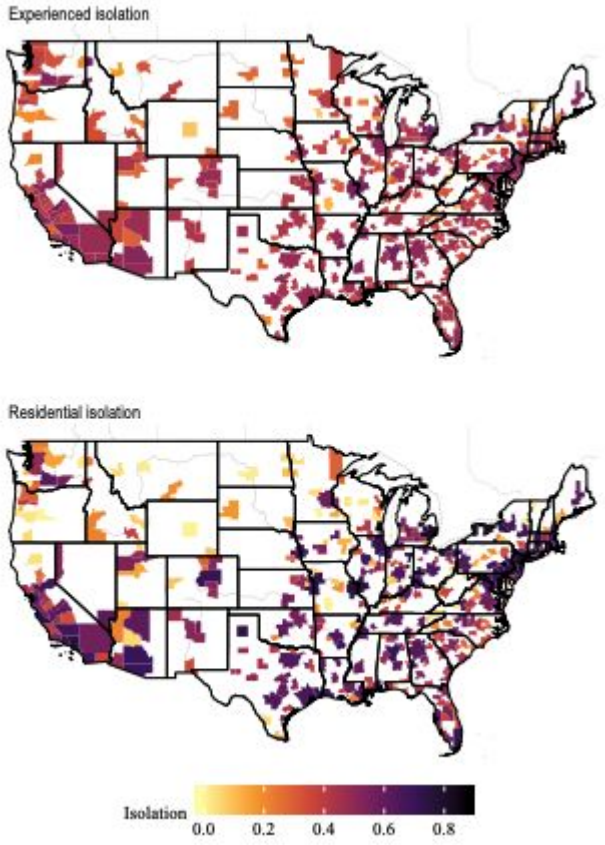
$$I_a = \frac{1}{|W_a|} \sum_{i \in W_a} e_i - \frac{1}{|NW_a|} \sum_{i \in NW_a} e_i$$

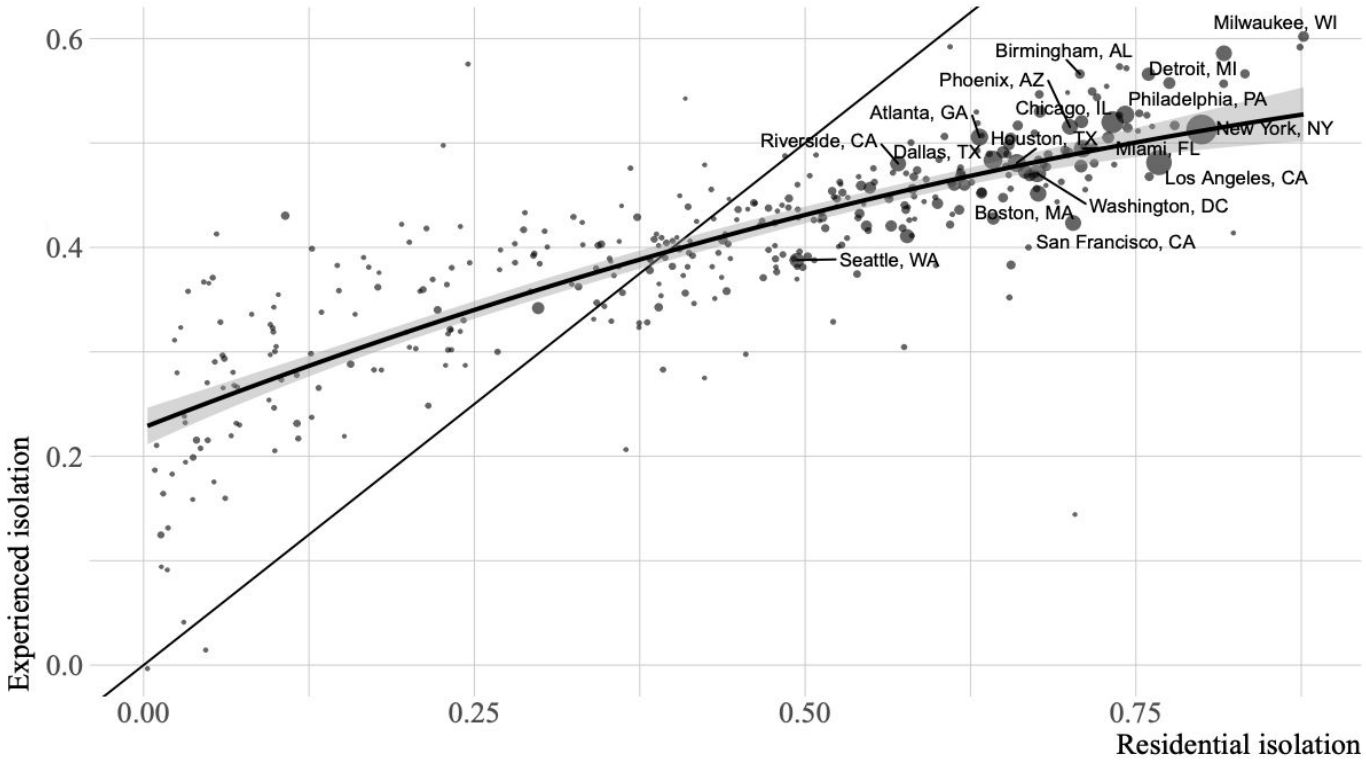
average proportion of group W's encounters that are with other members of group W

average proportion of group NW's encounters that are with members of group W

GPS TRACES TO COMPARE RACIAL ISOLATION ACROSS US CITIES

Athey et al. (2019)

