SCHAR SCHOOL OF POLICY
AND GOVERNMENT
George Mason University

College of Engineering and Computing
SID AND REVA DEWBERRY DEPARTMENT OF CIVIL,
ENVIRONMENTAL, AND INFRASTRUCTURE ENGINEERING
George Mason University

GOVT 490-002 / CEIE 499-005 Fall 2025
Infrastructure Past, Present and Future

Draft: 5/2/25

Instructor: Jonathan L. Gifford (jgifford@gmu.edu), George Mason University

- Professor, Schar School of Policy and Government
- Affiliate Faculty, Sid & Reva Dewberry Department of Civil, Environmental, and Infrastructure Engineering
- Director, Center for Infrastructure Public-Private Partnership Policy

Meeting time/place: Friday, 10:30 AM – 1:10 PM, Horizon Hall, rm. 4012.

Office hours: Thursdays, 3:00 – 4:00 p.m. (book through Blackboard), or arrange a separate appointment.

Learning Outcomes

The learning objectives of this course are to enhance students' knowledge, skills, and abilities of the infrastructure policy and governance domain, and to enhance students' capacity to use writing and speaking to deepen their own understanding of the material and communicate it effectively in ways appropriate to their academic and professional development.

Upon completion of this course, the successful student should be able to:

Infrastructure Policy and Governance

1. Describe the development of infrastructure systems in the U.S. and other nations in social and technological terms.
2. Identify and apply criteria for evaluating infrastructure performance.
3. Describe and critique alternative approaches to delivering infrastructure.
4. Develop a deep knowledge about one or more specific infrastructure sectors.
5. Evaluate options for future infrastructure development approaches.
6. Recognize relevant career opportunities in the infrastructure sector.

Writing and Speaking Skills and Abilities

7. Use informal or formal writing in ways that deepen their awareness of the field of study and its subject matter.
8. Draft and revise written works based on feedback from instructors and peers, using strategies appropriate to the genre, audience, and purpose.

9. Compose in one or more written genres specific to the field of study in order to communicate key ideas tailored to specific audiences and purposes; genres may be academic, public, or professional.
10. Present their work orally to an audience of their instructor and peers.

Requirements

Assignment 1 (10%) – Infrastructure Component Briefing (due week 2)

- Create a 4-slide briefing about an infrastructure component of your choice. Address each of the following 7 questions:
    1. What is it?
    2. What is its function?
    3. How well does it work?
    4. How do you judge how well it works (that is, what criteria did you use for question 3)?
    5. Who created it (that is, which company, government body or other entity)?
    6. How is it paid for?
    7. Why did you pick it?
- Upload the briefing slides in PDF to Blackboard by close of business on the day before the class meeting in week 2.
- Present the briefing to class in 3 minutes during class in week 2. Presentations will be timed and stopped at 5 minutes sharp. Out-loud rehearsing is advisable. To save time, you will only be able to use the briefing slides that you have uploaded to Blackboard before class. You may not use updated briefing slides from a source other than Blackboard.

Assignment 2 (30%) – Infrastructure Group Case Study (due starting week 8)

- Select an infrastructure project and presentation date during the class meeting of week 2. Selection will be constrained to balance groups. There will be approximately 5 groups of 3-4 students each.
- Create a group website of approximately 2,500 words about an assigned infrastructure project as a chapter in Wikibooks to be shared with the rest of the class four days before the lass meeting where the case will be discussed. [Examples of Wikibooks chapters created by students for this assignment are available here](#).
- Participate in the development and delivery of a 20-minute group presentation about the project on the presentation date.
- Submit a confidential self- and peer-evaluation to the instructor of each member of your group.

Assignment 3 (30%) – Research Paper

- The research paper should be approximately 2,000 words in length, excluding notes and references. It should focus on an analytical question.

- Analytical question: The core of the paper should be an evaluation or synthesis drawing inferences or conclusions. Describing an issue or topic area is not sufficient, although the paper may need to contain descriptive material to set the stage for the analysis.
- In approximately 250 words, compose a problem statement for the research paper, and meet with the instructor to discuss it and receive feedback in week 4. The problem statement must include the proposed analytical question for the paper, and a preliminary research plan including sources of evidence and methods to be used in analyzing that evidence (i.e., methodology).
- Resubmit the problem statement and analytical question in week 6.
- Submit a draft research paper for peer review in week 11. Each paper will be assigned 2 peer reviewers.
- Submit the research paper for a grade in week 13. Grades will be posted in week 14.
- Present a 3-minute briefing on the paper in class in week 14.
- If you wish, submit a revised version of the research paper on the final exam date. Include a 1-page writer's memo to the instructor explaining how you have revised the paper in light of the instructor's comments. The new grade will fully replace the original grade. The new grade may be higher (the usual case) or lower (if the paper is unchanged or worse) than the original grade.

