

When a Road Opens Before the Project Ends

Observed-sale price gradients around phased road openings in Kuwait

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Exploratory research note | Observed-sale proximity analysis

Abstract

Large road projects rarely open once. Bridges, ramps, tunnels, and service roads become usable in phases after years of visible construction, so an opening can combine a route change, relief from temporary works, new permanent traffic, and information about the wider project's completion. We study four dated road phases in Kuwait between 2016 and 2018 using source-checked opening records, present-day corridor traces, public 2011 census blocks, and an internal Ministry of Justice transaction panel. The outcome is mean log nominal private-residential registered completed-home house-plus-plot transfer price per recorded plot square metre among observed sales. For each phase, we estimate how that outcome changed with a continuous present-day corridor-proximity index. The opening quarter is excluded as a mixed transition period; post begins in the first full quarter. The four primary log differentials are 0.181, 0.074, 0.117, and 0.108, and every 95 percent interval includes zero. These are event-specific dose contrasts and should not be ranked or pooled. Jahra and JAND are overlapping western-corridor phases, while the Doha estimate is a supplemental South Doha-side comparison with only three near blocks and no Jaber Al-Ahmad blocks. Results move materially across event windows and fixed-effect structures. The paper therefore documents noisy, opening-centered observed-sale proximity patterns, not a causal access effect, total project capitalization, or welfare gain.

JEL codes: R31, R41, R42, C23

Keywords: transport infrastructure, registered home sales, proximity gradients, phased openings, Kuwait

1. Introduction

The main issue with a phased road project is that the opening date is economically meaningful without being the beginning of treatment. Construction, diversions, and public expectations can start years earlier. When one element becomes usable, nearby households may receive a shorter route, relief from temporary works, a new traffic disamenity, or an update about when the rest of the corridor will finish. A price change around that date can reflect any combination of these channels.

Kuwait provides a useful setting because the Jahra Road and Jamal Abdul Nasser Road developments opened through a sequence of bridges, ramps, tunnels, and service roads rather than one inauguration.

The Ministry of Public Works publicly described expected partial openings by May 2015 (Kuwait News Agency, 2015). The relevant empirical question is therefore narrow: among completed-home transfers that we observe, did the spatial price gradient around a documented road element change near the date that element became usable?

We answer that question for three western-project phases and one supplemental Doha case. The western phases are a Jahra service-road opening on 22 May 2016, a Sixth Ring bridge on 25 October 2016, and a Jamal Abdul Nasser-Jahra connector on 26 December 2016. The Doha Link opened on 8 March 2018. We source opening dates from contemporary reports and use present-day road traces only to locate each element. We do not use current map timestamps as event dates or relabel current geometry as a historical network.

Our outcome is precise but limited: the mean log nominal registered transfer price per recorded plot square metre for Ministry of Justice private-residential transactions classified as completed homes, conditional on at least one sale in a block-quarter. A completed-home record is a house-plus-plot transfer. The denominator is recorded plot area, not built floor area, and the data do not report structure age, condition, renovation, or a repeated-property identifier. The estimates therefore describe the homes that sold. They do not measure a constant-quality price for a fixed property.

For each event, distance from an approved census-block centroid to the present-day trace defines a generic corridor-proximity index, $\exp(-d/3)$. We scale it by a frozen interquartile range calculated over unique eligible blocks within twelve kilometres, independent of sale frequency. The primary model uses a twelve-kilometre estimation window, twelve quarters on either side, block and calendar-quarter fixed effects, and neighborhood-by-year effects. Because every road opened partway through a quarter, quarter 0 is a transition period and is excluded. Post-opening begins in quarter +1.

The results do not resolve a common sign or magnitude. The primary event-specific log differentials are 0.181 for the Jahra service road, 0.074 for the Sixth Ring bridge, 0.117 for the JAND-Jahra connector, and 0.108 for the Doha South-side sample. Their 95 percent intervals are [-0.199, 0.562], [-0.326, 0.473], [-0.480, 0.714], and [-0.167, 0.383]. Expressed as proportional differentials, the point estimates are approximately 19.9, 7.6, 12.4, and 11.4 percent, but the intervals permit economically meaningful movements in both directions. The four numbers are not a ranking: one dose unit represents a different geographic shift in each event market.

