Political Symbols and Urban Amenities: The Spatial Logic of Flag Placement in Istanbul

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May 6, 2026

Abstract

This article examines the spatial logic of political visibility in Istanbul by asking where parties place visible campaign symbols and what those placement decisions reveal about electoral strategy, organizational capacity, and the use of urban space. Drawing on 748,783 Google Street View panoramas collected during election months and the immediately preceding months, we construct a citywide dataset of political and national symbols across Istanbul's 39 districts and 1,009 precincts. We combine these images with district level electoral returns, demographic indicators, and an original geocoded amenities database containing 75,984 unique amenities, including 61,060 general amenities, 14,848 IETT bus stops, and 266 rail stations after deduplication. The results show that political symbols are concentrated in amenity rich and publicly visible urban environments. A one standard deviation increase in the total number of amenities within 250 meters is associated with a 36.1 percent increase in expected party symbol counts ($IRR = 1.361, p = .007$). Proximity to everyday commercial and service activity is especially important: greater distance from the nearest commercial amenity is associated with substantially lower expected symbol counts ($IRR = .535, p < .001$). Electoral context also shapes the value of visibility. In competitive districts, high exposure amenities are associated with a 51.4 percent increase in expected party symbol counts ($IRR = 1.514, p < .001$). By contrast, party specific sorting into theoretically expected amenity environments is more limited once panorama fixed effects are included. To our knowledge, this is the largest spatial dataset yet assembled to analyze the relationship between urban amenities and political symbols. More broadly, the study contributes to research on symbolic politics, urban political geography, campaign communication, and computational social science by showing how the streetscape itself can serve as a measurable record of political competition.

Keywords: political symbols; urban politics; political communication; electoral geography; Istanbul; street-level imagery; computer vision; spatial analysis

1 Introduction

In Istanbul, elections are fought not only through speeches, television appearances, and party manifestos, but also through the visual occupation of public space. During campaign season, party

pennants are strung between apartment buildings, banners are draped across storefronts, and leader portraits appear on facades, intersections, and commercial corridors. By morning, entire streets can appear politically claimed. In a city where conflicts over public space have long carried ideological meaning, these displays are more than campaign decoration. They are public assertions of presence, territorial reach, and organizational strength (Baykan and Hatuka, 2010; Esen and Gümüşcü, 2016).

This article asks a straightforward but important question: where do parties choose to place visible political symbols, and what do those placement decisions reveal about electoral strategy and voting patterns? A large literature shows that symbols matter in politics. Classic work treats political life as inseparable from symbolic contestation (Edelman, 1964). More recent research shows that campaign communication tends to have limited average persuasive effects, but visible campaign materials can still matter at the margin. Field experimental evidence suggests that campaign contact in general elections usually produces small average effects (Kalla and Broockman, 2018), while randomized studies of lawn signs find modest but detectable gains in vote share and little evidence of meaningful turnout effects (Green et al., 2016). Even so, political science still knows much more about what parties say than about where they choose to be seen.

That gap is especially consequential in Turkey. Turkish party politics is highly centralized, sharply polarized, and deeply shaped by symbolic struggles over public space. In this setting, flags and banners are not simply cheap campaign materials. They are visible traces of local organization, financing, and territorial ambition. A party that saturates a corridor with symbols is not only trying to persuade undecided voters one at a time. It is also signaling strength, normalizing its local presence, energizing supporters, and projecting the impression that a neighborhood belongs, or ought to belong, to its political camp. By the same logic, the absence of symbols in an electorally promising area may reveal strategic caution, weak organization, or low expectations about local returns (Esen and Gümüşcü, 2016; Baykan and Somer, 2022).

This article brings together the growing literature on street level imagery and computational social science with the study of elections. Research using Google Street View and related visual data has shown that computer vision can recover neighborhood level patterns in income, racial composition, education, urban change, and perceived safety at very large scale (Gebru et al., 2017; Naik et al., 2014; Cinnamon and Jahiu, 2021). Building on that insight, we use 748,783 Google Street View panoramas collected during election months and the immediately preceding months in Istanbul to detect and geolocate political symbols across the city. We then combine these detections with district level electoral returns and a citywide amenities database that includes public transportation nodes, commercial and service amenities, civic institutions, community spaces, and other urban features. This design allows us to analyze political symbolism not only as a count of visible campaign materials, but as a spatial relationship between partisan display, electoral context, and the everyday infrastructure of urban life.[1]

The article makes three contributions. First, it shifts the study of campaign communication away from messages alone and toward the spatial organization of visibility. Second, it shows how urban political symbolism can be measured systematically rather than discussed only interpretively. Third, it offers a framework for studying electoral competition in settings where symbolic domination of public space is itself part of the struggle for power. Istanbul is an especially useful setting for this inquiry because permissive campaign display practices and intense partisan competition repeatedly turn the city into a visual battlefield. More broadly, the framework is portable to other democracies

[1]The analysis uses all panoramas available in the relevant election and pre election months. Because Google Street View coverage is temporally uneven, usable coverage is substantially denser for more recent elections than for earlier contests.

and hybrid regimes in which parties compete not only to win votes, but also to shape what citizens encounter in everyday political life.

The argument of the article is not that each additional flag operates as a discrete and isolated causal treatment. Rather, we treat observed symbol placement as a revealed indicator of localized strategy, organizational capacity, and partisan investment in visibility. In that sense, the geography of flags provides a measurable external trace of the ground game that parties build on the street. By tracing where symbols cluster, which urban corridors they target, and how their distribution relates to electoral and urban context, the article identifies the spatial logic of symbolic campaigning in one of the world's most politically contested megacities. Figure 1 shows the thirty nine districts of Istanbul included in the analysis and situates the spatial scope of the study within the metropolitan area.

Empirically, the study combines 748,783 Google Street View panoramas from Istanbul's thirty nine districts with district level election returns and a citywide database of 75,984 unique amenities, including 61,060 general amenities, 14,848 IETT bus stops, and 266 rail stations after deduplication. The results point to three main patterns. First, political symbols are more common in amenity dense and publicly visible urban environments. A one standard deviation increase in the total number of amenities within 250 meters is associated with a 36.1 percent increase in expected party symbol counts ($IRR = 1.361, p = .007$). Second, party specific amenity sorting is more limited. Once panorama fixed effects are included, CHP, AKP, and MHP symbols do not consistently sort into the amenity environments predicted by their social coalitions, while HDP visibility is more strongly associated with Kurdish aligned electoral strength. Third, electoral context shapes the value of visibility. In competitive districts, high exposure amenities are associated with a 51.4 percent increase in expected party symbol counts ($IRR = 1.514, p < .001$), suggesting that visible urban nodes become especially important where electoral returns are plausibly higher.

To our knowledge, this is the largest spatial dataset yet assembled to study the relationship between urban amenities and political symbols. By combining hundreds of thousands of panoramas, tens of thousands of geocoded amenities, detected political and national symbols, and district election returns, the article provides a new quantitative foundation for studying how parties occupy, target, and symbolically claim public space.

2 The Spatial Logic of Political Visibility

This article sits at the intersection of four literatures: symbolic politics, public space, campaign communication, and urban visibility. Existing work shows that political symbols matter because they condense ideological meaning into forms that are immediate, emotional, and publicly legible. Edelman's classic formulation of politics as a contest over symbols remains foundational here (Edelman, 1964), and later work in visual politics argues that images, emblems, and repeated visual cues help structure political judgment, group attachment, and the boundaries of belonging (Brighenti, 2007; Schill, 2012; Grabe and Bucy, 2009; Bleiker, 2018). In polarized settings, these visual markers do more than communicate preferences. They stake claims about who belongs in a place and which political identity appears dominant there.

That broader point is especially important in Turkey, where symbolic struggles over public space have long been politically consequential. Your earlier paper rightly emphasizes that Istanbul is not simply a backdrop for electoral competition but a city in which public space itself has been repeatedly politicized through monuments, squares, mosques, flags, and mass gatherings. Work on Taksim Square shows that political claims over urban space are also claims over collective memory



Figure 1: Districts of Istanbul included in the analysis are shown in color. Neighboring districts that are not part of Istanbul are also shown in the legend.

and civic identity (Baykan and Hatuka, 2010), while research on contemporary Turkey underscores how polarization, clientelism, and centralized party organization shape the public display of political allegiance (Esen and Gümüşcü, 2016; Baykan and Somer, 2022). More broadly, scholarship on public space emphasizes that visibility is tied to recognition, contestation, and democratic claim-making (Mitchell, 1995). In that setting, flag placement should not be treated as decorative noise. It is better understood as a street-level manifestation of organized political power.

A second literature concerns the electoral effects of visible campaign materials. The strongest conclusion from this work is not that campaign exposure is overwhelmingly powerful, but that it can matter at the margin. Kalla and Broockman show that average persuasive effects of campaign contact are generally modest (Kalla and Broockman, 2018), and related work on political advertising reaches a similar conclusion (Coppock et al., 2020). Yet studies of lawn signs and local campaign presence suggest that visible, repeated cues in everyday environments can still shape vote choice or reinforce support under some conditions (Green et al., 2016; Makse and Sokhey, 2014; Panagopoulos, 2009; Tansella and Perrella, 2017; Maurice et al., 2023). This literature is useful for the present study because it shifts attention away from one-shot persuasion and toward ambient exposure. Citizens do not encounter campaign symbols only when they deliberately seek political information. They encounter them while walking to school, waiting for a bus, shopping, or crossing a commercial corridor. Your earlier paper uses this logic to argue that visible symbol density is a measurable proxy for organizational capacity and ground game. The present article extends that logic by asking not just whether density matters, but where parties choose to create it.

A third literature comes from urban studies and spatial behavior. Research on pedestrian movement and the built environment shows that human circulation is not random. Hillier and colleagues

argue that street configuration structures movement flows (Hillier et al., 1993), while Ewing and Cervero's meta-analysis shows that accessibility to destinations and network design are among the strongest built-environment predictors of travel behavior (Ewing and Cervero, 2010). Jan Gehl's work similarly emphasizes that public life concentrates where streets, destinations, and lingering opportunities bring people together (Gehl, 2011). Related work shows that destinations within walking distance, transport catchment design, and movement corridors shape where pedestrians actually go in everyday life (King et al., 2015; Gunn et al., 2017; Pais et al., 2025; Hasan et al., 2013; Porta et al., 2006). This matters for political symbol placement because visibility is not only a property of the object itself. It is also a property of where that object is placed within a movement system. A flag placed near a major transit stop, retail corridor, school, plaza, ferry terminal, or high-traffic intersection is more likely to be seen repeatedly by large numbers of people than an identical flag placed on a quiet back street.

This insight leads directly to the role of amenities and urban highlights. Amenities matter politically because they anchor everyday routines. Schools, hospitals, pharmacies, restaurants, cafés, markets, places of worship, bus stops, rail stations, and major commercial nodes generate repeated pedestrian exposure and organize patterns of neighborhood movement. They also often sit at visually prominent locations, including corners, arterials, transport interchanges, and mixed-use corridors. If parties are strategic actors, they should not distribute symbols uniformly across urban space. They should prefer locations where daily activity is dense, where lines of sight are long, and where displays can be seen by multiple audiences over the course of the day. This is precisely the intuition behind the amenity-based design in the current draft, which treats transit nodes, retail clusters, schools, and other everyday destinations as focal points for incidental political exposure.

The descriptive evidence in the current project is already consistent with this view. The new paper's distance dataset shows that Istanbul's political and national symbols are unevenly distributed across urban functions, with visible concentration near commercial, educational, and mobility-related nodes. It identifies especially dense symbol environments around food and dining amenities, education-related sites, and public transportation infrastructure, and it frames the empirical analysis around whether parties target places where movement and sightlines generate incidental exposure. The draft also highlights specific high-density examples around a community health center and a commercial venue, both located along major transport corridors and dense commercial areas. These patterns suggest that amenities are not merely contextual controls. They are part of the mechanism through which visibility becomes politically valuable.

A fourth literature concerns images as data. Work using Google Street View has shown that street-level imagery can recover neighborhood characteristics at scale, including income, education, perceived safety, and physical change over time (Gebru et al., 2017; Naik et al., 2014, 2017; Cinnamon and Jahiu, 2021; Biljecki et al., 2021). The contribution of this literature is methodological but also conceptual. It treats the visual field of the city as a measurable social environment rather than as anecdotal texture. In political science, recent work has shown how computer vision can be used to classify visual information, code campaign videos, and extend images-as-data research into substantively meaningful political domains (Torres and Cantú, 2022; Tarr et al., 2023). Your previous paper used this approach to build a citywide measure of partisan visibility and relate it to vote share. The present paper builds on that foundation by shifting the dependent variable from symbolic density alone to symbolic placement. That shift is important because placement is where urban theory and political strategy meet. It allows the analysis to ask whether parties prefer the places that structure movement, attention, and repeated contact in daily life.

These literatures suggest a simple but underexplored proposition: parties should place flags and

other political symbols where visibility yields the highest social return. In practice, that means not just strongholds or party offices, but also the urban highlights that organize circulation and attention. Amenities matter because they are where people go. Corridors matter because they are how people get there. Intersections and plazas matter because they multiply sightlines and encounters. Existing work on symbolic politics explains why these displays matter, and urban research explains why some locations are more valuable than others. What remains missing is a large-scale empirical test of whether parties actually behave in that way. This article provides that test by linking the geography of political symbols in Istanbul to the geography of the city's amenities, corridors, and everyday activity nodes.

3 Research Questions and Hypotheses

This article studies where parties in Istanbul choose to place highly visible street-level symbols, especially flags and banners, during election periods. We treat placement as a strategic decision rather than a random byproduct of campaign enthusiasm. In a dense urban environment, parties must decide which locations are worth occupying, which audiences they want to reach, and how to convert visibility into political advantage. These decisions are shaped by at least three considerations. First, some locations generate more incidental exposure than others because they sit along corridors of pedestrian movement, near major amenities, or at nodes with long sightlines. Second, political symbols do not simply inform. They also signal presence, territorial reach, and local organizational strength. Third, parties operate under electoral and organizational constraints that push them to allocate limited campaign resources unevenly across strongholds, contested areas, and socially distinct neighborhoods. The questions below bring together work on visibility and public display (Brighenti, 2007), pedestrian movement and spatial integration (Hillier et al., 1993; Ewing and Cervero, 2010; Gehl, 2011), campaign persuasion and political signage (Kalla and Broockman, 2018; Coppock et al., 2020; Green et al., 2016; Makse and Sokhey, 2014), resource targeting and electoral geography (Cox and McCubbins, 1986; Dixit and Londregan, 1996; Shaw, 2006), and Turkish party competition and cleavage structure. We also situate the project in the literature that uses large-scale imagery to study urban and political environments (Gebru et al., 2017; Naik et al., 2014; Biljecki et al., 2021; Torres and Cantú, 2022).

RQ1: Which amenity environments are most likely to attract political symbols?

The first question asks whether parties systematically place political symbols in urban microenvironments that maximize routine visibility. A long tradition in urban studies argues that movement through cities is shaped both by spatial configuration and by the distribution of destinations. Space-syntax research shows that some streets naturally attract more through-movement than others, while later work links walking and travel behavior to density, destination accessibility, and land-use mix (Hillier et al., 1993; Ewing and Cervero, 2010; Hajrasouliha and Yin, 2015). Research on public visibility further suggests that what matters politically is not only whether people move through a place, but whether a place repeatedly organizes co-presence, attention, and mutual observation (Brighenti, 2007). Studies of lively streets and urban vitality make a similar point from a different angle: commercial frontage, mixed uses, and neighborhood destinations increase lingering, sociability, and everyday exposure (Montgomery, 1998; Mehta, 2007). Because our data link each

observed symbol to nearby amenities and their distances, we can translate these broader arguments into directly testable expectations about transit access, commercial intensity, civic anchors, community gathering sites, amenity density, and land-use diversity.

H1a. Are political symbols especially common near transit and mobility nodes?
Political symbols should be especially common near transit and mobility infrastructure, including IETT bus stops, bus stations, railway stations, ferry terminals, taxi points, parking lots, parking entrances, ticket validators, and bicycle-related transport amenities, because these are locations where large numbers of people repeatedly pass by, wait, and change direction. This expectation is consistent with research showing that transit use is closely tied to the pedestrian environment around stops and stations, and that destinations connected to transit generate routine street-level exposure (Ewing and Cervero, 2010; Ryan and Frank, 2009). We examine this expectation through the distance from each symbol to the nearest transit or mobility amenity, the number of such amenities within buffers such as 50, 100, and 250 meters, and whether the symbol lies within short walking distance of at least one major mobility node.

H1b. Do political symbols cluster near everyday commercial and service amenities?
Political symbols should also cluster near everyday commercial and service amenities, such as restaurants, cafés, fast-food establishments, bars, pubs, pharmacies, banks, ATMs, marketplaces, food courts, and bureau de change locations, because these sites generate routine foot traffic, lingering, and repeated visual exposure across the day. Research on lively commercial streets emphasizes that retail and service clusters increase both pedestrian presence and stationary social activity, making them especially valuable settings for public visibility (Montgomery, 1998; Mehta, 2007). We assess this expectation by measuring the distance from each symbol to the nearest commercial or service amenity, the number of such amenities within local buffers, and the extent to which symbols are located near several distinct commercial categories rather than only one.

H1c. Are political symbols more likely to appear near civic and institutional anchors?
Political symbols should be more likely to appear near civic and institutional amenities, including schools, kindergartens, universities, hospitals, clinics, post offices, libraries, police facilities, courthouses, town halls, and fire stations, because these are durable neighborhood anchors that generate repeated and socially meaningful flows of people. Work on social infrastructure highlights that public institutions help stabilize everyday urban encounters and organize the public life of neighborhoods even when they are not always recognized as classic political spaces (Latham and Layton, 2019). We evaluate this expectation by measuring the distance from each symbol to the nearest civic or institutional amenity and by counting how many educational, governmental, health, and public-safety amenities fall within 100- and 250-meter radii of the symbol.

H1d. Are political symbols especially prevalent near congregational and community nodes?
Political symbols should be especially prevalent near amenities that bring together stable local audiences, above all places of worship, community centers, cultural centers, social facilities, and marketplaces, because these locations function as recurring nodes of neigh-

borhood visibility and collective attention. This expectation follows from work treating visibility as a socially organized field and from research showing that community-oriented spaces serve as important elements of urban public life and local social infrastructure (Brighenti, 2007; Latham and Layton, 2019). We examine this by measuring whether a symbol is located close to at least one congregation-oriented amenity, by recording the distance to the nearest such site, and by counting how many community-oriented amenities are present within a short surrounding radius.

H1e. **Are political symbols concentrated in amenity-dense micro-environments?**
More generally, political symbols should be concentrated in amenity-dense micro-environments rather than isolated ones, because dense local clusters increase the number of potential viewers and the frequency of incidental encounters. This expectation is in line with arguments that urban vitality emerges where activities and destinations are concentrated, as well as with evidence that built-environment intensity is associated with greater pedestrian movement (Ewing and Cervero, 2010; Montgomery, 1998). We assess this by counting the total number of amenities of any kind that fall within 50, 100, 250, and 500 meters of each symbol and by asking whether symbols are disproportionately concentrated in locations with high overall amenity counts.

H1f. **Are political symbols more common in mixed-use environments with diverse nearby amenities?**
Political symbols should be more common in mixed-use settings characterized by a wider variety of nearby amenity types, because environments that combine mobility, commerce, public institutions, and community functions sustain visibility across different times of day and across different segments of the urban population. Research on land-use mix and lively streets suggests that mixed-use environments support more continuous and heterogeneous patterns of everyday activity than single-purpose spaces (Ewing and Cervero, 2010; Montgomery, 1998; Mehta, 2007). We examine this by calculating the number of distinct amenity categories surrounding each symbol within fixed buffers and by constructing a local amenity-diversity measure, such as a simple category count or a Shannon index.

RQ2: Do parties target different amenity environments in ways that reflect their social coalitions?

The second question links placement strategy to party constituencies. Research on Turkish party competition suggests that parties differ not only along a general ideological spectrum, but across durable cleavages involving secularism and religiosity, conservatism, nationalism, and the Kurdish question (Çelik and Balta, 2020). If visible symbols are strategically placed, then parties should not merely differ in how many symbols they display. They should also differ in the kinds of urban amenity environments they choose to occupy. Because the present amenity file directly records nearby amenities but does not directly measure neighborhood education, class, or ethnicity at the symbol level, we translate these coalition differences into amenity-based proxies that can be observed for every symbol. Party identity comes from the predicted_class variable, and local urban context comes from the parsed amenities field. For each symbol, the relevant environment can be described through the type of the nearest relevant amenity, the number of relevant amenities within 100- and

250-meter buffers, and the share of all nearby amenities belonging to broader amenity families. To avoid overinterpreting sparse categories, the main analysis should group rare amenities into broader families rather than estimate each low-frequency amenity separately.

