

























Few urban spaces where such different constituents meet









Street Commerce

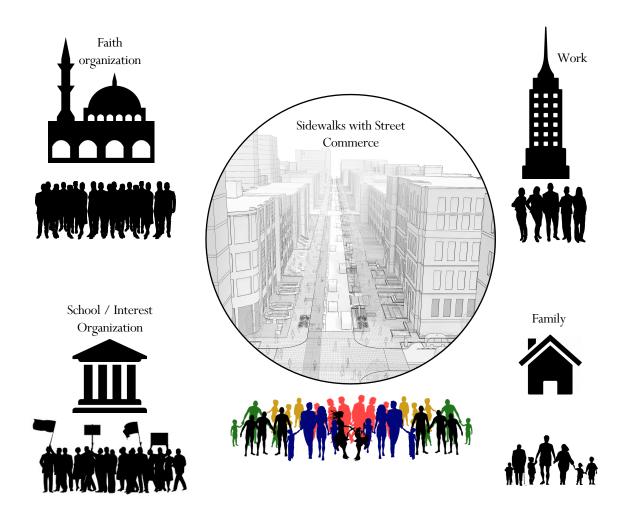
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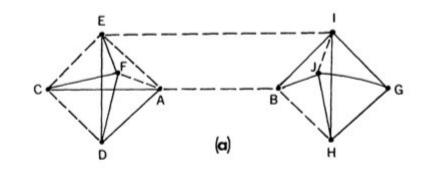


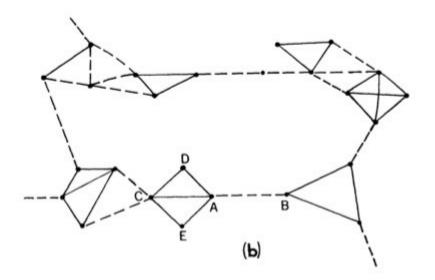




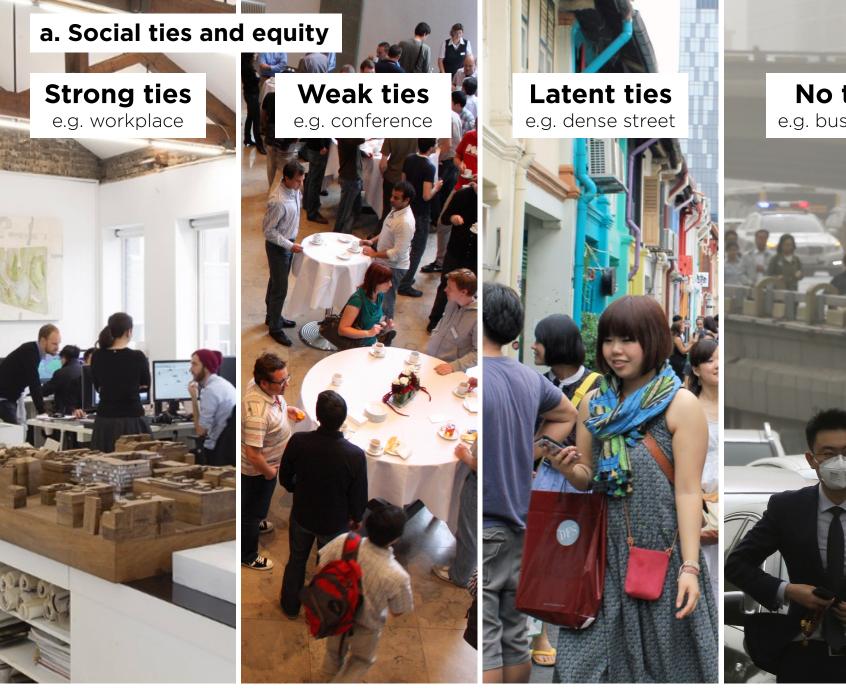
a. Social ties and equity

Strength of Weak TiesGranovetter 1973





People are more likely to find a job via someone they meet twice a year than someone they see more than twice a week.





Benefits

b. Environmental

Over 2/3 of all trips in the US are for shopping, personal, family, and social purposes. Amenity clusters—agglomerations of retail, food and beverage, and personal service establishments—that are accessible on foot or by public transit, play an important role in reducing daily transportation energy consumption.

c. Economic

A significant share of revenues generate by small, locally owned stores reverberate back into the local economy via subcontracting from local providers, payments and benefits made to local employees.



Factors affecting street commerce

Demographics

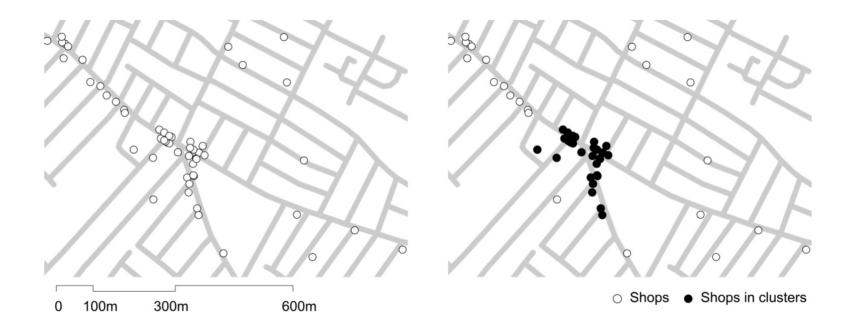


Contents

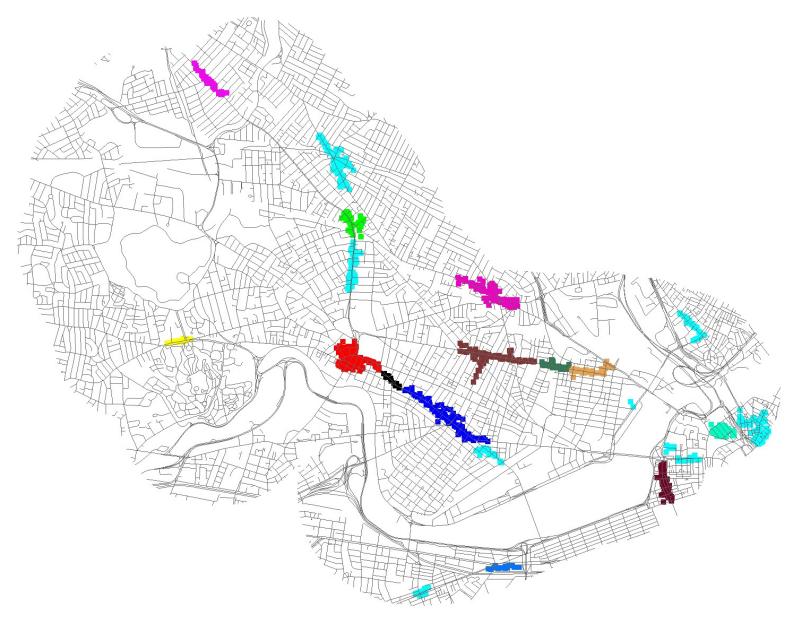
- 1. Macro picture -predictability of retail location patterns.
- 2. Micro picture survival of the individual store.
- 3. Economic view of retail densities.
- 4. Clustering between stores.
- 5. Coordination between stores.
- 6. COVID-19 impacts on street commerce.

