

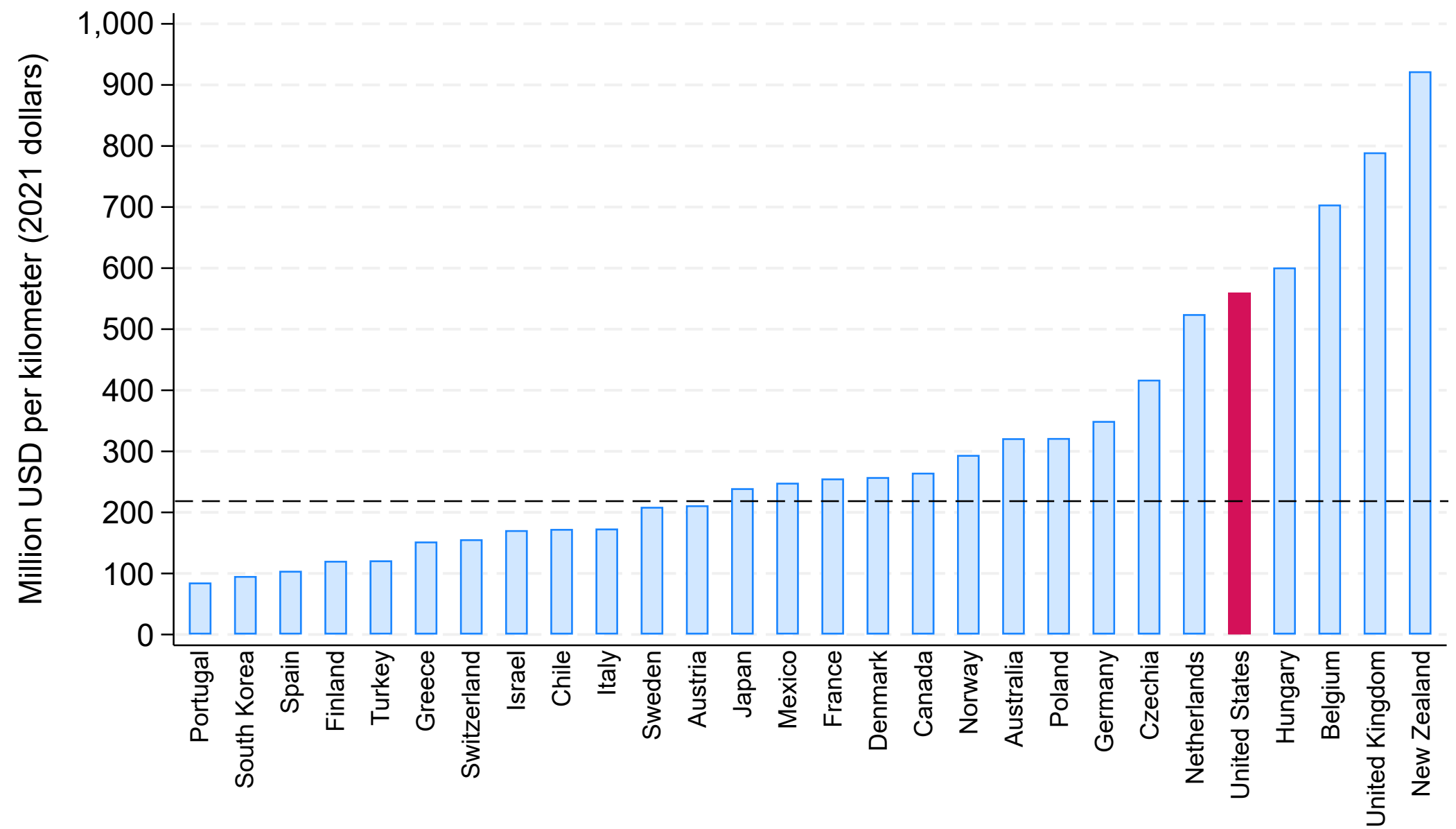
Why Is US Transportation Infrastructure So Expensive to Build?

