

## RESILIENT URBAN SYSTEMS: PRACTICUM ON TRANSIT

Columbia University / GSAPP 6617 / FALL 2018

**Day/Time:** Tuesdays 3:00pm-5:00pm

**Location:** first five classes in Ware Lounge, Room 600, Avery Hall (with A6832); subsequent classes in Room 200 of Buell Hall

**Instructor:** Thaddeus Pawlowski, [t.pawlowski@columbia.edu](mailto:t.pawlowski@columbia.edu), in coordination with Professor Kate Orff's "Resilient Design: Ecological Infrastructure" and Gideon Finck, Research Scholar at the Center for Resilient Cities and Landscapes. Office Hours by appointment

### COURSE DESCRIPTION

The only rail tunnel that connects New York City to the rest of America could be on the [brink of collapse \(Links to an external site.\)Links to an external site.](#); its 110 year old concrete structure is corroding from salt water brought in by Hurricane Sandy. While policymakers fixate on autonomous vehicles, public transit is becoming more [difficult to build \(Links to an external site.\)Links to an external site.](#) and maintain despite the widespread acknowledgement of its centrality [to our urban economie \(Links to an external site.\)Links to an external site.](#)s. With rising transportation and housing costs, [only 26% of US neighborhoods are now affordable \(Links to an external site.\)Links to an external site.](#) (combined housing and transportation costs being less than 45% of the average area income). Meanwhile, [at least 25 million kilometers of new roads are expected worldwide by 2050 \(Links to an external site.\)Links to an external site.](#)—enough to circle the Earth over 600 times. 90% of all road construction is occurring in developing nations, including many regions with exceptional biodiversity and vital ecosystem services.

How can we build transportation infrastructure that maximizes the benefit to those who need it most, minimizes harm to the environment, that is robust to the future stresses and shocks of the 21st century, and most of all, sets a framework for sustainable, equitable and resilient growth for our cities.

The seminar starts with an acknowledgement that many transportation projects of the past failed to be inclusive in their planning, failed to make the wisest investments in robust and adaptable hardware, and too often perpetrated ecological destruction and perpetuated social and economic divisions, sometimes through direct displacement of marginalized communities and sometimes through the disproportionate allocation of public benefit to the wealthy and powerful. We will then ask: What needs to change in our tools and processes for planning and designing transportation infrastructure to avoid making these same mistakes? Should greater mobility still be viewed as a universal good knowing what we know today about the power of telecommunications and the extreme vulnerability of our remaining intact ecosystems? What are the fundamental fragilities in the current and future movement of people and goods, and how can we better design our systems to anticipate future shocks and stresses? How should all of these decisions be made?

Working in teams of two, students will investigate these questions in relationship to a case study of recently completed or soon to be completed transportation project such as 7-line extension to Hudson Yards, Brooklyn-Queens Connector, Miami-Dade SMART plan, Bus Rapid Transit system in Curitiba, Metrocable in Medellin, or China's New Silk Road. Each of these case studies will be studied for their total costs and benefits across a variety of sectors, geographic scales, and timeframes. We will examine their implementation pathways with special attention to stakeholder engagement, systems design, and financing. Using resilience values, we will evaluate the completed projects and make recommendations for those which are in their planning phases.

As students are developing their case studies, the Center for Resilient Cities will be conducting a simultaneous analysis of the Leyenburg Corridor in the Hague, a proposed new transit line connecting the city center to the Zuid-West neighborhood, one of the more socially vulnerable locations in the Netherlands. In partnership with 100 Resilient Cities, the Chief Resilience Officer of the Hague, other senior city officials, and faculty in planning at TU Delft, this analysis will help to guide how the Leyenburg Corridor can learn lessons from other cities to build a more resilient transit system. The analysis will also serve a methodological framework for student case studies during the seminar. At the end of the term, we will compile all case studies and have a teleconference with our counterparts in the Netherlands.

## **FORMAT**

The class includes lectures by the instructors, invited speakers, library research, field trips, student-led presentations on case studies and readings, and discussions of timely issues. Students are expected to be prepared to discuss assigned readings and engage in active listening and a lively discussion during course time. During the first half of the semester, we will discuss the meaning of resilience and adaptation in the built environment via a series of lectures and readings.

Students are expected to do all of the assigned reading, to attend field trips, actively participate in class discussion, and to prepare questions for lectures and engage actively in dialogue.

In order to reduce paper consumption, PDFs of readings will be made available on Courseworks/Canvas, and books will be placed on our reserve shelf in Avery Library where possible. Note that your final report (approximately 10-15 pages) must source at least two required or recommended readings. You are asked to regularly and thoughtfully participate in discussions, and to prepare questions for speakers, and responses to readings. You cannot miss more than 3 classes. Please inform the instructor in advance should you have to miss class for any reason.

## **Course Schedule**

9/04

## 1. INTRODUCTION TO RESILIENCE AS A PLANNING FRAMEWORK

### Lecture & Discussion: Thad Pawlowski

#### Location: Ware Lounge

An introductory discussion on the objectives and format of the course, and review of the course schedule and expectations with Kate and Thad. Initial lecture on methodologies and strategies for changing the conversation and integrating resilience, infrastructure and equity into urban design & planning practice by Thad Pawlowski. What is the agency of the urban designer and planner? What is resilience? What is adaptation? How can resilience as an applied framework advance new collaborations, planning practice, and policy?

#### Reading:

*“Resilience thinking: sustaining ecosystems and people in a changing world.”* by BH Walker Island Press, 2006

IPCC 2014: Summary for Policymakers: [https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5\\_SYR\\_FINAL\\_SPM.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf) (Links to an external site.)Links to an external site.

