

2014 OECD Global Forum on the Knowledge Economy

“Encouraging open data across society”

MIC, METI, OECD
Friday, October 3, 2014

Professor Brett M. Frischmann
Cardozo Law School



“Encouraging open data across society”

WHY?

Data is often *infrastructural*

and

Managing infrastructural resources as *commons* (openly) is often critical to sustaining economic growth and social well-being



Infrastructure

The Social Value of Shared Resources

Brett M. Frischmann

OXFORD



Governing Knowledge Commons

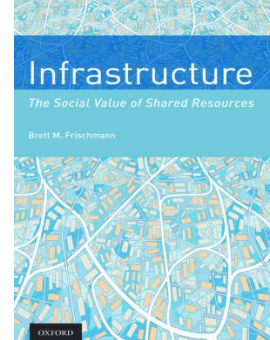
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Part I: Foundations

One: *Defining Infrastructure and Commons Management*

Two: *Overview of Infrastructure Economics*

Three: *Microeconomic Building Blocks*

Part II: A Demand-Side Theory of Infrastructure and Commons Management

Four: *Infrastructural Resources*

Five: *Managing Infrastructure as Commons*

Part III: Complications

Six: *Commons Management and Infrastructure Pricing*

Seven: *Managing Congestion*

Eight: *Supply-Side Incentives*

Part IV: Traditional Infrastructure

Nine: *Transportation Infrastructure: Roads*

Ten: *Communications Infrastructure: Telecommunications*

Part V: Nontraditional Infrastructure

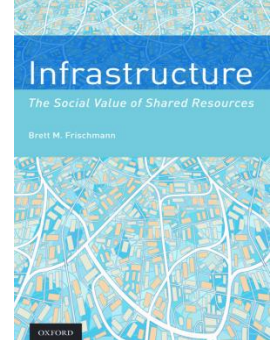
Eleven: *Environmental Infrastructure*

Twelve: *Intellectual Infrastructure*

Part VI: Modern Debates

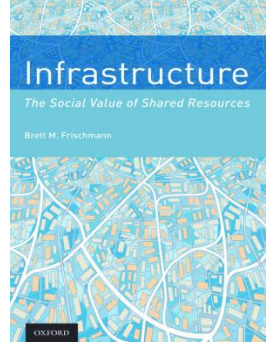
Thirteen: *The Internet and the Network Neutrality Debate*

