

# Data and the State

PUBPOL 2130 / INFO 3130



## Transit and Infrastructure

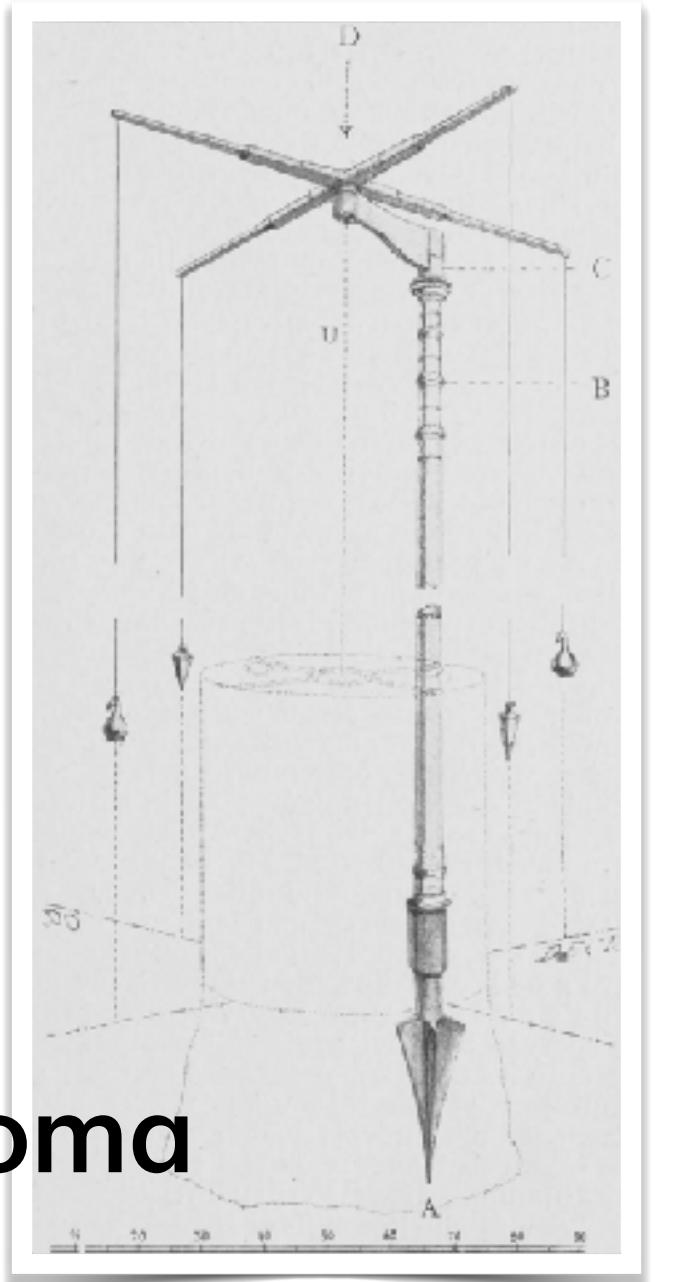
Lecture 15, Tuesday Mar 18

# Announcements

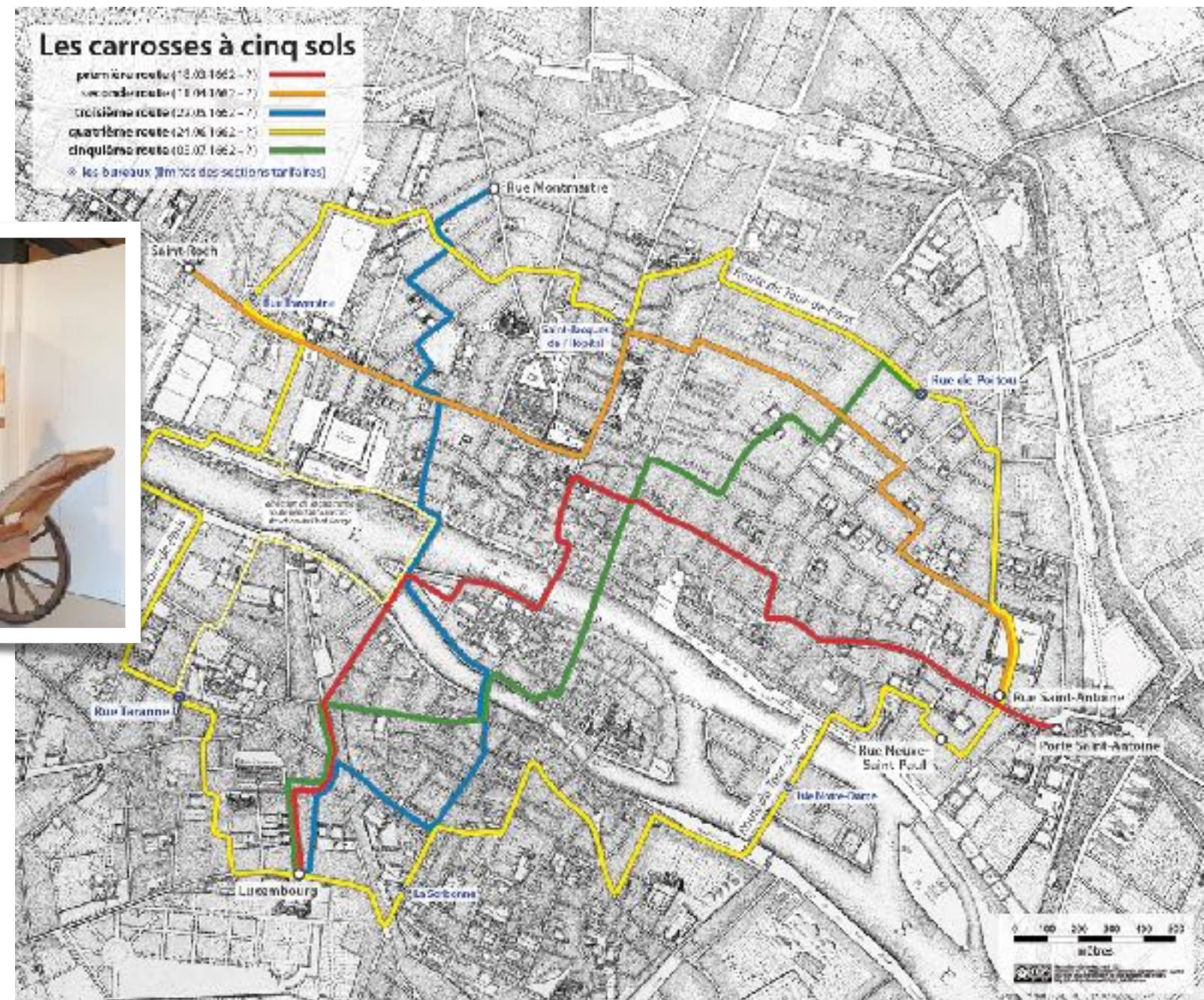
- Guest speaker **Nick Klein** (City and regional planning) this Thursday
- In-class exam Tuesday, same format. I'll distribute practice problems today.
  - Weapons (SIPRI papers, graphs, flows, commensurating units)
  - Elections (Rodden, precincts, spatial data transfer/MAUP)
  - Migration (Moretti, ACS and PUMS, drivers of migration, microdata)
  - Organs (Healy, STAR/OPTN, out-of-sequence allocation, integer programs)
  - Transit (Shoup, isochrones, tragedy of the commons, infrastructure, OSMnx, networks)
- How to study? Review notes and slides, review readings (on paper?), review notebooks and make sure you see how some of the key code blocks work
- **Review session?**

# Mass transit

- **Roman road network** required substantial engineering and planning (materials, drainage, milestones, specialized surveying tools, labor force)
- 1662 Paris **carrosses à cinq sols** ("five-cent coaches") — public access to horse-drawn carriages riding on planned routes
- proposed by mathematician/philosopher Blaise Pascal in 1661 — Paris was 2nd largest metro in the world, still with medieval city planning
- innovative idea: transit as a policy problem



1	1	1	1				
1	2	1					
1	3	3	1				
1	4	6	4	1			
1	5	10	10	5	1		
1	6	15	20	15	6	1	
1	7	21	35	35	21	7	1



