Territory, Politics of Power, and the Networks of Physical Spaces: The Case of Baghdad, Iraq

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Abstract

Despite our commonsense understanding of territory as a bounded region, some political aspects of territory can be better described as network effects. To illustrate the point, we study territorial practices of power in Baghdad before the 2003 Iraq War, and territorial changes in the city during the war. We use various techniques and measures of spatial networks provided by 'space syntax', because they have proven useful for describing the spatiality of social processes. We use Baghdad as a case study, because the territorial practices of power by the Ba'th regime favoring a Sunni minority and undermining a Shiite majority had existed in this city for decades before the 2003 Iraq war. These practices were upset and significant territorial changes occurred during the sectarian war in 2006 and 2007 at the time of US-led occupation of Iraq. We study the relationships between territorial practices and spatial networks before the war and during the war. Based on our findings, we conclude that spatial network dependency of territory and territoriality may exist under a dominant political system or even during a war when a dominant political system remains unclear. However, more studies are needed to generalize the findings of our study.

Keywords: Territory; networks; physical space; political power; space syntax

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1. Introduction

Despite the growing importance of the porosity and fluidity of boundaries in the late 20th century (Bingham & Thrift, 2000; Castells, 1996, 2011; Massey, 2004), the significance of territory as a politically salient spatial concept is continually affirmed and reaffirmed through various forms of social practices. Still today, much of ethno-religious violence and conflict among communities around the world is due to disputes over territories (Cowen & Gilbert, 2008; Grosby, 1995; Rapoport, 1996). Still today, when the thesis of a "borderless world" (Ohmae, 1990) or that of an "end of sovereignty" (Brenner, 2004; Brenner, Jessop, Jones, & Macleod, 2008; Swyngedouw, 2004) is widespread, significant efforts are being made to enforce territorial boundaries at all geographical scales—from gated residential communities to shopping malls to urban centers to cities to states. At the same time, increasingly more significance is given to the salience of territories (that include place, locality, region, and state) in promoting economic development, innovation, and competitiveness in a more globalized economy (for example, see Martin, 1999).

In order to explain the significance of territory in today's networked society, in this paper our aim is to present evidence supporting an argument that the political significance of territory is not limited to a bounded region but is also dependent on the network effects of social and spatial practices involving both human and non-human actors. Following Mitchell (1991), we argue that the geographies of networks may differ in important respects across time and space depending on social practices, but the fact that the concept of territory continues to exist as an important political dimension can be explained *in part* by the network effects of physical spaces. The key phrase here is 'in part', because we are acutely aware of the fact that human territorial processes are often too complex and messy to be explained by the network effects of physical spaces only.

The basis of our argument lies in the fact that physical space possesses a degree of autonomy concerning territorial practices. Foucault (1980) acknowledges this autonomy when he suggests that any study of power relations should not be overly concerned with ideologies, but rather with concrete outcomes. Since all political definitions of territory assume power relations, in the next section of the paper we examine how political power have been theorized in relation to territory in the literature. After this, we introduce space syntax and its techniques for the analysis of spatial networks. Following this, we present an empirical study showing how territory sustains power relations through the agency of the networks of physical spaces as a part of social practices in the City of Baghdad, Iraq.

2. Territory and power: some theoretical preludes

There are several forms of political power. For our purposes here, we use the distinction between 'power to' and 'power over' following Dovey (1999). While 'power to' refers to power as capacity, 'power over' refers to power as a relationship between individuals, agents, and groups. Among the two, 'power over' is more obvious since it clearly identifies the actors in power relations, and 'power to' is more subtle since actors are not identified. For example, X may believe that Y does not have 'power over' her without realizing that Y has 'power to' control her through 'Z'. 'Z' in this case may be a territory. Therefore, in most cases of social practices, 'power to' is more pervasive than 'power over', but spatial practices involving 'power to' is less visible than those involving 'power over'.

Dovey (1999) identifies five specific forms of 'power over'—*force*, *coercion*, *seduction*, *manipulation* and *segregation*—that are relevant to our discussion on territory. Force makes a subordinate, which can be an individual or a group, comply with the will of the dominant without choice. It may occur through confinement in a territory. Coercion threatens the use of force but does not quite use it to influence, control, or dominate the subordinate. Coercion in a territory may occur though surveillance. In seduction, the dominant uses propaganda to influence the subordinate. Territorial boundaries themselves may be an

instrument of propaganda when not used coercively. Manipulation is a form of 'power over' that the dominant uses to keep the subject ignorant. It often gives the subordinate an illusion of having a privileged relation with the dominant. In terms of territory, a more direct access to the dominant territory may give the subordinate territory as illusion of favoritism, while for the dominant this may be a way to control or influence the subordinate. Finally, segregation is a form of 'power over' that the dominant uses to isolate the subordinate. This is probably the most potent as well the easiest form of 'power over' exercised by the dominant over the subordinate. When the dominant cannot force, coerce, seduce, or manipulate the subordinate then keeping the subordinate isolated may be the best way to exercise power.

The literature indicates many theories and processes concerning how power relations—influence, control, or domination—could result from territory. Some of these theories and processes emphasize a dominant role of the territory as a bounded region in power relations (for example, see Sack, 1983). In fact, most literature on the politics of power in colonial cities may fall in this category (for example, see Home, 1983, 1990, 1996; Myers, 1997, 2003a, 2003b; Njoh, 2007). This literature considers territories as containers, and discusses power relations among territories in terms haves and have-nots assuming social practices in these territories do not overlap. In most cases, the literature also focuses on 'power over' in terms of physical form and space, and 'power to' in terms of the invisible rules and regulations of social practices.

In contrast, theories and processes emphasizing a dominant role of the network effects of social and spatial practices in power relations (for example, see Mitchell, 1991) seems to be more relevant to the modern society where what is outside the territory is as important as or even more important than what is inside the territory. It is hard to imagine a territory in the modern society which does not depend on the resources that lie beyond the territory. Today, in a networked world it must be hard to practice 'power over' without being noticed, criticized, and/or punished. Therefore, political actors may prefer 'power to' influence, control, or dominate the subordinates without identifying themselves and their counterparts. Apparently, this poses a problem for power practices involving physical form and space. Any attempt to

influence, control, or dominate others through physical form and space runs the risk of becoming visible; hence, translates into 'power over.' However, the problem can be easily overcome if we consider that spatial practices also include the 'invisible' networks of physical spaces, and that these networks can be used to exercise 'power to' influence, control, and/or dominate others without invoking political actors and ideologies. One set of theories and techniques that have shown remarkable successes in describing social practices using the networks of physical spaces is space syntax, to which we turn next.

3. Space Syntax and the networks of physical spaces

Space syntax provides a set of theories, techniques, and measures used for studying the syntactic structure of the networks of physical spaces. The theoretical foundations of space syntax were first provided by Hillier and Hanson in *The Social Logic of Space* (Hillier & Hanson, 1984), and were later elaborated by Hillier in *Space is the Machine* (Hillier, 1996/2007) and in several other articles that followed (for example, see Hillier, 2005, 2008; Hillier & Vaughan, 2007).

Among the many techniques of space syntax, the linear map analysis, the convex map analysis, and the visibility graph analysis are just a few. Most space syntax studies of urban areas and cities, however, use the techniques of linear map analyses that include the axial map analysis and the more recent segment map analysis (Hillier & Iida, 2005). Both these analyses involve representing the urban layout as a linear map, which is a network of the fewest number of lines needed to cover every street and complete every circulation ring of the layout. So defined, a linear map is more commonly known as the axial map in space syntax. When needed, a segment map can be generated by breaking the lines of a linear map into segments at their intersections. In the next stage of analysis, software programs use different syntactic measures to describe the patterns of connections, differentiation, and centrality of the axial map and the axial lines, or of the segment maps and the segments. Finally, correlations between any observed

phenomena along the axial lines or the segments and the syntactic measures of the lines or their segments are studied to explain the effects of spatial patterns on these phenomena.

One key syntactic measure of space syntax is integration. While the integration value (or the closeness value) of an axial line in an axial map is an algebraic function of the mean depth (MD) value of the line, defined as the sum of the shortest distances between the line and all the other lines in the map divided by the number of lines or segments in the map less 1 (Hillier & Hanson, 1984), the integration value of a segment in a segment map is the mean of all the angles of all the shortest paths on the segment (Turner, 2007). The integration value of a line or segment indicates how well the line is connected to all other lines in a linear map, or how close the line is to all other lines in the map. A higher integration value of a line indicates stronger connection of the line to the network. The integration value is also relativized to allow direct comparison between networks of different sizes (Hillier & Hanson, 1984). The integration value of the system as a whole is given by the mean of the integration values of the lines in the system. Again, the higher the integration value of a system the more connected the lines are within the system.

The other major syntactic measure of space syntax is choice. While integration is about closeness, choice is about betweenness. Unlike integration, choice gives the degree to which a line lies on simplest paths from one line to another line in the network. While the choice value of a given axial line is determined by dividing the number of the shortest paths between any two lines in the axial map containing the given line divided by all the shortest paths between any two lines in the map, the choice value of a segment is calculated by replacing shortest paths with paths that have the lowest angular cost for each possible origin and destination pair of segments on the given segment (Turner, 2007). In simple words, integration measures how easy is it to go one line to all other lines of a network, thus indicating the potential of a line for to-movement. In contrast, choice measures how likely is it for a line to be chosen on paths from one line to another in a network indicating its potential for through-movement (Hillier, 2005). Clearly, what is implied here is that in to-movements people want to maximize their accessibility to all physical spaces and in through-movements people use a space to get to another space with minimum efforts.

One reason why space syntax theories and techniques are useful for our purposes here is that, in numerous urban studies the closeness and betweenness values of space syntax show strong correlations with traffic movements (for example, see Hillier, 1996/2007, 2005; Hillier & Iida, 2005; Hillier, Penn, Hanson, Grajewski, & Xu, 1993). If we agree that traffic movements are often related to flow of resources in cities, then concerning our study of the network effects of space on territory we may want to know where the physical spaces with most movement potentials are located, who controls these spaces, and how they are related to the political geography of a city.

Another reason why space syntax theories and techniques are useful for our purposes here is that, they allow us to study the networks of physical spaces within territories, the differences of the networks of physical spaces among territories, and the relationships between the networks of physical spaces of a territory and that of the whole within which the territory is located. For example, a territory with higher closeness may provide better to-movement potential. As a result, the territory may also provide better potential for the internal flow of resources providing more opportunities for the community within to develop close ties. In contrast, a territory with higher betweenness may provide better through-movement potential. As a result, it may provide better potential for resources to flow from one territory to another through it while affecting its integrity negatively. Conversely, a territory with lower betweenness may provide less through-movement potential; therefore, it may become more isolated. An extreme case of this is an enclave, which provides no opportunities for through-movements due to discontinuities in spatial networks.

Yet another reason why space syntax theories and techniques are useful for our purposes here is that, ideas relevant to the relationships between spatial networks and territory already exist in such concepts as “the dual city” presented by Hillier and his colleagues (Hillier, 2005; Hillier & Vaughan, 2007). According to this concept, all cities are created by a dual process, where one part of the process uses space to generate life in the city and the other part uses space to conserve life that already exists in different parts of the city. According to Hillier (2005), public processes including micro-economic factors

determining the generative role of space in the city tend to follow similar logic in cities and manifest themselves in similar global structures of spatial network in cities. Most often these structures take a shape that brings closer the center and the periphery of the city. In contrast, local processes including cultural factors determining the conservative role of space tend to vary not only from one city to another but also from one part to another part of a city, and manifest themselves in different local structures. According to Hillier (2005), every city is unique in the way it finds a balance between the two parts of the dual process.

To illustrate the dual process Hillier uses Nicosia in Cyprus as an example (Hillier, 2005). The axial map analysis of Nicosia picks up a global deformed-wheel spatial structure reflecting the more consistent nature of public processes. It also picks up more nuanced local spatial structures indicating differences in local processes. Interesting for our purpose is that fact that these local structures match well with ethnic territories better known as the Greek and Turkish quarters. More recently, Rashid and Shateh (2012) observed a similar phenomenon in a study involving the Stone Town of Zanzibar, Tanzania. The study showed that the global syntactic structure of this city evolved over time following the logic of movement and economy, but the more differentiated local structures remained fairly unchanged reflecting more stable socio-cultural and ethno-religious patterns of the city.

