Data and the State

DATA 20195 / 30195

Transit, continued

Lecture 12, Wednesday Apr 29

What does an urban planning scholar do?

- Nick Klein, Assoc Prof of City and Regional Planning at Cornell. Work combines OR, urban analytics, public policy.
- Specialist in transportation planning with a focus on marginalized populations
- topics of some papers:
    - cars and employment, “Vehicles for Change” project
    - location affordability
    - millennials and car ownership
    - the Chinatown bus
    - scooter parking

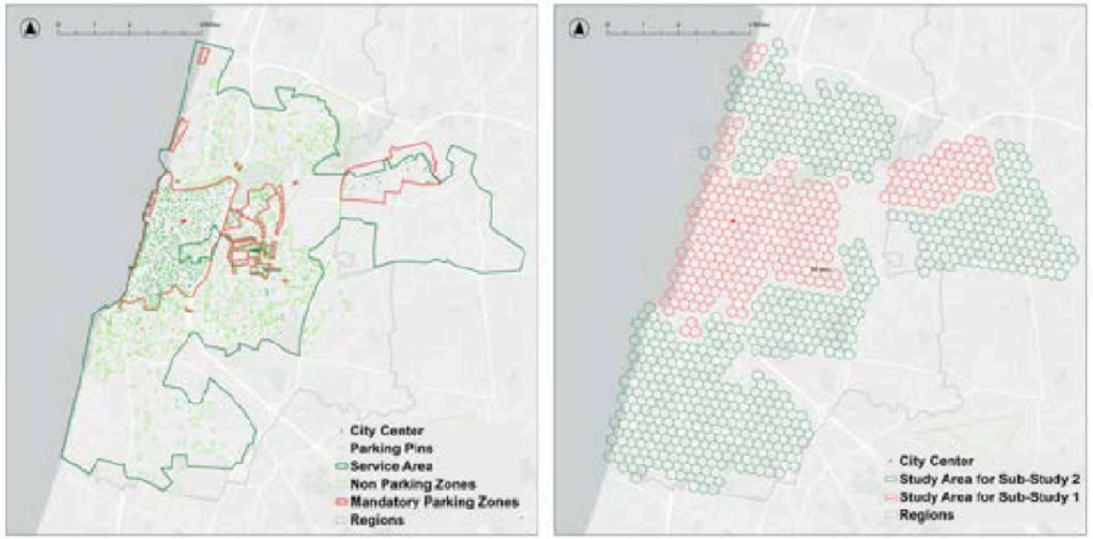
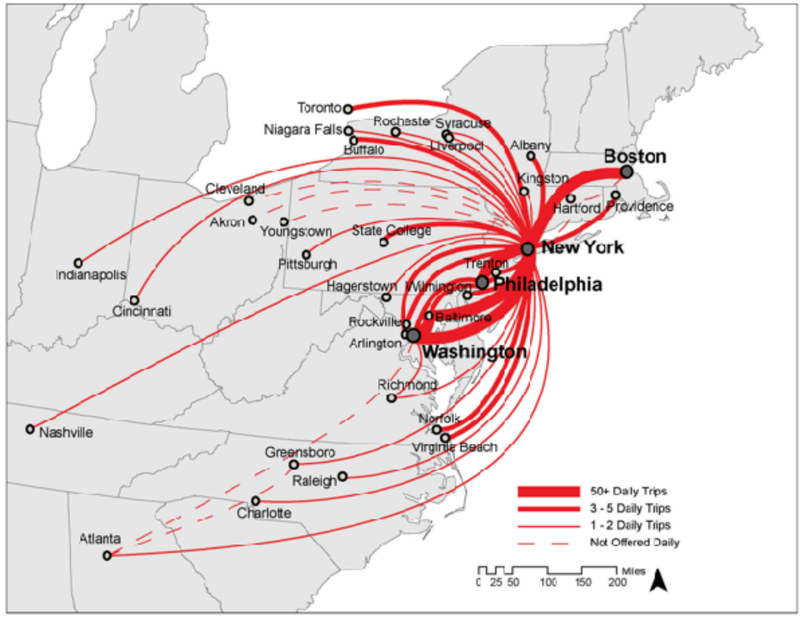
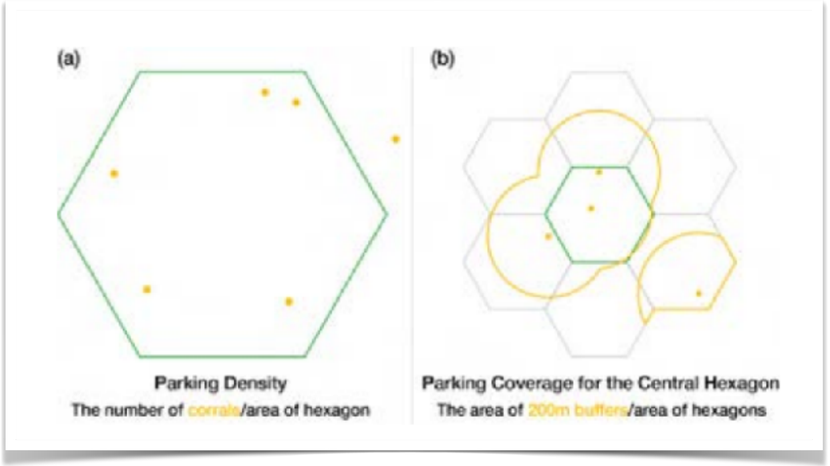
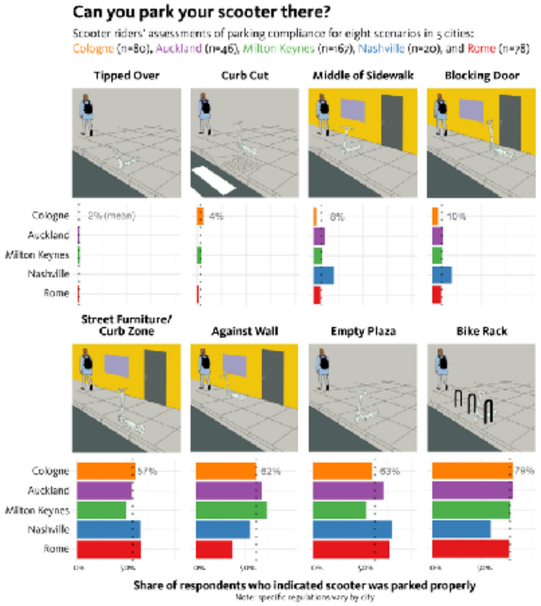
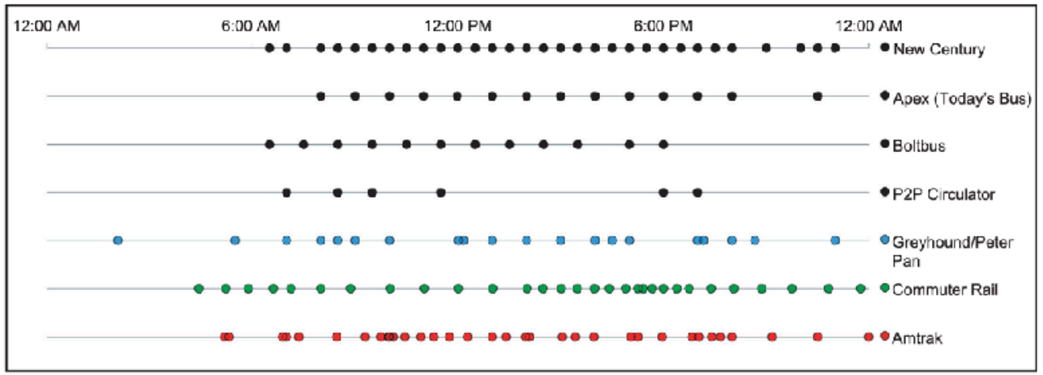