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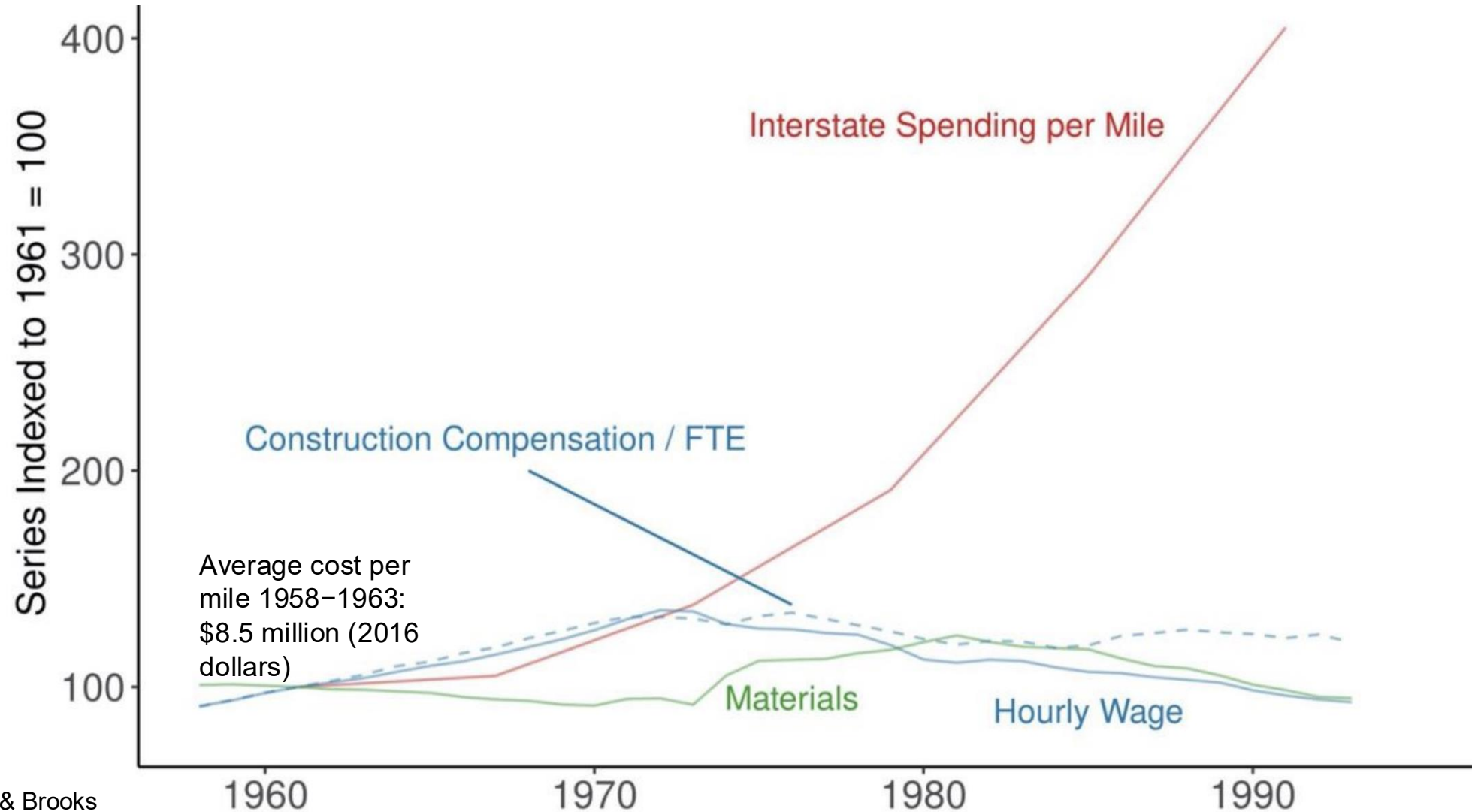
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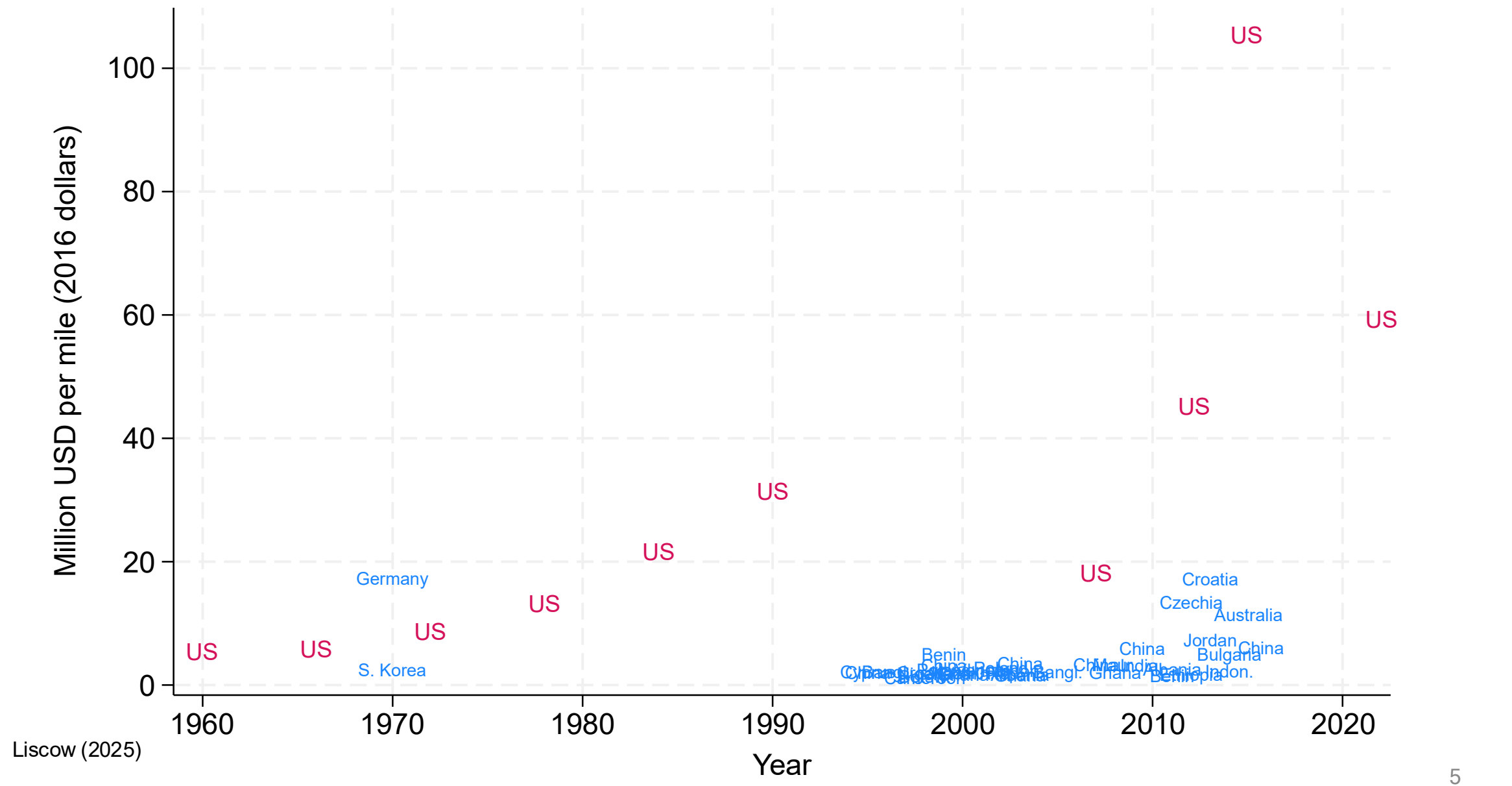
Transit costs about 3x as much to build in the US as abroad



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



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



High construction costs are concerning

- Strain public finances
- Build less infrastructure
 - Worse job matching → Lower productivity
 - More time spent commuting → Maybe fewer working hours
 - Worse good transport → More expensive goods

3 hypotheses 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 heavy litigation

How the US typically build transportation infrastructure

The government (for highways, typically the state):

- Plans the road
 - Possibly with consultants
- Get permits
- Puts it out to bid to private contractors
- Selects a winning bid
- Monitors the contractor

Why Are Costs High?

