

# The Road to Reelection: Political Returns to Highway Construction

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Public goods – e.g. transportation infrastructure – have large social benefits

- Donaldson and Hornbeck (2016)

This may be why democracies grow faster than autocracies

- Acemoglu, Naidu, Restrepo, and Robinson (2019)

But transportation infrastructure is costly and produces negative externalities

- Nall (2015); Glaeser and Ponzetto (2018)

Do electorates reward transportation infrastructure?

Public goods often targeted according to political logic

- Spatial targeting (Burgess, Jedwab, Miguel, Morjaria, & Padró I Miquel, 2015)
- Temporal targeting (Rogoff, 1990)
- Direction ambiguous: core or swing voters?
  - (Dixit & Londregan, 1996; Stokes, 2005)

Existing empirical literature yields mixed results

- Harding and Stasavage (2014); Goyal (2019); Huet-Vaughn (2019); Levitt and Snyder Jr. (1997)

While returns to direct cash transfers seem clear

- Manacorda, Miguel, and Vigorito (2011); Golden and Min (2013); Drazen and Eslava (2010)

- Question:
  - Did the construction of the Interstate Highway System in the US win votes for state or federal politicians in counties where it was built?
- Identification:
  - Bartik-style shift-share estimator
  - Interact state-level apportionments with county shares of planned highway
- Results:
  - Large positive effects on vote share for incumbent governors and representatives
  - Large effects on voter participation
  - Positive spillovers in neighboring counties

# The Interstate Highway System

## Federal Aid Highway Act of **1944**

- Created a plan in 1947 for a 40,000-mile system of Interstate Highways
  - Baum-Snow (2007)
- Little to no federal money appropriated until . . . .

## Federal Aid Highway Act of **1956**

- Cost: \$543 billion (2020 USD).
- Financed by Highway Trust Fund, which is funded by a federal fuel tax
- Length: 48,191 miles (as of 2016)
- Federal gov't paid 90% of costs, but highways are owned by states
- States required to use apportioned funds within 2 years or lose them

# Politics of the IHS legislation

Public Law 627

CHAPTER 462

June 29, 1956  
[H. R. 10660]

AN ACT

To amend and supplement the Federal-Aid Road Act approved July 11, 1916, to authorize appropriations for continuing the construction of highways; to amend the Internal Revenue Code of 1954 to provide additional revenue from the taxes on motor fuel, tires, and trucks and buses; and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

## TITLE I—FEDERAL-AID HIGHWAY ACT OF 1956

### SEC. 101. SHORT TITLE FOR TITLE I.

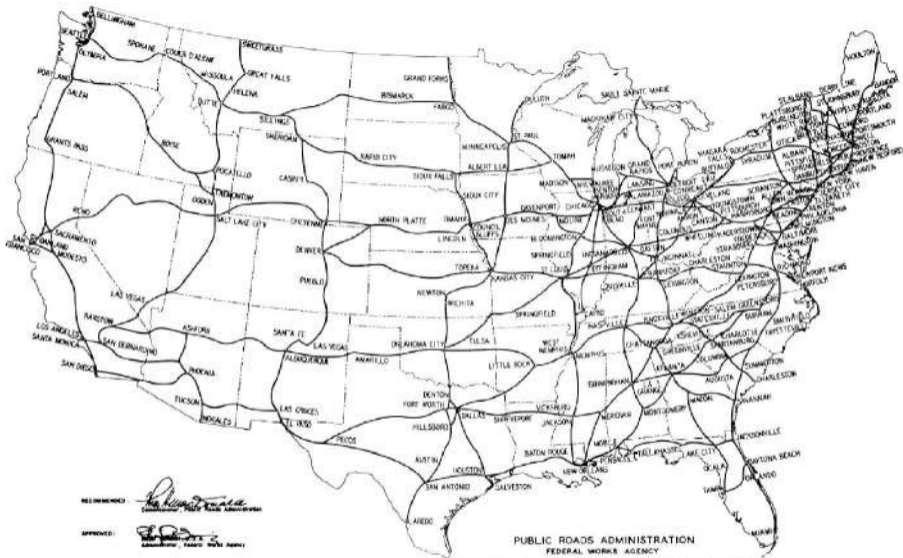
This title may be cited as the "Federal-Aid Highway Act of 1956".

