



The Effect of the NGA-W Move on Residential and Commercial Property Prices in St. Louis

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Presentation Outline

- About the NGA
- Timeline of NGA-W move
- Literature
- Appraisal data
- New NGA-W Property Value Changes
- Current NGA-W Property Value Changes
- Conclusion and next steps

About the NGA

- Provides and maintains maps of:
 - Imminent threats
 - Land and sea navigation
- Humanitarian and disaster relief
 - Supports FEMA
- Osama Bin Laden compound model



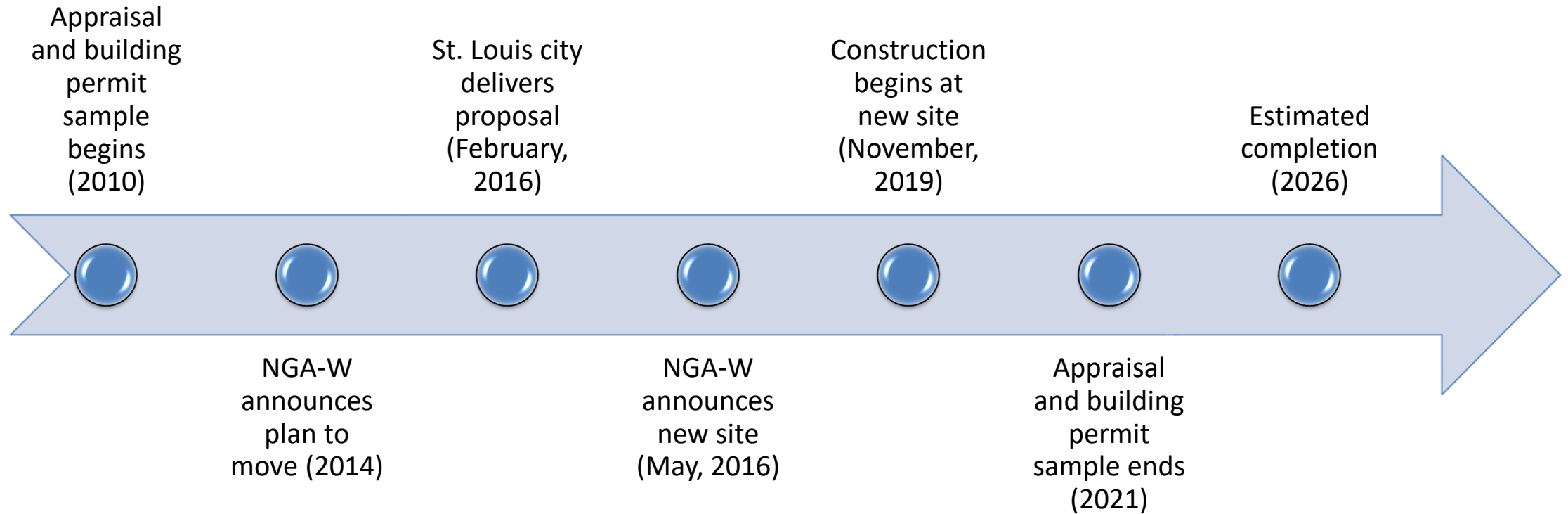
Original Prospective Sites for New NGA-W

St. Louis Public Radio | By Maria Altman

Published October 9, 2015 at 1:35 PM CDT



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2015 New NGA Campus



2017 New NGA Campus



2019 New NGA Campus



2021 New NGA Campus



April 2022 New NGA Campus



Relevant Literatures

- Very large hedonic price literature on housing prices
 - Price effects of local amenities or disamenities (crime, school quality, etc)
 - Cohen, et.al (2021) Noise and closing of Stapleton airport
- Effect of NGA-W move
 - Smith and Sandoval (2020). Effect on crime around new NGA site pre- and post-demolition. 2015-2018.
- Ours is first study to examine effect of NGA move on receiving and sending area property values

St. Louis City Appraisal Sample

- St. Louis City annually publishes assessed values by property
 - Assessed values are 31% of the appraised value for commercial, and 19% of the appraised value for residential properties
 - Appraised values are intended to reflect market value
 - Residential and commercial properties are reappraised regularly
- Sample selection:
 - Property must have a full panel of values for 2010-2021
 - Value in any year must be \geq \$500

Properties by location with complete assessment histories

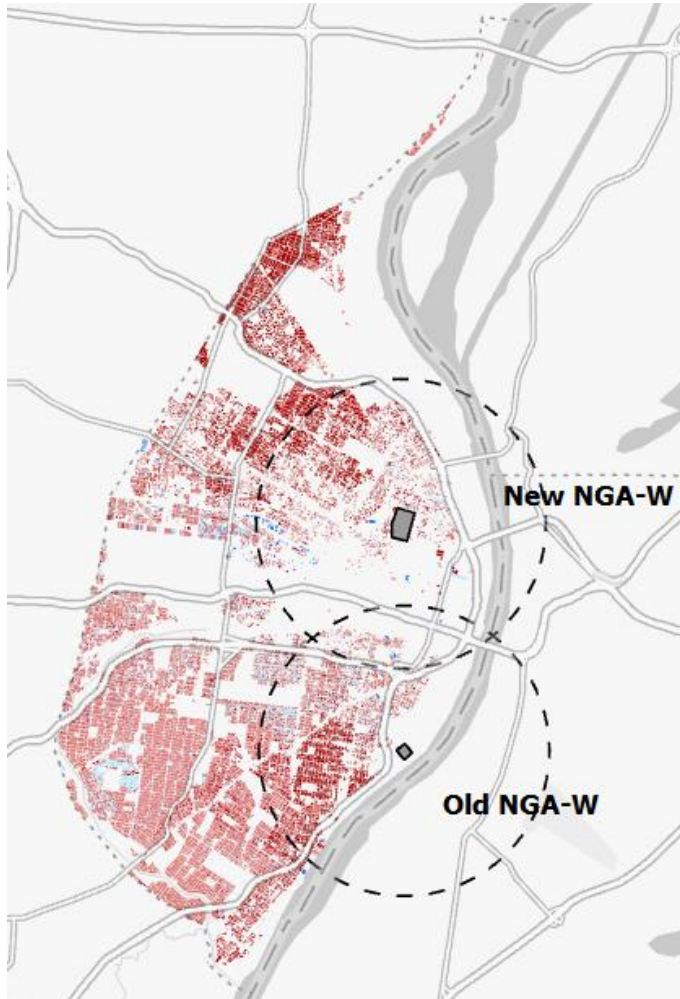
Location	New NGA-W		Current NGA-W	
	Residential	Commercial	Residential	Commercial
Full city	86,913	7,428	86,913	7,428
≤ 1 km	998	173	404	173
1 - 2 km	2,499	1,035	3,934	495
2 - 3 km	3,172	715	6,162	407
3 - 4 km	5,508	756	7,259	519

Note: A property's distance from an NGA site is calculated as the straight-line distance between property's centroid and the NGA property's centroid.

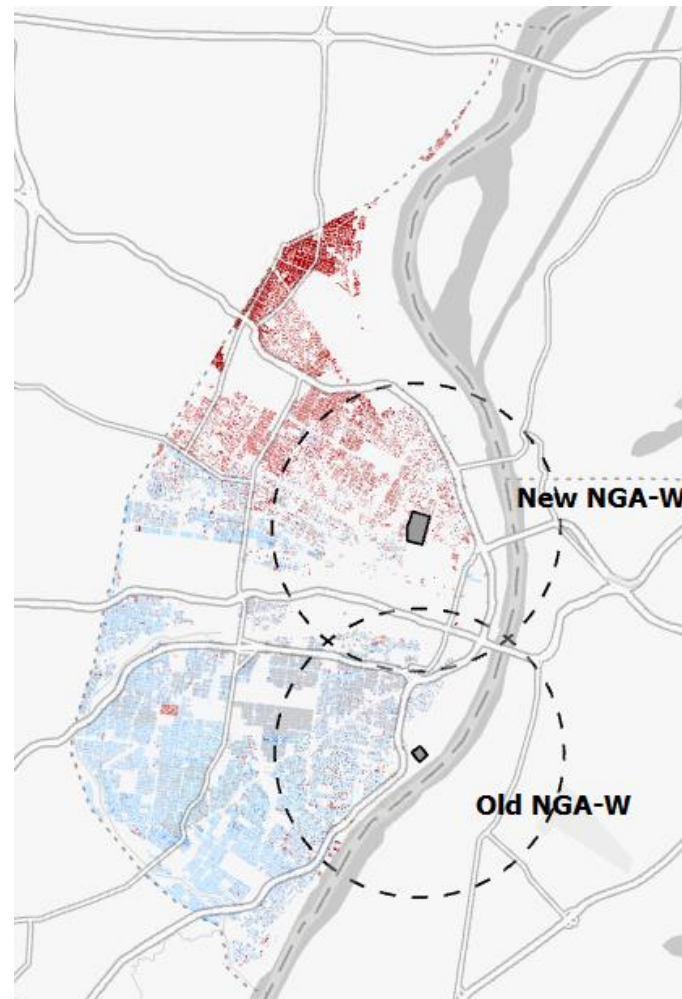
New NGA-W Property Value Changes

St. Louis City Percent Change in Residential Property Values: 4 km Radius of NGA-W sites

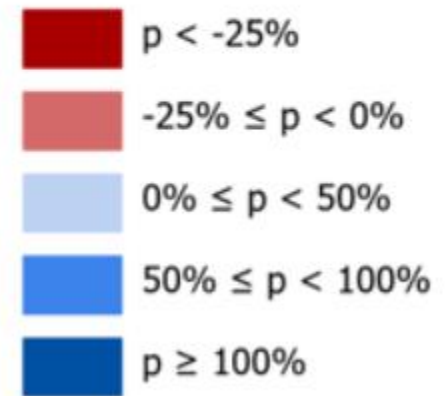
2011-2016



2016-2021



% Change in Property Value (p)

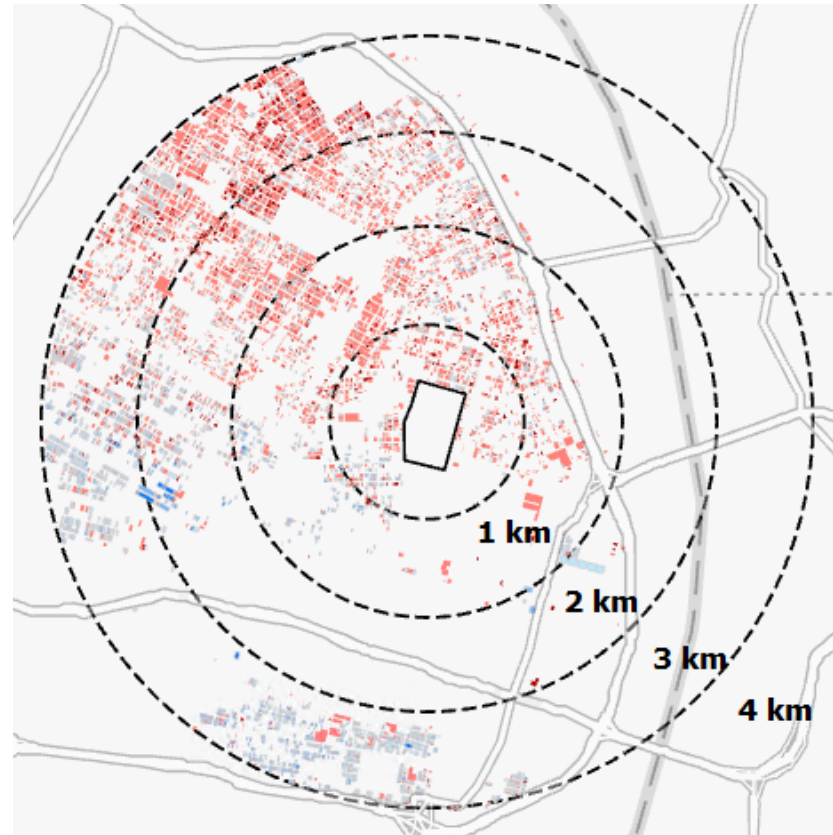
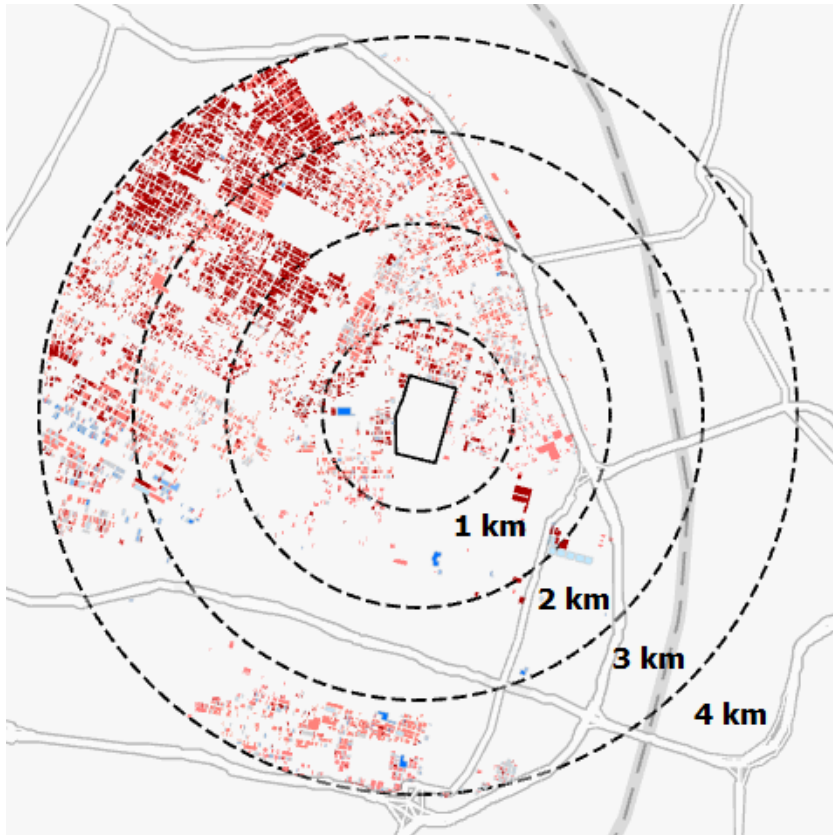


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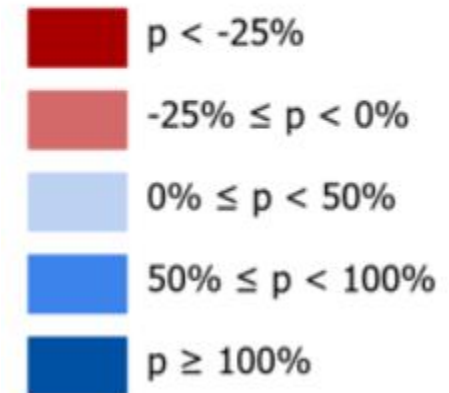
Percent Change in Residential Property Values Within 4 km of the New NGA-W

2011-2016

2016-2021



% Change in
Property Value (p)



Annual mean appraised residential property values (\$)

	New NGA-W				Current NGA-W			
	0-1	1-2	2-3	3-4	0-1	1-2	2-3	3-4
2010	15,344	32,881	35,809	77,008	95,256	86,067	92,731	108,234
2011	13,608	30,101	28,617	75,396	90,084	81,163	86,882	102,747
2012	13,723	29,467	29,427	74,748	89,874	81,089	86,979	102,245
2013	12,676	26,831	25,024	68,375	80,656	67,870	74,847	88,820
2014	12,782	25,524	25,374	69,130	80,751	68,283	75,229	88,992
2015	13,365	24,635	27,956	71,183	82,145	73,824	77,519	91,233
2016	13,355	25,808	31,010	71,430	82,301	74,530	78,044	92,915
2017	12,300	23,675	31,112	78,467	90,761	85,312	90,957	108,206
2018	12,715	24,591	29,964	78,832	91,087	86,225	91,758	108,290
2019	12,806	25,259	31,158	88,022	101,989	96,869	107,707	125,111
2020	12,682	25,338	31,129	88,118	102,248	97,891	108,764	126,156
2021	12,634	25,460	31,191	94,305	109,691	105,780	118,388	139,094
Properties	980	2,478	3,157	5,485	404	3,928	6,152	7,257
Appraisals/Property	4.5	5.2	5.6	6	5.8	6.2	6.5	6.7

Note: Appraised values are by property are denoted annually. Each column represents a different distance measured in kilometers from an NGA location. Appraisals/Property denotes the mean number of unique changes to appraisal values per property between 2010 and 2021.