Figure 2-2. Various Designated Parking Areas (left) and Study Areas (right) in Tel Aviv



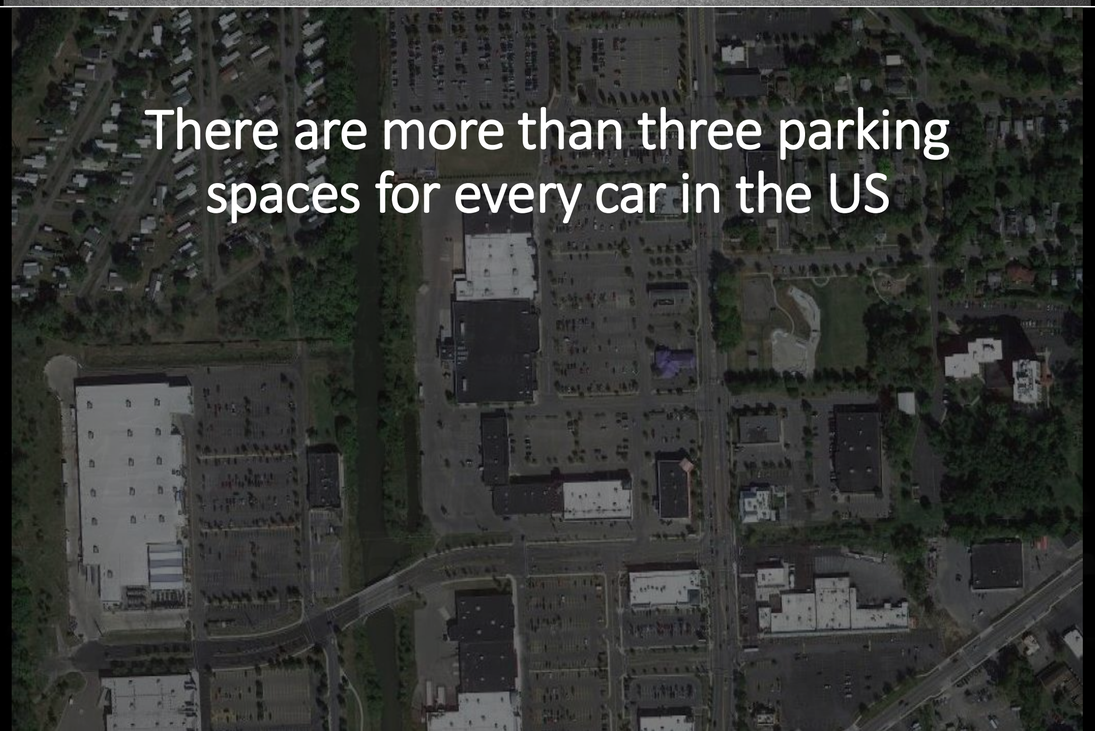






Cars spend 95% of their time parked

Parking is free for 99% of all US automobile trips

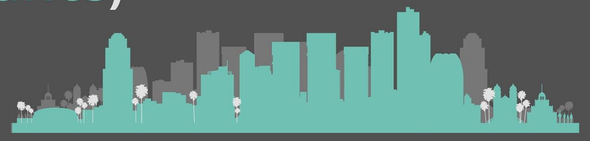


There are more than three parking spaces for every car in the US

City	New York	Philadelphia	Seattle	Des Moines	Jackson, WY
Total Parking Spaces	1.85M	2.2M	1.6M	1.6M	100,119
Parking density per acre	10.1	25.3	29.7	28.4	53.8
Parking spaces per household	0.6	3.7	5.2	19.4	27

Phoenix example

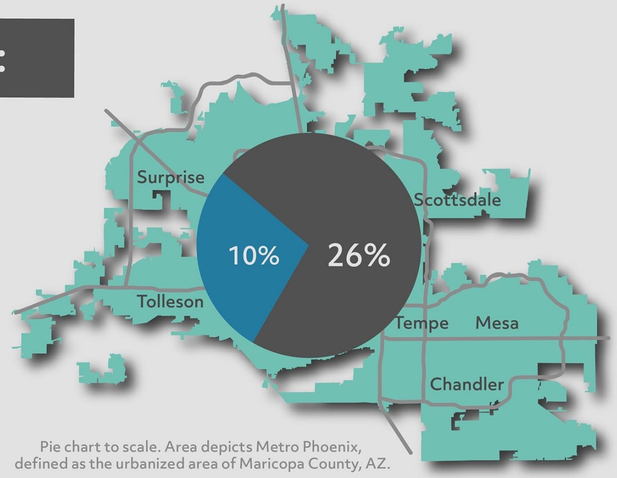
In 2017, **Metro Phoenix** had:
4.04 million **inhabitants**,
2.86 million **cars**, &
1.84 million **jobs**.



Phoenix example

Total coverage area:

approximately
36%
of urban area a
is covered by
parking & roads



Pie chart to scale. Area depicts Metro Phoenix, defined as the urbanized area of Maricopa County, AZ.