The cases are not independent replications either. Jahra and JAND share 160 blocks, a Jaccard overlap of 0.936, and a proximity-dose correlation of 0.995. We interpret them as two dates within one western-corridor sequence. Sixth Ring and JAND also share the same calendar quarter even though they opened 62 days apart. Doha is geographically distinct, but its matched near support contains only three South

Doha blocks and no Jaber Al-Ahmad block. It is retained as a supplemental view of the available side of the connector.

The paper contributes block-level exploratory evidence on phased road openings in Kuwait's registered private-residential market. Its substantive result is the instability of the opening-centered gradient: the estimates move with the event window and local comparison structure, while the data cannot distinguish access, nuisance, information, and sale selection. This places the paper next to work that separates transport access from local traffic externalities and treats announcement, construction, and delivery as distinct capitalization periods (Levkovich et al., 2016; Ossokina and Verweij, 2015; Yen et al., 2018; Melser, 2020). It also complements network-access designs by showing what can and cannot be learned when historical network states are unavailable (Gibbons and Machin, 2005; Gibbons et al., 2019).

2. Setting, mechanisms, and event sequence

2.1 Phased construction and anticipation

The Jahra Road project was under construction by 2010, and the Jamal Abdul Nasser contract was signed in early 2011 (Kuwait News Agency, 2011a; Kuwait News Agency, 2011b). Official reporting described progress and future phases well before the events studied here (Kuwait News Agency, 2014; Kuwait News Agency, 2015). Buyers and sellers could therefore react during construction, when an opening was announced, when one element became usable, or when a larger completion bundle became credible. Our opening-centered coefficients do not estimate the total response to the projects.

The candidate mechanisms imply different geographies. Table 1 makes that measurement boundary explicit.

Table 1. Candidate mechanisms and what the current exposure measures

Candidate channel	Economically relevant exposure	What present-day line proximity captures
Route access	Changes in generalized travel cost through entrances, exits, directions, destinations, and congestion	A spatial correlate at best; not a measured historical travel-time change
Construction relief	Changes in diversions, dust, noise, and worksite disruption	Proximity may correlate with the works, but the historical construction footprint is unavailable
Permanent traffic externality	Changes in traffic, noise, pollution, severance, and safety	Proximity may correlate with exposure, but the sign and traffic redistribution are unmeasured

Candidate channel	Economically relevant exposure	What present-day line proximity captures
Completion information	Beliefs about the timing and usability of the larger project	A corridor-wide belief update need not decay monotonically from one trace

Note: The empirical dose is a generic present-day corridor-proximity index. It is not a sufficient statistic for any one mechanism. Capitalization is therefore a possible interpretation of the observed-sale differential, not the identified parameter.

2.2 Event chronology

Table 2 records the four study dates and their measurement grades. The event quarter is never treated as fully post-opening. This matters most for the JAND connector, which opened on 26 December, after almost all of 2016Q4 had elapsed.

Table 2. Opening chronology and present-day geometry

Phase	Realized opening	Present-day geometry	Empirical role
Jahra service road	22 May 2016; reported 1.75 km after Al-Jahiz Street toward the United Nations Roundabout (Kuwait News Agency, 2016a)	Approximate 2.845 km corridor between documented endpoints	Western-corridor phase; geometry uncertainty is material
Sixth Ring bridge	25 October 2016; link toward west Jleeb Al-Shuyoukh and Abdullah Al-Mubarak (Kuwait News Agency, 2016b; Al-Anbaa, 2016)	Contiguous 1.621 km direction-matched trace	Separate spatial contrast, but part of the 2016 construction cycle
JAND-Jahra connector	26 December 2016; roughly 2 km toward Sulaibikhat and Jahra Road over Hospitals Road (Kuwait News Agency, 2016c)	Contiguous 2.332 km direction-matched trace	Later western-corridor phase; nearly the same dose geography as Jahra
Doha-Jaber connector	8 March 2018; direct connection toward Jaber Al-Ahmad City (Al-Anbaa, 2018b; Al-Anbaa, 2018a; Al-Rai, 2018)	Two present-day one-way chains, each about 2 km	Supplemental South Doha-side sample; no Jaber block in near support

