



NYU

**ROBERT F. WAGNER GRADUATE
SCHOOL OF PUBLIC SERVICE**

UPADM-GP 241

Technology and the American City

Spring 2021

Instructor Information

- Instructor: Nate Loewentheil

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 19th century to the dense industrial cities of the early 20th century to the modern suburban sprawl of the 21st 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.

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. 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)
- Crabgrass Frontier: The Suburbanization of the United States, Kenneth Jackson (first paperback edition, 1987)
- 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)
- City Center to Regional Mall: Architecture, the Automobile, and Retailing in Los Angeles, 1920-1950, Richard Longstreth (first edition, 1998, paperback)
- Disenchanted Night: The Industrialization of Light in the 19th Century, Wolfgang Schivelbusch (first paperback edition, 1995)
- Power Lines: Phoenix and the Making of the Modern Southwest, Andrew Needham (first paperback edition, 2014)
- The Electric City, Energy and the Growth of the Chicago Area, 1880-1930, Harold L. Platt (first edition, 1991, hardcover)

Expectations, Assignments & Grading

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).

Pop Quizzes (10%)

There will be five 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 four quizzes averaged for 10% of the grade.

Research Project (75%)

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. Possible technologies to consider: steam power, gas lighting, grain elevators, house balloon framing, freight trucking, containerized shipping, reinforced concrete, steel (for skyscrapers), bicycles, water filtration, aviation, the telegraph, telephony, micro-mobility, ride-sharing, autonomous vehicles, distributed renewable power generation, robotics, Internet of Things, and drones. 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 (15% of grade)

Students will prepare a 15-minute class presentation on their chosen theme. Wherever possible, presentations will be scheduled so that the subject of the presentation tie into the subject of that week's readings. Students can choose to give a simple lecture or to use aides such as a hand-out or slide deck.

Mid-term paper (20%)

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: Tuesday, March 30, 9 pm eastern. Submission by email to instructor.

Final paper (40%)

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: Tuesday, May 18, 9 pm eastern. Submission by email to instructors.

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.

Henry and Lucy Moses Center for Students with Disabilities at NYU

Academic accommodations are available for students with disabilities. Please visit the [Moses Center for Students with Disabilities \(CSD\) website](#) and click on the Reasonable Accommodations and How to Register tab or call or email CSD at (212-998-4980 or mosescsd@nyu.edu) for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

NYU's Calendar Policy on Religious Holidays

[NYU's Calendar Policy on Religious Holidays](#) states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. Please notify me in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.

Academic Integrity

Academic integrity is a vital component of Wagner and NYU. All students enrolled in this class are required to read and abide by [Wagner's Academic Code](#). All Wagner students have already read and signed the [Wagner Academic Oath](#). Plagiarism of any form will not be tolerated and students in this class are expected to report violations to me. If any student in this class is unsure about what is expected of you and how to abide by the academic code, you should consult with me.

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 in advance to schedule and cc personal.assist.loewentheil@gmail.com. If you have a conflicting schedule, or the slots are filled, we will find an alternative time.

Week by Week Topics & Reading Assignments

Section 1: Introduction

Class 1: Wealth, Race, Transportation and the Neighborhood in the 19th Century: New York, 1820 to 1898

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

- Excerpts on a "Walking City": pgs. 476-483, 659-666, 991-992
- Excerpts on Tenement Housing: pgs. 391-392, 744-748, 784-790, 1173-1174
- Excerpts on Sanitation and Disease: pgs. 356-365, 784-790, 919-921

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

- Chapter III: Up Slaughter Alley, pgs. 89-110
- Chapter V: Child Workers, pgs. 139-148
- Chapter XII: The Great Army of New York Poor, pgs. 259-278

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

Section 2: Technological Innovation in Historical Context

Section 2, Part A: Transportation & Mobility

Class 2: Railroads: The Rise of Chicago, 1840 to 1890

The Railway Journey, Wolfgang Schivelbusch

- Chapter 2: The Machine Ensemble, pgs. 23-32
- Chapter 3: Railroad Space and Railroad Time, pgs. 33-44
- Chapter 4: Panoramic Travel, pgs. 52-69