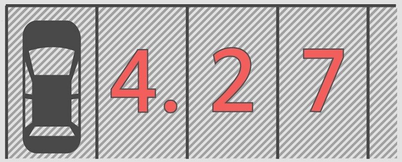
Total parking spaces:

3.67 million off-street residential spaces
+
3.60 million off-street non-residential spaces
+
4.93 million on-street spaces

12.2 million total parking spaces

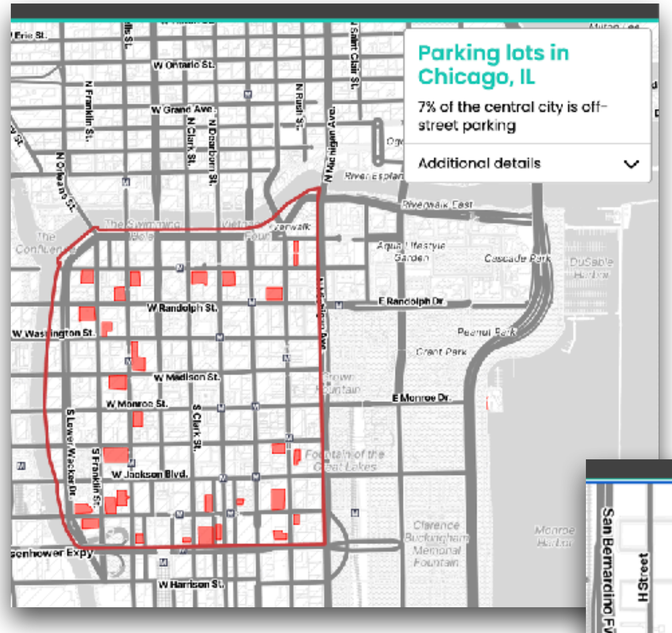
Spaces per ____:

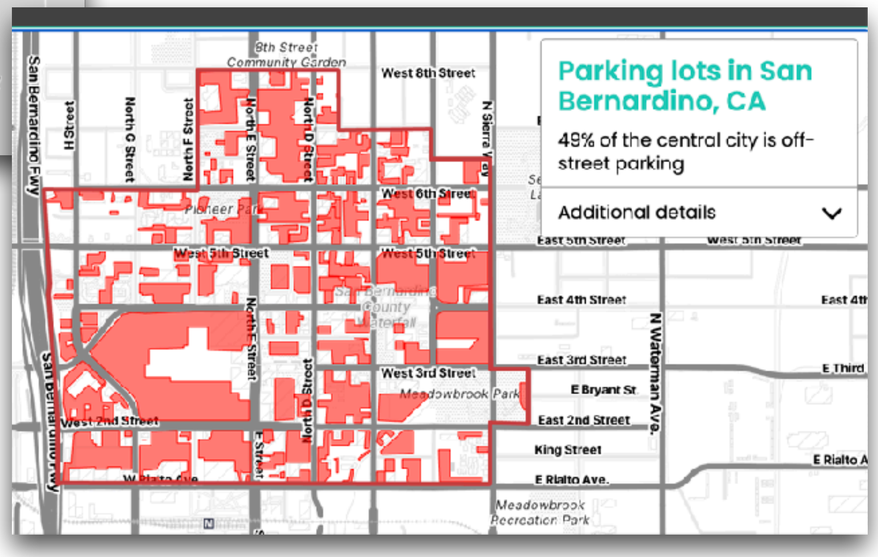
6.6 spaces per job

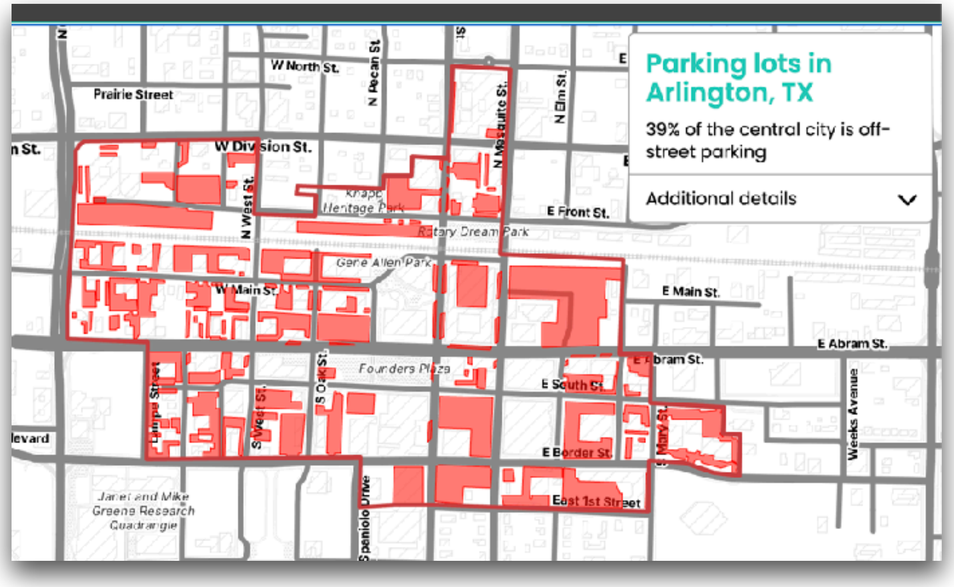


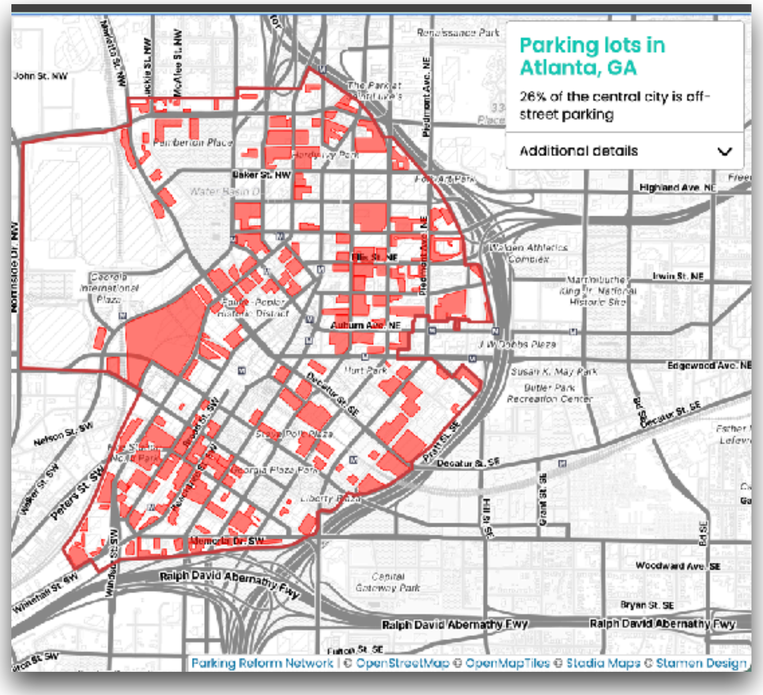
spaces per car

How does parking shape urban centers?









