

NYU WAGNER/NYU COLLEGE OF ARTS AND SCIENCE

TECHNOLOGY AND THE AMERICAN CITY

Instructor: Nate Loewentheil

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**Course Description**

Over the past two hundred years, urban planners, policymakers, industry leaders, real estate developers, and households together shaped and reshaped American cities in response to changing modes of economic production, race relations, social norms and recreational opportunities. But it was innovation in technology – especially in transportation, energy, material science, architecture, and communications – that enabled the rapid shifts in the forms of urban and suburban development, from the walking towns of the early 19<sup>th</sup> century to the dense industrial cities of the early 20<sup>th</sup> century to the modern suburban sprawl of the 21<sup>st</sup> century.

Today, the urban landscape is again evolving rapidly. Ride-sharing and micro-mobility options like scooters are providing the first meaningful alternatives to car-ownership for many Americans since the electric trolleys all but disappeared from the U.S. in the 1940s. Self-driving cars are showing great promise in real-world tests. The COVID pandemic dramatically accelerated longer-term trends towards remote work and distributed workforces for white-collar industries.

This course will explore how technological innovation has influenced the American city in order to shed light on how this newest wave of technology is likely to influence our future. We will explore technologies that were profoundly revolutionary at their time, such as the electric light and the automobile, and examine the demands they created for new kinds of infrastructure, like our electric grid and national highway system, and how that infrastructure in turn enabled new forms of urban and suburban development. Along the way, the course will be attentive to how developments in technology and infrastructure interacted with economic opportunity and race. At times, new modes of transportation and energy production and distribution aggravated inequality, contributed to racial segregation and enabled the unjust concentration of environmental harms in minority communities. At other times and in other places, new technology spurred widespread economic growth and prosperity.

The course will focus on archetypal U.S. cities whose most significant periods of growth correspond to different inflection points in the development of urban technology: Chicago, Boston, Los Angeles, and Phoenix. New York City, in which so many of the critical urban technologies were first developed and deployed, will be a central touchpoint throughout the course.

We will conclude by considering the social, economic and racial ramifications of emerging technologies, such as autonomous vehicles; the threats posed to privacy by data collection; and how the rapidly evolving business practices around remote work may shape future residential patterns of development.

## **I. Required Texts**

Below are the books I recommend you purchase for the course. For each book, I have indicated the year and edition; purchasing the same edition will make it easier to follow reading assignments, which are generally given by page number. I have indicated for each book whether it is available online via NYU library and if available included the link. If it is not available, you will need to purchase the hard copy. All other sources will be available digitally via our course site.

- Gotham: A History of New York City to 1898, Edwin G. Burrows & Mike Wallace (first paperback edition, 1999)
  - [NYU Library link](#)
  
- Crabgrass Frontier: The Suburbanization of the United States, Kenneth Jackson (first paperback edition, 1987)
  - [NYU Library link](#)
  
- Nature's Metropolis: Chicago and the Great West, William Cronon (first paperback edition, 1992)
  
- Streetcar suburbs: The Process of Growth in Boston, 1870 to 1900, Sam Bass Warner (second edition, 1998, paperback)
  - [NYU Library link](#)
  
- The Fragmented Metropolis: Los Angeles, 1850-1930, Robert Fogelson
  - [NYU Library link](#)
  
- Disenchanted Night: The Industrialization of Light in the 19<sup>th</sup> Century, Wolfgang Schivelbusch (first paperback edition, 1995)
  - I recommend you purchase. However, PDFs will be available on the class site for all assigned readings.
  
