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House Prices and London Underground: Does Multiple Interchange Tube Stations Link with Higher London House Prices in 2024?

More than just transport nodes, accessibility is often associated with higher property values, where homebuyers are more willing to pay more what a location allows them to do. In a fast-paced city, one of the most valuable “location advantages” is how easily does it allow its people to reach to jobs, services and social activities. Existing studies of transport improvements in the UK suggested that better accessibility can be reflected in property prices that sits near transit nodes (Gibbons and Machin, 2005).

Accessibility is beyond just proximity to Underground stations, but also about the quality of connectivity. While a single-line station offers one route, an interchange station offers options with fewer changes, more directions, and often more efficient journeys. Indeed, a recent survey indicated that 80% of Londoners have expressed that it is “fairly” and “very” important to choose property that is proximity to a station (Nationwide, 2021). This indicated beyond paying for the home itself, but the strategic location advantages are also part of what homebuyers consider.

Looking at London property sales in 2024, are prices higher for homes that is nearest to Underground stations that is a multiple interchange station with 2 lines or 3+ lines, or homes whose nearest station serves only one service line after controlling for property type, distance to central London, and neighbourhood deprivation?

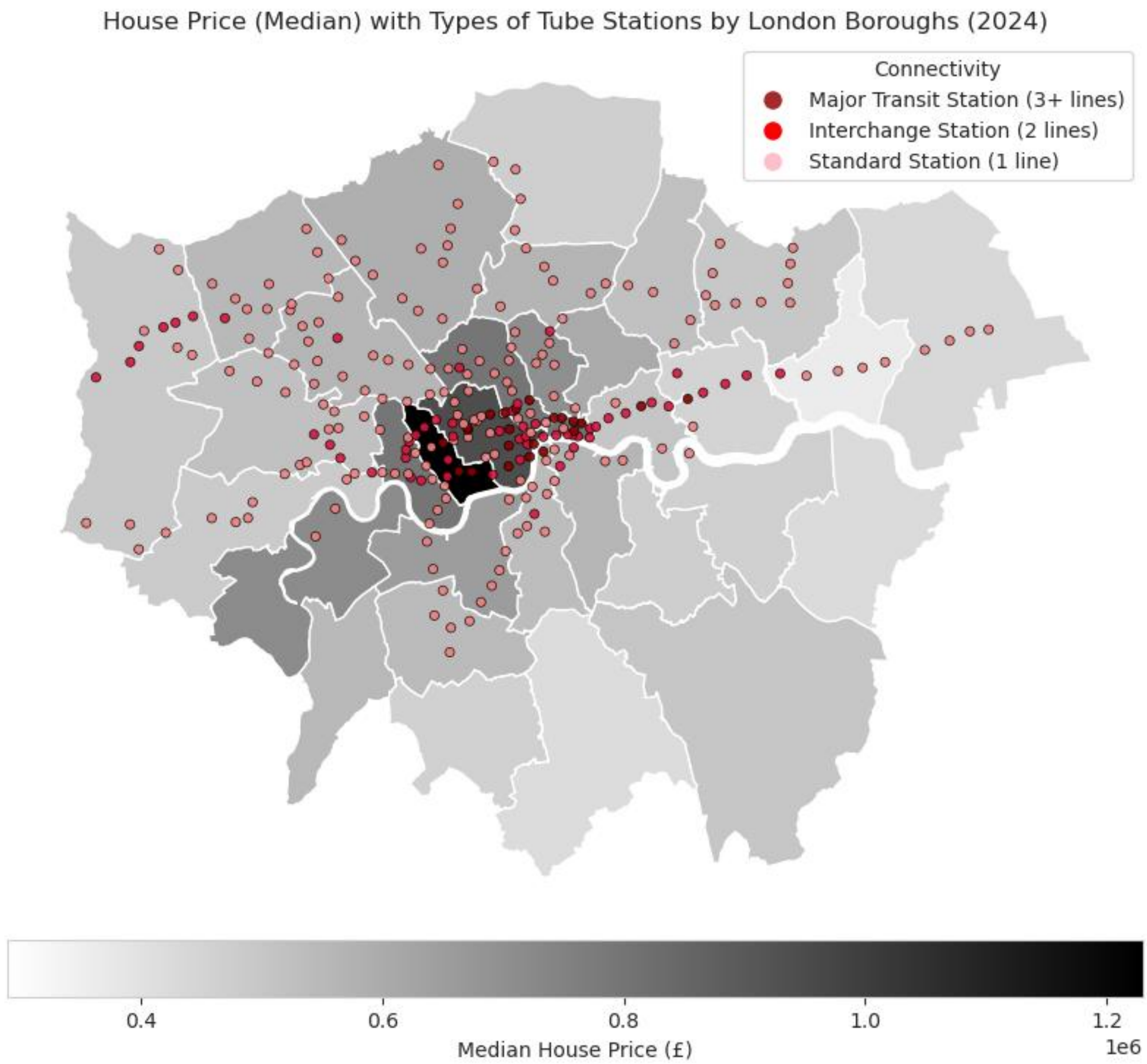

Figure 1 - House Price with Types of Tube Stations by London Boroughs in 2024