Fourteen: *Application to Other Modern Debates*

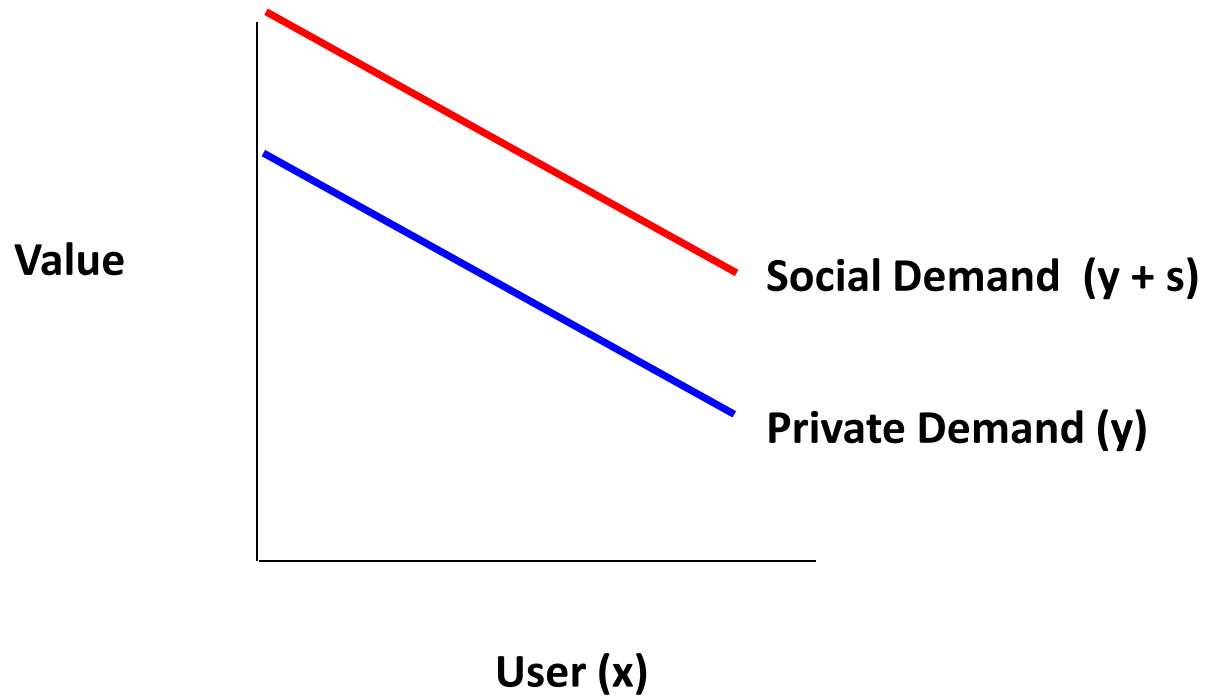


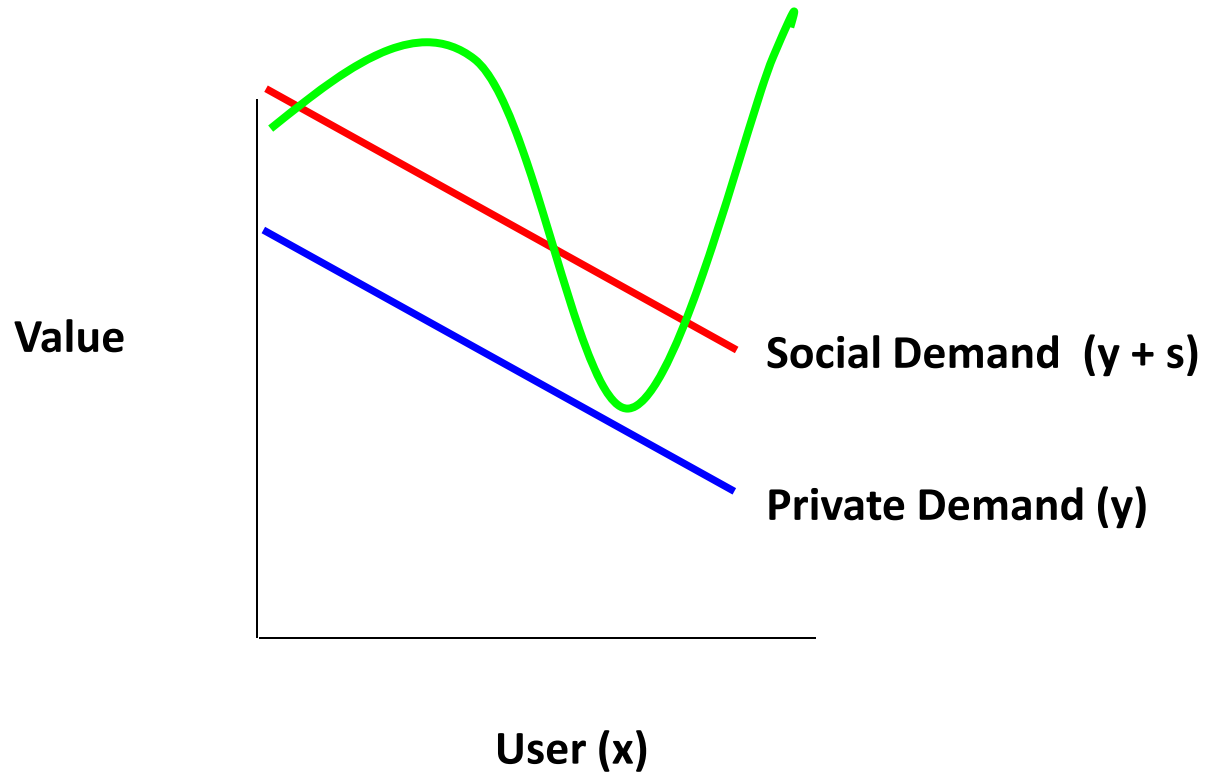
Infrastructural Resources

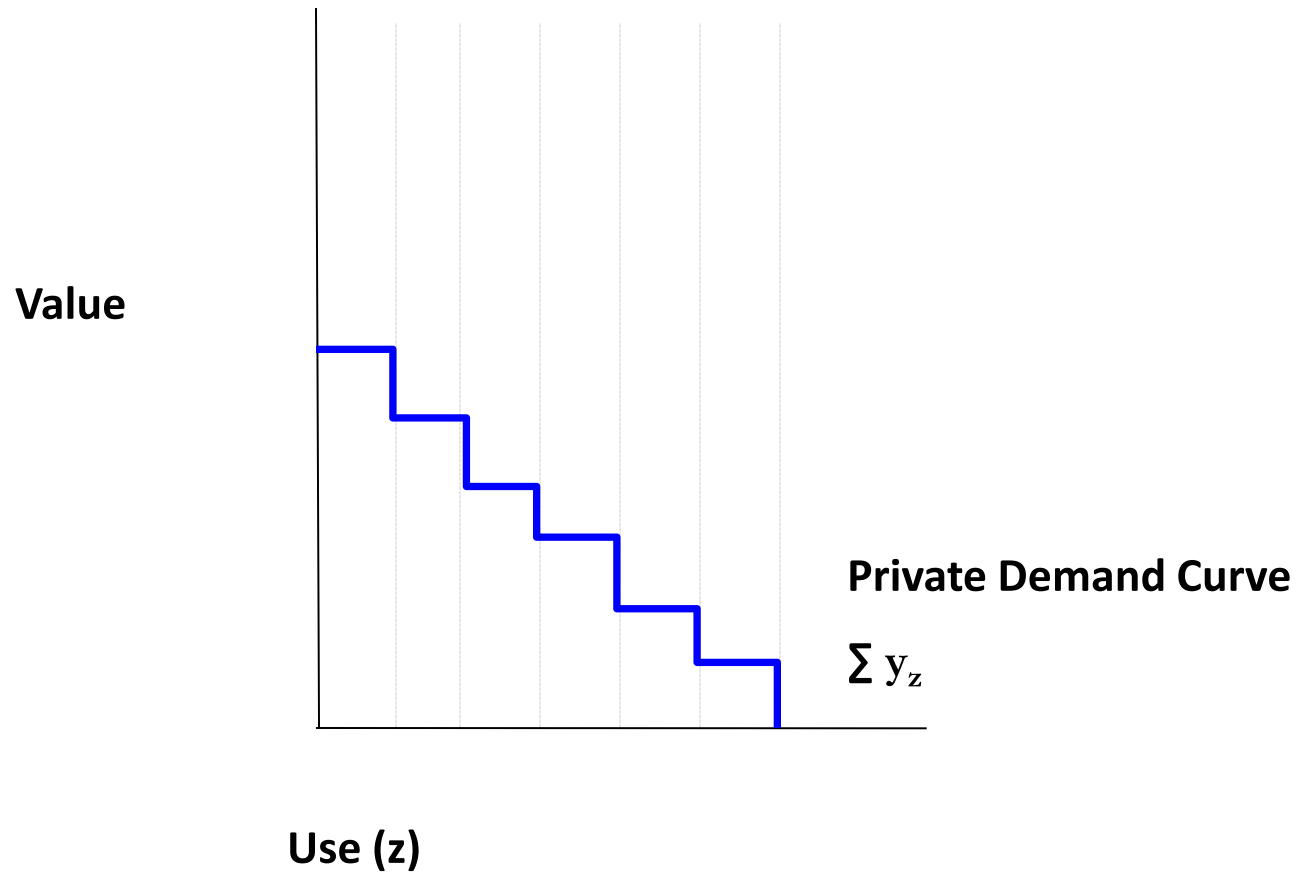
1. The resource may be consumed nonrivalrously;
2. social demand for the resource is driven primarily by downstream productive activity that requires the resource as an input; and
3. the resource is used as an input into a wide range of goods and services, including private goods, public goods and/or social goods.



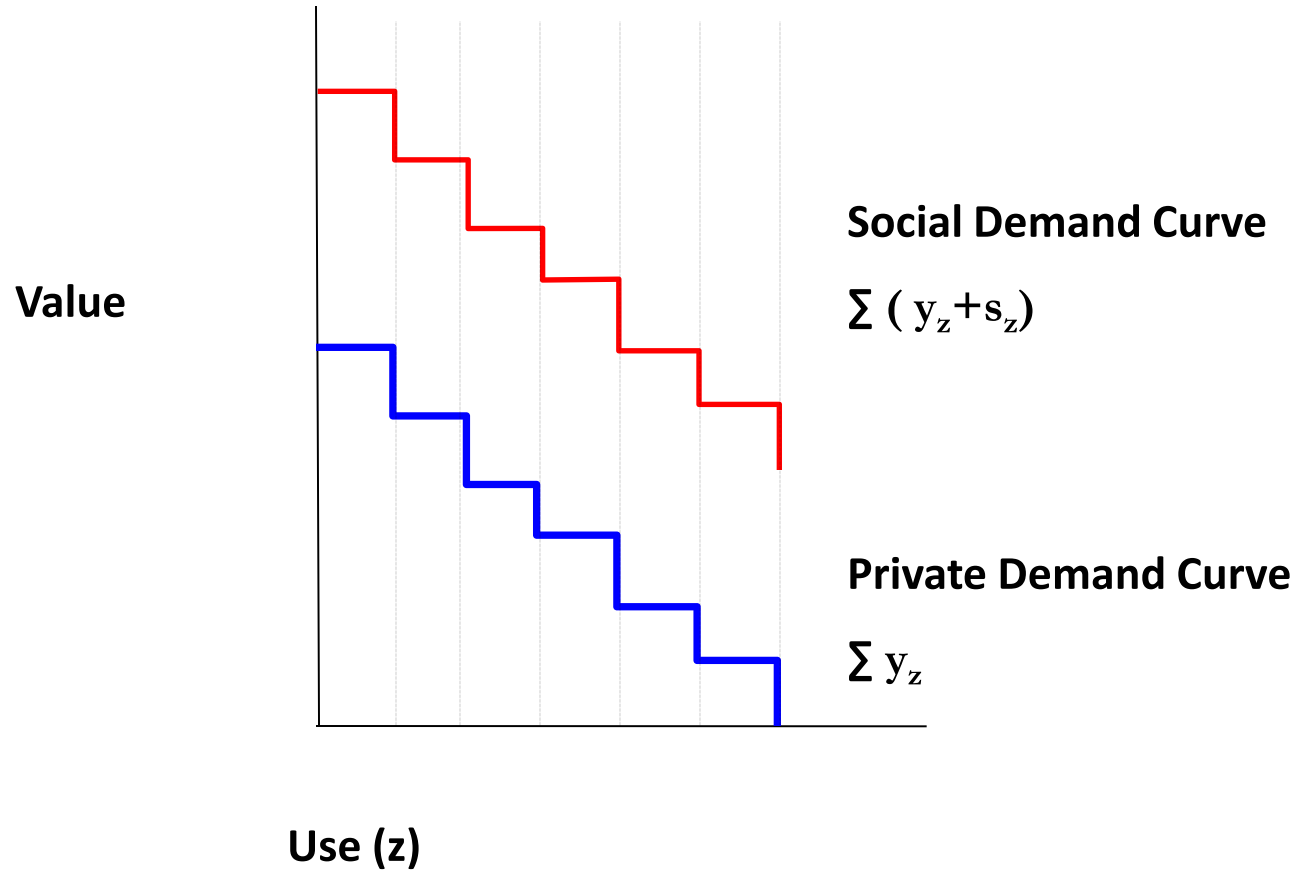
- Infrastructure enable many systems (markets and non-markets) to function and satisfy demand derived from many different types of users.
- Infrastructure are *not* special purpose resources, optimized for a particular user or use to satisfy the demand derived from a particular downstream market or set of markets.
- Infrastructure provide basic, multi-purpose functionality.