### SEC. 102. FEDERAL-AID HIGHWAYS.

(a) (1) AUTHORIZATION OF APPROPRIATIONS.—For the purpose of carrying out the provisions of the Federal-Aid Road Act approved July 11, 1916 (39 Stat. 355), and all Acts amendatory thereof and supplementary thereto, there is hereby authorized to be appropriated for the fiscal year ending June 30, 1957, \$125,000,000 in addition to any sums heretofore authorized for such fiscal year; the sum of \$850,000,000 for the fiscal year ending June 30, 1958; and the sum of \$875,000,000 for the fiscal year ending June 30, 1959. The sums herein authorized for each fiscal year shall be available for expenditure as follows:

23 USC 48 and  
note; 16 USC 503.

- Previously a Democratic priority (FDR)
- Championed by Republican president Dwight D. Eisenhower
- Initially unclear if it could pass in an election year
- Passed both chambers with overwhelming majorities



RECOMMENDED: *Richard W. ...*  
 Administrator, Public Roads Administration

APPROVED: *[Signature]*  
 Administrator, Federal Works Agency

PUBLIC ROADS ADMINISTRATION  
 FEDERAL WORKS AGENCY

**NATIONAL SYSTEM OF INTERSTATE HIGHWAYS**  
 SELECTED BY JOINT ACTION OF THE SEVERAL STATE HIGHWAY DEPARTMENTS  
 AS MODIFIED AND APPROVED  
 BY THE ADMINISTRATOR, FEDERAL WORKS AGENCY  
 AUGUST 2, 1947



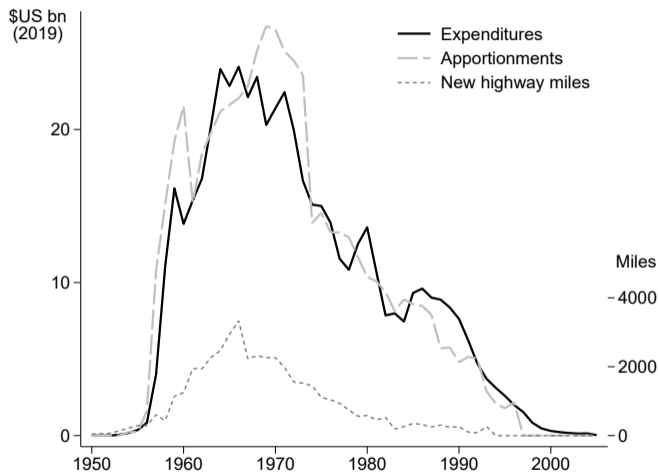
— Plan of 1947  
— IHS as of 2014

Created by Daniel Leff Yaffe  
Projection: USA Contiguous Equidistant Conic  
County boundaries from the 2015 census



# Funding and building the interstate

- Congress apportioned funds every few years
- Expenditures and construction closely track apportionments
- We focus on 1950-1972



- Governors are elected to 4-year or 2-year terms (depending on state and year)
- 36 states have gubernatorial term limits
- Main outcome variable:
  - Vote share for incumbent governor's party
  - County level
  - 1950-1972
  - Source: Inter-university Consortium for Political and Social Research