1. Personnel

Liscow, Slattery & Nober (2025) did a national survey of state DOT officials and contractors:

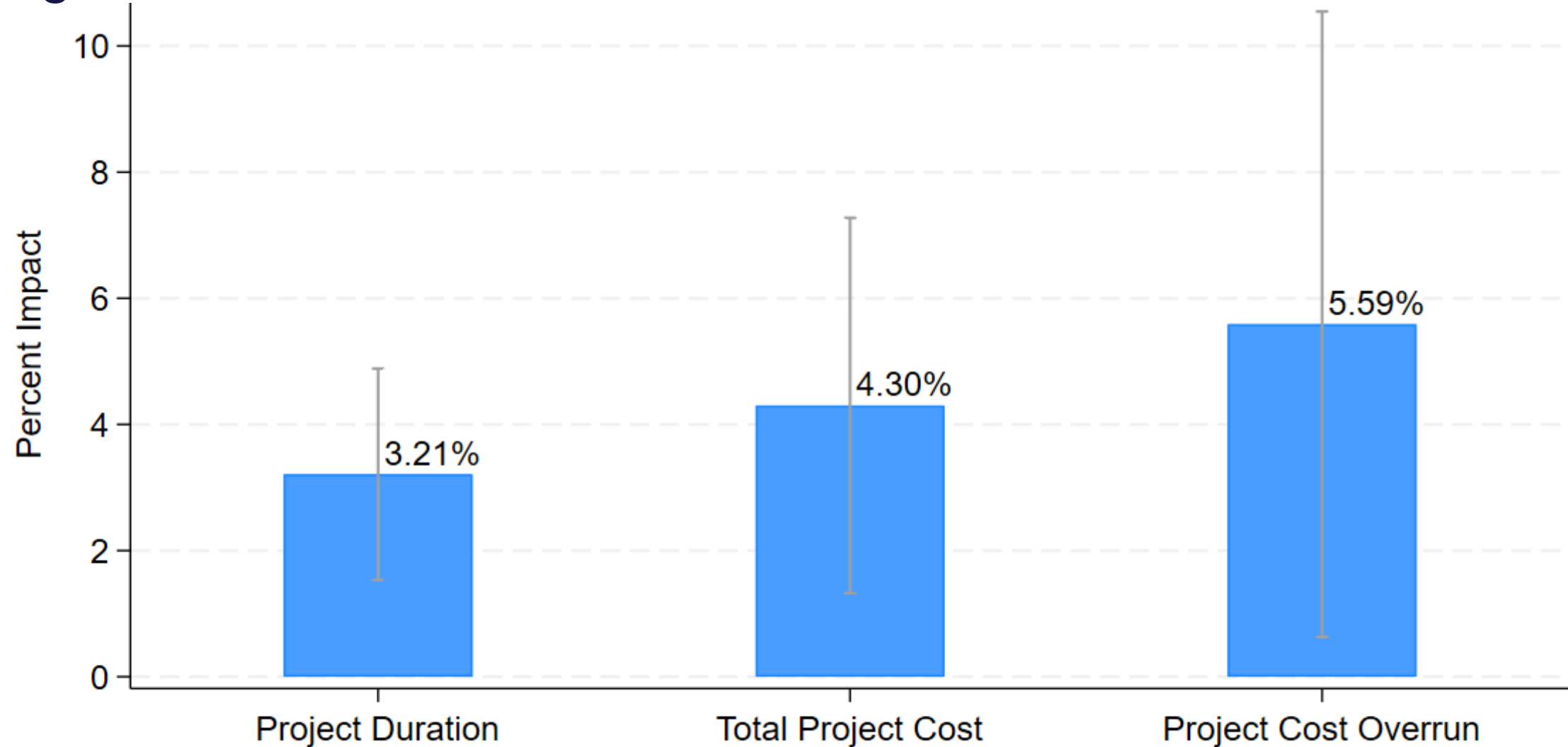
- Cite understaffing as a concern (88% of officials, 59% of contractors)
- Cite outsourcing as a concern (64% of officials, 78% of contractors)

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

Correlated with lower costs:

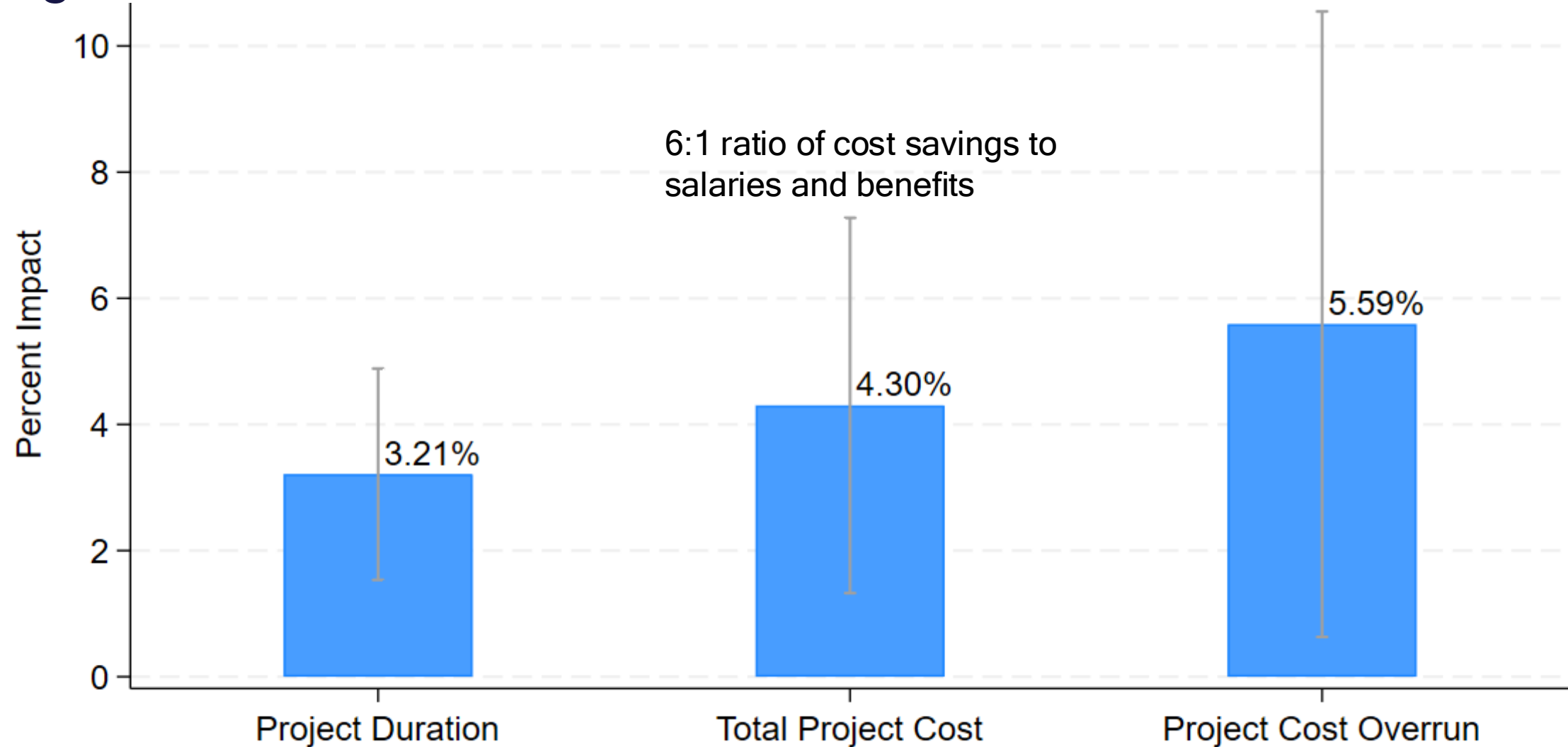
- More staffing
 - Increase DOT staffing by 1 per 1,000 population → 26% lower costs
- Less consultant use
 - Note: wide variation across states

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



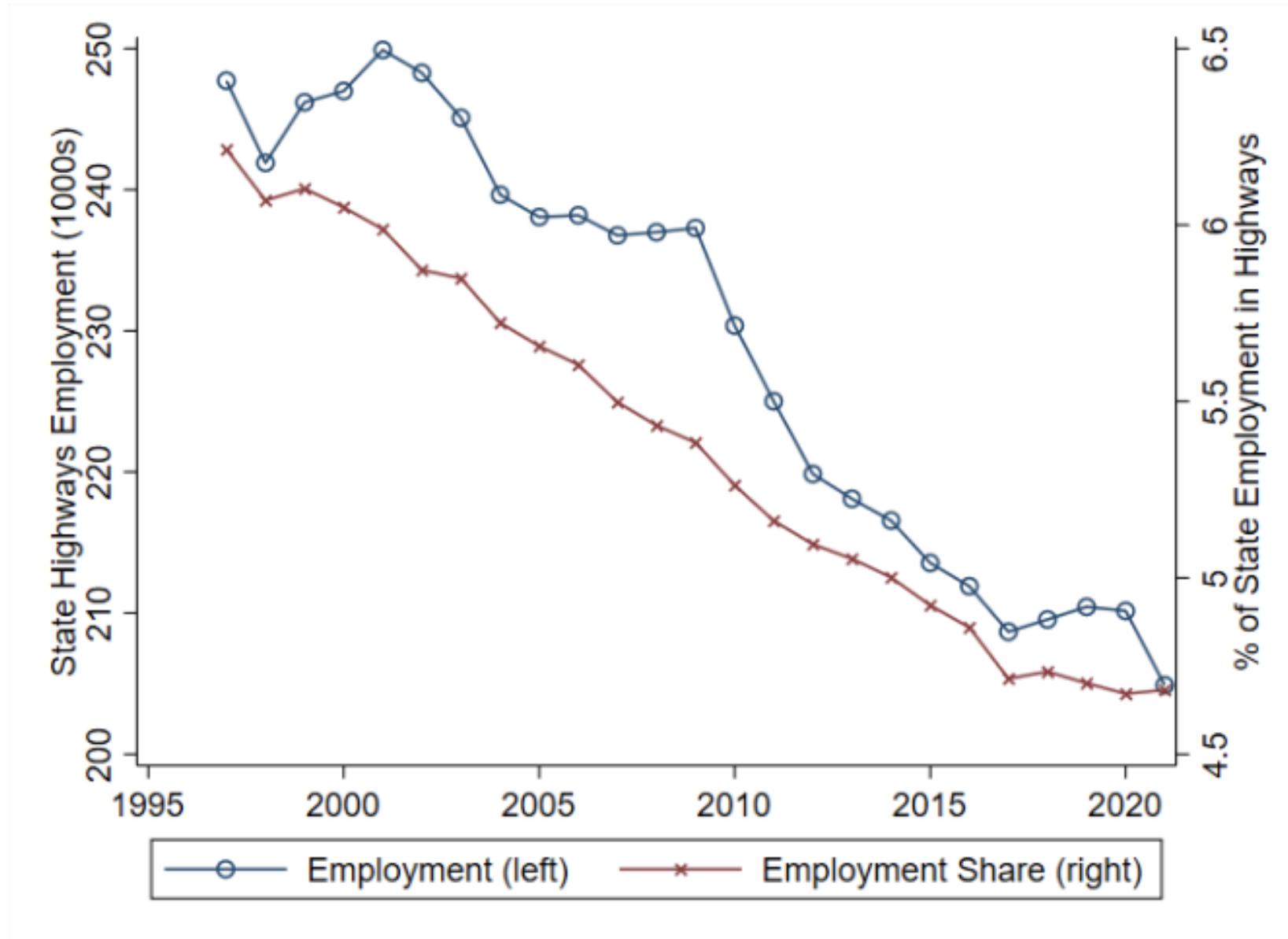
Note: Effects are at the mean by transportation district. Lines represent the 90% confidence interval.