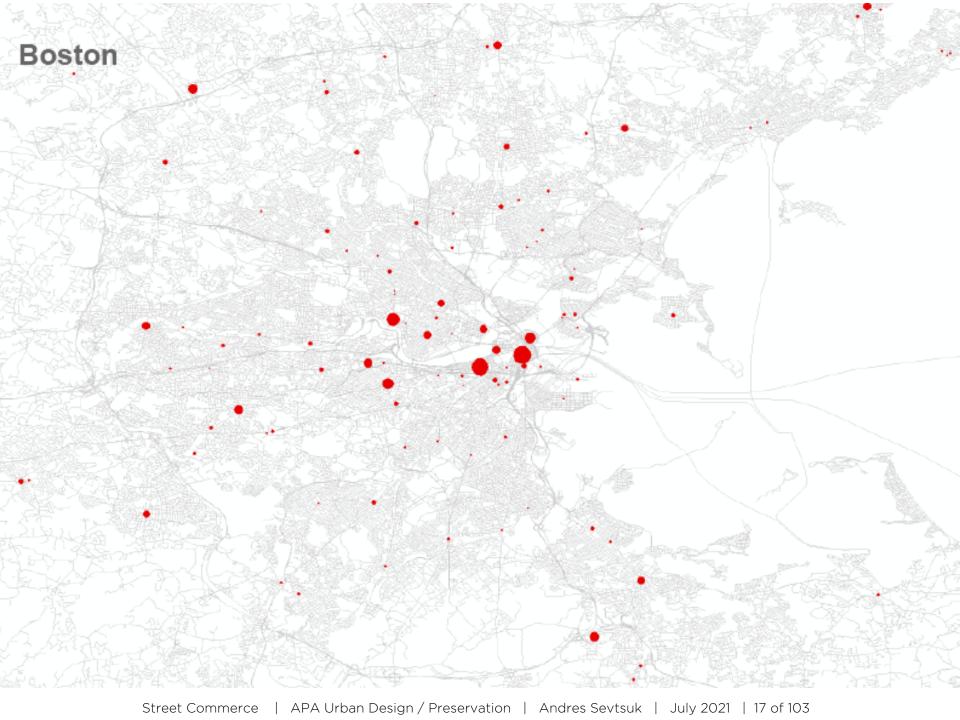
1.	Macro picture -predictability of retail location patterns.

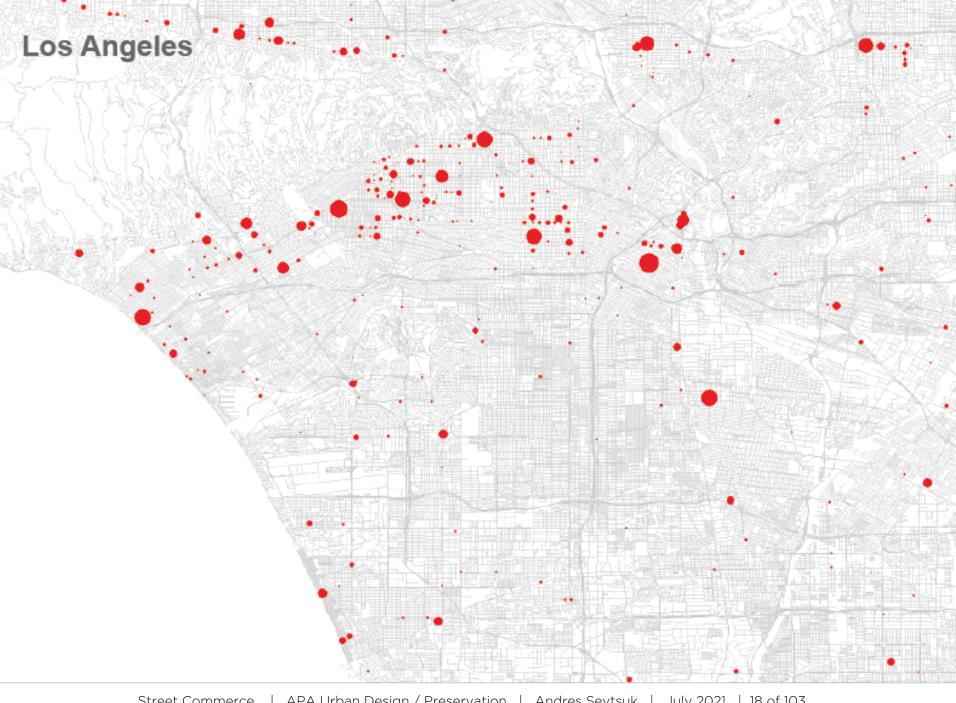
Defining retail clusters as agglomerations, where a minimum number of stores co-exist and where the distance between stores is less than a given limit.

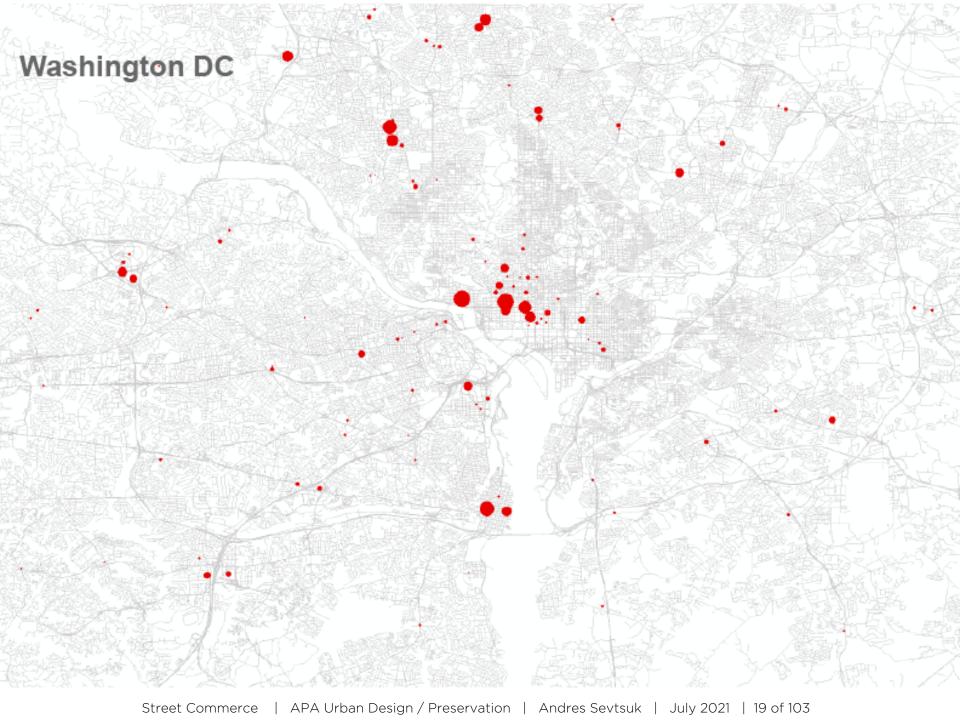


Clusters of street commerce around Cambridge MA.



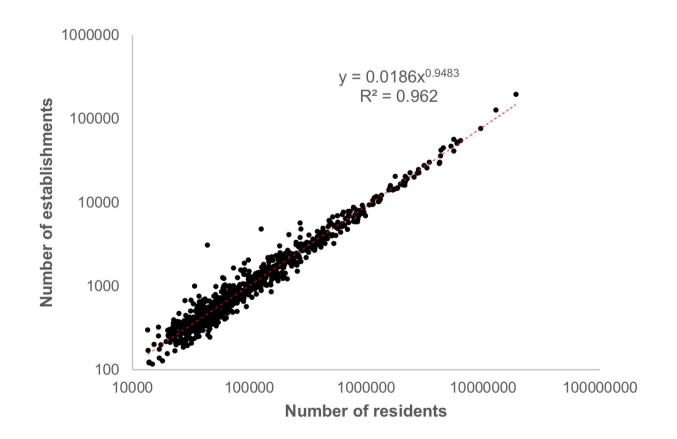






Predictability of retailers by city size

Log-Log scatter plot of retail, food and service establishments versus population size in 273 US metro areas, where population is greater than 40,000 people.

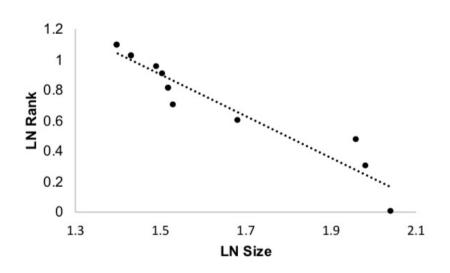


Example: Washington - Arlington - Alexandria metro population was 5.582 million in 2010. The trend line predicts a metro area of this size should have 46,505 retail, food and personal service establishments. The actual number is 41,453

Scaling of retail clusters: there are exponentially more small clusters than large clusters.

Virginia Beach, VA

Rank	log(rank)	Size	log(size)		
1	0	110	2.041393		
2	0.30103	96	1.982271		
3	0.477121	91	1.959041		
4	0.60206	48	1.681241		
5	0.69897	34	1.531479		
6.5	0.812913	33	1.518514		
6.5	0.812913	33	1.518514		
8	0.90309	32	1.50515		
9	0.954243	31	1.491362		
10.5	1.021189	27	1.431364		
10.5	1.021189	27	1.431364		
12.5	1.09691	25	1.39794		
12.5	1.09691	25	1.39794		



Example

In Phoenix AZ, Zipf's Law predicts 25 retail clusters with 25-52 establishments, while the actual number of such clusters is 23.