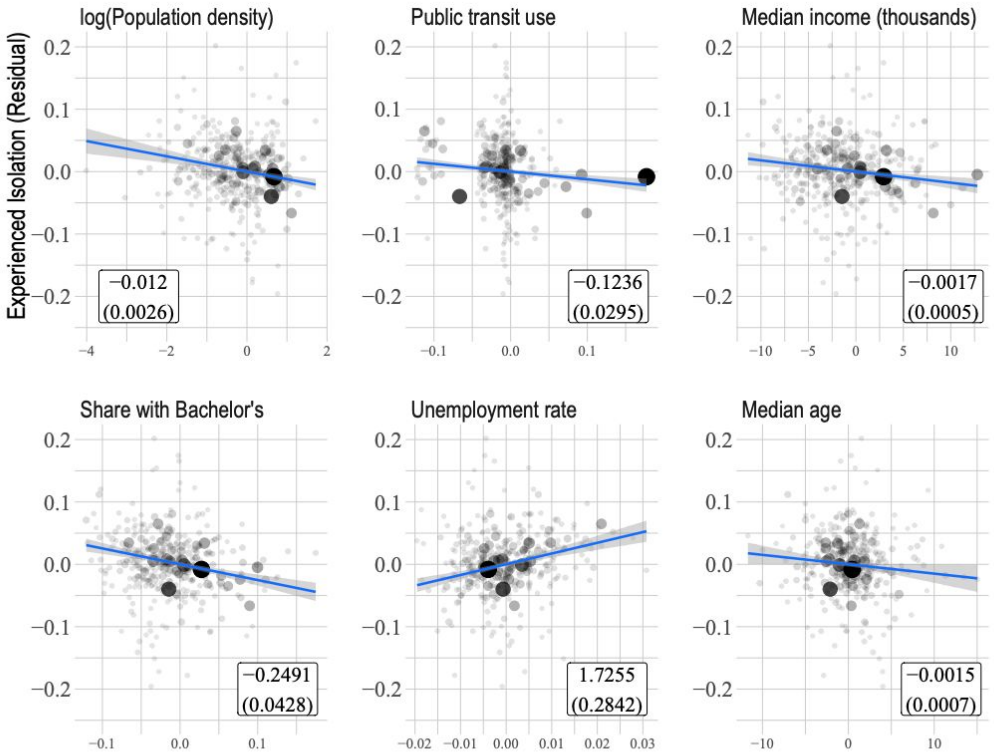


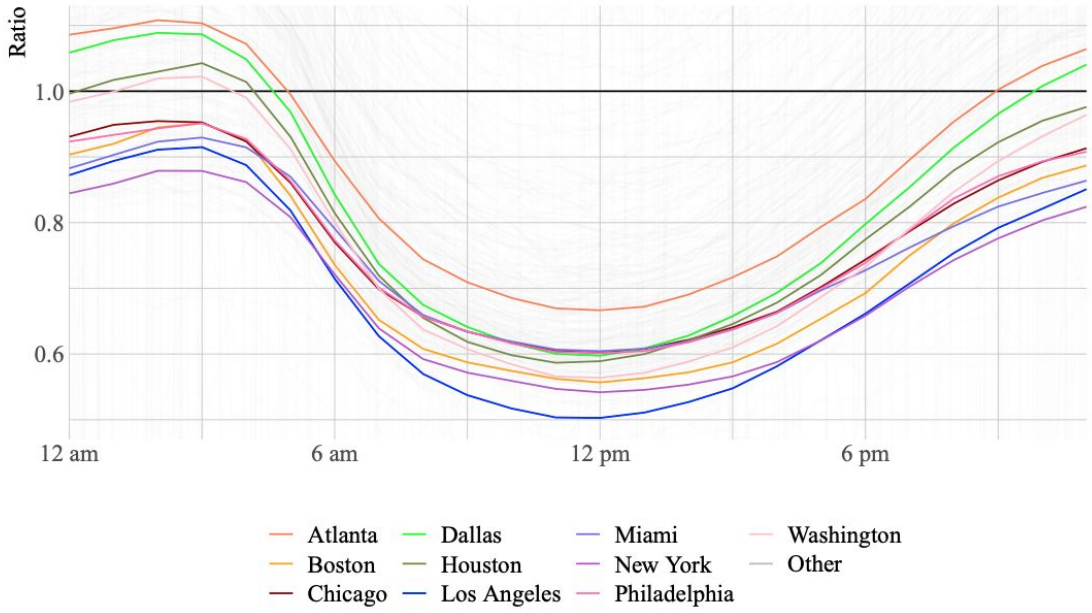


Residential isolation and experienced isolation are highly correlated, with larger cities seeing higher values of both residential and experienced isolation.

GPS TRACES TO COMPARE RACIAL ISOLATION ACROSS US CITIES

Athey et al. (2019)





Experienced isolation decreases over the course of the day as people move away from their residential spaces and into other parts of the city.

GPS TRACES: DISCUSSION

Strengths

Least biased sample of user locations.

Highly geographically precise–you can measure exposure on a very fine scale.