London's housing market is sharply uneven. Figure 1 highlighted a high price core within inner London, and price level falls moving towards outer London. Overlaying the location of 273 tube stations, the network patterns of tube stations mirrored a similar pattern. Stations with highest density of interchanges, are seen concentrated in central areas where borough medians are found highest, alongside with interchange stations of 2 servicing lines.

However, such simple comparison is not sufficient for understanding this "chicken or egg" problem, whether stations are linked with higher prices or just simply located in areas that are already expensive for other reasons. While transport accessibilities can contribute to housing prices, yet centrality of neighbourhoods, property types and socio-economic conditions varies dramatically across the city. As interchange hubs tends to concentrate in central and more affluent areas, the analysis makes fairer comparison by accounting for property type, distance to central London, as well as the Indices of Deprivation (IMD).

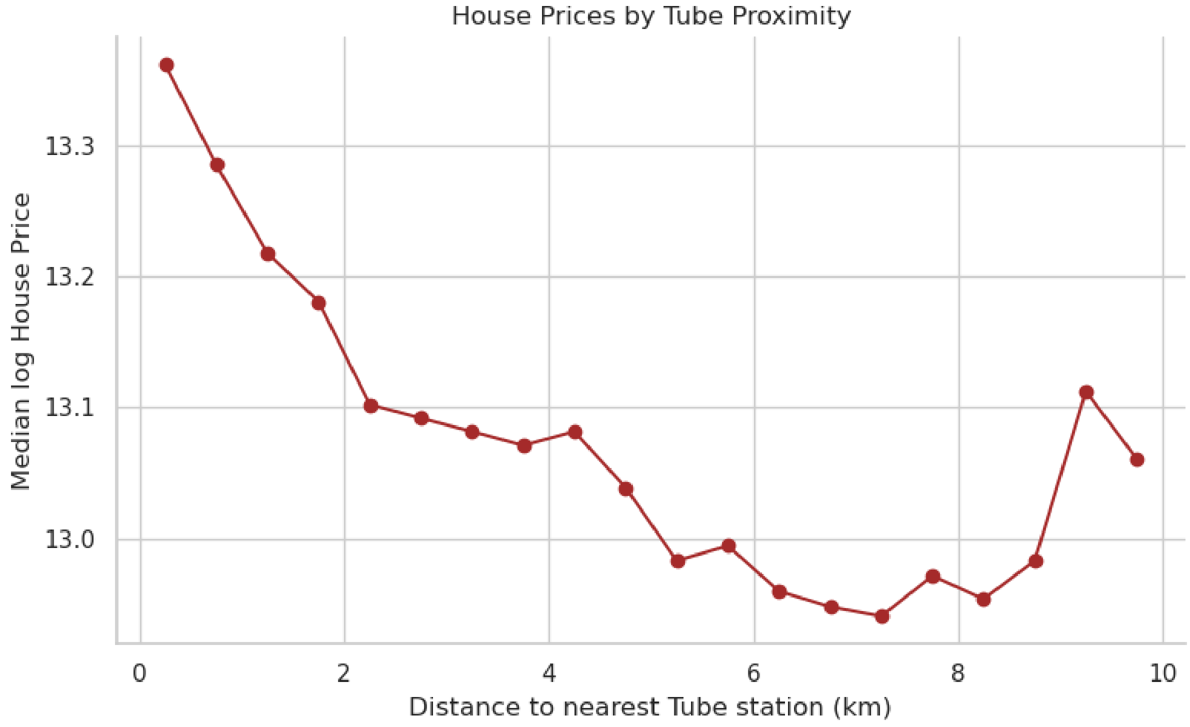

Figure 2 - House Price by Distance to Nearest Tube Station (km)

House prices are highest when distance to tube stations are very close at around 0.2 to 1.8 km and declines as distance increases in Figure 2. There is a steep fall in house prices within first few kilometres, suggesting that even a small distance away from a station is linked with a noticeably lower market price.

Stations however are rarely identical. While proximity matters, what makes a station valuable depends on connectivity levels and its ability to offer meaningful travel time savings. As interchange stations provide access to more destinations and reduce the need for time consuming interchanges, they tend to be valued more than a standard single line station.

