



NYU

WAGNER

**Prof. Manny Patole**

GCASL (238 Thompson) Rm 361  
M 4:55 - 6:35pm

NYU Email: [manny.patole@nyu.edu](mailto:manny.patole@nyu.edu)

Office: Virtual, By Appointment

# **Environmental Infrastructure for Sustainable Cities**

**Fall 2022: URPL-GP 2625.001**

## **Course Prerequisites**

1. CORE-GP.1018, Microeconomics for Public Management, Planning, and Policy Analysis; or
2. CORE-GP.1020, Management and Leadership; and
3. Co-requisites, any one of the following:
  - a. URPL-GP.1603, Urban Planning: Methods and Practice
  - b. URPL-GP.1620, Spatial Analysis and Visualization
  - c. URPL-GP.2608, Urban Economics
  - d. URPL-GP. 2631, Transportation, Land Use, and Urban Form
  - e. URPL-GP.2660, History and Theory of Planning

## **Course Description**

This class is about the physical structures and systems that determine the sustainability of cities and their environmental impact. We call those systems “environmental infrastructure.” The premise of the class is that compact, walkable cities are the least carbon- and energy intensive pattern of settlement today because of their integrated networks of infrastructure that allow us to move, eat, drink, play, and survive extreme weather. As our population shifts to urban and coastal areas, we will need to build more infrastructure systems to accommodate growth and to increase sustainability. Yet we are building too little, too slowly to maintain our existing infrastructure, let alone to facilitate next generation systems that will accelerate our society to a truly low-carbon future. Our transportation, water, parks, freight, solid waste, and energy infrastructure systems are crumbling, and new needs such as coastal flood mitigation and resiliency are not being met. With little political will for massive public works programs and current procurement practices that are slow and costly, cities are starting to use innovative ways to deliver these critical assets, including design-build procurement, long-term concessions, private operation, maintenance and financing, and other forms of public-private partnerships. Cities are pooling resources to solve problems through infrastructure exchanges and accelerators, and are creatively reimagining and reusing

obsolete and neglected land and buildings, and are integrating services to create infrastructure that is multi-purpose, resilient, and sustainable. And the federal government and some states are considering transformative, large-scale infrastructure investments for the first time.

## Course Objectives

This course is designed to educate planning and urban development professionals on contemporary physical infrastructure impacted by the challenges posed by climate variability. The class aims to look at environmental infrastructure through the lens of resiliency and sustainability to better understand infrastructure requirements, policy, funding, construction, and operations that are necessary to build the cities of tomorrow and achieve a sustainable society. Using case studies that highlight local, regional, and global “best practices” of “environmental infrastructure” – transportation, mobility, water/sanitation, energy, solid waste, public space, housing, connectivity – this course aims to inform project life cycles and think critically about what to consider and how decisions are made. Students will discuss the role of infrastructure and different policy approaches towards planning and project conception, cost benefit analysis, prioritization, alternative delivery and private-public partnerships, coalitions of interested stakeholders and partners, funding and financing, governance, and operations and maintenance. They will apply these lessons to current infrastructure issues in both group and individual formats that mimic the professional settings they will face after graduation, and will learn to receive and provide constructive feedback from and to their peers.

## Learning Objectives

By the end of this course, students will have the capacity to be active infrastructure leaders because they will be able to:

- Discuss the importance of infrastructure to improving the environment and creating sustainable cities and communities;
- Understand the importance of federal, state, and municipal policy to infrastructure development, how policy is created, and how policy can be influenced;
- Analyze standard infrastructure development stages and requirements, as well as different procurement approaches;
- Explain the characteristics and benefits of public private partnerships and alternative delivery mechanisms and analyze whether those mechanisms are appropriate for any or all stages of a particular project;
- Present analysis and solutions in different formats (group oral presentation with slides/graphics, and a written memorandum and business case);
- Develop expertise on the subject matters chosen for the group and individual project; and
- Expand critical analytical and thinking skills

## 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.

## **Henry and Lucy Moses Center for Students with Disabilities at NYU**

Academic accommodations are available for students with disabilities through the [Moses Center for Student Accessibility](#). You may also call or email CSA (212-998-4980 or [mosescsd@nyu.edu](mailto: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.

