Why Is US Transportation Infrastructure So Expensive to Build?

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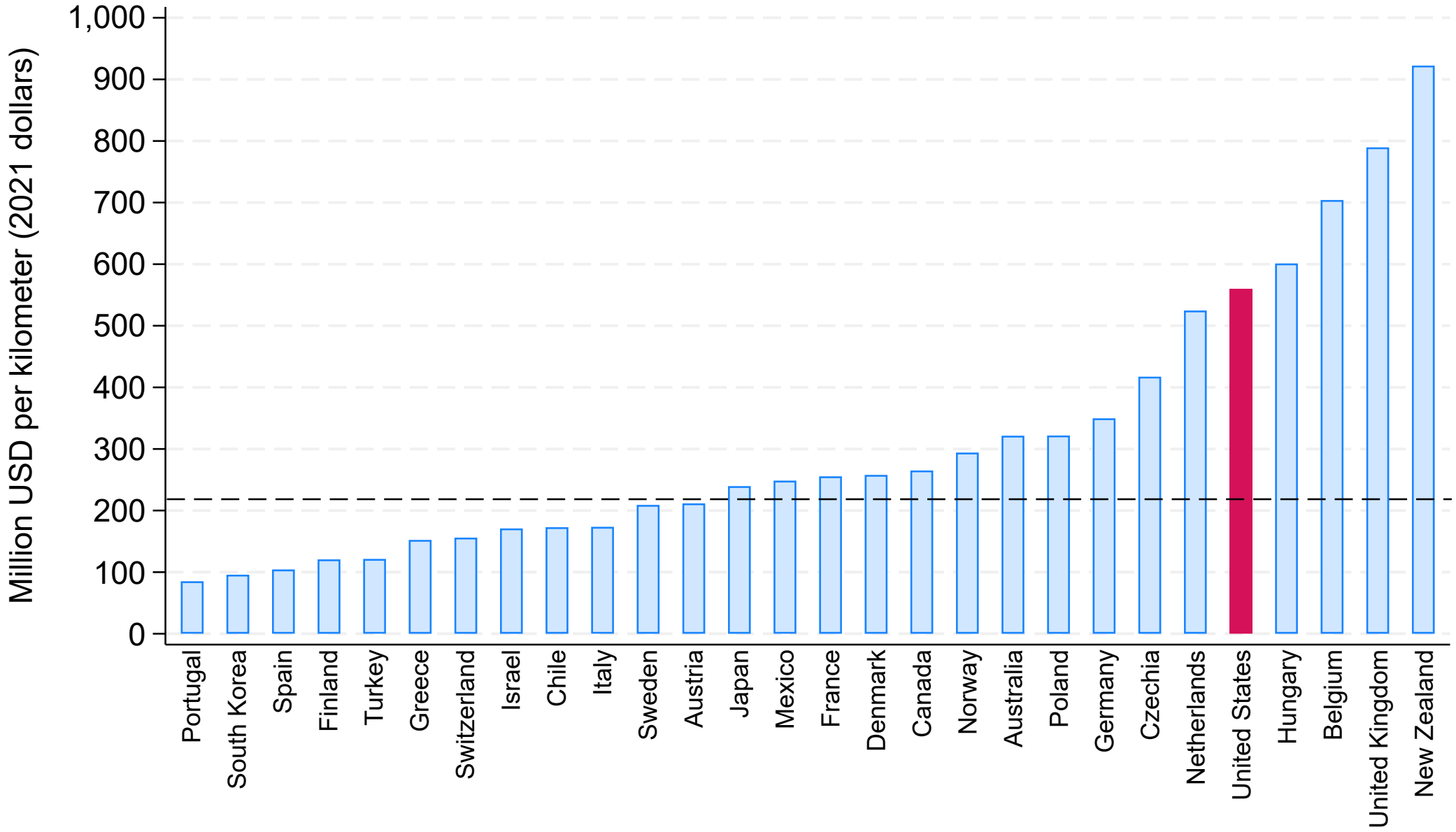
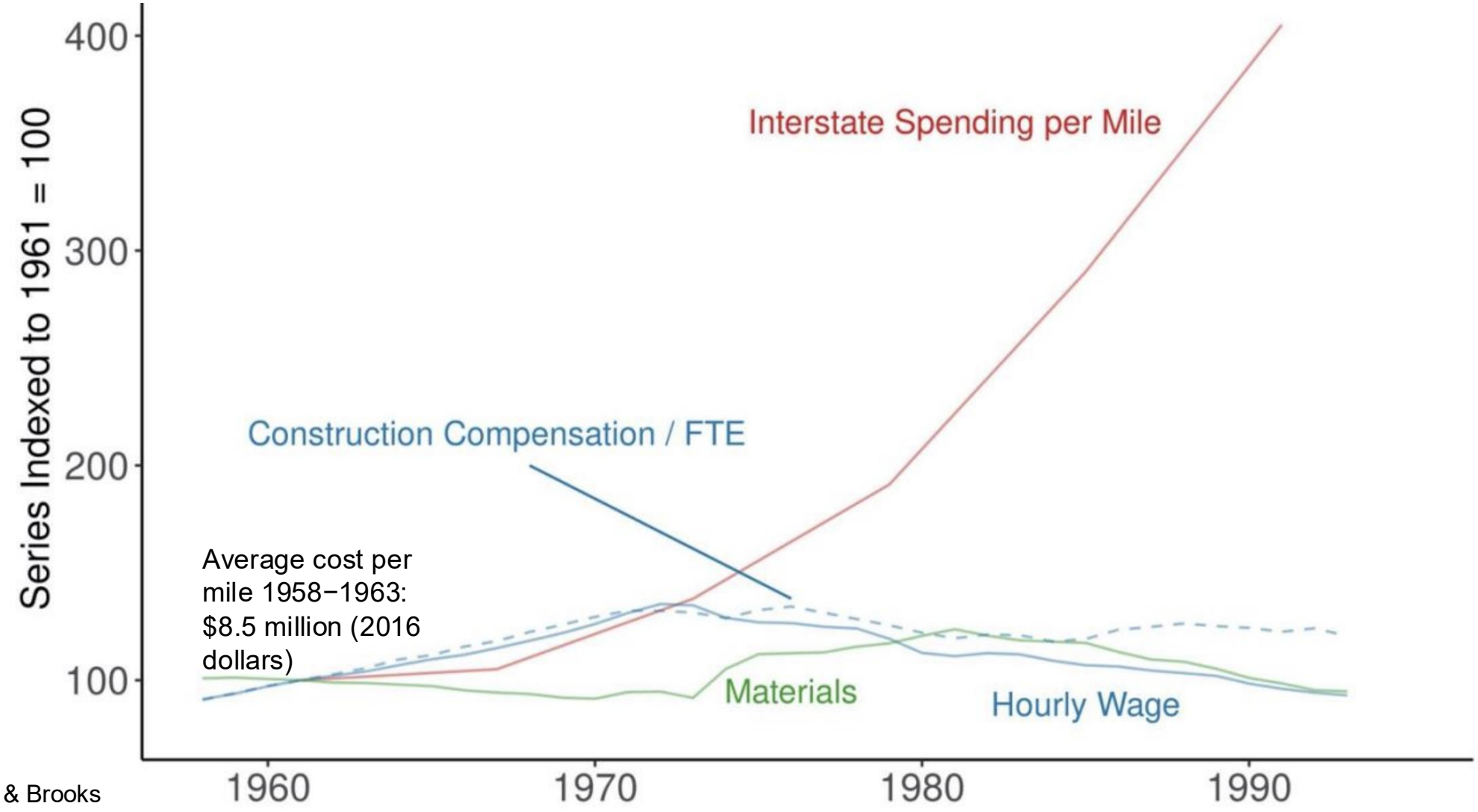
February 2026