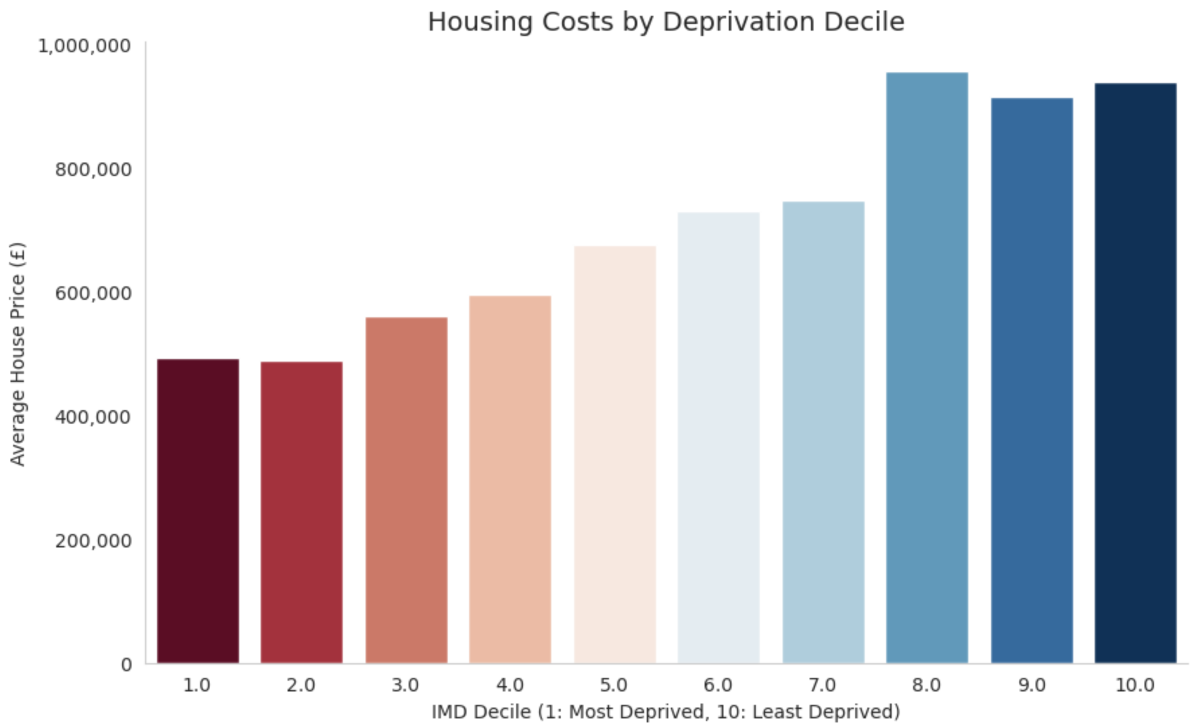

Figure 3 - House Price by IMD decile

Considering the socio-economic variations across London, neighbourhood deprivation indices separate the economic impact of transport connectivity from other local factors. Figure 3 showed a social gradient where average prices rise as areas become less deprived.

Affluent areas often benefit from a virtuous cycle, with high quality transportation attracting high-end retail, safer streets as well as better public spaces. Consequently, these well-off neighbourhoods tend to be equipped with better infrastructure and stronger amenities, alongside better transport connections. If multiple interchange stations are more common within affluent areas, failing to consider wider socio-economic factors are likely to misinterpret the impacts of well-off neighbourhoods to the stations' value itself.