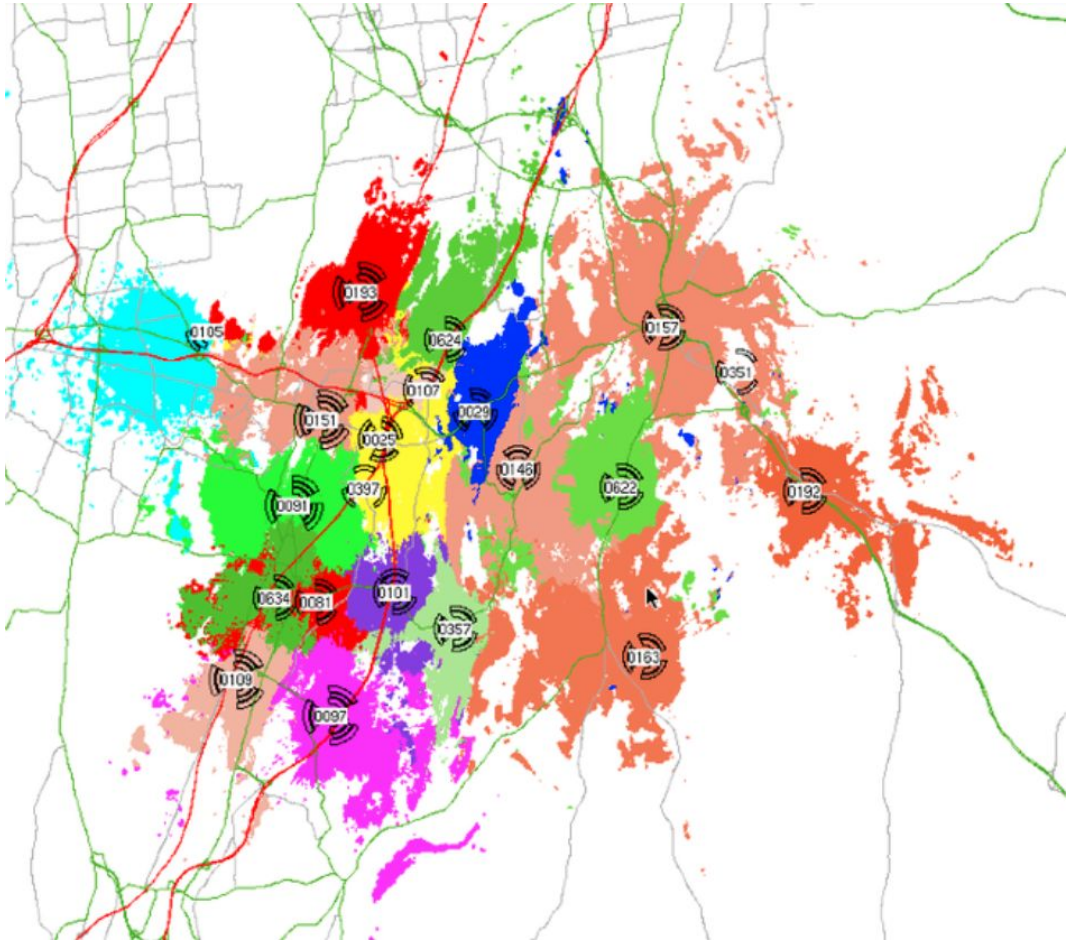
Weaknesses

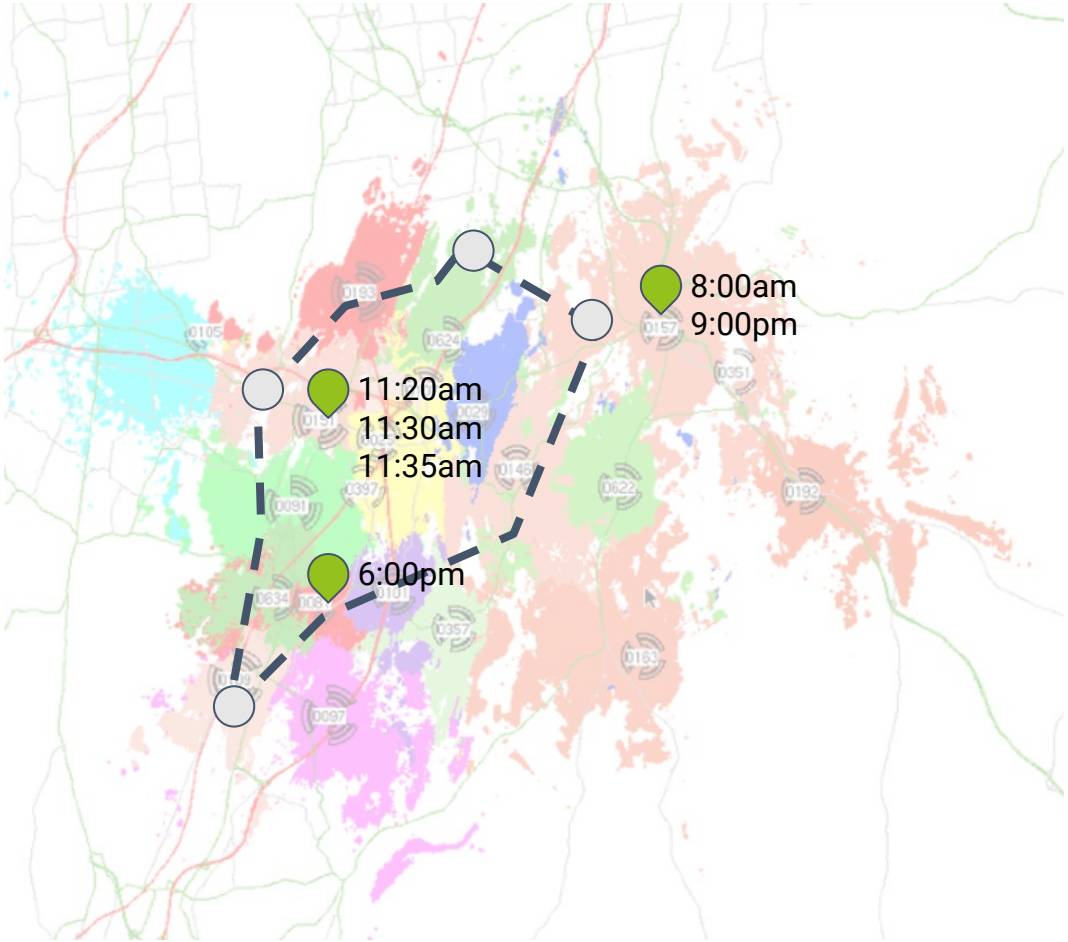
Really large datasets.

May be a small sample size relative to the full population.

Highly sensitive: you can estimate exact home locations due to geographic precision.

CALL DETAIL RECORDS (CDR)





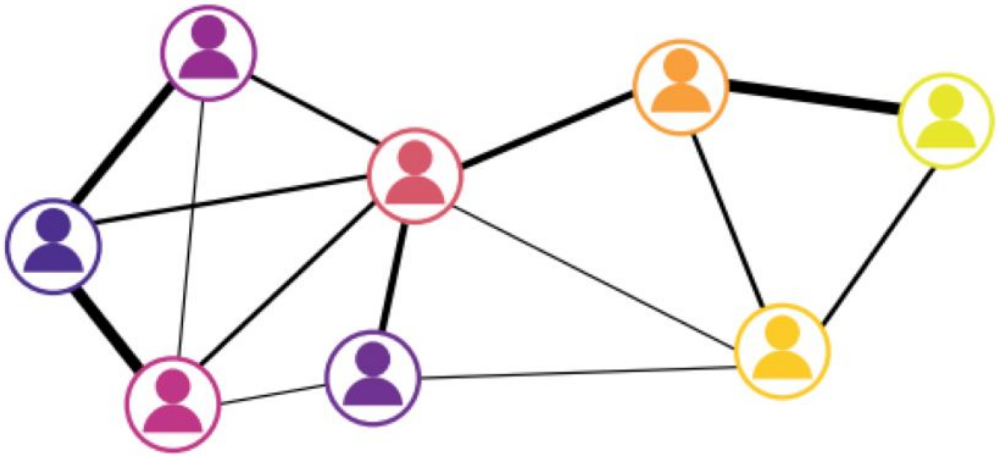
CELL PHONE RECORDS TO STUDY INCOME SEGREGATION IN SINGAPORE

Xu et al., Senseable City Lab (2019)

