

The Road Less Graveled:

How well do local Aldermen choose which streets to fix?

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Aims of Project

There are three (very ambitious) goals of the project

1. Create a social welfare function for road resurfacing, i.e. Map an intersection-to-intersection value of road resurfacing
 - ▶ Use commuting time data to estimate the time saved and its value. Two approaches in mind.
 - ▶ Use Lyft vertical acceleration data (Via John List?) with a vehicle dynamics model to estimate the odds of tire damage.
2. Create a political-economy model (PEM) of road resurfacing using precinct-level electoral data.
3. Compare actual allocations to the PEM's predictions and the predictions of an social planner (SP).

Why it's important

- ▶ Local politicians have political incentives to allocate resources to their constituents efficiently
 1. Citizens most effected by potholes have incentives to signal their preferences to politicians via 311 calls
 2. Deadweight costs are, in theory, minimized by competition between pressure groups (Becker, 1983)
- ▶ They also have incentives to misallocate resources towards supporters and away from opponents (Myerson, 1998)
- ▶ (Glaeser 2019) find a strong shortage of road maintenance in the country: is it a political economy problem?
- ▶ Incentives for politicians moving unilaterally with their own budgets are the same incentives that congress has when voting on infrastructure budgets, only in this setting we don't have any 'noise' from the voting process.

What do aldermen do?

“I remember crossing California going west, every street was resurfaced almost every year. They always had brand new lighting and then east of California, where Ald. Bernie Stone would lose the precincts consistently, I mean the streets were in shambles.”

-Ald. Carlos Ramirez-Rosa (35th Ward).

- ▶ Aldermen as Mini-Mayor over Ward
 - ▶ City council defers to Ward Alderman all internal issues
 - ▶ Eg. snow plows, garbage cleanup, sign permits, business licenses, liquor-moratoriums, and of course, construction and zoning.
 - ▶ A relatively new power that aldermen were granted in 1995 is the ability to allocate \$1.3M in infrastructure “menu” requests

What is the Aldermanic Menu Program?

Alderman have the power to allocate \$ 1.3M on a variety of infrastructure projects. They are given a map of 311 complaints for guidance.

- ▶ 5 primary categories:
 - ▶ **Streets/CDOT:** Alley/Road/Sidewalk Resurfacing, speed bump replacement, sign installation, Curb and Gutter fixes, etc.
 - ▶ **Crime Prevention and Lighting:** Camera installation and street lights
 - ▶ **Arts:** Murals and Neighborhood Arts programs
 - ▶ **Schools:** Direct grants to CPS, Sports Fields, Gardens, Auditoriums, Playgrounds, etc.
 - ▶ **Parks, Trees, and Gardens:** Tree planting, public garden formation, and park cleanup programs.

Resurfacing Data

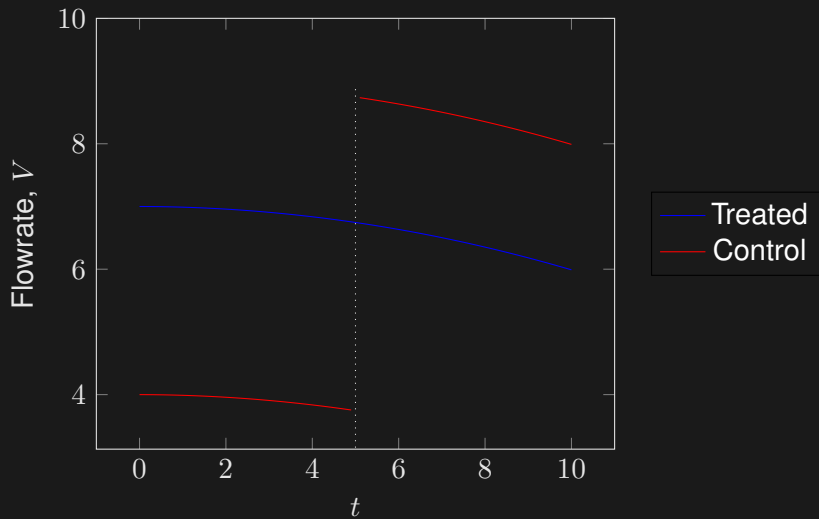
Assuming we want to map a road's characteristics to a predicted value of resurfacing. What resurfacing data might we use?

- ▶ I have 3881 resurfacing events since 2015
- ▶ I know the location and blocks of each of these events.
- ▶ We observe road closure permits, which are issued by the city to allow for road construction, that gives us timing.