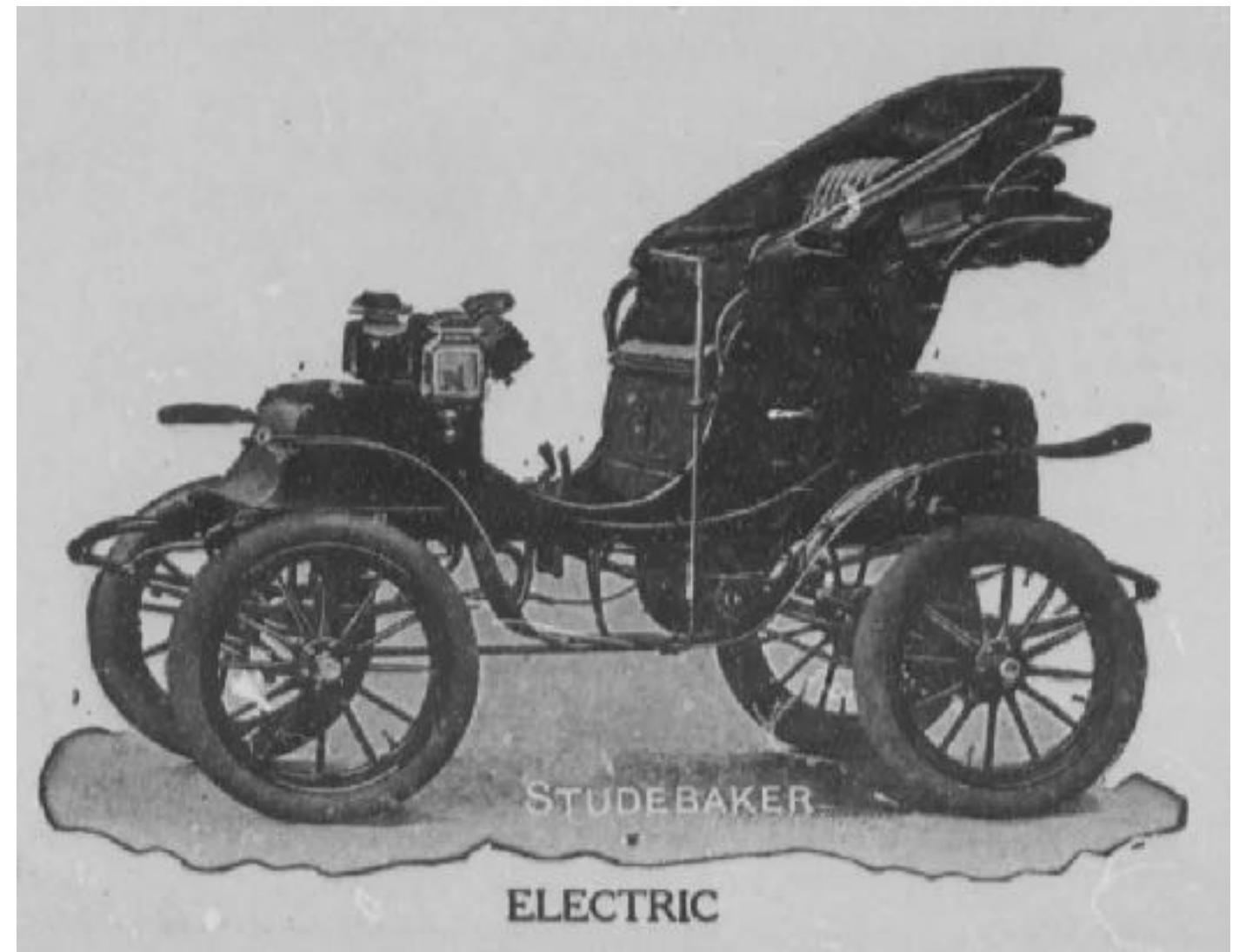
# 19th century explosion

- **omnibuses** (larger coaches on fixed routes)
- **streetcars** (still horse-drawn, now on tracks)
- **railways** (steam trains for long-distance travel, U.S. and Europe)
- **subways** (underground, starting London 1863 - still steam!)



# Engines and personal transit

- internal combustion engine around 1900
  - automotive **buses** 1910s
  - rise of the **cars** 1950s—present. Leads to massive highway expansion, dividing cities and killing neighborhoods.
- **high-speed rail** — Japan introduces Shinkansen 1964
- subway expansions 1970s
- “smart transit” — contactless payment, electric fleets