US transportation infrastructure is very expensive to build

Transit costs about 3x as much to build in the US as abroad

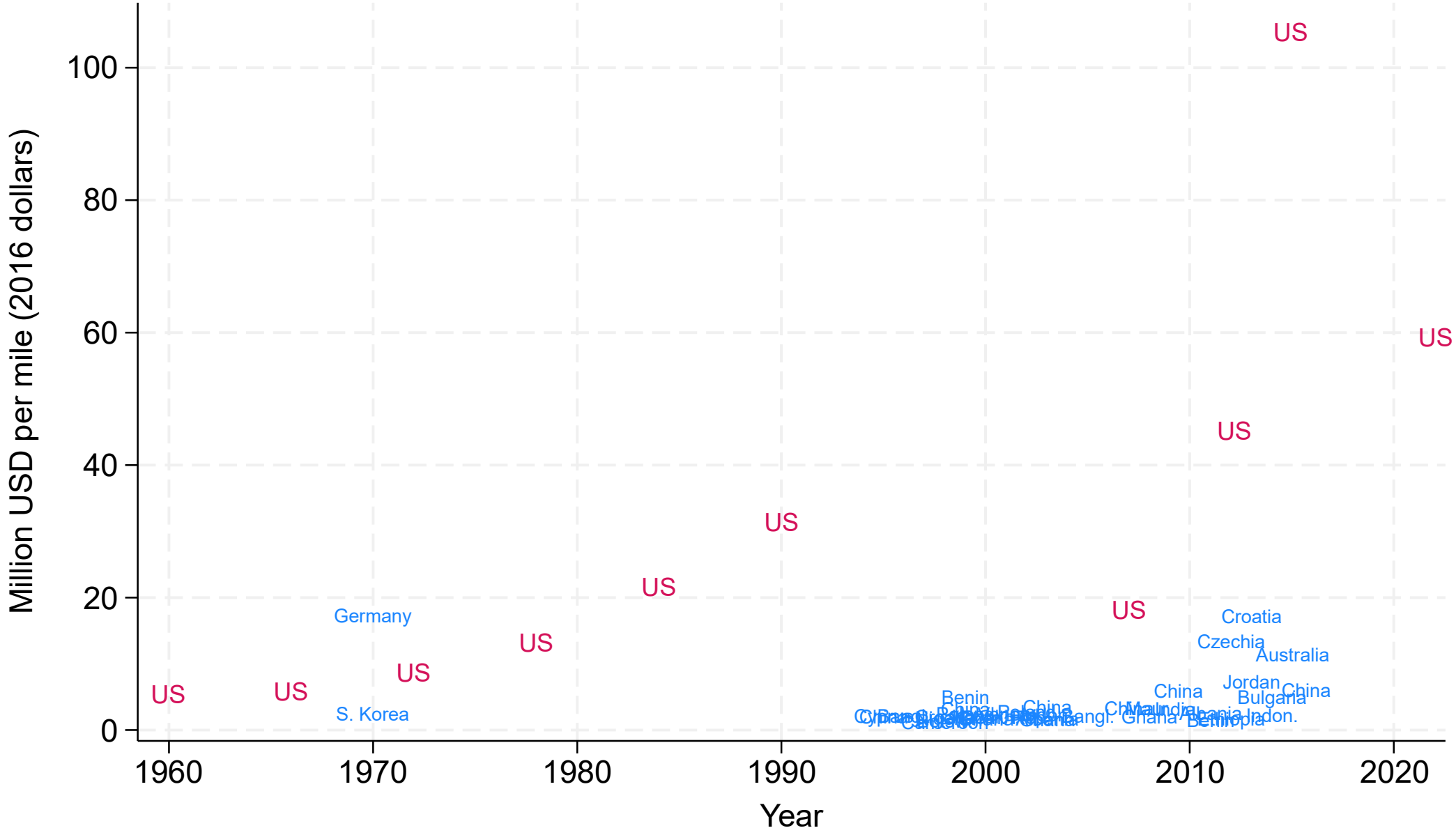


The cost to build the Interstates tripled in the second half of the 20th century – and it's not explained by prices