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

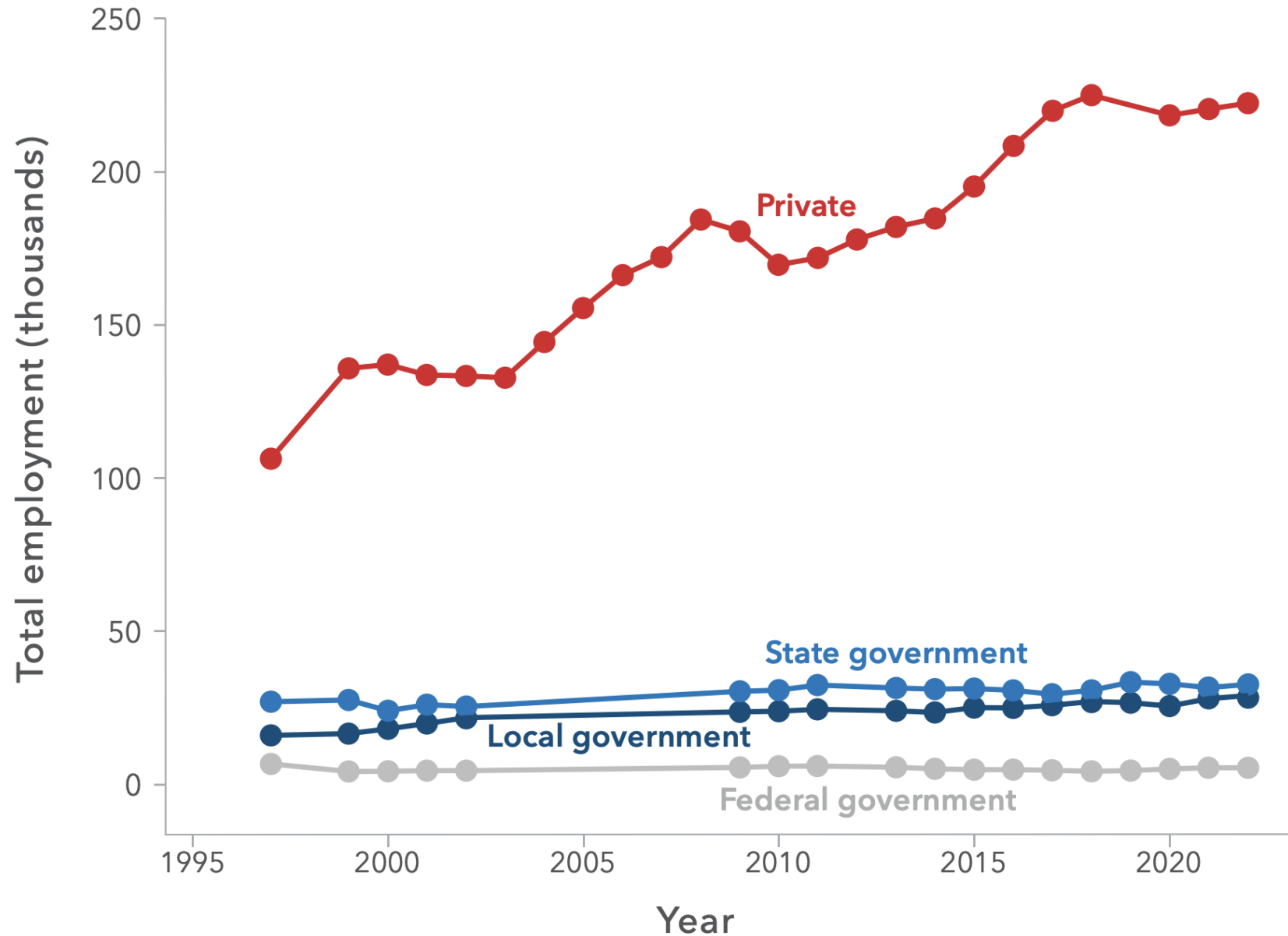


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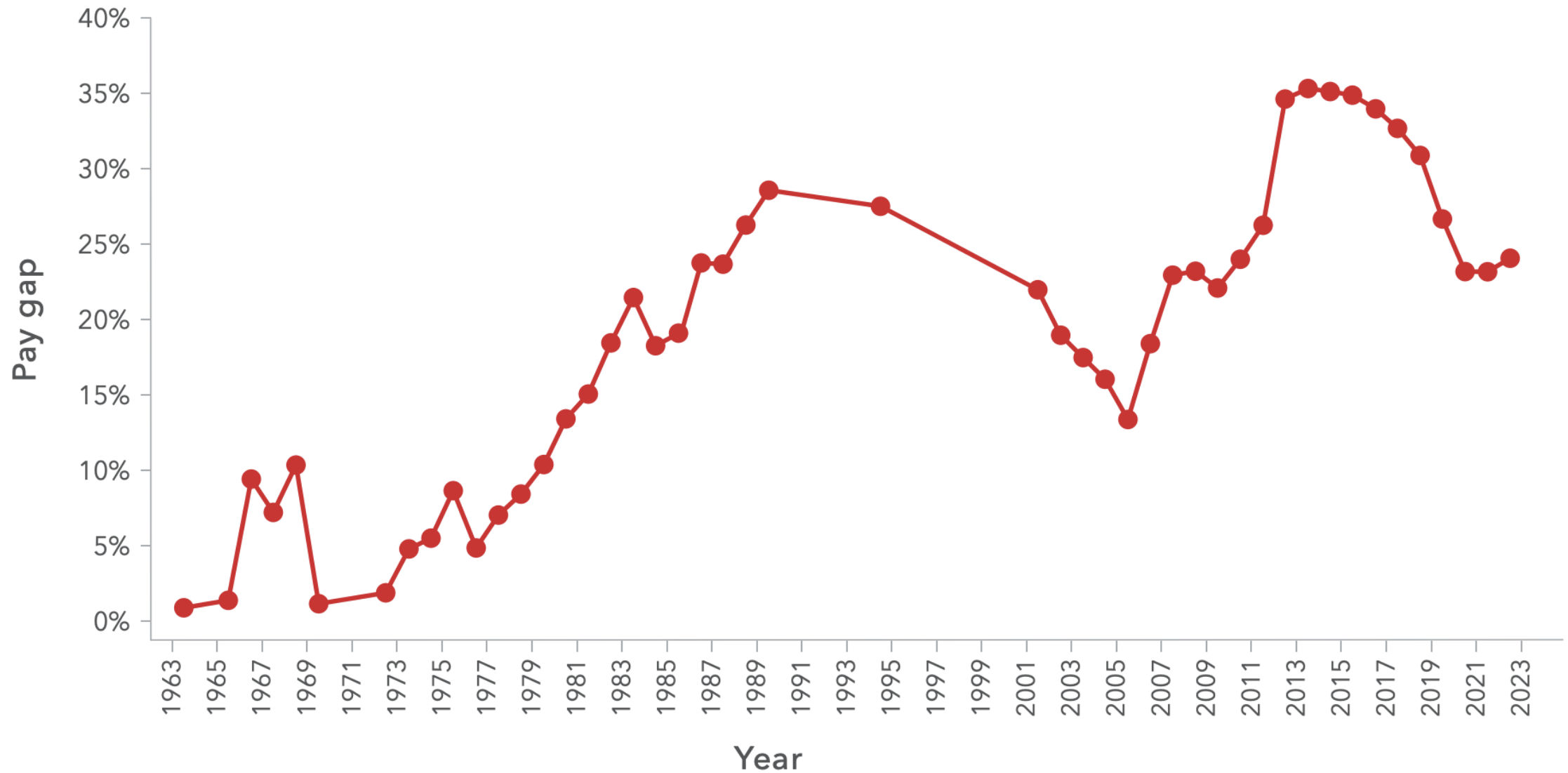
There have been large declines in staffing at state DOTs