Note: Sources identify realized dates and reported elements. Present-day traces locate the corridors; they are not reconstructed 2016 or 2018 networks. Quarter 0 is excluded and the first full quarter is the start of the post period.

The July 2018 western JAND record is not coded as another event. Reporting describes a completion and hand-over bundle covering main road, bridges, ramps, U-turns, service roads, and intersections (Al-Jarida, 2018b). A bridge in the same contract had already opened on 1 May (Al-Jarida, 2018a; Al-Anbaa, 2018c). A single July line would mix previously opened and residual works.



Figure 1. Phase timeline. The study dates sit inside an anticipated sequence rather than four isolated shocks. The May and December 2016 dates are alternative phase-centered views of a highly overlapping western-corridor geography. Public-source chronology only.

2.3 Kuwait's observed housing market

Kuwait's registered private-residential transfer market operates beside a citizen-oriented public-housing system built around state land development, public allocation, and specialized housing finance. Local research links that architecture to peripheral development, detached-house preferences, long delivery timelines, and spatially segmented urban growth (Alshalfan, 2013; Alshalfan et al., 2022; Oh and Shin, 2023; da Cruz et al., 2024). These institutions shape the market in which the road phases occur, but the transaction data do not identify citizenship, public-housing eligibility, waiting-list status, occupancy, finance, or buyer motives.

The distinction matters for interpretation. New districts may enter the registry at different times, while the current sample retains incumbent matched blocks with observed completed-home sales on both sides of an event. Kuwait price-index research also emphasizes the difficulty of constructing constant-quality measures with limited property attributes (Alfalah et al., 2023). We therefore treat the outcome as a selected registered-transfer measure, not the value of the full housing stock.

3. Data and measurement

3.1 Geography and road traces

The public 2011 Central Statistical Bureau geoportal supplies 773 lower-area, block-like polygons. We retain 541 whose historical district has an approved correspondence to a reviewed current neighborhood and whose integer block number matches a normalized MOJ label. These are historical census blocks, not current Municipality legal parcels. A block centroid is a geographic proxy for the properties recorded under that block label; no transaction is assigned a parcel coordinate.

Current OpenStreetMap geometry is used only to trace the documented elements. Two 2016 links alter travel time between their reported endpoints in the current graph, and the Doha trace behaves as a coherent connector. An earlier ten-anchor employment diagnostic produces no access change for its 42 origins. That result prevents us from using the diagnostic as an access first stage. It does not establish that the opening had no residential relevance, because the diagnostic population is narrow and current topology includes later infrastructure.

3.2 Outcome, sample, and exposure

The MOJ backbone spans 2006Q2-2026Q2. The primary outcome is the duplicate-equivalent-weighted mean of log nominal registered completed-home transfer price per recorded plot square metre in a block-quarter with at least one sale. Exact repeated fingerprints receive total weight one. Recorded land is not pooled with completed homes because the administrative land category is not verified vacant land.

For each event and block, raw proximity is a transformation of straight-line distance in kilometres from the block centroid to the present-day trace:

$$P_{be} = \exp\left(\frac{-d_{be}}{3}\right).$$

We divide raw proximity by an event-specific reference IQR calculated once over unique approved blocks within twelve kilometres, without weighting blocks by how often they sell. The frozen IQRs are 0.173 for Jahra, 0.197 for Sixth Ring, 0.156 for JAND, and 0.055 for Doha. A coefficient is therefore the within-event differential for one geographic IQR more proximity. Because those IQRs are different, coefficients cannot be read as a common kilometre contrast or ranked across events.