## **University Calendar Policy on Religious Holidays**

The Policy can be found [here](#). Please notify me in advance of any days you observe that may impact the submission of deliverables or impact your attendance and we can discuss mutually acceptable alternatives. Calendar for Fall 2022 can be found [here](#).

## **NYU's Wellness Exchange**

[NYU's Wellness Exchange](#) has extensive physical and mental health resources. A private hotline (212-443-9999) is available 24/7 that connects students with a professional who can help them address day-to-day challenges as well as other health-related concerns.

## **Class Statement on Diversity, Equity and Inclusion**

The NYU Wagner values an inclusive and equitable environment for all our students. I hope to foster a sense of community in this class and consider it a place where individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations, and abilities will be treated with respect. It is my intent that all students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. If this standard is not being upheld, please feel free to speak with me.

# Class Information

## Policies

### Participation and Attendance

Students are expected to be fully prepared for class by completing all reading and actively thinking about the issues to be discussed. Students are also expected to participate actively in class by enhancing our understanding, and not diverting or dominating the discussion but showing awareness of the flow of thought. Insightful questions count as least as much as insightful comments. Your participation will require that you answer questions, defend your point of view, and challenge the point of view of others. If you need to miss a class for any reason, please discuss the absence with me in advance.

### Late Work

There will be no credit granted to any written assignment that is not submitted on the due date noted in the course syllabus without advance notice and permission from the instructor.

### Standard Formatting

All assignments are submitted via Brightspace in either DOCX or PDF format, 1.5 to 2.0 spaced, 11-12pt font, and with a proper heading to the designated assignment folder otherwise instructed. A properly headed assignment should include your full name, the date of submission, and assignment title. Students must include their Wagner mailbox number on a paper so that the paper can be returned. For example:

*George Figueroa (Box 123)*

*September 1, 2022*

*Assignment #1*

For submissions that are more than one page, each page should have a header or footer that includes the page number, your LAST (or family) NAME and the assignment title (ie Patole Personal Biography).

### Citations

All written assignments must cite sources and be submitted to the course website (not via email unless otherwise instructed). A recognized citation style (ie APA, Chicago, MLA) should be used and used consistently throughout your work.

### Student Resources

There is no textbook for this class. All readings are available online on our Brightspace portal or through the library. [NYU Libraries](#) offer many quantitative and writing resources as well as skills workshops. [NYU Wagner has its own area of services curated for their specific student needs](#), including our very own librarian, [Katie Wissel](#) ([katie.wissel@nyu.edu](mailto:katie.wissel@nyu.edu)).

# Assignments

Failure to format any of your assignments according to the instructions above will result in a deduction of points on the assignment.

## Office Hours - By Appointment

Please email me to schedule an appointment for office hours via email.

## Required Readings

Required readings and optional readings are listed for each class in Brightspace.

## NYU Brightspace

All announcements, resources, and assignments will be delivered through the NYU Brightspace site. I may modify assignments, due dates, and other aspects of the course as we go through the term with advance notice provided as soon as possible through the course website.

## Grading

Grades will be determined from the following allocation:

- Participation (20%) - Including Brightspace discussion boards, in-class conversations and activities that will gauge your engagement with with the readings
- Group Presentation (40%) - Infrastructure Problem and Potential Solutions (40%)
- Policy Memo (40%) - Individual Memorandum and Business Case Analysis on an Infrastructure Delivery Plan

## Participation

In this class we learn from each other's professional and lived experience as well as the assigned readings and instructure. To that end, this class is designed to facilitate discussion: full and active participation is a key and graded part of the course.