Class Participation (30%)

- Attendance and on-time arrival (5%); preparation and class discussion (15%).
  - Inform the instructor in advance if you will miss a class. The instructor may assign make-up material in the case of an absence.
  - Read assigned material and participate in classroom discussion. The instructor incorporates occasional pop quizzes as a tool to gauge students' engagement with and understanding of the assigned readings. These quizzes are designed to encourage consistent preparation and reinforce key concepts from the material.
  - The class uses student-led discussion as a primary tool for class discussion. This means that the instructor poses questions for the students to discuss among themselves. The instructor's role is to assign prep materials, pose questions, and from time to time to guide the discussion if it is going off track.
- Write two research paper peer reviews of approximately 250 words in week 12 (4%)
- For groups other than your own group, write 200-word critiques of the other groups' Wikibooks chapters prior to class start on the day of each group's presentation through a Blackboard discussion board (4%). Critiques should answer three questions:
  1. What is the case study about, summarized in one short paragraph?
  2. What is your view of the worthiness of the infrastructure project that is the subject of the case? That is, did it make society better or worse off? Why?
  3. What is your assessment of the group's Wikibooks chapter (content, sources, objectivity, etc.)?
- Last class 3-minute term paper briefing (2%).

Grading Schema

In this course, academic excellence and achievement are recognized and graded on a traditional A-F scale. To earn an 'A', a student must demonstrate outstanding understanding and application of course materials, going beyond the basic requirements with insightful and original contributions. This includes completing all assigned work with a weighted average score of 90% and above and actively participating in class discussions. A 'B' is awarded to students who meet all the standard requirements competently, with weighted average scores of at least 80% but less than 90%, showing a good understanding of the course content. A 'C' reflects a satisfactory performance, where the student meets the basic learning objectives with scores of at least 70% but less than 80%. A 'D', scored from at least 60% but less than 70%, indicates that a student has met the minimum requirements but with significant room for improvement. Finally, an 'F' is given when a student fails to meet the basic learning objectives of the course, scoring below 60%. Attendance, participation, and adherence to class policies also play a crucial role in the final grade determination. This schema, including ranges for "+" and "-" is shown in the following chart:

Grades Scored Between	Will Equal	Grades Manually Entered as	Will Calculate as
97 % and 100 %	A+	A+	98.5 %
94 % and Less Than 97%	A	A	95 %
90 % and Less Than 94%	A-	A-	91.5 %
87 % and Less Than 90%	B+	B+	88.5 %
84 % and Less Than 87%	B	B	85 %
80 % and Less Than 84%	B-	B-	81.5 %
77 % and Less Than 80%	C+	C+	78.5 %
74 % and Less Than 77%	C	C	75 %
70 % and Less Than 74%	C-	C-	71.5 %
60 % and Less Than 70%	D	D	65 %
0 % and Less Than 60%	F	F	55 %

Note: Weekly assigned readings are accessible through the Leganto reserve list linked to the "Readings/Media" tab in Blackboard.

Instructor

Dr. Jonathan L. Gifford is a Professor in the Schar School of Policy and Government at George Mason University, an affiliate faculty member in the Sid & Reva Dewberry Department of Civil, Environmental, and Infrastructure Engineering, and the director of the [Center for Infrastructure Public-Private Partnership Policy](). The Center advances consideration of public-private partnerships in transportation system renewal and development through research, education, and public service.

Professor Gifford's primary area of expertise is transportation and public policy, with a particular focus on transportation and infrastructure finance. His recent research investigates transportation finance and the role of public-private partnerships.

His book *Flexible Urban Transportation* (2003) examines policies to improve the flexibility of urban transportation systems. He has also studied the role of standards in the development and adoption of technology, particularly technological cooperation across jurisdictional boundaries through coalitions and consortia.

He received a B.S. in Civil Engineering from Carnegie Mellon University, and an M.S. and Ph.D. (1983) in Civil Engineering (Transportation) from the University of California, Berkeley.

