Designing Climate Corridors

Urban arterials as models for transformative climate action, sustainability, and public health

COLUMBIA GSAPP A6940-1 FALL SEMESTER 2025
Wednesday 11am- 1pm EST (Avery 409)
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Image: Bauchplan, Competition entry for “The Future Park Design Idea Competition”, Melbourne, 2019

This seminar will explore the typology of the arterial street as an opportunity for transformative climate action. Working in partnership with Rebuild by Design, students will explore the role of streets as places to build neighborhood resilience and environmental justice, learn from case studies around the world and develop their own schematic design proposals for one of several potential “climate corridors” in New York City.
Arterial streets are long and wide roads that carry large amounts of vehicular traffic through neighborhoods. In New York City, only 15% of streets are arterials, but they are the site of 60% of traffic fatalities. Arterials like Northern Boulevard in Queens, Boston Road in the Bronx or Atlantic Avenue in Brooklyn are examples of roads with a long history as travel corridors and truck routes.

They serve a transient population traveling “through” while imposing health risks and environmental harm on directly adjacent communities. On average, more than 80% of the public right-of-way is dedicated to vehicles, while fewer than 40% of residents in adjacent neighborhoods own cars.

- How can these arterial streets be transformed to become a network for climate change mitigation and adaptation?
- How can they become destinations for adjacent communities rather than barriers and health hazards?
- What is the interplay between nature and technology that enables us to rethink the public right-of-way in new terms?

Urban arterials are ripe for reinvention. From reducing space for vehicular traffic to increase the amount of vegetation that sequesters carbon, absorbs stormwater and mitigates urban heat; From enhancing sustainable modes of transportation, to smart curb management, autonomous multimodal mobility and mechanisms for sustainable growth, they provide an opportunity to rethink how this outsized publicly-owned land between neighborhoods can be utilized for climate action and public health.

In addition to lectures and readings, case studies and site visits, students will work in teams to apply lessons learned to develop strategies for one arterial in New York City.

STRUCTURE & COURSE REQUIREMENTS

Seminar sessions will typically combine a lecture or presentation (1 hour) and a discussion of work in progress by student teams (1 hour). Readings listed under a specific date in the schedule should be read prior to that date and will inform the discussion of the day. There will be three parts to the semester, each with its own assignment and deliverable:

Global Context (20%) – (in pairs) will set the stage for what's at stake and introduce best practices from around the world, the state of climate action in the transportation sector as well as basic concepts and terminology for street design. Each student will pick a case study from a list of global best practices and tools for a pecha kucha presentation session. These case studies will explore a variety of cities, but also a variety of tools for transformation from landscaping to public transit to data-driven multi-modal mobility.

"Learning from the City" tours (30%) – (teams of 5-6) will take us on journeys throughout New York City and explore examples of recent or proposed changes to city streets. Working in teams, you will prepare an analysis of one of four locations and will lead a site tour for the entire class during which you present your findings.

Designing Climate Corridors (30%) – (teams of 3-4) will examine opportunities for reclaiming space within the right-of-way of the street for sustainable mobility and climate adaptation. Working in teams, you will develop a design strategy for a section of Atlantic Avenue in Brooklyn. This exercise will include a group site visit to study existing conditions of the corridor, a workshop with invited professionals and a final presentation at the end of the semester at the Center for Architecture as part of its exhibition "Searching for Superpublic."

Attendance, class participation and readings (20%) – We rely on each other to create the most valuable learning experience, to facilitate conversation, to listen, engage all participants and create an environment where everyone feels welcome and trusted to share their ideas, opinions, and concerns openly. As a group, we will work to make this class a safe space for **everyone** to contribute and participate each week. Come prepared with your ideas, questions or notes from assigned readings. Think about ways to contribute even when you don't feel like speaking up.