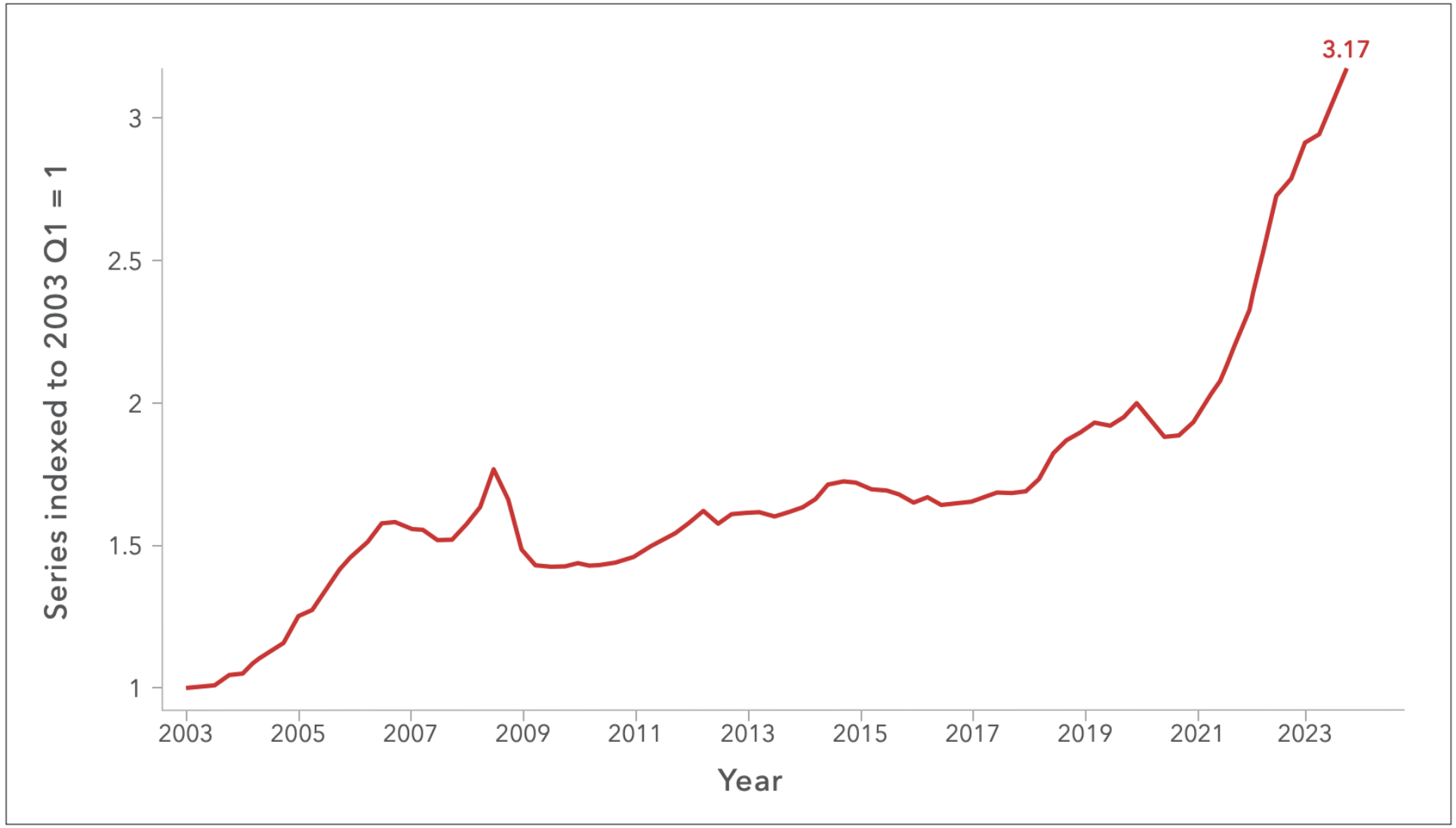
Liscow & Brooks (2023)

US highways are by far the most expensive ever built in the world



Recently there has been a dramatic rise in prices

Figure 3: National highway construction cost index



Source: US Department of Transportation, Federal Highway Administration 2023b.

4 reasons for high US infrastructure costs

1. Personnel
    - Understaffed
    - Don’t pay enough for quality
    - Too much outsourcing
2. Procurement procedures limit competition
3. Complex and lengthy permitting
    - Including too much litigation
4. Data
    - Too little, too unharmonized data

...and then I’ll turn to solutions.

Why Are Costs High?

1. Personnel

I did a national survey of state DOT officials and contractors:

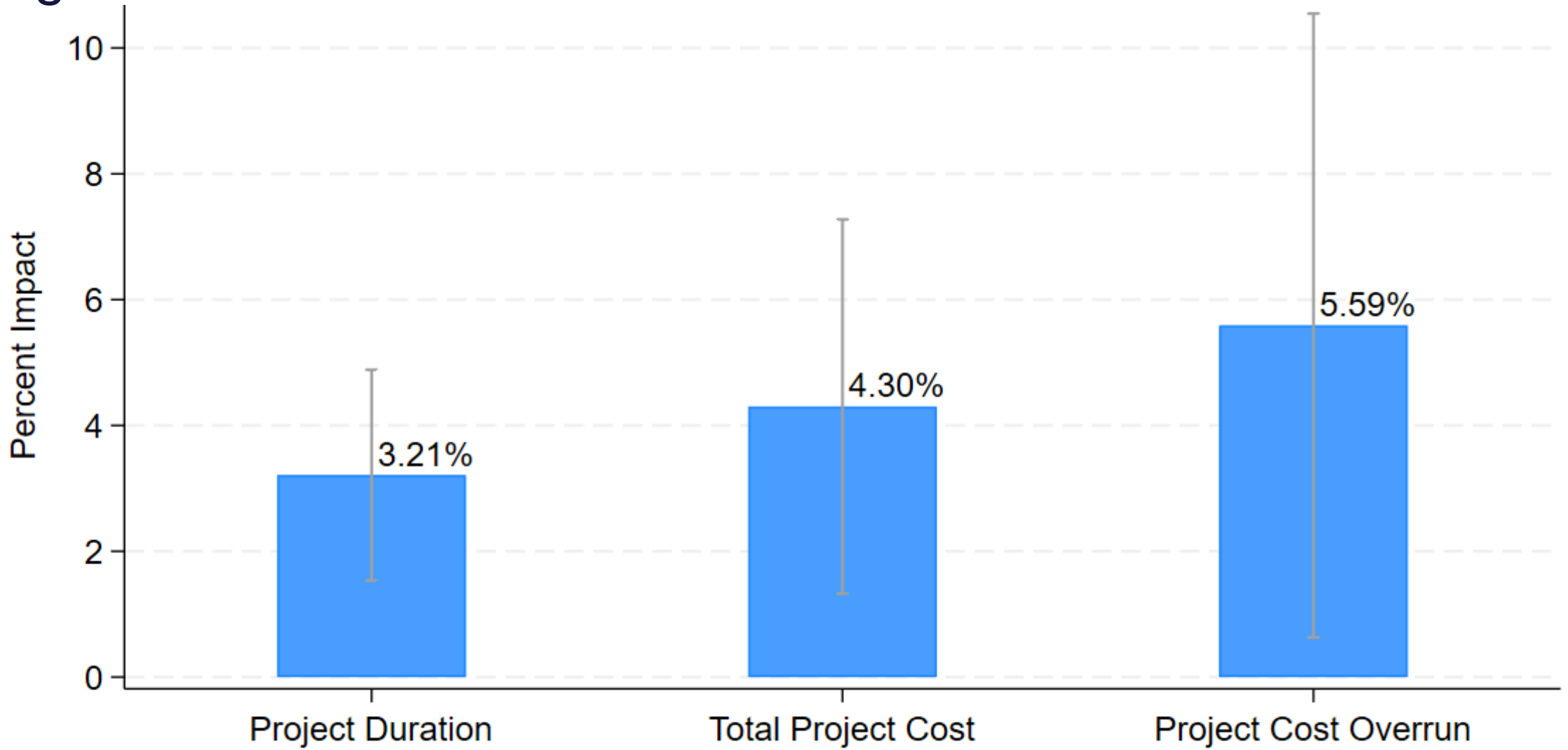
- Cite understaffing as a concern (88% of officials, 59% of contractors)
- Cite outsourcing as a concern (64% of officials, 78% of contractors)

I also collected, state-by-state, per-mile highway resurfacing cost data.

Correlated with lower costs:

- More staffing
  - Increase DOT staffing by 1 per 1,000 population → 26% lower costs
- Less consultant use
  - Note: wide variation across states

Impact of 1% of California Dept. of Transportation staff engineers retiring



Note: Effects are at the mean by transportation district. Lines represent the 90% confidence interval.