The primary estimation window contains blocks within twelve kilometres and quarters -12 through +12. A block must have at least one observed completed-home sale cell before the event and one after it. Quarter 0 is retained in sample counts but excluded from estimation. Table 3 describes the resulting conditional-sale samples.

Table 3. Primary observed-sale samples and frozen exposure units

Event sample	Blocks	Within 3 km	Sale cells	Deed-equivalent sales	Excluded q0 cells	Raw dose IQR
Jahra service road	170	22	2,248	3,748	85	0.173
Sixth Ring bridge	152	24	2,083	3,483	72	0.197
JAND-Jahra connector	161	18	2,152	3,565	74	0.156
Doha Link: South Doha side	56	3	788	1,395	35	0.055

Note: The outcome is mean log nominal private-residential registered completed-home house-plus-plot transfer price per recorded plot square metre among observed sales. Samples require pre- and post-opening sale support. The dose is $\exp(-d/3)$ scaled by the frozen unique-block IQR. Counts describe support, not effective independent geographic information.

The Doha scope is especially narrow. Its three blocks within three kilometres are blocks 1-3 in South Doha. No Jaber Al-Ahmad block enters the near support. We therefore do not interpret Doha as a Jaber-access estimate.

3.3 Corridor overlap

The first three cases share much of the same urban geography. Table 4 reports pairwise overlap among their primary samples.

Table 4. Overlap among the 2016 event samples

Pair	Common blocks	Jaccard overlap	Correlation of raw proximity dose
Jahra-Sixth Ring	150	0.872	0.393
Jahra-JAND	160	0.936	0.995
Sixth Ring-JAND	146	0.874	0.430

Note: Jaccard overlap equals shared blocks divided by the union. Dose correlations use $\exp(-d/3)$ among common blocks. Jahra and JAND are alternative dates on nearly the same western-corridor gradient, not

independent corroboration. Sixth Ring and JAND also share 2016Q4 as the outcome quarter despite different opening days.

4. Empirical strategy

4.1 Estimand

For each event separately, the primary estimand is the first-full-quarter-onward change in expected observed-sale log price per recorded plot square metre associated with one frozen geographic IQR more present-day corridor proximity, relative to other blocks in the twelve-kilometre estimation window after absorbing block, calendar-quarter, and neighborhood-by-year fixed effects.

We call this the **opening-centered observed-sale proximity differential**. It is a weighted projection parameter for recurring-sale blocks. A capitalization interpretation would additionally require the counterfactual spatial price gradient to remain stable at the opening date, no differently timed local shock, no exposure-related change in which homes sell, and a proximity measure that tracks the relevant economic channel. The parameter is not an ATE, ATT, travel-time elasticity, or welfare effect.

4.2 Event study and average post model

Let q_e be the opening quarter. We use bins -12 to -9, -8 to -5, -4 to -1, 0, 1 to 2, 3 to 4, 5 to 8, and 9 to 12. Quarters -4 to -1 form the pooled reference period, and quarter 0 is shown as an excluded transition period. For the remaining bins, we estimate

$$Y_{bq} = \alpha_b + \lambda_q + \mu_{n(b), y(q)} + \sum_h \beta_{eh} \widetilde{P}_{be} \mathbb{1}[q - q_e \in H_h] + \varepsilon_{bq}.$$

The average post model replaces the event-time interactions with the product of the scaled proximity dose and an indicator for the first full quarter onward. Regressions are weighted by duplicate-equivalent sales. Standard errors use a CR1 correction clustered by block and a normal reference distribution. Block clustering addresses serial dependence within mapped blocks, but it may not capture shocks correlated across nearby blocks; coarser spatial inference and neighborhood influence diagnostics remain priorities for future work.

The identifying assumption is conditional stability of the counterfactual proximity gradient. Road placement, visible construction, anticipation, local housing releases, other project phases, and sale composition all threaten that assumption. Event-specific estimation avoids a pooled staggered-adoption model, but it does not remove cross-phase contamination (Callaway and Sant'Anna, 2021; Sun and

Abraham, 2021). Pre-opening slope tests are reported as low-power diagnostics rather than proof of parallel trends (Roth, 2022).