That space syntax techniques and measures are associated with movement potentials and, hence, with resource distribution in a city; and that they are able to reveal culturally significant local spatial patterns within economically defined larger global structures of a city indicate that these techniques and measures can be used to understand the relationship between network structures and territorial practices. Therefore, what we provide below is an attempt to describe and understand the territorial practices in Baghdad applying space syntax techniques and measures.

4. Baghdad, Iraq: The sectarian geography before and after the 2003 Iraq War

Concerning the relationships between network structures and territorial practices, the City of Baghdad in Iraq offers a unique opportunity. The territorial practices of power by the Ba'th regime favoring a Sunni minority and undermining a Shiite majority had existed in the city for decades before the 2003 Iraq war. These territorial practices of power, however, were upset during the sectarian war in 2006 and 2007 at the time of the US-led occupation of Iraq as the city went through significant changes in its sectarian geography. These changes were recorded by several international organizations as they were occurring. In the rest of the paper, therefore, we would like to see if the practices of political power in everyday Baghdad were dependent on the structures of spatial networks. We would also like to see if the changes in territories between different sectarian groups in Baghdad showed any network dependency during the war when the dominant political ideology was undecided or being decided.

4.1. Sectarian geography before the war during the Ba'th regime

Since the first century of the Islamic era, tensions between Sunni and Shiite Muslims have existed in many countries of the Islamic world. Emanating from a political dispute over who deserved to be the successor of Prophet Muhammad, overtime these tensions took on a theological dimension that gave the two sects distinct identities characterized by a strong sense of antagonism and distrust of each other. The tensions between these sects became particularly fierce in Iraq, then Mesopotamia, when under the patronage of the British the minority Sunni Arabs gained political supremacy over the majority Shi'ite Arabs. This was first manifested in a massive Shiite revolt in 1920 against British rule. After the British left and before the Ba'th regime took control over Iraq in 1968, the tensions between Sunnis and Shiites were managed reasonably well by different regimes (Baram, 1998; ICG, 2006). However, during the Ba'th regime the tensions escalated resulting in large-scale Shiite unrest followed by severe repression in 1969, 1971-72, 1974, 1977, 1979-80, and in 1991.

Since at least 65-70 percent of the population of Baghdad were Shiites, any large-scale Shiite unrest here in the center of its power was deemed particularly dangerous by the Ba'th regime. To overcome such threats, the regime depended on Special Republican Guards (SRGs) made up of mostly Arab Sunnis from rural areas of the country. The First Battalion of SRGs, stationed close to the Presidential Complex, had its tightest grips on the Complex and the areas surrounding the Complex, where the ruling elites lived and worked (Baram, 1998). Security of these areas was also helped by the fact that they were located in areas where Sunnis represented a significant proportion of the mixed population, and at a safe distance from "Saddam City," now known as "Sadr City," in northeast Baghdad, where over a million Shiites lived separated from the rest of the city by an artificial canal, known as Army Canal (Baram, 1998). A safe distance from the old Shiite quarter of Kadhimiya was yet another feature that helped the Ba'th regime secure the elite quarters and government buildings of central Baghdad (**Figures 1 & 2**).

[INSERT FIGURES 1& 2 ABOUT HERE]

To further help secure Baghdad in case of Shiite uprising, by early 1998 the Sixth Battalion of SRGs stationed at al-Rashid barracks was given the responsibility to seal off Saddam City from the rest of Baghdad by closing the connecting roads crossing over Army Canal. The irony here was that the Canal, which was conceived in the 1950s by its designers – the Doxiadis Associates – as the channel of life bringing water from Tigris and Diyala to the then newly built areas of the city, had eventually become a tool to seal these areas off from the larger city; thus, threatening the survival of these areas (Theodosis, 2008). Similarly, the Tenth Battalion of SRGs was given the responsibility to protect Baghdad from any uprising in the old Shiite quarter of Kadhimiya.

Despite geographical separations of some Shiite areas and a visible presence of security forces in these areas to deter Shiite uprising, it has been observed in the literature that Baghdad during the Ba'th regime was still an integrated city from a sectarian perspective (Damluji, 2010; ICG, 2006). With the exception of a few areas, much of the city was still inhabited by communities of mixed Sunni and Shiite descents

(**Figure 3**). Residents of all sects could still move freely in most areas of the city during the Ba'th regime. If anything, the gulf between the rich and the poor was the most important fault line in the city often overshadowing the Sunni-Shiite distinction (Baram, 1998).

The above observation concerning Baghdad is supported by the fact that Saddam Hussein's position toward sectarian symbolism was never clear. He would often present himself as a champion of both Shiite and Sunni communities, regardless of his affiliation with the Ba'th Party (Dawisha, 1999). Though Saddam Hussein's policies had promoted differential treatment of Iraqis based on ethno-sectarian identities and had caused cruelty in many cases as chronicled by Kenan Makiya (1989), his top-down policies did not permeate the everyday life of the majority of Baghdad's residents. As one Iraqi put it in a *Crisis Group* interview, "Sects exist in Iraq. This is fact. But there is a difference between sect and sectarianism. Sectarianism never existed in Iraq before [the 2003 war]" (ICG, 2006, p. 6). According to another Iraqi, "religion or sect never played a major role in determining where people lived prior to 2013" (Ala Hussain Al-Quazzaz, quoted in Damluji, 2010, p. 76). Traditionally, the unit of social life in Baghdad and elsewhere in the country has been the *mahalla*, which was defined by family and clan relations. Many families stayed in the same *mahalla* for generations, making it socially significant as it became more diverse. Sectarianism became an important issue in this close-knit society only after the fall of the Ba'th regime, when it was exploited by those who sought political gains. It is to this phase of Baghdad that we turn next.

4.2. Sectarian geography after the fall of the Ba'th regime

The scene of cohabitation in heterogeneous communities and neighborhoods changed dramatically, and a strong sectarian division characterized by mostly homogeneous neighborhoods of Sunnis and Shiites throughout Baghdad began to emerge after the fall of the Ba'th regime in the 2003 US-led Iraq War (Damluji, 2010). That is because the US-led coalition misunderstood the complex sectarian dynamics in

the political sphere of Iraq (ICG, 2006; Kenan Makiya, 2005). They made simplistic political interventions in the early days of occupation that helped codify sectarian differences in the politics of Iraq. Sunni insurgent groups, Shiite militias, and government parties representing different sects used the political divisions of the US-led coalition as instruments for territorial aggression and consolidation in Baghdad, and in other places in the country.

Changes in the ethno-religious territories of Baghdad during the sectarian war at the time of US-led occupation were documented by different organizations. These documentations include the maps by IMC-International Medical Corps (published online at https://internationalmedicalcorps.org/sslpage.aspx?pid=1007, accessed July 1, 2014), the interactive maps by BBC News developed based on the IMC maps (published online at http://news.bbc.co.uk/2/shared/spl/hi/in_depth/baghdad_navigator/, accessed July 1, 2014), and the maps by the Gulf/2000 project at School of International and Public Affairs (SIPA) of Columbia University in New York City (published online at http://gulf2000.columbia.edu/index.shtml, accessed July 1, 2014). For our study, we use the 2003, late 2006, early 2007, late 2007 and the 2008-2009 maps of ethnic-religious neighborhoods of Baghdad by SIPA (**Figures 3-7**).

Complex political processes underlying various changes in the sectarian geography of Baghdad, after the fall of Ba'th regime in 2003, have been described in detail elsewhere (see Damluji, 2010; ICG, 2006). It is sufficient to mention here that after 2003 and before 2006 any spatial displacement of Baghdad residents based on sectarian identities occurred only at a small scale. As a result, the sectarian geography of Baghdad remained rather unchanged during the first three years of foreign occupation from 2003 to early 2006, as represented by the 2003 map (**Figure 3**). All this would change after Sunni militants destroyed a sacred Shiite shrine in Samarra in the late February of 2006 (Worth, 2006). This act of sectarian violence set in motion an aggressive campaign against Sunnis in Baghdad by the newly empowered Shiite-dominated police force and the paramilitary Mahdi Army of al-Sadr. The primary aim of this campaign was to displace Sunnis from their neighborhoods by force, intimidation and coercion, and to expand

Shiite-controlled territories to bolster political and economic power. However, Sunni militias did not sit idle as Shiites gained territories. Like Shiites, they also had used brutal means to seize territory. According to Gregory, "Politically these territorial gains were of immense symbolic significance. This was, after all, the capital city." (Gregory, 2008, p. 21)

The Mahdi Army and Sunni militias battled throughout 2006 to gain control of contested territories in Baghdad. Both used brutal forces in the process. In addition to armed militia conflicts and political assassinations, their strategic territorial practices involved eliminating Sunni or Shiite populations from designated areas of the city. Within a year they were able to establish in the urban geography of Baghdad the sectarian divisions that were codified by the US-led coalition in the political system of country.

The late 2006 map (**Figure 4**) shows the early significant changes in the sectarian make-up of the city resulting from the sectarian war. These changes can be seen in the outskirts as well as in the central areas of the city. By the early 2007, at a time when the sectarian fighting was intense, the segregation of Baghdad was almost complete (**Figure 5**). However, as the map shows, the city was not neatly divided into Sunni- and Shiite-controlled territories. Rather, Shiite and Sunni militias fought for control of key areas of the city to ensure strong presence on either side of the river. As a result, some areas changed from mixed neighborhoods to isolated sectarian enclaves surrounded by areas controlled by the opposing sect, and became the site of intense fighting between the Mahdi Army and Sunni militias (ICG, 2008).

Therefore, in April 2007 the U.S. military announced plans to construct a series of concrete perimeter walls around these neighborhoods in an attempt to curb sectarian violence. Also around the same time, the United States launched its "surge" strategy, drastically increasing the number of coalition troops deployed in Iraq, and especially in Baghdad. In August of that year, Shiite leader al-Sadr called for a tentative cease-fire, largely due to increasing pressure from the occupying forces, but also due to divisions within his own constituency (ICG, 2008). Finally, the US-led coalition had also recruited thousands of residents of key Sunni neighborhoods to work alongside them under the "Sons of Iraq" program. As a result of all

these strategies, the sectarian fighting had subsided significantly by the late 2007. Between the early and the late 2007 the only changes in the sectarian make-up were along the banks of Tigris (**Figure 6**). By 2008, territorial aggressions had stopped and the new sectarian divisions in Baghdad had become permanent (**Figure 7**).

[INSERT FIGURES 3-7 ABOUT HERE]

4.3. Some initial observations concerning the networks of physical spaces and territory in the sectarian geography of Baghdad

The sectarian geography of Baghdad during and after the Ba'th regime raises several questions concerning territorial practices of power in relation to the networks of physical spaces. As described in subsection 4.1, during the Ba'th regime, the sectarian geography of Baghdad was composed of mostly Sunni, Shiite, and mixed territories. These territories were scattered in different parts of the city. Though the regime was able to exercise 'power over' several territories by putting SRGs at strategic locations, it is not immediately clear whether the networks of physical spaces of the city gave the regime any additional advantages to influence, control, and/or dominate territories for political gains. Therefore, in Section 5 we study Ba'thist Baghdad using space syntax to determine whether the regime had practiced 'power over' its population, where the role of the networks of spaces was obvious in relation to force, coercion, seduction, manipulation and/or segregation; whether the regime had practiced 'power to' control its population, where the role of the networks was less obvious and more structural; or whether the regime had practiced both forms of power using the networks of physical spaces. We also study Ba'thist Baghdad using space syntax to determine whether the networks of physical spaces played any role in generating a sense of integration in the city despite the ominous presence of a despotic regime, as many commentators had observed.

In post-Ba'thist Baghdad described in subsection 4.2, sectarian war redefined territories among different warring factions. In this regard, it is not immediately clear whether the networks of physical spaces of the

city gave warring factions any strategic advantages to influence, control, and/or dominate each other's territories. Therefore, in Section 5 using space syntax we also investigate if the processes of territorial changes at different stages of the sectarian war in Baghdad can partly be explained by the networks of physical spaces.

