Urban Data Science for (Regional) Policy Change

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URBAN**DISPLACEMENT**

RSA Winter Conference 2017:
Analysis of Paper and Plenary Titles

Equity? Uneven development?
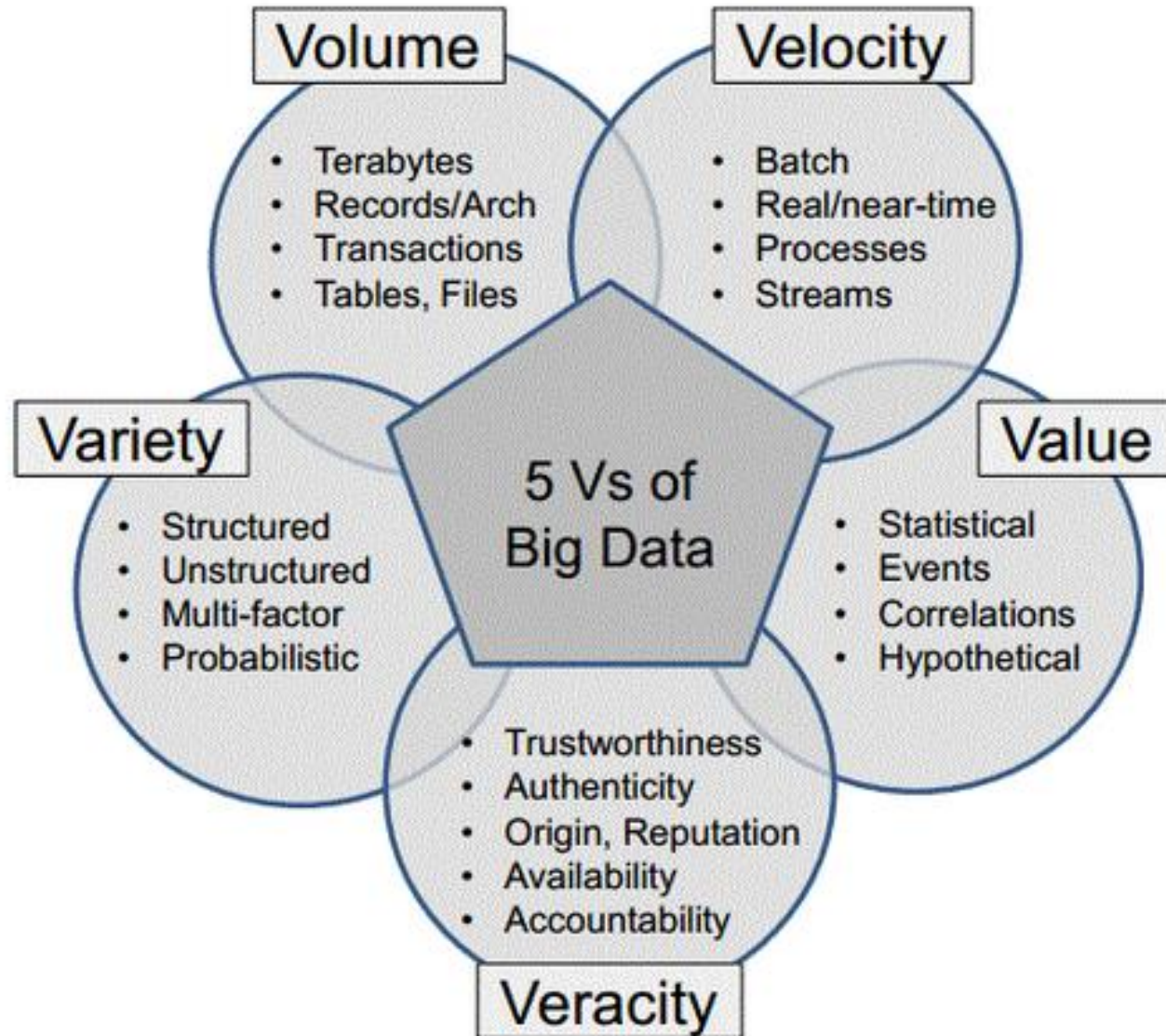
PhD dissertations in city and regional planning
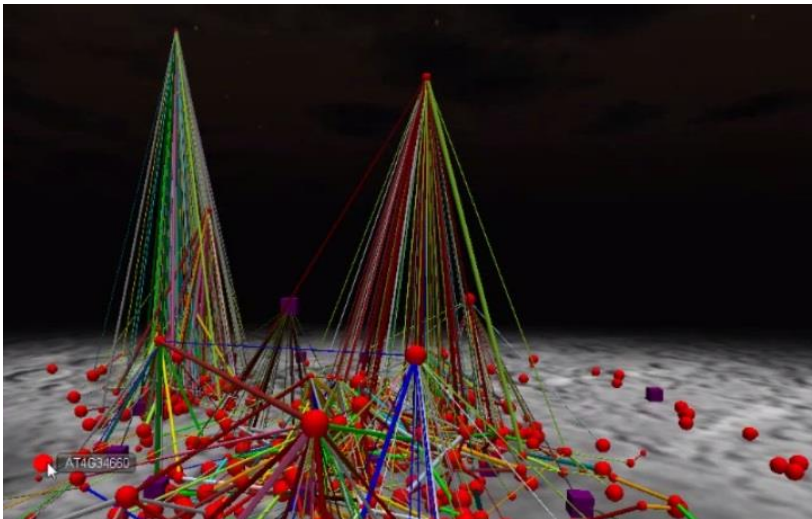
Is big data the panacea? The 5 Vs...

Scale:
Understanding the micro

Time: speed and continuity

Content:
lived human experience
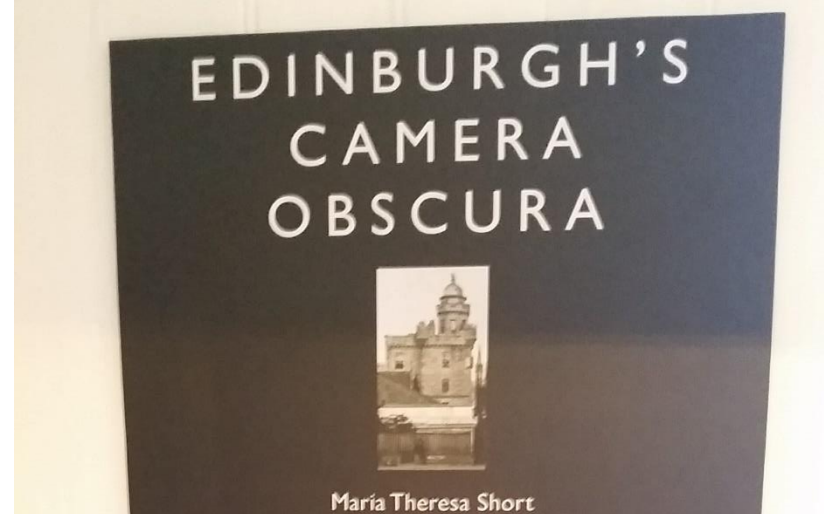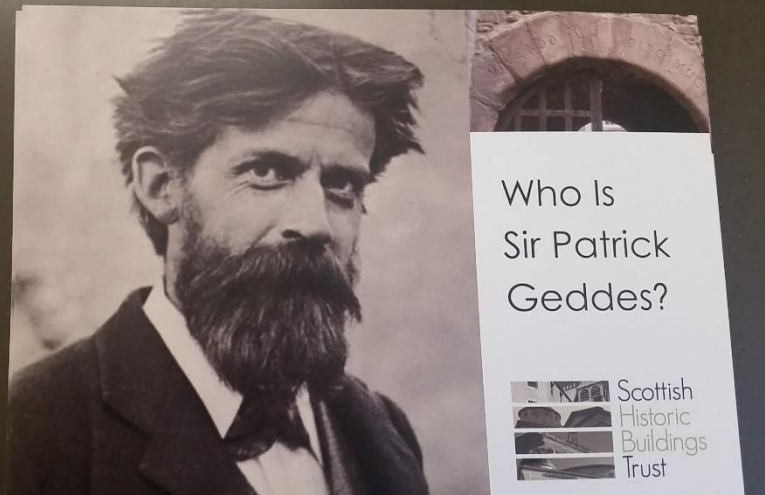
Spatial interaction

Big Data: The Epistemological Boost

via Rob Kitchin, Tracey P. Lauriault, and Gavin McArdle, eds. *Data and the City* (Routledge, 2017)

Redefining the urban experience, and our understanding of it:

"Our situatedness is mediated through mobile media networks, giving us on the one hand clues that are absent in the physical location, and at the same time turning our performances into data that can be circulated within these networks, both within and outside the original situated contexts."

Quoting Castells (2002:382): "Cities have always been communication systems, based on the interface between individual and communal identities and shared social representations."

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Who Is
Sir Patrick
Geddes?

Scottish
Historic
Buildings
Trust
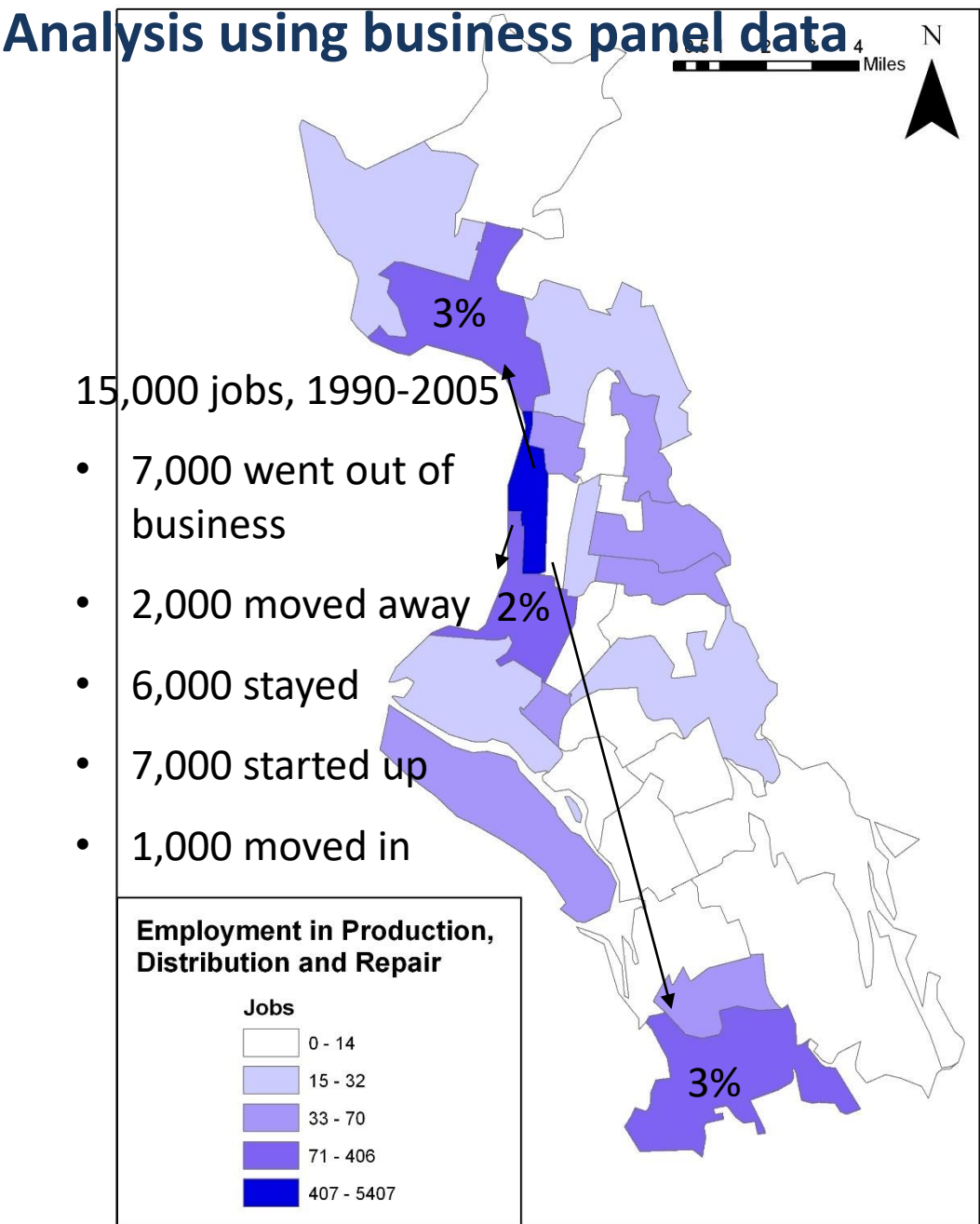
EDINBURGH'S
CAMERA
OBSCURA

