

# Organizational Capacity and Project Dynamics

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# Why Can't America Build Things?



The Gateway Project will upgrade rail links between New Jersey and New York City.

- 2011: proposed by Obama administration
- ⋮
- 2035: completion (projected)

# Why Can't America Build Things?



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**Andrew Reed**  
@andrew\_\_reed



Two projects, both started in 2003:

1. the Van Ness Bus Lane
2. Tesla

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## Why Can't America Build Things?

In the world of civic projects, the first budget is really just a down payment. If people knew the real cost from the start, nothing would ever be approved. **The idea is to get going. Start digging a hole and make it so big, there's no alternative to coming up with the money to fill it in.**

— Willie Brown (former mayor of San Francisco)

*San Francisco Chronicle*, July 2013

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- *Organizational capacity* — the ability to “get things done” — is therefore crucial.
- A rapidly emerging focus for scholars and practitioners
  - Promoted by bodies including UNDP, USAID, OECD, and the European Centre for Development Policy Management
- How does organizational capacity interact with the political environment?
  - Outcomes of interest: size, distribution of benefits, and delay in public projects



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  1. Inputs, such as human capital or budgets
  2. Outcomes, such as clients serviced
- Not a well defined concept for political economy scholars
- But a common, sensible intuition: organizational capacity is good!

# Our Framework

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  - Opponents may use legal and regulatory tools to attempt to revise projects
  - Revisions produce costly delay and can alter the distribution of project benefits
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- How do project designers account for both features?

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  - administers over \$2 billion a year in grants for joint federal-local public transportation projects
- Two technical stages before construction can begin
  1. Project Development
    - environmental review, local government approval, preliminary funding
  2. Engineering
    - finalized funding, safety and geotechnical reports, design

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  - Laws
    - Federal: National Environmental Policy Act, Endangered Species Act
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- **Independent of organizational capacity**, the political system generates opportunities for affecting the design and efficiency of projects.

## Example: The Gateway Saga



The Gateway Project will upgrade rail links between New Jersey and New York City.

- 2011: proposed by Obama administration
- 2016: entered CIG 'Project Development' phase
- 2017: frozen by Trump administration
- 2022: re-started by Biden administration

## Model Setup: Environment

- Two agents,  $A$  and  $B$ , discrete time  $t = 0, 1, 2, 3, \dots$ 
  - Period 0:  $A$  initiates project
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- Each period, agent in control may *revise* an incomplete project.

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- Project stages
  1. Development
  2. Execution, after which project is completed
- Each period, the project moves from development to execution with probability  $p$ 
  - Capacity is parameterized by  $p$

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- Project incurs per-period running cost  $c(s) = s^2$ , for each agent (e.g., taxes).
- Payoff of type  $\Delta^i$  project completion after  $\mathbb{T}$  periods for agent  $i \in \{A, B\}$ :

$$v \cdot s \cdot w - \mathbb{T} \cdot s^2$$

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  - Parameter  $q$  measures the power of regulatory review, litigation etc.
- A simple Markov process

## Equilibrium Concept

- We derive the Markov Perfect Equilibria (MPE) with state variables for  $t \geq 1$  and unfinished project:
  - agent in control  $\in \{A, B\}$
  - the current project type  $\in \{\Delta^A, \Delta^B\}$
- Agent  $i$  in control at  $t \geq 1$  chooses probability of revision  $\sigma^i \in [0, 1]$ .
- Agent  $A$  at time  $t = 0$  chooses scale  $s \in [0, s^{\max}]$  and division  $w \geq 0.5$ .

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- Each agent chooses her best response to maximize expected payoff minus expected running costs.