Percent of residential appraisals completed by distance to NGA site

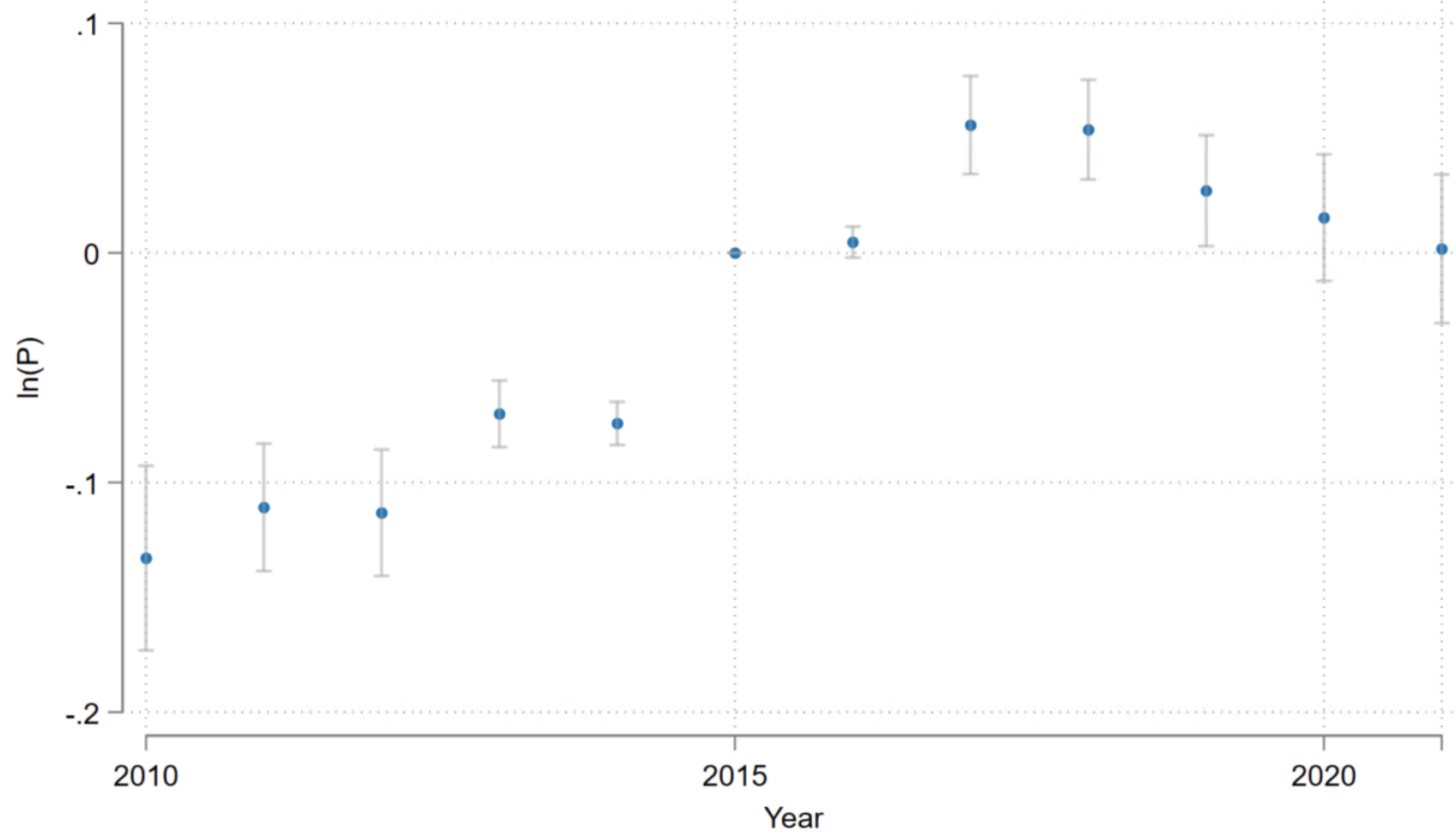
	New NGA-W				Current NGA-W			
	0-1	1-2	2-3	3-4	0-1	1-2	2-3	3-4
2010	-	-	-	-	-	-	-	-
2011	56.3	70.5	78.8	85.9	85.1	90.2	94.1	95.9
2012	0.9	1.0	1.2	1.5	1.0	2.6	1.7	2.0
2013	94.1	88.0	97.6	94.6	92.6	95.6	96.6	95.9
2014	2.9	2.4	0.9	1.8	2.7	2.3	2.8	1.9
2015	49.0	63.7	75.6	84.6	83.7	88.9	92.5	93.9
2016	0.1	0.5	1.5	1.1	2.7	1.9	2.3	1.7
2017	59.7	79.4	85.9	92.0	38.9	56.6	65.6	90.5
2018	1.2	1.4	0.4	1.1	2.0	2.2	2.9	1.8
2019	47.2	63.6	75.5	83.6	84.4	89.8	93.9	95.2
2020	2.4	4.4	4.3	5.6	9.7	8.1	8.8	5.5
2021	31.1	41.4	36.9	43.6	82.2	83.9	91.1	92.7
Properties	998	2,499	3,172	5,508	404	3,934	6,162	7,259



$$Y_{it} = \beta_0 + \beta_1 T_t + \beta_2 T_t I_i + \delta_i + \mu_{it}$$

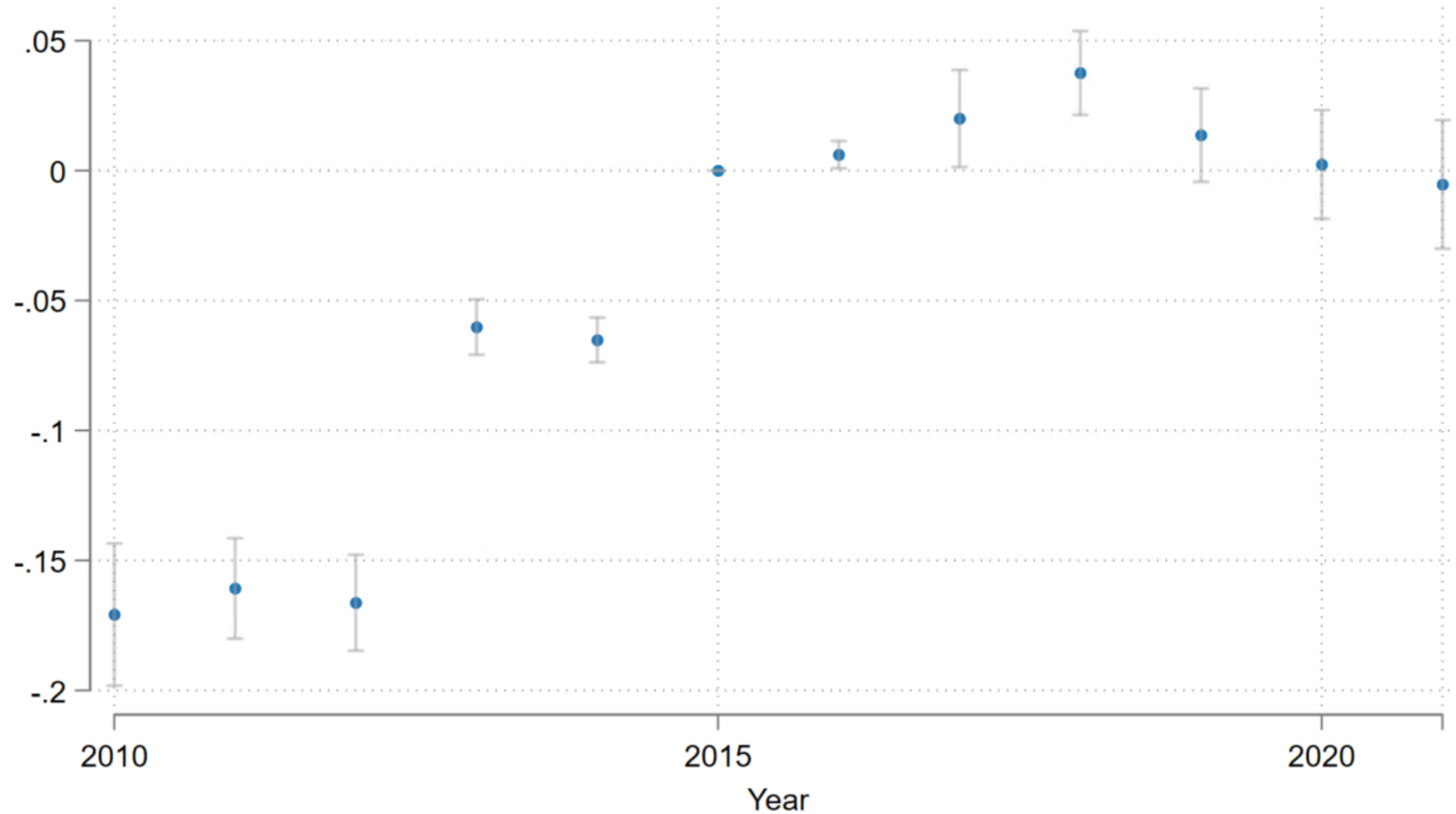
- Y represents the log of appraised value of property i in year t
- T represents year (2010-2021)
- I represents the impact (treatment) zone
- δ represents property fixed effects

Residential property value changes near the new NGA-W



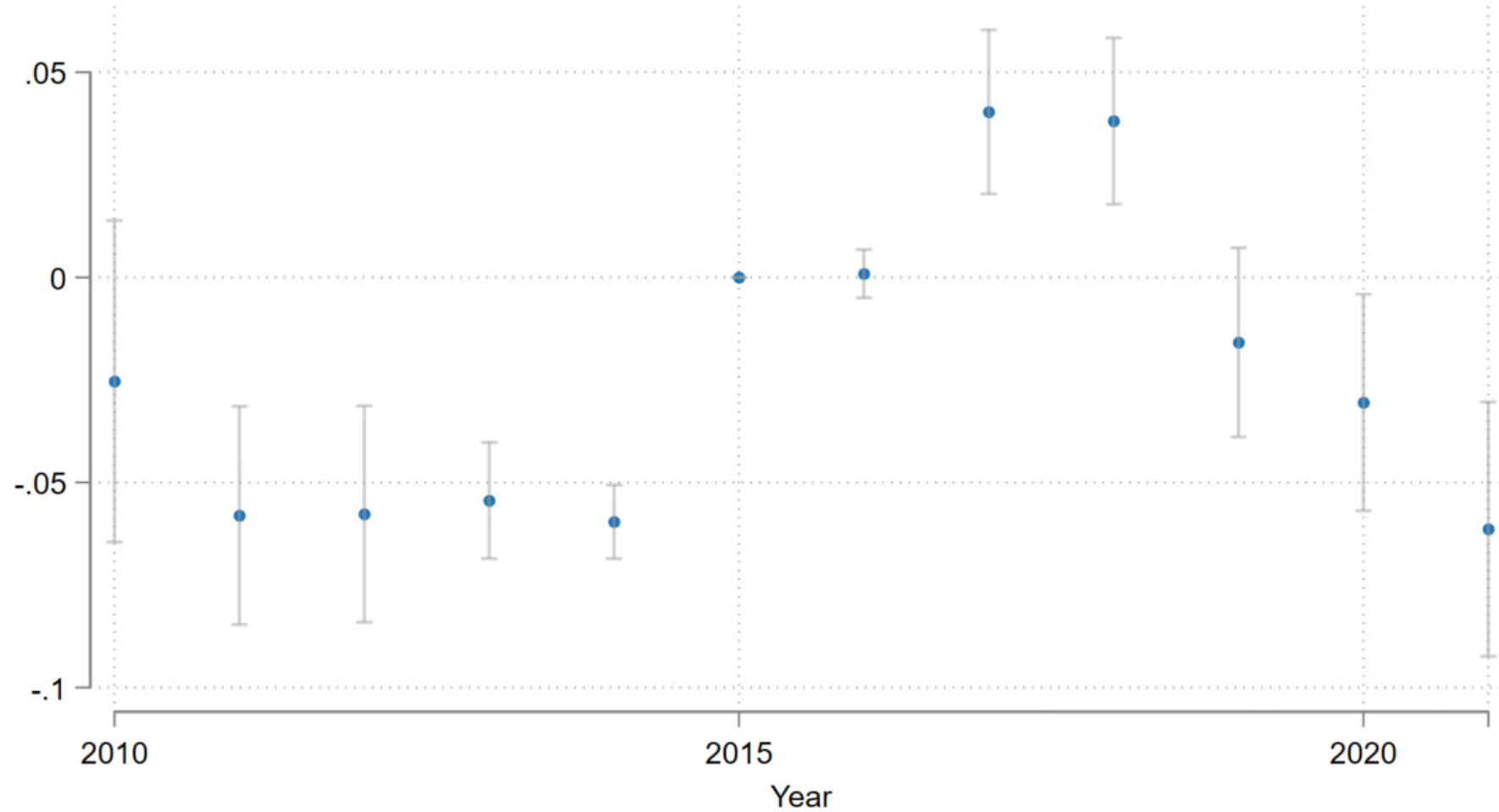
There are 980 properties less than or equal to 1 km from the new NGA-W site in the treatment group, and the control group has 3,150 properties 2-3 km from the new NGA-W.

Residential property value changes within 1.5 km of the new NGA-W



There are 2,251 properties less than or equal to 1.5 km from the new NGA-W site in the treatment group, and the control group has 3,150 properties 2-3 km from the new NGA-W.

Residential property value changes within 1 km of the new NGA-W



There are 980 properties less than or equal to 1 km from the new NGA-W site in the treatment group, and the control group has 8,642 properties 2-4 km from the new NGA-W.