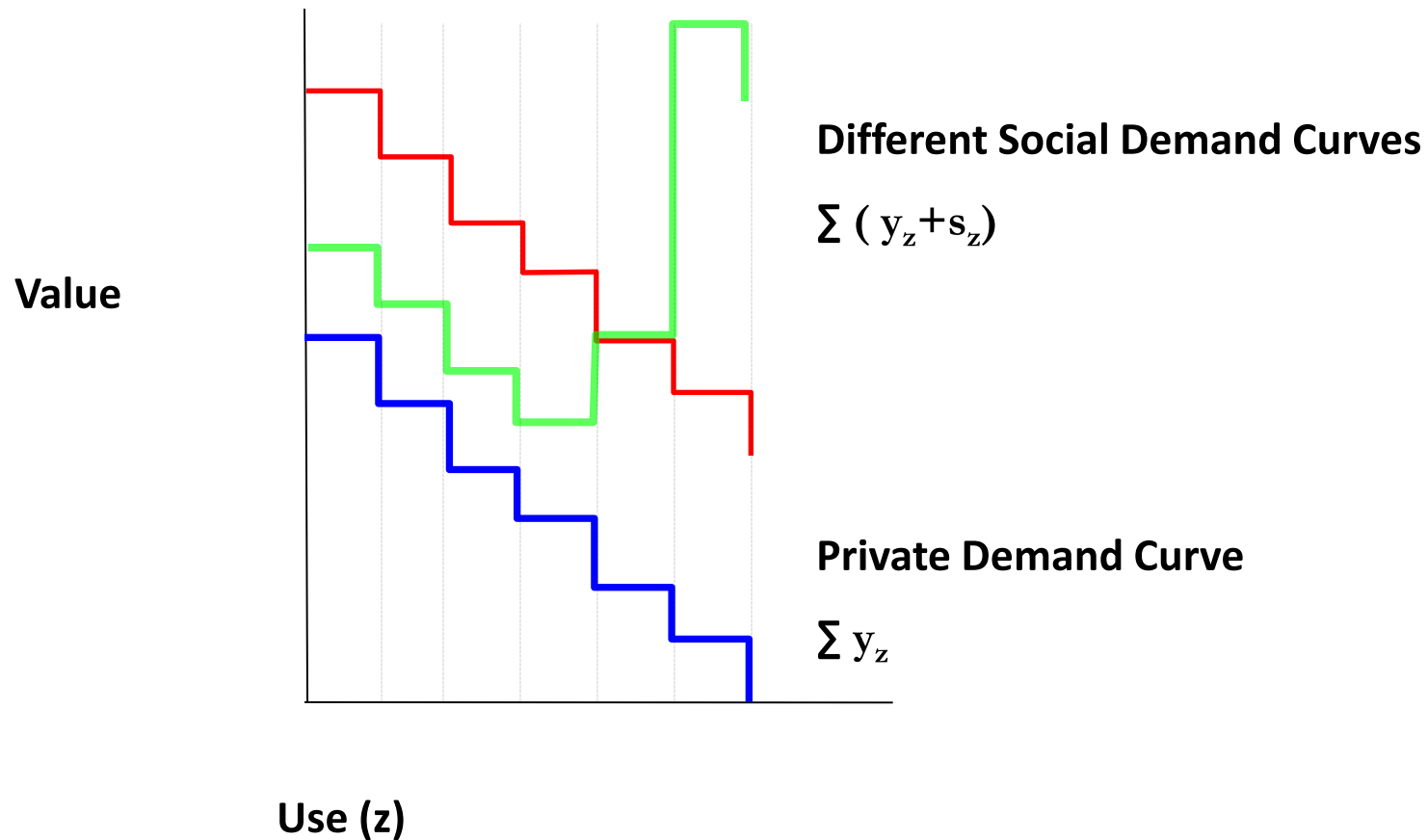




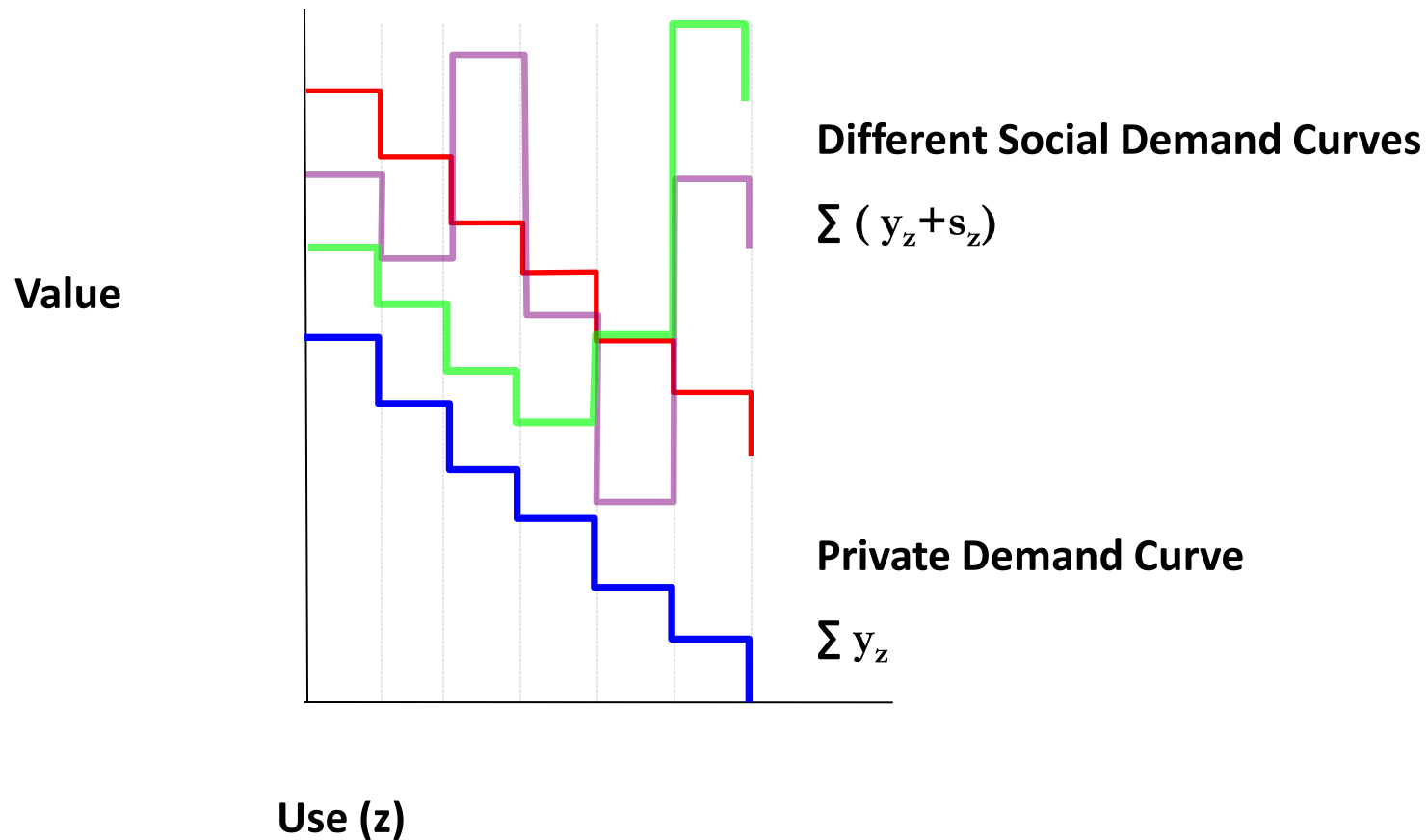
Uses z_1, z_2, z_3, \dots ranked according to aggregated willingness to pay.



