

Effects of Transit-Oriented Incentive Programs: Evidence from Los Angeles

Stephanie Kestelman
Arnold Ventures

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US faces a housing affordability crisis

- Ongoing policy efforts to legalize or encourage production of new housing units

US faces a housing affordability crisis

- Ongoing policy efforts to legalize or encourage production of new **multifamily** housing units
- Reforms in some states and localities allow greater density near transit by-right (“Transit-Oriented Development”, or TOD)
 - ▶ States: CA, CO, HI, MA, RI, UT, WA
 - ▶ Cities (incomplete list): Los Angeles, Phoenix, Chicago, San Diego, Austin, Raleigh

This paper: Evaluate impact of Los Angeles' TOD program

- Number, characteristics and location of new units
- Land and property values (not today)
- Impact of new development on rents (not today)

Institutional setting

- One of least affordable cities globally (FCPP, 2024)
 - ▶ 73% of households spent over 30% of income on rent/utilities
 - ▶ Unaffordability worsened after post-January 2025 wildfires
- Historically, local opposition to multifamily housing ▶ Types of opposition
- Transit-Oriented Communities program reduced discretion over some multifamily projects
 - ▶ Rollout based on distance to major transit stops
 - ▶ Can observe both proposed and permitted projects, before and after TOC

Main findings

TOC led to

- Increase in number of housing project applications
- No economically significant impact on housing production
- Change in project characteristics and locations: projects more likely to
 - ▶ Have income-restricted units
 - ▶ Be in areas with higher opposition to new housing development

Contributions to the literature

- Evaluate of a pro-housing policy that reduced discretion without formally rezoning land (Gyourko, Hartley and Krimmel, 2021; Manville et al., 2023; Büchler and Lutz, 2024; Chatman and Noland, 2014; Bhatt, 2024; Gold, 2025; Manville et al., 2023; Gabriel and Kung, 2025)
- Estimate impact on supply of income-restricted units and mixed-income buildings (Schuetz, Meltzer and Been, 2011; Been, Ellen and O'Regan, 2019; Kim, 2020; Mukhija et al., 2022)
- Inform broader discussion of which policies increase supply (Glaeser and Gyourko, 2002, 2018; Gyourko, Saiz and Summers, 2008; Gyourko and Molloy, 2015; Saiz, 2010; Peng, 2023; Greenaway-McGrevy and Phillips, 2023; Krimmel and Wang, 2023; Anagol, Ferreira and Rexer, 2023; Rollet, 2025)

Roadmap

1. Data
2. Housing Production in Los Angeles and the Transit-Oriented Communities program
3. Impact of TOC on production of new housing units
4. Impact of TOC on project characteristics and locations
5. Conclusion

Outline

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Data

Datasets used in the analysis

- Parcel characteristics from property tax assessment files (2006-2023)
- Building permits from LA Building and Safety (2009-2024)
- Zoning and overlay information from LA Planning Department
- Entitlement applications for projects requiring discretionary or ministerial review (2004-2023)
 - ▶ New dataset that constructs a project-level dataset, and links different applications related to the same project
 - ▶ Includes applications terminated, withdrawn and denied
 - ▶ Merge to transcripts from Zoning Board or City Planning hearing
- All data georeferenced using LA's parcel shapefile

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Housing Production in Los Angeles and the Transit-Oriented Communities program

Land use regulation in LA

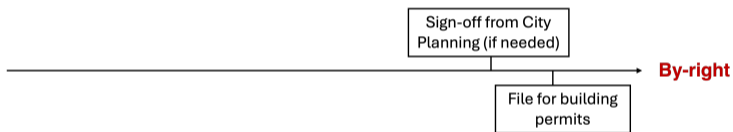
▶ Similar to other US cities

- Each parcel subject to rules related to use and characteristics
- Construction and changes in use can be
 1. **By-right/ministerial:** Meets standards and regulations in the Zoning Code
 2. **Discretionary:** Not in compliance with Zoning Code or 50+ units

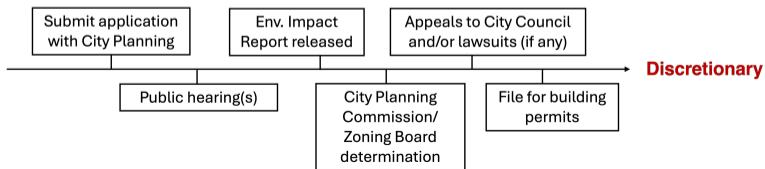
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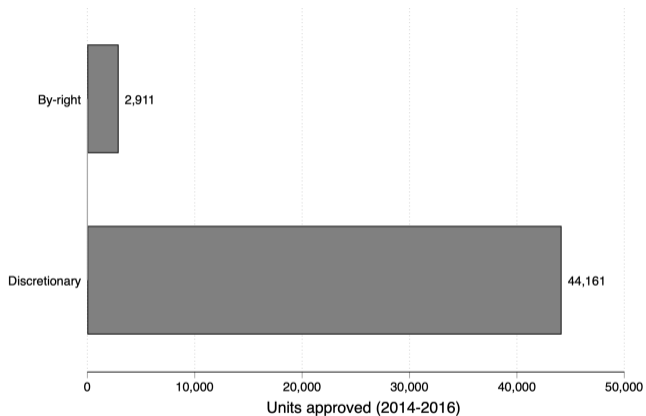
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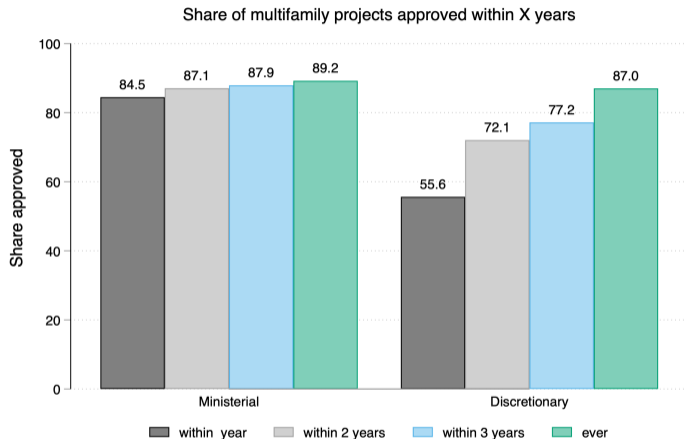


Discretionary approval is most common for LA multifamily units



Notes: Units approved in buildings with 5+ units approved through discretionary review, 2014-2016 (O'Neill et al., 2021).

Discretionary review delays and prevents project approval



Notes: Discretionary projects are reviewed by City Planning Commission, Area Planning Commissions, Zoning Administration, CEQA reviewers, or tentative tract. Ministerial projects are reviewed by the Director of Planning, or are subject to Administrative Review. Sample restricted to projects with at least one decision made.