5. Results

5.1 Dynamic patterns

Figure 2 puts the four event studies on one vertical scale. The event paths are noisy, and none shows a clean common break from the pooled pre-period. The transition quarter is shaded and not estimated. Jahra becomes more positive several quarters after the opening, Sixth Ring oscillates around zero, JAND changes sign across post bins, and Doha remains positive but imprecise in the post bins. These shapes should not be treated as independent phase responses because the western windows overlap.

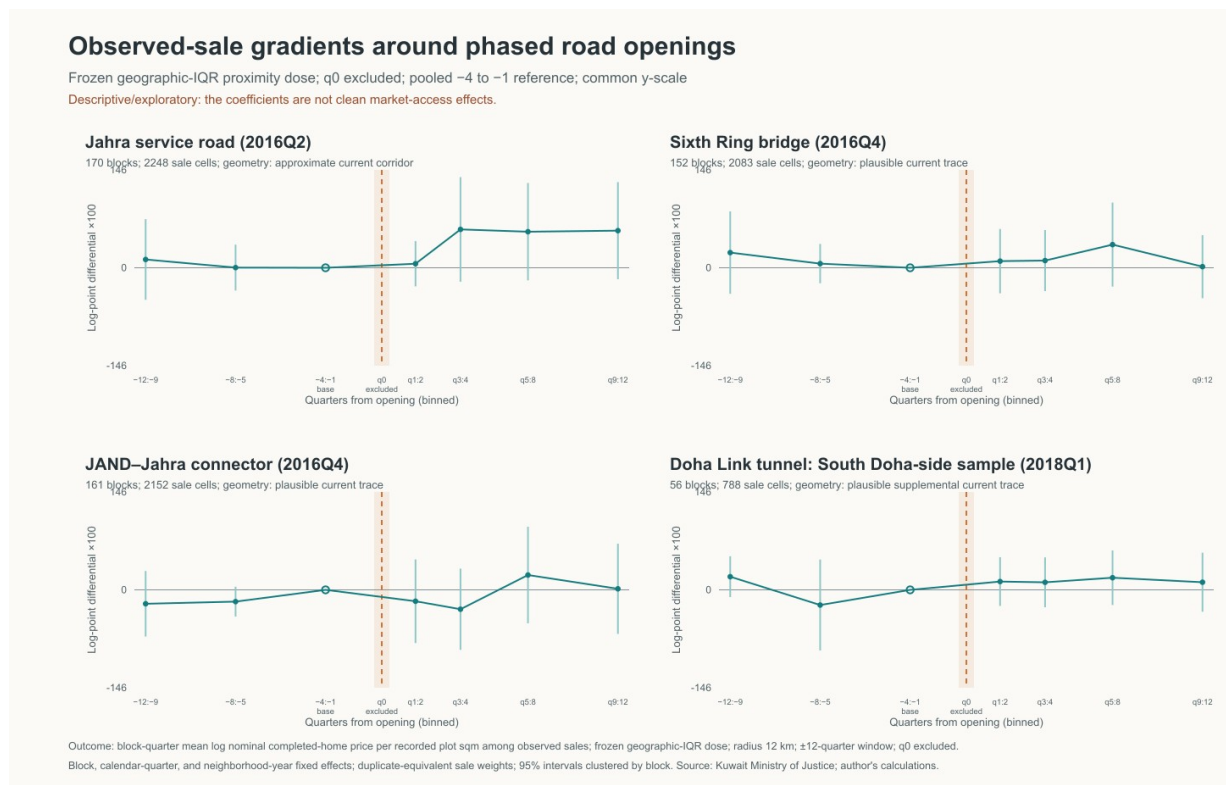


Figure 2. Opening-centered observed-sale proximity differentials in binned event time. All panels use one y-scale. Quarter 0 is an excluded transition period; quarters -4 to -1 are the pooled reference. The outcome is conditional on an observed completed-home sale. Intervals are 95 percent block-clustered intervals. Source: Kuwait Ministry of Justice; author's calculations.