- Power Lines: Phoenix and the Making of the Modern Southwest, Andrew Needham (first paperback edition, 2014)
  - [NYU Library link](#)
  
- The Electric City, Energy and the Growth of the Chicago Area, 1880-1930, Harold L. Platt (first edition, 1991, hardcover)
  - [NYU Library link](#)

## II. Expectations, Assignments & Grading

- (1) **Class Participation (15% of grade)**: Students should complete all reading assignments prior to class and come prepared to discuss them. I will circulate reading questions each week to help guide analysis and class discussion. Students may have up to one excused absence. After that, barring medical or family emergencies, or religious holidays, students will have five points deducted from their overall participation grade for each week of class missed (i.e. a 93 will shift to an 88).
- (2) **Pop Quizzes (15%)**: There will be six pop quizzes over the course of the semester testing whether students completed weekly reading assignments. The lowest quiz score will be dropped and the remaining five quizzes averaged for 10% of the grade.
- (3) **Research project**: Each student will complete three projects on a single theme. The projects - a class presentation, mid-term paper, and final paper – will build on one another over the course of the semester. As themes, students will pick a technology not covered in the course and explore how that technology shaped a city or region of the U.S. historically or might shape a city or region in the future. Students can select cities covered in the course (New York, Boston, Chicago, Los Angeles and Phoenix) or other cities of their choosing. Students are encouraged to choose one of the following technologies: steam power (industrial applications), steamboats, grain elevators, house balloon framing, freight trucking, steel (for skyscrapers), elevators, water filtration, reservoir and aqueduct construction, tunnel construction, sanitation, aviation, telephony, distributed renewable power generation, or energy transmission and distribution. Students wishing to write on alternative technologies are welcome to consult with the instructor for approval. In developing their presentation and writing their papers, students will be expected to draw on a range of sources, which might include primary historical records, economic, census and GIS data, and/or secondary historical and sociological texts.
  - **Class presentation (10% of grade)**: Students will deliver a 10 minute presentation during the final class of the semester on their chosen theme and city. Students can choose to give a simple lecture or to use aides such as a hand-out or slide deck.
  - **Mid-term paper (30%)**: The mid-term paper (approx. 5 to 15 pages) will focus on the historical development and impact of the chosen technology. The mid-term paper will also be an opportunity to identify relevant sources for the final paper.
    - **Due Date**: Friday, March 11, 9 pm eastern. Submission by email to instructor.
  - **Final paper (30%)**: The final paper (15-30 pages) will focus more narrowly on how that technology impacted the chosen city or region. The final paper can directly incorporate some or all of content from the mid-term paper.
    - **Due Date**: Wednesday, May 11, 9 pm eastern. Submission by email to instructor.

We will follow the University's standard grading scale:

- A = 94-100
- A- = 90-93
- B+ = 87-89
- B = 84-86;
- B- = 80-83
- C+ = 77-79
- C = 74-76
- C- = 70-73
- D+ = 67-69
- D = 65-66;
- F = below 65

Please note that I will not grant any extensions for papers except in case of family or health emergency. Your grade for each paper will be taken down 5 points (i.e. from a 93 to an 88) for each day it is late.

### **III. Moses Center for Students with Disabilities:**

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at [www.nyu.edu/csd](http://www.nyu.edu/csd). The Moses Center is located at 726 Broadway on the second floor.

### **IV. Religious holidays:**

NYU's policy is to accommodate students' observances of religious holidays. In order to receive accommodation, you must notify the instructor during the first two weeks of the semester of any planned absences related to religious observance. Further details on NYU's policies may be found at:

<http://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-calendar-policy-on-religious-holidays.html>

### **V. Academic honesty**

Intellectual integrity is the university's most fundamental commitment. Plagiarism of any kind will be penalized to the fullest possible extent, without warning or exception.

The most common causes of plagiarism are not deliberate dishonesty, but stress and uncertainty. You are encouraged to begin assignments well in advance of the deadline, and to check with the instructor if you have any questions. Whenever you draw upon somebody else's words or ideas to make a point, give them credit in a note. If you have questions about documentation requirements, don't guess – just ask.

