UEA Summer School
The Urban Transition, 1880-1940

Allison Shertzer
Philadelphia Federal Reserve

Summer 2025

Disclaimer

This lecture does not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

Urbanization in the United States

1. Didn't start in 1880 but has been underway since early 19th century.
2. "Move to city" gives way to intracity migration after World War II.
3. Boustan, Bunten, and Hearey (2018) provide an overview of how a nation of farmers became a nation of metros.

Figure 1

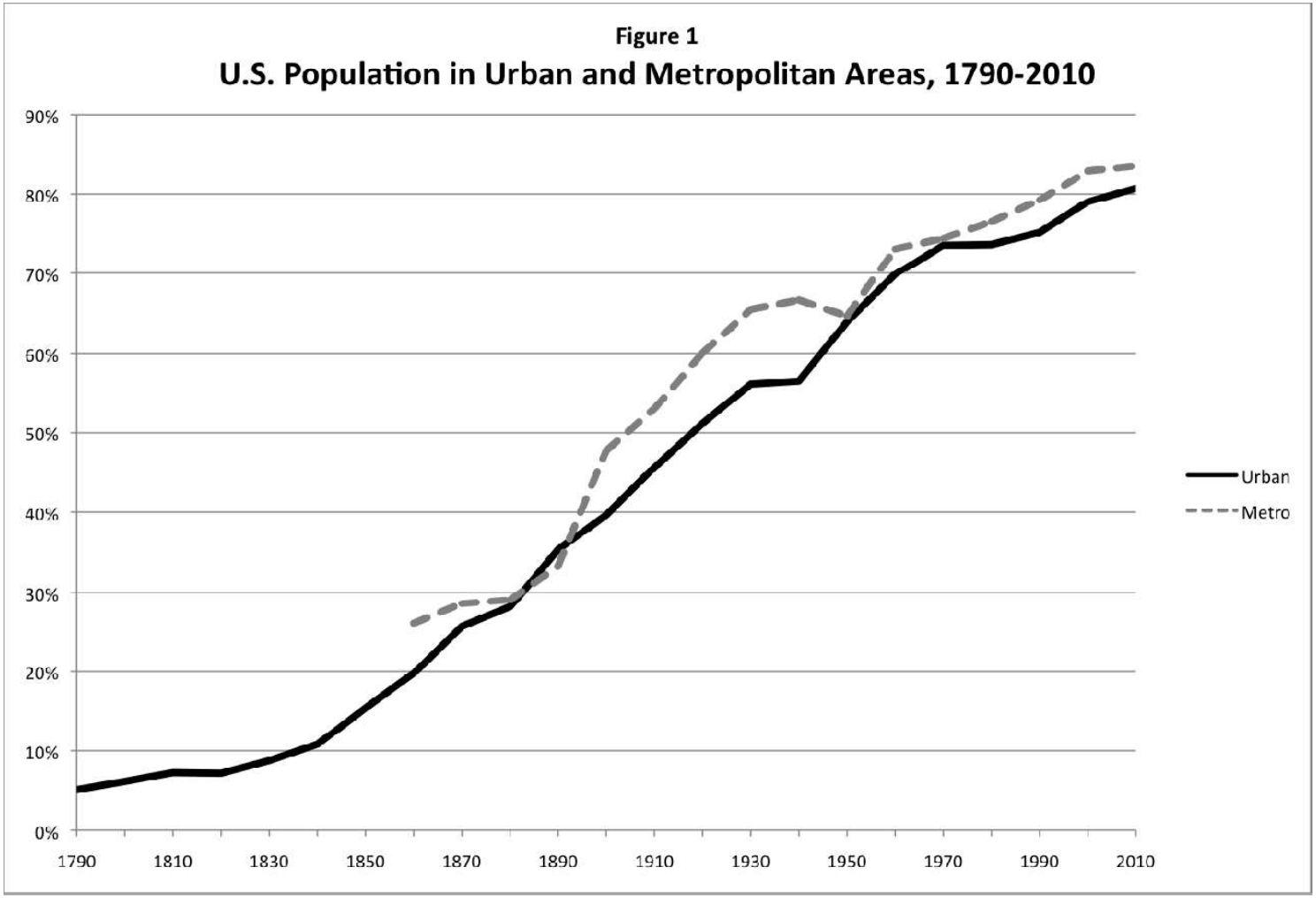

U.S. Population in Urban and Metropolitan Areas, 1790-2010
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1790
1810
1830
1850
1870
1890
1910
1930
1950
1970
1990
2010
Urban
Metro

Figure 1.1

U.S. Population in Urban Areas, 1790-2010

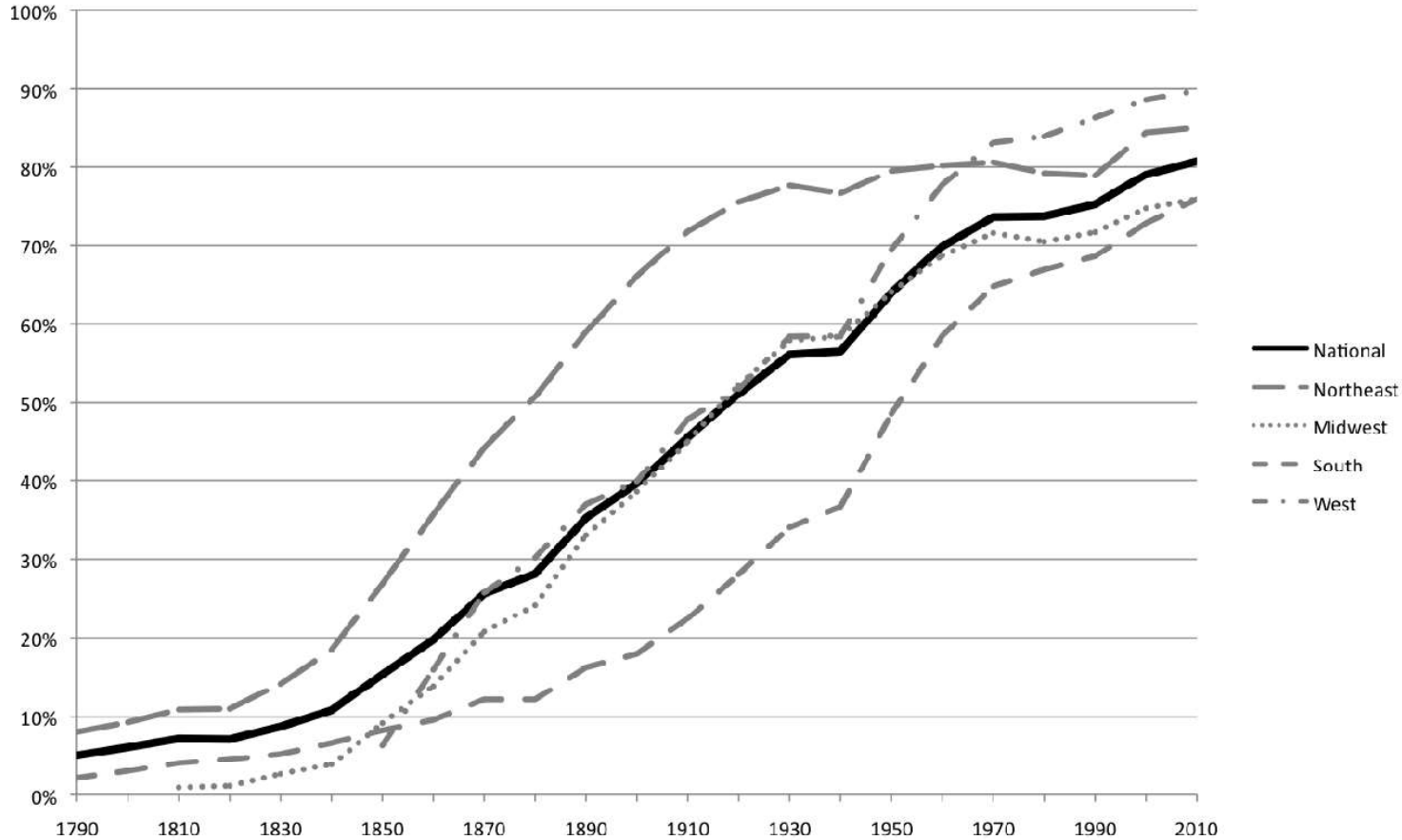
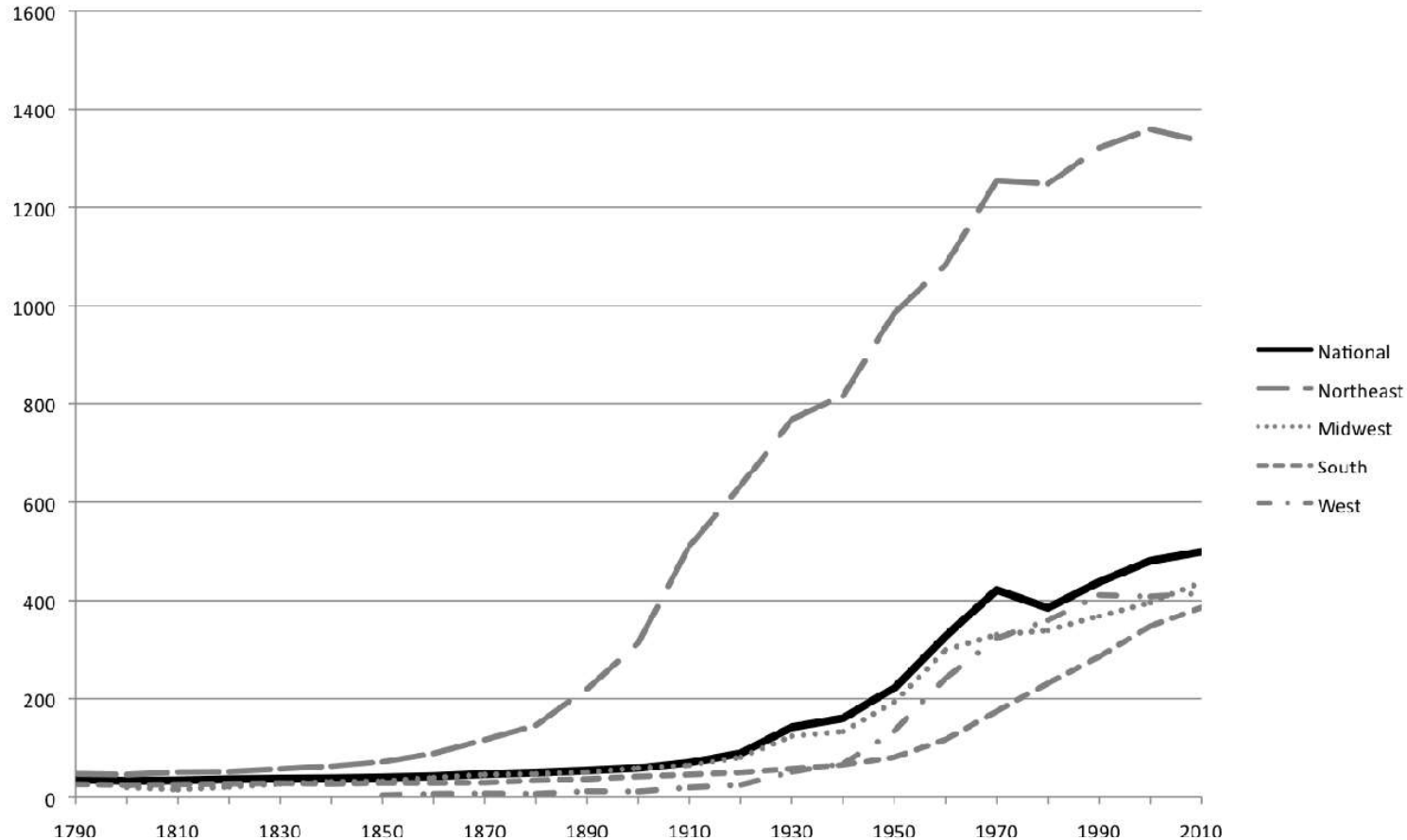


Figure 2

U.S. Population Density (per sq. mi.), 1790-2010



Rural to Urban Migration

- The paper presents a very simple version of a Rosen (1979) Roback (1982) model.
- Consider a group of firms and workers deciding where to settle. Each city has a quantity L and amenity level S.
- Amenities can be on both the consumption (theaters) and production (railroad access) side.
- In city i, workers receive w_i, which they allocate across consumption X_i and housing L_i^h.
- Firms produce X_i using labor, land for production L_i^p and productive amenities.

Historical application of Rosen-Roback

- Wages and rents will adjust until, in equilibrium, each firm and worker is indifferent across each cities.
- Note we are assuming costless shipment of the consumption good, which is probably not realistic for the 19th century.
- Cities will grow if (1) workers are attracted by a new consumption amenity or (2) if firms are attracted by a producer amenity.

Historical application of Rosen-Roback

- Suppose a new production amenity appears in city *i*.
- Firms will move to city *i* to take advantage of productivity boost and will pay higher wages.
- Workers move to city *i* to take advantage of higher wages.
- Competition over fixed land drives up rents, equalizing worker utility and ensuring zero profits for firms.

Historical application of Rosen-Roback

- Suppose a new consumption amenity appears in city i.
- Workers will move to city i to take advantage of the new amenity, driving up rents.
- Firms reduce their demand for land and reduce wages to reflect lower MP.
- Higher rents and lower wages counterbalance the higher amenity, equalizing worker utility across cities.

Historical application of Rosen-Roback

- Dual implications of simple model - city growth driven by production amenities should see higher wages and higher rents.
- City growth driven by consumption amenities should see lower wages and higher rents.
- So let's examine wage and rental premia in U.S. cities since 1820!
- Wait...

Historical wage data

- Assembling this data actually quite difficult - the census did not start asking about wages until 1940 and housing values or rents until 1930.
- Wage series is thus IPUMS (public-use census microdata) from 1940-2010, the Iowa census for 1915, and the census of manufacturing for 1850-1880, and Sokoloff and Villaflor (1992) for 1820 and 1832 (last source exclusive to NE and Mid Atlantic).
- The lousiness of U.S. data for wages and rents is (was?) one of the largest issues facing American economic history. It is getting better. Goal for now is to show what everyone was using until recently.