SCHEDULE

PART 1 GLOBAL CONTEXT

Week 1
9/5/2025 Introduction to the class and topic

An introductory discussion on the objectives and format of the course, review of the course schedule and expectations. Some questions we will discuss to frame the semester:

- What is the current state of climate action with respect to transport & mobility in cities?
- What is the environmental legacy of highways and larger arterial streets?
- What is the Avoid, Shift, Improve Framework for transportation?
- How can we utilize the space of the street more effectively for climate action?

Readings:

Gabby Birenbaum, How to end the American obsession with driving – To fight climate change, cities need to be designed with much more walking, biking, and public transit use in mind. In Vox, Sept 2021

IPCC, Sixth Assessment Report, Chapter 10: Global Transport and Climate Change https://www.ipcc.ch/report/ar6/wg3/chapter/chapter-10/

Maruxa Cardama, Agustina Krapp, Nikola Medimorec and Alice Yiu.: Transforming Transport and Mobility to Achieve the Targets of the Paris Agreement and the Sustainable Development Goals in Transport, Climate and Sustainability Global Status Report - 3rd edition, SLOCAT, 2023 (p.5 to p.31)

Urban Design Forum: Streets for Climate

Week 2
9/10/2025 Streets and Environmental Justice

We will discuss the link between road design and environmental justice, the disproportionate exposure to health impacts, heat, air pollution and traffic violence that EJ communities face as a result of systemic planning decisions reflected in a legacy of segregation and bias.

Readings:

Angie Schmitt, “The Profile of a Victim” in *Right of way : race, class, and the silent epidemic of pedestrian deaths in America*, Island Press, 2020 (in drive)

Transportation Alternatives, Five lessons for the 10-year anniversary of Vision Zero in New York City https://projects.transalt.org/lessons-from-vision-zero-new-york-city
Tamika Butler, Safe Roads for All, in Medium (2018)
Elli Blue, The Free Rider Myth, in Momentum Mag, March 2016

Review: https://heatstorynyc.org/ "Addressing the Urban Heat Island Effect through an Equity Lens: A Community Science Project"

At the end of Week 2, students will select a case study to share on Sep. 24th.

Week 3
9/17/2025 Lecture, Fabrizio Prati: Global Designing Cities Initiative

Readings:
Global Designing Cities Initiative, How to Implement Street Transformations, GDCI May 2022

Janette Sadik-Khan, Seth Solomonow, "Chapter 1: The Fight" in *Streetfight : Handbook for an Urban Revolution*, New York, New York : Penguin Books. 2016

Week 4
9/24/2025 Case Studies Pecha Kucha

This session will be used to discuss student research. At the end of this session, we will form teams for the following assignment.

PART 2 LEARNING FROM THE CITY

Week 5
10/01/2025 Lecture, Amy Chester: Rebuild by Design

Readings:
Municipal Art Society: Greener Corridors for a More Resilient City, 2024 Regional Plan Association: Re-envisioning the right of way, Oct 2021

Review:
Rebuild by Design: Parks as Climate Infrastructure
Atlas of Disaster, and Rainproof NYC

Week 6
10/08/2025 Site Tour: Atlantic Avenue
Existing conditions analysis and documentation /all groups

Week 7
10/15/2025 Site Tour Cross Bronx Expressway

Week 8
10/22/2025 Site Tour: Queens 34th Avenue "Paseo Park"
with Jim Burke, Co-founder of 34th Avenue Open Street

Week 9
10/29/2025 Center for Architecture Workshop: Re-imagining Atlantic Avenue

Week 10
11/05/2025 Site Tour: Manhattan Upper West Side Smart Curb Pilot

(dates are preliminary, to be confirmed with all teams,)

PART 3 DESIGNING CLIMATE CORRIDORS

Week 11 Lecture: Urban Forest / Nature-based solutions
11/12/2025
We will discuss nature-based solutions to climate change adaptation and mitigation in streets including tree canopy and urban heat island effect, large scale stormwater management and issues of air quality and pollution.