For further details on university policy, strictly adhered to in this class, see: <http://cas.nyu.edu/page/ug.academicintegrity>

## VI. Office Hours

I will be available for office hours on Tuesdays from 4 pm to 6 pm eastern for 30-minute intervals. Please email me at [nfl2011@nyu.edu](mailto:nfl2011@nyu.edu) in advance to schedule and cc [personal.assist.loewentheil@gmail.com](mailto:personal.assist.loewentheil@gmail.com). If you have a conflicting schedule, or the slots are filled, we will find an alternative time.

## VII. Week by Week Topics & Reading Assignments

### Section 1: Introduction

**January 26th, Class 1: Wealth, Race, Transportation and the Neighborhood in the 19<sup>th</sup> Century: New York, 1820 to 1898**

*Crabgrass Frontier*, Kenneth Jackson

- Chapter 1: Suburbs as Slums, pgs. 12-20
- Chapter 2: The Transportation Revolution and the Erosion of the Walking City, pgs. 20-44

*Gotham: A History of New York City to 1898*, Edwin G. Burrows & Mike Wallace

- Excerpts on a working class neighborhoods, tenement housing, sanitation and disease: 356-365, 391-392, 475-480, 744-748, 784-790, 919-922, 991-992

*Darkness and Daylight, or Lights and Shadows of New York Life*, Helen Campbell

[Available online](#)

PDF available

- Chapter III: Up Slaughter Alley, pgs. 89-110

### Section 2: Technological Innovation in Historical Context

*Section 2, Part A: Transportation & Mobility*

**February 2nd, Class 2: The First Commuters – Introduction of the Urban Railroad and Horsecar**

*Crabgrass Frontier*, Kenneth Jackson

- Chapter 5: The Main Line: Elite Suburbs and Commuter Railroads, pgs. 87-103

*The Railway Journey*, Wolfgang Schivelbusch

[Link to online book](#)

- Chapter 2: The Machine Ensemble, pgs. 23-32
- Chapter 3: Railroad Space and Railroad Time, pgs. 33-44

*Fares, Please! From Horse-Cars to Streamliners*, John Anderson Miller  
*PDF available*

- Chapter 1: Transportation for All, pgs. 1-16
- Chapter 2: Omnibus on Rails, pgs. 16-34
- Chapter 4: Railways on Stilts, 70-81

*Optional Additional Reading*

*The Railway Journey*, Wolfgang Schivelbusch

[Available online](#)

- Chapter 6, The American Railroad, pgs. 89-112

*The Young American*, Ralph Waldo Emerson, *The Dial* (1843)

[Link to reading](#)

**February 9th, Class 3: Economic Crossroads – Railroads and the Rise of Chicago, 1840 to 1890**

*Nature's Metropolis*, William Cronon

- Chapter 1: Dreaming the Metropolis, pgs. 41-54
- Chapter 2: Rails and Water, pgs. 55-93
- Chapter 3, The Wealth of Nature, pgs. 169-200
- Chapter 5: Annihilating Space, pgs. 207-213, 218-235, 243-247, 254-259

- *Don't miss the accompanying illustrations after page 328*

Optional additional reading:

Nature's Metropolis, William Cronon

- Chapter 7, *The Busy Hive Parts 2 & 3: The Merchant's World Pre-Railroad & Post-Railroad*, pgs. 318-333

**February 16th, Class 4: The Electric Trolley – Early Implementation**

Crabgrass Frontier, Kenneth Jackson

- Chapter 6: The Time of the Trolley, pgs. 103-115

Electrifying America, David Nye  
*PDF available*

- Chapter 3: Crosstown Transfer, pgs. 85 – 137

Gotham: A History of New York City to 1898, Edwin G. Burrows & Mike Wallace

- Pgs. 1049-1058, 1068-70

Fares, Please! From Horse-Cars to Streamliners, John Anderson Miller  
*PDF available*

- Chapter 3: Cars Run by Lightning, pgs. 54-69
- Chapter 7: Heyday of the Trolley, pgs. 99-117