Note: Uses z_1, z_2, z_3, \dots ranked according to aggregated willingness to pay.

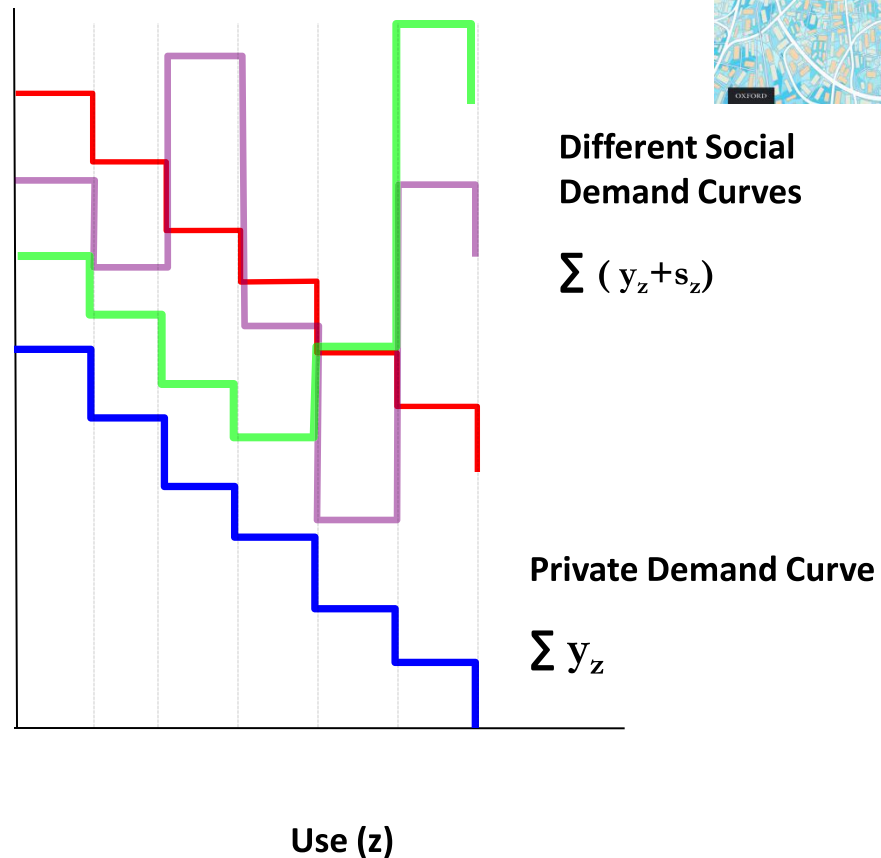
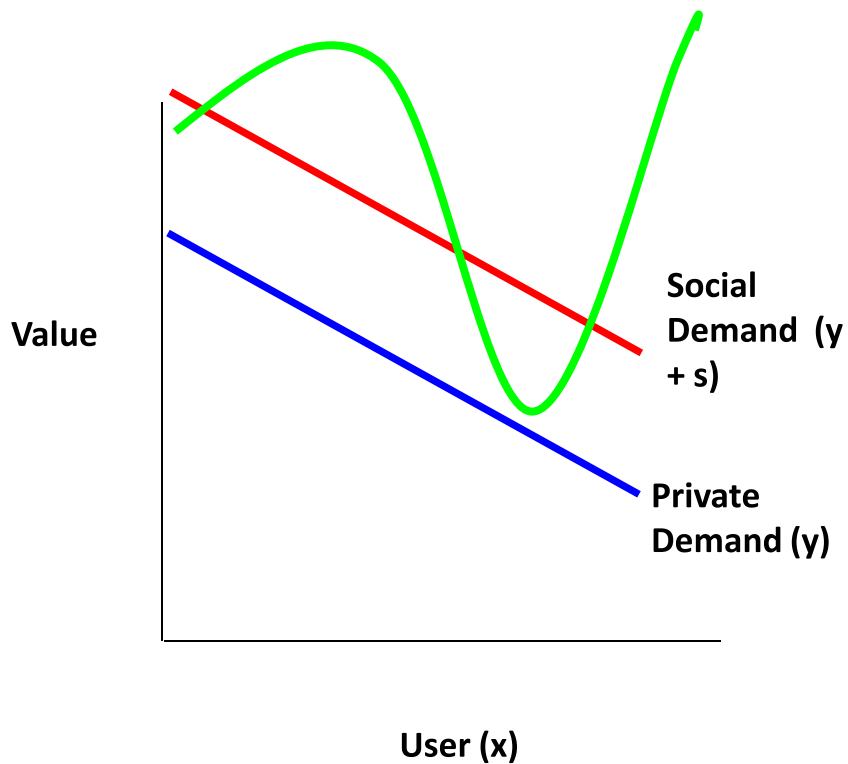


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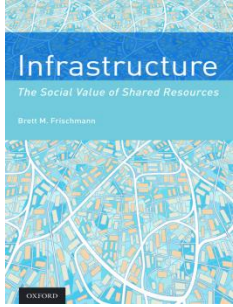


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Why does this matter?



