Data-driven real estate investment: Residential focus

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Hurdles to data-led decision making increasingly surmountable

Real estate investment decisions have long been based upon a combination of data analysis and intuition, with great variation in the sophistication of the data analysis and the weight given to intuition. To generalize though, the techniques employed have typically lagged the sophistication used in other asset classes (such as equities and fixed income) and intuition has played a greater role in the decision process.

There are valid reasons for this status quo. Assets are heterogenous and difficult to compare on a consistent basis. In addition, assets are truly marked-to-market only when they are traded, which occurs infrequently due to long average hold periods. Meanwhile, other institutional data are often tightly controlled, opaque, or accessible at only coarse predefined granularities. Furthermore, real estate is greatly influenced by behaviors (for example, community engagement or homeworking) that are not commonly measured. The dearth of accurate, consistent, and timely data and the limited ability to source, aggregate, and analyze the data at scale leave market participants with imperfect information, making it challenging to draw conclusions with sufficient precision. This creates a reliance on intuition to complete the picture.

However, the hurdles to more sophisticated data-led decision making are increasingly surmountable. Technological advances have greatly expanded data availability, enhanced the extraction and quality of data signals, and led to improved ways of analyzing the data to make more detailed and accurate assessments. New so-called 'nontraditional' data - when properly wielded to avoid becoming overwhelming or conveying false signals - serve to fill gaps in understanding or as primary factors in their own right. Of course, the real value lies in the synthesis of complex multisource data and the identification of patterns and relationships that impact investment performance and risk. These aims are also now more achievable than ever thanks to advances in data aggregation, data science, and machine intelligence that empower investors to make faster and more informed decisions.

The challenges and opportunities of data analysis vary across geographies and sectors, reflecting the broader heterogeneity of real estate, with the residential sector providing the most fertile ground for utilizing new data and techniques. Markets are fairly granular, transactions are relatively frequent and numerous, relevant data are available and plentiful, and the residential sector is the sector that is at once the most influenced by behavioral trends and the least supported by existing analytics. For these reasons, this paper concentrates on the residential sector, although much of what is discussed can be generalized to other sectors, as will be shown in subsequent papers.

The purpose of this paper is to illustrate how novel place types, novel analytical techniques, and nontraditional data - which are introduced in the following sections - can generate powerful insights at unprecedented granularity, reduce reliance on intuition, and maximize investment returns while minimizing risk and promoting social impact.

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Submarket analysis misses critical signals

Novel place types can reveal critical signals that the traditional submarket may be too coarse, indeterminate, and arbitrary to capture. Smaller than a submarket and able to capture the economic value of proximity to the nearest station, the station catchment—the area that is reachable within a given time by walking from the station—enables more granular investment analysis and thus identification of material investment opportunities and risks.

There can be significant variation within a submarket. The dynamics within a submarket (such as Fulham) are far from uniform, contradicting the prevailing assumption that a submarket is largely homogeneous and coherent. The 10-minute station catchments around Fulham Broadway, Imperial Wharf, Parsons Green, and Putney Bridge exhibit markedly disparate residential rent levels (with the greatest as much as 44% higher than the lowest) and recent rental movements (with some markets appreciating by 3% and others depreciating by 2%) - despite all being within the Fulham submarket. Using the submarket as the geography of analysis means missing critical signals that emerge at a higher geographic resolution, and missing such signals can mean the difference between a high return and a low (or even negative) return.

Figure 1: PLACEMAKE.IO Residential Rent Index, 10-minute station catchments in Fulham, £ per room
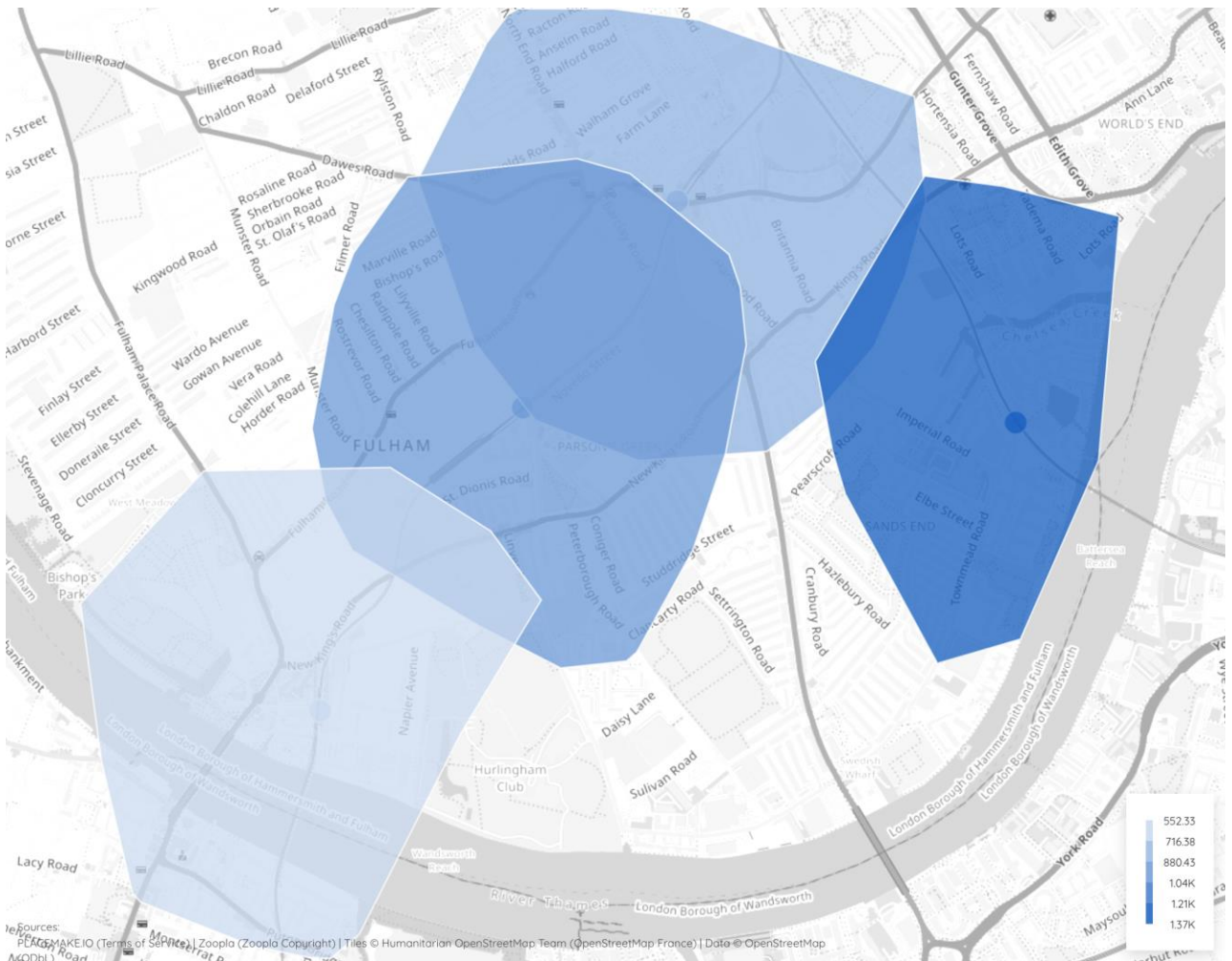
The 5-minute station catchments around Fulham Broadway, Imperial Wharf, Parsons Green, and Putney Bridge exhibit even more disparate residential rent levels (with the greatest as much as 61% higher than the lowest) and recent rental movements (with some markets appreciating by 3% and others depreciating by over 4%). The wider disparities in the residential rent levels and recent rental movements are driven by wider disparities in the underlying factors (such as population growth, residential development, walkability, and energy efficiency), with Imperial Wharf leading and Putney Bridge lagging.