**February 23rd, Class 5: The Electric Trolley – Case Study on Boston, 1870 to 1910**

Streetcar suburbs: The Process of Growth in Boston, 1870 to 1900, Sam Bass Warner (second edition)

[Link to reading](#)

- Chapter 1: A City Divided, pgs. 1-5
- Chapter 2: The Large Institutions, pgs. 15 – 34
- Chapter 3: The Three Towns, pgs. 35-45
- Chapter 4: A Selective Melting Pot, pgs. 46-66
- Chapter 5: The Weave of Small Patterns, pgs. 67-77
- Chapter 7: The Consequences, pgs. 153-166

## **March 2nd, Class 6: The Automobile – Early Adoption, Highways, Suburbanization, and Redlining**

*Main Street to Miracle Mile: American Roadside Architecture*, Chester Liebs

- Chapter 1: Main Street to Miracle Miles, pgs. 1-37

*Crabgrass Frontier*, Kenneth Jackson

- Chapter 9: The New Age of Automobility, pgs. 157-171
- Chapter 10: Suburban Development Between the Wars, pgs. 172-189
- Chapter 11: Federal Subsidies and the Suburban Dream: How Washington Changed the American Housing Market, pgs. 190-203 (skim)
- Chapter 13: The Baby Boom and the Age of the Subdivision, pgs. 231-245

*Brief Introduction to Redlining*

- *Segregated by Design*: Watch video summarizing Richard Rothstein's *The Color of Law* ([link](#))
- *Mapping Inequality*: Find your hometown on this [interactive version](#) of HOLC's redlining maps

*Optional additional reading:*

*America Adopts the Automobile, 1895-1910*, James Flink

- Chapter 3: Motives for Adoption, pgs. 88-112
- Chapter 6: Regulating the Motor Vehicles, pgs. 186-195
- Chapter 7: Roads, Services and Mechanical Expertise, pgs. 202-213

*The Car Culture*, James Flink

- Introduction, pgs. 1-4
- Chapter 1: Prologue, pgs. 5-17
- Chapter 2: Early Implementation in America, 18-41

## **March 9th, Class 7: The Automobile – Case Study on Los Angeles, 1850-1950**

*The Fragmented Metropolis: Los Angeles, 1850-1930*, Robert Fogelson



[Link to online book](#)

- Chapter 4: The Great Migration, pgs. 63-85
- Chapter 5: Transportation, Water and Real Estate, pgs. 85-95
- Chapter 7: The Urban Landscape, pgs. 137-154
- Chapter 8: The Failure of the Electric Railways, pgs. 164-185
- Chapter 12: City and Regional Planning, pgs. 247-272

*City Center to Regional Mall: Architecture, the Automobile, and Retailing in Los Angeles, 1920-1950*, Richard Longstreth

[Link to reading](#)

- Chapter 5: Fabulous Boulevard, pgs. 103-142 (*skim*)

*Lyrics to "Californication" by the Red Hot Chili Peppers*

[Link to lyrics](#)

*Optional additional reading:*

*City Center to Regional Mall: Architecture, the Automobile, and Retailing in Los Angeles, 1920-1950*, Richard Longstreth

- Introduction
- Chapter 1: The Perils of a Parkless Town, pgs. 3-18
- Chapter 6: A Guaranteed Neighborhood, pgs. 143-176
- Chapter 7: A Hindrance to Business, pgs. 177-198
- Chapter 9: Markets in the Meadows, pgs. 221-268
- Chapter 10: Grass on Main Street, pgs. 269 to 306

**SPRING BREAK 3/14-3/20**

**Section 2, Part B: Power**

**March 23rd, Class 8: Pre-Modern Night, Gas Lighting, and the Introduction of Electric Lighting, 1878 to 1900**

*At Day's Close: Night in Times Past (skim)*

*PDF available*

- Shutting In, Prelude, and Chapter 1, Pgs. 1-30
- Chapter 4: A Man's House is His Castle, Section IV, pgs. 100-111