The estimated pre-opening dose slopes per quarter are 0.010 for Jahra, -0.031 for Sixth Ring, -0.023 for JAND, and approximately zero for Doha. Their standard errors are 0.050, 0.061, 0.051, and 0.009. The

intervals are wide enough to permit relevant differential trends, so the tests do not validate the causal counterfactual.

5.2 First-full-quarter average differentials

Table 5. Primary opening-centered observed-sale proximity differentials

Event sample	Raw dose IQR	Log differential	Clustered SE	95% interval	Approx. proportional differential
Jahra service road	0.173	0.181	0.194	[-0.199, 0.562]	19.9% [-18.1%, 75.4%]
Sixth Ring bridge	0.197	0.074	0.204	[-0.326, 0.473]	7.6% [-27.8%, 60.5%]
JAND-Jahra connector	0.156	0.117	0.305	[-0.480, 0.714]	12.4% [-38.1%, 104.3%]
Doha Link: South Doha side	0.055	0.108	0.140	[-0.167, 0.383]	11.4% [-15.4%, 46.7%]

Note: The log coefficient is the first-full-quarter-onward differential for one frozen event-specific geographic IQR more $\exp(-d/3)$ proximity. The outcome is mean log nominal registered completed-home house-plus-plot transfer price per recorded plot square metre among observed sales. Models include block, calendar-quarter, and neighborhood-by-year fixed effects; use duplicate-equivalent sale weights; and cluster by block. Proportional differentials are $100[\exp(\hat{\beta})-1]$. IQRs differ, so rows cannot be ranked as common physical movements. Jahra and JAND are overlapping phases, not replications.

Every interval includes zero and permits meaningful changes in both directions. The appropriate summary is not “four positive effects.” It is that the design cannot determine a stable sign or magnitude for the opening-centered conditional-sale gradient.

5.3 Comparison structure and event windows

Figure 3 changes the radius and fixed-effect structure while keeping each event's unique-block dose scale frozen. In the twelve-kilometre sample, block-and-quarter models produce log differentials of 0.441 for Jahra, 0.555 for Sixth Ring, 0.362 for JAND, and -0.032 for Doha. The primary neighborhood-year estimates are 0.181, 0.074, 0.117, and 0.108. The within-neighborhood-quarter estimates are 0.448, 0.171, 0.190, and 0.079, with broader intervals.