# Shoup

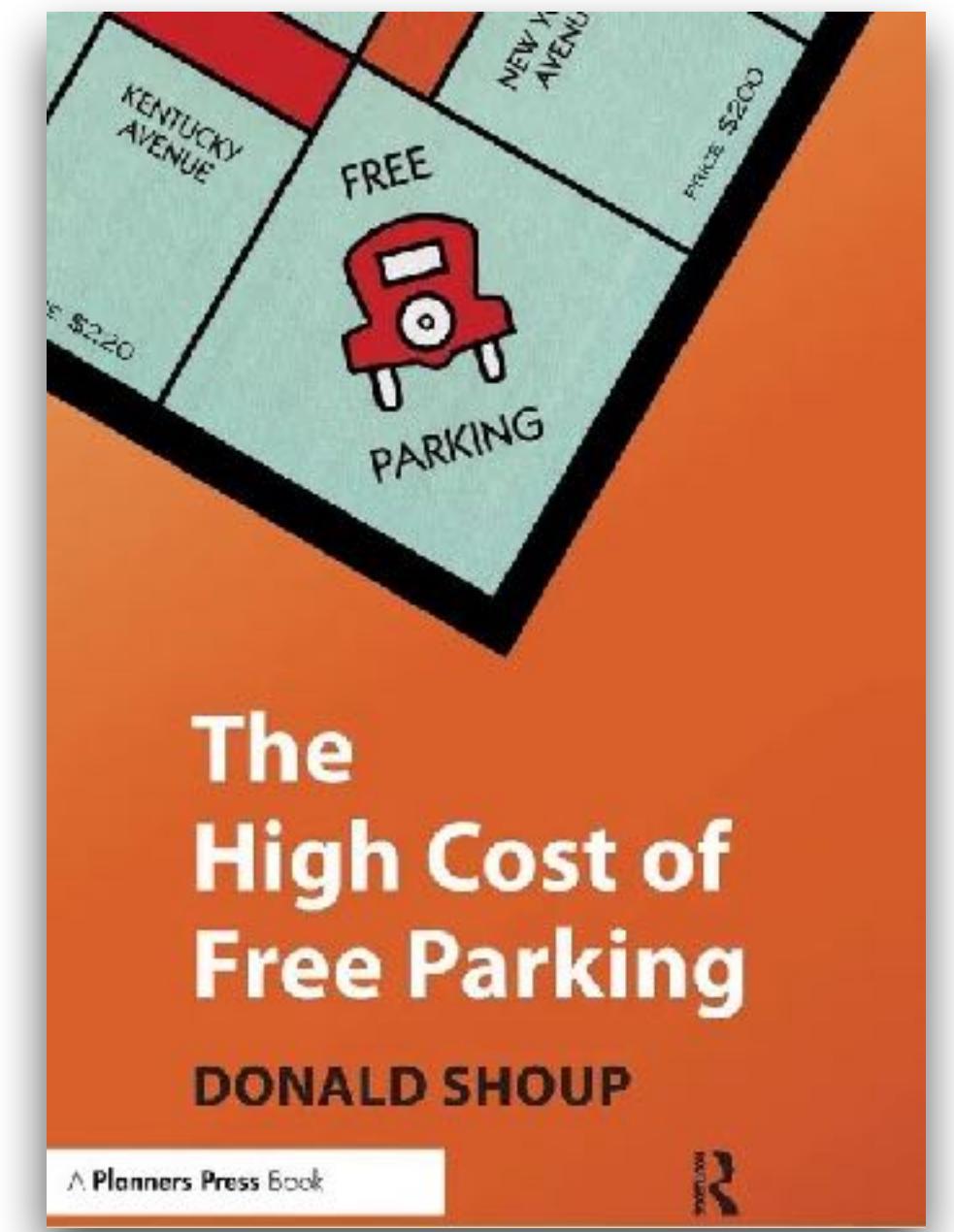
- Donald Shoup, engineer and urban planner at UCLA, died just last month (Feb 2025; see [NYT obit](#))
- “The Twenty-First Century Parking Problem”: free parking and the tragedy of the commons
- Aristotle: “What is common to the greatest number has the least care bestowed upon it. Every one thinks chiefly of his own, hardly at all of the common interest.”
- **Tragedy of the commons** coined by ecologist Garret Hardin 1968, arguing that “mutual coercion, mutually agreed upon” would be necessary to lower the birthrate
- Analogy to medicine and lead treatments (the do-something problem)



2005

# Shoup

- Vehicle ownership rates near **800** cars per 1000 people in United States in 2000 (update: 860 by 2020)
  - China's car ownership exploding — per 1000 people, has grown from approx. 2 (1980) to 6 (1990) to 16 (2000) to 58 (2010) to **210** (2020)
  - this is roughly exponential growth, tripling every 10 years
- Transport systems have vehicles, rights-of-way, terminal capacity
- All transit generates public burden
- NYC 1900 had 2.5 million pounds of **horse manure** on the streets every day!



2005

# Planning for parking

- **Parking meters** attempt a market solution
- American cars are parked 95% of the time, and there's a strong expectation for free parking
- This creates requirements for developers and loses a lot of land area to lots
- Cruising for parking generates immense policy costs, all passed on to consumers in prices
- “Free parking is an invitation to drive wherever we go.”
- “**Poleodomogenic**” problems – caused by city planners



Stuart Cohen, Transportation and Land Use Coalition

## Shoup's argument:

We need evidence- and data-based planning, just as we need evidence-based medicine

# Commuting data

- How do Americans commute to work according to ACS?