H2a. **Does the CHP target secular-professional and cosmopolitan amenity environments more heavily?**
If CHP symbol placement reflects the party's stronger association with secular, urban, and relatively educated constituencies, then CHP symbols should be disproportionately located near amenities associated with professional, cultural, and leisure-oriented urban life. In the current file, this environment can be represented by an amenity family that includes universities, colleges, libraries, cultural centers, art centers, theatres, cinemas, cafés, bars, pubs, co-working spaces, and restaurant clusters. Because the dataset does not directly observe highly educated professional neighborhoods, the hypothesis is stated in terms of observable amenities rather than resident composition. The expectation is that CHP symbols will be closer to these amenities, will have more of them within 100 and 250 meters, and will have a larger share of nearby amenities drawn from this family than symbols belonging to conservative or pro-government parties.

H2b. **Do the AKP and, to a lesser extent, the MHP target conservative, communal, and neighborhood-commercial amenity environments more heavily?**
If AKP and MHP symbol placement reflects more conservative, religious, nationalist, and neighborhood-based social coalitions, then their symbols should be relatively more common near amenities that organize communal life and routine neighborhood circulation (Ocaklı, 2017). In the current data, this environment can be represented by an amenity family that includes places of worship, schools, kindergartens, prep schools, marketplaces, pharmacies, clinics, hospitals, banks, ATMs, fast-food establishments, and other dense neighborhood-service amenities. The expectation is not simply that these parties appear near any one of these locations, but that their symbols are more deeply embedded in this amenity ecology overall. In practical terms, AKP and MHP symbols should be closer to the nearest worship or neighborhood-service amenity, should have higher counts of these amenities within 100 and 250 meters, and should display a larger local share of these community-oriented and neighborhood-commercial amenities than CHP symbols.

H2c. **Does the HDP target community-service and civic-access amenity environments in ways consistent with its ethnopolitical and left-pluralist coalition?**
Because the current file does not directly identify Kurdish-origin population at the micro level, this hypothesis cannot be tested through neighborhood ethnicity itself. Instead, it is reformulated in terms of observable amenity environments that are consistent with the HDP's pro-Kurdish, service-oriented, and left-pluralist urban coalition (Günay and Yörük, 2019; Kaya, 2019). In the present data, this environment can be represented by an amenity family that includes community centers, social facilities, public buildings, post offices, marketplaces, clinics, bus stations, railway stations, ferry terminals, and other amenities that link everyday service provision to neighborhood access and circulation. The hypothesis predicts that HDP symbols will be relatively more likely to appear near these community-service and civic-access nodes than near the amenity environments emphasized by the CHP or the AKP/MHP. In observable terms, HDP symbols should be closer to the nearest amenity in this family, should have higher local counts of such

amenities within 100 and 250 meters, and should exhibit a higher nearby share of these amenities, especially in districts where the broader pro-Kurdish party family is electorally stronger.

RQ3: Does amenity targeting vary across core, competitive, and hostile electoral environments?

The existing hypotheses establish that amenities matter for political visibility and that parties differ in the amenity environments they tend to occupy. A further question is whether the political value of those amenities depends on electoral context. Research on campaign allocation and electoral geography suggests that parties do not spread effort uniformly across space. Instead, they concentrate resources where expected returns are greatest, whether that means reinforcing loyal areas, competing more aggressively in marginal districts, or entering weak terrain only selectively (Cox and McCubbins, 1986; Dixit and Londregan, 1996; Johnston and Pattie, 2013; Shaw, 2006). At the same time, work on visibility and the built environment suggests that some urban locations are more valuable than others because they concentrate routine movement, co-presence, and repeated incidental exposure (Brighenti, 2007; Ewing and Cervero, 2010). In Turkey, these strategic incentives are layered onto a party system structured by durable secular–religious and nationalist–Kurdish cleavages, which gives differences across districts real electoral meaning (Ocaklı, 2017). The present dataset makes this question directly testable because each symbol can be linked to a party label, a district, a matched election context, and a local amenity profile.

Electoral environment is defined at the party–district–election level. For each symbol, party identity comes from the predicted_class variable, district from the district variable, and election context from the elex_suffix and election_month variables. Party-specific district performance comes from the relevant elex_{party}_pct field, and district environments are then classified as stronghold, competitive, or hostile according to the party's standing in that district relative to the district winner. In the main coding, strongholds are districts in which the party wins or trails the winner only narrowly, competitive districts are those in which the party remains electorally plausible but not dominant, and hostile districts are those in which it is clearly weak. Urban context is measured by parsing the amenities field and grouping observed categories into broad amenity families that correspond to the paper's theoretical mechanisms. One family captures high-exposure environments, combining transit and mobility nodes with dense everyday commercial and service amenities. A second captures community-embedded environments, including places of worship, schools, health facilities, civic institutions, and neighborhood marketplaces. A third captures mixed-use settings through local amenity density and the number of distinct nearby amenity categories. The analysis should be restricted to party symbols rather than national symbols.

H3a. Do parties prioritize high-exposure amenities more strongly in competitive districts?

In electorally competitive districts, parties should place symbols disproportionately near the highest-exposure amenities, especially transit and mobility nodes, dense everyday commercial sites, and mixed-use amenity clusters, because these locations maximize repeated incidental exposure where marginal returns to visibility are plausibly greatest (Johnston and Pattie, 2013; Shaw, 2006; Brighenti, 2007; Ewing and Cervero, 2010). In the current data, high-exposure amenities include IETT bus stops, bus stations, railway stations, ferry terminals, taxi points, parking lots, parking entrances, ticket val-

idators, bicycle-related transport amenities, restaurants, cafés, fast-food establishments, bars, pubs, food courts, pharmacies, banks, and ATMs. Competitive-district symbols should therefore be closer to transit and commercial amenities, should have more high-exposure amenities within buffers such as 100 and 250 meters, and should sit in denser, more mixed-use micro-environments than symbols placed by the same party in stronghold districts.

H3b. **Do parties rely more on community-embedded amenities in strongholds?**
In stronghold districts, parties should rely relatively more on community-embedded amenities, such as places of worship, schools, kindergartens, prep schools, universities, hospitals, clinics, town halls, post offices, libraries, community centers, cultural centers, police facilities, fire stations, courthouses, and local marketplaces, because these locations help reinforce an already favorable partisan climate and are more compatible with neighborhood-level organizational maintenance than with broad-based persuasion (Cox and McCubbins, 1986). In practical terms, stronghold symbols should be closer to the nearest community-oriented amenity, should have more such amenities within 100 and 250 meters, and should have a larger share of nearby amenities drawn from this neighborhood-oriented family than comparable symbols placed by the same party in competitive or hostile districts.

H3c. **In hostile districts, do parties retreat to especially visible or selective amenity nodes rather than dispersing symbols broadly?**
In electorally weak or hostile districts, parties should not use the full range of neighborhood settings equally. Instead, the symbols they do place should be concentrated around a narrower set of especially prominent amenities, above all transit nodes and dense commercial sites, rather than spread broadly across diverse community environments (Dixit and Londregan, 1996; Johnston and Pattie, 2013; Shaw, 2006; Ocaklı, 2017). Because the current dataset is symbol-based rather than a full citywide sample of symbol and non-symbol locations, the cleanest test concerns the composition of observed symbol environments rather than total absence. Hostile-district symbols should therefore be more dominated by high-exposure amenities, less diverse in their surrounding amenity composition, and less embedded in community-oriented amenity environments than symbols located in stronghold or competitive districts.

Across these questions, we interpret systematic differences in symbol placement as evidence of strategic uses of urban visibility rather than as purely spontaneous expressions of support. More specifically, statistically detectable differences in proximity to amenities, corridor prominence, clustering, frontier marking, and party-specific neighborhood targeting would indicate that parties treat the streetscape as a structured political resource. In that sense, the analysis speaks not only to campaign communication but also to the broader spatial logic through which parties convert public visibility into electoral and organizational advantage.

4 Prominent Forms of Visual Symbolism in Contemporary Turkish Politics

In Turkey, political communication is shaped as much by visual display as by spoken or written messages. Urban space is saturated with symbols that communicate ideological attachment, historical memory, and claims to public presence. This section reviews the most recognizable visual markers associated with Turkey's major political parties, together with the cross-partisan imagery of Mustafa Kemal Atatürk and the national flag. The focus throughout is on visual features that can later be translated into formal categories for automated detection. Figure 2 presents the canonical logos and emblematic images used in the recognition pipeline, while Figure 3 shows corresponding examples as they appear in Street View imagery.

The Justice and Development Party (Adalet ve Kalkınma Partisi, AKP) organizes its visual identity around white, orange, and blue, with orange serving as its most distinctive color. Its emblem is a glowing light bulb, typically rendered in yellow or gold against a white field. The symbol appears widely on banners, campaign materials, street decorations, and digital media. It evokes development, energy, and technological progress, while also carrying religious associations with light and illumination. The emblem thus allows the party to project modernization while maintaining symbolic continuity with a religious and cultural tradition.

The Nationalist Action Party (Milliyetçi Hareket Partisi, MHP) relies on a tightly controlled visual repertoire built around red and white. Its emblem features three white crescents, sometimes accompanied by the party initials, and draws on imagery associated with Ottoman military symbolism. The crescents signify strength, unity, and leadership, especially in relation to broader narratives of Turkic solidarity. Because the emblem has changed little over time, it reinforces an image of ideological consistency and attachment to tradition.

The Republican People's Party (Cumhuriyet Halk Partisi, CHP) centers its visual identity on one of the most recognizable emblems in Turkish politics: six white arrows radiating from a common base on a red background. Although the design sometimes appears in alternative orientations or inverted color schemes, its meaning remains stable. The arrows represent the Six Arrows of Kemalism—Reformism, Statism, Laicism, Nationalism, Populism, and Republicanism. The emblem thus links the party directly to the founding doctrine of the Republic and condenses that ideological inheritance into a compact visual form.

The Good Party (İYİ Partisi) adopts a brighter and more contemporary visual style centered on a yellow sun and the white "İYİ" logotype against a cyan background. The design partly draws on the Kayı tribal tamga and combines references to Turkic heritage with a more modern graphic vocabulary. The sun suggests renewal, clarity, and endurance, while the blue, yellow, and white palette communicates openness, optimism, and moderation. These elements help the party present itself as both nationally rooted and reform-oriented.

The Peoples' Democratic Party (Halkların Demokratik Partisi, HDP) is represented by a stylized tree whose branches end in hands holding multicolored leaves. Some versions include the party name beneath the image, whereas others present only the symbol itself. The tree conveys plurality and interconnectedness, reflecting the party's coalition of Kurdish, leftist, feminist, and environmentalist constituencies. It also invokes the symbolism of the "Tree of Life," giving the emblem a broader resonance tied to endurance, diversity, and collective flourishing.

Alongside party symbols, two forms of imagery stand above ordinary partisan competition in Turkey's visual landscape: the national flag and the image of Mustafa Kemal Atatürk. The flag, with its red field and white crescent and star, often appears alongside Atatürk's portrait, which is

frequently placed against the same red background. When combined, these two symbols fuse the Republic's founding narrative with a widely recognized sign of sovereignty and national unity. For secular audiences, this composite imagery often underscores the enduring significance of Kemalist ideals. For more conservative audiences, it can also function as a declaration of loyalty to the state and to the republican tradition. From the standpoint of computational analysis, the sharp color contrast, visual clarity, and relative consistency of these symbols also make them especially well suited to automated recognition. This distinction between idealized party symbols and their appearance in street-level contexts is illustrated by the contrast between Figure 2 and Figure 3.



Figure 2: Party symbols used for visual recognition. From left to right: National Flag, AKP, CHP, Good (İYİ) Party, HDP, and MHP.



Figure 3: Examples of corresponding Street View images.

5 Data

5.1 Istanbul Political Symbol and Party Office Dataset

Our analysis measures the visible presence of political actors in Istanbul by combining geographic information, manually annotated political symbols, and large-scale street-level imagery. Because flags, banners, and related campaign materials are most likely to appear near party infrastructure, we began by constructing a nationwide directory of political party offices in order to maximize the likelihood of observing partisan symbols in the surrounding environment. To do so, we queried all possible combinations of Turkey's 47 registered political parties across 960 districts, including provincial centers, using the Google Search API. The initial crawl returned 218,895 address records, many of which were duplicated, irrelevant, or incorrectly classified. We then retained only those records whose address strings explicitly included the relevant party name or acronym together with the corresponding district name. This filtering process produced 14,583 validated party office locations with precise latitude and longitude coordinates.

For each validated office, we generated twelve probe points arranged around a 20-meter-radius circle, using six bearings and testing each bearing at distances of 10 and 20 meters. We then queried the Google Street View API for each probe point and, whenever imagery was available, retrieved and stored the corresponding panorama metadata. This procedure identified 6,496 panoramas captured during election and pre-election months, when campaign activity is most intense, as well as 379,158 panoramas located around party offices. From these images, we manually annotated 18,035 political symbols, including flags, banners, and logos, using Roboflow. Inter-annotator reliability checks indicate a high level of coding consistency, exceeding Fleiss' $\kappa = 0.82$. The resulting corpus is, to our knowledge, the largest and most rigorously validated visual dataset of Turkish political symbols currently available.

5.2 Istanbul Street View Panorama Archive

To measure the spatial distribution of political symbols across Istanbul's built environment, we assembled a large-scale, citywide corpus of Street View panoramas using the Google Maps Street View API. To ensure systematic and spatially consistent coverage, we overlaid a 20 m $\times$ 20 m grid on the Istanbul Province polygon obtained from the Turkish General Directorate of Mapping. Street View metadata were then queried for the centroid of each grid cell, yielding more than 4.68 million candidate panorama locations. We restricted the analytic sample to panoramas captured during election months and the immediately preceding months for both local and general elections, producing a final dataset of 748,783 panoramas. Each panorama was recorded with its permanent panorama ID, latitude–longitude coordinates, and full $360°/180°$ image coverage. Data collection was conducted over approximately six months of continuous processing on a 2019 MacBook Pro and generated roughly 4 TB of image data. Although Street View offers an unusually broad and replicable source of urban visual data, its coverage is not complete. Pedestrian-only areas and restricted zones, including military facilities and gated communities, are often missing, and image refresh timing varies across neighborhoods. Even with these limitations, Street View remains the most comprehensive and reproducible platform currently available for large-scale visual political research.

To connect these images to Istanbul's electoral and demographic geography, we merged the panorama data with fine-grained administrative and socioeconomic information. Polygon boundaries for all 1,009 precincts (mahalle) were obtained from the Istanbul Metropolitan Municipality

Open Data Portal and imported into GeoPandas. Socioeconomic indicators, including population, household income, and the distribution of educational attainment, were drawn from the Turkish Statistical Institute (TÜİK, 2022). After cleaning and projecting all spatial layers to Web Mercator (EPSG 3857), we joined precinct polygons to the demographic data and constructed a unified GeoDataFrame suitable for spatial aggregation and regression at both the precinct and district levels. Each record includes administrative identifiers, infrastructure proxies such as dwelling units, workplaces, banks, and ATMs, spatial attributes including area, centroid, and bounding box, and detailed demographic measures by gender, age, and education.

5.3 Urban Contextualization of Political Symbols

To place political symbol placement in its broader urban setting, we constructed an original contextual dataset that links each panorama containing detected symbols to nearby amenities, transportation nodes, and electoral characteristics. The goal is not simply to record where symbols appear, but to situate those locations within the physical and political geography of Istanbul.

The first component is an amenities file built from OpenStreetMap (OSM). This file provides a detailed inventory of identifiable urban features across Istanbul, including parking facilities, pharmacies, schools, mosques, banks, and many other categories of infrastructure and public services. For every panorama in which political symbols were detected, we identified all OSM-coded amenities located within a one-kilometer radius. Each record includes the amenity's unique OSM identifier, its category, and its exact distance from the panorama in meters. Entries such as {`parkinga00191: 132.78 m, policestation005: 284.63 m`} therefore capture both spatial proximity and the functional composition of the surrounding urban environment.

The second component consists of IETT bus stops and railway stations, which represent Istanbul's principal forms of public transportation. For each panorama, the dataset records all IETT bus stops and rail stations within a one-kilometer buffer. Each record includes the identifier of the stop or station together with its straight-line distance from the panorama, for example {`stop_id: 364, distance: 158 m`} for bus stops and {`station_name: Aydıntepe, distance: 567 m`} for rail stations. To avoid inflated counts, duplicate and overlapping transport features were removed so that each stop or station appears only once per district.

The third component brings in district-level election results. Each panorama was matched to the nearest election month based on its timestamp, for example matching `pano_date = Mar-14` to `election_month = 2014-03`, and then assigned to the appropriate administrative district. This procedure allowed the full set of electoral measures, including party vote shares, turnout, and total ballots cast, to be merged into the master file. As a result, the dataset directly links the spatial distribution of political symbols to local electoral performance, making it possible to examine both statistical and spatial relationships across Istanbul's 39 districts.

This dataset provides a fine-grained account of how political visibility is embedded in Istanbul's urban and electoral landscape. By linking symbol-bearing panoramas to nearby amenities, transportation infrastructure, and district-level election returns, it creates the empirical foundation for analyzing how spatial propaganda relates to the city's material organization and to local patterns of political competition.

5.4 Descriptive Overview of Amenities, Political and National Symbols

As shown in Figure 4, the maps provide a citywide view of the spatial distribution of national and political symbols across Istanbul's 39 districts. The upper panel displays national symbols, specifically Atatürk portraits and Turkish flags, which are concentrated primarily along the southern and central parts of the metropolitan area, especially in coastal and densely urbanized districts. The lower panel presents the distribution of political party symbols, including major parties such as AKP, CHP, MHP, and İYİ, as well as smaller parties such as DEVA, SAADET, and Gelecek. These symbols also cluster in the metropolitan core, although their relative densities vary across districts in ways that are consistent with differences in local partisan presence and organizational activity. At the same time, the absence of symbols across large portions of the city should not be interpreted straightforwardly as evidence of true political absence. Rather, it reflects in part the uneven availability of Google Street View imagery during election and pre election months, which creates substantial spatial missingness in some districts and neighborhoods. Both maps use a consistent topographic basemap, district boundaries, north arrows, and 10 km scale bars to facilitate spatial interpretation.