*Disenchanted Night: The Industrialization of Light in the 19<sup>th</sup> Century*, Wolfgang Schivelbusch  
 PDF available

- Chapter 1: The Lamp, pgs. 14-44, 52-60

*The Age of Edison, Electric Light and the Invention of Modern America*, Ernest Freeberg  
[Available online](#)

- Chapter 2: Civic Light, pgs. 47-70
- Chapter 3: Creative Destruction: Edison and the Gas Companies, pgs. 71-88

*Gotham: A History of New York City to 1898*, Edwin G. Burrows & Mike Wallace

- Excerpts on electricity early days in New York: pgs. 1063-1070

*Electrifying America: Social Meaning of a New Technology*, David E. Nye  
 PDF available

- Chapter 2: The Great White Way, pgs. 29-37

*Optional additional reading:*

*Electrifying America: Social Meaning of a New Technology*, David E. Nye  
 PDF available

- Chapter 2: The Great White Way, pgs. 37-84

*Disenchanted Night: The Industrialization of Light in the 19<sup>th</sup> Century*, Wolfgang Schivelbusch  
 PDF available

- Chapter 1: The Lamp, pgs. 1-14
- Chapter 2: The Street, pgs. 79-134
- Chapter 3: Nightlife, pgs. 136-154

*The Age of Edison, Electric Light and the Invention of Modern America*, Ernest Freeberg  
[Available online](#)

- Chapter 4: Work Light, pgs. 89-107

**March 30th, Class 9: Development of Urban and Metropolitan Electric Grids – Case Study on Chicago, 1880-1930**

*The Electric City, Energy and the Growth of the Chicago Area, 1880-1930*, Harold L. Platt  
[PDF available](#)

- Pgs. 78-92, 95-108, 111-119, 147-155, 162-165, 173-183, 195-197, 250-261

*Networks of Power: Electrification of Western Society, 1880-1930*, Thomas Hughes  
[Link to reading](#)

- Chapter 8: Chicago: The Dominance of Technology, pgs. 204-226

### **April 6th, Class 10: The Regional Electric Grid, Cheap Power and The Rise of the Sunbelt**

*Networks of Power: Electrification of Western Society, 1880-1930*, Thomas Hughes  
[Available online](#)

- Chapter 12: Planned Systems, pgs. 324-333
- Chapter 13, The Culture of Regional Systems, pgs. 363-379

“*The End of the Long Hot Summer*,” *Journal of Southern History*, Raymond Arsenault, 1984 –  
[Link to reading](#)

*The Path to Power*, Robert Caro  
[PDF available](#)

- Chapter 27: Sad Irons

*Power Lines: Phoenix and the Making of the Modern Southwest*, Andrew Needham  
[Link to reading](#)

- Pgs. 1-23, 55-62, 73-83, 111-120, 123-138, 154-171

### **Section 3: Today’s Shifting Landscape**

#### **April 13th, Class 11: Ride-Sharing and Autonomous Vehicles**

[Spatial Economics: The Declining Cost of Distance](#), Bain Company (skim)

#### Ride-Sharing

- [Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States](#), Regina R. Clewlow and Gouri Shankar Mishra, UC Davis Institute of Transportation Studies
- [Ridesharing versus Public Transit: How Uber and Lyft Tend to Widen Disparities of Race and Class in Urban Transportation Systems](#), Steven Hill, The American Prospect
- [Travel Behavior: Shared Mobility and Transportation Equity](#) (executive summary and introduction only), Federal Highway Administration

- [\*Shared Mobility and the Transformation of Public Transit\*](#), American Public Transportation Association
- [\*Faster and Cheaper: How Ride-Sourcing Fills a Gap in Low-Income Los Angeles Neighborhoods\*](#), BOTEC Analysis