Figure 2: PLACEMAKE.IO Residential Rent Index, 10-minute station catchments, £ per room
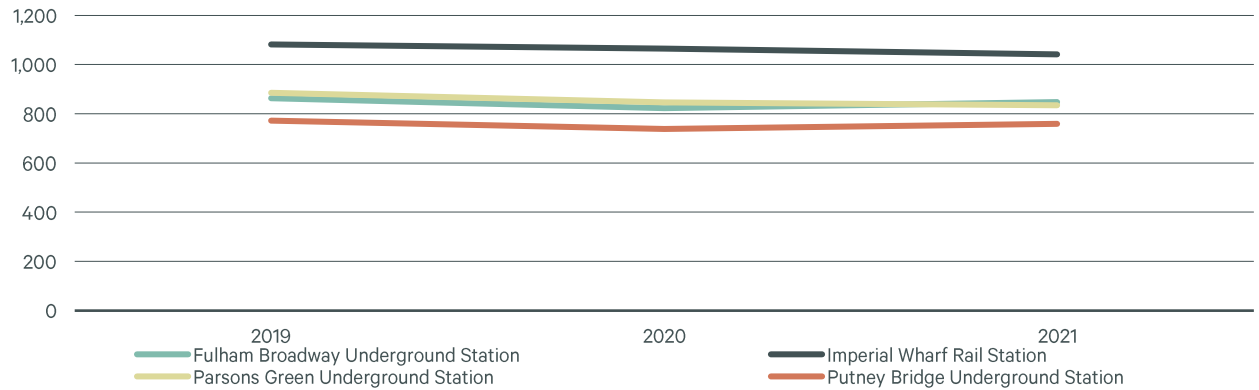
Source: PLACEMAKE.IO, Zoopla.

Such disparities, though glaring, are simply undiscoverable at the submarket level, illustrating that using the submarket as the geography of analysis means overlooking potentially material investment opportunities and risks.

Figure 3: PLACEMAKE.IO Residential Rent Index, 5-minute station catchments, £ per room
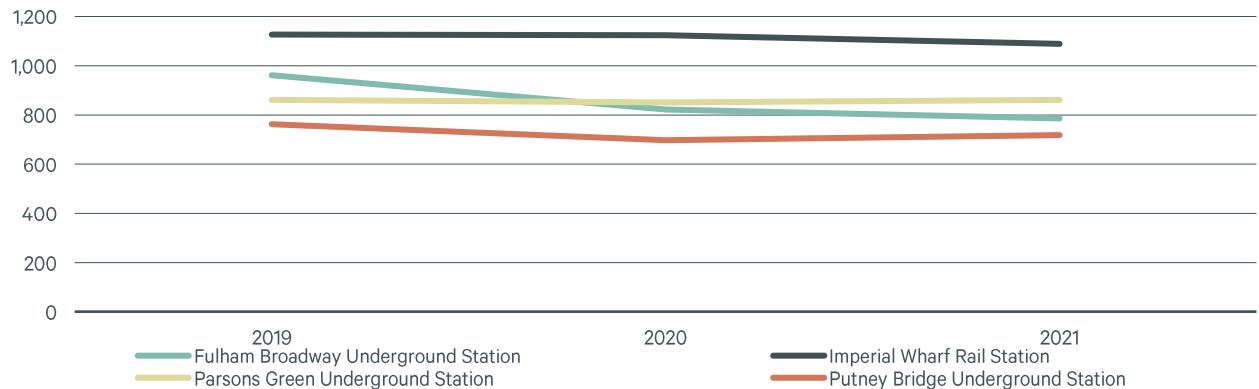

Source: PLACEMAKE.IO, Zoopla.