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
- 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 in 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

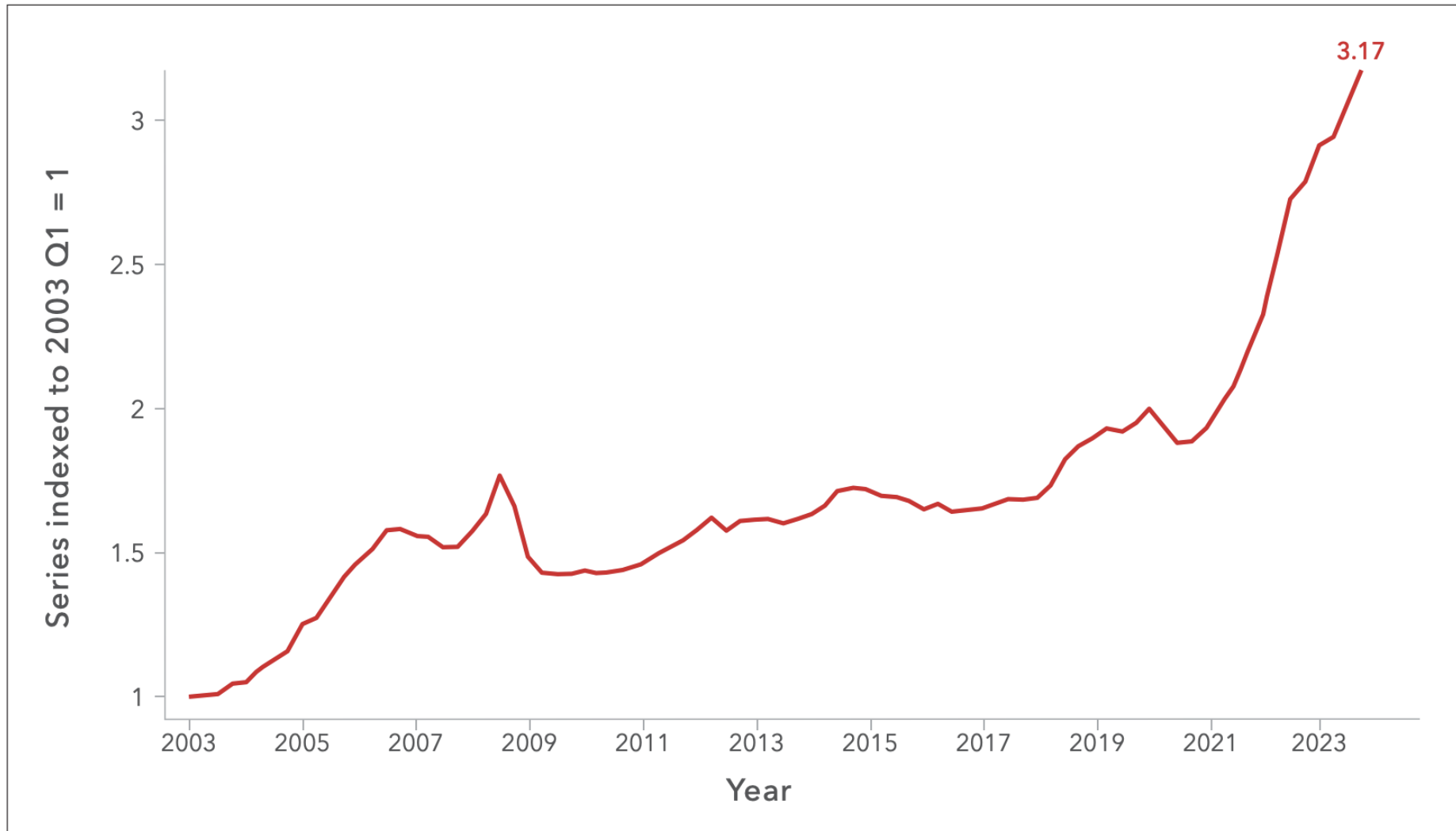
Many things reduce competition and make process harder for contractors

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.