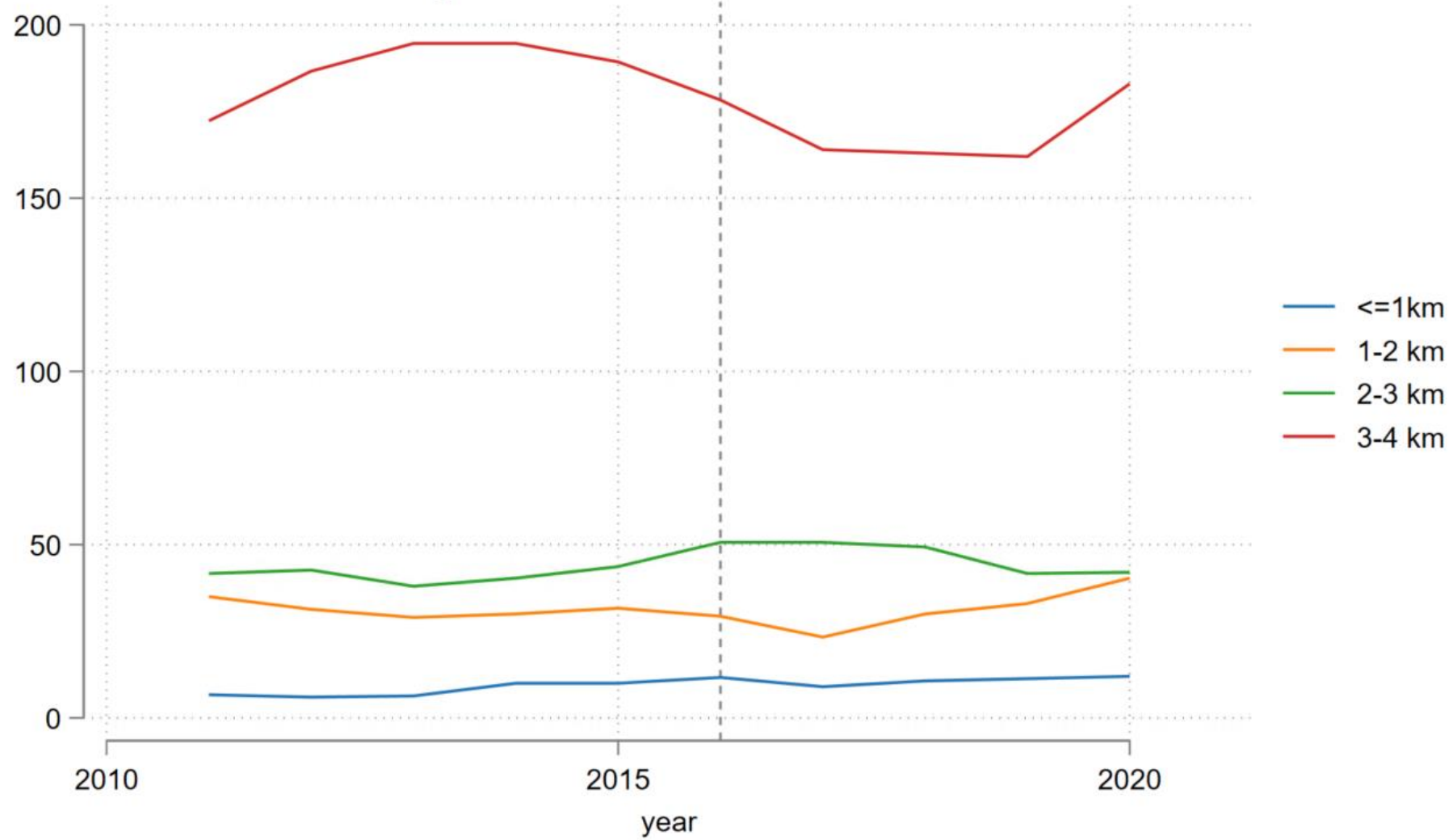
Building Permits and Value new NGA-W

- Property-level permits for residential and commercial properties
- Includes estimated cost, and a description of the type of project

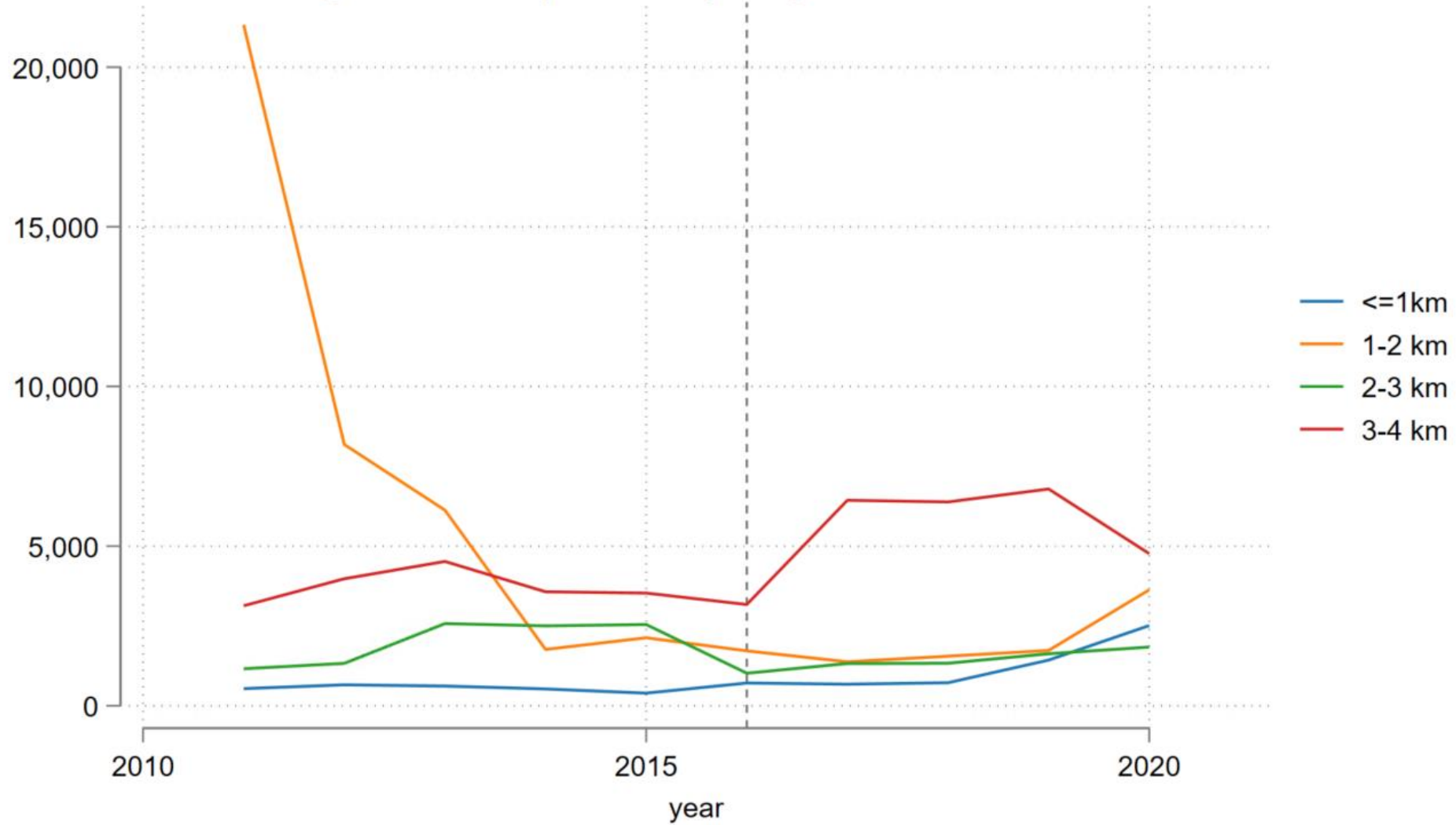
Residential Building Permits

	New NGA-W				Current NGA-W			
year	<1 km	1-2 km	2-3 km	3-4 km	<1 km	1-2 km	2-3 km	3-4 km
2010	9	31	42	143	27	190	324	244
2011	4	41	47	182	26	187	265	213
2012	7	30	33	173	22	235	336	265
2013	7	19	47	176	23	236	324	285
2014	5	36	29	199	22	196	337	293
2015	17	34	38	172	34	205	332	287
2016	7	25	57	165	31	243	273	268
2017	9	26	53	166	38	230	345	301
2018	10	15	38	134	25	255	307	300
2019	10	40	50	165	35	270	333	319
2020	12	37	31	168	42	238	300	311
2021	12	36	42	194	27	261	358	427

3-Year Moving Average of Residential Building Permits near New NGA-W

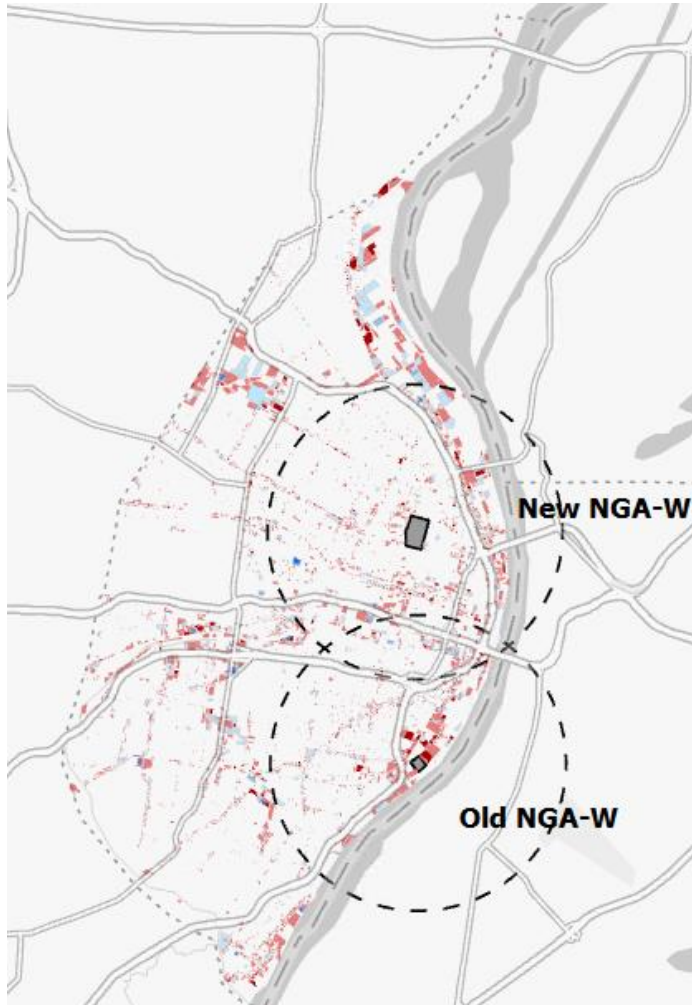


3-Year Moving Average of Estimated Cost of Residential Building Permits per Property near New NGA-W

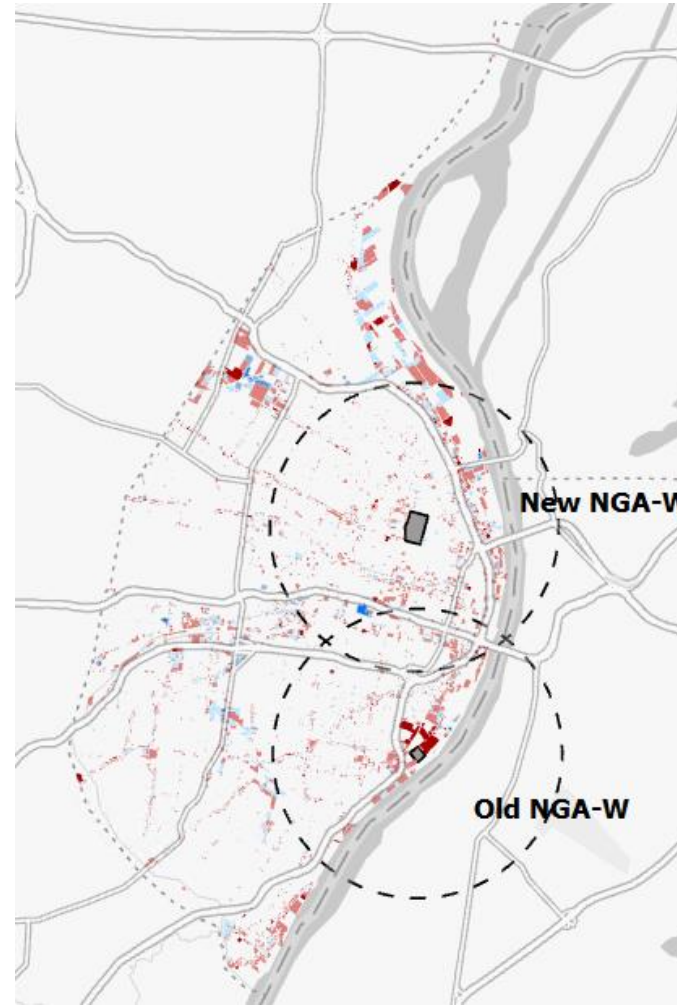


St. Louis City Percent Change in Commercial Property Values: 4 km Radius of NGA-W sites

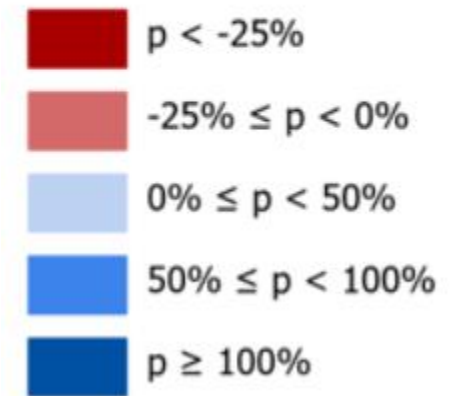
2011-2016



2016-2021

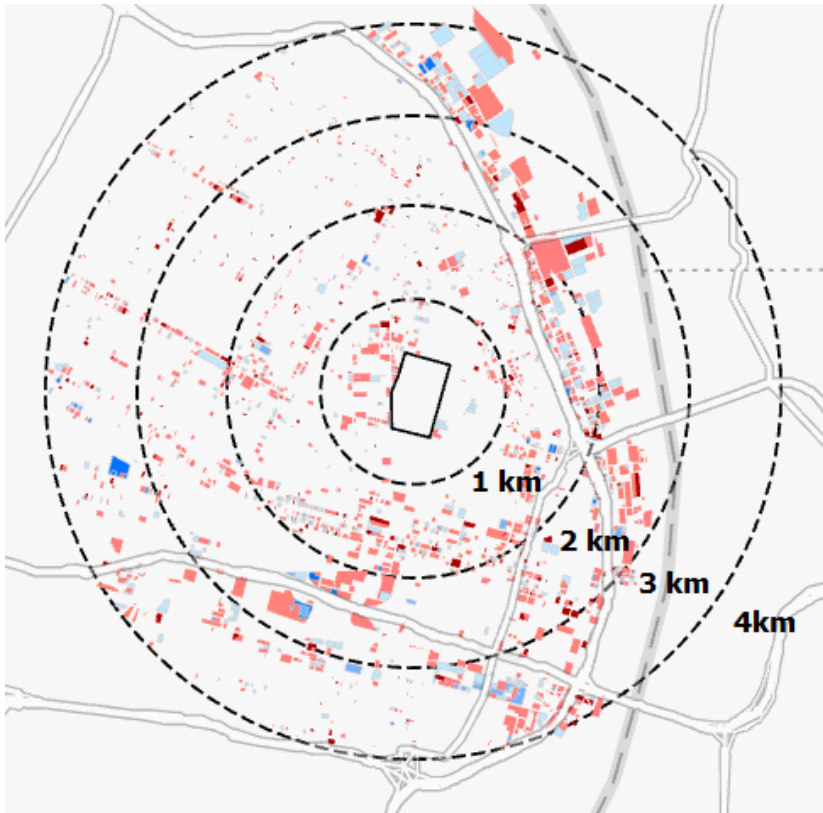


% Change in Property Value (p)