Significant variation exists within not only a submarket, but even a single station catchment. Around Fulham Broadway, residential rents dropped only marginally in 2020 before rebounding in the 10-minute station catchment, but fell notably in the 5-minute station catchment, indicating sharper appreciation in more distant areas. Conversely, around Parsons Green, residential rents fell notably in the 10-minute station catchment, but dropped only marginally before rebounding in the 5-minute station catchment, indicating sharper depreciation in more distant areas. In fact, the movements are so disparate that the 10-minute and 5-minute station catchments can be thought of as defining quite distinct markets with distinct risk-return profiles (so that what appears promising in one case may appear dismal in the other and vice versa) and distinct value drivers (so that an intervention that works in one case may fail in the other). What is vital to identifying the right microlocations and capitalizing on the right value drivers is a degree of precision that the submarket may be too coarse to deliver.

Another advantage of the station catchment is its ability to provide critical insight into how a given variable (such as residential rent) varies as a function of distance to the nearest station, revealing the economic value of proximity to the nearest station. For example, the 5-minute station catchments generally exhibit higher residential rents than the 10-minute station catchments, indicating a proximity premium. Interestingly, this is not always the case, though. Whether being closer is better depends heavily on the character and dynamics of the immediate vicinity of the station and beyond. The conclusion is that the proximity premium is real and potentially material, but it does not hold uniformly everywhere or at all times, indicating drivers of residential rent beyond proximity and thus opportunities to influence appreciation. Given such variability, generic assumptions (such as 'closer is better') must give way to granular analysis of market-specific features.

Using the station catchment as the geography of analysis can reveal otherwise inaccessible or hidden signals. For example, mapping residential prices using 15-minute station catchments clearly illustrates how residential price varies along each train line in Birmingham, revealing pricing gradients and investment opportunities that are undiscoverable in a traditional submarket analysis.

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Figure 4: PLACEMAKE.IO Residential Price Index, 15-minute station catchments in Birmingham, £ per sqm
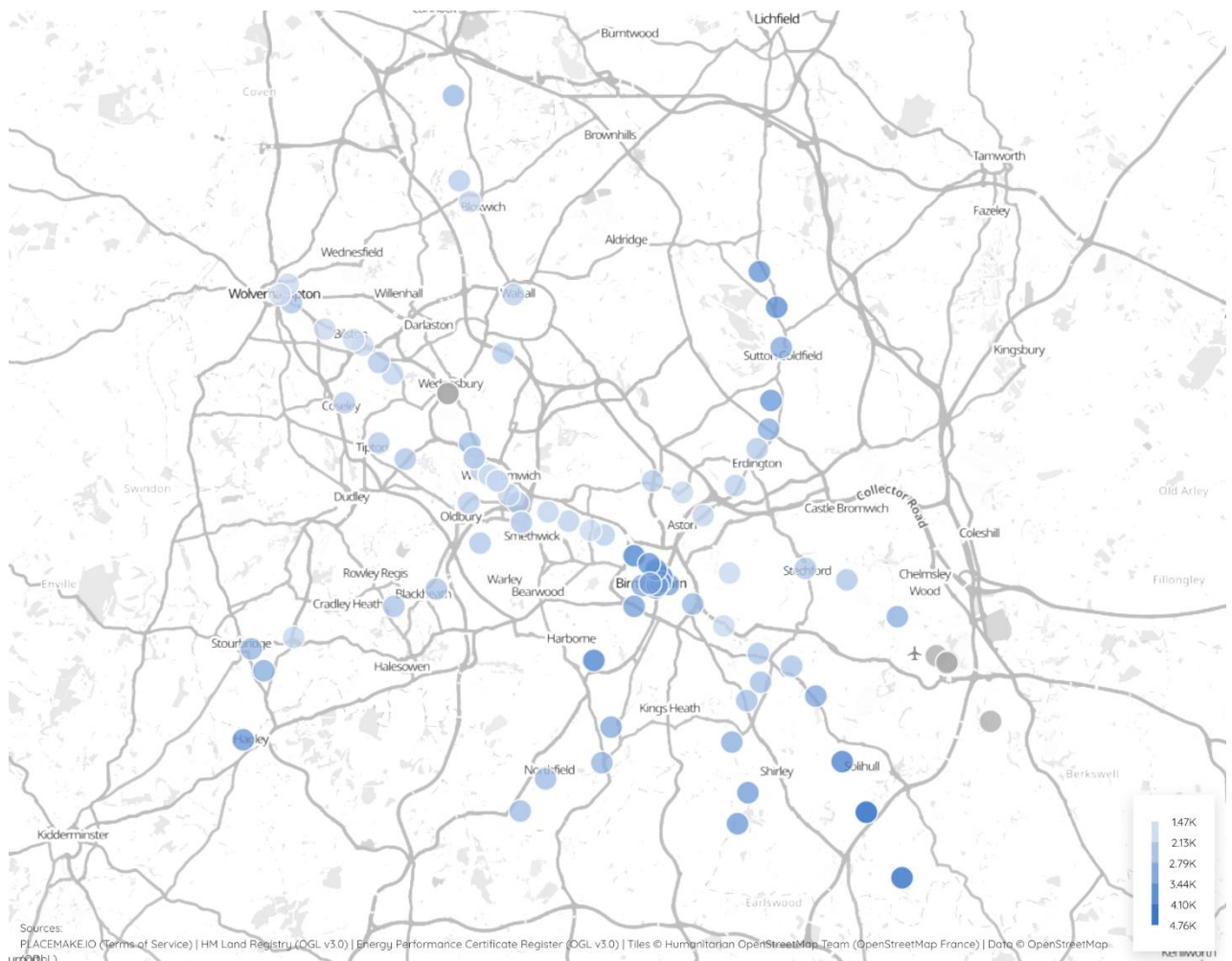
Novel analytical techniques can reveal new patterns

Novel analytical techniques can reveal or even predict patterns and trends that elude traditional methods. Gentrification provides one such example. A neighborhood changes in large part because people and capital, being mobile, freely flow into or out of it, whether due to economic pressure, arbitrage, or other factors (such as exogenous regeneration, as in King's Cross or the Olympic Park). Residential price appreciation can be explained to a large degree by endogenous gentrification, the process of neighborhood change due to the in-migration of wealthier residents into comparatively less expensive adjacent neighborhoods[1].

