

## INFRASTRUCTURE AND DEVELOPMENT

Course title – Intitulé du cours	INFRASTRUCTURE AND DEVELOPMENT
Level / Semester – Niveau /semestre	M2 / S1
School – Composante	Ecole d'Economie de Toulouse
Teacher – Enseignant responsable	STRAUB Stéphane
Other teacher(s) – Autre(s) enseignant(s)	
Other teacher(s) – Autre(s) enseignant(s)	
Other teacher(s) – Autre(s) enseignant(s)	
Other teacher(s) – Autre(s) enseignant(s)	
Other teacher(s) – Autre(s) enseignant(s)	
Lecture Hours – Volume Horaire CM	30
TA Hours – Volume horaire TD	
TP Hours – Volume horaire TP	
Course Language – Langue du cours	Anglais
TA and/or TP Language – Langue des TD et/ou TP	Anglais

### Teaching staff contacts – Coordonnées de l'équipe pédagogique :

Stéphane Straub, office T.355.

Meeting by appointment. Preferred mean of interaction: by email (stephane.straub@tse-fr.eu) or after the classes.

### Course's Objectives – Objectifs du cours :

The course will focus on infrastructure, defined here to encompass physical infrastructure in the four main sectors, energy, transport, water and sanitation, and information and communication technology (ICT). The objectives of the course are to introduce students to the main issues surrounding these topics, to familiarize them with the policy literature and discussion, and the analytical tools that applied researchers use to address these issues. At the end of the course, students should be able to understand and replicate good quality empirical research in this area, and to produce policy oriented synthesis on topics related to infrastructure.

### Prerequisites – Pré requis :

Familiarity with basic econometrics, and especially panel data techniques, will be helpful. A useful and accessible reference is:

Angrist, Joshua D, and Pischke, Jorn-Steffen, *Mostly Harmless Econometrics*, Princeton University Press

### Practical information about the sessions – Modalités pratiques de gestion du cours :

While this is a lecture course, students are expected to thoroughly read all the mandatory readings (marked by a star) prior to each session and actively participate in class. Readings with no star attached are optional. Laptops are accepted in the class.

#### **Distance learning – Enseignement à distance :**

Classes will be held in person until further notice.

The instructor will be available for online and face-to-face office hours (please send an email to make an appointment).

#### **Confidentiality – Confidentialité :**

If classes are to be held online, recording Zoom sessions in any form, including taking screenshots, is prohibited. Redistributing any class materials (such as articles and slides uploaded on Moodle) is also prohibited.

#### **Bibliography/references – Bibliographie/références :**

All required articles and chapters will become available on Moodle.

#### **Grading system – Modalités d'évaluation :**

There are two written assignments. The first one is a paper that discusses what has been covered in the first half of the course, due October 28, 6pm (up to 5 double-spaced pages). This exercise requires students to provide a brief analytical synthesis of the material, and point out what are the most important aspects and the main unresolved issues.

The second assignment is a final paper that is due at 6pm on December 10 (up to 10 double-spaced pages). This exercise consists of a policy note on a topic related to infrastructure, to be chosen among a menu provided by the instructor. The topic should be approved by the instructor beforehand.

All written assignments should be submitted via email. Late assignments will be discounted by 50% if they are less than a week late. No home assignment will be accepted more than 1 week after the due date.

The final grade is a weighted average: 25% midterm paper, 60% final paper, 15% class participation.

#### **Session planning – Planification des séances :**

Classes will be a mix of lectures and group discussions, and will rely on a mix of research and policy work. Each week, from the second week (of September 13) one of the two sessions will be devoted mostly to the discussion of the paper or material assigned.

The material to be used each week (usually one policy report or one applied research paper) will be announced in advance the week before. One or more class participants will make a brief presentation of the material as part of the class participation evaluation.

The course will follow the following sequence (some topics may take more or less than one week, so there is not necessary a direct correspondence between weeks and topics):

## Part A: The state of affairs

1. Introduction: course organization, review of issues, definitions.
2. Historical overview: from the Bronze Age to the Digital Age.
3. The empirics of infrastructure: data and measurement challenges.
4. Access around the world: a world of inequality.
5. Panel data econometrics and impact evaluation: the benefits of infrastructure and the cost of unequal access.

## Part B: Infrastructure policies

6. Funding and financing infrastructure.
7. The public vs. private debate: privatization and public-private partnerships (PPPs). Regulatory and governance issues.
8. The environmental impact of infrastructure, and its role in tackling climate change.
9. Infrastructure in the digital era, sectors overview (energy, water and sanitation, transport, information and communication technology–ICT ).

Finally, interventions by development practitioners (from the World Bank or similar type of organizations) will be organized if possible.