Liscow, Nober & Slattery (2025)

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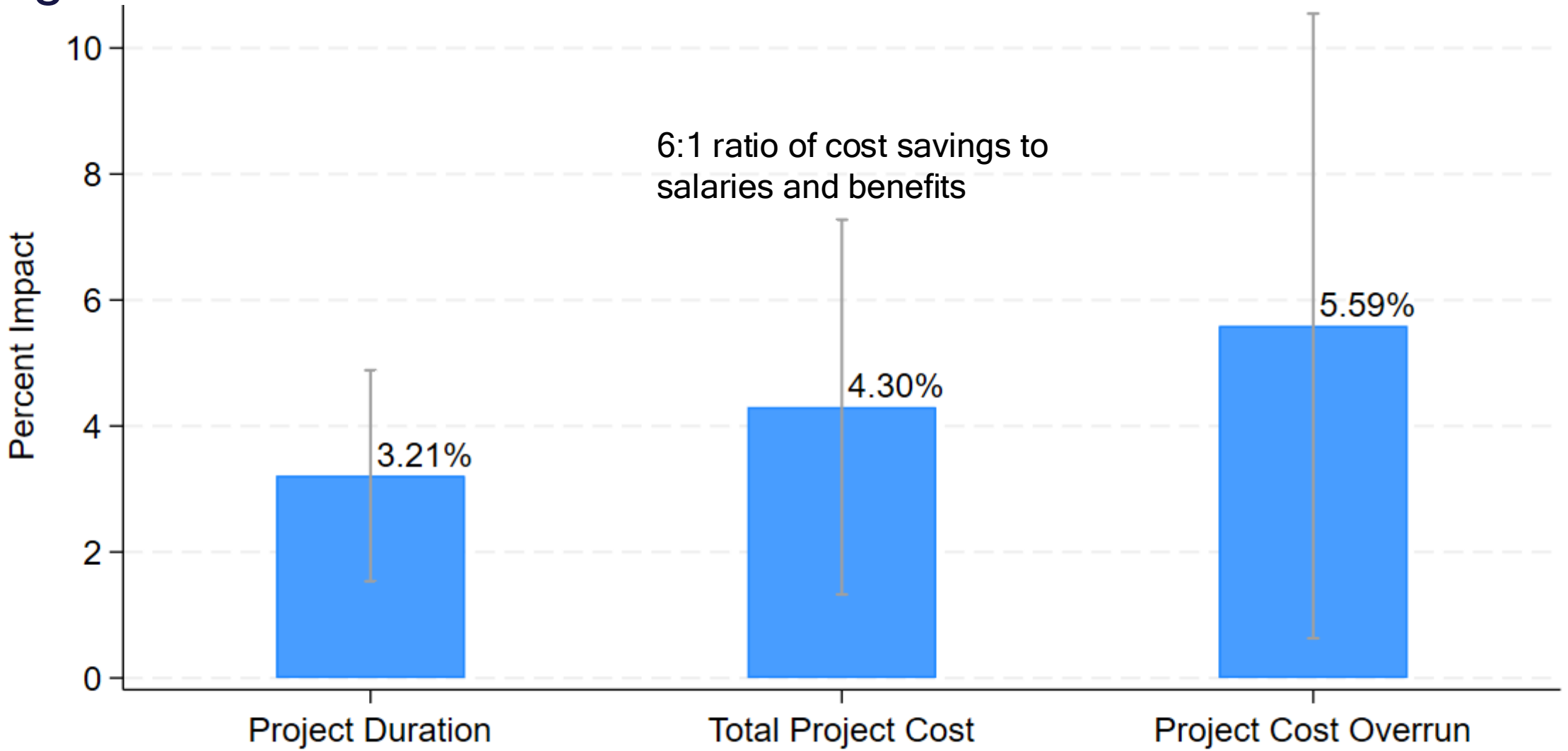