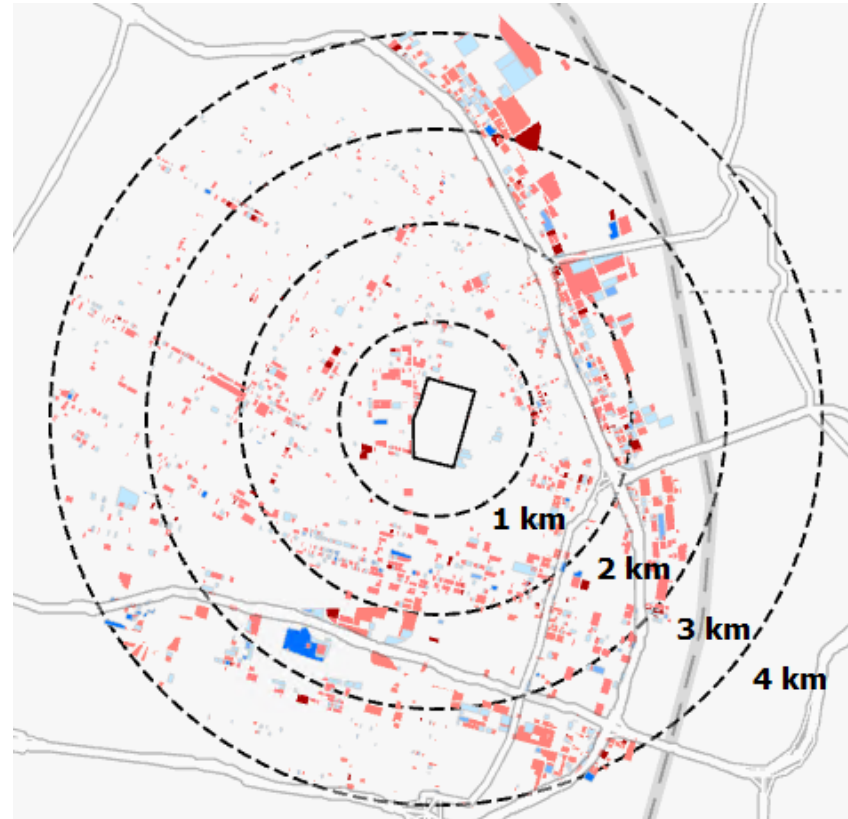


Percent Change in Commercial Property Values Within 4 km of the New NGA-W

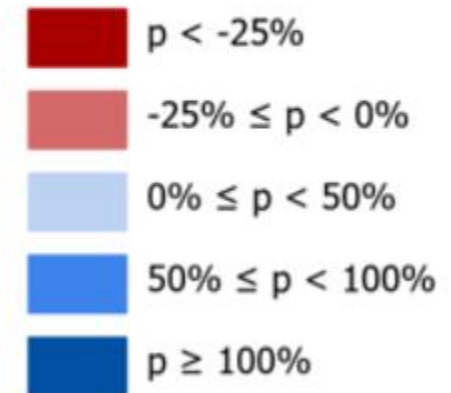
2011-2016



2016-2021



% Change in
Property Value (p)



Annual mean appraised commercial property values

	New NGA-W				Current NGA-W			
	0-1	1-2	2-3	3-4	0-1	1-2	2-3	3-4
2010	49,593	190,659	683,607	422,148	624,883	145,051	197,732	479,446
2011	47,045	166,429	638,383	411,744	561,491	144,856	191,695	457,585
2012	47,005	167,356	628,448	398,443	561,491	144,657	191,173	433,461
2013	46,949	163,145	626,160	400,947	487,957	147,332	190,225	431,494
2014	46,949	161,634	622,493	393,933	490,484	146,683	189,209	419,611
2015	46,325	159,673	587,485	390,458	450,419	144,141	192,955	407,730
2016	46,296	158,609	585,146	391,762	449,278	144,425	193,737	408,955
2017	45,991	159,315	592,053	450,798	408,926	147,613	193,526	428,297
2018	44,903	158,398	602,878	423,908	405,574	147,963	193,144	424,656
2019	45,896	162,066	606,624	428,442	406,156	152,502	198,881	430,359
2020	45,896	161,893	606,801	460,338	375,102	156,054	199,085	420,715
2021	45,362	184,545	599,089	408,713	289,312	149,201	215,050	418,106
Properties	172	1,033	707	748	172	492	405	515
Appraisals/Property	2.8	3	2.9	3	2.5	3.2	3.3	3.1

Note: Appraised values are by property are denoted annually. Each column represents a different distance measured in kilometers from an NGA location. Appraisals/Property denotes the mean number of unique changes to appraisal values per property between 2010 and 2021.

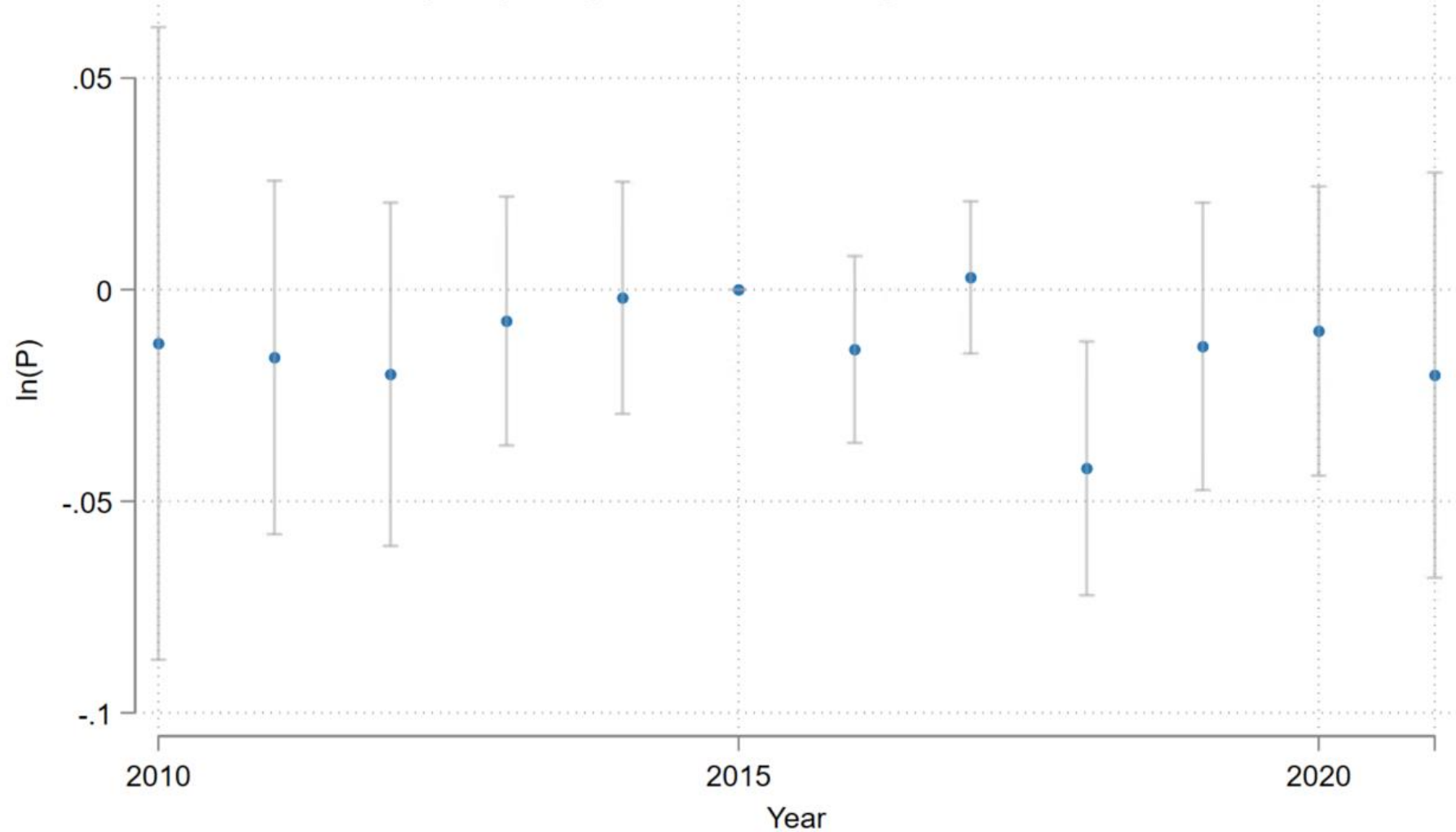


Percent of commercial appraisals completed by distance to NGA site

	New NGA-W				Current NGA-W			
	0-1	1-2	2-3	3-4	0-1	1-2	2-3	3-4
2010	-	-	-	-	-	-	-	-
2011	63.6	50.2	44.5	47.1	25.4	51.1	54.5	48.4
2012	0.6	2.0	2.9	2.2	0.0	1.4	2.5	2.5
2013	30.1	41.2	47.6	46.8	28.3	43.8	45.7	46.8
2014	0	3.4	2.8	3.2	2.9	1.6	3.7	4.2
2015	30.6	38.6	35.9	38.1	23.1	47.1	45.5	37.8
2016	0.6	2.2	2.0	0.8	1.7	1.4	1.0	1.3
2017	6.9	16.4	14.3	19.3	17.9	21.0	20.6	23.1
2018	9.2	1.3	1.7	1.9	1.7	1.8	3.2	2.3
2019	34.7	33.8	29.5	32.4	17.9	35.4	37.8	30.6
2020	0.6	3.9	2.4	3.3	15.0	7.9	8.6	3.7
2021	3.5	5.5	8.0	8.2	16.2	8.7	11.1	10.2
Properties	173	1,035	715	756	173	495	407	519

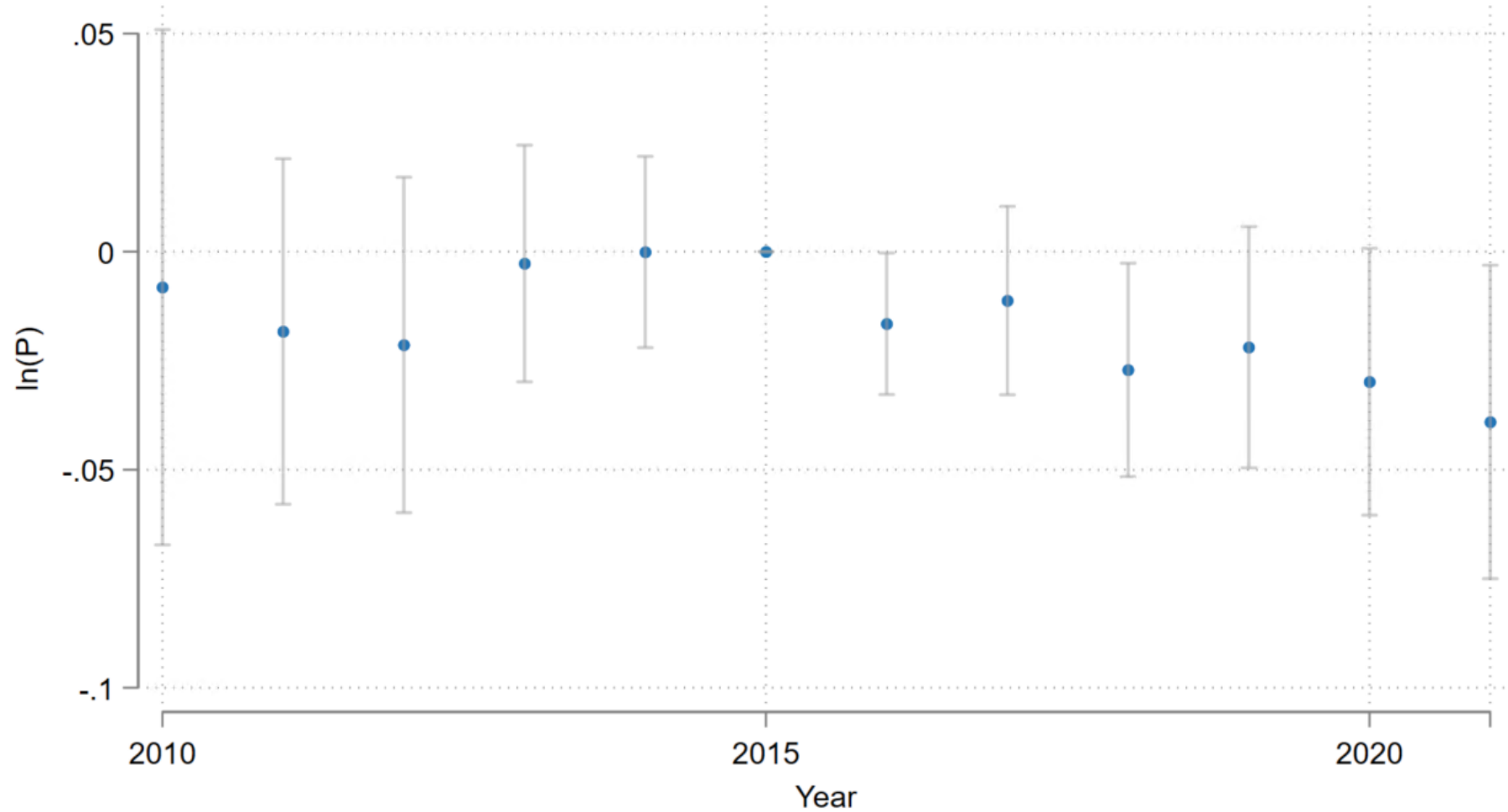


Commercial property value changes near the new NGA-W



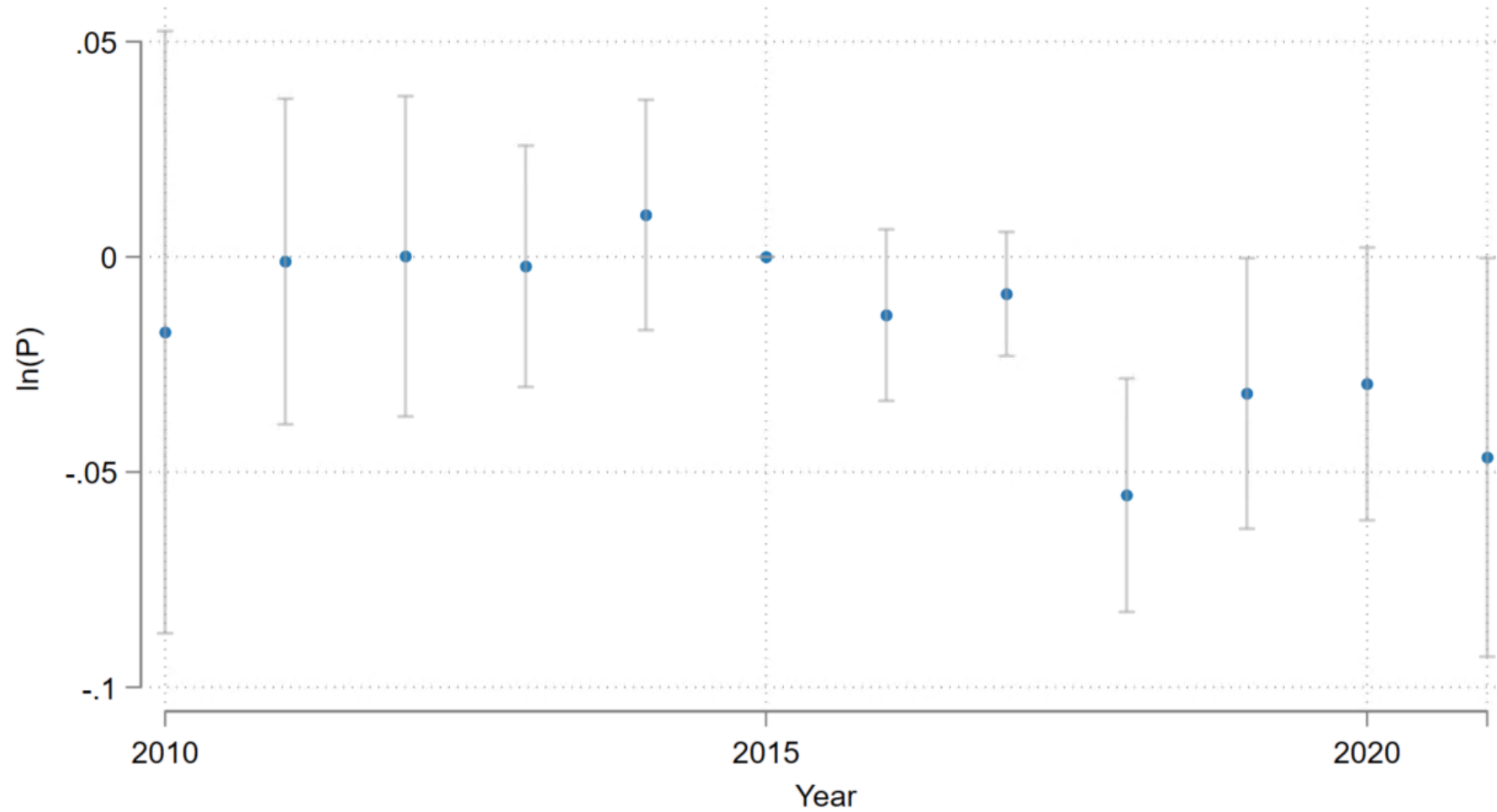
There are 172 properties less than or equal to 1 km from the new NGA-W site in the treatment group, and the control group has 707 properties 2-3 km from the new NGA-W.