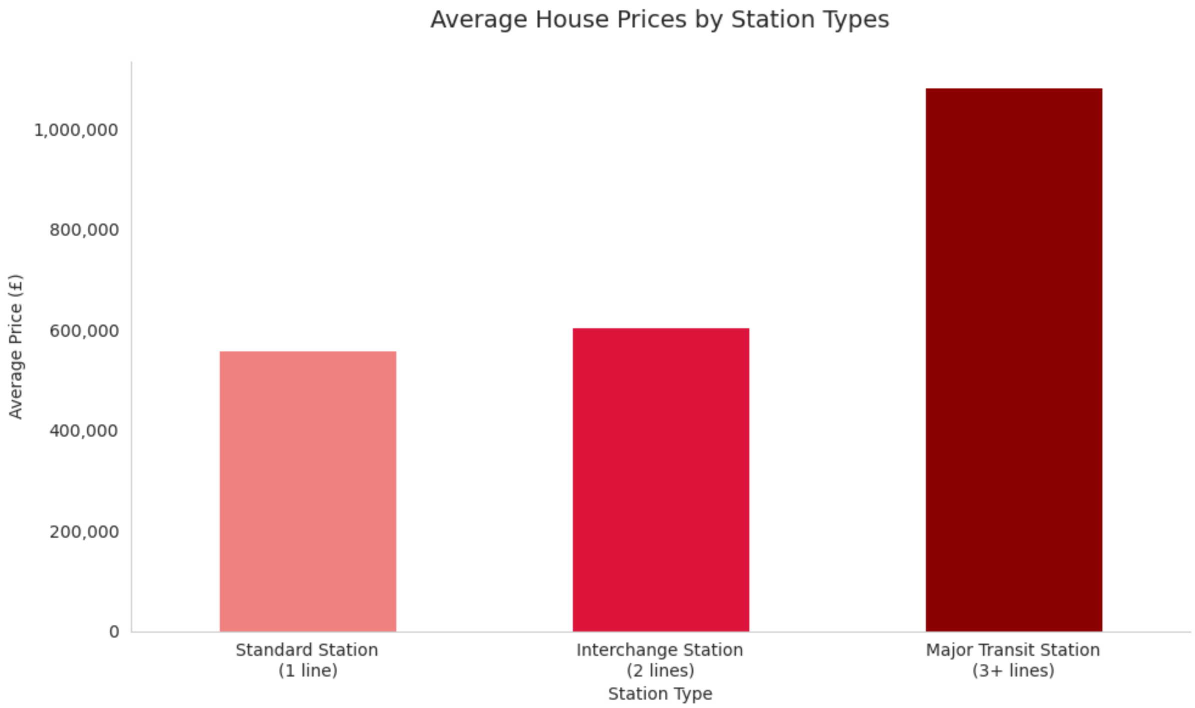

Figure 4 – Average House Prices by Station Types

Zooming in on the raw average prices by station types, prices are lowest near single line stations, higher near 2 lines interchange stations and highest near major transit stations. Taking single line station as a baseline, 2 lines station are about 8.5% more expensive on average, and homes near 3+ lines stations are about 94.3% more expensive. Yet, these unadjusted differences are subject to the fact that major transit hubs tend to locate within central and affluent areas in London.

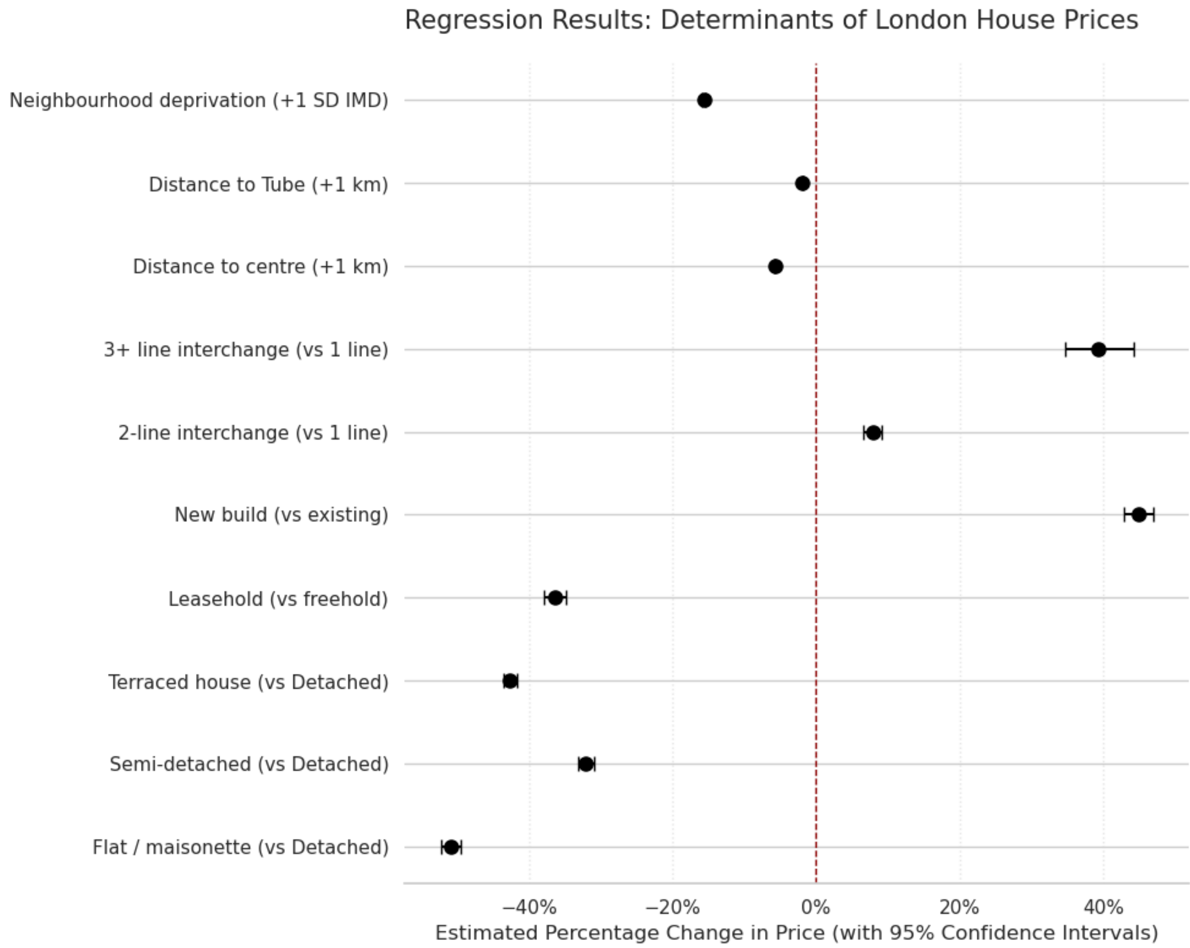

Figure 5 - Regression Results: Determinants of House Prices with Estimated Coefficient