The trend also predicts 9 clusters with 53-104 establishments, while the actual numbers is 8.

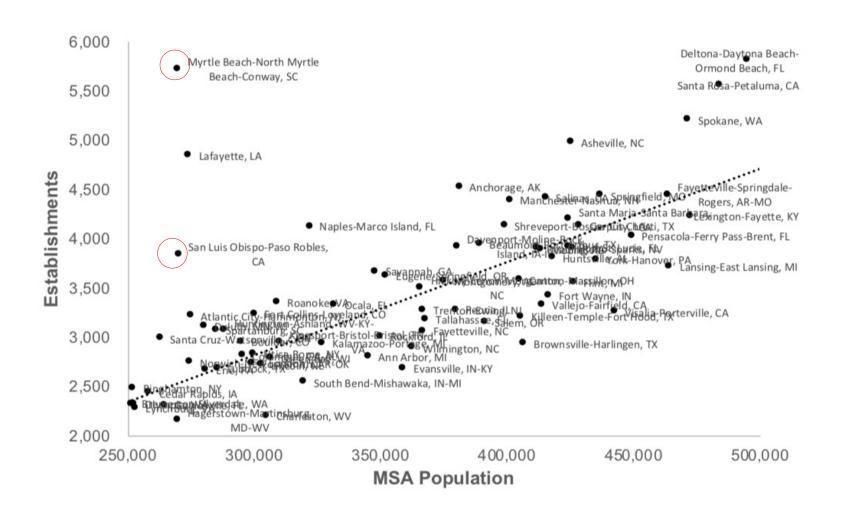
And the predicted number of clusters with 105-199 establishments is three, which exactly matches three such clusters in reality.

No clusters over 4,000 stores predicted, but there actually is one...



Predictability of retailers by city size

Log-Log scatter plot of retail, food and service establishments versus population size in 273 US metro areas, where population is greater than 40,000 people.

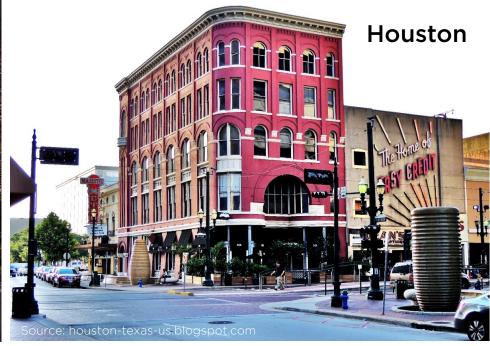










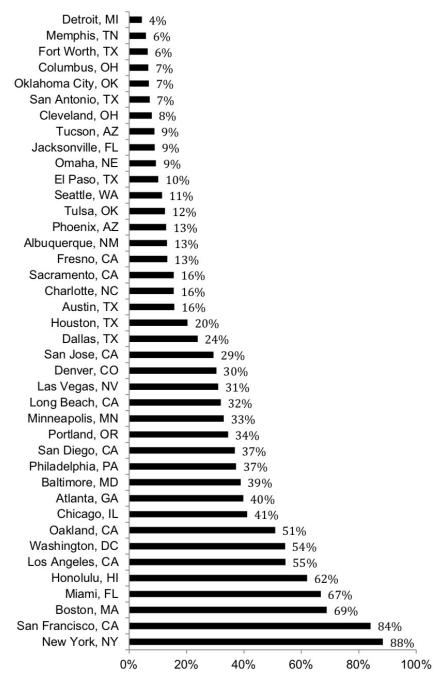












Percent of population living within 1,000 meters of at least one retail cluster of more than 25 establishments in cities with populations over 350,000 inhabitants

Cities, where more than $\frac{1}{2}$ of all residents have a retail cluster within a 15min walk (top) and those with the least (bottom).

		Population within						
		1000m of a						
		retail	Population	Land Area	Residential			Built
Rank	City	cluster	2010	(km2)	Density		FAR	Coverage
1	New York City, NY	88%	8,175,133	783.0	10,890	km ²	1.66	35.38%
2	San Francisco, CA	84%	805,235	121.5	7,174	km ²	0.43	27.42%
3	Boston, MA	69%	•	125.4	2,700	km ²	0.71	16.14%
4	Miami, FL	67%	399,457	93.2	4,866	km ²	-	-
5	Honolulu, HI	62%	337,256	156.7	•			14.16%
6	Los Angeles, CA	55%	3,792,621	1,214.0	3,275	km ²	1.40	18.67%
7	Washington, DC	54%	681,170	158.1	4,308	km ²	0.83	16.47%
8	Oakland, CA	51%	390,724	144.8	2,901	km ²	0.69	17.04%
9	Chicago, IL	41%	2,695,598	589.6	4,572		-	14.15%
10	Atlanta, GA	40%	417,735	344.9	1211.17	km ²	-	-
	Mean	61%	1,831,252	373.1	4,413.4	km²	1.03	19.93%
31	Omaha, NE	9%	383,964	329.2	1166.35	km ²	-	-
32	Jacksonville, FL	9%	822,050	1,934.7	425	km ²	0.05	1.23%
33	Tucson, AZ	9%	520,116	611.7	868	km ²	0.21	6.52%
34	Cleveland, OH	8%	396,815	201.2	1,972	km ²	-	-
35	San Antonio, TX	7%	1,469,845	1,193.7	1,147	km ²	-	-
36	Oklahoma City, OK	7%	579,999	1,556.9	360	km ²	-	-
37	Columbus, OH	7%	787,033	562.5	1,399	km ²	-	-
	Fort Worth, TX	6%	854,113	886.3		km ²	-	
39	Memphis, TN	6%	646,889	816.0		km ²	0.26	6.42%
40	Detroit, MI	4%	713,777	359.4	1,900	km ²	0.25	14.78%
-	Mean	7%	717,460	845.2	1,084.9	km²	0.19	7.24%

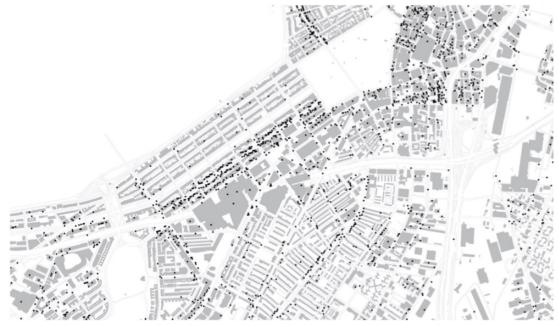
San Francisco

84% population has an amenity cluster within 15min of their home.



Boston

69% population has an amenity cluster within 15min of their home.



2. Micro picture - survival of the individual store.





Rent: \$12,500 / month Utilities: \$1,000 /month

Staff: (10 baristas x \$12/h)x20h/week + (2 managers x \$20/h)x40h/week = \$4,000/week =

\$16,000/month

Total: \$29,500 / month





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Store uses 70% of proceeds on covering fixed costs Typical customer spends \$5, of which 0.7*5 = \$3.5 go to fixed costs





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In order to generate \$ 29,500 / month, the shop needs 29,500 / 3.5 = 8,429 customers a month or 281/day.

If only one in 40 ppl in the area visit Starbucks once a day on average, then 281*40= 11,240 ppl needed in the daily catchment area to sustain the store.



2. How big of a catchment area (# of people) does this taxidermy store on **Essex Road in London UK need to break even?**





Rent: \$ 0/ month

Utilities: \$2,000 /month

Staff: $3 \times \$2,000 = \$6,000/month$

Total: \$8,000 / month



Rent: \$ 0/ month

Utilities: \$2,000 /month

Staff: $3 \times \$2,000 = \$6,000/month$

Total: \$8,000 / month

Store uses 57% of proceeds on covering fixed costs Typical customer spends \$465, of which 0.57*465 = \$265 go to fixed costs



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Total: \$8,000 / month

Store uses 57% of proceeds on covering fixed costs Typical customer spends \$465, of which 0.57*465 = \$265 go to fixed costs

In order to generate \$8,000 / month, the shop needs 8,000 / 265= 30 customers a month or 1/day.