Commercial property value changes within 1.5 km of the new NGA-W



There are 472 properties less than or equal to 1.5 km from the new NGA-W site in the treatment group, and the control group has 707 properties 2-3 km from the new NGA-W.

Commercial property value changes within 1 km of the new NGA-W

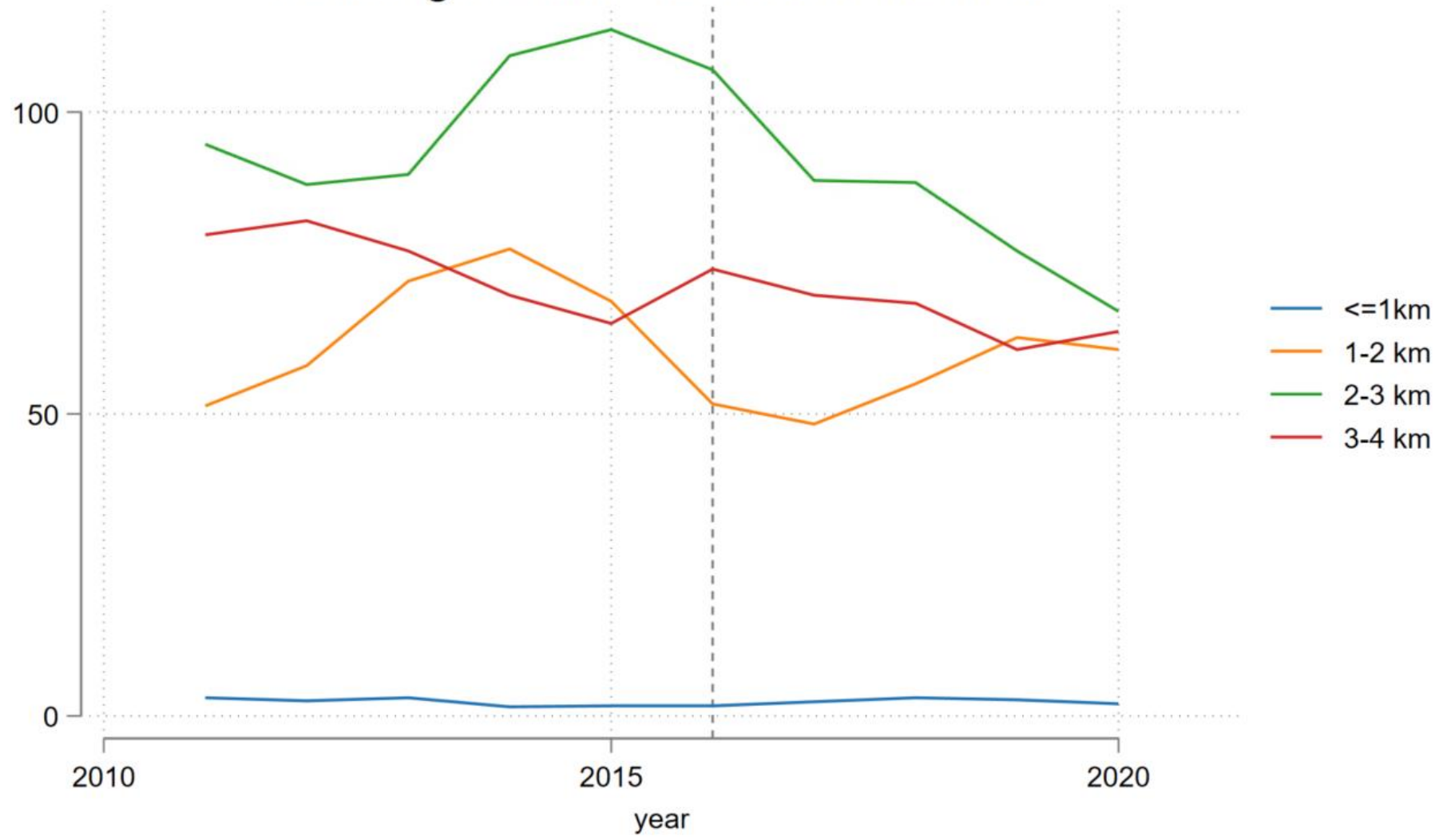


There are 172 properties less than or equal to 1 km from the new NGA-W site in the treatment group, and the control group has 1,455 properties 2-4 km from the new NGA-W.

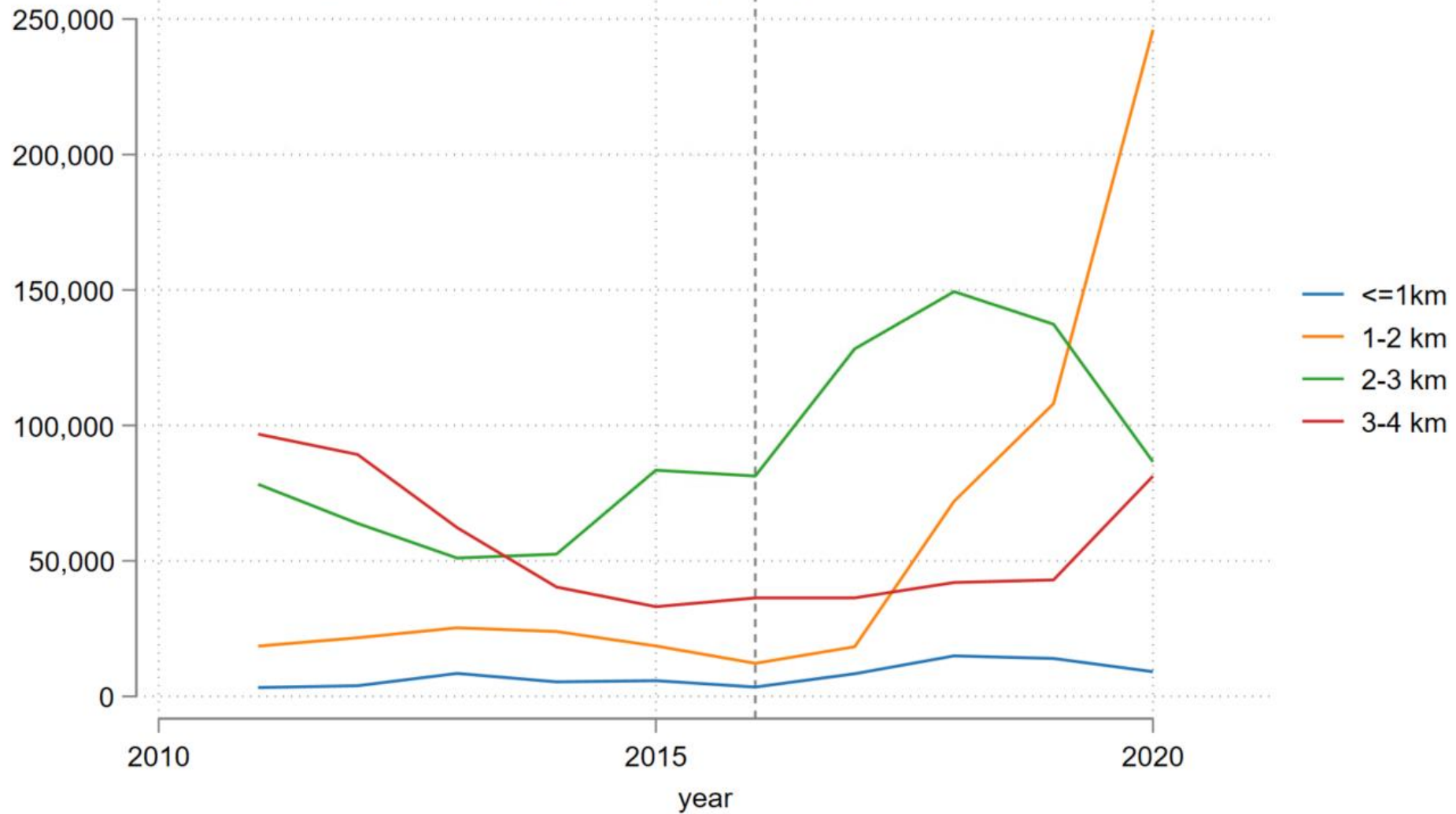
Commercial Building Permits

year	New NGA-W				Current NGA-W			
	<1 km	1-2 km	2-3 km	3-4 km	<1 km	1-2 km	2-3 km	3-4 km
2010	4	49	100	71	12	56	44	58
2011	1	43	98	60	6	55	30	53
2012	4	48	75	92	7	66	47	75
2013	0	69	81	77	11	58	58	42
2014	2	89	101	48	6	67	37	43
2015	1	65	131	76	13	60	43	71
2016	2	41	96	67	10	61	25	66
2017	1	38	81	70	12	62	39	56
2018	2	51	75	63	13	46	39	48
2019	4	62	95	55	14	44	44	69
2020	1	56	49	51	10	31	32	36
2021	1	49	49	68	22	46	49	55

3-Year Moving Average of Commercial Building Permits near New NGA-W



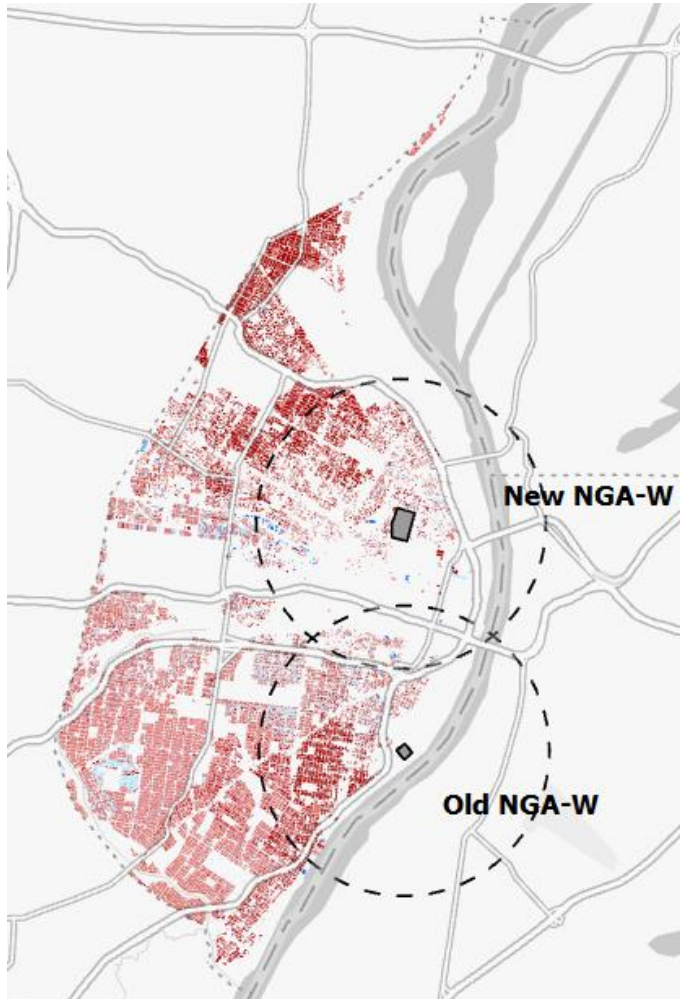
3-Year Moving Average of Estimated Cost of Commercial Building Permits per Property near New NGA-W



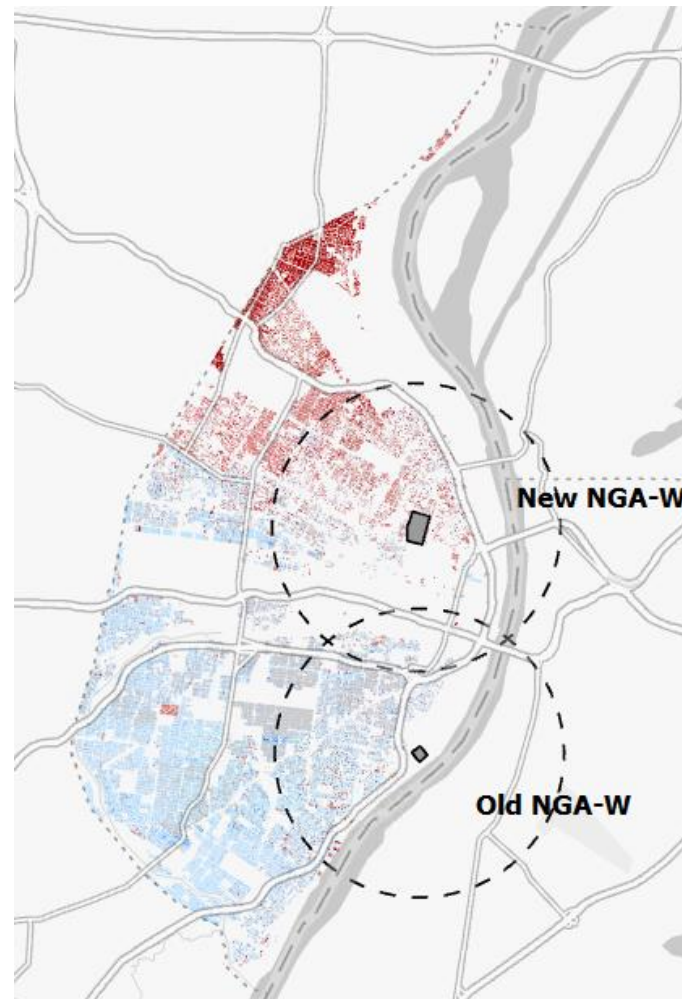
Current NGA-W Property Value Changes

St. Louis City Percent Change in Residential Property Values: 4 km Radius of NGA-W sites