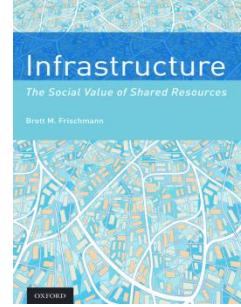
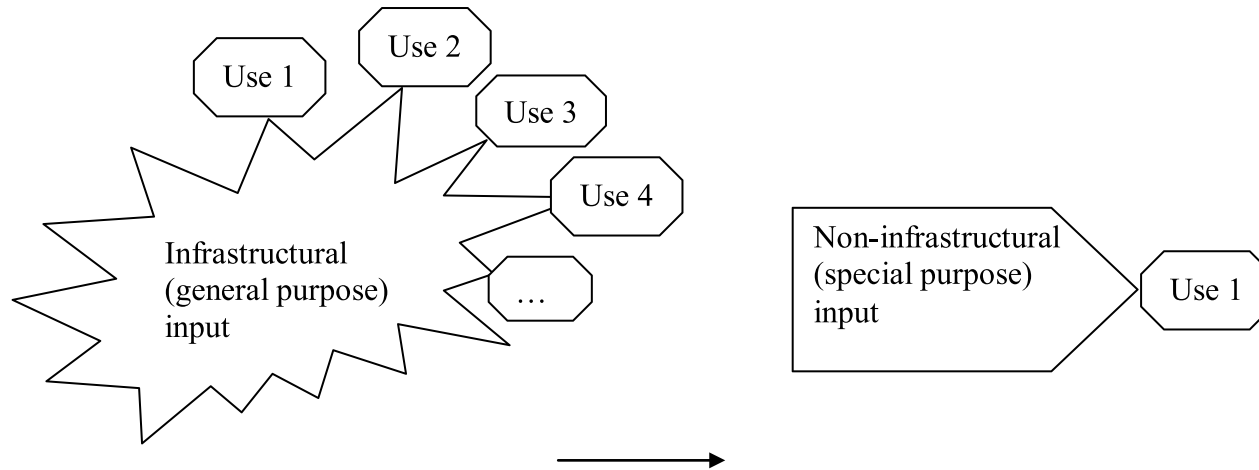
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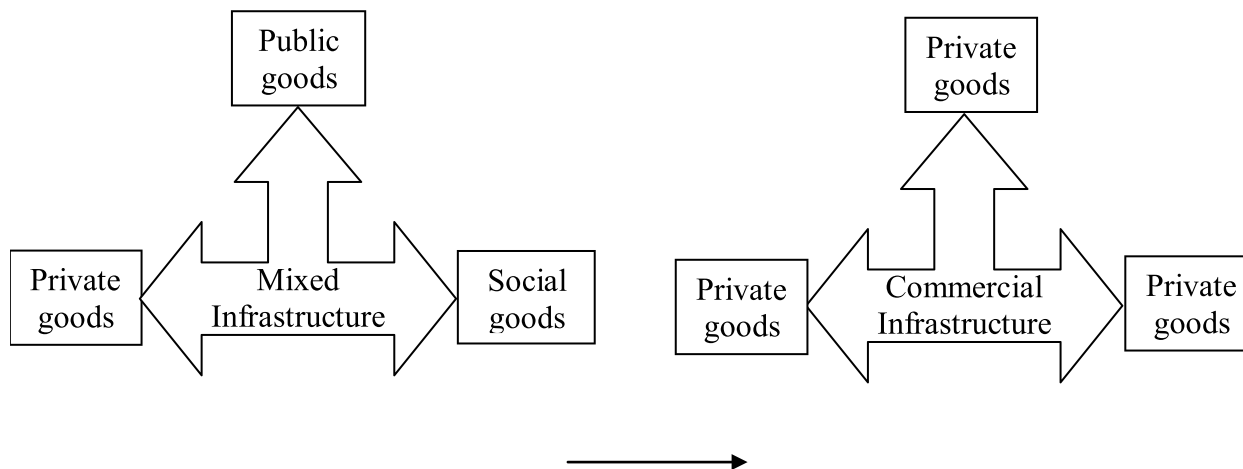
Market failures (from relying on blue curves)

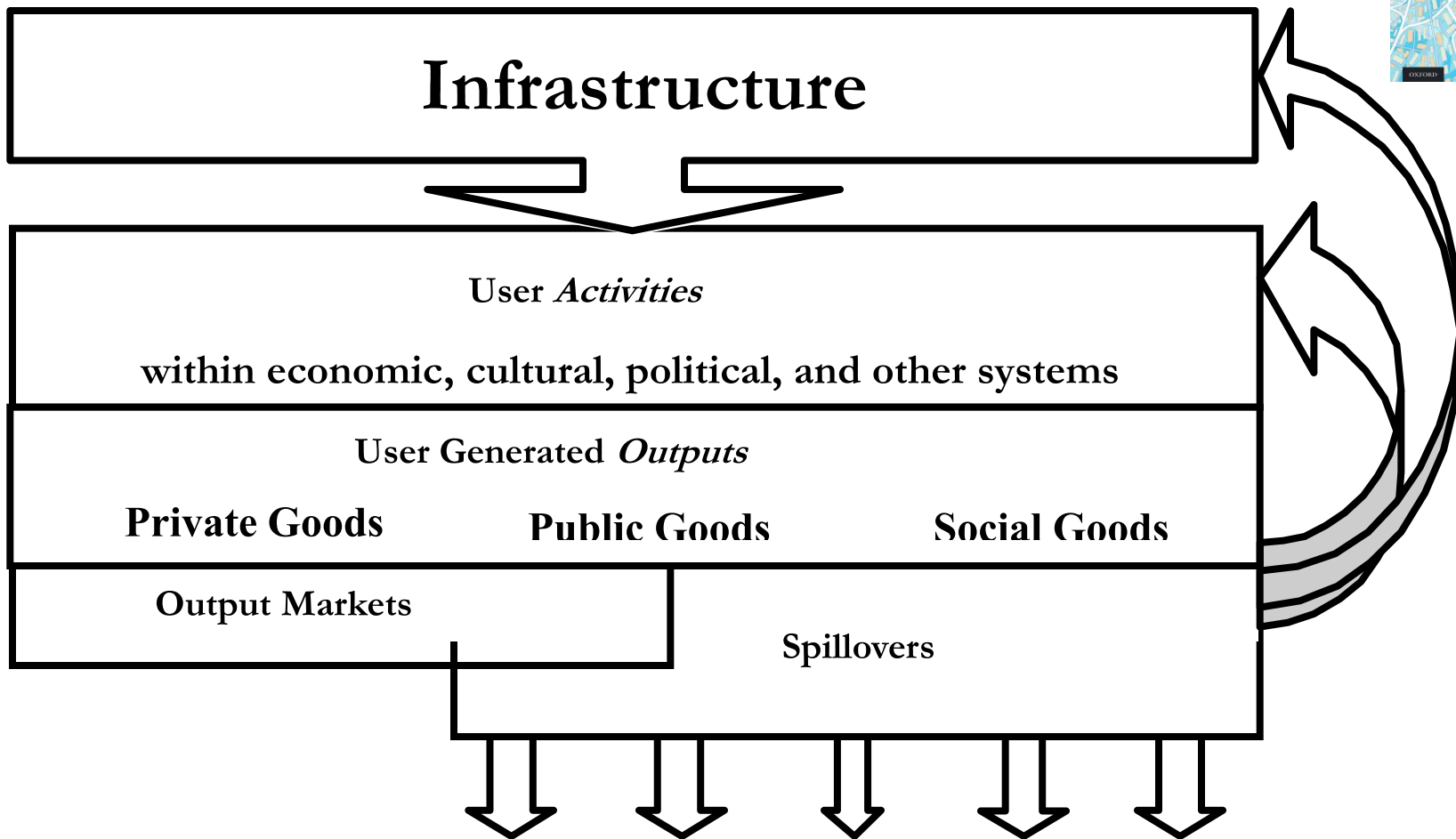
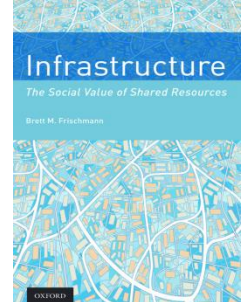
- Undersupply of infrastructure
- Undersupply of infrastructure-dependent public and social goods
- Misoptimization of infrastructure
- Market bias / Optimization for
 - Applications/uses that generate observable and appropriable value (rather than spillovers)
 - Known or expected applications/uses

First, evolution from infrastructure to non-infrastructure:

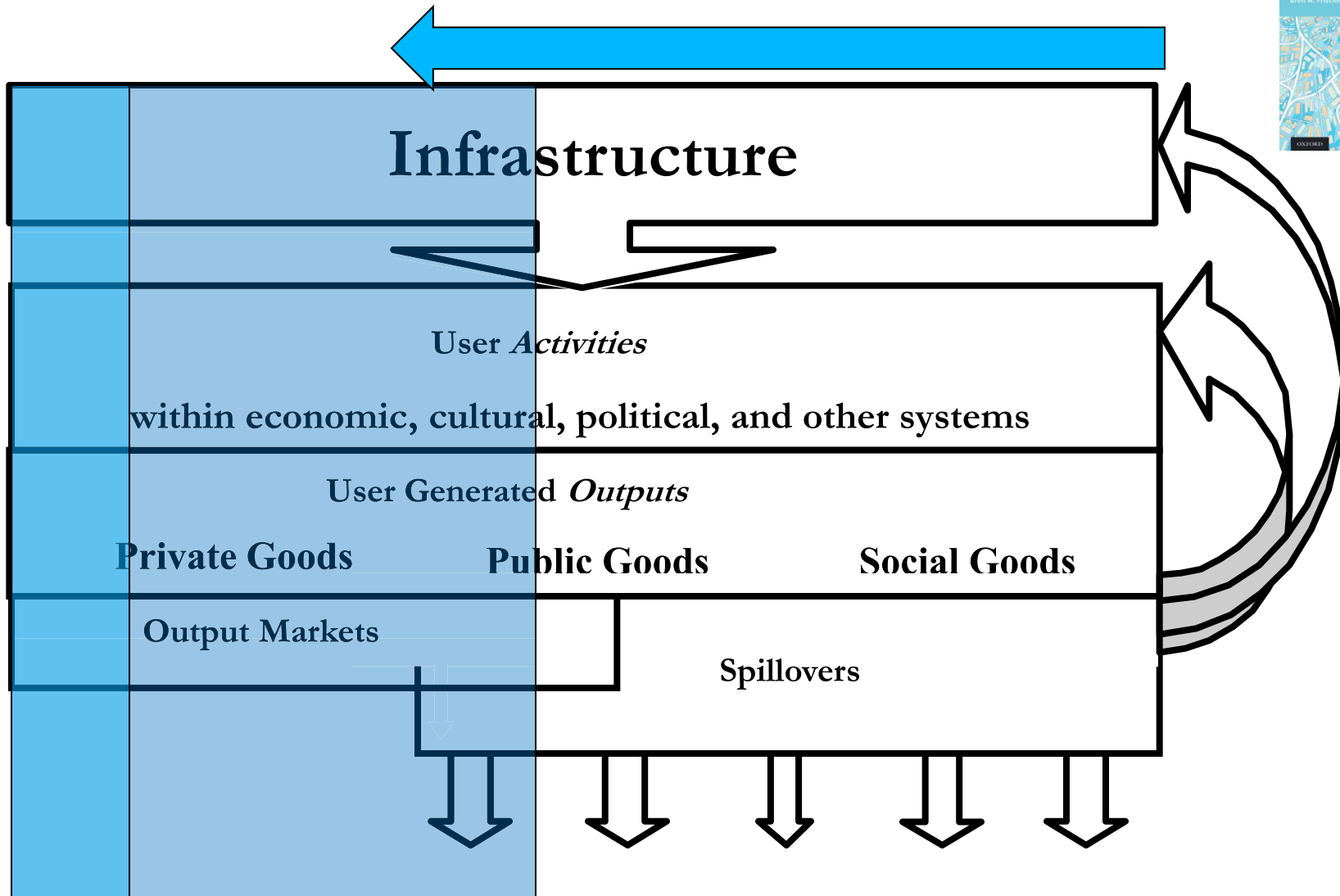
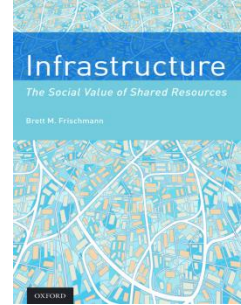


Second, evolution from mixed infrastructure to commercial infrastructure:

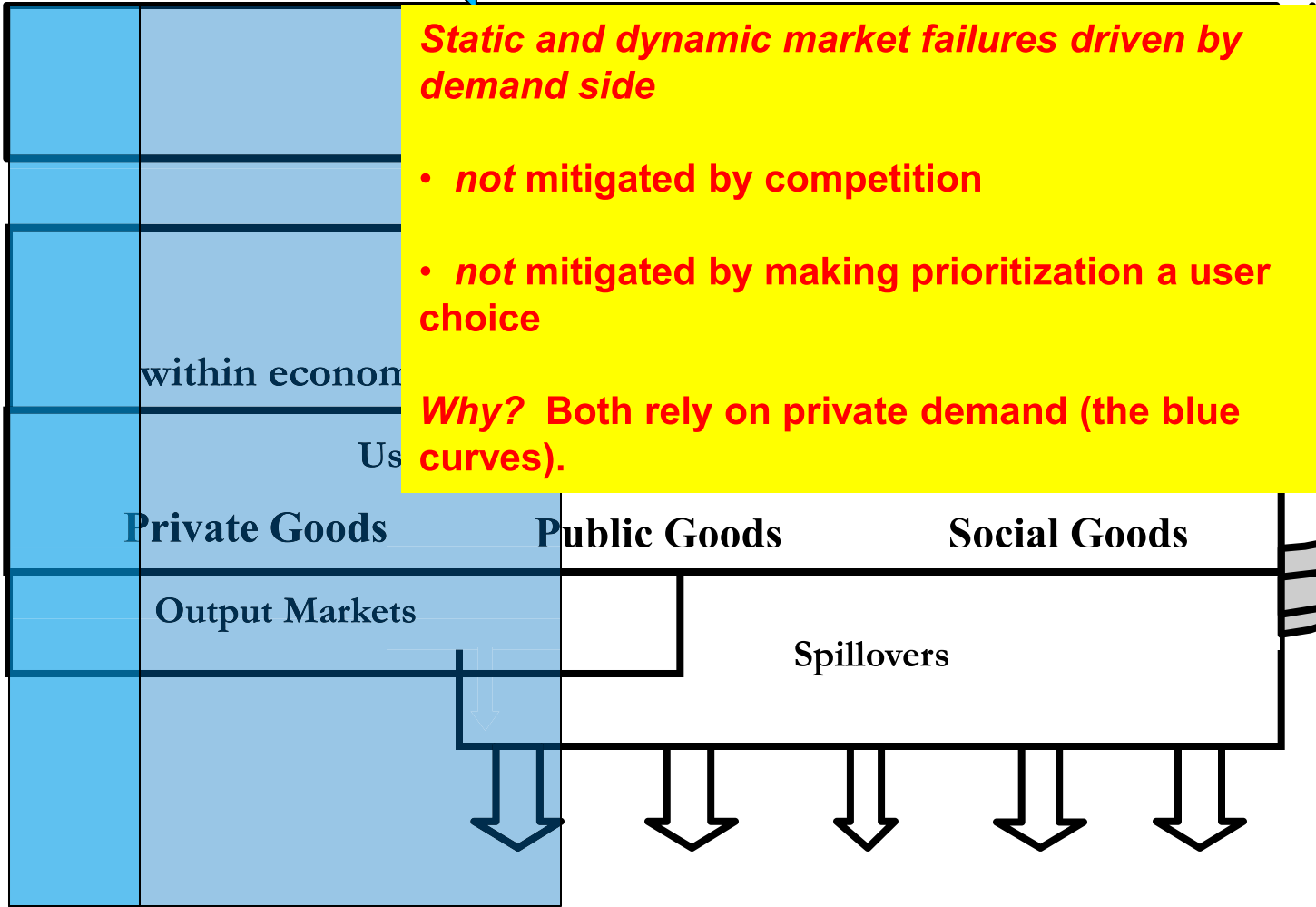
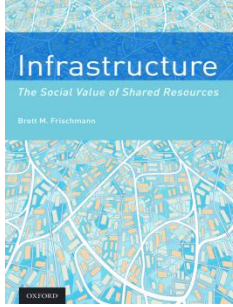


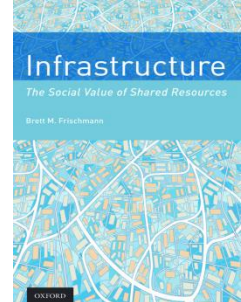


Special purpose input? Commercial infrastructure?