https://parkingreform.org/parking-lot-map/#city=atlanta-ga

Parking Myth #1
Parking regulations (minimums) are based on science

Before cars, horses and carriages were (freely) tethered out front

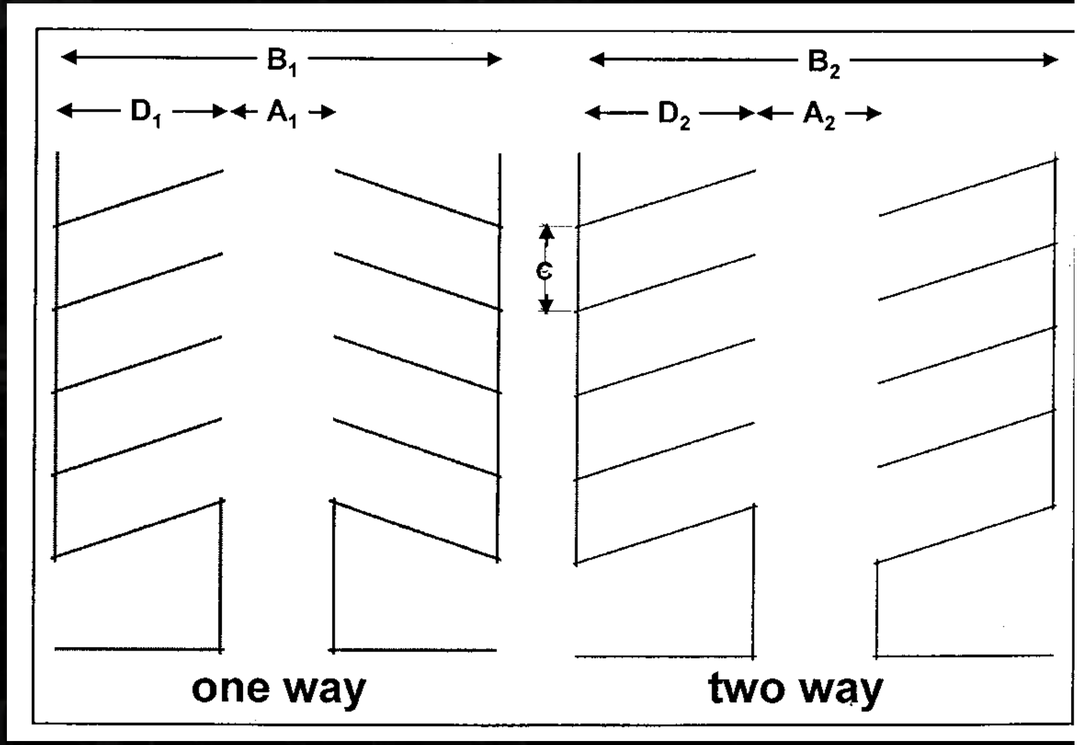
The “parking problem” emerged in the 1920s with the rapid growth in car ownership

- One solution to address this problem was the parking meter
- First installed in Oklahoma City in 1935
- Quickly spread to other cities

The second idea was to include in the zoning ordinance a provision that new developments include ample off-street parking for their visitors

In 1950, ~20% of cities over 10,000 included parking requirements.

By 1970s, 95% of cities over 25,000 zoned for parking



What went wrong?

	Restricted Business		General Business				Service Business		Central Business
	B-1		B-2[3]				B-4	B-5	CBD
	B-1A	B-1B	B-2A	B-2B	B-2C	B-2D [2]			
Minimum Parking Requirement (# spaces)									
Residential									
First three bed or sleeping rooms per dwelling unit	-	-	1 space per dwelling unit	1 space per 3 persons housed in building	-	-	-	-	-
4-5 bed or sleeping rooms per dwelling unit	-	-	2 spaces per dwelling unit		-	-	-	-	-
Each additional bed or sleeping room	-	-	+ 1 space per room		-	-	-	-	-
Home occupation	-	-	1		-	-	-	-	-
Multiple family dwelling	-	-	1 space per dwelling unit		-	-	-	-	-
Dormitory	-	-	1 space per 4 persons housed		-	-	-	-	-
Nonresidential									
Neighborhood commercial facility	-	-	1 space per 500 gross sf of floor area	See §325-20 [1]	-	1 space per 500 gross sf of floor area	-	-	-
Bed and breakfast home or inn	-	-	1 space per bedroom		-	1 space per bedroom	-	-	-
Hospital, nursing home, or similar use	-	-	1space per 5 beds		-	1space per 5 beds	-	-	-
Funeral home	-	-	1 space per 10 seats		-	1 space per 10 seats	-	-	-
Business or professional office	-	-	1 space per 250 sf of office floor		-	1 space per 250 sf of office floor	-	-	-
Retail store	-	-	1 space per 500 gross sf of floor area		-	1 space per 500 gross sf of floor area	-	-	-
Auditorium, theater	-	-	1 space per 5 seats		-	1 space per 5 seats	-	-	-
Bar, tavern, restaurant	-	-	1 space per 50 sf net floor area in assembly place		-	1 space per 50 sf net floor area in assembly place	-	-	-
Hotel, motel	-	-	1 space per guest room		-	1 space per guest room	-	-	-

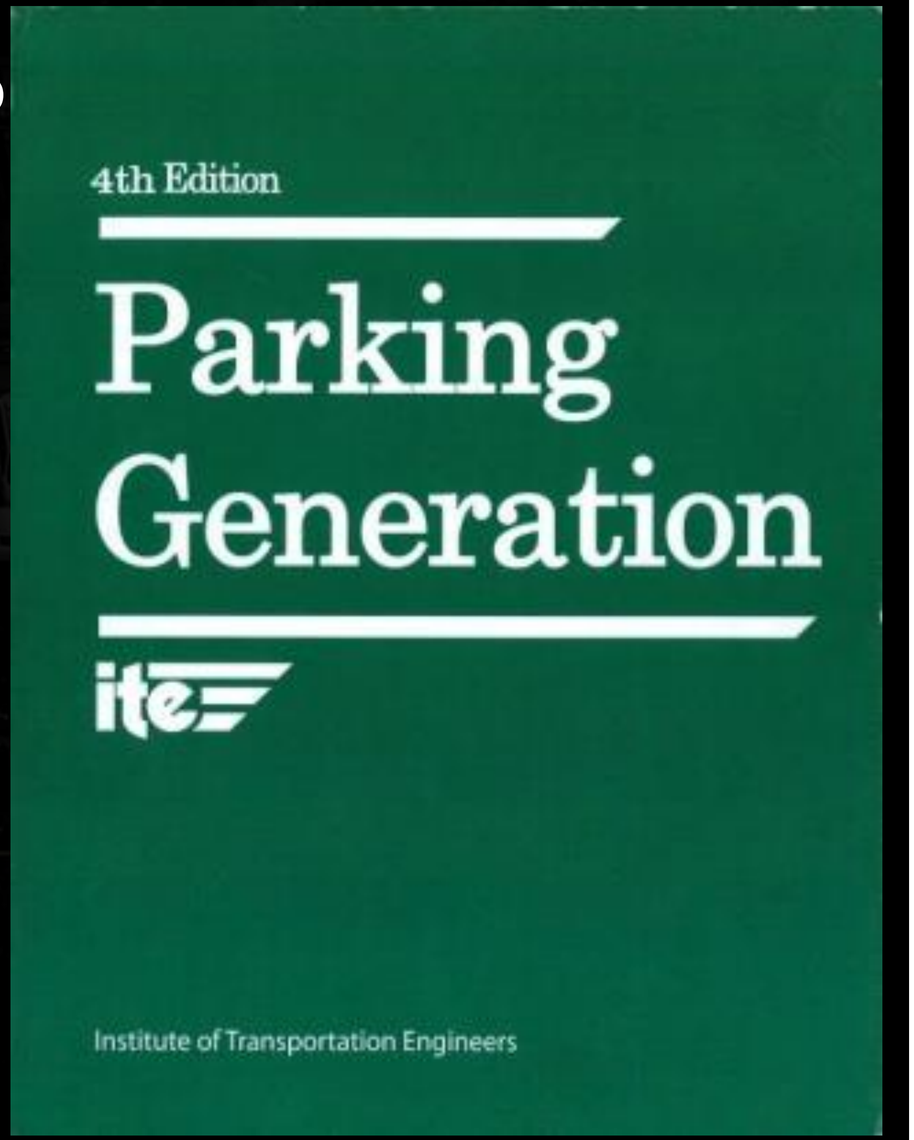
TABLE 1. SELECT PARKING REQUIREMENTS FOR "ENTERTAINMENT AND RECREATION" USES IN SAN JOSE, CALIFORNIA