Maria Theresa Short

Big data as a way to deal with fake news

- Idea of "truthiness"

- "Nobody really knows for sure"

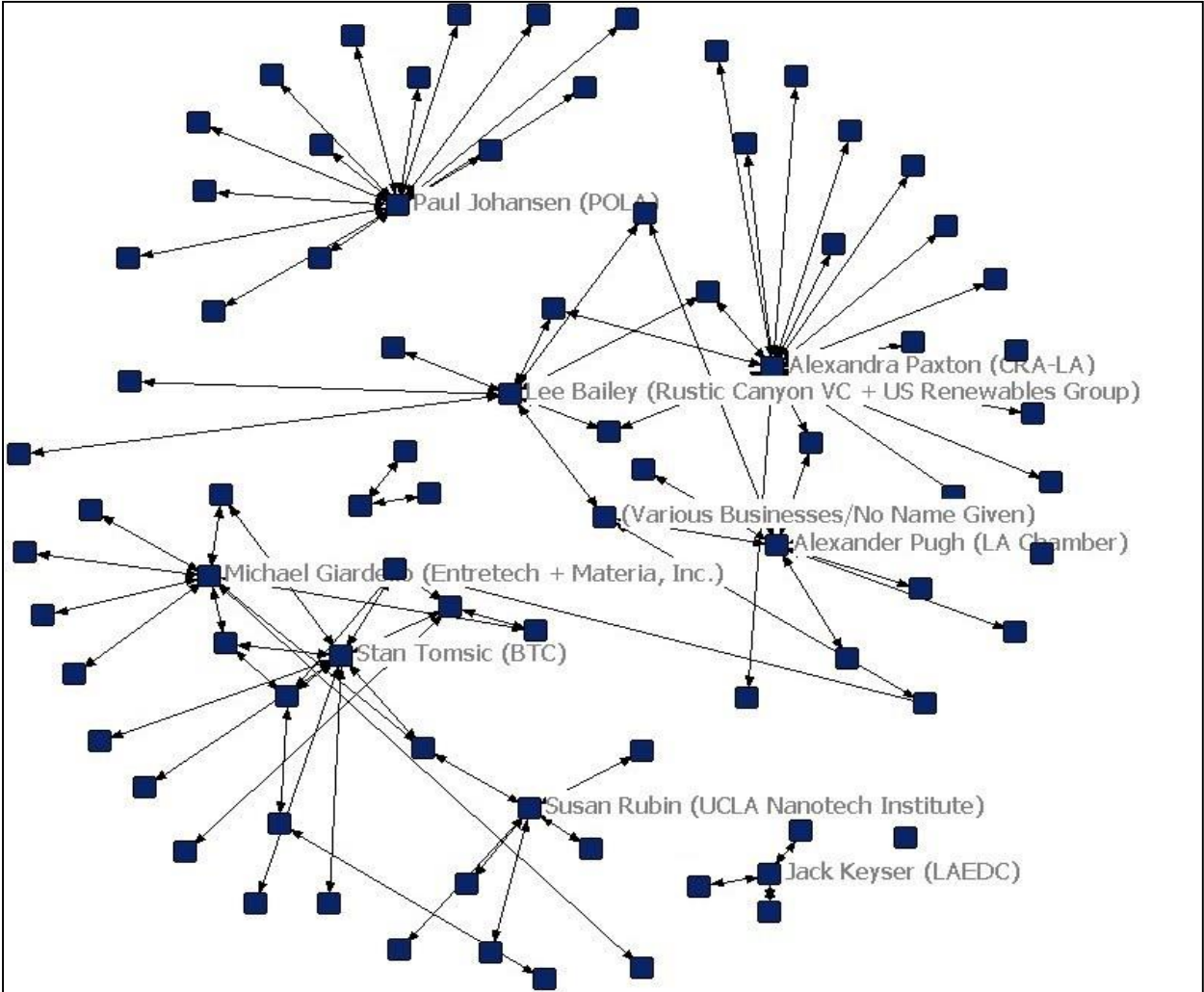- Crowdsourcing situatedness for validity: citizen science 2.0

- Challenging the truthiness of conventional wisdoms (and policies)
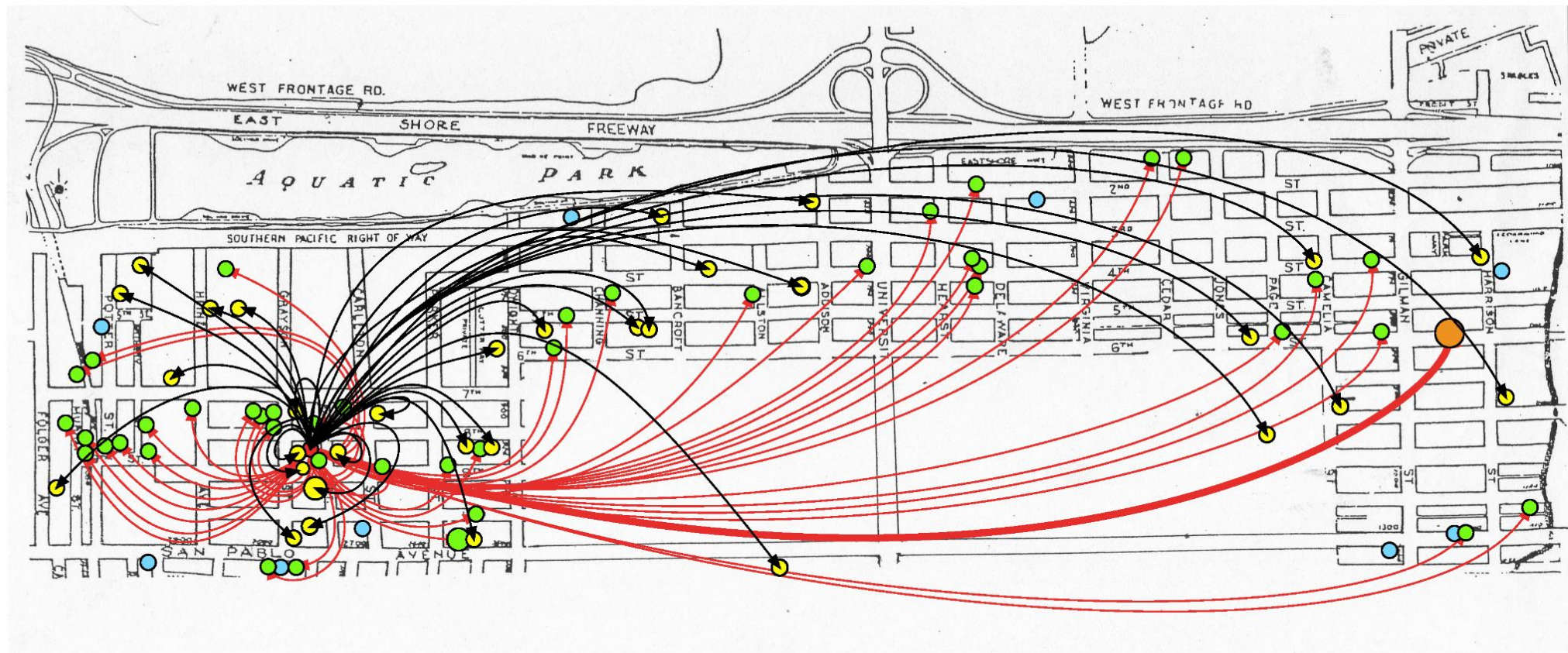
- The Urban Displacement Project

Conventional Wisdoms: Economic Development

- Cities can attract mobile capital

- Clusters, learning regions, etc. map to territories (or not)

- Startups (or patents, or green business, etc.) indicate innovation

- Commercial gentrification displaces mom-and-pops

- Etc.

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Analysis using business panel data

Analysis using surveys and UCINET

15,000 jobs, 1990-2005

- 7,000 went out of business

- 2,000 moved away

- 6,000 stayed

- 7,000 started up

- 1,000 moved in

3%

2%

3%

Employment in Production, Distribution and Repair

Jobs

- 0 - 14
- 15 - 32
- 33 - 70
- 71 - 406
- 407 - 5407

N

Miles

Paul Johansen (POLA)

Alexandra Paxton (CRA-LA)

Lee Bailey (Rustic Canyon VC + US Renewables Group)

(Various Businesses/No Name Given)

Alexander Pugh (LA Chamber)

Michael Giardello (Entretech + Materia, Inc.)