Transit-Oriented Communities

Ballot Measure JJJ (“Build Better LA” initiative)

- Approved with $\approx 64\%$ of votes in Nov. 2016
- Two provisions
 1. Require projects seeking general plan amendments or certain zone changes
 - set aside % of affordable housing OR pay into affordable housing trust fund
 - meet prevailing wage and labor standards in their construction
 2. Enable/mandate the City to create an affordable housing incentive program for developments located near major transit stops

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 2. Enable/mandate the City to create an affordable housing incentive program for developments located near major transit stops
- LA Planning Department designed Transit-Oriented Communities (TOC)
 - ▶ Guidelines were not subject to City Council approval [▶ Summary of public comments](#)
 - ▶ Program backed by Mayor Garcetti
 - ▶ Public debate focused on first provision [▶ Source: Urbanize LA](#)

Transit-Oriented Communities (TOC) program

- Guidelines went into effect September 22, 2017
- Only applies to parcels
 - ▶ Zoned to allow 2+ residential units (few exceptions)
 - ▶ Within .5 mile of major transit stop
- Two-pronged program:
 - ▶ TOC implementation
 - 1. Density bonus + reduced parking requirements if % of units are income-restricted
 - ▶ Requirement
 - ▶ Bonus
 - Based on AMI threshold & type of and dist. to transit stop (“Tier”)
 - 2. Larger size threshold for discretionary review
 - Before: all projects with 50+ units could trigger environmental review under the California Environmental Quality Act (CEQA), a public hearing & appeal, even if parcel zoned for 50+ units
 - After: many eligible projects of this size approved by-right or with approval from Director of Planning

Chart 1. TOC Affordable Housing Incentive Area Tiers

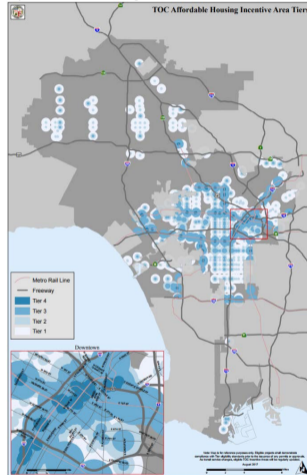
Type of Major Transit Stop	Tier 1 (Low)	Tier 2 (Medium)	Tier 3 (High)	Tier 4 (Regional)
	Distance to Major Transit Stop			
Two Regular Buses (intersection of 2 non Rapid Bus* lines, each w/ at least 15 min. average peak headways)	750 - 2640 ft.	< 750 ft.	-	-
Regular plus Rapid Bus* (intersection of a Regular Bus and Rapid Bus line)	1500 – 2640 ft.	750 – <1500 ft.	< 750 ft.	-
Two Rapid Buses* (intersection of two Rapid Bus lines)	-	1500-2640 ft.	< 1500 ft.	-
Metrolink Rail Stations	1500 – 2640 ft.	750 – <1500 ft.	< 750 ft.	-
Metro Rail Stations	-	-	≤ 2640 ft.	< 750 ft. from intersection with another rail line or a Rapid Bus*

Notes:

To be an eligible TOC Housing Development, the project must meet the Eligibility criteria in Section IV, including being located within one-half mile of a Major Transit Stop. In the case of bus stops, this always requires an intersection of two bus routes. An intersection of two bus lines is defined as the midpoint of the street intersection where two or more eligible bus routes meet or cross, and passengers have the direct ability to transfer on foot. This does not include bus routes that travel along the same street. For Tier 4, an intersection between a rail station and an eligible Rapid Bus line is defined as either the rail station entrance(s) or the Rapid Bus stop when the bus stop is

Parcels were treated based on distance to major transit stops

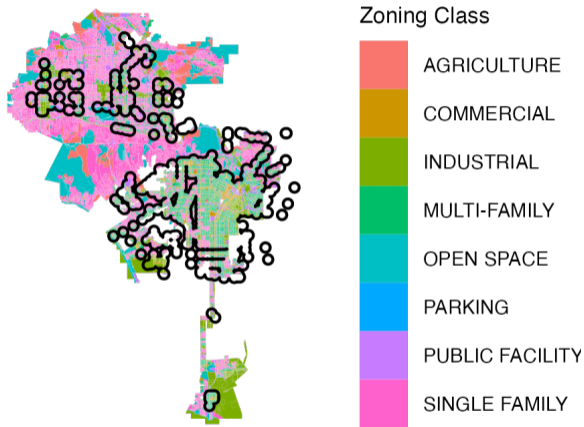
Map 1. TOC Affordable Housing Incentive Area Tiers



Note: Map is for reference purposes only. Please see the ZIMAS online mapping system for parcel level Tier information. However, confirmation of the correct Tier shall take place at the time a TOC application is accepted by the Department of City Planning. As transit service changes, eligible TOC Incentive Areas may be modified.

Notes: Map sourced from the original TOC guidelines.

Applies to 50% of parcels near major transit



Notes: This figure maps the TOC map with the major zoning classifications. The black lines encompass Major Transit Areas, which I define as the union of circles within half a mile of major transit stops. "Major transit stops" include stops at the intersection of bus lines with at least 15 min. average peak headways, intersection of regular + rapid bus stops or two rapid buses, Metrolink stations and Metro Rail stations. Intersections of two Metro Rail lines, or a Metro Rail line and a rapid bus line, received the largest density incentives.

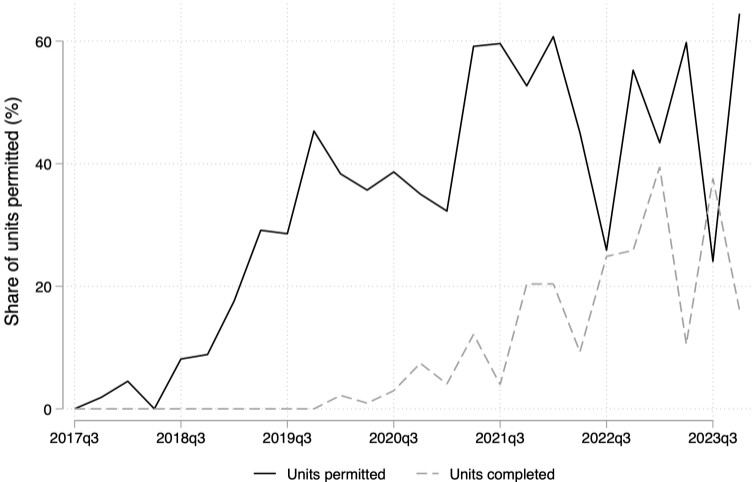
Outline

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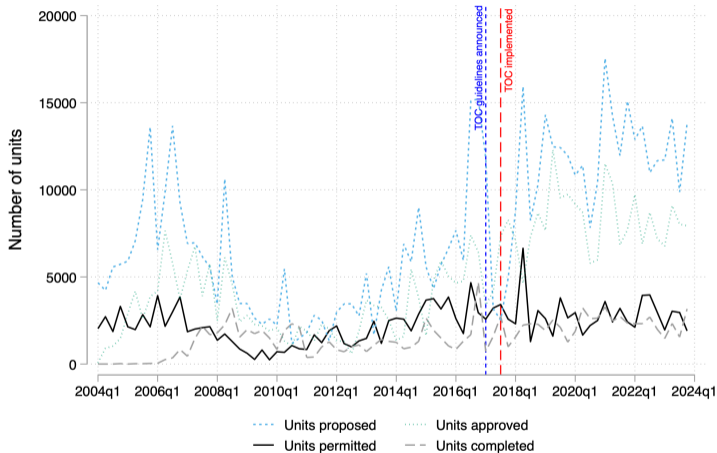
Impact of TOC on production of new housing units

High take-up of TOC incentives

Share of units permitted under TOC



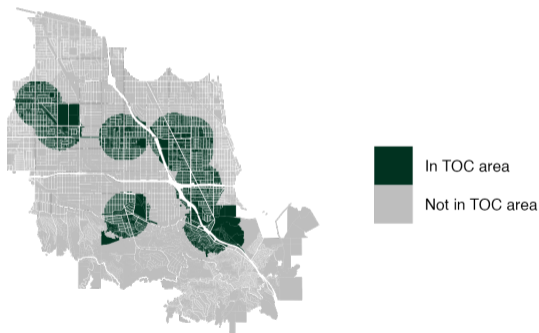
New units approved and permitted



Notes: Approved units were approved by the City Planning Commission, the Zoning Administrator, the Director of Planning, or any of the other reviewers. Permitted units have had a permit issued by the LA Building and Safety Department. Completed units have an issued Certificate of Occupancy. I do not observe applications for by-right permits. I exclude permits to build new duplexes.

