

Appendix A: Overview of 2013 and 2015 Chicago TOD ordinances

The 2013 transit-oriented development zoning ordinance was passed by the Chicago City Council on September 11, 2013 (Chicago 2013) and immediately went into effect. On September 24, 2015, the council passed a revision replacing it that expanded the number of parcels receiving benefits (Chicago 2015).

The 2013 ordinance applied only within specific geographic zones:

- Lots within 600 feet of rail station entrances operated by the Chicago Transit Authority 'L,' Metra, or South Shore Line systems. Distance measured "as the crow flies."
- Lots between 600 and 1,200 feet of station entrances, and *also* facing a Pedestrian Street designated by the city council, which imposes specific requirements with regards to new development, such as not allowing curb cuts through sidewalks.

The 2015 ordinance expanded zones to within $\frac{1}{4}$ mile of stations, or $\frac{1}{2}$ mile on pedestrian streets.

Depending on underlying zoning classification, the 2013 ordinance's benefits were:

- Properties zoned for business ("B"), commercial ("C"), downtown ("D"), and industrial ("M") could receive an up-to-50 percent reduction in required off-street residential parking, and an up-to-100 percent reduction in required off-street parking for non-residential uses. As of 2015, 99 percent of residential-zoned land required at least one parking space for each unit (see <http://www.metroplanning.org/news/7162/Minneapolis-strikes-again-How-Chicago-could-revamp-its-parking-requirements>).
- Properties in B, C, or D classifications *and* with allowed floor area ratios (FAR) of 3 could receive an additional +0.5 FAR in allowed density for new construction, effectively adding 16.7 percent to allowed floor space. FAR is calculated by dividing a building's floor space by its lot size; a six-story building that takes up half a lot has a FAR of 3, for example. These lots could also receive an increase in the allowed number of housing units per lots square footage (in the form of a reduction in minimum lot area, or MLA), and an increase in allowed building heights.

The 2015 ordinance eliminated parking requirements entirely (with minor planning department review) for all uses in applicable B, C, D, or M zones. For those B, C, or D zones with allowed FAR of 3, this ordinance increased the allowed density boost to a +1 FAR (up to a FAR of 4), in exchange for projects including steadily increasing levels of affordable housing on site. It also provided for an increase in allowed building heights above the 2013 level.

To summarize, with the passage of these ordinances, lots near stations were provided one of:

- a. Density boosts, receiving both reductions in parking requirements and increases in allowed construction. These were the B-3, C-3, and D-3-zoned lots.
- b. Reduced parking requirements only. These were the B, C, D, and M-zoned lots without FARs of 3; FARs of 1 to 16 are available in Chicago.
- c. No benefits. These were mostly lots zoned for purely residential ("R") uses, or under preexisting Planned Development ("PD") or Planned Manufacturing ("PMD") rules.

In neighborhoods through the city, parcels benefitting from the 2013 and 2015 ordinances were common along arterial streets that extend from most rail stations, as illustrated in Figure 1.