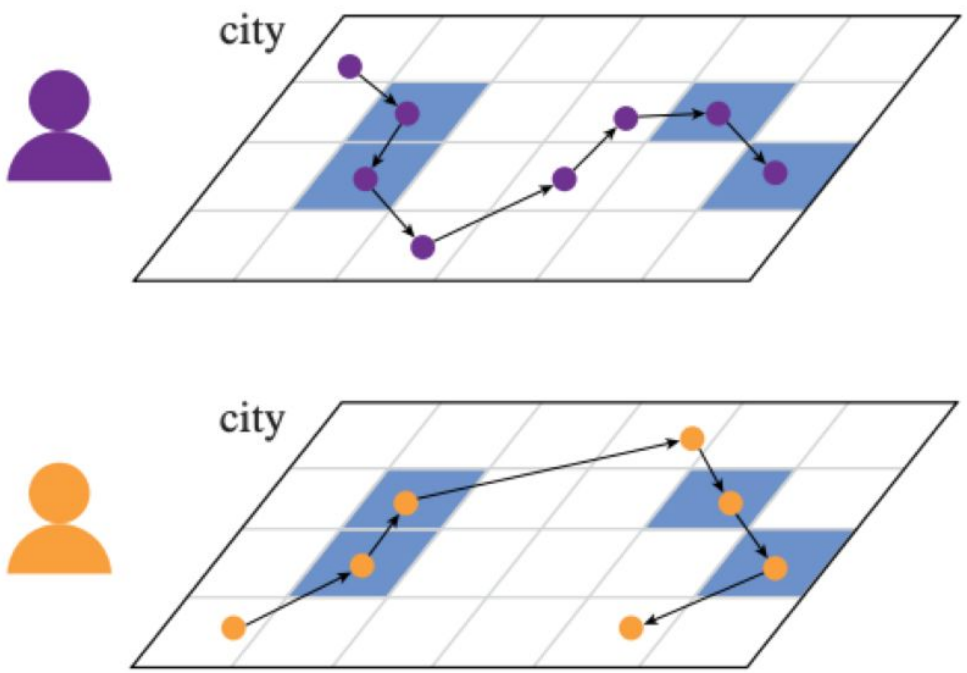
Using cell phone records we can:

estimate socioeconomic status of cell phone users based on home location.

construct social networks based on cell phone communication between users.

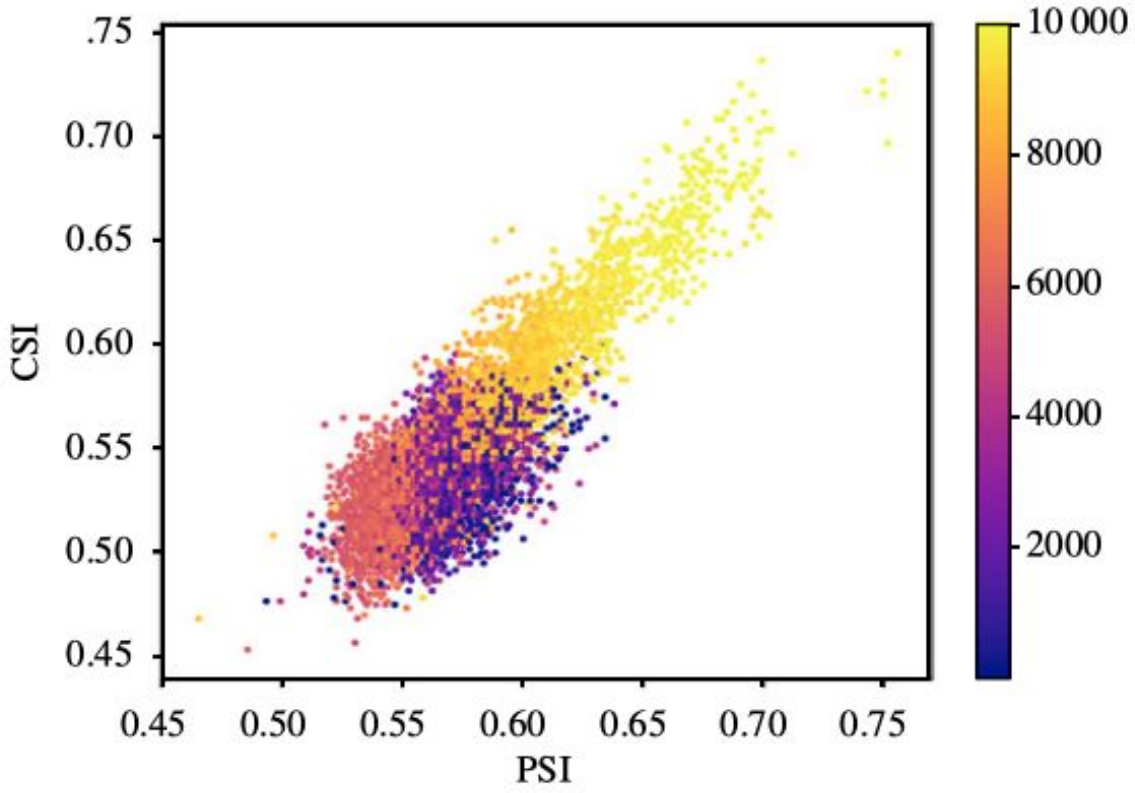


identify co-location in space as users move throughout the city.

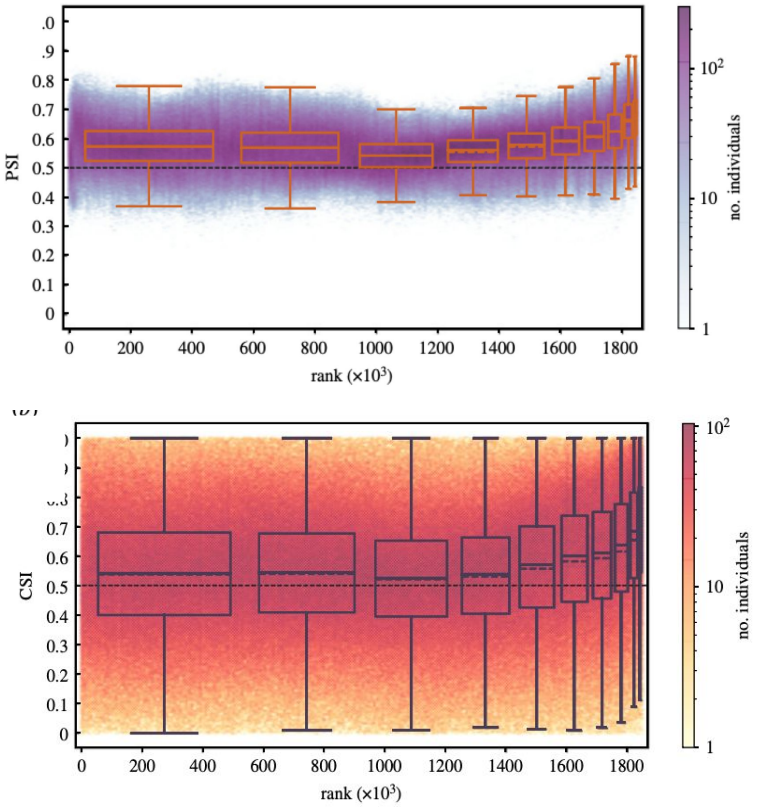


CELL PHONE RECORDS TO STUDY INCOME SEGREGATION IN SINGAPORE

Xu et al., Senseable City Lab (2019)