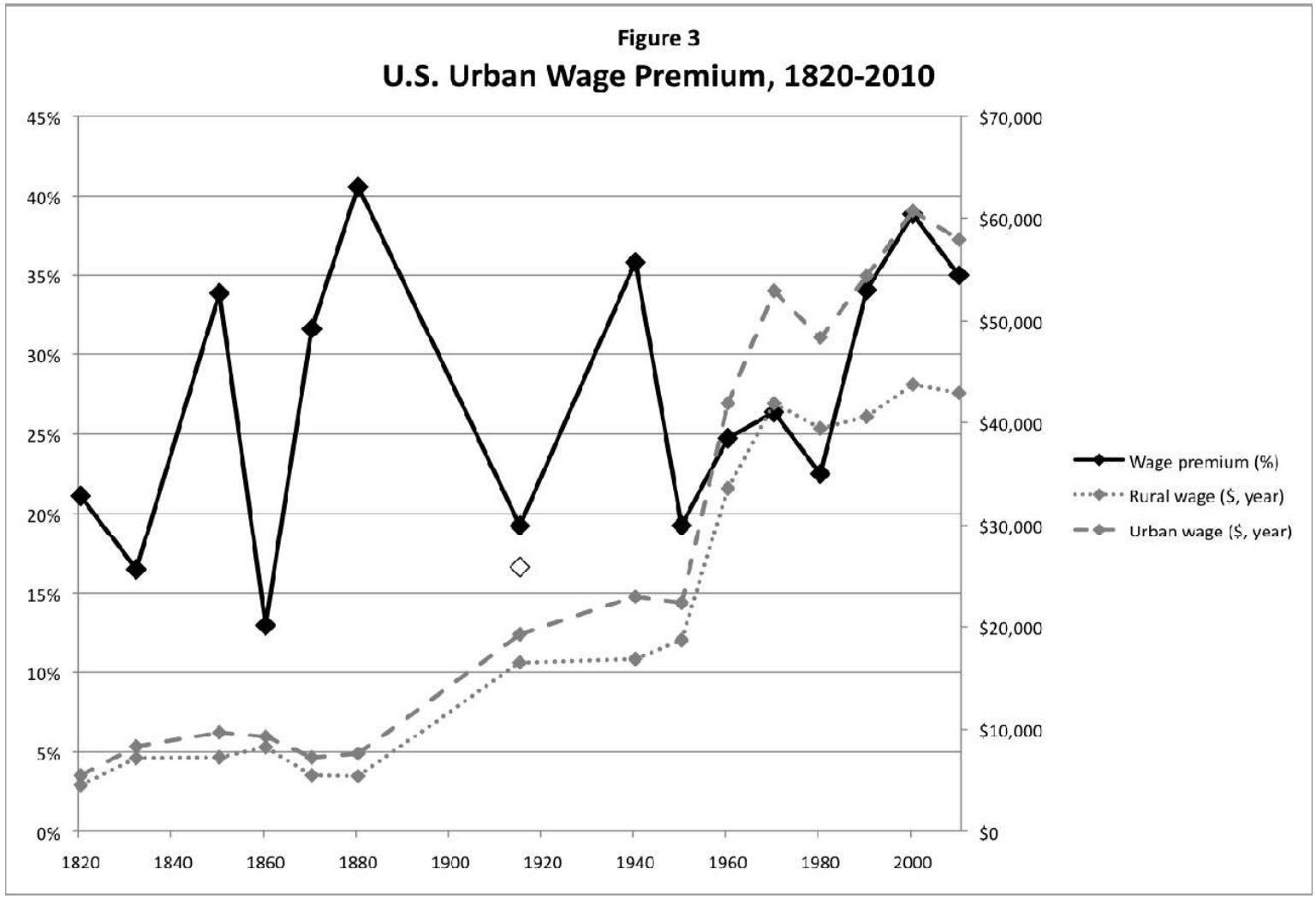


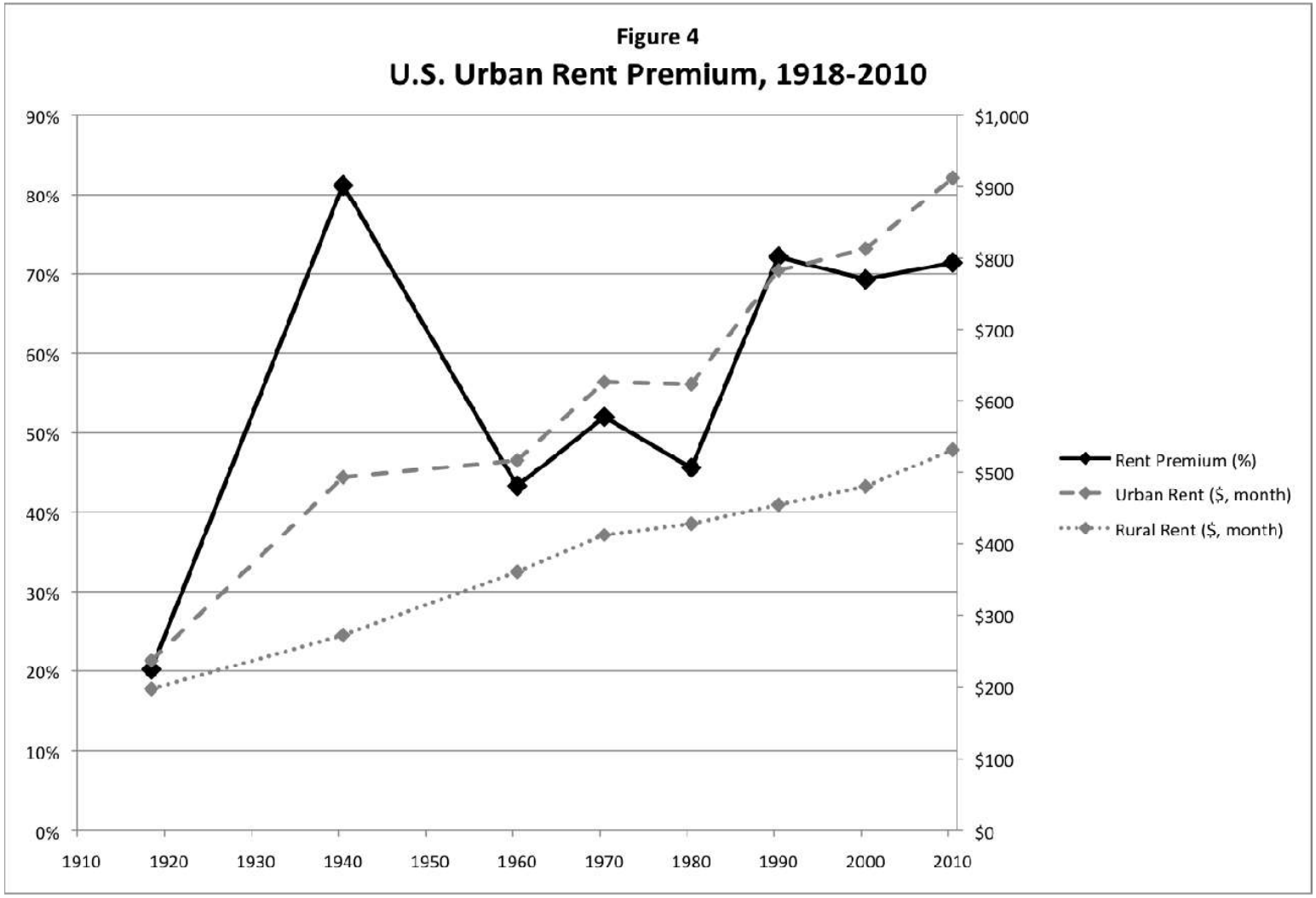
Figure 3
U.S. Urban Wage Premium, 1820-2010
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
Wage premium (%)
Rural wage ($, year)
Urban wage ($, year)

Historical rental data

- Premium calculated using IPUMS for 1940-2010 and 1918 using the Bureau of Labor Statistics.
- All figures from 1913 on are adjusted to 2010 using CPI from the BLS (note this is anchored to urban areas), David and Solar (1977) provide historical CoL estimates for prior to 1913. I recommend using Officer and Williamson now (measuringworth.com).
- Data on rents and housing prices has very recently gotten better, will return to this point in a moment.

Figure 4

U.S. Urban Rent Premium, 1918-2010



Phases of Urbanization in the U.S.

- Authors propose four eras of urbanization, the first (1820-1880) saw doubling of wage premium and exploding urban populations, consistent with cities becoming more productive.
- The second era (1880-1940) saw increasing wages but a declining wage premium, suggesting that urban amenities improved over his period, particularly before 1920 in the case of sanitation.
- Third era (1940-1980) saw continued declines in both urban rent and wage premia, indicating that cities were becoming relatively less productive (rise of trucking) and housing supply was expanding (postwar construction of suburbs).
- Fourth era (1980-present) sees increasing urban rent and wage premia, implying a boost in urban productivity and a slowdown of housing supply expansion.

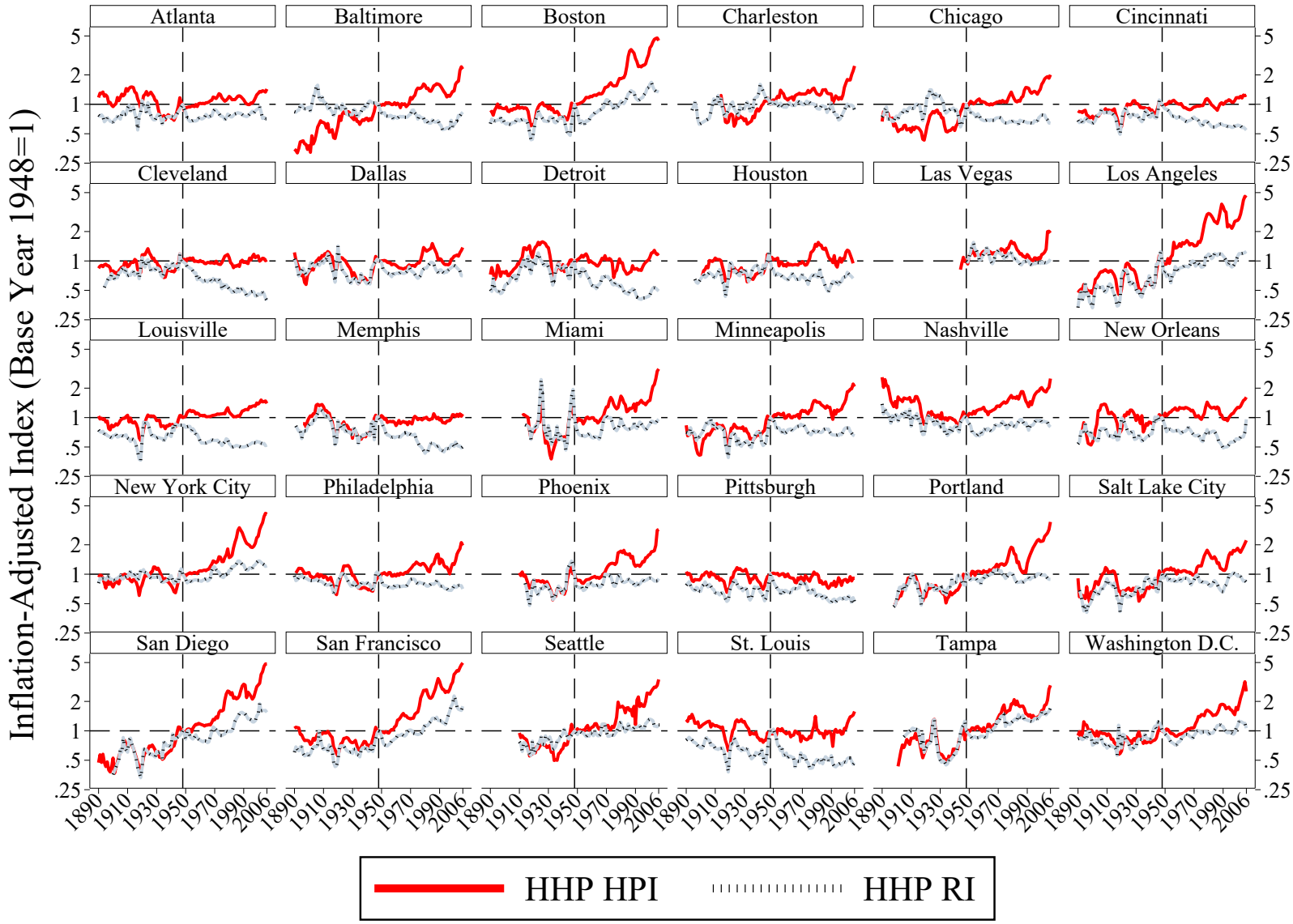
The Urban Transition, 1880-1940

- Today I will mostly focus on the second era, my favorite, and talk about infrastructure, land use regulation, and segregation.
- But before that, I will spend a few minutes on my recent project, which may be of interest to you now or in the future.
- Suppose you needed to know something as fundamental as how rents evolved in Philadelphia between 1917 and 1952. What would you do?
- Before: wave hands about how we don't have annual rental data for U.S. cities until later in the 20th century.
- Now: go to Philly Fed website and download HHP series!

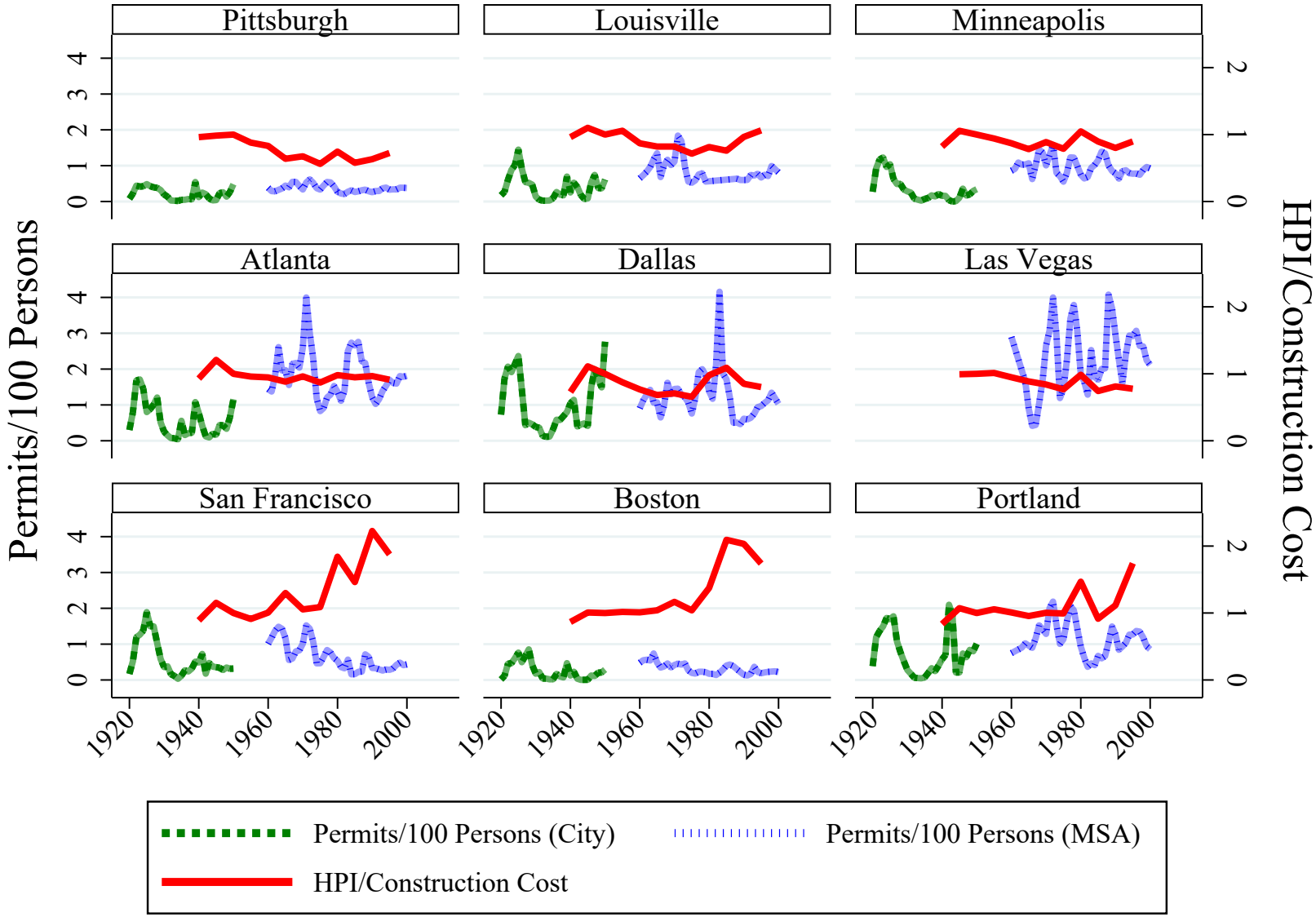
HHP Dataset

- We utilize online repositories of digitized newspapers, particularly newspapers.com, to create a consistently collected annual series for 30 cities.
- Real estate sections are sampled to obtain approx. 250 sales and 150 rentals per year or quarter.
- We digitized every attribute in listing including price, location, size and type.
- Use hedonic methods to create rental and housing prices indices (Lyons et al., 2025).