Stan Tomsic (BTC)
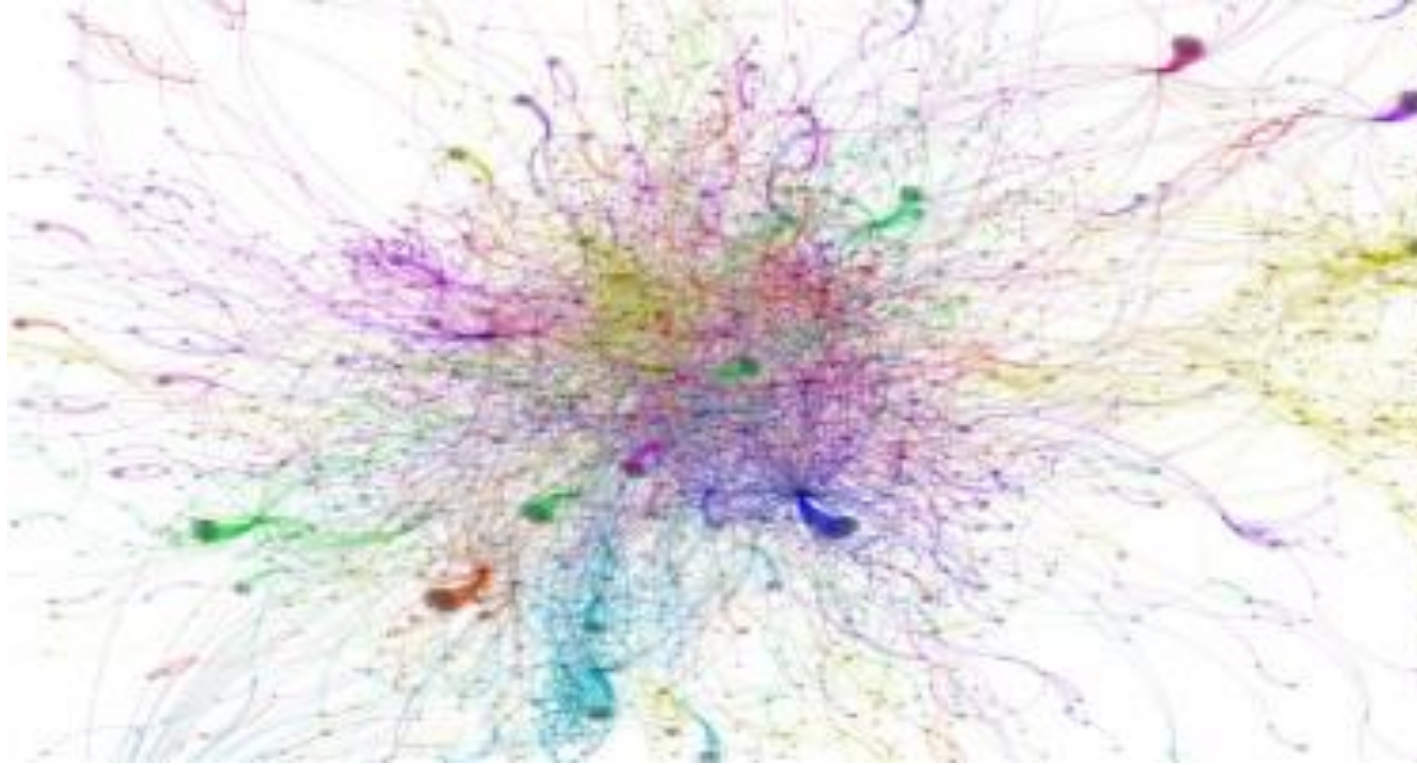
Susan Rubin (UCLA Nanotech Institute)

Jack Keyser (LAEDC)

Adams & Chittenden Scientific Glass
2741 Eighth Street
Berkeley CA 94710
Vox 510-843-5277
info@adamschittenden.com
www.adamschittenden.com

Customers
Suppliers
Personal links
Atlas Welding supplies
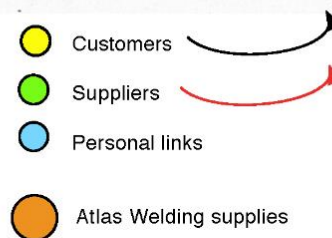
Much better: a business maps its own network

Insights from hashtag #supplychain and Twitter Analytics: Considering Twitter and Twitter data for supply chain practice and research
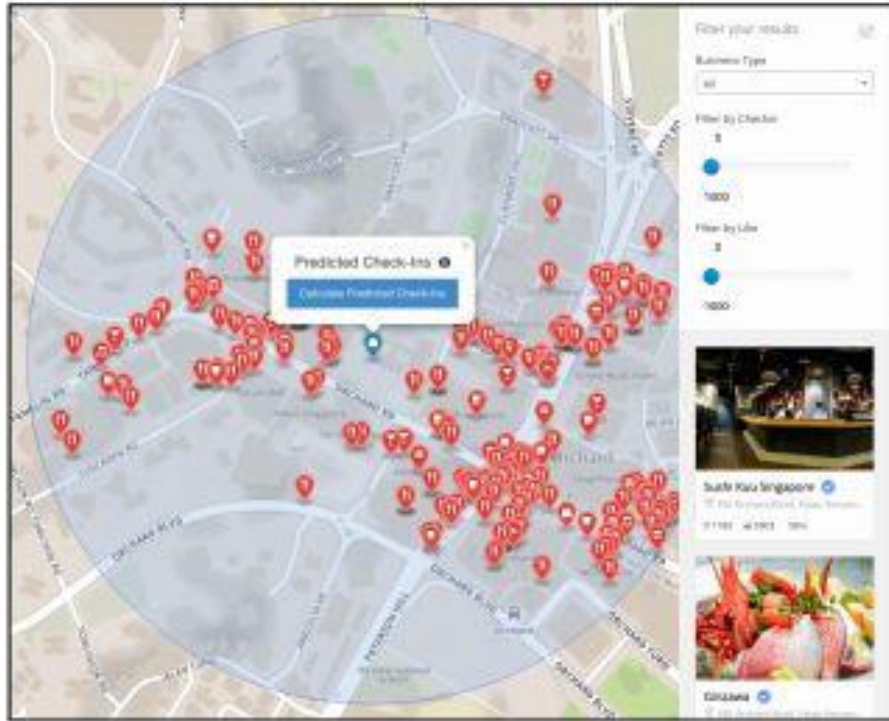
Bongsug (Kevin) Chae ✉

Figure 8: Our online interactive location analytics system.

Figure 3: The Facebook page of *Wimbly Lu Chocolates* that shows key popularity metrics such as 8.131 "likes" and 22K "check-ins".

Where is the Goldmine? Finding Promising Business Locations through Facebook Data Analytics

Jovian Lin, Richard Oentaryo, Ee-Peng Lim, Casey Vu, Adrian Vu, Agus Kwee
Living Analytics Research Centre, Singapore Management University, 80 Stamford Road, Singapore
jovian.lin@gmail.com, {roentaryo, eplim, caseyanhthu, adrianvu, aguskwee}@smu.edu.sg

Table 12.2 Product breakdown for GI digital technology firms

GI Product	Freq.	Percent	Cumulative
consultancy	1,276,928	65.39	65.39
care_or_maintenance	306,763	15.71	81.09
electronics	145,160	7.43	88.53
custom_software_development	113,763	5.83	94.35
broadband_services	38,672	1.98	96.33
web_hosting	28,808	1.48	97.81
software_desktop_or_server	21,096	1.08	98.89
advertising_network	15,638	0.8	99.69
peer_to_peer_communications	5,204	0.27	99.95
software_web_application	331	0.02	99.97
digital_media	305	0.02	99.99
software_mobile_application	255	0.01	100
Total	1,952,923	100	

Source: BSD CH Growth Intelligence

12 Exploring digital technology industry clusters using administrative and frontier data

Max Nathan and Anna Rosso
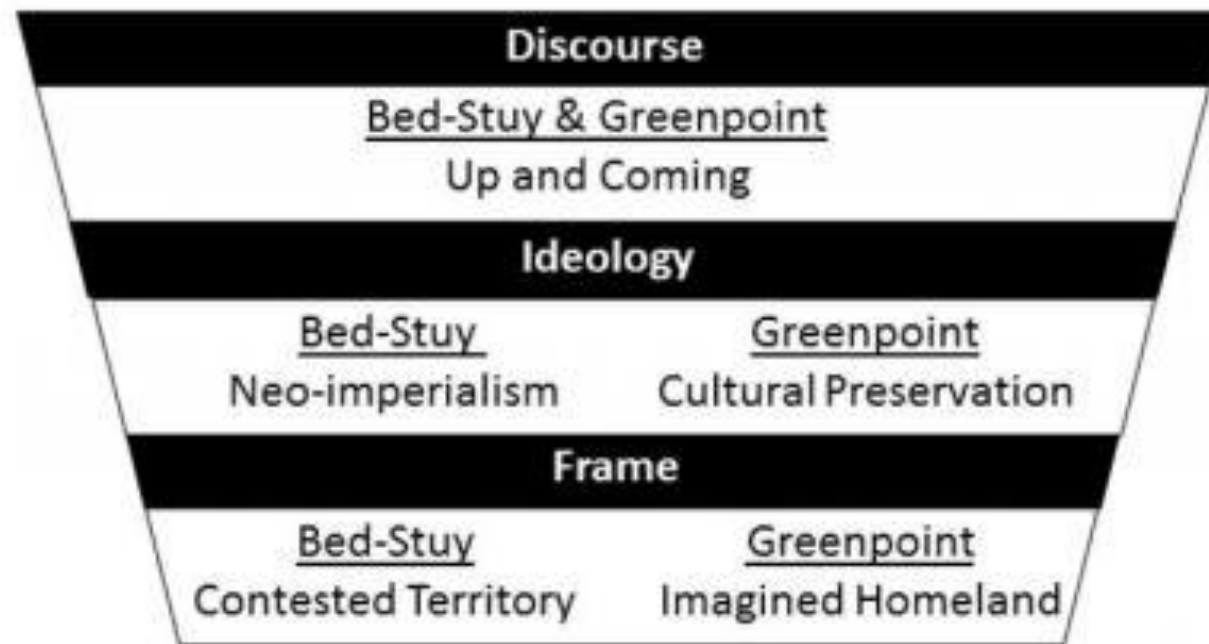
Analyzing business change with Yelp and content analysis

Figure 2. Frame analysis of two Brooklyn neighborhoods based on Yelp restaurant reviews.

Source: Zukin, Lindeman, and Hurson 2015

Credit card transactions

Source: Louail, Lenormand, Murillo Arias, and Ramasco 2017

Conventional Wisdoms: Land Use, Development, Regional Governance...