## **Bibliography/references – Bibliographie/références :**

### **Introduction**

- Gramlich, E. Infrastructure Investment: A Review Essay. *Journal of Economic Literature*, Vol. 32, No. 3. (Sep., 1994), pp. 1176—1196.
- Straub, S. (2011), "Infrastructure and Development: A Critical Appraisal of the Macro-Level Literature", *The Journal of Development Studies*, vol. 47, n°5, p. 683-708.
- Straub, S. (2008), "Infrastructure and Growth in Developing Countries: Recent Advances and Research Challenges", *World Bank Policy Research Working Paper No.4460*.

### **Historical Overview**

- Smil, V. 2017. *Energy and Civilization. A History*. MIT Press.
- Hugh Goldsmith. 2014. "The Long-Run Evolution of Infrastructure Services." *CESifo Working Paper No. 5073*
- Mithen, Steven. 2012. *Thirst: For Water and Power in the Ancient World*. Harvard University Press.
- Dalgaard, C-J, N Kaarsen, O Olsson and P Selaya. 2018. "Roman roads to prosperity: Persistence and non-persistence in public good provision", *CEPR Discussion Paper 12745*.
- Bogart, D. 2005. "Turnpike trusts and the transportation revolution in 18th century England." *Explorations in Economic History*, 42 (4), 479-508.
- Bakker, Jan David, Stephan Maurer, Jörn-Steffen Pischke, and Ferdinand Rauch, 2020. "Of Mice and Merchants: Connectedness and the Location of Economic Activity in the Iron Age." *Review of Economics and Statistics*.

### **Data, and Measurement**

- Asian Development Bank, 2017, Meeting Asia's Infrastructure Needs.

<https://www.adb.org/sites/default/files/publication/227496/special-report-infrastructure.pdf>

- Fay M, Han S, Lee HI, Mastruzzi M and Cho M (2019). Hitting the Trillion Mark a Look at How Much Countries are Spending on Infrastructure (English). Policy Research Working Paper WPS No. 8730. Washington, D.C: World Bank Group.

### **Funding and Financing**

- Blair, Henry Peter and Camille Gardner. 2019. Global Infrastructure: Potential, Perils, and a Framework for Distinction. Working Paper.

- Eichengreen, B. 1995. Financing infrastructure in developing countries: lessons from the railway age. *The World Bank Research Observer*, 10 (1), 75-91.

- Fay, Marianne, Martimort, David and Stéphane Straub. 2021. Funding and financing infrastructure: the joint-use of public and private finance. *Journal of Development Economics*.

### **Public-Private Partnerships, Regulation and Governance,**

- Engel, E., Fischer, R., and Galetovic, A. 2014. "The Economics of Public-Private Partnerships. A Basic Guide." Cambridge University Press.

- Anaïs Fabre and Stéphane Straub. 2021. "The Impact of public private partnerships (PPPs) in Infrastructure, Health and Education: A Review." Conditionally accepted, *Journal of Economic Literature*.

- Marin, P. 2009. Public-private partnerships for urban water utilities: a review of experiences in developing countries. The World Bank.

- Guasch, J.L., Laffont, J.J., Straub, S., 2008. Renegotiation of concession contracts in Latin America: evidence from the water and transport sectors. *International Journal of Industrial Organization* 26, 421–442.

- Straub, S., 2019. Understanding the performance of Public-Private Partnerships (PPPs) in Lebanon. IGC report S-47419-LBN-1.

- Jean-Jacques Dethier, Alex Moore et Stéphane Straub, « Regulation, Renegotiation and Capital Structure: Theory and Evidence from Latin American Transport Concessions », *Journal of Regulatory Economics*, vol. 45, n° 2, 2014, p. 209–232.

- Céline Bonnet, Pierre Dubois, David Martimort and Stéphane Straub, 2012, "Empirical Evidence on Satisfaction with Privatization in Latin America", *World Bank Economic Review*, Volume 26, Issue 1, Pp. 1-33.

- Martimort, D., and S. Straub. 2009. "Infrastructure Privatization and Changes in Corruption Patterns: The Roots of Public Discontent". *Journal of Development Economics* 90: 69–84.

- Laffont, J.J., 2005. *Regulation and Development*. Cambridge University Press.

- Kosec, K. 2014. The child health implications of privatizing Africa's urban water supply. *Journal of health economics*, 35, 1-19.

### **Access and Inequality**

- Rozenberg J. and Fay M. 2019. Beyond the Gap: How Countries Can Afford the Infrastructure They Need while Protecting the Planet. Sustainable Infrastructure. Washington, DC: World Bank.
- World Bank. 2017. Rethinking Infrastructure in Latin America and the Caribbean. Spending Better to Achieve More. Fay, M., Andres, L., Fox, C., Narloch, U., Straub, S. Slawson, M.
- Khandker, Shahidur R., Barnes, Douglas F., Samad, Hussain A. 2012. Are the energy poor also income poor? Evidence from India. *Energy Policy*, 47, 1–12.
- Barnes, Douglas F., Khandker, Shahidur R., Samad, Hussain A. 2011. Energy poverty in rural Bangladesh. *Energy Policy*, 39, 894–904
- Robin Burgess, Remi Jedwab, Edward Miguel, Ameet Morjaria and Gerard Padro-i-Miguel. “The Value of Democracy: Evidence from Road Building in Kenya”, NBER Working Paper No. 19398, , *American Economic Review*, June 2015.