Real housing prices (sale and rents) for 30 cities



One application - price levels and housing construction



"New" New Economic History - Digitization and AI

- The "new" economic history was using data at all, as Fogel did (field termed cliometrics eventually just took over). Temin coins term?
- Today I will coin a new term to describe the arrival of big data and AI-assisted dataset construction.
- We digitized the newspaper listings by hand because it was 2018 in tech terms and the NSF would fund this work.
- Now I'm digitizing Philly city directories (jointly with Akbar and Livas) but we're using AI to turn the directories into tabular data.

Imagine entering 3000 pages of this (1922)

Pennsylvania Coat and Apron Supply Co.
313-323 NORTH THIRTY-SECOND STREET
Bell Preston 5576 We Charge Only for Laundering Keystone West 1656

LION MILLS
HOFFMAN-CORR MFG. CO.
COTTON DUCK, AWNING STRIPES, FLAGS
Contractors to the Government No. 312 Market St.

ABRAMOVITZ
Abramovitz Abraham drygds 139 Cumberland
—Bernard h 717 Snyder av
—Bros (Leon & Isadore) drygds 3604 Haverford av
—Chas (Central Sewing Machine Co) h 340 N 5th
—Chas salesman h 1435 S 5th
—Harry (Abraham & Son) h 1204 N
—Harry clk h 165 Susq av
—Hyman printer h 165 Susq av
—Hyman bfurngs 6107 Market
—Isaac tailor h 2534 S Reese
—Isadore (Abramovitz Bros) h 3604 Haverford av
—Isadore cigars 522 Venango
—Jacob shoemkr 721 S 2d
—Jno lab h 495 Poplar
—Jos (Abramovitz & Son) h 1204 N 624
—Leon (Abramovitz Bros) h 3604 Wildey
—Louis drygds 3233 N Front
—Louis genl mchst 2534 Gtn av
—Max pkgs 165 Susq av
—Morris quilts 1435 S 5th
—Myer machine opr h 1627 N 7th
—Nathan crackers 1424 S 5th h 1706
—Raphael 165 Susq av [S 2d
—Saml chandelierwkr h 1 r 834 N 4th
—Saml delicatessen h 1406 S 5th
—& Son (Jos & Harry) drygds 1204 N 624
Abramowitz Abraham carp h 436 Poplar
—Fannie wid Myer h 1714 N 42d
—Isadore dining 1127 Columbia av
—Israel mchst 1714 N 42d
—L meat 3361 Fkd av
—Max drygds 2000 N 37th
—Wm shoemkr h 622 Mifflin
—Wm B butcher h 3361 Fkd av
Abrams Aaron (Wascea Mfg Co) h 6633 Wayne av Gtn
—Abraham h 2517 S 2d
—Abraham clk PO h 610 Wolf
—Abram cigars 1687 Meadow Fkd
—Abram h 715 S 52d
—Adolph clk h 4620 N Warnock
—Albert shipwkr h 4311 Leiper Fkd
—Albert tailor h 829 Reed
—A Roy dentist 5559 N 5th h 5004 N Hutchinson
—Barnett grocer 2000 S 6th
—Benj acct h 5015 DeLancey
—Benj clk h 1720 Marlton av
—Bertha 328 S Willard
—Benj lab h 35 N Redfield
—Bernard collector h 2549 N 30th
—Chas foreman h 2404 N 13th
—Chas D foreman h 1815 Ritner
—Dani lab h 3687 Moravian
—David fireman h 3883 Coral
—David salesman h 3117 Huntingdon
—David W treas Anchor Button Co h 6145 Locust
—Donald L h 706 Spruce
—Edw clk h 1009 S 27th
—Edw printer h 2210 S Mildred
—Edw real est 602 Penn Sq bl h 1720 Marlton av
—Edw salesman h 2543 N 29th
—Elias appraiser h 220 Wildey
—Frank carp h 6009 Allman
—Frank weaver h 1607 Foulkrod Fkd
—Geo gardener h 1630 Willington
—Geo lab h 3565 N 8th
—Geo printer h 1213 Jefferson
—Geo B foreman h 1421 N 2d
—Geo W driver h 2247 N Fairhill
—Gus B sec h 2226 Florence av
—Harris h 2858 Tulip
—Harrison painter h 1701 S 56th
—Harry clk h 1224 S 50th
—Harry machst h 3565 N 8th
—Harry machst h 3513 Old York rd
—Harry metalwkr h 2059 N 8th
—Harry salesman h 2744 N 7th
—Harry shoemkr 3434 H
—Harry shoemkr 3000 N Darien
—Harry S lawyer 523 Ri Est Tr bl h 1519 N 21st
—Henry janitor h 5352 DeLancey
—Henry R drygds 1500 & h 1519 N Franklin
—Herman h 47 N 63d
—Herman roofer 729 Poplar h 2563 Amber
—Herman S salesman h 3117 Huntingdon
—Howard h 4819 Duffield Fkd
—Hyman chauffeur h 1946 N Napa
—H Gordon adjuster h 236 Federal
—Ida h 922 N 42d
—Isaac h 236 Federal
—Isaac h 3540 Old York rd
—Isaac hucksters 2880 B Orleans
—Isaac ice cream 2301 S Darien
—Isaac jas h 5 N E 2 B & Huntingdon pk Fox Chase
—Isaac tailor 240 S 8th h 1632 S 4th
—Isidore milk 2448 S Philip
—Israel draftsman h 231 S Edgewood
—Israel shoemkr 2213 Arch
—I mgr h 3832 Trinity
—Jacob h 4822 Darrah Fkd
—Jacob (A & S Salestore) h 858 N
—Jacob peddler h 2325 N 8th [5th
—Jacob weaver h 2627 S Percy
—Jacob Jr pipeftr h 4822 Darrah Fkd

ABRAMS
—Jno fireman h 5445 Pine
—Jno jeweler h 1538 Glenwood av
—Jno lab h 1617 N Warnock
—Jno P police h 1935 Moravian
—Jos h 2034 E Clementine
—Jos h 1742 N 15th
—Jos chauffeur h 3439 B
—Jos electn 971 N Marshall
—Jos bfurngs 1409 Gtn av
—Jos machst h 1106 Harmer
—Jos painter h 426 Daly
—Jos rigger h 2034 E Clementine
—Jos salesman h 2553 N 31st
—Jos tailor 3220 Turner
—Jos (United Paper Mills Supply Co Inc) & junk 233 N 22d h 2028 N 20th
—Jos H student h 717 Snyder av
—Jos L embroidery 226 N 6th
—Josiah h 2235 N Fairhill
—Kathryn probation officer h 230 Wildey
—Lawrence bricklyr h 38 Harvey Gtn
—Leon h 1441 Ridge av
—Leon collector h 2483 N 30th
—Lewis butcher h 116 S 27th
—Lewis collector h 111 League
—Lewis meatcttr h 5233 Larchwood
—Lewis pawnbroker 301 N 10th h 4106 N Broad
—Louis bookkpr h 2531 N Newkirk
—Louis salesman h 2205 Natrona
—Louis shipftr h 717 Snyder av
—Louis tailor 2638 Oxford
—Louis E clk h 1910 N Park av
—Louis J varieties 2730 Grey's Ferry
—Marcus dyer 4103 Gtn av [av
—Margaret wid Jos h 4109 Locust
—Martin W jeweler 1026 Chestnut h 1519 N Franklin
—Mary h 3331 N 15th
—Mary wid Abraham h 2932 Kip
—Mary E wid Saml h 4112 Brown
—Maurice h 829 Reed
—Maurice metals 5001 N 11th
—Maurice tailor h 1324 N 57th
—Max hatmkr h 3139 Gordon
—Max (Hunting Park Scrap Iron & Metal Co) h 4139 Gtn av
—Max salesman h 2343 N 29th
—Max shoes 2939 Ken av
—Max J clk h 1632 S 4th
—Meyers A acct h 3229 Turner
—Miriam socialwkr h 422 Ruhnbridge
—Mitchell organizer h 5004 N Hutchinson
—Mollie E notary 1031 Land Tl bl h 5004 N Hutchinson
—Morris h 5731 Cedar av
—Morris furniture 4223 Ken av
—Morris jeweler h 1737 Diamond
—Morris shoemkr 702 N 8th h 7232 Saybrook
—Morris tailor h 2553 N 31st
—Morris vellings 1011 Chestnut room 428 h 2234 N Park av
—Nathan barber 1220 Filbert h 1923 N 20th
—Nathan machst h 2842 N 33d
—Peter treas & genl mgr Williams, Brown & Earle Inc h 1637 N 33d
—Phillip barber 135 N 9th h Willow Grove
—Philip salesman h 2353 N 31st
—Philip tailor h 610 Wolf
—Reba clk h 2553 N 31st
—Rebecca wid Saml h 2913 Norris
—Reuben H clk h 3211 Clifford
—Robt coachman h 240 E Graver's la CHill
—Robt lab h 4311 Leiper Fkd
—Saml h 618 N 18th
—Saml h 1819 N 31st
—Saml clk h 1939 N Marshall
—Saml collector h 2423 S Franklin
—Saml foreman h 2902 N Hollywood
—Saml tailor 1314 N Franklin
—Saml tailor h 2209 S Mildred
—Saml J salesman h 5004 N Hutchinson
—Saml J metals h 1817 S 54th
—Saml L engineer h 4023 Mulberry Fkd
—Sidney salesman h 928 Susq av
—S meat 705 Diamond
—S J (A Perez & Son) h 1817 S 54th
—Thos chauffeur h 2325 N 8th
—Thos horse clipper h 4812 Darrah Fkd
—Wm h 4629 A
—Wm butcher h 3505 N 8th
—Wm engineer h 30th bel Magazine la es
—Wm gardener h 1630 Willington
—Wm machst h 4822 Darrah Fkd
—Wm (Glenter Garage) h 4629 A
—Wm tailor h 827 Reed [Fville
—Wm Jr lab h 3505 N 8th
—Wm B rep Open Coil Heater & Purifier Co h 31 S 21st
—Wm H engineer h 5716 Walton av
—Wm L M police h 1540 N Robinson
—Wolf carp h 535 Fernon
—Abramson Aaron driver h 978 N 6th
—Abraham grocer 421 Reed
—Abraham grocer 1719 S 2d
—Abraham tailor h 858 N 50th
—August (Crystal Coal & Coke Co) h 847 N 5th
—A tailor h 2428 S Warnock

ABRAMSON
—Benj h 3025 N 20th
—Benj (S & S Produce Market) h 6038 Market
—Benj chauffeur h 823 Reed
—Benj peddler h 2542 N Patton
—Benj salesman h 2041 S Sartain
—Benj tailor h 605 Porter
—Chas electn h 603 Porter
—David grocer 1500 N 6th
—Dora F clk h 1839 N 7th
—Ellis tailor 605 Porter
—Fanny cheese 1644 S 7th
—Hannah varieties 2500 S 61st
—Harry (H A Cigar Co) h 1720 Marlton av
—Harry ironwkr h 2648 S Sartain
—Harry shoemkr 1831 Cumberland
—Harry shoemkr h 5001 Funston
—Harry shoemkr 415 Susq av
—Herman h 823 Reed
—Herman student h 603 Porter
—Isaac h 1349 N 11th
—Isidor J cigars 701 Reed
—Israel drygds 620 Poplar
—Jacob h 1229 N Sartain
—Jacob furniture 1929 South
—Jacob presser h 521 Fernon
—Jacob tailor 744 S 2d
—Jas A clk h 5437 Arlington
—Jos clothing 25 S 8th h 2210 Natrona
—Julius tailor h 5949 Addison
—Lenn tailor 3023 Ken av
—Lewis clk h 2309 N 30th
—Louis (Abramson & Freeman) h 615 Passyk av
—Louis carickcaner h 2309 N 30th
—Louis carp h 627 Passyk av
—Louis cigars 1630 Arch h 1922 N Myrtlewood
—Louis coal 1429 N American h 1418 N 5th
—Louis butter h 2486 N 6th
—Louis tailor 1620 S 7th
—Max cigars 2700 Allegheny av
—Mich mgr h 313 S 60th
—Morris h 545 N 6th
—Morris carp h 840 Jackson
—Morris clk h 2500 S 61st
—Morris milk h 851 Daly
—Nathan h 4546 N Marvine
—Nathan furniture 2932 Wharton
—Pincus tailors' trimmings 802 S 3d
—Ruben tailor 104 Diamond
—Saml architect h 6222 Catharine
—Saml butcher h 1919 N Stanley
—Saml clk h 603 Porter
—Saml shoemkr 103 Diamond
—Saml W collector h 837 Daly
—Sarah wid August h 6243 Larchwood
—Sophia h 2023 Ken av [wood
—Zimel h 633 Jefferson
—& Freeman (Louis Abramson & Harry Freeman) store fixtures 615 Passyk av

ABRASIVE COMPANY
Fredk S Dickson chairman of board Louis T Byers pres J Harvey Byers v-pres & genl mgr Lawrence J Morris v-pres Saml P Byers sec & treas Thos F Muldoon asst sec & asst treas grinding wheels Tacony & Fraley Bdg
Abrendts Henry J metalwkr h 2861 N 2d
Abriele Jos lab h 1524 S Mole
—Rosa wid Michl h 1524 S Mole
Abrohms A Jacob grocer 1901 Berkshire Pkd
Abromaitis Jno clk h 411 W Queen
Abromeit Ferdinand tailor 409 Spruce h 4103 N Reese
Abronski Alex pres Alexander Johns Co Inc 1615 Stiles
—Alex F sheet metalwkr h 1031 Spencer
—Jno sec & treas Alex Johns Co Inc h 2444 N 33d
—Louis F clk h 2628 N 17th
—Raymond h 2444 N 33d
—Raymond W salesman h 1501 Girard av
—V Jno metal h 2444 N 33d
Abronsky Herman h 5220 Wynnefield av
Abry Chas G h 256 S 15th
—Jacob lab h 3239 N Reese
Absalom Edmond C h 1818 Berks
Absetts Jno lacewkr h 728 Glenwood av
Abshagen Edw metalwkr h 2408 S
—Wm lab h 2408 S Percy [Percy
Absorbent Soap Co Inc Francis J Harvitt pres J D Gordon 2d v-pres N Franklin & city line Oak Lane
Abt Albert J morocecowkr h 2012 N 6th
—Dani meatcttr h 2208 N Lawrence
—Fredk electn h 2012 N 6th
—Godfried ironwkr h 2204 N 7th
—Henry fire dept h 5702 Sprague Gtn
—Jos T blksmith 331 & h 230 N 58th
—Lawrence electn h 6136 Gillespie Wissng