Rent: \$ 0/ month

Utilities: \$2,000 /month

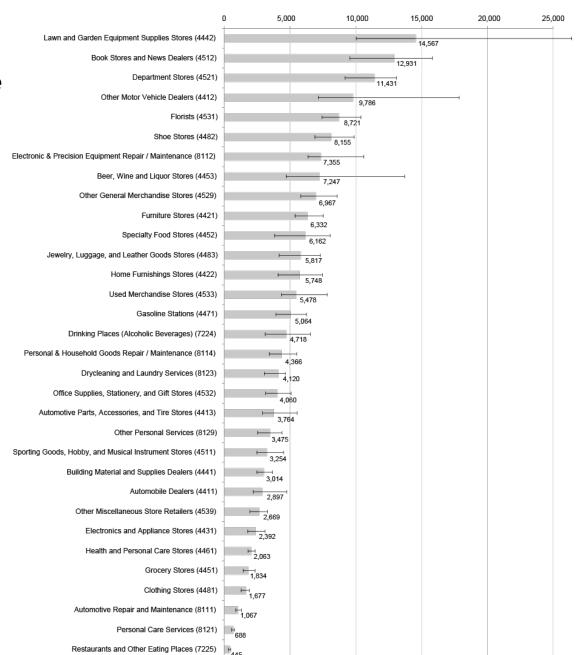
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In order to generate \$8,000 / month, the shop needs 8,000 / 265= 30 customers a month or 1/day.

If only one in 10,000 ppl in the city buy stuffed animals once in 3 years, on average, then (365*3)*10,000 = 10,95 million ppl needed in the daily catchment area to sustain the store. Median number of residents per business establishment among the 50 most populous US cities in 2010.



Source: Sevtsuk (upcoming 2019). Data: InforGoup 2010, US Census 2010. 3. Economic view of retail densities

A one-dimensional model

Classical retail location theory (Di Pasquale & Wheaton 1996)

Distance between stores (D) is determined by:

v: Frequency of purchase trips for a given good

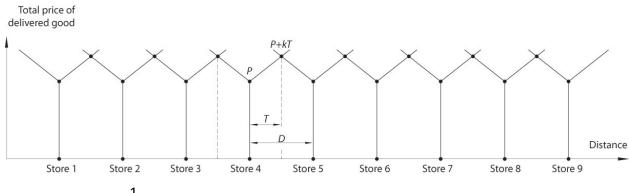
k: Transportation costs for consumers

F: Density of customers

C: Fixed costs for a retail facility

P: unit price of good

mc: marginal (wholesale) cost of a good to retailers



$$D = \left(\frac{C}{kvF}\right)^{\frac{1}{2}}$$

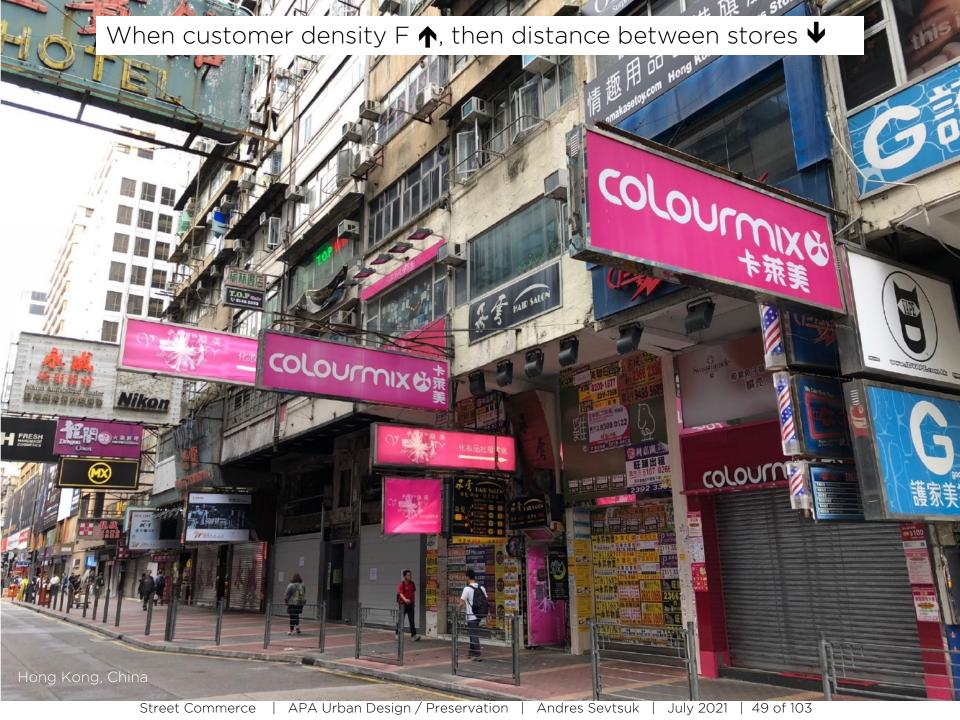
When fixed costs C \blacktriangledown , then distance between stores \blacktriangledown When customer density F \spadesuit , then distance between stores \blacktriangledown When frequency of visits v \spadesuit , then distance between stores \blacktriangledown When transportation costs k \spadesuit , then distance between stores \blacktriangledown







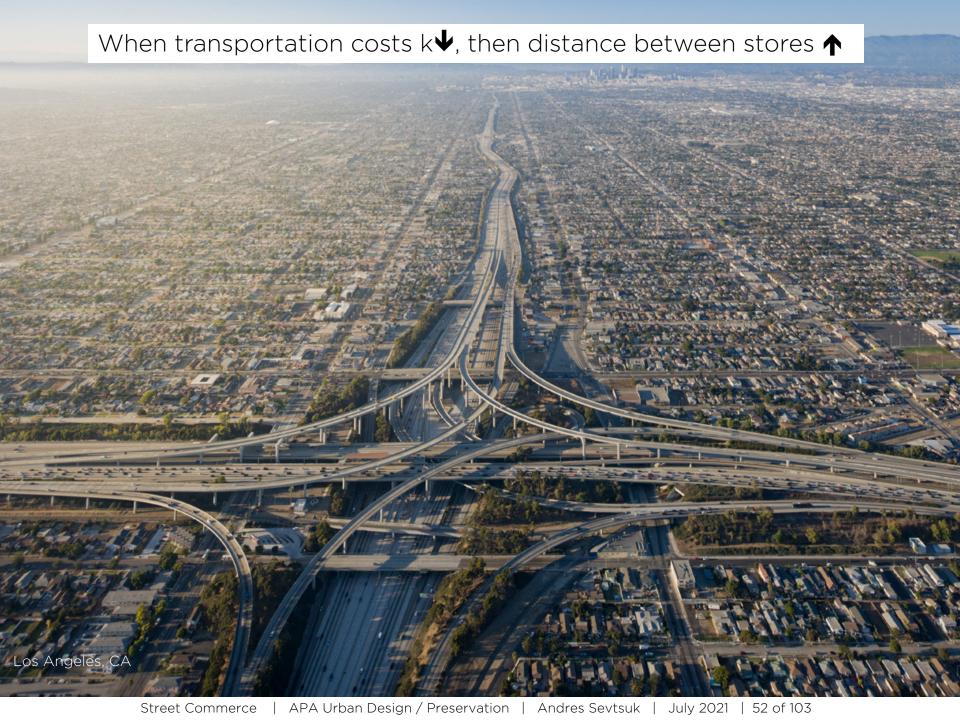




When customer density F Ψ , then distance between stores \spadesuit











Relative effects of destination size VS proximity

On store patronage.

In walkable/transit-oriented cities, retail patronage depends more on proximity...

Numerous but smaller destinations

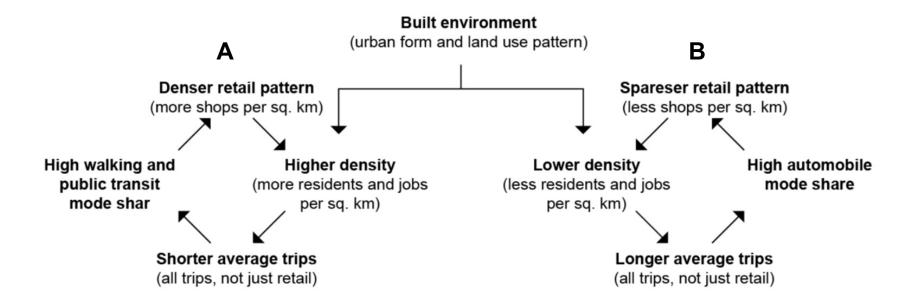
In car-oriented cities, retail patronage depends more on destination size

Fewer but larger retail destinations





Interactions between urban form, transportation mode share and retail density.