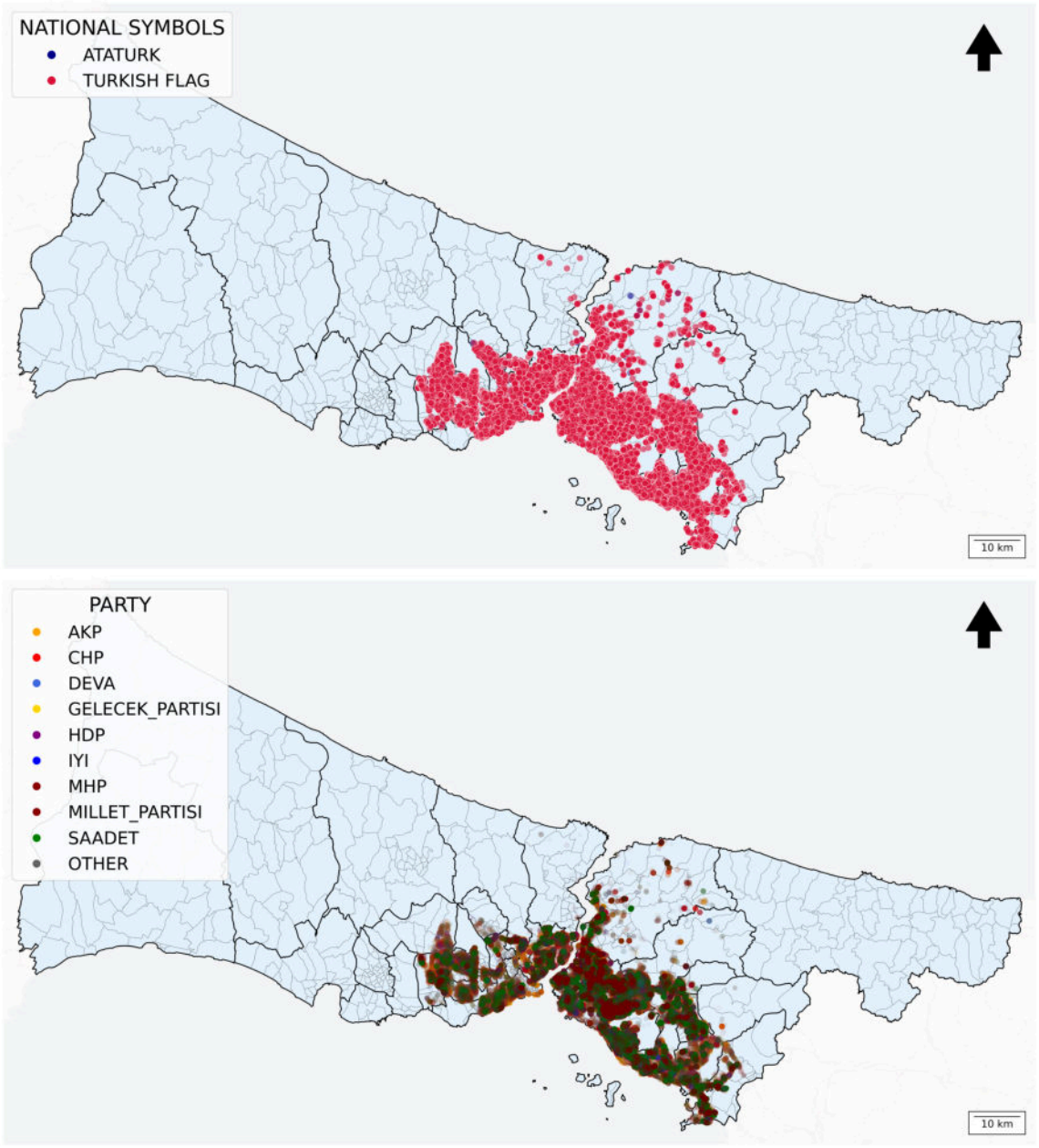
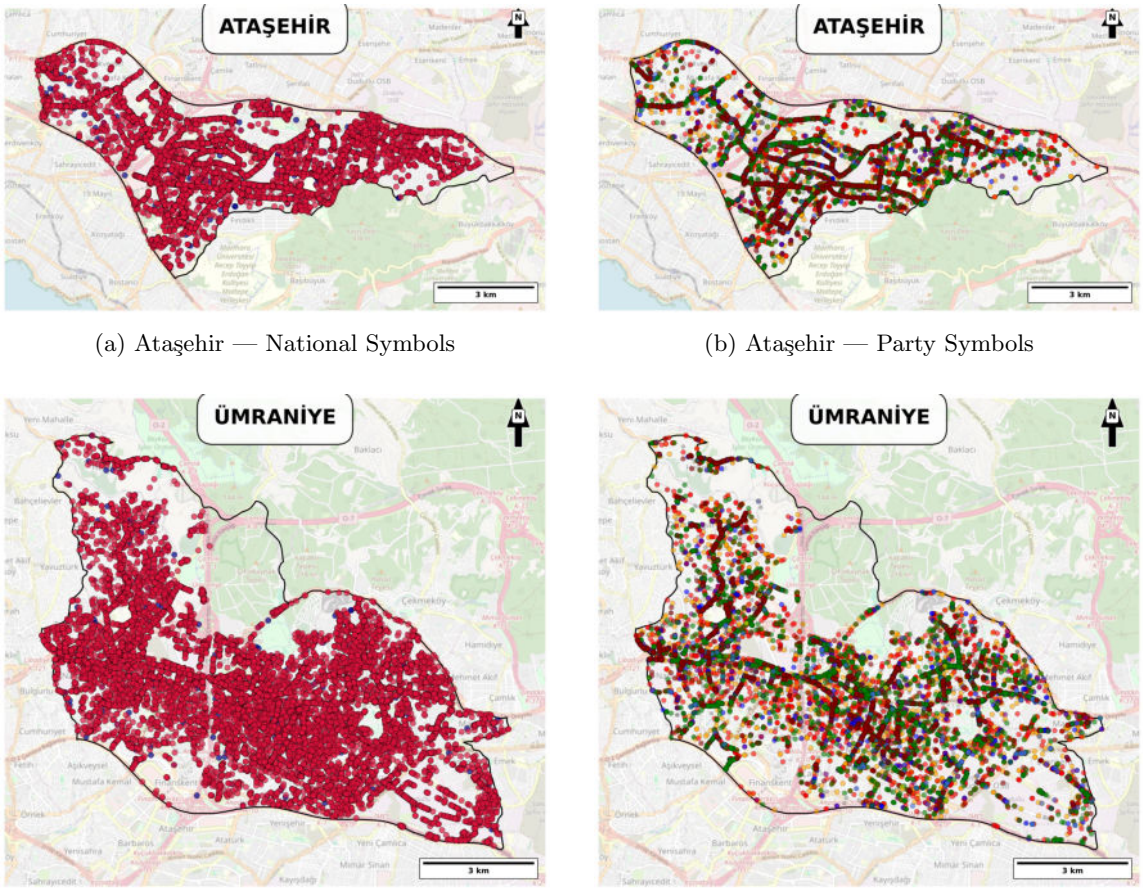


Figure 4: Istanbul - Political and National Symbol Maps

Figure 5 compares the spatial distribution of national and political symbols in two major districts on Istanbul's Asian side, Ataşehir and Ümraniye. Panels (a) and (c) map national symbols, specifically Atatürk portraits and Turkish flags, and show that these symbols are concentrated along prominent residential and commercial corridors. Panels (b) and (d) map political party symbols,

including those associated with parties such as AKP, CHP, MHP, İYİ, and HDP. These partisan symbols display a broadly similar spatial pattern, with visible concentrations along arterial roads and within densely populated neighborhood clusters. The panels indicate that both national and partisan imagery are embedded in the same highly visible urban spaces, underscoring the extent to which symbolic politics is woven into the everyday streetscape of the city.



(a) Ataşehir — National Symbols

(b) Ataşehir — Party Symbols

(c) Ümraniye — National Symbols

(d) Ümraniye — Party Symbols

Figure 5: District-level maps of Ataşehir and Ümraniye showing national and political symbols.

Table 1 reports the average distance, in meters, between detected political party symbols and a set of major urban landmarks in Istanbul, considering only symbols located within a 1 kilometer radius of each site. Table 2 complements these averages by reporting the corresponding number of symbols observed within the same distance threshold.

To construct these measures, we first compiled a georeferenced dataset of all detected political symbols from panoramic street-level imagery across Istanbul and assigned each observation precise latitude and longitude coordinates. We then linked these observations to the coordinates of ten carefully selected landmarks, commercial centers, and urban focal points. These sites were chosen to

reflect some of the most prominent, recognizable, and socially significant locations in Istanbul while also capturing a range of urban contexts, including civic spaces, commercial centers, waterfront areas, transportation hubs, and well-known neighborhood centers. The selected locations include Taksim Square (a major civic and symbolic public square), İstinye Park (an upscale shopping mall and commercial destination), Nişantaşı Merkez (a well-known retail and residential center), Beşiktaş Çarşı (the commercial and social center of the official district of Beşiktaş), Karaköy and the Galataport waterfront (a historic port area and redeveloped waterfront zone), Eminönü and the Spice Bazaar (a historic commercial area and major tourist destination), Altıyol Boğa Heykeli (a central meeting point and landmark in Kadıköy), Moda Merkez in Kadıköy (a well-known neighborhood center within the official district of Kadıköy), Kanyon in Levent (a prominent mixed-use shopping and office complex), and the Mall of Istanbul in Başakşehir (a large shopping and entertainment complex in the official district of Başakşehir).

Using geodesic distance calculations, we identified all political symbols located within one kilometer of each landmark. For each party, we then calculated the mean distance between its nearby symbols and the corresponding landmark. When no symbol associated with a given party appeared within the specified radius, the corresponding table entry is coded as "NA." These tables provide a descriptive account of how partisan visual activity is distributed around some of Istanbul's most visible and symbolically significant public locations.

Table 1: Average Distance (m) from Landmarks to Political Party Symbols (within 1 km radius)

Political Party	Taksim Square	İstinye Park	Nişantaşi Merkez	Beşiktaş Çarşı	Karaköy & Galataport	Eminönü & Spice Bazaar	Altiyol Boğa Heykeli	Moda Merkez	Kanyon	Mall of Istanbul
Turkish Flag	544.27	NA	709.44	582.48	700.99	615.76	666.97	623.19	781.53	636.03
AKP	684.89	NA	763.46	504.98	613.25	564.21	755.47	615.25	757.66	536.94
ANAP	NA	NA	883.94	NA	NA	NA	NA	NA	NA	NA
AO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATATÜRK	531.85	NA	717.61	449.94	688.15	541.67	680.26	673.28	794.91	646.77
BBP	580.21	NA	749.00	510.99	634.55	661.28	743.72	593.76	859.67	468.30
BDP	390.89	NA	740.90	NA	421.77	NA	852.94	NA	NA	NA
BTP	617.33	NA	635.14	NA	639.16	NA	607.12	383.57	NA	620.61
CHP	544.01	NA	811.81	489.39	792.02	690.44	697.82	678.73	797.36	624.74
DBP	626.76	NA	646.37	556.04	580.96	NA	652.81	727.68	962.85	708.62
DEVA	514.24	NA	729.08	369.86	645.91	NA	598.76	NA	742.44	573.19
DP	456.29	NA	743.41	317.44	NA	NA	606.34	835.08	NA	733.44
DSP	457.94	NA	658.19	320.06	734.77	830.62	586.84	491.71	632.98	490.74
EP	682.03	NA	735.77	514.07	694.75	NA	783.67	NA	722.57	638.96
GP	674.35	NA	764.43	NA	NA	NA	518.49	639.19	NA	704.00
GW	NA	NA	710.23	NA	NA	NA	423.90	NA	NA	NA
HDP	591.41	NA	578.89	485.57	806.99	824.57	526.98	664.79	755.44	596.16
HEPAR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HKP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HÜDA PAR	514.10	NA	639.06	625.60	468.53	852.33	651.55	893.83	770.54	631.27
HYP	552.96	NA	NA	415.67	NA	NA	747.47	554.17	NA	613.47
İP	822.43	NA	708.76	599.27	744.82	761.56	691.54	661.56	NA	769.59
İYİ	530.37	NA	707.59	381.96	703.39	761.84	660.73	607.58	791.91	616.33
MHP	589.23	NA	796.52	605.97	773.93	694.03	583.54	580.56	681.33	692.19
MP (1)	534.88	NA	887.92	NA	636.23	NA	693.82	851.53	NA	643.60
MP (2)	487.06	NA	720.66	442.22	716.69	789.65	703.75	387.92	739.74	583.61
Other Political Symbols	NA	NA	855.01	NA	NA	NA	508.19	265.11	633.77	392.78
ÖDP	571.62	NA	831.25	524.80	445.41	805.61	865.05	NA	NA	634.38
SAADET	559.50	NA	689.28	481.77	728.64	501.38	850.28	664.82	704.62	609.67
SDP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TDP (1)	590.50	NA	725.12	466.97	733.90	852.33	635.24	NA	817.19	663.46
TDP (2)	808.81	NA	585.40	NA	814.24	NA	601.86	NA	962.85	650.56
TIP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TKH	NA	NA	NA	NA	608.17	NA	NA	NA	NA	NA
TKP	862.95	NA	829.97	NA	788.45	NA	642.68	NA	NA	NA
ÜO	NA	NA	698.83	NA	NA	NA	NA	NA	NA	NA
VP	836.30	NA	847.44	NA	NA	NA	NA	NA	NA	NA
YRP	569.54	NA	753.64	664.65	627.69	NA	838.05	376.37	651.39	676.32
YSP	497.65	NA	629.62	484.51	641.83	532.90	703.36	703.61	757.89	582.28
ZP	519.98	NA	907.40	676.61	NA	NA	NA	NA	NA	NA

Note.

- MP (1) represents *Memleket Partisi*.
- MP (2) represents *Millet Partisi*.
- TDP (1) represents *Toplumcu Demokrasi Partisi*.
- TDP (2) represents *Türkiye Değişim Partisi*.

Table 2: Count of Political Party Symbols within 1 km radius of Landmarks

Political Party	Taksim Square	İstinye Park	Nişantaşi Merkez	Beşiktaş Çarşı	Karaköy & Galataport	Eminönü & Spice Bazaar	Altiyol Boğa Heykeli	Moda Merkez	Kanyon	Mall of Istanbul
Turkish Flag	1381	0	1544	519	653	172	3254	406	504	1593
AKP	2164	0	1935	102	2962	547	1415	58	299	600
ANAP	0	0	1	0	0	0	0	0	0	0
AO	0	0	0	0	0	0	0	0	0	0
ATATÜRK	227	0	223	72	117	23	303	32	87	138
BBP	12	0	12	8	10	2	14	1	2	2
BDP	1	0	3	0	1	0	2	0	0	0
BTP	2	0	8	0	3	0	15	1	0	1
CHP	1298	0	1700	226	649	86	3713	65	416	604
DBP	8	0	10	1	3	0	25	5	1	20
DEVA	21	0	21	4	7	0	29	0	9	12
DP	1	0	9	14	0	0	2	1	0	2
DSP	835	0	278	6	37	18	145	1	4	3
EP	5	0	12	6	4	0	13	0	4	2
GP	1	0	4	0	0	0	3	2	0	1
GW	0	0	1	0	0	0	1	0	0	0
HDP	91	0	750	51	20	2	129	5	7	30
HEPAR	0	0	0	0	0	0	0	0	0	0
HKP	0	0	0	0	0	0	0	0	0	0
HÜDA PAR	14	0	33	5	3	1	35	1	6	18
HYP	3	0	0	3	0	0	11	3	0	1
İP	27	0	23	4	9	1	36	7	0	18
İYİ	105	0	111	18	63	22	102	13	40	67
MHP	77	0	199	191	40	8	436	13	196	60
MP	19	0	18	0	10	0	70	1	0	7
MP (2)	39	0	48	8	27	14	70	3	8	12
ÖDP	4	0	4	1	1	1	9	0	0	2
SAADET	221	0	240	265	85	22	1866	28	100	332
SDP	0	0	0	0	0	0	0	0	0	0
TDP (1)	28	0	26	1	8	3	21	0	7	9
TDP (2)	6	0	5	0	4	0	5	0	1	1
TİP	0	0	0	0	0	0	0	0	0	0
TKH	0	0	0	0	1	0	0	0	0	0
TKP	2	0	2	0	1	0	5	0	0	0
Unidentified Political Symbols	0	0	1	0	0	0	2	1	1	2
ÜO	0	0	1	0	0	0	0	0	0	0
VP	1	0	2	0	0	0	0	0	0	0
YRP	4	0	11	4	2	0	12	1	3	4
YSP	89	0	183	22	47	11	259	4	23	61
ZP	1	0	1	1	0	0	0	0	0	0

Note.

- MP (1) represents *Memleket Partisi*
- MP (2) represents *Millet Partisi*
- TDP (1) represents *Toplumcu Demokrasi Partisi*
- TDP (2) represents *Türkiye Değişim Partisi*

Table 3 reports the full set of distinct amenity categories identified in the Istanbul urban dataset, including transportation-related features such as IETT bus stops and railway stations. For each category, the table presents the total number of unique amenities observed across the city after deduplication. Deduplication was necessary because amenities located exactly on, or very close to, district boundaries could otherwise be counted more than once when district-level summaries were generated. To avoid double-counting these boundary cases, we processed the citywide dataset so that each amenity was counted only once in the citywide summary. These duplicated cases account for less than one percent of all amenity observations, and their removal does not substantively alter the descriptive patterns reported in the analysis. The table provides a broad descriptive overview of Istanbul's functional urban landscape, covering highly prevalent features such as bus stops, parking areas, and restaurants, as well as less common facilities such as cultural centers and coworking spaces. The citywide totals reported in this summary are lower than the corresponding district-level aggregates because amenities located near district boundaries may appear in more than one district-level summary. By contrast, Table 3 counts each amenity only once across the city as a whole. It therefore provides the most conservative estimate of the total number of unique amenities identified across Istanbul.

Table 3: All Available Amenities with Counts, Including Bus Stops and Railway Stations

Amenity	Counts	Amenity	Counts	Amenity	Counts	Amenity	Counts
IETT Bus Stop	10,399	Ferry Terminal	158	Prison	19	Public Bookcase	2
Parking Lot	5,458	Veterinary	149	Childcare	18	Cultural Center	2
Restaurant	4,433	Pub	143	Post Box	15	Court Yard	2
Worship	4,171	Townhall	119	Clock	15	Course	2
Café	3,518	Theatre	116	Prep School	15	Ward	2
School	3,476	Fire Station	116	Post Depot	14	Billboard	2
Pharmacy	3,151	Bicycle Parking	116	Waste Transfer Station	12	Education	2
Fast Food	1,789	Food Court	106	Motorcycle Parking	12	Barn	2
Bank	1,444	Public Building	93	Payment Center	11	Boat Storage	2
ATM	1,252	Ice Cream	91	Music School	10	Sport Center	2
Parking Space	849	Social Facility	90	Bicycle Repair Station	9	Motel	2
Bench	743	Bicycle Rental	89	Dressing Room	8	Stock Exchange	2
Shelter	553	Doctors	81	Shower	8	Animal Boarding	2
Hospital	517	Car Rental	78	BBQ	7	Motorcycle Rental	1
Clinic	507	Telephone	74	Exhibition Centre	7	Baking Oven	1
Fuel	475	Events Venue	68	Animal Shelter	7	Healthcare	1
Fountain	352	Public Bathroom	64	Parcel Locker	6	Cultural Center	1
Toilets	322	Chair	61	Vehicle Inspection	6	Co-Working Space	1
Car Wash	321	Art Center	58	Nursing Home	6	Student Accommodation	1
Ticket Validator	318	Driving School	58	Weighbridge	6	Building	1
Library	309	Drinking Water	55	Hookah Lounge	5	Dojo	1
Parking Entrance	294	Charging Station	52	Research Institute	5	Eczane	1
Dentist	289	Grave Yard	52	Smoking Area	5	Notary	1
Post Office	284	Vending Machine	49	Special Education	4	Medicine	1
Bar	277	Cinema	44	Customs	4	Castel	1
Taxi	241	College	41	Security Booth	4	Planetarium	1
University	235	Nightclub	37	Animal Breeding	4	Post Box;Pharmacy	1
Waste Disposal	232	Social Center	36	Driver Training	4	Barassociation	1
Police	232	Internet Café	36	Compressed Air	4	Guest House	1
Rail Station	218	Language School	28	Publisher	3	Laboratory	1
Kindergarten	206	Money Transfer	27	Payment Terminal	3	Dancing School	1
Bus Station	206	Table	27	Training	3	Left Luggage	1
Recycling	193	Studio	26	Dive Center	3	Fast Food;Bicycle Rental	1
Community Center	184	Courthouse	24	Festival Grounds	3	Rescue Station	1
Marketplace	184	Water Point	23	Social Club	3	Gallery	1
Waste Basket	175	Car Sharing	20	Commercial	2	Luggage Locker	1
Bureau De Change	170	Conference Center	19	Sports Center	2		

Note. Counts are citywide totals after deduplication. Amenities located exactly on, or very close to, district boundaries may appear in more than one district-level summary, but they are counted only once in this table. Duplicated boundary cases account for less than one percent of all amenity observations.

To characterize the spatial distribution of urban amenities across Istanbul's districts, Table 4 reports district-level counts for the ten most frequently observed amenity categories, together with IETT bus stops and railway stations. The table is constructed from the Distance Dataset by first identifying all unique amenities located within a one-kilometer radius of each panorama, classifying them by amenity type, and then aggregating these counts to the district level. Each row corresponds to one of Istanbul's thirty-nine districts, while each column represents a specific amenity category. Cell entries report the number of amenities of a given type observed in the vicinity of panoramas containing political symbols, and the final column provides the district-level total across all listed categories. The resulting distribution is substantively informative. Central districts such as *Fatih*, *Kadıköy*, *Üsküdar*, and *Ümraniye* exhibit particularly high amenity densities, consistent with their dense urban form and concentration of public infrastructure. In contrast, peripheral districts such

as *Adalar*, *Silivri*, and *Çatalca* contain substantially fewer mapped amenities, reflecting lower urban density, more dispersed development patterns, and, in some cases, more limited Street View coverage.