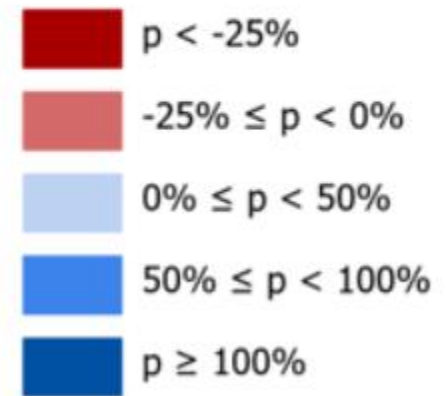
2011-2016



2016-2021

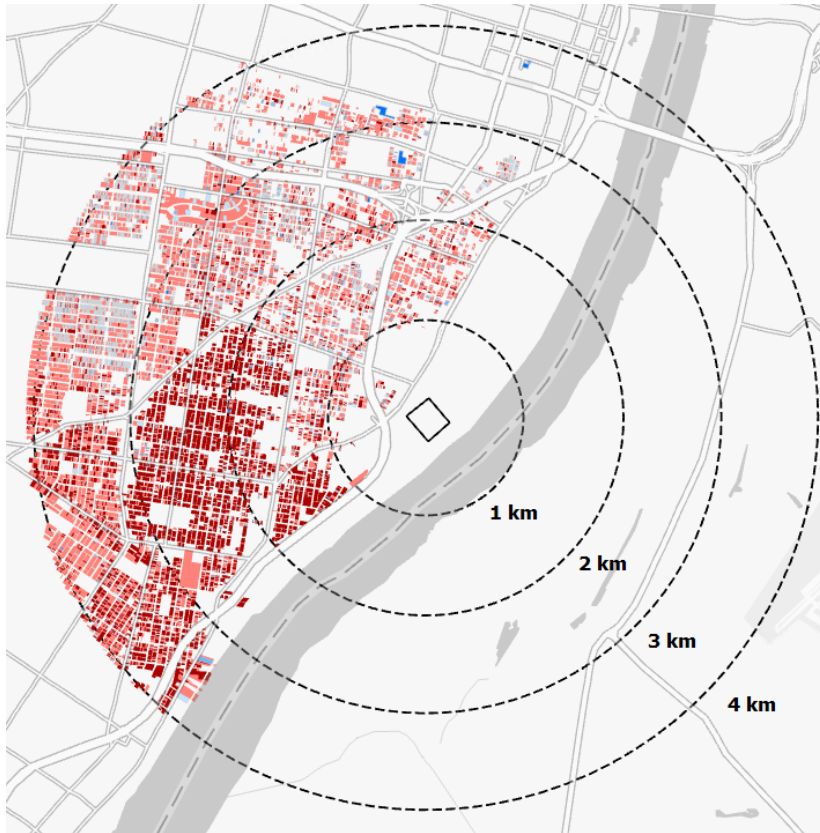


% Change in Property Value (p)

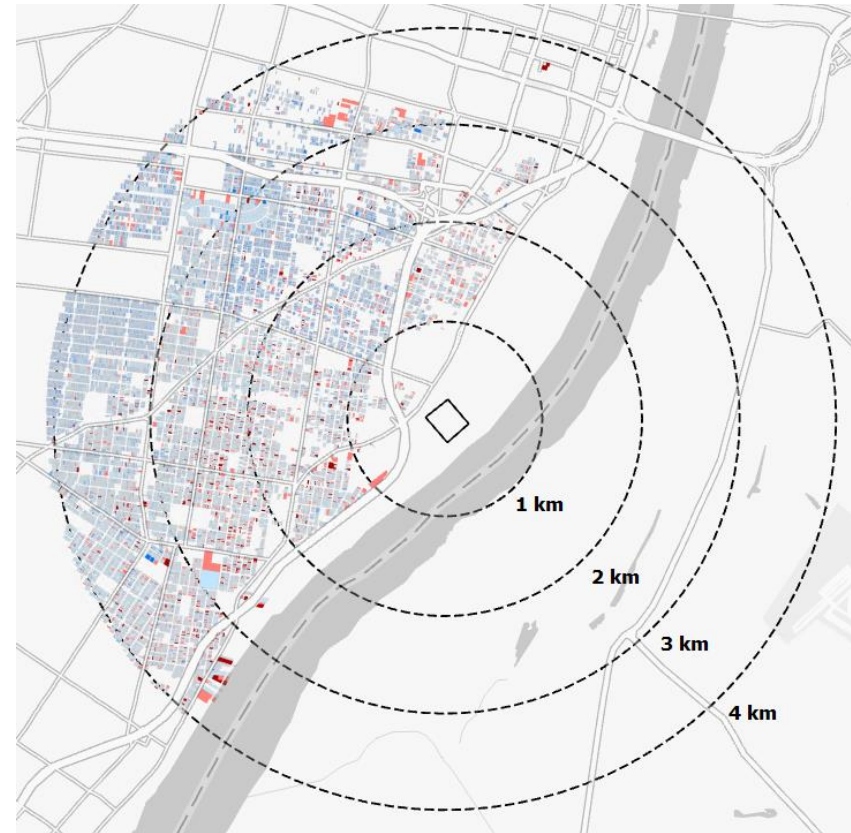


Percent Change in Residential Property Values Within 4 km of the Current NGA-W

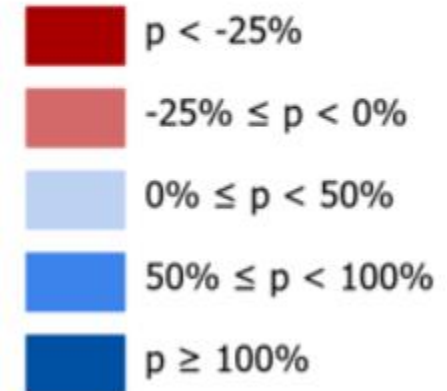
2011-2016



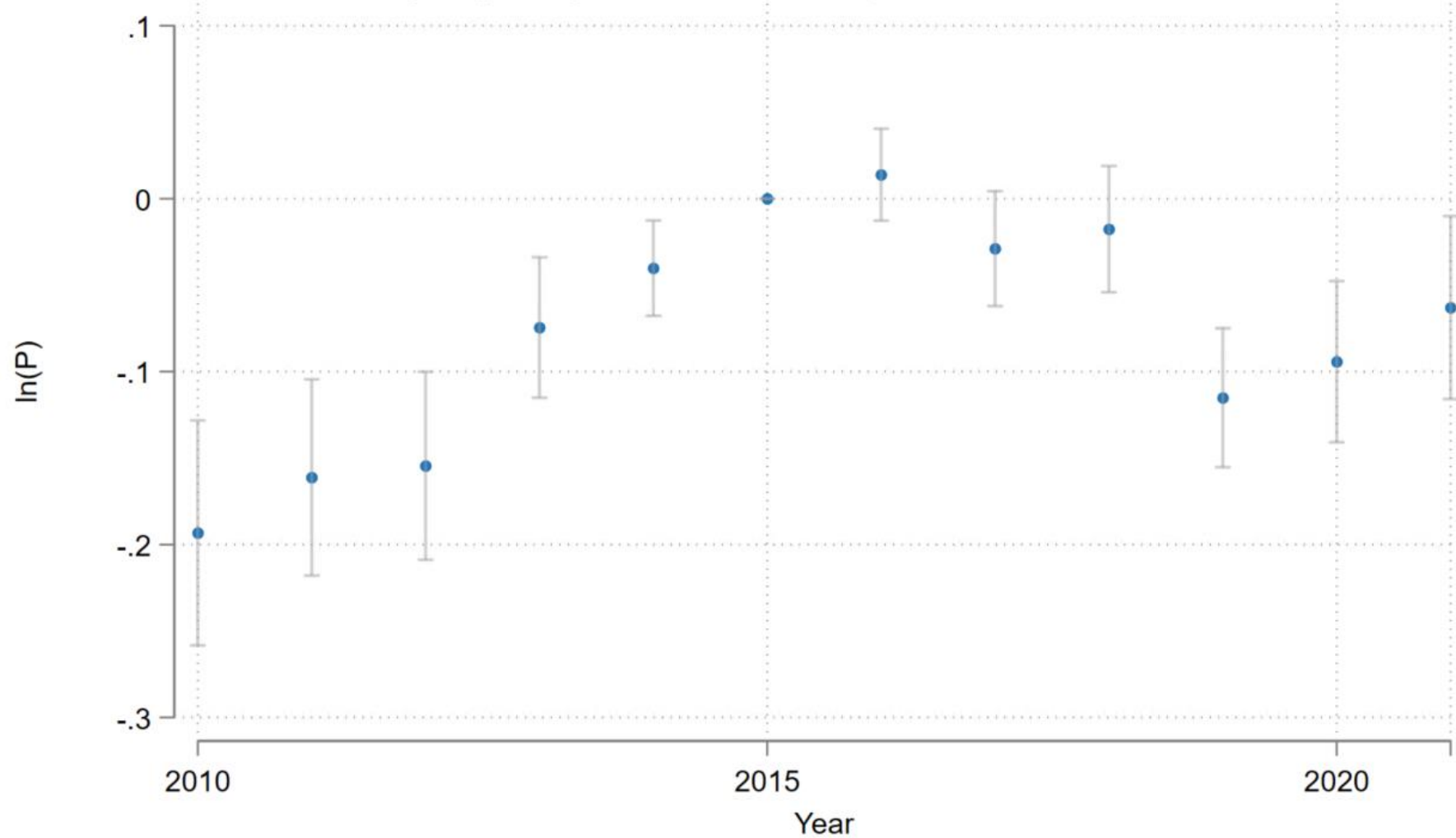
2016-2021



% Change in
Property Value (p)

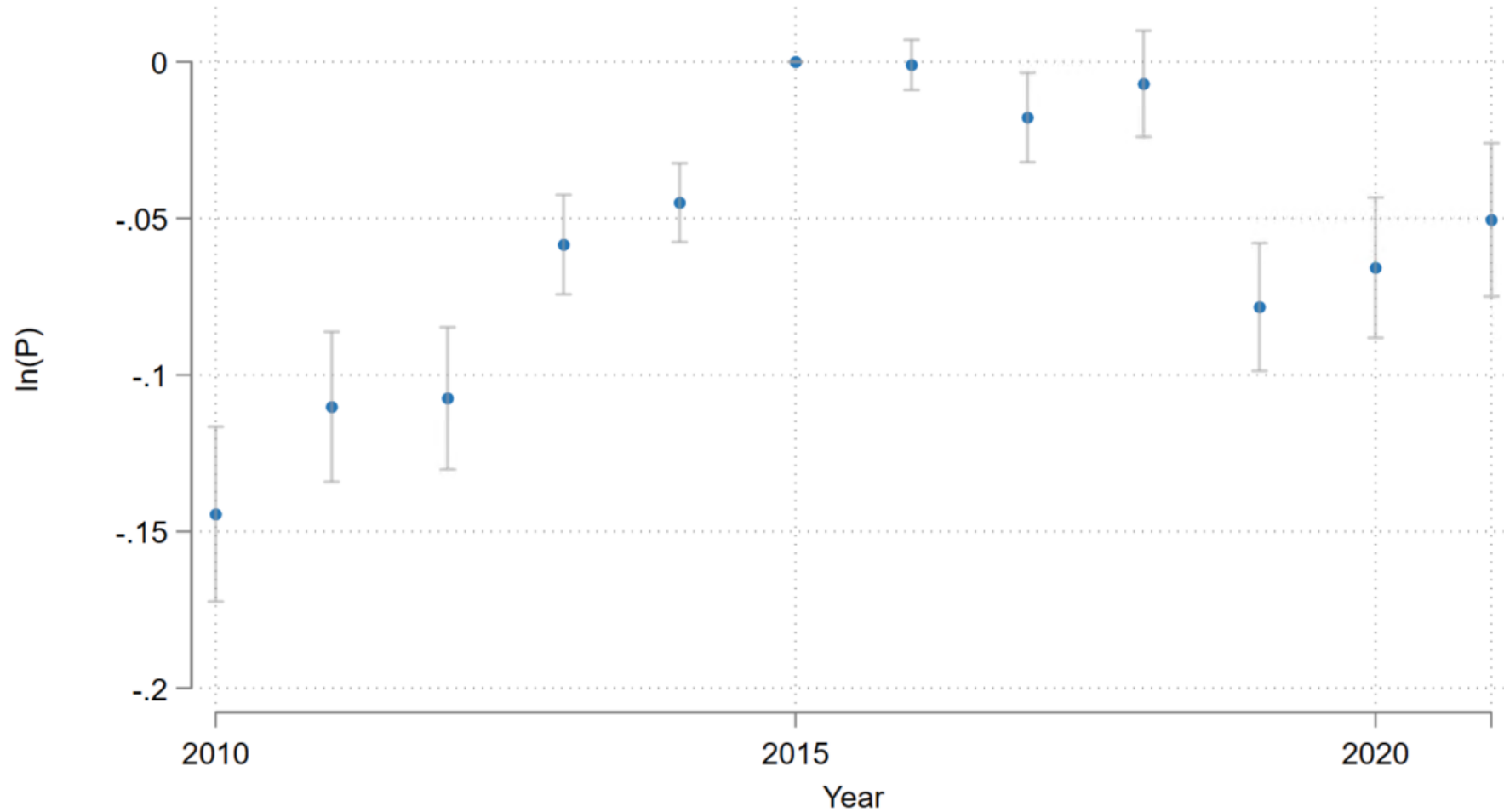


Residential property value changes near the current NGA-W



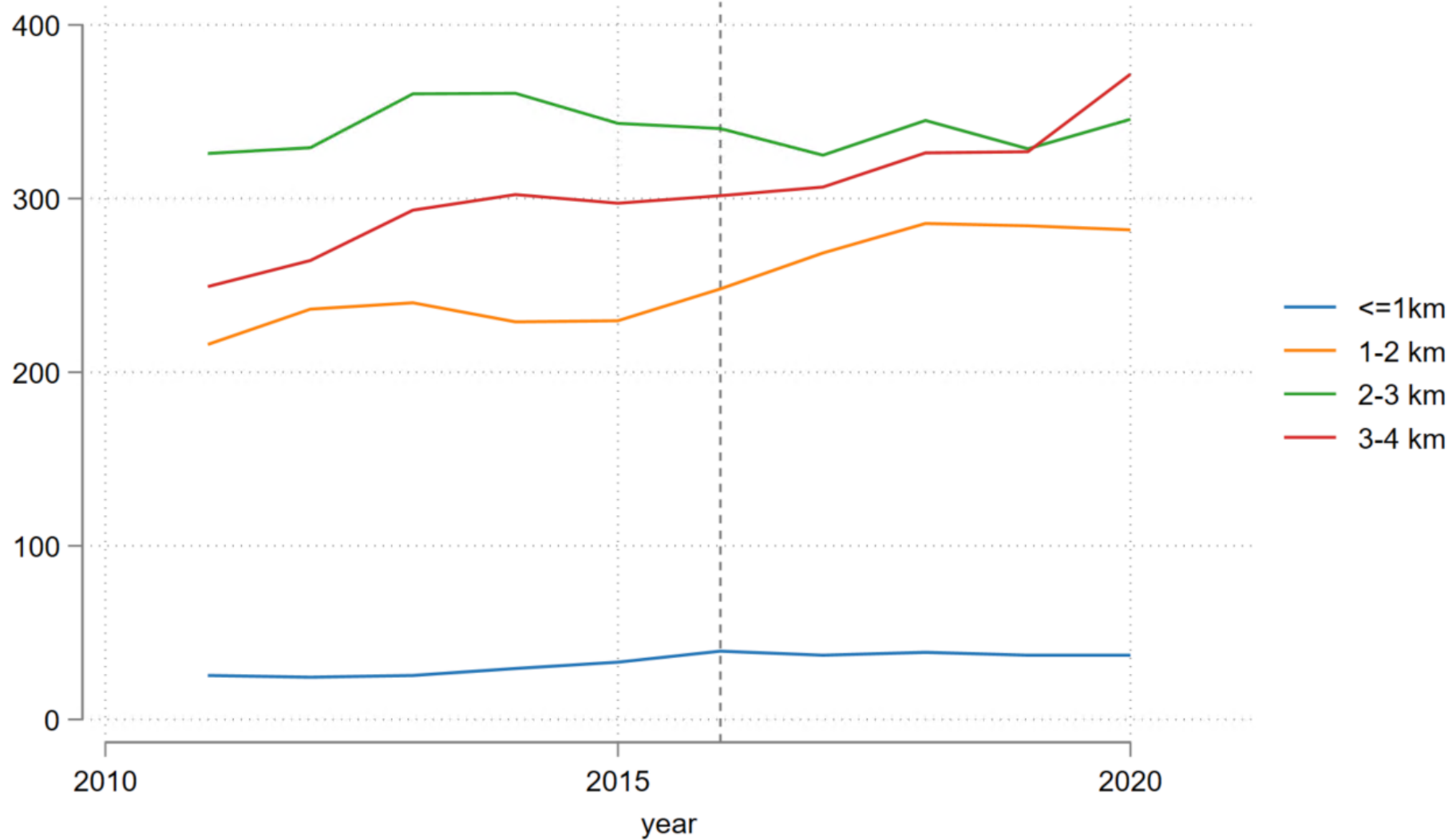
There are 405 properties less than or equal to 1 km from the current NGA-W site in the treatment group, and the control group has 6,153 properties 2-3 km from the current NGA-W.