	Drive alone	Carpool	Public transit	Walk	Bike	Taxi, Motorcycle, Other	Work from home
2013	76.4%	9.4%	5.2%	2.8%	0.6%	1.6%	4.0%
2023	69.2%	8.6%	3.5%	2.5%	0.5%	1.2%	13.8%

Icons representing different commuting methods:

- Drive alone: Red car and brown SUV
- Carpool: Blue van
- Public transit: Grey train
- Walk: Black silhouette of a person walking
- Bike: Green bicycle
- Taxi, Motorcycle, Other: Blue motorcycle and yellow taxi
- Work from home: Teal computer monitor



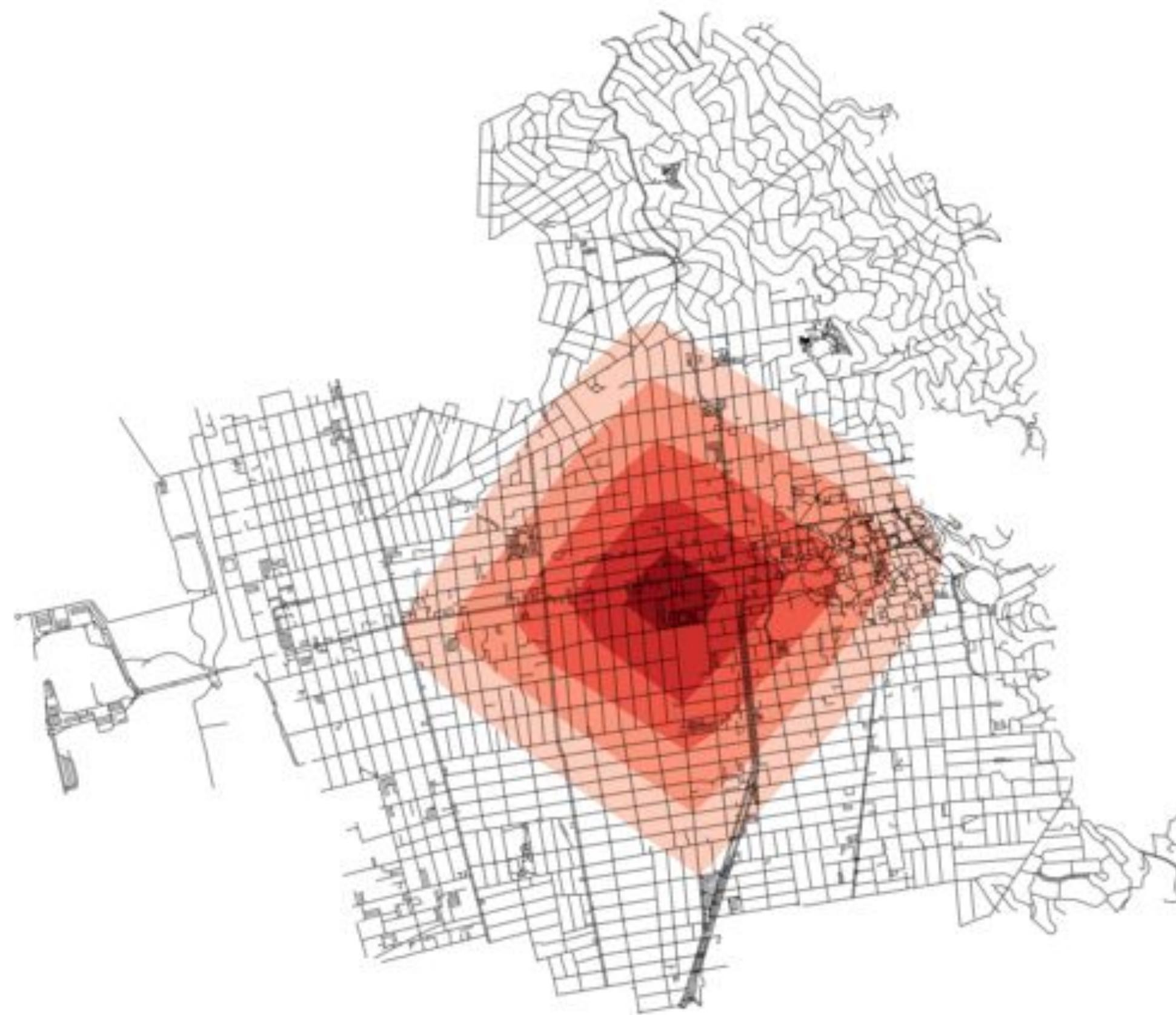
# Isochrones

PUBPOL 2130 / INFO 3130

March 17th, 2025

Jennah Gosciak

# What are isochrones?



**iso + chrone**



**equal**

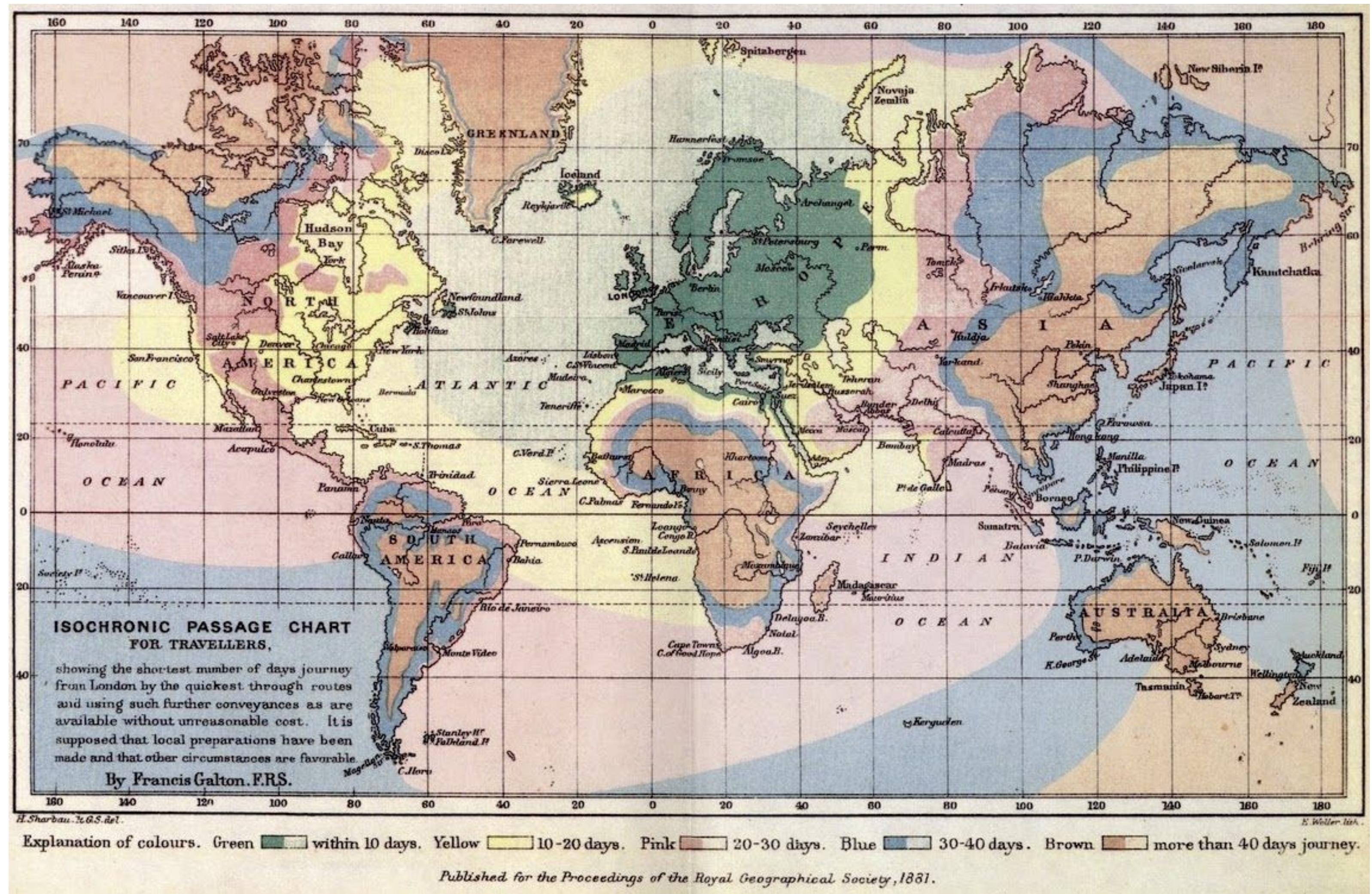
**time**

# History

Created by Francis Galton to study travel from London

Used:

- Time tables
- Average postal time
- Private information
- Past voyages



# Use cases today

- Site selection
- Service coverage
- Assessing and improving transit
- Business decisions (e.g., estimating reach)

# Use cases today

- Site selection
  - *Where should I locate a new store?*
- Service coverage
  - *How much of the area will a new hospital serve?*
- Assessing and improving transit
  - Identifying areas that need greater transit connectivity
- Business decisions (e.g., estimating reach)
  - Advertising, supply chain planning, predicting customer interactions, etc.

# Chronotrains

## Chronotrains

All trains      Night trains      New

Where from?

1 h    2 h    3 h    4 h    5 h    6 h    7 h    8 h      Max. time

### Where can you travel by train in Europe?

This interactive map shows you how far you can travel from each station in Europe.