Physical segregation and call-network segregation are highly correlated—those who encounter a more segregated slice of the city in their daily movements are more likely to have a segregated call network.



Lower-income residents of Singapore are more segregated in their physical interactions as they move throughout the city as well as in their communication networks. as well as in their communication networks.

CELL PHONE RECORDS: DISCUSSION

Strengths

Very dense.

Large and (relatively) unbiased sample of the population.

(Relatively) unbiased sample of user visits—we use our phones almost everywhere.

(Sometimes) contains communication information as well as colocation information.

Weaknesses

Expensive, highly sensitive, and difficult to obtain for multiple cities.

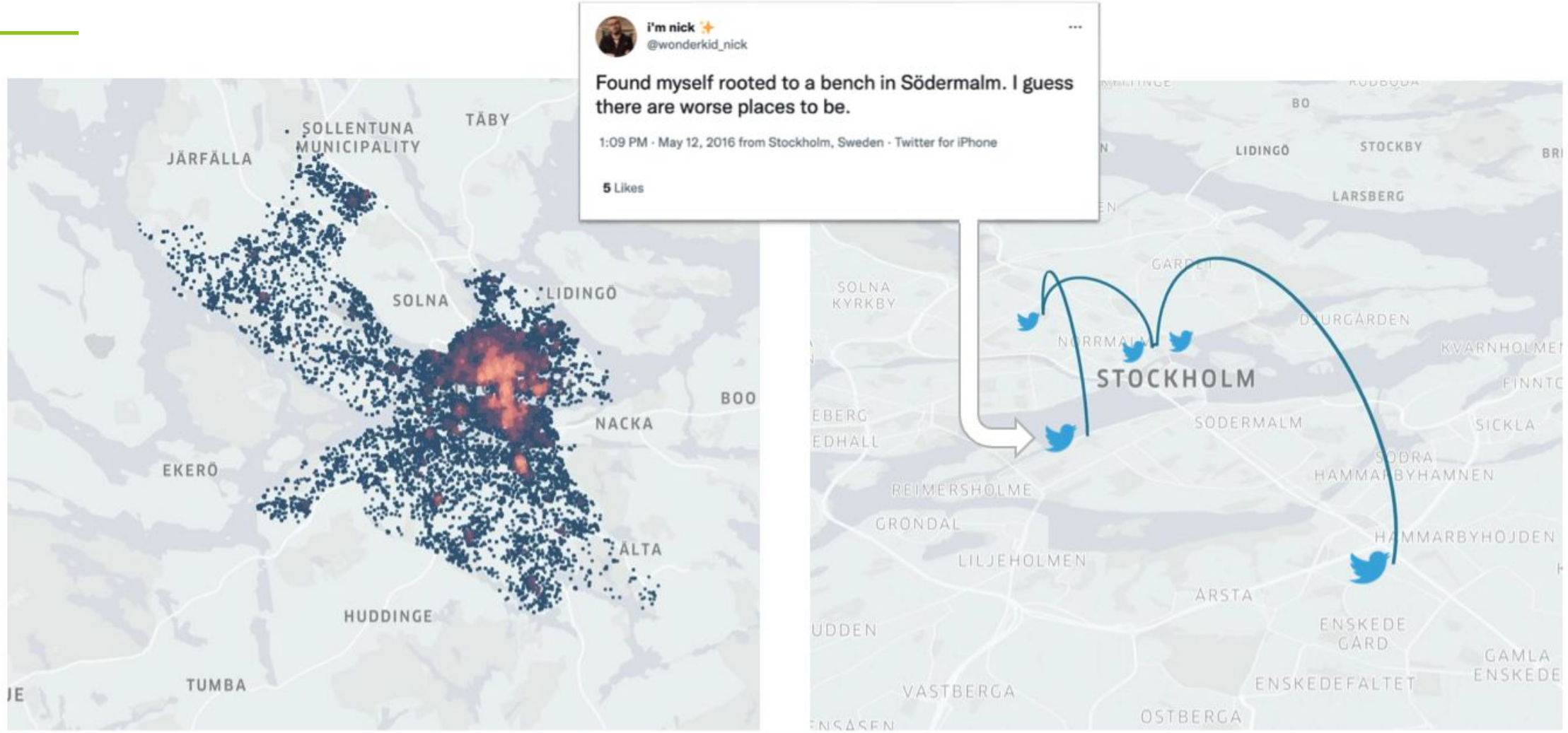
Geographic resolution is often at the cell tower level—resolution varies across the city and can be coarse.

“Bursty”

Often huge datasets, must be dealt with on large servers.

May not be able to share data for publication or combine with socioeconomic datasets.