One salient leading indicator of endogenous gentrification is randomness in the spatial distribution of residential prices, as such randomness reflects the future price uncertainty that is being capitalized into current prices and a market that is out of equilibrium, dynamic, and liable to appreciate[2]. The PLACEMAKE.IO Residential Local Price Regularity Index quantifies precisely these patterns to characterize the stability of local residential prices and degree of endogenous gentrification.

A more positive value indicates that more expensive properties are typically near other more expensive properties (see Figure 5A) whereas a more negative value indicates that more expensive properties are fairly evenly interspersed with less expensive properties (Figure 5B). Either indicates a more static and predictable market (such as Mayfair) in that there is little future price uncertainty being capitalized into current prices and people know more or less what prices to expect. By contrast, a value at or near zero (Figure 5C) indicates the telltale randomness characteristic of endogenous gentrification and a more dynamic market (such as Peckham) that is undergoing significant change.
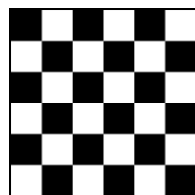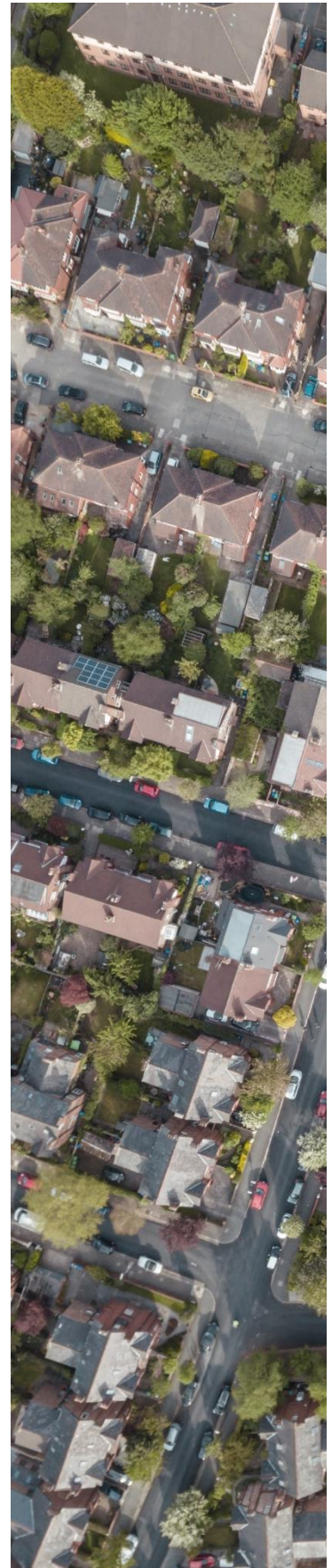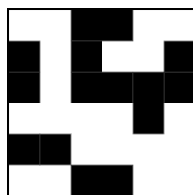
Figure 5A

Figure 5B

Figure 5C

Excluding the highly static central London markets reveals a light-colored ring of highly dynamic markets with values near zero. These dynamic markets lie in a transition zone between the highly static central London markets and the fairly static outer markets, reflecting waves of endogenous gentrification rippling outward. Notably, the sweep of neighborhood change is not uniform and appears to be penetrating deeper into the north and the southwest.

Just as critical is the transition from a static market to a dynamic market. Hackney transitioned in the late 1990s, shortly before it became more expensive than Greater London as a whole, and is becoming a more well-understood market, as indicated by the upward trend. Peckham followed Hackney years later, and Lewisham looks to be following Peckham in its downward trend toward dynamism.