Hover your mouse on the map, search for a station, or click on one of the examples below.

**London**  
United Kingdom

**Amsterdam**  
Netherlands

**Berlin**  
Germany

**Milan**  
Italy

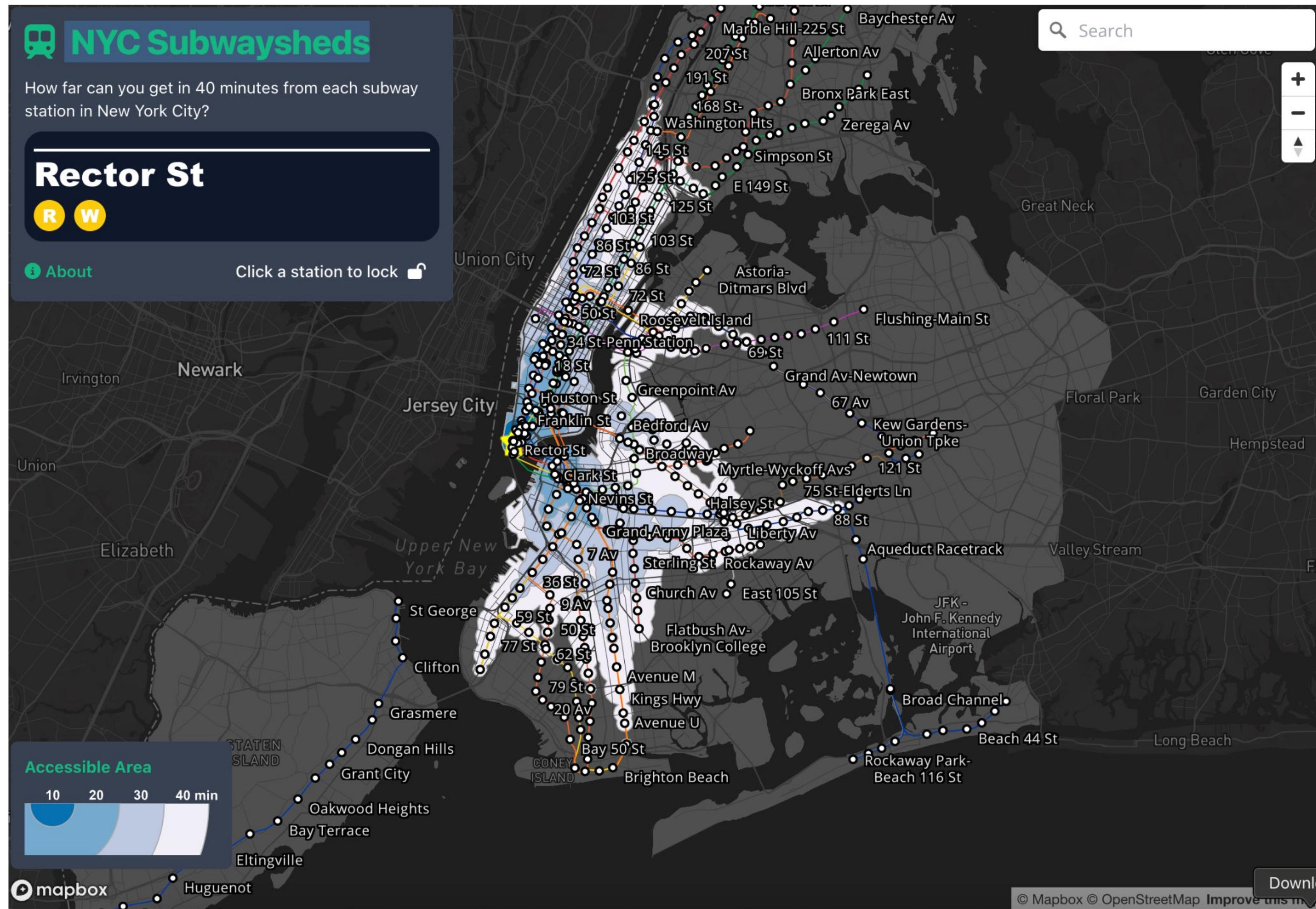
Traveling across Europe this summer? Don't forget your Rail Pass.