Table 4: Top 10 Frequent Amenities including Bus/Railway Stations in 39 Istanbul Districts

Districts	IETT Bus Stop	Parking Lot	Restaurant	Worship	Cafe	School	Pharmacy	Fast Food	Bank	ATM	Railway Station	Total
Adalar	0	0	0	0	0	0	0	0	0	0	0	0
Arnavutköy	0	0	0	0	0	0	0	0	0	0	0	0
Ataşehir	829	713	308	220	201	357	272	138	131	130	6	3,305
Avcılar	0	0	0	0	0	0	0	0	0	0	0	0
Bağcılar	543	231	222	258	114	364	253	151	83	122	15	2,356
Bahçelievler	468	204	108	172	70	283	207	54	75	44	13	1,698
Bakırköy	298	259	172	117	115	209	165	101	96	53	13	1,598
Başakşehir	309	266	21	101	31	60	22	24	13	6	6	859
Bayrampaşa	290	225	87	175	88	174	179	60	66	70	20	1,434
Beşiktaş	470	316	424	187	396	130	270	132	153	59	23	2,560
Beykoz	1,033	172	114	245	72	60	27	34	27	15	0	1,799
Beylikdüzü	0	0	0	0	0	0	0	0	0	0	0	0
Beyoğlu	318	223	717	437	608	93	137	208	136	141	18	3,036
Büyükçekmece	0	0	0	0	0	0	0	0	0	0	0	0
Çatalca	0	0	0	0	0	0	0	0	0	0	0	0
Çekmeköy	506	140	50	130	47	171	63	35	31	30	4	1,207
Esenler	323	288	79	171	63	191	142	51	52	71	11	1,442
Esenyurt	0	0	0	0	0	0	0	0	0	0	0	0
Eyüpsultan	577	337	174	405	167	245	189	90	55	61	16	2,316
Fatih	353	416	1,551	912	823	257	430	377	293	239	38	5,689
Gaziosmanpaşa	406	137	78	233	78	221	217	52	32	42	11	1,507
Güngören	278	259	106	126	75	188	145	51	66	50	17	1,361
Kadıköy	538	760	586	229	813	356	448	306	297	282	19	4,634
Kağıthane	504	307	104	205	82	161	148	45	56	25	12	1,649
Kartal	609	136	50	124	50	174	98	25	30	51	16	1,363
Küçükçekmece	576	609	81	187	84	219	149	58	48	38	3	2,052
Maltepe	690	458	251	190	236	247	231	123	83	66	17	2,592
Pendik	988	27	13	49	2	30	11	3	1	21	14	1,159
Sancaktepe	656	219	84	182	78	239	103	59	32	21	4	1,677
Sarıyer	312	165	94	104	74	28	38	15	15	7	2	854
Şile	0	0	0	0	0	0	0	0	0	0	0	0
Silivri	0	0	0	0	0	0	0	0	0	0	0	0
Şişli	449	213	376	231	355	156	311	139	126	62	21	2,439
Sultanbeyli	526	89	103	107	47	103	64	46	17	19	0	1,121
Sultangazi	208	86	28	119	42	127	88	24	25	15	9	771
Tuzla	453	0	0	0	0	0	0	0	0	0	4	457
Ümraniye	1,173	673	218	364	162	376	295	94	113	97	13	3,578
Üsküdar	976	692	182	499	215	365	275	88	101	114	18	3,525
Zeytinburnu	290	246	376	291	181	207	244	159	134	96	19	2,243
Total	15,949	8,866	6,757	6,770	5,369	5,791	5,221	2,742	2,387	2,047	382	62,281

Note. Districts with zero observations do not have available Google Street View imagery during the relevant election period and therefore should not be interpreted as districts with no nearby amenities.

The amenities dataset combines general amenities (61,060), IETT bus stops (14,848), and rail stations (266), producing a final total of 75,984 unique amenities after deduplication. Of these, 38,873 amenities have at least one political or national symbol within 100 m, while 61,381 have at least one symbol within 1 km. The mean number of symbols per amenity increases sharply from 99.9 within 100 m to 5,143.9 within 1 km, indicating substantial spatial clustering around urban amenities. The highest-density location contains 6,460 symbols within 100 m and 77,201 within 1 km, suggesting the presence of especially symbolically saturated public spaces.

Category-level patterns further show that food and dining (15.6%), education (15.5%), and transportation amenities, especially IETT stops (7.9%), account for a large share of the amenity landscape and are closely associated with symbolic density. Financial services and cultural venues also display above-average symbol counts, likely reflecting their location along major urban corridors. By contrast, religious and memorial sites, as well as some transit infrastructure, exhibit

lower symbol intensities, consistent with their more limited spatial footprints or more restricted forms of public exposure. Overall, these descriptive patterns suggest that Istanbul's political and national iconography is unevenly distributed across urban functions, with visible concentrations near commercial, educational, and mobility-related nodes.

Table 5: Flag Density Around Top-10 Amenities (100m and 1km Radii)

Amenity	**Counts**	**Flags within 100m**	**Flags within 1km**	**Avg. Flags per Amenity (100m)**	**Avg. Flags per Amenity (1km)**
IETT Bus Stop	10,399	1,395,983	60,882,654	134.24	5,854.66
Parking Lot	5,458	486,943	41,018,987	89.22	7,515.39
Restaurant	4,433	527,282	27,104,065	118.94	6,114.16
Worship	4,171	428,914	24,266,908	102.83	5,818.01
Café	3,518	427,040	21,500,645	121.39	6,111.61
School	3,476	318,259	25,425,613	91.56	7,314.62
Pharmacy	3,151	539,573	22,451,541	171.24	7,125.21
Fast Food	1,789	346,164	13,997,098	193.50	7,823.98
Bank	1,444	250,448	9,290,576	173.44	6,433.92
ATM	1,252	242,319	8,657,958	193.55	6,915.30

Figure 6 illustrates the spatial concentration of political and national symbols around selected public amenities in Istanbul's highest-density symbol areas. Concentric circles with radii of 100 m, 200 m, 400 m, 600 m, 800 m, and 1 km indicate distance buffers around each selected amenity.



(a) Rank #1: Ataşehir Toplum Sağlığı Merkezi



(b) Rank #2: Pala Pub



(c) Rank #3: Algan Ağız ve Diş Sağlığı Polikliniği



(d) Rank #4: Kadın Eli Mantı Evi

Figure 6: Disribution of Symbols Around Top Four Amenity Locations

Note. All four locations are in the official district of Ataşehir, which has the greatest density of political symbols in the dataset.

Figure 7 shows a clear distance-decay pattern in the spatial relationship between amenities and

political visibility. Across all panels, the largest increase in symbol counts occurs between 100 m and 400 m, after which most curves begin to flatten, suggesting that the strongest amenity-symbol clustering is highly localized. IETT stops dominate the distribution: for all flags, the count rises from roughly 0.75 million within 100 m to more than 1.2 million by 400 m, with only marginal gains beyond that distance. A similar pattern appears for political flags, where IETT stops increase from about 0.6 million to nearly 0.95 million over the same range. Parking lots, schools, and places of worship also show steep early increases, while restaurants grow more gradually and remain below the other major categories. The Turkish flag and Atatürk panels reproduce the same ordering at smaller scales.

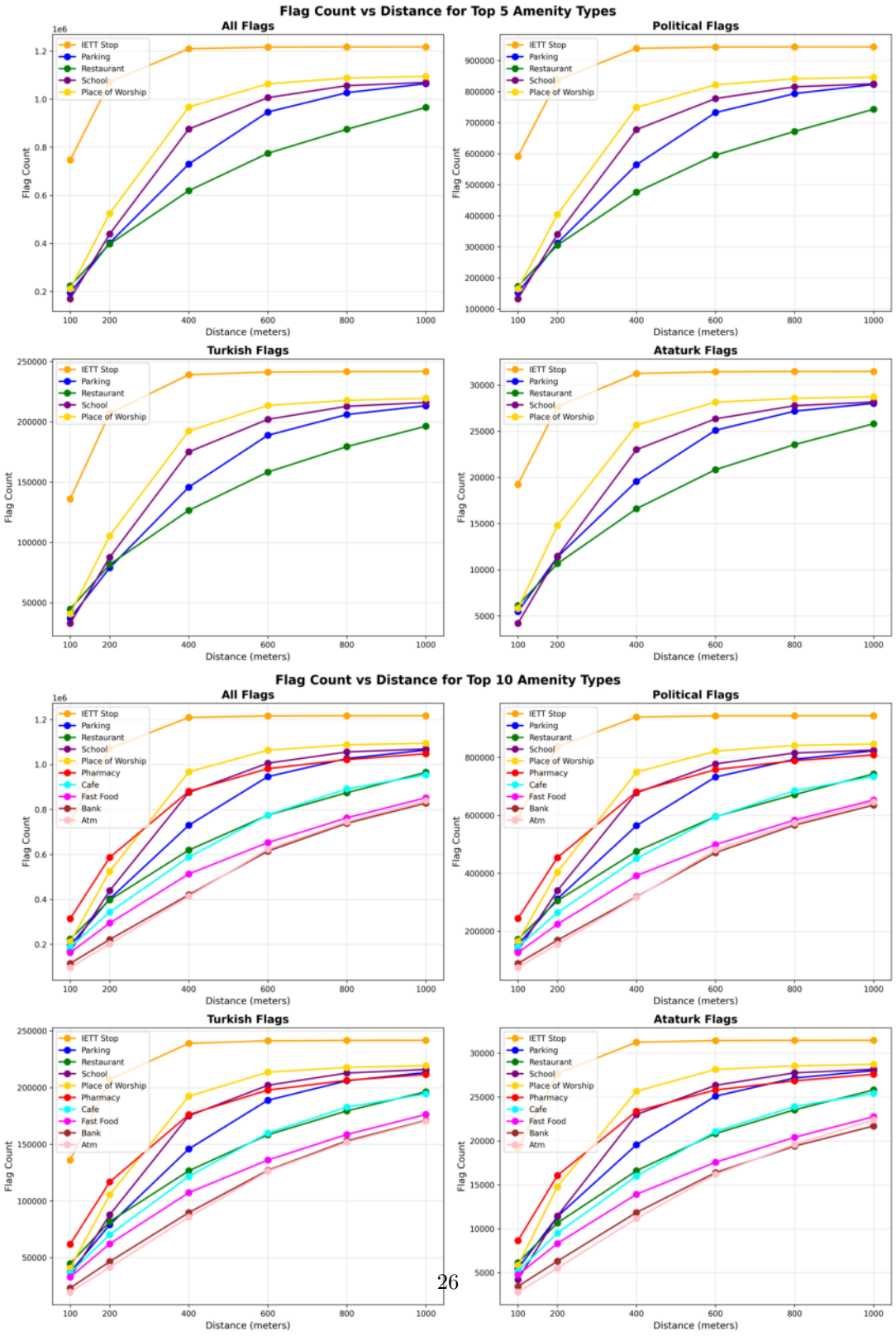


Figure 7: Flag Count vs. Distance

Finally, Table 6 reports summary statistics on the proximity between political symbols and urban amenities. The ten most frequently occurring amenity categories were identified from Table **??**, and railway stations were added because of their central importance within Istanbul's transportation network. Using the georeferenced coordinates of all political symbols, we calculated the geodesic distance, in kilometers, from each symbol to the nearest instance of each amenity type. We then aggregated the mean distances and standard deviations by political party. These statistics provide a concise descriptive measure of how different forms of political imagery are positioned relative to Istanbul's most common public, commercial, and transportation-related facilities.

Table 6: Mean (SD) Distance in Kilometers to the Nearest of the Top 10 Amenities from Each Party's Symbol

Political Party	IETT Bus Stop	Railway Station	ATM	Bank	Cafe	Fast Food	Parking	Pharmacy	Place of Worship	Restaurant	School
Turkish Flag	0.11	1.53	1.14	1.21	1.01	1.12	0.78	0.77	0.62	0.90	0.70
	(0.10)	(1.52)	(1.82)	(2.06)	(2.00)	(1.98)	(1.66)	(1.85)	(1.50)	(1.74)	(1.60)
AKP	0.10	1.67	1.41	1.50	1.26	1.40	0.97	1.00	0.79	1.14	0.91
	(0.09)	(1.71)	(2.25)	(2.51)	(2.45)	(2.42)	(2.07)	(2.31)	(1.89)	(2.15)	(2.00)
ANAP	0.08	1.48	1.06	1.03	0.92	1.08	0.69	0.57	0.56	0.82	0.56
	(0.07)	(0.96)	(1.58)	(1.81)	(1.82)	(1.81)	(1.48)	(1.66)	(1.34)	(1.61)	(1.47)
AO	0.10	1.56	1.24	1.45	1.18	1.17	0.81	0.88	0.68	0.99	0.78
	(0.07)	(1.24)	(1.37)	(1.59)	(1.55)	(1.49)	(1.18)	(1.36)	(1.03)	(1.22)	(1.08)
ATATÜRK	0.10	1.65	1.16	1.24	1.01	1.14	0.78	0.78	0.62	0.91	0.72
	(0.09)	(1.56)	(1.91)	(2.14)	(2.07)	(2.06)	(1.74)	(1.95)	(1.59)	(1.81)	(1.68)
BBP	0.09	2.48	4.80	5.58	5.34	5.35	4.27	4.68	3.76	4.57	4.10
	(0.07)	(2.14)	(3.69)	(4.18)	(4.31)	(4.15)	(3.70)	(3.92)	(3.42)	(3.76)	(3.53)
BDP	0.11	1.56	1.33	1.36	1.19	1.27	0.92	0.94	0.74	1.03	0.84
	(0.09)	(1.79)	(2.15)	(2.46)	(2.35)	(2.30)	(1.94)	(2.24)	(1.76)	(2.01)	(1.87)
BTP	0.10	1.48	1.18	1.24	1.06	1.17	0.86	0.79	0.68	0.95	0.77
	(0.12)	(1.42)	(1.89)	(2.13)	(2.12)	(2.08)	(1.79)	(1.94)	(1.63)	(1.87)	(1.72)
CHP	0.10	1.76	1.12	1.23	1.01	1.15	0.75	0.77	0.64	0.87	0.69
	(0.09)	(1.63)	(1.93)	(2.16)	(2.06)	(2.07)	(1.73)	(1.97)	(1.57)	(1.80)	(1.67)
DBP	0.10	1.56	1.15	1.20	1.01	1.09	0.81	0.78	0.65	0.91	0.71
	(0.09)	(1.50)	(1.80)	(2.04)	(2.00)	(1.97)	(1.70)	(1.84)	(1.52)	(1.77)	(1.62)
DEVA	0.10	1.61	1.27	1.34	1.13	1.25	0.88	0.92	0.72	0.99	0.81
	(0.09)	(1.72)	(2.08)	(2.32)	(2.23)	(2.21)	(1.88)	(2.10)	(1.70)	(1.96)	(1.80)
DP	0.10	0.96	0.87	1.02	0.86	1.15	0.96	0.66	0.68	0.88	0.72
	(0.08)	(1.47)	(1.28)	(1.56)	(1.39)	(1.54)	(1.19)	(1.32)	(0.93)	(1.21)	(1.02)
DSP	0.09	1.61	1.30	1.40	1.19	1.33	1.00	0.99	0.82	1.07	0.95
	(0.07)	(1.57)	(2.30)	(2.49)	(2.47)	(2.44)	(2.17)	(2.35)	(2.02)	(2.25)	(2.11)
EP	0.10	1.44	1.30	1.33	1.15	1.25	0.94	0.89	0.74	1.05	0.84
	(0.10)	(1.44)	(2.03)	(2.27)	(2.25)	(2.20)	(1.89)	(2.08)	(1.72)	(1.97)	(1.82)
GP	0.12	1.52	1.05	1.01	0.84	0.94	0.65	0.62	0.53	0.80	0.60
	(0.11)	(1.39)	(1.64)	(1.87)	(1.83)	(1.81)	(1.51)	(1.64)	(1.36)	(1.61)	(1.44)
GW	0.11	1.27	0.95	0.98	0.79	0.87	0.60	0.70	0.52	0.73	0.57
	(0.19)	(1.71)	(1.64)	(1.85)	(1.70)	(1.78)	(1.39)	(1.63)	(1.26)	(1.47)	(1.36)
HDP	0.09	1.85	1.31	1.41	1.15	1.27	0.83	0.80	0.65	0.98	0.71
	(0.07)	(1.56)	(1.79)	(2.08)	(2.03)	(1.98)	(1.63)	(1.81)	(1.45)	(1.70)	(1.54)
HEPAR	0.11	1.45	1.90	1.94	1.94	1.88	1.52	1.42	1.24	1.61	1.33
	(0.06)	(1.19)	(3.21)	(3.66)	(3.60)	(3.59)	(3.17)	(3.42)	(2.97)	(3.27)	(3.13)
HKP	0.08	2.51	0.78	1.28	0.52	0.63	0.44	0.46	0.34	0.27	0.52
	(0.05)	(1.64)	(0.57)	(0.33)	(0.39)	(0.27)	(0.40)	(0.51)	(0.28)	(0.32)	(0.43)
HÜDA PAR	0.10	1.49	1.20	1.27	1.07	1.17	0.85	0.82	0.69	0.96	0.75
	(0.10)	(1.45)	(1.94)	(2.20)	(2.16)	(2.13)	(1.80)	(1.98)	(1.62)	(1.88)	(1.73)
HYP	0.12	1.43	0.92	0.93	0.68	0.81	0.56	0.52	0.45	0.62	0.50
	(0.10)	(1.71)	(1.45)	(1.66)	(1.49)	(1.48)	(1.18)	(1.45)	(1.06)	(1.25)	(1.14)
İP	0.10	1.46	1.25	1.37	1.20	1.29	0.95	0.93	0.77	1.06	0.89
	(0.09)	(1.44)	(2.01)	(2.31)	(2.31)	(2.27)	(1.91)	(2.09)	(1.72)	(1.99)	(1.81)
İYİ	0.10	1.57	1.20	1.27	1.07	1.18	0.83	0.82	0.68	0.95	0.76
	(0.09)	(1.56)	(1.97)	(2.21)	(2.15)	(2.13)	(1.80)	(2.00)	(1.63)	(1.88)	(1.74)
MHP	0.09	1.40	1.25	1.28	1.08	1.18	0.89	0.85	0.70	1.01	0.79
	(0.08)	(1.40)	(2.05)	(2.26)	(2.21)	(2.22)	(1.92)	(2.10)	(1.77)	(1.99)	(1.87)
MP (1)	0.10	1.77	1.04	1.17	0.96	1.10	0.71	0.74	0.64	0.83	0.66
	(0.09)	(1.53)	(1.93)	(2.14)	(2.06)	(2.07)	(1.75)	(1.96)	(1.59)	(1.82)	(1.69)
MP (2)	0.09	1.82	1.35	1.46	1.15	1.29	0.87	0.93	0.69	1.05	0.82
	(0.07)	(1.85)	(2.11)	(2.35)	(2.26)	(2.24)	(1.88)	(2.15)	(1.72)	(1.96)	(1.82)
Other Political Symbols	0.11	1.50	1.07	1.13	0.90	0.98	0.68	0.69	0.54	0.80	0.61
	(0.12)	(1.49)	(1.53)	(1.75)	(1.71)	(1.71)	(1.45)	(1.58)	(1.29)	(1.53)	(1.40)
ÖDP	0.10	1.83	1.34	1.43	1.25	1.35	0.98	0.99	0.81	1.11	0.92
	(0.08)	(1.69)	(2.12)	(2.44)	(2.41)	(2.37)	(2.00)	(2.21)	(1.82)	(2.08)	(1.92)
SAADET	0.09	1.82	1.33	1.41	1.20	1.31	0.94	0.91	0.75	1.11	0.85
	(0.08)	(1.59)	(2.03)	(2.29)	(2.28)	(2.24)	(1.92)	(2.10)	(1.76)	(1.99)	(1.86)
SDP	0.12	0.94	1.17	1.22	1.08	1.16	0.96	0.89	0.74	0.96	0.85
	(0.09)	(0.80)	(1.69)	(1.91)	(1.92)	(1.94)	(1.63)	(1.76)	(1.47)	(1.71)	(1.58)
TDP (1)	0.09	1.64	1.15	1.23	1.02	1.13	0.78	0.78	0.64	0.91	0.72
	(0.08)	(1.60)	(1.91)	(2.15)	(2.08)	(2.07)	(1.73)	(1.97)	(1.57)	(1.81)	(1.67)
TDP (2)	0.09	1.73	1.22	1.30	1.02	1.17	0.77	0.83	0.63	0.91	0.71
	(0.08)	(1.82)	(1.92)	(2.15)	(2.00)	(2.02)	(1.61)	(1.94)	(1.45)	(1.69)	(1.55)
TIP	0.10	1.04	0.45	0.66	0.29	0.34	0.33	0.19	0.13	0.31	0.16
	(0.06)	(0.90)	(0.36)	(0.43)	(0.18)	(0.33)	(0.13)	(0.22)	(0.07)	(0.31)	(0.08)
TKH	0.08	1.81	1.09	1.27	1.10	1.19	0.61	0.63	0.39	0.84	0.56
	(0.08)	(1.76)	(1.74)	(1.71)	(1.55)	(1.50)	(0.85)	(1.12)	(0.58)	(1.07)	(0.89)
TKP	0.09	1.43	1.62	1.65	1.56	1.61	1.26	1.24	1.07	1.35	1.17
	(0.07)	(1.31)	(2.61)	(3.08)	(3.09)	(3.01)	(2.53)	(2.75)	(2.30)	(2.64)	(2.42)
ÜO	0.11	1.68	1.27	1.33	1.07	1.24	0.77	0.88	0.61	1.00	0.75
	(0.08)	(2.29)	(2.09)	(2.36)	(2.05)	(2.03)	(1.57)	(2.12)	(1.42)	(1.65)	(1.52)
VP	0.17	0.64	0.68	0.49	0.42	0.48	0.36	0.36	0.28	0.41	0.40
	(0.12)	(0.75)	(1.26)	(1.38)	(1.37)	(1.37)	(1.24)	(1.30)	(1.15)	(1.28)	(1.20)
YRP	0.10	1.72	1.73	1.84	1.66	1.77	1.36	1.38	1.17	1.52	1.28
	(0.08)	(1.64)	(2.79)	(3.04)	(3.04)	(3.00)	(2.68)	(2.90)	(2.50)	(2.75)	(2.61)
YSP	0.10	1.72	1.16	1.25	1.04	1.15	0.76	0.78	0.64	0.89	0.69
	(0.08)	(1.55)	(1.88)	(2.14)	(2.06)	(2.04)	(1.70)	(1.91)	(1.52)	(1.77)	(1.62)
ZP	0.11	1.62	1.55	1.66	1.53	1.59	1.21	1.22	1.02	1.34	1.14
	(0.11)	(1.37)	(2.45)	(2.76)	(2.79)	(2.73)	(2.36)	(2.56)	(2.16)	(2.45)	(2.29)

Note.