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Figure 6: PLACEMAKE.IO Residential Local Price Regularity Index map
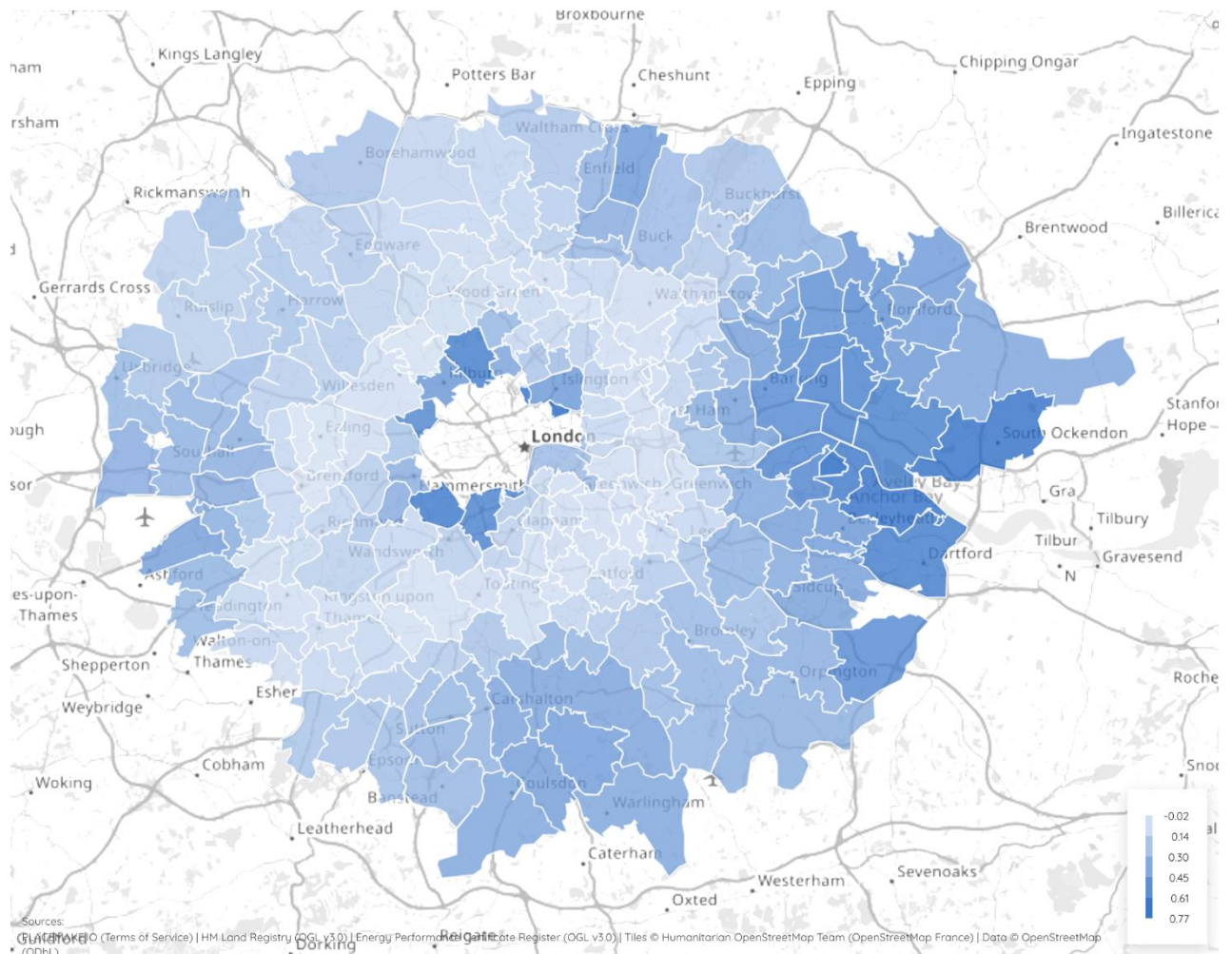
The index shows successive waves of transition, with different markets becoming more dynamic at different times and at different rates. Between 2012 and 2021, residential prices grew by 80% in Peckham (which has been undergoing significant change), 70% in Lewisham (which is trailing Peckham), and 57% in Hackney (which had already changed significantly by 2012 and has been emerging from its transition). By contrast, markets on the opposite end of the spectrum that are more static and well-understood do not show the same exuberance, with residential prices growing by just under 18% in St. John's Wood, Primrose Hill, and Marylebone. By identifying markets that are near or approaching zero and using other leading indicators (such as the PLACEMAKE.IO Residential Local Price Disparity Index and the PLACEMAKE.IO Deprivation Index), it is possible to identify markets that may see strong residential price appreciation.
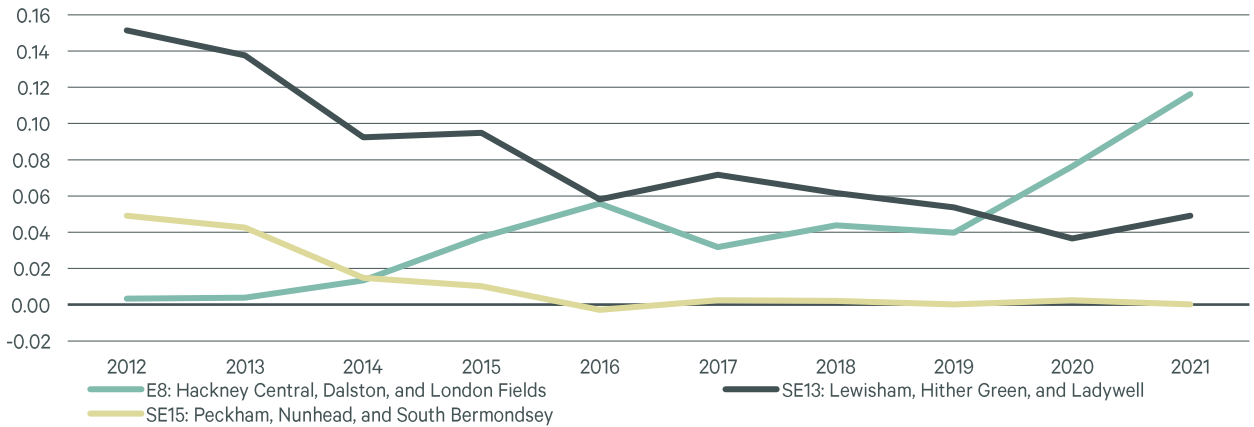
Residential price growth
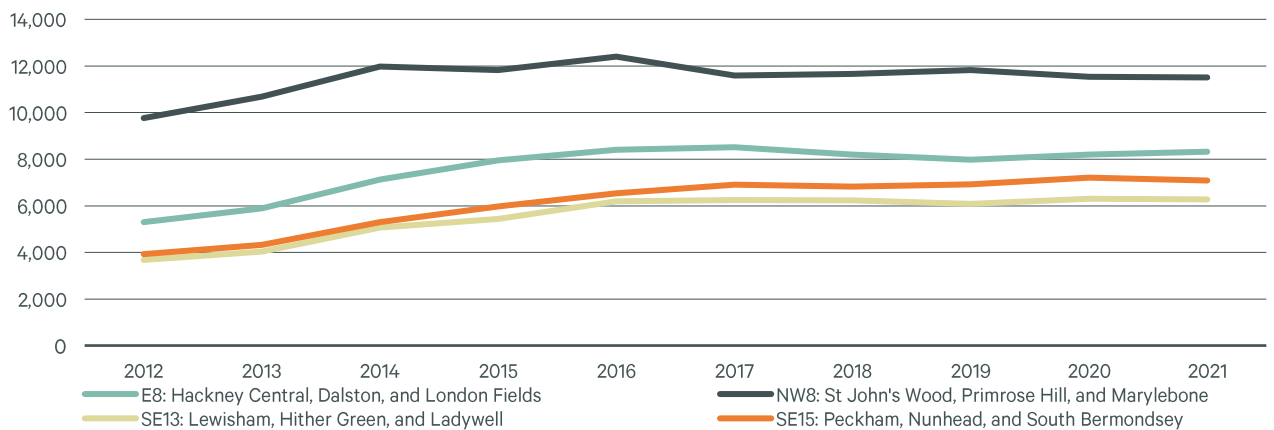2012-2021, cumulative

80%
Peckham

18%
St John's Wood

Figure 7: PLACEMAKE.IO Residential Local Price Regularity Index

Source: PLACEMAKE.IO, HM Land Registry, EPC Register.