ABT
—Louis paperhngr h 250 N 58th
—Robt O condtr h 3114 N Sheridan
—Theo USN h 7109 Guyer av
Abshove David ins agt h 2914 Oxford
—Maurice D photogr h 929 N Franklin
Academy of Fine Arts SW c Broad & Cherry
—of Natural Sciences of Phila 1900 —of Surgery 19 S 22d [Race
—of the Holy Child Jesus 3831 Chestnut
—of the Sacred Heart 1819 Arch
—of the Sacred Heart Eden Hall Convent ab State rd ns Torresdale
—of the Sisters of Mercy 1636 N Broad
—of the Sisters of Notre Dame 206 W Rittenhouse sq
—of the Sisters of the Holy Child Jesus 1135 Sge Garden
Acaley Roy clk h 1932 Race
Acampora Pesti lab h 1443 S Mole
Acaster Thos civ engr h 510 Hermit
Accelsior Express 25 S Front [Hox
Acceptance & Finance Corporation J P Crasston pres C DeBie Jr v-pres I M Tittus sec W T Sullivan treas bankers 801 Stock Exchange bl
—& Finance Corporation H H Phillips genl mgr bankers (security dept) 624 Welchtman bl
Accelsior Saml pipeftr h 1944 S Iseminger
Accommodation Ice Co (C J Broomall) 4814 N Marvine
Accooe Adelaide wid Jas h 1818 Ellsworth
—Albert porter h 1816 Reed
—Marion mill opr h 1224 North
Accor Anna art needlework 1811 Columbia av
Accrey E M machst h 209 Allegheny av
Accucelli Albert V spinner h 230 E Clarke Gtn
Accurate Addressing Co (Sarah A Moore) 521 Penfield bl
Ace Music Co (Jacob Strauss & Saml Caplan) 716 S 11th
—Motor Corporation Max M Sindkin pres Chas J Shuttleworth sec Jos T Beardwood treas 2203 E Erie av
Acen Adriano blksmith h 2347 N
Acello Jno lab h 935 Daly [Fhwn
Aceto Alfred clk h 1218 N 13th
—Jos barber h 1238 Girard av
Acford Frank masseur h 1911 Poplar
Achard Jno W elec engr h 4920 N 12th
Achatz Ophelia R wid Jno h 2651 S Iseminger
Ache Frank W ydmstr h 2009 Atlantic
—Harry L supt h 4810 N Hutchinson
Achembach Josephine (Keystone Mending Co) h 2201 N 8th
Achenbach Clarence H supt Wright Mfg Co h 133 Vassar Wms
—D S (Susq Rug & Premium Co) h Lenox Apts
—Fredk draftsman h 241 W Haines Gtn
—Fredk furniture h 412 Olney av
—Geo H electn h 322 N 32d
—Herman sawyer h 1624 Fanshawe Lawndale
—Jacob foreman h 2354 E Cumberland
—Jno bartndr h 2950 N 6th [land
—P J h 4027 Reno
—Wm sawmkr h 2815 N 5th
Achenson Armon D (A D Achenson Co) h Grant av bel Fkd av ns Torresdale
—D Co (Armon D Acheson T Marshall Holt & C H Bollinger) floor 567 Fluis Bourse
—Isabella h Grant av bel Fkd av ns
—Jane H 1733 N 61st [Torresdale
—Millard F sec & treas Putnam Mills Carpet Co h 1636 Glenwood av
—Saml J pres Putnam Mills Carpet Co h 2303 N 19th
—Saml J Jr insgr h 2303 N 19th
—Vick student h 5563 Gtn av
Achetoff Isaac paperhngr h 2521 N Patton
Achey Elizabeth wid Milton J h 2200 N Fairhill
—Geo ironwkr h 146 E Pomona Gtn
—Jesse W Jr (Jesse W Achey Jr & Co) h 6221 Gtn av
—Jesse W Jr & Co (Jesse W Achey Jr) real est 6221 Gtn av
—M T carp h 2626 N 12th
Achilles Albert sheet metal 1313 N
—Chas butcher h 528 Turner [29th
—Elec electn h 2026 N Hollywood
—Louis h 3247 N Fairhill
—Louis lab h 3122 N Hemberger
—Missing Link 6230 Market
Achino Jos D cigars 2063 Dickinson
Achner Choco-Lactine Co S T Appres Wm Swayne sec-treas chocolate 435 N Broad
—S T pres Achor Choco-Lactine Co h West Chester
Achramer Wm (Achramer & Ree) h 1461 N Hollywood

ACHRAMER
—& Ree (Wm Achramer & Peter Ree) dining 265 N 8th
Achroyd Annie wid Jas A h 1485 E Wlit
Acha Herman draftsman h 36 N
—Jno barber 1541 Vine [Millick
Achtermann August h 1737 Willington
—August G draftsman h 1737 Willington
—Ernst clockmkr h 2029 N 25th
—Wm draftsman h 2554 Page
—Wm huckster h 614 Columbia av
—Wm salesman h 1851 N Park av
—Wm H upholstr h 1934 N 24th
Achuff Alphonso auto supplies 6052 Hegerman Tac & garage SE c Vandike & Unrub Tac h 3524 Unrub Tac
—Amelia wid Jos h 2348 E Sergeant
—Chas surveyr h 4448 Paul Fkd
—Frank bldr 1600 N Front h 7435 RSun av
—Gilbert (Maple Grove Park) & cigars 1648 Orthodox Fkd
—Harry H paperhngr 4827 Mulberry Fkd
—Horace chauffeur h 2357 N Colorado
—Isaac lab h 2153 N Fairhill
—Jos 2348 E Sergeant
—Robt housemaphr h 3518 Lanc av
—Robt P photogr h 4934 N 13th
—Saml h 4934 N 13th
—Saml engineer h 1516 N 26th
—Walter B carp h 7435 RSun av
—Wm salesman h 2814 Judson
—Wm H H h Consholocken av bel Monument rd
Acinia Francisco cook h 343 N 10th
Acino Raphael mason h 350 N Simpson
Ackelson Jno N lab h 3431 N Bouvier
Acker Albert clk PO h 2030 S Bonsler
—A Lincoln purch agt 310 City Hall h 1843 Venango
—Benj music 3408 Gtn av
—Bros (Jno & Jos) soft drinks 1239 Columbia av

—Chas machst h 3147 Benner Wissng
—Chas A clk h 5324 James Fkd
—Chas E acct h 2918 Master
—Dani salesman h 116 N 52d
—Durbin S h Union League
—Earl W h 211 N Alden
—Edw C engineer h 128 E Washington Gtn
—Elizabeth B wid Finley h 4943 Rubicam Gtn
—Ernest salesman h 2830 Pratt Bdg
—Frank C butcher h 1735 Edgeley
—Fredk J police h 962 N 10th
—Fredk J Jr police h 939 N 11th
—F H h 1906 Tioga
—Fred 1502 Ridge av
—Harry C baker h 2658 N Bancroft
—Harry D carp h 2862 N Stillman
—Henry baker 1542 Lehigh av
—Henry electn h 3527 N 8th
—Henry J v-pres Ingraham Mfg Co 2921 N 7th
—Jas acct h 276 S Ithan
—Jas D clk h 5209 Chester av
—Jno (Acker Bros) h 1239 Columbia av
—Jno carp h 724 N Shedwick
—Jno machst h 409 E Ashmead Gtn
—Jno pkt billiards 2806 Bridge Bdg
—Jno H moldmkr h 5324 James Fkd
—Jos G dining 1502 Ridge av
—Jno N painter h 2765 N 23d
—Jos (Acker Bros) h 1239 Columbia av
—Jos h 1618 Susq av [av
—Jos steamftr h 601 Quarry
—Jos F lab h 5326 James Fkd
—J Durbin pres F C Schaible Co Inc h 5209 Chester av
—J Geo painter h 1457 N Camac
—J Henry Bailey (Cousins, Brenton & Acker) h 2234 George's rd
—Louis mgr h 607 Arthur Fox Chase
—Lydia T h 5101 Pulaski av Gtn
—Saml painter h 2918 Master
—Saml H draftsman h 1538 N Hollywood
—Thos G machst h 304 York
—Wm H engineer h 3951 Wallace

153

Three themes from the Urban Transition of 1880-1940

- Sanitation and Infrastructure
- Early Land Use Regulation
- Segregation and Redlining

Three themes from the Urban Transition of 1880-1940

- **Sanitation and Infrastructure**
- Early Land Use Regulation
- Segregation and Redlining

The Importance of Urban Sanitation: A debate

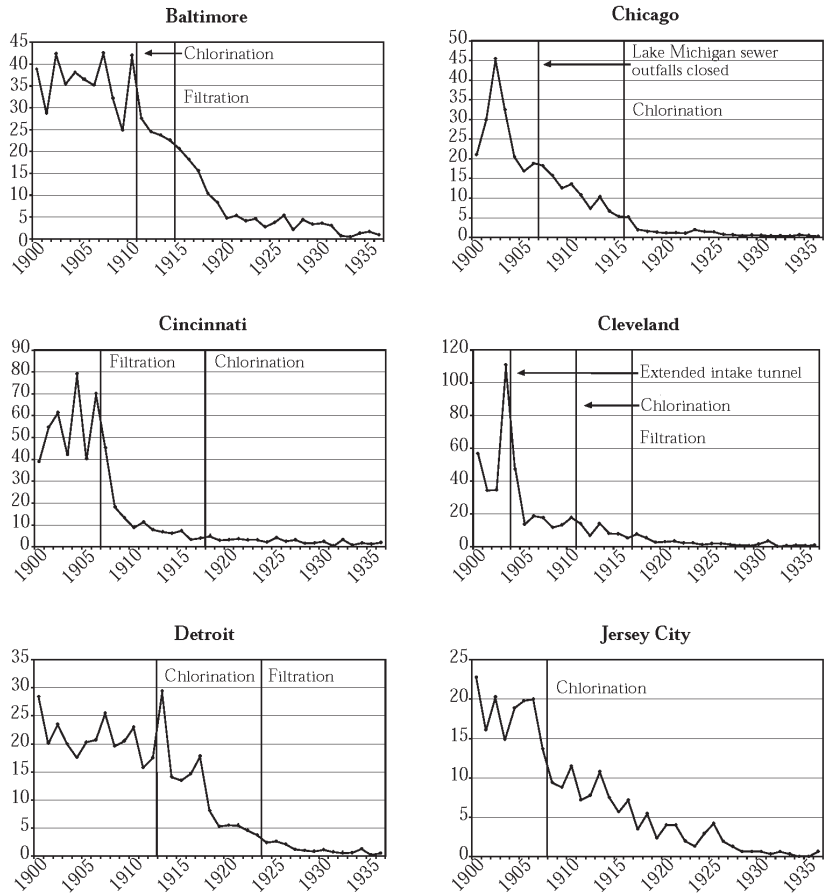
- One debate is whether mortality fell during the second phase because of rising incomes or specific investments in public health.
- There is evidence on the income channel, for instance Shari Eli (2015) looks at the impact of exogenous income shocks and finds Union Army veterans lived longer.
- But cities are building sewers, improving the purity of newly piped water supplies, pasteurizing milk, inventing cures for diseases like diptheria.
- Relative importance of these interventions, some of which were enormously expensive, have important implications for developing countries.

Debate renews c. (2005)

- Cutler and Miller release their influential paper on water filtration and chlorination
- It is very difficult to construct data on who has sewer and water access (but not impossible).
- They instead looked at the dates in which cities adopted particular investments and collected data on urban mortality rates.

The paper in one picture

Figure 2. Typhoid Fever Trends (Mortality per 100,000) and Sanitary Interventions, 1900–1936



Cutler and Miller (2005)

- Mortality falls by 30 percent between 1900 and 1936.
- Their results suggest that clean water can explain 45 percent of total reduction.
- Even bigger effects for kids - 74 percent of reduction in infant mortality can be traced to clean water.

How to Advance the Literature?

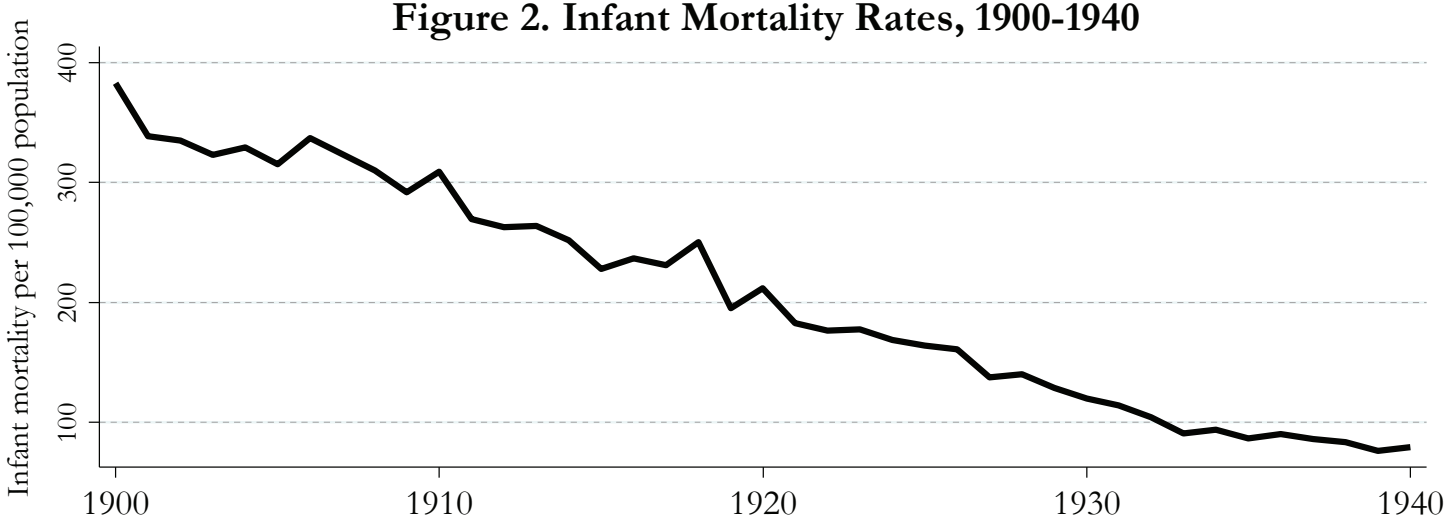
1. You can revisit the consensus.
2. You can go in a new direction entirely.

Revisiting the census

- Anderson et al. (2022) begins with a replication of Cutler et al. Claim that data transcription errors account for most of their findings.
- Correcting these errors, the authors argue that filtering reduces infant deaths by 11-12% but other public sanitation has no measurable effects (i.e. sewage treatment had no impact on infant mortality, no impact of chlorination on mortality).
- Cutler and Miller published a comment saying fixing errors changes estimated share of mortality reduction explained from 43% to 38%.
- Meanwhile Alsan and Goldin's 2019 study of Boston finds infrastructure interventions were complementary and explain about one third of child mortality decline.