### **Environmental challenges**

- Hallegatte, Stephane, Adrien Vogt-Schilb, Mook Bangalore, and Julie Rozenberg. 2017. *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*. Climate Change and Development Series. Washington, DC: World Bank.
- Kahn, Matthew. 2021. *Adapting to climate change. Markets and the management of an uncertain future*. Yale University Press.
- Müller, D. B., Liu, G., Løvik, A.N., Modaresi, R., Pauliuk S., Steinhoff F.S., Brattebø H. 2013. Carbon emissions of infrastructure development. *Environ. Sci. Technol.* 47, 11739–11746.
- Torres, A., Brandt, J., Lear, K. and Liu, J. 2017. A looming tragedy of the sand commons. *Science*. 357(6355): 970-971.
- David Martimort and Stéphane Straub, “How to Design Infrastructure Contracts in a Warming World? A Critical Appraisal of Public-Private Partnerships”, *International Economic Review*, vol. 57, n° 1, février 2016, p. 61–88.
- Elhacham et al. 2020. Global human-made mass exceeds all living biomass. *Nature*, 588, pages 442–444.
- Stiglitz, J. 2019. Addressing climate change through price and non-price interventions. *European Economic Review*, 119, 594–612.
- Gates, B. 2021. *How to avoid a climate disaster*. Allen Lane.
- Rifkin, J. 2011. *The Third Industrial Revolution*. St. Martin's Press.

### **Transport**

- World Development Report 2009, *Reshaping Economic Geography*.
- World Bank. 2017. *Transport Corridors in Latin America*.
- Donaldson, D., Jinhage, A. and Verhoogen, E. (2017). *Beyond borders: Making transport work for African trade*. IGC Growth Brief Series 009. London: International Growth Centre.
- Olken, Benjamin. 2007. “Monitoring Corruption: Evidence from a Field Experiment in Indonesia.” *Journal of Political Economy* 115(2): 200-249.
- D. Donaldson, "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure", forthcoming, *American Economic Review*.

- Bird, J. and S. Straub, 2019, " The Brasília Experiment: Road Access and the Spatial Pattern of Long-term Local Development in Brazil ", World Development.
- Abhijit Banerjee, Esther Duflo and Nancy Qian. 2020. "On the Road: Access to Transportation Infrastructure and Economic Growth in China". Journal of Development Economics.
- Remi Jedwab and Alexander Moradi. "The Permanent Economic Effects of Transportation Revolutions in Poor Countries: Evidence from Africa", Review of Economics and Statistics.
- Baum-Snow, N, L Brandt, V Henderson, M Turner and Q Zhang (2012), "Roads, Railroads and Decentralization of Chinese Cities", working paper.
- Ghani, E., Goswami, A. and W. Kerr, 2013, "Highway to success in India: the impact of the golden quadrilateral project for the location and performance of manufacturing", Policy Research Working Paper Series 6320, The World Bank.
- Storeygard, A., 2016, "Farther on down the road: transport costs, trade and urban growth in sub-Saharan Africa", Review of Economic Studies 83(3): 1263-1295.
- Casaburi, L., Glennerster, R. and Suri, T., 2013, "Rural Roads and Intermediated Trade: Regression Discontinuity Evidence from Sierra Leone", mimeo.
- Rema Hanna, Gabriel Kreindler and Ben Olken, "Citywide effects of high-occupancy vehicle restrictions: Evidence from "three-in-one" in Jakarta", Science, Vol. 357 (6346), 2017.
- Claudia Berg, Uwe Deichmann, Yishen Lieu and Harris Selod, "Transport Policies and Development, with, Journal of Development Studies," 2017, 53(4), 465-480.