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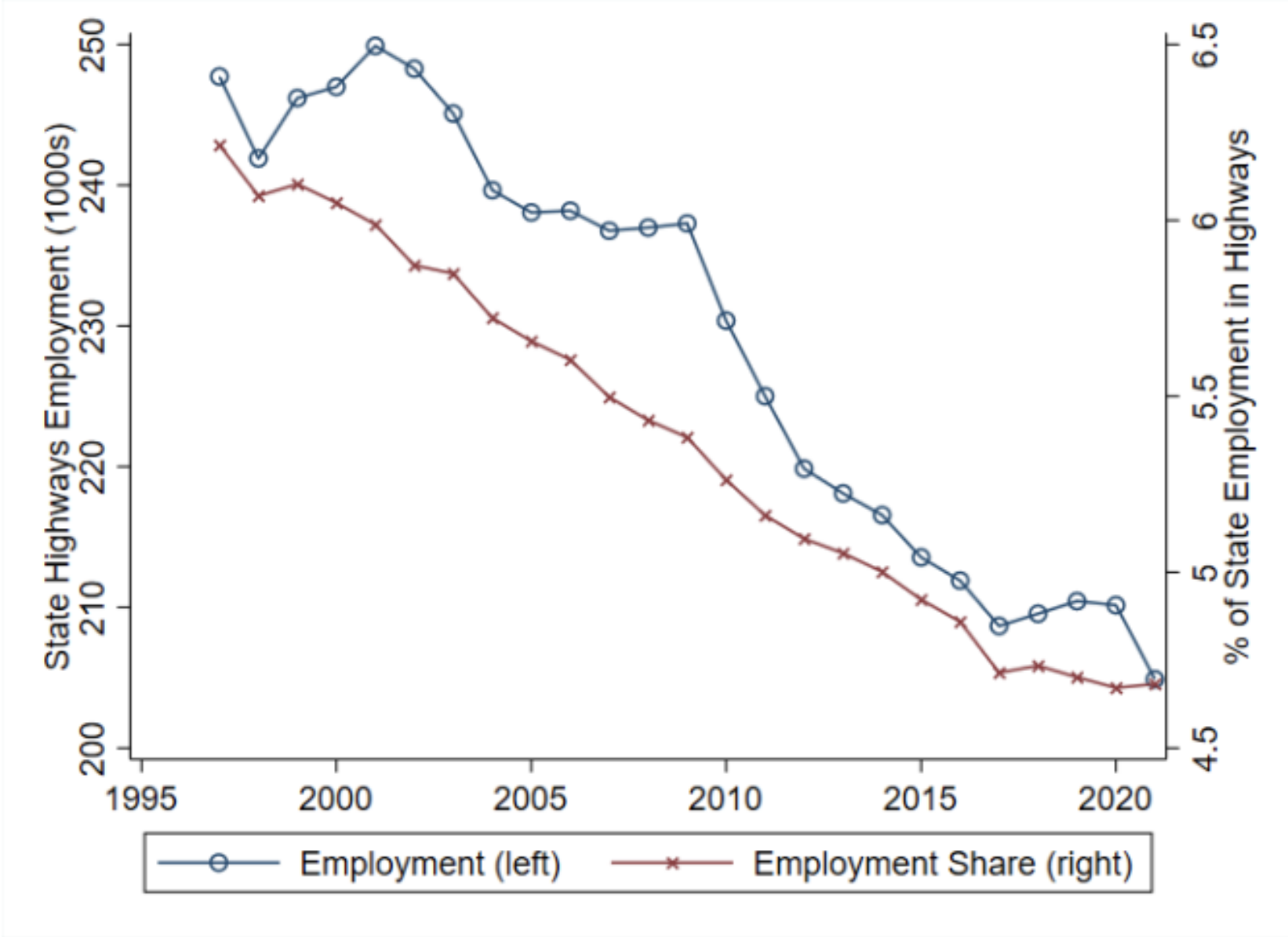
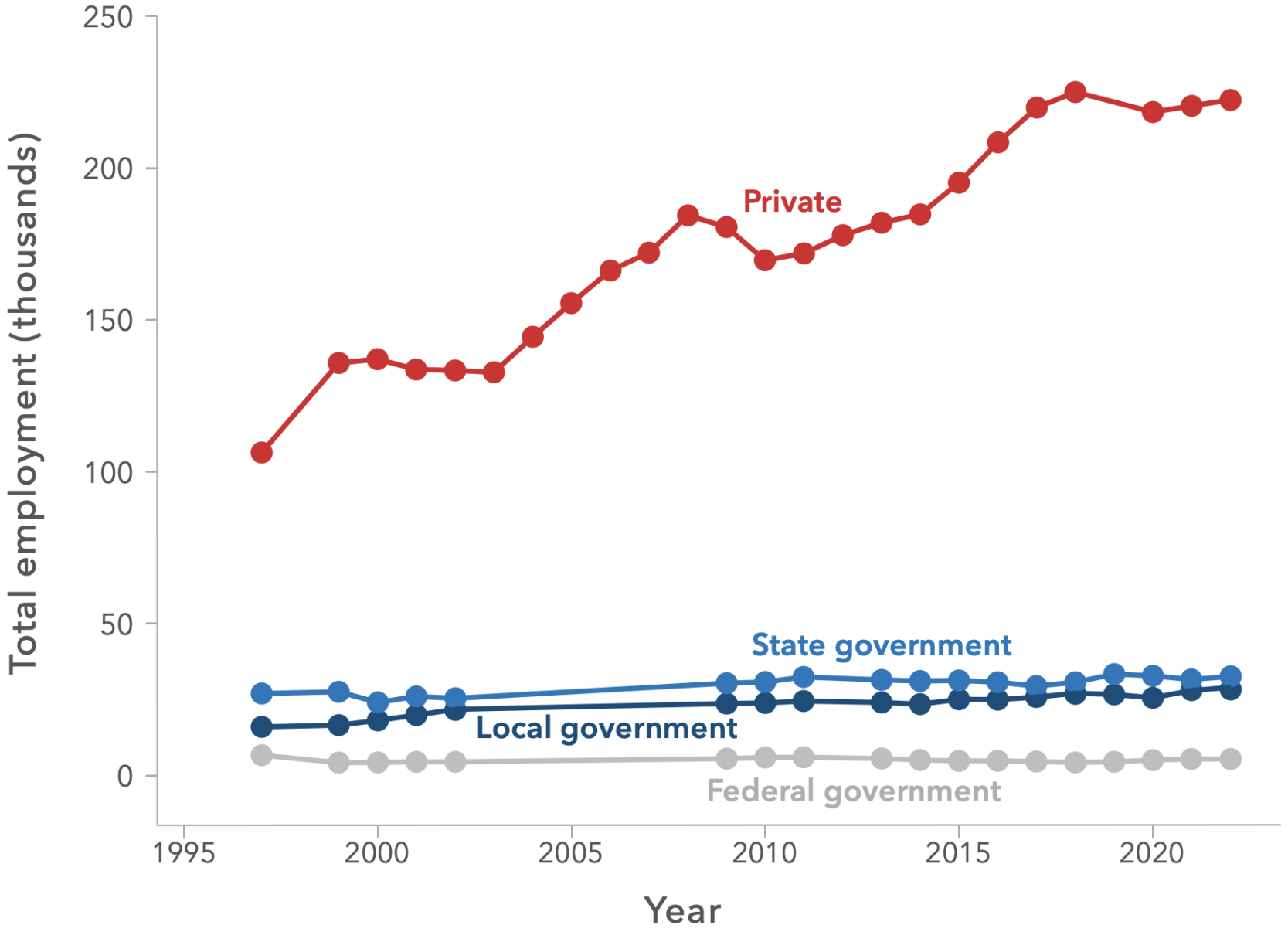
Liscow, Nober & Slattery (2025)