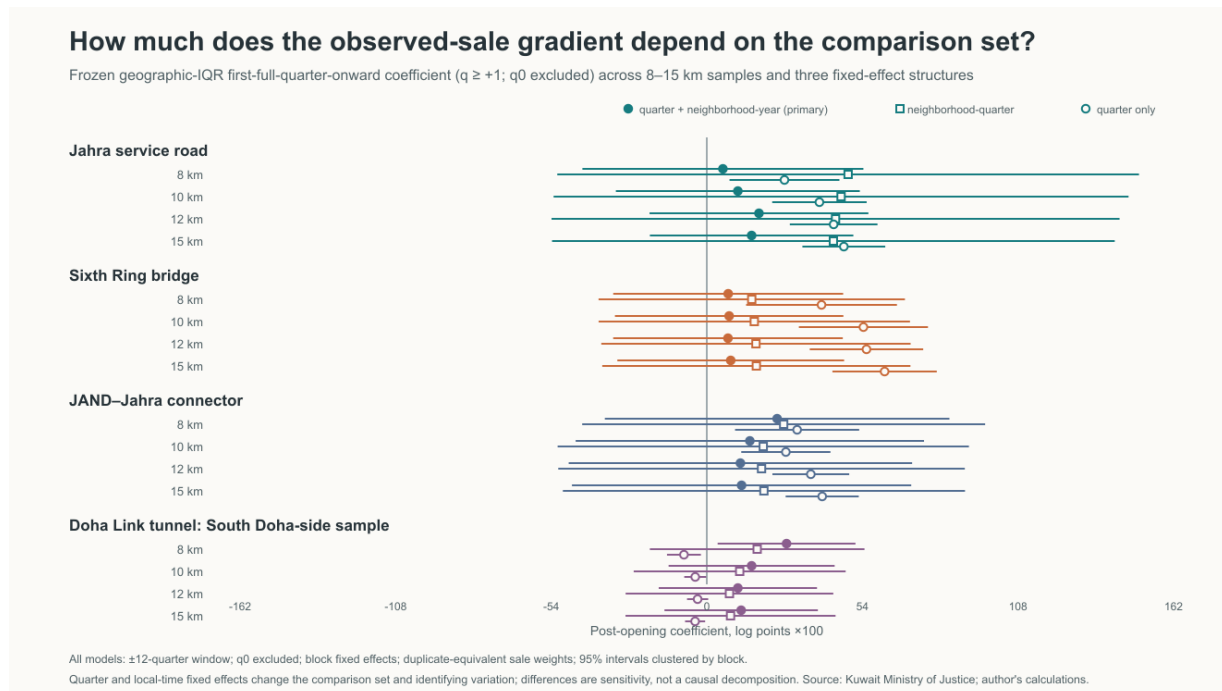


Figure 3. Sensitivity to estimation radius and fixed-effect structure. All coefficients use the same frozen event-specific dose scale and exclude quarter 0. The specifications change the comparison set and identifying variation; their differences are not a decomposition of a road component and confounding. Source: Kuwait Ministry of Justice; author's calculations.

This sensitivity is non-causal. Adding neighborhood-year effects does not reveal how much of the broad comparison is “the road” or “local cycles”; it changes the variation used to estimate the coefficient. The exercise shows that the observed-sale proximity pattern is first-order sensitive to local comparison structure.

Window length matters too. Across ± 4 , ± 6 , ± 8 , ± 10 , and ± 12 quarters, the Jahra estimate ranges from 0.063 to 0.181 and the Sixth Ring estimate from 0.027 to 0.271. JAND moves from -0.446 in the ± 4 -quarter window to 0.117 in the ± 12 -quarter window. Doha moves from 0.414 at ± 4 quarters to 0.040 at ± 10 and 0.108 at ± 12 . These shifts are consistent with overlapping phases, local cycles, anticipation, and sparse sales all entering longer or shorter windows. They do not select a preferred causal estimate.

Eight Doha binary-near specifications are algebraically non-estimable. The three blocks within three kilometres all belong to South Doha, so a near-by-post indicator is absorbed by neighborhood-year or neighborhood-quarter fixed effects at four radii. Those rows remain in the complete specification grid with blank coefficients and an `absorbed_by_fixed_effects` status. They are numerical identification results, not extreme estimates.

6. Relation to the literature

The closest transport-property work starts from the fact that a road can create access benefits and traffic disamenities at the same time. Levkovich, Rouwendal, and van Marwijk (2016) distinguish highway accessibility from local traffic and noise in housing prices. Ossokina and Verweij (2015) use traffic redistribution around a bypass to study local externalities. Yen et al. (2018) and Melser (2020) show why announcement, construction, commitment, and delivery can be separate capitalization periods. These papers motivate our mechanism and timing boundaries; their designs do not transfer automatically to Kuwait.

A second literature measures transport exposure through network access rather than distance to a project label. Gibbons and Machin (2005) study rail access and property prices, while Gibbons et al. (2019) construct small-area accessibility changes from new road links. Highway and road studies also emphasize endogenous placement and broader spatial adjustment (Baum-Snow, 2007; Duranton and Turner, 2012; Faber, 2014; Redding and Turner, 2015). Our present-day line-distance index is intentionally weaker than a historical network treatment.