4. Clustering between stores.

Central Places Rationales Schema der zentralen Orte W. Christaller, 1933 0 L-Ort K-Ort 21 km-K-Ring (schematisch) P-Ort A-Ort Ring der B-Orte (normal 36 km) G-Ort M-Ort Grenzen der L-Systeme

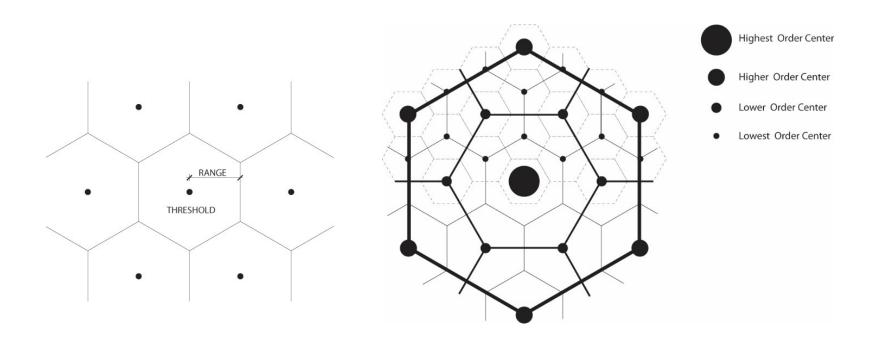
B-Ort

L-Richtungen 1. Grades

L-Richtungen 2. Grades

A two-dimensional schema

Classical retail location theory: Christaller and Losch

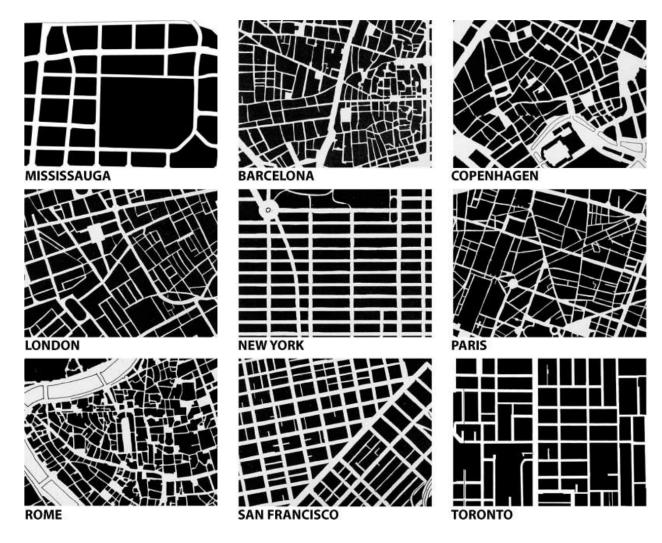


Assumptions

- 1. Customers undertake a separate trip for each good
- 2. Each good is obtained from the nearest available store
- 3. Customers are free travel in any direction along straight-line travel paths (Christaller 1933)

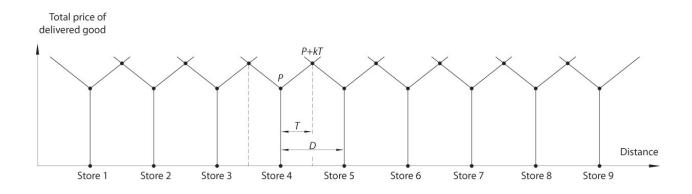
Accessibility to customers plays a key role for patronage, but accessibility is not evenly distributed in space.

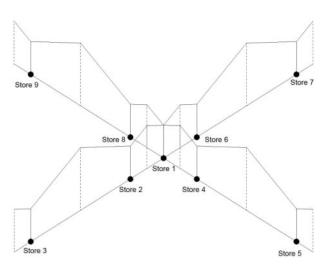
A city is not a "featureless plain" (Alonso 1964) → retail pattern not hex.



Introducing environmental geometry, uneven street networks

Classical retail location theory



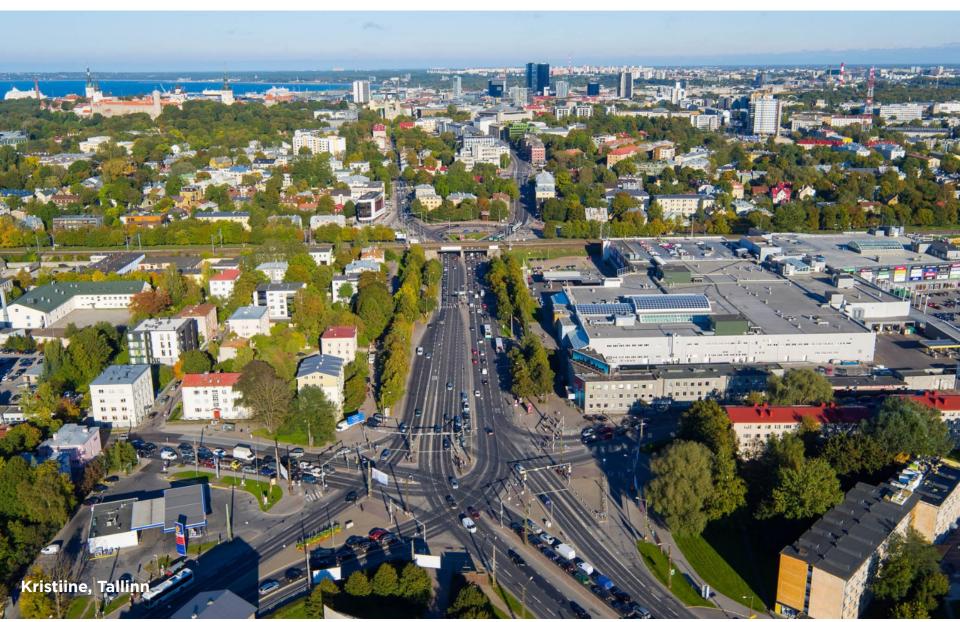




Exogenous clustering

Difficult to distinguish exogenous VS endogenous clustering empirically...

Retail densities emerge at locations with better accessibility.



Retail clustering

1. Complimentary

2. Competitive





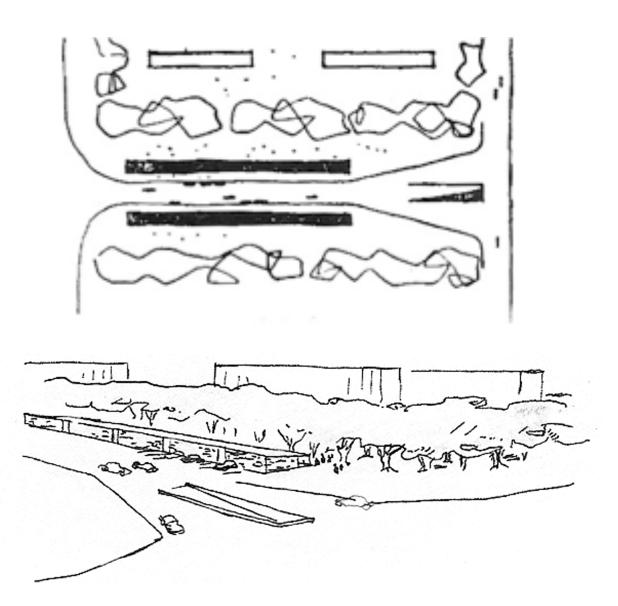
Retail clustering

Lessons from Brasilia, 1956



Retail clustering

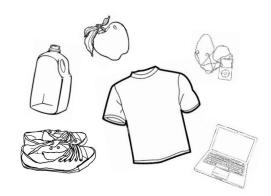
Lessons from Brasilia, 1956





Why do clusters form?

Neo-classical retail location theory



Complementary clustering

Multi-purpose shopping → Consumer savings in transportation costs Eaton & Lipsey, 1982
Positive demand externalities between stores
(Brueckner, 1993

Competitive clustering

Lower risk for unexpected behavior between competitors Hotelling, 1929

Price and product comparison → Lower search costs

Eaton & Lipsey 1975

Lower prices through Cournot competition

Dudey, 1990



Which stores are most likely to cluster with like stores?

Stores selling "comparison goods" cluster, "Convenience goods" do not!