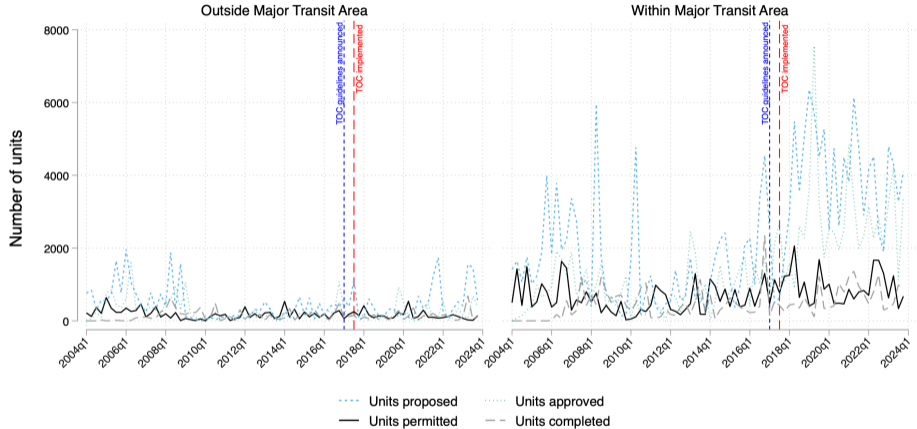
Leverage TOC eligibility for natural experiment

Empirical strategy: compare housing production immediately inside vs. outside TOC eligibility area



- Define Major Transit Area (MTA) as union of all half-mile-radius buffers around major transit stops
- Divide MTA borders into 2 mile segments
- Measure distance from each parcel to MTA border-segment
- Only parcels within distance *dist* of each parcel to MTA border-segment
- Neighboring have similar characteristics and are zoned similarly pre-TOC [▶ Plots](#)

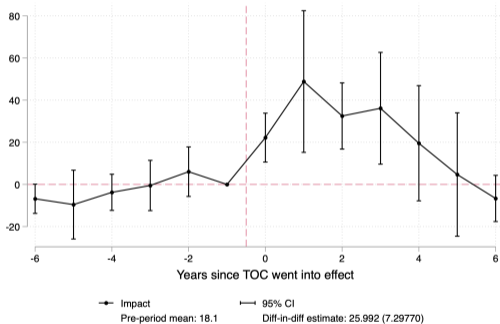
New units approved and permitted within .5 mile of MTA borders



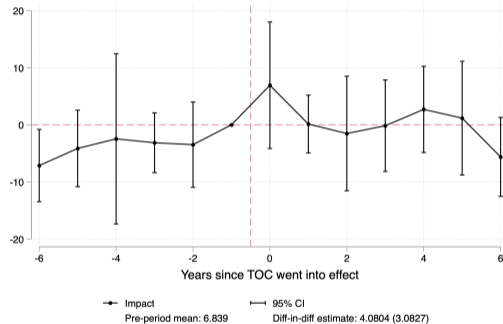
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Increase in no. units proposed, but not no. units permitted

Units proposed



Units permitted



Notes: Both panels measure outcomes at the year-MTA segment-treatment assignment level. Regressions control for segment-by-year fixed effects and treatment status fixed effects. Bars correspond to 95% confidence intervals. Standard errors are clustered at the Major Transit Area level.

Speculating why TOC had no impact on units permitted

- Limited developer capacity
- Timing
- Less-developed projects submitted for approval
- Program design

Speculating why TOC had no impact on units permitted

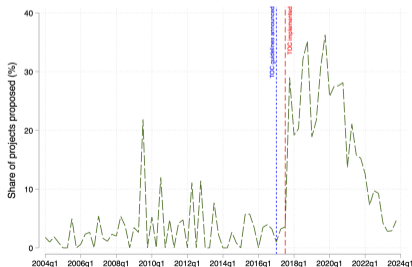
- Limited developer capacity
 - ▶ If limit on how many multifamily units LA has the capacity to build, then developers would pursue different projects, keeping number of units or buildings constant
 - ▶ Much of early take up were existing proposals, converted into TOC projects
- Timing
- Less-developed projects submitted for approval
- Program design

Speculating why TOC had no impact on units permitted

- Limited developer capacity
- Timing
 - ▶ “Not yet permitted” projects were proposed a few months later than permitted projects, on average
 - ▶ By the time developers were ready to pull permits, we have Covid-19 lockdowns followed interest rate hikes
- Less-developed projects submitted for approval
- Program design

Speculating why TOC had no impact on units permitted

- Limited developer capacity
- Timing
- Less-developed projects submitted for approval
 - ▶ Fewer documents and plans required in applications
 - ▶ Many applications associated earlier stage of the development process (e.g., without mention of the number of units proposed)



Speculating why TOC had no impact on units permitted

- Limited developer capacity
- Timing
- Less-developed projects submitted for approval
- Program design
 - ▶ AMI thresholds too low, or market-rate rent too high
 - ▶ Infill potential limited by ineligibility of lots zoned for single family
 - ▶ Still not enough regulatory relief to make projects pencil

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Impact of TOC on project characteristics and locations

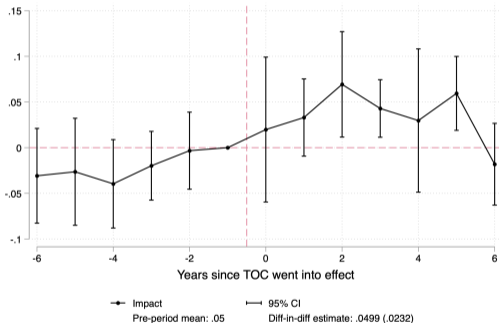
Did TOC shift type and location of projects?

- Accomplish goal of producing affordable housing?
 - ▶ Approach: quasi-experiment around MTA borders
- Produce units in neighborhoods with greater opposition to development?
 - ▶ Approach: estimate probability of approval for each project, had TOC not been in place

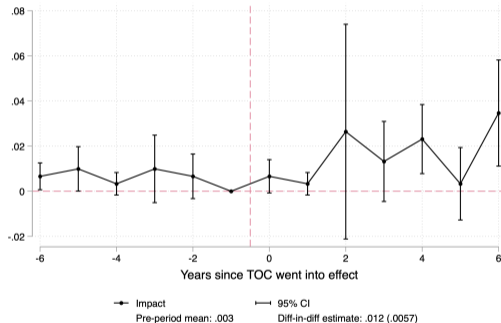
Impact on production of affordable housing

TOC increased number of buildings with income-restricted units

Mixed-income buildings



100% affordable buildings



Notes: Both panels measure outcomes at the year-MTA segment-treatment assignment level. Regressions control for segment-by-year fixed effects and treatment status fixed effects. Bars correspond to 95% confidence intervals. Standard errors are clustered at the Major Transit Area level.