Special purpose input? Commercial infrastructure?





Infrastructure

COMMONS MANAGEMENT

User Activities

within economic, cultural, political, and other systems

User Generated Outputs

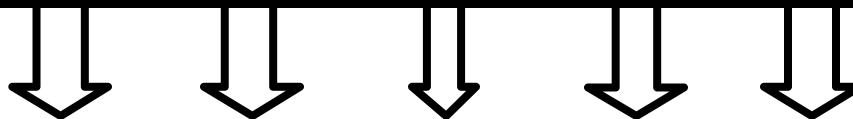
Private Goods

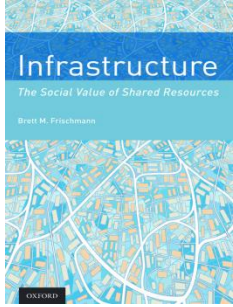
Public Goods

Social Goods

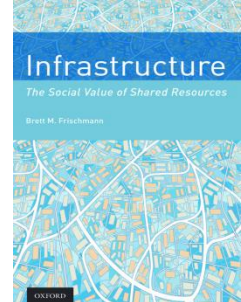
Output Markets

Spillovers





- Commons alleviates the need to rely on either the market mechanism or the government to “pick winners”
 - Market allocates access to infrastructure based on appropriability of returns from outputs
 - *Market failures w/r/t public and social goods*
 - Could rely on the government to figure out which public good or social good outputs are worthy of subsidization or special treatment
 - *Government failures w/r/t with public and social goods*

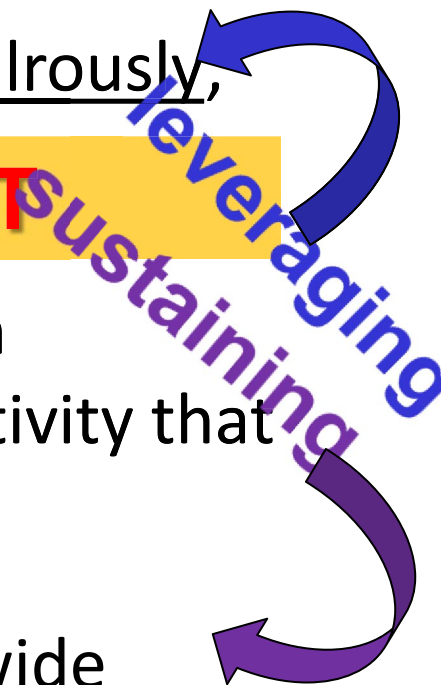


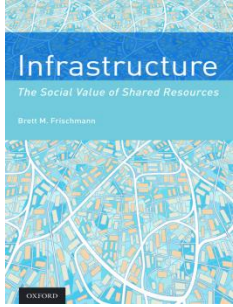
Infrastructural Resources

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COMMONS MANAGEMENT

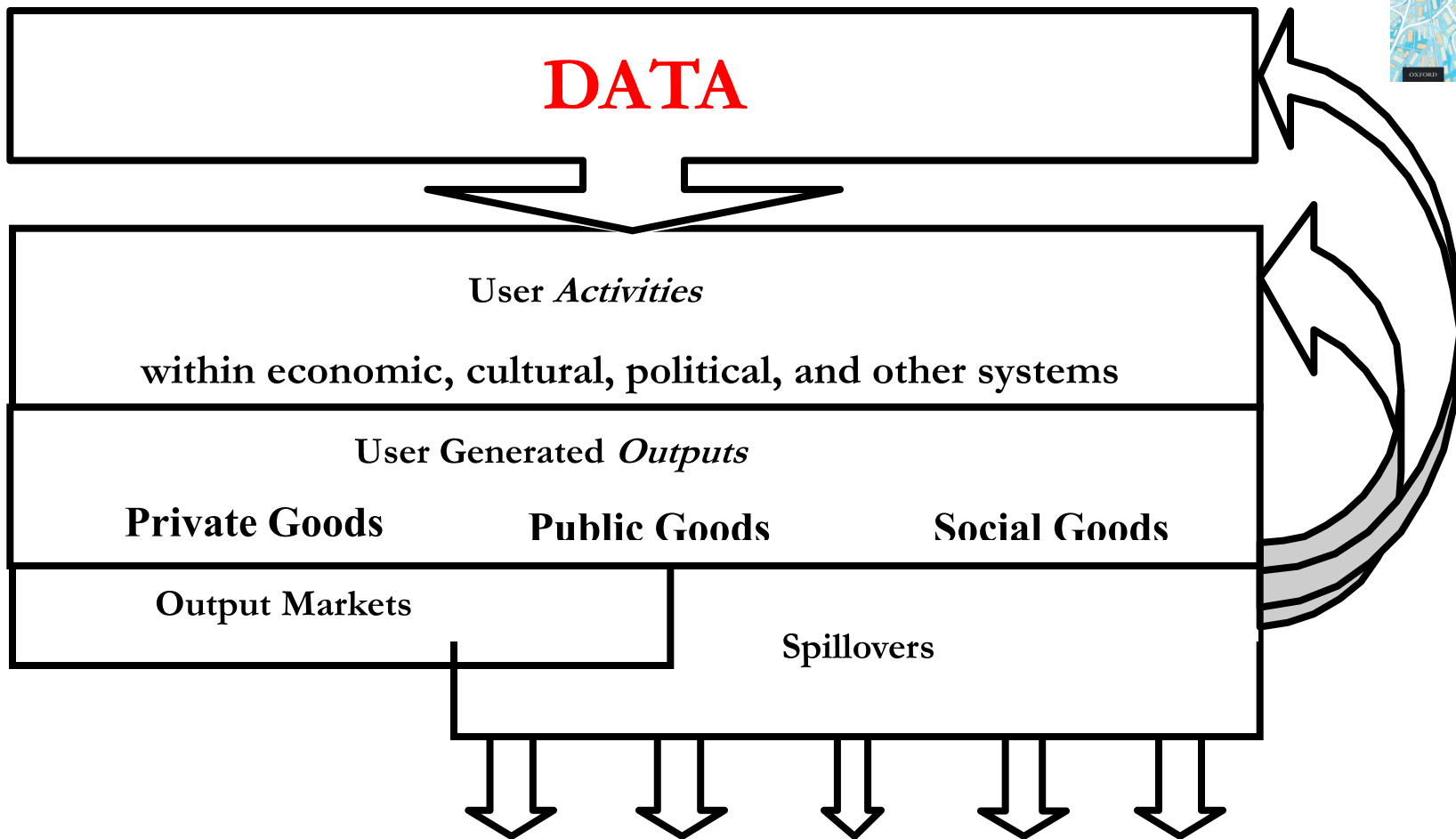
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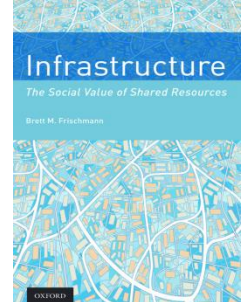




Chapter 12: Intellectual Infrastructure

- A. The Cultural Environment as Infrastructure (Meta- or Infra-
infrastructure)
 - B. Economic Characteristics of Intellectual Resources
 - 1. Supply-side problems
 - a. (Non)excludability
 - b. Nonrivalry
 - 2. Intellectual resources and activities, products and processes
 - C. Intellectual Infrastructure
 - 1. Applying the criteria to delineate intellectual infrastructure
 - 2. Ideas
 - a. Ideas as Infrastructure**
 - b. Commons Management via First Amendment, Copyright, and Patent
Jurisprudence
 - D. Intellectual Property Laws as Semi-commons Arrangements
- Appendix: Basic Research