Rank	Description	Clustering Coeff.
1	Sporting Goods, Hobby, Book, and Music Stores	0.817***
2	Food Services and Drinking Places	0.556**
3	Electronics & Appliance Stores	0.425*
4	Clothing and Clothing Accessories Stores	0.326**
5	Food & Beverage Stores	NONE
6	Miscellaneous Store Retailers	NONE







5. Coordination between stores.

Coordinated retail clusters: joint management









Uncoordinated retail clusters: fragmented ownership









Types of retail clusters

Shopping centers

- Coordinated lease contracts
- Controlled tenant entry
- Coordinated management

Street commerce

- Independent lease contracts
- Uncontrolled tenant entry
- Fragmented management





Average Sales Volume per Business Establishment in Los Angeles for year 2010 \$2,500,000 ■ Retail ■ Food & Beverage Services \$1,980,613 \$2,000,000 \$1,500,000 \$1,199,041 \$1,000,000 \$913,363 \$745,830 \$671,107 \$500,000 \$434,008 \$0 **Shopping Centers** In Cluster (Not Shopping Centers)

Uncoordinated retail clusters: fragmented ownership

Public benefits:

- More resilient to economic downturns and market shifts.
- Supports shared wealth creation, with more owners.
- Foster democratic public space between stores.
- Produces a genuinely diverse built environment that is more serendipitous and enriching than malls.









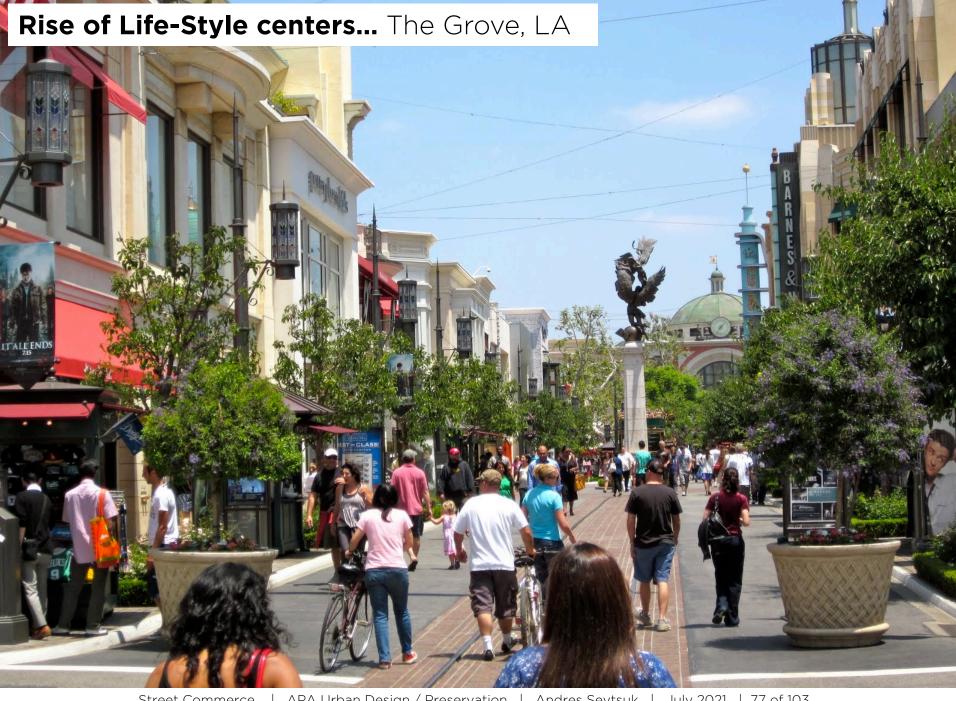
Rise of Life-Style centers... Assembly Square, Boston

Characteristic features:

- Outdoor circulation between stores, reminiscent of traditional main streets.
- Mixed use, including retail, food services, leisure and sometimes housing + office.

Catering to higher end customers.





Rise of Business Improvement Districts - BIDs

Flatiron - 23rd Street Partnership



Rise of Business Improvement Districts - BIDs

Flatiron - 23rd Street Partnership

Establishment of a BID

- BIDs are private-public partnerships
- Governed by a privately elected BID board
- But publicly incorporated and fees collected by the municipality
- 60% of property owners need to agree to establish a BID
- BID dues are usually levied on top of normal property taxes
- All property owners within boundary pay, regardless of agreement
- 5-year renewal cycle



Rise of Business Improvement Districts - BIDs

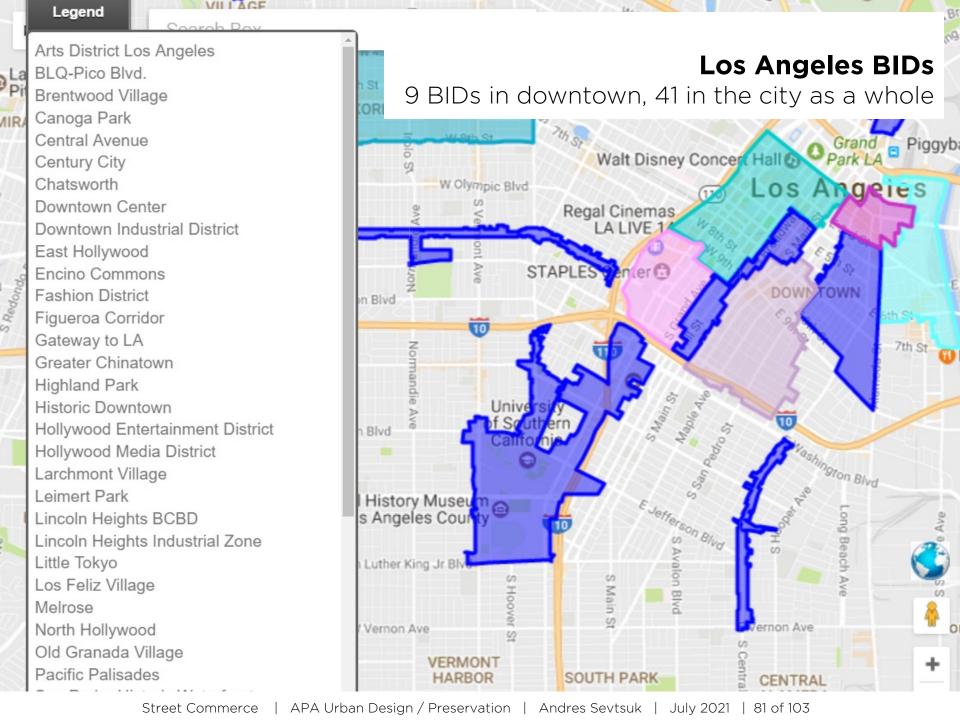
Flatiron - 23rd Street Partnership

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Typical BID activities

- Extra street cleaning and security patrols
- Join marketing of the cluster ads, festivals, events.
- Public space improvements street furniture, flowers, sidewalk paving.
- New tenant recruitment to vacant spaces
- Grants to attract desired tenants
- Coordinate opening hours of stores.





Events and marketing







Are BIDs successful?

Depends on how we measure success. Most evaluations performed by the BIDs themselves, hotly debated question...

Before-After Vacancies in NYC BIDs

BID	First Recorded Commercial Vacancy Rate	Rate in 2002
Flatbush Avenue	30%	3%
North Flatbush Avenue	22%	9%
Sunset Park – 5th Avenue	20%	5%
34th Street	9%	4%

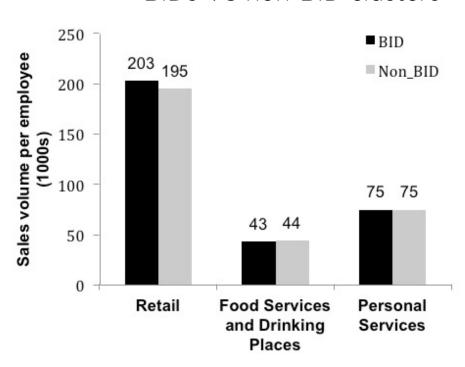
10%

25%

Lower East Side

Times Square

Sales per employee in LA BIDs VS non-BID clusters



Source: nyc.gov Source: Sevtsuk 2017.

5%

9%

Types of retail clusters

Shopping centers

- Coordinated lease contracts
- Controlled tenant entry
- Coordinated management

Street commerce

- Independent lease contracts
- Uncontrolled tenant entry
- Fragmented management

BIDs

- Independent lease contracts
- Uncontrolled tenant entry
- Partly joint management
- Common services, upkeep







5. COVID-19 impacts on street commerce

Major retail problems pre-date COVID19

- Rise of E-commerce
- Shift from stores to services
- Over-leveraged chains
- Retail leasing structure is outdated
- Lack of affordable retail space

What are the key factors impacting the patronage of amenity clusters?