### Figure 8: PLACEMAKE.IO Residential Price Index, £ per sqm

Source: PLACEMAKE.IO, HM Land Registry, EPC Register.

Just as the PLACEMAKE.IO Residential Local Price Regularity Index characterizes the stability of residential prices, the PLACEMAKE.IO Residential Local Rent Regularity Index characterizes (based on Zoopla rental listings) the stability of residential rents and is a leading indicator of gentrification in the rental market. Comparing the two shows that, in general, the stabler the sales market, the stabler the rental market. But the one market may be more dynamic than the other, with each place (such as Walthamstow) far above the diagonal exhibiting unexpectedly greater dynamism in the sales market than in the rental market and each place (such as White City) far below the diagonal exhibiting unexpectedly greater dynamism in the rental market than in the sales market. Such disparities mean that depending on the place, one strategy (such as build-to-rent) may be more advantageous than another (such as build-to-sell), further illustrating that understanding market-specific dynamics is vital to developing an effective investment strategy.

Disparities mean that depending on the place, one strategy (such as build-to-rent) may be more advantageous than another (such as build-to-sell), further illustrating that understanding market-specific dynamics is vital to developing an effective investment strategy.

Figure 9: PLACEMAKE.IO Residential Regularity Indices
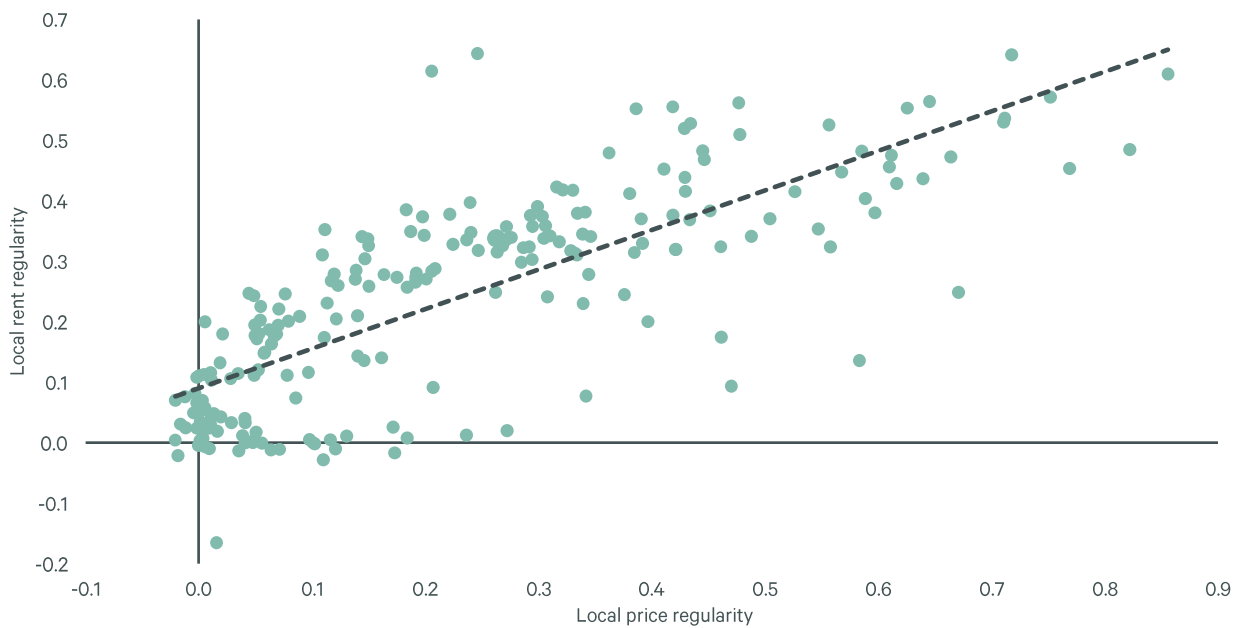
Source: PLACEMAKE.IO, HM Land Registry, EPC Register, Zoopla.

Predicting gentrification is important for reasons of equity also. By identifying gentrification early, it is possible to develop policies and strategies to target the neighborhoods in which active interventions are most needed, empower community stakeholders and local authorities, and forestall the future negative impacts (such as displacement) that often accompany neighborhood change.

Nontraditional data may harbor critical signals

Mobile data provide unprecedented visibility into aggregate mobility patterns (such as urban travel, footfall, visits, and dwell time), revealing where people visit and spend time and how they engage with places. These mobility patterns reveal evolving living patterns that are otherwise inaccessible, with significant implications for future asset use, potential, and value.