Yale 360, "Is the Global Era of Massive Infrastructure Projects Coming to an End?" (Links to an external site.)Links to an external site.

9/11

## 2. NEXT CENTURY INFRASTRUCTURE : ECOLOGY & SOCIAL LIFE

### Lecture & Discussion: Kate Orff

#### Location: Ware Lounge

This class lecture and discussion with Kate O. will provide an overview of the ecosystem driven resilience concepts and examples of shocks and stressors facing global cities from sea level rise, to coastal erosion, to threats such as lack of sediment supply and sand mining. Design strategies will be presented that aspire to rethink urban design as socio-ecological change process and design strategies for combining regenerative Infrastructure with social agency.

#### Reading:

Toward an Urban Ecology, K. Orff, INTRODUCTION and SCALE Chapters (on Seminar shelf)

Frampton, Kenneth. *“Toward an Urban Landscape”* Columbia Documents of Architecture and Theory 4 (1995): 83-94 (on Courseworks/Canvas)

Klein, Naomi. This Changes Everything Simon & Schuster (2014) Introduction (in Drive)

**\*\*\*do the reading & prepare 3 questions for Kate, submit in Assignments\*\*\***

9/18

### **3. THE RESILIENCE DIVIDEND**

**LECTURE: Dr. Judith Rodin, Former President, The Rockefeller Foundation [CONFIRMED]**

**Location: Ware Lounge**

Dr. Rodin will share themes and topics from her book *The Resilience Dividend: Being Strong in a World Where Things Go Wrong..* She will share examples from 100 RC / Rockefeller's work and highlight initiatives that span policy, strategy, design, funding and implementation.

Reading:

The Resilience Dividend Judith Rodin. (on the seminar shelf) it is suggested that you read the entire book over the course of the semester, however you may for the purposes of this seminar session focus on Introduction and Chapter I.

**\*\*\*do the reading & prepare 3 questions for Dr. Rodin - please submit your questions via CANVAS before class time.**

9/25

### **4. REBUILD BY DESIGN: PANEL DISCUSSION**

**Location: TBD**

**Rebuild by Design was effort to fundamentally rethink how disaster recovery works, but might have even changed the way that many practitioners think about planning and design under everyday circumstances.**

300-320 Sam Carter, Rockefeller RBD and 100 RC

320-350 Shaun Donovan - Policy, Governance, Leadership in Resilience - Fed Govt Perspective

350-400 Thad Pawlowski - City Gov't Perspective

400-410 Kate Orff - Designer / Consultant / Implementation Perspective

410-445 Q&A with students

445 - Debrief on case study selection

**There are readings about RBD (as we call it) in the folders. Also please submit your case study proposals before class.**

10/2

## 5. NATURAL CAPITAL: CASE STUDY OF MOZAMBIQUE

### ASSESSING INFRASTRUCTURE'S IMPACTS ON VULNERABLE ECOYSTEMS

Ryan Bartlett, WWF, Washington DC

**Location: Ware Lounge**

This overview of the Natural Capital concept will cover designing for biodiversity, including plant communities, forest ecology, marine ecology and design principles to build resilience, reduce fragmentation and increase habitat. Example: Mozambique

Reading: Natural Capital Assessment

10/09

## 6. DEFINITIONS OF RESILIENCE AND CASE STUDY METHODOLOGY :

- discuss definitions of resilience in relation to transit projects
- review case study methodology, assignments for the rest of term
- review case study proposals
- additional case study examples

10/16

## 7. NYC FERRY AND WATERFRONT TRANSFORMATION

**Location: meet at Wall Street Pier 11 for a ride on the East River Ferry, followed by a walking tour of Red Hook.**

Discussion on relationship between land use and transportation and how it has shaped NYC's coastal neighborhoods.

Discussion on the specific hazards and vulnerabilities impacting NYC's transportation systems.

**Reading:**

'Optimum Protective Measures for the New York City Infrastructure Subjected to Future Hurricanes and Sea Level Rise' (<https://www.nyserda.ny.gov/climaid> (Links to an external site.)Links to an external site.); Chapter 9, pages 323-344 and 352-354.

MTA Climate Adaptation Task Force

Report: <http://web.mta.info/sustainability/pdf/ResiliencyReport.pdf> (Links to an external site.)Links to an external site.

10/23

## **8. CASE STUDY REVIEW**

During this session we will be meeting in the classroom to review outlines/analytical frameworks Case Study Presentation. Please be prepared to discuss your work.

10/30

## **9. SHOCK/STRESS WORKSHOP**

**INVITED SPEAKER: MARIANE JANG, 100 RC**

Understanding the underlying challenges in your case study areas and how the transportation project addressed these challenges

11/06

## **10. ELECTION DAY / NO CLASS / OFFICE HOURS**

11/13

## **11. FUTURE OF TRANSPORTATION STUDY WITH ESTHI ZIPORI AND DEBORAH MORRIS**

Amphibious Cars, Hyperloops, Autonomous walking, and other phenomenon

11/20

## **12. DESIGNING STREETS AND TRANSIT FOR PEOPLE WITH SKYE DUNCAN AND JEFF SHUMAKER**

## **THANKSGIVING BREAK 11/23-11/24**

11/27

## **14. STUDENT CASE STUDY PRESENTATIONS & DISCUSSION**

Each student group should be prepared with a 10-15 min powerpoint on their case study of resilient infrastructure and to lead question and answer session re) its efficacy and impact.

*ERIC KLINENBERG LECTURE AT 5:30 DO NOT MISS IT !*

11/30

15. Last day of classes

12/11

**16. FINAL PAPERS DUE**

12/20

*Grades due*