Nature's Metropolis, William Cronon

- Chapter 2: Rails and Water, pgs. 55-97
- Chapter 5: Annihilating Space, pgs. 207 – 263
- Chapter 7, The Busy Hive Parts 2 & 3: The Merchant's World Pre-Railroad & Post-Railroad, pgs. 318-333

Optional additional reading:

The Railway Journey, Wolfgang Schivelbusch

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

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

Class 3: The Electric Trolley: Early Implementation

Electrifying America, David Nye

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

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

- Pgs. 1049-1070

Crabgrass Frontier, Kenneth Jackson

- Chapter 5: The Main Line: Elite Suburbs and Commuter Railroads, pgs. 87-103
- Chapter 6: The Time of the Trolley, pgs. 103-115

Class 4: 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)

- 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

Optional additional reading:

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

- Chapter 7: The Consequences, pgs. 153-166

Class 5: The Automobile: Early Adoption, Highways, Suburbanization, and Redlining

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. 190-218
- Chapter 13: The Baby Boom and the Age of the Subdivision, pgs. 231-245
- Chapter 14: The Drive-in Culture of Contemporary America, pgs. 246-271

Optional additional reading:

The Car Culture, James Flink

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

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

- Chapters 1, 3, 7

America Adopts the Automobile, 1895-1910, James Flink

- Introduction: pgs. 1-10
- Chapter 2: Developing a Mass Market, pgs. 63-86
- Chapter 3: Motives for Adoption, pgs. 87-104

Class 6: The Automobile: A Case Study on Los Angeles, 1850-1950

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

- Excerpts on the car and urban growth: pgs. 92-95, 151-154, 164-186, 247-253, 265-272
 - NYU Library Link

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 5: Fabulous Boulevard, pgs. 103-142
- Chapter 9: Markets in the Meadows, pgs. 221-268

Optional additional reading:

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

- Chapter 6: A Guaranteed Neighborhood, pgs. 143-176
- Chapter 7: A Hindrance to Business, pgs. 177-198
- Chapter 10: Grass on Main Street, pgs. 269 to 306

Section 2, Part B: Power

Class 7: Electrification: Introduction of Urban Electric Lighting, 1820 to 1900

Disenchanted Night: The Industrialization of Light in the 19th Century, Wolfgang Schivelbusch

- Chapter 1: The Lamp, pgs. 15-78
- Chapter 2: The Street, pgs. 79-134

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

- Chapter 2: The Great White Way, pgs. 29-72

Optional additional reading:

Disenchanted Night: The Industrialization of Light in the 19th Century, Wolfgang Schivelbusch

- Chapter 1: The Lamp, pgs. 1-14
- Chapter 3: Nightlife, pgs. 136-154

The Age of Edison, Electric Light and the Invention of Modern America, Ernest Freeberg

- Chapter 3: Creative Destruction: Edison and the Gas Companies, pgs. 71-88
- Chapter 4: Work Light, pgs. 89-107

Class 8: Electrification: Case Study on Chicago, 1880-1930

The Electric City, Energy and the Growth of the Chicago Area, 1880-1930, Harold L. Platt

- Part II: Metropolitan Webs of Power, 1898-1914, pgs. 93-197

Optional additional reading:

The Electric City, Energy and the Growth of the Chicago Area, 1880-1930, Harold L. Platt

- Part III: The Integration of a Region, 1914-1932, pgs. 201-290

Class 9: The Regional Electric Grid & Cheap Power: The Rise of the Sunbelt

Networks of Power: Electrification of Western Society, 1880-1930, Thomas Hughes

- Chapter 13: The Culture of Regional Systems, pgs. 363-384

Air Conditioning America: Engineers and the Controlled Environment, 1900-1960, Gail Cooper

- Chapter 6: From Luxury to Necessity, pgs. 140-164
- Chapter 7: Consumers and Air-Conditioning, pgs. 165-182

“The End of the Long Hot Summer,” Journal of Southern History, Raymond Arsenault, 1984

“Migration and Climate,” Journal of Regional Science, Philip Graves, 1980

“Examining the Role of Economic Opportunity and Amenities in Explaining Population Redistribution,” Journal of Urban Economics, Peter Mueser & Philip Graves, 1995