Infant Mortality in Boston - Why Consensus is Hard

Figure 2. Infant Mortality Rates, 1900-1940

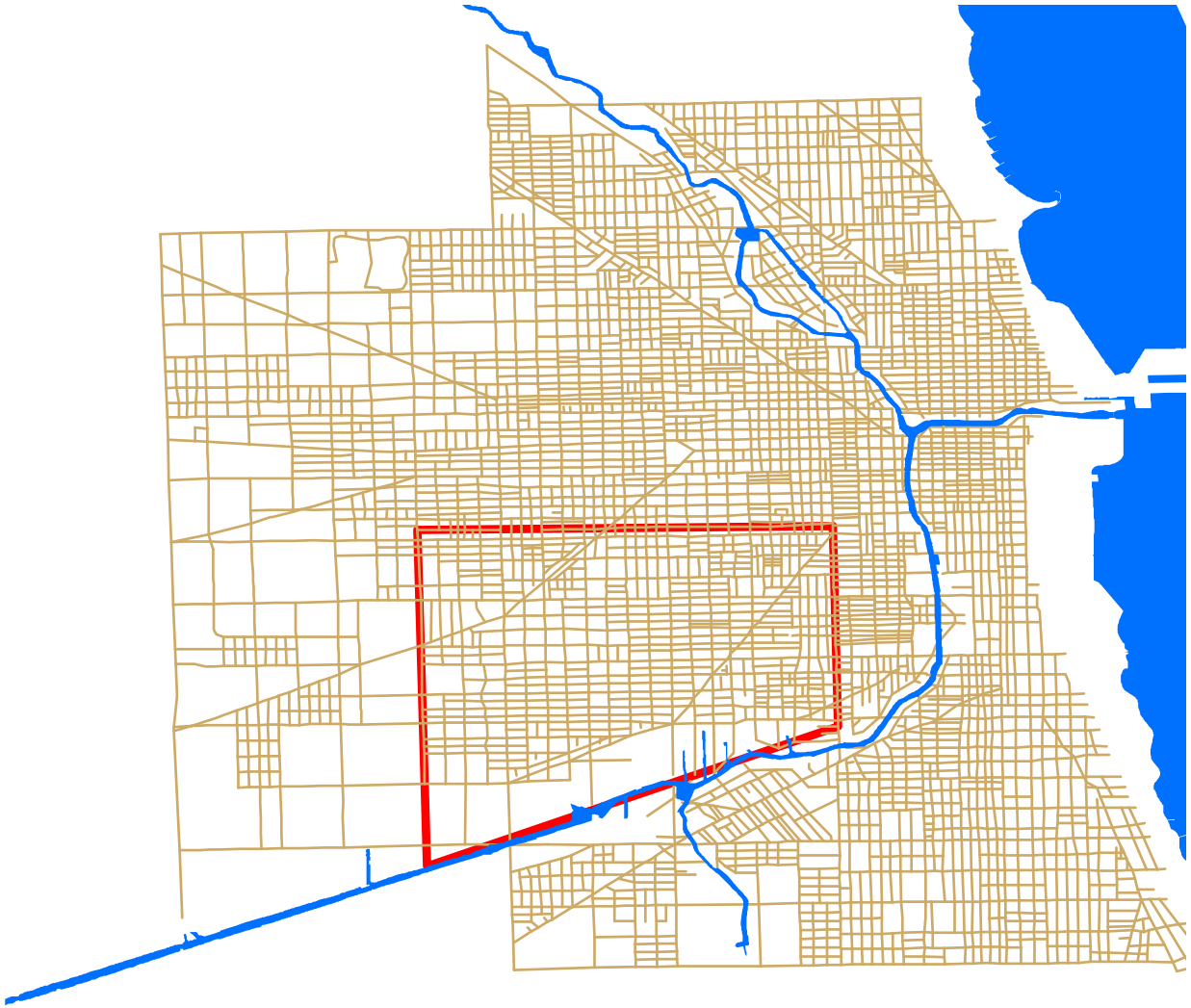


Notes: Based on annual data from *Mortality Statistics* and *Vital Statistics of the United States* for the period 1900-1940, published by the U.S. Census Bureau.

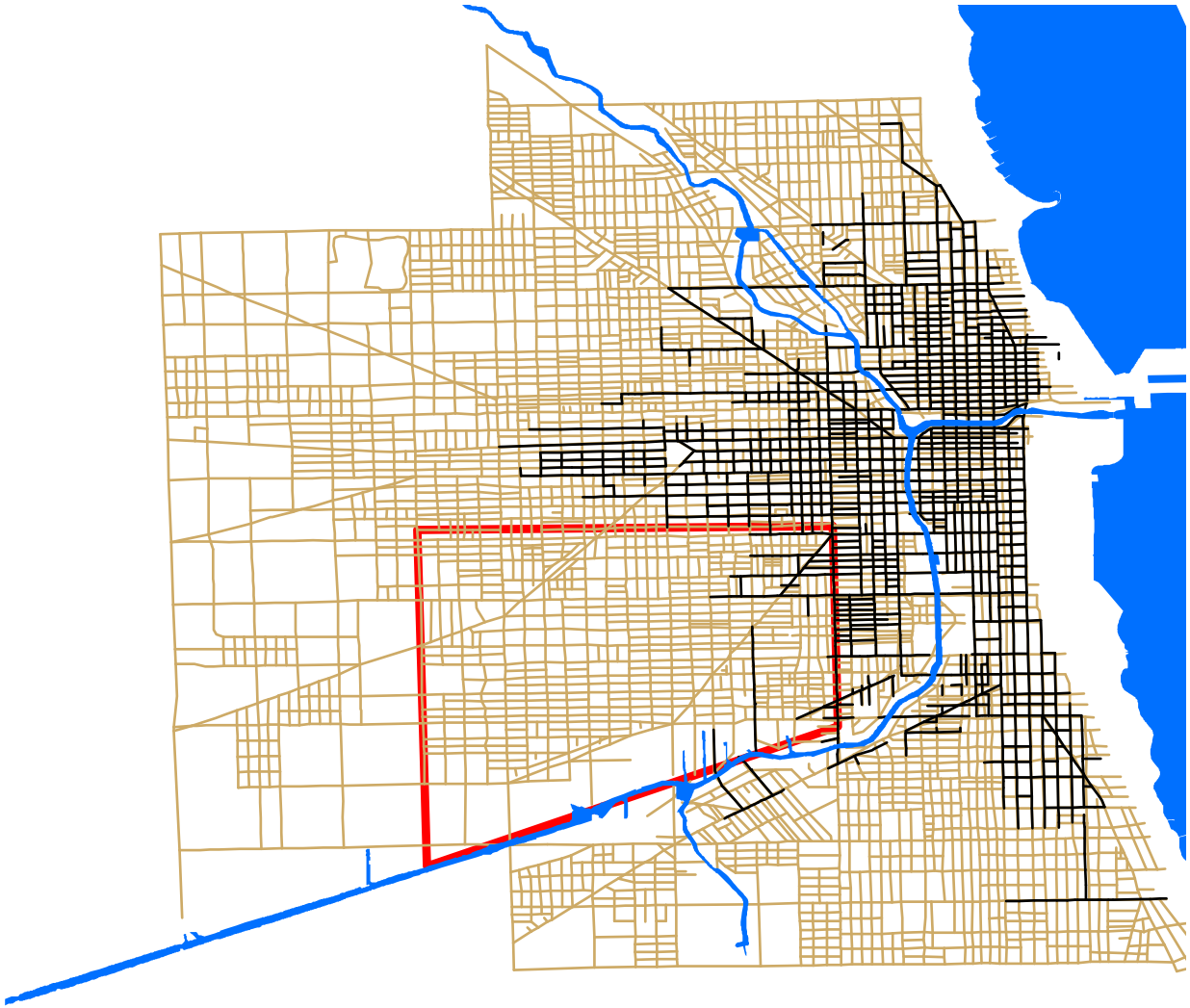
How to go in a different direction

- Coury et al. (forthcoming) return to sewers, but this time with land values as an outcome and with a cross-sectional research design.
- Lots of new data work, including parcel land transactions from Chicago Tribune and using the Fogel maps of Chicago's sanitation systems.
- Identification comes deep within an 1855 sewer plan, which delayed implementation of the sewer grid to the "Southwest Triangle" of the city because the ground needed to be raised 18 inches.

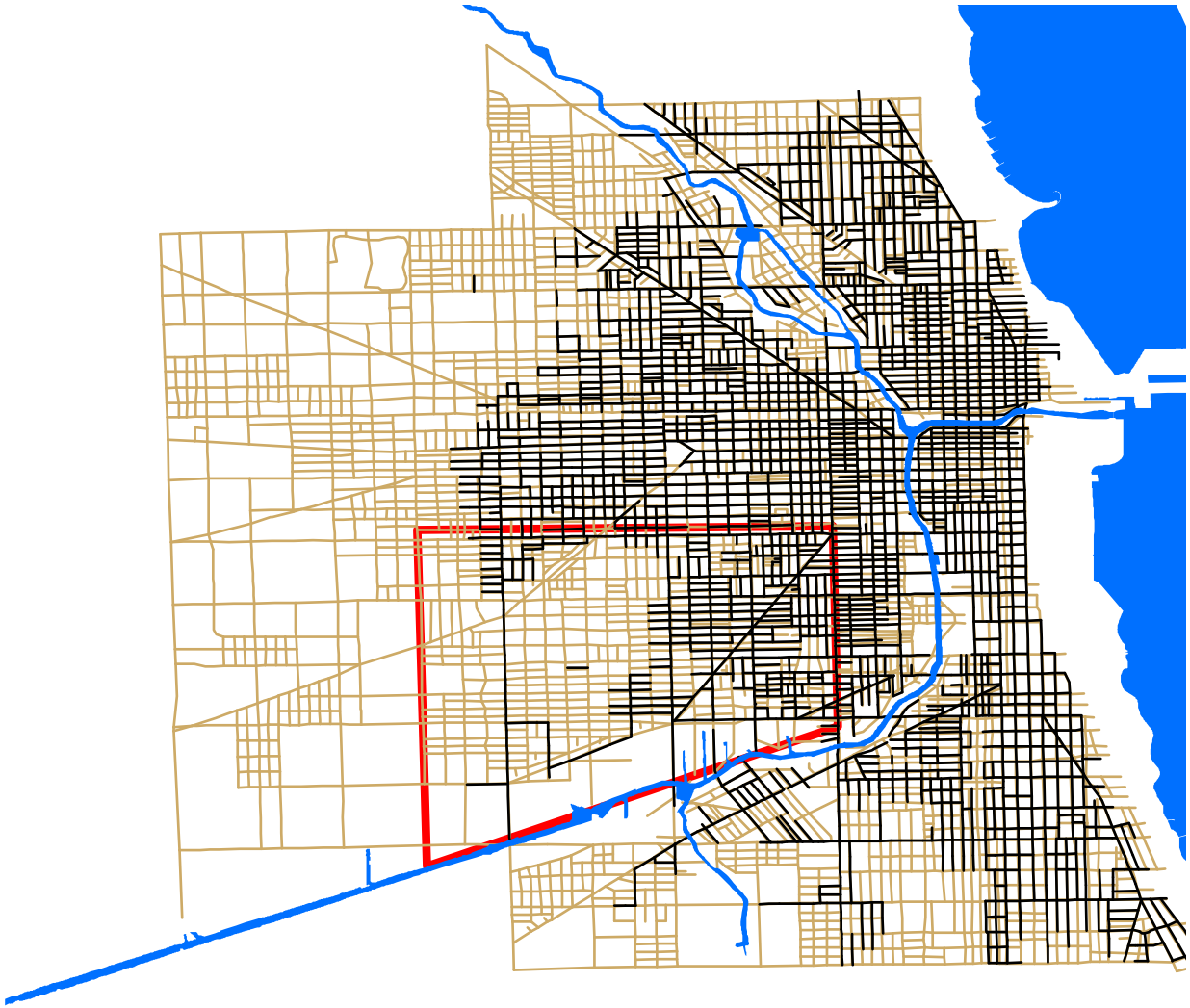
1880 Street Map and SW Triangle



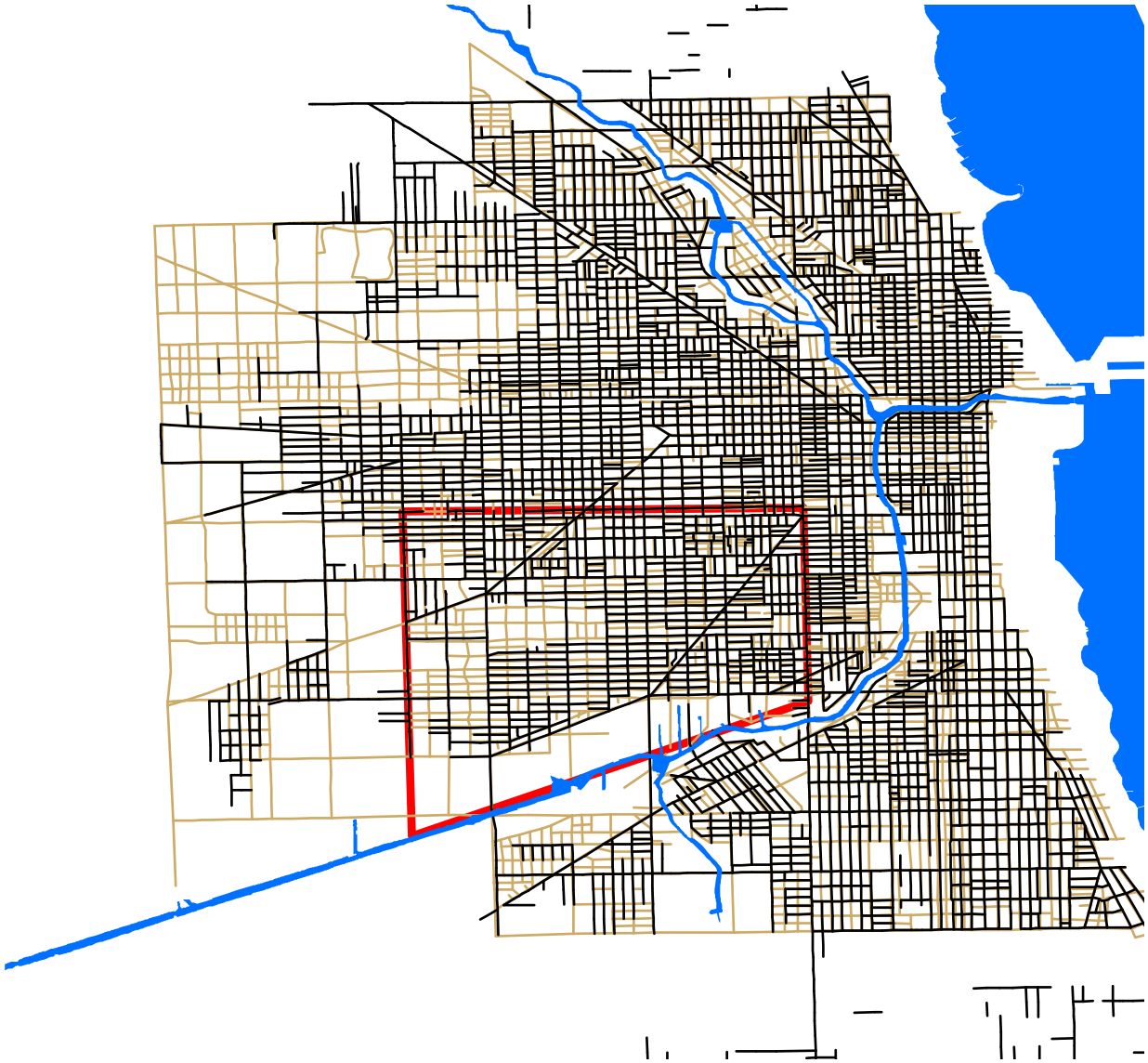
1870 Sewer Network



1880 Sewer Network



1890 Sewer Network



How to go in a different direction, con't

- Sewer access *doubled* the value of undeveloped land.
- Using a new estimator, we extrapolate these effects across the city in a principled way. Sewer impacts on land were 40-60x the cost in the 1870s.
- The "gutters [run] with filth at which the very swine turn up their noses. . ." - infrastructure matters for reasons beyond mortality rates.