- Land use regulation hinders production and raises prices

- New housing production causes displacement

- Regional governance occurs through formal bodies
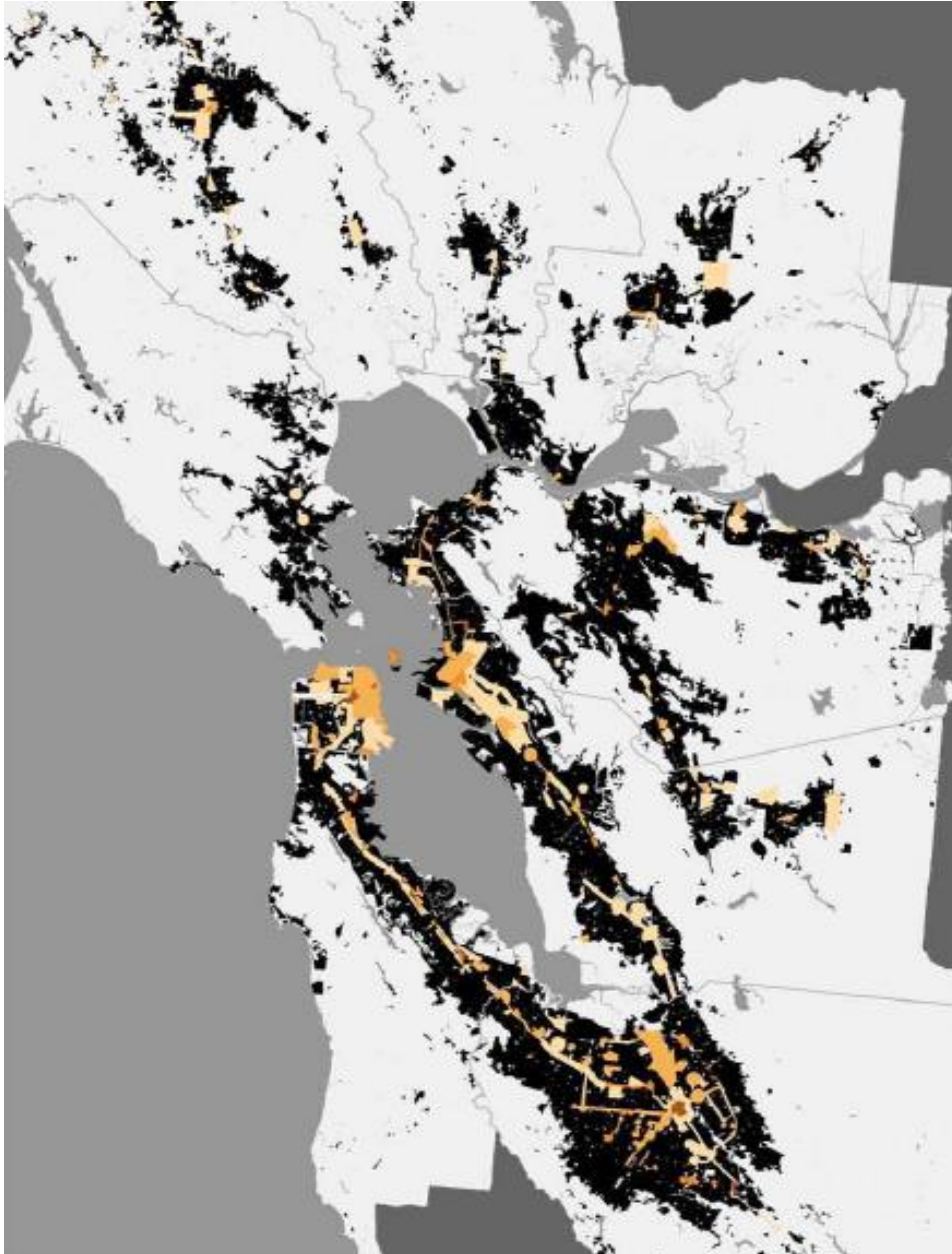
- Etc.

www.urbandisplacement.org
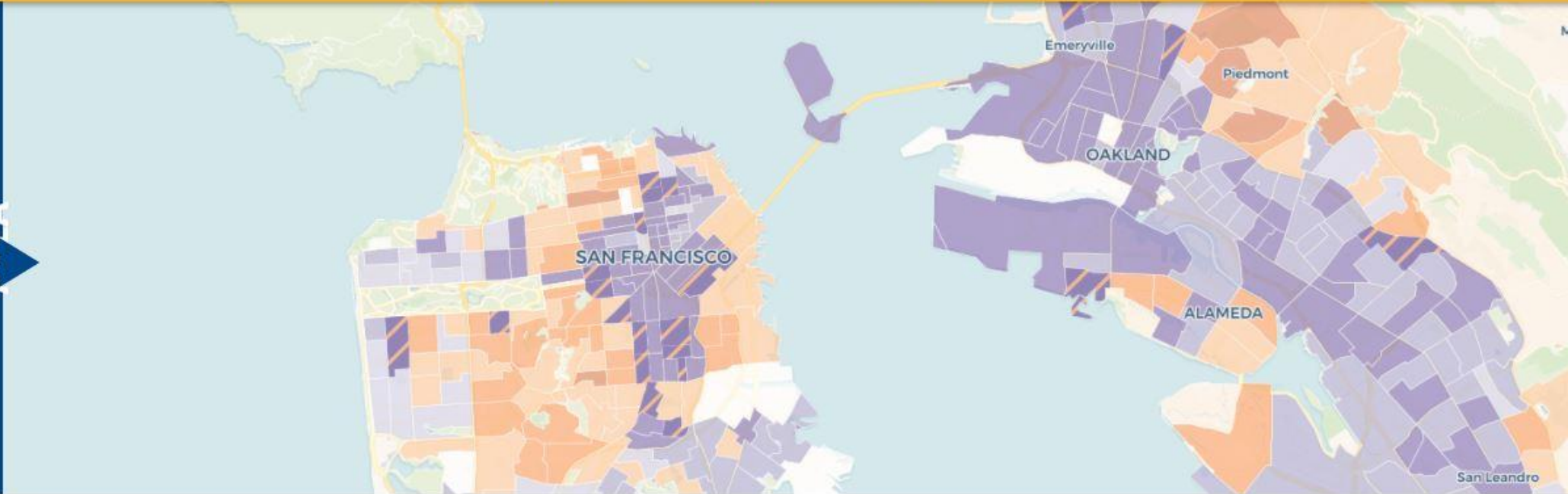
WHAT IS THE NATURE OF GENTRIFICATION AND DISPLACEMENT IN AMERICAN CITIES?

The Urban Displacement Project is a research and action initiative of UC Berkeley in collaboration with researchers at UCLA and
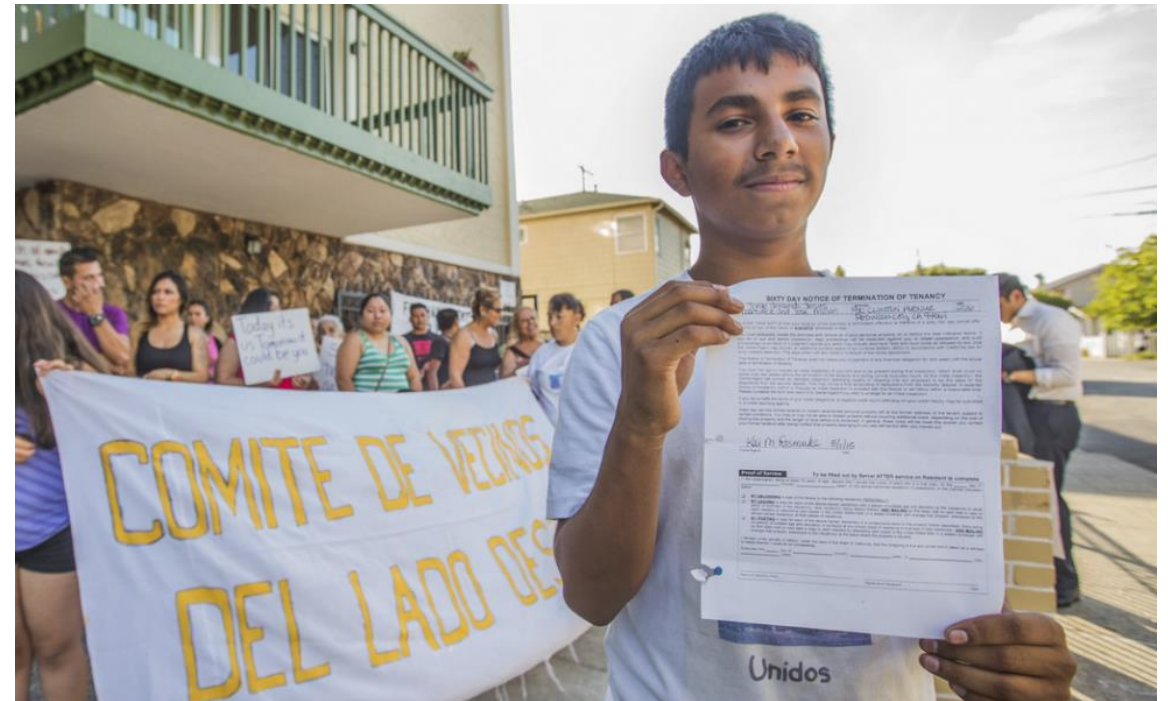
Regional sustainability planning, urban displacement?

2040 Plan Bay Area:

- 2 million new residents, 1 million new jobs
- 80% of new growth in 5% of land area

=

Methodologies for Analyzing Potential Displacement near Transit
Funded by California Air Resources Board and Department of Transportation

Community-based participatory research

Mixed-methods approach

- Fieldwork and interviews conducted jointly with community-based organizations
- Multi-level (parcel-tract-city) database:

Dataset	Variables	Years
Census	Race, income, age, educational attainment, HH composition, employment, jobs, tenure, vacancies, crowding, housing units, housing burdened, commute mode, car ownership, rent paid, immirgation status, nativity, linguistic isolation, income inequality, racial segregation, income bipolarity, % moved-in within last year (by race, education, income, tenure)	1990, 2000, 2010, 2009-2013
Parks/Open Space	Small parks (acres/1000 people) and protected areas (acres/1000 people)	2014
Transit Stations	# rail stations per acre and population	1990,2000, 2014
Walkability	Average score	2014
Transit ridership (BART, VTA, CalTrain)	# weekday entrances or exits	1992-2014
Residential Building Permits	# permits per year	1980-2013
Potentially rent controlled units	# of potentially rent controlled apt as percentage of total units	
Evictions (SF &LA only)		1998-2013
Non-profits	Total, rec, youth, social services and housing/advocacy-related	1995, 2000, 2010
PUMS	Movement in/out of neighborhood (with race, income, education)	2011, 2010, 2000
Affordable Housing	# deed restricted and public housing units	1990, 2000, 2013
Section 8	# of vouchers	2000-2013
NETS	# jobs, establishments, sales	
Budget	% of general revenue from property taxes	1992-2011
Anti-displacement policies	Production and preservation policies	

Shortcomings of previous research

- Lack of analytic distinction between gentrification and displacement

  – influx of capital and higher-income, higher-educated residents vs. forced moves and exclusion