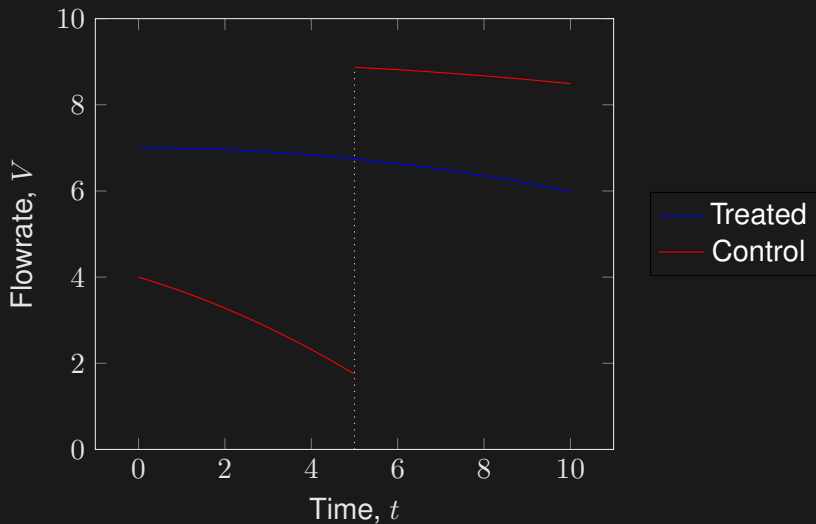
Ward: 1		
MenuPackage	Locations	Estimated 2020 Cost
Sidewalk Menu (2020)	2546 W HOMER ST	\$28,940.47
Street Resurfacing Menu (1-5) (2020)	ON W HURON ST FROM N PAULINA ST (1700 W) TO N WOOD ST (1800 W)	\$71,245.84
Street Resurfacing Menu (1-5) (2020)	ON N LEAVITT ST FROM W DIVISION ST (1200 N) TO W NORTH AVE (1600 N)	\$71,680.94
Street Resurfacing Menu (2020)	ON W OHIO ST FROM N BISHOP ST (1440 W) TO N ARMOUR ST (1500 W)	\$52,698.64
Street Resurfacing Menu (2020)	ON W HURON ST FROM N ASHLAND AVE (1600 W) TO N PAULINA ST (1700 W)	\$62,814.62
	ON W 15 MOHNS DR FROM N CLAREMONT AVE (2220 W) TO N	

Figure: Example of Resurfacing Data

DiD method



Dingel's critique: What if roads don't all decay at the same speed?



Structural Option: Assume that ‘fresh’ roads have identical density-flow mapping

If DiD is unconvincing, then we can try to find a structural option.

Let $Q_{t,r}(\rho_t, k, r)$ be the density-flow mapping for a road r of type k at time t , and let t^* be the time at which the road was resurfaced. We assume the following:

$$\forall t \text{ s.t. } \epsilon + t^* > t \geq t^* : Q_{t,r}(\rho_t, k) = Q_{t^*}(\rho_t)$$

Then we can find $\mathbb{E}[Q_{t^*} | \rho_t, k]$, and can compute road-specific treatments (γ_r):

$$\gamma_r = Q_{t^*}(\rho_{t^*}, k) - Q_{t_b,r}(\rho_{t_b}, k) \tag{1}$$

Where t_b is the time before resurfacing.

Key problem: We'll only be able to identify treatment effects for roads with densities and types covered by the menu data.

Old Work: Theory

Voters get utility from politician competence, the state of the infrastructure stock, and “conspicuous expenditures”

- ▶ Voters know their utility and infrastructure stock, but not the politician’s competence or the “conspicuous expenditures”
- ▶ Imagine conspicuous expenditures as faking competence
- ▶ Politicians get more competent over time
- ▶ Voters then form expectations about politicians’ competence taking into account expected conspicuous expenditures and infrastructure stock
 - ▶ Politicians know they’ll be more competent next period
 - ▶ So to secure votes less experienced politicians will spend more on conspicuous expenditures
 - ▶ But can still be kicked out by a large enough shock to the infrastructure stock

Old Work: DiD

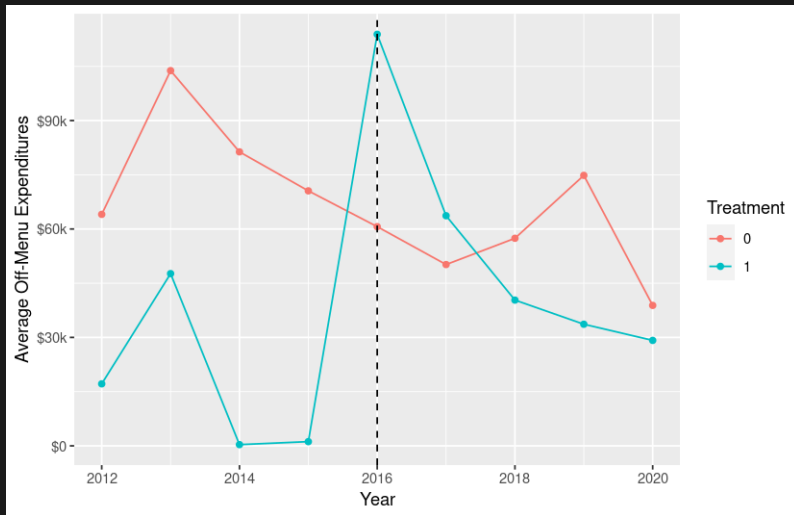


Figure: Old Diff-in-Diff Plot using Menu data from 2012–2020

Thank you