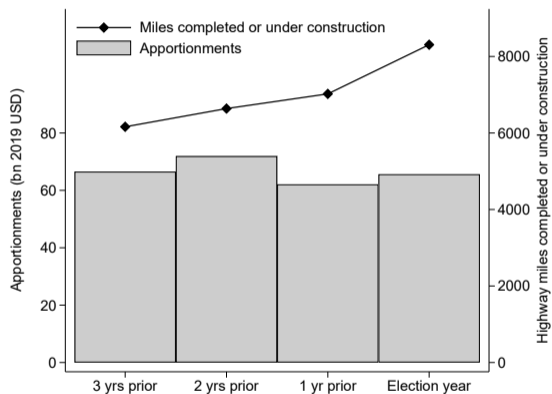
	Mean	Median	SD	N
<i>County</i>				
Dummy: any miles ever built in county $i$	0.38	0.00	0.49	3058
Total miles ever built in county $i$	10.60	0.00	19.93	3058
Total miles ever built in county $i$   ever IHS	27.76	24.00	23.75	1168
<i>County <math>\times</math> year</i>				
Num. new miles built in year $t$	0.46	0.00	2.63	70334
Num. new miles built in year $t$   ever IHS	1.21	0.00	4.15	26864
Dummy: any new miles built in year $t$	0.05	0.00	0.22	70334
Dummy: any new miles built in year $t$   ever IHS	0.14	0.00	0.35	26864
<i>County <math>\times</math> gubernatorial election term</i>				
New miles built in term ending in year $t$	1.26	0.00	5.12	24218
Dummy: any new miles built in term ending in year $t$	0.10	0.00	0.30	24218
Incumbent governor's party's vote share	59.30	56.05	19.86	24190

· Observation: county  $\times$  year (or county  $\times$  election year)

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \quad (1)$$

- $Y_{it}$ : Vote share for incumbent governor's party in county  $i$  in election year  $t$
- $X_{it}$ : IHS miles built in county  $i$  in election year  $t$
- $\varepsilon_{it}$ : Error term

## More construction (but not more apportionments) in election years



- States must use apportioned funds within 2 years
- They appear to use this flexibility to concentrate construction in election years
- They may also manipulate location, targeting electorally important counties at electorally important times

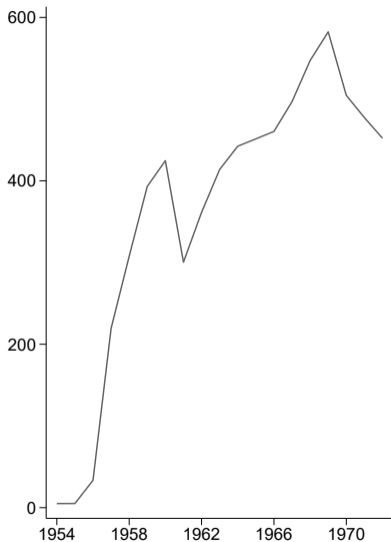
$$Y_{it} = \beta X_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (2)$$

- $\mu_i$ : County fixed effects
- $\gamma_t$ : Year fixed effects
- Instrument for highway construction using  $Z_{it}$ , multiplying:
  - a) fraction of a state's total planned miles represented by a given county by
  - b) the funds appropriated for that state by Congress in a given year

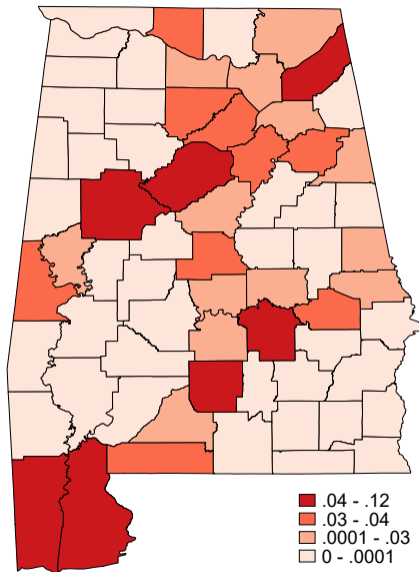
$$Z_{it} = \left( \frac{Plan47_i}{\sum_{i \in S(i)} Plan47_i} \right) W_{S(i)t} \quad (3)$$