- MP (1) represents *Memleket Partisi*
- MP (2) represents *Millet Partisi*
- TDP (1) represents *Toplumcu Demokrasi Partisi*
- TDP (2) represents *Türkiye Değişim Partisi*

6 Empirical Methods

6.1 Empirical Strategy for RQ1: Amenity Environments and Symbol Placement

To evaluate which amenity environments are most likely to attract political symbols, we estimate a set of panorama level models that link detected symbols to the surrounding urban environment. The raw analysis file is organized at the detection level, with each row corresponding to an observed symbol and including the panorama identifier, predicted symbol class, detection confidence, latitude and longitude, date, district, nearby amenities, and matched election variables. We first collapse these records to the panorama level using `pano_id`. For each panorama i, we construct a count outcome Y_i, defined as the number of detected political party symbols, and a binary outcome A_i, equal to one if at least one political party symbol appears in the panorama and zero otherwise. National symbols, including Turkish flags and Atatürk imagery, are excluded from the main party symbol models and analyzed separately in supplementary specifications.

The preferred estimation file retains the full universe of panoramas from the Street View archive. Panoramas without detected political symbols enter the dataset with $Y_i = 0$ and $A_i = 0$. This design allows us to distinguish locations where symbols appear from observationally comparable locations where they do not. If the estimation file is restricted to symbol bearing panoramas, the count models below should be interpreted as models of symbolic intensity rather than symbolic presence. In that case, the binary models should be estimated on a matched sample that pairs symbol bearing panoramas with symbol free panoramas from the same district and election period.

For each panorama, we parse the amenities field and classify nearby amenities into theoretically relevant families. Transit and mobility amenities include IETT bus stops, bus stations, railway stations, ferry terminals, taxi points, parking lots, parking entrances, ticket validators, and bicycle related transport amenities. Commercial and service amenities include restaurants, cafés, fast food establishments, bars, pubs, pharmacies, banks, ATMs, marketplaces, food courts, and bureau de change locations. Civic and institutional amenities include schools, kindergartens, universities, hospitals, clinics, post offices, libraries, police facilities, courthouses, town halls, and fire stations. Community and congregational amenities include places of worship, community centers, cultural centers, social facilities, and marketplaces.

For each amenity family k, we construct three measures around panorama i: the number of amenities in that family within radius r, denoted N_{ik}^r; an indicator for whether at least one such amenity is present within radius r, denoted I_{ik}^r; and the logged distance to the nearest amenity in that family, denoted $D_{ik} = \log(1 + \text{distance}_{ik})$. We estimate models separately for radii of 50, 100, 250, 500, and 1,000 meters in order to assess the spatial scale at which amenities are most strongly associated with symbol placement.

Because the symbol count outcome is nonnegative and likely overdispersed, the main models use negative binomial regression. The general form is

$$Y_i \sim \text{NegBin}(\mu_i, \theta),$$

$$\log(\mu_i) = \alpha + \beta Z_i + \mathbf{X}_i'\gamma + \delta_d + \lambda_t.$$

Here, Z_i is the hypothesis specific amenity measure, $\mathbf{X}_i$ is a vector of contextual controls, δ_d represents district fixed effects, and λ_t represents election period fixed effects. The controls include

available demographic, electoral, and infrastructure variables matched to the panorama, including district level turnout, vote shares, population, income, and educational composition where available. District fixed effects absorb stable differences across Istanbul's districts, including baseline urban density, political culture, administrative capacity, and uneven Street View coverage. Election period fixed effects account for variation across campaign periods and image capture dates. Standard errors are clustered by district.

For H1a, which asks whether political symbols are especially common near transit and mobility nodes, the main model is

$$\log(\mu_i) = \alpha + \beta_{1a} N^r_{i,\text{transit}} + \rho_{1a} D_{i,\text{transit}} + \mathbf{X}_i'\gamma + \delta_d + \lambda_t.$$

The hypothesis is supported if $\beta_{1a} > 0$ and $\rho_{1a} < 0$, indicating that symbol counts increase with the local density of transit amenities and decrease as the nearest transit amenity becomes farther away.

For H1b, which asks whether political symbols cluster near everyday commercial and service amenities, the model is

$$\log(\mu_i) = \alpha + \beta_{1b} N^r_{i,\text{commercial}} + \rho_{1b} D_{i,\text{commercial}} + \mathbf{X}_i'\gamma + \delta_d + \lambda_t.$$

The hypothesis is supported if $\beta_{1b} > 0$ and $\rho_{1b} < 0$, indicating that symbols are more numerous in commercial and service rich environments and closer to such amenities.

For H1c, which asks whether political symbols are more likely to appear near civic and institutional anchors, the model is

$$\log(\mu_i) = \alpha + \beta_{1c} N^r_{i,\text{civic}} + \rho_{1c} D_{i,\text{civic}} + \mathbf{X}_i'\gamma + \delta_d + \lambda_t.$$

The hypothesis is supported if $\beta_{1c} > 0$ and $\rho_{1c} < 0$, indicating that political symbols concentrate near schools, health facilities, public offices, libraries, and other institutional anchors.

For H1d, which asks whether political symbols are especially prevalent near congregational and community nodes, the model is

$$\log(\mu_i) = \alpha + \beta_{1d} N^r_{i,\text{community}} + \rho_{1d} D_{i,\text{community}} + \mathbf{X}_i'\gamma + \delta_d + \lambda_t.$$

The hypothesis is supported if $\beta_{1d} > 0$ and $\rho_{1d} < 0$, indicating that symbols are more common around places that organize recurring community presence, collective activity, and local visibility.

For H1e, which asks whether political symbols are concentrated in amenity dense micro environments, the model replaces family specific amenity counts with the total number of amenities of any type within radius r:

$$\log(\mu_i) = \alpha + \beta_{1e} N^r_{i,\text{all}} + \mathbf{X}_i'\gamma + \delta_d + \lambda_t.$$

The hypothesis is supported if $\beta_{1e} > 0$, indicating that political symbols are more numerous in locations with higher overall amenity density.

For H1f, which asks whether political symbols are more common in mixed use environments with diverse nearby amenities, we estimate

$$\log(\mu_i) = \alpha + \beta_{1f} C^r_i + \eta_{1f} H^r_i + \mathbf{X}_i'\gamma + \delta_d + \lambda_t.$$

Here, C_i^r is the number of distinct amenity categories within radius r, and H_i^r is a Shannon diversity index defined as

$$H_i^r = -\sum_{k=1}^{K} p_{ik}^r \log(p_{ik}^r),$$

where p_{ik}^r is the share of amenities within radius r around panorama i that belong to amenity family k. The hypothesis is supported if $\beta_{1f} > 0$ or $\eta_{1f} > 0$, indicating that symbols are more common in mixed use environments with a broader variety of nearby amenities.

For each of the six hypotheses, we also estimate an analogous logistic regression in which the dependent variable is A_i, an indicator for whether any political party symbol is present:

$$\Pr(A_i = 1) = \text{logit}^{-1}\left(\alpha + \beta Z_i + \mathbf{X}_i'\gamma + \delta_d + \lambda_t\right).$$

The logistic models assess whether amenity environments predict the presence of political symbols at all, while the negative binomial models assess whether those environments are associated with greater symbolic intensity. We report incidence rate ratios for the count models and average marginal effects for the logistic models.

For each model estimated under H1a through H1f, we conduct three straightforward robustness checks using only the existing data. First, we reestimate the model across alternative spatial buffers. In addition to the main radius r, we estimate the same specification using 50, 100, 250, 500, and 1,000 meter buffers. This check evaluates whether the estimated relationship is limited to very proximate amenities or whether it persists across broader urban surroundings. Second, we reestimate each model after reducing the influence of unusually dense symbolic locations. Specifically, we exclude panoramas in the top one percent of the symbol count distribution and compare the resulting coefficients to the baseline estimates. This check ensures that the findings are not driven solely by a small number of exceptionally saturated streets or public spaces. Third, we estimate the same models separately for political party symbols and for national symbols, including Turkish flags and Atatürk imagery. This comparison allows us to assess whether amenity based clustering is specific to partisan campaign activity or reflects a broader spatial logic of public symbolism in Istanbul. Results are interpreted as robust when the direction and substantive magnitude of the main coefficients remain similar across these alternative specifications.

Together, these specifications provide a direct test of whether political symbols are distributed randomly across Istanbul's streetscape or instead concentrate around the amenities that structure routine movement, public visibility, and everyday urban encounter.

6.2 Empirical Strategy for RQ2: Party Specific Amenity Targeting

To evaluate whether parties target different amenity environments in ways that reflect their social coalitions, we restructure the symbol data into a party by panorama file. The unit of analysis is party p in panorama i. For each panorama, we count the number of detected symbols associated with each party. The dependent variable Y_{ip} is therefore the number of symbols belonging to party p observed in panorama i. Party identity is taken from the `predicted_class` variable, while local urban context is constructed from the parsed amenities field associated with the panorama. National symbols, including Turkish flags and Atatürk imagery, are excluded from the main models because RQ2 concerns partisan differences in placement strategy.

This party by panorama structure has two advantages. First, it preserves information about symbolic intensity by allowing a party to have more than one symbol in the same panorama. Second, it allows us to include party specific zeroes. If a panorama contains CHP symbols but no AKP symbols, the CHP count is positive while the AKP count is zero. This design makes it possible to compare the amenity environments in which different parties are visually present, rather than only describing the locations where each party appears.

For each panorama i, we construct three types of amenity measures for each theoretically relevant amenity family g. First, N_{ig}^{r} is the number of amenities in family g within radius r, where the main analysis uses 100 and 250 meters. Second, S_{ig}^{r} is the share of all nearby amenities within radius r that belong to family g. Third, D_{ig} is the logged distance to the nearest amenity in family g, defined as $D_{ig} = \log(1 + \text{distance}_{ig})$. For ease of interpretation, the main interaction models use standardized amenity exposure measures, denoted E_{ig}^{r}. In the primary specification, E_{ig}^{r} is the standardized share of nearby amenities belonging to family g. Parallel specifications use the logged count of amenities in the family and the negative logged distance to the nearest amenity, so that larger values always indicate greater exposure to the relevant amenity environment.

Because Y_{ip} is a nonnegative count and includes many zeroes, the main specification uses Poisson pseudo maximum likelihood with high dimensional fixed effects. This estimator is appropriate for count outcomes and remains useful under overdispersion when the conditional mean is correctly specified. The general model is

$$Y_{ip} \sim \text{Poisson}(\mu_{ip}),$$

$$\log(\mu_{ip}) = \alpha_i + \eta_{pt} + \beta \left(E_{ig}^{r} \times T_p \right).$$

Here, α_i represents panorama fixed effects. These fixed effects absorb all panorama level characteristics, including the district, election period, local urban density, image availability, and all other observed and unobserved features that are common to parties within the same panorama. The term η_{pt} represents party by election period fixed effects, which account for differences in overall party visibility across election cycles. The coefficient of interest is β, which estimates whether the relevant party or party family is disproportionately represented in panoramas with greater exposure to the amenity environment g. Standard errors are clustered at the district level, and inference is based on comparisons within the same set of observed panoramas.

For H2a, which asks whether CHP symbols are disproportionately located near secular professional and cosmopolitan amenities, the relevant amenity family includes universities, colleges, libraries, cultural centers, art centers, theatres, cinemas, cafés, bars, pubs, co-working spaces, and restaurant clusters. The main comparison set is restricted to CHP, AKP, and MHP symbols. We estimate

$$\log(\mu_{ip}) = \alpha_i + \eta_{pt} + \beta_{2a} \left(E_{i,\text{secular}}^{r} \times CHP_p \right).$$

The hypothesis is supported if $\beta_{2a} > 0$, indicating that CHP symbols are more strongly associated with secular professional and cosmopolitan amenity environments than symbols belonging to AKP and MHP. In parallel models, support for the hypothesis also requires CHP symbols to have higher counts of these amenities within 100 and 250 meters and shorter distances to the nearest such amenity.

For H2b, which asks whether AKP and MHP symbols are more strongly associated with conservative, communal, and neighborhood commercial environments, the relevant amenity family

includes places of worship, schools, kindergartens, prep schools, marketplaces, pharmacies, clinics, hospitals, banks, ATMs, fast food establishments, and other neighborhood service amenities. The main comparison set again includes CHP, AKP, and MHP symbols, with CHP serving as the reference party. We estimate

$$\log(\mu_{ip}) = \alpha_i + \eta_{pt} + \beta_{2b}^{AKP}\left(E_{i,\text{communal}}^{r} \times AKP_p\right) + \beta_{2b}^{MHP}\left(E_{i,\text{communal}}^{r} \times MHP_p\right).$$

The hypothesis is supported if $\beta_{2b}^{AKP} > 0$ and $\beta_{2b}^{MHP} > 0$, indicating that AKP and MHP symbols are more common than CHP symbols in conservative, communal, and neighborhood commercial amenity environments. The claim that this pattern is stronger for AKP than for MHP is evaluated by comparing the two coefficients directly. In the count and distance versions of the model, the same expectation implies higher nearby amenity counts and shorter distances to the nearest relevant amenity for AKP and MHP symbols.

For H2c, which asks whether HDP symbols are associated with community service and civic access environments, the relevant amenity family includes community centers, social facilities, public buildings, post offices, marketplaces, clinics, bus stations, railway stations, ferry terminals, and related access oriented amenities. The main comparison set includes HDP, CHP, AKP, and MHP symbols. We estimate

$$\log(\mu_{ip}) = \alpha_i + \eta_{pt} + \beta_{2c}\left(E_{i,\text{access}}^{r} \times HDP_p\right).$$

The hypothesis is supported if $\beta_{2c} > 0$, indicating that HDP symbols are more strongly associated with community service and civic access amenities than the symbols of the comparison parties. To evaluate whether this pattern is stronger in electorally favorable settings for the broader Kurdish aligned party family, we also estimate an interaction model using the district level vote share variables already merged into the analysis file:

$$\log(\mu_{ip}) = \alpha_i + \eta_{pt} + \beta_{2c}\left(E_{i,\text{access}}^{r} \times HDP_p\right) + \kappa_{2c}\left(E_{i,\text{access}}^{r} \times HDP_p \times V_{dt}^{Kurdish}\right).$$

Here, $V_{dt}^{Kurdish}$ denotes the district level vote share of the broader Kurdish aligned party family in district d and election period t, constructed from the existing election variables in the dataset. The hypothesis receives stronger support if $\kappa_{2c} > 0$, indicating that HDP symbols are especially likely to appear near community service and civic access amenities in districts where this party family has greater electoral strength.

We report incidence rate ratios for the Poisson models and interpret the estimates as descriptive evidence of differential spatial placement rather than as causal effects of amenities on party behavior. The key estimand is whether symbols belonging to different parties are over represented in different amenity environments after holding constant the panorama itself and each party's overall visibility in a given election period.

For each model estimated under H2a through H2c, we conduct three robustness checks using only the existing data. First, we reestimate all models using alternative spatial buffers. The main specifications use 100 and 250 meter radii, while robustness checks repeat the analysis using 50, 500, and 1,000 meter buffers. This evaluates whether party specific amenity targeting is limited to very proximate surroundings or persists across broader local environments.

Second, we reestimate the models using a binary party presence outcome rather than symbol counts. In these models, the dependent variable equals one if party p has at least one symbol in panorama i, and zero otherwise. This check ensures that the results are not driven only by panoramas containing unusually large numbers of repeated symbols from the same party.

Third, we vary the comparison set for each hypothesis. For H2a, we compare CHP not only to AKP and MHP, but also to the full set of non CHP party symbols. For H2b, we estimate AKP and MHP both jointly and separately. For H2c, we compare HDP to the major party comparison set and then to all non HDP party symbols. Results are interpreted as robust when the direction and substantive magnitude of the relevant party by amenity coefficients remain similar across these alternative specifications.

6.3 Empirical Strategy for RQ3: Amenity Targeting Across Electoral Environments

To evaluate whether amenity targeting varies across core, competitive, and hostile electoral environments, we estimate party by panorama models that combine three components of the dataset: detected party symbols, district level election returns, and local amenity profiles. The unit of analysis is party p in panorama i, where panorama i is located in district d and matched to election period t. The dependent variable, Y_{ipdt}, is the number of symbols belonging to party p detected in panorama i. The analysis is restricted to political party symbols. National symbols, including Turkish flags and Atatürk imagery, are excluded because the purpose of RQ3 is to assess whether parties condition their visual strategies on electoral context.

Electoral environment is defined at the party by district by election level. Let V_{pdt} denote the vote share of party p in district d during election period t, and let V^*_{dt} denote the vote share of the district winner. We define the party's electoral deficit as

$$G_{pdt} = V^*_{dt} - V_{pdt}.$$

Parties are classified as operating in a stronghold when $G_{pdt} \leq 5$ percentage points, in a competitive environment when $5 < G_{pdt} \leq 15$, and in a hostile environment when $G_{pdt} > 15$. Winning parties are therefore coded as stronghold cases. Party by district by election observations with missing vote share information are excluded from the RQ3 models because their electoral environment cannot be assigned from the available data.

For each panorama, we construct three amenity exposure measures. The first, H^r_i, captures high exposure amenities within radius r, including transit and mobility nodes as well as dense everyday commercial and service amenities. The second, C^r_i, captures community embedded amenities, including places of worship, schools, health facilities, civic institutions, community centers, cultural facilities, and neighborhood marketplaces. The third, M^r_i, captures mixed use urban environments through overall amenity density and the number of distinct amenity categories within the same radius. The main specifications use 100 and 250 meter buffers, and all amenity measures are standardized to have mean zero and standard deviation one.

Because the outcome is a nonnegative count with a large number of zeroes, the main models are estimated using Poisson pseudo maximum likelihood with fixed effects. This estimator is appropriate for count outcomes and provides consistent estimates of conditional mean relationships even under overdispersion. The general specification is

$$Y_{ipdt} \sim \text{Poisson}(\mu_{ipdt}),$$

$$\log(\mu_{ipdt}) = \alpha_i + \zeta_{pdt} + \mathbf{W}'_{ipdt}\beta.$$

Here, α_i represents panorama fixed effects, which absorb all location specific characteristics of the image and its immediate environment, including baseline amenity density, street morphology, district, and image availability. The term ζ_{pdt} represents party by district by election fixed effects, which absorb each party's average level of visibility in each district and election period. The vector $\mathbf{W}_{ipdt}$ contains the hypothesis specific interactions between amenity exposure and electoral environment. This fixed effect structure is intentionally demanding: the estimates are identified by asking whether, within the same local urban setting and after accounting for each party's overall district election visibility, parties in different electoral environments concentrate their symbols around different types of amenities. Standard errors are clustered at the district level.