We are in a learning environment, which means none of us know the answer to everything. We should also be mindful that we all may not share the same opinions or lived experiences. Please be courteous and respectful to your fellow classmates and the instructor as we are here to grow as individuals and professionals.

- Discussion boards: I will post questions in advance of the class that will guide our in-class discussion. Students are encouraged to start the conversation in advance as well, through sharing materials or lived experience pertaining to the prompt.
- In-class Conversation: Be prepared to respond to questions about the topic, the assigned readings and discussion board questions. Innovation and ideation comes from these types of exchanges and are beneficial pedagogically and professionally.
- Activities: I will use other tools like debates, role playing, etc to expand your knowledge through immersion. The premise is to understand the positions through the lens of others and how they interpret decisions, processes, and policy.

## Group Presentation

Students will form “consultancies” of three students that have been “hired” by a New York City public agency or authority to help solve a complex issue related to a local infrastructure project or policy. There will be two deliverables to inform public officials whether or not to support an infrastructure project (but be prepared to answer how the presentation would be adjusted for meetings with different audiences i.e. local community, public officials, financial supporters, and other stakeholders):

- Presentation: The group will be challenged to explain the issue, to present analysis, and to propose solutions in 10 minutes with 7-10 slides.
- Supporting Policy Memo: The group will provide a memo that includes the research used to support what you presented.
- Midterm Memo with further details will be available in Brightspace

You are free to structure the presentation as the team feels is best to make the case or solve the problem identified. Both the presentation and memo should respond to most if not all of the following questions:

1. Problem definition: What is the problem? Why is it a problem? For whom is it a problem? What are the economic, environmental, and social costs?
2. Problem analysis: What are the causes of the problem? What role can infrastructure and supporting policy interventions play in solving it? What data exists or can be created to help inform the problem?
3. Solution generation: What is the solution? How does it solve the problem? What is required for its implementation, and is it feasible in a reasonable timeframe? Who should do what and when? What are threats along the way? How can these be dealt with?
4. Solution and alternatives analysis: In which measure does the solution solve the problem? How certain of its effectiveness are we? Do the benefits/advantages outweigh the costs/disadvantages? How can the solution be improved following the assessment?
5. The Precedent: The group must cite an infrastructure example from NYC history that supports your position. The example should be from a NYC borough that IS NOT Manhattan.

Progress Milestones:

- Identify teams and indicate general area of interest (Class 1);
- Presentation Topic Proposal (Class 3)
- Consultation with Professor (Between Class 2-5, by Zoom or office hours);
- Team meetings (outside of class between Classes 4 and 8);
- Supporting Policy Memo, Slide Deck (Class 9)
- In-class presentation with questions and feedback from non-presenting students (Classes 9/10); and
- Group self-assessment (Class 10)

## Policy Memo

Following the same structure and questions used to frame the group presentation, each student will prepare a memorandum and business case evaluation for an infrastructure delivery plan to address an historical or current environmental or social issue.

- If the topic is historical infrastructure: The Memo should describe what happened, why, and how, and the perceived benefits and costs, and should also include critical analysis, such as whether there were alternatives at the time (better/worse than the project, doing nothing), why alternatives were rejected, how project or program procurement, governance, financing could have been improved, etc.
- If the topic is current infrastructure: The memo should describe what happened to date, why and how, and the perceived benefits and costs, and should also include critical analysis, such as what are the current alternatives (to do nothing, other proposals to address the issue), why the plan is better than the alternatives, how project or program procurement, governance, financing could have been improved, etc.

### Parameters

- Final Project Memo with further details will be available in Brightspace
- The project cannot be a project based in NYC.
- The length should be long enough to inform the audience but not too long to fit into a busy schedule – the target length should be between 10-15 pages (or about 2,500 to 3,000 words).
- Standard formatting and citations
- Some ideas are listed in Brightspace in the corresponding assignment folder.