5. The structure of the networks of physical spaces of Baghdad

For our study of Ba'thist and post-Ba'thist Baghdad, we use the 2002 street map of Baghdad because, with the exception of some military complexes and some parts of the Presidential Complex, the networks of streets of the city remained relatively unchanged during the US-led occupation of Iraq starting in 2003. The syntactic structures of the axial and segment maps of 2002 Baghdad as defined by the closeness (i.e., integration) values of streets are shown in **Figures 8 & 9**, with colors ranging from red for very high integration values to blue for very low integration values. Based on the findings reported in the space syntax literature (Section 3), the red lines in these maps represent the most accessible streets that help produce urban liveliness in the city with the highest to-movement potential. In contrast, the blue lines are the least accessible streets that produce urban isolation in the city with the lowest to-movement potential.

As seen in these figures, for both the axial and the segment maps the core of the structure is centered on the two streets, Omar Bin Al-Khatab and Imam Ali Streets, along Army Canal on the eastern side of the city. Yet, in each case, highly integrated lines or segments are diffused over a very large part of the city covering both sides of Tigris. Since in a segment map, the larger axial lines are broken into smaller segments at the intersection of these lines, the syntactic structures of accessibility shown in these two maps (**Figures 8 & 9)** are those that exist at different levels of granularity of the city - the axial lines representing accessibility at a coarse level, while the segments representing accessibility at a fine level of granularity. In this sense, the syntactic structures of the networks of spaces, by diffusing themselves over a very large part of the city at different levels of granularity, had provided favorable conditions for

residents of all sects to move freely in most areas of the city. Put another way, these structures had helped promote a sense of integration from a sectarian perspective that several commentators of Ba'thist Baghdad had noted.

However, note that the syntactic structures defined by the more integrated lines in the axial and segment maps are relatively more diffused in the central region between Army Canal and Tigris than they are in the region west of Tigris and in the region east of Army Canal (**Figures 8 & 9)**. This observed difference might have provided the people living in the central region more advantage in terms of movement than those living either in the region west of Tigris or in the region east of Army Canal. Therefore, it is not surprising that people of all ethno-religious sects preferred living in this central region until late 2006 (**Figures 3 & 4**).

Also note that syntactic asymmetry discussed above is more identifiable in the axial map (**Figure 8**) than it is in the segment map (**Figure 9**). This is important, because our experience of cities are often closer to that of an interconnected set of sightlines than that of a set of finer segments of the axial lines that are more sensitive to local conditions. It is for this reason we may find more symbolic functions along the streets defining the most integrated lines of the syntactic structure of an axial map than what we may find along those streets defining the most integrated segment of the structure of a segment map. However, there may always be some streets, where both the syntactic structures of the axial and segment maps overlap. As a result, these streets may be suitable for all kinds of instrumental and symbolic functions, something that we also observe in Baghdad as described below.

The dual structure of spatial networks, where highly integrated axial lines reach out to different parts of the city maximizing access and where syntactically differentiated local areas represent cultural diversity (Hillier, 2005), is quite clear in the axial and segment maps of Baghdad (**Figures 8 & 9**). To underscore the economic significance of the most integrated lines or segments of the structure, it can be noted here that they represent many important streets of the city including Omar Bin Al-Khatab and Imam Ali

Streets, the two longest straight streets that run along the two sides of Army Canal from one end of the city to the other. Another one of these streets is Thawara Street, which starts at Baghdad Central Railway Station on the west side of Tigris, crosses the river via Ahrar Bridge, continues through the famous suqs in Rusafa, and then crosses the Army Canal to reach Baghdad Central Markets before becoming one of the most important commercial street in Sadr City. Yet another one of these streets is Bor Said Street, which begins as Yafa Street on the west side of the river, crosses the river via Jumhuriya Bridge before intersecting Abinuwas, Rashid, Khulafa and Saadoun Streets—four important commercial streets of the city—around Tahrir Suquare, then continues along Martyr's Monument before crossing Army Canal. Also included in the most integrated lines are such important commercial streets as Karada Dahil, Karada Kharidge and Nidhal Streets in Karada, Riyadh, and Wehda quarters (**Figure 2**).

In a way, then, the structures of the networks of physical spaces of the Ba'thist Baghdad were no different from many other cities around the world. Yet, these structures of Baghdad were a little bit more interesting since they also described the power relations in the city. The two streets along Army Canal–Omar Bin Al-Khatab and Imam Ali Streets–clearly separate the poor Shiite areas from the rest of the city. The two other–Thawara and Bor Said Streets–extend from the poor Shiite stronghold, Sadr City, at the one end to the Ba'thist stronghold, Karkh, at the other. Within Sadr City, Thawra Street is then connected to many more very integrated lines covering most areas of the district; thus, making the district extremely accessible as well as an area of perpetual surveillance (**Figures 8 & 9)**. These two highly integrated streets, therefore, might have helped the Ba'thist regime to practice 'power over' the poor Shiite population during periods of calm by directly connecting them not only to important commercial activities but also to the center of power. According to the definitions given in Section 2, we may describe such a practice as 'power over' by *seduction.*

The practice of 'power over' by seduction was further enhanced by the fact that some of the symbolically most important monuments and buildings of the city and the country have been placed along some of these most integrated streets. For example, Bor Said Street includes Hands of Victory Monuments,

Unknown Soldier Monument, Liberation Monument, and Martyr's Monument along or very close to it. It also includes the administrative buildings of Ministry of Foreign Affairs, Ministry of Planning, and Ministry of Youth. Thawara Street includes Iraqi National Museum, Calligraphy Museum, Ministry of Justice, and Ministry of Water. In addition to these very important buildings and monuments, numerous other monuments and buildings of somewhat lesser importance were also placed in the many squares along these streets. The reader may wish to consult Makiya (1991) to understand the immense political and symbolic significance some of these monuments might have had for the oppressed and the oppressor of the city and the country.

It is noteworthy here that, some of the streets, which gave the oppressed population of the city an easy access to the center of power of the Ba'th regime, were also the means by which the regime had practiced 'power over' by *force* in periods of political upheaval. The strategic locations of the army battalions at the ends of the two most integrated streets of the city–Omar Bin Al-Khatab and Imam Ali Streets–along Army Canal show how easy it was for the Ba'th regime not only to control Shiite unrest by force, but also to control major routes of movement of people and flow of goods from the west to the east when needed (refer to Subsection 4.1 & **Figure 2**).

The dual structure of Ba'thist Baghdad was even more interesting politically, because hidden beneath it was another spatial structure defining the political territories of the city. This structure reveals itself when the segment map of the city is colored using the betweenness (i.e., choice) values (**Figure 10**). It shows that the lines with the most betweenness values are distributed all over the city and they map almost perfectly on the map of Baghdad's neighborhoods or quarters (**Figure 11**). In other words, they sit at the boundaries of the quarters highlighting the fact that the quarters in these cities remained somewhat independent from one another, meeting only at their boundaries defined by streets with higher through-movement potentials (refer to Section 3). This finding, therefore, supports the fact that the regime had practiced 'power to' control its population by isolating them in clearly demarcated quarters, where the role of the networks was less obvious and more structural.

The above analysis of the structures of the axial and segment maps of Baghdad, therefore, clearly reveals how the network properties of spaces might have been used to exercise different forms of power. However, it is not clear how these structural properties might have affected the process of change in the sectarian geography during the sectarian war at the time of US-led occupation in Baghdad and Iraq. We turn to this issue next.

[INSERT FIGURES 8-11 ABOUT HERE]

6. The structure of the networks of physical spaces and the changing sectarian geography of Baghdad

To understand how the network properties of physical spaces might have affected the process of change in the sectarian geography of Baghdad during the sectarian war at the time of US-led occupation, we identified and counted the Shiite, Sunni, and mixed quarters (or neighborhoods) at various stages of the sectarian war, and computed the mean integration and choice values for all the quarters of each group for comparison. For this part of our study, we used the 2003, late 2006, early 2007, and the late 2007 maps of ethnic-religious neighborhoods of Baghdad presented earlier (**Figures 3-6**).

Altogether, we included 87 residential quarters of Baghdad in our study. As shown in **Figure 12**, before the sectarian war that started in 2006, 14 were predominantly Sunni quarters; 17 were predominantly Shiite quarters; and 56 were mixed quarters. By late 2006, mixed quarters decreased from 56 to 49; and Sunni quarters increased from 14 to 18 and Shiite quarters from 17 to 19. By early 2007, mixed quarters decreased from 49 to 25; and Sunni quarters increased from 18 to 23 and Shiite quarters from 19 to 38. By late 2007, mixed quarters decreased from 25 to 21; and Sunni quarters increased from 23 to 24 and Shiite quarters from 38 to 41. As noted earlier, after 2007 the sectarian war was contained with no more shifts in territories among different groups.

In summary, within one year and a half, mixed quarters dropped from 56 to 21, and Sunni quarters increased from 14 to 24 and Shiite quarters from 17 to 41. This findings clearly support an earlier

observation by Damluji: “Although Sunni militias had begun to drive Shi’a residents out of their home in mixed and predominantly Sunni areas before 2006, their efforts did not compare in scale or impact to the strategic campaign of Mahdi Army [*i.e., Shi’a militias*] following the Samarra bombing.” (Damluji, 2010, p.76)

The mean integration (or closeness) and the mean choice (or betweenness) values of the axial lines and segments of Sunni, Shiite and mixed quarters for each of the 4 stages of the sectarian war are shown in **Figures 13 & 14**. As shown, the mean integration and choice values of Sunni and Shiite quarters dropped as they gained territories in the early phase of the war. The finding can be explained using the principle of least efforts. When a territory is annexed by a group in the early stages of a war, first, the annexed territory must be internally segregated characterized by low integration. That is because, an internally segregated territory generally lacks a sense of community and self-preservation resulting from weak ties in spatial networks; therefore, poses least resistance against annexing external forces. Second, the annexed territory must also be externally segregated characterized by low choice, because it is difficult to get help and support from outside when a territory is not well connected to other territories. Therefore, as observed here, groups gaining territories in the early phase of the war saw an overall decrease in integration and choice for their territories because they generally annexed territories characterized by low integration and choice following the principle of least efforts. Conversely, as observed here, groups losing territories in the early phase of the war saw an overall increase in integration and choice for their territories because they generally lost more segregated territories to their opponents.

As shown in the figures, after the initial drop, the mean integration and choice values of Sunni and Shiite quarters increased, or at least the rate of change in these values decreased, as they gained more territories by the early 2007. This finding can be explained by the fact that any new territories to be annexed by a warring group in the later phases of a war must have higher integration and choice than the previously annexed territories, simply because territories with lower integration and choice have been already annexed by now. As a result, as observed here, groups gaining territories saw an overall increase in

integration and choice for their territories in the later phases of a war. In contrast, as observed here, groups losing territories continued to saw an overall increase or stagnation in integration and choice for their territories even in the later phases of a war, because they continued losing their segregated territories and continued making greater efforts to retain their integrated territories.

Finally, we observe that the increase in the mean integration and choice values of Shiite territories had almost plateaued in the final phase of the war. In contrast, the mean choice values of Sunni territories increased again in the late 2007 (**Figure 14**). This would indicate that, with some help from the coalition forces and the 'Sons of Iraq' volunteers, at this time Sunnis were able to take control of some strategically important territories that had more through-movement potentials (refer to Subsection 4.2). This finding can be explained by the fact that in a war dominant groups are not always driven to win territories with least efforts. In many cases, they choose to annex territories for strategic advantages even when such annexation may require greater efforts. From a strategic viewpoint, therefore, the betweenness (or choice) values of territories are important. A territory with higher betweenness has more through-movement potentials (refer to Section 3). In other words, a warring group may be better able to control the flow of goods and services by taking control of a territory with higher betweenness. Therefore, as observed here, it was possible for betweenness of Sunni territories to rise with a slight rise in closeness of these territories (compare **Figure 13 & Figure 14**). However, it is also possible for a group to gain territories without gaining any strategic advantages. In such a case, both closeness and betweenness of the territories of the group may fall following our earlier argument of least efforts.