There have been large declines in staffing at state DOTs

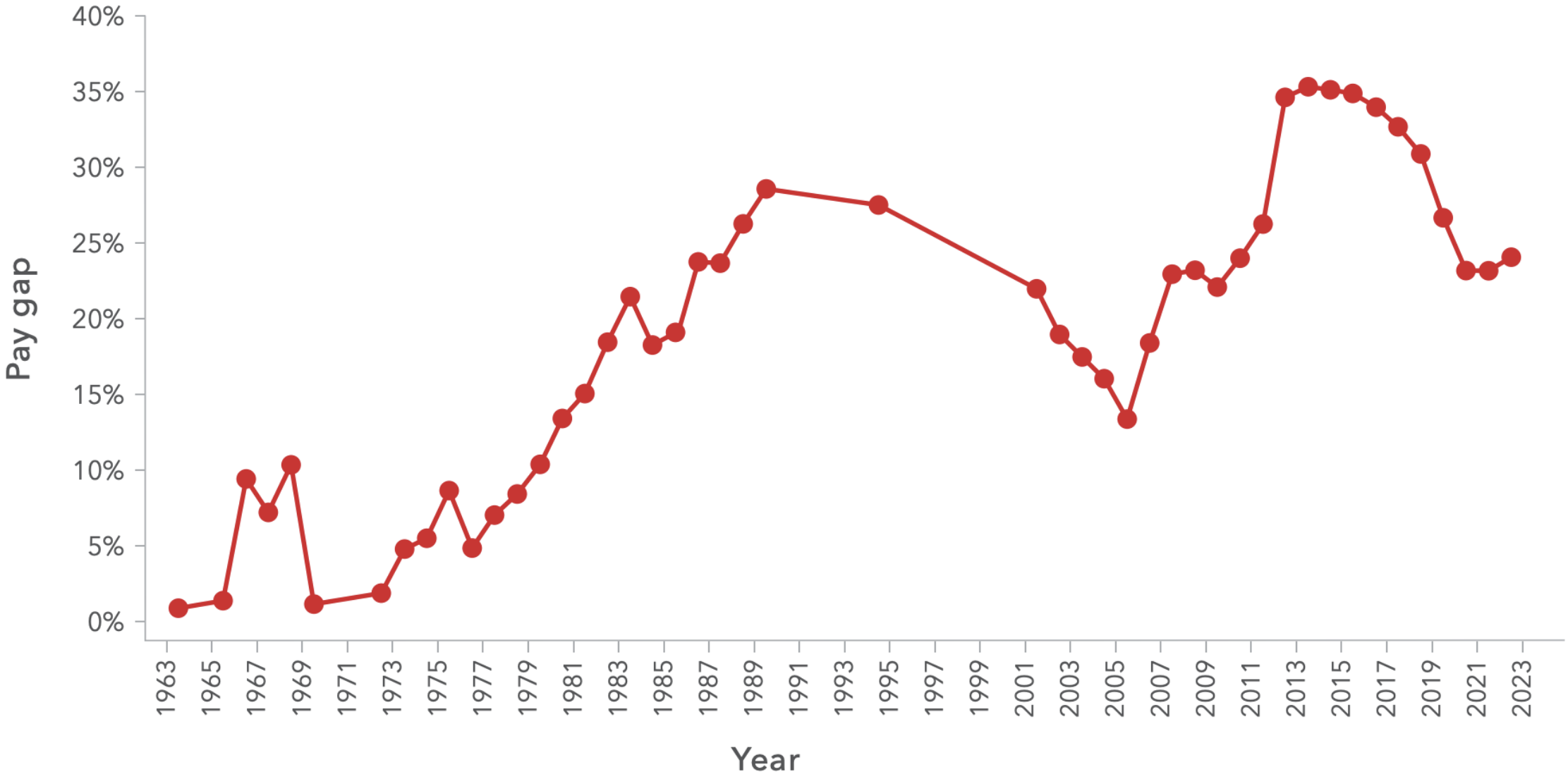


Liscow, Nober & Slattery (2025)

Civil-engineering has been increasingly outsourced over time



Public-sector pay has not kept up with private-sector pay



1. Personnel

- Increase worker quality from the 25th to the 75th percentile: get cost savings equal to 3x typical engineer salary!

- Building infrastructure is hard!

- Without adequate internal staffing, planning, bidding, and contract monitoring don't go as well
  - For example, more change orders (a big correlate of costs)

- And more consultants
  - Expensive per hour
  - Don't have great incentives
  - Won't produce good outcomes if they are directed well internally

2. Procedures that limit competition

Competition matters

- Each additional bidder is associated with 8% lower costs

- On average, projects our data have 3.3 bidders
  - 33% of projects have 2 or fewer bidders

- Little new entry of firms: only 6% of states say that there are often firms bidding that they don’t know/expect

- Decrease in highway-construction establishments from 2007-2017 in 70% of states

2. Procedures that limit competition

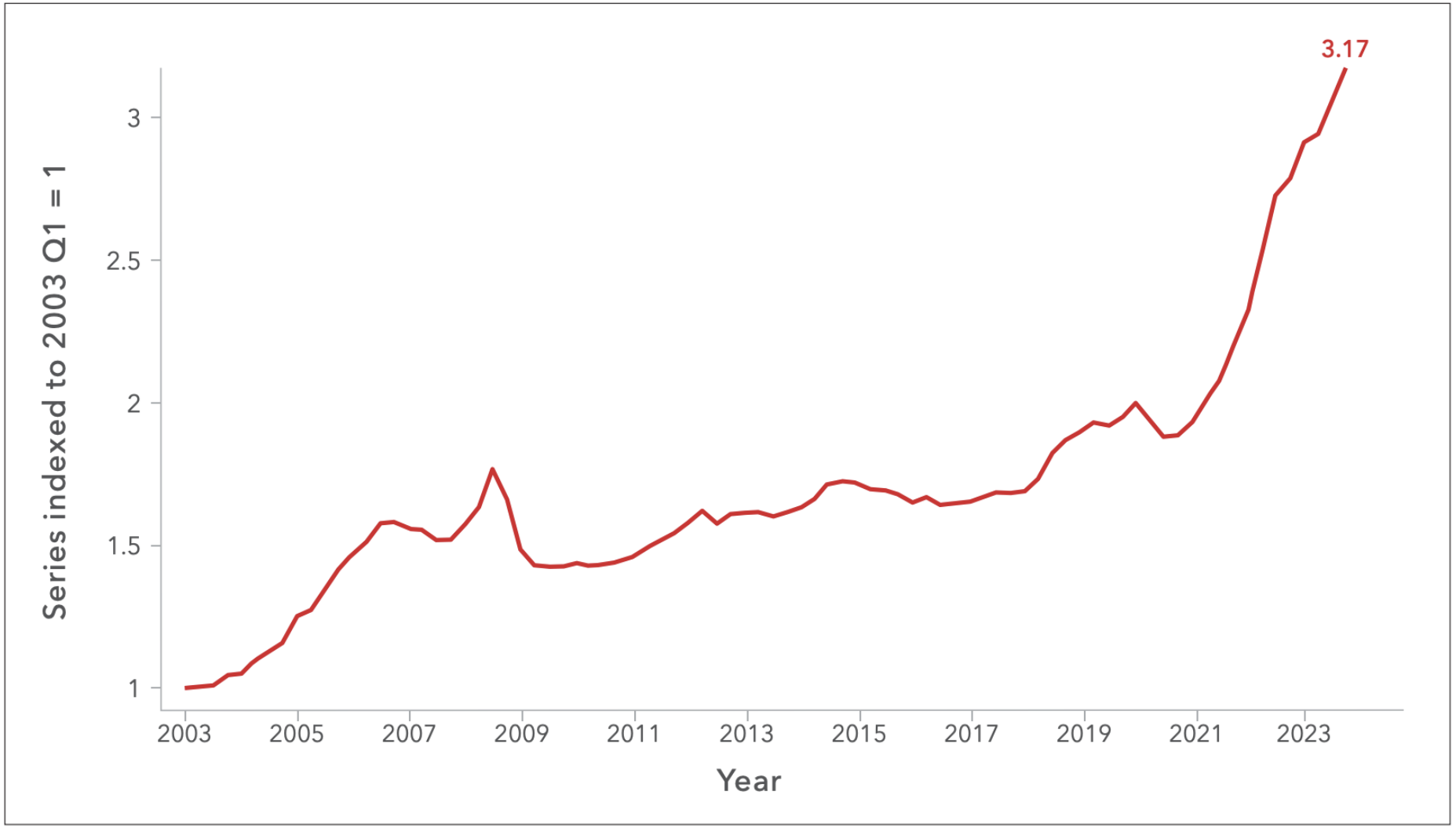
Many things reduce competition and make process harder for contractors

Correlated with higher costs:

- Lack of bidder outreach:
  - Do bidder outreach in 10% fewer projects → 15% higher costs
  - Low bidder outreach (only 24% of states do outreach more than ¼ of the time)
- Limits on subcontracting
- More administrative burden
- Complex paperwork
  - Increase of 50 pages in basic contracting template → 10% higher costs
  - Average page length: 165. Vary between 45 and 382.