SOCIAL MEDIA DATA

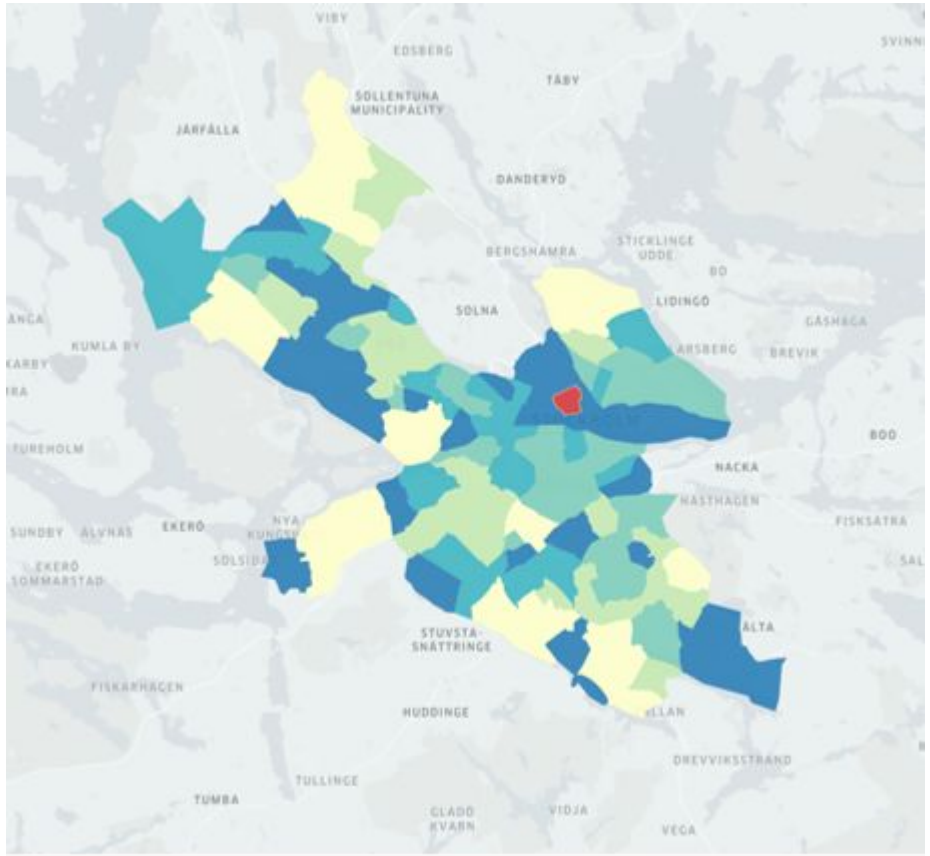


SOCIAL MEDIA DATA TO STUDY CONNECTIVITY OF NEIGHBORHOODS

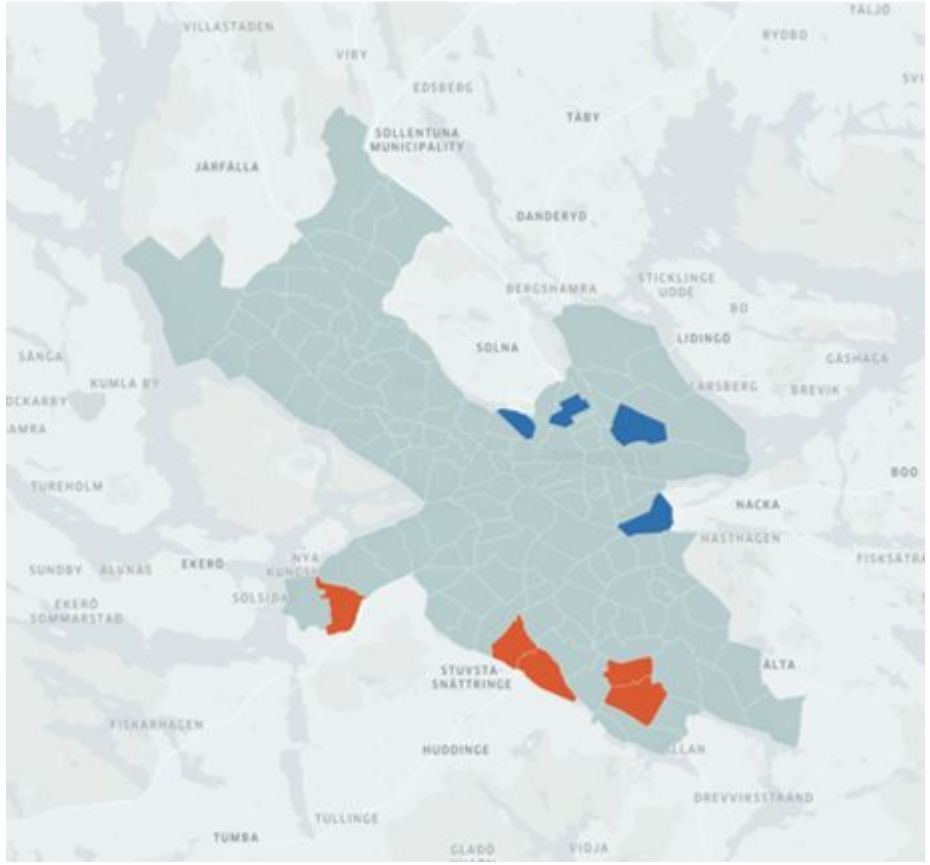
Heine et al., Senseable City Lab (2021)

SOCIAL MEDIA DATA TO STUDY CONNECTIVITY OF NEIGHBORHOODS

Heine et al., Senseable City Lab (2021)



People are more likely to travel between only-poor or only-wealthy neighborhoods, creating socioeconomic enclaves.



This effect is stronger in some neighborhoods than others. Dark orange neighborhoods are much more likely to be connected to neighborhoods similar to themselves; blue neighborhoods have more diverse connections.

SOCIAL MEDIA DATA: DISCUSSION

Strengths

Widely available across many different contexts.

Free (up to a certain point).

Publicly available, users opted in to share: fewer concerns with ethics & privacy.

Profile information allows you to infer socioeconomic + demographic traits of users.

Weaknesses

Biased sample of the population.

Biased sample of users' locations (you don't tweet everywhere you go).