That the process of change of the sectarian of geography of Baghdad was not random, but could have been strategically determined, has already been suggested by several observers. For example, Damluji (2010) observed that territorial expansion by Sunnis and Shiites involved strategic practices intended to eliminate Sunni or Shiite population from designated areas of the city. Likewise, Tripp observed that the battle for territory between Shiite and Sunni militias reflected how "each side is still seeking to impress on the other that it cannot take everything, that its enemies are so formidable that some kind of deal — to

share or devolve power, to divide the spoils — is required" (Tripp, 2007, cited in Gregory, 2008). This study, therefore, provides some indication for how Sunni and Shiite strategies might have worked at the level of the network of physical spaces in Baghdad during the sectarian war.

[INSERT FIGURES 12, 13, & 14 ABOUT HERE]

7. Conclusion

Since the beginning of the 20th century, the political importance of territory as a bounded region seems to be growing along with the growing importance of space of flows and networks in our cities and states (Brenner, 1999; Rapoport, 1996). Following Timothy Mitchell (1991), we have argued that this apparent contradiction could be explained if we would accept territories not only as bounded regions but also as products of network practices involving human and non-human actors. To illustrate the point, we used space syntax, a set of theories and techniques related to the networks of physical spaces, to study the effects of these networks on territory and power in Baghdad, Iraq. In this city, the Ba'th regime, with the help of a Sunni minority, had suppressed a Shiite majority for decades through different network practices until the regime was overthrown by the US-led War and Occupation of Iraq that started in 2003. However, during the US-led occupation of Iraq a sectarian war unsettled many of the social practices in Baghdad by redefining territorial boundaries among different ethno-religious groups. Since the changes in ethno-religious territories during the sectarian war were well-recorded by different organizations, we used space syntax also to study the effects of the networks of physical spaces on territorial changes in the city showing how warring factions might have used these networks as the basis for territorial changes.

Our study showed that the dual structure of the networks of physical spaces of Baghdad was no different from many other cities around the world that Hillier (2005) reported. However, beneath this more generic dual structure, we found a spatial structure of power that the Ba'th regime used for different forms of power practices involving territories. In order to exercise 'power to' control everyday experience, the

elites of the regime had located their territories on the west side of the river where the more integrated axial lines with more movement potentials were less pervasive compared to the areas on the east of the river. In contrast, to practice 'power over' Shiite territories in the city the regime had used some of the most integrated streets as strategic devices. One of these streets separated Sadr City, the largest Shiite district, from the other parts of city and allowed the military to enforce the separation during periods of political unrest. The others streets, which connected Sadr City to the center of power of the Ba'th regime on the west side of Tigris, gave the Shiites of Sadr City an easy access to the center of power and its ostentatious display around the Ba'thist headquarters. Therefore, they helped the regime to practice 'power over' Shiite by seduction. However, during the periods of strife these streets could easily be turned into an instrument of 'power over' by the regime using military force available from the army barracks located next to its headquarters at the other end of the arm.

Indeed, a large growing body of empirical literature already shows that spatial practices of social oppression do exist in a variety of settings along a range of political, racial, class, gender, and sexual divisions. These oppressive spatial practices are particularly strong in ethnically dominated homeland states, or "ethnocracies", that are embroiled in interethnic conflicts (Arasaratnam, 1987; Yiftachel, 1992a, 1992b, 1994, 1997, 1998, 1999, 2006). Our study adds to the literature on territorial practices of power by showing how the networks of physical spaces can be used to practice both 'power over' and 'power to' control territories of less-dominant groups in the city. This is significant, as was noted earlier, because in most cases of territorial practices of 'power to' is more pervasive than 'power over'. Yet, studies on spatial practices of 'power to' are rare because such practices may involve the networks of physical spaces. This study helps fill-in the gap by making these networks visible using space syntax to explain territorial practices of 'power to' control a population (in this case the population of Baghdad) by a dominant political system (in the case the Ba'th regime).

More importantly, however, this study shows that the networks of physical spaces do not always need a dominant political system, like the Ba'th regime, to have effects on territorial practices. Its findings

indicate that even at times of war, when a dominant political entity is undecided or still being decided, the warring factions of the city may use the networks of physical spaces to decide which territories are to be annexed now, and which are to be left alone or to be annexed later in the war. As a result, the networks of physical spaces may be the only constant in a territorial scenario that keeps changing during wars. Thus, in contrast to Lassault (2007), who had argued that it is the valorization of physical space by a dominant political ideology that help define the specificity of territory, according to our study it seems to be the other way around during wars. We observe that during wars territories emerge based on spatial connectedness, continuity and discontinuity, which political systems may valorize later during periods of calm.

As we have noted earlier in the paper, many authors have already argued how network practices may help enhance territorial definitions (Mitchell, 1991; Painter, 2010). In this regard, Harvey (1985, 2001) takes a more spatial viewpoint when he argues that we need socially produced geographical infrastructures – including urban built environments, street networks, and long-distance communication networks – in order for the space of flows or a networked society to be continually accelerated temporally and expanded spatially. This study supports Harvey's viewpoint by showing how practices involving the networks of physical spaces may affect the shifting geographical and political nature of territories.

Despite its strengths, however, the limitations of the study are clear. As indicated before, human territorial processes are quite messy and complex. It may be true that humans use the networks of physical spaces for territoriality, but these networks must be only one of many determinants, mechanisms and processes that help shape territory and territoriality, as so many others have argued (Cowen & Gilbert, 2008; Cox, 2008; Delaney, 2008; Giddens, 1985; Grosby, 1995; Lussault, 2007; Paasi, 2003; Sack, 1983; Storey, 2001) . This study tells us very little about these other determinants, mechanisms and processes, many of which cannot be studies and understood without extensive field data on territoriality. In future, therefore, it would be necessary to investigate the relationships between some of these other determinants of territoriality and spatial networks to describe, more precisely, the mechanisms and processes of

territoriality. In future, it would be also necessary to investigate other cities divided by war in recent times, like Mogadishu, Abidjan, and Benghazi, for further validation of the findings presented here.

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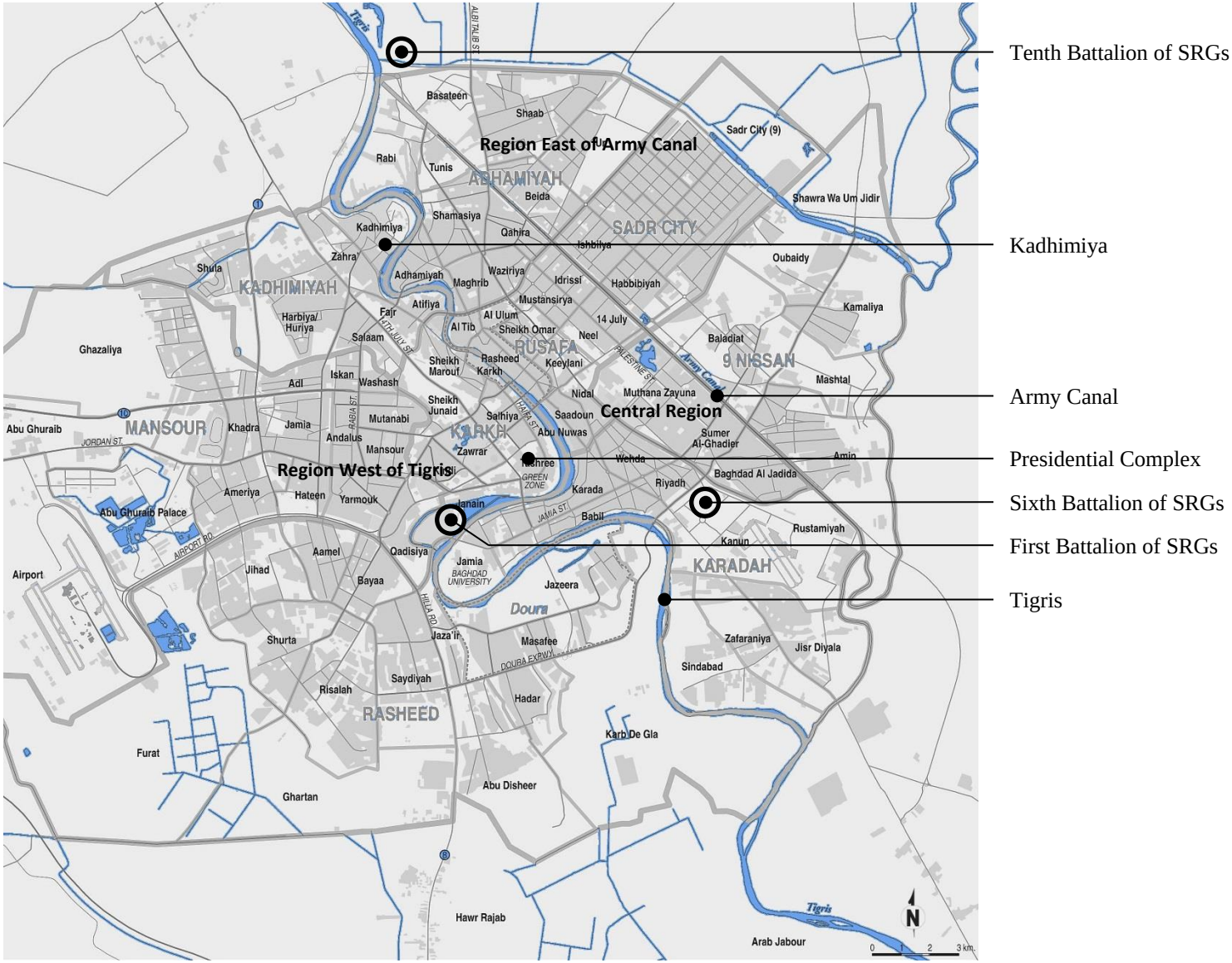


Figure 1: Regions, districts and neighborhoods (quarters) of Baghdad. Drawn based on a map by the Institute for the Study of War.