Appendix B: Characteristics of property transactions and covariates

	<i>Density classes</i>			<i>Parking classes</i>		
	Impacted by 2013 law	Impacted by 2015 law	Outside comparison area	Impacted by 2013 law	Impacted by 2015 law	Outside comparison area
<i>n (parcels)</i>	794	1,084	4,963	4,587	6,177	26,825
Mean distance from station entrances (feet)	507 (247)	1,167 (313)	1,798 (315)	472 (250)	1,148 (374)	1,886 (341)
Mean transaction price	\$1,013,644	\$780,488	\$627,624	\$1,507,469	\$1,097,771	\$711,879
Log mean transaction price	12.56 (1.23)	12.78 (1.06)	12.82 (0.92)	12.70 (1.23)	12.64 (1.13)	12.66 (1.09)
Share of nearby parcels occupied by buildings	52.6% (13.3)	52.8% (14.8)	53.5% (16.5)	60.8% (18.1)	55.4% (14.7)	50.3% (17.5)
<i>Share of total transactions by type</i>						
Land only	1.3%	2.9%	3.3%	1.7%	1.9%	2.9%
Single residence	78.7%	78.7%	85.9%	76.4%	76.7%	77.7%
Apartment building	3.1%	1.8%	1.3%	2.0%	2.6%	2.8%
Office, retail, or commercial building	11.3%	9.2%	5.3%	10.9%	8.9%	8.2%
Industrial building	0.4%	0.8%	0.7%	0.7%	1.0%	1.5%
<i>Characteristics of encompassing Census Tracts of the average transaction</i>						
<i>Source: U.S. Census American Community Survey 2011-2015</i>						
Population density per sq. mi.	26,296 (17,704)	26,143 (23,237)	20,895 (9,141)	31,475 (22,386)	37,718 (37,931)	26,197 (16,274)
Share white	58.6% (23.7)	63.2% (20.9)	59.4% (23.1)	62.1% (19.4)	60.9% (22.8)	57.5% (25.6)
Share black	18.4% (22.5)	14.6% (21.5)	16.4% (22.8)	12.1% (16.4)	12.0% (19.4)	14.9% (23.4)
Share using transit to commute to work	40.4% (13.6)	36.5% (11.2)	30.1% (9.0)	29.5% (11.6)	30.6% (12.2)	29.3% (11.1)
Share with college degrees	62.7% (22.3)	69.5% (19.2)	65.3% (21.2)	75.2% (19.2)	70.2% (23.3)	65.7% (24.8)
Median household income	\$71,751 (33,186)	\$84,641 (32,409)	\$91,585 (33,879)	\$89,280 (29,415)	\$79,098 (26,875)	\$80,516 (26,715)
Share renting	59.4% (17.1)	58.6% (12.5)	48.9% (16.7)	59.6% (12.4)	58.4% (13.2)	52.1% (12.1)
House value	\$347,351 (126,836)	\$354,492 (99,430)	\$371,475 (116,549)	\$383,694 (123,040)	\$374,055 (119,165)	\$365,418 (118,812)

Notes: Standard deviations in parentheses where appropriate.

Appendix C: Regressions of logged property transaction values citywide: Parking classes impacted by 2013 vs. 2015 laws (December 2010 to September 2015)

	Small apartment building, 2-6 units	Small mixed-use building	1-story commercial building	Industrial building	3+ story commercial building	Large mixed-use building
	(1)	(2)	(3)	(4)	(5)	(6)
Z_e Treatment	-0.237 (0.329)	0.168 (0.134)	0.179 (0.316)	-2.190*** (0.781)	1.096** (0.418)	-0.665 (0.711)
B_t Time period	-2.830 (3.284)	-5.809*** (1.348)	-1.183 (1.533)	2.237*** (0.639)	-0.383 (0.738)	-1.645 (2.950)
$Z_e B_t$ Difference-in-differences: Impact of 2013 ordinance	-0.100 (0.354)	-0.015 (0.162)	-0.337 (0.365)	1.231* (0.641)	0.252 (0.334)	0.498 (0.732)
Constant	12.802*** (1.443)	18.573*** (1.194)	15.237*** (2.042)	14.918*** (3.429)	23.700*** (6.352)	6.917 (5.501)
Observations	239	566	246	89	107	111
District and time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
District time trends	Yes	Yes	Yes	No	Yes	Yes
Property class	2-11	2-12, 5-92	5-17	5-93	5-91	3-18
R^2	0.776	0.719	0.631	0.828	0.690	0.694
Adjusted R^2	0.683	0.676	0.469	0.602	0.443	0.251

Notes: *** p<0.01, ** p<0.05, * p<0.10. Robust standard errors clustered at Census tract in parentheses. All models include adjustment for property classifications. When included, covariates are property distance from station; property zone density; property zone type; neighborhood building density; station type; and neighborhood Census data.

Appendix D: Regressions of logged property transaction values: 2015 upzoned areas vs. outside comparison areas (December 2010 to June 2018)