Impact on development of hard-to-approve projects

1. Estimate relationship between project characteristics and probability of approval

- TOC projects would have been subject to discretionary review before 2017
- Question: would they have been approved?
- Denote probability of approval $p(w) = \frac{\exp(w'\beta)}{1+\exp(w'\beta)}$
 - ▶ w : characteristics of the proposed project, of the site where the project was proposed, what is currently allowed by-right on that site, characteristics of neighbors

- Data: discretionary and ministerial multifamily project applications filed between 2004 and 2017
 - ▶ Project characteristics extracted from project description
 - ▶ Neighbor characteristics measured using assessor data
 - ▶ $B(i)$: neighbors within 300ft (hearing notice requirement) and 300-1320ft
- Estimation of $\hat{\beta}$: logistic regression model with LASSO regularization
- Calculate fitted probability of approval

$$\hat{p} = \frac{\exp(w' \hat{\beta})}{1 + \exp(w' \hat{\beta})}$$

- Same exercise for probability of appeal

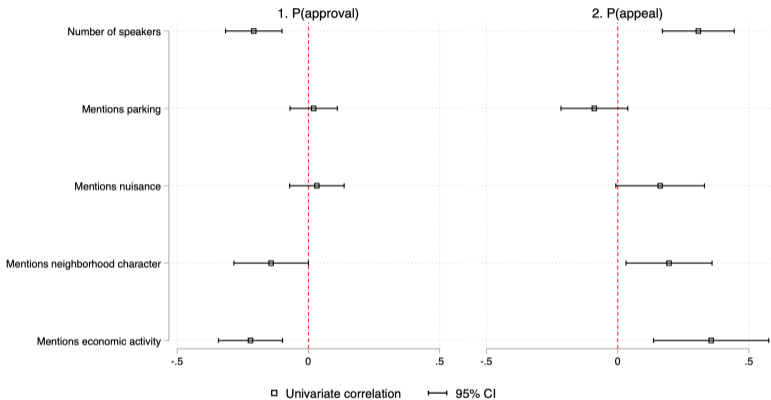
▶ Types of appeal

▶ Data construction

▶ Stable over time

▶ Correlograms

$\hat{P}(\text{approval})$ correlates with public comments pre-TOC



Notes: Correlograms plot coefficient from regressions of share of sentences in each project debate that mention each topic. All variables have been standardized.

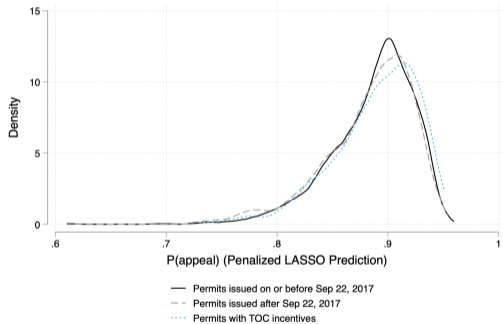
► Meeting minutes build ► Negative comments

2. Compute probability of approval \hat{p} for TOC projects

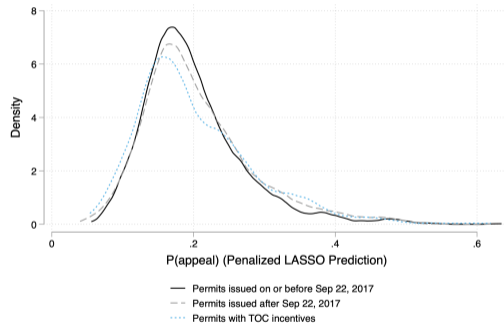
- Goal: calculate the probability of approval for TOC projects, had they been proposed under the previous discretionary regime
- Approach: apply the estimated mapping $\hat{p}()$ to permits with TOC incentives

Post-TOC projects were more likely to be appealed

Probability of approval



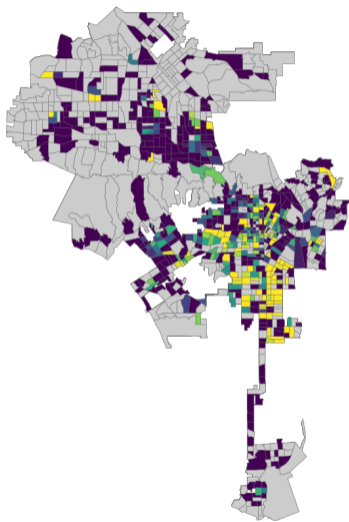
Probability of appeal



Post-TOC projects were more likely to be appealed

Outcome	Permits pre- vs. post- TOC			vs. permits utilizing TOC incentives	
	(1) Pre	(2) Post	(3) Difference	(4) Post + TOC incentives	(5) Difference
P(approval)	0.886 (0.038)	0.883 (0.041)	0.003 [2.277]	0.890 (0.039)	-0.003 [-1.536]
P(appeal)	0.200 (0.072)	0.206 (0.079)	-0.006 [-2.173]	0.203 (0.084)	-0.003 [-0.812]
Units proposed	53.687 (101.762)	49.023 (90.207)	4.664 [1.245]	49.353 (52.399)	4.334 [0.877]
N	1323	1313		464	

Discussion



- Higher ex-ante probability of appeal due to
 - ▶ Mixed-income
 - ▶ Project size (slightly above 50 units)
 - ▶ Issued in neighborhoods with more renters, more households with children, lower median household income, and lower rent

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- Program did not meaningfully increase the total number of permitted multifamily units...
- ...but enabled a different kind of development: more income-restricted buildings, often in lower-income, majority-renter neighborhoods with higher expected opposition
- Muted effect on supply is partly due to timing and partly due to the design of the program
- TOC increased the number of project applications, particularly less complete

Thank you!

Comments/questions: skestelman@arnoldventures.org

Appendix

References I

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Institutional Details

Comparison of Entitlement Process Across Major US Cities

	Los Angeles	New York	Houston	Miami	Minneapolis	Chicago	Seattle	Boston
<i>A. By-right development</i>								
Requires "by-right" certification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	*
Requires geographically specific approval?	No	No	Yes	No	No	No	.	NA
Time to decision	60 days	150 days	30 days	.	60 days	30 days	30 days	NA
Can others appeal decision or sue?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA
<i>B. Discretionary development</i>								
Requires public hearing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neighbors notified	300ft	Community Board	250ft	Abutting	350ft	250ft	.	Community Board
Min notification period	30 days	60 days	15 days	30 days	21 days	30 days	15 days	30 days
City Council may have final word	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Can developer appeal decision?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Can others appeal decision?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Types of Discretionary Review Mechanisms

Consistent with zoning	Consistent but zoning requires discretionary approval	Inconsistent and zoning requires discretionary approval
Design/Architectural Review	Conditional Use Permit (CUP)	Variance
Site Plan Review	Specific Plan Permits	Rezoning
Historic Preservation Review/Certificate of Appropriateness	Planned Unit Development (PUD)	General Plan Amendment
Local Coastal Development Permit	Subdivision	Development Agreement