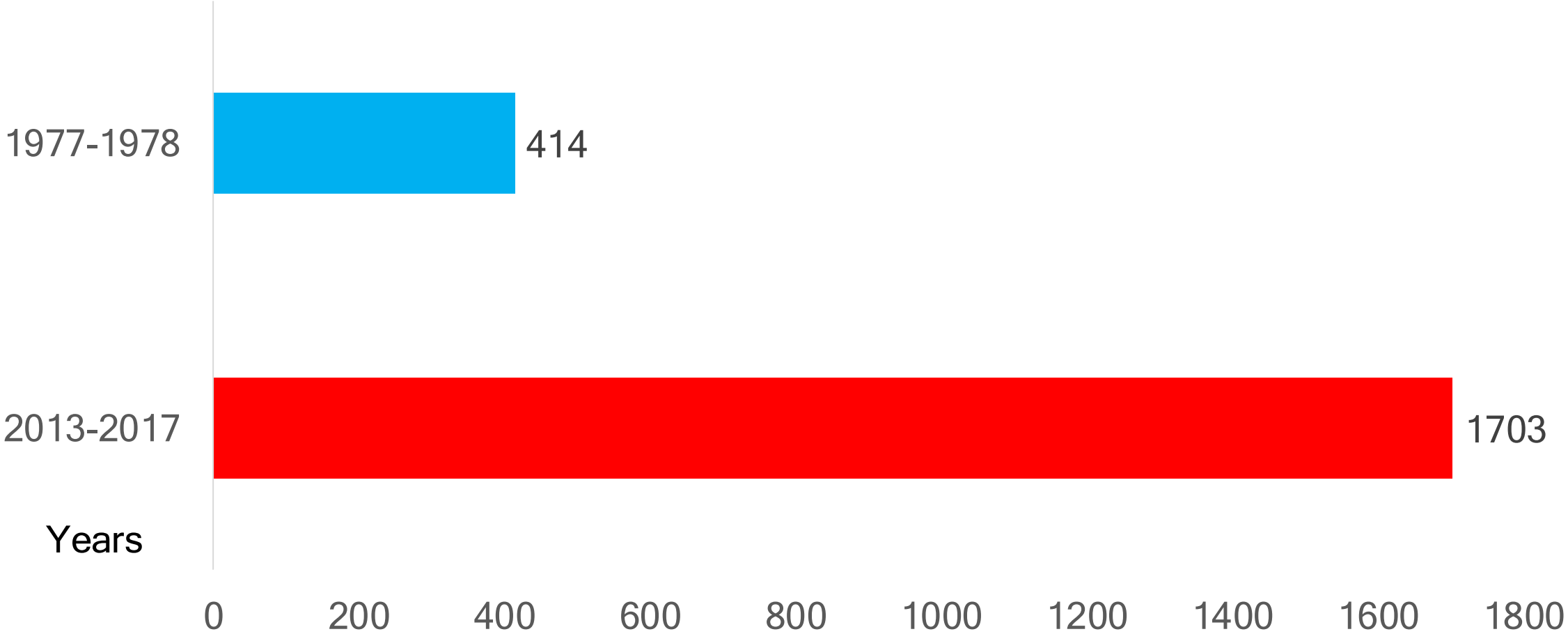
3. Complex and lengthy permitting

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

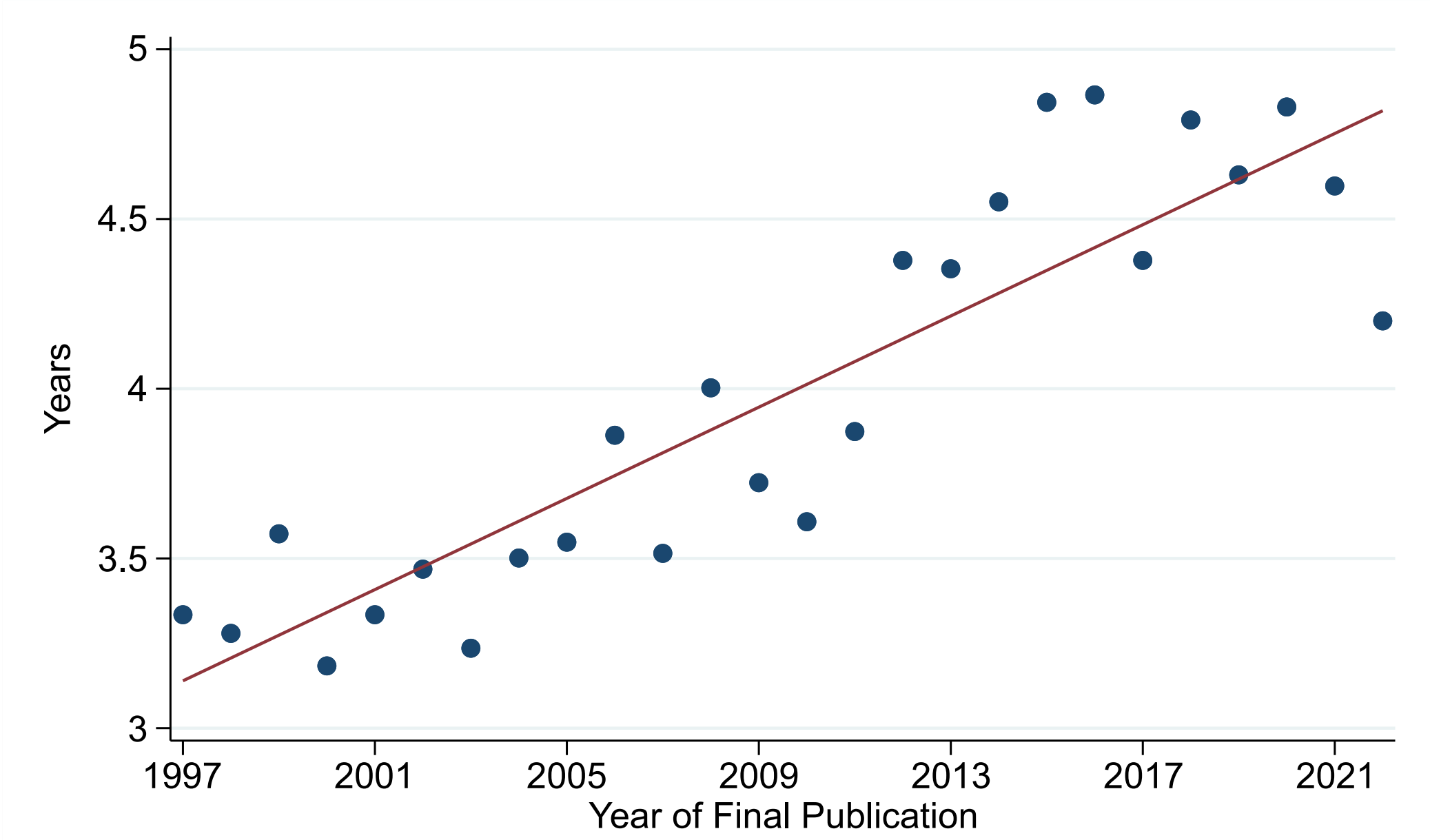
Intro to environmental permitting: the National Environmental Policy Act (NEPA)