Residential property value changes within 1.5 km of the current NGA-W

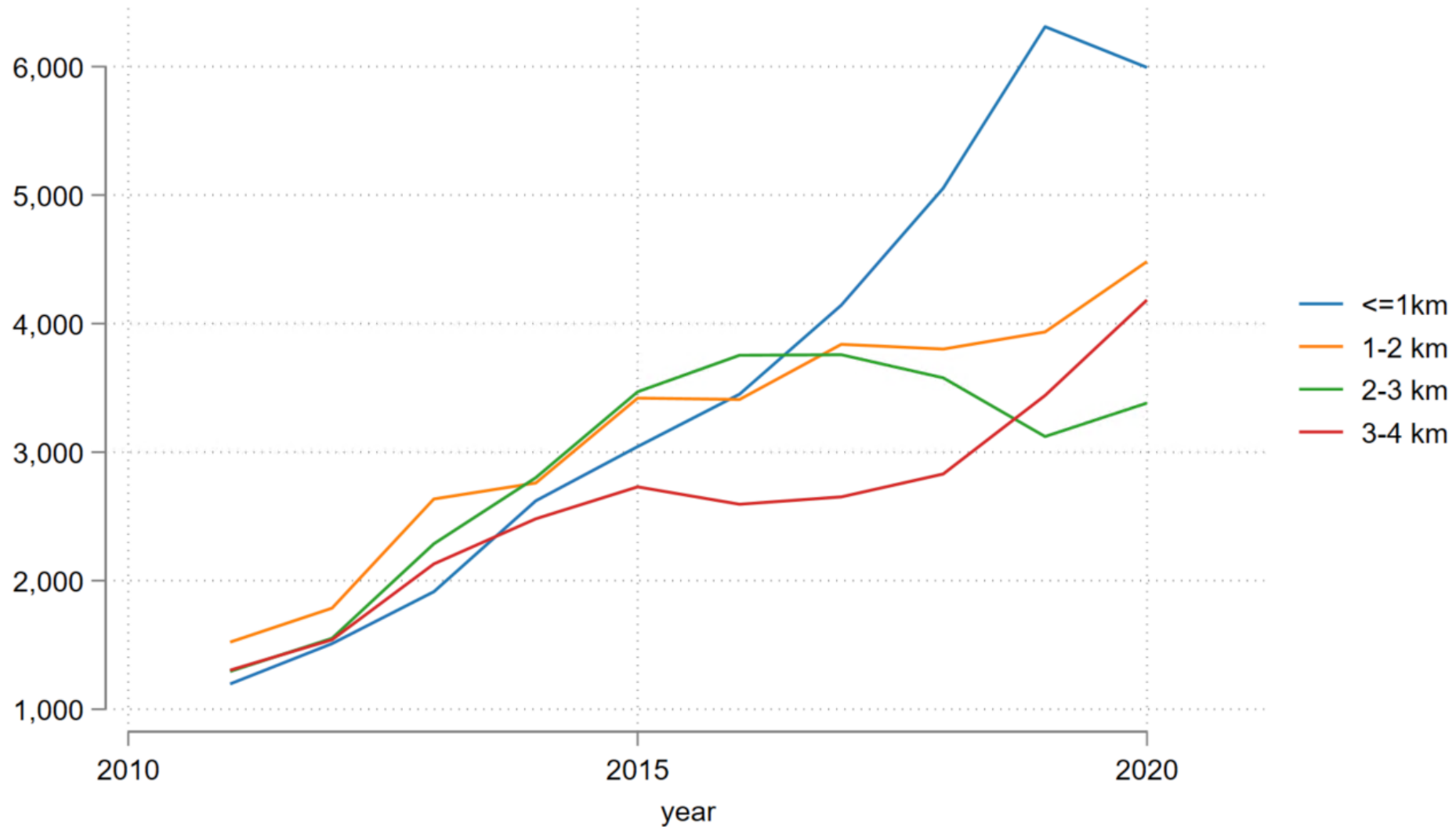


There are 2,109 properties less than or equal to 1.5 km the current NGA-W site in the treatment group, and the control group has 6,153 properties 2-3 km from the current NGA-W.

3-Year Moving Average of Residential Building Permits near Current NGA-W

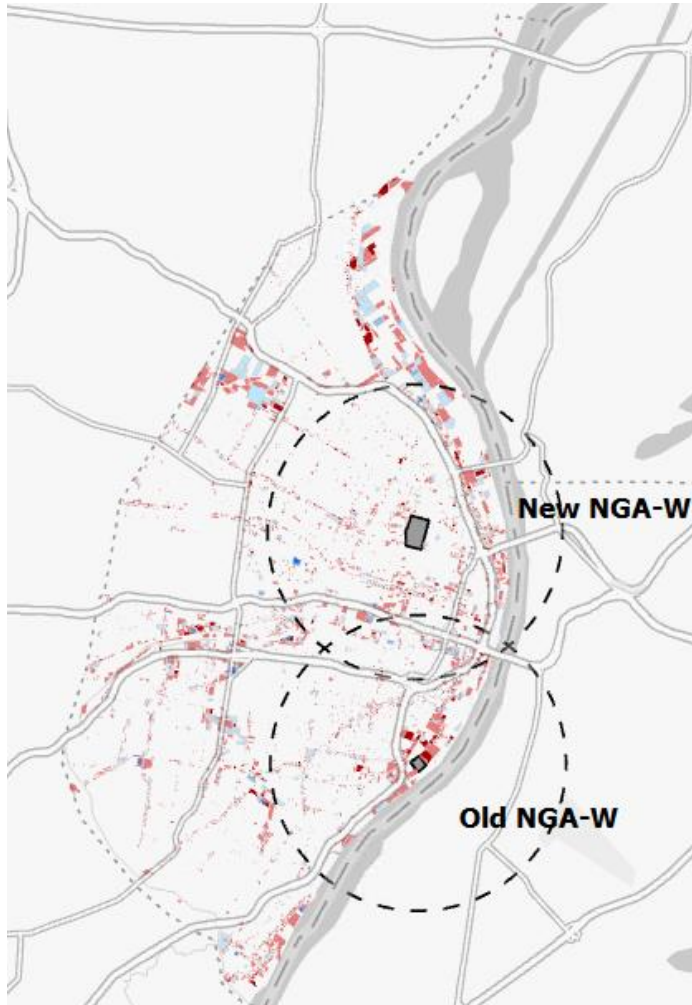


3-Year Moving Average of Estimated Cost of Residential Building Permits per Property near Current NGA-W

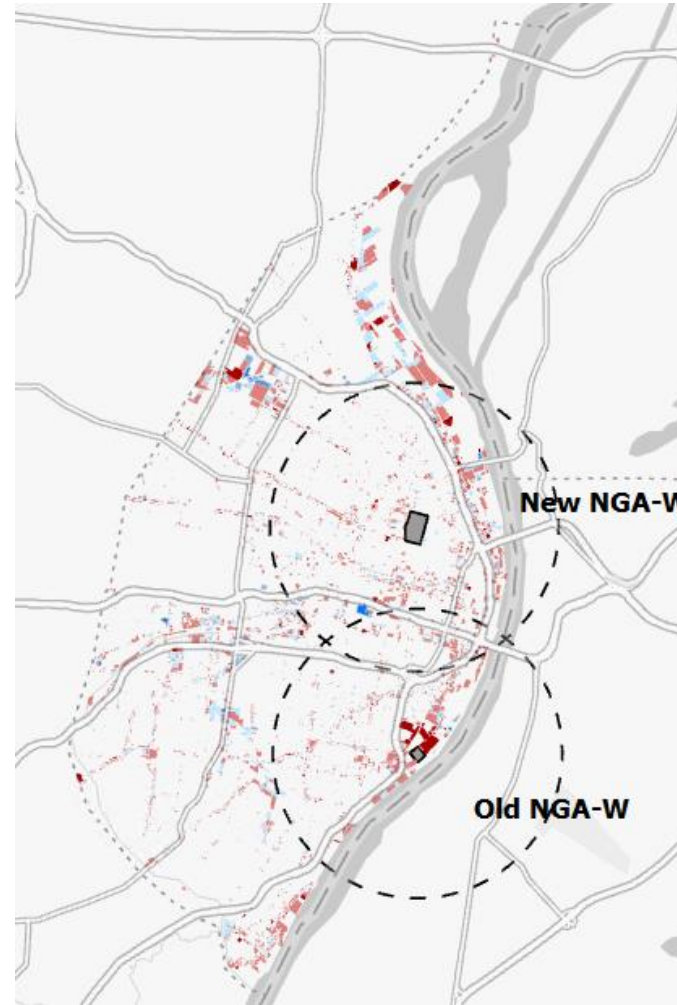


St. Louis City Percent Change in Commercial Property Values: 4 km Radius of NGA-W sites

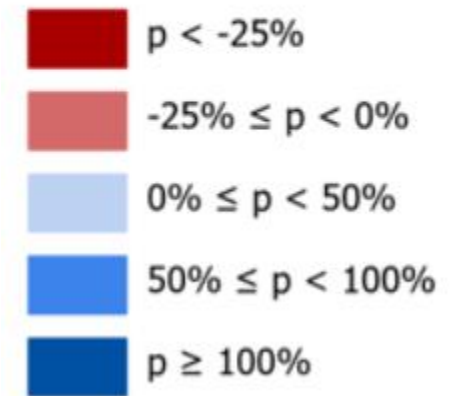
2011-2016



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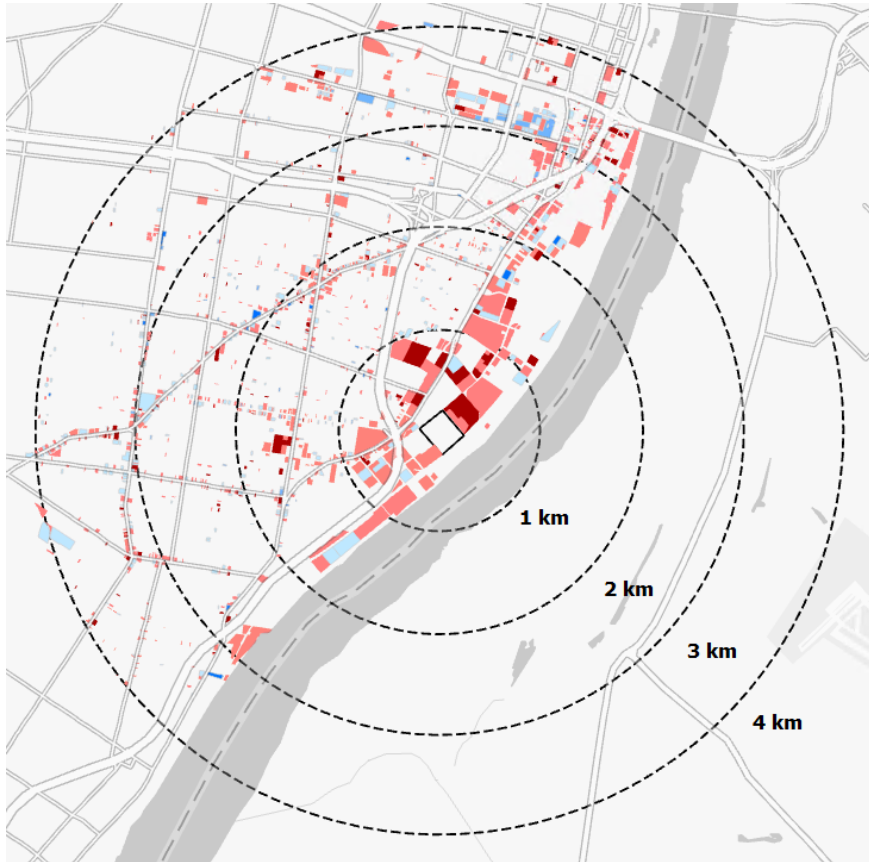


% Change in Property Value (p)