The dramatic recent price rise could have been aided by the difficulty of navigating processes

Figure 3: National highway construction cost index



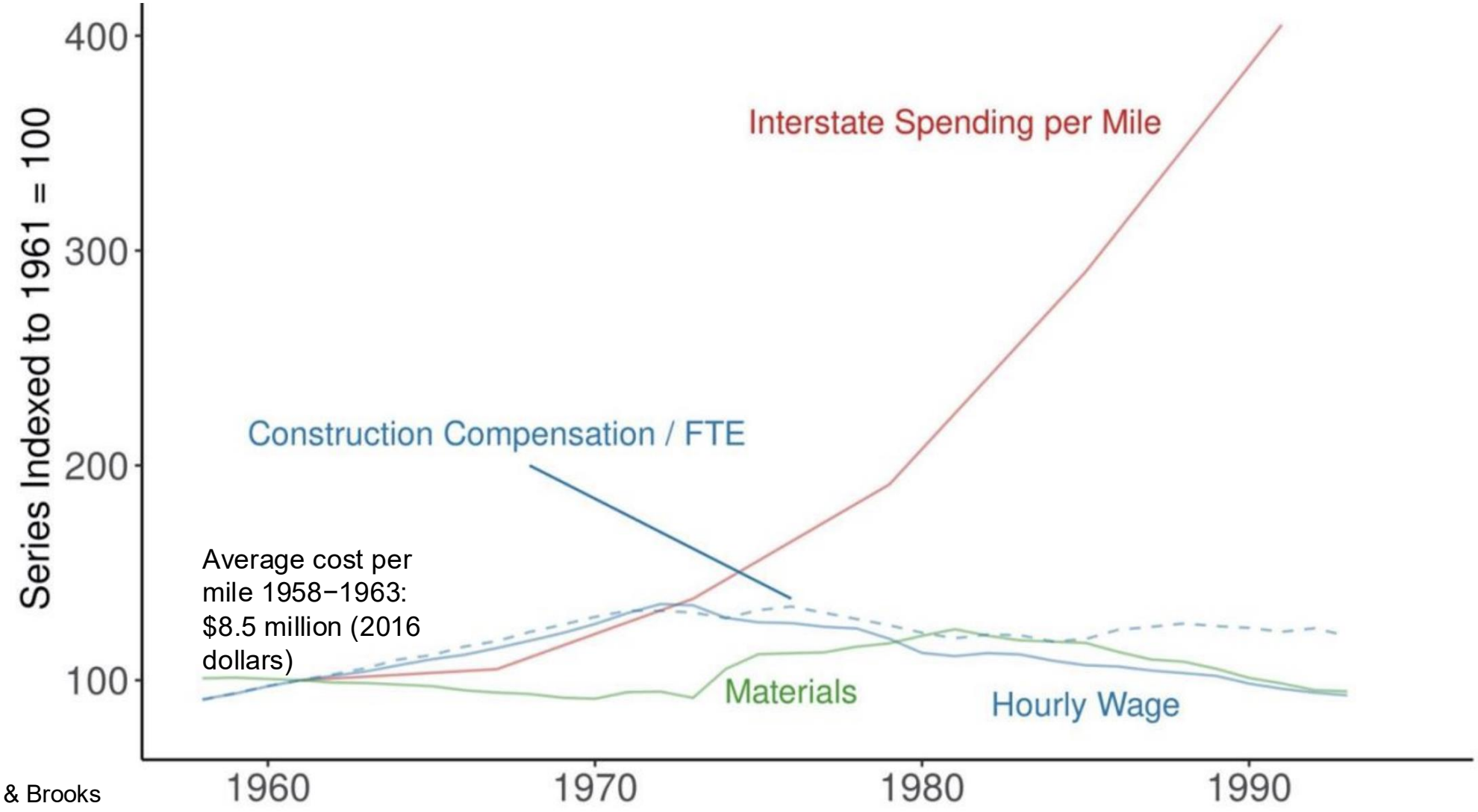
Source: US Department of Transportation, Federal Highway Administration 2023b.

3. Complex and lengthy permitting

- Especiallyl for megaprojects

- I'll focus on federal level
  - State/local matters even more

The timing of the increase in building highways coincides with the advent of the modern permitting regime