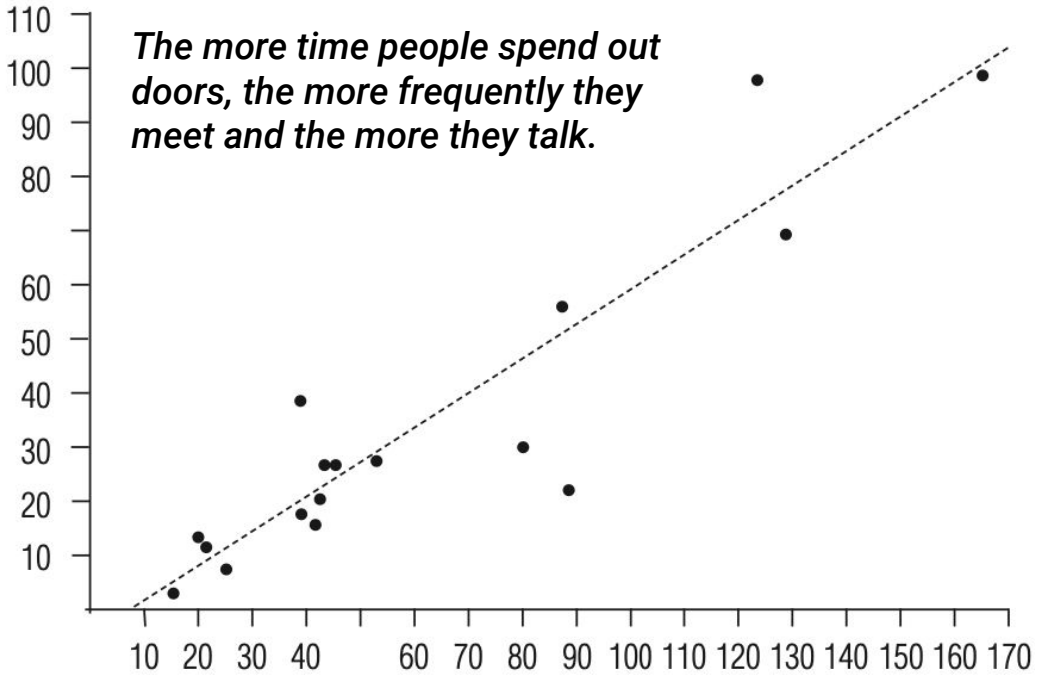
Sparse: most users tweet just a few times.

Bots.

Divided Cities

Designing for integration

CASE STUDY: PARKS AS INTEGRATORS

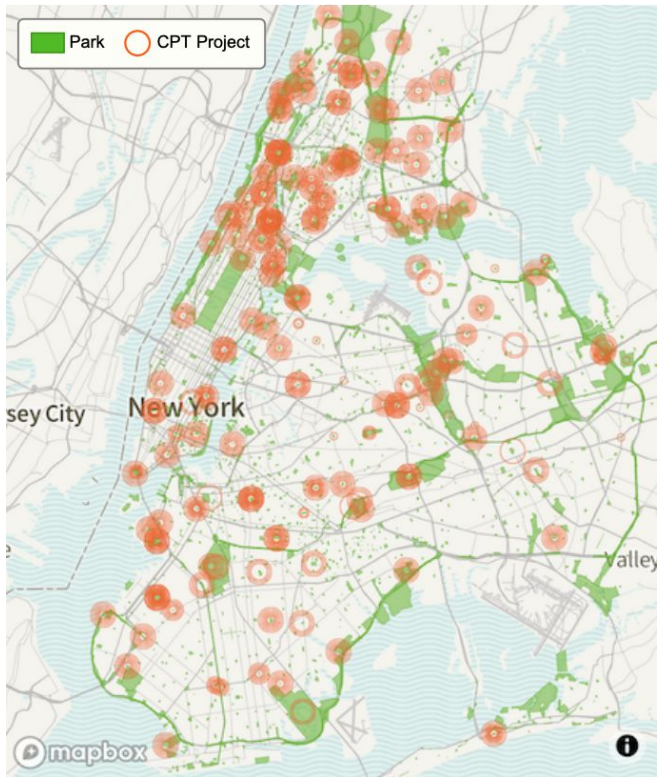


Jan Gehl, “Life Between Buildings”, 1971: Street life studies in Melbourne

William H. Whyte, The Social Life of Small Urban Spaces - documentary, 1979

CASE STUDY: PARKS AS INTEGRATORS

The relationship between park access and integration is difficult to identify, because people who live near a park may be different (e.g., richer) than those who don't.



Strategy: exploit variation in access to park due to park renovation projects.

Do people with higher access to parks experience more integration?

CASE STUDY: PARKS AS INTEGRATORS

	Dependent variable: $ExperiencedDiversity_{it}$					
	Black or White		Black Only		White Only	
Accesible Park Area (acres)	(1)	(2)	(3)	(4)	(5)	(6)
Total $_{(0\text{-}5km]}$	.0009**		.0004		.0014***	
	(.0004)		(.0007)		(.0004)	
(0-1km)		.0004		.0013		.0016*
		(.0007)		(.0012)		(.0009)
[1-2km)		.0009***		.0012**		.0010***
		(.0003)		(.0006)		(.0003)
[2km +)		.0002		.0002		.0003*
		(.0002)		(.0003)		(.0002)
Observations	57,431	57,431	15,504	15,504	41,927	41,927
User FE	✓	✓	✓	✓	✓	✓
Month FE	✓	✓	✓	✓	✓	✓
R^2	0.712	0.712	0.603	0.604	0.469	0.469

Note: Standard errors robust to heteroskedasticity and clustering at the individul level are reported in parentheses: *p<0.1; **p<0.05; ***p<0.01

* Individuals with more accessible park area within a 1-2km range experience higher integration.

WORK IN PROGRESS: STREETS AS CONNECTING SPACES

Pedestrianized streets in Covid-era Paris.

Design for Diversity, Emily Talen, p. 136.

WORK IN PROGRESS: STREETS AS CONNECTING SPACES

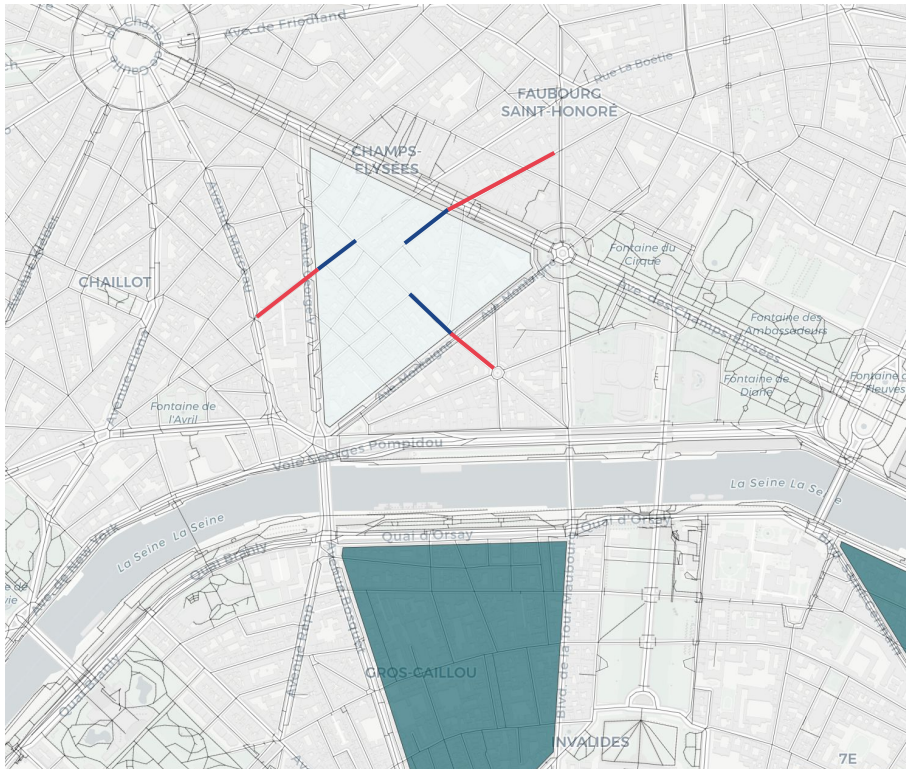
Policy:

- Staggered introduction starting in 2010 extending until 2019.
- Total zones: 142 covering most of Paris
- Restrict speed to 30km/h maximum

Goals:

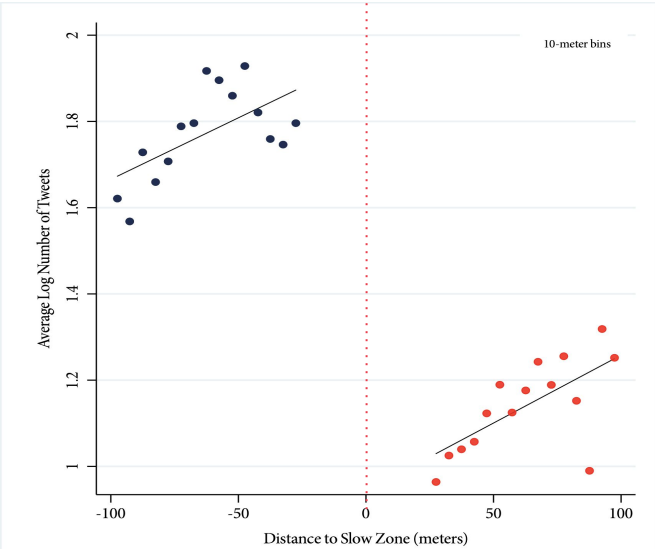
- Increase road safety
- Reduce noise pollution
- Favor bicycles and pedestrians
- Open possibilities for alternative uses (e.g., widening sidewalks, outdoor gathering space, and more vegetated areas.)

WORK IN PROGRESS: STREETS AS CONNECTING SPACES

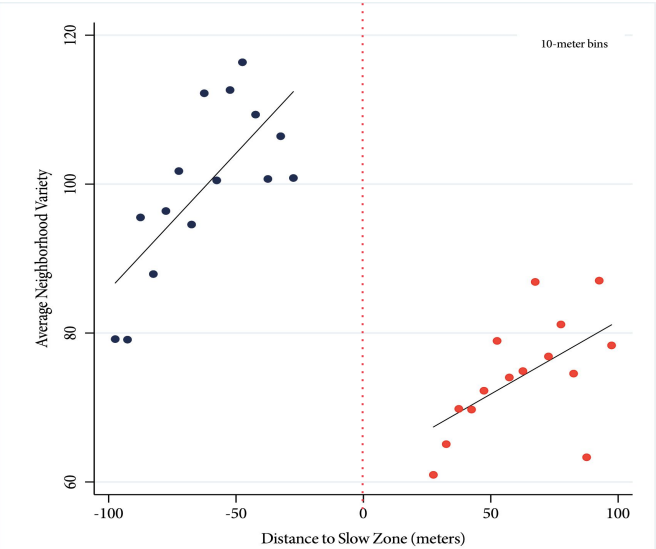


Strategy: compare human activity and social mixing as proxied by Twitter data immediately inside and outside the 30km/h zones.

Human Activity



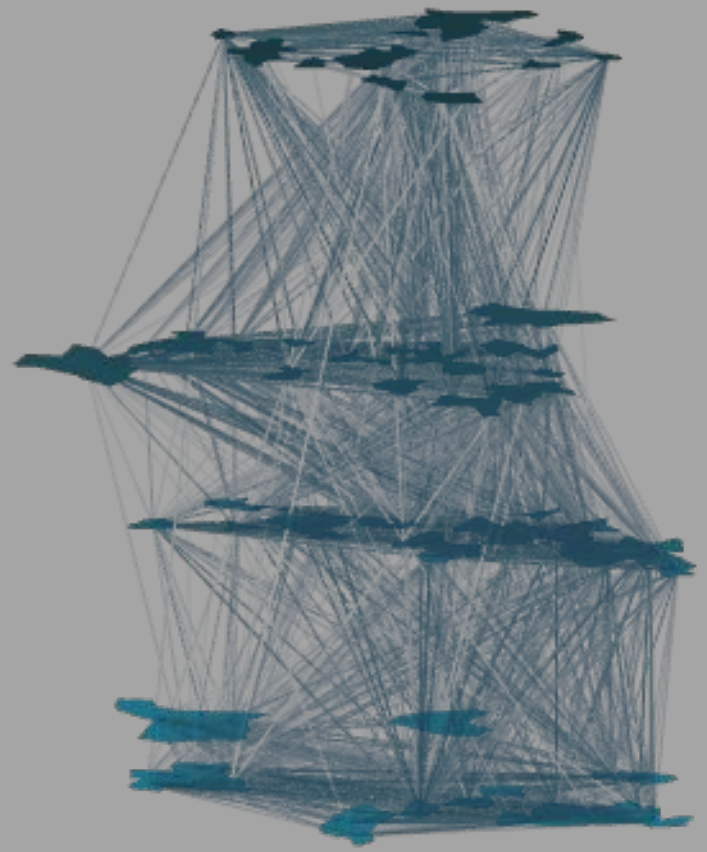
Social Mixing



Preliminary result: zones treated with reduced speed limits see a significant increase in human activity and social mixing as compared to very similar, nearby areas that do not.

BEYOND EXISTING RESEARCH

The papers we've discussed study just a few of the many unanswered questions about the way we move through cities and how our mobility patterns connect us or keep us apart.

What is one aspect of segregation and its relationship to cities that interests you? What's one question that you still have?

What kinds of data could you use to study it, and in what part of the world? What would be the benefits or drawbacks of different potential data sources?