	Citywide, all properties		Citywide, residences		High-income districts, all properties		Low-income districts, all properties	
	Density classes	Parking classes	Density classes	Parking classes	Density classes	Parking classes	Density classes	Parking classes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Z_e Treatment	0.094 (0.123)	-0.058 (0.072)	0.043 (0.119)	0.025 (0.074)	-0.093 (0.0.094)	-0.061 (0.055)	0.257 (0.311)	0.015 (0.099)
B_t Time period	0.027* (0.152)	0.005 (0.098)	0.096 (0.077)	-0.009 (0.056)	0.211 (0.175)	-0.024 (0.095)	0.561** (0.282)	-0.377* (0.214)
$Z_e B_t$ Difference-in-differences: Impact of 2015 ordinance	0.168** (0.069)	0.133*** (0.043)	0.097* (0.058)	0.004 (0.029)	0.148** (0.070)	0.145*** (0.054)	0.086 (0.254)	0.046 (0.094)
Constant	11.847*** (0.679)	10.778*** (0.596)	11.296*** (0.380)	10.385*** (0.225)	12.588*** (0.817)	10.544*** (0.578)	11.426*** (0.914)	12.096*** (1.030)
Observations	4,115	21,941	3,473	17,065	3,006	8,218	594	3,196
Analysis group	Density classes	Parking classes	Density classes	Parking classes	Density classes	Parking classes	Density classes	Parking classes
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Linear time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Property types	All	All	Single residences	Single residences	All	All	All	All
R^2	0.301	0.305	0.306	0.317	0.298	0.306	0.510	0.400
Adjusted R^2	0.289	0.302	0.295	0.314	0.285	0.301	0.461	0.388

Notes: *** p<0.01, ** p<0.05, * p<0.10. Robust standard errors clustered at Census tract in parentheses. District and quarter fixed effects are included in all models. All models are adjusted in hedonic regression for property classifications. High-income districts are Far Southwest Side, Lincoln Park-Lakeview, Near West Side, Milwaukee Avenue, North Central, and Northwest Side; their residents had median household incomes of more than \$50,000 in 2015. Low-income districts are Bronzeville-South Lakefront, Calumet, Midway, North Lakefront, Pilsen-Little Village, South Side, Stockyards, Stony Island, and West Side; their residents had median household incomes of less than \$50,000.

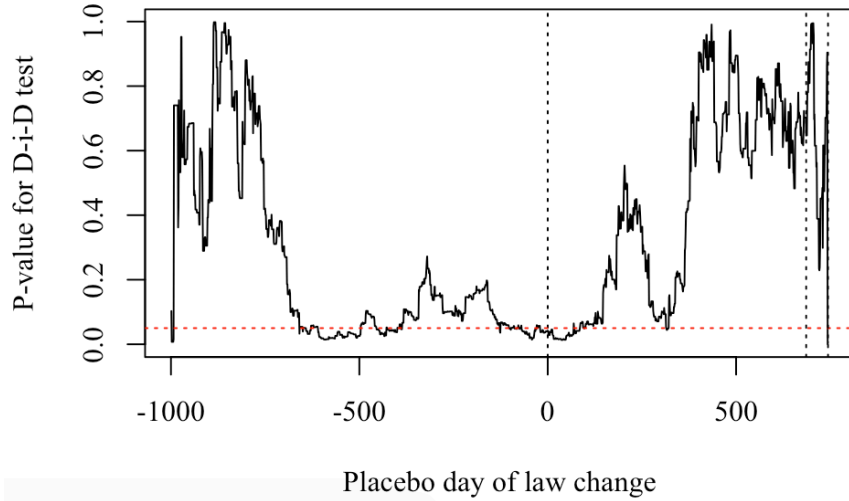
Appendix E: Regressions of logged property transaction values citywide in buffer zones (December 2010 to September 2015)

	All property types, density classes		Residential condominiums, parking classes	
	(1) 500-1200 ft	(2) 300-1350 ft	(3) 500-1200 ft	(4) 300-1350 ft
Z_e Treatment	-0.046 (0.118)	-0.007 (0.090)	-0.430*** (0.142)	-0.302** (0.153)
B_t Time period	-1.251** (0.554)	-0.642* (0.336)	0.263** (0.119)	-2.887*** (0.457)
$Z_e B_t$ Difference-in-differences: Impact of 2013 ordinance	0.255** (0.102)	0.167** (0.073)	0.131** (0.059)	0.101** (0.041)
Constant	12.880*** (1.024)	11.609*** (0.662)	11.136*** (0.411)	13.244*** (0.680)
Observations	954	1,452	3,446	5,258
Covariates	Yes	Yes	Yes	Yes
Linear time trends	Yes	Yes	Yes	Yes
R^2	0.583	0.637	0.324	0.251
Adjusted R^2	0.536	0.609	0.313	0.243

Notes: *** p<0.01, ** p<0.05, * p<0.10. Robust standard errors clustered at Census tract in parentheses. District and quarter fixed effects are included in all models. All models are adjusted in hedonic regression for property classifications. Covariates includes in some models include distance from station; zone density; zone type; neighborhood building density; service type (CTA or Metra); and Census data.