Mobile data reveal, for example, that the 10-minute station catchment around Fulham Broadway has exhibited a striking rise in localism far beyond what its west London peers have shown, indicating unique dynamics. For example, Fulham Broadway exhibited the sharpest decline with respect to the PLACEMAKE.IO-Visitor Insights Commute Distance Index (which characterizes the mean commute distance among local residents), indicating a uniquely strong desire to stay close to home.
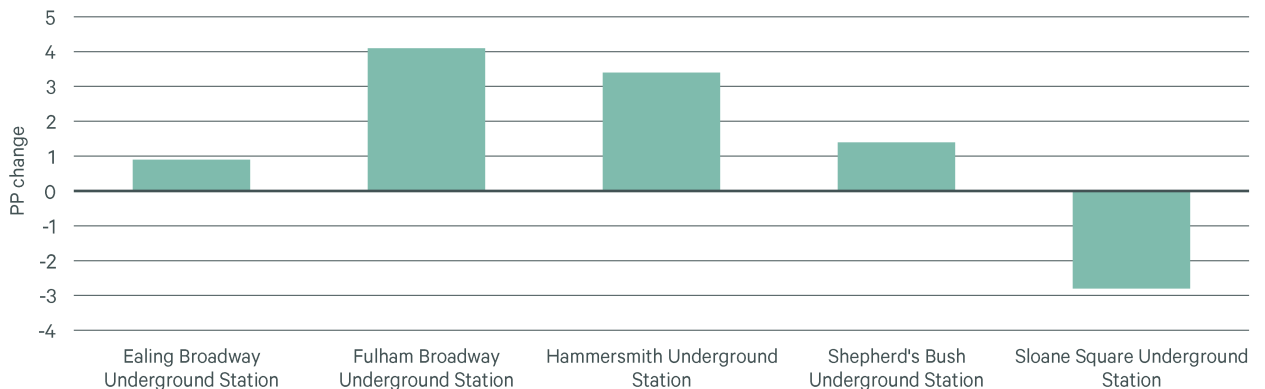
Figure 10: PLACEMAKE.IO-Visitor Insights Commute Distance Index (Q1 2019 vs Q1 2022)
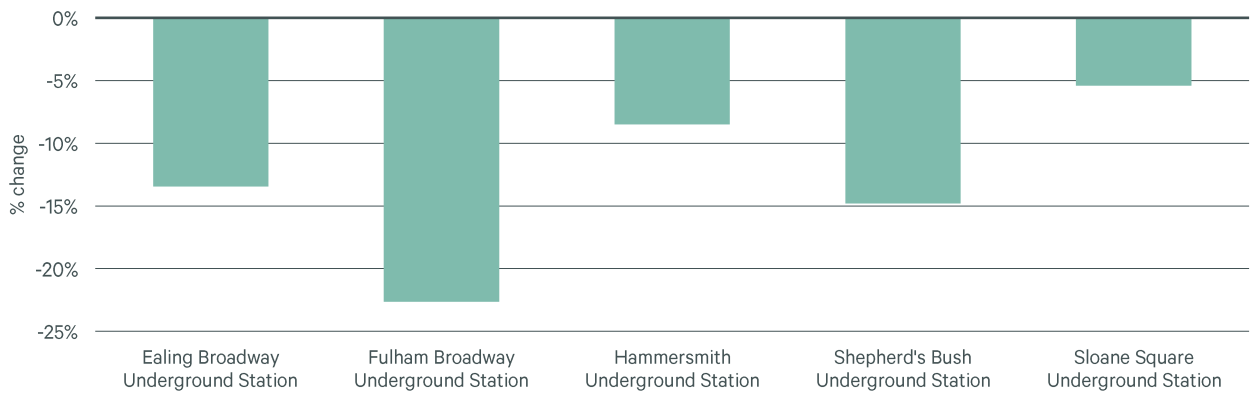
Source: PLACEMAKE.IO, Visitor Insights (all places are 10-min. catchments).

Furthermore, Fulham Broadway exhibited the sharpest increase with respect to the PLACEMAKE.IO-Visitor Insights Resident Visitor Index (which characterizes the proportion of total visits that are made by local residents as opposed to workers or nonresidents), indicating an unparalleled shift in balance toward local residents.

Figure 11: PLACEMAKE.IO-Visitor Insights Resident Visitor Index (Q1 2019 vs Q1 2022)
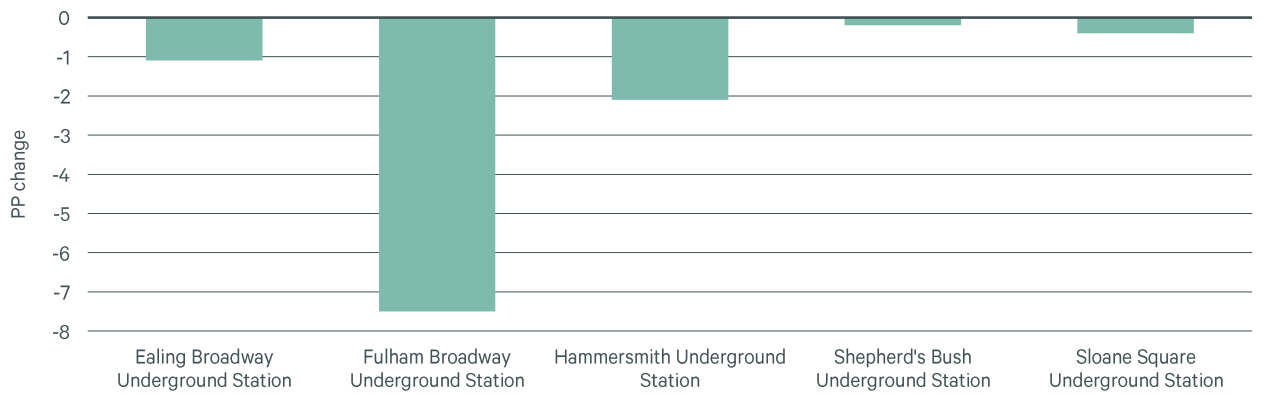

Source: PLACEMAKE.IO, Visitor Insights (all places are 10-min. catchments).

Finally, Fulham Broadway exhibited the sharpest decline with respect to the PLACEMAKE.IO-Visitor Insights Shared Visits Index (which characterizes the proportion of resident visitors to the given place who visited a competing retail center also), indicating an unparalleled shift toward local shopping. These patterns point to growing localism, increasing local engagement, and potentially sustained structural shifts that appear unique to Fulham Broadway and may portend greater resilience and lower risk of flight in the face of future shocks, trigger a reimagining of the use of spaces and more community features, and influence how the market evolves and is valued.

Examining how these patterns evolve, whether they persist over a longer horizon, and how they develop elsewhere can provide crucial insight into whether the shifts that they signify are deep and sustained and thus which interventions (such as mixed-use planning or flexible office space) would be most advantageous.