Academic Policies

Writing Across the Curriculum

This course satisfies the University's requirements for Writing Across the Curriculum (WAC). WAC emphasizes the multiple modes of writing:

1. Writing as Process: Students will receive feedback from the instructor on assignments and have the opportunity to revise and resubmit for further consideration. Students will also engage in peer review of the research paper assignment. Students will show how they have incorporated feedback into their edits and revisions. They will also learn how to provide substantive and constructive feedback for their peers and practice these skills in class activities.
2. Writing to Communicate: Students demonstrate how to communicate in a concise and informative manner as expected of professionals in the fields of government, civil engineering, and public administration, through the composition of both an infrastructure briefing and an infrastructure case study, and associated oral presentations. Students will also produce a research paper of 2,000 words. This is in addition to ongoing assignments/activities where students analyze sources, evaluate writing approaches, and learn how to craft a thesis statement.
3. Writing to Learn: Student will explore infrastructure projects and systems individually and in groups and brainstorm potential topics. In short written assignments throughout the course and in developing the research paper, students will have

opportunities to clarify the purpose and audience of the project, analyze infrastructure problems and solutions, evaluate group work, provide and receive feedback on oral presentations, and assess the case studies and Wikibooks presented by peers to help build the skills needed for the final paper

George Mason Honor Code

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University Community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this Honor Code: **Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.** The full text of the Honor Code is available here.

Chatbots and AI[1]

By now pretty much everyone has heard about chatbots like ChatGPT that write remarkably coherent text on almost any issue. Many worry that cheating will skyrocket and that the college essay will be finished.[2]

I don't agree. We'll discuss further in class, but here's a short statement about the use of ChatGPT and other services:

Use them, but use them carefully, as you would a powerful but dangerous tool. Since they are freely available and can produce passable, even convincing, text, they are likely to become widely used: perhaps they are already. Their ubiquity has effectively raised the writing bar for all of us: no one has an excuse to produce anything other than the standard that ChatGPT can easily achieve.

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[1] Adapted with permission from Todd La Porte, Environmental Policy, PUAD 642/EVPP 642 (syllabus), spring 2023, George Mason University.

[2] A list of notable articles for teachers and professors can be found here. Examples include:

Chen, Brian, "How to use ChatGPT and still be a good person," *The New York Times*, December 21, 2022.

Miller, Claire Cain, Adam Playford, Larry Buchanan and Aaron Krolik, "Did a fourth grader write this? Or the new chatbot?" *The New York Times,* December 26, 2022.

Harwell, Drew Nitasha Tiku and Will Oremus, "Stumbling with their words, some people let AI do the talking," *The Washington Post*, December 10, 2022.

ChatGPT/LLM Errors (a spreadsheet of mistakes in ChatGPT output) moderated by Davis, Hendler, Hsu, Leivada, Marcus, and Witbrock (ongoing).

Katwala, Amit, "ChatGPT's Fluent BS Is compelling because everything Is fluent BS," *Wired*, December 9, 2022.

Biddle, Sam, "The Internet's new favorite AI proposes torturing Iranians and surveilling mosques," *The Intercept,* December 8, 2022.

Bogost, Ian, "ChatGPT is dumber than you think," *The Atlantic*, December 7, 2022.

McMurtrie, Beth, "Teaching: Will ChatGPT change the way you teach?" *The Chronicle of Higher Education Newsletter,* January 5, 2023.

This can be helpful. If you struggle with writing, ChatGPT can polish your writing to a higher level. If English is not your native language, ChatGPT can help you get a leg up in communicating using conventional English. Like a handheld calculator, or the text correction/completion functions in a word processor, AI can help with some of the mechanics of calculating and writing. Early fears that electronic calculators would dumb down students' math skills appear to have been overblown. And Lord knows I'd rather read typo-free and logically constructed text than material that is full of mistakes or flaws in structure or syntax.

But there are serious shortcomings to these programs. They can indulge in outright fantasies, for example making up facts and the names of authorities. If this weren't so serious it would be hilarious. If you write reasonably well, ChatGPT will keep your writing at a very average level. Its output is, frankly, boring and middle-of-the-road. In an experiment with an early version of ChatGPT students were asked to try to "cheat" using the program to write a paper. Most found that it was harder to use the AI assist than to write the paper themselves, because it kept going off in directions the students didn't want it to go, and it was hard to piece together a coherent narrative with chunks of text generated from a model of the workings of the Internet hivemind. Some students found it was more work to "cheat" than to simply write their papers themselves.

Experiments with material like that in this syllabus show that ChatGPT does a reasonable job of summarizing top-level themes, but does so without depth or ability to hone in on interesting aspects of the material. As mentioned, ChatGPT output is frequently boring and superficial, and in fact relatively easy to spot. Use it as a helper, not as a substitute. It will not be helpful to use in Blackboard postings, as these are about your own thoughts and comments on the material, particularly as you respond to classmates' postings.

So, the course policy on using ChatGPT or other services is you may use them to get started with a new topic, to get your writing off and running, or to clean up something you are struggling with that an "extra" pair of eyes might help you with. If you use ChatGPT, however, you must flag the text that the program generated by ==highlighting it==, and you are required to provide a statement of how you used it to write and edit your paper. I reserve the right to inquire further if it seems to me that flagging is inconsistent or not utilized.

Here is an example of a statement of acknowledgements:

Acknowledgments

I acknowledge the following individuals reviewed, proofread, or provided feedback on the composition of this assignment.