Readings:
Sonja Dümpelmann, "Not so long ago, cities were starved for trees" in The Conversation, Jan 2019
Simon Beecham and Terry Lucke, Street Trees in Paved Urban Environments – The Benefits and Challenges in treenet, 2018

Sam Bloch, Like AC for the Outdoors
https://www.theatlantic.com/ideas/archive/2025/07/shade-climate-change/683578/, July 2025
NYC DEP Cloudburst Management (familiarize yourself with the concept and presentations)
Kühl, Kaja, Phytocorridors, Arcgis Storymap, youarethecity 2024

Other resources:
New York City Street tree map: https://tree-map.nycgovparks.org/
https://www.treefolio.org/ (maps tree canopy in streets)

Week 12
11/19/2025 Reframing Mobility
We will discuss the broadening of mobility trends from micromobility to enhanced public transit options, the prospect of autonomous vehicles and sharing systems.

- What impact does a greater variety of choices beyond the car have on emission reduction and traffic safety?
- What role does technology play?
- new modes of freight delivery and optimizing the last mile to reduce truck traffic, congestion and emissions from delivery.

Readings:
Eric Sanderson, Roads to Rails in Places Journal, 2013
Transportation Alternatives, Building an E-Micromobility Future, May 2023
NACTO, Designing for Small Things with Wheels, Working Paper, 2023
AIANY Freight and Logistics Working Group, Delivering the Goods, November 2022 (page 48 last mile interface)
https://www.popwheels.club/press/popwheels-and-uber-partner-to-open-americas-first-battery-swapping-hub

Week 13
11/26/2025 Thanksgiving, no class

Week 14 Final presentations
12/03/2025

CLASS LOGISTICS

Office Hours
In-person office hours can be scheduled Wednesday after the class. Other times of the week can be arranged for an online meeting. (Just send an email and ask and I will be happy to make time)

Attendance
TWO unexcused absences will result in a low pass and THREE unexcused absences will result in failing the class. (An excused absence can be allowed for medical or personal reasons, just notify me beforehand).

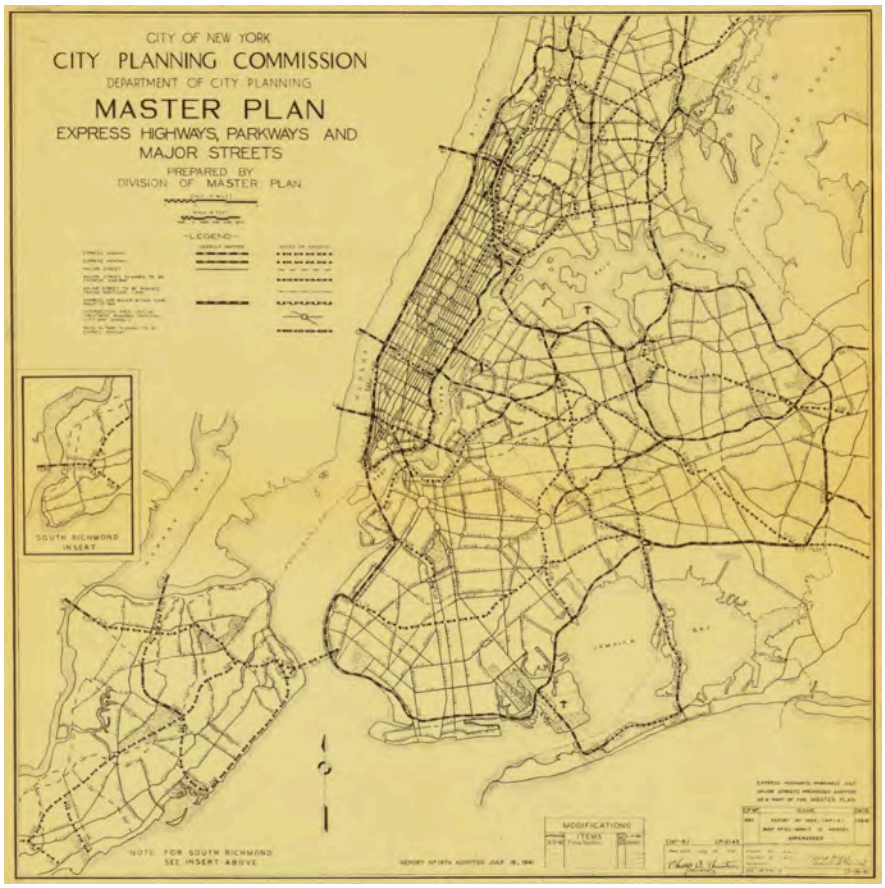
Plagiarism
Always credit your sources (this includes texts, images, and other media) and place a reference for sources in your deliverables (either as footnotes, endnotes or label underneath an image.)
GSAPP Plagiarism Policy: https://www.arch.columbia.edu/plagiarism-policy
GSAPP Honor System: https://www.arch.columbia.edu/honor-system
(A good habit to develop is to keep a running list of sources so you don't have to hunt them down at the end of the semester. You can leave the formatting to the end, but save at least a link, so you remember where you got that image or quote.)