Three themes from the Urban Transition of 1880-1940

- Sanitation and Infrastructure
- **Early Land Use Regulation**
- Segregation and Redlining

Another classic debate - does zoning matter?

- Comprehensive zoning was ruled legal in a surprise Supreme Court decision in 1926.
- Influential paper by Nancy Wallace (1988) - zoning "follows the market" unless land use under zoning differs from what it would have been without.
- Consensus view emerged that zoning doesn't really matter for uses and instead has just become a way to block construction.
- But zoning is one of the worst-measured policies there is - it is very costly to figure out the rules in any location by design.
- A very nice use case for ChatGPT is the work of Bartik, Gupta, and Milo (2025), which measures zoning stringency today.

But how to measure the impact of zoning?

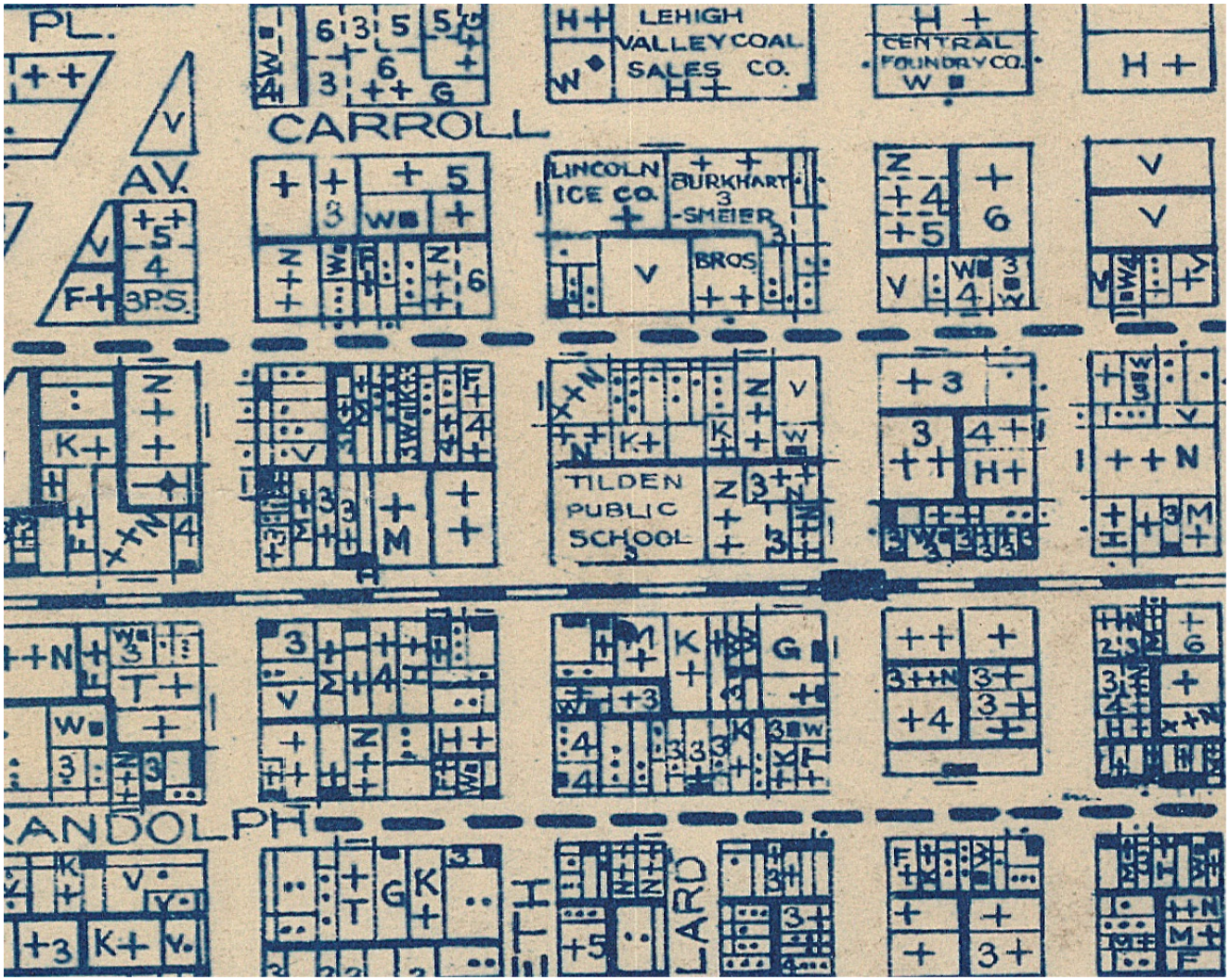
- Very little work in economics attempts to identify causal effects of zoning using regulation at the time of development because it is so hard to measure.

- And even if you measured zoning, how can you disentangle the long-run impact of zoning from the persistence of existing land use?

    1. Option 1 - find a case where the city conducted a land use survey so you can control for land use prior to the adoption of zoning (Shertzer et al., 2019).

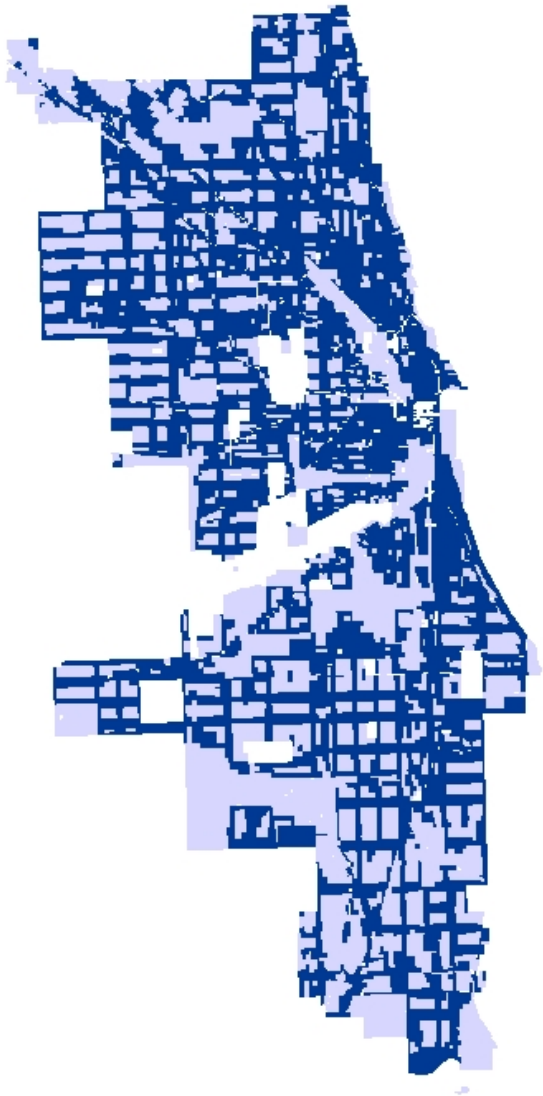
    2. Option 2 - look at greenfield development a long time ago (Gallagher et al., 2025).

Chicago's First Zoning Ordinance in 1923



Commercial Use Zoning is Important (Shertzer et al. 2019)

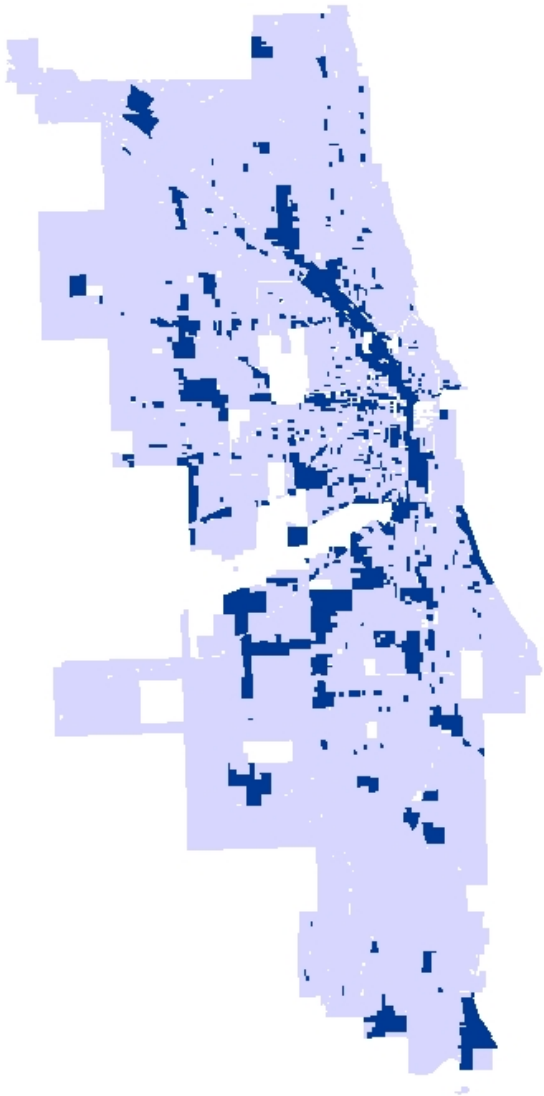
1922 Actual Comm. Uses



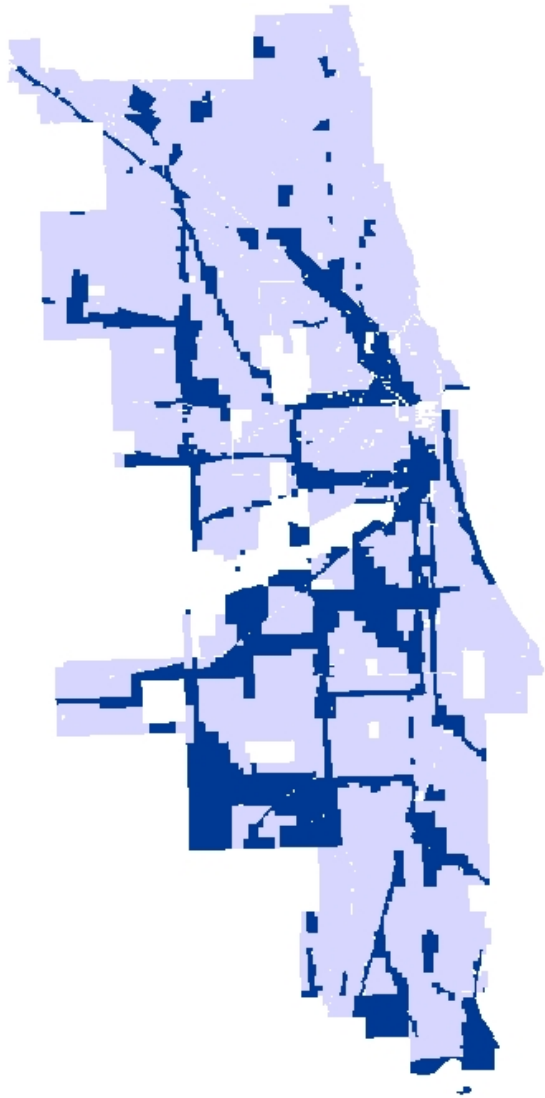
1923 Comm. Zoning

2005 Actual Comm. Uses

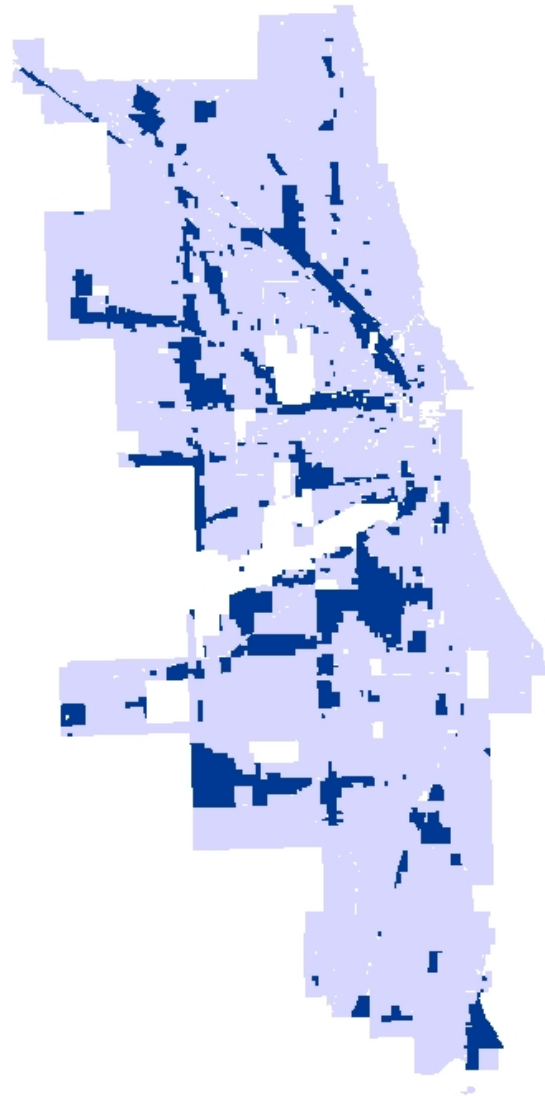
Industrial Use Zoning is Important (Shertzer et al. 2019)