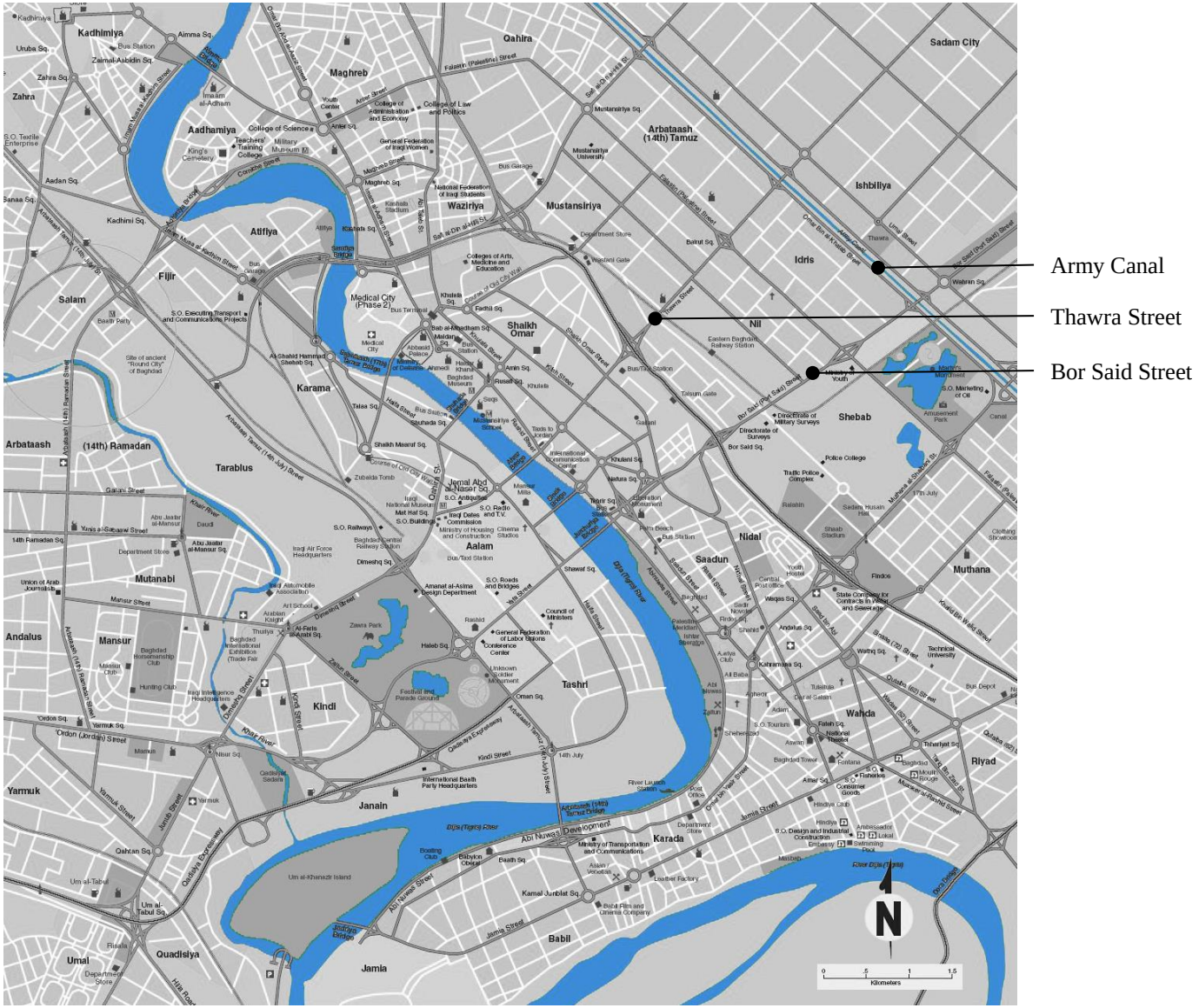


Figure 2: Central areas of Baghdad. Drawn based on a map by Engineering Surveys Reduction Ltd., The Washington Post.

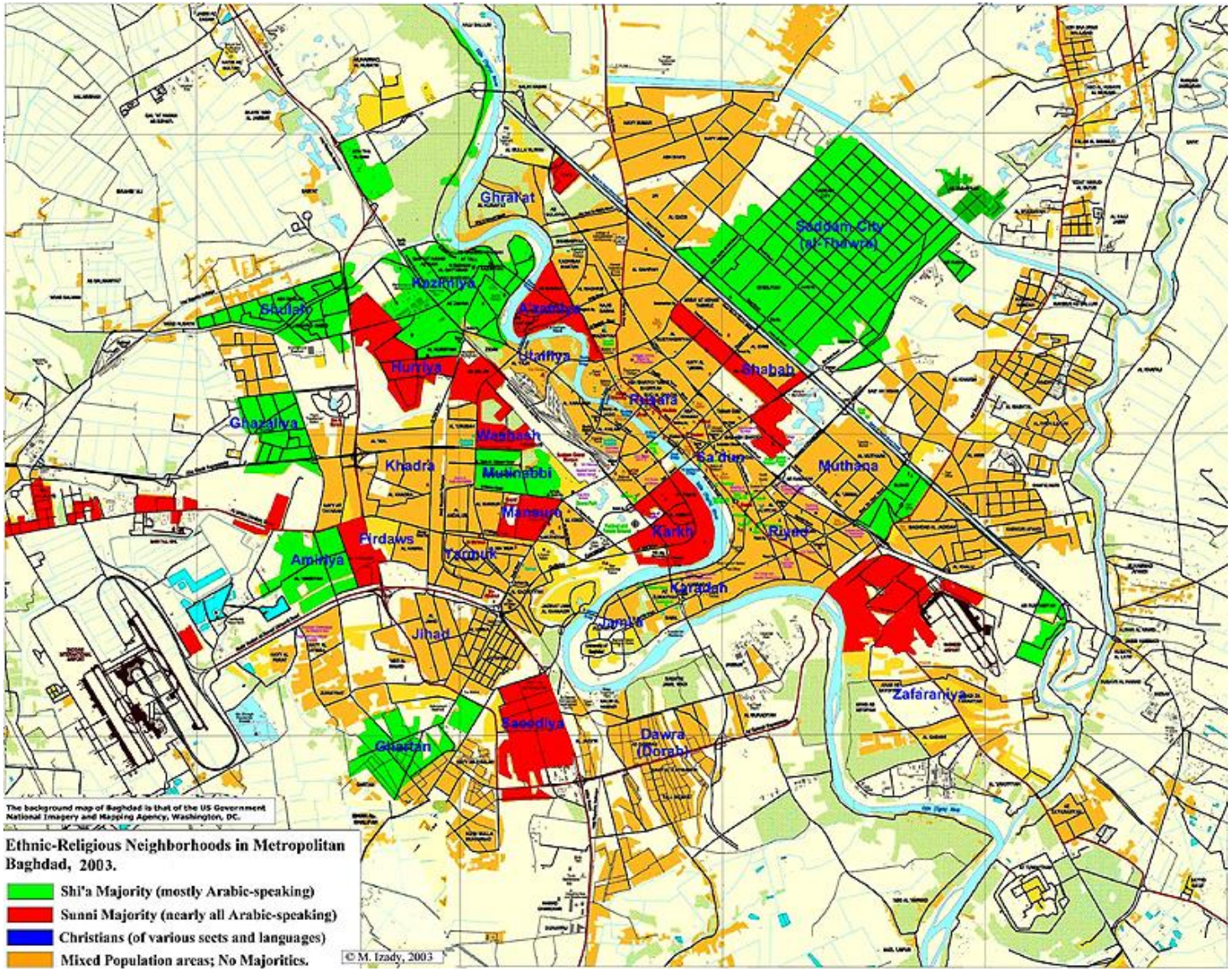


Figure 3: Ethnic-religious neighborhoods in Baghdad, 2003. Printed with permission from M. Izady.

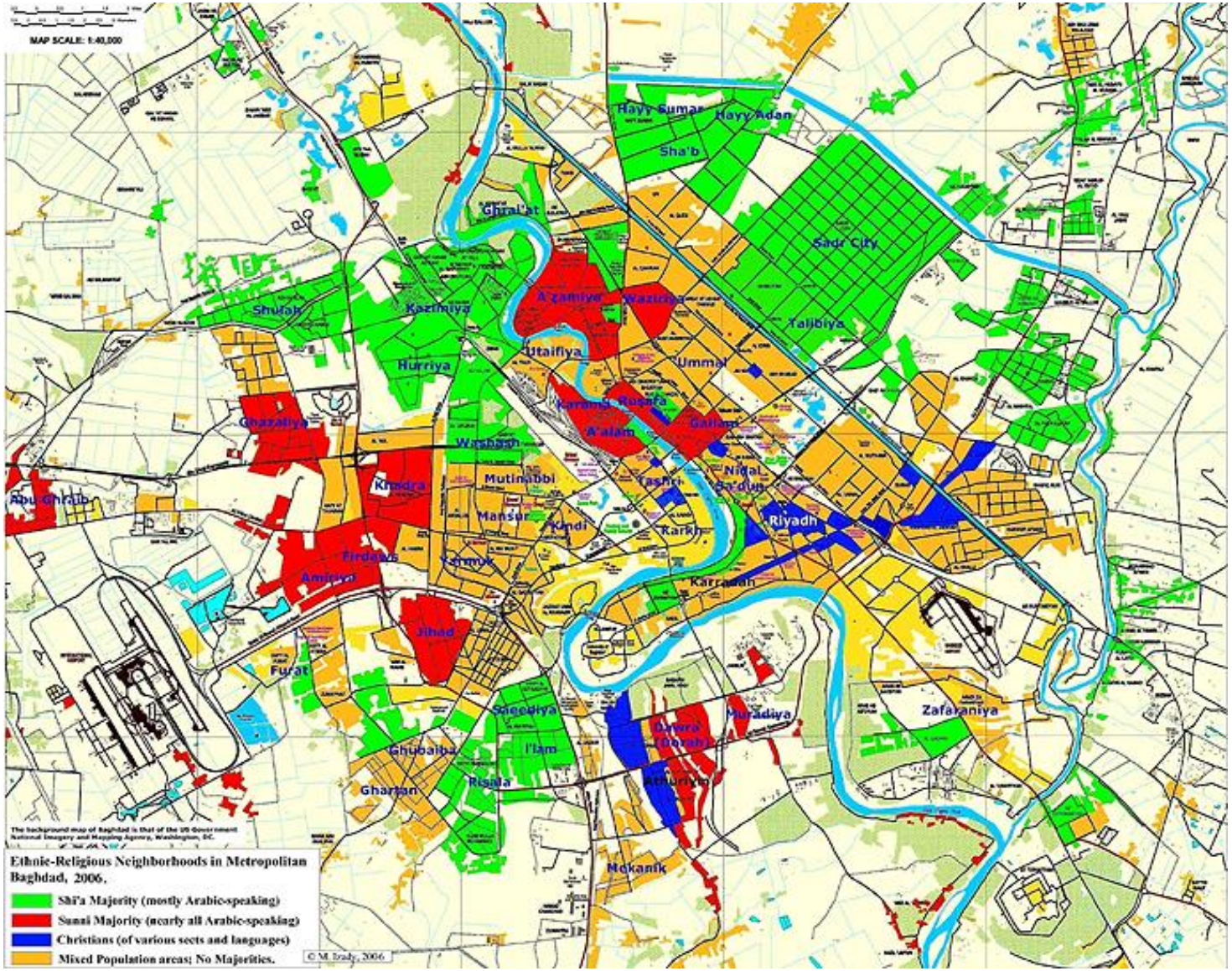


Figure 4: Ethnic-religious neighborhoods in Baghdad, late 2006. Printed with permission from M. Izady.

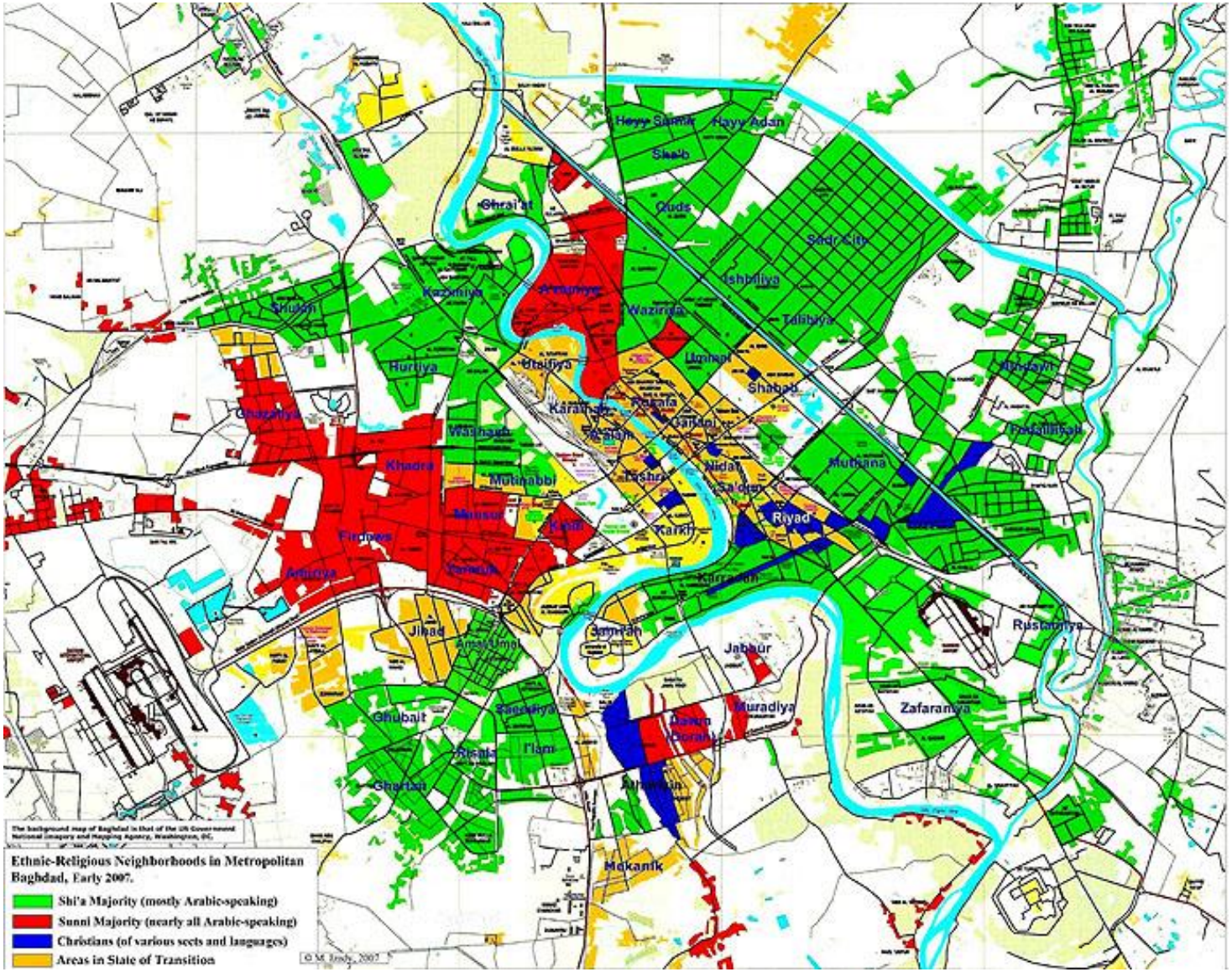


Figure 5: Ethnic-religious neighborhoods in Baghdad, early 2007. Printed with permission from M. Izady.