- Built Environment
- Regulations (e.g. COVID-19 closures).
- Behavior / Preferences

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somerville.flows.city

2019 spring

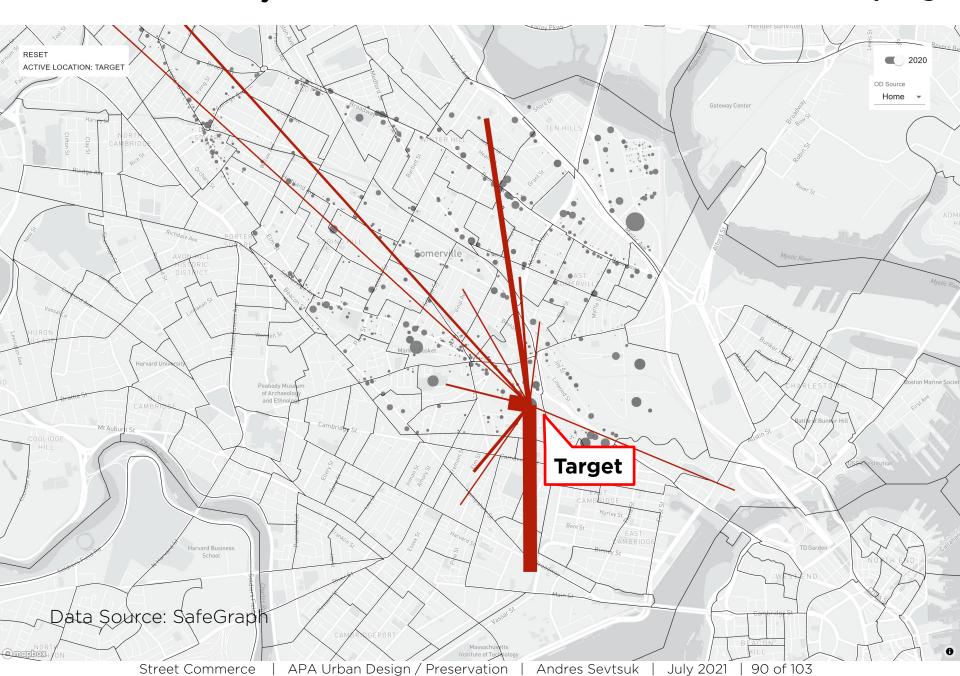


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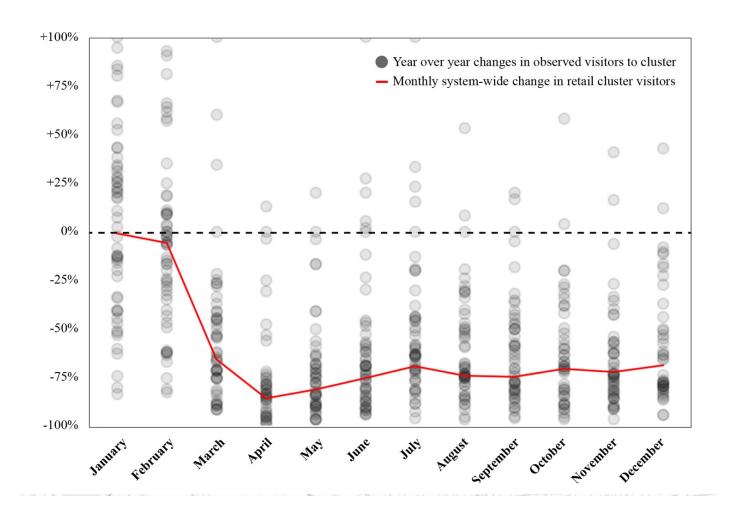
somerville.flows.city

2020 spring



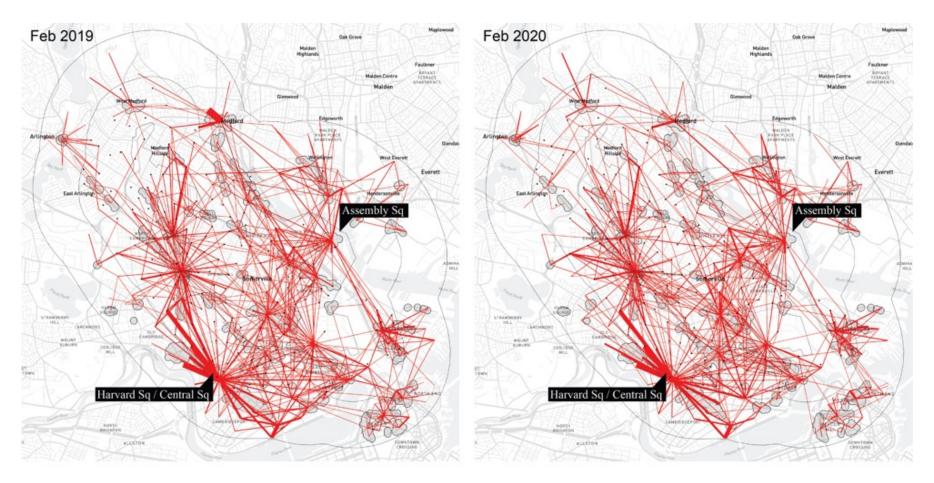
Add slide about which naics lost most from online site

Middlesex County activities



Ref: Sevtsuk, A., Hudson, A., Halpern, D., Ng, K., Basu, R., & Jong, J. de. (2021). The impact of COVID-19 on trips to urban amenities: Examining travel behavior changes in Somerville, MA. *PLOS ONE*.

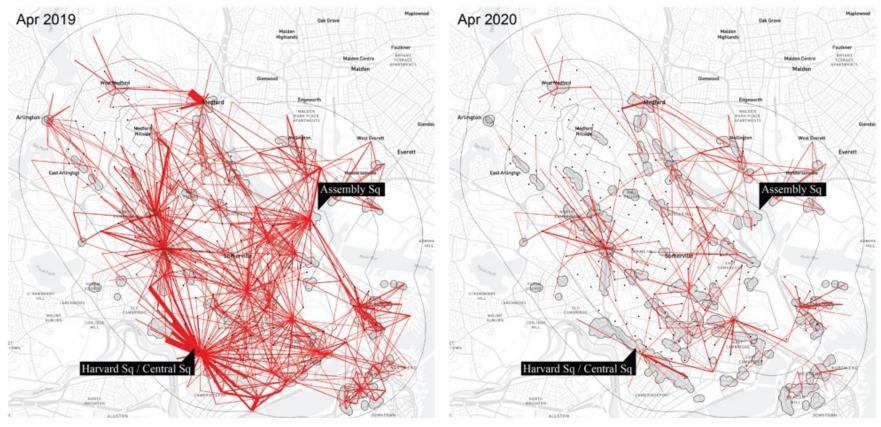
Visits to amenity clusters in and around Somerville, MA.



Same as expected

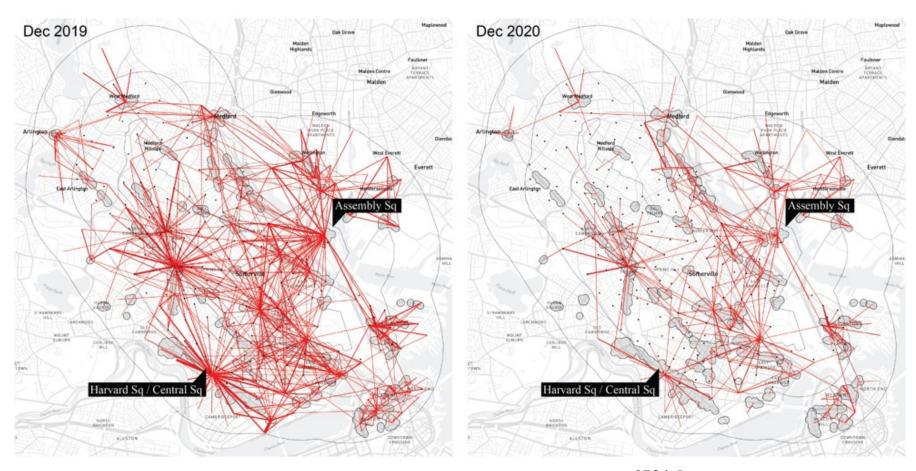
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Visits to amenity clusters in and around Somerville, MA.