Use	Vehicle Parking Required
Arcade, amusement game	1 per 200 sq. ft. of floor area
Batting cages	1 per station, plus 1 per employee
Bowling establishment	7 per lane
Driving range	1 per tee, plus 1 per employee
Golf course	8 per golf hole, plus 1 per employee
Health club, gymnasium	1 per 80 sq. ft. recreational space
Miniature golf	1.25 per tee, plus 1 per employee
Performing arts rehearsal space	1 per 250 sq. ft. of floor area
Poolroom/billiards establishment	1 per 200 sq. ft. of floor area
Private club or lodge	1 per 4 fixed seats on the premises, or 1 per 6 linear feet of seating, plus 1 per 200 square feet of area without seating but designed for meeting or assembly by guests, plus 1 per 500 sq. ft. of outdoor area developed for recreational purposes
Recreation, commercial (indoor)	1 per 80 sq. ft. of recreational area
Recreation, commercial (outdoor)	20 per acre of site
Skating rink	1 per 50 sq. ft. of floor area
Swim and tennis club	1 per 500 sq. ft. of recreation area

Where do these come from?

Many, *though not all*, cities rely on the Inst. of Transportation Engineers *Parking Generation* handbook.

This guide describe parking generation rates for numerous different land-uses.



Deeply flawed

The observations are all done at peak demand time in a “suburban developments with little or no significant transit ridership” – the ITE wants places where all parking and all visitors can be counted easily.

Fast food example

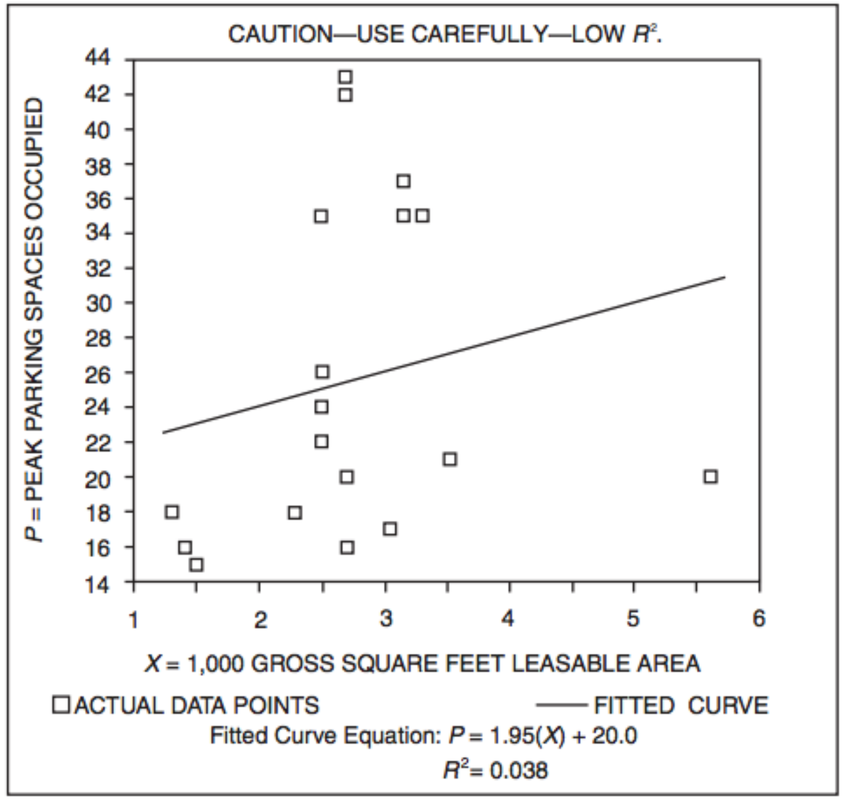
And planners often set standards <u>higher</u> than ITE precisely suggests

FIGURE 2 Fast Food Restaurant with Drive-In Window (Land Use 836)
Peak Parking Spaces Occupied vs:
1,000 Gross Square Feet Leasable Area
On a: weekday

PARKING GENERATION RATES

Average Rate	*Range of Rates*	*Standard Deviation*	*Number of Studies*	*Average 1,000 GSF Leasable Area*
9.95	3.55–15.92	3.41	18	3