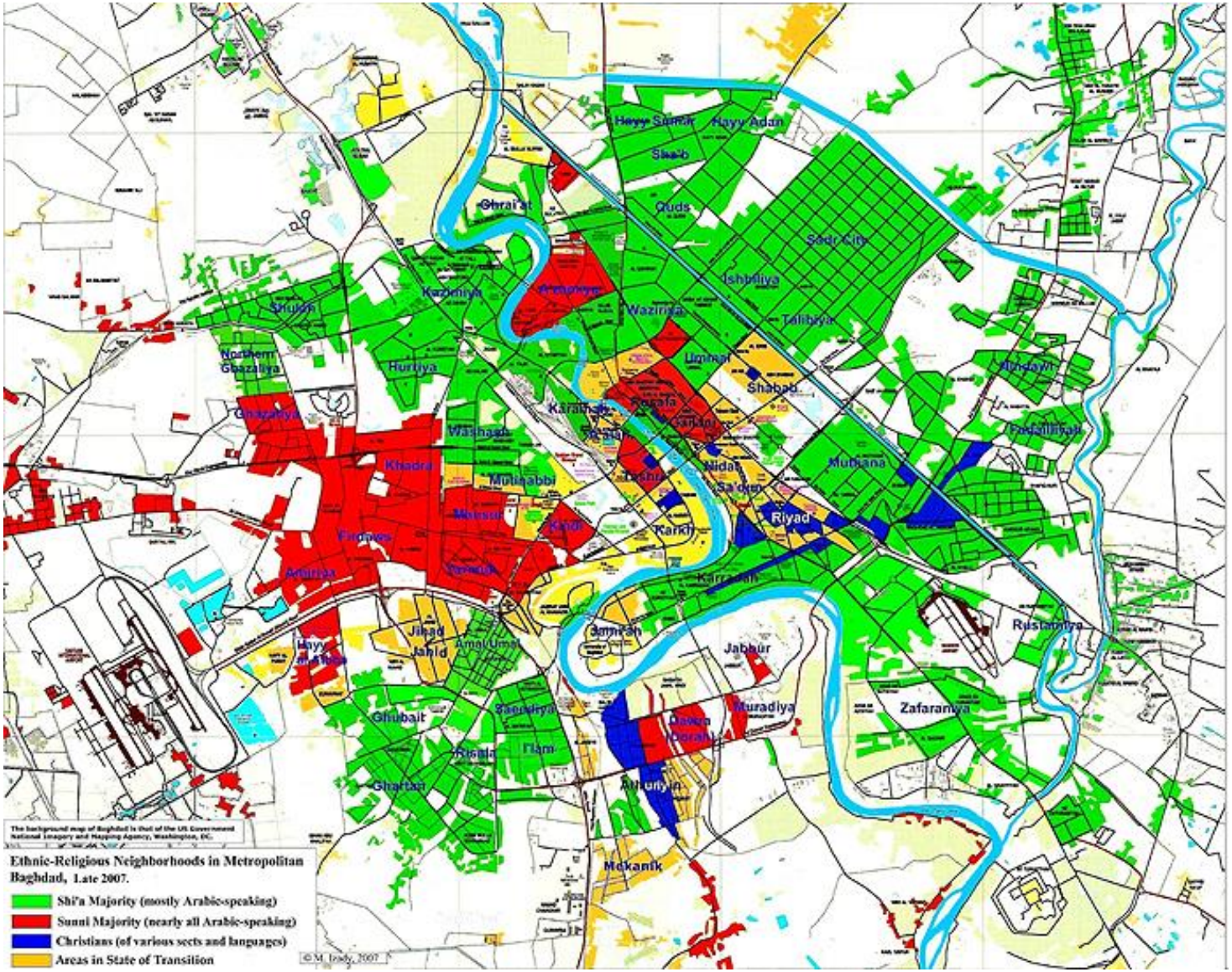


Figure 6: Ethnic-religious neighborhoods in Baghdad, late 2007. Printed with permission from M. Izady.

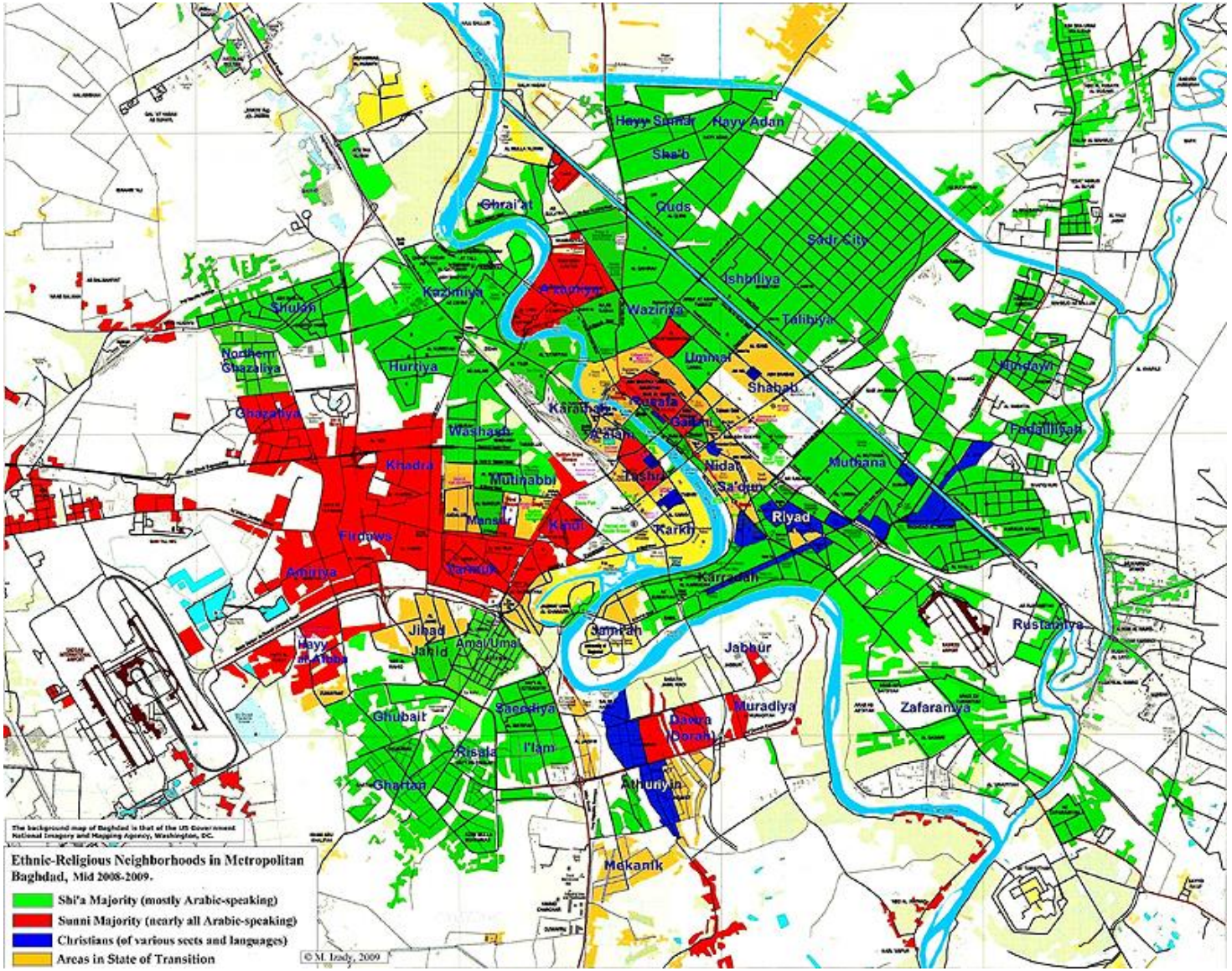


Figure 7: Ethnic-religious neighborhoods in Baghdad, mid 2008-2009. Printed with permission from M. Izady.

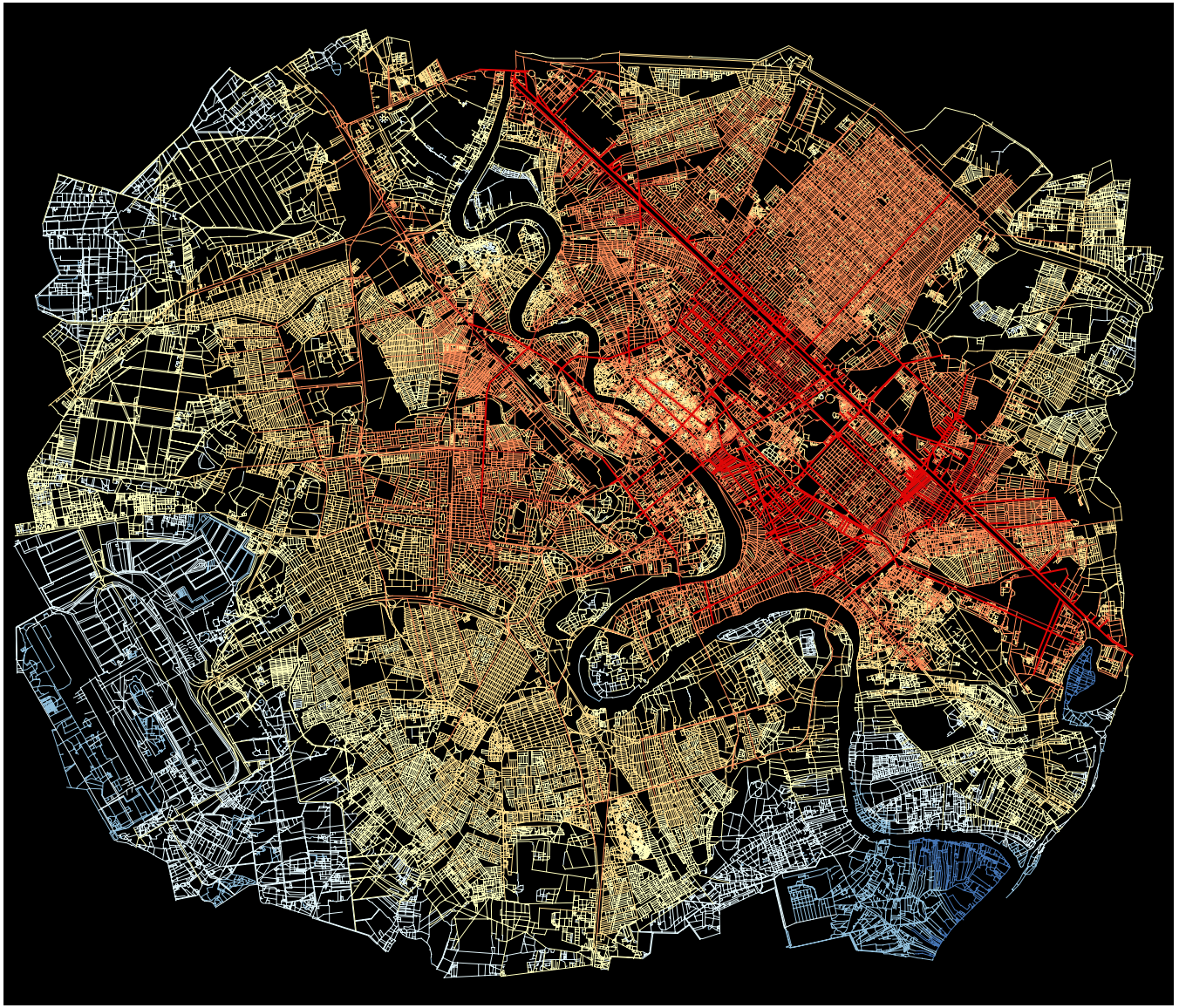


Figure 8: The axial map of Baghdad colored using Integration-Rn.