Building on this, to separate connectivity from London's expensive centres, the regression modelled 82,021 properties in figure 5, and estimated percentage differences in house sale price, while accounting for distance to central London, distance to the Tube, property characteristics, and neighbourhood deprivation. Even after these controls, connectivity still matters a lot. Homes whose nearest station is a two-line interchange sold for around 8% higher price than homes near a single-line station. Homes nearest to a major interchange (3+ lines) sold for around 39% more. Meanwhile, each additional kilometre from central London is associated with roughly a 6% lower selling price, and in more deprived neighbourhoods, sale prices are substantially lower.

The regression results suggested that it is not only being near an Underground station that links with higher prices but being near a station that connects people to wider destinations of the city. These findings showed associations yet does not proof causality. Major transit stations are not located by randomness, they tend to sit at areas with long standing economic activity with higher development pressures. Therefore, improved transportation systems alongside with better employment, retail opportunities and public spaces also collectively affect housing prices.

On the other extent, major interchanging hubs staggering price up is likely to accelerate London's housing inequality. Improving connectivity is indeed a public good, but if transport upgrades raise willingness-to-pay in its surrounding area, the gains can be capitalised into land and property values. This may intensify local affordability pressures unless paired with housing and affordability measures.

Technical Appendix

As the Prices Paid Data (PPD) from the HM Land Registry for 2025 is not complete, this analysis has used the yearly file for 2024. To focus on London house prices, the data is then filtered for Greater London and City of London, Category A for standard price data and excluded deleted records. To eliminate any invalidity, transactions under £10,000 will be removed (1 record removed).

As the PPD only included postcodes as the only geographic reference, the ONS Postcode Directory dataset was used for precise coordinates and LSOA codes. This enables any spatial joins and distance calculations with other variables later in the analysis. TfL’s Underground station location dataset was used to extract station locations, total count of serviced lines and distance to stations. Spatial data were all projected to British National Grid in meters, EPSG:27700 to ensure consistency.

Variable	Metadata	Data Type
dist_centre_km	Distance to Central London (Charing Cross) in km	Continuous
dist_tube_km	Distance to Nearest Tube Station	Continuous
duration	Tenure Duration (Freehold, Leasehold)	Categorical
imd_z	Deprivation, Standardised IMD score	Continuous
line_count_cat	Line Count of the Nearest Station (1 Line, 2 Lines, 3+ Lines)	Categorical
log_price	Log of Paid Price	Continuous
old_new	New Build, Exisiting Property	Categorical
price	Paid Price (£)	Continuous
property_type	Property Type (D, S, T, Flat)	Categorical