For H3a, which asks whether parties prioritize high exposure amenities more strongly in competitive districts, we estimate

Let C_{pdt} indicate competitive districts and H_{pdt} indicate hostile districts. We estimate

$$\log(\mu_{ipdt}) = \alpha_i + \zeta_{pdt} + \beta^C_{3a}(H^r_i C_{pdt}) + \beta^H_{3a}(H^r_i H_{pdt}) + \phi^C_{3a}(M^r_i C_{pdt}) + \phi^H_{3a}(M^r_i H_{pdt}).$$

Stronghold environments serve as the reference category. The hypothesis is supported if $\beta^C_{3a} > 0$ and $\phi^C_{3a} > 0$, indicating that parties in competitive districts place more symbols near high exposure amenities and mixed use micro environments than parties in strongholds. We also compare the competitive and hostile coefficients directly. The expectation is strongest if the competitive coefficients are larger than the corresponding hostile coefficients, which would suggest that parties especially prioritize high visibility locations where electoral returns are plausibly greatest.

For H3b, which asks whether parties rely more on community embedded amenities in strongholds, we estimate

Let S_{pdt} indicate stronghold districts and H_{pdt} indicate hostile districts. We estimate

$$\log(\mu_{ipdt}) = \alpha_i + \zeta_{pdt} + \beta^S_{3b}(C^r_i S_{pdt}) + \beta^H_{3b}(C^r_i H_{pdt}).$$

Competitive districts serve as the reference category. The hypothesis is supported if $\beta^S_{3b} > 0$, indicating that parties in strongholds place symbols more heavily around community embedded amenities than parties in competitive districts. The hypothesis receives stronger support if $\beta^S_{3b} > \beta^H_{3b}$, indicating that stronghold placement is more community embedded than hostile district placement as well.

For H3c, which asks whether parties in hostile districts retreat to especially visible or selective amenity nodes rather than dispersing symbols broadly, we estimate

Let C_{pdt} indicate competitive districts and H_{pdt} indicate hostile districts. We estimate

$$\log(\mu_{ipdt}) = \alpha_i + \zeta_{pdt} + \beta^C_{3c}(H^r_i C_{pdt}) + \beta^H_{3c}(H^r_i H_{pdt}) + \gamma^C_{3c}(C^r_i C_{pdt}) + \gamma^H_{3c}(C^r_i H_{pdt}) + \omega^C_{3c}(M^r_i C_{pdt}) + \omega^H_{3c}(M^r_i H_{pdt}).$$

Stronghold environments again serve as the reference category. The hypothesis is supported if $\beta^H_{3c} > 0$, $\gamma^H_{3c} < 0$, and $\omega^H_{3c} < 0$. This pattern would indicate that, in hostile districts, parties concentrate the symbols they do place around especially visible transit and commercial nodes, while avoiding broader community embedded or highly mixed use environments. We also conduct pairwise tests comparing hostile and competitive coefficients to assess whether hostile district placement is more selective than competitive district placement.

We report incidence rate ratios for all Poisson models. The estimates are interpreted as descriptive evidence of strategic spatial allocation rather than as causal effects of electoral competitiveness on party behavior. The key estimand is whether the relationship between amenity exposure and

symbol placement changes systematically across stronghold, competitive, and hostile electoral environments.

For each model estimated under H3a through H3c, we conduct three robustness checks using only the existing data. First, we vary the definition of electoral environment. In addition to the main 5 and 15 percentage point thresholds, we reestimate the models using alternative cutoffs of 10 and 20 percentage points and, separately, using a continuous electoral deficit measure G_{pdt} interacted with the relevant amenity exposure variables. This check evaluates whether the results depend on a particular categorical definition of stronghold, competitive, and hostile districts.

Second, we reestimate all models using alternative spatial buffers. The main specifications use 100 and 250 meter radii, while robustness checks repeat the analysis using 50, 500, and 1,000 meter buffers. This check assesses whether the estimated relationships are limited to the immediate surroundings of a panorama or whether they persist across broader local urban environments.

Third, we reestimate the models using a binary party presence outcome rather than symbol counts. In these specifications, the dependent variable equals one if party p has at least one symbol in panorama i, and zero otherwise. This check ensures that the results are not driven by a small number of panoramas containing unusually large numbers of repeated symbols from the same party. Results are interpreted as robust when the direction and substantive magnitude of the key interaction coefficients remain similar across these alternative specifications.

7 Results

7.1 RQ1: Amenity Environments and the Placement of Political Symbols

Table 7 reports the main RQ1 estimates for party-symbol placement using a 250-meter buffer. The table presents negative binomial models for party-symbol counts and logistic models for party-symbol presence. Because the amenity variables are standardized, the estimates can be interpreted as the change associated with a one-standard-deviation increase in the relevant amenity measure. Overall, the results show that political symbols are more common in amenity-rich and publicly visible urban environments. The clearest pattern concerns overall amenity density. A one-standard-deviation increase in the total number of amenities within 250 meters is associated with a 36.1 percent increase in expected party-symbol counts ($IRR = 1.361, p = .007$). The corresponding logistic model indicates a 1.04 percentage point increase in the probability that a panorama contains at least one party symbol ($p = .001$). These results provide strong support for H1e and suggest that symbolic visibility is concentrated in urban micro-environments with denser everyday activity.

The family-specific models show that proximity to amenities is often more predictive than the simple number of nearby amenities. For transit and mobility amenities, the count of nearby transit nodes is not statistically significant in the negative binomial model ($IRR = .960, p = .626$), but greater distance from the nearest transit amenity is associated with substantially fewer party symbols ($IRR = .610, p = .007$). The logistic model points in the same direction. Transit density is positively associated with symbol presence, while distance from the nearest transit amenity reduces the probability of observing a party symbol. This provides partial support for H1a. Symbols are more likely to appear close to mobility infrastructure, even if additional nearby transit nodes do not consistently increase symbolic intensity.

Commercial and service amenities display a similar pattern. The number of commercial amenities within 250 meters is positive but not statistically significant in the count model ($IRR =$

$1.074, p = .418$). By contrast, distance from the nearest commercial amenity is strongly and negatively associated with party-symbol counts ($IRR = .535, p < .001$). In the logistic model, commercial density increases the probability of symbol presence, while greater distance from commercial amenities reduces it by 2.47 percentage points ($p < .001$). These findings support H1b by showing that political symbols tend to be placed close to everyday commercial and service environments that structure routine pedestrian activity, lingering, and repeated visual exposure.

The evidence for civic and institutional amenities is more mixed. The local count of civic amenities is not associated with higher symbol intensity in the negative binomial model ($IRR = 1.004, p = .956$), but greater distance from the nearest civic amenity is negatively associated with party-symbol counts ($IRR = .654, p = .012$). The logistic models provide clearer support. Civic amenity density is positively associated with symbol presence, and distance from the nearest civic amenity is negatively associated with presence. These results suggest that civic and institutional anchors matter more for whether symbols appear at all than for how many repeated symbols are placed in the same panorama.

Community and congregational amenities provide the strongest family-specific evidence. A one-standard-deviation increase in community amenities within 250 meters is associated with an 18.9 percent increase in expected party-symbol counts ($IRR = 1.189, p < .001$), and greater distance from the nearest community amenity is associated with lower expected counts ($IRR = .717, p = .015$). The logistic model also shows a positive association between community amenities and symbol presence. These results support H1d and suggest that symbols are especially likely to appear near sites that organize recurring local co-presence, neighborhood interaction, and collective attention.

Finally, the mixed-use models indicate that diversity in nearby amenities is more strongly associated with symbol presence than with symbol intensity. In the count model, the number of distinct amenity categories is positive but not statistically significant ($IRR = 1.181, p = .237$), while the Shannon diversity index is positive and marginally significant ($IRR = 1.383, p = .099$). In the logistic models, both indicators are positive and statistically significant. Distinct amenity categories increase the probability of observing at least one party symbol by 1.09 percentage points, and the Shannon index increases it by 0.67 percentage points. These results provide moderate support for H1f. Mixed-use environments appear especially relevant for the initial presence of symbols, although they do not consistently predict repeated symbolic saturation within the same panorama.

The robustness checks reinforce the main interpretation. Tables 11 and 12 report the corresponding buffer-based robustness checks for the negative binomial and logistic specifications. Across alternative spatial buffers, overall amenity density remains consistently positive, with incidence-rate ratios increasing from approximately 1.31 at 50 meters to 1.54 at 1,000 meters. Commercial proximity is also stable across specifications, with greater distance from commercial amenities consistently associated with lower symbol counts. Excluding the top one percent of symbol-dense panoramas does not eliminate the main density and proximity patterns, indicating that the results are not driven solely by a small number of highly saturated public spaces. The models for national symbols, including Turkish flags and Atatürk imagery, show broadly similar spatial associations, particularly for commercial proximity, community amenities, total amenity density, and mixed-use environments. This suggests that the spatial logic identified here is not limited to partisan campaign activity alone, but reflects a broader geography of public symbolic display in Istanbul.

Table 7: Amenity Environments and Political Symbol Placement, 250 m Buffer

Hypothesis	Predictor	Negative binomial IRR	Logit AME, p.p.
H1a	Transit amenities within 250 m	0.960	0.281***
		(0.080)	(0.107)
H1a	Log distance to nearest transit amenity	0.610***	-1.382***
		(0.112)	(0.334)
H1b	Commercial/service amenities within 250 m	1.074	0.248**
		(0.095)	(0.122)
H1b	Log distance to nearest commercial/service amenity	0.535***	-2.473***
		(0.068)	(0.374)
H1c	Civic/institutional amenities within 250 m	1.004	0.390***
		(0.071)	(0.130)
H1c	Log distance to nearest civic/institutional amenity	0.654**	-1.159***
		(0.110)	(0.421)
H1d	Community/congregational amenities within 250 m	1.189***	0.437***
		(0.059)	(0.154)
H1d	Log distance to nearest community/congregational amenity	0.717**	-0.662*
		(0.098)	(0.381)
H1e	All amenities within 250 m	1.361***	1.039***
		(0.155)	(0.320)
H1f	Distinct amenity categories within 250 m	1.181	1.091***
		(0.166)	(0.239)
H1f	Amenity diversity, Shannon index	1.383*	0.673**
		(0.271)	(0.296)
Observations		751,983	751,983
District fixed effects		Yes	Yes
Election-period fixed effects		Yes	Yes

Note. The table reports the main RQ1 estimates using a 250 m buffer. Negative binomial entries are incidence-rate ratios. Logistic entries are average marginal effects reported in percentage points. All amenity predictors are standardized, so estimates correspond to a one-standard-deviation increase in the relevant measure. Standard errors are reported in parentheses. Standard errors are clustered by district. National symbols are excluded from the main party-symbol models. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

7.2 RQ2: Party Specific Amenity Targeting

Table 8 reports the main RQ2 models. The unit of analysis is the party by panorama, and the models include panorama fixed effects as well as party by election period fixed effects. The estimates therefore compare parties within the same panorama while accounting for each party's overall visibility in a given election period. The main exposure variables are standardized shares of nearby amenities in the theoretically relevant amenity family, measured within a 250-meter buffer.

The results provide little evidence that CHP symbols are disproportionately located in secular professional and cosmopolitan amenity environments. The interaction between CHP and secular professional exposure is close to one and statistically insignificant ($IRR = .981, p = .545$). In substantive terms, CHP symbols are not systematically overrepresented, relative to AKP and MHP symbols in the same panoramas, in environments with larger shares of universities, libraries, cultural venues, cafés, bars, pubs, co-working spaces, and restaurants. H2a is therefore not supported in the main specification.

The results also provide limited support for the expectation that AKP and MHP symbols are more strongly embedded in communal and neighborhood commercial environments. The AKP interaction is positive but statistically insignificant ($IRR = 1.031, p = .747$), and the MHP inter-

action is also positive but statistically insignificant ($IRR = 1.098, p = .295$). These estimates do not support the claim that AKP or MHP symbols are consistently more concentrated than CHP symbols in environments with larger shares of places of worship, schools, marketplaces, pharmacies, clinics, hospitals, banks, ATMs, or fast food establishments.

The clearest pattern in Table 8 appears in the HDP models. The interaction between HDP and community access exposure is negative and statistically insignificant ($IRR = .851, p = .132$), so the main amenity exposure term does not provide direct support for H2c. However, the interaction between HDP and Kurdish aligned vote share is positive and statistically significant ($IRR = 1.116, p = .022$). This indicates that HDP symbols are more numerous, relative to the comparison parties, in districts where the broader Kurdish aligned party family is electorally stronger. The three way interaction among HDP, access exposure, and Kurdish aligned vote share is also positive and marginally significant ($IRR = 1.046, p = .078$). This result suggests that the association between HDP symbols and community access amenities becomes somewhat stronger in electorally favorable districts for the Kurdish aligned party family, although this evidence falls short of conventional 5 percent significance thresholds.

The RQ2 results are more modest than the theoretical expectations. Once panorama level characteristics are absorbed, the models do not show strong evidence that CHP, AKP, or MHP symbols sort into the expected amenity environments. The most consistent pattern is electoral rather than purely amenity based. HDP visibility is higher in districts where Kurdish aligned parties have greater support, and there is suggestive evidence that this relationship is somewhat more pronounced around community service and access oriented amenities.

Table 8: RQ2 Party Specific Amenity Targeting Models, 250 m Buffer

Hypothesis	Predictor	IRR	SE
H2a	CHP × secular professional exposure	0.981	(0.032)
H2b	AKP × communal neighborhood exposure	1.031	(0.097)
H2b	MHP × communal neighborhood exposure	1.098	(0.098)
H2c	HDP × community access exposure	0.851	(0.091)
H2c	HDP × Kurdish aligned vote share	1.116**	(0.054)
H2c	HDP × access exposure × Kurdish aligned vote share	1.046*	(0.026)
Observations, H2a and H2b		158,211	
Observations, H2c		210,948	
Panorama fixed effects		Yes	
Party by election period fixed effects		Yes	

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models. Standard errors are reported in parentheses and clustered by district. The main exposure variables are standardized shares of nearby amenities in the relevant amenity family within 250 meters. The H2a comparison set is CHP, AKP, and MHP. The H2b comparison set is CHP, AKP, and MHP. The H2c comparison set is HDP, CHP, AKP, and MHP. National symbols are excluded. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

7.3 RQ3: Amenity Targeting Across Electoral Environments

Table 9 reports the main RQ3 models using the 5 and 15 percentage point classification of electoral environments. The unit of analysis is the party by panorama, and the models include panorama fixed effects and party by district by election fixed effects. The estimates therefore ask whether,

within the same local setting and after accounting for each party's average visibility in each district and election period, amenity exposure is associated with different levels of symbolic placement across stronghold, competitive, and hostile electoral environments.

The strongest result concerns high exposure amenities in competitive districts. In the H3a specification, a one standard deviation increase in high exposure amenities is associated with a 51.4 percent increase in expected party symbol counts in competitive environments relative to strongholds ($IRR = 1.514, p < .001$). High exposure amenities are also positively associated with symbol counts in hostile environments ($IRR = 1.336, p = .024$), although the competitive district coefficient is larger. This pattern is consistent with the expectation that parties prioritize visible transit, mobility, commercial, and service environments when electoral returns to visibility are plausibly higher. The mixed use result, however, points in the opposite direction from H3a. Mixed use exposure is negatively associated with symbol counts in competitive districts ($IRR = .636, p = .001$), while the hostile interaction is not statistically significant. Thus, H3a receives support for high exposure amenities but not for mixed use environments.

The H3b results do not support the expectation that parties rely more heavily on community embedded amenities in strongholds. The stronghold interaction is positive but statistically insignificant ($IRR = 1.064, p = .328$). By contrast, the hostile district interaction is positive and statistically significant ($IRR = 1.235, p = .041$). This suggests that community embedded amenities are not uniquely associated with symbolic maintenance in core electoral areas. Instead, symbols in hostile districts appear somewhat more common around community embedded environments than symbols in competitive districts, which is not the pattern expected under H3b.

The H3c specification provides partial evidence that parties in hostile districts select more visible amenity settings, but the evidence is not strong across all components of the hypothesis. High exposure amenities are positively associated with symbol counts in hostile districts ($IRR = 1.449, p = .059$), and the corresponding competitive district interaction is larger and statistically significant ($IRR = 1.842, p < .001$). However, the community embedded interaction for hostile districts is positive and statistically insignificant ($IRR = 1.113, p = .564$), and the mixed use interaction for hostile districts is negative but also statistically insignificant ($IRR = .806, p = .432$). These results suggest that hostile district placement is somewhat more oriented toward high exposure amenities, but they do not show a broader retreat away from community embedded or mixed use environments.

Taken together, the RQ3 results indicate that electoral context matters most for high exposure urban environments. Competitive districts show the clearest increase in symbolic placement around high exposure amenities, and hostile districts show a similar but weaker pattern. The evidence for stronghold based community reinforcement is limited, and the mixed use results are not consistent with a simple visibility maximization account. Overall, the findings suggest that parties respond to electoral context by emphasizing highly visible urban nodes, especially in competitive districts, rather than by uniformly intensifying placement across all amenity rich or mixed use environments.

Table 9: RQ3 Amenity Targeting Across Electoral Environments, 250 m Buffer

Hypothesis	Predictor	IRR	SE
H3a	High exposure amenities × competitive	1.514***	(0.128)
H3a	High exposure amenities × hostile	1.336**	(0.171)
H3a	Mixed use exposure × competitive	0.636***	(0.084)
H3a	Mixed use exposure × hostile	0.934	(0.156)
H3b	Community embedded exposure × stronghold	1.064	(0.067)
H3b	Community embedded exposure × hostile	1.235**	(0.128)
H3c	High exposure amenities × competitive	1.842***	(0.315)
H3c	High exposure amenities × hostile	1.449*	(0.285)
H3c	Community embedded exposure × competitive	1.231	(0.165)
H3c	Community embedded exposure × hostile	1.113	(0.206)
H3c	Mixed use exposure × competitive	0.460**	(0.147)
H3c	Mixed use exposure × hostile	0.806	(0.221)
Observations		85,645	
Panorama fixed effects		Yes	
Party by district by election fixed effects		Yes	

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models. Standard errors are reported in parentheses and clustered by district. All models include panorama fixed effects and party by district by election fixed effects. Stronghold environments serve as the reference category in H3a and H3c. Competitive environments serve as the reference category in H3b. Amenity variables are standardized. National symbols are excluded. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Before turning to the discussion, Table 10 summarizes the empirical support for each hypothesis across the three research questions. The table is intended to clarify the main patterns that emerge from the statistical analyses rather than to replace the more detailed model interpretations above. I classify each hypothesis as supported, partially supported, or not supported based on the direction, magnitude, and statistical significance of the main estimates, as well as the consistency of the robustness checks reported in the Appendix. The overall pattern is clear. The evidence is strongest for the general relationship between political symbols and visible, amenity-rich urban environments. It is more limited for party-specific sorting into theoretically expected amenity environments, and more conditional for electoral-context effects, where high-exposure amenities matter most in competitive districts.