## Energy

- Foster, V., & Rana, A. (2019). Rethinking power sector reform in the developing world. World Bank Publications.
- World Bank. Sustainable Energy for all - Global Tracking Framework - Progress toward Sustainable Energy 2017. <http://www.worldbank.org/en/topic/energy/publication/global-tracking-framework-2017>
- Gertler, P., O. Shelef, C. Wolfram, and A. Fuchs. (2016). "The Demand for Energy-Using Assets among the World's Rising Middle Classes," American Economic Review. Vol. 106, No. 6, pp. 1366-1401.
- Lee, K., Miguel, T., and C. Wolfram. (2020). "Does Household Electrification Supercharge Economic Development?" *Journal of Economic Perspectives*.
- Lee, K., Miguel, T., and C. Wolfram. (Forthcoming). "Experimental Evidence on the Demand for and Costs of Rural Electrification." *Journal of Political Economy*.
- Lipscomb, M., M. Mobarak and T. Barham, 2013, "Development Effects of Electrification: Evidence from the Topographic Placement of Hydropower Plants in Brazil", AEJ: Applied Economics, 5(2): 200--231.
- T. Dinkelman, 2011, "The effects of rural electrification on employment: New evidence from South Africa", American Economic Review, 101(7): 3078--3108.
- Allcott, Hunt, Allan Collard-Wexler, and Stephen D. O'Connell (2016). "How Do Electricity Shortages Affect Industry? Evidence from India." American Economic Review, Vol. 106, No. 3 (March), pages 587-624.

- Philippe Alby, Jean-Jacques Dethier et Stéphane Straub, « Firms Operating under Electricity Constraints in Developing Countries? », *The World Bank Economic Review*, vol. 27, n° 1, 2013, p. 109–132.
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## ICT

- World Development Report 2016: Digital Dividends.  
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- Smith, B. 2019. *Tools and Weapons: The Promise and the Peril of the Digital Age*. Penguin Press
- Jonas Hjort and Jonas Poulsen, “The Arrival of Fast Internet and Employment in Africa”, *American Economic Review*, vol. 109, no. 3, 1032-1079, March 2019
- Daniel Björkegren, “The Adoption of Network Goods: Evidence from the Spread of Mobile Phones in Rwanda,” *The Review of Economic Studies*, Volume 86, Issue 3, May 2019, Pages 1033–1060.
- Jensen R. (2007), "The Digital Divide: Information (Technology), Market performance, and Welfare in the South Indian Fisheries Sector", *Quarterly Journal of Economics*, 122(3), 879-924.
- Jenny Aker and Marcel Fafchamps, 2013, "How does mobile phone coverage affect farm-gate prices? Evidence from West Africa." *World Bank Economic Review*.
- Jenny Aker and Isaac M. Mbiti. 2010. " Mobile Phones and Economic Development in Africa." *Journal of Economic Perspectives*. 24(3): 207-32.
- Jenny Aker. 2010. " Information from Markets Near and Far: The Impact of Mobile Phones on Grain Markets in Niger." *American Economic Journal: Applied Economics*. 2: 46-59.
- Jenny Aker, Christopher Ksoll and Travis Lybbert. 2012. "Can Mobile Phones Improve Learning? Evidence from a Field Experiment in Niger." 4(4), *American Economic Journal: Applied Economics*.
- Bossuroy, Thomas, Clara Delavallade, and Vincent Pons. "Can Biometric Tracking Improve Healthcare Provision and Data Quality? Experimental Evidence from Tuberculosis Control in India." *Harvard Business School Working Paper*, No. 19-077, March 2019.

## Water and Sanitation

- World Health Organization (WHO). 2016. WASH POST-2015: proposed targets and indicators for drinking-water, sanitation and hygiene.  
[https://www.wssinfo.org/fileadmin/user\\_upload/resources/post-2015-WASH-targets-factsheet-12pp.pdf](https://www.wssinfo.org/fileadmin/user_upload/resources/post-2015-WASH-targets-factsheet-12pp.pdf)
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- Galiani, S., P. Gertler and E. Schargrodsky (2005), "Water for Life: The Impact of Privatization of Water Services on Child Mortality", *Journal of Political Economy*, 113: 83-120.

- Michael Greenstone, Esther Duflo, Raymond Guiteras, and Thomas Clasen, 2015, "Toilets Can Work: Short and Medium Run Health Impacts of Addressing Complementarities and Externalities in Water and Sanitation," Mimeograph.
- Alsan, M. and C. Goldin. (forthcoming). "Watersheds in Child Mortality: The Role of Effective Water and Sewerage Infrastructure, 1880 to 1920." *Journal of Political Economy*
- R. Guiteras, J. Levinsohn, A. M. Mobarak. "Demand Estimation with Strategic Complementarities: Sanitation in Bangladesh," mimeo.
- Bhalotra, S R, A Diaz-Cayeros, G Miller, A Miranda, and A S Venkataramani (2021), "Urban Water Disinfection and Mortality Decline in Lower-Income Countries", *American Economic Journal: Economic Policy* 13(4): 490–520.
- Graham, J.P. Hirai, M., Kim S-S. 2016. An Analysis of Water Collection Labor among Women and Children in 24 Sub-Saharan African Countries, *PLoS One*. 11(6): e0155981.

### **Session planning – Planification des séances**

At this stage, it is planned that all sessions will be held in physical presence. Hybrid mode will be used in case of necessity.