FIRST NAME LAST NAME - 31 March 2024

FIRST NAME LAST NAME - 13 April 2024

The following computer software was used to improve this assignment for submission. Grammarly (free version) 3 April 2024

ChatGPT 3 April 2024

Statement of Use: AI

After completing an original draft of the paper, ChatGPT and Grammarly Premium were used to polish grammar, sentence structure, and vocabulary. Edits from this software were reviewed and incorporated into the final copy as appropriate.

Disabilities

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit the [Disability Services website](#) for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500.
Email: ods@gmu.edu | Phone: (703) 993-2474.

Academic Standards

Academic Standards exist to promote authentic scholarship, support the institution's goal of maintaining high standards of academic excellence, and encourage continued ethical behavior of faculty and students to cultivate an educational community which values integrity and produces graduates who carry this commitment forward into professional practice.

As members of the George Mason University community, we are committed to fostering an environment of trust, respect, and scholarly excellence. Our academic standards are the foundation of this commitment, guiding our behavior and interactions within this academic community. The practices for implementing these standards adapt to modern practices, disciplinary contexts, and technological advancements. Our standards are embodied in our courses, policies, and scholarship, and are upheld in the following principles:

- Honesty: Providing accurate information in all academic endeavors, including communications, assignments, and examinations.
- Acknowledgement: Giving proper credit for all contributions to one's work. This involves the use of accurate citations and references for any ideas, words, or materials created by others in the style appropriate to the discipline. It also includes acknowledging shared authorship in group projects, coauthored pieces, and project reports.
- Uniqueness of Work: Ensuring that all submitted work is the result of one's own effort and is original, including free from self-plagiarism. This principle extends to written assignments, code, presentations, exams, and all other forms of academic work.

Violations of these standards—including but not limited to plagiarism, fabrication, and cheating—are taken seriously and will be addressed in accordance with university policies.

[The process for reporting, investigating, and adjudicating violations is outlined in the university's procedures here](). Consequences of violations may include academic sanctions, disciplinary actions, and other measures necessary to uphold the integrity of our academic community.

The principles outlined in these academic standards reflect our collective commitment to upholding the highest standards of honesty, acknowledgement, and uniqueness of work. By adhering to these principles, we ensure the continued excellence and integrity of George Mason University's academic community.

Student responsibility: Students are responsible for understanding how these general expectations regarding academic standards apply to each course, assignment, or exam they participate in; students should ask their instructor for clarification on any aspect that is not clear to them.

Accommodations for Students with Disabilities

Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit the [Disability Services website]() for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: [ods@gmu.edu](). Phone: (703) 993-2474.

Student responsibility: Students are responsible for registering with Disability Services and communicating about their approved accommodations with their instructor in advance of any relevant class meeting, assignment, or exam.

FERPA and Use of GMU Email Addresses for Course Communication

The Family Educational Rights and Privacy Act (FERPA) governs the disclosure of education records for eligible students and is an essential aspect of any course. **Students must use their GMU email account** to receive important University information, including communications related to this class. Instructors will not respond to messages sent from or send messages regarding course content to a non-GMU email address.

Student responsibility: Students are responsible for checking their GMU email regularly for course-related information, and/or ensuring that GMU email messages are forwarded to an account they do check.

Title IX Resources and Required Reporting

As a part of George Mason University's commitment to providing a safe and non-discriminatory learning, living, and working environment for all members of the University community, the University does not discriminate on the basis of sex or gender in any of its education or employment programs and activities. Accordingly, **all non-confidential employees, including your faculty member, have a legal requirement to report to the Title IX Coordinator, all relevant details obtained directly or indirectly about any incident of Prohibited Conduct** (such as sexual harassment, sexual assault, gender-based stalking, dating/domestic violence). Upon notifying the Title IX Coordinator of possible Prohibited Conduct, the Title IX Coordinator will assess the report and determine if outreach is required. If outreach is required, the individual the report is about (the "Complainant") will receive a communication, likely in the form of an email, offering that person the option to meet with a representative of the Title IX office.

For more information about non-confidential employees, resources, and Prohibited Conduct, please see University Policy 1202: [Sexual and Gender-Based Misconduct and Other Forms of Interpersonal Violence](). Questions regarding Title IX can be directed to the Title IX Coordinator via email to [TitleIX@gmu.edu](), by phone at 703-993-8730, or in person on the Fairfax campus in Aquia 373.

Student opportunity: If you prefer to speak to someone confidentially, please contact one of Mason's confidential employees in [Student Support & Advocacy (SSAC)](), Counseling and [Psychological Services (CAPS)](), [Student Health Services (SHS)](), and/or the [Office of the University Ombudsperson]().