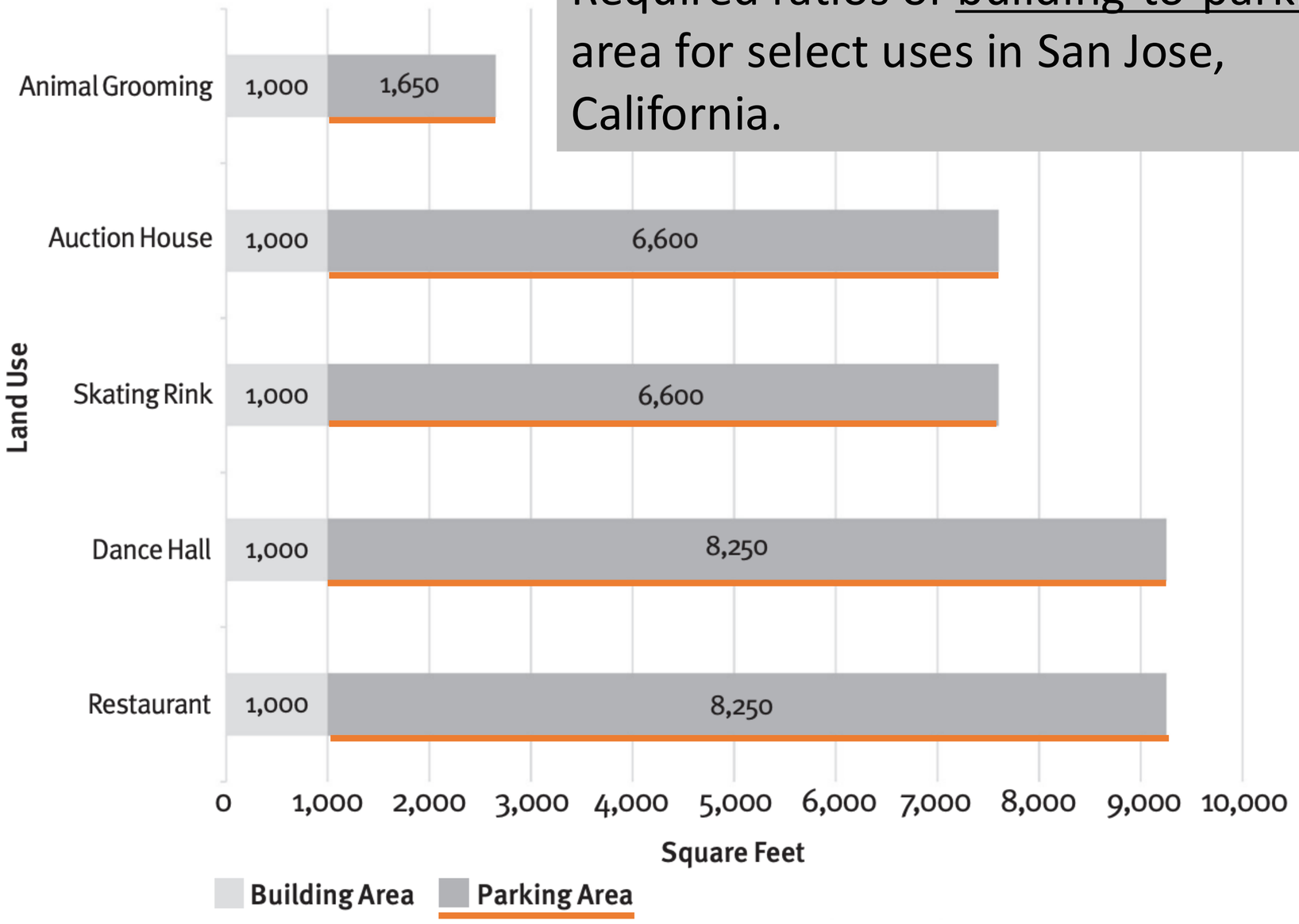
DATA PLOT AND EQUATION



Institute of Transportation Engineers, *Parking Generation*, 2nd edition (Washington, DC: 1987), p. 146.

The result is a built environment that is spread out – often with more space devoted to parking than buildings.

Required ratios of building-to-parking area for select uses in San Jose, California.



Donald Shoup, FAICP

Parking Myth #2
Free parking is free

"Even those who do not drive share in paying the cost of parking. Parking costs are embedded in higher retail prices, lower workplace salaries, higher rents, and the like." (Wilson, 2016)

Parking is expensive even when it is free

- The costs of parking are passed on to everyone. In the case of apartments, renters pay more for the parking they may or may not use.

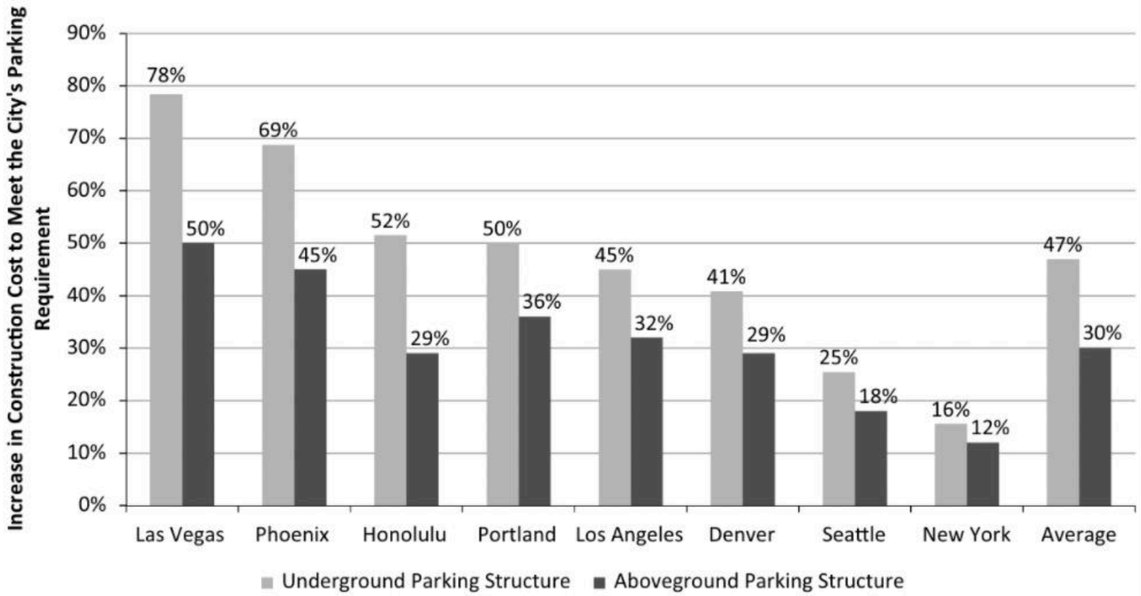
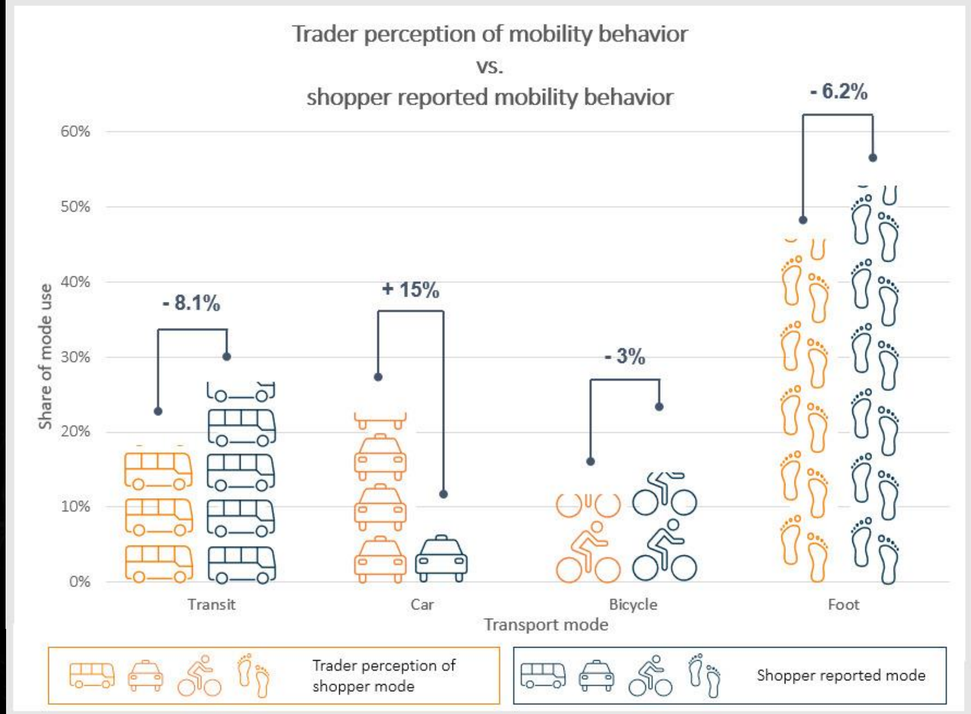


Figure 3-1 How parking requirements increase the cost of constructing office buildings

Parking Myth #3
Everyone drives
(and needs parking)

Business owners overestimate how many people drive

- Many business owners worry that reducing parking will hurt their business
- Studies from around the world find that business owners always overestimate the share of customers arriving by car.
- Reducing parking to improve bike, walk, transit access does *not* hurt businesses.