- Applies to big projects with federal funding, on federal land, or with enough federal regulatory involvement
- Must produce a document describing possible environmental impacts
- Importantly, project opponents can sue if they think that the review was not thorough enough
- Often the project is paused while litigation is ongoing

Average page lengths of NEPA environmental impact statements



NEPA environmental impact statement preparation time



Litigation over 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.

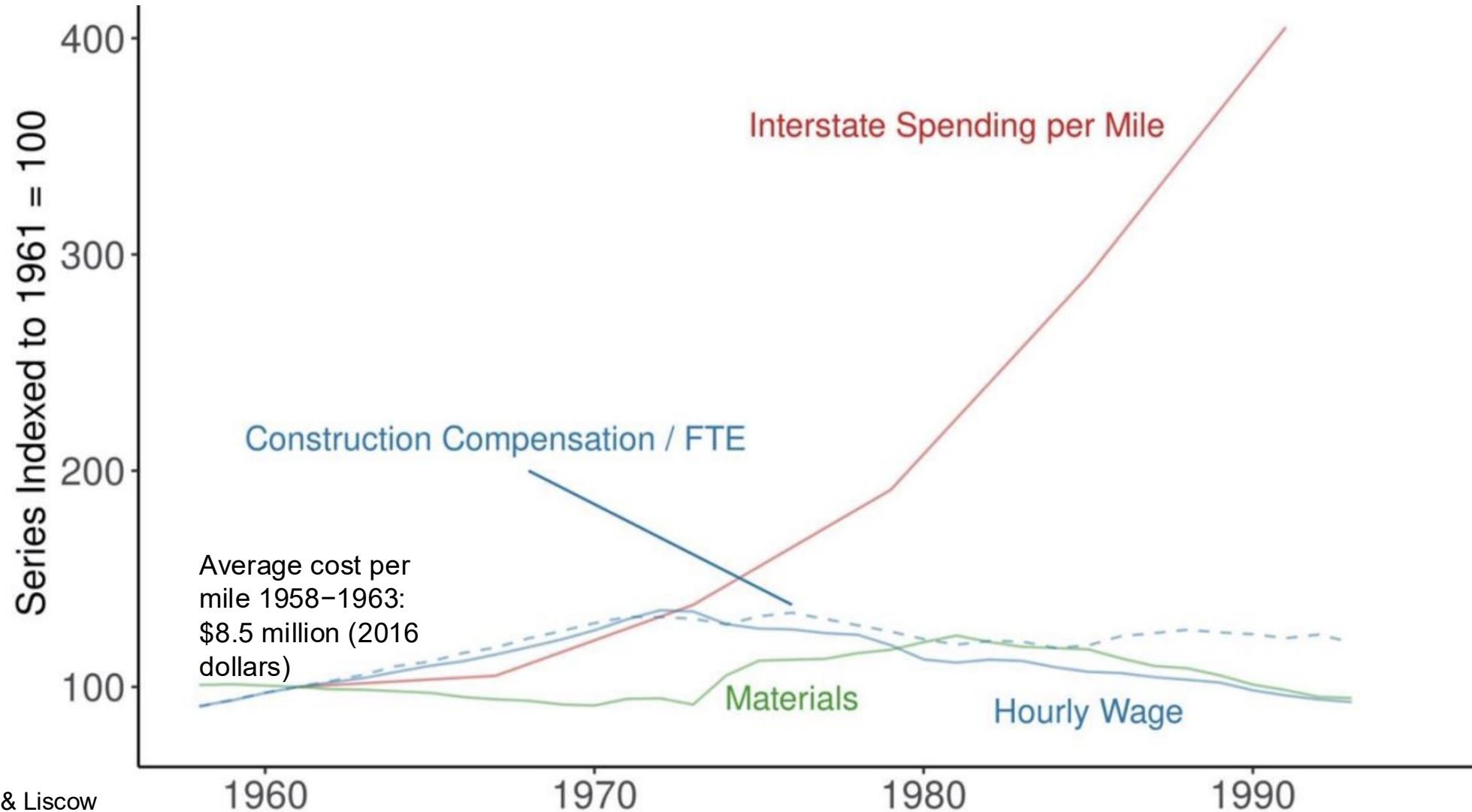
Consequence of complex and lengthy permitting:

- 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

Very expensive highway in suburban Detroit



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



Other permitting challenges: US Coast Guard navigation permit



Conclusion: The importance of studying public-sector innovation

- There's a huge need for more research in understanding why the US seems so bad at building infrastructure
 - What specific policies are actually the most impactful?
- Public procurement is 20% of government spending—huge scope for welfare gains from improvement
 - In 2024, the US government spent \$522 billion on transportation infrastructure alone
- Especially valuable to study innovation in the public sector because there are so many direct government tools to (possibly) help solve it:
 - Personnel policy
 - Competition and procurement policy
 - Permitting and regulatory policy
 - . . . in addition to standard R&D, regulations to help impact the private sector.

Further information

- Underlying papers:
 - “State Capacity and Infrastructure Costs” (with Cailin Slattery & Will Nober)
 - 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,” Journal of Economic Perspectives
 - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4775481
 - Policy Brief: [Niskanen Center](#)
 - “Infrastructure Costs,” AEJ: Applied (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