#### Autonomous Vehicles

- [\*Autonomous Vehicle Technology: A Guide for Policymakers\*](#), RAND Corporation (Chapters 1, 4, and 2, in that order)
- [\*The Impact of Autonomous Vehicles on Cities: A Review\*](#), Fabio Duarte, Journal of Urban Technology
- [\*How Driverless Cars Could Drive Even Deeper Economic Inequality\*](#), Ralph McLaughlin, Fast Company

#### *Optional additional reading:*

[\*On-demand High-Capacity Ride-Sharing via Dynamic Trip-Vehicle Assignment\*](#), Javier Alonso-Mora, Samitha Samaranyake, Alex Wallar, Emilio Frazzoli, and Daniela Rus, Proceedings of the National Academy of Sciences

[\*The New Automobility: Lyft, Uber and the Future of American Cities\*](#), Schaller Consulting

[\*Can Self-Driving Cars Stop the Urban Mobility Meltdown?\*](#), BCG

### Section 4: Future Disruption

#### **April 20th, Class 12: The Death of Distance: Broadband & Remote Work**

##### Broadband

- [\*The Different Internet Connection Types and How They Work\*](#), CNET
- [\*The Natural Evolution of Technology\*](#), POTs and PANs
- [\*The City that Was Saved by the Internet\*](#), Jason Koebler, VICE
- [\*The Broadband Gap's Dirty Secret: Redlining\*](#), Shara Tibken, CNET
- [\*Internet for All Seattle Report\*](#), Executive summary, pages 2-5

##### Remote Work

- [\*Offices are Useful for Soft Work, not Hard Work\*](#), Derek Thompson, The Atlantic
- [\*The Death of the City\*](#), Aitor Hernandez-Morales, Politico
- [\*Remote Work is Bringing the City to the Suburbs\*](#), Rani Molla, Vox.com
- [\*Remote Work is the New Signing Bonus\*](#), Chip Cutter and Kathryn Dill, WSJ
- [\*The Workplace of the Future is more Clubhouse than Cubicle\*](#), Conor Sen, Bloomberg
- [\*Superstar Cities are \(probably\) Immune from WFH\*](#), Justin Fox, Bloomberg

## **April 27th, Class 13: Internet of Things, Big Data, and the Threats to Privacy**

*The Age of Surveillance Capitalism*, Shoshana Zuboff

[Link to reading](#)

- Chapter 1

*The Internet of Things: Mapping the Value Beyond the Hype*, McKinsey Global Institute

- Executive Summary: Pgs. 1-16
- Introduction: Pgs. 17-20
- Cities: Pgs. 87-94

*The Quayside Plan*, Sidewalk Labs

- Read introduction, pages 8-11
- Skim pages 48-72
- *Optional: skim pages 12-47*

"The City of the Future Is a Data-Collection Machine," Sidney Fussell, The Atlantic: <https://www.theatlantic.com/technology/archive/2018/11/google-sidewalk-labs/575551/> (Links to an external site.)

Google's "Smart City of Surveillance" Faces New Resistance in Toronto, Ava Kofman, The Intercept, <https://theintercept.com/2018/11/13/google-quayside-toronto-smart-city/> (Links to an external site.)

*Toronto is surveillance capitalism's new frontier*, op-ed by Shoshana Zuboff, Toronto Life (<https://torontolife.com/city/toronto-is-surveillance-capitalisms-new-frontier/>) (Links to an external site.)

*Optional additional reading:*

*The Smart Enough City: Putting Technology in Its Place to Reclaim Our Urban Future*, Ben Green

[Link to reading](#)

- Chapter 4: The Just City: Machine Learning's Social and Political Foundations, pgs. 39-62

*Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia*, Anthony Townsend

- Chapter 3: Cities of Tomorrow, pgs. 93-114

- Chapter 4: The Open-Source Metropolis, pgs. 115-141

**May 4th, Class 14: Class Presentations**

***FINALS 5/11-5/17***