Figure 12: PLACEMAKE.IO-Visitor Insights Shared Visits Index (Q1 2019 vs Q1 2022)

Source: PLACEMAKE.IO, Visitor Insights (all places are 10-min. catchments).

Nontraditional data support social impact investment

The Indices of Deprivation are the official measures of impoverishment with respect to income, employment, health, education, crime, housing and local services, and living environment[3]. In characterizing the lack or underprovision of certain resources (such as housing), the Indices of Deprivation effectively quantify the demand for such resources and the potential for revitalization. In addition, deprivation (especially when combined with other measures such as urban social diversity) has been found to be a powerful predictor of gentrification[4]. Applying a novel spatial transformation based on the distribution of residential stock enables calculation of deprivation for the full range of place types, including station catchments. But to understand market dynamics, it is critical to understand not only market demand, but also market supply, which directly drives market dynamics (such as absorption, performance, risk, and potential). Juxtaposing the PLACEMAKE.IO Housing and Services Deprivation Index (which characterizes physical and financial barriers to housing and local services) and the PLACEMAKE.IO-Barbour ABI Residential Construction Starts Index (which characterizes the number of residential properties being or due to be started relative to existing residential stock) reveals several key insights.

Figure 13: Deprivation and construction starts
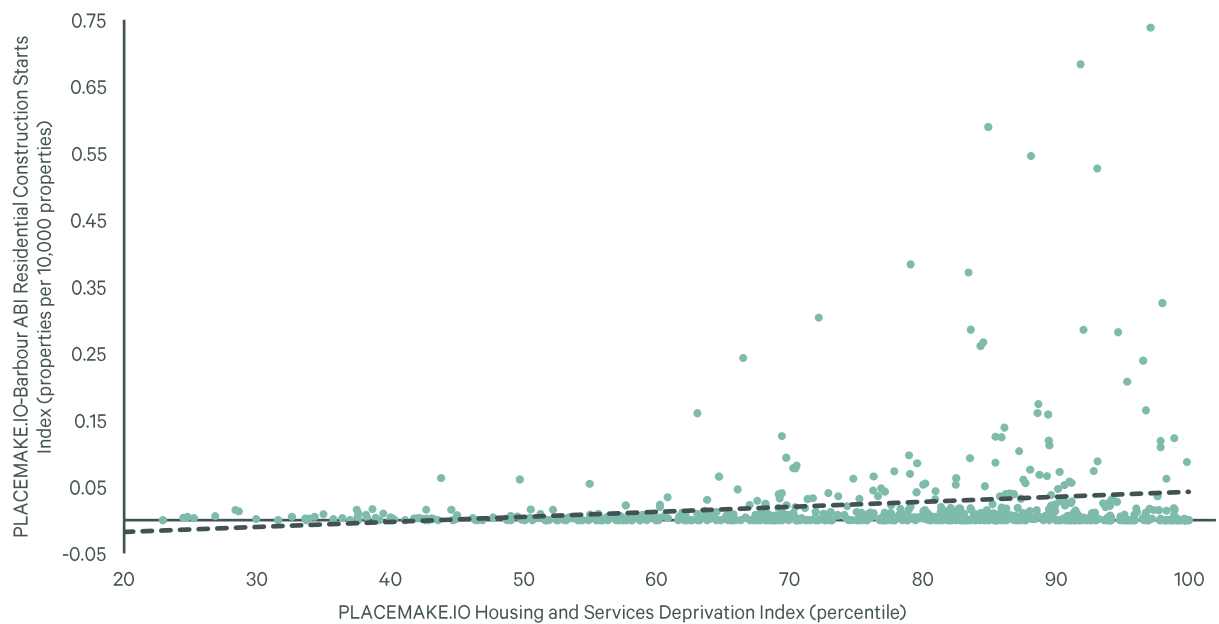
Source: PLACEMAKE.IO, MHCLG, VOA, Barbour ABI.

In general, the greater the housing and services deprivation, the greater the volume of residential construction starts (indicating the addressing of need) and the greater the variability of residential construction starts (indicating greater discretion, availability of development opportunities, and other construction decision factors). The sophisticated strategy targets the demand-supply imbalances in the lower righthand corner, as these places stand to benefit more from residential development (as the existing demand is greater) while enjoying a lower risk of oversaturation (as the incoming supply is lower).

> In general, the greater the housing and services deprivation, the greater the volume of residential construction starts and the greater the variability of residential construction starts.

New insights bringing many benefits

These examples clearly illustrate how novel place types, novel analytical techniques, and nontraditional data can generate powerful insights at unprecedented granularity, reveal critical signals (such as arbitrage opportunities, future price and volatility trends, and demand-supply imbalances) that are otherwise inaccessible. Assets that appear essentially identical or markets that appear homogeneous through the analysis of traditional metrics can often look very different in terms of nontraditional metrics. The heterogeneous nature of real estate assets can now be better captured.

Using new techniques and data is not without risk, traditional approaches and metrics should not suddenly be discarded, intuition cannot be completely replaced, and caution must be exercised to avoid acting upon spurious signals. However, as novel techniques and nontraditional data are adopted appropriately, they have the potential to create wide-ranging investment advantages such as optimized capital allocation, superior asset positioning, maximized returns, and minimized risk.

We believe that this type of analysis will increasingly be seen as a vital supplement to current research and underwriting processes and in time will constitute elements of valuation practices. It has the potential to enhance and streamline investment decision making by enabling the generation of actionable insights in a fraction of the time that is traditionally required. It also stands to benefit communities, by enabling investments to be tailored to address need and underprovision of resources, optimize the quantity, mix, and quality of community features, promote the most efficient use of the built environment, and maximize positive social impact.

> We believe that this type of analysis will increasingly be seen as a vital supplement to current research and underwriting processes and in time will constitute elements of valuation practices.

Sources

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