- Underspecification of models analyzing causes of gentrification

- Models that find little relationship between gentrification and displacement, due to poor proxies, limited timeframe (e.g. 1990-2000) and units of analysis

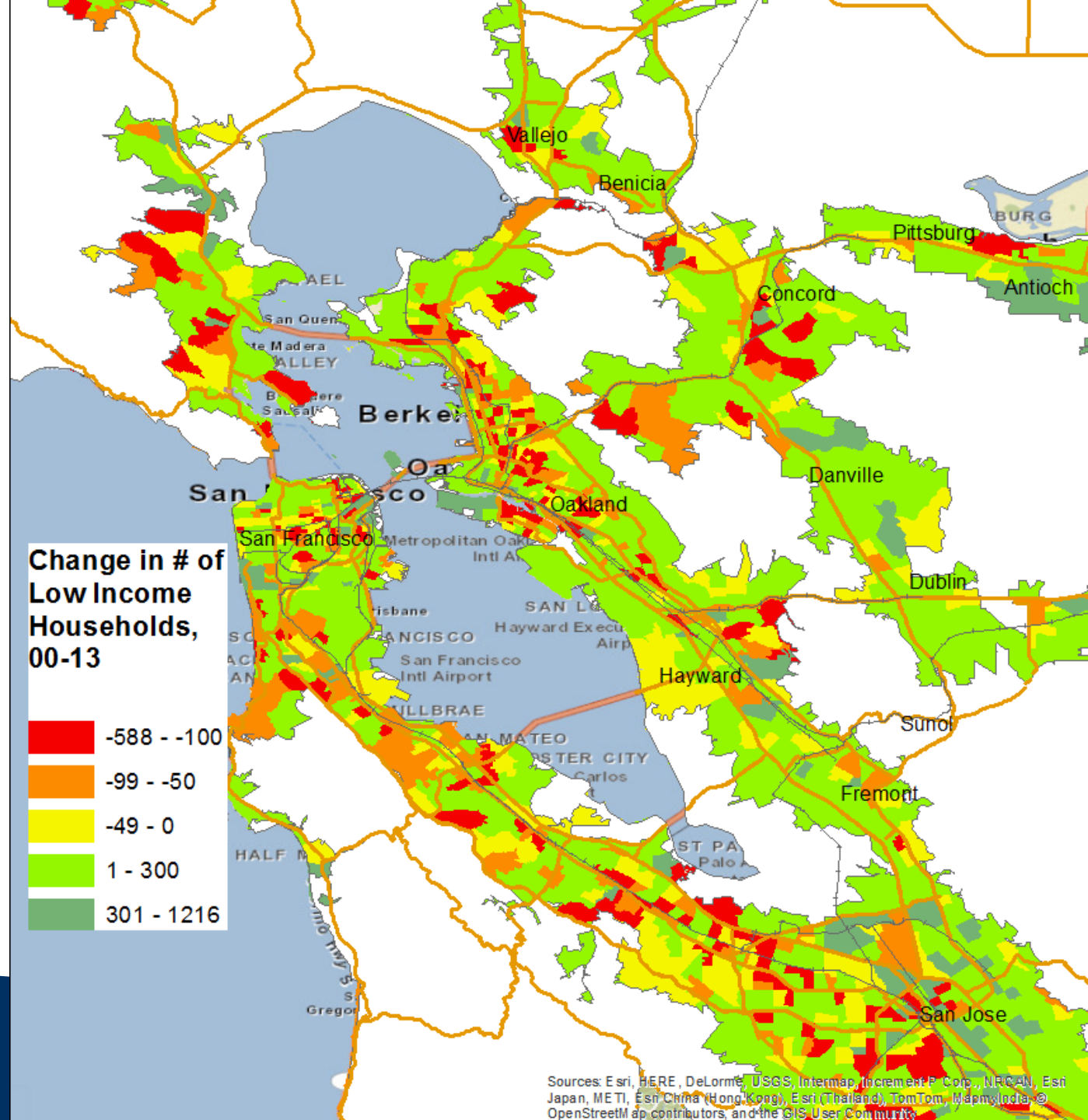# Defining gentrification and displacement

Gentrification

- Process of neighborhood change characterized by new real estate investment and an influx of new residents with higher income and educational levels
- May result in displacement

Displacement

- When a household moves for reasons beyond their control
- Many causes – related to both disinvestment and reinvestment
- Exclusionary displacement when future generations cannot move in

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Change in Low Income Households

➢ On average tracts **gained** 60 low income households.

➢**Loss** proxies for displacement

Change in # of Low Income Households, 00-13

- -588 - -100
- -99 - -50
- -49 - 0
- 1 - 300
- 301 - 1216

Sources: Esri, HERE, DeLorme, USGS, Intermap, Increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapmyindia, © OpenStreetMap contributors, and the GIS User Community
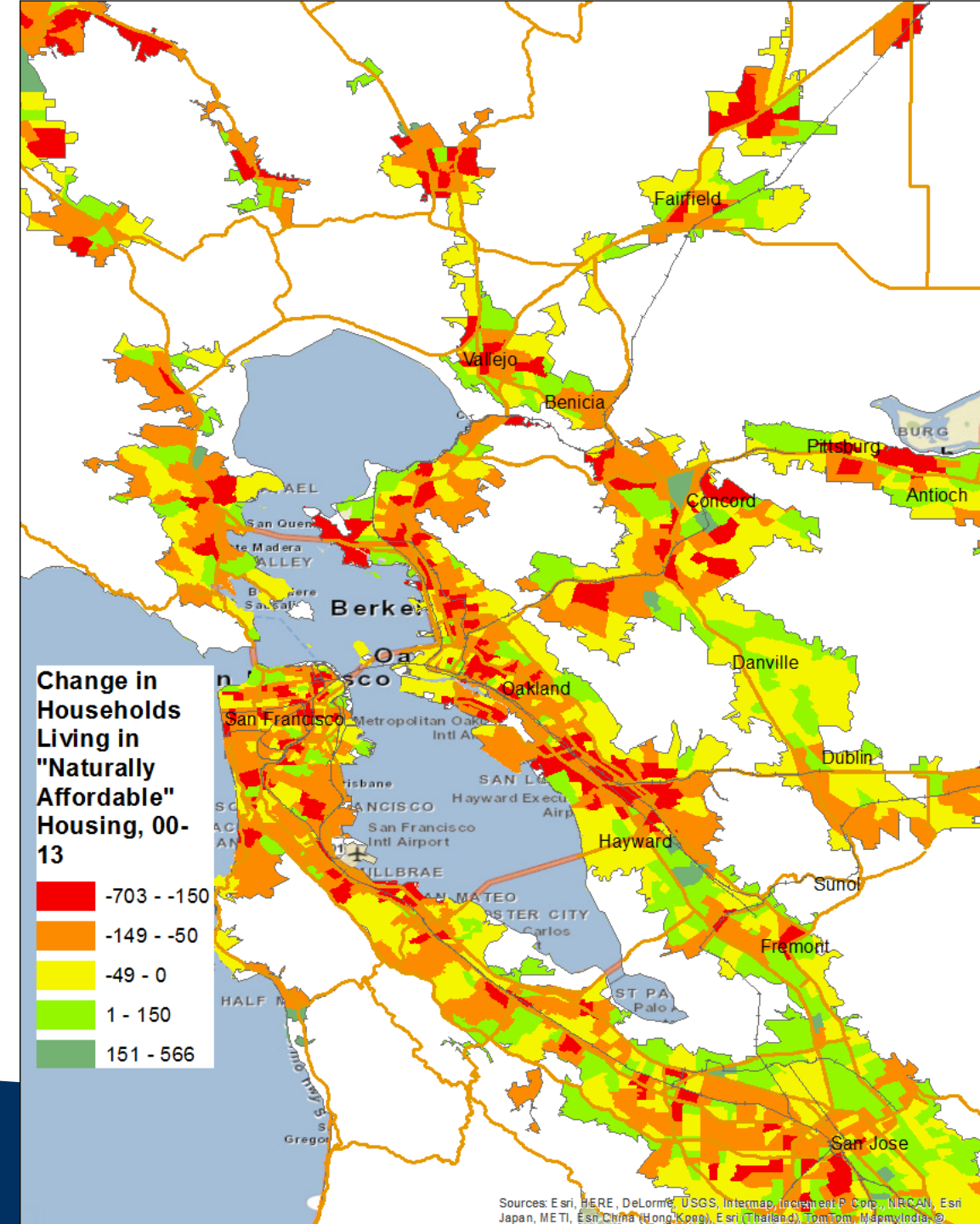
Loss of Naturally Occurring Affordable Housing

From trickle-down to trickle-up: housing formerly affordable at 30% of income or less


Change in Households Living in "Naturally Affordable" Housing, 00-13

- -703 - -150
- -149 - -50
- -49 - 0
- 1 - 150
- 151 - 566

Sources: Esri, HERE, DeLorme, USGS, Intermap, Increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapmyindia, ©
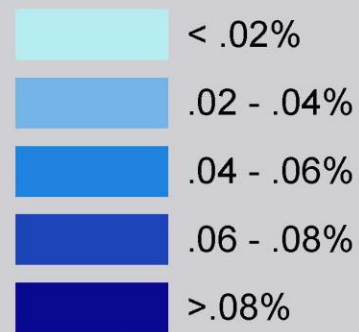
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Exclusionary displacement of low-income households