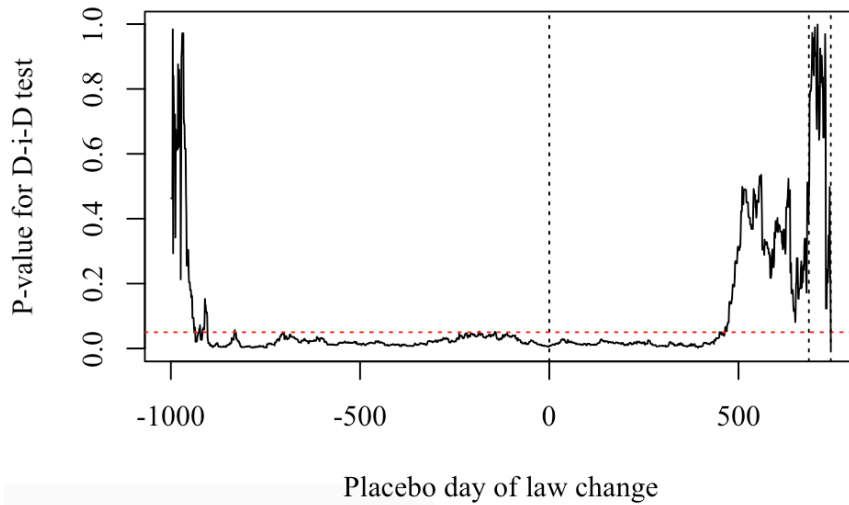
Appendix F: Placebo time tests

(A) P-values of placebo time tests of citywide density classes, all property types



Note: P-values based on robust standard errors clustered at Census tract. Based on Table 3, Model 4.

(B) P-values of placebo time tests of citywide parking classes, residential condos only



Note: P-values based on robust standard errors clustered at Census tract. Based on Table 4, Model 6.

Appendix G: Regressions of logged property transaction values over shorter timelines

	All property types, density classes			Residential condominiums, parking classes		
	Excludes transactions after July 29, 2015 ¹	Counts transactions after July 24, 2013 as post-reform ^x	Models (1) and (2) combined	Excludes transactions after July 29, 2015 _t	Counts transactions after July 24, 2013 as post-reform ^x	Models (4) and (5) combined
	(1)	(2)	(3)	(4)	(5)	(6)
Z_e Treatment	-0.018 (0.086)	-0.041 (0.095)	-0.040 (0.096)	-0.188 (0.123)	-0.186 (0.122)	-0.186 (0.124)
B_t Time period	-0.615* (0.340)	-0.175 (0.121)	-0.183 (0.121)	-2.775*** (0.416)	-0.059* (0.032)	-0.060* (0.032)
$Z_e B_t$ Difference-in-differences: Impact of 2013 ordinance	0.175** (0.084)	0.193** (0.091)	0.205** (0.095)	0.102*** (0.036)	0.091** (0.040)	0.091** (0.039)
Constant	11.769*** (0.542)	11.683*** (0.545)	11.785*** (0.541)	13.218*** (0.600)	13.175*** (0.604)	13.140*** (0.614)
Observations	1,767	1,878	1,767	6,120	6,465	6,120
Analysis group	Density properties	Density properties	Density properties	Parking properties	Parking properties	Parking properties
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Linear time trends	Yes	Yes	Yes	Yes	Yes	Yes
Property types	All	All	All	Residential condos	Residential condos	Residential condos
R^2	0.598	0.601	0.599	0.249	0.252	0.248
Adjusted R^2	0.572	0.577	0.573	0.241	0.245	0.241

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Robust standard errors clustered at Census tract in parentheses. District and quarter fixed effects are included in all models. All models are adjusted in hedonic regression for property classifications. ¹ When second zoning reform was proposed. ^x When first zoning reform was proposed.