POLICY RECOMMENDATIONS

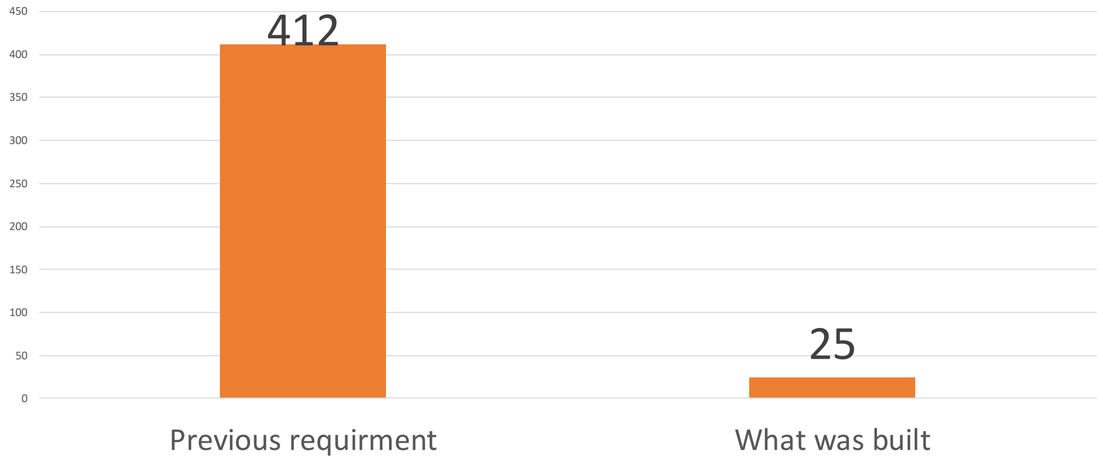
Eliminate parking minimums

- Get rid of parking minimums.
- Does not mean no one will build parking – but that they will only do so if they think it's worth it.
- Examples all over the country

Ithaca examples

- Collegetown and Downtown Ithaca have did away with parking *minimums* in 2014

Parking spaces built 2014-2020



2. Price the curb

The right prices will leave one or two open spaces on each block, so there will be no parking shortages. Prices will balance the demand and supply for on-street space.

Revenue can then be used to improve city service.

3. Parking cash outs

- Require employers who provide free or subsidized parking to offer $$$ to employees who opt out of parking.

In sum

- Parking minimums are based on bad science
  - Creates unpleasant sprawled out landscapes
  - Discourages non-driving
- Parking makes everything more expensive
- Retailers overestimate driving & parking

- We can fix this
  - Eliminate parking minimums
  - Charge for parking
  - Encourage people to use other modes

Another policy lever: Congestion pricing

Intended Benefits of Congestion Pricing

Congestion pricing has improved quality of life in other cities around the world, such as Stockholm, London, and Singapore, and could do the same in New York.

The program would generate $1 billion per year in revenue, which locks down $15 billion in bonds to fund the MTA's 2020-2024 Capital Program. Some of the program's projects included modernizing the system's more t
adding electric buses, making st
beginning the next phase of the

More than 700,000 vehicles ente
to average speeds of just 7 mph.
Yorkers lose 117 hours a year on
them nearly $2,000 in wasted tim
there would be an estimated 100
CBD daily, leading to less time w
streets for pedestrians and cyclis
emergency vehicles can also nav

Ultimately, the goal is to have a s

- Home
- Media
- Reports
- Get The Facts
- We Say No Congestion Tax
- Help Keep NYC Congestion Tax Free
- Join *Keep NYC Congestion Tax Free*
- Links
- Contact

Get The Facts

Don't believe the myths about Congestion Pricing

Estimates on costs to overhaul the NYC subway system range from $19 to $38 billion – or more. At most, the Congestion Tax will raise around $800 million per year (Appleseed Report December 2018) – not nearly enough to fund the MTA's plan even over the course of a decade. Even if congestion pricing works, the MTA cannot handle a significant increase in ridership

Myth #1 -- "*Congestion Pricing Will Fix the Subway*"
The Facts
"Congestion pricing, even if fully developed and completely implemented, will not be enough" - Joe Lhota (City & State, October 24, 2018)

Why Congestion Pricing is Such a Bad Idea...

- CP will increase costs for the movement of all goods and services through the Central Business District (CBD). These costs will be passed on to all residents.
- CP will not reduce the use of cars overall in the tri-state area and will only reduce total traffic by 3% in the CBD. Traffic will increase, however, in areas outside the zone, resulting in increased noise, pollution, and congestion. The traffic will be displaced to largely residential areas.
- Areas just outside the border will see an increase in "cruising" by for-hire vehicles avoiding the zone prior to a call, and increased demand for parking on the street and in garages will further escalate garage rates, the cost of taxis and for-hire vehicles, as well as food deliveries, will increase dramatically.
- Midtown is still suffering from low office occupancy and lower tourism revenue. A financial barrier to entry will negatively impact return to office workers, the destination restaurant and theater industries.
- The elderly and disabled and others, who might necessarily use their private automobiles or cars- for-hire to get to our hospital corridor and doctors' offices, will be unfairly impacted, and seeking toll exemptions for these rides, which would require determining need thus resulting in a breach of privacy.
- The MTA could raise the $1 Billion per year, they claim to need, by focusing on eliminating fare beating, toll evasion, and waste in all segments of the Authority.
- The MTA has a history of waste and inefficiency. There are numerous news reports addressing this issue.
- There has been no accounting, for how the $1 Billion that the MTA has already raised through taxi surcharges over the past three years has been

what happened?

congestion pricing delayed by Hochul, finally launched Jan 5, 2025

- Supporters were mainly right on key predictions
  - traffic - 100K fewer daily cars
  - revenue - $1B/yr for transit upgrades (before toll reduced)
  - air quality, asthma rates
  - transit ridership
- Opponents were mainly wrong on key predictions
  - business harm, esp. retail and dining
  - spillover pollution and “traffic dumping”
  - parking chaos in upper Manhattan
- Mixed results on other points
  - pace of revenue
  - housing costs – mixed effects
  - politics (Trump)
  - public opinion only shifted modestly in favor – 32/52 in 2024 to 42/35 by March 2025
  - “regressive tax” – jury is out! but 90% of commuters use transit