**Proportion of All Low-Income In-Movers by Census Tract, 2013**

- < .02%
- .02 - .04%
- .04 - .06%
- .06 - .08%
- >.08%

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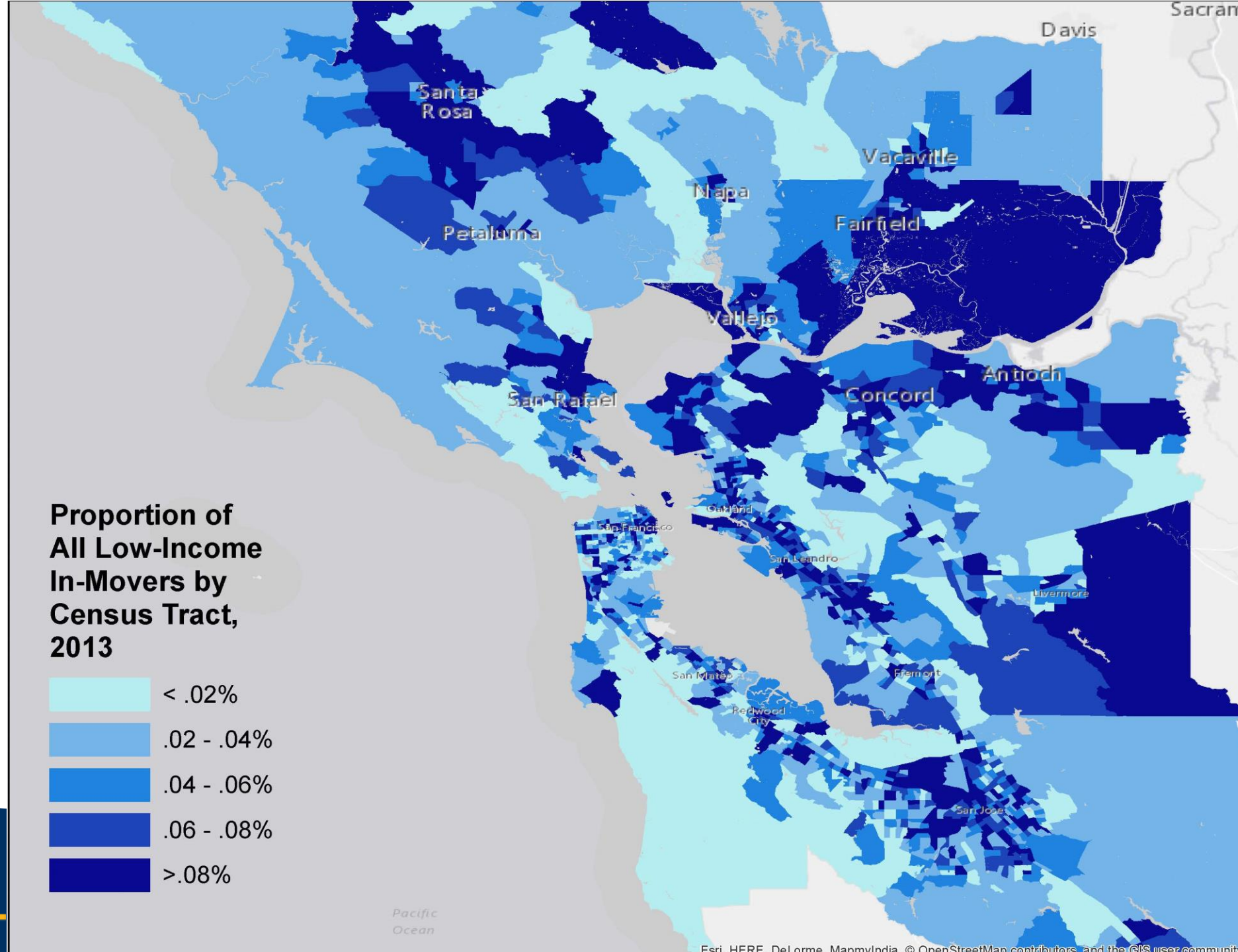
Transit-Oriented Gentrification
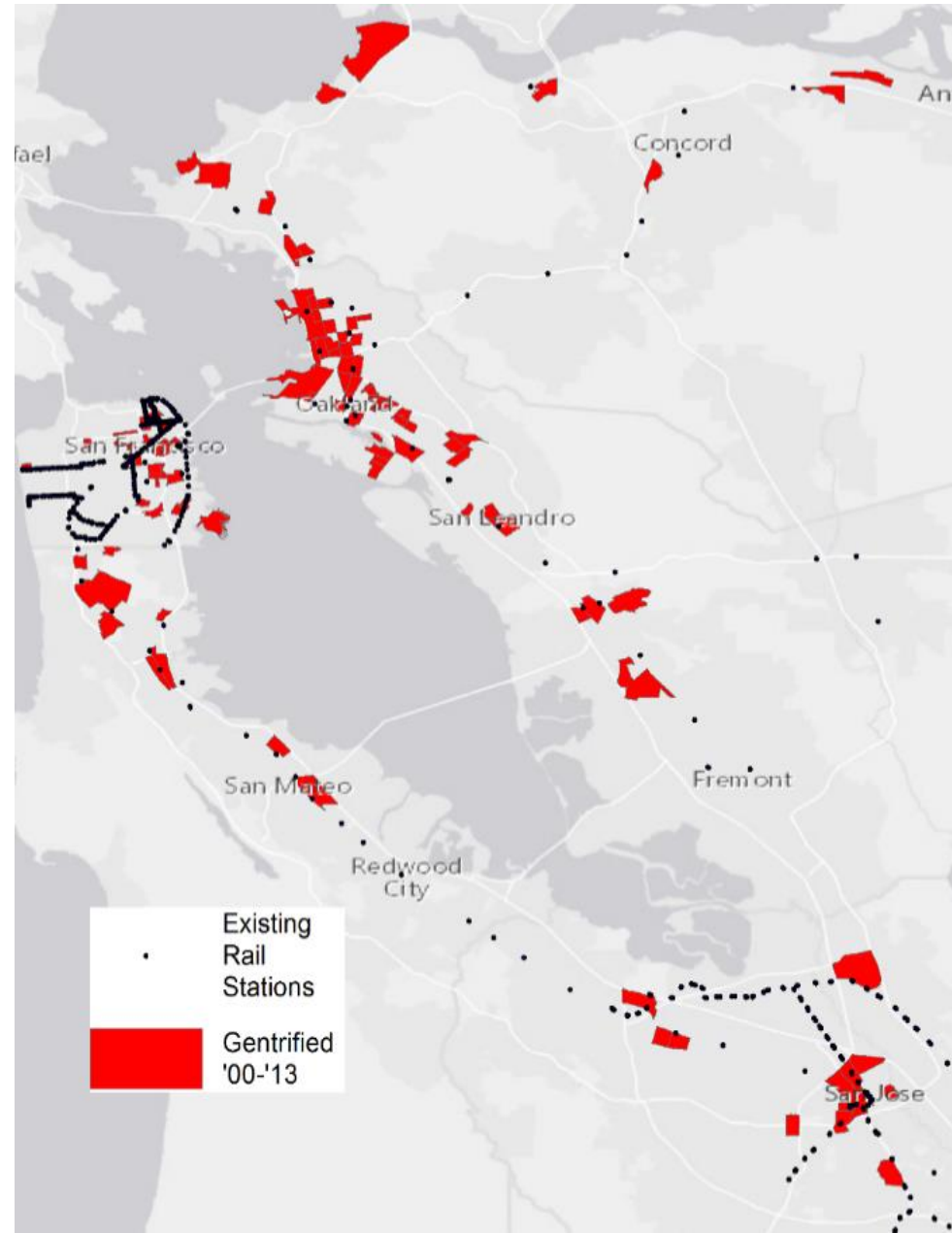
Regional displacement, 1990-2015

Census Tract Typology Classification

Lower Income Tracts (> 39% of HH are considered Low Income)	Moderate to High Income Tracts (<39% of HH are considered Low Income)
Not losing low income households or very early stages Does not fall within any of the below categories	**Not losing low income households or very early stages** Does not fall within any of the below categories
At risk of gentrification or displacement · Strong market · In TOD · Historic housing stock · Losing market rate affordable units · Employment center	**At risk of displacement** · Strong market · In TOD · Historic housing stock · Losing market rate affordable units · Employment center
Undergoing displacement · Already losing low income households, naturally affordable units, and in-migration of low income residents has declined · Stable or growing in size	**Undergoing displacement** · Already losing low income households · Decline in either naturally affordable units or in-migration of low income residents · Stable or growing in size