Table 10: Summary of Hypothesis Tests

RQ	Hyp.	Expected pattern	Main evidence	Assessment
RQ1	H1a	Symbols should be common near transit and mobility nodes.	Transit counts are not significant ($IRR = .960, p = .626$), but distance to nearest transit is negative in both count and presence models ($IRR = .610, p = .007; AME = -1.382, p < .01$).	**Partially supported**. Evidence is stronger for proximity than for transit counts.
RQ1	H1b	Symbols should cluster near commercial and service amenities.	Commercial counts are not significant in the count model ($IRR = 1.074, p = .418$), but commercial proximity is strongly associated with symbol placement ($IRR = .535, p < .001; AME = -2.473, p < .001$).	**Supported**. Symbols are more likely near everyday commercial and service activity.
RQ1	H1c	Symbols should appear near civic and institutional anchors.	Civic counts are not significant in the count model ($IRR = 1.004, p = .956$), but civic proximity is significant ($IRR = .654, p = .012; AME = -1.159, p < .01$). Civic counts also predict presence ($AME = .390, p < .01$).	**Partially supported**. Civic amenities predict presence more clearly than intensity.
RQ1	H1d	Symbols should be common near community and congregational nodes.	Community amenities are positive in the count and presence models ($IRR = 1.189, p < .001; AME = .437, p < .01$), and distance is negative ($IRR = .717, p = .015$).	**Supported**. This is the strongest family specific RQ1 pattern.
RQ1	H1e	Symbols should be concentrated in amenity dense environments.	Total amenities are positive in both models ($IRR = 1.361, p = .007; AME = 1.039, p = .001$), with positive IRRs across buffers (1.31–1.54).	**Strongly supported**. Overall amenity density is the most consistent predictor.
RQ1	H1f	Symbols should be more common in mixed use environments.	Distinct categories are not significant in the count model ($IRR = 1.181, p = .237$), while Shannon diversity is marginal ($IRR = 1.383, p = .099$). Both are positive in the presence models.	**Partially supported**. Mixed use predicts symbol presence more than repeated intensity.
RQ2	H2a	CHP symbols should be more common in secular professional environments.	The CHP interaction is close to one and insignificant ($IRR = .981, p = .545$). Robustness checks do not show a stable CHP specific pattern.	**Not supported**. CHP does not systematically sort into the expected amenities once panorama fixed effects are included.
RQ2	H2b	AKP and MHP symbols should be more common in communal neighborhood environments.	AKP and MHP interactions are insignificant in the main count model ($IRR = 1.031, p = .747; IRR = 1.098, p = .295$). Some robustness checks show localized MHP evidence.	**Not supported in the main model**. Supplemental evidence for MHP is limited and not stable across specifications.
RQ2	H2c	HDP symbols should be associated with community access amenities, especially where Kurdish aligned parties are stronger.	Direct HDP access exposure is insignificant ($IRR = .851, p = .132$). Kurdish aligned vote share is positive ($IRR = 1.116, p = .022$), and the three way interaction is marginal ($IRR = 1.046, p = .078$).	**Partially supported**. Evidence is conditional on electoral strength rather than direct amenity sorting.
RQ3	H3a	Parties should prioritize high exposure and mixed use amenities in competitive districts.	High exposure amenities are positive in competitive districts ($IRR = 1.514, p < .001$) and hostile districts ($IRR = 1.336, p = .024$). Mixed use is negative in competitive districts ($IRR = .636, p = .001$).	**Partially supported**. Competitive districts show high exposure targeting, but not mixed use targeting.
RQ3	H3b	Parties should rely more on community embedded amenities in strongholds.	Stronghold interaction is insignificant ($IRR = 1.064, p = .328$). Hostile interaction is positive ($IRR = 1.235, p = .041$), contrary to the expectation.	**Not supported**. No evidence of stronger community embedded placement in core areas.
RQ3	H3c	In hostile districts, parties should concentrate near visible amenities and avoid broader community or mixed use settings.	High exposure is positive and marginal in hostile districts ($IRR = 1.449, p = .059$), but hostile community and mixed use interactions are not significant ($IRR = 1.113, p = .564; IRR = .806, p = .432$).	**Partially supported**. Hostile districts show some high exposure placement, but not broader selective retreat.

Note. "Supported" indicates that the main estimate is in the expected direction and statistically significant, with broadly consistent robustness evidence. "Partially supported" indicates mixed, conditional, or outcome specific evidence. "Not supported" indicates that the main estimates are insignificant or contrary to expectation. IRRs are incidence rate ratios. AMEs are average marginal effects in percentage points.

8 Discussion

This article has examined the spatial logic of political symbol placement in Istanbul by treating flags, banners, party logos, Atatürk portraits, and national symbols not simply as campaign decoration, but as observable traces of political strategy in urban space. Using 748,783 Google Street View panoramas from Istanbul's 39 districts and 1,009 precincts, combined with district-level electoral returns, demographic indicators, and a newly assembled database of 75,984 unique amenities, the study provides a large-scale quantitative account of where parties choose to become visible. The results show that political visibility is not randomly distributed across the city. Rather, party symbols concentrate in amenity-rich, commercially active, and publicly visible environments where daily movement, repeated exposure, and symbolic signaling are likely to be most consequential.

The main empirical findings point to three broader conclusions. First, overall amenity density is strongly associated with symbolic visibility: a one-standard-deviation increase in the number of amenities within 250 meters is associated with a 36.1 percent increase in expected party-symbol counts. Second, proximity to everyday commercial and service activity is especially important. Greater distance from the nearest commercial amenity is associated with substantially lower expected symbol counts, with an incidence-rate ratio of .535. Third, electoral context conditions the value of visibility. In competitive districts, high-exposure amenities are associated with a 51.4 percent increase in expected party-symbol counts, suggesting that parties concentrate symbolic resources where marginal electoral returns may be greatest. At the same time, the evidence for party-specific sorting into theoretically expected amenity environments is more limited once panorama fixed effects are included, indicating that the shared logic of visibility may be stronger than the distinct social geography of individual parties.

These findings matter for the study of political communication, electoral strategy, and urban politics. They show that campaign visibility is not only a matter of message content or media exposure, but also of spatial placement. The streetscape becomes a measurable record of partisan investment, organizational capacity, and claims over public space. The study is also economically important because political symbols require resources: parties must decide where to spend money, labor, and logistical effort. By showing that symbols cluster around high-exposure amenities, the article suggests that campaigns allocate scarce resources in ways that resemble spatial targeting, prioritizing locations where visibility may produce greater political returns.

Several limitations should be noted. Google Street View coverage is temporally uneven and incomplete, especially in pedestrian-only areas, restricted zones, and neighborhoods with less frequent image updates. The analysis is observational and should not be interpreted as estimating the causal effect of any individual symbol on voting behavior. In addition, automated detection, amenity classification, and district-level electoral matching may introduce measurement error. Future research can extend this framework by incorporating temporal dynamics, comparing multiple cities or countries, linking symbol exposure to individual-level political behavior, and studying how regulations, campaign finance, and local party organizations shape the economics of symbolic visibility.

Appendix

A Additional Robustness Checks for RQ1

This appendix reports additional robustness checks for the RQ1 models on amenity environments and political-symbol placement. The main text reports the preferred 250-meter specifications. Here, we reestimate the models across alternative spatial buffers to assess whether the results depend on a particular definition of local urban context. The estimates should be interpreted as descriptive associations rather than causal effects of amenities on symbol placement.

A.1 Alternative Spatial Buffers: Negative Binomial Models

Table 11 reports incidence-rate ratios from negative binomial models estimated at 50, 100, 250, 500, and 1,000 meter buffers. The results show that the association between overall amenity density and symbol intensity is consistently positive, with the incidence-rate ratio increasing from 1.311 at 50 meters to 1.537 at 1,000 meters. This pattern suggests that political-symbol intensity is higher in broadly amenity-dense urban environments. Proximity to commercial amenities is especially stable across specifications. The distance to the nearest commercial or service amenity is negative and statistically significant at every buffer, indicating that symbols are more numerous in panoramas located closer to everyday commercial activity. Community and congregational amenities also become more strongly associated with symbol counts at larger buffers, especially at 250 and 500 meters. By contrast, simple counts of transit, commercial, and civic amenities are less consistent, suggesting that proximity and overall density are more robust predictors than the count of every individual amenity family.

Table 11: RQ1 Robustness Check: Alternative Spatial Buffers, Negative Binomial Models

Predictor	50 m	100 m	250 m	500 m	1,000 m
Transit amenities	0.988	1.011	0.960	1.036	1.028
Distance to nearest transit amenity	0.703	0.757	0.610***	0.645***	0.636***
Commercial/service amenities	1.104	1.097	1.074	1.084	1.147
Distance to nearest commercial/service amenity	0.553***	0.549***	0.535***	0.531***	0.539***
Civic/institutional amenities	0.988	1.022	1.004	1.170*	0.443
Distance to nearest civic/institutional amenity	0.647***	0.666**	0.654**	0.723**	0.398
Community/congregational amenities	0.965	1.059	1.189***	1.249***	1.205*
Distance to nearest community/congregational amenity	0.541**	0.698	0.717**	0.746**	0.600**
All amenities	1.311	1.360	1.361***	1.504***	1.537***
Distinct amenity categories	1.844***	1.895***	1.181	1.541	1.735***
Amenity diversity, Shannon index	0.814***	0.873	1.383*	0.931	0.781

Note. Entries are incidence-rate ratios from negative binomial models estimated separately at each spatial buffer. All models include district and election-period fixed effects, with standard errors clustered by district. Stars are shown when the corresponding clustered p-value is available and meets conventional thresholds. Distance variables are logged distances to the nearest amenity in the relevant family. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

A.2 Alternative Spatial Buffers: Logistic Models

Table 12 reports average marginal effects from logistic models of party-symbol presence. The logistic results are highly consistent with the main interpretation. Overall amenity density is positive and statistically significant at every buffer, indicating that amenity-rich environments are more likely to contain at least one party symbol. The distance measures are also stable. Greater distance from transit, commercial, civic, and community amenities is associated with a lower probability of symbol presence across all or nearly all buffer specifications. Commercial proximity is again the most consistent association, with distance from the nearest commercial or service amenity reducing the probability of symbol presence by approximately 2.3 to 2.5 percentage points across the five buffers. Mixed-use context also matters for symbol presence. The number of distinct amenity categories is positive and statistically significant across all buffers, suggesting that symbols are more likely to appear in functionally diverse urban settings.

Table 12: RQ1 Robustness Check: Alternative Spatial Buffers, Logistic Models

Predictor	50 m	100 m	250 m	500 m	1,000 m
Transit amenities	-0.040	0.179*	0.281***	0.301*	0.572***
Distance to nearest transit amenity	-1.667***	-1.448***	-1.382***	-1.432***	-1.345***
Commercial/service amenities	0.313***	0.300**	0.248**	0.252**	0.424**
Distance to nearest commercial/service amenity	-2.332***	-2.378***	-2.473***	-2.506***	-2.471***
Civic/institutional amenities	0.107	0.225	0.390***	0.632***	0.880***
Distance to nearest civic/institutional amenity	-1.416***	-1.273***	-1.159***	-1.068***	-1.046***
Community/congregational amenities	-0.020	0.169	0.437***	0.674***	0.649***
Distance to nearest community/congregational amenity	-1.003**	-0.811*	-0.662*	-0.664**	-0.747**
All amenities	1.012***	1.080***	1.039***	1.143***	1.490***
Distinct amenity categories	1.639***	0.977***	1.091***	1.509***	2.225***
Amenity diversity, Shannon index	-0.358**	0.608**	0.673**	0.225	-0.587

Note. Entries are average marginal effects from logistic models, reported in percentage points. All models include district and election-period fixed effects, with standard errors clustered by district. Distance variables are logged distances to the nearest amenity in the relevant family. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

B Additional Robustness Checks for RQ2

This appendix reports additional robustness checks for the RQ2 models on party specific amenity targeting. The main text reports the preferred 250-meter models using standardized shares of nearby amenities. Here, we vary the spatial buffer, replace the count outcome with a binary party presence outcome, change the party comparison sets, and estimate parallel specifications using amenity counts and distance based exposure measures. As in the main analysis, the estimates are descriptive associations rather than causal effects of amenity environments on party placement strategy.

B.1 Alternative Spatial Buffers

Table 13 reports the RQ2 estimates across 50, 100, 250, 500, and 1,000 meter buffers. The alternative buffer results reinforce the main conclusion that party specific amenity sorting is limited. The CHP interaction is not significant at 50, 100, or 250 meters, although it becomes marginally

positive at 1,000 meters ($IRR = 1.111, p = .081$). This suggests, at most, weak evidence that CHP symbols are associated with broader secular professional surroundings rather than immediate micro environments. For H2b, the AKP interaction remains statistically insignificant across all buffers. The MHP interaction is positive and statistically significant at 50 meters ($IRR = 1.145, p < .01$), marginal at 100 meters, and insignificant at larger buffers. This indicates that any MHP association with communal neighborhood amenities is localized and not robust across spatial scales. For H2c, the direct HDP access exposure term is not significant at any buffer. However, the HDP by Kurdish aligned vote share term is positive and statistically significant across all buffers, indicating a stable electoral geography of HDP visibility.

Table 13: RQ2 Robustness Check: Alternative Spatial Buffers

Predictor	50 m	100 m	250 m	500 m	1,000 m
CHP × secular professional exposure	0.993	0.995	0.981	1.081	1.111*
AKP × communal neighborhood exposure	1.029	1.049	1.031	1.052	1.056
MHP × communal neighborhood exposure	1.145***	1.130*	1.098	1.106	1.050
HDP × community access exposure	0.994	0.978	0.851	0.947	0.849
HDP × Kurdish aligned vote share	1.131***	1.129**	1.116**	1.132***	1.127**
HDP × access exposure × Kurdish aligned vote share	0.997	1.001	1.046*	0.979	1.002

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models estimated separately at each spatial buffer. All models include panorama fixed effects and party by election period fixed effects. Standard errors are clustered by district. Exposure variables are standardized shares of nearby amenities in the relevant amenity family. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

B.2 Binary Party Presence Outcome

Table 14 reestimates the main models using party presence rather than party symbol counts. The results are broadly consistent with the main count models. CHP is not significantly associated with secular professional exposure, and AKP is not significantly associated with communal neighborhood exposure. The one clear exception is MHP. A one-standard-deviation increase in communal neighborhood exposure is associated with an 8.1 percent increase in expected MHP presence relative to CHP ($IRR = 1.081, p < .001$). This suggests that the MHP pattern is more visible when modeling whether the party appears at all than when modeling repeated symbol counts. For H2c, neither the direct HDP access exposure term nor the three way interaction is statistically significant in the binary specification.

Table 14: RQ2 Robustness Check: Binary Party Presence Outcome, 250 m Buffer

Hypothesis	Predictor	IRR	SE
H2a	CHP × secular professional exposure	1.012	(0.011)
H2b	AKP × communal neighborhood exposure	1.005	(0.021)
H2b	MHP × communal neighborhood exposure	1.081***	(0.021)
H2c	HDP × community access exposure	0.974	(0.035)
H2c	HDP × Kurdish aligned vote share	0.971	(0.020)
H2c	HDP × access exposure × Kurdish aligned vote share	1.013	(0.011)

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models using a binary party presence outcome. The dependent variable equals one when party p appears at least once in panorama i. All models include panorama fixed effects and party by election period fixed effects. Standard errors are clustered by district. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

B.3 Alternative Party Comparison Sets

Table 15 varies the comparison set used for each hypothesis. The results again show limited evidence for broad party specific amenity sorting. When CHP is compared to all non CHP parties, the secular professional exposure coefficient is essentially one and statistically insignificant ($IRR = 1.002, p = .954$). When AKP and MHP are estimated separately against CHP, neither party shows a statistically significant association with communal neighborhood exposure. For H2c, comparing HDP to all non HDP parties yields the same pattern as the main model. The direct access exposure term remains negative and insignificant, while the HDP by Kurdish aligned vote share term remains positive and significant ($IRR = 1.103, p = .047$). The three way interaction remains positive and marginally significant ($IRR = 1.044, p = .078$).

Table 15: RQ2 Robustness Check: Alternative Party Comparison Sets, 250 m Buffer

Comparison	Predictor	IRR	SE
CHP vs. all non CHP	CHP × secular professional exposure	1.002	(0.033)
AKP vs. CHP	AKP × communal neighborhood exposure	1.031	(0.097)
MHP vs. CHP	MHP × communal neighborhood exposure	1.108	(0.099)
HDP vs. all non HDP	HDP × community access exposure	0.861	(0.086)
HDP vs. all non HDP	HDP × Kurdish aligned vote share	1.103**	(0.054)
HDP vs. all non HDP	HDP × access exposure × Kurdish aligned vote share	1.044*	(0.026)

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models using alternative party comparison sets. All models include panorama fixed effects and party by election period fixed effects. Standard errors are clustered by district. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

B.4 Alternative Amenity Exposure Measures

Table 16 reports parallel specifications using logged amenity counts and negative logged distance to the nearest amenity in the relevant family. These results do not materially change the interpretation.

CHP is not significantly associated with secular professional exposure under either the count or distance measure. AKP and MHP are not significantly associated with communal neighborhood exposure under either alternative measure. For HDP, the direct access exposure term remains statistically insignificant. The HDP by Kurdish aligned vote share term remains positive and statistically significant in both the count and distance specifications. This confirms that the most stable RQ2 finding is electoral rather than strictly amenity based: HDP symbols are relatively more numerous in districts where Kurdish aligned parties receive stronger electoral support.

Table 16: RQ2 Parallel Specifications: Count and Distance Exposure Measures, 250 m Buffer

Exposure measure	Predictor	IRR	SE
Logged count	CHP × secular professional exposure	1.007	(0.041)
Logged count	AKP × communal neighborhood exposure	0.959	(0.071)
Logged count	MHP × communal neighborhood exposure	1.065	(0.121)
Logged count	HDP × community access exposure	0.937	(0.100)
Logged count	HDP × Kurdish aligned vote share	1.132***	(0.044)
Logged count	HDP × access exposure × Kurdish aligned vote share	1.003	(0.018)
Distance	CHP × secular professional exposure	1.086	(0.066)
Distance	AKP × communal neighborhood exposure	0.925	(0.079)
Distance	MHP × communal neighborhood exposure	1.034	(0.126)
Distance	HDP × community access exposure	0.839	(0.141)
Distance	HDP × Kurdish aligned vote share	1.124**	(0.053)
Distance	HDP × access exposure × Kurdish aligned vote share	1.019	(0.036)

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models. Logged count specifications use the logged number of amenities in the relevant family within 250 meters. Distance specifications use negative logged distance to the nearest amenity in the relevant family, so larger values indicate closer proximity. All models include panorama fixed effects and party by election period fixed effects. Standard errors are clustered by district. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

C Additional Robustness Checks for RQ3

This appendix reports additional robustness checks for the RQ3 models on amenity targeting across electoral environments. The main text reports the preferred 250 meter specifications using stronghold, competitive, and hostile categories based on 5 and 15 percentage point electoral deficit thresholds. Here, we vary the electoral environment definition, reestimate the models across alternative spatial buffers, and replace the count outcome with a binary party presence outcome. The estimates are descriptive associations rather than causal effects of electoral context on party behavior.

C.1 Alternative Electoral Environment Definitions

Table 17 reports two checks on the electoral environment coding. First, we redefine stronghold, competitive, and hostile environments using 10 and 20 percentage point cutoffs. Second, we replace the categorical coding with a continuous electoral deficit measure. The alternative threshold results

closely mirror the main findings. High exposure amenities remain positively associated with symbol counts in competitive environments ($IRR = 1.639, p < .001$), and the hostile interaction remains positive and statistically significant ($IRR = 1.351, p = .020$). Mixed use exposure remains negative in competitive environments ($IRR = .594, p < .001$). The H3b pattern is also similar: community embedded exposure is not significant in strongholds, while the hostile interaction remains positive ($IRR = 1.249, p = .024$). In the continuous deficit model, high exposure amenities become more strongly associated with symbol counts as the party's electoral deficit increases ($IRR = 1.172, p = .082$), although this relationship is only marginally significant. Community embedded and mixed use interactions with electoral deficit are not statistically significant. Overall, the main conclusions do not depend on the specific 5 and 15 point thresholds.