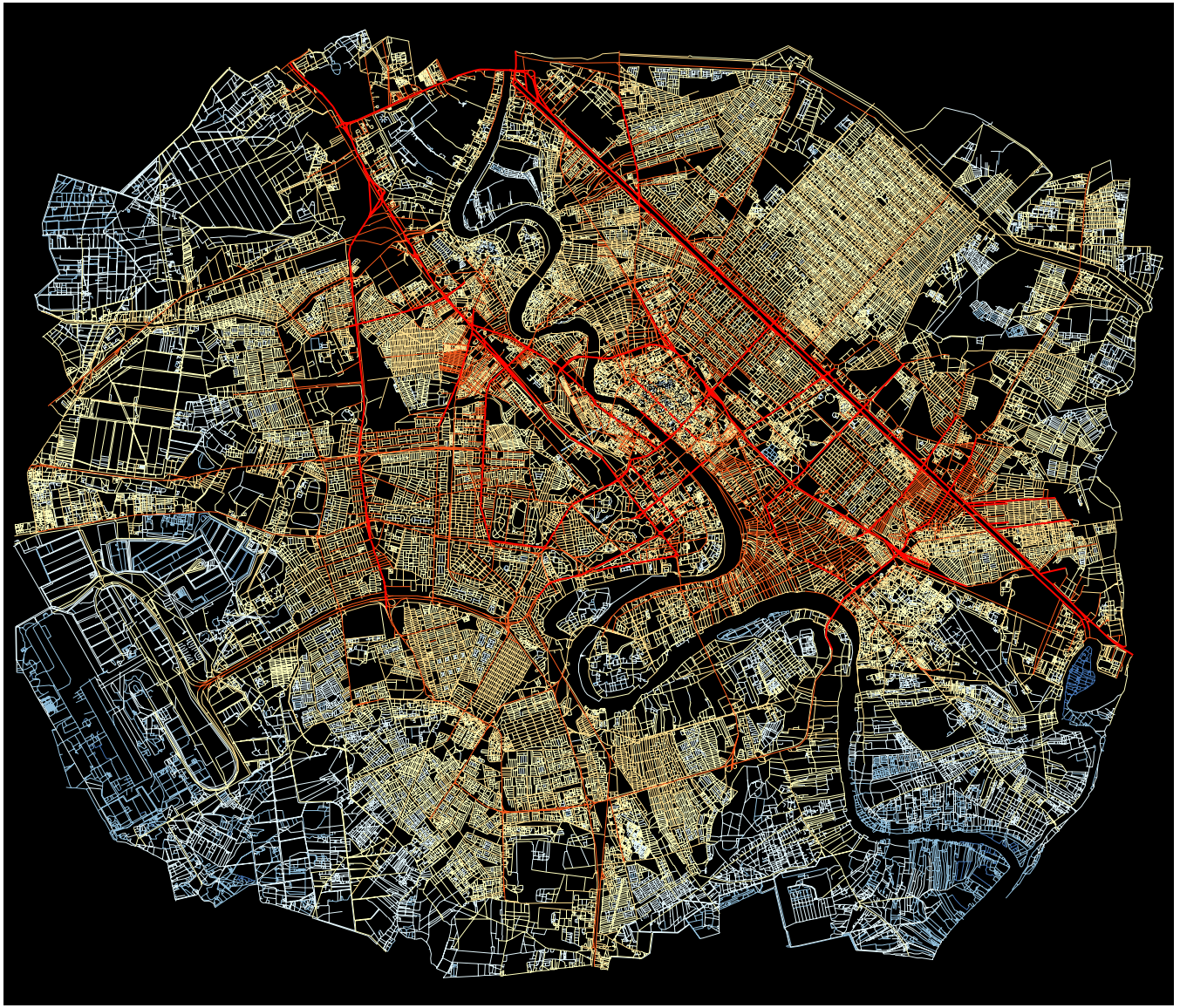


Figure 9: The segment map of Baghdad colored using Integration-Rn.

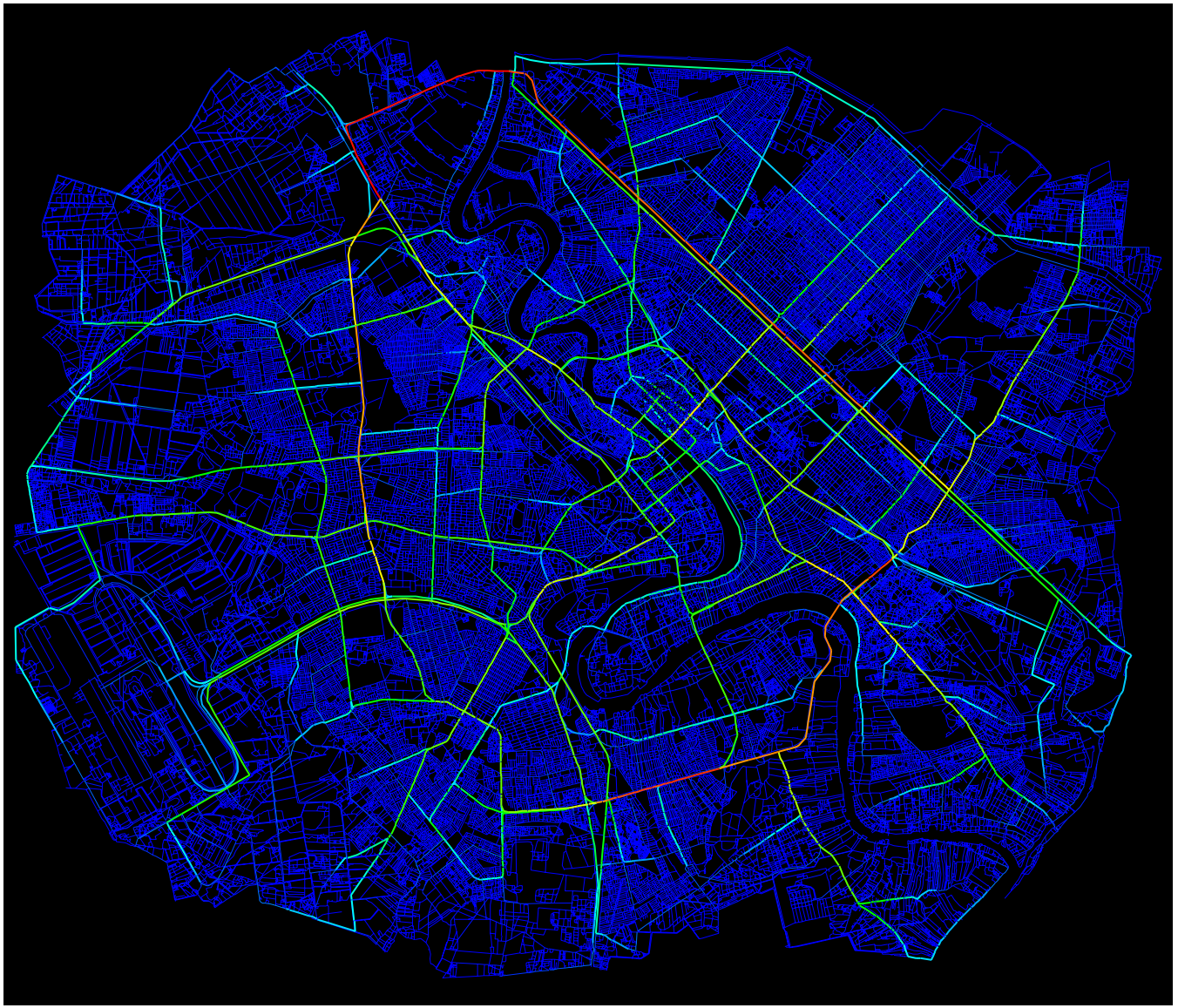


Figure 10: The segment map of Baghdad colored using Choice-Rn.

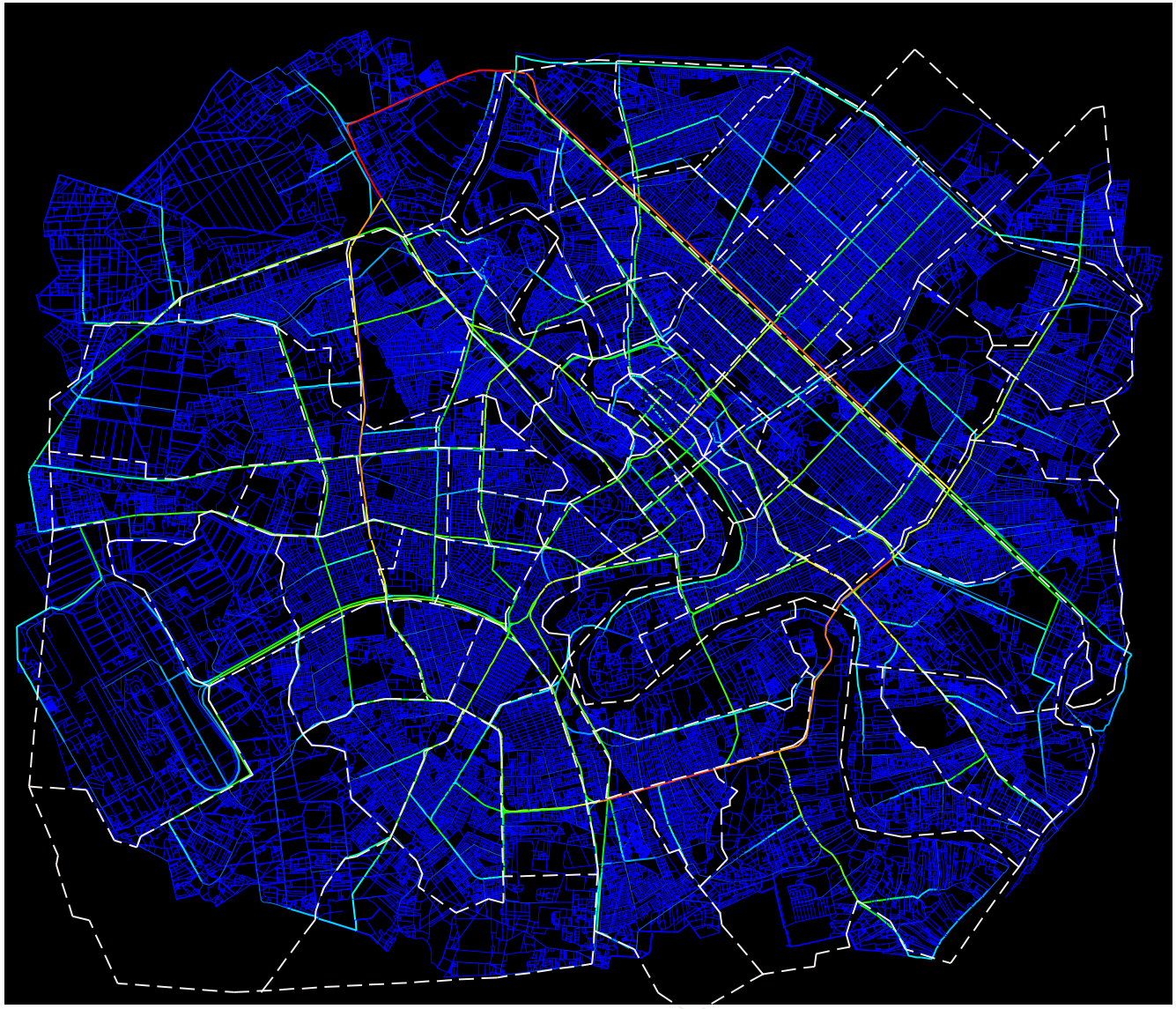


Figure 11: The segment map of Baghdad colored using Choice placed on the map of Baghdad’s neighborhoods (quarters).