Advanced Gentrification
· Gentrified between 1990 and 2000 or between 2000 and 2013 based on:
    o Neighborhood vulnerability
    o Demographic change
    o Real estate investment
	Advanced Exclusion
	· Very low proportion of low income households
	· Very low in-migration of low income households
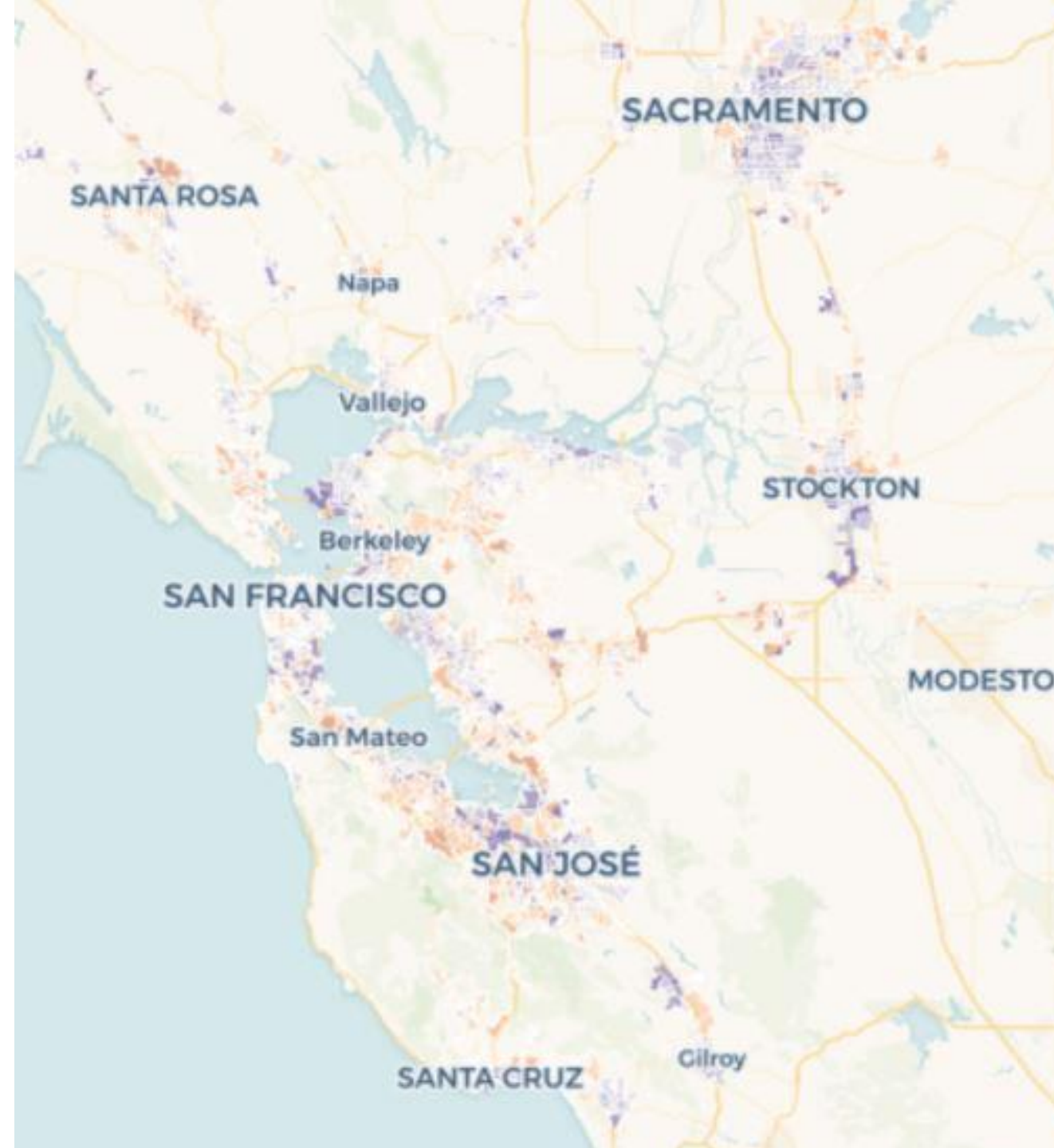
Regional policy inventory
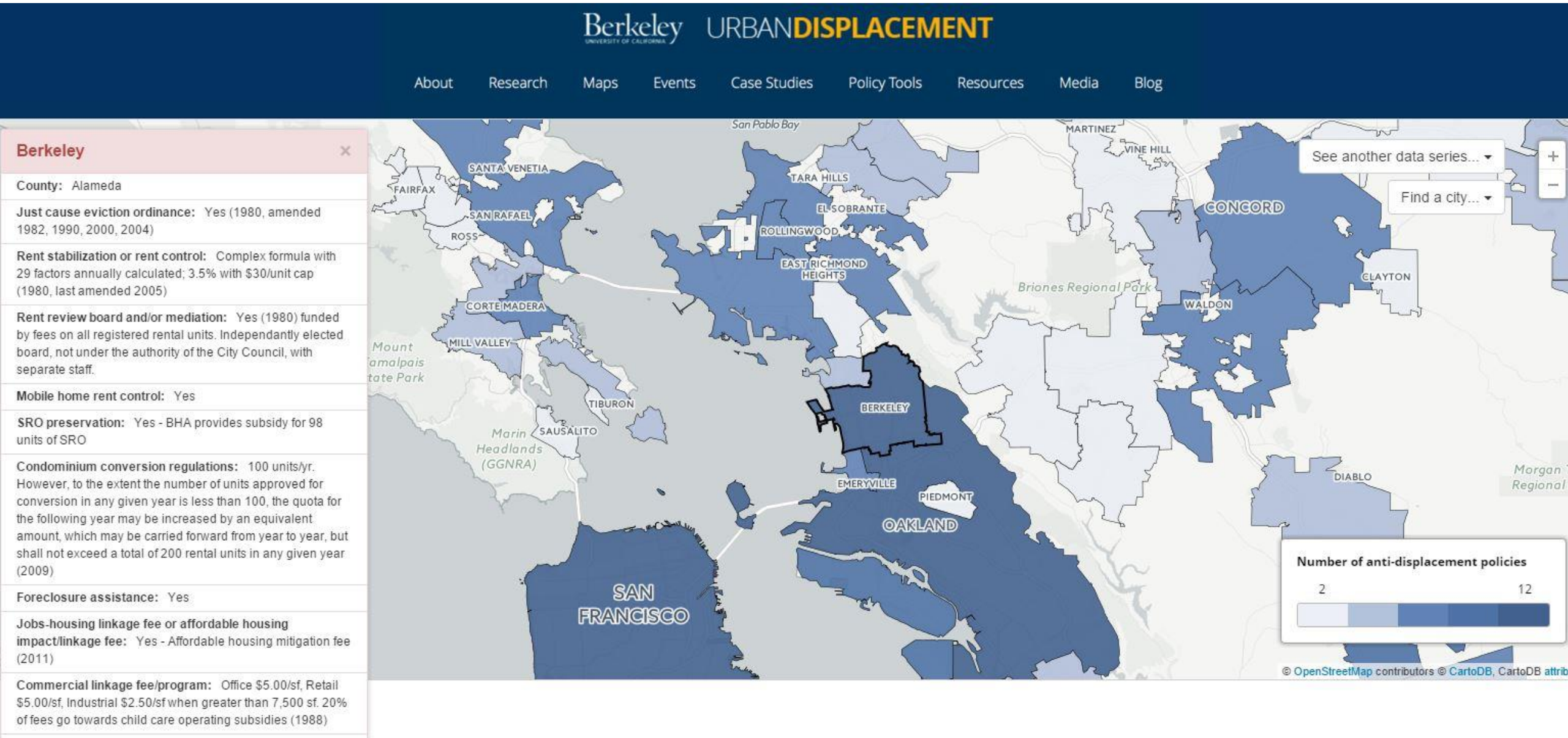
Policy change: incorporating time

San Francisco Chronicle

HUD to rethink veto of SF's preference housing law

By J.K. Dineen | September 2, 2016 | Updated: September 2, 2016 4:25pm

Mission residents and others will be favored for housing

By Mission Loc@l on September 22, 2016 at 5:00 PM

Mission 2015 Interim Controls

SAN FRANCISCO
PLANNING DEPARTMENT

September 24, 2015

Policy change: shifting from city to region

Plan Bay Area 2040

Plan Bay Area

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2040 Plan

Adequate Housing   2   House **100%** of the region's projected growth by income level without displacing current low-income residents and with no increase in in-commuters over the Plan baseline year*

Goals and Targets

Scenarios

Housing and Jobs

Goals and Targets

BART Board of Directors: Transit-Oriented Development Policy Performance Measures and Targets

POLICY GOAL	INTENT	#	Draft Performance Measures	STAND
F. Affordability & Equity	Ensure all incomes can live near transit	F1.	# affordable units on BART property	
		F2.	Share of housing units systemwide that are affordable	
	Increase Opportunities for Disadvantaged Businesses (Federal) and Small Businesses	F3.	Disadvantaged Business and Small Business Utilization	

Reanalyzing with big data: GTFS
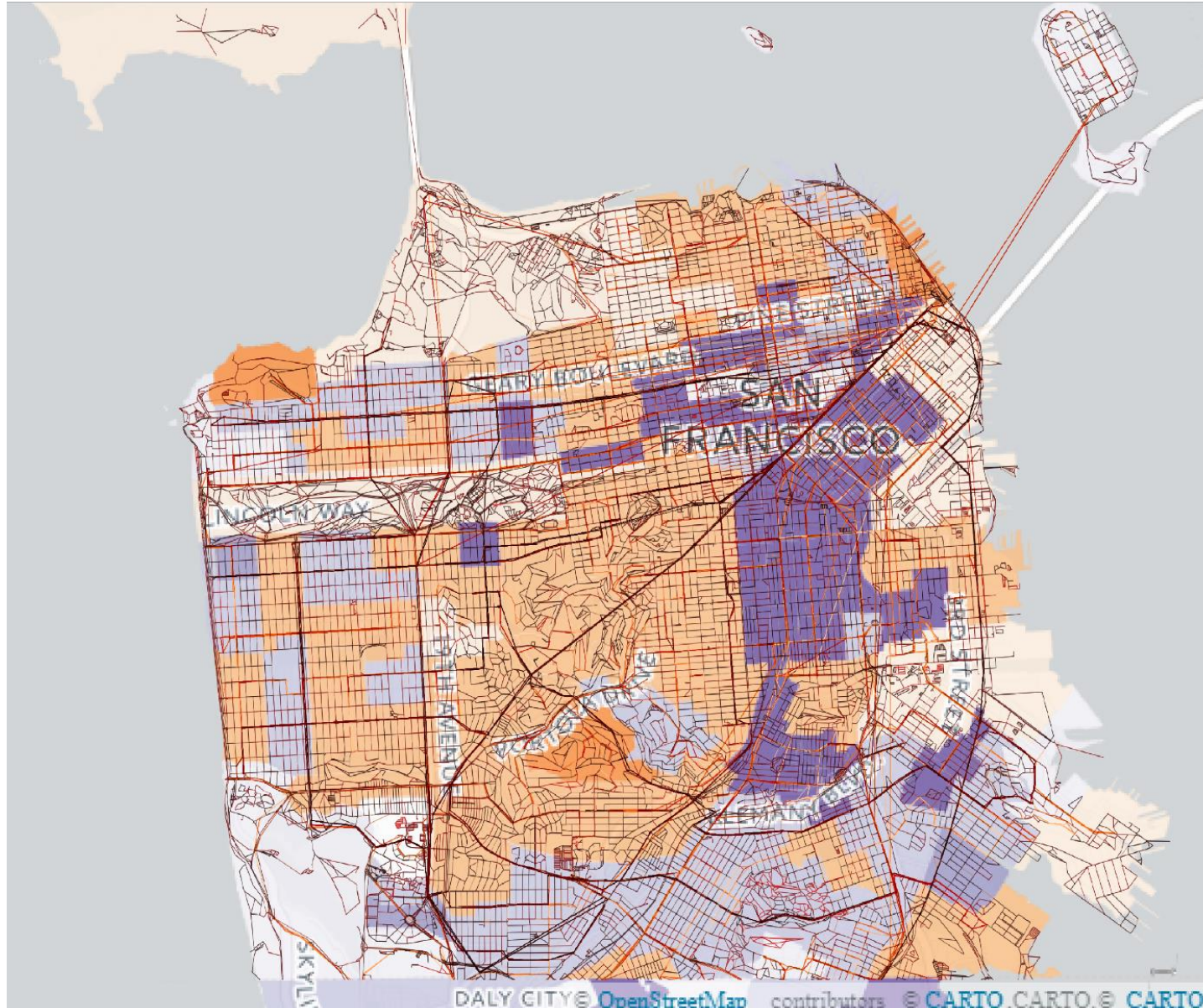
Rethinking accessibility from points to networks:

Adding General Transit Feed Specification data
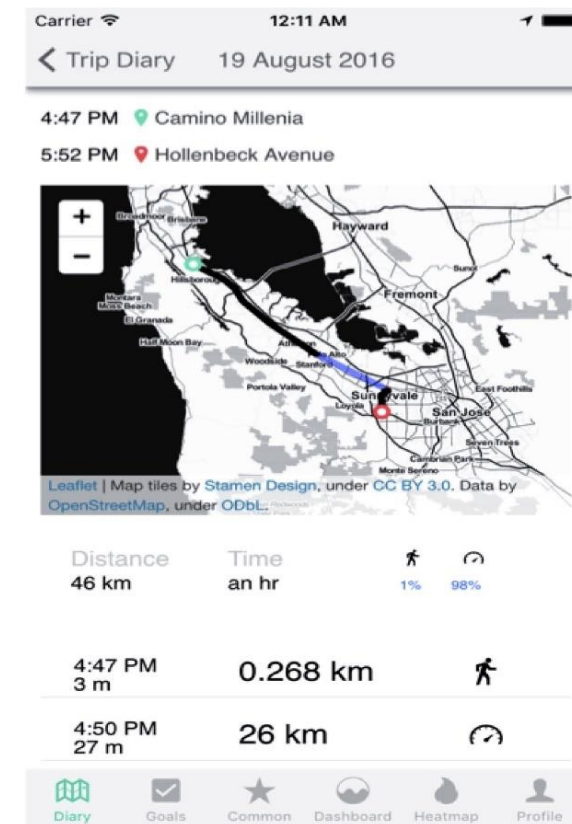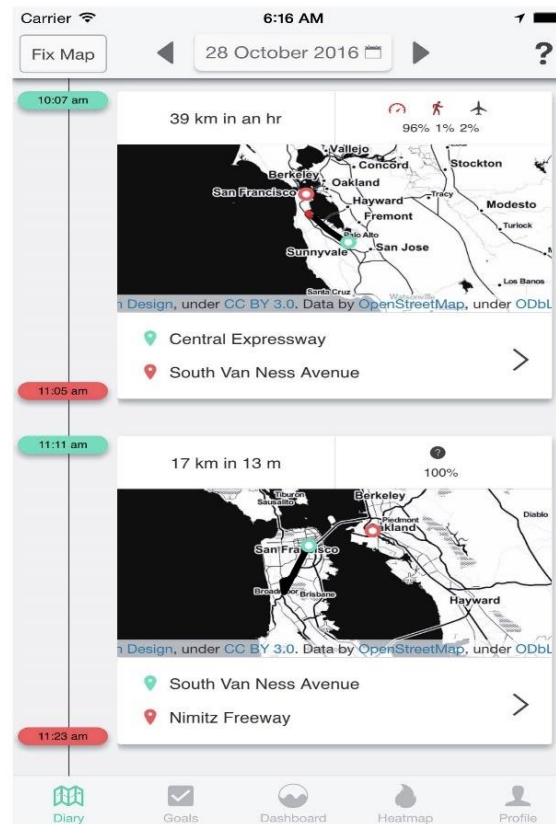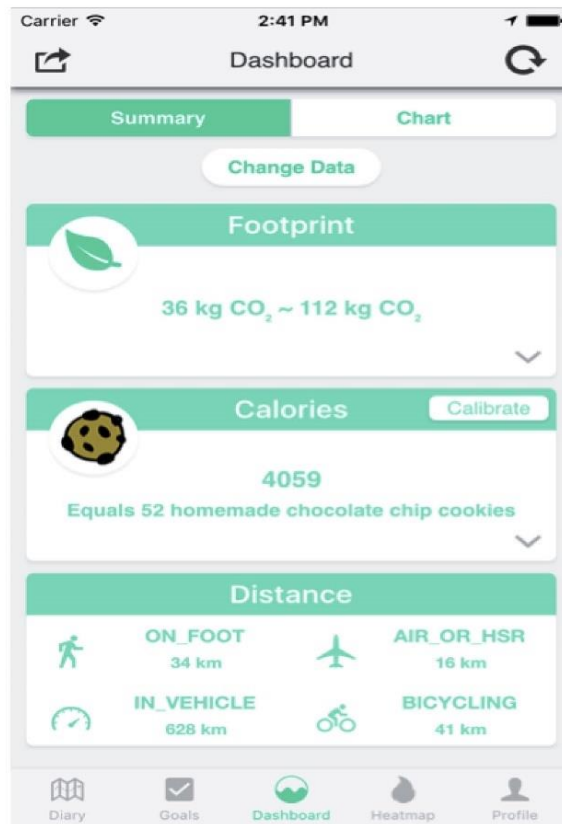
Reanalyzing with big data: travel diary app
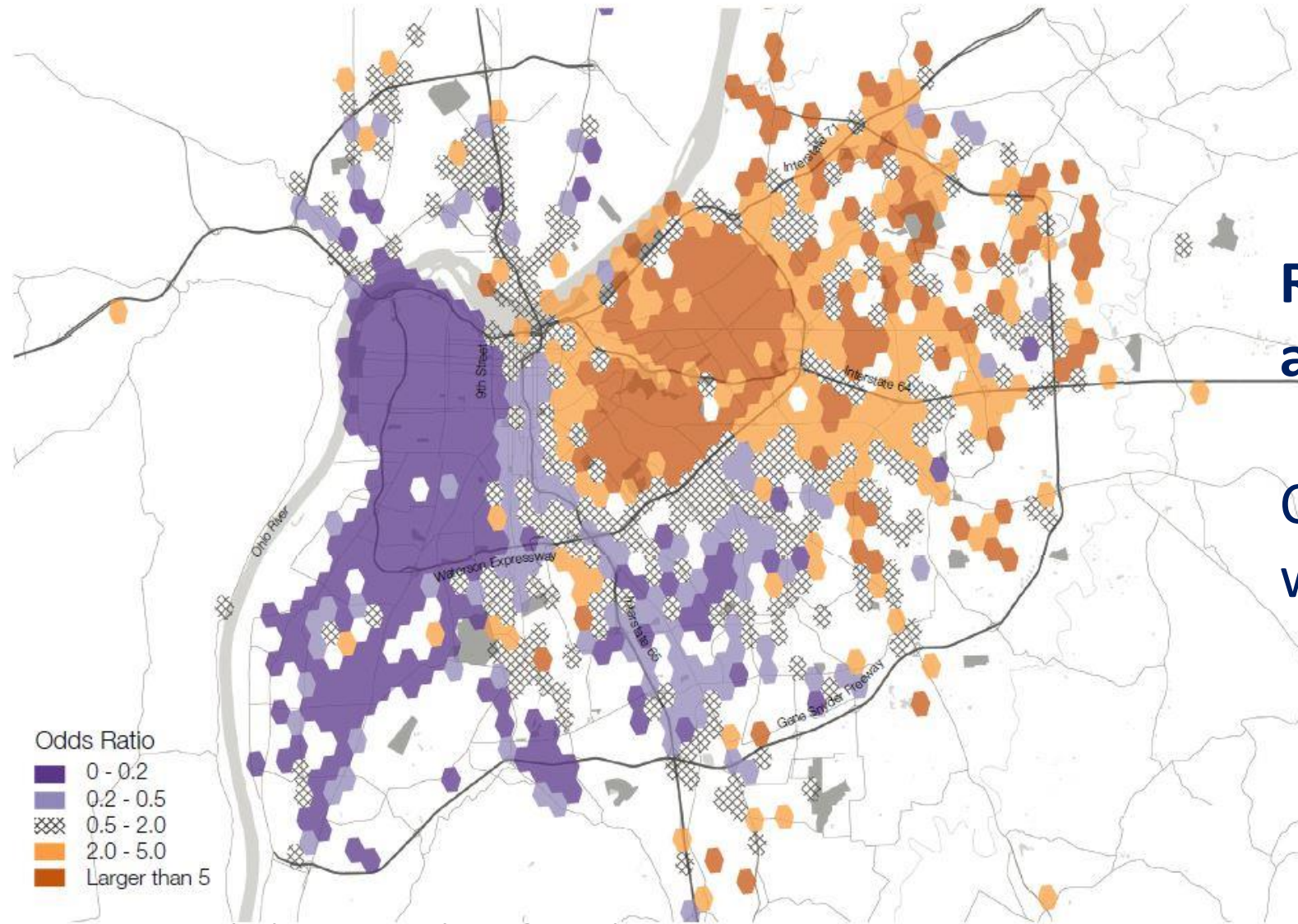
Automatically sensed travel diary

Reanalyzing with big data: geotagged tweets

Rethinking activity patterns

Collaboration with Matt Zook

Odds Ratio
- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 2.0
- 2.0 - 5.0
- Larger than 5

Source: Shelton, Poorthuis & Zook 2015

Fig. 3. Unevenly segregated activity spaces of West End and East End residents.

Reanalyzing with 311 (complaint) data
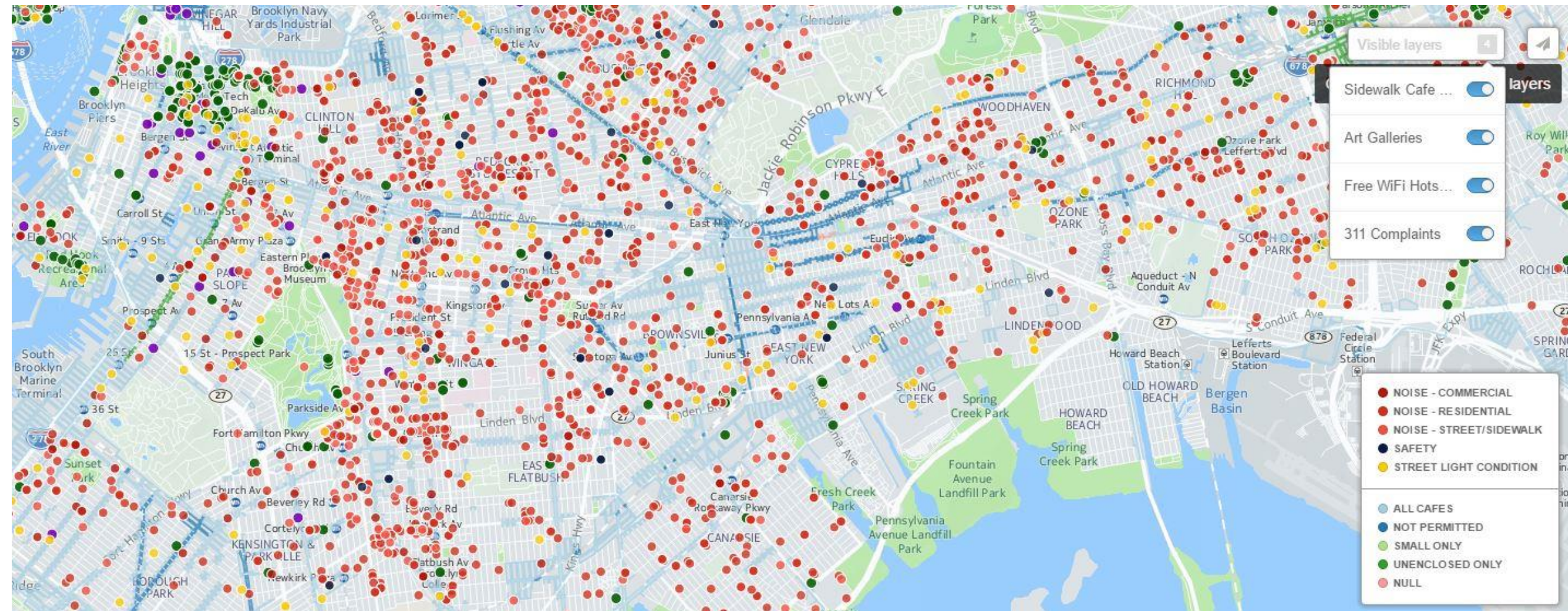
New policy possibilities

- Transit – housing linkage

- Opportunity via regional activity patterns, not just neighborhood

- Lived experience of gentrification and displacement

- Relationship between gentrification and displacement

- Early warning of neighborhood change

- ???

Making a difference through data

- big data and transparency to develop trust, overturn models, and change the world...and regional policy??