Figure 6 - Metadata, Key Variables for Regression Analysis

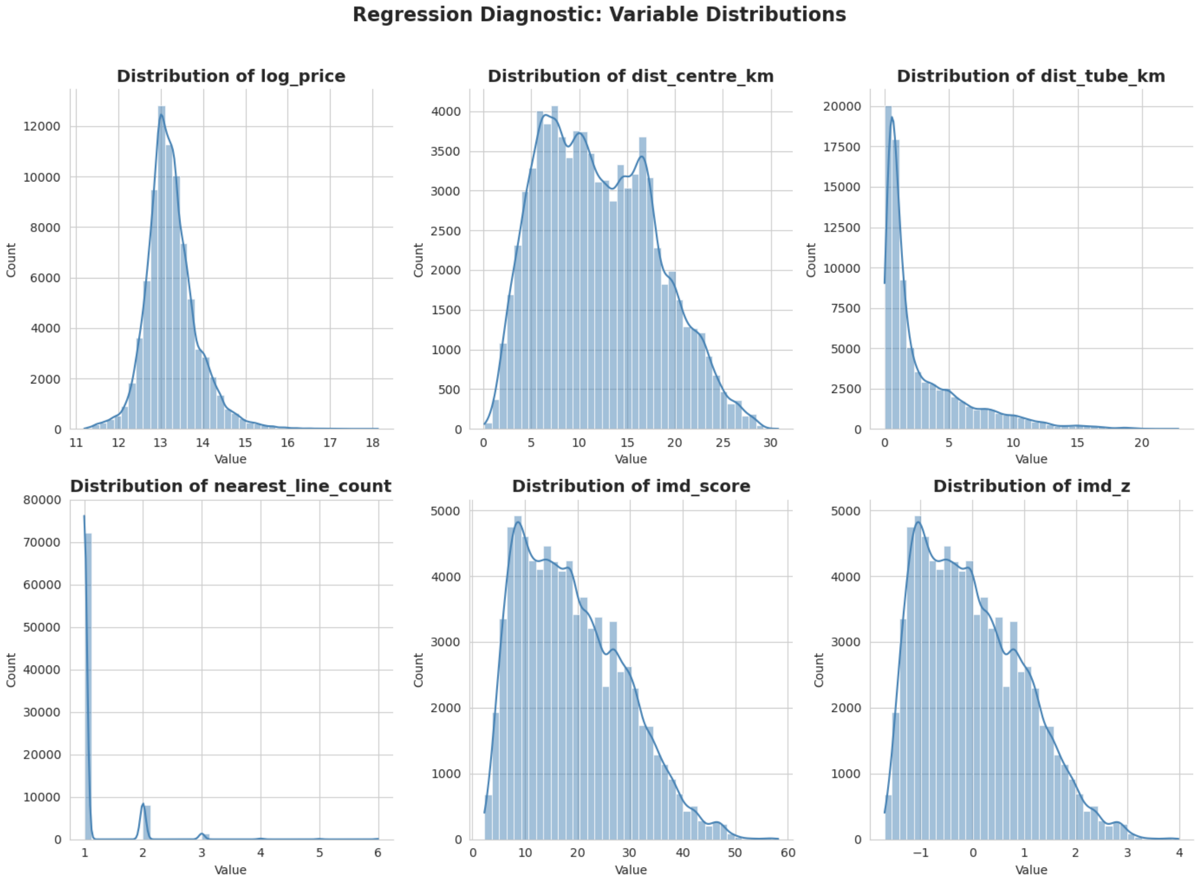

Figure 7 - Regression Diagnostics of Variable Distributions

To finalise the data cleaning process, a diagnostic check of data distribution of variables was performed (Figure 7). House prices were normalised after log-transformations while distance to central London and nearest tube station has showed an expected right skewed pattern. Although the line counts have showed a highest frequency for single-line stations, there is still a sufficient sample size for interchange stations to maintain our regression's statistical significance. This has finalised a total of 82,021 sample size with complete covariate data for regression.