Transit-Oriented Communities (TOC) policy

- Approved as part of ballot Measure JJJ in Nov 7, 2016 elections
 - ▶ [Opposing ballot Measure S](#)
 - ▶ Two provisions [▶ Measure JJJ provisions](#)
 1. Zoning variances require affordable housing & prevailing wage
 2. Establish affordable housing incentive program near major transit stops
- TOC guidelines were not subject to City Council approval
 - ▶ “Upzoning by fiat,” unlike changes to zoning code or general plan [▶ Evidence](#)
 - ▶ Proposed guidelines released March 13, 2017
 - ▶ Public support at City Planning Commission hearing [▶ Summary of public comments](#)
 - ▶ Guidelines went into effect September 22, 2017

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Ballot Measure JJJ included two provisions

1. Require that projects seeking general plan amendments or certain zone changes both include
 - ▶ a set percentage of affordable housing or pay a fee to an affordable housing trust fund
 - ▶ meet prevailing wage and labor standards in their construction (e.g., hire union labor)
2. Enable/mandate the City to create an affordable housing incentive program for developments located near major transit stops

“Shall an ordinance: 1) requiring that certain residential development projects provide for affordable housing and comply with prevailing wage, local hiring and other labor standards; 2) requiring the City to assess the impacts of community plan changes on affordable housing and local jobs; 3) creating an affordable housing incentive program for developments near major transit stops; and 4) making other changes; be adopted?”

Transit Oriented Communities was not focus of debates

While the debate over Measure JJJ mostly focused on the merits of inclusionary zoning, another aspect of the initiative, the Transit Oriented Communities Affordable Housing Incentive Program, was overlooked. – Urbanize LA, March 14, 2017

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Community groups opposed TOC-based projects

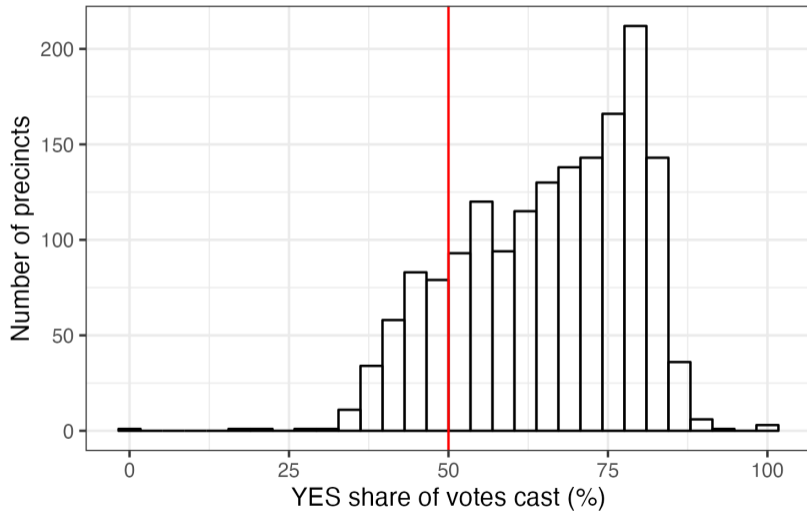
Rationale

- The voters approved Measure JJJ – Affordable Housing And Good Jobs. The bargain was simple: Developers provide affordable housing and good jobs, and they are granted certain incentives in return. The City has failed to provide for the “good jobs” part of the bargain.
- The TOC Guidelines (which were NOT voter-approved) were approved outside the voter-approved process per Measure JJJ.
- The TOC Guidelines, as written render much of the General Plan process provided in JJJ moot.

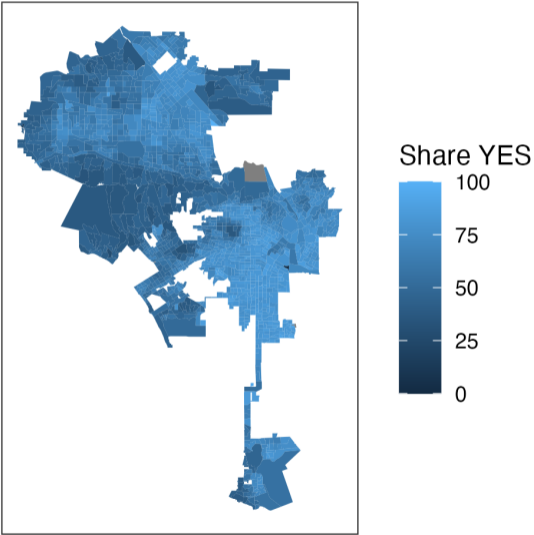
Source: Fix the City.org, last accessed Aug 26, 2024. Complaints refer to a proposed TOC project at 10400 Santa Monica Blvd, with 120 apartments (including 12 income restricted).

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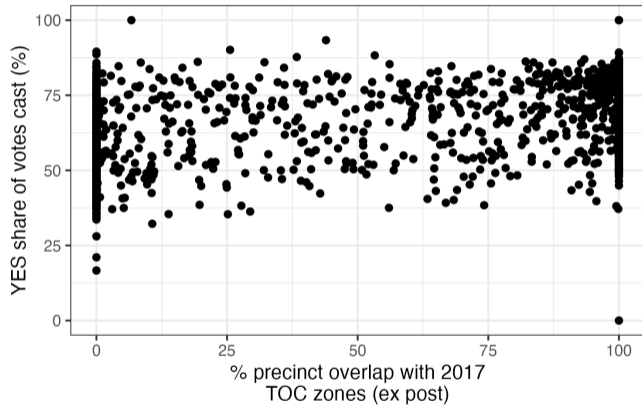
Distribution of Measure JJJ YES share of vote



Precincts in LA by YES share of votes cast



Diverse vote shares, given ex-post exposure



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Measure S (“Neighborhood Integrity Initiative”)

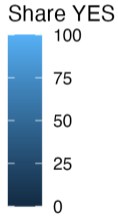
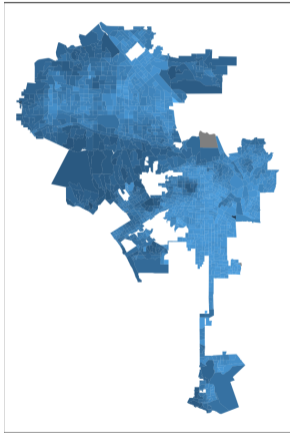
- Measure S was on the ballot in the March 7, 2017 off-year primary
 - ▶ Intended to be on the November 8, 2016 ballot (same as Measure JJJ)
 - ▶ Moved to 2017 ballot to coincide with city election cycle
- Sponsored by the AIDS Healthcare Foundation with additional support
 - ▶ Coalition to Preserve Los Angeles (CPLA)
 - ▶ Many homeowners associations
 - ▶ Audubon Society

*Do we want to continue allowing rule-breaking developers to do as they please?
I don't think so – Richard Riordan, LA Mayor 1993-2001*

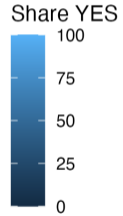
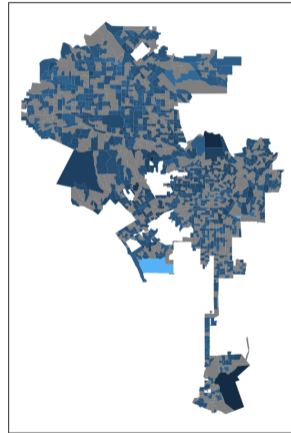
- Rejected with 70.4% of the vote

YES % of votes cast across precincts, Measure JJJ vs. Measure S

Measure JJJ



Measure S



Application Process for TOC Bonus

1. Submit TRANSIT-ORIENTED COMMUNITIES – TIER VERIFICATION FORM to Department of City Planning Development Services Center for Affordable Housing
2. DCP Housing Services Unit Staff checks qualification of the project for a given tier
3. If TOC approved AND developer only requesting base incentives → ministerial approval from Building and Safety Dept needed
4. If TOC approved BUT developer requesting more base incentives → Planning Dept approval needed

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Question 5: How do I file a ministerial Transit Oriented Communities (TOC Guidelines) project?