Table 17: RQ3 Robustness Check: Alternative Electoral Environment Definitions

Specification	Predictor	IRR	SE
Alternative 10 and 20 cutoffs	High exposure amenities × competitive	1.639***	(0.129)
Alternative 10 and 20 cutoffs	High exposure amenities × hostile	1.351**	(0.174)
Alternative 10 and 20 cutoffs	Mixed use exposure × competitive	0.594***	(0.061)
Alternative 10 and 20 cutoffs	Mixed use exposure × hostile	0.927	(0.155)
Alternative 10 and 20 cutoffs	Community embedded exposure × stronghold	1.078	(0.068)
Alternative 10 and 20 cutoffs	Community embedded exposure × hostile	1.249**	(0.123)
Alternative 10 and 20 cutoffs	Community embedded exposure × competitive	1.264*	(0.178)
Alternative 10 and 20 cutoffs	Community embedded exposure × hostile, H3c	1.113	(0.209)
Alternative 10 and 20 cutoffs	Mixed use exposure × competitive, H3c	0.410***	(0.116)
Alternative 10 and 20 cutoffs	Mixed use exposure × hostile, H3c	0.799	(0.220)
Continuous deficit	High exposure amenities × electoral deficit	1.172*	(0.107)
Continuous deficit	Community embedded exposure × electoral deficit	1.051	(0.084)
Continuous deficit	Mixed use exposure × electoral deficit	0.927	(0.119)
Observations		85,645	
Panorama fixed effects		Yes	
Party by district by election fixed effects		Yes	

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models. Standard errors are reported in parentheses and clustered by district. The alternative threshold specification codes strongholds as electoral deficits of 10 percentage points or less, competitive environments as deficits greater than 10 and no more than 20 points, and hostile environments as deficits greater than 20 points. The continuous deficit models interact standardized amenity exposure with the standardized electoral deficit. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

C.2 Alternative Spatial Buffers

Table 18 reports the main RQ3 interactions across 50, 100, 250, 500, and 1,000 meter buffers. The buffer results show that the strongest and most consistent findings occur at the 250 meter scale. At 250 meters, high exposure amenities are positively associated with symbol counts in competitive and hostile environments, and mixed use exposure is negatively associated with symbol counts in competitive environments. At shorter distances, the hostile high exposure interaction is significant at 50 meters, but the competitive interaction is not. At larger distances, the estimates become less precise, especially at 500 and 1,000 meters. The community embedded hostile interaction remains positive across buffers in the H3b specification and is statistically significant or marginally significant at 100, 250, 500, and 1,000 meters. These patterns suggest that the relevant scale of

high exposure targeting is concentrated around the 250 meter local environment, while community embedded associations in hostile districts extend across a wider set of local buffers.

Table 18: RQ3 Robustness Check: Alternative Spatial Buffers

Predictor	50 m	100 m	250 m	500 m	1,000 m
High exposure amenities × competitive, H3a	0.961	1.025	1.514***	1.250	1.549
High exposure amenities × hostile, H3a	1.196***	1.084	1.336**	0.872	1.141
Mixed use exposure × competitive, H3a	0.968	0.916	0.636***	0.726*	0.635
Mixed use exposure × hostile, H3a	0.933	1.083	0.934	1.342	0.996
Community embedded exposure × stronghold, H3b	1.001	1.020	1.064	1.124	1.345
Community embedded exposure × hostile, H3b	1.005	1.132***	1.235**	1.355*	1.513*
High exposure amenities × competitive, H3c	1.002	1.066	1.842***	1.232	1.458
High exposure amenities × hostile, H3c	1.203***	1.147	1.449*	0.895	1.143
Community embedded exposure × competitive, H3c	1.040	1.034	1.231	0.978	0.596***
Community embedded exposure × hostile, H3c	1.005	1.052	1.113	1.082	1.008
Mixed use exposure × competitive, H3c	0.916	0.867	0.460**	0.744	0.875
Mixed use exposure × hostile, H3c	0.926	0.998	0.806	1.241	0.990

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models estimated separately at each spatial buffer. All models include panorama fixed effects and party by district by election fixed effects. Standard errors are clustered by district. Amenity variables are standardized within each buffer. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

C.3 Binary Party Presence Outcome

Table 19 reestimates the RQ3 models using party presence rather than symbol counts. The binary outcome results are broadly consistent with the main finding that high exposure amenities are especially relevant in competitive districts. In the H3a specification, the high exposure interaction for competitive districts is positive and statistically significant ($IRR = 1.111, p = .011$), while the hostile interaction is positive but insignificant. In the H3c specification, high exposure exposure in competitive districts is also positive and statistically significant ($IRR = 1.168, p = .025$). The hostile high exposure coefficient is positive but not statistically significant. Community embedded exposure in hostile districts remains positive in the H3b binary model ($IRR = 1.074, p = .003$), and the corresponding H3c coefficient is marginally significant. Mixed use exposure in competitive districts is negative and marginally significant in H3c. These results indicate that the main conclusions are not driven only by repeated symbols in a small number of panoramas. The same broad pattern appears when the outcome is whether a party appears at all.

Table 19: RQ3 Robustness Check: Binary Party Presence Outcome, 250 m Buffer

Hypothesis	Predictor	IRR	SE
H3a	High exposure amenities × competitive	1.111**	(0.046)
H3a	High exposure amenities × hostile	1.059	(0.056)
H3a	Mixed use exposure × competitive	0.903	(0.059)
H3a	Mixed use exposure × hostile	1.037	(0.049)
H3b	Community embedded exposure × stronghold	1.006	(0.023)
H3b	Community embedded exposure × hostile	1.074***	(0.025)
H3c	High exposure amenities × competitive	1.168**	(0.081)
H3c	High exposure amenities × hostile	1.094	(0.066)
H3c	Community embedded exposure × competitive	1.054*	(0.030)
H3c	Community embedded exposure × hostile	1.039*	(0.022)
H3c	Mixed use exposure × competitive	0.831*	(0.093)
H3c	Mixed use exposure × hostile	0.979	(0.062)
Observations		85,645	
Panorama fixed effects		Yes	
Party by district by election fixed effects		Yes	

Note. Entries are incidence rate ratios from Poisson pseudo maximum likelihood models using a binary party presence outcome. The dependent variable equals one when party p appears at least once in panorama i. All models include panorama fixed effects and party by district by election fixed effects. Standard errors are clustered by district. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

D Earth Mover's Distance

This Appendix describes how we use Earth Mover's Distance (EMD), also known as the first Wasserstein distance, to compare the spatial amenity profiles surrounding different categories of political and national symbols in Istanbul. EMD is useful in this setting because the categories being compared are not unordered labels. They are ordered distance thresholds. A difference between the 100 m and 200 m bins is therefore substantively smaller than a difference between the 100 m and 1,000 m bins. Unlike simple measures of distributional difference, EMD incorporates this ordering directly by weighting discrepancies according to the distance over which probability mass would have to be moved.

D.1 Definition and Mathematical Formulation

Intuitively, EMD measures the minimum amount of work required to transform one probability distribution into another. Work is defined as the amount of probability mass moved multiplied by the distance over which it is moved. In this application, the distance is measured in meters across ordered spatial thresholds.

Let

$$P = \{(p_1, w_1), (p_2, w_2), \ldots, (p_m, w_m)\}$$

and

$$Q = \{(q_1, u_1), (q_2, u_2), \ldots, (q_n, u_n)\}$$

denote two discrete probability distributions, where p_i and q_j are locations on a common support and w_i and u_j are their associated probability weights, with $\sum_i w_i = \sum_j u_j = 1$. The Earth Mover's Distance is defined as

$$\mathrm{EMD}(P, Q) = \min_{f_{ij}} \sum_{i=1}^{m} \sum_{j=1}^{n} f_{ij} d_{ij},$$

subject to

$$f_{ij} \geq 0 \quad \forall i, j, \sum_{j=1}^{n} f_{ij} = w_i \quad \forall i, \sum_{i=1}^{m} f_{ij} = u_j \quad \forall j.$$

Here, f_{ij} is the amount of probability mass transported from location p_i to location q_j, and d_{ij} is the ground distance between those two locations. The constraints ensure that all probability mass in the first distribution is transported and that the resulting mass exactly reproduces the second distribution. Because the distributions are normalized, the total transported mass equals one, and the resulting EMD can be interpreted as the expected transportation cost per unit of probability mass.

D.2 Application to Symbol and Amenity Distributions

In this study, EMD is used to compare the spatial amenity profiles associated with three broad categories of visual symbolism: Atatürk portraits, Turkish flags, and political party flags. For each symbol category, we summarize the distribution of nearby amenities across six ordered distance thresholds: 100 m, 200 m, 400 m, 600 m, 800 m, and 1,000 m. These normalized profiles indicate how amenity access around each symbol type is distributed across progressively wider spatial scales.

The ground distance matrix is defined using the absolute distance between threshold values. For example,

$$d_{100\mathrm{m},200\mathrm{m}} = |100 - 200| = 100\,\mathrm{m},$$

and

$$d_{100\mathrm{m},400\mathrm{m}} = |100 - 400| = 300\,\mathrm{m}.$$

This specification ensures that disagreements between adjacent thresholds are treated as smaller than disagreements between more distant thresholds. The resulting EMD values therefore have a direct spatial interpretation in meters. Smaller values indicate that two symbol categories are embedded in very similar amenity distance profiles, while larger values indicate more pronounced differences in the spatial environments surrounding those symbols.

D.3 Results

We compute pairwise EMD values for three categories of political and national symbols observed in Istanbul: Atatürk portraits, Turkish flags, and political party flags. The political party flag category includes the major party symbols in the dataset, including AKP, CHP, MHP, İYİ Party, and HDP. Table 20 reports the resulting pairwise EMD values.

Table 20: Earth Mover's Distance between political and national symbol categories

	Atatürk Portraits	Turkish Flags	Political Party Flags
Atatürk Portraits	0.0	3.6	5.1
Turkish Flags	3.6	0.0	1.6
Political Party Flags	5.1	1.6	0.0

Note. Entries report Earth Mover's Distance in meters. Smaller values indicate more similar amenity distance profiles across symbol categories.

The pairwise distances are small. The closest comparison is between Turkish flags and political party flags, with an EMD of 1.6 m. The largest comparison is between Atatürk portraits and political party flags, with an EMD of 5.1 m. These values are substantively modest relative to the distance thresholds used in the analysis and to typical urban scales in Istanbul. They indicate that, although the symbolic meanings of these categories differ, the surrounding amenity profiles are highly similar.

Table 21 reports the normalized amenity profiles that underlie the EMD calculations. All three categories follow nearly the same distribution across distance thresholds. Approximately 2 percent of the normalized amenity profile is located at the 100 m threshold, while roughly one third is located at the 1,000 m threshold. The similarity of these profiles explains the small EMD values reported above.

Table 21: Normalized amenity distance profiles by symbol category

Symbol Type	100 m	200 m	400 m	600 m	800 m	1,000 m
Atatürk Portraits	0.020	0.040	0.136	0.210	0.267	0.328
Turkish Flags	0.018	0.038	0.134	0.209	0.270	0.331
Political Party Flags	0.018	0.037	0.132	0.210	0.271	0.332

Note. Values report normalized amenity profiles across ordered distance thresholds. Rows sum to approximately one, subject to rounding.

As an illustrative comparison, consider the profiles for Atatürk portraits and political party flags:

$$A_{\text{Atatürk}} = \{100\text{m} : 0.020,\ 200\text{m} : 0.040,\ 400\text{m} : 0.136,\ 600\text{m} : 0.210,\ 800\text{m} : 0.267,\ 1000\text{m} : 0.328\},$$

$$B_{\text{Party}} = \{100\text{m} : 0.018,\ 200\text{m} : 0.037,\ 400\text{m} : 0.132,\ 600\text{m} : 0.210,\ 800\text{m} : 0.271,\ 1000\text{m} : 0.332\}.$$

The resulting value, $\text{EMD}(A_{\text{Atatürk}}, B_{\text{Party}}) = 5.1\,\text{m}$, means that only a small amount of probability mass would need to be redistributed across nearby distance thresholds to transform one amenity profile into the other. This is consistent with the broader pattern in Table 20: the amenity environments surrounding different symbol categories are not sharply separated by distance structure.

D.4 Interpretation

The EMD analysis provides a descriptive comparison of the spatial contexts surrounding different forms of visual symbolism. The main finding is not that all political symbols are distributed uniformly across Istanbul, nor that parties lack distinct electoral geographies. Rather, the result is more specific: when nearby amenities are summarized across ordered distance thresholds, Atatürk portraits, Turkish flags, and political party flags exhibit highly similar amenity distance profiles.

This finding is substantively useful for two reasons. First, it suggests that broad categories of political and national symbolism are embedded in comparable urban amenity environments. The visual distinction between national, republican, and party specific symbols does not translate into large differences in their aggregate amenity distance profiles. Second, the result provides a baseline for the more detailed analyses in the main text. If aggregate EMD values are small across broad symbol categories, then any meaningful heterogeneity is more likely to emerge from finer comparisons, such as party specific placement, district level electoral context, or proximity to particular amenity families.

The results should therefore be interpreted as evidence of aggregate spatial similarity rather than as a claim of complete political homogeneity. EMD compares distributions over distance thresholds and is well suited for assessing whether symbol categories occupy different amenity distance structures. It does not, by itself, identify causal mechanisms, distinguish between all possible amenity types, or test whether particular parties target specific neighborhoods. Those questions are addressed in the regression analyses reported in the main text.

D.5 Why Earth Mover's Distance Is Useful Here

EMD has several advantages for this application. First, it is spatially interpretable. Because the support is measured in meters, the resulting values can also be interpreted in meters. Second, it respects the ordering of distance thresholds, which is important because nearby bins are more similar than distant bins. Third, it is less sensitive than many distributional measures to small shifts across adjacent bins. This makes it appropriate for comparing spatial profiles constructed from street level imagery, where small differences in geolocation, panorama placement, or amenity coding may otherwise generate misleading distributional differences.

Overall, the EMD results show that the broad amenity distance profiles surrounding Istanbul's major categories of political and national symbolism are very similar. This finding provides an important descriptive benchmark: while the volume and partisan composition of symbols may vary substantially across districts and elections, their aggregate distance based relationship to nearby amenities is strikingly consistent.

References

Baykan, A. and Hatuka, T. (2010). Politics and culture in the making of public space: Taksim square, 1 may 1977, istanbul. *Planning Perspectives*, 25(1):49–68.

Baykan, T. S. and Somer, M. (2022). Politics of notables versus national machine: Social, political and state transformations, party organizations and clientelism during AKP governments. *European Journal of Turkish Studies*, 34.

Biljecki, F., Ito, K., and Singh, K. (2021). Street view imagery in urban analytics and gis: A review. *ISPRS International Journal of Geo-Information*, 10(4):245.

Bleiker, R., editor (2018). *Visual Global Politics*. Routledge, London.

Brighenti, A. M. (2007). Visibility: A category for the social sciences. *Current Sociology*, 55(3):323–342.

Çelik, A. B. and Balta, E. (2020). Explaining the micro dynamics of the populist cleavage in the 'new turkey'. *Mediterranean Politics*, 25(2):160–181.

Cinnamon, J. and Jahiu, L. (2021). Panoramic street-level imagery in data-driven urban research: A comprehensive global review of applications, techniques, and practical considerations. *ISPRS International Journal of Geo-Information*, 10(7):471.

Coppock, A., Hill, S. J., and Vavreck, L. (2020). The small effects of political advertising in U.S. general elections: Evidence from 59 field experiments. *Science Advances*, 6(36):eabc4046.

Cox, G. W. and McCubbins, M. D. (1986). Electoral politics as a distributive game. *The Journal of Politics*, 48(2):370–389.

Dixit, A. and Londregan, J. (1996). The determinants of success of special interests in redistributive politics. *The Journal of Politics*, 58(4):1132–1155.

Edelman, M. (1964). *The Symbolic Uses of Politics*. University of Illinois Press, Urbana.

Esen, B. and Gümüşcü, S. (2016). Rising competitive authoritarianism in turkey. *Third World Quarterly*, 37(9):1581–1606.

Ewing, R. and Cervero, R. (2010). Travel and the built environment: A meta-analysis. *Journal of the American Planning Association*, 76(3):265–294.

Gebru, T., Krause, J., Wang, Y., Chen, D., Deng, J., Aiden, E. L., and Fei-Fei, L. (2017). Using deep learning and Google Street View to estimate the demographic makeup of neighborhoods across the united states. *Proceedings of the National Academy of Sciences*, 114(50):13108–13113.

Gehl, J. (2011). *Life Between Buildings: Using Public Space*. Island Press, Washington, DC, 6 edition.

Grabe, M. E. and Bucy, E. P. (2009). *Image Bite Politics: News and the Visual Framing of Elections*. Oxford University Press, New York.

Green, D. P., Krasno, J. S., and Coppock, A. (2016). The effects of yard signs on vote outcomes: Evidence from a natural experiment. *Political Communication*, 33(2):301–312.

Günay, O. and Yörük, E. (2019). Governing ethnic unrest: Political islam and the kurdish conflict in turkey. *New Perspectives on Turkey*, 61:9–43.

Gunn, L. D., King, T. L., Mavoa, S., Lamb, K. E., Giles-Corti, B., Kavanagh, A. M., Thornton, L. E., and Bentley, R. J. (2017). Identifying destination distances that support walking trips in local neighborhoods. *Journal of Transport & Health*, 5:133–141.

Hajrasouliha, A. and Yin, L. (2015). The impact of street network connectivity on pedestrian volume. *Urban Studies*, 52(13):2483–2497.

Hasan, S., Schneider, C. M., Ukkusuri, S. V., and Gonzalez, M. C. (2013). Spatiotemporal patterns of urban human mobility. *Journal of Statistical Physics*, 151(1–2):304–318.

Hillier, B., Penn, A., Hanson, J., Grajewski, T., and Xu, J. (1993). Natural movement: Or, configuration and attraction in urban pedestrian movement. *Environment and Planning B: Planning and Design*, 20(1):29–66.

Johnston, R. and Pattie, C. (2013). Learning electoral geography? party campaigning, constituency marginality and voting at the 2010 british general election. *Transactions of the Institute of British Geographers*, 38(2):285–298.

Kalla, J. L. and Broockman, D. E. (2018). The minimal persuasive effects of campaign contact in general elections: Evidence from 49 field experiments. *American Political Science Review*, 112(1):148–166.

Kaya, M. (2019). The potentials and challenges of left populism in turkey: The case of the peoples' democratic party (hdp). *British Journal of Middle Eastern Studies*, 46(5):797–812.

King, T. L., Bentley, R. J., Thornton, L. E., and Kavanagh, A. M. (2015). Does the presence and mix of destinations influence walking and physical activity? *International Journal of Behavioral Nutrition and Physical Activity*, 12:115.

Latham, A. and Layton, J. (2019). Social infrastructure and the public life of cities: Studying urban sociality and public spaces. *Geography Compass*, 13(7):e12444.

Makse, T. and Sokhey, A. E. (2014). The displaying of yard signs as a form of political participation. *Political Behavior*, 36(1):189–213.

Maurice, G. K., Barclay, P., Small, T. A., and Giguère, B. (2023). Do household political campaign signs help win vote share? *Canadian Journal of Political Science*, 56(3):574–593.

Mehta, V. (2007). Lively streets: Determining environmental characteristics to support social behavior. *Journal of Planning Education and Research*, 27(2):165–187.

Mitchell, D. (1995). The end of public space? people's park, definitions of the public, and democracy. *Annals of the Association of American Geographers*, 85(1):108–133.

Montgomery, J. (1998). Making a city: Urbanity, vitality and urban design. *Journal of Urban Design*, 3(1):93–116.

Naik, N., Kominers, S. D., Raskar, R., Glaeser, E. L., and Hidalgo, C. A. (2017). Computer vision uncovers predictors of physical urban change. *Proceedings of the National Academy of Sciences*, 114(29):7571–7576.

Naik, N., Philipoom, J., Raskar, R., and Hidalgo, C. A. (2014). Streetscore – predicting the perceived safety of one million streetscapes. In *2014 IEEE Conference on Computer Vision and Pattern Recognition Workshops*, pages 793–799.

Ocaklı, F. (2017). Islamist mobilisation in secularist strongholds: Institutional change and electoral performance in turkey. *South European Society and Politics*, 22(1):61–80.

Pais, A., Sousa, S., Coutinho-Rodrigues, J., and Moura, F. (2025). Walking to public transport: Rethinking catchment areas considering topography and surrogate buffers. *Journal of Transport Geography*, 118:104826.

Panagopoulos, C. (2009). Street fight: The impact of a street sign campaign on voter turnout. *Electoral Studies*, 28(2):309–313.

Porta, S., Crucitti, P., and Latora, V. (2006). The network analysis of urban streets: A dual approach. *Physica A: Statistical Mechanics and its Applications*, 369(2):853–866.

Ryan, S. and Frank, L. F. (2009). Pedestrian environments and transit ridership. *Journal of Public Transportation*, 12(1):39–57.

Schill, D. (2012). The visual image and the political image: A review of visual communication research in the field of political communication. *Review of Communication*, 12(2):118–142.

Shaw, D. R. (2006). *The Race to 270: The Electoral College and the Campaign Strategies of 2000 and 2004*. University of Chicago Press, Chicago.

Tansella, A. M. and Perrella, A. M. L. (2017). Looking for lawn signs: The influence of campaign presence on canadian federal election outcomes. *Canadian Journal of Political Science*, 50(2):427–449.

Tarr, A., Hwang, J., and Imai, K. (2023). Automated coding of political campaign advertisement videos: An empirical validation study. *Political Analysis*, 31(4):554–574.

Torres, M. and Cantú, F. (2022). Learning to see: Convolutional neural networks for the analysis of social science data. *Political Analysis*, 30(1):113–131.