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# Equilibrium Intuitions

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  - Revisions impose costly delays, and shift benefits toward the opposition
- This produces three cases
  1. High capacity ( $p \geq 2q$ ) or high stability in power ( $r > 1/2$ )
    - Completion time is short
    - Little opportunity for outside intervention
    - Designer can choose her ideal project, giving opposition nothing
    - Large and unequal

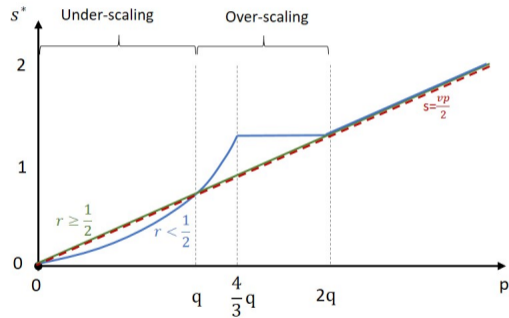
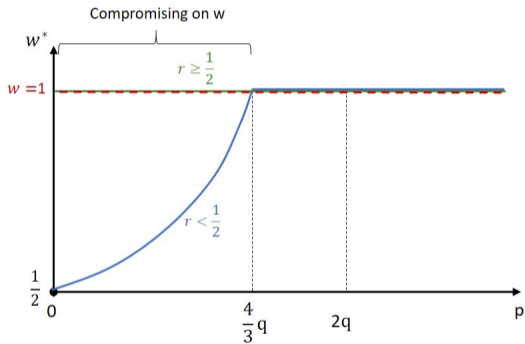
# Equilibrium Intuitions

1. Medium capacity and low stability ( $p \in [q, 2q)$ ,  $r < 1/2$ )
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  - Bad outcomes: relatively unequal, inefficiently large

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  - Greater risk of outside intervention
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  - Distribute some benefits to opposition
  - Bad outcomes: relatively unequal, inefficiently large
2. Low capacity and low stability ( $p < q$ ,  $r < 1/2$ )
  - Over-scaling too costly because completion times are long
  - Instead, *under-scale* and divide project benefits more equally

# Equilibrium: Distribution and Scale



## Additional Results: Political Environment and Delays

- What happens as the political/legal system makes revisions easier ( $q$  increases)?
  - Under-scaling and over-scaling regions of  $p$  “expand”

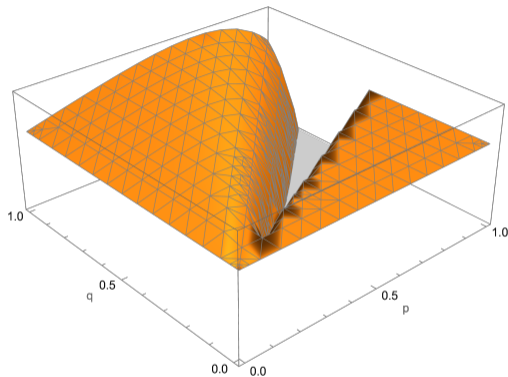
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  - If budgets or other restrictions make over-scaling impossible, then revisions result.
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  - If budgets or other restrictions make over-scaling impossible, then revisions result.
  - Higher capacity exacerbates this by increasing the benefit of revisions.
- What if projects require multiple phases?
  - Suppose projects require an initial “investment” phase.
  - Politicians may worry that successors will exploit their investments and design an undesirable final project.
  - Result: under-investment, possible cancellation of over-scaled projects.

## Welfare: Don't Fall in the Valley



- Welfare: over-scaled projects are bad.
  - Happens when  $p$  and  $q$  “match”
  - High capacity, high institutional constraint systems most vulnerable



# Application

- Our story is consistent with the arc of US institutional and infrastructure development in the 20th century (Altshuler and Luberoff 2003).
  - post-World War II: few institutional constraints (low  $q$ ), large projects
    - Boston Central Artery

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  - 1960s-1980s: environmental movement introduces legal constraints (high  $q$ ), leading to many delays and cancellations
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    - New York Westway
  - Late 20th century: return of “mega projects,” often with greater attention toward distributive concerns
    - Boston Central Artery / Tunnel (the “Big Dig”)

## Discussion

- Working definition of organizational capacity
  - Ability to move from one project stage to the next
  - Corresponds to personnel, capital, other resources
  - In isolation, high capacity increases speed and reduces variability of implementation
- Interaction between capacity and institutions
  - Size and equality of project designs
  - Revisions, cancellations, delays, and under-investment
- What works?
  - *Mismatching* capacity and institutional constraints
  - Low capacity  $\Rightarrow$  high constraints
  - High capacity  $\Rightarrow$  low constraints