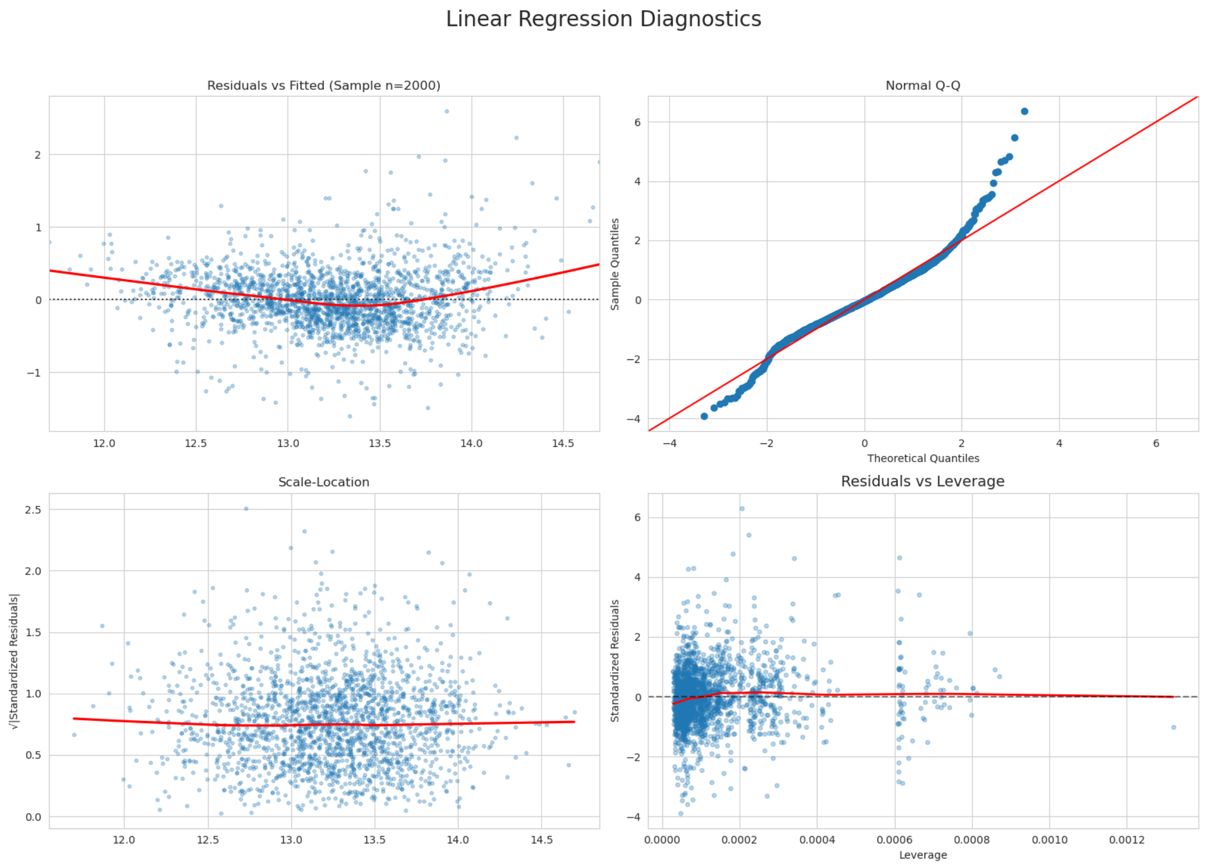

Figure 8 - Linear Regression Diagnostics

Before running the regression model, a collection of linear regression diagnostics was performed for basic OLS modelling checks. The residuals vs fitted plot followed a relatively flat trend line, indicating the model does not over or underestimate property values. The Normal Q-Q plot although revealed some outliers at the highest and lowest price data points, this is expected due to large data size of PPD. The Scale-Location heteroskedascity plot showed a relatively even spread of residuals, inferring a good data reliability status. Lastly, the Residuals vs Leverage plot confirmed that there are no individual price data points undue influence on results as data remain well within the threshold for cook's distance.

Furthermore, it is also found that multicollinearity is unlikely to dominate as key transport effects. The Variance Inflation Factor (VIF) values for core continuous predictors have been found relatively low results of dist_centre_km ≈ 1.64, dist_tube_km ≈ 1.40 and imd_z ≈ 1.13. These compelling results of above value of 1 but well below the common threshold of 5 or 10 indicated that multicollinearity is not a significant concern, allowing the model to provide stable and independent estimations for the impact of transport accessibility on house prices.

$$\log_{price} \sim \boldsymbol{C(property\_type) + C(duration) + C(old\_new) + distance\_centre\_km + distance\_tube\_km + C(line\_count\_cat) + imd\_z}$$

Figure 9 - Regression Model Equation

The process of running the OLS model from baseline of $\boldsymbol{log_{price} \sim C(property\_type) + C(duration) + C(old\_new)}$ to adding predictors of $\boldsymbol{dist\_centre\_km}$, $\boldsymbol{dist\_tube\_km}$, $\boldsymbol{C(line_count_cat)}$and $\boldsymbol{imd\_z}$ it showed how confounding factors impact interchange station changes. The baseline model alone explains a modest share of variation with $R^2 \approx 0.144$. Adding centrality increases explanatory power to $R^2 \approx 0.438$, confirming that location centrality is the dominant gradient. Tube distance and line count categories added small but meaningful effects on R^2 from 0.447 to 0.456, while neighbourhood deprivation further added substantial improvement to a 0.527 R^2. We include IMD (deprivation) in our final model because rich areas are more expensive and they also tend to have better transport. Without IMD we would unfairly over-credit Tube interchanges for price differences. This staged approach helps identifying the true impact of multiple interchange connectivity on house prices, ensuring property types, centrality, and socio-economic context are not biased.

Transitioning to a multi linear model to isolate the independent effects of connectivity, location, and socioeconomics, the null model initially revealed a ICC value of 0.237, implying that 23.7% of price variation was attributable to borough level differences. A group variance of 0.09 was also found, further verifying that around 0.009 of initial group variation in house prices was linked with boroughs. Yet, the borough level variance dropped to 0.00 upon the introduction of the full model. This sharp reduction suggested that borough influences is not an independent factor but purely a function for the locational advantages and socio-economic characteristics accounted for in the model.