Some DATA in various contexts

User Activities

within economic, cultural, political, and other systems

User Generated Outputs

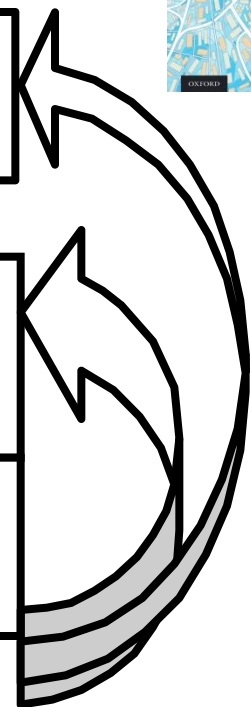
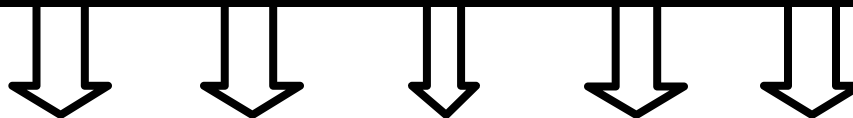
Private Goods

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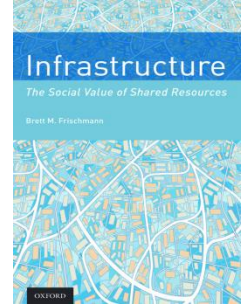
Social Goods

Output Markets

Spillovers



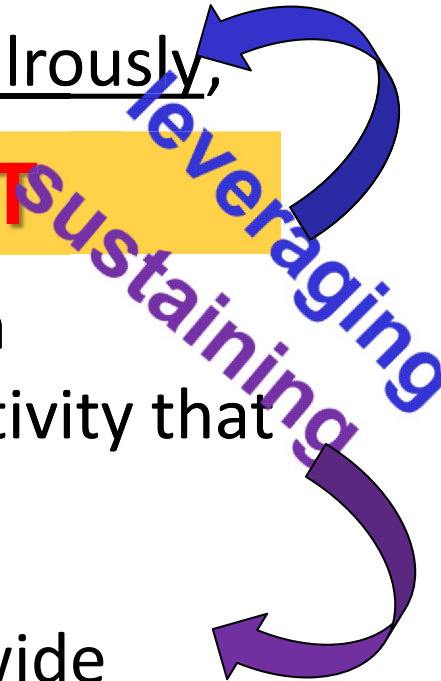
DATA in various contexts is infrastructural



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COMMONS MANAGEMENT

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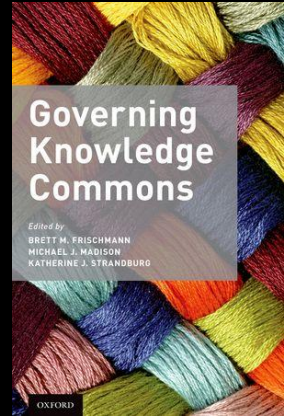
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MOTIVATION FOR THE KNOWLEDGE COMMONS PROJECT



- **Standard IP theory overly-simplistic**
 - Dichotomy btw property/ “public domain”
 - Incentive/free rider story
 - Difficulty making useful predictions – empirically unresolved balancing
- **Beyond binary of markets / public domain**
 - Approaches to creating intellectual resources that are
 - Collective/collaborative
 - Governed informally or formally by private ordering
- **Cooperative/collaborative modes of creativity**
 - String of “one-off” case studies reveals important of norms, governance

How to systematize the inquiry?

I. Background Environment

- A. What is the background context (legal, cultural, etc.) of this particular commons?**
- B. What is the “default” status of the resources involved in the commons? Patented? Copyright? Open?**

II. Attributes of the Commons

A. Resources

- i. What resources are pooled and how they are created or obtained?**
- ii. What are the characteristics of the resources, such as whether they are rival or non-rival, whether they are tangible or intangible,**
- iii. What technologies and skills are needed to create, obtain, maintain and use them?**

B. Community Members

- i. Who are the community members and what are their roles?**
- ii. What are the degree and nature of openness of the community with respect to each type of community member and the general public?**

C. Goals and Objectives

- i. What are the goals and objectives, including obstacles or dilemmas to overcome?**
- ii. What are the history and narrative of the commons?**

III. Governance

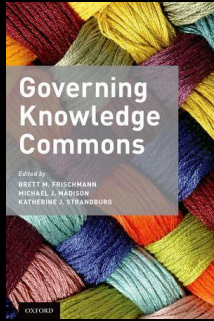
- A. What are the governance mechanisms of the commons (e.g., membership rules, resource contribution or extraction standards and requirements, conflict resolution mechanisms, sanctions for rule violation)?**
- B. Who are the decision-makers and how are they selected?**
- C. What are the institutions that govern decision-making?**
- D. What informal norms govern the commons?**
- E. How do nonmembers interact with the commons? What institutions govern those interactions?**
- F. What legal structures (including intellectual property rules, subsidies, contract and licensing law, antitrust provisions) govern the functioning of the commons?**

IV. Patterns and Outcomes

- A. What benefits are delivered to members and to others (including innovations and creative output, production, sharing, and dissemination of those innovations and output to a broader audience, and social interactions that emerge from the commons?)**
- B. What costs and risks are associated with the commons, including, for example, any negative externalities?**

Author	Title	Commons
Cole, Daniel	Learning from Lin: Lessons and Cautions from the Natural Commons for the Knowledge Commons	Theory
Benkler, Yochai	Between Spanish Huertas and the Open Road: A Tale of Two Commons?	Theory
Contreras, Jorge	Constructing the Genome Commons	Gene data
Von Overwalle, Geertrui	Van Overwalle, Geertrui, Governing Genomic Data: Plea for an 'Open Commons'	Gene data
Strandburg, Frischmann, & Cui	The Rare Diseases Clinical Research Network and the Urea Cycle Disorders Consortium as Nested Knowledge Commons	Rare disease research
Madison, Michael	Commons at the Intersection of Peer Production, Citizen Science, and Big Data: Galaxy Zoo	Astronomical data
Schweik, Charlie	Toward the Comparison of Open Source Commons Institutions	OSS
Morell, Mayo Fuster	Governance of online creation communities for the building of digital commons	Online creation communities
Shah, Sonali and Moody, Cyrus	Creating a Context for Entrepreneurship: Examining How Users' Technological & Organizational Innovations Set the Stage for Entrepreneurial Activity	User Innovation
Meyer, Peter	An inventive commons: Shared sources of the airplane and its industry	Airplane invention
Murray, Laura	Exchange Practices Among Nineteenth-century US Newspaper Editors: Cooperation in Competition	Journalism
Piper, Tina	How War Creates Commons: General McNaughton and the National Research Council, 1914-1939	Military Technology
Fagundes, David	Labor and/as Love: Roller Derby's Constructed Cultural Commons	Roller derby names
Daniels, Brigham	Legispedia	Congress

Themes from case studies



1. Knowledge commons confront ***diverse obstacles and social dilemmas***, many of which are not well described or reducible to the simple free rider dilemma.
2. Complex relationships between knowledge commons and the systems within which they operate and/or are nested. (***complex, nested systems***)
3. Knowledge commons often depended on ***shared infrastructure***
4. ***Informal governance*** institutions, and especially trusted leadership, often played key roles
5. Commons governance often evolved over time, and commons seemed to play an important role in early stages of some industries (***evolution***)
6. Knowledge commons governance often did not depend on one strong type or source of individual motivations for cooperation. (***many motivations; complex***)