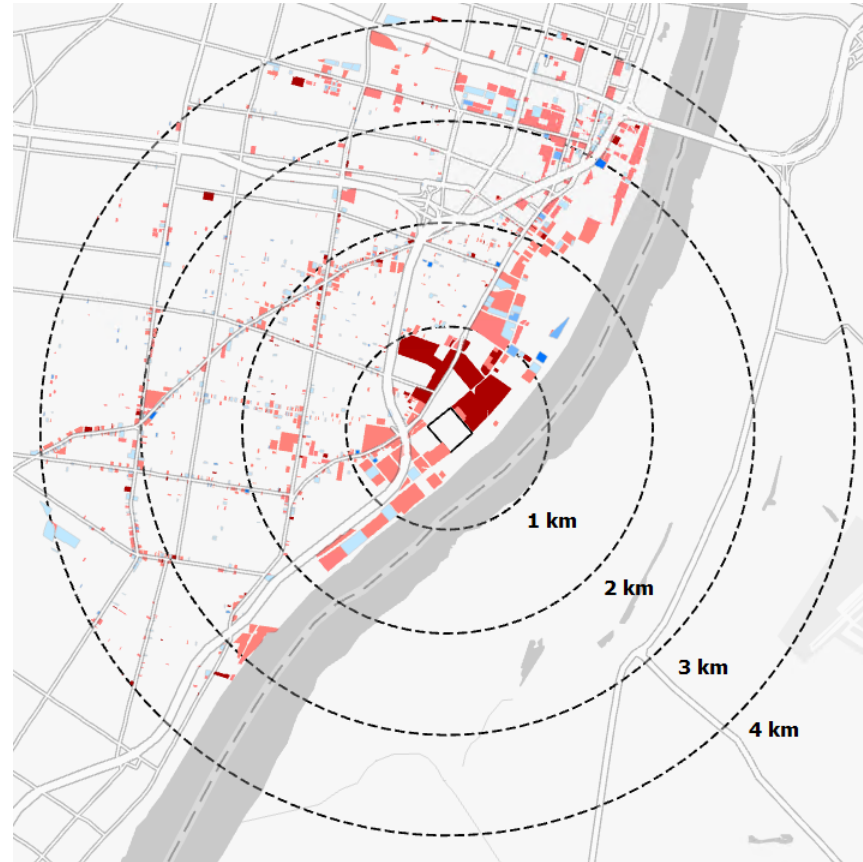


Percent Change in Commercial Property Values Within 4 km of the Current NGA-W

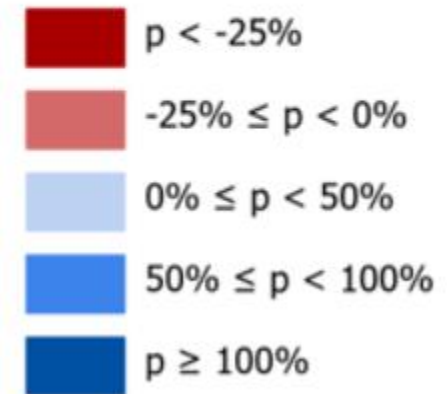
2011-2016



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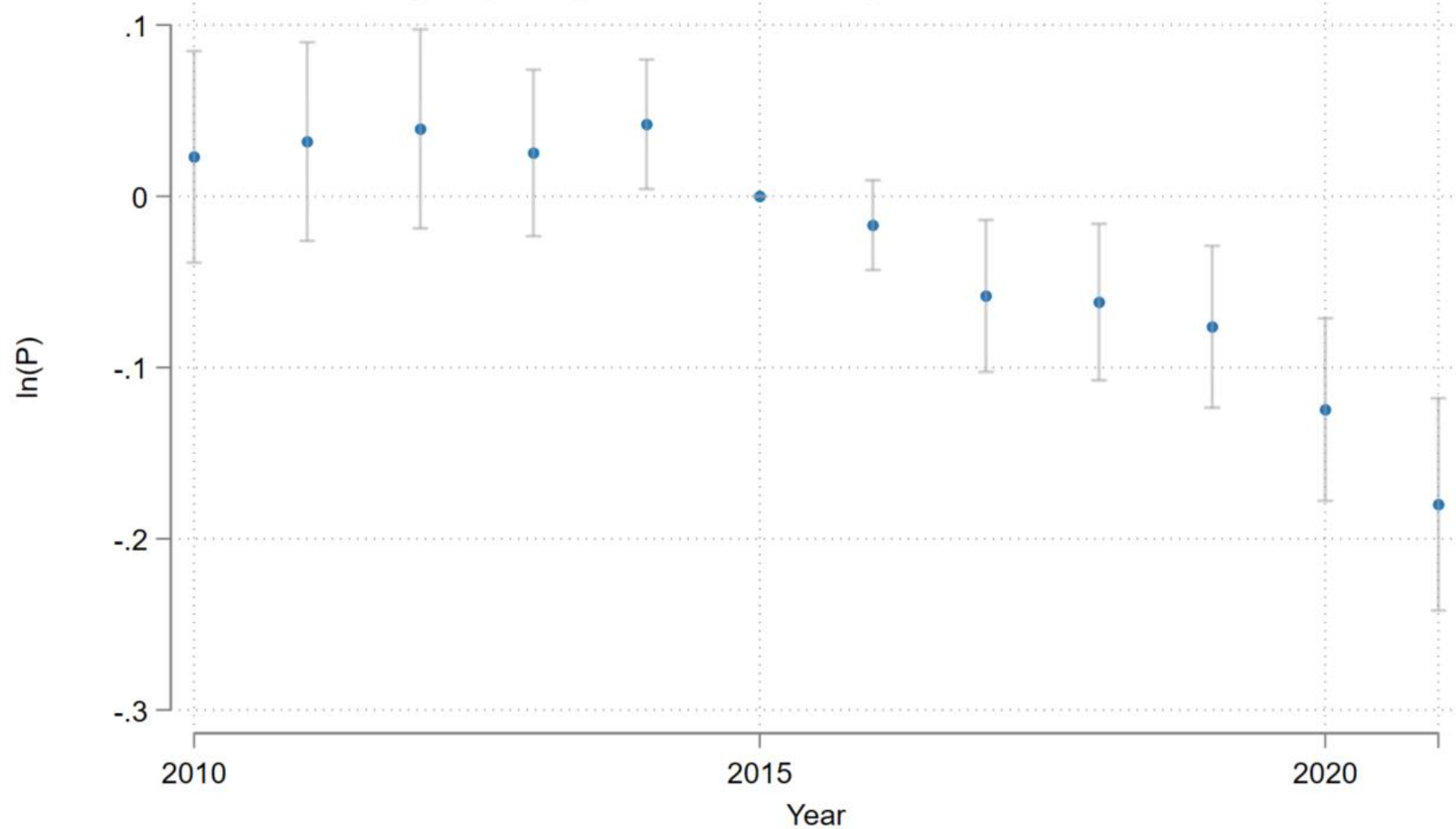


% Change in
Property Value (p)



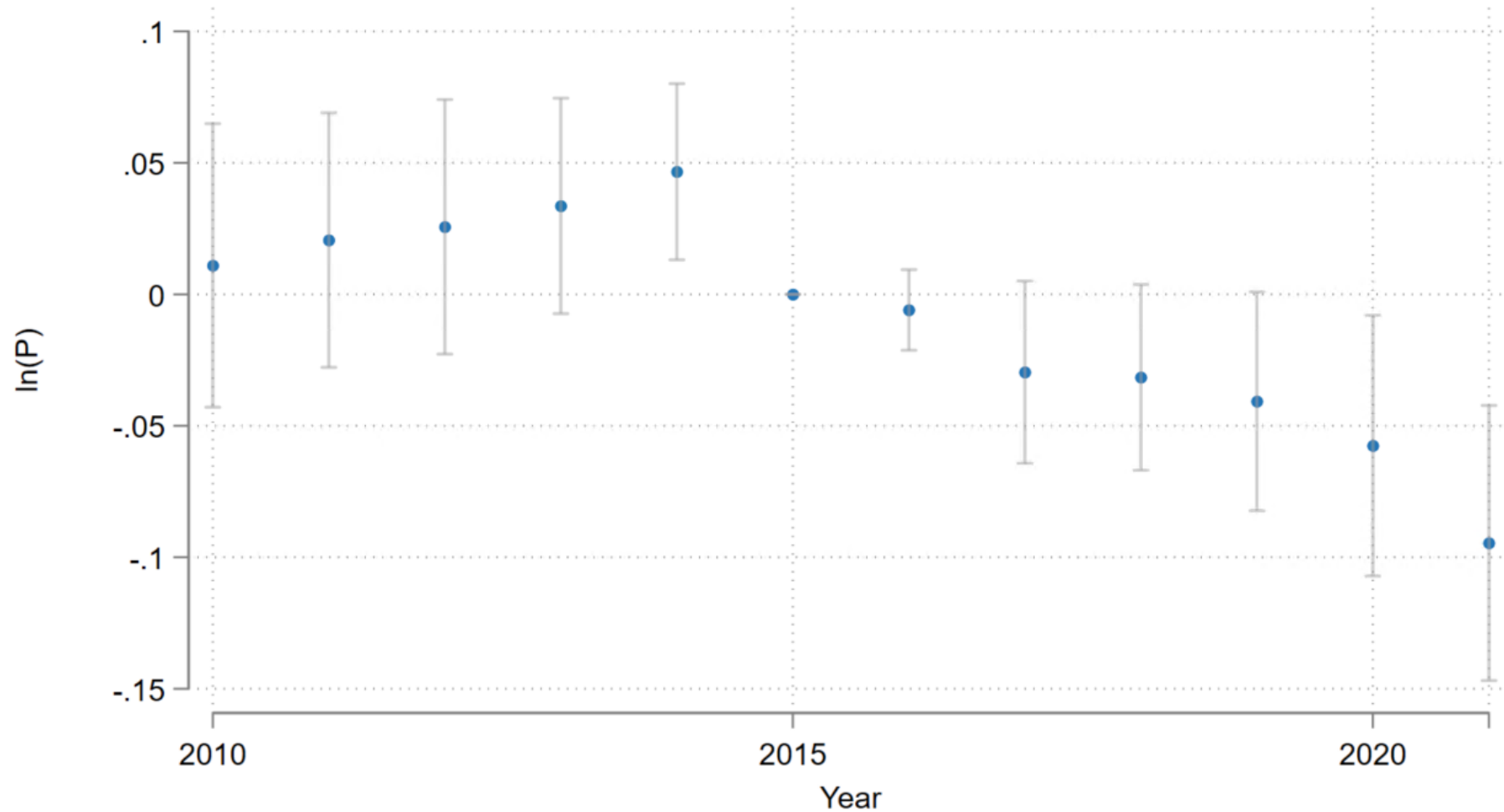
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Commercial property value changes near the current NGA-W



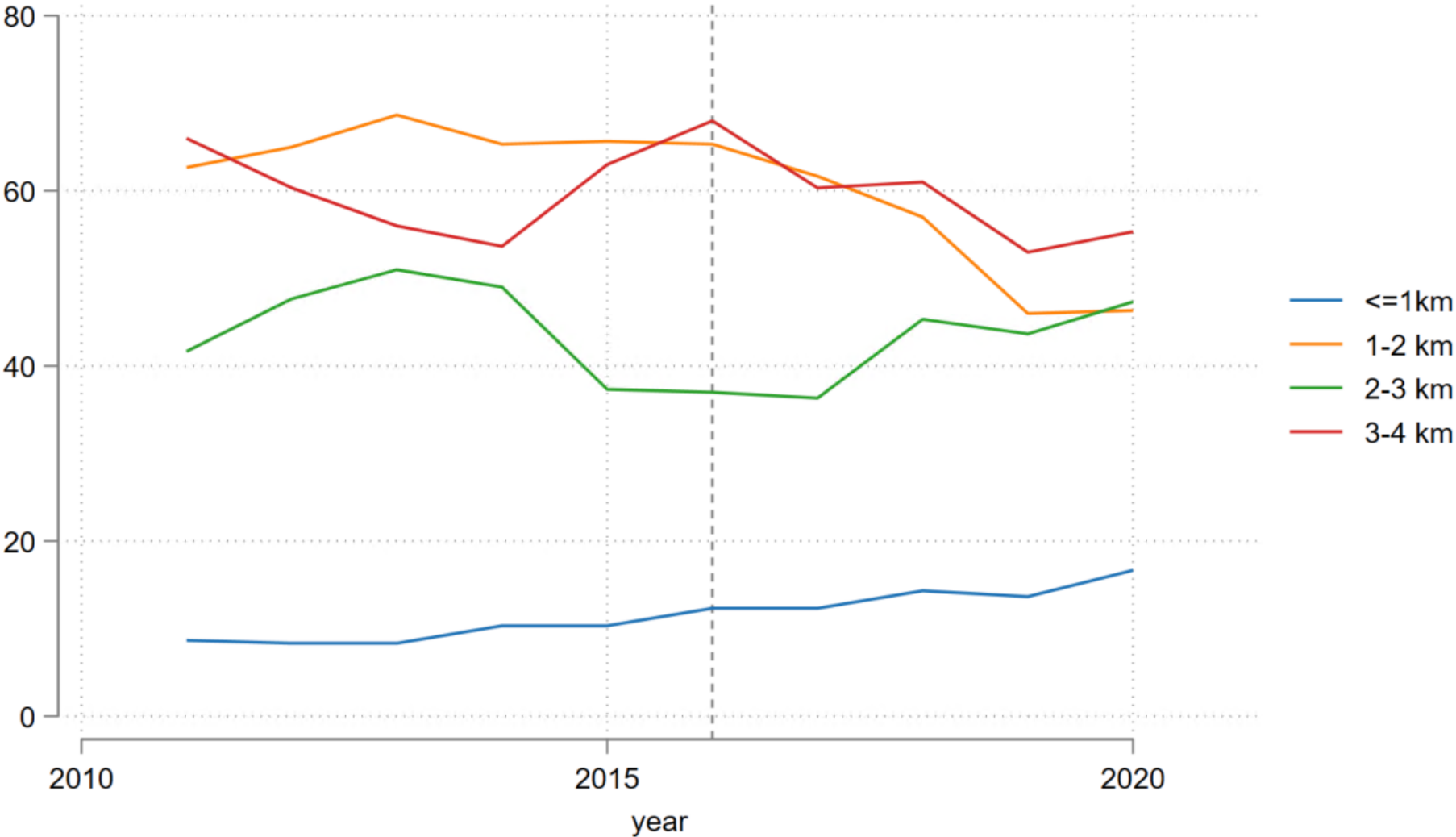
There are 172 properties less than or equal to 1 km from the current NGA-W site in the treatment group, and the control group has 405 properties 2-3 km from the current NGA-W.

Commercial property value changes within 1.5 km of the current NGA-W

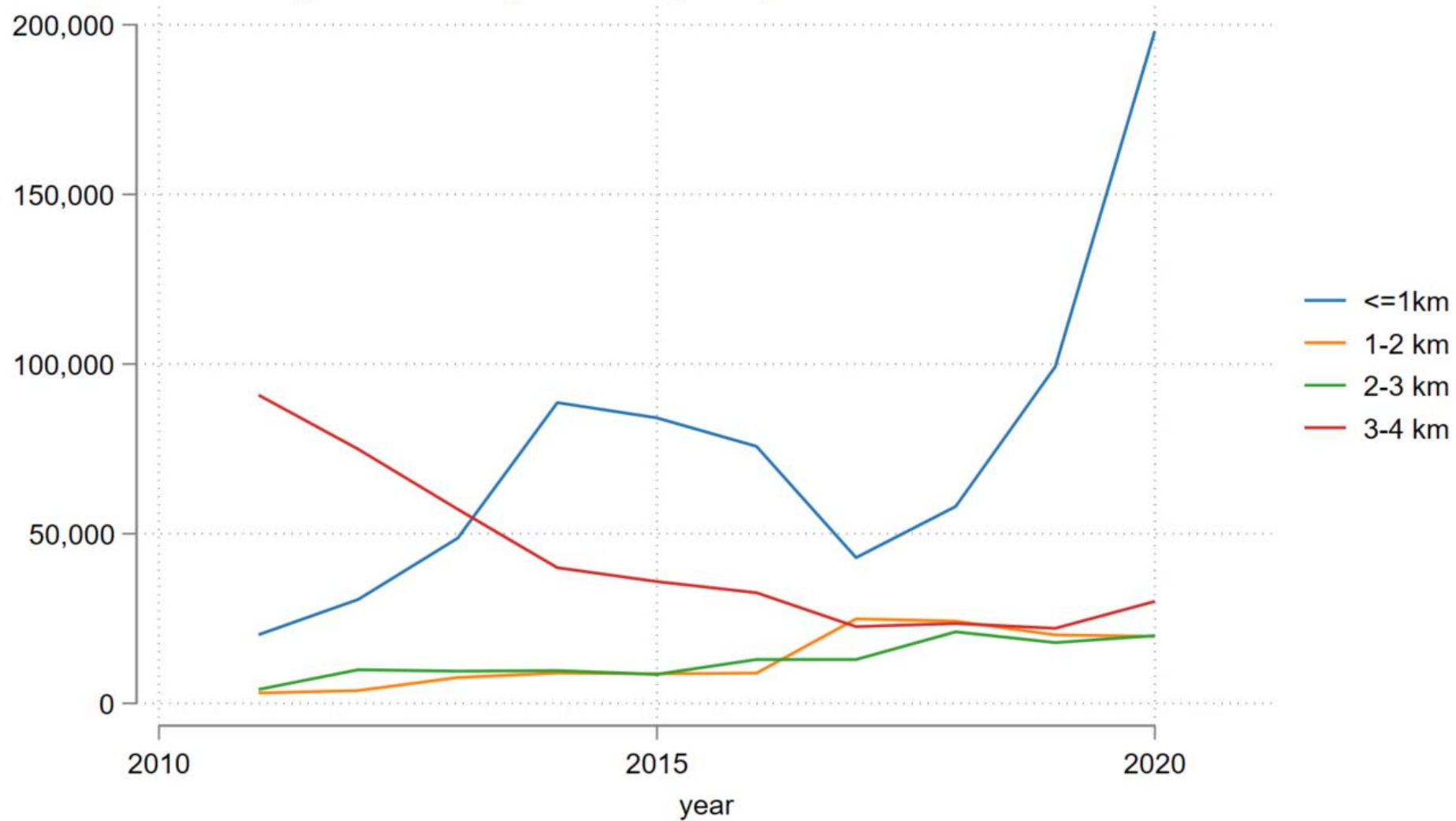


There are 327 properties less than or equal to 1.5 km from the current NGA-W site in the treatment group, and the control group has 405 properties 2-3 km from the current NGA-W.

3-Year Moving Average of Commercial Building Permits near Current NGA-W



3-Year Moving Average of Estimated Cost of Commercial Building Permits per Property near Current NGA-W



Conclusion and Next Steps

- Preliminary conclusions:
 - No evidence of gains in residential or commercial properties near the new NGA-W site
 - Some evidence of negative effects on residential and commercial properties near the current NGA-W site
- Next steps:
 - Examine property switches between vacant, residential, and commercial designations
 - Watch for changes closer to the opening date in 2026