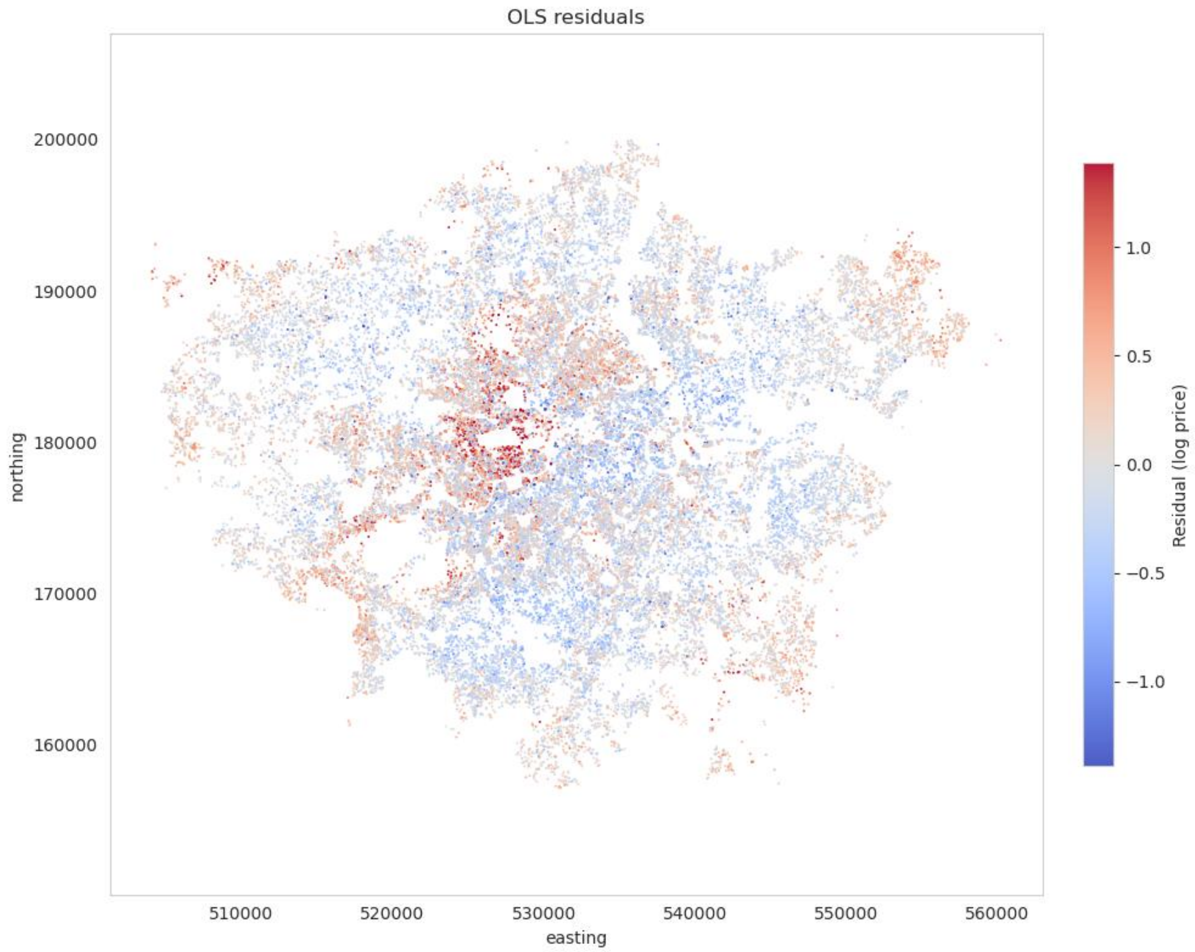

Figure 10 - Map of OLS residuals

Mapping residuals of the full model revealed spatial clustering within certain neighbourhoods in Figure 10. This suggests that even after controlling for centrality, deprivation and property types, residuals is likely to be influenced by its neighbours. The existence of spatial autocorrelation on micro-levels in London was confirmed with a Moran's I test value of 0.389 and a very low p-value of 0.001. While the model captured major drivers for property value, it is important to note that the complexity of London's housing market does display limitations. Neighbourhood factors such as urban greenspace and amenities not included in the model are also potential drivers which collectively shape clusters of property prices.

	Coefficient	Standard Error	P-value	Percentage Change (%)
Distance to Centre (km)	-0.059228	0.000341	< 0.001	-5.75
Distance to Nearest Tube Station (km)	-0.019473	0.000442	< 0.001	-1.93
Deprivation IMD Z-score	-0.169691	0.001587	< 0.001	-15.61
2 Lines Stations	0.076019	0.005962	< 0.001	7.90
3+ Lines Stations	0.331906	0.017554	< 0.001	39.36

Figure 11 - Regression Summary

To interpret the coefficients gradients in our log linear model, the formular of $\mathbf{100(\boldsymbol{exp}(\boldsymbol{\beta}) - 1)}$ was applied to translate the findings into percentage for easier interpretation. While proximity to a Tube station notes for a 1.93% decrease in price per kilometre, the model reveals that transport quality and socio-economic status are far more influential. Living near a multi-line interchange station has been noted with a 7.9% to 39.4% increase in property values.

In summary, the analysis has showed that borough level influences is not an independent geographic factor in influencing housing prices in London. Tube station itself explains accessibility partially. Although proximity to a multiple interchange hub can build 39.4% of a property's price, yet it is important to note that there are also areas further away that are well served by other mobility options with different housing types and neighbourhood characteristics will also collectively shape property prices.

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