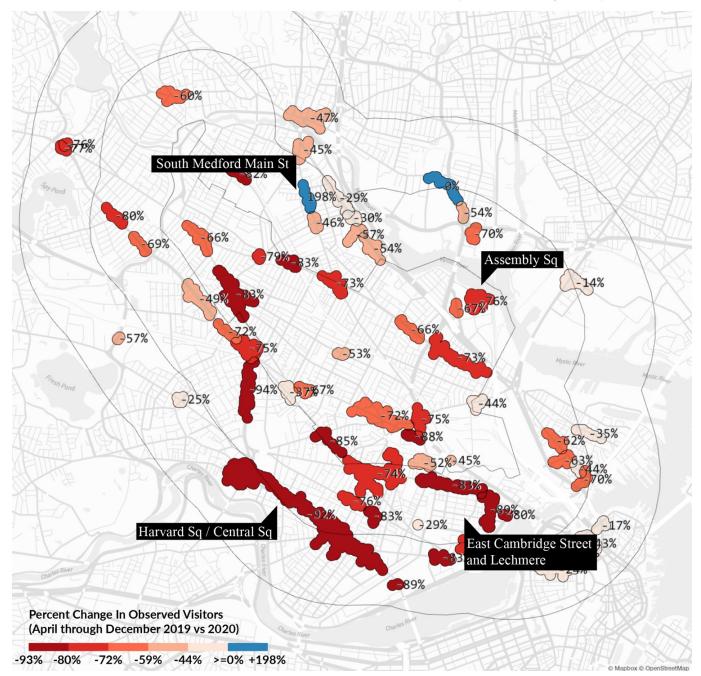


88% lower than expected

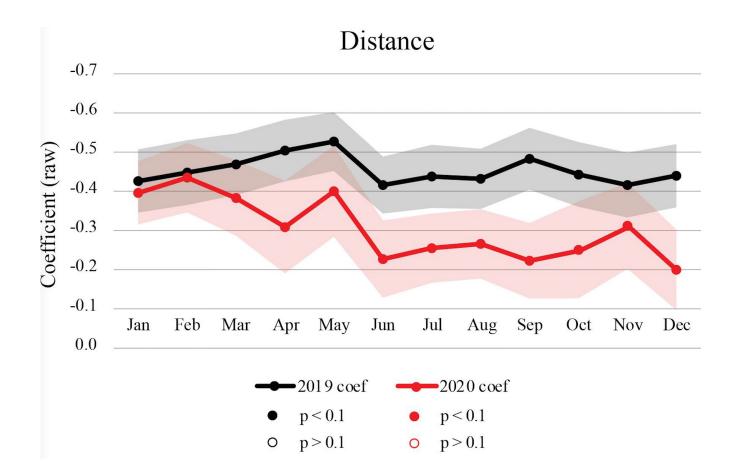
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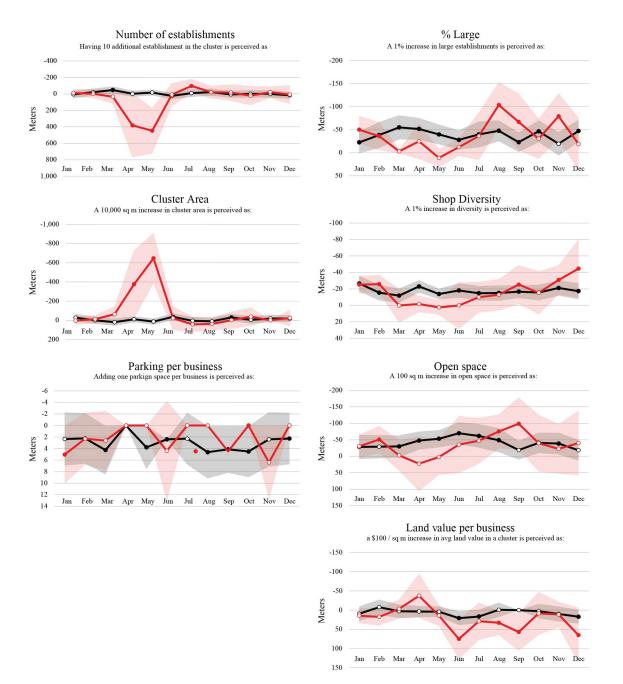


65% lower than expected



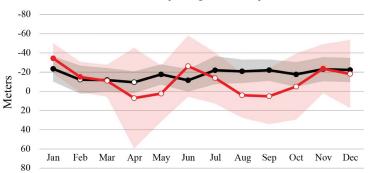






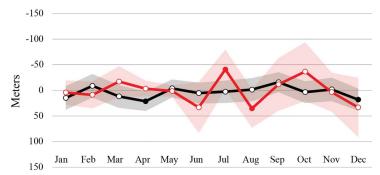
% Comparison

A 1% increase in comparison-goods stores is perceived as:



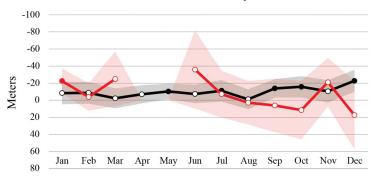
% Convenience

A 1% increase in convenience-goods stores is perceived as:



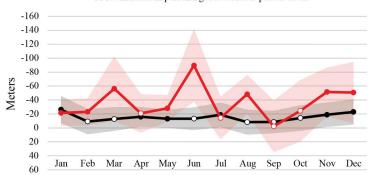
% F&B

A 1% increase in F&B stores is perceived as:



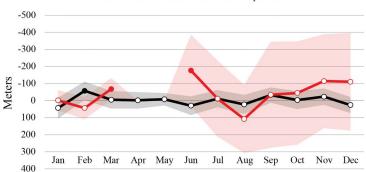
% Personal

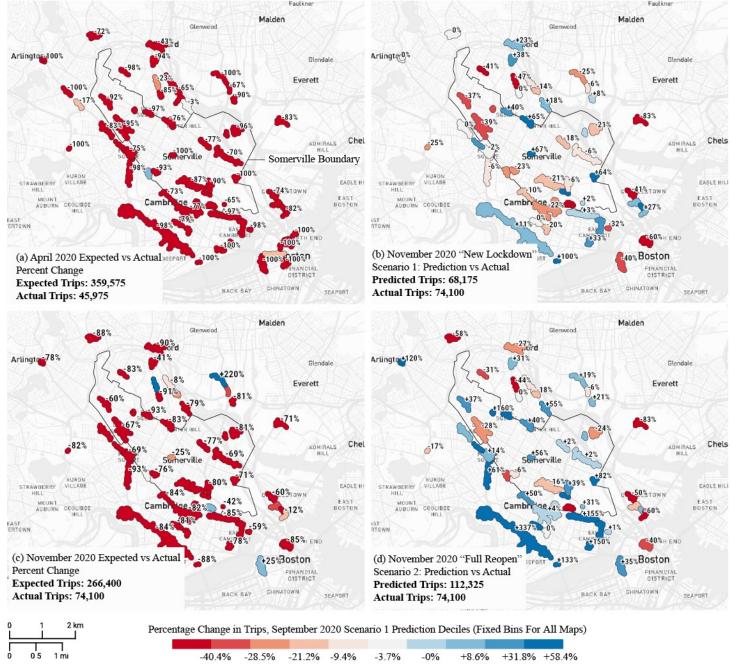
A 1% increase in personal-goods stores is perceived as:



% Entertainment

A 1% increase in entertainment stores is perceived as:





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COVID19 impacts?

- More trips originate from homes → amenities that were used to relying on demand from employees have suffered more.
- Heterogeneity in the relative importance of policy VS public behavior.
- Unclear how far the urban escape trends will last. Will people prefer suburbs again or return to inner cities with a vengeance?
- Remote working could stretch beyond COVID, giving people more time to spend time outside the office in other places they enjoy >> street commerce benefits?

What can cities do to support street commerce?

- Don't subsidize big box stores (with infrastructure, tax breaks etc) but small, locally owned stores.
- Ease zoning to allow more flexible uses on commercial streets.
- Support density and land use mixing.
- Support transit/walking/biking, organize car-free days etc.
- Establish Affordable retail space policies.
- Support F&B businesses doing their own online orders and organizing their own deliveries.

Thank you!

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