The Kuwait literature supplies the institutional and measurement setting. Alshalfan (2013), Alshalfan, Alrasheed, and Albabtain (2022), Oh and Shin (2023), and da Cruz et al. (2024) describe a state-led, spatially segmented housing model. AlBader and AlSabah (2025) provide a recent MOJ transaction benchmark while keeping their wait-list comparisons associational, and Alfalah, D'Arcy, and Stevenson (2023) address house-price-index construction under limited attributes. Our contribution is narrower: opening-centered spatial patterns among matched completed-home sales around dated phases of anticipated road projects.

7. Interpretation and implications

Three lessons follow from the evidence. First, the opening-centered gradients are estimable but unresolved. Their intervals allow economically meaningful positive and negative differentials, their event windows matter, and the western cases are not independent. The data do not justify a common “roads raise prices” or “roads do not matter” conclusion.

Second, the measured dose does not identify a mechanism. Straight-line proximity to a present-day trace is not historical travel-time change, a construction footprint, a traffic-noise measure, or a direct proxy for project beliefs. A true price response could also occur before opening because construction and public expectations were already visible. The coefficients therefore describe a transition from an evolving pre-opening state, not total project capitalization.

Third, the result is conditional on the transactions that appear in the registry. The current sample omits zero-sale block-quarters and requires sale support before and after the event. If proximity changes whether a home sells or the type and plot size of homes sold, the observed mean can move without a fixed property's value changing. A balanced block-quarter panel for any sale, duplicate-equivalent sale volume, and sold plot area is the highest-priority remaining outcome diagnostic. Those variables should be studied as selection outcomes, not inserted mechanically as controls.

The policy boundary is correspondingly tight. The results apply to observed private-residential completed-home transfers in matched incumbent blocks during the event windows. They do not cover renters, commercial property, recorded land, unsold homes, unmatched geography, or the directly served Jaber population in the Doha case. Even causal capitalization would not by itself measure travel-time benefits, construction cost, congestion, safety, renter welfare, buyer losses, or network-wide incidence. Nothing here supports a project ranking, benefit-cost calculation, or welfare claim.

The most valuable next data are targeted. Dated engineering plans or historical traffic states would permit an access treatment. Construction and diversion records would measure nuisance relief. A balanced sale panel and property attributes would clarify selection and composition. Neighborhood influence diagnostics and spatially coarser inference would show whether a few local areas drive the current gradients. These additions answer different questions.

8. Conclusion

We document four phased road openings and estimate how completed-home prices among observed sales changed with proximity to their present-day traces. The opening quarter is excluded, the dose scale is frozen on unique geographic blocks, and the western-corridor overlap is made explicit. The estimated gradients are noisy and move with the event window and comparison structure. Their intervals permit meaningful changes in either direction, while event-specific scaling and shared 2016 geography mean the point estimates should not be ranked or treated as independent corroboration.

The opening date is also not the start of treatment in the broader economic sense. Construction and public expectations predated each phase. Present-day line proximity does not separately measure access, construction relief, permanent traffic exposure, or completion information, and the selected-sale outcome cannot distinguish a value change from a change in which homes sold.

The paper therefore establishes an opening-centered observed-sale proximity pattern, not a causal road effect, total project capitalization, or welfare gain. The useful result is the instability itself: a documented opening and a plausible corridor map are enough to organize a serious empirical study, but not enough to determine why nearby registered sale prices moved.

Data and reproducibility note

The road-openings directory contains the opening registry, source boundaries, present-day geometry audits, exposure builder, frozen geographic scales, binned event-study estimates, complete sensitivity grid, window sensitivities, overlap matrix, Doha support audit, tests, and figure sources. Run `python3 scripts/build_corridor_capitalization.py`, `python3 scripts/check_paper_package.py`, and `python3 -m unittest discover -s tests -p 'test_*.py'` from the project directory. MOJ-derived aggregate estimates and figures may be published with explicit attribution. Transaction rows, deed identifiers, exact transaction locations, block-level exposure joins, and small-area prices remain private. Source: Kuwait Ministry of Justice; author's calculations.

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