1922 Actual Ind. Uses

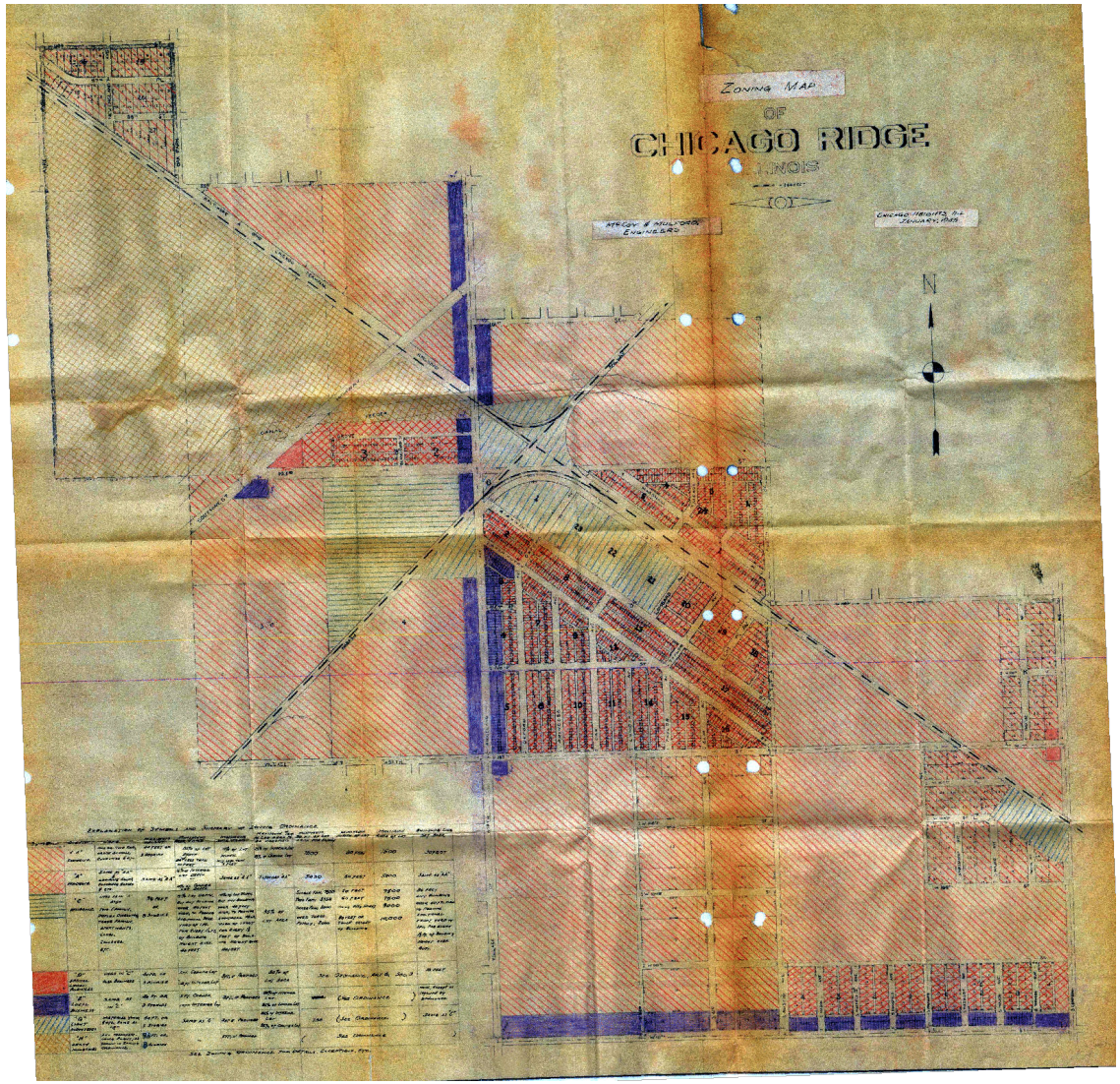


1923 Ind. Zoning

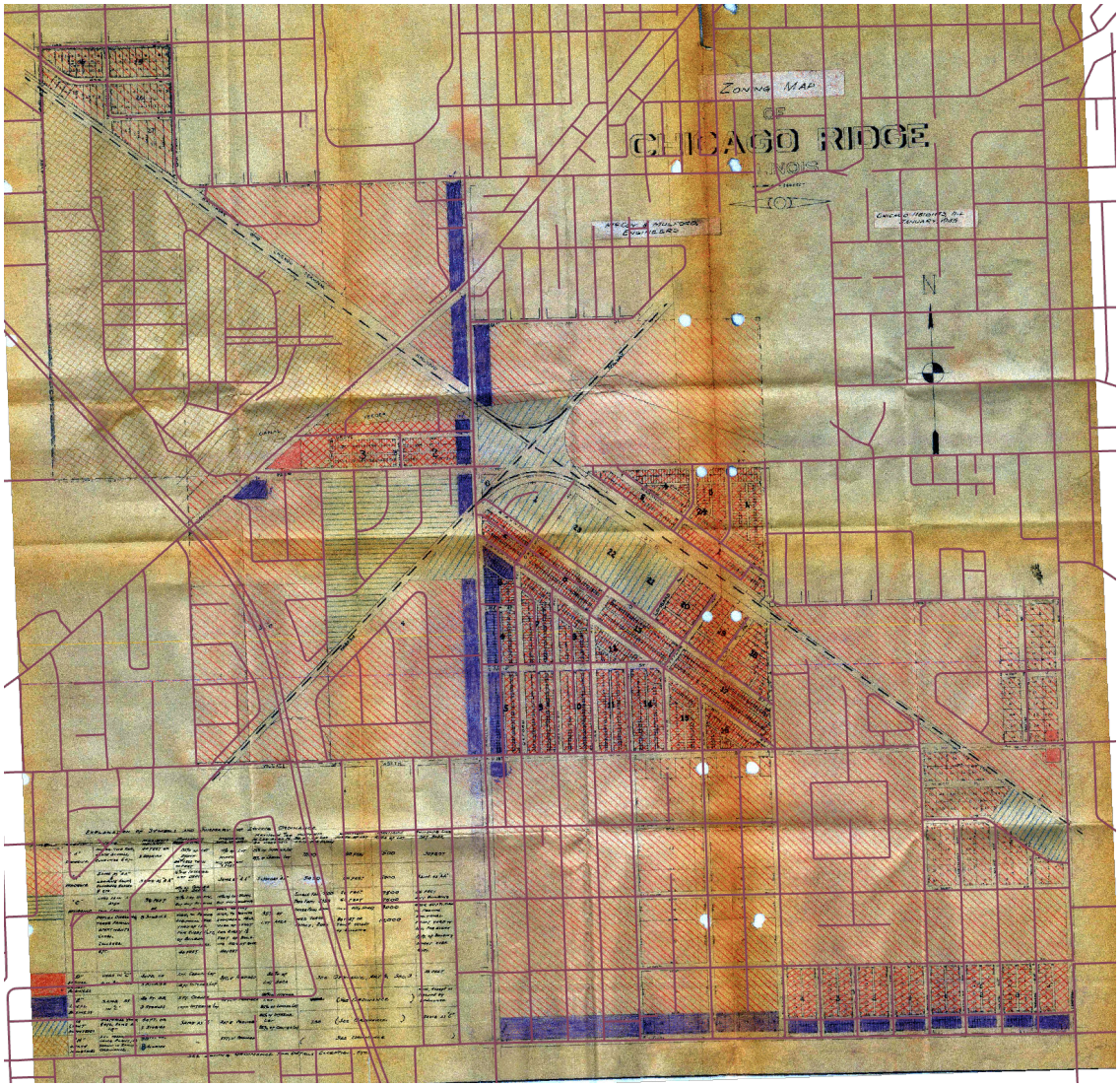


2005 Actual Ind. Uses

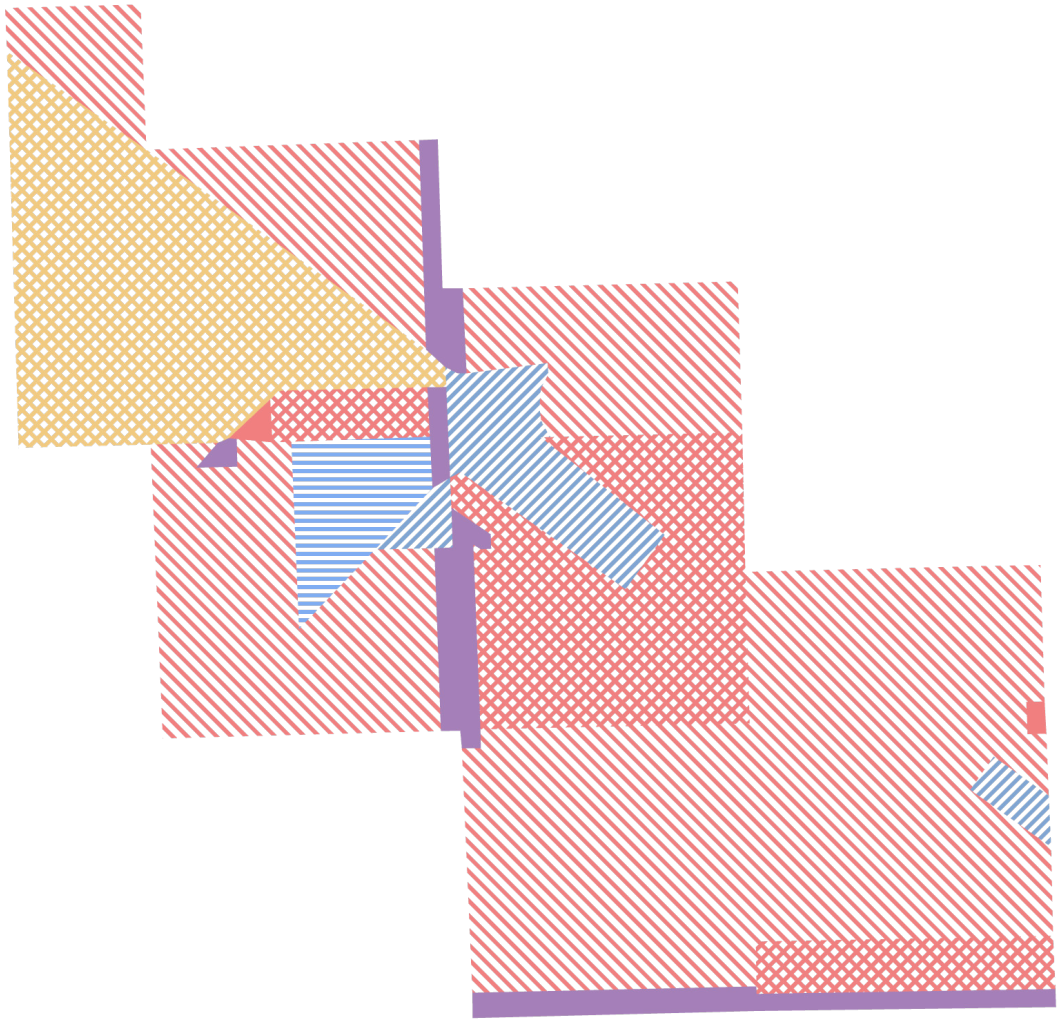
Identification from greenfields - Chicago Ridge in 1945



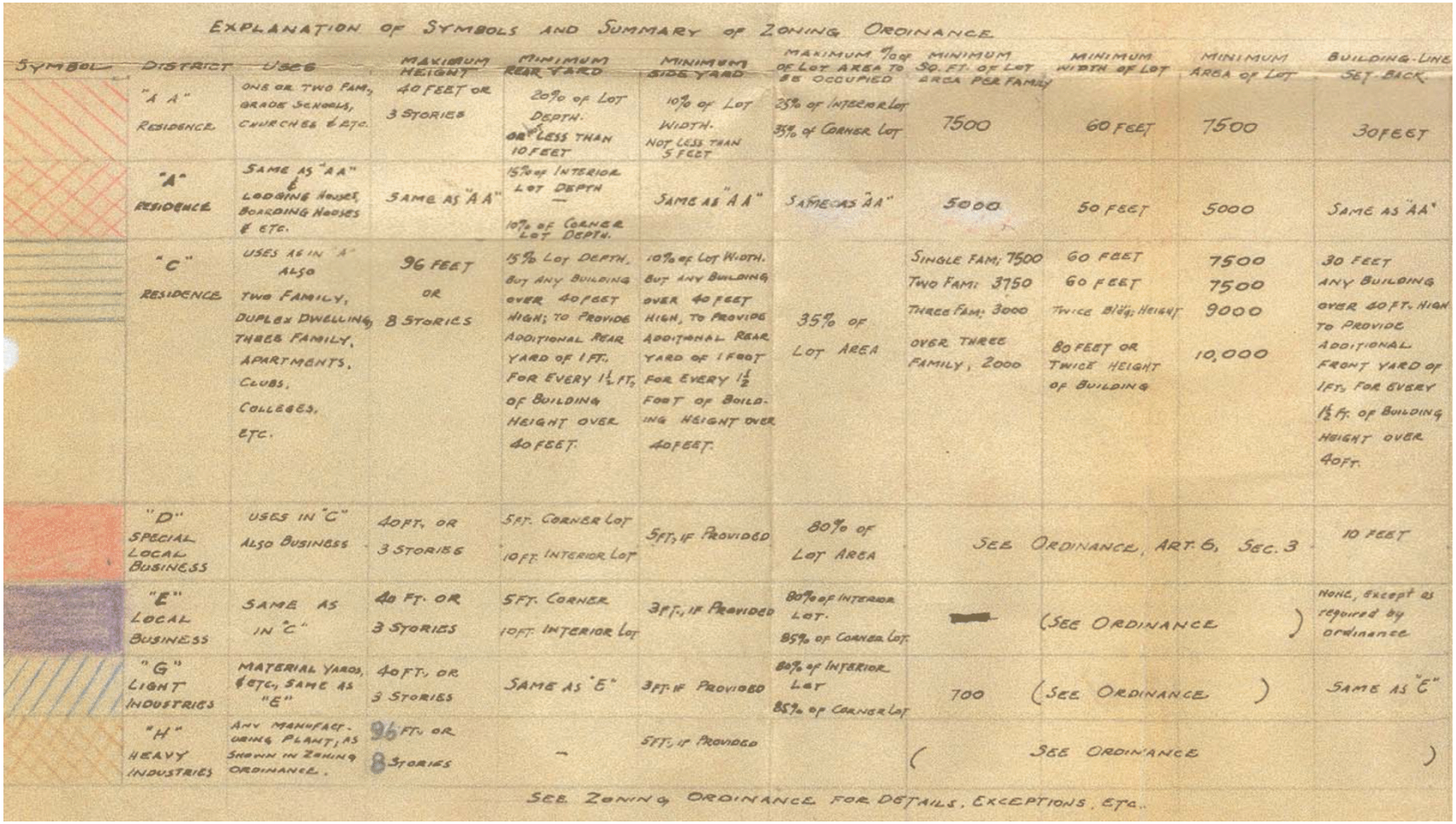
With street file



Zoning area shape file



Associated bylaws - no need for NLP!