### Progress Milestones:

- Final Project Proposal (Class 7);
- Final Project Abstract with outline (Class 11);
- Final Project Due December 16, 2022

# Grading Rubrics and Scale

Student work and progress towards course goals will be evaluated by professional standards, i.e., demonstrating a thorough understanding of applicable concepts, comprehensive research, rigorous analysis, and an unbiased, persuasive, and clear recommendation for action. In other words, a public official would find the presentation or document to be a sound basis to make a decision. Your emphasis should be on originality of approach and/or new analysis, depth of thought, clarity of expression, and brevity, not the number of words. Students are encouraged to spend at least twice as much time thinking and talking through the problem and solutions, especially on developing a unique approach to a problem, as in writing. Once students have a clear, logical framing of the problem and solution, the writing will be better and easier.

Detailed grading rubrics will be distributed before the group and individual assignments. Letter grades for the entire course will be assigned as follows:

- (A, 95-100) Excellent: Exceptional work for a graduate student. Work at this level is unusually thorough, well-reasoned, creative, methodologically sophisticated, and well written. Work is of exceptional, professional quality.
- (A-, 90-94) Very good: Very strong work for a graduate student. Work at this level shows signs of creativity, is thorough and well-reasoned, indicates strong understanding of appropriate methodological or analytical approaches, and meets professional standards.
- (B+, 87-89) Good: Sound work for a graduate student; well-reasoned and thorough, methodologically sound. This is the graduate student grade that indicates the student has fully accomplished the basic objectives of the course.
- (B, 83-86) Adequate: Competent work for a graduate student even though some weaknesses are evident. Demonstrates competency in the key course objectives but shows some indication that understanding of some important issues is less than complete. Methodological or analytical approaches used are adequate but student has not been thorough or has shown other weaknesses or limitations.
- (B-, 80-82) Borderline: Weak work for a graduate student; meets the minimal expectations for a graduate student in the course. Understanding of salient issues is somewhat incomplete. Methodological or analytical work performed in the course is minimally adequate. Overall performance, if consistent in graduate courses, would not suffice to sustain graduate status in “good standing.”
- (C/-/+ , 66-79) Deficient: Inadequate work for a graduate student; does not meet the minimal expectations for a graduate student in the course. Work is inadequately developed or flawed by numerous errors and misunderstanding of important issues. Methodological or analytical work performed is weak and fails to demonstrate knowledge or technical competence expected of graduate students.
- (F, <65) Fail: Work fails to meet even minimal expectations for course credit for a graduate student. Performance has been consistently weak in methodology and understanding, with serious limits in many areas. Weaknesses or limits are pervasive.



# Overview of the Semester

Class details will be provided in Brightspace before class.

Week	Date	Topic	Deliverable
Week 1	Sept 12	Welcome to Environmental Infrastructure! Introductions, Syllabus Overview, Assignments and Evaluation, The Role of Infrastructure in Economic Development, Environmental Protection, and Social Welfare	Personal Bio Midterm Teams
Week 2	Sept 19	Making the Case for Infrastructure: Politics, Stakeholders, Planning, and Economics	
Week 3	Sept 26	Governance, Funding, and Financing Infrastructure	Group Midterm Proposal
Week 4	Oct 3	Transportation	
Week 5	Oct 11 (Tuesday)	Mobility	
Week 6	Oct 17	Water Supply and Sanitation	Guest Lecture: Rachelle Sanderson
Week 7	Oct 24	Energy	Final Project Proposal
Week 8	Oct 31	Solid Waste	
Week 9	Nov 7	Group Presentations	Group Presentations
Week 10	Nov 14	Group Presentations/Intro Placemaking	Group Presentations
Week 11	Nov 21 / TBD	Public Spaces	Final Project: Abstract and Outline
Week 12	Nov 28	Housing	
Week 13	Dec 5	Digital Equity	
Week 14	Dec 12	Sustainable and Resilient Infrastructure	

Week 15	Dec 16	Reading Period	Final paper due by 5pm
---------	--------	----------------	---------------------------