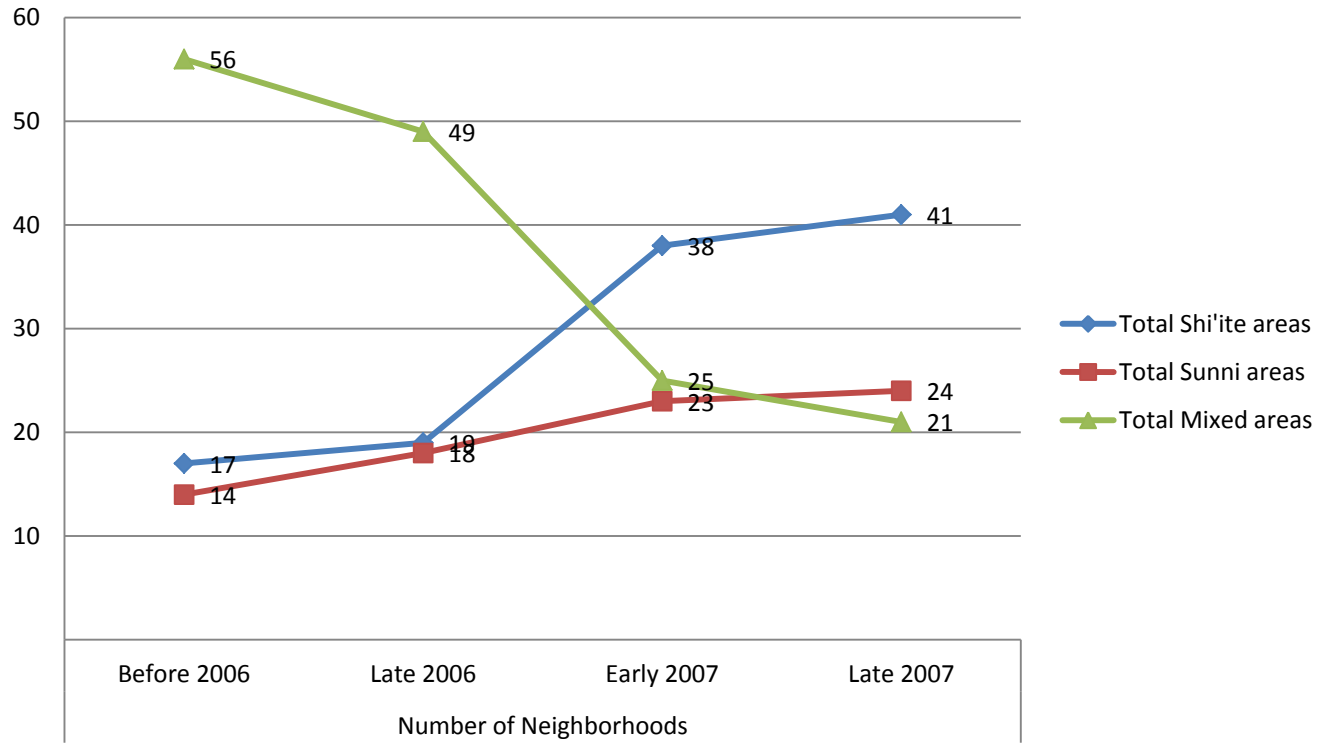
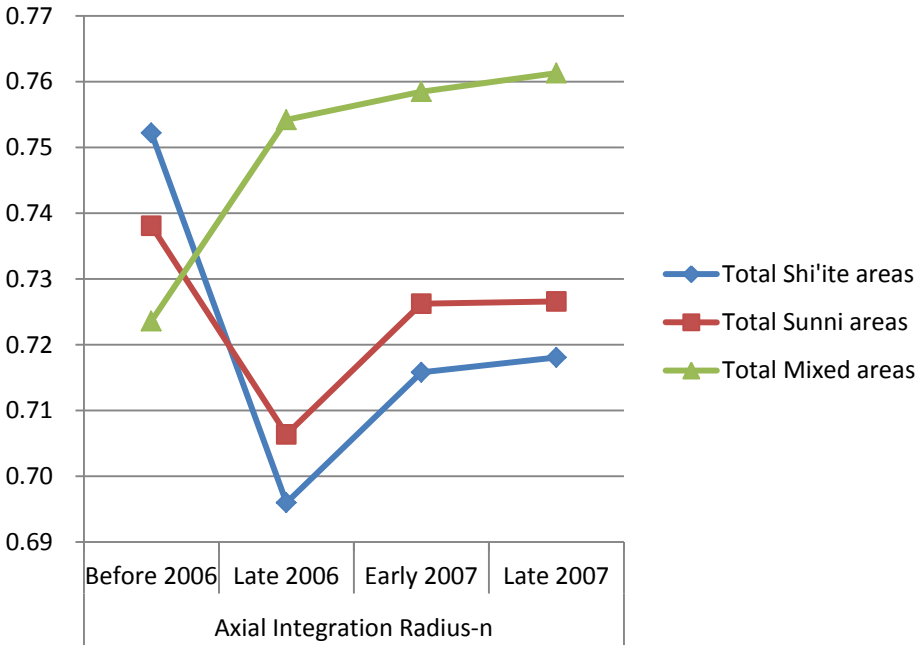


Figure 12: The number of the three primary ethnic-religious neighborhoods (quarters) in Baghdad before and during the sectarian war.



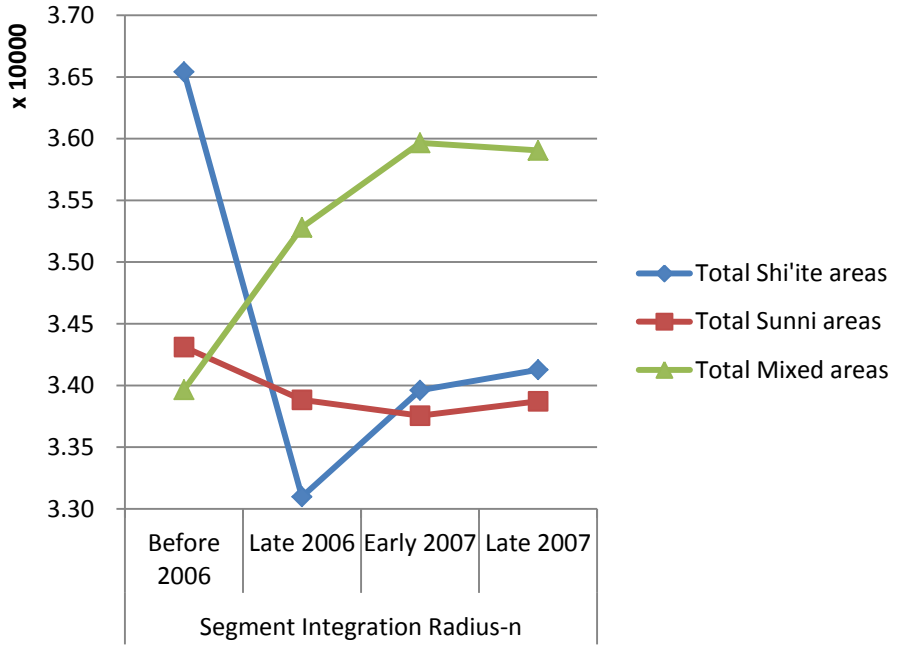
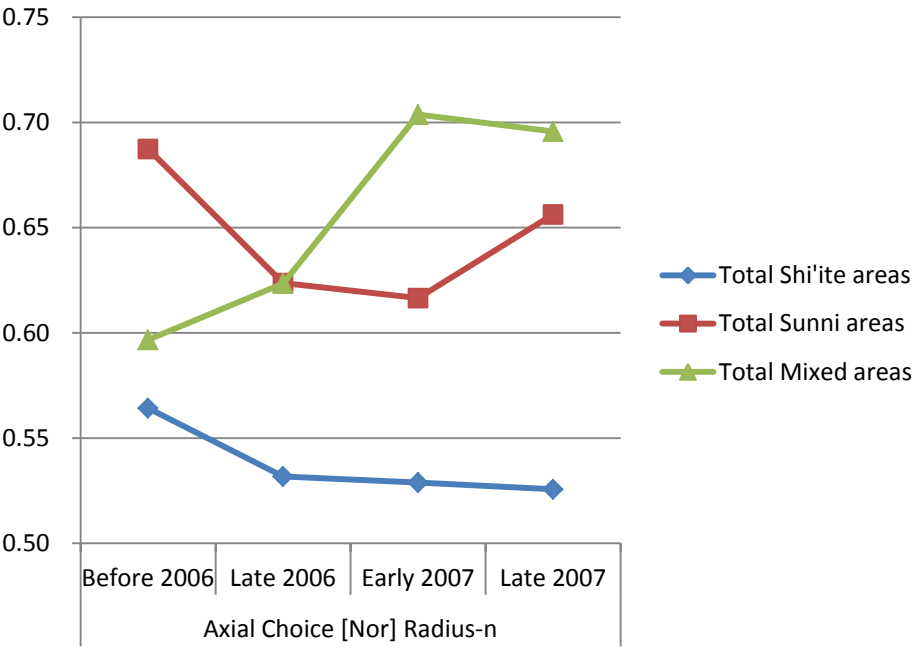


Figure 13: The mean integration values of the three primary ethnic-religious neighborhoods (quarters) in Baghdad before and during the sectarian war.



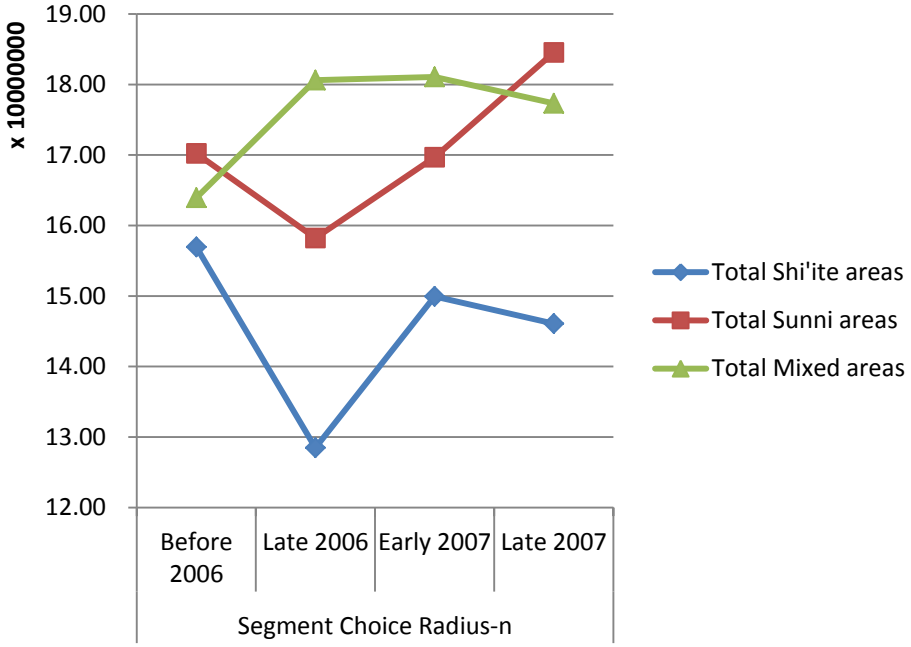


Figure 14: The mean choice values of the three primary ethnic-religious neighborhoods (quarters) in Baghdad before and during the sectarian war.