Answer:

Step one: Verify a TOC Tier by completing the *Transit-Oriented Communities – Tier Verification Form*¹.

Submit the form to the City Planning Housing Services Unit e-mail: dcpphp@lacity.org.

Step Two: Proceed with LADBS for Plan Check.

Step Three: Covenant and Affordable Housing Clearance (HCIDLA)

Step four: Planning Clearance (DCP Public Counters)

Step Five: Final Building Permit (DBS)

Question 6: How do I obtain a Transit-Oriented Communities Affordable Housing Form for a project seeking Additional Incentives?

Answer: Please submit your plans and completed *Transit-Oriented Communities – Referral Form (CP-4050)* to the City Planning Housing Services Unit via e-mail at dcpphp@lacity.org. Forms will be reviewed in the order a complete packet (form, radius map, bus schedules, and plans) is submitted and paid. Please note that the Housing Services Unit will also verify the Tier through this process.

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I. Project Information – To be completed by applicant

1. PROJECT LOCATION/ ZONING

Project Address: _____

Applicant Name and Phone/Email: _____

Assessor Parcel Number(s): _____

Community Plan: _____ Number of Lots: _____ Lot Size: _____ s.f.

Existing Zone: _____ Land Use Designation: _____

Specific Plan HPOZ DRB Enterprise Zone CRA CPIO

Q-condition/ D-limitation/ T-classification (*please specify*): _____

Other pertinent zoning information (*please specify*): _____

Location of Major Transit Stop (*please specify the intersection or metro stop*)!: _____

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II. Project Eligibility – To be completed by DCP Housing Services Unit Staff

2. TRANSPORTATION QUALIFIERS

Qualifier #1 (rail name & stop, ferry terminal or bus #): _____

Service Interval # 1: _____ [420 min / # of trips]²

Service Interval # 2: _____ [420 min / # of trips]

Qualifier #2 (rail name & stop, ferry terminal or bus #): _____

Service Interval # 1: _____ [420 min / # of trips]

Service Interval # 2: _____ [420 min / # of trips]

TOC Tier³: Tier 1 Tier 2 Tier 3 Tier 4 **Planning Staff Initials:** _____

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Question 8: What are the City Planning Fees associated with *Transit-Oriented Communities* projects?

Answer: The fee for a Tier Verification using the *Transit-Oriented Communities – Tier Verification Form* is \$471.09. The fee for a pre-application project review using the *Transit-Oriented Communities – Referral Form* is \$1,060.26. The price of an entitlement for a standalone TOC project seeking Additional Incentives is \$8,956.86. Fees may be subject to change.

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Tier Benefits

Tier	Units (% over base) ²	Parking ¹	FAR (% over base)
1	50	.5/bdr	40
2	60	1/unit	45
3	70	.5/unit	50
4	80	0	55

- Some projects may still require Site Plan Review

- ▶ Base unit count ≥ 50
- ▶ Parcels in special districts (including specific plan areas)
- ▶ If developers using TOC request additional incentives, such as extra height, reduced setbacks, or reduced requirements for open space

¹ If 100% of units are affordable, NO parking required

² Exceptions: Specific plan and RD zones

On-Site Restricted Affordable Units requirement

1. Tier 1: 8% of the total number of dwelling units shall be affordable to Extremely Low Income (ELI) income households, or 11% of the total number of dwelling units shall be affordable to Very Low (VL) income households, or 20% of the total number of dwelling units shall be affordable to Lower Income households.
2. Tier 2: 9% ELI, or 12% VL or 21% Lower.
3. Tier 3: 10% ELI, or 14% VL or 23% Lower.
4. Tier 4: 11% ELI, or 15% VL or 25% Lower.

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Public Comment from TOC Guidelines Approval Meeting

- 13 individuals provided comments
- 8 expressed support TOC guidelines
- Criticism raised
 - ▶ TOC does not allow for enough community input
 - ▶ Concerns about displacement, esp. of long term residents
 - ▶ TOC circumvents the prevailing wage requirement
 - ▶ “Too little parking”
 - ▶ Buildings not required to be “aesthetically pleasing;” “ugly buildings hurt the community”
 - ▶ Easier to build market rate units, not just 100% affordable buildings

Housing supply effects

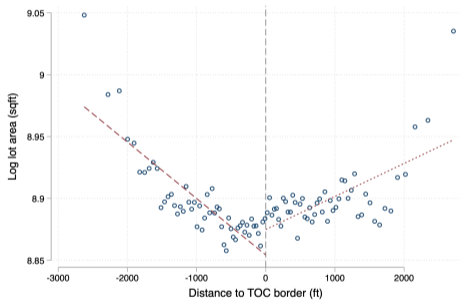
Characteristics of Parcels Near Major Transit

	Within .5 mile of major transit	All parcels
Area (sqft)	11,562.6 (121,464.7)	16,091.7 (227,103.9)
Number of residential units	2.7 (11.7)	2.1 (9.5)
Year built	1940.3 (24.3)	1948.3 (23.3)
Share residential use in 2016	87.1 (33.5)	90.9 (28.8)
Number of residential units	2.7 (11.7)	2.1 (9.5)
Share commercial use in 2016	8.8 (28.3)	5.6 (22.9)
Share industrial use in 2016	3.2 (17.7)	2.4 (15.4)
Share single family zoning	44.6 (49.7)	65.3 (47.6)
Share multifamily zoning	50.1 (50.0)	30.4 (46.0)
Observations	325063	663980

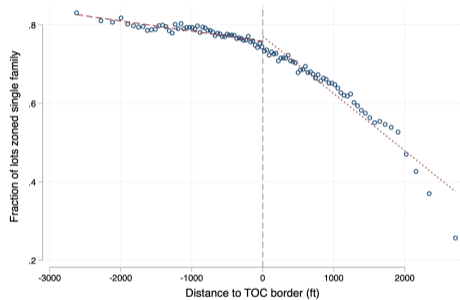
Notes: Standard deviation in parentheses.