Let's go! →

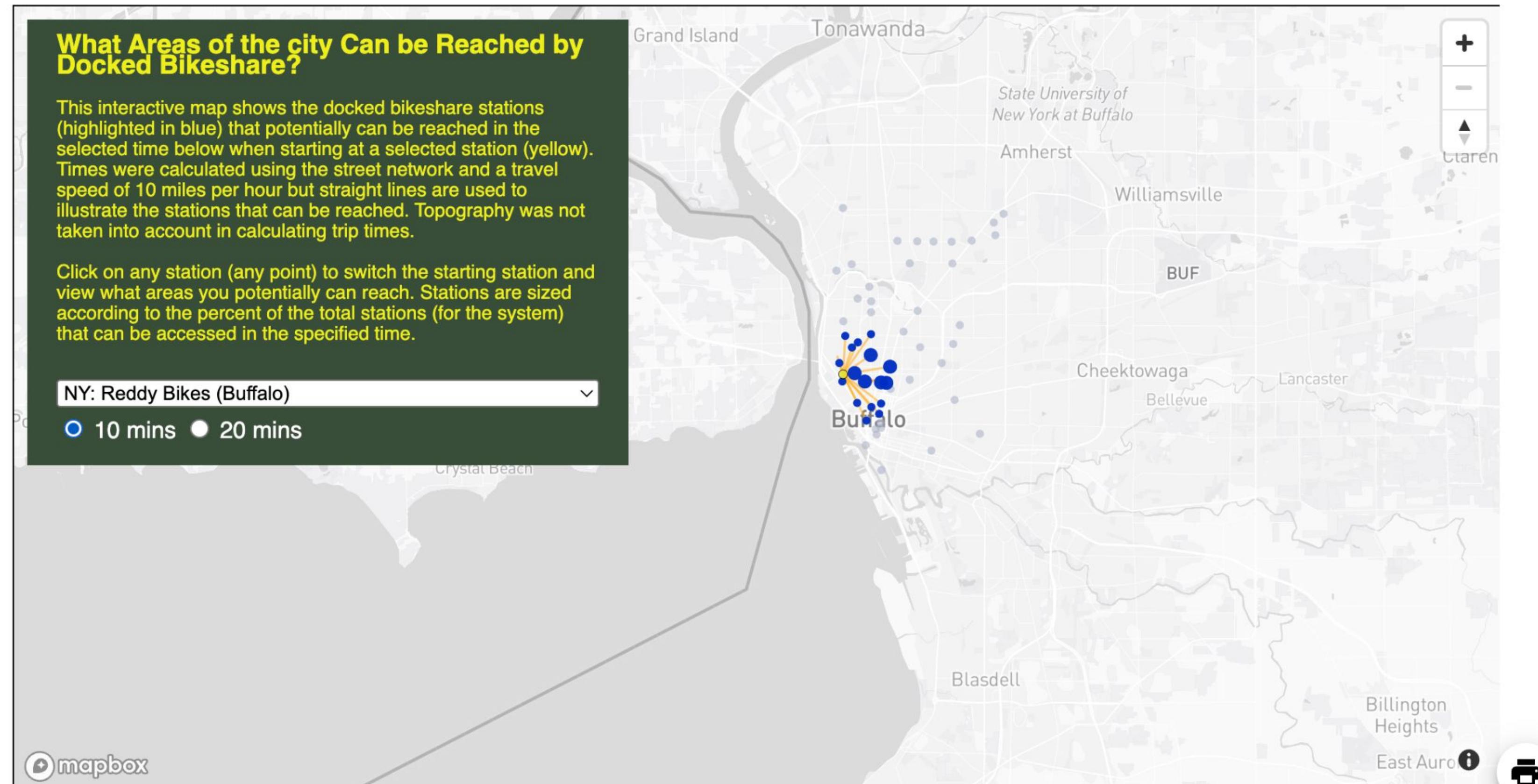
Explore   About

MapLibre | Protomaps © OpenStreetMap

# NYC Subwaysheds



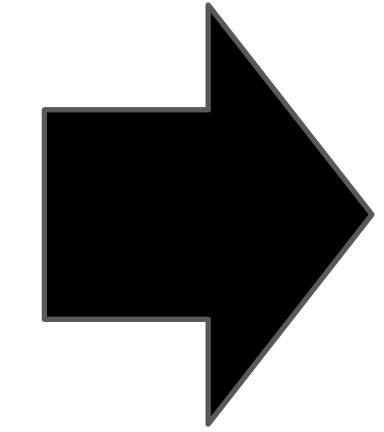
# Bike Share (Bureau of Transportation Statistics)



*Note: The map may take some time to load. If the map does not load after an extended period of time, try refreshing the page.*

# Walk to a Park Initiative

1 in 3 U.S. Residents  
do not live within a  
10-minute walk of a park or  
green space



Goal: 85% of New  
Yorkers to live  
within walking  
distance of a park

# Walk to a Park Initiative

Travel Time to Major  
Greenspaces