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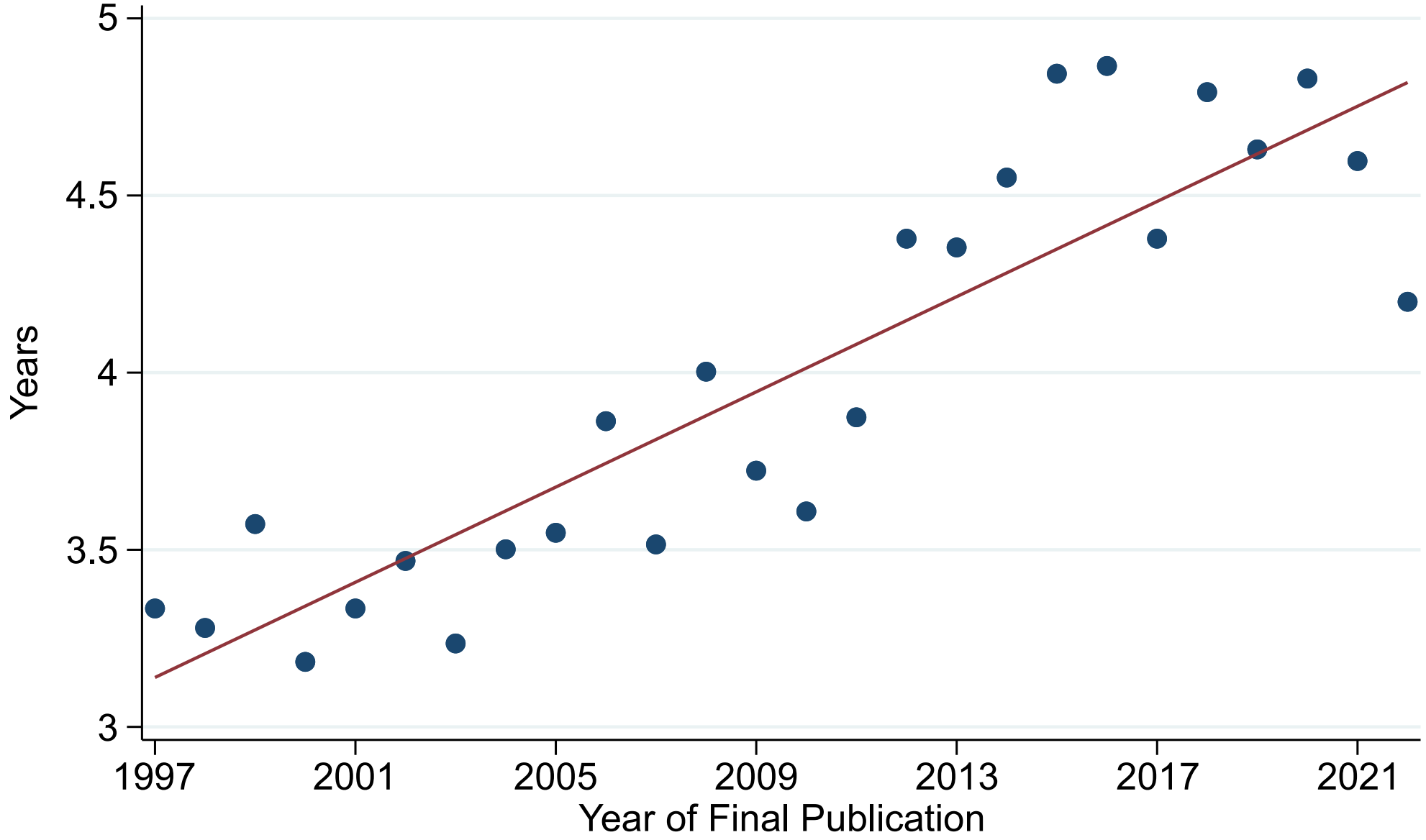
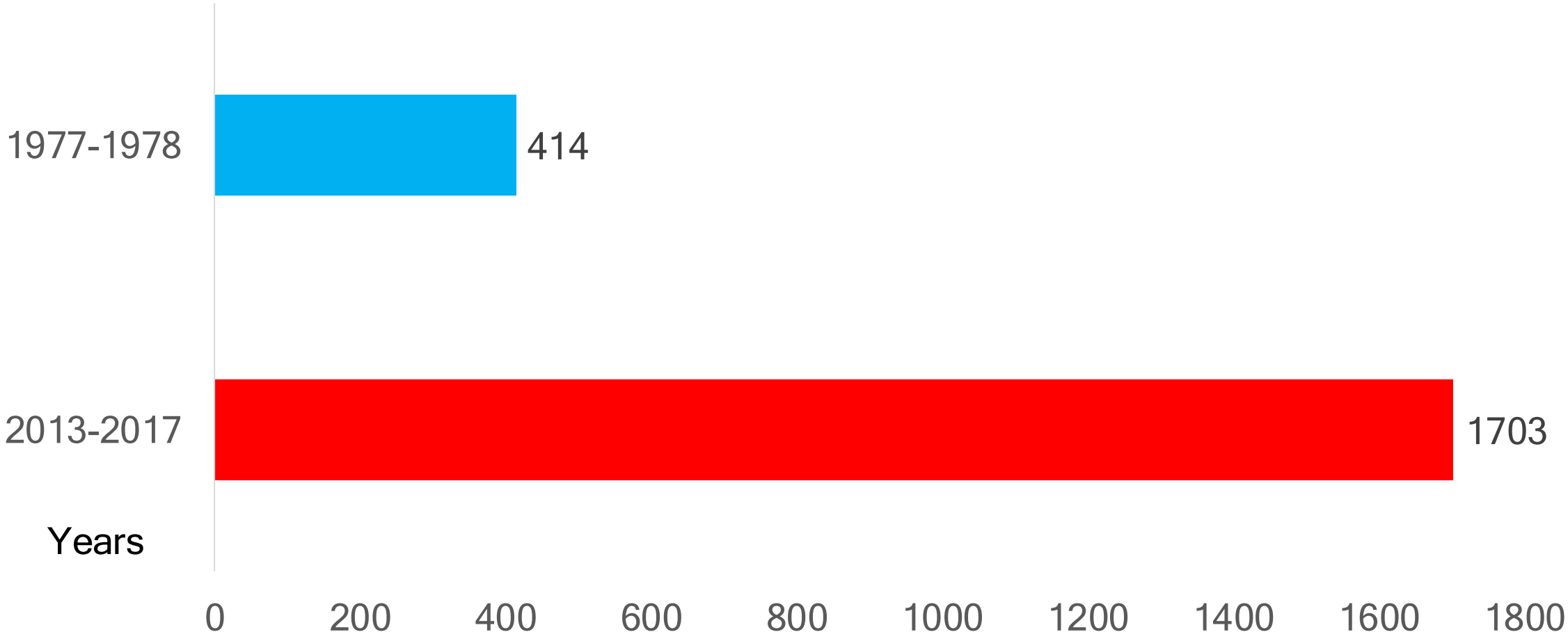
NEPA environmental impact statement preparation time



Average page lengths of NEPA environmental impact statements



3. Complex and lengthy permitting

NEPA litigation:

- Median litigation when lawsuit succeeds: 2 ½ years
- Median litigation even when the lawsuit fails: 1 ½ years

…and that's just the district court.

Consequence of complex and lengthy permitting:

- Permitting itself isn't directly a large expense
- Costs go up because of defensive and reactive measures
  - Build more to be able to actually move forward with a project

4. Weak data

- How do we most rigorously know how to reduce costs?
- It takes data
- But data are often not publicly available (and even internally may be hard to analyze)
  - Spending per mile
  - Project components
  - Project timelines
- And, when data are available, they are typically inconsistent across states

- I showed you some (hopefully useful) results
  - Those took years to assemble, state-by-state
- With better data, imagine how useful:
  - Researchers, legislators, journalists, citizens could be

What to Do?

1. Personnel

- Pay nearly in line with the private sector
- Staff up
- Reconsider hiring, firing, promotion procedures to improve quality of workers
- Be hesitant when outsourcing planning
  - Ammunition to legislators/budget offices that it's penny-wise, pound-foolish to outsource so much

2. Reform procedures to increase competition

Reform procurement at the state level:

- Seek out more bidders
- Loosen subcontracting restrictions
- Simplify the process
- Make procedures more consistent with those elsewhere to draw in competitors

3. Simplify permitting

- Reform permitting
  - Make it harder to sue
  - Improve front-end participation
- Preserve public participation and the environment
  - … while speeding up delivery and reducing costs

4. Better data

- Allow much better access to cost and timeline data
  - Have it historically too
- Have a good contact to talk about data
- Set standards to produce more comparability across states

Conclusion

- US transportation construction costs are high

- Four contributing factors:
  - Personnel (too few, too low quality)
  - Procedures limit competition (too many procedures, too little competition)
  - Permitting (too complex)
  - Data (too little)

Further information

- Underlying papers:
  - "State Capacity and Infrastructure Costs" (with Will Nober and Cailin Slattery)
    - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4522676
    - Policy Brief: Yale Tobin Center
  - "State Capacity for Building Infrastructure"
    - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5045644
  - "Getting Infrastructure Built: The Law and Economics of Permitting"
    - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4775481
    - Policy Brief: Niskanen Center
  - "Infrastructure Costs" (with Leah Brooks)
    - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3428675
- Other papers available here: https://law.yale.edu/zachary-liscow
- Contact info: zachary.liscow@yale.edu