Parcel characteristics, given distance to border

Log area sqft



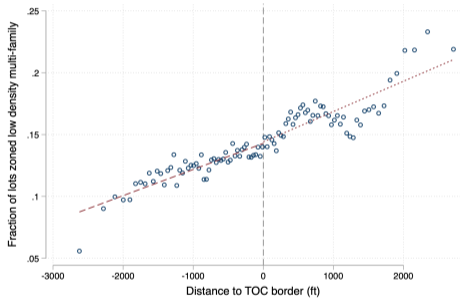
Zoned Single Fam



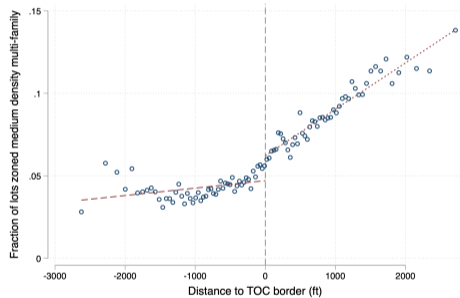
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Parcel characteristics, given distance to border

Low density zoning



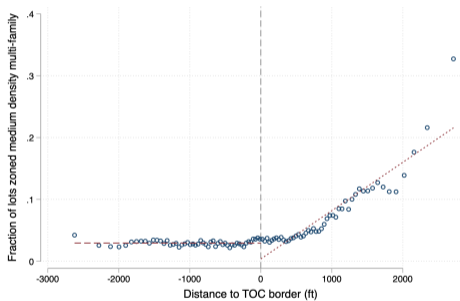
Medium density zoning



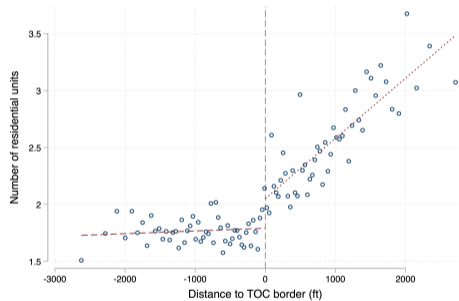
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Parcel characteristics, given distance to border

High density zoning



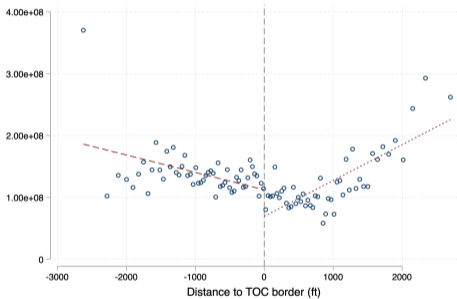
Residential units



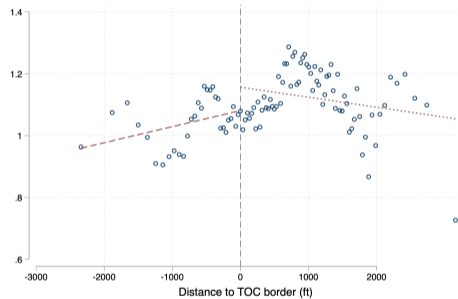
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Parcel characteristics, given distance to border

Min Area per Dwelling Unit



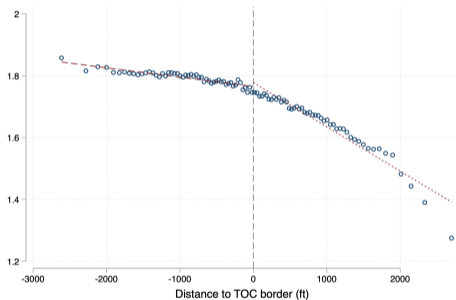
Max FAR



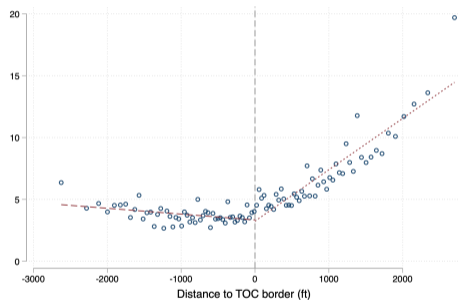
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Parcel characteristics, given distance to border

Min parking per DU



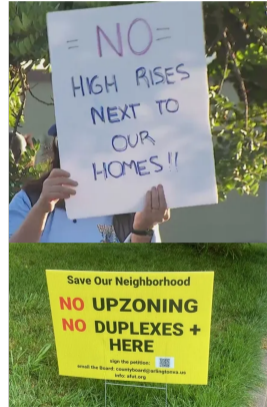
Max Dwelling Unit (Area/Min Area per DU)



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Meeting minutes

Opposition to multifamily housing



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Meeting minutes transcription

- Audio-to-text transcription done using *AutoModelForSpeechSeq2Seq*, a pre-trained model in Python transformers library
- Specifications:
 - ▶ Model: openai/whisper-base
 - ▶ Torch data type: float32
 - ▶ Language: English (misses translated text)
- Approach
 - ▶ Convert .mp3 into .wav
 - ▶ Segment .wav file into multiple files with of 30 seconds length
 - ▶ Transcribe each segment and append
 - ▶ Clean repeated phrases that may arise from segmentation

Topic classification and sentiment analysis

1. Transcript associated with each case gets decomposed into sentences using `sent_tokenize` function in the `nltk` python package
2. Sentences are assigned to topics if specific words or phrases are mentioned
3. If sentence mentions any of the topics, conduct sentiment and stance analysis

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Sentiment and stance analysis

1. Sentiment analysis

- ▶ Implementation: cardiffnlp/twitter-roberta-base-sentiment-latest model with HuggingFace package in Python
- ▶ Assigns probability that the text is neutral, positive or negative
- ▶ Classify sentiment as negative” if $p(\text{negative}) \geq .5$

2. Stance analysis

- ▶ Implementation: ynie/roberta-large-snli_mnli_fever_anli_R1_R2_R3-nli model with HuggingFace package in Python
- ▶ Classifies text as *supports*, *opposes* or *neither*

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Words and phrases filtered

- Filtered words: i, would, okay, commissioner, commission, thank, much, plan, project, one, two, three, four, five, six, seven, eight, nine, ten, thank, going, you, get, make, second, us, motion, name, well, see, really, very, yes, no, pacific, palisades, san, pedro, hollywood, number, go, know, also, lot, sorry, question, sure, staff, city, right, item, say, card, time, year, like, please, able, think, want, could, speak, 000, come, back
- Filtered phrases: community planning, community plans, community plan, city planning, area planning, neighborhood council, neighbourhood council, thank you, come back, im sorry, los angeles, little bit, good morning, good afternoon, good evening, my name, make sure, would like, even though, give us, move forward, motion carries, years ago, tell us, planning department, anything else

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[◀ Back to word cloud](#)

Topics and keywords

- Parking: parking
- Affordable housing: afford, affordable, affordability, low income, low-income, lower income, working class, expensive, luxury, cost of living, rent
- Economic activity: economic activity, economic vitality, economic benefits, economic growth, jobs, economic revitalization
- Neighborhood character: character neighborhood, neighborhood character, character community, community character, community feel, neighborhood feel, local character, neighborhood identity, beautiful neighborhood, neighborhood beautiful, residential neighborhood, neighborhood residential, nice neighborhood, preservation, gentrification, gentrif, redevelop, urban renewal, displace, displacing, neighborhood transition, neighborhood change
- Nuisance: noise, nuisance, undesirable uses, unwanted activities, loud, crime, security, pollution, privacy, open space, air quality, traffic, congestion, shadow

Quotes from public meetings I

- “Okay, half a parking space is totally inadequate and it gives seniors that live in a space no opportunity to have people visit them because theres no parking.”
- “Theres more traffic thats going to come and potholes are inevitable”
- “They were opposed to any type of redevelopment of the property”
- “As a mother, I don’t find it logical to have luxury housing built in our neighborhood”
- “I’m very surprised that this project is coming forward in our community because what we truly need in this community is affordable, economically attainable housing”