Third broad unit of the course: Where we live

- We will look at geospatial data that illuminates policy questions about neighborhoods, residences, regions, and communities
- We will try to understand the **places** we associate with home and the **policies** that form them
    - Built environment
    - Daily experience
- Our authors have mentioned affordable housing, accessibility of employment (including transit infrastructure), and consumption opportunities as factors in mobility
- Let's discuss how they shape our experience of home

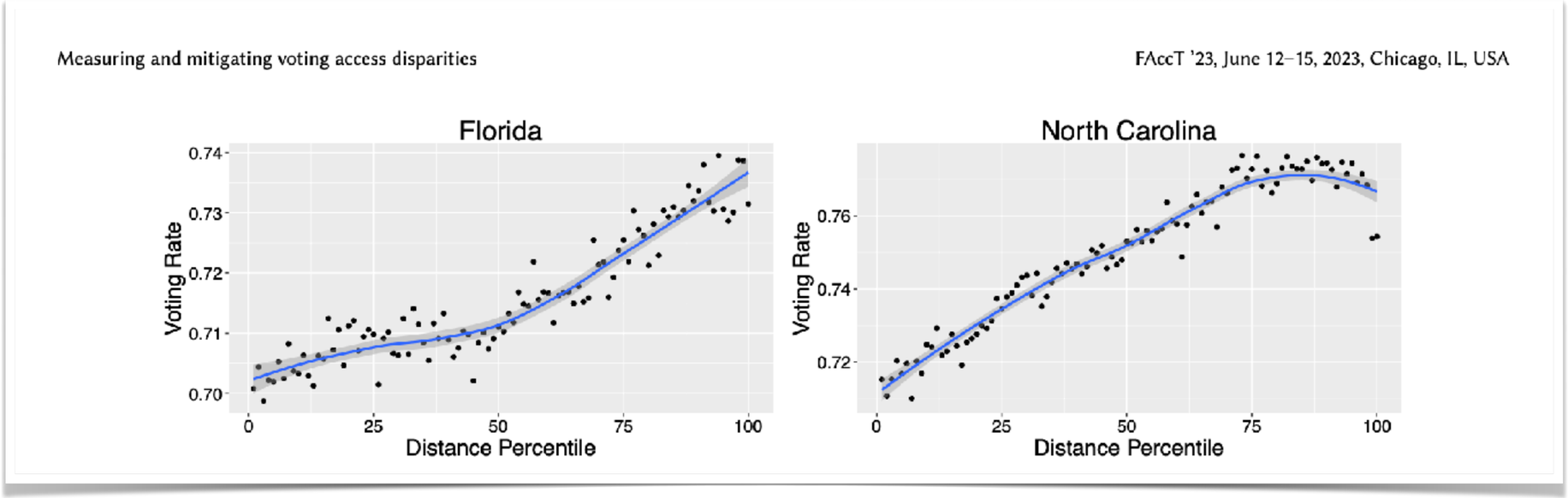
Housekeeping!

- Second **assessment** – Weds May 6, last 30 mins of class (2:20-2:50)
    - Covers flow topics: graphs and networks, commensurating units, geolocation, mobility, Great Migration, reverse migration, PUMS data, organ policy and planning, linear programming (high level), markets and institutions, transit, parking policy
    - 3 readings: Moretti, Healy, Shoup
- **Microproject** for grad students (MS, PhD) – topic should be submitted by May 6, via google form that asks for research questions, data sourcing, data prep, and intended methods.
    - First draft due May 20, final submission May 27. Format: Colab notebook with text blocks for lit review and discussion. Will live in course github and must be **replicable**!
    - Figure **20 hours** of work in the next month
    - Projects are solo, but I'll assign you to small discussion groups based on theme
    - Your goal: get beyond **correlation**!

a story of some creative thinking in a data-transit project

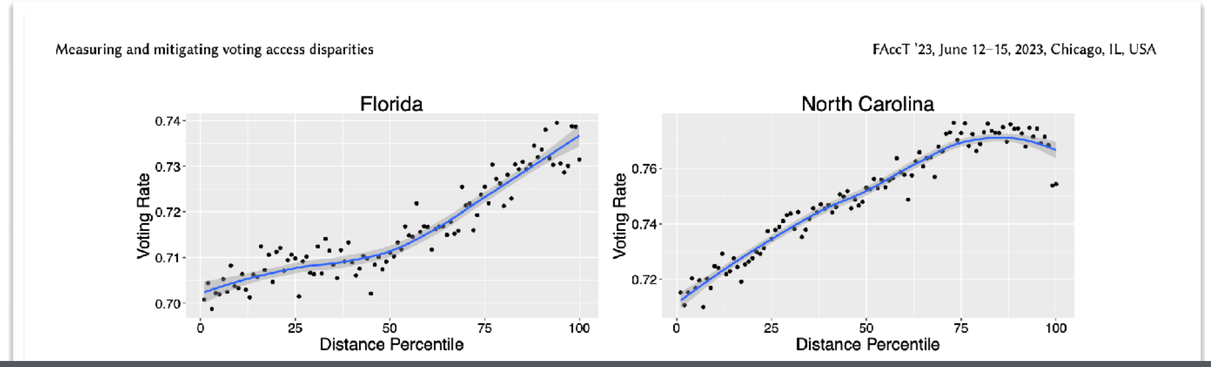
question: how does distance from polling place impact voter turnout?

- (Underlying motivation: do polling place locations create disparities in ease of voting?)
- First attempt: **geolocate** all polling places in certain states, and **geocode** the voter file. Obtain turnout rates. Compare turnout to distance.



Wait, what??

The farther you are, the **more** likely to vote?



from *Measuring and mitigating voting access disparities: a study of race and polling locations in Florida and North Carolina* by Abbasi, Barrett, Friedler, Lum, and Venkatasubramanian

So they came up with a new way to think about distance – instead of miles, they would "normalize." Maybe if you live in a rural area, you're used to driving to things and 5 miles is not far away, but if you're in a city, 5 miles is far.

So they made a new relative measure: distance to polling place divided by the distance to the nearest **school or library**. Call this "normalized distance."

With this new measure, things look much more understandable. (Though that doesn't mean it's "right"!)

two more examples of creative methods

- Michael has prepared a supplementary notebook on the **organ donation** data, which will be available to you by this Friday's lab.

- His premise: we did a logistic regression to try to relate some of the variables. How successful was it? What other data science techniques could help clarify relationships between the variables?

- Next week we'll kick things off with a look at crime, policing, and incarceration.

- Great timing! A leading national scholar on data science for police accountability is speaking here on Monday. He'll give a talk on novel data techniques for police body cam data.

Monday May 4
4pm
DSI 105