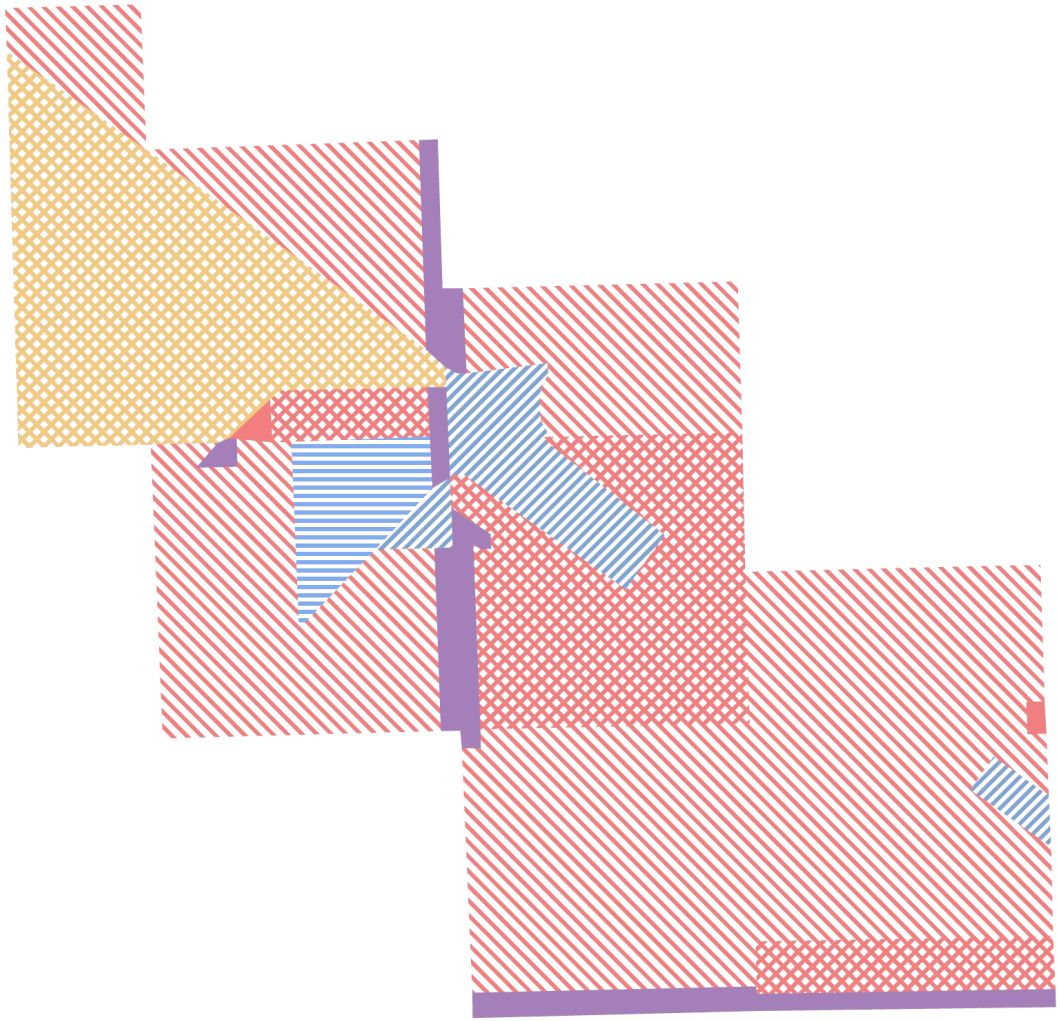


EXPLANATION OF SYMBOLS AND SUMMARY OF ZONING ORDINANCE

SYMBOL	DISTRICT	USES	MAXIMUM HEIGHT	MINIMUM REAR YARD	MINIMUM SIDE YARD	MAXIMUM % OF LOT AREA TO BE OCCUPIED	MINIMUM SQ. FT. OF LOT AREA PER FAMILY	MINIMUM WIDTH OF LOT	MINIMUM AREA OF LOT	BUILDING-LINE SET-BACK
"A A"	RESIDENCE	ONE OR TWO FAM., GRADE SCHOOLS, CHURCHES ETC.	40 FEET OR 3 STORIES	20% of LOT DEPTH. OR LESS THAN 10 FEET	10% of LOT WIDTH. NOT LESS THAN 5 FEET	25% of INTERIOR LOT 35% of CORNER LOT	7500	60 FEET	7500	30 FEET
"A"	RESIDENCE	SAME AS "AA" & LODGING HOUSES, BOARDING HOUSES & ETC.	SAME AS "AA"	15% of INTERIOR LOT DEPTH — 10% of CORNER LOT DEPTH.	SAME AS "AA"	SAME AS "AA"	5000	50 FEET	5000	SAME AS "AA"
"C"	RESIDENCE	USES AS IN "A" ALSO TWO FAMILY, DUPLEX DWELLING, THREE FAMILY, APARTMENTS, CLUBS, COLLEGES, ETC.	96 FEET OR 8 STORIES	15% LOT DEPTH. BUT ANY BUILDING OVER 40 FEET HIGH; TO PROVIDE ADDITIONAL REAR YARD OF 1 FT. FOR EVERY 1½ FT. OF BUILDING HEIGHT OVER 40 FEET.	10% of LOT WIDTH. BUT ANY BUILDING OVER 40 FEET HIGH, TO PROVIDE ADDITIONAL REAR YARD OF 1 FOOT FOR EVERY 1½ FOOT OF BUILDING HEIGHT OVER 40 FEET.	35% OF LOT AREA	SINGLE FAM; 7500 TWO FAM: 3750 THREE FAM: 3000 OVER THREE FAMILY, 2000	60 FEET 60 FEET TWICE BLDG. HEIGHT 80 FEET OR TWICE HEIGHT OF BUILDING	7500 7500 9000 10,000	30 FEET ANY BUILDING OVER 40 FT. HIGH TO PROVIDE ADDITIONAL FRONT YARD OF 1 FT. FOR EVERY 1½ FT. OF BUILDING HEIGHT OVER 40 FT.
"D"	SPECIAL LOCAL BUSINESS	USES IN "C" ALSO BUSINESS	40 FT. OR 3 STORIES	5 FT. CORNER LOT 10 FT. INTERIOR LOT	5 FT. IF PROVIDED	80% OF LOT AREA	SEE ORDINANCE, ART. 6, SEC. 3			10 FEET
"E"	LOCAL BUSINESS	SAME AS IN "C"	40 FT. OR 3 STORIES	5 FT. CORNER 10 FT. INTERIOR LOT	3 FT. IF PROVIDED	80% OF INTERIOR LOT. 85% OF CORNER LOT.	—	(SEE ORDINANCE)		NONE, EXCEPT AS REQUIRED BY ORDINANCE
"G"	LIGHT INDUSTRIES	MATERIAL YARDS, ETC., SAME AS "E"	40 FT. OR 3 STORIES	SAME AS "E"	3 FT. IF PROVIDED	80% OF INTERIOR LOT 85% OF CORNER LOT	700	(SEE ORDINANCE)		SAME AS "E"
"H"	HEAVY INDUSTRIES	ANY MANUFACT. USING PLANT, AS SHOWN IN ZONING ORDINANCE.	96 FT. OR 8 STORIES	—	5 FT. IF PROVIDED		(SEE ORDINANCE)			

SEE ZONING ORDINANCE FOR DETAILS, EXCEPTIONS, ETC.

Zoning area shape file - look at lower corner



Undeveloped areas of Chicago Ridge

Undeveloped areas got different zoning

There are different ways to advance the literature

- You can get insight from history
- Or a developing country (Anagol et al., 2021)
- Or undeveloped areas of a developed country (Turner et al. 2014)
- You can develop new methods using existing datasets (Sood, 2025 or Blanco and Sportiche, 2025)
- Or improvement measurement (Bartik et al., 2025)

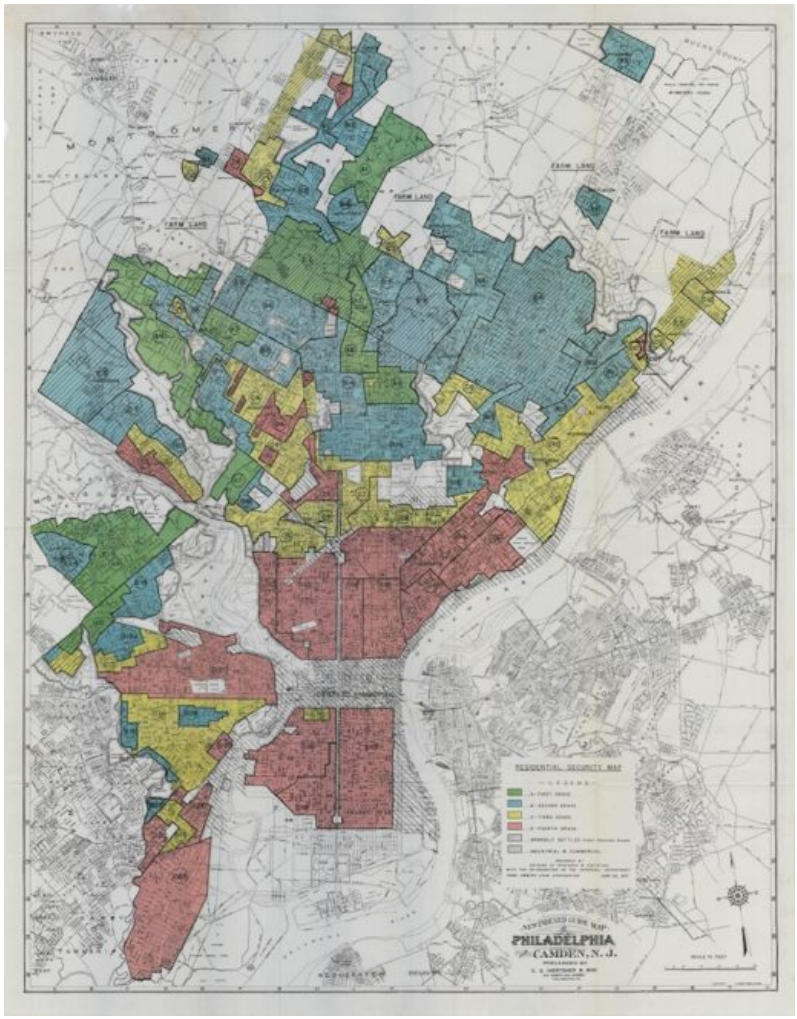
Three themes from the Urban Transition of 1880-1940

- Sanitation and Infrastructure
- Early Land Use Regulation
- **Segregation and Redlining**

Our final debate - segregation and redlining

- Usually economic historians complain that no one reads the history and many papers in economics make no sense (e.g. highway commuting in 1915).
- Other times, one sentence can be taken out of a book and become an enduring source of confusion.
- An instructive example is the recent "redlining" literature in economics and related social sciences.
- The Homeowners' Loan Corporation created maps showing the lending risk associated with different neighborhoods for dozens of cities between 1936 and 1939.

HOLC Security Zone Map for Philadelphia



- Ratings go from red ("worst") to yellow to blue to green ("best") neighborhoods.
- All central city neighborhoods were redlined, both black and white.

One website and an avalanche of papers

- A project at the University of Richmond digitized all of the HOLC maps and put them online, calling them "redlining" maps.
- A huge number of papers followed, evaluating the "impact" of the HOLC maps on home values but also outcomes like colorectal cancer, heat islands, bird diversity, and frequency of urological injuries (!).
- Many of these papers received coverage in the New York Times. Even John Oliver had a segment. The federal government redlined neighborhoods and look at all the impacts of reduced credit access!

The Problem

- The HOLC maps aren't actually redlining maps, in that they were never used to guide lending. The maps were made **after** the HOLC made all their loans.
- The HOLC actually made proportionally a lot of loans to African American households. The maps simply represent the risk associated with loans that had already been made.
- Single quote by Jackson in *Crabgrass Frontier* (1985) to the rescue: "The maps were probably used by the Federal Housing Administration." Cited by everyone.
- But later scholarship has turned up little evidence that these maps were used by the FHA or any other lender/insurer. Why do all of these papers find effects then?

Differences Across C-D Boundary in 1930 (before maps)

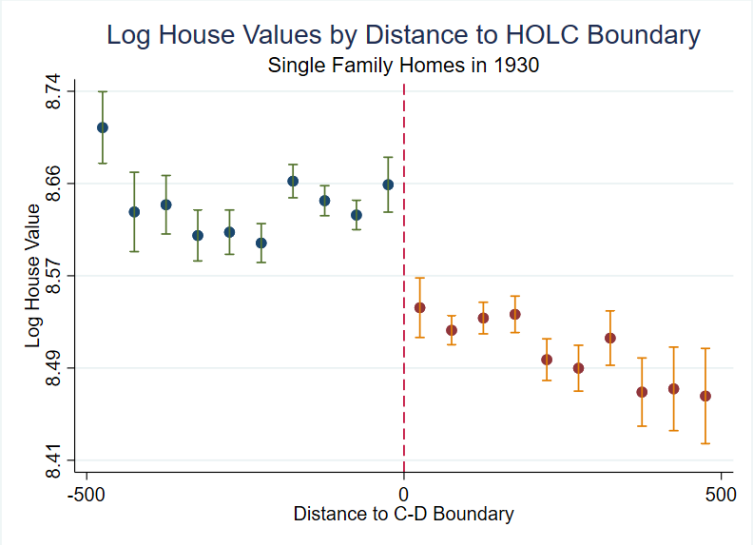


Figure: Source: Fishback et al., 2023

Already substantial differences in levels and trends across boundaries. How to interpret these papers? *Persistence* of this disadvantage.

The government didn't invent racism in housing markets

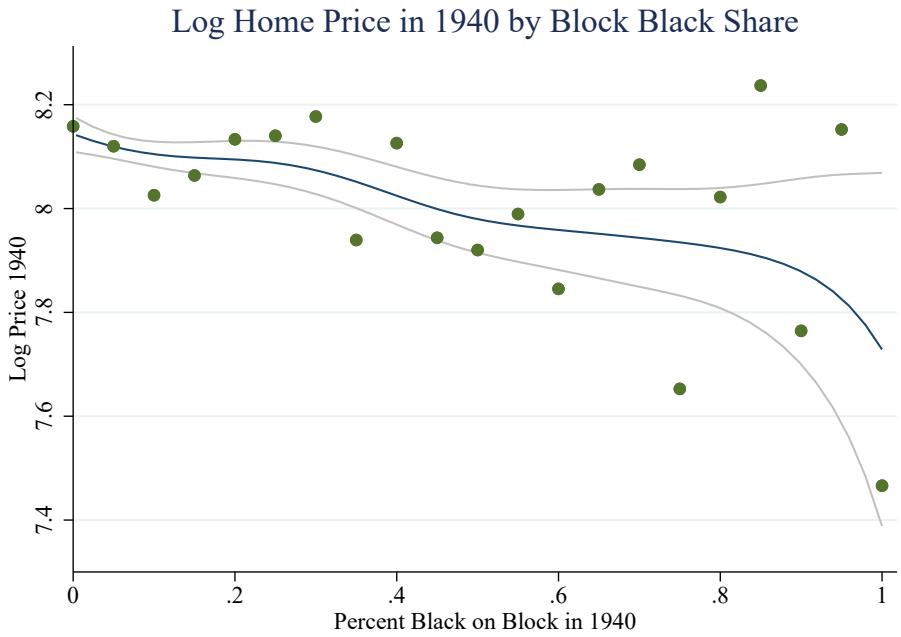


Figure: Source: Akbar et al., 2022

Homes on formerly all-white blocks lost 10% of their value by the time the block was majority black. The first black families paid a 28% premium to buy and lost even more. As proposed by Homer Hoyt in 1939.

Does the Literature Correct?

- Many scholars are now invested in a historical narrative that doesn't have a lot of supporting evidence. Explanations continue evolving.
- Blame can be spread around, to the popular press to a profession that rewards fancy estimation over a careful understanding of institutions.
- The HOLC maps did not cause these many disparate outcomes (but remember, no impact on lichens). But it's not as exciting to talk about neighborhood persistence.
- Bottom line is you need to understand your setting. Don't skip the books, but don't hang your whole paper on one sentence you found in a book either.