Quotes from public meetings II

- “This extra traffic from that high density cannot be supported by this neighborhood”
- “This neighborhood feels under assault”
- “They will gentrify, not only physically but socioeconomically too.
- “None of the residents can afford to pay the increased amount and will be forced to relocate outside of this area, driving up costs in lower rent neighborhoods and fueling gentrification.
- “They cited that the project is still too large in size, that the overflow parking would adversely impact the on-street parking in the single family residential neighborhoods, and that the applicant has not provided adequate traffic mitigation”

Meeting minutes - entitlements dataset

Description	Number of Files
Files transcribed	7743
Drop if no case information	1350
Multifamily cases	576
Cases pre-2017	278

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Sample used to estimate $\rho(\cdot)$

Sample restrictions

- Entitlement applications filed between 2004 and 2017
- First decision issued in 2017 or before
- Only include projects proposing 3 or more units, or mentioning multifamily housing in the project description
- Exclude projects that propose elder or supportive housing units; that propose small lot subdivisions; or that propose conversions into condominiums

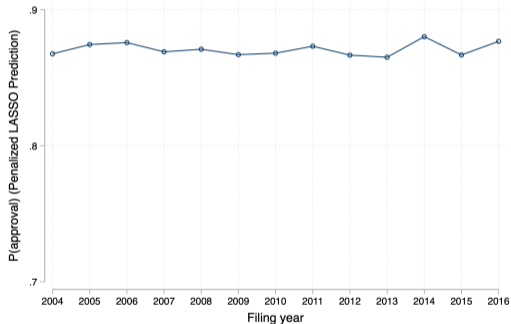
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Appeals

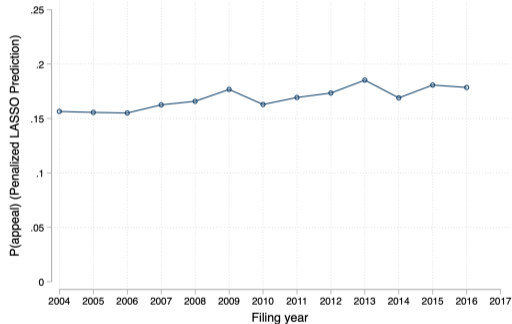
- Two reasons why we may observe an appeal
 1. Applicants can appeal a rejection
 2. Third parties can appeal an approval
- Second type makes up 94% of appeals in my LASSO estimation sample
- Only observe appeals conditional on the project being denied or approved in first decision
 - ▶ Issue: miss projects withdrawn or terminated because of high latent probability of appeal
- I assume that all projects denied or terminated prior to any decision would have been appealed by third parties had those projects been approved

Average probability of approval and appeal stable over time

$\hat{P}(\text{approval})$



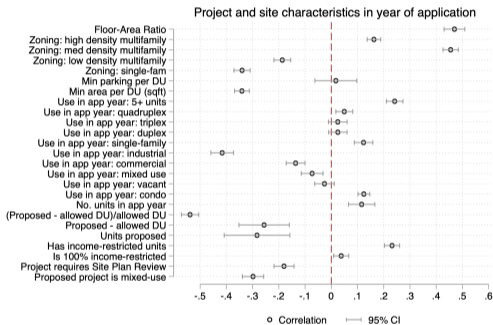
$\hat{P}(\text{appeal})$



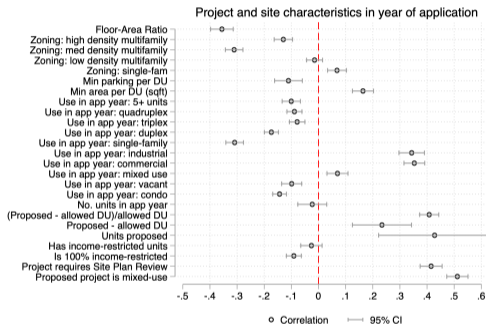
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Univariate relationship with project characteristics

$$\hat{P}(\text{approval})$$



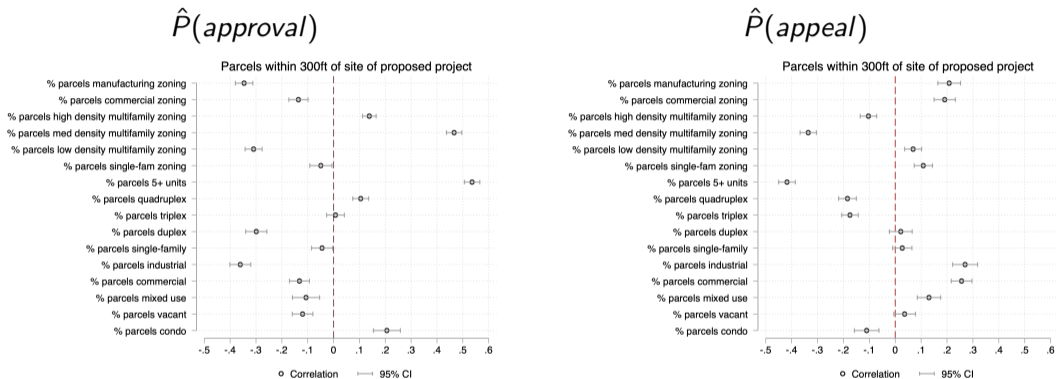
$$\hat{P}(\text{appeal})$$



Notes: This figure plots the univariate relationship between probability of approval, predicted by the LASSO logit model, and characteristics of the project and project site. I standardize all variables and regress the standardized probability of approval on the standardized covariates. Census tract characteristics are measured in 2000, while site- and neighbor-level characteristics are measured in the year of application

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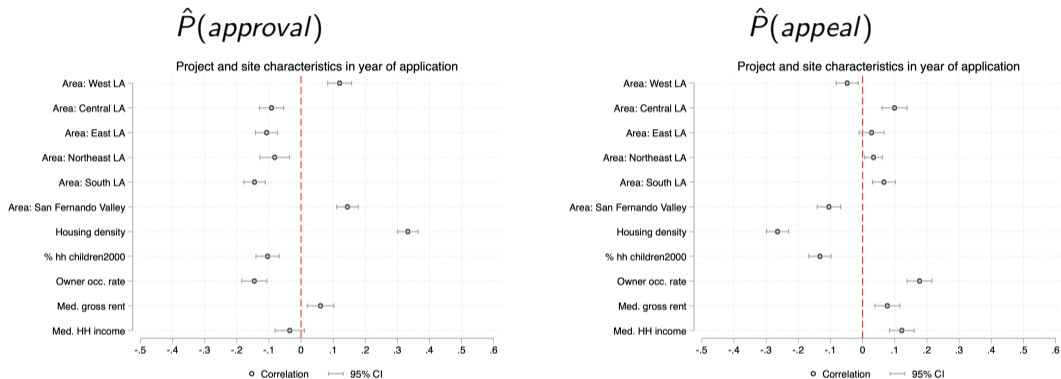
Univariate relationship with neighbors within 300ft



Notes: This figure plots the univariate relationship between probability of approval, predicted by the LASSO logit model, and characteristics of the project and project site. I standardize all variables and regress the standardized probability of approval on the standardized covariates. Census tract characteristics are measured in 2000, while site- and neighbor-level characteristics are measured in the year of application

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Univariate relationship with Census tract characteristics



Notes: This figure plots the univariate relationship between probability of approval, predicted by the LASSO logit model, and characteristics of the project and project site. I standardize all variables and regress the standardized probability of approval on the standardized covariates. Census tract characteristics are measured in 2000, while site- and neighbor-level characteristics are measured in the year of application

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