Grading and Academic progress
GSAPP Grades: https://www.arch.columbia.edu/grades and
https://www.arch.columbia.edu/satisfactory-academic-progress

Students with Disabilities
Students seeking reasonable accommodations or support services from Disability Services (DS) are required to register with the disability office.

Learning Environment
All participants are expected to show respect and tolerance of others, in all matters and at all times. If you feel uncomfortable with any aspect of the learning environment, let's talk about it or, if you prefer, make an appointment with the Dean of Students, Danielle Smoller. If you are feeling stressed, help is available: make an appointment to talk with a mental health professional at Counseling and Psychological Services.

BIBLIOGRAPHY



Master Plan for Express Highways, Parkways and Major Streets, New York City Planning Commission, 1941

Brown, Hilary, Caputoa, Stephen, High Performance Infrastructure Guidelines, Design Trust for Public Space, 2005

Cooper Hewitt, The Road Ahead: Reimagining Mobility, Cooper Hewitt Exhibition, Dec 2018 - Mar 2019

Davis, Veronica O., Inclusive Transportation: A Manifesto for Repairing Divided Communities, Island Press, 2023

Gehl, Jan, *Life Between Buildings*, Washington DC, Island Press, 2011

Global Designing Cities Initiative, Global Street Design Guide, Washington DC, Island Press 2016

Marshall, Wes, *Killed by a Traffic Engineer: Shattering the Delusion that Science Underlies our Transportation System*, Island Press, 2025

Moreno, Carlos, The 15-Minute City: A Solution to Saving Our Time and Our Planet, Wiley Publishers, 2024

NYC Public Design Commission, Designing New York, Streetscape for Wellness, 2022

New York Times, Street Wars, ongoing weekly series

Regional Plan Association, Re-Envisioning the Right-of-Way, Report, October 2021

Sadik-Khan,Janette and Solomonow, Seth, Streetfight : Handbook for an Urban Revolution, New York, New York : Penguin Books. 2016

Speck, Jeff, *Walkable City: How Downtown Can Save America, One Step at a Time,* Picador Paper, Tenth Anniversary Edition, 2022

Schmitt, Angie, *Right of Way: Race, Class, and the Silent Epidemic of Pedestrian Deaths in America*, Washington DC, Island Press 2020

Urban Design Forum, Streets Ahead Initiative, 2022, (See also Streets for Climate)

Zipori, Esther, "The future of the urban street in the united states: visions of alternative mobilities in the twenty-first century" (2022). Dissertations. 1646.

Resources and Organizations

Bloomberg Citylab https://www.bloomberg.com/citylab/transportation

Global Designing Cities Initiative https://globaldesigningcities.org/

National Association of City Transportation Officials (NACTO) https://nacto.org/

See Blueprint for Autonomous Urbanism and Urban Street Design Guide

Segregation by Design https://www.segregationbydesign.com/

Streetsblog https://nyc.streetsblog.org/

Transportation Alternatives https://transalt.org/

The Atlas of Sustainable City Transport https://atlas.itdp.org/

TUMI (Transformative Urban Mobility Initiative https://transformative-mobility.org/