Additional optional reading:

Technology and Transformation in the American Electric Utility Industry, Richard Hirsh

- Chapter 3: Manufacturers and Technical Progress before World War II, pgs. 36 – 46
- Chapter 4: Post-War Strategies of Utilities and Manufacturers, pgs. 47-70
 - Instructor will provide PDF via course site

Class 10: Long-Distance Electric Transmission, Coal-Burning Power Plants and Open Skies: Case Study on Phoenix and the Navajo Nation, 1950-1980

Power Lines: Phoenix and the Making of the Modern Southwest, Andrew Needham

- Introduction, pgs. 1-23
- Part II: Demand, pgs. 55-122
- Part III: Supply, pgs. 123-182
- Conclusion, pgs. 246-257

Additional optional reading:

Power Lines: Phoenix and the Making of the Modern Southwest, Andrew Needham
Part I: Fragments, pgs. 24-54

Section 3: Today’s Shifting Landscape

Class 11: Ride-Sharing and Urban Inequality

Ride-Sharing: The Urban Pessimists

- The New Automobility: Lyft, Uber and the Future of American Cities, Schaller Consulting, 2018
- Understanding the Surprising and Oversized Use of Ridesourcing Services in Poor Neighborhoods in New York City, Carol Atkinson-Palombo, Journal of the Research Transportation Board
- 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, Marcy 2018

Ride-Sharing: The Urban Optimists

- Faster and Cheaper: How Ride-Sourcing Fills a Gap in Low-Income Los Angeles Neighborhoods, BOTEC Analysis, July 2015
- On-demand High-Capacity Ride-Sharing via Dynamic Trip-Vehicle Assignment, Javier Alonso-Mora, Samitha Samaranayake, Alex Wallar, Emilio Frazzoli, and Daniela Rus, Proceedings of the National Academy of Sciences
- Travel Behavior: Shared Mobility and Transportation Equity (executive summary and introduction only), Federal Highway Administration, 2017
- Shared Mobility and the Transformation of Public Transit, American Public Transportation Association, March, 2016.

Section 4: Future Disruption

Class 12: Autonomous Vehicles

Autonomous cars

- Autonomous Vehicle Technology: A Guide for Policymakers, RAND Corporation, 2016
- The Impact of Autonomous Vehicles on Cities: A Review, Journal of Urban Technology, Fabio Duarte, July 2018
- Spatial Economics: The Declining Cost of Distance, Bain Company
- How Driverless Cars Could Drive Even Deeper Economic Inequality, Fast Company, 2017

Urban Drones

- Concepts of Airspace Structures and System Analysis for UAS Traffic flows for Urban Areas, American Institute of Aeronautics and Astronautics, NASA, Dae-Sung Jang, et al.

- Enabling Safe Operations of Unmanned Aircraft Systems in an Urban Environment: A Preliminary Study, Lakshmi Pathiyil et al, Air Traffic Management Research Institute, Nanyang Technological University
- Unmanned Traffic Self-Management: How Smart Drones Will Find Their Own Way in the Airspace, DJI White Paper submitted to ICAO, September 2017
- Uber and Hyundai Unveil Flying Car Model for Future Air Taxi Service, Fortune, January 6, 2020

Class 13: Remote Work

- Readings to be assigned

Class 14: Internet of Things, Big Data, and the Threats to Privacy

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

The Internet of Things: Mapping the Value Beyond the Hype, McKinsey Global Institute, 2015

- Executive Summary
- Section 3, Sub-Section: Retail Environments
- Section 3, Sub-Section: Offices
- Section 3, Sub-Section: Vehicles
- Section 3, Sub-Section: Cities

“The Quayside Plan,” Sidewalk Labs, 2019

- Introductions, pgs. 16-23
- Part 2.1, pgs. 96-141

The City of the Future Is a Data-Collection Machine, Sidney Fussell, The Atlantic, November 21, 2018

Google’s “Smart City of Surveillance” Faces New Resistance in Toronto, Ava Kofman, The Intercept, November 13, 2018

Additional optional reading:

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

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