- $W_{S(i)t}$ : Federal apportionments to state  $S(i)$  in year  $t$
- $Plan47_i$ : Number of total miles planned for county  $i$  (from 1947 plan)

State's federal IHS apportionments  
(Million real 2019 USD)



Share of state's total planned miles by county  
(AL Total: 803)



# Results



# Electoral outcomes: vote share at county-election-year level

	Governor		House		Senate		President	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
New miles	-0.237** (0.104)	2.745** (1.228)	-0.322*** (0.086)	1.567*** (0.579)	-0.306*** (0.098)	2.585 (1.582)	0.005 (0.052)	-3.247 (2.805)
Year FE		✓		✓		✓		✓
County FE		✓		✓		✓		✓
N	24190	19806	33564	27876	24415	20541	18257	15199
DV Mean	59	58	69	68	61	60	48	49
F-stat		21		16		13		9

Observation is at the county  $\times$  year level. OLS regressions include 1950-1972; IV regressions include 1954-1972 due to availability of apportionments data. SE clustered by state in parentheses. 'F-stat' reports the 1st-stage effective F-statistic of Montiel Olea and Pflueger (2013). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Electoral outcomes: votes cast

	Governor		House		Senate		President	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
New miles	229*** (76)	4879*** (1140)	37 (34)	3659*** (851)	278*** (78)	-1908 (3398)	210*** (53)	3168** (1541)
Votes last election	1.009*** (0.015)	0.379** (0.156)	1.000*** (0.011)	-0.014 (0.091)	1.023*** (0.026)	0.912*** (0.063)	1.019*** (0.014)	0.843*** (0.050)
Year FE		✓		✓		✓		✓
County FE		✓		✓		✓		✓
N	21139	19808	30600	27749	27434	27434	15202	15202
DV Mean	17182	17310	11625	11545	13354	13354	22873	22873
F-stat		23		12		10		11

Observation is at the county  $\times$  year level. OLS regressions include 1950-1972; IV regressions include 1954-1972 due to availability of apportionments data. SE clustered by state in parentheses. 'F-stat' reports the 1st-stage effective F-statistic of Montiel Olea and Pflueger (2013). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p \leq 0.01$

- Highway construction negatively selected on incumbent strength
- Highway construction increases vote share for governors and representatives
- Highway construction positively selected on number of votes cast
- Highway construction increases total number of votes cast for governor, representative, and president

- Highway construction negatively selected on incumbent strength
  - Highway construction increases vote share for governors and representatives
  - Highway construction positively selected on number of votes cast
  - Highway construction increases total number of votes cast for governor, representative, and president
- 
- Was there a backlash from neighboring counties who didn't get the highway?
    - Look at effect of construction on electoral outcomes in neighboring counties

# Spillovers: effects on vote share in neighboring counties

	Governor		House		Senate		President	
New neighbor miles	1.601** (0.635)	1.628** (0.730)	1.373** (0.617)	2.072* (1.085)	1.265 (0.822)	0.608 (0.916)	-1.866 (1.450)	-2.125 (1.932)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
County FE	✓	✓	✓	✓	✓	✓	✓	✓
Sample: no IHS...	This yr	Ever	This yr	Ever	This yr	Ever	This yr	Ever
N	18578	11698	26396	16210	19308	11729	14261	8666
DV Mean	58	58	68	69	60	61	49	49
F-stat	17	8	15	10	11	6	9	9

Observation is at the county  $\times$  year level. Years included: 1950-1972. SE clustered by state in parentheses. 'F-stat' reports the 1st-stage effective F-statistic of Montiel Olea and Pflueger (2013). \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

- Spatial and temporal variation in interstate highway construction let us study how voters reward governors for infrastructure
- Governors and Representatives in mid-century USA received electoral rewards for construction of federal highways

Thank you.

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 [@wsandholtz](https://twitter.com/wsandholtz)

## Appendix: Extra slides

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